



**TOWN OF ERIE**  
Community Development Department – Planning Division  
645 Holbrook Street – PO Box 750 – Erie, CO 80516  
Tel: 303.926.2770 – Fax: 303.926.2706 – Web: [www.erieco.gov](http://www.erieco.gov)

**LAND USE APPLICATION**

*Please fill in this form completely. Incomplete applications will not be processed.*

**STAFF USE ONLY**

<b>FILE NAME:</b>		
<b>FILE NO:</b>	<b>DATE SUBMITTED:</b>	<b>FEES PAID:</b>

**PROJECT/BUSINESS NAME:** Longs Peak Sprinkler  
**PROJECT ADDRESS:** Lot 8 Austin Industrial Park  
**PROJECT DESCRIPTION:** 4-Unit 6912 Sq Ft Metal Building W/5512 Sq Ft of Outdoor Storage

**LEGAL DESCRIPTION** *(attach legal description if Metes & Bounds)*

Subdivision Name: Austin Industrial Park  
 Filing #: \_\_\_\_\_ Lot #: 8 Block #: \_\_\_\_\_ Section: 19 Township: 1N Range: 68W

<b>OWNER</b> <i>(attach separate sheets if multiple)</i>	<b>AUTHORIZED REPRESENTATIVE</b>
Name/Company: Mike Amend	Company/Firm: Permontes Group
Contact Person: Mike Amend	Contact Person: Mickey Leyba
Address: 408 E. Geneseo Street	Address: 625 Main Street
City/State/Zip: Lafayette, CO 80026	City/State/Zip: Longmont, CO 80501
Phone: 303-665-1010 Fax: 303-666-1200	Phone: 720-684-4981 Fax: 866-471-7369
E-mail: <a href="mailto:longspeaksprinklers@comcast.net">longspeaksprinklers@comcast.net</a>	E-mail: <a href="mailto:mleyba@permontesgroup.com">mleyba@permontesgroup.com</a>

<b>MINERAL RIGHTS OWNER</b> <i>(attach separate sheets if multiple)</i>	<b>MINERAL LEASE HOLDER</b> <i>(attach separate sheets if multiple)</i>
Name/Company: _____	Name/Company: _____
Address: _____	Address: _____
City/State/Zip: _____	City/State/Zip: _____

**LAND-USE & SUMMARY INFORMATION**

Present Zoning: Light Industrial (LI)	Gross Site Density (du/ac): _____
Proposed Zoning: _____	# Lots/Units Proposed: _____
Gross Acreage: 42,200 SF	Gross Floor Area: 6912 SF

**SERVICE PROVIDERS**

Electric: XCEL Energy	Gas: XCEL Energy
Metro District: N/A	Fire District: Mountain View Fire Rescue
Water (if other than Town): _____	Sewer (if other than Town): _____

**PAGE TWO MUST BE SIGNED AND NOTARIZED**

DEVELOPMENT REVIEW FEES			
<b>ANNEXATION</b>		<b>SUBDIVISION</b>	
<input type="checkbox"/> Major (10+ acres)	\$ 4000.00	<input type="checkbox"/> Sketch Plan	\$ 1000.00 + 10.00 per lot
<input type="checkbox"/> Minor (less than 10 acres)	\$ 2000.00	<input type="checkbox"/> Preliminary Plat	\$ 2000.00 + 40.00 per lot
<input type="checkbox"/> Deannexation	\$ 1000.00	<input type="checkbox"/> Final Plat	\$ 2000.00 + 20.00 per lot
<b>COMPREHENSIVE PLAN AMENDMENT</b>		<input type="checkbox"/> Minor Subdivision Plat	\$ 2000.00
<input type="checkbox"/> Major	\$ 3000.00	<input type="checkbox"/> Minor Amendment Plat	\$ 1000.00 + 10.00 per lot
<input type="checkbox"/> Minor	\$ 1200.00	<input type="checkbox"/> Road Vacation (constructed)	\$ 1000.00
<b>ZONING/REZONING</b>		<input type="checkbox"/> Road Vacation (paper)	\$ 100.00
<input type="checkbox"/> Rezoning	\$ 1700.00 + 10.00 per acre	<b>SITE PLAN</b>	
<input type="checkbox"/> PUD Rezoning	\$ 1700.00 + 10.00 per acre	<input type="checkbox"/> Residential	\$ 1400.00 + 10.00 per unit
<input type="checkbox"/> PUD Amendment	\$ 1700.00 + 10.00 per acre	<input type="checkbox"/> Non-Resi. (>10,000 sq. ft.)	\$ 2200.00
<input type="checkbox"/> Major PD Amendment	\$ 3700.00 + 10.00 per acre	<input checked="" type="checkbox"/> Non-Resi. (>2,000 sq. ft.)	\$ 1000.00
<input type="checkbox"/> Minor PD Amendment	\$ 500.00	<input type="checkbox"/> Non-Resi. (<2,000 sq. ft.)	\$ 200.00
<b>SPECIAL REVIEW USE</b>		<input type="checkbox"/> Amendment (major)	\$ 1100.00
<input type="checkbox"/> Major	\$ 1000.00	<input type="checkbox"/> Amendment (minor)	\$ 350.00
<input checked="" type="checkbox"/> Minor	\$ 400.00	<b>VARIANCE</b> \$ 600.00	
<input type="checkbox"/> Oil & Gas	\$ 1200.00	<b>SERVICE PLAN</b> \$ 10,000.00	
All fees <b>include</b> both Town of Erie Planning & Engineering review. These fees <b>do not include</b> referral agency review fees, outside consultant review fees, or review fees incurred by consultants acting on behalf of staff. See Town of Erie Municipal Code, Title 2-10-5 for all COMMUNITY DEVELOPMENT FEES.			

The undersigned is fully aware of the request/proposal being made and the actions being initiated on the referenced property. The undersigned understand that the application must be found to be complete by the Town of Erie before the request can officially be accepted and the development review process initiated. The undersigned is aware that the applicant is fully responsible for all reasonable costs associated with the review of the application/request being made to the Town of Erie. Pursuant to Chapter 7 (Section 7.2.B.5) of the Unified Development Code (UDC) of the Town of Erie, applicants shall pay all costs billed by the Town for legal, engineering and planning costs incurred by staff, including consultants acting on behalf of staff, necessary for project review. By this acknowledgement, the undersigned hereby certify that the above information is true and correct.

Owner: Michael T. Amend Date: 5/3/16  
 Owner: \_\_\_\_\_ Date: \_\_\_\_\_  
 Applicant: Michael T. Amend Date: \_\_\_\_\_

STATE OF COLORADO )  
 County of Boulder ) ss.

The foregoing instrument was acknowledged before me this 3<sup>rd</sup> day of May, 2016, by Michael T. Amend.

My commission expires: 3-16-19  
 Witness my hand and official seal.

Micheline T. Miller  
 Notary Public

**MICHELENE T. MILLER**  
**NOTARY PUBLIC**  
**STATE OF COLORADO**  
**NOTARY ID 20154010711**  
**COMMISSION EXPIRES MAR. 16, 2019**



## **SITE PLAN AND SPECIAL REVIEW USE SITE PLAN**

***460 Jones Court, Erie CO***

***Lot 8 Austin Industrial Park***

### ***PROJECT NARRATIVE***

**a. General project concept and purpose of the request:**

The proposed building will serve as an office/warehouse and takes advantage of the inherent utility and economies that a pre-engineered steel building offers. The building is located within a light industrial development comprised of buildings of similar type and appearance. The building will be comprised of 4-units in which unit 1 will be finished at the time of construction and occupied by the property owner's Longs Peak Sprinkler business. A 5,512 SF outdoor storage area adjacent to the south property line is also proposed for the use of Longs Peak Sprinkler. The additional three units will remain unfinished until leases are secured.

**b. Discuss how the proposed development is in compliance with the five approval criteria of the Municipal Code Title 10 - UDC for Site Plan review and Special Use Review**

**Site Plan Review** – Compliance with the approval Criteria of the Municipal Code Title 10

**a. The Site Plan is generally consistent with the Town's Comprehensive Master Plan;**

The proposed development for Lot 8 Austin Industrial Park is consistent with the Town's Comprehensive Master Plan. The building promotes a high standard of design which will provide opportunities for quality business and employment.

**b. The Site Plan is generally consistent with any previously approved subdivision plat, planned development, or any other precedent plan or land use approval as applicable;**

The Longs Peak Sprinkler Site Plan is consistent with Austin Industrial Park Final Plat.

**c. The Site Plan complies with all applicable development and design standards set forth in this UDC, including but not limited to the provisions in Chapter 2, Chapter 3, Chapter 4, and Chapter 6;**

Longs Peak Sprinkler complies with the development and design standards set forth in the UDC for the Light Industrial zoning district.

- d. Any significant adverse impacts reasonably anticipated to result from the use will be mitigated or offset to the maximum extent reasonably practicable; and**

There will be no significant adverse impacts caused by the proposed development.

- e. The development proposed on the Site Plan and its general location is or will be compatible with the character of surrounding land uses.**

The Longs Peak Sprinkler Site Plan proposes a Light Industrial development that is compatible with the surrounding land uses. Unit No. 1 of the 4-unit building will be occupied by the Land Owner's Landscape and irrigation company. The three additional units will remain unfinished until future leases are secured.

**Special Review Use – Compliance with the approval Criteria of the Municipal Code Title 10**

- a. The proposed use is generally consistent with the Town's Comprehensive Master Plan and all applicable provisions of this UDC and applicable State and Federal regulations;**

The proposed development for Lot 8 Austin Industrial Park is consistent with the Town's Comprehensive Master Plan. The building promotes a high standard of design which will provide opportunities for quality business and employment.

- b. The proposed use is generally consistent with the purpose and intent of the zoning district in which it is located;**

The 4-unit office/warehouse building is consistent with the purpose and intent of the Light Industrial Zoning district.

- c. The proposed use is generally consistent with any applicable use-specific standards set forth in Section 3.2;**

The office/warehouse building is consistent with the Town's use-specific standards.

- d. The proposed use is compatible with adjacent uses in terms of scale, site design, and operating characteristics (hours of operation, traffic generation, lighting, noise, odor, dust, and other external impacts);**

The building is located within a light industrial development comprised of buildings of similar type and appearance. The proposed building is set to the interior of the development away from residential areas.

- e. Any significant adverse impacts anticipated to result from the use will be mitigated or offset to the maximum extent reasonably practicable;**

No significant adverse impacts on the natural environment are anticipated with development.

- f. Facilities and services (including sewage and waste disposal, water, gas, election, police and fire protection, and streets and transportation, as applicable) will be available to serve the subject property while maintaining adequate levels of service for existing development;**

Water and sanitary sewer services were stubbed to the property line with the overall development of Austin Industrial Park. Gas and electric is located within easements adjacent to the Jones Court right-of-way.

- g. Adequate assurances of continuing maintenance have been provided; and**

The property owner shall provide the overall maintenance for the building and site common space such as landscape areas, sidewalks, parking, drainage facilities, and parking/drive isles.

- h. Any significant adverse impacts on the natural environment will be mitigated to the maximum extent reasonably practicable.**

No significant adverse impacts on the natural environment are anticipated with development.

- c. Architecture provides visual interest consistent with community's identity, character and scale:**

The proposed building will serve as an office/warehouse and takes advantage of the inherent utility and economies that a pre-engineered steel building offers. The building is located within a light industrial development comprised of buildings of similar type and appearance. The proposed building is set to the interior of the development away from residential areas. The mass and form of the building is long and low, yielding a pleasing human scale, while maximizing the usefulness of the limited site area. Stone columns, entry canopies, and entrance patios will break up the elevations visible from the street. Earth tone colors allow the building to blend in to the generous landscaping planned for the site. The color and texture mix will provide a pleasing, warm, and welcoming feel to the pedestrian and others who approach. There will be shadow lines and visual relief provided by the projected columns and roof eave line. Overall, the proposed building along with the associated site improvements will complement and be consistent with the surrounding established community.

- d. Development schedule:**

Development shall consist of construction once final approvals of the Site Plan/Special Review Use Site plan and building permit plans are received from the town of Erie. Four (4) month duration is estimated for final completion of all site work and building construction. Construction is expected to begin fall of 2016 with an anticipated building occupancy prior to 2017.

- e. General business information:**

Unit No. 1 of the 4-unit office/warehouse building will initially be occupied by Longs Peak Sprinkler. The additional 3 units will be tenant finished upon leasing. General business information for Longs Peak Sprinkle is as follows;

- Total building square footage is 5,912 SF
- Longs Peak Sprinkler will occupy Unit 1 which is 2,208 SF
- Units 2-4 are each 1,568 SF and will be tenant finished upon leasing
- Longs Peak Sprinkler provides landscaping installation and maintenance as well as snow removal
- 6 employees may be on-site at any given time
- Business hours are typically 7:30am to 5:30 pm Monday through Friday
- Total project value is \$525K

**f. Controls (location, function, and maintenance):**

The property owner shall provide the overall maintenance for the building and site common space such as landscape areas, sidewalks, parking, drainage facilities, and parking/drive isles.

**g. Substance of any existing or proposed covenants, special conditions, grand of easements, or other restrictions:**

The Declaration of Protective Covenants for Austin Industrial Park Subdivision shall apply with the development of Lot 8. No additional covenants, grant of easements, of restrictions are proposed.



# LONGS PEAK SPRINKLER Final Drainage Report

Prepared for:  
Mike Amend  
460 Jones Court  
Erie, CO 80516

Date Prepared:  
March 16, 2016

Date Revised:  
May 17, 2016

Date Revised:  
October 3, 2016

Project Number: 197.001

# Final Drainage Report

## Longs Peak Sprinkler

Erie, CO

Prepared for:  
Mike Amend  
460 Jones Court  
Erie, CO 80516

Date Prepared:  
March 16, 2016

Date Revised:  
May 17, 2016

Date Revised:  
October 3, 2016

Project No: 197.001



**CERTIFICATION OF COMPLIANCE**

I hereby certify that this *Final Drainage Report* for the design of the Long's Peak Sprinkler project was prepared by me (or under my direct supervision) in accordance with the provisions of the *Town of Erie Design Criteria & Construction Regulations* for the owners thereof. I understand that the Town of Erie does not and will not assume liability for drainage facilities designed by others.

Linda M. Rohlfling, P.E.  
Registered Professional Engineer  
State of Colorado No. 45431  
(Affix Seal)

The following members of Permontes Group, Inc. staff contributed to the study and the preparation of this report:

Project Manager:	Mickey Leyba-Farnsworth
Project Engineer:	Linda M. Rohlfling

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## 1.0 INTRODUCTION

Permontes Group, Inc. has prepared the following final drainage report for Longs Peak Sprinkler, Lot 8 Austin Industrial Park in accordance with the Urban Drainage and Flood Control District Storm Drainage Criteria and the Town of Erie Standards and Specifications Section 800 - Storm Drainage Facilities requirements. This report will demonstrate that the proposed Longs Peak Sprinkler development will provide adequate drainage facilities to mitigate stormwater runoff and protect downstream properties.

### Site Location & Description

The 0.969 acre property is identified as Lot 8, Austin Industrial Park, Town of Erie, County of Weld, State of Colorado, located on a portion of the SW  $\frac{1}{4}$  Section 19, Township 1 North, Range 68 West of the 6<sup>th</sup> P.M. The property address is 780 Jones Court, and is bound on the north by Lot 6, on the west by Outlot B, Coal Creek Center, on the east by Lot 7 and on the south by Lot 10. The site is accessed from Jones Court.

This lot is currently undeveloped and contains primarily native grass and a gravel drive. The site has access to gas, water, sanitary sewer line and stormwater facilities. The proposed developments for the site includes a 6,940 square foot office/warehouse building with asphalt paved parking and drive aisles, landscaping and gravel storage area. Drainage facilities will be constructed that will provide for water quality in swales and a water quality pond.

This site is included on Flood Insurance Rate Map Panel No. 08013C0443J. According to this reference, the site is not located within any FEMA regulated flood zones. Refer to **Appendix A** for more information.

Native soil information was derived from the National Resources Conservation Service, Web Soil Survey of Weld County, Colorado, and Southern Part and consists mainly of Ascalon and similar soils with slopes of 0-3% which is classified as hydraulic soil group B. Refer to **Appendix A** for more information.

There is a small irrigation ditch located along the south property line.

### Previous Reports

Lot 8, Austin Industrial Park is included in the Final Drainage Report for Austin Industrial Park, by Acklam Associates, Inc., December 1998. Refer to Appendix D for more information. Detention for this site is to be modified from that approved plan and a variance from that approved drainage report will be requested. See the body of this report and the appendix for details of the requested variance.

## 2.0 DESCRIPTION OF BASINS & SUB-BASINS

### Historic Drainage Sub-basins

The project site currently drains as four basins, H1, H2, H3 and H4. Each basin consists of native grasses and a portion of the gravel drive. C-Values, impervious values, time of concentration and runoff rates are tabulated below.

Sub-Basins H1 is 0.520 acres and encompasses about 50% of the site. This basin is located in the middle portion of the site. Runoff from offsite enters the site along the western lot line then enters the basin. This basin is a depression. Runoff first ponds in this basin and then sheet flows easterly into the adjoining lot and the street.

Sub-Basin H2 is 0.127 acres and is located in the north east portion of the site. This basin sheet flows into Jones Court.

Basin H3 contains 0.116 acres and is located along the eastern part of the site, adjacent to lot 7. This basin sheet flows into the adjoining lot.

Basin H4 contains 0.206 acres and is located along the southern part of the site. This basin sheet flows into the swale that runs along the south lot line.

Return Periods are based on the Town of Erie for an initial storm event of 5-years and a major storm event of 100-Years.

Calculations for these basins are included in *Appendix B* and a summary is provided below.

**Table 1 – Historic C-Values and Imperviousness:**

Basin	Area (ac)	Imperv %	TOC (min)	C5	C10	C100
H1	0.520	5	6	0.14	0.23	0.42
H2	0.127	24	11	0.23	0.30	0.46
H3	0.116	12	10	0.17	0.26	0.44
H4	0.206	7	11	0.15	0.25	0.43
	0.969					

**Table 2 – Historic Release Rate Summary:**

Study Point	Basin	Area (ac)	Q5 (cfs)	Q10 (cfs)	Q100 (cfs)
1	H1	0.520	0.3	0.7	1.9
2	H2	0.127	0.1	0.2	0.4
3	H3	0.116	0.1	0.1	0.4
4	H4	0.206	0.1	0.2	0.6
		0.969	0.6	1.2	3.3

An Existing Drainage Map has been prepared and is included in this report for reference purposes (*Figure 2*). The Historic Drainage was calculated based on existing topography and soils information shown on Figure 2.

### 3.0 PROPOSED DRAINAGE PLAN

Proposed improvements for this project include a 6,940 square foot building, paved parking and driveway, landscaping and gravel storage area. Water quality drainage swales are located around the perimeter of the site and a water quality pond is located in the southeast corner of the site. Access to the site is through Jones Court, which is paved. An existing 18" culvert is under the driveway that enters this site. That culvert will be replaced with a 15" RCP on a 0.3% grade. The 15" culvert has a carrying capacity of 3.5 cfs. Runoff from Basin D3 will enter this culvert and in the 100 year, runoff from Basin D3 is 1.2 cfs. Any flows that will not go into the culvert will overtop this site's driveway then continue into the ditches in Jones Court. Runoff from Basin D2 and D3 flow into the ditches in Jones Court and from there, northward to Austin Avenue. The rip rap for the 15" culvert is sized for the maximum pipe capacity of 3.54 cfs.

There is an existing swale located on the south side of this lot that flows east to Mason Street. The existing swale has an approximate maximum carrying capacity of 0.8 cfs. The flows from this site through that swale in the developed 5 year storm event is 1.0 cfs. The swale will be improved to become a 6 foot wide grass v-swale with a maximum carrying capacity of 1.9 cfs. The swale will convey runoff from the water quality pond and some of the offsite flows from lots that are located to the east and south of this lot (lots 7, 9 and 10). From there, runoff will flow into the curb and gutter in Mason Street then continue southward to Bonnell Avenue.

The majority of on-site flows will enter low-flow grass swales, thereby achieving water quality. Additional water quality will be achieved in the water quality pond.

The developed site is divided into three basins, D1, D2 and D3. C-Values, impervious values, time of concentration and runoff rates are tabulated below.

Basin D1 is 0.535 acres and is located in the lower half of the site. This basin contains part of the building, pavement, landscaping and the gravel storage area. Downspouts will direct runoff from the building and discharge onto the pavement area. Runoff from this basin will sheet flow to the south across the paved driveway, be channeled into the water quality swales located on the east, west and south sides of this basin (S1-East and S1-West). From the water quality swales, flows will enter the water quality pond, SB. From the water quality pond, the flows will be released into a grass lined v-swale (WQ1) that is located in a 16' wide easement along the lot line between Lot 7 and Lot 9. From the swale, runoff will continue to flow eastward to Mason Street where it will enter the curb and gutter then continue southward to Bonnell Avenue.

Basin D2 is 0.237 acres and is located in the northwest portion of the site. This basin contains part of the building, pavement and landscaping. Downspouts will direct runoff from the building and discharge onto the pavement area. Basin D2 sheet flows into the water quality swale, S2, which is located along the north property line. From this swale, runoff will enter the ditch located on the north side of Jones Court. That runoff will then go into an existing inlet located near the intersection of Mason Street and Jones Court. From there, runoff will continue northward to Austin Avenue.

Basin D3 is 0.197 acres and is located in the northeast section of the site. This basin contains part of the building, pavement and landscaping. Downspouts will direct runoff from the building and discharge onto the pavement area. Runoff from this basin sheet flows into water quality Swale S3 or undetained into Jones Court. Runoff from Swale S3 flows into the ditch on the south side of Jones Court and then through the culvert to the north side of Jones Court. From Jones Court and the ditch, runoff will enter an existing inlet near the intersection of Mason Street and Jones Court. From the inlet, the flows will continue northward to Austin Avenue.

An existing rock and grass swale has been constructed in the easement located along the south side of this property, extending to Mason Street. That swale is inefficient in that the swale has no slope in some areas and negative slopes in other areas. The swale will be removed and replaced with a grass lined v-swale (WQ1) that will convey flows from the water quality pond and lots 7, 9 and 10. At Mason Street, runoff through this swale will enter into the existing curb and gutter. The required capacity is 1.8 cfs which is the current capacity of the swale (approximately 0.8 cfs) plus the required 5 year runoff from Basin D1 (1.0 cfs). The provided swale capacity is 1.9 cfs.

All grass swales are to be seeded and are sized for the 5 year storm event.

Calculations for these developed basins and swales are included in **Appendix B** and a summary is provided below.

Table 3 – Developed C-Values and Imperviousness:

Basin	Area (ac)	Imperv %	TOC (min)	C2	C5	C10	C100
D1	0.535	56	12	0.46	0.51	0.56	0.67
D2	0.237	68	6	0.58	0.62	0.67	0.76
D3	0.197	75	9	0.64	0.67	0.71	0.79
0.969							

Table 4 – Developed Runoff Rate Summary:

Study Point	Basin	Area (ac)	Q2 (cfs)	Q5 (cfs)	Q10 (cfs)	Q100 (cfs)
1	D1	0.535	0.6	1.0	1.3	2.4
2	D2	0.237	0.5	0.7	0.9	1.6
3	D3	0.197	0.4	0.5	0.7	1.2
TOTAL RUNOFF			1.4	2.2	2.9	5.2

Table 5 – Developed On-Site &amp; Offsite Swale Summary:

Basin #	Location Name	Design Q (cfs)	Time (min)	Long. Slope %	Side Slope (h:v)	Velocity (fps)	Depth (ft)	Top Width (ft)
D1	S1-East	0.5	8.2	0.50	5:1	0.49	0.45	4.5
D1	S1-West	0.5	9.1	0.50	4:1	0.54	0.48	3.8
D2	S2	0.7	2.4	0.50	4:1	0.61	0.52	4.2
D3	S3	0.5	1.3	2.30	6:1	0.87	0.31	3.7
Existing Swale	Offsite	1.9	4.5	0.35	4:1	0.82	0.75	6.0

Table 6 – Developed Site + Offsite Swale Summary:

SUB-BASIN	REQUIRED (CFS)	PROVIDED (cfs)
D1	1.0	1.0
Offsite	0.8	0.8
Required Capacity		1.8
Provided Capacity		1.9

### Direct Discharge Areas (Undetained)

Basin D2 will sheet flow from the north and northwest side of the building to the west and north property lines into landscaped areas and then into swale, S2, located along the north lot line. From there, flows will go into the ditch in Jones Court. The total 100 Year runoff from this basin is 1.6 cfs, most of which will be captured in low flow grass lined swale, S2. Basin D2 has a time of concentration of 6 minutes, therefore Swale S2 will provide some water quality for this basin.

Basin D3 will sheet flow from the north and northeast side of the building to the east property line. Those flows from the northeast part of the building will sheet flow across pavement and then into the ditch in Jones Court. A portion of the flows from the east side of the building will sheet flow into the low flow grass lined Swale S3, located along the east lot line. From there, flows will go into the ditch in Jones Court. The total 100 Year runoff from this basin is

1.2 cfs. Basin D3 has a time of concentration of 9 minutes, therefore Swale S3 will provide some water quality for this basin.

### Direct Discharge Areas (Detained)

Basin D1 is located in the south half of the lot. For the purpose of sizing the swales, it was assumed that approximately half of the runoff from this basin will sheet flow into swale S1-East and approximately half will flow into S1-West while knowing that some of the flows from this basin will sheet flow directly into the pond. A separate calculation for each of these cases was not done. All flows from basin D1 will runoff into the water quality pond, SB, located in the southeast corner of this site.

### Swales, Water Quality Pond & Spillway

#### VARIANCE FOR DRAINAGE DESIGN

The drainage design for Lot 8 is not in conformance with the overall subdivisions design as detailed in the Final Drainage Report for Austin Industrial Park, by Acklam Associates. That report states that each lot will provide detention for the volume between the historic 10-year storm and the developed 100-year storm, and that allowable release is to be the historic 10-year runoff. The variance request for modifications to the detention pond requirement is due to site constraints; the lot is not large enough to accommodate a detention pond and therefore, the site cannot provide the required detention volume. The proposed drainage design is similar to what was approved by the town for the surrounding properties. A copy of the variance request and response can be found in the appendix to this report.

#### VARIANCE FOR POND

A water quality pond will be constructed at the southeast corner of this site. The pond is sized to detain WQCV but during construction will be used as the temporary sediment basin. The water quality pond was designed using UDFCD sediment basin details, with some modifications to the size of the bottom of pond. Per UDFCD sediment basin design, the slopes on the basin are 3:1 and 4:1. Because the pond does not conform to UDFCD standards for sediment basins and it does not conform to the Town of Erie requirements for slopes no greater than 4:1, a variance for the pond will be requested.

#### VARIANCE FOR SWALES

Swales S1-East, S1-West and S2 are less than 2%. UDFCD standards state that swales less than 2% require an underdrain. No underdrain is proposed for these swales, which is not in conformance with UDFCD standards. A variance will be requested for these swales. The request will detail the treatment of subgrades for the swales. A copy of the variance request and response can be found in the appendix to this report.

#### DESIGN CONCEPTS:

##### On Site Swale Design:

The proposed drainage design is to capture most of the onsite flows into low flow grass line swales that will provide water quality. Swales are located along the perimeter of the site on the north, south, east and west, and offsite. The swales are a minimum of 4:1 side slopes, with grades of 0.5% except for a portion of the east lot line, which has a slope of 2.3%. All swales are located in easements.

Swale S3 is greater than 2% and no underdrain is required.

Offsite Swale design:

The existing offsite swale begins at the southeast corner of this site and continues along the property line between lots 7 and 9 and then empties into the existing curb and gutter in Mason Street. This swale is in need of improvements. Due to the poor condition of the swale, slopes are negative or flat. The existing capacity of the swale is based on the existing depth and width of the swale, neither of which are consistent. A portion of the swale is rock and a portion of the swale is grass lined. Flows from the swale are directed more or less, into an existing electric pedestal. That pedestal is being undermined by the flows eroding the soils around the pedestal. It is proposed that as part of this project, that swale be removed and replaced with a grass lined swale from the southeast property corner of this site to the existing driveway in Mason Street. The eastern most part of the swale will be outside of the existing easement so additional easement will have to be obtained from the owner of lot 9. A maintenance agreement will be made part of the easement.

The proposed offsite swale will be located in an existing 16' easement located between lots 7 and 9 of Austin Industrial Park with the following characteristics: approximately 215 feet in length, of which approximately 13 feet will be outside of the existing easement; 4:1 side slopes, 0.75 feet deep, a top width of 6.0 and a slope of 0.35%. No underdrain is proposed for this swale.

As noted above, a variance will be requested for those swales that do not have underdrains.

Water Quality Pond Design:

A water quality pond will be constructed in the southeast corner of the site. During construction, the water quality pond will act as a temporary sediment basin. Flows from basin D1 will be channeled into the water quality pond. The water quality pond was designed using UDFCD design standards for a sediment basin, modified to fit this site by sizing it for the required WQCV.

WQCV was calculated using UDFCD Stormwater Best Management Practice Design Workbook, EDB spreadsheet. This site is 0.969 acres, with an imperviousness of 63%. The required WQCV is 0.024 ac-ft, or 1,035 cu-ft.

Adjoining this site on the west is Outlot B which is the detention area for those properties to the west of this site. Some offsite flows from Outlot B will enter this site and be channeled into swale S1-West then into the water quality pond. No adjustment to the required pond volume was made to account for offsite flows.

The water quality pond is 3 feet deep with 4:1 and 3:1 side slopes, see detail on sheet C5. Runoff from the WQ pond will be regulated through a 6" pvc riser pipe fitted with 4-1/2" holes which allows for a 40 hour drain time. The 6" PVC from the pond is 19.3 feet at 0.5% and will daylight into the offsite swale after which it will be channeled into Mason Street. WQCV is achieved at elevation 5067.9'. The design characteristics for the pond can be found in Table 7 and the required and provided volumes can be found in Table 8 on page 7 of this report.

Table 7 –Water Quality Pond

WATER QUALITY POND										
SEDIMENT BASIN	DRAINAGE BASIN	VOLUME (REQ'D)	VOLUME (PRV'D)	BOTTOM WIDTH	BOTTOM LENGTH	TOP WIDTH	TOP LENGTH	BOTTOM ELEV.	TOP ELEV.	DEPTH
		(cu.ft.)	(cu.ft.)	(ft.)	(ft.)	(ft.)	(ft.)	(ft.)	(ft.)	(ft)
SB	D1	1,035	1,661	32.6	2.6	56.6	20.6	5065.5	5068.5	3.0

Spillway Design:

An overflow spillway of 4.5 foot wide by 2 foot long by 0.5 foot high spillway will be located on the downhill side of the basin. Six inch Riprap will be installed at the spillway.

## Allowable and Modeled Releases

A variance will be requested for the detention pond. See page 5 of this report for further discussion about this request. Therefore, allowable and modeled release rates are herein discussed only for the water quality pond.

Although a detention pond will not be provided for this site, a water quality pond will be installed at the southeast corner of the site and low flow swales are located around the perimeter of the site. Table 8 shows the required and provided water quality and the elevation at which WQCV is obtained in the water quality pond. The pond is designed to have a 40 hour drain time.

**Table 8 – Water Quality Pond:**

WATER QUALITY POND					
Required:		1,035 cfs			
Provided:		1,661 cfs			
Volume Method: Conic					
Contour	Volume			Stage	
Elevation	Area	Depth	Incr.	Cumm.	
(ft)	(sq. ft)	(ft)	(cu. ft.)	(cu. ft.)	
5,065.5	85	N/A	N/A	0.0	Bottom of Pond
5,066.5	349	1.00	202	202	
5,067.5	710	1.00	519	721	
5,067.9	831	0.40	327	1,048	WQCV
5,068.5	1,166	1.00	613	1,661	Top of Pond

Refer to Appendix A, B and C for calculations.

## Downstream Conveyance System

Basin D1 will flow into the water quality pond and then into the off-site grass lined swale. From there, runoff will enter the curb and gutter in Mason Street then continue southward to Bonnell Avenue. Basins D2 and D3 will enter the ditches in Jones Court and from there flow into the inlet located near the intersection of Jones Court and Mason Street. From there, flows will continue northward to Austin Avenue.

## Drainage Facility Maintenance

The ditch and storm drainage system in Jones Court and Mason Street are in public right-of-way and are maintained by the Town of Erie.

Erosion from runoff through the existing swale will be greatly reduced by re-aligning the swale away from the electric pedestals and into the existing curb and gutter in Mason Street. BMPs such as wattles or check dams will be installed in low flow swales to provide additional protection against swale erosion and larger rainfall events, particularly in the outfall ditch improvements along the south of Lot 7. The offsite grass swale will be maintained by the property owners of Lots 7 and 9 from whom maintenance agreements will be procured. An additional easement to accommodate the portion of the swale that is not within the existing easement will be obtained from the owners of Lot 9.

Once the site is fully developed the sediment basin, SB, will remain in place as the water quality pond and the site will be landscaped. The onsite swales, pond and 15" culvert and other BMP's will be maintained by the property owners.

## 4.0 DRAINAGE DESIGN CRITERIA

### Regulations and Development Criteria

This Final Drainage Report for Longs Peak Sprinkler was designed in accordance to Section 800 of the Town of Erie Storm Drainage Facilities and Urban Drainage and Flood Control District manuals, with some variance requests due to site constraints.

Per the Town of Erie Storm Drainage Facilities, Section 800 Storm Drainage, the design storm recurrence intervals for the minor storm is the 5-year and for the major storm 100-yr. The grass swale that is located offsite is designed to convey the 5 year runoff from basin D1 (1.0 cfs) and the existing capacity of the swale (approximated at 0.8cfs), for a total of 1.8 cfs. The maximum capacity of the offsite swale is 1.9 cfs.

### Hydrological Criteria

The Rational Method was used to quantify peak runoff from the historic and the developed site using UDFCD's rational method calculations. Imperviousness are UDFCD Recommended Impervious Values; C-values are from the table of Runoff Coefficients vs Watershed Imperviousness. P1 values are in accordance with Section 800 of the Town of Erie Storm Drainage Facilities and are used to calculate Intensities based on storm duration. Runoff is then calculated using the rational method  $Q = CIA$ , where C is the composite C for the basin, I is the intensity and A is area.

Grass swales were designed using UDFCD "Stormwater Best Management Practice Design Workbook" sheet GS, using 5 year runoff rates. The WQCV was calculated using "Stormwater Best Management Practice Design Workbook", sheet EDB.

### Hydraulic Criteria

This lot is an undeveloped site located in Austin Industrial Park. An existing off-site drainage system consists of curbs, gutters, inlets, storm sewers, ditches and swales. This site will access that drainage system.

The proposed drainage system for this site consists of onsite grass swales with slopes between 4:1 and 6:1, a water quality pond with a 6" riser pipe and an offsite grass lined v-swale with 4:1 side slopes.

All swales were designed for the 5-year storm event; however basin D1 drains to the east and west and has two swales. Each swale in basin D1 was designed for ½ of the 5 year runoff. The offsite grass swale was sized for the onsite 5 year storm event (1.0 cfs) plus the capacity of the existing swale (0.8 cfs) for a total capacity of 1.9 cfs.

