Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists

DRAINAGE MEMORANDUM

Date: March 12, 2026

To: Mr. James Danis
Deputy Director of Public Works
Town of Londonderry
268B Mammoth Road
Londonderry, NH

From: TFMoran, Inc.
Nicholas Golon, P.E.

Re: Town Hall Office and Parking Expansion
268C Mammoth Road, Londonderry, NH
TFM Project No. 12434-04

NARRATIVE

TFMoran has prepared this drainage memo on behalf of our Client, Londonderry SAU #25, and the property owner, the Town of Londonderry, to evaluate post-development stormwater runoff associated with a parking lot expansion at the Town of Londonderry's offices. As specifically requested by the Town, the focus of this limited stormwater analysis is to evaluate pre-development and post-development flows for a new stormwater basin to ensure no increase in runoff from the basin in comparison to pre-development conditions, and to size pretreatment and treatment practices consistent with the Town of Londonderry Site Plan Regulations.

This will be a phased project consisting of two phases. The initial phase will involve construction of the stormwater basin, a portion of the proposed parking lot, and a 5,300± sf. town office addition. Construction of the parking lot for phase-1 will be limited to upgradient areas, avoiding areas defined as jurisdictional wetlands. Phase-2 consists of an expansion of the parking lot to provide the parking necessary to accommodate the building expansion and anticipated number of employees, as well as an expansion of the police impound area. Improvements in this area will require a standard wetland permit for permanently impact 5,614 sf. of forested wetland with an additional 916sf of temporary impacts.

Pre-Development:

The town's municipal complex comprises approximately 22 ac and is a mix of municipal buildings with associated parking, recreational ball fields, and woodland areas. The topography generally slopes down from East to West at 2%±. On the East side of the property is a forested wetland approximately ¾ of an acre in size. The limits of the drainage subcatchments presented in this drainage memo are reflective of a survey by this office and on-site evaluation.

Post-Development:

The project involves construction of a 5,300± sf. addition to the town office for school administration. Work associated with the building addition includes 200± lf. of new sidewalk,

reconstruction of 240± lf. of existing sidewalk, a new accessibility ramp, and conversion of standard parking spaces to ADA spaces. All work associated with the addition falls within previously disturbed areas. To the Northeast of the existing town office parking will be a paved parking lot expansion with 70 new spaces. To the East of the new parking, a 5,300± sf. fenced gravel area will be constructed for police impounds. To the West of the new parking, a drainage basin is proposed. Construction of these components is primarily in forested areas which result in the removal of 1.4± ac. of woodland and permanently impact 5,614 sf. of forested wetland with an additional 916sf of temporary impacts.

The improvements associated with this project resulted in a phase-1 increase in impervious cover of 12,114 sf., with an additional increase in phase-2 of 14,578 sf., for a total of 26,695 sf. Stormwater Basin #1 has been designed with the standard Londonderry outlet structure to attenuate post-development flows. A BMP worksheet and stage storage table for Basin #1 has been included to show compliance with pretreatment and treatment requirements.

CONCLUSION

Peak Rate Flows

Analysis was conducted at the outlet of Basin #1 to verify flows. In evaluating the contributing areas to the discharge location please note that there is a difference in the drainage areas from pre to post-development. This is a function of the evaluation point being the discharge to the basin and that with raising the grade in the area of the parking lot expansion, a portion of the offsite runon will be directed around the stormwater basin along its existing flow path towards Sargent Road. The comparison of pre-conditions to post-conditions shows no increase in the peak rate of runoff for the 25-yr storm (see Table 1). Post development volumes are as identified in Table 2. Peak elevation of the 50-yr storm is 429.03' which provides 1.07' freeboard from the top of basin berm (430.10').

Table 1: Flow Summary

FLOW (CFS)									
POI	DESCRIPTOR	2-YR		10-YR		25-YR		50-YR	
		PRE	POST	PRE	POST	PRE	POST	PRE	POST
1	Basin #1	0.5	0.3	1.3	1.2	2.1	2.0	2.8	2.6

Table 2: Volume Summary

VOLUME (CF)									
POI	DESCRIPTOR	2-YR		10-YR		25-YR		50-YR	
		PRE	POST	PRE	POST	PRE	POST	PRE	POST
1	Basin #1	3482	2,944	8395	7,199	12,897	10,653	17,465	13,969

In the proposed conditions there will be no increase in the peak rate runoff from Basin #1 for the 25yr storm, there is 1.07 freeboard during the 50yr storm, and pretreatment and treatment is sized appropriately. We believe the results of this limited study have met the objective of analyzing Basin #1 flows.

Should there be any questions or concerns regarding this memorandum or the project in general please do not hesitate to contact the undersigned at 603.472.4488 or ngolon@tfmoran.com

TFMORAN, INC.

Nicholas Golon, P.E.
Civil Department Manager, Principal

FILTRATION PRACTICE DESIGN CRITERIA
(Env-Wq 1508.08)

Type/Node Name: **Filtration Basin / Basin #1**

Enter the type of filtration practice (e.g., bioretention system) and the node name in the drainage analysis, if applicable.

		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.08(a).	
0.89	ac	A = Area draining to the practice	
0.62	ac	A_I = Impervious area draining to the practice	
0.70	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.68	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.61	ac-in	WQV= 1" x Rv x A	
2,198	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
550	cf	25% x WQV (check calc for sediment forebay volume)	
1,649	cf	75% x WQV (check calc for surface sand filter volume)	
Forebay		Method of Pretreatment? (not required for clean or roof runoff)	
783	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	**≥ 25%WQV**
Calculate time to drain if system IS NOT underdrained:			
1,672	sf	A_{SA} = Surface area of the practice	
0.30	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
		If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided?	
	Yes/No	(Use the calculations below)	
52.6	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	**≤ 72-hrs**
Calculate time to drain if system IS underdrained:			
	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
-	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	**≤ 72-hrs**
425.50	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
424.43	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
420.40	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
425.50	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	**≥ 1'**
5.10	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	**≥ 1'**
1.07	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	**≥ 1'**
429.03	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
430.10	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	**← yes**
If a surface sand filter or underground sand filter is proposed:			
YES	ac	Drainage Area check.	**< 10 ac**
	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ 75%WQV**
	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course specification.	
	Yes/No	Access grate provided?	**← yes**

If a bioretention area is proposed:			
YES	ac	Drainage Area no larger than 5 ac?	**← yes**
2,209	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ WQV**
18.0	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet	D-05	Note what sheet in the plan set contains the filter course specification	
3.0	:1	Pond side slopes	**≥ 3:1**
Sheet	D-05	Note what sheet in the plan set contains the planting plans and surface cover	
If porous pavement is proposed:			
		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
	acres	A_{SA} = Surface area of the pervious pavement	
	:1	Ratio of the contributing area to the pervious surface area	**≤ 5:1**
	inches	D_{FC} = Filter course thickness	**12", or 18" if within GPA mod. 304.1 (see spec)**
Sheet		Note what sheet in the plan set contains the filter course spec.	

1. Rate of the limiting layer (either the filter course or the underlying soil). $Ksat_{design}$ includes factor of safey. See Env-Wq 1504.14 for guidance on determining the infiltration rate.

2. See lines 34, 40 and 48 for required depths of filter media.

3. Volume without depending on infiltration. The volume includes the storage above the filter (but below the invert of the outlet stucture, if any), the filter media voids, and the pretreatment area. The storage above the filter media shall not include the volume above the outlet structure, if any.

Designer's Notes:

Test Pit #1 Used (See test pit report for ESHWT elevation)

Minimum Basin Bottom = ESHWT (424.43)+1' seperation + 1.5' media = 426.93'

Basin Bottom Design Elev = 427.0'

Calculated by P.Silvernail 2/19/2026

Revised by P.Silvernail 3/3/2026

Stage-Area-Storage for Pond FB#1:

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
426.50	182	0
426.51	184	2
426.52	186	4
426.53	188	6
426.54	189	7
426.55	191	9
426.56	193	11
426.57	195	13
426.58	197	15
426.59	199	17
426.60	200	19
426.61	202	21
426.62	204	23
426.63	206	25
426.64	208	27
426.65	210	29
426.66	211	31
426.67	213	34
426.68	215	36
426.69	217	38
426.70	219	40
426.71	221	42
426.72	222	44
426.73	224	47
426.74	226	49
426.75	228	51
426.76	230	54
426.77	232	56
426.78	234	58
426.79	235	61
426.80	237	63
426.81	239	65
426.82	241	68
426.83	243	70
426.84	245	73
426.85	246	75
426.86	248	77
426.87	250	80
426.88	252	82
426.89	254	85
426.90	256	88
426.91	257	90
426.92	259	93
426.93	261	95
426.94	263	98
426.95	265	101
426.96	267	103
426.97	268	106
426.98	270	109
426.99	272	111
427.00	274	114
427.01	276	117
427.02	278	120
427.03	281	122
427.04	283	125
427.05	285	128
427.06	288	131
427.07	290	134
427.08	292	137
427.09	294	140
427.10	297	143
427.11	299	146
427.12	301	149
427.13	303	152
427.14	305	155
427.15	308	158
427.16	310	161
427.17	312	164
427.18	315	167
427.19	317	170
427.20	319	173
427.21	321	177
427.22	324	180
427.23	326	183
427.24	328	186
427.25	330	190
427.26	332	193
427.27	335	196
427.28	337	200
427.29	339	203
427.30	342	206
427.31	344	210
427.32	346	213
427.33	348	217
427.34	350	220
427.35	353	224
427.36	355	227
427.37	357	231
427.38	359	234
427.39	362	238
427.40	364	242
427.41	366	245
427.42	369	249
427.43	371	253
427.44	373	256
427.45	375	260
427.46	377	264
427.47	380	268
427.48	382	271
427.49	384	275
427.50	387	279
427.51	389	283
427.52	391	287
427.53	393	291

