Major Drainageway Plan and Flood Hazard Area Delineation for Bullhead Gulch and Prince Tributary

Baseline Hydrology Report | April 2023

PROJECT SPONSORS

Mile High Flood District | Boulder County | City of Lafayette

MHFD
MILE HIGH FLOOD DISTRICT

Boulder County

City of Lafayette

Prepared By
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APRIL 2023

Kurt Bauer
Project Manager
MILE HIGH FLOOD DISTRICT
2480 W. 26TH Ave. Suite 156-B
Denver, CO 80211

Re: Major Drainageway Plan and Flood Hazard Area Delineation for Bullhead Gulch and Prince Tributary Agreement No. 20-07.20

Dear Kurt Bauer,

Michael Baker International is pleased to submit the Baseline Hydrology Report for the Major Drainageway Plan and Flood Hazard Area Delineation for Bullhead Gulch and Prince Tributary. This report documents the baseline hydrology development process.

The hydrology report was prepared with the cooperation of MHFD, City of Lafayette, and Boulder County. The baseline hydrology will be used for the flood hazard area delineation, the alternatives analysis and conceptual design.

We appreciate the opportunity to work with you on this project and look forward to working with you on the next phase of the project.

Sincerely,

MICHAEL BAKER INTERNATIONAL, INC.

Andrew Friend, PE
Project Manager

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Table of Contents

Section 1: Introduction....1
1.1 Authorization....1
1.2 Purpose and Scope....1
1.3 Planning Process....1
1.4 Mapping and Surveys....2
1.5 Data Collection....2
1.6 Acknowledgements....3
Section 2: Study Area Description....4
2.1 Project Area....4
2.2 Land Use....4
2.3 Reach Descriptions....6
2.4 Flood History....9
2.5 Environmental Assessment....10
Section 3: Hydrologic Analysis....11
3.1 Overview....11
3.2 Design Rainfall....11
3.3 Subwatershed Characteristics....12
3.4 Detention....13
3.5 Hydrograph Routing....13
3.6 Previous Studies....14
3.7 Results of Analysis....14
References....18
Appendix A – Project Correspondence....19
Appendix B – Hydrologic Analysis....39

List of Figures

Figure 2-1: Project Location within the Mile High Flood Control District....4
Figure 2-2: Study Area and Reach Map....5
Figure 2-3 Concrete Channel near Goodhue Ditch....6
Figure 2-4 Crushed 18” CMP near BN Railroad....6
Figure 2-5 36” RCP under BN Railroad....7
Figure 2-6 6’ Deep Rectangular Channel under Pedestrian Bridge on Roser Dr....7
Figure 2-7 72” CMP outlet from Indian Peaks Filing 17 Pond near Courtesy Rd....7
Figure 2-8 Defined channel along Bullhead Gulch....7
Figure 2-9 24” RCP east of Spring Creek Dr....8
Figure 2-10 Detention Pond outlet downstream of N 111th St....8
Figure 2-11 Trail Crossing between Flatiron Circle and Flatiron Meadows Blvd on Prince Tributary....8
Figure 2-12 Natural channel of Prince Tributary....9
Figure 2-13 Pedestrian Bridge south of Erie Parkway and west of Flatiron Meadows Blvd on Prince Tributary....9

List of Tables

Table 1-1: Project Participants....3
Table 2-1 General Watershed Characteristics....4
Table 2-2 Existing Land Use Values....6
Table 2-3 Major Roadway Crossings....9
Table 3-1: Rainfall Depths....11
Table 3-2: Subwatershed Parameters....12
Table 3-3: Infiltration Rates....13
Table 3-4: Detention Ponds Data Table....13
Table 3-5: Manning’s Roughness (n-value) Coefficients....14
Table 3-6: Comparison of Future 100-Year Peak Flow Rates....15
Table 3-7: Summary of Peak Flows at Key Design Points....16
Table 3-8: % Change from Existing to Future at Key Design Points....17

List of Appendices

Appendix A: Project Correspondence
Appendix B: Hydrologic Analysis

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Section 1: Introduction

1.1 Authorization

On July 22nd, 2020 the Mile High Flood Control District (MHFD) contracted with Michael Baker International (Baker) to complete a Major Drainageway Plan (MDP) and Flood Hazard Area Delineation (FHAD) Study for Bullhead Gulch and Prince Tributary. The Project is co-sponsored by the City of Lafayette (COLA) and Boulder County (BC). All work for the Project was completed under Agreement Number 20-07.20. The original agreement was amended by Agreement No. 20-07.20A and Agreement No. 20-07.20B for additional scope of work to aid in completing this baseline hydrologic analysis.

1.2 Purpose and Scope

MHFD, COLA, and BC have engaged Baker to prepare a Baseline Hydrology Report for the Bullhead Gulch and Prince Tributary area which is located in BC. The purpose of this study is to analyze all existing drainageways within the study area; develop Flood Hazard Area Delineation (FHAD); develop alternative planning concepts to mitigate flood damages; prepare a conceptual design of an alternative selected by the COLA, BC, and MHFD. The information in this report will support the project stakeholders and other users in the implementation of drainage improvements, interagency coordination, floodplain management, and other land-use controls as needed to reduce potential damages and adverse development in flooded areas.

The following is a summary of the scope of work for this Baseline Hydrology Report:

- Develop and update existing and future conditions for the Bullhead Gulch and Prince Tributary watershed;
- Perform a field visit and inspection of the existing drainage facilities, documenting the drainage facilities with photographs, description of the drainage facility, and an assessment of the condition of the drainage facilities;
- Consult with MHFD, COLA and BC, then consult with any organization who has pertinent knowledge and interest in the watershed;
- Set up and maintain for the duration of the project a website linked to the MHFD's web address;
- Define watershed and subwatershed boundaries consistent with MHFD guidance;
- Evaluate peak flows and volumes for the existing and future land-use watershed conditions with existing drainage infrastructure for reasonableness;
- Further analysis of watershed routing based on 2D modeling under Agreement Number 20-07.20A and 20-07.20B and the necessary updates to the baseline hydrologic analysis;
- Address comments received on the Baseline Hydrology Report in coordination with MHFD, COLA and BC.

In addition to this Baseline Hydrology Report, the following tasks are being performed as part of this overall study:

- Collection and evaluation of available reports and studies on existing drainage facilities, zoning and land ownership plans, current and future land use plans, and other drainage related information;
- Coordination and meetings with the project stakeholders;
- Field Investigation to identify major drainage structures, existing problem locations and hydraulic parameters;
- Evaluation of the hydraulic capacity of the existing drainage system and facilities;
- Development of drainageway improvement alternatives that address stakeholders' future needs;
- Evaluation of alternatives based on criteria, estimated construction costs, potential flooding, planning constraints, and other related issues;
- Preparation of an Alternatives Analysis document and a Conceptual Design document.

1.3 Planning Process

An effective planning process typically begins with research and data collection and ends with a solid plan for future improvements that addresses multiple stakeholder's needs and can be used as a reference document for years to come. In between, the process includes technical analysis, engineering calculations, agency and public coordination, attention to the environment, and the use of sound judgement and common sense. This Baseline Hydrology Report articulates the vision of the stakeholders for the future of the watersheds and guides future planning and development activity by highlighting recommended projects and alternatives that align with community priorities.

The planning process followed for this project generally included the following tasks:

- Assessing the condition of the existing major drainage system and major public facilities.
- Analyzing the hydraulic capacity of the existing drainage system and facilities.
- Identifying drainageway improvements opportunities that reduce flood risk and improve water quality.
- Developing conceptual design documents that can be implemented to reduce risk and/or increase the stability of the drainageways.

The goals and objectives for this study identified during the project kickoff meting include:

- Updating information on areas in the Bullhead Gulch and Prince Tributary watershed that have been developed since the last FHAD (1991);
- To better understand and map flood risk in the Bullhead Gulch and Prince Tributary watershed;
- To mitigate and reduce flood risk in three specific areas of concern: Isabelle Road and US-HWY 287 intersection, Brownsville neighborhood in Unincorporated Areas of Boulder County, and southeast corner off Baseline Road and 95th Street;
- To have an MDP with updated existing and future land use, precipitation data, outfall locations and the latest versions of CUHP and EPA SWMM;
- To establish a plan to reduce or manage flood risk in the Bullhead Gulch and Prince Tributary watershed.

Coordination meetings between MBI, MHFD and key stakeholders occurred frequently through this process to aid in effective collaboration for this study. Key meeting notes and other project correspondence are provided in Appendix A.

1.4 Mapping and Surveys

Topographic Data

The topographic data consisted of 3-foot contours (2014) in an ESRI shape file format. The contours were developed from LiDAR data collected by Photo Science as part of the Colorado Flood LiDAR project in the fall of 2013 while there was no snow on the ground and rivers were at or below normal levels. The data was developed on a horizontal projection/datum of UTM 13 North, NAD83, meters and a vertical datum of NAVD88[1] .

Additional Survey

Additional ground survey of crossings and major hydraulic features along Bullhead Gulch was conducted in October 2020 by MFHD.

Aerial Photography

Aerial imagery was obtained from National Agriculture Imagery Program (NAIP, February 2015).

Base Mapping

Base mapping information was obtained from the CDOT Open Data Catalog, DRCOG Open Data Catalog, and MHFD Mapping and Data. Additional base mapping information, not available on the Open Data Catalog, was provided directly to Baker by the COL:

- Roads (Open Data Catalog)
- Parcels (Open Data Catalog)
- Jurisdictional boundaries (Open Data Catalog)
- Zoning (Open Data Catalog)
- Parks and Open Space (Open Data Catalog)
- Water Ways (Open Data Catalogs)
- Watershed Boundaries (MHFD Mapping and Data)
- Stormwater Facilities and Infrastructure (MHFD Mapping and Data, COL, BC)
- Planimetric Data (COL, BC)

Coordinate System and Datum

All Geographic Information Systems (GIS) mapping and data for this Project were developed using:

- Coordinate System: Colorado State Plane Central, Zone 0501 (US Feet)
- Horizontal Datum: NAD83
- Vertical Datum: NAVD88

[1] Photo Science, *LiDAR Data for Colorado Flood*.

1.5 Data Collection

The following types of information were collected and referenced for the hydrologic analysis in addition to the mapping and survey information collected in Section 1.4. A complete list of references is provided at the end of this report.

- *Flood Hazard Area Delineation: Bullhead Gulch and Tributaries* – Prepared by Advanced Sciences, Inc., July 1991
- *Alternative Development Report For Bullhead Gulch Watershed* – Prepared by Advanced Sciences, Inc., September 1991
- *Outfall Systems Planning: Bullhead Gulch Watershed* – Prepared by Advanced Sciences, Inc., June 1992
- *Town of Erie, Outfall Systems Plan (West of Coal Creek)* – Prepared by RESPEC Consulting and Services, January 2014
- *Westridge Phase I Landscape Plan* – Prepared by DTJ Design, February 2007
- *Westridge Tractor Supply* – Prepared by Jade Consulting LLC, September 2017
- *Silo Subdivision Phase I Road, Storm, Sanitary, and Water Public Improvements* – Prepared by CAGE Civil Engineering, January 2020
- *Silo Subdivision Phase I Road, Storm, Sanitary, and Water Public Improvements* – Prepared by CAGE Civil Engineering, June 2020
- *Silo Subdivision Offsite Stormwater, Sanitary Sewer, and Water Main Improvements* – Prepared by CAGE Civil Engineering, January 2020
- *US-287 & Isabelle Road Improvement Advertisement Plans* – Prepared by JUB Engineers, August 2020
- *Flatiron Meadows: Regional Detention Pond* – Prepared by Calibre, March 2016
- *Indian Peaks Filing No. 17 Final Plat* – Prepared by Hurst & Associates, Inc., October 2007
- *Arapahoe Ridge Pond Improvements and Maintenance Plan* – CH2M Hill, April 2007
- Arapahoe *Ridge Filing No 2* – Love & Associates, Inc., April 2003

1.6 Acknowledgements

This report was prepared in coordination with Project Sponsors MHFD, COLA, BC as well as Key Stakeholders from Town of Erie (TOE) and City of Louisville (COLO). Representatives who contributed to this study are listed in Table 1-1.

Table 1-1: Project Participants

Name	Representing	Project Role
Kurt Bauer	MHFD	Project Manager
Drew Roberts	MHFD	Project Engineer
Kelly Watson	Boulder County	Key Stakeholder, Project Sponsor
Dave Webster	Boulder County	Key Stakeholder, Project Sponsor
Jeff Arthur	City of Lafayette	Key Stakeholder, Project Sponsor
Wendi Palmer	Town of Erie	Key Stakeholder
Cameron Fowlkes	City of Louisville	Key Stakeholder
Tyler Trojan	City of Louisville	Key Stakeholder
Jillena Yeager	Michael Baker International	Project GIS Support
Farina Kazi	Michael Baker International	Project Engineer
Andrew Friend	Michael Baker International	Project Manager

Section 2: Study Area Description

2.1 Project Area

The study area includes all the contributing watershed area to the tributaries labeled Bullhead Gulch and Prince Tributary (see Figure 2-2) located approximately 20 miles northwest of Denver within Boulder County as seen in Figure 2-1. Bullhead Gulch is the west bank tributary to Prince Tributary. Prince Tributary is the southern tributary to Boulder Creek. The watershed slopes to the northeast and consists of several short tributary channels which either combine or flow directly into Boulder Creek. The watershed is situated primarily in T 1 N, R 69 W of the 6th Prime Meridian along US HWY-287 between Boulder Creek and Coal Gulch. The major transportation lanes in the watershed include US HWY-287 and N 95th St in the north-south direction and Baseline Road, Arapahoe Rd, Isabelle Road, and Jasper Rd in the east-west direction. The Union Pacific Railroad (UP Railroad) is another important transportation line in the watershed. This is a major railroad built and owned by the Denver Union Terminal (DUT) in 1912. The UP Railroad enters Denver via Cheyenne in the North and North Platte and Abilene in the East and was incorporated on July 1, 1862. The line was constructed to meet the Central Pacific line in the San Francisco Bay.

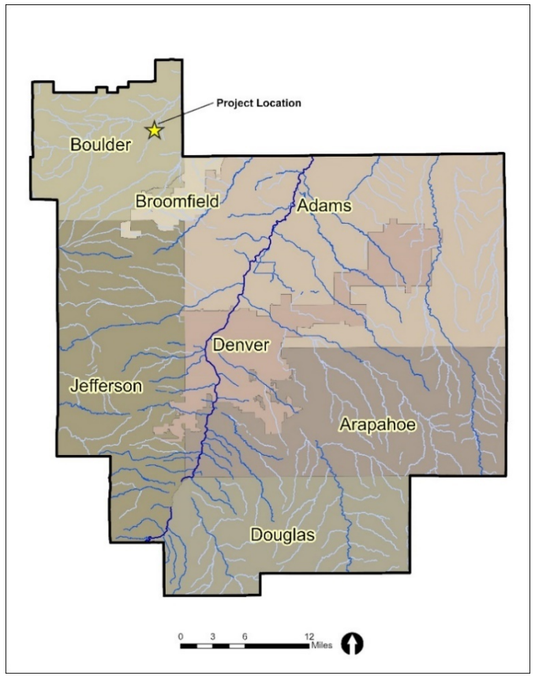

Figure 2-1: Project Location within the Mile High Flood Control District

Previous studies include a FHAD for the Bullhead Gulch and Tributaries watershed performed in 1991, a Bullhead Gulch Outfalls System Plan (OSP) Phase A from 1991, a Bullhead Gulch OSP Phase B from 1992, and a Town of Erie OSP from 2014. MHFD in partnership with the COLA, COLO, TOE, and BC seeks to develop an updated FHAD and MDP for the Bullhead Gulch and Prince Tributary watershed. All drainage pathways are located either in COLA, COLO, TOE or Boulder County. General watershed characteristics are shown in Table 2-1. The study area is primarily comprised of soils with moderate to high infiltration rates, with the exception of areas closer the confluence with Boulder Creek, which have low infiltration rates. The elevation change from the upstream most subasin to the confluence with Boulder Creek is approximately 650 ft. The various reaches within the watershed are discussed in Section 2.3.

Table 2-1 General Watershed Characteristics

Characteristic	Bullhead Gulch and Prince Tributary
Highest Watershed Elevation (ft)	5607.68
Lowest Watershed Elevation (ft)	4957.15
Average Watershed Slope (%)	1.3
Watershed Shape (length/width)	2.7
Watershed Area (square miles)	13.5

2.2 Land Use

Zoning data was provided by COLA, COLO, TOE and BC in GIS shapefile format. Existing land uses were initially determined based on the zoning data. Given that the zoning data originated from multiple sources, the land use attribute for the watershed was manually correlated to the respective City/District zoning datasets. The zoning information was then used to obtain an initial estimate of imperviousness based on MHFD recommended values for equivalent land uses. An impervious features shapefile was created from the GIS data and was used to obtain a direct calculation of imperviousness areas in each subwatershed. The combined zoning data was then compared to aerial imagery and the land uses were adjusted as necessary. This information was used to obtain an initial estimate of imperviousness for existing conditions.

Additional imperviousness based on future development in some portions of the watershed will have a direct impact on discharges. Zoning areas that did not have a direct correlation to current land uses based on aerial imagery inspection were assigned land uses representative of their respective future development potential as designated by the zoning data provided by COLA, COLO, TOE and BC. A majority of the watershed remains the same between existing and future conditions, except for some areas that have not been fully developed yet in the southern portion of the watershed. Table 2-2 lists the MHFD specific land uses, the associated percent impervious values, and the existing percent of the watershed area the land use makes up. Existing and future condition land use percent impervious values as well as development status for the watershed are shown on the Interactive Baseline Hydrology Map for the watershed in Figure B-1 as part of Appendix B.

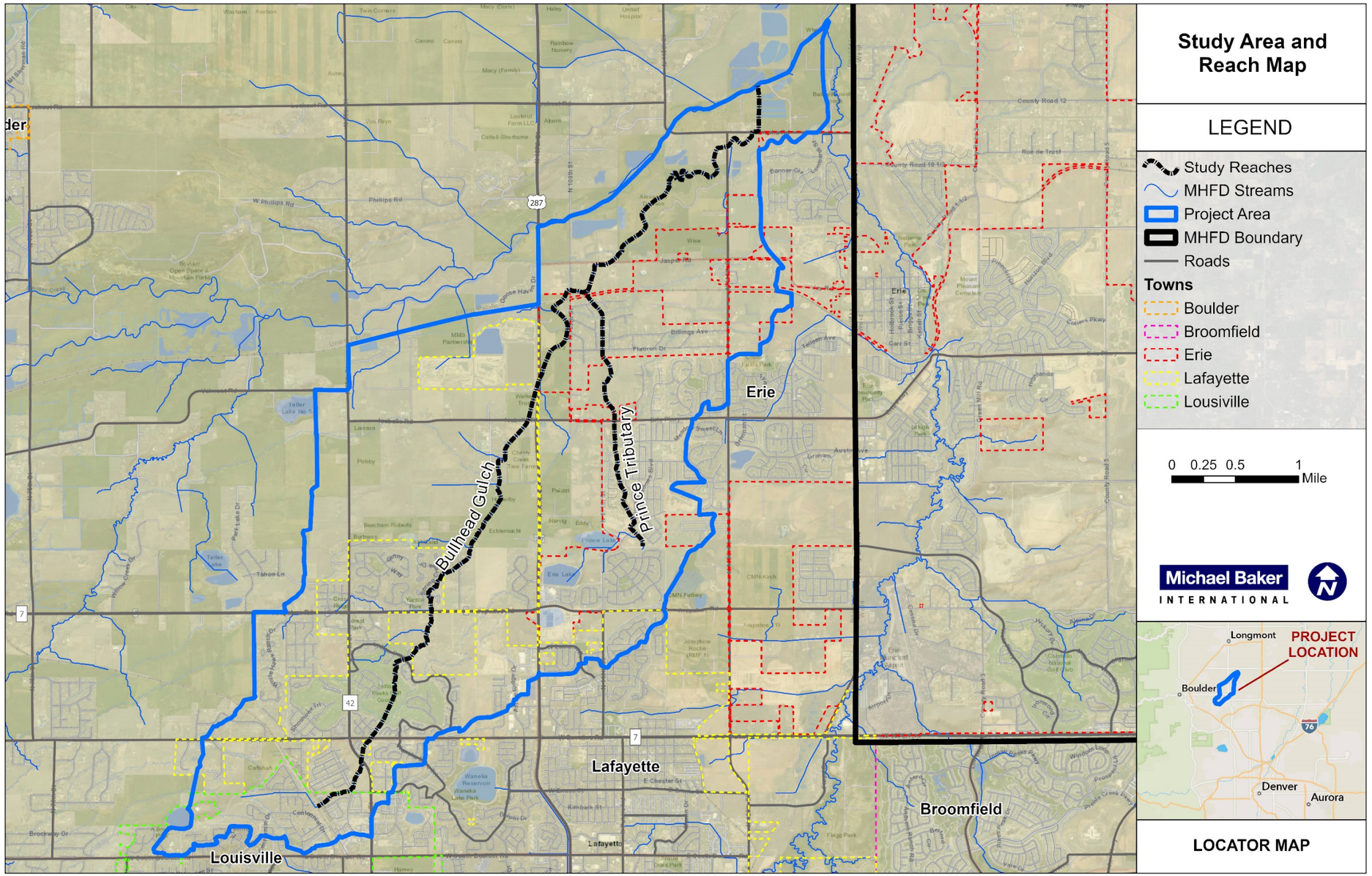

Figure 2-2: Study Area and Reach Map

Table 2-2 Existing Land Use Values

Land Use Description	% Impervious Value	Land Use % of Bullhead Gulch and Prince Tributary Watershed
Greenbelt/Agricultural	2%	60.3%
Park/Public District	10%	1.6%
Residential - Single Family (2.5 acres or larger)	12%	7.6%
Residential - Single Family (0.75 - 2.5 ac)	20%	7.2%
Residential - Single Family (0.25 - 0.75 ac)	30%	10.2%
Residential - Single Family (0.25 ac or less)	45%	8.2%
Schools	55%	0.3%
Residential - Apartments	75%	1.2%
Business/Downtown Areas	85% - 95%	0.3%
Bodies of Water	100%	3.7%

2.3 Reach Descriptions

The study area includes two distinct drainage pathways that eventually confluence at the downstream end and discharge into Boulder Creek. These tributaries are named Bullhead Gulch and Prince Tributary and are consistent with the names in the 1991 FHAD. Each drainage pathway is treated as a separate reach for hydrologic evaluation and alternatives development. Louisville Reservoir is located at the headwaters of this watershed; Indian Peaks Filing 17 is a detention pond (SWMM element STOR_02) located at the upstream end of this watershed; Erie Lake, Prince Lake No 1 and No 2 are located in the center and Henderson Pit Sand and Gravel Quarry is located at the downstream end. Major north/south roads crossing this study area are N 95th St, N 107th St, and US HWY-287. Major east/west roads crossing this study are Jasper Rd, Isabelle Rd, Arapahoe Rd and Baseline Rd. Other major physical features include the Burlington Northern Railroad (BN Railroad), the Union Pacific Railroad (UP Railroad), Davidson Ditch, the Highline Canal, Goodhue Ditch, South Boulder Canyon Ditch, Leyner Cottonwood Ditch, Lower Boulder Ditch, and Boulder and Weld Ditch, Marfell Lakes, and Elmwood Reservoir. Reach locations and limits are shown in Figure 2-2 and descriptions of each reach are provided in this section. All major crossings are listed in Table 2-3. The following reach descriptions are grouped by tributary.

Bullhead Gulch

Bullhead Gulch is a 5.8-mile reach that runs through a variation of existing storm sewers under residential roads, natural channels, and open agricultural areas. An approximate watershed size of 7.6 sq mi flows directly to Bullhead Gulch. The Bullhead Gulch watershed comprises of all subwatersheds west of US-HWY 287. The watershed for Bullhead Gulch is currently urbanized in the most upstream part of the watershed, while the remainder of the watershed is primarily rural, agricultural land with scattered, sparse development. The reach starts at approximately Cliffrose Lane and West Centennial Drive near Goodhue Ditch where there is a concrete lined channel. The Bullhead Gulch streamline eventually discharges into Prince Tributary to the northeast at the intersection of N 109th St and UP Railroad.

Figure 2-3 Concrete Channel near Goodhue Ditch

Bullhead Gulch streamline begins in the City of Louisville and flows through an irregular swale from the upstream end to a concrete lined ditch (Figure 2-3) near Goodhue Ditch. The stream continues to flow through a vegetated channel and is conveyed through a crushed 18” CMP under a pedestrian bridge (Figure 2-4) between Monarch St and Sunland St near BN Railroad.

Figure 2-4 Crushed 18” CMP near BN Railroad

Flow is picked up by a 36" RCP under the BN Railroad (Figure 2-5) into the City of Lafayette and conveyed through a natural channel to a 6' deep rectangular culvert crossing that is mostly blocked by vegetation under the pedestrian bridge on Roser Dr (Figure 2-6).

Figure 2-5 36" RCP under BN Railroad

The flow continues towards the Indian Peaks Filing 17 pond. In a meeting with COL and MHFD, it was established that an adequate assurance agreement will be implemented to ensure the operation of the pond. A 21" discharge outlet conveys flow from the pond to a 72" CMP (Figure 2-7) near Courtesy Rd out to a natural channel in a golf course located at the intersection of N 95th St and Baseline Rd.

Figure 2-6 6' Deep Rectangular Channel under Pedestrian Bridge on Roser Dr

Figure 2-7 72" CMP outlet from Indian Peaks Filing 17 Pond near Courtesy Rd

The stream continues along a defined channel to the northeast (Figure 2-8) to a 24" RCP (Figure 2-9) located under a pedestrian bridge east of Spring Creek Dr.

Figure 2-8 Defined channel along Bullhead Gulch

Figure 2-9 24" RCP east of Spring Creek Dr

Flow continues through a defined channel through agricultural fields through two (2) 30" circular pipes under Isabelle Rd at the intersection with US HWY-287. All overflow of the (2) 30" pipes will overtop Isabelle Rd towards the north at this location. There have been significant reports of flooding at this intersection. Flow splits at Isabelle road as some flow goes towards the Goosehaven Ponds to the north and some flow will continue towards the northeast through a 24" RCP under US HWY-287. Any overflow at this location will overtop US HWY-287 and continue towards Lower Boulder Ditch and N 109th St where Bullhead Gulch will converge with Prince Tributary near Jasper Rd.

Prince Tributary

Prince Tributary is a 4.7-mile reach east of Bullhead Gulch that discharges into the right bank of Boulder Creek just south of Lower Boulder Ditch and west of N 109th St. The Prince Tributary watershed is primarily rural, agricultural land with some residential properties at the upstream end and middle portion of the tributary. The latest study performed on the Prince Tributary watershed was completed in January 2014 by RESPEC for the Town of Erie, "Outfall Systems Plan (West of Coal Creek)." A more detailed description of Prince Tributary is provided in that study as well.

The Prince Tributary watershed comprises of all subwatersheds east of US-HWY 287. There are two detention ponds (SWMM elements STOR_1025 and STOR_1026) north of this location that are located east of US HWY-287 and north of Arapahoe Rd near the residential properties at the upstream end that help attenuate and discharge flow from other tributaries to Prince Tributary. The stream begins just east of Prince Lake #2, at the outlet of the detention pond located in the Arapahoe Ridge Filing 1 development. A portion of the City of Lafayette contributes to the Prince Tributary drainage and flows through a series of natural channels, culverts and bridges.

Figure 2-10 Detention Pond outlet downstream of N 111th St

The outlet of the downstream pond outlets into Prince Tributary (Figure 2-10). Flow continues along the stream over roads and agricultural areas (Figure 2-11 and Figure 2-12).

Figure 2-11 Trail Crossing between Flatiron Circle and Flatiron Meadows Blvd on Prince Tributary

Figure 2-12 Natural channel of Prince Tributary

Flow continues north through the Flatiron Meadows development south of Erie Parkway and east of N 111th St within the Town of Erie. There is another detention pond located on this property (SWMM element STOR_312). Flow crosses a pedestrian bridge just south of Erie Parkway and west of Flatiron Meadows Blvd (Figure 2-13) and confluences with Bullhead Gulch south of the intersection of Jasper Rd and N 109th St and continues to flow through rural agricultural areas of the watershed towards Boulder Creek. Prince Tributary eventually confluences with Boulder Creek north of Kenosha Rd.

Figure 2-13 Pedestrian Bridge south of Erie Parkway and west of Flatiron Meadows Blvd on Prince Tributary

Some of the existing infrastructure at major roadway crossings located in the Bullhead Gulch and Prince Tributary watershed are listed in Table 2-3.

Table 2-3 Major Roadway Crossings

Tributary	Roadway Location	Structure Type
Bullhead Gulch	Northwest of Sunland Rd under Railroad	36" RCP
	Wyonna Ct	6' Rectangular Culvert
	N 95th St	21" RCP to 72"CMP
	Isabelle Road	(2) 30" CMP
	US Highway 287	24" CMP
	Near Indian Peaks Golf Course	18" CMP to 15" CMP
Prince Tributary	Erie Parkway	(2) 9' x 6' RCB
	Flatiron Drive	41" x 82" RCBC(1)
	Lower Boulder Ditch	36" Steel Culvert(1)
	Dobbins Run	25" x 72" RCBC(1)
	Union Pacific Railroad	24" x 150" RCBC(1)
	Jasper Road	20" x 80" Opening(1)
	U.S. Highway 287	4' x 6' RCBC(1)
	Isabelle Road	24" RCP(1)

(1) Roadway Crossings are listed directly from the *Town of Erie Outfall Systems Plan (West of Coal Creek), prepared by RESPEC, January 2014.*

2.4 Flood History

The "*Flood Hazard Area Delineation Bullhead Gulch and Tributaries*" report prepared by Advanced Sciences Inc. from 1991 mentions:

"Information on historic flooding in the Bullhead Gulch and Prince Tributary watersheds is scarce, due to the predominantly rural nature of the area. However, long time residents have described major flooding along Bullhead Gulch in the past. According to local residents, significant floods occurred three times over the last 60 years, at roughly 20-year intervals. The depth of flooding over the intersection of Isabelle Rd and US HWY-287 was estimated at 3 ft during one storm event. This same storm was reported to have moved an existing house off of its foundation.

The reach of Bullhead Gulch between Isabelle Rd and the Leyner-Cottonwood Ditch is currently a gently sloping, broad floodplain area with no visible low flow channel. Prior to the construction of the Leyner-Cottonwood Ditch, Bullhead

Gulch had naturally eroded a channel 15-20 ft deep. This natural channel has since been artificially filled and is currently the site of nursery, greenhouses and agricultural land."

As stated above, significant floods have occurred along Bullhead Gulch three times over the past 70 years. One storm mid-1940s produced flood depths estimated at three feet near the intersection of Isabelle Road and the Leyner-Cottonwood Ditch prior to the construction of the ditch.

The Boulder County Flood Insurance Study (FIS), dated August 15, 2019 states that flooding in Boulder County is due mainly to snowmelt combined with heavy rainfall, especially in the form of cloudbursts. Floods caused by rainstorms can peak within a few hours of the rainfall, leaving little time for evacuation. Much of the floodplain away from the mountains and canyons is used for agriculture, thus the flood damage is mainly to crops, irrigation equipment, roads, and bridges. Damage to residential and industrial areas have occurred in the past. Many of these communities are experiencing fast, rapid growth and thus are increasing encroachment on the adjacent floodplain. Significant floods occurred in the South Boulder and Boulder Creek watersheds in 1894, 1914, and 1938, a somewhat smaller flood occurred in 1938.

There is no stream data available on Bullhead Gulch or Prince Tributary. The main sources of flooding in the Town of Erie are heavy thunderstorms in spring and summer. Flooding can become especially severe when these thunderstorms follow either rapid snowmelt or prolonged rainy weather. There are no flood protection measures along the segments of Bullhead Gulch in the Town of Erie. There are 2 regional detention ponds on the upstream end of Prince Tributary and one additional detention pond upstream of the crossing at Erie Parkway in the Town of Erie. In Lafayette, trails and utilities along both Coal Creek and Rock Creek were damaged by the 2013 flood. The flood of 1876, 1891, 1921 and 1935 were caused by rapid snowmelt in the mountains and heavy rainfall in the area of Lafayette. The 2013 flood event impacted homes, public infrastructure, and trails, and damaged the public golf course in the city of Louisville. A recorded amount of flood damage in the City of Louisville on Coal Creek and Rock Creek took place in 1938, 1949, and 1969.

Based on coordination meetings with COL, BC and MFHD, there are three specific areas of. The first location, as previously stated in the previous FHAD study from 1991, is the Bullhead Gulch crossing at the intersection of Isabelle Rd and US HWY-287. Boulder County has recently received an appeal to a development permit in this area, on the grounds that improvements are necessary at this road crossing or further upstream of this location to prevent flooding. The second area of concern is the Brownsville neighborhood in Unincorporated Areas of Boulder County due to complaints from current and past residents. The third area of concern is the current preliminary LOMR-F on SE corner of Baseline and 95th Street. These are outlined in Appendix A (Project Correspondence). Special consideration will be given to these areas of interest during a future Alternatives Analysis phase of this project.

2.5 Environmental Assessment

To be updated in future submittals of the MDP and FHAD.

Section 3: Hydrologic Analysis

3.1 Overview

This study updates the Bullhead Gulch hydrology for the 2-, 5-, 10-, 25-, 50-, 100-, and 500-yr storm frequencies. Future conditions are modeled assuming full build-out of the developing areas as explained in the subsequent sections. The Colorado Urban Hydrograph Procedure (CUHP, v 2.0.1)[2] was used to develop runoff hydrographs for individual subbasins within the watershed. The Environmental Protection Agency Stormwater Management Model (EPA SWMM, v 5.1.013)[3] was used to route the storm hydrographs through the watershed. This hydrologic analysis was performed using current MHFD and local agency criteria and built off the acquired baseline hydrology CUHP and EPA SWMM models from a previous study, "*Erie 2014 Outfall Systems Plan*" (2014 OSP) project, by RESPEC Consulting and Services (2014 OSP baseline model). The 2014 OSP baseline model included Prince Tributary Creek and unnamed tributaries downstream of Prince Tributary. The 2014 OSP baseline model was used for a Letter of Map Revision (LOMR) determined to be effective as of January 26, 2022. This revision used the 2014 OSP baseline model to aid in the hydraulic analysis of a new reach that was not defined in the effective FEMA Insurance Study (FIS). There were no hydrology updates to the 2014 OSP model for this LOMR. Per the scope of this study, Baker amended the existing SWMM and CUHP models from the 2014 OSP baseline model to include Bullhead Gulch tributary.

The peak flow runoff estimates developed in this study will be used to evaluate the existing drainage facilities, develop alternative drainage improvements for the drainageways, and delineate flood hazard areas adjacent to the channels. This hydrologic analysis utilized a number of previous drainage studies within the watershed. These reports were consulted to locate existing drainage patterns, detention facilities, culverts, land uses, and any additional sub-watershed characteristics needed for the analysis.

3.2 Design Rainfall

One-hour, two-hour, and six-hour rainfall depths for the 2-, 5-, 10-, 25-, 50-, 100-, and 500-year storm frequencies were obtained from NOAA's Atlas 14 through the Precipitation Frequency Data Server (PFDS)[4] for the following location: latitude 40.0289^0 and longitude -105.1074^0, provided in Appendix B. Table 3-1 lists the point rainfall depths at this location.

Table 3-1: Rainfall Depths

Storm Frequency	1-hour Rainfall (inches)	2-hour Rainfall (inches)	6-hour Rainfall (inches)
2-Year	0.805	0.95	1.24
5-Year	1.09	1.28	1.66
10-Year	1.37	1.61	2.06
25-Year	1.81	2.11	2.68
50-Year	2.2	2.55	3.22
100-Year	2.63	3.03	3.81
500-Year	3.8	4.34	5.39

The 1991 FHAD produced by Advanced Sciences Inc derived one-hour rainfall depths for the 2-, 5-, 10-, 50-, and 100-year return periods from the "Boulder County Storm Drainage Criteria Manual" published by the Boulder County in 1986. The values in Table 3-1 were compared to point precipitation values used in the 1991 FHAD. The 2-hour and 6-hour rainfall depths were not compared, as these were also not included in the 1991 FHAD. The rainfall depths used in this study are found to be higher for all storm frequencies, except the 50 year storm. This increase is due to the fact that Boulder County Manual used NOAA Atlas 2 Precipitation-Frequency Atlas, while the current version of MHFD CUHP references NOAA Atlas 14 Precipitation-Frequency Atlas. According to the CUHP User Manual (2016), a re-calibration of the CUHP method was performed by Enginuity Engineering Solutions, LLC. This recalibration adopted the new NOAA Rainfall Atlas No. 14 for Denver and the surrounding areas to determine the 1 hour point precipitation depths to match closely to both recorded flow and gage frequency analysis. Without this adoption, CUHP will remain higher when compared to frequency analysis at trusted gages. The CUHP v 2.0.0 released in 2016 was updated to reference NOAA Atlas 14 Point Precipitation Frequency Estimates for all future projects.

The rainfall duration used with CUHP varies with the size of the watershed being analyzed. Based on Table 5-1 from the Urban Storm Drainage Criteria Manual Volume 1 (USDCM) Manual, major storm events including the 25-, 50-, 100-, and 500-YR, should have Depth Reduction Factors (DRFs) applied to the incremental precipitation depths for watersheds greater than 15 square miles. For this study, there were no watersheds greater than 15 square miles at any design point and therefore no DRFs were applied for the major storm events. For the minor storm events including the 2-, 5-, and 10-YR storm events, DRFs should be applied to watersheds ranging from 2 square miles to 15 square miles. For this study, majority of the design points were less than 2 square miles and did not require a DRF to be applied. There were a handful of design points above the 2 square miles threshold that required the 2 or 5 square miles DRF listed in Table 5-3 of the USCDM Volume 1 Manual to be applied. The rainfall depths were adjusted to produce area corrected hydrographs by listing user-defined multiple scenarios to be run by CUHP v 2.0.1 for this study. The CUHP rainfall distribution at each design node with correlating rainfall area correction is included in Appendix B for all storm events.

[2] Mile High Flood District , *CUHP Version 2.0.1*.
[3] Environmental Protection Agency, *EPA Storm Water Management Model*.
[4] National Weather Service, *NOAA's Precipitation Frequency Data Server (PFDS)*.

3.3 Subwatershed Characteristics

The CUHP and EPA SWMM models from the 2014 OSP were used as the baseline for this study. The subwatershed characteristics that are required as inputs to the CUHP are listed below. All inputs for all subwatersheds are listed in a table in Appendix B.

- Drainage area (sq mi)
- Length to subwatershed centroid (mi)
- Length of subwatershed (mi)
- Subwatershed slope (ft/ft)
- Percent imperviousness (%)
- Maximum depression storage (in)
- Infiltration parameters

The subwatershed delineations for the Prince Tributary watershed (all subwatersheds that do not include "BH" in the name) were verified with best available data and left unchanged from the 2014 OSP for this study. Details on the hydrologic analysis on Prince Tributary can be referenced in the 2014 OSP.

Subwatershed delineations were done by hand for the Bullhead Gulch watershed (all subwatersheds that include "BH" in the name) based on 1-foot topographic mapping, aerial photography, and all available existing storm sewer inventory obtained from a combination of City of Lafayette, Town of Erie, City of Louisville, Boulder County, and Mile High Flood District. All subwatersheds for the Bullhead Gulch watershed are within the CUHP guidelines for drainage area. A summary of the Bullhead Gulch subwatershed drainage area characteristics are summarized in Table 3-2.

Table 3-2: Subwatershed Parameters

Parameter	Bullhead Gulch and Prince Tributary
Minimum Subwatershed Size	21.5 acres
Maximum Subwatershed Size	130.0 acres
Average Subwatershed Size	79.2 acres
Number of Subwatersheds	109
Total Drainage Area	13.5 sq mi

Subwatershed Shape

Subwatershed shape is described by drainage area, length to subwatershed centroid, and length of subwatershed. The length to subwatershed centroid is the distance from the design point of the subwatershed, along the main drainageway path, to the subwatershed centroid. The length of the subwatershed is the distance from the downstream design point of the subwatershed, along the main drainageway path, to the furthest point on the subwatershed boundary. General watershed characteristics in Table 2-1. All of the subwatersheds for this project adhere to the CUHP subwatershed shape guidelines.

Subwatershed Slope

Following the MHFD Criteria Manual's recommended approach, the slope of each subwatershed was determined using the topographic information obtained as previously described. The highest watershed elevation is 5,608 ft and lowest watershed elevation is 4957.2 ft. Final slope values ranged from 0.002 ft/ft to 0.020 ft/ft with an average of 0.02 ft/ft, and as a result, did not require a slope correction based on MHFD criteria.

Subwatershed Imperviousness

Impervious area percentages were originally determined based on land use information provided by COLA, COLO, TOE, and BC. An impervious features shapefile was created and used to obtain a direct calculation of imperviousness area for each subwatershed. A couple regions in the watershed are not fully developed as of yet. Development status is depicted on the Baseline Hydrology Map in Appendix B. Existing land use percentage for all land uses in the Bullhead Gulch and Prince Tributary watershed is listed in Table 2-2.

Future Conditions

Modeling the hydrology of future conditions involves anticipating future development within the watershed. Zoning datasets were provided by COLA, COLO, TOE, and BC. The zoning districts in those datasets were matched with the land use/surface characteristics and suggested percent impervious values in the MHFD Criteria Manual[5]. Developing areas were assigned the suggested percent impervious values correlating with the zoning overlay.

An area-weighted calculation of future percent impervious was calculated for all subwatersheds experiencing on-going development. The future impervious values were inputs for future hydrograph development in CUHP. Land use percent impervious layers for existing and future conditions are provided in the Baseline Hydrology Map in Appendix B.

Subwatershed Storage and Infiltration

Initial and final infiltration rates and Horton's decay rate were determined using Table 6-7 in the MHFD Criteria Manual. Table 3-3 summarizes these values. Storage values of 0.60 inches (pervious area) and 0.1 inches (impervious areas) were used for this study based on MHFD recommendations. Hydrologic Soil Groups (HSG) were determined by consulting the NRCS's soil survey information[6]. The Bullhead Gulch and Prince Tributary watershed is mostly comprised of HSG A and B. Soils are assigned according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms. HSG A soils have a high infiltration rate, HSG B have a moderate infiltration rate, HSG C have a slow infiltration rate and HSG D have very slow infiltration rates. The areas near the confluence with Boulder Creek are comprised more of HSG C and D at the downstream end of Bullhead Gulch and Prince Tributary. Depression Storage values of 0.60 inches (pervious areas) and 0.10 inches (impervious areas) based on MHFD recommendations. Soil types for the subwatersheds are provided in the Baseline Hydrology Map in Appendix B.

[5] Mile High Fod District, *Urban Storm Drainage Criteria Manual: Volume 1*, Table 6–7, 2016.

[6] Natural Resources Conservation Service, "Web Soil Survey - Home."

Table 3-3: Infiltration Rates

Recommended Horton's Equation Parameters			
NRCS Hydrologic Soil Group	Infiltration (inches per hour)		Decay Coefficient - a
	Initial - f_i	Final - f_o	
A	5.0	1.0	0.0007
B	4.5	0.6	0.0018
C	3.0	0.5	0.0018
D	3.0	0.5	0.0018

3.4 Detention

Detention facilities are an important component to the reduction of peak storm runoff rates in downstream reaches. MHFD recommends accounting for detention facilities if all the following conditions are met:

- The detention facility serves a watershed of at least 130 acres (or provides substantial flood reduction).
- The detention facility is owned and maintained by a public agency.
- A public agency has committed to ensure the detention facility operates in perpetuity as designed.

This hydrologic analysis includes 4 detention basins within the Bullhead Gulch and Prince Tributary watershed. Two of the four detention basins, Arapahoe Ridge Filing 1 & 2, near the intersection of N 111th St and Arapahoe Rd were included in the acquired 2014 OSP baseline model and have not been updated for this study. Arapahoe Ridge Filing 1 was designed with a spillway 80 ft wide by 120 ft long at a slope of 4:1. The outlet for the pond discharges through ha 36" RCP which outfalls within the energy dissipation section of the spillway. Arapahoe Ridge Filing 2 was designed with a 21" RCP and 24" RCP outlet pipe and a spillway 70 ft wide with a slope of 3:1. MHFD has confirmed they will establish the required documentation to establish these detention basins as regional detention basins.

The Flatiron Meadows Regional Detention Pond at Erie Pkwy was previously treated as a junction in the 2014 OSP baseline model. This new detention facility was deemed to meet all the above conditions and therefore, updated to a storage element as part of this study. This detention basin located at the intersection of Erie Parkway and N 111th St outlets through (2) 9'W X 6'H RCB at a slope of 0.38%. An additional detention basin, Indian Peaks Filing 17, was added to the SWMM model as a new storage element as well. Both storage elements used the most recent available design drawings from MHFD and the City of Lafayette for stage-discharge and stage-storage relationships. In coordination with the City of Lafayette and MHFD, an initial comparison of flows, with and without the Indian Peaks Filing 17 detention basin, was requested. The future condition 100-year total volume of flow resulted in a decrease in flow from approximately 890 cfs to 280 cfs at the downstream outlet of this detention basin just upstream of Baseline Rd. Therefore, the detention basin was included as part of this study. The City of Lafayette and MHFD have confirmed they will establish an adequate assurance agreement to ensure the operation of Indian Peaks Filing 17 detention basin. This detention basin located at the intersection of N 95th St and Baseline Rd outlets through a 21" RCP to a 72" CMP. All as-builts referenced in this section are included in Appendix B.

Flow entering a storage element was routed through a normal conveyance element representative of the drainages entering the structure. Flow exiting a storage element was connected back to the system through an outlet element. The outlet element included a discharge rating curve using as-built information developed in HydroCAD Stormwater Modeling software version 10.10-4a. The modeled stage-storage-discharge-volume relationships are included in Appendix B. The Baseline Hydrology Map in Appendix B provides the locations of these storage elements in the EPA SWMM Schematic layer. Further detail on the data source for these storage elements, ownership, and naming are provided in Table 3-4.

Table 3-4: Detention Ponds Data Table

Stream	Pond Name	SWMM Node Name	Ownership	Source of Data
Prince Tributary	Arapahoe Ridge Filing 1	STOR_1026	Town of Erie	2014 OSP
Prince Tributary	Arapahoe Ridge Filing 2	STOR_1025	Town of Erie	2014 OSP
Prince Tributary	Flat Iron Meadows Regional Detention Pond (1)	STOR_312(1)	Town of Erie	MHFD as-built plans(1)
Bullhead Gulch	Indian Peaks Filing 17	STOR_02	City of Lafayette	City of Lafayette as-built plans

(1)Flat Iron Meadows Regional Detention Pond was initially modeled as a junction element in the 2014 OSP baseline model. This study updates the junction to a storage unit using as-built plans dated March 2016 by Calibre Engineering, Inc.

3.5 Hydrograph Routing

EPA SWMM was used to route the subwatershed hydrographs generated by CUHP through the drainage system and combine them as they are routed downstream. Reach routing parameters for the EPA SWMM model for the Bullhead Gulch watershed were developed using the topographic information described in Section 1.4, along with storm sewer system mapping and survey data.

Reaches in the Bullhead Gulch watershed are primarily agricultural overland flow. There are areas of rural farmland as well as areas with dense vegetated overland flow. The developed city portions include residential and business areas with existing underground storm sewer systems. Initial runs of the model were performed to determine underground storm sewer reaches that did not have adequate capacity to convey larger events. For these reaches, an overflow reach was added to route flow that exceeded the capacity of the underground system.

A discovery made during the review process with MHFD, COL and BC was that flow routing in the northern portion of the Bullhead Gulch watershed was unclear due to the flat topography. For this reason, MBI, in coordination with MHFD and project stakeholders made the decision to supplement the EPA SWMM model with a coarse 2D analysis of the northern portion of the watershed using HEC-RAS 6.3. This 2D model was not intended to be used for mapping or regulatory purposes, only to be purely informational. The memorandum included in Appendix A outlines the steps completed to perform this coarse 2D modeling as well as recommendations on updates to the CUHP and EPA SWMM models for the purpose of this baseline hydrology study.

As the recommended updates were being implemented into the CUHP and EPA SWMM models, an additional discovery was made that the UP Railroad was a significant embankment in causing concurrent split flow at the outfall locations (Outfall 935, 936, 937, and 938) in the northern part of the watershed. Based on the coarse 2D model results, significant flow was leaving the Bullhead Gulch watershed to Boulder Creek in the northern direction while concurrently directing flow eastward towards Bullhead Gulch. Due to EPA SWMM restrictions in calculating split flow, a diversion table was necessary at each of these locations. MBI, in coordination with MHFD and project stakeholders deemed it necessary to create a refined version of the coarse 2D model in order to obtain accurate Inflow/Outflow diversion curves for input into EPA SWMM. Existing and future conditions showed similar trendlines and for this reason, the existing was input into the SWMM model. The memorandum detailing the approach and results of this additional detailed analysis are provided in Appendix A and the resulting flow diversion tables used in EPA SWMM are provided in Appendix B.

The reach parameters that were developed are representative of existing watershed conditions and are assumed to also represent future watershed conditions. Manning's roughness (n-value) for each reach was determined based on values listed in Table 6-1 of the HEC-RAS Manual Version 6.3 and "Mannings n for Channels (Chow, 1959)" using aerial imagery, field observation and best engineering judgement. Selected values are within acceptable reasonableness per industry standards. Table 3-5 lists the selected Manning's n-values that were used for each type of conduit routing element. Note, cross sections were taken from LiDAR data and defined under the "transects" parameter of the SWMM model to depict different kinds of channels in many parts of the watersheds. Some of these cross sections included street and paved areas resulting in lower Manning's n values while natural cross sections had higher Manning's n values.

Table 3-5: Manning's Roughness (n-value) Coefficients

Conduit Routing Element Description	Manning's n-value
Transect (Natural or Paved LiDAR Cross Section)	0.013 - 0.10
Concrete Culverts (Rectangular or Circle)	0.011 - 0.024
Trapezoidal Channel (Natural or Paved)	0.020 - 0.056

The SWMM routing schematic is provided in the Baseline Hydrology Map in Appendix B. The schematic shows where each subwatershed connects to the drainage system and more clearly shows the connectivity of all routing elements throughout the watershed.

3.6 Previous Studies

Bullhead Gulch and Prince Tributary were included as part of several past studies, though they are relatively dated. The most pertinent studies were a Flood Hazard Area Delineation (FHAD) for the Bullhead Gulch and Tributaries watershed performed by Advanced Sciences, Inc in 1991 (1991 FHAD), a Bullhead Gulch OSP Phase B performed by Advanced Sciences, Inc in 1992 (1992 OSP), and a Town of Erie OSP performed by RESPEC in 2014 (2014 OSP). The 1991 FHAD was a floodplain analysis of Bullhead Gulch, Prince Tributary and Indian Peaks Tributary. The 1992 OSP was a floodplain analysis for Bullhead Gulch and its tributaries. The 2014 OSP was a floodplain analysis for Coal Creek, Boulder Creek and Prince Lake Tributary. Bullhead Gulch was not analyzed as part of this 2014 OSP study and was considered an "offsite watershed." The models from this study were updated to include Bullhead Gulch for this baseline hydrology report.

This detailed hydrologic analysis was performed for the 2-, 5-, 10-, 50-, and 100-year events using CUHP and EPA SWMM models from the 2014 OSP. A comparison of the results between the 1991 FHAD, 1992 OSP and the 2014 OSP and this study is provided in Table **3-6**. The current SWMM nodes from this study were approximately located based on streamline intersection with the location descriptions listed in each respective study. The calculated discharges from this study are significantly lower than discharges from the 1991 FHAD, especially downstream of the UP Railroad. This is largely due to updated land assumptions and corresponding subbasin impervious values, the addition of new regional detention facilities, and the additional 2D analysis performed for this study at this location to calculate the amount of flow overtopping the UP Railroad and flowing into Boulder Creek before it is directed towards Bullhead Gulch. Project memorandums and other correspondence with MHFD and key stakeholders are included in Appendix A on this additional analysis. Additionally, this study used rainfall depths from NOAA Atlas 14, which are lower than the rainfall depths used in the studies from 1991 and 1992 which referenced the Boulder County Storm Drainage Criteria Manual from 1986. The modeling performed as part of this study were also completed using newer versions of both CUHP and EPA SWMM than previous studies. There was no information to calibrate the models to for the watershed. As a result, a calibration was not performed.

3.7 Results of Analysis

A summary of peak runoff rates at specified design points is presented Table 3-7. The flowpaths in the upstream portion of Bullhead Gulch are well defined. However, as flow moves downstream, there are less defined flowpaths. The UP Railroad, located near the watershed outfalls at the northern portion of the watershed creates a physical embankment to the surface runoff. An additional 2D model analysis aided in creating a more accurate representation of hydrograph flow routing in the downstream portion of this watershed. The input and output from the CUHP models are included in Appendix B. These models include the 2-, 5-, 10-, 25-, 50-, 100-, 500-year storm events. The input and output from the EPASWMM models for the 100-year event are included in the Appendix B, all other event input and output is available electronically. The existing and future peak flow results for all storm events for all design points, hydrographs at key locations and peak flow profiles along the drainageway centerline are provided in Appendix B as well. The stationing for the peak flow profiles are based on stream centerline data provided by MHFD.

Table 3-6: Comparison of Future 100-Year Peak Flow Rates

Tributary	Design Point		1991 FHAD	1992 OSP	2014 OSP	2022 FHAD
	Current SWMM Node	Location	*Max Flow (cfs)	*Max Flow (cfs)	*Max Flow (cfs)	*Max Flow (cfs)
Bullhead Gulch	OUTFALL_940	Boulder Creek	5831	5660	N/A	2826
	JUNCT_319	Jasper Road	5824	5797	N/A	2829
	JUNCT_318	Union Pacific Railroad (Prince Tributary Confluence)	3952	5864	N/A	2817
	73	Isabelle Road	3846	3118	N/A	2956
	72	Leyner Cottonwood Ditch	3560	2582	N/A	2628
	83	Arapahoe Road	2572	1733	N/A	1880
	113	Baseline Road	924	292	N/A	265
	125	Highway 42	553	N/A	N/A	244
	118	Burlington Northern Railroad	689	459	N/A	269
	107	Goodhue/Highline Ditch	359	29	N/A	201
Prince Tributary	JUNCT_318	Union Pacific Railroad	2505	2499	N/A	2817
	144	Isabelle Road	2387	2387	N/A	1602
	JUNCT_308	Flatiron Meadows Blvd	N/A	N/A	2106	1182
	144	Erie Pkway (Isabelle Road)	N/A	N/A	1792	1602
	JUNCT_303	Arapahoe Road	N/A	N/A	744	727

*Max flow represents the future conditions modeling for both the 1991 FHAD, 1992 OSP, 2014 OSP and 2022 MDP & FHAD Baseline Hydrology

Table 3-7: Summary of Peak Flows at Key Design Points

Design Point	Description	2-Year (cfs)		5-Year (cfs)		10-Year (cfs)		25-Year (cfs)		50-Year (cfs)		100-Year (cfs)		500-Year (cfs)	
		Existing	Future	Existing	Future	Existing	Future	Existing	Future	Existing	Future	Existing	Future	Existing	Future
Bullhead Gulch															
118	Bullhead Gulch @ Burlington Northern Railroad	12	12	25	24	37	37	109	109	176	176	269	269	477	477
125	Indian Peaks Filing 17 Outflow	6	12	12	16	14	19	23	26	28	31	130	244	794	941
113	Bullhead Gulch @ W Baseline Rd	11	18	20	29	28	39	70	89	106	126	151	265	878	1052
83	Bullhead Gulch @ Arapahoe Rd	78	147	155	229	228	318	736	833	1170	1267	1762	1880	3162	3268
73	Bullhead Gulch @ Isabelle Rd	84	174	177	300	275	429	1001	1208	1696	1923	2686	2956	4987	5328
143	Bullhead Gulch @ US-HWY 287	26	25	27	27	31	31	104	104	167	167	252	252	437	437
JUNCT_318	Bullhead Gulch and Prince Tributary Confluence @ Union Pacific Railroad	53	112	95	240	202	391	893	1194	1477	1832	2386	2817	4817	5469
Prince Tributary															
144	Prince Tributary @ Erie Pkwy	22	101	78	221	175	363	565	817	858	1140	1268	1602	2435	2965
JUNCT_315	Prince Tributary @ Flatiron Dr	28	107	84	236	190	389	615	880	961	1257	1448	1806	2880	3449
JUNCT_319	Prince Tributary @ Jasper Rd	53	111	95	239	202	383	892	1191	1481	1834	2394	2829	4850	5507
OUTFALL_940	Prince Tributary Confluence to Boulder Creek @ Outfall 940	53	111	96	238	204	369	887	1182	1483	1827	2397	2826	4868	5518

Table 3-8: % Change from Existing to Future at Key Design Points

Design Point	Description	2-Year (cfs)	5-Year (cfs)	10-Year (cfs)	25-Year (cfs)	50-Year (cfs)	100-Year (cfs)	500-Year (cfs)
		% Change	% Change	% Change	% Change	% Change	% Change	% Change
Bullhead Gulch								
118	Bullhead Gulch @ Burlington Northern Railroad	0%	-0.4%	0%	0%	0%	0%	0%
125	Indian Peaks Filing 17 Outflow	116%	36%	34%	14%	9%	87%	19%
113	Bullhead Gulch @ W Baseline Rd	64%	46%	38%	27%	19%	76%	20%
83	Bullhead Gulch @ Arapahoe Rd	88%	48%	39%	13%	8%	7%	3%
73	Bullhead Gulch @ Isabelle Rd	106%	69%	56%	21%	13%	10%	7%
143	Bullhead Gulch @ US-HWY 287	-2%	0%	0%	0%	0%	0%	0%
JUNCT_318	Bullhead Gulch and Prince Tributary Confluence @ Union Pacific Railroad	110%	151%	93%	34%	24%	18%	14%
Prince Tributary								
144	Prince Lake Tributary @ Erie Pkwy	357%	181%	108%	45%	33%	26%	22%
JUNCT_315	Prince Lake Tributary @ Flatiron Dr	279%	181%	104%	43%	31%	25%	20%
JUNCT_319	Prince Lake Tributary @ Jasper Rd	110%	151%	90%	34%	24%	18%	14%
OUTFALL_940	Prince Lake Tributary Confluence to Boulder Creek @ Outfall 940	109%	147%	81%	33%	23%	18%	13%

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Appendix A – Project Correspondence

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PROJECT:	Bullhead Gulch MDP and FHAD
PROJECT #:	107967
PURPOSE:	Kickoff Meeting
DATE/TIME HELD:	August 19, 2020 1:00pm-2:00pm
LOCATION:	Webex Call
INVITED:	Jim Watt, Drew Roberts, Kevin Trott, Kelly Watson, Matt Knight, Wendi Palmer Kevin Doyle, Chris Tagert, Andrew Park-Friend

Meeting Agenda

1. Introductions & Project Management
   a. Introductions
   b. Project Team and Stakeholders

Name	Project Responsibility	Company or Organization	e-mail
Jim Watt	MHFD Project Manager	MHFD	jwatt@udfcd.org
Drew Roberts	MHFD	MHFD	droberts@udfcd.org
Matt Knight	Key Stakeholder, Project Sponsor	City of Lafayette	mattknight.lafayette@gmail.com
Kelly Watson	Key Stakeholder, Project Sponsor	Boulder County	kwatson@bouldercounty.org
Kevin Trott	Key Stakeholder	City of Louisville	ktrott@louisvilleco.gov
Wendi Palmer	Key Stakeholder	Town of Erie	wpalmer@erieco.gov
Andrew Friend	Michael Baker Project Manager	Michael Baker	afriend@mbakerintl.com
Kevin Doyle	Michael Baker Group Lead	Michael Baker	kdoyle@mbakerintl.com
Chris Tagert	Michael Baker Principal-in-Charge	Michael Baker	ctagert@mbakerintl.com

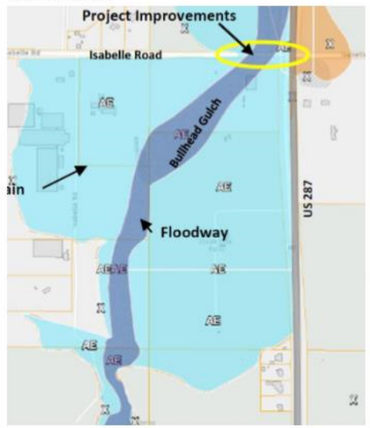
c. Communications Plan
   - Coordination Frequency
     - Monthly project update meetings/calls will be set up – Third Wednesday afternoon. Will cancel if there is little to talk about.
     - Additional coordination as needed
   - Communication Preferences – email/phone preferred

d. Critical Assumptions and Constraints

- [x] Budget is critical.
- [x] Schedule is critical. Jim noted that some FHAD and MDP projects have been running long lately – would like to meet or beat schedule.
- [ ] Political importance.
- [x] Public controversy. – see below
- [ ] Environmentally sensitive.
- [ ] Other (explain):

Three specific areas of public controversy:

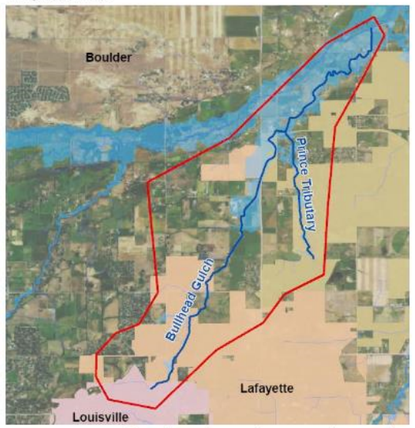
- Bullhead Gulch crossing of Isabelle Road. Boulder County recently received an appeal to a development permit in this area – on the grounds that more should be done to improve the road crossing and reduce flooding upstream of Isabelle Road.



- Brownsville neighborhood (Unincorporated Areas of Boulder County). At a meeting dated Aug 1, 2013 for the Erie outfall plan, many from this neighborhood were present to express concerns

- Current prelim missed LOMR-F on SE corner of Baseline/95th

2. Project Background and Goals
   a. Watershed/Drainage Summary – there has been a lot of development in this neighborhood since the last FHAD (1991).
   b. Project limits



   c. Project approach and goals – to better understand and map flood risk in this area, to establish a plan to reduce or manage flood risk.

3. Data Discussion
   a. Topographic Data
      - Data Obtained
        - 2013 Post Flood LiDAR data (PhotoScience) – DEM is the latest and greatest.
   b. Survey Data
      - No Data Obtained – anticipated that we will use data from the effective model. Andrew will let Jim know if any further needs are identified.
   c. Geospatial Data
      - Data Available – Boulder County https://opendata-bouldercounty.hub.arcgis.com/
        - Roads
        - Parcels
        - ROW/Easements (?)
        - Buildings
        - Jurisdictional Boundaries
        - Zoning

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        - Parks/Open Space
        - Stormwater Facilities
      - Erie and Louisville also have open data GIS – Andrew will look at what is available and contact Wendi/Kevin if there are other needs
      - Lafayette – Andrew will contact Matt with other needs
      - Floodplains – FEMA NFHL
      - Streams - MHFD
      - Additional Data Available?
        - Watershed Boundaries – MHFD has general watershed boundaries. Spatial subbasin data likely not available from 1991 hydrology model
        - Planimetric Data (Impervious Areas) – maybe?
        - High water marks/flood history – Boulder County has imagery from 2013 flood.
   d. Previous Studies and Reports
      - Data Obtained - Flood Hazard Area Delineation Bullhead Gulch and Tributaries (1991), Bullhead Gulch OSP Phase A (1991), Bullhead Gulch OSP Phase B (1992)
      - Digital models may be available – Andrew to follow up with Jim.
   e. Current/recent projects
      - Erie outfall plan – west of Coal Creek. Currently ongoing MFHD project, may have useful hydrology.
      - LOMR anticipated soon on Prince Tributary near Erie Parkway – Flatiron Meadows – Wendi will follow up with Andrew when she receives it.
      - "Silo" Development (behind Walmart) may have recent survey/topo

4. Schedule

	Task	Start Date	End Date	Duration (weeks)
	Kickoff Meeting	8/19/2020	8/19/2020	-
1	Phase 1 – Baseline Hydrology	8/19/2020	12/9/2020	16
2	Phase 2 – Flood Hazard Area Delineation			34
3	Phase 3 – Alternatives Analysis			20
4	Phase 4 – Conceptual Design			14
TOTAL				84

5. Next Steps

- Data collection – Andrew will set up a project dropbox and request data
- Baseline Hydrology – about to get underway
  - Begin the Field Collection – no access issues anticipated

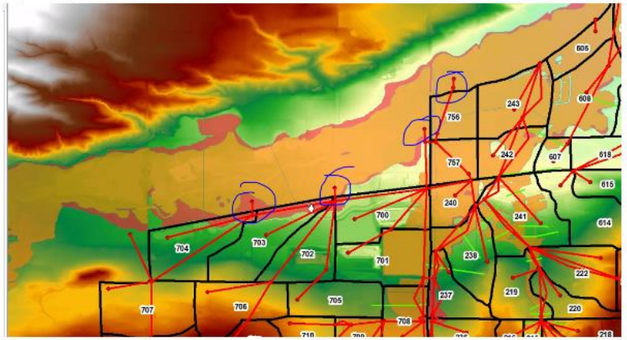
6. Action Item Tracking

	Action	Person Resp.	Date Due
1	Setup Dropbox, send out invitation	Baker	8/24
2	Site visit	Baker	Next 2-3 weeks
3	Requesting specific data	Baker	Ongoing
4	Setup recurring monthly meeting -3rd Wednesday	Baker	8/21
5			
6			
7			
8			
9			
10			
11			
12			
13			

PROJECT:	Bullhead Gulch MDP and FHAD
PROJECT #:	187240
PURPOSE:	Project Progress Updates
DATE/TIME HELD:	April 18, 202 2:00pm-3:00pm
LOCATION:	Teams Call
ATTENDEES:	Drew Roberts, Kurt Bauer, Ryan Tigera, Andrew Park-Friend, Farina Kazi, Lindsay James

Meeting Minutes

1. Baseline Hydrologic Analysis Updates
    a. Introductions – Project engineers – Farina Kazi, Lindsay James, and Ryan Tigera
    b. Current hydrologic issue:



    i. 2D Model was created to inform routing of the northern portion of the model. Some flow was seen to overtop the embankment into Boulder Creek and some flow was seen to be directed towards the Bullhead Gulch stream. The effective SFHA shows that the northern subbasins begin to flow directly into Boulder Creek sooner than the actual confluence with Bullhead Gulch and Prince Tributary. The question now is there is no clear quantifiable manner in which to split the flows for all storm events at this time. How do we want to proceed and do we want to include these results in the baseline hydrology update?

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    c. Drew Roberts – They had a similar project in Boulder County that also had overtopping occurring in which they set weir elevation at the ridge elevation? Is that possible?
    d. MBI – we would need a rating curve and we don't have sufficient and complete information for all storm events for a rating curve. The flow patterns seem to be a hydraulic split more than a hydrologic split. Currently, the scope does not include detailed hydrologic modeling for the flows flowing onto Boulder Creek.
    e. Kurt Bauer – flows from Bullhead Gulch possibly converge with Boulder Creek after Boulder Creek has peaked. What are the ramifications of not excluding the flows overtopping into Boulder Creek and assuming all flow stays within the system?
    f. MBI – The flows at the confluence area around Subbasin 242 for Bullhead Gulch may be overestimated if flows are not adjusted for all flow leaving the system at least the last half mile of the model
    g. MHFD – The confluence area is a potential problem area cause of many past complaints of the Brownsville neighborhood. MHFD would like to wait and discuss internally to assess options.
    h. Andrew - Current 2D model is based on LiDAR – our two options right now is to refine the 2D model for more detail for the outflow areas and run all storm event scenarios to get a specific flow that leaves the system for SWMM or to somehow come up with a better system for a rating curve
    i. Kurt – What would budget be to ramp up existing model to get better flow values –Ballpark amount for how much of an effort this would be to get a more detailed model?
    j. MBI to get that to MHFD, MHFD to assess internally, then MHFD and MBI to meet and discuss path forward

Action Items:

a. MBI – ballpark figure of a more detailed analysis - # of hours and budget
    i. Updating Geometry and Mesh enhancements?
    ii. Updating Rain on mesh to Inflow Hydrograph?
    iii. Adding all other recurrence intervals?
b. MHFD – analyze the two options and regroup as a team first to discuss path forward

PROJECT:	Bullhead Gulch MDP and FHAD
PROJECT #:	187240
PURPOSE:	Project Progress Updates
DATE/TIME HELD:	July 20, 2022 1:00pm-2:00pm
LOCATION:	Teams Call
ATTENDEES:	Tyler Trojan (City of Louisville Engineer), Kurt Bauer, Drew Roberts, Kelly Watson (Boulder County), Dave Webster (Boulder County Engineer PM), Bryan McIlwee (City of Lafayette Engineer), Andrew Park-Friend, Farina Kazi, Lindsay James

Meeting Minutes

1. Introductions
2. Recent Amendment approved for detailed hydrologic modeling at northern part of the watershed at Railroad embankment just upstream of Boulder Creek floodplain
    a. MBI has draft results – will have results to share next meeting
    b. Kurt Bauer – Did new analysis show anything different like we expected?
        i. AF – Loss of discharges to Boulder Creek watershed are more and will decrease Bullhead Gulch mainstem flows
    c. Original intent of 2D model was to be informative to SWMM routing and Hydraulic 1D model – but based on SWMM requirements, we had to refine the model to get discharges that are leaving the system for each storm event
    d. Significant loss by downstream end of Bullhead Gulch based on this analysis
    e. MBI to have hydrologic results and a chance for County to look at results at next monthly meeting
3. Meeting ended earlier than expected since we are waiting on results

Action Items:

a. MBI – continue to work on Amendment scope for detailed hydrologic analysis and have results by next meeting

PROJECT:	Bullhead Gulch MDP and FHAD
PROJECT #:	187240
PURPOSE:	Project Progress Updates
DATE/TIME HELD:	August 17, 2022 1:00pm-2:00pm
LOCATION:	Teams Call
ATTENDEES:	Tyler Trojan (City of Louisville Engineer), Kurt Bauer, Drew Roberts, Kelly Watson (Boulder County), Dave Webster (Boulder County Engineer PM), Bryan McIlwee (City of Lafayette Engineer), Wendi Palmer, Bryan McIlwee, Andrew Park-Friend, Farina Kazi, Lindsay James

Meeting Minutes

1. MBI Update – Discussions on specific area on northern part of the watershed and split flow occurring to Boulder Creek
    a. MBI completed enhanced analysis for this sensitive area per Amendment
    b. MBI send over Memorandum and models for input from District on analysis
    c. Discussion on final conclusion of numbers from Memorandum
        i. Significant different in flows going to Bullhead Gulch vs Boulder Creek
2. Question to Kurt, Drew and everyone – we have HEC-RAS 2D model for this detailed analysis, CUHP and EPA SWMM which have been updated and sent over
    a. Next steps?
    b. Kurt – He would not be reviewing it. Will Drew review? Drew would like to review first before moving forward
    c. Memorandum was super helpful to the team
    d. Andrew – would the rest of the project stakeholders like to review the Memorandum work?
        i. Kelly Watson – no technical review, would like to see the Memorandum – She appreciates the detailed updates
        ii. Andrew – Memo will be sent to the rest of the folks to review

Action Items:

a. MBI – send only Memo to all project stakeholders
b. Drew and Kurt – to do technical review of Amendment work
    a. Possible turnaround in first half of September
        i. Review comments and update models accordingly
    b. Next steps would be finalizing Baseline Hydrology submittal by MBI

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PROJECT:	Bullhead Gulch MDP and FHAD
PROJECT #:	187240
PURPOSE:	2D Model Detailed Analysis MHFD Comments Discussion
DATE/TIME HELD:	September 28, 2022 1:00pm-2:00pm
LOCATION:	Teams Call
ATTENDEES:	TBD - Kurt Bauer, Drew Roberts, Kelly Watson (Boulder County), Dave Webster (Boulder County Engineer PM), Andrew Park-Friend, Farina Kazi, Lindsay James

Meeting Agenda

1. Quick overview of MBI methodology and reasons for general modeling methodologies to the District for clarity post review.
2. Discuss/Clarify Specific Comments:
    a. PDF Comments:
        i. Page 5, "As HT noted, there are now several different models for the recurrence intervals, which then increases the risk of changes/updates being missed between models. Would it be easier and less risky to have the intervals only as input files and leave the models as Future/Existing?"
        ii. Page 7, "discuss more about the quasi-steady state, what conditions are we applying and why. when using the word quasi-steady state, would that actually apply in this context? Wouldn't the model be steady state, and the conditions that allowed modeling it that way be the quasi part?"
        iii. Page 7, This sentence is very unclear, it seems to stem from the "as the incremental increase..." part. would "Hydrographs were applied to the HEC-RAS model as boundary conditions, at locations where the previous analysis identified flow splits. These hydrographs correspond to Nodes 123, 456, etc."
        iv. Page 7, "If it's permanently set to 0, why is it in the model"
        v. Page 8, "Peak flows are exactly the same between existing condition and future condition. Are they true?"
        vi. Page 8, "Exactly same?" flow to Boulder Creek for 182
        vii. Page 8, "The comparison is not clear. Please provide clarity."
    b. Word Comments:
        i. "Sufficient profile lines shall be used to represent the critical locations at split flow locations to determine the divided flows correctly"

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        ii. "Please use terrain modification or equivalent methodology to remove the conveyance of canal/ditch to conform with the general assumption for baseline hydrology"
        iii. "The figure below shows an example, but not limited to, that the boundary condition location will potentially predetermine the flow split. Please confirm the location and extent of the boundary condition that can replicate the true nature of inflow distribution at the flow split location."
        iv. "Please confirm that the mesh faces represent key hydraulic controls correctly, especially at the split flow locations. The figure below shows leaky cells at the intersection of Valmont Rd and N 95th St because the breaklines were not enforced appropriately. Please investigate the following options to improve enforcement of the breaklines, including smaller cell sizes, manually enforce the breakline sequentially, and Enforce 1 Cell Protection Radius, etc. "
        v. "The figure below shows flow distribution and flow changes at Node 181 based on the modeling results for 100-year future condition 2D. Please confirm the flow distribution and peak flow conservation are reasonable at all split flow locations."

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TO: KURT BAUER, DREW ROBERTS, JIM WATT – MILE HIGH FLOOD DISTRICT
FROM: ANDREW PARK-FRIEND
SUBJECT: 2D HEC-RAS MODEL OF NORTHERN BULLHEAD GULCH
DATE: FEBRAUARY 1, 2022 (REVISED MARCH 2022)
CC: MIDORI PATTERSON

Introduction

Michael Baker International is performing a Flood Hazard Area Delineation (FHAD) and Master Drainage Plan (MDP) for Bullhead Gulch, an approximately 13.5 square mile watershed in the City of Lafayette, the City of Louisville, the Town of Erie, and unincorporated areas of Boulder County. Draft Baseline Hydrology has been submitted which used the Colorado Urban Hydrograph Procedure (CUHP) and an EPA SWMM model to route flows. It was discovered during the review of the draft Baseline Hydrology that the flow routing in the northern part of the watershed was unclear due to the flat topography. With coordination between Michael Baker International, Mile High Flood District (MHFD), and project stakeholders, it was determined that a 2D HEC-RAS hydraulic analysis should be created to inform the routing of the Baseline Hydrology. This 2D HEC-RAS model will not be used for mapping or regulatory purposes and is a coarse analysis intended to be purely informational. This memo describes the model production, outlines assumptions made in the modeling process, and summarizes the results and recommendations for further phases of this project.

Technical Modeling Details

DISCHARGES

Hydrology for this model came from two source types: discharge hydrographs from the EPA SWMM model and spatially uniform precipitation (rain-on-mesh). The hydrographs were inputted as external boundary conditions at four locations corresponding to EPA SWMM nodes where flows from the upstream portions excluded from the 2D region entered the 2D mesh area. The hydrographs were extracted from the EPA SWMM model that included the Indian Peaks Filing 17 pond based on the conclusion during the 1/19/22 Bullhead Gulch meeting that the City of Lafayette and MHFD will establish an adequate assurance agreement to ensure the operation of the pond. These input locations are shown in the figure below and the peak discharges and time of peak discharges are outlined in the table. The spatially uniform precipitation data was applied using the hydrograph generated by the CUHP spreadsheet to be consistent with the other methods used as part of the Baseline Hydrology submittal. This

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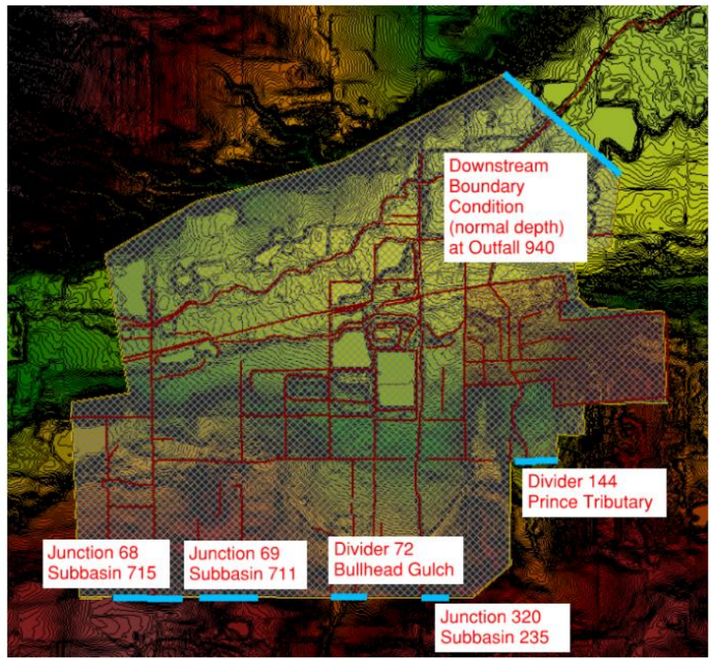
hyetograph was calculated by the CUHP and based on point precipitation data from NOAA Atlas 14 Precipitation Frequency Data Server.

Boundary Condition Hydrograph in HEC-RAS model	EPA SWMM Node	1%-annual chance hydrograph data	
		Peak flow (cfs)	Time of Peak Flow
BCLine: SB711	Junction 69	77.64	0:55
BCLine: SB715	Junction 68	73.90	0:53
BCLine: SB235	Junction 320	126.64	0:55
BCLine: BC Prince Trib	Divider 144	1,572.77	1:27
BCLine: BullheadGulch	Divider 72	2,577.26	1:15



MESH CREATION AND TERRAIN MODIFICATIONS

The grid was initially created with 200'x200' grid cells. A refinement region of 50'x50' grid cells was added in the area of Brownsville subdivisions. This level of refinement is appropriate for a model that is meant to inform routing. Breaklines were added to significant regions, especially in the areas of the main flow paths. Cells were refined along important breaklines to 50'x50' cells.

Several terrain modifications were made in areas where culverts where visible in aerial imagery and in areas significant to flow. Below is a table summarizing the terrain modifications with a brief justification for their necessity.

Terrain Modification Name as shown in HEC-RAS Model	General Location	Description
MA_PT_FlatironDrive	At the intersection of Prince Tributary and Flatiron Drive in Brownsville	Flatiron Drive serves as a significant obstruction to northward flow of Prince Tributary. A small culvert can be viewed from aerial imagery going under Flatiron Drive.
MA_PT_LowerBoulderDitch	At the intersection of Prince Tributary and Lower Boulder Ditch in Brownsville.	The north embankment of Lower Boulder Ditch is a significant obstruction to northward flow of the main channel of Prince Tributary. While the ditch is shown in the terrain, it should not be used as storage. For this reason a cut through the north bank was created to allow flows to pass through and not be stored within the banks of the irrigation ditch. A 36-inch pipe carries Prince Tributary across the irrigation ditch.
MA_GoosehavenOutlet	At the northeastern edge of the eastern-most Goosehaven pond.	The 2D model shows flows from Bullhead Gulch entering this pond on the south side. In order to disallow the pond from providing storage benefits, a cut was made to the embankment on the north side as this is the general direction of flow in the area.

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MA_Jasper_Carlisle	At Jasper Road near the Carlisle Equestrian Center	This culvert can be seen in aerial imagery and is important to overflows from Prince Trib as they move north towards Boulder Creek
MA_287Culvert	At the intersection of US HWY 287 and Jasper Road.	There is a small culvert visible from aerial imagery allowing flows to cross under 287 from west to east, on the south side of Jasper Road, which acts as a major obstruction to the natural northern flow path of Bullhead Gulch.
MA_109thStreet	Near the intersection of the railway and 109th Street	This is a small culvert visible in aerial imagery and allows conveyance of flow from north to south of merged flows from Bullhead Gulch and Prince Tributary
MA_PT_Rail	At the intersection of Prince Tributary and the railway	Can be viewed from aerial imagery and conveys main channel of Prince Tributary underneath the rail which otherwise acts as an obstruction to flow
MA_PT_DobbinsRun	At the intersection of Dobbins Run and Prince Tributary	Can be viewed from aerial imagery and is source of conveyance for main channel of Prince Tributary
MA_BG_South	Along Bullhead Gulch near southern most boundary of 2D extents	This can be seen from aerial imagery and was included in the EPA SWMM model. It is in the main channel of Bullhead Gulch
MA_BG_BotanyLane (1-5)	In various locations on Bullhead Gulch, just east of Botany Lane	There are a series of small culverts visible from aerial imagery along the main channel of Bullhead Gulch.

INFILTRATION

HEC-RAS 2D has a slightly different infiltration method than the CUHP model. Whereas the CUHP model uses Horton's equations, 2D HEC-RAS can use either Deficit Constant, Green Ampt, or SCS Curve number method. The SCS Curve Number method was selected based on

the available data. HEC-RAS calculates a Curve Number based on hydrologic soil group and land cover. Land Cover data for the region was downloaded from the National Land Cover Database (NLCD) from USGS. The same soil shapefile that was used for the Baseline Hydrology CUHP models was used which was originally downloaded from the USDA Web Soil Survey.

The manning's values applied to the NLCD layer were based on ranges provided by the USDA Natural Resources Conservation Service. Manning's values and curve numbers were adjusted based on calibration comparisons to the EPA SWMM model. More discussion of this process is included in the Initial Results and Calibration section of this memo.

INITIAL RESULTS AND CALIBRATION

The initial runs of the HEC-RAS 2D model were compared to the EPA SWMM results at Outfall 940 in order to validate and subsequently calibrate the results. This is the primary outfall for Bullhead Gulch after it has merged with Prince Tributary. A profile line was added to the 2D model at the approximate location of where Outfall 940 is located in the EPA SWMM model. Initially, this profile line showed a peak flow that was significantly less than the peak flow from the EPA SWMM Outfall 940 hydrograph. It was evident based on this discrepancy and visual inspection of the 2D model results that there were large areas of incidental storage locations which accounted for the decrease in peak flow. The EPA SWMM model bypasses these incidental storage locations such as the Goosehaven ponds, irrigation canals, and flat, agricultural parcels bounded by roads that trap flow.

To account for incidental storage in the watershed in the EPA SWMM model, CUHP inputs were re-evaluated. The CUHP accounts for incidental storage within the watershed using the Maximum Depression Storage parameters for pervious and impervious areas. The initial Baseline Hydrology submittals used the parameters that were used in the 2014 OSP spreadsheets: 0.38 watershed inches for pervious areas and 0.1 inches for pervious areas. The value was then increased to 0.6 watershed inches for pervious areas as this is where most of the storage appeared to be occurring. This value is still within the CUHP's recommended values and reflects the high amount of storage seen within the flat agricultural pervious areas of the watershed. The updated CUHP was inputted into the EPA SWMM model, and the results showed a decrease in the peak flow at Outfall 940 of 780 cfs. The updated hydrographs from the EPA SWMM model were entered in to the 2D HEC-RAS model.

In addition to this adjustment to the inflow hydrographs, a restart file was created for the 2D HEC-RAS model and used as initial conditions for the final model run. The restart file is saved by HEC-RAS at a user-defined time after the simulation begins. This restart file is then selected as the initial conditions file so that many of these incidental storage locations are filled. This scenario is much more akin to the SWMM model results and provides a conservative, yet

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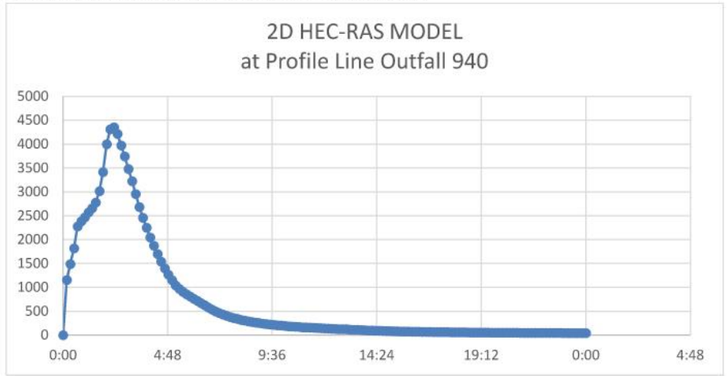
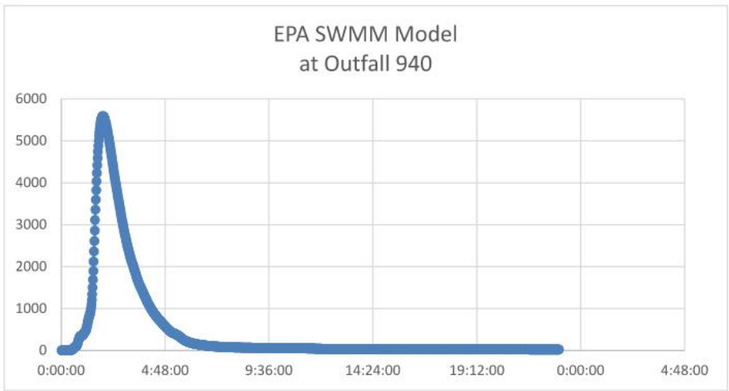
reasonable approach to flow routing and measurement, since the Goosehaven ponds and irrigation canals should be assumed to be filled and not providing stormwater benefits, and since the SWMM model does not account for storage in the routing process. Further calibration of the 2D HEC-RAS model included increasing the curve numbers and decreasing the manning's values within acceptable limits.

A comparison of the profile line hydrograph from the 2D HEC-RAS model outfall and the EPA SWMM hydrograph at Outfall 940 are shown below. The effective peak flow at Outfall 940 for the 100-year Future Conditions event was 5,263 cfs, and the discharge in this area in the effective FIS is 4,500 cfs. Based on these values, both the Bullhead Gulch EPA SWMM results and the 2D HEC-RAS model appear to be within reason.





Model Results and Conclusions

WATERSHED INVESTIGATION

Once the model had been calibrated and validated, a thorough investigation of the flow paths was conducted. This investigation was performed both on the initial plan run (i.e. before applying the restart file as initial conditions, titled "BullheadGulch_Future100year_Initial") and then completed with the final filled model (i.e. after applying the restart file as initial conditions, titled "BullheadGulch_Future100year_Filled"). The initial model was more useful in determining where the flows were headed because there were no initial conditions, that is, the entire Bullhead Gulch watershed was "dry" to begin with. The horizontal rendering method was used to trace flows as they were measured at each cell face from the input hydrographs as they moved through the system. Profile lines were drawn at key locations. Then, the final model was used to accurately measure through these profile lines. This final model more accurately represents the flow values since storage areas were already "full".

The main flow paths generally follow the locations of the inflow hydrographs and are listed below. The flow values listed were extracted from the BullheadGulch_Future100year_Filled plan and are the peak flow values. The locations where these flows were measured from can be viewed in the 2D HEC-RAS model and the Profile Line names for each measurement are provided in the narrative below.

Inflow from Junction 325 / Subbasin 235
These flows appear to follow the routing currently implemented in the EPA SWMM model. Flows are captured by the swale on the east side of Highway 287 and flow northward until eventually joining Bullhead Gulch in the vicinity of subbasin 237.

Inflow from Junction 68 / Subbasin 715
These flows also appear to follow the routing currently implemented in the EPA SWMM model. They will flow northward, some sheet flowing, some flowing in the swale along 95th street until they reach the intersection of 95th street and Isabelle Road. Here, it appears that most flow will overtop the intersection and begin to flow northeast across subbasin 704. The 2D HEC-RAS model results do show some flow leaving the system (Approximately 105 cfs, Profile Line: 95th_Jasper). An outfall should be added here.

Additionally, it does appear that the rail to the north does provide as a barrier to these flows. There are a couple instances of overtopping however the general trend is that northward flow is gathered by the railway and redirected eastward toward the main channel of Bullhead Gulch. One outfall could be added at the intersection of the rail and Peter Leyner Lane. Approximately 96 cfs is leaving the system at this location (Profile Line: Rail_PeterLeyner).

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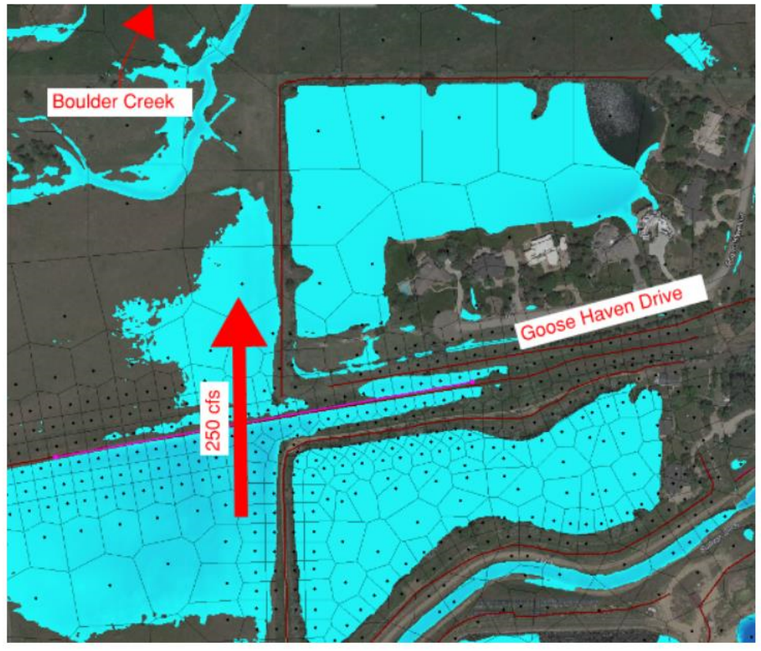
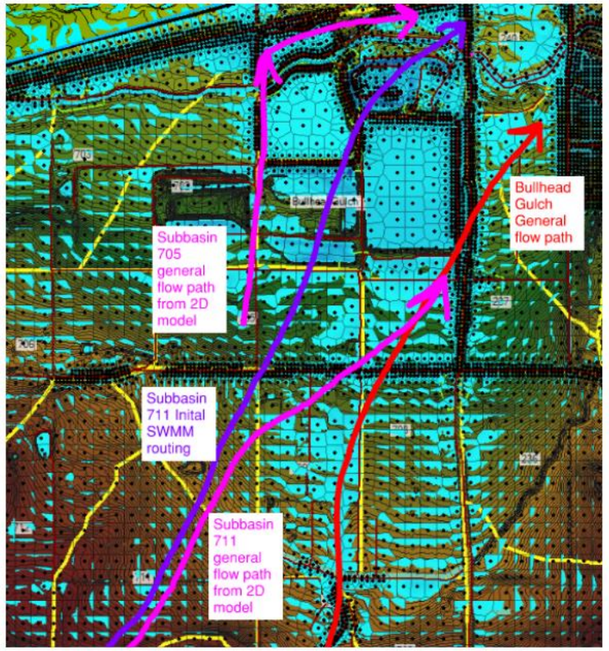
The main instance of railway overtopping occurs near 10365 Goose Haven Drive. Here, flows pool between the railway and one of the Goosehaven ponds until it overtops the rail and flows north into the Boulder Creek Watershed. Approximately 250 cfs will leave the system at this location (Profile Line: Rail_GooseHavenDrive). It should also be noted that in this area, the effective floodplain for Boulder Creek overtops the rail from the north to south.



Inflow from Junction 69 / Subbasin 711
The 2D HEC-RAS model results show a different routing of this flow than was initially assumed in the EPA SWMM model. Flows from this tributary were initially assumed to flow north until eventually being stopped by the rail. However, it appears that flows from subbasins 711 and 710 will actually flow east, confluencing with Bullhead Gulch in subbasin 708. Runoff from subasin 705 appear to flow due north along the eastern boundary of subbasin 702.



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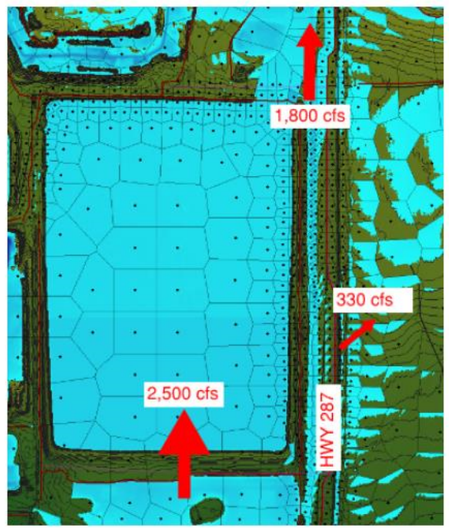
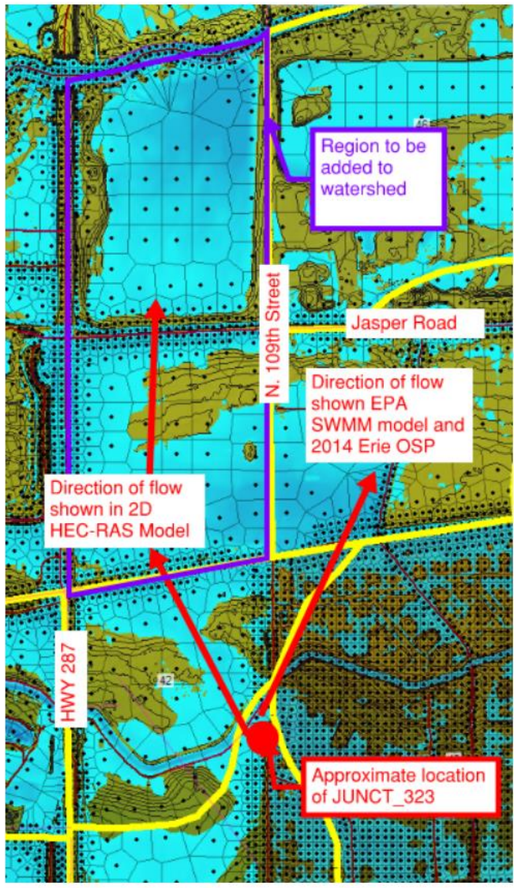
Inflow from Divider 72 / Bullhead Gulch
The following section will describe Bullhead Gulch as they leave the main channel at Junction 72 in the EPA SWMM model and flow northward.

Flow breaks from the main channel begin at the intersection of Bullhead Gulch with the Leyner Cottonwood Number Ditch. Some flow continues north across subbasin 709, and some will flow eastward to be captured along the swale on the west side of US-287. However, both of these general flow paths merge again when they pool in the swale on the southside of Isabelle Road.

Some flow will be conveyed underneath Isabelle Road by two (2) 30-inch reinforced concrete pipes, but most will sheet flow over Isabelle Road toward the Goose haven ponds. Approximately 2,500 cfs will enter the rectangular eastern-most reservoir (Profile line: GooseHaven_south). The flow that does not enter this reservoir will either sheet-flow across Highway 287 toward subbasin 237 or be contained in the swale along Highway 287 and flow north. Approximately 330 cfs crosses 287 at this location (Profile line: 287_nearGooseHaven). At peak flows, there will be around 1,800 cfs continuing northward in the swale at 287 (Profile line: Goosehaven_north). Note that this flow value includes the flow from the artificial cut in the embankment of the easternmost Goosehaven pond. While this channel doesn't exist, it represents the flows exiting the pond since we are not allowing the pond to provide storage benefits. These flows are shown below in the figure.



The flows crossing 287 at this location merge with the Prince Tributary at approximately the intersection of N. 109th Street and Sullivan Ditch. This junction corresponds with the current location of JUNCT_323 in the EPA SWMM model, which is also what was shown in the 2014 OSP Model. However, the EPA SWMM model and the 2014 OSP model show the combined flows of Prince Tributary and Bullhead Gulch then flowing to the northeast, eventually crossing subbasins 242 and 243 and reaching Outfall 940 at the northeast corner of subbasin 243. The 2D HEC-RAS model shows the majority of these flows actually heading slightly northwest from JUNCT_323 into a region currently not included in the Bullhead Gulch watershed. This region should be added to the watershed and a new outfall should be added west of subbasin 243. For organizational purposes, this outfall to be added will be referred to as Outfall 939. This region also ends of storing a lot of the flows as N. 109th street acts as a significant barrier to eastward flow.



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The flows from Bullhead Gulch that do not cross Highway 287 near the Goosehaven reservoir flow north, ponding at the intersection of the railway and Highway 287. Some of the flow overtops 287 here (Approximately 370 cfs, Profile Line: 287_rail). Some overtops the rail and continues northward until ponding near the intersection of Highway 287 and Jasper Road. Here there is a small culvert visible from aerial imagery that allows some flow to cross under 287. Approximately 415 cfs will cross Highway 287 here (Profile Line: 287_Jasper). Approximately 180 cfs will still remain on the west side of Highway 287 and outfall directly into Boulder Creek (Profile Line: BoulderCreek_Outfall).

Inflow from Divider 144 / Prince Tributary

Prince Tributary remains relatively channelized until it intersects Flatiron Drive. Though there is a culvert here visibly from aerial imagery (a terrain modification was also added at this area to allow passage of flow), most of the flow breaks out of the channel and sheet flows to the northwest where it joins Bullhead Gulch at the current location of JUNCT_323. However, some flow does continue north along the main channel. Around the intersection of the channel with the rail line, flows pond and merge with ponded flows from Bullhead Gulch. Some flows continue in and around the channel, crossing north of Jasper Road and east of N. 109th street (approximately 630 cfs, Profile Line: PrinceTrib_Jasper). These flows appear to end up at Outfall 940.

SUMMARY OF CONCLUSIONS AND NEXT STEPS

As predicted, there are not easily identifiable flow paths and outlets due to the topography of the area. However, there are a few key takeaways from the 2D HEC-RAS modelling effort. The changes to be made to the Baseline Hydrology are listed below.

Recommended Updates to the CUHP model

- Add two subbasins between Highway 287 and Subbasins 242 and 243. Develop parameters for these new subbasins and add them to the CUHP.
- Increase the pervious losses in all CUHP runs from 0.38 watershed inches to 0.6 watershed inches. Rerun CUHP models for all recurrence intervals.

Recommended Updates to the SWMM model

- Rerun EPA SWMM models for all recurrence intervals using the updated CUHP spreadsheets with increased storage values.
- Reroute subbasins 711, 710, and 705 as outlined in the Inflow from Junction 69 / Subbasin 711 section.
- Add conduits / junctions for Bullhead Gulch flow that does not cross HWY 287 near Goosehaven Ponds.
    - Flows crossing 287 at rail
    - Flows crossing 287 at Jasper Road

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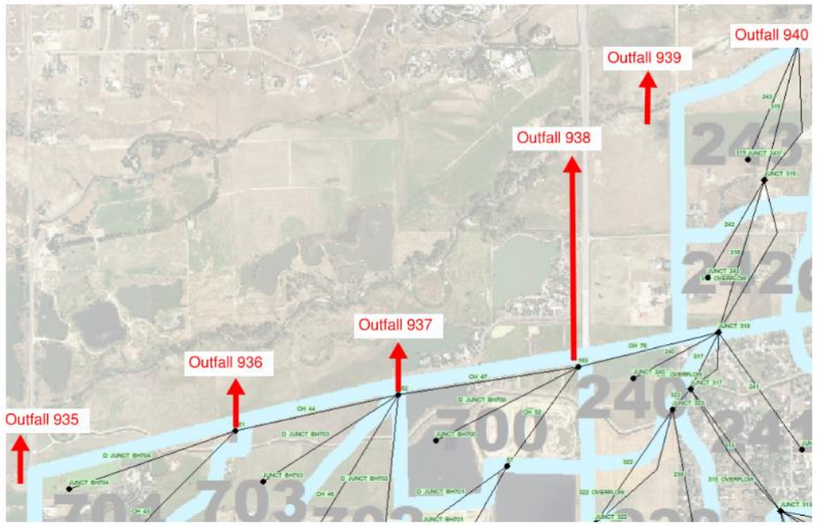
- Add conduits / junctions for Prince Tributary flow that do not merge with Bullhead Gulch and do continue to Outfall 940.
- Add Outfalls:
  - Outfall 935: Flows leaving Bullhead Gulch on the west side of 95th street at Jasper Road.
  - Outfall 936: Flows overtopping the rail near Peter Leyner Drive
  - Outfall 937: Flows leaving Bullhead Gulch on the north side of the railroad.
  - Outfall 938: Flows leaving bullhead gulch that do not make it across 287.
  - Outfall 939: Flow leaving Bullhead Relocate Outfall 940 to the new subbasin that will be added between Highway 287 and Subbasin 243.



Michael Baker INTERNATIONAL

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TO: KURT BAUER, DREW ROBERTS – MILE HIGH FLOOD DISTRICT

FROM: FARINA KAZI – MICHAEL BAKER INTERNATIONAL

SUBJECT: DETAILED 2D HEC-RAS MODEL OF NORTHERN BULLHEAD GULCH

DATE: AUGUST 11, 2022 (REVISED NOVEMBER 10, 2022)

CC: ANDREW PARK-FRIEND, JAMES LINDSAY – MICHAEL BAKER INTERNATIONAL

BACKGROUND

Michael Baker International (MBI) is performing a Flood Hazard Area Delineation (FHAD) and Master Drainage Plan (MDP) for Bullhead Gulch, an approximately 13.5 square mile watershed spanning the City of Lafayette, the City of Louisville, the Town of Erie, and unincorporated areas of Boulder County. The draft Baseline Hydrology (henceforth referred to as "Baseline Hydrology") included the Colorado Urban Hydrograph Procedure (CUHP) to obtain flow hydrographs and an Environmental Protection Agency Storm Water Management Model (EPA SWMM) for flow routing. The Baseline Hydrology has been previously submitted and reviewed by Mile High Flood District (MHFD). During the review process, the flow distribution in the northern part of the watershed was found to be not as easily identifiable due to the flat topography in the region. In February 2022 MBI, in coordination with MHFD and project stakeholders, moved forward with a 2D HEC-RAS coarse hydraulic analysis to help inform the flow routing in EPA SWMM. The coarse 2D HEC-RAS model from February 2022 was purely intended to be informational for flow distribution and did not serve as a means for any mapping or regulatory purposes. The procedure and results from this previous analysis from February 2022 are discussed in further details along with a list of "Recommended Updates" in the Memorandum delivered to MHFD (henceforth referred to as "February 2022 Memo"). This Memorandum, date November 2022, provides a description of the steps completed by MBI, in coordination with the District, as a follow up to implement the "Recommended Updates" from the February 2022 Memo to the Baseline Hydrology.

RECOMMENDED UPDATES

CUHP MODEL UPDATES

Based on the results of the February 2022 Memo, the following changes were recommended and implemented in both the existing and future condition CUHP models:

1. *"Add two subbasins between Highway 287 and Subbasins 242 and 243. Develop parameters for these new subbasins and add them to the CUHP."*

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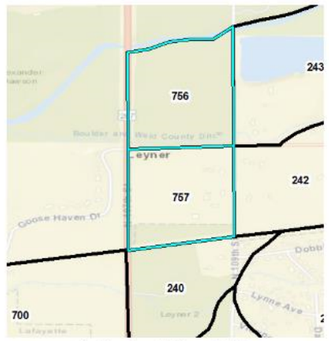
Two new subbasins (Basin 756 and 757) were added in the area shown below. This effort included adding new design points, centroids, longest flow paths, lengths to centroid, start and end elevations for each flowpath and GIS data analysis for soil and existing and future impervious percent parameters for both subbasins. Some areas were identified as "null" in the impervious shape files provided. Those areas were designated to be 2% impervious based on aerial imagery and impervious values designated to similar areas around these subbasins.



Subbasins 756 and 757

2. *"Increase the pervious losses in all CUHP runs from 0.38 watershed inches to 0.60 watershed inches. Rerun CUHP models for all recurrence intervals."*

   Maximum pervious depression storage values for all subbasins were updated to 0.6 inches based on the recommended value for "wooded areas and open fields" because this value agreed more with the large flat agricultural areas that make up the Bullhead Gulch watershed.

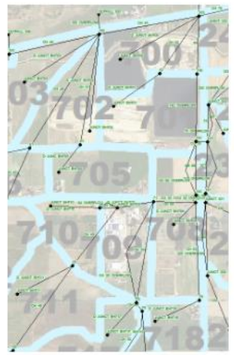
   The previous CUHP models were found to have some discrepancies that were corrected for as well during this update including corrected slopes for each watershed, corrected infiltration parameters and impervious percentage for all watersheds. Both existing and future condition CUHP models were re-run for all recurrence intervals.

EPA SWMM MODEL UPDATES

Based on the results of the February 2022 Memo, the following changes were recommended and implemented to the EPA SWMM models:

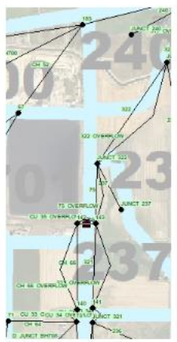
1. *"Reroute subbasins 711, 710, and 705 as outlined in the Inflow from Junction 69/Subbasin 711 section."*

Subbasins 710 and 711 were rerouted to confluence with Bullhead Gulch at subbasin 709. Subbasin 705 was rerouted to flow north towards subbasin 702. Junction 63 and Link CH_51 previously linking 705 to 701 were removed.

February 2022 Memo	*November 2022 Memo*
	

2. *"Add conduits/junctions for Bullhead Gulch flow that does not cross HWY 287 near Goosehaven Ponds.*
    a. *Flows crossing 287 at rail*
    b. *Flows crossing 287 at Jasper Road"*

Additional flowpaths with conduits and junctions from Link CU_35 to Outfall 938 were included. This allowed for flows to continue north towards the Goosehaven Ponds as well as to the east crossing the road and eventually flow northeast towards Jasper Road.

February 2022 Memo	*November 2022 Memo*
	

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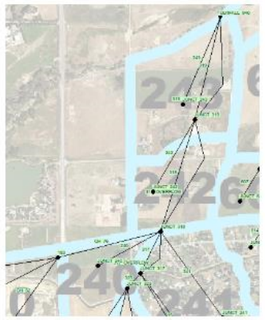
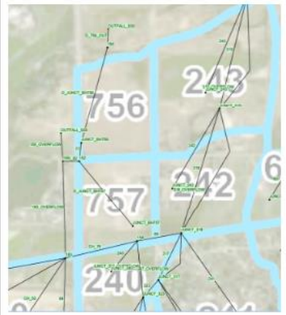
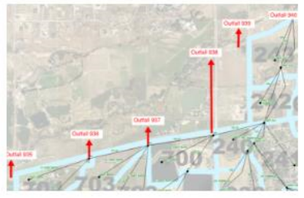
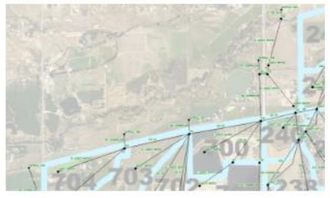
3. *"Add conduits/junctions for Prince Tributary flow that do not merge with Bullhead Gulch and do not continue to Outfall 940."*

Additional flowpath link included from JUCT_323 to Node 154 added to allow for overflow at JUNCT_323 to flow to Node 154. Note, every storm event ran in EPA SWMM for both existing and future conditions did not have any flow in this overflow link. Upon further review of the EPA SWMM model and 2D model results, flows from JUNCT 323 do not appear to overtop the Union Pacific Railroad (henceforth referred to as "Railroad") but instead continue to flow along Bullhead Gulch towards Outfall 940. The new additional Outfall 939 shows how much flow will be directed to Boulder Creek from subbasins 756 and 757.

February 2022 Memo	*November 2022 Memo*
	

4. *"Add Outfalls:*
    a. *Outfall 935: Flows leaving Bullhead Gulch on the west side of 95th street at Jasper Road.*
    b. *Outfall 936: Flows overtopping the rail near Peter Leyner Drive*
    c. *Outfall 937: Flows leaving Bullhead Gulch on the north side of the railroad.*
    d. *Outfall 938: Flows leaving bullhead gulch that do not make it across 287.*
    e. *Outfall 939: Flow leaving Bullhead Relocate Outfall 940 to the new subbasin that will be added between Highway 287 and Subbasin 243."*

All outfalls were added over the Railroad at these locations and each respective node changed from a "junction" to a "divider."

February 2022 Memo	November 2022 Memo
	

5. *"Rerun EPA SWMM models for all recurrence intervals using the updated CUHP spreadsheets with increased storage values."*

   EPA SWMM models for all recurrence intervals for both existing and future conditions were updated using both 2D HEC-RAS and the updated CUHP models with increased storage values. Further discussion on this update is provided in "Boulder Creek Diversion" section.

BOULDER CREEK DIVERSION

After adding the new "recommended" outfall locations from February 2022 Memo as overflow links, the EPA SWMM results showed zero flow overtopping Railroad along the tributary subbasins 707, 704, 703, 702, and 700. EPA SWMM results assumed the channel capacity along the Railroad to be sufficient to capture and direct total flow towards the confluence with the mainstem of Bullhead Gulch (approximately around subbasin 700 and 240). However, based on the results of the February 2022 coarse 2D HEC-RAS model results, it was clear that the flow along the Railroad is two-dimensional in nature in that it is directed concurrently to the east parallel to the Railroad as well as to the north overtopping the Railroad. The current effective mapped Flood Hazard Area (SFHA) for the main stem of Boulder Creek (north of Bullhead Gulch watershed) shows that any flow overtopping the Railroad would instead flow towards the Boulder Creek floodplain, not Bullhead Gulch.

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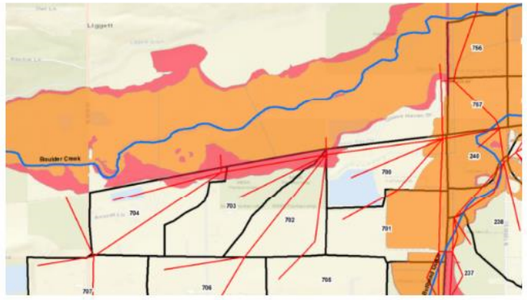
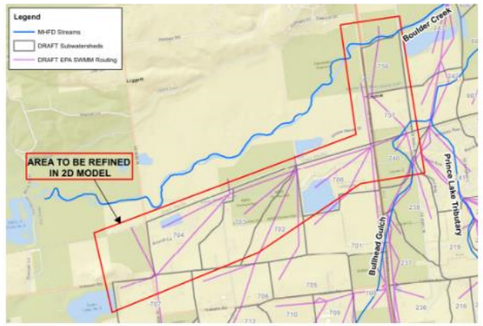


Effective SFHA of Boulder Creek and Bullhead Gulch

Upon further detailed technical review of EPA SWMM and its one-dimensional nature in performing hydrologic calculations, it was conclusive that EPA SWMM cannot calculate the concurrent split in flow along the Railroad embankment without a set "Inflow/Outflow Diversion Curve" for existing and future conditions. Therefore, it was deemed necessary to perform a separate two-dimensional detailed analysis of the split in flow along the Railroad in order to inform the diversion curves needed as input in the EPA SWMM model for the tributary subbasin outfall locations. The assumptions for split flow locations and the fact that the Railroad embankment overtops were predetermined from the results of the coarse 2D HEC-RAS model from February 2022.

The detailed 2D analysis from this November 2022 Memo would determine the amount of flow "leaving" the Bullhead Gulch watershed flowing into Boulder Creek and the amount of flow being directed "toward" the confluence with the main stem of Bullhead Gulch. Using the results of the split in flow for all recurrence intervals from the detailed 2D analysis, a diversion curve could be created for each split flow location for existing and future conditions. This would allow to mimic the split flow occurring in this region in EPA SWMM and have a more accurate representation of flow distribution between Boulder Creek and Bullhead Gulch, respectively. The base coarse 2D HEC-RAS model from February 2022 was therefore truncated and refined to create a more detailed model for the northern portion of the watershed as seen below.



Truncated Model Area for Detailed 2D HEC-RAS Model

The coarse 2D HEC-RAS model from February 2022 was updated per the agreed upon scope with MHFD for the detailed 2D HEC-RAS model. The updated model would be able to accurately calculate the inputs needed for the EPA SWMM diversion curves for the baseline hydrologic model for Bullhead Gulch. For a more detailed approach, the coarse 2D model was truncated and updated from rain-on-mesh to hydrograph inflows only, the 2D mesh was updated from 200x200 cells to 100x100 cells and further mesh refinements and breaklines were incorporated. Further terrain modifications such as removing canals or ditches were not implemented in this analysis to allow for the correct split in flow to be calculated using all existing conveyance paths in this region.

The locations and extents of the boundary conditions were placed according to the predetermined split flow locations from coarse 2D HEC-RAS model from February 2022. The peak flow hydrographs for these boundary conditions were taken from the EPA SWMM model for the respective split flow location for each recurrence interval before a "diversion curve" is included in the model (henceforth referred to as "original EPA SWMM model"). For reference, these hydrographs will be referred to as the "direct" EPA SWMM hydrographs at each node based on the original EPA SWMM model. In order to mimic the steady state flow routing through the EPA SWMM model in the detailed 2D HEC-RAS model, the HEC-RAS model was updated to be a quasi-steady state model. In other words, the model ran unsteady while the flow hydrograph inputs were set to steady state. Additionally, the EPA SWMM "direct" flow hydrograph result at each node is representative of the "total flow" at that node. If all the "direct" flow hydrographs were input into the 2D HEC-RAS model as boundary conditions, then inflows would be severely overestimated at each location. For this reason, after the first node (Node 180) with the "direct" flow hydrograph, each subsequent node downstream (Node 181, Node 182 and Node 183) were updated to only assume the "incremental" increase in peak flow from one node to the next to better represent the EPA SWMM routing in the 2D HEC-RAS model. All "incremental" flow hydrographs were created using a basic linear "ramp up" to the

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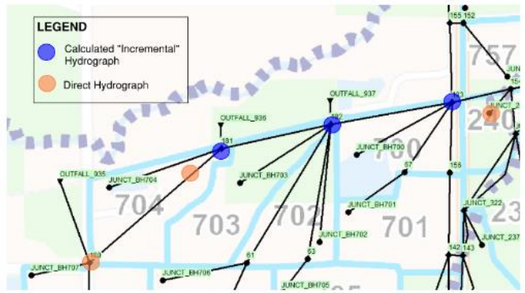
calculated incremental peak flow increase between EPA SWMM nodes to allow for model stability and limit water surface elevation errors. The table below lists the 2D HEC-RAS model boundary condition and the corresponding EPA SWMM "direct" or "incremental" (i.e. calculated) flow hydrograph for each recurrence interval.

2D HEC-RAS Boundary Condition and EPA SWMM Hydrograph

Boundary Condition Name	EPA SWMM Peak Flow Hydrograph
BC Detailed Node 180 ("direct")	Node 180
BC Detailed Node 181 Incremental ("incremental")	(Node 181 - Node 180)
BC Detailed Node 182 Incremental ("incremental")	(Node 182 - Node 181)
BC Detailed Node 183 Incremental ("incremental")	(Node 183 - Node 182)
BC Detailed Junction 240 ("direct")	Node 240



Direct and Incremental Hydrograph Inputs in Detailed 2D HEC-RAS Model

Once the base geometry of the truncated 2D HEC-RAS model was updated, additional plans and flow data were added for each recurrence interval for existing and future conditions as described above. The simulation run times were reasonably increased to reach model stability. An initial restart file was not required for this model. Profile lines were then drawn, perpendicular to flow, at the predetermined split flow outfall locations from the February 2022 Memo along the Railroad. Flows taken from these profile lines were then used to determine the respective "in system" flows to Bullhead Gulch and "out of system" flows to Boulder Creek. See table below for profile line designations.

Detailed 2D HEC-RAS Model Profile Line for Diversion Curve Values

Node	"In System" Flow	"Out of System" Flow
Node 180	Node 180 Split Flow	Node 180 Outfall
Node 181	Node 181 Split Flow	Node 181 Outfall
Node 182	Node 182 Split Flow	Node 182 Outfall
Node 183	Node 183 Split Flow	Node 183 Outfall

The original EPA SWMM and detailed 2D HEC-RAS models were compared for total flow rates at each node for reasonableness. Peak flows from the 2D HEC-RAS model were the calculated sum of the "in system" and "out of system" flows taken from the profile line designations at each node as listed above. Peak flows from the original EPA SWMM model seemed appropriate to compare against because these were the "original" peak flows used as either "direct" or "incremental" flows in the 2D HEC-RAS boundary conditions. The total flows between the original EPA SWMM model and the 2D HEC-RAS model were within 0-20 cfs of each other for all recurrence intervals at each node and therefore considered within acceptable range. The table below lists the comparison of total flows at each node for the existing and future conditions for the 100 year storm event.

100 YR EPA SWMM vs 2D HEC-RAS Total Flow before Diversion Analysis

Node	EXISTING or FUTURE	EPA SWMM Total Flow	HEC-RAS 2D Total Flow	Difference in Total Flow
Node 180	Existing	446	449	3
	Future	446	451	5
Node 181	Existing	538	537	1
	Future	538	538	0
Node 182	Existing	772	771	1
	Future	771	773	2
Node 183	Existing	3512	3514	2
	Future	3742	3748	6

Note, once the diversion curves based on 2D HEC-RAS results are input into the original EPA SWMM model, the "total peak flow" at each node is calculated differently. This is due to the fact that EPA SWMM performs different routing calculations once a diversion curve is taken into account at each node. Due to the nature of 2D vs 1D modeling, the "total flow" differences between the updated EPA SWMM with diversion curves and 2D HEC-RAS models were expected. Because the original flows matched very closely as seen in the table above, this was not a cause for concern. As stated before, the purpose of this detailed analysis to solely help inform the 1D EPA SWMM model for the split flow locations.

The "in system" and "out of system" flows from each recurrence interval were used to create a diversion curve at each node location for existing and future conditions, respectively. The direct

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and incremental hydrographs, and diversion curves are included in digital form in Attachment A of this Memo.

This detailed diversion curve analysis was ran on EPA SWMM for all 14 scenarios – 7 storm events (2 YR, 5 YR, 10 YR, 25 YR, 50 YR, 100 YR, 500 YR) each for existing and future. The detailed 2D HEC-RAS model therefore has 14 plans and 14 flow data sets referenced to 1 geometry. However, there are only 2 EPA SWMM models, one for existing condition and one for future condition. The user need only to update the input CUHP files for the respective storm event and existing/future condition to be able to see results.

RESULTS AND CONCLUSION

The results of this detailed analysis show that a majority of the flow from the tributary subbasins along the Railroad embankment overtops and flows into Boulder Creek instead of flowing towards the point of confluence with the main stem of Bullhead Gulch. For the smaller storm events (2 YR, 5 YR, 10 YR, 25 YR), most if not all, of the tributary subbasin flow stays within the system. However, for the larger storm events (50 YR, 100 YR, and 500 YR), most of the tributary subbasin flow leaves the system to Boulder Creek by the time flow reaches the point of confluence with Bullhead Gulch. The table below lists the results for comparison between before and after this November 2022 detailed analysis performed as part of this Memo for the 100 YR recurrence interval for both existing and future conditions.

Detailed Analysis Evaluation for 100 YR

Node	Existing or Future?	February 2022 Memo		November 2022 Memo	
		Flow to Bullhead Gulch (cfs)	Flow to Boulder Creek (cfs)	Flow to Bullhead Gulch (cfs)	Flow to Boulder Creek (cfs)
Node 180	Existing	446	0	395	51
	Future	446	0	395	51
Node 181	Existing	500	0	341	118
	Future	500	0	341	118
Node 182	Existing	723	0	268	321
	Future	723	0	268	321
Node 183	Existing	2342	1170	592	2446
	Future	2342	1399	666	2632

Note, the flow rates between existing and future are the same through subbasins 707, 704, 703, 702 and 700. These subbasins in this tributary (722, 715, 713, 707, 703, 702, and 700) to the main stem of Bullhead Gulch have the same percent impervious values between existing and future conditions. The main impact between existing and future conditions for the truncated area is near the confluence point with Bullhead Gulch near Node 183 where flow from the rest of the upstream portion of the Bullhead Gulch watershed confluences.

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The purpose of the table above is to compare the ratio in split flow between Bullhead Gulch and Boulder Creek, not the total flow as described before in this Memo. As seen from the values listed in the table, a significant amount of flow is routed to Boulder Creek instead of Bullhead Gulch using the diversion curve results from the detailed 2D HEC-RAS model along the Railroad embankment. Flow along this tributary to the main stem of Bullhead Gulch was overestimated prior to this detailed analysis. Therefore, the existing and future condition EPA SWMM models that have been created using the diversion curves using the detailed 2D HEC-RAS model results should be used to depict an accurate representation of the Baseline Hydrology flow rates for the Bullhead Gulch FHAD.

Attachment A: Diversion Curves for EPA SWMM Model

(Digital Files provided for all HEC-RAS 2D Input Flow Hydrographs)

***Inflow Value: Total inflow SWMM value at node before HEC-RAS 2D Detailed Analysis**
***Outflow Value: Outflow value from HEC-RAS 2D Detailed Analysis diverted flow to Boulder Creek**

Existing Node 180 Diversion Curve

Existing or Future	Recurrence Interval	Inflow (To Bullhead Gulch)	Outflow (To Boulder Creek)
Existing	2 YR	0	0
Existing	5 YR	1	0
Existing	10 YR	4	0
Existing	25 YR	119	13
Existing	50 YR	254	31
Existing	100 YR	446	51
Existing	500 YR	891	114

Future Node 180 Diversion Curve

Existing or Future	Recurrence Interval	Inflow (To Bullhead Gulch)	Outflow (To Boulder Creek)
Future	2 YR	0	0
Future	5 YR	1	0
Future	10 YR	4	0
Future	25 YR	119	13
Future	50 YR	254	31
Future	100 YR	446	51
Future	500 YR	891	114

Existing Node 181 Diversion Curve

Existing or Future	Recurrence Interval	Inflow (To Bullhead Gulch)	Outflow (To Boulder Creek)
Existing	2 YR	2	0
Existing	5 YR	3	0
Existing	10 YR	9	0
Existing	25 YR	148	13
Existing	50 YR	309	42
Existing	100 YR	538	140
Existing	500 YR	1064	403

Future Node 181 Diversion Curve

Existing or Future	Recurrence Interval	Inflow (To Bullhead Gulch)	Outflow (To Boulder Creek)
Future	2 YR	2	0
Future	5 YR	3	0
Future	10 YR	9	0
Future	25 YR	148	13
Future	50 YR	309	42
Future	100 YR	538	140
Future	500 YR	1064	403

Existing Node 182 Diversion Curve

Existing or Future	Recurrence Interval	Inflow (To Bullhead Gulch)	Outflow (To Boulder Creek)
Existing	2 YR	2	0
Existing	5 YR	3	0
Existing	10 YR	10	1
Existing	25 YR	182	60
Existing	50 YR	401	173
Existing	100 YR	772	431
Existing	500 YR	1682	1152

Future Node 182 Diversion Curve

Existing or Future	Recurrence Interval	Inflow (To Bullhead Gulch)	Outflow (To Boulder Creek)
Future	2 YR	2	0
Future	5 YR	3	0
Future	10 YR	10	1
Future	25 YR	182	60
Future	50 YR	401	173
Future	100 YR	772	431
Future	500 YR	1682	1152

Existing Node 183 Diversion Curve

Existing or Future	Recurrence Interval	Inflow (To Bullhead Gulch)	Outflow (To Boulder Creek)
Existing	2 YR	41	37
Existing	5 YR	110	100
Existing	10 YR	191	169
Existing	25 YR	1164	971
Existing	50 YR	2094	1704
Existing	100 YR	3512	2787
Existing	500 YR	6886	5303

Future Node 183 Diversion Curve

Existing or Future	Recurrence Interval	Inflow (To Bullhead Gulch)	Outflow (To Boulder Creek)
Future	2 YR	119	108
Future	5 YR	199	180
Future	10 YR	310	268
Future	25 YR	1336	1101
Future	50 YR	2281	1851
Future	100 YR	3742	2941
Future	500 YR	7201	5506

Appendix B – Hydrologic Analysis

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Baseline Hydrology Map

MDP and FHAD for Bullhead Gulch and Prince Tributary

MARCH 2023

Michael Baker INTERNATIONAL
165 S. Union Blvd., Suite 1000
Lakewood, CO 80228
Phone: (720) 514-1100

LEGEND

- Basin ID
- Design Points
- Outfalls
- Conveyance Links
- Storage Nodes
- Bullhead Gulch and Prince Tributary Study Area
- Subwatersheds
- Detention Ponds
- River Reaches
- Contours (10ft)

Jurisdictional Boundaries

- Town of Erie
- City of Lafayette
- City of Lousiville

Hydrologic Soil Rating

- A
- B
- C
- D

Percent Impervious

- 0 - 20
- 21 - 40
- 41 - 60
- 61 - 80
- 81 - 100

Development Status

- Not Fully Developed
- Fully Developed

Watershed Routing Delineation

- Bullhead Gulch
- Prince Tributary

MAP CONTROLS

Interactive map controls are provided below. Click the map type to display relevant layers.

Study Area
Hydrologic Soils
Existing Land Use - % Impervious
Future Land Use - % Impervious
Subwatershed Boundaries
Baseline Hydrology SWMM Routing

Additional interactive map controls are provided below. Click the feature type to display in the map view.

Development Status (Off)
Watershed Routing Delineation (Off)
Contours (10ft) (Off)
Jurisdictional Boundaries (Off)

0 0.25 0.5 Miles
1:12000 Scale (1" = 1000 Feet)

NAIP Imagery

NOAA Atlas Precipitation Frequency Data Server Data Sheet

NOAA Atlas 14, Volume 8, Version 2
Location name: Lafayette, Colorado, USA*
Latitude: 40.0289°, Longitude: -105.1074°
Elevation: 5126.68 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Deborah Martin, Sandra Pavlovic, Ishani Roy, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Michael Yekta, Geoffery Bonnin

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.218 (0.172-0.278)	0.267 (0.210-0.340)	0.362 (0.284-0.462)	0.455 (0.354-0.583)	0.603 (0.463-0.827)	0.734 (0.545-1.01)	0.879 (0.629-1.24)	1.04 (0.712-1.51)	1.28 (0.837-1.90)	1.47 (0.932-2.19)
10-min	0.320 (0.252-0.407)	0.391 (0.308-0.498)	0.530 (0.416-0.676)	0.666 (0.519-0.853)	0.883 (0.678-1.21)	1.07 (0.798-1.48)	1.29 (0.920-1.82)	1.52 (1.04-2.21)	1.87 (1.23-2.78)	2.16 (1.37-3.21)
15-min	0.390 (0.307-0.496)	0.477 (0.376-0.607)	0.646 (0.507-0.825)	0.812 (0.633-1.04)	1.08 (0.827-1.48)	1.31 (0.973-1.81)	1.57 (1.12-2.22)	1.86 (1.27-2.69)	2.28 (1.50-3.39)	2.63 (1.66-3.91)
30-min	0.536 (0.423-0.682)	0.654 (0.515-0.832)	0.883 (0.693-1.13)	1.11 (0.863-1.42)	1.47 (1.13-2.01)	1.78 (1.33-2.46)	2.14 (1.53-3.02)	2.53 (1.73-3.66)	3.11 (2.04-4.61)	3.58 (2.27-5.33)
60-min	0.656 (0.517-0.834)	0.805 (0.634-1.02)	1.09 (0.857-1.39)	1.37 (1.07-1.76)	1.81 (1.39-2.48)	2.20 (1.63-3.03)	2.63 (1.88-3.71)	3.11 (2.12-4.50)	3.80 (2.49-5.64)	4.38 (2.77-6.51)
2-hr	0.776 (0.618-0.975)	0.957 (0.761-1.20)	1.30 (1.03-1.64)	1.63 (1.29-2.07)	2.16 (1.67-2.92)	2.62 (1.96-3.56)	3.12 (2.26-4.35)	3.68 (2.55-5.26)	4.50 (2.98-6.59)	5.17 (3.31-7.60)
3-hr	0.842 (0.675-1.05)	1.04 (0.833-1.30)	1.42 (1.13-1.77)	1.77 (1.41-2.23)	2.34 (1.82-3.13)	2.82 (2.13-3.81)	3.36 (2.44-4.64)	3.95 (2.75-5.60)	4.81 (3.21-6.99)	5.52 (3.55-8.04)
6-hr	1.01 (0.818-1.24)	1.24 (1.00-1.52)	1.66 (1.34-2.05)	2.06 (1.65-2.56)	2.68 (2.11-3.54)	3.22 (2.45-4.28)	3.81 (2.79-5.18)	4.45 (3.13-6.22)	5.39 (3.63-7.72)	6.15 (4.01-8.85)
12-hr	1.26 (1.03-1.53)	1.52 (1.24-1.85)	2.00 (1.63-2.44)	2.44 (1.98-2.99)	3.13 (2.48-4.06)	3.72 (2.86-4.87)	4.37 (3.24-5.85)	5.07 (3.60-6.98)	6.09 (4.14-8.60)	6.92 (4.55-9.82)
24-hr	1.50 (1.24-1.81)	1.84 (1.52-2.22)	2.44 (2.01-2.94)	2.97 (2.44-3.60)	3.76 (3.00-4.78)	4.42 (3.42-5.67)	5.11 (3.82-6.72)	5.85 (4.18-7.90)	6.89 (4.73-9.57)	7.73 (5.15-10.8)
2-day	1.69 (1.41-2.00)	2.15 (1.80-2.55)	2.93 (2.44-3.48)	3.58 (2.96-4.28)	4.49 (3.58-5.56)	5.20 (4.05-6.54)	5.93 (4.46-7.63)	6.68 (4.81-8.83)	7.68 (5.31-10.5)	8.45 (5.69-11.7)
3-day	1.84 (1.55-2.17)	2.32 (1.95-2.73)	3.11 (2.60-3.67)	3.77 (3.14-4.47)	4.70 (3.78-5.78)	5.43 (4.26-6.77)	6.17 (4.67-7.88)	6.93 (5.03-9.10)	7.96 (5.54-10.8)	8.75 (5.93-12.0)
4-day	1.98 (1.68-2.32)	2.44 (2.06-2.86)	3.20 (2.70-3.76)	3.85 (3.23-4.55)	4.78 (3.86-5.85)	5.51 (4.35-6.83)	6.26 (4.76-7.96)	7.04 (5.13-9.20)	8.10 (5.67-10.9)	8.92 (6.08-12.2)
7-day	2.33 (1.99-2.70)	2.74 (2.33-3.17)	3.44 (2.92-3.99)	4.05 (3.42-4.73)	4.94 (4.05-6.01)	5.67 (4.53-6.98)	6.43 (4.95-8.11)	7.24 (5.34-9.38)	8.35 (5.92-11.1)	9.24 (6.36-12.5)
10-day	2.62 (2.25-3.01)	3.01 (2.58-3.47)	3.70 (3.16-4.27)	4.30 (3.65-4.98)	5.18 (4.28-6.26)	5.91 (4.75-7.22)	6.66 (5.17-8.35)	7.47 (5.55-9.62)	8.60 (6.13-11.4)	9.49 (6.57-12.7)
20-day	3.38 (2.94-3.84)	3.85 (3.34-4.37)	4.63 (4.01-5.28)	5.30 (4.55-6.06)	6.23 (5.18-7.37)	6.97 (5.65-8.35)	7.72 (6.04-9.49)	8.50 (6.37-10.7)	9.56 (6.88-12.4)	10.4 (7.26-13.7)
30-day	3.99 (3.49-4.49)	4.55 (3.98-5.13)	5.48 (4.77-6.19)	6.23 (5.39-7.07)	7.27 (6.06-8.48)	8.05 (6.56-9.54)	8.83 (6.95-10.7)	9.62 (7.24-12.0)	10.6 (7.70-13.7)	11.4 (8.04-14.9)
45-day	4.73 (4.16-5.28)	5.43 (4.78-6.07)	6.56 (5.74-7.35)	7.46 (6.50-8.39)	8.65 (7.25-9.98)	9.54 (7.81-11.2)	10.4 (8.22-12.5)	11.2 (8.51-13.9)	12.3 (8.95-15.6)	13.1 (9.28-16.9)
60-day	5.35 (4.73-5.94)	6.17 (5.45-6.86)	7.47 (6.58-8.32)	8.51 (7.45-9.52)	9.87 (8.30-11.3)	10.9 (8.94-12.6)	11.8 (9.39-14.1)	12.7 (9.69-15.6)	13.9 (10.2-17.5)	14.7 (10.5-19.0)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

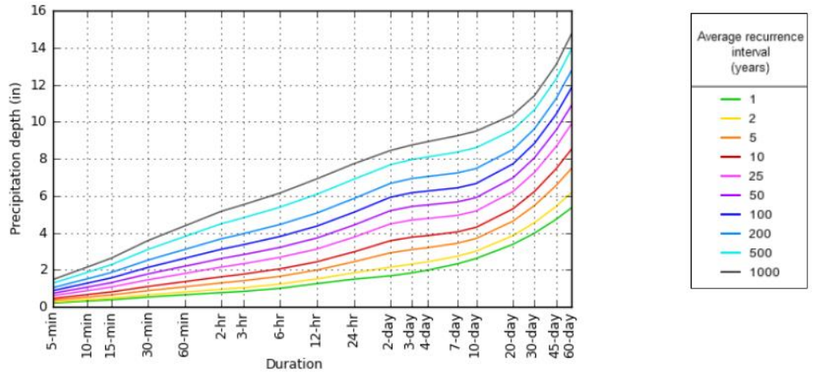
Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

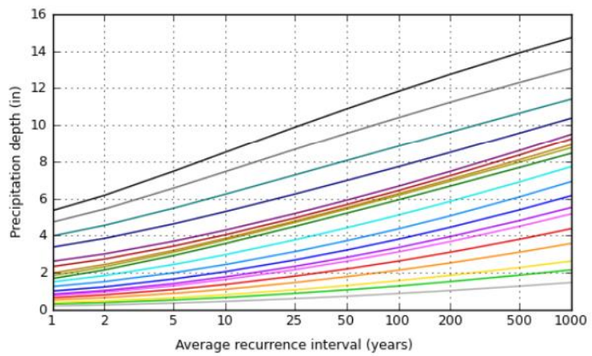
Please refer to NOAA Atlas 14 document for more information.

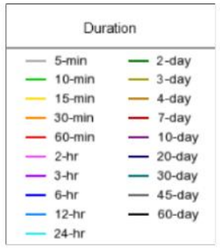
Back to Top

PF graphical

PDS-based depth-duration-frequency (DDF) curves
Latitude: 40.0289°, Longitude: -105.1074°





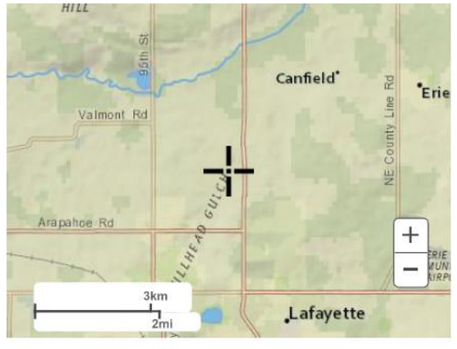


NOAA Atlas 14, Volume 8, Version 2 Created (GMT): Wed Feb 15 16:57:04 2023

Back to Top

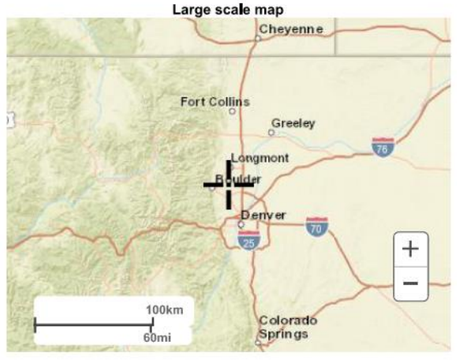
Maps & aerials

Small scale terrain

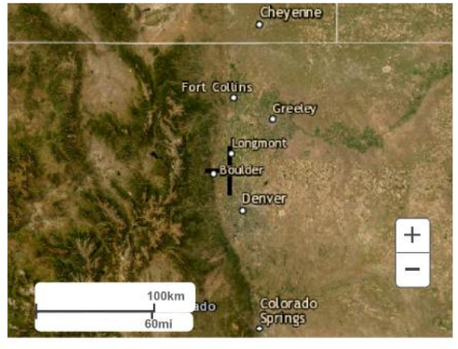


Large scale terrain

Large scale map



Large scale aerial



Back to Top

US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

Table B-1

CUHP Input Parameters – Existing and Future Conditions

Subcatchment Name	EPA SWMM Target Node	Area (mi^2)	Area (acres)	Length to Centroid (mi)	Length (mi)	Slope (ft/ft)	Percent Impervious (Existing)	Fully Developed?	Percent Impervious (Future)	Maximum Depression Storage		Horton's Infiltration Paramters		
										Pervious (in)	Impervious (in)	Initial Rate (in/hr)	Decay Coefficient (1/seconds)	Final Rate (in/hr)
JUNCT_201	JUNCT_201	0.09	56.75	0.24	0.69	0.015	13.1	N	67.5	0.6	0.1	4.50	0.00180	0.60
JUNCT_202	JUNCT_202	0.07	42.71	0.19	0.50	0.017	40.5	Y	40.5	0.6	0.1	4.50	0.00180	0.60
JUNCT_203	JUNCT_203	0.08	53.76	0.21	0.49	0.029	11.0	N	19.3	0.6	0.1	4.50	0.00180	0.60
JUNCT_204	JUNCT_204	0.13	85.19	0.18	0.44	0.019	28.4	Y	28.4	0.6	0.1	4.50	0.00180	0.60
JUNCT_205	JUNCT_205	0.12	73.63	0.28	0.62	0.016	37.6	N	38.5	0.6	0.1	4.50	0.00180	0.60
JUNCT_206	JUNCT_206	0.11	71.64	0.44	0.71	0.013	33.6	N	34.1	0.6	0.1	4.50	0.00180	0.60
JUNCT_207	JUNCT_207	0.12	79.93	0.33	0.55	0.017	36.8	N	37.9	0.6	0.1	4.50	0.00180	0.60
JUNCT_208	JUNCT_208	0.04	28.61	0.14	0.38	0.014	3.5	N	19.3	0.6	0.1	4.50	0.00180	0.60
JUNCT_209	JUNCT_209	0.19	124.76	0.29	0.68	0.019	40.8	N	41.4	0.6	0.1	4.50	0.00180	0.60
JUNCT_210	JUNCT_210	0.04	26.21	0.16	0.40	0.020	21.2	N	41.9	0.6	0.1	4.47	0.00180	0.60
JUNCT_211	JUNCT_211	0.06	40.16	0.23	0.44	0.011	2.0	N	24.8	0.6	0.1	4.50	0.00180	0.60
JUNCT_212	JUNCT_212	0.12	76.55	0.18	0.40	0.022	4.2	N	7.5	0.6	0.1	4.39	0.00180	0.59
JUNCT_213	JUNCT_213	0.10	62.92	0.24	0.48	0.019	33.0	N	42.5	0.6	0.1	4.30	0.00180	0.59
JUNCT_215	JUNCT_215	0.13	81.55	0.49	0.86	0.015	3.1	N	40.0	0.6	0.1	4.50	0.00180	0.60
JUNCT_216	JUNCT_216	0.08	49.88	0.30	0.58	0.020	2.7	Y	2.7	0.6	0.1	4.50	0.00180	0.60
JUNCT_217	JUNCT_217	0.19	122.48	0.47	0.92	0.020	35.3	N	44.1	0.6	0.1	4.34	0.00180	0.59
JUNCT_218	JUNCT_218	0.13	81.94	0.40	0.64	0.028	38.8	N	44.4	0.6	0.1	3.78	0.00180	0.55
JUNCT_219	JUNCT_219	0.11	70.38	0.34	0.58	0.013	3.5	N	9.5	0.6	0.1	4.50	0.00180	0.60
JUNCT_220	JUNCT_220	0.07	47.45	0.31	0.71	0.027	13.0	N	16.1	0.6	0.1	4.33	0.00180	0.59
JUNCT_221	JUNCT_221	0.12	74.77	0.19	0.49	0.020	24.0	N	30.1	0.6	0.1	3.66	0.00180	0.54
JUNCT_222	JUNCT_222	0.14	91.43	0.34	0.66	0.024	14.4	N	17.3	0.6	0.1	4.21	0.00180	0.58
JUNCT_235	JUNCT_235	0.19	122.43	0.38	0.88	0.027	8.4	Y	8.4	0.6	0.1	4.50	0.00180	0.60
JUNCT_236	JUNCT_236	0.16	99.82	0.29	0.64	0.024	2.8	Y	2.8	0.6	0.1	4.48	0.00180	0.60
JUNCT_237	JUNCT_237	0.09	58.64	0.36	0.77	0.017	7.7	N	9.4	0.6	0.1	4.30	0.00180	0.59
JUNCT_238	JUNCT_238	0.14	87.48	0.43	0.82	0.018	5.3	N	6.9	0.6	0.1	4.44	0.00180	0.60
JUNCT_240	JUNCT_240	0.08	49.31	0.33	0.58	0.009	5.7	N	7.4	0.6	0.1	4.50	0.00180	0.60
JUNCT_241	JUNCT_241	0.20	125.47	0.35	0.63	0.015	18.8	Y	18.8	0.6	0.1	4.50	0.00180	0.60
JUNCT_242	JUNCT_242	0.10	64.26	0.17	0.44	0.007	0.3	N	2.1	0.6	0.1	4.26	0.00180	0.58
JUNCT_243	JUNCT_243	0.16	99.76	0.36	0.55	0.007	22.0	Y	22.0	0.6	0.1	3.00	0.00180	0.50
JUNCT_606	JUNCT_606	0.07	45.71	0.40	0.69	0.006	2.0	N	2.6	0.6	0.1	3.00	0.00180	0.50
JUNCT_607	JUNCT_607	0.04	25.36	0.12	0.28	0.010	0.0	N	2.8	0.6	0.1	4.37	0.00180	0.59
JUNCT_608	JUNCT_608	0.20	129.88	0.38	0.73	0.007	2.0	N	2.1	0.6	0.1	3.14	0.00180	0.51
JUNCT_609	JUNCT_609	0.12	74.78	0.37	0.73	0.005	43.2	N	86.2	0.6	0.1	3.05	0.00180	0.50
JUNCT_613	JUNCT_613	0.10	66.08	0.32	0.61	0.015	23.4	N	35.3	0.6	0.1	4.50	0.00180	0.60
JUNCT_614	JUNCT_614	0.19	124.49	0.42	0.86	0.024	14.6	N	17.4	0.6	0.1	3.99	0.00180	0.57
JUNCT_615	JUNCT_615	0.15	95.81	0.43	0.76	0.025	1.1	N	10.0	0.6	0.1	4.42	0.00180	0.59
JUNCT_616	JUNCT_616	0.10	64.29	0.30	0.73	0.027	8.3	N	12.8	0.6	0.1	4.50	0.00180	0.60
JUNCT_617	JUNCT_617	0.18	114.79	0.38	0.84	0.019	3.9	Y	3.9	0.6	0.1	4.41	0.00180	0.59
JUNCT_618	JUNCT_618	0.15	96.16	0.34	0.67	0.007	1.2	N	12.3	0.6	0.1	4.41	0.00180	0.59
JUNCT_619	JUNCT_619	0.05	28.84	0.12	0.29	0.023	19.5	Y	19.4	0.6	0.1	4.50	0.00180	0.60
JUNCT_620	JUNCT_620	0.13	81.90	0.39	0.77	0.006	2.2	N	2.7	0.6	0.1	4.49	0.00180	0.60
JUNCT_621	JUNCT_621	0.10	65.56	0.41	0.88	0.005	2.9	Y	2.9	0.6	0.1	4.50	0.00180	0.60
JUNCT_622	JUNCT_622	0.12	75.99	0.20	0.56	0.006	7.0	N	13.9	0.6	0.1	3.06	0.00180	0.50
JUNCT_623	JUNCT_623	0.07	44.53	0.23	0.42	0.007	2.0	N	3.6	0.6	0.1	3.00	0.00180	0.50
JUNCT_624	JUNCT_624	0.08	51.89	0.41	1.01	0.007	9.5	N	15.9	0.6	0.1	3.26	0.00180	0.52
JUNCT_638	JUNCT_638	0.08	49.65	0.19	0.45	0.017	7.2	Y	7.2	0.6	0.1	4.50	0.00180	0.60
JUNCT_639	JUNCT_639	0.14	89.36	0.27	0.70	0.013	2.2	Y	2.2	0.6	0.1	4.50	0.00180	0.60
JUNCT_640	JUNCT_640	0.12	79.41	0.27	0.63	0.007	8.5	Y	8.5	0.6	0.1	3.75	0.00180	0.55
JUNCT_641	JUNCT_641	0.05	29.55	0.22	0.41	0.007	3.9	Y	3.9	0.6	0.1	3.00	0.00180	0.50
JUNCT_648	JUNCT_648	0.13	80.35	0.35	0.63	0.007	27.3	Y	27.3	0.6	0.1	3.12	0.00180	0.51
JUNCT_655	JUNCT_655	0.19	121.47	0.57	0.99	0.010	20.5	N	21.0	0.6	0.1	3.28	0.00180	0.52
JUNCT_BH700	JUNCT_BH700	0.16	100.77	0.40	0.51	0.008	34.7	Y	34.6	0.6	0.1	4.60	0.00115	0.82
JUNCT_BH701	JUNCT_BH701	0.17	107.99	0.30	0.61	0.008	42.1	Y	41.9	0.6	0.1	4.84	0.00106	0.87
JUNCT_BH702	JUNCT_BH702	0.14	88.79	0.51	0.76	0.013	2.0	Y	2.0	0.6	0.1	4.59	0.00146	0.72
JUNCT_BH703	JUNCT_BH703	0.17	105.67	0.50	0.95	0.014	3.7	Y	3.7	0.6	0.1	4.39	0.00139	0.73
JUNCT_BH704	JUNCT_BH704	0.16	105.53	0.45	0.74	0.016	17.5	Y	17.5	0.6	0.1	4.53	0.00143	0.73
JUNCT_BH705	JUNCT_BH705	0.12	79.76	0.13	0.40	0.023	3.2	Y	3.2	0.6	0.1	5.00	0.00070	1.00

Subcatchment Name	EPA SWMM Target Node	Area (mi^2)	Area (acres)	Length to Centroid (mi)	Length (mi)	Slope (ft/ft)	Percent Impervious (Existing)	Fully Developed?	Percent Impervious (Future)	Maximum Depression Storage		Horton's Infiltration Paramters		
										Pervious (in)	Impervious (in)	Initial Rate (in/hr)	Decay Coefficient (1/seconds)	Final Rate (in/hr)
JUNCT_BH706	JUNCT_BH706	0.17	106.31	0.30	0.80	0.024	5.5	Y	5.5	0.6	0.1	4.92	0.00080	0.96
JUNCT_BH707	JUNCT_BH707	0.19	118.90	0.30	0.57	0.015	4.2	Y	4.2	0.6	0.1	4.06	0.00122	0.76
JUNCT_BH708	JUNCT_BH708	0.18	113.80	0.39	0.81	0.013	7.0	Y	6.9	0.6	0.1	4.85	0.00103	0.88
JUNCT_BH709	JUNCT_BH709	0.12	76.67	0.28	0.53	0.013	10.5	Y	10.5	0.6	0.1	4.79	0.00117	0.83
JUNCT_BH710	JUNCT_BH710	0.09	60.27	0.20	0.40	0.013	3.0	Y	3.0	0.6	0.1	4.57	0.00166	0.65
JUNCT_BH711	JUNCT_BH711	0.20	125.64	0.20	0.56	0.026	2.0	Y	2.0	0.6	0.1	4.50	0.00179	0.60
JUNCT_BH712	JUNCT_BH712	0.20	129.99	0.43	0.90	0.021	3.1	Y	3.1	0.6	0.1	4.52	0.00176	0.62
JUNCT_BH713	JUNCT_BH713	0.20	129.77	0.17	0.52	0.015	3.0	Y	3.0	0.6	0.1	4.58	0.00161	0.67
JUNCT_BH714	JUNCT_BH714	0.12	77.51	0.31	0.70	0.016	17.3	Y	17.3	0.6	0.1	4.56	0.00167	0.65
JUNCT_BH715	JUNCT_BH715	0.19	120.37	0.18	0.53	0.025	4.1	Y	4.1	0.6	0.1	4.43	0.00180	0.60
JUNCT_BH716	JUNCT_BH716	0.14	91.95	0.34	0.73	0.022	11.4	N	36.7	0.6	0.1	4.50	0.00180	0.60
JUNCT_BH717	JUNCT_BH717	0.12	79.98	0.40	0.71	0.021	2.8	Y	2.8	0.6	0.1	4.65	0.00147	0.72
JUNCT_BH718	JUNCT_BH718	0.10	62.06	0.20	0.49	0.032	5.1	Y	4.9	0.6	0.1	4.57	0.00166	0.65
JUNCT_BH719	JUNCT_BH719	0.17	111.54	0.69	0.98	0.024	10.8	Y	10.7	0.6	0.1	4.51	0.00178	0.61
JUNCT_BH720	JUNCT_BH720	0.12	74.28	0.36	0.77	0.033	5.3	Y	5.3	0.6	0.1	4.48	0.00180	0.60
JUNCT_BH721	JUNCT_BH721	0.14	87.90	0.36	0.63	0.017	26.7	Y	26.6	0.6	0.1	4.50	0.00180	0.60
JUNCT_BH722	JUNCT_BH722	0.11	72.45	0.29	0.56	0.011	3.5	Y	3.5	0.6	0.1	4.50	0.00180	0.60
JUNCT_BH723	JUNCT_BH723	0.10	65.19	0.27	0.50	0.005	19.6	Y	19.4	0.6	0.1	3.75	0.00180	0.55
JUNCT_BH724	JUNCT_BH724	0.03	21.52	0.08	0.24	0.016	8.1	Y	8.1	0.6	0.1	4.50	0.00180	0.60
JUNCT_BH725	JUNCT_BH725	0.11	69.83	0.38	0.60	0.025	21.1	N	47.9	0.6	0.1	4.50	0.00180	0.60
JUNCT_BH726	JUNCT_BH726	0.14	88.19	0.33	0.68	0.037	4.5	N	30.0	0.6	0.1	4.29	0.00180	0.59
JUNCT_BH727	JUNCT_BH727	0.06	36.30	0.23	0.46	0.021	27.4	N	28.7	0.6	0.1	4.50	0.00180	0.60
JUNCT_BH728	JUNCT_BH728	0.13	86.02	0.16	0.46	0.013	45.4	N	84.0	0.6	0.1	3.56	0.00180	0.54
JUNCT_BH729	JUNCT_BH729	0.10	61.89	0.30	0.52	0.015	14.4	Y	12.4	0.6	0.1	4.50	0.00180	0.60
JUNCT_BH730	JUNCT_BH730	0.13	82.84	0.30	0.60	0.040	3.8	N	18.3	0.6	0.1	4.43	0.00180	0.60
JUNCT_BH731	JUNCT_BH731	0.09	55.93	0.21	0.48	0.024	5.8	N	76.2	0.6	0.1	4.50	0.00180	0.60
JUNCT_BH732	JUNCT_BH732	0.11	73.12	0.24	0.51	0.034	3.0	N	4.7	0.6	0.1	4.43	0.00180	0.60
JUNCT_BH733	JUNCT_BH733	0.18	114.90	0.46	0.91	0.013	34.7	N	34.8	0.6	0.1	3.21	0.00180	0.51
JUNCT_BH734	JUNCT_BH734	0.15	99.09	0.37	0.71	0.022	19.9	Y	19.9	0.6	0.1	4.46	0.00180	0.60
JUNCT_BH735	JUNCT_BH735	0.16	99.90	0.37	0.80	0.020	15.8	Y	15.8	0.6	0.1	3.50	0.00180	0.53
JUNCT_BH736	JUNCT_BH736	0.20	128.96	0.36	0.98	0.021	16.3	Y	16.3	0.6	0.1	3.94	0.00180	0.56
JUNCT_BH737	JUNCT_BH737	0.20	125.23	0.31	0.96	0.022	21.4	Y	21.3	0.6	0.1	4.42	0.00180	0.59
JUNCT_BH738	JUNCT_BH738	0.20	124.90	0.40	0.84	0.029	22.6	Y	22.6	0.6	0.1	4.33	0.00180	0.59
JUNCT_BH739	JUNCT_BH739	0.11	72.54	0.23	0.65	0.022	33.5	Y	33.5	0.6	0.1	4.50	0.00180	0.60
JUNCT_BH740	JUNCT_BH740	0.09	59.83	0.30	0.44	0.023	16.6	Y	16.6	0.6	0.1	4.40	0.00180	0.59
JUNCT_BH741	JUNCT_BH741	0.08	51.06	0.14	0.48	0.023	18.5	Y	18.5	0.6	0.1	4.50	0.00180	0.60
JUNCT_BH742	JUNCT_BH742	0.14	90.95	0.34	0.54	0.027	29.6	N	33.8	0.6	0.1	4.33	0.00180	0.59
JUNCT_BH743	JUNCT_BH743	0.14	90.77	0.29	0.49	0.026	14.0	N	66.9	0.6	0.1	4.21	0.00180	0.58
JUNCT_BH744	JUNCT_BH744	0.15	94.03	0.23	0.51	0.019	29.6	N	63.0	0.6	0.1	4.50	0.00180	0.60
JUNCT_BH745	JUNCT_BH745	0.08	53.81	0.21	0.47	0.019	27.1	N	72.7	0.6	0.1	4.43	0.00180	0.60
JUNCT_BH746	JUNCT_BH746	0.11	69.99	0.38	0.61	0.020	26.0	N	82.3	0.6	0.1	4.30	0.00180	0.59
JUNCT_BH747	JUNCT_BH747	0.05	34.12	0.13	0.30	0.030	2.6	N	71.8	0.6	0.1	4.50	0.00180	0.60
JUNCT_BH748	JUNCT_BH748	0.10	61.98	0.23	0.53	0.023	4.4	Y	4.3	0.6	0.1	4.50	0.00180	0.60
JUNCT_BH749	JUNCT_BH749	0.16	102.07	0.28	0.73	0.044	11.8	N	11.9	0.6	0.1	4.50	0.00180	0.60
JUNCT_BH750	JUNCT_BH750	0.09	60.13	0.13	0.40	0.022	27.2	Y	27.2	0.6	0.1	4.50	0.00180	0.60
JUNCT_BH751	JUNCT_BH751	0.06	40.92	0.09	0.33	0.021	21.0	N	28.4	0.6	0.1	4.50	0.00180	0.60
JUNCT_BH752	JUNCT_BH752	0.08	49.47	0.31	0.47	0.021	28.9	N	50.4	0.6	0.1	4.31	0.00180	0.59
JUNCT_BH753	JUNCT_BH753	0.15	95.19	0.31	0.74	0.038	28.6	Y	28.5	0.6	0.1	4.44	0.00180	0.60
JUNCT_BH754	JUNCT_BH754	0.19	122.87	0.39	0.87	0.041	15.5	Y	15.4	0.6	0.1	4.23	0.00180	0.58
JUNCT_BH755	JUNCT_BH755	0.05	34.40	0.20	0.39	0.008	41.0	Y	40.8	0.6	0.1	3.59	0.00180	0.54
JUNCT_BH756	JUNCT_BH756	0.08	52.59	0.19	0.42	0.002	2.0	Y	2.0	0.6	0.1	3.13	0.00180	0.51
JUNCT_BH757	JUNCT_BH757	0.07	47.84	0.20	0.38	0.006	2.0	Y	2.0	0.6	0.1	4.65	0.00118	0.82

Table B-2

Detention Pond Rating Curves

Detention Element: STOR_1025
Name: Arapahoe Ridge Filing 2
Source: 2014 OSP

Stage-Storage-Volume-Discharge			
Stage (ft)	Storage (ft^2)	Volume (ft^3)	Discharge (cfs)
0.00	6277.00	0.00	0.00
1.00	7793.00	7793.00	0.00
2.00	9399.00	18798.00	0.00
3.00	11079.00	33237.00	0.00
4.00	12865.00	51460.00	0.00
5.00	45167.00	225835.00	0.00
6.00	80281.00	481686.00	57.88
7.00	101450.00	710150.00	63.76
8.00	122841.00	982728.00	69.13
9.00	134256.00	1208304.00	74.12

Detention Element: STOR_1026
Name: Arapahoe Ridge Filing 1
Source: 2014 OSP

Stage-Storage-Volume-Discharge			
Stage (ft)	Storage (ft^2)	Volume (ft^3)	Discharge (cfs)
0.00	768.00	0.00	31.12
1.00	8649.00	8649.00	43.57
2.00	41711.00	83422.00	56.02
3.00	88994.00	266982.00	76.32
4.00	132639.00	530556.00	100.32
5.00	142902.00	714510.00	160.00
6.00	174095.00	1044570.00	480.00
6.14	174095.00	1068943.30	536.00

Detention Element: STOR_312
Name: Flat Iron Meadows Regional Detention Pond
Source: 2014 OSP

Stage-Storage-Volume-Discharge			
Stage (ft)	Storage (ft^2)	Volume (ft^3)	High Discharge (cfs)
0.00	0.00	0.00	0.00
0.50	17424.00	8712.00	0.00
1.00	4356.00	4356.00	0.00
1.50	4356.00	6534.00	0.00
2.00	8712.00	17424.00	0.00
2.50	17424.00	43560.00	0.00
3.00	52272.00	156816.00	0.00
3.50	95832.00	335412.00	0.00
4.00	156816.00	627264.00	0.00
4.50	235224.00	1058508.00	0.00
5.00	313632.00	1568160.00	0.00
5.50	392040.00	2156220.00	39.00
6.00	435600.00	2613600.00	266.00
6.50	479160.00	3114540.00	618.00
7.00	505296.00	3537072.00	1076.00
7.50	531432.00	3985740.00	1635.00
8.00	531432.00	4251456.00	3830.00
8.50	531432.00	4517172.00	6080.00
9.00	531432.00	4782888.00	7967.00
9.50	531432.00	5048604.00	9651.00

Detention Element: STOR_020
Name: Indian Peak Filing 17
Source: City of Lafayette As-Builts and HydroCAD

Stage-Storage-Volume			Storage-Discharge		
Stage (ft)	Storage (ft^2)	Volume (ft^3)	Stage (ft)	High Discharge (cfs)	Low Discharge (cfs)
0.00	0.00	0.00	0.00	0.00	0.00
0.30	71055.80	21316.74	0.30	0.00	0.14
1.30	218814.10	284458.33	0.60	0.00	0.36
2.30	305890.00	703547.00	0.90	0.00	0.59
3.30	344436.00	1136638.80	1.20	0.00	0.74
4.30	360050.00	1548215.00	1.50	0.00	4.39
5.30	375664.00	1991019.20	1.80	0.00	9.67
6.30	391278.00	2465051.40	2.10	0.00	11.48
7.30	406892.00	2970311.60	2.40	0.00	12.24
8.30	422506.00	3506799.80	2.70	0.00	13.81
9.30	435917.80	4054035.54	3.00	0.00	15.21
10.30	451681.40	4652318.42	3.30	0.00	16.50
12.30	500917.80	6161288.94	3.60	0.00	17.70
			3.90	0.00	18.81
			4.20	0.00	19.87
			4.50	0.00	20.87
			4.80	0.00	21.83
			5.10	0.00	22.74
			5.40	0.00	23.63
			5.70	0.00	24.47
			6.00	0.00	25.30
			6.30	0.00	26.09
			6.60	0.00	26.86
			6.90	0.00	27.61
			7.20	0.00	28.34
			7.50	0.00	29.05
			7.80	0.00	29.75
			8.10	0.00	30.43
			8.40	0.00	31.09
			8.70	0.00	31.74
			9.00	28.29	32.38
			9.30	112.64	33.00
			9.60	222.91	33.61
			9.90	358.72	34.22
			10.20	516.03	34.81
			10.50	687.88	35.39
			10.80	877.77	35.96
			11.10	1082.50	36.53
			11.40	1301.06	37.08
			11.70	1532.62	37.63
			12.00	1776.49	38.17
			12.30	2032.08	38.70

Table B-3

EPA SWMM Flow Diversion Tables (Based on 2D HEC-RAS Model as described under Appendix A Project Correspondence)

Existing Node 180 Diversion Curve			
Existing or Future	Recurrence Interval	Inflow (To Bullhead Gulch)	Outflow (To Boulder Creek)
Existing	2 YR	0	0
Existing	5 YR	1	0
Existing	10 YR	4	0
Existing	25 YR	119	13
Existing	50 YR	254	31
Existing	100 YR	446	51
Existing	500 YR	891	114

Future Node 180 Diversion Curve			
Existing or Future	Recurrence Interval	Inflow (To Bullhead Gulch)	Outflow (To Boulder Creek)
Future	2 YR	0	0
Future	5 YR	1	0
Future	10 YR	4	0
Future	25 YR	119	13
Future	50 YR	254	31
Future	100 YR	446	51
Future	500 YR	891	114

Existing Node 181 Diversion Curve			
Existing or Future	Recurrence Interval	Inflow (To Bullhead Gulch)	Outflow (To Boulder Creek)
Existing	2 YR	2	0
Existing	5 YR	3	0
Existing	10 YR	9	0
Existing	25 YR	148	13
Existing	50 YR	309	42
Existing	100 YR	538	140
Existing	500 YR	1064	403

Future Node 181 Diversion Curve			
Existing or Future	Recurrence Interval	Inflow (To Bullhead Gulch)	Outflow (To Boulder Creek)
Future	2 YR	2	0
Future	5 YR	3	0
Future	10 YR	9	0
Future	25 YR	148	13
Future	50 YR	309	42
Future	100 YR	538	140
Future	500 YR	1064	403

Existing Node 182 Diversion Curve			
Existing or Future	Recurrence Interval	Inflow (To Bullhead Gulch)	Outflow (To Boulder Creek)
Existing	2 YR	2	0
Existing	5 YR	3	0
Existing	10 YR	10	1
Existing	25 YR	182	60
Existing	50 YR	401	173
Existing	100 YR	772	431
Existing	500 YR	1682	1152

Future Node 182 Diversion Curve			
Existing or Future	Recurrence Interval	Inflow (To Bullhead Gulch)	Outflow (To Boulder Creek)
Future	2 YR	2	0
Future	5 YR	3	0
Future	10 YR	10	1
Future	25 YR	182	60
Future	50 YR	401	173
Future	100 YR	772	431
Future	500 YR	1682	1152

Existing Node 183 Diversion Curve			
Existing or Future	Recurrence Interval	Inflow (To Bullhead Gulch)	Outflow (To Boulder Creek)
Existing	2 YR	41	37
Existing	5 YR	110	100
Existing	10 YR	191	169
Existing	25 YR	1164	971
Existing	50 YR	2094	1704
Existing	100 YR	3512	2787
Existing	500 YR	6886	5303

Future Node 183 Diversion Curve			
Existing or Future	Recurrence Interval	Inflow (To Bullhead Gulch)	Outflow (To Boulder Creek)
Future	2 YR	119	108
Future	5 YR	199	180
Future	10 YR	310	268
Future	25 YR	1336	1101
Future	50 YR	2281	1851
Future	100 YR	3742	2941
Future	500 YR	7201	5506

Table B-4

Peak Flow and Runoff Volumes for all EPA SWMM Model Nodes

SWMM Node	Location	Tributary Area (sq mi)	Tributary Area (ac)	Minor Storms Area Correction Factor (sq mi)	Major Storms Area Correction Factor (sq mi)	100-Year Runoff Volume (ac-ft)		Minor Storms						Major Storms							
								2-Year Maximum Total Inflow (cfs)		5-Year Maximum Total Inflow (cfs)		10-Year Maximum Total Inflow (cfs)		25-Year Maximum Total Inflow (cfs)		50-Year Maximum Total Inflow (cfs)		100-Year Maximum Total Inflow (cfs)		500-Year Maximum Total Inflow (cfs)	
						Existing	Future	Existing	Future	Existing	Future	Existing	Future	Existing	Future	Existing	Future	Existing	Future	Existing	Future
55	Indian Peaks Trail W and Red Deer Trail	0.53	342	0	0	13.6	13.6	11	11	24	24	38	38	160	160	259	259	398	397	727	727
56	Southeast of W Baseline Rd and N 96th St	0.14	91	0	0	4.1	4.3	11	14	20	25	28	35	70	81	104	118	146	163	251	277
61	Northeast of N 95th St and Isabelle Rd	0.37	236	0	0	5.9	5.9	0	0	2	2	3	3	42	42	83	83	158	158	350	350
62	N 95th St and Cottonwood Number 1 Ditch	0.50	323	0	0	10.9	10.9	1	1	4	4	7	7	110	110	215	215	356	356	695	695
63	Northwest of US-HWY 287 and Isabelle Rd	0.12	80	0	0	0.8	0.8	0	0	0	0	1	1	4	4	6	6	48	48	153	153
64	South of Isabelle Rd	0.09	60	0	0	1.9	1.9	0	0	1	1	1	1	21	21	39	39	64	64	122	122
65	No 95ht St Sout of Leyner Cottonwood Number 1 Ditch	0.30	193	0	0	6.7	6.7	1	1	3	3	6	6	72	72	130	130	209	209	402	402
66	Southeast of Isabelle Rd and N 9th St	0.20	130	0	0	4.3	4.3	0	0	1	1	3	3	39	39	72	72	116	116	218	218
67	Southwest of Union Pacific Railroad and US-HWY 287	0.17	108	0	0	4.6	4.6	25	25	34	34	45	44	76	76	116	116	168	168	298	297
68	Northwest of N 95th St and Blue Heronway	0.11	72	0	0	2.5	2.5	0	0	1	1	2	2	23	23	41	41	65	65	122	122
69	Northeast of N 95th St and Lake Meadow Dr	0.12	78	0	0	3.0	3.0	3	3	6	6	9	9	32	32	52	52	78	78	141	141
70	Leyner Cottonwood Ditch and Isabelle Rd	0.32	203	0	0	7.3	7.3	2	2	5	5	9	9	69	69	127	127	205	205	397	397
71	US-HWY 287 and Isabelle Rd	4.45	2849	2	0	124.0	135.0	84	174	176	299	272	426	984	1187	1650	1871	2588	2850	4761	5090
72	Southwest of Leyner Cottonwood Number 1 Ditch and US-HWY 287	4.04	2586	2	0	107.0	119.0	87	185	178	302	268	425	942	1136	1540	1752	2384	2628	4341	4627
73	US-HWY 287 and Isabelle Rd	4.73	3024	2	0	128.0	140.0	84	174	177	300	275	429	1001	1208	1696	1923	2686	2956	4987	5328
74	95th St South of Beauprez Ave	0.11	73	0	0	3.4	3.4	11	11	19	19	26	26	60	60	89	88	123	123	209	209
75	Cross Ridge Park North of Arapahoe Rd	0.10	65	0	0	2.8	2.8	3	3	6	6	9	9	30	30	46	46	66	66	115	115
76	N 95th St and Blue Heron Way	0.03	22	0	0	0.8	0.8	0	0	1	1	2	2	12	12	20	20	31	31	57	57
78	Southwest of Leyner Cottonwood Number 1 Ditch and US-HWY 287	3.92	2506	2	0	105.0	116.0	87	185	178	302	267	424	931	1124	1514	1724	2333	2574	4233	4517
79	US-HWY 287 and Leyney Cottonwood Number 1 Ditch	0.10	62	0	0	2.0	2.0	0	0	2	1	3	3	25	25	46	46	74	74	140	139
80	West of US-HWY 287 and North of Arapahoe Rd	3.74	2394	2	0	101.0	112.0	88	191	179	308	268	422	915	1106	1478	1683	2267	2508	4115	4380
81	Arapahoe Rd East of Spring Creek Dr	3.31	2119	2	0	90.2	101.0	81	174	163	275	242	376	812	972	1306	1473	1992	2189	3605	3814
82	South of Spring Creek Xing	3.06	1961	2	0	84.3	93.0	78	152	156	238	230	329	761	872	1217	1330	1843	1977	3320	3444
83	Arapahoe Rd South of Spring Creek Xing	3.06	1961	2	0	81.5	89.7	78	147	155	229	228	318	736	833	1170	1267	1762	1880	3162	3268
84	Northeast of Lost Creek Ln	1.84	1178	0	0	43.9	50.8	37	89	72	137	105	193	351	471	536	685	803	967	1439	1658
85	South Boulder Canyon Ditch South of Arapahoe Rd	0.05	34	0	0	1.2	2.2	0	28	1	39	1	51	16	77	29	101	46	129	86	198
86	Concord Circle and Lexington St	0.53	342	0	0	13.6	13.6	11	11	24	24	38	38	160	160	258	258	397	397	725	725
87	N 107th St and Summit Pl	0.06	36	0	0	1.6	1.6	3	3	6	6	8	9	22	23	32	34	46	48	80	83
90	North of Ginny Wy	0.17	109	0	0	4.6	4.6	8	8	14	14	20	20	62	62	96	96	140	139	246	246
93	Between Spring Creek Dr and Arapahoe Rd	3.17	2031	2	0	87.1	96.6	81	165	161	259	239	355	787	921	1259	1399	1910	2077	3444	3619
94	Northeast of Arapahoe Rd and Forest Park Cir	0.10	65	0	0	7.4	8.8	31	86	48	121	66	154	128	224	176	283	236	352	403	524
95	Indian Peaks Trail and Blue Stem Trail	0.69	441	0	0	17.7	17.7	15	15	33	33	51	51	201	201	326	326	502	502	917	917
97	N 95th St West of Concord Circle	0.53	342	0	0	13.6	13.6	11	11	24	24	38	38	160	160	258	258	397	397	725	725
99	Indian Peak Golf Course West of Eagles Nest Dr	1.34	855	0	0	31.6	35.4	29	32	52	57	75	82	198	216	295	317	423	448	1075	1312
101	Arapahoe Rd and 95th St	0.34	215	0	0	10.0	10.1	16	16	28	29	40	40	115	115	172	172	250	250	430	430
102	Arapahoe Rd and N 95th St	0.10	65	0	0	2.8	2.8	3	3	6	6	10	10	29	29	45	45	66	66	115	115
103	Between Arapahoe Rd and Kerry Rd	0.16	100	0	0	4.2	4.2	4	4	8	8	12	12	49	49	76	76	111	111	194	193
104	W Baseline Rd and Applewood Dr	0.33	213	0	0	8.3	8.3	6	6	15	15	24	24	105	105	170	170	262	262	482	482
105	Between Elgin Dr and Applewood Dr	0.24	153	0	0	6.0	6.0	4	4	11	11	17	17	78	78	127	127	196	196	358	358
106	W Baseline Rd Northeast of Nyland Way	0.16	102	0	0	3.8	3.8	2	3	7	7	11	11	54	54	88	88	133	133	240	240
107	Monarch Ct and McKinley Ave	0.15	95	0	0	6.7	6.7	11	10	20	20	29	29	90	90	138	138	201	201	344	344
108	On Burlington Northern Santa Fe Railroad South of Davidson Way	0.10	62	0	0	2.1	2.1	0	0	1	1	2	2	25	25	44	44	68	68	126	126
109	Southeast of W Baseline Rd and King St	0.16	103	0	0	3.9	4.0	4	6	8	11	11	16	49	53	84	89	129	135	232	240
111	Intersection of Paschal Dr and Hecla Dr and Roser Dr	0.47	299	0	0	16.0	16.4	23	31	45	53	67	75	190	203	296	310	451	467	799	825
113	W Baseline Road and N 96th St	1.03	657	0	0	23.1	26.9	11	18	20	29	28	39	70	89	106	126	151	265	878	1052
114	Indian Peak Trail and Lost Creek Ln	1.53	980	0	0	36.8	40.6	34	37	64	69	92	101	260	278	390	411	564	588	1189	1461
116	N Washington Ave and W Birch Ct	0.05	34	0	0	1.8	1.8	7	7	11	11	15	15	31	31	44	43	59	59	97	97
117	Sunland St and Sunland Ct	0.24	155	0	0	9.5	9.5	12	12	25	24	37	37	109	109	176	176	269	269	477	477
118	Burlington Northern Santa Fe Railroad and Cascade Creek Dr	0.39	250	0	0	9.5	9.5	12	12	25	24	37	37	109	109	176	176	269	269	477	477
119	West of Davidson Ditch and Cliffrose Ln	0.05	34	0	0	1.8	1.8	7	7	11	11	15	14	31	31	43	43	59	59	97	96
120	Hecla Dr and Treece St	0.47	299	0	0	16.0	16.4	23	31	45	53	67	75	190	203	296	310	451	467	799	825
121	West of Wyonna Ct	0.15	95	0	0	13.7	13.7	20	20	38	38	57	57	164	164	257	257	393	392	694	694
122	Wyonna Ct and Treece St	0.15	95	0	0	13.7	13.7	20	20	38	38	57	57	164	164	257	257	393	392	694	694
123	Indian Peak Trail W and Blue Lake Trail	0.33	213	0	0	8.4	8.4	6	6	15	15	24	24	104	104	170	170	261	261	481	481
124	South of Arapahoe Rd North of Lost Creek Ln	2.63	1681	2	0	64.1	70.9	50	91	104	156	155	225	541	627	877	968	1331	1446	2422	2548
125	Hedgerow Cir and Stonewall Ln	0.88	566	0	0	19.0	22.7	6	12	12	16	14	19	23	26	28	31	130	244	794	941
126	Indian Peaks Golf Course North of W Baseline Rd	1.03	657	0	0	23.0	26.8	11	18	19	29	28	39	69	88	105	125	151	264	877	1051
127	South Boulder Canyon Ditch North of Apache Ln	0.20	125	0	0	4.7	7.8	3	87	8	122	13	158	68	249	111	327	167	422	303	655
128	East of Apache Ln	0.14	91	0	0	3.6	5.6	3	60	8	85	12	111	52	175	82	231	122	298	218	462
129	Southeast of Arapahoe Rd and 95th St	0.34	215	0	0	10.0	10.1	16	16	28	29	40	40	115	115	172	172	250	250	430	430
130	Arapahoe Rd and Forest Park Circle	0.34	215	0	0	10.1	10.1	16	16	28	29	40	40	115	115	172	172	250	250	438	438
131	Arapahoe Rd and Forest Park Circle	0.34	215	0	0	10.1	10.1	16	16	28	28	40	40	115	115	172	172	250	250	434	435