## 5.0 POST CONSTRUCTION STORMWATER MANAGEMENT

### Stormwater Quality Control Measures

Post-development storm water quality will be controlled by the vegetated and low-slope swales around the perimeter of the property as well as the proposed water quality pond. Riprap will be located at the overflow area of the water quality pond. Runoff from the pond will flow into the grass swale. In addition, some construction BMPs, such as riprap, silt fences, inlet protection and the water quality pond shall be maintained and remain in place until the site is stabilized with approximately 70% growth, to ensure limited erosion of the soils. At the end of construction sediment basin SB will remain in place as a permanent water quality pond. The pond, swales, seeded areas and other permanent erosion control methods are to be maintained by the property owner or assigns. The grass lined v-swale

extending from the southeast corner of this site to Mason Street will direct flows into the existing curb and gutter in Mason Street. This will alleviate the erosion that is currently occurring through that area and around the existing utility boxes.

## 6.0 CONCLUSION

This report is written to describe the developed drainage conditions for the proposed commercial development known as Longs Peak Sprinkler. This Final Drainage Report for Longs Peak Sprinkler was designed in accordance with Section 800 of the Town of Erie Storm Drainage Facilities and Urban Drainage and Flood Control District manuals and with associated variances for requirements for drainage design, detention pond and underdrains for swales.

## 7.0 REFERENCES

- 1) *Town of Erie Storm Drainage Facilities Section 800*
- 2) *Web Soil Survey 2.0, National Cooperative Soil Survey, Weld County, Colorado, Southern Part*  
United States Department of Agriculture, Natural Resources Conservation Service  
<http://websoilsurvey.nrcs.usda.gov>
- 3) *Urban Storm Drainage Criteria Manual, Volume 1,2 June 2001 revised April 2008 and Volume 3, November 2010 edition*, Urban Drainage and Flood Control District
- 4) *Final Drainage Report for Austin Industrial Park, Erie, Colorado, January 1998, by Acklam Associates, Inc.*

**DESIGN DATA****Design References**

- AutoCAD CIVIL 3D
- Stormwater Best Management Practice Design Workbook (UD-BMP), Sheet GS. Version 3.03a, December 2013. Urban Drainage and Flood Control District.
- Stormwater Best Management Practice Design Workbook (UD-BMP), Sheet EDB. Version 3.03a, December 2013. Urban Drainage and Flood Control District.
- Section SC-7, Urban Drainage and Flood Control District.
- Town of Erie Standards and Specifications Section 800 – Storm Drainage Facilities, 2012

**Design Storms – Town of Erie**

Minor Storm – 5 YEAR (Design)

Major Storm - 100 YEAR (Design)

**Runoff Coefficients** – UDFCD Table 6-3 and Table 6-5 Type B Soils.**Time of Concentration (Tc)** – UDFCD**One hour precipitation** – Section 800 Town of Erie**Rainfall Intensities (I)** – UDFCD**Required 5-Year Swale Capacity** - UDFCD**Runoff Quantities Calculated by Rational Method** – UDFCD

Q=CIA

**Manning's *n* Values**

PVC	n = 0.011
RCP	n = 0.013
GRASS SWALE	n = 0.08
CONCRETE PAN	n = 0.013

# APPENDIX A

## Supporting Reference Information

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# VICINITY MAP

## 780 JONES COURT

### ERIE, CO

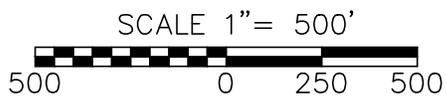
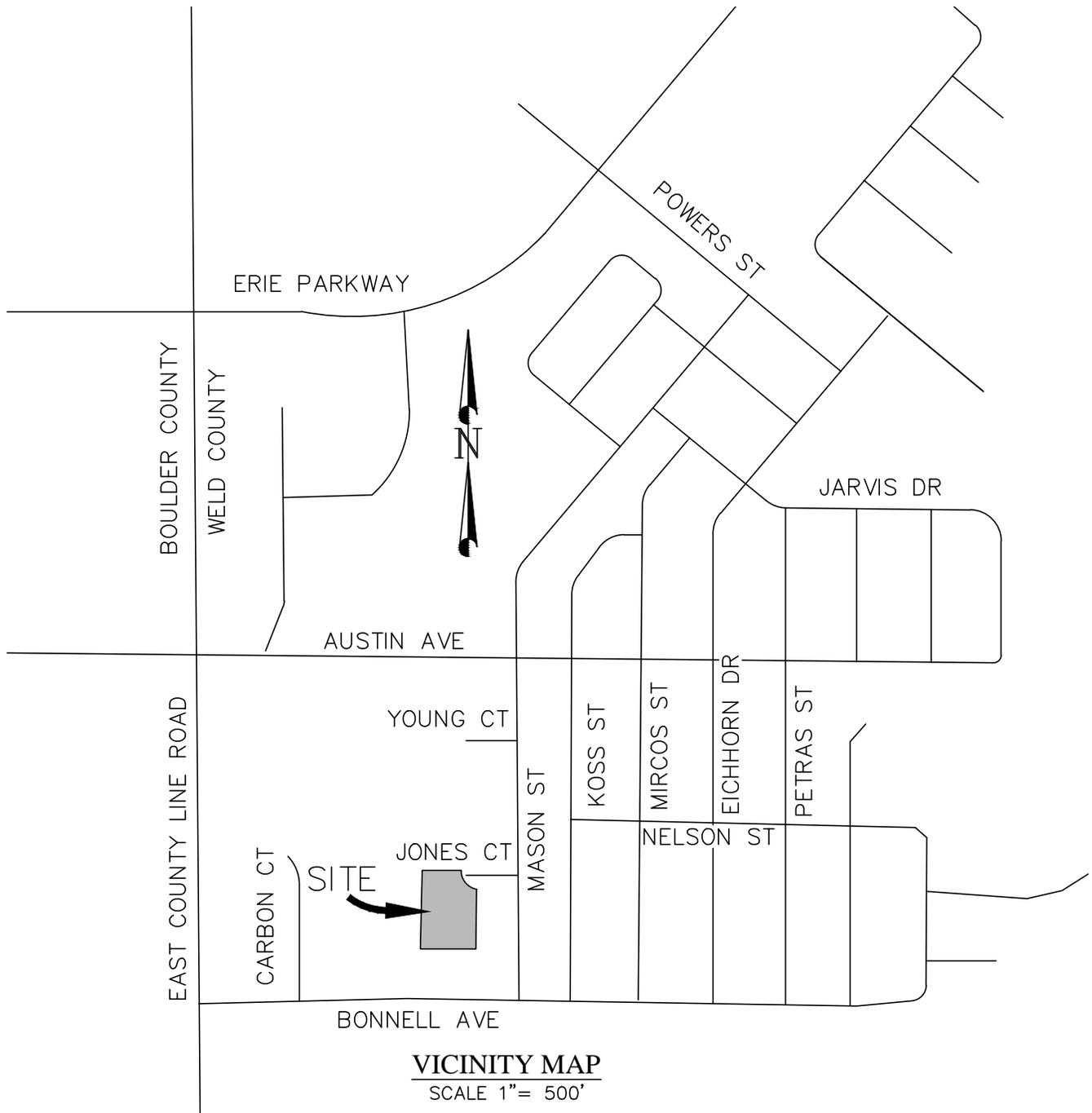
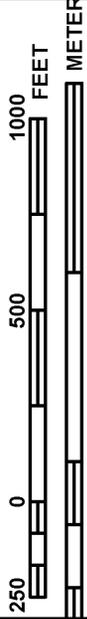


FIGURE 1



MAP SCALE 1" = 500'



NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0443J

**FIRM**  
FLOOD INSURANCE RATE MAP  
BOULDER COUNTY,  
COLORADO  
AND INCORPORATED AREAS

PANEL 443 OF 615

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
BOULDER COUNTY	080023	0443	J
ERIE, TOWN OF	080181	0443	J
LAFAYETTE, CITY OF	080028	0443	J

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.



MAP NUMBER  
08013C0443J

MAP REVISED  
DECEMBER 18, 2012

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at [www.msc.fema.gov](http://www.msc.fema.gov)

Cottonwood

JOINS PANEL 0441

3125000 FT

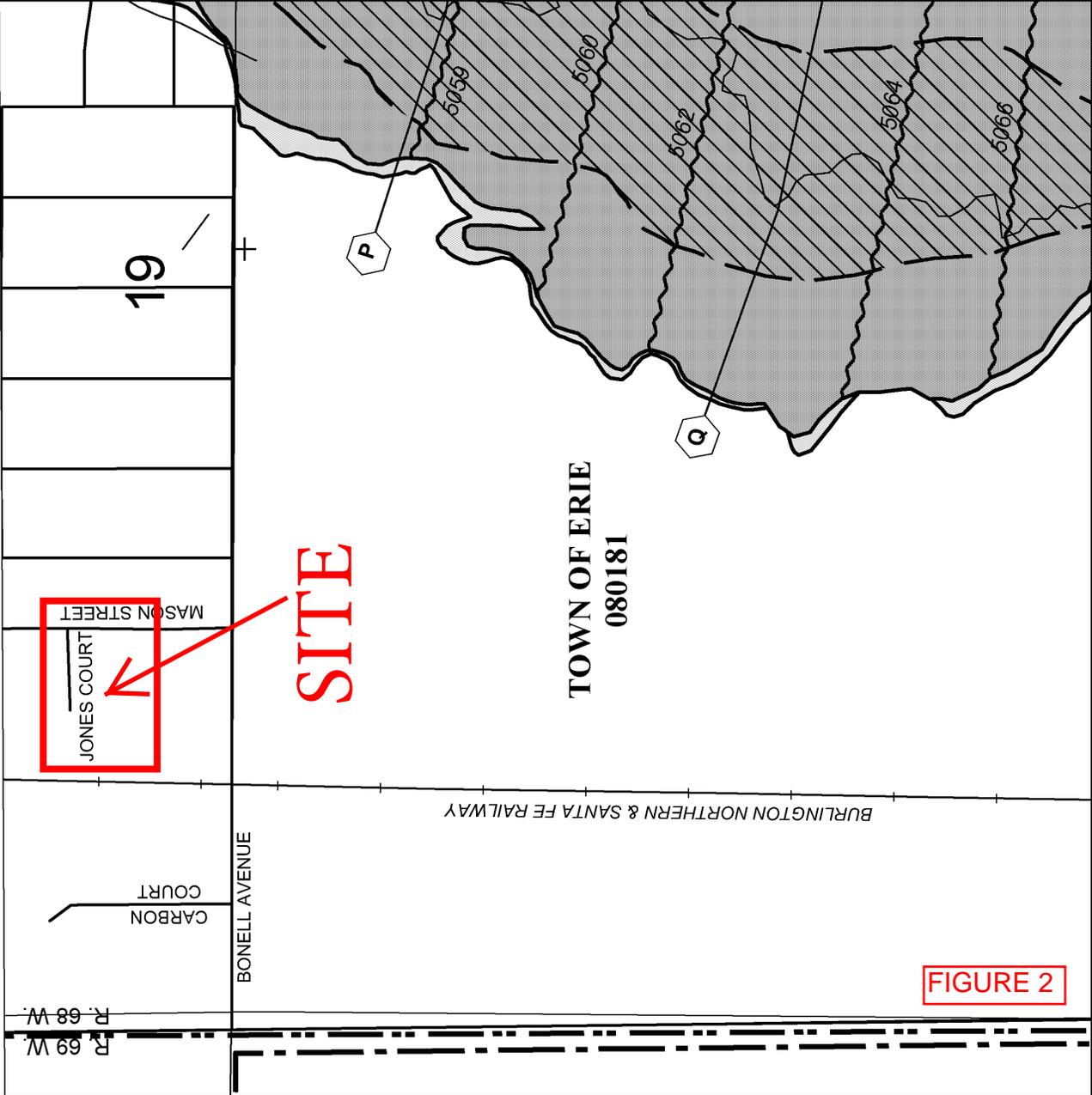
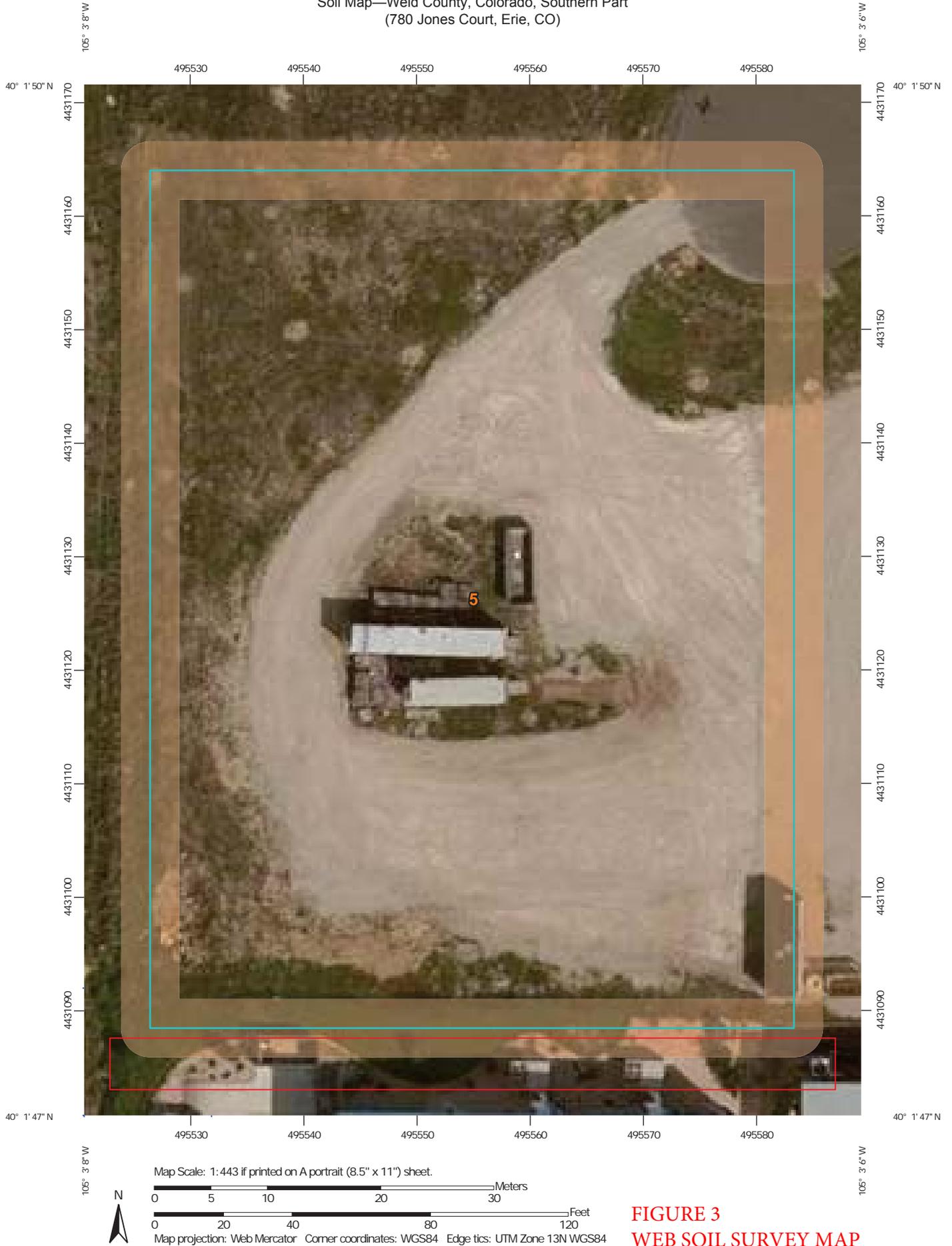


FIGURE 2

Soil Map—Weld County, Colorado, Southern Part  
(780 Jones Court, Erie, CO)



**FIGURE 3**  
**WEB SOIL SURVEY MAP**

## MAP LEGEND

 Area of Interest (AOI)	 Spoil Area
 Soil Map Unit Polygons	 Stony Spot
 Soil Map Unit Lines	 Very Stony Spot
 Soil Map Unit Points	 Wet Spot
 Special Point Features	 Other
 Blowout	 Special Line Features
 Borrow Pit	<b>Water Features</b>
 Clay Spot	 Streams and Canals
 Closed Depression	<b>Transportation</b>
 Gravel Pit	 Rails
 Gravelly Spot	 Interstate Highways
 Landfill	 US Routes
 Lava Flow	 Major Roads
 Marsh or swamp	 Local Roads
 Mine or Quarry	<b>Background</b>
 Miscellaneous Water	 Aerial Photography
 Perennial Water	
 Rock Outcrop	
 Saline Spot	
 Sandy Spot	
 Severely Eroded Spot	
 Sinkhole	
 Slide or Slip	
 Sodic Spot	

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

**Warning:** Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service  
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>  
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Weid County, Colorado, Southern Part  
Survey Area Data: Version 14, Sep 22, 2015

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 30, 2014—Sep 18, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

## Map Unit Legend

Weld County, Colorado, Southern Part (CO618)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
5	Ascalon sandy loam, 0 to 3 percent slopes	1.1	100.0%
<b>Totals for Area of Interest</b>		<b>1.1</b>	<b>100.0%</b>

## Weld County, Colorado, Southern Part

### 5—Ascalon sandy loam, 0 to 3 percent slopes

#### Map Unit Setting

*National map unit symbol:* 2swl3

*Elevation:* 3,870 to 5,960 feet

*Mean annual precipitation:* 12 to 16 inches

*Mean annual air temperature:* 46 to 57 degrees F

*Frost-free period:* 135 to 160 days

*Farmland classification:* Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60

#### Map Unit Composition

*Ascalon and similar soils:* 85 percent

*Minor components:* 15 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

#### Description of Ascalon

##### Setting

*Landform:* Interfluves, plains

*Landform position (two-dimensional):* Summit

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Parent material:* Wind-reworked alluvium and/or calcareous sandy eolian deposits

##### Typical profile

*Ap - 0 to 6 inches:* sandy loam

*Bt1 - 6 to 12 inches:* sandy clay loam

*Bt2 - 12 to 19 inches:* sandy clay loam

*Bk - 19 to 35 inches:* sandy clay loam

*C - 35 to 80 inches:* sandy loam

##### Properties and qualities

*Slope:* 0 to 3 percent

*Depth to restrictive feature:* More than 80 inches

*Natural drainage class:* Well drained

*Runoff class:* Low

*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high  
(0.60 to 2.00 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Calcium carbonate, maximum in profile:* 10 percent

*Salinity, maximum in profile:* Nonsaline to very slightly saline (0.1 to 2.0 mmhos/cm)

*Sodium adsorption ratio, maximum in profile:* 1.0

*Available water storage in profile:* Moderate (about 7.7 inches)

##### Interpretive groups

*Land capability classification (irrigated):* 3e

*Land capability classification (nonirrigated):* 4c

*Hydrologic Soil Group:* B

*Ecological site:* Sandy Plains (R067BY024CO)

*Hydric soil rating:* No

**Minor Components**

**Olnest**

*Percent of map unit:* 10 percent  
*Landform:* Interfluves  
*Landform position (two-dimensional):* Summit  
*Landform position (three-dimensional):* Tread  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Ecological site:* Sandy Plains (R067BY024CO)  
*Hydric soil rating:* No

**Vona**

*Percent of map unit:* 5 percent  
*Landform:* Interfluves  
*Landform position (two-dimensional):* Summit  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Ecological site:* Sandy Plains (R067BY024CO)  
*Hydric soil rating:* No

# APPENDIX B

## Hydrologic Calculations

---



**Recommended Percent Impervious Values for Land Type**

Land Use or Surface Characteristics	Percent Imperviousness
<b>Business:</b>	
Commercial areas	95
Neighborhood areas	85
<b>Residential:</b>	
Single-family	*
Multiunit (detached)	60
Multiunit (attached)	75
Half-acre lot or larger	*
Apartments	80
<b>Industrial:</b>	
Light areas	80
Heavy areas	90
<b>Parks, cemeteries:</b>	5
<b>Playgrounds:</b>	10
<b>Schools:</b>	50
<b>Railroad yard areas:</b>	15
<b>Undeveloped areas:</b>	
Historical Flow Analysis	2
Greenbelts, agricultural Off-site flow analysis (when land use not defined)	45
<b>Streets:</b>	
Paved	100
Gravel (packed)	40
<b>Driveways and sidewalks:</b>	90
<b>Roofs:</b>	90
Lawns, sandy soil	0
Lawns, clayey soil	0

\*Refer to Figures RO-3 through RO-5 in Runoff Chapter of USDCM.



**INTENSITY-DURATION CURVE DEVELOPMENT**

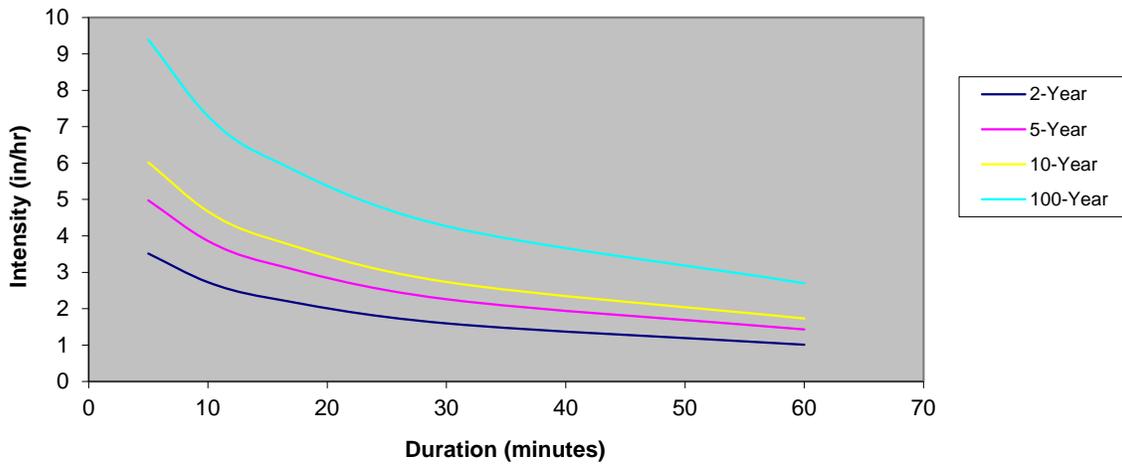
**I. One-hr Precipitation Values for Section 14, T2N, R68W**

Return Period (Years)	2	5	10	100
*Depth (Inches)	1.01	1.43	1.73	2.70

\*From NOAA Atlas 2, Vol. III, Colorado 1973

Duration (min)	Duration Factor	2-Year		5-Year		10-Year		100-Year	
		Depth (in)	Intensity (in/hour)						
5	0.29	0.293	3.515	0.415	4.98	0.502	6.02	0.783	9.40
10	0.45	0.455	2.727	0.644	3.86	0.779	4.67	1.215	7.29
15	0.57	0.576	2.303	0.815	3.26	0.986	3.94	1.539	6.16
30	0.79	0.798	1.596	1.130	2.26	1.367	2.73	2.133	4.27
60	1.00	1.010	1.010	1.430	1.43	1.730	1.73	2.700	2.70

**INTENSITY-DURATION-FREQUENCY CURVES**





## Runoff Coefficient vs. Watershed Imperviousness

Based on Runoff Coefficient estimating equation published by Urbonas, et.al. (1990) & WEF (1998)

### Basic equation for NRCS Soil Types C & D:

$$C_{CD} = K_{CD} + (0.858*i^3 - 0.786*i^2 + 0.774*i + 0.04)$$

### Basic equation for NRCS Soil Type A:

$$C_A = K_A + (1.31*i^3 - 1.44*i^2 + 1.135*i - 0.12) \text{ in which use values for } C_A > 0$$

in which:  $i = I_a/100$ , imperviousness ratio

Imperv. Ratio ( % )	Values of Runoff Coefficient $C_{CD}$										Values of Runoff Coefficient $C_A$										Values of Runoff Coefficient $C_H$									
	Type A NRCS Hydrologic Soils Group										Type B NRCS Hydrologic Soils Group										Type C NRCS Hydrologic Soils Group									
	C <sub>2</sub>	C <sub>5</sub>	C <sub>10</sub>	C <sub>25</sub>	C <sub>50</sub>	C <sub>100</sub>	C <sub>2</sub>	C <sub>5</sub>	C <sub>10</sub>	C <sub>25</sub>	C <sub>50</sub>	C <sub>100</sub>	C <sub>2</sub>	C <sub>5</sub>	C <sub>10</sub>	C <sub>25</sub>	C <sub>50</sub>	C <sub>100</sub>	C <sub>2</sub>	C <sub>5</sub>	C <sub>10</sub>	C <sub>25</sub>	C <sub>50</sub>	C <sub>100</sub>						
0.00	0.04	0.15	0.25	0.37	0.44	0.50	0.00	0.09	0.17	0.24	0.32	0.00	0.09	0.17	0.24	0.32	0.02	0.12	0.21	0.31	0.36	0.41								
0.02	0.06	0.16	0.26	0.38	0.45	0.51	0.00	0.09	0.17	0.24	0.32	0.00	0.09	0.17	0.24	0.32	0.03	0.13	0.21	0.31	0.36	0.41								
0.05	0.08	0.18	0.28	0.39	0.46	0.52	0.00	0.09	0.16	0.23	0.31	0.04	0.13	0.22	0.31	0.36	0.04	0.13	0.22	0.31	0.36	0.41								
0.10	0.11	0.21	0.30	0.41	0.48	0.53	0.00	0.08	0.16	0.22	0.26	0.06	0.15	0.23	0.32	0.37	0.06	0.15	0.23	0.32	0.37	0.41								
0.15	0.14	0.24	0.32	0.43	0.49	0.54	0.02	0.10	0.17	0.23	0.27	0.30	0.08	0.17	0.25	0.33	0.08	0.17	0.25	0.33	0.38	0.42								
0.20	0.17	0.26	0.34	0.44	0.50	0.55	0.06	0.13	0.20	0.26	0.30	0.33	0.12	0.20	0.27	0.35	0.12	0.20	0.27	0.35	0.40	0.44								
0.25	0.20	0.28	0.36	0.46	0.52	0.56	0.09	0.16	0.23	0.29	0.32	0.35	0.15	0.22	0.30	0.37	0.15	0.22	0.30	0.37	0.42	0.46								
0.30	0.22	0.30	0.38	0.47	0.53	0.57	0.13	0.19	0.25	0.31	0.34	0.37	0.18	0.25	0.32	0.39	0.18	0.25	0.32	0.39	0.43	0.47								
0.35	0.25	0.33	0.40	0.48	0.54	0.57	0.16	0.22	0.28	0.33	0.36	0.39	0.20	0.27	0.34	0.41	0.20	0.27	0.34	0.41	0.45	0.48								
0.40	0.28	0.35	0.42	0.50	0.55	0.58	0.19	0.25	0.30	0.35	0.38	0.41	0.23	0.30	0.36	0.42	0.23	0.30	0.36	0.42	0.46	0.50								
0.45	0.31	0.37	0.44	0.51	0.56	0.59	0.22	0.27	0.33	0.37	0.40	0.43	0.26	0.32	0.38	0.44	0.26	0.32	0.38	0.44	0.48	0.51								
0.50	0.34	0.40	0.46	0.53	0.57	0.60	0.25	0.30	0.35	0.40	0.42	0.45	0.29	0.35	0.40	0.46	0.29	0.35	0.40	0.46	0.50	0.52								
0.55	0.37	0.43	0.48	0.55	0.59	0.62	0.29	0.33	0.38	0.42	0.45	0.47	0.33	0.38	0.43	0.48	0.33	0.38	0.43	0.48	0.52	0.54								
0.60	0.41	0.46	0.51	0.57	0.61	0.63	0.33	0.37	0.41	0.45	0.47	0.50	0.37	0.41	0.46	0.51	0.37	0.41	0.46	0.51	0.54	0.56								
0.65	0.45	0.49	0.54	0.59	0.63	0.65	0.37	0.41	0.45	0.49	0.51	0.53	0.41	0.45	0.49	0.54	0.41	0.45	0.49	0.54	0.57	0.59								
0.70	0.49	0.53	0.57	0.62	0.66	0.68	0.42	0.45	0.49	0.53	0.54	0.56	0.45	0.49	0.53	0.58	0.45	0.49	0.53	0.58	0.60	0.62								
0.75	0.54	0.58	0.62	0.66	0.69	0.71	0.47	0.50	0.54	0.57	0.59	0.61	0.51	0.54	0.58	0.62	0.51	0.54	0.58	0.62	0.64	0.66								
0.80	0.60	0.63	0.66	0.70	0.73	0.74	0.54	0.56	0.60	0.63	0.64	0.66	0.57	0.59	0.63	0.66	0.57	0.59	0.63	0.66	0.69	0.70								
0.85	0.66	0.68	0.71	0.75	0.78	0.79	0.61	0.63	0.66	0.69	0.70	0.72	0.63	0.66	0.69	0.72	0.63	0.66	0.69	0.72	0.74	0.75								
0.90	0.73	0.75	0.77	0.80	0.83	0.83	0.69	0.71	0.73	0.76	0.77	0.79	0.71	0.73	0.75	0.78	0.71	0.73	0.75	0.78	0.80	0.81								
0.95	0.80	0.82	0.84	0.87	0.89	0.89	0.78	0.80	0.82	0.84	0.85	0.86	0.79	0.81	0.83	0.85	0.79	0.81	0.83	0.85	0.87	0.88								
1.00	0.89	0.90	0.92	0.94	0.96	0.96	0.89	0.90	0.92	0.94	0.95	0.96	0.89	0.90	0.92	0.94	0.89	0.90	0.92	0.94	0.95	0.96								

Notes: For Type B Soils, use the average of coefficients  $C_{CD}$  and  $C_A$ .

When the Runoff Coefficient in above table is < 0, use 0.

When compositing the Runoff Coefficient for different soil types, use the table values above regardless if they are < 0.



**Historic Sub-Basin Coefficients**

Weighted Coefficients for HSG "B" Soils							
BASIN	LAND USE	AREA (ac.)	C <sub>2</sub>	C <sub>5</sub>	C <sub>10</sub>	C <sub>100</sub>	I(%)
H1	Undeveloped	0.520	0.05	<b>0.14</b>	0.23	<b>0.42</b>	5%
H2	Undeveloped	0.127	0.15	<b>0.23</b>	0.30	<b>0.46</b>	24%
H3	Undeveloped	0.116	0.09	<b>0.17</b>	0.26	<b>0.44</b>	12%
H4	Undeveloped	0.206	0.08	<b>0.15</b>	0.25	<b>0.43</b>	7%
Total Area		0.969					

BASIN	LAND USE	AREA (ac.)	I(%)
H1	Bare Ground	0.451	0%
	Gravel	0.069	40%
Total Area		0.520	
<b>Composite</b>			<b>5.3%</b>

BASIN	LAND USE	AREA (ac.)	C <sub>5</sub>	C <sub>100</sub>
H1	Bare Ground	0.451	0.05	0.19
	Gravel	0.069	0.02	0.03
Total Area		0.520		
<b>Composite</b>			<b>0.14</b>	<b>0.42</b>

BASIN	LAND USE	AREA (ac.)	I(%)
H2	Bare Ground	0.050	0%
	Gravel	0.077	40%
Total Area		0.127	
<b>Composite</b>			<b>24%</b>

BASIN	LAND USE	AREA (ac.)	C <sub>5</sub>	C <sub>100</sub>
H2	Bare Ground	0.050	0.01	0.02
	Gravel	0.077	0.02	0.04
Total Area		0.127		
<b>Composite</b>			<b>0.23</b>	<b>0.46</b>

BASIN	LAND USE	AREA (ac.)	I(%)
H3	Bare Ground	0.080	0%
	Gravel	0.036	40%
Total Area		0.116	
<b>Composite</b>			<b>12%</b>

BASIN	LAND USE	AREA (ac.)	C <sub>5</sub>	C <sub>100</sub>
H3	Bare Ground	0.080	0.01	0.03
	Gravel	0.036	0.01	0.02
Total Area		0.116		
<b>Composite</b>			<b>0.17</b>	<b>0.44</b>

BASIN	LAND USE	AREA (ac.)	I(%)
H4	Bare Ground	0.170	0%
	Gravel	0.036	40%
Total Area		0.206	
<b>Composite</b>			<b>7%</b>

BASIN	LAND USE	AREA (ac.)	C <sub>5</sub>	C <sub>100</sub>
H4	Bare Ground	0.170	0.02	0.07
	Gravel	0.036	0.01	0.02
Total Area		0.206		
<b>Composite</b>			<b>0.15</b>	<b>0.43</b>



**Developed Sub-Basin Coefficients**

**Weighted Coefficients for HSG "B" Soils**

BASIN	LAND USE	AREA (ac.)	C <sub>2</sub>	C <sub>5</sub>	C <sub>10</sub>	C <sub>100</sub>	I(%)	Location
D1	Commercial	0.535	0.46	0.51	0.56	0.67	56%	South
D2	Commercial	0.237	0.58	0.62	0.67	0.76	68%	West
D3	Commercial	0.197	0.64	0.67	0.71	0.79	75%	East
Total Area		0.969						

BASIN	LAND USE	AREA (ac.)	I(%)
D1	Landscaped	0.157	0%
	Roof / Concrete	0.096	90%
	Pavement	0.165	100%
	Gravel	0.117	40%
Total Area		0.535	
<b>Composite</b>			<b>56%</b>

BASIN	LAND USE	AREA (ac.)	C <sub>2</sub>	C <sub>5</sub>	C <sub>10</sub>	C <sub>100</sub>
D1	Landscaped	0.157	0.00	0.02	0.03	0.06
	Roof / Concrete	0.096	0.07	0.07	0.07	0.08
	Pavement	0.165	0.15	0.15	0.15	0.16
	Gravel	0.117	0.03	0.03	0.04	0.06
Total Area		0.535				
<b>Composite</b>			<b>0.46</b>	<b>0.51</b>	<b>0.56</b>	<b>0.67</b>

BASIN	LAND USE	AREA (ac.)	I(%)
D2	Landscaped	0.070	0%
	Roof / Concrete	0.059	90%
	Pavement	0.108	100%
Total Area		0.237	
<b>Composite</b>			<b>68%</b>

BASIN	LAND USE	AREA (ac.)	C <sub>2</sub>	C <sub>5</sub>	C <sub>10</sub>	C <sub>100</sub>
D2	Landscaped	0.070	0.00	0.01	0.01	0.03
	Roof / Concrete	0.059	0.04	0.04	0.04	0.05
	Pavement	0.108	0.10	0.10	0.10	0.10
Total Area		0.237				
<b>Composite</b>			<b>0.58</b>	<b>0.62</b>	<b>0.67</b>	<b>0.76</b>

BASIN	LAND USE	AREA (ac.)	I(%)
D3	Landscaped	0.044	0%
	Roof / Concrete	0.058	90%
	Pavement	0.095	100%
Total Area		0.197	
<b>Composite</b>			<b>75%</b>

BASIN	LAND USE	AREA (ac.)	C <sub>2</sub>	C <sub>5</sub>	C <sub>10</sub>	C <sub>100</sub>
D3	Landscaped	0.044	0.00	0.01	0.01	0.02
	Roof / Concrete	0.058	0.04	0.04	0.04	0.05
	Pavement	0.095	0.08	0.09	0.09	0.09
Total Area		0.197				
<b>Composite</b>			<b>0.64</b>	<b>0.67</b>	<b>0.71</b>	<b>0.79</b>



**RUNOFF RELEASE RATE SUMMARY**

Historic Release Rates

BASIN	AREA (acres)	2YR (cfs)	5YR (cfs)	10YR (cfs)	100YR (cfs)
H1	0.52	0.1	0.3	0.7	1.9
H2	0.13	0.1	0.1	0.2	0.4
H3	0.12	0.0	0.1	0.1	0.4
H4	0.21	0.0	0.1	0.2	0.6
Total	0.97	0.2	0.6	1.2	3.3

