

FINAL DRAINAGE LETTER AND PLAN

EQUIPMENT RESOURCES 7340 UTAH LANE EL PASO COUNTY, COLORADO

JANUARY, 2019
JULY, 2019
SEPTEMBER, 2019

All the appendices(calculations, drainage maps, etc.) are missing. Please include the missing pages with the re-submittal. Signed engineering documents may be submitted.

Prepared for:

*T-P Enterprises Inc.
5055 E 39th Avenue
Denver CO 80207*

Prepared by:

*Core Engineering Group, LLC
15004 1st Avenue S.
Burnsville, MN 55306*

Project No. 315.003

PCD File # PPR 19-024



CORE
ENGINEERING GROUP

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APPENDIX A

VICINITY MAP

SCS SOILS INFORMATION

FEMA FIRM MAP

APPENDIX B

HYDROLOGY & HYDRAULIC CALCULATIONS

APPENDIX C

WATER QUALITY CALCULATIONS

APPENDIX D

DRAINAGE MAP



El Paso County Development Services
Engineering Division
2880 International Circle, Suite 110
Colorado Springs, CO. 80910

RE: Equipment Resources
7340 Utah Lane
El Paso County, Colorado

Dear Representative:

In accordance with the requirements of the El Paso County Development Code, a final drainage letter has been prepared for Equipment Resources, an existing development located at 7340 Utah Lane. The purpose of this letter is to support the approval of the use variance for this property

This report has been prepared under the current El Paso County Drainage Criteria.

Seven (7) complete copies of the drainage report and plan are hereby transmitted for your review and approval. If there are any questions or comments concerning this report, please contact the undersigned.

Sincerely,

Richard L. Schindler, P.E. #33997

Date

cc: file, client

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 El Paso 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.

Richard L. Schindler, P.E. #33997
For and on Behalf of Core Engineering Group, LLC

Date

OWNER'S STATEMENT

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

T-P Enterprises Inc.

Business Name

Date

By

Title

5055 E. 39th Avenue

Address

Denver, CO 80207

FLOODPLAIN STATEMENT

To the best of my knowledge and belief, this development is not located within a designated floodplain as shown on Flood Insurance Rate Map Panel No. 08041C0529 G, effected December 7, 2018. (See Appendix A, FEMA FIRMette Exhibit)

Richard L. Schindler, #33997

Date

EL PASO COUNTY

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

County Engineer/ECM Administrator

Date

1.0 INTRODUCTION

Property Location

Equipment Resources is located at 7340 Utah Lane, El Paso County, Colorado, adjacent to and west of Utah Lane and approximately 0.2 miles south of East Woodmen Road, between Powers Boulevard and Marksheffel Road. The property is located in a portion of the north one-half of Section 8, Township 13 South, Range 65 West of the 6th Principal Meridian in the County of El Paso, State of Colorado. See **Appendix A** for vicinity map.

Property Description

Equipment Resources, located at 7340 Utah Lane contains 5.01 acres and is adjacent to Utah Lane. Storm water is directed westerly and southerly with moderate slopes to 2-existing water quality and sedimentation swales, runoff then continues in a southerly direction.

Currently the site contains an existing structure with gravel parking and a storage yard for the contractor's equipment. A 40'x24' gravel drive is proposed at the bottom of the existing drive in basin 2; this drive will require surface course material, and 2-Porous Landscape Detention facilities will be constructed in basins 1 and 2. The location of these facilities is shown on the attached drainage plan. No other construction is anticipated at this time.

Existing soils in the area consist mostly of the Blakeland Complex, a deep and somewhat excessively drained soil. Permeability of the soil is rapid, which gives it a Hydrologic Group 'A' rating. Other characteristics of this soil, is slow surface runoff and the hazard of erosion is moderate.

According to the current FEMA Flood Insurance Rate Map (FIRM) number 08041C0529 G, effective December 7, 2018 shows that this site is not located within 100 year FEMA floodplain. See **Appendix A** for FEMA FIRMette Flood Map.

Purpose and Scope

The purpose of this report is to support the use variance request for this property. This report confirms and verifies the findings and conclusions from the previously approved drainage reports. In addition to the existing 2-Grass Swale Sedimentation Swales, 2-Porous Landscape Detention facilities will be constructed. These facilities and recommendations will be discussed in greater detail later in this report. No other construction is planned for this site.

2.0 DRAINAGE DESIGN CRITERIA

The supporting drainage design and calculations were performed in accordance with the City of Colorado Springs and El Paso County "Drainage Criteria Manual (DCM)", dated November, 1991, the El Paso County "Engineering Criteria Manual", and the UDFCD "Urban Storm Drainage Criteria Manual" Volumes 1, 2 and 3.

The Rational Method as outlined in Section 6.3.0 of the May 2014 "Drainage Criteria Manual" and in Section 3.2.8.F of the El Paso County "Engineering Criteria Manual" was used for basins less than 130 acres to determine the rainfall and runoff conditions for the proposed development of the site. The runoff rates for the 5-year initial storm and 100-year major design storm were calculated.