Table B-4

Peak Flow and Runoff Volumes for all Design Points

SWMM Node	Location	Tributary Area (sq mi)	Tributary Area (ac)	Minor Storms Area Correction Factor (sq mi)	Major Storms Area Correction Factor (sq mi)	100-Year Runoff Volume (ac-ft)		Minor Storms						Major Storms							
								2-Year Maximum Total Inflow (cfs)		5-Year Maximum Total Inflow (cfs)		10-Year Maximum Total Inflow (cfs)		25-Year Maximum Total Inflow (cfs)		50-Year Maximum Total Inflow (cfs)		100-Year Maximum Total Inflow (cfs)		500-Year Maximum Total Inflow (cfs)	
						Existing	Future	Existing	Future	Existing	Future	Existing	Future	Existing	Future	Existing	Future	Existing	Future	Existing	Future
135	Yarrow St and Spring Creek Dr	0.10	65	0	0	7.4	8.8	31	86	48	121	66	154	128	224	176	283	236	352	403	524
136	Yarrow St and Spring Creek Dr	0.10	65	0	0	7.4	8.8	31	86	48	121	66	154	128	224	176	283	236	352	403	525
137	Arapahoe Rd East of Spring Creek Dr	3.31	2119	2	0	90.2	101.0	81	174	163	275	242	376	812	971	1306	1473	1992	2189	3605	3814
140	US-HWY 287 and Isabelle Rd	4.73	3024	2	0	128.0	140.0	84	174	177	300	275	429	1001	1208	1696	1923	2686	2956	4988	5328
141	US-HWY 287 and Isabelle Rd	0.35	222	0	0	7.9	7.9	1	1	6	6	10	10	82	82	145	145	230	230	429	429
142	North of US-HWY 287 and Isabelle Rd	4.73	3024	2	0	128.0	140.0	84	174	177	301	275	429	1000	1207	1695	1921	2685	2954	4986	5324
143	East of US-HWY 287 and North of Isabelle Rd	5.07	3247	5	0	22.1	22.1	26	25	27	27	31	31	104	104	167	167	252	252	437	437
144	Isabelle Rd and 111th St	2.04	1305	2	0	57.2	65.6	22	101	78	221	175	363	565	817	858	1140	1268	1602	2435	2965
145	Roser Dr and Hoyt Ln	0.16	103	0	0	4.0	4.1	3	7	7	10	11	12	46	50	79	84	122	127	223	231
146	Between Wyonna Ct and Cascade Creek Dr	0.39	250	0	0	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
147	Burlington Northern Santa Fe Railroad and Sunland Ct	0.24	155	0	0	9.5	9.5	12	12	25	25	37	37	109	109	176	176	269	269	477	477
148	Between Cascade Creek Dt and Wyonna Ct	0.88	566	0	0	16.0	16.2	6	12	12	16	14	19	23	26	28	31	33	34	36	36
150	Northeast of US-HWY 287 and Boulder and Wald County Ditch	0.16	100	0	0	5.4	5.4	4	4	4	4	5	5	25	25	49	49	81	81	155	155
152	US-HWY 287 and Goose Haven Dr	0.07	48	0	0	3.4	3.4	4	4	4	4	4	4	8	8	20	20	36	36	74	74
154	N 109th St and Jasper Road	5.38	3442	5	0	25.7	28.2	6	11	12	29	27	52	172	211	338	389	617	680	1298	1386
155	Boulder and Wald County Ditch and US-HWY 287	6.70	4291	5	0	115.0	124.0	47	128	129	222	211	326	920	1076	1563	1732	2446	2647	4403	4662
156	Southwest of Union Pacific Railroad and US-HWY 287	4.73	3024	2	0	114.0	125.0	61	150	154	277	251	406	976	1183	1671	1897	2661	2930	4962	5301
180	N 95th St and Valmont Rd	0.69	442	0	0	14.3	14.3	1	1	4	4	8	8	119	119	254	254	446	446	891	891
181	East of N 9th St and Union Pacific Railroad	0.85	547	0	0	16.4	16.4	3	3	9	9	17	17	135	135	278	278	487	487	950	950
182	West of Goose Haven Dr on Union Pacific Railroad	1.65	1058	0	0	26.7	26.7	3	3	9	9	18	18	158	158	337	337	615	615	1229	1229
183	Southwest of Union Pacific Railroad and US-HWY 287	6.70	4291	5	0	138.0	150.0	52	142	144	255	243	382	1103	1297	1916	2132	3066	3330	5679	6028
JUNCT_1025	Northeast of Erie Lake west of 111th St	0.72	458	0	0	19.2	24.2	23	112	47	168	78	225	250	460	373	604	527	785	835	1239
JUNCT_1026	111th St and Flatiron Meadows Blvd	0.24	152	0	0	7.2	7.3	31	33	35	36	45	47	75	76	95	96	132	136	310	315
JUNCT_200	Lucerne Dr and Sedge Way	0.17	110	0	0	4.3	7.1	6	80	11	112	17	145	60	220	95	284	142	362	253	553
JUNCT_201	Subwatershed	0.09	57	0	0	2.2	3.5	1	29	3	41	5	53	23	86	37	113	55	145	99	225
JUNCT_202	Subwatershed	0.07	43	0	0	2.1	2.1	10	10	15	15	20	20	42	42	59	59	81	81	134	134
JUNCT_203	Subwatershed	0.08	54	0	0	2.0	2.2	1	3	3	7	5	10	27	32	43	50	66	73	120	128
JUNCT_204	Subwatershed	0.13	85	0	0	3.8	3.8	11	11	21	21	30	30	76	76	114	114	160	160	276	276
JUNCT_205	Subwatershed	0.12	74	0	0	3.6	3.6	13	14	21	22	30	31	64	66	92	94	127	129	213	216
JUNCT_206	Subwatershed	0.11	72	0	0	3.4	3.4	8	8	13	13	18	19	43	44	63	64	88	89	149	151
JUNCT_207	Subwatershed	0.12	80	0	0	3.8	3.9	14	15	23	24	32	33	69	71	100	103	137	141	231	236
JUNCT_208	Subwatershed	0.04	29	0	0	1.0	1.2	0	2	0	3	1	5	11	15	19	24	29	35	55	61
JUNCT_209	Subwatershed	0.19	125	0	0	6.2	6.2	32	33	48	49	66	68	136	137	193	195	262	265	435	439
JUNCT_210	Subwatershed	0.04	26	0	0	1.1	1.3	2	6	3	9	5	13	14	26	22	37	32	50	56	83
JUNCT_211	Subwatershed	0.06	40	0	0	1.4	1.7	0	3	0	5	1	7	12	21	22	32	35	45	65	79
JUNCT_212	Subwatershed	0.12	77	0	0	2.7	2.8	0	1	2	4	3	6	39	42	69	72	106	109	197	200
JUNCT_213	Subwatershed	0.10	63	0	0	3.0	3.2	9	17	16	26	23	35	54	71	78	99	109	134	184	221
JUNCT_215	Subwatershed	0.13	82	0	0	2.8	4.0	0	13	1	20	1	27	20	58	36	82	58	113	109	187
JUNCT_216	Subwatershed	0.08	50	0	0	1.7	1.7	0	0	1	1	1	1	15	15	27	27	43	43	81	81
JUNCT_217	Subwatershed	0.19	122	0	0	5.9	6.3	17	28	28	42	39	57	90	115	129	160	179	217	302	356
JUNCT_218	Subwatershed	0.13	82	0	0	4.1	4.3	16	21	26	33	36	44	77	89	109	123	148	165	246	270
JUNCT_219	Subwatershed	0.11	70	0	0	2.4	2.6	0	1	1	3	2	4	22	25	39	42	61	65	114	118
JUNCT_220	Subwatershed	0.07	47	0	0	1.8	1.9	1	2	3	3	4	5	18	19	29	31	44	45	79	81
JUNCT_221	Subwatershed	0.12	75	0	0	3.3	3.7	8	11	14	19	20	27	57	69	86	101	121	139	208	237
JUNCT_222	Subwatershed	0.14	91	0	0	3.6	3.5	3	4	7	9	11	13	45	48	72	75	106	110	189	194
JUNCT_235	Subwatershed	0.19	122	0	0	4.4	4.4	1	1	4	4	8	8	49	49	83	83	127	127	232	232
JUNCT_236	Subwatershed	0.16	100	0	0	3.4	3.4	0	0	1	1	2	2	40	40	71	71	111	111	208	208
JUNCT_237	Subwatershed	0.09	59	0	0	2.1	2.2	0	1	2	2	3	3	18	19	30	31	47	48	86	87
JUNCT_238	Subwatershed	0.14	87	0	0	3.1	3.1	0	1	2	2	3	4	26	27	46	47	72	73	134	135
JUNCT_240	Subwatershed	0.08	49	0	0	1.7	1.8	0	0	1	1	2	2	13	14	23	23	36	37	67	68
JUNCT_241	Subwatershed	0.20	125	0	0	5.1	5.1	7	7	14	14	20	20	67	67	105	105	154	154	271	272
JUNCT_242	Subwatershed	0.10	64	0	0	2.2	2.2	0	0	0	1	0	1	23	24	42	43	66	67	124	125
JUNCT_243	Subwatershed	0.16	100	0	0	4.6	4.6	7	7	12	12	17	17	56	56	83	83	117	117	199	199
JUNCT_300	Prince Reservoir north of South Boulder Canyon Ditch	0.26	166	0	0	6.6	2.1	6	95	13	135	20	177	78	282	127	344	191	435	328	671
JUNCT_302	South Boulder Canyon Ditch and N 111th St	0.07	43	0	0	2.1	11.2	10	10	15	15	20	20	42	42	59	59	81	81	134	134
JUNCT_303	N 111th St and Morris Dr	0.54	348	0	0	14.5	19.4	23	118	44	175	65	233	202	414	317	550	467	727	765	1176
JUNCT_305	N 111th St and Dickens St	0.54	348	0	0	14.6	19.5	23	112	43	168	63	225	199	412	314	545	463	722	764	1169
JUNCT_306	At Prince Lake west of N 111th St	0.91	583	0	0	25.6	30.7	46	134	73	203	113	275	342	538	516	726	700	975	1156	1574
JUNCT_308	Flatiron Circ and Granite Dr	1.30	829	0	0	36.5	42.5	78	171	124	249	159	333	432	660	644	880	890	1182	1612	2045
JUNCT_310	Homestead Pkwy and Lyons Ln	0.12	77	0	0	2.7	2.8	0	1	2	4	3	6	39	42	69	72	106	109	197	200
JUNCT_311	Carbonate Ln and Dinosaur Dr	1.51	969	0	0	42.2	48.6	82	172	123	270	176	357	490	723	748	988	1051	1357	1909	2361
JUNCT_313	Between N 109th St and Baxster Farm Ln	2.22	1423	2	0	61.9	70.5	22	102	79	223	177	367	580	836	892	1179	1331	1672	2577	3117

Table B-4

Peak Flow and Runoff Volumes for all Design Points

SWMM Node	Location	Tributary Area (sq mi)	Tributary Area (ac)	Minor Storms Area Correction Factor (sq mi)	Major Storms Area Correction Factor (sq mi)	100-Year Runoff Volume (ac-ft)		Minor Storms						Major Storms							
								2-Year Maximum Total Inflow (cfs)		5-Year Maximum Total Inflow (cfs)		10-Year Maximum Total Inflow (cfs)		25-Year Maximum Total Inflow (cfs)		50-Year Maximum Total Inflow (cfs)		100-Year Maximum Total Inflow (cfs)		500-Year Maximum Total Inflow (cfs)	
						Existing	Future	Existing	Future	Existing	Future	Existing	Future	Existing	Future	Existing	Future	Existing	Future	Existing	Future
JUNCT_315	Southeast of N 109th St and Flatiron Dr	2.48	1589	2	0	69.1	78.3	28	107	84	236	190	389	615	880	961	1257	1448	1806	2880	3449
JUNCT_317	N 109th St and Lynne Ave	7.78	4982	5	0	97.3	107.0	49	101	83	209	173	335	705	967	1108	1412	1717	2085	3386	3940
JUNCT_318	Union Pacific Railroad and N 109th St	7.98	5107	5	0	128.0	140.0	53	112	95	240	202	391	893	1194	1477	1832	2386	2817	4817	5469
JUNCT_319	Northeast of 109th St and Jasper Rd	8.08	5171	5	0	130.0	142.0	53	111	95	239	202	383	892	1191	1481	1834	2394	2829	4850	5507
JUNCT_320	Northeast of US-HWY 287 and Leyner Cottonwood Number 1 Ditch	0.19	122	0	0	4.4	4.4	1	1	4	4	8	8	49	49	83	83	127	127	232	232
JUNCT_321	Southeast of US-HWY 287 and Isabelle Rd	0.35	222	0	0	7.9	7.9	1	1	6	6	10	10	82	82	145	145	230	230	429	429
JUNCT_322	Between US-HWY 287 and 109th St	5.16	3305	5	0	24.5	24.5	24	24	27	28	31	32	107	108	180	181	282	282	498	499
JUNCT_323	109th St and Lynne Ave	5.30	3393	5	0	27.6	27.7	24	25	27	28	32	34	124	125	213	215	330	332	586	587
JUNCT_606	Subwatershed	0.07	46	0	0	1.7	1.8	0	0	0	0	0	1	11	11	18	18	28	28	51	51
JUNCT_607	Subwatershed	0.04	25	0	0	0.8	0.9	0	0	0	0	0	1	9	10	17	18	27	28	51	51
JUNCT_608	Subwatershed	0.20	130	0	0	4.9	4.9	0	0	1	1	2	2	46	47	78	78	119	119	216	216
JUNCT_609	Subwatershed	0.12	75	0	0	4.0	5.3	13	44	21	62	28	79	59	119	81	149	110	185	177	275
JUNCT_613	Subwatershed	0.10	66	0	0	2.8	3.1	4	9	8	15	11	21	33	48	50	70	73	98	126	165
JUNCT_614	Subwatershed	0.19	124	0	0	5.0	5.1	4	6	9	12	14	17	59	62	92	96	136	141	242	248
JUNCT_615	Subwatershed	0.15	96	0	0	3.2	3.5	0	1	0	4	1	7	30	37	54	62	86	94	163	171
JUNCT_616	Subwatershed	0.10	64	0	0	2.3	2.4	1	1	2	4	4	6	24	27	41	44	62	66	114	118
JUNCT_617	Subwatershed	0.18	115	0	0	4.0	4.0	0	0	2	2	3	3	39	39	68	68	108	108	200	200
JUNCT_618	Subwatershed	0.15	96	0	0	3.2	3.7	0	2	0	5	1	8	27	35	49	58	78	87	148	157
JUNCT_619	Subwatershed	0.05	29	0	0	1.2	1.2	2	2	4	4	6	6	20	19	31	31	44	44	78	78
JUNCT_620	Subwatershed	0.13	82	0	0	2.8	2.8	0	0	1	1	1	1	19	19	34	34	56	56	106	106
JUNCT_621	Subwatershed	0.10	66	0	0	2.2	2.2	0	0	0	0	1	1	13	13	23	23	38	38	72	72
JUNCT_622	Subwatershed	0.12	76	0	0	3.0	3.2	1	3	3	6	4	9	34	39	55	60	82	87	145	152
JUNCT_623	Subwatershed	0.07	45	0	0	1.7	1.7	0	0	0	1	1	1	17	17	28	28	42	43	76	76
JUNCT_624	Subwatershed	0.08	52	0	0	2.1	2.2	0	1	1	3	2	4	13	15	21	23	32	34	57	60
JUNCT_638	Subwatershed	0.08	50	0	0	1.8	1.8	0	0	2	2	3	3	21	21	36	36	56	56	102	102
JUNCT_639	Subwatershed	0.14	89	0	0	3.0	3.0	0	0	1	1	1	1	30	30	53	53	85	85	159	159
JUNCT_640	Subwatershed	0.12	79	0	0	3.0	3.0	1	1	3	3	5	5	31	31	50	50	76	76	137	137
JUNCT_641	Subwatershed	0.05	30	0	0	1.2	1.2	0	0	0	0	1	1	10	10	16	16	25	25	45	45
JUNCT_648	Subwatershed	0.13	80	0	0	3.8	3.8	6	6	11	11	16	16	44	44	65	65	91	91	155	155
JUNCT_655	Subwatershed	0.19	121	0	0	5.4	5.4	6	6	10	11	15	15	50	51	75	76	109	110	188	189
JUNCT_702	South of Jasper Rd and north of Dobbins Run	0.04	25	0	0	0.8	0.9	0	0	0	0	0	1	9	10	17	18	27	28	51	51
JUNCT_703	Northwest from 119th St and Jasper Rd	0.24	155	0	0	5.8	5.8	0	0	1	1	2	2	52	53	89	90	141	142	260	261
JUNCT_705	North of Rissect Dr east of N 119th St	0.10	66	0	0	2.8	3.1	4	9	8	15	11	21	33	48	50	70	73	98	126	165
JUNCT_706	N 119th St and Juniper St	0.38	245	0	0	9.2	9.6	5	11	12	21	18	30	95	108	151	175	234	264	432	475
JUNCT_707	Northeast of Dobbins Run and Surrey Ct	0.34	220	0	0	8.2	8.7	4	7	10	15	15	24	88	99	146	158	222	235	404	419
JUNCT_708	Jasper Road west of N 119th St	0.58	370	0	0	22.4	23.8	9	17	21	38	34	59	211	245	355	399	535	578	970	1029
JUNCT_709	West of N 119th St north of Jasper Rd	0.81	518	0	0	29.5	31.1	7	15	20	35	33	57	228	263	355	391	569	610	1057	1116
JUNCT_710	N 115th St and Kenosha Rd	0.93	594	0	0	33.1	34.8	7	16	20	38	35	62	242	270	375	408	598	643	1127	1189
JUNCT_715	Northeast of 110th St and Jasper Rd	0.08	50	0	0	1.8	1.8	0	0	2	2	3	3	21	21	36	36	56	56	102	102
JUNCT_716	Between N 119th St and Banner Cir	0.22	139	0	0	4.8	4.8	0	0	2	2	4	4	46	46	84	84	135	135	254	254
JUNCT_717	North of Jasper Rd and south of Bailey Kenosha Ponds	0.34	218	0	0	7.9	7.9	1	1	3	3	7	7	71	71	127	127	205	205	383	383
JUNCT_BH700	Subwatershed	0.16	101	0	0	4.0	4.0	13	13	19	19	28	28	53	52	85	85	128	128	230	230
JUNCT_BH701	Subwatershed	0.17	108	0	0	4.6	4.6	25	25	34	34	45	44	76	76	116	116	168	168	298	297
JUNCT_BH702	Subwatershed	0.14	89	0	0	2.6	2.6	0	0	0	0	1	1	13	13	31	31	56	56	112	112
JUNCT_BH703	Subwatershed	0.17	106	0	0	3.1	3.1	0	0	1	1	2	2	16	16	37	37	67	67	134	134
JUNCT_BH704	Subwatershed	0.16	106	0	0	3.7	3.7	3	3	7	7	11	11	34	34	61	61	95	95	176	176
JUNCT_BH705	Subwatershed	0.12	80	0	0	0.8	0.8	0	0	0	0	1	1	4	4	6	6	48	48	153	153
JUNCT_BH706	Subwatershed	0.17	106	0	0	1.5	1.5	0	0	0	0	2	2	6	6	17	17	53	53	146	146
JUNCT_BH707	Subwatershed	0.19	119	0	0	3.3	3.3	0	0	1	1	3	3	24	24	62	62	110	110	223	223
JUNCT_BH708	Subwatershed	0.18	114	0	0	2.5	2.5	0	0	1	1	3	3	8	8	30	30	66	65	150	150
JUNCT_BH709	Subwatershed	0.21	137	0	0	16.5	16.5	2	2	6	6	10	10	76	76	150	150	264	264	513	513
JUNCT_BH710	Subwatershed	0.09	60	0	0	1.9	1.9	0	0	1	1	1	1	21	21	39	39	64	64	122	122
JUNCT_BH711	Subwatershed	0.20	126	0	0	4.2	4.2	0	0	2	2	3	3	62	62	112	112	176	176	331	331
JUNCT_BH712	Subwatershed	0.20	130	0	0	4.3	4.3	0	0	1	1	3	3	39	39	72	72	116	116	218	218
JUNCT_BH713	Subwatershed	0.20	130	0	0	4.1	4.1	0	0	2	2	4	4	54	54	105	105	171	171	328	328
JUNCT_BH714	Subwatershed	0.12	78	0	0	3.0	3.0	3	3	6	6	9	9	32	32	52	52	78	78	141	141
JUNCT_BH715	Subwatershed	0.19	120	0	0	4.2	4.2	1	1	3	3	6	6	66	66	116	116	179	179	334	334
JUNCT_BH716	Subwatershed	0.14	92	0	0	3.4	4.4	2	15	5	26	8	36	39	78	64	113	96	155	174	261
JUNCT_BH717	Subwatershed	0.12	80	0	0	2.3	2.3	0	0	1	1	1	1	15	15	35	35	60	60	119	119
JUNCT_BH718	Subwatershed	0.10	62	0	0	2.0	2.0	0	0	2	1	3	3	25	25	46	46	74	74	140	139
JUNCT_BH719	Subwatershed	0.17	112	0	0	4.1	4.1	1	1	4	4	7	7	34	34	57	57	88	88	161	160
JUNCT_BH720	Subwatershed	0.12	74	0	0	2.6	2.6	0	0	2	2	3	3	26	26	45	45	70	70	130	130

Table B-4

Peak Flow and Runoff Volumes for all Design Points

SWMM Node	Location	Tributary Area (sq mi)	Tributary Area (ac)	Minor Storms Area Correction Factor (sq mi)	Major Storms Area Correction Factor (sq mi)	100-Year Runoff Volume (ac-ft)		Minor Storms						Major Storms							
								2-Year Maximum Total Inflow (cfs)		5-Year Maximum Total Inflow (cfs)		10-Year Maximum Total Inflow (cfs)		25-Year Maximum Total Inflow (cfs)		50-Year Maximum Total Inflow (cfs)		100-Year Maximum Total Inflow (cfs)		500-Year Maximum Total Inflow (cfs)	
						Existing	Future	Existing	Future	Existing	Future	Existing	Future	Existing	Future	Existing	Future	Existing	Future	Existing	Future
JUNCT_BH721	Subwatershed	0.14	88	0	0	3.9	3.9	7	7	13	13	19	19	51	51	77	76	110	110	191	191
JUNCT_BH722	Subwatershed	0.11	72	0	0	2.5	2.5	0	0	1	1	2	2	23	23	41	41	65	65	122	122
JUNCT_BH723	Subwatershed	0.10	65	0	0	2.8	2.8	3	3	6	6	9	9	30	30	46	46	66	66	115	115
JUNCT_BH724	Subwatershed	0.03	22	0	0	0.8	0.8	0	0	1	1	2	2	12	12	20	20	31	31	57	57
JUNCT_BH725	Subwatershed	0.11	70	0	0	2.9	3.7	4	20	8	30	11	40	35	77	54	106	79	142	139	231
JUNCT_BH726	Subwatershed	0.14	88	0	0	3.1	4.0	0	11	2	19	3	27	36	67	62	99	97	139	179	239
JUNCT_BH727	Subwatershed	0.06	36	0	0	1.6	1.6	3	3	6	6	8	9	22	23	32	34	46	48	80	83
JUNCT_BH728	Subwatershed	0.13	86	0	0	4.6	6.0	31	86	48	121	65	154	125	223	173	281	233	350	379	523
JUNCT_BH729	Subwatershed	0.10	62	0	0	2.4	2.3	2	1	4	3	6	5	27	25	43	41	64	62	115	113
JUNCT_BH730	Subwatershed	0.13	83	0	0	2.9	3.4	0	5	2	10	3	14	35	49	62	77	97	113	180	199
JUNCT_BH731	Subwatershed	0.09	56	0	0	2.0	3.7	0	43	2	60	3	78	24	117	41	150	64	190	118	290
JUNCT_BH732	Subwatershed	0.11	73	0	0	2.5	2.6	0	0	1	2	2	3	33	34	57	58	90	91	167	168
JUNCT_BH733	Subwatershed	0.18	115	0	0	5.7	5.7	15	15	25	25	35	35	83	83	118	118	162	162	269	270
JUNCT_BH734	Subwatershed	0.15	99	0	0	4.1	4.1	6	6	11	11	16	16	51	52	80	80	116	117	205	205
JUNCT_BH735	Subwatershed	0.16	100	0	0	4.2	4.2	4	4	8	8	12	12	49	49	76	76	111	111	194	193
JUNCT_BH736	Subwatershed	0.20	129	0	0	5.3	5.3	5	5	11	11	16	16	62	62	97	97	142	142	251	251
JUNCT_BH737	Subwatershed	0.20	125	0	0	5.2	5.2	8	8	15	15	22	22	69	69	106	106	153	153	268	268
JUNCT_BH738	Subwatershed	0.20	125	0	0	5.3	5.3	9	9	17	17	24	24	71	71	108	108	157	156	272	272
JUNCT_BH739	Subwatershed	0.11	73	0	0	3.4	3.4	11	11	19	19	26	26	60	60	89	88	123	123	209	209
JUNCT_BH740	Subwatershed	0.09	60	0	0	2.4	2.4	3	3	6	6	8	8	31	31	49	49	73	73	129	129
JUNCT_BH741	Subwatershed	0.08	51	0	0	2.1	2.1	3	3	7	7	10	10	32	32	51	51	74	74	131	131
JUNCT_BH742	Subwatershed	0.14	91	0	0	4.1	4.3	11	14	20	25	28	35	70	81	104	118	146	163	251	277
JUNCT_BH743	Subwatershed	0.14	91	0	0	3.6	5.6	3	60	8	85	12	111	52	175	82	231	122	298	218	462
JUNCT_BH744	Subwatershed	0.15	94	0	0	4.2	5.6	12	58	22	80	32	107	78	172	117	230	164	299	283	469
JUNCT_BH745	Subwatershed	0.08	54	0	0	2.4	3.4	5	37	10	52	14	68	36	104	54	134	78	172	135	263
JUNCT_BH746	Subwatershed	0.11	70	0	0	3.1	4.8	5	50	10	69	14	89	39	132	58	167	82	209	142	314
JUNCT_BH747	Subwatershed	0.05	34	0	0	1.2	2.2	0	28	1	39	1	51	16	77	29	101	46	129	86	198
JUNCT_BH748	Subwatershed	0.10	62	0	0	2.1	2.1	0	0	1	1	2	2	25	25	44	44	68	68	126	126
JUNCT_BH749	Subwatershed	0.16	102	0	0	3.8	3.8	2	3	7	7	11	11	54	54	88	88	133	133	240	240
JUNCT_BH750	Subwatershed	0.09	60	0	0	2.7	2.7	8	8	15	15	21	21	53	53	81	81	114	114	198	198
JUNCT_BH751	Subwatershed	0.06	41	0	0	1.7	1.8	4	6	7	11	11	16	33	40	51	59	73	83	129	144
JUNCT_BH752	Subwatershed	0.08	49	0	0	2.2	2.7	5	16	9	24	12	32	32	59	47	80	67	106	115	172
JUNCT_BH753	Subwatershed	0.15	95	0	0	4.3	4.3	11	11	19	19	27	27	69	69	103	103	147	146	253	252
JUNCT_BH754	Subwatershed	0.19	123	0	0	4.9	4.9	5	5	11	11	16	16	64	64	101	101	149	149	265	264
JUNCT_BH755	Subwatershed	0.05	34	0	0	1.8	1.8	7	7	11	11	15	15	31	31	44	43	59	59	97	97
JUNCT_BH756	Subwatershed	0.08	53	0	0	5.4	5.4	4	4	4	4	5	5	25	25	49	49	81	81	155	155
JUNCT_BH757	Subwatershed	0.07	48	0	0	1.1	1.1	0	0	0	0	0	0	4	4	16	16	32	32	70	70
OUTFALL_935	Outfall at N 95th St and Valmont Rd	0.69	442	0	0	1.6	1.6	0	0	0	0	0	0	13	13	31	31	51	51	114	114
OUTFALL_936	Outfall at Lower Boulder Ditch and Union Pacific Railroad	0.85	547	0	0	2.7	2.7	0	0	0	0	1	1	12	12	36	36	118	118	345	345
OUTFALL_937	Outfall at Goose Haven Dr and Union Pacific Railroad	1.65	1058	0	0	11.5	11.5	0	0	1	1	4	4	52	52	140	140	321	321	792	792
OUTFALL_938	Boulder Creek Outfall at Boulder and Wald County Ditch and US-HWY 287	6.70	4291	5	0	112.0	122.0	43	124	126	218	208	322	917	1072	1559	1728	2442	2642	4398	4656
OUTFALL_939	Boulder Creerk Outfall at 109th St	0.16	100	0	0	5.4	5.4	4	4	4	4	5	5	25	25	48	48	80	80	154	154
OUTFALL_940	Boulder Creek Outfall from Prince Lake Tributary	8.24	5271	5	0	135.0	147.0	53	111	96	238	204	369	887	1182	1483	1827	2397	2826	4868	5518
OUTFALL_954	Boulder Creek Outfall from Tributary south of Lookout Dr	0.07	46	0	0	1.7	1.8	0	0	0	0	0	1	11	11	18	18	28	28	51	51
OUTFALL_955	Boulder Creek Outfall from Tributary at 115th St	0.28	180	0	0	10.1	11.4	13	44	21	62	28	79	95	126	151	185	221	263	371	400
OUTFALL_958	Boulder Creek Outfall from Tributary Northeast of N 115th St and Kenosha Rd	1.00	638	0	0	34.8	36.6	7	16	20	38	35	62	250	277	385	419	618	664	1171	1235
OUTFALL_959	Boulder Creek Outfall from Tributary southwest of Bailey-Kenosha Ponds	0.08	52	0	0	2.1	2.2	0	1	1	3	2	4	13	15	21	23	32	34	57	60
OUTFALL_961	Boulder Creek Outfall from Tributary east of Bailey-Kenosha Ponds	0.39	248	0	0	9.1	9.1	1	1	4	4	7	7	78	78	140	140	227	227	411	411
OUTFALL_963	Boulder Creek Outfall from Tributary east of Bailey-Kenosha Ponds	0.13	80	0	0	3.8	3.8	6	6	11	11	16	16	44	44	65	65	91	91	155	155
OUTFALL_965	Boulder Creek Outfall from Tributary west of East County Line Rd and Westview Rd	0.19	121	0	0	5.4	5.4	6	6	10	11	15	15	50	51	75	76	109	110	188	189
STOR_02	Indian Peak Filing 17 West of N 95th St	0.88	566	0	0	27.2	30.9	40	119	75	176	107	235	325	443	510	634	773	885	1394	1547
STOR_1025	Arapahoe Ridge Filing 2	0.17	110	0	0	5.2	5.2	16	17	27	28	38	40	85	88	125	128	172	177	290	297
STOR_1026	Arapahoe Ridge Filing 1	0.24	152	0	0	7.2	7.3	21	22	35	37	49	51	111	114	160	163	222	227	375	382
STOR_312	Flatiron Meadows Regional Detention Pond	2.04	1305	2	0	57.3	65.7	100	206	167	331	230	446	602	856	903	1194	1321	1680	2435	2965

Table B-5

Design Rainfall Distributions

NOTE: Major Storm Events (25-, 50-, 100-, and 500-YR events) did not need depth reduction factors because there were no watersheds greater than 15 sq mi
Minor Storm Events (2-, 5-, 10-YR storm events needed depth reduction factors up to 5 sq mi)

Return Period	500
1 Hr Depth	3.8
6 Hr Depth	5.39
Time	Unadjusted Depth
0:05	0.038
0:10	0.114
0:15	0.175
0:20	0.304
0:25	0.532
0:30	0.950
0:35	0.532
0:40	0.304
0:45	0.236
0:50	0.190
0:55	0.152
1:00	0.152
1:05	0.152
1:10	0.076
1:15	0.076
1:20	0.046
1:25	0.046
1:30	0.046
1:35	0.046
1:40	0.046
1:45	0.046
1:50	0.046
1:55	0.046
2:00	0.046

Return Period	100
1 Hr Depth	2.63
6 Hr Depth	3.81
Time	Unadjusted Depth
0:05	0.026
0:10	0.079
0:15	0.121
0:20	0.210
0:25	0.368
0:30	0.658
0:35	0.368
0:40	0.210
0:45	0.163
0:50	0.132
0:55	0.105
1:00	0.105
1:05	0.105
1:10	0.053
1:15	0.053
1:20	0.032
1:25	0.032
1:30	0.032
1:35	0.032
1:40	0.032
1:45	0.032
1:50	0.032
1:55	0.032
2:00	0.032

Return Period	50
1 Hr Depth	2.2
6 Hr Depth	3.22
Time	Unadjusted Depth
0:05	0.029
0:10	0.077
0:15	0.110
0:20	0.176
0:25	0.330
0:30	0.550
0:35	0.264
0:40	0.176
0:45	0.110
0:50	0.110
0:55	0.070
1:00	0.070
1:05	0.070
1:10	0.053
1:15	0.053
1:20	0.040
1:25	0.040
1:30	0.031
1:35	0.031
1:40	0.031
1:45	0.031
1:50	0.031
1:55	0.031
2:00	0.031

Return Period	25
1 Hr Depth	1.81
6 Hr Depth	2.68
Time	Unadjusted Depth
0:05	0.024
0:10	0.063
0:15	0.090
0:20	0.145
0:25	0.272
0:30	0.452
0:35	0.217
0:40	0.145
0:45	0.090
0:50	0.090
0:55	0.058
1:00	0.058
1:05	0.058
1:10	0.043
1:15	0.043
1:20	0.033
1:25	0.033
1:30	0.025
1:35	0.025
1:40	0.025
1:45	0.025
1:50	0.025
1:55	0.025
2:00	0.025

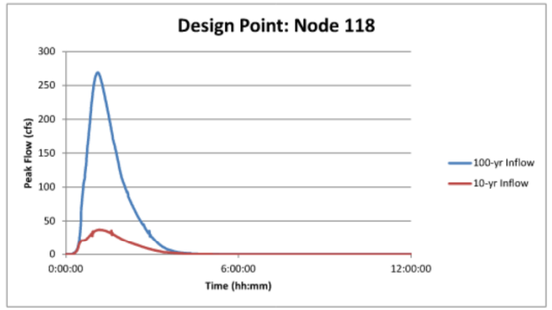
Return Period	10		
1 Hr Depth	1.37		
6 Hr Depth	2.06		
Time	Unadjusted Depth	Adjusted Depth (2 sq miles)	Adjusted Depth (5 sq miles)
0:05	0.027	0.027	0.027
0:10	0.051	0.051	0.051
0:15	0.112	0.112	0.109
0:20	0.206	0.206	0.177
0:25	0.343	0.343	0.295
0:30	0.164	0.164	0.141
0:35	0.077	0.077	0.074
0:40	0.059	0.059	0.057
0:45	0.052	0.052	0.052
0:50	0.044	0.044	0.044
0:55	0.044	0.044	0.044
1:00	0.044	0.044	0.044
1:05	0.044	0.044	0.044
1:10	0.044	0.044	0.044
1:15	0.044	0.044	0.044
1:20	0.034	0.034	0.034
1:25	0.026	0.026	0.026
1:30	0.026	0.026	0.026
1:35	0.026	0.026	0.026
1:40	0.026	0.026	0.026
1:45	0.026	0.026	0.026
1:50	0.026	0.026	0.026
1:55	0.023	0.023	0.023
2:00	0.018	0.018	0.018

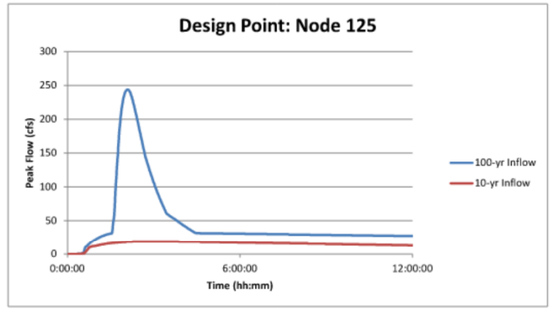
Return Period	5		
1 Hr Depth	1.09		
6 Hr Depth	1.66		
Time	Unadjusted Depth	Adjusted Depth (2 sq miles)	Adjusted Depth (5 sq miles)
0:05	0.022	0.022	0.022
0:10	0.040	0.040	0.040
0:15	0.095	0.095	0.092
0:20	0.167	0.167	0.143
0:25	0.273	0.273	0.234
0:30	0.142	0.142	0.122
0:35	0.063	0.063	0.061
0:40	0.048	0.048	0.047
0:45	0.039	0.039	0.039
0:50	0.039	0.039	0.039
0:55	0.033	0.033	0.033
1:00	0.033	0.033	0.033
1:05	0.033	0.033	0.033
1:10	0.033	0.033	0.033
1:15	0.027	0.027	0.027
1:20	0.024	0.024	0.024
1:25	0.024	0.024	0.024
1:30	0.024	0.024	0.024
1:35	0.024	0.024	0.024
1:40	0.016	0.016	0.016
1:45	0.016	0.016	0.016
1:50	0.016	0.016	0.016
1:55	0.016	0.016	0.016
2:00	0.014	0.014	0.014

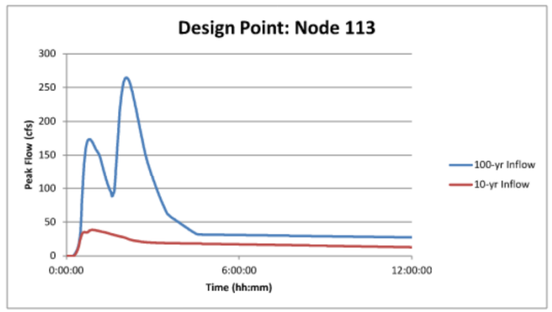
Return Period	2		
1 Hr Depth	0.805		
6 Hr Depth	1.24		
Time	Unadjusted Depth	Adjusted Depth (2 sq miles)	Adjusted Depth (5 sq miles)
0:05	0.016	0.016	0.016
0:10	0.032	0.032	0.032
0:15	0.068	0.068	0.068
0:20	0.129	0.129	0.129
0:25	0.201	0.201	0.201
0:30	0.113	0.113	0.113
0:35	0.051	0.051	0.051
0:40	0.040	0.040	0.040
0:45	0.024	0.024	0.024
0:50	0.024	0.024	0.024
0:55	0.024	0.024	0.024
1:00	0.024	0.024	0.024
1:05	0.024	0.024	0.024
1:10	0.016	0.016	0.016
1:15	0.016	0.016	0.016
1:20	0.016	0.016	0.016
1:25	0.016	0.016	0.016
1:30	0.016	0.016	0.016
1:35	0.016	0.016	0.016
1:40	0.016	0.016	0.016
1:45	0.016	0.016	0.016
1:50	0.016	0.016	0.016
1:55	0.008	0.008	0.008
2:00	0.008	0.008	0.008

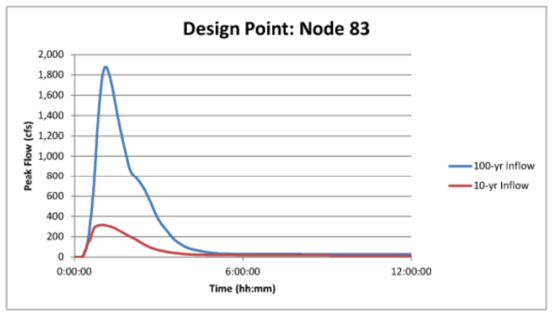
Figure B-2

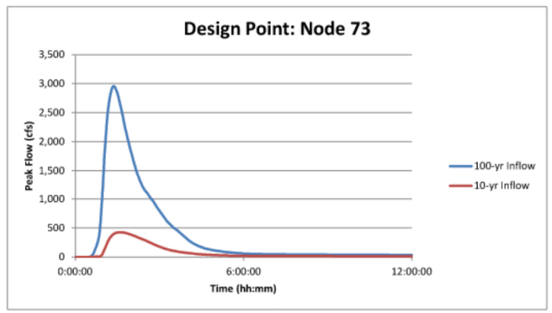
Future 10 Year and 100 Year Hydrographs at Key Design Points for Bullhead Gulch

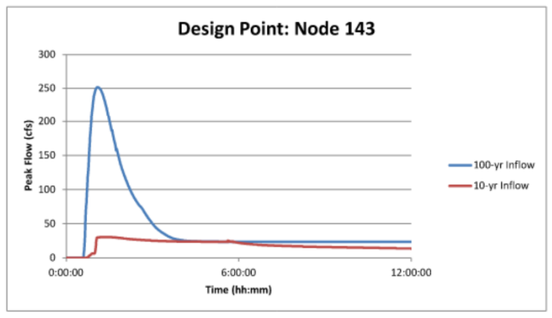












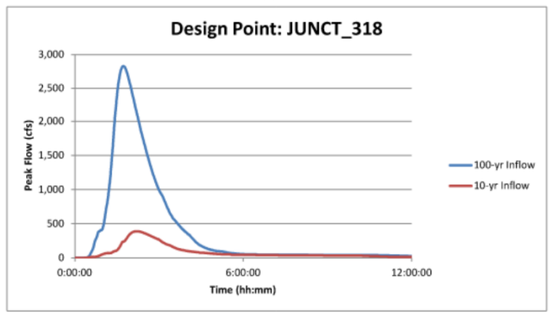


Figure B-2

Future 10 Year and 100 Year Hydrographs at Key Design Points for Prince Tributary

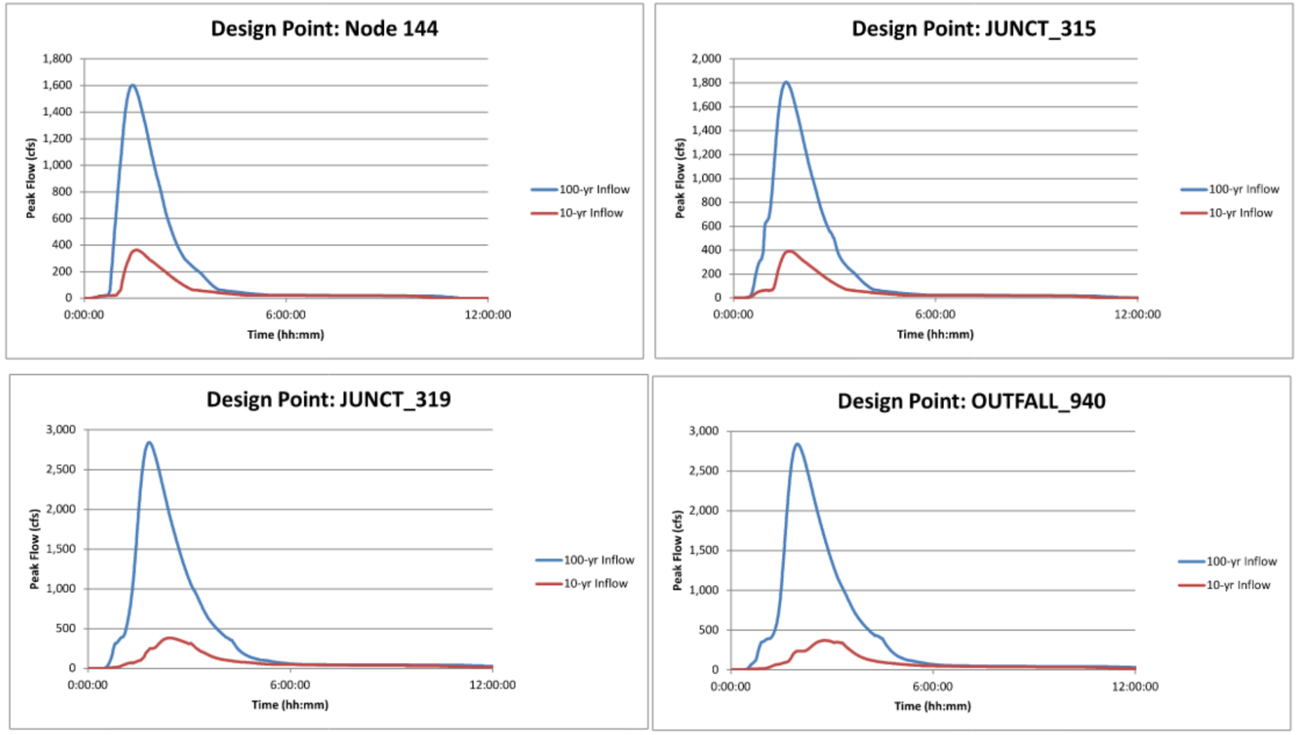
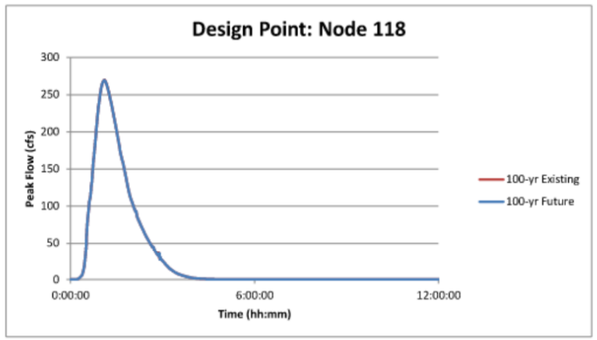
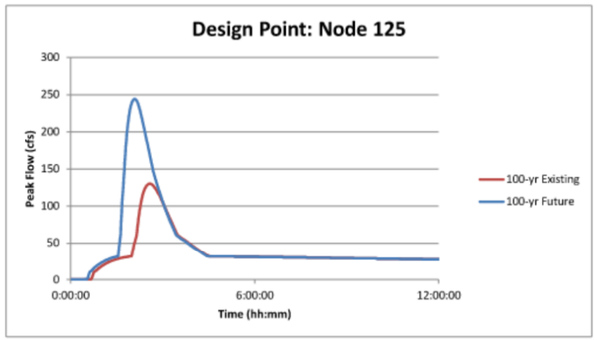
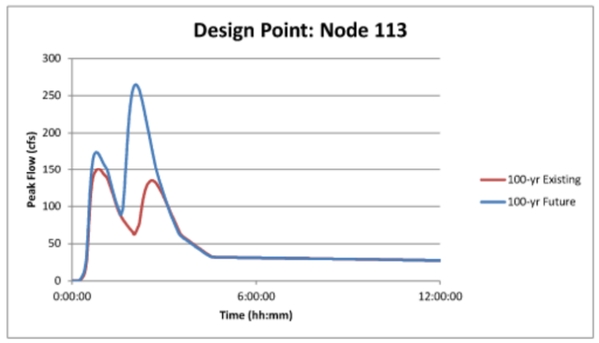


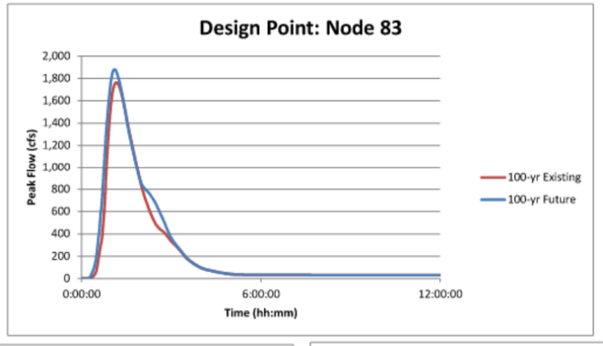
Figure B-3

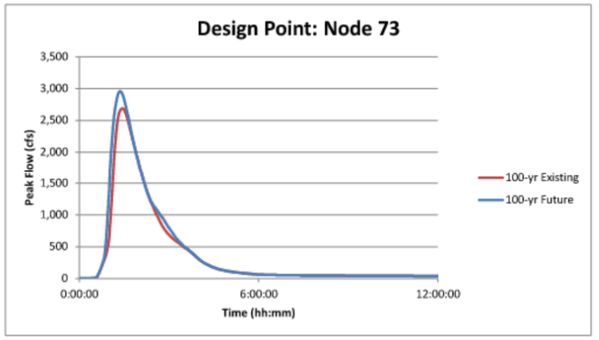
Existing and Future 100 Year Hydrographs at Key Design Points for Bullhead Gulch

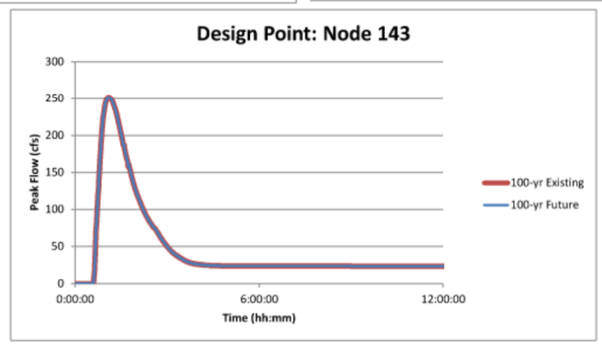












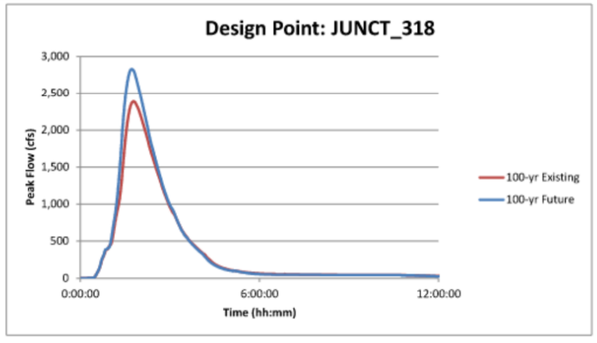
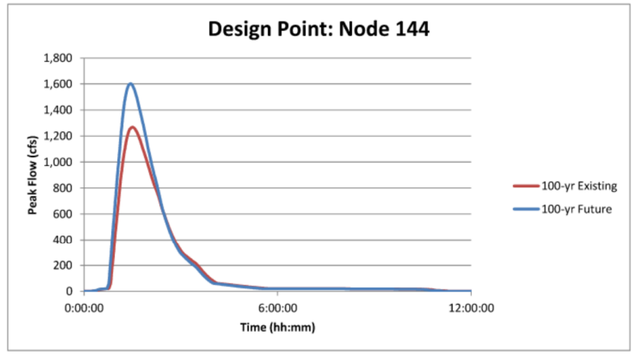
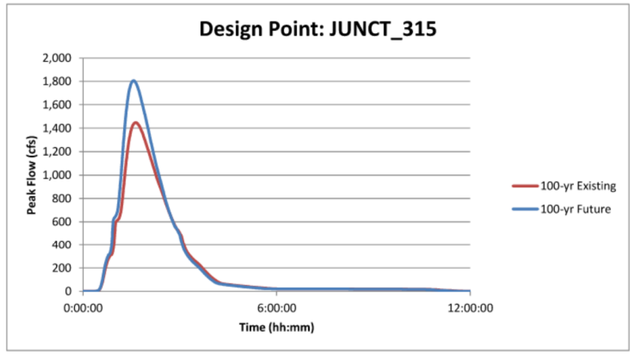
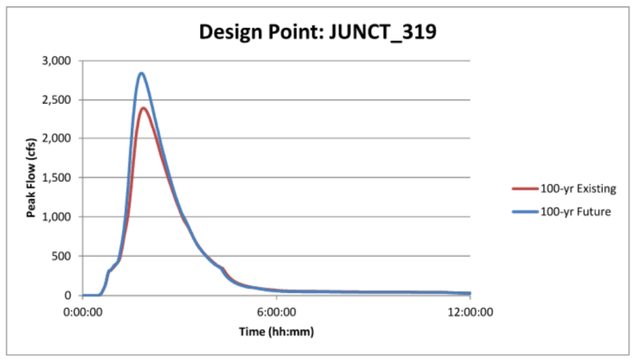


Figure B-3

Existing and Future 100 Year Hydrographs at Key Design Points for Prince Tributary







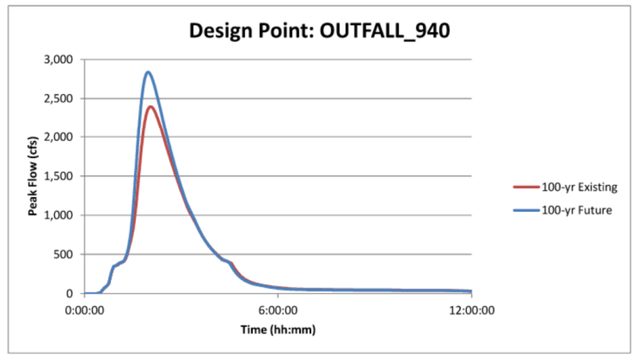


Figure B-4

Existing Condition Peak Flow Profile for Bullhead Gulch

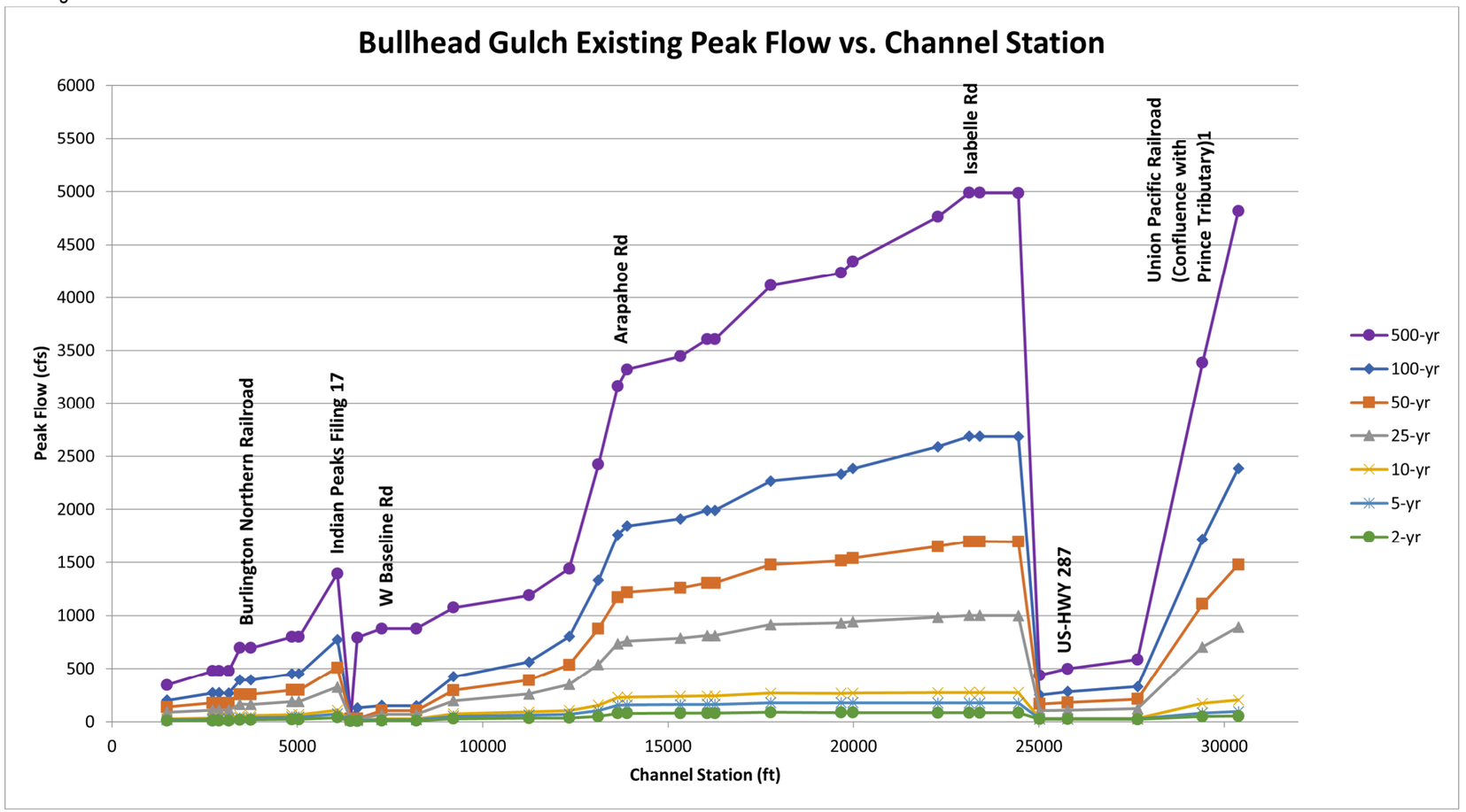


Figure B-4

Future Condition Peak Flow Profile for Bullhead Gulch

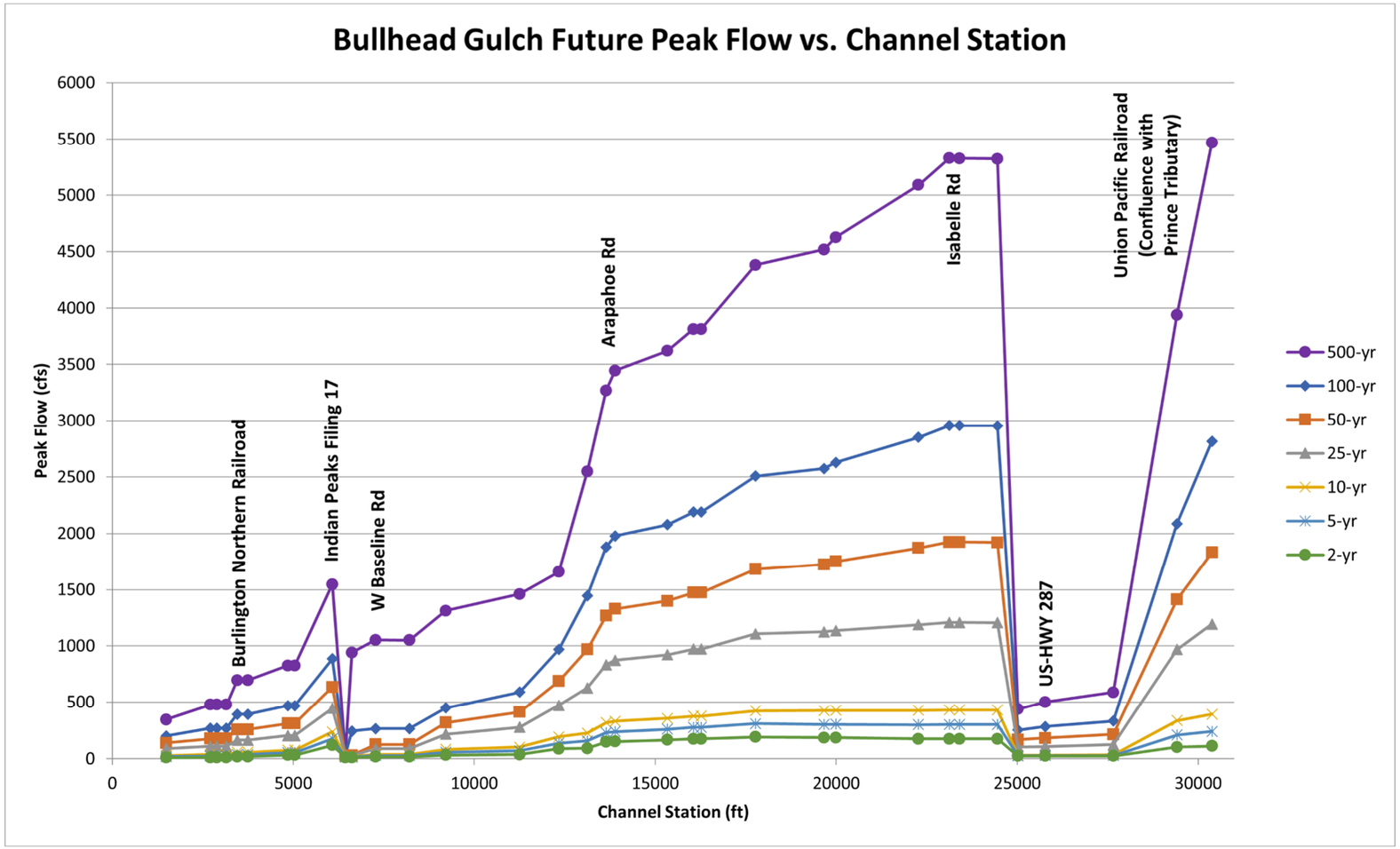


Figure B-4

Existing Condition Peak Flow Profile for Prince Tributary

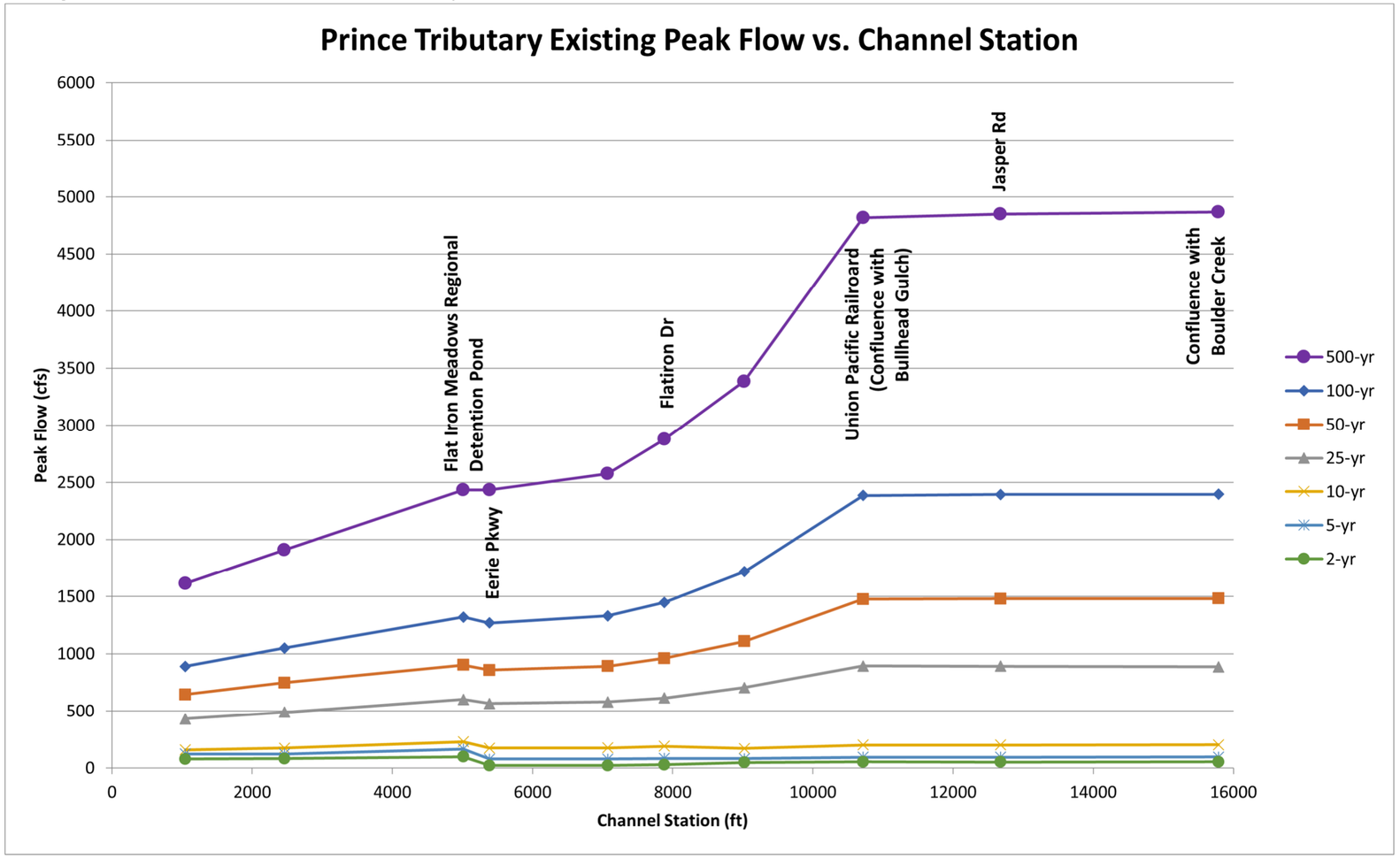
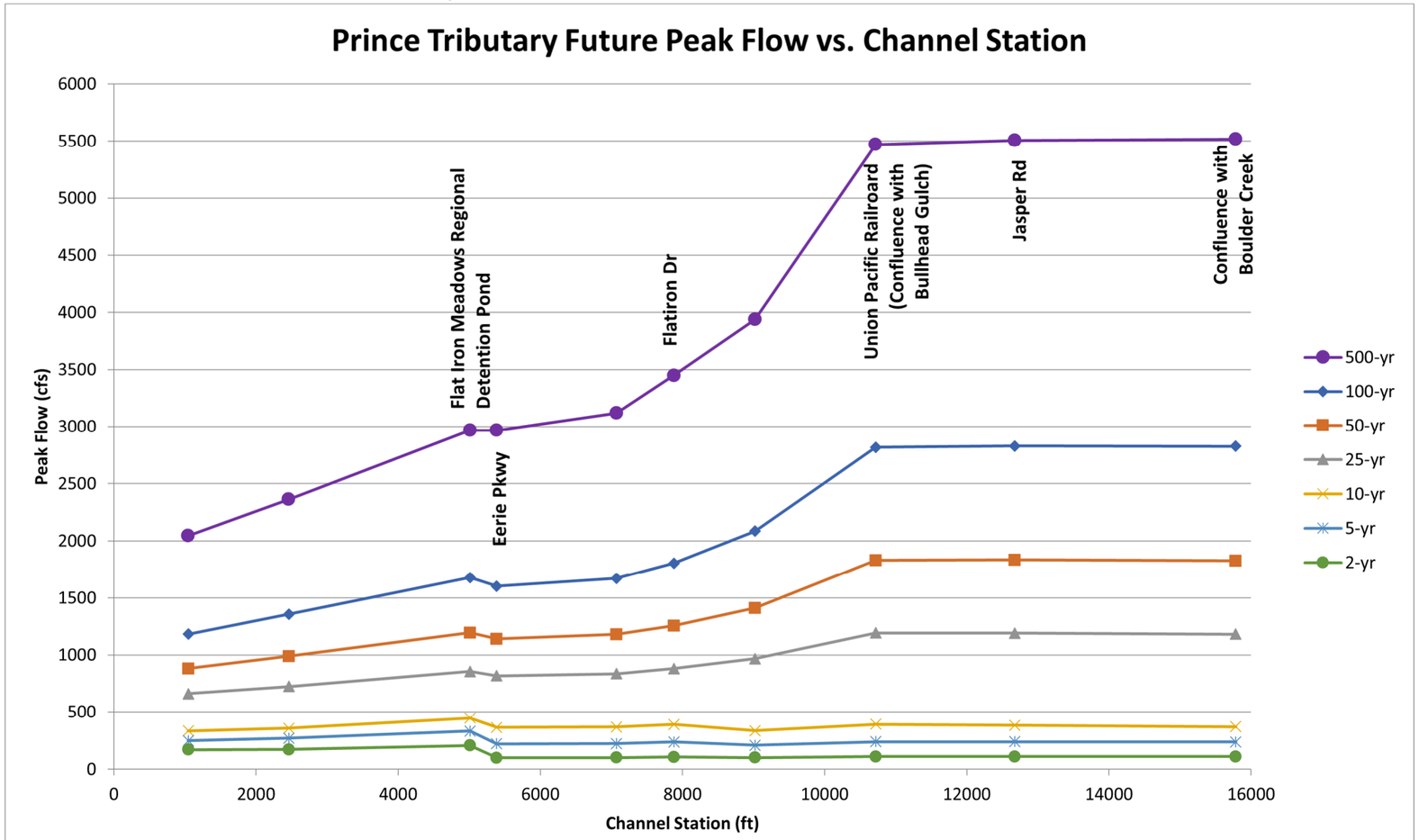


Figure B-4

Future Condition Peak Flow Profile for Prince Tributary



AS-BUILT DRAWINGS FOR DETENTION PONDS

ARAPAHOE RIDGE
REGIONAL DETENTION POND NO.1026
MAINTENANCE SITE PLAN
OCTOBER, 2007
(PROJECT TO BE COMPLETED OCTOBER, 2007)

PROJECT INFORMATION

1.0 GENERAL INFORMATION
A. DETENTION POND NO. 1026 OF PRINCE LAKE NO. 2 TRIBUTARY
B. PROPERTY OWNER: TOWN OF ERIE
PUBLIC WORKS
(303) 926-2700
C. DESIGN ENGINEER: CH2M HILL, INC.
(720) 286-5500

1.1 HYDRAULIC INFORMATION
A. ONLINE OR OFFLINE FACILITY: ONLINE
B. FLOW RATES INFLOW OUTFLOW
10 YEAR: 202 CFS 94 CFS
100 YEAR: 465 CFS 304 CFS
C. POND DESCRIPTION

	VOLUME	WSEL	DEPTH
10-YEAR	3.9 AF	5186.5	4.2
TOTAL CAPACITY	7.15 AF	5187.5	6.0

D. OUTLET TYPE
10-YEAR OUTLET STRUCTURE
100-YEAR RIPRAP SPILLWAY

1.2 MISCELLANEOUS INFORMATION
A. PROJECT SURVEY:

CONTROL POINTS	NORTHING	EASTING	ELEVATION
CP93*	116473.32	251263.68	5188.89
CP92**	115822.31	251233.49	5188.43

* X CHISELED ON TYPE R INLET ON BETTS CIRCLE
** PIN AND CAP IN EMBANKMENT AT SOUTHWEST END OF CONCRETE LOW FLOW CHANNEL A.

PROJECT NOTES

2.0 GENERAL FACILITY DESCRIPTION
THIS FACILITY IS A DETENTION POND THAT RECEIVES INFLOWS FROM TWO STORM SYSTEM OUTFALLS. THIS FACILITY DOES NOT PROVIDE WATER QUALITY. THE POND RELEASES TO A NATURAL DRAINAGE TO THE NORTH, WHICH WILL BE IMPROVED WHEN THAT PROPERTY IS DEVELOPED.

2.1 MAINTENANCE NOTES
A. MAINTENANCE FREQUENCY
ROUTINE MAINTENANCE TASKS, INCLUDING MOWING AND DEBRIS REMOVAL, SHOULD BE PERFORMED ON AN AS-NEEDED BASIS. DEBRIS REMOVAL SHOULD BE DONE PRIOR TO THE SUMMER STORM SEASON AND FOLLOWING SIGNIFICANT RAINFALL EVENTS. IN ADDITION, THE PROPERTY OWNER SHOULD PERFORM A SITE INSPECTION ON AN ANNUAL BASIS TO EVALUATE THE NEED FOR ADDITIONAL MAINTENANCE, INCLUDING SEDIMENT REMOVAL, EROSION CONTROL, REVEGETATION, AND STRUCTURAL REPAIRS. IF ADDITIONAL MAINTENANCE IS REQUIRED, THE PROPERTY OWNER MAY REQUEST ASSISTANCE FROM UDFCD.

B. EQUIPMENT AND SPECIAL TOOLS REQUIRED
RAKE OR BROOM
SKID STEER
DUMP TRUCK

2.2 MAINTENANCE PROCEDURE
A. SEDIMENT REMOVAL
ALL SEDIMENT MUST BE REMOVED FROM THE LOW FLOW CHANNEL.

B. DEBRIS REMOVAL
DEBRIS BUILDUP IS EXPECTED AT THE OUTLET STRUCTURE TRASH RACK. ALL DEBRIS SHOULD BE COLLECTED AND DISPOSED OF OFFSITE. A BROOM OR RAKE WILL BE NECESSARY TO CLEAN THE TRASH RACK.

C. RIPRAP
INSPECT RIPRAP FOR DISPLACED ROCK AND REPLACE AS REQUIRED.

D. MOW AREA (APPROXIMATELY 5 ACRES)
THE MOW AREA IS GENERALLY DESCRIBED AS THE INTERIOR SIDES AND BOTTOM OF THE ENTIRE POND UP TO THE PEDESTRIAN PATH. GRASSES SHOULD BE MAINTAINED AT A HEIGHT OF 4-6 INCHES UNTIL NATIVE VEGETATION IS ESTABLISHED.

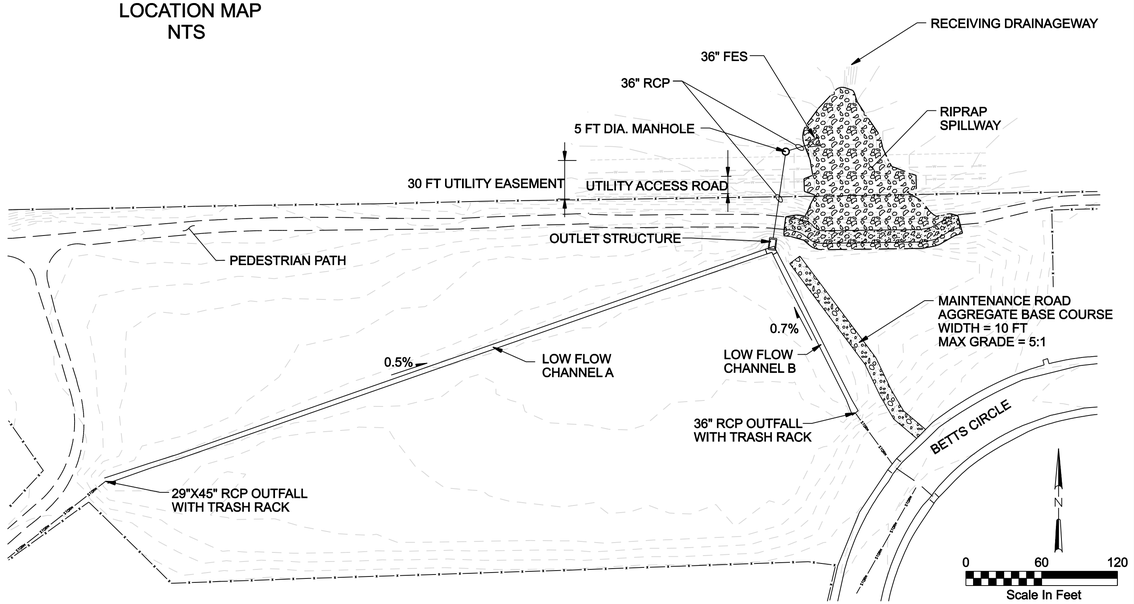
E. WEED PREVENTION
MONITOR FOR WEEDS ON A PERIODIC BASIS (I.E. THE SPRING AND FALL). IF NOXIOUS WEEDS ARE FOUND, MECHANICAL (MOWING) AND/OR CHEMICAL TREAT AREAS TO PREVENT SPREAD AND LOSS OF NATIVE VEGETATION.

F. SITE INSPECTION
THE FOLLOWING ITEMS SHOULD BE INSPECTED A MINIMUM OF ONCE PER YEAR AND MAINTAINED AS NEEDED:
GENERAL:
CONCRETE TRICKLE CHANNELS
MAINTENANCE ROAD
EROSION
VEGETATION

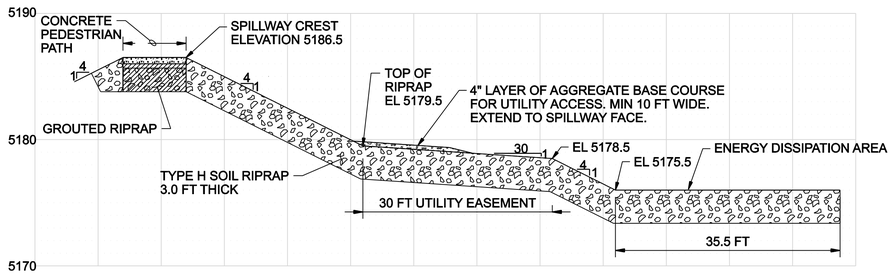
EQUIPMENT AND STRUCTURES:
OUTLET STRUCTURE
36 INCH RCP AND FLARED END SECTION
MANHOLE
RIPRAP SPILLWAY
CONCRETE SPILLWAY CREST

G. POST-MAINTENANCE CONSIDERATIONS
FOLLOWING COMPLETION OF MAINTENANCE ACTIVITIES, ALL DEBRIS, TRASH, AND EXCAVATED SEDIMENT MUST BE REMOVED OFFSITE. IF NECESSARY, BETTS CIRCLE MUST BE SWEPT CLEAN.

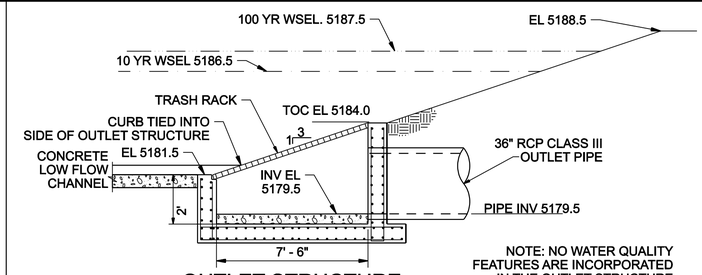
LOCATION MAP
NTS



NOTE: ACCESS SHALL BE VIA BETTS CIRCLE AND THE MAINTENANCE ROAD ONLY. DO NOT USE UTILITY ACCESS ROAD UNLESS PROPER APPROVALS HAVE BEEN MADE.



SPILLWAY PROFILE
NTS



OUTLET STRUCTURE
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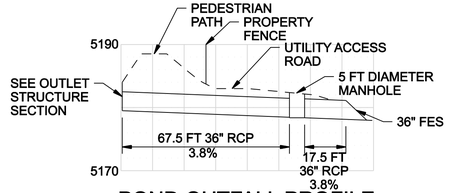

POND OUTFALL PROFILE
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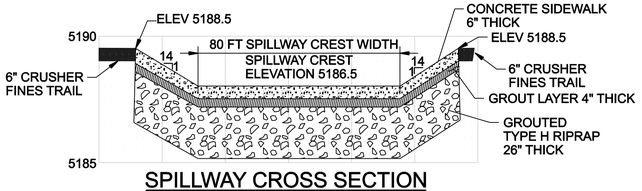
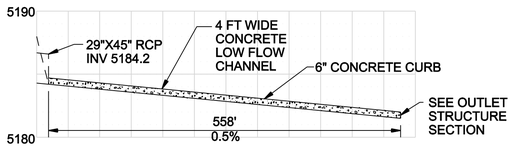
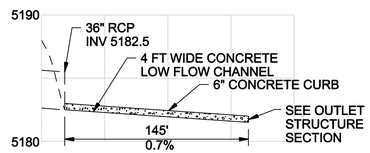


SPILLWAY CROSS SECTION
NTS



LOW FLOW CHANNEL A PROFILE
NTS



LOW FLOW CHANNEL B PROFILE
NTS

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REUSE OF DOCUMENTS:

DSGN	C DAVIS					VERIFY SCALE	CH2MHILL
DR	R OSTERMANN					BAR IS ONE INCH ON ORIGINAL DRAWING. 0 1" IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.	9193 S. JAMAICA ST ENGLEWOOD, CO 80112 CONTACT: CHAD DAVIS (720)286-5500
CHK	K HAMILTON						
APVD	K HAMILTON	NO.	DATE	REVISION	BY	APVD	

TOWN OF ERIE
URBAN DRAINAGE AND FLOOD CONTROL DISTRICT

ARAPAHOE RIDGE POND
MAINTENANCE SITE PLAN

SHEET	1 OF 1
DWG	1 OF 1
DATE	OCTOBER 2007
PROJ	328175

FILENAME: Erie_MntcePln.dgr PLOT DATE: 10/2/2007 PLOT TIME: 4:26:04 PM

Arapahoe Ridge Pond Improvements

PREPARED FOR: Rich Borchardt/Urban Drainage and Flood Control District
Wendi Palmer/Town of Erie

PREPARED BY: Chad Davis/CH2M HILL
Kyle Hamilton/CH2M HILL

DATE: April 20, 2007

Introduction

A design of improvements for the Arapahoe Ridge Pond in the Town of Erie and County of Boulder has been developed. Improvements to the pond's outlet and spillway are being conducted to bring the pond into Urban Drainage Flood Control District (UDFCD) compliance and maintenance eligibility. The project is located near North 111th Street and Arapahoe Road. A site location map is provided in Appendix A.

Design Objective

The objective of the design is to bring the pond into UDFCD compliance and maintenance eligibility. Specific design components included the following:

- Replace the existing outlet with sloped concrete structure with a trash rack,
- Replace existing outlet with 36-inch RCP,
- Design spillway to adequately convey the 100-year design storm,
- Incorporate utility easement into design,
- Reestablish trail across spillway, and
- Provide connection to existing trail and Bett's Circle.

Data Gathering

To facilitate the analysis of the existing facility, the UDSWMM routing model developed for the "Erie Outfall Systems Planning" (OSP) by Love & Associates (2001), was provided by the Town of Erie. The model was updated with survey information gathered by GeoSurv Inc. for the pond and its vicinity. This survey was bounded to the north by the property fence line. Data to supplement this survey was acquired from SEH, the engineering firm that designed a new 24-inch waterline just north of the property line. One existing waterline is located just north of the fence line, while the second is currently under construction. The Town of Erie and SEH provided drawings for the existing and proposed water lines. Verification of the vertical and horizontal alignment of the existing waterline was acquired by pothole data collected by AJ Ventures.

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Analysis and Results

Given that the pond was constructed with less volume than intended by the OSP, several spillway and outlet configurations were investigated to determine a suitable combination that would convey the OSP discharges while providing adequate freeboard. The routing model was updated with detention data and stage-storage curve to represent the as-built condition of the pond. Using CulvertMaster, a 36 inch outlet pipe combined with an 80 feet wide spillway was determined adequate to pass the 100-year peak flow rate. The discharge rating curve from CulvertMaster was combined with the stage-storage data to develop stage-discharge curve for the pond, which was entered into element 1026 of the SWMM model. The updated model determined that the peak discharge from the pond during the 100-year event of 304 cfs. The water surface elevation of the 100-year event is 5187.5 feet which is 1.0 below the top of the pond embankment, thus providing adequate freeboard.

The stage-discharge curve is provided in Appendix B. The UDSWMM model output is provided in Appendix C. Calculations for culvert and spillway discharges, riprap sizing, trash rack open area, and grate section weight are provided in Appendix D.

Design Components

Two major considerations in the spillway design were avoiding conflicts with the existing and proposed waterlines and meeting the access requirements of the utility easement to the north of the pond. Achieving both of these objectives resulted in a spillway 80 feet wide by 120 feet long with a slope of 4:1 that incorporates a relatively level section at the utility access road. The maximum velocity within the spillway is 9.23 ft/sec at the 100-year peak flow rate (320 cfs was used for riprap sizing), which required that the spillway be constructed of type H soil riprap.

Given that the pond was constructed with less volume than intended by the OSP, the outlet structure was designed for detention only, with no water quality component. The structure is a standard UDFCD sloping grate type outlet. This outlet discharges through a 36-inch RCP which outfalls within the energy dissipation section of the spillway. The capacity of the pipe is 80 cfs with the water surface elevation at the crest of the spillway (5186.5 feet).

Within this design, access is maintained both for the pedestrian walking trail and the maintenance road of the waterlines. The existing pedestrian trail across the spillway will be concrete lined to prevent damage of the trail during overtopping events. In addition, a new maintenance access will connect the sidewalk to the southeast of the pond with the trail along the spillway. Finally, additional effort was made to provide suitable access for the utility easement. This included laying back the side slopes of the type H soil riprap spillway to 8:1, and adding a wedge of aggregate base course to provide a 12:1 entrance and exit. Given that the aggregate base course would be sacrificed during a large event a 2-3″ rock chinking was provided on the surface of the type H riprap to enable crossing the spillway immediately after a storm event.

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Contract Drawings and Cost Estimate

A set of contract drawings is provided in Appendix E. An engineer's estimate of probable cost was developed for the design. The estimated cost of this project is $136,015. A breakdown of the cost estimate is provided in Appendix F.

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APPENDIX A

Arapahoe Ridge Pond Location Map

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Arapahoe Ridge Pond
Betts Cir
Prince Cir
Odell Dr
Pickett Ct
Holeman Dr
Payne Ct
N 111TH St
Hunt Ct
Woodward St
Walker St
Freeman Ct
Stevens Cir N
Bell Dr
Macculloch Dr
Grenfell Ct
Williams Ct
Hughs Dr
Larson Ctr
Stevens Cir S
Arapahoe Rd
© 2007 Navteq
Google
Pointer 40°01'07.73" N 105°05'20.03" W elev 5207 ft
Streaming 100%
Eye alt 9523 ft

APPENDIX B

Arapahoe Ridge Pond Stage-Discharge Results

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Stage Storage Curve for Arapahoe Ridge Detention Pond

	Elevation (ft)	Surface Area [1] (ft^2)	Incremental depth (ft)	Incremental Volume [2] (ac-ft)	Cumulative Volume (ac-ft)	Total Q (cfs)
	5182	768	0			31.12
	5183	8,649	1	0.09	0.09	43.57
	5184	41,711	1	0.53	0.62	56.02
	5185	88,994	1	1.47	2.09	76.32
	5186	132,639	1	2.53	4.62	100.32
Spillway Crest	5186.5	142,902	0.8	2.53	7.15	112.32
	5187	153,166	0.2	0.68	7.83	160.00
	5188	174,095	1	3.75	11.58	480.00
150% of Q100	5188.14	174,095	0.14	0.56	12.14	536.00

[1] Surface Area Data is assumed the same as 5188 for all elevations above 5188.

[2] It was assumed that spillway grading would have a negligable effect on pond volume.

APPENDIX C

Arapahoe Ridge Pond UDSWMM Results

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URBAN DRAINAGE STORM WATER MANAGEMENT MODEL - 32 BIT VERSION 1998
REVISED BY UNIVERSITY OF COLORADO AT DENVER

*** ENTRY MADE TO RUNOFF MODEL ***

Bullhead Gulch/Prince Tributary Love & Associates, Inc. Outfall Plan
100 yr storm, future land use 2/00 9922A Erie Outfall Study

0NUMBER OF TIME STEPS 150
0INTEGRATION TIME INTERVAL (MINUTES) 2.00

10.0 PERCENT OF IMPERVIOUS AREA HAS ZERO DETENTION DEPTH
0FOR 25 RAINFALL STEPS, THE TIME INTERVAL IS 5.00 MINUTES
0FOR RAINGAGE NUMBER 1 RAINFALL HISTORY IN INCHES PER HOUR

.36	.96	1.44	2.64	4.56	8.16	4.56	2.64	2.04	1.68
1.32	1.32	1.32	.60	.60	.36	.36	.36	.36	.36
.36	.36	.36	.36	.00					

1

Bullhead Gulch/Prince Tributary Love & Associates, Inc. Outfall Plan
100 yr storm, future land use 2/00 9922A Erie Outfall Study

SUBAREA NUMBER	GUTTER OR MANHOLE	WIDTH (FT)	AREA (AC)	PERCENT IMPERV.	SLOPE (FT/FT)	RESISTANCE FACTOR IMPERV.	RESISTANCE FACTOR PERV.	SURFACE STORAGE(IN) IMPERV.	SURFACE STORAGE(IN) PERV.	INFILTRATION RATE(IN/HR) MAXIMUM	INFILTRATION RATE(IN/HR) MINIMUM	INFILTRATION RATE(IN/HR) DECAY RATE	GAGE NO
-1	0	2.	.0	1.0	1.0000	1.000	1.000	1.000	1.000	1.00	1.00	1.00000	
200	200	7889.	95.6	37.3	.0220	.020	.200	.100	.300	4.50	.60	.00180	1
201	201	11713.	56.7	8.4	.0150	.020	.200	.100	.300	4.50	.60	.00180	1
202	202	8003.	42.8	30.0	.0160	.020	.200	.100	.300	4.50	.60	.00180	1
203	203	5688.	53.8	18.0	.0200	.020	.200	.100	.300	4.50	.60	.00180	1
204	204	4860.	85.2	30.3	.0190	.020	.200	.100	.300	4.50	.60	.00180	1
205	205	9331.	73.6	47.1	.0160	.020	.200	.100	.300	4.50	.60	.00180	1
206	206	12114.	71.6	50.0	.0150	.020	.200	.100	.300	4.50	.60	.00180	1
207	207	10584.	79.8	50.0	.0130	.020	.200	.100	.300	4.50	.60	.00180	1
208	208	4666.	65.1	3.4	.0140	.020	.200	.100	.300	4.50	.60	.00180	1
209	209	4561.	124.8	3.4	.0190	.020	.200	.100	.300	4.50	.60	.00180	1
210	210	3564.	26.2	48.1	.0170	.020	.200	.100	.300	4.50	.60	.00180	1
211	211	5022.	40.1	21.7	.0070	.020	.200	.100	.300	4.50	.60	.00180	1
212	212	5292.	76.7	46.6	.0210	.020	.200	.100	.300	4.50	.60	.00180	1
213	213	6552.	64.8	50.0	.0140	.020	.200	.100	.300	4.50	.60	.00180	1
215	215	7852.	81.6	45.2	.0150	.020	.200	.100	.300	4.50	.60	.00180	1
216	216	6426.	49.9	2.0	.0210	.020	.200	.100	.300	4.50	.60	.00180	1
217	217	11405.	110.5	44.2	.0280	.020	.200	.100	.300	4.50	.60	.00180	1
218	218	6880.	91.0	50.0	.0230	.020	.200	.100	.300	4.50	.60	.00180	1
219	219	5393.	64.1	30.0	.0130	.020	.200	.100	.300	4.50	.60	.00180	1
220	220	3528.	26.7	33.5	.0300	.020	.200	.100	.300	4.50	.60	.00180	1
221	221	3614.	20.6	38.5	.0130	.020	.200	.100	.300	4.50	.60	.00180	1
222	222	10087.	69.8	39.0	.0220	.020	.200	.100	.300	4.50	.60	.00180	1
235	235	9817.	122.4	2.0	.0270	.020	.200	.100	.300	4.50	.60	.00180	1
236	236	3652.	99.8	2.0	.0140	.020	.200	.100	.300	4.50	.60	.00180	1
237	237	5530.	58.6	4.5	.0140	.020	.200	.100	.300	4.50	.60	.00180	1

238	238	5166.	87.5	16.8	.0060	.020	.200	.100	.300	4.50	.60	.00180	1
240	240	9380.	49.3	5.0	.0080	.020	.200	.100	.300	4.50	.60	.00180	1
241	241	8482.	103.3	42.3	.0140	.020	.200	.100	.300	4.50	.60	.00180	1
242	242	6552.	64.3	3.8	.0070	.020	.200	.100	.300	4.34	.59	.00180	1
243	243	10314.	99.9	2.0	.0030	.020	.200	.100	.300	3.06	.50	.00180	1
101	101	3744.	73.6	39.0	.0260	.020	.200	.100	.300	4.50	.60	.00180	1
102	102	3888.	70.1	38.5	.0310	.020	.200	.100	.300	4.50	.60	.00180	1
601	601	3715.	51.3	2.0	.0060	.020	.200	.100	.300	4.47	.60	.00180	1
602	602	8208.	52.1	2.0	.0060	.020	.200	.100	.300	3.03	.50	.00180	1

0TOTAL NUMBER OF SUBCATCHMENTS, 34
0TOTAL TRIBUTARY AREA (ACRES), 2403.20
1

Bullhead Gulch/Prince Tributary Love & Associates, Inc. Outfall Plan
100 yr storm, future land use 2/00 9922A Erie Outfall Study

*** CONTINUITY CHECK FOR SUBCATCHMEMT ROUTING IN UDSWM386 MODEL ***

WATERSHED AREA (ACRES)	2403.200
TOTAL RAINFALL (INCHES)	3.156
TOTAL INFILTRATION (INCHES)	.963
TOTAL WATERSHED OUTFLOW (INCHES)	1.898
TOTAL SURFACE STORAGE AT END OF STORM (INCHES)	.295
ERROR IN CONTINUITY, PERCENTAGE OF RAINFALL	.001

1

Bullhead Gulch/Prince Tributary Love & Associates, Inc. Outfall Plan
100 yr storm, future land use 2/00 9922A Erie Outfall Study

GUTTER NUMBER	GUTTER CONNECTION	NDP	NP		WIDTH OR DIAM (FT)	LENGTH (FT)	INVERT SLOPE (FT/FT)	SIDE SLOPES HORIZ TO VERT L	R	OVERBANK/SURCHARGE MANNING N	DEPTH (FT)	JK
200	300	0	4	CHANNEL	5.0	2435.	.0220	3.0	3.0	.044	3.00	0
				OVERFLOW	23.0	2435.	.0220	20.0	20.0	.056	10.00	
201	300	0	4	CHANNEL	5.0	3615.	.0150	3.0	3.0	.044	3.00	0
				OVERFLOW	23.0	3615.	.0150	20.0	20.0	.056	10.00	
202	302	0	4	CHANNEL	8.0	2615.	.0160	3.0	3.0	.020	.50	0
				OVERFLOW	11.0	2615.	.0160	20.0	20.0	.044	10.00	
203	303	0	4	CHANNEL	8.0	1580.	.0200	3.0	3.0	.044	3.00	0
				OVERFLOW	26.0	1580.	.0200	20.0	20.0	.056	10.00	
204	303	0	4	CHANNEL	8.0	2250.	.0190	3.0	3.0	.020	.50	0
				OVERFLOW	11.0	2250.	.0190	20.0	20.0	.044	10.00	
205	1025	0	4	CHANNEL	8.0	3240.	.0160	3.0	3.0	.020	.50	0
				OVERFLOW	11.0	3240.	.0160	20.0	20.0	.044	10.00	
206	1026	0	4	CHANNEL	8.0	3365.	.0150	3.0	3.0	.020	.50	0

				OVERFLOW	11.0	3365.	.0150	20.0	20.0	.044	10.00	
207	1026	0	4	CHANNEL	8.0	3675.	.0130	3.0	3.0	.020	.50	0
				OVERFLOW	11.0	3675.	.0130	20.0	20.0	.044	10.00	
208	307	0	4	CHANNEL	5.0	2160.	.0140	3.0	3.0	.044	3.00	0
				OVERFLOW	23.0	2160.	.0140	20.0	20.0	.056	10.00	
209	306	0	4	CHANNEL	10.0	1810.	.0190	3.0	3.0	.044	3.00	0
				OVERFLOW	28.0	1810.	.0190	20.0	20.0	.056	10.00	
210	308	0	4	CHANNEL	8.0	1100.	.0170	3.0	3.0	.044	3.00	0
				OVERFLOW	26.0	1100.	.0170	20.0	20.0	.056	10.00	
211	308	0	4	CHANNEL	10.0	1550.	.0070	3.0	3.0	.044	3.00	0
				OVERFLOW	28.0	1550.	.0070	20.0	20.0	.056	10.00	
212	310	0	4	CHANNEL	5.0	2100.	.0210	3.0	3.0	.044	3.00	0
				OVERFLOW	23.0	2100.	.0210	20.0	20.0	.056	10.00	
213	1028	0	4	CHANNEL	8.0	1820.	.0140	3.0	3.0	.044	3.00	0
				OVERFLOW	26.0	1820.	.0140	20.0	20.0	.056	10.00	
215	312	0	4	CHANNEL	10.0	3635.	.0150	3.0	3.0	.038	3.00	0
				OVERFLOW	28.0	3635.	.0150	20.0	20.0	.056	10.00	
216	312	0	4	CHANNEL	8.0	2975.	.0210	3.0	3.0	.020	.50	0
				OVERFLOW	11.0	2975.	.0210	20.0	20.0	.044	10.00	
217	1029	0	4	CHANNEL	5.0	3520.	.0280	3.0	3.0	.044	3.00	0
				OVERFLOW	23.0	3520.	.0280	20.0	20.0	.056	10.00	
218	1029	0	4	CHANNEL	8.0	3185.	.0230	3.0	3.0	.020	.50	0
				OVERFLOW	11.0	3185.	.0230	20.0	20.0	.044	10.00	
219	313	0	4	CHANNEL	10.0	2140.	.0130	3.0	3.0	.038	3.00	0
				OVERFLOW	28.0	2140.	.0130	20.0	20.0	.056	10.00	
220	313	0	4	CHANNEL	5.0	1400.	.0300	3.0	3.0	.044	3.00	0
				OVERFLOW	23.0	1400.	.0300	20.0	20.0	.056	10.00	
101	102	0	4	CHANNEL	8.0	1300.	.0260	3.0	3.0	.020	.50	0
				OVERFLOW	11.0	1300.	.0260	20.0	20.0	.044	10.00	
102	1030	0	4	CHANNEL	5.0	1350.	.0310	3.0	3.0	.044	3.00	0
				OVERFLOW	23.0	1350.	.0310	20.0	20.0	.056	10.00	
221	315	0	4	CHANNEL	5.0	1255.	.0130	3.0	3.0	.044	3.00	0
				OVERFLOW	23.0	1255.	.0130	20.0	20.0	.056	10.00	
222	315	0	4	CHANNEL	5.0	4670.	.0220	3.0	3.0	.044	3.00	0
				OVERFLOW	23.0	4670.	.0220	20.0	20.0	.056	10.00	
235	320	0	4	CHANNEL	8.0	4545.	.0270	3.0	3.0	.020	.50	0
				OVERFLOW	11.0	4545.	.0270	20.0	20.0	.044	10.00	
236	321	0	4	CHANNEL	8.0	1691.	.0140	3.0	3.0	.020	.50	0
				OVERFLOW	11.0	1691.	.0140	20.0	20.0	.044	10.00	
237	322	0	4	CHANNEL	10.0	2560.	.0140	3.0	3.0	.044	3.00	0
				OVERFLOW	28.0	2560.	.0140	20.0	20.0	.056	10.00	
238	323	0	4	CHANNEL	10.0	2050.	.0060	3.0	3.0	.044	3.00	0
				OVERFLOW	28.0	2050.	.0060	20.0	20.0	.056	10.00	
240	318	0	4	CHANNEL	5.0	2895.	.0080	3.0	3.0	.044	3.00	0
				OVERFLOW	23.0	2895.	.0080	20.0	20.0	.056	10.00	
241	318	0	4	CHANNEL	5.0	2945.	.0140	3.0	3.0	.044	3.00	0
				OVERFLOW	23.0	2945.	.0140	20.0	20.0	.056	10.00	
242	319	0	4	CHANNEL	10.0	1820.	.0070	3.0	3.0	.044	3.00	0
				OVERFLOW	28.0	1820.	.0070	20.0	20.0	.056	10.00	
243	940	0	4	CHANNEL	10.0	2865.	.0030	3.0	3.0	.044	3.00	0
				OVERFLOW	28.0	2865.	.0030	20.0	20.0	.056	10.00	
300	301	0	3		.0	0.	.0001	.0	.0	.001	.01	0
302	203	0	3		.0	0.	.0001	.0	.0	.001	.01	0
303	1027	0	3		.0	0.	.0001	.0	.0	.001	.01	0
305	209	0	3		.0	0.	.0001	.0	.0	.001	.01	0
306	211	0	3		.0	0.	.0001	.0	.0	.001	.01	0
308	309	0	3		.0	0.	.0001	.0	.0	.001	.01	0
310	213	0	3		.0	0.	.0001	.0	.0	.001	.01	0

```
 311        215          0          3                      .0        0.     .0001       .0    .0       .001         .01        0
 312        219          0          3                      .0        0.     .0001       .0    .0       .001         .01        0
 313        314          0          3                      .0        0.     .0001       .0    .0       .001         .01        0
 315       1031          0          3                      .0        0.     .0001       .0    .0       .001         .01        0
 317        318          0          3                      .0        0.     .0001       .0    .0       .001         .01        0
 318        242          0          3                      .0        0.     .0001       .0    .0       .001         .01        0
 319        243          0          3                      .0        0.     .0001       .0    .0       .001         .01        0
 320        236          0          3                      .0        0.     .0001       .0    .0       .001         .01        0
 321        237          0          3                      .0        0.     .0001       .0    .0       .001         .01        0
 322       1032          0          3                      .0        0.     .0001       .0    .0       .001         .01        0
 323        317          0          3                      .0        0.     .0001       .0    .0       .001         .01        0
 940       1500          0          3                      .0        0.     .0001       .0    .0       .001         .01        0
 301        303          0          4      CHANNEL         8.0     1010.     .0200      3.0   3.0       .038        2.00        0
                                            OVERFLOW       20.0     1010.     .0200     20.0  20.0       .056       10.00
 304        305          0          4      CHANNEL         8.0     1600.     .0140      3.0   3.0       .020         .50        0
                                            OVERFLOW       11.0     1600.     .0140     20.0  20.0       .044       10.00
 307        308          0          4      CHANNEL         5.0     1690.     .0220      3.0   3.0       .038        3.00        0
                                            OVERFLOW       23.0     1690.     .0220     20.0  20.0       .056       10.00
 309        311          0          4      CHANNEL        10.0      900.     .0120      3.0   3.0       .038        1.50        0
                                            OVERFLOW       19.0      900.     .0120     20.0  20.0       .056       10.00
 314        315          0          4      CHANNEL        10.0      800.     .0130      3.0   3.0       .038        1.50        0
                                            OVERFLOW       19.0      800.     .0130     20.0  20.0       .056       10.00
 316        317          0          4      CHANNEL        10.0     2735.     .0100      3.0   3.0       .038        1.50        0
                                            OVERFLOW       19.0     2735.     .0100     20.0  20.0       .056       10.00
1021        322          0          4      CHANNEL        10.0     1600.     .0110      3.0   3.0       .038        1.50        0
                                            OVERFLOW       19.0     1600.     .0110     20.0  20.0       .056       10.00
1025        305          5          2      PIPE            .0        0.     .0001       .0    .0       .001         .01        0
                  RESERVOIR STORAGE IN ACRE-FEET VS SPILLWAY OUTFLOW
                        .0      .0       .7    30.0      2.1    60.0      4.5   108.0       5.0   200.0
1026        210          9          2      PIPE            .0        0.     .0001       .0    .0       .001         .01        0
                  RESERVOIR STORAGE IN ACRE-FEET VS SPILLWAY OUTFLOW
                        .0      .0       .1    43.6       .6    56.0      2.1    76.3       4.6   100.3       7.2   112.3
                      7.8   160.0     11.6   480.0     12.1   536.0
1027        304          5          2      PIPE            .0        0.     .0001       .0    .0       .001         .01        0
                  RESERVOIR STORAGE IN ACRE-FEET VS SPILLWAY OUTFLOW
                        .0      .0      5.2   100.0     14.4   200.0     23.6   264.0      35.0   400.0
1028        311          7          2      PIPE            .0        0.     .0001       .0    .0       .001         .01        0
                  RESERVOIR STORAGE IN ACRE-FEET VS SPILLWAY OUTFLOW
                        .0      .0      3.4    40.0      7.8    80.0     10.0    96.5      12.0   150.0      14.1   240.0
                     16.0   400.0
1029        312          7          2      PIPE            .0        0.     .0001       .0    .0       .001         .01        0
                  RESERVOIR STORAGE IN ACRE-FEET VS SPILLWAY OUTFLOW
                        .0      .0      6.8    40.0     15.6    80.0     20.0    96.5      24.0   150.0      28.2   240.0
                     32.0   400.0
1030        221          7          2      PIPE            .0        0.     .0001       .0    .0       .001         .01        0
                  RESERVOIR STORAGE IN ACRE-FEET VS SPILLWAY OUTFLOW
                        .0      .0      3.4    40.0      7.8    80.0     10.0    96.5      12.0   150.0      14.1   240.0
                     16.0   400.0
1031        316          4          3                      .0        0.     .0001       .0    .0       .001         .01      103
                  DIVERSION TO GUTTER NUMBER 103 - TOTAL Q VS DIVERTED Q IN CFS
                        .0      .0    500.0   500.0   1000.0   500.0   5000.0   500.0
 103        318          0          4      CHANNEL        10.0     2600.     .0130      3.0   3.0       .044        4.00        0
                                            OVERFLOW       26.0     2600.     .0130     20.0  20.0       .056       10.00
 601        700          0          4      CHANNEL         8.0     1720.     .0060      3.0   3.0       .020         .50        0
                                            OVERFLOW       11.0     1720.     .0060     20.0  20.0       .044       10.00
 602        951          0          4      CHANNEL         8.0     2280.     .0060      3.0   3.0       .044        3.00        0
                                            OVERFLOW       26.0     2280.     .0060     20.0  20.0       .056       10.00
 700        602          0          3                      .0        0.     .0001       .0    .0       .001         .01        0
```

```
 951        1500          0          3                        .0        0.     .0001       .0    .0       .001         .01        0
1032         325          4          3                        .0        0.     .0001       .0    .0       .001         .01      104
                    DIVERSION TO GUTTER NUMBER 104 - TOTAL Q VS DIVERTED Q IN CFS
                          .0      .0    1000.0  1000.0    2000.0  1000.0    5000.0  1000.0
 104         324          0          4      CHANNEL        20.0     2400.     .0090      4.0   4.0       .044        6.00        0
                                            OVERFLOW       26.0     2400.     .0090     20.0  20.0       .056       10.00
 324         601          0          3                        .0        0.     .0001       .0    .0       .001         .01        0
 325         238          0          3                        .0        0.     .0001       .0    .0       .001         .01        0
1020        1021         17          3                        .0        0.     .0001       .0    .0       .001         .01       -1
                    TIME IN HRS VS INFLOW IN CFS
                          .0      .0        .3    12.8        .4    62.4        .8  1355.5       1.2  3612.7       1.3  3753.8
                         1.3  3746.0       1.4  3612.7       1.8  2523.5       2.0  1799.9       2.5   948.0       3.0   565.2
                         3.5   365.8       4.0   277.2       5.0   161.6       6.0    71.6       8.0      .0
0TOTAL NUMBER OF GUTTERS/PIPES,  75
1
```

Bullhead Gulch/Prince Tributary Love & Associates, Inc. Outfall Plan
100 yr storm, future land use 2/00 9922A   Erie Outfall Study

ARRANGEMENT OF SUBCATCHMENTS AND GUTTERS/PIPES

GUTTER	TRIBUTARY GUTTER/PIPE										TRIBUTARY SUBAREA										D.A.(AC)
101	0	0	0	0	0	0	0	0	0	0	101	0	0	0	0	0	0	0	0	0	73.6
102	101	0	0	0	0	0	0	0	0	0	102	0	0	0	0	0	0	0	0	0	143.7
103	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.0
104	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.0
200	0	0	0	0	0	0	0	0	0	0	200	0	0	0	0	0	0	0	0	0	95.6
201	0	0	0	0	0	0	0	0	0	0	201	0	0	0	0	0	0	0	0	0	56.7
202	0	0	0	0	0	0	0	0	0	0	202	0	0	0	0	0	0	0	0	0	42.8
203	302	0	0	0	0	0	0	0	0	0	203	0	0	0	0	0	0	0	0	0	96.6
204	0	0	0	0	0	0	0	0	0	0	204	0	0	0	0	0	0	0	0	0	85.2
205	0	0	0	0	0	0	0	0	0	0	205	0	0	0	0	0	0	0	0	0	73.6
206	0	0	0	0	0	0	0	0	0	0	206	0	0	0	0	0	0	0	0	0	71.6
207	0	0	0	0	0	0	0	0	0	0	207	0	0	0	0	0	0	0	0	0	79.8
208	0	0	0	0	0	0	0	0	0	0	208	0	0	0	0	0	0	0	0	0	65.1
209	305	0	0	0	0	0	0	0	0	0	209	0	0	0	0	0	0	0	0	0	532.5
210	1026	0	0	0	0	0	0	0	0	0	210	0	0	0	0	0	0	0	0	0	177.6
211	306	0	0	0	0	0	0	0	0	0	211	0	0	0	0	0	0	0	0	0	572.6

212	0	0	0	0	0	0	0	0	0	0	212	0	0	0	0	0	0	0	0	0	76.7
213	310	0	0	0	0	0	0	0	0	0	213	0	0	0	0	0	0	0	0	0	141.5
215	311	0	0	0	0	0	0	0	0	0	215	0	0	0	0	0	0	0	0	0	1038.4
216	0	0	0	0	0	0	0	0	0	0	216	0	0	0	0	0	0	0	0	0	49.9
217	0	0	0	0	0	0	0	0	0	0	217	0	0	0	0	0	0	0	0	0	110.5
218	0	0	0	0	0	0	0	0	0	0	218	0	0	0	0	0	0	0	0	0	91.0
219	312	0	0	0	0	0	0	0	0	0	219	0	0	0	0	0	0	0	0	0	1353.9
220	0	0	0	0	0	0	0	0	0	0	220	0	0	0	0	0	0	0	0	0	26.7
221	1030	0	0	0	0	0	0	0	0	0	221	0	0	0	0	0	0	0	0	0	164.3
222	0	0	0	0	0	0	0	0	0	0	222	0	0	0	0	0	0	0	0	0	69.8
235	0	0	0	0	0	0	0	0	0	0	235	0	0	0	0	0	0	0	0	0	122.4
236	320	0	0	0	0	0	0	0	0	0	236	0	0	0	0	0	0	0	0	0	222.2
237	321	0	0	0	0	0	0	0	0	0	237	0	0	0	0	0	0	0	0	0	280.8
238	325	0	0	0	0	0	0	0	0	0	238	0	0	0	0	0	0	0	0	0	368.3
240	0	0	0	0	0	0	0	0	0	0	240	0	0	0	0	0	0	0	0	0	49.3
241	0	0	0	0	0	0	0	0	0	0	241	0	0	0	0	0	0	0	0	0	103.3
242	318	0	0	0	0	0	0	0	0	0	242	0	0	0	0	0	0	0	0	0	2199.9
243	319	0	0	0	0	0	0	0	0	0	243	0	0	0	0	0	0	0	0	0	2299.8
300	200	201	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	152.3
301	300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	152.3
302	202	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	42.8
303	203	204	301	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	334.1
304	1027	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	334.1
305	304	1025	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	407.7
306	209	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	532.5
307	208	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	65.1
308	210	211	307	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	815.3
309	308	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	815.3
310	212	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	76.7

311	309	1028	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	956.8
312	215	216	1029	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1289.8
313	219	220	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1380.6
314	313	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1380.6
315	221	222	314	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1614.7
316	1031	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1614.7
317	323	316	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1983.0
318	240	241	317	103	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2135.6
319	242	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2199.9
320	235	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	122.4
321	236	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	222.2
322	237	1021	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	280.8
323	238	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	368.3
324	104	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.0
325	1032	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	280.8
601	324	0	0	0	0	0	0	0	0	0	601	0	0	0	0	0	0	0	0	0	0	51.3
602	700	0	0	0	0	0	0	0	0	0	602	0	0	0	0	0	0	0	0	0	0	103.4
700	601	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	51.3
940	243	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2299.8
951	602	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	103.4
1020	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.0
1021	1020	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.0
1025	205	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	73.6
1026	206	207	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	151.4
1027	303	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	334.1
1028	213	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	141.5
1029	217	218	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	201.5
1030	102	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	143.7
1031	315	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1614.7
1032	322	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	280.8

Bullhead Gulch/Prince Tributary Love & Associates, Inc. Outfall Plan
100 yr storm, future land use 2/00 9922A Erie Outfall Study

*** PEAK FLOWS, STAGES AND STORAGES OF GUTTERS AND DETENTION DAMS ***

CONVEYANCE ELEMENT	PEAK (CFS)	STAGE (FT)	STORAGE (AC-FT)	TIME (HR/MIN)
201	106.	2.0		0 46.
200	285.	2.9		0 34.
202	115.	1.0		0 36.
300	356.	(DIRECT FLOW)		0 36.
302	115.	(DIRECT FLOW)		0 36.
301	344.	2.5		0 40.
204	189.	1.2		0 36.
203	222.	2.3		0 40.
303	745.	(DIRECT FLOW)		0 38.
205	226.	1.4		0 36.
1027	284.	.0	25.3	1 18.
1025	140.	.0	4.7	0 56.
304	283.	1.5		1 22.
305	382.	(DIRECT FLOW)		1 18.
209	473.	3.1		1 6.
207	231.	1.4		0 38.
206	234.	1.4		0 36.
212	265.	2.8		0 34.
208	75.	1.7		0 52.
306	473.	(DIRECT FLOW)		1 6.
1026	304.	.0	9.5	0 56.
310	265.	(DIRECT FLOW)		0 34.
307	74.	1.4		0 58.
211	503.	3.8		1 10.
210	338.	3.0		0 56.
213	447.	3.4		0 36.
308	882.	(DIRECT FLOW)		1 4.
1028	184.	.0	12.8	1 8.
309	878.	3.4		1 6.
235	165.	1.1		0 54.
218	295.	1.4		0 36.
217	365.	3.1		0 34.
311	1061.	(DIRECT FLOW)		1 6.
320	165.	(DIRECT FLOW)		0 54.
1029	153.	.0	24.2	1 20.
216	83.	.8		0 48.
215	1090.	4.2		1 12.
236	237.	1.4		0 58.
312	1293.	(DIRECT FLOW)		1 12.
101	233.	1.2		0 32.
1020	3862.	(DIRECT FLOW)		1 16.
321	237.	(DIRECT FLOW)		0 58.
220	94.	1.6		0 32.
219	1324.	4.6		1 16.

Element 1026 is the Arapahoe Ridge Pond 100-yr flow rate is 304cfs. Please note that 320cfs was used in the modeling for riprap sizing and detention capacity.

102	435.	3.2		0	34.
1021	3720.	5.9		1	20.
237	301.	2.8		1	4.
313	1343.	(DIRECT FLOW)		1	16.
1030	155.	.0	12.1	1	10.
322	3967.	(DIRECT FLOW)		1	20.
314	1340.	3.9		1	18.
222	186.	2.4		0	38.
221	172.	2.6		1	8.
1032	3967.	(DIRECT FLOW)		1	20.
315	1572.	(DIRECT FLOW)		1	14.
325	2967.	(DIRECT FLOW)		1	20.
1031	1572.	(DIRECT FLOW)		1	14.
238	2910.	6.9		1	26.
316	1024.	3.8		1	24.
323	2910.	(DIRECT FLOW)		1	26.
104	1000.	4.2		1	44.
103	500.	3.6		1	42.
317	3928.	(DIRECT FLOW)		1	26.
241	278.	3.1		0	36.
240	74.	2.0		0	52.
324	1000.	(DIRECT FLOW)		1	44.
318	4534.	(DIRECT FLOW)		1	26.
601	1035.	3.2		1	14.
242	4503.	7.8		1	30.
700	1035.	(DIRECT FLOW)		1	14.
319	4503.	(DIRECT FLOW)		1	30.
602	1062.	5.1		1	26.
243	4270.	8.8		1	40.
951	1062.	(DIRECT FLOW)		1	26.
940	4270.	(DIRECT FLOW)		1	40.
1500	5324.	(DIRECT FLOW)		1	40.

APPENDIX D

Arapahoe Ridge Pond Hand Calculations

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Culvert Designer/Analyzer Report
100-year pond outfall

Analysis Component			
Storm Event	Check	Discharge	320.00 cfs

100yr flow rate used to size riprap

Peak Discharge Method: User-Specified			
Design Discharge	67.00 cfs	Check Discharge	320.00 cfs

Tailwater properties: Trapezoidal Channel			

Tailwater conditions for Check Storm.			
Discharge	320.00 cfs	Bottom Elevation	5,176.00 ft
Depth	2.76 ft	Velocity	12.16 ft/s

Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-36 inch Circular	87.59 cfs	5,187.56 ft	17.52 ft/s
Weir	Broad Crested	232.58 cfs	5,187.56 ft	N/A
Total	----------	320.17 cfs	5,187.56 ft	N/A

Flow used in HEC-RAS to determine max velocity

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Culvert Designer/Analyzer Report
100-year pond outfall

Component:Culvert-1

Culvert Summary					
Computed Headwater Eleva	5,187.56	ft	Discharge	87.59	cfs
Inlet Control HW Elev.	5,187.56	ft	Tailwater Elevation	5,178.76	ft
Outlet Control HW Elev.	5,186.08	ft	Control Type	Inlet Control	
Headwater Depth/Height	2.69				

Grades					
Upstream Invert	5,179.50	ft	Downstream Invert	5,176.00	ft
Length	92.00	ft	Constructed Slope	0.038043	ft/ft

Hydraulic Profile					
Profile	S2		Depth, Downstream	2.00	ft
Slope Type	Steep		Normal Depth	1.80	ft
Flow Regime	Supercritical		Critical Depth	2.83	ft
Velocity Downstream	17.52	ft/s	Critical Slope	0.014911	ft/ft

Section					
Section Shape	Circular		Mannings Coefficient	0.013	
Section Material	Concrete		Span	3.00	ft
Section Size	36 inch		Rise	3.00	ft
Number Sections	1				

Outlet Control Properties					
Outlet Control HW Elev.	5,186.08	ft	Upstream Velocity Head	2.50	ft
Ke	0.50		Entrance Loss	1.25	ft

Inlet Control Properties					
Inlet Control HW Elev.	5,187.56	ft	Flow Control	N/A	
Inlet Type	Square edge w/headwall		Area Full	7.1	ft²
K	0.00980		HDS 5 Chart	1	
M	2.00000		HDS 5 Scale	1	
C	0.03980		Equation Form	1	
Y	0.67000				

Culvert Designer/Analyzer Report
100-year pond outfall

Component:Weir

Hydraulic Component(s): Broad Crested					
Discharge	232.58	cfs	Allowable HW Elevation	5,187.56	ft
Weir Coefficient	2.65	US	Length	80.00	ft
Crest Elevation	5,186.50	ft	Headwater Elevation	5,187.56	ft

Culvert Designer/Analyzer Report
100-year pond outfall

Overtopping Analysis

Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-36 inch Circular	79.60 cfs	5,186.50 ft	17.10 ft/s
Weir	Broad Crested	0.00 cfs	5,186.50 ft	N/A
Total	----------	79.60 cfs	5,186.50 ft	N/A

Flow rate through 36" RCP with water surface elevation at spillway crest.

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Culvert Designer/Analyzer Report
100-year pond outfall

Component:Culvert-1

Culvert Summary					
Computed Headwater Eleva	5,186.50	ft	Discharge	79.60	cfs
Inlet Control HW Elev.	5,186.50	ft	Tailwater Elevation	5,177.39	ft
Outlet Control HW Elev.	5,185.45	ft	Control Type	Inlet Control	
Headwater Depth/Height	2.33				

Grades					
Upstream Invert	5,179.50	ft	Downstream Invert	5,176.00	ft
Length	92.00	ft	Constructed Slope	0.038043	ft/ft

Hydraulic Profile					
Profile	S2		Depth, Downstream	1.88	ft
Slope Type	Steep		Normal Depth	1.70	ft
Flow Regime	Supercritical		Critical Depth	2.77	ft
Velocity Downstream	17.10	ft/s	Critical Slope	0.012353	ft/ft

Section					
Section Shape	Circular		Mannings Coefficient	0.013	
Section Material	Concrete		Span	3.00	ft
Section Size	36 inch		Rise	3.00	ft
Number Sections	1				

Outlet Control Properties					
Outlet Control HW Elev.	5,185.45	ft	Upstream Velocity Head	2.12	ft
Ke	0.50		Entrance Loss	1.06	ft

Inlet Control Properties					
Inlet Control HW Elev.	5,186.50	ft	Flow Control	Submerged	
Inlet Type	Square edge w/headwall		Area Full	7.1	ft²
K	0.00980		HDS 5 Chart	1	
M	2.00000		HDS 5 Scale	1	
C	0.03980		Equation Form	1	
Y	0.67000				

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Culvert Designer/Analyzer Report
100-year pond outfall

Component:Weir

Hydraulic Component(s): Broad Crested					
Discharge	0.00	cfs	Allowable HW Elevation	5,186.50	ft
Weir Coefficient	2.65	US	Length	80.00	ft
Crest Elevation	5,186.50	ft	Headwater Elevation	N/A	ft

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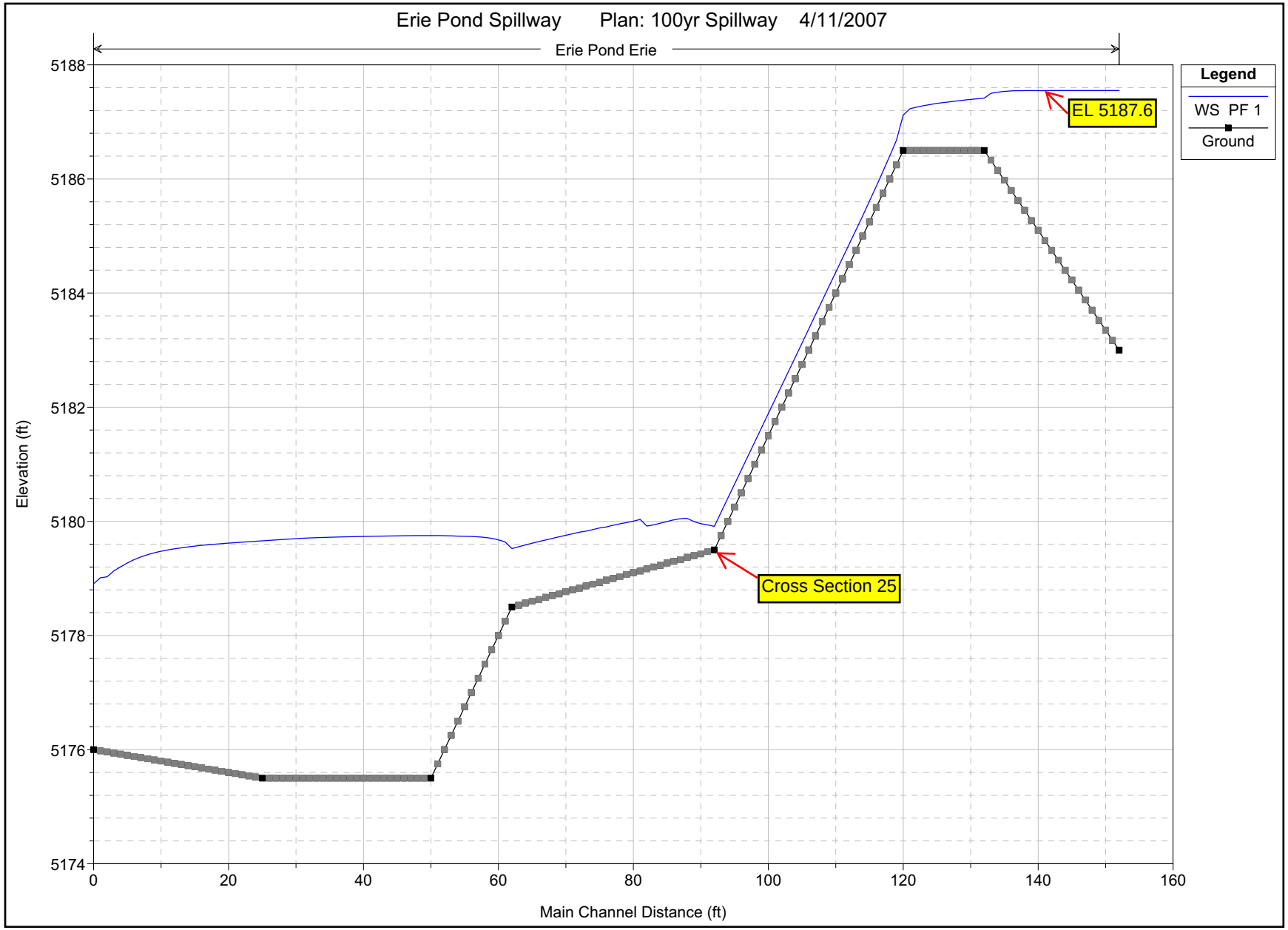
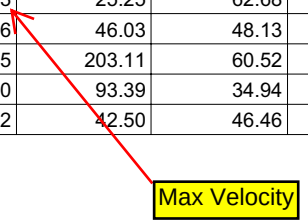

Erie Pond Spillway Plan: 100yr Spillway 4/11/2007
Erie Pond Erie
Legend
WS PF 1
Ground
EL 5187.6
Cross Section 25
Elevation (ft)
Main Channel Distance (ft)
5188
5186
5184
5182
5180
5178
5176
5174
0
20
40
60
80
100
120
140
160

HEC-RAS Plan: 100 River: Erie Pond Reach: Erie Profile: PF 1

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Erie	60	PF 1	233.00	5183.00	5187.55	5183.19	5187.55	0.000001	0.09	2532.08	592.81	0.01
Erie	50	PF 1	233.00	5186.50	5187.42		5187.53	0.007976	2.74	85.18	105.69	0.54
Erie	40	PF 1	233.00	5186.50	5187.12	5187.12	5187.40	0.030819	4.24	54.95	97.35	0.99
Erie	25	PF 1	233.00	5179.50	5179.91	5180.26	5181.23	0.229305	9.23	25.25	62.68	2.56
Erie	20	PF 1	233.00	5178.50	5179.52	5179.46	5179.92	0.021920	5.06	46.03	48.13	0.91
Erie	15	PF 1	233.00	5175.50	5179.75		5179.77	0.000216	1.15	203.11	60.52	0.11
Erie	12	PF 1	233.00	5175.50	5179.66		5179.75	0.001410	2.50	93.39	34.94	0.27
Erie	1	PF 1	233.00	5176.00	5178.91	5178.99	5179.62	0.011220	7.32	42.50	46.46	0.86



Riprap Sizing

$Q_{100} = 320$ cfs

per Hec-Ras the highest velocity down the embankment will be 9.23 ft/s

equation MD-13

$$\frac{V S^{0.17}}{(G_s-1)^{0.66}} \qquad \frac{(9.23)(\frac{1}{4})^{0.17}}{(2.5-1)^{0.66}} = 5.57 \therefore \text{Type H Riprap}$$

Verify with "Development of Riprap Design Criteria by Riprap Testing in Flumes: Phase II"

$$q_d' = q \times C_f = \frac{2.33 \text{ cfs}}{60 \text{ ft}} \times 3.0 = 11.65 \text{ cfs/ft}$$

(60 ft to Toe)

$C_f = 3.0$ for high probability of channalized flow

$$q_{design} = 1.35\, q_d' = 15.7 \text{ cfs/ft}$$

$$D_{50} = 5.23\, S^{0.43} q_{des}^{0.56} = 5.23\,(0.25)^{.43}(15.7)^{0.56} = 13.5" \therefore \text{Type H with } d_{50} = 18" \text{ is ok}$$

Grate Open Area

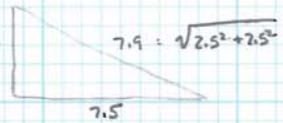
Pipe Area $= \frac{\pi d^2}{4} = \frac{\pi (3)^2}{4} = 7.07 \text{ ft}^2$

Provide $4A = 7.07(4) = 28.3 \text{ ft}^2$

Grating $\frac{1}{4}$" every $1\frac{3}{8}$" $= 8(\frac{1}{4}) = 2" \times 12" = 24 \text{ in}^2/\text{SF}$

$\frac{3}{8}$" every 4" $= 3(\frac{3}{8}) = 1.125" \times 12" = 13.5 \text{ in}^2/\text{SF}$ → $37.5 \text{ in}^2/\text{SF} / 12^2 = 0.26 \text{ SF/SF}$

Grating Length



need $28.3(1.26) = 35.66$ SF

provide $5' \times 7.9' = 39.5$ SF

minus grating $= 39.5(.26) = 10.27$ SF

Total $= 29.23$ SF > 28.3 required

$29.23 / 7.07 = 4.1$ provided

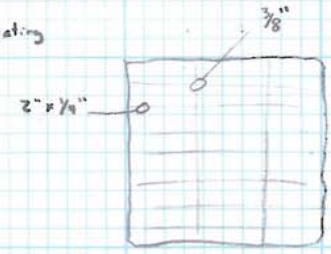
Grate Section Weight

2" × 1/4" $= 0.5 \text{ in}^2 \times 8 \text{ per ft} = 4 \text{ in}^2/12^2 = 0.0278 \text{ ft}^2 \times 5 \text{ ft width} = 0.139 \text{ ft}^3/\text{ft}$

3/8" dia $= \frac{\pi(\frac{3}{8})^2}{4} = .011 \text{ in}^2 \times 3 \text{ per ft} = 0.33 \text{ in}^2/12^2 = .0023 \text{ ft}^2 \times 1 \text{ ft} = 0.0023 \text{ ft}^3/\text{ft}$ → $0.141 \text{ ft}^3/\text{ft}$ of grating

$0.141 \text{ ft}^3/\text{ft}$ of grating (490 lb/ft³ steel) $= 69$ lbs per ft of grating

provide in 2 ft sections $= 69 \times 2 = 138$ lb / section



APPENDIX E

Arapahoe Ridge Pond Contract Drawings

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LEGEND

- PROPOSED 1 FT CONTOURS
- EXISTING 1 FT CONTOURS
- EXISTING BARBED WIRE FENCE
- EXISTING WATER LINE
- EXISTING EASEMENT

N

0 10 20 30

CALL BEFORE YOU DIG
CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO (UNCC) TOLL FREE AT (800) 922-1987 PRIOR TO DIGGING

SURVEY CONTROL

THE HORIZONTAL DATUM IS NAD83 EXPRESSED IN U.S. SURVEY FEET.
THE VERTICAL DATUM IS NAVD88, EXPRESSED IN U.S. SURVEY FEET.

CONTROL POINTS	NORTHING	EASTING	ELEVATION
CP93*	116473.32	251263.68	5188.89
CP92**	115822.31	251233.49	5188.43

* X CHISELED ON TYPE R INLET ON BETTS CIRCLE
** PIN AND CAP IN EMBANKMENT AT SOUTHWEST END OF CONCRETE LOW FLOW CHANNEL.

PROJECT NOTES:

1. AGGREGATE BASE COURSE SHALL BE CDOT CLASS 6.
2. SOIL RIPRAP SHALL BE 65% RIPRAP AND 35% SOIL BY VOLUME, AND SHALL BE COMPACTED.
3. ADDITIONAL SOIL SHALL BE PLACED OVER ALL SOIL RIPRAP TO THE TOP OF THE RIPRAP.
4. SEED ALL DISTURBED AREAS AND SOIL RIPRAP WITH THE TOWN OF ERIE NATIVE SEED MIX. APPLY AT 15 LBS/ACRE FOR DRILL SEED. IF BROADCASTED, USE 2 TIMES THE APPLICATION RATE AND RAKE IN.
5. RAISE PEDESTRIAN PATH TO A MIN. EL 5188.5 ALONG THE ENTIRE EMBANKMENT AS NEEDED.
6. CONTRACTOR SHALL PROVIDE SAFETY FENCE AND SIGNAGE AS REQUIRED TO MAINTAIN A SAFE SITE.
7. CONTRACTOR SHALL COORDINATE ANY TRAIL CLOSURE, TEMPORARY PATH, AND/OR DETOUR ROUTE WITH TOWN.
8. CONTRACTOR SHALL BE LICENSED TO PERFORM WORK IN THIS TOWN/COUNTY.
9. CONTRACTOR SHALL OBTAIN ALL REQUIRED PERMITS.
10. IT IS THE INTENT OF THESE PLANS TO SHOW ALL EXISTING UTILITIES, HOWEVER IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY ALL UTILITIES PRIOR TO CONSTRUCTION, WHETHER SHOWN ON THESE PLANS OR NOT. CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO (UNCC) TOLL-FREE AT (800) 922-1987, PRIOR TO DIGGING. THE ENGINEER AND UDFCD SHALL BE NOTIFIED OF ANY POTENTIAL CONFLICTS.
11. RCP PIPE SHALL BE PLACED IN CLASS 2 BEDDING PER CDOT SPECIFICATIONS.

LIMIT OF TYPE H SOIL RIPRAP
INSTALL ANY ADDITIONAL PYRAMAT ALONG NORTHEAST SIDE OF SPILLWAY
36" CONCRETE FLARED END SECTION WITH ANCHORS
INSTALL EROSION CONTROL BLANKET PYRAMAT
PIPE INV 5176.0
NORTHING 116403.90
EASTING 251513.85
36" RCP, CLASS III
17.5 LF AT 3.8%
MANHOLE, 5' DIA.
NORTHING 116385.40
EASTING 251508.16
RIM EL 5182.5
INV IN 5176.9
INV OUT 5176.7
36" RCP, CLASS III
67.5 LF AT 3.8%
EXISTING 30 FT UTILITY EASEMENT
EXISTING UTILITY ACCESS ROAD
CONTOURS REFLECT TOP OF RIPRAP PROVIDE 12:1 SLOPE WITH AGGREGATE BASE COURSE AS SHOWN IN SECTION C ON SHEET 2
REMOVE EXISTING 30" CMP
REMOVE EXISTING HEADWALL
EXISTING PEDESTRIAN PATH
PROPOSED PEDESTRIAN PATH MIN 10FT WIDTH 2% CROSS SLOPE WITH CROWN
TIE INTO EXISTING TRAIL
POND OUTLET STRUCTURE SEE SHEET 4
OUTLET STRUCTURE NORTHING 116374.31 EASTING 251430.29
SAWCUT AND REMOVE EXISTING CONCRETE REPLACE IN KIND, SEE SHEET 3
REMOVE EXISTING 30" RCP
REMOVE EXISTING OUTLET STRUCTURE
INSTALL EROSION CONTROL BLANKET PYRAMAT
EXISTING CONCRETE LOW FLOW CHANNEL
CONTOURS REFLECT TOP OF RIPRAP PROVIDE 12:1 SLOPE WITH AGGREGATE BASE COURSE AS SHOWN IN SECTION C ON SHEET 2
EXISTING 30 FT UTILITY EASEMENT
EXISTING PEDESTRIAN PATH
TIE INTO EXISTING TRAIL WITH CRUSHER FINES
LIMIT OF TYPE H SOIL RIPRAP
LIMITS OF CONCRETE

MAINTENANCE ACCESS NOTE:

190' OF MAINTENANCE ACCESS SHALL BE CONSTRUCTED ALONG THE EXISTING ALIGNMENT THROUGH THE POND. THIS SHALL CONNECT TO THE EXISTING PEDESTRIAN PATH TO THE SIDEWALK ADJACENT TO BETTS CIRCLE. MAINTENANCE ACCESS SHALL BE 10' WIDE AND CONSTRUCTED PER MAINTENANCE ACCESS SPECIFICATIONS FOUND BELOW AND PER THE TOWN OF ERIE SOFT TRAIL DETAIL:

MAINTENANCE ACCESS SPECIFICATIONS
- 10 FT WIDE
- GEOTEXTILE LAYER
- 6" LAYER OF CRUSHER FINES
- 5:1 MAX LONGITUDINAL SLOPE
- 2% MAX CROSS SLOPE
- 3:1 MAX SIDE SLOPES FOR FILL/CUT ADJACENT TO TRAIL
- PROVIDE 6' RADIUS AT BOTH ENDS OF THE ACCESS, EACH SIDE

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REUSE OF DOCUMENTS:

DSGN C DAVIS DR R OSTERMANN CHK K HAMILTON APVD K HAMILTON	NO.	DATE	REVISION	BY	APVD	VERIFY SCALE: BAR IS ONE INCH ON ORIGINAL DRAWING. 0 1" IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.	CH2MHILL 9193 S. JAMAICA ST ENGLEWOOD, CO 80112 CONTACT: KYLE HAMILTON (720)286-5500

URBAN DRAINAGE AND FLOOD CONTROL DISTRICT
TOWN OF ERIE
ARAPAHOE RIDGE POND
FINAL DESIGN

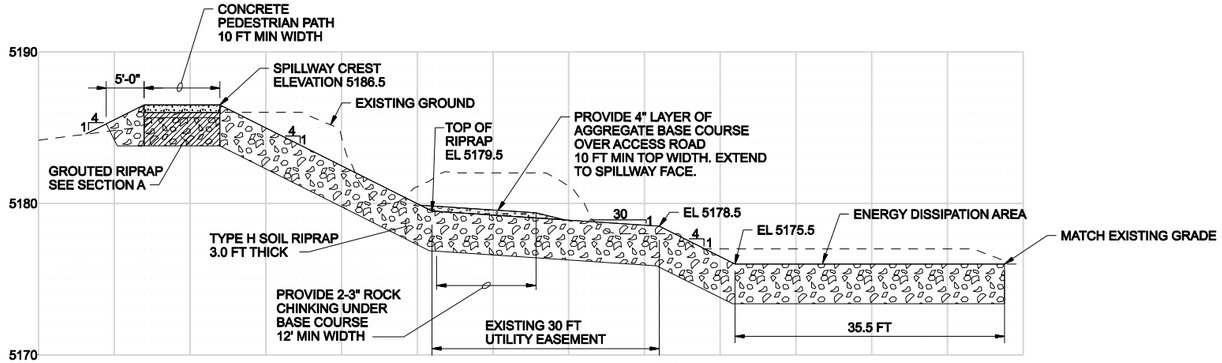
PLAN VIEW

SHEET	1
DWG	1
DATE	MARCH 2007
PROJ	328175

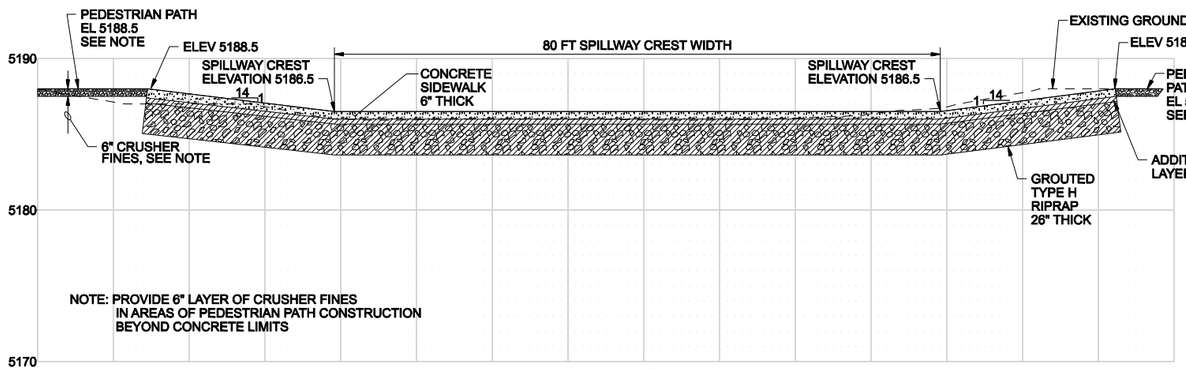
FILENAME: erieppn001.dlv PLOT DATE: 4/12/2007 PLOT TIME: 3:53:44 PM

0 10 20 30
Horizontal Scale

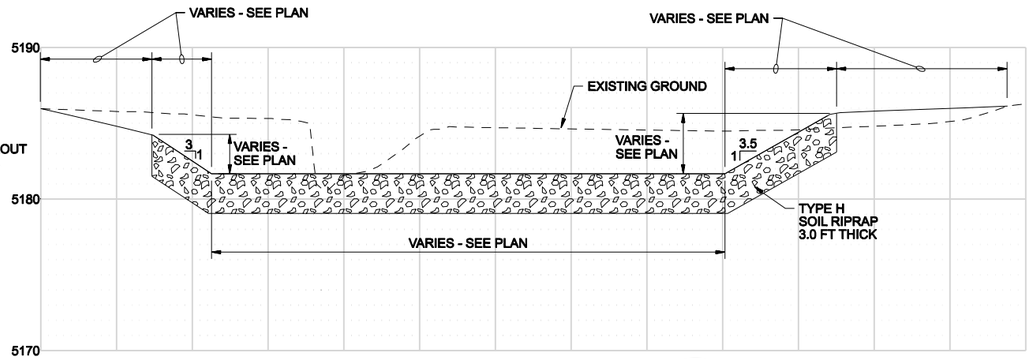
0 5 10 15
Vertical Scale



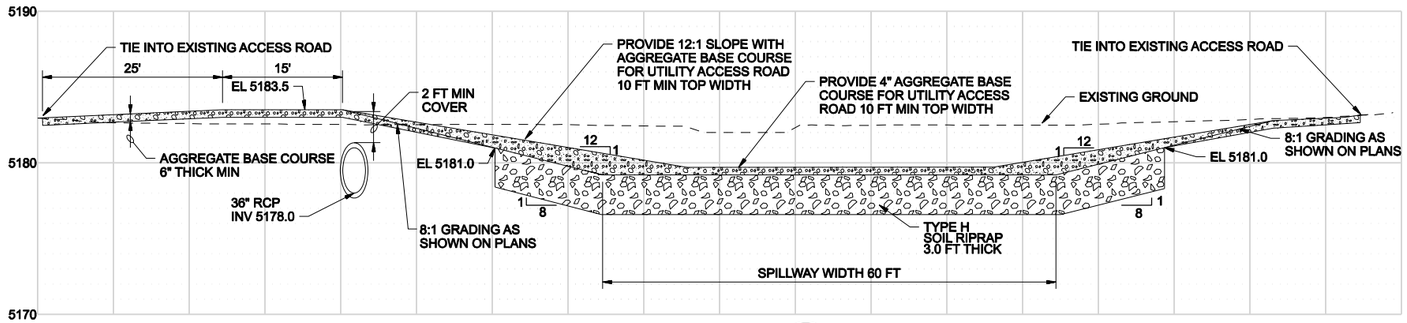
SPILLWAY PROFILE 1



CROSS SECTION A



CROSS SECTION B



CROSS SECTION C

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URBAN DRAINAGE AND FLOOD CONTROL DISTRICT
TOWN OF ERIE
ARAPAHOE RIDGE POND
FINAL DESIGN

SPILLWAY PROFILE AND CROSS SECTIONS

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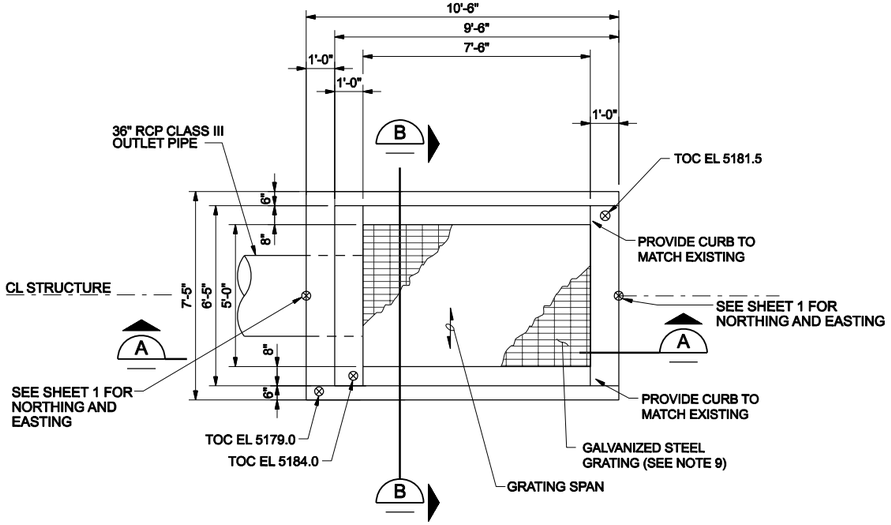
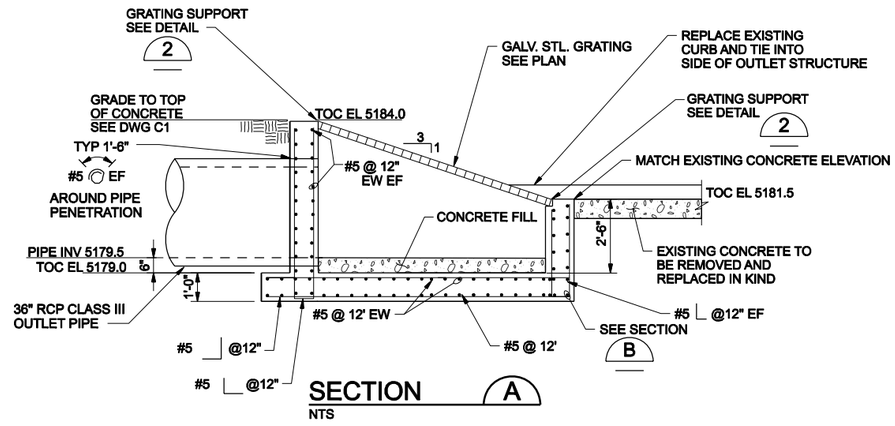
DWG	2
DATE	MARCH 2007
PROJ	328175

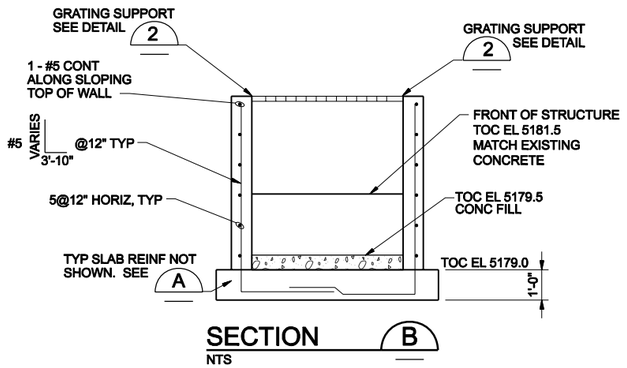
FILENAME: erie_dt01.dlv PLOT DATE: 4/11/2007 PLOT TIME: 1:18:35 PM



OUTLET STRUCTURE PLAN
NTS



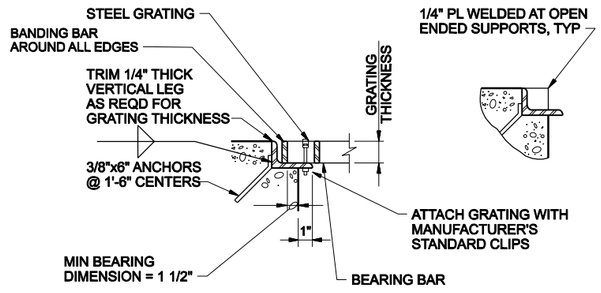
SECTION A
NTS



SECTION B
NTS

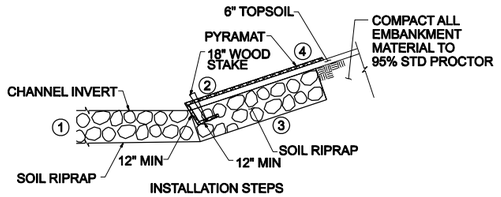
STRUCTURAL NOTES

1. CLEARANCE FOR REINFORCEMENT BARS, UNLESS SHOWN OTHERWISE, SHALL BE:
   - WHEN PLACED ON GROUND: —— 3"
   - ALL OTHER CONCRETE SURFACES: #5 BAR OR SMALLER —— 1 1/2"
2. ALL BENDS, UNLESS OTHERWISE SHOWN, SHALL BE A 90 DEGREE STANDARD HOOK AS DEFINED IN LATEST EDITION OF ACI 318.
3. ALL WALL CORNER AND WALL INTERSECTION REINFORCEMENT BARS SHALL BE CONTINUOUS AROUND CORNERS AND THROUGH COLUMNS OR PILASTERS. REINFORCEMENT SHALL BE EXTENDED INTO CONNECTING WALLS AND LAPPED ON THE OPPOSITE FACE OF THE CONNECTING WALLS.
4. VERTICAL WALL BARS SHALL BE LAPPED WITH DOWELS FROM BASE SLABS AND EXTENDED TO TOP OF WALL. PROVIDE A MINIMUM OF TWO FULL HEIGHT VERTICAL BARS WITH MATCHING DOWELS AT WALL ENDS, CORNERS AND INTERSECTIONS WITH SIZE TO MATCH TYPICAL VERTICAL REINFORCING STEEL SHOWN.
5. UNLESS INDICATED OTHERWISE , CONTRACTOR MAY SPLICE CONTINUOUS SLAB OR LONGITUDINAL BEAM BARS AT LOCATIONS OF HIS CHOOSING, EXCEPT THAT TOP BAR SPLICES SHALL BE LOCATED AT MIDSPAN AND BOTTOM BAR SPLICES SHALL BE LOCATED AT SUPPORTS. ALL REINFORCEMENT BENDS AND LAPS, UNLESS OTHERWISE NOTED, SHALL SATISFY THE FOLLOWING REQUIREMENT:
   - MIN 2'-4"
   - CONCRETE FOR STRUCTURE AND PATHS SHALL BE CDOT CLASS B, f'c = 3000 PSI MIN
   - REINFORCING STEEL SHALL MEET THE REQUIREMENTS OF ASTM A615, GRADE 60.
6. WATER CURE ALL CONCRETE AND GROUT FOR A MINIMUM OF 7 DAYS. CURING COMPOUND MAY BE SUBSTITUTED AS APPROVED BY THE ENGINEER. CURING COMPOUND SHALL BE MASTERBUILDERS MASTERKURE 100W, OR APPROVED EQUAL. SUBMIT CURING COMPOUND DATA AND APPLICATION INSTRUCTIONS.
7. ADHESIVE DOWELS SHALL BE ANCHORED WITH HILTI HIT HY-150 EPOXY ADHESIVE OR APPROVED EQUAL. CONCRETE ANCHORS SHALL BE SST HILTI KWIK BOLT - III WEDGE ANCHORS OR APPROVED EQUAL. ALL ANCHORS SHALL BE INSTALLED ACCORDING TO MANUFACTURER INFORMATION AND THE ICBO REPORT FOR EACH ANCHOR. SUBMIT ANCHOR DATA, REPORTS, AND INSTALLATION INSTRUCTIONS.
8. ALL METAL FABRICATIONS SHALL BE CONSTRUCTED FROM ASTM A36 STEEL SHAPES AND PLATES. ALL WELDS SHALL BE FILLET OR COMPLETE PENETRATION GROOVE WELDS. HOT DIP GALVANIZE ALL STEEL AFTER FABRICATION IN ACCORDANCE WITH ASTM A123.
9. GRATING SHALL BE WELDED STEEL WITH 2" x 1/4" BEARING BARS SPACED AT 1-3/8" ON CENTER. 3/8" DIAMETER CROSS BARS WELDED AT 4" ON CENTER. IKG/BORDEN TYPE C10A STYLE HW, HOT DIP GALVANIZED OR EQUAL. PROVIDE GRATING IN 2' WIDE SECTIONS. A TOTAL OF 4 SECTIONS WILL BE REQUIRED.
10. ALL STEEL (INCLUDING EMBEDDED FRAME) SHALL BE HOT DIP GALVANIZED AFTER FABRICATION.
11. CONTRACTOR SHALL SUBMIT REINFORCING STEEL AND TRASH RACK SHOP DRAWINGS FOR APPROVAL, INCLUDING ATTACHMENT CLIPS AND EMBEDDED FRAME.



NOTE: THIS DETAIL APPLIES TO ALL FOUR SIDES OF THE BOX

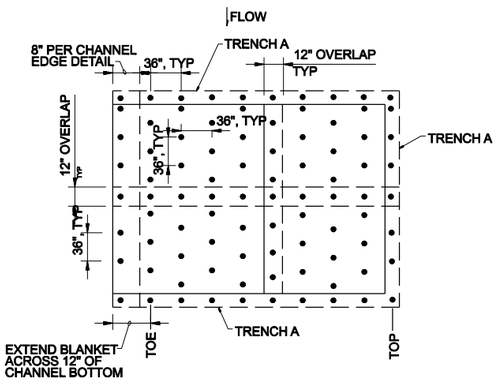
DETAIL 2
NTS



INSTALLATION STEPS

1. PLACE SOIL RIPRAP ACROSS CHANNEL BOTTOM.
2. INSTALL BLANKET CHECK SLOT AT TOE OF SLOPE.
3. INSTALL SOIL RIPRAP ON CHANNEL BANK.
4. PLACE TOPSOIL, SEED, AND INSTALL BLANKET ON CHANNEL BANK.

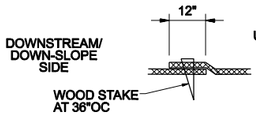
BLANKET AT CHANNEL EDGE
SECTION, NTS



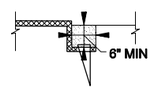
STAKING PATTERN FOR EROSION CONTROL BLANKETS

SAW 2"X4" LUMBER ON DIAGONAL

WOOD STAKE DETAIL
NTS



OVERLAP DETAIL
NTS



TRENCH A
NTS

NOTES:

1. INSTALL BLANKET AT THE TOE OF THE SLOPE AND DOWNSTREAM EDGE FIRST.
2. WOOD STAKES SHALL BE INSTALLED SUCH THAT THE TOP OF STAKES ARE WITHIN 1" OF FINISHED GRADE.
3. BLANKET SHALL BE PYRAMAT WHICH WILL BE PROVIDED BY UDFCD.
4. STAKES AT OVERLAPS AND AROUND THE PERIMETER SHALL BE AT 36" OC.
5. OFFSET EACH ROW OF STAKES 18" FROM PREVIOUS ROW. ADDITIONAL STAKES MAY BE REQUIRED (<36" OC) AT OVERLAPS.
6. BROADCAST SEED PRIOR TO PLACEMENT OF BLANKET.

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DSGN	C DAVIS				
DR	R OSTERMANN				
CHK	K HAMILTON				
APVD	K HAMILTON	NO.	DATE	REVISION	BY / APVD

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING. 0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

CH2MHILL
9193 S. JAMAICA ST
ENGLEWOOD, CO 80112
CONTACT: KYLE HAMILTON
(720)286-5500

URBAN DRAINAGE AND FLOOD CONTROL DISTRICT
TOWN OF ERIE
ARAPAHOE RIDGE POND
FINAL DESIGN

DETAILS

SHEET	3
DWG	3
DATE	MARCH 2007
PROJ	328175

FILENAME: erie_dt03.dlv PLOT DATE: 4/11/2007 PLOT TIME: 1:13:57 PM

APPENDIX F

Arapahoe Ridge Pond Cost Estimate

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ARAPAHOE RIDGE POND
ENGINEER'S COST ESTIMATE

				ENGINEER'S ESTIMATE	
BID ITEM NO.	DESCRIPTION OF BID ITEM	QUANTITY	PAY UNIT	UNIT PRICE	TOTAL COST OF BID ITEM
1	Mobilization and Safe Site	1	LS	$7,000.00	$7,000.00
2	Construction Survey	1	LS	$2,000.00	$2,000.00
3	Vehicle Tracking Control	1	EA	$2,000.00	$2,000.00
4	Remove Existing Outlet Structure, Pipe, Headwall	1	LS	$5,000.00	$5,000.00
5	Topsoil Removal, Stockpile (silt fence) and Replacement 4" Thick	35	CY	$10.00	$350.00
6	Excavation and Haul Offsite	1,266	CY	$15.00	$18,990.00
7	Type H Soil Riprap*	905	CY	$50.00	$45,250.00
8	Type H Grouted Riprap	115	CY	$90.00	$10,350.00
9	Additional 4" Grout Layer	18	CY	$100.00	$1,800.00
10	36" RCP	85	LF	$95.00	$8,075.00
11	36" Concrete FES	1	EA	$800.00	$800.00
12	5' Diameter Manhole	1	EA	$3,000.00	$3,000.00
13	Pond Outlet Structure and Trash Rack (includes remove and repair existing concrete low flow channel)	1	LS	$15,000.00	$15,000.00
14	Aggregate Base Course	45	CY	$55.00	$2,475.00
15	2-3" Rock Chinking	10	CY	$60.00	$600.00
16	Crusher Fines	75	CY	$50.00	$3,750.00
17	Class 2 Pipe Bedding	5	CY	$60.00	$300.00
18	6" Concrete Sidewalk	159	SY	$50.00	$7,950.00
19	Erosion Control Blanket - Pyramat**	180	SY	$2.50	$450.00
20	Seeding, Short Grass Mix/Broadcast	0.35	AC	$2,500.00	$875.00
				TOTAL	$136,015.00

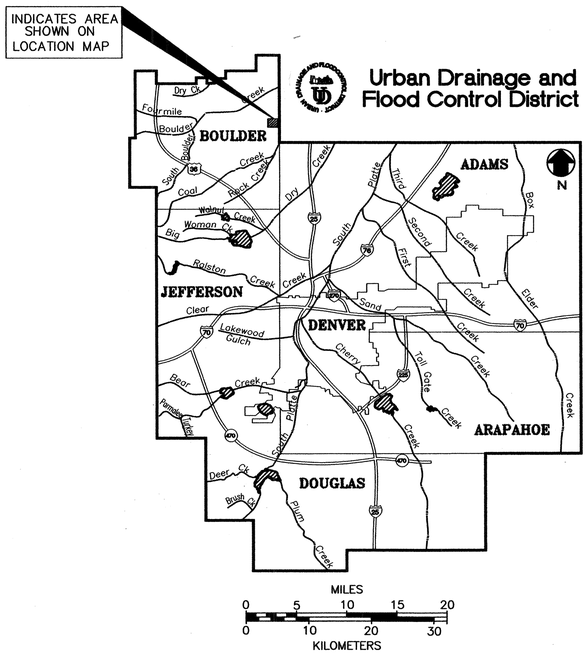
* Includes soil volume, actual volume of Type H Riprap = 590 CY

ARAPAHOE RIDGE FILING NO. 2
DETENTION POND IMPROVEMENTS

TOWN OF ERIE

URBAN DRAINAGE AND FLOOD CONTROL DISTRICT

MARCH 24, 2003



SITE VICINITY MAP

SHEET INDEX

1	COVER SHEET
2	GENERAL NOTES
3	PLAN VIEW
4	EROSION CONTROL PLAN
5	DETAILS
6	DETAILS
7	TETRA TECH RMC – PLAN – GRADING WEST OF DETENTION POND

PROJECT APPROVALS

APPROVED: TOWN OF ERIE

JUDY DING, P.E.
DIRECTOR OF PUBLIC WORKS — DATE

WENDI PALMER, P.E.
PROJECT MANAGER — DATE

APPROVED: URBAN DRAINAGE & FLOOD CONTROL DISTRICT

L. Scott Tucker — 4/30/03
L. SCOTT TUCKER, P.E.
EXECUTIVE DIRECTOR — DATE

Dave Lloyd — 4-30-03
DAVE LLOYD
CHIEF, DESIGN AND CONSTRUCTION PROGRAM — DATE

PREPARED BY: LOVE & ASSOCIATES, INC.

David J. Love — 4-30-03
DAVID J. LOVE, P.E., PRINCIPAL — DATE

No	Date	Revision	Appr
1	4/15/03	Forebay Slope to 2%	DJL

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Designed By: RJP Date: 3-03
Drawn By: PEM Date: 3-03
Checked By: DJL Date: 3-03

TOWN OF ERIE
URBAN DRAINAGE AND FLOOD CONTROL DISTRICT

ARAPAHOE RIDGE FILING NO. 2
DETENTION POND IMPROVEMENTS

COVER SHEET

Sheet: 1
Of: 7

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GENERAL NOTES

1. STANDARDS

ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND THE LATEST EDITION OF 'STANDARDS AND SPECIFICATIONS FOR DESIGN AND CONSTRUCTION OF PUBLIC IMPROVEMENTS, TOWN OF ERIE, COLORADO', WHICH CAN BE OBTAINED FROM THE TOWN OF ERIE. REFER TO THIS DOCUMENT FOR ADDITIONAL GENERAL NOTES AND ALL TECHNICAL SPECIFICATIONS.

2. UTILITY VERIFICATION

THE TYPE, SIZE, LOCATION AND NUMBER OF ALL KNOWN UNDERGROUND UTILITIES ARE APPROXIMATE AS SHOWN ON THE DRAWINGS. THE CONTRACTOR SHALL NOTE THAT NOT ALL UTILITIES MAY APPEAR ON THE DRAWINGS.

THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE EXISTENCE, TYPE, SIZE, NUMBER AND LOCATION OF ALL UNDERGROUND UTILITIES WITHIN THE WORK LIMITS. THE CONTRACTOR IS RESPONSIBLE FOR NOTIFYING THE UTILITY NOTIFICATION CENTER (1-800-922-1987) AND OTHER UTILITY OWNERS, AND OBTAINING FIELD LOCATES OF ALL UNDERGROUND UTILITIES PRIOR TO BEGINNING EXCAVATION WORK.

THE CONTRACTOR SHALL VERIFY THE LOCATION AND DEPTH OF ALL TIE-IN POINTS WELL IN ADVANCE OF THE WORK TO ALLOW FOR UTILITY RELOCATION OR DESIGN MODIFICATIONS IF REQUIRED.

CONTRACTOR SHALL POTHOLE AND FIELD LOCATE ALL UTILITIES THAT MAY CONFLICT WITH THIS PROJECT AS TO BOTH LINE AND GRADE. THE CONTRACTOR SHALL NOTIFY THE PROJECT MANAGER OF ALL DISCREPANCIES AND DEVIATIONS FROM THE DRAWINGS AND CONFLICTS WITH THE PROPOSED IMPROVEMENTS. THE CONTRACTOR SHALL SCHEDULE UTILITY FIELD LOCATES AND POTHOLING WELL IN ADVANCE OF THE WORK TO ALLOW FOR UTILITY RELOCATION OR DESIGN MODIFICATIONS IF REQUIRED.

THE CONTRACTOR SHALL COORDINATE CONSTRUCTION ACTIVITIES WITH UTILITY RELOCATIONS TO ELIMINATE CONFLICT WITH THE PROGRESS OF THE WORK. THE POTENTIAL CONFLICT WITH UTILITIES SHALL BE CONSIDERED IN PREPARATION OF THE BID.

THE CONTRACTOR IS RESPONSIBLE FOR PROTECTING ALL UTILITIES FROM DAMAGE BY CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPAIR OF ANY DAMAGE TO UTILITIES.

3. PROTECTION OF EXISTING IMPROVEMENTS

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ADJACENT PROPERTY INCLUDING BUT NOT LIMITED TO, EXISTING WALLS, FENCING, GAS WELL AND FACILITIES, VEGETATION, TREES, LANDSCAPING, UTILITIES, STRUCTURES, AND PUBLIC IMPROVEMENTS INCLUDING STREETS, STORM SEWERS, CURB AND GUTTER, AND WALKS. ANY DAMAGE SHALL BE REPAIRED OR REPLACED TO THE SATISFACTION OF THE PROJECT MANAGER AT THE CONTRACTOR'S EXPENSE.

4. SUPERVISION AT THE WORK SITE

THE CONTRACTOR SHALL ASSIGN AN EMPLOYEE TO BE RESPONSIBLE FOR ALL ASPECTS OF THIS PROJECT DURING AND AFTER NORMAL WORKING HOURS AND OVER WEEKENDS AS EMERGENCY STANDBY. THIS EMPLOYEE SHALL BE ONSITE AT ALL TIMES DURING WORKING HOURS OR IF TEMPORARILY OFFSITE WILL BE EASILY CONTACTED BY TELEPHONE. THE NAME AND TELEPHONE NUMBERS, INCLUDING PAGER AND MOBILE PHONE, FOR THIS INDIVIDUAL SHALL BE SUBMITTED TO THE PROJECT MANAGER DURING THE PRE-CONSTRUCTION MEETING.

5. CONDUCT AT THE WORK SITE

THE CONTRACTOR'S EMPLOYEES WILL BE EXPECTED TO MAINTAIN A CIVIL DECORUM THROUGHOUT THE TERM OF THIS CONTRACT. ANY WORKERS WHO FAIL TO ACT IN A PROFESSIONAL AND WORKMANLIKE MANNER TOWARD THE PROJECT MANAGER, HIS\HER REPRESENTATIVE, THE ENGINEER, AND THE CITIZENS SHALL BE IMMEDIATELY AND PERMANENTLY REMOVED FROM THE JOB SITE BY THE CONTRACTOR UPON DIRECTION FROM THE PROJECT MANAGER.

6. SALVAGE AND DISPOSAL OF MATERIALS AND EQUIPMENT

UNLESS OTHERWISE INDICATED, ALL ITEMS DESIGNATED FOR REMOVAL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE LEGALLY DISPOSED OF OFFSITE OF THE PROJECT AREA.

EXISTING MATERIALS AND STRUCTURES REMOVED BY THE CONTRACTOR SHALL NOT BE REUSED IN THE WORK EXCEPT AS NOTED IN THE DRAWINGS OR AS APPROVED BY THE PROJECT MANAGER.

7. SAFETY

IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES AND THE REQUIREMENTS OF STATE AND FEDERAL SAFETY REGULATIONS, THE CONTRACTOR WILL BE SOLELY AND COMPLETELY RESPONSIBLE FOR CONDITIONS ON THE JOB SITE, INCLUDING SAFETY OF ALL PERSONS, CHILDREN, AND PROPERTY DURING PERFORMANCE OF WORK. THIS REQUIREMENT WILL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS. THE DUTY OF THE PROJECT MANAGER OR HIS\HER REPRESENTATIVE IS TO CONDUCT CONSTRUCTION OBSERVATION OF THE CONTRACTOR'S PERFORMANCE AND IS NOT INTENDED TO INCLUDE REVIEW OF THE ADEQUACY OF THE CONTRACTOR'S AND SUBCONTRACTOR'S SAFETY MEASURES, IN, ON, OR NEAR THE CONSTRUCTION SITE.

THE CONTRACTOR SHALL AT ALL TIMES, WHETHER OR NOT SO SPECIFICALLY DIRECTED BY THE PROJECT MANAGER OR HIS\HER REPRESENTATIVES, TAKE NECESSARY PRECAUTIONS TO INSURE THE PROTECTION OF THE PUBLIC. THE CONTRACTOR SHALL FURNISH, ERECT, AND MAINTAIN, AT HIS OWN EXPENSE, ALL NECESSARY BARRICADES, TEMPORARY FENCING, SUITABLE AND SUFFICIENT AMBER FLASHING LIGHTS, CONSTRUCTION SIGNS, PROVIDE A SUFFICIENT NUMBER OF WATCHMEN OR FLAGMEN AND TAKE ALL NECESSARY PRECAUTIONS FOR THE PROTECTION OF THE WORK AND THE SAFETY OF THE PUBLIC THROUGH OR AROUND HIS CONSTRUCTION OPERATIONS. PLEASE REFER TO THE GENERAL CONDITIONS FOR ADDITIONAL INFORMATION.

8. CLEAN UP

CONTRACTOR SHALL KEEP THE WORK SITE FREE AT ALL TIMES FROM ACCUMULATIONS OF WASTE MATERIALS AND RUBBISH. CONTRACTOR SHALL PROVIDE ADEQUATE TRASH RECEPTACLES ABOUT THE SITE AND SHALL PROMPTLY EMPTY THE CONTAINERS WHEN FILLED.

CONSTRUCTION MATERIALS SUCH AS CONCRETE FORMS AND SCAFFOLDING SHALL BE NEATLY STACKED BY CONTRACTOR WHEN NOT IN USE. CONTRACTOR SHALL PROMPTLY REMOVE SPLATTERED CONCRETE, ASPHALT, OIL, PAINT, CORROSIVE LIQUIDS, AND CLEANING SOLUTIONS FROM SURFACES TO PREVENT MARRING OR OTHER DAMAGE.

VOLATILE WASTES SHALL BE PROPERLY STORED IN COVERED METAL CONTAINERS AND REMOVED DAILY.

WASTES SHALL NOT BE BURIED OR BURNED ON THE SITE OR DISPOSED OF INTO STORM DRAINS, SANITARY SEWERS, DITCHES, STREAMS, OR WATERWAYS. ALL WASTES SHALL BE REMOVED FROM THE SITE AND DISPOSED OF IN A MANNER COMPLYING WITH LOCAL ORDINANCES AND ANTI-POLLUTION LAWS.

ADEQUATE CLEANUP WILL BE A CONDITION FOR RECOMMENDATION OF PROGRESS PAYMENT APPLICATIONS.

9. USE OF SITE

THE CONTRACTOR MUST MAINTAIN ALL OF HIS CONSTRUCTION ACTIVITIES WITHIN THE LIMITS OF CONSTRUCTION AS DESIGNATED ON THE CONSTRUCTION DRAWINGS, OR OTHER STATED AREAS, UNLESS PERMITS AND/OR WRITTEN AGREEMENTS ARE OBTAINED BY THE CONTRACTOR, FROM APPROPRIATE AUTHORITIES OR PRIVATE PROPERTY OWNERS, OUTSIDE OF THESE AREAS. THE PERMITS AND/OR WRITTEN AGREEMENTS MUST BE SECURED AND PAID FOR BY THE CONTRACTOR AT NO EXTRA COST TO THE OWNER. COPIES OF THE PERMITS AND/OR WRITTEN AGREEMENTS SHALL BE PROVIDED TO THE OWNER.

THE CONTRACTOR MAY USE THE STAGING AREA AND THE AREA WITHIN THE LIMITS OF CONSTRUCTION DESIGNATED ON THE CONSTRUCTION DRAWINGS FOR EQUIPMENT AND MATERIALS STORAGE AS LONG AS HE CONFINES HIS OPERATIONS TO THOSE PERMITTED BY LOCAL LAWS, REGULATIONS, ORDINANCE AND PERMITS AND MEETS THE FOLLOWING REQUIREMENTS:

DO NOT UNREASONABLY ENCUMBER SITE WITH MATERIALS OR EQUIPMENT.

ASSUME FULL RESPONSIBILITY FOR PROTECTION AND SAFEKEEPING OF PRODUCTS STORED ON PREMISES.

OBTAIN AND PAY FOR USE OF ADDITIONAL STORAGE OR WORK AREAS NEEDED FOR OPERATIONS.

THE CONSTRUCTION STAGING AREA MUST BE RESTORED TO PRE-PROJECT CONDITIONS AT THE END OF THE PROJECT.

CONSTRUCTION NOTES

1. NOTICE TO AFFECTED PARTIES

THE CONTRACTOR SHALL NOTIFY THE PROJECT MANAGER AND ANY OTHER APPROVAL AUTHORITIES AT LEAST 48-HOURS PRIOR TO BEGINNING EXCAVATION NEAR EXISTING UTILITIES OR FACILITIES.
UTILITY NOTIFICATION CENTER, 1-800-922-1987
TELEPHONE: QWEST COMMUNICATIONS
XCEL ENERGY
CABLE TELEVISION
WATER AND SANITARY:
TOWN OF ERIE
STORM SEWER: TOWN OF ERIE

THE CONTRACTOR SHALL MAINTAIN CONTINUOUS ACCESS TO ALL PROPERTY OWNERS AND TENANTS, DURING THE LENGTH OF THE PROJECT. WHEN IT IS NECESSARY TO TEMPORARILY DENY ACCESS TO OWNERS OR TENANTS TO THEIR PROPERTY THE CONTRACTOR SHALL NOTIFY THE PROPERTY OWNER AND TENANTS 48 HOURS IN ADVANCE AND RESTORE ACCESS AT THE EARLIEST PRACTICAL TIME.

THE CONTRACTOR SHALL MAINTAIN CONTINUOUS UTILITY SERVICE TO ALL PROPERTY OWNERS AND TENANTS, DURING THE LENGTH OF THE PROJECT. WHEN IT IS NECESSARY TO TEMPORARILY INTERRUPT UTILITY SERVICE CONNECTIONS THE CONTRACTOR SHALL NOTIFY THE PROPERTY OWNER AND TENANTS 48 HOURS IN ADVANCE AND RESTORE THE UTILITY SERVICE AT THE EARLIEST PRACTICAL TIME. WHEN UTILITY SERVICE CONNECTIONS ARE ACCIDENTALLY INTERRUPTED THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE PROPERTY OWNER AND TENANTS AND RESTORE THE UTILITY SERVICE AT THE EARLIEST PRACTICAL TIME.

2. LICENSES AND PERMITS

ALL PERMITS, LICENSES AND APPROVALS REQUIRED FOR PROSECUTION OF THE WORK SHALL BE OBTAINED AND PAID FOR BY THE CONTRACTOR.

GROUNDWATER DISCHARGE PERMIT: THE CONTRACTOR WILL OBTAIN A GROUNDWATER DISCHARGE PERMIT FROM THE COLORADO STATE HEALTH DEPARTMENT, IF ANY DEWATERING OPERATIONS WILL BE DISCHARGED INTO ANY DRAINAGEWAYS, OPEN CHANNELS, OR IRRIGATION DITCHES. THE CONTRACTOR WILL ALSO MONITOR GROUNDWATER DISCHARGE, AS REQUIRED FOR THIS PERMIT.

U.S. CORPS OF ENGINEERS 404 PERMIT: ACCORDING TO THE TOWN OF ERIE, A U.S. CORPS OF ENGINEERS 404 PERMIT IS NOT NEEDED.

3. ADDITIONAL INSUREDS

THE CONTRACTORS GENERAL LIABILITY INSURANCE SHALL NAME THE URBAN DRAINAGE & FLOOD CONTROL DISTRICT, THE TOWN OF ERIE, AND LOVE & ASSOCIATES, INC. AS ADDITIONAL INSUREDS. REFER TO THE GENERAL CONTRACT CONDITIONS.

4. PROJECT IDENTIFICATION

THE CONTRACTOR SHALL ERECT AT A LOCATION TO BE DESIGNATED BY THE PROJECT MANAGER, A PRE-PRINTED PROJECT SIGN 4' X 8' MINIMUM SIZE. THE SIGN SHALL BE CONSTRUCTED IN CONFORMANCE WITH THE "PROJECT SIGN" DETAIL IN THE CONSTRUCTION DRAWINGS.

THE CONTRACTOR SHALL MAINTAIN THE PROJECT SIGN IN A GOOD CONDITION, SATISFACTORY TO THE PROJECT MANAGER, DURING THE PERIOD OF HIS PERFORMANCE OF THIS CONTRACT, AND UPON COMPLETION OF THE CONTRACT WORK, OR AS DIRECTED, SHALL REMOVE THE SIGN. THE CONTRACTOR SHALL NOT BE REQUIRED TO RELOCATE THE SIGN DURING THE CONTRACT.

5. WATER CONTROL

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE ACCEPTANCE AND CONTROL OF ALL FLOWS, INCLUDING STORM FLOWS, IN AND ENTERING THE DETENTION POND AND ADJACENT DRAINAGEWAYS. THE CONTRACTOR SHALL BE RESPONSIBLE TO TAKE REASONABLE MEANS TO PREVENT POLLUTION TO THE DETENTION AND THESE DRAINAGEWAYS.

6. EQUIPMENT USE ON THE STREETS

SCRAPERS AND TRACKED EQUIPMENT MAY NOT TRAVEL ON THE STREETS OF ERIE. IF THE CONTRACTOR TRACKS DIRT OR MUD ON THE STREETS OF ERIE, THE STREETS SHALL IMMEDIATELY BE CLEANED BY ACCEPTABLE METHODS.

THE CONTRACTOR WILL BE HELD LIABLE FOR THE COST OF REPAIR TO STREETS. DAMAGE TO EXISTING CURBS, WALKS, CONCRETE PANS AND OTHER IMPROVEMENTS WILL BE REPLACED BY THE CONTRACTOR AT NO COST TO THE OWNER.

7. CONSTRUCTION STAKING

THE CONTRATOR WILL PROVIDE ALL CONSTRUCTION STAKING.

8. MATERIALS TESTING

THE OWNER WILL PROVIDE SOILS AND MATERIAL TESTING AND INSPECTION NECESSARY FOR THE PROJECT AT NO EXPENSE TO THE CONTRACTOR. RE-TESTS OF FAILED TESTS TO BE PAID FOR BY THE CONTRACTOR. REFERENCE SPECIFICATION SECTION 354.00 COMPACTION TESTING.

9. SITE DOCUMENTATION

CONTRACTOR SHALL VIDEO-TAPE ENTIRE PROJECT SITE TO DOCUMENT EXISTING FACILITIES (PUBLIC AND PRIVATE) INCLUDING ACCESS AND HAUL ROUTES AND STAGING AREAS PRIOR TO CONSTRUCTION. COPIES OF THE VHS VIDEO TAPES SHALL BE SUBMITTED TO BOTH THE ENGINEER AND OWNER PRIOR TO COMMENCEMENT OF WORK.

10. STRIPPINGS

ALL STRIPPINGS SHALL BE USED FOR TOPSOIL IN RESTORATION GRADING OF DETENTION POND AREA.

11. PROJECT MANAGER

THE PROJECT MANAGER IS WENDI PALMER, P.E., TOWN OF ERIE, PUBLIC WORKS, 303-926-2875.

12. CONCRETE

ALL CONCRETE TO BE CDOT, CLASS B WITH CLASS 6 AGGREGATE (3/4" MINUS).

13. SOIL RIPRAP

RIPRAP SOIL TO BE TYPE 'M' RIPRAP MIXTURE. 70% RIPRAP AND 30% TOPSOIL, MIX WELL BEFORE PLACEMENT.

13. RE-VEGETATION

ALL DISTURBED AREAS WITHIN DETENTION POND TO BE RE-SEEDED WITH DRYLAND SEED MIX.

No	Date	Revision	Appr

Love & Associates, Inc.
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841 Front Street
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Fax: 303-673-9796

Designed By: RJP Date: 3-03
Drawn By: PEM Date: 3-03
Checked By: DJL Date: 3-03

TOWN OF ERIE
URBAN DRAINAGE AND FLOOD CONTROL DISTRICT

ARAPAHOE RIDGE FILING NO. 2
DETENTION POND IMPROVEMENTS

GENERAL NOTES

Sheet: 2
Of: 7

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BENCHMARK DESCRIPTION:
SQUARE STEEL PIN IN CONCRETE RING FILLED WITH GRAVEL IN CENTER OF EMBANKMENT OVER THE OLD OUTLET WORKS – PIN IS 6" BELOW GROUND SURFACE NEAR COTTONWOOD TREES ON N.E. CORNER OF EMBANKMENT. ELEV. = 5234.46

NOTE:
ALL FILL PLACED BELOW 5215 IN DETENTION POND MUST BE APPROVED FOR EMBANKMENT AND COMPACTED TO 95% STANDARD PROCTOR AT ±2% OF OPTIMUM MOISTURE.

ERIE LAKE

111TH ST.

DICKENS

STAGING AREA

EXCESS EXCAVATION DISPOSAL AREA

0 20 40
SCALE: 1"=40'
EXISTING CONTOUR INTERVAL: 2'
PROPOSED CONTOUR INTERVAL: 1' OR 2'

14.5 EXISTING SPOT ELEVATION

MAINTENANCE ROAD SEE DETAIL (C/5)

GROUTED RIPRAP BASIN. TOP OF RIPRAP = 5212.0

REMOVE AND RE-INSTALL 3± CY EXISTING RIPRAP TO 6" BELOW INVERT OF CULVERT

CONCRETE CUT-OFF WALL. SEE DETAIL (D/5)

PROVIDE 3 CY TYPE M RIPRAP (1'-9" LAYER) TYPICAL, EACH SIDE

MICROPOOL 2'DEEP, SA=0.27'

EMERGENCY SPILLWAY SEE, NOTE 1

DUAL STAGE, WQ OUTLET, SEE DETAILS. DO NOT DISTURB EXISTING 21" OUTLET PIPE AND INSTALL NEW 24" OUTLET PIPE WITH FES. SEE DETAILS SHEET 6.

REMOVE EXISTING OUTLET STRUCTURE. DO NOT DISTURB EXISTING OUTLET PIPE.

PROVIDE 15 CY TYPE M RIPRAP OVER 12-INCH LAYER TYPE 2 BEDDING MATERIAL FOR DISHED ROCK RUNDOWN.

PROVIDE 15 CY TYPE M RIPRAP OVER 12-INCH LAYER TYPE 2 BEDDING MATERIAL FOR DISHED ROCK RUNDOWN.

TRICKLE CHANNEL SEE DETAIL (D/5)

MAINTENANCE ROAD SEE DETAIL (G/5)

DO NOT DISTURB GAS LINE

TRIANGULAR SEDIMENT TRAP DITCH, 3:1 SIDE SLOPES, 1' DEEP

PROVIDE 45 CY TYPE M RIPRAP FOR ROCK DAM. BED RIPRAP WITH 12-INCH LAYER TYPE 2 BEDDING MATERIAL

PROVIDE 30 CY GROUTED TYPE MG ROCK RUNDOWN. SEE DETAIL (A/5)

PROVIDE WEST FOREBAY WITH CONCRETE INVERT (69 CY) SEE DETAIL (C/5)

FOREBAY ACCESS RAMP SEE DETAIL (B/5)

PROVIDE 25 LF 6-INCH PVC, SDR35 @ 4.8% SLOPE

MAINTENANCE ROAD SEE DETAIL (G/5)

SOUTH FOREBAY WITH CONCRETE INVERT (65 CY) SEE DETAIL (C/5)

FOREBAY ACCESS RAMP SEE DETAIL (B/5)

LIMITS OF DISTURBANCE

PROVIDE 65 CY TYPE M RIPRAP FOR ROCK DAM. BED RIPRAP WITH 12-INCH LAYER TYPE 2 BEDDING MATERIAL.

PROVIDE 25 LF 6-INCH PVC, SDR35 @ 2% SLOPE

DO NOT DISTURB EXISTING STORM SEWER OR FES

NOTE:
ALL DISTURBED AREAS WITHIN DETENTION POND TO BE RE-SEEDED WITH APPROVED DRYLAND SEED MIX.

NOTES:
1. PROVIDE 1.75' LAYER TYPE M RIPRAP SOIL FOR EMERGENCY SPILLWAY. BED RIPRAP SOIL WITH 12-INCH LAYER TYPE 2 BEDDING MATERIAL. SPILLWAY ELEVATION 14.0. SEE DETAIL FOR SPILLWAY SECTION (E/5) SEE DETAIL FOR SPILLWAY PROFILE (F/5) INCLUDING CONCRETE CUT-OFF WALL.

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1	4/15/03	Foreboy Slope to 2%	DJL

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TOWN OF ERIE
URBAN DRAINAGE AND FLOOD CONTROL DISTRICT

ARAPAHOE RIDGE FILING NO. 2
DETENTION POND IMPROVEMENTS

PLAN

Sheet: 3
Of: 7

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BENCHMARK DESCRIPTION:
SQUARE STEEL PIN IN CONCRETE RING FILLED WITH GRAVEL IN CENTER OF EMBANKMENT OVER THE OLD OUTLET WORKS - PIN IS 6" BELOW GROUND SURFACE NEAR COTTONWOOD TREES ON N.E. CORNER OF EMBANKMENT.
ELEV. = 5234.46

ERIE LAKE

111TH ST.

DICKENS

LIMITS OF DISTURBANCE

(SR) SURFACE ROUGHING TO BE PROVIDED ON ALL SIDE SLOPES

NOTE:
SEE SHEET 6 FOR EROSION CONTROL DETAILS.

0 20 40
SCALE: 1"=40'
EXISTING CONTOUR INTERVAL: 2'
PROPOSED CONTOUR INTERVAL: 1' OR 2'

14.5 EXISTING SPOT ELEVATION

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TOWN OF ERIE
URBAN DRAINAGE AND FLOOD CONTROL DISTRICT

ARAPAHOE RIDGE FILING NO. 2
DETENTION POND IMPROVEMENTS

EROSION CONTROL

Sheet: 4
Of: 7

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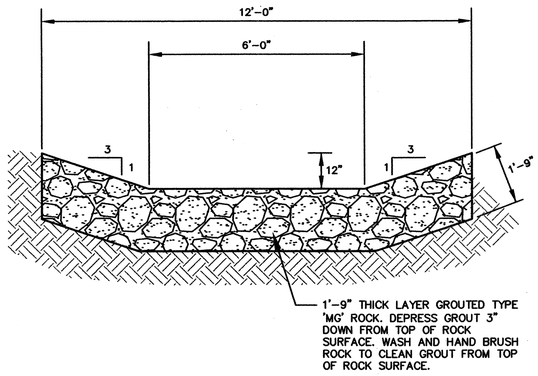

A/5 GROUTED TYPE MG ROCK RUNDOWN
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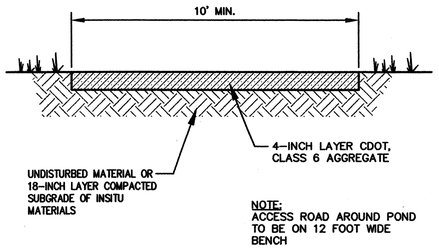

G/5 MAINTENANCE ACCESS ROAD
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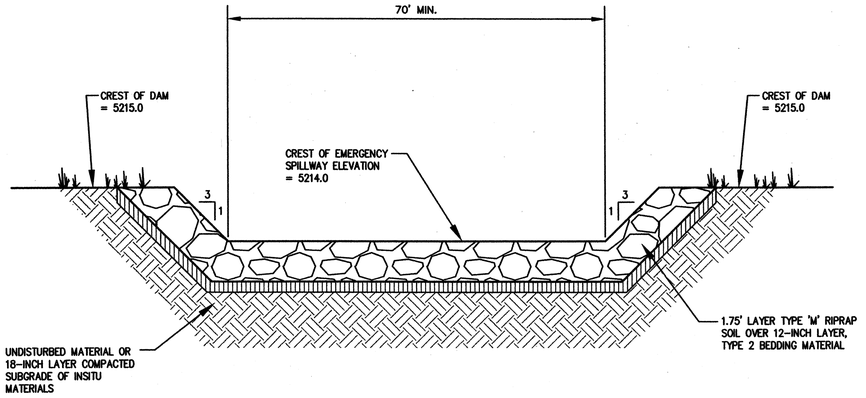

E/5 EMERGENCY SPILLWAY SECTION
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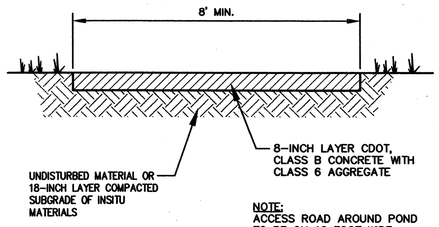
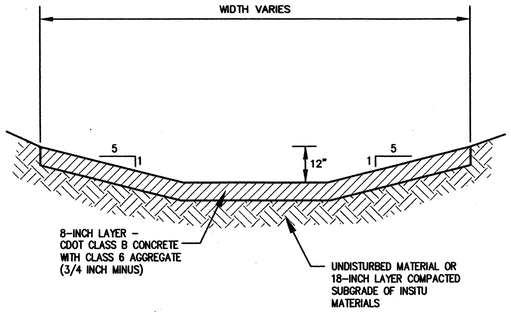
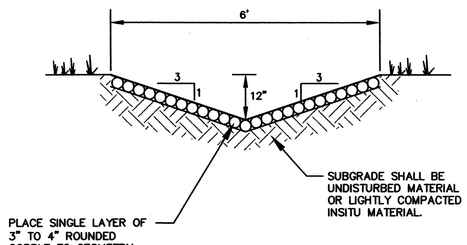


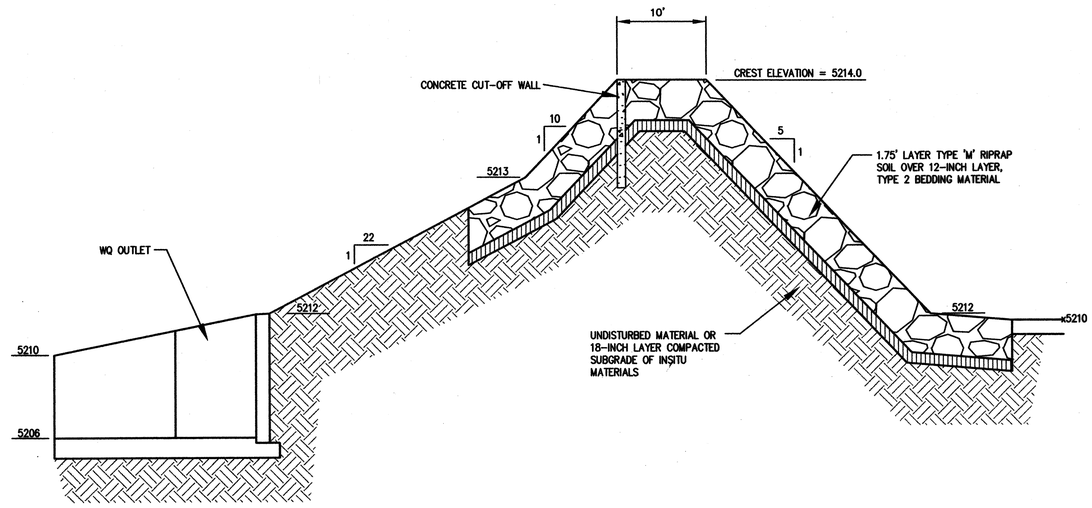
B/5 FOREBAY ACCESS RAMP
N.T.S.