Developed Runoff Rates for Undetained Basins

INDIVIDUAL UNDETAINED BASINS	AREA (acres)	2YR (cfs)	5YR (cfs)	10YR (cfs)	100YR (cfs)
D2	0.237	0.5	0.7	0.9	1.6
D3	0.197	0.4	0.5	0.7	1.2
	0.434				

Developed Runoff Rates for Detained Sub-Basins

DESIGN POINT TO SEDIMENT BASIN	AREA (acres)	2YR (cfs)	5YR (cfs)	10YR (cfs)	100YR (cfs)
D1	0.535	0.6	1.0	1.3	2.4
Total Detained Runoff	0.535	0.6	1.0	1.3	2.4

# APPENDIX B

## Hydrologic Calculations

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HISTORIC



**EXISTING RUNOFF**

\*Basins soils are HSG B

BASIN	AREAS (AC)	% IMP.	C <sub>2</sub>	C <sub>5</sub>	C <sub>10</sub>	C <sub>100</sub>	AVG. SLOP	SOIL TYPE
H1	0.52	5%	0.05	0.14	0.23	0.42	3.3%	B
H2	0.13	24%	0.15	0.23	0.30	0.46	1.6%	B
H3	0.12	12%	0.09	0.17	0.26	0.44	0.1%	B
H4	0.21	7%	0.08	0.15	0.25	0.43	0.5%	B
TOTAL	0.97	ACRES						

**EXISTING TIME OF CONCENTRATION**

BASIN	INITIAL/OVERLAND TIME (ti)				TRAVEL TIME (tt)				t <sub>c</sub> =t <sub>i</sub> +t <sub>t</sub>	C <sub>v</sub>	CHECK t <sub>i</sub> = L/180 + 10
	C <sub>5</sub>	LENGTH Ft	SLOPE %	t <sub>i</sub> Min	LENGTH Ft	SLOPE %	VEL. FPS	t <sub>t</sub> Min			
	FINAL Min										
H1	0.14	35	7.0%	5	68	1.50	12.2	0.09	6	10	11
H2	0.23	90	1.2%	14	53	2.30	15.2	0.06	14	10	11
H3	0.17	46	1.1%	11	33	0.80			11	10	10
H4	0.15	241	0.5%	34					34	10	11

Velocity Coefficients (Table RO-2)

- 2.5 Heavy Meadow
- 5 Tillage / Field
- 7 Short pasture & lawns
- 10 Nearly bare ground
- 15 Grassed waterway
- 20 Paved areas and shallow paved swales

$$t_i = 0.395 \frac{(1.1 - C_5)L^{1/2}}{S^{1/3}} \quad t_t = \frac{L}{60V}$$

$$V = C_v \cdot S^{1/2}$$

C<sub>f</sub> = Frequency Adjustment Factor

C<sub>f</sub> 2 and 10 year = 1.0

C<sub>v</sub> = Velocity Coefficients

**EXISTING RUNOFF**

BASIN	T <sub>c</sub> (min)	I <sub>2</sub> (in/hr)	I <sub>5</sub> (in/hr)	I <sub>10</sub> (in/hr)	I <sub>100</sub> (in/hr)	AREA (ac.)	Q <sub>2</sub> (cfs)	Q <sub>5</sub> (cfs)	Q <sub>10</sub> (cfs)	Q <sub>100</sub> (cfs)
H1	6	3.26	4.61	5.58	8.71	0.52	0.1	0.3	0.7	1.9
H2	11	2.63	3.72	4.50	7.03	0.13	0.1	0.1	0.2	0.4
H3	10	2.69	3.80	4.60	7.18	0.12	0.0	0.1	0.1	0.4
H4	11	2.60	3.68	4.45	6.94	0.21	0.0	0.1	0.2	0.6

TOTAL 1.0 0.2 0.6 1.2 3.3 Total runoff

**RATIONAL METHOD**

$$Q = CIA$$

Q - FLOW IN CUBIC FEET PER SECOND

C - RUNOFF FACTOR

A - AREA

I - AVERAGE RAINFALL INTENSITY

$$I = (28.5 P) / ((10 + T_c)^{0.786})$$

# APPENDIX B

## Hydrologic Calculations

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DEVELOPED



Project: Long's Peak Sprinkler  
 Project #: 197.001  
 Date: May 13, 2016

**TIME OF CONCENTRATION**

DEVELOPED			BASIN DATA			INITIAL/OVERLAND TIME (Tc)			TRAVEL TIME (Tt)					Tc CHECK (Urbanized Basins)			FINAL Tc	REMARKS
BASIN ID:	AREA (acres)	C <sub>s</sub>	LENGTH (ft)	AVG. SLOPE (%)	Ti (min)	LENGTH (ft)	AVG. SLOPE (%)	C <sub>v</sub>	VEL (fps)	Tt (min)	COMP Tc	TOTAL LENGTH (ft)	Tc=(L/180)+10 (min)	FINAL Tc (min)	REMARKS			
D1	0.535	0.51	300	1.0	19				0.0	0.00	19	300	12	12	Min			
D2	0.237	0.62	130	4.0	6				0.0	0.00	6	130	11	6	Min			
D3	0.197	0.67	196	1.5	9				0.0	0.00	9	196	11	9	Min			

C<sub>v</sub> - Conveyance Coefficients

- 2.5 Heavy Meadow
- 5 Tillage / Field
- 7 Short pasture & lawns
- 10 Nearly bare ground
- 15 Grassed waterway
- 20 Paved areas and shallow paved swales

$$t_t = \frac{0.395(1.1 - C_s) L^{1/2}}{s^{1/3}}$$

$$t_t = \frac{L}{60V} \quad V = C_v \cdot S^{1/2}$$

# APPENDIX C

## Hydraulic Calculations

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**DEVELOPED RUNOFF SUMMARY TABLE**

			RUNOFF COEFFICIENTS				DIRECT RUNOFF				TOTAL RUNOFF				
DESIGN POINT	AREA DESIG.	AREA (Acres)	C2	C5	C10	C100	Q2 (CFS)	Q5 (CFS)	Q10 (CFS)	Q100 (CFS)	Q2 (CFS)	Q5 (CFS)	Q10 (CFS)	Q100 (CFS)	COMMENTS
1	D1	0.535	0.46	0.51	0.56	0.67	0.62	1.0	1.3	2.4	0.6	1.0	1.3	2.4	To Sediment Basin then to WQ1 swale then east to Mason Street
2	D2	0.237	0.58	0.62	0.67	0.76	0.45	0.7	0.9	1.6	0.5	0.7	0.9	1.6	To Swale S2 then to Ditch then north
3	D3	0.197	0.64	0.67	0.71	0.79	0.36	0.5	0.7	1.2	0.4	0.5	0.7	1.2	To Swale S3 then to Culvert then north



**DEVELOPED RUNOFF  
 (RATIONAL METHOD PROCEDURE)  
 2 - YEAR**

DESIGN POINT	DIRECT RUNOFF							TOTAL RUNOFF				CHANNEL				PIPE			TRAVEL TIME			COMMENTS	
	AREA DESIG.	AREA (Acres)	RUNOFF COEFF	Tc (min)	C A (Acres)	I (in/hour)	Q (cfs)	Tc (min)	C A (Acres)	I (in/hour)	Q (cfs)	FLOW (CFS)	SLOPE (%)	LENGTH (ft)	VELOCITY (fps)	FLOW (CFS)	SLOPE (%)	PIPE DIA. (in)	LENGTH (ft)	VELOCITY (fps)	Tt (min)		
1	D1	0.535	0.46	12	0.24	2.54	0.6																To Sediment Basin then to W/Q1 swale then east to Mason
2	D2	0.237	0.58	6	0.14	3.26	0.5																To Swale S2 then to Ditch then north
3	D3	0.197	0.64	9	0.13	2.84	0.4																To Swale S3 then to Culvert then north



**DEVELOPED RUNOFF  
 (RATIONAL METHOD PROCEDURE)  
 5 - YEAR**

DESIGN POINT	DIRECT RUNOFF						TOTAL RUNOFF				CHANNEL				PIPE			TRAVEL TIME			COMMENTS
	AREA DESIG.	AREA (Acres)	RUNOFF COEFF	Tc (min)	C A (Acres)	I (in/hour)	Q (cfs)	Tc (min)	C A (Acres)	I (in/hour)	Q (cfs)	FLOW (CFS)	SLOPE (%)	LENGTH (ft)	VELOCITY (fps)	PIPE DIA. (in)	LENGTH (ft)	VELOCITY (fps)	Tt (min)		
1	D1	0.536	0.51	12	0.27	3.59	1.0													To Sediment Basin then to WC1 swale then east to Mason	
2	D2	0.237	0.62	6	0.15	4.61	0.7													To Swale S2 then to Ditch then north	
3	D3	0.197	0.67	9	0.13	4.03	0.5													To Swale S3 then to Culvert then north	



**DEVELOPED RUNOFF  
 (RATIONAL METHOD PROCEDURE)  
 10 - YEAR**

DESIGN POINT	DIRECT RUNOFF						TOTAL RUNOFF				CHANNEL				PIPE			TRAVEL TIME			COMMENTS
	AREA DESIG.	AREA (Acres)	RUNOFF COEFF	Tc (min)	C A (Acres)	I (in/hour)	Q (cfs)	Tc (min)	C A (Acres)	I (in/hour)	Q (cfs)	FLOW (CFS)	SLOPE (%)	LENGTH (ft)	VELOCITY (fps)	PIPE DIA. (in)	LENGTH (ft)	VELOCITY (fps)	Tt (min)		
1	D1	0.535	0.56	12	0.30	4.34	1.3													To Sediment Basin then to WC1 swale then east to Mason	
2	D2	0.237	0.67	6	0.16	5.58	0.9													To Swale S2 then to Ditch then north	
3	D3	0.197	0.71	9	0.14	4.87	0.7													To Swale S3 then to Culvert then north	



Project: Long's Peak Sprinkler  
 Project #: 197.001  
 Date: May 13, 2016

**DEVELOPED RUNOFF  
 (RATIONAL METHOD PROCEDURE)  
 100 - YEAR**

DESIGN POINT	DIRECT RUNOFF						TOTAL RUNOFF				CHANNEL				PIPE			TRAVEL TIME			COMMENTS
	AREA DESIG.	AREA (Acres)	RUNOFF COEFF	Tc (min)	C A (Acres)	I (in/hour)	Q (cfs)	Tc (min)	C A (Acres)	I (in/hour)	Q (cfs)	FLOW (CFS)	SLOPE (%)	LENGTH (ft)	VELOCITY (fps)	PIPE DIA. (in)	LENGTH (ft)	VELOCITY (fps)	Tt (min)		
1	D1	0.535	0.67	12.00	0.36	6.78	2.4													To Sediment Basin then to WC1 swale then east to Mason	
2	D2	0.237	0.76	6.00	0.18	8.71	1.6													To Swale S2 then to Ditch then north	
3	D3	0.197	0.79	9.00	0.16	7.61	1.2													To Swale S3 then to Culvert then north	

Sediment Basin  
Water Quality Pond

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**Design Procedure Form: Extended Detention Basin (EDB)**

**Designer:** Linda Rohlfing, PE  
**Company:** Permontes Group  
**Date:** September 5, 2016  
**Project:** Long's Peak Sprinkler  
**Location:** Erie, Colorado

<p>1. Basin Storage Volume</p> <p>A) Effective Imperviousness of Tributary Area, <math>I_a</math></p> <p>B) Tributary Area's Imperviousness Ratio (<math>i = I_a / 100</math>)</p> <p>C) Contributing Watershed Area</p> <p>D) For Watersheds Outside of the Denver Region, Depth of Average Runoff Producing Storm</p> <p>E) Design Concept (Select EURV when also designing for flood control)</p> <p>F) Design Volume (1.2 WQCV) Based on 40-hour Drain Time (<math>V_{DESIGN} = (1.0 * (0.91 * i^3 - 1.19 * i^2 + 0.78 * i) / 12 * Area * 1.2)</math>)</p> <p>G) For Watersheds Outside of the Denver Region, Water Quality Capture Volume (WQCV) Design Volume (<math>V_{WQCV\ OTHER} = (d_e * V_{DESIGN} / 0.43)</math>)</p> <p>H) User Input of Water Quality Capture Volume (WQCV) Design Volume (Only if a different WQCV Design Volume is desired)</p> <p>I) Predominant Watershed NRCS Soil Group</p> <p>J) Excess Urban Runoff Volume (EURV) Design Volume                      For HSG A: <math>EURVA = (0.1878i - 0.0104) * Area</math>                      For HSG B: <math>EURVB = (0.1178i - 0.0042) * Area</math>                      For HSG C/D: <math>EURV_{C/D} = (0.1043i - 0.0031) * Area</math> </p>	<p><math>I_a =</math> <u>63.0</u> %</p> <p><math>i =</math> <u>0.630</u></p> <p>Area = <u>0.969</u> ac</p> <p><math>d_e =</math> _____ in</p> <p>Choose One _____</p> <p><input checked="" type="radio"/> Water Quality Capture Volume (WQCV)</p> <p><input type="radio"/> Excess Urban Runoff Volume (EURV)</p> <p><math>V_{DESIGN} =</math> <u>0.024</u> ac-ft</p> <p><math>V_{DESIGN\ OTHER} =</math> _____ ac-ft</p> <p><math>V_{DESIGN\ USER} =</math> _____ ac-ft</p> <p>Choose One _____</p> <p><input type="radio"/> A</p> <p><input type="radio"/> B</p> <p><input type="radio"/> C / D</p> <p>EURV = _____ ac-ft</p>
<p>2. Basin Shape: Length to Width Ratio (A basin length to width ratio of at least 2:1 will improve TSS reduction.)</p>	<p>L : W = _____ : 1</p>
<p>3. Basin Side Slopes</p> <p>A) Basin Maximum Side Slopes (Horizontal distance per unit vertical, 4:1 or flatter preferred)</p>	<p>Z = _____ ft / ft</p>
<p>4. Inlet</p> <p>A) Describe means of providing energy dissipation at concentrated inflow locations:</p>	<p>_____</p> <p>_____</p> <p>_____</p>



Project: Long's Peak Sprinkler  
 Project #: 197.001  
 Date: May 13, 2016

**WATER QUALITY POND**

NAME	AREA	AVERAG E IMP.	WQCV	WQCV
	(ACRES)	(%)	(ac-ft)	(C.F.)
SB	0.969	63%	0.0238	1,035

$WQCV = 1 * (0.91i^3 - 1.19i^2 + 0.78i) / 12 * AREA * 1.2$  40-hr drain time

*WQCV VOLUMES REQUIRED	
WQ Vol=	0.024 AC - FT
WQ Vol=	1,035 CU.FT

\*Storage Volume calculated using the the following formula  
 $V_{1,2} = [(A_1 + A_2 + \{((A_1 * A_2)^{0.5} * d)\}] / 3$

PROVIDED WQCV VOLUMES*				
CONTOUR	AREA	STAGE VOLUME (cu-ft)	CUM. VOL. (cu-ft)	LABELS
5065.5	85		0	BOTTOM OF POND
		202		
5066.5	349		202	
		519		
5067.5	710		721	
		327		
5067.90	831		1,048	WQCV
		613		
5068.5	1,166		1,661	TOP OF POND

WQCV PROVIDED IN PERMANENT SEDIMENT BASIN

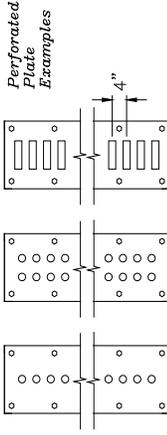
## STAGE-DISCHARGE SIZING OF THE WATER QUALITY CAPTURE VOLUME (WQCV) OUTLET

Project: Long's Peak Sprinkler  
 Basin ID: Sediment Basin, SB

**WQCV Design Volume (Input):**

Catchment Imperviousness,  $I_p$  = 63.0 percent  
 Catchment Area,  $A_c$  = 0.97 acres  
 Depth at WQCV outlet above lowest perforation,  $H$  = 2.40 feet  
 Vertical distance between rows,  $h$  = 4.00 inches  
 Number of rows,  $N_L$  = 4.00  
 Orifice discharge coefficient,  $C_{d_o}$  = 0.65  
 Slope of Basin Trickles Channel,  $S$  = 0.005 ft / ft  
 Time to Drain the Pond = 40 hours

Diameter of holes,  $D$  = 0.515 inches  
 Number of holes per row,  $N$  = 1  
 OR  
 Height of slot,  $H$  = inches  
 Width of slot,  $W$  = inches



**Watershed Design Information (Input):**

Percent Soil Type A = %  
 Percent Soil Type B = 100 %  
 Percent Soil Type C/D = %

**Outlet Design Information (Output):**

Excess Urban Runoff Volume (From Full-Spectrum Sheet) = 0.840 watershed inches  
 N/A  
**Excess Urban Runoff Volume (From Full-Spectrum Sheet) = 0.068 acre-feet**  
 Outlet area per row,  $A_o$  = 0.21 square inches  
 Total opening area at each row based on user-input above,  $A_o$  = 0.21 square inches  
 Total opening area at each row based on user-input above,  $A_o$  = 0.001 square feet

3

		Central Elevations of Rows of Holes in feet																						Σ Flow	
		Row 1	Row 2	Row 3	Row 4	Row 5	Row 6	Row 7	Row 8	Row 9	Row 10	Row 11	Row 12	Row 13	Row 14	Row 15	Row 16	Row 17	Row 18	Row 19	Row 20	Row 21	Row 22		Row 23
		5067.44	5067.82	5068.16	5068.49																				
5067.30	0.0000	0.0000	0.0000	0.0000	0.0000																				
5067.50	0.0018	0.0000	0.0000	0.0000	0.0000																				
5067.70	0.0038	0.0000	0.0000	0.0000	0.0000																				
5067.90	0.0051	0.0021	0.0000	0.0000	0.0000																				
5068.10	0.0061	0.0040	0.0000	0.0000	0.0000																				
5068.30	0.0070	0.0052	0.0028	0.0000	0.0000																				
5068.50	0.0078	0.0062	0.0044	0.0008																					

Collection Capacity for Each Row of Holes in cfs

## Description

A sediment basin is a temporary pond built on a construction site to capture eroded or disturbed soil transported in storm runoff prior to discharge from the site. Sediment basins are designed to capture site runoff and slowly release it to allow time for settling of sediment prior to discharge. Sediment basins are often constructed in locations that will later be modified to serve as post-construction stormwater basins.



**Photograph SB-1.** Sediment basin at the toe of a slope. Photo courtesy of WWE.

## Appropriate Uses

Most large construction sites (typically greater than 2 acres) will require one or more sediment basins for effective management of construction site runoff. On linear construction projects, sediment basins may be impractical; instead, sediment traps or other combinations of BMPs may be more appropriate.

Sediment basins should not be used as stand-alone sediment controls. Erosion and other sediment controls should also be implemented upstream.

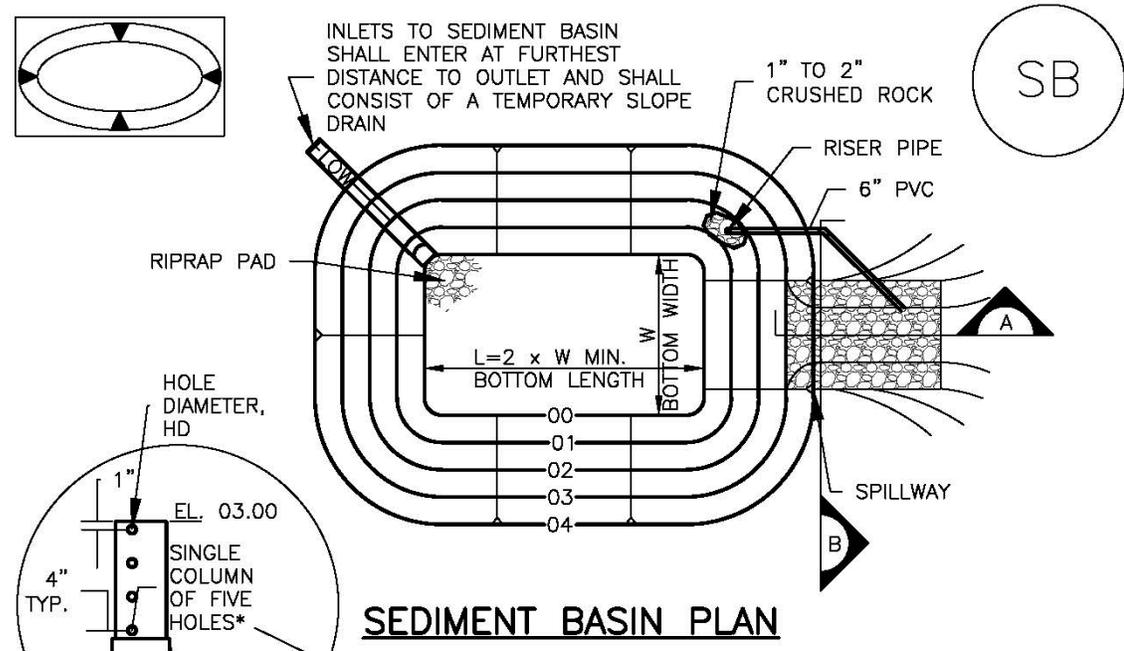
When feasible, the sediment basin should be installed in the same location where a permanent post-construction detention pond will be located.

## Design and Installation

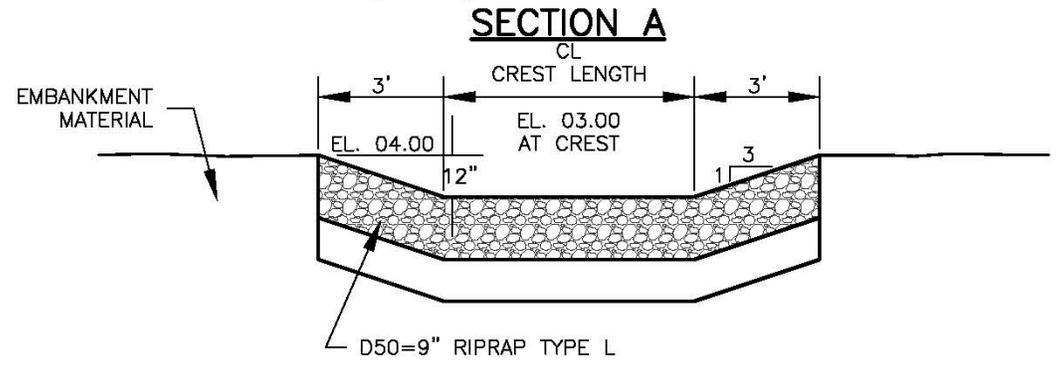
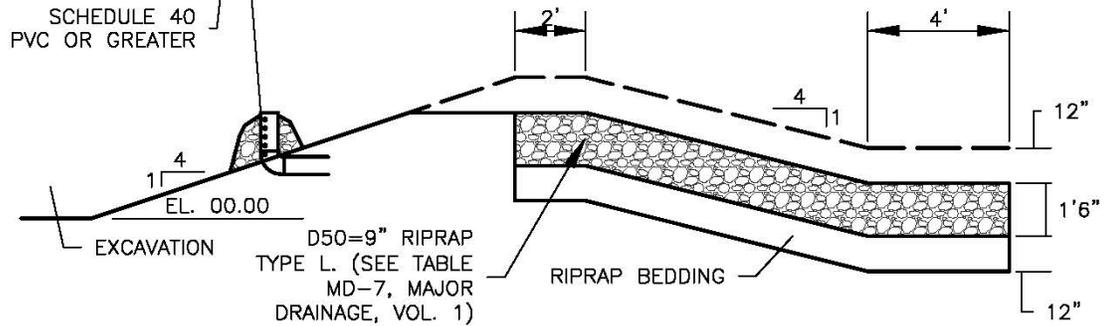
The design procedure for a sediment basin includes these steps:

- **Basin Storage Volume:** Provide a storage volume of at least 3,600 cubic feet per acre of drainage area. To the extent practical, undisturbed and/or off-site areas should be diverted around sediment basins to prevent “clean” runoff from mixing with runoff from disturbed areas. For undisturbed areas (both on-site and off-site) that cannot be diverted around the sediment basin, provide a minimum of 500 ft<sup>3</sup>/acre of storage for undeveloped (but stable) off-site areas in addition to the 3,600 ft<sup>3</sup>/acre for disturbed areas. For stable, developed areas that cannot be diverted around the sediment basin, storage volume requirements are summarized in Table SB-1.
- **Basin Geometry:** Design basin with a minimum length-to-width ratio of 2:1 (L:W). If this cannot be achieved because of site space constraints, baffling may be required to extend the effective distance between the inflow point(s) and the outlet to minimize short-circuiting.
- **Dam Embankment:** It is recommended that embankment slopes be 4:1 (H:V) or flatter and no steeper than 3:1 (H:V) in any location.

Sediment Basins	
Functions	
Erosion Control	No
Sediment Control	Yes
Site/Material Management	No



\*EXCEPT WHERE THE HOLES EXCEED 1" DIAMETER, THEN UP TO TWO COLUMNS OF SAME SIZED HOLES MAY BE USED





**Project: Long's Peak Sprinkler**  
**Project #: 197.001**  
**Date: May 13, 2016**

## EMERGENCY OVERFLOW AT SEDIMENT BASIN

### OVERFLOW WEIR

$$Q_{(WEIR)} = C(L-0.1iH)H^{3/2}$$

Undetained 100-yr flow: 2.40 cfs

$$C = 3.330$$

$$L = 2.5$$

$$H = 0.50$$

$$i = 2$$

$$Q_{(WEIR)} = 2.83 \quad \text{cfs}$$

Use: 2 foot long x 2.5 foot wide weir ft  
Spillway Elev: 5068.50

# PIPE SIZING

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# Channel Report

## Long's Peak Sprinkler 6in Pipe from Sediment Basin

### Circular

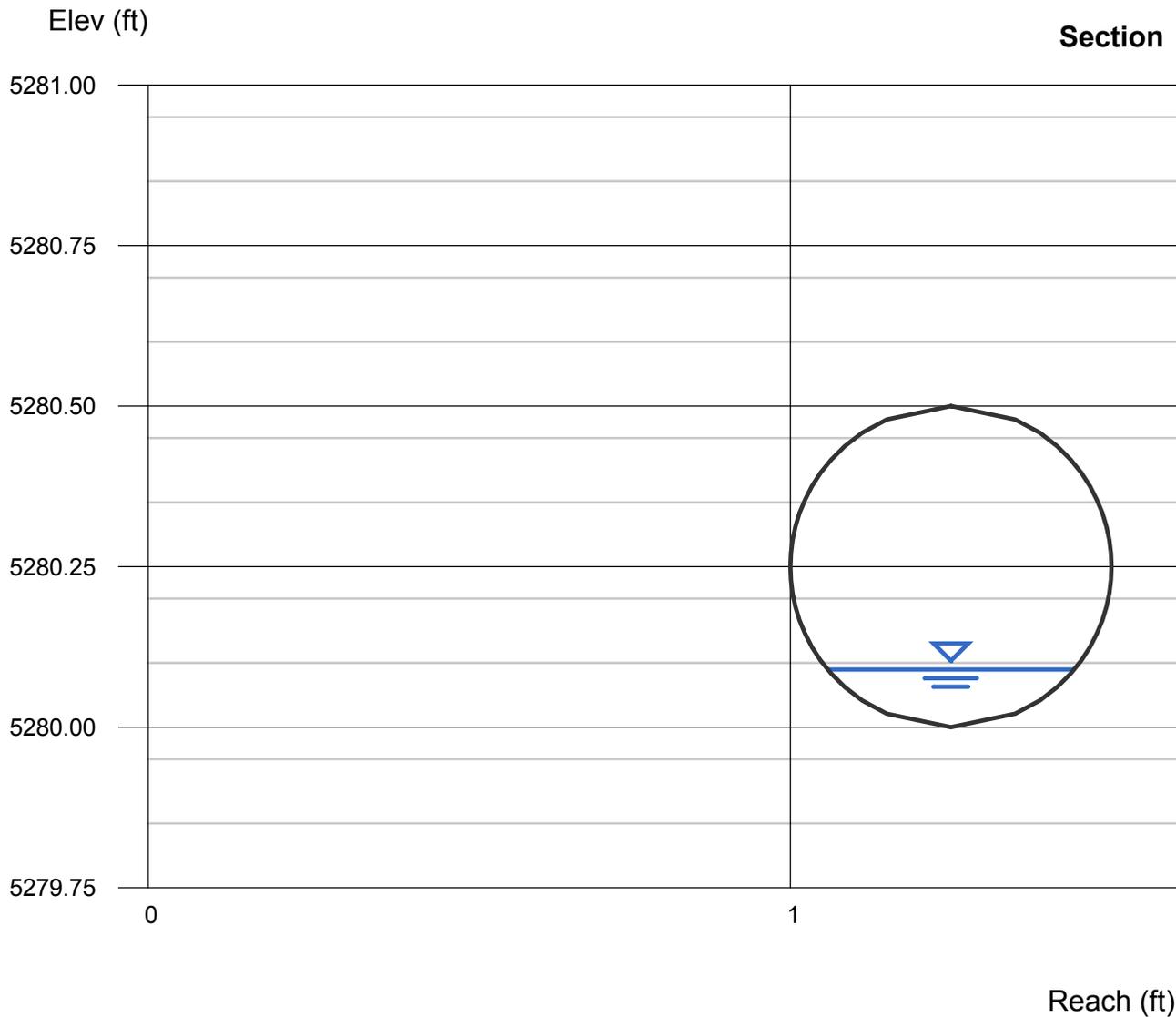
Diameter (ft) = 0.50  
  
Invert Elev (ft) = 5280.00  
Slope (%) = 0.50  
N-Value = 0.011

### Highlighted

Depth (ft) = 0.09  
Q (cfs) = 0.030  
Area (sqft) = 0.02  
Velocity (ft/s) = 1.23  
Wetted Perim (ft) = 0.44  
Crit Depth, Yc (ft) = 0.09  
Top Width (ft) = 0.39  
EGL (ft) = 0.11

### Calculations

Compute by: Known Q  
Known Q (cfs) = 0.03



# Channel Report

## Long's Peak Sprinkler 15in Culvert - 100 year

### Circular

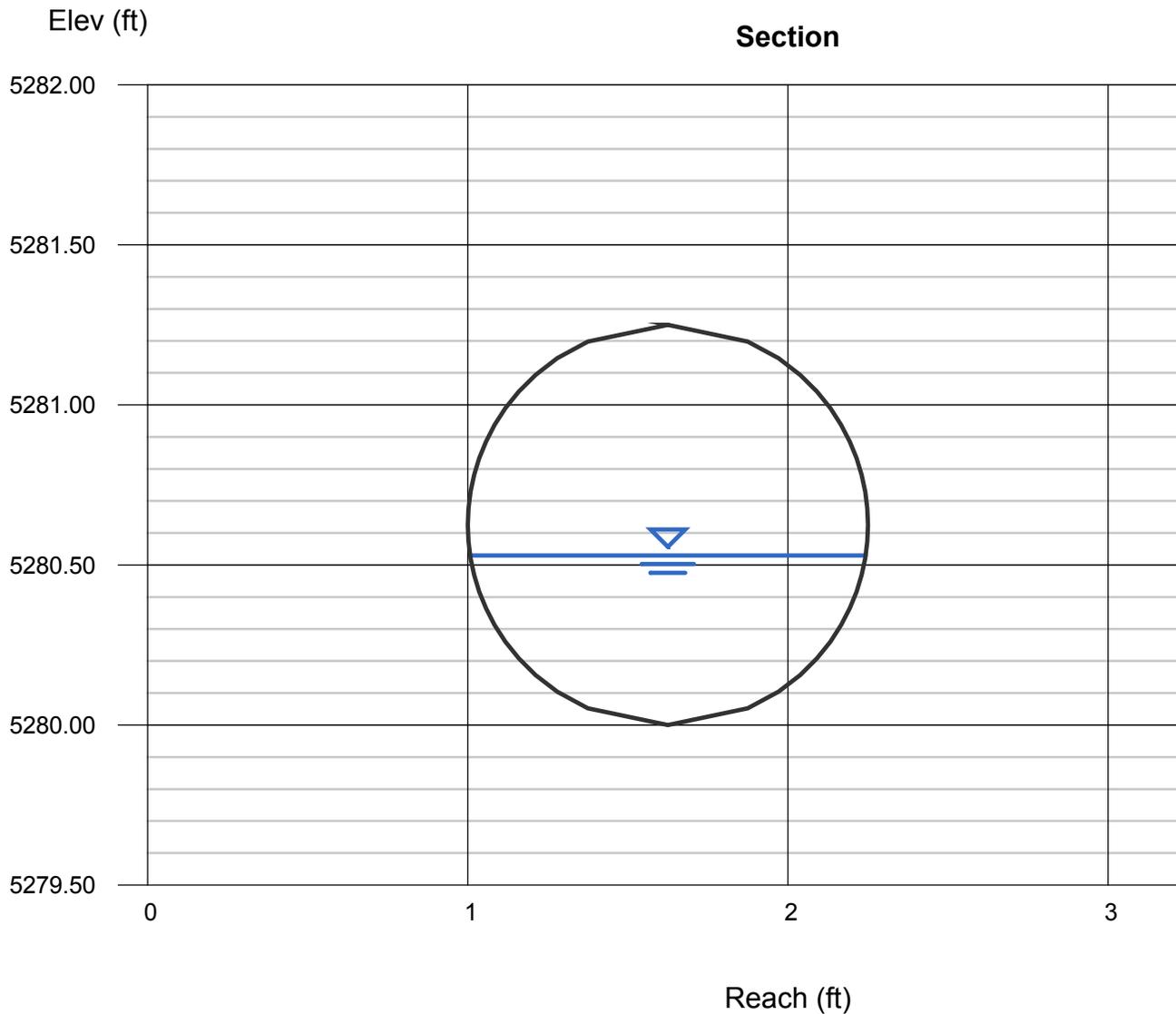
Diameter (ft) = 1.25  
  
Invert Elev (ft) = 5280.00  
Slope (%) = 0.30  
N-Value = 0.013

### Calculations

Compute by: Known Q  
Known Q (cfs) = 1.30

### Highlighted

Depth (ft) = 0.53  
Q (cfs) = 1.300  
Area (sqft) = 0.50  
Velocity (ft/s) = 2.62  
Wetted Perim (ft) = 1.77  
Crit Depth, Yc (ft) = 0.45  
Top Width (ft) = 1.24  
EGL (ft) = 0.64