Stage-Area-Storage for Pond FB#1: (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
427.54	396	295
427.55	398	299
427.56	400	303
427.57	402	307
427.58	404	311
427.59	407	315
427.60	409	319
427.61	411	323
427.62	414	327
427.63	416	331
427.64	418	335
427.65	420	340
427.66	423	344
427.67	425	348
427.68	427	352
427.69	429	357
427.70	431	361
427.71	434	365
427.72	436	370
427.73	438	374
427.74	441	378
427.75	443	383
427.76	445	387
427.77	447	392
427.78	449	396
427.79	452	401
427.80	454	405
427.81	456	410
427.82	458	414
427.83	461	419
427.84	463	424
427.85	465	428
427.86	468	433
427.87	470	438
427.88	472	442
427.89	474	447
427.90	476	452
427.91	479	457
427.92	481	461
427.93	483	466
427.94	485	471
427.95	488	476
427.96	490	481
427.97	492	486
427.98	495	491
427.99	497	496
428.00	499	501
428.01	502	506
428.02	504	511
428.03	507	516
428.04	510	521
428.05	512	526
428.06	515	531
428.07	518	536
428.08	520	541
428.09	523	546
428.10	526	552
428.11	528	557
428.12	531	562
428.13	534	568
428.14	536	573
428.15	539	578
428.16	542	584
428.17	544	589
428.18	547	595
428.19	550	600
428.20	552	606
428.21	555	611
428.22	558	617
428.23	560	622
428.24	563	628
428.25	566	634
428.26	568	639
428.27	571	645
428.28	573	651
428.29	576	656
428.30	579	662
428.31	581	668
428.32	584	674
428.33	587	680
428.34	589	686
428.35	592	691
428.36	595	697
428.37	597	703
428.38	600	709
428.39	603	715
428.40	605	721
428.41	608	727
428.42	611	734
428.43	613	740
428.44	616	746
428.45	619	752
428.46	621	758
428.47	624	764
428.48	627	771
428.49	629	777
428.50	632	783
428.51	635	790
428.52	638	796
428.53	641	802
428.54	644	809
428.55	647	815
428.56	650	822
428.57	653	828

Forebay #1 required WQV 550 cf.

Stage-Area-Storage for Pond FB#1: (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
428.58	656	835
428.59	659	841
428.60	662	848
428.61	665	855
428.62	668	861
428.63	670	868
428.64	673	875
428.65	676	881
428.66	679	888
428.67	682	895
428.68	685	902
428.69	688	909
428.70	691	916
428.71	694	922
428.72	697	929
428.73	700	936
428.74	703	943
428.75	706	951
428.76	709	958
428.77	712	965
428.78	715	972
428.79	718	979
428.80	721	986
428.81	724	993
428.82	727	1,001
428.83	730	1,008
428.84	733	1,015
428.85	736	1,023
428.86	739	1,030
428.87	742	1,037
428.88	744	1,045
428.89	747	1,052
428.90	750	1,060
428.91	753	1,067
428.92	756	1,075
428.93	759	1,082
428.94	762	1,090
428.95	765	1,098
428.96	768	1,105
428.97	771	1,113
428.98	774	1,121
428.99	777	1,128
429.00	**780**	1,136
429.01	780	1,144
429.02	780	1,152
429.03	780	1,160
429.04	780	1,167
429.05	780	1,175
429.06	780	1,183
429.07	780	1,191
429.08	780	1,199
429.09	780	1,206
429.10	780	**1,214**

Stage-Area-Storage for Pond Basin#1:

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
427.00	2,027	0
427.01	2,034	20
427.02	2,042	41
427.03	2,049	61
427.04	2,057	82
427.05	2,064	102
427.06	2,072	123
427.07	2,079	144
427.08	2,087	165
427.09	2,094	185
427.10	2,102	206
427.11	2,109	228
427.12	2,117	249
427.13	2,124	270
427.14	2,132	291
427.15	2,139	312
427.16	2,147	334
427.17	2,154	355
427.18	2,162	377
427.19	2,169	399
427.20	2,177	420
427.21	2,184	442
427.22	2,192	464
427.23	2,199	486
427.24	2,207	508
427.25	2,214	530
427.26	2,222	552
427.27	2,229	575
427.28	2,237	597
427.29	2,244	619
427.30	2,252	642
427.31	2,259	664
427.32	2,267	687
427.33	2,274	710
427.34	2,282	732
427.35	2,289	755
427.36	2,297	778
427.37	2,304	801
427.38	2,312	824
427.39	2,319	847
427.40	2,327	871
427.41	2,334	894
427.42	2,342	917
427.43	2,349	941
427.44	2,357	964
427.45	2,364	988
427.46	2,372	1,012
427.47	2,379	1,035
427.48	2,387	1,059
427.49	2,394	1,083
427.50	2,402	1,107
427.51	2,409	1,131
427.52	2,416	1,155
427.53	2,424	1,180
427.54	2,431	1,204
427.55	2,439	1,228
427.56	2,446	1,253
427.57	2,454	1,277
427.58	2,461	1,302
427.59	2,469	1,326
427.60	2,476	1,351
427.61	2,484	1,376
427.62	2,491	1,401
427.63	2,499	1,426
427.64	2,506	1,451
427.65	2,514	1,476
427.66	2,521	1,501
427.67	2,529	1,526
427.68	2,536	1,552
427.69	2,544	1,577
427.70	2,551	1,602
427.71	2,559	1,628
427.72	2,566	1,654
427.73	2,574	1,679
427.74	2,581	1,705
427.75	2,589	1,731
427.76	2,596	1,757
427.77	2,604	1,783
427.78	2,611	1,809
427.79	2,619	1,835
427.80	2,626	1,861
427.81	2,634	1,888
427.82	2,641	1,914
427.83	2,649	1,940
427.84	2,656	1,967
427.85	2,664	1,994
427.86	2,671	2,020
427.87	2,679	2,047
427.88	2,686	2,074
427.89	2,694	2,101
427.90	2,701	2,128
427.91	2,709	2,155
427.92	2,716	2,182
427.93	2,724	2,209
427.94	2,731	2,236
427.95	2,739	2,264
427.96	2,746	2,291
427.97	2,754	2,319
427.98	2,761	2,346
427.99	2,769	2,374
428.00	2,776	2,402
428.01	2,784	2,429
428.02	2,792	2,457
428.03	2,800	2,485

Basin #1 required WQV 2,198 cf.

Stage-Area-Storage for Pond Basin#1: (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
428.04	2,808	2,513	428.56	3,302	4,083
428.05	2,816	2,541	428.57	3,327	4,116
428.06	2,824	2,570	428.58	3,351	4,150
428.07	2,832	2,598	428.59	3,376	4,183
428.08	2,840	2,626	428.60	3,401	4,217
428.09	2,848	2,655	428.61	3,426	4,251
428.10	2,856	2,683	428.62	3,451	4,286
428.11	2,864	2,712	428.63	3,476	4,320
428.12	2,872	2,740	428.64	3,501	4,355
428.13	2,880	2,769	428.65	3,526	4,390
428.14	2,888	2,798	428.66	3,551	4,426
428.15	2,896	2,827	428.67	3,576	4,461
428.16	2,904	2,856	428.68	3,601	4,497
428.17	2,912	2,885	428.69	3,626	4,533
428.18	2,920	2,914	428.70	3,650	4,570
428.19	2,928	2,943	428.71	3,675	4,607
428.20	2,936	2,973	428.72	3,700	4,643
428.21	2,944	3,002	428.73	3,725	4,681
428.22	2,952	3,032	428.74	3,750	4,718
428.23	2,960	3,061	428.75	3,775	4,756
428.24	2,968	3,091	428.76	3,800	4,793
428.25	2,976	3,121	428.77	3,825	4,832
428.26	2,984	3,150	428.78	3,850	4,870
428.27	2,992	3,180	428.79	3,875	4,909
428.28	3,000	3,210	428.80	3,900	4,947
428.29	3,008	3,240	428.81	3,925	4,986
428.30	3,016	3,270	428.82	3,949	5,026
428.31	3,024	3,301	428.83	3,974	5,065
428.32	3,032	3,331	428.84	3,999	5,105
428.33	3,040	3,361	428.85	4,024	5,145
428.34	3,048	3,392	428.86	4,049	5,186
428.35	3,056	3,422	428.87	4,074	5,226
428.36	3,064	3,453	428.88	4,099	5,267
428.37	3,072	3,483	428.89	4,124	5,308
428.38	3,080	3,514	428.90	4,149	5,350
428.39	3,088	3,545	428.91	4,174	5,391
428.40	3,096	3,576	428.92	4,199	5,433
428.41	3,104	3,607	428.93	4,224	5,475
428.42	3,112	3,638	428.94	4,248	5,518
428.43	3,120	3,669	428.95	4,273	5,560
428.44	3,128	3,700	428.96	4,298	5,603
428.45	3,136	3,732	428.97	4,323	5,646
428.46	3,144	3,763	428.98	4,348	5,690
428.47	3,152	3,795	428.99	4,373	5,733
428.48	3,160	3,826	429.00	4,398	5,777
428.49	3,168	3,858	429.01	4,414	5,821
428.50	3,176	3,890	429.02	4,430	5,865
428.51	3,177	3,921	429.03	4,446	5,910
428.52	3,202	3,953	429.04	4,462	5,954
428.53	3,227	3,985	429.05	4,478	5,999
428.54	3,252	4,018	429.06	4,494	6,044
428.55	3,277	4,050	429.07	4,510	6,089