C/5 FOREBAY
N.T.S.



D/5 TRICKLE CHANNEL
N.T.S.



NOTES:
1. 250 CY OF TYPE 'M' RIPRAP SOIL INCLUDED WITHIN EMERGENCY SPILLWAY.

2. WQ OUTLET AND OUTLET PIPE NOT SHOWN

CONCRETE CUT-OFF WALL TO BE 5 FEET DEEP BY 1 FOOT WIDE. TOP OF CUT-OFF TO BE SAME GEOMETRY AS EMERGENCY SPILLWAY SECTION DETAIL

CUT-OFF MAY BE FORMED CONCRETE OR UNFORMED EXCAVATED 1 FOOT WIDE TRENCH OR A COMBINATION OF THE TWO. PROVIDE 5 FOOT LONG #4 REBARS AT 24" O.C. VERTICALLY WITHIN CUT-OFF WITH MIN. 4" CLEAR.

F/5 EMERGENCY SPILLWAY PROFILE
N.T.S.

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DETAILS

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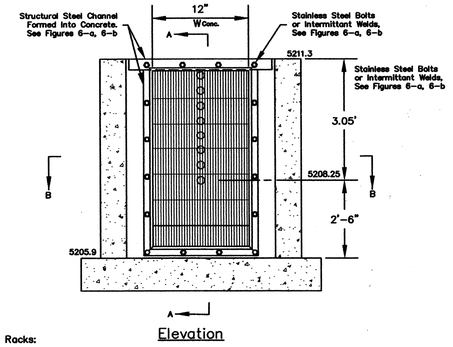
F:\PROJECTS - CURRENT\0306A\DRAWINGS\CURRENT\DETAILS-2.DWG, 03/28/2003 07:36:31 AM, LOVE & ASSOCIATES, INC.

Note: Vertical WQCV Trash Racks are shown in Figures 6, 6-a, and 6-b for suggested standardized outlet design. Adverse-Slope Trash Rack design may be used for non-standardized designs, but must meet minimum design criteria.



Elevation

WQCV Trash Racks:

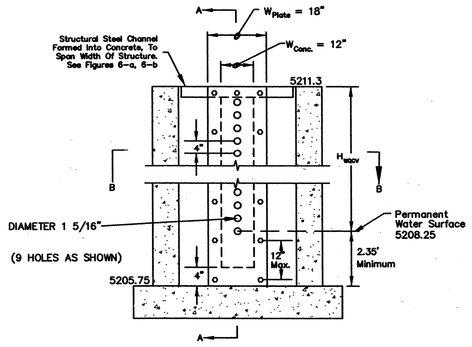
1. Well-screen trash racks shall be stainless steel and shall be attached by intermittant welds along the edge of the mounting frame.
2. Bar grate trash racks shall be aluminum and shall be bolted using stainless steel hardware.
3. Trash Rack widths are for specified trash rack material. Finer well-screen or mesh size than specified is acceptable, however, trash rack dimensions need to be adjusted for materials having a different open area/gross area ratio (R value)
4. Structural design of trash rack shall be based on full hydrostatic head with zero head downstream of the rack.

Overflow Trash Racks:

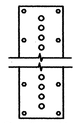
1. All trash racks shall be mounted using stainless steel hardware and provided with hinged and lockable or boltable access panels.
2. Trash racks shall be stainless steel, aluminum, or steel. Steel trash racks shall be hot dip galvanized and may be hot powder painted after galvanizing.
3. Trash Racks shall be designed such that the diagonal dimension of each opening is smaller than the diameter of the outlet pipe.
4. Structural design of trash rack shall be based on full hydrostatic head with zero head downstream of the rack.

Urban Drainage and Flood Control District Drainage Criteria Manual (V.3) File: V3-Outlet Details.dwg	Figure 6 Suggested WQCV Outlet Standardized Trash Rack Design

Orifice Perforation Details



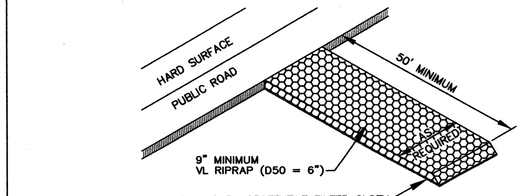
Circular Openings: $W_{Conc.}$ Obtained From Table 6a-1
Rectangular Openings: $W_{Conc.}$ = (Width of Rectangular Perforation W) + 12"
Rectangular Openings: $W_{Opening}$ (see Figure 6-b) Obtained From Table 6b-1



Example Perforation Pattern

Note: The goal in designing the outlet is to minimize the number of columns of perforations that will drain the WQCV in the desired time. Do not, however, increase the diameter of circular perforations or the height of the rectangular perforations beyond 2 inches. Use the allowed perforation shapes and configurations shown above along with Figure 5 to determine the pattern that provides an area per row closest to that required without exceeding it.

Urban Drainage and Flood Control District Drainage Criteria Manual (V.3) File: V3-Outlet Details.dwg	Figure 4 Orifice Details for Draining WQCV



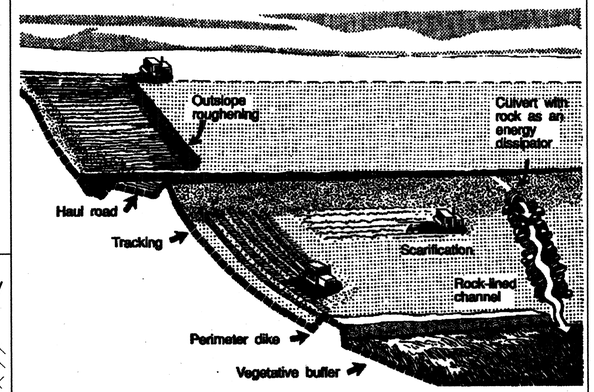
VTC VEHICLE TRACKING CONTROL
N.T.S.

SURFACE ROUGHING DEFINITION

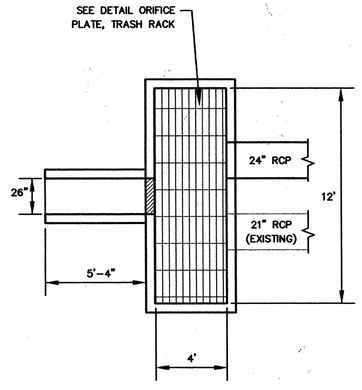
PROVIDE A ROUGH SOIL SURFACE WITH HORIZONTAL DEPRESSIONS CREATED BY OPERATING A TILLAGE OR OTHER SUITABLE IMPLEMENT ON THE CONTOUR, OR BY LEAVING SLOPES IN A ROUGHENED CONDITION BY NOT FINE-GRADING THEM.

PURPOSE

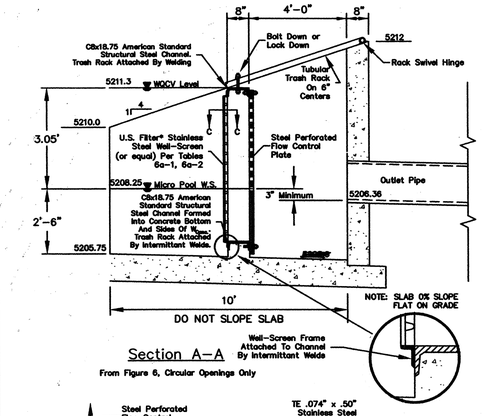
1. TO AID IN SEED BED PREPARATION AND ESTABLISHMENT OF VEGETATIVE COVER.
2. TO REDUCE RUNOFF VELOCITY AND INCREASE INFILTRATION.
3. TO REDUCE RUNOFF AND WIND EROSION AND PROVIDE FOR SEDIMENT TRAPPING.



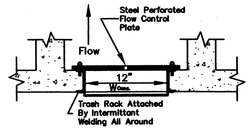
SR SURFACE ROUGHENING
N.T.S.



Plan View



Section A-A
From Figure 6, Circular Openings Only

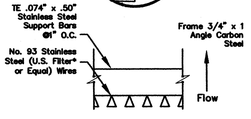


Section B-B - Plan View
From Figure 6, Circular Openings Only

Limits for this Standardized Design:

1. All outlet plate openings are circular.
2. Maximum diameter of opening = 2 inches.

*U.S. Filter, St. Paul, Minnesota, USA

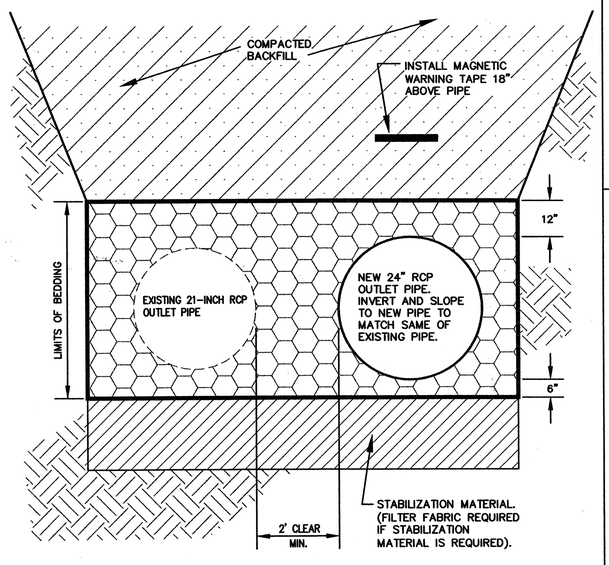


Section C-C
From Figure 6, Circular Openings Only

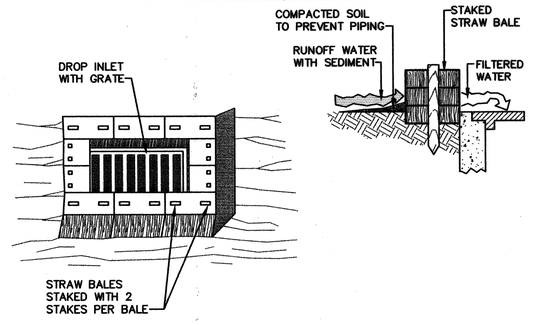
R Value = (net open area)/(gross rack area) = 0.60

Urban Drainage and Flood Control District Drainage Criteria Manual (V.3) File: V3-Outlet Details.dwg	Figure 3 Typical WQCV Outlet Structure Wingwall Configurations

Urban Drainage and Flood Control District Drainage Criteria Manual (V.3) File: V3-Outlet Details.dwg	Figure 6-a Suggested Standardardized Trash Rack and Outlet Design For WQCV Outlets With Circular Openings



G6 OUTLET PIPE
N.T.S.



SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE THE INLET DRAINS A RELATIVELY FLAT AREA (SLOPES NO GREATER THAN 5 PERCENT) WHERE SHEET OR OVERLAND FLOWS (NOT EXCEEDING 0.5 CFS) ARE TYPICAL. THE METHOD SHALL NOT APPLY TO INLETS RECEIVING CONCENTRATED FLOWS, SUCH AS IN STREET OR HIGHWAY MEDIANS.

IP STORM DRAIN INLET FILTER
N.T.S.

No	Date	Revision	Appr

Love & Associates, Inc.
water resource consultants
841 Front Street
Louisville, Colorado 80027-1849
Phone: 303-673-9795
Fax: 303-673-9798

Designed By: RJP Date: 3-03
Drawn By: PEM Date: 3-03
Checked By: DJL Date: 3-03

TOWN OF ERIE
URBAN DRAINAGE AND FLOOD CONTROL DISTRICT

ARAPAHOE RIDGE FILING NO. 2
DETENTION POND IMPROVEMENTS

DETAILS

Sheet: 6
Of: 7

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BENCHMARK DESCRIPTION:
SQUARE STEEL PIN IN CONCRETE RING FILLED WITH GRAVEL IN CENTER OF EMBANKMENT OVER THE OLD OUTLET WORKS – PIN IS 6" BELOW GROUND SURFACE NEAR COTTONWOOD TREES ON N.E. CORNER OF EMBANKMENT. ELEV. = 5234.46

RE-VEGETATE ENTIRE AREA, INCLUDING STOCKPILE, WITH UPLAND SEED MIX APPROVED BY THE TOWN OF ERIE.

FILLNOTE:
LOWEST PORTION OF BULK FILL AREA TO BE STRIPPINGS AND UNSUITABLE MATERIALS MIXED WITH DRY MATERIAL AND COMPACTED TO A MINIMUM 90% STANDARD PROCTOR. UPPER PORTIONS OF FILL TO BE CLEAN COMMON FILL AND SUITABLE FOR RE-VEGETATING.

NOTE:
ALL FILL PLACED BELOW 5215 IN DETENTION POND MUST BE APPROVED FOR EMBANKMENT AND COMPACTED TO 95% STANDARD PROCTOR AT ±2% OF OPTIMUM MOISTURE.

ERIE LAKE

111TH ST.

DICKENS

EXCESS EXCAVATION DISPOSAL AREA

STAGING AREA

TRIANGULAR SEDIMENT TRAP DITCH, 3:1 SIDE SLOPES, 1' DEEP

PROVIDE 45 CY TYPE M RIPRAP FOR ROCK DAM. BED RIPRAP WITH 12-INCH LAYER TYPE 2 BEDDING MATERIAL

PROVIDE 15 CY TYPE M RIPRAP OVER 12-INCH LAYER TYPE 2 BEDDING MATERIAL FOR DISHED ROCK RUNDOWN.

PROVIDE 15 CY TYPE M RIPRAP OVER 12-INCH LAYER TYPE 2 BEDDING MATERIAL FOR DISHED ROCK RUNDOWN.

PROVIDE 3 CY TYPE M RIPRAP (1'-9" LAYER) TYPICAL, EACH SIDE

MICROPOOL 2'DEEP, SA=0.27'

MAINTENANCE ROAD SEE DETAIL (G/5)

GROUTED RIPRAP BASIN. TOP OF RIPRAP = 5212.0

REMOVE AND RE-INSTALL 3± CY EXISTING RIPRAP TO 6" BELOW INVERT OF CULVERT

CONCRETE CUT-OFF WALL. SEE DETAIL (F/5)

EMERGENCY SPILLWAY SEE NOTE 1

DUAL STAGE WQ OUTLET, SEE DETAILS. DO NOT DISTURB EXISTING 21" OUTLET PIPE AND INSTALL NEW 24" OUTLET PIPE WITH FES. SEE DETAILS SHEET 6.

REMOVE EXISTING OUTLET STRUCTURE. DO NOT DISTURB EXISTING OUTLET PIPE!

TRICKLE CHANNEL SEE DETAIL (D/5)

MAINTENANCE ROAD SEE DETAIL (G/5)

DO NOT DISTURB GAS LINE

PROVIDE 65 CY TYPE M RIPRAP FOR ROCK DAM. BED RIPRAP WITH 12-INCH LAYER TYPE 2 BEDDING MATERIAL.

PROVIDE 25 LF 6-INCH PVC, SDR35 @ 2% SLOPE

DO NOT DISTURB EXISTING STORM SEWER OR FES

PROVIDE 30 CY GROUTED TYPE MG ROCK RUNDOWN. SEE DETAIL (A/5)

PROVIDE 25 LF 6-INCH PVC, SDR35 @ 4.8% SLOPE

PROVIDE WEST FOREBAY WITH CONCRETE INVERT (69 CY) SEE DETAIL (C/5)

FOREBAY ACCESS RAMP SEE DETAIL (B/5)

MAINTENANCE ROAD SEE DETAIL (G/5)

SOUTH FOREBAY WITH CONCRETE INVERT (65 CY) SEE DETAIL (C/5)

FOREBAY ACCESS RAMP SEE DETAIL (B/5)

LIMITS OF DISTURBANCE

NOTE:
GRADING WEST OF DETENTION POND BY TETRA TECH RMC.

NOTES:
1. PROVIDE 1.75' LAYER TYPE M RIPRAP SOIL FOR EMERGENCY SPILLWAY. BED RIPRAP SOIL WITH 12-INCH LAYER TYPE 2 BEDDING MATERIAL. SPILLWAY ELEVATION 14.0. SEE DETAIL FOR SPILLWAY SECTION (E/5) SEE DETAIL FOR SPILLWAY PROFILE INCLUDING CONCRETE CUT-OFF WALL. (F/5)

0 20 40
SCALE: 1"=40'
EXISTING CONTOUR INTERVAL: 2'
PROPOSED CONTOUR INTERVAL: 1' OR 2'

14.5 EXISTING SPOT ELEVATION

No	Date	Revision	Appr

Love & Associates, Inc.
water resource consultants
841 Front Street
Louisville, Colorado 80027-1848
Phone: 303-673-9795
Fax: 303-673-9796

Designed By: RJP Date: 3-03
Drawn By: PEM Date: 3-03
Checked By: DJL Date: 3-03

TOWN OF ERIE
URBAN DRAINAGE AND FLOOD CONTROL DISTRICT

ARAPAHOE RIDGE FILING NO. 2
DETENTION POND IMPROVEMENTS

TETRA TECH RMC – PLAN
GRADING WEST OF DETENTION POND

Sheet: 7
Of: 7

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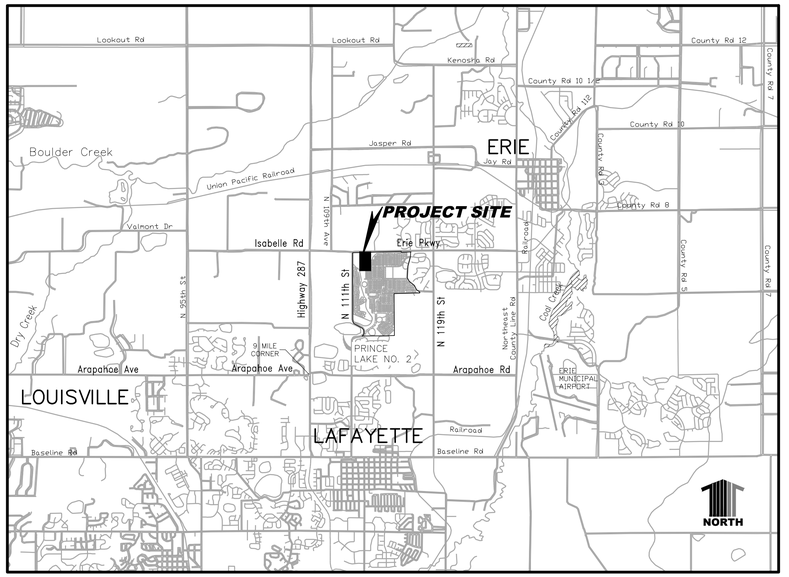
FLATIRON MEADOWS - REGIONAL DETENTION POND

PROPOSED GRADING AND UTILITY IMPROVEMENT PLANS

LOCATED IN A PORTION OF THE SOUTH HALF OF SECTION 23 AND THE NORTHWEST OF SECTION 26, BOTH IN TOWNSHIP 1 NORTH, RANGE 69 WEST OF THE 6TH PRINCIPAL MERIDIAN, TOWN OF ERIE, COUNTY OF BOULDER, STATE OF COLORADO

LEGEND

- ROW/PROPERTY LINE
- CENTERLINE
- PROPERTY BOUNDARY
- EASEMENT
- PROP. WATER MAIN — W — W
- PROP. SANITARY SEWER MAIN — S
- PROP. STORM DRAIN — D
- PROP. STORM DRAIN INLET
- PROP. IRRIGATION PIPE
- PROP. IRRIGATION STRUCTURE
- STORM DRAINAGE STRUCTURE NUMBER [SD 1]
- EX. GAS MAIN — G — G — G
- EX. WATER MAIN — W — W — W
- EX. WATER VALVE
- EX. FIRE HYDRANT
- EX. SANITARY SEWERS — S
- EX. STORM DRAIN
- EX. STORM DRAIN INLET
- EX. POWER POLE
- EX. UNDERGROUND ELECTRIC — E — E
- EX. UNDERGROUND TELEPHONE — T
- EX. FENCE — X — X — X



VICINITY MAP

N.T.S.

SHEET INDEX

SHEET NO.	SHEET	DESCRIPTION
1	T1	TITLE SHEET
2	GN1	GENERAL NOTES
3	CD1	CONTROL DIAGRAM
4	GE1	GRADING & EROSION CONTROL PLAN
5	GE2	GRADING & EROSION CONTROL PLAN
6	GE3	GRADING & EROSION CONTROL PLAN
7	SM1	MAINTENANCE SITE PLANS
8	SM2	MAINTENANCE SITE PLANS
9	CH1	CHANNEL PLAN & PROFILE
10	CH2	CHANNEL PLAN & PROFILE
11	CH3	CHANNEL PLAN & PROFILE
12	CH4	CHANNEL PLAN & PROFILE
13	SD1	STORM PLAN AND PROFILE
14	SD2	STORM PLAN AND PROFILE
15	SD3	STORM PLAN AND PROFILE
16	IR1	IRRIGATION PLAN & PROFILE
17	IR2	IRRIGATION SECTIONS & DETAILS
18	DT1	ERIE PKWY RCB & POND OUTFALL PLAN
19	DT2	ERIE PKWY RCB & GSBD 1 DETAILS
20	DT3	POND OUTFALL DETAILS
21	DT4	GSBD 2 DETAILS
22	DT5	GSBD 2 DETAILS
23	DT6	GSBD 2 DETAILS
24	DT7	STORM DETAILS
25	DT8	STORM DETAILS
26	DT9	STORM DETAILS
27	DT10	STORM DETAILS
28	DT11	EROSION CONTROL DETAILS
29	DT12	EROSION CONTROL DETAILS

UNCC
CALL BEFORE
YOU DIG
811
OR
1-800-922-1987

Utility Notification
Center of Colorado
Administrative Office 303-232-1991
12600 W. Colfax Ave., Suite B-310
Lakewood, Co. 80215

CALL 2 BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

CALIBRE ENGINEERING, INC. ASSUMES NO RESPONSIBILITY FOR EXISTING UTILITY LOCATIONS (HORIZONTAL AND VERTICAL). THE EXISTING UTILITIES SHOWN ON THIS DRAWING HAVE BEEN PLOTTED FROM THE BEST AVAILABLE INFORMATION. IT IS, HOWEVER, THE RESPONSIBILITY OF THE CONTRACTOR TO FIELD VERIFY THE LOCATIONS OF ALL UTILITIES PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION ACTIVITIES.

ONLY SHEETS MARKED WITH "RECORD DRAWING" HAVE BEEN MODIFIED TO REFLECT FIELD DATA.

RECORD DRAWING

THIS PLAN AND THE INFORMATION CONTAINED HEREON ACCURATELY REPRESENTS THE "AS BUILT CONDITION OR RECORD INFORMATION" FOR THE IMPROVEMENTS AS SHOW AS OF 8/23/16.

CALIBRE ENGINEERING BY: TAJ P.E. NO. 37660

PROJECT BENCHMARK:

TOP OF 3 1/4" ALUMINUM CAP IN RANGE BOX STAMPED 1999 LS NO. 29414 AT THE INTERSECTION OF ISABELLE ROAD (AKA COUNTY ROAD NO. 52) AND NORTH 111TH STREET (AKA COUNTY ROAD NO. 9) BEING THE WEST QUARTER CORNER OF SECTION 23, TOWNSHIP 1 NORTH, RANGE 69 WEST, OF THE 6TH PRINCIPAL MERIDIAN, TOWN OF ERIE, COUNTY OF BOULDER, STATE OF COLORADO.

NAVD 88 DATUM = 5104.20

PROJECT BASIS OF BEARINGS:

BEARINGS ARE BASED ON THE NORTH LINE OF THE SOUTH HALF OF SECTION 23, TOWNSHIP 1 NORTH, RANGE 69 WEST, OF THE 6TH PRINCIPAL MERIDIAN, TOWN OF ERIE, COUNTY OF BOULDER, STATE OF COLORADO, AND IS MONUMENTED ON THE WEST WITH A 3 1/4" ALUMINUM CAP IN RANGE BOX STAMPED 1999 LS NO. 29414, ON THE EAST WITH A 3 1/4" ALUMINUM CAP ILLEGIBLE.

BEARING IS ASSUMED TO BEAR: **NORTH 88°23'44" EAST**

OWNER/DEVELOPER:
HT FLATIRON LP
1515 WYNKOOP STREET, SUITE 800
DENVER, CO 80202
(720) 932-0522
CONTACT: DAVID KLEBBA

TOWN OF ERIE:
645 HOLBROOK P.O. BOX 750
ERIE, COLORADO 80516
(303) 926-2865
CONTACT: MATT WIEDERSPAHN

ENGINEER/SURVEYOR:
CALIBRE ENGINEERING, INC.
9090 SOUTH RIDGELINE BLVD., SUITE 105
HIGHLANDS RANCH, CO 80129
(303) 730-0434
CONTACT: TODD A. JOHNSON

UDFCD
2480 WEST 26TH AVENUE
SUITE 156-B
DENVER, CO 80211
(303)-455-6277
CONTACT: MIKE SARMENTO

THESE REGIONAL DETENTION POND IMPROVEMENT PLANS FOR FLATIRON MEADOWS WERE PREPARED BY ME (OR UNDER MY DIRECT SUPERVISION) IN ACCORDANCE WITH THE REQUIREMENTS OF THE ROADWAY DESIGN AND CONSTRUCTION STANDARDS AND THE STORM DRAINAGE DESIGN AND TECHNICAL CRITERIA OF TOWN OF ERIE.

COLORADO LICENSED
TODD A. JOHNSON
37660
03-31-16
PROFESSIONAL ENGINEER

TODD A. JOHNSON
REGISTERED PROFESSIONAL ENGINEER
STATE OF COLORADO NO. 37660
CALIBRE ENGINEERING, INC.
(303) 730-0434

ALL WORK SHALL BE CONSTRUCTED TO TOWN OF ERIE STANDARDS AND SPECIFICATIONS. THIS DRAWING HAS BEEN REVIEWED AND FOUND TO BE IN GENERAL COMPLIANCE WITH THESE STANDARD AND SPECIFICATIONS AND OTHER TOWN REQUIREMENTS.

THE ENGINEERING DESIGN AND CONCEPT REMAINS THE RESPONSIBILITY OF THE PROFESSIONAL ENGINEER WHOSE STAMP AND SIGNATURE APPEAR HEREON.

ACCEPTED BY: _____ _____
DEPUTY DIRECTOR OF PUBLIC WORKS DATE

DATE		REVISION DESCRIPTION
	6	
	5	
	4	
	3	
	2	
3/31/16	1	APPROVED FOR CONSTRUCTION

Hines

Drawing Name: 101T1.dwg			
Job Number: WORTH FLATIRON			
Prepared For: HT FLATIRON LP	Designer: KLH	Drafter: KLH	Checked: BKM

Calibre
Calibre Engineering, Inc.
9090 South Ridgeline Blvd., Suite 105
Highlands Ranch, CO 80129 (303) 730-0434
www.calibre-engineering.com
Municipal Engineering Development Surveying

FLATIRON MEADOWS
REGIONAL DETENTION POND IMPROVEMENT PLANS
TITLE SHEET

Sheet T1 of 29
Date MARCH 31, 2016

PATH: P:\WORTH FLATIRON\CADD\CIVIL\101 REGIONAL POND - AS BUILTS\101T1.DWG
PLOTTED BY: Lorraine Aiff PLOT DATE: 8/23/2016 3:58 PM
XREFS: Vicinity Map Road Centerlines, 101TB, Vicinity Map.

GENERAL NOTES - CONSTRUCTION

1. ALL CONSTRUCTION SHALL CONFORM TO THE LATEST "STANDARDS AND SPECIFICATIONS FOR DESIGN AND CONSTRUCTION OF PUBLIC IMPROVEMENTS" BY THE TOWN OF ERIE. COPIES OF THE TOWN OF ERIE STANDARDS AND SPECIFICATIONS MAY BE OBTAINED FROM THE TOWN OF ERIE WEB SITE. CONTRACTOR SHALL HAVE A SET ON SITE AT ALL TIMES.

2. THE OWNER SHALL SCHEDULE A PRE-CONSTRUCTION MEETING WITH THE TOWN OF ERIE ENGINEERING STAFF AT LEAST 48 HOURS PRIOR TO THE START OF CONSTRUCTION. THOSE IN ATTENDANCE SHALL INCLUDE THE OWNER, HIS ENGINEER, THE TOWN OF ERIE ENGINEERING STAFF, REPRESENTATIVES OF THE CONTRACTORS AND OTHER AFFECTED AGENCIES. PLANS SIGNED AND ACCEPTED BY THE TOWN OF ERIE WILL BE DISTRIBUTED AT THE PRE-CONSTRUCTION MEETING. CONTRACTOR SHALL HAVE (1) COPY OF THE SIGNED PLANS ON SITE AT ALL TIMES.

3. THE TOWN OF ERIE, THROUGH ACCEPTANCE OF THIS DOCUMENT, ASSUMES NO RESPONSIBILITY FOR THE COMPLETENESS AND/OR ACCURACY OF THIS DOCUMENT. THE OWNER AND DESIGN ENGINEER UNDERSTAND THAT THE RESPONSIBILITY FOR THE ENGINEERING ADEQUACY OF THE FACILITIES DEPICTED IN THIS DOCUMENT LIES SOLELY WITH THE REGISTERED PROFESSIONAL ENGINEER WHOSE STAMP AND SIGNATURE ARE AFFIXED TO THIS DOCUMENT. REPORT ALL DISCREPANCIES TO THE DESIGN ENGINEER IMMEDIATELY.

4. PRIOR TO BEGINNING THE WORK, THE CONTRACTOR SHALL OBTAIN ANY/ALL WRITTEN AGREEMENTS FOR INGRESS AND EGRESS TO THE WORK SITE FROM ADJACENT PRIVATE PROPERTY OWNERS. A COPY OF ALL AGREEMENTS SHALL BE PROVIDED TO THE TOWN. ACCESS TO ANY ADJACENT PRIVATE PROPERTY SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD.

5. ALL MATERIALS AND WORKMANSHIP SHALL BE SUBJECT TO INSPECTION BY THE TOWN OF ERIE ENGINEERING STAFF. THE TOWN RESERVES THE RIGHT TO ACCEPT OR REJECT ANY SUCH MATERIALS AND WORKMANSHIP THAT DOES NOT CONFORM TO TOWN STANDARDS AND SPECIFICATIONS. INSPECTIONS AND ONSITE VISITS ARE NOT TO BE CONSTRUED AS A GUARANTEE BY THE TOWN ENGINEERING STAFF OF THE CONTRACTORS" CONTRACTUAL COMMITMENT. REQUESTS FOR INSPECTION BY THE TOWN OF ERIE SHALL BE MADE BY THE CONTRACTOR A MINIMUM OF TWENTY-FOUR (24) HOURS IN ADVANCE.

6. CONSTRUCTION WATER IS AVAILABLE TO THE CONTRACTOR AS ESTABLISHED IN THE TOWN OF ERIE STANDARDS AND SPECIFICATIONS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO CONTACT THE TOWN OF ERIE REGARDING CURRENT REGULATIONS, FEES AND REQUIRED AGREEMENTS RELATED TO THE PROVISION OF CONSTRUCTION WATER.

7. THE CONTRACTOR SHALL COORDINATE HIS ACTIVITIES WITH THE AFFECTED UTILITY COMPANIES AND SHALL NOTIFY COLORADO 811, PHONE NUMBER 811, FORTY-EIGHT (48) HOURS PRIOR TO THE START OF CONSTRUCTION.

8. UTILITIES IN THE AREA OF CONSTRUCTION ARE APPROXIMATE ONLY. THEY HAVE BEEN LOCATED FROM FIELD INVESTIGATION AND THE BEST AVAILABLE UTILITY RECORDS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE LOCATION, PROTECTION AND REPAIR OF ALL UTILITIES ENCOUNTERED DURING CONSTRUCTION WHETHER SHOWN ON THESE PLANS OR NOT. THE CONTRACTOR SHALL CONTACT ALL RESPECTIVE UTILITIES AND HAVE ALL UTILITIES FIELD-LOCATED PRIOR TO CONSTRUCTION. IF ANY UNKNOWN SUBSURFACE STRUCTURES ARE ENCOUNTERED DURING CONSTRUCTION, IT SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE TOWN OF ERIE ENGINEERING STAFF AND DESIGN ENGINEER PRIOR TO PROCEEDING.

9. THE CONTRACTOR SHALL NOTIFY TOWN OF ERIE ENGINEERING STAFF OF ANY PROBLEM IMPACTING WATER AND WASTE WATER FACILITIES THAT WOULD POTENTIALLY REQUIRE A VARIANCE FROM THE APPROVED PLANS AND SPECIFICATIONS. ANY VARIANCE FROM THE APPROVED DOCUMENTS SHALL BE AT THE SOLE DISCRETION OF THE TOWN OF ERIE ENGINEERING STAFF.

10. CONTRACTOR SHALL OBTAIN, AT HIS OWN EXPENSE, ALL APPLICABLE SPECIFICATIONS AND PERMITS NECESSARY TO PERFORM THE PROPOSED WORK.

11. AS-BUILT DRAWINGS AND A CD INCLUDING AUTOCAD AND PDF FILES, AS REQUIRED IN THE SPECIFICATIONS, ARE TO BE SUBMITTED BY THE OWNER/DEVELOPER PRIOR TO SUBSTANTIAL COMPLETION/CONSTRUCTION ACCEPTANCE OF THE CONSTRUCTION.

12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING AND REPLACING ANY EXISTING SIGNS, STRUCTURES, FENCES, ETC., ENCOUNTERED ON THE JOB AND RESTORING THEM TO THEIR ORIGINAL CONDITION.

13. THE CONTRACTOR IS RESPONSIBLE FOR:

    A. NOTIFYING THE TOWN OF ERIE UTILITY CUSTOMERS OF POTENTIAL SERVICE OUTAGES, AND COORDINATE WITH THE TOWN OF ERIE FOR DETERMINATION OF MINIMUM TIME REQUIREMENT.

    B. NOTIFYING THE TOWN OF ERIE ENGINEERING STAFF IF WORK IS SUSPENDED FOR ANY PERIOD OF TIME AFTER INITIAL START-UP. THE CONTRACTOR SHALL NOTIFY THE TOWN OF ERIE FORTY-EIGHT (48) HOURS PRIOR TO RESTART.

    C. IN THE EVENT OF AN AFTER HOURS EMERGENCY, CALL 303-441-4444.

    D. NOTIFYING THE MOUNTAIN VIEW FIRE PROTECTION DISTRICT OF ALL STREET CLOSURES AND EXISTING FIRE HYDRANTS TAKEN OUT OF SERVICE A MINIMUM OF FORTY-EIGHT (48) HOURS PRIOR TO THE START OF CONSTRUCTION.

14. PRIOR TO INSTALLATION OF UTILITY MAINS, ROAD CONSTRUCTION MUST HAVE PROGRESSED TO AT LEAST THE "SUB-GRADE" STAGE.

15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING ANY GROUNDWATER ENCOUNTERED DURING THE CONSTRUCTION OF ANY PORTION OF THIS PROJECT. A CONSTRUCTION DEWATERING PERMIT MUST BE OBTAINED FROM THE COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT (CDPHE). GROUNDWATER SHALL BE PUMPED, PIPED, REMOVED AND DISPOSED OF IN A MANNER WHICH DOES NOT CAUSE FLOODING OF EXISTING STREETS OR EROSION OF ABUTTING PROPERTIES IN ORDER TO CONSTRUCT THE IMPROVEMENTS SHOWN ON THESE PLANS. THE USE OF ANY SANITARY SEWER TO DISPOSE OF TRENCH WATER WILL NOT BE PERMITTED. NO CONCRETE SHALL BE PLACED WHERE GROUNDWATER IS VISIBLE OR UNTIL THE GROUNDWATER TABLE HAS BEEN LOWERED BELOW THE PROPOSED IMPROVEMENTS. ANY UNSTABLE AREAS, AS A RESULT OF GROUNDWATER, ENCOUNTERED DURING THE CONSTRUCTION OF THE PROPOSED IMPROVEMENTS SHALL BE STABILIZED AS AGREED UPON BY THE CONTRACTOR, THE TOWN OF ERIE, AND THE DESIGN ENGINEER AT THE TIME OF THE OCCURRENCE.

16. IT SHALL BE THE RESPONSIBILITY OF THE DESIGN ENGINEER TO RESOLVE CONSTRUCTION PROBLEMS WITH THE TOWN OF ERIE DUE TO CHANGED CONDITIONS ENCOUNTERED BY THE CONTRACTOR DURING THE PROGRESS OF ANY PORTION OF THE PROPOSED WORK. IF, IN THE OPINION OF THE TOWN OF ERIE, PROPOSED ALTERATIONS TO THE SIGNED CONSTRUCTION PLANS INVOLVES SIGNIFICANT CHANGES TO THE CHARACTER OF THE WORK, OR TO THE FUTURE CONTIGUOUS PUBLIC OR PRIVATE IMPROVEMENTS, THE DESIGN ENGINEER SHALL BE RESPONSIBLE FOR SUBMITTING REVISED PLANS TO THE TOWN OF ERIE FOR REVIEW, PRIOR TO ANY FURTHER CONSTRUCTION RELATED TO THAT PORTION OF THE WORK.

17. DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR CONDITIONS AT AND ADJACENT TO THE JOB INCLUDING SAFETY OF ALL PERSONS AND PROPERTY DURING PERFORMANCE OF THE WORK. THE CONTRACTOR SHALL PROVIDE ALL LIGHTS, SIGNS, BARRICADES, FLAGMEN, OR OTHER DEVICES NECESSARY TO PROVIDE FOR PUBLIC SAFETY. THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND IS NOT LIMITED TO NORMAL WORKING HOURS. THE TOWN OF ERIE OR THE DESIGN ENGINEER EXERCISE NO CONTROLS OVER THE SAFETY OR ADEQUACY OF ANY EQUIPMENT, BUILDING COMPONENTS, SCAFFOLDING, FORMS OR OTHER WORK AIDS USED IN OR ABOUT THE PROJECT, OR IN THE SUPERINTENDING OF THE SAME. THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD HARMLESS FROM ANY AND ALL LIABILITY, REAL AND ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING FOR LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE OWNER, THE DESIGN ENGINEER OR THE TOWN. THE TOWN OF ERIE ENGINEERING STAFF, OR ANY CONTRACTED ENGINEER, ARE NOT RESPONSIBLE FOR SAFETY IN, ON OR ABOUT THE PROJECT SITE, NOR FOR COMPLIANCE BY THE APPROPRIATE PARTY OF ANY REGULATIONS RELATING THERETO.

18. WORK IN PUBLIC STREETS, ONCE BEGUN, SHALL BE PROSECUTED TO COMPLETION WITHOUT DELAY SO AS TO PROVIDE MINIMUM INCONVENIENCE TO ADJACENT PROPERTY OWNERS AND TO THE TRAVELING PUBLIC.

19. THE CONTRACTOR SHALL TAKE ALL NECESSARY AND PROPER PRECAUTIONS TO PROTECT ADJACENT PROPERTIES FROM ANY AND ALL DAMAGE THAT MAY OCCUR FROM STORM WATER RUNOFF AND/OR DEPOSITION OF DEBRIS RESULTING FROM ANY AND ALL WORK. THE OWNER/CONTRACTOR IS RESPONSIBLE FOR OBTAINING A STORMWATER DISCHARGE PERMIT FOR CONSTRUCTION ACTIVITIES FOR ANY PROJECT DISTURBING OVER ONE ACRE FROM BOTH THE COLORADO DEPARTMENT OF PUBLIC HEALTH AND THE TOWN OF ERIE.

20. EACH TYPE OF CONSTRUCTION SHALL BE COMPLETED BY A CONTRACTOR THAT HAS DEMONSTRATED ACCEPTABLE QUALIFICATIONS TO THE TOWN AND IS A LICENSED CONTRACTOR IN THE TOWN OF ERIE.

21. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TRAFFIC CONTROL DURING CONSTRUCTION. ALL TRAFFIC CONTROLS SHALL CONFORM TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, (MUTCD) LATEST EDITION. A PLAN SHALL BE SUBMITTED TO THE TOWN FOR REVIEW AND APPROVAL PRIOR TO THE PRE-CONSTRUCTION MEETING.

22. ALL BACKFILL SHALL CONFORM TO THE TRENCH DETAIL LOCATED IN THE TOWN OF ERIE STANDARDS & SPECIFICATIONS.

23. THE CONTRACTOR SHALL IMMEDIATELY REMOVE ANY CONSTRUCTION DEBRIS OR MUD TRACKED ONTO EXISTING ROADWAYS.

24. THE CONTRACTOR SHALL REPAIR ANY EXCAVATION OR PAVEMENT FAILURES CAUSED BY HIS CONSTRUCTION.

25. THE CONTRACTOR SHALL RENEW OR REPLACE ANY EXISTING TRAFFIC STRIPING AND/OR PAVEMENT MARKINGS, WHICH HAVE BEEN EITHER REMOVED OR THE EFFECTIVENESS OF WHICH HAS BEEN REDUCED DURING HIS OPERATION. RENEWAL OF PAVEMENT STRIPING AND MARKING SHALL BE DONE IN CONFORMANCE WITH THE TOWN OF ERIE STANDARD SPECIFICATIONS.

26. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO TAKE EVERY MEASURE NECESSARY TO COMPLY WITH ANY STATE, COUNTY OR TOWN DUST CONTROL ORDINANCE.

27. CONSTRUCTION VEHICLES SHALL USE TRUCK ROUTES DESIGNATED BY THE TOWN.

28. THE OWNER/DEVELOPER WILL BE HELD RESPONSIBLE FOR THE PROPER FUNCTIONING OF THE IMPROVEMENTS FOR A MINIMUM OF TWO (2) YEARS FROM THE DATE OF SUBSTANTIAL COMPLETION/ CONSTRUCTION ACCEPTANCE OF THE IMPROVEMENTS BY THE TOWN OF ERIE. ANY FAILURE DURING THIS PERIOD OF GUARANTEE SHALL BE REMEDIED BY THE OWNER/CONTRACTOR TO THE SATISFACTION OF THE TOWN OF ERIE AT NO EXPENSE TO THE TOWN.

29. THE DESIGN ENGINEER SHALL PERFORM SUFFICIENT INSPECTIONS AND SURVEYS DURING GRADING AND CONSTRUCTION SO THAT AN OPINION CAN BE RENDERED AND VERIFIED IN WRITING AS TO COMPLIANCE WITH THE PLANS AND CODES WITHIN THE DESIGN ENGINEER'S PURVIEW.

30. THE SOILS ENGINEER SHALL PERFORM SUFFICIENT INSPECTIONS DURING GRADING AND CONSTRUCTION SO THAT AN OPINION CAN BE RENDERED AND VERIFIED IN WRITING AS TO COMPLIANCE WITH THE PLANS AND CODES WITHIN THE SOILS ENGINEER'S PURVIEW.

ENGINEER NOTES

1. LOCATION OF ALL EXISTING UTILITIES (PRIVATE OR PUBLIC) SHALL BE IDENTIFIED OR VERIFIED BY CONTRACTOR PRIOR TO MOBILIZATION, CONSTRUCTION, OR ORDERING OF MATERIALS. FOR INFORMATION CONTACT: DENVER INTER-UTILITY GROUP, 1-800-922-1987 OR LOCAL AGENCY, PRIVATE ENTITY, OR OTHER ASSOCIATED ENTITIES WITHIN THE LIMITS OF CONSTRUCTION. THE CONTRACTOR SHALL BEAR THE FULL COST OF REMOVAL, REPLACEMENT, AND DELAY RELATED TO UNVERIFIED EXISTING CONDITIONS. WHERE THE CONTRACTOR FINDS CONFLICTS OR DISCREPANCIES THEY SHALL BE REPORTED IMMEDIATELY TO THE ENGINEER.

2. THE CONTRACTOR SHALL PERFORM ALL WORK NECESSARY TO COMPLETE THE WORK SHOWN ON THE PLANS OR DESCRIBED IN THE SPECIFICATIONS IN A SATISFACTORY MANNER. UNLESS OTHERWISE PROVIDED. THE CONTRACTOR SHALL FURNISH ALL MATERIALS, EQUIPMENT, TOOLS, LABOR, AND INCIDENTALS TO COMPLETE THE WORK.

3. IN SOME CASES THERE ARE AREAS OF THE SITE DEPICTED ON MORE THAN ONE PAGE OF THE PLANS, HOWEVER ALL IMPROVEMENTS ARE NOT DEPICTED ON EVERY PAGE. THE CONTRACTOR SHALL REVIEW EACH PAGE OF THE PLANS AND DETAILS AND SHALL CONSTRUCT ALL IMPROVEMENTS REGARDLESS OF WHETHER THEY ARE SHOWN ON EVERY PAGE. WHERE DISCREPANCIES ARE FOUND ON PLANS OR DETAILS SHOWN ON THE PLANS THE CONTRACTOR SHALL NOTIFY THE ENGINEER PRIOR TO BEGINNING CONSTRUCTION. THE CONTRACTOR SHALL BEAR THE FULL COST OF REMOVAL, REPLACEMENT, DELAY, AND MOBILIZATION RELATED TO FAILURE TO REVIEW ALL PLANS.

4. THE MANUFACTURER/SUPPLIER SHALL DETERMINE PIPE CLASS BASED ON THE COVER AND BEDDING SHOWN ON THE PLANS AND SOIL TYPE SHOWN IN THE GEOTECHNICAL REPORT. THE CONTRACTOR SHALL PROVIDE PIPE DLOAD CALCULATIONS STAMPED BY A REGISTERED ENGINEER. IN NO CASE SHALL RCP PIPE CLASS BE LESS THAN CLASS III.

GENERAL NOTES - GRADING

1. ALL CONSTRUCTION ACTIVITIES THAT DISTURBS ONE OR MORE ACRES OF LAND, AS WELL AS ACTIVITIES THAT DISTURB LESS THAN ONE ACRE OF LAND, BUT IS PART OF A LARGER COMMON PLAN OF DEVELOPMENT, MUST COMPLY WITH BOTH LOCAL AND STATE REGULATIONS REGARDING STORMWATER DRAINAGE ON CONSTRUCTION SITES. OWNERS OR CONTRACTORS MUST OBTAIN A COLORADO STORMWATER DISCHARGE PERMIT FOR CONSTRUCTION ACTIVITIES FROM THE COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT (CDPHE) AND EITHER A PUBLIC IMPROVEMENT PERMIT OR A GRADING AND STORMWATER QUALITY PERMIT FROM THE TOWN OF ERIE. CONTRACTOR SHALL:

    A. MAINTAIN A COPY OF THE STORM WATER MANAGEMENT PLAN (SWMP) ONSITE AT ALL TIMES. THE SWMP MUST BE MAINTAINED AND MADE AVAILABLE TO TOWN OF ERIE INSPECTORS UPON REQUEST.

    B. INSTALL AND MAINTAIN EROSION, SEDIMENT, AND MATERIALS MANAGEMENT CONTROL BMPS AS SPECIFIED IN THE SWMP.

    C. INSPECT ALL BEST MANAGEMENT PRACTICES (BMPS) AT LEAST EVERY FOURTEEN (14) DAYS AND WITHIN TWENTY FOUR (24) HOURS AFTER ANY PRECIPITATION OR SNOWMELT EVENT THAT CAUSES SURFACE RUNOFF.

    D. MAINTAIN INSPECTION AND MAINTENANCE RECORDS OF BMPS ONSITE WITH THE SWMP. COPIES OF THESE REPORTS SHALL BE PROVIDED TO THE TOWN OF ERIE ENGINEERING STAFF.

    E. BASED ON INSPECTIONS PERFORMED BY THE PERMIT HOLDER OR BY TOWN PERSONNEL, MODIFICATIONS TO THE SWMP WILL BE NECESSARY IF AT ANY TIME THE SPECIFIED BMPS DO NOT MEET THE OBJECTIVES OF THE PERMIT. ALL MODIFICATIONS SHALL BE COMPLETED AS SOON AS PRACTICABLE AFTER THE REFERENCED INSPECTION, AND SHALL BE RECORDED ON THE OWNER'S COPY OF THE SWMP.

    F. THE OPERATOR SHALL AMEND THE SWMP WHENEVER THERE IS A SIGNIFICANT CHANGE IN DESIGN, CONSTRUCTION, OPERATION, OR MAINTENANCE, WHICH HAS A SIGNIFICANT EFFECT ON THE POTENTIAL FOR DISCHARGE OF POLLUTANTS TO THE RECEIVING WATERS, OR IF THE SWMP PROVES TO BE INEFFECTIVE IN ACHIEVING THE GENERAL OBJECTIVES OF CONTROLLING POLLUTANTS IN STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITIES.

    G. INSTALLATION AND MAINTENANCE OF BMPS SHALL BE SUPERVISED BY PERSONNEL CERTIFIED IN EROSION AND SEDIMENT CONTROL.

2. ALL SITE GRADING (EXCAVATION, EMBANKMENT, AND COMPACTION) SHALL CONFORM TO THE RECOMMENDATIONS OF THE LATEST SOILS INVESTIGATION FOR THIS PROPERTY AND SHALL FURTHER BE IN CONFORMANCE WITH THE TOWN OF ERIE "STANDARDS AND SPECIFICATIONS FOR THE DESIGN AND CONSTRUCTION OF PUBLIC IMPROVEMENTS", LATEST EDITION.

3. ALL GRADING AND FILLING OPERATIONS SHALL BE OBSERVED, INSPECTED AND TESTED BY A LICENSED SOILS ENGINEER. ALL TEST RESULTS SHALL BE SUBMITTED TO THE TOWN OF ERIE ENGINEERING STAFF.

4. NATURAL VEGETATION SHALL BE RETAINED AND PROTECTED WHEREVER POSSIBLE. EXPOSURE OF SOIL TO EROSION BY REMOVAL OR DISTURBANCE OF VEGETATION SHALL BE LIMITED TO THE AREA REQUIRED FOR IMMEDIATE CONSTRUCTION OPERATION AND FOR THE SHORTEST PRACTICAL PERIOD OF TIME. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO AVOID ANY DAMAGE TO EXISTING FOLIAGE THAT LIES IN THE PROJECT AREA UNLESS DESIGNATED FOR REMOVAL AND SHALL BE LIABLE FOR SUCH DAMAGE AT HIS/HER EXPENSE.

5. TOPSOIL SHALL BE STOCKPILED TO THE EXTENT PRACTICABLE ON THE SITE FOR USE ON AREAS TO BE RE-VEGETATED. ANY AND ALL STOCKPILES SHALL BE LOCATED AND PROTECTED FROM EROSIVE ELEMENTS.

6. TEMPORARY VEGETATION SHALL BE INSTALLED ON ALL DISTURBED AREAS WHERE PERMANENT SURFACE IMPROVEMENTS ARE NOT SCHEDULED FOR IMMEDIATE INSTALLATION. SEEDING WILL BE DONE ACROSS THE SLOPE FOLLOWING THE CONTOURS. VEGETATION SHALL CONFORM TO THE TOWN OF ERIE STANDARDS AND SPECIFICATIONS. PROJECT SCHEDULING SHOULD TAKE ADVANTAGE OF SPRING OR FALL PLANTING SEASONS FOR NATURAL GERMINATION. SEEDED AREAS SHALL BE IRRIGATED IN ACCORDANCE WITH THE TOWN OF ERIE'S STANDARDS AND SPECIFICATIONS.

7. AT ALL TIMES, THE PROPERTY SHALL BE MAINTAINED AND/OR WATERED TO PREVENT WIND-CAUSED EROSION. EARTHWORK OPERATIONS SHALL BE DISCONTINUED WHEN FUGITIVE DUST SIGNIFICANTLY IMPACTS ADJACENT PROPERTY. IF EARTHWORK IS COMPLETE OR DISCONTINUED AND DUST FROM THE SITE CONTINUES TO CREATE PROBLEMS, THE OWNER/DEVELOPER SHALL IMMEDIATELY INSTITUTE MITIGATIVE MEASURES AND SHALL CORRECT DAMAGE TO ADJACENT PROPERTY.

8. FILL SLOPES SHALL BE COMPACTED BY MEANS OF SHEEPSFOOT COMPACTOR OR OTHER SUITABLE EQUIPMENT. COMPACTING SHALL CONTINUE UNTIL SLOPES ARE STABLE AND THERE IS NOT AN APPRECIABLE AMOUNT OF LOOSE SOIL ON THE SLOPES.

9. TEMPORARY CUT/FILL SLOPES SHALL ABIDE BY THE SOILS REPORT. PERMANENT SLOPES SHALL BE AS SHOWN ON PLANS.

10. DEPTH OF MOISTURE-DENSITY CONTROL SHALL BE FULL DEPTH ON ALL EMBANKMENT AND SIX (6) INCHES ON THE BASE OF CUTS AND FILLS.

11. OUTLET SIDES OF ALL STORM PIPES SHALL BE GRADED TO DRAIN AND SHALL HAVE SUFFICIENT EROSION PROTECTION.

12. THE PERMITTEE OR HIS AGENT SHALL NOTIFY THE SITE GEOTECHNICAL ENGINEER WHEN THE GRADING OPERATION IS READY FOR EACH OF THE FOLLOWING INSPECTIONS:

    A. INITIAL INSPECTION WHEN THE PERMITTEE IS READY TO BEGIN WORK, BUT NOT LESS THAN TWO (2) DAYS BEFORE ANY GRADING OR GRUBBING IS STARTED.

    B. AFTER THE NATURAL GROUND OR BEDROCK IS EXPOSED AND PREPARED TO RECEIVE FILL, BUT BEFORE FILL IS PLACED.

    C. EXCAVATION INSPECTION AFTER THE EXCAVATION IS STARTED BUT BEFORE THE VERTICAL DEPTH OF THE EXCAVATION EXCEEDS TEN (10) FEET.

    D. FILL INSPECTION AFTER THE FILL PLACEMENT IS STARTED, BUT BEFORE THE FILL EXCEEDS TEN (10) FEET.

GENERAL NOTES - STORM DRAIN

1. EXCEPT WHERE NOTED, ALL STORM SEWER PIPE SHALL BE REINFORCED CONCRETE, CLASS III AND SHALL CONFORM TO REQUIREMENTS OF ASTM C76. ALL RCP SHALL HAVE RUBBER GASKETED JOINTS AND SHALL CONFORM TO REQUIREMENTS OF ASTM C443, AND SHALL PROVIDE WATERTIGHT PERFORMANCE CHARACTERISTICS.

2. TONGUE AND GROOVE JOINTS SHALL NOT BE ALLOWED.

3. THE MINIMUM COVERAGE FOR ALL STORM DRAINAGE PIPES SHALL BE 1.5 FEET FOR CLASS III PIPE AND 1 FOOT FOR CLASS IV PIPE.

4. BEDDING MATERIAL SHALL CONFORM TO TOWN OF ERIE STANDARDS AND SPECIFICATIONS.

5. ALL MANHOLES SHALL BE CONCRETE AND CONFORM TO CDOT STANDARD M-604-20.

6. THE MINIMUM MANHOLE DIAMETER SHALL BE AS SPECIFIED BELOW:

    PIPE DIAMETER MANHOLE SIZE
    15" TO 18" 4' DIAMETER
    21" TO 42" 5' DIAMETER
    48" TO 54" 6' DIAMETER
    60" AND LARGER BOX BASE MANHOLE

7. ALL STREET INLETS SHALL BE CURB OPENING TYPE R, CONFORMING TO CDOT STANDARD M-604-12, EXCEPT WHERE OTHERWISE NOTED.

8. ALL INLET ACCESS COVERS SHALL HAVE THE WORDS "NO DUMPING - DRAINS TO RIVERS" AND "STORM SEWER" CAST INTO THE COVER PER TOWN OF ERIE STANDARD DETAIL.

9. ALL END SECTIONS SHALL CONFORM TO CDOT STANDARD M-603-10.

10. WHERE RIPRAP IS CALLED FOR ON THE PLANS FOR EROSION CONTROL, IT SHALL CONFORM TO THE URBAN STORM DRAINAGE CRITERIA MANUAL SPECIFICATIONS (LATEST REVISION).

UDFCD CONSTRUCTION NOTES

1. THE URBAN DRAINAGE AND FLOOD CONTROL DISTRICT MAY CONDUCT SITE VISITS DURING PROJECT CONSTRUCTION WITHIN OR NEAR THE CHANNEL TO OBSERVE CONSTRUCTION FOR CONFORMANCE WITH THE APPROVED PLANS AND SPECIFICATIONS. ALL GROUTED BOULDER DROP STRUCTURES, CHECK STRUCTURES, HEADWALLS AND WING WALLS MUST HAVE A GROUT/CEMENT PRE-PLACEMENT INSPECTION. COORDINATION WITH THE UDFCD CONSTRUCTION MANAGER IS REQUIRED 48 HOURS PRIOR TO PLACEMENT. CONTACT MIKE SARMENTO, UDFCD CONSTRUCTION MANAGER, AT 303-455-6277 OR EMAIL: MSARMENTO@UDFCD.ORG.

WETLAND NOTES

1. THE REGIONAL DRAINAGE IMPROVEMENTS WILL IMPACT JURISDICTIONAL WATERS OF THE US AS REGULATED UNDER SECTION 404 OF THE CLEAN WATER ACT. A WETLAND DELINEATION REPORT HAS BEEN PREPARED FOR THIS AREA MAPPING AND IDENTIFYING ALL WATERS OF THE US AND JURISDICTIONAL FIELD VERIFICATION FROM THE US ARMY CORPS OF ENGINEERS (USACE) DENVER REGULATORY OFFICE HAS BEEN COMPLETED WITH THE LIMITS TO JURISDICTIONAL WATERS SHOWN.
2. UNDER SECTION 404 OF THE CLEAN WATER ACT GENERALLY ANY PROPOSED PLACEMENT OF FILL AND/OR IMPACT TO JURISDICTIONAL WATERS OF THE US MUST RECEIVE PRIOR AUTHORIZATION THROUGH THE US ARMY CORPS OF ENGINEERS PERMIT REVIEW PROCESS. AS PART OF THE PERMIT REVIEW PROCESS ANY IMPACT TO JURISDICTIONAL WATERS OF THE US REQUIRE COMPENSATORY MITIGATION AT 1:1 REPLACEMENT RATIO. A COMPENSATORY MITIGATION PLAN WAS PREPARED AND APPROVED UNDER THE PERMIT REVIEW PROCESS. OFF-SITE WETLANDS WILL BE PURCHASED AS MITIGATION FOR DISTURBANCE AT THE FLATIRON MEADOWS SITE.

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Job Number: WORTH FLATIRON			
Prepared For: HT FLATIRON LP	Designer: BKM	Drafter: BKM	Checked: BKM

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FLATIRON MEADOWS
REGIONAL DETENTION POND IMPROVEMENT PLANS
GENERAL NOTES

Sheet GN1 2 of 29

Date MARCH 31, 2016

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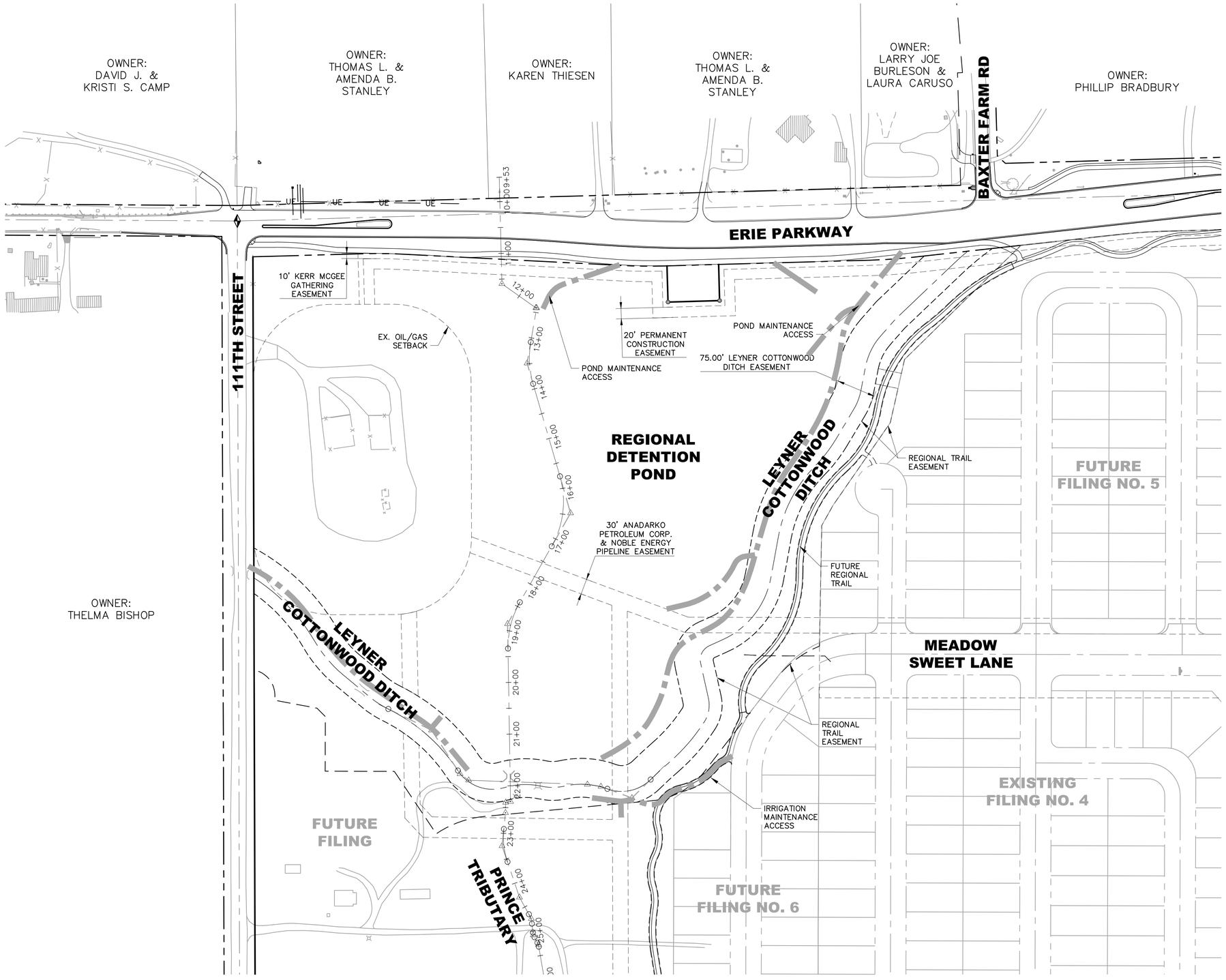

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Drawing Name	101CD1.dwg
Job Number	WORTH FLATIRON
Prepared For	HT FLATIRON LP
Designer	KLH
Drafter	KLH
Checked	BKM

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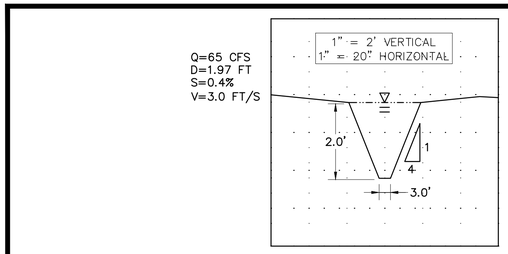
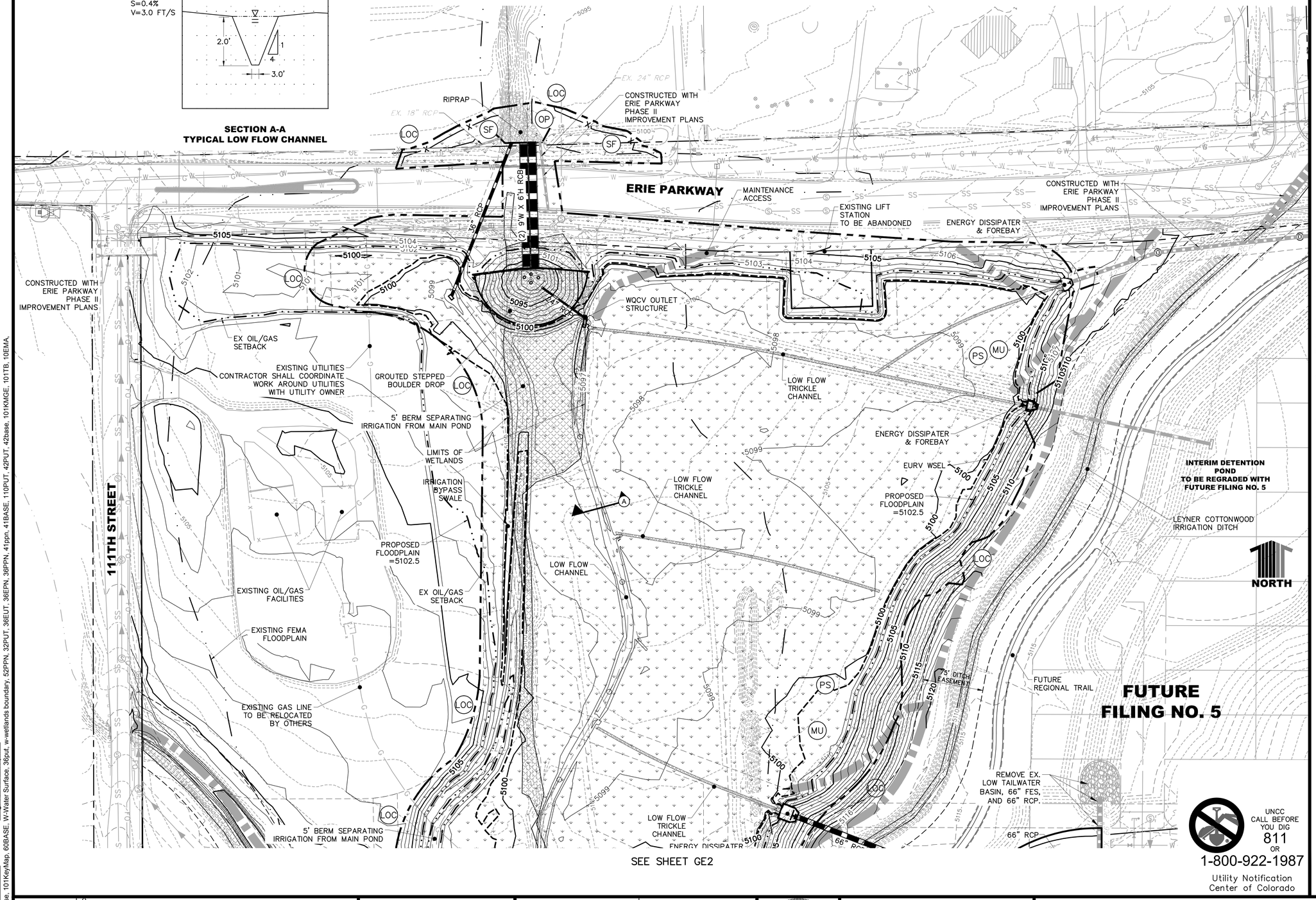
FLATIRON MEADOWS
REGIONAL DETENTION POND IMPROVEMENT PLANS
CONTROL DIAGRAM

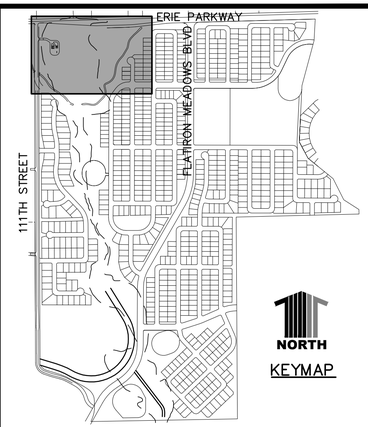
Sheet CD1 3 of 29
Date MARCH 31, 2016



SECTION A-A
TYPICAL LOW FLOW CHANNEL



SEE SHEET GE2



KEYMAP

GENERAL NOTES:

1. WHERE CONSTRUCTION DETAILS AND SPECIFICATIONS ARE NOTED ON THESE PLANS USE THE TOWN OF ERIE STANDARD SPECIFICATIONS FOR DESIGN AND CONSTRUCTION.
2. SEE SHEET T1 FOR BENCHMARK, BASIS OF BEARINGS.
3. SEE GN1 SHEET FOR GENERAL NOTES RELATED TO THESE PLANS.
4. SEE DT SHEETS FOR DETAILS.
5. SEE SHEET DT7 FOR LOW FLOW TRICKLE CHANNEL SECTION.
6. SEE SHEETS CH2, CH3 AND CH4 FOR CHECK STRUCTURES

CONSTRUCTION NOTES:

1. THE LOW FLOW CHANNEL SHOULD BE SEEDED WITH A WETLAND SEED MIX, SEE MAINTENANCE SITE PLAN (SM1) FOR DETAILS.

WETLAND NOTES:

1. THE REGIONAL DRAINAGE IMPROVEMENTS WILL IMPACT JURISDICTIONAL WATERS OF THE US AS REGULATED UNDER SECTION 404 OF THE CLEAN WATER ACT. A WETLAND DELINEATION REPORT HAS BEEN PREPARED FOR THIS AREA MAPPING AND IDENTIFYING ALL WATERS OF THE US AND JURISDICTIONAL FIELD VERIFICATION FROM THE US ARMY CORPS OF ENGINEERS (USACE) DENVER REGULATORY OFFICE HAS BEEN COMPLETED WITH THE LIMITS TO JURISDICTIONAL WATERS SHOWN.
2. UNDER SECTION 404 OF THE CLEAN WATER ACT GENERALLY ANY PROPOSED PLACEMENT OF FILL AND/OR IMPACT TO JURISDICTIONAL WATERS OF THE US MUST RECEIVE PRIOR AUTHORIZATION THROUGH THE US ARMY CORPS OF ENGINEERS PERMIT REVIEW PROCESS. AS PART OF THE PERMIT REVIEW PROCESS ANY IMPACT TO JURISDICTIONAL WATERS OF THE US REQUIRE COMPENSATORY MITIGATION AT 1:1 REPLACEMENT RATIO. A COMPENSATORY MITIGATION PLAN WAS PREPARED AND APPROVED UNDER THE PERMIT REVIEW PROCESS. OFF-SITE WETLANDS WILL BE PURCHASED AS MITIGATION FOR DISTURBANCE AT THE FLATIRON MEADOWS SITE.

LEGEND:

- SF — SILT FENCE EROSION BARRIER
- VTC — TRACKING CONTROL PAD
- SSA — STABLIZED STAGING AREA
- CWA — CONCRETE WASHOUT AREA
- IP / OP — INLET/OUTLET PROTECTION
- MU — MULCHING
- PS — PERMANENT SEEDING (PER TOWN REQUIREMENTS)
- LOC — LIMITS OF CONSTRUCTION
- PROPOSED CONTOURS — 4925
- EXISTING CONTOURS — 4925
- PROPOSED FLOODPLAIN (100-YEAR WSEL)
- EURV WSEL

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DATE		REVISION DESCRIPTION
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Drawing Name: 101GE1.dwg
Job Number: WORTH FLATIRON
Prepared For: HT FLATIRON LP
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Designer: KLH | Drafter: KLH | Checked: BKM

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FLATIRON MEADOWS
REGIONAL DETENTION POND IMPROVEMENT PLANS
GRADING & EROSION CONTROL PLAN

Sheet GE1 — 4 of 29
Date: MARCH 31, 2016

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PLOTTED BY: LAiff PLOT DATE: Aug 23, 2016 4:03pm
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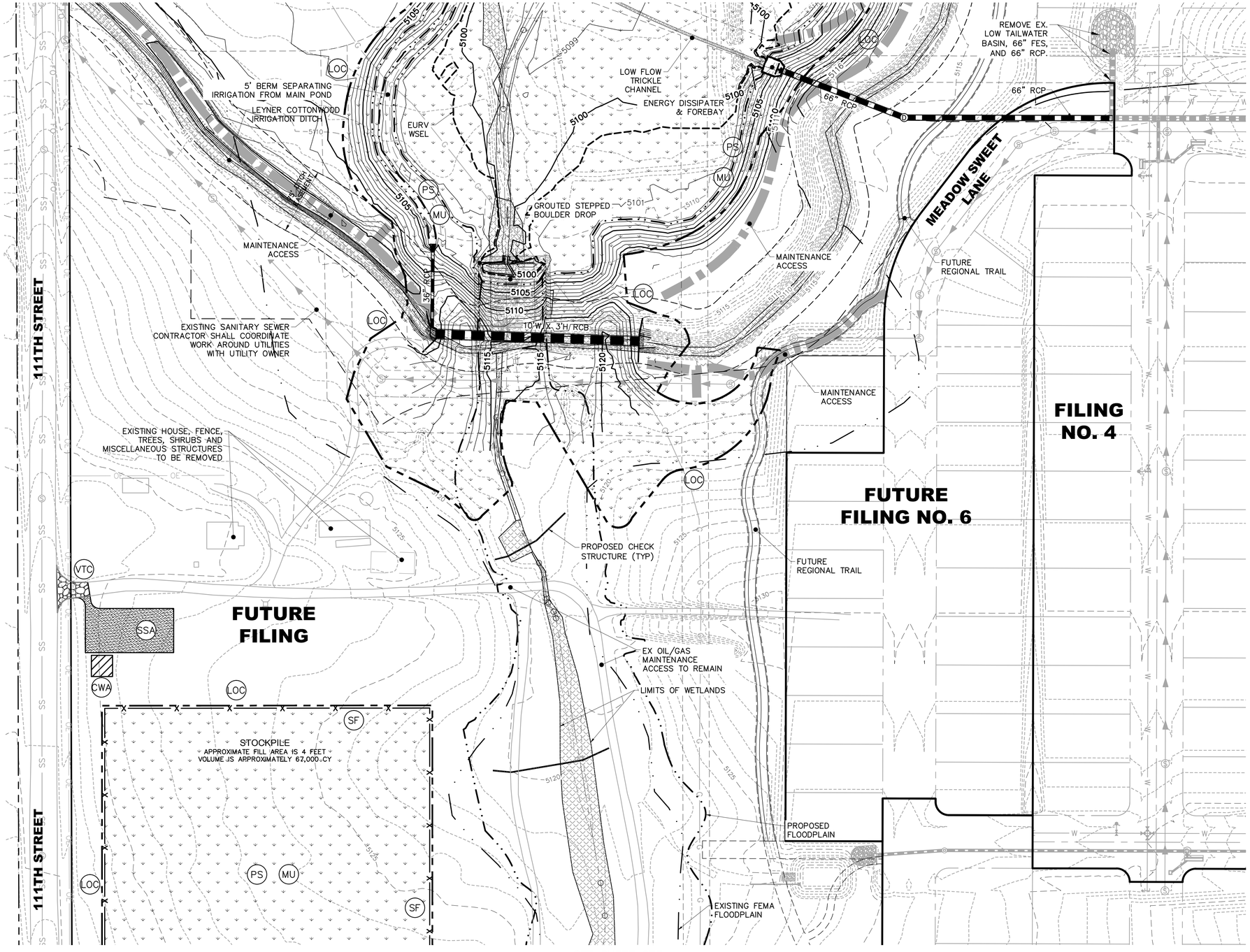

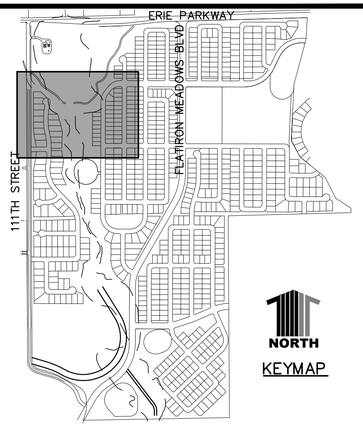

KEYMAP

GENERAL NOTES:

1. WHERE CONSTRUCTION DETAILS AND SPECIFICATIONS ARE NOTED ON THESE PLANS USE THE TOWN OF ERIE STANDARD SPECIFICATIONS FOR DESIGN AND CONSTRUCTION.
2. SEE SHEET T1 FOR BENCHMARK, BASIS OF BEARINGS.
3. SEE GN1 SHEET FOR GENERAL NOTES RELATED TO THESE PLANS.
4. SEE DT SHEETS FOR DETAILS.
5. SEE SHEET DT7 FOR LOW FLOW TRICKLE CHANNEL SECTION.
6. SEE SHEETS CH2, CH3 AND CH4 FOR CHECK STRUCTURES

CONSTRUCTION NOTES:

1. THE LOW FLOW CHANNEL SHOULD BE SEEDED WITH A WETLAND SEED MIX, SEE MAINTENANCE SITE PLAN (SM1) FOR DETAILS.

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LEGEND:

- SF — SILT FENCE EROSION BARRIER
- VTC — TRACKING CONTROL PAD
- SSA — STABLIZED STAGING AREA
- CWA — CONCRETE WASHOUT AREA
- IP / OP — INLET/OUTLET PROTECTION
- MU — MULCHING
- PS — PERMANENT SEEDING (PER TOWN REQUIREMENTS)
- LOC — LIMITS OF CONSTRUCTION
- PROPOSED CONTOURS — 4925
- EXISTING CONTOURS — 4925
- PROPOSED FLOODPLAIN (100-YEAR WSEL)
- EURV WSEL

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DATE		REVISION DESCRIPTION
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3/31/16	1	APPROVED FOR CONSTRUCTION

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Drawing Name: 101GE1.dwg
Job Number: WORTH FLATIRON
Prepared For: HT FLATIRON LP
1 inch = 60 ft. Horizontal
Designer: KLH | Drafter: KLH | Checked: TAJ

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FLATIRON MEADOWS
REGIONAL DETENTION POND IMPROVEMENT PLANS
GRADING & EROSION CONTROL PLAN

Sheet GE2 of 29
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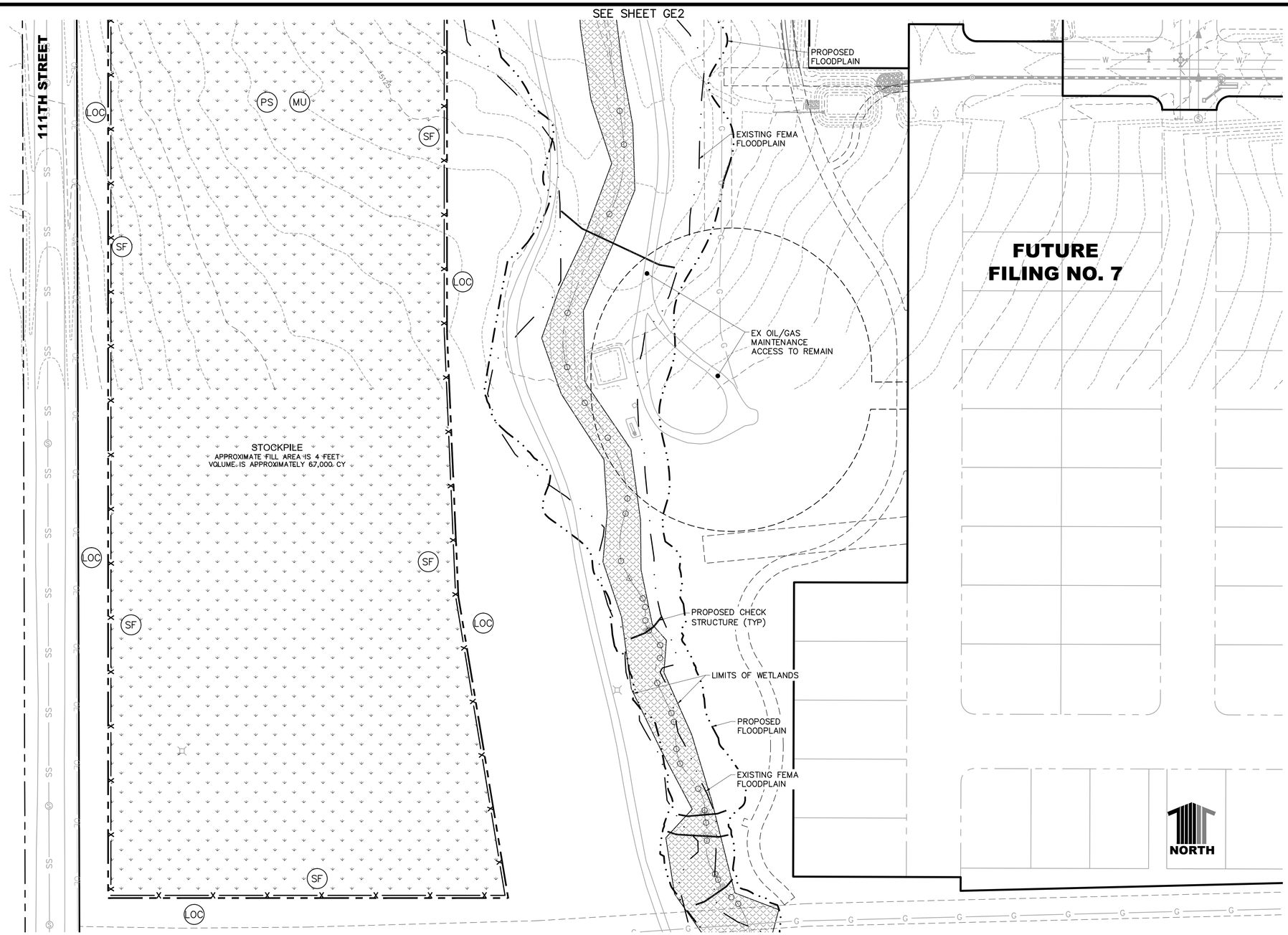

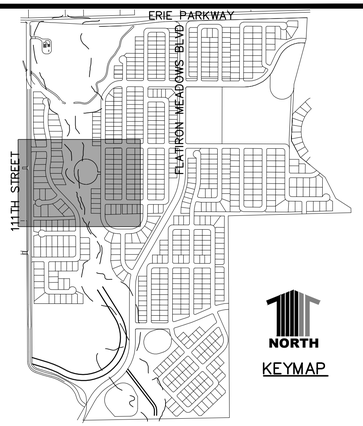

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Sheet GE3 6 of 29
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PROJECT INFORMATION

1.0 GENERAL INFORMATION
A. UDFCD DRAINAGEWAY #
B. PROPERTY OWNER: HT FLATIRON LP
720-932-0522
C. DESIGN ENGINEER: CALIBRE ENGINEERING, INC.
TODD A. JOHNSON, PE
303-730-0434

1.1 HYDRAULIC INFORMATION
A. FACILITY TRIBUTARY AREA = 546 ACRES

B. ONLINE FACILITY

C. FLOW RATES
NORMAL LOW-FLOW 65 CFS
POND 100-YEAR INFLOW=1,745 CFS OUTFLOW=1,635 CFS

			ORIFICE	100-YR WEIR
POND STAGE	POND DEPTH	STORAGE	RELEASE	RELEASE
FEET	FEET DEPTH	AC-FT	CFS	CFS
5095.0	0.0	0.1	0.0	0
5095.5	0.5	0.2	0.3	0
5096.0	1.0	0.2	0.7	0
5096.5	1.5	0.3	1.2	0
5097.0	2.0	0.4	1.8	0
5097.5	2.5	0.6	2.5	0
5098.0	3.0	1.2	3.2	0
5098.5	3.5	2.3	4.0	0
5099.0	4.0	4.1	4.8	0
5099.5	4.5	6.8	5.7	0
5100.0	5.0	10.4	6.6	0
5100.5	5.5	14.9	7.3	39
5101.0	6.0	19.9	8.0	266
5101.5	6.5	25.4	8.5	618
5102.0	7.0	31.2	9.1	1,076
5102.5	7.5	37.3	9.5	1,635

D. POND DESCRIPTION

	WSEL	VOLUME	STRUCTURE TYPE
MICROPOOL	5095.00'	.036 AC-FT	CONCRETE
EURV	5100.30'	13.3 AC-FT	BOX WITH ORIFICE
100-YEAR	5102.50'	37.5 AC-FT	EARTHEN WEIR/BERM

E. OUTLET TYPE
10-YEAR: N/A
100-YEAR: DROP BOX OUTLET STRUCTURE

F. EURV DRAIN TIME: 72 HOURS

1.2 MISCELLANEOUS INFORMATION
A. PROJECT SURVEY:
SURVEY BENCHMARK: TOP OF 3 1/4" ALUMINUM CAP IN RANGE BOX STAMPED 1999 LS NO.29414 AT THE INTERSECTION OF ISABELLE ROAD (AKA COUNTY ROAD NO. 52) AND NORTH 111TH STREET (AKA COUNTY ROAD NO. 9) NAVD 88 DATUM = 5104.20

MAINTENANCE CONTROL POINT: TOP OF HEADWALL FOR POND OUTLET STRUCTURE, NORTHEAST CORNER AT BEGINNING OF WINGWALL. SEE SITE PLAN FOR LOCATION. MARKED BY "X" CHISELED INTO TOP OF WALL. EL = 5098.73'

B. SEED MIXES:
UPLAND SEED MIX

COMMON NAME	VARIETY	% OF MIX
WOOLY SEDGE	NATIVE	1
NEBRASKA SEDGE	LOVINGTON	0.01
BLUE GRAMA	NATIVE	5
INLAND SALTGRASS	NATIVE	3
BALTIC RUSH	NATIVE	0.04
PRAIRIE CORDGRASS	NATIVE	15
SAND DROPSEED	NATIVE	5
SWITCHGRASS	BLACKWELL	28
WESTERN WHEATGRASS	ARRIBA	37

Wetland Native Seed Mixes

Table A-8. Wetland seed mix – loamy to sandy soils
(Recommended for detention ponds and less eroding wetland areas.)

Common Name	Scientific Name	Growth Season	Growth Form	% Mix	Wetland Indicator*	Lb/ac (PLS[1])
Grasses and Herbaceous Species						
American Sloughgrass	*Beckmannia syzigachne*	Cool	Sod	15	OBL	0.8
Prairie cordgrass	*Spartina pectinata*	Warm	Sod	15	FACW	4.6
Switchgrass	*Panicum virgatum*	Warm	Sod/Bunch	15	FAC	2.3
Western wheatgrass	*Pascopyrum smithii*	Cool	Sod	10	FACU	5.5
Fowl mannagrass	*Glyceria striata*	Cool	Sod	10	OBL	3.3
Hardstem bulrush	*Scirpus acutus*			10	OBL	1.6
Baltic rush	*Juncus balticus*			10	OBL	0.1
Creeping spikerush	*Eleocharis palustris*			10	OBL	1.0
Wildflowers						
Blue vervain	*Verbena hastata*			2.5	FACW	0.1
Nuttall's sunflower	*Helianthus nuttallii*			2.5	FAC	0.5
TOTAL PLS POUNDS/ACRE				**100**		**19.8**

[1]PLS = Pure Live Seed – If broadcast seeding, double the rate

C. MOW AREA: 14.5 ACRES
MOW AREA IS POND BOTTOM AND SIDES UP TO 5110'. GRASSES SHOULD BE MAINTAINED AT A HEIGHT OF 4" TO 6".

PROJECT NOTES

2.0 GENERAL FACILITY DESCRIPTION

THIS FACILITY IS AN ONLINE REGIONAL DETENTION POND THAT PROVIDES FULL SPECTRUM DETENTION, INLCLUDING TREATMENT OF EURV AND REDUCTION OF 100-YR DISCHARGE, FOR THE PRINCE TRIBUTARY AS IT PASSES THROUGH THE FLATIRON MEADOWS SITE. THE POND DISCHARGES THROUGH A CULVERT NORTH OF THE SITE UNDER ERIE PARKWAY.

2.1 MAINTENANCE NOTES

A. MAINTENANCE FREQUENCY
ROUTINE MAINTENANCE TASKS, INCLUDING MOWING AND DEBRIS REMOVAL, SHOULD BE PERFORMED ON AN AS-NEEDED BASIS. DEBRIS REMOVAL SHOULD BE DONE PRIOR TO THE SUMMER STORM SEASON AND FOLLOWING SIGNIFICANT RAINFALL EVENTS. IN ADDITION, THE PROPERTY OWNER SHOULD PERFORM A SITE INSPECTION ON AN ANNUAL BASIS TO EVALUATE THE NEED FOR ADDITIONAL MAINTENANCE, INCLUDING SEDIMENT REMOVAL, EROSION CONTROL, REVEGETATION, AND STRUCTURAL REPAIRS. IF ADDITIONAL MAINTENANCE IS REQUIRED, THE PROPERTY OWNER MAY REQUEST ASSISTANCE FROM UDFCD.

B. EQUIPMENT AND TOOLS REQUIRED

C. ELECTRICAL SERVICE
N/A

2.2 MAINTENANCE PROCEDURE

A. DEWATERING

B. SEDIMENT REMOVAL
SEDIMENT MUST BE REMOVED FROM THE FOREBAYS AND MICROPOOL WHEN THEY HAVE REACHED 3/4 CAPACITY, AS DETERMINED BY THE PROPERTY OWNER. REMOVAL OF EXCESS SEDIMENT FROM THE MICROPOOL CAN BE DONE WITH THE EXCAVATOR FROM THE MAINTENANCE ACCESS FROM EAST OF THE MICROPOOL. CARE SHOULD BE TAKEN NOT TO DAMAGE THE OUTLET STRUCTURE – HAND REMOVAL MAY BE NECESSARY IMMEDIATELY ADJACENT TO THE STRUCTURE. ANY SEDIMENT BUILDUP IN THE OUTLET STRUCTURE SHOULD BE REMOVED. THIS MUST BE DONE BY HAND – OPEN TRASH RACK ON EURV CONTROL (WITH KEY) FOR ACCESS.

ALL SEDIMENT MUST BE REMOVED OFFSITE. AS SEDIMENT WILL BE WET, CARE MUST BE TAKEN NOT TO TRACK OR DRIP MUD ONTO ERIE PARKWAY.

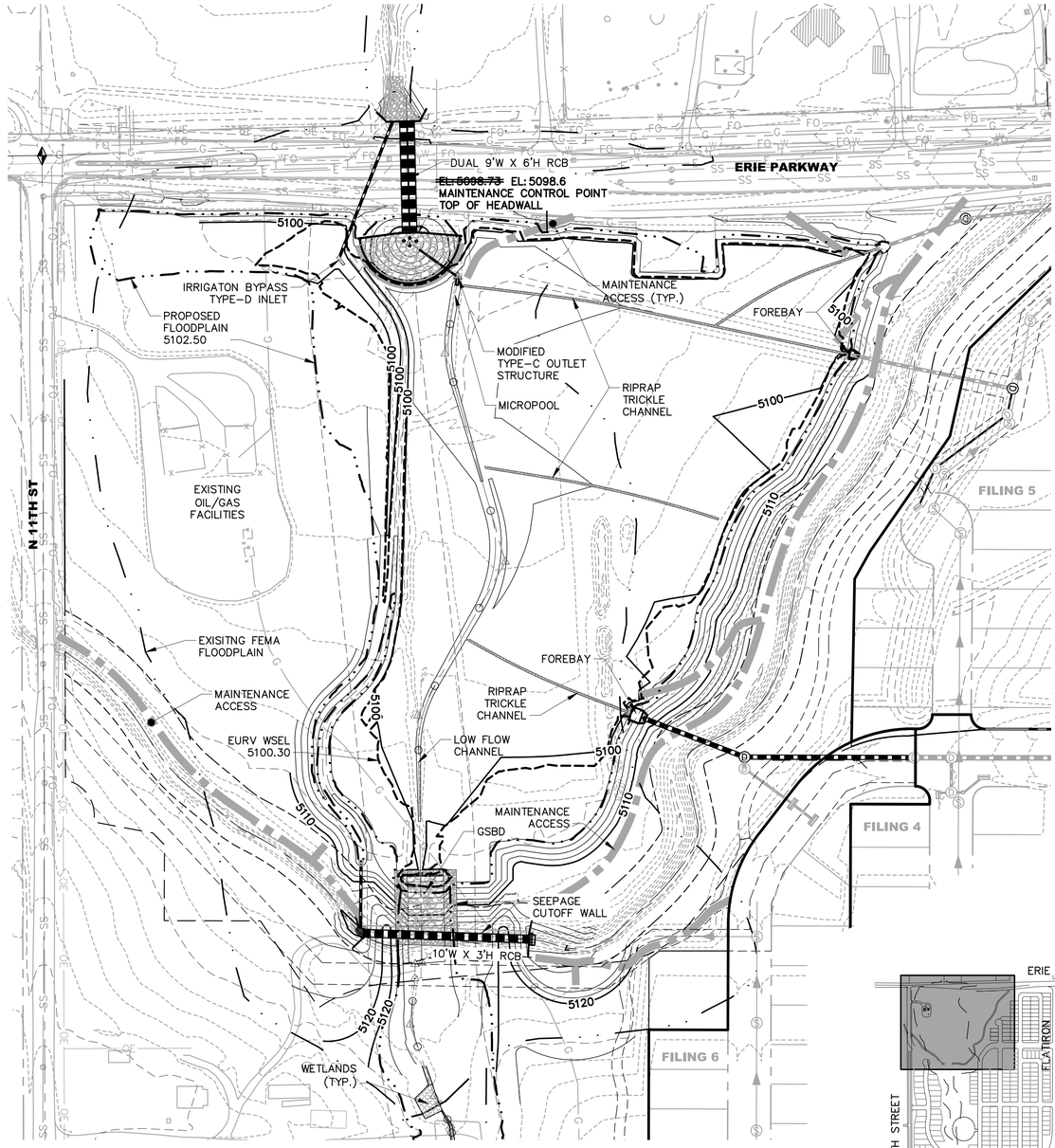
C. DEBRIS REMOVAL
DEBRIS BUILDUP IS EXPECTED AT THE INLET STRUCTURE, THE GRATES OF THE OUTLET STRUCTURES, CULVERT ENTRANCES, AND FOREBAYS. ALL DEBRIS SHOULD BE COLLECTED AND DISPOSED OFFSITE.

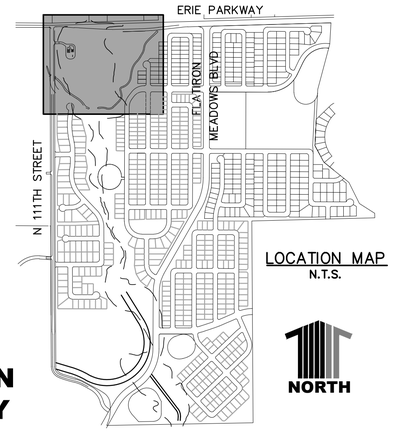
D. SITE INSPECTION
THE FOLLOWING ITEMS SHOULD BE INSPECTED A MINIMUM OF ONCE PER YEAR AND MAINTAINED AS NECESSARY:

GENERAL
CONCRETE STRUCTURE
INTERCEPTOR GRATE
CONCRETE SLAB AND VERTICAL WALLS

OUTLET STRUCTURE
CONCRETE STRUCTURE
OVERFLOW GRATE
TRASH RACK
WATER QUALITY SCREEN
FLOW CONTROL PLATE
DUAL 9'X6' CONCRETE CULVERTS

E. POST-MAINTENANCE CONSIDERATIONS
FOLLOWING COMPLETION OF MAINTENANCE ACTIVITIES, ALL DEBRIS, TRASH, AND EXCAVATED SEDIMENT MUST BE REMOVED OFFSITE. IF NECESSARY, ERIE PARKWAY AND STREETS IN SURROUNDING FILINGS 4,5, AND 6 MUST BE SWEPT CLEAN.





RECORD DRAWING

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CALIBRE ENGINEERING BY: TAJ P.E. NO. 37660

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1 inch = 100 ft. Horizontal
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Sheet SM1 7 of 29
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PATH: P:\WORTH FLATIRON\CADD\CIVIL\101 REGIONAL POND - AS BUILTS\101MSP.DWG
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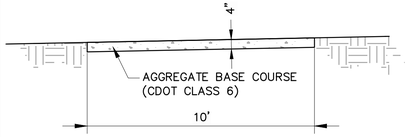
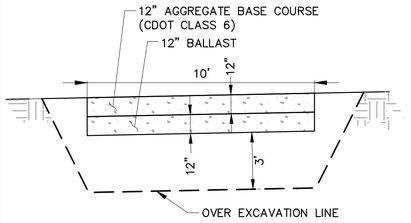


MAINTENANCE ACCESS ABOVE EURV
NOT TO SCALE



DURABLE SURFACE MAINTENANCE ACCESS BELOW EURV
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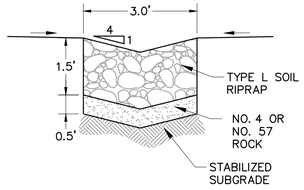

RIPRAP TRICKLE CHANNEL SECTION
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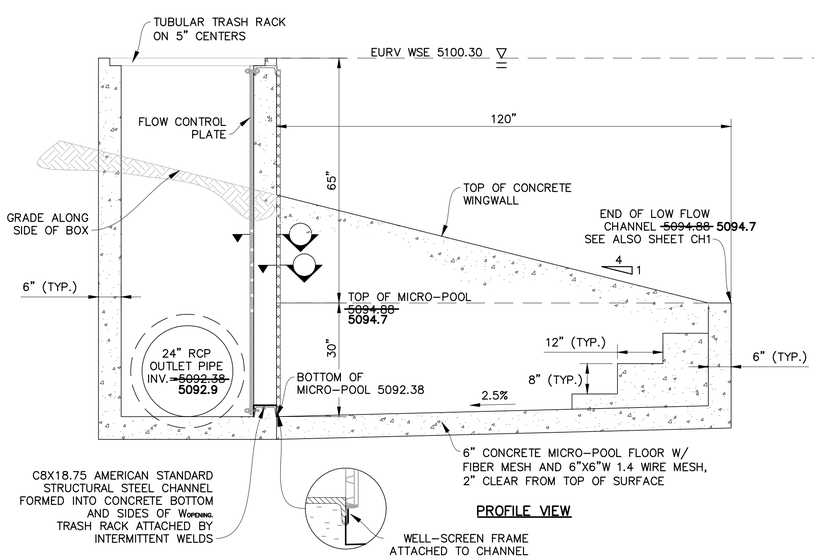
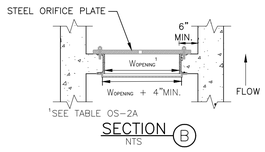


PROFILE VIEW



SECTION B
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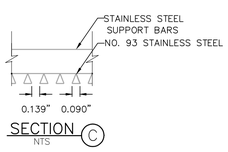

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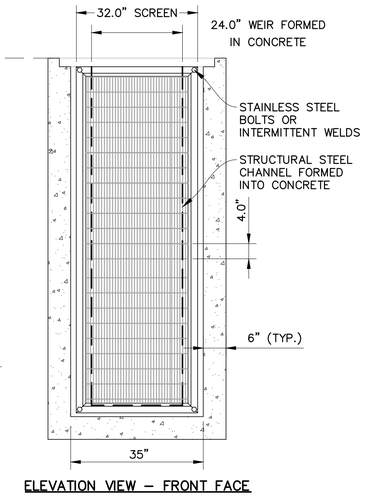
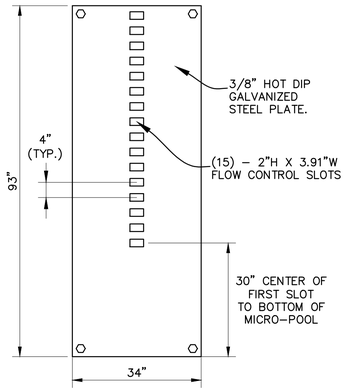
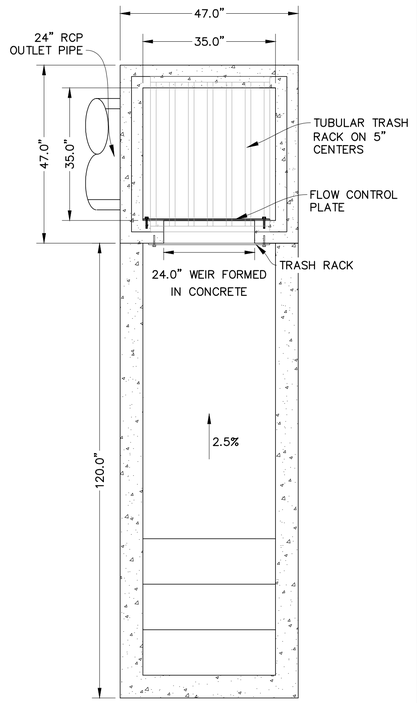


ELEVATION VIEW – FRONT FACE



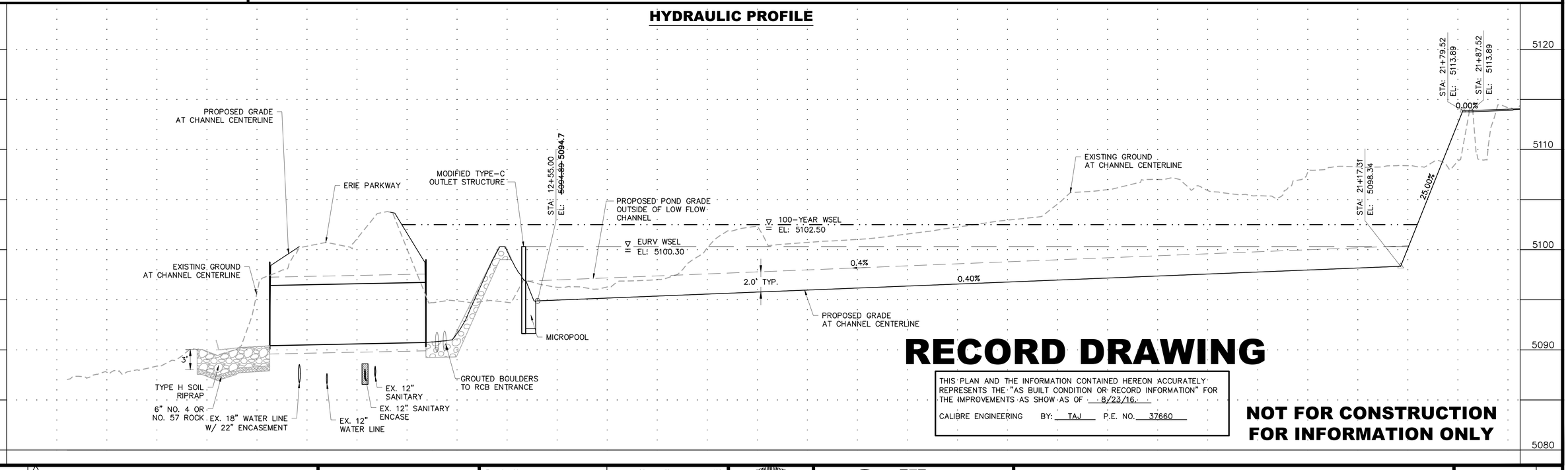
EURV FLOW CONTROL PLATE DETAIL



TOP VIEW

OUTLET STRUCTURE
NOT TO SCALE

HYDRAULIC PROFILE



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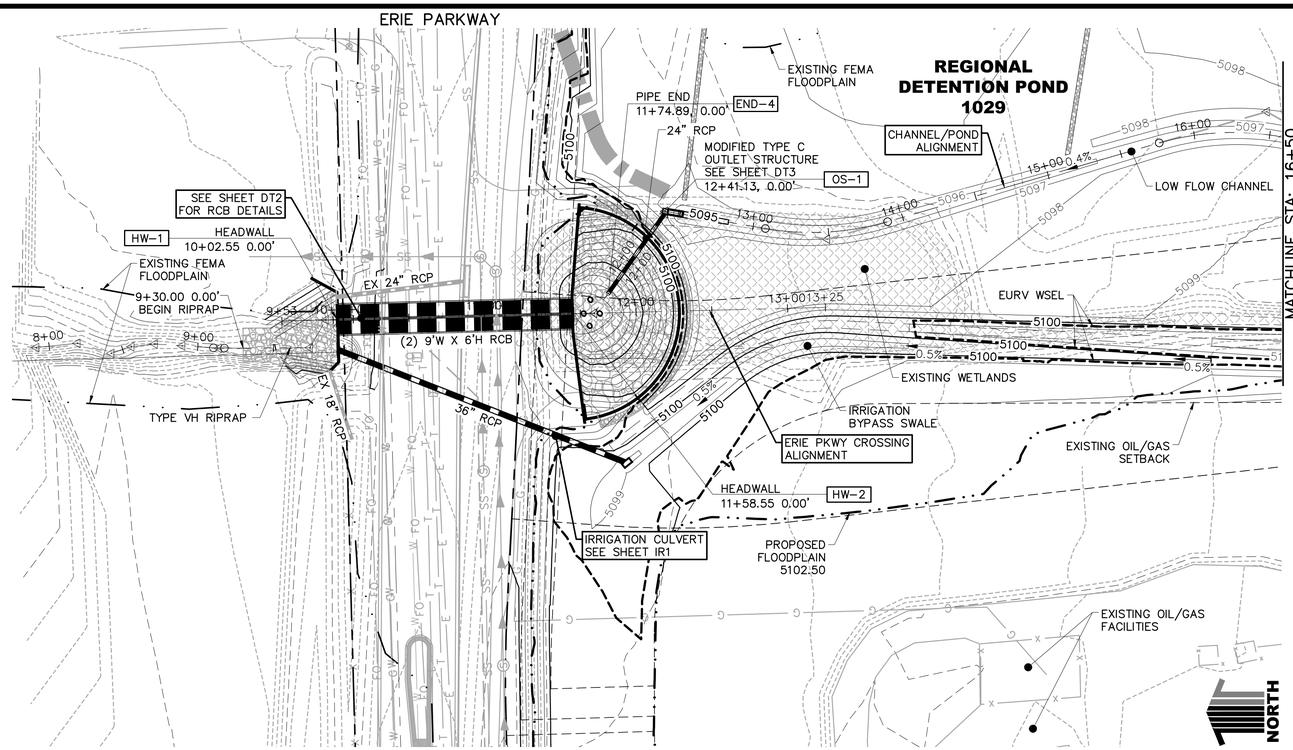
Sheet **SM2** 8 of 29

Date MARCH 31, 2016

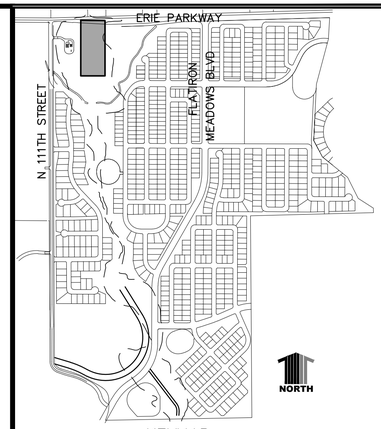
PATH: P:\WORTH FLATIRON\CADD\CIVIL\101 REGIONAL POND - AS BUILTS\101MSP.DWG
PLOTTED BY: Lorraine Aliff PLOT DATE: 8/23/2016 4:08 PM
XREFS: 36EUT, 36EPN, 52BASE, 41BASE, 101KeyMap, 101CH1, 101DT1, w-wetlands boundary, W-Water Surface, 36PPN, 110PUT, 10EMA, 42BASE, 101TB,



RECORD DRAWING

THIS PLAN AND THE INFORMATION CONTAINED HEREON ACCURATELY REPRESENTS THE "AS BUILT CONDITION OR RECORD INFORMATION" FOR THE IMPROVEMENTS AS SHOW AS OF 8/23/16.

CALIBRE ENGINEERING BY: TAJ P.E. NO. 37660



KEYMAP

GENERAL NOTES:

1. WHERE CONSTRUCTION DETAILS AND SPECIFICATIONS ARE NOTED ON THESE PLANS USE THE TOWN OF ERIE STANDARD SPECIFICATIONS FOR DESIGN AND CONSTRUCTION.
2. ALL DIMENSIONS ARE TO FLOWLINE, EXCEPT PROFILES, WHICH ARE CENTERLINE DIMENSIONS, OR UNLESS OTHERWISE NOTED.
3. SEE SHEET T1 FOR BENCHMARK, BASIS OF BEARINGS.
4. SEE GN1 SHEET FOR GENERAL NOTES RELATED TO THESE PLANS.
5. SEE SHEETS DT1 TO DT11 FOR DETENTION, STORM DRAIN AND CHANNEL DETAILS.
6. 'TOW' INDICATES FINISHED GRADE ELEVATION AT TOP OF WALL.
7. 'BOW' INDICATES FINISHED GRADE ELEVATION AT BOTTOM OF WALL.

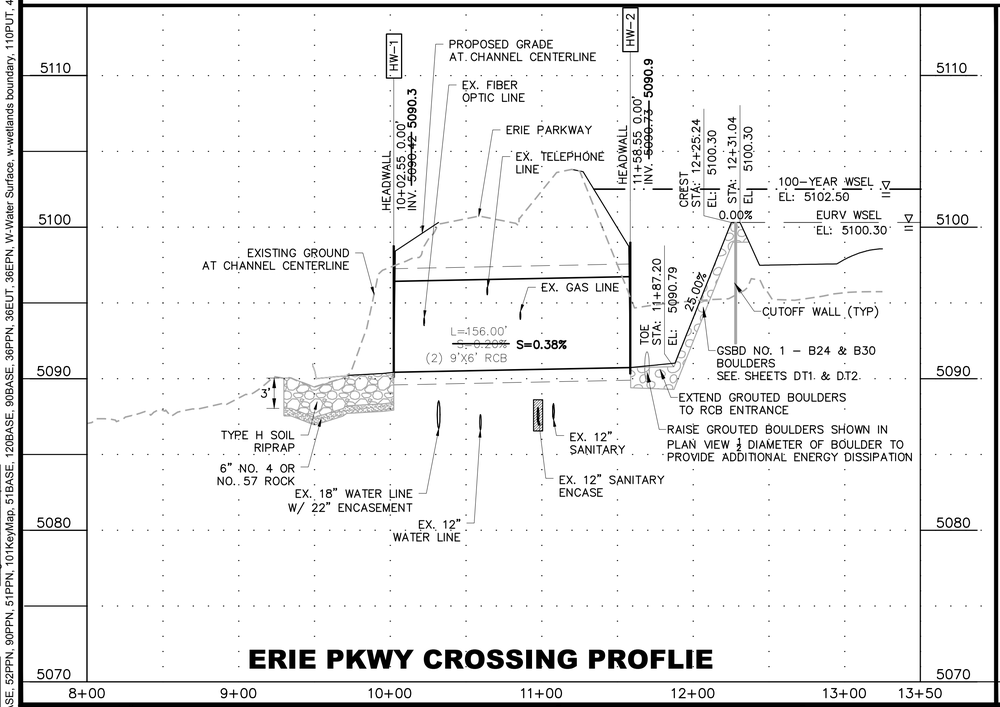
CONSTRUCTION NOTES:

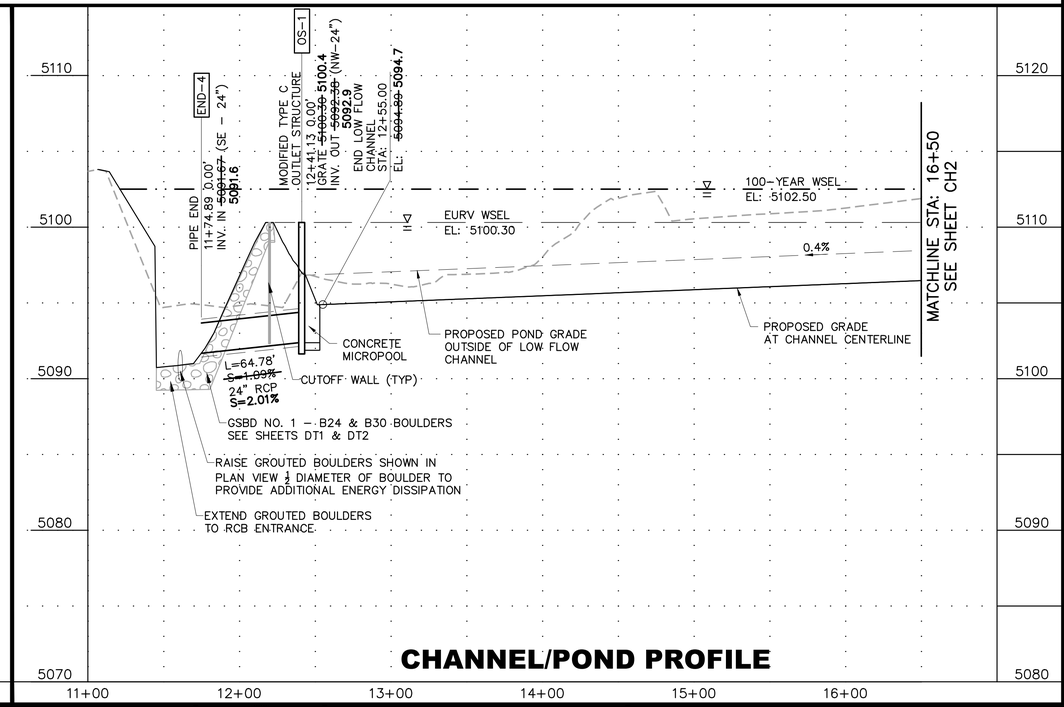
1. BOX CULVERT WILL BE PHASED. NORTH HALF WILL BE CONSTRUCTED AND THE TRAFFIC WILL BE DETOURED ON THE SOUTH SIDE OF ERIE PARKWAY. TRAFFIC WILL THEN BE MOVED TO THE NORTH SIDE OF THE ROAD AND THE SOUTHERN HALF OF THE CULVERTS WILL BE CONSTRUCTED.
2. CONTRACTOR TO POTHOLE EXISTING UTILITIES TO DETERMINE DEPTH PRIOR TO BEGINNING OF CONSTRUCTION.
3. CONTRACTOR TO COORDINATE DRY UTILITY LOWERINGS WITH DETOUR AND CULVERT CONSTRUCTION.
4. THE URBAN DRAINAGE AND FLOOD CONTROL DISTRICT (UDFCD) MAY CONDUCT SITE VISITS DURING PROJECT CONSTRUCTION WITHIN OR NEAR THE CHANNEL TO OBSERVE CONSTRUCTION FOR CONFORMANCE WITH THE APPROVED PLANS AND SPECIFICATIONS. THE UDFCD CONSTRUCTION MANAGER SHOULD ATTEND THE PRE-CONSTRUCTION MEETING FOR THE PROJECT. ALL GROUTED BOULDER INSTALLATIONS MUST HAVE A SUBGRADE INSPECTION PRIOR TO BOULDER PLACEMENT AND A PRE-GROUT INSPECTION. COORDINATION WITH UDFCD CONSTRUCTION MANAGER IS REQUIRED 48 HOURS PRIOR TO ANY CONSTRUCTION AND AHEAD OF ANY GROUT OPERATIONS. CONTACT MIKE SARMENTO, UDFCD CONSTRUCTION MANAGER, 303-455-6277, MSARMENTO@UDFCD.ORG
5. SEE GEOTECHNICAL INVESTIGATION, FLATIRON MEADOWS SUBDIVISION, REGIONAL POND AND CULVERT IMPROVEMENTS BY CTL THOMPSON, REVISED NOVEMBER 6, 2015 FOR GUIDANCE REGARDING BOX CULVERT BEDDING, DROP STRUCTURE CONSIDERATIONS AND BOX CULVERT AND WINGWALL FOUNDATIONS.

GSBD KEY NOTES

(A)	BEGIN DROP APPROACH	(D)	DROP TOE
(B)	DROP CREST	(E)	END SILL
(C)	MID DROP	(F)	CHANNEL SECTION

UNCC CALL BEFORE YOU DIG 811 OR 1-800-922-1987 Utility Notification Center of Colorado





6		
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1	3/31/16	APPROVED FOR CONSTRUCTION
	DATE	REVISION DESCRIPTION

Hines

Drawing Name	101CH1.dwg
Job Number	WORTH FLATIRON
Prepared For	HT FLATIRON LP

1 inch = 50 ft. Horizontal
1 inch = 5 ft. Vertical

Designer	Drafter	Checked
KLH	KLH	TAJ

COLORADO LICENSED 37660 03-31-16 PROFESSIONAL ENGINEER

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9090 South Ridgeline Blvd., Suite 105
Highlands Ranch, CO 80129 (303) 730-0434
www.calibre-engineering.com
Municipal Engineering Development Surveying

FLATIRON MEADOWS
REGIONAL DETENTION POND IMPROVEMENT PLANS
CHANNEL PLAN & PROFILE

Sheet CH1 9 of 29

Date MARCH 31, 2016

PATH: P:\WORTH FLATIRON\CADD\Civil\101 Regional Pond - AS BUILTS\101CH1.dwg
PLOTTED BY: LAliff PLOT DATE: Aug 23, 2016 4:12pm
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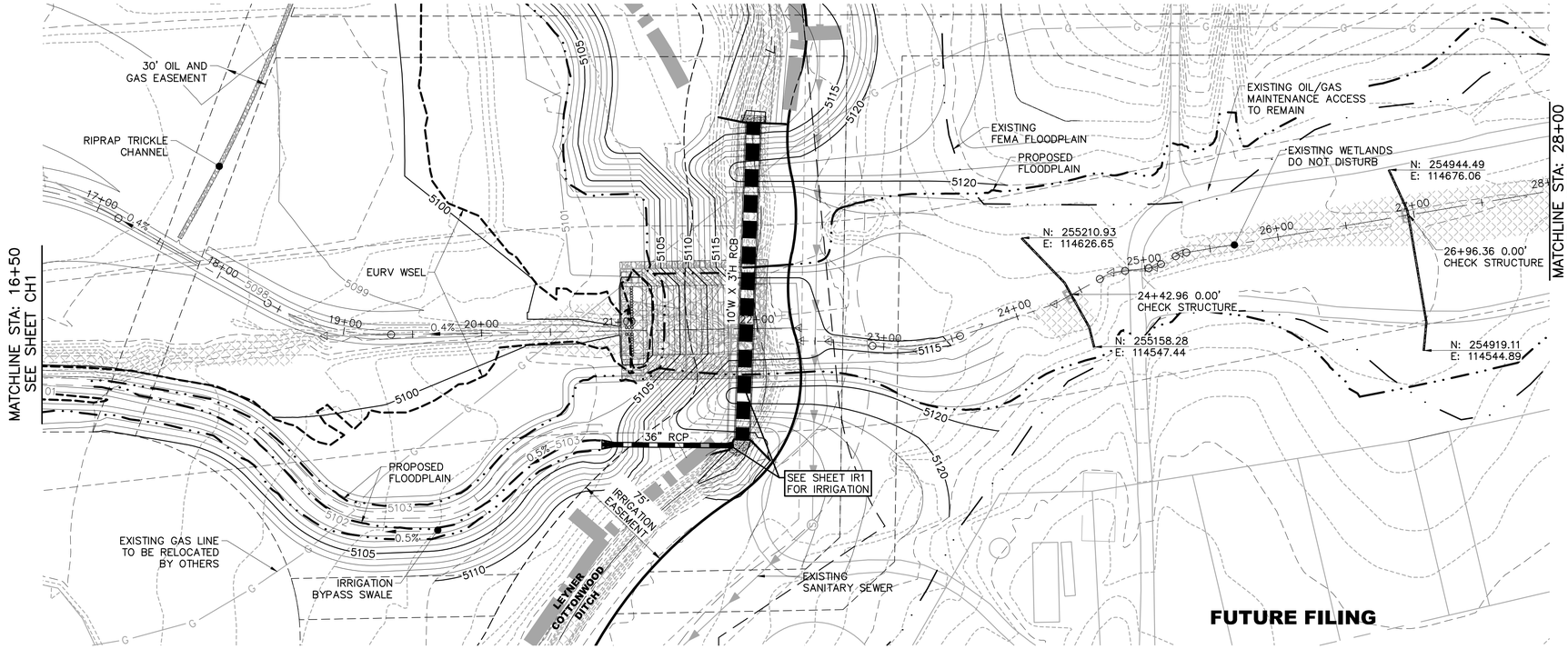

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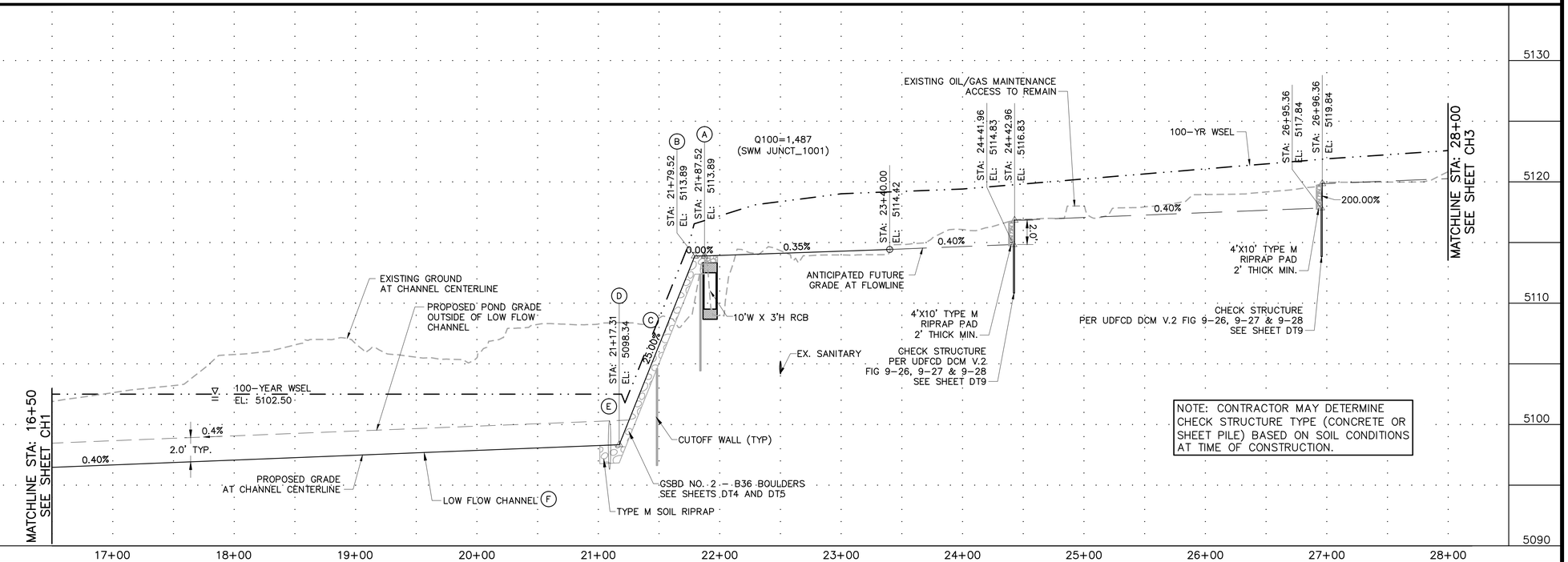
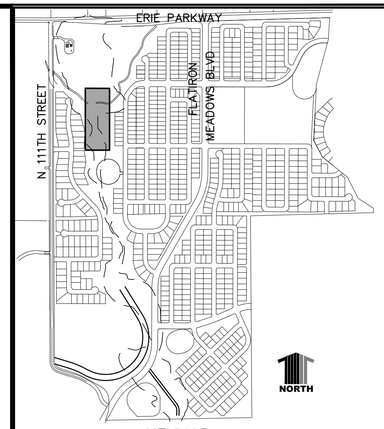


NOTE: CONTRACTOR MAY DETERMINE CHECK STRUCTURE TYPE (CONCRETE OR SHEET PILE) BASED ON SOIL CONDITIONS AT TIME OF CONSTRUCTION.



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UNCC CALL BEFORE YOU DIG 811 OR 1-800-922-1987
Utility Notification Center of Colorado

6		
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1	APPROVED FOR CONSTRUCTION	3/31/16
	REVISION DESCRIPTION	DATE

Hines

Drawing Name: 101CH1.dwg
Job Number: WORTH FLATIRON
Prepared For: HT FLATIRON LP
1 inch = 50 ft. Horizontal
1 inch = 5 ft. Vertical
Designer: KLH | Drafter: KLH | Checked: TAJ

COLORADO LICENSED PROFESSIONAL ENGINEER 37660 03-31-16

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FLATIRON MEADOWS
REGIONAL DETENTION POND IMPROVEMENT PLANS
CHANNEL PLAN & PROFILE

Sheet CH2 10 of 29
Date MARCH 31, 2016

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PLOTTED BY: LAliff PLOT DATE: Aug 23, 2016 4:13pm
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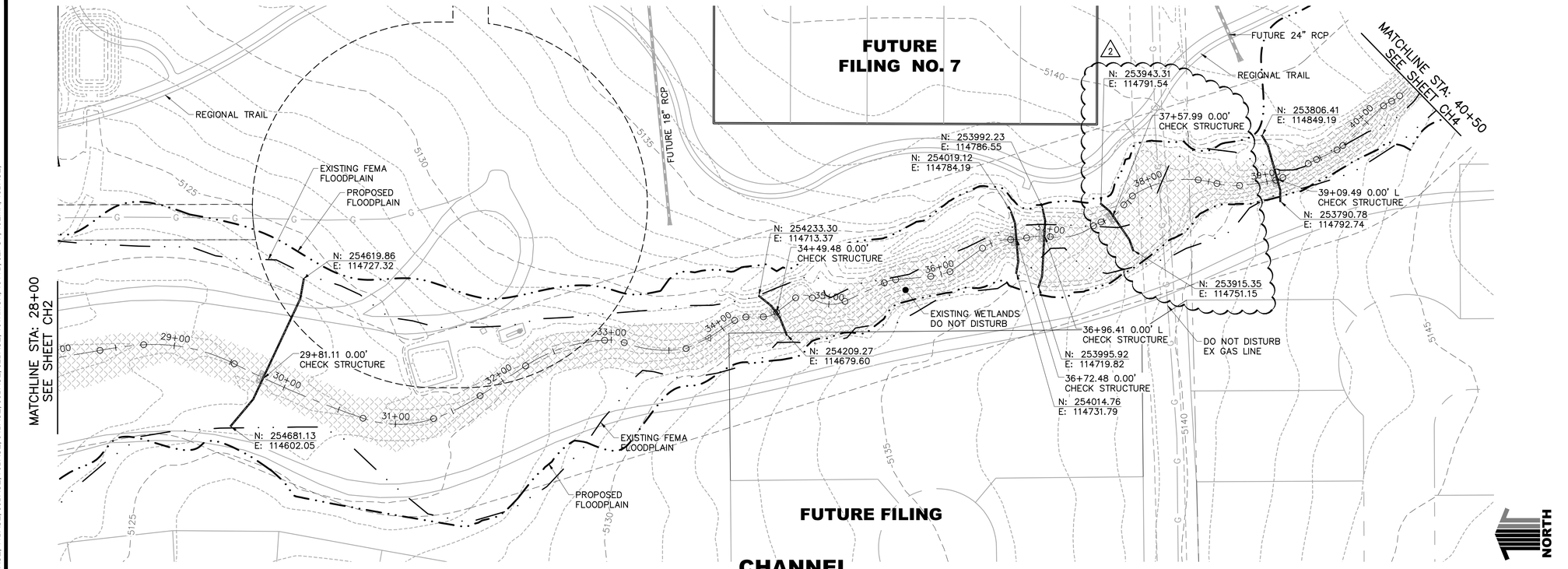

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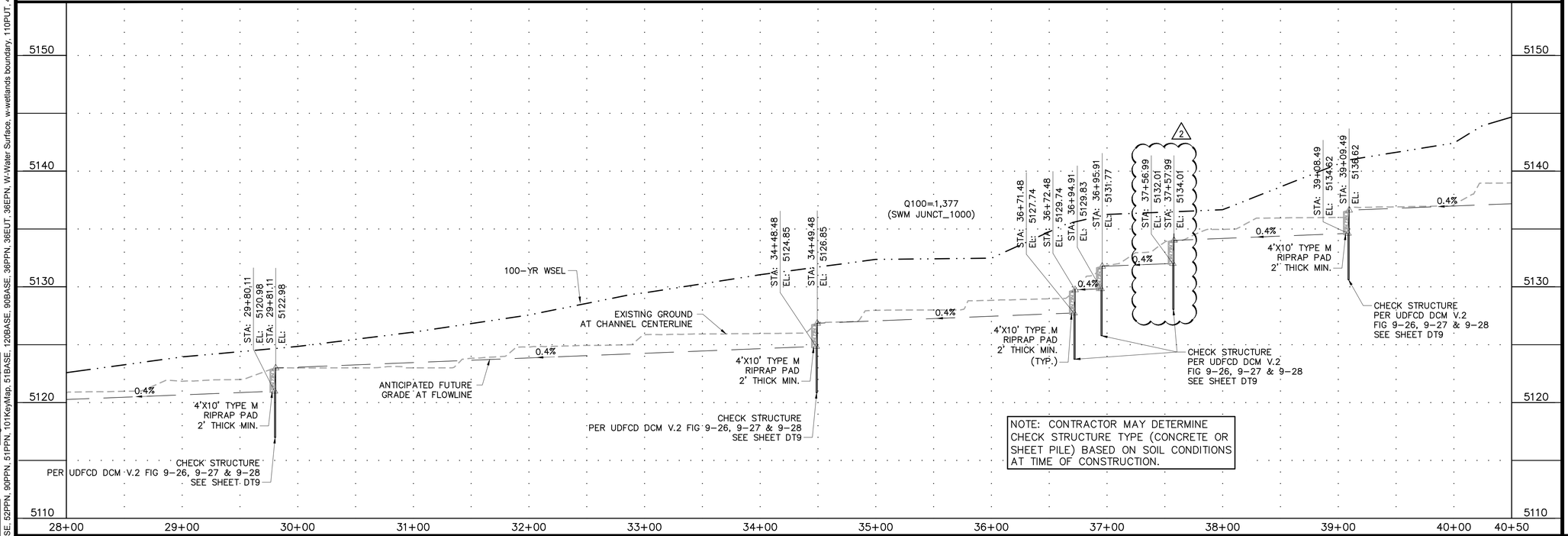

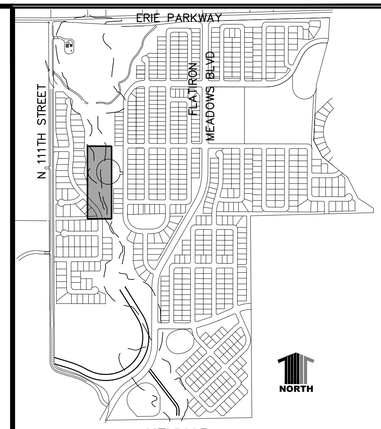

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UNCC CALL BEFORE YOU DIG 811 OR 1-800-922-1987
Utility Notification Center of Colorado

DATE	REVISION DESCRIPTION
5/4/16	2 REVISE CHECK STRUCTURE LOCATION
3/31/16	1 APPROVED FOR CONSTRUCTION

Hines

Drawing Name: 101CH1.dwg
Job Number: WORTH FLATIRON
Prepared For: HT FLATIRON LP
1 inch = 50 ft. Horizontal
1 inch = 5 ft. Vertical
Designer: KLH | Drafter: KLH | Checked: TAJ

COLORADO LICENSED GOOD TO PRACTICE ENGINEERING 37660 03-31-16 PROFESSIONAL ENGINEER

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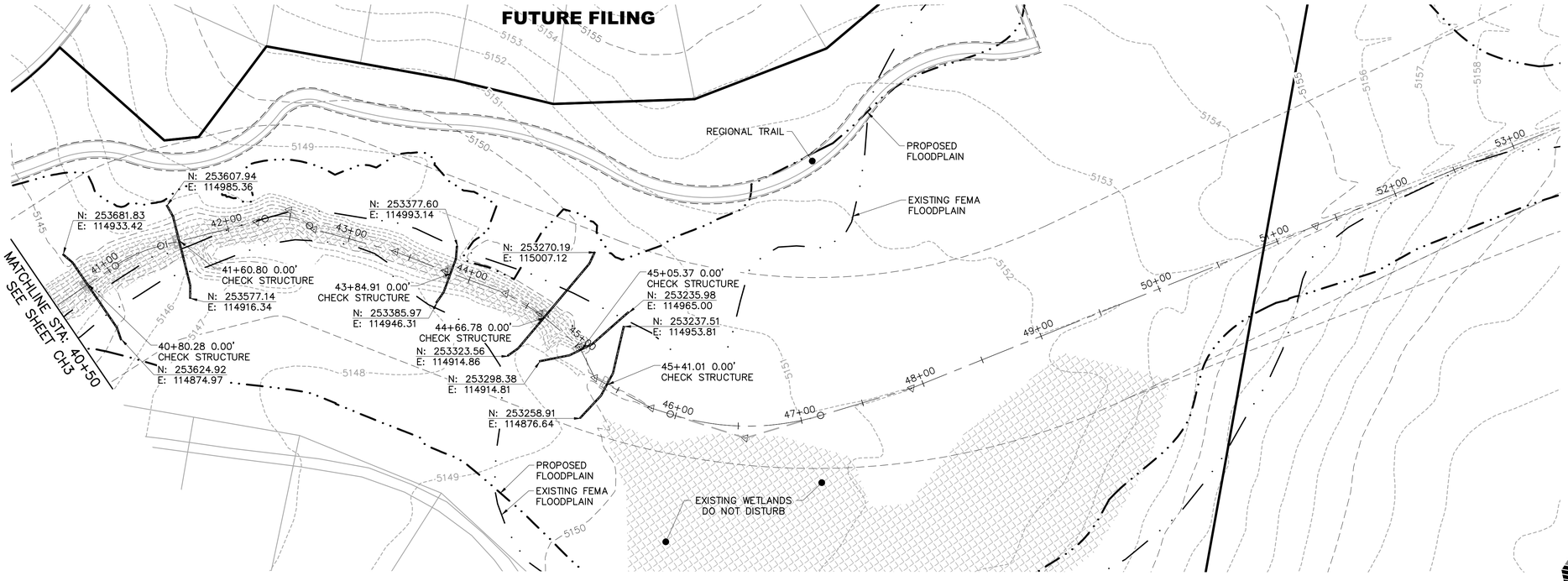
FLATIRON MEADOWS
REGIONAL DETENTION POND IMPROVEMENT PLANS
CHANNEL PLAN & PROFILE

Sheet CH3 | 11 of 29
Date: MARCH 31, 2016

PATH: P:\WORTH FLATIRON\CADD\Civil\101 Regional Pond - AS BUILTS\101CH1.dwg
PLOTTED BY: LAliff PLOT DATE: Aug 23, 2016 4:13pm
XREFS: 52BASE, 60BASE, 52PPN, 90PPN, 51PPN, 101KeyMap, 51BASE, 120BASE, 90BASE, 38PPN, 36EUT, 36EPN, W-Water Surface, w-wetlands boundary, 110PUT, 42BASE, 41BASE, 80BASE, 70BASE, 34BASE, 33BASE, 32BASE, 101KMCH, 101TB, 32PUT, 10EMA, 10BASE,



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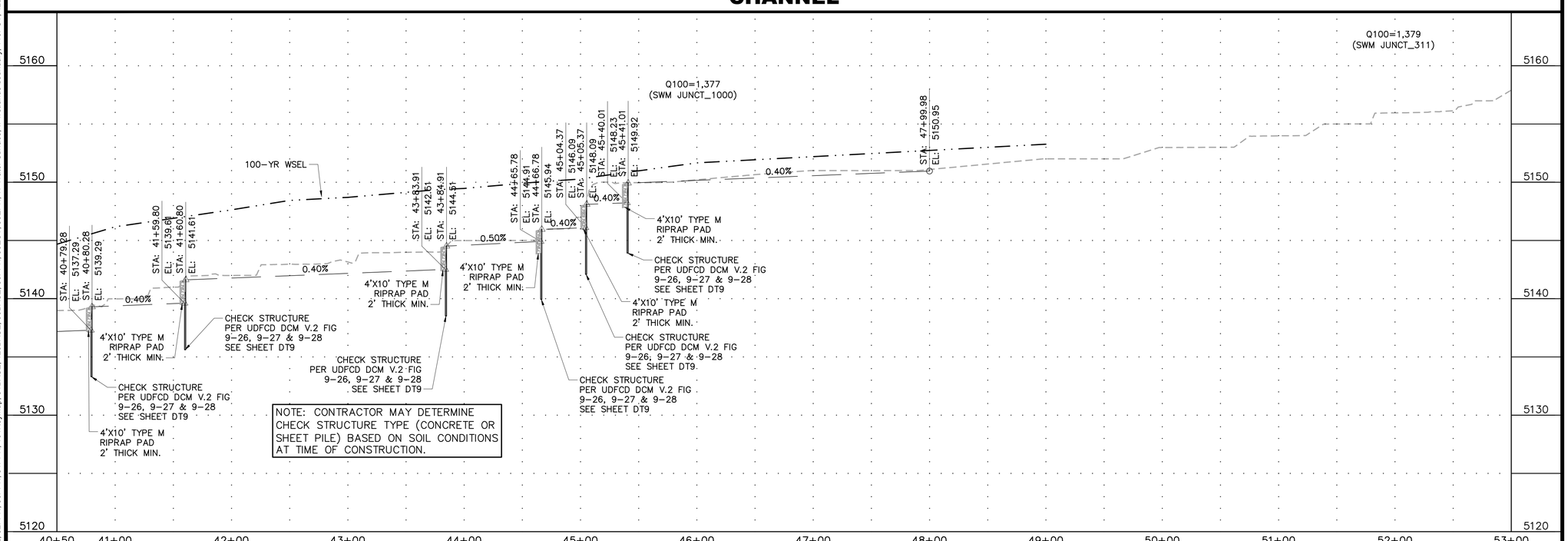

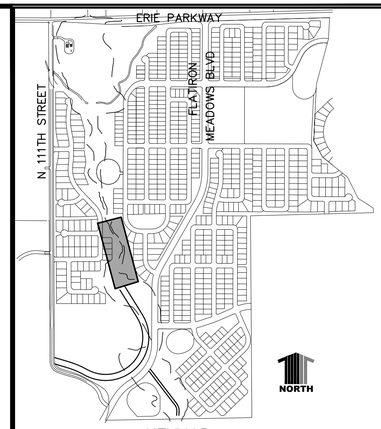

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Utility Notification Center of Colorado

DATE	NO.	REVISION DESCRIPTION
	6	
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	4	
	3	
	2	
3/31/16	1	APPROVED FOR CONSTRUCTION

Hines

Drawing Name: 101CH1.dwg
Job Number: WORTH FLATIRON
Prepared For: HT FLATIRON LP
Designer: KLH | Drafter: KLH | Checked: TAJ
1 inch = 50 ft. Horizontal
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COLORADO LICENSED 37660 03-31-16 PROFESSIONAL ENGINEER

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Sheet CH4 12 of 29
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PLOTTED BY: LAff PLOT DATE: Aug 23, 2016 4:13pm
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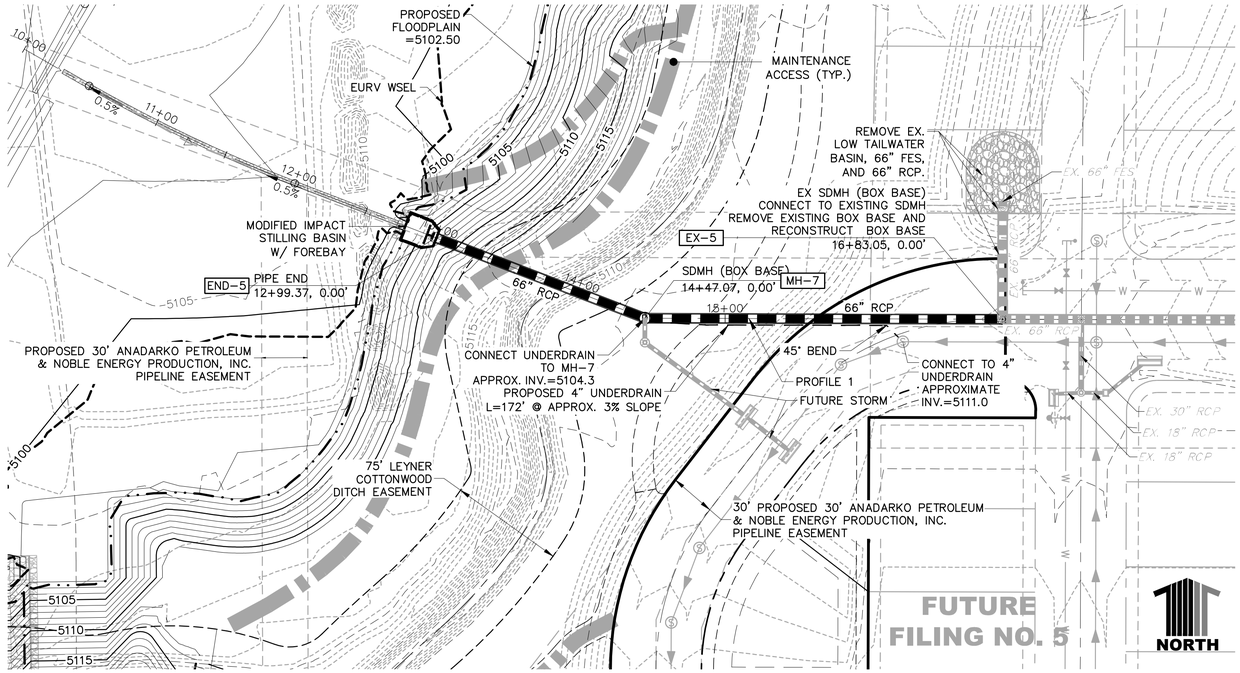

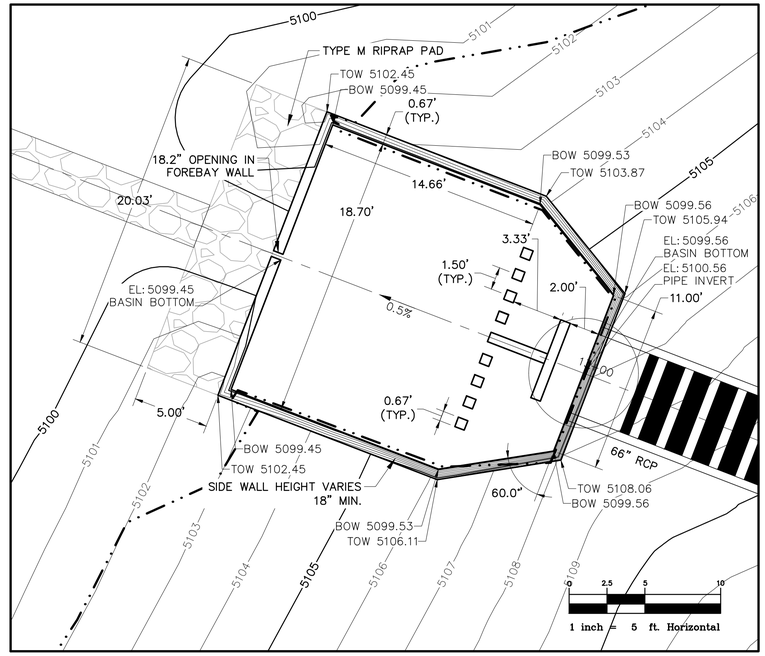

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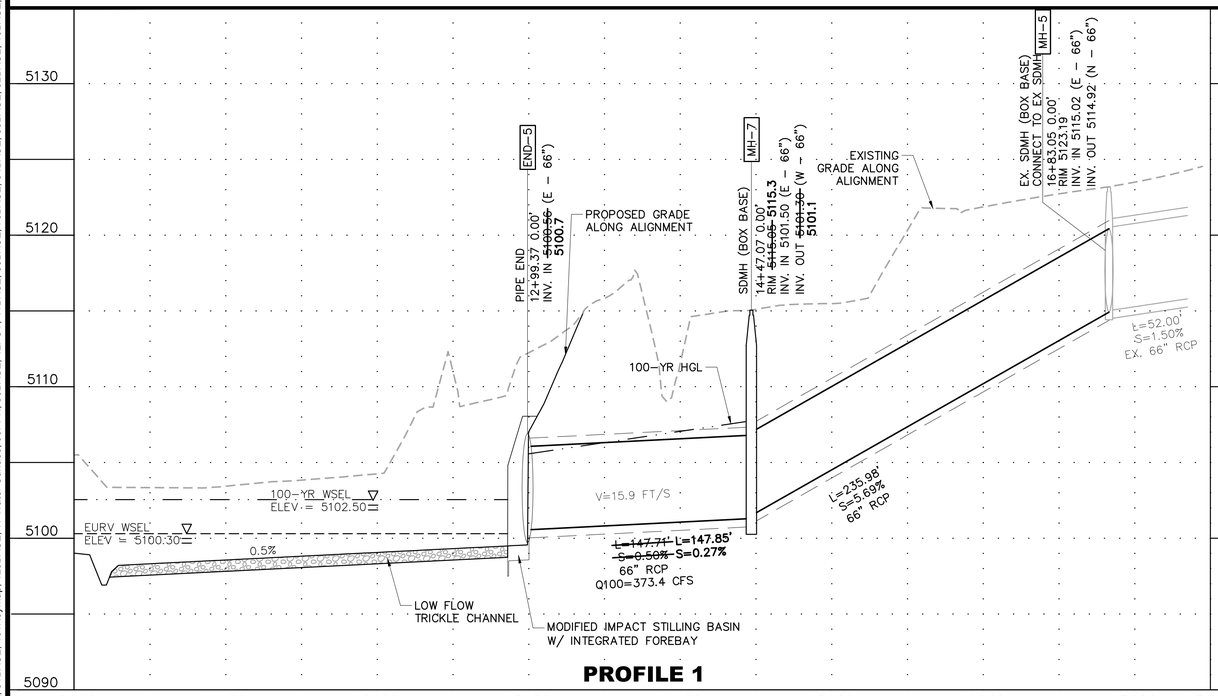

PROFILE 1

RECORD DRAWING

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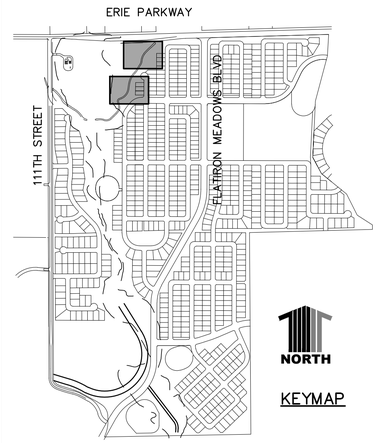
CALIBRE ENGINEERING BY: TAJ P.E. NO. 37660



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CONSTRUCTION NOTES:

1. GRANULAR BEDDING SHALL NOT BE USED BENEATH THE IRRIGATION BOX CULVERT, AS SUCH MATERIAL CAN FACILITATE SUBSURFACE FLOW AND COMPROMISE THE SEEPAGE CUTOFF FOR THE DROP STRUCTURE.
2. CONTRACTOR WILL BE RESPONSIBLE FOR STORMWATER CONTROL DURING CONSTRUCTION.
2. CONTRACTOR TO POTHOLE EXISTING UTILITIES TO DETERMINE DEPTH PRIOR TO BEGINNING OF CONSTRUCTION.
3. CONTRACTOR TO COORDINATE DRY UTILITY LOWERINGS WITH DETOUR AND CULVERT CONSTRUCTION.

KEY FLOW VALUES:

1. REGIONAL POND LOW FLOW CHANNEL DESIGN CAPACITY = 65 CFS
2. IRRIGATION BYPASS CHANNEL DESIGN CAPACITY = 120 CFS
3. TOTAL 100-YR RUNOFF ENTERING REGIONAL POND = 1,745 CFS
4. 100-YR CONTROLLED POND RELEASE (WEIR CAPACITY) = 1,635 CFS

UNCC CALL BEFORE YOU DIG 811 OR 1-800-922-1987 Utility Notification Center of Colorado

6		
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2		
1	3/31/16	APPROVED FOR CONSTRUCTION
	DATE	REVISION DESCRIPTION

Hines

Drawing Name: 101SD1.dwg
Job Number: WORTH FLATIRON
Prepared For: HT FLATIRON LP
Designer: KLH | Drafter: KLH | Checked: BKM

COLORADO LICENSED 37660 03-31-16 PROFESSIONAL ENGINEER

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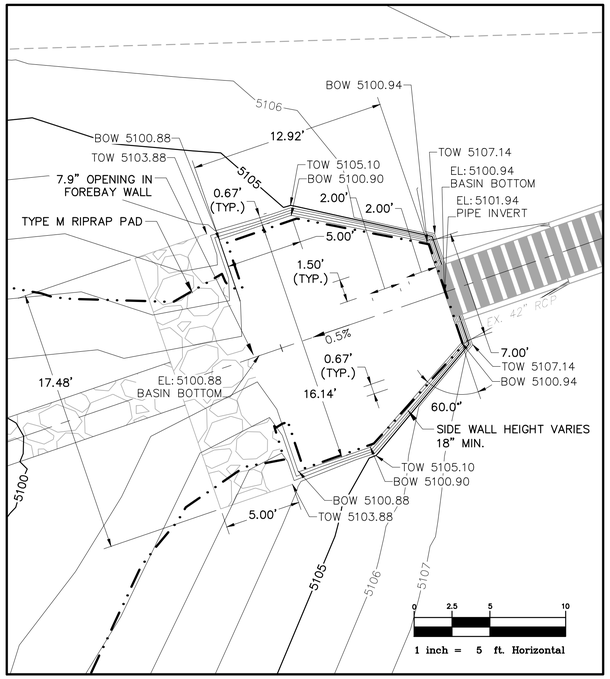
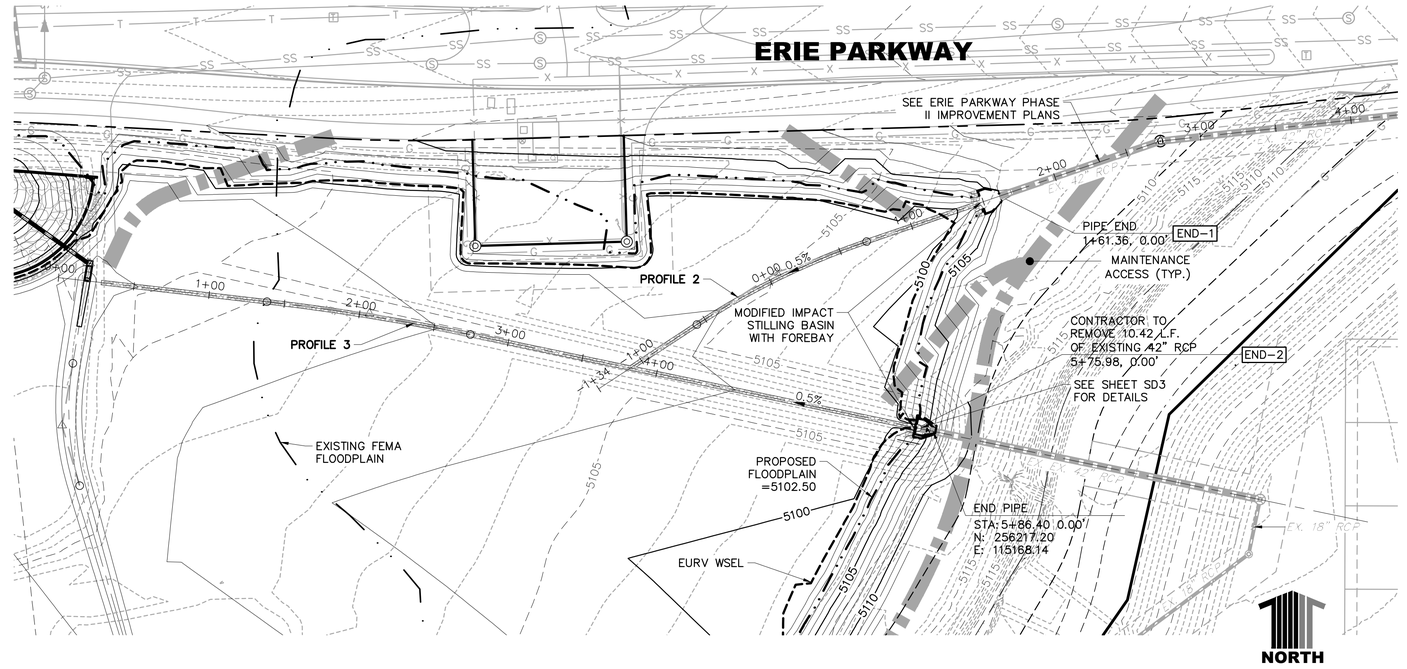
FLATIRON MEADOWS
REGIONAL DETENTION POND IMPROVEMENT PLANS
STORM PLAN AND PROFILE

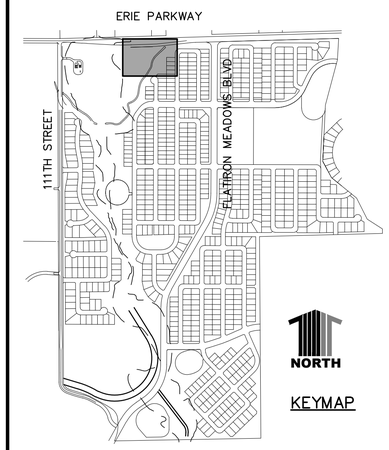
Sheet SD1 13 of 29
Date MARCH 31, 2016

PATH: P:\WORTH FLATIRON\CADD\CIVIL\101 REGIONAL POND - AS BUILTS\101SD1.DWG
PLOTTED BY: Lorraine Aiff PLOT DATE: 8/23/2016 4:17 PM
XREFS: 52BASE, 60BASE, 51BASE, 101KeyMap, 120BASE, W-Water Surface, 36PPN, 90BASE, 42PUT, 41BASE, 80BASE, 70BASE, 34BASE, 33BASE, 32BASE, 10BASE, 42BASE, 101KMIR, 110PUT, 101TB, 10EUT, 10EMA, 10EPN,



MODIFIED IMPACT STILLING BASIN W/ INTEGRATED FOREBAY - END-1





KEYMAP

GENERAL NOTES:

1. WHERE CONSTRUCTION DETAILS AND SPECIFICATIONS ARE NOTED ON THESE PLANS USE THE TOWN OF ERIE STANDARD SPECIFICATIONS FOR DESIGN AND CONSTRUCTION.
2. ALL DIMENSIONS ARE TO FLOWLINE, EXCEPT PROFILES, WHICH ARE CENTERLINE DIMENSIONS, UNLESS OTHERWISE NOTED.
3. SEE SHEET T1 FOR BENCHMARK, BASIS OF BEARINGS.
4. SEE GN1 SHEET FOR GENERAL NOTES RELATED TO THESE PLANS.
5. SEE SHEETS DT1 TO DT9 FOR DETENTION, STORM DRAIN AND CHANNEL DETAILS.
6. 'TOW' INDICATES FINISHED GRADE ELEVATION AT TOP OF WALL.
7. 'BOW' INDICATES FINISHED GRADE ELEVATION AT BOTTOM OF WALL.

CONSTRUCTION NOTES:

1. GRANULAR BEDDING SHALL NOT BE USED BENEATH THE IRRIGATION BOX CULVERT, AS SUCH MATERIAL CAN FACILITATE SUBSURFACE FLOW AND COMPROMISE THE SEEPAGE CUTOFF FOR THE DROP STRUCTURE.
2. CONTRACTOR WILL BE RESPONSIBLE FOR STORMWATER CONTROL DURING CONSTRUCTION.
2. CONTRACTOR TO POTHOLE EXISTING UTILITIES TO DETERMINE DEPTH PRIOR TO BEGINNING OF CONSTRUCTION.
3. CONTRACTOR TO COORDINATE DRY UTILITY LOWERINGS WITH DETOUR AND CULVERT CONSTRUCTION.

KEY FLOW VALUES:

1. REGIONAL POND LOW FLOW CHANNEL DESIGN CAPACITY = 65 CFS
2. IRRIGATION BYPASS CHANNEL DESIGN CAPACITY = 120 CFS
3. TOTAL 100-YR RUNOFF ENTERING REGIONAL POND = 1,745 CFS
4. 100-YR CONTROLLED POND RELEASE (WEIR CAPACITY) = 1,635 CFS

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RECORD DRAWING

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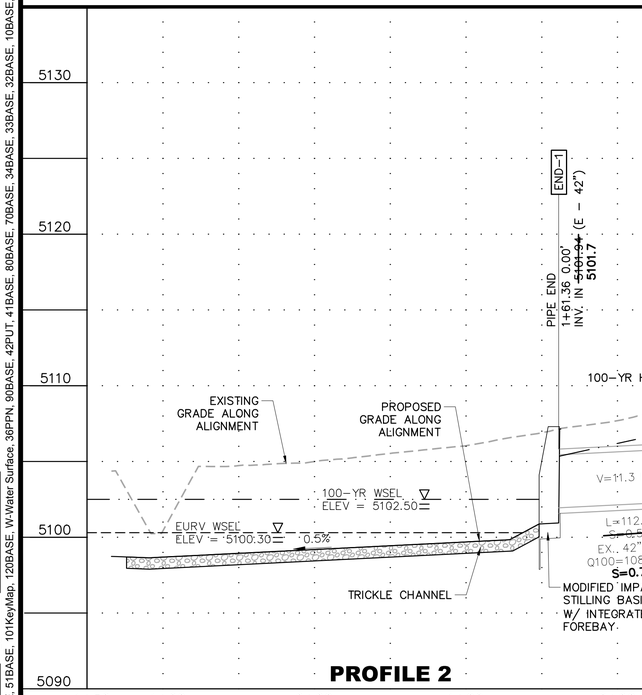
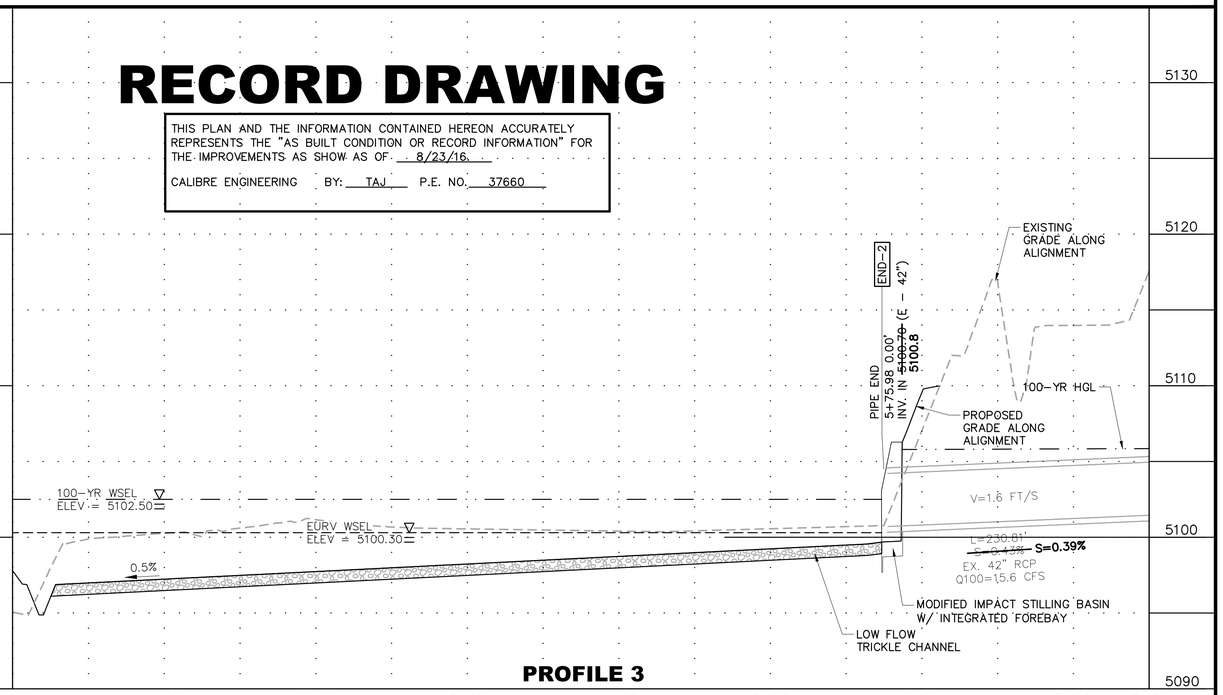
CALIBRE ENGINEERING BY: TAJ P.E. NO. 37660



PROFILE 2



PROFILE 3

6					
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1	APPROVED FOR CONSTRUCTION				
DATE	REVISION DESCRIPTION				

Hines

Drawing Name: 101SD1.dwg
Job Number: WORTH FLATIRON
Prepared For: HT FLATIRON LP
Designer: KLH | Drafter: KLH | Checked: BKM

COLORADO LICENSED 37660 03-31-16 PROFESSIONAL ENGINEER

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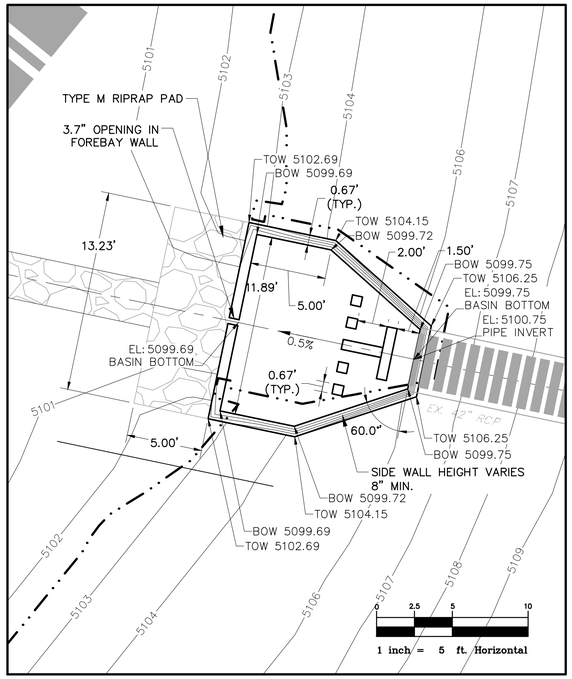
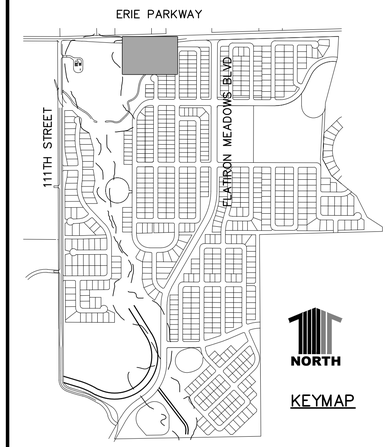
FLATIRON MEADOWS
REGIONAL DETENTION POND IMPROVEMENT PLANS
STORM PLAN AND PROFILE

Sheet SD2 14 of 29
Date MARCH 31, 2016

PATH: P:\WORTH FLATIRON\CADD\CIVIL\101 REGIONAL POND - AS BUILTS\101SD1.DWG
PLOTTED BY: Lorraine Aiff PLOT DATE: 8/23/2016 4:17 PM
XREFS: 52BASE, 60BASE, 51BASE, 101KeyMap, 120BASE, W-Water Surface, 36PPN, 90BASE, 42PUT, 41BASE, 80BASE, 70BASE, 34BASE, 33BASE, 32BASE, 10BASE, 42BASE, 101KMIR, 110PUT, 101TB, 10EUT, 10EMA, 10EPN,



MODIFIED IMPACT STILLING BASIN W/ INTEGRATED FOREBAY - END-2



KEYMAP

GENERAL NOTES:

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2. ALL DIMENSIONS ARE TO FLOWLINE, EXCEPT PROFILES, WHICH ARE CENTERLINE DIMENSIONS, UNLESS OTHERWISE NOTED.
3. SEE SHEET T1 FOR BENCHMARK, BASIS OF BEARINGS.
4. SEE GN1 SHEET FOR GENERAL NOTES RELATED TO THESE PLANS.
5. SEE SHEETS DT1 TO DT9 FOR DETENTION, STORM DRAIN AND CHANNEL DETAILS.
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CONSTRUCTION NOTES:

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6		
5		
4		
3		
2		
3/31/16	1	APPROVED FOR CONSTRUCTION
DATE		REVISION DESCRIPTION

Hines

Drawing Name: 101SD1.dwg
Job Number: WORTH FLATIRON
Prepared For: HT FLATIRON LP
Designer: KLH | Drafter: KLH | Checked: BKM

COLORADO LICENSED KEVIN L. HOUSEMAN 37660 03-31-16 PROFESSIONAL ENGINEER

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FLATIRON MEADOWS
REGIONAL DETENTION POND IMPROVEMENT PLANS
STORM PLAN AND PROFILE

Sheet: SD3 | 15 of 29
Date: MARCH 31, 2016

PATH: P:\WORTH-FLATIRON\CADD\CIVIL\101 REGIONAL POND - AS BUILTS\101SD1.DWG
PLOTTED BY: Lorraine Alff PLOT DATE: 8/23/2016 4:17 PM
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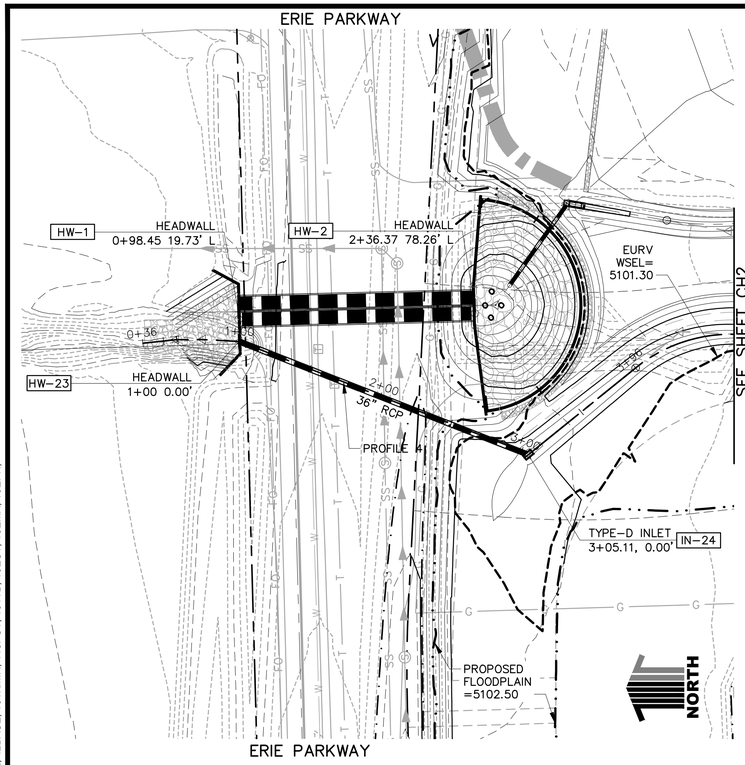

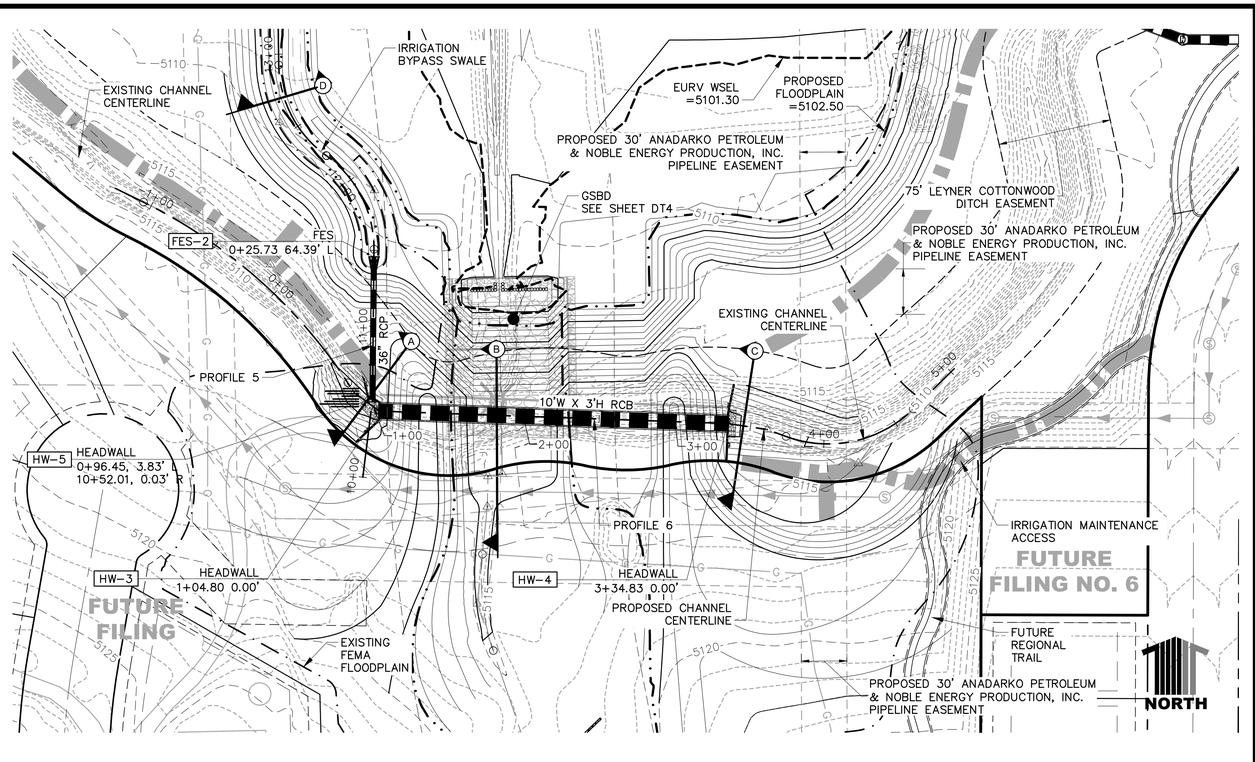

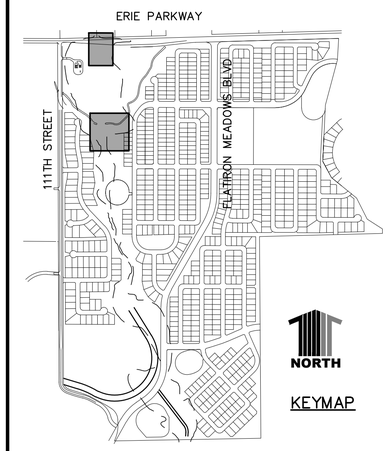

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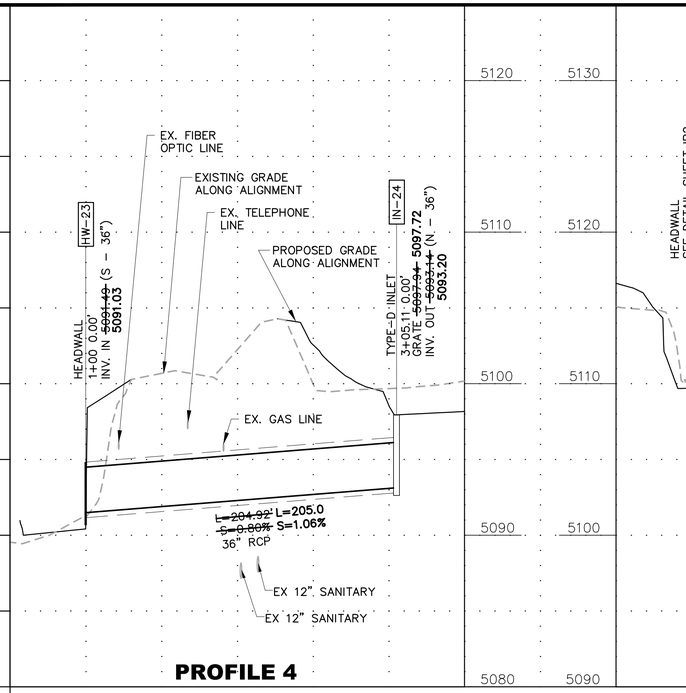

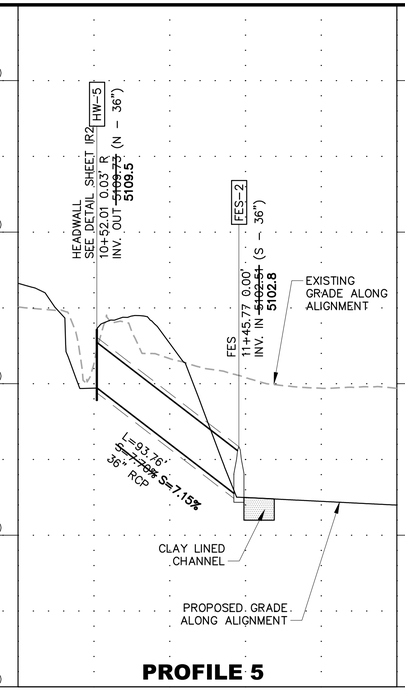

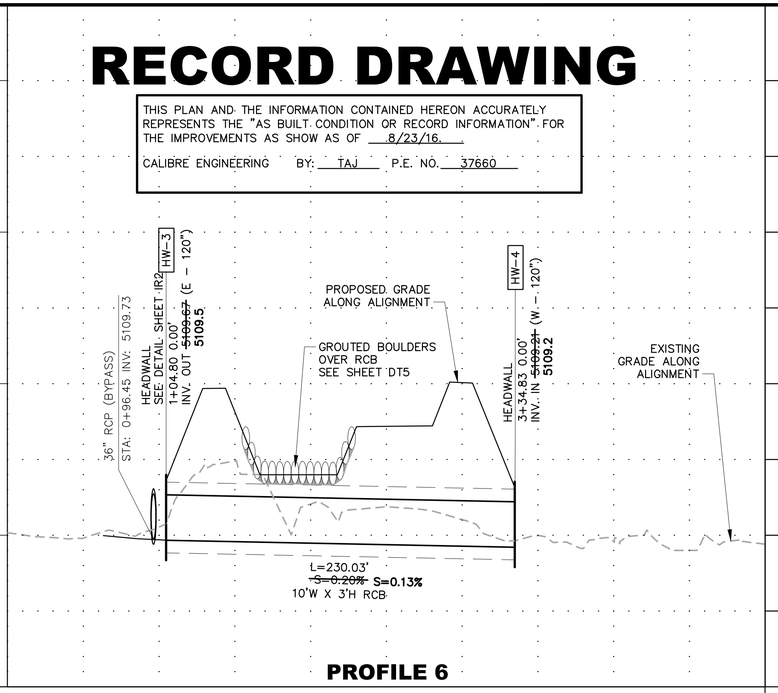

RECORD DRAWING

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CALIBRE ENGINEERING BY: TAJ P.E. NO. 37660

6		
5		
4		
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2		
3/31/16	1	APPROVED FOR CONSTRUCTION
DATE		REVISION DESCRIPTION

Hines

Drawing Name: 101IR1.dwg	0 25 50 100		
Job Number: WORTH FLATIRON	1 inch = 50 ft. Horizontal 1 inch = 5 ft. Vertical		
Prepared For: HT FLATIRON LP	Designer: KLH	Drafter: KLH	Checked: TAJ

COLORADO LICENSED 37660 03-31-16 PROFESSIONAL ENGINEER

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FLATIRON MEADOWS
REGIONAL DETENTION POND IMPROVEMENT PLANS
IRRIGATION PLAN & PROFILE

Sheet IR1 16 of 29

Date MARCH 31, 2016

PATH: P:\WORTH FLATIRON\CADD\CIVIL\101 REGIONAL POND - AS BUILTS\101IR1.DWG
PLOTTED BY: Lorraine Aliff PLOT DATE: 8/23/2016 4:20 PM
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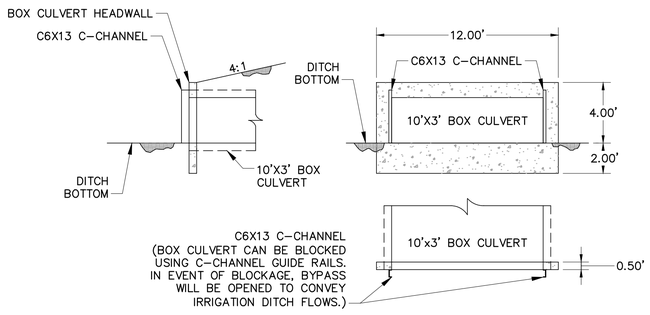
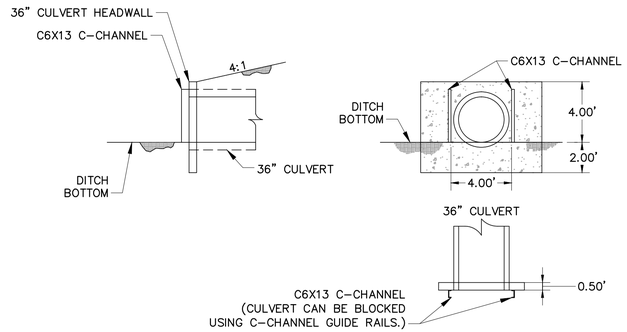
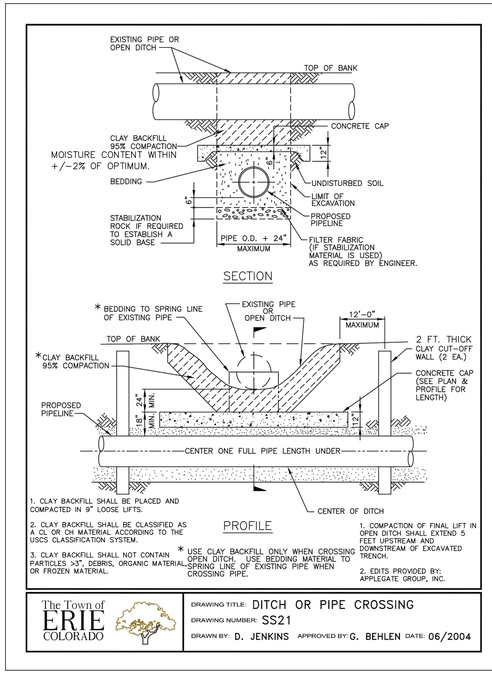


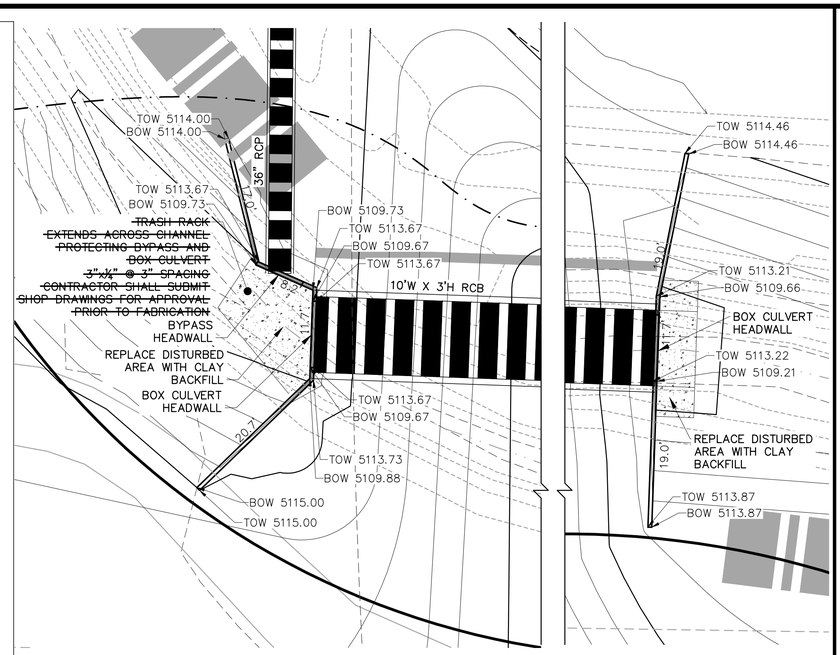
BOX CULVERT HEADWALL DETAILS



BYPASS HEADWALL DETAILS

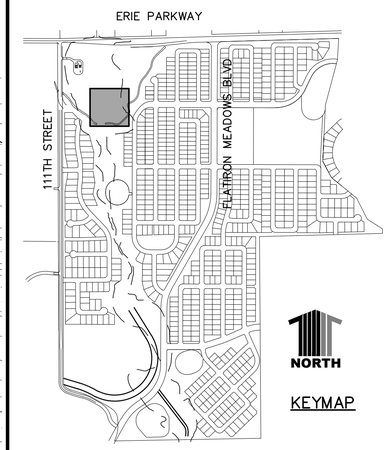


IRRIGATION CHANNEL DETAILS



0 5 10 20
1 inch = 10 ft. Horizontal

NORTH



KEYMAP

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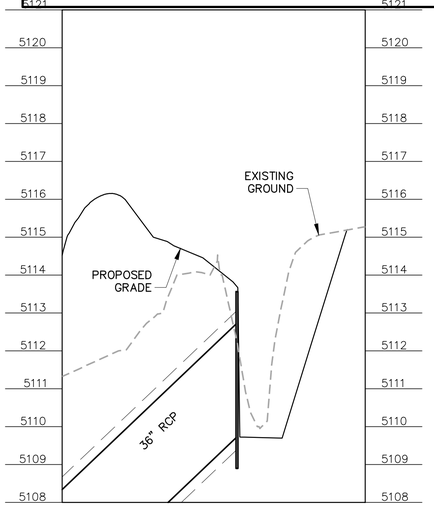
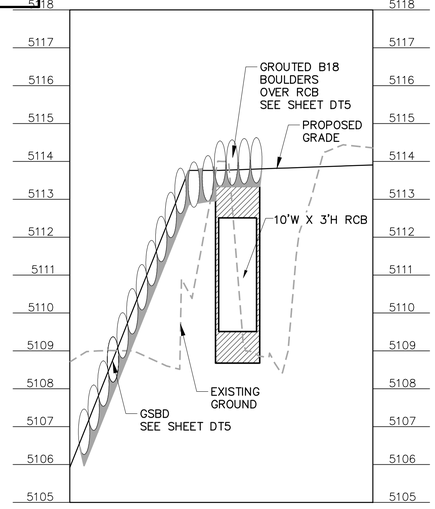
CALIBRE ENGINEERING BY: TAJ P.E. NO. 37660

IRRIGATION CROSS-SECTIONS

1" = 2' VERTICAL
1" = 20" HORIZONTAL



SECTION A-A



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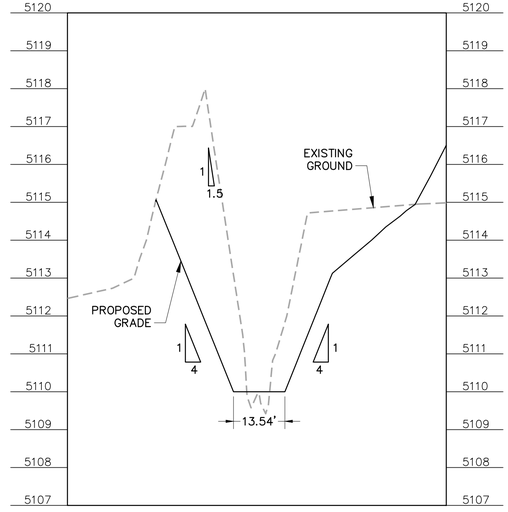
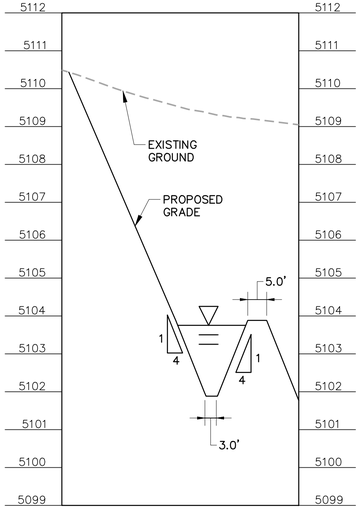


SECTION C-C



SECTION D-D
IRRIGATION BYPASS SWALE

DATE	REVISION DESCRIPTION
6	
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2	
3/31/16	1 APPROVED FOR CONSTRUCTION

Hines

Drawing Name: 101IR1.dwg
Job Number: WORTH FLATIRON
Prepared For: HT FLATIRON LP

Designer	Drafter	Checked
KLH	KLH	BKM

COLORADO LICENSED 37660 03-31-16 PROFESSIONAL ENGINEER

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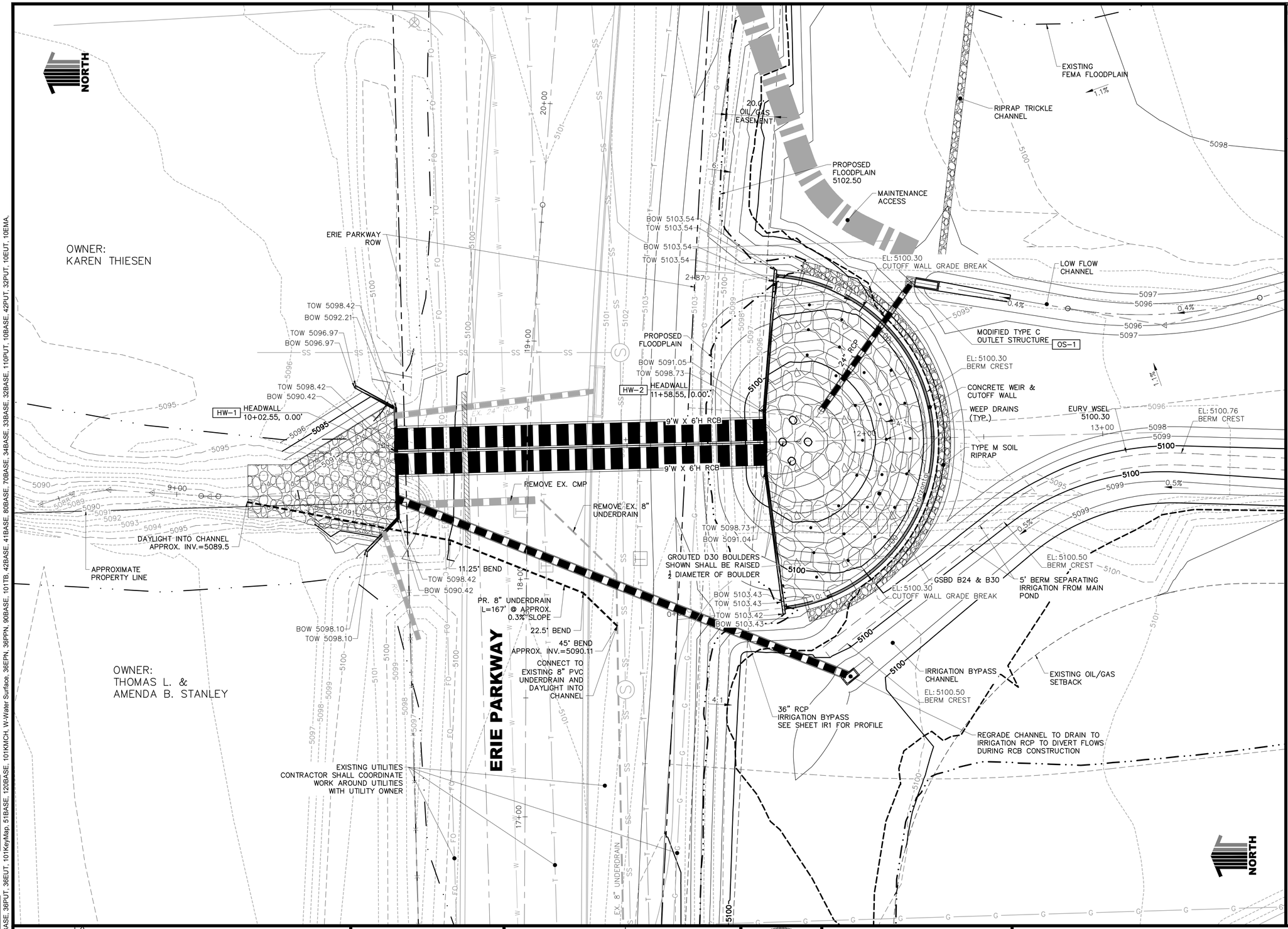
FLATIRON MEADOWS
REGIONAL DETENTION POND IMPROVEMENT PLANS
IRRIGATION SECTIONS & DETAILS

Sheet IR2 17 of 29
Date MARCH 31, 2016

PATH: P:\WORTH FLATIRON\CADD\CIVIL\101 REGIONAL POND - AS BUILTS\101IR1.DWG
PLOTTED BY: Lorraine Aliff PLOT DATE: 8/23/2016 4:21 PM
XREFS: 52BASE, 60BASE, 51BASE, 120BASE, 101KMIR, 110PUT, 101TB, 10EUT, 10EMA, 10EPN, 10BASE, 42BASE, 101KMIR, 110PUT, 101TB, 10EUT, 10EMA, 10EPN, 90BASE, 41PPN, 52PPN, W-Water Surface, 101KeyMap, 101IR1 SE, 80BASE, 70BASE, 34BASE, 33BASE, 32BASE, 10BASE, 4



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7. 'BOW' INDICATES FINISHED GRADE ELEVATION AT BOTTOM OF WALL.

