



**RG AND ASSOCIATES, LLC**

Del Norte • Silverthorne • Wheat Ridge

March 20, 2019

Paint Brush Hills Metropolitan District  
9985 Towner Avenue  
Falcon, CO 80831

**RE: Drainage**

To Whom It May Concern:

The Paint Brush Hills Metropolitan District (PBHMD) is located in Peyton, Colorado in unincorporated El Paso County. This drainage conformance letter pertains to the PBHMD project called the Pump House (Site) and is located north of Jaggar Way, just west of Beckham St. within the Paint Brush Hills Filing No. 13.

The Site is located in the NW ¼, Section 25, Township 12 South, Range 65 West of the 6th PM, County of El Paso, State of Colorado.

The Site was previously studied for drainage improvements as a part of the Final Drainage Report for Paint Brush Hills – Phase 2 (Filing No. 13) which was prepared in October 2005 and with a latest revision date of June 2008. This site includes a small area in the northern portion of the Paint Brush Hills Filing 13C, Tract A, and crosses Parcel B of the Paint Brush Hills Metropolitan Exemption Plat and in general drains north to south. This area is within sub basins "U" and "N" of the Filing No. 13 Final Drainage Report.

The Filing No. 13 phase 2 site is planned for a single family home development with over 550 homes (in the 2,000+ square foot range), a 10 acre elementary school site, a 6 acre community commercial site and 44 acres of trails and open space. The Filing 13 site has provided for regional detention and water quality for the overall site development.

The PBHMD – Pump House is approximately 24' x 20' within the Single Family development and has a total square footage of approximately 480 square feet with its respective access driveway. The driveway includes a 6" vertical curb to contain the runoff and convey it to Jaggar Way, similar to how a side lot swale of a "Type A" residential lot would drain to the front of the property. This is in conformance to the proposed drainage concept for sub basin "N" and "U" of the Filing 13 Final Drainage Report. The area of imperviousness for the site is the pump house roof at 480 SF, asphalt 4210 SF, concrete curb, gutter and sidewalk 1498 SF, for a total of 6188 SF of Imperviousness. The lots surrounding the pump house site average approximately 9,971 SF, which if we use this average size lot along with 6188 SF of impervious area, calculates to 62% impervious. 62% impervious then translates to a C5 of 0.48 and a C100 of 0.59, which is less than the assumed C factors of 0.55 and 0.65 respectively for basin "N" of the Filing 13 Report.

Due to the minimal amount of imperviousness created by the proposed Pump House and associated access drive, it would have less impact than a 2,000 SF house with associated driveway, within the same planned residential filing. Therefore, the proposed Pump House development would be within the parameters which were planned for with the development of the Paint Brush Hills, Filing 13

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project. Development of the proposed Pump House will not have any adverse drainage effects on any of the adjacent property and will not require any additional detention or water quality facilities.

If you have any questions or concerns with drainage concepts associated with this proposed construction, please contact me at 303-293-8107.

Sincerely,

Douglas J Richter, PE



**FINAL DRAINAGE REPORT  
FOR  
PAINT BRUSH HILLS – PHASE 2  
(FILING No. 13)**

**OCTOBER 2005  
REVISED MARCH 2006  
REVISED JULY 2006  
REVISED JUNE 2008**

**PREPARED FOR:**

**SIX NINETY-NINE PROPERTIES, LLC.  
545 E. PIKES PEAK AVENUE  
SUITE 207  
COLORADO SPRINGS, CO 80903  
(719) 328-1672**

**PREPARED BY:  
CLASSIC CONSULTING ENGINEERS & SURVEYORS, LLC  
6385 CORPORATE DRIVE, SUITE 101  
COLORADO SPRINGS, CO 80919  
(719) 785-0790**