# Channel Report

## Long's Peak Sprinkler 15in Culvert - Max Capacity

### Circular

Diameter (ft) = 1.25

Invert Elev (ft) = 5280.00

Slope (%) = 0.30

N-Value = 0.013

### Calculations

Compute by: Q vs Depth

No. Increments = 15

### Highlighted

Depth (ft) = 1.17

Q (cfs) = 3.804

Area (sqft) = 1.19

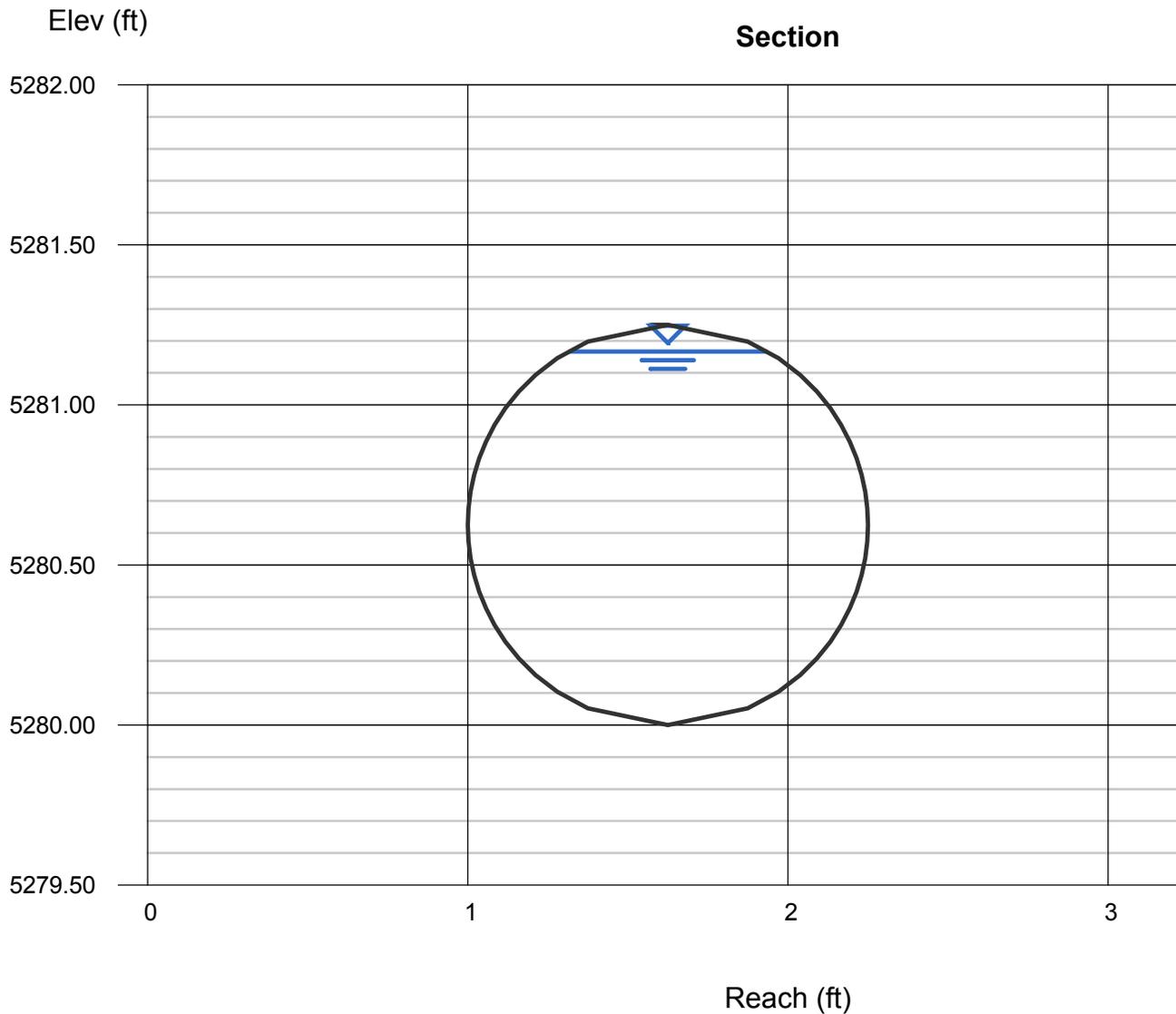
Velocity (ft/s) = 3.19

Wetted Perim (ft) = 3.28

Crit Depth, Yc (ft) = 0.79

Top Width (ft) = 0.62

EGL (ft) = 1.32



# APPENDIX B

## Hydrologic Calculations

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### SWALES

## Design Procedure Form: Grass Swale (GS)

Sheet 1 of 1

**Designer:** Linda Rohlfing  
**Company:** Permontes  
**Date:** September 5, 2016  
**Project:** Long's Peak Sprinkler - V-Swale S1 - East - Basin D1  
**Location:** Erie Colorado

1. Design Discharge for 2-Year Return Period	$Q_2 = \underline{0.50} \text{ cfs}$
2. Hydraulic Residence Time A) : Length of Grass Swale B) Calculated Residence Time (based on design velocity below)	$L_S = \underline{242.0} \text{ ft}$ $T_{HR} = \underline{8.2} \text{ minutes}$
3. Longitudinal Slope (vertical distance per unit horizontal) A) Available Slope (based on site constraints) B) Design Slope	$S_{avail} = \underline{0.005} \text{ ft / ft}$ $S_D = \underline{0.005} \text{ ft / ft}$
4. Swale Geometry A) Channel Side Slopes (Z = 4 min., horiz. distance per unit vertical) B) Bottom Width of Swale (enter 0 for triangular section)	$Z = \underline{5.00} \text{ ft / ft}$ $W_B = \underline{0.00} \text{ ft}$
5. Vegetation A) Type of Planting (seed vs. sod, affects vegetal retardance factor)	Choose One _____ <input checked="" type="radio"/> Grass From Seed <input type="radio"/> Grass From Sod
6. Design Velocity (0.807 ft / s maximum for desirable 5-minute residence time)	$V_2 = \underline{0.49} \text{ ft / s}$
7. Design Flow Depth (1 foot maximum) A) Flow Area B) Top Width of Swale C) Froude Number (0.50 maximum) D) Hydraulic Radius E) Velocity-Hydraulic Radius Product for Vegetal Retardance F) Manning's n (based on SCS vegetal retardance curve E for seeded grass) G) Cumulative Height of Grade Control Structures Required	$D_2 = \underline{0.45} \text{ ft}$ $A_2 = \underline{1.0} \text{ sq ft}$ $W_T = \underline{4.5} \text{ ft}$ $F = \underline{0.18}$ $R_H = \underline{0.22}$ $VR = \underline{0.11}$ $n = \underline{0.078}$ $H_D = \underline{0.00} \text{ ft}$
8. Underdrain (Is an underdrain necessary?)	Choose One _____ <input checked="" type="radio"/> YES <input type="radio"/> NO <b>AN UNDERDRAIN IS REQUIRED IF THE DESIGN SLOPE &lt; 2.0%</b>
9. Soil Preparation (Describe soil amendment)	_____ _____ _____
10. Irrigation	Choose One _____ <input type="radio"/> Temporary <input type="radio"/> Permanent

Notes: \_\_\_\_\_

## Design Procedure Form: Grass Swale (GS)

Sheet 1 of 1

**Designer:** Linda Rohlfing  
**Company:** Permontes  
**Date:** September 5, 2016  
**Project:** Long's Peak Sprinkler - V-Swale S1 - West - Basin D1  
**Location:** Erie Colorado

1. Design Discharge for 2-Year Return Period	$Q_2 = \underline{0.50} \text{ cfs}$
2. Hydraulic Residence Time A) : Length of Grass Swale B) Calculated Residence Time (based on design velocity below)	$L_S = \underline{295.0} \text{ ft}$ $T_{HR} = \underline{9.1} \text{ minutes}$
3. Longitudinal Slope (vertical distance per unit horizontal) A) Available Slope (based on site constraints) B) Design Slope	$S_{avail} = \underline{0.005} \text{ ft / ft}$ $S_D = \underline{0.005} \text{ ft / ft}$
4. Swale Geometry A) Channel Side Slopes (Z = 4 min., horiz. distance per unit vertical) B) Bottom Width of Swale (enter 0 for triangular section)	$Z = \underline{4.00} \text{ ft / ft}$ $W_B = \underline{0.00} \text{ ft}$
5. Vegetation A) Type of Planting (seed vs. sod, affects vegetal retardance factor)	Choose One _____ <input checked="" type="radio"/> Grass From Seed <input type="radio"/> Grass From Sod
6. Design Velocity (0.983 ft / s maximum for desirable 5-minute residence time)	$V_2 = \underline{0.54} \text{ ft / s}$
7. Design Flow Depth (1 foot maximum) A) Flow Area B) Top Width of Swale C) Froude Number (0.50 maximum) D) Hydraulic Radius E) Velocity-Hydraulic Radius Product for Vegetal Retardance F) Manning's n (based on SCS vegetal retardance curve E for seeded grass) G) Cumulative Height of Grade Control Structures Required	$D_2 = \underline{0.48} \text{ ft}$ $A_2 = \underline{0.9} \text{ sq ft}$ $W_T = \underline{3.8} \text{ ft}$ $F = \underline{0.20}$ $R_H = \underline{0.23}$ $VR = \underline{0.13}$ $n = \underline{0.074}$ $H_D = \underline{0.00} \text{ ft}$
8. Underdrain (Is an underdrain necessary?)	Choose One _____ <input checked="" type="radio"/> YES <input type="radio"/> NO <b>AN UNDERDRAIN IS REQUIRED IF THE DESIGN SLOPE &lt; 2.0%</b>
9. Soil Preparation (Describe soil amendment)	_____ _____ _____
10. Irrigation	Choose One _____ <input type="radio"/> Temporary <input type="radio"/> Permanent

Notes: \_\_\_\_\_

## Design Procedure Form: Grass Swale (GS)

Sheet 1 of 1

**Designer:** Linda Rohlfing  
**Company:** Permontes  
**Date:** September 5, 2016  
**Project:** Long's Peak Sprinkler - V-Swale S2 - Basin D2  
**Location:** Erie Colorado

1. Design Discharge for 2-Year Return Period	$Q_2 = \underline{0.7} \text{ cfs}$
2. Hydraulic Residence Time A) : Length of Grass Swale B) Calculated Residence Time (based on design velocity below)	$L_S = \underline{76.0} \text{ ft}$ $T_{HR} = \underline{2.1} \text{ minutes}$
3. Longitudinal Slope (vertical distance per unit horizontal) A) Available Slope (based on site constraints) B) Design Slope	$S_{avail} = \underline{0.005} \text{ ft / ft}$ $S_D = \underline{0.005} \text{ ft / ft}$
4. Swale Geometry A) Channel Side Slopes (Z = 4 min., horiz. distance per unit vertical) B) Bottom Width of Swale (enter 0 for triangular section)	$Z = \underline{4.00} \text{ ft / ft}$ $W_B = \underline{0.00} \text{ ft}$
5. Vegetation A) Type of Planting (seed vs. sod, affects vegetal retardance factor)	Choose One _____ <input checked="" type="radio"/> Grass From Seed <input type="radio"/> Grass From Sod
6. Design Velocity (0.253 ft / s maximum for desirable 5-minute residence time)	$V_2 = \underline{0.61} \text{ ft / s}$
7. Design Flow Depth (1 foot maximum) A) Flow Area B) Top Width of Swale C) Froude Number (0.50 maximum) D) Hydraulic Radius E) Velocity-Hydraulic Radius Product for Vegetal Retardance F) Manning's n (based on SCS vegetal retardance curve E for seeded grass) G) Cumulative Height of Grade Control Structures Required	$D_2 = \underline{0.52} \text{ ft}$ $A_2 = \underline{1.1} \text{ sq ft}$ $W_T = \underline{4.2} \text{ ft}$ $F = \underline{0.21}$ $R_H = \underline{0.25}$ $VR = \underline{0.15}$ $n = \underline{0.069}$ $H_D = \underline{0.00} \text{ ft}$
8. Underdrain (Is an underdrain necessary?)	Choose One _____ <input checked="" type="radio"/> YES <input type="radio"/> NO <b>AN UNDERDRAIN IS REQUIRED IF THE DESIGN SLOPE &lt; 2.0%</b>
9. Soil Preparation (Describe soil amendment)	_____ _____ _____
10. Irrigation	Choose One _____ <input type="radio"/> Temporary <input type="radio"/> Permanent

Notes: \_\_\_\_\_

## Design Procedure Form: Grass Swale (GS)

Sheet 1 of 1

**Designer:** Linda Rohlfing  
**Company:** Permontes  
**Date:** September 5, 2016  
**Project:** Long's Peak Sprinkler - V-Swale S3 - Basin D3  
**Location:** Erie Colorado

1. Design Discharge for 2-Year Return Period	$Q_2 =$ <u>0.50</u> cfs
2. Hydraulic Residence Time A) : Length of Grass Swale B) Calculated Residence Time (based on design velocity below)	$L_S =$ <u>68.0</u> ft $T_{HR} =$ <u>1.3</u> minutes
3. Longitudinal Slope (vertical distance per unit horizontal) A) Available Slope (based on site constraints) B) Design Slope	$S_{avail} =$ <u>0.023</u> ft / ft $S_D =$ <u>0.023</u> ft / ft
4. Swale Geometry A) Channel Side Slopes (Z = 4 min., horiz. distance per unit vertical) B) Bottom Width of Swale (enter 0 for triangular section)	$Z =$ <u>6.00</u> ft / ft $W_B =$ <u>0.00</u> ft
5. Vegetation A) Type of Planting (seed vs. sod, affects vegetal retardance factor)	Choose One _____ <input checked="" type="radio"/> Grass From Seed <input type="radio"/> Grass From Sod
6. Design Velocity (0.227 ft / s maximum for desirable 5-minute residence time)	$V_2 =$ <u>0.87</u> ft / s
7. Design Flow Depth (1 foot maximum) A) Flow Area B) Top Width of Swale C) Froude Number (0.50 maximum) D) Hydraulic Radius E) Velocity-Hydraulic Radius Product for Vegetal Retardance F) Manning's n (based on SCS vegetal retardance curve E for seeded grass) G) Cumulative Height of Grade Control Structures Required	$D_2 =$ <u>0.31</u> ft $A_2 =$ <u>0.6</u> sq ft $W_T =$ <u>3.7</u> ft $F =$ <u>0.39</u> $R_H =$ <u>0.15</u> $VR =$ <u>0.13</u> $n =$ <u>0.072</u> $H_D =$ <u>0.00</u> ft
8. Underdrain (Is an underdrain necessary?)	Choose One _____ <input checked="" type="radio"/> YES <input type="radio"/> NO
9. Soil Preparation (Describe soil amendment)	_____ _____ _____
10. Irrigation	Choose One _____ <input type="radio"/> Temporary <input type="radio"/> Permanent

Notes: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Design Procedure Form: Grass Swale (GS)**

**Designer:** Linda Rohlfing  
**Company:** Permontes  
**Date:** September 5, 2016  
**Project:** Long's Peak Sprinkler - Offsite Swale for 5 Year Site + Existing Swale Capacity (WQ1)  
**Location:** Erie Colorado

1. Design Discharge for 2-Year Return Period	$Q_2 =$ <u>1.9</u> cfs
2. Hydraulic Residence Time A) : Length of Grass Swale B) Calculated Residence Time (based on design velocity below)	$L_S =$ <u>220.0</u> ft $T_{HR} =$ <u>4.5</u> minutes
3. Longitudinal Slope (vertical distance per unit horizontal) A) Available Slope (based on site constraints) B) Design Slope	$S_{avail} =$ <u>0.004</u> ft / ft $S_D =$ <u>0.004</u> ft / ft
4. Swale Geometry A) Channel Side Slopes (Z = 4 min., horiz. distance per unit vertical) B) Bottom Width of Swale (enter 0 for triangular section)	$Z =$ <u>4.00</u> ft / ft $W_B =$ <u>0.00</u> ft
5. Vegetation A) Type of Planting (seed vs. sod, affects vegetal retardance factor)	Choose One _____ <input checked="" type="radio"/> Grass From Seed <input type="radio"/> Grass From Sod
6. Design Velocity (0.733 ft / s maximum for desirable 5-minute residence time)	$V_2 =$ <u>0.82</u> ft / s
7. Design Flow Depth (1 foot maximum) A) Flow Area B) Top Width of Swale C) Froude Number (0.50 maximum) D) Hydraulic Radius E) Velocity-Hydraulic Radius Product for Vegetal Retardance F) Manning's n (based on SCS vegetal retardance curve E for seeded grass) G) Cumulative Height of Grade Control Structures Required	$D_2 =$ <u>0.75</u> ft $A_2 =$ <u>2.3</u> sq ft $W_T =$ <u>6.0</u> ft $F =$ <u>0.24</u> $R_H =$ <u>0.36</u> $VR =$ <u>0.30</u> $n =$ <u>0.055</u> $H_D =$ <u>0.00</u> ft
8. Underdrain (Is an underdrain necessary?)	Choose One _____ <input checked="" type="radio"/> YES <input type="radio"/> NO <b>AN UNDERDRAIN IS REQUIRED IF THE DESIGN SLOPE &lt; 2.0%</b>
9. Soil Preparation (Describe soil amendment)	_____ _____ _____
10. Irrigation	Choose One _____ <input type="radio"/> Temporary <input type="radio"/> Permanent

Notes: \_\_\_\_\_

## Design Procedure Form: Grass Swale (GS)

Sheet 1 of 1

**Designer:** John Britton  
**Company:** Permontes Group  
**Date:** September 7, 2016  
**Project:** Longs Peak Sprinkler - Grass Swale Outfall Alternative  
**Location:** Austin Industrial Park, Lot 8 -- Erie, CO

1. Design Discharge for 2-Year Return Period	$Q_2 =$ <u>1.40</u> cfs
2. Hydraulic Residence Time A) : Length of Grass Swale B) Calculated Residence Time (based on design velocity below)	$L_S =$ <u>210.0</u> ft $T_{HR} =$ <u>5.0</u> minutes
3. Longitudinal Slope (vertical distance per unit horizontal) A) Available Slope (based on site constraints) B) Design Slope	$S_{avail} =$ <u>0.005</u> ft / ft $S_D =$ <u>0.0035</u> ft / ft
4. Swale Geometry A) Channel Side Slopes (Z = 4 min., horiz. distance per unit vertical) B) Bottom Width of Swale (enter 0 for triangular section)	$Z =$ <u>4.00</u> ft / ft $W_B =$ <u>2.00</u> ft
5. Vegetation A) Type of Planting (seed vs. sod, affects vegetal retardance factor)	Choose One _____ <input checked="" type="radio"/> Grass From Seed <input type="radio"/> Grass From Sod
6. Design Velocity (0.7 ft / s maximum for desirable 5-minute residence time)	$V_2 =$ <u>0.70</u> ft / s
7. Design Flow Depth (1 foot maximum) A) Flow Area B) Top Width of Swale C) Froude Number (0.50 maximum) D) Hydraulic Radius E) Velocity-Hydraulic Radius Product for Vegetal Retardance F) Manning's n (based on SCS vegetal retardance curve E for seeded grass) G) Cumulative Height of Grade Control Structures Required	$D_2 =$ <u>0.50</u> ft $A_2 =$ <u>2.0</u> sq ft $W_T =$ <u>6.0</u> ft $F =$ <u>0.21</u> $R_H =$ <u>0.33</u> $VR =$ <u>0.23</u> $n =$ <u>0.060</u> $H_D =$ <u>#VALUE!</u> ft
8. Underdrain (Is an underdrain necessary?)	Choose One _____ <span style="color: blue; font-weight: bold;">AN UNDERDRAIN IS REQUIRED IF THE DESIGN SLOPE &lt; 2.0%</span> <input checked="" type="radio"/> YES <input type="radio"/> NO
9. Soil Preparation (Describe soil amendment)	_____ _____ _____
10. Irrigation	Choose One _____ <input checked="" type="radio"/> Temporary <input type="radio"/> Permanent

Notes: Proposed Bedding Zone = Sandy Loam -- Scarified to 2' depth and Lightly re-compacted subgrade soils.  
 Primary Benefits are increased permeability and water infiltration into Free-draining sandy soils underneath the grass swale section.  
 These soil subgrade improvements are being proposed for this Outfall Swale design, in lieu of installing a 4-inch underdrain collector pipe.

RIPRAP

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## RIPRAP CALCULATIONS

### Spillway

#### A. DESIGN DATA

Number of Outlets:	1		Normal Depth ( $Y_n$ )	0.5 ft
Channel Width:	54 in.	= 4.5 ft	Tailwater ( $Y_t$ )	0.5 ft
Total Discharge ( $Q_d$ ):	2.40 cfs	16 sf	Slope (S)	0.50 %
Velocity (v)	0.15 fps		Mannings (n)	0.013

#### B. RIP-RAP SIZING

Froude Number (Fr) =  $\frac{V}{\text{SQRT}(gd)}$  = 0.04 (Subcritical Flow)

If Froude Number is greater than 1 ( Supercritical Flow) then use:  
 $Da = 1/2*(D+Y_n)$  (Substitute Da for D in all equations) = 2.5

$Q/D^{1.5} = 0.25$   
 $Y_t/D = 0.111111$

If Froude Number is less than 1 ( Subcritical Flow) then use:  
 $D = 4.5$

From Figure MD-21 (Urban Drainage Design Criteria Manual)

Use Type VL RipRap  
 $d_{50} = 6$  inches

#### C. LENGTH OF PROTECTION

$$L = (1 / (2 \tan \theta))(A_t / Y_t - D)$$

where:

L	=	-	Length of Protection (Not less than 3D or greater than 10D when Froude parameter $\leq 6$ )
D	=	4.5 ft	Diameter of Conduit
$Y_t$	=	0.5 ft	Tailwater depth
$A_t$	=	15.90 sf	Required Area of flow at allowable velocity ( $Q/V$ )
Q	=	2.40 cfs	Design Discharge (100-yr event)
V	=	0.15 fps	Allowable non-eroding velocity (5.5 fps for erosive soils)
$\theta$	=		Expansion angle of culvert flow

$$Q/D^{2.5} = 0.056$$

$$Y_t/D = 0.111$$

From Figure MD-23 (Urban Drainage Design Criteria Manual)

**expansion factor  $1/(2 \tan \theta) = 3.5$**

If $Q/D^{2.5} \leq 6$	
Minimum Length (3D)=	13.5
Calculated Length =	95.52
Maximum Length (10D)=	45

Channel Width =	4.5	ft
Designed Rip Rap Length =	4	ft
Width 1 (2D) =	9	ft
Width 2 (3D) =	13.5	ft
Thickness $1.5*(d_{50})$ =	0.8	ft
$d_{50}$ =	6.0	in



## RIPRAP CALCULATIONS

*15" Culvert*

### A. DESIGN DATA

Number of Outlets:	1		Normal Depth ( $Y_n$ )	0.25 ft
Outlet Width:	15 in.	= 1.3 ft	Tailwater ( $Y_t$ )	0.25 ft
Total Discharge ( $Q_d$ ):	3.54 cfs	1.2 sf	Slope (S)	1.00 %
Velocity (v)	3.19 fps		Mannings (n)	0.013

### B. RIP-RAP SIZING

$$\text{Froude Number (Fr)} = \frac{V}{\text{SQRT}(gd)}$$

$$= 1.12 \quad (\text{Supercritical Flt})$$

If Froude Number is greater than 1 ( Supercritical Flow) then use:  

$$D_a = 1/2*(D+Y_n) \quad (\text{Substitute } D_a \text{ for } D \text{ in all equations})$$

$$= 0.75$$

If Froude Number is less than 1 ( Subcritical Flow) then use:  

$$D = 1.25$$

$$Q/D^{1.5} = 2.53$$
  

$$Y_t/D = 0.2$$

From Figure MD-21 (Urban Drainage Design Criteria Manual)

Use Type VL RipRap  
 $d_{50} = 6$  inches

### C. LENGTH OF PROTECTION

$$L = (1 / (2 \tan \theta)) (A_t / Y_t - D)$$

where:

L	=	-	Length of Protection (Not less than 3D or greater than 10D when Froude parameter $\leq 6$ )
D	=	1.25 ft	Diameter of Conduit
$Y_t$	=	0.25 ft	Tailwater depth
$A_t$	=	1.11 sf	Required Area of flow at allowable velocity ( $Q/V$ )
Q	=	3.54 cfs	Design Discharge (100-yr event)
V	=	3.19 fps	Allowable non-eroding velocity (5.5 fps for erosive soils)
$\theta$	=		Expansion angle of culvert flow

$$Q/D^{2.5} = 2.026$$

$$Y_t/D = 0.2$$

From Figure MD-23 (Urban Drainage Design Criteria Manual)

**expansion factor  $1/(2 \tan \theta) = 3.5$**

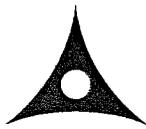
If $Q/D^{2.5} \leq 6$	
Minimum Length (3D)=	3.75
Calculated Length =	11.16
Maximum Length (10D)=	12.5

Pipe Diameter =	1.3	ft
Designed Rip Rap Length =	4.0	ft
Width 1 (2D) =	2.5	ft
Width 2 (3D) =	4.0	ft
Thickness $1.5*(d_{50})$ =	0.8	ft
$d_{50}$ =	6.0	in

# APPENDIX D

## Excerpts from Previous Reports

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**ACKLAM**  
**ASSOCIATES, INC.**  
SURVEYING - ENGINEERING

**FINAL  
DRAINAGE REPORT**

**FOR**

**AUSTIN INDUSTRIAL PARK  
ERIE, COLORADO**

**REVISED: JANUARY, 1998**

**Prepared For:**

**Richard Fagre**

The soil has a SCS hydrologic group classification of "B". Drainage flows from the site by natural drainage swales and traverses easterly for a distance of approximately 2,000 feet to Cottonwood Extension Ditch.

#### **IV. PROPOSED DRAINAGE FACILITIES**

It is proposed that each lot owner provide on lot storm water management. Each lot will provide detention facilities to store the difference between the historic 10-year recurrence run-off volume from the lot and the developed condition 100-year recurrence run-off volume from the lot. The allowable release rate from the detention facility shall be the historic 10-year recurrence interval runoff discharge from the proposed site.

The borrow ditch for Bonnell Avenue and Mason Street will convey the stormwater run-off for a 100-year recurrence storm interval within the street Right-of-way width and the historic run-off from a 10-year recurrence interval storm for the area of adjacent lots.

The DCM recommended release rate flows for hydrologic soil group B is 0.85 cfs per acre. The total release rate for the streets from the site is 7.37 c.f.s. which is 2.23 c.f.s. less than the release rate using 0.85 c.f.s. per acre. Therefore, no detention for the entire site release will be utilized.

Run-off from the North ditch on Bonnell Avenue will flow west to the west ditch on Mason Street. Run-off from the South ditch will flow west to Mason Street and then be released into a natural drainage swale flowing to the Southeast.

# APPENDIX E

## Variance Requests

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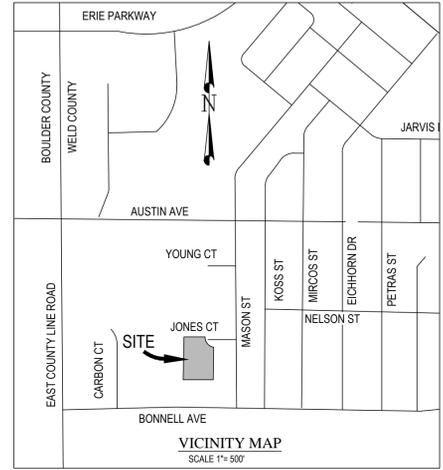
# FIGURES

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DRAWING FILE: S:\PROJECTS\197.001 LONGS PEAK SPRINKLER\_3 ENGINEERING\DRAWINGS\197.001 DRAINAGE MAP.DWG PLOT DATE: 9/6/2016 2:33 PM BY: LINDA ROHLING CTB\_PG\_2015\_MONO.CTB

HISTORIC RUNOFF										
S	P	A	T	TOC	C5	C10	C100	Q5	Q10	Q100
1	H1	0.520	5	6	0.14	0.2	0.42	0.1	0.7	1.9
2	H2	0.127	24	11	0.2	0.10	0.46	0.1	0.2	0.4
3	H3	0.116	12	10	0.17	0.26	0.44	0.1	0.1	0.4
4	H4	0.206	7	11	0.15	0.25	0.4	0.1	0.2	0.6
TOTAL HISTORIC RUNOFF					0.6	1.2				

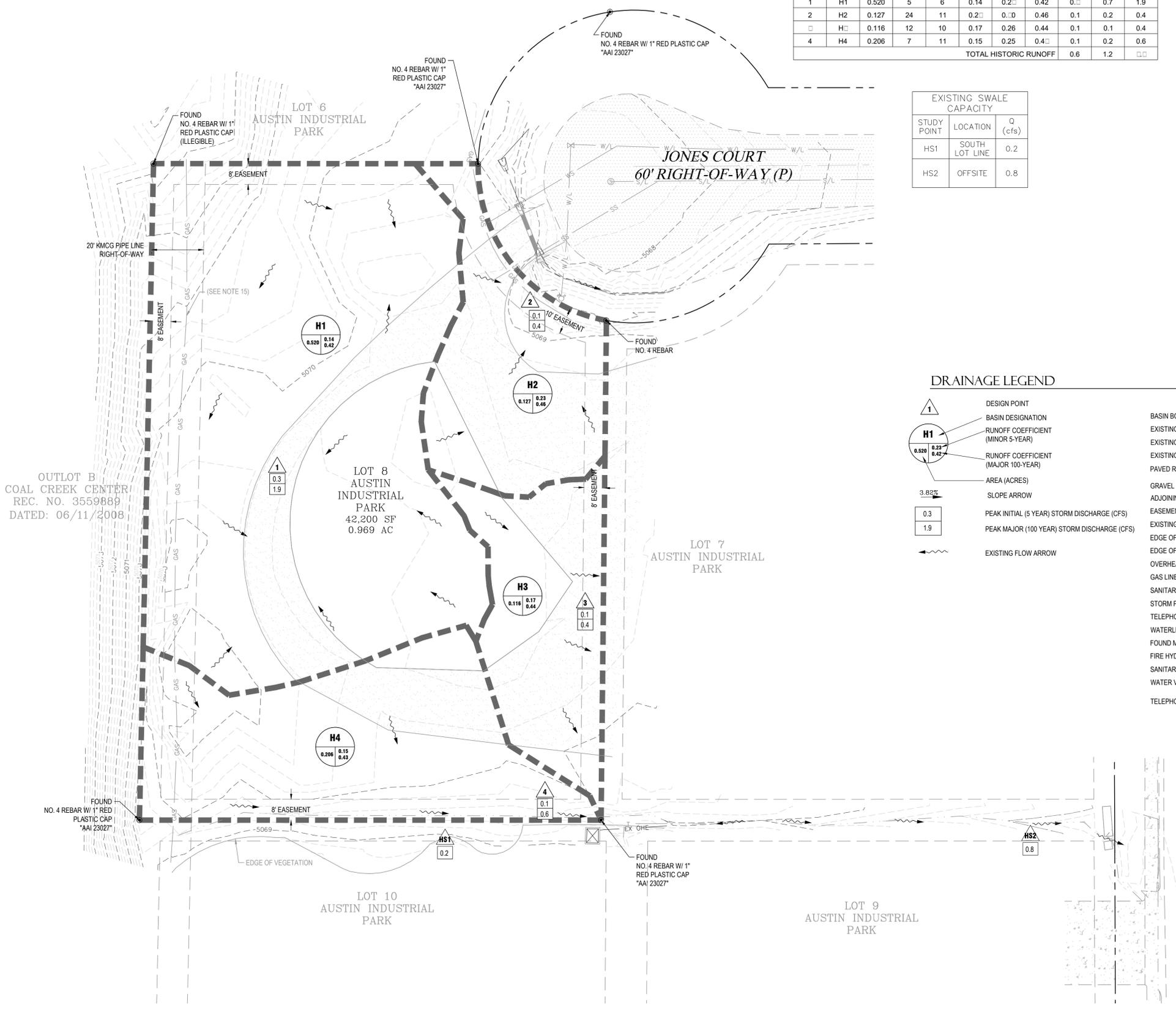
EXISTING SWALE CAPACITY		
STUDY POINT	LOCATION	Q (cfs)
HS1	SOUTH LOT LINE	0.2
HS2	OFFSITE	0.8



- PERMISSION TO REPRODUCE THESE PLANS IS HEREBY GIVEN TO THE TOWN FOR PURPOSES ASSOCIATED WITH PLAN REVIEW, APPROVAL, PERMITTING, INSPECTION AND CONSTRUCTION OF WORK.
- OWNER/CONTRACTOR MUST OBTAIN PERMITS FROM THE COLORADO DEPT. OF HEALTH, WATER QUALITY CONTROL DIVISION PERMIT ENFORCEMENT SECTION, AND THE TOWN OF ERIE PRIOR TO CLEARING, GRADING, OR EXCAVATION.
- THE PROPERTY IS OUTSIDE OF THE 100-YEAR FLOOD PLAIN AND LIES WITH IN ZONE C ACCORDING TO FLOOD INSURANCE RATE MAP PANEL NO. 08013C0443J, DECEMBER 18, 2012.

### DRAINAGE LEGEND

	DESIGN POINT	<b>SYMBOLS</b>
	BASIN DESIGNATION	BASIN BOUNDARY
	RUNOFF COEFFICIENT (MINOR 5-YEAR)	EXISTING MINOR CONTOUR
	RUNOFF COEFFICIENT (MAJOR 100-YEAR)	EXISTING MAJOR CONTOUR
	AREA (ACRES)	EXISTING DRAINAGE SWALE
	SLOPE ARROW	PAVED ROAD
	PEAK INITIAL (5 YEAR) STORM DISCHARGE (CFS)	GRAVEL ROAD
	PEAK MAJOR (100 YEAR) STORM DISCHARGE (CFS)	ADJOINING LOT LINE
	EXISTING FLOW ARROW	EASEMENT LINE
		EXISTING RIGHT-OF-WAY
		EDGE OF GRAVEL
		EDGE OF PAVED ROAD
		OVERHEAD ELECTRIC LINE
		GAS LINE
		SANITARY LINE
		STORM PIPE
		TELEPHONE LINE
		WATERLINE
		FOUND MONUMENT
		FIRE HYDRANT
		SANITARY MANHOLE
		WATER VALVE
		TELEPHONE PEDESTAL



REVISION	LOCK
DATE	DESCRIPTION
REV.	

625 Main Street  
Longmont, CO 80501  
T: (720) 684-4881  
F: (866) 563-9212  
www.permontesgroup.com

PREPARED FOR: MIKE AMEND

SHEET TITLE: LONGS PEAK SPRINKLER  
780 JONES COURT  
HISTORIC MAP

DESIGNED	
DRAWN	
CHECKED	
APPROVED	

PROJECT NO.	197.001
DATE	01/16/2015
SCALE	1" = 20'

SHEET NO.  
**C1**  
SHEET 1 OF 1

FIGURE 4





January 9, 2017

Town of Erie Planning Commission  
645 Holbrook  
PO Box 750  
Erie, CO 80516

RE: Long's Peak Sprinkler – Alternative Compliance Request

Dear Planning Commission Members,

Please accept this formal request for a ruling on alternative compliance with respect to the Longs Peak Sprinkler project. This proposed project is currently under review by the Town of Erie.

- 1) MC 10.6.4.G.10 sets forth requirements for fencing of outdoor storage, including providing a fence setback of 15 feet from the property line. The Owner is requesting an alternative compliance request for the southern fence be approved with a 10-foot setback. This setback distance coincides closely with the 8-foot drainage and utility easement, and the proposed water quality swale in the area of the property.
- 2) MC 10.6.9 D sets forth the requirement that a wall articulation is necessary for building walls which exceed 40 feet in length. The proposed length of the northern building wall is 49 feet, which is slightly longer than the 40 feet criteria. The Owner is requesting that intensified landscaping with deciduous and evergreen trees, above the minimum Code requirements, be installed along the north building wall in lieu of the wall articulation. This will also provide the appropriate screening of the gas and electric meters in this specific area.
- 3) MC 10.6.9 D sets forth the requirement that a wall articulation is necessary for building walls which exceed 40 feet in length. The proposed length of the southern building wall is 49 feet, which is slightly longer than the 40 feet criteria. The Owner is submitting an alternative compliance request for this southern building wall by utilizing the following features, in lieu of the wall articulation.
  - a) 12' x 32' overhang lean-to on the south wall
  - b) 12'x16' overhead sliding door on the south wall
  - c) Utilize 3 different materials (and colors) on the south building wall as follows:  
Woodgrain lap siding (power grey), Steel ribbed sheeting (burnished slate), and Thin stoned columns (plum creek)
  - d) The south building wall and outdoor storage area will be adequately screened from other properties by utilizing a 6-foot wood fence.
  - e) Trees and shrubs along the perimeter of the screening fence will be installed.