CONSTRUCTION NOTES:

1. BOX CULVERT WILL BE PHASED. NORTH HALF WILL BE CONSTRUCTED AND THE TRAFFIC WILL BE DETOURED ON THE SOUTH SIDE OF ERIE PARKWAY. TRAFFIC WILL THEN BE MOVED TO THE NORTH SIDE OF THE ROAD AND THE SOUTHERN HALF OF THE CULVERTS WILL BE CONSTRUCTED.
2. CONTRACTOR TO POTHOLE EXISTING UTILITIES TO DETERMINE DEPTH PRIOR TO BEGINNING OF CONSTRUCTION.
3. CONTRACTOR TO COORDINATE DRY UTILITY LOWERINGS WITH DETOUR AND CULVERT CONSTRUCTION.
4. THE URBAN DRAINAGE AND FLOOD CONTROL DISTRICT (UDFCD) MAY CONDUCT SITE VISITS DURING PROJECT CONSTRUCTION WITHIN OR NEAR THE CHANNEL TO OBSERVE CONSTRUCTION FOR CONFORMANCE WITH THE APPROVED PLANS AND SPECIFICATIONS. THE UDFCD CONSTRUCTION MANAGER SHOULD ATTEND THE PRE-CONSTRUCTION MEETING FOR THE PROJECT. ALL GROUTED BOULDER INSTALLATIONS MUST HAVE A SUBGRADE INSPECTION PRIOR TO BOULDER PLACEMENT AND A PRE-GROUT INSPECTION. COORDINATION WITH UDFCD CONSTRUCTION MANAGER IS REQUIRED 48 HOURS PRIOR TO ANY CONSTRUCTION AND AHEAD OF ANY GROUT OPERATIONS. CONTACT MIKE SARMENTO, UDFCD CONSTRUCTION MANAGER, 303-455-6277, MSARMENTO@UDFCD.ORG
5. SEE GEOTECHNICAL INVESTIGATION, FLATIRON MEADOWS SUBDIVISION, REGIONAL POND AND CULVERT IMPROVEMENTS BY CTL THOMPSON, REVISED NOVEMBER 6, 2015 FOR GUIDANCE REGARDING BOX CULVERT BEDDING, DROP STRUCTURE CONSIDERATIONS AND BOX CULVERT AND WINGWALL FOUNDATIONS.

GSBD KEY NOTES

(A)	BEGIN DROP APPROACH	(D)	DROP TOE
(B)	DROP CREST	(E)	END SILL
(C)	MID DROP	(F)	CHANNEL SECTION

UNCC
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OR
1-800-922-1987
Utility Notification
Center of Colorado

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1	APPROVED FOR CONSTRUCTION	3/31/16
	REVISION DESCRIPTION	DATE

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Drawing Name: 101DT1.dwg
Job Number: WORTH FLATIRON
Prepared For: HT FLATIRON LP
0 10 20 40
1 inch = 20 ft. Horizontal
Designer: KLH | Drafter: KLH | Checked: TAJ

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FLATIRON MEADOWS
REGIONAL DETENTION POND IMPROVEMENT PLANS
ERIE PKWY RCB & POND OUTFALL PLAN

Sheet: DT1 | 18 of 29
Date: MARCH 31, 2016

PATH: P:\WORTH FLATIRON\CADD\CIVIL\101 REGIONAL POND - AS BUILTS\101DT1.DWG
PLOTTED BY: Lorraine Aliff PLOT DATE: 8/23/2016 4:25 PM
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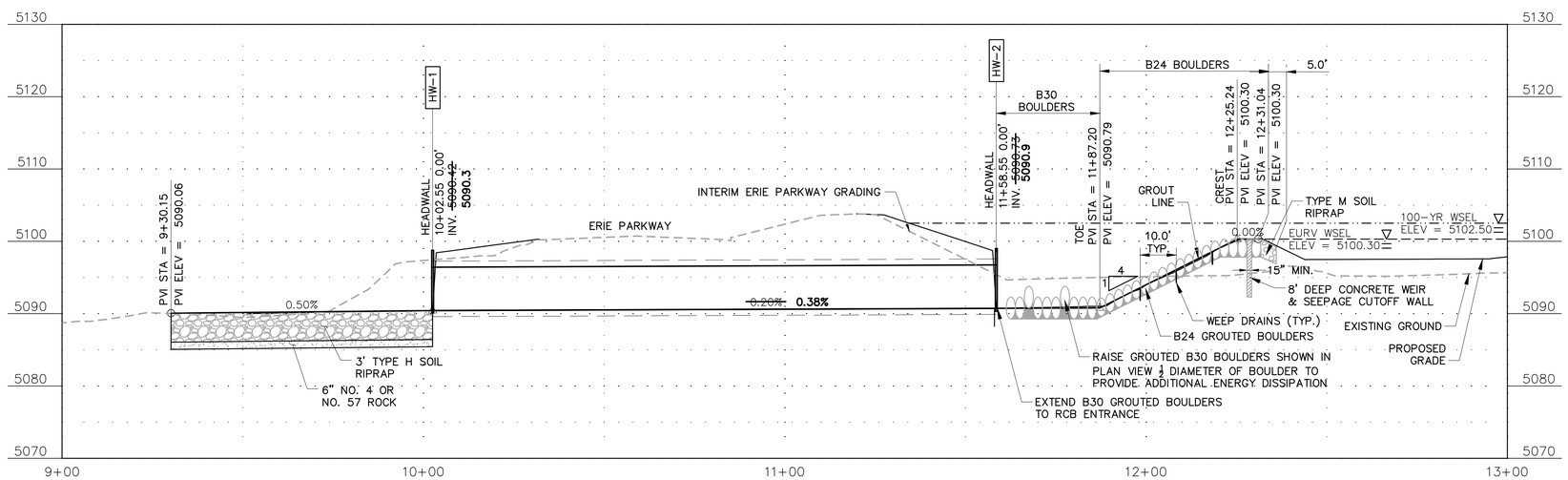


ERIE PKWY RCB & GSBD PROFILE

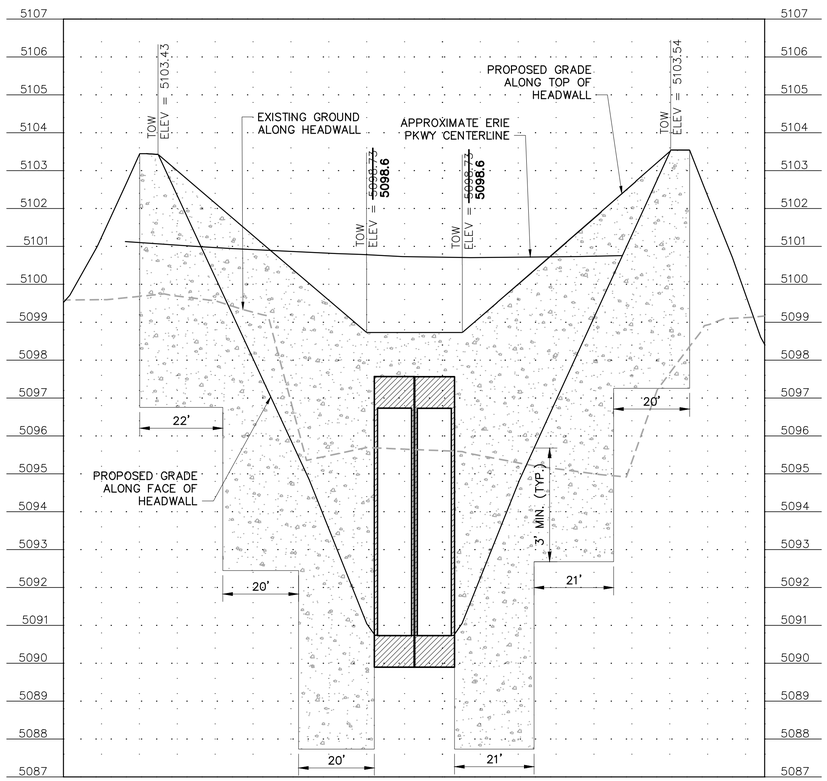
NOTES:
SEE SHEET DT6 FOR FOLLOWING DETAILS:
- FIG. 9-7 SHEET PILE CUTOFF WALL UPSTREAM OF DROP
- FIG. 9-8 SHEET PILE CUTOFF WALL CONNECTIONS BETWEEN BOULDERS
- FIG. 9-9 CONCRETE OR GROUT CUTOFF WALL UPSTREAM OF DROP
- FIG. 9-10 WEEP DRAINS
- FIG. 9-15 GROUTED BOULDER PLACEMENT DETAIL
- FIG. 9-22 EDGE WALL DETAIL

- 27 TOTAL WEEP DRAINS ARE PROVIDED FOR GSBD

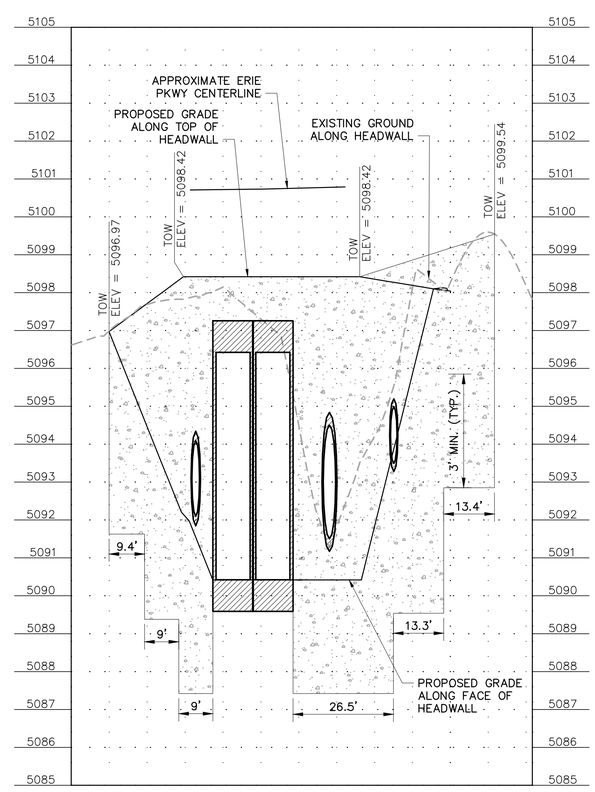
RECORD DRAWING

THIS PLAN AND THE INFORMATION CONTAINED HEREON ACCURATELY REPRESENTS THE "AS BUILT CONDITION OR RECORD INFORMATION" FOR THE IMPROVEMENTS AS SHOW AS OF 8/23/16.

CALIBRE ENGINEERING BY: TAJ P.E. NO. 37660



HEADWALL 2



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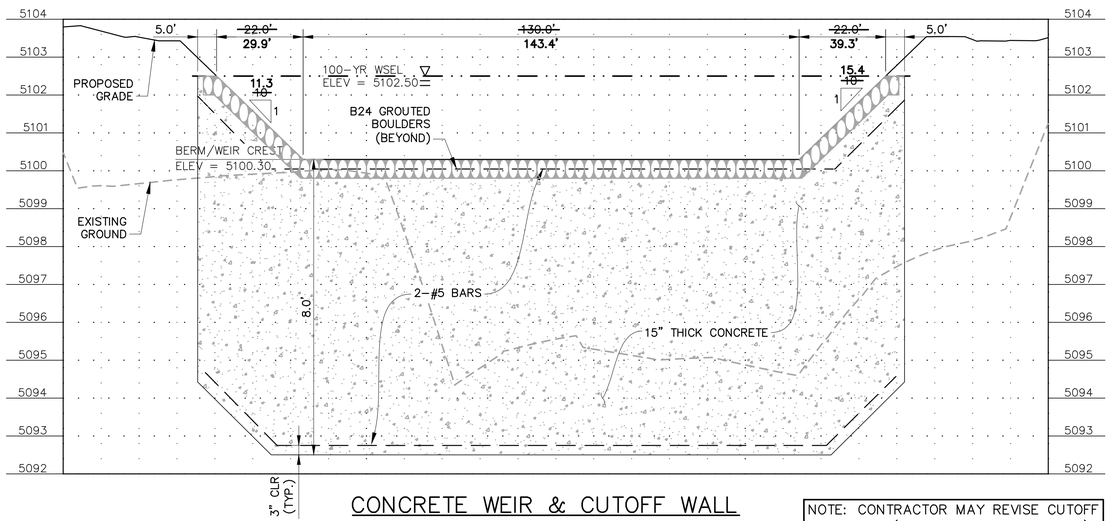

CONCRETE WEIR & CUTOFF WALL 100-YR CONTROL STRUCTURE

NOTE: CONTRACTOR MAY REVISE CUTOFF WALL TYPE (CONCRETE OR SHEET PILE) BASED ON SOIL CONDITIONS AT TIME OF CONSTRUCTION.

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3/31/16	1	APPROVED FOR CONSTRUCTION
DATE		REVISION DESCRIPTION

Hines

Drawing Name: 101DT1.dwg
Job Number: WORTH FLATIRON
Prepared For: HT FLATIRON LP
Designer: KLH | Drafter: | Checked: TAJ

1 inch = 20 ft. Horizontal (0, 10, 20, 40)

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FLATIRON MEADOWS
REGIONAL DETENTION POND IMPROVEMENT PLANS
ERIE PKWY RCB & GSBD 1 DETAILS

Sheet: DT2 — 19 of 29
Date: MARCH 31, 2016

PATH: P:\WORTH FLATIRON\CADD\CIVIL\101 REGIONAL POND - AS BUILTS\101DT1.DWG
PLOTTED BY: Lorraine Aiff PLOT DATE: 8/23/2016 4:25 PM
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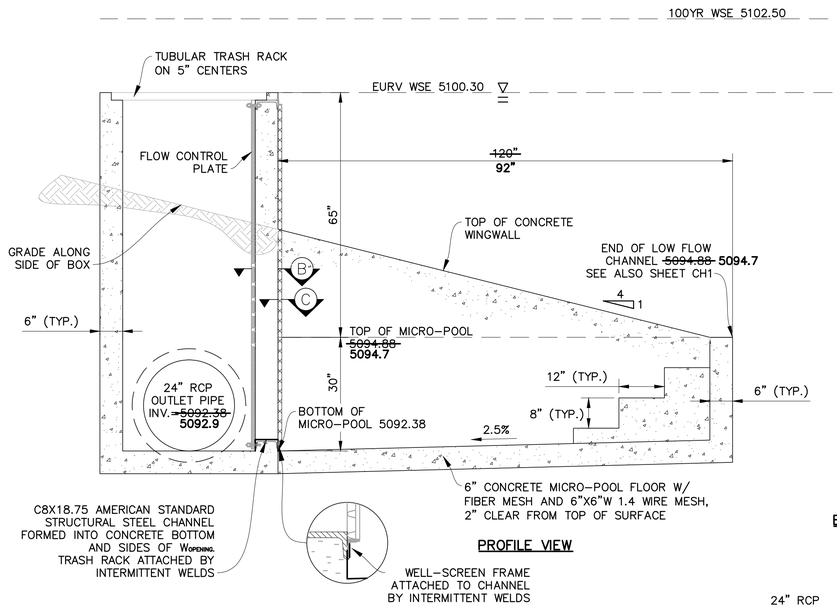
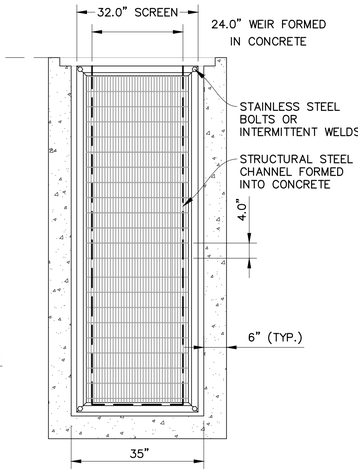
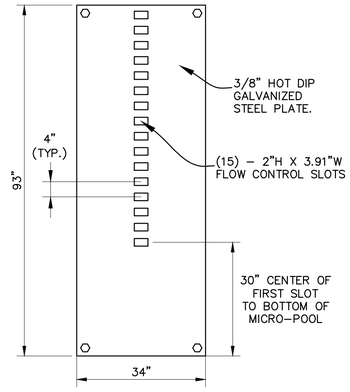


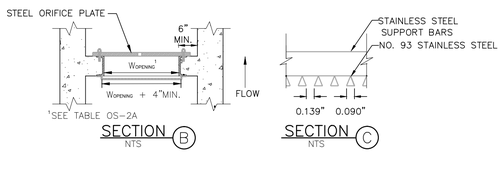
PROFILE VIEW



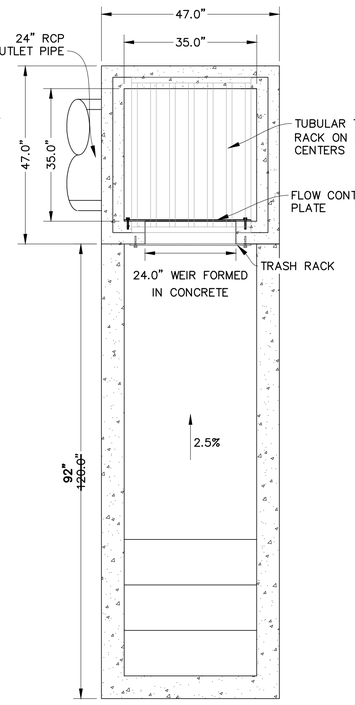
ELEVATION VIEW – FRONT FACE



EURV FLOW CONTROL PLATE DETAIL



R VALUE = (NET OPEN AREA)/(GROSS RACK AREA) = 0.60



TOP VIEW

ORIFICE PLATE AND TRASH RACK NOTES

ORIFICE PLATE NOTES:

1. MINIMIZE THE NUMBER OF COLUMNS.
2. PROVIDE CONTINUOUS NEOPRENE GASKET MATERIAL BETWEEN THE ORIFICE PLATE AND CONCRETE.

EURV AND WQCV TRASH RACKS:

1. WELL-SCREEN TRASH RACKS SHALL BE STAINLESS STEEL AND SHALL BE ATTACHED BY INTERMITTENT WELDS ALONG THE EDGE OF THE MOUNTING FRAME.
2. BAR GRATE TRASH RACKS SHALL BE ALUMINUM AND SHALL BE BOLTED USING STAINLESS STEEL HARDWARE.
3. TRASH RACK WIDTHS PROVIDED IN TABLE OS-2A AND OS-3A ARE FOR SPECIFIED TRASH RACK MATERIAL AND NEED TO BE ADJUSTED FOR MATERIALS HAVING A DIFFERENT OPEN AREA/GROSS AREA RATIO (R VALUE)
4. STRUCTURAL DESIGN OF TRASH RACKS SHALL BE BASED ON FULL HYDROSTATIC HEAD WITH ZERO HEAD DOWNSTREAM OF THE RACK.

OVERFLOW TRASH RACKS:

1. ALL TRASH RACKS SHALL BE MOUNTED USING STAINLESS STEEL HARDWARE AND PROVIDED WITH HINGED AND LOCKABLE OR BOLTABLE ACCESS PANELS.
2. TRASH RACKS SHALL BE STAINLESS STEEL, ALUMINUM, OR STEEL. STEEL TRASH RACKS SHALL BE HOT DIP GALVANIZED AND MAY BE HOT POWDER COATED AFTER GALVANIZING.
3. TRASH RACKS SHALL BE DESIGNED SUCH THAT THE DIAGONAL DIMENSION OF EACH OPENING IS SMALLER THAN THE DIAMETER OF THE OUTLET PIPE.
4. STRUCTURAL DESIGN OF TRASH RACKS SHALL BE BASED ON FULL HYDROSTATIC HEAD WITH ZERO HEAD DOWNSTREAM OF THE RACK.

POND 1029 EURV CONTROL STRUCTURE
MODIFIED TYPE C INLET

RECORD DRAWING

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1	APPROVED FOR CONSTRUCTION	3/31/16
	REVISION DESCRIPTION	DATE

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Drawing Name: 101DT1.dwg
Job Number: WORTH FLATIRON
Prepared For: HT FLATIRON LP
Designer: KLH | Drafter: | Checked: TAJ

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FLATIRON MEADOWS
REGIONAL DETENTION POND IMPROVEMENT PLANS
POND OUTFALL DETAILS

Sheet DT3 20 of 29
Date MARCH 31, 2016

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PLOTTED BY: Lorraine Aiff PLOT DATE: 8/23/2016 4:26 PM
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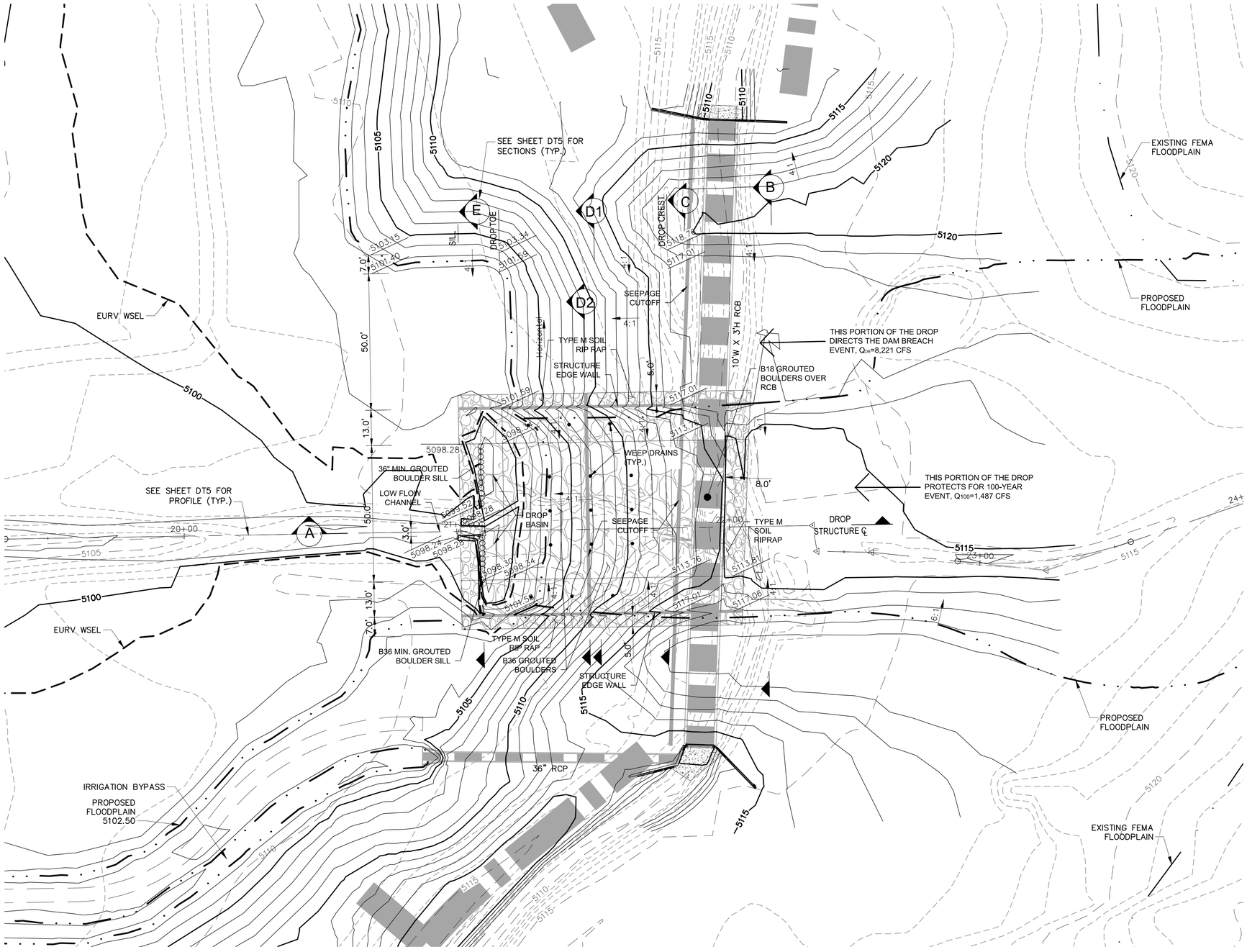

DROP STRUCTURE PLAN

NOTES:
SEE SHEET DT6 FOR FOLLOWING DETAILS:

- FIG. 9–7 SHEET PILE CUTOFF WALL UPSTREAM OF DROP
- FIG. 9–8 SHEET PILE CUTOFF WALL CONNECTIONS BETWEEN BOULDERS
- FIG. 9–9 CONCRETE OR GROUT CUTOFF WALL UPSTREAM OF DROP
- FIG. 9–10 WEEP DRAINS
- FIG. 9–15 GROUTED BOULDER PLACEMENT DETAIL
- FIG. 9–22 EDGE WALL DETAIL

- GRANULAR BEDDING SHALL NOT BE USED BENEATH THE IRRIGATION RCB, SUCH MATERIAL CAN FACILITATE SUBSURFACE FLOW AND COMPROMISE THE SEEPAGE CUTOFF FOR THE DROP STRUCTURE
- 15 TOTAL WEEP DRAINS ARE PROVIDED FOR GSBD

DATE	REVISION DESCRIPTION
3/31/16	1 APPROVED FOR CONSTRUCTION

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Drawing Name: 101DT4.dwg
Job Number: WORTH FLATIRON
Prepared For: HT FLATIRON LP
Designer: BKM | Drafter: BKM | Checked: TAJ
0 10 20 40
1 inch = 20 ft. Horizontal

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FLATIRON MEADOWS
REGIONAL DETENTION POND IMPROVEMENT PLANS
GSBD 2 DETAILS

Sheet DT4 21 of 29
Date MARCH 31, 2016

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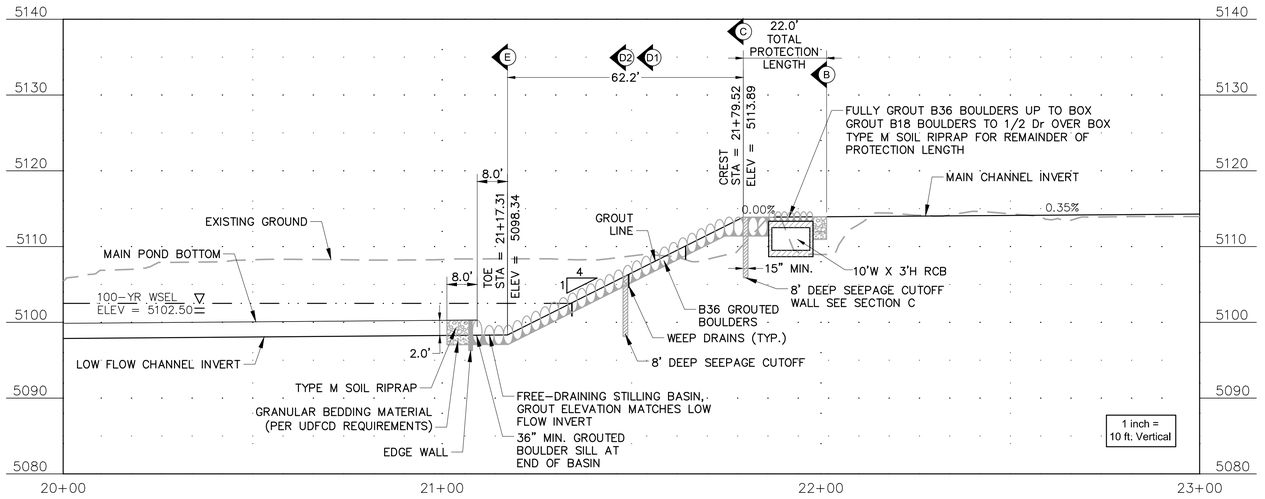
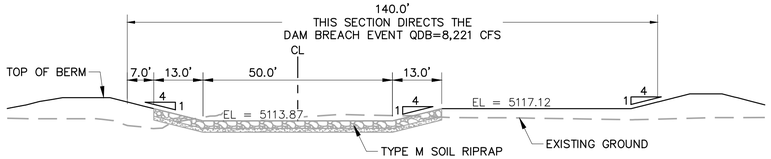


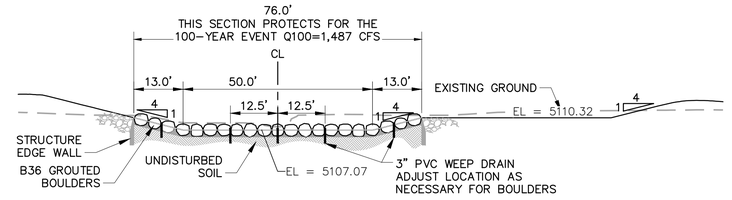
SECTION A
DROP STRUCTURE PROFILE

NOTES:
SEE SHEET DT6 FOR FOLLOWING DETAILS:
- FIG. 9-7 SHEET PILE CUTOFF WALL UPSTREAM OF DROP
- FIG. 9-8 SHEET PILE CUTOFF WALL CONNECTIONS BETWEEN BOULDERS
- FIG. 9-9 CONCRETE OR GROUT CUTOFF WALL UPSTREAM OF DROP
- FIG. 9-10 WEEP DRAINS
- FIG. 9-15 GROUTED BOULDER PLACEMENT DETAIL
- FIG. 9-22 EDGE WALL DETAIL

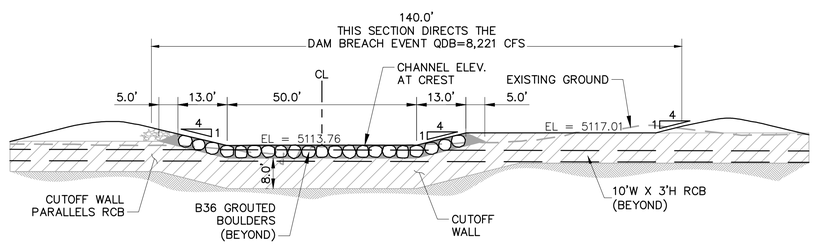
- GRANULAR BEDDING SHALL NOT BE USED BENEATH THE IRRIGATION RCB, SUCH MATERIAL CAN FACILITATE SUBSURFACE FLOW AND COMPROMISE THE SEEPAGE CUTOFF FOR THE DROP STRUCTURE
- 15 TOTAL WEEP DRAINS ARE PROVIDED FOR GSBD



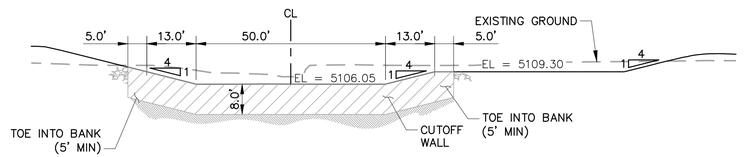
SECTION B
CHANNEL SECTION (UPSTREAM OF DROP)



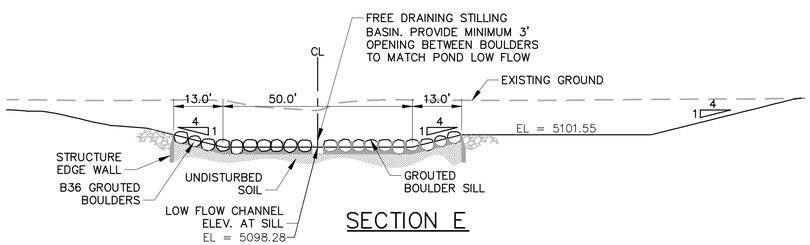
SECTION D1
DROP FACE SECTION



SECTION C
CUTOFF WALL SECTION



SECTION D2
MID-DROP CUTOFF WALL



SECTION E
DROP BASIN SECTION AND SILL

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3/31/16	1	APPROVED FOR CONSTRUCTION
DATE		REVISION DESCRIPTION

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Drawing Name: 101DT4.dwg			
Job Number: WORTH FLATIRON			
Prepared For: HT FLATIRON LP	Designer: BKM	Drafter: BKM	Checked: TAJ

0 10 20 40
1 inch = 20 ft. Horizontal

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37660
03-31-16
PROFESSIONAL ENGINEER

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REGIONAL DETENTION POND IMPROVEMENT PLANS
GSBD 2 DETAILS

Sheet DT5 22 of 29
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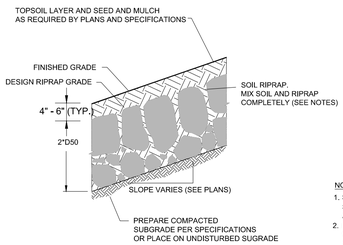
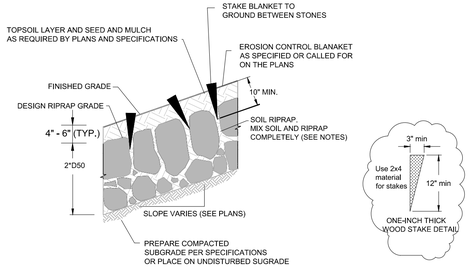
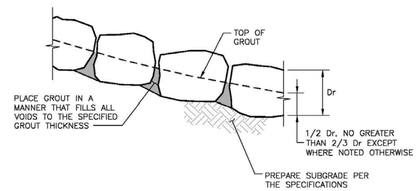


TYPICAL SECTION -
SOIL RIPRAP WITH MUCLH

NOTES:
1. SOIL RIPRAP DETAILS ARE APPLICABLE TO SLOPED AREAS. REFER TO THE SITE PLAN ACTUAL LOCATION AND LIMITS.
2. MIX UNIFORM ALLY 65% RIPRAP BY VOLUME WITH 35% OF APPROVED SOIL BY VOLUME PRIOR TO PLACEMENT.
3. PLACE STONE-SOIL MIX TO RESULT IN SECURELY INTERLOCKED ROCK AT THE DESIGN THICKNESS AND GRADE. COMPACT AND LEVEL TO ELIMINATE ALL VOIDS AND ROCKS PROJECTING ABOVE DESIGN RIPRAP TOP GRADE.
4. CRIMP OR TACKIFY MULCH OR USE APPROVED HYDROMULCH AS CALLED FOR IN THE PLANS AND SPECIFICATIONS.



TYPICAL SECTION -
SOIL RIPRAP WITH EROSION CONTROL FABRIC

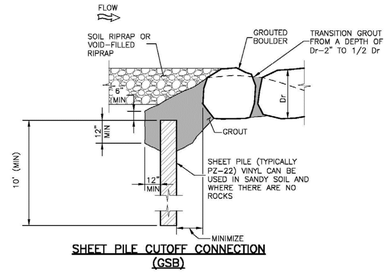


BOULDER PLACEMENT NOTES:
1. PLACE BOULDERS WITH THE REQUIRED BOULDER HEIGHT VERTICAL. PLACE BOULDERS AS TIGHTLY TOGETHER AS POSSIBLE (WITHOUT TOUCHING) WHILE PROVIDING ENOUGH ROOM BETWEEN THEM TO THOROUGHLY VIBRATE THE GROUT AND TO ENSURE NO GAPS IN THE GROUT. THE SMALL DIMENSION OF A 2X4 CAN BE USED AS A GUIDE TO CHECK MINIMUM SPACING.
2. BEFORE GROUTING, CLEAN ALL DIRT AND MATERIAL FROM ROCK THAT COULD PREVENT THE GROUT FROM BINDING TO THE ROCK. KEEP BOULDERS FROM TOUCHING. AVOID SLIDING BOULDERS AGAINST SUBGRADE TO PROPERLY POSITION.

MATERIAL SPECIFICATIONS:
1. ALL GROUT SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH EQUAL TO 3200 PSI.
2. ONE CUBIC YARD OF GROUT SHALL HAVE A MINIMUM OF SIX (6) SACKS OF TYPE II PORTLAND CEMENT.
3. A MAXIMUM OF 25% TYPE F FLY ASH MAY BE SUBSTITUTED FOR THE PORTLAND CEMENT.
4. THE AGGREGATE SHALL BE COMPRISED OF 70% NATURAL SAND (FINES) AND 30% ⅜-INCH ROCK (COARSE).
5. THE GROUT SLUMP SHALL BE BETWEEN 4-INCHES TO 6-INCHES.
6. AIR ENTRAINMENT SHALL BE BETWEEN 5.5% AND 7.5%.
7. TO CONTROL SHRINKAGE AND CRACKING, 1.5 POUNDS OF FIBERMESH, OR EQUIVALENT, SHALL BE USED PER CUBIC YARD OF GROUT.
8. COLOR ADDITIVE IN REQUIRED AMOUNTS SHALL BE USED WHEN SO SPECIFIED BY CONTRACT.

GROUT PLACEMENT SPECIFICATIONS:
1. SPECIAL PROCEDURES SHALL BE REQUIRED FOR GROUT PLACEMENT WHEN THE AIR TEMPERATURES ARE LESS THAN 40°F OR GREATER THAN 90°F. CONTRACTOR SHALL OBTAIN PRIOR APPROVAL FROM THE DESIGN ENGINEER OF THE PROCEDURES TO BE USED FOR PROTECTING THE GROUT.
2. GROUT SHALL BE DELIVERED BY MEANS OF A LOW PRESSURE (LESS THAN 10 PSI) GROUT PUMP USING A 2-INCH DIAMETER (MAXIMUM) NOZZLE.
3. FULL DEPTH PENETRATION OF THE GROUT INTO THE BOULDER VOIDS SHALL BE ACHIEVED BY INJECTING GROUT STARTING WITH THE NOZZLE NEAR THE BOTTOM AND RAISING IT AS THE GROUT FILLS, WHILE VIBRATING GROUT INTO PLACE USING A PENCIL VIBRATOR.
4. ALL GROUT BETWEEN BOULDERS SHALL BE TREATED WITH A BROOM FINISH.
5. AFTER GROUT PLACEMENT, EXPOSED BOULDER FACES SHALL BE CLEANED AND FREE OF GROUT.
6. ALL FINISHED GROUT SURFACES SHALL BE SPRAYED WITH A CLEAR LIQUID MEMBRANE CURING COMPOUND AS SPECIFIED IN ASTM C309.

Figure 9-15. Grouted boulder placement detail



SHEET PILE CUTOFF CONNECTION
(GSB)

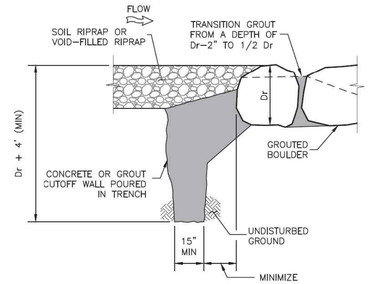
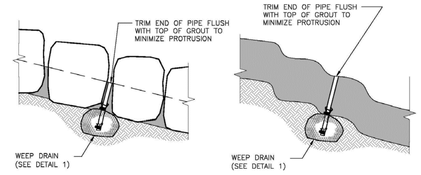
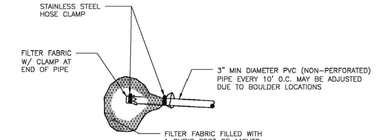


Figure 9-9. Concrete or grout cutoff wall upstream of drop

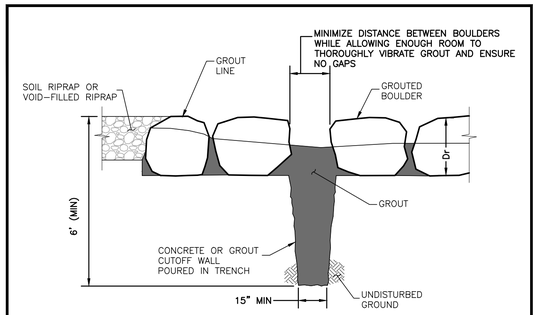


GROUTED BOULDERS | SCULPTED CONCRETE

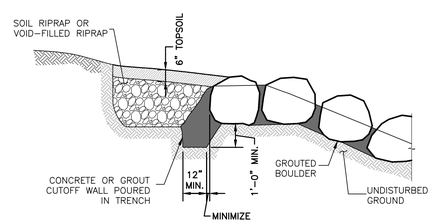


DETAIL
WEEP DRAIN (1)

NOTE: INSTALL WEEP DRAINS FOR DROPS AND WALLS 5' AND GREATER AT 10' O.C. AT ELEVATIONS AND LOCATIONS SHOWN ON THE DRAWINGS



GROUT WALL CONNECTION
TRENCHED VERTICAL WALL
BETWEEN BOULDERS



STRUCTURE EDGE WALL DETAIL (GSB)
NTS

GROUTED STEPPED BOULDER DROP NOTES:

GROUT
GROUT ALL BOULDERS TO A DEPTH OF ONE-HALF THEIR HEIGHT THROUGH THE APPROACH, SLOPING FACE, AND BASIN AREAS. GROUT SHOULD EXTEND NEAR FULL DEPTH OF THE ROCK AT THE UPSTREAM CREST AND AROUND THE PERIMETER OF THE STRUCTURE WHERE IT IS ADJOINING THE EARTH IN ORDER TO PROVIDE STABILITY OF THE APPROACH CHANNEL. SEE FIGURE 9-15 FOR GROUT PLACEMENT AND MATERIAL SPECIFICATIONS.

EDGE WALL
A WALL SHOULD BE CONSTRUCTED THAT EXTENDS ROUGHLY 3 FEET BELOW THE TOP SURFACE OF THE STRUCTURE AROUND THE ENTIRE PERIMETER OF THE GSB DROP STRUCTURE. SEE FIGURE 9-22 FOR AN EDGE WALL DETAIL. AN EDGE WALL IS ESPECIALLY NECESSARY FOR STRUCTURES DESIGNED TO CONVEY LESS THAN THE 100-YEAR FLOW BUT IS ALSO BENEFICIAL FOR STRUCTURES THAT DO SPAN THE 100-YEAR FLOW. THE TRANSITION BETWEEN SOIL AND THE GROUTED BOULDERS CAN BECOME A PROBLEM IF NOT PROPERLY ADDRESSED DURING DESIGN AND CONSTRUCTION. ENSURE COMPACTION AROUND THE PERIMETER OF THE STRUCTURE AND GRADE THIS AREA HIGHER THAN THE STRUCTURE TO PROMOTE SHEET FLOW ONTO THE STRUCTURE. IN ADDITION TO THE EDGE WALL, IN MOST CASES IT IS RECOMMENDED THAT BURIED RIPRAP BE INSTALLED AROUND THE PERIMETER OF THE STRUCTURE TO REDUCE THE POTENTIAL FOR EROSION.

BOULDER PLACEMENT
PLACE BOULDERS TO CREATE A STEPPED APPEARANCE, WHICH HELPS TO INCREASE ROUGHNESS.

CONSTRUCTION GUIDANCE
DURING PLACEMENT OF THE ROCK AND CONSTRUCTION IN GENERAL, DISTURB THE SUBGRADE AS LITTLE AS POSSIBLE TO REDUCE THE POTENTIAL FOR PIPING UNDER THE STRUCTURE. GOOD SUBGRADE PREPARATION, CAREFUL ROCK PLACEMENT, AND REMOVAL OF LOOSE MATERIALS WILL REDUCE POTENTIAL PIPING. ABSOLUTELY NO GRANULAR BEDDING (OR SUBGRADE FILL USING GRANULAR MATERIALS) SHOULD BE PLACED BETWEEN SUBGRADE AND THE BOULDERS. THIS CAN CAUSE PIPING. PLACE BOULDERS DIRECTLY ON UNDISTURBED SUBGRADE WHERE POSSIBLE. WHERE THE DESIGN REQUIRES OVER EXCAVATION AND/OR FILL OR WHERE WET OR POOR SUBGRADE EXISTS ONSITE, ENSURE PROPER DENSITY AND COMPACTION. SEE DIVISION 31 SPECIFICATIONS AVAILABLE AT WWW.UDFCD.ORG. WHEN FILL IS REQUIRED IT IS BEST TO FILL AND COMPACT TO A SET ELEVATION (OR SLOPED SURFACE) AND THEN "CARVE" THE SURFACE AS NECESSARY TO PLACE BOULDERS. SEE FIGURE 9-15 FOR A PLACEMENT DETAIL.

PROPER GROUT PLACEMENT IS NEEDED TO BOTH PROVIDE OVERALL MASS SUFFICIENT TO OFFSET UPLIFT AND REDUCE PIPING UNDER THE STRUCTURE. THE GREATEST RISK LIES WITH A "SUGAR-COATED" GROUT JOB, WHERE THE GROUT DOES NOT PENETRATE THE VOIDS FULLY BETWEEN THE ROCK AND THE SUBGRADE AND LEAVES VOIDS BELOW THE GROUT THAT ACT AS A DIRECT PIPING ROUTE FOR WATER, GUARANTEEING EARLY FAILURE. ENSURE GROUT THICKNESS SET AT ONE-HALF THE BOULDER HEIGHT, BUT NO MORE THAN TWO-THIRDS THE BOULDER HEIGHT (EXCEPT AT THE CREST AND AROUND THE PERIMETER OF THE STRUCTURE WHERE THE GROUT SHOULD BE NEAR GRADE). LIMITING GROUT THICKNESS ALSO IMPROVES THE OVERALL APPEARANCE OF THE GROUTED BOULDER STRUCTURE.

PROBLEMS WITH ROCK DENSITY, DURABILITY AND HARDNESS ARE OF CONCERN AND CAN VARY WIDELY FOR DIFFERENT LOCATIONS. THE ROCK SHOULD BE INSPECTED AT REGULAR INTERVALS TO MEET MINIMUM PHYSICAL DIMENSIONS, STRENGTHS, DURABILITY AND WEIGHTS AS DEFINED IN THE SPECIFICATIONS.

IT IS IMPORTANT TO COMPACT THE SOIL AROUND THE PERIMETER OF THE STRUCTURE AND LEAVE IT SLIGHTLY HIGHER THAN THE STRUCTURE TO PROMOTE SHEET FLOW ONTO THE STRUCTURE. IF THE SOIL SETTLES, SURFACE EROSION ALONG THE EDGE OF THE CONCRETE AND ULTIMATELY STRUCTURE PIPING MAY OCCUR.

NO.	DATE	REVISION DESCRIPTION
6		
5		
4		
3		
2		
1	3/31/16	APPROVED FOR CONSTRUCTION

Hines

Drawing Name: 101DT4.dwg
Job Number: WORTH FLATIRON
Prepared For: HT FLATIRON LP

0 — 1 inch = ft. Horizontal

Designer	Drafter	Checked
BKM	BKM	TAJ

COLORADO LICENSED PROFESSIONAL ENGINEER 37660 03-31-16

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Municipal Engineering Development Surveying

FLATIRON MEADOWS
REGIONAL DETENTION POND IMPROVEMENT PLANS
GSBD 2 DETAILS

Sheet DT6 — 23 of 29
Date: MARCH 31, 2016

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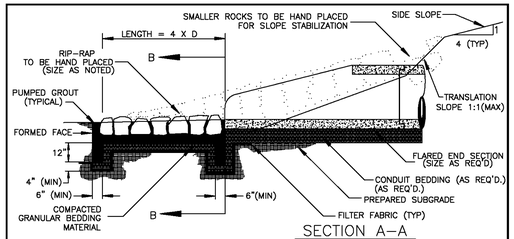
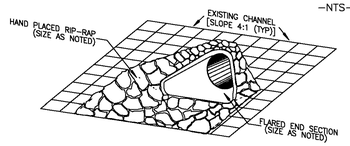


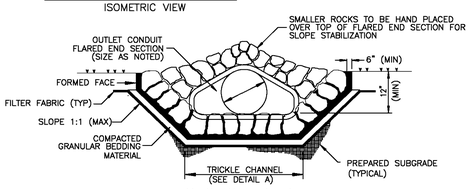
SECTION A–A

–NTS–



STORM SEWER OUTLET

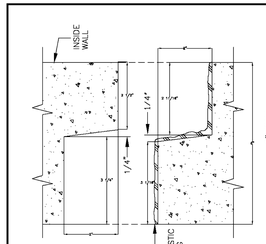
ISOMETRIC VIEW

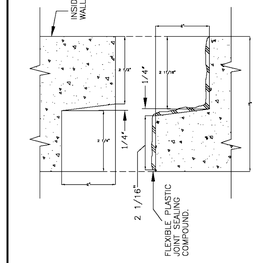


SECTION B–B

–NTS–

The Town of ERIE COLORADO	DRAWING TITLE: STORM SEWER OUTLET DRAWING NUMBER: STM2 DRAWN BY: D. JENKINS APPROVED BY: G. BEHLEN DATE: 06/2004





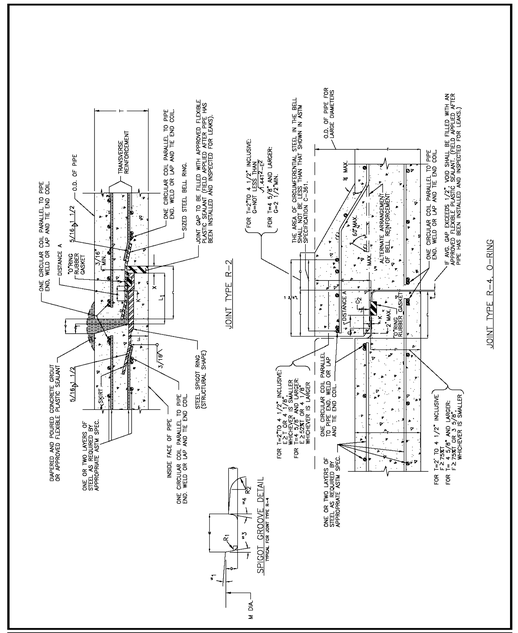
SHIPLAP JOINTS FOR REINFORCED CONCRETE PIPE

NO SCALE

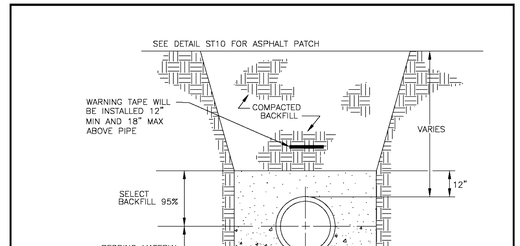
NOTES:

1. t = WALL THICKNESS OF PIPE FURNISHED.
2. THE CONCRETE SHALL CONFORM TO DIMENSIONS AND DIMENSIONS, REQUIRED BY THE SPECIFIC PIPE JOINT DETAILS SHOWN, TO THE ENGINEER PRIOR TO FABRICATION.
3. ALL DIMENSIONS SHALL BE GIVEN IN INCHES, UNLESS OTHERWISE NOTED, AND ARE FOR BELL AND SPIGOT IN CONCENTRIC POSITION. DEFLECTED PIPE JOINT TOLERANCES & DIMENSIONS SHALL ALSO BE FURNISHED.
4. JOINT CLEARANCE DIMENSION X IS AT CLOSEST POINT WITHIN DISTANCE A.
5. THESE JOINT CONFIGURATIONS ARE IN ACCORDANCE WITH BUREAU OF RECLAMATION'S "TYPE R" JOINT DETAILS.
6. RUBBER "O" RING GASKET SHALL BE IN CONFORMANCE W/ASTM C-443 OR C-361.
7. APPLICABLE CONCRETE PIPE JOINT SPECIFICATIONS:
   A. ASTM C-76
   B. ASTM C-361
8. STEEL REINFORCEMENT SHALL BE IN ACCORDANCE WITH THE APPROPRIATE ASTM SPECIFICATION FOR THE PIPE SIZE AND STRENGTH ISSUED ON CAD/PDMS DRAWINGS.

The Town of ERIE COLORADO	DRAWING TITLE: CONCRETE PIPE JOINTS – SHIPLAP DRAWING NUMBER: STM11A (1 OF 2) DRAWN BY: D. JENKINS APPROVED BY: G. BEHLEN DATE: 01/2012



The Town of ERIE COLORADO	DRAWING TITLE: CONCRETE PIPE JOINTS – TYPE "R" DRAWING NUMBER: STM11B (2 OF 2) DRAWN BY: D. JENKINS APPROVED BY: G. BEHLEN DATE: 01/2012

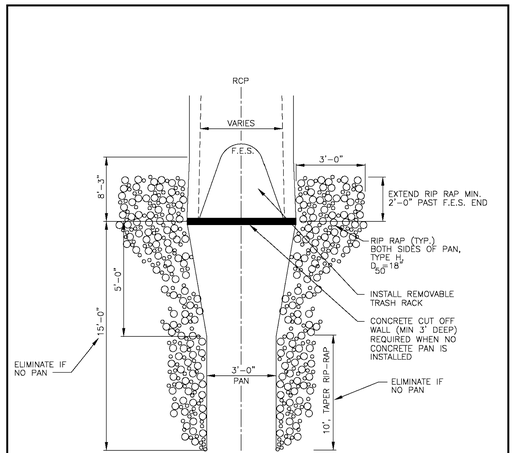


BEDDING MATERIAL GRADATION	
SIEVE SIZE	% BY WEIGHT
3/4"	90 – 100
3/8"	20 – 55
NO. 4	0 – 10
NO. 8	0 – 5

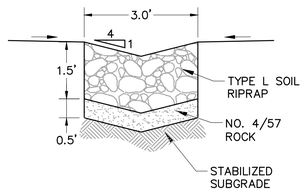
NOTES:

1. FULL TRENCH SECTION IN ROADWAY OR STREET R.O.W. LIMITS WILL REQUIRE 95% S.P.D. TRENCH ZONE ABOVE BEDDING MATERIALS, OUTSIDE OF STREET R.O.W. WILL REQUIRE 90% S.P.D.
2. FILTER FABRIC IS REQUIRED IF STABILIZATION MATERIAL IS USED. THE FABRIC SHALL BE INSTALLED AS SHOWN IN THE DETAIL.
3. TRENCH TO BE BRACED OR SHEETED AS NECESSARY FOR THE SAFETY OF THE WORKMEN AND PROTECTION OF OTHER UTILITIES IN ACCORDANCE WITH APPLICABLE LOCAL, STATE AND FEDERAL SAFETY REGULATIONS.
4. PIPE SHALL BE BEDDED FROM 6" BELOW THE BOTTOM OF THE PIPE TO THE HORIZONTAL CENTERLINE OF THE PIPE. SEE TABLE FOR BEDDING MATERIAL GRADATION.
5. TRENCH WIDTH SHALL NOT BE MORE THAN 24" NOR LESS THAN 12" WIDER THAN THE LARGEST OUTSIDE DIAMETER OF THE PIPE.
6. SHOULD THE TRENCH BE EXCAVATED WIDER THAN ALLOWED, A CONCRETE CRADLE SHALL BE PLACED WITH 2500 P.S.I. CONCRETE FROM TRENCH BOTTOM TO PIPE SPRINGLINE.

The Town of ERIE COLORADO	DRAWING TITLE: STORM SEWER TRENCH DETAIL DRAWING NUMBER: STM12 DRAWN BY: D. JENKINS APPROVED BY: G. BEHLEN REV. DATE: 01/2012

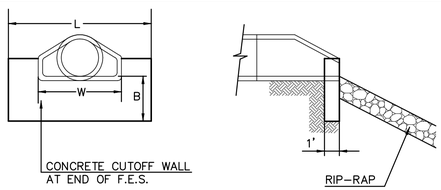


The Town of ERIE COLORADO	DRAWING TITLE: FLARED END SECTION RIPRAP DRAWING NUMBER: STM14 DRAWN BY: D. JENKINS APPROVED BY: G. BEHLEN DATE: 01/2012



RIPRAP TRICKLE CHANNEL SECTION

N.T.S.



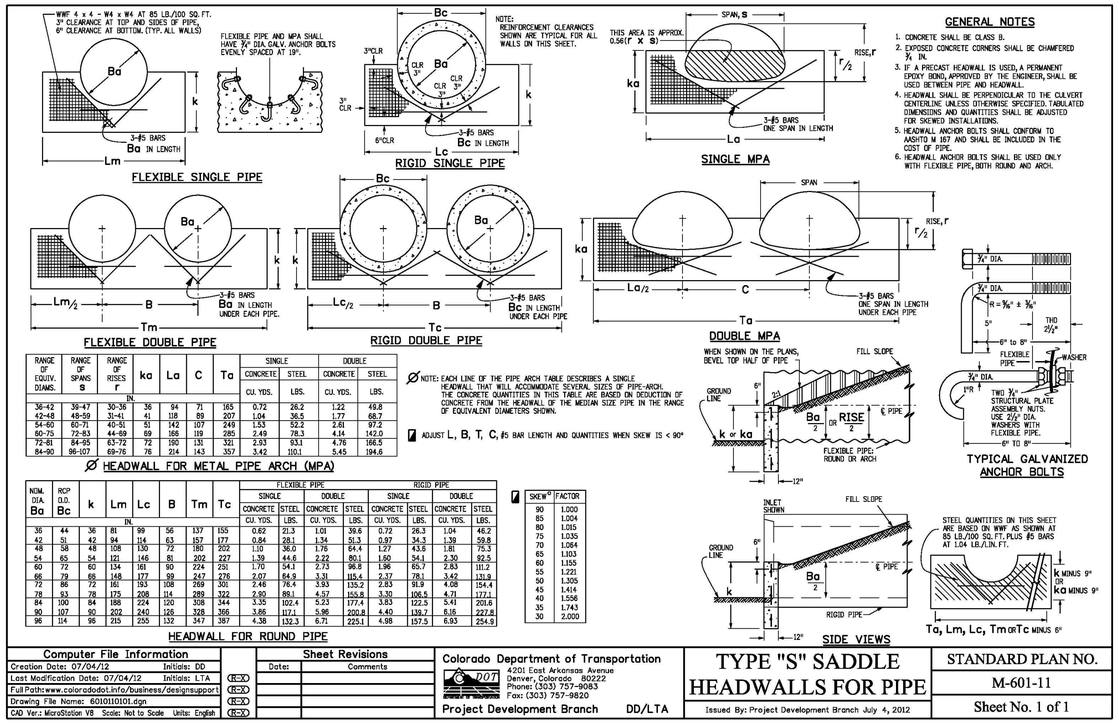
NOTE

1. SEE CDOT M-601-11 TYPE "S" SADDLE HEADWALLS FOR PIPE CULVERTS.
2. INCLUDE JOINT RESTRAINTS PER M-603-10.

CUT-OFF WALL DEPTHS			
	W (FT.)	B (FT.)	L (FT.)
60" RCP	8.83'	4.25'	22'
42" RCP	7.25'	3.50'	14'
18" RCP	3.00'	1.50'	6.50'
36" RCP	6.00'	3.00'	8.25'

CONCRETE CUTOFF WALL

N.T.S.



RANGE OF EQUIV. DIAMS.	RANGE OF SPANS s	RANGE OF RISES r	ka	La	C	Ta	SINGLE CONCRETE CU. YDS.	SINGLE STEEL LBS.	DOUBLE CONCRETE CU. YDS.	DOUBLE STEEL LBS.
IN.										
36-42	39-47	30-36	36	94	71	165	0.72	26.2	1.22	49.8
42-48	48-59	31-41	41	118	89	207	1.04	36.5	1.77	68.7
54-60	60-71	40-51	51	142	107	249	1.53	52.2	2.61	97.2
60-75	72-83	44-69	69	166	119	285	2.49	78.3	4.14	142.0
72-81	84-95	63-72	72	190	131	321	2.93	93.1	4.76	166.5
84-90	96-107	69-76	76	214	143	357	3.42	110.1	5.45	194.6

NOTE: EACH LINE OF THE PIPE ARCH TABLE DESCRIBES A SINGLE HEADWALL THAT WILL ACCOMMODATE SEVERAL SIZES OF PIPE-ARCH. THE CONCRETE QUANTITIES IN THIS TABLE ARE BASED ON DEDUCTION OF CONCRETE FROM THE HEADWALL OF THE MEDIAN SIZE PIPE IN THE RANGE OF EQUIVALENT DIAMETERS SHOWN.

ADJUST L, B, T, C, #5 BAR LENGTH AND QUANTITIES WHEN SKEW IS < 90°

NOM. DIA. Ba	RCP O.D. Bc	k	Lm	Lc	B	Tm	Tc	FLEXIBLE PIPE SINGLE CONCRETE CU. YDS.	FLEXIBLE PIPE SINGLE STEEL LBS.	FLEXIBLE PIPE DOUBLE CONCRETE CU. YDS.	FLEXIBLE PIPE DOUBLE STEEL LBS.	RIGID PIPE SINGLE CONCRETE CU. YDS.	RIGID PIPE SINGLE STEEL LBS.	RIGID PIPE DOUBLE CONCRETE CU. YDS.	RIGID PIPE DOUBLE STEEL LBS.
IN.															
36	44	36	81	99	56	137	155	0.62	21.3	1.01	39.6	0.72	26.3	1.04	46.2
42	51	42	94	114	63	157	177	0.84	28.1	1.34	51.3	0.97	34.3	1.39	59.8
48	58	48	108	130	72	180	202	1.10	36.0	1.76	64.4	1.27	43.6	1.81	75.3
54	65	54	121	146	81	202	227	1.39	44.6	2.22	80.1	1.60	54.1	2.30	92.5
60	72	60	134	161	90	224	251	1.70	54.1	2.73	98.8	1.96	65.7	2.83	111.2
66	79	66	148	177	99	247	276	2.07	64.9	3.31	115.4	2.37	78.1	3.42	131.9
72	86	72	161	193	108	269	301	2.46	76.4	3.93	135.2	2.83	91.9	4.08	154.4
78	93	78	175	208	114	289	322	2.90	89.1	4.57	155.8	3.30	106.5	4.71	177.1
84	100	84	188	224	120	308	344	3.35	102.4	5.23	177.4	3.83	122.5	5.41	201.6
90	107	90	202	240	126	328	366	3.86	117.1	5.96	200.8	4.40	139.7	6.16	227.8
96	114	96	215	255	132	347	387	4.38	132.3	6.71	225.1	4.98	157.5	6.83	254.9

SKEW°	FACTOR
90	1.000
85	1.004
80	1.015
75	1.035
70	1.064
65	1.103
60	1.155
55	1.221
50	1.305
45	1.414
40	1.556
35	1.743
30	2.000

GENERAL NOTES

1. CONCRETE SHALL BE CLASS B.
2. EXPOSED CONCRETE CORNERS SHALL BE CHAMFERED ¾ IN.
3. IF A PRECAST HEADWALL IS USED, A PERMANENT EPOXY BOND, APPROVED BY THE ENGINEER, SHALL BE USED BETWEEN PIPE AND HEADWALL.
4. HEADWALL SHALL BE PERPENDICULAR TO THE CULVERT CENTERLINE UNLESS OTHERWISE SPECIFIED. TABULATED DIMENSIONS AND QUANTITIES SHALL BE ADJUSTED FOR SKEWED INSTALLATIONS.
5. HEADWALL ANCHOR BOLTS SHALL CONFORM TO AASHTO M 167 AND SHALL BE INCLUDED IN THE COST OF PIPE.
6. HEADWALL ANCHOR BOLTS SHALL BE USED ONLY WITH FLEXIBLE PIPE, BOTH ROUND AND ARCH.

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Sheet Revisions	
Date:	Comments
	(REV)
	(REV)
	(REV)
	(REV)

Colorado Department of Transportation
4201 East Arkansas Avenue
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Fax: (303) 757-9820
Project Development Branch DD/LTA

TYPE "S" SADDLE HEADWALLS FOR PIPE

Issued By: Project Development Branch July 4, 2012

STANDARD PLAN NO. M-601-11

Sheet No. 1 of 1

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5		
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1	3/31/16	APPROVED FOR CONSTRUCTION
	DATE	REVISION DESCRIPTION

Hines

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Job Number: WORTH FLATIRON
Prepared For: HT FLATIRON LP
Designer: KLH | Drafter: KLH | Checked: TAJ

COLORADO LICENSED 37660 03-31-16 PROFESSIONAL ENGINEER

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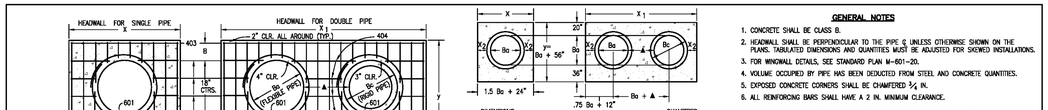
FLATIRON MEADOWS

REGIONAL DETENTION POND IMPROVEMENT PLANS

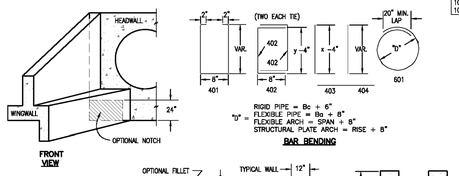
STORM DETAILS

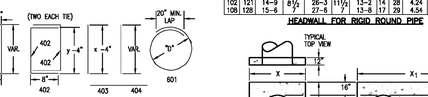
Sheet DT7 of 29

Date MARCH 31, 2016

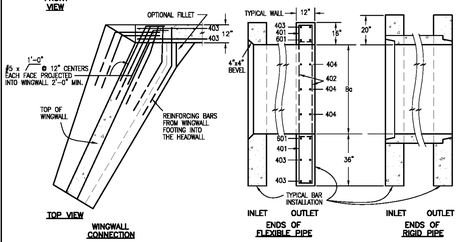


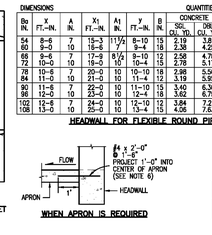
TYPICAL BAR LAYOUT FOR CONCRETE HEADWALLS





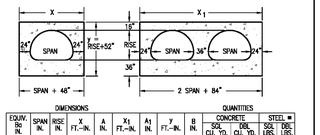
BAR BENDING





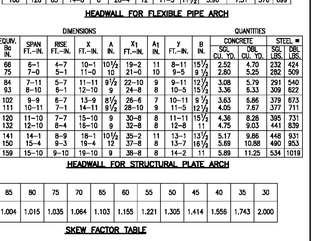
DIMENSIONS									QUANTITIES			
Bo IN.	Bc IN.	X FT.–IN.	A IN.	X_1 FT.–IN.	A_1 IN.	y FT.–IN.	B IN.	X_2 IN.	CONCRETE SQ. CU. YD.	CONCRETE DIR. CU. YD.	STEEL ■ SQ. LBS.	STEEL ■ DIR. LBS.
54	65	8–6	8½	15–6	7	9–2	17	20	2.12	3.55	208	364
60	72	9–6	9	17–0	10	9–8	11	21	2.35	3.99	236	414
66	79	10–6	11½	18–6	7	10–2	14	22	2.60	4.44	249	453
72	86	11–0	10	20–0	10	10–8	17	23	2.83	4.91	270	478
78	93	11–9	8½	21–3	11	11–2	11	24	3.11	5.29	306	527
84	100	12–6	7	22–6	7	11–8	14	25	3.38	5.68	333	572
90	107	13–3	11½	23–9	8½	12–2	17	26	3.66	6.08	335	593
96	114	14–0	10	25–0	10	12–8	11	27	3.84	6.48	379	649
102	121	14–9	8½	26–3	11½	13–2	14	28	4.24	6.89	400	664
108	128	15–8	7	27–6	7	13–8	17	29	4.54	7.30	424	707

HEADWALL FOR RIGID ROUND PIPE



DIMENSIONS										QUANTITIES			
Bo IN.	Bc IN.	X FT.–IN.	A IN.	X_1 FT.–IN.	A_1 IN.	y FT.–IN.	B IN.	X_2 IN.	X_3 IN.	CONCRETE SQ. CU. YD.	CONCRETE DIR. CU. YD.	STEEL ■ SQ. LBS.	STEEL ■ DIR. LBS.
54	65	8–6	7	15–3	11½	8–10	15	20	24	2.19	3.81	211	358
60	72	9–0	10	16–6	7	9–4	18	21	24	2.36	4.25	217	386
66	79	9–6	7	17–0	8½	9–10	12	22	24	2.58	4.70	252	454
72	86	10–0	10	19–0	10	10–4	15	23	24	2.78	5.17	255	472
78	93	10–6	7	20–0	10	10–10	18	24	24	2.98	5.56	276	499
84	100	11–0	10	21–0	10	11–4	12	25	24	3.19	5.95	297	553
90	107	11–6	7	22–0	10	11–10	15	26	24	3.40	6.36	317	517
96	114	12–0	10	23–0	10	12–4	18	27	24	3.62	6.79	321	597
102	121	12–6	7	24–0	10	12–10	12	28	24	3.84	7.21	364	663
108	128	13–0	10	25–0	10	13–4	15	29	24	4.06	7.63	362	678

HEADWALL FOR FLEXIBLE ROUND PIPE



DIMENSIONS									QUANTITIES			
Bo IN.	Bc IN.	X FT.–IN.	A IN.	X_1 FT.–IN.	A_1 IN.	y FT.–IN.	B IN.	X_2 IN.	CONCRETE SQ. CU. YD.	CONCRETE DIR. CU. YD.	STEEL ■ SQ. LBS.	STEEL ■ DIR. LBS.
54	65	8–6	7	15–3	11½	8–10	15	20	2.19	3.81	211	358
60	72	9–0	10	16–6	7	9–4	18	21	2.36	4.25	217	386
66	79	9–6	7	17–0	8½	9–10	12	22	2.58	4.70	252	454
72	86	10–0	10	19–0	10	10–4	15	23	2.78	5.17	255	472
78	93	10–6	7	20–0	10	10–10	18	24	2.98	5.56	276	499
84	100	11–0	10	21–0	10	11–4	12	25	3.19	5.95	297	553
90	107	11–6	7	22–0	10	11–10	15	26	3.40	6.36	317	517
96	114	12–0	10	23–0	10	12–4	18	27	3.62	6.79	321	597
102	121	12–6	7	24–0	10	12–10	12	28	3.84	7.21	364	663
108	128	13–0	10	25–0	10	13–4	15	29	4.06	7.63	362	678

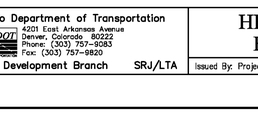
HEADWALL FOR FLEXIBLE PIPE ARCH

DIMENSIONS										QUANTITIES			
EQUIV. Bo IN.	SPAN IN.	RISE IN.	X FT.–IN.	A IN.	X_1 FT.–IN.	A_1 IN.	y FT.–IN.	B IN.	X_2 IN.	CONCRETE SQ. CU. YD.	CONCRETE DIR. CU. YD.	STEEL ■ SQ. LBS.	STEEL ■ DIR. LBS.
72	81	59	10–9	8½	20–6	7	9–3	17½	26	2.72	5.10	250	467
78	87	63	11–3	11½	21–6	7	9–7	10½	27	2.85	5.34	275	531
84	95	67	11–9	8½	22–10	9	9–11	17½	27	3.00	5.62	290	547
90	103	71	12–7	7½	24–2	11	10–3	15	30	3.30	6.21	321	591
96	112	75	13–4	12	25–8	8	10–7	16½	29	3.52	6.85	314	606
102	117	79	13–9	8½	25–6	7	10–11	9½	30	3.63	6.86	358	672
108	128	83	14–8	8	28–4	12	11–3	11½	30	3.96	7.51	376	699

HEADWALL FOR FLEXIBLE PIPE ARCH

DIMENSIONS										QUANTITIES			
EQUIV. Bo IN.	SPAN IN.	RISE IN.	X FT.–IN.	A IN.	X_1 FT.–IN.	A_1 IN.	y FT.–IN.	B IN.	X_2 IN.	CONCRETE SQ. CU. YD.	CONCRETE DIR. CU. YD.	STEEL ■ SQ. LBS.	STEEL ■ DIR. LBS.
66	74	51	9–11	10½	19–2	11	8–11	15½	25	2.52	4.70	232	424
75	7–0	5–1	11–0	10	21–0	10	9–5	9½	25	2.80	5.25	282	509
84	7–11	5–7	11–11	9½	22–10	9	9–11	12½	25	3.08	5.79	291	540
83	8–10	6–1	12–10	9	24–8	8	10–5	15½	25	3.36	6.33	309	622
102	9–9	6–7	13–9	8½	26–6	7	10–11	9½	25	3.63	6.86	379	673
111	10–11	7–1	14–11	9½	28–10	9	11–5	12½	25	4.05	7.67	377	711
120	11–10	7–7	15–10	9	30–8	8	11–11	15½	25	4.36	8.25	395	731
132	12–10	8–4	16–10	9	32–8	8	12–8	11	25	4.75	9.03	441	839
141	14–1	8–9	18–1	10½	35–2	11	13–1	13½	25	5.17	9.86	468	931
150	15–4	9–3	19–4	12	37–8	8	13–7	16½	25	5.59	10.68	490	953
159	15–10	9–10	19–10	9	38–8	8	14–2	11	25	5.89	11.25	534	1019

HEADWALL FOR STRUCTURAL PLATE ARCH



WHEN APRON IS REQUIRED

SKEW ANGLE ∧°	90	85	80	75	70	65	60	55	50	45	40	35	30
FACTOR (cosec∧°)	1.000	1.004	1.015	1.035	1.064	1.103	1.155	1.221	1.305	1.414	1.556	1.743	2.000

SKEW FACTOR TABLE

GENERAL NOTES

1. CONCRETE SHALL BE CLASS B.
2. HEADWALL SHALL BE PERPENDICULAR TO THE PIPE ℄ UNLESS OTHERWISE SHOWN ON THE PLANS. TABULATED DIMENSIONS AND QUANTITIES MUST BE ADJUSTED FOR SKEWED INSTALLATIONS.
3. FOR WINGWALL DETAILS, SEE STANDARD PLAN M-601-20.
4. VOLUME OCCUPIED BY PIPE HAS BEEN DEDUCTED FROM STEEL AND CONCRETE QUANTITIES.
5. EXPOSED CONCRETE CORNERS SHALL BE CHAMFERED ¾ IN.
6. ALL REINFORCING BARS SHALL HAVE A 2 IN. MINIMUM CLEARANCE.

▲ WHEN TWO OR MORE PIPES ARE LAID SIDE BY SIDE, THEY SHALL BE PLACED SO THAT THE ADJACENT PIPES WILL BE ½ INSIDE DIAMETER APART, OR ½ INSIDE SPAN APART, OR 3 FT. APART (INCLUDING WALL THICKNESS), WHICHEVER IS LESS.

■ ADD 0.89 x (X OR X_1) (LB.) WHEN APRON IS REQUIRED.

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CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English			

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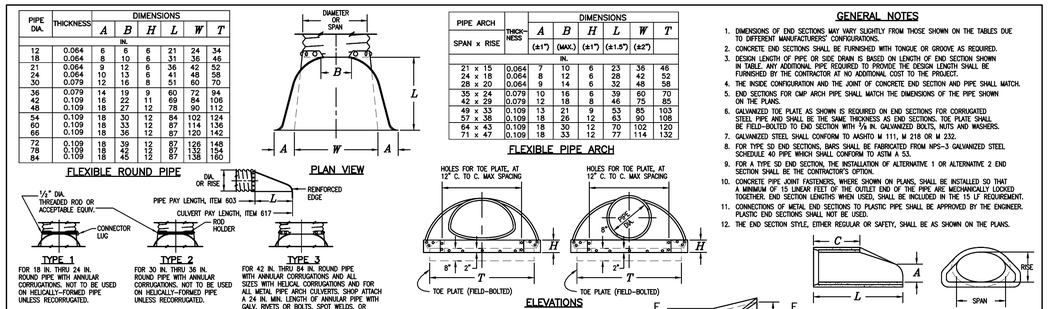
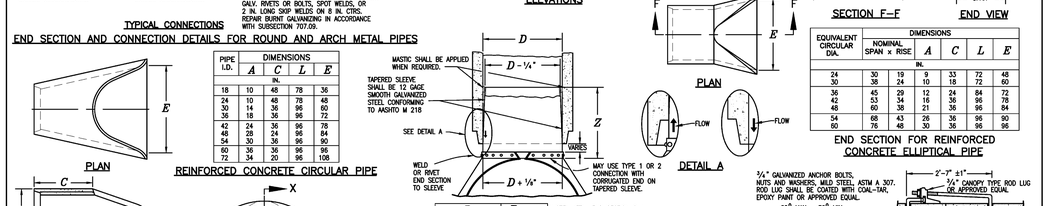
CONCRETE AND METAL END SECTIONS

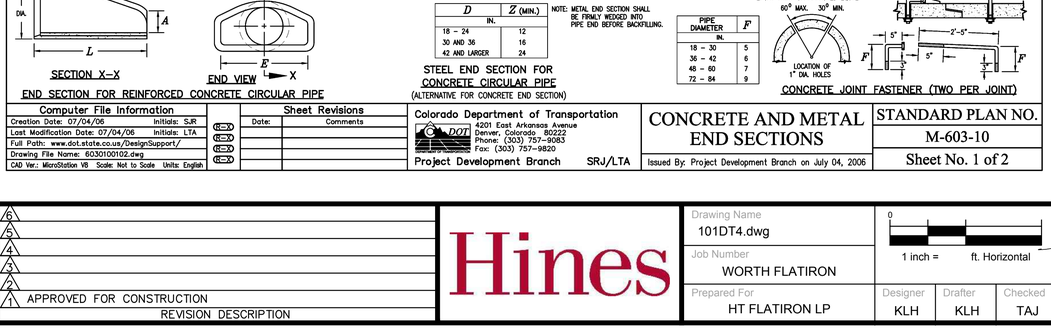
STANDARD PLAN NO. M-603-10

Sheet No. 1 of 2

Issued By: Project Development Branch on July 04, 2006







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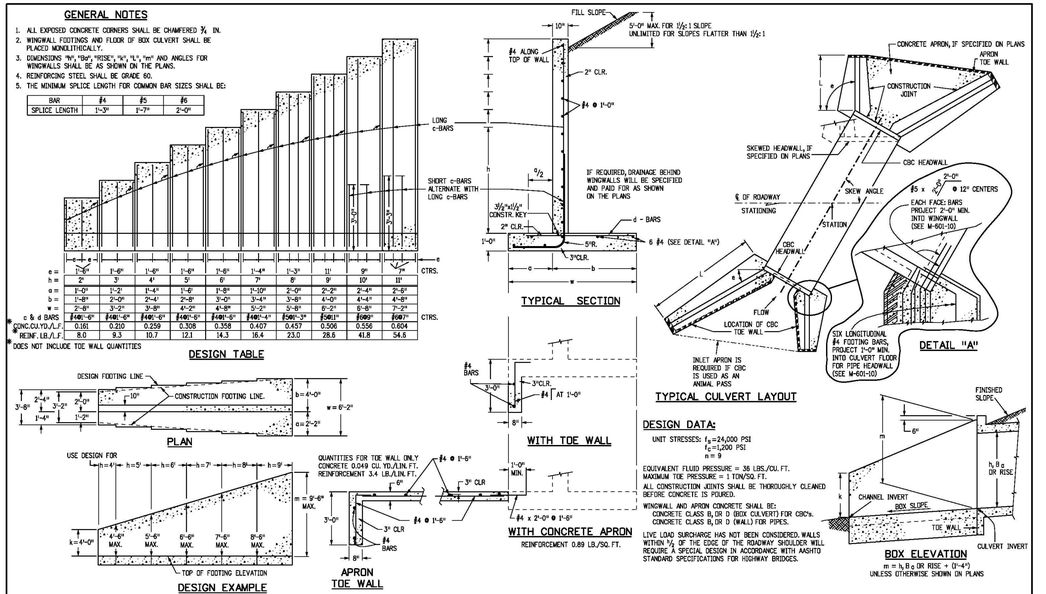
CONCRETE AND METAL END SECTIONS

STANDARD PLAN NO. M-603-10

Sheet No. 1 of 2

Issued By: Project Development Branch on July 04, 2006



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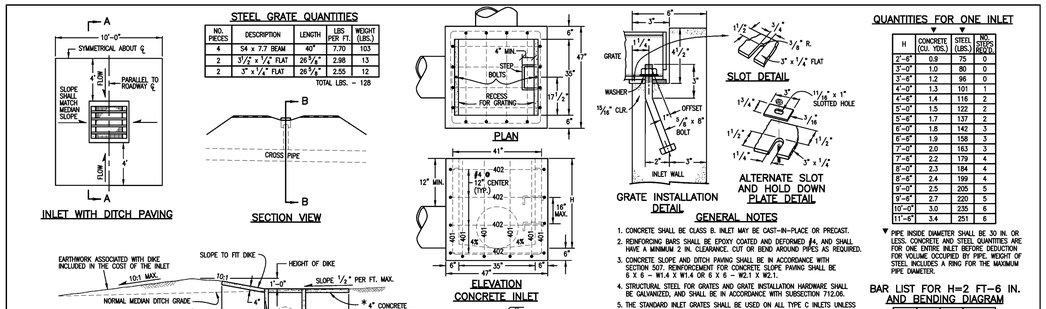
WINGWALLS FOR PIPE OR BOX CULVERTS

STANDARD PLAN NO. M-601-20

Sheet No. 1 of 1

Issued By: Project Development Branch July 4, 2012



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INLET, TYPE C

STANDARD PLAN NO. M-604-10

Sheet No. 1 of 1

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6		
5		
4		
3		
2		
3/31/16	1	APPROVED FOR CONSTRUCTION
DATE		REVISION DESCRIPTION

Hines

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Job Number: WORTH FLATIRON
Prepared For: HT FLATIRON LP
0 1 inch = ft. Horizontal
Designer: KLH Drafter: KLH Checked: TAJ

COLORADO LICENSED 37660 03–31–16 PROFESSIONAL ENGINEER

Calibre

Calibre Engineering, Inc.
9090 South Ridgeline Blvd., Suite 105
Highlands Ranch, CO 80129 (303) 730-0434
www.calibre-engineering.com
Municipal Engineering Development Surveying

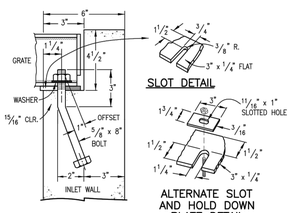
FLATIRON MEADOWS

REGIONAL DETENTION POND IMPROVEMENT PLANS

STORM DETAILS

Sheet DT8 25 of 29

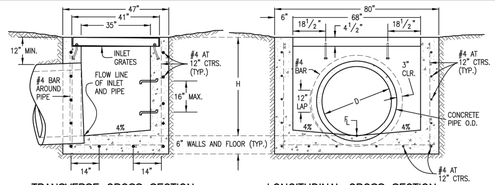
Date MARCH 31, 2016



GRATE INSTALLATION DETAIL

SLOT DETAIL

ALTERNATE SLOT AND HOLD DOWN PLATE DETAIL

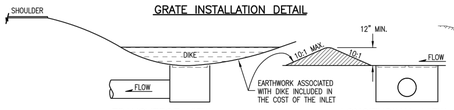


TRANSVERSE CROSS SECTION LONGITUDINAL CROSS SECTION

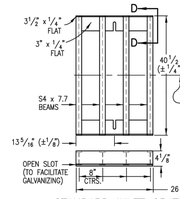
LEVEL GRATE INSTALLATION

GENERAL NOTES

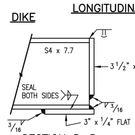
1. CONCRETE SHALL BE CLASS B. INLET MAY BE CAST-IN-PLACE OR PRECAST.
2. SEE PLANS FOR SIZE AND LOCATION OF PIPE.
3. STRUCTURAL STEEL FOR GRATES AND GRATE INSTALLATION HARDWARE SHALL BE GALVANIZED AND SHALL BE IN ACCORDANCE WITH SUBSECTION 712.06.
4. STANDARD INLET GRATES SHALL BE USED ON ALL TYPE D INLETS UNLESS CLOSE MESH GRATES ARE SPECIFIED ON THE PLANS.
5. STEPS SHALL BE PROVIDED WHEN INLET DIMENSION "H" IS EQUAL TO OR GREATER THAN 3 FT.–6 IN. AND SHALL CONFORM WITH AASHTO M 199.
6. REINFORCING BARS SHALL BE EPOXY COATED AND DEFORMED #4, AND SHALL HAVE A 2 IN. MINIMUM CLEARANCE. CUT OR BEND BARS AROUND PIPE AS REQUIRED.



TRANSVERSE VIEW LONGITUDINAL VIEW



STANDARD INLET GRATE



SECTION D–D

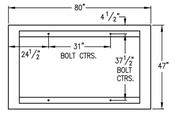
TWO STEEL GRATE PER INLET QUANTITIES

NO. PIECES	DESCRIPTION	LENGTH	LBS PER FT.	WEIGHT (LBS.)
8	S4 x 7.7 BEAM	40"	7.70	206
4	3 1/2" x 1/4" FLAT	26 5/8"	2.98	26
4	3" x 1/4" FLAT	26 5/8"	2.55	24

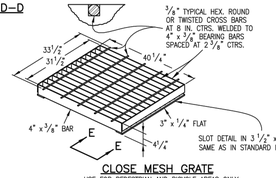
TOTAL LBS. – 256

TRANSVERSE CROSS SECTION LONGITUDINAL CROSS SECTION

SLOPING GRATE INSTALLATION

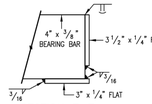


PLAN VIEW (SHOWING ANCHOR BOLT LAYOUT)



CLOSE MESH GRATE

USE FOR PEDESTRIAN AND BICYCLE AREAS ONLY.



SECTION E–E

OUTLET PIPE INSIDE DIA. FT. – "D"	MIN. "H" FT.
1.5	3.0
2.0	3.5
2.5	4.0
3.0	4.5
3.5	5.0

"H" FT.	CONCRETE CU. YDS.	STEEL LBS.	CIRCULAR PIPE RANGE INSIDE DIA., IN. – "D"
3.0	1.5	127	18
3.5	1.7	149	18–24
4.0	1.9	157	18–30
4.5	2.0	179	18–36
5.0	2.2	187	18–42
5.5	2.4	208	18–42
6.0	2.6	215	18–42
6.5	2.8	236	18–42
7.0	2.9	243	18–42
7.5	3.1	264	18–42
8.0	3.3	271	18–42
8.5	3.5	292	18–42
9.0	3.6	299	18–42
9.5	3.8	320	18–42
10.0	4.0	327	18–42

▼ CONCRETE AND STEEL QUANTITIES ARE FOR ONE ENTIRE INLET BEFORE DEDUCTION FOR VOLUME OCCUPIED BY PIPE. WEIGHT OF STEEL INCLUDES A RING FOR THE MAXIMUM PIPE DIAMETER.

QUANTITIES FOR ONE INLET

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Last Modification Date: 07/04/06	Initials: LTA
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INLET, TYPE D

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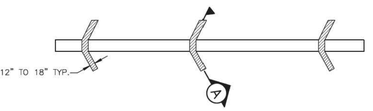
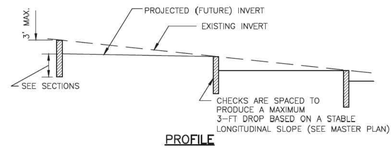
STANDARD PLAN NO.
M-604-11
Sheet No. 1 of 1



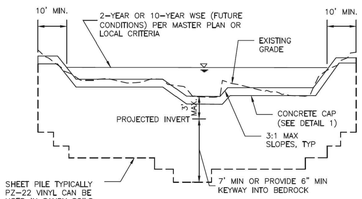
PLAN VIEW



PROFILE

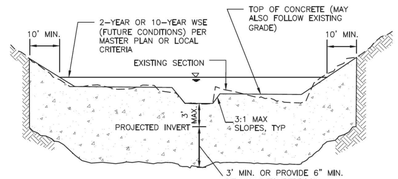
NOTES:
1. SHEET PILE IS PREFERRED AND MUST BE USED WHERE SOIL CANNOT HOLD A VERTICAL WALL.

Figure 9-26. Check structure details (Part 1 of 3)



NOTE: THE STRUCTURE MAY BE COVERED WITH 6" OF SOIL OUTSIDE OF THE LOW FLOW AREA.

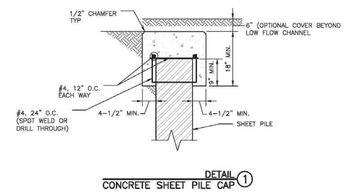
SECTION A1
SHEET PILE CHECK



NOTES: 1. TRENCH IN UNDISTURBED SOIL. FORM TOP 6" OF CHECK. DO NOT OVER EXCAVATE TO FORM WALLS OR CONSTRUCT A FOOTING.
2. THE STRUCTURE MAY BE COVERED WITH 6" OF SOIL OUTSIDE OF THE LOW FLOW AREA.
3. VIBRATE CONCRETE INTO TRENCH.

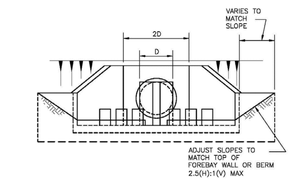
SECTION A2
CONCRETE CHECK

Figure 9-27. Check structure details (Part 2 of 3)

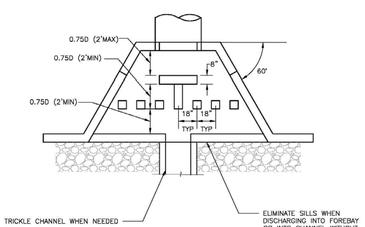


DETAIL 1
CONCRETE SHEET PILE CAP

Figure 9-28. Check structure details (Part 3 of 3)



ELEVATION

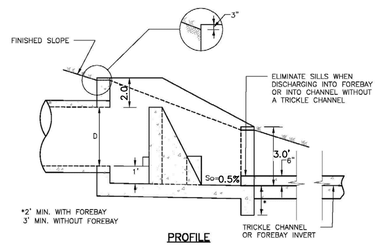


PLAN

NOTE: DESIGN OF REINFORCING STEEL IS THE RESPONSIBILITY OF THE DESIGN ENGINEER.

Figure 8-43. Modified Impact Stilling Basin for Conduits 18" to 48" in Diameter

(Part 1 of 2)



PROFILE

ELEVATION (LOOKING UPSTREAM) PLAN VIEW

BAFFLE BLOCK GEOMETRY

Figure 8-44. Modified Impact Stilling Basin for Conduits 18" to 48" in Diameter

(Part 2 of 2)

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3/31/16	1	APPROVED FOR CONSTRUCTION
DATE		REVISION DESCRIPTION

Hines

Drawing Name: 101DT4.dwg
Job Number: WORTH FLATIRON
Prepared For: HT FLATIRON LP
Designer: KLH Drafter: KLH Checked: TAJ
0 1 inch = ft. Horizontal

COLORADO LICENSED 37660 03–31–16 PROFESSIONAL ENGINEER

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FLATIRON MEADOWS
REGIONAL DETENTION POND IMPROVEMENT PLANS
STORM DETAILS

Sheet DT9 26 of 29
Date MARCH 31, 2016

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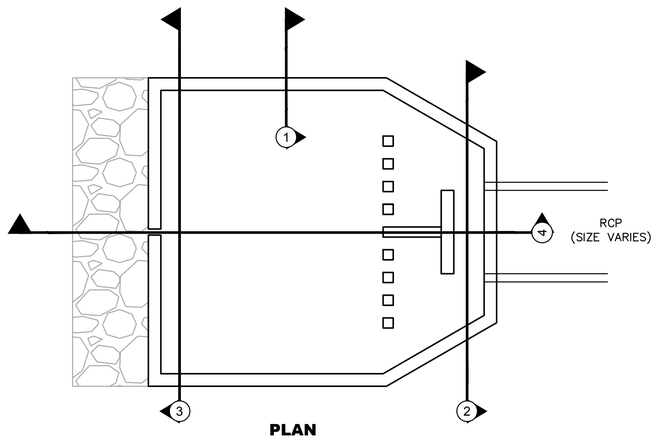
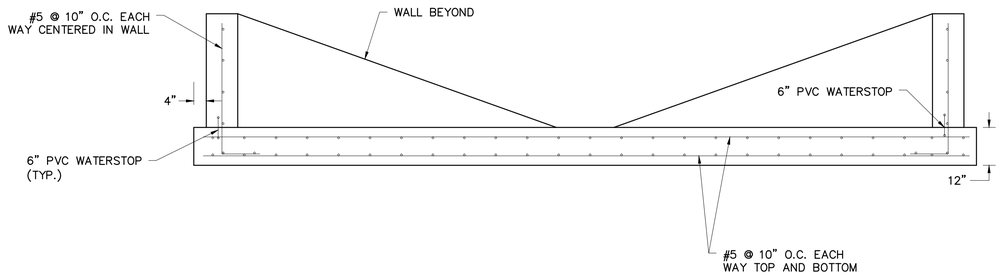


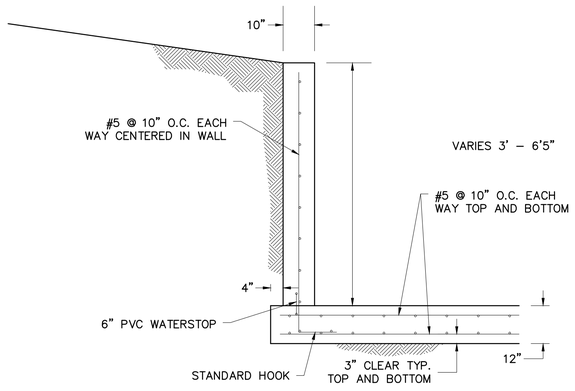
PLAN

NOTES

1. REFER TO SD SHEETS FOR PLAN DIMENSIONS AND ELEVATIONS FOR EACH STILLING BASIN.
2. INSTALL 6" PVC WATERSTOP AT BASE OF ALL EXTERIOR WALLS.



SECTION 3



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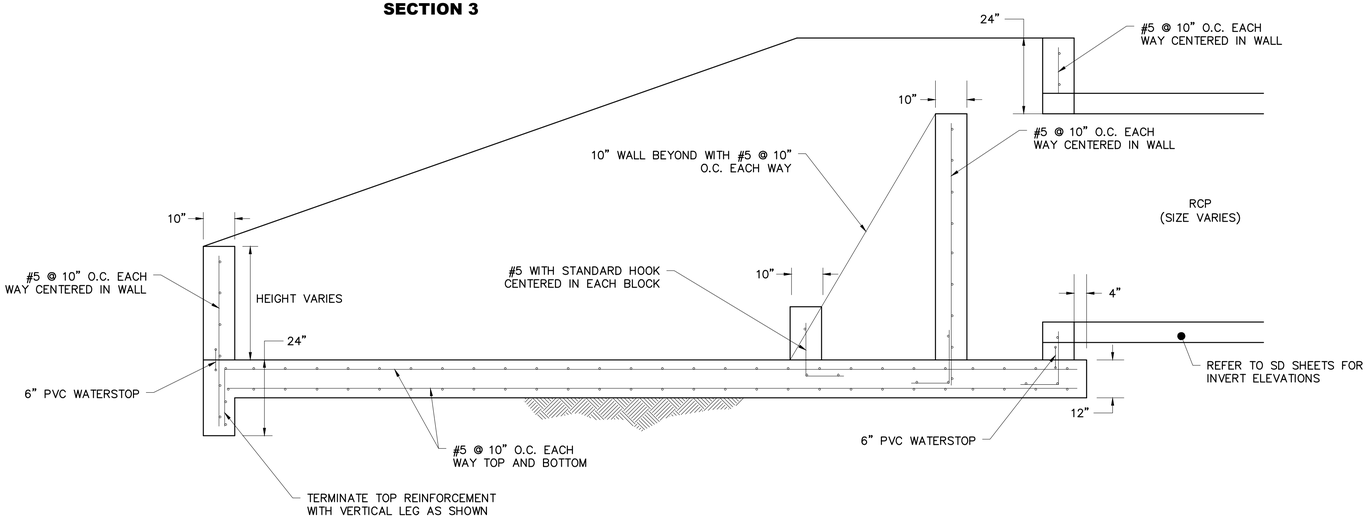

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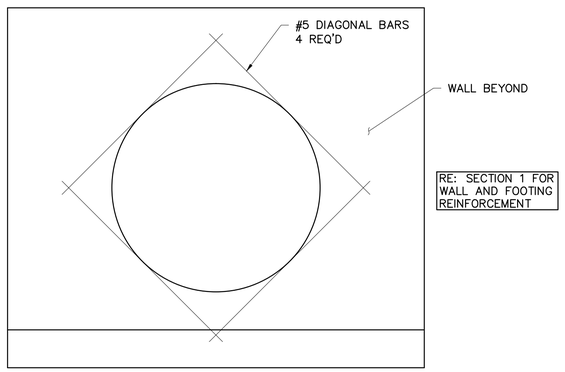

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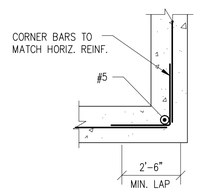
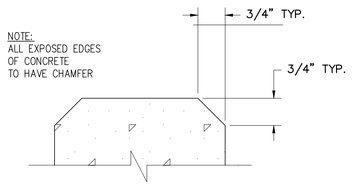


TYPICAL CORNER OF CONCRETE WALLS AND FOOTINGS

TYPICAL CORNER REINFORCING DETAIL NTS



TYP. CONCRETE CHAMFER DETAIL

NTS

REINFORCING STEEL

1. FABRICATE AND PLACE REINFORCING BARS IN ACCORDANCE WITH CRSI "MANUAL OF STANDARD PRACTICE" AND CRSI "RECOMMENDED PRACTICE FOR PLACING REINFORCING BARS".
2. REINFORCING STEEL TO COMPLY WITH ASTM A615, GRADE 60.
3. LAP REINFORCING STEEL IN CONCRETE 2'-6" MINIMUM.
4. PROVIDE REINFORCING STEEL WITH PROTECTIVE COVERING OF CONCRETE AS NOTED IN SECTIONS.
5. DO NOT USE BRICK OR POROUS MATERIAL TO SUPPORT FOOTING STEEL OFF THE GROUND.
6. SUBMIT SHOP DRAWINGS.
7. WHERE SINGLE CURTAIN OF REINFORCEMENT SHOWN, CENTER BARS IN WALL.
8. THE CONTRACTOR SHALL PROVIDE AND INSTALL 1,000 POUNDS OF ADDITIONAL REINF. STEEL AS DIRECTED BY THE ENGINEER. SIZES REQUIRED BY THE ENGINEER WILL NOT BE SMALLER THAN #4 NOR LARGER THAN #6.
9. REFER TO DETAIL THIS SHEET FOR CORNER BARS.

CONCRETE

1. ALL CONCRETE WORK SHALL CONFORM TO ALL REQUIREMENTS OF ACI 301 "SPECIFICATIONS FOR STRUCTURAL BUILDINGS," EXCEPT AS MODIFIED BY THE SUPPLEMENTAL REQUIREMENTS CONTAINED HERIN OR SHOWN ON THE DRAWINGS, AND AS SPECIFIED IN SECTION 03000.
2. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS 4,000 PSI.
3. CEMENT SHALL CONFORM TO ASTM C 150, TYPE I/II; CONTRACTOR SHALL SUBSTITUTE 20% OF CLASS F FLYASH FOR CEMENT.
4. AGGREGATES ASTM C 33.
5. CONCRETE SHALL CONTAIN 6" AIR ENTRAINMENT, ±1%
6. PROVIDE 3/4" CHAMFER ON ALL EXPOSED EDGES PER DETAIL ABOVE
7. WATER CEMENT RATIO SHALL BE 0.45 MAX.

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3/31/16	1	APPROVED FOR CONSTRUCTION
DATE		REVISION DESCRIPTION

Hines

Drawing Name: 101DT4.dwg
Job Number: WORTH FLATIRON
Prepared For: HT FLATIRON LP

0 — 1 inch = NTS ft. Horizontal

Designer	Drafter	Checked
KLH	KLH	TAJ

COLORADO LICENSED — TIMOTHY A. JOHNSON — 37660 — 03-31-16 — PROFESSIONAL ENGINEER

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FLATIRON MEADOWS
REGIONAL DETENTION POND IMPROVEMENT PLANS
STORM DETAILS

Sheet DT10 — 27 of 29

Date: MARCH 31, 2016

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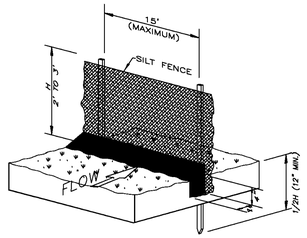
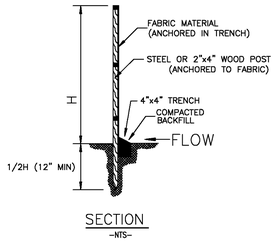


SILT FENCE INSTALLATION
-NTS-



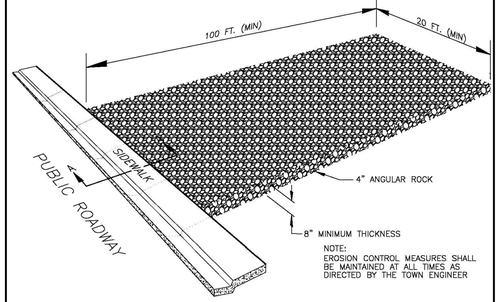
SECTION
-NTS-

NOTES:
1. INSTALL SILT FENCE PARALLEL TO THE CONTOUR OF THE LAND.
2. EXTEND ENDS UPSLOPE TO ALLOW WATER TO POND BEHIND FENCE.
3. EXCAVATE A TRENCH 4 INCHES WIDE AND 4 INCHES DEEP.
4. INSTALL FENCE WITH POSTS ON THE DOWNSLOPE SIDE.
5. PLACE 8 INCHES OF FABRIC IN THE TRENCH, EXTENDING THE BOTTOM 4 INCHES TOWARD THE UPSLOPE SIDE.
6. JOIN SILT FENCE SECTIONS BY USING A WRAP JOINT.
7. BACKFILL TRENCH WITH SOIL MATERIALS AND COMPACT.
8. INSPECT AT LEAST WEEKLY AND AFTER EACH STORM EVENT, REPAIRING AS NEEDED AND REMOVING SEDIMENT DEPOSITS WHEN THEY REACH ONE-HALF THE FENCE HEIGHT.

FOR SINGLE LOT EROSION CONTROL
SEE SHEET STM8

The Town of ERIE COLORADO

DRAWING TITLE: SILT FENCE EROSION BARRIER
DRAWING NUMBER: STM4
DRAWN BY: D. JENKINS APPROVED BY: G. BEHLEN DATE: 06/2004



NOTE:
EROSION CONTROL MEASURES SHALL BE MAINTAINED AT ALL TIMES AS DIRECTED BY THE TOWN ENGINEER

SECTION A–A
–NTS–

NOTES:
1. ALL ROCK TO BE REMOVED UPON COMPLETION OF CONSTRUCTION
2. PUBLIC ROADWAY TO BE KEPT CLEAN AND FREE OF MUD, DIRT AND DEBRIS AT ALL TIMES

The Town of ERIE COLORADO

DRAWING TITLE: TRACKING CONTROL PAD– CRUSHED ROCK
DRAWING NUMBER: STM6A
DRAWN BY: D. JENKINS APPROVED BY: G. BEHLEN DATE: 1/2013

MU

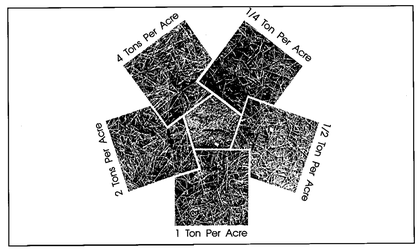
MULCHING

Definition

Application of plant residues or other suitable materials to the soil surface.

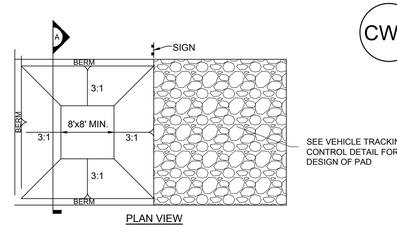
Purposes

1. To prevent erosion by protecting the soil surface from raindrop impact and reducing the velocity of overland flow.
2. To foster the growth of vegetation by increasing available moisture and providing insulation against extreme heat and cold.

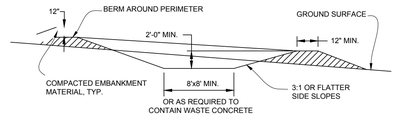


From: Environmental Protection Agency, 1976

FIGURE C-5
Mulching



PLAN VIEW



SECTION A

CONCRETE WASHOUT AREA INSTALLATION NOTES

1. SEE PLAN VIEW FOR LOCATIONS OF CONCRETE WASHOUT AREA
2. THE CONCRETE WASHOUT AREA SHALL BE INSTALLED PRIOR TO ANY CONCRETE PLACEMENT ON SITE.
3. VEHICLE TRACKING CONTROL IS REQUIRED AT THE ACCESS POINT.
4. SIGNS SHALL BE PLACED AT THE CONSTRUCTION ENTRANCE, AT THE WASHOUT AREA, AND ELSEWHERE AS NECESSARY TO CLEARLY INDICATE THE LOCATION OF THE CONCRETE WASHOUT AREA TO OPERATORS OF CONCRETE TRUCKS AND PUMP RIGS.
5. EXCAVATED MATERIAL SHALL BE UTILIZED IN PERIMETER BERM CONSTRUCTION

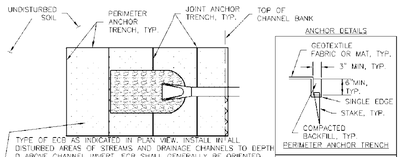
CONCRETE WASHOUT AREA MAINTENANCE NOTES

1. THE CONCRETE WASHOUT AREA SHALL BE REPAIRED AND ENLARGED OR CLEANED OUT AS NECESSARY TO MAINTAIN CAPACITY FOR WASTED CONCRETE.
2. AT THE END OF CONSTRUCTION, ALL CONCRETE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF AT AN APPROVED WASTE SITE.
3. WHEN THE CONCRETE WASHOUT AREA IS REMOVED, COVER THE DISTURBED AREA WITH TOP SOIL, DRILL SEED AND CRIMP MULCH OR OTHERWISE STABILIZE IN A MANNER APPROVED BY THE LOCAL JURISDICTION.
4. INSPECT WEEKLY, DURING AND AFTER ANY STORM EVENT.

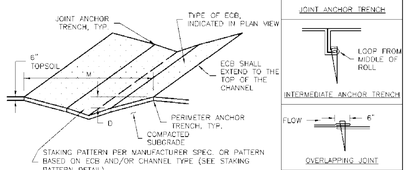
DETAIL BASED ON DETAILS PROVIDED BY DOUGLAS COUNTY

Urban Drainage and Flood Control District Drainage Criteria Manual (V.3)	Figure C3-2 CONCRETE WASHOUT AREA

ECB

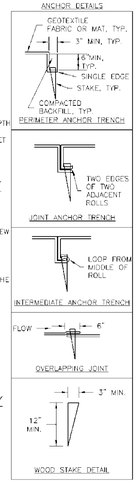


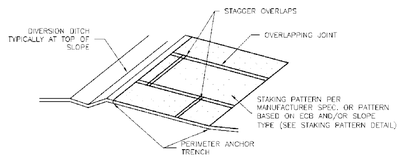
ECB–1. PIPE OUTLET TO DRAINAGEWAY



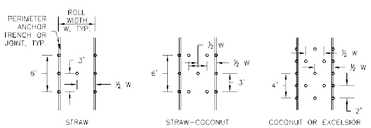
ECB–2. SMALL DITCH OR DRAINAGEWAY

ANCHOR DETAILS

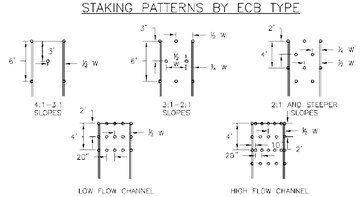




ECB–3. OUTSIDE OF DRAINAGEWAY



STAKING PATTERNS BY ECB TYPE



STAKING PATTERNS BY SLOPE OR CHANNEL TYPE

EROSION CONTROL BLANKET INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   - LOCATION OF ECB.
   - TYPE OF ECB (STRAW, STRAW–COCONUT, COCONUT, OR EXCELSIOR).
   - AREA, A, IN SQUARE YARDS OF EACH TYPE OF ECB.
2. 100% NATURAL AND BIODEGRADABLE MATERIALS ARE PREFERRED FOR RECPs, ALTHOUGH SOME JURISDICTIONS MAY ALLOW OTHER MATERIALS IN SOME APPLICATIONS.
3. IN AREAS WHERE ECBS ARE SHOWN ON THE PLANS, THE PERIMETER SHALL PLACE TOPSOIL AND PERFORM FINAL GRADING, SURFACE PREPARATION, AND SEEDING AND MULCHING. SUBGRADE SHALL BE SMOOTH AND MOIST PRIOR TO ECB INSTALLATION AND THE ECB SHALL BE IN FULL CONTACT WITH SUBGRADE. NO GAPS OR VOIDS SHALL EXIST UNDER THE BLANKET.
4. PERIMETER ANCHOR TRENCH SHALL BE USED ALONG THE OUTSIDE PERIMETER OF ALL BLANKET AREAS.
5. JOINT ANCHOR TRENCH SHALL BE USED TO JOIN ROLLS OF ECBs TOGETHER (LONGITUDINALLY AND TRANSVERSELY) FOR ALL ECBs EXCEPT STRAW WHICH MAY USE AN OVERLAPPING JOINT.
6. INTERMEDIATE ANCHOR TRENCH SHALL BE USED AT SPACING OF ONE–HALF ROLL LENGTH FOR COCONUT AND EXCELSIOR ECBs.
7. OVERLAPPING JOINT DETAIL SHALL BE USED TO JOIN ROLLS OF ECBs TOGETHER FOR ECBs ON SLOPES.
8. MATERIAL SPECIFICATIONS OF ECBs SHALL CONFORM TO TABLE ECB–1.
9. ANY AREAS OF SEEDING AND MULCHING DISTURBED IN THE PROCESS OF INSTALLING ECBS SHALL BE RESEEDED AND MULCHED.
10. DETAILS ON DESIGN PLANS FOR MAJOR DRAINAGEWAY STABILIZATION WILL GOVERN IF DIFFERENT FROM THOSE SHOWN HERE.

TABLE ECB–1, ECB MATERIAL SPECIFICATIONS

TYPE	COCONUT CONTENT	STRAW CONTENT	EXCELSIOR CONTENT	RECOMMENDED NETTING**
STRAW*	–	100%	–	DOUBLE/ NATURAL
STRAW–COCONUT	30% MIN	70% MAX	–	DOUBLE/ NATURAL
COCONUT	100%	–	–	DOUBLE/ NATURAL
EXCELSIOR	–	–	100%	DOUBLE/ NATURAL

*STRAW ECBs MAY ONLY BE USED OUTSIDE OF STREAMS AND DRAINAGE CHANNELS.
**ALTERNATE NETTING MAY BE ACCEPTABLE IN SOME JURISDICTIONS

EROSION CONTROL BLANKET MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.
2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.
4. ECBs SHALL BE LEFT IN PLACE TO EVENTUALLY BIODEGRADE, UNLESS REQUESTED TO BE REMOVED BY THE LOCAL JURISDICTION.
5. ANY ECB PULLED OUT, TORN, OR OTHERWISE DAMAGED SHALL BE REPAIRED OR REINSTALLED. ANY SUBGRADE AREAS BELOW THE GEOTEXTILE THAT HAVE ERODED TO CREATED A VOID UNDER THE BLANKET, OR THAT REMAIN DEVOID OF GRASS SHALL BE REPAIRED, RESEEDED AND MULCHED AND THE ECB REINSTALLED.

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

(DETAILS ADAPTED FROM DOUGLAS COUNTY, COLORADO AND TOWN OF PARKER COLORADO, NOT AVAILABLE IN AUTOCAD)

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XREFS: 101TB,

DATE		REVISION DESCRIPTION
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3/31/16	1	APPROVED FOR CONSTRUCTION

Hines

Drawing Name: 101DT10.dwg
Job Number: WORTH FLATIRON
Prepared For: HT FLATIRON LP

Designer	Drafter	Checked
KLH	KLH	BKM

COLORADO LICENSED 37660 03–31–16 PROFESSIONAL ENGINEER

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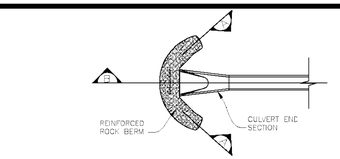
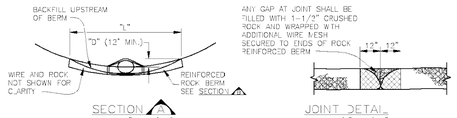
FLATIRON MEADOWS
REGIONAL DETENTION POND IMPROVEMENT PLANS
EROSION CONTROL DETAILS

Sheet DT11 28 of 29
Date MARCH 31, 2016



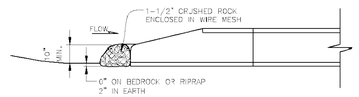
PLAN
SCALE: 1" = 10'-0"

RRC



SECTION A
SCALE: 1" = 10'-0"

JOINT DETAIL
SCALE: 1/4" = 1'-0"



SECTION B
SCALE: 1/4" = 1'-0"

INSTALLATION NOTES

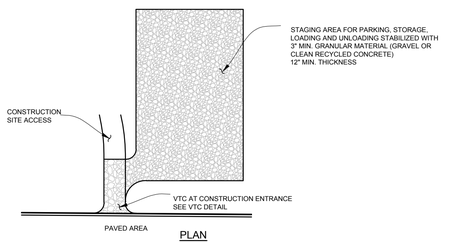
1. SEE PLAN VIEW FOR:
   - LOCATIONS OF CULVERT INLET FILTERS.
   - LENGTH, "L", AND DEPTH, "D".
2. CRUSHED ROCK SHALL BE FRACTURED FACE (ALL SIDES) AND SHALL COMPLY WITH GRADATION SHOWN ON SHEET 1 (1-1/2" MINUS). RECYCLED CONCRETE MEETING THIS GRADATION MAY BE USED.
3. WIRE MESH SHALL BE FABRICATED OF 10 GAUGE WIRE TWISTED INTO A MESH WITH A MAXIMUM OPENING OF 1.0 INCH (COMMONLY TERMED "CHICKEN WIRE").
4. WIRE MESH SHALL BE SECURED USING "HOG RINGS" OR WIRE TIES AT 6-INCH CENTERS ALONG ALL JOINTS AND AT 2-INCH CENTERS ON ENDS OF BERM.
5. THE ENDS OF THE REINFORCED ROCK BERM SHALL BE 12" HIGHER THAN THE CENTER OF THE BERM.

MAINTENANCE NOTES

1. THE GESC MANAGER SHALL INSPECT CULVERT INLET FILTER WEEKLY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS OR CLEAN OUT AS NECESSARY.
2. SEDIMENT ACCUMULATED UPSTREAM OF CULVERT INLET FILTER SHALL BE REMOVED WHEN THE SEDIMENT DEPTH UPSTREAM OF FILTER IS $\frac{1}{2}$ THE HEIGHT OF THE REINFORCED ROCK BERM.
3. RRB FOR CULVERT PROTECTION ARE TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND GRASS COVER IS APPROVED BY THE CITY.
4. WHEN CULVERT INLET FILTERS ARE REMOVED, ANY DISTURBED AREA SHALL BE DRILL SEEDED AND CRIMP MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE CITY.

DT | RRC | RRB FOR CULVERT PROTECTION | 13

SSA



PLAN

STABILIZED STAGING AREA INSTALLATION NOTES

1. SEE PLAN VIEW FOR GENERAL LOCATION OF STAGING AREA. CONTRACTOR MAY MODIFY LOCATION AND SIZE OF STABILIZED STAGING AREA WITH APPROVAL FROM LOCAL JURISDICTION.
2. STABILIZED STAGING AREA SHALL BE LARGE ENOUGH TO FULLY CONTAIN PARKING, STORAGE, AND UNLOADING AND LOADING OPERATIONS.
3. IF REQUIRED BY THE LOCAL JURISDICTION, SITE ACCESS ROADS SHALL BE STABILIZED IN THE SAME MANNER AS THE STAGING AREA.
4. STAGING AREA SHALL BE STABILIZED PRIOR TO ANY OTHER OPERATIONS ON THE SITE.
5. THE STABILIZED STAGING AREA SHALL CONSIST OF A MINIMUM OF 3" OF GRANULAR MATERIAL (GRAVEL OR CLEAN RECYCLED CONCRETE).

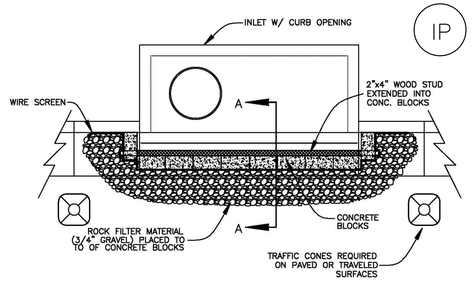
STABILIZED STAGING AREA MAINTENANCE NOTES

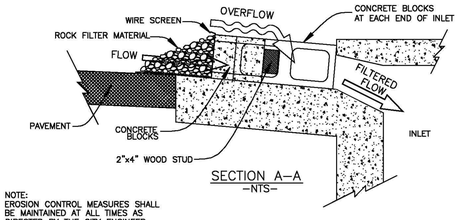
1. THE SWMP MANAGER SHALL INSPECT THE STABILIZED STAGING AREA WEEKLY, DURING AND AFTER ANY STORM EVENT AND MAKE REPAIRS OR CLEAN OUT UPSTREAM SEDIMENT AS NECESSARY.
2. SWMP MANAGER SHALL PROVIDE ADDITIONAL THICKNESS OF GRANULAR MATERIAL IF ANY RUTTING OCCURS OR UNDERLYING SUBGRADE BECOMES EXPOSED.
3. STABILIZED STAGING AREA SHALL BE ENLARGED IF NECESSARY TO CONTAIN PARKING, STORAGE, AND UNLOADING AND LOADING OPERATIONS.
4. ANY ACCUMULATED DIRT OR MUD SHALL BE REMOVED FROM THE SURFACE OF THE STABILIZED STAGING AREA.
5. THE STABILIZED STAGING AREA SHALL BE REMOVED AT THE END OF CONSTRUCTION. THE GRANULAR MATERIAL SHALL BE REMOVED OR, IF APPROVED BY THE LOCAL JURISDICTION, USED ON SITE, AND THE AREA TOPSOILED, DRILL SEEDED AND CRIMP MULCHED OR OTHERWISE STABILIZED.

DETAIL BASED ON DETAILS PROVIDED BY DOUGLAS COUNTY

Urban Drainage and Flood Control District Drainage Criteria Manual (V.3)	Figure C3-1 STABILIZED STAGING AREA

IP





SECTION A–A
–NTS–

NOTE:
EROSION CONTROL MEASURES SHALL BE MAINTAINED AT ALL TIMES AS DIRECTED BY THE CITY ENGINEER

The Town of ERIE COLORADO	DRAWING TITLE: CURB INLET GRAVEL FILTER DRAWING NUMBER: STM3 DRAWN BY: D. JENKINS APPROVED BY: G. BEHLEN DATE: 06/2004

OP

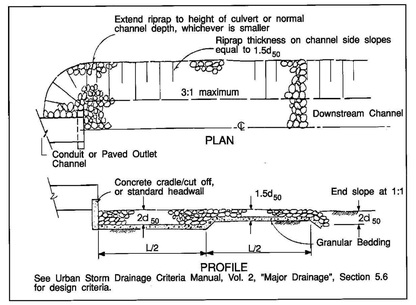
OUTLET PROTECTION

Definition

Structurally lined aprons or other acceptable energy dissipating devices placed at the outlets of pipes or paved channel sections.

Purposes

To prevent scour at stormwater outlets and to minimize the potential for downstream erosion by reducing the velocity of concentrated stormwater flows.



See Urban Storm Drainage Criteria Manual, Vol. 2, "Major Drainage", Section 5.6 for design criteria.

From: Urban Drainage and Flood Control District, 1969

FIGURE C-20
Outlet Protection

PATH: P:\WORTH FLATIRON\CADD\CIVIL\101 REGIONAL POND - AS BUILTS\101DT10.DWG
PLOTTED BY: Lorraine Aliff PLOT DATE: 8/23/2016 4:28 PM
XREFS: 101TB,

NO.	DATE	REVISION DESCRIPTION
6		
5		
4		
3		
2		
1	3/31/16	APPROVED FOR CONSTRUCTION

Hines

Drawing Name	101DT10.dwg
Job Number	WORTH FLATIRON
Prepared For	HT FLATIRON LP

Designer	Drafter	Checked
KLH	KLH	BKM

COLORADO LICENSED [illegible] APPROVED 37660 03-31-16 PROFESSIONAL ENGINEER

Calibre
Calibre Engineering, Inc.
9090 South Ridgeline Blvd., Suite 105
Highlands Ranch, CO 80129 (303) 730-0434
www.calibre-engineering.com
Municipal Engineering Development Surveying

FLATIRON MEADOWS
REGIONAL DETENTION POND IMPROVEMENT PLANS
EROSION CONTROL DETAILS

Sheet DT12 29 of 29

Date MARCH 31, 2016

OFFICIAL DEVELOPMENT PLAN

INDIAN PEAKS

CONSULTANTS:

DJA

PLANNERS :
DAVID JENSEN ASSOCIATES, INC.
1451 SOUTH PARKER ROAD
DENVER, COLORADO 80231

ROCKY MOUNTAIN CONSULTANTS
1960 Industrial Circle Suite A
Longmont,Colorado 80501
303/772-5282

AQUATIC AND WETLAND CONSULTANTS
1911 11th Street Suite 301
Boulder,Colorado 80302
303/442-5770

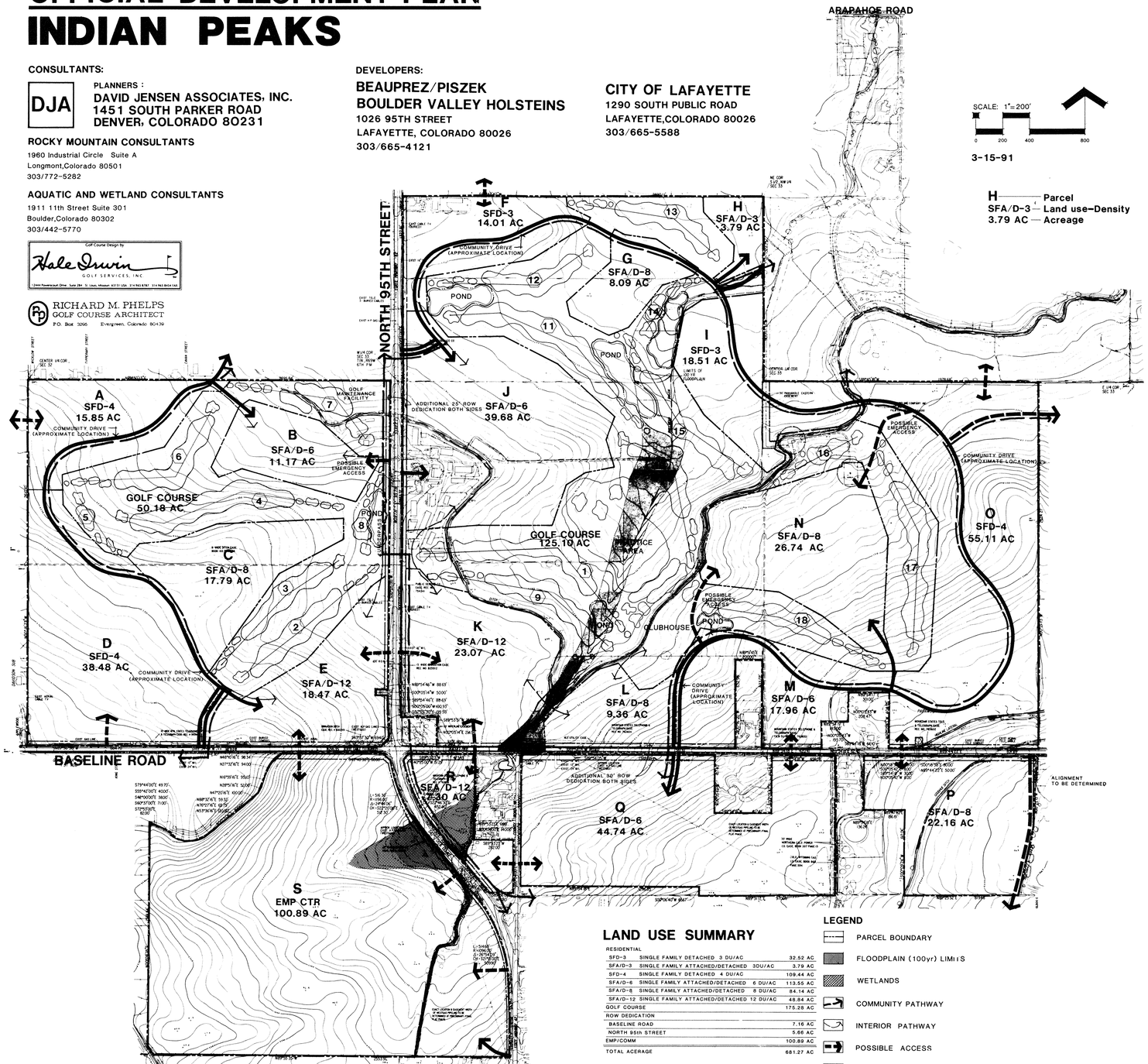
Golf Course Design by
Hale Irwin
GOLF SERVICES, INC

RICHARD M. PHELPS
GOLF COURSE ARCHITECT
P.O. Box 3266 Evergreen, Colorado 80439

DEVELOPERS:

BEAUPREZ/PISZEK
BOULDER VALLEY HOLSTEINS
1026 95TH STREET
LAFAYETTE, COLORADO 80026
303/665-4121

CITY OF LAFAYETTE
1290 SOUTH PUBLIC ROAD
LAFAYETTE,COLORADO 80026
303/665-5588



SCALE: 1"=200'
0 200 400 800

3-15-91

H——— Parcel
SFA/D-3 — Land use-Density
3.79 AC — Acreage

LAND USE SUMMARY

RESIDENTIAL			
SFD-3	SINGLE FAMILY DETACHED 3 DU/AC	32.52 AC	
SFA/D-3	SINGLE FAMILY ATTACHED/DETACHED 3DU/AC	3.79 AC	
SFD-4	SINGLE FAMILY DETACHED 4 DU/AC	109.44 AC	
SFA/D-6	SINGLE FAMILY ATTACHED/DETACHED 6 DU/AC	113.55 AC	
SFA/D-8	SINGLE FAMILY ATTACHED/DETACHED 8 DU/AC	84.14 AC	
SFA/D-12	SINGLE FAMILY ATTACHED/DETACHED 12 DU/AC	48.84 AC	
GOLF COURSE		175.28 AC	
ROW DEDICATION			
BASELINE ROAD		7.16 AC	
NORTH 95th STREET		5.66 AC	
EMP/COMM		100.89 AC	
TOTAL ACREAGE		681.27 AC	

LEGEND

- PARCEL BOUNDARY
- FLOODPLAIN (100yr) LIMITS
- WETLANDS
- COMMUNITY PATHWAY
- INTERIOR PATHWAY
- POSSIBLE ACCESS
- EXISTING BUILDING TO REMAIN

MAXIMUM DWELLING UNITS ALLOWED: 1427

CITY ADMINISTRATOR'S CERTIFICATE

ADMINISTRATOR OF THE CITY OF LAFAYETTE, COLORADO HEREBY CERTIFIES THAT I HAVE EXAMINED THE ABOVE O.D.P. SITE PLAN AND IT IS IN COMPLIANCE WITH ALL APPLICABLE ORDINANCES OF THE CITY AND THAT A SUBDIVISION AGREEMENT HAS BEEN EXECUTED BY THE DEVELOPER AND ACCEPTED BY CITY COUNCIL.

Brian E. Pick
CITY ADMINISTRATOR
CITY OF LAFAYETTE

ATTEST: Beverly A. Smith
CITY CLERK

PLANNING COMMISSION CERTIFICATION

THE SITE PLAN OF INDIAN PEAKS O.D.P. WAS APPROVED AT A REGULAR MEETING OF THE PLANNING COMMISSION ATTENDED BY A QUORUM WITH A VOTING FOR APPROVAL. DATED THIS 25 DAY OF mar, 1991.

Kimberly K. Mullaney
SECRETARY
PLANNING COMMISSION

S. Thorey
CHAIRMAN
PLANNING COMMISSION

CITY COUNCIL CERTIFICATION

THE SITE PLAN OF INDIAN PEAKS O.D.P. WAS APPROVED AT A REGULAR MEETING OF THE CITY COUNCIL ATTENDED BY A QUORUM WITH A MAJORITY VOTING FOR APPROVAL. DATED THIS 2nd DAY OF April, 1991.

MAYOR

ATTEST: Beverly A. Smith
CITY CLERK

OWNER'S ACKNOWLEDGMENT

KNOW ALL MEN BY THESE PRESENTS THAT EDWARD J. PISZEK, JR. AND JOE BEAUPREZ, BEING THE OWNERS OF THAT PARCEL OF LAND SHOWN AND DESCRIBED HEREON, HAS SUBMITTED TO THE CITY OF LAFAYETTE IN THE COUNTY OF BOULDER, STATE OF COLORADO, FOR APPROVAL OF SAID PARCEL AS AN O.D.P. SITE PLAN AND DOES HEREBY ACKNOWLEDGE SAID NOTES FOR CONDITIONS THIS ____ DAY OF ____, 1991.

BY: Edward J. Piszek Jr.
EDWARD J. PISZEK, JR.

Joe Beauprez
JOE BEAUPREZ

ATTEST: Donna Rogers

CLERK AND RECORDER'S CERTIFICATE

THIS PLAT WAS FILED FOR RECORD IN THE OFFICE OF THE CLERK AND RECORDER AT 8:09 O'CLOCK A.M. ON Apr. 10th, 1991
AT FILM NO. 1748 REC. NO. 1749860
PLANFILE P-27 F-1 #18
FEES 10.00

Charlotte Houston
CLERK AND RECORDER
COUNTY OF BOULDER
by Deputy

P-27 F-1 #18

P-27 F-1 #18

#01174990 04/16/92 08:09 AM REAL ESTATE RECORDS
F1726 CHARLOTTE HOUSTON BOULDER CNTY CO RECORDER

Generated by TallPDF.NET Evaluation

INDIAN PEAKS FILING NO. 17
FINAL PLAT

A PORTION OF THE NORTHEAST QUARTER OF SECTION 5, T1S, R69W OF THE 6TH P.M., CITY OF LAFAYETTE, COUNTY OF BOULDER, STATE OF COLORADO

45 LOTS, 8 OUTLOTS AND 3 TRACTS; 100.86 ACRES

SHEET 1 OF 3

DEDICATION:

KNOW ALL MEN BY THESE PRESENTS THAT EDWARD J. PISZEK, JR., GEORGE W. PISZEK, ANN L. REITENBAUGH AND EDWARD J. PISZEK, JR., TRUSTEE, ALL D/B/A BRADDOCK REALTY COMPANY, A PARTNERSHIP, ARE SOLE OWNERS IN FEE SIMPLE OF ALL THAT REAL PROPERTY DESCRIBED AS:

A PORTION OF THE NORTHEAST QUARTER OF SECTION 5, TOWNSHIP 1 SOUTH RANGE 69 WEST, SIXTH PRINCIPAL MERIDIAN, BOULDER COUNTY, COLORADO, DESCRIBED AS FOLLOWS:

COMMENCING AT THE EAST QUARTER CORNER OF SAID SECTION 5;

THENCE N89°55'30"W, 73.90 FEET ALONG THE SOUTHERLY BOUNDARY OF SAID NORTHEAST QUARTER OF SECTION 5 TO THE POINT OF BEGINNING;

THENCE N89°55'30"W, 2499.70 FEET ALONG SAID SOUTHERLY BOUNDARY TO THE EASTERLY RIGHT OF WAY OF THE BURLINGTON AND NORTHERN RAILROAD;

THENCE N31°38'43"W, 124.74 FEET ALONG SAID EASTERLY RIGHT OF WAY TO THE WESTERLY BOUNDARY OF SAID NORTHEAST QUARTER OF SECTION 5;

THENCE N00°09'31"E, 1541.74 FEET ALONG SAID WESTERLY BOUNDARY TO THE SOUTHERLY BOUNDARY OF A TRACT OF LAND DESCRIBED IN A DEED RECORDED ON FILM 1490, RECEPTION NO. 870709;

THENCE ALONG THE SOUTHERLY AND EASTERLY BOUNDARY OF THOSE TRACTS OF LAND DESCRIBED IN DEED RECORDED ON FILM 1490, RECEPTION NO. 870709; FILM 1383, RECEPTION NO. 727315; FILM 1456, RECEPTION NO. 824281; FILM 1661, RECEPTION NO. 1086984 THE FOLLOWING COURSES:

S72°48'54"E, 82.00 FEET;
S60°32'54"E, 71.00 FEET;
S41°55'54"E, 38.00 FEET;
S55°37'54"E, 40.00 FEET;
S79°39'54"E, 48.13 FEET;
N88°35'31"E, 60.39 FEET;
N76°30'31"E, 65.75 FEET;
N53°39'31"E, 120.00 FEET;
N50°34'31"E, 300.00 FEET;
N47°23'31"E, 100.00 FEET;
N28°54'31"E, 52.00 FEET;
N17°02'31"E, 95.10 FEET;
N27°35'31"E, 94.00 FEET;
N48°13'31"E, 61.63 FEET TO THE SOUTHERLY RIGHT OF WAY OF BASELINE ROAD;

THENCE ALONG SAID SOUTHERLY RIGHT OF WAY THE FOLLOWING COURSES:
N89°33'00"E, 10.40 FEET;
N89°37'58"E, 500.78 FEET;
N89°24'04"E, 140.59 FEET;
N89°38'00"E, 32.94 FEET TO THE WESTERLY RIGHT OF WAY OF COLORADO HIGHWAY NO 42 (95TH STREET);

THENCE ALONG SAID WESTERLY RIGHT OF WAY THE FOLLOWING COURSES:
S48°17'57"E, 146.51 FEET;

THENCE 451.59 FEET ALONG THE ARC OF A NON-TANGENT CURVE TO THE LEFT SAID ARC SUBTENDED BY A RADIUS OF 1221.00 FEET, A CENTRAL ANGLE OF 21°11'27", AND A CHORD BEARING S24°09'22"E, 449.02 FEET;

S39°40'30"E, 308.03 FEET;
S42°12'00"E, 133.41 FEET;
S39°43'30"E, 291.66 FEET;

THENCE 500.70 FEET ALONG THE ARC OF A NON-TANGENT CURVE TO THE RIGHT SAID ARC SUBTENDED BY A RADIUS OF 1071.00 FEET, A CENTRAL ANGLE OF 26°47'10", AND A CHORD BEARING S21°15'00"E, 496.15 FEET;

S02°46'30"E, 291.66 FEET;

S00°18'00"E, 323.39 FEET TO THE POINT OF BEGINNING, CONTAINING 100.86 ACRES, MORE OR LESS.

HAVE BY THESE PRESENTS LAID OUT, PLATTED AND SUBDIVIDED THE SAME INTO OUTLOTS, TRACTS, LOTS AND BLOCKS AS SHOWN HEREON AND DESIGNATE THE SAME AS "INDIAN PEAKS FILING NO. 17", IN THE CITY OF LAFAYETTE, COUNTY OF BOULDER, COLORADO; AND DO HEREBY GRANT TO THE CITY OF LAFAYETTE, COUNTY OF BOULDER, COLORADO, FOR PUBLIC USE THE STREETS RIGHT-OF-WAY SHOWN HEREON, INCLUDING WAYS, CIRCLES, ROADS, DRIVES AND LANES. THE PUBLIC LANDS SHOWN HEREON FOR THEIR INDICATED PUBLIC USE AND THE UTILITY AND DRAINAGE EASEMENTS SHOWN HEREON FOR UTILITY AND DRAINAGE PURPOSES ONLY; AND SO FURTHER STATE THAT THIS SUBDIVISION SHALL BE SUBJECT TO THE PROTECTIVE COVENANTS FILED AND RECORDED FOR THIS SUBDIVISION IN THE OFFICE OF THE CLERK AND RECORDER OF BOULDER COUNTY, COLORADO AS DOCUMENT NO. 2917883.

EXECUTED THIS 6TH DAY OF DECEMBER, A.D. 2007.

BRADDOCK ENTERPRISES, L.P. / BY PANCO LLC, ITS GENERAL PARTNER

BY: WILLIAM P. PISZEK & HELEN P. NELSON - CO-MANAGERS

ACKNOWLEDGMENT:

STATE OF PENNSYLVANIA)
)SS
COUNTY OF MONTGOMERY)

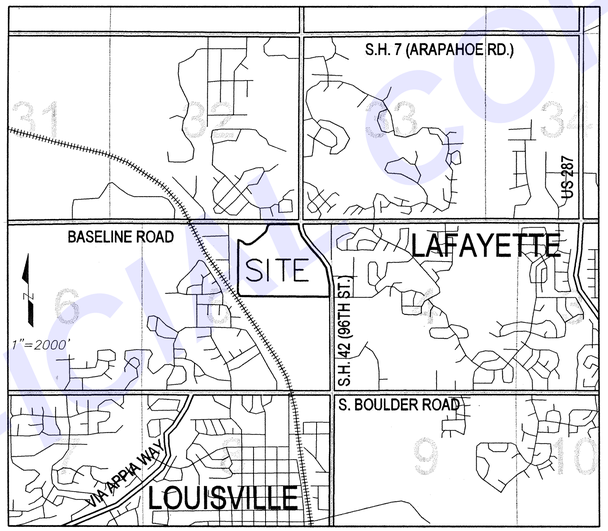
THE FOREGOING INSTRUMENT WAS ACKNOWLEDGED BEFORE ME THIS 6TH DAY OF DECEMBER, 20 07, BY WM. P. PISZEK/HELEN P. NELSON AS CO-MANAGER OF BRADDOCK ENTERPRISES, L.P. / PANCO LLC, ITS GENERAL PARTNER

WITNESS MY HAND AND OFFICIAL SEAL

NOTARY PUBLIC P. Edith Nelson

MY COMMISSION EXPIRES: _____

COMMONWEALTH OF PENNSYLVANIA
Notarial Seal
P. Edith Nelson, Notary Public
Upper Dublin Twp., Montgomery County
My Commission Expires March 29, 2011
Member, Pennsylvania Association of Notaries



VICINITY MAP

NOTES:

1. NOTICE: ACCORDING TO COLORADO LAW, YOU MUST COMMENCE ANY LEGAL ACTION BASED UPON ANY DEFECT IN THIS SURVEY WITHIN THREE YEARS AFTER YOU FIRST DISCOVER SUCH DEFECT. IN NO EVENT MAY ANY ACTION BASED UPON ANY DEFECT IN THIS SURVEY BE COMMENCED MORE THAN TEN YEARS FROM THE DATE OF THE CERTIFICATION SHOWN HEREON.
2. BEARINGS ARE BASED ON THE EASTERLY LINE OF THE NORTHEAST QUARTER OF SECTION 5: N00°03'50"E.
3. ALL OUTLOTS SHALL BE OWNED AND MAINTAINED BY THE HOMEOWNERS ASSOCIATION.
4. WATER METERS AND PERPENDICULAR UTILITY CROSSINGS THROUGH THE ARBORCULTURAL EASEMENT ARE ALLOWED.
5. OUTLOT A INCLUDES TRAILS PUBLIC ACCESS EASEMENT.
6. COVENANTS RECORDED INFORMATION _____
7. THE DEVELOPMENT AGREEMENT RECORDED INFORMATION _____
8. OUTLOT H IS DEDICATED AS A DRAINAGE EASEMENT.
9. UNLESS OTHERWISE NOTED, ALL PROPERTY CORNERS ARE FOUND 2" ALUMINUM CAPS STAMPED "ORTHMAN PLS 15315".
10. OUTLOTS F & G SHALL BE USED FOR LANDSCAPING & SIGNAGE.

ATTORNEY'S CERTIFICATE

I, MICHAEL BRADDOCK AN ATTORNEY LICENSED TO PRACTICE LAW IN THE STATE OF COLORADO, CERTIFY THAT I HAVE EXAMINED TITLE TO THE ABOVE DESCRIBED LAND DEDICATION TO THE CITY OF LAFAYETTE, COLORADO, AND THAT THE PARTIES EXECUTING THE DEDICATION ARE THE OWNERS THEREOF IN FEE SIMPLE, AND THE DEDICATED LAND IS FREE AND CLEAR OF ALL LIENS AND ENCUMBRANCES.

ATTORNEY AT LAW

EXECUTED THIS 17 DAY OF DECEMBER, A.D., 2007

PLANNING COMMISSION CERTIFICATE

THE PRELIMINARY PLAT FOR "INDIAN PEAKS FILING NO. 17" WAS APPROVED BY THE CITY OF LAFAYETTE PLANNING COMMISSION ON OCTOBER 24TH, 2006. A.D.

CHAIRPERSON

ATTEST: SECRETARY

CITY COUNCIL CERTIFICATE

THIS FINAL PLAT IS APPROVED BY THE CITY COUNCIL OF THE CITY OF LAFAYETTE, BOULDER COUNTY, COLORADO, THIS 19 DAY OF February, 2008 A.D. FOR FILING WITH THE CLERK AND RECORDER OF BOULDER COUNTY AND FOR CONVEYANCE TO THE CITY OF THE PUBLIC DEDICATIONS SHOWN HEREON; SUBJECT TO THE PROVISION THAT APPROVAL IN NO WAY OBLIGATES THE CITY OF LAFAYETTE, FOR THE FINANCING OR CONSTRUCTING OF IMPROVEMENTS ON LAND, OR EASEMENTS DEDICATED TO THE PUBLIC EXCEPT AS SPECIFICALLY AGREED TO BY THE CITY COUNCIL.

MAYOR

WITNESS MY HAND AND OFFICIAL SEAL OF THE CITY OF LAFAYETTE.

ATTEST: CITY CLERK

CITY OF LAFAYETTE HOME RULE BOULDER COUNTY, COLO. APRIL 1, 1909

CITY CLERK

CITY ADMINISTRATOR'S CERTIFICATE

I, Gary Klaphake CITY ADMINISTRATOR OF THE CITY OF LAFAYETTE, COLORADO, HEREBY CERTIFY THAT I HAVE EXAMINED THE FINAL PLAT AND IT APPEARS TO BE IN COMPLIANCE WITH ALL APPLICABLE ORDINANCES OF THE CITY AND THAT A SUBDIVISION AGREEMENT HAS BEEN EXECUTED BY THE DEVELOPER AND ACCEPTED BY THE CITY.

CITY ADMINISTRATOR

ATTEST:

CITY CLERK

EASEMENT APPROVALS

CITY ENGINEER

PUBLIC SERVICE CO. OF COLORADO

QWEST, INC.

SURVEYOR'S CERTIFICATE

FOR AND ON BEHALF OF HURST AND ASSOCIATES, INC., I, BO BAIZE, DO HEREBY CERTIFY THAT I AM A LICENSED LAND SURVEYOR LICENSED UNDER THE LAWS OF THE STATE OF COLORADO, THAT THIS PLAT IS A TRUE, CORRECT AND COMPLETE PLAT OF "INDIAN PEAKS FILING NO. 17" AS LAID OUT, PLATTED, DEDICATED AND SHOWN HEREON, THAT SUCH PLAT WAS MADE FROM AN ACCURATE SURVEY OF SAID PROPERTY BY ME AND UNDER MY SUPERVISION AND CORRECTLY SHOWS THE LOCATION AND DIMENSIONS OF THE LOTS, STAKED UPON THE GROUND IN COMPLIANCE WITH C.R.S. 38-50 THROUGH 38-53 GOVERNING THE SUBDIVISION OF LAND.

IN WITNESS WHEREOF, I HAVE SET MY HAND AND SEAL THIS 27TH DAY OF NOVEMBER, A.D., 2007

BO BAIZE
PLS NO. 37990

COLORADO LICENSED BO BAIZE 37990 PROFESSIONAL LAND SURVEYOR

COUNTY CLERK & RECORDER'S CERTIFICATE

STATE OF COLORADO)
) SS
COUNTY OF BOULDER)

I HEREBY CERTIFY THAT THIS PLAT WAS FILED IN MY OFFICE AT 12:38 O'CLOCK, P M. ON THE 21ST DAY OF March, 2008 AND IS DULY RECORDED AT RECEPTION NO. 2917883 AND PLAN FILE P-69 F-2 # 42,43+44 FEES PAID: $31.00

Hillary Hall
COUNTY CLERK & RECORDER

BY: DEPUTY

2917883
Page 1 of 3
03/21/2008 08:12A
R 31.00 D 0.00
Boulder County Clerk, CO PLAT

P-69 F-2 #42(1of3)

INDIAN PEAKS FILING 17
FINAL PLAT

SCALE HOR. N\A VERT. N\A	HURST & ASSOCIATES, INC
DESIGN/APPR. BO	CONSULTING ENGINEERS
DRAWN BY RH	4999 Pearl East Circle, Suite 106
DATE 10/11/07	Boulder, Colorado 80301 (303) 449-9105
FILE G:\1009124\SURVEY\FINAL\01-124-FP-CV	SHEET 1 OF 3

ORG: 03/28/07
REV: 06/07/07
REV: 07/18/07
REV: 10/11/07

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INDIAN PEAKS FILING NO. 17
FINAL PLAT

SHEET 2 OF 3

NORTH QUARTER CORNER, SECTION 5, FOUND 2.5" ALUMINUM CAP W/ 3/4" REBAR THROUGH CENTER, ILLEGIBLE MARKINGS IN RANGE BOX W/ NO LID. LOCATION MATCHES MONUMENT RECORD FILED BY LS 15315 ON 04/26/2005

BASELINE ROAD

EXISTING PUBLIC SERVICE EASEMENT (R# 1361553)

N89°37'58"E 500.78'

N89°24'04"E 140.59'

S48°17'51"E 146.51'

N17°02'31"E 85.10'

N27°35'31"E 84.00'

N47°23'31"E 100.00'

N50°34'31"E 300.00'

N53°39'31"E 120.00'

L1 L2 L3 L4 L5 L6 L7 L8 L9 L10 L11

OUTLOT G
4,728 S.F.

PUBLIC ACCESS EASEMENT

OUTLOT F
12,014 S.F.

N89°21'39"E 143.60'

EXISTING ELECTRIC EASEMENT (R# 754342)

L=451.59'
R=1221.00'
Δ=21°11'27"
CH=S24°09'22"E
449.02'

PUBLIC ACCESS EASEMENT
L=284.84'
R=1000.00'
Δ=15°09'45"
CH=S62°13'36"W
283.86'

TRACT A
447,182 S.F.
10.27 AC.

30' EMERGENCY ACCESS EASEMENT (CENTERLINE DESCRIBED)

20' UTILITY EASEMENT

UNPLATTED MAJOR

UNPLATTED KAMAS

UNPLATTED SLEEPER

UNPLATTED BASCOM

OUTLOT A

BLOCK 1

BLOCK 2

BLOCK 3

(SEE SHEET 3)

CRATER LAKE LANE

OUTLOT B (PRIVATE STREET)

GRAND LAKE DRIVE

OUTLOT I (PRIVATE STREET)

GREEN LAKE WAY

ROSER DRIVE

L=263.66'
R=300.00'
Δ=50°21'13"
CH=S29°26'05"W
255.25'

S26°17'26"E 350.06'

S63°42'34"W 571.00'

N89°59'55"W 169.12'

N25°31'14"W 120.20'

N26°17'26"W 112.50'

S63°42'34"W 314.22'

N28°17'26"W 45.00'

L=104.31'
R=40.00'
Δ=149°25'07"
CH=N79°00'01"E
77.17'

L=39.27'
R=25.00'
Δ=90°00'00"
CH=S18°42'34"W
35.36'

L=84.90'
R=45.00'
Δ=108°06'00"
CH=N53°34'06"E
72.86'

L=32.52'
R=45.00'
Δ=41°24'55"
CH=S84°24'52"W
31.82'

S26°17'26"E 67.00'

N63°42'34"E 19.21'

S63°42'34"E 66.00'

N63°42'34"E 29.66'

S63°42'34"W 29.90'

S26°17'26"E 61.63'

S63°42'39"W 18.71'

N63°42'39"E 228.73'

N63°42'39"E 233.66'

N63°42'39"E 199.66'

S72°26'17"E 193.70'

119.66'

20' UTILITY EASEMENT

S17°33'43"W 142.68'

S17°33'43"W 101.82'

N81°25'40"E 40.75'

UTILITY EASEMENT

S26°34'20"E 54.13'

S38°34'20"E 20.00'

S51°25'40"W 41.50'

S0°08'14"E 112.98'

S20°08'14"E 101.82'

100 YR. FLOODPLAIN BOUNDARY

OUTLOT H
534,393 S.F.
12.27 AC.

150' ROW

95TH STREET / SH 42

S42°12'00"E 1,331.47'

S39°43'30"E 291.66'

S39°40'30"E 308.03'

S38°39'57"E 485.59'

S52°49'05"E 207.16'

S53°05'48"E 72.64'

S30°57'29"E 8.40'

S59°04'12"E 152.21'

L=500.70'
R=1071.00'
Δ=26°47'10"
CH=S21°15'00"E
496.15'

S02°46'30"E 291.66'

S05°18'00"E 323.39'

NORTHEAST CORNER, SECTION 5 FOUND: 2.5" ALUMINUM CAP IN RANGE BOX, MARKED AS SHOWN

1531.5
T1N R69W
S33
S5 | S4
T1S | R69W
C | C
2005

SECTION LINE (BASIS OF BEARINGS): N00°03'30"E 2137.51'

S87°18'48"E 128.02'

N87°39'48"E 107.38'

N87°39'48"E 106.89'

N10°20'12"E 97.24'

77.40'

N84°14'43"E 147.06'

N55°46'32"W 265.07'

S27°16'15"W 436.91'

N09°42'17"E 217.83'

N10°20'01"E 74.80'

N03°59'40"E 115.09'

S89°36'49"E 96.41'

48.84'

N00°23'11"E 185.49'

N00°04'30"E 277.03'

S20°08'14"E 101.82'

S51°25'46"W 241.19'

S38°19'24"E 82.24'

TRACT B
356,166 S.F.
8.18 AC.

TRACT C
2,288,385 S.F.
52.53 AC.

TRACT D
135,875 S.F.
3.12 AC.

100 YR. FLOODPLAIN BOUNDARY

L=266.02'
R=450.00'
Δ=33°52'16"
CH=S17°00'39"W
262.17'

20' UTILITY EASEMENT

NOTE:

ALL LOTS, OUTLOTS, AND TRACTS OF INDIAN PEAKS FILING NO. 17 SHOWN ON THIS PLAT ARE BURDENED WITH A PERPETUAL, NON EXCLUSIVE EASEMENT PERMITTING TRAIN NOISE AND VIBRATION TO ENTER ON THE SAME FROM THE ADJACENT BURLINGTON NORTHERN SANTA FE RAIL ROAD. UNDER NO CIRCUMSTANCES SHALL THE CITY OF LAFAYETTE, ITS OFFICERS, EMPLOYEES OR AGENTS AND ITS SUCCESSORS AND ASSIGNS, MCSTAIN ENTERPRISES INC., AND BRADDOCK ENTERPRISE L.P. BE HELD LIABLE FOR ANY DAMAGE OR INJURY RESULTING FROM NOISE OR VIBRATION FROM THE EXISTING BNSF OR FUTURE FASTRACKS TRAINS ON SAID LOTS, AND OUTLOTS AND TRACTS OF THIS SUBDIVISION.

SET 2" ALUMINUM CAP, LS 37990 AT MIDPOINT OF BOUNDARY LINE PER C.R.S. 38-51-105(C)

GRACE MAR 1 SUBDIVISION

N0°09'31"E 1541.74'

1261.97'

BNSF RAILROAD

CENTER QUARTER CORNER, SECTION 5, NOTHING FOUND OR SET, FALLS IN RAILROAD BALLAST

N31°38'43"W 1124.72'

WEST QUARTER CORNER, SECTION 5, FOUND: STONE W/ CHISELED CROSS

SOUTH QUARTER CORNER, SECTION 5, FOUND: 3" ALUMINUM CAP IN RANGE BOX, MARKED AS SHOWN

T1S R69W
1/4
S5
S8
2002
PLS 14070

1897.05'

N89°55'30"W 2499.70'

SET 2" ALUMINUM CAP, LS 37990 AT MIDPOINT OF BOUNDARY LINE PER C.R.S. 38-51-105(C)

UNPLATTED - LOCKETT & LORENZ

379.35'

223.30'

73.90'

POINT OF BEGINNING

POINT OF COMMENCEMENT: EAST QUARTER CORNER, SECTION 5 FOUND: 2.5" ALUMINUM CAP IN RANGE BOX W/ ILLEGIBLE MARKINGS, LOCATION MATCHING MONUMENT RECORD BY LS 14070 FILED 01/24/2000

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

CURVE TABLE					
CURVE	LENGTH	RADIUS	DELTA	CHORD	BEARING
C1	28.98'	1221.00'	1°21'36"	28.98'	S14°14'26"E
C2	275.40'	1221.00'	12°55'24"	274.82'	S21°22'56"E
C3	147.21'	1221.00'	6°54'28"	147.12'	S31°17'52"E
C8	103.20'	45.00'	131°24'12"	82.03'	S88°00'06"W
C9	32.52'	45.00'	41°24'35"	31.82'	N43°00'17"E
C10	39.27'	25.00'	90°00'00"	35.36'	S71°17'26"E
C11	39.27'	25.00'	90°00'00"	35.36'	N71°17'26"W
C12	39.27'	25.00'	90°00'00"	35.36'	N18°42'34"E
C13	106.68'	122.50'	49°53'40"	103.34'	S01°20'36"E
C14	19.29'	20.00'	55°15'26"	18.55'	S01°29'17"W
C15	21.75'	73.00'	17°04'26"	21.67'	N20°25'48"E
C16	33.46'	37.00'	51°48'59"	32.33'	S37°48'05"W
C17	18.43'	25.00'	42°14'43"	18.02'	N84°49'56"E
C18	42.32'	32.00'	75°46'27"	39.30'	S36°09'29"E
C19	23.09'	155.00'	8°32'03"	23.07'	S05°58'46"W
C20	45.53'	245.00'	10°38'54"	45.47'	N04°56'21"E
C21	39.28'	25.00'	90°01'05"	35.36'	S44°37'26"W

LINE TABLE		
LINE	BEARING	LENGTH
L1	S72°48'54"E	82.00'
L2	S60°32'54"E	71.00'
L3	S41°55'54"E	38.00'
L4	S55°37'54"E	40.00'
L5	S79°39'54"E	48.13'
L6	N88°35'31"E	60.39'
L7	N76°30'31"E	65.75'
L8	N28°54'31"E	52.00'
L9	N48°13'31"E	61.63'
L10	N89°33'00"E	10.40'
L11	N89°38'00"E	32.94'
L12	S26°17'26"E	42.92'
L13	N63°42'34"E	58.00'
L14	N00°04'30"E	57.50'

2917883
Page 2 of 3
03/21/2008 12:38P
R 21.00 D 0.00
Boulder County Clerk, CO PLAT

INDIAN PEAKS FILING 17
FINAL PLAT

SCALE HOR. 1"=100' VERT. N\A	HURST & ASSOCIATES, INC
DESIGN/APPR. BO	CONSULTING ENGINEERS
DRAWN BY RH	4999 Pearl East Circle, Suite 106
DATE 01/30/08	Boulder, Colorado 80301 (303) 449-9105
FILE G:\1009124\SURVEY\FINAL\02-124-FP1	SHEET 2 OF 3

P-69 F-2 #43 (2 of 3)

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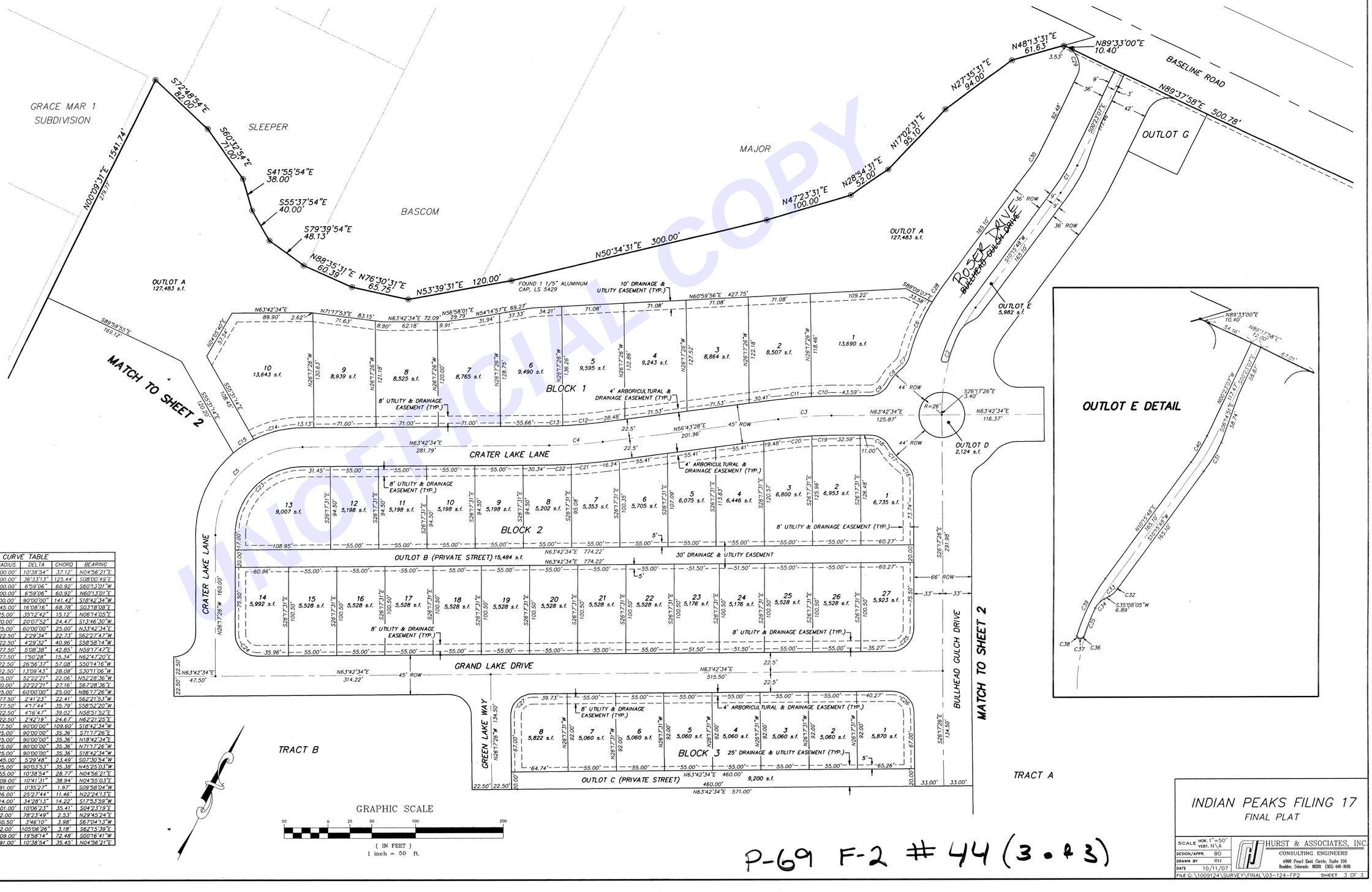
INDIAN PEAKS FILING NO. 17
FINAL PLAT

SHEET 3 OF 3



CURVE TABLE					
CURVE	LENGTH	RADIUS	DELTA	CHORD	BEARING
C1	37.17'	200.00'	10°38'54"	37.12'	N04°56'21"E
C2	127.60'	200.00'	36°33'13"	125.44'	S08°10'49"E
C3	60.96'	500.00'	6°59'06"	60.92'	S62°13'01"W
C4	60.96'	500.00'	6°59'06"	60.92'	N60°13'01"E
C5	157.08'	100.00'	90°00'00"	141.42'	S18°42'34"W
C6	69.01'	245.00'	16°08'16"	68.78'	S03°18'08"E
C7	15.36'	25.00'	35°12'42"	15.12'	N06°14'05"E
C8	24.59'	70.00'	20°07'52"	24.47'	S13°46'30"W
C9	26.18'	25.00'	60°00'00"	25.00'	N33°42'34"E
C10	22.73'	522.50'	2°29'34"	22.73'	S62°27'47"W
C11	40.97'	522.50'	4°29'32"	40.96'	S58°58'14"W
C12	42.87'	477.50'	5°08'38"	42.85'	N59°17'47"E
C13	15.34'	477.50'	1°50'28"	15.34'	N62°47'20"E
C14	52.61'	122.50'	26°56'37"	57.08'	S50°14'16"W
C15	28.14'	122.50'	1°39'43"	28.08'	S30°11'06"W
C16	22.85'	25.00'	52°22'21"	22.06'	N52°28'36"W
C17	27.33'	70.00'	22°22'21"	27.16'	S67°28'36"E
C18	26.18'	25.00'	60°00'00"	25.00'	N86°17'26"W
C19	22.41'	477.50'	2°41'23"	22.41'	S62°21'53"W
C20	35.80'	477.50'	4°17'44"	35.79'	S58°52'20"W
C21	39.03'	522.50'	4°16'47"	39.02'	N58°51'52"E
C22	24.67'	522.50'	2°42'19"	24.67'	N62°21'25"E
C23	121.74'	77.50'	90°00'00"	109.60'	S18°42'34"W
C24	39.27'	25.00'	90°00'00"	35.36'	S71°17'26"E
C25	39.27'	25.00'	90°00'00"	35.36'	N18°42'34"E
C26	39.27'	25.00'	90°00'00"	35.36'	N71°17'26"W
C27	39.27'	25.00'	90°00'00"	35.36'	S18°42'34"W
C28	23.50'	245.00'	5°29'48"	23.49'	S07°30'54"W
C29	39.30'	25.00'	90°03'53"	35.38'	N45°26'03"W
C30	28.81'	155.00'	10°38'54"	28.77'	N04°56'21"E
C31	39.00'	209.00'	10°41'31"	38.94'	N04°55'03"E
C32	1.97'	191.00'	0°35'27"	1.97'	S09°58'04"W
C33	11.55'	26.00'	25°27'44"	11.46'	N22°24'13"E
C34	14.44'	24.00'	34°28'13"	14.22'	S17°53'59"W
C35	35.45'	201.00'	10°06'23"	35.41'	S04°21'19"E
C36	2.74'	2.00'	78°23'49"	2.53'	N29°45'24"E
C37	3.98'	60.50'	3°46'10"	3.98'	S67°04'13"W
C38	3.67'	2.00'	105°06'26"	3.18'	S62°15'39"E
C39	72.85'	209.00'	19°58'14"	72.48'	S00°16'41"W
C40	35.50'	191.00'	10°38'54"	35.45'	N04°56'21"E

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

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2917883
Pages: 3 of 3
10/12/2007 12:38P
R 31.00 D 0.00
Boulder County Clerk, CO RECORDER

P-69 F-2 # 44 (3 of 3)

INDIAN PEAKS FILING 17
FINAL PLAT

SCALE HOR. 1"=50' VERT. N\A	HURST & ASSOCIATES, INC.
DESIGN/APPR. BO	CONSULTING ENGINEERS
DRAWN BY RH	4990 Pearl East Circle, Suite 106
DATE 10/11/07	Boulder, Colorado 80301 (303) 449-9105
FILE G:\1009124\SURVEY\FINAL\03-124-FP2	SHEET 3 OF 3

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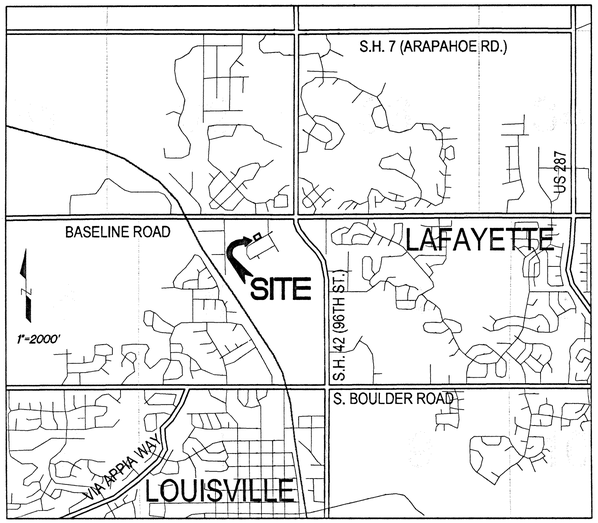
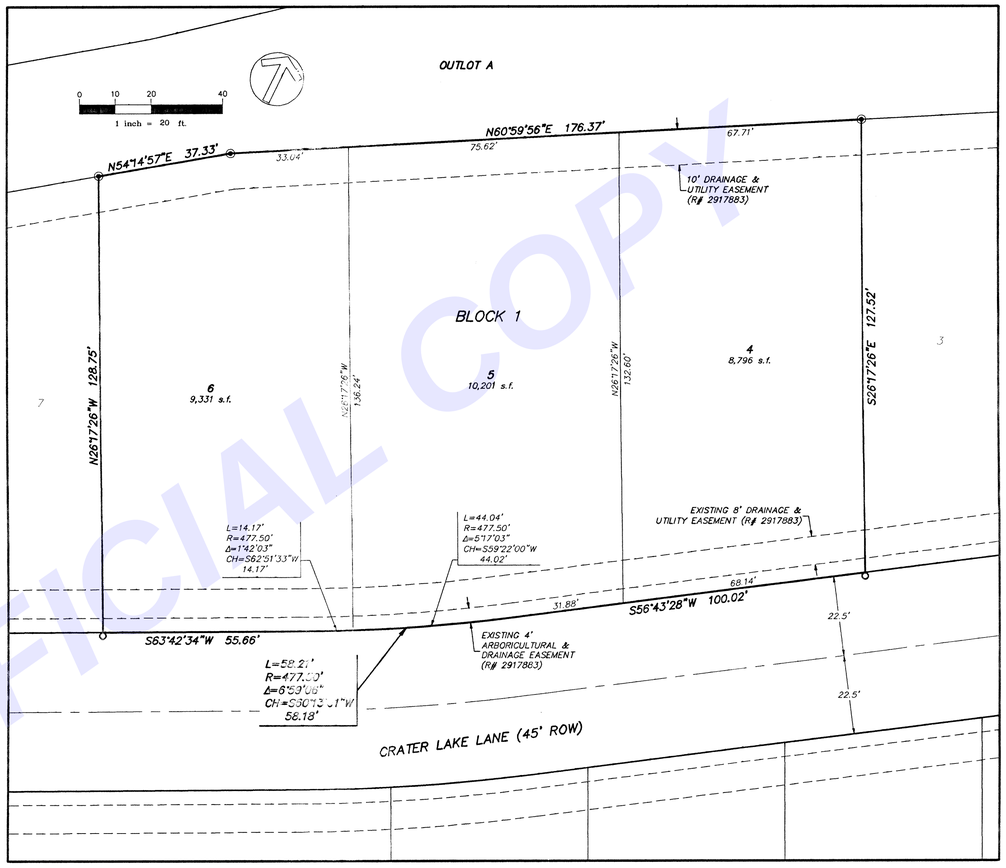
INDIAN PEAKS FILING NO. 17 REPLAT A MINOR SUBDIVISION

A REPLAT OF INDIAN PEAKS FILING NO. 17 LOTS 4, 5 AND 6, BLOCK 1
LOCATED IN THE NORTHEAST QUARTER OF SECTION 5, TOWNSHIP 1 SOUTH, RANGE 69 WEST OF THE 6TH P.M., CITY OF LAFAYETTE, COUNTY OF BOULDER, STATE OF COLORADO

3 LOTS – 28,328 SQUARE FEET



VICINITY MAP



CERTIFICATE OF OWNERSHIP

KNOW ALL MEN BY THESE PRESENTS THAT THE UNDERSIGNED, BEING SOLE OWNER OF ALL THAT REAL PROPERTY SITUATED IN BOULDER COUNTY, COLORADO, AND LYING WITHIN THE EXTERIOR BOUNDARY OF "INDIAN PEAKS FILING NO. 17" A SUBDIVISION OF A PORTION OF THE NORTHEAST QUARTER OF SECTION 5, T1S, R69W OF THE 6TH P.M. CITY OF LAFAYETTE, COUNTY OF BOULDER, STATE OF COLORADO DESCRIBED AS FOLLOWS:

LOTS 4, 5 & 6 OF BLOCK 1, "INDIAN PEAKS FILING NO. 17" AS RECORDED 03/21/2008 AT PLAN FILE P-69, F-2, #42-44;

HAVE BY THESE PRESENTS LAID OUT, PLATTED AND SUBDIVIDED THE SAME INTO LOTS AS SHOWN HEREON AND DESIGNATE THE SAME AS "INDIAN PEAKS FILING NO. 17 REPLAT A MINOR SUBDIVISION" IN THE CITY OF LAFAYETTE, COUNTY OF BOULDER, STATE OF COLORADO.

EXECUTED THIS 31st DAY OF July, 2008 A.D.,

INDIAN PEAKS SOUTH, LLC,
A COLORADO LIMITED LIABILITY COMPANY
BY McSTAIN ENTERPRISES, INC.,
ITS MANAGER

BY: _____

ACKNOWLEDGMENT

STATE OF COLORADO)
) SS
COUNTY OF Boulder)

THE FOREGOING INSTRUMENT WAS ACKNOWLEDGED BEFORE ME THIS 31st DAY OF July, 2008 BY Bruce Valentine AS Vice President OF McSTAIN ENTERPRISES, INC., MANAGER OF INDIAN PEAKS SOUTH, LLC.

