

CLAREMONT BUSINESS PARK 2

“AMENDMENT” OF THE
PRELIMINARY DRAINAGE REPORT
FOR
CLAREMONT COMMERCIAL
SUBDIVISION FILING NO. 2
A RESUBDIVISION OF TRACT C OF
CLAREMONT BUSINESS PARK FILING NO. 2

EL PASO COUNTY, COLORADO

JULY 2020

Prepared for:

Hammers Construction, Inc.
1411 Woosley Heights
Colorado Springs, CO 80906
(719) 570-1599
&
Lena Gail Case
c/o Randy Case II
102 E. Pikes Peak Ave, Suite 200
Colorado Springs, CO 80903

Prepared by:



102 E. Pikes Peak, Suite 500
Colorado Springs, CO 80903
(719) 955-5485

Project #44-037
PCD – SP 197

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DRAINAGE PLAN STATEMENTS

ENGINEERS STATEMENT

The attached drainage plan and report was prepared under my direction and supervision and are correct to the best of my knowledge and belief. Said drainage report has been prepared according to the criteria established by the County for drainage reports and said report is in conformity with the master plan of the drainage basin. I accept responsibility for any liability caused by any negligent acts, errors or omissions on my part in preparing this report.

Virgil A. Sanchez, P.E. #37160
For and on Behalf of M&S Civil Consultants, Inc



DEVELOPER’S STATEMENT

I, the developer(s) have read and will comply with all the requirements specified in this drainage report and plan.

BY: _____ BY: _____

TITLE: _____ TITLE: _____
DATE: _____ DATE: _____

ADDRESS: Lena Gail Case	Hammers Construction, Inc.
2432 Parkview Lane	1411 Woosley Heights
Colorado Springs, CO 80903	Colorado Springs, CO 80906

EL PASO COUNTY'S STATEMENT

Filed in accordance with the requirements of El Paso County Land Development Code, Drainage Criteria Manual Volumes 1 and 2, and the Engineering Manual, as amended.

BY: _____ DATE: _____
Jennifer Irvin, P.E.
County Engineer / ECM Administrator

CONDITIONS:

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PURPOSE

This document is intended to serve as the Claremont Business Park 2 “Amendment” to the Preliminary Drainage Report for Claremont Commercial Subdivision Filing No. 2 and will effectively supersede the previously approved Preliminary Drainage Report for Claremont Commercial Subdivision Fil No. 2, A Resubdivision of Tract C of Claremont BusinessPark Filing No. 2, El Paso County, Colorado previously approved in December of 2018. The purpose of this document is to identify and analyze the onsite drainage patterns and to ensure that post development runoff is routed through the site safely and in a manner that satisfies the requirements set forth by theEl Paso County and City of Colorado Springs Drainage Criteria Manual. The proposed principal use for the site will be neighborhood commercial andlight industrial. The parcel is zoned by El Paso County for commercial service as CS. This isa preliminary drainage report; a Final Drainage Report shall be required with a Final Plat application, provided that no significant change from this Preliminary Drainage Report is being proposed.

GENERAL LOCATION AND DESCRIPTION

Claremont Business Park 2 is located in the Northeast ¼ of the Northeast ¼ of Section 8, and the Southeast ¼ of the Southeast ¼ of Section 5, Township 14 South, Range 65 West of the 6th P.M. in El Paso County, Colorado. The site isborderedto the southeast by U.S. Highway 24 and to the northeast by N. Marksheffel Road, to the north and west by Meadowbrook Parkway, andto the southby a vacant, undeveloped lot. The site lies within the Sand Creek Drainage Basin. Flows from this site are tributary to Sand Creek.

The site consists of 13.7 acres which is currently vacant land with a relatively new roadway infrastructure for Meadowbrook Parkway and associated utilities services directly adjacent to the site. Vegetation is sparse, consisting of native grasses and weeds. Existing site terrain generally slopes from north to southwest at grade rates that vary between 1.2% and 2%. A soil retention wall runs along the eastside of the proposed site, next to U.S. Highway 24 and N. Marksheffel Road, and borders a large portion of the back of the proposed lots. The Claremont Commercial site is currently zoned "CS" and the proposed principal use for the site will be neighborhood commercial and light industrial.

Two (2)sand filterbasins will provide water quality treatment for the proposed developments. The outlet structures of the proposed water quality ponds will tie into an existing storm sewer system near Meadowbrook Parkway, which routes the treated runoff southwest into Sand Creek. See Appendix for details.

SOILS

Soils for this project are delineated by the map in the appendix as Ellicott Loamy Course Sand (28), Blendon Sandy Loam (10) and Blakeland Loamy Sand (8)and have been characterized as Hydrologic Soil Types "A" &"B". Soils in the study area are shown as mapped by S.C.S. in the "Soils Survey of El Paso County Area". See Appendix for soils report.

HYDROLOGIC CALCULATIONS

Hydrologic calculations were performed using the El Paso County and City of Colorado Springs Storm Drainage Design Criteria manual and where applicable the Urban Storm Drainage Criteria Manual. The Rational Method was used to estimate stormwater runoff anticipated from design storms with 5-year and 100-year recurrence intervals.

HYDRAULIC CALCULATIONS

Hydraulic calculations were estimated using the Manning's Formula and the methods described in the El Paso County and City of Colorado Springs Storm Drainage Design Criteria manual. The relevant data sheets are included in the Appendix of this report.

FLOODPLAIN STATEMENT

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Panel No. 08041C0756G, revised December 7, 2018. No portion of this site is located within the 100 year floodplain. See Appendix.

DRAINAGE CRITERIA

This drainage analysis has been prepared in accordance with the current City of Colorado Springs/El Paso County Drainage Criteria Manual. Calculations were performed to determine runoff quantities for the 5-year and 100-year frequency storms for developed conditions using the Rational Method as required for basins having areas less than 100 acres. See Appendix for calculations.

FOUR STEP PROCESS

Step1 Employ Runoff Reduction Practices –Roof drains will be directed to property lines swales to minimize direct connection of impervious surfaces.

Step 2 Stabilize Drainageways – The site is upstream of an existing 42"/48" RCP storm sewer system that directly discharges to Sand Creek Channel via an outlet structure with wingwalls (privately owned and maintained by the Central Marksheffel Metropolitan District). The "Final Drainage Report for Claremont Business Park Filing No. 2", dated November 2006, by Matrix Design Group, Inc. (henceforth referred to as "Matrix FDR") has been designed to discharge developed flows via a 48" RCP storm sewer system directly into the East Fork Sand Creek. The Claremont Commercial Filing No. 2 site proposes a two (2) Sand Filter Water Quality Facilities before flows from both WQ facilities are discharged to the existing private 42"/48" RCP system east of Meadowbrook Parkway. The outlet underdrains are redesigned to drain the ponds in a peak event within 12 hours, therefore it's not anticipated to have negative effects on the downstream drainageways.

Step 3 Provide Water Quality Capture Volume – Two(2) Sand Filter Basin water quality facilities are proposed to provide WQCV.

Step4 Consider Need for Industrial and Commercial BMP's – This submittal provides a Preliminary Grading and Erosion Control plan. A Final GEC plan with BMP's in place shall be required with a Final Plat and Site Development applications. The proposed project will use silt fence, a vehicle tracking control pad, a concrete washout area, mulching and reseeding to mitigate the potential for erosion across the site.

It appears that the existing 30" stub may conflict with your proposed 30" ADS pipe. Please clarify. Also please clearly state what is to become of this pipe.

EXISTING DRAINAGE CONDITIONS

The Claremont Business Park 2 site consists of 13.7 acres and is situated east of the East Fork Reach of the Sand Creek Watershed. This area was previously studied in the "Final Drainage Report for Claremont Business Park Filing No. 2", dated November 2006, by Matrix Design Group, Inc. (henceforth referred to as "Matrix FDR"). The Matrix FDR calculations indicate that, under the fully developed conditions, the total tributary area of Sub-basins B1, B2, and B3 (18.1 acres), with basin B3 including the eastern half of Meadowbrook Parkway, would produce a cumulative runoff of approximately $Q_5=42.6$ cfs and $Q_{100}=86.6$ cfs (Design Point 2). The Matrix FDR illustrates that the watershed would drain from east to the southwest towards Meadowbrook Parkway. Sub-Basin B2 identifies a private 30" RCP (Matrix FDR) to be installed and used to drain the sub-basin into the 42"/48" storm system. The 30" RCP is stubbed to the east from an existing storm manhole (See Drainage Map). This system is privately owned and maintained by the Central Marksheffel Metropolitan District.

A separate system; Sub-Basin B1 identifies a private 36" RCP to be installed along Meadowbrook Pkwy and stubbed to the sub-basin and used to drain also into the 42"/48" storm system. Field locates found no evidence that the future private 36" RCP was installed. If it was installed, this report and construction drawings require the 36" RCP to be removed. If present, the elevation of the pipe does not work with the current design. (See Proposed Drainage – Basin F).

As stated in the Matrix FDR, overlot grading activities for the entire site have been completed. Per Resolution 16-426 of the BoCC, on-site WQCV is required but on-site stormwater detention is not required per the FDR for Claremont Business Park Fil. 2.

A 48" public storm sewer runs along Woolsey Heights and is routed directly to the Sand Creek channel. Two 10' Type R at grade inlets exist at the intersection of Woolsey Heights and Meadowbrook Parkway, one on the northwest and the other on the northeast corner of the intersection. Runoff from the site and the two surrounding streets, Meadowbrook Parkway and Woolsey Heights, is intercepted by these inlets and conveyed to the Sand Creek channel via the existing 48" public storm sewer.

Refer to the drainage basin descriptions that follow for additional information as well as the Drainage Map located within the Appendix of this report.

The callout for the 36" pipe is located in basin O.

PROPOSED DRAINAGE CHARACTERISTICS

General Concept Drainage Discussion

The majority of the site will consist of neighborhood commercial and light industrial, asphalt, curb, two (2) storm water quality sand filter basins, and landscaping. The flows generated by the site will typically sheetflow across asphalt and impermeable surfaces which direct runoff primarily to the south and southwest to proposed private pipe systems which direct runoff to one of two private ponds. The outlet structures of the proposed water quality ponds will release runoff to the existing private 42" RCP storm sewer located at the southwest corner of the site. A survey and inspection of the existing 42" RCP shall be made before use. The existing private 42" storm sewer ties into an existing public 48" storm sewer which will route the treated runoff to Sand Creek. For more information of drainage basins, existing and proposed structures refer to the Proposed Drainage Map located within the Appendix of this report.

Detailed Drainage Discussion

Basin A, 0.19 acres, consists of steep slopes of 32% adjacent to portions of U.S Highway 24 and N. Marksheffel Rd. The roadway embankment within **Basin A** slopes into a soil retention wall that runs along the south east boundary of the site. Runoff for **Basin A** is limited has been calculated to reach peak flow

rates of Q5=0.1 cfs and Q100=0.6cfs. Flows produced within thebasinwill be conveyed westward into adjacent basins (**Basin B**)as sheet flow.

Basin B, 1.39 acres, consists of Lot 10 along the northeast corner of the proposed site. Runoff produced within **Basin B**is anticipated to reach peak runoff rates ofQ5=5.5 cfs and Q100=10.1 cfs. A proposed private 24” polyethylene storm drain (**Pipe 1**) will be extended to **Design Point 1**(Q5=5.5 cfs and Q100=10.1 cfs)to capture runoff from **Basins A** and**B**.

Basin C, 0.30 acres, consists of portion of steep slopes of up to 33%that lie adjacent to portions of U.S Highway 24. Similar to **Basin A**, the roadway embankment within **Basin C**,slopes into a soil retention wall that runs along the eastern boundary. Runoff for **Basin C** has been calculated to reach peak flow rates of Q5=0.1 cfs and Q100=1.0 cfs. The limited runoff produced is assumed to be conveyed westward into adjacent **Basin D** as sheet flow.

Basin D, 1.53 acres, consists of Lot 8 along the eastern boundary of the proposed site. Runoff produced within **Basin D** is anticipated to reach peak runoff rates of Q5=6.3 cfs and Q100=11.5 cfs. A proposed private 24” polyethylene storm drain (**Pipe 2**) will be extended to **Design Point 2**(Q5=6.4 cfs and Q100=12.4 cfs) to capture runoff from **Basins C** and**D**. Runoff collected within Pipes 1 and 2 will be routed to a proposed private water quality pond via a private 30” polyethylene storm drain (**Pipe 3**) at peak flow rates of Q5=11.8 cfs and Q100=22.6 cfs. A small riprap pad will be required to reduce velocities prior to entering the pond. A swale/berm shall be constructedalong the south line of Lot 8, to ensure flows are conveying westerly to a 24” pipe to the proposed storm system and then conveyed to the proposed WQ pond for the retail center area.

Basin E, 1.55 acres, consists of Lot 9 and a portion of the planned private access entrance, which is located adjacent to a portion of Meadowbrook Parkway. Runoff produced within **Basin E** is anticipated to reach peak runoff rates of Q5=6.5 cfs and Q100=11.8 cfs. A proposed private 24” polyethylene storm drain (**Pipe 4**) will be extended from the private pond to collect runoff reaching **Design Point 3**(Q5=6.5cfs and Q100=11.8cfs).

Basin F, 0.36 acres, consists of a land (Tract B) which is dedicated to house a proposed private onsite Sand Filter Basin Water Quality Pond (**Pond 1**) adjacent to existing Meadowbrook Parkway. Runoff produced within **Basin F** will ultimately combine with flows entering the pond via **Pipes 3** and **4** at **Design Point 4**. The total flow anticipated to reach the pond (**DP4**) is calculated by the rational method to be Q5=18.2cfs and Q100=35.0cfs. Using the UD-Detention worksheet, flows treated via the Sand Filter Basin are to be discharged through a 6.0’ x 2.91’ CDOT Modified Type D outlet structure and proposed private 24” polyethylene Storm Sewer (Pipe Runs5, 5.1, 5.2). The proposed pond shall be constructed with 4:1 SS and is anticipated to store 0.095, 0.155 and 0.183 ac-ft and discharge 0.1cfs, 7.2cfs, and 15.5 cfs in the water quality, 5 year and 100 year events respectively. The emergency spillway shall be designed to discharge the peak inflow safely to Meadowbrook Parkway in the event that the inlet would become clogged. Runoff conveyed in Pipe 5.2 will combine with flows from a second onsite pond, prior to being discharged downstream via an existing 42” RCP storm sewer.

Basin G, 0.27 acres, consists of a landscaping strip running alongside and adjacent to Meadowbrook Parkway and a small section of pavement associated with site access. Excluding thesmall section of street the basin consists primarily of trees, bushes/grasses, and decorative ground cover. Low runoff values produced by Basin G of Q5=0.5cfs and Q100=1.3cfs will travel as sheet flow into Meadowbrook Parkway.

Basin H, 0.71 acres, consists of steep slopes of up to 33% adjacent to portions of U.S Highway 24. The roadway embankment within **Basin H** slopes into a soil retention wall that runs along the south east boundary of the site. Runoff for **Basin H** has been calculated to reach peak flow rates of Q5=0.3 cfs and Q100=2.0 cfs. Flows produced within the basin will be conveyed westward into adjacent basins (**Basin I**) as sheet flow.

Basin I, 2.75 acres, consists of Lots 5 and 6, portions of Lots 2-4 and 7 and section of proposed private street, which is generally located within the center of the proposed site. Runoff produced within **Basin I** is anticipated to reach peak runoff rates of $Q_5=9.8$ cfs and $Q_{100}=17.9$ cfs. Runoff from the **Basins H** and **I** shall be conveyed via side lot swales and curb and gutter to a proposed private street and a pair of proposed CDOT Type R at grade inlets located at **Design Point 5** ($Q_5=10.1$ cfs and $Q_{100}=19.8$ cfs). Runoff intercepted by the inlets will be conveyed south to a second proposed water quality pond via proposed private 24" and 30" polyethylene **Pipes 6** and **7** at 5 year flow rates of 6.4 cfs and 10.1 cfs and at 100 year flow rates of 10.6 and 16.6 cfs respectively. Runoff bypassing the inlets will continue west within the street to **Design Point 6**.