We would be happy to address any additional questions or concerns that you may have regarding these specific items.

Respectfully Yours,

A handwritten signature in black ink that reads "Mickey Leyba". The signature is written in a cursive style with a large, looping initial "M".

Mickey Leyba  
President/Project Manager

LOT 8, AUSTIN INDUSTRIAL PARK  
LONGS PEAK SPRINKLER, 460 JONES COURT

ROOFING & TRIM -

WAINSCOT -

WINDOW FRAMES (METAL)



DOORS & FRAMES METAL



SECONDARY STEEL SIDING



CORBELS - DOOR & WINDOW WOOD CASING PAINTED

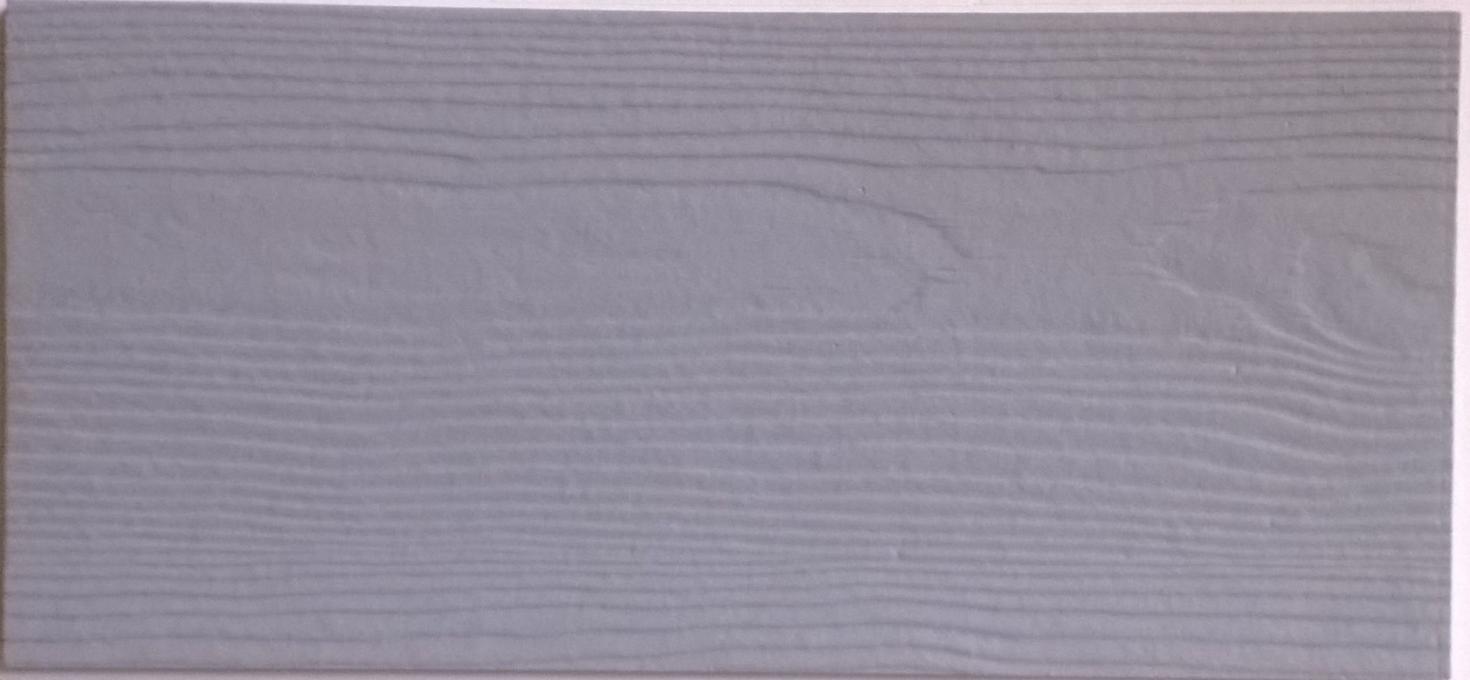


WEATHERED GALVALUME

TEXTURED CEMENT BOARD

POWER GRAY LAP SIDING

THIS IS ALSO THE FENCE COLOR



THIN STONE COLUMNS

Plum Creek



ENV.  
4381-  
4382

# AUSTIN INDUSTRIAL PARK

## A PART OF THE SOUTHWEST ONE-QUARTER OF THE SOUTHWEST ONE-QUARTER SECTION 19, TOWNSHIP 1 NORTH, RANGE 68 WEST OF THE 6TH PRINCIPAL MERIDIAN, WELD COUNTY, COLORADO

### SHEET 1 OF 3

#### CERTIFICATE OF DEDICATION, OWNERSHIP AND MAINTENANCE:

Know all men by these presents that Richard Fagre and The Town of Erie, being the Owners of certain lands in Weld County, Colorado, described as follows:

That part of the Southwest one-quarter Southwest one-quarter Section 19, Township 1 North, Range 68 West of the 6th Principal Meridian, Weld County, Colorado lying East of the 100 foot Town of Erie Right-of-Way formerly known as the Burlington Northern Railroad Right-of-Way.

EXCEPT the East 40 feet thereof.

TOGETHER with the South 40.00 feet of said former Burlington Northern Railroad Right-of-Way lying in said SW 1/4 SW 1/4,

TOGETHER with that part of the Southwest one-quarter Southwest one-quarter said Section 19 described as: Beginning at the Northwest Corner said Southwest one-quarter Southwest one-quarter, thence S89°15'10"E along the North line said Southwest one-quarter Southwest one-quarter a distance of 855.37 feet to a point on the Easterly Right-of-way line of the former Burlington Northern Railroad Right-of-Way, thence S01°51'10"W along said Easterly Right-of-way line a distance 40.02 feet, thence N89°15'10"W parallel with the North Line Southwest one-quarter Southwest one-quarter said Section 19 a distance of 854.08 feet to a point on the West line said Southwest one-quarter Southwest one-quarter, thence N00°00'00"E along said West line a distance of 40.00 feet to the Point of Beginning EXCEPT the West 30.00 feet thereof.

Containing 11.96 acres more or less, have by these presents laid out, platted and subdivided the same into lots and blocks, as shown on this plat, under the name and style of Austin Industrial Park and do hereby dedicate to the Town of Erie, public, school district, owners and future owners of this subdivision all ways, public rights-of-way, easements, parks and open space, and other public rights-of-way and easements for the purposes shown hereon.

Basis of Bearings: The West line said Southwest one-quarter Southwest one-quarter is assumed to bear N00°00'00"E.

Executed this 23 day of DECEMBER A.D., 1996.

Richard Fagre  
Richard Fagre

Wendell Smith  
Mayor

Attest:  
Ann B. Shewini  
Town Clerk

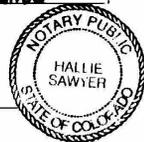
State of Colorado )  
County of Held ) s.s.

The foregoing dedication was acknowledged before me this 23<sup>rd</sup> day of December 1996 by Richard Fagre.

My commission expires: January 3, 1999

Hallie Sawyer  
Notary Public

Hallie Sawyer  
Witness my hand and seal



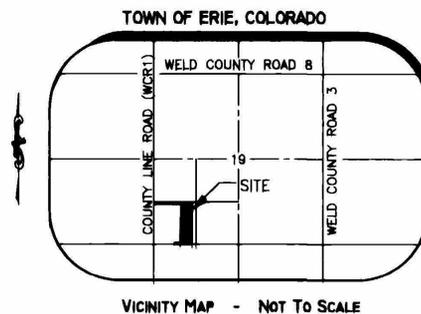
State of Colorado )  
County of Weld ) s.s.

The foregoing dedication was acknowledged before me this 13<sup>th</sup> day of January 1997 by the Mayor of Erie, Colorado.

My commission expires: January 3, 1997

Hallie Sawyer  
Notary Public

Hallie Sawyer  
Witness my hand and seal



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 certification shown hereon.

#### CERTIFICATE OF SURVEY:

I, Curt E. Acklam, do hereby certify that the accompanying plat of AUSTIN INDUSTRIAL PARK and the survey of the boundary thereof were made by me and that the same are correct to the best of my knowledge and belief.

Curt E. Acklam - LS NO 23027  
(For and on behalf of Acklam & Associates, Inc.)  
Job No. 6110 Date: April 16, 1996



#### APPROVALS:

Approved by the Erie Planning Commission of the Town of Erie, Colorado, this day 7<sup>th</sup> of November, 1996.

Jack H. Sargent  
Chairperson

Hallie Sawyer, Secretary

This is to certify that this subdivision was accepted and approved by the Board of Trustees of the Town of Erie, Colorado by resolution this 12<sup>th</sup> day of December, 1996.

Wendell Smith  
Mayor

Attest:  
Ann B. Shewini  
Town Clerk

#### CLERK AND RECORDER CERTIFICATE:

This plat was filed for record in the office of the Weld County Clerk and Recorder, in the State of Colorado at \_\_\_\_\_ M., on the \_\_\_\_\_ day of \_\_\_\_\_, 19\_\_\_\_.

County Clerk and Recorder \_\_\_\_\_

Deputy \_\_\_\_\_

BOOK: \_\_\_\_\_  
PAGE: \_\_\_\_\_  
MAP: \_\_\_\_\_  
RECEPTION NUMBER: \_\_\_\_\_

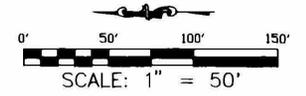
#### NOTE:

All easements are 8 feet unless otherwise noted.

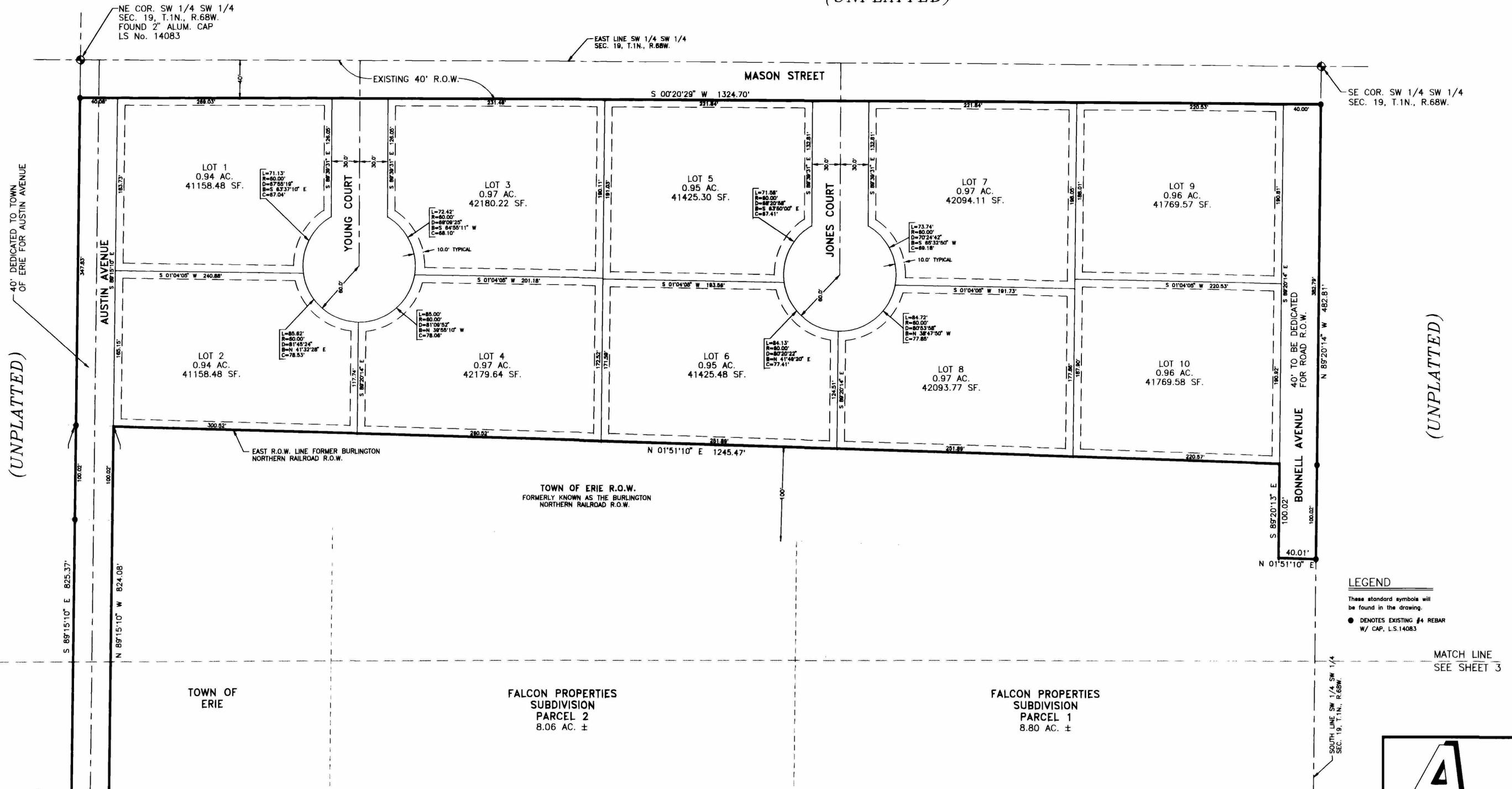
**Acklam**  
Associates, Inc.  
P.O. Box 795  
Brighton, Colorado 80601  
303-659-8546

# AUSTIN INDUSTRIAL PARK

A PART OF THE SOUTHWEST ONE-QUARTER OF THE SOUTHWEST ONE-QUARTER SECTION 19, TOWNSHIP 1 NORTH, RANGE 68 WEST OF THE 6TH PRINCIPAL MERIDIAN, WELD COUNTY, COLORADO  
SHEET 2 OF 3



(UNPLATTED)



**LEGEND**  
These standard symbols will be found in the drawing.  
● DENOTES EXISTING #4 REBAR  
W/ CAP, L.S.14083

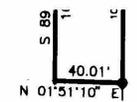
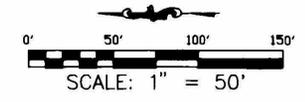
MATCH LINE  
SEE SHEET 3

NOTE: ALL EASEMENTS SHOWN ARE 8" UTILITY AND DRAINAGE EASEMENTS UNLESS OTHERWISE NOTED.

**Acklam**  
Associates, Inc.  
P.O. Box 795  
Brighton, Colorado 80601  
303-659-8546

C:\SC12\WORK\FAGRE\FAGRE.DWG

AUSTIN INDUSTRIAL PARK  
A PART OF THE SOUTHWEST ONE-QUARTER OF THE SOUTHWEST ONE-QUARTER  
SECTION 19, TOWNSHIP 1 NORTH, RANGE 68 WEST OF THE 6TH PRINCIPAL MERIDIAN,  
WELD COUNTY, COLORADO  
SHEET 3 OF 3



**LEGEND**  
These standard symbols will be found in the drawing.  
● DENOTES EXISTING #4 REBAR W/ CAP. L.S. 14083

MATCH LINE  
SEE SHEET 2

TOWN OF ERIE

FALCON PROPERTIES  
SUBDIVISION  
PARCEL 2  
8.06 AC. ±

FALCON PROPERTIES  
SUBDIVISION  
PARCEL 1  
8.80 AC. ±

WELD COUNTY

BOULDER COUNTY

COUNTY LINE ROAD

COUNTY LINE ROAD

NORTH LINE SW 1/4 SW 1/4  
SEC. 19, T.1N., R.68W.

SOUTH LINE SW 1/4 SW 1/4  
SEC. 19, T.1N., R.68W.

S 89°15'10" E 823.37'

N 89°15'10" W 824.08'

N 00°00'00" E 1326.55'  
(BASIS OF BEARINGS)

WEST LINE SW 1/4 SW 1/4  
SEC. 19, T.1N., R.68W.

SW COR. SEC. 19,  
T.1N., R.68W.  
FOUND 2" ALUM. CAP IN  
MONUMENT BOX - LS No. 14083

NW COR. SW 1/4 SW 1/4  
SEC. 19, T.1N., R.68W.  
FOUND 2" ALUM. CAP IN  
MONUMENT BOX - LS No. 14083

NOTE: ALL EASEMENTS SHOWN ARE 8" UTILITY AND  
DRAINAGE EASEMENTS UNLESS OTHERWISE NOTED.

**Acklam**  
Associates, Inc.  
P.O. Box 795  
Brighton, Colorado 80601  
303-659-8546

DRAWING FILE: S:\PROJECTS\197.001 LONGS PEAK SPRINKLER\3. ENGINEERING\DRAWINGS\197.001 CS.DWG  
 PLOT DATE: 1/9/2017 2:46 PM  
 BY: STEPHEN WILLIAMS  
 CTB: PC\_2015\_MONO.CTB

**LEGAL DESCRIPTION:**

LOT 8, AUSTIN INDUSTRIAL PARK, LOCATED IN THE SOUTHWEST QUARTER OF SECTION 19, TOWNSHIP 1 NORTH, RANGE 68 WEST OF THE 6TH P.M. TOWN OF ERIE, COUNTY OF WELD, STATE OF COLORADO

**BASIS OF BEARINGS:**

GPS DERIVED BEARINGS BASED ON A BEARING OF N01°14'08"E ALONG THE WEST LINE OF LOT 8, BETWEEN A FOUND NO. 4 REBAR W/ 1" RED PLASTIC CAP "AAI 23027" AT THE SOUTHWEST CORNER OF LOT 8 AND A FOUND NO. 4 REBAR W/ 1" RED PLASTIC CAP (ILLEGIBLE) AT THE NORTHWEST CORNER OF LOT 8 AS SHOWN HEREON. COLORADO STATE PLANE COORDINATE SYSTEM, COLORADO NORTH ZONE, NORTH AMERICAN DATUM 1983 (NAD83). ALL BEARINGS SHOWN HEREON ARE RELATIVE THERETO.

**BENCHMARK INFORMATION:**

GPS DERIVED BEARINGS BASED ON A BEARING OF N01°14'08"E ALONG THE WEST LINE OF LOT 8, BETWEEN A FOUND NO. 4 REBAR W/ 1" RED PLASTIC CAP "AAI 23027" AT THE SOUTHWEST CORNER OF LOT 8 AND A FOUND NO. 4 REBAR W/ 1" RED PLASTIC CAP (ILLEGIBLE) AT THE NORTHWEST CORNER OF LOT 8 AS SHOWN HEREON. COLORADO STATE PLANE COORDINATE SYSTEM, COLORADO NORTH ZONE, NORTH AMERICAN DATUM 1983 (NAD83). ALL BEARINGS SHOWN HEREON ARE RELATIVE THERETO.

**PROPOSED DEVELOPMENT SCHEDULE**

CONSTRUCTION TO BEGIN END OF JANUARY 2017. ANTICIPATED CONSTRUCTION TO LAST 7 MONTHS.

**FLOODPLAIN INFORMATION**

FIRM PANEL #08013C04431 EFFECTIVE DATE OF DECEMBER 18, 2012 SHOWS THAT THE PROPERTY LIES OUTSIDE THE 500-YEAR FLOODPLAIN OF COAL CREEK FLOODWAY IN FLOODWAY AREA ZONE X. FLOODWAY AREA ZONE X IS AREAS DETERMINED TO BE OUTSIDE 500-YEAR FLOODPLAIN DETERMINED TO BE OUTSIDE THE 1% AND 0.2% ANNUAL CHANCE FLOODPLAINS.

**LOT 8, AUSTIN INDUSTRIAL PARK**  
 LONGS PEAK SPRINKLER, 460 JONES COURT  
 LOCATED IN THE SOUTHWEST QUARTER OF SECTION 19, TOWNSHIP 1 NORTH, RANGE 68 WEST OF THE 6TH P.M.  
 TOWN OF ERIE, COUNTY OF WELD, STATE OF COLORADO  
 0.97± ACRES  
 SITE PLAN - SP-000775-2016  
 SRU AREA - 0.97± ACRES - TOTAL AREA 0.97± ACRES  
 SPECIAL REVIEW USE SITE PLAN - SRU-000774-2016

**SHEET INDEX**

C1	COVER SHEET
C2	SITE PLAN
C3	UTILITY PLAN
C4	GRADING PLAN
C5	DRAINAGE & ER CONTROL PLAN
C6	DRAINAGE & ER CONTROL NOTES
C7	DETAILS - CIVIL DETAILS I
C8	LANDSCAPE PLAN
C9	LANDSCAPING SCHEDULES
C10	ELECTRICAL SITE PHOTOMETRIC PLAN (BY OTHERS)
A-1	FLOOR PLAN SHEET (BY OTHERS)
A-2	ELEVATIONS SHEET (BY OTHERS)
A-3	ELEVATIONS SHEET (BY OTHERS)

**SPECIAL REVIEW USE SITE PLAN APPROVAL CERTIFICATE:**

THIS SPECIAL REVIEW USE PLAN HAS BEEN REVIEWED AND FOUND TO BE COMPLETE AND IN ACCORDANCE WITH APPLICABLE TOWN OF ERIE REGULATIONS.

PLANNING COMMISSION - CHAIRMAN \_\_\_\_\_ DATE \_\_\_\_\_

BOARD OF TRUSTEES - MAYOR \_\_\_\_\_ DATE \_\_\_\_\_

THE UNDERSIGNED AS THE OWNER OR OWNER'S REPRESENTATIVE OF THE LANDS DESCRIBED HEREIN, HEREBY AGREES ON BEHALF OF HIMSELF/HERSELF, THEIR HEIRS, SUCCESSORS, AND ASSIGNS TO DEVELOP AND MAINTAIN THE PROPERTY DESCRIBED HEREON IN ACCORDANCE WITH THIS APPROVED SITE PLAN AND IN COMPLIANCE WITH THE TOWN OF ERIE UNIFIED DEVELOPMENT CODE AND MUNICIPAL CODE.

OWNER SIGNATURE \_\_\_\_\_ OWNER NAME PRINTED \_\_\_\_\_

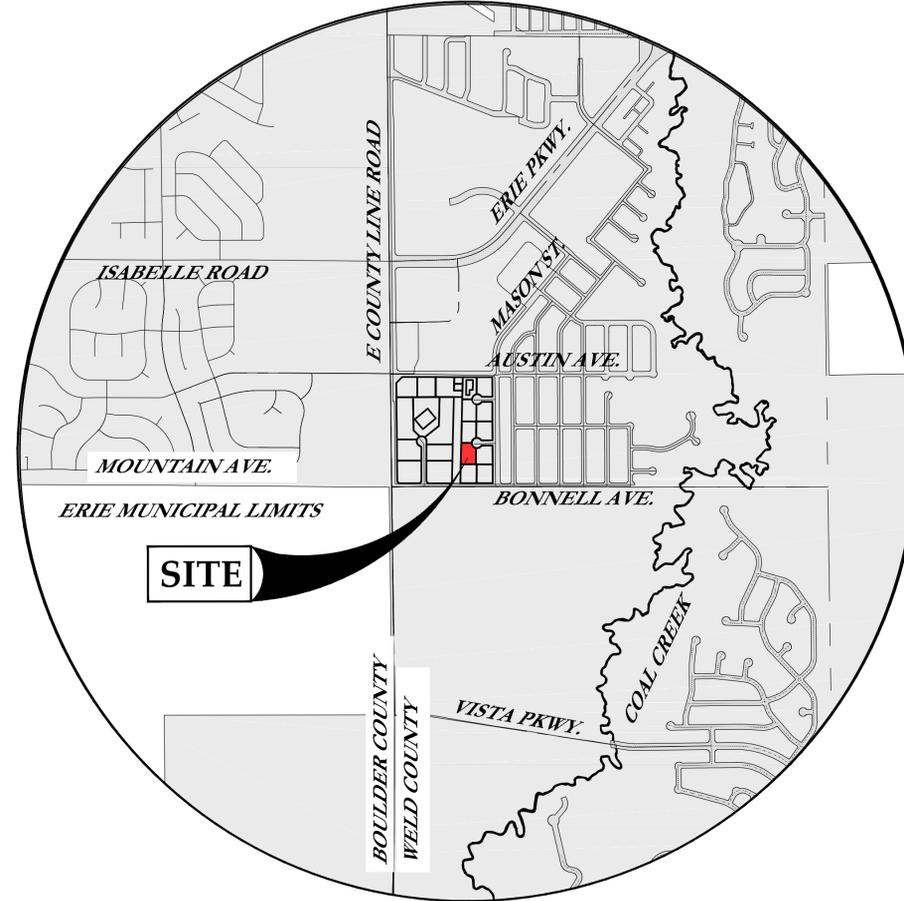
ACKNOWLEDGED BEFORE ME THIS \_\_\_\_\_ DAY OF \_\_\_\_\_, 20\_\_\_\_

BY \_\_\_\_\_ AS \_\_\_\_\_

WITNESS MY HAND AND SEAL:

NOTARY PUBLIC \_\_\_\_\_

MY COMMISSION EXPIRES: \_\_\_\_\_



**DRAWING LEGEND**

	EXISTING	PROPOSED
ROW OR PROPERTY LINE	---	---
SECTION LINE	---	---
CENTER LINE	---	---
EASEMENT LINE	---	---
CONTOURS	--- 4685 --- --- 4684 ---	--- 4685 --- --- 4684 ---
SANITARY SEWER LINE	--- S/L ---	--- S/L ---
SANITARY SERVICE LINE	--- SS ---	--- SS ---
STORM DRAIN LINE	--- S/D ---	--- S/D ---
WATER LINE	--- W/L ---	--- W/L ---
WATER SERVICE LINE	--- WS ---	--- WS ---
ELECTRIC LINE	--- E ---	--- E ---
OVERHEAD ELEC LINE	--- OHE ---	--- OHE ---
UNDERGROUND ELEC LINE	--- UGE ---	--- UGE ---
GAS LINE	--- G ---	--- G ---
TELEPHONE LINE	--- T ---	--- T ---
OVERHEAD TEL LINE	--- OHT ---	--- OHT ---
UNDERGROUND TEL LINE	--- UGT ---	--- UGT ---
FIBER OPTIC LINE	--- FO ---	--- FO ---
SANITARY MANHOLE	--- S ---	--- S ---
STORM DRAIN MANHOLE	--- D ---	--- D ---
DRAINAGE SWALE	---	---
CURB & GUTTER	---	---
BARB-WIRE FENCE	--- X ---	--- X ---
CHAIN-LINK FENCE	---	---
WOOD FENCE	---	---
RR TRACKS	---	---
SANITARY CLEANOUT	---	--- CO ---
STORM DRAIN INLET (TYPE "R")	---	---
STORM DRAIN INLET (TYPE "C")	---	---

WATER METER	---
BACKFLOW PREVENTER	---
SUMP PIT	---
GATE VALVE	---
FIRE HYDRANT	---
DOWNSPOUT DRAIN	---
ELECTRIC TRANSFORMER	---
TELEPHONE PEDESTAL	---
UTILITY POLE	---
LIGHT POLE	---
SECTION CORNER	---
SURVEY MARKER/MONUMENT	---
ASPHALT PAVING	---
GRAVEL DRIVE	---
CONCRETE PAVEMENT	---
RIPRAP	---
BUILDING	---
PEDESTAL POLE & MASTARM	---
PEDESTAL POLE & SIGNAL HEADS	---
RECORDED BRGDIST PER PLAT	---
MEASURED BRGDIST	---

**OWNER/APPLICANT**

OWNER/APPLICANT  
 MIKE AMEND  
 115 WIGGETT CT  
 ERIE, CO 80516

**TECHNICAL CONSULTANTS**

**SURVEYING**  
 FLATIRONS, INC.  
 655 FOURTH AVE.  
 LONGMONT, CO 80501  
 PHONE: 303-776-1700  
 CONTACT: JESS KUNT

**PLANNING/ENGINEERING**  
 PERMONTES GROUP  
 625 MAIN STREET  
 LONGMONT, CO 80501  
 PHONE: 720-684-4981  
 CONTACT: MICKEY LEY  
 MLEY@PERMONTESGROUP.COM

**GEOTECHNICAL ENGINEERING**  
 KUMAR & ASSOCIATES, INC.  
 2390 SOUTH LIPAN STREET  
 DENVER, CO 80223  
 PHONE: (303) 742-9700  
 CONTACT: KEN MENDENHALL  
 www.kumarusa.com

SITE DATA SUMMARY CHART ZONE DISTRICT - LIGHT INDUSTRIAL (LI)		
ITEM	SQUARE FOOTAGE	PERCENT OF GROSS SITE
GROSS SITE AREA:	42,200 S.F. (0.970 AC)	100 %
• BUILDING FOOTPRINT:	6,912 S.F.	16.4 %
• PARKING/ROADS: DRIVEWAYS AND PARKING:	18,600 S.F.	44.0 %
OUTDOOR STORAGE AREA	5,300 S.F.	12.7 %
<b>HARDSCAPE TOTAL</b>	<b>31,022 S.F.</b>	<b>73.4 %</b>
• PLANTED AREA	6,529 S.F.	15.5 %
• NON-LANDSCAPED (NATIVE SEED) AREA	4,810 S.F.	11.4 %
• EXISTING VEGETATION	-----	---
• TRAILS & SIDEWALKS	-----	---
<b>LANDSCAPE TOTAL</b>	<b>6,529 S.F.</b>	<b>15.5 %</b>

ITEM	DESCRIPTION
BUILDING SIZE: 1 STORY	
• AN UNDETERMINED MIX OF OFFICE AND/OR LIGHT INDUSTRIAL	6,912 S.F.
TOTAL	6,912 S.F.
PARKING	
• TOTAL REQUIRED (OFFICE 1/300 S.F.)	23 SPACES
• TOTAL PROVIDED (INCLUDING HANDICAP)	23 SPACES
• HANDICAP PROVIDED	1 SPACE

UNCC  
 811  
 Know what's below. Call before you dig.

permontesgroup  
 T: (720) 684-4981  
 F: (666) 563-9212  
 625 Main Street  
 Longmont, CO 80501  
 www.permontesgroup.com

PREPARED FOR: MIKE AMEND  
 SHEET TITLE: COVER SHEET  
 LOT 8, AUSTIN INDUSTRIAL PARK  
 460 JONES COURT, ERIE, CO

DESIGNED BY: ML
DRAWN BY: SDW
CHECKED BY: ML
APPROVED BY: JHP
PROJECT NO.: 197.001
DATE: 5.10.2016
SCALE: AS SHOWN
SHEET NO. C1
SHEET 1 OF 10

THE CONTRACTOR SHALL LOCATE AND VERIFY ALL EXISTING UTILITY LOCATIONS PRIOR TO CONSTRUCTION

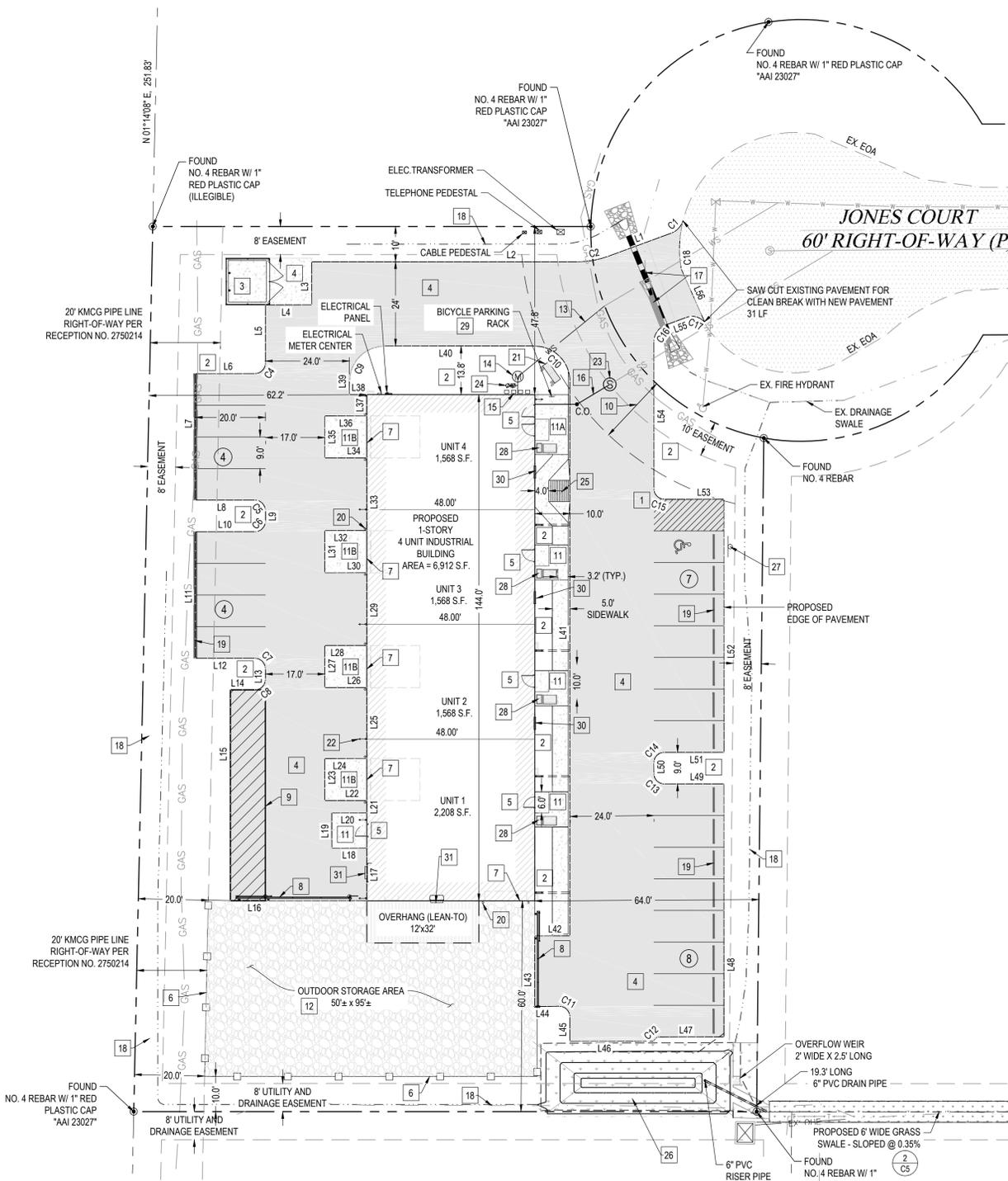
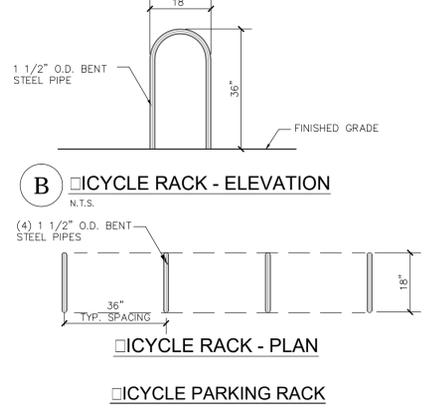
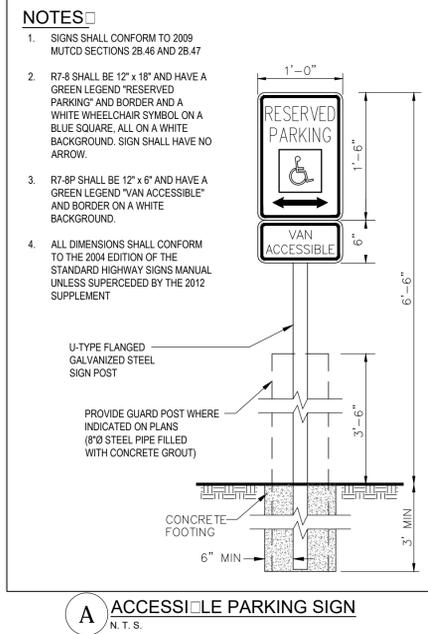
DRAWING FILE: S:\PROJECTS\197.001 LONGS PEAK SPRINKLER 3 ENGINEERING\DRAWINGS\197.001 SITE PLANNING PLOT DATE: 1/9/2017 2:59 PM BY: STEPHEN WILLIAMS CTB: PC\_2015\_MONO.CTB