WITNESS MY HAND AND OFFICIAL SEAL.

MY COMMISSION EXPIRES: 10-11-09

_____
NOTARY PUBLIC

S. ZISSIMOS
NOTARY PUBLIC
STATE OF COLORADO
My Commission Expires Oct. 11, 2009

MORTGAGEE'S ACCEPTANCE:

UNITED WESTERN BANK HEREBY CONSENTS TO THE RECORDING OF THE INDIAN PEAKS FILING NO. 17 REPLAT A MINOR SUBDIVISION, AND JOIN IN THE DEDICATION MADE HEREIN TO THE EXTENT OF THEIR INTEREST THEREIN.

BY: _____

SVP
TITLE

ACKNOWLEDGMENT

STATE OF COLORADO)
) SS
COUNTY OF Boulder)

CRISTINA CORTES
Notary Public
State of Colorado
My Commission Expires 4-6-2010

THE FOREGOING INSTRUMENT WAS ACKNOWLEDGED BEFORE ME THIS 1st DAY OF August, 2008 BY Michael Saun J. AS SVP OF UNITED WESTERN BANK

WITNESS MY HAND AND OFFICIAL SEAL.

MY COMMISSION EXPIRES: June 2, 2010

_____
NOTARY PUBLIC

MORTGAGEE'S ACCEPTANCE:

BRADDOCK ENTERPRISES, L.P., A PENNSYLVANIA LIMITED PARTNERSHIP HEREBY CONSENTS TO THE RECORDING OF THE INDIAN PEAKS FILING NO. 17 REPLAT A MINOR SUBDIVISION, AND JOIN IN THE DEDICATION MADE HEREIN TO THE EXTENT OF THEIR INTEREST THEREIN.

_____
HELEN P. NELSON, CO-MANAGER

_____
WILLIAM P. PISZEK, CO-MANAGER

ACKNOWLEDGMENT

STATE OF Pennsylvania)
) SS
COUNTY OF Montgomery)

THE FOREGOING INSTRUMENT WAS ACKNOWLEDGED BEFORE ME THIS 8 DAY OF August, 2008, BY HELEN P. NELSON AND WILLIAM P. PISZEK, CO-MANAGERS OF BRADDOCK ENTERPRISES, L.P., A PENNSYLVANIA LIMITED PARTNERSHIP.

WITNESS MY HAND AND OFFICIAL SEAL.

MY COMMISSION EXPIRES: COMMONWEALTH OF PENNSYLVANIA

_____
NOTARY PUBLIC

Notarial Seal
P. Erik Nelson, Notary Public
Lower Dublin Twp., Montgomery County
My Commission Expires March 23, 2011
Member, Pennsylvania Association of Notaries

NOTES:

1) NOTICE: ACCORDING TO COLORADO LAW, YOU MUST COMMENCE ANY LEGAL ACTION BASED UPON ANY DEFECT IN THIS SURVEY WITHIN THREE YEARS AFTER YOU FIRST DISCOVER SUCH DEFECT. IN NO EVENT MAY ANY ACTION BASED UPON ANY DEFECT IN THIS SURVEY BE COMMENCED MORE THAN TEN YEARS FROM THE DATE OF THE CERTIFICATION SHOWN HEREON.

2) BASIS OF BEARINGS: THE NORTHWESTERLY LINE OF LOTS 4 AND 5, BEARING N60°59'56"E, AS SHOWN ON THE "INDIAN PEAKS FILING NO. 17" PLAT.

3) THE PURPOSE OF THIS REPLAT IS TO ADJUST THE LOT LINES BETWEEN THE THREE LOTS.

4) NO EASEMENTS ARE CREATED OR VACATED BY THIS PLAT.

5) 1" PLASTIC CAPS (PLS 37990) ON #5 REBAR WILL BE SET ON REAR CORNERS AND A 1 FOOT OFFSET NAIL/SHINER WILL BE SET IN SIDEWALK ON FRONT CORNERS.

SURVEYOR'S CERTIFICATE

FOR AND ON BEHALF OF HURST & ASSOCIATES, INC., I, BO BAIZE, DO HEREBY CERTIFY THAT I AM A DULY LICENSED LAND SURVEYOR LICENSED UNDER THE LAWS OF THE STATE OF COLORADO, THAT THIS PLAT IS A TRUE, CORRECT AND COMPLETE PLAT OF "INDIAN PEAKS FILING NO. 17 REPLAT A MINOR SUBDIVISION" AS LAID OUT, PLATTED, DEDICATED AND SHOWN HEREON, THAT SUCH PLAT WAS MADE FROM AN ACCURATE SURVEY OF SAID PROPERTY BY ME AND UNDER MY DIRECT RESPONSIBILITY, SUPERVISION AND CHECKING AND CORRECTLY SHOWS THE LOCATION AND DIMENSIONS OF THE TRACTS, STAKED UPON THE GROUND IN COMPLIANCE WITH ARTICLES 50-53 OF TILE 38, COLORADO REVISED STATUES GOVERNING THE SUBDIVISION OF LAND.

IN WITNESS WHEREOF, I HAVE SET MY HAND AND SEAL THIS 21ST DAY OF JULY, 2008 A.D.

_____
BO BAIZE
COLORADO LICENSED PROFESSIONAL LAND SURVEYOR NO. 37990
4999 PEARL EAST CIRCLE, SUITE 106
BOULDER, CO 80301
303-449-9105

COLORADO LICENSED
BO BAIZE
37990
PROFESSIONAL LAND SURVEYOR

TITLE COMPANY'S CERTIFICATE:

I, Kimberly Zuwwyerwyd REPRESENTING LAND TITLE GUARANTEE COMPANY, CERTIFY THAT I HAVE EXAMINED TITLE TO THE DESCRIBED LAND WITHIN THE CITY OF LAFAYETTE, COLORADO, AND THAT THE PROPERTY IS FREE AND CLEAR EXCEPT FOR THOSE MATTERS SHOWN IN TITLE COMMITMENT ABN70218969 WITH AN EFFECTIVE DATE OF JULY 01, 2008.

_____
NAME

Title Officer
TITLE

EXECUTED THIS 31ST DAY OF July, A.D., 2008

CITY ADMINISTRATOR'S CERTIFICATE

I, GARY KLAPHAKE, CITY ADMINISTRATOR OF THE CITY OF LAFAYETTE, COLORADO, HEREBY CERTIFY THAT I HAVE EXAMINED THE MINOR SUBDIVISION PLAT AND IT APPEARS TO BE IN COMPLIANCE WITH ALL APPLICABLE ORDINANCES OF THE CITY AND THAT A DEVELOPMENT AGREEMENT HAS BEEN EXECUTED BY THE DEVELOPER AND ACCEPTED BY THE CITY.

_____
CITY ADMINISTRATOR

_____
ATTEST: CITY CLERK

CITY OF LAFAYETTE HOME RULE APRIL 1, 1909 BOULDER COUNTY, COLORADO

PLANNING DIRECTOR CERTIFICATE

PURSUANT TO SECTION 26-16-6 OF THE LAFAYETTE CODE OF ORDINANCES, THIS MINOR SUBDIVISION PLAT FOR "INDIAN PEAKS FILING NO. 17 REPLAT A MINOR SUBDIVISION" WAS APPROVED BY THE PLANNING DIRECTOR OF THE CITY OF LAFAYETTE, COLORADO ON August 13, 2008 A.D.

_____
PLANNING DIRECTOR

_____
ATTEST: CITY CLERK

CITY OF LAFAYETTE HOME RULE APRIL 1, 1909 BOULDER COUNTY, COLORADO

REVIEW CERTIFICATES

_____
CITY OF LAFAYETTE ENGINEER

_____
QWEST COMMUNICATIONS, INC.

_____
PUBLIC SERVICE COMPANY OF COLORADO

COUNTY CLERK & RECORDER'S CERTIFICATE

STATE OF COLORADO)
) SS
COUNTY OF BOULDER)

I HEREBY CERTIFY THAT THIS PLAT WAS FILED IN MY OFFICE AT 9:28 O'CLOCK A. M. ON THE 13th DAY OF August, 2008 AND IS DULY RECORDED AT RECEPTION NO. 2949409 AND PLAN FILE P-70 F-2 # 34

FEES PAID: $ 11.00

_____
COUNTY CLERK & RECORDER

_____
BY: DEPUTY

2949409
Page 1 of 1
08/14/2008 09:28a
R 11.00 D 0.00
Boulder County Clerk, CO PLAT

P-70 F-2 #34

INDIAN PEAKS FILING NO. 17 REPLAT A MINOR SUBDIVISION PLAT LAFAYETTE, COLORADO		
SCALE HOR. 1"=20' VERT. N/A	HURST & ASSOCIATES, INC CONSULTING ENGINEERS 4999 Pearl East Circle, Suite 106 Boulder, Colorado 80301 (303) 449-9105	
DESIGN/APPR. BO		
DRAWN BY BO		
DATE 07/29/08		
ORG: 07/08/08 REV: 07/09/08 REV: 07/29/08	FILE G:\1009124\SURVEY\124-REPLAT A	SHEET 1 OF 1

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03058314
Page 1 of 3
DF: $0.00
RF: $31.00
02/11/2010 12:21 PM
Boulder County Clerk, CO

Indian Peaks Filing No. 17 - Tract A

FINAL PLAN/ PUD

Lafayette, Colorado

A PORTION OF THE NORTHEAST QUARTER OF SECTION 5, T1S, R69W OF THE 6TH P.M., CITY OF LAFAYETTE, COUNTY OF BOULDER, STATE OF COLORADO

SHEET INDEX

COVER SHEET	1 OF 3
PUD PLAN	2 OF 3
LANDSCAPE PLAN	3 OF 3

CIVIL ENGINEERING
PLANNING
SURVEYING

HURST

4999 Pearl East Circle
Suite 106
Boulder, CO 80301
303.449.9105
www.hurst-assoc.com

OWNER'S CERTIFICATE

KNOW ALL MEN BY THESE PRESENTS, THAT INDIAN PEAKS SOUTH, LLC. A COLORADO LIMITED LIABILITY COMPANY, HEREBY CERTIFIES THAT IT IS THE OWNER OF FEE TITLE TO ALL THAT REAL PROPERTY SITUATED IN BOULDER COUNTY, COLORADO, AND LYING WITHIN THE EXTERIOR BOUNDARY OF "INDIAN PEAKS FILING NO. 17", A SUBDIVISION OF A PORTION OF THE NORTHEAST QUARTER OF SECTION 5, TOWNSHIP 1 SOUTH, RANGE 69 WEST OF THE 6TH P.M., CITY OF LAFAYETTE, COUNTY OF BOULDER, STATE OF COLORADO, DESCRIBED AS FOLLOWS:

TRACT A, OUTLOT F AND OUTLOT G OF "INDIAN PEAKS FILING NO. 17" (PLAT RECORDED 03/21/2008 AT RECEPTION NO. 2917883), LOCATED IN THE NORTHEAST QUARTER OF SECTION 5, TOWNSHIP 1 SOUTH, RANGE 69 WEST OF THE 6TH P.M., CITY OF LAFAYETTE, COUNTY OF BOULDER, STATE OF COLORADO, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE NORTHEASTERLY CORNER OF OUTLOT G;

THENCE ALONG THE SOUTHERLY RIGHT OF WAY LINE OF BASELINE ROAD AND THE WESTERLY RIGHT OF WAY LINE OF 95TH STREET THE FOLLOWING FIVE COURSES:

1) N89°37'58"E, 329.95 FEET;
2) N89°24'04"E, 140.59 FEET;
3) N89°38'00"E, 32.94 FEET;
4) S48°17'57"E, 146.51 FEET;
5) 304.38 FEET ALONG THE ARC OF A NON-TANGENT CURVE TO THE LEFT, SAID CURVE HAVING A RADIUS OF 1,221.00 FEET, A CENTRAL ANGLE OF 14°17'00", AND A CHORD BEARING S20°42'08"E, 303.60 FEET;

THENCE ALONG THE SOUTHERLY LINE OF TRACT A THE FOLLOWING ELEVEN COURSES:

1) S65°38'55"W, 217.21 FEET;
2) S62°12'27"W, 213.15 FEET;
3) S18°44'56"W, 35.79 FEET;
4) S26°17'31"E, 154.04 FEET;
5) S72°26'37"E, 74.04 FEET;
6) S63°42'29"W, 199.66 FEET;
7) 103.20 FEET ALONG THE ARC OF A NON-TANGENT CURVE TO THE LEFT, SAID CURVE HAVING A RADIUS OF 45.00 FEET, A CENTRAL ANGLE OF 131°24'12", AND A CHORD BEARING S88°00'06"W, 82.03 FEET;
8) 32.52 FEET ALONG THE ARC OF A REVERSE CURVE TO THE RIGHT, SAID CURVE HAVING A RADIUS OF 45.00 FEET, A CENTRAL ANGLE OF 41°24'35", AND A CHORD BEARING S43°00'17"W, 31.82 FEET;
9) S63°42'34"W, 19.21 FEET;
10) 39.27 FEET ALONG THE ARC OF A TANGENT CURVE TO THE RIGHT, SAID CURVE HAVING A RADIUS OF 25.00 FEET, A CENTRAL ANGLE OF 90°00'00", AND A CHORD BEARING N71°17'26"W, 35.36 FEET;
11) N26°17'26"W, 67.00 FEET;

THENCE ALONG THE EASTERLY RIGHT OF WAY LINE OF ROSER DRIVE THE FOLLOWING FOURTEEN COURSES:

1) N26°17'26"W, 350.06 FEET;
2) 19.29 FEET ALONG THE ARC OF A TANGENT CURVE TO THE RIGHT, SAID CURVE HAVING A RADIUS OF 20.00 FEET, A CENTRAL ANGLE OF 55°15'27", AND A CHORD BEARING N01°20'17"E, 18.55 FEET;
3) 21.75 FEET ALONG THE ARC OF A REVERSE CURVE TO THE LEFT, SAID CURVE HAVING A RADIUS OF 73.00 FEET, A CENTRAL ANGLE OF 17°04'26", AND A CHORD BEARING N20°25'48"E, 21.67 FEET;
4) 33.46 FEET ALONG THE ARC OF A REVERSE CURVE TO THE RIGHT, SAID CURVE HAVING A RADIUS OF 37.00 FEET, A CENTRAL ANGLE OF 51°48'59", AND A CHORD BEARING N37°48'05"E, 32.33 FEET;
5) N63°42'34"E, 29.90 FEET;
6) N26°17'26"W, 62.00 FEET;
7) S63°42'34"W, 29.66 FEET;
8) 18.43 FEET ALONG THE ARC OF A TANGENT CURVE TO THE RIGHT, SAID CURVE HAVING A RADIUS OF 25.00 FEET, A CENTRAL ANGLE OF 42°14'43", AND A CHORD BEARING S84°49'56"W, 18.02 FEET;
9) 42.32 FEET ALONG THE ARC OF A COMPOUND CURVE TO THE RIGHT, SAID CURVE HAVING A RADIUS OF 32.00 FEET, A CENTRAL ANGLE OF 75°46'27", AND A CHORD BEARING N36°09'29"W, 39.30 FEET;
10) 23.09 FEET ALONG THE ARC OF A COMPOUND CURVE TO THE RIGHT, SAID CURVE HAVING A RADIUS OF 155.00 FEET, A CENTRAL ANGLE OF 08°32'03", AND A CHORD BEARING N05°59'46"E, 23.07 FEET;
11) N10°15'48"E, 165.10 FEET;
12) 45.53 FEET ALONG THE ARC OF A TANGENT CURVE TO THE LEFT, SAID CURVE HAVING A RADIUS OF 245.00 FEET, A CENTRAL ANGLE OF 10°38'54", AND A CHORD BEARING N04°56'21"E, 45.47 FEET;
13) N00°23'07"W, 92.44 FEET;
14) 39.28 FEET ALONG THE ARC OF A TANGENT CURVE TO THE RIGHT, SAID CURVE HAVING A RADIUS OF 25.00 FEET, A CENTRAL ANGLE OF 90°01'05", AND A CHORD BEARING N44°37'26"E, 35.36 FEET;

THENCE N89°37'58"E, 37.66 FEET ALONG THE NORTHERLY LINE OF OUTLOT G TO THE POINT OF BEGINNING, CONTAINING 10.65 ACRES, MORE OR LESS.

BASIS OF BEARINGS: BEARINGS ARE BASED ON THE NORTHERLY LINE OF OUTLOT G (SOUTHERLY RIGHT OF WAY LINE OF BASELINE ROAD) TO BE N89°37'58"E, TO MATCH THE "INDIAN PEAKS FILING NO. 17" FINAL PLAT.

EXECUTED THIS 11TH DAY OF January, 2010 A.D.

INDIAN PEAKS SOUTH, LLC. A COLORADO LIMITED LIABILITY COMPANY, BY MCSTAIN ENTERPRISES INC. ITS MANAGER

BY: THOMAS R. HUNT
AS: PRESIDENT

ACKNOWLEDGMENT:

STATE OF COLORADO)
)SS
COUNTY OF BOULDER)

THE FOREGOING INSTRUMENT WAS ACKNOWLEDGED BEFORE ME THIS 11TH DAY OF January, 2010 A.D. BY THOMAS R. HUNT OF MCSTAIN ENTERPRISES AS OWNER OF THE PROPERTY DESCRIBED HEREON.

WITNESS MY HAND AND OFFICIAL SEAL.

MY COMMISSION EXPIRES 10-16-2011

NOTARY PUBLIC

LOT 1 DESCRIPTION:

A PORTION OF TRACT A OF "INDIAN PEAKS FILING NO. 17" (PLAT RECORDED 03/21/2008 AT RECEPTION NO. 29178830, LOCATED IN THE NORTHEAST QUARTER OF SECTION 5, TOWNSHIP 1 SOUTH, RANGE 69 WEST OF THE 6TH P.M., CITY OF LAFAYETTE, COUNTY OF BOULDER, STATE OF COLORADO, DESCRIBED AS FOLLOWS:

BEGINNING AT THE MOST SOUTHEASTERLY CORNER OF THE RIGHT OF WAY FOR ROSER DRIVE AS SHOWN ON THE INDIAN PEAKS FILING NO. 17 PLAT;

THENCE N26°17'26"W, 222.00 FEET ALONG THE SOUTHWESTERLY LINE OF TRACT A, ALSO BEING THE NORTHEASTERLY RIGHT OF WAY LINE OF ROSER DRIVE (BASIS OF BEARINGS);

THENCE N63°42'34"E, 180.00 FEET;

THENCE S26°17'26"E, 25.00 FEET;

THENCE N63°42'34"E, 88.12 FEET;

THENCE S26°17'26"E, 20.00 FEET;

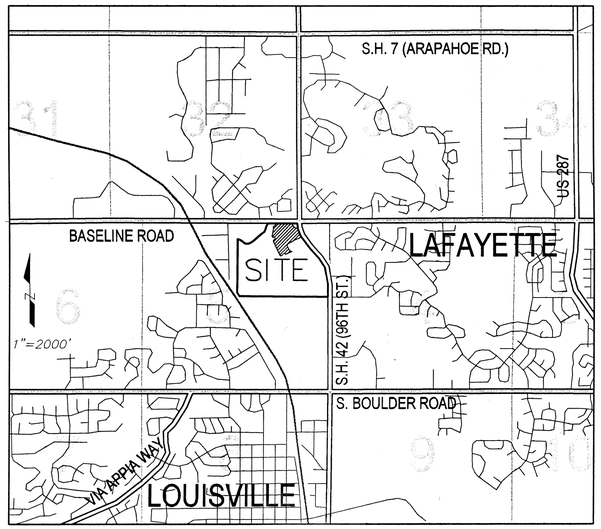
THENCE S06°24'36"E, 190.34 FEET;

THENCE S63°42'34"W, 103.39 FEET;

THENCE S26°17'26"E, 67.66 FEET TO THE SOUTHERLY LINE OF TRACT A;

THENCE ALONG THE SOUTHERLY LINE OF SAID TRACT A THE FOLLOWING FIVE COURSES:

1) 28.78 FEET ALONG THE ARC OF A NON-TANGENT CURVE TO THE LEFT, SAID CURVE HAVING A RADIUS OF 45.00 FEET, A CENTRAL ANGLE OF 36°38'29", AND A CHORD BEARING S40°37'14"W, 28.29 FEET;
2) 32.52 FEET ALONG THE ARC OF A REVERSE CURVE TO THE RIGHT, SAID CURVE HAVING A RADIUS OF 45.00 FEET, A CENTRAL ANGLE OF 41°24'35", AND A CHORD BEARING S43°00'17"W, 31.82 FEET;
3) S63°42'34"W, 19.21 FEET;
4) 39.27 FEET ALONG THE ARC OF A TANGENT CURVE TO THE RIGHT, SAID CURVE HAVING A RADIUS OF 25.00 FEET, A CENTRAL ANGLE OF 90°00'00", AND A CHORD BEARING N71°17'26"W, 35.36 FEET;
5) N26°17'26"W, 67.00 FEET TO THE POINT OF BEGINNING, CONTAINING 60,342 SQUARE FEET OR 1.39 ACRES, MORE OR LESS.



REGIONAL MAP

Planning Commission Certificate:

The Preliminary Planned Unit Development for "Indian Peaks Filing No. 17 – Tract A" was approved by the City of Lafayette Planning Commission on Dec 2nd 2009 *a.d.*

Chairperson — Attest: Secretary

City Council Certificate:

This final PUD is approved by the City Council of the City of Lafayette, Colorado, this 25th *day of* January, 2010 *A.D. for filing with the Clerk and Recorder of Boulder County and subject to the provision that approval in no way obligates the City of Lafayette for the financing or constructing of improvements on land or easements dedicated to the public except as specifically agreed to by the City Council.*

Mayor

Witness my hand and official seal of the City of Lafayette.

Attest: City Clerk

CITY OF LAFAYETTE HOME RULE APRIL 1, 1969 BOULDER COUNTY, COLORADO

Review Certificates:

City of Lafayette Engineer — Public Service Company of Colorado

Qwest Communications, Inc.

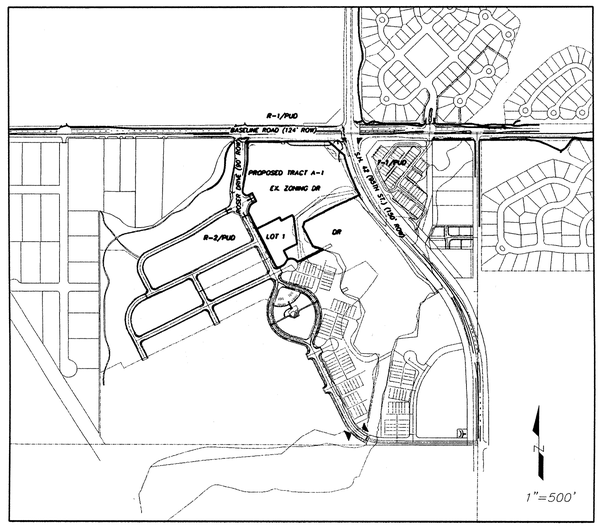
City Administrator's Certificate:

I, Gary Klaphake, City Administrator of the City of Lafayette, Colorado, hereby certify that I have examined the final PUD and it appears to be in compliance with all applicable ordinances of the city and that a development agreement has been executed by the developer and accepted by the City.

City Administrator

Attest: City Clerk

CITY OF LAFAYETTE HOME RULE APRIL 1, 1969 BOULDER COUNTY, COLORADO



VICINITY MAP

Design Guidelines for Indian Peaks South Commercial Parcels

The intent is to develop an attractive and financially viable neighborhood center which serves as the western gateway to Lafayette and is compatible with the architectural character of the overall Indian Peaks development.

With that goal in mind we are proposing the following Design Guidelines:

- *All development within the commercial parcel will comply with the City of Lafayette's Commercial Development Design Guidelines (C1 Regional Business District)*
- *Architectural Styles will be limited to those already approved for Indian Peaks (Craftsman, Farmhouse, or Colorado Chautauqua) OR for Hedgerow (Contemporary Barn style)*
- *The proposed Child Care facility must be constructed in Craftsman style, using the same materials and details incorporated in existing Craftsman homes in Indian Peaks*
- *The balance of the center, located north of the proposed Child Care facility, may be constructed in any of the styles listed under the second bullet, but all structures located there, must use the same style.*
- *Separate structures within the commercial parcel may be connected by arcades.*
- *No single commercial building will have a footprint more than 60% greater than the total square footage of the largest townhouse building in Indian Peaks (maximum allowable building footprint 30,000 sq. ft.)*
- *Residential apartments will be encouraged (although not required) above the ground floor commercial space in some buildings so as to keep the character of the development residential in feel.*
- *Colors shall be limited to those already used on homes within Indian Peaks*
- *Materials shall be limited to those already used within Indian Peaks unless they is similar in character and of a higher quality*
- *All plans must be pre-approved and signed by the management of Indian Peaks South, LLC and City of Lafayette for compliance with the design intent of these guidelines before any construction can commence*

Indian Peaks South Commercial Business District(s) Regulations:

The business owner(s) associated with operations within the boundaries of the commercial Tracts A and B (the "Commercial Property") as defined by the Indian Peak Filing No. 17 final plat recorded on March 21, 2008, Boulder County, under reception no. 2917883 will be required to establish a business association district. The business association district shall be a non-profit entity to establish restrictive covenants, mechanisms for the operation, maintenance and preservation of the business district. The business district association shall bear all costs associated with its operation including the maintaining and repairs of any signage serving the Commercial Property.

The business district association will be required to enter into an infrastructure and cost share agreement with the existing Indian Peaks South residential association. This agreement shall address the maintenance and cost sharing associated with the mutual use of the common street area ("Roser Drive") and it's related landscaping and amenities, and Greenbelt areas (common open space, trail systems and detention pond) serving both the residential property and the Commercial Property.

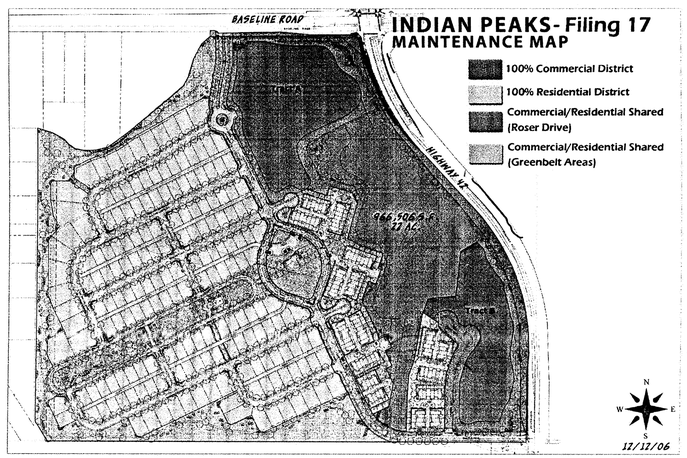
Note: *A separate preliminary plan/PUD shall be submitted and approved prior to any development of Tract A1*

Clerk and Recorder's Certificate:

I hereby certify that this instrument was filed in my office at 12:21 *o'clock* P *m., this* 11th *day of* February, *2010 and is recorded in Plan File #* ———

Reception # 3058314 — Fees: $31.00

Deputy — Clerk and Recorder



APPLICANT/ PROPERTY OWNER: INDIAN PEAKS SOUTH, LLC. 357 S. McCASLIN BLVD. SUITE 200 LOUISVILLE, CO 80027 303-494-5900

DRAWN BY: RH
APPROVED BY: JJ
DATE: 10.21.2009
REVISIONS:

FINAL PLAN/ PUD
Indian Peaks Filing No. 17
Lafayette, Colorado

SHEET TITLE
COVER SHEET

SHEET NUMBER
SHEET 1 OF 3

Boulder County, CO 03058314 2 of 3

Indian Peaks Filing No. 17 - Tract A

FINAL PLAN/ PUD

Lafayette, Colorado

A PORTION OF THE NORTHEAST QUARTER OF SECTION 5, T1S, R69W OF THE 6TH P.M., CITY OF LAFAYETTE, COUNTY OF BOULDER, STATE OF COLORADO

Hours of Operation for all uses shall be allowed between 5 a.m. and 2 a.m. and prohibited between 2 a.m. and 5 a.m.

USE	B1
Accessory uses	Yes
Accessory building or structure	Yes
Agriculture use (crop production only)	Yes
Animals	No
Art gallery or studio	Yes
Asphalt plant	No
Assisted living	sur
Automobile storage yard	No
Automotive and recreational vehicle service and sales greater than two ton	No
Automotive and recreational vehicle service and sales less than two ton	No
Automotive paint and body shop	No
Bed and breakfast	sur
Board and care facility	No
Camper park or campground	No
Church	sur
Commercial parking lot	No
Commercial recreational establishment (e.g., bowling alley, skating rink)	sur
Daycare center	Yes
Drive-up restaurant	sur
Drive-up gas station	No
Drive-up convenience store, or other drive-up facility	sur
Enclosed (i.e., screened and fenced) storage yard	No
Extraction of minerals	No
Extraction of oil and gaseous materials	sur
Feedmill	No
Golf course (public or private)	No
Halfway house	No
Home occupation	No
Household pets, not exceeding three (3) each of dogs, cats, and one other species of household pet. This limitation applies to rabbits, but does not apply to other household pets customarily housed in a cage, aquarium, or similar enclosure.	Yes
Hospital	Yes
Indoor amusement, entertainment, or arcade	s u r
Kennel and similar uses such as dog day care	s u r
Library	Yes
Lumber, plumbing, electrical, or building supplies	s u r
Machine shop	No
Marijuana Use Dispensary & Cultivation	No
Medical or dental office	Yes
Mini-bank detached from principal building	s u r
Mobile home park or subdivision	No
Mobile home sales and service	No
Mobile home on individual lot	No
Mortuary (Not to include crematory)	s u r
Motel, hotel, or resort	s u r
Municipal or public utility facility and buildings, excluding offices, repair and storage yards	s u r
Nursery or commercial greenhouse	s u r
Nursing home or convalescent home	s u r
Office and neighborhood retail, if approved as part of PUD, per Sec 26-18-6	Yes
Office	Yes
Park or playground	Yes
Parking lot or structure	s u r
Personal service outlets such as barber and beauty shop, self-service laundry, shoe repair, tailors, dry cleaners, travel agency	Yes
Printing or publishing	s u r
Private or public membership club	Yes
Recreational club or facility (indoor or outdoor)	Yes
Refinement of hydro-carbons, mineral, or gaseous materials	No
Research facility: testing, laboratory, and facility for manufacturing, fabricating, processing, or storing products	No
Residential	
Two-family dwelling	s u r
Accessory Dwelling	No
Multi-family dwelling	s u r
Single-family dwelling	s u r
Single family dwelling in a mixed use building complex (Refer to Note 1)	Yes
Duplex two-family dwellings in a mixed use building complex	Yes
Multi-family dwellings in a mixed use building complex	Yes
Restaurant	s u r
Retail sales with floor areas less than 20,000 square feet, including the sale of food, beverages, dry goods, furniture, appliances, hardware, or clothing	Yes
Retail sales with floor areas of 20,000 square feet and over	s u r
School, private	s u r
School, public	s u r
Sexually Oriented Business	No
Slaughtering and processing animals	No
Tailoring, millinery, electronic parts assembly, woodwork, and other similar limited manufacturing activity that does not generate high noise levels and that meets the provisions of the Uniform Building Code Group F Division 1 requirements	s u r
Telecommunication Facilities	⊥
Theater, auditorium, or place of assembly	s u r
Transportation center	s u r
Veterinarian hospital or clinic	Yes
Warehouse (including mini-storage)	No
Wholesale establishment	No

YES= PERMITTED
SUR= SPECIAL USE REVIEW
⊥= SEE SECTION 26-22.5-8 LAFAYETTE MUNICIPAL CODE
NO= NOT PERMITTED

LEGEND

PROPERTY LINE

APPROXIMATE LOCATION OF FUTURE PUBLIC LAND DEDICATION

PUBLIC LAND DEDICATION REQUIRED

USES	PERCENT OF GROSS ACRES	GROSS ACRES	ACRES REQUIRED
NON-RESIDENTIAL	6%	10.65	0.64
TOTAL			0.64

LAND USE DATA

UNDERLYING ZONING: B-1/PUD

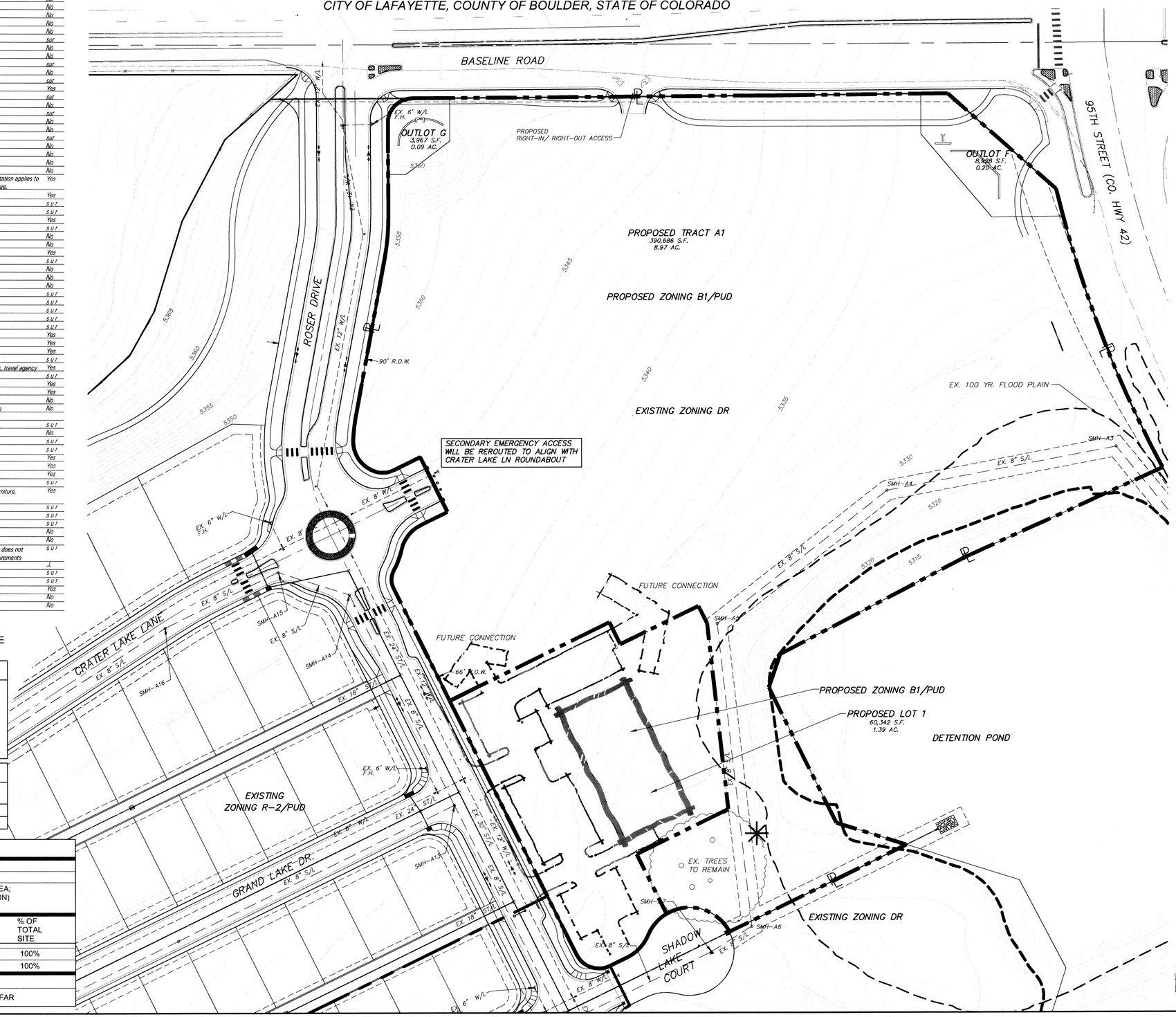
80,000 SF MAXIMUM NON-RESIDENTIAL CONSTRUCTION

MINIMUM OPEN AREA PROVIDED: 0.93 AC (8.7% OF GROSS SITE AREA; INCLUDES OUTLOTS F,G, AND 0.64 AC PUBLIC LAND DEDICATION) (NOT INCLUDING OPEN SPACE WITHIN EACH LOT)

USE	APPROXIMATE ACREAGE	DU/AC	% OF TOTAL SITE
COMMERCIAL	10.65	0	100%
TOTAL	10.65		100%

DEVELOPMENT INTENSITY FOR THE COMMERCIAL AREA

80,000 SF FLOOR AREA / 463,923 SF GROSS SITE AREA = 0.17 FAR



CIVIL ENGINEERING
PLANNING
SURVEYING

HURST

4999 Pearl East Circle
Suite 105
Boulder, CO 80301
303.449.9105
www.hurst-assoc.com

APPLICANT/ PROPERTY OWNER: INDIAN PEAKS SOUTH, LLC.
357 S. McCASLIN BLVD.
SUITE 200
LOUISVILLE, CO 80027
303-494-5900

DRAWN BY: RH
APPROVED BY: JJ
DATE: 10-21-2009
REVISIONS:

FINAL PLAN / PUD
Indian Peaks Filing No. 17
Lafayette, Colorado

SHEET TITLE
PUD PLAN

SHEET NUMBER
SHEET 2 OF 3

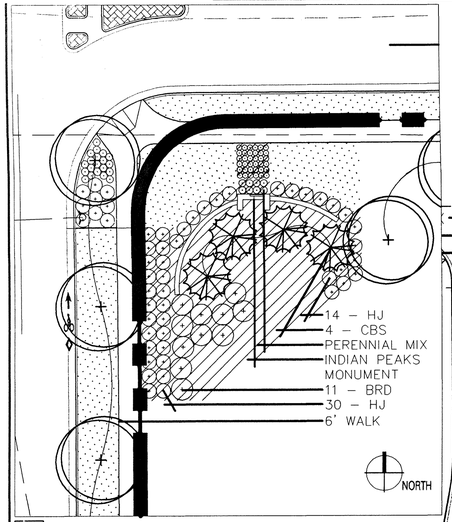
Boulder County, CO 03058314 3 of 3

Indian Peaks Filing No. 17 - Tract A

FINAL PLAN/ PUD

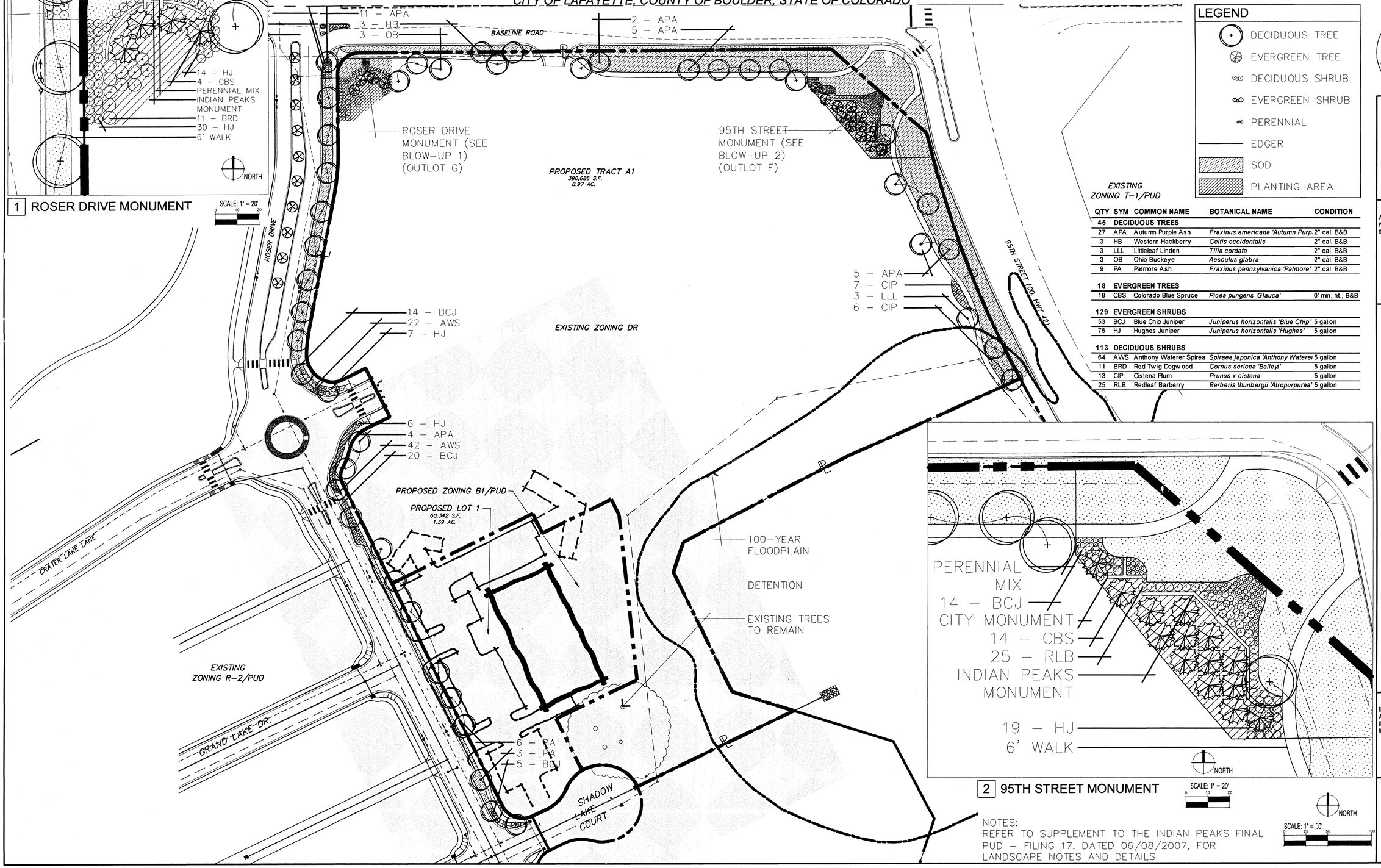
Lafayette, Colorado

A PORTION OF THE NORTHEAST QUARTER OF SECTION 5, T1S, R69W OF THE 6TH P.M., CITY OF LAFAYETTE, COUNTY OF BOULDER, STATE OF COLORADO



1 ROSER DRIVE MONUMENT

SCALE: 1" = 20'



LEGEND

- DECIDUOUS TREE
- EVERGREEN TREE
- DECIDUOUS SHRUB
- EVERGREEN SHRUB
- PERENNIAL
- EDGER
- SOD
- PLANTING AREA

QTY	SYM	COMMON NAME	BOTANICAL NAME	CONDITION
46		**DECIDUOUS TREES**		
27	APA	Autumn Purple Ash	*Fraxinus americana 'Autumn Purp.*	2" cal. B&B
3	HB	Western Hackberry	*Celtis occidentalis*	2" cal. B&B
3	LLL	Littleleaf Linden	*Tilia cordata*	2" cal. B&B
3	OB	Ohio Buckeye	*Aesculus glabra*	2" cal. B&B
9	PA	Patmore Ash	*Fraxinus pennsylvanica 'Patmore'*	2" cal. B&B
18		**EVERGREEN TREES**		
18	CBS	Colorado Blue Spruce	*Picea pungens 'Glauca'*	6' min. ht., B&B
129		**EVERGREEN SHRUBS**		
53	BCJ	Blue Chip Juniper	*Juniperus horizontalis 'Blue Chip'*	5 gallon
76	HJ	Hughes Juniper	*Juniperus horizontalis 'Hughes'*	5 gallon
113		**DECIDUOUS SHRUBS**		
64	AWS	Anthony Waterer Spirea	*Spiraea japonica 'Anthony Waterer*	5 gallon
11	BRD	Red Twig Dogwood	*Cornus sericea 'Baileyi'*	5 gallon
13	CIP	Cistena Plum	*Prunus x cistena*	5 gallon
25	RLB	Redleaf Barberry	*Berberis thunbergii 'Atropurpurea'*	5 gallon

2 95TH STREET MONUMENT

SCALE: 1" = 20'

NORTH

SCALE: 1" = 50'

NOTES:
REFER TO SUPPLEMENT TO THE INDIAN PEAKS FINAL PUD – FILING 17, DATED 06/08/2007, FOR LANDSCAPE NOTES AND DETAILS

CIVIL ENGINEERING
PLANNING
SURVEYING

HURST

4999 Pearl East Circle
Suite 106
Boulder, CO 80301
303.449.9105
www.hurst-assoc.com

RHONDA RENEE DIRK
489
04/17/2008
STATE OF COLORADO
LICENSED LANDSCAPE ARCHITECT

APPLICANT/ PROPERTY OWNER: INDIAN PEAKS SOUTH, LLC.
357 S. McCASLIN BLVD.
SUITE 200
LOUISVILLE, CO 80027
303-494-5900

FINAL PLAN / PUD
Indian Peaks Filing No. 17
Lafayette, Colorado

DRAWN BY: RH
APPROVED BY: RD
DATE: 10-21-2009
REVISIONS:

SHEET TITLE
LANDSCAPE PLAN

SHEET NUMBER
SHEET 3 OF 3

03171805
09/19/2011 03:38 PM RF: $21.00 Page: 1 of 2
Boulder County Clerk, CO DF: $0.00

INDIAN PEAKS FILING NO. 17 REPLAT B MINOR SUBDIVISION

A REPLAT OF INDIAN PEAKS FILING NO. 17 TRACT C

LOCATED IN THE NORTHEAST QUARTER OF SECTION 5, TOWNSHIP 1 SOUTH, RANGE 69 WEST OF THE 6TH P.M., CITY OF LAFAYETTE, COUNTY OF BOULDER, STATE OF COLORADO

2 LOTS, 1 OUTLOT & 1 TRACT – 52.30 ACRES

SHEET 1 OF 2

CERTIFICATE OF OWNERSHIP

KNOW ALL MEN BY THESE PRESENTS THAT THE UNDERSIGNED, BEING SOLE OWNER OF ALL THAT REAL PROPERTY SITUATED IN BOULDER COUNTY, COLORADO, AND LYING WITHIN THE EXTERIOR BOUNDARY OF "INDIAN PEAKS FILING NO. 17" A SUBDIVISION OF A PORTION OF THE NORTHEAST QUARTER OF SECTION 5, T1S, R69W OF THE 6TH P.M. CITY OF LAFAYETTE, COUNTY OF BOULDER, STATE OF COLORADO DESCRIBED AS FOLLOWS:

TRACT C, "INDIAN PEAKS FILING NO. 17" AS RECORDED 03/21/2008 AT PLAN FILE P–69, F–2, #42–44, EXCEPTING THEREFROM THE RIGHT OF WAY FOR PASCHAL DRIVE AS DESCRIBED IN INSTRUMENT RECORDED 04/18/2011 AT RECEPTION NO. 3144090;

HAVE BY THESE PRESENTS LAID OUT, PLATTED AND SUBDIVIDED THE SAME INTO LOTS AS SHOWN HEREON AND DESIGNATE THE SAME AS "INDIAN PEAKS FILING NO. 17 REPLAT B MINOR SUBDIVISION" IN THE CITY OF LAFAYETTE, COUNTY OF BOULDER, STATE OF COLORADO AND DO HEREBY DEDICATE AND CONVEY TO THE CITY OF LAFAYETTE, COLORADO, THE UTILITY AND DRAINAGE EASEMENTS SHOWN HERON FOR UTILITY AND DRAINAGE PURPOSES ONLY.

EXECUTED THIS 7TH DAY OF SEPTEMBER, 2011 A.D.,

BRADDOCK ENTERPRISES, L.P.
A PENNSYLVANIA LIMITED PARTNERSHIP

BY: BRADDOCK INVESTMENTS, L.P.
A PENNSYLVANIA LIMITED PARTNERSHIP
ITS GENERAL PARTNER

BY: PANCO, LLC
A PENNSYLVANIA LIMITED LIABILITY COMPANY
ITS GENERAL PARTNER

BY: _____
WILLIAM P. PISZEK
CO–MANAGER

BY: _____
HELEN P. NELSON
CO–MANAGER

ACKNOWLEDGMENT

COMMONWEALTH OF PENNSYLVANIA)
) SS
COUNTY OF MONTGOMERY)

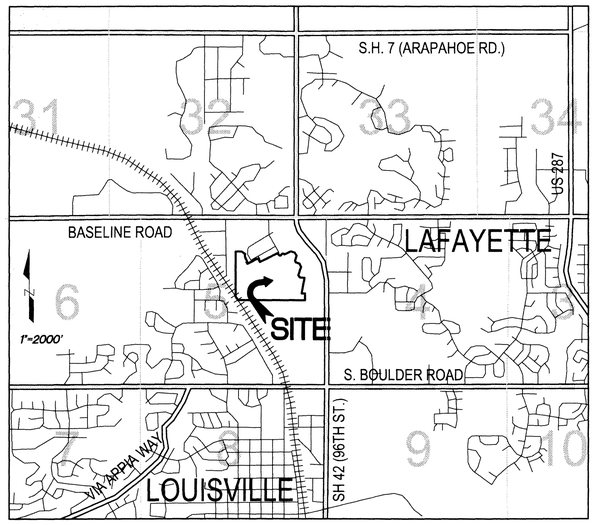
THE FOREGOING INSTRUMENT WAS ACKNOWLEDGED BEFORE ME THIS 7TH DAY OF SEPTEMBER 2011, BY WILLIAM P. PISZEK AND HELEN P. NELSON, AS CO–MANAGERS OF PANCO, LLC, A PENNSYLVANIA LIMITED LIABILITY COMPANY, GENERAL PARTNER OF BRADDOCK INVESTMENTS, L.P., GENERAL PARTNER OF BRADDOCK ENTERPRISES, L.P., A PENNSYLVANIA LIMITED PARTNERSHIP.

WITNESS MY HAND AND OFFICIAL SEAL.

MY COMMISSION EXPIRES: _____

_____
NOTARY PUBLIC

COMMONWEALTH OF PENNSYLVANIA
Notarial
P. Erick Nelson, Notary Public
Upper Dublin Twp., Montgomery County
My Commission Expires March 23, 2015
MEMBER, PENNSYLVANIA ASSOCIATION OF NOTARIES



VICINITY MAP

NOTES:

1) NOTICE: ACCORDING TO COLORADO LAW, YOU MUST COMMENCE ANY LEGAL ACTION BASED UPON ANY DEFECT IN THIS SURVEY WITHIN THREE YEARS AFTER YOU FIRST DISCOVER SUCH DEFECT. IN NO EVENT MAY ANY ACTION BASED UPON ANY DEFECT IN THIS SURVEY BE COMMENCED MORE THAN TEN YEARS FROM THE DATE OF THE CERTIFICATION SHOWN HEREON.

2) BASIS OF BEARINGS: SOUTHERLY LINE OF TRACT C, BEING N89°55'30"W BETWEEN CORNERS AS MONUMENTED BY REBARS WITH 1" PLASTIC CAPS, STAMPED PLS 37990, AS SHOWN ON THE "INDIAN PEAKS FILING NO. 17" PLAT.

3) THE PURPOSE OF THIS REPLAT IS TO CREATE 2 LOTS, 1 OUTLOT AND 1 TRACT OUT OF AN EXISTING TRACT.

4) SEE SHEET 2 FOR CORNER MONUMENTATION INFORMATION.

5) PER INDIAN PEAKS FILING NO. 17 FINAL PLAT, ALL LOTS, OUTLOTS, AND TRACTS OF INDIAN PEAKS FILING NO. 17 SHOWN ON THIS PLAT ARE BURDENED WITH A PERPETUAL, NON EXCLUSIVE EASEMENT PERMITTING TRAIN NOISE AND VIBRATION TO ENTER ON THE SAME FROM THE ADJACENT BURLINGTON NORTHERN SANTA FE RAIL ROAD. UNDER NO CIRCUMSTANCES SHALL THE CITY OF LAFAYETTE, ITS OFFICERS, EMPLOYEES OR AGENTS AND ITS SUCCESSORS AND ASSIGNS, MC3 HOLDINGS, LLC, INDIAN PEAKS SOUTH, LLC, AND BRADDOCK ENTERPRISES L.P. BE HELD LIABLE FOR ANY DAMAGE OR INJURY RESULTING FROM NOISE OR VIBRATION FROM THE EXISTING BNSF OR FUTURE FASTRACKS TRAINS ON SAID LOTS, AND OUTLOTS AND TRACTS OF THIS SUBDIVISION.

6) FLOOD PLAIN INFORMATION FROM FLOOD INSURANCE RATE MAP NO. 08013C0557G WITH AN REVISION DATE OF 10/04/2002.

7) WATER METERS AND PERPENDICULAR UTILITY CROSSINGS THROUGH THE ARBORICULTURAL EASEMENTS ARE ALLOWED.

8) OUTLOT A SHALL INCLUDE A TRAIL AND PUBLIC ACCESS EASEMENT.

TITLE COMPANY'S CERTIFICATE:

I, Wendy Sanchez, REPRESENTING LAND TITLE GUARANTEE COMPANY, CERTIFY THAT I HAVE EXAMINED TITLE TO THE DESCRIBED LAND WITHIN THE CITY OF LAFAYETTE, COLORADO, AND THAT THE PARTIES EXECUTING THE PLAT ARE THE OWNERS THEREOF IN FEE SIMPLE.

Wendy Sanchez
NAME

Title officer
TITLE

EXECUTED THIS 29 DAY OF August, A.D., 2011

SURVEYOR'S CERTIFICATE

FOR AND ON BEHALF OF HURST & ASSOCIATES, INC., I, BO BAIZE, DO HEREBY CERTIFY THAT I AM A DULY LICENSED LAND SURVEYOR LICENSED UNDER THE LAWS OF THE STATE OF COLORADO, THAT THIS PLAT IS A TRUE, CORRECT AND COMPLETE PLAT OF "INDIAN PEAKS FILING NO. 17 REPLAT B MINOR SUBDIVISION" AS LAID OUT, PLATTED, DEDICATED AND SHOWN HEREON, THAT SUCH PLAT WAS MADE FROM AN ACCURATE SURVEY OF SAID PROPERTY BY ME AND UNDER MY DIRECT RESPONSIBILITY, SUPERVISION AND CHECKING AND CORRECTLY SHOWS THE LOCATION AND DIMENSIONS OF THE TRACTS, STAKED UPON THE GROUND IN COMPLIANCE WITH ARTICLES 50–53 OF TILE 38, COLORADO REVISED STATUES GOVERNING THE SUBDIVISION OF LAND.

IN WITNESS WHEREOF, I HAVE SET MY HAND AND SEAL THIS 24TH DAY OF AUGUST, 2011 A.D.

_____
BO BAIZE
COLORADO LICENSED PROFESSIONAL
LAND SURVEYOR NO. 37990
4999 PEARL EAST CIRCLE, SUITE 106
BOULDER, CO 80301
303–449–9105

COLORADO LICENSED
BO BAIZE
37990
PROFESSIONAL LAND SURVEYOR

CITY ADMINISTRATOR'S CERTIFICATE

I, GARY KLAPHAKE, CITY ADMINISTRATOR OF THE CITY OF LAFAYETTE, COLORADO, HEREBY CERTIFY THAT I HAVE EXAMINED THE MINOR SUBDIVISION PLAT AND IT APPEARS TO BE IN COMPLIANCE WITH ALL APPLICABLE ORDINANCES OF THE CITY.

_____
CITY ADMINISTRATOR

_____
ATTEST: CITY CLERK

COMMUNITY DEVELOPMENT DIRECTOR CERTIFICATE

PURSUANT TO SECTION 26–16–6 OF THE LAFAYETTE CODE OF ORDINANCES, THIS MINOR SUBDIVISION PLAT FOR "INDIAN PEAKS FILING NO. 17 REPLAT B MINOR SUBDIVISION" WAS APPROVED BY THE COMMUNITY DEVELOPMENT DIRECTOR OF THE CITY OF LAFAYETTE, COLORADO ON Sept. 13, 2011 A.D.

_____
COMMUNITY DEVELOPMENT DIRECTOR

_____
ATTEST: CITY CLERK

REVIEW CERTIFICATES

_____
CITY OF LAFAYETTE ENGINEER

_____
CENTURYLINK, INC. F.K.A. QWEST COMMUNICATIONS, INC.

_____
PUBLIC SERVICE COMPANY OF COLORADO

COUNTY CLERK & RECORDER'S CERTIFICATE

STATE OF COLORADO)
) SS
COUNTY OF BOULDER)

I HEREBY CERTIFY THAT THIS PLAT WAS FILED IN MY OFFICE AT 3:38 O'CLOCK, P. M. ON THE 19TH DAY OF SEPTEMBER, 2011, AND IS DULY RECORDED AT RECEPTION NO. 3171805 AND PLAN FILE P–__ F–__ # ____.

FEES PAID: $ 21.00

_____
COUNTY CLERK & RECORDER

_____
BY: DEPUTY

INDIAN PEAKS FILING NO. 17
REPLAT B
MINOR SUBDIVISION PLAT
LAFAYETTE, COLORADO

HURST
CIVIL ENGINEERING
PLANNING
SURVEYING

1350 Pine Street, Suite 1
Boulder, CO 80302
303.449.9105
www.hurst-assoc.com

SCALE HOR. N/A VERT. N/A
DESIGN/APPR.
DRAWN BY BO
DATE 08/24/11
SHEET 1 OF 2

ORG: 05/06/11
REV: 05/23/11
REV: 07/29/11
REV: 08/03/11
REV: 08/22/11
REV: 08/24/11

FILE G:\1009124\SURVEY\REPLAT B\IP17 REPLAT B–2011

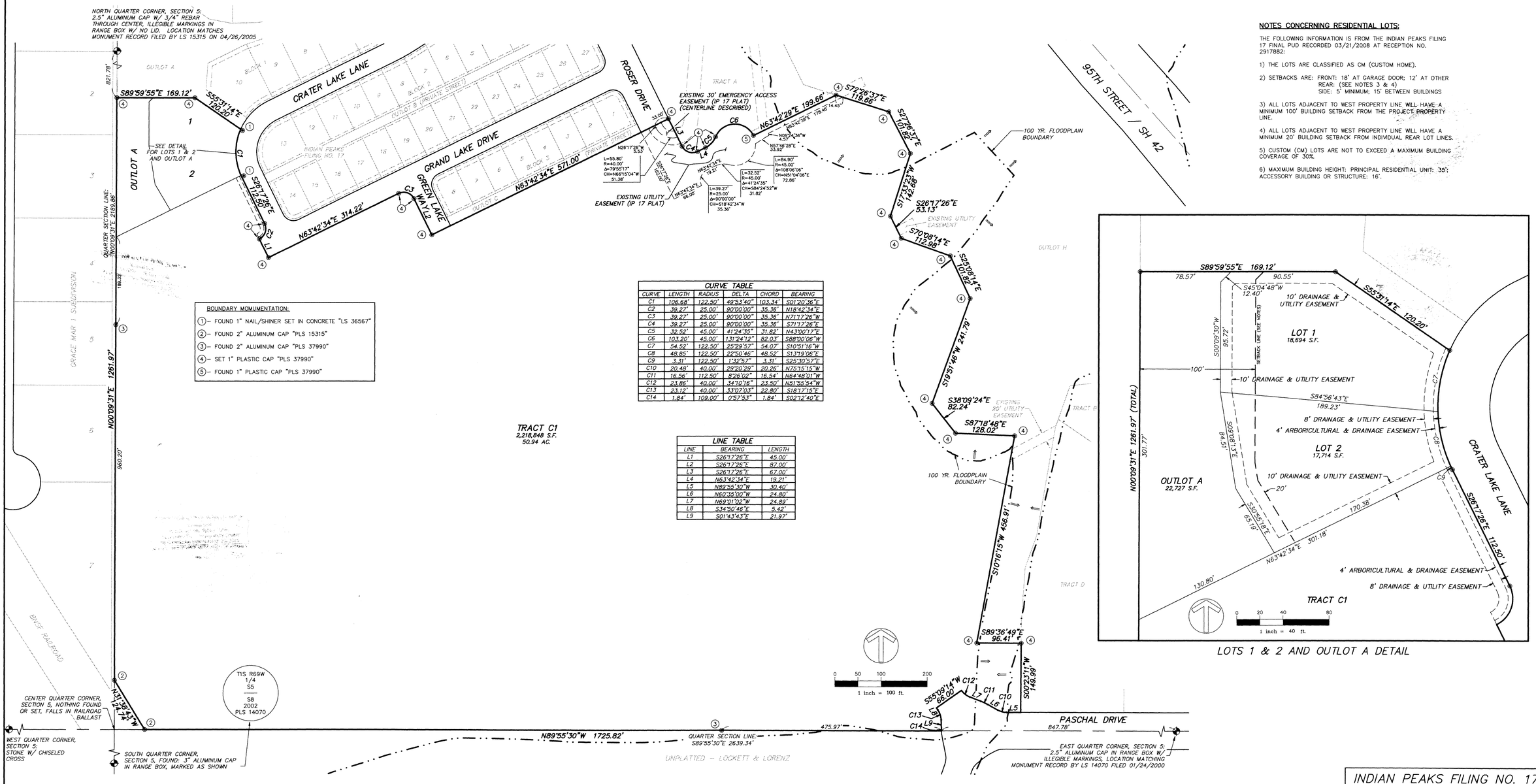
INDIAN PEAKS FILING NO. 17 REPLAT B MINOR SUBDIVISION

A REPLAT OF INDIAN PEAKS FILING NO. 17 TRACT C

LOCATED IN THE NORTHEAST QUARTER OF SECTION 5, TOWNSHIP 1 SOUTH, RANGE 69 WEST OF THE 6TH P.M., CITY OF LAFAYETTE, COUNTY OF BOULDER, STATE OF COLORADO

2 LOTS, 1 OUTLOT & 1 TRACT – 52.30 ACRES

SHEET 2 OF 2



BOUNDARY MOMUMENTATION:

1. – FOUND 1" NAIL/SHINER SET IN CONCRETE "LS 36567"
2. – FOUND 2" ALUMINUM CAP "PLS 15315"
3. – FOUND 2" ALUMINUM CAP "PLS 37990"
4. – SET 1" PLASTIC CAP "PLS 37990"
5. – FOUND 1" PLASTIC CAP "PLS 37990"

CURVE TABLE					
CURVE	LENGTH	RADIUS	DELTA	CHORD	BEARING
C1	106.68'	122.50'	49°53'40"	103.34'	S01°20'36"E
C2	39.27'	25.00'	90°00'00"	35.36'	N18°42'34"E
C3	39.27'	25.00'	90°00'00"	35.36'	N71°17'26"W
C4	39.27'	25.00'	90°00'00"	35.36'	S71°17'26"E
C5	32.52'	45.00'	41°24'35"	31.82'	N43°00'17"E
C6	103.20'	45.00'	131°24'12"	82.03'	S88°00'06"W
C7	54.52'	122.50'	25°29'57"	54.07'	S10°51'16"W
C8	48.85'	122.50'	22°50'46"	48.52'	S13°19'08"E
C9	3.31'	122.50'	1°32'57"	3.31'	S25°30'57"E
C10	20.48'	40.00'	29°20'29"	20.26'	N75°15'15"W
C11	16.56'	112.50'	8°26'02"	16.54'	N64°48'01"W
C12	23.86'	40.00'	34°10'16"	23.50'	N51°55'54"W
C13	23.12'	40.00'	33°07'03"	22.80'	S18°17'15"E
C14	1.84'	109.00'	0°57'53"	1.84'	S02°12'40"E

LINE TABLE		
LINE	BEARING	LENGTH
L1	S26°17'26"E	45.00'
L2	S26°17'26"E	87.00'
L3	S26°17'26"E	67.00'
L4	N63°42'34"E	19.21'
L5	N89°55'30"W	30.40'
L6	N60°35'00"W	24.80'
L7	N69°01'02"W	24.89'
L8	S34°50'46"E	5.42'
L9	S01°43'43"E	21.97'

NOTES CONCERNING RESIDENTIAL LOTS:

THE FOLLOWING INFORMATION IS FROM THE INDIAN PEAKS FILING 17 FINAL PUD RECORDED 03/21/2008 AT RECEPTION NO. 2917882:

1) THE LOTS ARE CLASSIFIED AS CM (CUSTOM HOME).

2) SETBACKS ARE: FRONT: 18' AT GARAGE DOOR; 12' AT OTHER
REAR: (SEE NOTES 3 & 4)
SIDE: 5' MINIMUM; 15' BETWEEN BUILDINGS

3) ALL LOTS ADJACENT TO WEST PROPERTY LINE WILL HAVE A MINIMUM 100' BUILDING SETBACK FROM THE PROJECT PROPERTY LINE.

4) ALL LOTS ADJACENT TO WEST PROPERTY LINE WILL HAVE A MINIMUM 20' BUILDING SETBACK FROM INDIVIDUAL REAR LOT LINES.

5) CUSTOM (CM) LOTS ARE NOT TO EXCEED A MAXIMUM BUILDING COVERAGE OF 30%.

6) MAXIMUM BUILDING HEIGHT: PRINCIPAL RESIDENTIAL UNIT: 35'; ACCESSORY BUILDING OR STRUCTURE: 16'.

LOTS 1 & 2 AND OUTLOT A DETAIL

INDIAN PEAKS FILING NO. 17 REPLAT B
MINOR SUBDIVISION PLAT
LAFAYETTE, COLORADO

HURST
CIVIL ENGINEERING
PLANNING
SURVEYING
1350 Pine Street, Suite 1
Boulder, CO 80302
303.449.9105
www.hurst-assoc.com

SCALE	HOR. 1"=100' VERT. N/A
DESIGN/APPR.	
DRAWN BY	BO
DATE	08/24/11
SHEET	2 OF 2

FILE G:\1009124\SURVEY\REPLAT B\IP17 REPLAT B-2011

03246467
Page: 1 of 6
08/23/2012 03:56 PM RF: $61.00 DF: $0.00
Boulder County Clerk, CO

1 LEGAL DESCRIPTION

DEDICATION:

KNOW ALL MEN BY THESE PRESENTS THAT THE UNDERSIGNED BEING SOLE OWNERS IN FEE SIMPLE OF ALL THAT REAL PROPERTY DESCRIBED AS:

A PORTION OF THE NORTHEAST QUARTER OF SECTION 5, TOWNSHIP 1 SOUTH RANGE 69 WEST, SIXTH PRINCIPAL MERIDIAN, BOULDER COUNTY, COLORADO,
DESCRIBED AS FOLLOWS:

COMMENCING AT THE EAST QUARTER CORNER OF SAID SECTION 5;

THENCE N89°55'30"W, 73.90 FEET ALONG THE SOUTHERLY BOUNDARY OF SAID NORTHEAST QUARTER OF SECTION 5 TO THE POINT OF BEGINNING;

THENCE N89°55'30"W, 2499.70 FEET ALONG SAID SOUTHERLY BOUNDARY TO THE EASTERLY RIGHT OF WAY OF THE BURLINGTON AND NORTHERN RAILROAD;

THENCE N31°38'43"W, 124.74 FEET ALONG SAID EASTERLY RIGHT OF WAY TO THE WESTERLY BOUNDARY OF SAID NORTHEAST QUARTER OF SECTION 5;

THENCE N00°09'31"E, 1541.74 FEET ALONG SAID WESTERLY BOUNDARY TO THE SOUTHERLY BOUNDARY OF A TRACT OF LAND DESCRIBED IN A DEED RECORDED ON FILM 1490, RECEPTION NO. 870709;

THENCE ALONG THE SOUTHERLY AND EASTERLY BOUNDARY OF THOSE TRACTS OF LAND DESCRIBED IN DEED RECORDED ON FILM 1490, RECEPTION NO. 870709; FILM 1383, RECEPTION NO. 727315; FILM 1456, RECEPTION NO. 824281; FILM 1661, RECEPTION NO. 1086984 THE FOLLOWING COURSES:

S72°48'54"E, 82.00 FEET;
S60°32'54"E, 71.00 FEET;
S41°55'54"E, 38.00 FEET;
S55°37'54"E, 40.00 FEET;
S79°39'54"E, 48.13 FEET;
N88°35'31"E, 60.39 FEET;
N76°30'31"E, 65.75 FEET;
N53°39'31"E, 120.00 FEET;
N50°34'31"E, 300.00 FEET;
N47°23'31"E, 100.00 FEET;
N28°54'31"E, 52.00 FEET;
N17°07'31"E, 95.10 FEET;
N27°35'31"E, 94.00 FEET;
N48°13'31"E, 61.63 FEET TO THE SOUTHERLY RIGHT OF WAY OF BASELINE ROAD;

THENCE ALONG SAID SOUTHERLY RIGHT OF WAY THE FOLLOWING COURSES:
N89°33'00"E, 10.40 FEET;
N89°37'58"E, 500.78 FEET;
N89°24'04"E, 140.59 FEET;
N89°38'00"E, 32.94 FEET TO THE WESTERLY RIGHT OF WAY OF COLORADO HIGHWAY NO 42 (95TH STREET);

THENCE ALONG SAID WESTERLY RIGHT OF WAY THE FOLLOWING COURSES:
S48°17'57"E, 149.51 FEET;

THENCE 451.59 FEET ALONG THE ARC OF A NON-TANGENT CURVE TO THE LEFT SAID ARC SUBTENDED BY A RADIUS OF 1221.00 FEET, A CENTRAL ANGLE OF 21°11'27", AND A CHORD BEARING S24°09'22"E, 449.02 FEET;

S39°45'30"E, 308.03 FEET;
S42°12'00"E, 133.41 FEET;
S39°43'30"E, 291.66 FEET;

THENCE 500.70 FEET ALONG THE ARC OF A NON-TANGENT CURVE TO THE RIGHT SAID ARC SUBTENDED BY A RADIUS OF 1071.00 FEET, A CENTRAL ANGLE OF 26°47'10", AND A CHORD BEARING S21°15'00"E, 496.15 FEET;

S02°46'30"E, 291.66 FEET;

S00°18'00"E, 323.39 FEET TO THE POINT OF BEGINNING, CONTAINING 100.86 ACRES, MORE OR LESS.

HAVE BY THESE PRESENTS LAID OUT, PLATTED AND SUBDIVIDED THE SAME INTO OUTLOTS, TRACTS, LOTS AND BLOCKS AS SHOWN HEREON AND DESIGNATE THE SAME AS INDIAN PEAKS FILING NO. 17, IN THE CITY OF LAFAYETTE, COUNTY OF BOULDER, COLORADO, AND DO HEREBY GRANT TO THE CITY OF LAFAYETTE, COUNTY OF BOULDER, COLORADO, FOR PUBLIC USE THE STREETS RIGHT-OF-WAY SHOWN HEREON, INCLUDING WAYS, CIRCLES, ROADS, DRIVES AND LANES, THE PUBLIC LANDS SHOWN HEREON FOR THEIR INDICATED PUBLIC USE AND THE UTILITY AND DRAINAGE EASEMENTS SHOWN HEREON FOR UTILITY AND DRAINAGE PURPOSES ONLY; AND SO FURTHER STATE THAT THIS SUBDIVISION SHALL BE SUBJECT TO THE PROTECTIVE COVENANTS FILED AND RECORDED FOR THIS SUBDIVISION IN THE OFFICE OF THE CLERK AND RECORDER OF BOULDER COUNTY, COLORADO AS DOCUMENT NO._____.

EXECUTED THIS_____DAY OF_____ A.D. 20_____

BRADDOCK ENTERPRISES, L.P.

A PENNSYLVANIA LIMITED PARTNERSHIP

BY: BRADDOCK INVESTMENTS, L.P.
A PENNSYLVANIA LIMITED PARTNERSHIP
ITS GENERAL PARTNER

BY: PANCO, LLC
A PENNSYLVANIA LIMITED LIABILITY COMPANY
ITS GENERAL PARTNER

BY: _____
WILLIAM P. PISZEK
CO-MANAGER

BY: _____
HELEN P. NELSON
CO-MANAGER

ACKNOWLEDGEMENT

COMMONWEALTH OF PENNSYLVANIA)
) SS
COUNTY OF Montgomery)

THE FOREGOING INSTRUMENT WAS ACKNOWLEDGED BEFORE ME
THIS 25 DAY OF July 2012

BY WILLIAM P. PISZEK AND HELEN P. NELSON, AS CO-MANAGERS OF PANCO, LLC, A PENNSYLVANIA LIMITED LIABILITY COMPANY, GENERAL PARTNER OF BRADDOCK INVESTMENTS, L.P., GENERAL PARTNER OF BRADDOCK ENTERPRISES, L.P., A PENNSYLVANIA LIMITED PARTNERSHIP.

WITNESS MY HAND AND OFFICIAL SEAL.

MY COMMISSION EXPIRES: _____

P. Erik Nelson
NOTARY PUBLIC

COMMONWEALTH OF PENNSYLVANIA
Notarial Seal
P. Erik Nelson, Notary Public
Upper Dublin Twp., Montgomery County
My Commission Expires March 23, 2015
MEMBER, PENNSYLVANIA ASSOCIATION OF NOTARIES

2 PUD NOTES

1. NOTICE: ACCORDING TO COLORADO LAW, YOU MUST COMMENCE ANY LEGAL ACTION BASED UPON ANY DEFECT IN THIS SURVEY WITHIN THREE YEARS AFTER YOU FIRST DISCOVER SUCH DEFECT. IN NO EVENT MAY ANY ACTION BASED UPON ANY DEFECT IN THIS SURVEY BE COMMENCED MORE THAN TEN YEARS FROM THE DATE OF THE CERTIFICATION SHOWN HEREON.
2. BEARINGS ARE BASED ON THE EASTERLY LINE OF THE NORTHEAST QUARTER OF SECTION 5: N00°03'50"E.
3. ALL OUTLOTS SHALL BE OWNED AND MAINTAINED BY THE INDIAN PEAKS SOUTH HOMEOWNER ASSOCIATION.
4. WATER METERS AND PERPENDICULAR UTILITY CROSSINGS THROUGH A DEFINED EASEMENT ARE ALLOWED.
5. OUTLOT A INCLUDES TRAILS PUBLIC ACCESS EASEMENT.
6. THE SECOND AMENDMENT TO THE COMMUNITY CHARTER FOR THE INDIAN PEAKS SOUTH ASSOCIATION (CHARTER) IS HEREBY RECORDED ON THIS 30th DAY OF August, 2012, UNDER RECEPTION # 3246469. THE OWNER SHALL COMPLY WITH ALL PROVISIONS OF THIS CHARTER. TO THE EXTENT THAT THIS CHARTER AND ANY PRIOR CHARTER ARE INCONSISTENT, THIS CHARTER SHALL PREVAIL.
7. THE INDIAN PEAKS FILING NO. 17 AMENDMENT A, DEVELOPMENT AGREEMENT ("AGREEMENT") IS HEREBY RECORDED ON THIS 28th DAY OF August, 2012, UNDER RECEPTION # 3246468. THE OWNER SHALL DEVELOP THE PROPERTY IN ACCORDANCE WITH AND IS SUBJECT TO ALL PROVISIONS OF THIS AGREEMENT. THE DEVELOPMENT AND ANNEXATION AGREEMENTS RECORDED THE 21ST DAY OF SEPTEMBER, 1990, UNDER RECEPTION #01065413, THE 31ST DAY OF JANUARY, 1991, UNDER RECEPTION #01085568, THE 28TH DAY OF FEBRUARY, 1992, UNDER RECEPTION #01164201, THE 31ST DAY OF AUGUST, 1992, UNDER RECEPTION #1215601, #1215603, AND #1215604, THE 29TH DAY OF OCTOBER, 1993, UNDER RECEPTION #1355209, THE 9TH DAY OF JUNE, 1998 UNDER RECEPTION #1705030; THE AMENDMENT TO INDIAN PEAKS DEVELOPMENT AGREEMENTS, (THE "CONSTRUCTION SCHEDULE") RECORDED THE 13TH DAY OF JUNE, 2000, UNDER RECEPTION # 2052529; THE INDIAN PEAKS FILING NO. 17 DEVELOPMENT AGREEMENT RECORDED THE 21ST DAY OF MARCH, 2008, UNDER RECEPTION # 2917894; THE AMENDMENT TO INDIAN PEAKS DEVELOPMENT AGREEMENTS RECORDED THE 21ST DAY OF MARCH, 2008, UNDER RECEPTION # 2917886; THE AMENDED AND RESTATED INDIAN PEAKS FILING NO. 17 DEVELOPMENT AGREEMENT RECORDED THE 7TH DAY OF SEPTEMBER, 2010, UNDER RECEPTION # 03098992; AND THE FOLLOWING TERMS AND SPECIFICATIONS AS HEREIN AGREED. TO THE EXTENT THAT THIS AGREEMENT AND ANY PRIOR AGREEMENT ARE INCONSISTENT, THIS AGREEMENT SHALL PREVAIL.

3 PLANNING COMMISSION CERTIFICATE

THE PRELIMINARY PLANNED UNIT DEVELOPMENT FOR "INDIAN PEAKS FILING NO. 17" WAS APPROVED BY THE CITY OF LAFAYETTE PLANNING COMMISSION ON APRIL 24, 2012, A.D.

_____
CHAIRPERSON

Michelle Veverka
ATTEST: SECRETARY

4 TITLE COMPANY'S CERTIFICATE:

I, Scott Bennetts, REPRESENTING LAND TITLE GUARANTEE COMPANY, CERTIFY THAT I HAVE EXAMINED TITLE TO THE DESCRIBED LAND WITHIN THE CITY OF LAFAYETTE, COLORADO, AND THAT THE PARTIES EXECUTING THE PLAT ARE THE OWNERS THEREOF IN FEE SIMPLE.

_____
NAME

Title Officer/Underwriter/Agent
TITLE

EXECUTED THIS 27th DAY OF July, A.D., 2012

5 CITY COUNCIL CERTIFICATE

THIS FINAL PUD IS APPROVED BY THE CITY COUNCIL OF THE CITY OF LAFAYETTE, COLORADO, THIS 28th DAY OF August, 2012, A.D. FOR FILING WITH THE CLERK AND RECORDER OF BOULDER COUNTY AND SUBJECT TO THE PROVISION THAT APPROVAL IN NO WAY OBLIGATES THE CITY OF LAFAYETTE FOR THE FINANCING OR CONSTRUCTING OF IMPROVEMENTS ON LAND OR EASEMENTS DEDICATED TO THE PUBLIC EXCEPT AS SPECIFICALLY AGREED TO BY THE CITY COUNCIL.

Carolyn D. Lutter
MAYOR

WITNESS MY HAND AND OFFICIAL SEAL OF THE CITY OF LAFAYETTE

Susan Koster
ATTEST: CITY CLERK

6 CITY ADMINISTRATOR'S CERTIFICATE

I, GARY KLAPHAKE, CITY ADMINISTRATOR OF THE CITY OF LAFAYETTE, COLORADO, HEREBY CERTIFY THAT I HAVE EXAMINED THE FINAL PUD AND IT APPEARS TO BE IN COMPLIANCE WITH ALL APPLICABLE ORDINANCES OF THE CITY AND THAT A SUBDIVISION AGREEMENT HAS BEEN EXECUTED BY THE DEVELOPER AND ACCEPTED BY THE CITY.

_____
CITY ADMINISTRATOR

Susan Koster
ATTEST: CITY CLERK

7 COUNTY CLERK & RECORDER'S CERTIFICATE

STATE OF COLORADO)
) SS
COUNTY OF BOULDER)

I HEREBY CERTIFY THAT THIS PUD WAS FILED IN MY OFFICE AT 3:56 O'CLOCK, P. M. ON THE 28th DAY OF August, 2012 AND IS DULY RECORDED AT RECEPTION NO. #3246467 AND PLAN FILE P-__ F-__ # _____ FEES PAID: $ 61.00

Hillary Hall
COUNTY CLERK & RECORDER

BY: DEPUTY

8 REVIEW CERTIFICATES

_____
CITY OF LAFAYETTE ENGINEER

_____
PUBLIC SERVICE COMPANY OF COLORADO

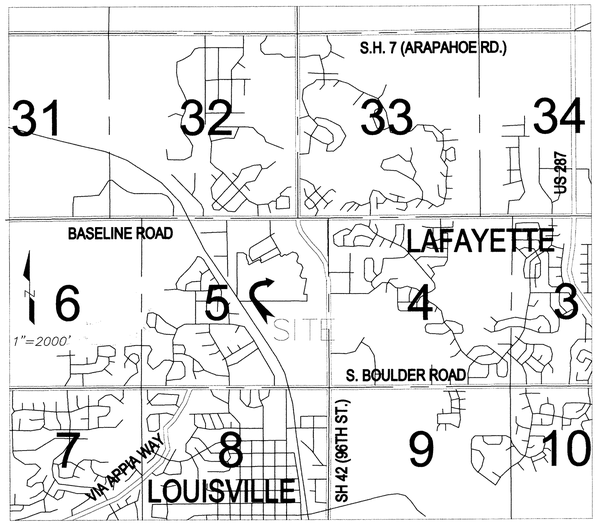
Neal P. Hely
CENTURY LINK, INC. F.K.A. QWEST COMMUNICATIONS INC.

VESTED PROPERTY RIGHT

APPROVAL OF THIS PLAN MAY CREATE A VESTED PROPERTY RIGHT PURSUANT TO ARTICLE 68 OF TITLE 24, C.R.S., AS AMENDED.

9 VICINITY MAP

NOT TO SCALE



VICINITY MAP

10 PUD SHEET INDEX

1 COVER SHEET
2 GENERAL NOTES & CALCULATIONS
3 OVERALL PUD
4 PUD STREET CROSS SECTIONS
5 TRAIL CROSS SECTIONS

LANDSCAPE ARCHITECT:
G.E. ENTERPRISES
LANDSCAPE DESIGN, INSTALLATION & MAINTENANCE

LANDSCAPE ARCHITECT:
FLA
FARRENKOPF LAND & ASSOCIATES

CIVIL ENGINEER:
HURST
2500 Broadway, Suite B
Boulder, CO 80304
303.449.9105
www.hurst-assoc.com

PLANNER / OWNER / DEVELOPER:
McSTAIN NEIGHBORHOODS
7100 North Broadway, Suite 5-H
Denver, Colorado 80221
303-494-5900

INDIAN PEAKS
FINAL PUD FILING NO. 17, AMENDMENT A
LAFAYETTE, COLORADO

NORTH 0 10' 20' 40'
SCALE: 1"=20'

JOB NO.: McStain 101
ACAD FILE: IPS_PH2_PUD_shts 1-2 Jan2012.dwg
DRAWN: MN
CHECKED: MN/DW
ISSUE: 02/24/2012
REVISIONS: 05/18/2012
07/17/2012 - FINAL

SHEET TITLE:

COVER

SHEET NO.:

1of 5

Boulder County, CO 03246467 2 of 6

1 GENERAL NOTES

1. LAND USES FOR THIS INDIAN PEAKS FILING 17 FINAL PUD IS PROPOSED TO INCLUDE MEDIUM DENSITY RESIDENTIAL USES (3 TO 6 D.U./AC.) WITH PRIVATE PARKS AND OPEN SPACE AND FUTURE COMMERCIAL DEVELOPMENT TRACTS.
2. PUBLIC AVENUES, CIRCLES, DRIVES, LANES, ROADS, STREETS AND WAYS ARE TO BE DEDICATED TO THE CITY OF LAFAYETTE WITH THE FINAL PLAT.
3. ALL TRACTS, OUTLOTS, COMMON AREAS, SHARED PRIVATE DRIVES, COMMON PARKING AREAS, AND WALKWAYS NOT DEDICATED TO THE CITY OF LAFAYETTE OR OUTSIDE OF PRIVATE LOTS ARE INTENDED TO BE OWNED AND MAINTAINED BY THE INDIAN PEAKS SOUTH HOMEOWNER ASSOCIATION.
4. PUBLIC LAND DEDICATIONS APPLICABLE TO THIS PROPERTY HAVE BEEN SATISFIED WITH PREVIOUS FILINGS AT INDIAN PEAKS.
5. THIS PUD IS ANTICIPATED TO BE DEVELOPED IN PHASES.
6. IRRIGATION PLANS ARE TO BE SUBMITTED CONCURRENT WITH EACH FILING PHASE
7. LANDSCAPING, IRRIGATION AND OTHER IMPROVEMENTS MAY BE PHASED WITH EACH FILING.
8. LOT DESIGNATIONS ILLUSTRATED ON THE OVERALL PUD MAY BE MODIFIED ADMINISTRATIVELY SO LONG AS OVERALL DENSITIES DO NOT CHANGE. LOT DESIGNATION REVISIONS ARE SUBJECT TO ADMINISTRATIVE REVIEW AND APPROVAL BY THE CITY OF LAFAYETTE.
9. THE NUMBER OF OCCUPANTS PER DWELLING UNIT IS EXPECTED TO VARY. ONE OR TWO PERSONS MAY RESIDE IN SMALLER, ONE-BEDROOM UNITS, WHILE LARGER FAMILIES MAY LIVE IN TWO, THREE, OR FOUR BEDROOM UNITS.
10. IN AREAS WHERE FIRE ACCESS IS PROVIDED THROUGH PRIVATE DRIVES, 25' INSIDE AND 45' OUTSIDE TURNING RADII SHALL BE PROVIDED, PER THE FIRE DEPARTMENT.
11. NO STRUCTURES OVER 36 INCHES IN HEIGHT SHALL BE CONSTRUCTED WITHIN THE SIGHT CLEARANCE AREA DEFINED BY CITY OF LAFAYETTE CODE AT ALL PUBLIC AND PRIVATE STREET DRIVEWAY INTERSECTIONS.
12. DRIVEWAYS, WITH A MINIMUM DEPTH OF 18' SHALL BE PROVIDED FOR ALL UNITS THAT DO NOT INCLUDE A 2 CAR GARAGE, UNLESS AN ALTERNATIVE SOLUTION IS APPROVED (AS PER DETAIL 5 ON THIS SHEET).
13. ARBORICULTURE EASEMENTS ARE TO BE MAINTAINED BY THE INDIVIDUAL HOMEOWNER. THE INDIAN PEAKS SOUTH HOMEOWNER ASSOCIATION CC&RS GOVERN THE USE AND ESTABLISH MAINTENANCE REQUIREMENTS.

2 SITE PLAN LEGEND

SITE PLAN SYMBOLS

- 5124 / 5126 / 5128 / 5130 — EX. CONTOUR / PR. CONTOUR
- RIGHT-OF-WAY
- STREET CENTERLINE
- PROPERTY LINE
- EASEMENT LINE
- W — WATER LINE
- SS — SANITARY SEWER
- MANHOLE
- FIRE HYDRANT
- STORM DRAIN PIPE
- EXISTING TREES (TO REMAIN)
- PROPOSED RTD BUS STOP LOCATION
- SIGHT TRIANGLE
- RETAINING WALL
- STREET LIGHTS
- M — MAILBOX
- 8 — BLOCK NUMBER
- 2 / PH — LOT NUMBER / LOT TYPE

LOT TYPE LEGEND

- CM - CUSTOM HOME
- MSF - MEDIUM SINGLE FAMILY
- AL - ALLEY LOADED
- HDSF - HIGH DENSITY SINGLE FAMILY

3 BUILDING SETBACKS*:

FRONT LOADED UNITS- CUSTOM (CM) & MEDIUM SINGLE FAMILY (MSF) (BLOCKS 1, 5, 11 & 12)

FRONT:	18' AT GARAGE DOOR; 12' AT OTHER
REAR:	20' MIN. (25' ON BLOCK 1)
SIDE:	5' MIN.; 15' BETWEEN BUILDINGS

ALLEY LOADED (AL) UNITS- (BLOCKS 2 - 4 & 6 - 10)

FRONT:	12'
REAR:	18' WITH DRIVEWAY PARKING 5' WITHOUT DRIVEWAY PARKING
SIDE:	5' MIN.; 15' BETWEEN BUILDINGS** 10' MIN. BETWEEN ADJACENT BUILDING AND DETACHED GARAGE **UNLESS ADJACENT TO 40' LOT

40' WIDE ALLEY LOADED (AL) UNITS (BLOCKS 2 - 4 & 6 - 10)

FRONT:	12'
REAR:	18' WITH DRIVEWAY PARKING 5' WITHOUT DRIVEWAY PARKING
SIDE:	5' MIN.; 10' BETWEEN BUILDINGS

*** UNLESS OTHERWISE NOTED**

BUILDING ENVELOPE & SETBACK NOTES

1. FOR SINGLE FAMILY HOMES, REAR YARDS AT ALLEYS ARE 18' WITH DRIVEWAY PARKING PERPENDICULAR TO THE ALLEY; 5' WITHOUT DRIVEWAY PARKING, OR WITH SIDE LOADED GARAGES PER DETAIL 5 ON THIS SHEET.
2. ALL LOTS ADJACENT TO WEST PROPERTY LINE WILL HAVE A MINIMUM 100' BUILDING SETBACK FROM THE PROJECT PROPERTY LINE.
3. ALL LOTS ADJACENT TO WEST PROPERTY LINE WILL HAVE A MINIMUM 20' BUILDING SETBACK FROM INDIVIDUAL REAR LOT LINES.
4. ALL LOTS ADJACENT TO ROSER DRIVE ON WEST SIDE WILL HAVE A MINIMUM 30' BUILDING SETBACK FROM THE ROSER DRIVE BACK OF CURB.
5. CUSTOM (CM) AND MEDIUM SINGLE FAMILY (MSF) LOTS ARE NOT TO EXCEED A MAXIMUM BUILDING COVERAGE OF 30%.
6. ALLEY LOADED (AL) LOTS ARE NOT TO EXCEED A MAXIMUM BUILDING COVERAGE OF 50%

3A HIGH DENSITY SINGLE FAMILY BUILDING SETBACKS*:

HIGH DENSITY SINGLE FAMILY (HDSF) UNITS (BLOCKS 13-17)

FRONT:	5' 3' AT UPPER LEVELS
REAR:	12' TO BUILDING 6' TO PORCH
SIDE:	5' MIN.; 10' BETWEEN BUILDINGS 8' TO R.O.W. AT CORNER LOTS

*** UNLESS OTHERWISE NOTED**

BUILDING ENVELOPE & SETBACK NOTES

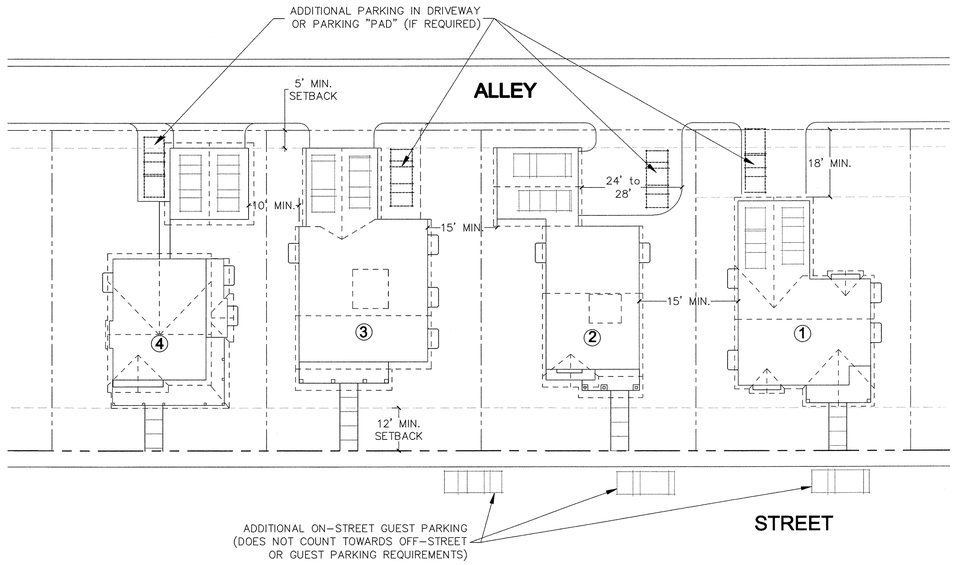
1. 16" CANTILEVER OR BAY WINDOW ALLOWED TO ENCROACH IN REAR AND SIDE SETBACKS
2. 2' CANTILEVER ALLOWED TO ENCROACH IN FRONT SETBACK
3. COVERED PORCH ALLOWED TO ENCROACH 6' INTO REAR SETBACK
4. ROOF OVERHANG ALLOWED TO EXTEND 16" BEYOND ALL CANTILEVERS, BAY WINDOWS, COVERED PORCHES AND BUILDING WALLS INTO SETBACK, WITHIN THE PROPERTY LINE
5. ALL LOTS ADJACENT TO ROSER DRIVE ON EAST SIDE WILL HAVE A MINIMUM 25' BUILDING SETBACK FROM THE ROSER DRIVE BACK OF CURB AND COVERED PORCH ALLOWED TO ENCROACH 6' INTO SETBACK
6. MINIMUM 10' BETWEEN BUILDINGS REQUIRED
7. LOTS ARE NOT TO EXCEED A MAXIMUM BUILDING COVERAGE OF 50%
8. ALL UNITS WILL HAVE 2 OFF STREET PARKING SPACES IN GARAGE

4 LOT COVERAGE (by housing type)

HOUSING TYPE	LOT SIZE	STANDARD MAXIMUM BUILDING COVERAGE	PERCENTAGE OF LOT
CM SINGLE FAMILY (BLOCKS 5, 11 & 12)	+/- 12,000 sq.ft.	3,600 sq.ft.	30.0%
MSF SINGLE FAMILY (BLOCKS 1 & 11)	+/- 8,520 sq.ft.	2,560 sq.ft.	30.0%
AL SINGLE FAMILY (BLOCKS 2 - 4, 6 - 10)	+/- 5,060 sq.ft.	2,530 sq.ft.	50.0%
HDSF SINGLE FAMILY (BLOCKS 13-17)	+/- 2,516 sq.ft.	1,258 sq.ft.	50.0%

5 GARAGE/PARKING ALTERNATIVES: ALLEY SERVED LOTS

SCALE: 1"=20'



6 LAND USE BREAKDOWN

TOTAL SITE AREA	GROSS		4,393,482 +/- Sq.Ft.		100.86 Acres +/-
	NET		3,734,949 +/- Sq.Ft.		85.74 Acres +/-
FUTURE DEVELOPMENT (TRACTS A1 & B1)	NET		771,167 +/- Sq.Ft.		17.70 Acres +/-
FUTURE DEVELOPMENT (TRACT D1)	NET	25 UNITS	126,947 +/- Sq.Ft.		2.91 Acres +/-
THIS PUD	GROSS		3,133,974 +/- Sq.Ft.		71.95 Acres +/-
	NET		1,454,989 +/- Sq.Ft.		33.40 Acres +/-
LOT AREA FOR DWELLINGS	CM (CUSTOM HOME SINGLE FAMILY)	13	203,584 +/- Sq.Ft.		4.67 Acres +/-
	MSF (MID SIZED SINGLE FAMILY)	27	228,957 +/- Sq.Ft.		5.26 Acres +/-
	AL (ALLEY LOADED SINGLE FAMILY)	166	827,944 +/- Sq.Ft.		19.01 Acres +/-
	HDSF (HIGH DENSITY SINGLE FAMILY)	71	194,504 +/- Sq.Ft.		4.47 Acres +/-
	TOTAL NUMBER OF LOTS	277	1,454,989 +/- Sq.Ft.		33.40 Acres +/-
DENSITY	GROSS				3.85 Du./Ac.
	NET				8.29 Du./Ac.
RESIDENTIAL COVERAGE	BUILDINGS		554,300 +/- Sq.Ft.	12.72 Acres +/-	12.6%
	STREET R.O.W.		255,693 +/- Sq.Ft.	5.87 Acres +/-	5.8%
	PRIVATE YARDS		790,589 +/- Sq.Ft.	18.15 Acres +/-	18.0%
	PARKING & DRIVES		190,888 +/- Sq.Ft.	4.38 Acres +/-	4.3%
OPEN AREA	COMMON OPEN PARK AREA REQUIRED		189,404 +/- Sq.Ft.	4.35 Acres +/-	4.3%
	TOTAL COMMON OPEN PARK AREA PROVIDED		192,984 +/- Sq.Ft.	4.43 Acres +/-	4.4%
	OTHER HOA COMMON OPEN SPACE		1,093,248 +/- Sq.Ft.	25.10 Acres +/-	24.9%
	TOTAL OPEN AREA		1,286,232 +/- Sq.Ft.	29.53 Acres +/-	29.3%

MAXIMUM BUILDING HEIGHT***	PRINCIPAL RESIDENTIAL UNIT	35'
	ACCESSORY BUILDING OR STRUCTURE	16'

DWELLING UNIT DISTRIBUTION	CM (CUSTOM HOME)	BLOCKS 5, 11 & 12
	MSF (MID SIZED SINGLE FAMILY UNITS)	BLOCKS 1 & 11
	AL (ALLEY LOADED SINGLE FAMILY UNIT)	BLOCKS 2-4 & 6-10
	HDSF (HIGH DENSITY SINGLE FAMILY UNITS)	BLOCKS 13-17

PARKING	HOUSING TYPE	UNITS		REQUIRED RATIO	# OF SPACES REQUIRED	# OF OFF STREET SPACES PROVIDED
	SINGLE FAMILY (CM, MSF, AL & HDSF)	277	DU	2 SPACES/1 DU	554	554

* PRIOR TO DEVELOPMENT OF FUTURE TRACTS A1, B1 & D1, PRELIMINARY PLAN AND REZONING APPROVAL IS REQUIRED TO BE OBTAINED.
** REQUIRED OFF-STREET PARKING SPACES PROVIDED BY 2-CAR GARAGES PER UNIT.
*** BUILDING HEIGHTS ARE AS MEASURED FROM THE TOP OF THE ROOF TO THE OVER-LOT GRADE ELEVATIONS AS SPECIFIED IN THE CITY OF LAFAYETTE DEVELOPMENT CODE.

LANDSCAPE ARCHITECT:
G.E. ENTERPRISES
LANDSCAPE DESIGN, INSTALLATION & MAINTENANCE

LANDSCAPE ARCHITECT:
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FLETEMEYER & LEE

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INDIAN PEAKS
FINAL PUD FILING NO. 17, AMENDMENT A
LAFAYETTE, COLORADO

NORTH SCALE: 1"=20' (0, 10', 20', 40')

JOB NO.: McStain 101
ACAD FILE: IPS_PH2_PUD_shts 1-2_Jan2012.dwg
DRAWN: MN
CHECKED: MN/DW
ISSUE: 02/24/2012
REVISIONS: 05/18/2012
07/17/2012 - FINAL

SHEET TITLE:
GENERAL NOTES & CALCULATIONS

SHEET NO.:
2 of 5

Boulder County, CO 03246467 3 of 6

1 OUTLOT OWNERSHIP AND MAINTENANCE EXHIBIT

NOTE; ALL OUTLOTS SHALL BE OWNED AND MAINTAINED BY THE INDIAN PEAKS SOUTH HOMEOWNER ASSOCIATION.

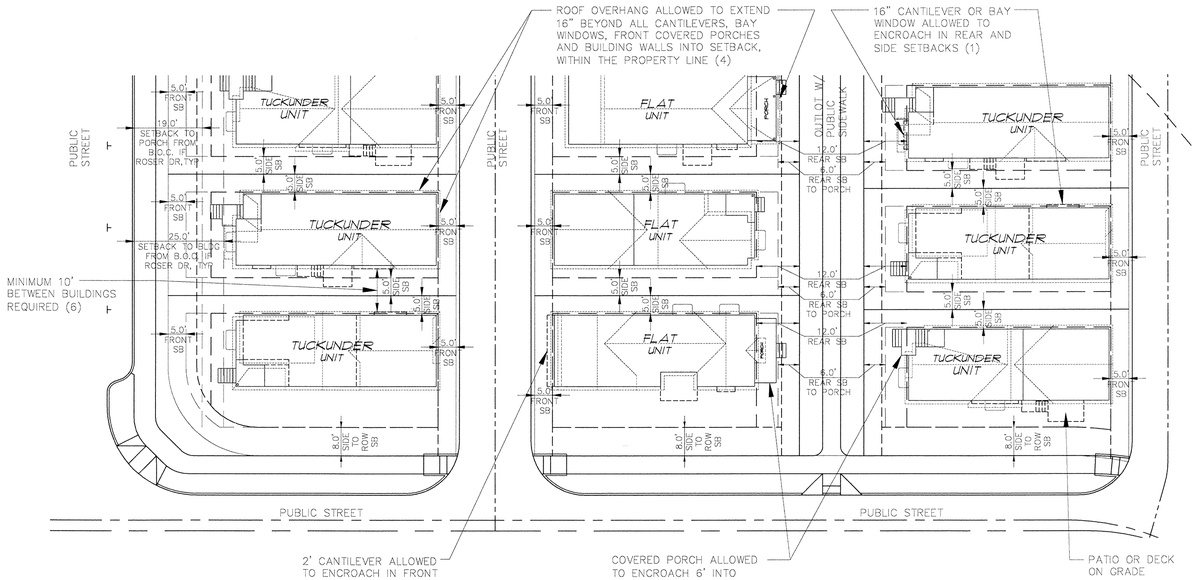
Phase	Replat	Location	Description	Parcel Size	Maintenance Elements
Phase 1		Outlot A	Open Space north of block 1	127,483	Turf, native grass, plantings, irrigation, sidewalk + tot lot
Phase 1		Outlot B	Alley in block 2	15,484	Concrete Alley
Phase 1		Outlot C	Alley in block 3	9,200	Concrete Alley
Phase 1		Outlot D	Roundabout	2,124	Concrete, native grass, plantings, & irrigation
Phase 1		Outlot E	Roser Dr median north of roundabout	5,982	Native grass, plantings & irrigation
Phase 1		Outlot F	Baseline and Hwy 42 Gateway Monument	12,014	Future Gateway sign (monument, plantings, lighting & irrigation)
Phase 1		Outlot G	Baseline and Roser IPS Monument	4,728	Entry monument (monument, plantings, lighting & irrigation)
Phase 1	B	Outlot A	Open Space nw of block 5	22,727	Turf, native grass, plantings, irrigation & sidewalk
Phase 2	C	Outlot A	Alley in block 7	9,200	Concrete Alley
Phase 2	C	Outlot B	Linear park between Green Lake and Roser	45,414	Turf, plantings, irrigation + amentities
Phase 2	C	Outlot C	Alley in block 9	15,138	Concrete Alley
Phase 2	C	Outlot D	Alley in block 10	9,540	Concrete Alley
Phase 2	C	Outlot E	Open space south of Block 11	131,107	Native grass, plantings, irrigation & sidewalk
Phase 2	C	Outlot F	Cottage open space, muse, parking	30,321	Native grass, plantings, irrigation + parking spaces
Phase 2	C	Outlot G	Cottage Parking and Landscape Median	1,940	Plantings, irrigation + parking spaces
Phase 2	C	Outlot H	East Roser Park	29,409	Turf, plantings, irrigation + amentities
Phase 2	C	Outlot I	Detention Pond and Drainage Way	623,871	Water quality, wetlands, native grass
Phase 2	C	Outlot J	Roser Drive Median	699	Plantings + irrigation
Phase 2	C	Outlot K	Paschal and Hwy 42 Gateway Monument	5,174	Entry monument (monument, plantings, lighting & irrigation)
Phase 2	C	Outlot L	Green Lake Way Mailbox 1 (Lot 1, Block 6)	28	USPS 25 unit mailbox location
Phase 2	C	Outlot M	Clear Creek Land Mailbox (Lot 9, Block 10)	52	USPS 61 unit mailbox location

Total IPS HOA Land Area (sqft) = 1,101,635
Total IPS HOA Land Area (ac) = 25.29

2 HIGH DENSITY ALLEY LOADED SINGLE FAMILY BUILDING ENVELOPE AND SETBACK NOTES

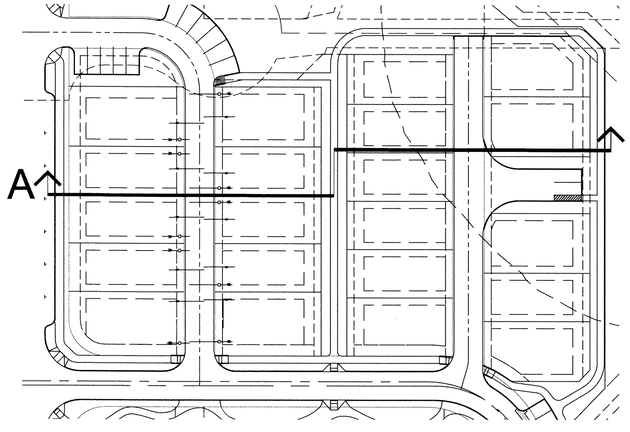
SCALE: 1"=30' 1"=20'

NOTE: (#) INDICATES THE CORRESPONDONDING BUILDING ENVELOPE AND SETBACK NOTE # IN TABLE 3A/SHEET 2.



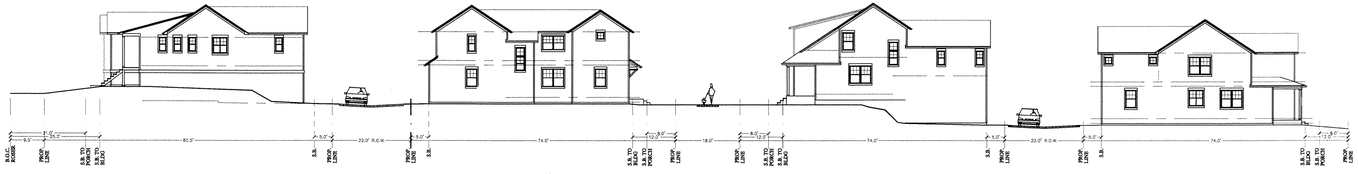
3 SECTION KEY MAP

SCALE: 1"=20' 1"=50'



4 SITE SECTION A

SCALE: 1"=20'



LANDSCAPE ARCHITECT:

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LANDSCAPE DESIGN, INSTALLATION & MAINTENANCE

LANDSCAPE ARCHITECT:

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FLETEMEYER & ASSOCIATES

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INDIAN PEAKS
FINAL PUD FILING NO. 17, AMENDMENT A
LAFAYETTE, COLORADO

NORTH SCALE: 1"=20'

JOB NO.: McStain 101
ACAD FILE: IPS_PH2_PUD_shts 1-2 Jan2012.dwg
DRAWN: MN
CHECKED: MN/DW
ISSUE: 02/24/2012
REVISIONS: 05/18/2012
07/17/2012 -- FINAL

SHEET TITLE:
ADDITIONAL EXHIBITS

SHEET NO.:
2-A of 5

Boulder County, CO 03246467 4 of 6

LOT LEGEND

LOT NUMBER
LOT TYPE

LOT TYPE LEGEND
CM - CUSTOM HOME
MSF - MEDIUM SINGLE FAMILY
AL - ALLEY LOADED
HDSF - HIGH DENSITY SINGLE FAMILY

BASELINE ROAD

PROPOSED LOCATION OF RTD BUS STOP; FINAL LOCATION TO BE DETERMINED BY RTD. REFER TO PUD SUPPLEMENT SHEET SET FOR SITE FURNITURE SPECIFICATIONS.

THIS PUD DOES NOT INCLUDE:
BLOCK 1 LOTS 1–10
BLOCK 2 LOTS 1–27
BLOCK 3 LOTS 1–8
BLOCK 5 LOTS 1–2

INDICATES EXISTING TREES TO BE PRESERVED PER GENERAL LANDSCAPE NOTES

EXISTING 100 YEAR FLOODPLAIN

PROPOSED 100 YEAR FLOODPLAIN

BOUNDARY OF THE AREA OF THIS PUD

TRACT A1

TRACT B1

TRACT D1

TRACT A

OUTLOT A

OUTLOT B

OUTLOT D

OUTLOT E

OUTLOT F

OUTLOT G

OUTLOT 1

OUTLOT 3

OUTLOT 11

OUTLOT 12

OUTLOT 13

OUTLOT 14

PARK (TOT LOT– SEE SHT L5.0)

PARK (SEE SHT L6.0) FUTURE OUTLOT

PARK (SEE SHT L4.1) OUTLOT B

PARK (SEE SHT L4.0) OUTLOT H

FUTURE OUTLOT

ROSER DRIVE

95th STREET

PASCHAL DRIVE

CRATER LAKE LANE

GRAND LAKE DRIVE

SHADOW LAKE ROAD

TWIN LAKES CIRCLE

TWIN LAKES DRIVE

CASCADE GREEN DRIVE

CLEAR GREEN LANE

HOLY STONE WAY

STRAIGHT CREEK WAY

TAKODA SUBDIVISION

LANDSCAPE ARCHITECT:
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LANDSCAPE ARCHITECT:
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FLATMEYER & LEE LANDSCAPE ARCHITECTURE

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INDIAN PEAKS
FINAL PUD FILING NO. 17, AMENDMENT A
LAFAYETTE, COLORADO

NORTH SCALE: 1" = 20' 1" = 100'

JOB NO.: McStain 101
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ISSUE: 02/24/2012
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07/17/2012 – FINAL

SHEET TITLE:

OVERALL PUD

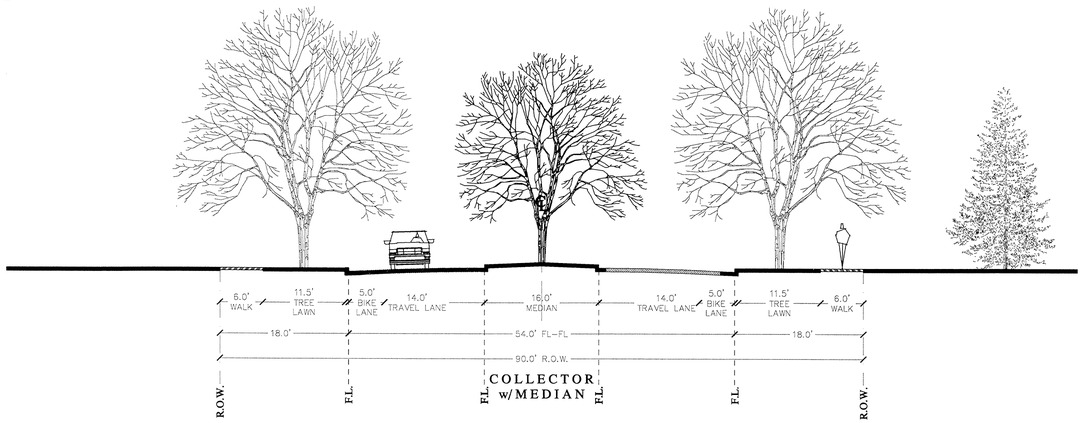
SHEET NO.:

3 of 5

5 of 6
Boulder County, CO 03246467

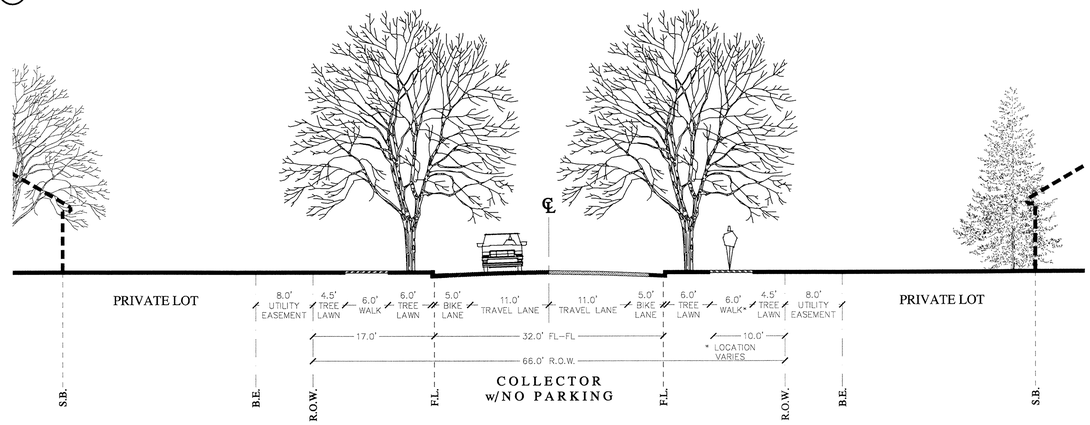
1 COLLECTOR with MEDIAN STREET SECTION

SCALE: 1"=10'



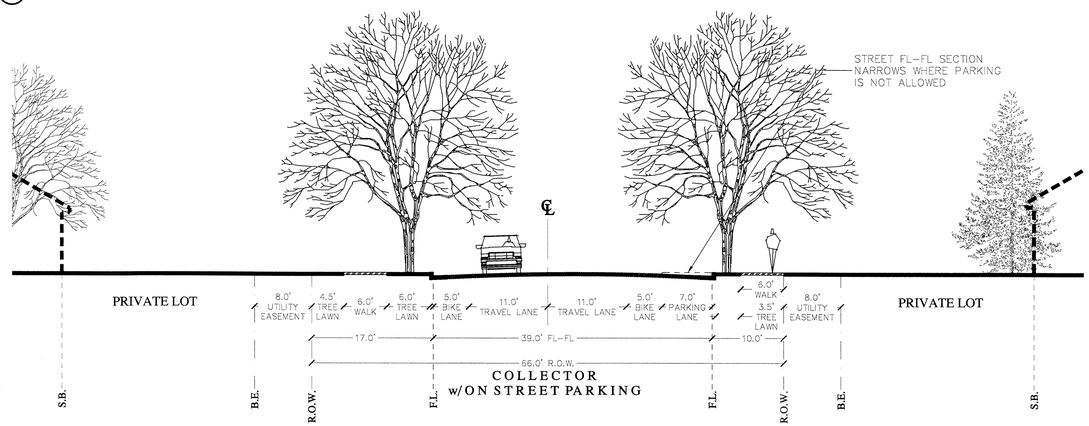
2 TYPICAL COLLECTOR with NO ON STREET PARKING

SCALE: 1"=10'



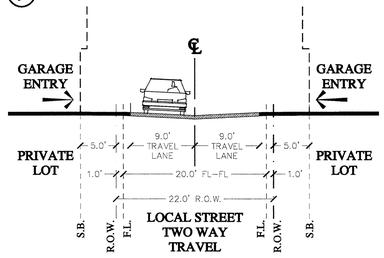
3 TYPICAL COLLECTOR with ON STREET PARKING

SCALE: 1"=10'



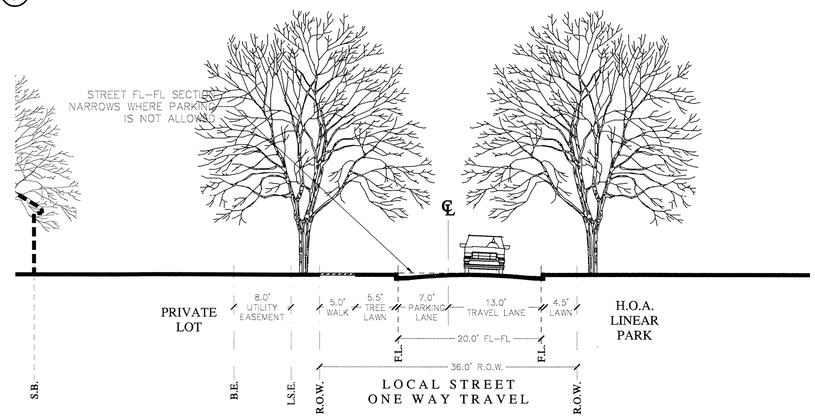
9 TYPICAL LOCAL STREETS EAST OF ROSER DRIVE- TWO WAY TRAFFIC

SCALE: 1"=10'



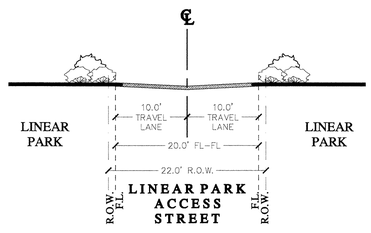
5 TYPICAL LOCAL STREETS WEST OF ROSER DRIVE - ONE WAY TRAFFIC

SCALE: 1"=10'



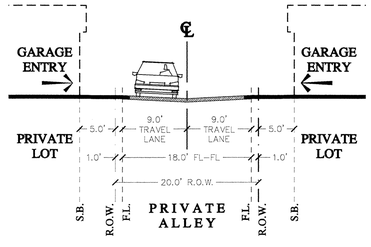
6 LINEAR PARK ACCESS STREET

SCALE: 1"=10'



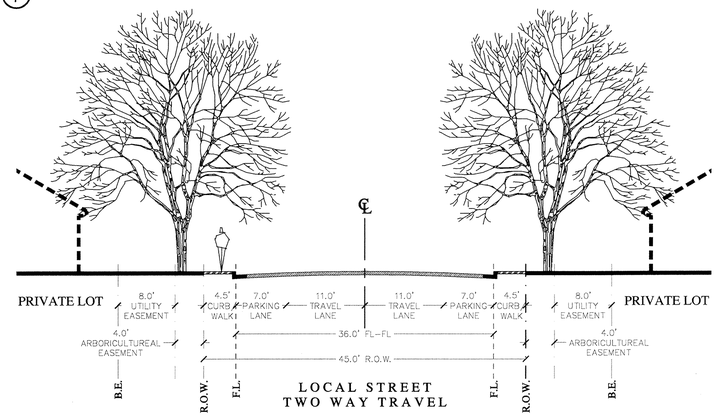
8 TYPICAL PRIVATE ALLEY

SCALE: 1"=10'



7 TYPICAL LOCAL STREETS WEST OF ROSER DRIVE - TWO WAY TRAFFIC

SCALE: 1"=10'



LANDSCAPE ARCHITECT:

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LANDSCAPE DESIGN, INSTALLATION & MAINTENANCE

LANDSCAPE ARCHITECT:

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CIVIL ENGINEER:

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INDIAN PEAKS
FINAL PUD FILING NO. 17, AMENDMENT A
LAFAYETTE, COLORADO

0 10' 20' 40'

SCALE: 1"=20'

JOB NO.: McStain 101
ACAD FILE: IPS PH2 PUD shts 4-5 Jan2012.dwg
DRAWN: MN
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07/17/2012 - FINAL

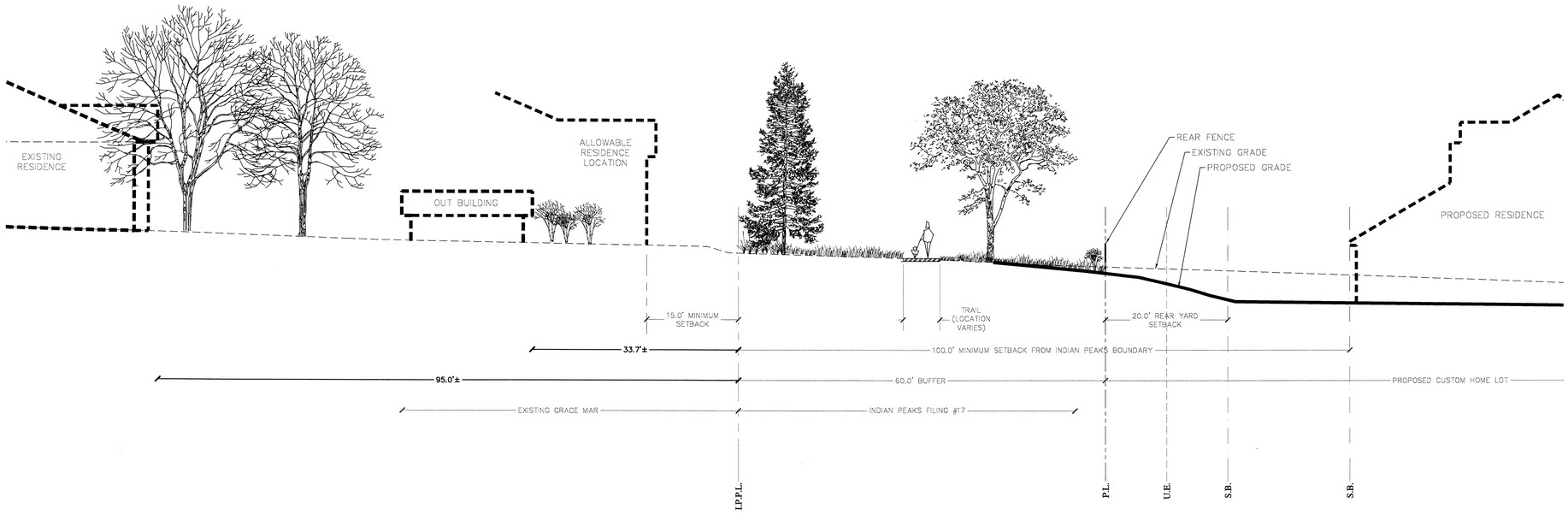
SHEET TITLE:
PUD STREET SECTIONS

SHEET NO.:
4 of 5

Boulder County, CO 03246467 6 of 6

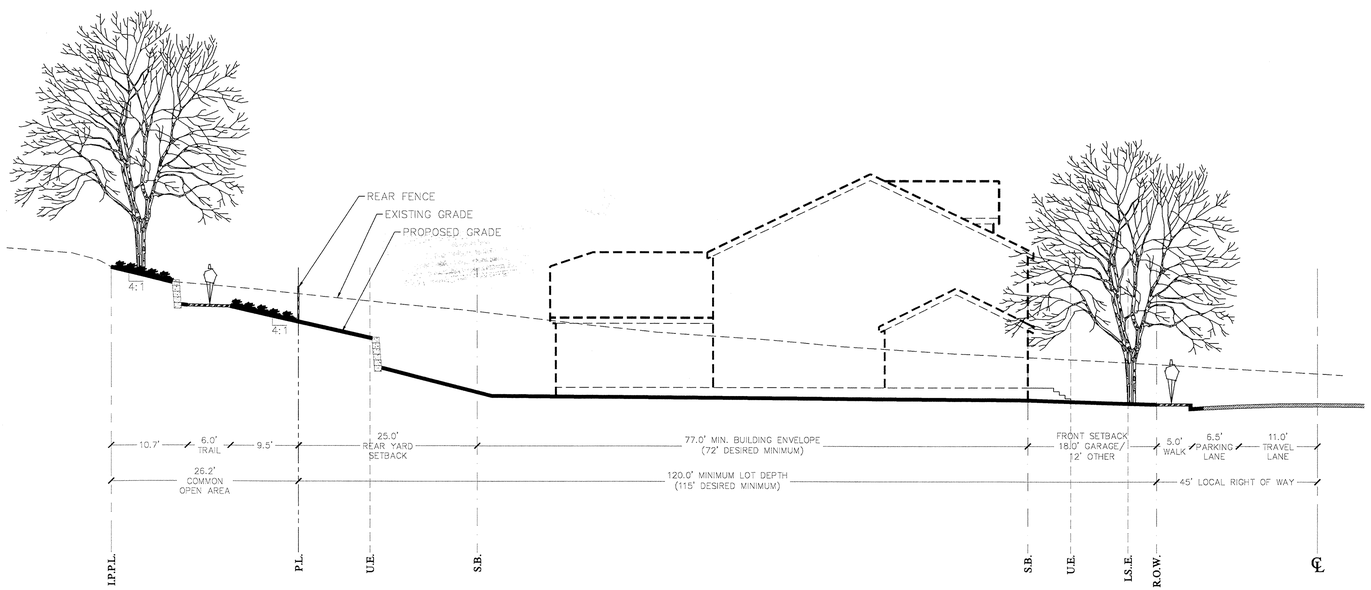
1 TRAIL SECTION A

SCALE: 1"=10'



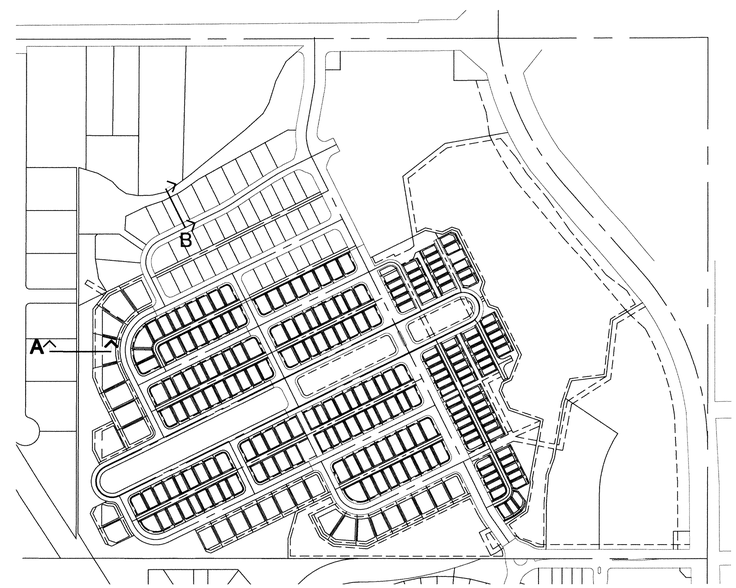
2 TRAIL SECTION 'B'

SCALE: 1"=10'



3 KEY MAP

SCALE: 1"=300'



LANDSCAPE ARCHITECT:

G.E. ENTERPRISES
LANDSCAPE DESIGN, INSTALLATION & MAINTENANCE

LANDSCAPE ARCHITECT:

FLATIRONS LAND ARCHITECTS

CIVIL ENGINEER:

HURST CIVIL ENGINEERING PLANNING SURVEYING
2500 Broadway, Suite B
Boulder, CO 80304
303.449.9105
www.hurst-assoc.com

PLANNER / OWNER / DEVELOPER:

McSTAIN NEIGHBORHOODS
7100 North Broadway, Suite 5-H
Denver, Colorado 80221
303-494-3900

INDIAN PEAKS
FINAL PUD FILING NO. 17, AMENDMENT A
LAFAYETTE, COLORADO

0 10' 20' 40'

SCALE: 1"=20'

JOB NO.: McStain 101
ACAD FILE: IPS_PH2_PUD shts 4-5 Jan2012.dwg
DRAWN: MN
CHECKED: MN/DW
ISSUE: 02/24/2012
REVISIONS: 05/18/2012
07/17/2012 -- FINAL

SHEET TITLE:
PUD TRAIL SECTIONS

SHEET NO.:
5 of 5

1 LEGAL DESCRIPTION

DEDICATION:

KNOW ALL MEN BY THESE PRESENTS THAT THE UNDERSIGNED BEING SOLE OWNERS IN FEE SIMPLE OF ALL THAT REAL PROPERTY DESCRIBED AS:

A PORTION OF THE NORTHEAST QUARTER OF SECTION 5, TOWNSHIP 1 SOUTH RANGE 69 WEST, SIXTH PRINCIPAL MERIDIAN, BOULDER COUNTY, COLORADO, DESCRIBED AS FOLLOWS:

COMMENCING AT THE EAST QUARTER CORNER OF SAID SECTION 5;

THENCE N89°55'30"W, 73.90 FEET ALONG THE SOUTHERLY BOUNDARY OF SAID NORTHEAST QUARTER OF SECTION 5 TO THE POINT OF BEGINNING;

THENCE N89°55'30"W, 2499.70 FEET ALONG SAID SOUTHERLY BOUNDARY TO THE EASTERLY RIGHT OF WAY OF THE BURLINGTON AND NORTHERN RAILROAD;

THENCE N31°38'43"W, 124.74 FEET ALONG SAID EASTERLY RIGHT OF WAY TO THE WESTERLY BOUNDARY OF SAID NORTHEAST QUARTER OF SECTION 5;

THENCE N00°09'31"E, 1541.74 FEET ALONG SAID WESTERLY BOUNDARY TO THE SOUTHERLY BOUNDARY OF A TRACT OF LAND DESCRIBED IN A DEED RECORDED ON FILM 1490, RECEPTION NO. 870709;

THENCE ALONG THE SOUTHERLY AND EASTERLY BOUNDARY OF THOSE TRACTS OF LAND DESCRIBED IN DEED RECORDED ON FILM 1490, RECEPTION NO. 870709; FILM 1383, RECEPTION NO. 727315; FILM 1456, RECEPTION NO. 824281; FILM 1661, RECEPTION NO. 1086984 THE FOLLOWING COURSES:

S72°48'54"E, 82.00 FEET;
S60°32'54"E, 71.00 FEET;
S41°55'54"E, 38.00 FEET;
S55°37'54"E, 40.00 FEET;
S79°39'54"E, 48.13 FEET;
N88°35'31"E, 60.39 FEET;
N76°30'31"E, 65.75 FEET;
N53°39'31"E, 120.00 FEET;
N50°34'31"E, 300.00 FEET;
N47°23'31"E, 100.00 FEET;
N28°54'31"E, 52.00 FEET;
N17°02'31"E, 95.10 FEET;
N27°35'31"E, 94.00 FEET;
N48°13'31"E, 61.63 FEET TO THE SOUTHERLY RIGHT OF WAY OF BASELINE ROAD;

THENCE ALONG SAID SOUTHERLY RIGHT OF WAY THE FOLLOWING COURSES:
N89°33'00"E, 10.40 FEET;
N89°37'58"E, 500.78 FEET;
N89°24'04"E, 140.59 FEET;
N89°38'00"E, 32.94 FEET TO THE WESTERLY RIGHT OF WAY OF COLORADO HIGHWAY NO 42 (95TH STREET);

THENCE ALONG SAID WESTERLY RIGHT OF WAY THE FOLLOWING COURSES:
S48°17'57"E, 146.51 FEET;

THENCE 451.59 FEET ALONG THE ARC OF A NON-TANGENT CURVE TO THE LEFT SAID ARC SUBTENDED BY A RADIUS OF 1221.00 FEET, A CENTRAL ANGLE OF 21°11'27", AND A CHORD BEARING S24°09'22"E, 449.02 FEET;

S39°40'30"E, 308.03 FEET;
S42°12'00"E, 133.41 FEET;
S39°43'30"E, 291.66 FEET;

THENCE 500.70 FEET ALONG THE ARC OF A NON-TANGENT CURVE TO THE RIGHT SAID ARC SUBTENDED BY A RADIUS OF 1071.00 FEET, A CENTRAL ANGLE OF 26°47'10", AND A CHORD BEARING S21°15'00"E, 496.15 FEET;

S02°46'30"E, 291.66 FEET;

S00°18'00"E, 323.39 FEET TO THE POINT OF BEGINNING, CONTAINING 100.86 ACRES, MORE OR LESS.

HAVE BY THESE PRESENTS LAID OUT, PLATTED AND SUBDIVIDED THE SAME INTO OUTLOTS, TRACTS, LOTS AND BLOCKS AS SHOWN HEREON AND DESIGNATE THE SAME AS INDIAN PEAKS FILING NO. 17, IN THE CITY OF LAFAYETTE, COUNTY OF BOULDER, COLORADO.

INDIAN PEAKS SOUTH 4, LLC, A COLORADO LIMITED LIABILITY COMPANY

BY: _____
NAME: DAVID B. WARE
TITLE: CHIEF EXECUTIVE OFFICER

ACKNOWLEDGEMENT

STATE OF COLORADO)
) SS
COUNTY OF ADAMS)

THE FOREGOING INSTRUMENT WAS ACKNOWLEDGED BEFORE ME THIS 28th DAY OF September, 20 15
BY DAVID B. WARE, AS CHIEF EXECUTIVE OFFICER OF INDIAN PEAKS SOUTH 4, LLC, A COLORADO LIMITED LIABILITY COMPANY.

WITNESS MY HAND AND OFFICIAL SEAL.

MY COMMISSION EXPIRES: 10-16-2015

_____
NOTARY PUBLIC

LYNNE A. DYER
NOTARY PUBLIC
STATE OF COLORADO
MY COMMISSION EXPIRES 10/16/2015

BJ BASELINE, LLC, A COLORADO LIMITED LIABILITY COMPANY

BY: _____
NAME: JEFFERY WINGERT
TITLE: MANAGER

ACKNOWLEDGEMENT

STATE OF COLORADO)
) SS
COUNTY OF BOULDER)

THE FOREGOING INSTRUMENT WAS ACKNOWLEDGED BEFORE ME THIS 28 DAY OF SEPTEMBER, 20 15
BY JEFFERY WINGERT, AS MANAGER OF BJ BASELINE, LLC, A COLORADO LIMITED LIABILITY COMPANY.

WITNESS MY HAND AND OFFICIAL SEAL.

MY COMMISSION EXPIRES: 10/23/16

_____
NOTARY PUBLIC

JODI WILLIAMS
NOTARY PUBLIC
STATE OF COLORADO
MY COMMISSION EXPIRES 10/23/2016

2 PUD NOTES

1. NOTICE: ACCORDING TO COLORADO LAW, YOU MUST COMMENCE ANY LEGAL ACTION BASED UPON ANY DEFECT IN THIS SURVEY WITHIN THREE YEARS AFTER YOU FIRST DISCOVER SUCH DEFECT. IN NO EVENT MAY ANY ACTION BASED UPON ANY DEFECT IN THIS SURVEY BE COMMENCED MORE THAN TEN YEARS FROM THE DATE OF THE CERTIFICATION SHOWN HEREON.
2. BEARINGS ARE BASED ON THE EASTERLY LINE OF THE NORTHEAST QUARTER OF SECTION 5: N00°03'50".
3. ALL OUTLOTS SHALL BE OWNED AND MAINTAINED BY THE INDIAN PEAKS SOUTH HOMEOWNER ASSOCIATION.
4. WATER METERS AND PERPENDICULAR UTILITY CROSSINGS THROUGH A DEFINED EASEMENT ARE ALLOWED.
5. THIS PLAT IS SUBJECT TO THE COMMUNITY CHARTER FOR INDIAN PEAKS SOUTH IN THE REAL PROPERTY RECORDS OF BOULDER COUNTY, STATE OF COLORADO ON AUGUST 28, 2007, AT RECEPTION NO. 2879363, AS AMENDED BY FIRST AMENDMENT RECORDED IN THE REAL PROPERTY RECORDS OF BOULDER COUNTY, COLORADO ON APRIL 14, 2008, AT RECEPTION NO. 2923170, BY SECOND AMENDMENT RECORDED IN THE REAL PROPERTY RECORDS OF BOULDER COUNTY, COLORADO ON SEPTEMBER 24, 2008, AT RECEPTION NO. 2956490, BY SECOND AMENDMENT RECORDED IN THE REAL PROPERTY RECORDS OF BOULDER COUNTY, COLORADO ON AUGUST 23, 2012, AT RECEPTION NO. 03246469, BY THIRD AMENDMENT RECORDED IN THE REAL PROPERTY RECORDS OF BOULDER COUNTY, COLORADO, ON MAY 01, 2013, AT RECEPTION NO. 03308830, BY FOURTH AMENDMENT RECORDED IN THE REAL PROPERTY RECORDS OF BOULDER COUNTY, COLORADO ON JULY 31, 2013, AT RECEPTION NO. 03331760, AND BY FIFTH AMENDMENT RECORDED IN THE REAL PROPERTY RECORDS OF BOULDER COUNTY, COLORADO ON DECEMBER 23, 2014, AT RECEPTION NO. 03419582 (THE "CHARTER").
6. THE INDIAN PEAKS FILING NO. 17, REPLAT G, DEVELOPMENT AGREEMENT ("AGREEMENT") IS HEREBY RECORDED ON THIS _____ DAY OF _____, 2015, UNDER RECEPTION # _____. THE OWNER SHALL DEVELOP THE PROPERTY IN ACCORDANCE WITH AND IS SUBJECT TO ALL PROVISIONS OF THIS AGREEMENT. THE DEVELOPMENT AND ANNEXATION AGREEMENTS RECORDED THE 21ST DAY OF SEPTEMBER, 1990, UNDER RECEPTION #01065413, THE 31ST DAY OF JANUARY, 1991, UNDER RECEPTION #01085568, THE 28TH DAY OF FEBRUARY, 1992, UNDER RECEPTION #01164201, THE 31ST DAY OF AUGUST, 1992, UNDER RECEPTION #215601, #215603, AND #215604, THE 29TH DAY OF OCTOBER, 1993, UNDER RECEPTION #13555209, THE 9TH DAY OF JUNE, 1998 UNDER RECEPTION #1705030; THE AMENDMENT TO INDIAN PEAKS DEVELOPMENT AGREEMENTS, (THE "CONSTRUCTION SCHEDULE") RECORDED THE 13TH DAY OF JUNE, 2000, UNDER RECEPTION # 2052529; THE INDIAN PEAKS FILING NO. 17 DEVELOPMENT AGREEMENT RECORDED THE 21ST DAY OF MARCH, 2008, UNDER RECEPTION # 2917884; THE AMENDMENT TO INDIAN PEAKS DEVELOPMENT AGREEMENTS RECORDED THE 21ST DAY OF MARCH, 2008, UNDER RECEPTION # 2917886; THE AMENDED AND RESTATED INDIAN PEAKS FILING NO. 17 DEVELOPMENT AGREEMENT RECORDED THE 7TH DAY OF SEPTEMBER, 2010, UNDER RECEPTION # 03096992; THE INDIAN PEAKS FILING NO. 17 REPLAT C DEVELOPMENT AGREEMENT RECORDED THE 23RD DAY OF AUGUST, 2012, UNDER RECEPTION NO. 03246468; THE INDIAN PEAKS FILING NO. 17 REPLAT D DEVELOPMENT AGREEMENT RECORDED THE 26TH DAY OF JUNE, 2013, UNDER RECEPTION NO. 03322898; THE INDIAN PEAKS FILING NO. 17 REPLAT E DEVELOPMENT AGREEMENT RECORDED THE 4TH DAY OF FEBRUARY, 2014, UNDER RECEPTION NO. 03364736; THE INDIAN PEAKS FILING NO. 17 REPLAT F DEVELOPMENT AGREEMENT RECORDED THE 7TH DAY OF APRIL, 2015, UNDER RECEPTION NO. 03437911; AND THE FOLLOWING TERMS AND SPECIFICATIONS AS HEREIN AGREED. TO THE EXTENT THAT THIS AGREEMENT AND ANY PRIOR AGREEMENT ARE INCONSISTENT, THIS AGREEMENT SHALL PREVAIL.

3 PLANNING COMMISSION CERTIFICATE

THE AMENDED PRELIMINARY PLANNED UNIT DEVELOPMENT FOR "INDIAN PEAKS FILING NO. 17" WAS APPROVED BY THE CITY OF LAFAYETTE PLANNING COMMISSION ON June 23, 2015, A.D.

_____
CHAIRPERSON

_____
ATTEST: SECRETARY

4 TITLE COMPANY'S CERTIFICATE:

I, Charles L. Wittala, only REPRESENTING FIDELITY NATIONAL TITLE COMPANY, CERTIFY THAT I HAVE EXAMINED TITLE TO THE DESCRIBED LAND WITHIN THE CITY OF LAFAYETTE, COLORADO, AND THAT THE PARTIES EXECUTING THE PLAT ARE THE OWNERS THEREOF IN FEE SIMPLE, AND THE DEDICATED LAND IS FREE AND CLEAR OF ALL LIENS AND ENCUMBRANCES EXCEPT AS PROVIDED FOR IN TITLE COMMITMENT NO. _____ DATED _____

_____
NAME

Title Officier
TITLE

EXECUTED THIS 27th DAY OF September, A.D., 2015

5 CITY COUNCIL CERTIFICATE

THIS FINAL PUD IS APPROVED BY THE CITY COUNCIL OF THE CITY OF LAFAYETTE, COLORADO, THIS 6 DAY OF October, 20 15 A.D. FOR FILING WITH THE CLERK AND RECORDER OF BOULDER COUNTY AND SUBJECT TO THE PROVISION THAT APPROVAL IN NO WAY OBLIGATES THE CITY OF LAFAYETTE FOR THE FINANCING OR CONSTRUCTING OF IMPROVEMENTS ON LAND OR EASEMENTS DEDICATED TO THE PUBLIC EXCEPT AS SPECIFICALLY AGREED TO BY THE CITY COUNCIL.

_____
MAYOR

WITNESS MY HAND AND OFFICIAL SEAL OF THE CITY OF LAFAYETTE

_____
ATTEST: CITY CLERK

CITY OF LAFAYETTE HOME RULE BOULDER COUNTY, COLO. FEB. 1, 1909

6 CITY ADMINISTRATOR'S CERTIFICATE

I, GARY KLAPHAKE, CITY ADMINISTRATOR OF THE CITY OF LAFAYETTE, COLORADO, HEREBY CERTIFY THAT I HAVE EXAMINED THE FINAL PUD AND IT APPEARS TO BE IN COMPLIANCE WITH ALL APPLICABLE ORDINANCES OF THE CITY AND THAT A SUBDIVISION AGREEMENT HAS BEEN EXECUTED BY THE DEVELOPER AND ACCEPTED BY THE CITY.

_____
CITY ADMINISTRATOR

_____
ATTEST: CITY CLERK

7 COUNTY CLERK & RECORDER'S CERTIFICATE

STATE OF COLORADO)
) SS
COUNTY OF BOULDER)

I HEREBY CERTIFY THAT THIS PUD WAS FILED IN MY OFFICE AT _____ O'CLOCK, __. M. ON THE _____ DAY OF _____, 20___, AND IS DULY RECORDED AT RECEPTION NO. _____ AND PLAN FILE P-___ F-___ # _____. FEES PAID: $_____

_____
COUNTY CLERK & RECORDER

_____
BY: DEPUTY

8 REVIEW CERTIFICATES

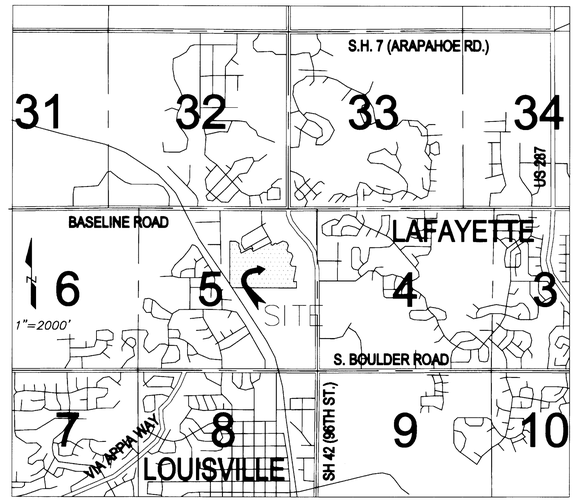
_____
CITY OF LAFAYETTE ENGINEER

VESTED PROPERTY RIGHT

APPROVAL OF THIS PLAN MAY CREATE A VESTED PROPERTY RIGHT PURSUANT TO ARTICLE 68 OF TITLE 24, C.R.S., AS AMENDED.

9 VICINITY MAP

NOT TO SCALE



VICINITY MAP

10 PUD SHEET INDEX

1 COVER SHEET
2 GENERAL NOTES & CALCULATIONS
2A ADDITIONAL EXHIBITS
3 OVERALL PUD
4 PUD STREET CROSS SECTIONS
5 TRAIL CROSS SECTIONS

CIVIL ENGINEER:
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2500 Broadway, Suite B
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PLANNER / OWNER / DEVELOPER:
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INDIAN PEAKS
FINAL
PUD FILING NO. 17, AMENDMENT B
LAFAYETTE, COLORADO

0 10' 20' 40'
NORTH SCALE: 1"=20'

JOB NO.: McStain 101
ACAD FILE: IPS PH2 PUD shts 1-2-2A July2015.dwg
DRAWN: MN
CHECKED: MN/DW
ISSUE: 09/03/2015
REVISIONS:

SHEET TITLE:

COVER

SHEET NO.:

1 of 5

1 GENERAL NOTES

1. IN AREAS WHERE FIRE ACCESS IS PROVIDED THROUGH PRIVATE DRIVES, 25' INSIDE AND 45' OUTSIDE TURNING RADII SHALL BE PROVIDED, PER THE FIRE DEPARTMENT.
2. NO STRUCTURES OVER 36 INCHES IN HEIGHT SHALL BE CONSTRUCTED WITHIN THE SIGHT CLEARANCE AREA DEFINED BY CITY OF LAFAYETTE CODE AT ALL PUBLIC AND PRIVATE STREET DRIVEWAY INTERSECTIONS.
3. DRIVEWAYS, WITH A MINIMUM DEPTH OF 18' SHALL BE PROVIDED FOR ALL UNITS THAT DO NOT INCLUDE A 2 CAR GARAGE, UNLESS AN ALTERNATIVE SOLUTION IS APPROVED (AS PER DETAIL 5 ON THIS SHEET).

2 SITE PLAN LEGEND

SITE PLAN SYMBOLS

- 5124 — EX. CONTOUR
- 5125 — PR. CONTOUR
- RIGHT-OF-WAY
- STREET CENTERLINE
- PROPERTY LINE
- EASEMENT LINE
- WATER LINE
- SS — SANITARY SEWER
- MANHOLE
- FIRE HYDRANT
- STORM DRAIN PIPE
- EXISTING TREES (TO REMAIN)
- PROPOSED RTD BUS STOP LOCATION
- SIGHT TRIANGLE
- RETAINING WALL
- STREET LIGHTS
- MAILBOX
- 8 — BLOCK NUMBER
- 2 PH — LOT NUMBER / LOT TYPE

LOT TYPE LEGEND
- CM - CUSTOM HOME
- MSF - MEDIUM SINGLE FAMILY
- AL - ALLEY LOADED
- HDSF - HIGH DENSITY SINGLE FAMILY

3 BUILDING SETBACKS*:

FRONT LOADED UNITS- CUSTOM (CM) & MEDIUM SINGLE FAMILY (MSF) (BLOCKS 1, 5, 11 & 12)

FRONT: 18' AT GARAGE DOOR; 12' AT OTHER
REAR: 20' MIN. (25' ON BLOCK 1)
SIDE: 5' MIN.; 15' BETWEEN BUILDINGS

ALLEY LOADED (AL) UNITS- (BLOCKS 2 - 4 & 6 - 10)

FRONT: 12'
REAR: 18' WITH DRIVEWAY PARKING
5' WITHOUT DRIVEWAY PARKING
SIDE: 5' MIN.; 15' BETWEEN BUILDINGS**
10' MIN. BETWEEN ADJACENT BUILDING AND DETACHED GARAGE

**UNLESS ADJACENT TO 40' LOT

40' WIDE ALLEY LOADED (AL) UNITS (BLOCKS 2 - 4 & 6 - 10)

FRONT: 12'
REAR: 18' WITH DRIVEWAY PARKING
5' WITHOUT DRIVEWAY PARKING
SIDE: 5' MIN.; 10' BETWEEN BUILDINGS

* UNLESS OTHERWISE NOTED

BUILDING ENVELOPE & SETBACK NOTES

1. FOR SINGLE FAMILY HOMES, REAR YARDS AT ALLEYS ARE 18' WITH DRIVEWAY PARKING PERPENDICULAR TO THE ALLEY; 5' WITHOUT DRIVEWAY PARKING, OR WITH SIDE LOADED GARAGES PER DETAIL 5 ON THIS SHEET.
2. ALL LOTS ADJACENT TO WEST PROPERTY LINE WILL HAVE A MINIMUM 100' BUILDING SETBACK FROM THE PROJECT PROPERTY LINE.
3. ALL LOTS ADJACENT TO WEST PROPERTY LINE WILL HAVE A MINIMUM 20' BUILDING SETBACK FROM INDIVIDUAL REAR LOT LINES.
4. ALL LOTS ADJACENT TO ROSER DRIVE ON WEST SIDE WILL HAVE A MINIMUM 30' BUILDING SETBACK FROM THE ROSER DRIVE BACK OF CURB.
5. CUSTOM (CM) AND MEDIUM SINGLE FAMILY (MSF) LOTS ARE NOT TO EXCEED A MAXIMUM BUILDING COVERAGE OF 30%.
6. ALLEY LOADED (AL) LOTS ARE NOT TO EXCEED A MAXIMUM BUILDING COVERAGE OF 50%

3A HIGH DENSITY SINGLE FAMILY BUILDING SETBACKS*:

HIGH DENSITY SINGLE FAMILY (HDSF) UNITS (BLOCKS 13-17 & REPLAT G, BLOCK 18)

FRONT: 5'
18' WITH DRIVEWAY PARKING (REPLAT G, BLOCK 18, LOTS 20-25)
3' AT UPPER LEVELS
REAR: 12' TO BUILDING
6' TO PORCH
SIDE: 5' MIN.; 10' BETWEEN BUILDINGS
8' TO R.O.W. AT CORNER LOTS

* UNLESS OTHERWISE NOTED

BUILDING ENVELOPE & SETBACK NOTES

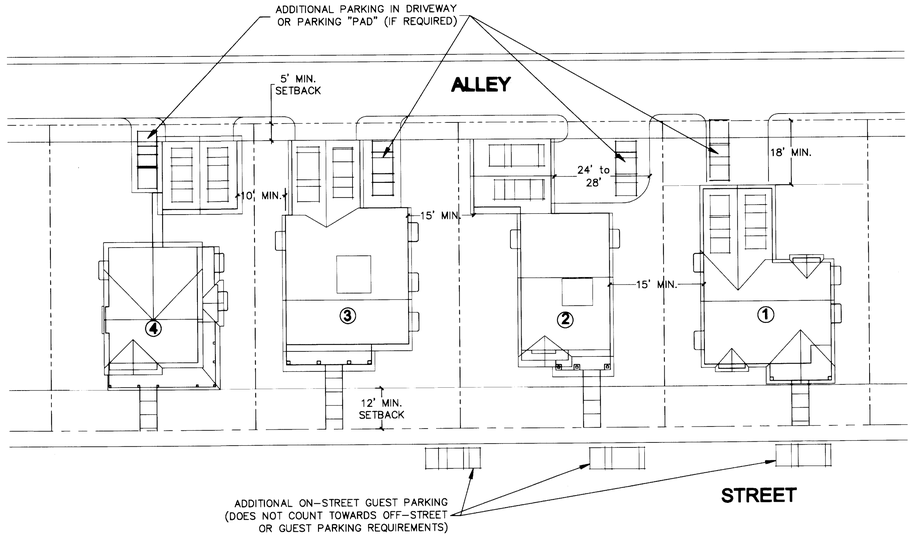
1. 16" CANTILEVER OR BAY WINDOW ALLOWED TO ENCROACH IN REAR AND SIDE SETBACKS
2. 2' CANTILEVER ALLOWED TO ENCROACH INTO FRONT SETBACK
3. COVERED PORCH ALLOWED TO ENCROACH 6' INTO REAR SETBACK
4. ROOF OVERHANG ALLOWED TO EXTEND 18" BEYOND ALL CANTILEVERS, BAY WINDOWS, COVERED PORCHES AND BUILDING WALLS INTO SETBACK, WITHIN THE PROPERTY LINE
5. ALL LOTS ADJACENT TO ROSER DRIVE ON EAST SIDE WILL HAVE A MINIMUM 25' BUILDING SETBACK FROM THE ROSER DRIVE BACK OF CURB AND COVERED PORCH ALLOWED TO ENCROACH 6' INTO SETBACK
6. PUD BUILDING SEPARATION AND MINIMUM DISTANCE BETWEEN BUILDINGS SHALL BE 10'
7. LOTS ARE NOT TO EXCEED A MAXIMUM BUILDING COVERAGE OF 50%
8. ALL UNITS WILL HAVE 2 OFF STREET PARKING SPACES IN GARAGE
9. THE MAXIMUM ALLOWABLE BUILDING HEIGHT SHALL BE 35', MEASURED TO THE PEAK, EXCEPT LOTS 1 AND 2, BLOCK 18, REPLAT G, SHALL BE NO MORE THAN 30'
10. FRONT TO REAR GABLE ROOF FORMS ARE REQUIRED ON LOTS 1 AND 2, BLOCK 18, REPLAT G
11. ALL LOTS ADJACENT TO WETLANDS WILL HAVE A MINIMUM 25' SETBACK FROM WETLANDS, EXCEPT LOTS 24 & 25, BLOCK 18, REPLAT G, WHICH WILL HAVE A MINIMUM 20' SETBACK FROM WETLANDS

4 LOT COVERAGE (by housing type)

HOUSING TYPE	MINIMUM LOT AREA	STANDARD MAXIMUM BUILDING COVERAGE	MAX. LOT COVERAGE %
CM SINGLE FAMILY (BLOCKS 5, 11 & 12)	+/- 12,000 sq.ft.	3,600 sq.ft.	30.0%
MSF SINGLE FAMILY (BLOCKS 1 & 11)	+/- 8,520 sq.ft.	2,560 sq.ft.	30.0%
AL SINGLE FAMILY (BLOCKS 2 - 4, 6 - 10)	+/- 5,060 sq.ft.	2,530 sq.ft.	50.0%
HDSF SINGLE FAMILY (BLOCKS 13-17 & REPLAT G, BLOCK 18)	+/- 2,600 sq.ft.	1,200 sq.ft.	80.0%

5 GARAGE/PARKING ALTERNATIVES: ALLEY SERVED LOTS

SCALE: 1"=20'



6 LAND USE BREAKDOWN

TOTAL SITE AREA	GROSS		4,393,482* +/- Sq.Ft.		100.86 Acres +/-
	NET		3,734,949 +/- Sq.Ft.		85.74 Acres +/-
FUTURE DEVELOPMENT (TRACTS A1)	NET		243,525 +/- Sq.Ft.		5.59 Acres +/-
FUTURE DEVELOPMENT (TRACT B1)	NET		771,167 +/- Sq.Ft.		17.70 Acres +/-
FUTURE DEVELOPMENT (TRACT D1)	NET		126,947 +/- Sq.Ft.		2.91 Acres +/-
THIS PUD	GROSS		3,325,062 +/- Sq.Ft.		76.33 Acres +/-
	NET		1,540,090 +/- Sq.Ft.		35.36 Acres +/-
LOT AREA FOR DWELLINGS	CM (CUSTOM HOME SINGLE FAMILY)	13	203,584* +/- Sq.Ft.		4.67 Acres +/-
	MSF (MID SIZED SINGLE FAMILY)	27	228,957* +/- Sq.Ft.		5.26 Acres +/-
	AL (ALLEY LOADED SINGLE FAMILY)	165	827,944* +/- Sq.Ft.		19.01 Acres +/-
	HDSF (HIGH DENSITY SINGLE FAMILY)	96	279,605* +/- Sq.Ft.		6.42 Acres +/-
	TOTAL NUMBER OF LOTS	301	1,540,090 +/- Sq.Ft.		35.36 Acres +/-
DENSITY	GROSS				3.94 Du./Ac.
	NET				8.51 Du./Ac.
RESIDENTIAL COVERAGE	BUILDINGS		582,100 +/- Sq.Ft.	13.36 Acres +/-	13.2%
	STREET R.O.W.		275,702 +/- Sq.Ft.	6.33 Acres +/-	6.3%
	PRIVATE YARDS		845,890 +/- Sq.Ft.	19.42 Acres +/-	19.3%
	PARKING & DRIVES		194,256 +/- Sq.Ft.	4.46 Acres +/-	4.4%
OPEN AREA	COMMON OPEN PARK AREA REQUIRED		205,815 +/- Sq.Ft.	4.72 Acres +/-	4.7%
	TOTAL COMMON OPEN PARK AREA PROVIDED		213,700* +/- Sq.Ft.	4.91 Acres +/-	4.9%
	OTHER HOA COMMON OPEN SPACE		1,098,958* +/- Sq.Ft.	25.23 Acres +/-	25.0%
	TOTAL OPEN AREA		1,312,658 +/- Sq.Ft.	30.13 Acres +/-	29.9%

MAXIMUM BUILDING HEIGHT***	PRINCIPAL RESIDENTIAL UNIT	35'
	ACCESSORY BUILDING OR STRUCTURE	16'

DWELLING UNIT DISTRIBUTION	CM (CUSTOM HOME)	BLOCKS 5, 11 & 12
	MSF (MID SIZED SINGLE FAMILY UNITS)	BLOCKS 1 & 11
	AL (ALLEY LOADED SINGLE FAMILY UNIT)	BLOCKS 2-4 & 6-10
	HDSF (HIGH DENSITY SINGLE FAMILY UNITS)	BLOCKS 13-17, REPLAT G BLOCKS 1-4

PARKING	HOUSING TYPE	UNITS		REQUIRED RATIO	# OF SPACES REQUIRED	# OF OFF STREET SPACES PROVIDED
	SINGLE FAMILY (CM, MSF, AL & HDSF)	301	DU	2 SPACES/1 DU	602	602

* PRIOR TO DEVELOPMENT OF FUTURE TRACTS A1, B1 & D1, PRELIMINARY PLAN AND REZONING APPROVAL IS REQUIRED TO BE OBTAINED.
** REQUIRED OFF-STREET PARKING SPACES PROVIDED BY 2-CAR GARAGES PER UNIT.
*** BUILDING HEIGHTS ARE AS MEASURED FROM THE TOP OF THE ROOF TO THE OVER-LOT GRADE ELEVATIONS AS SPECIFIED IN THE CITY OF LAFAYETTE DEVELOPMENT CODE.

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INDIAN PEAKS
FINAL PUD FILING NO. 17, AMENDMENT B
LAFAYETTE, COLORADO

0 10' 20' 40'
NORTH SCALE: 1"=20'

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DRAWN: MN
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REVISIONS:

SHEET TITLE:
GENERAL NOTES & CALCULATIONS
SHEET NO.:
2 of 5

1 OUTLOT OWNERSHIP AND MAINTENANCE EXHIBIT

NOTE: ALL OUTLOTS SHALL BE OWNED AND MAINTAINED BY THE INDIAN PEAKS SOUTH HOMEOWNER ASSOCIATION.

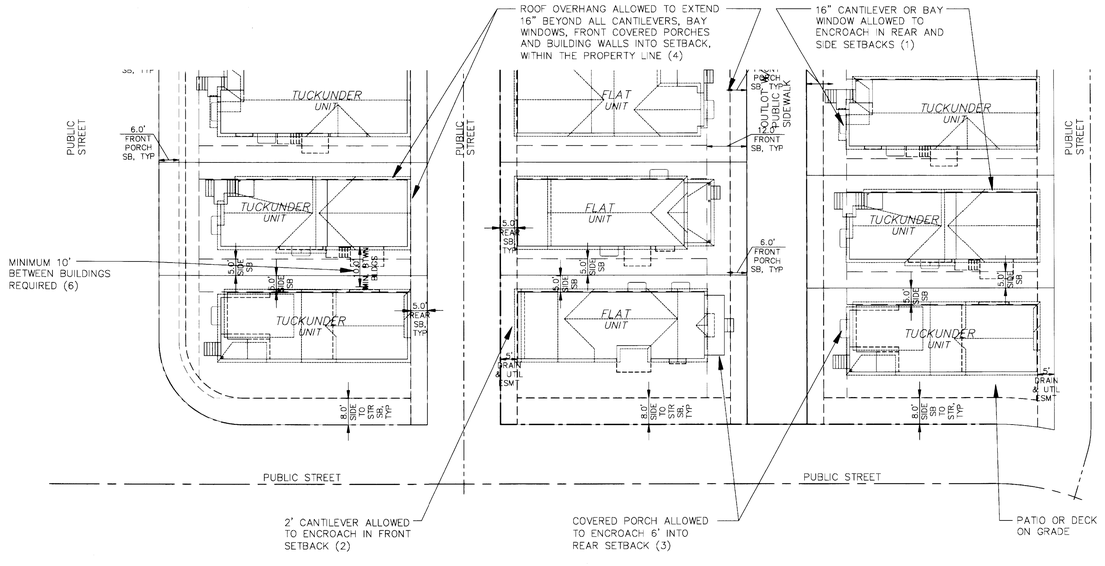
Phase	Replat	Location	Description	Parcel Size	Maintenance Elements
Phase 1		Outlot A	Open Space north of block 1	127,483	Turf, native grass, plantings, irrigation, sidewalk + tot lot
Phase 1		Outlot B	Alley in block 2	15,484	Concrete Alley
Phase 1		Outlot C	Alley in block 3	9,200	Concrete Alley
Phase 1		Outlot D	Roundabout	2,124	Concrete, native grass, plantings, & irrigation
Phase 1		Outlot E	Roser Dr median north of roundabout	5,982	Native grass, plantings & irrigation
Phase 1		Outlot G	Baseline and Roser IPS Monument	4,728	Entry monument (monument, plantings, lighting & irrigation)
Phase 1	B	Outlot A	Open Space nw of block 5	22,727	Turf, native grass, plantings, irrigation & sidewalk
Phase 2	C	Outlot A	Alley in block 7	9,200	Concrete Alley
Phase 2	C	Outlot B	Linear park between Green Lake and Roser	45,414	Turf, plantings, irrigation + amentities
Phase 2	C	Outlot C	Alley in block 9	15,138	Concrete Alley
Phase 2	C	Outlot D	Alley in block 10	9,540	Concrete Alley
Phase 2	C	Outlot E	Open space south of Block 11	131,107	Native grass, plantings, irrigation & sidewalk
Phase 2	C	Outlot F	Bungalow open space, muse, parking	30,321	Outlot F changed to Outlot D, Replat G
Phase 2	C	Outlot G	Bungalow Parking and Landscape Median	1,940	Plantings, irrigation + parking spaces
Phase 2	C	Outlot H	East Roser Park	29,409	Turf, plantings, irrigation + amentities
Phase 2	C	Outlot I	Detention Pond and Drainage Way	623,871	Water quality, wetlands, native grass
Phase 2	C	Outlot J	Roser Drive Median	699	Plantings + irrigation
Phase 2	C	Outlot K	Paschal and Hwy 42 Gateway Monument	5,174	Entry monument (monument, plantings, lighting & irrigation)
Phase 2	C	Outlot L	Green Lake Way Mailbox 1 (Lot 1, Block 6)	28	USPS 25 unit mailbox location
Phase 2	C	Outlot M	Clear Creek Land Mailbox (Lot 9, Block 10)	52	USPS 61 unit mailbox location
Phase 3	D	Outlot A	Bungalow open space, muse, parking	59,494	Native grass, plantings, irrigation + parking spaces
Phase 3	D	Outlot B	Bungalow pedestrian easement	1,610	Landscape, irrigation + sidewalk
Phase 4	E	Outlot A	Open space buffer on west side	43,651	Native grass, plantings, irrigation and sidewalk
Phase 4	E	Outlot B	Alley in Block 4	10,034	Concrete Alley
Phase 4	E	Outlot C	Alley in Block 6	10,364	Concrete Alley
Phase 5	F	Outlot A	West Linear Park + Pool	86,223	Turf, plantings, irrigation + amentities + community pool
Phase 5	F	Outlot B	Alley in Block 8	9,360	Concrete Alley
Phase 5	F	Outlot C	Alley in Block 9	5,595	Concrete Alley
Phase 5	F	Outlot D	Open space buffer on west side	105,331	Native grass, plantings, irrigation and sidewalk
Phase 5	F	Outlot E	Kiowa Creek Way Mailbox (Lot 18, Block 8)	28	USPS XX unit mailbox location
Phase 6	G	Outlot A	Landscape and Sidewalk Median	5,098	Concrete sidewalk and landscaping
Phase 6	G	Outlot B	Landscape Buffer adjacent Lot 13, Block 1	612	Concrete sidewalk and landscaping
Phase 6	G	Outlot C	Open space/park, sidewalk and parking	30,716	Native grass, plantings, irrigation, sidewalk, parking and mailbox
Phase 6	G	Outlot D	Roser Drive - Muse	1,432	Landscape, irrigation + sidewalk

Total IPS Private HOA Land Area (sqft) = 1,459,169
Total IPS Private HOA Land Area (ac) = 33.50

2 HIGH DENSITY ALLEY LOADED SINGLE FAMILY BUILDING ENVELOPE AND SETBACK NOTES

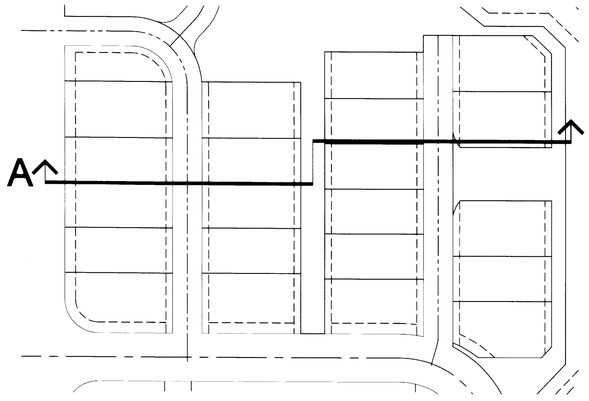
SCALE: 1"=30'

NOTE: (#) INDICATES THE CORRESPONDONDING BUILDING ENVELOPE AND SETBACK NOTE # IN TABLE 3A/SHEET 2.



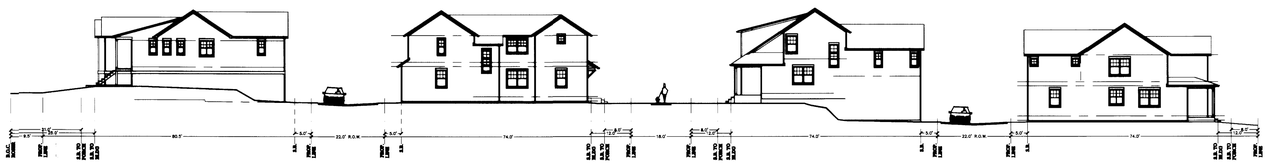
3 SECTION KEY MAP

SCALE: 1"=20'



4 SITE SECTION A

SCALE: 1"=20'



CIVIL ENGINEER:
HURST
2500 Broadway, Suite B
Boulder, CO 80304
303.449.9105
www.hurst-assoc.com

PLANNER / OWNER / DEVELOPER:
McSTAIN NEIGHBORHOODS
7100 North Broadway, Suite 5-H
Denver, Colorado 80221
303-494-9900

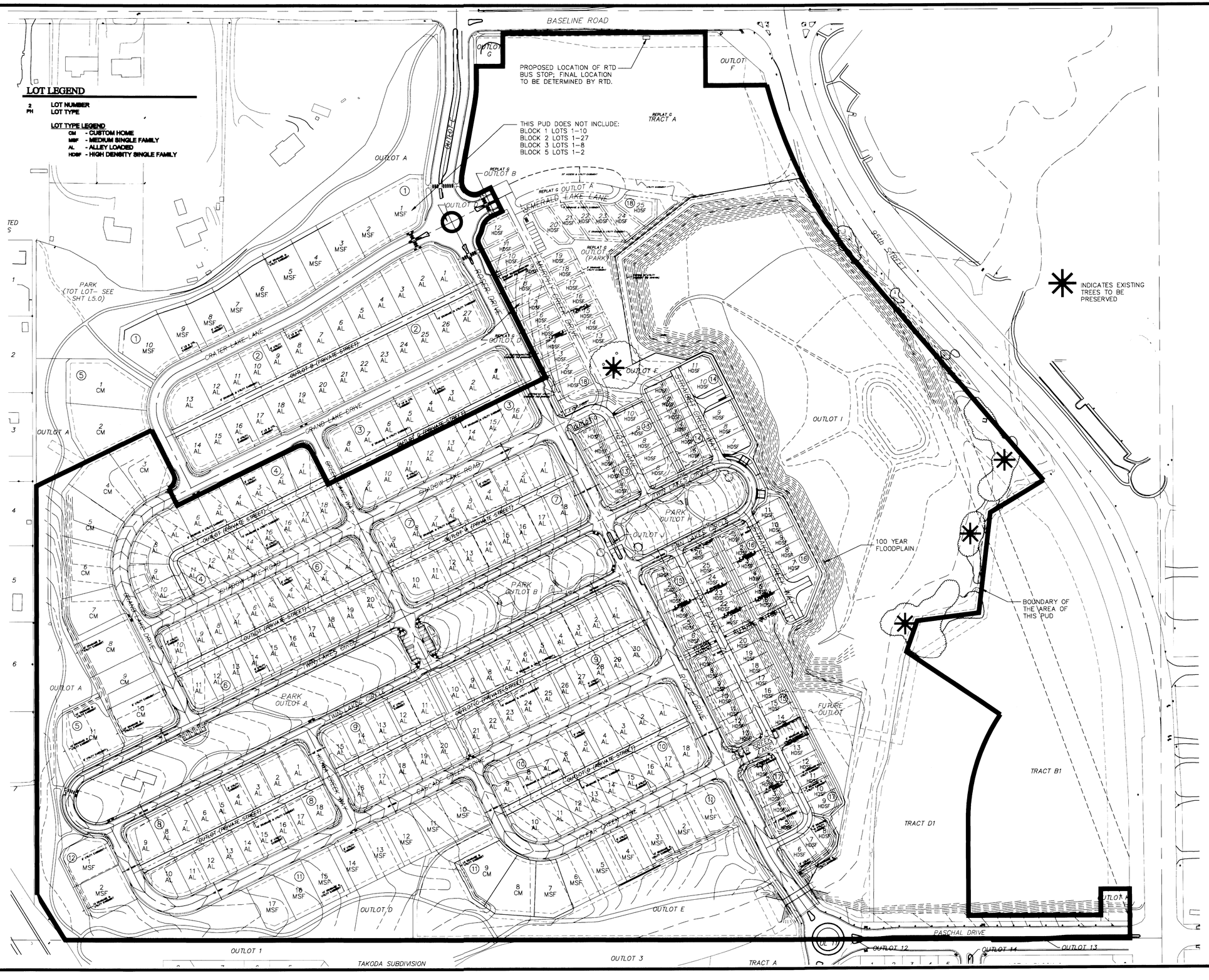
INDIAN PEAKS
FINAL PUD FILING NO. 17, AMENDMENT B
LAFAYETTE, COLORADO

NORTH 0 10' 20' 40'
SCALE: 1"=20'

JOB NO.: McStain 101
ACAD FILE: IPS PH2 PUD amts 1-2-2A July2015.dwg
DRAWN: MN
CHECKED: MN/DW
ISSUE: 09/03/2015
REVISIONS:

SHEET TITLE:
ADDITIONAL EXHIBITS

SHEET NO.:
2-A of 5



CIVIL ENGINEER:

HURST DENVER

2500 Broadway, Suite B
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303.449.9105
www.hurst-assoc.com

PLANNER / OWNER / DEVELOPER:

McSTAIN NEIGHBORHOODS

7100 North Broadway, Suite 5-N
Denver, Colorado 80221
303-494-5900

INDIAN PEAKS
FINAL
PUD FILING NO. 17,
AMENDMENT B
LAFAYETTE, COLORADO

NORTH

0 10' 20' 40'

SCALE: 1"=20'

JOB NO.: McStain 101
ACAD FILE: IPS_PH2_PUD sht 3 July2015.dwg
DRAWN: MN
CHECKED: MN/DW
ISSUE: 09/03/2015
REVISIONS:

SHEET TITLE:

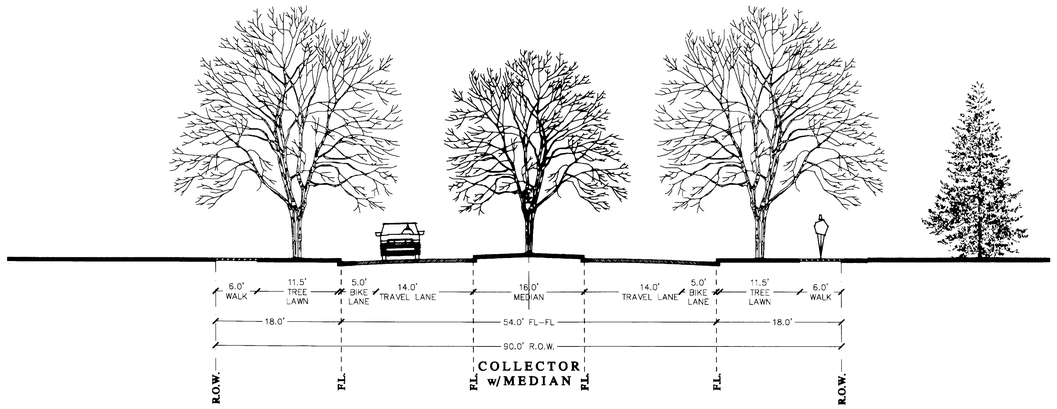
OVERALL PUD

SHEET NO.:

3 of 5

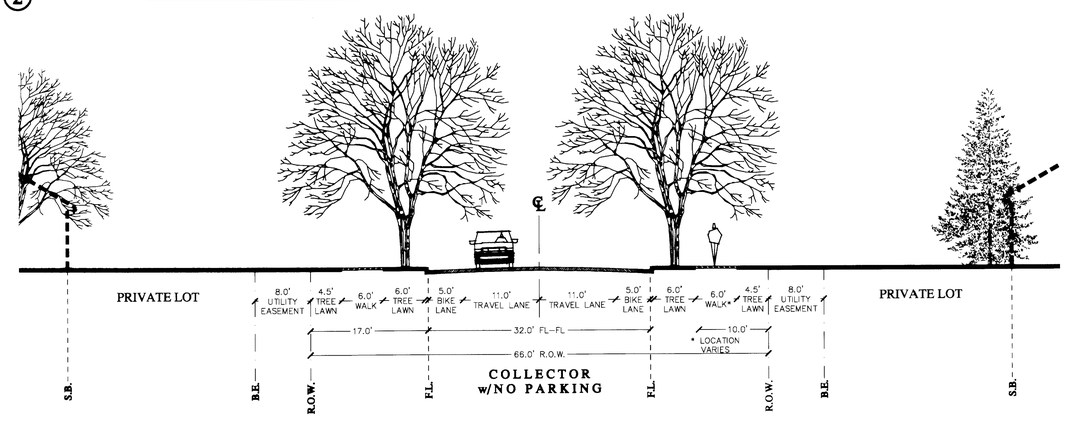
1 COLLECTOR with MEDIAN STREET SECTION

SCALE: 1"=10'



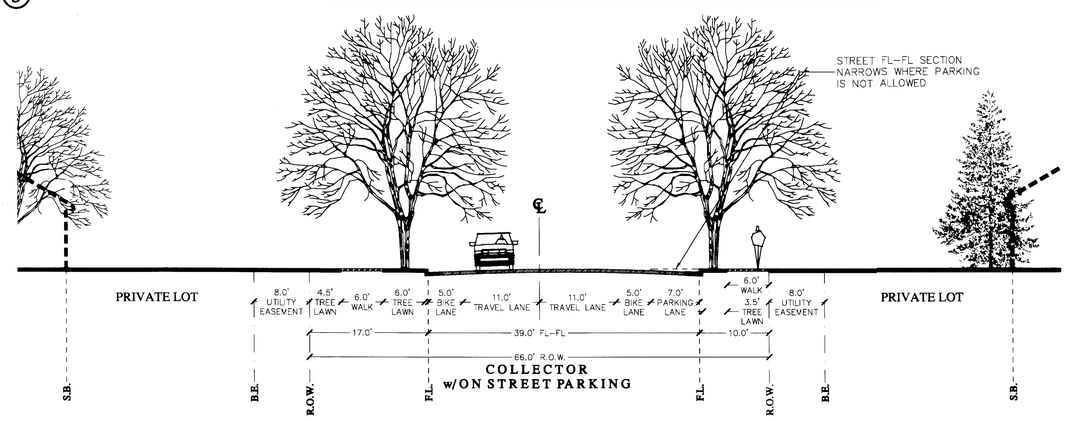
2 TYPICAL COLLECTOR with NO ON STREET PARKING

SCALE: 1"=10'



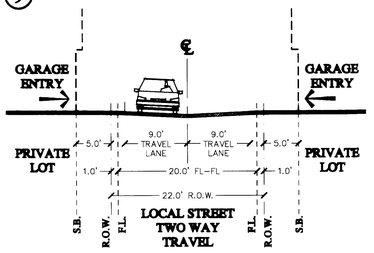
3 TYPICAL COLLECTOR with ON STREET PARKING

SCALE: 1"=10'



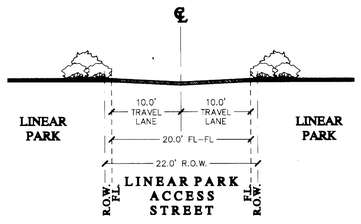
9 TYPICAL LOCAL STREETS EAST OF ROSER DRIVE- TWO WAY TRAFFIC

SCALE: 1"=10'



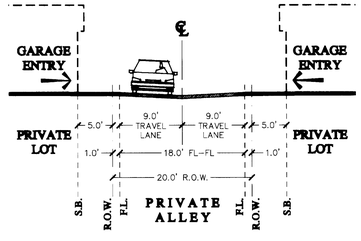
6 LINEAR PARK ACCESS STREET

SCALE: 1"=10'



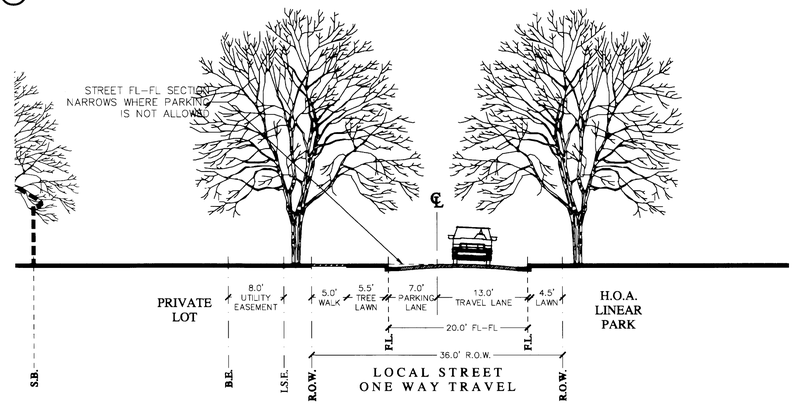
8 TYPICAL PRIVATE ALLEY

SCALE: 1"=10'



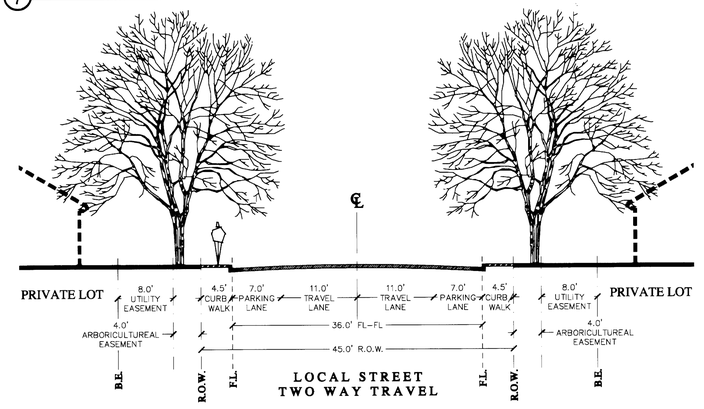
5 TYPICAL LOCAL STREETS WEST OF ROSER DRIVE - ONE WAY TRAFFIC

SCALE: 1"=10'



7 TYPICAL LOCAL STREETS WEST OF ROSER DRIVE - TWO WAY TRAFFIC

SCALE: 1"=10'



CIVIL ENGINEER:
HURST
2500 Broadw
Boulder,
30
www.hurst-

PLANNER / OWNER / DEVELOPER:
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7100 North Broadway, Suite 5-H
Denver, Colorado 80221
303-494-9900

INDIAN PEAKS
FINAL
PUD FILING NO. 17,
AMENDMENT B

0 10' 20'

SCALE: 1"=20'

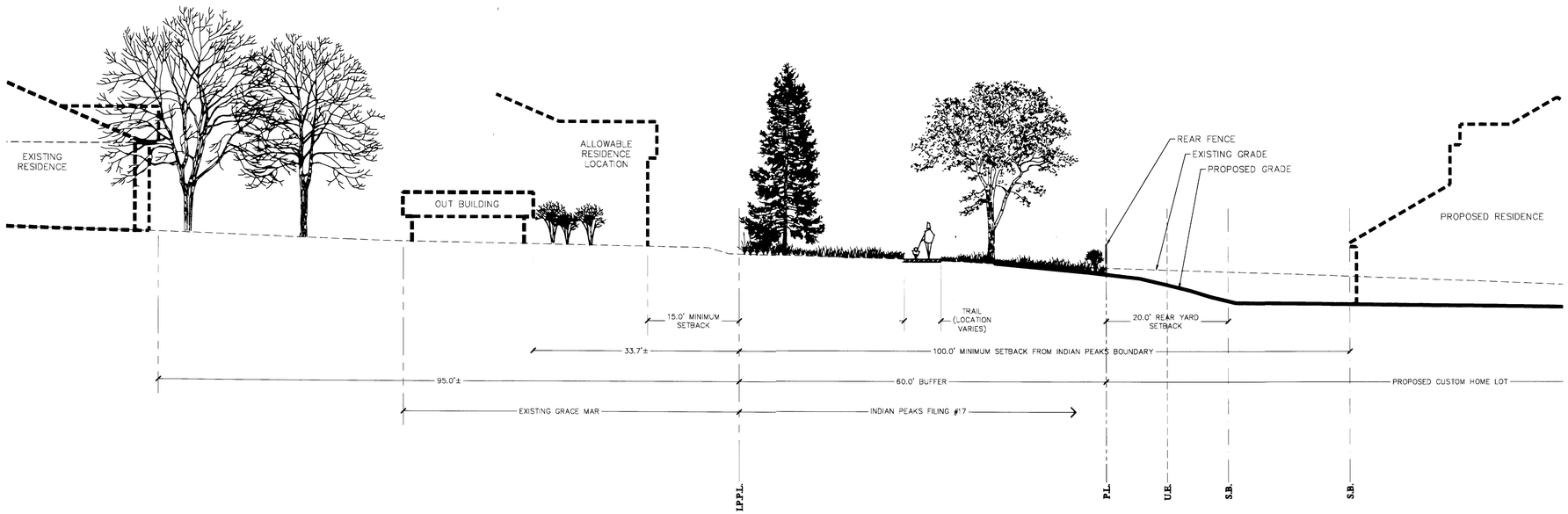
JOB NO.: McStain 101
ACAD FILE: IPS PH2 PUD shts 4-5 July2
DRAWN: MN
CHECKED: MN/DW
ISSUE: 09/03/2015
REVISIONS:

SHEET TITLE:
PUD STREET SECTIONS

SHEET NO.:
4 of 5

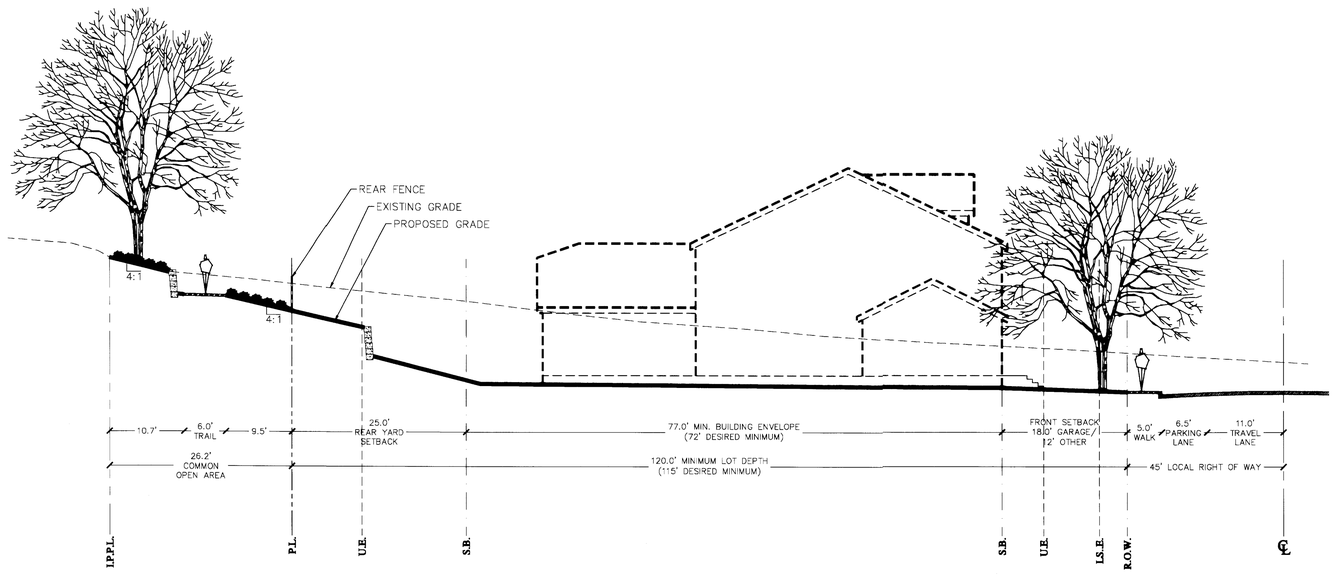
1 TRAIL SECTION A

SCALE: 1"=10'



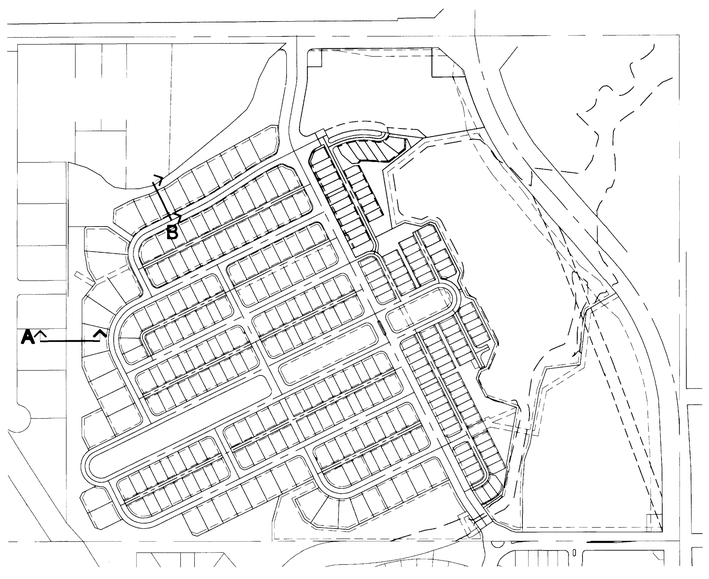
2 TRAIL SECTION 'B'

SCALE: 1"=10'



3 KEY MAP

SCALE: 1"=300'



CIVIL ENGINEER:

HURST DENISEN

2500 Broadway, S
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303.44
www.hurst-asso

PLANNER / OWNER / DEVELOPER:

McSTAIN NEIGHBORHOODS

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Denver, Colorado 80221
303-494-3900

INDIAN PEAKS

FINAL PUD FILING NO. 17, AMENDMENT B

LAFAYETTE, COLORADO

0 10' 20' 40'

SCALE: 1"=20'

JOB NO.: McStain 101
ACAD FILE: IPS PH2 PUD shts 4-5 July2015
DRAWN: MN
CHECKED: MN/DW
ISSUE: 09/03/2015
REVISIONS:

SHEET TITLE:

PUD TRAIL SECTIONS

SHEET NO.:

5 of 5

03246466
08/23/2012 03:56 PM RF: $71.00 Page: 1 of 7
Boulder County Clerk, CO DF: $0.00

INDIAN PEAKS FILING NO. 17 REPLAT C

A REPLAT OF INDIAN PEAKS FILING NO. 17 TRACTS A, B & D & OUTLOT H AND INDIAN PEAKS FILING NO. 17 REPLAT B TRACT C1

LOCATED IN THE NORTHEAST QUARTER OF SECTION 5, TOWNSHIP 1 SOUTH, RANGE 69 WEST OF THE 6TH P.M., CITY OF LAFAYETTE, COUNTY OF BOULDER, STATE OF COLORADO

86 LOTS, 13 OUTLOTS & 13 TRACTS – 84.21 ACRES

SHEET 1 OF 7

CERTIFICATE OF OWNERSHIP

KNOW ALL MEN BY THESE PRESENTS THAT THE UNDERSIGNED, BEING THE SOLE OWNER OF ALL THAT REAL PROPERTY SITUATED IN BOULDER COUNTY, COLORADO, AND LYING WITHIN THE EXTERIOR BOUNDARY OF "INDIAN PEAKS FILING NO. 17 REPLAT C" A SUBDIVISION OF A PORTION OF THE NORTHEAST QUARTER OF SECTION 5, T1S, R69W OF THE 6TH P.M. CITY OF LAFAYETTE, COUNTY OF BOULDER, STATE OF COLORADO DESCRIBED AS FOLLOWS:

TRACT A, TRACT B, TRACT D AND OUTLOT H OF "INDIAN PEAKS FILING NO. 17" AS RECORDED 03/21/2008 AT RECEPTION NO. 2917883 ALONG WITH TRACT C1 OF "INDIAN PEAKS FILING NO. 17 REPLAT B" AS RECORDED 09/19/2011 AT RECEPTION NO. 3171805, EXCEPTING THEREFROM THOSE PORTIONS OF TRACT B AND TRACT D OF "INDIAN PEAKS FILING NO. 17 CONVEYED TO THE CITY OF LAFAYETTE BY DOCUMENT RECORDED 04/18/2011 AT RECEPTION NO. 3144090, CONTAINING 84.21 ACRES, MORE OR LESS;

HAVE BY THESE PRESENTS LAID OUT, PLATTED AND SUBDIVIDED THE SAME INTO TRACTS, LOTS AND OUTLOTS AS SHOWN HEREON AND DESIGNATE THE SAME AS "INDIAN PEAKS FILING NO. 17 REPLAT C" IN THE CITY OF LAFAYETTE, COUNTY OF BOULDER, STATE OF COLORADO AND DO HEREBY DEDICATE AND CONVEY TO THE CITY OF LAFAYETTE, COLORADO, FOR PUBLIC USE THE STREETS AND RIGHTS-OF-WAY (R.O.W.), THE PEDESTRIAN ACCESS EASEMENTS SHOWN HEREON FOR PEDESTRIAN ACCESS PURPOSES ONLY UNLESS OTHERWISE NOTED, THE ACCESS EASEMENTS SHOWN HEREON FOR ACCESS PURPOSES ONLY UNLESS OTHERWISE NOTED, THE EMERGENCY ACCESS EASEMENTS FOR EMERGENCY ACCESS PURPOSES ONLY UNLESS OTHERWISE NOTED, THE UTILITY EASEMENTS SHOWN HEREON FOR UTILITY PURPOSES ONLY UNLESS OTHERWISE NOTED AND THE DRAINAGE EASEMENTS SHOWN HEREON FOR DRAINAGE PURPOSES ONLY UNLESS OTHERWISE NOTED.