Basin J, 1.05 acres, consists of portions of Lots 1, 2 and 7 and a segment of the proposed street, which is located along the western edge of the proposed site. Runoff produced within **Basin J** is anticipated to reach peak runoff rates of $Q_5=4.4$ cfs and $Q_{100}=8.0$ cfs. Runoff from the **Basins J** and flow-by from **DP5** shall be intercepted by a pair of proposed CDOT Type R at grade inlets located at **Design Point 6** ($Q_5=4.4$ cfs and $Q_{100}=11.2$ cfs). Runoff intercepted by the proposed inlets will be conveyed south to a second proposed water quality pond via proposed private 18" and 24" polyethylene **Pipes 8** and **9** at 5 year flow rates of 2.8 cfs and 4.4 cfs and at 100 year flow rates of 6.9 and 11.0 cfs respectively. Based upon the preliminary assumptions, approximately 0.1 cfs will bypass DP6 and will be continued within the curb and gutter to the adjacent street in the 100 year event.

Basin K, 0.42 acres, consists of the rear halves of Lots 1 and 2, which is generally located along the southwest corner of the proposed site. Runoff produced within **Basin K** is anticipated to reach peak runoff rates of $Q_5=1.8$ cfs and $Q_{100}=3.2$ cfs. Runoff from the **Basin K** can be conveyed to a manhole at the southwest corner of Lot 1 which can be fitted with a beehive style grate or inlet. Runoff collected at the local depression would combine with flows in **Pipe 9** and continue to the proposed water quality pipe via pipes 10 and 10.1 at peak flow rates of 6.2 cfs and 14.3 cfs in the 5 and 100 year storm events.

Basin L, 1.32 acres, consists of steep slopes of 32% adjacent to portions of U.S Highway 24. The roadway embankment within **Basin L** slopes into a soil retention wall that runs along the south east boundary of the site. Runoff for **Basin L** has been calculated to reach peak flow rates of $Q_5=0.5$ cfs and $Q_{100}=3.7$ cfs. Flows produced within the basin will be conveyed westward into adjacent basins (**Basin M**) as sheet flow.

Basin M, 1.84 acres, consists of a portion of Lots 3 and 4, which is generally located along the south and southeast sides of the proposed site. Runoff produced within **Basin M** is anticipated to reach peak runoff rates of $Q_5=6.7$ cfs and $Q_{100}=12.2$ cfs. Runoff from the **Basins L** and **M** shall be conveyed to a proposed line swale or pipe system that will extend out of proposed WQ Pond 2. Peak runoff reaching **Design Point 8** is anticipated to have peak flow rates of $Q_5=7.2$ cfs and $Q_{100}=15.7$ cfs. The proposed swale would need to be a minimum of 1.5' deep at 0.5% using a 2' bottom width and 3:1 side slopes. A riprap rundown and pad would need to be required to arrest flows entering the pond. Should a pipe system be extended it would likely be a minimum of 24".

Basin N, 0.47 acres, consists of a land (Tract A) which is dedicated to house a proposed private onsite Sand Filter Basin Water Quality Pond (**Pond 2**) adjacent to existing Meadowbrook Parkway. Runoff produced within **Basin N** will ultimately combine with flows entering the pond via **Pipes 7, 10.1** and from the Swale (**DP8**). The total flow anticipated to reach the pond (**Design Point 9**) is calculated by the rational method to be $Q_5=23.0$ cfs and $Q_{100}=46.3$ cfs. Using the UD-Detention worksheet, flows treated via the Sand Filter Basin are to be discharged through a 7.0' x 2.91' CDOT Modified Type D outlet structure and proposed private 24" polyethylene Storm Sewer (Pipe Run 11). The proposed pond shall be constructed with 4:1 SS and is anticipated to store 0.120, 0.196 and 0.298 ac-ft and discharge 0.2 cfs, 11.0 cfs, and 23.1 cfs in the water quality, 5 year and 100 year events respectively. The emergency spillway shall be designed to discharge the peak inflow safely to Meadowbrook Parkway in the event that the inlet

would become clogged. Runoff conveyed in Pipe 11 will combine with flows within Pipe 5.2, prior to being discharged downstream via an existing 42" RCP storm sewer and into the backside of the existing 10' Type R at grade inlet along existing Woolsey Heights and then to the west via an existing 48" storm sewer.

The Matrix "Final Drainage Report for Claremont Business Park Filing No. 2" calculated that DP 1 combining Sub Basins B1 and B2 generated of (Q5=31.5cfs and Q100=63.6). The existing 42" RCP pipe with the revised development are expected to be less than that of the Matrix report of Q5=17.6cfs and Q100=33.8 cfs. These flows will combine downstream in the existing 42" pipe with the flows from Lot 2-1A Claremont Business Park of (Q5=7.5cfs and Q100=15.4) The original Matrix Report identified flows at the back side of the 10' Type R inlet (Q5=42.6cfs and Q100=86.6) the combined flows is significantly less that previously reported in the Matrix report. Therefore the proposed development shall not have a negative impact on the downstream storm system and is adequately sized to convey the proposed generated flows.

Basin O, 0.16 acres, consists of a landscaping strip running alongside and adjacent to Meadowbrook Parkway. The basin will most likely be composed of trees, bushes/grasses, and decorative ground cover. Low runoff values produced by **Basin O** of Q5=0.2 cfs and Q100=0.6 cfs will travel as sheet flow into Meadowbrook Parkway.

Basin P, 0.03 acres, consists of steep slopes of up to 33% adjacent to portions of U.S Highway 24. The roadway embankment within **Basin P** slopes into a soil retention wall that runs along the south east boundary of the site. Runoff for **Basin P** has been calculated to reach peak flow rates of Q5=0.0 cfs and Q100=0.1 cfs. Flows produced within the basin will be conveyed westward into adjacent basins (**Basin Q**) as sheet flow.

Basin Q, 0.11 acres, consists of a thin utility corridor alongside the south boundary of the site. The basin will most likely be composed native ground cover. Low runoff values produced by Basin Q of Q5=0.0 cfs and Q100=0.3 cfs will combine with flows from **Basin P** and will discharge to adjacent site to the south as sheet flow.

There are no planned or required improvements to the Sand Creek Drainage Channel with the development of the Claremont Business Park 2 site.

Please indicate 4 ft. minimum as there a some lots that have a 2 ft. easement on one side and 5' or more on the other side

DRAINAGE EASEMENTS

The Preliminary Plan for this site is submitting a Waiver of the El Paso County Land Development Code to request 2' foot side lot easements for drainage. Therefore, the drainage easement being 4' foot in total width. (It is likely that some lots will have a building on each lot, 4 feet apart). A calculation sheet is included in the appendix to show the maximum capacity of a concrete drainage channel with varying slopes. The final drainage report for these lots will show the slope and total amount of drainage to be conveyed in the drainage channel. The channel is proposed to be a 6" inch tall x 3' foot wide trickle channel. The final drainage report will ensure that the maximum capacity is not exceeded.

Please indicate the lots where these reduced easements are located. Make it clear that all of these lots with the reduced easements will have this channel. Also indicate that these lots shall be graded accordingly so that runoff from that area of each of the lots will be conveyed to these drainage channels (or something along those lines).

WATER QUALITY PROVISIONS AND MAINTENANCE

The subject site was previously analyzed within the Final Drainage Report for Claremont Business Park Filing No. 2 prepared by Matrix Design Group approved April 24, 2006. Per Resolution 16-426 of the BoCC, on-site WQCV is required but on-site stormwater detention is not required per the FDR for Claremont Business Park Fil. 2. The water quality volume required for the site has been determined using the UDFCD UD-Detention workbook per the guidelines set forth in the City of Colorado Springs/El Paso County Drainage Criteria Manual - Volume II.

As previously discussed water quality for the site is provided by two proposed Sand Filter Basins(SFB). Pond 1 is designed to treat runoff from approx 5.33 acres, by providing 0.095 acre-feet of water quality storage, while Pond 2 will treat runoff from approx 8.57 acres, by providing 0.120 acre-feet of water quality storage. Per ECM section 1.7.1.C.1, 20% of the project site (not to exceed 1.0 acre) may be excluded from the 100% WQ treatment requirement per El Paso County criteria. This report identifies that Basins G, O, P and Q are unable to reach one of the two proposed WQ ponds. Combined total acreage of the Basins are 0.59 AC, and doesn't exceed the 1.0 acre maximum allowance of acreage runoff.

Flows tributary to the two SFBs are released through outlet structures into an existing storm sewer system located along Meadowbrook Parkway. The water quality basins will be private and shall be maintained by the property owner. Access shall be granted to the owner and El Paso County for access and maintenance of the private WQCV facility. A private maintenance agreement document shall accompany the final drainage report(s) submittal(s) which construct the two ponds. The rest of the private storm sewer system (Inlets, Storm pipe, manholes, etc..) will be owned and maintained by the Claremont Merchants Association.

EROSION CONTROL

It is the policy of the El Paso County that we submit a grading and erosion control plan with the drainage report. Proposed silt fence, vehicle traffic control, and concrete washout area are proposed as erosion control measures.

CONSTRUCTION COST OPINION

Private Drainage Facilities (NON-Reimbursable):

Item	Description	Quantity	Unit Cost	Cost
1.	18" PP	48 LF	\$40 /LF	\$1,920.00
2.	24" PP	1327 LF	\$48 /LF	\$63,696.00
3.	30" PP	126 LF	\$65 /LF	\$8,190.00
4.	At Grade Inlets (Type R) L=15'	4 EA	\$7,200 /EA	\$28,800.00
5.	Manholes	5 EA	\$4,000 /EA	\$20,000.00
6.	WQCV Sand Filter Pond	2 EA	\$19,000 /EA	\$38,000.00
				Total \$160,606.00

M &S Civil Consultants, Inc. (M &S) cannot and does not guarantee the construction cost will not vary from these opinions of probable costs. These opinions represent our best judgment as design professionals familiar with the construction industry and this development in particular. The above is only an estimate of the facility cost in 2018.

DRAINAGE & BRIDGE FEES

This site is in the Sand Creek Drainage Basin. The site is proposed to be subdivided into ten commercial lots. Drainage fees were paid at the time of the previous platting as Tract C of Claremont Business Park Filing No. 2 (Reception No. 207712506), therefore no additional Drainage Bridge and/or Pond fees are. See Appendix of the "Final Drainage Report for Claremont Business Park Filing No. 2", Revised November 2006, by Matrix Design Group, Inc, for previously paid drainage and bridge fees.

SUMMARY

Development of Claremont Business Park 2 will not adversely affect the surrounding development. The proposed drainage facilities will adequately convey, detain and route runoff from the onsite & offsite flows to existing facilities. All drainage facilities described herein and shown on the included Proposed Drainage Map (See Appendix) are subject to change being dependent upon individual lot development. Care will be taken to accommodate overland emergency flow routes on site and temporary drainage conditions.

Please revise this statement as the lot owners that develop the lots shall comply with the final drainage report that will be submitted with the final plat application.

Although fees were paid with the previous platting, per ECM appendix L section 3.13a drainage fees may still be applicable if there is an increase in impervious acreage. Please include what the previous impervious that this site was designed for compared to your impervious to demonstrate/prove that this development does not have an increase in impervious acreage and therefore does not owe any fees.

REFERENCES

- 1.) "El Paso County and City of Colorado Springs Drainage Criteria Manual".
- 2.) "Urban Storm Drainage Criteria Manual"
- 3.) SCS Soils Map for El Paso County.
- 4.) Flood Insurance Rate Map (FIRM), Federal Emergency Management Agency, Effective date December 7, 2018.
- 5.) "Final Drainage Report for Claremont Business Park Filing No. 2", dated November 2006, by Matrix Design Group, Inc.

APPENDIX

VICINITY MAP



VICINITY MAP

N.T.S.



20 BOULDER CRESCENT, SUITE 110
 COLORADO SPRINGS, CO 80903
 PHONE: 719.955.5485

SOILS MAP



Summary by Map Unit — El Paso County Area, Colorado (CO625)

Map unit symbol	Map unit name	Rating
8	Blakeland loamy sand, 1 to 9 percent slopes	A
10	Blendon sandy loam, 0 to 3 percent slopes	B
28	Ellicott loamy coarse sand, 0 to 5 percent slopes	A

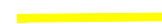
HYDROLOGIC
TYPE A SOILS



HYDROLOGIC
TYPE B SOILS



SITE BOUNDARY



NOT TO SCALE

SOILS MAP



CLAREMONT BUSINESS PARK 2

FEMA FIRM PANEL

National Flood Hazard Layer FIRMMette



38°51'19.98"N



USGS The National Map: Orthoimagery, Data refreshed April, 2019. 0 250 500 1,000 1,500 2,000 Feet 1:6,000 38°50'51.96"N

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D

OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
GENERAL STRUCTURES		Area of Undetermined Flood Hazard Zone D
		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall

OTHER AREAS		Area of Minimal Flood Hazard Zone X
		Effective LOMRs
GENERAL STRUCTURES		Area of Undetermined Flood Hazard Zone D
		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
		17.5 Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature

MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

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This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.



104°40'49.00"W

104°41'26.46"W

HYDROLOGIC CALCULATIONS

CLAREMONT BUSINESS PARK 2

"AMENDMENT" TO THE PDR FOR CLAREMONT COMMERCIAL FILING NO. 2 PROPOSED DRAINAGE CALCULATIONS (Area Runoff Coefficient Summary)

			ROOFS 0.73-0.81 COMMERCIAL AREAS 0.81-0.88 ASPHALT DRIVES 0.90-0.96			LANDSCAPED AREAS 0.16-0.41 GRAVEL STORAGE YARD 0.30-0.50 LIGHT INDUST AREAS 0.59-0.70			PARKS 0.12-0.39 GREENBELTS/AGRI. 0.09-0.36			WEIGHTED	
BASIN	TOTAL AREA (SF)	TOTAL AREA (Acres)	AREA (Acres)	C ₅	C ₁₀₀	AREA (Acres)	C ₅	C ₁₀₀	AREA (Acres)	C ₅	C ₁₀₀	C ₅	C ₁₀₀
<i>A</i>	8359.6	0.19	0.00	0.73	0.81	0.00	0.30	0.50	0.19	0.09	0.36	0.09	0.36
<i>B</i>	60660.5	1.39	1.39	0.81	0.88	0.00	0.59	0.70	0.00	0.30	0.50	0.81	0.88
<i>C</i>	13279.8	0.30	0.00	0.81	0.88	0.00	0.59	0.70	0.30	0.09	0.36	0.09	0.36
<i>D</i>	66703.6	1.53	1.53	0.81	0.88	0.00	0.59	0.70	0.00	0.09	0.36	0.81	0.88
<i>E</i>	67533.9	1.55	1.55	0.81	0.88	0.00	0.59	0.70	0.00	0.09	0.36	0.81	0.88
<i>F</i>	15781.4	0.36	0.00	0.73	0.81	0.00	0.30	0.50	0.36	0.12	0.39	0.12	0.39
<i>G</i>	12722.3	0.29	0.06	0.90	0.96	0.23	0.16	0.41	0.00	0.09	0.36	0.32	0.53
<i>H</i>	31099.0	0.71	0.00	0.90	0.96	0.00	0.16	0.41	0.71	0.09	0.36	0.09	0.36
<i>I</i>	119584.6	2.75	2.75	0.81	0.88	0.00	0.30	0.50	0.00	0.12	0.39	0.81	0.88
<i>J</i>	45863.7	1.05	1.05	0.81	0.88	0.00	0.30	0.50	0.00	0.09	0.36	0.81	0.88
<i>K</i>	18476.1	0.42	0.42	0.81	0.88	0.00	0.30	0.50	0.00	0.09	0.36	0.81	0.88
<i>L</i>	57315.2	1.32	0.00	0.81	0.88	0.00	0.30	0.50	1.32	0.09	0.36	0.09	0.36
<i>M</i>	80126.1	1.84	1.84	0.81	0.88	0.00	0.30	0.50	0.00	0.09	0.36	0.81	0.88
<i>N</i>	20642.4	0.47	0.00	0.81	0.88	0.00	0.16	0.41	0.47	0.12	0.39	0.12	0.39
<i>O</i>	6997.2	0.16	0.02	0.90	0.96	0.00	0.30	0.50	0.14	0.12	0.41	0.22	0.48
<i>P</i>	1393.0	0.03	0.00	0.81	0.88	0.00	0.30	0.50	0.03	0.09	0.36	0.09	0.36
<i>Q</i>	4961.4	0.11	0.00	0.90	0.96	0.00	0.30	0.50	0.11	0.09	0.36	0.09	0.36