**LOT 8, AUSTIN INDUSTRIAL PARK**  
 LONGS PEAK SPRINKLER, 460 JONES COURT  
 LOCATED IN THE SOUTHWEST QUARTER OF SECTION 19, TOWNSHIP 1 NORTH, RANGE 68 WEST OF THE 6TH P.M  
 TOWN OF ERIE, COUNTY OF WELD, STATE OF COLORADO  
 0.97± ACRES  
**SITE PLAN - SP-000775-2016**  
 SRU AREA - 0.97± ACRES - TOTAL AREA 0.97± ACRES  
 SPECIAL REVIEW USE SITE PLAN - SRU-000774-2016

LINE #	LENGTH	DIRECTION	START POINT (N,E)	END POINT (N,E)
L1	19.43	N70°01'07"E	(1254689.07, 3126334.36)	(1254695.71, 3126352.62)
L2	75.96	S89°59'35"E	(1254687.58, 3126249.85)	(1254687.57, 3126325.81)
L3	12.30	N00°00'25"E	(1254675.28, 3126249.85)	(1254687.58, 3126249.85)
L4	13.25	N89°59'35"W	(1254675.28, 3126249.85)	(1254675.28, 3126236.60)
L5	16.54	N00°00'25"E	(1254658.74, 3126236.59)	(1254675.28, 3126236.60)
L6	17.00	S89°59'35"E	(1254655.74, 3126216.59)	(1254655.74, 3126233.59)
L7	36.00	N00°00'25"E	(1254619.74, 3126216.59)	(1254655.74, 3126216.59)
L8	17.00	N89°59'35"W	(1254619.74, 3126233.59)	(1254619.74, 3126216.59)
L9	3.00	N00°00'25"E	(1254613.74, 3126236.59)	(1254616.74, 3126236.59)
L10	17.00	S89°59'35"E	(1254610.74, 3126216.59)	(1254610.74, 3126233.59)
L11	36.00	N00°00'25"E	(1254574.74, 3126216.59)	(1254610.74, 3126216.59)
L12	17.00	N89°59'35"W	(1254574.74, 3126233.58)	(1254574.74, 3126216.58)
L13	3.00	N00°00'25"E	(1254568.74, 3126236.58)	(1254574.74, 3126236.58)
L14	7.00	S89°59'35"E	(1254565.74, 3126226.58)	(1254568.74, 3126233.58)
L15	60.00	N00°00'25"E	(1254505.74, 3126226.58)	(1254565.74, 3126226.58)
L16	39.00	N89°59'35"W	(1254505.74, 3126265.58)	(1254505.74, 3126226.58)
L17	15.00	S00°00'25"W	(1254520.74, 3126265.58)	(1254505.74, 3126265.58)
L18	10.00	S89°59'35"E	(1254520.74, 3126255.58)	(1254520.74, 3126265.58)
L19	10.00	S00°00'25"W	(1254530.74, 3126255.58)	(1254520.74, 3126255.58)
L20	10.00	N89°59'35"W	(1254530.74, 3126265.58)	(1254530.74, 3126255.58)
L21	3.49	S00°00'25"W	(1254534.23, 3126265.58)	(1254530.74, 3126265.58)
L22	12.00	S89°59'35"E	(1254534.23, 3126265.58)	(1254534.23, 3126265.58)
L23	12.00	S00°00'25"W	(1254546.23, 3126253.58)	(1254534.23, 3126253.58)
L24	12.00	N89°59'35"W	(1254546.23, 3126265.58)	(1254546.23, 3126253.58)
L25	20.16	S00°00'25"W	(1254566.40, 3126265.58)	(1254546.23, 3126265.58)
L26	12.00	S89°59'35"E	(1254566.40, 3126253.58)	(1254566.40, 3126265.58)
L27	12.00	S00°00'25"W	(1254578.40, 3126253.59)	(1254566.40, 3126253.58)
L28	12.00	N89°59'34"W	(1254578.40, 3126265.59)	(1254578.40, 3126253.59)
L29	20.67	S00°00'20"W	(1254599.06, 3126265.59)	(1254578.40, 3126265.59)
L30	12.00	S89°59'35"E	(1254599.07, 3126253.59)	(1254599.06, 3126265.59)

LINE #	LENGTH	DIRECTION	START POINT (N,E)	END POINT (N,E)
L31	12.00	S00°00'25"W	(1254611.07, 3126253.59)	(1254599.07, 3126253.59)
L32	12.00	N89°59'35"W	(1254611.06, 3126265.59)	(1254611.07, 3126253.59)
L33	20.67	S00°00'25"W	(1254631.73, 3126265.59)	(1254611.06, 3126265.59)
L34	12.00	S89°59'35"E	(1254631.73, 3126253.59)	(1254631.73, 3126265.59)
L35	12.00	S00°00'25"W	(1254643.73, 3126253.59)	(1254631.73, 3126253.59)
L36	12.00	N89°59'35"W	(1254643.73, 3126265.59)	(1254643.73, 3126253.59)
L37	6.01	N00°00'43"E	(1254643.73, 3126265.59)	(1254649.74, 3126265.59)
L38	5.00	S89°59'33"E	(1254649.74, 3126260.59)	(1254649.74, 3126265.59)
L39	3.84	S00°00'25"W	(1254653.58, 3126260.59)	(1254649.74, 3126260.59)
L40	43.00	N89°59'35"W	(1254663.57, 3126313.60)	(1254663.57, 3126270.60)
L41	154.00	N00°00'25"E	(1254495.73, 3126323.58)	(1254649.73, 3126323.59)
L42	10.00	N90°00'00"E	(1254495.73, 3126313.58)	(1254495.73, 3126323.58)
L43	20.04	N00°00'25"E	(1254475.69, 3126313.57)	(1254495.73, 3126313.58)
L44	7.00	S89°39'25"W	(1254475.73, 3126320.57)	(1254475.69, 3126313.57)
L45	7.00	N00°00'25"E	(1254465.73, 3126323.57)	(1254472.73, 3126323.57)
L46	24.00	N89°59'35"W	(1254465.73, 3126347.57)	(1254465.73, 3126323.57)
L47	18.50	N89°59'37"W	(1254466.99, 3126367.57)	(1254466.99, 3126349.07)
L48	72.00	S00°00'25"W	(1254538.99, 3126367.58)	(1254466.99, 3126367.57)
L49	17.00	S89°59'35"E	(1254538.99, 3126350.58)	(1254538.99, 3126367.58)
L50	3.00	S00°00'25"W	(1254544.99, 3126347.58)	(1254544.99, 3126347.58)
L51	17.00	N89°59'35"W	(1254547.99, 3126367.58)	(1254544.99, 3126350.58)
L52	72.00	S00°00'25"W	(1254619.99, 3126367.59)	(1254547.99, 3126367.58)
L53	17.00	S89°59'35"E	(1254619.99, 3126350.59)	(1254619.99, 3126367.59)
L54	41.78	S00°00'19"W	(1254664.85, 3126347.60)	(1254623.07, 3126347.60)
L55	6.16	S70°03'08"W	(1254671.65, 3126356.68)	(1254669.55, 3126350.89)
L56	16.71	S23°59'12"E	(1254685.51, 3126355.42)	(1254670.23, 3126362.17)

CURVE #	RADIUS	LENGTH	DELTA	STARTING POINT (N,E)	END POINT (N,E)
C1	5.58	4.99	51°13'32"	(1254695.71, 3126352.62)	(1254699.25, 3126355.91)
C2	25.00	8.72	19°59'18"	(1254687.57, 3126325.81)	(1254689.07, 3126334.36)
C4	3.00	4.71	90°00'00"	(1254655.74, 3126233.59)	(1254658.74, 3126236.59)
C5	3.00	4.71	90°00'00"	(1254616.74, 3126236.59)	(1254619.74, 3126233.59)
C6	3.00	4.71	90°00'00"	(1254610.74, 3126233.59)	(1254613.74, 3126236.59)
C7	3.00	4.71	90°00'00"	(1254571.74, 3126236.58)	(1254574.74, 3126233.58)
C8	3.00	4.71	90°00'00"	(1254565.74, 3126233.58)	(1254568.74, 3126236.58)
C9	10.00	15.71	90°00'00"	(1254663.57, 3126270.60)	(1254653.58, 3126260.59)
C10	10.00	15.71	90°00'00"	(1254663.57, 3126323.59)	(1254663.57, 3126313.60)
C11	3.00	4.71	90°00'00"	(1254472.73, 3126323.57)	(1254475.73, 3126320.57)
C12	1.55	2.12	78°42'24"	(1254466.99, 3126349.07)	(1254465.73, 3126347.57)
C13	3.00	4.71	90°00'00"	(1254541.99, 3126347.58)	(1254538.99, 3126350.58)
C14	3.00	4.71	90°00'00"	(1254547.99, 3126350.58)	(1254544.99, 3126347.58)
C15	3.00	4.71	89°59'37"	(1254622.99, 3126347.59)	(1254619.99, 3126350.59)
C16	5.00	6.11	70°02'44"	(1254669.55, 3126350.89)	(1254664.85, 3126347.60)
C17	4.54	6.12	77°15'05"	(1254670.23, 3126362.17)	(1254671.65, 3126356.68)
C18	33.13	13.84	23°59'19"	(1254699.25, 3126355.91)	(1254685.51, 3126355.42)



- SITE NOTES**
- PROPERTY IS ZONED "LIGHT INDUSTRIAL" (LI).
  - THERE ARE NO MAJOR DRAINAGE WAYS AFFECTING THE SITE.
  - THE SITE DOES NOT LIE WITHIN 100-YR FLOODPLAIN.
  - OWNER/CONTRACTOR MUST OBTAIN PERMITS FROM THE COLORADO DEPT. OF HEALTH, WATER QUALITY CONTROL DIVISION PERMIT ENFORCEMENT SECTION, AND THE TOWN OF ERIE PRIOR TO CLEARING, GRADING, OR EXCAVATION.
  - TREE PRESERVATION METHODS SHALL INCLUDE THOSE LISTED IN THE UNIFIED DEVELOPMENT CODE - SECTION 10.6.4 - E AS APPLICABLE.
- PARKING BREAKDOWN**
- REQUIRED: 23 OPEN SPACES  
 PROVIDED: 22 OPEN SPACES, 1 ACCESSIBLE SPACES, 23 TOTAL SPACES
- LOADING BERTH**
- REQUIRED: 1 OPEN SPACE  
 PROVIDED: 1 OPEN SPACE

- SITE PLAN FLAG NOTES**
- VAN-ACCESSIBLE HANDICAP PARKING WITH SIGNS
  - LANDSCAPE ISLAND
  - ENCLOSED DUMPSTER W/ 12' SWING GATE & CONCRETE PAD
  - PAVEMENT SECTION TO BE A FLEXIBLE ASPHALT SECTION OR RIGID CONCRETE SECTION AS RECOMMENDED IN THE "GEOTECHNICAL ENGINEERING STUDY AND PAVEMENT THICKNESS DESIGN PROPOSED AUSTIN INDUSTRIAL PARK BUILDING 460 JONES COURT ERIE, CO." PREPARED BY KUMAR & ASSOCIATES, INC., DATED JUNE 24, 2016.
  - ACCESS MAN DOOR (TYP.)
  - PERIMETER FENCING
  - 12' X 16' OVERHEAD SLIDING DOOR
  - 14' SWING GATE
  - 10' X 60' LOADING BERTH
  - 20' BUILDING SETBACK
  - 10'X10' CONCRETE PAD
  - 15'X10' CONCRETE PAD
  - 12'X10' CONCRETE PAD
  - OUTDOOR STORAGE AREA TO BE RECYCLED ASPHALT OR RECYCLED CONCRETE
  - 1" WATER SERVICE
  - 1" WATER METER
  - NATURAL GAS SERVICE METERS
  - 4" SANITARY SEWER SERVICE
  - 15" RCP STORM PIPE W/ FES TO BE REMOVED & REPLACED
  - DRAINAGE SWALE
  - PARKING ASPHALT CURB STOP
  - BOLLARDS LOCATED ON EACH END OF OVERHEAD DOORS (10 TOTAL)
  - FLAGSTONE MONUMENT SIGN (APPROXIMATELY 4x6)
  - ROOF DRAINS (10 TOTAL)
  - FLOW METER/ SAMPLING STATION
  - REDUCED PRESSURE ASSEMBLY
  - CURB RAMP TYPE 1 DETAIL SW5
  - WATER QUALITY POND
  - ACCESSIBLE PARKING SIGN
  - PLANTER BOX AND SITTING BENCH
  - BICYCLE PARKING RACK
  - APPROXIMATE LOCATION OF FUTURE ACHEATER LOCATION (3'-6" WIDE X 15' HIGH) (1' - 10 1/2" FROM GROUND)
  - ACHEATER LOCATION

DESIGNED BY: ML  
 DRAWN BY: SDW  
 CHECKED BY: ML  
 APPROVED BY: JHP

PROJECT NO.: 197.001  
 DATE: 05.10.2016  
 SCALE: AS SHOWN

SHEET NO. **C2**  
 SHEET 2 OF 10

THE CONTRACTOR SHALL LOCATE AND VERIFY ALL EXISTING UTILITY LOCATIONS PRIOR TO CONSTRUCTION

UNICC  
 UNIVERSITY OF NORTH COLORADO  
 811  
 Know what's below. Call before you dig.

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 T: (720) 684-4981  
 625 Main Street  
 Longmont, CO 80501  
 F: (866) 563-9212  
 www.permontesgroup.com

MIKE AMEND  
 SITE PLAN  
 LOT 8, AUSTIN INDUSTRIAL PARK  
 460 JONES COURT, ERIE, CO

PREPARED FOR:  
 SHEET TITLE:

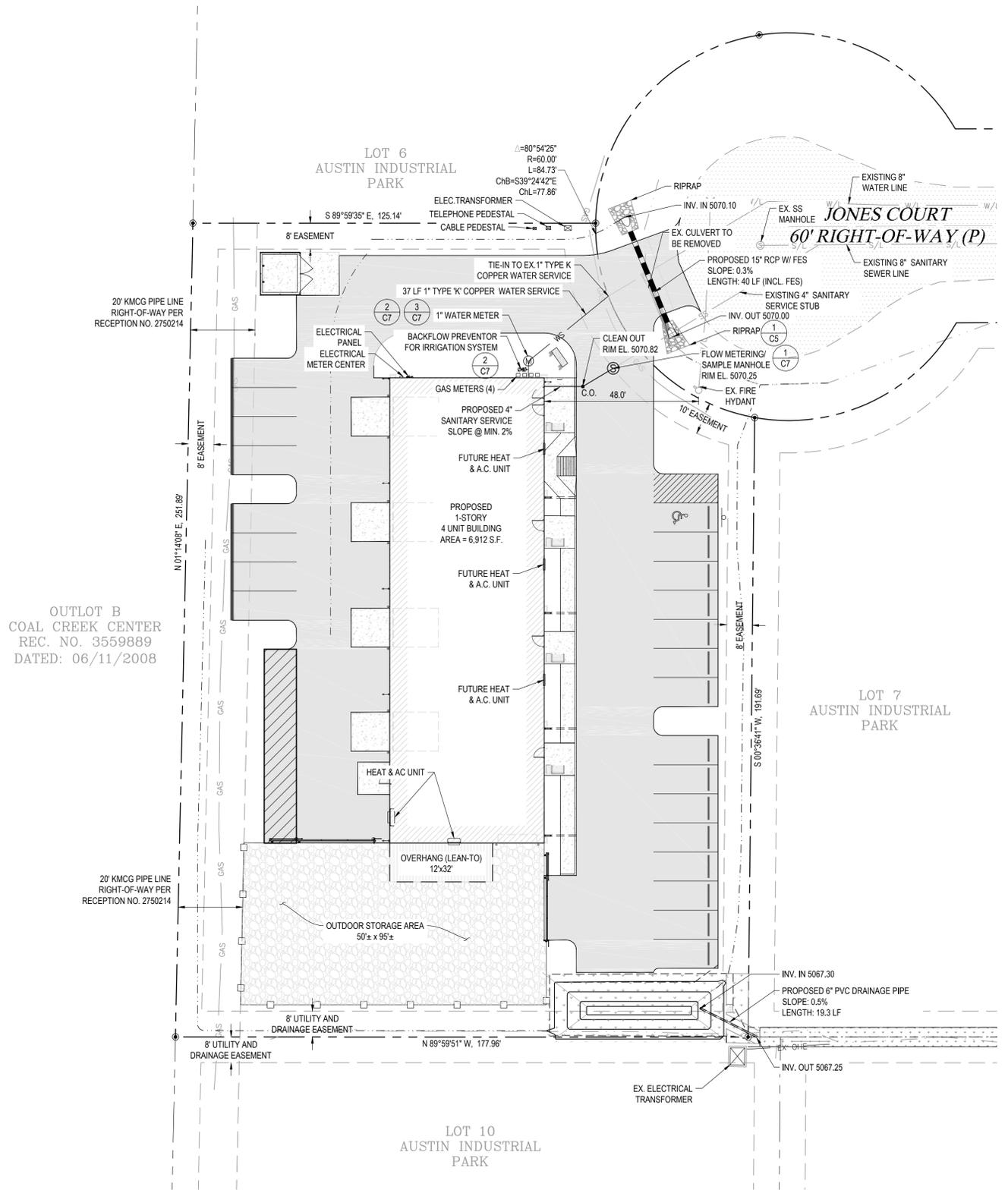
COMMUNITY DEVELOPMENT - TOWN OF ERIE  
 TOWN REVIEW COMMENTS  
 11-2-16  
 07-28-16  
 REV. DATE

DESCRIPTION  
 REVISION  
 LOCK

DRAWING FILE: S:\PROJECTS\197.001 LONGS PEAK SPRINKLER\3. ENGINEERING\DRAWINGS\197.001 UTILITY PLANDWG PLOT DATE: 1/9/2017 2:48 PM BY: STEPHEN WILLIAMS CTB: PC\_2015\_MONO.CTB

## LOT 8, AUSTIN INDUSTRIAL PARK

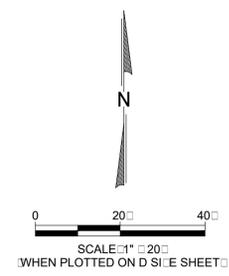
LONGS PEAK SPRINKLER, 460 JONES COURT  
 LOCATED IN THE SOUTHWEST QUARTER OF SECTION 19, TOWNSHIP 1 NORTH, RANGE 68 WEST OF THE 6TH P.M  
 TOWN OF ERIE, COUNTY OF WELD, STATE OF COLORADO  
 0.97± ACRES  
 SITE PLAN - SP-000775-2016  
 SRU AREA - 0.97± ACRES - TOTAL AREA 0.97± ACRES  
 SPECIAL REVIEW USE SITE PLAN - SRU-000774-2016



### GENERAL NOTES

1. CONTRACTOR SHALL CONFIRM ALL EXISTING UTILITIES LOCATIONS AND INFORM PERMONTES GROUP, INC. OF ANY CONFLICTS A MINIMUM OF 5 DAYS PRIOR TO CONSTRUCTION.
2. ALL CONSTRUCTION SHALL BE PER TOWN OF ERIE STANDARDS & SPECIFICATIONS, LATEST EDITION.
3. THE BUILDING LIGHTING SHALL BE AIMED AT THE BUILDING SO THAT LIGHT DOES NOT DRIFT OFF THE SITE.
4. CONTRACTOR TO COORDINATE DRY UTILITIES WITH APPROPRIATE AGENCIES.
5. CONTRACTOR SHALL PROVIDE NECESSARY MEASURES TO ADEQUATELY PROTECT THE EXISTING GAS MAINS AND OTHER UTILITIES DURING ALL SITE CONSTRUCTION ACTIVITIES.

OUTLOT B  
 COAL CREEK CENTER  
 REC. NO. 3559889  
 DATED: 06/11/2008



THE CONTRACTOR SHALL LOCATE AND VERIFY ALL EXISTING UTILITY LOCATIONS PRIOR TO CONSTRUCTION

REV.	DATE	DESCRIPTION
1	07/28/16	TOWN REVIEW COMMENTS
2	11/2/16	COMMUNITY DEVELOPMENT - TOWN OF ERIE



**permontesgroup**

T: (720) 684-4981  
 F: (686) 563-9212  
 www.permontesgroup.com

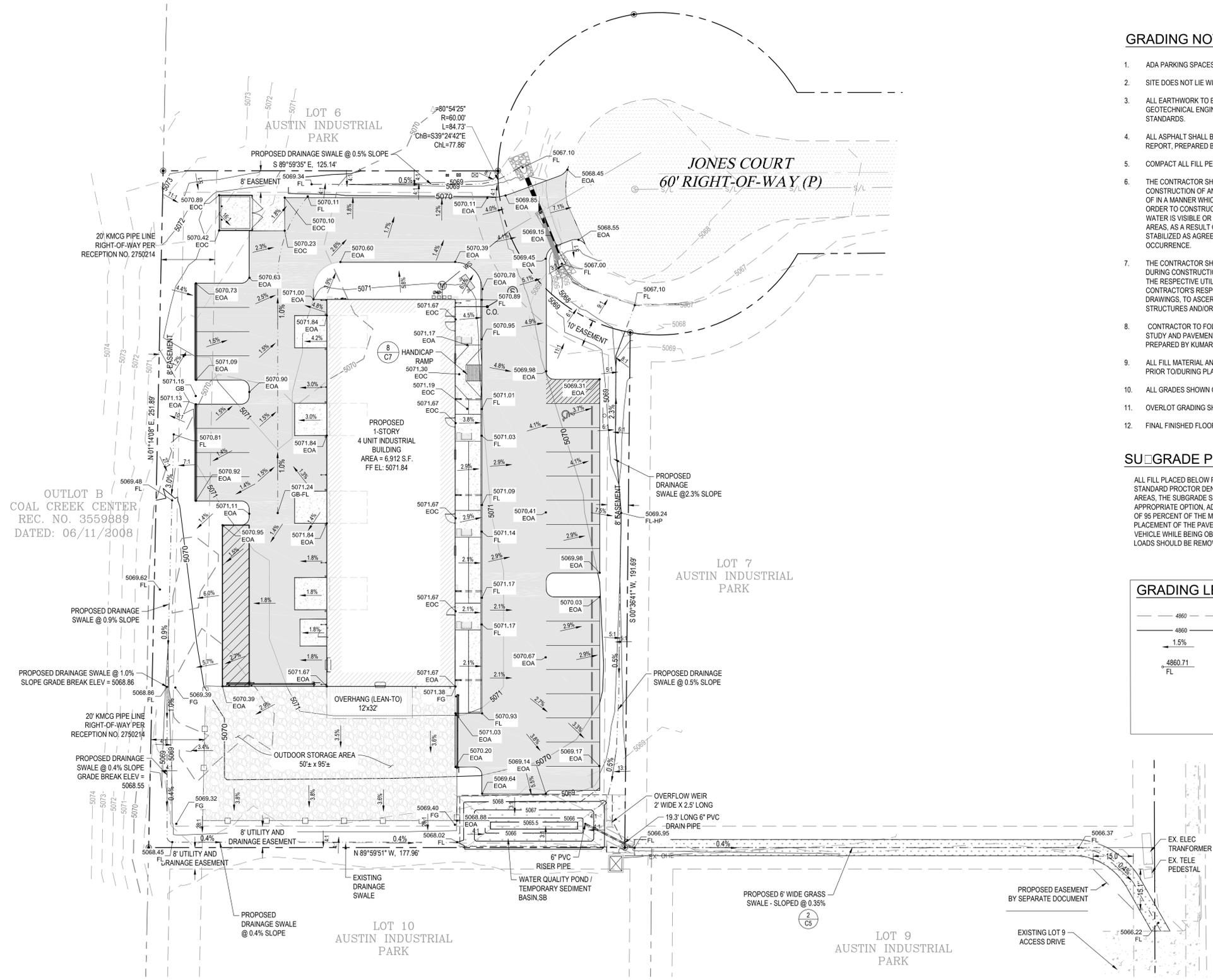
PREPARED FOR: **MIKE AMEND**

SHEET TITLE: **UTILITY PLAN**

**LOT 8, AUSTIN INDUSTRIAL PARK**  
**460 JONES COURT, ERIE, CO**

DESIGNED BY:	ML
DRAWN BY:	SDW
CHECKED BY:	ML
APPROVED BY:	JHP
PROJECT NO.:	197.001
DATE:	05.10.2016
SCALE:	AS SHOWN
SHEET NO.	<b>C</b>
SHEET	1 OF 10

**LOT 8, AUSTIN INDUSTRIAL PARK**  
 LONGS PEAK SPRINKLER, 460 JONES COURT  
 LOCATED IN THE SOUTHWEST QUARTER OF SECTION 19, TOWNSHIP 1 NORTH, RANGE 68 WEST OF THE 6TH P.M  
 TOWN OF ERIE, COUNTY OF WELD, STATE OF COLORADO  
 0.97± ACRES  
 SITE PLAN - SP-000775-2016  
 SRU AREA - 0.97± ACRES - TOTAL AREA 0.97± ACRES  
 SPECIAL REVIEW USE SITE PLAN - SRU-000774-2016



**GRADING NOTES**

- ADA PARKING SPACES SHALL NOT EXCEED 5% LONGITUDINAL SLOPE OR 2% CROSS SLOPE AT ANY POINT.
- SITE DOES NOT LIE WITHIN 100-YR FLOODPLAIN PER FIRM PANEL NO. 08013C04435, DATED DECEMBER 18, 2012.
- ALL EARTHWORK TO BE INSTALLED IN ACCORDANCE WITH RECOMMENDATIONS SPECIFIED IN THE SOILS REPORT, GEOTECHNICAL ENGINEERING REPORT, PREPARED BY KUMAR & ASSOCIATES, DATED MAY, 2016, AND THE TOWN OF ERIE STANDARDS.
- ALL ASPHALT SHALL BE IN ACCORDANCE WITH THE RECOMMENDATIONS SPECIFIED IN THE GEOTECHNICAL ENGINEERING REPORT, PREPARED BY KUMAR & ASSOCIATES, DATED MAY, 2016.
- COMPACT ALL FILL PER SOILS ENGINEER.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING ANY GROUND WATER ENCOUNTERED DURING THE CONSTRUCTION OF ANY PORTION OF THIS PROJECT. GROUND WATER SHALL BE PUMPED, PIPED, REMOVED AND DISPOSED OF IN A MANNER WHICH DOES NOT CAUSE FLOODING OF EXISTING STREETS NOR EROSION ON ABUTTING PROPERTIES IN ORDER TO CONSTRUCT THE IMPROVEMENTS SHOWN ON THESE PLANS. NO CONCRETE SHALL BE PLACED WHERE GROUND WATER IS VISIBLE OR UNTIL THE GROUND WATER TABLE HAS BEEN LOWERED BELOW THE IMPROVEMENTS. ANY UNSTABLE AREAS, AS A RESULT OF GROUND WATER, ENCOUNTERED DURING THE CONSTRUCTION OF THE IMPROVEMENTS SHALL BE STABILIZED AS AGREED UPON BY THE CONTRACTOR, THE TOWN, AND THE DESIGN ENGINEER AT THE TIME OF THEIR OCCURRENCE.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE LOCATION, PROTECTION, AND REPAIR OF UTILITIES ENCOUNTERED DURING CONSTRUCTION, WHETHER SHOWN ON THESE PLANS OR NOT. CONTRACTOR SHALL CONTACT REPRESENTATIVES OF THE RESPECTIVE UTILITIES AND HAVE ALL UTILITIES FIELD LOCATED PRIOR TO CONSTRUCTION. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL LOCATIONS OF EXISTING STRUCTURES AND UTILITIES SHOWN ON THE DRAWINGS, TO ASCERTAIN WHETHER ANY STRUCTURES AND UTILITIES MAY EXIST, AND REPAIR AND/OR REPLACE ANY STRUCTURES AND/OR UTILITIES THAT ARE DAMAGED BY THE CONTRACTOR.
- CONTRACTOR TO FOLLOW ALL RECOMMENDATIONS FROM THE GEOTECHNICAL REPORT, "GEOTECHNICAL ENGINEERING STUDY AND PAVEMENT THICKNESS DESIGN PROPOSED AUSTIN INDUSTRIAL PARK BUILDING 460 JONES COURT ERIE, CO." PREPARED BY KUMAR & ASSOCIATES, INC., DATED JUNE 24, 2016.
- ALL FILL MATERIAL AND PLACEMENT OF FILL BELOW THE BUILDINGS TO BE REVIEWED AND APPROVED BY SOILS ENGINEER PRIOR TO DURING PLACEMENT. COMPACTION TO BE IN ACCORDANCE WITH SOILS REPORT DESIGN STANDARDS.
- ALL GRADES SHOWN ON THIS PLAN ARE TO FINISHED GRADE.
- OVERLOT GRADING SHALL BE TO SUBGRADE OF THE BUILDINGS AND ASPHALT PARKING LOT.
- FINAL FINISHED FLOOR ELEVATION SHALL NOT EXCEED MINIMUM FINISHED FLOOR ELEVATION BY MORE THAN TWO (2) FEET.

**SU<sub>2</sub> GRADE PREPARATION**

ALL FILL PLACED BELOW PAVEMENTS SHOULD BE COMPACTED TO AT LEAST 95 PERCENT OF THE MAXIMUM STANDARD PROCTOR DENSITY WITHIN ±2 PERCENT OF THE OPTIMUM MOISTURE CONTENT. IN CUT AND FILL AREAS, THE SUBGRADE SHOULD BE SCARIFIED TO A MINIMUM DEPTH OF 6 INCHES OR AS DESCRIBED IN THE APPROPRIATE OPTION, ADJUSTED TO NEAR OPTIMUM MOISTURE CONTENT AND RECOMPACTED TO A MINIMUM OF 95 PERCENT OF THE MAXIMUM STANDARD PROCTOR DENSITY AS DETERMINED BY ASTM D698. PRIOR TO PLACEMENT OF THE PAVEMENT, THE SUBGRADE SHOULD BE PROOF ROLLED WITH A HEAVY, PNEUMATIC TIRED VEHICLE WHILE BEING OBSERVED BY THE GEOTECHNICAL ENGINEER. AREAS WHICH DEFORM UNDER WHEEL LOADS SHOULD BE REMOVED AND REPLACED.