EXECUTED THIS 28TH DAY OF JULY, 2012 A.D.,

BRADDOCK ENTERPRISES, L.P.
A PENNSYLVANIA LIMITED PARTNERSHIP

BY: BRADDOCK INVESTMENTS, L.P.
A PENNSYLVANIA LIMITED PARTNERSHIP
ITS GENERAL PARTNER

BY: PANCO, LLC
A PENNSYLVANIA LIMITED LIABILITY COMPANY
ITS GENERAL PARTNER

BY: _____
WILLIAM P. PISZEK
CO-MANAGER

BY: _____
HELEN P. NELSON
CO-MANAGER

ACKNOWLEDGMENT

COMMONWEALTH OF PENNSYLVANIA)
) SS
COUNTY OF MONTGOMERY)

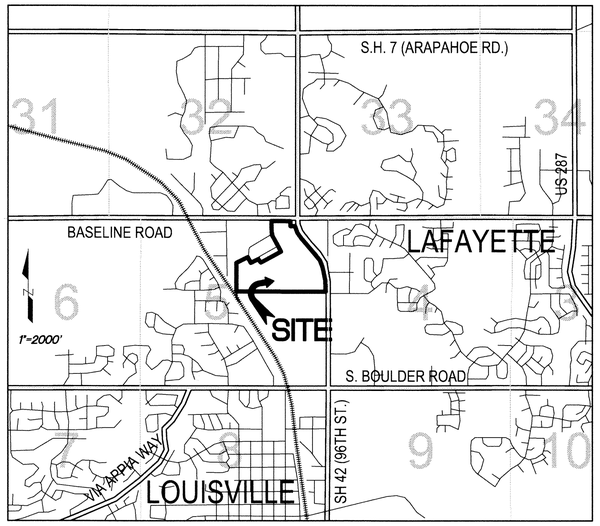
THE FOREGOING INSTRUMENT WAS ACKNOWLEDGED BEFORE ME THIS 28TH DAY OF JULY 2012 BY WILLIAM P. PISZEK AND HELEN P. NELSON, AS CO-MANAGERS OF PANCO, LLC, A PENNSYLVANIA LIMITED LIABILITY COMPANY, GENERAL PARTNER OF BRADDOCK INVESTMENTS, L.P., GENERAL PARTNER OF BRADDOCK ENTERPRISES, L.P., A PENNSYLVANIA LIMITED PARTNERSHIP.

WITNESS MY HAND AND OFFICIAL SEAL.

MY COMMISSION EXPIRES: _____

_____
NOTARY PUBLIC

COMMONWEALTH OF PENNSYLVANIA
Notarial Seal
Rebecca Lynn Montgomery County
My Commission Expires Feb. 23, 2015
MEMBER, PENNSYLVANIA ASSOCIATION OF NOTARIES



VICINITY MAP

NOTES:

1) NOTICE: ACCORDING TO COLORADO LAW, YOU MUST COMMENCE ANY LEGAL ACTION BASED UPON ANY DEFECT IN THIS SURVEY WITHIN THREE YEARS AFTER YOU FIRST DISCOVER SUCH DEFECT. IN NO EVENT MAY ANY ACTION BASED UPON ANY DEFECT IN THIS SURVEY BE COMMENCED MORE THAN TEN YEARS FROM THE DATE OF THE CERTIFICATION SHOWN HEREON.

2) BASIS OF BEARINGS: SOUTHERLY LINE OF TRACT C, BEING N89°55'30"W BETWEEN CORNERS AS MONUMENTED BY REBARS WITH 1" PLASTIC CAPS, STAMPED PLS 37990, AS SHOWN ON THE "INDIAN PEAKS FILING NO. 17" PLAT.

3) THE PURPOSE OF THIS REPLAT IS TO CREATE 86 LOTS, 13 OUTLOTS AND 13 TRACTS OUT OF FOUR EXISTING TRACTS AND ONE OUTLOT.

4) SEE SHEET 2 FOR CORNER MONUMENTATION INFORMATION.

5) PER INDIAN PEAKS FILING NO. 17 FINAL PLAT, ALL LOTS, OUTLOTS, AND TRACTS OF INDIAN PEAKS FILING NO. 17 SHOWN ON THIS PLAT ARE BURDENED WITH A PERPETUAL, NON EXCLUSIVE EASEMENT PERMITTING TRAIN NOISE AND VIBRATION TO ENTER ON THE SAME FROM THE ADJACENT BURLINGTON NORTHERN SANTA FE RAIL ROAD. UNDER NO CIRCUMSTANCES SHALL THE CITY OF LAFAYETTE, ITS OFFICERS, EMPLOYEES OR AGENTS AND ITS SUCCESSORS AND ASSIGNS, MC3 HOLDINGS, LLC, INDIAN PEAKS SOUTH, LLC, AND BRADDOCK ENTERPRISES L.P. BE HELD LIABLE FOR ANY DAMAGE OR INJURY RESULTING FROM NOISE OR VIBRATION FROM THE EXISTING BNSF OR FUTURE FASTRACKS TRAINS ON SAID LOTS, AND OUTLOTS AND TRACTS OF THIS SUBDIVISION.

6) FLOOD PLAIN INFORMATION FROM FLOOD INSURANCE RATE MAP NO. 08013C0557G WITH AN REVISION DATE OF 10/04/2002.

7) ALL OUTLOTS SHALL BE OWNED AND MAINTAINED BY THE INDIAN PEAKS SOUTH HOMEOWNERS ASSOCIATION.

8) THE DECLARATION OF RESTRICTIVE COVENANTS FOR THIS PROPERTY SHALL INCLUDE ALTERNATIVE DISPUTE RESOLUTION PROVISIONS, WHICH PROVISIONS SHALL NOT BE MODIFIED OR DELETED WITHOUT THE CONSENT OF THE CITY.

9) THIS PLAT IS SUBJECT TO THE INDIAN PEAKS FILING NO. 17 REPLAT C DEVELOPMENT AGREEMENT RECORDED 8-23-12 AT RECEPTION NO. #3241468

10) THERE IS AN EXISTING CONDITIONAL LETTER OF MAP REVISION AFFECTING PROPERTY. AFTER GRADING IS COMPLETED AND APPROVED, AND THE FINAL LETTER OF MAP REVISION IS ISSUED FROM FEMA, TRACTS 1-4 & 8-11 WILL BE REPLATTED PER A MINOR SUBDIVISION APPLICATION INTO LOTS

PLANNING COMMISSION CERTIFICATE

THE PRELIMINARY PLAT FOR "INDIAN PEAKS FILING NO. 17 REPLAT C" WAS APPROVED BY THE CITY OF LAFAYETTE PLANNING COMMISSION ON APRIL 24, 2012, A.D.

_____
CHAIRPERSON

_____
ATTEST: SECRETARY

CITY COUNCIL CERTIFICATE

THIS FINAL PLAT IS APPROVED BY THE CITY COUNCIL OF THE CITY OF LAFAYETTE, BOULDER COUNTY, COLORADO, THIS 21ST DAY OF AUGUST, A.D., 2012 FOR FILING WITH THE CLERK AND RECORDER OF BOULDER COUNTY AND FOR CONVEYANCE TO THE CITY OF THE PUBLIC DEDICATIONS SHOWN HEREON; SUBJECT TO THE PROVISION THAT APPROVAL IN NO WAY OBLIGATES THE CITY OF LAFAYETTE, FOR THE FINANCING OR CONSTRUCTING OF IMPROVEMENTS ON LAND, STREETS OR EASEMENTS TO THE PUBLIC EXCEPT AS SPECIFICALLY AGREED TO BY THE CITY COUNCIL.

_____
MAYOR

WITNESS MY HAND AND OFFICIAL SEAL OF THE CITY OF LAFAYETTE

_____
ATTEST: CITY CLERK

TITLE COMPANY'S CERTIFICATE:

I, SCOTT BARNETT, A TITLE OFFICER, REPRESENTING LAND TITLE GUARANTEE COMPANY, CERTIFY THAT I HAVE EXAMINED TITLE TO THE DESCRIBED LAND DEDICATION TO THE CITY OF LAFAYETTE, COLORADO, AND THAT THE PARTIES EXECUTING THE DEDICATION ARE THE OWNERS THEREOF IN FEE SIMPLE, AND THE DEDICATED LAND IS FREE AND CLEAR OF ALL LIENS AND ENCUMBRANCES, EXCEPT AS SHOWN IN TITLE COMMITMENT NO. ABS70530884 AND IN TITLE POLICY LITES7027414.2.

_____
NAME

TITLE OFFICER / UNDERWRITING AGENT
TITLE

EXECUTED THIS 27TH DAY OF JULY, A.D., 2012

SURVEYOR'S CERTIFICATE

FOR AND ON BEHALF OF HURST & ASSOCIATES, INC., I, BO BAIZE, DO HEREBY CERTIFY THAT I AM A DULY REGISTERED PROFESSIONAL LAND SURVEYOR LICENSED UNDER THE LAWS OF THE STATE OF COLORADO, THAT THIS PLAT IS A TRUE, CORRECT AND COMPLETE PLAT OF "INDIAN PEAKS FILING NO. 17 REPLAT C" AS LAID OUT, PLATTED, DEDICATED AND SHOWN HEREON, THAT SUCH PLAT WAS MADE FROM AN ACCURATE SURVEY OF SAID PROPERTY BY ME AND UNDER MY DIRECT RESPONSIBILITY, SUPERVISION AND CHECKING AND CORRECTLY SHOWS THE LOCATION AND DIMENSIONS OF THE TRACTS STAKED UPON THE GROUND IN COMPLIANCE WITH ARTICLES 50-53 OF TILE 38, COLORADO REVISED STATUES GOVERNING THE SUBDIVISION OF LAND.

IN WITNESS WHEREOF, I HAVE SET MY HAND AND SEAL THIS 27TH DAY OF JULY, 2012 A.D.

_____
BO BAIZE
COLORADO LICENSED PROFESSIONAL
LAND SURVEYOR NO. 37990
2550 BROADWAY, SUITE B
BOULDER, CO 80304
303-449-9105

COLORADO LICENSED BO BAIZE 37990 PROFESSIONAL LAND SURVEYOR

CITY ADMINISTRATOR'S CERTIFICATE

I, GARY KLAPHAKE, CITY ADMINISTRATOR OF THE CITY OF LAFAYETTE, COLORADO, HEREBY CERTIFY THAT I HAVE EXAMINED THE FINAL PLAT AND IT APPEARS TO BE IN COMPLIANCE WITH ALL APPLICABLE ORDINANCES OF THE CITY AND THAT A DEVELOPMENT AGREEMENT HAS BEEN EXECUTED BY THE DEVELOPER AND ACCEPTED BY THE CITY.

_____
CITY ADMINISTRATOR

_____
ATTEST: CITY CLERK

CITY OF LAFAYETTE HOME RULE APRIL 1, 1908 BOULDER COUNTY, COLO.

REVIEW CERTIFICATES

_____
CITY OF LAFAYETTE ENGINEER

_____
CENTURY LINK, INC. F.K.A. QWEST COMMUNICATIONS, INC.

BY SIGNING BELOW, PUBLIC SERVICE COMPANY OF COLORADO (PSCO) MAKES NO REPRESENTATION OR WARRANTY AS TO THE ACCURACY OF THE PLAT GENERALLY, AND IS NOT RESPONSIBLE FOR ANY ERRORS OR OMISSIONS

_____
PUBLIC SERVICE COMPANY OF COLORADO

COUNTY CLERK & RECORDER'S CERTIFICATE

STATE OF COLORADO)
) SS
COUNTY OF BOULDER)

I HEREBY CERTIFY THAT THIS PLAT WAS FILED IN MY OFFICE AT 3:51P O'CLOCK, P. M. ON THE 23RD DAY OF AUGUST, 2012, AND IS DULY RECORDED AT RECEPTION NO. 3241468 AND PLAN FILE P- - F- - # _____.
FEES PAID: $ 71.00

_____
HILLARY HALL
COUNTY CLERK & RECORDER

_____
BY: DEPUTY

INDIAN PEAKS FILING NO. 17
REPLAT C
FINAL PLAT
LAFAYETTE, COLORADO

HURST
CIVIL ENGINEERING
PLANNING
SURVEYING
1350 Pine Street, Suite 1
Boulder, CO 80302
303.449.9105
www.hurst-assoc.com

SCALE HOR. N/A VERT. N/A
DESIGN/APPR.
DRAWN BY BO
DATE 07/20/12
SHEET 1 OF 7
FILE G:\1009124\SURVEY\REPLAT C\P17 REPLAT C SH1-2

ORG: 12/08/11
REV: 02/24/12
REV: 04/24/12
REV: 05/18/12
REV: 07/13/12
REV: 07/20/12

INDIAN PEAKS FILING NO. 17 REPLAT C

SHEET 2 OF 7

NORTH QUARTER CORNER, SECTION 5, FOUND 2.5" ALUMINUM CAP W/ 3/4" REBAR THROUGH CENTER, ILLEGIBLE MARKINGS IN RANGE BOX W/ NO LID. LOCATION MATCHES MONUMENT RECORD FILED BY LS 15315 ON 04/26/2005

BASELINE ROAD

N89°37'58"E 329.95'

N89°24'04"E 140.59'

N89°38'00"E 5.87'

S00°00'00"E 126.98'

N89°21'39"E 143.60'

N00°03'31"E 960.20'

N63°42'34"E 301.18'

N63°42'34"E 314.22'

N63°42'34"E 571.00'

N28°17'26"W 350.06'

N31°39'43"W 815.86'

N89°55'30"W 1725.82'

N89°55'30"W 632.57'

S39°40'30"E 308.03'

S42°12'00"E 133.41'

S39°43'30"E 291.66'

S02°46'30"E 291.66'

S00°18'00"E 283.39'

TRACT A1
383,664 s.f.
8.81 Ac.

TRACT B1
336,636 s.f.
7.73 Ac.

TRACT C1
972,220 s.f.
22.32 Ac.
(NO EASEMENTS ARE CREATED IN TRACT C1)

TRACT C2
224,605 s.f.
5.16 Ac.

TRACT D1
126,947 s.f.
2.91 Ac.

OUTLOT E
131,107 s.f.
3.01 Ac.

OUTLOT I
623,871 s.f.
14.32 Ac.

OUTLOT K
5,174 s.f.

L=422.61'
R=1221.00'
Δ=19°49'52"
CH=S24°50'10"E
420.50'

L=500.70'
R=1071.00'
Δ=26°47'10"
CH=S21°15'00"E
496.15'

CURRENT 100-YEAR FLOOD PLAIN BOUNDARY

PROPOSED 100-YEAR FLOOD PLAIN BOUNDARY

UNPLATTED MAJOR

UNPLATTED KAMAS

UNPLATTED SLEEPER

UNPLATTED BASCOM

IP17 REPLAT C

CRATER LAKE LANE

ROSER DRIVE

GRAND LAKE DRIVE

SHADOW LAKE ROAD

TWIN LAKES CIRCLE

GREEN LAKE WAY

HOYT LANE

STRAIGHT CREEK WAY

CASCADE CREEK DRIVE

CLEAR CREEK LANE

95TH STREET / SH 42

PASCHAL DRIVE (80' ROW)

OUTLOT A (PRIVATE STREET)

OUTLOT B (PRIVATE STREET)

OUTLOT C (PRIVATE STREET)

OUTLOT D (PRIVATE STREET)

BLOCK 1

BLOCK 2

BLOCK 3

BLOCK 7

BLOCK 9

BLOCK 10

BLOCK 11

BLOCK 13

TR. 1 TR. 2 TR. 3 TR. 4 TR. 5 TR. 6 TR. 7 TR. 8 TR. 9 TR. 10 TR. 11

OUTLOT A OUTLOT B OUTLOT F OUTLOT G OUTLOT H OUTLOT I OUTLOT J OUTLOT L OUTLOT M

SHEET 3 SHEET 4 SHEET 5 SHEET 6 SHEET 7

NORTHEAST CORNER, SECTION 5, FOUND: 2.5" ALUMINUM CAP IN RANGE BOX, MARKED AS SHOWN

T1N R69W
S33
S5 S4
T1S R69W
C C
2005

SECTION LINE (BASIS OF BEARINGS): N00°03'30"E 2197.51'

CENTER QUARTER CORNER, SECTION 5, NOTHING FOUND OR SET, FALLS IN RAILROAD BALLAST

WEST QUARTER CORNER, SECTION 5, FOUND: STONE W/ CHISELED CROSS

SOUTH QUARTER CORNER, SECTION 5, FOUND: 3" ALUMINUM CAP IN RANGE BOX, MARKED AS SHOWN

T1S R69W
1/4
S5
S8
2002
PLS 14070

EAST QUARTER CORNER, SECTION 5, FOUND: 2.5" ALUMINUM CAP IN RANGE BOX W/ ILLEGIBLE MARKINGS, LOCATION MATCHING MONUMENT RECORD BY LS 14070 FILED 01/24/2000

LINE TABLE

LINE	BEARING	LENGTH
L2	N60°35'00"W	24.80'
L3	N69°01'02"W	24.89'
L4	S55°09'14"W	66.00'
L5	S34°50'46"E	5.42'
L6	S01°43'43"E	21.97'
L7	S26°17'26"E	45.00'
L8	S26°17'26"E	87.00'
L9	N63°42'34"E	29.90'
L10	N26°17'26"W	62.00'
L11	S63°42'34"W	29.66'
L12	N00°23'07"W	39.73'
L13	S90°00'00"E	62.15'
L14	N00°00'10"W	78.13'

CURVE TABLE

CURVE	LENGTH	RADIUS	DELTA	CHORD	BEARING
C1	20.48'	40.00'	29°20'29"	20.26'	S75°15'15"E
C2	16.56'	112.50'	8°26'02"	16.54'	N64°48'01"W
C3	23.86'	40.00'	34°10'16"	23.50'	S51°55'54"E
C5	23.12'	40.00'	33°07'03"	22.80'	N18°17'15"W
C6	3.31'	122.50'	1°32'57"	3.31'	S25°30'57"E
C7	39.27'	25.00'	90°00'00"	35.36'	N18°42'34"E
C8	39.27'	25.00'	90°00'00"	35.36'	N71°17'26"W
C9	19.29'	20.00'	55°15'26"	18.55'	S01°20'17"W
C10	21.75'	73.00'	17°04'26"	21.67'	N20°25'48"E
C11	33.46'	37.00'	51°48'59"	32.33'	S37°48'05"W
C12	18.43'	25.00'	42°14'43"	18.02'	N84°49'56"E
C13	42.20'	32.00'	75°46'27"	39.30'	S36°09'29"E
C14	23.09'	155.00'	8°32'03"	23.07'	S05°59'46"W
C15	45.53'	245.00'	10°38'54"	45.47'	N04°56'21"E
C16	1.84'	109.00'	0°57'53"	1.84'	S02°12'40"E

0 50 100 200
1 inch = 100 ft.

INDIAN PEAKS FILING NO. 17 REPLAT C FINAL PLAT

LAFAYETTE, COLORADO

HURST
CIVIL ENGINEERING
PLANNING
SURVEYING
1350 Pine Street, Suite 1
Boulder, CO 80302
303.449.9105
www.hurst-assoc.com

SCALE HOR. 1"=100' VERT. N/A
DESIGN/APPR.
DRAWN BY BO
DATE 07/20/12
SHEET 2 OF 7
FILE G:\1009124\SURVEY\REPLAT C\IP17 REPLAT C SH1-2

INDIAN PEAKS FILING NO. 17
REPLAT C
SHEET 3 OF 7

BASELINE ROAD (ROW VARIES)
N89°37'58"E 329.95'
N89°24'04"E 140.59'
N89°38'00"E 5.87'
EXISTING PUBLIC SERVICE EASEMENT (R# 1361553)
EXISTING PUBLIC ACCESS EASEMENT (IP17 FINAL PLAT)
OUTLOT G
42'
N00°00'00"W 78.13'
N90°00'00"E 62.15'
C6 N00°21'00"W 38.13'
C7
36'
N10°15'48"E 185.10'
OUTLOT E
C5
C4 S63°42'34"W 29.66'
N63°42'34"E 29.90'
N26°17'26"W 62.05'
C3
C2
C1
OUTLOT D
S00°00'00"E 126.98'
OUTLOT F
N89°21'39"E 143.60'
51.53'
50'
EXISTING ELECTRIC EASEMENT (R# 754342)
HIGH PRESSURE GASLINE EASEMENT
L=141.08' R=1171.00'
EXISTING PUBLIC ACCESS EASEMENT (IP17 FINAL PLAT) (HATCHED)
C18
L=422.61'
R=1221.00'
Δ=19°49'52"
CH=S24°50'10"E 420.50'
TRACT A1
383,664 s.f.
8.81 Ac.
S39°45'25"E 97.42'
EXISTING 30' EMERGENCY ACCESS EASEMENT (IP17 FINAL PLAT)
77.81'
S80°05'13"W 267.51'
20'
UTILITY EASEMENT
TRACT A2 R=1148.00' L=388.58'
S39°55'54"E 326.19'
C19
S39°55'03"E 71.59'
95TH STREET / SH 42
150'
S39°40'30"E 308.03'
S51°48'33"W 224.94'
PROPOSED 100-YEAR FLOOD PLAIN BOUNDARY
CURRENT 100-YEAR FLOOD PLAIN BOUNDARY
20' UTILITY EASEMENT
S09°57'24"E 257.26'
OUTLOT I
623,871 s.f.
14.32 Ac.
HIGH PRESSURE GASLINE, UTILITY AND PEDESTRIAN ACCESS EASEMENT
S39°45'25"E 142.25'
75'
S39°45'25"E 104.98'
UTILITY EASEMENT
EXISTING 50' PIPELINE RIGHT OF WAY (R# 3232175)
S39°55'03"E 247.62'
EXISTING 10'X15' TELECOMMUNICATION EASEMENT (R# 2952040)
EXISTING 4' TELECOMMUNICATION EASEMENT (R# 2952039)
66'
N26°17'26"W 350.06'
ROSER DRIVE
26
27
1
2
3
BLOCK 3
10' UTILITY EASEMENT
S26°17'26"E 61.20'
196.52'
N63°42'34"E 257.89'
S72°26'37"E 23.08'
S76°45'51"E 72.75'
N63°42'34"E 44.35'
61.37'
TRACT 11
TRACT 10
TRACT 1
TRACT 2
STRAIGHT CREEK WAY
OUTLOT F (BLANKET UTILITY EASEMENT)
OUTLOT F
S26°17'26"E 237.99'
10' UTILITY EASEMENT

CURVE TABLE					
CURVE	LENGTH	RADIUS	DELTA	CHORD	BEARING
C1	19.29'	20.00'	55°15'26"	18.55'	S01°20'17"W
C2	21.75'	73.00'	17°04'26"	21.67'	N20°25'48"E
C3	33.46'	37.00'	51°48'59"	32.33'	S37°48'05"W
C4	18.43'	25.00'	42°14'43"	18.02'	N84°49'56"E
C5	42.32'	32.00'	75°46'27"	39.30'	S36°09'29"E
C6	23.09'	155.00'	8°32'03"	23.07'	S05°59'46"W
C7	45.53'	245.00'	10°38'54"	45.47'	N04°56'21"E
C18	236.05'	1221.00'	11°04'36"	235.68'	S20°27'32"E
C19	186.56'	1221.00'	8°45'16"	186.38'	S30°22'28"E

0 25 50 100
1 inch = 50 ft.

MATCH TO SHEET 4

MATCH TO SHEET 5

INDIAN PEAKS FILING NO. 17
REPLAT C
FINAL PLAT
LAFAYETTE, COLORADO

HURST
CIVIL ENGINEERING
PLANNING
SURVEYING
1350 Pine Street, Suite 1
Boulder, CO 80302
303.449.9105
www.hurst-assoc.com

SCALE HOR. 1"=50' VERT. N/A
DESIGN/APPR.
DRAWN BY BO
DATE 07/20/12
SHEET 3 OF 7
FILE G:\1009124\SURVEY\REPLAT C\IP17 REPLAT C SH 3

Boulder County, CO 03246466 4 of 7

INDIAN PEAKS FILING NO. 17
REPLAT C
SHEET 4 OF 7

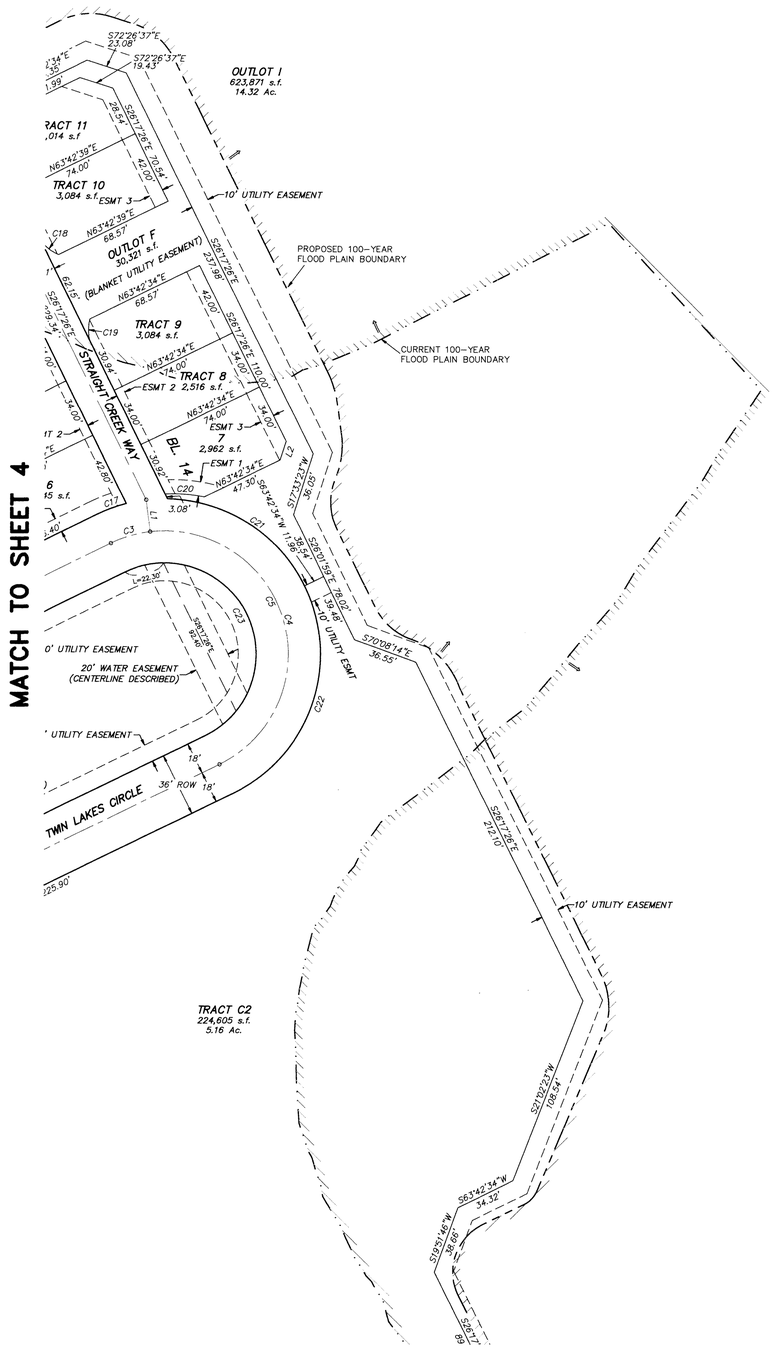
MATCH TO SHEET 3
MATCH TO SHEET 5
MATCH TO SHEET 6
GRAND LAKE DRIVE
SHADOW LAKE ROAD
HOYT LANE
ROSER DRIVE
STRAIGHT CREEK WAY
GREEN LAKE WAY
TWIN LAKES CIRCLE
OUTLOT C (PRIVATE STREET)
OUTLOT A (PRIVATE OUTLOT ALLEY)
OUTLOT B 45,414 s.f. 1.04 Ac.
OUTLOT F 30,321 s.f. (BLANKET UTILITY EASEMENT)
OUTLOT G 1,940 s.f.
OUTLOT H 29,409 s.f.
OUTLOT I 623,871 s.f. 14.32 Ac.
OUTLOT J 699 s.f.
OUTLOT L 28 s.f.
TRACT A1 383,664 s.f. 8.81 Ac.
TRACT C1 972,220 s.f. 22.32 Ac.
TRACT C2 224,605 s.f. 5.16 Ac.
BLOCK 3
BLOCK 7
BLOCK 9
BLOCK 13
BLOCK 14
INDIAN PEAKS FILING NO. 17
EXISTING 4' TELECOMMUNICATION EASEMENT (R# 2952039)
EXISTING 30' EMERGENCY ACCESS EASEMENT (IP17 FINAL PLAT)
CURRENT 100-YEAR FLOOD PLAIN BOUNDARY
PROPOSED 100 FLOOD PLAIN E
10' UTILITY EASEMENT
20' WATER EASEMENT (CENTERLINE DESCRIBED)
5' DRAINAGE & UTILITY EASEMENT
8' UTILITY EASEMENT
66' ROW
45' ROW
36' ROW
22' ROW
N26°17'26"W 350.06'
N63°42'34"E 571.00'
N63°42'34"E 515.50'
S26°17'26"E 244.50'
N63°42'34"E 460.00'
N63°42'34"E 480.00'
N63°42'34"E 283.90'
S26°17'26"E 212.00'
S26°17'26"E 189.00'
N63°42'34"E 124.50'
S26°17'26"E 72.00'
N63°42'34"E 159.40'
S26°17'26"E 138.00'
S26°17'26"E 114.50'
N63°42'34"E 257.89'
N63°42'34"E 83.50'
N63°42'34"E 47.50'
N63°42'34"E 57.00'
S26°17'26"E 36.00'
S26°17'26"E 39.49'
S26°17'26"E 78.01'
S26°17'26"E 227.98'
S26°17'26"E 110.00'
S26°17'26"E 42.84'
S26°17'26"E 68.57'
S26°17'26"E 70.54'
S26°17'26"E 62.15'
S26°17'26"E 229.34'
S26°17'26"E 203.50'
S26°17'26"E 202.50'
S26°17'26"E 92.00'
S26°17'26"E 138.00'
S26°17'26"E 114.50'
S26°17'26"E 244.50

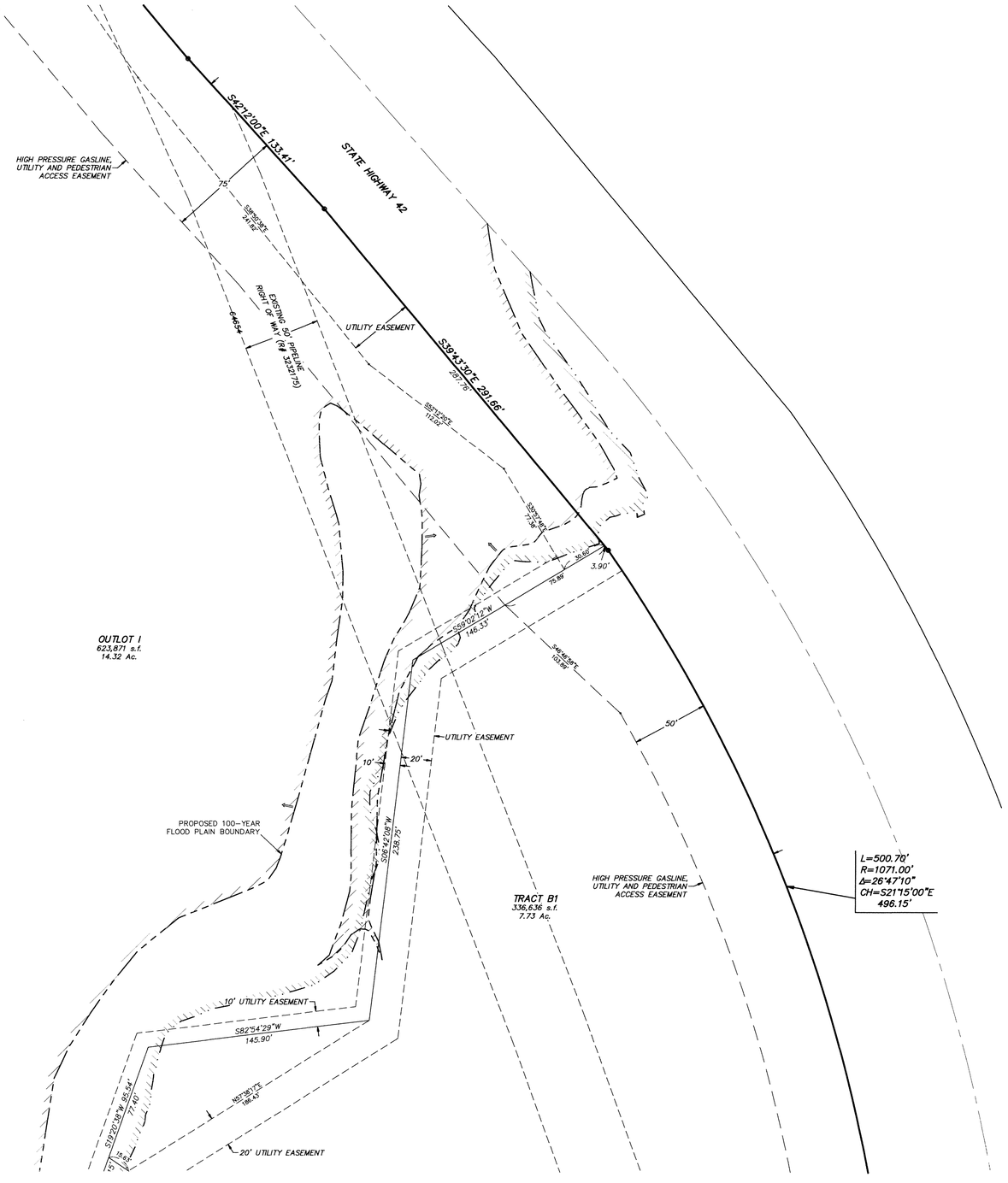
INDIAN PEAKS FILING NO. 17
REPLAT C

SHEET 5 OF 7

MATCH TO SHEET 3

MATCH TO SHEET 4





CURVE TABLE					
CURVE	LENGTH	RADIUS	DELTA	CHORD	BEARING
C4	193.66'	69.00'	160°48'28"	136.07'	N16°41'40"W
C5	216.77'	69.00'	180°00'00"	138.00'	N26°17'26"W
C17	17.72'	87.00'	11°40'18"	17.69'	S69°32'43"W
C18	12.45'	24.50'	29°07'07"	12.32'	S52°26'42"E
C19	12.45'	24.50'	29°07'23"	12.32'	S00°08'01"E
C20	22.07'	87.50'	14°27'01"	22.01'	N86°03'57"W
C21	95.55'	87.00'	62°55'26"	90.82'	N57°45'08"W
C22	136.66'	87.00'	90°00'00"	123.04'	N18°42'34"E
C23	160.22'	51.00'	180°00'00"	102.00'	N26°17'26"W

EASEMENT LEGEND:

ESMT 1: 8' UTILITY EASEMENT
ESMT 2: 5' DRAINAGE & UTILITY EASEMENT
ESMT 3: 8' DRAINAGE & UTILITY EASEMENT

0 20 40 80

1 inch = 40 ft.

MATCH TO SHEET 7

INDIAN PEAKS FILING NO. 17
REPLAT C
FINAL PLAT
LAFAYETTE, COLORADO

HURST
CIVIL ENGINEERING
PLANNING
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Boulder, CO 80302
303.449.9105
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SCALE HOR. 1"=40' VERT. N/A
DESIGN/APPR.
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DATE 07/20/12
SHEET 5 OF 7
FILE G:\1009124\SURVEY\REPLAT C\P17 REPLAT C SH 4-7

INDIAN PEAKS FILING NO. 17
REPLAT C

SHEET 6 OF 7

MATCH TO SHEET 4

MATCH TO SHEET 7

BLOCK 9
BLOCK 10
BLOCK 11
OUTLOT C (PRIVATE OUTLOT ALLEY) 15,138 s.f.
OUTLOT D (PRIVATE OUTLOT ALLEY) 9,540 s.f.
CASCADE CREEK DRIVE
CLEAR CREEK LANE
ROSER DRIVE
OUTLOT M 52 s.f.
OUTLOT E 131,107 s.f. 3.01 Ac.
OUTLOT I 623,871 s.f. 14.32 Ac.
TRACT C1 972,220 s.f. 22.32 Ac.
TRACT C2 224,605 s.f. 5.16 Ac.
5' DRAINAGE & UTILITY EASEMENT
8' UTILITY EASEMENT
10' UTILITY EASEMENT
10' DRAINAGE & UTILITY EASEMENT
UTILITY EASEMENT
45' ROW
66' ROW
64' ROW
36' ROW
CURRENT 100-YEAR FLOOD PLAIN BOUNDARY
PROPOSED 100-YEAR FLOOD PLAIN BOUNDARY
20' WATER EASEMENT (CENTERLINE DESCRIBED)

CURVE TABLE					
CURVE	LENGTH	RADIUS	DELTA	CHORD	BEARING
C1	157.08'	100.00'	90°00'00"	141.42'	S71°17'26"E
C6	39.27'	25.00'	90°00'00"	35.36'	S71°17'26"E
C7	39.27'	25.00'	90°00'00"	35.36'	S18°42'34"W
C8	121.74'	77.50'	90°00'00"	109.60'	S71°17'26"E
C9	22.63'	122.50'	10°35'02"	22.60'	S31°34'56"E
C10	55.25'	122.50'	25°50'35"	54.79'	S49°47'45"E
C11	46.51'	122.50'	21°45'08"	46.23'	S73°35'56"E
C12	46.37'	122.50'	21°41'16"	46.09'	N84°41'12"E
C13	21.66'	122.50'	10°07'59"	21.64'	N68°46'34"E
C26	42.56'	285.00'	8°33'21"	42.52'	S30°34'06"E
C27	37.63'	252.00'	8°33'21"	37.60'	S30°34'06"E
C28	47.49'	318.00'	8°33'21"	47.44'	S30°34'06"E

OUTER BOUNDARY TABLE					
CURVE	LENGTH	RADIUS	DELTA	CHORD	BEARING
OB2	16.56'	112.50'	8°26'02"	16.54'	N64°48'01"W
OB3	23.86'	40.00'	34°10'16"	23.50'	S51°55'54"E
OB4	23.12'	40.00'	33°07'03"	22.80'	N18°17'15"W
OB5	1.84'	109.00'	0°57'53"	1.84'	S02°12'40"E

0 20 40 80
1 inch = 40 ft.

INDIAN PEAKS FILING NO. 17
REPLAT C
FINAL PLAT
LAFAYETTE, COLORADO

HURST
CIVIL ENGINEERING
PLANNING
SURVEYING
1350 Pine Street, Suite
Boulder, CO 80302
303.449.9105
www.hurst-assoc.com

SCALE HOR. 1"=40' VERT. N/A
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SHEET 6 OF 7
FILE G:\10091124\SURVEY\REPLAT C\P17 REPLAT C SH 4-7

INDIAN PEAKS FILING NO. 17
REPLAT C

SHEET 7 OF 7

MATCH TO SHEET 5

MATCH TO SHEET 6

OUTLOT I
623,871 s.f.
14.32 Ac.

TRACT C2
224,605 s.f.
5.16 Ac.

TRACT D1
126,947 s.f.
2.91 Ac.

TRACT B1
336,636 s.f.
7.73 Ac.

OUTLOT K
5,174 s.f.

CURRENT 100-YEAR FLOOD PLAIN BOUNDARY

PROPOSED 100-YEAR FLOOD PLAIN BOUNDARY

EXISTING 50' PIPELINE RIGHT OF WAY (R# 3242175)

HIGH PRESSURE GASLINE, UTILITY AND PEDESTRIAN ACCESS EASEMENT

20' UTILITY EASEMENT

10' UTILITY EASEMENT

UTILITY EASEMENT

20' UTILITY EASEMENT (CENTERLINE DESCRIBED)

20' WATER EASEMENT (CENTERLINE DESCRIBED)

66' ROW

40' (DEDICATED TO CITY OF LAFAYETTE – R# 3144090)

PASCHAL DRIVE

STATE HIGHWAY 42

TAKODA SUBDIVSION OUTLOT 11

TAKODA SUBDIVSION OUTLOT 12

TAKODA SUBDIVSION OUTLOT 13

CURVE TABLE					
CURVE	LENGTH	RADIUS	DELTA	CHORD	BEARING
C26	42.56'	285.00'	8°33'21"	42.52'	S30°34'06"E
C27	37.63'	252.00'	8°33'21"	37.60'	S30°34'06"E
C28	47.49'	318.00'	8°33'21"	47.44'	S30°34'06"E

OUTER BOUNDARY TABLE					
CURVE	LENGTH	RADIUS	DELTA	CHORD	BEARING
OB1	20.48'	40.00'	29°20'29"	20.26'	S75°15'15"E
OB2	16.56'	112.50'	8°26'02"	16.54'	N64°48'01"W
OB3	23.86'	40.00'	34°10'16"	23.50'	S51°55'54"E
OB4	23.12'	40.00'	33°07'03"	22.80'	N18°17'15"W
OB5	1.84'	109.00'	0°57'53"	1.84'	S02°12'40"E

1 inch = 40 ft.

INDIAN PEAKS FILING NO. 17
REPLAT C
FINAL PLAT
LAFAYETTE, COLORADO

HURST
CIVIL ENGINEERING
PLANNING
SURVEYING
1350 Pine Street, Suite 1
Boulder, CO 80302
303.449.9105
www.hurst-assoc.com

SCALE HOR. 1"=40' VERT. N/A
DESIGN/APPR.
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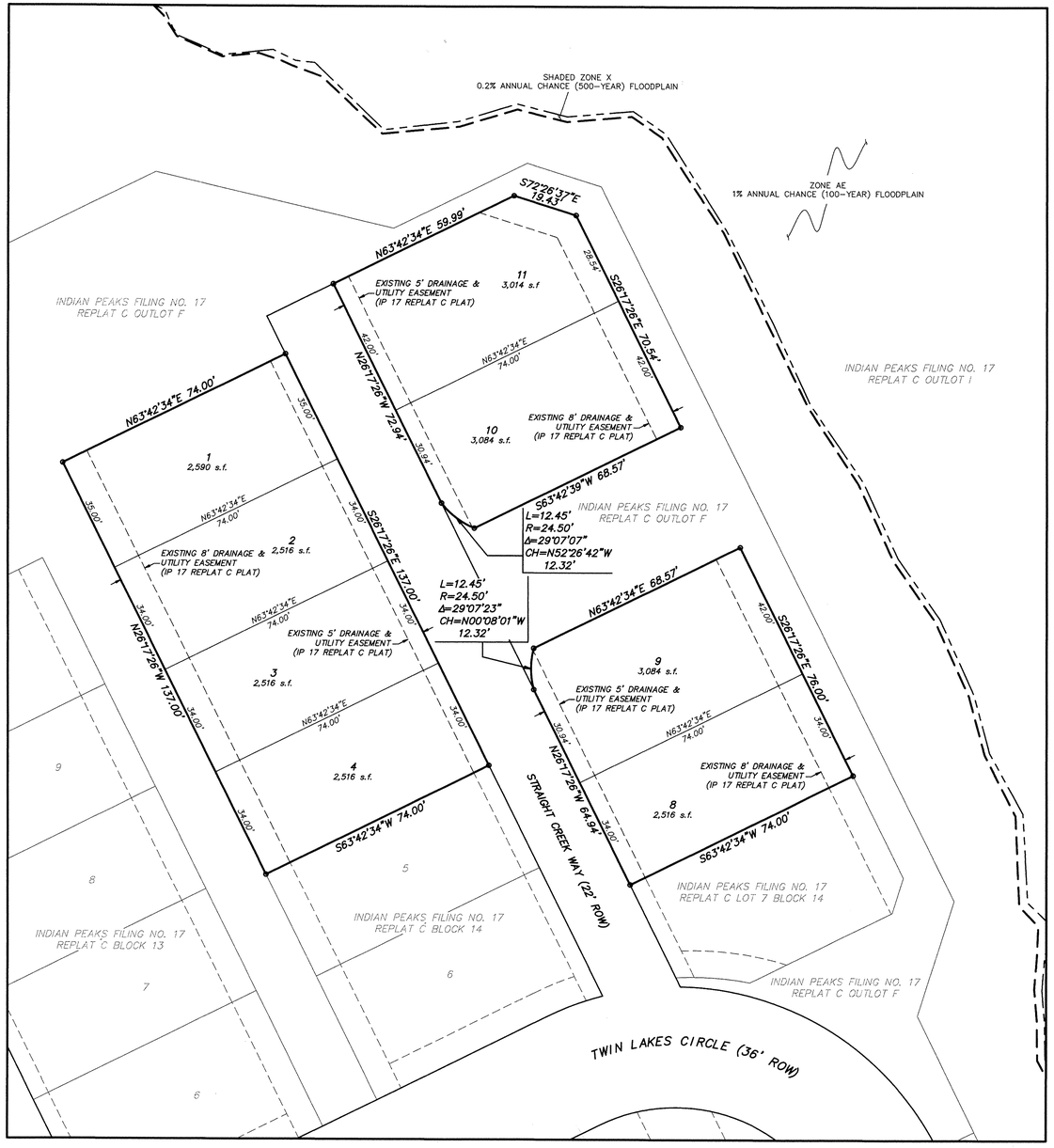
DATE 07/20/12
SHEET 7 OF 7
FILE G:\1009124\SURVEY\REPLAT C\IP17 REPLAT C SH 4-7

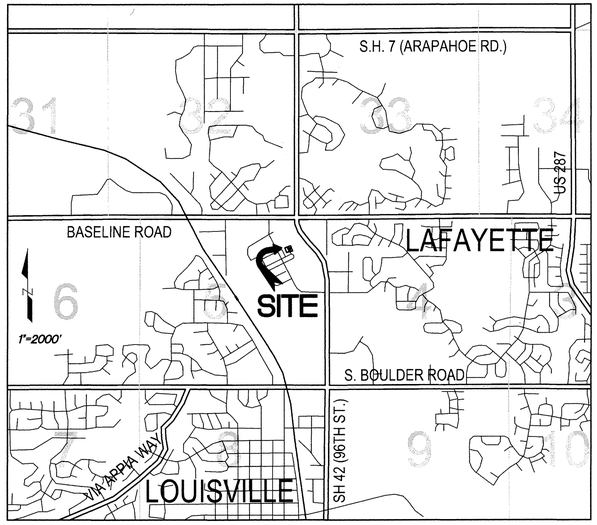
03364431
Page: 1 of 1
01/31/2014 03:03 PM RF: $11.00
Boulder County Clerk, CO DF: $0.00

INDIAN PEAKS FILING NO. 17 REPLAT C1

A REPLAT OF INDIAN PEAKS FILING NO. 17 REPLAT C TRACTS 1–4 & 8–11

LOCATED IN THE NORTHEAST QUARTER OF SECTION 5,
TOWNSHIP 1 SOUTH, RANGE 69 WEST OF THE 6TH P.M.,
CITY OF LAFAYETTE, COUNTY OF BOULDER, STATE OF COLORADO
8 LOTS – 21,836 S.F. (0.50 ACRE)





VICINITY MAP

NOTES:

1) NOTICE: ACCORDING TO COLORADO LAW, YOU MUST COMMENCE ANY LEGAL ACTION BASED UPON ANY DEFECT IN THIS SURVEY WITHIN THREE YEARS AFTER YOU FIRST DISCOVER SUCH DEFECT. IN NO EVENT MAY ANY ACTION BASED UPON ANY DEFECT IN THIS SURVEY BE COMMENCED MORE THAN TEN YEARS FROM THE DATE OF THE CERTIFICATION SHOWN HEREON.

2) BASIS OF BEARINGS: SOUTHERLY LINE OF TRACT C, BEING N89°55'30"W BETWEEN CORNERS AS MONUMENTED BY REBARS WITH 1" PLASTIC CAPS, STAMPED PLS 37990, AS SHOWN ON THE "INDIAN PEAKS FILING NO. 17" PLAT.

3) THE PURPOSE OF THIS REPLAT IS TO CREATE 8 LOTS FROM 8 EXISTING TRACTS.

4) PER INDIAN PEAKS FILING NO. 17 FINAL PLAT, ALL LOTS, OUTLOTS, AND TRACTS OF INDIAN PEAKS FILING NO. 17 SHOWN ON THIS PLAT ARE BURDENED WITH A PERPETUAL, NON EXCLUSIVE EASEMENT PERMITTING TRAIN NOISE AND VIBRATION TO ENTER ON THE SAME FROM THE ADJACENT BURLINGTON NORTHERN SANTA FE RAIL ROAD. UNDER NO CIRCUMSTANCES SHALL THE CITY OF LAFAYETTE, ITS OFFICERS, EMPLOYEES OR AGENTS AND ITS SUCCESSORS AND ASSIGNS, MCJ HOLDINGS, LLC, INDIAN PEAKS SOUTH, LLC, AND BRADDOCK-ENTERPRISES L.P. BE HELD LIABLE FOR ANY DAMAGE OR INJURY RESULTING FROM NOISE OR VIBRATION FROM THE EXISTING BNSF OR FUTURE FASTRACKS TRAINS ON SAID LOTS, AND OUTLOTS AND TRACTS OF THIS SUBDIVISION.

5) PROPERTY IS LOCATED IN UNSHADED ZONE X (AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN PER FEMA LETTER OF MAP REVISION CASE NUMBER 13-08-0605P WITH AN EFFECTIVE DATE OF _____.

6) THE DECLARATION OF RESTRICTIVE COVENANTS FOR THIS PROPERTY SHALL INCLUDE ALTERNATIVE DISPUTE RESOLUTION PROVISIONS, WHICH PROVISIONS SHALL NOT BE MODIFIED OR DELETED WITHOUT THE CONSENT OF THE CITY.

7) THIS PLAT IS SUBJECT TO THE INDIAN PEAKS FILING NO. 17 REPLAT C DEVELOPMENT AGREEMENT RECORDED 08/23/2012 AT RECEPTION NO. 3246468.

8) EXTERIOR OF SUBDIVISION MONUMENTED WITH 1" PLASTIC CAPS MARKED "PLS 37990" SET ON #5 REBAR.

0 10 20 40
1 inch = 20 ft.

CERTIFICATE OF OWNERSHIP

KNOW ALL MEN BY THESE PRESENTS THAT THE UNDERSIGNED, BEING THE SOLE OWNER OF ALL THAT REAL PROPERTY SITUATED IN BOULDER COUNTY, COLORADO, AND LYING WITHIN THE EXTERIOR BOUNDARY OF "INDIAN PEAKS FILING NO. 17 REPLAT C1" A SUBDIVISION OF A PORTION OF THE NORTHEAST QUARTER OF SECTION 5, T1S, R69W OF THE 6TH P.M. CITY OF LAFAYETTE, COUNTY OF BOULDER, STATE OF COLORADO DESCRIBED AS FOLLOWS:

TRACTS 1, 2, 3, 4, 8, 9, 10 AND 11 OF "INDIAN PEAKS FILING NO. 17 REPLAT C" AS RECORDED 09/23/2013 AT RECEPTION NO. 3246466, CONTAINING 0.50 ACRE, MORE OR LESS;

HAVE BY THESE PRESENTS LAID OUT, PLATTED AND SUBDIVIDED THE SAME INTO LOTS AS SHOWN HEREON AND DESIGNATE THE SAME AS "INDIAN PEAKS FILING NO. 17 REPLAT C1" IN THE CITY OF LAFAYETTE, COUNTY OF BOULDER, STATE OF COLORADO.

EXECUTED THIS 20th DAY OF August 20 13 A.D.,

INDIAN PEAKS SOUTH 2, LLC
A COLORADO LIMITED LIABILITY COMPANY

BY: _____
DAVID B. WARE
CHIEF EXECUTIVE OFFICER OF INDIAN PEAKS SOUTH 2, LLC

ACKNOWLEDGMENT

STATE OF COLORADO)
) SS
COUNTY OF ADAMS)

THE FOREGOING INSTRUMENT WAS ACKNOWLEDGED BEFORE ME THIS 20th DAY OF August 20 13 BY DAVID B. WARE AS CHIEF EXECUTIVE OFFICER OF INDIAN PEAKS SOUTH 2, LLC, A COLORADO LIMITED LIABILITY COMPANY.

WITNESS MY HAND AND OFFICIAL SEAL.

MY COMMISSION EXPIRES: 10.16.2015

_____
NOTARY PUBLIC

LYNNE A. TYLER NOTARY PUBLIC STATE OF COLORADO MY COMMISSION EXPIRES 10/16/2015

COMMUNITY DEVELOPMENT DIRECTOR CERTIFICATE

PURSUANT TO SECTION 26-16-6 OF THE LAFAYETTE CODE OF ORDINANCES, THIS MINOR SUBDIVISION PLAT FOR "INDIAN PEAKS FILING NO. 17 REPLAT D" WAS APPROVED BY THE COMMUNITY DEVELOPMENT DIRECTOR OF THE CITY OF LAFAYETTE, COLORADO ON 5-20-13 A.D.

_____
COMMUNITY DEVELOPMENT DIRECTOR

_____
ATTEST: CITY CLERK

CITY ADMINISTRATOR'S CERTIFICATE

I, GARY KLAPHAKE, CITY ADMINISTRATOR OF THE CITY OF LAFAYETTE, COLORADO, HEREBY CERTIFY THAT I HAVE EXAMINED THE FINAL PLAT AND IT APPEARS TO BE IN COMPLIANCE WITH ALL APPLICABLE ORDINANCES OF THE CITY AND THAT A DEVELOPMENT AGREEMENT HAS BEEN EXECUTED BY THE DEVELOPER AND ACCEPTED BY THE CITY.

_____
CITY ADMINISTRATOR

_____
ATTEST: CITY CLERK

REVIEW CERTIFICATES

_____
CITY OF LAFAYETTE ENGINEER

TITLE COMPANY'S CERTIFICATE:

I, JON LOCKHART A TITLE EXAMINER REPRESENTING LAND TITLE GUARANTEE COMPANY, CERTIFY THAT I HAVE EXAMINED TITLE TO THE DESCRIBED LAND DEDICATION TO THE CITY OF LAFAYETTE, COLORADO, AND THAT THE PARTIES EXECUTING THE DEDICATION ARE THE OWNERS THEREOF IN FEE SIMPLE, AND THE DEDICATED LAND IS FREE AND CLEAR OF ALL LIENS AND ENCUMBRANCES, EXCEPT AS SHOWN ON TITLE COMMITMENT NO. 703 76826.

_____
NAME

TITLE EXAMINER
TITLE

EXECUTED THIS 30th DAY OF July A.D., 2013

SURVEYOR'S CERTIFICATE

FOR AND ON BEHALF OF HURST & ASSOCIATES, INC., I, BO BAIZE, DO HEREBY CERTIFY THAT I AM A DULY REGISTERED PROFESSIONAL LAND SURVEYOR LICENSED UNDER THE LAWS OF THE STATE OF COLORADO, THAT THIS PLAT IS A TRUE, CORRECT AND COMPLETE PLAT OF "INDIAN PEAKS FILING NO. 17 REPLAT C1" AS LAID OUT, PLATTED, DEDICATED AND SHOWN HEREON, THAT SUCH PLAT WAS MADE FROM AN ACCURATE SURVEY OF SAID PROPERTY BY ME AND UNDER MY DIRECT RESPONSIBILITY, SUPERVISION AND CHECKING AND CORRECTLY SHOWS THE LOCATION AND DIMENSIONS OF THE TRACTS STAKED UPON THE GROUND IN COMPLIANCE WITH ARTICLES 50-53 OF TILE 38, COLORADO REVISED STATUES GOVERNING THE SUBDIVISION OF LAND.

IN WITNESS WHEREOF, I HAVE SET MY HAND AND SEAL THIS 17th DAY OF July 2013 A.D.

_____
BO BAIZE
COLORADO LICENSED PROFESSIONAL LAND SURVEYOR NO. 37990
2550 BROADWAY, SUITE B
BOULDER, CO 80304
303-449-9105

COLORADO LICENSED BO BAIZE 37990 PROFESSIONAL LAND SURVEYOR

COUNTY CLERK & RECORDER'S CERTIFICATE

STATE OF COLORADO)
) SS
COUNTY OF BOULDER)

I HEREBY CERTIFY THAT THIS PLAT WAS FILED IN MY OFFICE AT 3:03 O'CLOCK, P M. ON THE 31st DAY OF January 20 14 AND IS DULY RECORDED AT RECEPTION NO. 3364431 AND PLAN FILE P-___ F-___ # _____.

FEES PAID: $11.00

_____
COUNTY CLERK & RECORDER

_____
BY: DEPUTY

INDIAN PEAKS FILING NO. 17
REPLAT C1
FINAL PLAT
LAFAYETTE, COLORADO

DATE	04/30/13	SCALE	HOR. 1"= 20' VERT. N/A
REVISED	05/23/13		
	07/17/13	DESIGN/APPR.	BO
	(FINAL)	DRAWN BY	BO
		SHEET	1 OF 1

HURST CIVIL ENGINEERING PLANNING SURVEYING
2590 Broadway, Suite B Boulder, CO 80304 303.449.9105 www.hurst-assoc.com

FILE G:\1009124\SURVEY\REPLAT C\IP17 REPLAT C1

03322897
Page: 1 of 2
06/26/2013 01:10 PM RF: $21.00 DF: $0.00
Boulder County Clerk, CO

INDIAN PEAKS FILING NO. 17 REPLAT D

A REPLAT OF INDIAN PEAKS FILING NO. 17 REPLAT C TRACT C2

LOCATED IN THE NORTHEAST QUARTER OF SECTION 5, TOWNSHIP 1 SOUTH, RANGE 69 WEST OF THE 6TH P.M.,
CITY OF LAFAYETTE, COUNTY OF BOULDER, STATE OF COLORADO

42 LOTS, 2 OUTLOTS & 8 TRACTS – 5.16 ACRES

SHEET 1 OF 2

DEDICATION AND OWNERSHIP CERTIFICATE

KNOW ALL MEN BY THESE PRESENTS THAT THE UNDERSIGNED, BEING THE SOLE OWNER OF ALL THAT REAL PROPERTY SITUATED IN BOULDER COUNTY, COLORADO, AND LYING WITHIN THE EXTERIOR BOUNDARY OF "INDIAN PEAKS FILING NO. 17 REPLAT D" A SUBDIVISION OF A PORTION OF THE NORTHEAST QUARTER OF SECTION 5, T1S, R69W OF THE 6TH P.M. CITY OF LAFAYETTE, COUNTY OF BOULDER, STATE OF COLORADO DESCRIBED AS FOLLOWS:

TRACT C2 OF "INDIAN PEAKS FILING NO. 17 REPLAT C" AS RECORDED 08/23/2012 AT RECEPTION NO. 3246466, CONTAINING 5.16 ACRES, MORE OR LESS;

HAVE BY THESE PRESENTS LAID OUT, PLATTED AND SUBDIVIDED THE SAME INTO TRACTS, LOTS AND OUTLOTS AS SHOWN HEREON AND DESIGNATE THE SAME AS "INDIAN PEAKS FILING NO. 17 REPLAT D" IN THE CITY OF LAFAYETTE, COUNTY OF BOULDER, STATE OF COLORADO AND DO HEREBY DEDICATE AND CONVEY TO THE CITY OF LAFAYETTE, COLORADO, FOR PUBLIC USE THE STREETS AND RIGHTS-OF-WAY (R.O.W.), THE PEDESTRIAN ACCESS EASEMENTS SHOWN HEREON FOR PEDESTRIAN ACCESS PURPOSES ONLY, THE VEHICLE ACCESS EASEMENTS SHOWN HEREON FOR VEHICLE ACCESS PURPOSES ONLY, THE UTILITY EASEMENTS SHOWN HEREON FOR UTILITY PURPOSES ONLY, AND DRAINAGE AND UTILITY EASEMENTS SHOWN HEREON FOR DRAINAGE AND UTILITY PURPOSES ONLY.

EXECUTED THIS 30th DAY OF May, 2013 A.D.,

BRADDOCK ENTERPRISES, L.P.
A PENNSYLVANIA LIMITED PARTNERSHIP

BY: BRADDOCK INVESTMENTS, L.P.
A PENNSYLVANIA LIMITED PARTNERSHIP
ITS GENERAL PARTNER

BY: PANCO, LLC
A PENNSYLVANIA LIMITED LIABILITY COMPANY
ITS GENERAL PARTNER

BY: _____
WILLIAM P. PISZEK
CO-MANAGER

BY: _____
HELEN P. NELSON
CO-MANAGER

ACKNOWLEDGMENT

COMMONWEALTH OF PENNSYLVANIA)
) SS
COUNTY OF Montgomery)

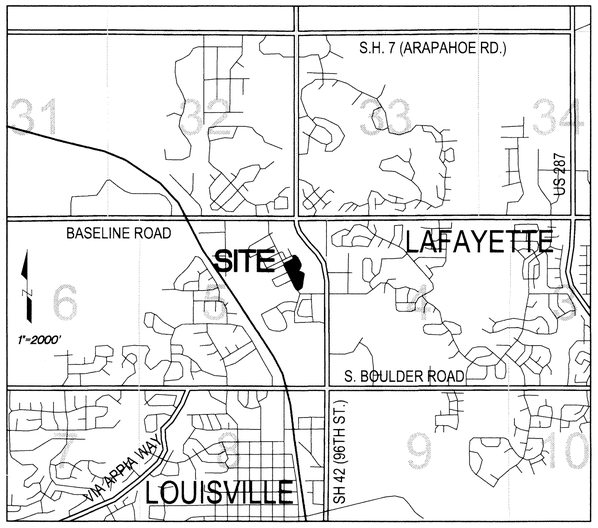
THE FOREGOING INSTRUMENT WAS ACKNOWLEDGED BEFORE ME THIS 30th DAY OF May, 2013, BY WILLIAM P. PISZEK AND HELEN P. NELSON, AS CO-MANAGERS OF PANCO, LLC, A PENNSYLVANIA LIMITED LIABILITY COMPANY, GENERAL PARTNER OF BRADDOCK INVESTMENTS, L.P., GENERAL PARTNER OF BRADDOCK ENTERPRISES, L.P., A PENNSYLVANIA LIMITED PARTNERSHIP.

WITNESS MY HAND AND OFFICIAL SEAL.

MY COMMISSION EXPIRES: _____

_____
NOTARY PUBLIC

COMMONWEALTH OF PENNSYLVANIA
NOTARIAL SEAL
P. Erik Nelson, Notary Public
Upper Dublin Twp., Montgomery County
My Commission Expires March 26, 2015
MEMBER, PENNSYLVANIA ASSOCIATION OF NOTARIES



VICINITY MAP

NOTES:

1) NOTICE: ACCORDING TO COLORADO LAW, YOU MUST COMMENCE ANY LEGAL ACTION BASED UPON ANY DEFECT IN THIS SURVEY WITHIN THREE YEARS AFTER YOU FIRST DISCOVER SUCH DEFECT. IN NO EVENT MAY ANY ACTION BASED UPON ANY DEFECT IN THIS SURVEY BE COMMENCED MORE THAN TEN YEARS FROM THE DATE OF THE CERTIFICATION SHOWN HEREON.

2) BASIS OF BEARINGS: SOUTHERLY LINE OF INDIAN PEAKS FILING NO. 17 TRACT C, BEING N89°55'30"W BETWEEN CORNERS AS MONUMENTED BY REBARS WITH 1" PLASTIC CAPS, STAMPED PLS 37990, AS SHOWN ON THE "INDIAN PEAKS FILING NO. 17" PLAT.

3) THE PURPOSE OF THIS REPLAT IS TO CREATE 42 LOTS, 2 OUTLOTS AND 8 TRACTS OUT OF ONE EXISTING TRACT.

4) SUBDIVISION CORNERS ARE MONUMENTED WITH 1" PLASTIC CAPS, PLS 37990 SET ON #5 REBAR.

5) PER INDIAN PEAKS FILING NO. 17 FINAL PLAT, ALL LOTS, OUTLOTS, AND TRACTS OF INDIAN PEAKS FILING NO. 17 SHOWN ON THIS PLAT ARE BURDENED WITH A PERPETUAL, NON EXCLUSIVE EASEMENT PERMITTING TRAIN NOISE AND VIBRATION TO ENTER ON THE SAME FROM THE ADJACENT BURLINGTON NORTHERN SANTA FE RAIL ROAD. UNDER NO CIRCUMSTANCES SHALL THE CITY OF LAFAYETTE, ITS OFFICERS, EMPLOYEES OR AGENTS AND ITS SUCCESSORS AND ASSIGNS, MCJ HOLDINGS, LLC, INDIAN PEAKS SOUTH, LLC, INDIAN PEAKS SOUTH 2, LLC AND BRADDOCK ENTERPRISES L.P. BE HELD LIABLE FOR ANY DAMAGE OR INJURY RESULTING FROM NOISE OR VIBRATION FROM THE EXISTING BNSF OR FUTURE FASTRACKS TRAINS ON SAID LOTS, AND OUTLOTS AND TRACTS OF THIS SUBDIVISION.

6) FLOOD PLAIN INFORMATION FROM FLOOD INSURANCE RATE MAP NO. 08013C0582J WITH AN REVISION DATE OF 12/18/2012.

7) ALL OUTLOTS SHALL BE OWNED AND MAINTAINED BY THE INDIAN PEAKS SOUTH HOMEOWNERS ASSOCIATION.

8) OUTLOT A SHALL CONTAIN A BLANKET PEDESTRIAN ACCESS EASEMENT AND A BLANKET UTILITY EASEMENT. OUTLOT B SHALL CONTAIN A BLANKET PEDESTRIAN ACCESS EASEMENT.

9) THIS PLAT IS SUBJECT TO THE INDIAN PEAKS FILING NO. 17 REPLAT D DEVELOPMENT AGREEMENT RECORDED _____ AT RECEPTION NO. _____.

10) TRACTS 3-10 MUST BE REPLATTED PER A MINOR SUBDIVISION REPLAT INTO LOTS PRIOR TO ISSUANCE OF BUILDING PERMITS FOR THOSE TRACTS.

11) THIS PLAT IS SUBJECT TO THE SECOND AMENDMENT TO THE COMMUNITY CHARTER RECORDED 08/23/2012 AT RECEPTION NO. 03246469.

PLANNING COMMISSION CERTIFICATE

THE PRELIMINARY PLAT FOR "INDIAN PEAKS FILING NO. 17 REPLAT D" WAS APPROVED BY THE CITY OF LAFAYETTE PLANNING COMMISSION ON APRIL 24, 2012, A.D.

_____
CHAIRPERSON

Michelle Vervaeke
ATTEST: SECRETARY

CITY COUNCIL CERTIFICATE

THIS FINAL PLAT (SUBDIVISION) IS APPROVED BY THE CITY COUNCIL OF THE CITY OF LAFAYETTE, BOULDER COUNTY, COLORADO, THIS ____ DAY OF _____ A.D., 20___ AND MAY BE FILED WITH THE CLERK AND RECORDER OF BOULDER COUNTY. ALL PUBLIC DEDICATIONS SHOWN HEREON ARE ACCEPTED BY THE CITY, SUBJECT TO THE PROVISION THAT NEITHER APPROVAL NOR ACCEPTANCE OBLIGATES THE CITY OF LAFAYETTE, FOR THE FINANCING OR CONSTRUCTING OF IMPROVEMENTS ON LAND OR EASEMENTS TO THE CITY EXCEPT AS SPECIFICALLY AGREED TO BY THE CITY COUNCIL.

_____
MAYOR

WITNESS MY HAND AND OFFICIAL SEAL OF THE CITY OF LAFAYETTE

_____
ATTEST: CITY CLERK

CITY OF LAFAYETTE HOME RULE BOULDER COUNTY, COLORADO APRIL 1, 1958

TITLE COMPANY'S CERTIFICATE

I, Wendy Sanchez, A Land Title REPRESENTING LAND TITLE GUARANTEE COMPANY, CERTIFY THAT I HAVE EXAMINED TITLE TO THE DESCRIBED LAND DEDICATION TO THE CITY OF LAFAYETTE, COLORADO, AND THAT THE PARTIES EXECUTING THE DEDICATION ARE THE OWNERS THEREOF IN FEE SIMPLE, AND THE DEDICATED LAND IS FREE AND CLEAR OF ALL LIENS AND ENCUMBRANCES. Except As shown on Title Commitment No 70380249 issued by Land Title Guarantee Company

Wendy Sanchez
NAME

Title officer
TITLE

EXECUTED THIS 4th DAY OF June, A.D., 2013

SURVEYOR'S CERTIFICATE

FOR AND ON BEHALF OF HURST & ASSOCIATES, INC., I, BO BAIZE, DO HEREBY CERTIFY THAT I AM A DULY REGISTERED PROFESSIONAL LAND SURVEYOR LICENSED UNDER THE LAWS OF THE STATE OF COLORADO, THAT THIS PLAT IS A TRUE, CORRECT AND COMPLETE PLAT OF "INDIAN PEAKS FILING NO. 17 REPLAT D" AS LAID OUT, PLATTED, DEDICATED AND SHOWN HEREON, THAT SUCH PLAT WAS MADE FROM AN ACCURATE SURVEY OF SAID PROPERTY BY ME AND UNDER MY DIRECT RESPONSIBILITY, SUPERVISION AND CHECKING AND CORRECTLY SHOWS THE LOCATION AND DIMENSIONS OF THE TRACTS STAKED UPON THE GROUND IN COMPLIANCE WITH ARTICLES 50-53 OF TILE 38, COLORADO REVISED STATUES GOVERNING THE SUBDIVISION OF LAND.

IN WITNESS WHEREOF, I HAVE SET MY HAND AND SEAL THIS 28th DAY OF MAY, 2013 A.D.

_____
BO BAIZE
COLORADO LICENSED PROFESSIONAL LAND SURVEYOR NO. 37990
2550 BROADWAY, SUITE B
BOULDER, CO 80304
303-449-9105

COLORADO LICENSED BO BAIZE 37990 PROFESSIONAL LAND SURVEYOR

CITY ADMINISTRATOR'S CERTIFICATE

I, GARY KLAPHAKE, CITY ADMINISTRATOR OF THE CITY OF LAFAYETTE, COLORADO, HEREBY CERTIFY THAT I HAVE EXAMINED THE FINAL PLAT AND IT APPEARS TO BE IN COMPLIANCE WITH ALL APPLICABLE ORDINANCES OF THE CITY AND THAT A DEVELOPMENT AGREEMENT HAS BEEN EXECUTED BY THE DEVELOPER AND ACCEPTED BY THE CITY.

_____
CITY ADMINISTRATOR

_____
ATTEST: CITY CLERK

REVIEW CERTIFICATES

_____
CITY OF LAFAYETTE ENGINEER

COUNTY CLERK & RECORDER'S CERTIFICATE

STATE OF COLORADO)
) SS
COUNTY OF BOULDER)

I HEREBY CERTIFY THAT THIS PLAT WAS FILED IN MY OFFICE AT 1:10 O'CLOCK, P. M. ON THE 26th DAY OF June, 2013 AND IS DULY RECORDED AT RECEPTION NO. 3322897 AND PLAN FILE P-__ F-__ # ____.
FEES PAID: $21.00

Hilary Hall
COUNTY CLERK & RECORDER

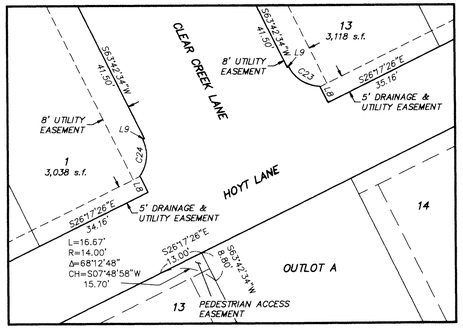
_____
BY: DEPUTY

INDIAN PEAKS FILING NO. 17
REPLAT D
FINAL PLAT
LAFAYETTE, COLORADO

DATE 03/15/13		SCALE HOR. N/A VERT. N/A
REVISED 05/06/13	HURST CIVIL ENGINEERING PLANNING SURVEYING 2500 Broadway, Suite B Boulder, CO 80304 303.449.9105 www.hurst-assoc.com	DESIGN/APPR.
		DRAWN BY BO
		SHEET 1 OF 2
FILE G:\1009124\SURVEY\REPLAT D\P17 REPLAT D		

INDIAN PEAKS FILING NO. 17
REPLAT D

SHEET 2 OF 2



DETAIL (1"=20')

LINE TABLE		
LINE	BEARING	LENGTH
L1	N53°42'34"E	11.66'
L2	S77°00'00"E	21.09'
L3	S10°16'15"W	4.25'
L4	S77°00'00"E	26.61'
L5	S10°16'15"W	21.43'
L6	S33°47'55"W	25.99'
L7	S63°42'34"W	22.00'
L8	S63°42'34"W	5.15'
L9	S26°17'26"E	0.90'

CURVE TABLE					
CURVE	LENGTH	RADIUS	DELTA	CHORD	BEARING
C1	8.73'	50.00'	10°00'00"	8.72'	N58°42'34"E
C2	50.27'	36.00'	80°00'00"	46.28'	N13°42'34"E
C3	11.42'	87.00'	7°31'14"	11.41'	N48°16'40"E
C4	11.97'	87.00'	7°53'02"	11.96'	N40°34'31"E
C5	13.06'	87.00'	8°36'09"	13.05'	N32°19'56"E
C6	11.03'	24.00'	26°19'35"	10.93'	S39°27'13"E
C7	26.62'	24.00'	63°40'25"	25.32'	S84°27'13"E
C8	37.70'	24.00'	90°00'00"	33.94'	S18°42'34"W
C9	82.48'	87.00'	54°19'17"	79.43'	N00°52'13"E
C10	17.72'	87.00'	11°40'18"	17.69'	N57°52'26"E
C11	39.27'	25.00'	90°00'00"	35.36'	S71°17'26"E
C12	39.27'	25.00'	90°00'00"	35.36'	S18°42'34"W
C13	34.91'	25.00'	80°00'00"	32.14'	N13°42'34"E
C14	6.81'	39.00'	10°00'00"	6.80'	N58°42'34"E
C15	12.01'	47.00'	14°38'51"	11.98'	N18°58'10"W
C16	6.42'	47.00'	7°49'37"	6.42'	N07°44'06"W
C17	28.79'	47.00'	36°18'56"	29.29'	N14°20'11"E
C18	17.40'	47.00'	21°12'56"	17.30'	N43°06'07"E
C19	3.13'	252.00'	0°42'42"	3.13'	S26°38'46"E
C20	34.50'	252.00'	7°50'39"	34.47'	S30°55'27"E
C21	4.33'	61.00'	4°04'04"	4.33'	N55°44'36"E
C22	6.32'	61.00'	5°55'56"	6.31'	N60°44'36"E
C23	10.86'	10.00'	62°15'05"	10.34'	N32°35'02"E
C24	10.86'	10.00'	62°15'05"	10.34'	N85°09'53"W

NOTES:

1. OUTLOT A SHALL CONTAIN A BLANKET PEDESTRIAN ACCESS EASEMENT AND A BLANKET UTILITY EASEMENT.

2. OUTLOT B SHALL CONTAIN A BLANKET ACCESS EASEMENT.

0 20 40 80

1 inch = 40 ft.

INDIAN PEAKS FILING NO. 17
REPLAT D
FINAL PLAT
LAFAYETTE, COLORADO

HURST
CIVIL ENGINEERING
PLANNING
SURVEYING
2500 Broadway, Suite B
Boulder, CO 80304
303.449.9105
www.hurst-assoc.com

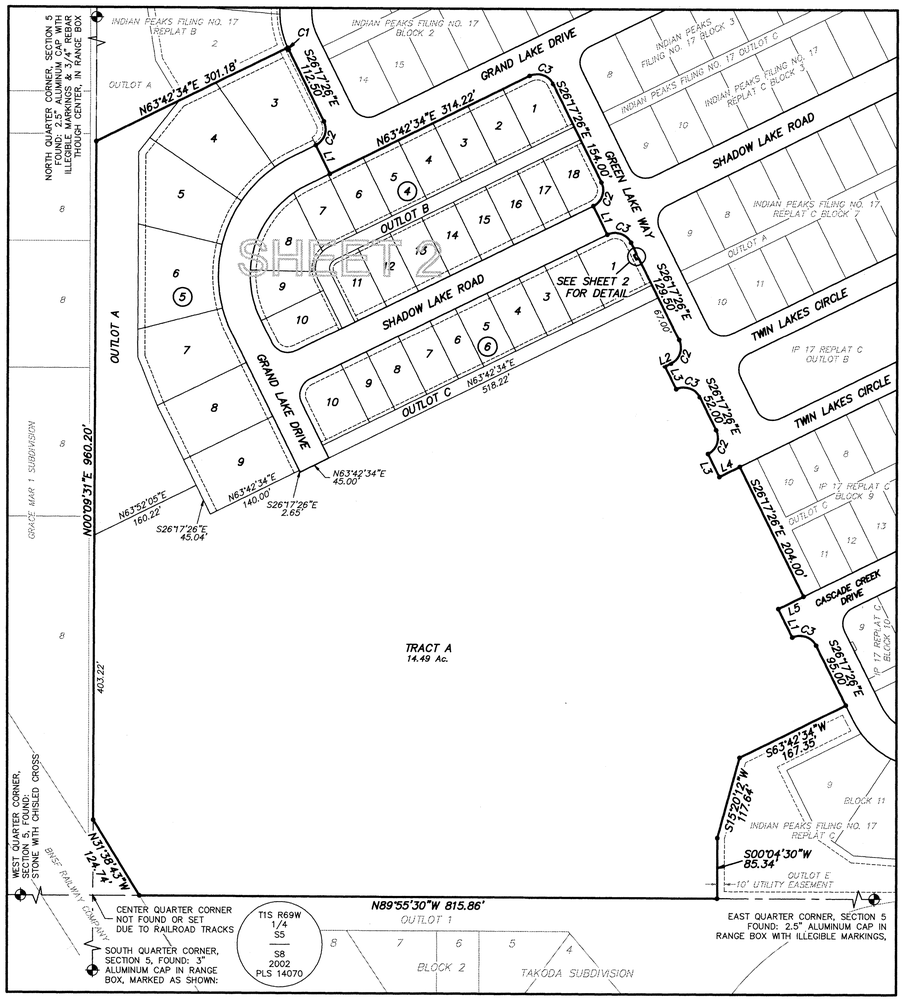
SCALE	HOR. 1"=40' VERT. N/A
DESIGN/APPR.	
DRAWN BY	BO
DATE	05/06/13
SHEET	2 OF 2

FILE G:\1009124\SURVEY\REPLAT D\P17 REPLAD D

03364737
Page 1 of 2
DF: $0.00
RF: $21.00
02/04/2014 08:59 AM
Boulder County Clerk, CO

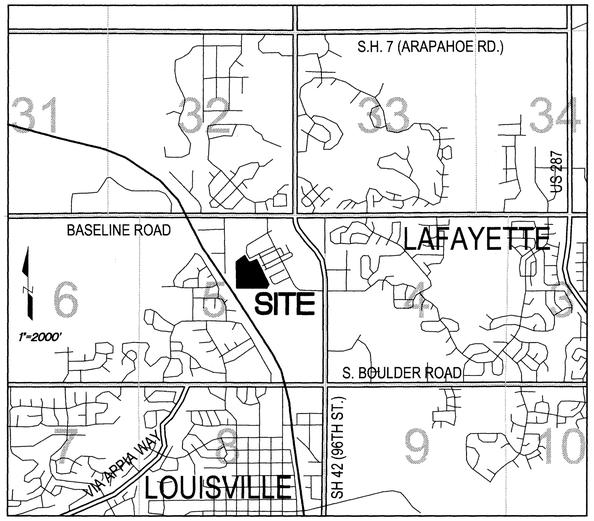
INDIAN PEAKS FILING NO. 17 REPLAT E

A REPLAT OF INDIAN PEAKS FILING NO. 17 REPLAT C TRACT C1
LOCATED IN THE NORTHEAST QUARTER OF SECTION 5,
TOWNSHIP 1 SOUTH, RANGE 69 WEST OF THE 6TH P.M.,
CITY OF LAFAYETTE, COUNTY OF BOULDER, STATE OF COLORADO
35 LOTS, 3 OUTLOTS & 1 TRACT – 22.32 ACRES



CURVE TABLE					
CURVE	LENGTH	RADIUS	DELTA	CHORD	BEARING
C1	3.31'	122.50'	1°32'57"	3.31'	S25°30'57"E
C2	39.27'	25.00'	90°00'00"	35.36'	S18°42'34"W
C3	39.27'	25.00'	90°00'00"	35.36'	S71°17'26"E

LINE TABLE		
LINE	BEARING	LENGTH
L1	S26°17'26"E	45.00'
L2	S63°42'34"W	9.50'
L3	S26°17'26"E	36.00'
L4	N63°42'34"E	32.35'
L5	S63°42'34"W	39.85'



VICINITY MAP

NOTES:

1) NOTICE: ACCORDING TO COLORADO LAW, YOU MUST COMMENCE ANY LEGAL ACTION BASED UPON ANY DEFECT IN THIS SURVEY WITHIN THREE YEARS AFTER YOU FIRST DISCOVER SUCH DEFECT. IN NO EVENT MAY ANY ACTION BASED UPON ANY DEFECT IN THIS SURVEY BE COMMENCED MORE THAN TEN YEARS FROM THE DATE OF THE CERTIFICATION SHOWN HEREON.

2) BASIS OF BEARINGS: THE WESTERLY LINE OF INDIAN PEAKS FILING NO. 17 REPLAT C, BEING S00°09'31"W BETWEEN CORNERS AS MONUMENTED BY REBARS WITH 1" PLASTIC CAPS, STAMPED PLS 37990, AS SHOWN ON THE "INDIAN PEAKS FILING NO. 17 REPLAT C" PLAT.

3) THE PURPOSE OF THIS REPLAT IS TO CREATE 35 LOTS, 3 OUTLOTS AND 1 TRACT FROM AN EXISTING TRACT.

4) PER INDIAN PEAKS FILING NO. 17 FINAL PLAT, ALL LOTS, OUTLOTS, AND TRACTS OF INDIAN PEAKS FILING NO. 17 SHOWN ON THIS PLAT ARE BURDENED WITH A PERPETUAL, NON EXCLUSIVE EASEMENT PERMITTING TRAIN NOISE AND VIBRATION TO ENTER ON THE SAME FROM THE ADJACENT BURLINGTON NORTHERN SANTA FE RAIL ROAD. UNDER NO CIRCUMSTANCES SHALL THE CITY OF LAFAYETTE, ITS OFFICERS, EMPLOYEES OR AGENTS AND ITS SUCCESSORS AND ASSIGNS, MC3 HOLDINGS, LLC, INDIAN PEAKS SOUTH, LLC, INDIAN PEAKS SOUTH 2, LLC AND BRADDOCK ENTERPRISES L.P. BE HELD LIABLE FOR ANY DAMAGE OR INJURY RESULTING FROM NOISE OR VIBRATION FROM THE EXISTING BNSF OR FUTURE FASTRACKS TRAINS ON SAID LOTS, AND OUTLOTS AND TRACTS OF THIS SUBDIVISION.

5) PROPERTY IS LOCATED IN UNSHADED ZONE X (AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN PER FEMA FLOOD INFORMATION RATE MAP PANEL NUMBER 08013C0582J WITH AN EFFECTIVE DATE OF 12/18/2012.

6) ALL OUTLOTS SHALL BE OWNED AND MAINTAINED BY THE INDIAN PEAKS SOUTH HOMEOWNER'S ASSOCIATION.

7) A BLANKET PEDESTRIAN EASEMENT ACROSS OUTLOT A IS DEDICATED BY THIS PLAT.

8) EXTERIOR OF SUBDIVISION MONUMENTED WITH 1" PLASTIC CAPS MARKED "PLS 37990" SET ON #5 REBAR.

9) THIS PLAT IS SUBJECT TO THE INDIAN PEAKS FILING NO. 17 REPLAT E DEVELOPMENT AGREEMENT RECORDED CONCURRENTLY WITH THIS PLAT.

10) THIS PLAT IS SUBJECT TO THE COMMUNITY CHARTER FOR INDIAN PEAKS SOUTH IN THE REAL PROPERTY RECORDS OF BOULDER COUNTY, STATE OF COLORADO ON AUGUST 28, 2007, AT RECEPTION NO. 2879363, AS AMENDED BY FIRST AMENDMENT RECORDED IN THE REAL PROPERTY RECORDS OF BOULDER COUNTY, COLORADO ON APRIL 14, 2008, AT RECEPTION NO. 2923170, AND BY SECOND AMENDMENT RECORDED IN THE REAL PROPERTY RECORDS OF BOULDER COUNTY, COLORADO ON SEPTEMBER 24, 2008, AT RECEPTION NO. 2956490, AND BY SECOND AMENDMENT RECORDED IN THE REAL PROPERTY RECORDS OF BOULDER COUNTY, COLORADO ON AUGUST 23, 2012, AT RECEPTION NO. 03246469, AND BY THIRD AMENDMENT RECORDED IN THE REAL PROPERTY RECORDS OF BOULDER COUNTY, COLORADO ON MAY 01, 2013, AT RECEPTION NO. 03308830, AND BY FOURTH AMENDMENT RECORDED IN THE REAL PROPERTY RECORDS OF BOULDER COUNTY, COLORADO ON JULY 31, 2013, AT RECEPTION NO. 03331760 ("THE "CHARTER").

DEDICATION AND OWNERSHIP CERTIFICATE

KNOW ALL MEN BY THESE PRESENTS THAT THE UNDERSIGNED, BEING THE SOLE OWNER OF ALL THAT REAL PROPERTY SITUATED IN BOULDER COUNTY, COLORADO, AND LYING WITHIN THE EXTERIOR BOUNDARY OF "INDIAN PEAKS FILING NO. 17 REPLAT E" A SUBDIVISION OF A PORTION OF THE NORTHEAST QUARTER OF SECTION 5, T1S, R69W OF THE 6TH P.M. CITY OF LAFAYETTE, COUNTY OF BOULDER, STATE OF COLORADO DESCRIBED AS FOLLOWS:

TRACT C1 OF "INDIAN PEAKS FILING NO. 17 REPLAT C" AS RECORDED 08/23/2012 AT RECEPTION NO. 3246466, CONTAINING 22.32 ACRES, MORE OR LESS;

HAVE BY THESE PRESENTS LAID OUT, PLATTED AND SUBDIVIDED THE SAME INTO TRACTS, LOTS AND OUTLOTS AS SHOWN HEREON AND DESIGNATE THE SAME AS "INDIAN PEAKS FILING NO. 17 REPLAT E" IN THE CITY OF LAFAYETTE, COUNTY OF BOULDER, STATE OF COLORADO AND DO HEREBY DEDICATE AND CONVEY TO THE CITY OF LAFAYETTE, COLORADO, FOR PUBLIC USE THE STREETS, ROADS, DRIVES, LANES, WAYS AND RIGHTS-OF-WAY (R.O.W.), THE PEDESTRIAN EASEMENTS SHOWN HEREON FOR PEDESTRIAN PURPOSES ONLY THE UTILITY EASEMENTS SHOWN HEREON FOR UTILITY PURPOSES ONLY, AND DRAINAGE AND UTILITY EASEMENTS SHOWN HEREON FOR DRAINAGE AND UTILITY PURPOSES ONLY.

EXECUTED THIS 23rd DAY OF December 2013 A.D.,

BRADDOCK ENTERPRISES, L.P.
A PENNSYLVANIA LIMITED PARTNERSHIP

BY: BRADDOCK INVESTMENTS, L.P.
A PENNSYLVANIA LIMITED PARTNERSHIP
ITS GENERAL PARTNER

BY: PANCO, LLC
A PENNSYLVANIA LIMITED LIABILITY COMPANY
ITS GENERAL PARTNER

BY: _____
WILLIAM P. PISZEK
CO-MANAGER

BY: _____
HELEN P. NELSON
CO-MANAGER

ACKNOWLEDGMENT

COMMONWEALTH OF PENNSYLVANIA)
) SS
COUNTY OF Montgomery)

THE FOREGOING INSTRUMENT WAS ACKNOWLEDGED BEFORE ME THIS 23rd DAY OF December, 2013, BY WILLIAM P. PISZEK AND HELEN P. NELSON AS CO-MANAGERS OF PANCO, LLC, A PENNSYLVANIA LIMITED LIABILITY COMPANY, GENERAL PARTNER OF BRADDOCK INVESTMENTS, L.P., GENERAL PARTNER OF BRADDOCK ENTERPRISES, L.P., A PENNSYLVANIA LIMITED PARTNERSHIP.

WITNESS MY HAND AND OFFICIAL SEAL.

MY COMMISSION EXPIRES: _____

_____
NOTARY PUBLIC

COMMONWEALTH OF PENNSYLVANIA
NOTARIAL SEAL
P. Gail Nolan, Notary Public
Montgomery County
My Commission Expires October 16, 2016
Member, Pennsylvania Association of Notaries

PLANNING COMMISSION CERTIFICATE

THE PRELIMINARY PLAT FOR "INDIAN PEAKS FILING NO. 17 REPLAT C" WAS APPROVED BY THE CITY OF LAFAYETTE PLANNING COMMISSION ON APRIL 24, 2012, A.D.

_____
CHAIRPERSON

_____
ATTEST: SECRETARY

CITY ADMINISTRATOR'S CERTIFICATE

I, GARY KLAPHAKE, CITY ADMINISTRATOR OF THE CITY OF LAFAYETTE, COLORADO, HEREBY CERTIFY THAT I HAVE EXAMINED THE FINAL PLAT AND IT APPEARS TO BE IN COMPLIANCE WITH ALL APPLICABLE ORDINANCES OF THE CITY AND THAT A DEVELOPMENT AGREEMENT HAS BEEN EXECUTED BY THE DEVELOPER AND ACCEPTED BY THE CITY.

_____
CITY ADMINISTRATOR

_____
ATTEST: CITY CLERK

REVIEW CERTIFICATES

_____
CITY OF LAFAYETTE ENGINEER

CITY COUNCIL CERTIFICATE

THIS FINAL PLAT OF INDIAN PEAKS FILING NO. 17 REPLAT E IS APPROVED BY THE CITY COUNCIL OF THE CITY OF LAFAYETTE, BOULDER COUNTY, COLORADO, THIS 21st DAY OF January A.D., 2014, AND MAY BE FILED WITH THE CLERK AND RECORDER OF BOULDER COUNTY. ALL PUBLIC DEDICATIONS SHOWN HEREON ARE ACCEPTED BY THE CITY, SUBJECT TO THE PROVISION THAT NEITHER APPROVAL NOR ACCEPTANCE OBLIGATES THE CITY OF LAFAYETTE, FOR THE FINANCING OR CONSTRUCTING OF IMPROVEMENTS ON LAND OR EASEMENTS TO THE CITY EXCEPT AS SPECIFICALLY AGREED TO BY THE CITY COUNCIL.

_____
MAYOR

WITNESS MY HAND AND OFFICIAL SEAL OF THE CITY OF LAFAYETTE

_____
ATTEST: CITY CLERK

CITY OF LAFAYETTE HOME RULE APRIL 1, 1978 BOULDER COUNTY, COLORADO

TITLE COMPANY'S CERTIFICATE

I, Jon Lochhart A Title Examiner REPRESENTING LAND TITLE GUARANTEE COMPANY, CERTIFY THAT I HAVE EXAMINED TITLE TO THE DESCRIBED LAND DEDICATION TO THE CITY OF LAFAYETTE, COLORADO, AND THAT THE PARTIES EXECUTING THE DEDICATION ARE THE OWNERS THEREOF IN FEE SIMPLE, AND THE DEDICATED LAND IS FREE AND CLEAR OF ALL LIENS AND ENCUMBRANCES EXCEPT AS PROVIDED FOR IN TITLE COMMITMENT NO. F10322382 DATED 11-29-2013.

_____
NAME

Title Examiner
TITLE

EXECUTED THIS 30th DAY OF December A.D., 2013

SURVEYOR'S CERTIFICATE

FOR AND ON BEHALF OF HURST & ASSOCIATES, INC., I, BO BAIZE, DO HEREBY CERTIFY THAT I AM A DULY REGISTERED PROFESSIONAL LAND SURVEYOR LICENSED UNDER THE LAWS OF THE STATE OF COLORADO, THAT THIS PLAT IS A TRUE, CORRECT AND COMPLETE PLAT OF "INDIAN PEAKS FILING NO. 17 REPLAT E" AS LAID OUT, PLATTED, DEDICATED AND SHOWN HEREON, THAT SUCH PLAT WAS MADE FROM AN ACCURATE SURVEY OF SAID PROPERTY BY ME AND UNDER MY DIRECT RESPONSIBILITY, SUPERVISION AND CHECKING AND CORRECTLY SHOWS THE LOCATION AND DIMENSIONS OF THE TRACTS STAKED UPON THE GROUND IN COMPLIANCE WITH ARTICLES 50-53 OF TILE 38, COLORADO REVISED STATUES GOVERNING THE SUBDIVISION OF LAND.

IN WITNESS WHEREOF, I HAVE SET MY HAND AND SEAL THIS 03rd DAY OF January, 2014 A.D.

_____
BO BAIZE
COLORADO LICENSED PROFESSIONAL
LAND SURVEYOR NO. 37990
2550 BROADWAY, SUITE B
BOULDER, CO 80304
303-449-9105

COLORADO LICENSED BO BAIZE 37990 PROFESSIONAL LAND SURVEYOR

COUNTY CLERK & RECORDER'S CERTIFICATE

STATE OF COLORADO)
) SS
COUNTY OF BOULDER)

I HEREBY CERTIFY THAT THIS PLAT WAS FILED IN MY OFFICE AT 8:38 O'CLOCK, A M. ON THE 4th DAY OF February, 2014, AND IS DULY RECORDED AT RECEPTION NO. 03364737 AND PLAN FILE P- F- # FEES PAID: $ 21.00

Hillary Hall
COUNTY CLERK & RECORDER

BY: DEPUTY

INDIAN PEAKS FILING NO. 17 REPLAT E
FINAL PLAT
LAFAYETTE, COLORADO

DATE 08/12/13		SCALE HOR. 1"=100' VERT. N/A	
REVISED 09/09/13			
11/26/13	HURST CIVIL ENGINEERING PLANNING SURVEYING	2500 Broadway, Suite B Boulder, CO 80304 303.449.9105 www.hurst-assoc.com	DESIGN/APPR. BO
			DRAWN BY BO
			SHEET 1 OF 2

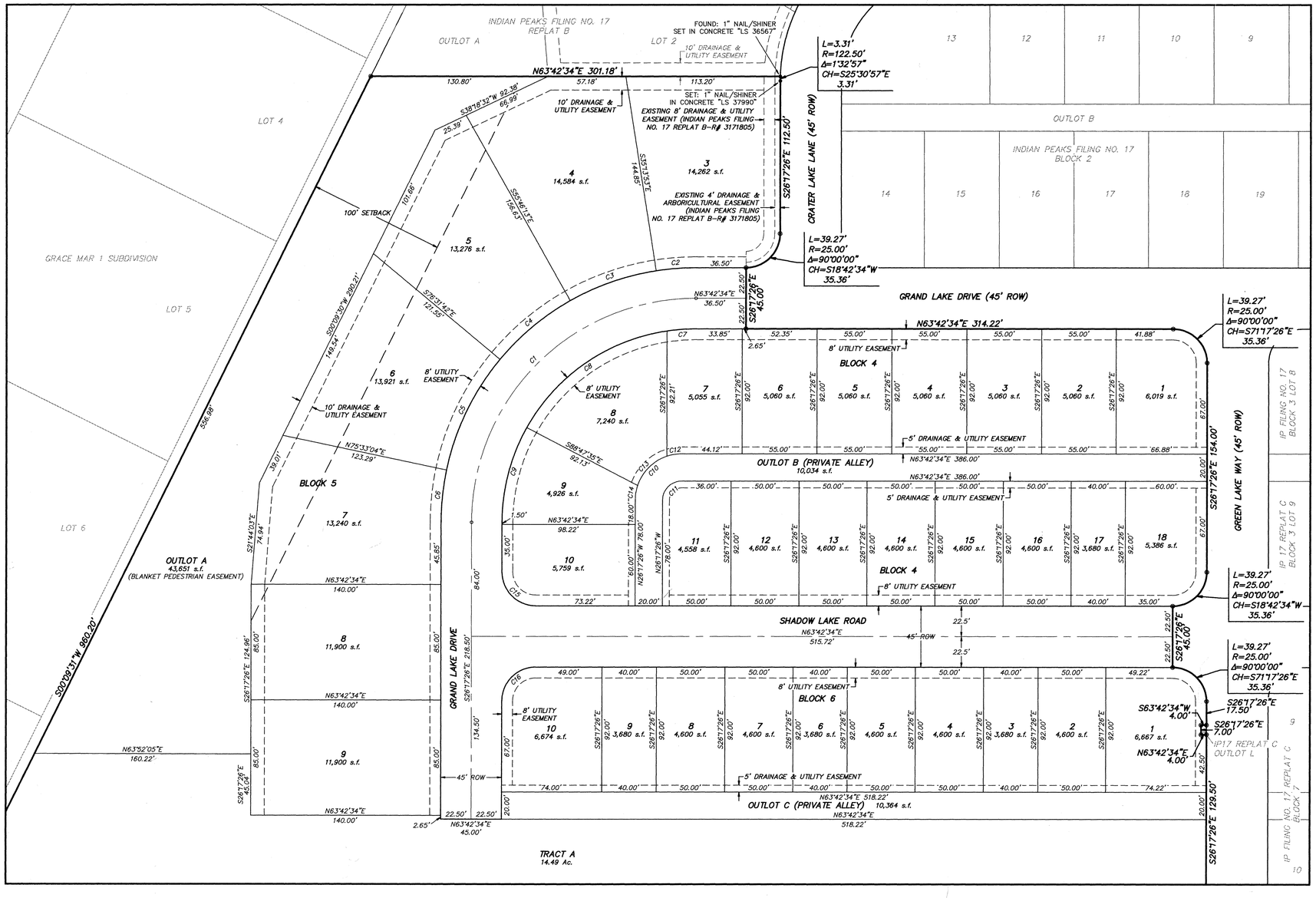
FILE G:\1009124\SURVEY\REPLAT E\IP17 REPLAT E

COVER ONLY REV: 12/12/13

Boulder County, CO 03364737 2 of 2

INDIAN PEAKS FILING NO. 17 REPLAT E

SHEET 2 OF 2



CURVE TABLE					
CURVE	LENGTH	RADIUS	DELTA	CHORD	BEARING
C1	259.18'	165.00'	90°00'00"	233.35'	S18°42'34"W
C2	29.26'	187.50'	8°56'27"	29.23'	S59°14'21"W
C3	67.21'	187.50'	20°32'20"	66.85'	S44°29'57"W
C4	67.93'	187.50'	20°45'29"	67.56'	S23°51'03"W
C5	91.37'	187.50'	27°55'14"	90.47'	S00°29'19"E
C6	38.75'	187.50'	11°50'30"	38.68'	S20°22'11"E
C7	21.23'	142.50'	8°32'10"	21.21'	S59°26'29"W
C8	129.74'	142.50'	52°09'50"	125.30'	S29°05'29"W
C9	72.87'	142.50'	29°18'00"	72.08'	S11°38'26"E
C10	53.41'	34.00'	90°00'00"	48.08'	S18°42'34"W
C11	21.99'	14.00'	90°00'00"	19.80'	S18°42'34"W
C12	11.07'	34.00'	18°39'24"	11.02'	S54°22'52"W
C13	31.45'	34.00'	53°00'02"	30.34'	S18°33'09"W
C14	10.88'	34.00'	18°20'34"	10.84'	S17°07'09"E
C15	39.27'	25.00'	90°00'00"	35.36'	S71°17'26"E
C16	39.27'	25.00'	90°00'00"	35.36'	S18°42'34"W

0 20 40 80

1 inch = 40 ft.

INDIAN PEAKS FILING NO. 17 REPLAT E

FINAL PLAT

LAFAYETTE, COLORADO

HURST
CIVIL ENGINEERING
PLANNING
SURVEYING
2500 Broadway, Suite B
Boulder, CO 80304
303.449.9105
www.hurst-assoc.com

SCALE	HOR. 1"=40' VERT. N/A
DESIGN/APPR.	
DRAWN BY	BO
DATE	11/25/13
SHEET	2 OF 2

FILE G:\1009124\SURVEY\REPLAT E\IP17 REPLAT E

INDIAN PEAKS FILING NO. 17 REPLAT F

A REPLAT OF INDIAN PEAKS FILING NO. 17 REPLAT E TRACT A
LOCATED IN THE NORTHEAST QUARTER OF SECTION 5,
TOWNSHIP 1 SOUTH, RANGE 69 WEST OF THE 6TH P.M.,
CITY OF LAFAYETTE, COUNTY OF BOULDER, STATE OF COLORADO
50 LOTS & 5 OUTLOTS – 14.49 ACRES

DEDICATION AND OWNERSHIP CERTIFICATE

KNOW ALL MEN BY THESE PRESENTS THAT THE UNDERSIGNED, BEING THE SOLE OWNER OF ALL THAT REAL PROPERTY SITUATED IN BOULDER COUNTY, COLORADO, AND LYING WITHIN THE EXTERIOR BOUNDARY OF "INDIAN PEAKS FILING NO. 17 REPLAT F" A SUBDIVISION OF A PORTION OF THE NORTHEAST QUARTER OF SECTION 5, T1S, R69W OF THE 6TH P.M. CITY OF LAFAYETTE, COUNTY OF BOULDER, STATE OF COLORADO DESCRIBED AS FOLLOWS:

TRACT A OF "INDIAN PEAKS FILING NO. 17 REPLAT E" AS RECORDED 02/04/2014 AT RECEPTION NO. 3364737, CONTAINING 14.49 ACRES, MORE OR LESS;

HAVE BY THESE PRESENTS LAID OUT, PLATTED AND SUBDIVIDED THE SAME INTO TRACTS, LOTS AND OUTLOTS AS SHOWN HEREON AND DESIGNATE THE SAME AS "INDIAN PEAKS FILING NO. 17 REPLAT F" IN THE CITY OF LAFAYETTE, COUNTY OF BOULDER, STATE OF COLORADO AND DO HEREBY DEDICATE AND CONVEY TO THE CITY OF LAFAYETTE, COLORADO, FOR PUBLIC USE THE STREETS AND RIGHTS-OF-WAY (R.O.W.), THE UTILITY EASEMENTS SHOWN HEREON FOR UTILITY PURPOSES ONLY, AND DRAINAGE AND UTILITY EASEMENTS SHOWN HEREON FOR DRAINAGE AND UTILITY PURPOSES ONLY.

EXECUTED THIS 18th DAY OF February, 2015 A.D.,

BRADDOCK ENTERPRISES, L.P.
A PENNSYLVANIA LIMITED PARTNERSHIP

BY: BRADDOCK INVESTMENTS, L.P.
A PENNSYLVANIA LIMITED PARTNERSHIP
GENERAL PARTNER

BY: PANCO, LLC
A PENNSYLVANIA LIMITED LIABILITY COMPANY
GENERAL PARTNER

BY: Helen P. Nelson
HELEN P. NELSON
MANAGER

ACKNOWLEDGMENT

COMMONWEALTH OF PENNSYLVANIA)
) SS
COUNTY OF Montgomery)

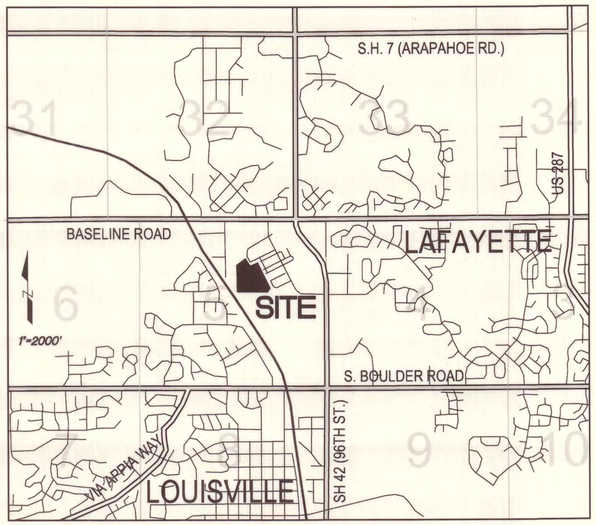
THE FOREGOING INSTRUMENT WAS ACKNOWLEDGED BEFORE ME THIS 18th DAY OF February, 2015 BY HELEN P. NELSON AS MANAGER OF PANCO, LLC, A PENNSYLVANIA LIMITED LIABILITY COMPANY, GENERAL PARTNER OF BRADDOCK INVESTMENTS, L.P., GENERAL PARTNER OF BRADDOCK ENTERPRISES, L.P., A PENNSYLVANIA LIMITED PARTNERSHIP.

WITNESS MY HAND AND OFFICIAL SEAL.

MY COMMISSION EXPIRES: _____

P. Erik Nelson
NOTARY PUBLIC

COMMONWEALTH OF PENNSYLVANIA
Notarial Seal
P. Erik Nelson, Notary Public
Upper Dublin Twp., Montgomery County
My Commission Expires March 25, 2015
MEMBER, PENNSYLVANIA ASSOCIATION OF NOTARIES



VICINITY MAP

NOTES:

1) NOTICE: ACCORDING TO COLORADO LAW, YOU MUST COMMENCE ANY LEGAL ACTION BASED UPON ANY DEFECT IN THIS SURVEY WITHIN THREE YEARS AFTER YOU FIRST DISCOVER SUCH DEFECT. IN NO EVENT MAY ANY ACTION BASED UPON ANY DEFECT IN THIS SURVEY BE COMMENCED MORE THAN TEN YEARS FROM THE DATE OF THE CERTIFICATION SHOWN HEREON.

2) BASIS OF BEARINGS: THE WESTERLY LINE OF INDIAN PEAKS FILING NO. 17 REPLAT C, BEING S00°09'31"W BETWEEN THE NORTHWESTERLY CORNER (1" PLASTIC CAP, STAMPED PLS 37990) AND THE SOUTHWESTERLY CORNER (2" ALUMINUM CAP, STAMPED PLS 15315) TO MATCH THE "INDIAN PEAKS FILING NO. 17 REPLAT C" PLAT.

3) THE PURPOSE OF THIS REPLAT IS TO CREATE 50 LOTS AND 5 OUTLOTS FROM AN EXISTING TRACT.

4) PER INDIAN PEAKS FILING NO. 17 FINAL PLAT, ALL LOTS, OUTLOTS, AND TRACTS OF INDIAN PEAKS FILING NO. 17 SHOWN ON THIS PLAT ARE BURDENED WITH A PERPETUAL, NON EXCLUSIVE EASEMENT PERMITTING TRAIN NOISE AND VIBRATION TO ENTER ON THE SAME FROM THE ADJACENT BURLINGTON NORTHERN SANTA FE RAIL ROAD. UNDER NO CIRCUMSTANCES SHALL THE CITY OF LAFAYETTE, ITS OFFICERS, EMPLOYEES OR AGENTS AND ITS SUCCESSORS AND ASSIGNS, MC3 HOLDINGS, LLC, INDIAN PEAKS SOUTH, LLC, INDIAN PEAKS SOUTH 2, LLC, INDIAN PEAKS SOUTH 3, LLC AND BRADDOCK ENTERPRISES L.P. BE HELD LIABLE FOR ANY DAMAGE OR INJURY RESULTING FROM NOISE OR VIBRATION FROM THE EXISTING BNSF OR FUTURE FASTRACKS TRAINS ON SAID LOTS, AND OUTLOTS AND TRACTS OF THIS SUBDIVISION.

5) PROPERTY IS LOCATED IN UNSHADED ZONE X (AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN PER FEMA FLOOD INFORMATION RATE MAP PANEL NUMBER 08013C0582J WITH AN EFFECTIVE DATE OF 12/18/2012.

6) ALL OUTLOTS SHALL BE OWNED AND MAINTAINED BY THE INDIAN PEAKS SOUTH HOMEOWNER'S ASSOCIATION.

7) A BLANKET PEDESTRIAN EASEMENT ACROSS OUTLOTS A AND D IS DEDICATED BY THIS PLAT. A BLANKET UTILITY EASEMENT AND A BLANKET DRAINAGE EASEMENT ACROSS OUTLOTS A, B, C AND D ARE DEDICATED BY THIS PLAT.

8) SEE SHEET 2 FOR SUBDIVISION CORNER MONUMENTATION.

9) THIS PLAT IS SUBJECT TO THE INDIAN PEAKS FILING NO. 17 REPLAT F DEVELOPMENT AGREEMENT RECORDED CONCURRENTLY WITH THIS PLAT.

10) THIS PLAT IS SUBJECT TO THE COMMUNITY CHARTER FOR INDIAN PEAKS SOUTH IN THE REAL PROPERTY RECORDS OF BOULDER COUNTY, STATE OF COLORADO ON AUGUST 28, 2007, AT RECEPTION NO. 2879363, AS AMENDED BY FIRST AMENDMENT RECORDED IN THE REAL PROPERTY RECORDS OF BOULDER COUNTY, COLORADO ON APRIL 14, 2008, AT RECEPTION NO. 2923170, AND BY SECOND AMENDMENT RECORDED IN THE REAL PROPERTY RECORDS OF BOULDER COUNTY, COLORADO ON SEPTEMBER 24, 2008, AT RECEPTION NO. 2956490, AND BY SECOND AMENDMENT RECORDED IN THE REAL PROPERTY RECORDS OF BOULDER COUNTY, COLORADO ON AUGUST 23, 2012, AT RECEPTION NO. 03246469, AND BY THIRD AMENDMENT RECORDED IN THE REAL PROPERTY RECORDS OF BOULDER COUNTY, COLORADO ON MAY 01, 2013, AT RECEPTION NO. 03308830, AND BY FOURTH AMENDMENT RECORDED IN THE REAL PROPERTY RECORDS OF BOULDER COUNTY, COLORADO ON JULY 31, 2013, AT RECEPTION NO. 03331760 ("THE "CHARTER").

PLANNING COMMISSION CERTIFICATE

THE PRELIMINARY PLAT FOR "INDIAN PEAKS FILING NO. 17 REPLAT C" WAS APPROVED BY THE CITY OF LAFAYETTE PLANNING COMMISSION ON APRIL 24, 2012, A.D.

CHAIRPERSON

Michelle Verrastro
ATTEST: SECRETARY

CITY COUNCIL CERTIFICATE

THIS FINAL PLAT (SUBDIVISION) IS APPROVED BY THE CITY COUNCIL OF THE CITY OF LAFAYETTE, BOULDER COUNTY, COLORADO, THIS ____ DAY OF _____ A.D., 20____, AND MAY BE FILED WITH THE CLERK AND RECORDER OF BOULDER COUNTY. ALL PUBLIC DEDICATIONS SHOWN HEREON ARE ACCEPTED BY THE CITY, SUBJECT TO THE PROVISION THAT NEITHER APPROVAL NOR ACCEPTANCE OBLIGATES THE CITY OF LAFAYETTE, FOR THE FINANCING OR CONSTRUCTING OF IMPROVEMENTS ON LAND OR EASEMENTS TO THE CITY EXCEPT AS SPECIFICALLY AGREED TO BY THE CITY COUNCIL.

MAYOR

WITNESS MY HAND AND OFFICIAL SEAL OF THE CITY OF LAFAYETTE

Susan Kosten
ATTEST: CITY CLERK

CITY OF LAFAYETTE HOME RULE APRIL 1, 1958 BOULDER COUNTY, COLORADO

TITLE COMPANY'S CERTIFICATE

I, BRUCE ROSELLEN, A TITLE OFFICER REPRESENTING LAND TITLE GUARANTEE COMPANY, CERTIFY THAT I HAVE EXAMINED TITLE TO THE DESCRIBED LAND DEDICATION TO THE CITY OF LAFAYETTE, COLORADO, AND THAT THE PARTIES EXECUTING THE DEDICATION ARE THE OWNERS THEREOF IN FEE SIMPLE, AND THE DEDICATED LAND IS FREE AND CLEAR OF ALL LIENS AND ENCUMBRANCES EXCEPT AS PROVIDED FOR IN TITLE COMMITMENT NO. ABR70432933-T DATED 2/10/15.

Bruce Rosellen
NAME

TITLE OFFICER
TITLE

EXECUTED THIS 24th DAY OF FEBRUARY A.D., 2015

SURVEYOR'S CERTIFICATE

FOR AND ON BEHALF OF HURST & ASSOCIATES, INC., I, BO BAIZE, DO HEREBY CERTIFY THAT I AM A DULY REGISTERED PROFESSIONAL LAND SURVEYOR LICENSED UNDER THE LAWS OF THE STATE OF COLORADO, THAT THIS PLAT IS A TRUE, CORRECT AND COMPLETE PLAT OF "INDIAN PEAKS FILING NO. 17 REPLAT F" AS LAID OUT, PLATTED, DEDICATED AND SHOWN HEREON, THAT SUCH PLAT WAS MADE FROM AN ACCURATE SURVEY OF SAID PROPERTY BY ME AND UNDER MY DIRECT RESPONSIBILITY, SUPERVISION AND CHECKING AND CORRECTLY SHOWS THE LOCATION AND DIMENSIONS OF THE TRACTS STAKED UPON THE GROUND IN COMPLIANCE WITH ARTICLES 50-53 OF TILE 38, COLORADO REVISED STATUES GOVERNING THE SUBDIVISION OF LAND.

IN WITNESS WHEREOF, I HAVE SET MY HAND AND SEAL THIS 11th DAY OF FEBRUARY 2015 A.D.

COLORADO LICENSED BO BAIZE 37990 PROFESSIONAL LAND SURVEYOR

BO BAIZE
COLORADO LICENSED PROFESSIONAL
LAND SURVEYOR NO. 37990
2550 BROADWAY, SUITE B
BOULDER, CO 80304
303-449-9105

CITY ADMINISTRATOR'S CERTIFICATE

I, GARY KLAPHAKE, CITY ADMINISTRATOR OF THE CITY OF LAFAYETTE, COLORADO, HEREBY CERTIFY THAT I HAVE EXAMINED THE FINAL PLAT AND IT APPEARS TO BE IN COMPLIANCE WITH ALL APPLICABLE ORDINANCES OF THE CITY AND THAT A DEVELOPMENT AGREEMENT HAS BEEN EXECUTED BY THE DEVELOPER AND ACCEPTED BY THE CITY.

CITY ADMINISTRATOR

Susan Kosten
ATTEST: CITY CLERK

REVIEW CERTIFICATES

CITY OF LAFAYETTE ENGINEER

COUNTY CLERK & RECORDER'S CERTIFICATE

STATE OF COLORADO)
) SS
COUNTY OF BOULDER)

I HEREBY CERTIFY THAT THIS PLAT WAS FILED IN MY OFFICE AT _____ O'CLOCK, __ M. ON THE _____ DAY OF _____, 20___, AND IS DULY RECORDED AT RECEPTION NO. _____ AND PLAN FILE P-__ F-__ # _____. FEES PAID: $_____

COUNTY CLERK & RECORDER

BY: DEPUTY

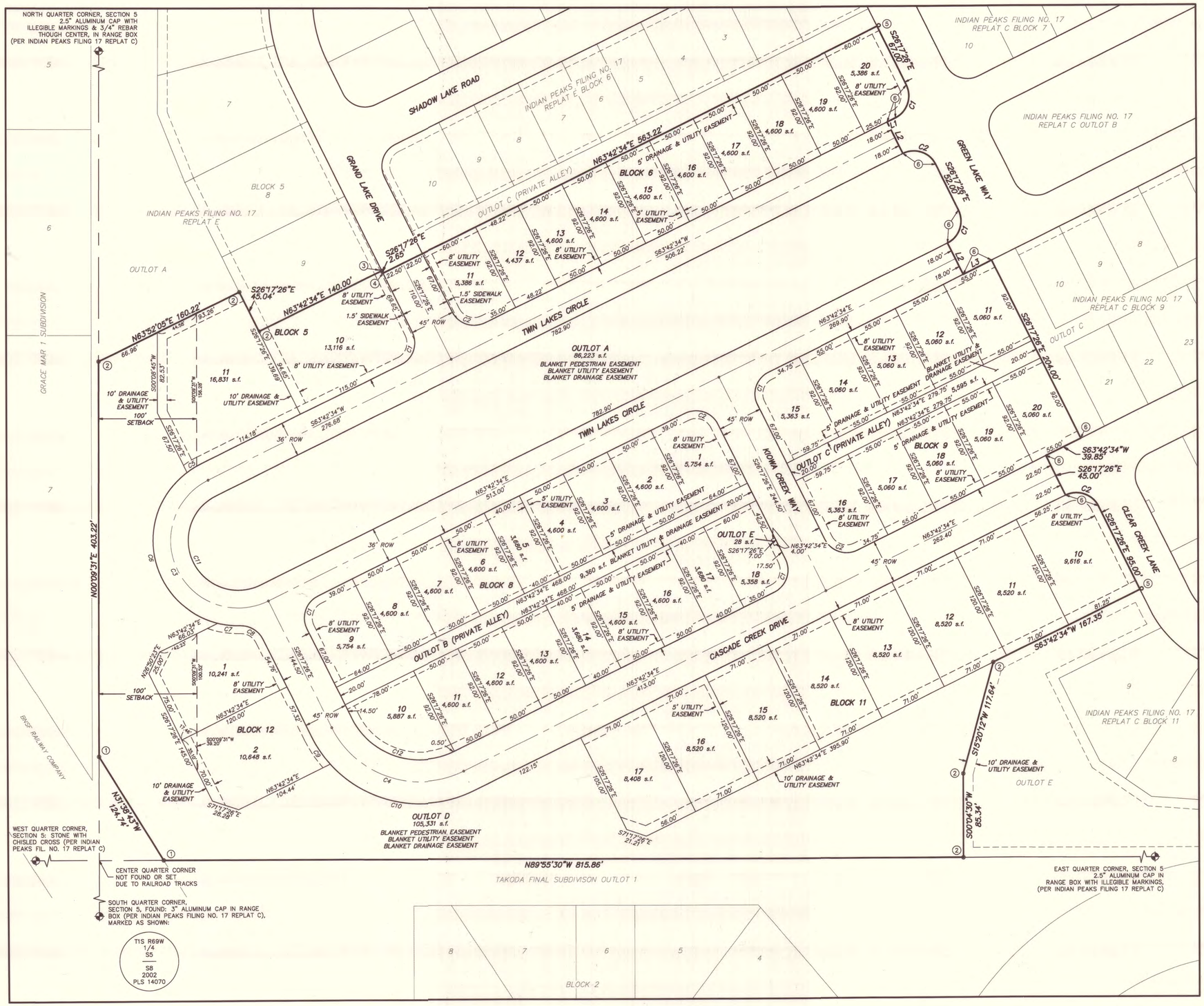
INDIAN PEAKS FILING NO. 17
REPLAT F
FINAL PLAT
LAFAYETTE, COLORADO

DATE 09/24/14	HURST CIVIL ENGINEERING PLANNING SURVEYING	2500 Broadway, Suite B Boulder, CO 80304 303.449.9105 www.hurst-assoc.com	SCALE HOR. N/A VERT. N/A
REVISED 10/28/14			
01/29/15			DESIGN/APPR. BO
			DRAWN BY BO
			SHEET 1 OF 2

FILE G:\1009124\SURVEY\REPLAT F\IP17 REPLAT F

INDIAN PEAKS FILING NO. 17 REPLAT F

SHEET 2 OF 2



CURVE TABLE					
CURVE	LENGTH	RADIUS	DELTA	CHORD	BEARING
C1	39.27'	25.00'	90°00'00"	35.36'	N18°42'34"E
C2	39.27'	25.00'	90°00'00"	35.36'	N71°17'26"W
C3	216.77'	69.00'	180°00'00"	138.00'	S26°17'26"E
C4	157.08'	100.00'	90°00'00"	141.42'	S71°17'26"E
C5	15.91'	87.00'	10°28'49"	15.89'	S58°28'11"W
C6	195.95'	87.00'	129°02'58"	157.08'	S11°17'42"E
C7	23.35'	87.00'	15°22'35"	23.28'	S83°30'29"E
C8	28.32'	25.00'	64°54'21"	26.83'	N58°44'36"W
C9	33.09'	122.50'	15°28'28"	32.98'	S34°01'40"E
C10	159.34'	122.50'	74°31'32"	148.34'	S79°01'40"E
C11	160.22'	51.00'	180°00'00"	102.00'	S26°17'26"E
C12	121.74'	77.50'	90°00'00"	109.60'	S71°17'26"E

LINE TABLE		
LINE	BEARING	LENGTH
L1	S63°42'34"W	9.50'
L2	S26°17'26"E	36.00'
L3	N63°42'34"E	32.35'

CORNER MONUMENTATION:

1. – FOUND 2" ALUMINUM CAP, "ORTHMAN PLS 1535"
2. – NOTHING FOUND, SET 1" PLASTIC CAP, "PLS 37990" ON #5 REBAR
3. – FOUND NAIL/SHINER IN WALK, "LS 37990"
4. – NOT FOUND, NOT SET TO AVOID CONFUSION WITH LOT 10 CORNER
5. – NOTHING FOUND, SET NAIL/SHINER "LS 37990" AT 2' OFFSET TO CORNER
6. – NOTHING FOUND, DID NOT SET DUE TO CONSTRUCTION ACTIVITY; WILL SET NAIL/SHINER OFFSETS IN WALK AFTER CONSTRUCTION

COLORADO LICENSED
BO BAIZE
01/29/15
37990
PROFESSIONAL LAND SURVEYOR

0 25 50 100
1 inch = 50 ft.

INDIAN PEAKS FILING NO. 17 REPLAT F

FINAL PLAT

LAFAYETTE, COLORADO

HURST
CIVIL ENGINEERING
PLANNING
SURVEYING
2500 Broadway, Suite B
Boulder, CO 80304
303.449.9105
www.hurst-assoc.com

SCALE	HOR. 1"=50' VERT. N/A
DESIGN/APPR.	
DRAWN BY	BO
DATE	01/29/15
SHEET	2 OF 2

FILE G:\1009124\SURVEY\REPLAT F\IP17 REPLAT F

INDIAN PEAKS FILING NO. 17 REPLAT G

A REPLAT OF TRACT A1 AND A PORTION OF OUTLOT F, INDIAN PEAKS FILING NO. 17 REPLAT C

LOCATED IN THE NORTHEAST QUARTER OF SECTION 5,
TOWNSHIP 1 SOUTH, RANGE 69 WEST OF THE 6TH PRINCIPAL MERIDIAN,
CITY OF LAFAYETTE, COUNTY OF BOULDER, STATE OF COLORADO
25 LOTS, 4 OUTLOTS & 1 TRACT – 8.84 ACRES

DEDICATION AND OWNERSHIP CERTIFICATE

KNOW ALL MEN BY THESE PRESENTS THAT THE UNDERSIGNED, BEING THE SOLE OWNER OF ALL THAT REAL PROPERTY SITUATED IN BOULDER COUNTY, COLORADO, AND LYING WITHIN THE EXTERIOR BOUNDARY OF "INDIAN PEAKS FILING NO. 17 REPLAT G" A SUBDIVISION OF A PORTION OF THE NORTHEAST QUARTER OF SECTION 5, T1S, R69W OF THE 6TH P.M. CITY OF LAFAYETTE, COUNTY OF BOULDER, STATE OF COLORADO DESCRIBED AS FOLLOWS:

TRACT A1 OF "INDIAN PEAKS FILING NO. 17 REPLAT C" AS RECORDED 09/23/2012 AT RECEPTION NO. 3246466,

AND:

A PORTION OF OUTLOT F OF "INDIAN PEAKS FILING NO. 17 REPLAT C", LOCATED IN THE NORTHEAST QUARTER OF SECTION 5, TOWNSHIP 1 SOUTH, RANGE 69 WEST OF THE 6TH PRINCIPAL MERIDIAN, CITY OF LAFAYETTE, COUNTY OF BOULDER, STATE OF COLORADO, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT THE WESTERNMOST CORNER OF SAID OUTLOT F BEING ON THE NORTHEASTERLY RIGHT OF WAY OF ROSER DRIVE AND ALSO BEING THE SOUTHERLY CORNER OF TRACT A1 OF "INDIAN PEAKS FILING NO. 17 REPLAT C";

THENCE N63°42'34"E, 95.50 FEET ALONG THE NORTHWESTERLY LINE OF SAID OUTLOT F TO THE POINT OF BEGINNING;

THENCE CONTINUING ALONG THE NORTHWESTERLY OUTLOT LINE N63°42'34"E 22.00 FEET;

THENCE S26°17'26"E, 18.46 FEET;

THENCE 34.52 FEET ALONG THE ARC OF A TANGENT CURVE TO THE RIGHT, SAID CURVE HAVING A RADIUS OF 46.00 FEET, A CENTRAL ANGLE OF 42°59'52", AND A CHORD BEARING S04°47'29"E, 33.72 FEET;

THENCE S16°42'27"W, 6.58 FEET;

THENCE 17.58 FEET ALONG THE ARC OF A TANGENT CURVE TO THE LEFT, SAID CURVE HAVING A RADIUS OF 15.00 FEET, A CENTRAL ANGLE OF 67°09'58", AND A CHORD BEARING S16°52'32"E, 16.59 FEET TO A POINT ON THE NORTHERLY RIGHT OF WAY LINE OF HOYT LANE;

THENCE ALONG SAID NORTHERLY RIGHT OF WAY LINE THE FOLLOWING COURSE: 41.45 FEET ALONG THE ARC OF A NON-TANGENT CURVE TO THE LEFT, SAID CURVE HAVING A RADIUS OF 52.00 FEET, A CENTRAL ANGLE OF 45°40'04", AND A CHORD BEARING N73°17'33"W, 40.36 FEET;

THENCE 17.58 FEET ALONG THE ARC OF A NON-TANGENT CURVE TO THE LEFT, SAID CURVE HAVING A RADIUS OF 15.00 FEET, A CENTRAL ANGLE OF 67°09'58", AND A CHORD BEARING N50°17'26"E, 16.59 FEET;

THENCE N16°42'27"E, 6.58 FEET;

THENCE 18.01 FEET ALONG THE ARC OF A TANGENT CURVE TO THE LEFT, SAID CURVE HAVING A RADIUS OF 24.00 FEET, A CENTRAL ANGLE OF 42°59'52", AND A CHORD BEARING N04°47'29"W, 17.59 FEET;

THENCE N26°17'26"W, 18.46 FEET TO THE POINT OF BEGINNING.

NET AREA: 8.81 ACRES, MORE OR LESS;

HAVE BY THESE PRESENTS LAID OUT, PLATTED AND SUBDIVIDED THE SAME INTO TRACTS, LOTS AND OUTLOTS AS SHOWN HEREON AND DESIGNATE THE SAME AS "INDIAN PEAKS FILING NO. 17 REPLAT G" IN THE CITY OF LAFAYETTE, COUNTY OF BOULDER, STATE OF COLORADO AND DO HEREBY DEDICATE AND CONVEY TO THE CITY OF LAFAYETTE, COLORADO, FOR PUBLIC USE THE STREETS AND RIGHTS-OF-WAY (R.O.W.), THE UTILITY EASEMENTS SHOWN HEREON FOR UTILITY PURPOSES ONLY, DRAINAGE AND UTILITY EASEMENTS SHOWN HEREON FOR DRAINAGE AND UTILITY PURPOSES ONLY.

EXECUTED THIS 28 DAY OF SEPTEMBER, 2015 A.D.,

BJ BASELINE, LLC, A COLORADO LIMITED LIABILITY COMPANY

BY:
NAME: JEFFREY WINGERT
TITLE: MANAGER

ACKNOWLEDGMENT

STATE OF COLORADO)
) SS
COUNTY OF BOULDER)

THE FOREGOING INSTRUMENT WAS ACKNOWLEDGED BEFORE ME THIS 28 DAY OF SEPTEMBER, 2015, BY JEFFREY WINGERT AS MANAGER OF BJ BASELINE, LLC, A COLORADO LIMITED LIABILITY COMPANY.

WITNESS MY HAND AND OFFICIAL SEAL.

MY COMMISSION EXPIRES: 10/23/16

NOTARY PUBLIC

JODI WILLIAMS
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID 20024013125
My Commission Expires Oct. 23, 2016

EXECUTED THIS 28th DAY OF September, 2015 A.D.,

INDIAN PEAKS SOUTH ASSOCIATION, INC., A COLORADO NON-PROFIT CORPORATION

BY:
NAME: DAVID B. WARE
TITLE: PRESIDENT

ACKNOWLEDGMENT

STATE OF COLORADO)
) SS
COUNTY OF ADAMS)

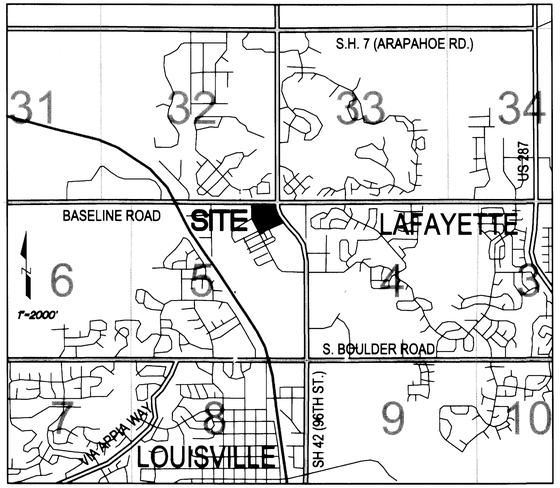
THE FOREGOING INSTRUMENT WAS ACKNOWLEDGED BEFORE ME THIS 28th DAY OF September, 2015 BY DAVID B. WARE AS PRESIDENT OF INDIAN PEAKS SOUTH ASSOCIATION, INC., A COLORADO NON-PROFIT CORPORATION.

WITNESS MY HAND AND OFFICIAL SEAL.

MY COMMISSION EXPIRES: 10-16-2015

NOTARY PUBLIC

LYNNE A DYER
NOTARY PUBLIC
STATE OF COLORADO
MY COMMISSION EXPIRES



VICINITY MAP

NOTES:

1) NOTICE: ACCORDING TO COLORADO LAW, YOU MUST COMMENCE ANY LEGAL ACTION BASED UPON ANY DEFECT IN THIS SURVEY WITHIN THREE YEARS AFTER YOU FIRST DISCOVER SUCH DEFECT. IN NO EVENT MAY ANY ACTION BASED UPON ANY DEFECT IN THIS SURVEY BE COMMENCED MORE THAN TEN YEARS FROM THE DATE OF THE CERTIFICATION SHOWN HEREON.

2) BASIS OF BEARINGS: THE WESTERLY LINE OF INDIAN PEAKS FILING NO. 17 REPLAT C, BEING S00°09'31"W BETWEEN THE NORTHWESTERLY CORNER (1" PLASTIC CAP, STAMPED PLS 37990) AND THE SOUTHWESTERLY CORNER (2" ALUMINUM CAP, STAMPED PLS 15315) TO MATCH THE "INDIAN PEAKS FILING NO. 17 REPLAT C" PLAT.

3) THE PURPOSE OF THIS REPLAT IS TO CREATE 25 LOTS, 4 OUTLOTS AND 1 TRACT FROM AN EXISTING TRACT AND OUTLOT.

4) PER INDIAN PEAKS FILING NO. 17 FINAL PLAT, ALL LOTS, OUTLOTS, AND TRACTS OF INDIAN PEAKS FILING NO. 17 SHOWN ON THIS PLAT ARE BURDENED WITH A PERPETUAL, NON EXCLUSIVE EASEMENT PERMITTING TRAIN NOISE AND VIBRATION TO ENTER ON THE SAME FROM THE ADJACENT BURLINGTON NORTHERN SANTA FE RAIL ROAD. UNDER NO CIRCUMSTANCES SHALL THE CITY OF LAFAYETTE, ITS OFFICERS, EMPLOYEES OR AGENTS AND ITS SUCCESSORS AND ASSIGNS, MCS HOLDINGS, LLC, INDIAN PEAKS SOUTH, LLC, INDIAN PEAKS SOUTH 2, LLC, INDIAN PEAKS SOUTH 3, LLC, BRADDOCK ENTERPRISES L.P., McSTAIN CONSTRUCTORS, LLC AND INDIAN PEAKS SOUTH 4, LLC BE HELD LIABLE FOR ANY DAMAGE OR INJURY RESULTING FROM NOISE OR VIBRATION FROM THE EXISTING BNSF OR FUTURE FASTRACKS TRAINS ON SAID LOTS, AND OUTLOTS AND TRACTS OF THIS SUBDIVISION.

5) PROPERTY IS LOCATED IN UNSHADED ZONE X (AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN PER FEMA FLOOD INFORMATION RATE MAP PANEL NUMBER 08013C0582J WITH AN EFFECTIVE DATE OF 12/18/2012 AND LETTER OF MAP REVISION (CASE NO. 13-08-0605) WITH AN EFFECTIVE DATE OF 01/24/2014.

6) ALL OUTLOTS SHALL BE OWNED AND MAINTAINED BY THE INDIAN PEAKS SOUTH HOMEOWNER'S ASSOCIATION.

7) BLANKET PEDESTRIAN EASEMENTS, BLANKET DRAINAGE EASEMENTS AND BLANKET UTILITY EASEMENTS ARE DEDICATED FOR THE BENEFIT OF THE CITY OF LAFAYETTE ACROSS OUTLOTS A, B, C AND D BY THIS PLAT.

8) THE 37 FOOT ACCESS EASEMENT IS DEDICATED FOR THE PUPOSE OF VEHICULAR USES TO BENEFIT THE OWNERS OF LOTS 1-25, BLOCK 18, INDIAN PEAKS FILING NO. 17, REPLAT G. THE CO-LOCATED UTILITY EASEMENT IS DEDICATED TO THE CITY FOR UTILITY PURPOSES ONLY.

9) UTILITY AND DRAINAGE/UTILITY EASEMENT ARE DEDICATED TO THE CITY OF LAFAYETTE FOR THE BENEFIT OF THE APPLICABLE UTILITY PROVIDERS FOR THE INSTALLATION, MAINTENANCE, AND REPLACEMENT OF ELECTRIC, GAS, TELEVISION, CABLE AND TELECOMMUNICATIONS FACILITIES (DRY UTILITIES). PERMANENT STRUCTURES, IMPROVEMENTS, OBJECTS, BUILDINGS, WELLS, WATER METERS AND OTHER OBJECTS THAT MAY INTERFERE WITH THE UTILITY FACILITIES OR USE THEREOF (INTERFERING OBJECTS) SHALL NOT BE PERMITTED WITHIN SAID UTILITY EASEMENTS AND THE UTILITY PROVIDERS, AS GRANTEES, MAY REMOVE ANY INTERFERING OBJECTS AT NO COST TO SUCH GRANTEES, INCLUDING, WITHOUT LIMITATION, VEGETATION. PUBLIC SERVICE COMPANY OF COLORADO (PSCO) AND ITS SUCCESSORS RESERVE THE RIGHT TO REQUIRE ADDITIONAL EASEMENTS AND TO REQUIRE THE PROPERTY OWNER TO GRANT PSCO AN EASEMENT ON ITS STANDARD FORM.

10) SEE SHEET 2 FOR SUBDIVISION CORNER MONUMENTATION.

11) THIS PLAT IS SUBJECT TO THE INDIAN PEAKS FILING NO. 17 REPLAT G DEVELOPMENT AGREEMENT RECORDED CONCURRENTLY WITH THIS PLAT.

12) THIS PLAT IS SUBJECT TO THE COMMUNITY CHARTER FOR INDIAN PEAKS SOUTH IN THE REAL PROPERTY RECORDS OF BOULDER COUNTY, STATE OF COLORADO ON AUGUST 28, 2007, AT RECEPTION NO. 2879363, AS AMENDED BY FIRST AMENDMENT RECORDED IN THE REAL PROPERTY RECORDS OF BOULDER COUNTY, COLORADO ON APRIL 14, 2008, AT RECEPTION NO. 2923170, BY SECOND AMENDMENT RECORDED IN THE REAL PROPERTY RECORDS OF BOULDER COUNTY, COLORADO ON SEPTEMBER 24, 2008, AT RECEPTION NO. 2956490, BY SECOND AMENDMENT RECORDED IN THE REAL PROPERTY RECORDS OF BOULDER COUNTY, COLORADO ON AUGUST 23, 2012, AT RECEPTION NO. 03246469, BY THIRD AMENDMENT RECORDED IN THE REAL PROPERTY RECORDS OF BOULDER COUNTY, COLORADO ON MAY 01, 2013, AT RECEPTION NO. 03308830, BY FOURTH AMENDMENT RECORDED IN THE REAL PROPERTY RECORDS OF BOULDER COUNTY, COLORADO ON JULY 31, 2013, AT RECEPTION NO. 03331760, AND BY FIFTH AMENDMENT RECORDED IN THE REAL PROPERTY RECORDS OF BOULDER COUNTY, COLORADO ON DECEMBER 23, 2014, AT RECEPTION NO. 03419582 ("THE "CHARTER").

PLANNING COMMISSION CERTIFICATE

THE PRELIMINARY PLAT FOR "INDIAN PEAKS FILING NO. 17 REPLAT G" WAS APPROVED BY THE CITY OF LAFAYETTE PLANNING COMMISSION ON June 23, 2015 A.D.

CHAIRPERSON

ATTEST: SECRETARY

CITY COUNCIL CERTIFICATE

THIS FINAL PLAT (SUBDIVISION) IS APPROVED BY THE CITY COUNCIL OF THE CITY OF LAFAYETTE, BOULDER COUNTY, COLORADO, THIS 18 DAY OF December A.D., 2015, AND MAY BE FILED WITH THE CLERK AND RECORDER OF BOULDER COUNTY. ALL PUBLIC DEDICATIONS SHOWN HEREON ARE ACCEPTED BY THE CITY, SUBJECT TO THE PROVISION THAT NEITHER APPROVAL NOR ACCEPTANCE OBLIGATES THE CITY OF LAFAYETTE, FOR THE FINANCING OR CONSTRUCTING OF IMPROVEMENTS ON LAND OR EASEMENTS TO THE CITY EXCEPT AS SPECIFICALLY AGREED TO BY THE CITY COUNCIL.

MAYOR

WITNESS MY HAND AND OFFICIAL SEAL OF THE CITY OF LAFAYETTE

ATTEST: CITY CLERK

CITY OF LAFAYETTE HOME RULE APRIL 1, 1909 BOULDER COUNTY, COLORADO

TITLE COMPANY'S CERTIFICATE

I, Charles L. Winfield A title officer REPRESENTING FIDELITY NATIONAL TITLE COMPANY, CERTIFY THAT I HAVE EXAMINED TITLE TO THE DESCRIBED LAND DEDICATION TO THE CITY OF LAFAYETTE, COLORADO, AND THAT THE PARTIES EXECUTING THE DEDICATION ARE THE OWNERS THEREOF IN FEE SIMPLE, AND THE DEDICATED LAND IS FREE AND CLEAR OF ALL LIENS AND ENCUMBRANCES EXCEPT AS PROVIDED FOR IN TITLE COMMITMENT NO. FCS24161 DATED September 3, 2015.

NAME

TITLE

EXECUTED THIS 28th DAY OF September A.D., 2015

SURVEYOR'S CERTIFICATE

FOR AND ON BEHALF OF HURST & ASSOCIATES, INC., I, BO BAIZE, DO HEREBY CERTIFY THAT I AM A DULY REGISTERED PROFESSIONAL LAND SURVEYOR LICENSED UNDER THE LAWS OF THE STATE OF COLORADO, THAT THIS PLAT IS A TRUE, CORRECT AND COMPLETE PLAT OF "INDIAN PEAKS FILING NO. 17 REPLAT G" AS LAID OUT, PLATTED, DEDICATED AND SHOWN HEREON, THAT SUCH PLAT WAS MADE FROM AN ACCURATE SURVEY OF SAID PROPERTY BY ME AND UNDER MY DIRECT RESPONSIBILITY, SUPERVISION AND CHECKING AND CORRECTLY SHOWS THE LOCATION AND DIMENSIONS OF THE TRACTS STAKED UPON THE GROUND IN COMPLIANCE WITH ARTICLES 50-53 OF TILE 38, COLORADO REVISED STATUES GOVERNING THE SUBDIVISION OF LAND.

IN WITNESS WHEREOF, I HAVE SET MY HAND AND SEAL THIS 25th DAY OF SEPTEMBER, 2015 A.D.

COLORADO LICENSED BO BAIZE 37990 PROFESSIONAL LAND SURVEYOR

BO BAIZE
COLORADO LICENSED PROFESSIONAL
LAND SURVEYOR NO. 37990
2550 BROADWAY, SUITE B
BOULDER, CO 80304
303-449-9105

CITY ADMINISTRATOR'S CERTIFICATE

I, GARY KLAPHAKE, CITY ADMINISTRATOR OF THE CITY OF LAFAYETTE, COLORADO, HEREBY CERTIFY THAT I HAVE EXAMINED THE FINAL PLAT AND IT APPEARS TO BE IN COMPLIANCE WITH ALL APPLICABLE ORDINANCES OF THE CITY AND THAT A DEVELOPMENT AGREEMENT HAS BEEN EXECUTED BY THE DEVELOPER AND ACCEPTED BY THE CITY.

CITY ADMINISTRATOR

ATTEST: CITY CLERK

REVIEW CERTIFICATES

CITY OF LAFAYETTE ENGINEER

COUNTY CLERK & RECORDER'S CERTIFICATE

STATE OF COLORADO)
) SS
COUNTY OF BOULDER)

I HEREBY CERTIFY THAT THIS PLAT WAS FILED IN MY OFFICE AT _____ O'CLOCK, ___ M. ON THE _____ DAY OF _____, 20___, AND IS DULY RECORDED AT RECEPTION NO. _____

FEES PAID: $_____

COUNTY CLERK & RECORDER

BY: DEPUTY

SCALE VERIFICATION
BAR IS ONE INCH ON ORIGINAL DRAWING.
IF NOT ONE INCH ON THIS SHEET ADJUST SCALES ACCORDINGLY

REVISIONS

NO	DESCRIPTION	DATE	BY
	Original Typed	03/13/15	Bo
1	Remove Outlot F, adjust lots	04/08/15	Bo
2	Add ROW across Outlot F	05/20/15	Bo
3	Edits per City Comments, 07/06/15	09/01/15	Bo
4	Final	09/18/15	Bo

HURST & ASSOCIATES, INC.
2500 Broadway, Suite B
Boulder, CO 80304
303.449.9105

HURST
CIVIL ENGINEERING
PLANNING
SURVEYING

INDIAN PEAKS FILING 17
REPLAT G
FINAL PLAT
LAFAYETTE, COLORADO

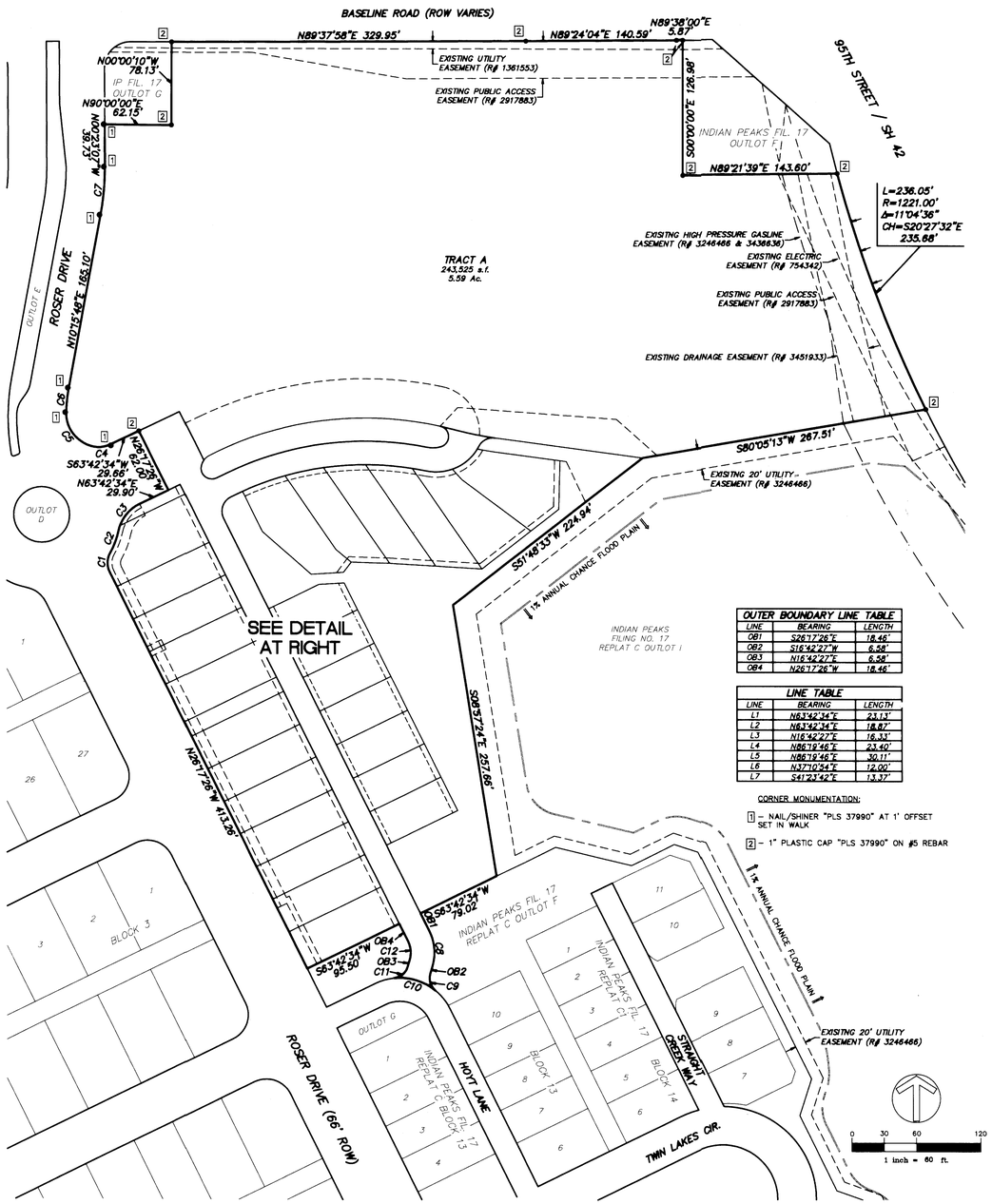
DRAWN BY: BO
DESIGNED BY:
APPROVED BY:
JOB NUMBER: 1009-124
DATE: 09/18/15
SCALE: N/A
SHEET NO.: 1 OF 2
FILE LOCATION: G:\1009124\SURVEY\P17 REPLAT G

INDIAN PEAKS FILING NO. 17 REPLAT G

SHEET 2 OF 2

EASEMENT NOTE:

BLANKET PEDESTRIAN EASEMENTS, BLANKET DRAINAGE EASEMENTS AND BLANKET UTILITY EASEMENTS ARE DEDICATED ACROSS OUTLOTS A, B, C AND D BY THIS PLAT.