**2053.21**

**RECEIVED**

**JUL 17 2008**

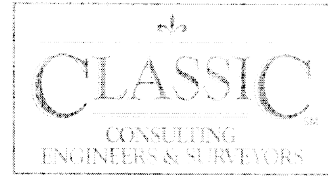
**EPC DEVELOPMENT SERVICES**

**FOR REVIEW PURPOSES ONLY  
JUL 11 2008**



Basins T, O1 and O3 are tributary to the sump condition at Design Points 12 ( $Q_5 = 2$  cfs and  $Q_{100} = 5$  cfs) and 13 ( $Q_5 = 13$  cfs and  $Q_{100} = 27$  cfs). At these locations a 4' Type R sump inlet and a 12' Type R sump inlet will be installed to collect both the 5-year and 100-year developed flows, respectively. These collected flows are conveyed via a 30" RCP storm sewer and then combined with the Design Point 11 flows mentioned earlier. A 36" RCP storm sewer conveys the total flow south towards the natural channel. The emergency overflow route at this location is 1.0' maximum ponding and then spill over the highpoint and around the corner in a southerly direction. Basin O2 is tributary to the proposed 12' Type R at-grade inlet at Design Point 14A ( $Q_5 = 8$  cfs and  $Q_{100} = 17$  cfs). This facility will capture  $Q_5 = 6$  cfs and  $Q_{100} = 10$  cfs. The flow-by ( $Q_5 = 2$  cfs and  $Q_{100} = 7$  cfs), along with the developed flow from Basins P1, P3 and N will then travel towards the sump condition at Design Points 14 ( $Q_5 = 12$  cfs and  $Q_{100} = 28$  cfs) and 15 ( $Q_5 = 8$  cfs and  $Q_{100} = 17$  cfs). At these locations a 12' Type R sump inlet and a 6' Type R sump inlet will be installed to collect both the 5-year and 100-year developed flows, respectively. These collected flows are conveyed via a 36" RCP storm sewer and then combined with the previously mentioned flows within the 36" RCP storm sewer from Design Points 12 and 13. Once combined, a 48" RCP storm sewer conveys the total flow southwest towards the channel. A rip-rap dissipater will be installed to minimize sediment transfer and erosion. The emergency overflow route at this location is via a natural swale between two lots within a drainage easement and then directly into the channel.

Basins P2 and Q are tributary to the sump condition at Design Points 16 ( $Q_5 = 6$  cfs and  $Q_{100} = 12$  cfs) and 17 ( $Q_5 = 2$  cfs and  $Q_{100} = 3$  cfs). At these locations 4' Type R sump inlets will be installed to collect both the 5-year and 100-year developed flows. These collected flows are then conveyed via a 24" RCP storm sewer south towards Design Point 18. At Design Point 18 ( $Q_5 = 12$  cfs and  $Q_{100} = 26$  cfs) a 12' Type R sump inlet will completely accept both the 5-year and 100-year developed flows. These collected flows will then combine with the flows from Design Points 16 and 17 and are conveyed via a 30" RCP storm sewer directly into the existing pond B1. A rip-rap dissipater will be installed to minimize erosion. The emergency overflow route at this location is 1.0' maximum ponding and then spill over the curb and directly into the existing



## REFERENCES

1. City of Colorado Springs/County of El Paso Drainage Criteria Manual, dated October 1991.
2. Soil Survey of El Paso County Area, Colorado Soil Conservation Service, June 1981.
3. "Master Development Drainage Plan, Falcon Hills Development," by Kiowa Engineering Corporation, May 2002.
4. "Preliminary Drainage Report for Falcon Hills," by Classic Consulting Engineers and Surveyors, approved November 2002.
5. "Final Drainage Report for Paint Brush Hills Filing Nos. 10, 11 & 12," by Classic Consulting Engineers and Surveyors, approved July 2003.
6. "Preliminary Drainage Report for Paint Brush Hills – Phase 2", by Classic Consulting Engineers and Surveyors, approved January 2005.
7. "Drainage Report for Paint Brush Hills Filing No. 3," by Berge-Brewer & Assoc., Inc., April 1983.
8. "Falcon Area Drainage Basin Planning Study – Preliminary Design Report", by URS, October 2001.
9. "Final Drainage Study and Erosion Control Plan for Paint Brush Hills Filing No. 9," by Martin/Martin, Inc., approved September 2000.

JOB NAME: PAINT BRUSH HILLS - PHASE 2 (FILING NO. 13)