Stage-Area-Storage for Pond Basin#1: (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
429.08	4,526	6,134
429.09	4,542	6,179
429.10	4,558	6,225
429.11	4,574	6,271
429.12	4,590	6,316
429.13	4,606	6,362
429.14	4,622	6,409
429.15	4,638	6,455
429.16	4,654	6,501
429.17	4,670	6,548
429.18	4,686	6,595
429.19	4,702	6,642
429.20	4,718	6,689
429.21	4,734	6,736
429.22	4,750	6,783
429.23	4,766	6,831
429.24	4,782	6,879
429.25	4,799	6,927
429.26	4,815	6,975
429.27	4,831	7,023
429.28	4,847	7,071
429.29	4,863	7,120
429.30	4,879	7,169
429.31	4,895	7,217
429.32	4,911	7,267
429.33	4,927	7,316
429.34	4,943	7,365
429.35	4,959	7,415
429.36	4,975	7,464
429.37	4,991	7,514
429.38	5,007	7,564
429.39	5,023	7,614
429.40	5,039	7,664
429.41	5,055	7,715
429.42	5,071	7,766
429.43	5,087	7,816
429.44	5,103	7,867
429.45	5,119	7,918
429.46	5,135	7,970
429.47	5,151	8,021
429.48	5,167	8,073
429.49	5,183	8,124
429.50	5,199	8,176
429.51	5,209	8,228
429.52	5,220	8,281
429.53	5,230	8,333
429.54	5,240	8,385
429.55	5,251	8,438
429.56	5,261	8,490
429.57	5,271	8,543
429.58	5,281	8,596
429.59	5,292	8,648
429.60	5,302	8,701
429.61	5,312	8,755
429.62	5,323	8,808
429.63	5,333	8,861
429.64	5,343	8,914
429.65	5,353	8,968
429.66	5,364	9,021
429.67	5,374	9,075
429.68	5,384	9,129
429.69	5,395	9,183
429.70	5,405	9,237
429.71	5,415	9,291
429.72	5,426	9,345
429.73	5,436	9,399
429.74	5,446	9,454
429.75	5,457	9,508
429.76	5,467	9,563
429.77	5,477	9,618
429.78	5,487	9,672
429.79	5,498	9,727
429.80	5,508	9,782
429.81	5,518	9,838
429.82	5,529	9,893
429.83	5,539	9,948
429.84	5,549	10,004
429.85	5,560	10,059
429.86	5,570	10,115
429.87	5,580	10,171
429.88	5,590	10,226
429.89	5,601	10,282
429.90	5,611	10,338
429.91	5,621	10,395
429.92	5,632	10,451
429.93	5,642	10,507
429.94	5,652	10,564
429.95	5,662	10,620
429.96	5,673	10,677
429.97	5,683	10,734
429.98	5,693	10,791
429.99	5,704	10,848
430.00	**5,714**	**10,905**
430.01	5,714	10,905
430.02	5,714	10,905
430.03	5,714	10,905
430.04	5,714	10,905
430.05	5,714	10,905
430.06	5,714	10,905
430.07	5,714	10,905
430.08	5,714	10,905
430.09	5,714	10,905
430.10	5,714	10,905

Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists

TEST PIT REPORT

FOR

Londonderry Town Hall Office & Parking Lot Expansion

238 Mammoth Road

Londonderry, NH

PREPARED FOR

Londonderry SAU #25

PREPARED BY

TFMORAN, INC.

48 Constitution Drive

Bedford, NH 03110

JN: 123434-04

February 9, 2026

Tp#1 January 30, 2026 (Elev = 427.1')

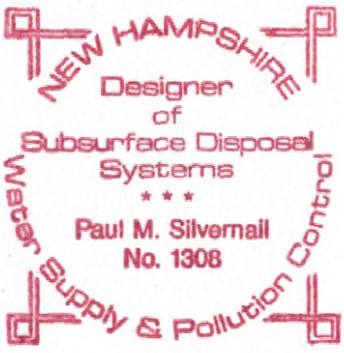
0" – 16 "	10yr 3/2 Very Dark Grayish Brown, Fine Sandy Loam, Granular, Friable
16" - 25"	2.5y 5/4 Light Olive Brown, Sandy Loam, Friable, Granular (previously Disturbed)
25" – 35"	10yr 5/4 Yellowish Brown, Medium Sand, Weak Blocky, Friable
35" – 96"	2.5y 5/4 Light Olive Brown, Silty fine sand, Blocky, Firm

20% redox. Concentrations at 32"
No Water Observed
No Ledge Observed
Roots to 36"
ESHWT = 32" (Elev = 424.43')

Tp#2 January 30, 2026 (Elev = 427.4')

0 - 8"	10yr 3/2 Very Dark Brown, Fine Sandy Loam, Granular, Friable
8" - 22"	2.5y 5/4 Light Olive Brown, Sandy Loam, Friable, Massive (previously Disturbed)
22" - 25"	10yr 2/2 Very Dark Brown, Fine Sandy Loam, Friable, Granular,
35" – 41"	10yr 3/2 Very Dark Grayish Brown, Loamy Sand, Weak Blocky, Friable
41" – 84"	2.5y 5/4 Silty Fine Sand, Blocky, Firm

Redox. Concentrations at 41"
No Water Observed
No Ledge Observed
Roots to 51"
ESHWT = 41" (Elev= 423.98')



Summary Tables

(25-Year Storm)

POST-DEVELOPMENT PIPES/SWALES

Node (#)	Location	Size	Type	Length (Ft)	Slope (Ft/Ft)	Manning's (N)	Peak Discharge (CFS)	Flow Depth (Ft)	Peak Velocity (FPS)
CB #1	CB#1 TO CB#2	15"	HDPE	177	0.010	0.013	1.8	0.66	3.79
CB #2	CB#2 TO HW #1	18"	HDPE	41	0.005	0.013	2.6	1.5	1.81
OS #1	Basin #1 to FES #1	15"	HDPE	15	0.120	0.013	2.1	0.30	2.85

RIPRAP CALCULATIONS
SAU #25 Parking & Town
Office Expansion
238 Mammoth Road
Londonderry, NH 03053
Date: February 20, 2026 By: P.Silvernail
Revised: March 3, 2026 By: P.Silvernail

Project No.: 12434-04

OUTLET	Do (ft.)	Q25 (cfs)	V (fps)	Tw (ft.)	La (ft.)	Wup (ft.)	Wdn (ft.)	d50 (in.)*
FES #1 (From Basin #1)	1.25	2.1	2.9	0.3	11.5	3.8	15.2	6.0
Headwall #1(Into forebay #1)	1.80	2.6	1.8	1.5	15.8	5.4	11.7	6.0
Forebay #1 Weir	6.00	3.7	1.2	0.3	42.5	18.0	60.5	6.0
Basin #1 Weir	9.00	0.0	0.0	0.0	63.0	27.0	90.0	6.0

*Note:6"min.

Notes:

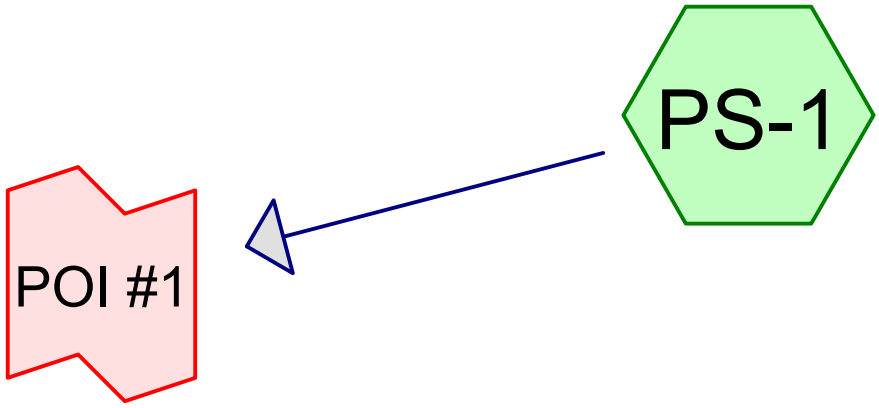
1 Use NHDOT Class C Stone
2 Depth of Stone to be 12" min. or 1.5 times d50 - which ever is larger
3 Actual riprap dimensions may vary from calculations. See Plans.

