

JONES & BEACH ENGINEERS INC.

DRAINAGE ANALYSIS

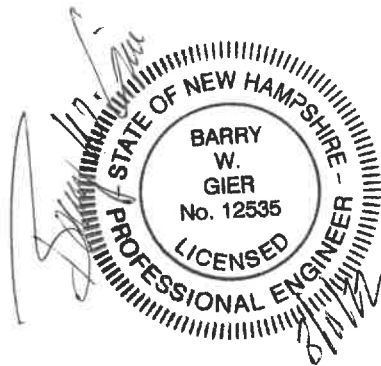
EROSION AND SEDIMENT CONTROL PLAN

ROCK IRON REPAIR

Project Tax Map 265 / Lot 11 & 12
Calef Highway
Barrington, NH

Prepared for:

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Prepared by:

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3/9/2022
JBE Project No. 21206

TABLE OF CONTENTS

1. USGS Map
2. Executive Summary
3. Surface Impairments Map
4. AoT Screening Layers Map
5. Web Soil Survey Map
6. Aerial Photography of Site
7. Representative Photographs of Site
8. Groundwater Recharge Volume Calculations
9. BMP Work Sheets
10. Drainage Analysis
 - 10.1. Introduction
 - 10.2. Methodology
 - 10.3. Existing Conditions Analysis
 - 10.4. Proposed Conditions Analysis
 - 10.5. Conclusion
 - 10.6. Drainage Appendix I – Pre-Development Conditions Analysis
 - 10.6.1. 2-Year – 24 Hour Summary Analysis
 - 10.6.2. 10-Year – 24 Hour Complete Analysis
 - 10.6.3. 25-Year – 24 Hour Summary Analysis
 - 10.6.4. 50-Year – 24 Hour Summary Analysis
 - 10.7. Drainage Appendix II – Proposed-Development Conditions Analysis
 - 10.7.1. 2-Year – 24 Hour Summary Analysis
 - 10.7.2. 10-Year – 24 Hour Complete Analysis
 - 10.7.3. 25-Year - 24 Hour Summary Analysis
 - 10.7.4. 50-Year – 24 Hour Summary Analysis
11. Extreme Precipitation Table
12. Rip-Rap Calculations
13. Operations and Maintenance Manual
14. Plans
 - 14.1. Design Plans
 - 14.2. Soil Plans
 - 14.2.1. Pre-Development Soil Plan
 - 14.2.2. Post-Development Soil Plan
 - 14.3. Drainage Plan
 - 14.3.1. Pre-Development Drainage Plan
 - 14.3.2. Post-Development Drainage Plan