3.0 EXISTING HYDROLOGICAL CONDITIONS

The property is located within the "Sand Creek DBPS" (FOFO 4000) a studied drainage basin. The site is currently developed with an existing building, ground cover consists of native grasses and a gravel parking lot, this parking lot is located on the eastern portion of the site. An existing earthen berm is located along the south boundary that directs flow easterly to an existing drainageway. There is also an existing stock pond on the site along the drainageway. No grading, construction or development is proposed near the existing drainageway on the western side of the site.

The previous approved drainage report and plan was prepared by using drainage criteria that was in effect in 2008, this report updates that criteria and conforms to the current Drainage Criteria Manuals.

Basin OS-1

Basin OS-1 is the west half of Utah Lane (graveled private drive); runoff is directed southerly to an existing 18" CMP that conveys runoff under the entrance to this property. This flow then continues in a southerly direction. The total flow from this 0.40 acre basin is 1.1cfs for the 5-year event and 2.2cfs for the 100-year storm event.

Basin OS-2

Basin OS-2 is located north of this site and flows from a portion of the existing animal hospital are directed southerly overland onto this property as shown on the attached final drainage plan. The total flow from this 0.81 acre basin is 2.2cfs for the 5-year event and 4.4cfs for the 100-year storm event.

Basin A1

Basin A1 is located on the easterly edge of and contains the existing building and gravel parking lot, runoff is directed overland westerly and southerly to the 2 existing Grass Swale Sedimentation Facilities as shown on the attached final drainage plan. These sedimentation swales shall be cleaned and restored to their original condition. Continued maintenance of these swales shall be routine and as necessary. The total flow from this 1.46 acre basin is 2.8cfs for the 5-year event and 6.4cfs for the 100-year storm event. This basin will require 2 proposed Porous Landscape Detention facilities to provide water quality for the impervious area (roof and concrete pads); PLD #1 is located at the northeast corner of this basin and PLD #2 is located at the bottom of the slope in basin 2 and is shown on the attached final Drainage Plan. The 2 PLD's have been sized to handle the 2-year event, the 5-year and 100-year flow will be routed as mentioned previously. These 2-PLD's will be discussed in greater detail in the water quality section of this report.

Basin A2

Basin A2 is used for a storage yard and is located on the westerly portion of this site, runoff is directed westerly overland to the existing drainageway that flows in a southerly direction, as shown on the attached final drainage plan. A 40'x24' gravel drive is proposed at the bottom of the existing drive in this basin and will require surface course material; water quality runoff will be treated by directing flow in a southwesterly and westerly direction through natural vegetation and open space that will promote filtration, infiltration, and settling to reduce pollutants for approximately 400 feet to an existing drainage ditch. This gravel drive should not change runoff coefficient for this basin. The total flow from this 3.46 acre basin is 4.2cfs for the 5-year event and 11.7cfs for the 100-year storm event.

Basin A

Basin A is the combined flow from basins A1 and A2 and is directed to the previously mentioned drainageway that flows in a southerly direction, as shown on the attached final drainage plan. The total flow from this 4.92 acre basin is 6.7cfs for the 5-year event and 17.6cfs for the 100-year storm event.

Design Point 1

Design Point 1 (DP-1) is located on the south edge of the property at the existing drainageway as shown on the attached final drainage plan, and is the combined runoff from basins A and OS-2. The total flow generated at this 5.73 acre design point is 7.9cfs for the 5-year event and 19.5cfs for the 100-year storm event.

4.0 DEVELOPED HYDROLOGICAL CONDITIONS

The proposed conditions for this development consist of constructing 2- Porous Landscape Detention Facilities, grass swale, an underground PVC storm pipes that convey roof and concrete surface flow to the PLD, and a 40'x24' gravel drive. The existing sedimentation swales shall be cleaned and restored to their original condition. The locations of these facilities are shown on the attached final drainage plan. No other construction is planned for this site.

5.0 PROPOSED PUBLIC IMPROVEMENTS

No public improvements are proposed for this site.

6.0 GRADING AND EROSION CONTROL

No grading or erosion control is proposed for this site. Site disturbance is confined to the 2 Porous Landscape Detention facilities and contains approximately 0.2 acres. Care will be taken to protect the downstream drainageway and that if needed, temporary BMP's will be employed.

7.0 WATER QUALITY CONTROL

Water quality for the impervious areas will be provided by 2 Porous Landscape Detention facilities; locations of these facilities are shown on the attached final drainage plan and noted as PLD #1 and PLD #2. The proposed 40'x24' gravel drive in basin 2 will be treated by directing flow in a southwesterly and westerly direction through natural vegetation and open space.