Calculations

1. 'When Tw < 0.5Do at pipe outlet:
La = 1.8Q/Do^3/2 + 7Do
Wup = 3Do
Wdn = 3Do + La
d50 = (0.02Q^4/3)/(TwDo)

2. When Tw > or = 0.5Do at pipe outlet:
La = 3Q/Do^3/2 + 7Do
Wup = 3Do
Wdn = 3Do + 0.4La
d50 = (0.02Q^4/3)/(TwDo)

Where:
Tw is the tailwater depth at the outlet of the pipe or channel
Do is the diameter of the pipe or the width of channel
Q is the discharge from the pipe of channel
La is the length of apron
Wup is the upstream width of apron
Wdn is the downstream width of apron
d50 is the median stone diameter



Subcat Reach Pond Link

Routing Diagram for 12434-04 SAU #25 Town Office and Parking Expansion PreDrainage

Prepared by T F Moran Inc, Printed 3/4/2026

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.038	74	>75% Grass cover, Good, HSG C (PS-1)
0.010	98	Roofs, HSG C (PS-1)
1.377	70	Woods, Good, HSG C (PS-1)
1.426	**70**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
1.426	HSG C	PS-1
0.000	HSG D	
0.000	Other	
1.426		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.038	0.000	0.000	0.038	>75% Grass cover, Good	PS-1
0.000	0.000	0.010	0.000	0.000	0.010	Roofs	PS-1
0.000	0.000	1.377	0.000	0.000	1.377	Woods, Good	PS-1
0.000	**0.000**	**1.426**	**0.000**	**0.000**	**1.426**	**TOTAL AREA**	

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment PS-1: Runoff Area=62,099 sf 0.73% Impervious Runoff Depth>0.67"
Flow Length=560' Tc=39.1 min CN=70 Runoff=0.5 cfs 3,482 cf

Link POI #1: Inflow=0.5 cfs 3,482 cf
Primary=0.5 cfs 3,482 cf

Total Runoff Area = 1.426 ac Runoff Volume = 3,482 cf Average Runoff Depth = 0.67"
99.27% Pervious = 1.415 ac 0.73% Impervious = 0.010 ac

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment PS-1: Runoff Area=62,099 sf 0.73% Impervious Runoff Depth>1.62"
Flow Length=560' Tc=39.1 min CN=70 Runoff=1.3 cfs 8,395 cf

Link POI #1: Inflow=1.3 cfs 8,395 cf
Primary=1.3 cfs 8,395 cf

Total Runoff Area = 1.426 ac Runoff Volume = 8,395 cf Average Runoff Depth = 1.62"
99.27% Pervious = 1.415 ac 0.73% Impervious = 0.010 ac

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment PS-1: Runoff Area=62,099 sf 0.73% Impervious Runoff Depth>2.49"
Flow Length=560' Tc=39.1 min CN=70 Runoff=2.1 cfs 12,897 cf

Link POI #1: Inflow=2.1 cfs 12,897 cf
Primary=2.1 cfs 12,897 cf

Total Runoff Area = 1.426 ac Runoff Volume = 12,897 cf Average Runoff Depth = 2.49"
99.27% Pervious = 1.415 ac 0.73% Impervious = 0.010 ac

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment PS-1: Runoff Area=62,099 sf 0.73% Impervious Runoff Depth>3.37"
Flow Length=560' Tc=39.1 min CN=70 Runoff=2.8 cfs 17,465 cf

Link POI #1: Inflow=2.8 cfs 17,465 cf
Primary=2.8 cfs 17,465 cf

Total Runoff Area = 1.426 ac Runoff Volume = 17,465 cf Average Runoff Depth = 3.37"
99.27% Pervious = 1.415 ac 0.73% Impervious = 0.010 ac

Summary for Subcatchment PS-1:

Runoff = 1.3 cfs @ 12.57 hrs, Volume= 8,395 cf, Depth> 1.62"
Routed to Link POI #1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10yr Rainfall=4.45"

Area (sf)	CN	Description
59,988	70	Woods, Good, HSG C
454	98	Roofs, HSG C
1,657	74	>75% Grass cover, Good, HSG C
62,099	70	Weighted Average
61,645		99.27% Pervious Area
454		0.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.0	100	0.0125	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.94"
6.7	224	0.0123	0.55		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
5.4	236	0.0212	0.73		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
39.1	560	Total			

Summary for Link POI #1:

Inflow Area = 1.426 ac, 0.73% Impervious, Inflow Depth > 1.62" for 10yr event
Inflow = 1.3 cfs @ 12.57 hrs, Volume= 8,395 cf
Primary = 1.3 cfs @ 12.57 hrs, Volume= 8,395 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Subcatchment PS-1:

Runoff = 2.1 cfs @ 12.56 hrs, Volume= 12,897 cf, Depth> 2.49"
Routed to Link POI #1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25yr Rainfall=5.63"

Area (sf)	CN	Description
59,988	70	Woods, Good, HSG C
454	98	Roofs, HSG C
1,657	74	>75% Grass cover, Good, HSG C
62,099	70	Weighted Average
61,645		99.27% Pervious Area
454		0.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.0	100	0.0125	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.94"
6.7	224	0.0123	0.55		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
5.4	236	0.0212	0.73		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
39.1	560	Total			

Summary for Link POI #1:

Inflow Area = 1.426 ac, 0.73% Impervious, Inflow Depth > 2.49" for 25yr event
Inflow = 2.1 cfs @ 12.56 hrs, Volume= 12,897 cf
Primary = 2.1 cfs @ 12.56 hrs, Volume= 12,897 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Subcatchment PS-1:

Runoff = 2.8 cfs @ 12.55 hrs, Volume= 17,465 cf, Depth> 3.37"
Routed to Link POI #1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50yr Rainfall=6.74"

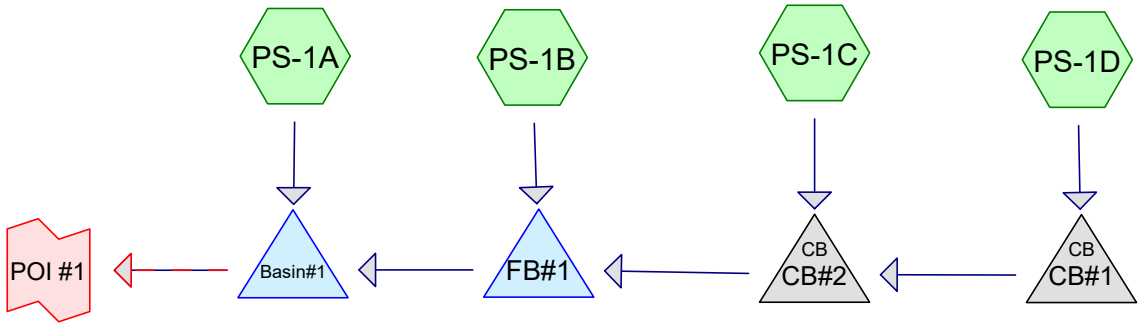
Area (sf)	CN	Description
59,988	70	Woods, Good, HSG C
454	98	Roofs, HSG C
1,657	74	>75% Grass cover, Good, HSG C
62,099	70	Weighted Average
61,645		99.27% Pervious Area
454		0.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.0	100	0.0125	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.94"
6.7	224	0.0123	0.55		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
5.4	236	0.0212	0.73		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
39.1	560	Total			

Summary for Link POI #1:

Inflow Area = 1.426 ac, 0.73% Impervious, Inflow Depth > 3.37" for 50yr event
Inflow = 2.8 cfs @ 12.55 hrs, Volume= 17,465 cf
Primary = 2.8 cfs @ 12.55 hrs, Volume= 17,465 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs



Subcat Reach Pond Link

Routing Diagram for 12434-04 SAU #25 Town Office and Parking Expansion PostDrainage

Prepared by T F Moran Inc, Printed 3/4/2026

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.265	74	>75% Grass cover, Good, HSG C (PS-1A, PS-1B, PS-1C)
0.613	98	Paved parking, HSG C (PS-1B, PS-1C, PS-1D)
0.010	98	Roofs, HSG C (PS-1B)
0.889	**91**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.889	HSG C	PS-1A, PS-1B, PS-1C, PS-1D
0.000	HSG D	
0.000	Other	
0.889		**TOTAL AREA**

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	Basin#1	425.20	425.00	15.0	0.0133	0.013	0.0	15.0	0.0	
2	CB#1	429.84	427.75	177.0	0.0118	0.013	0.0	15.0	0.0	
3	CB#2	427.50	427.30	41.0	0.0049	0.013	0.0	18.0	0.0	

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment PS-1A: Runoff Area=7,254 sf 0.00% Impervious Runoff Depth>0.87"
Tc=6.0 min CN=74 Runoff=0.2 cfs 526 cf

Subcatchment PS-1B: Runoff Area=4,949 sf 14.83% Impervious Runoff Depth>1.09"
Tc=6.0 min CN=78 Runoff=0.1 cfs 448 cf

Subcatchment PS-1C: Runoff Area=11,926 sf 99.23% Impervious Runoff Depth>2.71"
Tc=6.0 min CN=98 Runoff=0.8 cfs 2,690 cf

Subcatchment PS-1D: Runoff Area=14,578 sf 100.00% Impervious Runoff Depth>2.71"
Tc=6.0 min CN=98 Runoff=0.9 cfs 3,288 cf

Pond Basin#1: Peak Elev=428.26' Storage=3,159 cf Inflow=2.0 cfs 6,160 cf
Discarded=0.0 cfs 946 cf Primary=0.3 cfs 2,944 cf Secondary=0.0 cfs 0 cf Outflow=0.4 cfs 3,890 cf