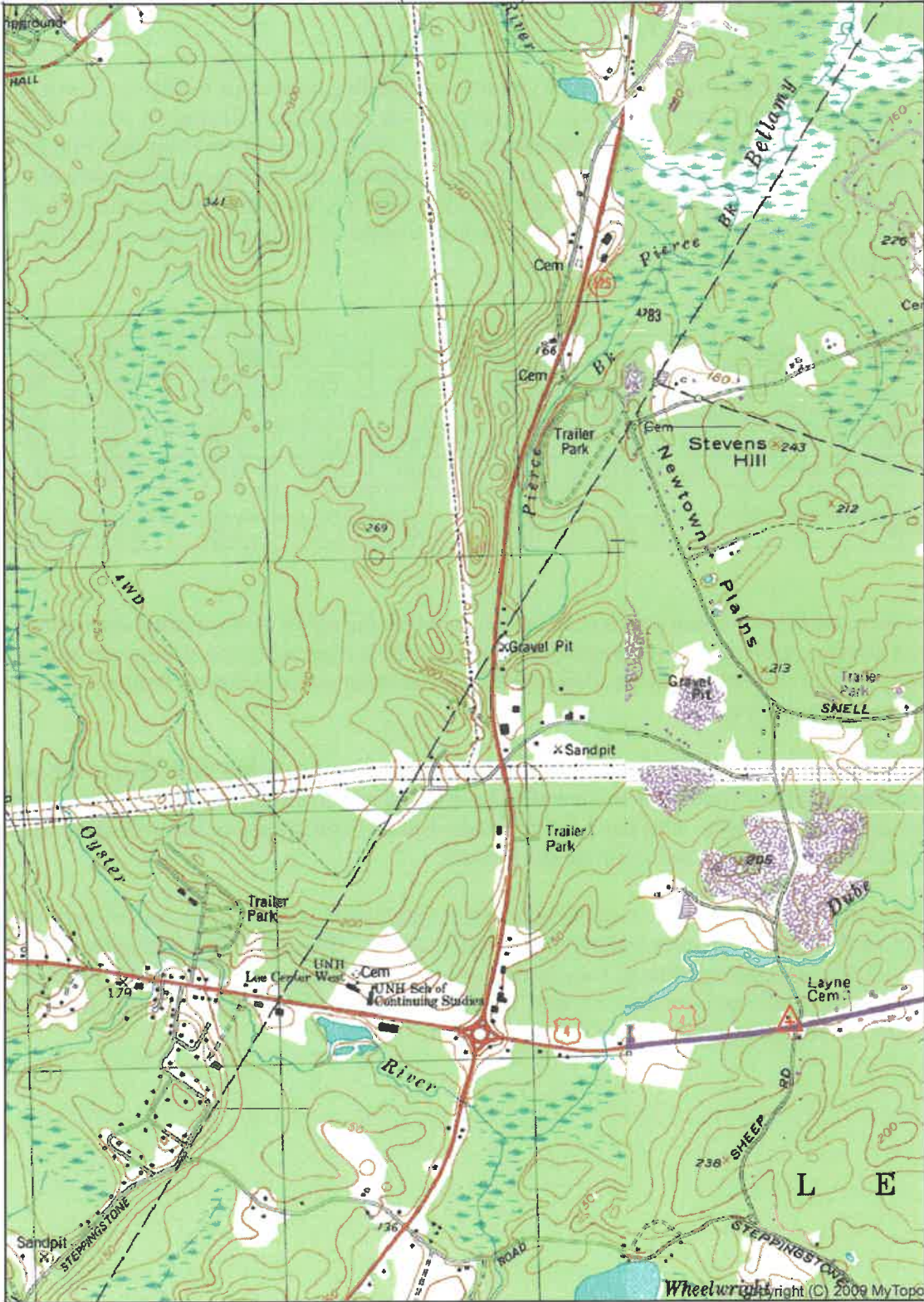
071° 01' 47.59" W
043° 11' 09.75" N

(BAXTER LAKE)

070° 59' 05.42" W
043° 11' 09.75" N

(NORTHWOOD)

(DOVER WEST)



043° 08' 22.18" N
071° 01' 47.59" W

(EPPING)

Printed: Wed Mar 02, 2022

070° 59' 05.42" W
043° 08' 22.18" N

(MT PAWUCKAWAY)

(NEWMARKET)

Produced by MyTopo Terrain Navigator
Topography based on USGS 1:24,000
Maps

North American 1983 Datum (NAD83)
Transverse Mercator Projection

To place on the predicted North American
1927 move the projection lines 9M N and
40M E

Declination



SCALE 1:24000



CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM 1929

BARRINGTON, NH
1995

EXECUTIVE SUMMARY

The purpose of this project is to construct a commercial welding and repair facility on Town of Barrington Tax Map 265, Lots 11 and 12. The proposed development will contain one 3,600 sq.ft. building, with associated parking, drainage, and utilities. Two models were compiled, one for the area in its existing (pre-development) condition, and a second for its proposed (post-development) condition. The analysis was conducted using the USDA SCS TR-20 method within the HydroCAD Stormwater Modeling System environment. A summary of the existing and proposed conditions peak rates of runoff is as follows:

Analysis Point	2-Year		10-Year		25-Year		50-Year	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Analysis Point #1	0.00	0.00	0.02	0.02	0.15	0.16*	0.60	0.47
Analysis Point #2	0.13	0.15*	0.71	0.43	1.32	0.70	1.96	0.96
Analysis Point #3	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01
Total	0.13	0.15	0.73	0.45	1.47	0.86	2.57	1.44

* Minor increase in post-construction peak rate of runoff is the result of stormwater downgrade of the proposed drainage system. All proposed development area is directed to the stormwater treatment and infiltration system. No stormwater is discharged from the stormwater treatment features at the 2, 10, and 25-year storm events.

The drainage design intent for this site is to maintain the post-development peak flow to the pre-development peak flow conditions to the extent practicable and to effectively treat stormwater from the development of this project. This has been accomplished through the use of an infiltration basin to maintain the peak discharge and infiltrate stormwater.

In addition, the potential for increased erosion and sedimentation is handled by way of vegetated treatment swales and riprap inlet and outlet protection aprons. The use of Best Management Practices per the NHDES Stormwater Manual have been applied to the design of this drainage system and will be observed during all stages of construction. Existing wetlands and abutting property owners will suffer minimal impact resultant from this development.

Surface Impairments Map



Legend

- Designated Rivers Quarter Buffer
- Public Water Supply Wells
- Groundwater Classification / GA1
- Groundwater Classification / GA2
- Water Supply Intake Protect Areas
- Wellhead Protection Areas
- Class A Lakes with a Quarter Buffer
- Class A - All Features
- All Lakes, with a Quarter Mile Buffer
- Outstanding Resource Water Watersheds
- Surface Waters with Impairment 2016 with Quarter Mile Buffer
- Watersheds with Chloride Impairments 2016