**GRADING LEGEND**

	4860	EXISTING CONTOURS
	4860	PROPOSED CONTOURS
	1.5%	FINISHED GRADE SLOPE
	4860.71	PROPOSED SURFACE ELEVATION SPOT GRADE DESCRIPTIONS
	EOA	EDGE OF ASPHALT
	EOC	EDGE OF CONCRETE
	FG	FINISHED GRADE
	FL	FLOW LINE
	FF	FINISHED FLOOR
	HP LP	HIGH POINT / LOW POINT
	G	GRADE - REAK

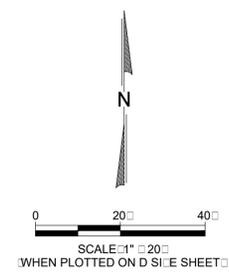
NO.	DATE	DESCRIPTION	REVISION
1	07/21/16	TOWN REVIEW COMMENTS	
2	11/2/16	COMMUNITY DEVELOPMENT - TOWN OF ERIE	



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PREPARED FOR: **MIKE AMEND**  
 SHEET TITLE: **GRADING PLAN**  
**LOT 8, AUSTIN INDUSTRIAL PARK**  
**460 JONES COURT, ERIE, CO**

DESIGNED BY:	ML
DRAWN BY:	SDW
CHECKED BY:	ML
APPROVED BY:	JHP
PROJECT NO.:	197.001
DATE:	05.10.2016
SCALE:	AS SHOWN
SHEET NO.:	<b>C4</b>
SHEET 4 OF 10	

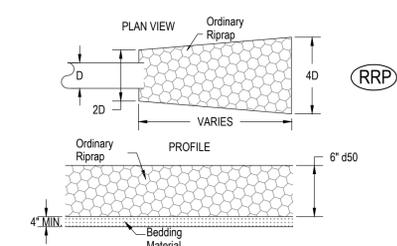
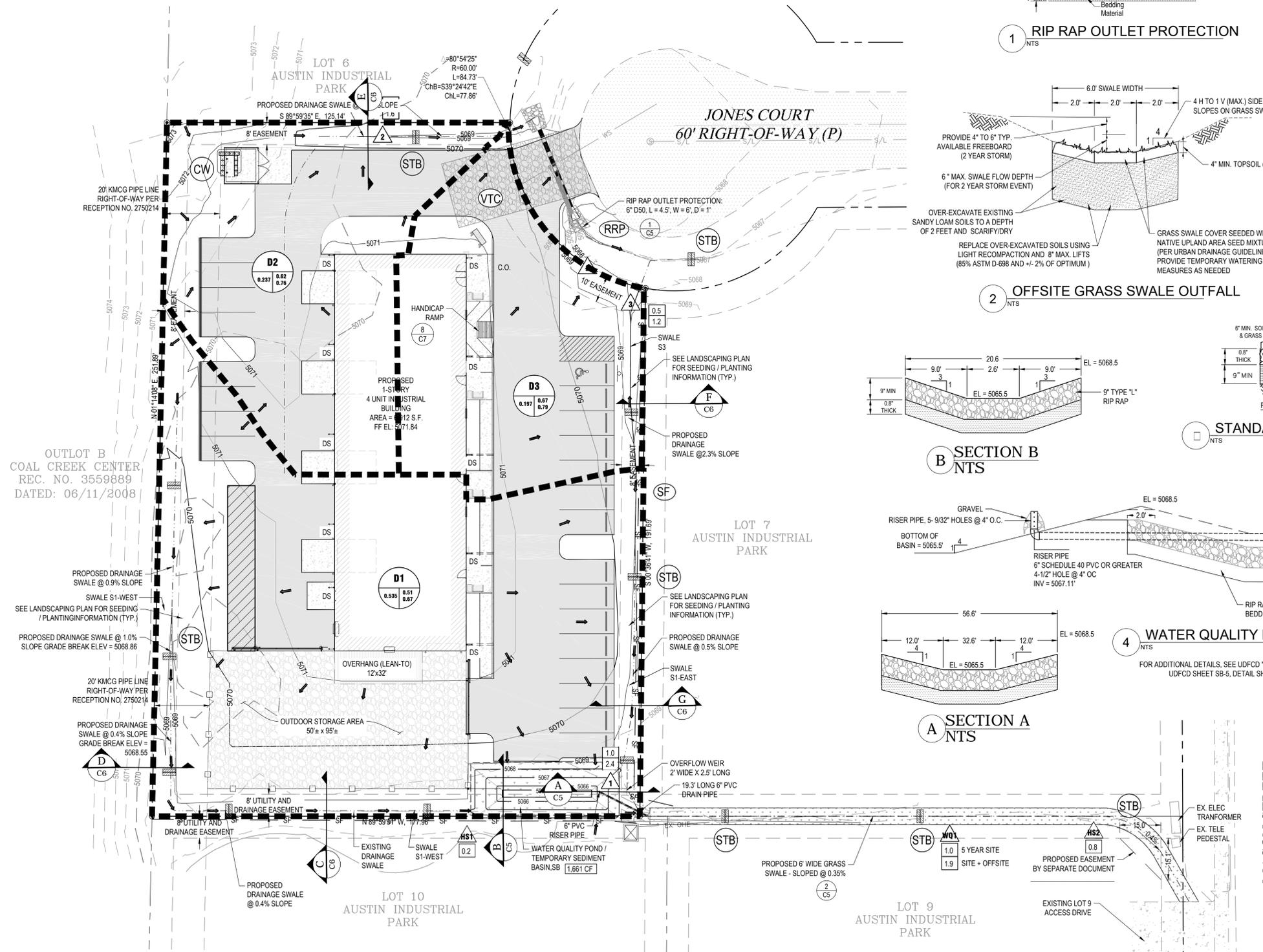


THE CONTRACTOR SHALL LOCATE AND VERIFY ALL EXISTING UTILITY LOCATIONS PRIOR TO CONSTRUCTION

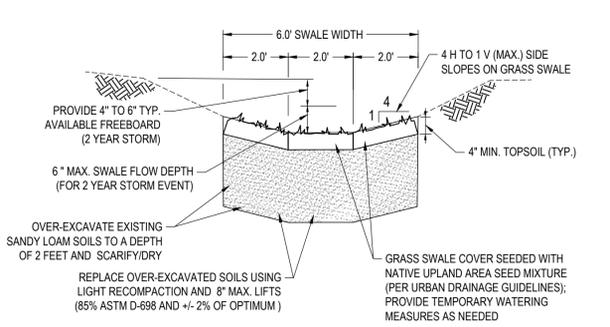
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PLOT DATE: 1/9/2017 2:50 PM BY: STEPHEN WILLIAMS CTB: PC\_2015\_MONO.CTB  
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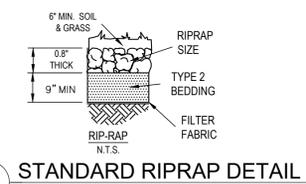
**LOT 8, AUSTIN INDUSTRIAL PARK**  
 LONGS PEAK SPRINKLER, 460 JONES COURT  
 LOCATED IN THE SOUTHWEST QUARTER OF SECTION 19, TOWNSHIP 1 NORTH, RANGE 68 WEST OF THE 6TH P.M  
 TOWN OF ERIE, COUNTY OF WELD, STATE OF COLORADO  
 0.97± ACRES  
 SITE PLAN - SP-000775-2016  
 SRU AREA - 0.97± ACRES - TOTAL AREA 0.97± ACRES  
 SPECIAL REVIEW USE SITE PLAN - SRU-000774-2016



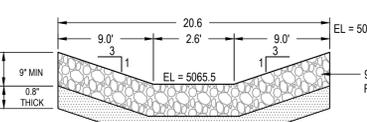
**1 RIP RAP OUTLET PROTECTION**  
NTS



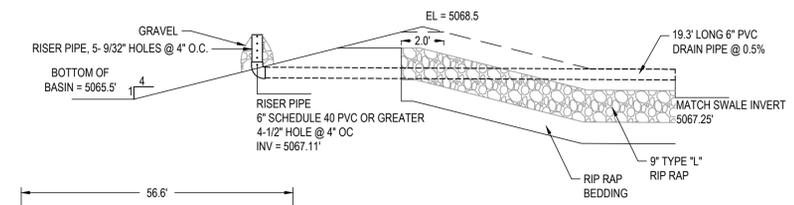
**2 OFFSITE GRASS SWALE OUTFALL**  
NTS



**3 STANDARD RIPRAP DETAIL**  
NTS



**SECTION B**  
NTS



**SECTION A**  
NTS



**4 WATER QUALITY POND DETAIL**  
NTS

**DRAINAGE DETENTION AREA NOTES**

- NO BUILDING, STRUCTURE, OR FILL WILL BE PLACED IN THE DETENTION AREAS AND NO CHANGES OR ALTERATIONS AFFECTING THE HYDRAULIC CHARACTERISTICS OF THE DETENTION AREAS WILL BE MADE WITHOUT THE APPROVAL OF THE TOWN.
- PERMISSION TO REPRODUCE THESE PLANS IS HEREBY GIVEN TO THE TOWN FOR PURPOSES ASSOCIATED WITH PLAN REVIEW, APPROVAL, PERMITTING, INSPECTION AND CONSTRUCTION OF WORK.
- THERE ARE NO MAJOR DRAINAGE WAYS AFFECTING THE SITE.
- THE SITE DOES NOT LIE WITHIN 100-YR FLOODPLAIN.
- OWNER/CONTRACTOR MUST OBTAIN PERMITS FROM THE COLORADO DEPT. OF HEALTH, WATER QUALITY CONTROL DIVISION PERMIT ENFORCEMENT SECTION, AND THE TOWN OF ERIE PRIOR TO CLEARING, GRADING, OR EXCAVATION.

**EROSION CONTROL CONSTRUCTION NOTES**

- AT ALL TIMES DURING THE CONSTRUCTION OF THE PROJECT, EROSION AND SEDIMENT CONTROL SYSTEMS SHALL BE MAINTAINED TO PREVENT DAMAGING FLOWS ON THE SITE AND IN THE WATERSHED BELOW THE SITE. CONTROL SYSTEMS SHALL BE INSTALLED PRIOR TO STRIPPING OF NATIVE VEGETATIVE COVER AND AS GRADING PROGRESSES. CONTROL SYSTEMS SHALL INCLUDE, AS A MINIMUM, STRAW BALE SEDIMENT TRAPS (OR EQUIVALENT) ALONG NATURAL DRAINAGE-WAYS PRIOR TO GRADING, AND UTILIZATION OF DESIGNED STORM DETENTION BASINS PRIOR TO FINAL GRADING REVEGETATION. THE MINIMUM STORAGE CAPACITIES FOR THE TWO SEDIMENT BASINS ARE INDICATED ON THIS DRAWING.
- ALL SEDIMENT TRAPS WILL BE CLEANED AND MAINTAINED TO PROVIDE ADEQUATE PROTECTION FROM SOIL LOSS UNTIL A TIME WHEN THE TOWN DETERMINES THEY ARE NO LONGER NEEDED.
- THE CONTRACTOR IS RESPONSIBLE FOR IMPLEMENTING MEASURES TO PREVENT EROSION OF DISTURBED SOIL BY WINDS.
- CONTRACTOR SHALL OBTAIN PERMITS FROM THE COLORADO DEPT. OF HEALTH, WATER QUALITY CONTROL DIVISION PERMIT ENFORCEMENT SECTION, AND THE TOWN OF ERIE PRIOR TO CLEARING, GRADING, OR EXCAVATION.
- THE CONSTRUCTION EROSION SEDIMENT CONTROL PLAN MAY BE MODIFIED BY THE STATE OF COLORADO HEALTH DEPARTMENT OR AUTHORIZED REPRESENTATIVE AS FIELD CONDITIONS WARRANT.
- CONTRACTOR TO MONITOR AND MAINTAIN VEHICLE TRACKING CONTROL PAD. IF MUD AND DIRT BECOMES A PROBLEM ON THE ROADWAY MAINTENANCE SHALL INCLUDE, BUT NOT BE LIMITED TO, ADDITIONAL AGGREGATE AND CLEANING OF STREETS.
- WHERE AREAS ARE TO BE LEFT BARE FOR EXTENDED PERIODS, SEED WITH FOOTHILL SEED MIXTURE.
- ALL EROSION CONTROL METHODS NEED TO BE INSTALLED AND APPROVED BY THE TOWN OF ERIE INSPECTOR PRIOR TO ANY CONSTRUCTION.
- CONCRETE WASHOUT SHOULD BE PROPERLY DISPOSED OF OFF-SITE.
- TEMPORARY CONCRETE WASHOUT FACILITIES SHALL BE CONSTRUCTED WITH SUFFICIENT QUANTITY AND VOLUME TO CONTAIN ALL LIQUID AND CONCRETE WASTE GENERATED BY WASHOUT OPERATIONS.

**EROSION CONTROL LEGEND**

EXISTING CONTOUR (1')	---	5074
PROPOSED CONTOUR (1')	---	5075
SILT FENCE	(SF)	SF
RIP RAP OUTLET PROTECTION	(RRP)	RRP
CURB INLET PROTECTION	(CIP)	CIP
INLET PROTECTION	(IP)	IP
CONCRETE WASHOUT BASIN	(CW)	CW
VEHICLE TRACKING CONTROL	(VTC)	VTC
STRAW BALE DAM	(STB)	STB

VEHICLE TRACKING CONTROL (VTC) SHALL BE USED DURING ALL PHASES OF CONSTRUCTION AT CONTRACTOR'S AND TOWN OF ERIE INSPECTOR'S DISCRETION.

**DRAINAGE LEGEND**

<b>H1</b>	DESIGN POINT	SYMBOLS
0.05	BASIN DESIGNATION	HISTORIC BASIN BOUNDARY
0.25	RUNOFF COEFFICIENT (MINOR 5-YEAR)	DEVELOPED BASIN BOUNDARY
0.51	RUNOFF COEFFICIENT (MAJOR 100-YEAR)	PROPOSED DRAINAGE SWALE
3.82%	AREA (ACRES)	PROPOSED DRAINAGE SLOPE
0.0	SLOPE ARROW	DRAIN SPOUT
1.2	PEAK INITIAL (5 YEAR) STORM DISCHARGE (CFS)	
	PEAK MAJOR (100 YEAR) STORM DISCHARGE (CFS)	

11.2.16	COMMUNITY DEVELOPMENT - TOWN OF ERIE	
07.28.16	TOWN REVIEW COMMENTS	
	DATE	
	REV.	
	DESCRIPTION	
	REVISION	

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PREPARED FOR: MIKE AMEND  
 SHEET TITLE: DRAINAGE EROSION CTRL PLAN  
 LOT 8, AUSTIN INDUSTRIAL PARK  
 460 JONES COURT, ERIE, CO

DESIGNED BY	ML
DRAWN BY	SDW
CHECKED BY	ML
APPROVED BY	
PROJECT NO.	197.001
DATE	05.10.2016
SCALE	AS SHOWN
SHEET NO.	C5
SHEET 5 OF 10	

SCALE: 1" = 20'  
 PLOTTED ON D S I E SHEET C5  
 THE CONTRACTOR SHALL LOCATE AND VERIFY ALL EXISTING UTILITY LOCATIONS PRIOR TO CONSTRUCTION

DRAWING FILE: S:\PROJECTS\197.001 LONGS PEAK SPRINKLER\3. ENGINEERING\DRAWINGS\197.001 GRADING PLAN.DWG  
 PLOT DATE: 1/9/2017 2:50 PM  
 BY: STEPHEN WILLIAMS  
 CTB: PC\_2015\_MONO.CTB

**LOT 8, AUSTIN INDUSTRIAL PARK**  
 LONGS PEAK SPRINKLER, 460 JONES COURT  
 LOCATED IN THE SOUTHWEST QUARTER OF SECTION 19, TOWNSHIP 1 NORTH, RANGE 68 WEST OF THE 6TH P.M  
 TOWN OF ERIE, COUNTY OF WELD, STATE OF COLORADO  
 0.97± ACRES  
 SITE PLAN - SP-000775-2016  
 SRU AREA - 0.97± ACRES - TOTAL AREA 0.97± ACRES  
 SPECIAL REVIEW USE SITE PLAN - SRU-000774-2016

EMERGENCY SPILLWAY □ RIPRAP AT FOOT OF □ERM									
BASIN	Q100 (cfs)	TOP OF BERM (ft)	WIDTH OF SPILLWAY (ft)	DEPTH OF SPILLWAY (ft)	SPILLWAY INVERT (ft)	LENGTH (ft)	WIDTH (ft)	THICKNESS (ft)	VELOCITY (fps)
SB	2.40	5069.25	4.50	0.50	5068.75	4.5	13.5	0.8	0.15

DEVELOPED RUNOFF											
S	P	Ar	I	TOC	C5	C10	C100	Q5	Q10	Q100	
1	D1	0.5:5	56	12	0.51	0.56	0.67	1.0	1.0	2.4	
2	D2	0.2:74	68	6	0.62	0.67	0.76	0.7	0.9	1.6	
□	D□	0.1969	75	9	0.67	0.71	0.79	0.5	0.7	1.2	
TOTAL DEVELOPED RUNOFF							2.2	2.9	5.2		

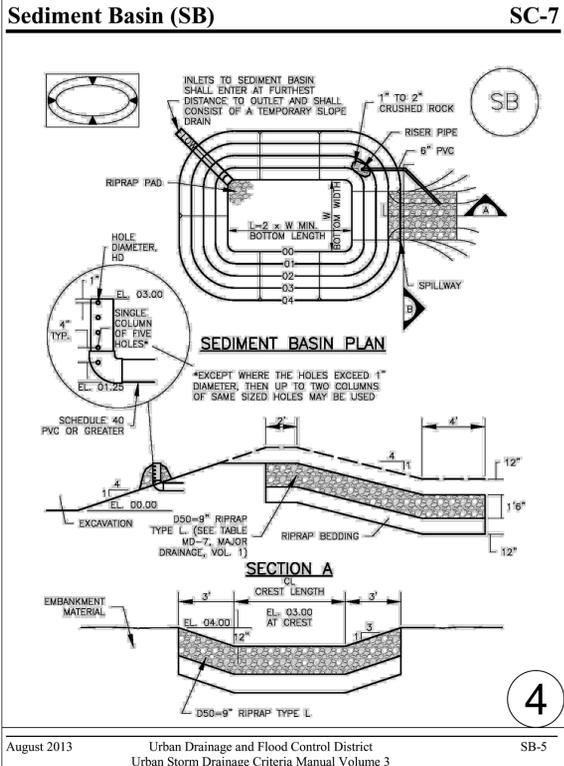
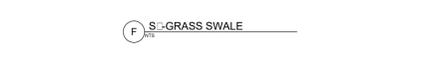
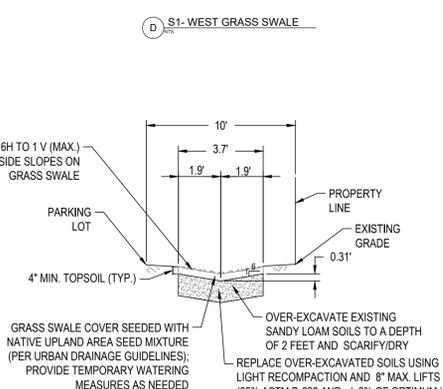
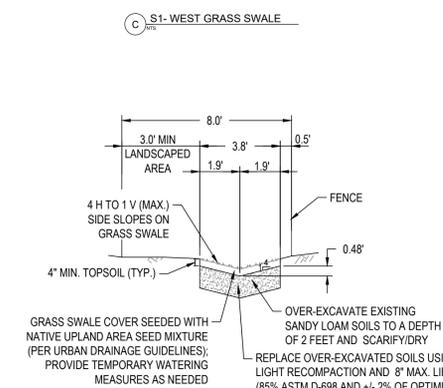
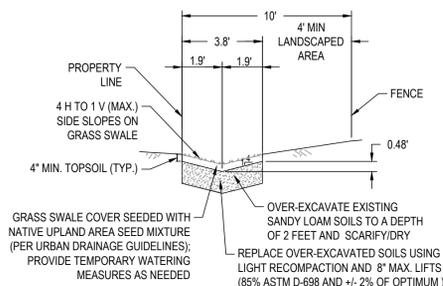
RIP RAP					
PIPE	LOCATION	LENGTH (ft)	WIDTH (ft)	THICKNESS (ft)	VELOCITY (fps)
6" PIPE	SEDIMENT BASIN	1.5	1.5	0.8	1.23
18" PIPE	DRIVEWAY CULVERT	4.5	4.5	0.8	3.11

WQCV		
REQUIRED	AC-FT	PROVIDED
CU-FT	AC-FT	SB CU-FT
1,035	0.024	1,661

SEDIMENT BASIN VOLUME		
REQUIRED	AC-FT	PROVIDED
CU-FT	AC-FT	SB CU-FT
3,488	0.08	1,661

PROPOSED OFFSITE SWALE CAPACITY (WQ1)		
STUDY POINT	BASIN	Q5 (cfs)
1	D1	1.0
WQ1	OFFSITE	0.8
REQUIRED: 1.8 cfs		
PROVIDED 1.9 cfs		

SWALE CHARACTERISTICS								
Basin	Location	Design Q	Time	Long. Slope	Side Slope	Velocity	Depth	Top Width
#	Name	(cfs)	(min)	%	(h:v)	(fps)	(ft)	(ft)
D1	S1-East	0.5	8.2	0.50	5:1	0.49	0.45	4.5
D1	S1-West	0.5	9.1	0.50	4:1	0.54	0.48	3.8
D2	S2	0.7	2.4	0.50	4:1	0.61	0.52	4.2
D3	S3	0.5	1.3	2.30	6:1	0.87	0.31	3.7
Existing Swale	Offsite	1.9	4.5	0.35	4:1	0.82	0.75	6.0

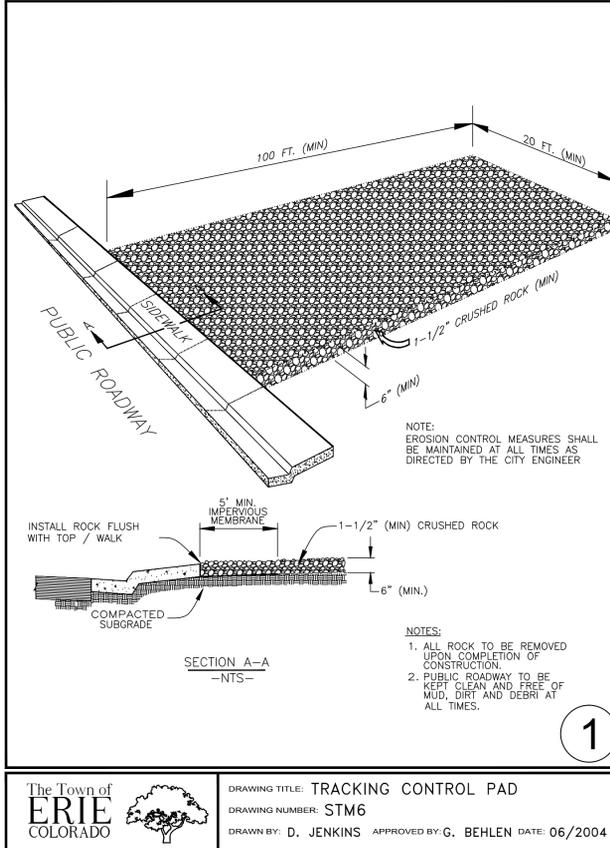


August 2013 Urban Drainage and Flood Control District Urban Storm Drainage Criteria Manual Volume 3 SB-5

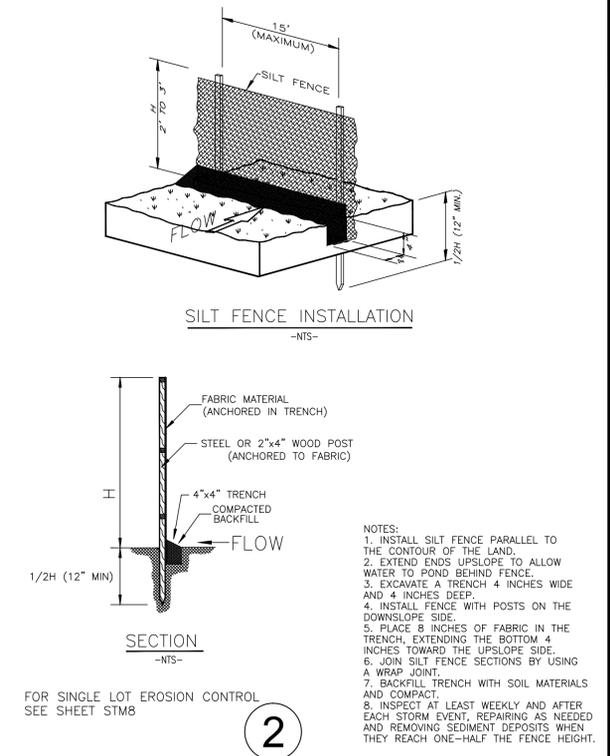
### CONSTRUCTION SEQUENCE FOR EROSION □ SEDIMENT CONTROL PRACTICES FOR SINGLE LOT

- INSTALL PERIMETER EROSION AND SEDIMENT CONTROLS**  
IDENTIFY THE AREAS WHERE SEDIMENT LADEN RUNOFF COULD LEAVE THE CONSTRUCTION SITE, AND INSTALL PERIMETER CONTROLS TO MINIMIZE THE POTENTIAL FOR OFF-SITE SEDIMENTATION. IT IS IMPORTANT THAT PERIMETER CONTROLS ARE IN PLACE BEFORE ANY LOT EXCAVATION ACTIVITIES BEGIN.  
**PREFERRED METHODS**
  - PROTECT DOWN-SLOPE AREAS WITH VEGETATIVE FILTER STRIPS
  - PROTECT DOWN-SLOPE AREAS WITH SILT FENCES AND OTHER APPROPRIATE PRACTICES
  - INSTALL STABLE CONSTRUCTION TRAFFIC ENTRANCE
- PREPARE THE SITE FOR CONSTRUCTION**  
PREPARE THE SITE FOR CONSTRUCTION AND FOR INSTALLATION OF UTILITIES. NOTIFY ALL CONTRACTORS ESPECIALLY THE EXCAVATION CONTRACTOR OF AREAS TO BE PROTECTED.  
**PREFERRED METHOD**
  - SALVAGE AND STOCKPILE TOPSOIL OR SUBSOIL
- BUILD STRUCTURES AND CONNECT UTILITIES**  
CONSTRUCT THE HOME AND CONNECT THE UTILITIES.
- MAINTAIN CONTROL PRACTICES**  
MAINTAIN ALL EROSION AND SEDIMENT CONTROL PRACTICES UNTIL CONSTRUCTION IS COMPLETED AND THE LOT IS STABILIZED.
- RE-VEGETATE BUILDING SITE**  
IMMEDIATELY AFTER ALL OUTSIDE CONSTRUCTION ACTIVITIES ARE COMPLETED, STABILIZE THE LOT WITH SOD, SEED AND/OR MULCH.  
**METHODS**
  - REDISTRIBUTE THE STOCKPILED SUBSOIL AND TOPSOIL
  - SEED OR SOD AREAS
  - MULCH NEWLY SEEDED AREAS
- REMOVE REMAINING TEMPORARY CONTROL MEASURES**  
ONCE THE SOD AND/OR VEGETATION IS WELL ESTABLISHED, REMOVE ANY REMAINING TEMPORARY EROSION AND SEDIMENT CONTROL PRACTICES.

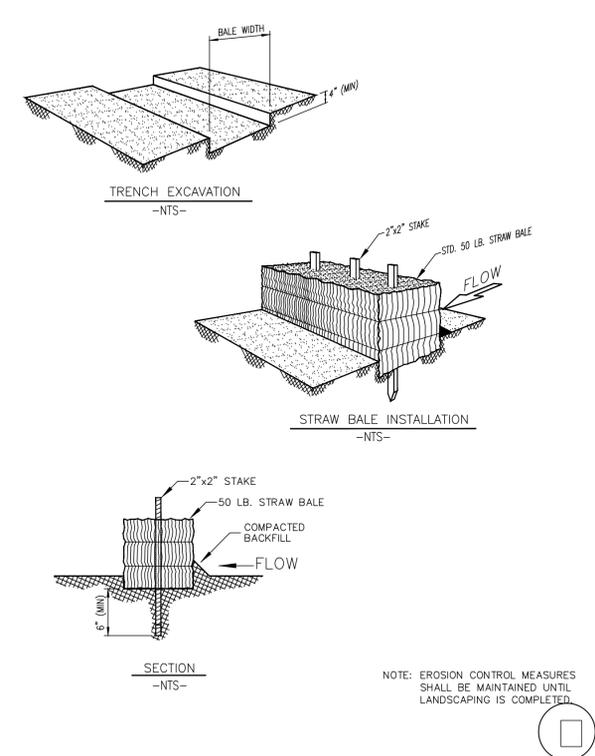
The Town of ERIE COLORADO  
DRAWING TITLE: EROSION CONTROL SEQUENCE SINGLE LOT  
DRAWING NUMBER: STM7  
DRAWN BY: D. JENKINS APPROVED BY: G. BEHLEN DATE: 06/2004



The Town of ERIE COLORADO  
DRAWING TITLE: TRACKING CONTROL PAD  
DRAWING NUMBER: STM6  
DRAWN BY: D. JENKINS APPROVED BY: G. BEHLEN DATE: 06/2004



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



The Town of ERIE COLORADO  
DRAWING TITLE: STRAW BALE EROSION BARRIER  
DRAWING NUMBER: STM5  
DRAWN BY: D. JENKINS APPROVED BY: G. BEHLEN DATE: 06/2004

NO.	DATE	DESCRIPTION	REVISION
1	07/28/16	TOWN REVIEW COMMENTS	
2	11/2/16	COMMUNITY DEVELOPMENT - TOWN OF ERIE	



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PREPARED FOR: MIKE AMEND  
 SHEET TITLE: DRAINAGE □ EROSION CONTROL NOTES  
 LOT 8, AUSTIN INDUSTRIAL PARK  
 460 JONES COURT, ERIE, CO

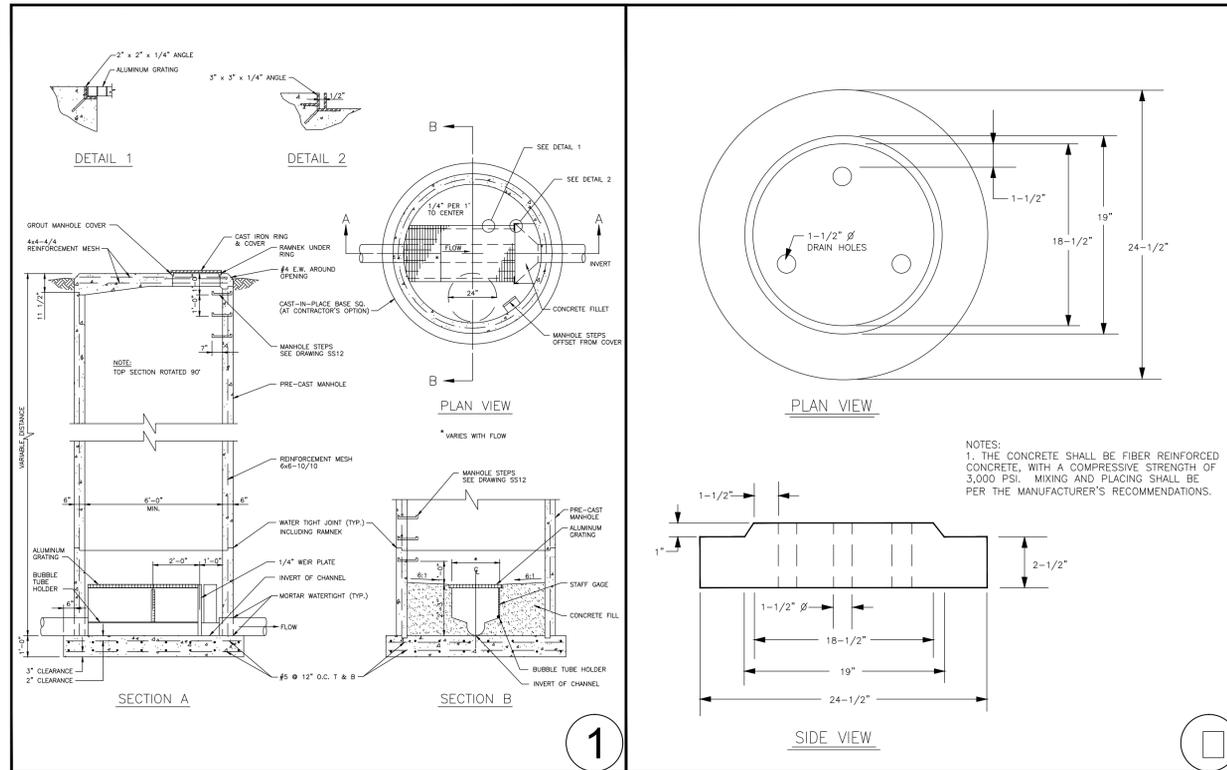
DESIGNED BY:	ML
DRAWN BY:	SDW
CHECKED BY:	ML
APPROVED BY:	
PROJECT NO.:	197.001
DATE:	05/10/2016
SCALE:	AS SHOWN
SHEET NO.:	C6
SHEET 6 OF 10	

THE CONTRACTOR SHALL LOCATE AND VERIFY ALL EXISTING UTILITY LOCATIONS PRIOR TO CONSTRUCTION

PLOT DATE: 1/9/2017 2:51 PM BY: STEPHEN WILLIAMS  
 DRAWING FILE: S:\PROJECTS\197.001 LONGS PEAK SPRINKLER\3. ENGINEERING\DRAWINGS\DETAILS.DWG

# LOT 8, AUSTIN INDUSTRIAL PARK

LONGS PEAK SPRINKLER, 460 JONES COURT  
 LOCATED IN THE SOUTHWEST QUARTER OF SECTION 19, TOWNSHIP 1 NORTH, RANGE 68 WEST OF THE 6TH P.M  
 TOWN OF ERIE, COUNTY OF WELD, STATE OF COLORADO  
 0.97± ACRES  
 SITE PLAN - SP-000775-2016  
 SRU AREA - 0.97± ACRES - TOTAL AREA 0.97± ACRES  
 SPECIAL REVIEW USE SITE PLAN - SRU-000774-2016

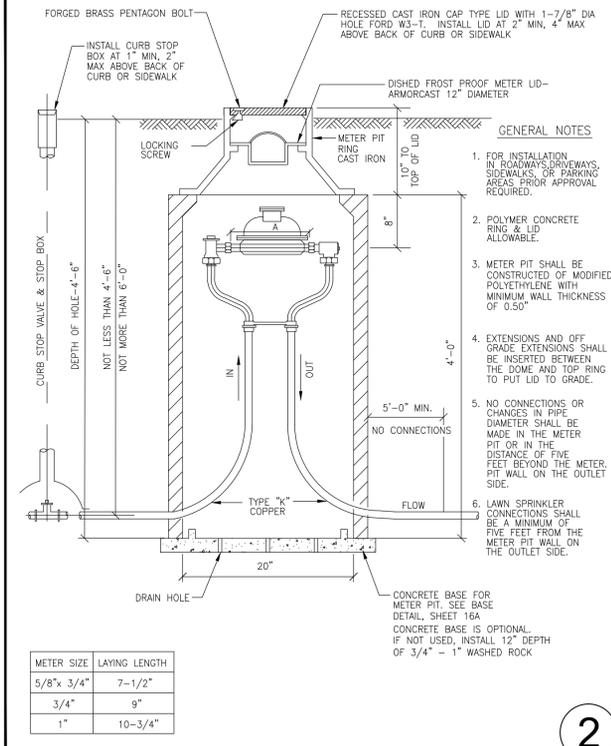


The Town of  
**ERIE**  
 COLORADO

DRAWING TITLE: FLOW METERING AND SAMPLING STATION  
 DRAWING NUMBER: SS2  
 DRAWN BY: D. JENKINS APPROVED BY: G. BEHLEN DATE: 01/2009

The Town of  
**ERIE**  
 COLORADO

DRAWING TITLE: CONCRETE BASE FOR METER PIT  
 DRAWING NUMBER: W14B (2 OF 2)  
 DRAWN BY: D. JENKINS APPROVED BY: G. BEHLEN DATE: 06/2004



METER SIZE	LAYING LENGTH
5/8" x 3/4"	7-1/2"
3/4"	9"
1"	10-3/4"

The Town of  
**ERIE**  
 COLORADO

DRAWING TITLE: OUTSIDE SETTING FOR 5/8" x 3/4", 3/4" & 1" METER  
 DRAWING NUMBER: W14A (1 OF 2)  
 DRAWN BY: D. JENKINS APPROVED BY: G. BEHLEN DATE: 06/2004



The Town of  
**ERIE**  
 COLORADO

DRAWING TITLE: CURB RAMP TYPE 1 ATTACHED WALK  
 DRAWING NUMBER: SW5  
 DRAWN BY: C. GERATY APPROVED BY: G. BEHLEN DATE: 04/2016

REV.	DATE	DESCRIPTION
1	07/28/16	TOWN REVIEW COMMENTS
2	11/2/16	COMMUNITY DEVELOPMENT - TOWN OF ERIE



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 Longmont, CO 80501

PREPARED FOR: MIKE AMEND  
 SHEET TITLE: DETAILS - CIVIL DETAILS I  
 LOT 8, AUSTIN INDUSTRIAL PARK  
 460 JONES COURT, ERIE, CO

DESIGNED BY:	ML
DRAWN BY:	SDW
CHECKED BY:	ML
APPROVED BY:	
PROJECT NO.:	197.001
DATE:	4/28/2016
SCALE:	AS SHOWN
SHEET NO.	C7
SHEET 7 OF 10	





# LOT 8, AUSTIN INDUSTRIAL PARK

## LONGS PEAK SPRINKLER, 460 JONES COURT

LOCATED IN THE SOUTHWEST QUARTER OF SECTION 19, TOWNSHIP 1 NORTH, RANGE 68 WEST OF THE 6TH P.M.