PLD #1 is located on the North side and collects flow from the North half of the roof. Roof flow is directed to several downspouts and routed north-northwesterly to a grass swale that flows westerly to PLD #1. The contributing area to this PLD is 3,960 square feet, and it requires a capture volume of 132 cubic feet, the minimum flat surface area is 79 square feet, the flat surface is 5' wide and 16' long, which gives an actual flat area of 80 square feet. Side slopes are 4:1 and a depth of 8.1" and gives an actual volume of 132.3 cubic feet. The outlet weir for additional runoff was designed for a 100 year flow of 5.0cfs, this weir has bottom length of 6.0', weir depth of 0.5', 4:1 side slope, flow depth to convey 5.0cfs is 0.34'. Stormwater exits this PLD by infiltration, percolation/infiltration test will be required, and the test shall be taken at the bottom of the excavation. If the percolation test fails, a perforated outlet pipe shall be installed. For maintenance of this PLD, see the Standard Operation Procedures for Inspection and Maintenance manual.

PLD #2 is located on the South side and collects flow from the South half of the roof and the existing concrete pads. Roof flow is directed southerly to several downspouts and routed across the existing concrete pads to proposed 8" area inlets. These inlets will convey hard surface runoff southerly via 8" PVC storm laterals to an 8" PVC storm pipe that will route runoff westerly to PLD #2. The contributing

area to this PLD is 4,665 square feet, and it requires a capture volume of 155.5 cubic feet, the minimum flat surface area is 93 square feet, the flat surface is 5' wide and 19' long, which gives an actual flat area of 95 square feet. Side slopes are 4:1 and a depth of 9" which gives an actual volume of 157.8 cubic feet. The outlet weir for additional runoff was designed for a 100 year flow of 5.6cfs, this weir has bottom length of 8.0', weir depth of 0.5', 4:1 side slope, flow depth to convey 5.6cfs is 0.35'. Stormwater exits this PLD by infiltration, percolation/infiltration test will be required, and the test shall be taken at the bottom of the excavation. If the percolation test fails, a perforated outlet pipe shall be installed. For maintenance of this PLD, see the standard Operation Procedures for Inspection and Maintenance manual.

Water Quality Maintenance Recommendations:
for
Porous Landscape Detention and Exist. Grass Swale

<u>Required Action</u>	<u>Frequency</u>
Lawn mowing and lawn care	Routine, as needed
Debris and litter removal	Routine, as needed by inspection
Sediment removal	Routine, as needed by inspection
Landscaping removal and Replacement	5-10 years, or as needed by, inspection
Inspections	Routine, annual inspection is suggested

8.0 FOUR STEP PROCESS

The site has been developed to minimize wherever possible the rate of developed runoff that will leave the site and to provide water quality management for the runoff produced by the site. The following four step process should be considered and incorporated into the storm water collection system and storage facilities where applicable.

Step 1: Employ Runoff Reduction Practices

Equipment Resources at 7340 Utah Lane has employed several methods of reducing runoff.

- Minimize pavement by utilizing gravel drives and parking throughout the site.
- Using a grass buffer by draining the gravel drive and parking areas over approximately 1.8 acres of native grasses to the existing drainageway.
- Using grass swales to slow runoff and increase infiltration.

Step 2: Stabilize Drainageways

The existing drainageway is stabilized by natural vegetation and native grasses. This small drainageway is part of the Sand Creek Drainage Basin.

Step 3: Water Quality Capture Volume (WCQV)

Water quality capture volume (WQCV) is provided by 2-Porous Landscape Detention facilities and provides a total volume of 287.5 cubic feet of Stormwater.

Step 4: Implement Site Specific & Source Control BMP's

There are no potential sources of contaminants or hazardous materials for this site. Criteria recommends porous landscape detention for this building and outlying uses. No need for industrial and commercial BMP's.

9.0 FACILITIES

There are no planned major drainage facilities for this area.

10.0 DRAINAGE AND BRIDGE FEES

The site is located in the Sand Creek Drainage Basin. There is no platting action proposed for this site, therefore no Drainage Fees are due.

11.0 CONCLUSIONS

This drainage report has been prepared in compliance with the City of Colorado Springs/El Paso County Drainage Criteria Manual, El Paso County Engineering Criteria Manual and the drainage studies for surrounding developments. A gravel drive will be added and those impacts will be mitigated. No other development improvements will be constructed for this site, will not generate an increase in runoff, and should not adversely affect downstream properties. The purpose of this report is to accompany the approval of the use variance for this property. This final drainage letter is in general conformance with the previously approved final drainage reports prepared by Core Engineering and WestWorks Engineering.

12.0 REFERENCES

1. City of Colorado Springs/El Paso County Drainage Criteria Manual, Vol. 1 & 2.
2. Soil Survey of El Paso County Area, Colorado by USDA, SCS.
3. The UDFCD "Urban Storm Drainage Criteria Manual" Volumes 1, 2 and 3.
4. Final Drainage Report for 7340 Utah Lane prepared by WestWorks Engineering, Dated 7/16/2004.
5. Final Drainage Report for Equipment Resources at 7340 Utah Lane, prepared by Core Engineering, dated 1/27/2009.


Drainage Report_v3_redlines.pdf Markup Summary

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JANUARY, 2019
JULY, 2019
SEPTEMBER, 2019

All the appendices(calculations, drainage maps, etc.) are missing. Please include the missing pages with the resubmittal. Signed engineering documents may be submitted.

Prepared for:
T.P. Engineering Inc.
5005 E 50th Avenue
Denver, CO 80231

Subject: Text Box
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