Calculated by: DLM
Date: 11/19/2019
Checked by: VAS

CLAREMONT BUSINESS PARK 2

"AMENDMENT" TO THE PDR FOR CLAREMONT COMMERCIAL FILING NO. 2 PROPOSED DRAINAGE CALCULATIONS (Area Drainage Summary)

From Area Runoff Coefficient Summary				OVERLAND				STREET / CHANNEL FLOW				Time of Travel (T _t)		INTENSITY *		TOTAL FLOWS	
BASIN	AREA TOTAL (Acres)	C ₅	C ₁₀₀	C ₅	Length (ft)	Height (ft)	T _c (min)	Length (ft)	Slope (%)	Velocity (fps)	T _t (min)	TOTAL (min)	CHECK (min)	I ₅ (in/hr)	I ₁₀₀ (in/hr)	Q ₅ (c.f.s.)	Q ₁₀₀ (c.f.s.)
		From DCM Table 5-1															
A	0.19	0.09	0.36	0.09	40	5.0	5.0	0	0.0%	0.0	0.0	5.0	10.2	5.2	8.7	0.1	0.6
B	1.39	0.81	0.88	0.81	80	1.0	4.4	250	1.6%	2.5	1.7	6.0	11.8	4.9	8.2	5.5	10.1
C	0.30	0.09	0.36	0.09	40	8.0	4.3	0	0.0%	0.0	0.0	4.3	10.2	5.2	8.7	0.1	1.0
D	1.53	0.81	0.88	0.81	60	1.2	3.2	350	2.0%	2.8	2.1	5.3	12.3	5.1	8.5	6.3	11.5
E	1.55	0.81	0.88	0.81	60	1.2	3.2	167	2.0%	2.8	1.0	4.2	11.3	5.2	8.7	6.5	11.8
F	0.36	0.12	0.39	0.12	60	1.2	10.9	30	33.0%	11.5	0.0	10.9	10.5	4.1	6.8	0.2	1.0
G	0.29	0.32	0.53	0.32	25	0.5	5.6	0	0.0%	0.0	0.0	5.6	10.1	5.0	8.4	0.5	1.3
H	0.71	0.09	0.36	0.09	100	17.0	7.2	0	0.0%	0.0	0.0	7.2	10.6	4.6	7.8	0.3	2.0
I	2.75	0.81	0.88	0.81	60	1.2	3.2	425	2.0%	1.4	5.0	8.2	12.7	4.4	7.4	9.8	17.9
J	1.05	0.81	0.88	0.81	60	1.2	3.2	200	2.0%	2.8	1.2	4.4	11.4	5.2	8.7	4.4	8.0
K	0.42	0.81	0.88	0.81	60	1.2	3.2	175	2.0%	2.8	1.0	4.3	11.3	5.2	8.7	1.8	3.2
L	1.32	0.09	0.36	0.09	100	17.0	7.2	0	0.0%	0.0	0.0	7.2	10.6	4.6	7.8	0.5	3.7
M	1.84	0.81	0.88	0.81	100	1.0	5.2	400	1.5%	2.4	2.7	8.0	12.8	4.5	7.5	6.7	12.2
N	0.47	0.12	0.39	0.12	60	1.2	10.9	30	33.0%	11.5	0.0	10.9	10.5	4.1	6.8	0.2	1.3
O	0.16	0.22	0.48	0.22	25	0.5	6.3	0	0.0%	0.0	0.0	6.3	10.1	4.8	8.1	0.2	0.6
P	0.03	0.09	0.36	0.09	100	17.0	7.2	0	0.0%	0.0	0.0	7.2	10.6	4.6	7.8	0.0	0.1
Q	0.11	0.09	0.36	0.09	25	0.5	7.1	0	0.0%	0.0	0.0	7.1	10.1	4.6	7.8	0.0	0.3

* Intensity equations assume a minimum travel time of 5 minutes.

Calculated by: DLM
Date: 11/19/2019
Checked by: VAS

CLAREMONT BUSINESS PARK 2

"AMENDMENT" TO THE PDR FOR CLAREMONT COMMERCIAL FILING NO. 2 PROPOSED DRAINAGE CALCULATIONS (Basin Routing Summary)

<i>From Area Runoff Coefficient Summary</i>				OVERLAND				PIPE / CHANNEL FLOW				Time of Travel (T _t)	INTENSITY *		TOTAL FLOWS		COMMENTS
DESIGN POINT	CONTRIBUTING BASINS DPS AND/OR PIPES	CA ₅	CA ₁₀₀	C _s	Length (ft)	Height (ft)	T _c (min)	Length (ft)	Slope (%)	Velocity (fps)	T _t (min)	TOTAL (min)	I ₅ (in/hr)	I ₁₀₀ (in/hr)	Q ₅ (c.f.s.)	Q ₁₀₀ (c.f.s.)	
1	A, B	1.15	1.29	TAKEN FROM BASIN B								6.0	4.9	8.2	5.6	10.6	Proposed PVT 24" Storm Sewer
2	C, D	1.27	1.46	TAKEN FROM BASIN D								5.3	5.1	8.5	6.4	12.4	Proposed PVT 24" Storm Sewer
3	E	1.26	1.36	TAKEN FROM BASIN E (Adj to Min T _c)								5.0	5.2	8.7	6.5	11.8	Proposed PVT 24" Storm Sewer
4	F, Pipes 3 & 4	3.71	4.26	TAKEN FROM DESIGN POINT 1								6.0	4.9	8.2	18.2	35.0	PVT Sand Filter Basin FSD Pond 1
5	H, I	2.29	2.67	TAKEN FROM BASIN I								8.2	4.4	7.4	10.1	19.8	10' and 15' Type R Inlets (assumed split flows)
6	J, FB DP5	0.85	1.29	TAKEN FROM BASIN J (Adj to Min T _c)								5.0	5.2	8.7	4.4	11.2	10' and 15' Type R Inlets (assumed split flows)
7	K	0.34	0.37	TAKEN FROM BASIN K (Adj to Min T _c)								5.0	5.2	8.7	1.8	3.2	Manhole w/ Grate
8	L, M	1.61	2.09	TAKEN FROM BASIN M								8.0	4.5	7.5	7.2	15.7	PVT Swale or PVT 24" Storm Sewer
9	N, DP8, Pipes 7 and 10.1	5.15	6.16	TAKEN FROM DESIGN POINT 8								8.0	4.5	7.5	23.0	46.3	PVT Sand Filter Basin FSD Pond 2

Calculated by: DLM
Date: 11/19/2019
Checked by: VAS

CLAREMONT BUSINESS PARK 2

"AMENDMENT" TO THE PDR FOR CLAREMONT COMMERCIAL FILING NO. 2

PROPOSED DRAINAGE CALCULATIONS

(Storm Sewer Routing Summary)

PIPE RUN	Contributing Pipes/Design Points	Equivalent CA ₅	Equivalent CA ₁₀₀	Maximum T _C	Intensity*		Flow		Pipe Size
					I ₅	I ₁₀₀	Q ₅	Q ₁₀₀	
1	DP1	1.15	1.29	6.0	5.2	8.7	6.5	11.8	PROP 24" PP
2	DP2	1.27	1.46	5.3	5.1	8.5	6.4	12.4	PROP 24" PP
3	PR1, PR2	2.41	2.75	6.0	4.9	8.2	11.8	22.6	PROP 30" PP
4	DP3	1.26	1.36	5.0	5.2	8.7	6.5	11.8	PROP 24" PP
5	POND 1 OUTFALL	1.48	1.89	6.0	4.9	8.2	7.2	15.5	PROP 24" PP
5.1	PIPE 5	1.48	1.89	6.0	4.9	8.2	7.2	15.5	PROP 24" PP
5.2	PIPE 5.1	1.48	1.89	6.0	4.9	8.2	7.2	15.5	PROP 24" PP
6	INLET 1	1.44	1.43	8.2	4.4	7.4	6.4	10.6	PROP 24" PP
7	PIPE 6, INLET 2	2.28	2.24	8.2	4.4	7.4	10.1	16.6	PROP 30" PP
8	INLET 3	0.55	0.80	5.0	5.2	8.7	2.8	6.9	PROP 18" PP
9	PIPE 8, INLET 4	0.86	1.27	5.0	5.2	8.7	4.4	11.0	PROP 24" PP
10	PIPE 9, DP7	1.20	1.64	5.0	5.2	8.7	6.2	14.3	PROP 24" PP
10.1	PIPE 10	1.20	1.64	5.0	5.2	8.7	6.2	14.3	PROP 24" PP
11	POND 2 OUTFALL	2.45	3.07	8.0	4.5	7.5	11.0	23.1	PROP 30" PP
12	PR5.2, PR11	3.93	4.50	8.0	4.5	7.5	17.6	33.8	EX 42" RCP

* Intensity equations assume a minimum travel time of 5 minutes.

DP - Design Point
PR - Pipe Run

FB- Flow By from Design Point
INT- Intercepted Flow from Design Point

Calculated by: DLM

Date: 11/20/2019

Checked by: VAS

HYDRAULIC CALCULATIONS / SFB WQCV CALCULATIONS

Rating Table for 3' wide 6" deep Rectangular Channel

Project Description							
Friction Method	Manning Formula						
Solve For	Discharge						
Input Data							
Roughness Coefficient	0.013						
Channel Slope	0.003 ft/ft						
Normal Depth	6.0 in						
Bottom Width	3.00 ft						
Channel Slope (ft/ft)	Discharge (cfs)	Velocity (ft/s)	Flow Area (ft ²)	Wetted Perimeter (ft)	Top Width (ft)		
0.003	4.46	2.97	1.5	4.0	3.00		
0.005	6.30	4.20	1.5	4.0	3.00		
0.008	7.72	5.15	1.5	4.0	3.00		
0.010	8.92	5.94	1.5	4.0	3.00		
0.013	9.97	6.65	1.5	4.0	3.00		
0.015	10.92	7.28	1.5	4.0	3.00		
0.018	11.79	7.86	1.5	4.0	3.00		
0.020	12.61	8.41	1.5	4.0	3.00		
0.023	13.37	8.92	1.5	4.0	3.00		
0.025	14.10	9.40	1.5	4.0	3.00		
0.028	14.79	9.86	1.5	4.0	3.00		
0.030	15.44	10.30	1.5	4.0	3.00		

CLAREMONT BUSINESS PARK 2
"Amendment" for Claremont Commercial Filing No. 2
PRELIMINARY DRAINAGE PLAN CALCULATIONS
(Pond Volume Calculation)

WQCV POND 1

Elevation	SF	CF	Storage	
			AF	Sum
6373.00	3,690.00	0.00	0.00	0.00
6374.00	4,280.00	3,985.00	0.09	0.09
6375.00	6,051.00	5,165.50	0.12	0.21
6376.00	7,382.00	6,716.50	0.15	0.36
6376.50	8,085.00	3,866.75	0.09	0.45
Total =		<u>19,734</u> CF		
		Total =	<u>0.5</u> Ac-ft	

Calculated by: DLM
Date: 11/20/2019
Checked by: _____

CLAREMONT BUSINESS PARK 2

"AMENDMENT" TO THE PDR FOR
CLAREMONT COMMERCIAL FILING NO. 2 (PROPOSED CONDITIONS)

Weighted Percent Imperviousness of Proposed WQ Sand Filter Pond 1				
Contributing Basins	Area (Acres)	C_s	Impervious % (I)	(Acres)*(I)
<i>A</i>	0.19	0.09	2	0.38
<i>B</i>	1.39	0.81	95	132.29
<i>C</i>	0.30	0.09	2	0.61
<i>D</i>	1.53	0.81	95	145.47
<i>E</i>	1.55	0.81	95	147.28
<i>F</i>	0.36	0.12	7	2.54
Totals	5.33			428.58
Imperviousness % to FSD	80.4			

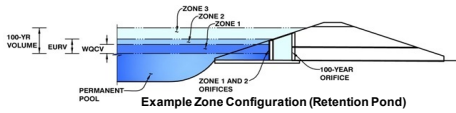
1.77 A soils 33%
3.57 B soils 67%
5.33 total area

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.01 (January 2020)

Project: **CLAREMONT BUSINESS PARK 2**

Basin ID: **WQ Pond 1**



Watershed Information

Selected BMP Type =	SF	
Watershed Area =	5.33	acres
Watershed Length =	735	ft
Watershed Length to Centroid =	325	ft
Watershed Slope =	0.016	ft/ft
Watershed Imperviousness =	80.40%	percent
Percentage Hydrologic Soil Group A =	33.0%	percent
Percentage Hydrologic Soil Group B =	67.0%	percent
Percentage Hydrologic Soil Groups C/D =	0.0%	percent
Target WQC Drain Time =	12.0	hours
Location for 1-hr Rainfall Depths =	User Input	

After providing required inputs above including 1-hour rainfall depths, click "Run CUHP" to generate runoff hydrographs using the embedded Colorado Urban Hydrograph Procedure.

Water Quality Capture Volume (WQCV) =	0.118	acre-feet
Excess Urban Runoff Volume (EURV) =	0.505	acre-feet
2-yr Runoff Volume (P1 = 1.19 in.) =	0.399	acre-feet
5-yr Runoff Volume (P1 = 1.5 in.) =	0.525	acre-feet
10-yr Runoff Volume (P1 = 1.75 in.) =	0.629	acre-feet
25-yr Runoff Volume (P1 = 2 in.) =	0.749	acre-feet
50-yr Runoff Volume (P1 = 2.25 in.) =	0.860	acre-feet
100-yr Runoff Volume (P1 = 2.52 in.) =	0.989	acre-feet
500-yr Runoff Volume (P1 = 2.53 in.) =	0.994	acre-feet
Approximate 2-yr Detention Volume =	0.375	acre-feet
Approximate 5-yr Detention Volume =	0.492	acre-feet
Approximate 10-yr Detention Volume =	0.603	acre-feet
Approximate 25-yr Detention Volume =	0.668	acre-feet
Approximate 50-yr Detention Volume =	0.706	acre-feet
Approximate 100-yr Detention Volume =	0.749	acre-feet

Optional User Overrides

0.118	acre-feet
0.505	acre-feet
1.19	inches
1.50	inches
1.75	inches
2.00	inches
2.25	inches
2.52	inches
2.53	inches