### TOWN OF ERIE, COUNTY OF WELD, STATE OF COLORADO

0.97 ± ACRES

### SITE PLAN - SP-000775-2016

SRU AREA - 0.97 ± ACRES - TOTAL AREA 0.97 ± ACRES

### SPECIAL REVIEW USE SITE PLAN - SRU-000774-2016



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SUBMITTED FOR:		
NO.	DATE	DESCRIPTION
11-23-2016		PER TOWN COMMENTS

#### Universe® Collection Medium LED – UCM

TYPE

**ORDERING INFORMATION**

1	2	3	4	5	6	7	8	9	10
UCM	ANG	T4-32LED	SK	700	DB	SC	120-277		WMA20
MODEL	Hood	Distribution	CCT	Lumen Package	Finish	Options	Control	Voltage	Mounting

**1. MODEL**  
UCM Universe medium without luminous element  
UCM-WND Universe medium with luminous window  
UCM-SR Universe medium with luminous solid rings  
UCM-VSL Universe medium with luminous vertical slots  
UCM-LUM Universe medium with luminous rings

**2. HOOD (May choose one)**  
FLR Flared hood  
FLR-ST5 Flared hood in natural brushed stainless steel  
FLR-COP Flared hood in natural brushed copper  
ANG Angled hood  
ANG-ST5 Angled hood in natural brushed stainless steel  
ANG-COP Angled hood in natural brushed copper  
STR Straight hood  
STR-ST5 Straight hood in natural brushed stainless steel  
STR-COP Straight hood in natural brushed copper  
BEL Bell hood  
BEL-ST5 Bell hood in natural brushed stainless steel  
BEL-COP Bell hood in natural brushed copper  
SKB Skirted bell hood  
SKB-ST5 Skirted bell hood in natural brushed stainless steel  
SKB-COP Skirted bell hood in natural brushed copper

**3. DISTRIBUTION**  
MicroCore Precision aimed optics  
T2-32LED Type 2  
T3-32LED Type 3  
T4-32LED Type 4  
T5-32LED Type 5  
TX-32LED Custom 1

**4. COLOR TEMPERATURE**  
3K 3000K  
400K 4000K  
5K 5000K  
27K 2700K  
35K 3500K  
AM >60 nm monochromatic amber 1

**5. LUMEN PACKAGE**  
700 71 watts  
450 48 watts  
XMA Custom wattage or drive current 1

**6. FINISH**  
WH Acrylic White  
BL Black  
BLT Matte Black  
DB Dark Bronze  
DGN Dark Green  
TT Titanium  
WDB Weathered Bronze  
MDB Bronze Metallic  
VBU Venetian Blue  
CRT Corten  
MAL Matte Aluminum  
MG Medium Gray  
AGN Antique Green  
LG Light Gray  
RAL Premium Color  
CLUSTOM \* Contact Factory

**7. OPTIONS (May choose as noted)**  
FTD Flat clear glass lens 1  
SAG Sag clear glass lens 1  
HSS House Side shield for Type 4  
SLC Unit (luminous) element  
R80 80 CRI minimum  
BL Blue inner lens  
GRN Green inner lens

**8. CONTROLS – (May choose as noted)**  
WIR wIScape connectivity  
WIRSC wIScape connectivity, integral motion sensor  
SCP Integral photo-control and motion sensor 1  
SCPREMOTE Handheld commissioning tool 1

**9. VOLTAGE**  
120-277 120-277 VAC input  
347 347 VAC input  
480 480 VAC input

**POLE MOUNT**  
SLA2 SLA3  
SLA4 SLA4-2  
SLA7 SLA7-2  
SLA7(S) SLA7(S)-2  
SLA8(S) SLA8(S)-2  
SLA9-2 SLA9  
SLA10-2 SLA10  
SLA16-2 SLA16  
SLA17-2 SLA17  
SLA17(S)-2 SLA17(S)  
SLA18-2 SLA18  
SLA20-2 SLA20  
SLA20A-2 SLA20A  
SLA20B-2 SLA20B  
SLA20C-2 SLA20C  
SLA20D-2 SLA20D  
SLA24-2 SLA24  
SLA24(S)-2 SLA24(S)

**WALL MOUNT**  
WMA4 WMA5  
WMA6 WMA8  
WMA9 WMA10  
WMA11 WMA12  
WMA16 WMA17  
WMA18 WMA19  
WMA22 WMA24  
WMA37 WMA38  
WMA39

**ARCHITECTURAL AREA LIGHTING**  
16555 East Gale Ave. | City of Industry | CA 91745  
P 626.968.5666 | F 626.969.2695 | www.aal.net  
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**JOB TYPE**  
NOTES: FULL CUT-OFF FIXTURE

#### Universe® Collection Medium LED – UCM

TYPE

**FEATURES**

- DLC qualified
- Up to 1000 wireless communication
- Motion sensing up to 40' mounting height
- Superior BUG ratings
- Types II, III, IV, V and custom distributions
- IP66, 3G vibration housing
- 20kV/10kA surge suppression
- 2700 – 5000K CCT
- >360 nm Amber
- Custom lumen packages
- Integral thermal protection
- 0-10V dimmable
- 13 standard powder coat finishes

**SPECIFICATIONS**

CONFIGURATION	UCM-ANG	UCM-WND-ANG	UCM-SR-ANG	UCM-VSL-ANG	UCM-LUM-ANG
DIAMETER	20.592mm	20.592mm	20.592mm	20.592mm	20.592mm
HEIGHT	14.7/27.3mm	20.5/52.0mm	21.7/52.6mm	20.6/52.1mm	20.6/52.0mm
WEIGHT	18.25 lbs/8.28kg	21.75 lbs/9.89kg	25.25 lbs/11.3kg	22.25 lbs/10.1kg	24.25 lbs/11.1kg
EPA	60	72	74	72	74

CONFIGURATION	UCM-BEL	UCM-WND-BEL	UCM-SR-BEL	UCM-VSL-BEL	UCM-LUM-BEL
DIAMETER	24.8/10mm	24.8/10mm	24.8/10mm	24.8/10mm	24.8/10mm
HEIGHT	19.8/49.3mm	21.6/54.9mm	21.6/54.9mm	19.8/49.3mm	21.6/54.9mm
WEIGHT	20.25 lbs/9.2kg	23.5 lbs/10.6kg	27 lbs/12.2kg	24.25 lbs/11.1kg	26 lbs/11.8kg
EPA	73	85	87	85	86

CONFIGURATION	UCM-FLR	UCM-WND-FLR	UCM-SR-FLR	UCM-VSL-FLR	UCM-LUM-FLR
DIAMETER	22.592mm	22.592mm	22.592mm	22.592mm	22.592mm
HEIGHT	14.5/36.8mm	19.8/50.3mm	20.1/51.0mm	19.8/50.3mm	20.2/50.8mm
WEIGHT	18.5 lbs/8.4kg	21.75 lbs/9.87kg	25.25 lbs/11.5kg	21.75 lbs/9.8kg	24.25 lbs/11.1kg
EPA	53	65	67	65	67

CONFIGURATION	UCM-STR	UCM-WND-STR	UCM-SR-STR	UCM-VSL-STR	UCM-LUM-STR
DIAMETER	24.8/10mm	24.8/10mm	24.8/10mm	24.8/10mm	24.8/10mm
HEIGHT	14.5/36.8mm	19.8/50.3mm	20.1/51.0mm	19.8/50.3mm	19.8/50.3mm
WEIGHT	20 lbs/9.07kg	23.25 lbs/10.58kg	26.75 lbs/12.13kg	23.75 lbs/10.77kg	25.75 lbs/11.68kg
EPA	59	71	73	71	73

CONFIGURATION	UCM-SKB	UCM-WND-SKB	UCM-SR-SKB	UCM-VSL-SKB	UCM-LUM-SKB
DIAMETER	24.8/10mm	24.8/10mm	24.8/10mm	24.8/10mm	24.8/10mm
HEIGHT	19.7/50.0mm	23.9/60.7mm	24.2/61.5mm	23.9/60.7mm	24.7/61.9mm
WEIGHT	20.5 lbs/9.29kg	23.75 lbs/10.77kg	27 lbs/12.2kg	24.25 lbs/11.1kg	26.25 lbs/11.9kg
EPA	90	103	105	103	105

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**JOB TYPE**  
NOTES: FULL CUT-OFF FIXTURE

#### Universe® Collection Medium LED – UCM

TYPE

**LUMINAIRE PERFORMANCE**

Optical System	Secondary Lens or Shield	Distribution	Light Engine	3K				5K				Drive Current (mA)	System Watts		
				Delivered Lumens	Efficacy (lm/W)	Reg Rating	Bug Rating	Delivered Lumens	Efficacy (lm/W)	Reg Rating	Bug Rating				
MicroCore	No Lens (Standard)	TYPE 2	T2-32LED	6186	87	1.0	2	6561	92	1.0	2	6570	92	810	71
		TYPE 3	T3-32LED	6188	87	1.0	2	6542	92	1.0	2	6550	92	810	71
		TYPE 4	T4-32LED	6381	86	1.0	2	6449	91	1.0	2	6467	91	810	71
		TYPE 5	T5-32LED	6227	88	3.0	2	6556	93	3.0	2	6626	93	810	71
		TYPE 6	T6-32LED--HSS	4485	63	0.0	2	4768	87	0.0	2	4791	87	0.0	2
MicroCore	House Side Shield	TYPE 2	T2-32LED	4627	86	1.0	2	4630	103	2.0	2	4844	101	2.0	2
		TYPE 3	T3-32LED	4570	85	1.0	1	4791	100	1.0	2	4855	101	1.0	2
		TYPE 4	T4-32LED	4570	97	1.0	2	4791	102	1.0	2	4855	100	1.0	2
		TYPE 5	T5-32LED	4602	98	3.0	1	4825	103	3.0	1	4839	103	3.0	1
		TYPE 6	T6-32LED--HSS	3366	72	0.0	2	3529	75	0.0	2	3539	74	0.0	2

**SENSOR DETECTION RANGE**

COVERAGE	SENSOR MOUNTING HEIGHT												RATIO
	8'	10'	12'	14'	16'	18'	20'	25'	30'	35'	40'	12.5'	
SCP	22	25	30	35	40	45	50	62.5	75	87.5	100	12.5	
WIRSC	16	20	24	28	32	36	45	N/A	N/A	N/A	N/A	1.2	

**LED COLOR**

Ordering Code	3K	4K	5K
CCT Average	3000K	4000K	5000K
CRI Minimum	70	70	70
SP Ratio	1.2	1.5	1.8

Consult factory for Amber, Turtle Friendly, Gull Coast and Observatory applications.

**TM-21 LIFETIME CALCULATION**

Optical System	Ordering Code	Ambient Environment °C	Projected Lumen Maintenance (% vs. Xhrs)							Reported L70
			15	25	50	60	100			
MicroCore	32LED	15	98	98	97	96	94	>90Khrs		
		25	98	97	96	96	93			
		35	96	95	93	92	89			
		40	96	95	93	92	89			

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**JOB TYPE**  
NOTES: FULL CUT-OFF FIXTURE

#### ELECTRICAL CHARACTERISTICS

Optical System	Ordering Code	LED Drive mA	System Drive mA	Line Voltage VAC	Amps AC	Min. Power Factor	Max THD (%)	Operating Temp. Range	Dimming Range	Source current out of 0-10V purple wire		Absolute voltage range on 0-10V purple wire	
										Min	Max	Min	Max
MicroCore	Without Luminous Element	700	650	71	230	0.6	0.3	0.2	0.1	0.1	0.1	0.1	
	WND/SR/VSL/LUM	450	450	47	230	0.6	0.3	0.2	0.1	0.1	0.1	0.1	
	WND/SR/VSL/LUM	450	450	51	230	0.4	0.2	0.1	0.1	0.1	0.1	0.1	

**SENSOR DETECTION RANGE**

COVERAGE	SENSOR MOUNTING HEIGHT												RATIO
	8'	10'	12'	14'	16'	18'	20'	25'	30'	35'	40'	12.5'	
SCP	22	25	30	35	40	45	50	62.5	75	87.5	100	12.5	
WIRSC	16	20	24	28	32	36	45	N/A	N/A	N/A	N/A	1.2	

**LED COLOR**

Ordering Code	3K	4K	5K
CCT Average	3000K	4000K	5000K
CRI Minimum	70	70	70
SP Ratio	1.2	1.5	1.8

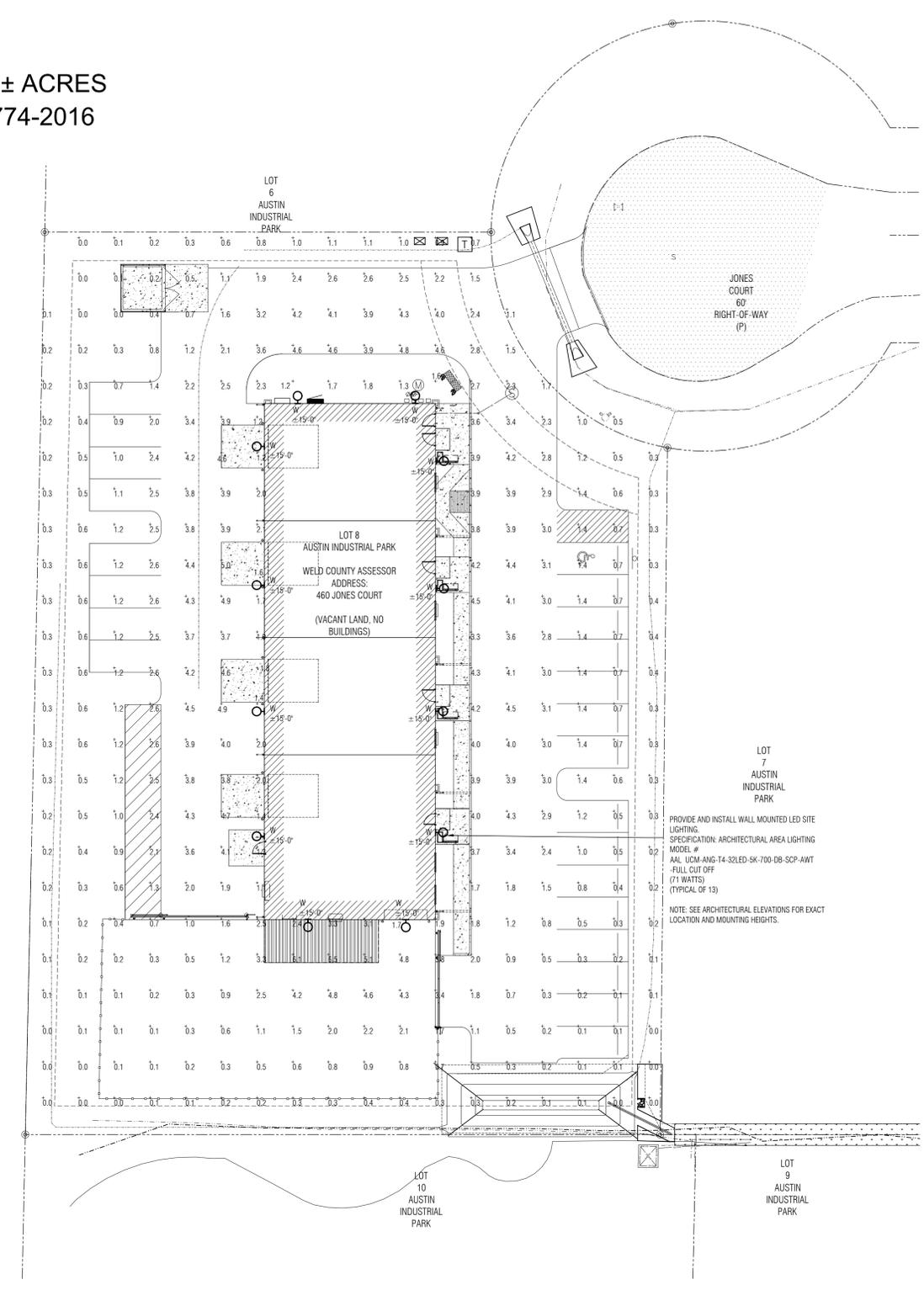
Consult factory for Amber, Turtle Friendly, Gull Coast and Observatory applications.

**TM-21 LIFETIME CALCULATION**

Optical System	Ordering Code	Ambient Environment °C	Projected Lumen Maintenance (% vs. Xhrs)							Reported L70
			15	25	50	60	100			
MicroCore	32LED	15	98	98	97	96	94	>90Khrs		
		25	98	97	96	96	93			
		35	96	95	93	92	89			
		40	96	95	93	92	89			

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**JOB TYPE**  
NOTES: FULL CUT-OFF FIXTURE



#### ELECTRICAL PHOTOMETRIC SITE PLAN

SCALE: 1" = 20'

1

z

**Luminaire Schedule**

Symbol	Label	Total Lamp Lumens	LLF	Description
W	W	N.A.	0.900	AAL UCM-ANG-T4-32LED-SK-700-AWT

**Calculation Summary**

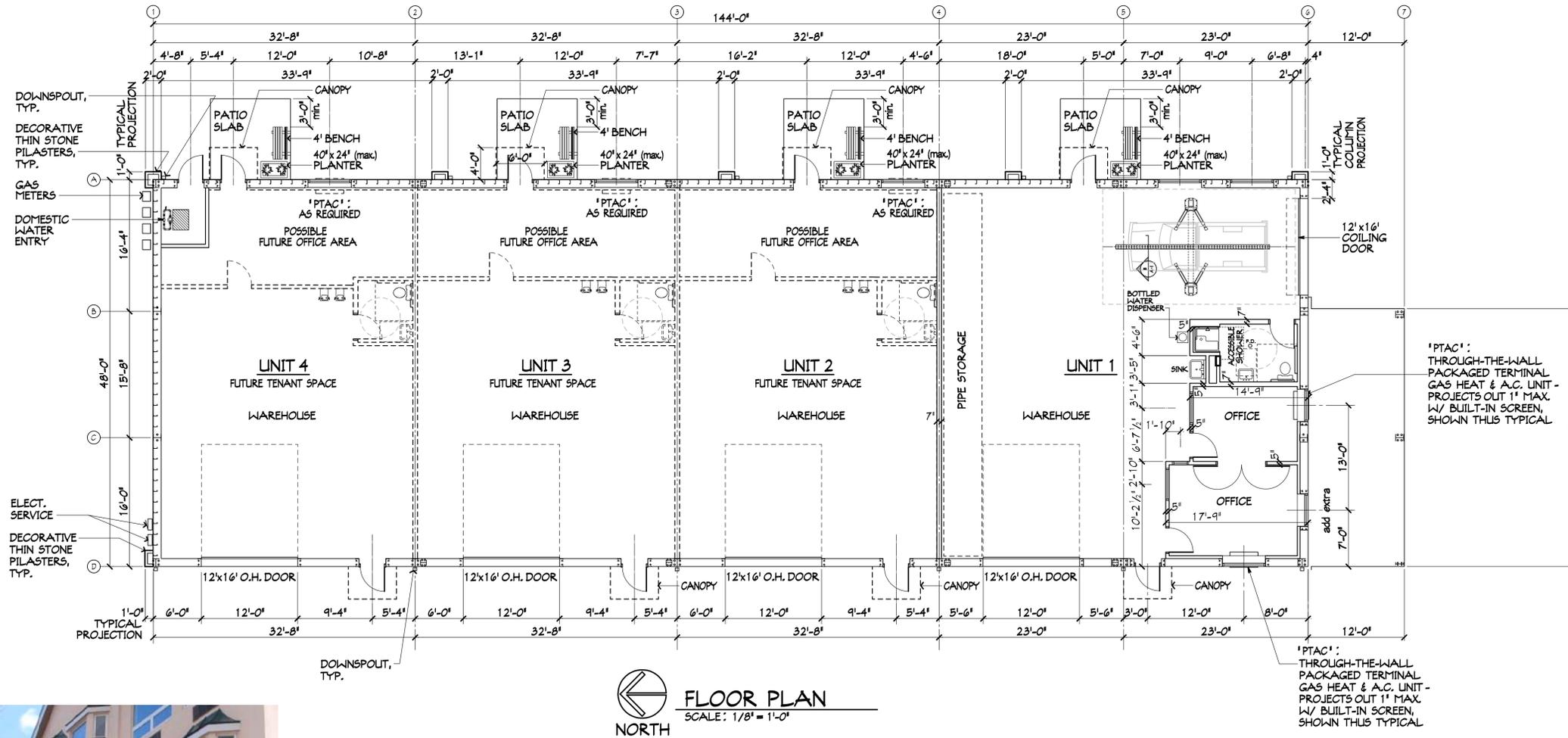
Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
Ground_Planar	Planar	Illuminance	Fc	1.67	6.5	0.0	N.A.

LONGS PEAK SPRINKLER  
460 JONES COURT  
ERIE, COLORADO

# LOT 8, AUSTIN INDUSTRIAL PARK

LONGS PEAK SPRINKLER, 460 JONES COURT  
 LOCATED IN THE SOUTHWEST QUARTER OF SECTION 19, TOWNSHIP 1 NORTH, RANGE 68 WEST OF THE 6TH P.M.  
 TOWN OF ERIE, COUNTY OF WELD, STATE OF COLORADO

0.97± ACRES  
 SITE PLAN - SP - 000775-2016  
 SRU AREA - 0.97± ACRES - TOTAL AREA 0.97± ACRES  
 SPECIAL REVIEW USE SITE PLAN - SRU-000774-2016



EXAMPLE - PACKAGED TERMINAL GAS HEAT & AC UNIT (can be added as required)

CHESLEY ALEXANDER - ARCHITECT  
 13719 WEST 59th DRIVE  
 ARVADA, COLORADO 80004  
 PHONE: (303) 988-9482

OFFICE/WAREHOUSE  
 LONGS PEAK SPRINKLER  
 460 JONES COURT  
 ERIE, COLORADO

DESIGNED: CDA  
 DRAWN: CDA  
 CHECKED: CDA  
 DATE: 08/23/16

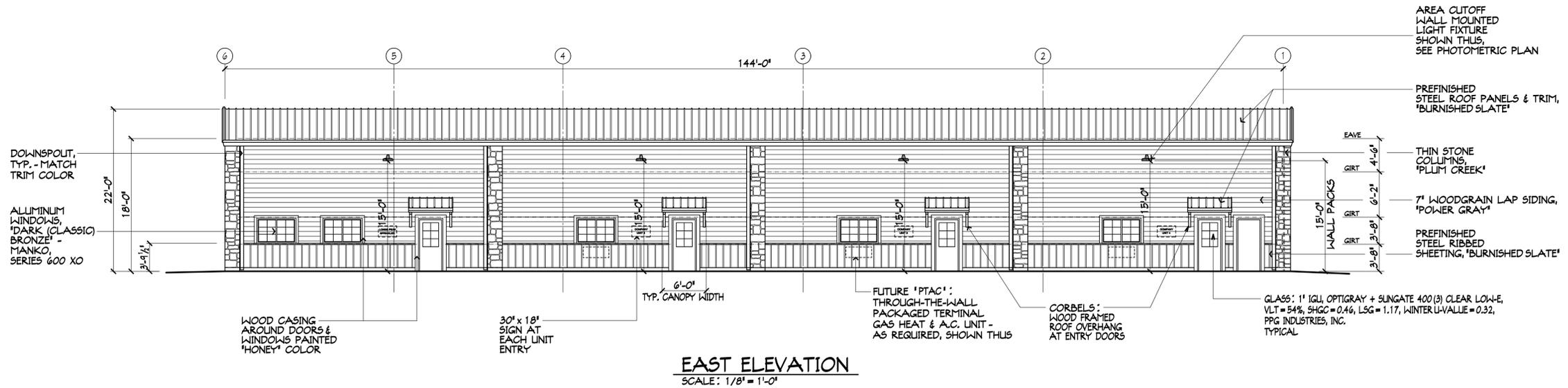
REVISIONS:

FIRESTONE INFORMATION BLOCK	
FLOOR PLAN SHEET	
Name of Submittal:	Longs Peak Sprinkler
Type of Submittal:	SPECIAL REVIEW USE
Filing Number:	
Preparation Date:	5/10/2016
Revisions Date:	7/28/16 TOWN REVIEW COMMENTS
Revisions Date:	12/9/16 TOWN REVIEW COMMENTS
Revisions Date:	
PROJECT: 16293	
DRAWING	
A-1	
SHEET 11 of 13	

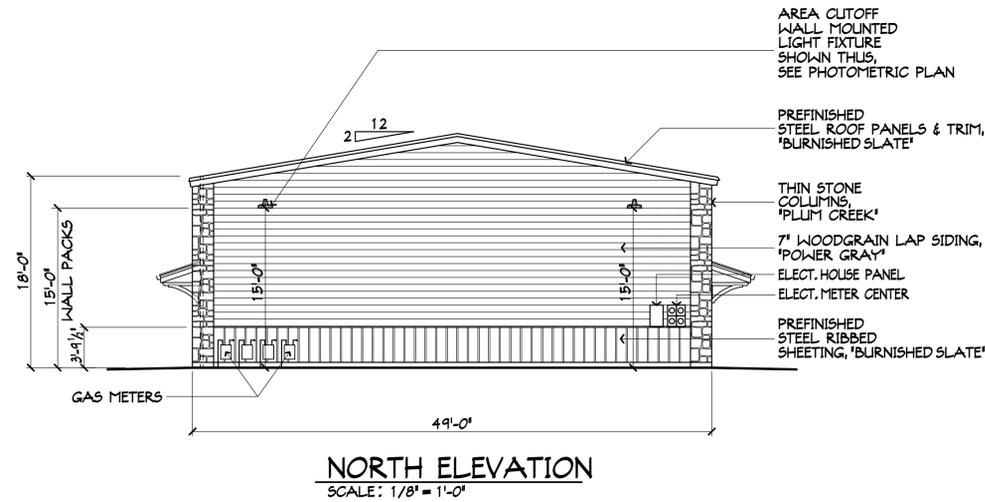
PROJECT: 16293  
 DRAWING  
**A-1**  
 SHEET 11 OF 13

# LOT 8, AUSTIN INDUSTRIAL PARK

LONGS PEAK SPRINKLER, 460 JONES COURT  
 LOCATED IN THE SOUTHWEST QUARTER OF SECTION 19, TOWNSHIP 1 NORTH, RANGE 68 WEST OF THE 6TH P.M.  
 TOWN OF ERIE, COUNTY OF WELD, STATE OF COLORADO  
 0.97 ± ACRES  
 SITE PLAN - SP - 000775-2016  
 SRU AREA - 0.97 ± ACRES - TOTAL AREA 0.97 ± ACRES  
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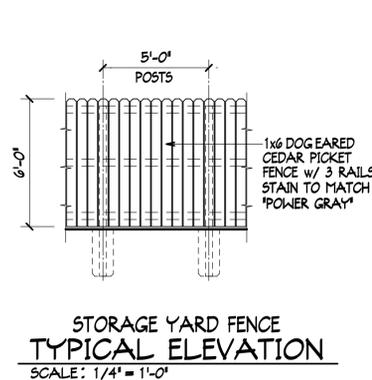


**EAST ELEVATION**  
 SCALE: 1/8" = 1'-0"

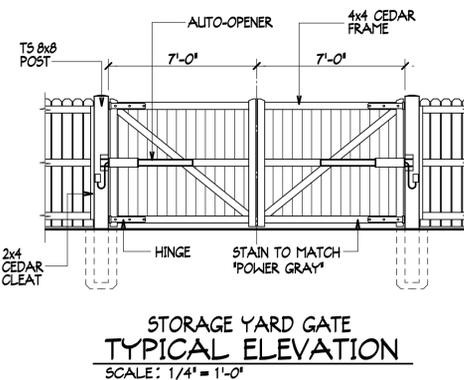


**NORTH ELEVATION**  
 SCALE: 1/8" = 1'-0"

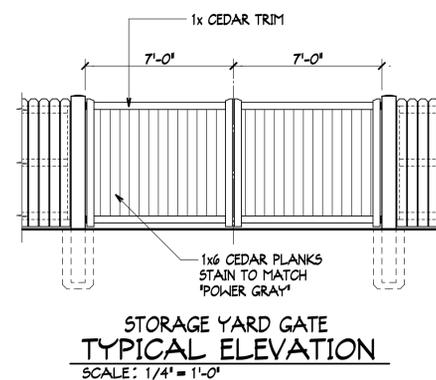
THE BUILDING ELEVATIONS SHOWN AND APPROVED HEREON ARE INTENDED TO DEMONSTRATE HOW ALL HVAC AND OTHER MECHANICAL EQUIPMENT SHALL BE SCREENED ACCORDING TO TOWN OF ERIE, UNIFIED DEVELOPMENT CODE REQUIREMENTS. IT IS THE APPLICANT'S RESPONSIBILITY TO ENSURE THAT THIS APPROVED SCREENING OCCURS IN THE FIELD AS DEMONSTRATED BY THESE PLANS REGARDLESS OF CURB REQUIREMENTS, MECHANICAL PLAN CHANGES OR OTHER CIRCUMSTANCES. FAILURE TO PROVIDE APPROVED SCREENING MAY RESULT IN DELAY OF FINAL INSPECTIONS AND/OR ISSUANCE OF A CERTIFICATE OF OCCUPANCY.



**STORAGE YARD FENCE  
 TYPICAL ELEVATION**  
 SCALE: 1/4" = 1'-0"



**STORAGE YARD GATE  
 TYPICAL ELEVATION**  
 SCALE: 1/4" = 1'-0"



**STORAGE YARD GATE  
 TYPICAL ELEVATION**  
 SCALE: 1/4" = 1'-0"

FIRESTONE INFORMATION BLOCK	
ELEVATIONS SHEET	
Name of Submittal:	Longs Peak Sprinkler
Type of Submittal:	SPECIAL REVIEW USE
Filing Number:	
Preparation Date:	5/10/2016
Revisions Date:	7/28/16 TOWN REVIEW COMMENTS
Revisions Date:	12/30/16 TOWN REVIEW COMMENTS
Revisions Date:	
SHEET	12 of 13

CHESLEY ALEXANDER - ARCHITECT  
 13719 WEST 59th DRIVE  
 ARVADA, COLORADO 80004  
 PHONE: (303) 988-9482

OFFICE/WAREHOUSE  
 LONGS PEAK SPRINKLER  
 460 JONES COURT  
 ERIE, COLORADO

DESIGNED: CDA  
 DRAWN: CDA  
 CHECKED: CDA  
 DATE: 08/23/16  
 REVISIONS:

PROJECT: 16293

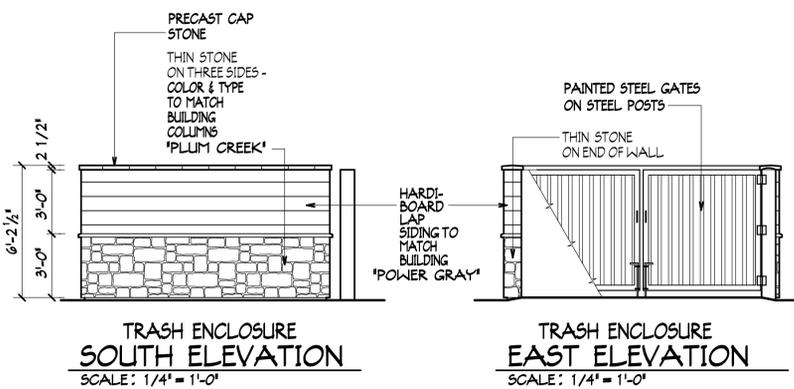
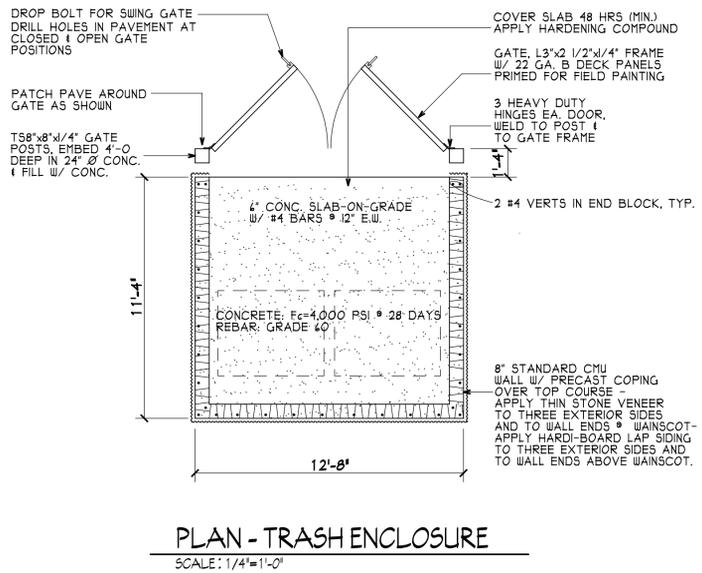
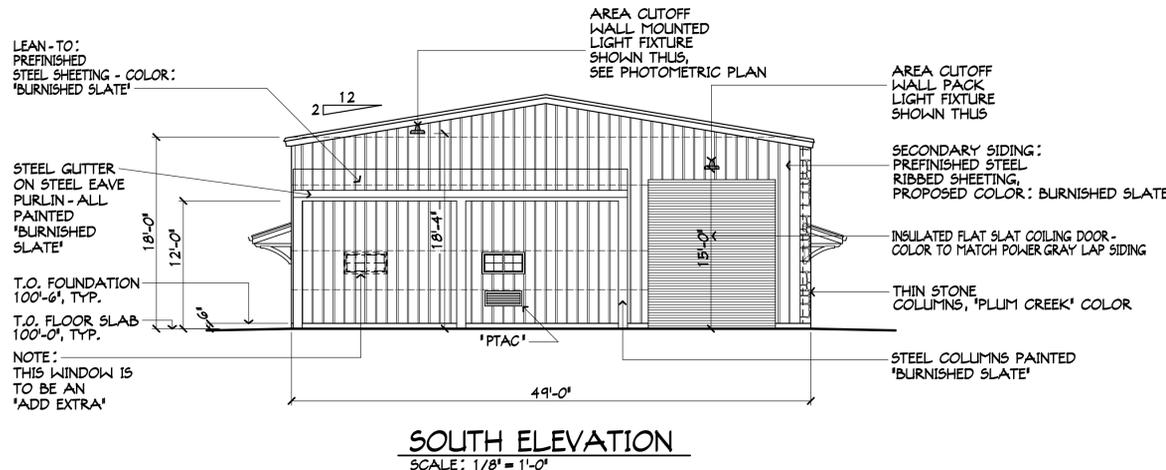
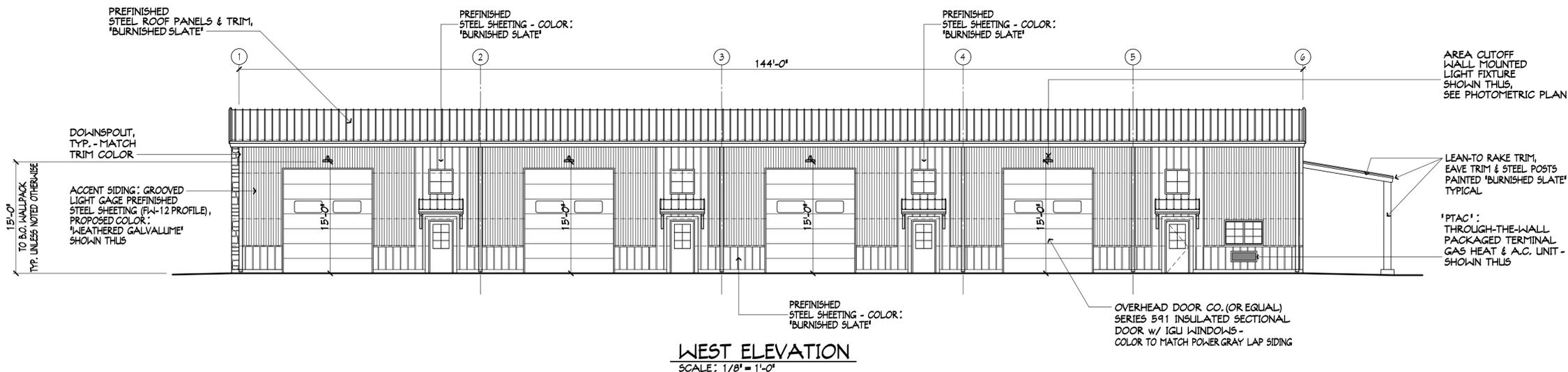
DRAWING

A-2

SHEET 12 OF 13

# LOT 8, AUSTIN INDUSTRIAL PARK

LONGS PEAK SPRINKLER, 460 JONES COURT  
 LOCATED IN THE SOUTHWEST QUARTER OF SECTION 19, TOWNSHIP 1 NORTH, RANGE 68 WEST OF THE 6TH P.M.  
 TOWN OF ERIE, COUNTY OF WELD, STATE OF COLORADO  
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**CHESLEY ALEXANDER - ARCHITECT**  
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**LONGS PEAK SPRINKLER**  
 460 JONES COURT  
 ERIE, COLORADO

DESIGNED: CDA  
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 DATE: 08/23/16

FIRESTONE INFORMATION BLOCK	
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Name of Submittal:	Longs Peak Sprinkler
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Revisions Date:	
SHEET 13 of 13	

PROJECT: 16293  
 DRAWING  
**A-3**  
 SHEET 3 OF 6

CHESLEY ALEXANDER C:\data\CADD\Drawings\16293-LongsPeak



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