STORM_10-5_13-14
STORM SEWER DESIGN COMPUTATIONS

PROJECT: Dominion Access Road
LOCATION: Richmond International Airport
COUNTY: Henrico

Designed by: IJH
Checked by: KPO

STORM FREQUENCY **10**

UNITS **ENGLISH**

PIPE NO	FROM POINT REFERENCE	FROM POINT STA.	TO POINT REFERENCE	TO POINT STA.	DRAIN. AREA "A" Acre	RUNOFF COEFF. "C"	CA INCRE-MENT	CA ACCUM-ULATED	CA ADDTL CA	TOTAL INLET TIME Minutes	RAIN FALL In/Hr	RUNOFF Q CFS	INVERT ELEVATIONS UPPER END	INVERT ELEVATIONS LOWER END	LENGTH of Pipe Ft.	SLOPE Ft./Ft.	SIZE (Dia. Or Span/Rise) In.	SHAPE	Capacity CFS	Friction Slope Ft./Ft.	VEL Vn Ft/Sec	FLOW TIME Sec.	REMARKS
	(1)		(2)		(3)	(4)	(5)	(6)		(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)		(15)		(16)	(17)	(18)
10-5 TO 10-6	10-5	1+25.00	10-6	1+48.34	0.290	0.850	0.247	0.247	0.000	5.000	6.966	1.717	152.640	152.570	23.336	0.003	15.000	Circular	3.537	0.001	2.867	0.136	Exist. Pipe
10-6 TO 10-7	10-6	1+48.34	10-7	1+71.67	0.060	0.850	0.051	0.298	0.000	5.136	6.919	2.058	152.560	152.490	23.325	0.003	15.000	Circular	3.538	0.001	2.998	0.130	Exist. Pipe
10-7 TO 10-9	10-7	1+71.67	10-9	2+94.37	0.140	0.850	0.119	0.417	0.000	5.265	6.875	2.863	152.400	152.030	122.677	0.003	15.000	Circular	3.547	0.002	3.224	0.634	Exist. Pipe
10-8 TO 10-9	10-8	2+94.37	10-9	2+94.37	0.310	0.350	0.109	0.109	0.000	7.800	6.122	0.664	153.125	153.000	8.346	0.015	15.000	Circular	7.903	0.000	3.922	0.035	Exist. Pipe
10-9 TO 10-14	10-9	2+94.37	10-14	3+44.37	0.040	0.850	0.034	0.559	0.000	7.835	6.113	3.417	152.000	151.850	50.000	0.003	18.000	Circular	5.752	0.001	3.402	0.245	Exist. Pipe
10-10 TO 10-13	10-10	3+19.37	10-13	3+44.37	0.180	0.850	0.153	0.153	0.000	5.000	6.966	1.066	152.530	152.310	25.000	0.009	15.000	Circular	6.058	0.000	3.725	0.112	Exist. Pipe
10-12 TO 10-13	10-12	3+69.37	10-13	3+44.37	0.230	0.700	0.161	0.161	0.000	5.000	6.966	1.122	152.630	152.310	25.000	0.013	15.000	Circular	7.306	0.000	4.320	0.096	Exist. Pipe
3-9 TO 10-13	3-9	3+44.37	10-13	3+44.37	3.100	0.400	1.240	1.240	0.000	54.800	2.361	2.927	154.000	152.860	9.552	0.119	15.000	Circular	22.310	0.002	12.607	0.013	Prop. Pipe
10-13 TO 10-14	10-13	3+44.37	10-14	3+44.37	0.040	0.850	0.034	1.588	0.000	54.813	2.360	3.748	152.310	151.850	56.000	0.008	15.000	Circular	5.853	0.003	5.072	0.184	Exist. Pipe
10-14 TO 10-14A	10-14	3+44.37	10-14A	4+75.37	0.150	0.850	0.128	2.275	0.000	54.997	2.356	5.358	151.750	151.357	131.000	0.003	18.000	Circular	5.752	0.003	3.708	0.589	Exist. Pipe
10-14A TO 11-2	10-14A	4+75.37	11-2	5+44.37	0.000	0.000	0.000	2.275	0.000	55.586	2.340	5.323	149.547	149.230	69.000	0.005	18.000	Circular	7.118	0.003	4.428	0.260	Exist. Pipe
3-1 to 3-2	Str. 3-1	11+96.24	Str. 3-2	11+62.22	0.280	0.800	0.224	0.224	0.000	5.000	6.966	1.560	153.722	153.620	34.025	0.003	15.000	Circular	3.537	0.001	2.798	0.203	Prop. Pipe
3-2 to 11-1	Str. 3-2	4+78.18	11-1	5+44.37	0.320	0.750	0.240	0.464	0.000	5.203	6.896	3.200	153.524	153.280	81.218	0.003	15.000	Circular	3.537	0.002	3.272	0.414	Prop. Pipe
11-1 to 11-2	11-1	5+44.37	11-2	5+44.37	0.110	0.850	0.094	0.558	0.000	5.614	6.758	3.768	153.180	151.810	56.000	0.024	15.000	Circular	10.101	0.003	7.647	0.122	Exist. Pipe
11-2 TO 11-6	11-2	5+44.37	11-6	6+94.37	0.110	0.850	0.094	2.926	0.000	55.845	2.333	6.827	149.130	148.440	150.000	0.005	24.000	Circular	15.341	0.001	4.751	0.526	Exist. Pipe