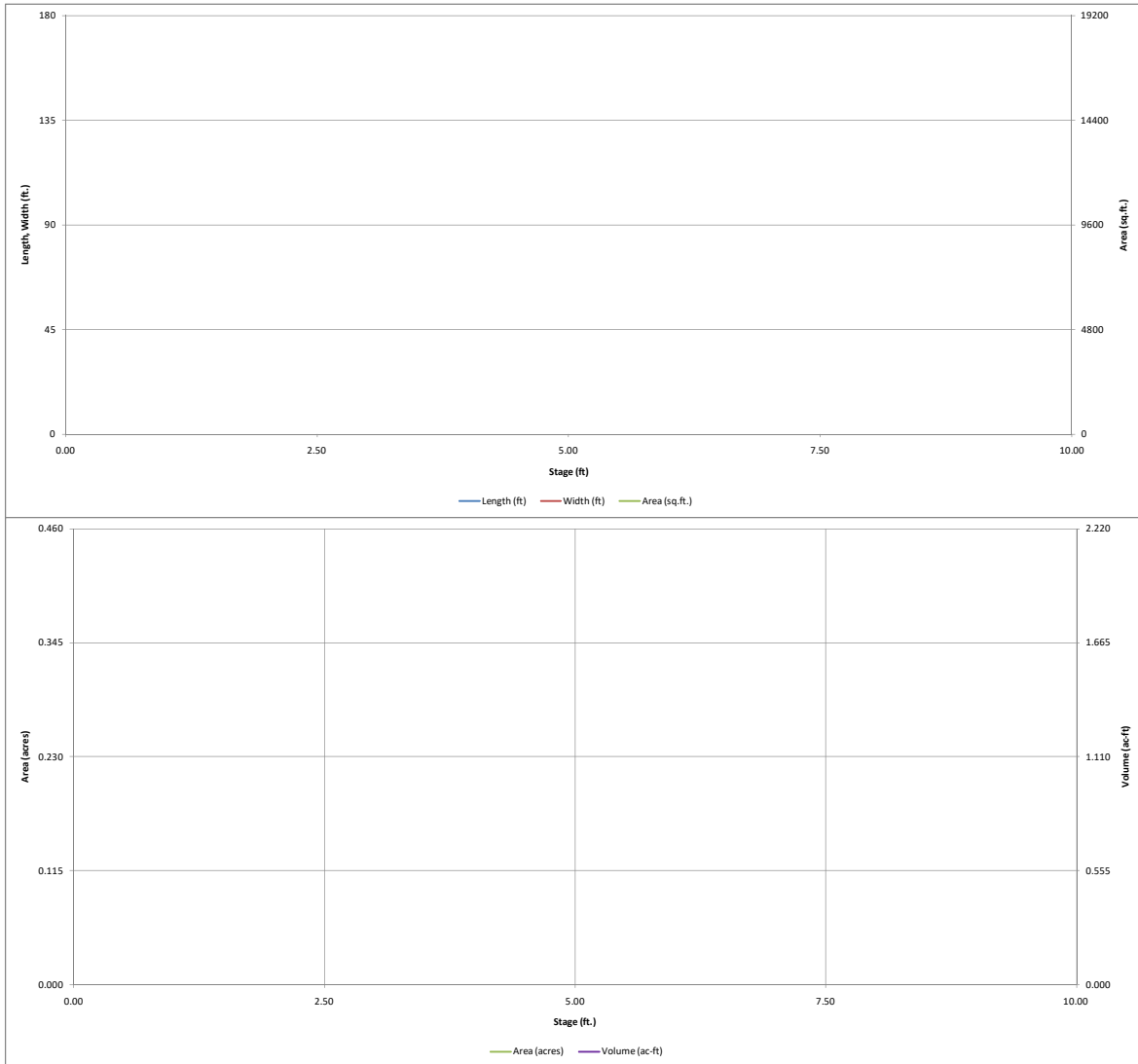
Define Zones and Basin Geometry

Zone 1 Volume (WQCV) =	0.118	acre-feet
Zone 2 Volume (100-year - Zone 1) =	0.631	acre-feet
Select Zone 3 Storage Volume (Optional) =		acre-feet
Total Detention Basin Volume =	0.749	acre-feet
Initial Surcharge Volume (ISV) =	N/A	ft ³
Initial Surcharge Depth (ISD) =	N/A	ft
Total Available Detention Depth (H _{total}) =	user	ft
Depth of Trickle Channel (H _{tc}) =	N/A	ft
Slope of Trickle Channel (S _{tc}) =	N/A	ft/ft
Slopes of Main Basin Sides (S _{main}) =	user	H:V
Basin Length-to-Width Ratio (R _{LW}) =	user	
Initial Surcharge Area (A _{ISV}) =	user	ft ²
Surcharge Volume Length (L _{ISV}) =	user	ft
Surcharge Volume Width (W _{ISV}) =	user	ft
Depth of Basin Floor (H _{FLOOR}) =	user	ft
Length of Basin Floor (L _{FLOOR}) =	user	ft
Width of Basin Floor (W _{FLOOR}) =	user	ft
Area of Basin Floor (A _{FLOOR}) =	user	ft ²
Volume of Basin Floor (V _{FLOOR}) =	user	ft ³
Depth of Main Basin (H _{MAIN}) =	user	ft
Length of Main Basin (L _{MAIN}) =	user	ft
Width of Main Basin (W _{MAIN}) =	user	ft
Area of Main Basin (A _{MAIN}) =	user	ft ²
Volume of Main Basin (V _{MAIN}) =	user	ft ³
Calculated Total Basin Volume (V _{total}) =	user	acre-feet

Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft ²)	Optional Override Area (ft ²)	Area (acre)	Volume (ft ³)	Volume (ac-ft)
Media Surface	--	0.00	--	--	--	3,690	0.085		
6374	--	1.00	--	--	4,280		0.098	3,985	0.091
6375	--	2.00	--	--	6,051		0.139	9,150	0.210
6376	--	3.00	--	--	7,382		0.169	15,867	0.364
6377	--	4.00	--	--	8,085		0.186	23,600	0.542

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.01 (January 2020)

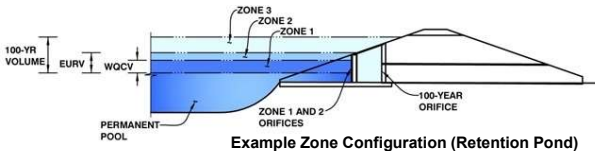


DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.01 (January 2020)

Project: CLAREMONT BUSINESS PARK 2

Basin ID: WQ Pond 1



	Estimated Stage (ft)	Estimated Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	1.26	0.118	Filtration Media
Zone 2 (100-year)	#VALUE!	0.631	Weir&Pipe (Restrict)
Zone 3			
Total (all zones)		0.749	

User Input: Orifice at Underdrain Outlet (typically used to drain WQCV in a Filtration BMP)

Underdrain Orifice Invert Depth =	2.55	ft (distance below the filtration media surface)
Underdrain Orifice Diameter =	1.61	inches

Calculated Parameters for Underdrain

Underdrain Orifice Area =	0.0	ft ²
Underdrain Orifice Centroid =	0.07	feet

User Input: Orifice Plate with one or more orifices or Elliptical Slot Weir (typically used to drain WQCV and/or EURV in a sedimentation BMP)

Invert of Lowest Orifice =	N/A	ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Orifice Plate =	N/A	ft (relative to basin bottom at Stage = 0 ft)
Orifice Plate: Orifice Vertical Spacing =	N/A	inches
Orifice Plate: Orifice Area per Row =	N/A	inches

Calculated Parameters for Plate

WQ Orifice Area per Row =	N/A	ft ²
Elliptical Half-Width =	N/A	feet
Elliptical Slot Centroid =	N/A	feet
Elliptical Slot Area =	N/A	ft ²

User Input: Stage and Total Area of Each Orifice Row (numbered from lowest to highest)

	Row 1 (optional)	Row 2 (optional)	Row 3 (optional)	Row 4 (optional)	Row 5 (optional)	Row 6 (optional)	Row 7 (optional)	Row 8 (optional)
Stage of Orifice Centroid (ft)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Orifice Area (sq. inches)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

	Row 9 (optional)	Row 10 (optional)	Row 11 (optional)	Row 12 (optional)	Row 13 (optional)	Row 14 (optional)	Row 15 (optional)	Row 16 (optional)
Stage of Orifice Centroid (ft)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Orifice Area (sq. inches)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

User Input: Vertical Orifice (Circular or Rectangular)

	Not Selected	Not Selected	
Invert of Vertical Orifice =			ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Vertical Orifice =			ft (relative to basin bottom at Stage = 0 ft)
Vertical Orifice Diameter =			inches

Calculated Parameters for Vertical Orifice

	Not Selected	Not Selected	
Vertical Orifice Area =			ft ²
Vertical Orifice Centroid =			feet

User Input: Overflow Weir (Dropbox with Flat or Sloped Grate and Outlet Pipe OR Rectangular/Trapezoidal Weir (and No Outlet Pipe)

	Zone 2 Weir	Not Selected	
Overflow Weir Front Edge Height, H _o =	1.26		ft (relative to basin bottom at Stage = 0 ft)
Overflow Weir Front Edge Length =	6.00		feet
Overflow Weir Grate Slope =	0.00		H:V
Horiz. Length of Weir Sides =	2.91		feet
Overflow Grate Open Area % =	70%		%, grate open area/total area
Debris Clogging % =	50%		%

Calculated Parameters for Overflow Weir

	Zone 2 Weir	Not Selected	
Height of Grate Upper Edge, H _u =	1.26		feet
Overflow Weir Slope Length =	2.91		feet
Grate Open Area / 100-yr Orifice Area =	4.84		
Overflow Grate Open Area w/o Debris =	12.22		ft ²
Overflow Grate Open Area w/ Debris =	6.11		ft ²

User Input: Outlet Pipe w/ Flow Restriction Plate (Circular Orifice, Restrictor Plate, or Rectangular Orifice)

	Zone 2 Restrictor	Not Selected	
Depth to Invert of Outlet Pipe =	2.69		ft (distance below basin bottom at Stage = 0 ft)
Outlet Pipe Diameter =	24.00		inches
Restrictor Plate Height Above Pipe Invert =	18.00		inches

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

	Zone 2 Restrictor	Not Selected	
Outlet Orifice Area =	2.53		ft ²
Outlet Orifice Centroid =	0.83		feet
Half-Central Angle of Restrictor Plate on Pipe =	2.09	N/A	radians

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage =	2.00	ft (relative to basin bottom at Stage = 0 ft)
Spillway Crest Length =	6.00	feet
Spillway End Slopes =	4.00	H:V
Freeboard above Max Water Surface =	1.00	feet

Calculated Parameters for Spillway

Spillway Design Flow Depth =	0.78	feet
Stage at Top of Freeboard =	3.78	feet
Basin Area at Top of Freeboard =	0.18	acres
Basin Volume at Top of Freeboard =	0.50	acre-ft

Please fix.

Routed Hydrograph Results

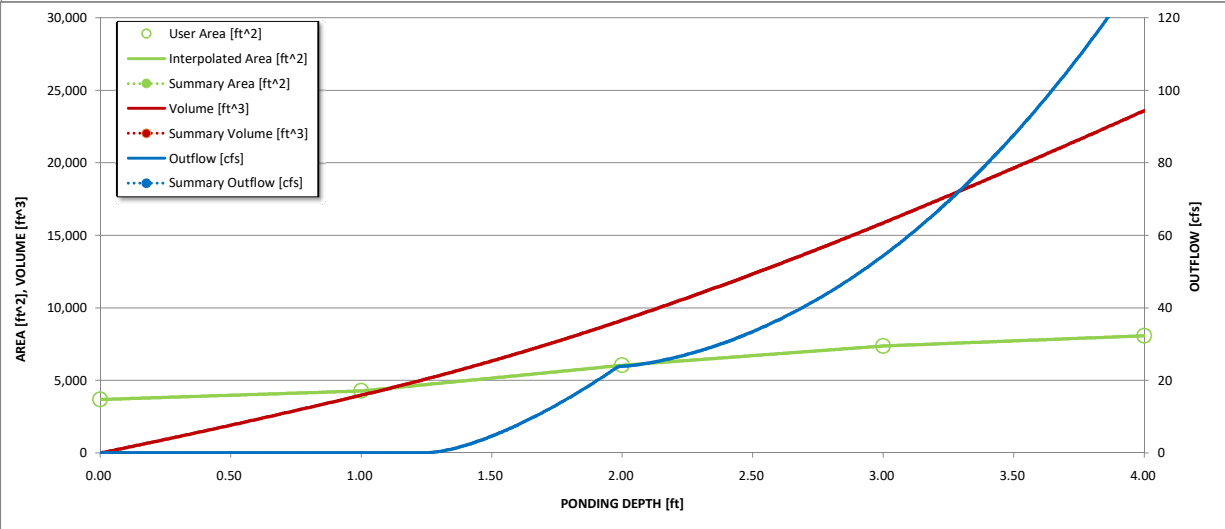
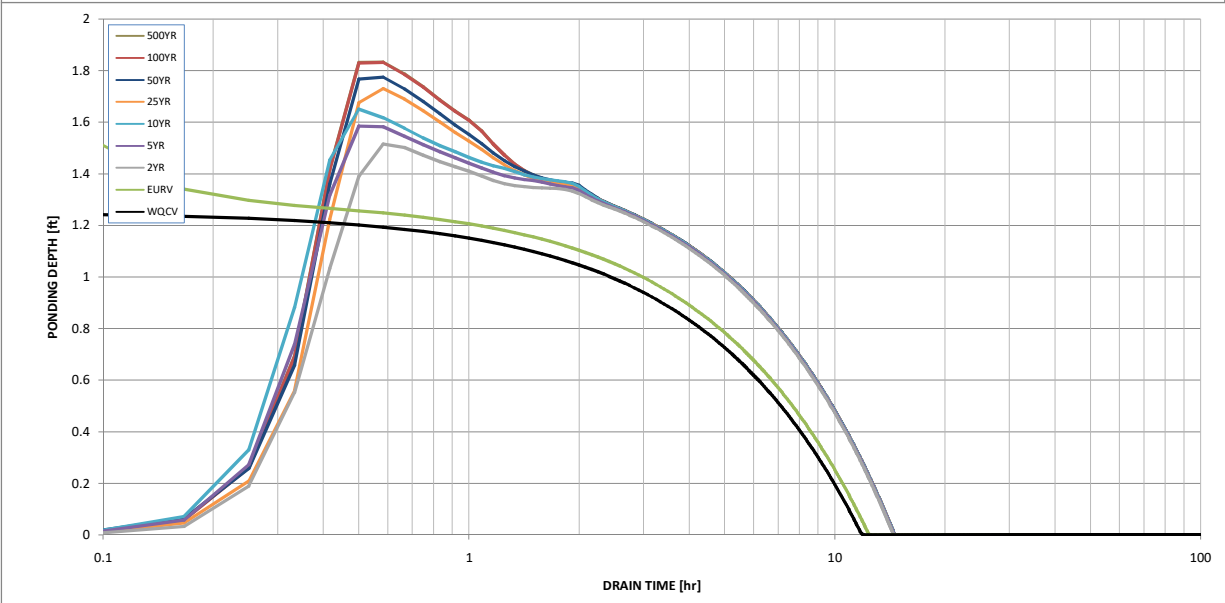
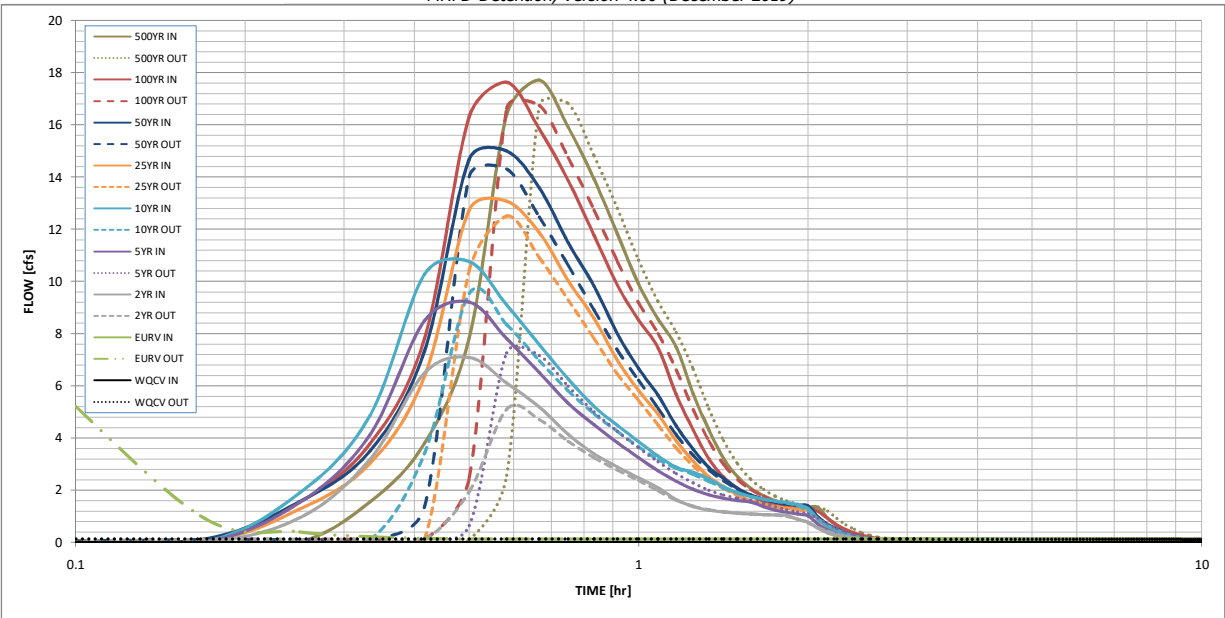
The user can override the default CUHP hydrographs and runoff volumes by entering new values in the Inflow Hydrographs table (Columns W through AF).