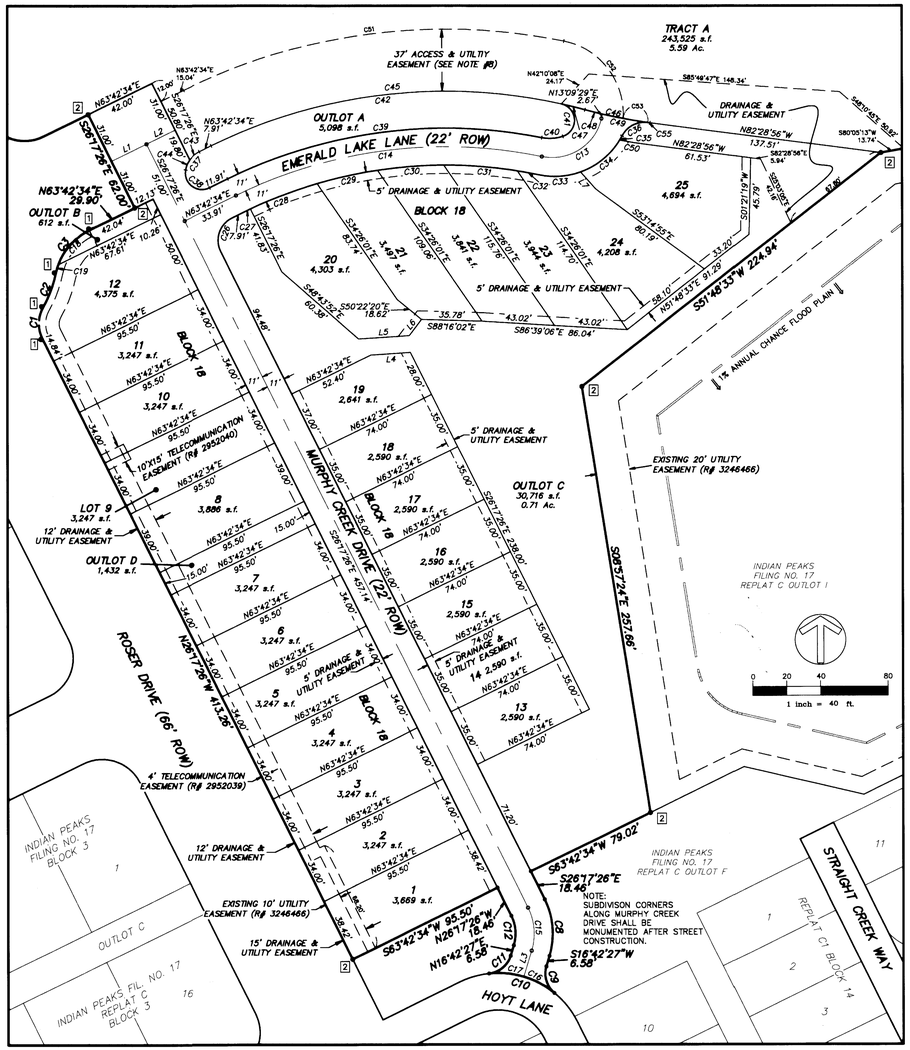
OUTER BOUNDARY LINE TABLE		
LINE	BEARING	LENGTH
OB1	S26°17'26"E	18.46'
OB2	S16°42'27"W	6.58'
OB3	N16°42'27"E	6.58'
OB4	N26°17'26"W	18.46'

LINE TABLE		
LINE	BEARING	LENGTH
L1	N63°42'34"E	23.13'
L2	N63°42'34"E	18.87'
L3	N16°42'27"E	16.33'
L4	N86°16'46"E	23.40'
L5	N86°19'46"E	30.11'
L6	N37°10'54"E	12.00'
L7	S41°23'42"E	13.37'

CORNER MONUMENTATION:

1 – NAIL/SHINER "PLS 37990" AT 1' OFFSET SET IN WALK

2 – 1" PLASTIC CAP "PLS 37990" ON #5 REBAR



CURVE TABLE					
CURVE	LENGTH	RADIUS	DELTA	CHORD	BEARING
C1	19.29'	20.00'	55°15'26"	18.55'	N01°20'17"E
C2	21.78'	73.00'	17°04'26"	21.67'	N20°25'48"E
C3	33.46'	37.00'	51°48'59"	32.33'	N37°48'06"E
C4	18.43'	25.00'	42°14'43"	18.02'	S84°49'56"W
C5	42.32'	32.00'	75°46'27"	39.30'	N36°09'29"W
C6	23.09'	155.00'	8°32'03"	23.07'	N05°59'46"E
C7	45.53'	245.00'	10°38'54"	45.47'	N04°56'21"E
C8	34.52'	46.00'	42°59'52"	33.72'	N04°47'29"W
C9	17.58'	15.00'	67°08'58"	16.59'	S16°52'32"E
C10	41.45'	52.00'	45°40'04"	40.36'	N73°17'33"W
C11	17.58'	15.00'	67°08'58"	16.59'	N50°17'26"E
C12	18.01'	24.00'	42°59'52"	17.59'	N04°47'29"W
C13	46.39'	30.00'	88°36'15"	41.91'	N57°27'36"E
C14	185.96'	280.00'	38°03'09"	182.56'	S82°44'09"W
C15	28.23'	37.00'	43°41'18"	27.55'	S41°50'55"W
C19	5.23'	37.00'	8°05'41"	5.22'	S15°36'26"W
C26	23.56'	15.00'	90°00'00"	21.21'	S18°42'34"W
C27	4.09'	269.00'	0°52'17"	4.09'	S64°08'43"W

CURVE TABLE					
CURVE	LENGTH	RADIUS	DELTA	CHORD	BEARING
C28	42.35'	269.00'	9°01'16"	42.31'	S69°05'29"W
C29	36.68'	269.00'	7°48'48"	36.68'	S77°30'32"W
C30	39.31'	269.00'	8°22'21"	39.27'	S85°36'06"W
C31	43.72'	269.00'	9°18'46"	43.67'	N85°33'20"W
C32	13.09'	269.00'	2°47'18"	13.09'	N79°30'18"W
C33	24.94'	45.00'	31°44'55"	24.62'	N86°00'53"E
C34	30.47'	45.00'	38°47'39"	29.89'	N50°11'57"W
C35	2.93'	45.00'	3°43'41"	2.93'	N29°29'03"E
C36	18.36'	15.00'	70°06'51"	17.23'	S62°40'31"W
C37	13.91'	15.00'	53°07'48"	13.42'	S37°08'40"W
C38	22.14'	10.00'	126°52'12"	17.89'	S52°51'20"E
C39	190.86'	291.00'	37°34'47"	187.46'	S82°29'58"W
C40	12.76'	25.00'	29°14'27"	12.62'	N86°40'08"E
C41	26.07'	10.00'	149°22'24"	19.29'	N02°38'18"W
C42	212.86'	313.00'	38°57'56"	208.79'	S83°11'32"W
C43	7.43'	15.00'	28°23'31"	7.36'	S49°30'49"W
C44	6.48'	15.00'	24°44'18"	6.43'	S22°56'55"W
C45	227.19'	313.00'	41°35'15"	222.23'	S84°30'12"W

CURVE TABLE					
CURVE	LENGTH	RADIUS	DELTA	CHORD	BEARING
C46	39.17'	288.50'	7°46'45"	39.14'	S78°35'34"E
C47	14.34'	313.00'	2°37'30"	14.34'	N76°00'45"W
C48	10.77'	288.50'	2°08'20"	10.77'	S75°46'21"E
C49	27.32'	288.50'	5°25'33"	27.31'	S79°33'17"E
C50	16.33'	301.50'	3°06'09"	16.32'	S80°55'52"E
C51	231.18'	350.00'	37°50'43"	227.00'	S82°37'56"W
C52	63.35'	44.00'	82°29'31"	58.02'	N37°11'57"W
C53	14.88'	290.65'	2°56'01"	14.88'	S80°47'43"E
C55	1.08'	288.50'	0°12'53"	1.08'	S82°22'30"E

SCALE VERIFICATION

BAR IS ONE INCH ON ORIGINAL DRAWING

IF NOT ONE INCH ON THIS SHEET ADJUST SCALES ACCORDINGLY

SURVEYORS STAMP:

COLORADO LICENSED PROFESSIONAL LAND SURVEYOR — BO BAYNE — 09/15/15 — 37990

HURST & ASSOCIATES, INC.
2500 Broadway, Suite B
Boulder, CO 80304
303.449.9105

HURST
CIVIL ENGINEERING
PLANNING
SURVEYING

INDIAN PEAKS FILING 17
REPLAT G
FINAL PLAT
LAFAYETTE, COLORADO

DRAWN BY: BO
DESIGNED BY: JJ
APPROVED BY:

JOB NUMBER: 1009-124
DATE: 09/18/15
SCALE: N/A
SHEET NO.: 2 OF 2

FILE LOCATION: G:\1009\PASURVEY\PT1 REPLAT G

100-yr Future EPA SWMM Input

```
[TITLE]
;;Project Title/Notes
Bullhead Gulch
Baseline Hydrology
Michael Baker International, February 2023

[OPTIONS]
;;Option             Value
FLOW_UNITS           CFS
INFILTRATION         MODIFIED_HORTON
FLOW_ROUTING         KINWAVE
LINK_OFFSETS         DEPTH
MIN_SLOPE            0
ALLOW_PONDING        YES
SKIP_STEADY_STATE    NO

START_DATE           07/01/2021
START_TIME           00:00:00
REPORT_START_DATE    07/01/2021
REPORT_START_TIME    00:00:00
END_DATE             07/01/2021
END_TIME             23:00:00
SWEEP_START          01/01
SWEEP_END            12/31
DRY_DAYS             0
REPORT_STEP          00:01:00
WET_STEP             00:01:00
DRY_STEP             00:01:00
ROUTING_STEP         0:01:00
RULE_STEP            00:00:00

INERTIAL_DAMPING     PARTIAL
NORMAL_FLOW_LIMITED  BOTH
FORCE_MAIN_EQUATION  H-W
VARIABLE_STEP        0.75
LENGTHENING_STEP     0
MIN_SURFAREA         12.566
MAX_TRIALS           8
HEAD_TOLERANCE       0.005
SYS_FLOW_TOL         5
LAT_FLOW_TOL         5
MINIMUM_STEP         0.5
THREADS              1

[FILES]
;;Interfacing Files
USE    INFLOWS    "C:\Users\farina.kazi\OneDrive    -    Michael    Baker    International\Desktop\Bullhead    Gulch\Baseline
Hydrology\CUHP\CUHP_Outputs_20220808\Future\CUHP_OUT_FUT500YR.txt"

[EVAPORATION]
;;Data Source    Parameters
;;-------------- ----------------
CONSTANT         0.0
DRY_ONLY         NO

[JUNCTIONS]
;;Name           Elevation  MaxDepth   InitDepth  SurDepth   Aponded
;;-------------- ---------- ---------- ---------- ---------- ----------
61               5088       0          0          0          0
62               5135       0          0          0          0
63               5072       0          0          0          0
65               5172       0          0          0          0
66               5131       0          0          0          0
67               5054       0          0          0          0
68               5248       0          0          0          0
69               5188       0          0          0          0
70               5129       0          0          0          0
```

100-yr Future EPA SWMM Input

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;Information on how flows would cross subbasin 708 or if they are stopped by Isabell Road and flow east could be determined
in future field studies.
71               5088       0          0          0          0
;No information on if there's a culvert here, but looks like there's a collection point on west side of 95th that is somehow
carried across to open channel in Blue Heron subdivision.
76               5248       0          0          0          0
78               5125       0          0          0          0
79               5124       0          0          0          0
80               5147       0          0          0          0
82               5192       0          0          0          0
;Culvert underneath Arapahoe Road, visible from aerial imagery and LiDAR
83               5198       0          0          0          0
84               5211       0          0          0          0
85               5277       0          0          0          0
;from City of Lafayette data, Blue Heron
90               5215       0          0          0          0
93               5174       0          0          0          0
94               5247       0          0          0          0
95               5242       0          0          0          0
99               5257       0          0          0          0
;Pond B (City of Lafayette)
101              5268       0          0          0          0
102              5255.94    0          0          0          0
103              5277       0          0          0          0
105              5390       0          0          0          0
106              5413       0          0          0          0
107              5405       0          0          0          0
108              5394       0          0          0          0
109              5359       0          0          0          0
111              5330       0          0          0          0
113              5294       0          0          0          0
;Culvert underneath Indian Peaks Trail, visible from aerial imagery and LiDAR.
114              5232       0          0          0          0
116              5591       0          0          0          0
119              5424       0          0          0          0
120              5331       0          0          0          0
121              5350       0          0          0          0
122              5347       0          0          0          0
124              5204       0          0          0          0
;Elevation pulled from LiDAR, supported by images taken in the field
125              5305.32    0          0          0          0
126              5282       0          0          0          0
127              5252       0          0          0          0
128              5295       0          0          0          0
129              5267       0          0          0          0
131              5265       0          0          0          0
136              5223       0          0          0          0
137              5163       0          0          0          0
146              5367       0          0          0          0
JUNCT_201        5248.57    0          0          0          0
JUNCT_202        5261.57    0          0          0          0
JUNCT_203        5228.12    0          0          0          0
JUNCT_204        5228.12    0          0          0          0
JUNCT_205        5207.35    0          0          0          0
JUNCT_206        5183.23    0          0          0          0
JUNCT_207        5183.23    0          0          0          0
JUNCT_208        5200.89    0          0          0          0
JUNCT_209        5173.33    0          0          0          0
JUNCT_210        5163.75    0          0          0          0
JUNCT_211        5163.75    0          0          0          0
JUNCT_212        5176.40    0          0          0          0
JUNCT_213        5150.96    0          0          0          0
JUNCT_215        5095.38    0          0          0          0
JUNCT_216        5095.38    0          0          0          0
JUNCT_217        5095.38    0          0          0          0
JUNCT_218        5095.38    0          0          0          0
JUNCT_219        5068.08    0          0          0          0
JUNCT_220        5068.08    0          0          0          0
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100-yr Future EPA SWMM Input

```
JUNCT_222       5051.98    0          0          0          0
JUNCT_235       5109.89    0          0          0          0
JUNCT_236       5084.05    0          0          0          0
JUNCT_237       5050.46    0          0          0          0
JUNCT_238       5036.77    0          0          0          0
JUNCT_240       5025.98    0          0          0          0
JUNCT_241       5025.98    0          0          0          0
JUNCT_242       5013.49    0          0          0          0
JUNCT_243       4997.41    0          0          0          0
JUNCT_302       5261.56    0          0          0          0
JUNCT_305       5207.34    0          0          0          0
JUNCT_606       4987.84    0          0          0          0
JUNCT_607       5015.84    0          0          0          0
JUNCT_608       4988.62    0          0          0          0
JUNCT_609       4985.59    0          0          0          0
JUNCT_613       5124.32    0          0          0          0
JUNCT_614       5027.96    0          0          0          0
JUNCT_615       5027.96    0          0          0          0
JUNCT_616       5052.49    0          0          0          0
JUNCT_617       5052.49    0          0          0          0
JUNCT_618       5013.88    0          0          0          0
JUNCT_619       5013.88    0          0          0          0
JUNCT_620       4996.12    0          0          0          0
JUNCT_621       4996.12    0          0          0          0
JUNCT_622       4986.05    0          0          0          0
JUNCT_623       4975.81    0          0          0          0
JUNCT_624       4972.48    0          0          0          0
JUNCT_638       5020.62    0          0          0          0
JUNCT_639       5003.94    0          0          0          0
JUNCT_640       4979.49    0          0          0          0
JUNCT_641       4968.61    0          0          0          0
JUNCT_648       4965.05    0          0          0          0
JUNCT_655       4955.79    0          0          0          0
JUNCT_702       5015.83    0          0          0          0
JUNCT_715       5020.61    0          0          0          0
JUNCT_BH700     6000       0          0          0          0
JUNCT_BH701     6000       0          0          0          0
JUNCT_BH702     5068       0          0          0          0
JUNCT_BH703     6000       0          0          0          0
JUNCT_BH704     6000       0          0          0          0
JUNCT_BH705     5113.51    0          0          0          0
JUNCT_BH706     6000       0          0          0          0
JUNCT_BH707     6000       0          0          0          0
JUNCT_BH708     6000       0          0          0          0
JUNCT_BH709     5100       0          0          0          0
JUNCT_BH710     5125       0          0          0          0
JUNCT_BH711     6000       0          0          0          0
JUNCT_BH712     6000       0          0          0          0
JUNCT_BH713     6000       0          0          0          0
JUNCT_BH714     6000       0          0          0          0
JUNCT_BH715     6000       0          0          0          0
JUNCT_BH716     6000       0          0          0          0
JUNCT_BH717     6000       0          0          0          0
JUNCT_BH718     6000       0          0          0          0
JUNCT_BH719     6000       0          0          0          0
JUNCT_BH720     6000       0          0          0          0
JUNCT_BH721     6000       0          0          0          0
JUNCT_BH722     6000       0          0          0          0
JUNCT_BH723     6000       0          0          0          0
JUNCT_BH724     6000       0          0          0          0
JUNCT_BH725     6000       0          0          0          0
JUNCT_BH726     6000       0          0          0          0
JUNCT_BH727     6000       0          0          0          0
JUNCT_BH728     6000       0          0          0          0
JUNCT_BH729     6000       0          0          0          0
JUNCT_BH730     6000       0          0          0          0
JUNCT_BH731     6000       0          0          0          0
JUNCT_BH732     6000       0          0          0          0
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100-yr Future EPA SWMM Input

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JUNCT_BH733     6000       0          0          0          0
JUNCT_BH734     6000       0          0          0          0
JUNCT_BH735     6000       0          0          0          0
JUNCT_BH736     6000       0          0          0          0
JUNCT_BH737     6000       0          0          0          0
JUNCT_BH738     6000       0          0          0          0
JUNCT_BH739     6000       0          0          0          0
JUNCT_BH740     6000       0          0          0          0
JUNCT_BH741     6000       0          0          0          0
JUNCT_BH742     6000       0          0          0          0
JUNCT_BH743     6000       0          0          0          0
JUNCT_BH744     6000       0          0          0          0
JUNCT_BH745     6000       0          0          0          0
JUNCT_BH746     6000       0          0          0          0
JUNCT_BH747     6000       0          0          0          0
JUNCT_BH748     6000       0          0          0          0
JUNCT_BH749     6000       0          0          0          0
JUNCT_BH750     6000       0          0          0          0
JUNCT_BH751     6000       0          0          0          0
JUNCT_BH752     6000       0          0          0          0
JUNCT_BH753     6000       0          0          0          0
JUNCT_BH754     6000       0          0          0          0
JUNCT_BH755     6000       0          0          0          0
;Part of golf course, predates subdivision (City of Lafayette)
55              5315       0          0          0          0
;from City of Lafayette Storm data. Part of golf course, predates subdivision.
86              5253       0          0          0          0
;IP 5 (City of Lafayette)
56              5300       0          0          0          0
148             5307.25    0          0          0          0
JUNCT_BH756     5016       0          0          0          0
JUNCT_BH757     5025       0          0          0          0
150             5010       0          0          0          0
152             5021       0          0          0          0
154             5029       0          0          0          0
156             5050       0          0          0          0

[OUTFALLS]
;;Name           Elevation  Type       Stage Data       Gated    Route To
;;-------------- ---------- ---------- ---------------- -------- ----------------
OUTFALL_940     4997.40    FREE                        NO
OUTFALL_954     4987.83    FREE                        NO
OUTFALL_955     4985.58    FREE                        NO
OUTFALL_958     4975.80    FREE                        NO
OUTFALL_959     4972.47    FREE                        NO
OUTFALL_961     4968.60    FREE                        NO
OUTFALL_963     4965.04    FREE                        NO
OUTFALL_965     4955.78    FREE                        NO
OUTFALL_936     5042       FREE                        NO
OUTFALL_937     5036       FREE                        NO
OUTFALL_938     5020       FREE                        NO
OUTFALL_939     5008       FREE                        NO
OUTFALL_935     5061       FREE                        NO

[DIVIDERS]
;;Name           Elevation  Diverted Link    Type       Parameters
;;-------------- ---------- ---------------- ---------- ----------
72              5123       CH_39_OVERFLOW   OVERFLOW   0          0          0          0
;Info from plans for US287/Isabelle Road Improvements
73              5080.37    CU_33_OVERFLOW   OVERFLOW   0          0          0          0
81              5170       CU_20_OVERFLOW   OVERFLOW   0          0          0          0
87              5233.72    CU_32_OVERFLOW   OVERFLOW   0          0          0          0
97              5272       CU_13_OVERFLOW   OVERFLOW   0          0          0          0
104             5353       CU_06_OVERFLOW   OVERFLOW   0          0          0          0
117             5381.1     CU_01_OVERFLOW   OVERFLOW   0          0          0          0
;From field investigation, appears that most flow goes along RR. There is an additional culvert heading eastward underneath
pedestrian crossing.
118             5368       CU_14_OVERFLOW   OVERFLOW   0          0          0          0
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100-yr Future EPA SWMM Input

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;from Lafayette storm data
123             5339.65    CU_07_OVERFLOW   OVERFLOW   0          0          0          0
130             5266       CU_15_OVERFLOW   OVERFLOW   0          0          0          0
135             5225.6     CU_12_OVERFLOW   OVERFLOW   0          0          0          0
;Info from plans for US287/Isabelle Road Improvements
140             5078.65    CH_66_OVERFLOW   OVERFLOW   0          0          0          0
141             5078.36    321_OVERFLOW     OVERFLOW   0          0          0          0
143             5067       75_OVERFLOW      OVERFLOW   0          0          0          0
144             5090.3     312_OVERFLOW     OVERFLOW   0          0          0          0
145             5339       CU_21_OVERFLOW   OVERFLOW   0          0          0          0
147             5373       CU_02            OVERFLOW   0          0          0          0
JUNCT_1025      5207.32    1025_OVERFLOW    OVERFLOW   0          0          0          0
JUNCT_1026      5183.21    1026_OVERFLOW    OVERFLOW   0          0          0          0
JUNCT_200       5262.09    200_OVERFLOW     OVERFLOW   0          0          0          0
JUNCT_221       5060.50    221_OVERFLOW     OVERFLOW   0          0          0          0
JUNCT_300       5248.56    300_OVERFLOW     OVERFLOW   0          0          0          0
JUNCT_303       5228.11    303_OVERFLOW     OVERFLOW   0          0          0          0
JUNCT_306       5173.32    306_OVERFLOW     OVERFLOW   0          0          0          0
JUNCT_308       5163.74    308_OVERFLOW     OVERFLOW   0          0          0          0
JUNCT_310       5176.39    310_OVERFLOW     OVERFLOW   0          0          0          0
JUNCT_311       5150.95    311_OVERFLOW     OVERFLOW   0          0          0          0
JUNCT_313       5068.07    313_OVERFLOW     OVERFLOW   0          0          0          0
JUNCT_315       5051.97    315_OVERFLOW     OVERFLOW   0          0          0          0
JUNCT_317       5036.75    317_OVERFLOW     OVERFLOW   0          0          0          0
JUNCT_318       5025.97    318_OVERFLOW     OVERFLOW   0          0          0          0
JUNCT_319       5013.48    319_OVERFLOW     OVERFLOW   0          0          0          0
JUNCT_320       5109.88    320_OVERFLOW     OVERFLOW   0          0          0          0
JUNCT_321       5084.04    CU_34_OVERFLOW   OVERFLOW   0          0          0          0
JUNCT_322       5050.45    322_OVERFLOW     OVERFLOW   0          0          0          0
JUNCT_703       4988.61    703_OVERFLOW     OVERFLOW   0          0          0          0
JUNCT_705       5124.31    705_OVERFLOW     OVERFLOW   0          0          0          0
JUNCT_706       5052.48    706_OVERFLOW     OVERFLOW   0          0          0          0
JUNCT_707       5027.95    707_OVERFLOW     OVERFLOW   0          0          0          0
JUNCT_708       5013.87    708_OVERFLOW     OVERFLOW   0          0          0          0
JUNCT_709       4996.11    709_OVERFLOW     OVERFLOW   0          0          0          0
JUNCT_710       4986.04    710_OVERFLOW     OVERFLOW   0          0          0          0
JUNCT_716       5003.93    716_OVERFLOW     OVERFLOW   0          0          0          0
JUNCT_717       4979.48    717_OVERFLOW     OVERFLOW   0          0          0          0
;Part of golf course, predates subdivision (City of Lafayette)
74              5304       CU_38_OVERFLOW   OVERFLOW   0          0          0          0
;Tracts H&C (City of Lafayette)
75              5256.25    CU_10_OVERFLOW   OVERFLOW   0          0          0          0
180             5089       180_OVERFLOW     TABULAR    Node180DiversionCurve 0          0          0
181             5044       181_OVERFLOW     TABULAR    Node181DiversionCurve 0          0          0
182             5037       182_OVERFLOW     TABULAR    Node182DiversionCurve 0          0          0
183             5031       183_OVERFLOW     TABULAR    Node183DiversionCurve 0          0          0
JUNCT_323       5036.76    JUNCT_323_OVERFLOW OVERFLOW   0          0          0          0
142             5069       142_OVERFLOW     OVERFLOW   0          0          0          0
155             5024       155_OVERFLOW     OVERFLOW   0          0          0          0
64              5100       64_OVERFLOW      OVERFLOW   0          0          0          0

[STORAGE]
;;Name           Elev.    MaxDepth   InitDepth  Shape      Curve Name/Params            N/A      Fevap    Psi      Ksat     IMD
;;-------------- -------- ---------- ---------- ---------- ---------------------------- -------- --------          --------
--------
STOR_1025       5207.33  9          0          TABULAR    STORAGE_CURVE_1025           0        0
STOR_1026       5183.22  6.14       0          TABULAR    STORAGE_CURVE_1026           0        0
STOR_312        5095     9.5        0          TABULAR    STORAGE_CURVE_312            0        0
;Indian Peaks Filing 17. Stage-Storage curve was determined by tracing contours in provided design drawings from City of
Lafayette. HydroCAD utilized outfall structure details to create rating curve.
STOR_02         5307.7   12.3       0          TABULAR    STORAGE_CURVE_02             0        0

[CONDUITS]
;;Name           From Node        To Node          Length     Roughness  InOffset   OutOffset  InitFlow   MaxFlow
;;-------------- ---------------- ---------------- ---------- ---------- ---------- ---------- ---------- ----------
1025_OVERFLOW   JUNCT_1025       JUNCT_306        1810       .056       0          0          0          0
1026_OVERFLOW   JUNCT_1026       JUNCT_308        1100       .056       0          0          0          0
200             JUNCT_200        JUNCT_300        2435       .044       0          0          0          0
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100-yr Future EPA SWMM Input

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200_OVERFLOW    JUNCT_200        JUNCT_300        2435       .056       0          0          0          0
201             JUNCT_201        JUNCT_300        1          0.01       0          0          0          0
202             JUNCT_202        JUNCT_302        1          0.01       0          0          0          0
203             JUNCT_203        JUNCT_303        1          0.01       0          0          0          0
204             JUNCT_204        JUNCT_303        1          0.01       0          0          0          0
205             JUNCT_205        STOR_1025        1          0.01       0          0          0          0
206             JUNCT_206        STOR_1026        1          0.01       0          0          0          0
207             JUNCT_207        STOR_1026        1          0.01       0          0          0          0
208             JUNCT_208        JUNCT_308        1690       .038       0          0          0          0
209             JUNCT_209        JUNCT_306        1          0.01       0          0          0          0
210             JUNCT_210        JUNCT_308        1          0.01       0          0          0          0
211             JUNCT_211        JUNCT_308        1          0.01       0          0          0          0
212             JUNCT_212        JUNCT_310        1          0.01       0          0          0          0
213             JUNCT_213        JUNCT_311        1          0.01       0          0          0          0
215             JUNCT_215        STOR_312         1          0.01       0          0          0          0
216             JUNCT_216        STOR_312         1          0.01       0          0          0          0
217             JUNCT_217        STOR_312         1          0.01       0          0          0          0
218             JUNCT_218        STOR_312         1          0.01       0          0          0          0
219             JUNCT_219        JUNCT_313        1          0.01       0          0          0          0
220             JUNCT_220        JUNCT_313        1          0.01       0          0          0          0
221             JUNCT_221        JUNCT_315        2675       .044       0          0          0          0
221_OVERFLOW    JUNCT_221        JUNCT_315        2675       0.056      0          0          0          0
222             JUNCT_222        JUNCT_315        1          0.01       0          0          0          0
235             JUNCT_235        JUNCT_320        1          0.01       0          0          0          0
236             JUNCT_236        JUNCT_321        1          0.01       0          0          0          0
237             JUNCT_237        JUNCT_322        1          0.01       0          0          0          0
238             JUNCT_238        JUNCT_323        1          0.01       0          0          0          0
240             JUNCT_240        154              1          0.01       0          0          0          0
241             JUNCT_241        JUNCT_318        1          0.01       0          0          0          0
242             JUNCT_242        JUNCT_319        1          0.01       0          0          0          0
243             JUNCT_243        OUTFALL_940      1          0.01       0          0          0          0
300             JUNCT_300        JUNCT_303        1010       .038       0          0          0          0
300_OVERFLOW    JUNCT_300        JUNCT_303        1010       .056       0          0          0          0
302             JUNCT_302        JUNCT_303        1580       .044       0          0          0          0
303             JUNCT_303        JUNCT_305        1600       .02        0          0          0          0
303_OVERFLOW    JUNCT_303        JUNCT_305        1600       .044       0          0          0          0
305             JUNCT_305        JUNCT_1025       1          0.01       0          0          0          0
306             JUNCT_306        JUNCT_308        1550       .044       0          0          0          0
306_OVERFLOW    JUNCT_306        JUNCT_308        1550       .056       0          0          0          0
308             JUNCT_308        JUNCT_311        900        .038       0          0          0          0
308_OVERFLOW    JUNCT_308        JUNCT_311        900        0.056      0          0          0          0
310             JUNCT_310        JUNCT_311        1820       .044       0          0          0          0
310_OVERFLOW    JUNCT_310        JUNCT_311        1820       0.056      0          0          0          0
311             JUNCT_311        STOR_312         3635       .038       0          0          0          0
311_OVERFLOW    JUNCT_311        STOR_312         3635       0.056      0          0          0          0
312             144              JUNCT_313        2140       .038       0          0          0          0
313             JUNCT_313        JUNCT_315        1350       .038       0          0          0          0
1025            JUNCT_1025       JUNCT_306        1810       .044       0          0          0          0
1026            JUNCT_1026       JUNCT_308        1100       .044       0          0          0          0
313_OVERFLOW    JUNCT_313        JUNCT_315        1350       0.056      0          0          0          0
315             JUNCT_315        JUNCT_317        2735       .038       0          0          0          0
315_OVERFLOW    JUNCT_315        JUNCT_317        2735       0.056      0          0          0          0
317             JUNCT_317        JUNCT_318        1115       .044       0          0          0          0
317_OVERFLOW    JUNCT_317        JUNCT_318        1115       .056       0          0          0          0
318             JUNCT_318        JUNCT_319        1820       .044       0          0          0          0
318_OVERFLOW    JUNCT_318        JUNCT_319        1820       .056       0          0          0          0
319             JUNCT_319        OUTFALL_940      2865       .044       0          0          0          0
319_OVERFLOW    JUNCT_319        OUTFALL_940      2865       .056       0          0          0          0
320             JUNCT_320        JUNCT_321        1690       .02        0          0          0          0
320_OVERFLOW    JUNCT_320        JUNCT_321        1690       .044       0          0          0          0
321             141              143              1762       .044       0          0          0          0
321_OVERFLOW    141              143              1762       0.035      0          0          0          0
322             JUNCT_322        JUNCT_323        2050       .044       0          0          0          0
322_OVERFLOW    JUNCT_322        JUNCT_323        2050       .056       0          0          0          0
;Open channel indicated in Boulder County Stormwater Data. Cross section and elevations taken from LiDAR.
CH_37           76               90               2222       0.01       0          0          0          0
;Created from same geometry as 321
75              143              JUNCT_322        2230       0.044      0          0          0          0
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100-yr Future EPA SWMM Input

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323              JUNCT_323        JUNCT_317        1          0.01       0          0          0          0
606              JUNCT_606        OUTFALL_954      1          0.01       0          0          0          0
607              JUNCT_607        JUNCT_702        1          0.01       0          0          0          0
608              JUNCT_608        JUNCT_703        1          0.01       0          0          0          0
609              JUNCT_609        OUTFALL_955      1          0.01       0          0          0          0
613              JUNCT_613        JUNCT_705        1          0.01       0          0          0          0
614              JUNCT_614        JUNCT_707        1          0.01       0          0          0          0
615              JUNCT_615        JUNCT_707        1          0.01       0          0          0          0
616              JUNCT_616        JUNCT_706        1          0.01       0          0          0          0
617              JUNCT_617        JUNCT_706        1          0.01       0          0          0          0
618              JUNCT_618        JUNCT_708        1          0.01       0          0          0          0
619              JUNCT_619        JUNCT_708        1          0.01       0          0          0          0
620              JUNCT_620        JUNCT_709        1          0.01       0          0          0          0
621              JUNCT_621        JUNCT_709        1          0.01       0          0          0          0
622              JUNCT_622        JUNCT_710        1          0.01       0          0          0          0
623              JUNCT_623        OUTFALL_958      1          0.01       0          0          0          0
624              JUNCT_624        OUTFALL_959      1          0.01       0          0          0          0
638              JUNCT_638        JUNCT_715        1          0.01       0          0          0          0
639              JUNCT_639        JUNCT_716        1          0.01       0          0          0          0
640              JUNCT_640        JUNCT_717        1          0.01       0          0          0          0
641              JUNCT_641        OUTFALL_961      1          0.01       0          0          0          0
648              JUNCT_648        OUTFALL_963      1          0.01       0          0          0          0
655              JUNCT_655        OUTFALL_965      1          0.01       0          0          0          0
702              JUNCT_702        JUNCT_703        3715       .044       0          0          0          0
703              JUNCT_703        OUTFALL_955      1995       .044       0          0          0          0
703_OVERFLOW     JUNCT_703        OUTFALL_955      1995       .056       0          0          0          0
705              JUNCT_705        JUNCT_706        2700       .02        0          0          0          0
705_OVERFLOW     JUNCT_705        JUNCT_706        2700       .044       0          0          0          0
706              JUNCT_706        JUNCT_708        1285       .02        0          0          0          0
706_OVERFLOW     JUNCT_706        JUNCT_708        1285       .044       0          0          0          0
707              JUNCT_707        JUNCT_708        3240       .044       0          0          0          0
707_OVERFLOW     JUNCT_707        JUNCT_708        3240       .056       0          0          0          0
708              JUNCT_708        JUNCT_709        4465       .044       0          0          0          0
708_OVERFLOW     JUNCT_708        JUNCT_709        4465       .056       0          0          0          0
709              JUNCT_709        JUNCT_710        2265       .044       0          0          0          0
709_OVERFLOW     JUNCT_709        JUNCT_710        2265       .056       0          0          0          0
710              JUNCT_710        OUTFALL_958      1090       .044       0          0          0          0
710_OVERFLOW     JUNCT_710        OUTFALL_958      1090       .056       0          0          0          0
715              JUNCT_715        JUNCT_716        2640       .044       0          0          0          0
716              JUNCT_716        JUNCT_717        2780       .044       0          0          0          0
716_OVERFLOW     JUNCT_716        JUNCT_717        2780       .056       0          0          0          0
717              JUNCT_717        OUTFALL_961      1885       .044       0          0          0          0
717_OVERFLOW     JUNCT_717        OUTFALL_961      1885       .056       0          0          0          0
;overflow made from swale alongside 287
75_OVERFLOW      143              JUNCT_322        2230       0.01       0          0          0          0
;Vegetated channel inspected during field visit.
CH_01            107              117              1364       0.01       0          0          0          0
;Concrete lined channel
CH_02            119              107              1500       0.01       0          0          0          0
CH_04            116              119              2986       0.05       0          0          0          0
CH_05            111              STOR_02          1102       0.05       0          0          0          0
;Swale on east side of railroad.
CH_06            118              121              840        0.01       0          0          0          0
;natural swale
CH_07            122              120              1255       0.05       0          0          0          0
;Generalized channel through subbasin 741
CH_08            106              105              1588       0.01       0          0          0          0
;Generalized channel through subbasin 740
CH_09            105              104              1916       0.01       0          0          0          0
;natural swale, seen in field investigation
CH_10            146              120              1207       0.01       0          0          0          0
;Generalized channel through SB736 downstream of detention facility
CH_11            55               97               1680       0.01       0          0          0          0
;Generalized channel from pond flowing towards subbasin 729.
CH_13            86               95               1196       0.01       0          0          0          0
;Natural swale crossing subbasin. Terrain cut from LiDAR data.
CH_14            95               124              1971       0.01       0          0          0          0
CH_15            125              113              865        0.01       0          0          0          0
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100-yr Future EPA SWMM Input

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;Bullhead Gulch until golf course culvert visible from aerial imagery and lidar data.
CH_16            113              126              754        0.01       0          0          0          0
;Swale through golf course. City of Lafyette information indicates some infrastructure labeled as "Bullhead Gulch Irrigation
System". From LiDAR and aerial, looks like this may actually be a culvert underneath a section of the golf course.
CH_17            126              99               838        0.01       0          0          0          0
CH_18            99               114              1888       0.01       0          0          0          0
CH_19            114              84               1321       0.01       0          0          0          0
CH_20            128              127              1072       0.01       0          0          0          0
CH_21            85               127              772        0.01       0          0          0          0
CH_22            127              84               1479       0.01       0          0          0          0
CH_23            84               124              375        0.01       0          0          0          0
CH_24            103              101              2557       0.01       0          0          0          0
CH_25            129              130              400        0.01       0          0          0          0
CH_26            131              83               2481       0.01       0          0          0          0
CH_27            102              94               1416       0.01       0          0          0          0
CH_28            94               135              400        0.01       0          0          0          0
CH_29            136              83               809        0.01       0          0          0          0
CH_30            124              83               950        0.01       0          0          0          0
CH_31            83               82               370        0.01       0          0          0          0
CH_32            82               93               1334       0.01       0          0          0          0
CH_33            93               81               400        0.01       0          0          0          0
CH_34            137              80               873        0.01       0          0          0          0
CH_35            80               78               2390       0.05       0          0          0          0
CH_36            90               80               2809       0.035      0          0          0          0
CH_38            78               72               137        0.05       0          0          0          0
CH_39            72               71               2670       0.035      0          0          0          0
CH_39_OVERFLOW   72               71               2670       0.035      0          0          0          0
CH_40            68               65               2103       0.035      0          0          0          0
CH_41            65               62               1597       0.035      0          0          0          0
CH_42            62               180              2115       0.035      0          0          0          0
CH_44            181              182              2326       0.035      0          0          0          0
CH_45            66               61               1445       0.01       0          0          0          0
CH_46            61               182              400        0.035      0          0          0          0
CH_47            182              183              2668       0.035      0          0          0          0
CH_48            69               70               2905       0.035      0          0          0          0
CH_49            70               JUNCT_BH709      2005       0.035      0          0          0          0
CH_50            64               JUNCT_BH709      1425       0.035      0          0          0          0
CH_51            63               182              2291       0.035      0          0          0          0
CH_52            67               183              1855       0.035      0          0          0          0
CH_53            109              145              1541       0.013      0          0          0          0
CH_63            79               73               2629       0.04       0          0          0          0
CH_64            71               73               400        0.035      0          0          0          0
CH_66            140              142              1115       0.04       0          0          0          0
CH_66_OVERFLOW   140              142              1115       0.04       0          0          0          0
CH_67            108              109              881        0.01       0          0          0          0
CH_76            183              154              1440       0.035      0          0          0          0
;Crushed CMP underneath pedestrian bridge
CU_01            117              147              18.5       0.024      0          0          0          0
CU_01_OVERFLOW   117              147              50         0.01       0          0          0          0
;RCP under railroad. Inspected during field visit
CU_02            147              118              80         0.013      0          0          0          0
CU_02_OVERFLOW   147              118              80         0.01       0          0          0          0
CU_04            120              111              113.5      0.011      0          0          0          0
;Culvert under Wynonna Ct
CU_05            121              122              140        0.01       0          0          0          0
;from Lafayette storm sewer data
CU_06            104              123              509        0.011      0          0          0          0
CU_06_OVERFLOW   104              123              750        0.01       0          0          0          0
;from Lafayette storm data
CU_07            123              55               1002       0.011      0          0          0          0
CU_07_OVERFLOW   123              55               1002       0.01       0          0          0          0
;72" CMP from City of Lafayette data. Elevations provided in Indian Peaks Filing 17 design drawings.
CU_08            148              125              175        0.024      0          0          0          0
CU_09            56               113              124        0.013      0          0          0          0
;from City of Lafayette Data
CU_10            75               102              129.930985 0.013      0          0          0          0
CU_10_OVERFLOW   75               102              400        0.01       0          0          0          0
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100-yr Future EPA SWMM Input

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;culvert underneath 95th street. Lafayette data did not include invert elevations but they appeared to be at ground level
from aerial imagery, so elevations were extracted from LiDAR data.
CU_11            101             129             156         0.013      0          0          0          0
;from City of Lafayette Data. Inverts estimated from LiDAR.
CU_12            135             136             106.730706 0.013       0          0          0          0
CU_12_OVERFLOW   135             136             50          0.01       0          0          0          0
;24" CMP storm line shown in City of Lafayette drawings. Invert elevations not provided, estimated from LiDAR.
CU_13            97              86              363         0.024      0          0          0          0
CU_13_OVERFLOW   97              86              80          0.01       0          0          0          0
;flow under pedestrian bridge, inspected during field visit
CU_14_OVERFLOW   118             146             42          0.02       0          0          0          0
;Culvert from Lafayette storm data. Does not include inverts, inverts estimated from LiDAR.
CU_15            130             131             145         0.013      0          0          0          0
CU_15_OVERFLOW   130             131             400         0.01       0          0          0          0
;information collected from field observation
CU_20            81              137             95          0.012      0          0          0          0
CU_20_OVERFLOW   81              137             95          0.01       0          0          0          0
;Elevations estimated from LiDAR. Addtional parameters from City of Lafayette stormwater data.
CU_21            145             STOR_02         361         0.013      0          0          0          0
CU_21_OVERFLOW   145             STOR_02         361         0.01       0          0          0          0
CU_32            87              STOR_1025       104.126135 0.024       0          0          0          0
CU_32_OVERFLOW   87              STOR_1025       400         0.01       0          0          0          0
;Info from plans for US287/Isabelle Road Improvements
CU_33            73              140             122         0.013      0          0          0          0
CU_33_OVERFLOW   73              140             70          0.02       0          0          0          0
CU_34            JUNCT_321       141             195         0.013      0          0          0          0
CU_34_OVERFLOW   JUNCT_321       141             70          0.01       0          0          0          0
;Parameters estimated from field inspection data.
CU_35            142             143             184         0.013      0          0          0          0
;Lafayette stormwater data shows 18" pipe leading to 15" pipe continuing to Junction 99. Entire reach modeled as 15" pipe to
be conservative, elevations not provided and so were estimated from LiDAR.
CU_38            74              99              1370        0.013      0          0          0          0
;Overflow through golf course
CU_38_OVERFLOW   74              99              1200        0.01       0          0          0          0
D_JUNCT_BH700    JUNCT_BH700     183             400         0.01       0          0          0          0
D_JUNCT_BH701    JUNCT_BH701     67              400         0.01       0          0          0          0
D_JUNCT_BH702    JUNCT_BH702     182             400         0.01       0          0          0          0
D_JUNCT_BH703    JUNCT_BH703     182             400         0.01       0          0          0          0
D_JUNCT_BH704    JUNCT_BH704     181             400         0.01       0          0          0          0
D_JUNCT_BH706    JUNCT_BH706     61              400         0.01       0          0          0          0
D_JUNCT_BH707    JUNCT_BH707     180             400         0.01       0          0          0          0
D_JUNCT_BH708    JUNCT_BH708     73              400         0.01       0          0          0          0
D_JUNCT_BH709    JUNCT_BH709     71              400         0.01       0          0          0          0
D_JUNCT_BH710    JUNCT_BH710     64              400         0.01       0          0          0          0
D_JUNCT_BH711    JUNCT_BH711     70              400         0.01       0          0          0          0
D_JUNCT_BH712    JUNCT_BH712     66              400         0.01       0          0          0          0
D_JUNCT_BH713    JUNCT_BH713     62              400         0.01       0          0          0          0
D_JUNCT_BH714    JUNCT_BH714     69              400         0.01       0          0          0          0
D_JUNCT_BH715    JUNCT_BH715     65              400         0.01       0          0          0          0
D_JUNCT_BH716    JUNCT_BH716     80              400         0.01       0          0          0          0
D_JUNCT_BH717    JUNCT_BH717     72              400         0.01       0          0          0          0
D_JUNCT_BH718    JUNCT_BH718     79              400         0.01       0          0          0          0
D_JUNCT_BH719    JUNCT_BH719     78              400         0.01       0          0          0          0
D_JUNCT_BH720    JUNCT_BH720     80              400         0.01       0          0          0          0
D_JUNCT_BH721    JUNCT_BH721     90              400         0.01       0          0          0          0
D_JUNCT_BH722    JUNCT_BH722     68              400         0.01       0          0          0          0
D_JUNCT_BH723    JUNCT_BH723     75              400         0.01       0          0          0          0
D_JUNCT_BH724    JUNCT_BH724     76              400         0.01       0          0          0          0
D_JUNCT_BH725    JUNCT_BH725     93              400         0.01       0          0          0          0
D_JUNCT_BH726    JUNCT_BH726     81              400         0.01       0          0          0          0
D_JUNCT_BH727    JUNCT_BH727     87              400         0.01       0          0          0          0
D_JUNCT_BH728    JUNCT_BH728     94              400         0.01       0          0          0          0
D_JUNCT_BH729    JUNCT_BH729     124             400         0.01       0          0          0          0
D_JUNCT_BH730    JUNCT_BH730     82              400         0.01       0          0          0          0
D_JUNCT_BH731    JUNCT_BH731     JUNCT_200       400         0.01       0          0          0          0
D_JUNCT_BH732    JUNCT_BH732     84              400         0.01       0          0          0          0
D_JUNCT_BH733    JUNCT_BH733     101             400         0.01       0          0          0          0
D_JUNCT_BH734    JUNCT_BH734     95              400         0.01       0          0          0          0
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100-yr Future EPA SWMM Input

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D_JUNCT_BH735    JUNCT_BH735     103             400         0.01       0          0          0          0
D_JUNCT_BH736    JUNCT_BH736     55              400         0.01       0          0          0          0
D_JUNCT_BH737    JUNCT_BH737     99              400         0.01       0          0          0          0
D_JUNCT_BH738    JUNCT_BH738     114             400         0.01       0          0          0          0
D_JUNCT_BH739    JUNCT_BH739     74              400         0.01       0          0          0          0
D_JUNCT_BH740    JUNCT_BH740     104             400         0.01       0          0          0          0
D_JUNCT_BH741    JUNCT_BH741     105             400         0.01       0          0          0          0
D_JUNCT_BH742    JUNCT_BH742     56              400         0.01       0          0          0          0
D_JUNCT_BH743    JUNCT_BH743     128             400         0.01       0          0          0          0
D_JUNCT_BH744    JUNCT_BH744     STOR_02         400         0.01       0          0          0          0
D_JUNCT_BH745    JUNCT_BH745     JUNCT_200       400         0.01       0          0          0          0
D_JUNCT_BH746    JUNCT_BH746     STOR_02         400         0.01       0          0          0          0
D_JUNCT_BH747    JUNCT_BH747     85              400         0.01       0          0          0          0
D_JUNCT_BH748    JUNCT_BH748     108             400         0.01       0          0          0          0
D_JUNCT_BH749    JUNCT_BH749     106             400         0.01       0          0          0          0
D_JUNCT_BH750    JUNCT_BH750     117             400         0.01       0          0          0          0
D_JUNCT_BH751    JUNCT_BH751     109             400         0.01       0          0          0          0
D_JUNCT_BH752    JUNCT_BH752     120             400         0.01       0          0          0          0
D_JUNCT_BH753    JUNCT_BH753     121             400         0.01       0          0          0          0
D_JUNCT_BH754    JUNCT_BH754     107             400         0.01       0          0          0          0
D_JUNCT_BH755    JUNCT_BH755     116             400         0.01       0          0          0          0
312_OVERFLOW     144             JUNCT_313       2140        0.056      0          0          0          0
D_JUNC_BH705     JUNCT_BH705     63              400         0.01       0          0          0          0
181_OVERFLOW     181             OUTFALL_936     400         0.035      0          0          0          0
182_OVERFLOW     182             OUTFALL_937     400         0.035      0          0          0          0
155_OVERFLOW     155             OUTFALL_938     400         0.035      0          0          0          0
D_JUNCT_BH757    JUNCT_BH757     152             400         0.01       0          0          0          0
77               152             JUNCT_BH756     400         0.035      0          0          0          0
D_JUNCT_BH756    JUNCT_BH756     150             400         0.01       0          0          0          0
D_756_OUT        150             OUTFALL_939     400         0.035      0          0          0          0
JUNCT_323_OVERFLOW JUNCT_323     154             400         0.035      0          0          0          0
80               154             JUNCT_318       400         0.035      0          0          0          0
142_OVERFLOW     142             156             400         0.035      0          0          0          0
CU_82            155             152             400         0.01       0          0          0          0
84               156             183             400         0.035      0          0          0          0
180_OVERFLOW     180             OUTFALL_935     400         0.035      0          0          0          0
88               180             181             400         0.035      0          0          0          0
183_OVERFLOW     183             155             400         0.035      0          0          0          0
64_OVERFLOW      64              JUNCT_BH709     1425        0.01       0          0          0          0

[OUTLETS]
;;Name           From Node       To Node         Offset     Type            QTable/Qcoeff    Qexpon     Gated
;;-------------- --------------- --------------- ---------- --------------- ---------------- ---------- --------
OUTLET_1025      STOR_1025       JUNCT_1025      0          TABULAR/DEPTH   RATING_CURVE_1025             NO
OUTLET_1026      STOR_1026       JUNCT_1026      0          TABULAR/DEPTH   RATING_CURVE_1026             NO
OUTLET_312_HIGH  STOR_312        144             0          TABULAR/DEPTH   RATING_CURVE_312_HIGH           NO
OUTLET_312_LOW   STOR_312        144             0          FUNCTIONAL/DEPTH 10.0            0.5        NO
;Rating curve for 21" RCP showing in Indian Peaks Filing 17 design drawings, generated in HydroCAD.
OUTLET_02_LOW    STOR_02         148             0          TABULAR/DEPTH   RATING_CURVE_02_LOW            NO
OUTLET_02_HIGH   STOR_02         125             0          TABULAR/DEPTH   RATING_CURVE_02_HIGH           NO

[XSECTIONS]
;;Link           Shape           Geom1           Geom2      Geom3      Geom4      Barrels    Culvert
;;-------------- --------------- --------------- ---------- ---------- ---------- ---------- ----------
1025_OVERFLOW    TRAPEZOIDAL     10              56         20         20         1
1026_OVERFLOW    TRAPEZOIDAL     10              56         20         20         1
200              TRAPEZOIDAL     3               5          3          3          1
200_OVERFLOW     TRAPEZOIDAL     10              46         20         20         1
201              DUMMY           0               0          0          0          1
202              DUMMY           0               0          0          0          1
203              DUMMY           0               0          0          0          1
204              DUMMY           0               0          0          0          1
205              DUMMY           0               0          0          0          1
206              DUMMY           0               0          0          0          1
207              DUMMY           0               0          0          0          1
208              TRAPEZOIDAL     3               5          3          3          1
209              DUMMY           0               0          0          0          1
210              DUMMY           0               0          0          0          1
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100-yr Future EPA SWMM Input

211	DUMMY	0	0	0	0	1
212	DUMMY	0	0	0	0	1
213	DUMMY	0	0	0	0	1
215	DUMMY	0	0	0	0	1
216	DUMMY	0	0	0	0	1
217	DUMMY	0	0	0	0	1
218	DUMMY	0	0	0	0	1
219	DUMMY	0	0	0	0	1
220	DUMMY	0	0	0	0	1
221	TRAPEZOIDAL	3	5	3	3	1
221_OVERFLOW	TRAPEZOIDAL	10	38	20	20	1
222	DUMMY	0	0	0	0	1
235	DUMMY	0	0	0	0	1
236	DUMMY	0	0	0	0	1
237	DUMMY	0	0	0	0	1
238	DUMMY	0	0	0	0	1
240	DUMMY	0	0	0	0	1
241	DUMMY	0	0	0	0	1
242	DUMMY	0	0	0	0	1
243	DUMMY	0	0	0	0	1
300	TRAPEZOIDAL	2	8	3	3	1
300_OVERFLOW	TRAPEZOIDAL	10	40	20	20	1
302	TRAPEZOIDAL	3	8	3	3	1
303	TRAPEZOIDAL	.5	8	3	3	1
303_OVERFLOW	TRAPEZOIDAL	10	22	20	20	1
305	DUMMY	0	0	0	0	1
306	TRAPEZOIDAL	3	10	3	3	1
306_OVERFLOW	TRAPEZOIDAL	10	56	20	20	1
308	TRAPEZOIDAL	1.5	10	3	3	1
308_OVERFLOW	TRAPEZOIDAL	10	38	20	20	1
310	TRAPEZOIDAL	3	8	3	3	1
310_OVERFLOW	TRAPEZOIDAL	10	52	20	20	1
311	TRAPEZOIDAL	3	10	3	3	1
311_OVERFLOW	TRAPEZOIDAL	10	56	20	20	1
312	TRAPEZOIDAL	3	10	3	3	1
313	TRAPEZOIDAL	3	10	3	3	1
1025	TRAPEZOIDAL	3	10	3	3	1
1026	TRAPEZOIDAL	3	10	3	3	1
313_OVERFLOW	TRAPEZOIDAL	10	38	20	20	1
315	TRAPEZOIDAL	1.5	10	3	3	1
315_OVERFLOW	TRAPEZOIDAL	10	38	20	20	1
317	TRAPEZOIDAL	3	5	3	3	1
317_OVERFLOW	TRAPEZOIDAL	10	46	20	20	1
318	TRAPEZOIDAL	3	10	3	3	1
318_OVERFLOW	TRAPEZOIDAL	10	56	20	20	1
319	TRAPEZOIDAL	3	10	3	3	1
319_OVERFLOW	TRAPEZOIDAL	10	56	20	20	1
320	TRAPEZOIDAL	.5	8	3	3	1
320_OVERFLOW	TRAPEZOIDAL	10	22	20	20	1
321	TRAPEZOIDAL	3	10	3	3	1
321_OVERFLOW	IRREGULAR	SB_237	0	0	0	1
322	TRAPEZOIDAL	3	10	3	3	1
322_OVERFLOW	TRAPEZOIDAL	10	56	20	20	1
CH_37	IRREGULAR	BlueHeron	0	0	0	1
75	TRAPEZOIDAL	1	10	3	3	1
323	DUMMY	0	0	0	0	1
606	DUMMY	0	0	0	0	1
607	DUMMY	0	0	0	0	1
608	DUMMY	0	0	0	0	1
609	DUMMY	0	0	0	0	1
613	DUMMY	0	0	0	0	1
614	DUMMY	0	0	0	0	1
615	DUMMY	0	0	0	0	1
616	DUMMY	0	0	0	0	1
617	DUMMY	0	0	0	0	1
618	DUMMY	0	0	0	0	1
619	DUMMY	0	0	0	0	1
620	DUMMY	0	0	0	0	1

100-yr Future EPA SWMM Input

621	DUMMY	0	0	0	0	1
622	DUMMY	0	0	0	0	1
623	DUMMY	0	0	0	0	1
624	DUMMY	0	0	0	0	1
638	DUMMY	0	0	0	0	1
639	DUMMY	0	0	0	0	1
640	DUMMY	0	0	0	0	1
641	DUMMY	0	0	0	0	1
648	DUMMY	0	0	0	0	1
655	DUMMY	0	0	0	0	1
702	TRAPEZOIDAL	3	8	3	3	1
703	TRAPEZOIDAL	3	10	3	3	1
703_OVERFLOW	TRAPEZOIDAL	10	84	20	20	1
705	TRAPEZOIDAL	.5	8	3	3	1
705_OVERFLOW	TRAPEZOIDAL	10	33	20	20	1
706	TRAPEZOIDAL	.5	8	3	3	1
706_OVERFLOW	TRAPEZOIDAL	10	33	20	20	1
707	TRAPEZOIDAL	3	8	3	3	1
707_OVERFLOW	TRAPEZOIDAL	10	78	20	20	1
708	TRAPEZOIDAL	3	10	3	3	1
708_OVERFLOW	TRAPEZOIDAL	10	84	20	20	1
709	TRAPEZOIDAL	3	10	3	3	1
709_OVERFLOW	TRAPEZOIDAL	10	84	20	20	1
710	TRAPEZOIDAL	3	10	3	3	1
710_OVERFLOW	TRAPEZOIDAL	10	84	20	20	1
715	TRAPEZOIDAL	3	8	3	3	1
716	TRAPEZOIDAL	3	10	3	3	1
716_OVERFLOW	TRAPEZOIDAL	10	84	20	20	1
717	TRAPEZOIDAL	3	10	3	3	1
717_OVERFLOW	TRAPEZOIDAL	10	84	20	20	1
75_OVERFLOW	IRREGULAR	SB_237	0	0	0	1
CH_01	IRREGULAR	SB_751	0	0	0	1
CH_02	IRREGULAR	SB_754_East	0	0	0	1
CH_04	IRREGULAR	OpenChannel1	0	0	0	1
CH_05	IRREGULAR	IndianPeaks_02	0	0	0	1
CH_06	IRREGULAR	RailroadSwale	0	0	0	1
CH_07	IRREGULAR	IndianPeaks_01	0	0	0	1
CH_08	IRREGULAR	SB741	0	0	0	1
CH_09	IRREGULAR	SB740	0	0	0	1
CH_10	IRREGULAR	SB752_Northswale	0	0	0	1
CH_11	IRREGULAR	SB736_DSofPond	0	0	0	1
CH_13	IRREGULAR	SB734_DSofPond	0	0	0	1
CH_14	IRREGULAR	SB729	0	0	0	1
CH_15	IRREGULAR	BullheadGulch	0	0	0	1
CH_16	IRREGULAR	BullheadGulch	0	0	0	1
CH_17	IRREGULAR	GolfCourse	0	0	0	1
CH_18	IRREGULAR	BullheadGulch	0	0	0	1
CH_19	IRREGULAR	BullheadGulch	0	0	0	1
CH_20	IRREGULAR	SB732_fromSB743	0	0	0	1
CH_21	IRREGULAR	SB732	0	0	0	1
CH_22	IRREGULAR	SB732	0	0	0	1
CH_23	IRREGULAR	BullheadGulch	0	0	0	1
CH_24	IRREGULAR	ArapahoeSwale	0	0	0	1
CH_25	IRREGULAR	ArapahoeSwale_02	0	0	0	1
CH_26	IRREGULAR	ArapahoeSwale_02	0	0	0	1
CH_27	IRREGULAR	ArapahoeSwale_02	0	0	0	1
CH_28	IRREGULAR	ArapahoeSwale_02	0	0	0	1
CH_29	IRREGULAR	ArapahoeSwale_02	0	0	0	1
CH_30	IRREGULAR	BullheadGulch	0	0	0	1
CH_31	IRREGULAR	BullheadGulch	0	0	0	1
CH_32	IRREGULAR	BullheadGulch	0	0	0	1
CH_33	IRREGULAR	BullheadGulch	0	0	0	1
CH_34	IRREGULAR	BullheadGulch	0	0	0	1
CH_35	IRREGULAR	BullheadGulch	0	0	0	1
CH_36	IRREGULAR	SB716	0	0	0	1
CH_38	IRREGULAR	BullheadGulch	0	0	0	1
CH_39	IRREGULAR	Standard_Agricultural	0	0	0	1
CH_39_OVERFLOW	IRREGULAR	Standard_Agricultural	0	0	0	1

100-yr Future EPA SWMM Input

```
CH_40            IRREGULAR    Standard_Agricultural 0          0          0          1
CH_41            IRREGULAR    Standard_Agricultural 0          0          0          1
CH_42            IRREGULAR    Standard_Agricultural 0          0          0          1
CH_44            IRREGULAR    Standard_Agricultural 0          0          0          1
CH_45            IRREGULAR    Standard_Agricultural 0          0          0          1
CH_46            IRREGULAR    Standard_Agricultural 0          0          0          1
CH_47            IRREGULAR    Standard_Agricultural 0          0          0          1
CH_48            IRREGULAR    Standard_Agricultural 0          0          0          1
CH_49            IRREGULAR    Standard_Agricultural 0          0          0          1
CH_50            IRREGULAR    Standard_Agricultural 0          0          0          1
CH_51            IRREGULAR    Standard_Agricultural 0          0          0          1
CH_52            IRREGULAR    Standard_Agricultural 0          0          0          1
CH_53            IRREGULAR    SB_744_STREET    0          0          0          1
CH_63            IRREGULAR    SB708_287swale   0          0          0          1
CH_64            IRREGULAR    Standard_Agricultural 0          0          0          1
CH_66            IRREGULAR    SB708_287swale   0          0          0          1
CH_66_OVERFLOW   IRREGULAR    SB708_287swale   0          0          0          1
CH_67            IRREGULAR    SB_751           0          0          0          1
CH_76            IRREGULAR    Standard_Agricultural 0          0          0          1
CU_01            CIRCULAR     1.5              0          0          0          1
CU_01_OVERFLOW   IRREGULAR    StreetOverflow   0          0          0          1
CU_02            CIRCULAR     3                0          0          0          1
CU_02_OVERFLOW   IRREGULAR    StreetOverflow   0          0          0          1
CU_04            RECT_CLOSED  6                10         0          0          1
CU_05            RECT_CLOSED  6                10         0          0          1
CU_06            CIRCULAR     1.25             0          0          0          1
CU_06_OVERFLOW   IRREGULAR    StreetOverflow   0          0          0          1
CU_07            CIRCULAR     2                0          0          0          1
CU_07_OVERFLOW   IRREGULAR    SB736_USofPond   0          0          0          1
CU_08            CIRCULAR     6                0          0          0          1
CU_09            IRREGULAR    BullheadGulch    0          0          0          1
CU_10            CIRCULAR     1.5              0          0          0          1
CU_10_OVERFLOW   IRREGULAR    StreetOverflow   0          0          0          1
CU_11            CIRCULAR     24               0          0          0          1
CU_12            CIRCULAR     24               0          0          0          1
CU_12_OVERFLOW   IRREGULAR    StreetOverflow   0          0          0          1
CU_13            CIRCULAR     2                0          0          0          1
CU_13_OVERFLOW   IRREGULAR    StreetOverflow   0          0          0          1
CU_14_OVERFLOW   CIRCULAR     2                0          0          0          1
CU_15            CIRCULAR     3                0          0          0          1
CU_15_OVERFLOW   IRREGULAR    StreetOverflow   0          0          0          1
CU_20            CIRCULAR     2                0          0          0          1
CU_20_OVERFLOW   IRREGULAR    SB726            0          0          0          1
CU_21            CIRCULAR     3                0          0          0          1
CU_21_OVERFLOW   IRREGULAR    StreetOverflow   0          0          0          1
CU_32            CIRCULAR     1.5              0          0          0          1
CU_32_OVERFLOW   IRREGULAR    StreetOverflow   0          0          0          1
CU_33            CIRCULAR     2.5              0          0          0          2
CU_33_OVERFLOW   IRREGULAR    StreetOverflow_Extend 0          0          0          1
CU_34            CIRCULAR     3                0          0          0          1
CU_34_OVERFLOW   IRREGULAR    StreetOverflow   0          0          0          1
CU_35            CIRCULAR     2                0          0          0          1
CU_38            CIRCULAR     1.25             0          0          0          1
CU_38_OVERFLOW   IRREGULAR    GolfCourse       0          0          0          1
D_JUNCT_BH700    DUMMY        0                0          0          0          1
D_JUNCT_BH701    DUMMY        0                0          0          0          1
D_JUNCT_BH702    DUMMY        0                0          0          0          1
D_JUNCT_BH703    DUMMY        0                0          0          0          1
D_JUNCT_BH704    DUMMY        0                0          0          0          1
D_JUNCT_BH706    DUMMY        0                0          0          0          1
D_JUNCT_BH707    DUMMY        0                0          0          0          1
D_JUNCT_BH708    DUMMY        0                0          0          0          1
D_JUNCT_BH709    DUMMY        0                0          0          0          1
D_JUNCT_BH710    DUMMY        0                0          0          0          1
D_JUNCT_BH711    DUMMY        0                0          0          0          1
D_JUNCT_BH712    DUMMY        0                0          0          0          1
D_JUNCT_BH713    DUMMY        0                0          0          0          1
D_JUNCT_BH714    DUMMY        0                0          0          0          1
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100-yr Future EPA SWMM Input

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D_JUNCT_BH715    DUMMY        0                0          0          0          1
D_JUNCT_BH716    DUMMY        0                0          0          0          1
D_JUNCT_BH717    DUMMY        0                0          0          0          1
D_JUNCT_BH718    DUMMY        0                0          0          0          1
D_JUNCT_BH719    DUMMY        0                0          0          0          1
D_JUNCT_BH720    DUMMY        0                0          0          0          1
D_JUNCT_BH721    DUMMY        0                0          0          0          1
D_JUNCT_BH722    DUMMY        0                0          0          0          1
D_JUNCT_BH723    DUMMY        0                0          0          0          1
D_JUNCT_BH724    DUMMY        0                0          0          0          1
D_JUNCT_BH725    DUMMY        0                0          0          0          1
D_JUNCT_BH726    DUMMY        0                0          0          0          1
D_JUNCT_BH727    DUMMY        0                0          0          0          1
D_JUNCT_BH728    DUMMY        0                0          0          0          1
D_JUNCT_BH729    DUMMY        0                0          0          0          1
D_JUNCT_BH730    DUMMY        0                0          0          0          1
D_JUNCT_BH731    DUMMY        0                0          0          0          1
D_JUNCT_BH732    DUMMY        0                0          0          0          1
D_JUNCT_BH733    DUMMY        0                0          0          0          1
D_JUNCT_BH734    DUMMY        0                0          0          0          1
D_JUNCT_BH735    DUMMY        0                0          0          0          1
D_JUNCT_BH736    DUMMY        0                0          0          0          1
D_JUNCT_BH737    DUMMY        0                0          0          0          1
D_JUNCT_BH738    DUMMY        0                0          0          0          1
D_JUNCT_BH739    DUMMY        0                0          0          0          1
D_JUNCT_BH740    DUMMY        0                0          0          0          1
D_JUNCT_BH741    DUMMY        0                0          0          0          1
D_JUNCT_BH742    DUMMY        0                0          0          0          1
D_JUNCT_BH743    DUMMY        0                0          0          0          1
D_JUNCT_BH744    DUMMY        0                0          0          0          1
D_JUNCT_BH745    DUMMY        0                0          0          0          1
D_JUNCT_BH746    DUMMY        0                0          0          0          1
D_JUNCT_BH747    DUMMY        0                0          0          0          1
D_JUNCT_BH748    DUMMY        0                0          0          0          1
D_JUNCT_BH749    DUMMY        0                0          0          0          1
D_JUNCT_BH750    DUMMY        0                0          0          0          1
D_JUNCT_BH751    DUMMY        0                0          0          0          1
D_JUNCT_BH752    DUMMY        0                0          0          0          1
D_JUNCT_BH753    DUMMY        0                0          0          0          1
D_JUNCT_BH754    DUMMY        0                0          0          0          1
D_JUNCT_BH755    DUMMY        0                0          0          0          1
312_OVERFLOW     TRAPEZOIDAL  10               56         10         10         1
D_JUNC_BH705     DUMMY        0                0          0          0          1
181_OVERFLOW     IRREGULAR    Standard_Agricultural 0          0          0          1
182_OVERFLOW     IRREGULAR    Standard_Agricultural 0          0          0          1
155_OVERFLOW     IRREGULAR    Standard_Agricultural 0          0          0          1
D_JUNCT_BH757    DUMMY        0                0          0          0          1
77               IRREGULAR    Standard_Agricultural 0          0          0          1
D_JUNCT_BH756    DUMMY        0                0          0          0          1
D_756_OUT        IRREGULAR    Standard_Agricultural 0          0          0          1
JUNCT_323_OVERFLOW IRREGULAR    Standard_Agricultural 0          0          0          1
80               IRREGULAR    Standard_Agricultural 0          0          0          1
142_OVERFLOW     IRREGULAR    Standard_Agricultural 0          0          0          1
CU_82            CIRCULAR     1                0          0          0          1
84               IRREGULAR    Standard_Agricultural 0          0          0          1
180_OVERFLOW     IRREGULAR    Standard_Agricultural 0          0          0          1
88               IRREGULAR    Standard_Agricultural 0          0          0          1
183_OVERFLOW     IRREGULAR    Standard_Agricultural 0          0          0          1
64_OVERFLOW      IRREGULAR    Standard_Agricultural 0          0          0          1

[TRANSECTS]
;;Transect Data in HEC-2 format
;
NC 0.035    0.035    0.035
X1 ArapahoeSwale     30       120      130      0.0      0.0      0.0      0.0      0.0
GR 5276.5655 0        5276.4999 3.272993233 5276.4263 6.545986465 5276.2428 9.818979697 5276.124 13.0919729
GR 5276.0524 16.36496613 5275.9559 19.6379594 5275.8763 22.9109526 5275.7138 26.18394586 5275.5916 29.45693909
GR 5275.4611 32.72993233 5275.221 36.00292559 5274.7027 39.27591883 5274.2032 42.54891207 5274.1099 45.82190533
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100-yr Future EPA SWMM Input

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GR 5274.4972 49.09489859 5274.8001 52.36789182 5274.6932 55.6408851 5274.6952 58.91387836 5274.7566 62.18687163
GR 5274.7794 65.45986487 5274.8167 68.73285814 5274.819 72.00585143 5274.8254 75.27884469 5274.8347 78.55183797
GR 5274.9534 81.82483123 5275.2834 85.09782451 5275.6304 88.3708178 5275.9711 91.64381106 5276.5811 94.91680434
;
NC 0.035    0.035    0.035
X1 ArapahoeSwale_02  84       145      160      0.0      0.0      0.0      0.0      0.0
GR 5268.7375 0        5268.7735 3.27620963752 5268.9354 6.55241923034 5268.9558 9.82862885296 5268.9563 13.1048384905
GR 5269.0389 16.3810481131 5269.0107 19.6572577357 5269.0348 22.9334673434 5269.0328 26.2096769661 5269.0371 29.4858866185
GR 5269.0173 32.7620962411 5268.9727 36.0383058786 5268.8758 39.3145155013 5268.846 42.5907251537 5268.8323 45.8669348061
GR 5268.8445 49.1431444287 5268.8643 52.4193540812 5269.0028 55.6955637336 5269.2203 58.9717733711 5269.3107 62.2479830235
GR 5269.4179 65.5241926759 5269.4903 68.8004023284 5269.5   72.0766119808 5269.542 75.352821663 5269.4903 78.6290313154
GR 5269.4297 81.9052409679 5269.3589 85.1814506501 5269.3738 88.4576603025 5269.4312 91.7338699847 5269.3992 95.010079667
GR 5269.3582 98.2862893194 5269.2594 101.562499002 5269.3031 104.838708684 5269.1265 108.114918366 5268.9915 111.391128033
GR 5268.9195 114.667337716 5269.1678 117.943547398 5269.1497 121.21975711 5268.9696 124.495966792 5268.4526 127.772176474
GR 5267.5775 131.048386201 5266.5129 134.324595883 5265.4392 137.600805566 5264.7142 140.877015293 5264.4199 144.153224975
GR 5264.8708 147.429434687 5265.6613 150.705644399 5266.4391 153.981854096 5266.9205 157.258063838 5267.2376 160.53427352
GR 5267.3192 163.810483247 5267.788 167.086692959 5268.6264 170.362902686 5269.4385 173.639112398 5270.002 176.91532214
GR 5270.2548 180.191531867 5270.4158 183.467741579 5270.5292 186.743951336 5270.6167 190.020161048 5270.6892 193.296370775
GR 5270.7503 196.572580516 5270.8026 199.848790273 5270.849 203.125000015 5270.888 206.270882519 5270.9213 209.416765055
GR 5270.9495 212.562647573 5270.9733 215.708530107 5270.9934 218.854412643 5271.0102 222.000295147 5271.0244 225.14617768
GR 5271.036 228.292060231 5271.0454 231.437942764 5271.053 234.583825271 5271.058 237.729707834 5271.0588 240.87559037
GR 5271.055 244.021472903 5271.0477 247.16735544 5271.0388 250.313237988 5271.0296 253.459120554 5271.0225 256.605003087
GR 5271.0167 259.750885653 5271.0127 262.896768186 5271.0101 266.042650753 5271.0099 269.188533318
;
NC 0.03     0.03     0.03
X1 BlueHeron         27       55       65       0.0      0.0      0.0      0.0      0.0
GR 5250.8606 0        5250.7705 3.27190166712 5250.5793 6.54380340874 5250.4108 9.81570509076 5250.2359 13.0876067728
GR 5250.0998 16.3595084995 5249.9238 19.6314101815 5249.7551 22.9033119082 5249.5875 26.1752135903 5249.4876 29.4471153319
GR 5249.3697 32.7190170139 5249.1792 35.9909187406 5248.7355 39.2628204226 5248.3674 42.5347221494 5248.1351 45.8066238314
GR 5247.5243 49.078525573 5246.7359 52.3504272997 5246.0953 55.6223289818 5246.0584 58.8942307234 5246.4903 62.1661323905
GR 5246.853 65.4380341321 5247.2155 68.7099358588 5247.585 71.9818375409 5247.9614 75.2537392825 5248.3394 78.5256410092
GR 5248.6428 81.7975427508 5248.7092 85.0694444329
;
NC 0.05     0.05     0.05
X1 BullheadGulch     169      225      250      0.0      0.0      0.0      0.0      0.0
GR 5315.1807 0        5315.1847 3.26299555537 5315.1663 6.52599116687 5315.1119 9.78898672043 5315.0125 13.051982289
GR 5314.9012 16.3149778873 5314.7837 19.5779734559 5314.6684 22.8409690691 5314.5576 26.1039646228 5314.4503 29.3669602361
GR 5314.3459 32.6299557899 5314.245 35.8929513436 5314.1478 39.1559469569 5314.054 42.4189425106 5313.9627 45.6819381239
GR 5313.8721 48.9449336776 5313.7824 52.207929291 5313.6927 55.4709249043 5313.6019 58.7339204582 5313.5104 61.9969160715
GR 5313.417 65.2599116849 5313.3222 68.5229072386 5313.2291 71.7859028522 5313.1388 75.0488984656 5313.0525 78.3118940194
GR 5312.9785 81.5748896328 5312.9718 84.8378852463 5312.9808 88.1008808001 5312.9152 91.3638764136 5312.8084 94.6268720271
GR 5312.6934 97.8898676407 5312.596 101.152863254 5312.5778 104.415858808 5312.5137 107.678854422 5312.4408 110.941850035
GR 5312.4185 114.204845649 5312.3826 117.467841262 5312.3747 120.730836861 5312.3658 123.993832475 5312.4669 127.256828088
GR 5312.6528 130.519823702 5312.864 133.782819315 5313.1281 137.045814929 5313.2981 140.308810543 5313.3364 143.571806156
GR 5313.3381 146.834801755 5313.3309 150.097797369 5313.3232 153.360792983 5313.3131 156.623788596 5313.2979 159.88678421
GR 5313.2755 163.149779824 5313.2445 166.412775437 5313.202 169.675771036 5313.1447 172.93876671 5313.0705 176.201762323
GR 5312.9559 179.464757937 5312.7547 182.727753551 5312.5017 185.99074915 5312.2778 189.253744823 5312.2322 192.516740437
GR 5312.2326 195.779736051 5312.2557 199.042731709 5312.0794 202.305727323 5311.6473 205.568722937 5310.9406 208.831718596
GR 5310.0396 212.094714209 5309.1297 215.357709823 5308.3549 218.620705497 5307.6509 221.883701096 5307.1851 225.146696769
GR 5306.8131 228.409692383 5306.4855 231.672687997 5306.2537 234.935683656 5306.3003 238.198679329 5306.4643 241.461674928
GR 5306.6523 244.724670543 5306.8847 247.987666216 5306.9955 251.250661875 5307.1002 254.513657489 5307.2732 257.776653162
GR 5307.3085 261.039648776 5307.458 264.302644435 5307.6515 267.565640094 5307.7347 270.828635708 5307.8657 274.091631382
GR 5307.9919 277.354627041 5308.1888 280.617622655 5308.3146 283.880618328 5308.2821 287.143613987 5308.3245 290.406609661
GR 5308.4547 293.66960526 5308.5177 296.932600934 5308.5478 300.195596593 5308.5541 303.458592267 5308.5714 306.721587925
GR 5308.6136 309.98458354 5308.6642 313.247579213 5308.7171 316.510574872 5308.7902 319.773570546 5308.894 323.036566205
GR 5308.9987 326.299561879 5309.1137 329.562557538 5309.2569 332.825553212 5309.4103 336.088548871 5309.6214 339.351544545
GR 5309.8141 342.614540204 5309.9569 345.877535878 5310.105 349.140531537 5310.3022 352.403527211 5310.4756 355.66652287
GR 5310.7198 358.929518544 5311.035 362.192514203 5311.1574 365.455509862 5311.2918 368.718505595 5311.5436 371.981501254
GR 5311.7717 375.244496928 5311.9423 378.507492588 5312.0983 381.770488247 5312.1208 385.03348398 5311.9655 388.296479639
GR 5311.874 391.559475314 5311.9405 394.822470973 5312.069 398.085466647 5312.2119 401.348462366 5312.3657 404.611458025
GR 5312.5289 407.874453699 5312.7007 411.137449418 5312.8821 414.400445077 5313.0751 417.663440796 5313.2823 420.92643647
GR 5313.5117 424.189432129 5313.7693 427.452427848 5313.9388 430.715423522 5313.9881 433.978419241 5313.9624 437.241414901
GR 5313.8969 440.504410619 5313.7814 443.767406294 5313.7354 447.030402013 5313.7891 450.293397687 5313.8008 453.556393406
GR 5313.8435 456.819389065 5313.9819 460.082384784 5314.1048 463.345380503 5314.1576 466.608376178 5314.2386 469.871371897
GR 5314.3005 473.134367556 5314.3471 476.397363275 5314.411 479.660359009 5314.4596 482.923354728 5314.5519 486.186350388
GR 5314.652 489.449346107 5314.6882 492.712341826 5314.6901 495.9753375 5314.7636 499.238333219 5314.8148 502.501328938
GR 5314.8118 505.764324658 5314.8349 509.027320377 5314.8738 512.290316051 5314.9171 515.55331177 5314.9643 518.816307489
GR 5315.0392 522.079303209 5315.1857 525.342298928 5315.4093 528.605294647 5315.6838 531.868290366 5315.9478 535.131286085
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100-yr Future EPA SWMM Input

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GR 5316.1058 538.394281805 5316.1684 541.657277539 5316.2486 544.920273258 5316.3711 548.183268978
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NC 0.03     0.03     0.03
X1 GolfCourse        120      0.0      0.0      0.0      0.0      0.0      0.0      0.0
GR 5283.9806 0        5283.837 3.25575734486 5283.688 6.51151466927 5283.55  9.76727194769 5283.4712 13.0230292798
GR 5283.4598 16.2787866042 5283.4944 19.5345439337 5283.4511 22.7903012658 5283.243 26.0460585902 5283.1004 29.301815935
GR 5283.0562 32.5575732518 5282.995 35.8133306043 5282.9523 39.069087921 5282.9423 42.3248452378 5282.966 45.5806025826
GR 5282.9831 48.8363599581 5282.9411 52.0921172748 5282.9008 55.3478746069 5282.8844 58.6036319441 5282.8154 61.8593893119
GR 5282.6899 65.115146644 5282.552 68.3709040195 5282.4039 71.6266613362 5282.2889 74.8824187194 5282.1483 78.1381760949
GR 5282.0273 81.3939334244 5281.9244 84.6496907922 5281.8807 87.9054481754 5281.8489 91.1612055509 5281.8142 94.4169629187
GR 5281.7495 97.6727202354 5281.6559 100.928477619 5281.6157 104.184234994 5281.5569 107.439992362 5281.4618 110.69574973
GR 5281.3199 113.951507105 5281.1932 117.207264511 5281.0793 120.463021894 5281.0206 123.718779262 5280.9704 126.974536638
GR 5280.8905 130.230294057 5280.8174 133.486051424 5280.7304 136.741808808 5280.6493 139.997566206 5280.6158 143.253323589
GR 5280.5912 146.509081008 5280.5438 149.764838376 5280.5157 153.020595803 5280.4288 156.276353209 5280.3249 159.532110576
GR 5280.2985 162.787867995 5280.2512 166.043625409 5280.2202 169.299382828 5280.2216 172.555140247 5280.2963 175.810897668
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GR 5281.3115 227.903016539 5281.1904 231.158773945 5281.1834 234.414531403 5281.2893 237.67028888 5281.5411 240.926046286
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GR 5283.7675 260.460591035 5283.8626 263.716348505 5283.813 266.972105947 5283.8037 270.227863455 5283.8607 273.48362092
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GR 5283.8383 341.854528208 5283.9848 345.110285701 5284.194 348.366043209 5284.3332 351.621800702 5284.5223 354.877558256
GR 5284.6587 358.133315749 5284.843 361.389073309 5285.0405 364.644830789 5285.2884 367.900588297 5285.638 371.156345856
GR 5286.2376 374.412103337 5286.9562 377.667860896 5287.2755 380.923618435 5287.4012 384.179375994 5287.4811 387.435133487
;
NC 0.05     0.05     0.05
X1 IndianPeaks_01    35       77       97       0.0      0.0      0.0      0.0      0.0
GR 5351.0835 3.27117793235 5350.9835 6.54235588729 5350.829 9.81353384223 5350.6397 13.0847118263 5350.2631 16.3558897813
GR 5349.7311 19.6270677541 5349.1533 22.898245709 5348.6343 26.1694237028 5348.1366 29.440601648 5347.6448 32.7117796418
GR 5347.0669 35.9829576194 5346.4803 39.2541356035 5345.8956 42.5253135973 5345.3769 45.7964915651 5344.9226 49.0676695589
GR 5344.3741 52.338847543 5343.8986 55.6100255594 5343.3596 58.8812035435 5342.8446 62.152381521 5342.3433 65.4235595148
GR 5341.8458 68.6947375215 5341.266 71.9659155056 5340.3874 75.2370935609 5339.3059 78.5082715676 5338.6176 81.7794495743
GR 5338.4353 85.0506275681 5338.4215 88.3218055748 5338.6525 91.5929836203 5339.3663 94.8641616367 5340.4923 98.1353396434
GR 5341.2902 101.406517689 5341.7065 104.677695717 5341.9899 107.948873723 5342.2951 111.220051769 5342.5385 114.491229814
;
;Open channel beginning at Roser Drive, discharging into regional detention facility.
NC 0.06     0.06     0.06
X1 IndianPeaks_02    23       35       55       0.0      0.0      0.0      0.0      0.0
GR 5337.2999 3.2209264078 5337.0189 6.44185277285 5336.3254 9.66277919545 5335.4178 12.8837056016 5334.5429 16.1046320225
GR 5333.7391 19.3255584303 5333.0119 22.5464848512 5332.2102 25.7674111259 5331.3207 28.9883376799 5330.4343 32.2092640268
GR 5329.7692 35.4301904939 5329.7292 38.6511168556 5329.8826 41.8720433176 5329.9691 45.0929696809 5329.9679 48.3138961429
GR 5330.0184 51.5348225638 5330.3461 54.75574897 5331.1303 57.9766753892 5332.0268 61.197601792 5332.6969 64.4185282573
GR 5333.433 67.6394546749 5334.1871 70.8603810777 5335.1316 74.0813074969
;
;Swale running through open space east of City of Lousiville Water Treatment Plant
NC 0.013    0.013    0.015
X1 OpenChannel1      28       15       30       0.0      0.0      0.0      0.0      0.0
GR 153.3844 3.240999031 149      6.481998078 148.3026 9.72299714 143.2443 12.9639962 129.2983 16.20499526
GR 110.0854 19.44599432 108.3554 22.68699341 126.1623 25.92799247 122.3329 29.16899153 124.6164 32.40999059
GR 147.8336 35.65098969 154.5774 38.89198878 158.1672 42.13298784 165.5317 45.37398693 172.1837 48.61498602
GR 175.4204 51.8559851 174.3227 55.09698419 173.3893 58.3379833 179.9398 61.57898239 187.4034 64.81998148
GR 188.1249 68.06098057 182.4443 71.30197966 180.6028 74.54297878 179.047  77.78397787 170.2836 81.024977
GR 158.2714 83.63315937 152.6109 86.24134171 147.7422 88.84952405
;
;Swale along west side of railroad
NC 0.05     0.05     0.05
X1 RailroadSwale     63       80       110      0.0      0.0      0.0      0.0      0.0
GR 5371.6922 0        5371.6542 3.24545996005 5371.5823 6.49091989213 5371.4609 9.73637985975 5371.2625 12.981839807
GR 5370.9658 16.2272997595 5370.6016 19.4727597195 5370.2078 22.7182196667 5369.7928 25.9636796344 5369.3584 29.2091395431
GR 5368.9197 32.4545994979 5368.4711 35.7000594579 5367.947 38.9455194127 5367.3069 42.1909793366 5366.6863 45.4364393042
GR 5366.3026 48.6818992514 5366.0541 51.9273591677 5365.8899 55.1728191505 5365.7168 58.4182790615 5365.5796 61.6637390291
GR 5365.4641 64.9091989454 5365.319 68.1546589078 5365.2666 71.4001188392 5365.3824 74.6455787631 5365.7806 77.8910387459
GR 5366.028 81.1364986773 5366.1255 84.3819586321 5366.0334 87.6274185711 5365.7296 90.8728785026 5365.5359 94.118338434
GR 5365.3947 97.3637984168 5365.3518 100.609258341 5365.4097 103.854718274 5365.6159 107.100178206 5366.1488 110.345638137
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100-yr Future EPA SWMM Input

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GR 5371.0191 129.818397779 5370.9813 133.063857725 5370.512 136.309317672 5369.5369 139.554777567 5368.5564 142.800237514
GR 5367.1849 146.04569746 5365.5267 149.291157407 5363.9821 152.536617302 5362.99  155.782077249 5362.698 159.027537211
GR 5362.8552 162.272997106 5363.2169 165.518457052 5363.4742 168.763916963 5363.7025 172.009376925 5363.832 175.254836871
GR 5363.8742 178.500296794 5363.9879 181.745756743 5364.3105 184.991216651 5364.9359 188.236676569 5365.5932 191.482136531
GR 5366.1398 194.727596441 5366.4031 197.775695349 5366.689 200.823794287
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NC 0.035    0.035    0.035
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GR 5065.2025 16.37895023 5065.2988 19.65474031 5065.3746 22.93053037 5065.4606 26.20632038 5065.5042 29.48211051
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GR 5065.7179 49.13685087 5065.7059 52.41264088 5065.4768 55.68843094 5064.9155 58.96422101 5064.144 62.24001109
GR 5063.4744 65.51580115 5062.6793 68.79159122 5062.0432 72.0673813 5061.9342 75.34317135 5062.0373 78.61896143
GR 5062.1564 81.8947515 5062.2748 85.17054156 5062.3969 88.44633164 5062.5285 91.7221217 5062.4798 94.99791177
GR 5062.3035 98.27370184 5062.0841 101.5494919 5061.9378 104.825282 5061.5618 108.1010721 5061.4106 111.3768622
GR 5061.4718 114.6526522 5061.5088 117.9284423 5061.503 121.2042324 5061.4787 124.4800224 5061.4873 127.7558126
GR 5061.4546 131.0316026 5061.3784 134.3073927 5061.404 137.5831828 5061.3306 140.8589728 5061.3562 144.134763
GR 5061.3949 147.410553 5061.3786 150.6863431 5061.4102 153.9621332 5061.306 157.2379233 5061.2981 160.5137134
GR 5061.2772 163.7895034 5061.2918 167.0652935 5061.3578 170.3410836 5061.332 173.6168737 5061.3101 176.8926638
GR 5061.312 180.1684539 5061.3426 183.444244 5061.2955 186.7200341 5061.318 189.9958242 5061.3466 193.2716143
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GR 5061.3363 294.8211075 5061.3263 298.0968976 5061.4443 301.3726877 5061.5147 304.6484778 5061.5451 307.9242679
GR 5061.5494 311.200058 5061.5189 314.4758482 5061.5127 317.7516383 5061.5015 321.0274284 5061.4856 324.3032185
GR 5061.5352 327.5790086 5061.6456 330.8547987 5061.6759 334.1305889 5061.6335 337.406379 5061.7286 340.6821691
GR 5061.7447 343.9579592 5061.7588 347.2337494 5061.7561 350.5095395 5061.7603 353.7853296 5061.8617 357.0611197
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GR 5061.9316 409.4737618 5061.9315 412.749552 5061.9565 416.0253422 5061.9959 419.3011323 5061.9823 422.5769224
GR 5062.0734 425.8527125 5062.196 429.1285027 5062.267 432.4042928 5062.1437 435.680083 5061.9898 438.9558731
GR 5062.0298 442.2316633 5062.0444 445.5074534 5062.0722 448.7832436 5062.0487 452.0590337 5062.0087 455.3348239
GR 5062.0263 458.610614 5062.0543 461.8864041 5062.0318 465.1621943 5062.0305 468.4379844 5062.0591 471.7137746
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GR 5062.124 507.7474663 5062.1553 511.0232564 5062.1829 514.2990466 5062.1706 517.5748367 5062.2006 520.8506269
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GR 5062.2903 540.5053679 5062.3334 543.7811581 5062.3574 547.0569482 5062.3756 550.3327384 5062.34  553.6085286
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;
;High manning's to account for blocked obstructions
NC 0.1      0.1      0.1
X1 SB_751            233      390      410      0.0      0.0      0.0      0.0      0.0
GR 5378.9885 0        5378.944 3.28042437741 5378.8843 6.56084878459 5378.8367 9.84127319117 5378.8596 13.1216975686
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100-yr Future EPA SWMM Input

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GR 5371.7828 246.03183578 5371.7175 249.312260353 5371.6053 252.592684898 5371.4227 255.873109472 5371.2652 259.153534047
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GR 5370.0633 360.846696751 5370.0727 364.127121385 5370.0744 367.407546005 5370.0556 370.687970656 5369.9694 373.968395307
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GR 5369.2112 393.65094324 5369.3689 396.93136789 5369.732 400.211792569 5370.1454 403.492217221 5370.3468 406.772641888
GR 5370.2444 410.053066568 5369.902 413.33349122 5369.6461 416.613915899 5369.6519 419.894340581 5369.8677 423.17476526
GR 5370.1823 426.455189942 5370.5724 429.735614624 5371.0287 433.016039303 5371.4749 436.296463985 5371.527 439.576888696
GR 5371.2473 442.857313376 5370.9147 446.137738087 5370.682 449.418162769 5370.5239 452.698587451 5370.4325 455.979012161
GR 5370.3992 459.259436872 5370.413 462.539861583 5370.4807 465.820286295 5370.5996 469.100710992 5370.7449 472.381135703
GR 5370.8929 475.661560412 5371.0035 478.941985126 5371.0234 482.222409867 5370.9801 485.502834576 5370.9484 488.783259305
GR 5370.9138 492.063684016 5370.8921 495.344108758 5370.8869 498.624533484 5370.8845 501.904958226 5370.8882 505.185382937
GR 5370.8988 508.465807693 5370.9102 511.746232435 5370.9148 515.026657176 5370.9037 518.307081905 5370.8802 521.587506646
GR 5370.8594 524.867931387 5370.8245 528.148356143 5370.7632 531.428780916 5370.5907 534.709205643 5370.3876 537.989630414
GR 5370.2904 541.270055172 5370.2281 544.550479944 5370.16  547.830904699 5370.0866 551.111329443 5370.0196 554.391754229
GR 5369.975 557.672179003 5369.8519 560.952603758 5369.7774 564.233028547 5369.7145 567.513453317 5369.638 570.793878106
GR 5369.5745 574.074302892 5369.4457 577.354727665 5369.4006 580.635152453 5369.5059 583.915577239 5369.6008 587.196002042
GR 5369.6888 590.476426831 5369.724 593.756851616 5369.7498 597.037276405 5369.7622 600.317701208 5369.7432 603.598125994
GR 5369.7109 606.878550812 5369.7206 610.1589756 5369.8508 613.439400418 5370.1533 616.719825221 5370.4632 620.000250039
GR 5370.7979 623.280674857 5371.1835 626.561099672 5371.6487 629.841524491 5372.1477 633.121949308 5372.3463 636.402374126
GR 5372.4048 639.682798974 5372.4979 642.963223792 5372.5166 646.243648861 5372.5698 649.524073458 5372.6408 652.804498276
GR 5372.7708 656.084923125 5372.9248 659.365347973 5372.9962 662.645772791 5373.0501 665.926197639 5373.1374 669.206622486
GR 5373.228 672.487047334 5373.3591 675.767472184 5373.4888 679.047897047 5373.5798 682.328321894 5373.7342 685.608746742
GR 5373.9009 688.889171622 5373.984 692.16959647 5374.0717 695.450021332 5374.1726 698.730446212 5374.3538 702.01087106
GR 5374.4497 705.291295937 5374.6243 708.571720802 5374.8595 711.85214568 5375.0445 715.132570559 5375.3257 718.412995452
GR 5375.6409 721.693420331 5375.9442 724.973845211 5376.1055 728.254270073 5376.2332 731.534694983 5376.4446 734.81511986
GR 5376.6139 738.095544755 5376.6347 741.375969635 5376.6833 744.656394527 5376.7565 747.936819437 5376.9383 751.217244361
GR 5377.0978 754.497669239 5377.2488 757.778094163 5377.371 761.058519073
;
;concrete lined channel through eastern portion of subbasin 754, inspected during field visit
NC 0.07     0.07     0.02
X1 SB_754_East       107      145      150      0.0      0.0      0.0      0.0      0.0
GR 5427.305 0        5427.2421 3.27574517486 5427.1883 6.55149037962 5427.1386 9.82723559918 5427.0746 13.1029808039
GR 5427.0281 16.3787260083 5427.0048 19.654471213 5426.9704 22.9302164326 5426.9532 26.2059616373 5426.9374 29.4817068719
GR 5426.8789 32.7574520914 5426.786 36.0331972961 5426.6711 39.3089425456 5426.5321 42.58468778 5426.4316 45.8604329848
GR 5426.3275 49.1361782341 5426.2022 52.4119234389 5426.0981 55.6876686883 5425.9732 58.9634139228 5425.7631 62.2391591722
GR 5425.3944 65.514904407 5424.84  68.7906496565 5424.1912 72.0663949208 5423.6861 75.3421401702 5423.4522 78.6178854196
GR 5423.361 81.8936306541 5423.3375 85.1693759039 5423.4036 88.445121183 5423.4653 91.7208664474 5423.4193 94.9966116971
GR 5423.2857 98.2723569763 5423.1167 101.548102241 5422.9111 104.82384752 5422.6705 108.099592799 5422.46  111.375338064
GR 5422.4117 114.651083313 5422.4145 117.926828623 5422.4182 121.202573902 5422.4916 124.478319181 5422.4797 127.754064446
GR 5422.3359 131.029809755 5422.1884 134.305555034 5421.8991 137.581300344 5421.0938 140.857045623 5420.1792 144.132790932
GR 5420.4158 147.408536241 5421.428 150.684281521 5421.823 153.96002683 5421.7939 157.235772139 5421.705 160.511517449
GR 5421.7747 163.787262758 5422.2587 167.063008067 5422.8126 170.338753376 5422.98  173.614498715 5423.0223 176.890244025
GR 5423.0938 180.165989364 5423.2102 183.441734673 5423.268 186.717480012 5423.2259 189.993225336 5423.1787 193.268970676
GR 5423.1517 196.544715985 5423.0642 199.820461324 5422.8878 203.096206663 5422.7594 206.371952017 5422.7568 209.647697356
GR 5422.7508 212.923442696 5422.7947 216.199188035 5423.0184 219.474933389 5423.3496 222.750678758 5423.6465 226.026424097
GR 5423.6796 229.302169451 5423.5735 232.57791482 5423.4882 235.853660189 5423.3098 239.129405543 5423.0433 242.405150912
GR 5422.8357 245.680896296 5422.7865 248.956641665 5422.8633 252.232387034 5422.8956 255.508132388 5422.7804 258.783877787
GR 5422.7056 262.059623171 5422.8   265.33536854 5422.9344 268.611113924 5423.1825 271.886859308 5423.4404 275.162604707
GR 5423.4717 278.438350091 5423.4048 281.71409549 5423.4349 284.989840874 5423.5103 288.265586288 5423.559 291.541331687
GR 5423.61  294.817077071 5423.7143 298.092822484 5423.8762 301.368567883 5424.0784 304.644313297 5424.2792 307.920058711
GR 5424.4049 311.19580411 5424.5457 314.471549554 5424.7711 317.747294968 5424.9731 321.023040382 5425.1758 324.298785795
GR 5425.4206 327.574531239 5425.6719 330.850276668 5425.9785 334.126022082 5426.2601 337.401767525 5426.4078 340.677512969
GR 5426.5071 343.953258383 5426.5889 347.229003827
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100-yr Future EPA SWMM Input

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NC 0.035    0.035    0.035
X1 SB205_287swale    88       60       70       0.0      0.0      0.0      0.0      0.0
GR 5252.0989 0         5252.0688 3.26272589931 5252.0241 6.52545175384 5251.9824 9.78817759354 5251.9104 13.0509034929
GR 5251.8168 16.3136293475 5251.747 19.5763552021 5251.6932 22.8390811013 5251.6222 26.1018069409 5251.5327 29.364532855
GR 5251.4786 32.6272586947 5251.4235 35.8899846088 5251.3391 39.1527104484 5251.2452 42.4154363475 5251.1625 45.6781622021
GR 5251.0508 48.9408881012 5250.8605 52.2036139557 5250.5068 55.4663398548 5249.9973 58.7290657094 5249.3936 61.9917916085
GR 5248.7555 65.2545174629 5248.2072 68.517243362 5247.7754 71.7799692611 5247.6937 75.0426951155 5248.0076 78.3054210146
GR 5248.5254 81.5681469137 5249.214 84.8308727681 5249.955 88.0935986672 5250.5942 91.3563245662 5250.8604 94.6190504205
GR 5250.8261 97.8817763196 5250.7828 101.144502219 5250.7693 104.407228133 5250.7811 107.669953972 5250.7335 110.932679871
GR 5250.69  114.195405785 5250.6654 117.458131684 5250.608 120.720857523 5250.5611 123.983583437 5250.5963 127.246309336
GR 5250.66  130.509035235 5250.6171 133.771761134 5250.5166 137.034487048 5250.5232 140.297212947 5250.5146 143.559938845
GR 5250.5197 146.822664745 5250.5383 150.085390658 5250.4773 153.348116497 5250.4211 156.610842396 5250.4328 159.87356831
GR 5250.4843 163.136294209 5250.4951 166.399020167 5250.4763 169.661746007 5250.4986 172.92447192 5250.5152 176.187197864
GR 5250.4993 179.449923778 5250.4832 182.712649676 5250.4362 185.975375575 5250.3889 189.238101474 5250.4038 192.500827388
GR 5250.3992 195.763553286 5250.3358 199.026279185 5250.294 202.289005084 5250.2892 205.551731042 5250.319 208.814456941
GR 5250.3145 212.077182854 5250.2984 215.339908753 5250.3097 218.602634652 5250.3914 221.865360551 5250.5441 225.128086509
GR 5250.4121 228.390812408 5249.9766 231.653538321 5249.6113 234.916264264 5249.3431 238.178990178 5249.1454 241.441716077
GR 5249.0483 244.704441975 5249.0304 247.967167933 5249.0123 251.229893832 5248.9548 254.49261979 5248.9409 257.755345689
GR 5248.9358 261.018071587 5248.8975 264.280797546 5248.8589 267.543523459 5248.8455 270.806249402 5248.9607 274.068975316
GR 5249.481 277.331701259 5249.6614 280.594427172 5249.7718 283.85715313
;
NC 0.035    0.016    0.04
X1 SB708_287swale    131      360      385      0.0      0.0      0.0      0.0      0.0
GR 5079.0674 0         5078.9789 3.25854696333 5078.9768 6.51709392667 5078.9565 9.7756409049 5078.9154 13.0341878682
GR 5078.902 16.2927348316 5078.9052 19.5512817949 5078.8857 22.8098287582 5078.9127 26.0683757663 5078.8895 29.3269227445
GR 5078.903 32.5854697078 5078.9121 35.8440166712 5078.9164 39.1025636345 5078.8921 42.3611105978 5078.9087 45.6196575612
GR 5078.9516 48.8782045245 5078.9577 52.1367515475 5078.9069 55.3952985108 5078.8489 58.6538454741 5078.809 61.9123924375
GR 5078.8103 65.1709394008 5078.842 68.4294864088 5078.8471 71.6880333871 5078.8456 74.9465803504 5078.8422 78.2051273137
GR 5078.8141 81.4636743218 5078.7986 84.7222212851 5078.8159 87.9807682484 5078.7962 91.2393152267 5078.7415 94.4978622347
GR 5078.7648 97.756409198 5078.7475 101.014956161 5078.7517 104.273503184 5078.7745 107.532050148 5078.731 110.790597171
GR 5078.786 114.049144134 5078.8219 117.307691142 5078.8222 120.56623812 5078.8043 123.824785084 5078.7686 127.083332092
GR 5078.7971 130.341879055 5078.7807 133.600426078 5078.7058 136.858973101 5078.7128 140.117520064 5078.6976 143.376067072
GR 5078.7226 146.63461405 5078.6889 149.893161058 5078.6733 153.151708022 5078.7566 156.410255045 5078.7175 159.668802008
GR 5078.7036 162.927349031 5078.6553 166.185896039 5078.6559 169.444443002 5078.6493 172.702990025 5078.6156 175.961536989
GR 5078.6212 179.220084012 5078.5774 182.47863102 5078.6126 185.737178043 5078.6052 188.995725006 5078.622 192.254272029
GR 5078.5979 195.512819052 5078.5536 198.77136606 5078.4764 202.029913023 5078.4421 205.288460046 5078.4575 208.547007069
GR 5078.4376 211.805554077 5078.3698 215.0641011 5078.371 218.322648123 5078.3498 221.581195086 5078.3006 224.839742094
GR 5078.3057 228.098289117 5078.3423 231.35683614 5078.2924 234.615383148 5078.2771 237.873930171 5078.2978 241.132477194
GR 5078.2738 244.391024202 5078.2668 247.649571225 5078.2586 250.908118248 5078.2675 254.166665271 5078.2138 257.425212279
GR 5078.158 260.683759302 5078.1958 263.942306325 5078.207 267.200853333 5078.2147 270.459400356 5078.2116 273.717947379
GR 5078.1588 276.976494387 5078.1289 280.23504141 5078.0436 283.493588433 5078.0328 286.752135441 5078.0161 290.010682523
GR 5077.9942 293.269229531 5077.9631 296.527776554 5077.9222 299.786323577 5077.9275 303.044870585 5077.9283 306.303417608
GR 5077.8916 309.561964676 5077.8502 312.820511699 5077.825 316.079058722 5077.835 319.33760573 5077.8625 322.596152812
GR 5077.872 325.85469982 5077.8812 329.113246843 5077.9269 332.371793866 5077.9507 335.630340934 5077.9891 338.888887957
GR 5078.1008 342.147434965 5077.968 345.405982047 5077.6001 348.664529055 5077.2813 351.923076123 5076.9795 355.181623146
GR 5076.6258 358.440170169 5076.0565 361.698717237 5075.5898 364.957264259 5075.5808 368.215811327 5075.7412 371.47435835
GR 5075.9517 374.732905418 5076.2272 377.991452441 5076.6485 381.249999508 5077.2665 384.508546531 5078.0834 387.767093599
GR 5078.9779 391.025640622 5079.6457 394.284187689 5080.09  397.542734712 5080.4964 400.80128178 5080.6818 404.059828848
GR 5080.6874 407.318375871 5080.7534 410.576922938 5080.8318 413.835469961 5080.9476 417.094017029 5081.0014 420.352564096
GR 5081.0149 423.611111119
;
;Natural terrain swale through subbasin 716
NC 0.035    0.035    0.035
X1 SB716             50       75       105      0.0      0.0      0.0      0.0      0.0
GR 5187.2222 0         5187.2357 3.27735254169 5187.2258 6.55470511317 5187.1321 9.83205768466 5187.1257 13.1094102561
GR 5187.1065 16.3867628127 5187.113 19.6641153842 5187.1311 22.9414679557 5187.1227 26.2188205272 5187.042 29.4961730987
GR 5186.9741 32.7735256702 5186.9211 36.0508782566 5186.8831 39.328230828 5186.8468 42.6055834293 5186.7781 45.8829360008
GR 5186.7537 49.1602886021 5186.7271 52.4376411885 5186.7003 55.7149937898 5186.67  58.9923463613 5186.6297 62.2696989775
GR 5186.572 65.547051549 5186.5062 68.8244041502 5186.4591 72.1017567664 5186.4386 75.3791093677 5186.378 78.656461969
GR 5186.286 81.9338145852 5186.2726 85.2111671865 5186.2953 88.4885198027 5186.3106 91.765872404 5186.3083 95.0432250202
GR 5186.3658 98.3205776513 5186.3977 101.597930267 5186.4377 104.875282899 5186.5097 108.152635515 5186.5955 111.429988146
GR 5186.6668 114.707340762 5186.7215 117.984693393 5186.7973 121.262046039 5186.9466 124.539398655 5187.0469 127.816751286
GR 5187.1216 131.094103932 5187.2323 134.371456563 5187.3041 137.648809209 5187.3787 140.926161855 5187.4194 144.203514516
GR 5187.4975 147.480867162 5187.5884 150.758219808 5187.7444 154.035572454 5187.7545 157.312925115 5187.7215 160.590277761
;
;natural terrain
NC 0.05     0.05     0.05
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100-yr Future EPA SWMM Input

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X1 SB726             131      145      160      0.0      0.0      0.0      0.0      0.0
GR 5176.5324 0         5176.548 3.25865636646 5176.549 6.51731268773 5176.5237 9.77596905419 5176.4776 13.0346253756
GR 5176.4748 16.2932817271 5176.4962 19.5519380931 5176.5396 22.8105944447 5176.6181 26.0692508106 5176.6936 29.3279071622
GR 5176.7769 32.5865635138 5176.724 35.8452198798 5176.7529 39.1038762314 5176.7588 42.3625325979 5176.6814 45.6211889787
GR 5176.5349 48.8798453452 5176.5248 52.1385016963 5176.5571 55.3971580925 5176.5846 58.655814459 5176.3976 61.9144708403
GR 5176.1668 65.1731272064 5175.9175 68.4317835878 5175.4321 71.6904399841 5174.8813 74.9490963654 5174.587 78.2077527617
GR 5174.2785 81.4664091281 5173.9569 84.7250655239 5173.6497 87.9837219351 5173.1757 91.2423783313 5172.8995 94.5010347276
GR 5172.641 97.759691109 5172.1909 101.018347535 5171.5914 104.277003931 5170.9327 107.535660328 5170.2672 110.794316739
GR 5169.469 114.052973135 5168.622 117.311629561 5167.8362 120.570285957 5167.4107 123.828942383 5166.696 127.087598809
GR 5165.833 130.346255235 5165.17  133.604911662 5164.5941 136.863568073 5163.9747 140.122224499 5163.5772 143.380880925
GR 5163.4138 146.639537351 5163.4126 149.898193777 5163.4456 153.156850233 5163.4279 156.415506659 5163.0658 159.674163085
GR 5162.5837 162.932819541 5162.1705 166.191475968 5161.8733 169.450132424 5162.2456 172.708788879 5162.8399 175.96744532
GR 5163.3478 179.226101777 5163.8824 182.484758232 5164.5479 185.743414659 5165.1854 189.002071114 5165.8312 192.260727571
GR 5166.2785 195.519384056 5166.5334 198.778040498 5166.8155 202.036696983 5167.0956 205.295353439 5167.2909 208.554009925
GR 5167.4038 211.812666381 5167.4876 215.071322853 5167.5883 218.329979338 5167.7795 221.588635794 5168.0304 224.847292265
GR 5168.3044 228.105948751 5168.6816 231.364605237 5169.189 234.623261738 5169.7575 237.881918224 5170.399 241.14057471
GR 5171.0899 244.399231211 5171.729 247.657887696 5172.0773 250.916544168 5172.1537 254.175200684 5172.2141 257.433857184
GR 5172.3224 260.69251367 5172.4617 263.951170186 5172.5941 267.209826687 5172.6554 270.468483203 5172.7163 273.727139704
GR 5172.8448 276.985796219 5172.9829 280.24445272 5173.1337 283.503109251 5173.3006 286.761765767 5173.5064 290.020422297
GR 5173.7622 293.279078783 5174.0105 296.537735314 5174.2325 299.796391845 5174.4378 303.055048391 5174.6355 306.313704921
GR 5174.85  309.572361422 5175.0905 312.831017968 5175.3247 316.089674499 5175.5222 319.348331029 5175.7606 322.60698759
GR 5176.0045 325.865644136 5176.2474 329.124300666 5176.4483 332.382957197 5176.6438 335.641613758 5176.8548 338.900270319
GR 5177.0832 342.158926864 5177.3238 345.417583425 5177.5267 348.676239986 5177.736 351.934896517 5177.9398 355.193553077
GR 5178.1786 358.452209638 5178.5003 361.710866228 5178.7352 364.969522789 5178.8874 368.228179335 5179.0327 371.486835925
GR 5179.1663 374.745492486 5179.2902 378.004149076 5179.4357 381.262805637 5179.6565 384.521462227 5179.9442 387.780118788
GR 5180.3266 391.038775394 5180.668 394.297431954 5180.8653 397.556088545 5181.0149 400.814745136 5181.1995 404.073401726
GR 5181.4013 407.332058317 5181.5853 410.590714907 5181.7807 413.849371498 5181.9781 417.108028088 5182.1906 420.366684724
GR 5182.3767 423.625341314
;
NC 0.035    0.035    0.035
X1 SB727_287Swale    65       130      160      0.0      0.0      0.0      0.0      0.0
GR 5255.8035 0         5255.7859 3.23486323655 5255.7714 6.46972648799 5255.7621 9.70458973944 5255.7564 12.939452976
GR 5255.755 16.174316287 5255.7583 19.4091795236 5255.7659 22.644042775 5255.7774 25.8789060712 5255.7895 29.1137693226
GR 5255.7944 32.3486325741 5255.788 35.5834958702 5255.7886 38.8183591217 5255.7906 42.0532223731 5255.6781 45.2880856693
GR 5255.4968 48.5229489207 5255.3527 51.7578122169 5255.1886 54.9926754534 5254.9989 58.2275387049 5254.8311 61.462402001
GR 5254.6427 64.6972652525 5254.4879 67.9321285486 5254.4241 71.1669918001 5254.3454 74.4018550962 5254.2417 77.6367183477
GR 5254.1866 80.8715816438 5254.1624 84.1064449549 5254.1442 87.3413081914 5254.108 90.5761715025 5253.9897 93.811034739
GR 5253.8068 97.0458980501 5253.6402 100.280761346 5253.5009 103.515624598 5253.3765 106.750487894 5253.2146 109.98535119
GR 5253.0598 113.220214441 5252.9853 116.455077738 5253.0213 119.689941049 5253.0962 122.924804285 5252.875 126.159667596
GR 5252.6016 129.394530892 5252.475 132.629394189 5252.2923 135.86425744 5252.1662 139.099120736 5252.1391 142.333984047
GR 5252.0675 145.568847343 5251.9814 148.803710639 5252.0418 152.038573891 5252.1707 155.273437187 5252.2316 158.508300498
GR 5252.2851 161.743163794 5252.3485 164.97802709 5252.4103 168.212890387 5252.4716 171.447753638 5252.5404 174.682616934
GR 5252.6734 177.917480245 5252.709 181.152343601 5252.787 184.387206838 5252.8473 187.622070149 5252.8645 190.856933445
GR 5252.9535 194.091796741 5253.0398 197.326660052 5253.13  200.561523348 5253.1725 203.796386644 5253.1298 207.03124994
;
NC 0.035    0.035    0.035
X1 SB729             132      150      170      0.0      0.0      0.0      0.0      0.0
GR 5237.5257 0         5237.2894 3.26311272699 5237.1514 6.52622545398 5236.9954 9.78933817491 5236.8584 13.0524509261
GR 5236.5215 16.3155636531 5236.1402 19.578676374 5235.7604 22.8417891283 5235.3177 26.1049018795 5234.7739 29.3680146064
GR 5234.2402 32.6311273788 5233.7883 35.8942401058 5233.1755 39.15735286 5232.6862 42.4204656324 5232.3785 45.6835783594
GR 5232.1709 48.9466911318 5232.0314 52.209803886 5231.9036 55.4729166644 5231.661 58.7360294186 5231.3517 61.9991422046
GR 5231.0295 65.2622549589 5230.749 68.5253677312 5230.5493 71.7884805127 5230.3433 75.0515932911 5230.1419 78.3147060393
GR 5230.072 81.5778188313 5230.0584 84.840931631 5229.9494 88.1040444124 5229.7985 91.3671571908 5229.7338 94.6302700041
GR 5229.7271 97.8933828037 5229.6391 101.156495558 5229.4225 104.419608377 5229.1069 107.682721177 5228.852 110.945833982
GR 5228.7973 114.208946771 5228.7452 117.472059577 5228.6213 120.73517239 5228.4504 123.998285223 5228.3278 127.261398023
GR 5228.1398 130.524510842 5228.0088 133.787623642 5227.9824 137.050736488 5228.031 140.313849288 5228.0804 143.576962134
GR 5228.1587 146.840074961 5228.2377 150.103187774 5228.2815 153.366300621 5228.1283 156.629413448 5228.0169 159.892526294
GR 5228.0933 163.155639121 5228.1688 166.418751968 5228.2478 169.681864795 5228.2675 172.944977641 5228.2297 176.208090506
GR 5228.2149 179.471203333 5228.2257 182.7343162 5228.1968 185.997429047 5228.1653 189.260541874 5228.1299 192.523654766
GR 5228.0962 195.786767612 5228.1295 199.04988048 5228.185 202.312993358 5228.2208 205.576106232 5228.237 208.839219072
GR 5228.2756 212.102331964 5228.2616 215.365444838 5228.2365 218.628557706 5228.2788 221.891670584 5228.2414 225.154783458
GR 5228.1934 228.41789635 5228.2119 231.681009217 5228.2047 234.944122136 5228.3127 238.20723501 5228.3301 241.470347902
GR 5228.3433 244.733460797 5228.3376 247.996573689 5228.3449 251.259686608 5228.3758 254.522799509 5228.3897 257.785912401
GR 5228.4563 261.049025296 5228.4554 264.312138215 5228.5273 267.575251134 5228.5343 270.838364059 5228.5788 274.101476954
GR 5228.5932 277.364589873 5228.6407 280.627702792 5228.7264 283.890815707 5228.7453 287.153928626 5228.7528 290.417041573
GR 5228.7768 293.680154492 5228.8311 296.943267438 5228.9333 300.206380333 5229.0264 303.469493293 5229.1037 306.732606212
GR 5229.2915 309.995719159 5229.4111 313.258832125 5229.4598 316.521945071 5229.5332 319.78505799 5229.5984 323.048170964
GR 5229.6185 326.311283896 5229.7402 329.57439687 5229.8586 332.837509816 5229.8583 336.100622776 5229.9513 339.363735747
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100-yr Future EPA SWMM Input

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GR 5229.9639 342.626848707 5230.0437 345.889961681 5230.1343 349.153074627 5230.2606 352.416187614 5230.3769 355.679300561
GR 5230.4869 358.942413572 5230.5698 362.205526546 5230.6359 365.468639506 5230.718 368.731752479 5230.7758 371.994865466
GR 5230.8397 375.257978464 5230.9305 378.521091451 5231.0041 381.784204439 5231.085 385.04731743 5231.1698 388.310430418
GR 5231.2621 391.573543391 5231.3575 394.836656403 5231.4337 398.099769417 5231.505 401.362882415 5231.5406 404.625995429
GR 5231.6055 407.889108441 5231.703 411.152221442 5231.8031 414.415334447 5231.8866 417.678447461 5231.8351 420.9415605
GR 5231.8778 424.204673501 5231.9621 427.46778654
;
NC 0.035    0.035    0.035
X1 SB731_287swale    75       170      180      0.0      0.0      0.0      0.0      0.0
GR 5276.0216 0        5275.9796 3.2729932315 5275.9031 6.54598646348 5275.8364 9.81897969498 5275.8207 13.091972927
GR 5275.8017 16.3649661439 5275.7439 19.6379593312 5275.6687 22.910952563 5275.5931 26.1839457948 5275.4658 29.4569390268
GR 5275.3483 32.7299322586 5275.3046 36.0029254757 5275.269 39.2759187075 5275.1797 42.5489119395 5275.103 45.8219051718
GR 5275.0823 49.0948984036 5275.0564 52.3678916359 5274.9675 55.6408849273 5274.8594 58.9138781596 5274.7773 62.1868713916
GR 5274.7226 65.4598646092 5274.7093 68.7328578412 5274.6921 72.0058510735 5274.6427 75.2788443056 5274.5909 78.5518375379
GR 5274.5418 81.8248308298 5274.4705 85.0978240621 5274.4135 88.3708172942 5274.4076 91.6438105269 5274.3553 94.9168038039
GR 5274.2714 98.1897970362 5274.2021 101.462790269 5274.1075 104.735783501 5274.0475 108.008776778 5273.9521 111.281770011
GR 5273.8391 114.554763243 5273.7874 117.827756476 5273.6989 121.100749768 5273.5514 124.373743001 5273.3809 127.646736278
GR 5273.2095 130.919729511 5273.091 134.192722743 5273.0178 137.465716035 5272.9446 140.738709268 5272.9273 144.011702545
GR 5272.9116 147.284695778 5272.8673 150.557689011 5272.8901 153.830682303 5272.9076 157.103675536 5272.892 160.376668814
GR 5272.7719 163.649662046 5272.5353 166.922655339 5272.2169 170.195648572 5271.7445 173.46864185 5271.1605 176.741635142
GR 5270.503 180.014628375 5269.8527 183.287621653 5269.4783 186.560614886 5269.5761 189.833608178 5270.0098 193.106601411
GR 5270.2891 196.379594689 5270.3099 199.652587982 5270.3094 202.925581215 5270.3665 206.198574493 5270.4321 209.471567726
GR 5270.4871 212.744561019 5270.5716 216.017554297 5270.636 219.29054759 5270.6889 222.563540823 5270.7547 225.836534101
GR 5270.8479 229.109527394 5270.9582 232.382520672 5271.0237 235.655513905 5271.0749 238.928507198 5271.1495 242.201500476
;
;Natural swale with agricultural ponds
NC 0.04     0.05     0.04
X1 SB732             132      180      260      0.0      0.0      0.0      0.0      0.0
GR 5253.1813 0        5253.4099 3.26769304968 5253.5167 6.53538607299 5253.5631 9.80307912666 5253.4293 13.0707721603
GR 5253.2075 16.3384651997 5253.0637 19.6061582493 5252.933 22.8738513013 5252.8582 26.141544351 5252.8937 29.4092373903
GR 5252.8922 32.6769304567 5252.8422 35.9446235207 5252.799 39.2123165704 5252.7237 42.4800096385 5252.6551 45.7477026881
GR 5252.6438 49.0153957562 5252.97  52.2830888058 5253.4682 55.5507818699 5253.7424 58.8184749522 5253.5249 62.0861680163
GR 5252.9183 65.3538610843 5252.6738 68.6215541627 5252.5633 71.8892472267 5252.4179 75.1569403211 5252.3173 78.4246333891
GR 5252.329 81.6923264819 5252.3079 84.9600195356 5252.2309 88.2277126443 5252.1598 91.495405737 5252.064 94.7630988154
GR 5251.9386 98.0307918995 5251.8706 101.298484992 5251.8136 104.566178087 5251.7748 107.833871179 5251.7812 111.101564288
GR 5251.7751 114.369257382 5251.764 117.636950479 5251.7108 120.904643588 5251.6093 124.172336697 5251.3928 127.440029789
GR 5251.2024 130.707722913 5250.8483 133.975416021 5250.4921 137.24310913 5250.0262 140.510802227 5249.4652 143.77849535
GR 5248.8964 147.046188459 5248.3767 150.313881596 5247.8732 153.581574705 5247.4575 156.849267842 5247.0955 160.116960951
GR 5246.6598 163.384654101 5246.1309 166.652347224 5245.4918 169.920040332 5244.891 173.18773347 5244.4317 176.455426607
GR 5243.9918 179.723119745 5243.5971 182.990812898 5243.2645 186.258506007 5242.9372 189.52619916 5242.6581 192.793892298
GR 5242.3044 196.061585435 5241.9205 199.329278585 5241.7957 202.596971751 5241.857 205.864664904 5242.2006 209.132358058
GR 5242.4739 212.400051195 5242.577 215.667744374 5242.604 218.935437511 5242.1287 222.203130693 5241.4139 225.470823847
GR 5241.7553 228.738517013 5242.7529 232.006210162 5243.0663 235.27390333 5243.1139 238.541596512 5243.3006 241.809289662
GR 5243.3378 245.076982844 5242.9268 248.344676022 5242.6168 251.612369204 5242.6768 254.880062386 5242.8104 258.14775555
GR 5242.8976 261.415448732 5242.9365 264.683141915 5243.0254 267.950835093 5243.1932 271.218528316 5243.373 274.486221484
GR 5243.492 277.753914666 5243.7251 281.021607873 5244.0097 284.289301071 5244.4335 287.556994263 5244.8493 290.824687446
GR 5245.2539 294.092380668 5245.7215 297.360073865 5246.3296 300.627767059 5246.7248 303.89546027 5246.9567 307.163153493
GR 5247.104 310.430846685 5247.2502 313.698539884 5247.3683 316.966233121 5247.47  320.233926303 5247.579 323.501619526
GR 5247.8319 326.769312763 5248.1574 330.037005986 5248.4485 333.304699213 5248.6719 336.572392422 5248.8779 339.840085657
GR 5249.0846 343.10777887 5249.3756 346.375472093 5249.6883 349.64316533 5249.9746 352.910858581 5250.3008 356.178551794
GR 5250.6988 359.446245046 5251.1657 362.713938299 5251.8472 365.981631522 5252.1988 369.249324759 5252.5086 372.517018011
GR 5252.6761 375.784711252 5252.7926 379.052404519 5252.9378 382.320097757 5253.0497 385.587791008 5253.1738 388.855484262
GR 5253.2663 392.123177528 5253.3517 395.390870766 5253.4621 398.658564032 5253.6365 401.9262573 5253.8837 405.193950566
GR 5254.2149 408.461643819 5254.6362 411.729337071 5255.0718 414.997030353 5255.4466 418.264723635 5255.5466 421.532416886
GR 5255.6916 424.800110184 5255.7835 428.06780345
;
;Natural terrain swale flowing northwest from subbasin 743
NC 0.035    0.035    0.035
X1 SB732_fromSB743   77       60       90       0.0      0.0      0.0      0.0      0.0
GR 5268.5305 0        5268.4795 3.26223737 5268.3804 6.524474699 5268.2594 9.786712045 5268.1988 13.04894942
GR 5268.1439 16.31118675 5268.1009 19.57342414 5268.0635 22.83566147 5267.9705 26.09789886 5267.8487 29.36013619
GR 5267.6991 32.62237358 5267.5325 35.88461091 5267.3483 39.14684831 5267.2304 42.40908564 5267.196 45.67132303
GR 5267.2043 48.93356037 5267.167 52.1957977 5266.9101 55.4580351 5266.681 58.72027249 5266.51  61.98250982
GR 5266.4173 65.24474722 5266.4436 68.50698456 5266.4751 71.76922189 5266.571 75.03145929 5266.6489 78.29369663
GR 5266.6416 81.55593401 5266.6262 84.81817137 5266.7347 88.08040875 5266.9284 91.34264609 5267.1579 94.60488349
GR 5267.3857 97.86712083 5267.4668 101.1293582 5267.6726 104.3915956 5268.0121 107.6538329 5268.3991 110.9160703
GR 5268.5761 114.1783077 5268.5657 117.4405451 5268.6957 120.7027824 5268.8469 123.9650198 5268.9963 127.2272571
GR 5269.2025 130.4894945 5269.4612 133.7517319 5269.7081 137.0139693 5269.8619 140.2762066 5269.9508 143.538444
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100-yr Future EPA SWMM Input

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GR 5269.9784 146.8006814 5269.9312 150.0629188 5269.8792 153.3251561 5269.9092 156.5873935 5270.065 159.8496309
GR 5270.3005 163.1118683 5270.5428 166.3741056 5270.5811 169.636343 5270.4404 172.8985804 5270.3608 176.1608178
GR 5270.3965 179.4230552 5270.4822 182.6852925 5270.5394 185.9475299 5270.5352 189.2097673 5270.4171 192.4720047
GR 5270.3903 195.734242 5270.473 198.9964794 5270.5377 202.2587168 5270.6209 205.5209542 5270.6648 208.7831916
GR 5270.6818 212.0454289 5270.6577 215.3076663 5270.6614 218.5699037 5270.6984 221.8321411 5270.7133 225.0943785
GR 5270.8532 228.3566159 5271.1037 231.6188532 5271.3489 234.8810907 5271.4554 238.143328 5271.567 241.4055654
GR 5271.5812 244.6678028 5271.502 247.9300401
;
NC 0.03     0.03     0.03
X1 SB734_DSofPond    50       50       85       0.0      0.0      0.0      0.0      0.0
GR 5249.4693 0        5249.9427 3.26926290439 5250.2798 6.5385258001 5250.5535 9.80778873557 5250.6009 13.07705164
GR 5250.4566 16.3463145841 5250.2774 19.6155774885 5250.0217 22.884840424 5249.7052 26.1541033197 5249.3165 29.4233662604
GR 5248.9089 32.6926291474 5248.5024 35.961892109 5248.1205 39.2311550444 5247.7711 42.5004179851 5247.466 45.769680893
GR 5247.1182 49.0389438337 5246.8095 52.3082067692 5246.5671 55.5774697307 5246.3938 58.846732654 5246.2282 62.1159956069
GR 5246.1152 65.385258551 5245.998 68.6545214918 5245.8823 71.9237844757 5246.0759 75.1930474251 5246.3855 78.4623103606
GR 5246.6095 81.7315733134 5246.7585 85.0008362454 5246.9994 88.2700992467 5247.2175 91.5393621874 5247.391 94.80862518
GR 5247.4699 98.0778881208 5247.6004 101.347151113 5248.0121 104.616414037 5248.398 107.885677038 5248.722 111.154939987
GR 5249.0395 114.424202971 5249.1667 117.693465961 5248.9584 120.962728941 5248.7247 124.231991942 5248.6983 127.501254931
GR 5248.8518 130.770517912 5249.1283 134.039780913 5249.426 137.309043837 5249.7424 140.578306883 5250.0713 143.847569867
GR 5250.4067 147.116832865 5250.7438 150.386095854 5251.0802 153.655358826 5251.4159 156.924621836 5251.748 160.193884873
;
;General channel upstream of pond
NC 0.03     0.013    0.03
X1 SB736_USofPond    179      275      325      0.0      0.0      0.0      0.0      0.0
GR 5360.2478 0        5360.3696 3.26563796461 5360.4869 6.53127597328 5360.5982 9.79691400919 5360.7047 13.0625519826
GR 5360.8031 16.3281899913 5360.8978 19.5938280152 5360.9962 22.8594660479 5361.1098 26.1251040598 5361.2468 29.3907420925
GR 5361.3951 32.6563801164 5361.492 35.9220181491 5361.506 39.1876561609 5361.4395 42.4532941936 5361.3684 45.7189322175
GR 5361.2733 48.9845702623 5361.105 52.2502082861 5361.0244 55.5158463189 5361.0647 58.7814843548 5361.1188 62.0471224379
GR 5361.1552 65.3127604706 5361.106 68.5783985065 5361.0693 71.8440365657 5361.061 75.1096746224 5361.0631 78.3753126583
GR 5361.0754 81.6409507415 5361.1006 84.9065888215 5361.12  88.1722268694 5361.1029 91.4378649406 5361.0643 94.7035029973
GR 5361.0397 97.9691410685 5361.0528 101.234779116 5361.0103 104.500417212 5360.9393 107.766055295 5360.8648 111.031693399
GR 5360.7484 114.297331447 5360.5671 117.562969542 5360.2708 120.828607625 5359.8766 124.09424572 5359.4002 127.359883824
GR 5358.8138 130.625521907 5358.1167 133.891160003 5357.6407 137.15679811 5357.1904 140.422436205 5356.6664 143.6880743
GR 5356.1432 146.953712407 5355.7071 150.219350503 5355.3665 153.484988598 5355.0059 156.750626705 5354.835 160.016264835
GR 5354.8404 163.281902955 5354.9354 166.547541062 5355.0228 169.813179216 5355.1544 173.078817311 5355.2421 176.344455431
GR 5355.3773 179.610093573 5355.4916 182.875731692 5355.4123 186.141369847 5355.3405 189.407008001 5355.2742 192.672646121
GR 5355.2489 195.938284254 5355.2185 199.203922382 5355.1878 202.469560528 5355.1601 205.735198706 5355.1454 209.000836861
GR 5355.137 212.26647498 5355.1453 215.532113147 5355.1631 218.797751292 5355.1791 222.063389471 5355.1339 225.329027625
GR 5354.9671 228.594665795 5354.6267 231.860303949 5354.2901 235.125942128 5353.9047 238.391580282 5353.4827 241.657218452
GR 5353.0875 244.922856631 5352.7818 248.188494809 5352.4464 251.454132979 5352.2966 254.719771157 5352.3978 257.985409362
GR 5352.504 261.251047541 5352.5744 264.516685719 5352.6866 267.782323924 5352.6647 271.047962103 5352.6768 274.313600305
GR 5352.7275 277.579238522 5352.6988 280.844876701 5352.6169 284.11051493 5352.6357 287.376153135 5352.7566 290.641791313
GR 5353.2143 293.907429542 5353.9534 297.173067745 5354.7772 300.43870597 5355.3562 303.704344199 5355.8598 306.969982378
GR 5356.3137 310.235620607 5356.6831 313.501258836 5356.7683 316.766897086 5356.801 320.032535314 5356.8268 323.298173543
GR 5356.8443 326.563811781 5356.8586 329.829450022 5356.8655 333.095088251 5356.8725 336.360726489 5356.8795 339.62636473
GR 5356.8786 342.892002959 5356.8721 346.157641221 5356.885 349.423279462 5356.8273 352.688917691 5356.7085 355.954555979
GR 5356.6048 359.220194229 5356.5987 362.485832482 5356.5804 365.751470758 5356.5571 369.017109011 5356.6652 372.282747264
GR 5356.7182 375.54838554 5356.8757 378.814023829 5357.0938 382.079662078 5357.2753 385.345300391 5357.3765 388.610938632
GR 5357.4509 391.87657692 5357.542 395.142215185 5357.7014 398.407853473 5357.736 401.673491773 5357.8677 404.939130086
GR 5358.0386 408.204768351 5358.13  411.470406651 5358.1666 414.736044939 5358.0554 418.001683239 5357.9607 421.267321552
GR 5357.8719 424.532959852 5357.7889 427.798598164 5357.7077 431.064236465 5357.6359 434.329874765 5357.5793 437.595513077
GR 5357.5565 440.861151401 5357.3869 444.126789702 5357.0542 447.39242804 5356.7287 450.658066365 5356.3746 453.923704665
GR 5356.041 457.189343013 5355.9256 460.454981326 5355.955 463.720619685 5356.0048 466.986257985 5356.1334 470.251896348
GR 5356.3668 473.517534673 5356.6233 476.783173032 5356.8016 480.048811356 5356.9542 483.314449707 5357.1442 486.580088043
GR 5357.2944 489.845726403 5357.4492 493.111364754 5357.5849 496.377003102 5357.6427 499.642641462 5357.7913 502.908279836
GR 5357.718 506.173918196 5357.7237 509.439556579 5357.9167 512.705194916 5358.1275 515.970833291 5358.2668 519.23647165
GR 5358.2454 522.502110025 5358.2635 525.767748408 5358.3226 529.033386783 5358.4001 532.299025167 5358.5143 535.564663542
GR 5358.4051 538.83030196 5358.3057 542.095940335 5358.2224 545.361578719 5357.9927 548.627217094 5357.5234 551.892855477
GR 5357.0949 555.158493923 5356.8235 558.424132307 5356.8603 561.689770682 5357.0151 564.955409116 5357.2556 568.221047499
GR 5357.3988 571.486685907 5357.4512 574.752324341 5357.4715 578.017962716 5357.4845 581.28360115
;
;Generalized channel through subbasin 740
NC 0.03     0.013    0.03
X1 SB740             37       25       85       0.0      0.0      0.0      0.0      0.0
GR 5356.0691 0        5356.1988 3.26243406077 5356.2325 6.52486811758 5356.2622 9.78730220709 5356.169 13.0497362976
GR 5355.8802 16.3121703831 5355.3753 19.5746044439 5354.5055 22.8370385483 5353.5773 26.0994726388 5353.2206 29.3619067253
GR 5353.7177 32.6243408149 5354.4008 35.8867749054 5354.8073 39.1492089949 5354.8657 42.4116431141 5354.8524 45.6740772046
GR 5354.9347 48.936511309 5354.9562 52.1989453995 5354.8832 55.4613795158 5354.775 58.7238136093 5354.7218 61.9862477285
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100-yr Future EPA SWMM Input

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GR 5354.6726 65.2486818637 5354.3877 68.5111159532 5353.9306 71.7735500734 5353.7236 75.0359842075 5353.7078 78.2984183278
GR 5354.5876 81.560852447 5355.6807 84.8232865811 5356.6211 88.0857207053 5357.2043 91.3481548246 5357.5681 94.6105889587
GR 5357.7738 97.8730230829 5357.892 101.135457232 5358.0295 104.397891366 5357.9168 107.66032552 5357.9738 110.922759654
GR 5358.2772 114.185193803 5358.6228 117.447627942
;
;Generalized Channel through subbasin
NC 0.04     0.04     0.04
X1 SB741             148      90       110      0.0      0.0      0.0      0.0      0.0
GR 5399.2001 0        5399.1976 3.26062038605 5399.1882 6.52124076127 5399.1788 9.78186115815 5399.1689 13.0424815851
GR 5399.1594 16.3031019604 5399.1483 19.5637223681 5399.135 22.8243427433 5399.117 26.0849631709 5399.0758 29.3455835569
GR 5398.9845 32.6062039538 5398.8041 35.8668243916 5398.6486 39.1274447777 5398.505 42.3880652053 5398.465 45.648685613
GR 5398.5302 48.9093060508 5398.6471 52.1699264886 5398.7448 55.4305468747 5398.7525 58.6911673022 5398.588 61.9517877509
GR 5398.3567 65.2124081785 5398.1307 68.4730286271 5397.9393 71.733649065 5397.7503 74.9942695034 5397.6945 78.2548899002
GR 5397.6655 81.5155103898 5397.6132 84.7761308174 5397.6216 88.0367512661 5397.5594 91.2973717153 5397.5806 94.557992164
GR 5397.639 97.8186126018 5397.6109 101.079233062 5397.5955 104.33985353 5397.6209 107.600473979 5397.552 110.861094428
GR 5397.4033 114.121714918 5397.3856 117.382335356 5397.3944 120.642955857 5397.4925 123.903576317 5397.5031 127.164196806
GR 5397.5474 130.424817256 5397.5747 133.685437757 5397.6133 136.946058246 5397.6482 140.206678695 5397.7003 143.467299196
GR 5397.7022 146.727919697 5397.6065 149.988540198 5397.5506 153.249160677 5397.5268 156.509781178 5397.5447 159.770401679
GR 5397.563 163.03102218 5397.5613 166.291642681 5397.5669 169.552263171 5397.6137 172.812883682 5397.6507 176.073504183
GR 5397.7134 179.334124725 5397.7844 182.594745237 5397.8334 185.855365738 5397.8978 189.115986239 5397.9181 192.376606781
GR 5397.9017 195.637227282 5397.8686 198.897847835 5397.8079 202.158468336 5397.775 205.419088899 5397.839 208.6797094
GR 5397.8775 211.940329942 5397.9398 215.200950464 5398.0143 218.461570996 5398.0714 221.72219156 5398.1077 224.982812082
GR 5398.1018 228.243432624 5398.1711 231.504053188 5398.2658 234.764673752 5398.2893 238.025294294 5398.3458 241.285914846
GR 5398.3286 244.54653541 5398.4063 247.807155963 5398.5239 251.067776527 5398.6317 254.328397091 5398.6145 257.589017654
GR 5398.4926 260.849638249 5398.4049 264.110258812 5398.3213 267.370879376 5398.2551 270.631499939 5398.2336 273.892120534
GR 5398.2686 277.152741097 5398.2863 280.413361702 5398.2991 283.673982255 5398.3898 286.934602881 5398.4131 290.195223445
GR 5398.4793 293.455844039 5398.5408 296.716464666 5398.5232 299.977085229 5398.584 303.237705824 5398.672 306.49832644
GR 5398.7494 309.758947025 5398.7821 313.019567629 5398.801 316.280188245 5398.8387 319.540808861 5398.833 322.801429477
GR 5398.8537 326.062050081 5398.9067 329.278567166 5398.9548 332.49508424 5398.9743 335.711601314 5399.0805 338.92811841
GR 5399.1277 342.144635483 5399.1323 345.361152568 5399.1246 348.577669642 5399.1525 351.794186738 5399.1407 355.010703812
GR 5399.1923 358.227220937 5399.3586 361.443738033 5399.3371 364.660255118 5399.2931 367.876772254 5399.315 371.093289328
GR 5399.3802 374.309806424 5399.3882 377.52632355 5399.4571 380.742840645 5399.6015 383.95935777 5399.66  387.175874906
GR 5399.7267 390.392392002 5399.8507 393.608909128 5400.006 396.825426224 5400.0785 400.04194336 5400.0851 403.258460496
GR 5400.1099 406.474977621 5400.1951 409.691494717 5400.2505 412.908011883 5400.1943 416.124529001 5400.0567 419.341046137
GR 5400.0485 422.557563273 5400.107 425.774080421 5400.1748 428.990597587 5400.2431 432.207114705 5400.3126 435.423631881
GR 5400.3673 438.640149029 5400.4246 441.856666165 5400.5229 445.073183323 5400.5604 448.289700511 5400.6308 451.506217636
GR 5400.7759 454.722734794 5401.1445 457.939251982 5401.4577 461.15576914 5401.7241 464.372286328 5401.8744 467.588803475
GR 5401.9471 470.805320663 5402.0058 474.021837821 5401.9966 477.238355009
;
NC 0.05     0.05     0.07
X1 SB752_Northswale  52       70       85       0.0      0.0      0.0      0.0      0.0
GR 5362.1561 0        5362.3598 3.24405059921 5362.5506 6.4881012282 5362.4759 9.732151826 5362.4112 12.976202455
GR 5362.4598 16.220253084 5362.5597 19.4643036962 5362.1819 22.7083543252 5361.739 25.9524049542 5361.3541 29.1964555818
GR 5361.0025 32.4405062108 5360.6298 35.6845568398 5360.2522 38.9286074688 5360.0222 42.1726580959 5359.9732 45.4167087547
GR 5360.0518 48.6607593967 5360.3445 51.9048100257 5360.6132 55.148860683 5360.4539 58.392911312 5359.9569 61.6369619708
GR 5358.9289 64.8810126277 5357.5278 68.1250632846 5356.6347 71.3691139583 5356.4329 74.6131646157 5356.8154 77.8572152744
GR 5357.5429 81.1012659313 5358.2342 84.345316605 5358.6071 87.5893672619 5358.8223 90.8334179207 5359.0989 94.0774686079
GR 5359.4261 97.3215192797 5359.6156 100.565569968 5359.7174 103.809620655 5359.7994 107.053671327 5359.88  110.297722014
GR 5360.0004 113.541772702 5360.1033 116.785823375 5360.1129 120.029874093 5360.1446 123.273924765 5360.2454 126.517975481
GR 5360.3604 129.762026154 5360.541 133.00607687 5360.8093 136.250127574 5361.1786 139.494178291 5361.6318 142.738228992
GR 5362.0852 145.982279694 5362.6291 149.226330411 5363.4032 152.470381112 5364.4156 155.714431829 5365.4558 158.958482562
GR 5366.3164 162.202533262 5367.1158 165.44658401
;
;General cross section for agricultural areas where there isn't a clear channel, cut from LiDAR data
NC 0.035    0.035    0.035
X1 Standard_Agricultural  201      250      350      0.0      0.0      0.0      0.0      0.0
GR 5081.1285 0        5081.0541 3.27698142356 5080.8993 6.55396287247 5080.88  9.83094429603 5081.0212 13.1079257196
GR 5081.1717 16.3849072097 5081.0741 19.6618886527 5081.0862 22.9388700763 5081.0738 26.2158515115 5081.0997 29.4928329899
GR 5081.0267 32.7698144272 5080.904 36.0467959056 5080.7771 39.323777335 5080.7004 42.6007587586 5080.6833 45.877740237
GR 5080.5447 49.1547217154 5080.417 52.4317031527 5080.354 55.708684629 5080.4052 58.9856661074 5080.262 62.2626475447
GR 5080.1578 65.5396290231 5080.1335 68.8166104957 5080.1576 72.0935919742 5080.0909 75.3705734526 5079.9975 78.647554931
GR 5079.9791 81.9245363546 5079.9376 85.201517833 5079.8431 88.4784993114 5079.8039 91.7554807898 5079.8682 95.0324622978
GR 5079.8853 98.3094437762 5079.9033 101.586425255 5079.896 104.863406721 5079.9187 108.1403882 5079.8343 111.417369678
GR 5079.7559 114.6943512 5079.7722 117.971332678 5079.7993 121.248314145 5079.7286 124.525295665 5079.6577 127.802277143
GR 5079.598 131.07925861 5079.682 134.356240143 5079.7075 137.633221651 5079.6844 140.910203118 5079.5992 144.187184651
GR 5079.5438 147.464166118 5079.4688 150.741147637 5079.4611 154.018129159 5079.519 157.295110681 5079.5439 160.572092148
GR 5079.5044 163.849073655 5079.4534 167.126055183 5079.4315 170.403036691 5079.3864 173.680018158 5079.4686 176.956999679
GR 5079.4526 180.233981199 5079.4206 183.510962775 5079.4047 186.787944242 5079.4367 190.06492575 5079.4672 193.341907313
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100-yr Future EPA SWMM Input

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GR 5079.4371 196.618888835 5079.4056 199.895870337 5079.4001 203.172851858 5079.4083 206.449833421 5079.384 209.726814943
GR 5079.5641 213.003796439 5079.4652 216.280778016 5079.3871 219.557759529 5079.3449 222.834741039 5079.3729 226.111722602
GR 5079.377 229.38870411 5079.3507 232.665685686 5079.3205 235.942667189 5079.3352 239.21964874 5079.3315 242.496630316
GR 5079.2876 245.773611813 5079.2077 249.050593375 5079.3408 252.327574946 5079.3738 255.604556442 5079.3005 258.881538005
GR 5079.3243 262.15851957 5079.3749 265.435501127 5079.3667 268.71248269 5079.3359 271.989464241 5079.3468 275.266445792
GR 5079.2982 278.543427349 5079.3518 281.820408914 5079.4369 285.097390477 5079.3904 288.374372028 5079.4637 291.651353585
GR 5079.4808 294.928335191 5079.3077 298.205316742 5079.3312 301.482298287 5079.4635 304.759279852 5079.4608 308.036261456
GR 5079.4226 311.313243015 5079.3866 314.590224607 5079.3505 317.867206172 5079.3691 321.144187729 5079.3334 324.421169335
GR 5079.3405 327.698150928 5079.3221 330.975132487 5079.2519 334.252114079 5079.3043 337.529095644 5079.3592 340.80607723
GR 5079.3296 344.083058836 5079.3138 347.360040382 5079.3491 350.637021988 5079.4156 353.914003588 5079.4225 357.190985194
GR 5079.4167 360.467966788 5079.4043 363.744948375 5079.485 367.021929981 5079.553 370.298911587 5079.4795 373.575893175
GR 5079.4401 376.852874781 5079.4483 380.129856368 5079.3819 383.406837974 5079.3802 386.683819562 5079.4695 389.96080121
GR 5079.4264 393.23778281 5079.3111 396.514764404 5079.3577 399.791746004 5079.3903 403.06872764 5079.3455 406.34570924
GR 5079.4682 409.622690876 5079.5128 412.899672476 5079.5542 416.176654125 5079.5395 419.453635711 5079.3924 422.730617306
GR 5079.3338 426.007598949 5079.39  429.284580596 5079.474 432.56156224 5079.5466 435.83854382 5079.6383 439.115525464
GR 5079.6464 442.392507111 5079.6548 445.669488754 5079.6034 448.946470341 5079.6787 452.22345199 5079.737 455.50043362
GR 5079.7834 458.777415257 5079.8056 462.054396899 5079.8411 465.331378529 5079.8579 468.608360178 5079.8013 471.885341807
GR 5079.7642 475.162323457 5079.8066 478.439305086 5079.8632 481.716286783 5079.9755 484.99326842 5080.1313 488.27025005
GR 5080.1641 491.547231685 5080.1266 494.82421337 5079.9736 498.101195013 5079.9588 501.378176643 5079.8955 504.655158322
GR 5079.9754 507.932139965 5080.0727 511.209121656 5080.1322 514.486103285 5080.1706 517.763084958 5080.2757 521.040066643
GR 5080.3794 524.317048292 5080.449 527.594029965 5080.4997 530.87101165 5080.534 534.147993273 5080.5652 537.424974958
GR 5080.5945 540.701956643 5080.6348 543.978938327 5080.6379 547.255920006 5080.585 550.532901679 5080.5303 553.809883363
GR 5080.5924 557.086865036 5080.676 560.363846715 5080.7375 563.6408284 5080.7386 566.917810073 5080.7177 570.194791757
GR 5080.7492 573.471773436 5080.7503 576.748755123 5080.7703 580.025736807 5080.8473 583.302718521 5080.9586 586.579700194
GR 5081.0289 589.856681873 5081.0606 593.133663601 5080.9918 596.410645274 5081.0248 599.687627013 5081.0208 602.964608686
GR 5081.0989 606.241590406 5081.0638 609.518572079 5081.2008 612.795553806 5081.2868 616.072535479 5081.2848 619.349517207
GR 5081.3032 622.626498921 5081.3411 625.903480594 5081.3884 629.180462322 5081.4396 632.457444044 5081.4468 635.734425758
GR 5081.5313 639.011407431 5081.6015 642.288389214 5081.5393 645.565370887 5081.5517 648.842352601 5081.5283 652.119334317
GR 5081.599 655.396316031
;
;General street overflow conditions
NC 0.05     0.05     0.02
X1 StreetOverflow    62       110      170      0.0      0.0      0.0      0.0      0.0
GR 5253.1448 0        5253.1126 3.26128501663 5253.0992 6.52257004061 5253.1306 9.78385505724 5253.1822 13.0451400788
GR 5253.229 16.3064251003 5253.2924 19.5677101169 5253.4945 22.828995136 5253.6823 26.0902801576 5253.7708 29.3515651742
GR 5253.8006 32.6128502545 5253.7882 35.8741352711 5253.7527 39.1354202902 5253.7189 42.3967053069 5253.6922 45.6579903676
GR 5253.6729 48.9192753989 5253.6635 52.1805604155 5253.6646 55.4418454763 5253.6741 58.7031304929 5253.6921 61.9644155095
GR 5253.7149 65.225700585 5253.7389 68.4869856016 5253.7597 71.7482706574 5253.7669 75.0095557353 5253.7508 78.2708407495
GR 5253.7172 81.53212582 5253.678 84.7934108366 5253.6395 88.0546958925 5253.5608 91.3159809679 5253.3517 94.5772659796
GR 5253.0171 97.8385510501 5252.5919 101.099836106 5252.1756 104.361121181 5251.6534 107.622406252 5251.1312 110.883691264
GR 5250.6963 114.144976319 5250.3721 117.40626139 5249.9944 120.667546458 5249.6679 123.928831514 5249.4379 127.190116584
GR 5249.4374 130.451401635 5249.5355 133.712686706 5249.5619 136.973971772 5249.6299 140.235256825 5249.736 143.496541895
GR 5249.8459 146.757826966 5249.8116 150.019112017 5249.6926 153.280397129 5249.6124 156.541682195 5249.566 159.80296726
GR 5249.5844 163.064252311 5249.6577 166.325537438 5249.8281 169.586822489 5250.0745 172.848107613 5250.2926 176.109392662
GR 5250.6011 179.370677728 5250.8872 182.631962837 5251.1727 185.8932479 5251.4369 189.15453301 5251.6128 192.415818073
GR 5251.6839 195.677103183 5251.6863 198.938388227
;
NC 0.035    0.035    0.02
X1 StreetOverflow_Extend  294      120      160      0.0      0.0      0.0      0.0      0.0
GR 5088.5654 0        5088.5722 3.2708707854 5088.5921 6.54174163028 5088.5316 9.81261241568 5088.5197 13.083483201
GR 5088.5302 16.3543540458 5088.5275 19.625224831 5088.5333 22.8960956163 5088.5028 26.166966461 5088.4852 29.4378372463
GR 5088.488 32.708708091 5088.5092 35.9795788761 5088.4974 39.2504496614 5088.4443 42.521320506 5088.4501 45.7921912912
GR 5088.3839 49.0630621212 5088.3475 52.3339329211 5088.3585 55.6048037509 5088.3317 58.8756745358 5088.2954 62.1465453804
GR 5088.2592 65.4174161654 5088.2234 68.6882870101 5088.2444 71.9591578547 5088.2479 75.2300286396 5088.2327 78.5008994843
GR 5088.2092 81.7717703289 5088.1726 85.042641114 5088.238 88.3135119435 5088.197 91.5843827431 5088.1642 94.8552535729
GR 5088.1481 98.1261244173 5088.1532 101.396995202 5088.0907 104.667866046 5088.0949 107.938736891 5088.0068 111.209607736
GR 5087.9586 114.480478565 5087.9053 117.75134935 5087.9244 121.022220194 5087.8556 124.293091038 5087.8502 127.563961883
GR 5087.8614 130.834832712 5087.8503 134.105703557 5087.8721 137.376574341 5087.8673 140.647445186 5087.8247 143.91831603
GR 5087.7862 147.189186874 5087.764 150.460057703 5087.7194 153.730928548 5087.6686 157.001799392 5087.6961 160.272670236
GR 5087.7172 163.543541065 5087.6191 166.814411909 5087.639 170.085282754 5087.6453 173.356153598 5087.6499 176.627024427
GR 5087.6365 179.897895271 5087.5424 183.168766115 5087.5115 186.439636959 5087.477 189.710507788 5087.4634 192.981378632
GR 5087.5163 196.252249536 5087.4856 199.523120365 5087.3432 202.793991209 5087.2989 206.064862053 5087.2979 209.335732897
GR 5087.4013 212.606603786 5087.3951 215.877474629 5087.3433 219.148345473 5087.3382 222.419216302 5087.3553 225.690087206
GR 5087.2888 228.960958035 5087.3336 232.231828879 5087.3537 235.502699723 5087.2904 238.773570611 5087.2249 242.044441455
GR 5087.1648 245.315312299 5087.2028 248.586183187 5087.2172 251.857054031 5087.2235 255.127924919 5087.2047 258.398795763
GR 5087.2129 261.669666607 5087.1696 264.940537495 5087.1696 268.211408339 5087.1884 271.482279227 5087.1586 274.753150071
GR 5087.105 278.024020959 5087.0724 281.294891803 5087.0432 284.565762706 5087.0028 287.836633535 5087.0819 291.107504438
GR 5087.0294 294.378375266 5087.0563 297.649246169 5087.0449 300.920117013 5087.0592 304.190987901 5086.9508 307.461858789
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100-yr Future EPA SWMM Input

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GR 5086.9485 310.732729633 5087.0081 314.003600521 5087.0413 317.274471365 5086.9407 320.545342268 5086.9287 323.816213156
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GR 5086.8536 343.44143841 5086.8348 346.712309298 5086.8905 349.9831802 5086.8686 353.254051088 5086.7701 356.524921976
GR 5086.692 359.79579282 5086.7439 363.066663722 5086.8345 366.33753461 5086.8085 369.608405498 5086.7738 372.879276401
GR 5086.7931 376.150147289 5086.7405 379.421018177 5086.6337 382.69188908 5086.6816 385.962759968 5086.6926 389.23363087
GR 5086.69  392.504501698 5086.6519 395.775372646 5086.5962 399.046243548 5086.5969 402.317114436 5086.5784 405.587985324
GR 5086.5335 408.858856226 5086.4534 412.129727114 5086.4668 415.400598017 5086.5176 418.671468904 5086.4776 421.942339792
GR 5086.4401 425.213210695 5086.5488 428.484081582 5086.4735 431.75495247 5086.4415 435.025823417 5086.39  438.29669432
GR 5086.3609 441.567565207 5086.31  444.838436095 5086.3864 448.109306997 5086.3856 451.380177944 5086.4081 454.651048832
GR 5086.3817 457.921919734 5086.3332 461.192790681 5086.3109 464.463661569 5086.2948 467.734532456 5086.2793 471.005403358
GR 5086.2546 474.276274305 5086.2589 477.547145193 5086.2517 480.81801608 5086.2188 484.088887027 5086.2342 487.359757929
GR 5086.2504 490.630628817 5086.2079 493.901499764 5086.1889 497.172370651 5086.2105 500.443241598 5086.1608 503.7141125
GR 5086.1621 506.984983447 5086.1663 510.255854334 5086.1523 513.526725281 5086.1066 516.797596183 5086.1172 520.06846713
GR 5086.1299 523.339338017 5086.0692 526.610208964 5086.0779 529.881079851 5086.0652 533.151950798 5086.0635 536.422821744
GR 5086.0483 539.693692646 5086.0127 542.964563593 5086.0485 546.23543454 5086.0269 549.506305427 5085.9776 552.777176374
GR 5085.9682 556.04804732 5085.9616 559.318918207 5086.0134 562.589789154 5086.0389 565.8606601 5086.0081 569.131531002
GR 5086.03  572.402401949 5086.011 575.673272895 5086.0216 578.944143842 5086.0119 582.215014788 5085.9999 585.485885675
GR 5085.9685 588.756756622 5085.9093 592.027627568 5085.9194 595.298498514 5085.9093 598.569369461 5085.8833 601.840240407
GR 5085.853 605.111111294 5085.8225 608.38198224 5085.859 611.652853187 5085.8049 614.923724133 5085.7724 618.19459508
GR 5085.8054 621.465466026 5085.8074 624.736336972 5085.7599 628.007207918 5085.7585 631.278078865 5085.8009 634.548949811
GR 5085.7834 637.819820757 5085.7333 641.090691703 5085.7524 644.36156265 5085.723 647.632433656 5085.7074 650.903304602
GR 5085.6943 654.174175548 5085.661 657.445046494 5085.6977 660.71591744 5085.7391 663.986788386 5085.7261 667.257659332
GR 5085.7079 670.528530278 5085.7038 673.799401224 5085.6956 677.070272215 5085.6726 680.341143161 5085.6362 683.612014107
GR 5085.6067 686.882885053 5085.6075 690.153756059 5085.5958 693.424627005 5085.567 696.695497951 5085.574 699.966368941
GR 5085.5596 703.237239887 5085.5141 706.508110833 5085.476 709.778981779 5085.4466 713.049852785 5085.4668 716.320723731
GR 5085.4443 719.591594721 5085.4271 722.862465667 5085.4648 726.133336613 5085.4715 729.404207618 5085.44  732.675078564
GR 5085.39  735.945949569 5085.345 739.216820515 5085.3166 742.487691506 5085.3059 745.758562451 5085.3022 749.029433457
GR 5085.282 752.300304402 5085.2781 755.571175393 5085.2861 758.842046338 5085.2654 762.112917344 5085.2181 765.383788349
GR 5085.2308 768.654659295 5085.2501 771.925530285 5085.215 775.19640123 5085.2085 778.467272236 5085.1937 781.738143181
GR 5085.1499 785.009014172 5085.1497 788.279885177 5085.1621 791.550756167 5085.1412 794.821627112 5085.1503 798.092498117
GR 5085.1588 801.363369123 5085.1392 804.634240068 5085.1149 807.905111058 5085.1003 811.175982063 5085.1181 814.446853053
GR 5085.1409 817.717723999 5085.1679 820.988595004 5085.1946 824.259466009 5085.2251 827.530336999 5085.2561 830.801208004
GR 5085.3045 834.072078994 5085.3587 837.342949999 5085.3877 840.613821003 5085.4285 843.884691949 5085.4603 847.155562939
GR 5085.4888 850.426433943 5085.5369 853.697304933 5085.5774 856.968175938 5085.6131 860.239046943 5085.6681 863.509917933
GR 5085.7503 866.780788938 5085.8124 870.051659927 5085.8175 873.322530932 5085.8217 876.593401937 5085.8602 879.864272927
GR 5085.9055 883.135143976 5085.9509 886.406014981 5086.0359 889.676885986 5086.1142 892.947756975 5086.159 896.21862798
GR 5086.1944 899.489498969 5086.2171 902.760369974 5086.2599 906.031240979 5086.3362 909.302111968 5086.3817 912.572983018
GR 5086.4094 915.843854022 5086.4223 919.114725027 5086.4187 922.385596016 5086.4573 925.656467066 5086.5464 928.92733807
GR 5086.5808 932.198209075 5086.5795 935.469080123 5086.6014 938.739951113 5086.6599 942.010822118 5086.6843 945.281693167
GR 5086.6578 948.552564171 5086.5869 951.823435161 5086.5123 955.094306224 5086.4504 958.365177214
;
NC 0.03     0.013    0.03
X1 SB736_DSofPond    52       100      150      0.0      0.0      0.0      0.0      0.0
GR 5362.1561 0        5362.3598 3.24405059921 5362.5506 6.4881012282 5362.4759 9.732151826 5362.4112 12.976202455
GR 5362.4598 16.220253084 5362.5597 19.4643036962 5362.1819 22.7083543252 5361.739 25.9524049542 5361.3541 29.1964555818
GR 5361.0025 32.4405062108 5360.6298 35.6845568398 5360.2522 38.9286074688 5360.0222 42.1726580959 5359.9732 45.4167087547
GR 5360.0518 48.6607593967 5360.3445 51.9048100257 5360.6132 55.148860683 5360.4539 58.392911312 5359.9569 61.6369619708
GR 5358.9289 64.8810126277 5357.5278 68.1250632846 5356.6347 71.3691139583 5356.4329 74.6131646157 5356.8154 77.8572152744
GR 5357.5429 81.1012659313 5358.2342 84.345316605 5358.6071 87.5893672619 5358.8223 90.8334179207 5359.0989 94.0774686079
GR 5359.4261 97.3215192797 5359.6156 100.565569968 5359.7174 103.809620655 5359.7994 107.053671327 5359.88  110.297722014
GR 5360.0004 113.541772702 5360.1033 116.785823375 5360.1129 120.029874093 5360.1446 123.273924765 5360.2454 126.517975481
GR 5360.3604 129.762026154 5360.541 133.00607687 5360.8093 136.250127574 5361.1786 139.494178291 5361.6318 142.738228992
GR 5362.0852 145.982279694 5362.6291 149.226330411 5363.4032 152.470381112 5364.4156 155.714431829 5365.4558 158.958482562
GR 5366.3164 162.202533262 5367.1158 165.44658401

[LOSSES]
;;Link           Kentry     Kexit      Kavg       Flap Gate  Seepage
;;-------------- ---------- ---------- ---------- ---------- ----------
CH_27            0.5        0          0          NO         0
CU_01            0.9        0          0          NO         0
CU_02            0.5        0          0          NO         0
CU_04            0.5        0          0          NO         0
CU_05            0.5        0          0          NO         0
CU_06            0.5        0          0          NO         0
CU_07            0.5        0          0          NO         0
CU_08            0.5        0          0          NO         0
CU_09            0.5        0          0          NO         0
CU_10            0.5        0          0          NO         0
```

100-yr Future EPA SWMM Input

```
CU_11            0.5        0          0          NO         0
CU_12            0.5        0          0          NO         0
CU_13            0.5        0          0          NO         0
CU_15            0.5        0          0          NO         0
CU_20            0.5        0          0          NO         0
CU_21            0.5        0          0          NO         0
CU_32            0.5        0          0          NO         0
CU_33            0.5        0          0          NO         0
CU_34            0.5        0          0          NO         0
CU_35            0.5        0          0          NO         0
CU_38            0.5        0          0          NO         0

[CURVES]
;;Name           Type       X-Value    Y-Value
;;-------------- ---------- ---------- ----------
; Inflow for all storm events from SWMM and outflow determined using HEC-RAS 2D Model
Node180DiversionCurve Diversion  0          0
Node180DiversionCurve            1          0
Node180DiversionCurve            4          0
Node180DiversionCurve            119        13
Node180DiversionCurve            254        31
Node180DiversionCurve            446        51
Node180DiversionCurve            891        114
;
; Inflow for all storm events from SWMM and outflow determined using HEC-RAS 2D Model
Node181DiversionCurve Diversion  2          0
Node181DiversionCurve            3          0
Node181DiversionCurve            9          0
Node181DiversionCurve            148        13
Node181DiversionCurve            309        42
Node181DiversionCurve            538        140
Node181DiversionCurve            1064       403
;
; Inflow for all storm events from SWMM and outflow determined using HEC-RAS 2D Model
Node182DiversionCurve Diversion  2          0
Node182DiversionCurve            3          0
Node182DiversionCurve            10         1
Node182DiversionCurve            182        60
Node182DiversionCurve            401        173
Node182DiversionCurve            772        431
Node182DiversionCurve            1682       1152
;
; Inflow for all storm events from SWMM and outflow determined using HEC-RAS 2D Model
Node183DiversionCurve Diversion  119        108
Node183DiversionCurve            199        180
Node183DiversionCurve            310        268
Node183DiversionCurve            1336       1101
Node183DiversionCurve            2281       1851
Node183DiversionCurve            3742       2941
Node183DiversionCurve            7201       5506
;
RATING_CURVE_1025 Rating     0          0
RATING_CURVE_1025            1          0
RATING_CURVE_1025            2          0
RATING_CURVE_1025            3          0
RATING_CURVE_1025            4          0
RATING_CURVE_1025            5          0
RATING_CURVE_1025            6          57.88
RATING_CURVE_1025            7          63.76
RATING_CURVE_1025            8          69.13
RATING_CURVE_1025            9          74.12
;
RATING_CURVE_1026 Rating     0          31.12
RATING_CURVE_1026            1          43.57
RATING_CURVE_1026            2          56.02
RATING_CURVE_1026            3          76.32
RATING_CURVE_1026            4          100.32
RATING_CURVE_1026            4.5        112.32
```

100-yr Future EPA SWMM Input

```
RATING_CURVE_1026            5          160
RATING_CURVE_1026            6          480
RATING_CURVE_1026            6.14       536
;
;ORIFICE FLOW Rating Curve for Flatiron Meadows Regional Detention Factility As-Built Drawings
RATING_CURVE_312_LOW Rating     0          0.0
RATING_CURVE_312_LOW            0.5        0.3
RATING_CURVE_312_LOW            1.0        0.7
RATING_CURVE_312_LOW            1.5        1.2
RATING_CURVE_312_LOW            2.0        1.8
RATING_CURVE_312_LOW            2.5        2.5
RATING_CURVE_312_LOW            3.0        3.2
RATING_CURVE_312_LOW            3.5        4.0
RATING_CURVE_312_LOW            4.0        4.8
RATING_CURVE_312_LOW            4.5        5.7
RATING_CURVE_312_LOW            5.0        6.6
RATING_CURVE_312_LOW            5.5        7.3
RATING_CURVE_312_LOW            6.0        8.0
RATING_CURVE_312_LOW            6.5        8.5
RATING_CURVE_312_LOW            7.0        9.1
RATING_CURVE_312_LOW            7.5        9.5
RATING_CURVE_312_LOW            8.0        9.5
RATING_CURVE_312_LOW            8.5        9.5
RATING_CURVE_312_LOW            9.0        9.5
RATING_CURVE_312_LOW            9.5        9.5
;
;WEIR FLOW Rating Curve for Flatiron Meadows Regional Detention Factility As-Built Drawings
RATING_CURVE_312_HIGH Rating     0          0
RATING_CURVE_312_HIGH            0.5        0
RATING_CURVE_312_HIGH            1.0        0
RATING_CURVE_312_HIGH            1.5        0
RATING_CURVE_312_HIGH            2.0        0
RATING_CURVE_312_HIGH            2.5        0
RATING_CURVE_312_HIGH            3.0        0
RATING_CURVE_312_HIGH            3.5        0
RATING_CURVE_312_HIGH            4.0        0
RATING_CURVE_312_HIGH            4.5        0
RATING_CURVE_312_HIGH            5.0        0
RATING_CURVE_312_HIGH            5.5        39
RATING_CURVE_312_HIGH            6.0        266
RATING_CURVE_312_HIGH            6.5        618
RATING_CURVE_312_HIGH            7.0        1076
RATING_CURVE_312_HIGH            7.5        1635
RATING_CURVE_312_HIGH            8.0        3830
RATING_CURVE_312_HIGH            8.5        6080
RATING_CURVE_312_HIGH            9.0        7967
RATING_CURVE_312_HIGH            9.5        9651
;
;Rating curve developed in HydroCAD based on details from Indian Peaks Filing 17 design drawings.
RATING_CURVE_02_LOW Rating     0.00       0
RATING_CURVE_02_LOW            0.30       0.14
RATING_CURVE_02_LOW            0.60       0.36
RATING_CURVE_02_LOW            0.90       0.59
RATING_CURVE_02_LOW            1.20       0.74
RATING_CURVE_02_LOW            1.50       4.39
RATING_CURVE_02_LOW            1.80       9.67
RATING_CURVE_02_LOW            2.10       11.48
RATING_CURVE_02_LOW            2.40       12.24
RATING_CURVE_02_LOW            2.70       13.81
RATING_CURVE_02_LOW            3.00       15.21
RATING_CURVE_02_LOW            3.30       16.5
RATING_CURVE_02_LOW            3.60       17.7
RATING_CURVE_02_LOW            3.90       18.81
RATING_CURVE_02_LOW            4.20       19.87
RATING_CURVE_02_LOW            4.50       20.87
RATING_CURVE_02_LOW            4.80       21.83
RATING_CURVE_02_LOW            5.10       22.74
RATING_CURVE_02_LOW            5.40       23.63
```

100-yr Future EPA SWMM Input

```
RATING_CURVE_02_LOW            5.70       24.47
RATING_CURVE_02_LOW            6.00       25.3
RATING_CURVE_02_LOW            6.30       26.09
RATING_CURVE_02_LOW            6.60       26.86
RATING_CURVE_02_LOW            6.90       27.61
RATING_CURVE_02_LOW            7.20       28.34
RATING_CURVE_02_LOW            7.50       29.05
RATING_CURVE_02_LOW            7.80       29.75
RATING_CURVE_02_LOW            8.10       30.43
RATING_CURVE_02_LOW            8.40       31.09
RATING_CURVE_02_LOW            8.70       31.74
RATING_CURVE_02_LOW            9.00       32.38
RATING_CURVE_02_LOW            9.30       33
RATING_CURVE_02_LOW            9.60       33.61
RATING_CURVE_02_LOW            9.90       34.22
RATING_CURVE_02_LOW            10.20      34.81
RATING_CURVE_02_LOW            10.50      35.39
RATING_CURVE_02_LOW            10.80      35.96
RATING_CURVE_02_LOW            11.10      36.53
RATING_CURVE_02_LOW            11.40      37.08
RATING_CURVE_02_LOW            11.70      37.63
RATING_CURVE_02_LOW            12.00      38.17
RATING_CURVE_02_LOW            12.30      38.7
;
;Rating curve for pond spillway shown in Indian Peaks Filing 17 design drawing. Rating curve was developed using HydroCAD.
RATING_CURVE_02_HIGH Rating     0.00       0
RATING_CURVE_02_HIGH            0.30       0
RATING_CURVE_02_HIGH            0.60       0
RATING_CURVE_02_HIGH            0.90       0
RATING_CURVE_02_HIGH            1.20       0
RATING_CURVE_02_HIGH            1.50       0
RATING_CURVE_02_HIGH            1.80       0
RATING_CURVE_02_HIGH            2.10       0
RATING_CURVE_02_HIGH            2.40       0
RATING_CURVE_02_HIGH            2.70       0
RATING_CURVE_02_HIGH            3.00       0
RATING_CURVE_02_HIGH            3.30       0
RATING_CURVE_02_HIGH            3.60       0
RATING_CURVE_02_HIGH            3.90       0
RATING_CURVE_02_HIGH            4.20       0
RATING_CURVE_02_HIGH            4.50       0
RATING_CURVE_02_HIGH            4.80       0
RATING_CURVE_02_HIGH            5.10       0
RATING_CURVE_02_HIGH            5.40       0
RATING_CURVE_02_HIGH            5.70       0
RATING_CURVE_02_HIGH            6.00       0
RATING_CURVE_02_HIGH            6.30       0
RATING_CURVE_02_HIGH            6.60       0
RATING_CURVE_02_HIGH            6.90       0
RATING_CURVE_02_HIGH            7.20       0
RATING_CURVE_02_HIGH            7.50       0
RATING_CURVE_02_HIGH            7.80       0
RATING_CURVE_02_HIGH            8.10       0
RATING_CURVE_02_HIGH            8.40       0
RATING_CURVE_02_HIGH            8.70       0
RATING_CURVE_02_HIGH            9.00       28.29
RATING_CURVE_02_HIGH            9.30       112.64
RATING_CURVE_02_HIGH            9.60       222.91
RATING_CURVE_02_HIGH            9.90       358.72
RATING_CURVE_02_HIGH            10.20      516.03
RATING_CURVE_02_HIGH            10.50      687.88
RATING_CURVE_02_HIGH            10.80      877.77
RATING_CURVE_02_HIGH            11.10      1082.5
RATING_CURVE_02_HIGH            11.40      1301.06
RATING_CURVE_02_HIGH            11.70      1532.62
RATING_CURVE_02_HIGH            12.00      1776.49
RATING_CURVE_02_HIGH            12.30      2032.08
;
```

100-yr Future EPA SWMM Input

```
STORAGE_CURVE_1025 Storage    0          6277
STORAGE_CURVE_1025            1          7793
STORAGE_CURVE_1025            2          9399
STORAGE_CURVE_1025            3          11079
STORAGE_CURVE_1025            4          12865
STORAGE_CURVE_1025            5          45167
STORAGE_CURVE_1025            6          80281
STORAGE_CURVE_1025            7          101450
STORAGE_CURVE_1025            8          122841
STORAGE_CURVE_1025            9          134256
;
STORAGE_CURVE_1026 Storage    0          768
STORAGE_CURVE_1026            1          8649
STORAGE_CURVE_1026            2          41711
STORAGE_CURVE_1026            3          88994
STORAGE_CURVE_1026            4          132639
STORAGE_CURVE_1026            5          142902
STORAGE_CURVE_1026            6          174095
STORAGE_CURVE_1026            6.14       174095
;
;from Flatiron Meadows Regional Detention Pond As-Builts. Divide Storage by Depth to get surface area in feet.
STORAGE_CURVE_312 Storage     0          0
STORAGE_CURVE_312             0.5        17424
STORAGE_CURVE_312             1          4356
STORAGE_CURVE_312             1.5        4356
STORAGE_CURVE_312             2          8712
STORAGE_CURVE_312             2.5        17424
STORAGE_CURVE_312             3          52272
STORAGE_CURVE_312             3.5        95832
STORAGE_CURVE_312             4          156816
STORAGE_CURVE_312             4.5        235224
STORAGE_CURVE_312             5          313632
STORAGE_CURVE_312             5.5        392040
STORAGE_CURVE_312             6          435600
STORAGE_CURVE_312             6.5        479160
STORAGE_CURVE_312             7          505296
STORAGE_CURVE_312             7.5        531432
STORAGE_CURVE_312             8.0        531432
STORAGE_CURVE_312             8.5        531432
STORAGE_CURVE_312             9.0        531432
STORAGE_CURVE_312             9.5        531432
;
;Storage curve created from design drawings for Indian Peaks Filing 17, provided by City of Lafayette.
STORAGE_CURVE_02 Storage      0          0
STORAGE_CURVE_02              0.3        71055.8
STORAGE_CURVE_02              1.3        218814.1
STORAGE_CURVE_02              2.3        305890
STORAGE_CURVE_02              3.3        344436
STORAGE_CURVE_02              4.3        360050
STORAGE_CURVE_02              5.3        375664
STORAGE_CURVE_02              6.3        391278
STORAGE_CURVE_02              7.3        406892
STORAGE_CURVE_02              8.3        422506
STORAGE_CURVE_02              9.3        435917.8
STORAGE_CURVE_02              10.3       451681.4
STORAGE_CURVE_02              12.3       500917.8

[REPORT]
;;Reporting Options
SUBCATCHMENTS ALL
NODES ALL
LINKS ALL

[TAGS]
Node       71             CULVERTPLACEHOLDER
Node       76             CULVERTPLACEHOLDER
Node       83             CULVERTPLACEHOLDER
Node       90             STORAGEPLACEHOLDER
```

100-yr Future EPA SWMM Input

```
Node       101            STORAGEPLACEHOLDER
Node       113            CULVERTPLACEHOLDER
Node       114            CULVERTPLACEHOLDER
Node       125            LAFAYETTE_INC
Node       JUNCT_BH700    DUMMY
Node       JUNCT_BH701    DUMMY
Node       JUNCT_BH702    DUMMY
Node       JUNCT_BH703    DUMMY
Node       JUNCT_BH704    DUMMY
Node       JUNCT_BH705    DUMMY
Node       JUNCT_BH706    DUMMY
Node       JUNCT_BH707    DUMMY
Node       JUNCT_BH708    DUMMY
Node       JUNCT_BH709    DUMMY
Node       JUNCT_BH710    DUMMY
Node       JUNCT_BH711    DUMMY
Node       JUNCT_BH712    DUMMY
Node       JUNCT_BH713    DUMMY
Node       JUNCT_BH714    DUMMY
Node       JUNCT_BH715    DUMMY
Node       JUNCT_BH716    DUMMY
Node       JUNCT_BH717    DUMMY
Node       JUNCT_BH718    DUMMY
Node       JUNCT_BH719    DUMMY
Node       JUNCT_BH720    DUMMY
Node       JUNCT_BH721    DUMMY
Node       JUNCT_BH722    DUMMY
Node       JUNCT_BH723    DUMMY
Node       JUNCT_BH724    DUMMY
Node       JUNCT_BH725    DUMMY
Node       JUNCT_BH726    DUMMY
Node       JUNCT_BH727    DUMMY
Node       JUNCT_BH728    DUMMY
Node       JUNCT_BH729    DUMMY
Node       JUNCT_BH730    DUMMY
Node       JUNCT_BH731    DUMMY
Node       JUNCT_BH732    DUMMY
Node       JUNCT_BH733    DUMMY
Node       JUNCT_BH734    DUMMY
Node       JUNCT_BH735    DUMMY
Node       JUNCT_BH736    DUMMY
Node       JUNCT_BH737    DUMMY
Node       JUNCT_BH738    DUMMY
Node       JUNCT_BH739    DUMMY
Node       JUNCT_BH740    DUMMY
Node       JUNCT_BH741    DUMMY
Node       JUNCT_BH742    DUMMY
Node       JUNCT_BH743    DUMMY
Node       JUNCT_BH744    DUMMY
Node       JUNCT_BH745    DUMMY
Node       JUNCT_BH746    DUMMY
Node       JUNCT_BH747    DUMMY
Node       JUNCT_BH748    DUMMY
Node       JUNCT_BH749    DUMMY
Node       JUNCT_BH750    DUMMY
Node       JUNCT_BH751    DUMMY
Node       JUNCT_BH752    DUMMY
Node       JUNCT_BH753    DUMMY
Node       JUNCT_BH754    DUMMY
Node       JUNCT_BH755    DUMMY
Node       JUNCT_BH756    DUMMY
Node       JUNCT_BH757    DUMMY
Node       104            LAFAYETTE
Node       123            LAFAYETTE
Node       183            CULVERTPLACEHOLDER
Node       142            STREET_OVERFLOW_EXTEND
Link       CH_04          Swale
Link       CH_08          GC
```

100-yr Future EPA SWMM Input

```
Link       CH_09            GC
Link       CH_11            GC
Link       CH_13            GC
Link       CH_15            BULLHEADGULCH
Link       CH_16            BULLHEADGULCH
Link       CH_18            BULLHEADGULCH
Link       CH_19            BULLHEADGULCH
Link       CH_23            BULLHEADGULCH
Link       CH_27            LAFAYETTE_INC
Link       CH_30            BULLHEADGULCH
Link       CH_31            BULLHEADGULCH
Link       CH_32            BULLHEADGULCH
Link       CH_33            BULLHEADGULCH
Link       CH_34            BULLHEADGULCH
Link       CH_35            BULLHEADGULCH
Link       CH_38            BULLHEADGULCH
Link       CH_39            STND_AG
Link       CH_39_OVERFLOW   STND_AG
Link       CH_40            STND_AG
Link       CH_41            STND_AG
Link       CH_42            STND_AG
Link       CH_44            STND_AG
Link       CH_45            STND_AG
Link       CH_46            STND_AG
Link       CH_47            STND_AG
Link       CH_48            STND_AG
Link       CH_49            STND_AG
Link       CH_50            STND_AG
Link       CH_51            STND_AG
Link       CH_52            STND_AG
Link       CH_53            GC
Link       CH_64            STND_AG
Link       CH_67            GC
Link       CH_76            STND_AG
Link       CU_01_OVERFLOW   STREET_OVERFLOW
Link       CU_06            LAFAYETTE
Link       CU_06_OVERFLOW   STREET_OVERFLOW
Link       CU_07            LAFAYETTE
Link       CU_08            LAFAYETTE_INC
Link       CU_09            BULLHEADGULCH
Link       CU_10_OVERFLOW   STREET_OVERFLOW
Link       CU_11            LAFAYETTE_INC
Link       CU_12            LAFAYETTE_INC
Link       CU_12_OVERFLOW   STREET_OVERFLOW
Link       CU_13            LAFAYETTE_INC
Link       CU_13_OVERFLOW   STREET_OVERFLOW
Link       CU_15            LAFAYETTE_INC
Link       CU_15_OVERFLOW   STREET_OVERFLOW
Link       CU_20_OVERFLOW   STREET_OVERFLOW
Link       CU_21            LAFAYETTE_INC
Link       CU_21_OVERFLOW   STREET_OVERFLOW
Link       CU_32            LAFAYETTE
Link       CU_32_OVERFLOW   STREET_OVERFLOW
Link       CU_33_OVERFLOW   STREET_OVERFLOW_EXTEND
Link       CU_34_OVERFLOW   STREET_OVERFLOW
Link       CU_38            LAFAYETTE_INC
Link       D_JUNCT_BH700    DUMMY
Link       D_JUNCT_BH701    DUMMY
Link       D_JUNCT_BH702    DUMMY
Link       D_JUNCT_BH703    DUMMY
Link       D_JUNCT_BH704    DUMMY
Link       D_JUNCT_BH706    DUMMY
Link       D_JUNCT_BH707    DUMMY
Link       D_JUNCT_BH708    DUMMY
Link       D_JUNCT_BH709    DUMMY
Link       D_JUNCT_BH710    DUMMY
Link       D_JUNCT_BH711    DUMMY
Link       D_JUNCT_BH712    DUMMY
```

100-yr Future EPA SWMM Input

```
Link       D_JUNCT_BH713    DUMMY
Link       D_JUNCT_BH714    DUMMY
Link       D_JUNCT_BH715    DUMMY
Link       D_JUNCT_BH716    DUMMY
Link       D_JUNCT_BH717    DUMMY
Link       D_JUNCT_BH718    DUMMY
Link       D_JUNCT_BH719    DUMMY
Link       D_JUNCT_BH720    DUMMY
Link       D_JUNCT_BH721    DUMMY
Link       D_JUNCT_BH722    DUMMY
Link       D_JUNCT_BH723    DUMMY
Link       D_JUNCT_BH724    DUMMY
Link       D_JUNCT_BH725    DUMMY
Link       D_JUNCT_BH726    DUMMY
Link       D_JUNCT_BH727    DUMMY
Link       D_JUNCT_BH728    DUMMY
Link       D_JUNCT_BH729    DUMMY
Link       D_JUNCT_BH730    DUMMY
Link       D_JUNCT_BH731    DUMMY
Link       D_JUNCT_BH732    DUMMY
Link       D_JUNCT_BH733    DUMMY
Link       D_JUNCT_BH734    DUMMY
Link       D_JUNCT_BH735    DUMMY
Link       D_JUNCT_BH736    DUMMY
Link       D_JUNCT_BH737    DUMMY
Link       D_JUNCT_BH738    DUMMY
Link       D_JUNCT_BH739    DUMMY
Link       D_JUNCT_BH740    DUMMY
Link       D_JUNCT_BH741    DUMMY
Link       D_JUNCT_BH742    DUMMY
Link       D_JUNCT_BH743    DUMMY
Link       D_JUNCT_BH744    DUMMY
Link       D_JUNCT_BH745    DUMMY
Link       D_JUNCT_BH746    DUMMY
Link       D_JUNCT_BH747    DUMMY
Link       D_JUNCT_BH748    DUMMY
Link       D_JUNCT_BH749    DUMMY
Link       D_JUNCT_BH750    DUMMY
Link       D_JUNCT_BH751    DUMMY
Link       D_JUNCT_BH752    DUMMY
Link       D_JUNCT_BH753    DUMMY
Link       D_JUNCT_BH754    DUMMY
Link       D_JUNCT_BH755    DUMMY
Link       D_JUNC_BH705     DUMMY
Link       D_JUNCT_BH757    DUMMY
Link       D_JUNCT_BH756    DUMMY

[MAP]
DIMENSIONS 3089946.798 1233412.410 3144269.714 1277534.153
Units      None

[COORDINATES]
;;Node           X-Coord            Y-Coord
;;-------------- ------------------ ------------------
61               3106745.450        1257726.955
62               3103377.320        1255559.385
63               3108048.594        1257804.834
65               3103401.922        1253701.977
66               3106111.081        1256330.641
67               3110116.592        1259660.628
68               3102859.583        1251837.158
69               3106315.002        1252447.678
70               3107857.037        1254656.880
71               3109951.885        1256321.303
76               3103352.440        1250308.998
78               3109658.013        1253475.455
79               3111139.954        1253759.694
80               3108755.376        1251678.580
```

100-yr Future EPA SWMM Input

82	3106807.806	1248713.247
83	3106769.527	1248456.300
84	3106657.027	1247255.711
85	3108595.088	1246304.605
90	3105772.607	1250896.560
93	3107234.761	1249924.193
94	3104828.884	1248522.114
95	3104988.805	1246956.322
99	3105283.404	1244621.095
101	3103240.396	1248349.217
102	3103440.307	1248516.711
103	3100737.531	1248271.811
105	3099526.319	1243892.196
106	3098531.681	1243057.984
107	3100296.361	1240707.751
108	3100673.361	1242424.304
109	3101627.892	1242143.559
111	3103368.508	1240916.305
113	3104130.529	1243130.176
114	3105766.868	1246434.940
116	3096943.469	1239279.965
119	3098020.560	1240030.165
120	3103310.477	1240844.494
121	3102165.292	1240374.185
122	3102316.310	1240452.326
124	3106709.721	1247906.320
125	3103658.343	1242623.337
126	3104716.423	1243854.203
127	3107769.024	1246321.060
128	3108289.017	1245810.941
129	3103467.323	1248343.814
131	3104158.909	1248349.217
136	3105985.130	1248522.114
137	3108024.875	1250277.430
146	3101984.485	1240845.389
JUNCT_201	3111878.426	1247701.173
JUNCT_202	3112462.229	1246065.616
JUNCT_203	3113070.218	1247809.583
JUNCT_204	3115074.433	1247507.476
JUNCT_205	3113174.747	1249207.146
JUNCT_206	3114734.187	1250353.536
JUNCT_207	3115946.072	1249686.572
JUNCT_208	3116914.559	1250558.210
JUNCT_209	3112023.699	1251187.727
JUNCT_210	3115558.677	1251333.000
JUNCT_211	3114997.677	1251888.710
JUNCT_212	3117834.621	1252446.760
JUNCT_213	3116333.466	1253124.701
JUNCT_215	3114082.480	1255524.998
JUNCT_216	3113428.128	1255707.490
JUNCT_217	3115737.394	1255080.394
JUNCT_218	3115416.291	1255969.601
JUNCT_219	3113567.907	1257913.568
JUNCT_220	3114904.924	1257275.446
JUNCT_222	3116042.920	1258645.077
JUNCT_235	3111926.851	1252979.427
JUNCT_236	3112265.821	1255884.889
JUNCT_237	3111762.934	1258108.043
JUNCT_238	3112846.913	1258499.803
JUNCT_240	3111926.851	1260921.021
JUNCT_241	3114348.068	1259904.110
JUNCT_242	3112992.186	1262373.751
JUNCT_243	3113573.278	1264068.604
JUNCT_302	3113934.202	1247025.598
JUNCT_305	3113870.203	1250049.542
JUNCT_606	3115849.223	1266925.640
JUNCT_607	3114687.039	1262180.054
JUNCT_608	3115607.101	1264698.120

100-yr Future EPA SWMM Input

JUNCT_609	3117108.256	1266635.094
JUNCT_613	3118706.260	1258063.984
JUNCT_614	3114898.846	1261286.497
JUNCT_615	3115730.900	1261412.387
JUNCT_616	3118657.835	1260824.172
JUNCT_617	3120158.990	1260436.777
JUNCT_618	3118026.458	1262503.982
JUNCT_619	3118813.048	1262873.197
JUNCT_620	3118186.987	1264751.382
JUNCT_621	3118893.313	1264911.910
JUNCT_622	3118331.463	1267223.522
JUNCT_623	3118411.727	1268796.702
JUNCT_624	3119335.776	1268911.039
JUNCT_638	3120643.234	1262276.903
JUNCT_639	3120013.717	1264359.150
JUNCT_640	3119965.293	1267216.186
JUNCT_641	3120207.414	1268911.039
JUNCT_648	3121272.750	1269685.828
JUNCT_655	3122580.208	1271332.256
JUNCT_702	3115074.433	1262809.571
JUNCT_715	3120982.204	1264601.272
JUNCT_BH700	3109095.289	1260031.017
JUNCT_BH701	3108918.387	1258804.283
JUNCT_BH702	3108306.020	1258171.599
JUNCT_BH703	3106608.122	1259435.928
JUNCT_BH704	3103821.397	1259332.469
JUNCT_BH705	3107499.329	1257090.524
JUNCT_BH706	3104956.996	1257351.773
JUNCT_BH707	3102157.613	1257457.410
JUNCT_BH708	3110474.537	1255737.877
JUNCT_BH709	3109012.890	1256162.035
JUNCT_BH710	3107288.055	1256211.069
JUNCT_BH711	3106423.063	1253921.384
JUNCT_BH712	3104998.370	1254481.085
JUNCT_BH713	3102184.022	1255450.305
JUNCT_BH714	3103602.728	1251508.486
JUNCT_BH715	3102210.431	1253311.154
JUNCT_BH716	3107876.463	1250966.958
JUNCT_BH717	3108755.376	1252859.686
JUNCT_BH718	3109994.079	1253212.914
JUNCT_BH719	3109761.462	1252290.468
JUNCT_BH720	3108585.689	1250648.483
JUNCT_BH721	3105718.741	1250381.405
JUNCT_BH722	3101735.064	1251515.323
JUNCT_BH723	3101761.474	1249376.172
JUNCT_BH724	3102560.847	1249705.880
JUNCT_BH725	3105196.264	1249459.655
JUNCT_BH726	3107186.634	1249330.619
JUNCT_BH727	3110595.674	1249065.917
JUNCT_BH728	3103794.988	1249270.535
JUNCT_BH729	3106031.570	1247261.131
JUNCT_BH730	3107017.448	1248473.180
JUNCT_BH731	3110267.907	1248019.644
JUNCT_BH732	3107138.506	1246964.344
JUNCT_BH733	3102887.232	1247501.769
JUNCT_BH734	3104010.210	1245271.855
JUNCT_BH735	3099728.432	1248079.066
JUNCT_BH736	3101180.469	1245494.008
JUNCT_BH737	3106057.030	1243642.894
JUNCT_BH738	3105600.971	1246070.229
JUNCT_BH739	3102028.956	1244269.196
JUNCT_BH740	3099358.229	1244675.321
JUNCT_BH741	3097886.235	1243338.454
JUNCT_BH742	3104290.954	1242472.431
JUNCT_BH743	3108256.864	1245463.168
JUNCT_BH744	3102606.239	1241656.939
JUNCT_BH745	3110027.460	1246778.467
JUNCT_BH746	3103978.125	1240346.794

100-yr Future EPA SWMM Input

```
JUNCT_BH747      3108879.122       1246009.812
JUNCT_BH748      3099631.536       1242959.041
JUNCT_BH749      3097380.351       1242807.275
JUNCT_BH750      3100515.095       1241339.722
JUNCT_BH751      3100668.599       1242883.158
JUNCT_BH752      3102972.740       1240419.998
JUNCT_BH753      3101758.705       1239744.262
JUNCT_BH754      3097051.526       1240252.559
JUNCT_BH755      3095898.023       1239237.347
55               3101756.232       1245287.898
86               3103873.848       1246378.791
56               3104411.273       1242905.580
148              3103502.297       1242515.414
JUNCT_BH756      3111404.206       1263173.334
JUNCT_BH757      3112303.583       1261705.601
150              3111860.906       1264852.904
152              3111368.937       1262850.741
154              3112379.578       1261447.265
156              3111079.206       1259653.347
OUTFALL_940      3114299.644       1265763.456
OUTFALL_954      3115849.223       1267361.460
OUTFALL_955      3116549.223       1268349.189
OUTFALL_958      3117931.470       1269298.433
OUTFALL_959      3119238.927       1269734.253
OUTFALL_961      3120207.414       1270363.769
OUTFALL_963      3121272.750       1270702.740
OUTFALL_965      3123112.876       1272784.987
OUTFALL_936      3106198.960       1260665.727
OUTFALL_937      3108529.945       1261176.206
OUTFALL_938      3111048.163       1263337.076
OUTFALL_939      3111872.631       1265171.949
OUTFALL_935      3102765.387       1259454.251
72               3109509.274       1253688.974
73               3111048.143       1256302.661
81               3107878.624       1250233.555
87               3111088.661       1249643.944
97               3103304.338       1246370.769
104              3100752.703       1243816.562
117              3101489.948       1240720.850
118              3101854.919       1240785.021
123              3101098.829       1244700.096
130              3103942.788       1248343.814
135              3105860.861       1248516.711
140              3111051.885       1256503.623
141              3111303.145       1256531.237
143              3111355.752       1257883.181
144              3114376.194       1256509.700
145              3102806.669       1242223.870
147              3101650.375       1240756.946
JUNCT_1025       3113566.209       1250337.536
JUNCT_1026       3114728.021       1251704.209
JUNCT_200        3111515.959       1246805.689
JUNCT_221        3116792.330       1257775.865
JUNCT_300        3111733.153       1248282.266
JUNCT_303        3113886.203       1249041.560
JUNCT_306        3113691.974       1250923.625
JUNCT_308        3114657.059       1252513.177
JUNCT_310        3115946.072       1252349.911
JUNCT_311        3114977.585       1253947.915
JUNCT_313        3114327.576       1258247.822
JUNCT_315        3114041.940       1259019.645
JUNCT_317        3112750.065       1260775.748
JUNCT_318        3113148.570       1261584.287
JUNCT_319        3113815.400       1263778.058
JUNCT_320        3111355.752       1254394.783
JUNCT_321        3111300.915       1256296.957
JUNCT_322        3111380.061       1258843.402
JUNCT_703        3116227.741       1265670.169
```

100-yr Future EPA SWMM Input

```
JUNCT_705        3119214.370       1259405.780
JUNCT_706        3119294.634       1262841.092
JUNCT_707        3115245.255       1261815.226
JUNCT_708        3117171.775       1263146.165
JUNCT_709        3117288.027       1265826.923
JUNCT_710        3117304.080       1268539.856
JUNCT_716        3120013.717       1266441.397
JUNCT_717        3120740.082       1268765.766
74               3103192.040       1244590.047
75               3103035.081       1248608.562
180              3103390.425       1257724.704
181              3106211.396       1260168.345
182              3108545.976       1260687.141
183              3111126.763       1261153.710
JUNCT_323        3112486.139       1260478.209
142              3111051.885       1257889.259
155              3111084.380       1262850.741
64               3108560.192       1256163.784
STOR_1025        3113486.587       1249716.588
STOR_1026        3114798.983       1250909.433
STOR_312         3114376.194       1256321.303
STOR_02          3103280.274       1242432.325

[VERTICES]
;;Link           X-Coord           Y-Coord
;;-------------- ----------------- ------------------
1025_OVERFLOW    3113774.205       1250625.531
1026_OVERFLOW    3114557.712       1252087.404
200_OVERFLOW     3111470.248       1247937.581
221_OVERFLOW     3115122.858       1258354.530
300_OVERFLOW     3112943.762       1248911.782
303_OVERFLOW     3114094.199       1249521.551
306_OVERFLOW     3114032.592       1252129.981
308_OVERFLOW     3114444.917       1252931.003
310_OVERFLOW     3115171.282       1252979.427
311_OVERFLOW     3115268.131       1255110.099
313_OVERFLOW     3114105.946       1258645.077
315_OVERFLOW     3113331.157       1259807.261
317_OVERFLOW     3113136.415       1261061.635
318_OVERFLOW     3113998.201       1263025.301
319_OVERFLOW     3114348.068       1264455.999
320_OVERFLOW     3111214.252       1255425.442
321_OVERFLOW     3111591.300       1257202.003
322_OVERFLOW     3112265.821       1259613.564
CH_37            3103617.168       1250341.299
CH_37            3103601.125       1250870.703
703_OVERFLOW     3116769.286       1266731.943
705_OVERFLOW     3118948.381       1261308.416
706_OVERFLOW     3118415.713       1263390.663
707_OVERFLOW     3116564.040       1262429.038
708_OVERFLOW     3117931.470       1265521.334
709_OVERFLOW     3117496.714       1267432.209
710_OVERFLOW     3117769.612       1268909.072
716_OVERFLOW     3120691.658       1267748.854
717_OVERFLOW     3120836.931       1269588.980
75_OVERFLOW      3111472.106       1258330.442
CH_18            3105375.486       1244813.565
CH_18            3105237.296       1245379.615
CH_18            3105301.635       1245865.430
CH_18            3105365.805       1246298.578
CH_19            3106055.634       1246691.620
CH_19            3106288.251       1246940.280
CH_19            3106520.868       1247060.599
CH_32            3106689.315       1249089.981
CH_32            3106681.293       1249282.491
CH_32            3106913.910       1249450.938
CH_35            3109131.509       1252271.321
CH_35            3109648.263       1253095.202
```

100-yr Future EPA SWMM Input

```
CH_39_OVERFLOW   3109249.266        1255005.837
CH_42            3103383.471        1257435.243
CH_66_OVERFLOW   3110788.825        1257146.559
CU_01_OVERFLOW   3101522.033        1240841.170
CU_02_OVERFLOW   3101710.535        1240853.202
CU_06_OVERFLOW   3100719.070        1244350.164
CU_07_OVERFLOW   3101179.530        1245074.042
CU_10_OVERFLOW   3103249.122        1248632.299
CU_12_OVERFLOW   3105915.875        1248542.224
CU_13_OVERFLOW   3103604.841        1246526.875
CU_15_OVERFLOW   3104091.300        1248258.267
CU_20_OVERFLOW   3107967.322        1250226.995
CU_21_OVERFLOW   3102970.226        1242481.370
CU_32_OVERFLOW   3111660.844        1249979.680
CU_32_OVERFLOW   3112214.852        1249890.476
CU_33_OVERFLOW   3110926.152        1256416.520
CU_34_OVERFLOW   3111454.001        1256413.284
CU_38_OVERFLOW   3104016.826        1244885.803
D_JUNCT_BH732    3106689.315        1247253.109
D_JUNCT_BH746    3103986.344        1242017.713
312_OVERFLOW     3114527.855        1257358.699
64_OVERFLOW      3108762.754        1256299.813
OUTLET_312_HIGH  3114408.214        1256396.838
OUTLET_312_LOW   3114351.095        1256396.356
OUTLET_02_HIGH   3103384.588        1242629.746


[BACKDROP]
FILE        "C:\Users\farina.kazi\OneDrive - Michael Baker International\Desktop\Bullhead Gulch\Baseline Hydrology\DETAILED
HYDROLOGY\EPASWMM\Basemap\SWMM_Basemap_Streets1_with_Streams.bmp"
DIMENSIONS 3089946.798 1233412.410 3144269.714 1277534.153
```

100-yr Existing EPA SWMM Input

```
  [TITLE]
;;Project Title/Notes
Bullhead Gulch
Baseline Hydrology
Michael Baker International, October 2021

[OPTIONS]
;;Option             Value
FLOW_UNITS           CFS
INFILTRATION         MODIFIED_HORTON
FLOW_ROUTING         KINWAVE
LINK_OFFSETS         DEPTH
MIN_SLOPE            0
ALLOW_PONDING        YES
SKIP_STEADY_STATE    NO

START_DATE           07/01/2021
START_TIME           00:00:00
REPORT_START_DATE    07/01/2021
REPORT_START_TIME    00:00:00
END_DATE             07/01/2021
END_TIME             23:00:00
SWEEP_START          01/01
SWEEP_END            12/31
DRY_DAYS             0
REPORT_STEP          00:01:00
WET_STEP             00:01:00
DRY_STEP             00:01:00
ROUTING_STEP         0:01:00
RULE_STEP            00:00:00

INERTIAL_DAMPING     PARTIAL
NORMAL_FLOW_LIMITED  BOTH
FORCE_MAIN_EQUATION  H-W
VARIABLE_STEP        0.75
LENGTHENING_STEP     0
MIN_SURFAREA         12.566
MAX_TRIALS           8
HEAD_TOLERANCE       0.005
SYS_FLOW_TOL         5
LAT_FLOW_TOL         5
MINIMUM_STEP         0.5
THREADS              1

[FILES]
;;Interfacing Files
USE    INFLOWS    "C:\Users\farina.kazi\OneDrive    -    Michael    Baker    International\Desktop\Bullhead    Gulch\Baseline
Hydrology\CUHP\CUHP_Outputs_20220808\Existing\CUHP_OUT_EX100YR.txt"

[EVAPORATION]
;;Data Source    Parameters
;;-------------- ----------------
CONSTANT         0.0
DRY_ONLY         NO

[JUNCTIONS]
;;Name           Elevation  MaxDepth   InitDepth  SurDepth   Aponded
;;-------------- ---------- ---------- ---------- ---------- ----------
61               5088       0          0          0          0
62               5135       0          0          0          0
63               5072       0          0          0          0
65               5172       0          0          0          0
66               5131       0          0          0          0
67               5054       0          0          0          0
68               5248       0          0          0          0
69               5188       0          0          0          0
70               5129       0          0          0          0
```

100-yr Existing EPA SWMM Input

```
;Information on how flows would cross subbasin 708 or if they are stopped by Isabell Road and flow east could be determined
in future field studies.
71               5088       0          0          0          0
;No information on if there's a culvert here, but looks like there's a collection point on west side of 95th that is somehow
carried across to open channel in Blue Heron subdivision.
76               5248       0          0          0          0
78               5125       0          0          0          0
79               5124       0          0          0          0
80               5147       0          0          0          0
82               5192       0          0          0          0
;Culvert underneath Arapahoe Road, visible from aerial imagery and LiDAR
83               5198       0          0          0          0
84               5211       0          0          0          0
85               5277       0          0          0          0
;from City of Lafayette data, Blue Heron
90               5215       0          0          0          0
93               5174       0          0          0          0
94               5247       0          0          0          0
95               5242       0          0          0          0
99               5257       0          0          0          0
;Pond B (City of Lafayette)
101              5268       0          0          0          0
102              5255.94    0          0          0          0
103              5277       0          0          0          0
105              5390       0          0          0          0
106              5413       0          0          0          0
107              5405       0          0          0          0
108              5394       0          0          0          0
109              5359       0          0          0          0
111              5330       0          0          0          0
113              5294       0          0          0          0
;Culvert underneath Indian Peaks Trail, visible from aerial imagery and LiDAR.
114              5232       0          0          0          0
116              5591       0          0          0          0
119              5424       0          0          0          0
120              5331       0          0          0          0
121              5350       0          0          0          0
122              5347       0          0          0          0
124              5204       0          0          0          0
;Elevation pulled from LiDAR, supported by images taken in the field
125              5305.32    0          0          0          0
126              5282       0          0          0          0
127              5252       0          0          0          0
128              5295       0          0          0          0
129              5267       0          0          0          0
131              5265       0          0          0          0
136              5223       0          0          0          0
137              5163       0          0          0          0
146              5367       0          0          0          0
JUNCT_201        5248.57    0          0          0          0
JUNCT_202        5261.57    0          0          0          0
JUNCT_203        5228.12    0          0          0          0
JUNCT_204        5228.12    0          0          0          0
JUNCT_205        5207.35    0          0          0          0
JUNCT_206        5183.23    0          0          0          0
JUNCT_207        5183.23    0          0          0          0
JUNCT_208        5200.89    0          0          0          0
JUNCT_209        5173.33    0          0          0          0
JUNCT_210        5163.75    0          0          0          0
JUNCT_211        5163.75    0          0          0          0
JUNCT_212        5176.40    0          0          0          0
JUNCT_213        5150.96    0          0          0          0
JUNCT_215        5095.38    0          0          0          0
JUNCT_216        5095.38    0          0          0          0
JUNCT_217        5095.38    0          0          0          0
JUNCT_218        5095.38    0          0          0          0
JUNCT_219        5068.08    0          0          0          0
JUNCT_220        5068.08    0          0          0          0
```

100-yr Existing EPA SWMM Input