3-3 to 3-8
STORM SEWER DESIGN COMPUTATIONS

PROJECT: Dominion Access Road (Turnaround Road)
LOCATION: Richmond International Airport
COUNTY: Henrico

Designed by: IJH
Checked by: KPO

STORM FREQUENCY **10**

UNITS **ENGLISH**

PIPE NO	FROM POINT REFERENCE	FROM POINT STA.	TO POINT REFERENCE	TO POINT STA.	DRAIN. AREA "A" Acre	RUNOFF COEFF. "C"	CA INCRE-MENT	CA ACCUM-ULATED	CA ADDTL CA	TOTAL INLET TIME Minutes	RAIN FALL In/Hr	RUNOFF Q CFS	INVERT ELEVATIONS UPPER END	INVERT ELEVATIONS LOWER END	LENGTH of Pipe Ft.	SLOPE Ft./Ft.	SIZE (Dia. Or Span/Rise) In.	SHAPE	Capacity CFS	Friction Slope Ft./Ft.	VEL Vn Ft/Sec	FLOW TIME Sec.	REMARKS
	(1)		(2)		(3)	(4)	(5)	(6)		(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)		(15)		(16)	(17)	(18)
3-4 to 3-5	3-4	10+43.98	3-5	10+43.98	0.860	0.300	0.258	0.258	0.000	5.000	6.966	1.797	152.441	152.410	10.380	0.003	18.000	Circular	5.752	0.000	2.883	0.060	
3-3 to 3-5	3-3	10+18.98	3-5	10+43.98	0.110	0.700	0.077	0.077	0.000	5.000	6.966	0.536	152.485	152.410	25.000	0.003	18.000	Circular	5.752	0.000	2.043	0.204	
3-5 to 3-6	3-5	10+43.98	3-6	10+67.90	0.210	0.700	0.147	0.482	0.000	5.204	6.896	3.324	152.312	152.240	23.927	0.003	18.000	Circular	5.752	0.001	3.380	0.118	
3-6 to 3-7	3-6	10+67.90	3-7	11+14.90	0.000	0.000	0.000	0.482	0.000	5.322	6.855	3.304	152.141	152.000	47.000	0.003	18.000	Circular	5.752	0.001	3.375	0.232	
3-7 to 3-8	3-7	11+14.90	3-8	11+32.99	0.000	0.000	0.000	0.482	0.000	5.554	6.778	3.267	151.904	151.850	18.088	0.003	18.000	Circular	5.752	0.001	3.366	0.090	
3-8 to EX-1	3-8	11+32.99	EX-1	11+71.21	0.560	0.850	0.476	0.958	0.000	5.700	6.730	6.447	151.750	150.460	38.214	0.034	18.000	Circular	19.296	0.004	9.849	0.065	
EX-1 to EX-2	EX-1	11+71.21	EX-2	13+57.71	6.360	0.550	3.498	4.456	0.000	14.400	4.837	21.555	148.050	146.960	186.505	0.006	27.000	Circular	23.674	0.005	6.764	0.460	
4-5 to 4-6	4-5	14+03.11	4-6	14+04.39	0.120	0.900	0.108	0.108	0.000	5.000	6.966	0.752	154.342	153.580	38.090	0.020	8.000	Circular	2.221	0.002	5.761	0.110	
4-6 to 4-7	4-6	14+04.39	4-7	13+92.68	0.000	0.000	0.000	0.108	0.000	5.110	6.928	0.748	153.484	153.250	11.710	0.020	8.000	Circular	2.221	0.002	5.752	0.034	
4-7 to 4-8	4-7	13+92.68	4-8	13+93.63	0.000	0.000	0.000	0.108	0.000	5.144	6.916	0.747	152.753	152.158	34.512	0.017	8.000	Circular	2.063	0.002	5.448	0.106	
4-8 to EX-2	4-8	13+93.63	EX-2	13+57.71	0.000	0.000	0.000	0.108	0.000	5.250	6.880	0.743	151.500	149.043	72.925	0.034	15.000	Circular	11.854	0.000	5.395	0.225	
EX-2 to EX-3	EX-2	13+57.71	EX-3	14+69.00	0.000	0.900	0.000	4.564	0.000	14.860	4.771	21.773	146.880	146.200	111.284	0.006	27.000	Circular	24.207	0.005	6.906	0.269	
EX-3 to EX-4	EX-3	14+69.00	EX-4	16+63.00	0.000	0.000	0.000	4.564	0.000	15.128	4.733	21.600	146.100	144.740	194.002	0.007	27.000	Circular	25.928	0.005	7.313	0.442	