	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
Design Storm Return Period =	N/A	N/A	1.19	1.50	1.75	2.00	2.25	2.52	2.53
One-Hour Rainfall Depth (in) =	N/A	N/A	1.19	1.50	1.75	2.00	2.25	2.52	2.53
CUHP Runoff Volume (acre-ft) =	0.118	0.505	0.399	0.525	0.629	0.749	0.860	0.989	0.994
Inflow Hydrograph Volume (acre-ft) =	N/A	N/A	0.399	0.525	0.629	0.749	0.860	0.989	0.994
CUHP Predevelopment Peak Q (cfs) =	N/A	N/A	0.1	0.9	1.6	3.4	4.5	5.9	5.9
OPTIONAL Override Predevelopment Peak Q (cfs) =	N/A	N/A							
Predevelopment Unit Peak Flow, q (cfs/acre) =	N/A	N/A	0.02	0.16	0.31	0.64	0.84	1.11	1.12
Peak Inflow Q (cfs) =	N/A	N/A	7.1	9.2	10.8	13.1	15.0	17.6	17.7
Peak Outflow Q (cfs) =	0.1	47.5	5.1	7.3	9.5	12.5	14.3	16.7	16.8
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	8.3	5.8	3.7	3.2	2.8	2.8
Structure Controlling Flow =	#REF!	#REF!	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1
Max Velocity through Grate 1 (fps) =	#REF!	#REF!	0.42	0.6	0.8	1.0	1.1	1.4	1.4
Max Velocity through Grate 2 (fps) =	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Time to Drain 97% of Inflow Volume (hours) =	#REF!	#REF!	13	13	13	12	12	11	11
Time to Drain 99% of Inflow Volume (hours) =	#REF!	#REF!	14	14	14	14	14	14	14
Maximum Ponding Depth (ft) =	#REF!	#REF!	1.52	1.59	1.65	1.73	1.77	1.83	1.83
Area at Maximum Ponding Depth (acres) =	#REF!	#REF!	0.12	0.12	0.12	0.13	0.13	0.13	0.13
Maximum Volume Stored (acre-ft) =	#REF!	#REF!	0.147	0.155	0.164	0.173	0.179	0.187	0.187

NOTE: Per resolution 16-426 of the BoCC (included in Appendix), on-site WQCV is required but on-site stormwater detention is not required per the FDR for Claremont Commercial Subdivision Fil. 2. Should be Claremont Business Park Filing No. 2

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.00 (December 2019)



S-A-V-D Chart Axis Override	X-axis	Left Y-Axis	Right Y-Axis
minimum bound			
maximum bound			

CLAREMONT BUSINESS PARK 2
"Amendment" for Claremont Commercial Filing No.2
Preliminary DRAINAGE REPORT DRAINAGE CALCULATIONS
(Pond Volume Calculation)

WQCV POND 2

Elevation	SF	CF	Storage	
			AF	Sum
6365.50	3,292.00	0.00	0.00	0.00
6366.00	3,840.00	1,783.00	0.04	0.04
6367.00	5,015.00	4,427.50	0.10	0.14
6368.00	6,290.00	5,652.50	0.13	0.27
6369.00	7,665.00	6,977.50	0.16	0.43
Total =		<u>18,841</u> CF		
		Total =	<u>0.4</u> Ac-ft	

Calculated by: DLM
Date: 3/20/2017
Checked by: _____

CLAREMONT BUSINESS PARK 2

"AMENDMENT TO THE PDR FOR
CLAREMONT COMMERCIAL FILING NO. 2 (PROPOSED CONDITIONS)

Weighted Percent Imperviousness of Proposed WQ Sand Filter Pond 2				
Contributing Basins	Area (Acres)	C₅	Impervious % (I)	(Acres)*(I)
<i>H</i>	0.71	0.09	2	1.43
<i>I</i>	2.75	0.81	95	260.80
<i>J</i>	1.05	0.81	95	100.02
<i>K</i>	0.42	0.81	2	0.85
<i>L</i>	1.32	0.09	2	2.63
<i>M</i>	1.84	0.81	95	174.75
<i>N</i>	0.47	0.12	7	3.32
Totals	8.57			543.80
Imperviousness of WQ Pond 2	63.5			

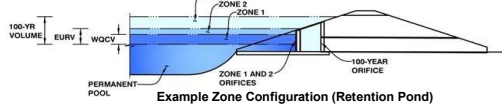
8.57 B soils
8.57 total area

RETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.01 (January 2020)

Project: CLAREMONT BUSINESS PARK 2

Basin ID: WQ Pond 2



Example Zone Configuration (Retention Pond)

Watershed Information

Table with watershed parameters: Selected BMP Type (SF), Watershed Area (8.57 acres), Watershed Length (665 ft), Watershed Length to Centroid (325 ft), Watershed Slope (0.018 ft/ft), Watershed Imperviousness (63.50% percent), Percentage Hydrologic Soil Group A (100.0% percent), Percentage Hydrologic Soil Group B (0.0% percent), Percentage Hydrologic Soil Groups C/D (0.0% percent), Target WQCV Drain Time (12.0 hours), Location for 1-hr Rainfall Depths (User Input).

After providing required inputs above including 1-hour rainfall depths, click 'Run CUHP' to generate runoff hydrographs using the embedded Colorado Urban Hydrograph Procedure.

Table with water quality capture volume (WQCV) and runoff volumes for various return periods (2-yr to 100-yr) in acre-feet and inches. Includes an 'Optional User Overrides' section with input fields for these values.

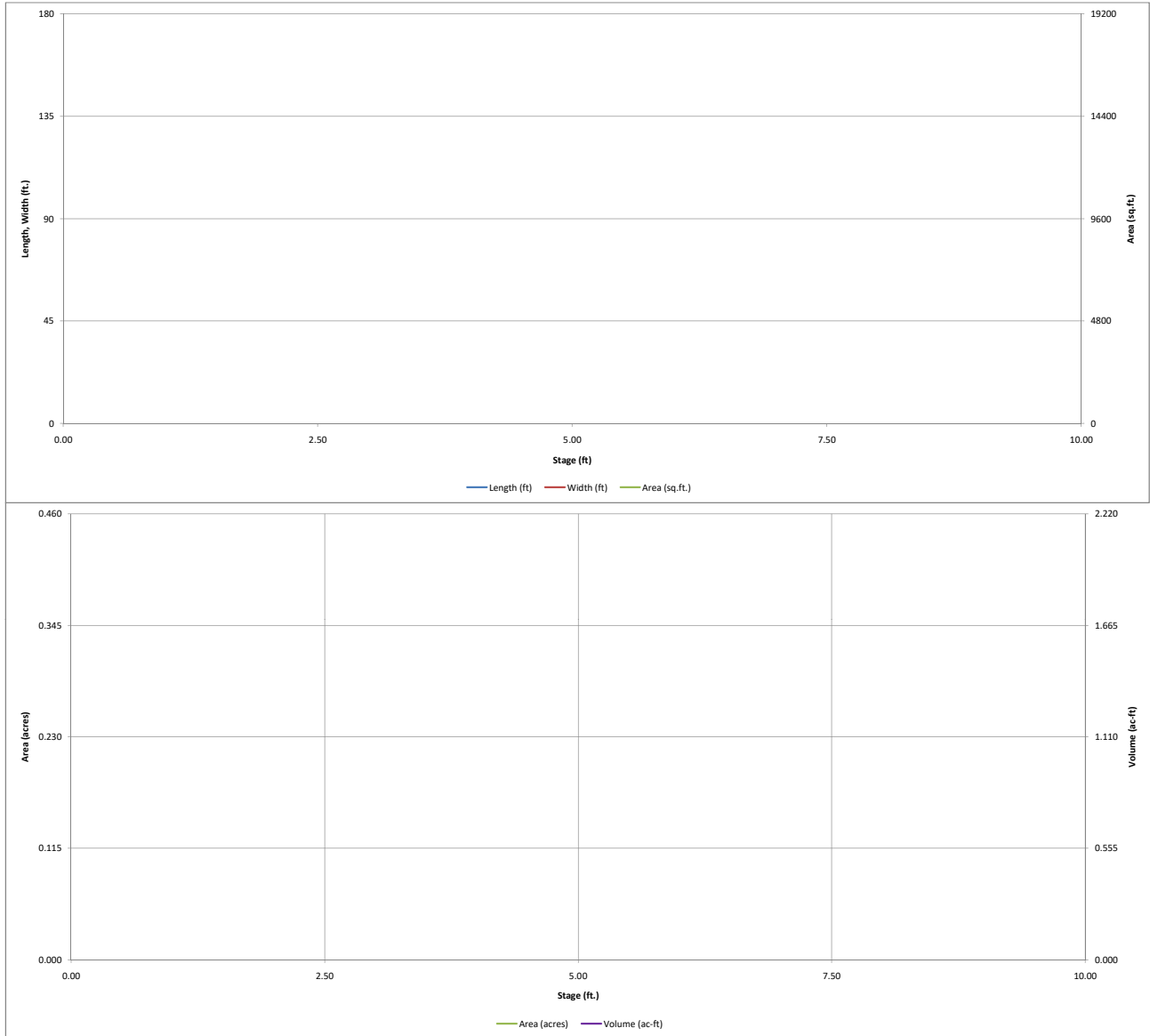
Define Zones and Basin Geometry

Table with basin geometry parameters: Zone 1 Volume (WQCV) (0.142 acre-feet), Zone 2 Volume (100-year - Zone 1) (0.863 acre-feet), Select Zone 3 Storage Volume (Optional) (acre-feet), Total Detention Basin Volume (1.005 acre-feet), Initial Surcharge Volume (ISV) (N/A ft^3), Initial Surcharge Depth (ISD) (N/A ft), Total Available Detention Depth (H_total) (user ft), Depth of Trickle Channel (H_TC) (N/A ft), Slope of Trickle Channel (S_TC) (N/A ft/ft), Slopes of Main Basin Sides (S_main) (user H:V), Basin Length-to-Width Ratio (R_LW) (user), Initial Surcharge Area (A_ISV) (user ft^2), Surcharge Volume Length (L_ISV) (user ft), Surcharge Volume Width (W_ISV) (user ft), Depth of Basin Floor (H_FLOOR) (user ft), Length of Basin Floor (L_FLOOR) (user ft), Width of Basin Floor (W_FLOOR) (user ft), Area of Basin Floor (A_FLOOR) (user ft^2), Volume of Basin Floor (V_FLOOR) (user ft^3), Depth of Main Basin (H_MAIN) (user ft), Length of Main Basin (L_MAIN) (user ft), Width of Main Basin (W_MAIN) (user ft), Area of Main Basin (A_MAIN) (user ft^2), Volume of Main Basin (V_MAIN) (user ft^3), Calculated Total Basin Volume (V_total) (user acre-feet).

Main table for Stage-Storage Table Builder with columns: Stage - Storage Description, Stage (ft), Optional Override Stage (ft), Length (ft), Width (ft), Area (ft^2), Optional Override Area (ft^2), Area (acre), Volume (ft^3), Volume (ac-ft). Includes rows for Media Surface and various storage stages.

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.01 (January 2020)

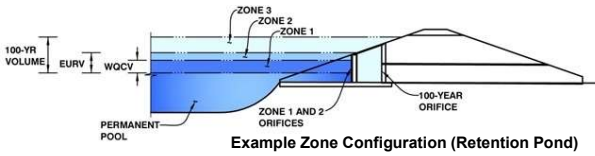


DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.01 (January 2020)

Project: CLAREMONT BUSINESS PARK 2

Basin ID: WQ Pond 2



	Estimated Stage (ft)	Estimated Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	1.31	0.142	Filtration Media
Zone 2 (100-year)	#VALUE!	0.818	Weir&Pipe (Restrict)
Zone 3			
Total (all zones)		0.960	

User Input: Orifice at Underdrain Outlet (typically used to drain WQCV in a Filtration BMP)

Underdrain Orifice Invert Depth =	2.65	ft (distance below the filtration media surface)
Underdrain Orifice Diameter =	1.75	inches

Calculated Parameters for Underdrain

Underdrain Orifice Area =	0.0	ft ²
Underdrain Orifice Centroid =	0.07	feet

User Input: Orifice Plate with one or more orifices or Elliptical Slot Weir (typically used to drain WQCV and/or EURV in a sedimentation BMP)

Invert of Lowest Orifice =	N/A	ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Orifice Plate =	N/A	ft (relative to basin bottom at Stage = 0 ft)
Orifice Plate: Orifice Vertical Spacing =	N/A	inches
Orifice Plate: Orifice Area per Row =	N/A	inches

Calculated Parameters for Plate

WQ Orifice Area per Row =	N/A	ft ²
Elliptical Half-Width =	N/A	feet
Elliptical Slot Centroid =	N/A	feet
Elliptical Slot Area =	N/A	ft ²

User Input: Stage and Total Area of Each Orifice Row (numbered from lowest to highest)

	Row 1 (optional)	Row 2 (optional)	Row 3 (optional)	Row 4 (optional)	Row 5 (optional)	Row 6 (optional)	Row 7 (optional)	Row 8 (optional)
Stage of Orifice Centroid (ft)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Orifice Area (sq. inches)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

	Row 9 (optional)	Row 10 (optional)	Row 11 (optional)	Row 12 (optional)	Row 13 (optional)	Row 14 (optional)	Row 15 (optional)	Row 16 (optional)
Stage of Orifice Centroid (ft)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Orifice Area (sq. inches)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

User Input: Vertical Orifice (Circular or Rectangular)

	Not Selected	Not Selected	
Invert of Vertical Orifice =			ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Vertical Orifice =			ft (relative to basin bottom at Stage = 0 ft)
Vertical Orifice Diameter =			inches

Calculated Parameters for Vertical Orifice

	Not Selected	Not Selected	
Vertical Orifice Area =			ft ²
Vertical Orifice Centroid =			feet

User Input: Overflow Weir (Dropbox with Flat or Sloped Grate and Outlet Pipe OR Rectangular/Trapezoidal Weir (and No Outlet Pipe)

	Zone 2 Weir	Not Selected	
Overflow Weir Front Edge Height, Ho =	1.31		ft (relative to basin bottom at Stage = 0 ft)
Overflow Weir Front Edge Length =	7.00		feet
Overflow Weir Grate Slope =	0.00		H:V
Horiz. Length of Weir Sides =	2.91		feet
Overflow Grate Open Area % =	70%		%, grate open area/total area
Debris Clogging % =	50%		%

Calculated Parameters for Overflow Weir

	Zone 2 Weir	Not Selected	
Height of Grate Upper Edge, H _u =	1.31		feet
Overflow Weir Slope Length =	2.91		feet
Grate Open Area / 100-yr Orifice Area =	6.41		
Overflow Grate Open Area w/o Debris =	14.26		ft ²
Overflow Grate Open Area w/ Debris =	7.13		ft ²

User Input: Outlet Pipe w/ Flow Restriction Plate (Circular Orifice, Restrictor Plate, or Rectangular Orifice)

	Zone 2 Restrictor	Not Selected	
Depth to Invert of Outlet Pipe =	3.00		ft (distance below basin bottom at Stage = 0 ft)
Outlet Pipe Diameter =	24.00		inches
Restrictor Plate Height Above Pipe Invert =	16.00		inches

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

	Zone 2 Restrictor	Not Selected	
Outlet Orifice Area =	2.22		ft ²
Outlet Orifice Centroid =	0.75		feet
Half-Central Angle of Restrictor Plate on Pipe =	1.91	N/A	radians

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage =	2.50	ft (relative to basin bottom at Stage = 0 ft)
Spillway Crest Length =	10.00	feet
Spillway End Slopes =	4.00	H:1
Freeboard above Max Water Surface =	1.00	feet

Calculated Parameters for Spillway

Spillway Design Flow Depth =	0.84	feet
Stage at Top of Freeboard =	4.34	feet
Basin Area at Top of Freeboard =	0.21	acres
Basin Volume at Top of Freeboard =	0.50	acre-ft

Routed Hydrograph Results

The user can override the default CUHP hydrographs and runoff volumes by entering new values in the Inflow Hydrographs table (Columns W through AF).