```
JUNCT_222        5051.98    0          0          0          0
JUNCT_235        5109.89    0          0          0          0
JUNCT_236        5084.05    0          0          0          0
JUNCT_237        5050.46    0          0          0          0
JUNCT_238        5036.77    0          0          0          0
JUNCT_240        5025.98    0          0          0          0
JUNCT_241        5025.98    0          0          0          0
JUNCT_242        5013.49    0          0          0          0
JUNCT_243        4997.41    0          0          0          0
JUNCT_302        5261.56    0          0          0          0
JUNCT_305        5207.34    0          0          0          0
JUNCT_606        4987.84    0          0          0          0
JUNCT_607        5015.84    0          0          0          0
JUNCT_608        4988.62    0          0          0          0
JUNCT_609        4985.59    0          0          0          0
JUNCT_613        5124.32    0          0          0          0
JUNCT_614        5027.96    0          0          0          0
JUNCT_615        5027.96    0          0          0          0
JUNCT_616        5052.49    0          0          0          0
JUNCT_617        5052.49    0          0          0          0
JUNCT_618        5013.88    0          0          0          0
JUNCT_619        5013.88    0          0          0          0
JUNCT_620        4996.12    0          0          0          0
JUNCT_621        4996.12    0          0          0          0
JUNCT_622        4986.05    0          0          0          0
JUNCT_623        4975.81    0          0          0          0
JUNCT_624        4972.48    0          0          0          0
JUNCT_638        5020.62    0          0          0          0
JUNCT_639        5003.94    0          0          0          0
JUNCT_640        4979.49    0          0          0          0
JUNCT_641        4968.61    0          0          0          0
JUNCT_648        4965.05    0          0          0          0
JUNCT_655        4955.79    0          0          0          0
JUNCT_702        5015.83    0          0          0          0
JUNCT_715        5020.61    0          0          0          0
JUNCT_BH700      6000       0          0          0          0
JUNCT_BH701      6000       0          0          0          0
JUNCT_BH702      5068       0          0          0          0
JUNCT_BH703      6000       0          0          0          0
JUNCT_BH704      6000       0          0          0          0
JUNCT_BH705      5113.51    0          0          0          0
JUNCT_BH706      6000       0          0          0          0
JUNCT_BH707      6000       0          0          0          0
JUNCT_BH708      6000       0          0          0          0
JUNCT_BH709      5100       0          0          0          0
JUNCT_BH710      5125       0          0          0          0
JUNCT_BH711      6000       0          0          0          0
JUNCT_BH712      6000       0          0          0          0
JUNCT_BH713      6000       0          0          0          0
JUNCT_BH714      6000       0          0          0          0
JUNCT_BH715      6000       0          0          0          0
JUNCT_BH716      6000       0          0          0          0
JUNCT_BH717      6000       0          0          0          0
JUNCT_BH718      6000       0          0          0          0
JUNCT_BH719      6000       0          0          0          0
JUNCT_BH720      6000       0          0          0          0
JUNCT_BH721      6000       0          0          0          0
JUNCT_BH722      6000       0          0          0          0
JUNCT_BH723      6000       0          0          0          0
JUNCT_BH724      6000       0          0          0          0
JUNCT_BH725      6000       0          0          0          0
JUNCT_BH726      6000       0          0          0          0
JUNCT_BH727      6000       0          0          0          0
JUNCT_BH728      6000       0          0          0          0
JUNCT_BH729      6000       0          0          0          0
JUNCT_BH730      6000       0          0          0          0
JUNCT_BH731      6000       0          0          0          0
JUNCT_BH732      6000       0          0          0          0
```

100-yr Existing EPA SWMM Input

```
JUNCT_BH733      6000       0          0          0          0
JUNCT_BH734      6000       0          0          0          0
JUNCT_BH735      6000       0          0          0          0
JUNCT_BH736      6000       0          0          0          0
JUNCT_BH737      6000       0          0          0          0
JUNCT_BH738      6000       0          0          0          0
JUNCT_BH739      6000       0          0          0          0
JUNCT_BH740      6000       0          0          0          0
JUNCT_BH741      6000       0          0          0          0
JUNCT_BH742      6000       0          0          0          0
JUNCT_BH743      6000       0          0          0          0
JUNCT_BH744      6000       0          0          0          0
JUNCT_BH745      6000       0          0          0          0
JUNCT_BH746      6000       0          0          0          0
JUNCT_BH747      6000       0          0          0          0
JUNCT_BH748      6000       0          0          0          0
JUNCT_BH749      6000       0          0          0          0
JUNCT_BH750      6000       0          0          0          0
JUNCT_BH751      6000       0          0          0          0
JUNCT_BH752      6000       0          0          0          0
JUNCT_BH753      6000       0          0          0          0
JUNCT_BH754      6000       0          0          0          0
JUNCT_BH755      6000       0          0          0          0
;Part of golf course, predates subdivision (City of Lafayette)
55               5315       0          0          0          0
;from City of Lafayette Storm data. Part of golf course, predates subdivision.
86               5253       0          0          0          0
;IP 5 (City of Lafayette)
56               5300       0          0          0          0
148              5307.25    0          0          0          0
JUNCT_BH756      5016       0          0          0          0
JUNCT_BH757      5025       0          0          0          0
150              5010       0          0          0          0
152              5021       0          0          0          0
154              5029       0          0          0          0
156              5050       0          0          0          0

[OUTFALLS]
;;Name           Elevation  Type       Stage Data       Gated    Route To
;;-------------- ---------- ---------- ---------------- -------- ----------------
OUTFALL_940      4997.40    FREE                        NO
OUTFALL_954      4987.83    FREE                        NO
OUTFALL_955      4985.58    FREE                        NO
OUTFALL_958      4975.80    FREE                        NO
OUTFALL_959      4972.47    FREE                        NO
OUTFALL_961      4968.60    FREE                        NO
OUTFALL_963      4965.04    FREE                        NO
OUTFALL_965      4955.78    FREE                        NO
OUTFALL_936      5042       FREE                        NO
OUTFALL_937      5036       FREE                        NO
OUTFALL_938      5020       FREE                        NO
OUTFALL_939      5008       FREE                        NO
OUTFALL_935      5061       FREE                        NO

[DIVIDERS]
;;Name           Elevation  Diverted Link    Type       Parameters
;;-------------- ---------- ---------------- ---------- ----------
72               5123       CH_39_OVERFLOW   OVERFLOW   0          0          0          0
;Info from plans for US287/Isabelle Road Improvements
73               5080.37    CU_33_OVERFLOW   OVERFLOW   0          0          0          0
81               5170       CU_20_OVERFLOW   OVERFLOW   0          0          0          0
87               5233.72    CU_32_OVERFLOW   OVERFLOW   0          0          0          0
97               5272       CU_13_OVERFLOW   OVERFLOW   0          0          0          0
104              5353       CU_06_OVERFLOW   OVERFLOW   0          0          0          0
117              5381.1     CU_01_OVERFLOW   OVERFLOW   0          0          0          0
;From field investigation, appears that most flow goes along RR. There is an additional culvert heading eastward underneath
pedestrian crossing.
118              5368       CU_14_OVERFLOW   OVERFLOW   0          0          0          0
```

100-yr Existing EPA SWMM Input

```
;from Lafayette storm data
123              5339.65    CU_07_OVERFLOW    OVERFLOW   0          0          0          0
130              5266       CU_15_OVERFLOW    OVERFLOW   0          0          0          0
135              5225.6     CU_12_OVERFLOW    OVERFLOW   0          0          0          0
;Info from plans for US287/Isabelle Road Improvements
140              5078.65    CH_66_OVERFLOW    OVERFLOW   0          0          0          0
141              5078.36    321_OVERFLOW      OVERFLOW   0          0          0          0
143              5067       75_OVERFLOW       OVERFLOW   0          0          0          0
144              5090.3     312_OVERFLOW      OVERFLOW   0          0          0          0
145              5339       CU_21_OVERFLOW    OVERFLOW   0          0          0          0
147              5373       CU_02             OVERFLOW   0          0          0          0
JUNCT_1025       5207.32    1025_OVERFLOW     OVERFLOW   0          0          0          0
JUNCT_1026       5183.21    1026_OVERFLOW     OVERFLOW   0          0          0          0
JUNCT_200        5262.09    200_OVERFLOW      OVERFLOW   0          0          0          0
JUNCT_221        5060.50    221_OVERFLOW      OVERFLOW   0          0          0          0
JUNCT_300        5248.56    300_OVERFLOW      OVERFLOW   0          0          0          0
JUNCT_303        5228.11    303_OVERFLOW      OVERFLOW   0          0          0          0
JUNCT_306        5173.32    306_OVERFLOW      OVERFLOW   0          0          0          0
JUNCT_308        5163.74    308_OVERFLOW      OVERFLOW   0          0          0          0
JUNCT_310        5176.39    310_OVERFLOW      OVERFLOW   0          0          0          0
JUNCT_311        5150.95    311_OVERFLOW      OVERFLOW   0          0          0          0
JUNCT_313        5068.07    313_OVERFLOW      OVERFLOW   0          0          0          0
JUNCT_315        5051.97    315_OVERFLOW      OVERFLOW   0          0          0          0
JUNCT_317        5036.75    317_OVERFLOW      OVERFLOW   0          0          0          0
JUNCT_318        5025.97    318_OVERFLOW      OVERFLOW   0          0          0          0
JUNCT_319        5013.48    319_OVERFLOW      OVERFLOW   0          0          0          0
JUNCT_320        5109.88    320_OVERFLOW      OVERFLOW   0          0          0          0
JUNCT_321        5084.04    CU_34_OVERFLOW    OVERFLOW   0          0          0          0
JUNCT_322        5050.45    322_OVERFLOW      OVERFLOW   0          0          0          0
JUNCT_703        4988.61    703_OVERFLOW      OVERFLOW   0          0          0          0
JUNCT_705        5124.31    705_OVERFLOW      OVERFLOW   0          0          0          0
JUNCT_706        5052.48    706_OVERFLOW      OVERFLOW   0          0          0          0
JUNCT_707        5027.95    707_OVERFLOW      OVERFLOW   0          0          0          0
JUNCT_708        5013.87    708_OVERFLOW      OVERFLOW   0          0          0          0
JUNCT_709        4996.11    709_OVERFLOW      OVERFLOW   0          0          0          0
JUNCT_710        4986.04    710_OVERFLOW      OVERFLOW   0          0          0          0
JUNCT_716        5003.93    716_OVERFLOW      OVERFLOW   0          0          0          0
JUNCT_717        4979.48    717_OVERFLOW      OVERFLOW   0          0          0          0
;Part of golf course, predates subdivision (City of Lafayette)
74               5304       CU_38_OVERFLOW    OVERFLOW   0          0          0          0
;Tracts H&C (City of Lafayette)
75               5256.25    CU_10_OVERFLOW    OVERFLOW   0          0          0          0
180              5089       180_OVERFLOW      TABULAR    Node180DiversionCurve 0          0          0
181              5044       181_OVERFLOW      TABULAR    Node181DiversionCurve 0          0          0
182              5037       182_OVERFLOW      TABULAR    Node182DiversionCurve 0          0          0
183              5031       183_OVERFLOW      TABULAR    Node183DiversionCurve 0          0          0
JUNCT_323        5036.76    JUNCT_323_OVERFLOW OVERFLOW   0          0          0          0
142              5069       142_OVERFLOW      OVERFLOW   0          0          0          0
155              5024       155_OVERFLOW      OVERFLOW   0          0          0          0
64               5100       64_OVERFLOW       OVERFLOW   0          0          0          0

[STORAGE]
;;Name           Elev.    MaxDepth   InitDepth  Shape      Curve Name/Params            N/A      Fevap    Psi      Ksat     IMD
;;-------------- -------- ---------- ---------- ---------- ---------------------------- -------- --------          --------
--------
STOR_1025        5207.33  9          0          TABULAR    STORAGE_CURVE_1025           0        0
STOR_1026        5183.22  6.14       0          TABULAR    STORAGE_CURVE_1026           0        0
STOR_312         5095     9.5        0          TABULAR    STORAGE_CURVE_312            0        0
;Indian Peaks Filing 17. Stage-Storage curve was determined by tracing contours in provided design drawings from City of
Lafayette. HydroCAD utilized outfall structure details to create rating curve.
STOR_02          5307.7   12.3       0          TABULAR    STORAGE_CURVE_02             0        0

[CONDUITS]
;;Name           From Node        To Node          Length     Roughness  InOffset   OutOffset  InitFlow   MaxFlow
;;-------------- ---------------- ---------------- ---------- ---------- ---------- ---------- ---------- ----------
1025_OVERFLOW    JUNCT_1025       JUNCT_306        1810       .056       0          0          0          0
1026_OVERFLOW    JUNCT_1026       JUNCT_308        1100       .056       0          0          0          0
200              JUNCT_200        JUNCT_300        2435       .044       0          0          0          0
```

100-yr Existing EPA SWMM Input

```
200_OVERFLOW     JUNCT_200        JUNCT_300        2435       .056       0          0          0          0
201              JUNCT_201        JUNCT_300        1          0.01       0          0          0          0
202              JUNCT_202        JUNCT_302        1          0.01       0          0          0          0
203              JUNCT_203        JUNCT_303        1          0.01       0          0          0          0
204              JUNCT_204        JUNCT_303        1          0.01       0          0          0          0
205              JUNCT_205        STOR_1025        1          0.01       0          0          0          0
206              JUNCT_206        STOR_1026        1          0.01       0          0          0          0
207              JUNCT_207        STOR_1026        1          0.01       0          0          0          0
208              JUNCT_208        JUNCT_308        1690       .038       0          0          0          0
209              JUNCT_209        JUNCT_306        1          0.01       0          0          0          0
210              JUNCT_210        JUNCT_308        1          0.01       0          0          0          0
211              JUNCT_211        JUNCT_308        1          0.01       0          0          0          0
212              JUNCT_212        JUNCT_310        1          0.01       0          0          0          0
213              JUNCT_213        JUNCT_311        1          0.01       0          0          0          0
215              JUNCT_215        STOR_312         1          0.01       0          0          0          0
216              JUNCT_216        STOR_312         1          0.01       0          0          0          0
217              JUNCT_217        STOR_312         1          0.01       0          0          0          0
218              JUNCT_218        STOR_312         1          0.01       0          0          0          0
219              JUNCT_219        JUNCT_313        1          0.01       0          0          0          0
220              JUNCT_220        JUNCT_313        1          0.01       0          0          0          0
221              JUNCT_221        JUNCT_315        2675       .044       0          0          0          0
221_OVERFLOW     JUNCT_221        JUNCT_315        2675       0.056      0          0          0          0
222              JUNCT_222        JUNCT_315        1          0.01       0          0          0          0
235              JUNCT_235        JUNCT_320        1          0.01       0          0          0          0
236              JUNCT_236        JUNCT_321        1          0.01       0          0          0          0
237              JUNCT_237        JUNCT_322        1          0.01       0          0          0          0
238              JUNCT_238        JUNCT_323        1          0.01       0          0          0          0
240              JUNCT_240        154              1          0.01       0          0          0          0
241              JUNCT_241        JUNCT_318        1          0.01       0          0          0          0
242              JUNCT_242        JUNCT_319        1          0.01       0          0          0          0
243              JUNCT_243        OUTFALL_940      1          0.01       0          0          0          0
300              JUNCT_300        JUNCT_303        1010       .038       0          0          0          0
300_OVERFLOW     JUNCT_300        JUNCT_303        1010       .056       0          0          0          0
302              JUNCT_302        JUNCT_303        1580       .044       0          0          0          0
303              JUNCT_303        JUNCT_305        1600       .02        0          0          0          0
303_OVERFLOW     JUNCT_303        JUNCT_305        1600       .044       0          0          0          0
305              JUNCT_305        JUNCT_1025       1          0.01       0          0          0          0
306              JUNCT_306        JUNCT_308        1550       .044       0          0          0          0
306_OVERFLOW     JUNCT_306        JUNCT_308        1550       .056       0          0          0          0
308              JUNCT_308        JUNCT_311        900        .038       0          0          0          0
308_OVERFLOW     JUNCT_308        JUNCT_311        900        0.056      0          0          0          0
310              JUNCT_310        JUNCT_311        1820       .044       0          0          0          0
310_OVERFLOW     JUNCT_310        JUNCT_311        1820       0.056      0          0          0          0
311              JUNCT_311        STOR_312         3635       .038       0          0          0          0
311_OVERFLOW     JUNCT_311        STOR_312         3635       0.056      0          0          0          0
312              144              JUNCT_313        2140       .038       0          0          0          0
313              JUNCT_313        JUNCT_315        1350       .038       0          0          0          0
1025             JUNCT_1025       JUNCT_306        1810       .044       0          0          0          0
1026             JUNCT_1026       JUNCT_308        1100       .044       0          0          0          0
313_OVERFLOW     JUNCT_313        JUNCT_315        1350       0.056      0          0          0          0
315              JUNCT_315        JUNCT_317        2735       .038       0          0          0          0
315_OVERFLOW     JUNCT_315        JUNCT_317        2735       0.056      0          0          0          0
317              JUNCT_317        JUNCT_318        1115       .044       0          0          0          0
317_OVERFLOW     JUNCT_317        JUNCT_318        1115       .056       0          0          0          0
318              JUNCT_318        JUNCT_319        1820       .044       0          0          0          0
318_OVERFLOW     JUNCT_318        JUNCT_319        1820       .056       0          0          0          0
319              JUNCT_319        OUTFALL_940      2865       .044       0          0          0          0
319_OVERFLOW     JUNCT_319        OUTFALL_940      2865       .056       0          0          0          0
320              JUNCT_320        JUNCT_321        1690       .02        0          0          0          0
320_OVERFLOW     JUNCT_320        JUNCT_321        1690       .044       0          0          0          0
321              141              143              1762       .044       0          0          0          0
321_OVERFLOW     141              143              1762       0.035      0          0          0          0
322              JUNCT_322        JUNCT_323        2050       .044       0          0          0          0
322_OVERFLOW     JUNCT_322        JUNCT_323        2050       .056       0          0          0          0
;Open channel indicated in Boulder County Stormwater Data. Cross section and elevations taken from LiDAR.
CH_37            76               90               2222       0.01       0          0          0          0
;Created from same geometry as 321
75               143              JUNCT_322        2230       0.044      0          0          0          0
```

100-yr Existing EPA SWMM Input

```
323              JUNCT_323        JUNCT_317        1          0.01       0          0          0          0
606              JUNCT_606        OUTFALL_954      1          0.01       0          0          0          0
607              JUNCT_607        JUNCT_702        1          0.01       0          0          0          0
608              JUNCT_608        JUNCT_703        1          0.01       0          0          0          0
609              JUNCT_609        OUTFALL_955      1          0.01       0          0          0          0
613              JUNCT_613        JUNCT_705        1          0.01       0          0          0          0
614              JUNCT_614        JUNCT_707        1          0.01       0          0          0          0
615              JUNCT_615        JUNCT_707        1          0.01       0          0          0          0
616              JUNCT_616        JUNCT_706        1          0.01       0          0          0          0
617              JUNCT_617        JUNCT_706        1          0.01       0          0          0          0
618              JUNCT_618        JUNCT_708        1          0.01       0          0          0          0
619              JUNCT_619        JUNCT_708        1          0.01       0          0          0          0
620              JUNCT_620        JUNCT_709        1          0.01       0          0          0          0
621              JUNCT_621        JUNCT_709        1          0.01       0          0          0          0
622              JUNCT_622        JUNCT_710        1          0.01       0          0          0          0
623              JUNCT_623        OUTFALL_958      1          0.01       0          0          0          0
624              JUNCT_624        OUTFALL_959      1          0.01       0          0          0          0
638              JUNCT_638        JUNCT_715        1          0.01       0          0          0          0
639              JUNCT_639        JUNCT_716        1          0.01       0          0          0          0
640              JUNCT_640        JUNCT_717        1          0.01       0          0          0          0
641              JUNCT_641        OUTFALL_961      1          0.01       0          0          0          0
648              JUNCT_648        OUTFALL_963      1          0.01       0          0          0          0
655              JUNCT_655        OUTFALL_965      1          0.01       0          0          0          0
702              JUNCT_702        JUNCT_703        3715       .044       0          0          0          0
703              JUNCT_703        OUTFALL_955      1995       .044       0          0          0          0
703_OVERFLOW     JUNCT_703        OUTFALL_955      1995       .056       0          0          0          0
705              JUNCT_705        JUNCT_706        2700       .02        0          0          0          0
705_OVERFLOW     JUNCT_705        JUNCT_706        2700       .044       0          0          0          0
706              JUNCT_706        JUNCT_708        1285       .02        0          0          0          0
706_OVERFLOW     JUNCT_706        JUNCT_708        1285       .044       0          0          0          0
707              JUNCT_707        JUNCT_708        3240       .044       0          0          0          0
707_OVERFLOW     JUNCT_707        JUNCT_708        3240       .056       0          0          0          0
708              JUNCT_708        JUNCT_709        4465       .044       0          0          0          0
708_OVERFLOW     JUNCT_708        JUNCT_709        4465       .056       0          0          0          0
709              JUNCT_709        JUNCT_710        2265       .044       0          0          0          0
709_OVERFLOW     JUNCT_709        JUNCT_710        2265       .056       0          0          0          0
710              JUNCT_710        OUTFALL_958      1090       .044       0          0          0          0
710_OVERFLOW     JUNCT_710        OUTFALL_958      1090       .056       0          0          0          0
715              JUNCT_715        JUNCT_716        2640       .044       0          0          0          0
716              JUNCT_716        JUNCT_717        2780       .044       0          0          0          0
716_OVERFLOW     JUNCT_716        JUNCT_717        2780       .056       0          0          0          0
717              JUNCT_717        OUTFALL_961      1885       .044       0          0          0          0
717_OVERFLOW     JUNCT_717        OUTFALL_961      1885       .056       0          0          0          0
;overflow made from swale alongside 287
75_OVERFLOW      143              JUNCT_322        2230       0.01       0          0          0          0
;Vegetated channel inspected during field visit.
CH_01            107              117              1364       0.01       0          0          0          0
;Concrete lined channel
CH_02            119              107              1500       0.01       0          0          0          0
CH_04            116              119              2986       0.05       0          0          0          0
CH_05            111              STOR_02          1102       0.05       0          0          0          0
;Swale on east side of railroad.
CH_06            118              121              840        0.01       0          0          0          0
;natural swale
CH_07            122              120              1255       0.05       0          0          0          0
;Generalized channel through subbasin 741
CH_08            106              105              1588       0.01       0          0          0          0
;Generalized channel through subbasin 740
CH_09            105              104              1916       0.01       0          0          0          0
;natural swale, seen in field investigation
CH_10            146              120              1207       0.01       0          0          0          0
;Generalized channel through SB736 downstream of detention facility
CH_11            55               97               1680       0.01       0          0          0          0
;Generalized channel from pond flowing towards subbasin 729.
CH_13            86               95               1196       0.01       0          0          0          0
;Natural swale crossing subbasin. Terrain cut from LiDAR data.
CH_14            95               124              1971       0.01       0          0          0          0
CH_15            125              113              865        0.01       0          0          0          0
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100-yr Existing EPA SWMM Input

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;Bullhead Gulch until golf course culvert visible from aerial imagery and lidar data.
CH_16            113              126              754        0.01       0          0          0          0
;Swale through golf course. City of Lafyette information indicates some infrastructure labeled as "Bullhead Gulch Irrigation
System". From LiDAR and aerial, looks like this may actually be a culvert underneath a section of the golf course.
CH_17            126              99               838        0.01       0          0          0          0
CH_18            99               114              1888       0.01       0          0          0          0
CH_19            114              84               1321       0.01       0          0          0          0
CH_20            128              127              1072       0.01       0          0          0          0
CH_21            85               127              772        0.01       0          0          0          0
CH_22            127              84               1479       0.01       0          0          0          0
CH_23            84               124              375        0.01       0          0          0          0
CH_24            103              101              2557       0.01       0          0          0          0
CH_25            129              130              400        0.01       0          0          0          0
CH_26            131              83               2481       0.01       0          0          0          0
CH_27            102              94               1416       0.01       0          0          0          0
CH_28            94               135              400        0.01       0          0          0          0
CH_29            136              83               809        0.01       0          0          0          0
CH_30            124              83               950        0.01       0          0          0          0
CH_31            83               82               370        0.01       0          0          0          0
CH_32            82               93               1334       0.01       0          0          0          0
CH_33            93               81               400        0.01       0          0          0          0
CH_34            137              80               873        0.01       0          0          0          0
CH_35            80               78               2390       0.05       0          0          0          0
CH_36            90               80               2809       0.035      0          0          0          0
CH_38            78               72               137        0.05       0          0          0          0
CH_39            72               71               2670       0.035      0          0          0          0
CH_39_OVERFLOW   72               71               2670       0.035      0          0          0          0
CH_40            68               65               2103       0.035      0          0          0          0
CH_41            65               62               1597       0.035      0          0          0          0
CH_42            62               180              2115       0.035      0          0          0          0
CH_44            181              182              2326       0.035      0          0          0          0
CH_45            66               61               1445       0.01       0          0          0          0
CH_46            61               182              400        0.035      0          0          0          0
CH_47            182              183              2668       0.035      0          0          0          0
CH_48            69               70               2905       0.035      0          0          0          0
CH_49            70               JUNCT_BH709      2005       0.035      0          0          0          0
CH_50            64               JUNCT_BH709      1425       0.035      0          0          0          0
CH_51            63               182              2291       0.035      0          0          0          0
CH_52            67               183              1855       0.035      0          0          0          0
CH_53            109              145              1541       0.013      0          0          0          0
CH_63            79               73               2629       0.04       0          0          0          0
CH_64            71               73               400        0.035      0          0          0          0
CH_66            140              142              1115       0.04       0          0          0          0
CH_66_OVERFLOW   140              142              1115       0.04       0          0          0          0
CH_67            108              109              881        0.01       0          0          0          0
CH_76            183              154              1440       0.035      0          0          0          0
;Crushed CMP underneath pedestrian bridge
CU_01            117              147              18.5       0.024      0          0          0          0
CU_01_OVERFLOW   117              147              50         0.01       0          0          0          0
;RCP under railroad. Inspected during field visit
CU_02            147              118              80         0.013      0          0          0          0
CU_02_OVERFLOW   147              118              80         0.01       0          0          0          0
CU_04            120              111              113.5      0.011      0          0          0          0
;Culvert under Wynonna Ct
CU_05            121              122              140        0.01       0          0          0          0
;from Lafayette storm sewer data
CU_06            104              123              509        0.011      0          0          0          0
CU_06_OVERFLOW   104              123              750        0.01       0          0          0          0
;from Lafayette storm data
CU_07            123              55               1002       0.011      0          0          0          0
CU_07_OVERFLOW   123              55               1002       0.01       0          0          0          0
;72" CMP from City of Lafayette data. Elevations provided in Indian Peaks Filing 17 design drawings.
CU_08            148              125              175        0.024      0          0          0          0
CU_09            56               113              124        0.013      0          0          0          0
;from City of Lafayette Data
CU_10            75               102              129.930985 0.013      0          0          0          0
CU_10_OVERFLOW   75               102              400        0.01       0          0          0          0
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100-yr Existing EPA SWMM Input

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;culvert underneath 95th street. Lafayette data did not include invert elevations but they appeared to be at ground level
from aerial imagery, so elevations were extracted from LiDAR data.
CU_11            101              129              156         0.013      0          0          0          0
;from City of Lafayette Data. Inverts estimated from LiDAR.
CU_12            135              136              106.730706 0.013      0          0          0          0
CU_12_OVERFLOW   135              136              50          0.01       0          0          0          0
;24" CMP storm line shown in City of Lafayette drawings. Invert elevations not provided, estimated from LiDAR.
CU_13            97               86               363         0.024      0          0          0          0
CU_13_OVERFLOW   97               86               80          0.01       0          0          0          0
;flow under pedestrian bridge, inspected during field visit
CU_14_OVERFLOW   118              146              42          0.02       0          0          0          0
;Culvert from Lafayette storm data. Does not include inverts, inverts estimated from LiDAR.
CU_15            130              131              145         0.013      0          0          0          0
CU_15_OVERFLOW   130              131              400         0.01       0          0          0          0
;information collected from field observation
CU_20            81               137              95          0.012      0          0          0          0
CU_20_OVERFLOW   81               137              95          0.01       0          0          0          0
;Elevations estimated from LiDAR. Addtional parameters from City of Lafayette stormwater data.
CU_21            145              STOR_02          361         0.013      0          0          0          0
CU_21_OVERFLOW   145              STOR_02          361         0.01       0          0          0          0
CU_32            87               STOR_1025        104.126135 0.024      0          0          0          0
CU_32_OVERFLOW   87               STOR_1025        400         0.01       0          0          0          0
;Info from plans for US287/Isabelle Road Improvements
CU_33            73               140              122         0.013      0          0          0          0
CU_33_OVERFLOW   73               140              70          0.02       0          0          0          0
CU_34            JUNCT_321        141              195         0.013      0          0          0          0
CU_34_OVERFLOW   JUNCT_321        141              70          0.01       0          0          0          0
;Parameters estimated from field inspection data.
CU_35            142              143              184         0.013      0          0          0          0
;Lafayette stormwater data shows 18" pipe leading to 15" pipe continuing to Junction 99. Entire reach modeled as 15" pipe to
be conservative, elevations not provided and so were estimated from LiDAR.
CU_38            74               99               1370        0.013      0          0          0          0
;Overflow through golf course
CU_38_OVERFLOW   74               99               1200        0.01       0          0          0          0
D_JUNCT_BH700    JUNCT_BH700      183              400         0.01       0          0          0          0
D_JUNCT_BH701    JUNCT_BH701      67               400         0.01       0          0          0          0
D_JUNCT_BH702    JUNCT_BH702      182              400         0.01       0          0          0          0
D_JUNCT_BH703    JUNCT_BH703      182              400         0.01       0          0          0          0
D_JUNCT_BH704    JUNCT_BH704      181              400         0.01       0          0          0          0
D_JUNCT_BH706    JUNCT_BH706      61               400         0.01       0          0          0          0
D_JUNCT_BH707    JUNCT_BH707      180              400         0.01       0          0          0          0
D_JUNCT_BH708    JUNCT_BH708      73               400         0.01       0          0          0          0
D_JUNCT_BH709    JUNCT_BH709      71               400         0.01       0          0          0          0
D_JUNCT_BH710    JUNCT_BH710      64               400         0.01       0          0          0          0
D_JUNCT_BH711    JUNCT_BH711      70               400         0.01       0          0          0          0
D_JUNCT_BH712    JUNCT_BH712      66               400         0.01       0          0          0          0
D_JUNCT_BH713    JUNCT_BH713      62               400         0.01       0          0          0          0
D_JUNCT_BH714    JUNCT_BH714      69               400         0.01       0          0          0          0
D_JUNCT_BH715    JUNCT_BH715      65               400         0.01       0          0          0          0
D_JUNCT_BH716    JUNCT_BH716      80               400         0.01       0          0          0          0
D_JUNCT_BH717    JUNCT_BH717      72               400         0.01       0          0          0          0
D_JUNCT_BH718    JUNCT_BH718      79               400         0.01       0          0          0          0
D_JUNCT_BH719    JUNCT_BH719      78               400         0.01       0          0          0          0
D_JUNCT_BH720    JUNCT_BH720      80               400         0.01       0          0          0          0
D_JUNCT_BH721    JUNCT_BH721      90               400         0.01       0          0          0          0
D_JUNCT_BH722    JUNCT_BH722      68               400         0.01       0          0          0          0
D_JUNCT_BH723    JUNCT_BH723      75               400         0.01       0          0          0          0
D_JUNCT_BH724    JUNCT_BH724      76               400         0.01       0          0          0          0
D_JUNCT_BH725    JUNCT_BH725      93               400         0.01       0          0          0          0
D_JUNCT_BH726    JUNCT_BH726      81               400         0.01       0          0          0          0
D_JUNCT_BH727    JUNCT_BH727      87               400         0.01       0          0          0          0
D_JUNCT_BH728    JUNCT_BH728      94               400         0.01       0          0          0          0
D_JUNCT_BH729    JUNCT_BH729      124              400         0.01       0          0          0          0
D_JUNCT_BH730    JUNCT_BH730      82               400         0.01       0          0          0          0
D_JUNCT_BH731    JUNCT_BH731      JUNCT_200        400         0.01       0          0          0          0
D_JUNCT_BH732    JUNCT_BH732      84               400         0.01       0          0          0          0
D_JUNCT_BH733    JUNCT_BH733      101              400         0.01       0          0          0          0
D_JUNCT_BH734    JUNCT_BH734      95               400         0.01       0          0          0          0
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100-yr Existing EPA SWMM Input

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D_JUNCT_BH735    JUNCT_BH735      103              400         0.01       0          0          0          0
D_JUNCT_BH736    JUNCT_BH736      55               400         0.01       0          0          0          0
D_JUNCT_BH737    JUNCT_BH737      99               400         0.01       0          0          0          0
D_JUNCT_BH738    JUNCT_BH738      114              400         0.01       0          0          0          0
D_JUNCT_BH739    JUNCT_BH739      74               400         0.01       0          0          0          0
D_JUNCT_BH740    JUNCT_BH740      104              400         0.01       0          0          0          0
D_JUNCT_BH741    JUNCT_BH741      105              400         0.01       0          0          0          0
D_JUNCT_BH742    JUNCT_BH742      56               400         0.01       0          0          0          0
D_JUNCT_BH743    JUNCT_BH743      128              400         0.01       0          0          0          0
D_JUNCT_BH744    JUNCT_BH744      STOR_02          400         0.01       0          0          0          0
D_JUNCT_BH745    JUNCT_BH745      JUNCT_200        400         0.01       0          0          0          0
D_JUNCT_BH746    JUNCT_BH746      STOR_02          400         0.01       0          0          0          0
D_JUNCT_BH747    JUNCT_BH747      85               400         0.01       0          0          0          0
D_JUNCT_BH748    JUNCT_BH748      108              400         0.01       0          0          0          0
D_JUNCT_BH749    JUNCT_BH749      106              400         0.01       0          0          0          0
D_JUNCT_BH750    JUNCT_BH750      117              400         0.01       0          0          0          0
D_JUNCT_BH751    JUNCT_BH751      109              400         0.01       0          0          0          0
D_JUNCT_BH752    JUNCT_BH752      120              400         0.01       0          0          0          0
D_JUNCT_BH753    JUNCT_BH753      121              400         0.01       0          0          0          0
D_JUNCT_BH754    JUNCT_BH754      107              400         0.01       0          0          0          0
D_JUNCT_BH755    JUNCT_BH755      116              400         0.01       0          0          0          0
312_OVERFLOW     144              JUNCT_313        2140        0.056      0          0          0          0
D_JUNC_BH705     JUNCT_BH705      63               400         0.01       0          0          0          0
181_OVERFLOW     181              OUTFALL_936      400         0.035      0          0          0          0
182_OVERFLOW     182              OUTFALL_937      400         0.035      0          0          0          0
155_OVERFLOW     155              OUTFALL_938      400         0.035      0          0          0          0
D_JUNCT_BH757    JUNCT_BH757      152              400         0.01       0          0          0          0
77               152              JUNCT_BH756      400         0.035      0          0          0          0
D_JUNCT_BH756    JUNCT_BH756      150              400         0.01       0          0          0          0
D_756_OUT        150              OUTFALL_939      400         0.035      0          0          0          0
JUNCT_323_OVERFLOW JUNCT_323      154              400         0.035      0          0          0          0
80               154              JUNCT_318        400         0.035      0          0          0          0
142_OVERFLOW     142              156              400         0.035      0          0          0          0
CU_82            155              152              400         0.01       0          0          0          0
84               156              183              400         0.035      0          0          0          0
180_OVERFLOW     180              OUTFALL_935      400         0.035      0          0          0          0
88               180              181              400         0.035      0          0          0          0
183_OVERFLOW     183              155              400         0.035      0          0          0          0
64_OVERFLOW      64               JUNCT_BH709      1425        0.01       0          0          0          0

[OUTLETS]
;;Name           From Node        To Node          Offset     Type            QTable/Qcoeff    Qexpon     Gated
;;-------------- ---------------- ---------------- ---------- --------------- ---------------- ---------- --------
OUTLET_1025      STOR_1025        JUNCT_1025       0          TABULAR/DEPTH   RATING_CURVE_1025              NO
OUTLET_1026      STOR_1026        JUNCT_1026       0          TABULAR/DEPTH   RATING_CURVE_1026              NO
OUTLET_312_HIGH  STOR_312         144              0          TABULAR/DEPTH   RATING_CURVE_312_HIGH            NO
OUTLET_312_LOW   STOR_312         144              0          FUNCTIONAL/DEPTH 10.0            0.5        NO
;Rating curve for 21" RCP showing in Indian Peaks Filing 17 design drawings, generated in HydroCAD.
OUTLET_02_LOW    STOR_02          148              0          TABULAR/DEPTH   RATING_CURVE_02_LOW              NO
OUTLET_02_HIGH   STOR_02          125              0          TABULAR/DEPTH   RATING_CURVE_02_HIGH             NO

[XSECTIONS]
;;Link           Shape            Geom1            Geom2      Geom3      Geom4      Barrels    Culvert
;;-------------- ---------- ---------------- ---------- ---------- ---------- ---------- ----------
1025_OVERFLOW    TRAPEZOIDAL  10               56         20         20         1
1026_OVERFLOW    TRAPEZOIDAL  10               56         20         20         1
200              TRAPEZOIDAL  3                5          3          3          1
200_OVERFLOW     TRAPEZOIDAL  10               46         20         20         1
201              DUMMY        0                0          0          0          1
202              DUMMY        0                0          0          0          1
203              DUMMY        0                0          0          0          1
204              DUMMY        0                0          0          0          1
205              DUMMY        0                0          0          0          1
206              DUMMY        0                0          0          0          1
207              DUMMY        0                0          0          0          1
208              TRAPEZOIDAL  3                5          3          3          1
209              DUMMY        0                0          0          0          1
210              DUMMY        0                0          0          0          1
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100-yr Existing EPA SWMM Input

211	DUMMY	0	0	0	0	1
212	DUMMY	0	0	0	0	1
213	DUMMY	0	0	0	0	1
215	DUMMY	0	0	0	0	1
216	DUMMY	0	0	0	0	1
217	DUMMY	0	0	0	0	1
218	DUMMY	0	0	0	0	1
219	DUMMY	0	0	0	0	1
220	DUMMY	0	0	0	0	1
221	TRAPEZOIDAL	3	5	3	3	1
221_OVERFLOW	TRAPEZOIDAL	10	38	20	20	1
222	DUMMY	0	0	0	0	1
235	DUMMY	0	0	0	0	1
236	DUMMY	0	0	0	0	1
237	DUMMY	0	0	0	0	1
238	DUMMY	0	0	0	0	1
240	DUMMY	0	0	0	0	1
241	DUMMY	0	0	0	0	1
242	DUMMY	0	0	0	0	1
243	DUMMY	0	0	0	0	1
300	TRAPEZOIDAL	2	8	3	3	1
300_OVERFLOW	TRAPEZOIDAL	10	40	20	20	1
302	TRAPEZOIDAL	3	8	3	3	1
303	TRAPEZOIDAL	.5	8	3	3	1
303_OVERFLOW	TRAPEZOIDAL	10	22	20	20	1
305	DUMMY	0	0	0	0	1
306	TRAPEZOIDAL	3	10	3	3	1
306_OVERFLOW	TRAPEZOIDAL	10	56	20	20	1
308	TRAPEZOIDAL	1.5	10	3	3	1
308_OVERFLOW	TRAPEZOIDAL	10	38	20	20	1
310	TRAPEZOIDAL	3	8	3	3	1
310_OVERFLOW	TRAPEZOIDAL	10	52	20	20	1
311	TRAPEZOIDAL	3	10	3	3	1
311_OVERFLOW	TRAPEZOIDAL	10	56	20	20	1
312	TRAPEZOIDAL	3	10	3	3	1
313	TRAPEZOIDAL	3	10	3	3	1
1025	TRAPEZOIDAL	3	10	3	3	1
1026	TRAPEZOIDAL	3	10	3	3	1
313_OVERFLOW	TRAPEZOIDAL	10	38	20	20	1
315	TRAPEZOIDAL	1.5	10	3	3	1
315_OVERFLOW	TRAPEZOIDAL	10	38	20	20	1
317	TRAPEZOIDAL	3	5	3	3	1
317_OVERFLOW	TRAPEZOIDAL	10	46	20	20	1
318	TRAPEZOIDAL	3	10	3	3	1
318_OVERFLOW	TRAPEZOIDAL	10	56	20	20	1
319	TRAPEZOIDAL	3	10	3	3	1
319_OVERFLOW	TRAPEZOIDAL	10	56	20	20	1
320	TRAPEZOIDAL	.5	8	3	3	1
320_OVERFLOW	TRAPEZOIDAL	10	22	20	20	1
321	TRAPEZOIDAL	3	10	3	3	1
321_OVERFLOW	IRREGULAR	SB_237	0	0	0	1
322	TRAPEZOIDAL	3	10	3	3	1
322_OVERFLOW	TRAPEZOIDAL	10	56	20	20	1
CH_37	IRREGULAR	BlueHeron	0	0	0	1
75	TRAPEZOIDAL	1	10	3	3	1
323	DUMMY	0	0	0	0	1
606	DUMMY	0	0	0	0	1
607	DUMMY	0	0	0	0	1
608	DUMMY	0	0	0	0	1
609	DUMMY	0	0	0	0	1
613	DUMMY	0	0	0	0	1
614	DUMMY	0	0	0	0	1
615	DUMMY	0	0	0	0	1
616	DUMMY	0	0	0	0	1
617	DUMMY	0	0	0	0	1
618	DUMMY	0	0	0	0	1
619	DUMMY	0	0	0	0	1
620	DUMMY	0	0	0	0	1

100-yr Existing EPA SWMM Input

621	DUMMY	0	0	0	0	1
622	DUMMY	0	0	0	0	1
623	DUMMY	0	0	0	0	1
624	DUMMY	0	0	0	0	1
638	DUMMY	0	0	0	0	1
639	DUMMY	0	0	0	0	1
640	DUMMY	0	0	0	0	1
641	DUMMY	0	0	0	0	1
648	DUMMY	0	0	0	0	1
655	DUMMY	0	0	0	0	1
702	TRAPEZOIDAL	3	8	3	3	1
703	TRAPEZOIDAL	3	10	3	3	1
703_OVERFLOW	TRAPEZOIDAL	10	84	20	20	1
705	TRAPEZOIDAL	.5	8	3	3	1
705_OVERFLOW	TRAPEZOIDAL	10	33	20	20	1
706	TRAPEZOIDAL	.5	8	3	3	1
706_OVERFLOW	TRAPEZOIDAL	10	33	20	20	1
707	TRAPEZOIDAL	3	8	3	3	1
707_OVERFLOW	TRAPEZOIDAL	10	78	20	20	1
708	TRAPEZOIDAL	3	10	3	3	1
708_OVERFLOW	TRAPEZOIDAL	10	84	20	20	1
709	TRAPEZOIDAL	3	10	3	3	1
709_OVERFLOW	TRAPEZOIDAL	10	84	20	20	1
710	TRAPEZOIDAL	3	10	3	3	1
710_OVERFLOW	TRAPEZOIDAL	10	84	20	20	1
715	TRAPEZOIDAL	3	8	3	3	1
716	TRAPEZOIDAL	3	10	3	3	1
716_OVERFLOW	TRAPEZOIDAL	10	84	20	20	1
717	TRAPEZOIDAL	3	10	3	3	1
717_OVERFLOW	TRAPEZOIDAL	10	84	20	20	1
75_OVERFLOW	IRREGULAR	SB_237	0	0	0	1
CH_01	IRREGULAR	SB_751	0	0	0	1
CH_02	IRREGULAR	SB_754_East	0	0	0	1
CH_04	IRREGULAR	OpenChannel1	0	0	0	1
CH_05	IRREGULAR	IndianPeaks_02	0	0	0	1
CH_06	IRREGULAR	RailroadSwale	0	0	0	1
CH_07	IRREGULAR	IndianPeaks_01	0	0	0	1
CH_08	IRREGULAR	SB741	0	0	0	1
CH_09	IRREGULAR	SB740	0	0	0	1
CH_10	IRREGULAR	SB752_Northswale	0	0	0	1
CH_11	IRREGULAR	SB736_DSofPond	0	0	0	1
CH_13	IRREGULAR	SB734_DSofPond	0	0	0	1
CH_14	IRREGULAR	SB729	0	0	0	1
CH_15	IRREGULAR	BullheadGulch	0	0	0	1
CH_16	IRREGULAR	BullheadGulch	0	0	0	1
CH_17	IRREGULAR	GolfCourse	0	0	0	1
CH_18	IRREGULAR	BullheadGulch	0	0	0	1
CH_19	IRREGULAR	BullheadGulch	0	0	0	1
CH_20	IRREGULAR	SB732_fromSB743	0	0	0	1
CH_21	IRREGULAR	SB732	0	0	0	1
CH_22	IRREGULAR	SB732	0	0	0	1
CH_23	IRREGULAR	BullheadGulch	0	0	0	1
CH_24	IRREGULAR	ArapahoeSwale	0	0	0	1
CH_25	IRREGULAR	ArapahoeSwale_02	0	0	0	1
CH_26	IRREGULAR	ArapahoeSwale_02	0	0	0	1
CH_27	IRREGULAR	ArapahoeSwale_02	0	0	0	1
CH_28	IRREGULAR	ArapahoeSwale_02	0	0	0	1
CH_29	IRREGULAR	ArapahoeSwale_02	0	0	0	1
CH_30	IRREGULAR	BullheadGulch	0	0	0	1
CH_31	IRREGULAR	BullheadGulch	0	0	0	1
CH_32	IRREGULAR	BullheadGulch	0	0	0	1
CH_33	IRREGULAR	BullheadGulch	0	0	0	1
CH_34	IRREGULAR	BullheadGulch	0	0	0	1
CH_35	IRREGULAR	BullheadGulch	0	0	0	1
CH_36	IRREGULAR	SB716	0	0	0	1
CH_38	IRREGULAR	BullheadGulch	0	0	0	1
CH_39	IRREGULAR	Standard_Agricultural	0	0	0	1
CH_39_OVERFLOW	IRREGULAR	Standard_Agricultural	0	0	0	1

100-yr Existing EPA SWMM Input

```
CH_40            IRREGULAR    Standard_Agricultural 0          0          0          1
CH_41            IRREGULAR    Standard_Agricultural 0          0          0          1
CH_42            IRREGULAR    Standard_Agricultural 0          0          0          1
CH_44            IRREGULAR    Standard_Agricultural 0          0          0          1
CH_45            IRREGULAR    Standard_Agricultural 0          0          0          1
CH_46            IRREGULAR    Standard_Agricultural 0          0          0          1
CH_47            IRREGULAR    Standard_Agricultural 0          0          0          1
CH_48            IRREGULAR    Standard_Agricultural 0          0          0          1
CH_49            IRREGULAR    Standard_Agricultural 0          0          0          1
CH_50            IRREGULAR    Standard_Agricultural 0          0          0          1
CH_51            IRREGULAR    Standard_Agricultural 0          0          0          1
CH_52            IRREGULAR    Standard_Agricultural 0          0          0          1
CH_53            IRREGULAR    SB_744_STREET    0          0          0          1
CH_63            IRREGULAR    SB708_287swale   0          0          0          1
CH_64            IRREGULAR    Standard_Agricultural 0          0          0          1
CH_66            IRREGULAR    SB708_287swale   0          0          0          1
CH_66_OVERFLOW   IRREGULAR    SB708_287swale   0          0          0          1
CH_67            IRREGULAR    SB_751           0          0          0          1
CH_76            IRREGULAR    Standard_Agricultural 0          0          0          1
CU_01            CIRCULAR     1.5              0          0          0          1
CU_01_OVERFLOW   IRREGULAR    StreetOverflow   0          0          0          1
CU_02            CIRCULAR     3                0          0          0          1
CU_02_OVERFLOW   IRREGULAR    StreetOverflow   0          0          0          1
CU_04            RECT_CLOSED  6                10         0          0          1
CU_05            RECT_CLOSED  6                10         0          0          1
CU_06            CIRCULAR     1.25             0          0          0          1
CU_06_OVERFLOW   IRREGULAR    StreetOverflow   0          0          0          1
CU_07            CIRCULAR     2                0          0          0          1
CU_07_OVERFLOW   IRREGULAR    SB736_USofPond   0          0          0          1
CU_08            CIRCULAR     6                0          0          0          1
CU_09            IRREGULAR    BullheadGulch    0          0          0          1
CU_10            CIRCULAR     1.5              0          0          0          1
CU_10_OVERFLOW   IRREGULAR    StreetOverflow   0          0          0          1
CU_11            CIRCULAR     24               0          0          0          1
CU_12            CIRCULAR     24               0          0          0          1
CU_12_OVERFLOW   IRREGULAR    StreetOverflow   0          0          0          1
CU_13            CIRCULAR     2                0          0          0          1
CU_13_OVERFLOW   IRREGULAR    StreetOverflow   0          0          0          1
CU_14_OVERFLOW   CIRCULAR     2                0          0          0          1
CU_15            CIRCULAR     3                0          0          0          1
CU_15_OVERFLOW   IRREGULAR    StreetOverflow   0          0          0          1
CU_20            CIRCULAR     2                0          0          0          1
CU_20_OVERFLOW   IRREGULAR    SB726            0          0          0          1
CU_21            CIRCULAR     3                0          0          0          1
CU_21_OVERFLOW   IRREGULAR    StreetOverflow   0          0          0          1
CU_32            CIRCULAR     1.5              0          0          0          1
CU_32_OVERFLOW   IRREGULAR    StreetOverflow   0          0          0          1
CU_33            CIRCULAR     2.5              0          0          0          2
CU_33_OVERFLOW   IRREGULAR    StreetOverflow_Extend 0          0          0          1
CU_34            CIRCULAR     3                0          0          0          1
CU_34_OVERFLOW   IRREGULAR    StreetOverflow   0          0          0          1
CU_35            CIRCULAR     2                0          0          0          1
CU_38            CIRCULAR     1.25             0          0          0          1
CU_38_OVERFLOW   IRREGULAR    GolfCourse       0          0          0          1
D_JUNCT_BH700    DUMMY        0                0          0          0          1
D_JUNCT_BH701    DUMMY        0                0          0          0          1
D_JUNCT_BH702    DUMMY        0                0          0          0          1
D_JUNCT_BH703    DUMMY        0                0          0          0          1
D_JUNCT_BH704    DUMMY        0                0          0          0          1
D_JUNCT_BH706    DUMMY        0                0          0          0          1
D_JUNCT_BH707    DUMMY        0                0          0          0          1
D_JUNCT_BH708    DUMMY        0                0          0          0          1
D_JUNCT_BH709    DUMMY        0                0          0          0          1
D_JUNCT_BH710    DUMMY        0                0          0          0          1
D_JUNCT_BH711    DUMMY        0                0          0          0          1
D_JUNCT_BH712    DUMMY        0                0          0          0          1
D_JUNCT_BH713    DUMMY        0                0          0          0          1
D_JUNCT_BH714    DUMMY        0                0          0          0          1
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100-yr Existing EPA SWMM Input

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D_JUNCT_BH715    DUMMY        0                0          0          0          1
D_JUNCT_BH716    DUMMY        0                0          0          0          1
D_JUNCT_BH717    DUMMY        0                0          0          0          1
D_JUNCT_BH718    DUMMY        0                0          0          0          1
D_JUNCT_BH719    DUMMY        0                0          0          0          1
D_JUNCT_BH720    DUMMY        0                0          0          0          1
D_JUNCT_BH721    DUMMY        0                0          0          0          1
D_JUNCT_BH722    DUMMY        0                0          0          0          1
D_JUNCT_BH723    DUMMY        0                0          0          0          1
D_JUNCT_BH724    DUMMY        0                0          0          0          1
D_JUNCT_BH725    DUMMY        0                0          0          0          1
D_JUNCT_BH726    DUMMY        0                0          0          0          1
D_JUNCT_BH727    DUMMY        0                0          0          0          1
D_JUNCT_BH728    DUMMY        0                0          0          0          1
D_JUNCT_BH729    DUMMY        0                0          0          0          1
D_JUNCT_BH730    DUMMY        0                0          0          0          1
D_JUNCT_BH731    DUMMY        0                0          0          0          1
D_JUNCT_BH732    DUMMY        0                0          0          0          1
D_JUNCT_BH733    DUMMY        0                0          0          0          1
D_JUNCT_BH734    DUMMY        0                0          0          0          1
D_JUNCT_BH735    DUMMY        0                0          0          0          1
D_JUNCT_BH736    DUMMY        0                0          0          0          1
D_JUNCT_BH737    DUMMY        0                0          0          0          1
D_JUNCT_BH738    DUMMY        0                0          0          0          1
D_JUNCT_BH739    DUMMY        0                0          0          0          1
D_JUNCT_BH740    DUMMY        0                0          0          0          1
D_JUNCT_BH741    DUMMY        0                0          0          0          1
D_JUNCT_BH742    DUMMY        0                0          0          0          1
D_JUNCT_BH743    DUMMY        0                0          0          0          1
D_JUNCT_BH744    DUMMY        0                0          0          0          1
D_JUNCT_BH745    DUMMY        0                0          0          0          1
D_JUNCT_BH746    DUMMY        0                0          0          0          1
D_JUNCT_BH747    DUMMY        0                0          0          0          1
D_JUNCT_BH748    DUMMY        0                0          0          0          1
D_JUNCT_BH749    DUMMY        0                0          0          0          1
D_JUNCT_BH750    DUMMY        0                0          0          0          1
D_JUNCT_BH751    DUMMY        0                0          0          0          1
D_JUNCT_BH752    DUMMY        0                0          0          0          1
D_JUNCT_BH753    DUMMY        0                0          0          0          1
D_JUNCT_BH754    DUMMY        0                0          0          0          1
D_JUNCT_BH755    DUMMY        0                0          0          0          1
312_OVERFLOW     TRAPEZOIDAL  10               56         10         10         1
D_JUNC_BH705     DUMMY        0                0          0          0          1
181_OVERFLOW     IRREGULAR    Standard_Agricultural 0          0          0          1
182_OVERFLOW     IRREGULAR    Standard_Agricultural 0          0          0          1
155_OVERFLOW     IRREGULAR    Standard_Agricultural 0          0          0          1
D_JUNCT_BH757    DUMMY        0                0          0          0          1
77               IRREGULAR    Standard_Agricultural 0          0          0          1
D_JUNCT_BH756    DUMMY        0                0          0          0          1
D_756_OUT        IRREGULAR    Standard_Agricultural 0          0          0          1
JUNCT_323_OVERFLOW IRREGULAR    Standard_Agricultural 0          0          0          1
80               IRREGULAR    Standard_Agricultural 0          0          0          1
142_OVERFLOW     IRREGULAR    Standard_Agricultural 0          0          0          1
CU_82            CIRCULAR     1                0          0          0          1
84               IRREGULAR    Standard_Agricultural 0          0          0          1
180_OVERFLOW     IRREGULAR    Standard_Agricultural 0          0          0          1
88               IRREGULAR    Standard_Agricultural 0          0          0          1
183_OVERFLOW     IRREGULAR    Standard_Agricultural 0          0          0          1
64_OVERFLOW      IRREGULAR    Standard_Agricultural 0          0          0          1

[TRANSECTS]
;;Transect Data in HEC-2 format
;
NC 0.035    0.035    0.035
X1 ArapahoeSwale     30       120      130      0.0      0.0      0.0      0.0      0.0
GR 5276.5655 0        5276.4999 3.272993233 5276.4263 6.545986465 5276.2428 9.818979697 5276.124 13.0919729
GR 5276.0524 16.36496613 5275.9559 19.6379594 5275.8763 22.9109526 5275.7138 26.18394586 5275.5916 29.45693909
GR 5275.4611 32.72993233 5275.221 36.00292559 5274.7027 39.27591883 5274.2032 42.54891207 5274.1099 45.82190533
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100-yr Existing EPA SWMM Input

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GR 5274.4972 49.09489859 5274.8001 52.36789182 5274.6932 55.6408851 5274.6952 58.91387836 5274.7566 62.18687163
GR 5274.7794 65.45986487 5274.8167 68.73285814 5274.819 72.00585143 5274.8254 75.27884469 5274.8347 78.55183797
GR 5274.9534 81.82483123 5275.2834 85.09782451 5275.6304 88.3708178 5275.9711 91.64381106 5276.5811 94.91680434
;
NC 0.035    0.035    0.035
X1 ArapahoeSwale_02  84       145      160      0.0      0.0      0.0      0.0      0.0
GR 5268.7375 0        5268.7735 3.27620963752 5268.9354 6.55241923034 5268.9558 9.82862885296 5268.9563 13.1048384905
GR 5269.0389 16.3810481131 5269.0107 19.6572577357 5269.0348 22.9334673434 5269.0328 26.2096769661 5269.0371 29.4858866185
GR 5269.0173 32.7620962411 5268.9727 36.0383058786 5268.8758 39.3145155013 5268.846 42.5907251537 5268.8323 45.8669348061
GR 5268.8445 49.1431444287 5268.8643 52.4193540812 5269.0028 55.6955637336 5269.2203 58.9717733711 5269.3107 62.2479830235
GR 5269.4179 65.5241926759 5269.4903 68.8004023284 5269.5   72.0766119808 5269.542 75.352821663 5269.4903 78.6290313154
GR 5269.4297 81.9052409679 5269.3589 85.1814506501 5269.3738 88.4576603025 5269.4312 91.7338699847 5269.3992 95.010079667
GR 5269.3582 98.2862893194 5269.2594 101.562499002 5269.3031 104.838708684 5269.1265 108.114918366 5268.9915 111.391128033
GR 5268.9195 114.667337716 5269.1678 117.943547398 5269.1497 121.21975711 5268.9696 124.495966792 5268.4526 127.772176474
GR 5267.5775 131.048386201 5266.5129 134.324595883 5265.4392 137.600805566 5264.7142 140.877015293 5264.4199 144.153224975
GR 5264.8708 147.429434687 5265.6613 150.705644399 5266.4391 153.981854096 5266.9205 157.258063838 5267.2376 160.53427352
GR 5267.3192 163.810483247 5267.788 167.086692959 5268.6264 170.362902686 5269.4385 173.639112398 5270.002 176.91532214
GR 5270.2548 180.191531867 5270.4158 183.467741579 5270.5292 186.743951336 5270.6167 190.020161048 5270.6892 193.296370775
GR 5270.7503 196.572580516 5270.8026 199.848790273 5270.849 203.125000015 5270.888 206.270882519 5270.9213 209.416765055
GR 5270.9495 212.562647573 5270.9733 215.708530107 5270.9934 218.854412643 5271.0102 222.000295147 5271.0244 225.14617768
GR 5271.036 228.292060231 5271.0454 231.437942764 5271.053 234.583825271 5271.058 237.729707834 5271.0588 240.87559037
GR 5271.055 244.021472903 5271.0477 247.16735544 5271.0388 250.313237988 5271.0296 253.459120554 5271.0225 256.605003087
GR 5271.0167 259.750885653 5271.0127 262.896768186 5271.0101 266.042650753 5271.0099 269.188533318
;
NC 0.03     0.03     0.03
X1 BlueHeron         27       55       65       0.0      0.0      0.0      0.0      0.0
GR 5250.8606 0        5250.7705 3.27190166712 5250.5793 6.54380340874 5250.4108 9.81570509076 5250.2359 13.0876067728
GR 5250.0998 16.3595084995 5249.9238 19.6314101815 5249.7551 22.9033119082 5249.5875 26.1752135903 5249.4876 29.4471153319
GR 5249.3697 32.7190170139 5249.1792 35.9909187406 5248.7355 39.2628204226 5248.3674 42.5347221494 5248.1351 45.8066238314
GR 5247.5243 49.078525573 5246.7359 52.3504272997 5246.0953 55.6223289818 5246.0584 58.8942307234 5246.4903 62.1661323905
GR 5246.853 65.4380341321 5247.2155 68.7099358588 5247.585 71.9818375409 5247.9614 75.2537392825 5248.3394 78.5256410092
GR 5248.6428 81.7975427508 5248.7092 85.0694444329
;
NC 0.05     0.05     0.05
X1 BullheadGulch     169      225      250      0.0      0.0      0.0      0.0      0.0
GR 5315.1807 0        5315.1847 3.26229555537 5315.1663 6.52599116687 5315.1119 9.78898672043 5315.0125 13.051982289
GR 5314.9012 16.3149778873 5314.7837 19.5779734559 5314.6684 22.8409690691 5314.5576 26.1039646228 5314.4503 29.3669602361
GR 5314.3459 32.6299557899 5314.245 35.8929513436 5314.1478 39.1559469569 5314.054 42.4189425106 5313.9627 45.6819381239
GR 5313.8721 48.9449336776 5313.7824 52.207929291 5313.6927 55.4709249043 5313.6019 58.7339204582 5313.5104 61.9969160715
GR 5313.417 65.2599116849 5313.3222 68.5229072386 5313.2291 71.7859028522 5313.1388 75.0488984656 5313.0525 78.3118940194
GR 5312.9785 81.5748896328 5312.9718 84.8378852463 5312.9808 88.1008808001 5312.9152 91.3638764136 5312.8084 94.6268720271
GR 5312.6934 97.8898676407 5312.596 101.152863254 5312.5778 104.415858808 5312.5137 107.678854422 5312.4408 110.941850035
GR 5312.4185 114.204845649 5312.3826 117.467841262 5312.3747 120.730836861 5312.3658 123.993832475 5312.4669 127.256828088
GR 5312.6528 130.519823702 5312.864 133.782819315 5313.1281 137.045814929 5313.2981 140.308810543 5313.3364 143.571806156
GR 5313.3381 146.834801755 5313.3309 150.097797369 5313.3232 153.360792983 5313.3131 156.623788596 5313.2979 159.88678421
GR 5313.2755 163.149779824 5313.2445 166.412775437 5313.202 169.675771036 5313.1447 172.93876671 5313.0705 176.201762323
GR 5312.9559 179.464757937 5312.7547 182.727753551 5312.5017 185.99074915 5312.2778 189.253744823 5312.2322 192.516740437
GR 5312.2326 195.779736051 5312.2557 199.042731709 5312.0794 202.305727323 5311.6473 205.568722937 5310.9406 208.831718596
GR 5310.0396 212.094714209 5309.1297 215.357709823 5308.3549 218.620705497 5307.6509 221.883701096 5307.1851 225.146696769
GR 5306.8131 228.409692383 5306.4855 231.672687997 5306.2537 234.935683656 5306.3003 238.198679329 5306.4643 241.461674928
GR 5306.6523 244.724670543 5306.8847 247.987666216 5306.9955 251.250661875 5307.1002 254.513657489 5307.2732 257.776653162
GR 5307.3085 261.039648776 5307.458 264.302644435 5307.6515 267.565640094 5307.7347 270.828635708 5307.8657 274.091631382
GR 5307.9919 277.354627041 5308.1888 280.617622655 5308.3146 283.880618328 5308.2821 287.143613987 5308.3245 290.406609661
GR 5308.4547 293.66960526 5308.5177 296.932600934 5308.5478 300.195596593 5308.5541 303.458592267 5308.5714 306.721587925
GR 5308.6136 309.98458354 5308.6642 313.247579213 5308.7171 316.510574872 5308.7902 319.773570546 5308.894 323.036566205
GR 5308.9987 326.299561879 5309.1137 329.562557538 5309.2569 332.825553212 5309.4103 336.088548871 5309.6214 339.351544545
GR 5309.8141 342.614540204 5309.9569 345.877535878 5310.105 349.140531537 5310.3022 352.403527211 5310.4756 355.66652287
GR 5310.7198 358.929518544 5311.035 362.192514203 5311.1574 365.455509862 5311.2918 368.718505595 5311.5436 371.981501254
GR 5311.7717 375.244496928 5311.9423 378.507492588 5312.0983 381.770488247 5312.1208 385.03348398 5311.9655 388.296479639
GR 5311.874 391.559475314 5311.9405 394.822470973 5312.069 398.085466647 5312.2119 401.348462366 5312.3657 404.611458025
GR 5312.5289 407.874453699 5312.7007 411.137449418 5312.8821 414.400445077 5313.0751 417.663440796 5313.2823 420.92643647
GR 5313.5117 424.189432129 5313.7693 427.452427848 5313.9388 430.715423522 5313.9881 433.978419241 5313.9624 437.241414901
GR 5313.8969 440.504410619 5313.7814 443.767406294 5313.7354 447.030402013 5313.7891 450.293397687 5313.8008 453.556393406
GR 5313.8435 456.819389065 5313.9819 460.082384784 5314.1048 463.345380503 5314.1576 466.608376178 5314.2386 469.871371897
GR 5314.3005 473.134367556 5314.3471 476.397363275 5314.411 479.660359009 5314.4596 482.923354728 5314.5519 486.186350388
GR 5314.652 489.449346107 5314.6882 492.712341826 5314.6901 495.9753375 5314.7636 499.238333219 5314.8148 502.501328938
GR 5314.8118 505.764324658 5314.8349 509.027320377 5314.8738 512.290316051 5314.9171 515.55331177 5314.9643 518.816307489
GR 5315.0392 522.079303209 5315.1857 525.342298928 5315.4093 528.605294647 5315.6838 531.868290366 5315.9478 535.131286085
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100-yr Existing EPA SWMM Input

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GR 5316.1058 538.394281805 5316.1684 541.657277539 5316.2486 544.920273258 5316.3711 548.183268978
;
NC 0.03     0.03     0.03
X1 GolfCourse        120      0.0      0.0      0.0      0.0      0.0      0.0      0.0
GR 5283.9806 0        5283.837 3.25575734486 5283.688 6.51151466927 5283.55  9.76727194769 5283.4712 13.0230292798
GR 5283.4598 16.2787866042 5283.4944 19.5345439337 5283.4511 22.7903012658 5283.243 26.0460585902 5283.1004 29.301815935
GR 5283.0562 32.5575732518 5282.995 35.8133306043 5282.9523 39.069087921 5282.9423 42.3248452378 5282.966 45.5806025826
GR 5282.9831 48.8363599581 5282.9411 52.0921172748 5282.9008 55.3478746069 5282.8844 58.6036319441 5282.8154 61.8593893119
GR 5282.6899 65.115146644 5282.552 68.3709040195 5282.4039 71.6266613362 5282.2889 74.8824187194 5282.1483 78.1381760949
GR 5282.0273 81.3939334244 5281.9244 84.6496907922 5281.8807 87.9054481754 5281.8489 91.1612055509 5281.8142 94.4169629187
GR 5281.7495 97.6727202354 5281.6559 100.928477619 5281.6157 104.184234994 5281.5569 107.439992362 5281.4618 110.69574973
GR 5281.3199 113.951507105 5281.1932 117.207264511 5281.0793 120.463021894 5281.0206 123.718779262 5280.9704 126.974536638
GR 5280.8905 130.230294057 5280.8174 133.486051424 5280.7304 136.741808808 5280.6493 139.997566206 5280.6158 143.253323589
GR 5280.5912 146.509081008 5280.5438 149.764838376 5280.5157 153.020595803 5280.4288 156.276353209 5280.3249 159.532110576
GR 5280.2985 162.787867995 5280.2512 166.043625409 5280.2202 169.299382828 5280.2216 172.555140247 5280.2963 175.810897668
GR 5280.4654 179.06665508 5280.6413 182.322412486 5280.9265 185.57816992 5281.349 188.833927326 5281.7464 192.089684737
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GR 5281.3115 227.903016539 5281.1904 231.158773945 5281.1834 234.414531403 5281.2893 237.67028888 5281.5411 240.926046286
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GR 5283.7675 260.460591035 5283.8626 263.716348505 5283.813 266.972105947 5283.8037 270.227863455 5283.8607 273.48362092
GR 5283.9749 276.739378377 5284.0764 279.995135834 5284.0886 283.250893342 5284.1164 286.506650784 5284.2256 289.7624083
GR 5284.3304 293.018165757 5284.4986 296.27392325 5284.6874 299.529680708 5284.8806 302.785438216 5285.059 306.041195673
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GR 5283.8383 341.854528208 5283.9848 345.110285701 5284.194 348.366043209 5284.3332 351.621800702 5284.5223 354.877558256
GR 5284.6587 358.133315749 5284.843 361.389073309 5285.0405 364.644830789 5285.2884 367.900588297 5285.638 371.156345856
GR 5286.2376 374.412103337 5286.9562 377.667860896 5287.2755 380.923618435 5287.4012 384.179375994 5287.4811 387.435133487
;
NC 0.05     0.05     0.05
X1 IndianPeaks_01    35       77       97       0.0      0.0      0.0      0.0      0.0
GR 5351.0835 3.27117793235 5350.9835 6.54235588729 5350.829 9.81353384223 5350.6397 13.0847118263 5350.2631 16.3558897813
GR 5349.7311 19.6270677541 5349.1533 22.898245709 5348.6343 26.1694237028 5348.1366 29.440601648 5347.6448 32.7117796418
GR 5347.0669 35.9829576194 5346.4803 39.2541356035 5345.8956 42.5253135973 5345.3769 45.7964915651 5344.9226 49.0676695589
GR 5344.3741 52.338847543 5343.8986 55.6100255594 5343.3596 58.8812035435 5342.8446 62.152381521 5342.3433 65.4235595148
GR 5341.8458 68.6947375215 5341.266 71.9659155056 5340.3874 75.2370935609 5339.3059 78.5082715676 5338.6176 81.7794495743
GR 5338.4353 85.0506275681 5338.4215 88.3218055748 5338.6525 91.5929836203 5339.3663 94.8641616367 5340.4923 98.1353396434
GR 5341.2902 101.406517689 5341.7065 104.677695717 5341.9899 107.948873723 5342.2951 111.220051769 5342.5385 114.491229814
;
;Open channel beginning at Roser Drive, discharging into regional detention facility.
NC 0.06     0.06     0.06
X1 IndianPeaks_02    23       35       55       0.0      0.0      0.0      0.0      0.0
GR 5337.2999 3.2209264078 5337.0189 6.44185277285 5336.3254 9.66277919545 5335.4178 12.8837056016 5334.5429 16.1046320225
GR 5333.7391 19.3255584303 5333.0119 22.5464848512 5332.2102 25.7674111259 5331.3207 28.9883376799 5330.4343 32.2092640268
GR 5329.7692 35.4301904939 5329.7292 38.6511168556 5329.8826 41.8720433176 5329.9691 45.0929696809 5329.9679 48.3138961429
GR 5330.0184 51.5348225638 5330.3461 54.75574897 5331.1303 57.9766753892 5332.0268 61.197601792 5332.6969 64.4185282573
GR 5333.433 67.6394546749 5334.1871 70.8603810777 5335.1316 74.0813074969
;
;Swale running through open space east of City of Lousiville Water Treatment Plant
NC 0.013    0.013    0.015
X1 OpenChannel1      28       15       30       0.0      0.0      0.0      0.0      0.0
GR 153.3844 3.240999031 149      6.481998078 148.3026 9.72299714 143.2443 12.9639962 129.2983 16.20499526
GR 110.0854 19.44599432 108.3554 22.68699341 126.1623 25.92799247 122.3329 29.16899153 124.6164 32.40999059
GR 147.8336 35.65098969 154.5774 38.89198878 158.1672 42.13298784 165.5317 45.37398693 172.1837 48.61498602
GR 175.4204 51.8559851 174.3227 55.09698419 173.3893 58.3379833 179.9398 61.57898239 187.4034 64.81998148
GR 188.1249 68.06098057 182.4443 71.30197966 180.6028 74.54297878 179.047  77.78397787 170.2836 81.024977
GR 158.2714 83.63315937 152.6109 86.24134171 147.7422 88.84952405
;
;Swale along west side of railroad
NC 0.05     0.05     0.05
X1 RailroadSwale     63       80       110      0.0      0.0      0.0      0.0      0.0
GR 5371.6922 0        5371.6542 3.24545996005 5371.5823 6.49091989213 5371.4609 9.73637985975 5371.2625 12.981839807
GR 5370.9658 16.2272997595 5370.6016 19.4727597195 5370.2078 22.7182196667 5369.7928 25.9636796344 5369.3584 29.2091395431
GR 5368.9197 32.4545994979 5368.4711 35.7000594579 5367.947 38.9455194127 5367.3069 42.1909793366 5366.6863 45.4364393042
GR 5366.3026 48.6818992514 5366.0541 51.9273591677 5365.8899 55.1728191505 5365.7168 58.4182790615 5365.5796 61.6637390291
GR 5365.4641 64.9091989454 5365.319 68.1546589078 5365.2666 71.4001188392 5365.3824 74.6455787631 5365.7806 77.8910387459
GR 5366.028 81.1364986773 5366.1255 84.3819586321 5366.0334 87.6274185711 5365.7296 90.8728785026 5365.5359 94.118338434
GR 5365.3947 97.3637984168 5365.3518 100.609258341 5365.4097 103.854718274 5365.6159 107.100178206 5366.1488 110.345638137
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100-yr Existing EPA SWMM Input

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GR 5367.1849 146.04569746 5365.5267 149.291157407 5363.9821 152.536617302 5362.99  155.782077249 5362.698 159.027537211
GR 5362.8552 162.272997106 5363.2169 165.518457052 5363.4742 168.763916963 5363.7025 172.009376925 5363.832 175.254836871
GR 5363.8742 178.500296794 5363.9879 181.745756743 5364.3105 184.991216651 5364.9359 188.236676569 5365.5932 191.482136531
GR 5366.1398 194.727596441 5366.4031 197.775695349 5366.689 200.823794287
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NC 0.035    0.035    0.035
X1 SB_237            181      200      300      0.0      0.0      0.0      0.0      0.0
GR 5064.9656 0        5065.0397 3.275790014 5065.0571 6.551580087 5065.1161 9.827370146 5065.1686 13.10316016
GR 5065.2025 16.37895023 5065.2988 19.65474031 5065.3746 22.93053037 5065.4606 26.20632038 5065.5042 29.48211051
GR 5065.5351 32.75790053 5065.5923 36.03369059 5065.6887 39.30948066 5065.7087 42.58527072 5065.7602 45.86106079
GR 5065.7179 49.13685087 5065.7059 52.41264088 5065.4768 55.68843094 5064.9155 58.96422101 5064.144 62.24001109
GR 5063.4744 65.51580115 5062.6793 68.79159122 5062.0432 72.0673813 5061.9342 75.34317135 5062.0373 78.61896143
GR 5062.1564 81.8947515 5062.2748 85.17054156 5062.3969 88.44633164 5062.5285 91.7221217 5062.4798 94.99791177
GR 5062.3035 98.27370184 5062.0841 101.5494919 5061.9378 104.825282 5061.5618 108.1010721 5061.4106 111.3768622
GR 5061.4718 114.6526522 5061.5088 117.9284423 5061.503 121.2042324 5061.4787 124.4800224 5061.4873 127.7558126
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GR 5061.3949 147.410553 5061.3786 150.6863431 5061.4102 153.9621332 5061.306 157.2379233 5061.2981 160.5137134
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GR 5061.3363 294.8211075 5061.3263 298.0968976 5061.4443 301.3726877 5061.5147 304.6484778 5061.5451 307.9242679
GR 5061.5494 311.200058 5061.5189 314.4758482 5061.5127 317.7516383 5061.5015 321.0274284 5061.4856 324.3032185
GR 5061.5352 327.5790086 5061.6456 330.8547987 5061.6759 334.1305889 5061.6335 337.406379 5061.7286 340.6821691
GR 5061.7447 343.9579592 5061.7588 347.2337494 5061.7561 350.5095395 5061.7603 353.7853296 5061.8617 357.0611197
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GR 5061.9316 409.4737618 5061.9315 412.749552 5061.9565 416.0253422 5061.9959 419.3011323 5061.9823 422.5769224
GR 5062.0734 425.8527125 5062.196 429.1285027 5062.267 432.4042928 5062.1437 435.680083 5061.9898 438.9558731
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GR 5062.2903 540.5053679 5062.3334 543.7811581 5062.3574 547.0569482 5062.3756 550.3327384 5062.34  553.6085286
GR 5062.3993 556.8843188 5062.5097 560.1601089 5062.532 563.4358991 5062.5137 566.7116892 5062.5621 569.9874794
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GR 5062.5821 589.6422204
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NC 0.1      0.1      0.013
X1 SB_744_STREET     48       60       90       0.0      0.0      0.0      0.0      0.0
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GR 5348.4288 144.68885195 5348.532 147.90415981 5348.593 150.074298706
;
;High manning's to account for blocked obstructions
NC 0.1      0.1      0.1
X1 SB_751            233      390      410      0.0      0.0      0.0      0.0      0.0
GR 5378.9885 0        5378.944 3.28042437741 5378.8843 6.56084878459 5378.8367 9.84127319117 5378.8596 13.1216975686
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100-yr Existing EPA SWMM Input

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GR 5369.975 557.672179003 5369.8519 560.952603758 5369.7774 564.233028547 5369.7145 567.513453317 5369.638 570.793878106
GR 5369.5745 574.074302892 5369.4457 577.354727665 5369.4006 580.635152453 5369.5059 583.915577239 5369.6008 587.196002042
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GR 5372.4048 639.682798974 5372.4979 642.963223792 5372.5166 646.243648861 5372.5698 649.524073458 5372.6408 652.804498276
GR 5372.7708 656.084923125 5372.9248 659.365347973 5372.9962 662.645772791 5373.0501 665.926197639 5373.1374 669.206622486
GR 5373.228 672.487047334 5373.3591 675.767472184 5373.4888 679.047897047 5373.5798 682.328321894 5373.7342 685.608746742
GR 5373.9009 688.889171622 5373.984 692.16959647 5374.0717 695.450021332 5374.1726 698.730446212 5374.3538 702.01087106
GR 5374.4497 705.291295937 5374.6243 708.571720802 5374.8595 711.85214568 5375.0445 715.132570559 5375.3257 718.412995452
GR 5375.6409 721.693420331 5375.9442 724.973845211 5376.1055 728.254270073 5376.2332 731.534694983 5376.4446 734.81511986
GR 5376.6139 738.095544755 5376.6347 741.375969635 5376.6833 744.656394527 5376.7565 747.936819437 5376.9383 751.217244361
GR 5377.0978 754.497669239 5377.2488 757.778094163 5377.371 761.058519073
;
;concrete lined channel through eastern portion of subbasin 754, inspected during field visit
NC 0.07     0.07     0.02
X1 SB_754_East       107      145      150      0.0      0.0      0.0      0.0      0.0
GR 5427.305 0        5427.2421 3.27574517486 5427.1883 6.55149037962 5427.1386 9.82723559918 5427.0746 13.1029808039
GR 5427.0281 16.3787260083 5427.0048 19.654471213 5426.9704 22.9302164326 5426.9532 26.2059616373 5426.9374 29.4817068719
GR 5426.8789 32.7574520914 5426.786 36.0331972961 5426.6711 39.3089425456 5426.5321 42.58468778 5426.4316 45.8604329848
GR 5426.3275 49.1361782341 5426.2022 52.4119234389 5426.0981 55.6876686883 5425.9732 58.9634139228 5425.7631 62.2391591722
GR 5425.3944 65.514904407 5424.84  68.7906496565 5424.1912 72.0663949208 5423.6861 75.3421401702 5423.4522 78.6178854196
GR 5423.361 81.8936306541 5423.3375 85.1693759039 5423.4036 88.445121183 5423.4653 91.7208664474 5423.4193 94.9966116971
GR 5423.2857 98.2723569763 5423.1167 101.548102241 5422.9111 104.82384752 5422.6705 108.099592799 5422.46  111.375338064
GR 5422.4117 114.651083313 5422.4145 117.926828623 5422.4182 121.202573902 5422.4916 124.478319181 5422.4797 127.754064446
GR 5422.3359 131.029809755 5422.1884 134.305555034 5421.8991 137.581300344 5421.0938 140.857045623 5420.1792 144.132790932
GR 5420.4158 147.408536241 5421.428 150.684281521 5421.823 153.96002683 5421.7939 157.235772139 5421.705 160.511517449
GR 5421.7747 163.787262758 5422.2587 167.063008067 5422.8126 170.338753376 5422.98  173.614498715 5423.0223 176.890244025
GR 5423.0938 180.165989364 5423.2102 183.441734673 5423.268 186.717480012 5423.2259 189.993225336 5423.1787 193.268970676
GR 5423.1517 196.544715985 5423.0642 199.820461324 5422.8878 203.096206663 5422.7594 206.371952017 5422.7568 209.647697356
GR 5422.7508 212.923442696 5422.7947 216.199188035 5423.0184 219.474933389 5423.3496 222.750678758 5423.6465 226.026424097
GR 5423.6796 229.302169451 5423.5735 232.57791482 5423.4882 235.853660189 5423.3098 239.129405543 5423.0433 242.405150912
GR 5422.8357 245.680896296 5422.7865 248.956641665 5422.8633 252.232387034 5422.8956 255.508132388 5422.7804 258.783877787
GR 5422.7056 262.059623171 5422.8   265.33536854 5422.9344 268.611113924 5423.1825 271.886859308 5423.4404 275.162604707
GR 5423.4717 278.438350091 5423.4048 281.71409549 5423.4349 284.989840874 5423.5103 288.265586288 5423.559 291.541331687
GR 5423.61  294.817077071 5423.7143 298.092822484 5423.8762 301.368567883 5424.0784 304.644313297 5424.2792 307.920058711
GR 5424.4049 311.19580411 5424.5457 314.471549554 5424.7711 317.747294968 5424.9731 321.023040382 5425.1758 324.298785795
GR 5425.4206 327.574531239 5425.6719 330.850276668 5425.9785 334.126022082 5426.2601 337.401767525 5426.4078 340.677512969
GR 5426.5071 343.953258383 5426.5889 347.229003827
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100-yr Existing EPA SWMM Input

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;
NC 0.035    0.035    0.035
X1 SB205_287swale    88       60       70       0.0      0.0      0.0      0.0      0.0
GR 5252.0989 0         5252.0688 3.26272589931 5252.0241 6.52545175384 5251.9824 9.78817759354 5251.9104 13.0509034929
GR 5251.8168 16.3136293475 5251.747 19.5763552021 5251.6932 22.8390811013 5251.6222 26.1018069409 5251.5327 29.364532855
GR 5251.4786 32.6272586947 5251.4235 35.8899846088 5251.3391 39.1527104484 5251.2452 42.4154363475 5251.1625 45.6781622021
GR 5251.0508 48.9408881012 5250.8605 52.2036139557 5250.5068 55.4663398548 5249.9973 58.7290657094 5249.3936 61.9917916085
GR 5248.7555 65.2545174629 5248.2072 68.517243362 5247.7754 71.7799692611 5247.6937 75.0426951155 5248.0076 78.3054210146
GR 5248.5254 81.5681469137 5249.214 84.8308727681 5249.955 88.0935986672 5250.5942 91.3563245662 5250.8604 94.6190504205
GR 5250.8261 97.8817763196 5250.7828 101.144502219 5250.7693 104.407228133 5250.7811 107.669953972 5250.7335 110.932679871
GR 5250.69  114.195405785 5250.6654 117.458131684 5250.608 120.720857523 5250.5611 123.983583437 5250.5963 127.246309336
GR 5250.66  130.509035235 5250.6171 133.771761134 5250.5166 137.034487048 5250.5232 140.297212947 5250.5146 143.559938845
GR 5250.5197 146.822664745 5250.5383 150.085390658 5250.4773 153.348116497 5250.4211 156.610842396 5250.4328 159.87356831
GR 5250.4843 163.136294209 5250.4951 166.399020167 5250.4763 169.661746007 5250.4986 172.92447192 5250.5152 176.187197864
GR 5250.4993 179.449923778 5250.4832 182.712649676 5250.4362 185.975375575 5250.3889 189.238101474 5250.4038 192.500827388
GR 5250.3992 195.763553286 5250.3358 199.026279185 5250.294 202.289005084 5250.2892 205.551731042 5250.319 208.814456941
GR 5250.3145 212.077182854 5250.2984 215.339908753 5250.3097 218.602634652 5250.3914 221.865360551 5250.5441 225.128086509
GR 5250.4121 228.390812408 5249.9766 231.653538321 5249.6113 234.916264264 5249.3431 238.178990178 5249.1454 241.441716077
GR 5249.0483 244.704441975 5249.0304 247.967167933 5249.0123 251.229893832 5248.9548 254.49261979 5248.9409 257.755345689
GR 5248.9358 261.018071587 5248.8975 264.280797546 5248.8589 267.543523459 5248.8455 270.806249402 5248.9607 274.068975316
GR 5249.481 277.331701259 5249.6614 280.594427172 5249.7718 283.85715313
;
NC 0.035    0.016    0.04
X1 SB708_287swale    131      360      385      0.0      0.0      0.0      0.0      0.0
GR 5079.0674 0         5078.9789 3.25854696333 5078.9768 6.51709392667 5078.9565 9.7756409049 5078.9154 13.0341878682
GR 5078.902 16.2927348316 5078.9052 19.5512817949 5078.8857 22.8098287582 5078.9127 26.0683757663 5078.8895 29.3269227445
GR 5078.903 32.5854697078 5078.9121 35.8440166712 5078.9164 39.1025636345 5078.8921 42.3611105978 5078.9087 45.6196575612
GR 5078.9516 48.8782045245 5078.9577 52.1367515475 5078.9069 55.3952985108 5078.8489 58.6538454741 5078.809 61.9123924375
GR 5078.8103 65.1709394008 5078.842 68.4294864088 5078.8471 71.6880333871 5078.8456 74.9465803504 5078.8422 78.2051273137
GR 5078.8141 81.4636743218 5078.7986 84.7222212851 5078.8159 87.9807682484 5078.7962 91.2393152267 5078.7415 94.4978622347
GR 5078.7648 97.756409198 5078.7475 101.014956161 5078.7517 104.273503184 5078.7745 107.532050148 5078.731 110.790597171
GR 5078.786 114.049144134 5078.8219 117.307691142 5078.8222 120.56623812 5078.8043 123.824785084 5078.7686 127.083332092
GR 5078.7971 130.341879055 5078.7807 133.600426078 5078.7058 136.858973101 5078.7128 140.117520064 5078.6976 143.376067072
GR 5078.7226 146.63461405 5078.6889 149.893161058 5078.6733 153.151708022 5078.7566 156.410255045 5078.7175 159.668802008
GR 5078.7036 162.927349031 5078.6553 166.185896039 5078.6559 169.444443002 5078.6493 172.702990025 5078.6156 175.961536989
GR 5078.6212 179.220084012 5078.5774 182.47863102 5078.6126 185.737178043 5078.6052 188.995725006 5078.622 192.254272029
GR 5078.5979 195.512819052 5078.5536 198.77136606 5078.4764 202.029913023 5078.4421 205.288460046 5078.4575 208.547007069
GR 5078.4376 211.805554077 5078.3698 215.0641011 5078.371 218.322648123 5078.3498 221.581195086 5078.3006 224.839742094
GR 5078.3057 228.098289117 5078.3423 231.35683614 5078.2924 234.615383148 5078.2771 237.873930171 5078.2978 241.132477194
GR 5078.2738 244.391024202 5078.2668 247.649571225 5078.2586 250.908118248 5078.2675 254.166665271 5078.2138 257.425212279
GR 5078.158 260.683759302 5078.1958 263.942306325 5078.207 267.200853333 5078.2147 270.459400356 5078.2116 273.717947379
GR 5078.1588 276.976494387 5078.1289 280.23504141 5078.0436 283.493588433 5078.0328 286.752135441 5078.0161 290.010682523
GR 5077.9942 293.269229531 5077.9631 296.527776554 5077.9222 299.786323577 5077.9275 303.044870585 5077.9283 306.303417608
GR 5077.8916 309.561964676 5077.8502 312.820511699 5077.825 316.079058722 5077.835 319.33760573 5077.8625 322.596152812
GR 5077.872 325.85469982 5077.8812 329.113246843 5077.9269 332.371793866 5077.9507 335.630340934 5077.9891 338.888887957
GR 5078.1008 342.147434965 5077.968 345.405982047 5077.6001 348.664529055 5077.2813 351.923076123 5076.9795 355.181623146
GR 5076.6258 358.440170169 5076.0565 361.698717237 5075.5898 364.957264259 5075.5808 368.215811327 5075.7412 371.47435835
GR 5075.9517 374.732905418 5076.2272 377.991452441 5076.6485 381.249999508 5077.2665 384.508546531 5078.0834 387.767093599
GR 5078.9779 391.025640622 5079.6457 394.284187689 5080.09  397.542734712 5080.4964 400.80128178 5080.6818 404.059828848
GR 5080.6874 407.318375871 5080.7534 410.576922938 5080.8318 413.835469961 5080.9476 417.094017029 5081.0014 420.352564096
GR 5081.0149 423.611111119
;
;Natural terrain swale through subbasin 716
NC 0.035    0.035    0.035
X1 SB716             50       75       105      0.0      0.0      0.0      0.0      0.0
GR 5187.2222 0         5187.2357 3.27735254169 5187.2258 6.55470511317 5187.1321 9.83205768466 5187.1257 13.1094102561
GR 5187.1065 16.3867628127 5187.113 19.6641153842 5187.1311 22.9414679557 5187.1227 26.2188205272 5187.042 29.4961730987
GR 5186.9741 32.7735256702 5186.9211 36.0508782566 5186.8831 39.328230828 5186.8468 42.6055834293 5186.7781 45.8829360008
GR 5186.7537 49.1602886021 5186.7271 52.4376411885 5186.7003 55.7149937898 5186.67  58.9923463613 5186.6297 62.2696989775
GR 5186.572 65.547051549 5186.5062 68.8244041502 5186.4591 72.1017567664 5186.4386 75.3791093677 5186.378 78.656461969
GR 5186.286 81.9338145852 5186.2726 85.2111671865 5186.2953 88.4885198027 5186.3106 91.765872404 5186.3083 95.0432250202
GR 5186.3658 98.3205776513 5186.3977 101.597930267 5186.4377 104.875282899 5186.5097 108.152635515 5186.5955 111.429988146
GR 5186.6668 114.707340762 5186.7215 117.984693393 5186.7973 121.262046039 5186.9466 124.539398655 5187.0469 127.816751286
GR 5187.1216 131.094103932 5187.2323 134.371456563 5187.3041 137.648809209 5187.3787 140.926161855 5187.4194 144.203514516
GR 5187.4975 147.480867162 5187.5884 150.758219808 5187.7444 154.035572454 5187.7545 157.312925115 5187.7215 160.590277761
;
;natural terrain
NC 0.05     0.05     0.05
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100-yr Existing EPA SWMM Input

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X1 SB726             131      145      160      0.0      0.0      0.0      0.0      0.0
GR 5176.5324 0         5176.548 3.25865636646 5176.549 6.51731268773 5176.5237 9.77596905419 5176.4776 13.0346253756
GR 5176.4748 16.2932817271 5176.4962 19.5519380931 5176.5396 22.8105944447 5176.6181 26.0692508106 5176.6936 29.3279071622
GR 5176.7769 32.5865635138 5176.724 35.8452198798 5176.7529 39.1038762314 5176.7588 42.3625325979 5176.6814 45.6211889787
GR 5176.5349 48.8798453452 5176.5248 52.1385016963 5176.5571 55.3971580925 5176.5846 58.655814459 5176.3976 61.9144708403
GR 5176.1668 65.1731272064 5175.9175 68.4317835878 5175.4321 71.6904399841 5174.8813 74.9490963654 5174.587 78.2077527617
GR 5174.2785 81.4664091281 5173.9569 84.7250655239 5173.6497 87.9837219351 5173.1757 91.2423783313 5172.8995 94.5010347276
GR 5172.641 97.759691109 5172.1909 101.018347535 5171.5914 104.277003931 5170.9327 107.535660328 5170.2672 110.794316739
GR 5169.469 114.052973135 5168.622 117.311629561 5167.8362 120.570285957 5167.4107 123.828942383 5166.696 127.087598809
GR 5165.833 130.346255235 5165.17  133.604911662 5164.5941 136.863568073 5163.9747 140.122224499 5163.5772 143.380880925
GR 5163.4138 146.639537351 5163.4126 149.898193777 5163.4456 153.156850233 5163.4279 156.415506659 5163.0658 159.674163085
GR 5162.5837 162.932819541 5162.1705 166.191475968 5161.8733 169.450132424 5162.2456 172.708788879 5162.8399 175.96744532
GR 5163.3478 179.226101777 5163.8824 182.484758232 5164.5479 185.743414659 5165.1854 189.002071114 5165.8312 192.260727571
GR 5166.2785 195.519384056 5166.5334 198.778040498 5166.8155 202.036696983 5167.0956 205.295353439 5167.2909 208.554009925
GR 5167.4038 211.812666381 5167.4876 215.071322853 5167.5883 218.329979338 5167.7795 221.588635794 5168.0304 224.847292265
GR 5168.3044 228.105948751 5168.6816 231.364605237 5169.189 234.623261738 5169.7575 237.881918224 5170.399 241.14057471
GR 5171.0899 244.399231211 5171.729 247.657887696 5172.0773 250.916544168 5172.1537 254.175200684 5172.2141 257.433857184
GR 5172.3224 260.69251367 5172.4617 263.951170186 5172.5941 267.209826687 5172.6554 270.468483203 5172.7163 273.727139704
GR 5172.8448 276.985796219 5172.9829 280.24445272 5173.1337 283.503109251 5173.3006 286.761765767 5173.5064 290.020422297
GR 5173.7622 293.279078783 5174.0105 296.537735314 5174.2325 299.796391845 5174.4378 303.055048391 5174.6355 306.313704921
GR 5174.85  309.572361422 5175.0905 312.831017968 5175.3247 316.089674499 5175.5222 319.348331029 5175.7606 322.60698759
GR 5176.0045 325.865644136 5176.2474 329.124300666 5176.4483 332.382957197 5176.6438 335.641613758 5176.8548 338.900270319
GR 5177.0832 342.158926864 5177.3238 345.417583425 5177.5267 348.676239986 5177.736 351.934896517 5177.9398 355.193553077
GR 5178.1786 358.452209638 5178.5003 361.710866228 5178.7352 364.969522789 5178.8874 368.228179335 5179.0327 371.486835925
GR 5179.1663 374.745492486 5179.2902 378.004149076 5179.4357 381.262805637 5179.6565 384.521462227 5179.9442 387.780118788
GR 5180.3266 391.038775394 5180.668 394.297431954 5180.8653 397.556088545 5181.0149 400.814745136 5181.1995 404.073401726
GR 5181.4013 407.332058317 5181.5853 410.590714907 5181.7807 413.849371498 5181.9781 417.108028088 5182.1906 420.366684724
GR 5182.3767 423.625341314
;
NC 0.035    0.035    0.035
X1 SB727_287Swale    65       130      160      0.0      0.0      0.0      0.0      0.0
GR 5255.8035 0         5255.7859 3.23486323655 5255.7714 6.46972648799 5255.7621 9.70458973944 5255.7564 12.939452976
GR 5255.755 16.174316287 5255.7583 19.4091795236 5255.7659 22.644042775 5255.7774 25.8789060712 5255.7895 29.1137693226
GR 5255.7944 32.3486325741 5255.788 35.5834958702 5255.7886 38.8183591217 5255.7906 42.0532223731 5255.6781 45.2880856693
GR 5255.4968 48.5229489207 5255.3527 51.7578122169 5255.1886 54.9926754534 5254.9989 58.2275387049 5254.8311 61.462402001
GR 5254.6427 64.6972652525 5254.4879 67.9321285486 5254.4241 71.1669918001 5254.3454 74.4018550962 5254.2417 77.6367183477
GR 5254.1866 80.8715816438 5254.1624 84.1064449549 5254.1442 87.3413081914 5254.108 90.5761715025 5253.9897 93.811034739
GR 5253.8068 97.0458980501 5253.6402 100.280761346 5253.5009 103.515624598 5253.3765 106.750487894 5253.2146 109.98535119
GR 5253.0598 113.220214441 5252.9853 116.455077738 5253.0213 119.689941049 5253.0962 122.924804285 5252.875 126.159667596
GR 5252.6016 129.394530892 5252.475 132.629394189 5252.2923 135.86425744 5252.1662 139.099120736 5252.1391 142.333984047
GR 5252.0675 145.568847343 5251.9814 148.803710639 5252.0418 152.038573891 5252.1707 155.273437187 5252.2316 158.508300498
GR 5252.2851 161.743163794 5252.3485 164.97802709 5252.4103 168.212890387 5252.4716 171.447753638 5252.5404 174.682616934
GR 5252.6734 177.917480245 5252.709 181.152343601 5252.787 184.387206838 5252.8473 187.622070149 5252.8645 190.856933445
GR 5252.9535 194.091796741 5253.0398 197.326660052 5253.13  200.561523348 5253.1725 203.796386644 5253.1298 207.03124994
;
NC 0.035    0.035    0.035
X1 SB729             132      150      170      0.0      0.0      0.0      0.0      0.0
GR 5237.5257 0         5237.2894 3.26311272699 5237.1514 6.52622545398 5236.9954 9.78933817491 5236.8584 13.0524509261
GR 5236.5215 16.3155636531 5236.1402 19.578676374 5235.7604 22.8417891283 5235.3177 26.1049018795 5234.7739 29.3680146064
GR 5234.2402 32.6311273788 5233.7883 35.8942401058 5233.1755 39.15735286 5232.6862 42.4204656324 5232.3785 45.6835783594
GR 5232.1709 48.9466911318 5232.0314 52.209803886 5231.9036 55.4729166644 5231.661 58.7360294186 5231.3517 61.9991422046
GR 5231.0295 65.2622549589 5230.749 68.5253677312 5230.5493 71.7884805127 5230.3433 75.0515932911 5230.1419 78.3147060393
GR 5230.072 81.5778188313 5230.0584 84.840931631 5229.9494 88.1040444124 5229.7985 91.3671571908 5229.7338 94.6302700041
GR 5229.7271 97.8933828037 5229.6391 101.156495558 5229.4225 104.419608377 5229.1069 107.682721177 5228.852 110.945833982
GR 5228.7973 114.208946771 5228.7452 117.472059577 5228.6213 120.73517239 5228.4504 123.998285223 5228.3278 127.261398023
GR 5228.1398 130.524510842 5228.0088 133.787623642 5227.9824 137.050736488 5228.031 140.313849288 5228.0804 143.576962134
GR 5228.1587 146.840074961 5228.2377 150.103187774 5228.2815 153.366300621 5228.1283 156.629413448 5228.0169 159.892526294
GR 5228.0933 163.155639121 5228.1688 166.418751968 5228.2478 169.681864795 5228.2675 172.944977641 5228.2297 176.208090506
GR 5228.2149 179.471203333 5228.2257 182.7343162 5228.1968 185.997429047 5228.1653 189.260541874 5228.1299 192.523654766
GR 5228.0962 195.786767612 5228.1295 199.04988048 5228.185 202.312993358 5228.2208 205.576106232 5228.237 208.839219072
GR 5228.2756 212.102331964 5228.2616 215.365444838 5228.2365 218.628557706 5228.2788 221.891670584 5228.2414 225.154783458
GR 5228.1934 228.41789635 5228.2119 231.681009217 5228.2047 234.944122136 5228.3127 238.20723501 5228.3301 241.470347902
GR 5228.3433 244.733460797 5228.3376 247.996573689 5228.3449 251.259686608 5228.3758 254.522799509 5228.3897 257.785912401
GR 5228.4563 261.049025296 5228.4554 264.312138215 5228.5273 267.575251134 5228.5343 270.838364059 5228.5788 274.101476954
GR 5228.5932 277.364589873 5228.6407 280.627702792 5228.7264 283.890815707 5228.7453 287.153928626 5228.7528 290.417041573
GR 5228.7768 293.680154492 5228.8311 296.943267438 5228.9333 300.206380333 5229.0264 303.469493293 5229.1037 306.732606212
GR 5229.2915 309.995719159 5229.4111 313.258832125 5229.4598 316.521945071 5229.5332 319.78505799 5229.5984 323.048170964
GR 5229.6185 326.311283896 5229.7402 329.57439687 5229.8586 332.837509816 5229.8583 336.100622776 5229.9513 339.363735747
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100-yr Existing EPA SWMM Input

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GR 5229.9639 342.626848707 5230.0437 345.889961681 5230.1343 349.153074627 5230.2606 352.416187614 5230.3769 355.679300561
GR 5230.4869 358.942413572 5230.5698 362.205526546 5230.6359 365.468639506 5230.718 368.731752479 5230.7758 371.994865466
GR 5230.8397 375.257978464 5230.9305 378.521091451 5231.0041 381.784204439 5231.085 385.04731743 5231.1698 388.310430418
GR 5231.2621 391.573543391 5231.3575 394.836656403 5231.4337 398.099769417 5231.505 401.362882415 5231.5406 404.625995429
GR 5231.6055 407.889108441 5231.703 411.152221442 5231.8031 414.415334447 5231.8866 417.678447461 5231.8351 420.9415605
GR 5231.8778 424.204673501 5231.9621 427.46778654
;
NC 0.035    0.035    0.035
X1 SB731_287swale    75       170      180      0.0      0.0      0.0      0.0      0.0
GR 5276.0216 0        5275.9796 3.2729932315 5275.9031 6.54598646348 5275.8364 9.81897969498 5275.8207 13.091972927
GR 5275.8017 16.3649661439 5275.7439 19.6379593312 5275.6687 22.910952563 5275.5931 26.1839457948 5275.4658 29.4569390268
GR 5275.3483 32.7299322586 5275.3046 36.0029254757 5275.269 39.2759187075 5275.1797 42.5489119395 5275.103 45.8219051718
GR 5275.0823 49.0948984036 5275.0564 52.3678916359 5274.9675 55.6408849273 5274.8594 58.9138781596 5274.7773 62.1868713916
GR 5274.7226 65.4598646092 5274.7093 68.7328578412 5274.6921 72.0058510735 5274.6427 75.2788443056 5274.5909 78.5518375379
GR 5274.5418 81.8248308298 5274.4705 85.0978240621 5274.4135 88.3708172942 5274.4076 91.6438105269 5274.3553 94.9168038039
GR 5274.2714 98.1897970362 5274.2021 101.462790269 5274.1075 104.735783501 5274.0475 108.008776778 5273.9521 111.281770011
GR 5273.8391 114.554763243 5273.7874 117.827756476 5273.6989 121.100749768 5273.5514 124.373743001 5273.3809 127.646736278
GR 5273.2095 130.919729511 5273.091 134.192722743 5273.0178 137.465716035 5272.9446 140.738709268 5272.9273 144.011702545
GR 5272.9116 147.284695778 5272.8673 150.557689011 5272.8901 153.830682303 5272.9076 157.103675536 5272.892 160.376668814
GR 5272.7719 163.649662046 5272.5353 166.922655339 5272.2169 170.195648572 5271.7445 173.46864185 5271.1605 176.741635142
GR 5270.503 180.014628375 5269.8527 183.287621653 5269.4783 186.560614886 5269.5761 189.833608178 5270.0098 193.106601411
GR 5270.2891 196.379594689 5270.3099 199.652587982 5270.3094 202.925581215 5270.3665 206.198574493 5270.4321 209.471567726
GR 5270.4871 212.744561019 5270.5716 216.017554297 5270.636 219.29054759 5270.6889 222.563540823 5270.7547 225.836534101
GR 5270.8479 229.109527394 5270.9582 232.382520672 5271.0237 235.655513905 5271.0749 238.928507198 5271.1495 242.201500476
;
;Natural swale with agricultural ponds
NC 0.04     0.05     0.04
X1 SB732             132      180      260      0.0      0.0      0.0      0.0      0.0
GR 5253.1813 0        5253.4099 3.26769304968 5253.5167 6.53538607299 5253.5631 9.80307912666 5253.4293 13.0707721603
GR 5253.2075 16.3384651997 5253.0637 19.6061582493 5252.933 22.8738513013 5252.8582 26.141544351 5252.8937 29.4092373903
GR 5252.8922 32.6769304567 5252.8422 35.9446235207 5252.799 39.2123165704 5252.7237 42.4800096385 5252.6551 45.7477026881
GR 5252.6438 49.0153957562 5252.97  52.2830888058 5253.4682 55.5507818699 5253.7424 58.8184749522 5253.5249 62.0861680163
GR 5252.9183 65.3538610843 5252.6738 68.6215541627 5252.5633 71.8892472267 5252.4179 75.1569403211 5252.3173 78.4246333891
GR 5252.329 81.6923264819 5252.3079 84.9600195356 5252.2309 88.2277126443 5252.1598 91.495405737 5252.064 94.7630988154
GR 5251.9386 98.0307918995 5251.8706 101.298484992 5251.8136 104.566178087 5251.7748 107.833871179 5251.7812 111.101564288
GR 5251.7751 114.369257382 5251.764 117.636950479 5251.7108 120.904643588 5251.6093 124.172336697 5251.3928 127.440029789
GR 5251.2024 130.707722913 5250.8483 133.975416021 5250.4921 137.24310913 5250.0262 140.510802227 5249.4652 143.77849535
GR 5248.8964 147.046188459 5248.3767 150.313881596 5247.8732 153.581574705 5247.4575 156.849267842 5247.0955 160.116960951
GR 5246.6598 163.384654101 5246.1309 166.652347224 5245.4918 169.920040332 5244.891 173.18773347 5244.4317 176.455426607
GR 5243.9918 179.723119745 5243.5971 182.990812898 5243.2645 186.258506007 5242.9372 189.52619916 5242.6581 192.793892298
GR 5242.3044 196.061585435 5241.9205 199.329278585 5241.7957 202.596971751 5241.857 205.864664904 5242.2006 209.132358058
GR 5242.4739 212.400051195 5242.577 215.667744374 5242.604 218.935437511 5242.1287 222.203130693 5241.4139 225.470823847
GR 5241.7553 228.738517013 5242.7529 232.006210162 5243.0663 235.27390333 5243.1139 238.541596512 5243.3006 241.809289662
GR 5243.3378 245.076982844 5242.9268 248.344676022 5242.6168 251.612369204 5242.6768 254.880062386 5242.8104 258.14775555
GR 5242.8976 261.415448732 5242.9365 264.683141915 5243.0254 267.950835093 5243.1932 271.218528316 5243.373 274.486221484
GR 5243.492 277.753914666 5243.7251 281.021607873 5244.0097 284.289301071 5244.4335 287.556994263 5244.8493 290.824687446
GR 5245.2539 294.092380668 5245.7215 297.360073865 5246.3296 300.627767059 5246.7248 303.89546027 5246.9567 307.163153493
GR 5247.104 310.430846685 5247.2502 313.698539884 5247.3683 316.966233121 5247.47  320.233926303 5247.579 323.501619526
GR 5247.8319 326.769312763 5248.1574 330.037005986 5248.4485 333.304699213 5248.6719 336.572392422 5248.8779 339.840085657
GR 5249.0846 343.10777887 5249.3756 346.375472093 5249.6883 349.64316533 5249.9746 352.910858581 5250.3008 356.178551794
GR 5250.6988 359.446245046 5251.1657 362.713938299 5251.8472 365.981631522 5252.1988 369.249324759 5252.5086 372.517018011
GR 5252.6761 375.784711252 5252.7926 379.052404519 5252.9378 382.320097757 5253.0497 385.587791008 5253.1738 388.855484262
GR 5253.2663 392.123177528 5253.3517 395.390870766 5253.4621 398.658564032 5253.6365 401.9262573 5253.8837 405.193950566
GR 5254.2149 408.461643819 5254.6362 411.729337071 5255.0718 414.997030353 5255.4466 418.264723635 5255.5466 421.532416886
GR 5255.6916 424.800110184 5255.7835 428.06780345
;
;Natural terrain swale flowing northwest from subbasin 743
NC 0.035    0.035    0.035
X1 SB732_fromSB743   77       60       90       0.0      0.0      0.0      0.0      0.0
GR 5268.5305 0        5268.4795 3.26223737 5268.3804 6.524474699 5268.2594 9.786712045 5268.1988 13.04894942
GR 5268.1439 16.31118675 5268.1009 19.57342414 5268.0635 22.83566147 5267.9705 26.09789886 5267.8487 29.36013619
GR 5267.6991 32.62237358 5267.5325 35.88461091 5267.3483 39.14684831 5267.2304 42.40908564 5267.196 45.67132303
GR 5267.2043 48.93356037 5267.167 52.1957977 5266.9101 55.4580351 5266.681 58.72027249 5266.51  61.98250982
GR 5266.4173 65.24474722 5266.4436 68.50698456 5266.4751 71.76922189 5266.571 75.03145929 5266.6489 78.29369663
GR 5266.6416 81.55593401 5266.6262 84.81817137 5266.7347 88.08040875 5266.9284 91.34264609 5267.1579 94.60488349
GR 5267.3857 97.86712083 5267.4668 101.1293582 5267.6726 104.3915956 5268.0121 107.6538329 5268.3991 110.9160703
GR 5268.5761 114.1783077 5268.5657 117.4405451 5268.6957 120.7027824 5268.8469 123.9650198 5268.9963 127.2272571
GR 5269.2025 130.4894945 5269.4612 133.7517319 5269.7081 137.0139693 5269.8619 140.2762066 5269.9508 143.538444
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100-yr Existing EPA SWMM Input

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GR 5269.9784 146.8006814 5269.9312 150.0629188 5269.8792 153.3251561 5269.9092 156.5873935 5270.065 159.8496309
GR 5270.3005 163.1118683 5270.5428 166.3741056 5270.5811 169.636343 5270.4404 172.8985804 5270.3608 176.1608178
GR 5270.3965 179.4230552 5270.4822 182.6852925 5270.5394 185.9475299 5270.5352 189.2097673 5270.4171 192.4720047
GR 5270.3903 195.734242 5270.473 198.9964794 5270.5377 202.2587168 5270.6209 205.5209542 5270.6648 208.7831916
GR 5270.6818 212.0454289 5270.6577 215.3076663 5270.6614 218.5699037 5270.6984 221.8321411 5270.7133 225.0943785
GR 5270.8532 228.3566159 5271.1037 231.6188532 5271.3489 234.8810907 5271.4554 238.143328 5271.567 241.4055654
GR 5271.5812 244.6678028 5271.502 247.9300401
;
NC 0.03     0.03     0.03
X1 SB734_DSofPond    50       50       85       0.0      0.0      0.0      0.0      0.0
GR 5249.4693 0        5249.9427 3.26926290439 5250.2798 6.5385258001 5250.5535 9.80778873557 5250.6009 13.07705164
GR 5250.4566 16.3463145841 5250.2774 19.6155774885 5250.0217 22.884840424 5249.7052 26.1541033197 5249.3165 29.4233662604
GR 5248.9089 32.6926291474 5248.5024 35.961892109 5248.1205 39.2311550444 5247.7711 42.5004179851 5247.466 45.769680893
GR 5247.1182 49.0389438337 5246.8095 52.3082067692 5246.5671 55.5774697307 5246.3938 58.846732654 5246.2282 62.1159956069
GR 5246.1152 65.385258551 5245.998 68.6545214918 5245.8823 71.9237844757 5246.0759 75.1930474251 5246.3855 78.4623103606
GR 5246.6095 81.7315733134 5246.7585 85.0008362454 5246.9994 88.2700992467 5247.2175 91.5393621874 5247.391 94.80862518
GR 5247.4699 98.0778881208 5247.6004 101.347151113 5248.0121 104.616414037 5248.398 107.885677038 5248.722 111.154939987
GR 5249.0395 114.424202971 5249.1667 117.693465961 5248.9584 120.962728941 5248.7247 124.231991942 5248.6983 127.501254931
GR 5248.8518 130.770517912 5249.1283 134.039780913 5249.426 137.309043837 5249.7424 140.578306883 5250.0713 143.847569867
GR 5250.4067 147.116832865 5250.7438 150.386095854 5251.0802 153.655358826 5251.4159 156.924621836 5251.748 160.193884873
;
;General channel upstream of pond
NC 0.03     0.013    0.03
X1 SB736_USofPond    179      275      325      0.0      0.0      0.0      0.0      0.0
GR 5360.2478 0        5360.3696 3.26563796461 5360.4869 6.53127597328 5360.5982 9.79691400919 5360.7047 13.0625519826
GR 5360.8031 16.3281899913 5360.8978 19.5938280152 5360.9962 22.8594660479 5361.1098 26.1251040598 5361.2468 29.3907420925
GR 5361.3951 32.6563801164 5361.492 35.9220181491 5361.506 39.1876561609 5361.4395 42.4532941936 5361.3684 45.7189322175
GR 5361.2733 48.9845702623 5361.105 52.2502082861 5361.0244 55.5158463189 5361.0647 58.7814843548 5361.1188 62.0471224379
GR 5361.1552 65.3127604706 5361.106 68.5783985065 5361.0693 71.8440365657 5361.061 75.1096746224 5361.0631 78.3753126583
GR 5361.0754 81.6409507415 5361.1006 84.9065888215 5361.12  88.1722268694 5361.1029 91.4378649406 5361.0643 94.7035029973
GR 5361.0397 97.9691410685 5361.0528 101.234779116 5361.0103 104.500417212 5360.9393 107.766055295 5360.8648 111.031693399
GR 5360.7484 114.297331447 5360.5671 117.562969542 5360.2708 120.828607625 5359.8766 124.09424572 5359.4002 127.359883824
GR 5358.8138 130.625521907 5358.1167 133.891160003 5357.6407 137.15679811 5357.1904 140.422436205 5356.6664 143.6880743
GR 5356.1432 146.953712407 5355.7071 150.219350503 5355.3665 153.484988598 5355.0059 156.750626705 5354.835 160.016264835
GR 5354.8404 163.281902955 5354.9354 166.547541062 5355.0228 169.813179216 5355.1544 173.078817311 5355.2421 176.344455431
GR 5355.3773 179.610093573 5355.4916 182.875731692 5355.4123 186.141369847 5355.3405 189.407008001 5355.2742 192.672646121
GR 5355.2489 195.938284254 5355.2185 199.203922382 5355.1878 202.469560528 5355.1601 205.735198706 5355.1454 209.000836861
GR 5355.137 212.26647498 5355.1453 215.532113147 5355.1631 218.797751292 5355.1791 222.063389471 5355.1339 225.329027625
GR 5354.9671 228.594665795 5354.6267 231.860303949 5354.2901 235.125942128 5353.9047 238.391580282 5353.4827 241.657218452
GR 5353.0875 244.922856631 5352.7818 248.188494809 5352.4464 251.454132979 5352.2966 254.719771157 5352.3978 257.985409362
GR 5352.504 261.251047541 5352.5744 264.516685719 5352.6866 267.782323924 5352.6647 271.047962103 5352.6768 274.313600305
GR 5352.7275 277.579238522 5352.6988 280.844876701 5352.6169 284.11051493 5352.6357 287.376153135 5352.7566 290.641791313
GR 5353.2143 293.907429542 5353.9534 297.173067745 5354.7772 300.43870597 5355.3562 303.704344199 5355.8598 306.969982378
GR 5356.3137 310.235620607 5356.6831 313.501258836 5356.7683 316.766897086 5356.801 320.032535314 5356.8268 323.298173543
GR 5356.8443 326.563811781 5356.8586 329.829450022 5356.8655 333.095088251 5356.8725 336.360726489 5356.8795 339.62636473
GR 5356.8786 342.892002959 5356.8721 346.157641221 5356.885 349.423279462 5356.8273 352.688917691 5356.7085 355.954555979
GR 5356.6048 359.220194229 5356.5987 362.485832482 5356.5804 365.751470758 5356.5571 369.017109011 5356.6652 372.282747264
GR 5356.7182 375.54838554 5356.8757 378.814023829 5357.0938 382.079662078 5357.2753 385.345300391 5357.3765 388.610938632
GR 5357.4509 391.87657692 5357.542 395.142215185 5357.7014 398.407853473 5357.736 401.673491773 5357.8677 404.939130086
GR 5358.0386 408.204768351 5358.13  411.470406651 5358.1666 414.736044939 5358.0554 418.001683239 5357.9607 421.267321552
GR 5357.8719 424.532959852 5357.7889 427.798598164 5357.7077 431.064236465 5357.6359 434.329874765 5357.5793 437.595513077
GR 5357.5565 440.861151401 5357.3869 444.126789702 5357.0542 447.39242804 5356.7287 450.658066365 5356.3746 453.923704665
GR 5356.041 457.189343013 5355.9256 460.454981326 5355.955 463.720619685 5356.0048 466.986257985 5356.1334 470.251896348
GR 5356.3668 473.517534673 5356.6233 476.783173032 5356.8016 480.048811356 5356.9542 483.314449707 5357.1442 486.580088043
GR 5357.2944 489.845726403 5357.4492 493.111364754 5357.5849 496.377003102 5357.6427 499.642641462 5357.7913 502.908279836
GR 5357.718 506.173918196 5357.7237 509.439556579 5357.9167 512.705194916 5358.1275 515.970833291 5358.2668 519.23647165
GR 5358.2454 522.502110025 5358.2635 525.767748408 5358.3226 529.033386783 5358.4001 532.299025167 5358.5143 535.564663542
GR 5358.4051 538.83030196 5358.3057 542.095940335 5358.2224 545.361578719 5357.9927 548.627217094 5357.5234 551.892855477
GR 5357.0949 555.158493923 5356.8235 558.424132307 5356.8603 561.689770682 5357.0151 564.955409116 5357.2556 568.221047499
GR 5357.3988 571.486685907 5357.4512 574.752324341 5357.4715 578.017962716 5357.4845 581.28360115
;
;Generalized channel through subbasin 740
NC 0.03     0.013    0.03
X1 SB740             37       25       85       0.0      0.0      0.0      0.0      0.0
GR 5356.0691 0        5356.1988 3.26243406077 5356.2325 6.52486811758 5356.2622 9.78730220709 5356.169 13.0497362976
GR 5355.8802 16.3121703831 5355.3753 19.5746044439 5354.5055 22.8370385483 5353.5773 26.0994726388 5353.2206 29.3619067253
GR 5353.7177 32.6243408149 5354.4008 35.8867749054 5354.8073 39.1492089949 5354.8657 42.4116431141 5354.8524 45.6740772046
GR 5354.9347 48.936511309 5354.9562 52.1989453995 5354.8832 55.4613795158 5354.775 58.7238136093 5354.7218 61.9862477285
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100-yr Existing EPA SWMM Input

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GR 5354.6726 65.2486818637 5354.3877 68.5111159532 5353.9306 71.7735500734 5353.7236 75.0359842075 5353.7078 78.2984183278
GR 5354.5876 81.560852447 5355.6807 84.8232865811 5356.6211 88.0857207053 5357.2043 91.3481548246 5357.5681 94.6105889587
GR 5357.7738 97.8730230829 5357.892 101.135457232 5358.0295 104.397891366 5357.9168 107.66032552 5357.9738 110.922759654
GR 5358.2772 114.185193803 5358.6228 117.447627942
;
;Generalized Channel through subbasin
NC 0.04     0.04     0.04
X1 SB741              148      90       110      0.0      0.0      0.0      0.0      0.0
GR 5399.2001 0        5399.1976 3.26062038605 5399.1882 6.52124076127 5399.1788 9.78186115815 5399.1689 13.0424815851
GR 5399.1594 16.3031019604 5399.1483 19.5637223681 5399.135 22.8243427433 5399.117 26.0849631709 5399.0758 29.3455835569
GR 5398.9845 32.6062039538 5398.8041 35.8668243916 5398.6486 39.1274447777 5398.505 42.3880652053 5398.465 45.648685613
GR 5398.5302 48.9093060508 5398.6471 52.1699264886 5398.7448 55.4305468747 5398.7525 58.6911673022 5398.588 61.9517877509
GR 5398.3567 65.2124081785 5398.1307 68.4730286271 5397.9393 71.733649065 5397.7503 74.9942695034 5397.6945 78.2548899002
GR 5397.6655 81.5155103898 5397.6132 84.7761308174 5397.6216 88.0367512661 5397.5594 91.2973717153 5397.5806 94.557992164
GR 5397.639 97.8186126018 5397.6109 101.079233062 5397.5955 104.33985353 5397.6209 107.600473979 5397.552 110.861094428
GR 5397.4033 114.121714918 5397.3856 117.382335356 5397.3944 120.642955857 5397.4925 123.903576317 5397.5031 127.164196806
GR 5397.5474 130.424817256 5397.5747 133.685437757 5397.6133 136.946058246 5397.6482 140.206678695 5397.7003 143.467299196
GR 5397.7022 146.727919697 5397.6065 149.988540198 5397.5506 153.249160677 5397.5268 156.509781178 5397.5447 159.770401679
GR 5397.563 163.03102218 5397.5613 166.291642681 5397.5669 169.552263171 5397.6137 172.812883682 5397.6507 176.073504183
GR 5397.7134 179.334124725 5397.7844 182.594745237 5397.8334 185.855365738 5397.8978 189.115986239 5397.9181 192.376606781
GR 5397.9017 195.637227282 5397.8686 198.897847835 5397.8079 202.158468336 5397.775 205.419088899 5397.839 208.6797094
GR 5397.8775 211.940329942 5397.9398 215.200950464 5398.0143 218.461570996 5398.0714 221.72219156 5398.1077 224.982812082
GR 5398.1018 228.243432624 5398.1711 231.504053188 5398.2658 234.764673752 5398.2893 238.025294294 5398.3458 241.285914846
GR 5398.3286 244.54653541 5398.4063 247.807155963 5398.5239 251.067776527 5398.6317 254.328397091 5398.6145 257.589017654
GR 5398.4926 260.849638249 5398.4049 264.110258812 5398.3213 267.370879376 5398.2551 270.631499939 5398.2336 273.892120534
GR 5398.2686 277.152741097 5398.2863 280.413361702 5398.2991 283.673982255 5398.3898 286.934602881 5398.4131 290.195223445
GR 5398.4793 293.455844039 5398.5408 296.716464666 5398.5232 299.977085229 5398.584 303.237705824 5398.672 306.49832644
GR 5398.7494 309.758947025 5398.7821 313.019567629 5398.801 316.280188245 5398.8387 319.540808861 5398.833 322.801429477
GR 5398.8537 326.062050081 5398.9067 329.278567166 5398.9548 332.49508424 5398.9743 335.711601314 5399.0805 338.92811841
GR 5399.1277 342.144635483 5399.1323 345.361152568 5399.1246 348.577669642 5399.1525 351.794186738 5399.1407 355.010703812
GR 5399.1923 358.227220937 5399.3586 361.443738033 5399.3371 364.660255118 5399.2931 367.876772254 5399.315 371.093289328
GR 5399.3802 374.309806424 5399.3882 377.52632355 5399.4571 380.742840645 5399.6015 383.95935777 5399.66  387.175874906
GR 5399.7267 390.392392002 5399.8507 393.608909128 5400.006 396.825426224 5400.0785 400.04194336 5400.0851 403.258460496
GR 5400.1099 406.474977621 5400.1951 409.691494717 5400.2505 412.908011883 5400.1943 416.124529001 5400.0567 419.341046137
GR 5400.0485 422.557563273 5400.107 425.774080421 5400.1748 428.990597587 5400.2431 432.207114705 5400.3126 435.423631881
GR 5400.3673 438.640149029 5400.4246 441.856666165 5400.5229 445.073183323 5400.5604 448.289700511 5400.6308 451.506217636
GR 5400.7759 454.722734794 5401.1445 457.939251982 5401.4577 461.15576914 5401.7241 464.372286328 5401.8744 467.588803475
GR 5401.9471 470.805320663 5402.0058 474.021837821 5401.9966 477.238355009
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NC 0.05     0.05     0.07
X1 SB752_Northswale  52       70       85       0.0      0.0      0.0      0.0      0.0
GR 5362.1561 0        5362.3598 3.24405059921 5362.5506 6.4881012282 5362.4759 9.732151826 5362.4112 12.976202455
GR 5362.4598 16.220253084 5362.5597 19.4643036962 5362.1819 22.7083543252 5361.739 25.9524049542 5361.3541 29.1964555818
GR 5361.0025 32.4405062108 5360.6298 35.6845568398 5360.2522 38.9286074688 5360.0222 42.1726580959 5359.9732 45.4167087547
GR 5360.0518 48.6607593967 5360.3445 51.9048100257 5360.6132 55.148860683 5360.4539 58.392911312 5359.9569 61.6369619708
GR 5358.9289 64.8810126277 5357.5278 68.1250632846 5356.6347 71.3691139583 5356.4329 74.6131646157 5356.8154 77.8572152744
GR 5357.5429 81.1012659313 5358.2342 84.345316605 5358.6071 87.5893672619 5358.8223 90.8334179207 5359.0989 94.0774686079
GR 5359.4261 97.3215192797 5359.6156 100.565569968 5359.7174 103.809620655 5359.7994 107.053671327 5359.88  110.297722014
GR 5360.0004 113.541772702 5360.1033 116.785823375 5360.1129 120.029874093 5360.1446 123.273924765 5360.2454 126.517975481
GR 5360.3604 129.762026154 5360.541 133.00607687 5360.8093 136.250127574 5361.1786 139.494178291 5361.6318 142.738228992
GR 5362.0852 145.982279694 5362.6291 149.226330411 5363.4032 152.470381112 5364.4156 155.714431829 5365.4558 158.958482562
GR 5366.3164 162.202533262 5367.1158 165.44658401
;
;General cross section for agricultural areas where there isn't a clear channel, cut from LiDAR data
NC 0.035    0.035    0.035
X1 Standard_Agricultural  201      250      350      0.0      0.0      0.0      0.0      0.0
GR 5081.1285 0        5081.0541 3.27698142356 5080.8993 6.55396287247 5080.88  9.83094429603 5081.0212 13.1079257196
GR 5081.1717 16.3849072097 5081.0741 19.6618886527 5081.0862 22.9388700763 5081.0738 26.2158515115 5081.0997 29.4928329899
GR 5081.0267 32.7698144272 5080.904 36.0467959056 5080.7771 39.323777335 5080.7004 42.6007587586 5080.6833 45.877740237
GR 5080.5447 49.1547217154 5080.417 52.4317031527 5080.354 55.708684629 5080.4052 58.9856661074 5080.262 62.2626475447
GR 5080.1578 65.5396290231 5080.1335 68.8166104957 5080.1576 72.0935919742 5080.0909 75.3705734526 5079.9975 78.647554931
GR 5079.9791 81.9245363546 5079.9376 85.201517833 5079.8431 88.4784993114 5079.8039 91.7554807898 5079.8682 95.0324622978
GR 5079.8853 98.3094437762 5079.9033 101.586425255 5079.896 104.863406721 5079.9187 108.1403882 5079.8343 111.417369678
GR 5079.7559 114.6943512 5079.7722 117.971332678 5079.7993 121.248314145 5079.7286 124.525295665 5079.6577 127.802277143
GR 5079.598 131.07925861 5079.682 134.356240143 5079.7075 137.633221651 5079.6844 140.910203118 5079.5992 144.187184651
GR 5079.5438 147.464166118 5079.4688 150.741147637 5079.4611 154.018129159 5079.519 157.295110681 5079.5439 160.572092148
GR 5079.5044 163.849073655 5079.4534 167.126055183 5079.4315 170.403036691 5079.3864 173.680018158 5079.4686 176.956999679
GR 5079.4526 180.233981199 5079.4206 183.510962775 5079.4047 186.787944242 5079.4367 190.06492575 5079.4672 193.341907313
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100-yr Existing EPA SWMM Input

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GR 5079.5641 213.003796439 5079.4652 216.280778016 5079.3871 219.557759529 5079.3449 222.834741039 5079.3729 226.111722602
GR 5079.377 229.38870411 5079.3507 232.665685686 5079.3205 235.942667189 5079.3352 239.21964874 5079.3315 242.496630316
GR 5079.2876 245.773611813 5079.2077 249.050593375 5079.3408 252.327574946 5079.3738 255.604556442 5079.3005 258.881538005
GR 5079.3243 262.15851957 5079.3749 265.435501127 5079.3667 268.71248269 5079.3359 271.989464241 5079.3468 275.266445792
GR 5079.2982 278.543427349 5079.3518 281.820408914 5079.4369 285.097390477 5079.3904 288.374372028 5079.4637 291.651353585
GR 5079.4808 294.928335191 5079.3077 298.205316742 5079.3312 301.482298287 5079.4635 304.759279852 5079.4608 308.036261456
GR 5079.4226 311.313243015 5079.3866 314.590224607 5079.3505 317.867206172 5079.3691 321.144187729 5079.3334 324.421169335
GR 5079.3405 327.698150928 5079.3221 330.975132487 5079.2519 334.252114079 5079.3043 337.529095644 5079.3592 340.80607723
GR 5079.3296 344.083058836 5079.3138 347.360040382 5079.3491 350.637021988 5079.4156 353.914003588 5079.4225 357.190985194
GR 5079.4167 360.467966788 5079.4043 363.744948375 5079.485 367.021929981 5079.553 370.298911587 5079.4795 373.575893175
GR 5079.4401 376.852874781 5079.4483 380.129856368 5079.3819 383.406837974 5079.3802 386.683819562 5079.4695 389.96080121
GR 5079.4264 393.23778281 5079.3111 396.514764404 5079.3577 399.791746004 5079.3903 403.06872764 5079.3455 406.34570924
GR 5079.4682 409.622690876 5079.5128 412.899672476 5079.5542 416.176654125 5079.5395 419.453635711 5079.3924 422.730617306
GR 5079.3338 426.007598949 5079.39  429.284580596 5079.474 432.56156224 5079.5466 435.83854382 5079.6383 439.115525464
GR 5079.6464 442.392507111 5079.6548 445.669488754 5079.6034 448.946470341 5079.6787 452.22345199 5079.737 455.50043362
GR 5079.7834 458.777415257 5079.8056 462.054396899 5079.8411 465.331378529 5079.8579 468.608360178 5079.8013 471.885341807
GR 5079.7642 475.162323457 5079.8066 478.439305086 5079.8632 481.716286783 5079.9755 484.99326842 5080.1313 488.27025005
GR 5080.1641 491.547231685 5080.1266 494.82421337 5079.9736 498.101195013 5079.9588 501.378176643 5079.8955 504.655158322
GR 5079.9754 507.932139965 5080.0727 511.209121656 5080.1322 514.486103285 5080.1706 517.763084958 5080.2757 521.040066643
GR 5080.3794 524.317048292 5080.449 527.594029965 5080.4997 530.87101165 5080.534 534.147993273 5080.5652 537.424974958
GR 5080.5945 540.701956643 5080.6348 543.978938327 5080.6379 547.255920006 5080.585 550.532901679 5080.5303 553.809883363
GR 5080.5924 557.086865036 5080.676 560.363846715 5080.7375 563.6408284 5080.7386 566.917810073 5080.7177 570.194791757
GR 5080.7492 573.471773436 5080.7503 576.748755123 5080.7703 580.025736807 5080.8473 583.302718521 5080.9586 586.579700194
GR 5081.0289 589.856681873 5081.0606 593.133663601 5080.9918 596.410645274 5081.0248 599.687627013 5081.0208 602.964608686
GR 5081.0989 606.241590406 5081.0638 609.518572079 5081.2008 612.795553806 5081.2868 616.072535479 5081.2848 619.349517207
GR 5081.3032 622.626498921 5081.3411 625.903480594 5081.3884 629.180462322 5081.4396 632.457444044 5081.4468 635.734425758
GR 5081.5313 639.011407431 5081.6015 642.288389214 5081.5393 645.565370887 5081.5517 648.842352601 5081.5283 652.119334317
GR 5081.599 655.396316031
;
;General street overflow conditions
NC 0.05     0.05     0.02
X1 StreetOverflow    62       110      170      0.0      0.0      0.0      0.0      0.0
GR 5253.1448 0        5253.1126 3.26128501663 5253.0992 6.52257004061 5253.1306 9.78385505724 5253.1822 13.0451400788
GR 5253.229 16.3064251003 5253.2924 19.5677101169 5253.4945 22.828995136 5253.6823 26.0902801576 5253.7708 29.3515651742
GR 5253.8006 32.6128502545 5253.7882 35.8741352711 5253.7527 39.1354202902 5253.7189 42.3967053069 5253.6922 45.6579903676
GR 5253.6729 48.9192753989 5253.6635 52.1805604155 5253.6646 55.4418454763 5253.6741 58.7031304929 5253.6921 61.9644155095
GR 5253.7149 65.225700585 5253.7389 68.4869856016 5253.7597 71.7482706574 5253.7669 75.0095557353 5253.7508 78.2708407495
GR 5253.7172 81.53212582 5253.678 84.7934108366 5253.6395 88.0546958925 5253.5608 91.3159809679 5253.3517 94.5772659796
GR 5253.0171 97.8385510501 5252.5919 101.099836106 5252.1756 104.361121181 5251.6534 107.622406252 5251.1312 110.883691264
GR 5250.6963 114.144976319 5250.3721 117.40626139 5249.9944 120.667546458 5249.6679 123.928831514 5249.4379 127.190116584
GR 5249.4374 130.451401635 5249.5355 133.712686706 5249.5619 136.973971772 5249.6299 140.235256825 5249.736 143.496541895
GR 5249.8459 146.757826966 5249.8116 150.019112017 5249.6926 153.280397129 5249.6124 156.541682195 5249.566 159.80296726
GR 5249.5844 163.064252311 5249.6577 166.325537438 5249.8281 169.586822489 5250.0745 172.848107613 5250.2926 176.109392662
GR 5250.6011 179.370677728 5250.8872 182.631962837 5251.1727 185.8932479 5251.4369 189.15453301 5251.6128 192.415818073
GR 5251.6839 195.677103183 5251.6863 198.938388227
;
NC 0.035    0.035    0.02
X1 StreetOverflow_Extend  294      120      160      0.0      0.0      0.0      0.0      0.0
GR 5088.5654 0        5088.5722 3.2708707854 5088.5921 6.54174163028 5088.5316 9.81261241568 5088.5197 13.083483201
GR 5088.5302 16.3543540458 5088.5275 19.625224831 5088.5333 22.8960956163 5088.5028 26.166966461 5088.4852 29.4378372463
GR 5088.488 32.708708091 5088.5092 35.9795788761 5088.4974 39.2504496614 5088.4443 42.521320506 5088.4501 45.7921912912
GR 5088.3839 49.0630621212 5088.3475 52.3339329211 5088.3585 55.6048037509 5088.3317 58.8756745358 5088.2954 62.1465453804
GR 5088.2592 65.4174161654 5088.2234 68.6882870101 5088.2444 71.9591578547 5088.2479 75.2300286396 5088.2327 78.5008994843
GR 5088.2092 81.7717703289 5088.1726 85.042641114 5088.238 88.3135119435 5088.197 91.5843827431 5088.1642 94.8552535729
GR 5088.1481 98.1261244173 5088.1532 101.396995202 5088.0907 104.667866046 5088.0949 107.938736891 5088.0068 111.209607736
GR 5087.9586 114.480478565 5087.9053 117.75134935 5087.9244 121.022220194 5087.8556 124.293091038 5087.8502 127.563961883
GR 5087.8614 130.834832712 5087.8503 134.105703557 5087.8721 137.376574341 5087.8673 140.647445186 5087.8247 143.91831603
GR 5087.7862 147.189186874 5087.764 150.460057703 5087.7194 153.730928548 5087.6686 157.001799392 5087.6961 160.272670236
GR 5087.7172 163.543541065 5087.6191 166.814411909 5087.639 170.085282754 5087.6453 173.356153598 5087.6499 176.627024427
GR 5087.6365 179.897895271 5087.5424 183.168766115 5087.5115 186.439636959 5087.477 189.710507788 5087.4634 192.981378632
GR 5087.5163 196.252249536 5087.4856 199.523120365 5087.3432 202.793991209 5087.2989 206.064862053 5087.2979 209.335732897
GR 5087.4013 212.606603786 5087.3951 215.877474629 5087.3433 219.148345473 5087.3382 222.419216302 5087.3553 225.690087206
GR 5087.2888 228.960958035 5087.3336 232.231828879 5087.3537 235.502699723 5087.2904 238.773570611 5087.2249 242.044441455
GR 5087.1648 245.315312299 5087.2028 248.586183187 5087.2172 251.857054031 5087.2235 255.127924919 5087.2047 258.398795763
GR 5087.2129 261.669666607 5087.1696 264.940537495 5087.1696 268.211408339 5087.1884 271.482279227 5087.1586 274.753150071
GR 5087.105 278.024020959 5087.0724 281.294891803 5087.0432 284.565762706 5087.0028 287.836633535 5087.0819 291.107504438
GR 5087.0294 294.378375266 5087.0563 297.649246169 5087.0449 300.920117013 5087.0592 304.190987901 5086.9508 307.461858789
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100-yr Existing EPA SWMM Input

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GR 5086.8536 343.44143841 5086.8348 346.712309298 5086.8905 349.9831802 5086.8686 353.254051088 5086.7701 356.524921976
GR 5086.692 359.79579282 5086.7439 363.066663722 5086.8345 366.33753461 5086.8085 369.608405498 5086.7738 372.879276401
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GR 5086.69  392.504501698 5086.6519 395.775372646 5086.5962 399.046243548 5086.5969 402.317114436 5086.5784 405.587985324
GR 5086.5335 408.858856226 5086.4534 412.129727114 5086.4668 415.400598017 5086.5176 418.671468904 5086.4776 421.942339792
GR 5086.4401 425.213210695 5086.5488 428.484081582 5086.4735 431.75495247 5086.4415 435.025823417 5086.39  438.29669432
GR 5086.3609 441.567565207 5086.31  444.838436095 5086.3864 448.109306997 5086.3856 451.380177944 5086.4081 454.651048832
GR 5086.3817 457.921919734 5086.3332 461.192790681 5086.3109 464.463661569 5086.2948 467.734532456 5086.2793 471.005403358
GR 5086.2546 474.276274305 5086.2589 477.547145193 5086.2517 480.81801608 5086.2188 484.088887027 5086.2342 487.359757929
GR 5086.2504 490.630628817 5086.2079 493.901499764 5086.1889 497.172370651 5086.2105 500.443241598 5086.1608 503.7141125
GR 5086.1621 506.984983447 5086.1663 510.255854334 5086.1523 513.526725281 5086.1066 516.797596183 5086.1172 520.06846713
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GR 5086.0483 539.693692646 5086.0127 542.964563593 5086.0485 546.23543454 5086.0269 549.506305427 5085.9776 552.777176374
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GR 5085.9685 588.756756622 5085.9093 592.027627568 5085.9194 595.298498514 5085.9093 598.569369461 5085.8833 601.840240407
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GR 5085.8054 621.465466026 5085.8074 624.736336972 5085.7599 628.007207918 5085.7585 631.278078865 5085.8009 634.548949811
GR 5085.7834 637.819820757 5085.7333 641.090691703 5085.7524 644.36156265 5085.723 647.632433656 5085.7074 650.903304602
GR 5085.6943 654.174175548 5085.661 657.445046494 5085.6977 660.71591744 5085.7391 663.986788386 5085.7261 667.257659332
GR 5085.7079 670.528530278 5085.7038 673.799401224 5085.6956 677.070272215 5085.6726 680.341143161 5085.6362 683.612014107
GR 5085.6067 686.882885053 5085.6075 690.153756059 5085.5958 693.424627005 5085.567 696.695497951 5085.574 699.966368941
GR 5085.5596 703.237239887 5085.5141 706.508110833 5085.476 709.778981779 5085.4466 713.049852785 5085.4668 716.320723731
GR 5085.4443 719.591594721 5085.4271 722.862465667 5085.4648 726.133336613 5085.4715 729.404207618 5085.44  732.675078564
GR 5085.39  735.945949569 5085.345 739.216820515 5085.3166 742.487691506 5085.3059 745.758562451 5085.3022 749.029433457
GR 5085.282 752.300304402 5085.2781 755.571175393 5085.2861 758.842046338 5085.2654 762.112917344 5085.2181 765.383788349
GR 5085.2308 768.654659295 5085.2501 771.925530285 5085.215 775.19640123 5085.2085 778.467272236 5085.1937 781.738143181
GR 5085.1499 785.009014172 5085.1497 788.279885177 5085.1621 791.550756167 5085.1412 794.821627112 5085.1503 798.092498117
GR 5085.1588 801.363369123 5085.1392 804.634240068 5085.1149 807.905111058 5085.1003 811.175982063 5085.1181 814.446853053
GR 5085.1409 817.717723999 5085.1679 820.988595004 5085.1946 824.259466009 5085.2251 827.530336999 5085.2561 830.801208004
GR 5085.3045 834.072078994 5085.3587 837.342949999 5085.3877 840.613821003 5085.4285 843.884691949 5085.4603 847.155562939
GR 5085.4888 850.426433943 5085.5369 853.697304933 5085.5774 856.968175938 5085.6131 860.239046943 5085.6681 863.509917933
GR 5085.7503 866.780788938 5085.8124 870.051659927 5085.8175 873.322530932 5085.8217 876.593401937 5085.8602 879.864272927
GR 5085.9055 883.135143976 5085.9509 886.406014981 5086.0359 889.676885986 5086.1142 892.947756975 5086.159 896.21862798
GR 5086.1944 899.489498969 5086.2171 902.760369974 5086.2599 906.031240979 5086.3362 909.302111968 5086.3817 912.572983018
GR 5086.4094 915.843854022 5086.4223 919.114725027 5086.4187 922.385596016 5086.4573 925.656467066 5086.5464 928.92733807
GR 5086.5808 932.198209075 5086.5795 935.469080123 5086.6014 938.739951113 5086.6599 942.010822118 5086.6843 945.281693167
GR 5086.6578 948.552564171 5086.5869 951.823435161 5086.5123 955.094306224 5086.4504 958.365177214
;
NC 0.03     0.013    0.03
X1 SB736_DSofPond    52       100      150      0.0      0.0      0.0      0.0      0.0
GR 5362.1561 0        5362.3598 3.24405059921 5362.5506 6.4881012282 5362.4759 9.732151826 5362.4112 12.976202455
GR 5362.4598 16.220253084 5362.5597 19.4643036962 5362.1819 22.7083543252 5361.739 25.9524049542 5361.3541 29.1964555818
GR 5361.0025 32.4405062108 5360.6298 35.6845568398 5360.2522 38.9286074688 5360.0222 42.1726580959 5359.9732 45.4167087547
GR 5360.0518 48.6607593967 5360.3445 51.9048100257 5360.6132 55.148860683 5360.4539 58.392911312 5359.9569 61.6369619708
GR 5358.9289 64.8810126277 5357.5278 68.1250632846 5356.6347 71.3691139583 5356.4329 74.6131646157 5356.8154 77.8572152744
GR 5357.5429 81.1012659313 5358.2342 84.345316605 5358.6071 87.5893672619 5358.8223 90.8334179207 5359.0989 94.0774686079
GR 5359.4261 97.3215192797 5359.6156 100.565569968 5359.7174 103.809620655 5359.7994 107.053671327 5359.88  110.297722014
GR 5360.0004 113.541772702 5360.1033 116.785823375 5360.1129 120.029874093 5360.1446 123.273924765 5360.2454 126.517975481
GR 5360.3604 129.762026154 5360.541 133.00607687 5360.8093 136.250127574 5361.1786 139.494178291 5361.6318 142.738228992
GR 5362.0852 145.982279694 5362.6291 149.226330411 5363.4032 152.470381112 5364.4156 155.714431829 5365.4558 158.958482562
GR 5366.3164 162.202533262 5367.1158 165.44658401

[LOSSES]
;;Link           Kentry     Kexit      Kavg       Flap Gate  Seepage
;;-------------- ---------- ---------- ---------- ---------- ----------
CH_27            0.5        0          0          NO         0
CU_01            0.9        0          0          NO         0
CU_02            0.5        0          0          NO         0
CU_04            0.5        0          0          NO         0
CU_05            0.5        0          0          NO         0
CU_06            0.5        0          0          NO         0
CU_07            0.5        0          0          NO         0
CU_08            0.5        0          0          NO         0
CU_09            0.5        0          0          NO         0
CU_10            0.5        0          0          NO         0
```

100-yr Existing EPA SWMM Input

```
CU_11            0.5        0          0          NO         0
CU_12            0.5        0          0          NO         0
CU_13            0.5        0          0          NO         0
CU_15            0.5        0          0          NO         0
CU_20            0.5        0          0          NO         0
CU_21            0.5        0          0          NO         0
CU_32            0.5        0          0          NO         0
CU_33            0.5        0          0          NO         0
CU_34            0.5        0          0          NO         0
CU_35            0.5        0          0          NO         0
CU_38            0.5        0          0          NO         0

[CURVES]
;;Name           Type       X-Value    Y-Value
;;-------------- ---------- ---------- ----------
;Diversion Curve - Inflow for all storm events from SWMM and outflow determined using HEC-RAS 2D Model
Node180DiversionCurve Diversion  0          0
Node180DiversionCurve            1          0
Node180DiversionCurve            4          0
Node180DiversionCurve            119        13
Node180DiversionCurve            254        31
Node180DiversionCurve            446        51
Node180DiversionCurve            891        114
;
;Diversion Curve - Inflow for all storm events from SWMM and outflow determined using HEC-RAS 2D Model
Node181DiversionCurve Diversion  2          0
Node181DiversionCurve            3          0
Node181DiversionCurve            9          0
Node181DiversionCurve            148        13
Node181DiversionCurve            309        42
Node181DiversionCurve            538        140
Node181DiversionCurve            1064       403
;
;Diversion Curve - Inflow for all storm events from SWMM and outflow determined using HEC-RAS 2D Model
Node182DiversionCurve Diversion  2          0
Node182DiversionCurve            3          0
Node182DiversionCurve            10         1
Node182DiversionCurve            182        60
Node182DiversionCurve            401        173
Node182DiversionCurve            772        431
Node182DiversionCurve            1682       1152
;
;Diversion Curve - Inflow for all storm events from SWMM and outflow determined using HEC-RAS 2D Model
Node183DiversionCurve Diversion  41         37
Node183DiversionCurve            110        100
Node183DiversionCurve            191        169
Node183DiversionCurve            1164       971
Node183DiversionCurve            2094       1704
Node183DiversionCurve            3512       2787
Node183DiversionCurve            6886       5303
;
RATING_CURVE_1025 Rating     0          0
RATING_CURVE_1025            1          0
RATING_CURVE_1025            2          0
RATING_CURVE_1025            3          0
RATING_CURVE_1025            4          0
RATING_CURVE_1025            5          0
RATING_CURVE_1025            6          57.88
RATING_CURVE_1025            7          63.76
RATING_CURVE_1025            8          69.13
RATING_CURVE_1025            9          74.12
;
RATING_CURVE_1026 Rating     0          31.12
RATING_CURVE_1026            1          43.57
RATING_CURVE_1026            2          56.02
RATING_CURVE_1026            3          76.32
RATING_CURVE_1026            4          100.32
RATING_CURVE_1026            4.5        112.32
```

100-yr Existing EPA SWMM Input

```
RATING_CURVE_1026            5          160
RATING_CURVE_1026            6          480
RATING_CURVE_1026            6.14       536
;
;ORIFICE FLOW Rating Curve for Flatiron Meadows Regional Detention Factility As-Built Drawings
RATING_CURVE_312_LOW Rating     0          0.0
RATING_CURVE_312_LOW            0.5        0.3
RATING_CURVE_312_LOW            1.0        0.7
RATING_CURVE_312_LOW            1.5        1.2
RATING_CURVE_312_LOW            2.0        1.8
RATING_CURVE_312_LOW            2.5        2.5
RATING_CURVE_312_LOW            3.0        3.2
RATING_CURVE_312_LOW            3.5        4.0
RATING_CURVE_312_LOW            4.0        4.8
RATING_CURVE_312_LOW            4.5        5.7
RATING_CURVE_312_LOW            5.0        6.6
RATING_CURVE_312_LOW            5.5        7.3
RATING_CURVE_312_LOW            6.0        8.0
RATING_CURVE_312_LOW            6.5        8.5
RATING_CURVE_312_LOW            7.0        9.1
RATING_CURVE_312_LOW            7.5        9.5
RATING_CURVE_312_LOW            8.0        9.5
RATING_CURVE_312_LOW            8.5        9.5
RATING_CURVE_312_LOW            9.0        9.5
RATING_CURVE_312_LOW            9.5        9.5
;
;WEIR FLOW Rating Curve for Flatiron Meadows Regional Detention Factility As-Built Drawings
RATING_CURVE_312_HIGH Rating     0          0
RATING_CURVE_312_HIGH            0.5        0
RATING_CURVE_312_HIGH            1.0        0
RATING_CURVE_312_HIGH            1.5        0
RATING_CURVE_312_HIGH            2.0        0
RATING_CURVE_312_HIGH            2.5        0
RATING_CURVE_312_HIGH            3.0        0
RATING_CURVE_312_HIGH            3.5        0
RATING_CURVE_312_HIGH            4.0        0
RATING_CURVE_312_HIGH            4.5        0
RATING_CURVE_312_HIGH            5.0        0
RATING_CURVE_312_HIGH            5.5        39
RATING_CURVE_312_HIGH            6.0        266
RATING_CURVE_312_HIGH            6.5        618
RATING_CURVE_312_HIGH            7.0        1076
RATING_CURVE_312_HIGH            7.5        1635
RATING_CURVE_312_HIGH            8.0        3830
RATING_CURVE_312_HIGH            8.5        6080
RATING_CURVE_312_HIGH            9.0        7967
RATING_CURVE_312_HIGH            9.5        9651
;
;Rating curve developed in HydroCAD based on details from Indian Peaks Filing 17 design drawings.
RATING_CURVE_02_LOW Rating     0.00       0
RATING_CURVE_02_LOW            0.30       0.14
RATING_CURVE_02_LOW            0.60       0.36
RATING_CURVE_02_LOW            0.90       0.59
RATING_CURVE_02_LOW            1.20       0.74
RATING_CURVE_02_LOW            1.50       4.39
RATING_CURVE_02_LOW            1.80       9.67
RATING_CURVE_02_LOW            2.10       11.48
RATING_CURVE_02_LOW            2.40       12.24
RATING_CURVE_02_LOW            2.70       13.81
RATING_CURVE_02_LOW            3.00       15.21
RATING_CURVE_02_LOW            3.30       16.5
RATING_CURVE_02_LOW            3.60       17.7
RATING_CURVE_02_LOW            3.90       18.81
RATING_CURVE_02_LOW            4.20       19.87
RATING_CURVE_02_LOW            4.50       20.87
RATING_CURVE_02_LOW            4.80       21.83
RATING_CURVE_02_LOW            5.10       22.74
RATING_CURVE_02_LOW            5.40       23.63
```

100-yr Existing EPA SWMM Input

```
RATING_CURVE_02_LOW            5.70       24.47
RATING_CURVE_02_LOW            6.00       25.3
RATING_CURVE_02_LOW            6.30       26.09
RATING_CURVE_02_LOW            6.60       26.86
RATING_CURVE_02_LOW            6.90       27.61
RATING_CURVE_02_LOW            7.20       28.34
RATING_CURVE_02_LOW            7.50       29.05
RATING_CURVE_02_LOW            7.80       29.75
RATING_CURVE_02_LOW            8.10       30.43
RATING_CURVE_02_LOW            8.40       31.09
RATING_CURVE_02_LOW            8.70       31.74
RATING_CURVE_02_LOW            9.00       32.38
RATING_CURVE_02_LOW            9.30       33
RATING_CURVE_02_LOW            9.60       33.61
RATING_CURVE_02_LOW            9.90       34.22
RATING_CURVE_02_LOW            10.20      34.81
RATING_CURVE_02_LOW            10.50      35.39
RATING_CURVE_02_LOW            10.80      35.96
RATING_CURVE_02_LOW            11.10      36.53
RATING_CURVE_02_LOW            11.40      37.08
RATING_CURVE_02_LOW            11.70      37.63
RATING_CURVE_02_LOW            12.00      38.17
RATING_CURVE_02_LOW            12.30      38.7
;
;Rating curve for pond spillway shown in Indian Peaks Filing 17 design drawing. Rating curve was developed using HydroCAD.
RATING_CURVE_02_HIGH Rating     0.00       0
RATING_CURVE_02_HIGH            0.30       0
RATING_CURVE_02_HIGH            0.60       0
RATING_CURVE_02_HIGH            0.90       0
RATING_CURVE_02_HIGH            1.20       0
RATING_CURVE_02_HIGH            1.50       0
RATING_CURVE_02_HIGH            1.80       0
RATING_CURVE_02_HIGH            2.10       0
RATING_CURVE_02_HIGH            2.40       0
RATING_CURVE_02_HIGH            2.70       0
RATING_CURVE_02_HIGH            3.00       0
RATING_CURVE_02_HIGH            3.30       0
RATING_CURVE_02_HIGH            3.60       0
RATING_CURVE_02_HIGH            3.90       0
RATING_CURVE_02_HIGH            4.20       0
RATING_CURVE_02_HIGH            4.50       0
RATING_CURVE_02_HIGH            4.80       0
RATING_CURVE_02_HIGH            5.10       0
RATING_CURVE_02_HIGH            5.40       0
RATING_CURVE_02_HIGH            5.70       0
RATING_CURVE_02_HIGH            6.00       0
RATING_CURVE_02_HIGH            6.30       0
RATING_CURVE_02_HIGH            6.60       0
RATING_CURVE_02_HIGH            6.90       0
RATING_CURVE_02_HIGH            7.20       0
RATING_CURVE_02_HIGH            7.50       0
RATING_CURVE_02_HIGH            7.80       0
RATING_CURVE_02_HIGH            8.10       0
RATING_CURVE_02_HIGH            8.40       0
RATING_CURVE_02_HIGH            8.70       0
RATING_CURVE_02_HIGH            9.00       28.29
RATING_CURVE_02_HIGH            9.30       112.64
RATING_CURVE_02_HIGH            9.60       222.91
RATING_CURVE_02_HIGH            9.90       358.72
RATING_CURVE_02_HIGH            10.20      516.03
RATING_CURVE_02_HIGH            10.50      687.88
RATING_CURVE_02_HIGH            10.80      877.77
RATING_CURVE_02_HIGH            11.10      1082.5
RATING_CURVE_02_HIGH            11.40      1301.06
RATING_CURVE_02_HIGH            11.70      1532.62
RATING_CURVE_02_HIGH            12.00      1776.49
RATING_CURVE_02_HIGH            12.30      2032.08
;
```

100-yr Existing EPA SWMM Input

```
STORAGE_CURVE_1025 Storage    0          6277
STORAGE_CURVE_1025            1          7793
STORAGE_CURVE_1025            2          9399
STORAGE_CURVE_1025            3          11079
STORAGE_CURVE_1025            4          12865
STORAGE_CURVE_1025            5          45167
STORAGE_CURVE_1025            6          80281
STORAGE_CURVE_1025            7          101450
STORAGE_CURVE_1025            8          122841
STORAGE_CURVE_1025            9          134256
;
STORAGE_CURVE_1026 Storage    0          768
STORAGE_CURVE_1026            1          8649
STORAGE_CURVE_1026            2          41711
STORAGE_CURVE_1026            3          88994
STORAGE_CURVE_1026            4          132639
STORAGE_CURVE_1026            5          142902
STORAGE_CURVE_1026            6          174095
STORAGE_CURVE_1026            6.14       174095
;
;from Flatiron Meadows Regional Detention Pond As-Builts. Divide Storage by Depth to get surface area in feet.
STORAGE_CURVE_312 Storage     0          0
STORAGE_CURVE_312             0.5        17424
STORAGE_CURVE_312             1          4356
STORAGE_CURVE_312             1.5        4356
STORAGE_CURVE_312             2          8712
STORAGE_CURVE_312             2.5        17424
STORAGE_CURVE_312             3          52272
STORAGE_CURVE_312             3.5        95832
STORAGE_CURVE_312             4          156816
STORAGE_CURVE_312             4.5        235224
STORAGE_CURVE_312             5          313632
STORAGE_CURVE_312             5.5        392040
STORAGE_CURVE_312             6          435600
STORAGE_CURVE_312             6.5        479160
STORAGE_CURVE_312             7          505296
STORAGE_CURVE_312             7.5        531432
STORAGE_CURVE_312             8.0        531432
STORAGE_CURVE_312             8.5        531432
STORAGE_CURVE_312             9.0        531432
STORAGE_CURVE_312             9.5        531432
;
;Storage curve created from design drawings for Indian Peaks Filing 17, provided by City of Lafayette.
STORAGE_CURVE_02 Storage      0          0
STORAGE_CURVE_02              0.3        71055.8
STORAGE_CURVE_02              1.3        218814.1
STORAGE_CURVE_02              2.3        305890
STORAGE_CURVE_02              3.3        344436
STORAGE_CURVE_02              4.3        360050
STORAGE_CURVE_02              5.3        375664
STORAGE_CURVE_02              6.3        391278
STORAGE_CURVE_02              7.3        406892
STORAGE_CURVE_02              8.3        422506
STORAGE_CURVE_02              9.3        435917.8
STORAGE_CURVE_02              10.3       451681.4
STORAGE_CURVE_02              12.3       500917.8

[REPORT]
;;Reporting Options
SUBCATCHMENTS ALL
NODES ALL
LINKS ALL

[TAGS]
Node       71             CULVERTPLACEHOLDER
Node       76             CULVERTPLACEHOLDER
Node       83             CULVERTPLACEHOLDER
Node       90             STORAGEPLACEHOLDER
```

100-yr Existing EPA SWMM Input

```
Node       101            STORAGEPLACEHOLDER
Node       113            CULVERTPLACEHOLDER
Node       114            CULVERTPLACEHOLDER
Node       125            LAFAYETTE_INC
Node       JUNCT_BH700    DUMMY
Node       JUNCT_BH701    DUMMY
Node       JUNCT_BH702    DUMMY
Node       JUNCT_BH703    DUMMY
Node       JUNCT_BH704    DUMMY
Node       JUNCT_BH705    DUMMY
Node       JUNCT_BH706    DUMMY
Node       JUNCT_BH707    DUMMY
Node       JUNCT_BH708    DUMMY
Node       JUNCT_BH709    DUMMY
Node       JUNCT_BH710    DUMMY
Node       JUNCT_BH711    DUMMY
Node       JUNCT_BH712    DUMMY
Node       JUNCT_BH713    DUMMY
Node       JUNCT_BH714    DUMMY
Node       JUNCT_BH715    DUMMY
Node       JUNCT_BH716    DUMMY
Node       JUNCT_BH717    DUMMY
Node       JUNCT_BH718    DUMMY
Node       JUNCT_BH719    DUMMY
Node       JUNCT_BH720    DUMMY
Node       JUNCT_BH721    DUMMY
Node       JUNCT_BH722    DUMMY
Node       JUNCT_BH723    DUMMY
Node       JUNCT_BH724    DUMMY
Node       JUNCT_BH725    DUMMY
Node       JUNCT_BH726    DUMMY
Node       JUNCT_BH727    DUMMY
Node       JUNCT_BH728    DUMMY
Node       JUNCT_BH729    DUMMY
Node       JUNCT_BH730    DUMMY
Node       JUNCT_BH731    DUMMY
Node       JUNCT_BH732    DUMMY
Node       JUNCT_BH733    DUMMY
Node       JUNCT_BH734    DUMMY
Node       JUNCT_BH735    DUMMY
Node       JUNCT_BH736    DUMMY
Node       JUNCT_BH737    DUMMY
Node       JUNCT_BH738    DUMMY
Node       JUNCT_BH739    DUMMY
Node       JUNCT_BH740    DUMMY
Node       JUNCT_BH741    DUMMY
Node       JUNCT_BH742    DUMMY
Node       JUNCT_BH743    DUMMY
Node       JUNCT_BH744    DUMMY
Node       JUNCT_BH745    DUMMY
Node       JUNCT_BH746    DUMMY
Node       JUNCT_BH747    DUMMY
Node       JUNCT_BH748    DUMMY
Node       JUNCT_BH749    DUMMY
Node       JUNCT_BH750    DUMMY
Node       JUNCT_BH751    DUMMY
Node       JUNCT_BH752    DUMMY
Node       JUNCT_BH753    DUMMY
Node       JUNCT_BH754    DUMMY
Node       JUNCT_BH755    DUMMY
Node       JUNCT_BH756    DUMMY
Node       JUNCT_BH757    DUMMY
Node       104            LAFAYETTE
Node       123            LAFAYETTE
Node       183            CULVERTPLACEHOLDER
Node       142            STREET_OVERFLOW_EXTEND
Link       CH_04          Swale
Link       CH_08          GC
```

100-yr Existing EPA SWMM Input

```
Link       CH_09            GC
Link       CH_11            GC
Link       CH_13            GC
Link       CH_15            BULLHEADGULCH
Link       CH_16            BULLHEADGULCH
Link       CH_18            BULLHEADGULCH
Link       CH_19            BULLHEADGULCH
Link       CH_23            BULLHEADGULCH
Link       CH_27            LAFAYETTE_INC
Link       CH_30            BULLHEADGULCH
Link       CH_31            BULLHEADGULCH
Link       CH_32            BULLHEADGULCH
Link       CH_33            BULLHEADGULCH
Link       CH_34            BULLHEADGULCH
Link       CH_35            BULLHEADGULCH
Link       CH_38            BULLHEADGULCH
Link       CH_39            STND_AG
Link       CH_39_OVERFLOW   STND_AG
Link       CH_40            STND_AG
Link       CH_41            STND_AG
Link       CH_42            STND_AG
Link       CH_44            STND_AG
Link       CH_45            STND_AG
Link       CH_46            STND_AG
Link       CH_47            STND_AG
Link       CH_48            STND_AG
Link       CH_49            STND_AG
Link       CH_50            STND_AG
Link       CH_51            STND_AG
Link       CH_52            STND_AG
Link       CH_53            GC
Link       CH_64            STND_AG
Link       CH_67            GC
Link       CH_76            STND_AG
Link       CU_01_OVERFLOW   STREET_OVERFLOW
Link       CU_06            LAFAYETTE
Link       CU_06_OVERFLOW   STREET_OVERFLOW
Link       CU_07            LAFAYETTE
Link       CU_08            LAFAYETTE_INC
Link       CU_09            BULLHEADGULCH
Link       CU_10_OVERFLOW   STREET_OVERFLOW
Link       CU_11            LAFAYETTE_INC
Link       CU_12            LAFAYETTE_INC
Link       CU_12_OVERFLOW   STREET_OVERFLOW
Link       CU_13            LAFAYETTE_INC
Link       CU_13_OVERFLOW   STREET_OVERFLOW
Link       CU_15            LAFAYETTE_INC
Link       CU_15_OVERFLOW   STREET_OVERFLOW
Link       CU_20_OVERFLOW   STREET_OVERFLOW
Link       CU_21            LAFAYETTE_INC
Link       CU_21_OVERFLOW   STREET_OVERFLOW
Link       CU_32            LAFAYETTE
Link       CU_32_OVERFLOW   STREET_OVERFLOW
Link       CU_33_OVERFLOW   STREET_OVERFLOW_EXTEND
Link       CU_34_OVERFLOW   STREET_OVERFLOW
Link       CU_38            LAFAYETTE_INC
Link       D_JUNCT_BH700    DUMMY
Link       D_JUNCT_BH701    DUMMY
Link       D_JUNCT_BH702    DUMMY
Link       D_JUNCT_BH703    DUMMY
Link       D_JUNCT_BH704    DUMMY
Link       D_JUNCT_BH706    DUMMY
Link       D_JUNCT_BH707    DUMMY
Link       D_JUNCT_BH708    DUMMY
Link       D_JUNCT_BH709    DUMMY
Link       D_JUNCT_BH710    DUMMY
Link       D_JUNCT_BH711    DUMMY
Link       D_JUNCT_BH712    DUMMY
```

100-yr Existing EPA SWMM Input

```
Link       D_JUNCT_BH713    DUMMY
Link       D_JUNCT_BH714    DUMMY
Link       D_JUNCT_BH715    DUMMY
Link       D_JUNCT_BH716    DUMMY
Link       D_JUNCT_BH717    DUMMY
Link       D_JUNCT_BH718    DUMMY
Link       D_JUNCT_BH719    DUMMY
Link       D_JUNCT_BH720    DUMMY
Link       D_JUNCT_BH721    DUMMY
Link       D_JUNCT_BH722    DUMMY
Link       D_JUNCT_BH723    DUMMY
Link       D_JUNCT_BH724    DUMMY
Link       D_JUNCT_BH725    DUMMY
Link       D_JUNCT_BH726    DUMMY
Link       D_JUNCT_BH727    DUMMY
Link       D_JUNCT_BH728    DUMMY
Link       D_JUNCT_BH729    DUMMY
Link       D_JUNCT_BH730    DUMMY
Link       D_JUNCT_BH731    DUMMY
Link       D_JUNCT_BH732    DUMMY
Link       D_JUNCT_BH733    DUMMY
Link       D_JUNCT_BH734    DUMMY
Link       D_JUNCT_BH735    DUMMY
Link       D_JUNCT_BH736    DUMMY
Link       D_JUNCT_BH737    DUMMY
Link       D_JUNCT_BH738    DUMMY
Link       D_JUNCT_BH739    DUMMY
Link       D_JUNCT_BH740    DUMMY
Link       D_JUNCT_BH741    DUMMY
Link       D_JUNCT_BH742    DUMMY
Link       D_JUNCT_BH743    DUMMY
Link       D_JUNCT_BH744    DUMMY
Link       D_JUNCT_BH745    DUMMY
Link       D_JUNCT_BH746    DUMMY
Link       D_JUNCT_BH747    DUMMY
Link       D_JUNCT_BH748    DUMMY
Link       D_JUNCT_BH749    DUMMY
Link       D_JUNCT_BH750    DUMMY
Link       D_JUNCT_BH751    DUMMY
Link       D_JUNCT_BH752    DUMMY
Link       D_JUNCT_BH753    DUMMY
Link       D_JUNCT_BH754    DUMMY
Link       D_JUNCT_BH755    DUMMY
Link       D_JUNC_BH705     DUMMY
Link       D_JUNCT_BH757    DUMMY
Link       D_JUNCT_BH756    DUMMY

[MAP]
DIMENSIONS 3072896.060 1233062.792 3131719.494 1277184.535
Units      None

[COORDINATES]
;;Node           X-Coord            Y-Coord
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61               3091944.971        1257377.337
62               3088576.841        1255209.767
63               3093248.115        1257455.216
65               3088601.443        1253352.359
66               3091310.602        1255981.023
67               3095316.113        1259311.010
68               3088059.104        1251487.540
69               3091514.523        1252098.060
70               3093056.558        1254307.262
71               3095151.406        1255971.685
76               3088551.961        1249959.380
78               3094857.534        1253125.837
79               3096339.475        1253410.076
80               3093954.897        1251328.962
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100-yr Existing EPA SWMM Input

82	3092007.327	1248363.629
83	3091969.048	1248106.682
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85	3093794.609	1245954.987
90	3090972.128	1250546.942
93	3092434.282	1249574.575
94	3090028.405	1248172.496
95	3090188.326	1246606.704
99	3090484.652	1244288.551
101	3088439.917	1247999.599
102	3088639.828	1248167.093
103	3085937.052	1247922.193
105	3084725.840	1243542.578
106	3083731.202	1242708.366
107	3085495.882	1240358.133
108	3085872.882	1242074.686
109	3086827.413	1241793.941
111	3088568.029	1240566.687
113	3089330.050	1242780.558
114	3090966.389	1246085.322
116	3082142.990	1238930.347
119	3083220.081	1239680.547
120	3088509.998	1240494.876
121	3087364.813	1240024.567
122	3087515.831	1240102.708
124	3091909.242	1247556.702
125	3088857.864	1242273.719
126	3089915.944	1243504.585
127	3092968.545	1245971.442
128	3093488.538	1245461.323
129	3088666.844	1247994.196
131	3089358.430	1247999.599
136	3091184.651	1248172.496
137	3093224.396	1249927.812
146	3087184.006	1240495.771
JUNCT_201	3097077.947	1247351.555
JUNCT_202	3097661.750	1245715.998
JUNCT_203	3098269.739	1247459.965
JUNCT_204	3100273.954	1247157.858
JUNCT_205	3098374.268	1248857.528
JUNCT_206	3099933.708	1250003.918
JUNCT_207	3101145.593	1249336.954
JUNCT_208	3102114.080	1250208.592
JUNCT_209	3097223.220	1250838.109
JUNCT_210	3100758.198	1250983.382
JUNCT_211	3100197.198	1251539.092
JUNCT_212	3103034.142	1252097.142
JUNCT_213	3101532.987	1252775.083
JUNCT_215	3099282.001	1255175.380
JUNCT_216	3098627.649	1255357.872
JUNCT_217	3100936.915	1254730.776
JUNCT_218	3100615.812	1255619.983
JUNCT_219	3098767.428	1257563.950
JUNCT_220	3100104.445	1256925.828
JUNCT_222	3101242.441	1258295.459
JUNCT_235	3097126.372	1252629.809
JUNCT_236	3097465.342	1255535.271
JUNCT_237	3096962.455	1257758.425
JUNCT_238	3098046.434	1258150.185
JUNCT_240	3097126.372	1260571.403
JUNCT_241	3099547.589	1259554.492
JUNCT_242	3098191.707	1262024.133
JUNCT_243	3098772.799	1263718.986
JUNCT_302	3099133.723	1246675.980
JUNCT_305	3099069.724	1249699.924
JUNCT_606	3101048.744	1266576.022
JUNCT_607	3099886.560	1261830.436
JUNCT_608	3100806.622	1264348.502

100-yr Existing EPA SWMM Input

JUNCT_609	3102307.777	1266285.476
JUNCT_613	3103905.781	1257714.366
JUNCT_614	3100098.367	1260936.879
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JUNCT_616	3103857.356	1260474.554
JUNCT_617	3105358.511	1260087.159
JUNCT_618	3103225.979	1262154.364
JUNCT_619	3104012.569	1262523.579
JUNCT_620	3103386.508	1264401.764
JUNCT_621	3104092.834	1264562.292
JUNCT_622	3103530.984	1266873.904
JUNCT_623	3103611.248	1268447.084
JUNCT_624	3104535.297	1268561.421
JUNCT_638	3105842.755	1261927.285
JUNCT_639	3105213.238	1264009.532
JUNCT_640	3105164.814	1266866.568
JUNCT_641	3105406.935	1268561.421
JUNCT_648	3106472.271	1269336.210
JUNCT_655	3107779.729	1270982.638
JUNCT_702	3100273.954	1262459.953
JUNCT_715	3106181.725	1264251.654
JUNCT_BH700	3094294.810	1259681.399
JUNCT_BH701	3094117.908	1258454.665
JUNCT_BH702	3093505.541	1257821.981
JUNCT_BH703	3091807.643	1259086.310
JUNCT_BH704	3089020.918	1258982.851
JUNCT_BH705	3092698.850	1256740.906
JUNCT_BH706	3090156.517	1257002.155
JUNCT_BH707	3087357.134	1257107.792
JUNCT_BH708	3095674.058	1255388.259
JUNCT_BH709	3094212.411	1255812.417
JUNCT_BH710	3092487.576	1255861.451
JUNCT_BH711	3091622.584	1253571.766
JUNCT_BH712	3090197.891	1254131.467
JUNCT_BH713	3087383.543	1255100.687
JUNCT_BH714	3088802.249	1251158.868
JUNCT_BH715	3087409.952	1252961.536
JUNCT_BH716	3093075.984	1250617.340
JUNCT_BH717	3093954.897	1252510.068
JUNCT_BH718	3095193.600	1252863.296
JUNCT_BH719	3094960.983	1251940.850
JUNCT_BH720	3093785.210	1250298.865
JUNCT_BH721	3090918.262	1250031.787
JUNCT_BH722	3086934.585	1251165.705
JUNCT_BH723	3086960.995	1249026.554
JUNCT_BH724	3087760.368	1249356.262
JUNCT_BH725	3090395.785	1249110.037
JUNCT_BH726	3092386.155	1248981.001
JUNCT_BH727	3095795.195	1248716.299
JUNCT_BH728	3088994.509	1248920.917
JUNCT_BH729	3091231.091	1246911.513
JUNCT_BH730	3092216.969	1248123.562
JUNCT_BH731	3095467.428	1247670.026
JUNCT_BH732	3092338.027	1246614.726
JUNCT_BH733	3088086.753	1247152.151
JUNCT_BH734	3089209.731	1244922.237
JUNCT_BH735	3084927.953	1247729.448
JUNCT_BH736	3086379.990	1245144.390
JUNCT_BH737	3091256.551	1243293.276
JUNCT_BH738	3090800.492	1245720.611
JUNCT_BH739	3087228.477	1243919.578
JUNCT_BH740	3084557.750	1244325.703
JUNCT_BH741	3083085.756	1242988.836
JUNCT_BH742	3089490.475	1242122.813
JUNCT_BH743	3093456.385	1245113.550
JUNCT_BH744	3087805.760	1241307.321
JUNCT_BH745	3095226.981	1246428.849

100-yr Existing EPA SWMM Input

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JUNCT_BH747      3094078.643       1245660.194
JUNCT_BH748      3084831.057       1242609.423
JUNCT_BH749      3082579.872       1242457.657
JUNCT_BH750      3085714.616       1240990.104
JUNCT_BH751      3085868.120       1242533.540
JUNCT_BH752      3088172.261       1240070.380
JUNCT_BH753      3086958.226       1239394.644
JUNCT_BH754      3082251.047       1239902.941
JUNCT_BH755      3081097.544       1238887.729
55               3086955.753       1244938.280
86               3089073.369       1246029.173
56               3089610.794       1242555.962
148              3088701.818       1242165.796
JUNCT_BH756      3096603.727       1262823.716
JUNCT_BH757      3097503.104       1261355.983
150              3097060.427       1264503.286
152              3096568.458       1262501.123
154              3097579.099       1261097.647
156              3096278.727       1259303.729
OUTFALL_940      3099499.165       1265413.838
OUTFALL_954      3101048.744       1267011.842
OUTFALL_955      3101748.744       1267999.571
OUTFALL_958      3103130.991       1268948.815
OUTFALL_959      3104438.448       1269384.635
OUTFALL_961      3105406.935       1270014.151
OUTFALL_963      3106472.271       1270353.122
OUTFALL_965      3108312.397       1272435.369
OUTFALL_936      3091398.481       1260316.109
OUTFALL_937      3093729.466       1260826.588
OUTFALL_938      3096247.684       1262987.458
OUTFALL_939      3097072.152       1264822.331
OUTFALL_935      3087964.908       1259104.633
72               3094708.795       1253339.356
73               3096247.664       1255953.043
81               3093078.145       1249883.937
87               3096288.182       1249294.326
97               3088503.859       1246021.151
104              3085952.224       1243466.944
117              3086689.469       1240371.232
118              3087054.440       1240435.403
123              3086298.350       1244350.478
130              3089142.309       1247994.196
135              3091060.382       1248167.093
140              3096251.406       1256154.005
141              3096502.666       1256181.619
143              3096555.273       1257533.563
144              3099575.715       1256160.082
145              3088006.190       1241874.252
147              3086849.896       1240407.328
JUNCT_1025       3098765.730       1249987.918
JUNCT_1026       3099927.542       1251354.591
JUNCT_200        3096715.480       1246456.071
JUNCT_221        3101991.851       1257426.247
JUNCT_300        3096932.674       1247932.648
JUNCT_303        3099085.724       1248691.942
JUNCT_306        3098891.495       1250574.007
JUNCT_308        3099856.580       1252163.559
JUNCT_310        3101145.593       1252000.293
JUNCT_311        3100177.106       1253598.297
JUNCT_313        3099527.097       1257898.204
JUNCT_315        3099241.461       1258670.027
JUNCT_317        3097949.586       1260426.130
JUNCT_318        3098348.091       1261234.669
JUNCT_319        3099014.921       1263428.440
JUNCT_320        3096555.273       1254045.165
JUNCT_321        3096500.436       1255947.339
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100-yr Existing EPA SWMM Input

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JUNCT_322        3096579.582       1258493.784
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JUNCT_705        3104413.891       1259056.162
JUNCT_706        3104494.155       1262491.474
JUNCT_707        3100444.776       1261465.608
JUNCT_708        3102371.296       1262796.547
JUNCT_709        3102487.548       1265477.305
JUNCT_710        3102503.601       1268190.238
JUNCT_716        3105213.238       1266091.779
JUNCT_717        3105939.603       1268416.148
74               3088391.561       1244240.429
75               3088234.602       1248258.944
180              3088589.946       1257375.086
181              3091410.917       1259818.727
182              3093745.497       1260337.523
183              3096326.284       1260804.092
JUNCT_323        3097685.660       1260128.591
142              3096251.406       1257539.641
155              3096283.901       1262501.123
64               3093759.713       1255814.166
STOR_1025        3098686.108       1249366.970
STOR_1026        3099998.504       1250559.815
STOR_312         3099575.715       1255971.685
STOR_02          3088479.795       1242082.707

[VERTICES]
;;Link           X-Coord           Y-Coord
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1025_OVERFLOW    3098973.726       1250275.913
1026_OVERFLOW    3099757.233       1251737.786
200_OVERFLOW     3096669.769       1247587.963
221_OVERFLOW     3100322.379       1258004.912
300_OVERFLOW     3098143.283       1248562.164
303_OVERFLOW     3099293.720       1249171.933
306_OVERFLOW     3099232.113       1251780.363
308_OVERFLOW     3099644.438       1252581.385
310_OVERFLOW     3100370.803       1252629.809
311_OVERFLOW     3100467.652       1254760.481
313_OVERFLOW     3099305.467       1258295.459
315_OVERFLOW     3098530.678       1259457.643
317_OVERFLOW     3098335.936       1260712.017
318_OVERFLOW     3099197.722       1262675.683
319_OVERFLOW     3099547.589       1264106.381
320_OVERFLOW     3096413.773       1255075.824
321_OVERFLOW     3096790.821       1256852.385
322_OVERFLOW     3097465.342       1259263.946
CH_37            3088816.689       1249991.681
CH_37            3088800.646       1250521.085
703_OVERFLOW     3101968.807       1266382.325
705_OVERFLOW     3104147.902       1260958.798
706_OVERFLOW     3103615.234       1263041.045
707_OVERFLOW     3101763.561       1262079.420
708_OVERFLOW     3103130.991       1265171.716
709_OVERFLOW     3102696.235       1267082.591
710_OVERFLOW     3102969.133       1268559.454
716_OVERFLOW     3105891.179       1267399.236
717_OVERFLOW     3106036.452       1269239.362
75_OVERFLOW      3096671.627       1257980.824
CH_18            3090575.007       1244463.947
CH_18            3090436.817       1245029.997
CH_18            3090501.156       1245515.812
CH_18            3090565.326       1245948.960
CH_19            3091255.155       1246342.002
CH_19            3091487.772       1246590.662
CH_19            3091720.389       1246710.981
CH_32            3091888.836       1248740.363
CH_32            3091880.814       1248932.873
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100-yr Existing EPA SWMM Input

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CH_35            3094331.030       1251921.703
CH_35            3094847.784       1252745.584
CH_39_OVERFLOW   3094448.787       1254656.219
CH_42            3088582.992       1257085.625
CH_66_OVERFLOW   3095988.346       1256796.941
CU_01_OVERFLOW   3086721.554       1240491.552
CU_02_OVERFLOW   3086910.056       1240503.584
CU_06_OVERFLOW   3085918.591       1244000.546
CU_07_OVERFLOW   3086379.051       1244724.424
CU_10_OVERFLOW   3088448.643       1248282.681
CU_12_OVERFLOW   3091115.396       1248192.606
CU_13_OVERFLOW   3088804.362       1246177.257
CU_15_OVERFLOW   3089290.821       1247908.649
CU_20_OVERFLOW   3093166.843       1249877.377
CU_21_OVERFLOW   3088169.747       1242131.752
CU_32_OVERFLOW   3096860.365       1249630.062
CU_32_OVERFLOW   3097414.373       1249540.858
CU_33_OVERFLOW   3096125.673       1256066.902
CU_34_OVERFLOW   3096653.522       1256063.666
CU_38_OVERFLOW   3089216.347       1244536.185
D_JUNCT_BH732    3091888.836       1246903.491
D_JUNCT_BH746    3089185.865       1241668.095
312_OVERFLOW     3099727.376       1257009.081
64_OVERFLOW      3093962.275       1255950.195
OUTLET_312_HIGH  3099607.735       1256047.220
OUTLET_312_LOW   3099550.616       1256046.738
OUTLET_02_HIGH   3088584.109       1242280.128


[BACKDROP]
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