Map Scale

1: 12,988



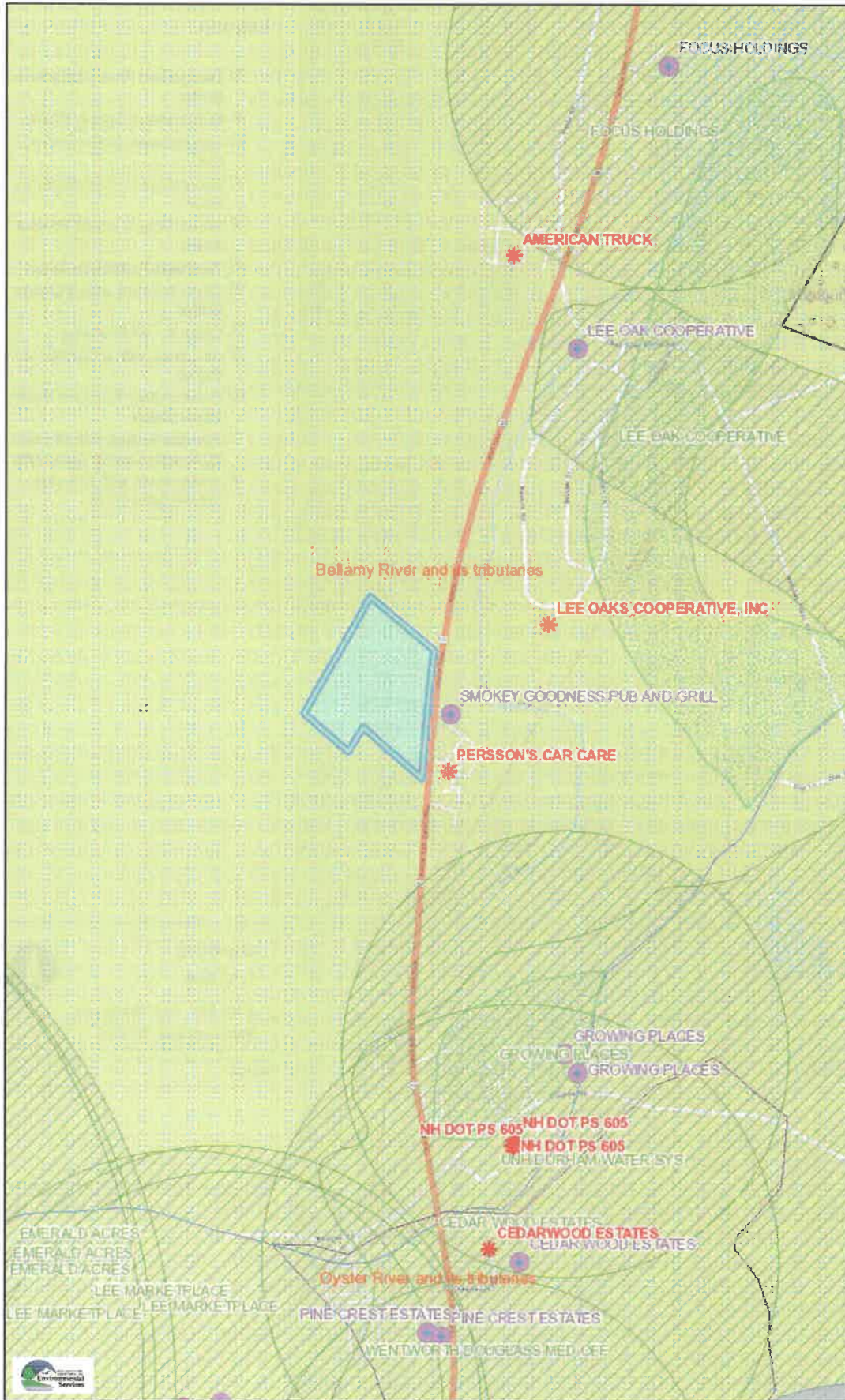
© NH DES, <http://des.nh.gov>

Map Generated: 3/2/2022

Notes



Aot Screening Layers



Legend

- ★ Remediation Sites
- ☒ Coastal and Great Bay Regi Communities
- Designated Rivers Quarterr Buffer
- Public Water Supply Wells
- Groundwater Classification / GA1
- Groundwater Classification / GA2
- ☒ Water Supply Intake Protect Areas
- Wellhead Protection Areas
- ☒ Class A Lakes with a Quarte Buffer
- ☐ Class A - All Features
- All Lakes, with a Quarter Mil Buffer
- ☒ Outstanding Resource Wate Watersheds
- ☒ Surface Waters with Impairn 2016 with Quarter Mile Buffe
- ☒ Watersheds with Chloride Impairments 2016

Map Scale

1: 10,000

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Map Generated: 3/2/2022



Notes

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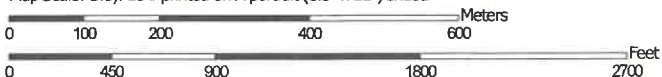
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Soil Map—Strafford County, New Hampshire



Map Scale: 1:9,710 if printed on A portrait (8.5" x 11") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

- Area of Interest (AOI)
- Area of Interest (AOI)
- Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points
- Special Point Features**
 - Blowout
 - Borrow Pit
 - Clay Spot
 - Closed Depression
 - Gravel Pit
 - Gravelly Spot
 - Landfill
 - Lava Flow
 - Marsh or swamp
 - Mine or Quarry
 - Miscellaneous Water
 - Perennial Water
 - Rock Outcrop
 - Saline Spot
 - Sandy Spot
 - Severely Eroded Spot
 - Sinkhole
 - Slide or Slip
 - Sodic Spot

- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features
- Water Features**
 - Streams and Canals
- Transportation**
 - Rails
 - Interstate Highways
 - US Routes
 - Major Roads
 - Local Roads
- Background**
 - Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Strafford County, New Hampshire
 Survey Area Data: Version 22, Aug 31, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 31, 2009—Sep 9, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
GIC	Gloucester fine sandy loam, 8 to 15 percent slopes	2.9	0.6%
GsB	Gloucester very stony fine sandy loam, 3 to 8 percent slopes	188.5	39.1%
GsC	Gloucester very stony fine sandy loam, 8 to 15 percent slopes	17.8	3.7%
GsD	Gloucester very stony fine sandy loam, 15 to 25 percent slopes	24.1	5.0%
Gv	Gravel and borrow pits	18.1	3.7%
HaA	Hinckley loamy sand, 0 to 3 percent slopes	40.1	8.3%
HaB	Hinckley loamy sand, 3 to 8 percent slopes	62.6	13.0%
HaC	Hinckley loamy sand, 8 to 15 percent slopes	11.6	2.4%
LeA	Leicester very stony fine sandy loam, 0 to 3 percent slopes	35.2	7.3%
Mp	Freetown and Swansea mucky peats, 0 to 2 percent slopes	33.8	7.0%
Sb	Saugatuck loamy sand	11.9	2.5%
WdA	Windsor loamy sand, 0 to 3 percent slopes	25.2	5.2%
WdC	Windsor loamy sand, 8 to 15 percent slopes	10.1	2.1%
Totals for Area of Interest		482.0	100.0%

Aerial Map



Legend

Parcels

Parcel Polygons

Attributes for Additional Lines

Map Scale

1: 10,000

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Map Generated: 3/2/2022



Notes

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GROUNDWATER RECHARGE VOLULME (GRV) CALCULATION (Env-Wq 1507.04)

0.35	ac	Area of HSG A soil that was replaced by impervious cover	0.40"
	ac	Area of HSG B soil that was replaced by impervious cover	0.25"
	ac	Area of HSG C soil that was replaced by impervious cover	0.10"
	ac	Area of HSG D soil or impervious cover that was replaced by impervious cover	0.0"
0.40 inches		Rd = Weighted groundwater recharge depth	
0.1418 ac-in		GRV = AI * Rd	
515 cf		GRV conversion (ac-in x 43,560 sf/ac x 1ft/12")	

Provide calculations below showing that the project meets the groundwater recharge requirements (Env-Wq 1507.04):

Infiltraton Basin #1: 3,482 CF provided

Total = 3,482 CF provided



INFILTRATION PRACTICE CRITERIA (Env-Wq 1508.06)

Type/Node Name: 1P- Infiltration Basin #1

Enter the type of infiltration practice (e.g., basin, trench) and the node name in the drainage analysis, if applicable.

YES	Have you reviewed Env-Wq 1508.06(a) to ensure that infiltration is allowed?	← yes
2.13 ac	A = Area draining to the practice	
0.17 ac	A _i = Impervious area draining to the practice	
0.08 decimal	I = Percent impervious area draining to the practice, in decimal form	
0.12 unitless	R _v = Runoff coefficient = 0.05 + (0.9 x I)	
0.26 ac-in	WQV = 1" x R _v x A	
955 cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
239 cf	25% x WQV (check calc for sediment forebay volume)	
FOREBAY		
	Method of pretreatment? (not required for clean or roof runoff)	
317 cf	V _{SED} = Sediment forebay volume, if used for pretreatment	≥ 25%WQV
3,482 cf	V = Volume ¹ (attach a stage-storage table)	≥ WQV
2,992 sf	A _{SA} = Surface area of the bottom of the pond	
3.00 iph	K _{sat} _{DESIGN} = Design infiltration rate ⁴	
1.3 hours	I _{DRAIN} = Drain time = V / (A _{SA} × I _{DESIGN})	< 72-hrs
199.00 feet	E _{BTM} = Elevation of the bottom of the basin	
196.00 feet	E _{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
196.00 feet	E _{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
3.00 feet	D _{SHWT} = Separation from SHWT	≥ *³
3.0 feet	D _{ROCK} = Separation from bedrock	≥ *³
- ft	D _{amend} = Depth of amended soil, if applicable due high infiltration rate	≥ 24"
- ft	D _T = Depth of trench, if trench proposed	4 - 10 ft
N/A Yes/No	If a trench or underground system is proposed, has observation well been provided?	← yes
	If a trench is proposed, does material meet Env-Wq 1508.06(k)(2) requirements. ⁴	← yes
Y Yes/No	If a basin is proposed, Is the perimeter curvilinear, and basin floor flat?	← yes
3.0 :1	If a basin is proposed, pond side slopes.	≥3:1
199.40 ft	Peak elevation of the 10-year storm event (infiltration can be used in analysis)	
200.48 ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
201.00 ft	Elevation of the top of the practice (if a basin, this is the elevation of the berm)	
YES	10 peak elevation ≤ Elevation of the top of the trench? ⁵	← yes
YES	If a basin is proposed, 50-year peak elevation ≤ Elevation of berm?	← yes