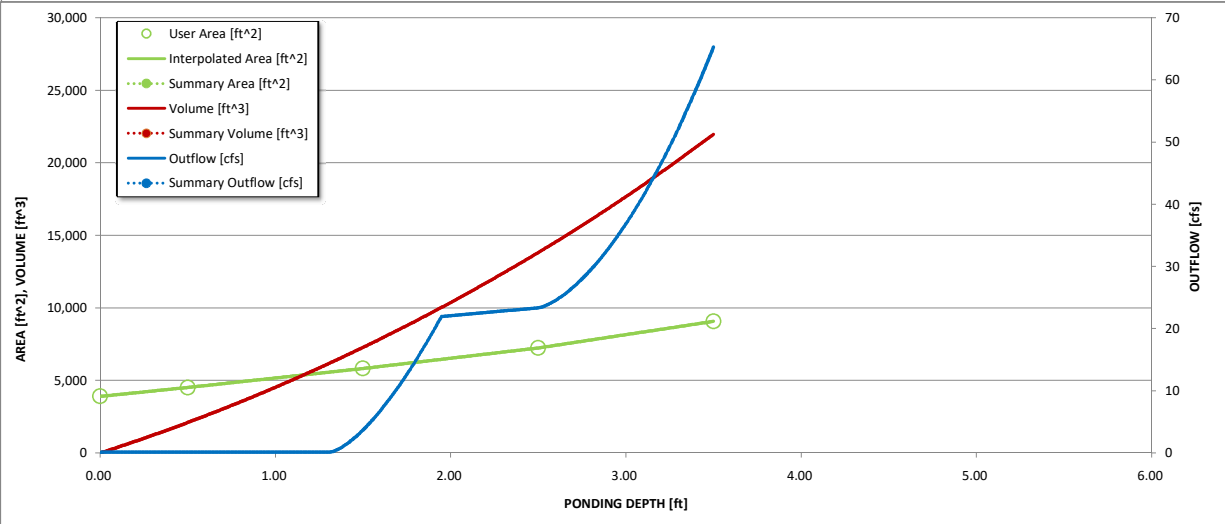
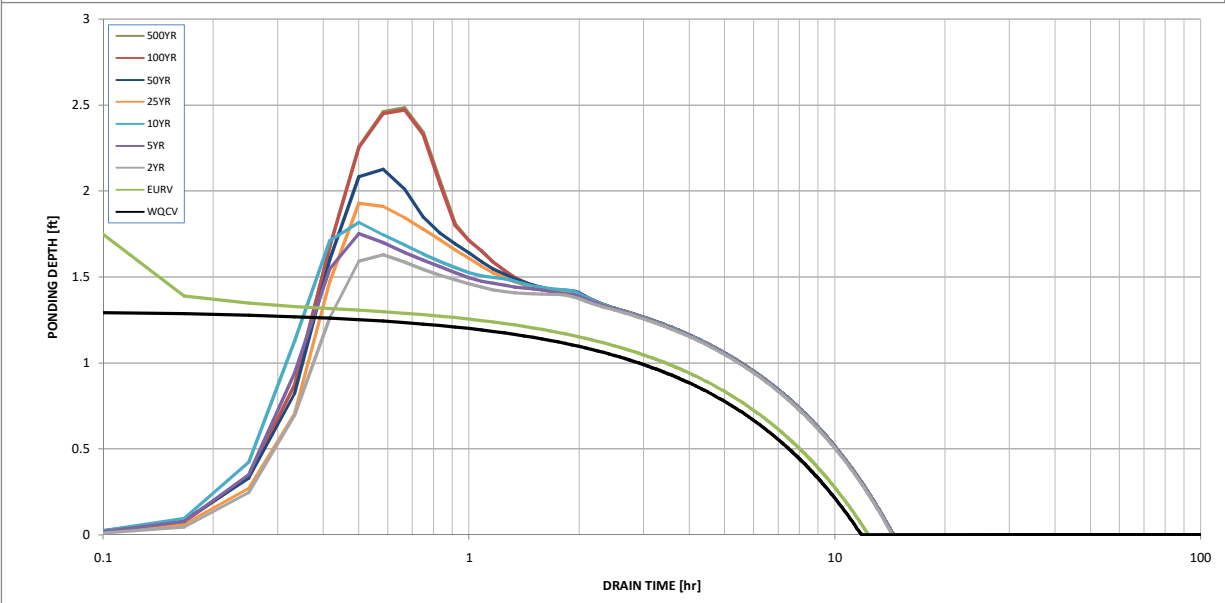
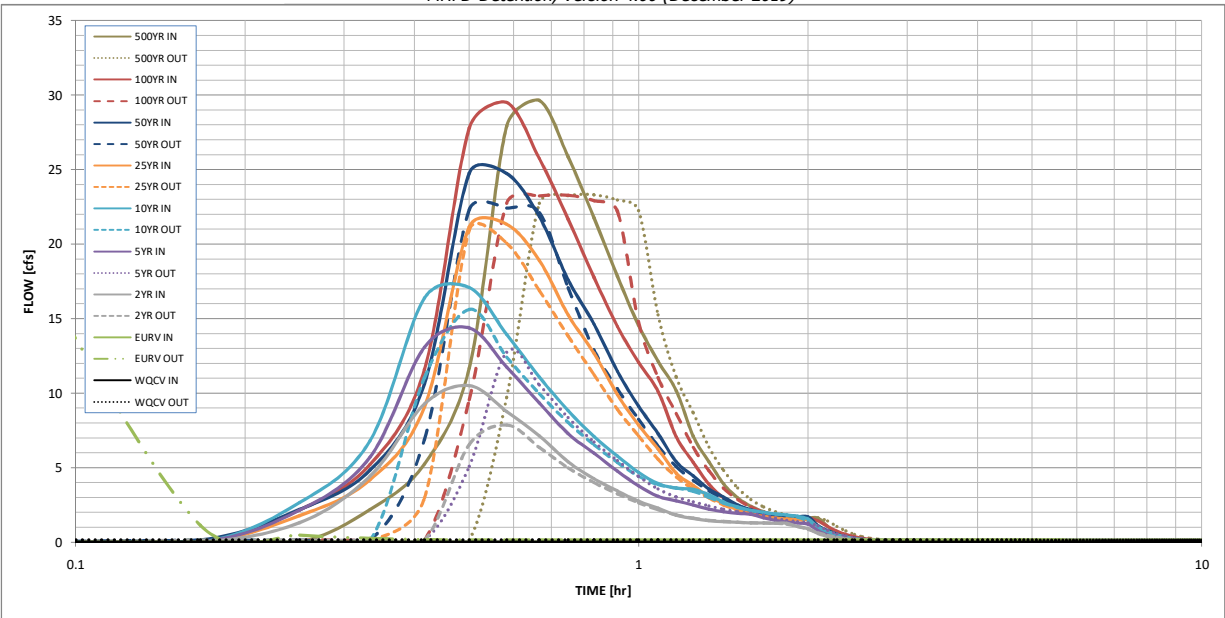
	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
Design Storm Return Period	N/A	N/A	1.19	1.50	1.75	2.00	2.25	2.52	2.53
One-Hour Rainfall Depth (in)			0.521	0.713	0.877	1.080	1.254	1.466	1.473
CUHP Runoff Volume (acre-ft)	0.142	0.593	0.521	0.713	0.877	1.080	1.254	1.466	1.473
Inflow Hydrograph Volume (acre-ft)	N/A	N/A	0.521	0.713	0.877	1.080	1.254	1.466	1.473
CUHP Predevelopment Peak Q (cfs)	N/A	N/A	1.2	3.2	4.8	8.5	10.7	13.3	13.4
OPTIONAL Override Predevelopment Peak Q (cfs)	N/A	N/A							
Predevelopment Unit Peak Flow, q (cfs/acre)	N/A	N/A	0.14	0.38	0.56	0.99	1.24	1.56	1.57
Peak Inflow Q (cfs)	N/A	N/A	10.5	14.4	17.1	21.3	24.8	29.5	29.6
Peak Outflow Q (cfs)	0.2	45.0	7.9	12.8	15.6	20.9	22.4	23.3	23.3
Ratio Peak Outflow to Predevelopment Q	N/A	N/A	N/A	4.0	3.2	2.5	2.1	1.7	1.7
Structure Controlling Flow	#REF!	#REF!	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Outlet Plate 1	Outlet Plate 1	Outlet Plate 1
Max Velocity through Grate 1 (fps)	#REF!	#REF!	0.54	0.9	1.1	1.5	1.6	1.6	1.6
Max Velocity through Grate 2 (fps)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Time to Drain 97% of Inflow Volume (hours)	#REF!	#REF!	13	13	12	12	11	11	11
Time to Drain 99% of Inflow Volume (hours)	#REF!	#REF!	14	14	14	14	13	13	13
Maximum Ponding Depth (ft)	#REF!	#REF!	1.63	1.75	1.82	1.93	2.13	2.47	2.48
Area at Maximum Ponding Depth (acres)	#REF!	#REF!	0.14	0.14	0.14	0.15	0.15	0.17	0.17
Maximum Volume Stored (acre-ft)	#REF!	#REF!	0.183	0.202	0.210	0.226	0.256	0.311	0.314

Should be Claremont Business Park Filing No. 2

Appendix), on-site WQCV is required but R for Claremont Commercial Subdivision Fil. 2.

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.00 (December 2019)

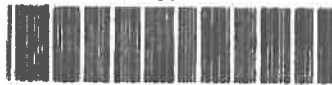


S-A-V-D Chart Axis Override	X-axis	Left Y-Axis	Right Y-Axis
minimum bound			
maximum bound			

BOCC RESOLUTION 16-426

502
Chuck Broerman
11/28/2016 11:50:04 AM
Doc \$0.00 2
Rec \$0.00 Pages

EL PASO COUNTY, W



216137149

RESOLUTION NO. 16- 426

**BOARD OF COUNTY COMMISSIONERS
COUNTY OF EL PASO, STATE OF COLORADO**

Resolution Denying an Appeal by Hammers Construction LLC (APP-16-002) of the Administrative Determination made by the Planning and Community Development Department Executive Director regarding the requirement for permanent/post construction Water Quality (permanent stormwater quality best management practices or BMP's).

WHEREAS, pursuant to §§30-11-101(1)(e) and 30-11-107(1)(e), C.R.S., the Board of County Commissioners of El Paso County, Colorado (hereinafter "Board") has the legislative authority to manage the concerns of El Paso County when deemed by the Board to be in the best interests of the County and its inhabitants; and

WHEREAS, after consultation with the County Attorney's Office, the Executive Director of Planning and Community Development on August 4, 2016 issued an administrative determination finding made an administrative determination that all undeveloped lots within the Claremont Business Park are subject to installation of permanent stormwater management best management practices (BMP's) associated with development, and that the terms of a 2008 approved deviation relieving the developer of the requirements have not been met.; and

WHEREAS, an appeal of the administrative determination was filed by Hammers Construction on August 10, 2016, and a hearing date was set for September 27, 2016 to hear the appeal; and

WHEREAS, the hearing was continued to a date certain of November 22, 2016; and

WHEREAS, at the Applicant's appeal hearing on November 22, 2016, testimony from the Applicant and the Applicant's representatives was heard by the Board in favor of the appeal, testimony from representatives of Planning and Community Development Department and was presented, and such testimony and associated evidence was weighed by the Board; and

WHEREAS, the Board, having reviewed the testimony and evidence, hereby finds and determines that the requested appeal of the administrative determination by the Planning and Community Development Executive Director by the Applicant did not satisfy the criteria of approval to overturn the administrative determination.

NOW, THEREFORE, BE IT RESOLVED that the Board of County Commissioners of El Paso County, Colorado, hereby denies the appeal of the administrative determination by Hammers Construction and determines that permanent stormwater management best management practices (BMP's) are required with new development within the Claremont Business Park: and

BE IT FURTHER RESOLVED that Sallie Clark, duly elected, qualified member and Chair of the Board of County Commissioners, or Darryl Glenn, duly elected, qualified member and Vice Chair of the Board of County Commissioners, be and is hereby authorized on behalf of the Board to execute any and all documents necessary to carry out the intent of the Board as described herein.


DONE THIS 22nd day of November, 2016, at Colorado Springs Colorado.

**BOARD OF COUNTY COMMISSIONERS
EL PASO COUNTY, COLORADO**

ATTEST:  *Christina D. Broerman*
County Clerk & Recorder

By: *Sallie Clark*
Chair of the Board

PROPOSED DRAINAGE MAP



Please provide the drainage map at the end of the report.