JOB NUMBER: 2053.21

DATE: 06/10/08

CALCULATED BY: MAW

## FINAL DRAINAGE REPORT ~ BASIN RUNOFF COEFFICIENT SUMMARY

BASIN	TOTAL AREA (AC)	IMPERVIOUS AREA / STREETS		LANDSCAPE/UNDEVELOPED AREAS		WEIGHTED		WEIGHTED CA	
		AREA (AC)	C(5)	AREA (AC)	C(5)	C(5)	C(100)	CA(5)	CA(100)
A	0.52	0.42	0.90	0.10	0.35	0.79	0.85	0.41	0.44
B1	5.03	0.00	0.90	5.03	0.50	0.50	0.60	2.52	3.02
B2	1.26	0.00	0.90	1.26	0.50	0.50	0.60	0.63	0.76
C1	3.85	0.00	0.90	3.85	0.50	0.50	0.60	1.93	2.31
C2	4.28	0.00	0.90	4.28	0.50	0.50	0.60	2.14	2.57
D1	5.17	0.00	0.90	5.17	0.50	0.50	0.60	2.59	3.10
D2	2.67	0.00	0.90	2.67	0.50	0.50	0.60	1.34	1.60
E	4.48	0.00	0.90	4.48	0.50	0.50	0.60	2.24	2.69
F	4.34	0.00	0.90	4.34	0.50	0.50	0.60	2.17	2.60
G	2.61	2.10	0.90	0.51	0.35	0.79	0.85	2.07	2.22
H	1.32	0.00	0.90	1.32	0.48	0.48	0.58	0.63	0.77
I	3.70	0.00	0.90	3.70	0.35	0.35	0.45	1.30	1.67
J	3.87	0.00	0.90	3.87	0.50	0.50	0.60	1.94	2.32
K	0.96	0.65	0.90	0.31	0.55	0.79	0.85	0.76	0.82
L	4.36	0.00	0.90	4.36	0.55	0.55	0.65	2.40	2.83
M	0.12	0.08	0.90	0.05	0.55	0.77	0.84	0.09	0.10
N	4.85	0.00	0.90	4.85	0.55	0.55	0.65	2.67	3.15
O1	6.23	0.00	0.90	6.23	0.55	0.55	0.65	3.43	4.05
O2	4.78	0.00	0.90	4.78	0.55	0.55	0.65	2.63	3.11
O3	1.02	0.00	0.90	1.02	0.55	0.55	0.65	0.56	0.66
P1	3.64	0.00	0.90	3.64	0.55	0.55	0.65	2.00	2.37
P2	3.15	0.00	0.90	3.15	0.55	0.55	0.65	1.73	2.05
P3	2.26	0.00	0.90	2.26	0.55	0.55	0.65	1.24	1.47
Q	0.73	0.00	0.90	0.73	0.55	0.55	0.65	0.40	0.47
R1	4.94	0.00	0.90	4.94	0.55	0.55	0.65	2.72	3.21
R2	2.11	0.00	0.90	2.11	0.55	0.55	0.65	1.16	1.37
S	5.95	5.95	0.80	0.00	0.35	0.80	0.90	4.76	5.36
T	0.75	0.62	0.90	0.13	0.35	0.80	0.86	0.60	0.65
U	18.11	0.00	0.90	18.11	0.25	0.25	0.35	4.53	6.34

JOB NAME: PAIN'T BRUSH HILLS - PHASE 2 (FILING NO. 13)

JOB NUMBER: 2053.21

DATE: 06/10/08

CALC'D BY: MAW

## FINAL DRAINAGE REPORT ~ BASIN RUNOFF SUMMARY

BASIN	WEIGHTED		OVERLAND				STREET / CHANNEL FLOW				TOTAL FLOWS				
	CA(5)	CA(100)	C(5)	Length (ft)	Height (ft)	Tc (min)	Length (ft)	Slope (%)	Velocity (fps)	Tc (min)	TOTAL (min)	I(5) (in/hr)	I(100) (in/hr)	Q(5) (cfs)	Q(100) (cfs)
A	0.41	0.44	0.25	20	1	4.2	550	4.0%	7.0	1.3	5.5	4.98	8.86	2	4
B1	2.52	3.02	0.25	150	3	15.5	900	2.7%	5.8	2.6	18.1	3.17	5.63	8	17
B2	0.63	0.76	0.25	60	1.2	9.8	750	1.5%	4.3	2.9	12.7	3.72	6.62	2	5
C1	1.93	2.31	0.25	120	2.4	13.9	250	1.2%	3.8	1.1	14.9	3.47	6.17	7	14
C2	2.14	2.57	0.25	150	3	15.5	750	1.5%	4.3	2.9	18.4	3.14	5.59	7	14
D1	2.59	3.10	0.25	150	3	15.5	600	1.2%	3.8	2.6	18.1	3.17	5.63	8	17
D2	1.34	1.60	0.25	150	3	15.5	200	1.5%	4.3	0.8	16.3	3.33	5.93	4	9
E	2.24	2.69	0.25	150	3	15.5	380	3.4%	6.5	1.0	16.5	3.32	5.89	7	16
F	2.17	2.60	0.25	200	11	12.8					12.8	3.71	6.60	8	17
G	2.07	2.22	0.25	20	1	4.2	2650	5.0%	7.8	5.6	9.8	4.13	7.34	9	16
H	0.63	0.77	0.25	100	3	11.1	100	3.0%	6.1	0.3	11.3	3.91	6.94	2	5
I	1.30	1.67	0.25	500	18	23.3					23.3	2.79	4.95	4	8
J	1.94	2.32	0.25	300	8	19.9	550	1.5%	4.3	2.1	22.1	2.87	5.10	6	12
K	0.76	0.82	0.25	20	1	4.2	700	3.0%	6.1	1.9	6.1	4.84	8.60	4	7
L	2.40	2.83	0.25	300	8	19.9	550	1.5%	4.3	2.1	22.1	2.87	5.10	7	14
M	0.09	0.10	0.25								5.0	5.10	9.07	0.47	0.91
N	2.67	3.15	0.25	150	3	15.5	900	1.5%	4.3	3.5	19.0	3.09	5.50	8	17
O1	3.43	4.05	0.25	150	3	15.5	500	1.5%	4.3	1.9	17.4	3.23	5.74	11	23
O2	2.63	3.11	0.25	150	3	15.5	900	1.5%	4.3	3.5	19.0	3.09	5.50	8	17
O3	0.56	0.66	0.25	60	1.2	9.8	400	2.8%	5.9	1.1	10.9	3.96	7.04	2	5