4-1 to EX-6
STORM SEWER DESIGN COMPUTATIONS

PROJECT: Dominion Access Road (Fuel Farm Road)
LOCATION: Richmond International Airport
COUNTY: Henrico

Designed by: IJH
Checked by: KPO

STORM FREQUENCY **10 year**

UNITS **ENGLISH**

PIPE NO	FROM POINT REFERENCE	FROM POINT STA.	TO POINT REFERENCE	TO POINT STA.	DRAIN. AREA "A" Acre	RUNOFF COEFF. "C"	CA INCRE-MENT	CA ACCUM-ULATED	CA ADDTL CA	TOTAL INLET TIME Minutes	RAIN FALL In/Hr	RUNOFF Q CFS	INVERT ELEVATIONS UPPER END	INVERT ELEVATIONS LOWER END	LENGTH of Pipe Ft.	SLOPE Ft./Ft.	SIZE (Dia. Or Span/Rise) In.	SHAPE	Capacity CFS	Friction Slope Ft./Ft.	VEL Vn Ft/Sec	FLOW TIME Sec.	REMARKS
	(1)		(2)		(3)	(4)	(5)	(6)		(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)		(15)		(16)	(17)	(18)
4-1 to 4-2	4-1	10+19.83	4-2	10+85.03	0.250	0.600	0.150	0.150	0.000	5.000	6.966	1.045	153.700	151.620	65.191	0.032	15.000	Circular	11.535	0.000	5.851	0.186	Prop. Pipe
4-2 to EX-5	4-2	10+85.03	EX-5	11+00.52	0.140	0.450	0.063	0.213	0.000	6.900	6.366	1.356	151.516	151.470	15.499	0.003	15.000	Circular	3.537	0.000	2.697	0.096	Prop. Pipe
EX-5 to EX-6	EX-5	11+00.52	EX-6	11+72.39	0.140	0.850	0.119	0.332	0.000	6.996	6.339	2.105	151.370	150.980	71.862	0.005	15.000	Circular	4.758	0.001	3.766	0.318	Ex. Pipe

COMMONWEALTH OF VIRGINIA
KEVIN O'MEARA
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6/30/2019
PROFESSIONAL ENGINEER

REVISION DESCRIPTION
DATE

DATE 6/30/2019
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DESIGNED BY KPO
CHECKED BY CMK
SCALE N.T.S.

JOB NO. 40930.001
SHEET NO. 02H(03)

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EAST RAMP 3 ACCESS ROAD
HENRICO COUNTY - VIRGINIA
STORM SEWER DESIGN COMPUTATIONS

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