CLAREMONT BUSINESS PARK 2

"AMENDMENT" TO THE PRELIMINARY DRAINAGE REPORT FOR CLAREMONT

COMMERCIAL FILING NO. 2

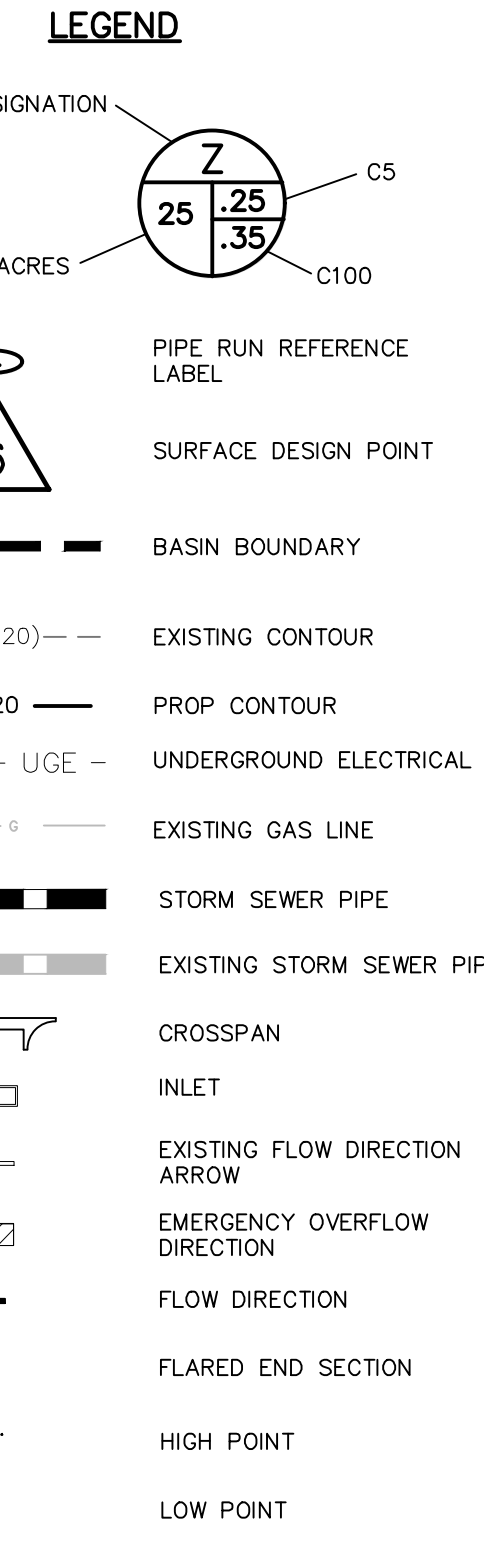
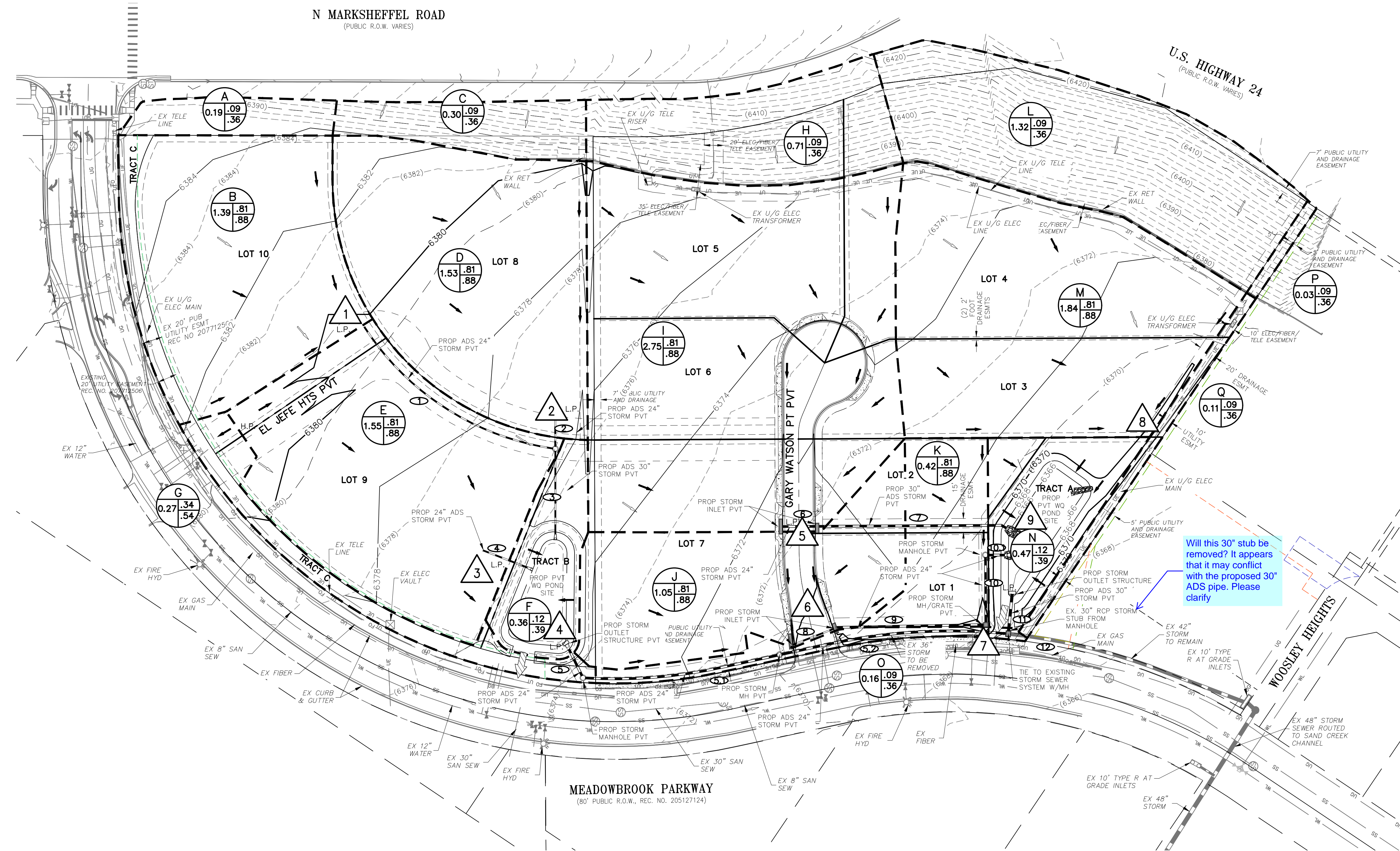
COUNTY OF EL PASO, STATE OF COLORADO

PROPOSED DRAINAGE MAP

JULY 2020

N MARKSHEFFEL ROAD
(PUBLIC R.O.W. VARIES)

U.S. HIGHWAY 24
(PUBLIC R.O.W. VARIES)



BASIN SUMMARY			
BASIN	AREA (ACRES)	Q ₅	Q ₁₀₀
A	0.19	0.1	0.6
B	1.39	5.5	10.1
C	0.3	0.1	1.0
D	1.53	6.3	11.5
E	1.55	6.5	11.8
F	0.36	0.2	1.0
G	0.29	0.5	1.3
H	0.71	0.3	2.0
I	2.75	9.8	17.9
J	1.05	4.4	8.0
K	0.42	1.8	3.2
L	1.32	0.5	3.7
M	1.84	6.7	12.2
N	0.47	0.2	1.3
O	0.16	0.0	0.1
P	0.03	0.0	0.1
Q	0.11	0.0	0.3

DESIGN POINT SUMMARY				
DESIGN POINT	Q ₅	Q ₁₀₀	BASIN	STRUCTURE
1	5.6	10.6	A, B	24" PP
2	6.4	12.4	C, D	24" PP
3	6.5	11.8	E	24" PP
4	18.2	35.0	F, 3, 4	POND 1
5	10.1	19.8	H, I	10"/15" INLETS
6	4.4	11.2	J, FBOP5	10"/15" INLETS
7	1.8	3.2	K	MH W/GRATE
8	7.2	15.7	L, M	24" PP OR SWALE
9	23.0	46.3	DP8, 7,10,1, N	POND 2

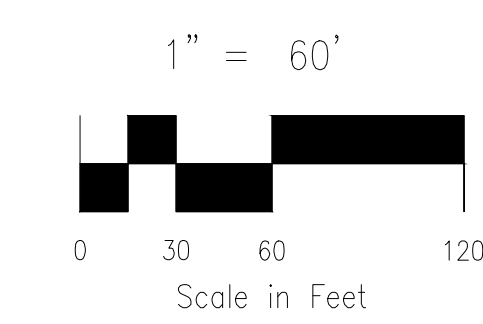
STORM SEWER SUMMARY				
PIPE RUN	Q ₅	Q ₁₀₀	PIPE SIZE	CONTRIBUTING DP/BASIN/PIPES
1	6.5	11.8	24"	DP1
2	6.4	12.4	24"	DP2
3	11.8	22.6	30"	PR1, PR2
4	6.5	11.8	24"	DP3
5	7.2	15.5	24"	POND 1 OUTFALL
5.1	7.2	15.5	24"	PR5
5.2	7.2	15.5	24"	PR5.1
6	6.4	10.6	24"	INLET 1
7	10.1	16.6	30"	PR6, INLET 2
8	2.8	6.9	18"	INLET 3
9	4.4	11.0	24"	PR8, INLET 4
10	6.2	14.3	24"	PR9, DP7
10.1	6.2	14.3	24"	PIPE 10
11	11.0	23.1	30"	POND 2 OUTFALL
12	17.6	33.8	EX42"	PR5, PR11

SF WQCV POND 1 SUMMARY	
EPC/URBAN DRAINAGE SAND FILTER BASIN—SEE STD. DET.	
AREA REQUIRED	2,335 SF
AREA PROVIDED	3,690 SF

SF ELEV = 6373.00
WQCV WSE = 6374.04
100 YR SPILLWAY ELEV = 6375.00
100 YR WSE = 6374.80

SF WQCV POND 2 SUMMARY	
EPC/URBAN DRAINAGE SAND FILTER BASIN—SEE STD. DET.	
AREA REQUIRED	2,962 SF
AREA PROVIDED	3,292 SF

SF ELEV = 6365.50
WQCV WSE = 6366.63
100 YR SPILLWAY ELEV = 6368.00
100 YR WSE = 6367.88



CLAREMONT BUSINESS PARK 2				
PROPOSED DRAINAGE MAP				
PROJECT NO. 44-037A	FILE: \\dwg\Eng Exhibits\44037-PDRM.dwg	DATE: 07-01-2020		
DESIGNED BY: GW	SCALE: HORIZ: 1"=60'	VERT: N/A	SHEET 1 OF 1	PDM01
DRAWN BY: CLP				
CHECKED BY: VAS				

File: c:\44037A-CBP-F2-Lots 1-8.dwg; User: PDM; Plot: 7/1/2020 8:20 PM

FOR LOCATING & MARKING GAS, ELECTRIC, WATER & TELEPHONE LINES
FOR BURIED UTILITY INFORMATION
48 HRS BEFORE YOU DIG
CALL 1-800-922-1987

**EXCERPT OF “FINAL DRAINAGE REPORT FOR CLAREMONT
BUSINESS PARK FIL NO. 2 “, BY MATRIX DESIGN DATED
NOVEMBER 2006
&
EXISTING DRAINAGE MAP**



FINAL DRAINAGE REPORT

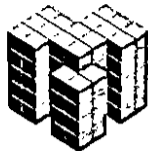
For

“Claremont Business Park Filing No. 2”

Prepared for:
El Paso County
Department of Public Works
Engineering Division

On Behalf of:
Claremont Development, Inc.

Prepared by:



Matrix Design Group, Inc.
Integrated Design Solutions *Infrastructure Engineering*
Community Development
Program Management

2435 Research Parkway, Suite 300
Colorado Springs, CO 80920
(719) 575-0100
fax (719) 572-0208

Revised November 2006

Engineer's Statement:

The *revisions* (changes made to the base Final Drainage Report since July, 2006) to the attached drainage plan and report were prepared under my direction and supervision and are correct to the best of my knowledge and belief. The revisions encompassed adding additional right of way to the study area at the County's request, the handling of offsite drainage due to the additional right of way, a breakdown of private drainage within lot numbers 10 through 25 of Filing No. 2 due to cross-lot drainage (contrary to note # 25 on the recorded plat), profiling additional inlets along the channel edge, and rip-rap sizing for outlet structures along the channel. The Final Drainage Report dated July, 2006 was prepared under the direct supervision of Richard G. Gallegos, Jr. in July, 2006 and stamped (see next sheet).

The Final Drainage Report was prepared according to the criteria established by the County for drainage reports and said report is in conformity with the master plan of the drainage basin. I accept responsibility for any liability caused by any negligent acts, errors or omissions on my part in preparing the *revisions* to this report.

Brady A. Shyrock
Registered Professional Engineer
State of Colorado
No. 38164

SEAL

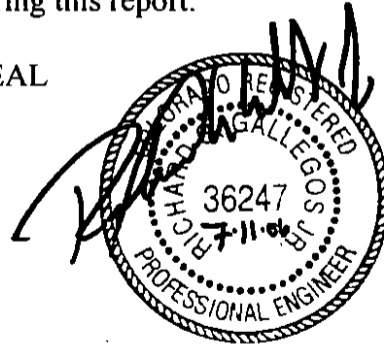


Engineer's Statement:

The attached drainage plan and report were prepared under my direction and supervision and are correct to the best of my knowledge and belief. Said drainage report has been prepared according to the criteria established by the County for drainage reports and said report is in conformity with the master plan of the drainage basin. I accept responsibility for any liability caused by any negligent acts, errors or omissions on my part in preparing this report.

SEAL

Richard G. Gallegos, Jr.
Registered Professional Engineer
State of Colorado
No. 36247



Developer's Statement:

I, the developer have read and will comply with all of the requirements specified in this drainage report and plan.

Claremont Development, Inc.

Business Name

By: _____

[Handwritten signature]

Title: _____

Address: 3460 Capital Drive

Colorado Springs, CO 80915

El Paso County:

Filed in accordance with Section 51.1 of the El Paso Land Development Code, as amended.

[Handwritten signature]
Mr. John McCarty, County Engineer/Director

4/23/07
Date

Conditions:

D. Drainage and Bridge Fees

Claremont Business Park Filing No. 2 has not been previously platted. The drainage basin and bridge fees have been determined per the El Paso County Drainage Basin Fees Sheet, dated February 3, 2006, Resolution No. 06-31. The site is located entirely within the Sand Creek Drainage Basin. The fees are based upon the percent impervious of the development, which have been included within the appendix of this report. The fees due have been calculated as follows.

Claremont Business Park Filing No. 2
Final Drainage Report
Drainage and Bridge Fees

	Area (ac.)	Fee/Imp. Acre	% Imp.	Fee Due	Reimbursable Const. Costs	Fee Credit	Fee Due at Platting	Fee Credit Remaining
Drainage Fee	62.967	\$15,000.00	80%	\$755,604.00	\$0.00	\$1,225,355.45	\$0.00	\$469,751.45
Bridge Fee	62.967	\$1,503.00	80%	\$75,711.52	\$75,711.52	\$0.00	\$0.00	\$0.00
Total Fee Due at Platting							\$0.00	

The developer of Claremont Business Park is completing the construction of the channel improvements on behalf of the Central Marksheffel Metropolitan District. The construction costs for both Filing 1 and Filing 2 combined exceed the drainage fees due for the site. No drainage fees will be required at the time of platting.

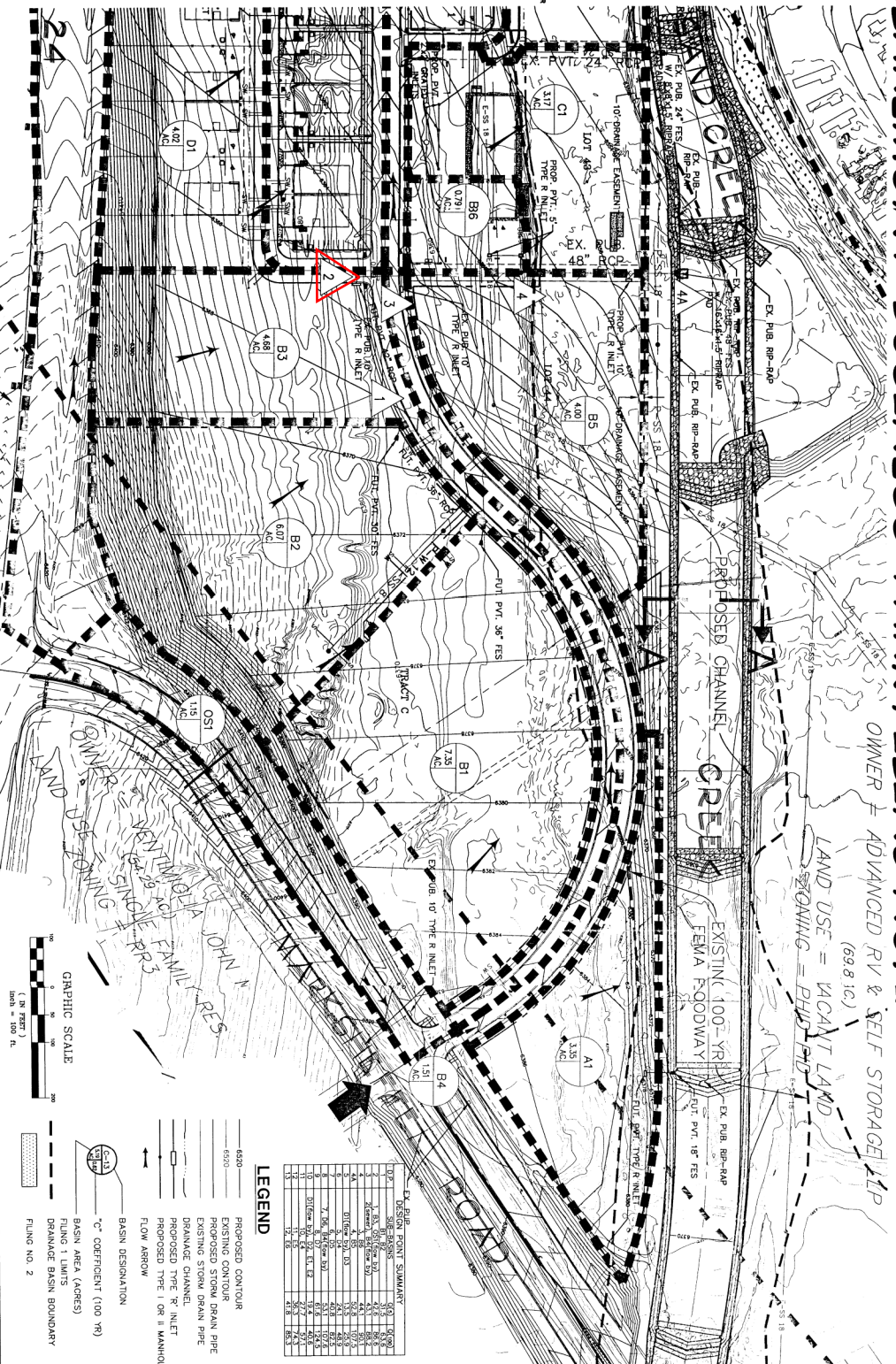
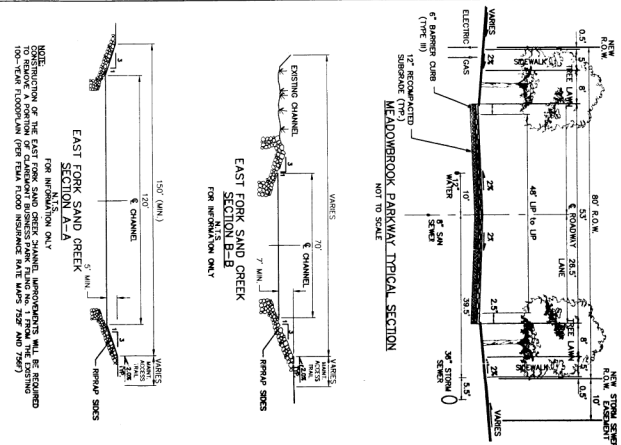
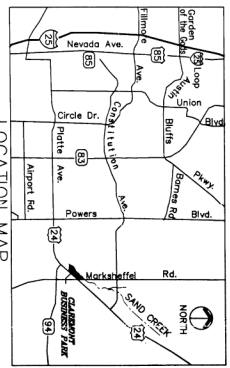
It should be noted that the Central Marksheffel Business District is reimbursing the developer of Claremont Business Park Filing 2 for the construction costs of the channel minus the drainage fees due for the site. The District has \$1,225,355.45 of drainage credits available within the Sand Creek Basin. This credit amount is based upon the construction cost estimate for the channel minus the drainage fees assessed for Claremont Business Park Filing No. 1. The District will use an additional \$755,604.00 of the drainage credits for the platting of Claremont Business Park Filing No. 2. The District will have \$469,751.45 of drainage credits left within the Sand Creek Fee basin.