- Volume below the lowest invert of the outlet structure and excludes forebay volume
- K_{sat}_{DESIGN} includes a factor of safety. See Env-Wq 1504.14 for requirements for determining the infiltr. rate
- 1' separation if treatment not required; 4' for treatment in GPAs & WSIPAs; & 3' in all other areas.
- Clean, washed well graded diameter of 1.5 to 3 inches above the in-situ soil.
- If 50-year peak elevation exceeds top of trench, the overflow must be routed in HydroCAD as secondary discharge.

Designer's Notes: _____

21206-PR-DRAINAGE

Prepared by Jones & Beach Engineers

HydroCAD® 10.10-4a s/n 10589 © 2020 HydroCAD Software Solutions LLC

Type III 24-hr 100-YR Rainfall=8.45"

Printed 3/2/2022

Stage-Area-Storage for Pond 1F: FOREBAY #1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
199.00	81	0	200.06	265	173
199.02	83	2	200.08	271	179
199.04	86	3	200.10	276	184
199.06	89	5	200.12	281	190
199.08	91	7	200.14	286	195
199.10	94	9	200.16	292	201
199.12	96	11	200.18	297	207
199.14	99	13	200.20	303	213
199.16	102	15	200.22	308	219
199.18	105	17	200.24	314	225
199.20	107	19	200.26	320	232
199.22	110	21	200.28	325	238
199.24	113	23	200.30	331	245
199.26	116	25	200.32	337	251
199.28	119	28	200.34	343	258
199.30	122	30	200.36	349	265
199.32	125	33	200.38	355	272
199.34	128	35	200.40	361	279
199.36	131	38	200.42	367	287
199.38	134	40	200.44	373	294
199.40	137	43	200.46	379	301
199.42	141	46	200.48	385	309
199.44	144	49	200.50	392	317
199.46	147	52	200.52	398	325
199.48	151	55	200.54	404	333
199.50	154	58	200.56	411	341
199.52	157	61	200.58	417	349
199.54	161	64	200.60	424	358
199.56	164	67	200.62	430	366
199.58	168	71	200.64	437	375
199.60	171	74	200.66	444	384
199.62	175	77	200.68	450	393
199.64	178	81	200.70	457	402
199.66	182	85	200.72	464	411
199.68	186	88	200.74	471	420
199.70	190	92	200.76	478	430
199.72	193	96	200.78	485	439
199.74	197	100	200.80	492	449
199.76	201	104	200.82	499	459
199.78	205	108	200.84	506	469
199.80	209	112	200.86	513	479
199.82	213	116	200.88	521	490
199.84	217	120	200.90	528	500
199.86	221	125	200.92	535	511
199.88	225	129	200.94	543	521
199.90	229	134	200.96	550	532
199.92	233	138	200.98	557	543
199.94	237	143	201.00	565	555
199.96	241	148	201.02		
199.98	246	153			
200.00	250	158			
200.02	255	163			
200.04	260	168			

Lowest Outlet= 200.50

25% WQV= 239 cu.ft.