Pond CB#1: Peak Elev=430.30' Inflow=0.9 cfs 3,288 cf
15.0" Round Culvert n=0.013 L=177.0' S=0.0118 '/' Outflow=0.9 cfs 3,288 cf

Pond CB#2: Peak Elev=428.79' Inflow=1.7 cfs 5,978 cf
18.0" Round Culvert n=0.013 L=41.0' S=0.0049 '/' Outflow=1.7 cfs 5,978 cf

Pond FB#1: Peak Elev=428.75' Storage=949 cf Inflow=1.8 cfs 6,426 cf
Outflow=1.8 cfs 5,634 cf

Link POI #1: Inflow=0.3 cfs 2,944 cf
Primary=0.3 cfs 2,944 cf

Total Runoff Area = 0.889 ac Runoff Volume = 6,952 cf Average Runoff Depth = 2.16"
29.87% Pervious = 0.265 ac 70.13% Impervious = 0.623 ac

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment PS-1A: Runoff Area=7,254 sf 0.00% Impervious Runoff Depth>1.93"
Tc=6.0 min CN=74 Runoff=0.4 cfs 1,168 cf

Subcatchment PS-1B: Runoff Area=4,949 sf 14.83% Impervious Runoff Depth>2.25"
Tc=6.0 min CN=78 Runoff=0.3 cfs 928 cf

Subcatchment PS-1C: Runoff Area=11,926 sf 99.23% Impervious Runoff Depth>4.21"
Tc=6.0 min CN=98 Runoff=1.2 cfs 4,186 cf

Subcatchment PS-1D: Runoff Area=14,578 sf 100.00% Impervious Runoff Depth>4.21"
Tc=6.0 min CN=98 Runoff=1.4 cfs 5,116 cf

Pond Basin#1: Peak Elev=428.69' Storage=4,518 cf Inflow=3.2 cfs 10,605 cf
Discarded=0.0 cfs 1,065 cf Primary=1.2 cfs 7,199 cf Secondary=0.0 cfs 0 cf Outflow=1.2 cfs 8,264 cf

Pond CB#1: Peak Elev=430.42' Inflow=1.4 cfs 5,116 cf
15.0" Round Culvert n=0.013 L=177.0' S=0.0118 '/' Outflow=1.4 cfs 5,116 cf

Pond CB#2: Peak Elev=428.92' Inflow=2.6 cfs 9,302 cf
18.0" Round Culvert n=0.013 L=41.0' S=0.0049 '/' Outflow=2.6 cfs 9,302 cf

Pond FB#1: Peak Elev=428.83' Storage=1,009 cf Inflow=2.9 cfs 10,230 cf
Outflow=2.8 cfs 9,437 cf

Link POI #1: Inflow=1.2 cfs 7,199 cf
Primary=1.2 cfs 7,199 cf

Total Runoff Area = 0.889 ac Runoff Volume = 11,398 cf Average Runoff Depth = 3.53"
29.87% Pervious = 0.265 ac 70.13% Impervious = 0.623 ac

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment PS-1A: Runoff Area=7,254 sf 0.00% Impervious Runoff Depth>2.87"
Tc=6.0 min CN=74 Runoff=0.6 cfs 1,737 cf

Subcatchment PS-1B: Runoff Area=4,949 sf 14.83% Impervious Runoff Depth>3.25"
Tc=6.0 min CN=78 Runoff=0.4 cfs 1,341 cf

Subcatchment PS-1C: Runoff Area=11,926 sf 99.23% Impervious Runoff Depth>5.39"
Tc=6.0 min CN=98 Runoff=1.5 cfs 5,356 cf

Subcatchment PS-1D: Runoff Area=14,578 sf 100.00% Impervious Runoff Depth>5.39"
Tc=6.0 min CN=98 Runoff=1.8 cfs 6,547 cf

Pond Basin#1: Peak Elev=428.89' Storage=5,314 cf Inflow=4.2 cfs 14,186 cf
Discarded=0.0 cfs 1,148 cf Primary=2.0 cfs 10,653 cf Secondary=0.0 cfs 0 cf Outflow=2.0 cfs 11,801 cf

Pond CB#1: Peak Elev=430.51' Inflow=1.8 cfs 6,547 cf
15.0" Round Culvert n=0.013 L=177.0' S=0.0118 '/' Outflow=1.8 cfs 6,547 cf

Pond CB#2: Peak Elev=429.02' Inflow=3.3 cfs 11,903 cf
18.0" Round Culvert n=0.013 L=41.0' S=0.0049 '/' Outflow=3.3 cfs 11,903 cf

Pond FB#1: Peak Elev=428.91' Storage=1,071 cf Inflow=3.7 cfs 13,243 cf
Outflow=3.6 cfs 12,449 cf

Link POI #1: Inflow=2.0 cfs 10,653 cf
Primary=2.0 cfs 10,653 cf

Total Runoff Area = 0.889 ac Runoff Volume = 14,981 cf Average Runoff Depth = 4.64"
29.87% Pervious = 0.265 ac 70.13% Impervious = 0.623 ac

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment PS-1A: Runoff Area=7,254 sf 0.00% Impervious Runoff Depth>3.81"
Tc=6.0 min CN=74 Runoff=0.7 cfs 2,305 cf

Subcatchment PS-1B: Runoff Area=4,949 sf 14.83% Impervious Runoff Depth>4.24"
Tc=6.0 min CN=78 Runoff=0.6 cfs 1,747 cf

Subcatchment PS-1C: Runoff Area=11,926 sf 99.23% Impervious Runoff Depth>6.50"
Tc=6.0 min CN=98 Runoff=1.8 cfs 6,457 cf

Subcatchment PS-1D: Runoff Area=14,578 sf 100.00% Impervious Runoff Depth>6.50"
Tc=6.0 min CN=98 Runoff=2.2 cfs 7,893 cf

Pond Basin#1: Peak Elev=429.03' Storage=5,930 cf Inflow=5.0 cfs 17,606 cf
Discarded=0.0 cfs 1,215 cf Primary=2.6 cfs 13,969 cf Secondary=0.0 cfs 0 cf Outflow=2.7 cfs 15,184 cf

Pond CB#1: Peak Elev=430.58' Inflow=2.2 cfs 7,893 cf
15.0" Round Culvert n=0.013 L=177.0' S=0.0118 '/' Outflow=2.2 cfs 7,893 cf

Pond CB#2: Peak Elev=429.13' Inflow=3.9 cfs 14,350 cf
18.0" Round Culvert n=0.013 L=41.0' S=0.0049 '/' Outflow=3.9 cfs 14,350 cf

Pond FB#1: Peak Elev=429.05' Storage=1,178 cf Inflow=4.5 cfs 16,097 cf
Outflow=4.3 cfs 15,301 cf

Link POI #1: Inflow=2.6 cfs 13,969 cf
Primary=2.6 cfs 13,969 cf

Total Runoff Area = 0.889 ac Runoff Volume = 18,402 cf Average Runoff Depth = 5.71"
29.87% Pervious = 0.265 ac 70.13% Impervious = 0.623 ac

Summary for Subcatchment PS-1A:

Runoff = 0.4 cfs @ 12.10 hrs, Volume= 1,168 cf, Depth> 1.93"
Routed to Pond Basin#1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10yr Rainfall=4.45"

Area (sf)	CN	Description
7,254	74	>75% Grass cover, Good, HSG C
7,254		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PS-1B:

Runoff = 0.3 cfs @ 12.09 hrs, Volume= 928 cf, Depth> 2.25"
Routed to Pond FB#1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10yr Rainfall=4.45"

Area (sf)	CN	Description
454	98	Roofs, HSG C
280	98	Paved parking, HSG C
4,215	74	>75% Grass cover, Good, HSG C
4,949	78	Weighted Average
4,215		85.17% Pervious Area
734		14.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PS-1C:

Runoff = 1.2 cfs @ 12.09 hrs, Volume= 4,186 cf, Depth> 4.21"
Routed to Pond CB#2 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10yr Rainfall=4.45"

Area (sf)	CN	Description
399	98	Paved parking, HSG C
11,435	98	Paved parking, HSG C
92	74	>75% Grass cover, Good, HSG C
11,926	98	Weighted Average
92		0.77% Pervious Area
11,834		99.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PS-1D:

Runoff = 1.4 cfs @ 12.09 hrs, Volume= 5,116 cf, Depth> 4.21"
Routed to Pond CB#1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10yr Rainfall=4.45"

Area (sf)	CN	Description
14,578	98	Paved parking, HSG C
14,578		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Pond Basin#1:

Inflow Area = 0.889 ac, 70.13% Impervious, Inflow Depth > 3.29" for 10yr event
Inflow = 3.2 cfs @ 12.10 hrs, Volume= 10,605 cf
Outflow = 1.2 cfs @ 12.35 hrs, Volume= 8,264 cf, Atten= 63%, Lag= 15.1 min
Discarded = 0.0 cfs @ 12.35 hrs, Volume= 1,065 cf
Primary = 1.2 cfs @ 12.35 hrs, Volume= 7,199 cf
Routed to Link POI #1 :
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link POI #1 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 428.69' @ 12.35 hrs Surf.Area= 3,615 sf Storage= 4,518 cf
Flood Elev= 430.10' Surf.Area= 5,714 sf Storage= 10,905 cf