The Central Marksheffel Business District has also constructed the Marksheffel Road Bridge over East Fork Sand Creek. This structure has been identified as a needed public improvement within the Drainage Basin Planning Study for Sand Creek and is eligible for reimbursement. Since the construction of the Marksheffel Bridge is in excess of the \$75,711.52 in bridge fees due for this site, no bridge fees are required at the time of platting. The fee will be deducted from the eligible reimbursable construction costs of the bridge and the remaining credits will be utilized or reimbursement applied for by the Central Marksheffel Business District.

DRAINAGE PLAN CLAREMONT BUSINESS PARK FILING NO. 2

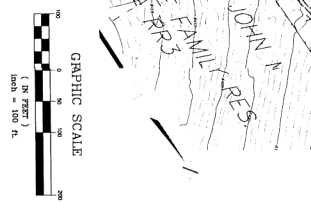
OWNER = ADVANCED RV & SELF STORAGE LLP
(69.8 AC)

LAND USE = VACANT LAND
SIGNING = BLDG FOOTPRINT



LEGEND

- PROPOSED CONTOUR
- PAVING CONTOUR
- EXISTING STORM DRAIN PIPE
- DRAINAGE CHANNEL
- PROPOSED TYPE 'R' INLET
- PROPOSED TYPE 'I' OR 'II' MANHOLE
- FLOW ARROW
- BASIN DESIGNATION
- "C" COEFFICIENT (100 RP)
- BASIN AREA (ACRES)
- FILING 1 LIMITS
- DRAINAGE BASIN BOUNDARY
- FILING NO. 2



DRAWINGS		DESCRIPTION		SUBDIVIDER		FOR AND ON BEHALF OF	
NO.	DATE	BY	REVISIONS	HAMERS CONSTRUCTION INC.	MATRIX DESIGN GROUP, INC.	FOR AND ON BEHALF OF	MATRIX DESIGN GROUP, INC.
1				3460 CAPITAL DRIVE			
2				COLORADO SPRINGS, CO 80915-9710			
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CLAREMONT BUSINESS PARK
FINAL DRAINAGE PLAN
MASTER DEVELOPMENT DRAINAGE PLAN
FINAL DRAINAGE PLAN
FILING NO. 2
DR01

Matrix Design Group, Inc.
Integrated Design Solutions
2435 Research Parkway, Suite 20
Colorado Springs, CO 80909
Phone: 719-575-4288
Fax: 719-575-4288

REFERENCES
DRAWINGS
NO. DATE
BY

DESCRIPTION
BENCHMARK DATA(ELEV.)
SUBDIVIDER
HAMERS CONSTRUCTION INC.
3460 CAPITAL DRIVE
COLORADO SPRINGS, CO 80915-9710

FOR AND ON BEHALF OF
MATRIX DESIGN GROUP, INC.

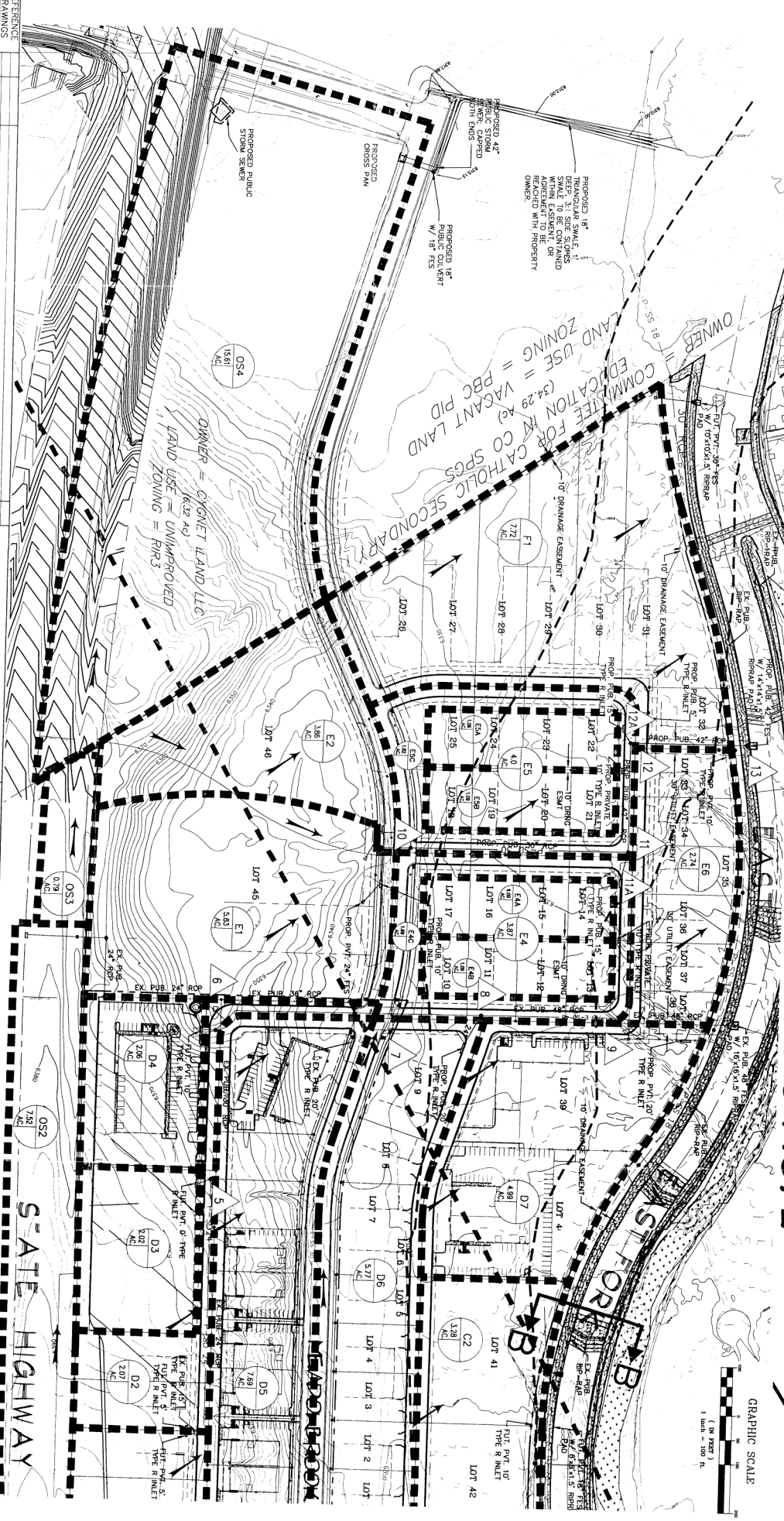
CLAREMONT BUSINESS PARK
FINAL DRAINAGE PLAN
MASTER DEVELOPMENT DRAINAGE PLAN
FINAL DRAINAGE PLAN
FILING NO. 2
DR01

CLAREMONT BUSINESS PARK
FINAL DRAINAGE PLAN
MASTER DEVELOPMENT DRAINAGE PLAN
FINAL DRAINAGE PLAN
FILING NO. 2
DR01

DESIGN POINT SUMMARY

NO.	DATE	DESCRIPTION	BY	CHKD.
1	04/26/2017	PRELIMINARY	MM	MM
2	05/11/2017	REVISIONS	MM	MM
3	05/11/2017	REVISIONS	MM	MM
4	05/11/2017	REVISIONS	MM	MM
5	05/11/2017	REVISIONS	MM	MM

DRAINAGE PLAN CLAREMONT BUSINESS PARK FILING NO. 2



REFERENCE DRAWINGS

NO.	DATE	REVISIONS	BY
1			
2			

SUBDIVIDER
HANMERS CONSTRUCTION, INC.
 3460 W. 106TH AVE.
 COLO SPRINGS, CO 80915-9710

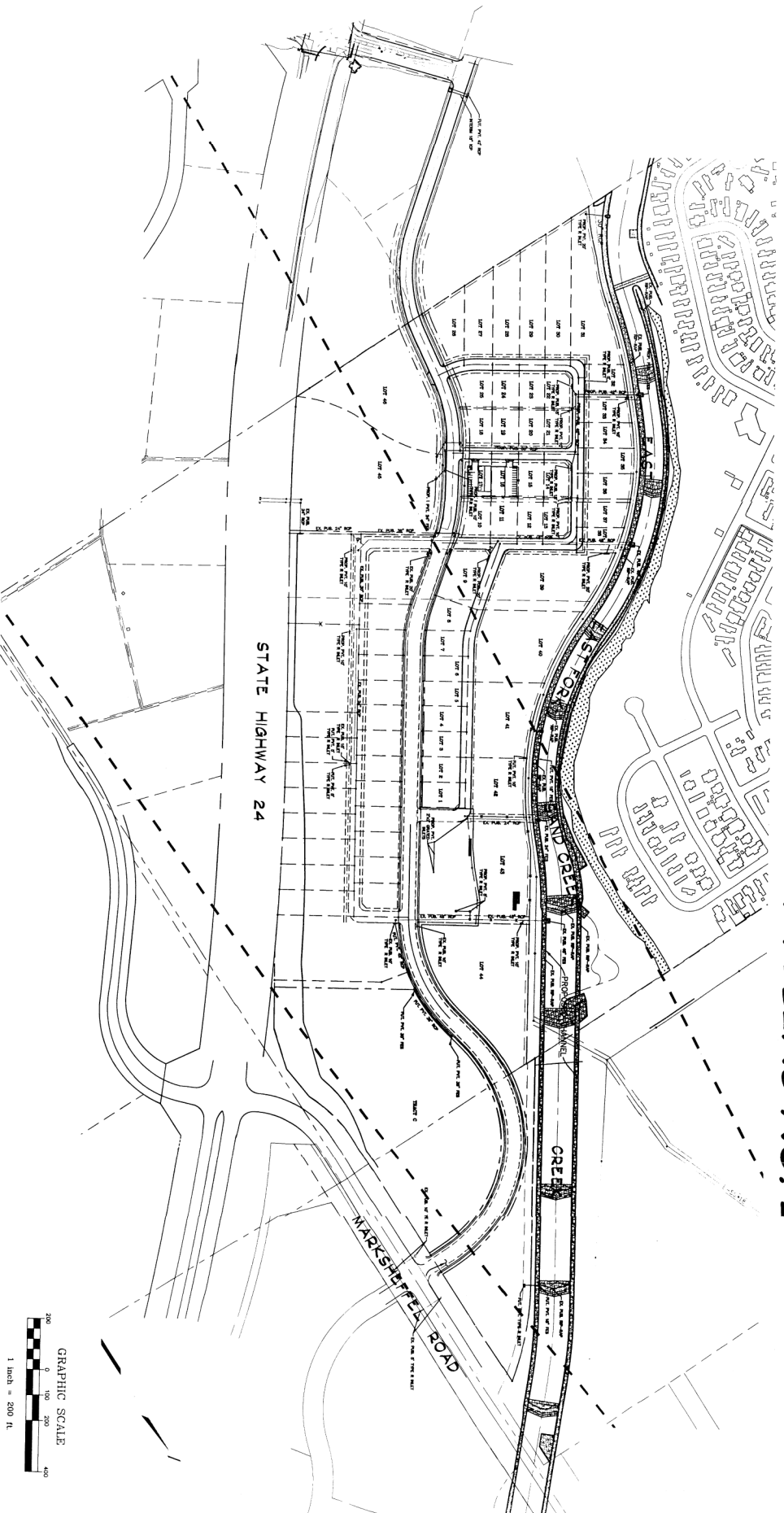
FOR AND ON BEHALF OF
MATRIX DESIGN GROUP, INC.

Matrix Design Group, Inc.
 Integrated Design Solutions 2435 Research Parkway, Suite 300
 Colorado Springs, CO 80920
 Phone: 719-575-4100
 Fax: 719-575-6208

CLAREMONT BUSINESS PARK
 REVISED FINAL DRAINAGE PLAN
 MASTER DEVELOPMENT DRAINAGE PLAN
 REVISED FINAL DRAINAGE PLAN
 FILING NO. 2

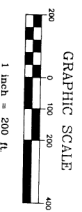


STORM DRAINAGE DESTINATION PLAN CLAREMONT BUSINESS PARK FILING NO. 2



STATE HIGHWAY 24

MARKSHEFFEL ROAD



REFERENCE DRAWINGS		SUBMITTER		FOR AND ON BEHALF OF		DESIGNED BY		DATE ISSUED		SHEET NO.		SHEET NO.		SHEET NO.			
NO.	DATE	NO.	DATE	NO.	DATE	NO.	DATE	NO.	DATE	NO.	DATE	NO.	DATE	NO.	DATE		
		SUBMITTER: HANMERS CONSTRUCTION, INC. 3460 CAPITAL DRIVE COLORADO SPRINGS, CO 80915		FOR AND ON BEHALF OF MATRIX DESIGN GROUP, INC.		Matrix Design Group, Inc. Integrated Design Solutions 2635 Research Parkway, Suite 300 Colorado Springs, CO 80909 Phone: 719-575-0030 Fax: 719-575-0208		STORM DRAINAGE DESIGNATION PLAN FILING NO. 2		JANUARY 2010		1 OF 1 SHEETS		1 OF 1 SHEETS		EXH01	
REVISIONS NO. DATE DESCRIPTION BY		BENCHMARK DATA(ELEV.) (DESCRIPTION/LOCATION)															
TITLE: Storm Drainage and Site Design (applicable to Documents V05 15 100) (PDK/ML) New Resources 200-10000-0000.dwg DATE: 01/14/10 DRAWN BY: [blank] CHECKED BY: [blank]																	