Plug-Flow detention time= 152.0 min calculated for 8,264 cf (78% of inflow)
Center-of-Mass det. time= 73.8 min (871.7 - 797.9)

Volume	Invert	Avail.Storage	Storage Description
#1	427.00'	10,905 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
427.00	2,027	0	0
428.00	2,776	2,402	2,402
428.50	3,176	1,488	3,890
428.51	3,177	32	3,921
429.00	4,398	1,856	5,777
429.50	5,199	2,399	8,176
430.00	5,714	2,728	10,905

Device	Routing	Invert	Outlet Devices
#1	Discarded	427.00'	**0.300 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Device 4	427.93'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.70 0.70 1.17 Width (feet) 0.53 0.53 1.25 1.25
#3	Secondary	429.50'	**9.0' long + 3.0 '/' SideZ x 9.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.46 2.55 2.70 2.69 2.68 2.68 2.67 2.64 2.64 2.64 2.65 2.64 2.65 2.65 2.66 2.67 2.69
#4	Primary	425.20'	**15.0" Round Culvert** L= 15.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 425.20' / 425.00' S= 0.0133 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#5	Device 4	429.10'	**36.0" x 36.0" Horiz. OS RIM (3'x3' Horiz. Rim)** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.0 cfs @ 12.35 hrs HW=428.69' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=1.2 cfs @ 12.35 hrs HW=428.69' TW=0.00' (Dynamic Tailwater)
└**4=Culvert** (Passes 1.2 cfs of 10.0 cfs potential flow)
  ├**2=Custom Weir/Orifice** (Weir Controls 1.2 cfs @ 2.66 fps)
  └**5=OS RIM (3'x3' Horiz. Rim)** (Controls 0.0 cfs)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=427.00' TW=0.00' (Dynamic Tailwater)
└**3=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)

Summary for Pond CB#1:

Inflow Area = 0.335 ac,100.00% Impervious, Inflow Depth > 4.21" for 10yr event
Inflow = 1.4 cfs @ 12.09 hrs, Volume= 5,116 cf
Outflow = 1.4 cfs @ 12.09 hrs, Volume= 5,116 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.4 cfs @ 12.09 hrs, Volume= 5,116 cf
Routed to Pond CB#2 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 430.42' @ 12.09 hrs
Flood Elev= 434.10'

Device	Routing	Invert	Outlet Devices
#1	Primary	429.84'	**15.0" Round Culvert** L= 177.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 429.84' / 427.75' S= 0.0118 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.4 cfs @ 12.09 hrs HW=430.41' TW=428.90' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 1.4 cfs @ 3.62 fps)

Summary for Pond CB#2:

Inflow Area = 0.608 ac, 99.65% Impervious, Inflow Depth > 4.21" for 10yr event
Inflow = 2.6 cfs @ 12.09 hrs, Volume= 9,302 cf
Outflow = 2.6 cfs @ 12.09 hrs, Volume= 9,302 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.6 cfs @ 12.09 hrs, Volume= 9,302 cf
Routed to Pond FB#1 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 428.92' @ 12.12 hrs
Flood Elev= 432.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	427.50'	**18.0" Round Culvert** L= 41.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 427.50' / 427.30' S= 0.0049 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=2.0 cfs @ 12.09 hrs HW=428.90' TW=428.82' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 2.0 cfs @ 1.52 fps)

Summary for Pond FB#1:

Inflow Area = 0.722 ac, 86.31% Impervious, Inflow Depth > 3.90" for 10yr event
Inflow = 2.9 cfs @ 12.09 hrs, Volume= 10,230 cf
Outflow = 2.8 cfs @ 12.10 hrs, Volume= 9,437 cf, Atten= 1%, Lag= 1.0 min
Primary = 2.8 cfs @ 12.10 hrs, Volume= 9,437 cf
Routed to Pond Basin#1 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 428.83' @ 12.10 hrs Surf.Area= 730 sf Storage= 1,009 cf
Flood Elev= 429.10' Surf.Area= 780 sf Storage= 1,214 cf

Plug-Flow detention time= 76.2 min calculated for 9,437 cf (92% of inflow)
Center-of-Mass det. time= 35.3 min (792.4 - 757.1)

Volume	Invert	Avail.Storage	Storage Description
#1	426.50'	1,214 cf	**FB #1 - 0% Voids (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
426.50	182	0	0
427.00	274	114	114
428.00	499	387	501
428.50	632	283	783
429.00	780	353	1,136
429.10	780	78	1,214

Device	Routing	Invert	Outlet Devices
#1	Primary	428.50'	**6.0' long x 7.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.40 2.52 2.70 2.68 2.68 2.67 2.66 2.65 2.65 2.65 2.66 2.65 2.66 2.68 2.70 2.73 2.78

Primary OutFlow Max=2.8 cfs @ 12.10 hrs HW=428.83' TW=428.43' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 2.8 cfs @ 1.42 fps)

Summary for Link POI #1:

Inflow Area = 0.889 ac, 70.13% Impervious, Inflow Depth > 2.23" for 10yr event
Inflow = 1.2 cfs @ 12.35 hrs, Volume= 7,199 cf
Primary = 1.2 cfs @ 12.35 hrs, Volume= 7,199 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Subcatchment PS-1A:

Runoff = 0.6 cfs @ 12.09 hrs, Volume= 1,737 cf, Depth> 2.87"
Routed to Pond Basin#1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25yr Rainfall=5.63"

Area (sf)	CN	Description
7,254	74	>75% Grass cover, Good, HSG C
7,254		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PS-1B:

Runoff = 0.4 cfs @ 12.09 hrs, Volume= 1,341 cf, Depth> 3.25"
Routed to Pond FB#1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25yr Rainfall=5.63"

Area (sf)	CN	Description
454	98	Roofs, HSG C
280	98	Paved parking, HSG C
4,215	74	>75% Grass cover, Good, HSG C
4,949	78	Weighted Average
4,215		85.17% Pervious Area
734		14.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PS-1C:

Runoff = 1.5 cfs @ 12.09 hrs, Volume= 5,356 cf, Depth> 5.39"
Routed to Pond CB#2 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25yr Rainfall=5.63"

Area (sf)	CN	Description
399	98	Paved parking, HSG C
11,435	98	Paved parking, HSG C
92	74	>75% Grass cover, Good, HSG C
11,926	98	Weighted Average
92		0.77% Pervious Area
11,834		99.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PS-1D:

Runoff = 1.8 cfs @ 12.09 hrs, Volume= 6,547 cf, Depth> 5.39"
Routed to Pond CB#1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25yr Rainfall=5.63"

Area (sf)	CN	Description
14,578	98	Paved parking, HSG C
14,578		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Pond Basin#1:

Inflow Area = 0.889 ac, 70.13% Impervious, Inflow Depth > 4.40" for 25yr event
Inflow = 4.2 cfs @ 12.10 hrs, Volume= 14,186 cf
Outflow = 2.0 cfs @ 12.26 hrs, Volume= 11,801 cf, Atten= 52%, Lag= 9.8 min
Discarded = 0.0 cfs @ 12.26 hrs, Volume= 1,148 cf
Primary = 2.0 cfs @ 12.26 hrs, Volume= 10,653 cf
Routed to Link POI #1 :
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link POI #1 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 428.89' @ 12.26 hrs Surf.Area= 4,127 sf Storage= 5,314 cf
Flood Elev= 430.10' Surf.Area= 5,714 sf Storage= 10,905 cf

Plug-Flow detention time= 132.8 min calculated for 11,801 cf (83% of inflow)
Center-of-Mass det. time= 65.4 min (855.1 - 789.7)

Volume	Invert	Avail.Storage	Storage Description
#1	427.00'	10,905 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
427.00	2,027	0	0
428.00	2,776	2,402	2,402
428.50	3,176	1,488	3,890
428.51	3,177	32	3,921
429.00	4,398	1,856	5,777
429.50	5,199	2,399	8,176
430.00	5,714	2,728	10,905

Device	Routing	Invert	Outlet Devices
#1	Discarded	427.00'	**0.300 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Device 4	427.93'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.70 0.70 1.17 Width (feet) 0.53 0.53 1.25 1.25
#3	Secondary	429.50'	**9.0' long + 3.0 '/' SideZ x 9.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.46 2.55 2.70 2.69 2.68 2.68 2.67 2.64 2.64 2.64 2.65 2.64 2.65 2.65 2.66 2.67 2.69
#4	Primary	425.20'	**15.0" Round Culvert** L= 15.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 425.20' / 425.00' S= 0.0133 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#5	Device 4	429.10'	**36.0" x 36.0" Horiz. OS RIM (3'x3' Horiz. Rim)** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.0 cfs @ 12.26 hrs HW=428.89' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=1.9 cfs @ 12.26 hrs HW=428.89' TW=0.00' (Dynamic Tailwater)
└**4=Culvert** (Passes 1.9 cfs of 10.3 cfs potential flow)
  ├**2=Custom Weir/Orifice** (Weir Controls 1.9 cfs @ 2.80 fps)
  └**5=OS RIM (3'x3' Horiz. Rim)** (Controls 0.0 cfs)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=427.00' TW=0.00' (Dynamic Tailwater)
└**3=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)

Summary for Pond CB#1:

Inflow Area = 0.335 ac,100.00% Impervious, Inflow Depth > 5.39" for 25yr event
Inflow = 1.8 cfs @ 12.09 hrs, Volume= 6,547 cf
Outflow = 1.8 cfs @ 12.09 hrs, Volume= 6,547 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.8 cfs @ 12.09 hrs, Volume= 6,547 cf
Routed to Pond CB#2 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 430.51' @ 12.09 hrs
Flood Elev= 434.10'

Device	Routing	Invert	Outlet Devices
#1	Primary	429.84'	**15.0" Round Culvert** L= 177.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 429.84' / 427.75' S= 0.0118 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.7 cfs @ 12.09 hrs HW=430.50' TW=428.99' (Dynamic Tailwater)
↑**1=Culvert** (Outlet Controls 1.7 cfs @ 3.81 fps)

Summary for Pond CB#2:

Inflow Area = 0.608 ac, 99.65% Impervious, Inflow Depth > 5.39" for 25yr event
Inflow = 3.3 cfs @ 12.09 hrs, Volume= 11,903 cf
Outflow = 3.3 cfs @ 12.09 hrs, Volume= 11,903 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.3 cfs @ 12.09 hrs, Volume= 11,903 cf
Routed to Pond FB#1 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 429.02' @ 12.12 hrs
Flood Elev= 432.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	427.50'	**18.0" Round Culvert** L= 41.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 427.50' / 427.30' S= 0.0049 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=2.6 cfs @ 12.09 hrs HW=428.99' TW=428.88' (Dynamic Tailwater)
↑**1=Culvert** (Outlet Controls 2.6 cfs @ 1.84 fps)

Summary for Pond FB#1:

Inflow Area = 0.722 ac, 86.31% Impervious, Inflow Depth > 5.05" for 25yr event
Inflow = 3.7 cfs @ 12.09 hrs, Volume= 13,243 cf
Outflow = 3.6 cfs @ 12.10 hrs, Volume= 12,449 cf, Atten= 2%, Lag= 0.6 min
Primary = 3.6 cfs @ 12.10 hrs, Volume= 12,449 cf
Routed to Pond Basin#1 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 428.91' @ 12.29 hrs Surf.Area= 755 sf Storage= 1,071 cf
Flood Elev= 429.10' Surf.Area= 780 sf Storage= 1,214 cf

Plug-Flow detention time= 64.1 min calculated for 12,449 cf (94% of inflow)
Center-of-Mass det. time= 30.6 min (784.0 - 753.3)

Volume	Invert	Avail.Storage	Storage Description
#1	426.50'	1,214 cf	**FB #1 - 0% Voids (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
426.50	182	0	0
427.00	274	114	114
428.00	499	387	501
428.50	632	283	783
429.00	780	353	1,136
429.10	780	78	1,214

Device	Routing	Invert	Outlet Devices
#1	Primary	428.50'	**6.0' long x 7.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.40 2.52 2.70 2.68 2.68 2.67 2.66 2.65 2.65 2.65 2.66 2.65 2.66 2.68 2.70 2.73 2.78

Primary OutFlow Max=3.0 cfs @ 12.10 hrs HW=428.89' TW=428.72' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 3.0 cfs @ 1.28 fps)

Summary for Link POI #1:

Inflow Area = 0.889 ac, 70.13% Impervious, Inflow Depth > 3.30" for 25yr event
Inflow = 2.0 cfs @ 12.26 hrs, Volume= 10,653 cf
Primary = 2.0 cfs @ 12.26 hrs, Volume= 10,653 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Subcatchment PS-1A:

Runoff = 0.7 cfs @ 12.09 hrs, Volume= 2,305 cf, Depth> 3.81"
Routed to Pond Basin#1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50yr Rainfall=6.74"

Area (sf)	CN	Description
7,254	74	>75% Grass cover, Good, HSG C
7,254		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PS-1B:

Runoff = 0.6 cfs @ 12.09 hrs, Volume= 1,747 cf, Depth> 4.24"
Routed to Pond FB#1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50yr Rainfall=6.74"

Area (sf)	CN	Description
454	98	Roofs, HSG C
280	98	Paved parking, HSG C
4,215	74	>75% Grass cover, Good, HSG C
4,949	78	Weighted Average
4,215		85.17% Pervious Area
734		14.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PS-1C:

Runoff = 1.8 cfs @ 12.09 hrs, Volume= 6,457 cf, Depth> 6.50"
Routed to Pond CB#2 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50yr Rainfall=6.74"

Area (sf)	CN	Description
399	98	Paved parking, HSG C
11,435	98	Paved parking, HSG C
92	74	>75% Grass cover, Good, HSG C
11,926	98	Weighted Average
92		0.77% Pervious Area
11,834		99.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PS-1D:

Runoff = 2.2 cfs @ 12.09 hrs, Volume= 7,893 cf, Depth> 6.50"
Routed to Pond CB#1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50yr Rainfall=6.74"

Area (sf)	CN	Description
14,578	98	Paved parking, HSG C
14,578		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Pond Basin#1:

Inflow Area = 0.889 ac, 70.13% Impervious, Inflow Depth > 5.46" for 50yr event
Inflow = 5.0 cfs @ 12.10 hrs, Volume= 17,606 cf
Outflow = 2.7 cfs @ 12.23 hrs, Volume= 15,184 cf, Atten= 47%, Lag= 7.8 min
Discarded = 0.0 cfs @ 12.23 hrs, Volume= 1,215 cf
Primary = 2.6 cfs @ 12.23 hrs, Volume= 13,969 cf
Routed to Link POI #1 :
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link POI #1 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 429.03' @ 12.23 hrs Surf.Area= 4,453 sf Storage= 5,930 cf
Flood Elev= 430.10' Surf.Area= 5,714 sf Storage= 10,905 cf

Plug-Flow detention time= 119.9 min calculated for 15,152 cf (86% of inflow)
Center-of-Mass det. time= 60.8 min (844.7 - 783.9)

Volume	Invert	Avail.Storage	Storage Description
#1	427.00'	10,905 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
427.00	2,027	0	0
428.00	2,776	2,402	2,402
428.50	3,176	1,488	3,890
428.51	3,177	32	3,921
429.00	4,398	1,856	5,777
429.50	5,199	2,399	8,176
430.00	5,714	2,728	10,905

Device	Routing	Invert	Outlet Devices
#1	Discarded	427.00'	**0.300 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Device 4	427.93'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.70 0.70 1.17 Width (feet) 0.53 0.53 1.25 1.25
#3	Secondary	429.50'	**9.0' long + 3.0 '/' SideZ x 9.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.46 2.55 2.70 2.69 2.68 2.68 2.67 2.64 2.64 2.64 2.65 2.64 2.65 2.65 2.66 2.67 2.69
#4	Primary	425.20'	**15.0" Round Culvert** L= 15.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 425.20' / 425.00' S= 0.0133 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#5	Device 4	429.10'	**36.0" x 36.0" Horiz. OS RIM (3'x3' Horiz. Rim)** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.0 cfs @ 12.23 hrs HW=429.03' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=2.6 cfs @ 12.23 hrs HW=429.03' TW=0.00' (Dynamic Tailwater)
└**4=Culvert** (Passes 2.6 cfs of 10.6 cfs potential flow)
  ├**2=Custom Weir/Orifice** (Weir Controls 2.6 cfs @ 2.99 fps)
  └**5=OS RIM (3'x3' Horiz. Rim)** (Controls 0.0 cfs)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=427.00' TW=0.00' (Dynamic Tailwater)
└**3=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)

Summary for Pond CB#1:

Inflow Area = 0.335 ac,100.00% Impervious, Inflow Depth > 6.50" for 50yr event
Inflow = 2.2 cfs @ 12.09 hrs, Volume= 7,893 cf
Outflow = 2.2 cfs @ 12.09 hrs, Volume= 7,893 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.2 cfs @ 12.09 hrs, Volume= 7,893 cf
Routed to Pond CB#2 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 430.58' @ 12.09 hrs
Flood Elev= 434.10'

Device	Routing	Invert	Outlet Devices
#1	Primary	429.84'	**15.0" Round Culvert** L= 177.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 429.84' / 427.75' S= 0.0118 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=2.0 cfs @ 12.09 hrs HW=430.57' TW=429.10' (Dynamic Tailwater)
1=Culvert (Outlet Controls 2.0 cfs @ 3.93 fps)

Summary for Pond CB#2:

Inflow Area = 0.608 ac, 99.65% Impervious, Inflow Depth > 6.50" for 50yr event
Inflow = 3.9 cfs @ 12.09 hrs, Volume= 14,350 cf
Outflow = 3.9 cfs @ 12.09 hrs, Volume= 14,350 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.9 cfs @ 12.09 hrs, Volume= 14,350 cf
Routed to Pond FB#1 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 429.13' @ 12.12 hrs
Flood Elev= 432.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	427.50'	**18.0" Round Culvert** L= 41.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 427.50' / 427.30' S= 0.0049 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=3.0 cfs @ 12.09 hrs HW=429.10' TW=428.97' (Dynamic Tailwater)
1=Culvert (Outlet Controls 3.0 cfs @ 2.01 fps)

Summary for Pond FB#1:

Inflow Area = 0.722 ac, 86.31% Impervious, Inflow Depth > 6.14" for 50yr event
Inflow = 4.5 cfs @ 12.09 hrs, Volume= 16,097 cf
Outflow = 4.3 cfs @ 12.10 hrs, Volume= 15,301 cf, Atten= 4%, Lag= 0.6 min
Primary = 4.3 cfs @ 12.10 hrs, Volume= 15,301 cf
Routed to Pond Basin#1 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 429.05' @ 12.27 hrs Surf.Area= 780 sf Storage= 1,178 cf
Flood Elev= 429.10' Surf.Area= 780 sf Storage= 1,214 cf

Plug-Flow detention time= 55.8 min calculated for 15,301 cf (95% of inflow)
Center-of-Mass det. time= 27.2 min (778.0 - 750.7)

Volume	Invert	Avail.Storage	Storage Description
#1	426.50'	1,214 cf	**FB #1 - 0% Voids (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
426.50	182	0	0
427.00	274	114	114
428.00	499	387	501
428.50	632	283	783
429.00	780	353	1,136
429.10	780	78	1,214

Device	Routing	Invert	Outlet Devices
#1	Primary	428.50'	**6.0' long x 7.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.40 2.52 2.70 2.68 2.68 2.67 2.66 2.65 2.65 2.65 2.66 2.65 2.66 2.68 2.70 2.73 2.78

Primary OutFlow Max=3.1 cfs @ 12.10 hrs HW=428.98' TW=428.89' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 3.1 cfs @ 1.08 fps)

Summary for Link POI #1:

Inflow Area = 0.889 ac, 70.13% Impervious, Inflow Depth > 4.33" for 50yr event
Inflow = 2.6 cfs @ 12.23 hrs, Volume= 13,969 cf
Primary = 2.6 cfs @ 12.23 hrs, Volume= 13,969 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

LEGEND

- PROPERTY LINE
- LIMITS OF DRAINAGE SUBCATCHMENT
- SOIL GROUP BREAKLINE
- FLOW PATH (Tc LINE)
- REACH
- POI-1 — POINT OF INTEREST
- ES-1 — SUBCATCHMENT AREA
- EP-1 — POND, CULVERT, OR CATCH BASIN
- ER-1 — REACH

NOTES

1. PER NRCS WEB SOIL SURVEY THE ENTIRE SITE CONSISTS OF 446B SOILS.

PRE-DEVELOPMENT SUBCATCHMENT AREAS	
PS-1	15,065 SF.
TOTAL	15,065

SOIL LEGEND
(PER USDA NRCS WEB SOIL SURVEY)

SYMBOL	DESCRIPTION	HYDROLOGIC SOIL GROUP	DRAINAGE CLASS
446B	SCITUATE-NEWFIELDS COMPLEX 3% - 8% SLOPES, VERY STONY	B/C	MOD. WELL

STATE OF NEW HAMPSHIRE
NICHOLAS C. GOLON
No. 14086
LICENSED PROFESSIONAL ENGINEER
3/12/26

TAX MAP 9 LOT 45

PRE-DEVELOPMENT DRAINAGE MAP

TOWN HALL OFFICE & PARKING EXPANSION

268B MAMMOTH ROAD

OWNED BY

TOWN OF LONDONDERRY

PREPARED FOR

LONDONDERRY SAU 25

SCALE: 1"=30' **FEBRUARY 20, 2026**

HORIZONTAL SCALE 1"=30'
30 15 0 30

REV	DATE	DESCRIPTION	DR	CK

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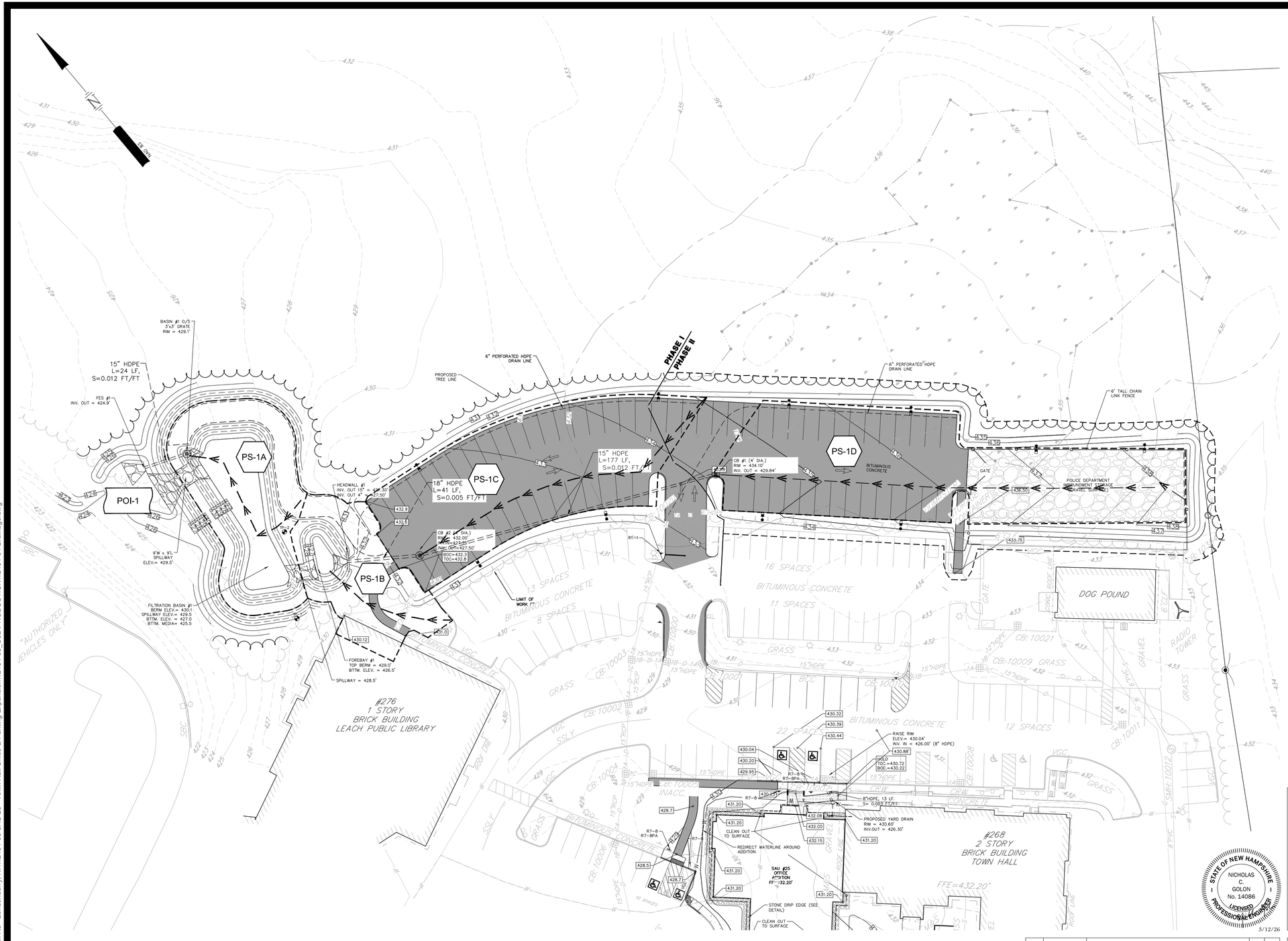
Bedford, NH 03110
Phone (603) 472-4488
www.tfmoran.com

FILE	DR	PS	CADFILE		
12434-04	CK	NG		12434-04 DRAINAGE	D-01

Mar 11, 2026 - 3:32pm
F:\TFM Projects\12434 Mammoth Rd - Londonderry, NH\12434-03 SAU 25 - Town Hall Office & Parking Expansion\12434-03_C3D\PRODUCTION\12434-04 Drainage.dwg



LEGEND

- PROPERTY LINE
- LIMITS OF DRAINAGE SUBCATCHMENT
- SOIL GROUP BREAKLINE
- FLOW PATH (Tc LINE)
- REACH
- POI-1 — POINT OF INTEREST
- PS-1 — SUBCATCHMENT AREA
- PP-1 — POND, CULVERT, OR CATCH BASIN
- PR-1 — REACH

NOTES

1. PER NRCS WEB SOIL SURVEY THE ENTIRE SITE CONSISTS OF 446B SOILS.

POST-DEVELOPMENT SUBCATCHMENT AREAS	
PS-1A	7,254 SF.
PS-1B	4,949 SF.
PS-1C	11,926 SF.
PS-1D	14,578 SF.
TOTAL	38,707 SF.

SOIL LEGEND (PER USDA NRCS WEB SOIL SURVEY)			
SYMBOL	DESCRIPTION	HYDROLOGIC SOIL GROUP	DRAINAGE CLASS
446B	SCITUATE–NEWFIELDS COMPLEX 3% – 8% SLOPES, VERY STONY	B/C	MOD. WELL

HORIZONTAL SCALE 1"=20'
20 10 0 20

TAX MAP 9 LOT 45

POST-DEVELOPMENT DRAINAGE MAP

TOWN HALL OFFICE & PARKING EXPANSION

268B MAMMOTH ROAD

OWNED BY

TOWN OF LONDONDERRY

PREPARED FOR

LONDONDERRY SAU 25

SCALE: 1"=30' **FEBRUARY 20, 2026**

STATE OF NEW HAMPSHIRE
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REV	DATE	DESCRIPTION	DR	CK

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FILE	DR	PS	CADFILE		
12434-04	CK	NG	–	12434-04 DRAINAGE	D-02

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