Vol Prov'd= 317 cu.ft.

21206-PR-DRAINAGE

Type III 24-hr 100-YR Rainfall=8.45"

Prepared by Jones & Beach Engineers

Printed 3/2/2022

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Stage-Area-Storage for Pond 1P: INFILTRATION BASIN #1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
199.00	2,992	0	200.06	4,057	3,724
199.02	3,011	60	200.08	4,077	3,805
199.04	3,029	120	200.10	4,097	3,887
199.06	3,048	181	200.12	4,118	3,969
199.08	3,067	242	200.14	4,138	4,052
199.10	3,086	304	200.16	4,158	4,135
199.12	3,105	366	200.18	4,179	4,218
199.14	3,124	428	200.20	4,199	4,302
199.16	3,143	491	200.22	4,220	4,386
199.18	3,162	554	200.24	4,240	4,471
199.20	3,181	617	200.26	4,261	4,556
199.22	3,201	681	200.28	4,282	4,641
199.24	3,220	745	200.30	4,302	4,727
199.26	3,239	810	200.32	4,323	4,813
199.28	3,259	875	200.34	4,344	4,900
199.30	3,278	940	200.36	4,365	4,987
199.32	3,298	1,006	200.38	4,385	5,074
199.34	3,317	1,072	200.40	4,406	5,162
199.36	3,337	1,139	200.42	4,427	5,251
199.38	3,357	1,206	200.44	4,448	5,340
199.40	3,377	1,273	200.46	4,470	5,429
199.42	3,396	1,341	200.48	4,491	5,518
199.44	3,416	1,409	200.50	4,512	5,608
199.46	3,436	1,477	200.52	4,533	5,699
199.48	3,456	1,546	200.54	4,554	5,790
199.50	3,476	1,616	200.56	4,576	5,881
199.52	3,496	1,685	200.58	4,597	5,973
199.54	3,517	1,755	200.60	4,619	6,065
199.56	3,537	1,826	200.62	4,640	6,157
199.58	3,557	1,897	200.64	4,662	6,250
199.60	3,578	1,968	200.66	4,683	6,344
199.62	3,598	2,040	200.68	4,705	6,438
199.64	3,618	2,112	200.70	4,727	6,532
199.66	3,639	2,185	200.72	4,748	6,627
199.68	3,660	2,258	200.74	4,770	6,722
199.70	3,680	2,331	200.76	4,792	6,818
199.72	3,701	2,405	200.78	4,814	6,914
199.74	3,722	2,479	200.80	4,836	7,010
199.76	3,743	2,554	200.82	4,858	7,107
199.78	3,763	2,629	200.84	4,880	7,205
199.80	3,784	2,704	200.86	4,902	7,302
199.82	3,805	2,780	200.88	4,924	7,401
199.84	3,826	2,857	200.90	4,946	7,499
199.86	3,848	2,933	200.92	4,969	7,598
199.88	3,869	3,010	200.94	4,991	7,698
199.90	3,890	3,088	200.96	5,013	7,798
199.92	3,911	3,166	200.98	5,036	7,899
199.94	3,933	3,245	201.00		
199.96	3,954	3,323			
199.98	3,975	3,403			
200.00	3,997	3,482			
200.02	4,017	3,563			
200.04	4,037	3,643			

Lowest Outlet= 200.00
 WQV Req'd= 955 cu.ft.
 WQV Prov'd= 3,482 cu.ft.



10. DRAINAGE ANALYSIS

10.1 INTRODUCTION

The purpose of this project is to construct a commercial welding and repair facility on Town of Barrington Tax Map 265, Lots 11 and 12. The proposed development will contain one 3,600 sq.ft. building, with associated parking, drainage, and utilities. This project will be serviced by on site sewer and water.

10.2 METHODOLOGY

The existing and proposed watersheds were modeled utilizing HydroCad stormwater software, version 9.10. The watersheds were analyzed utilizing the SCS TR-20 methodology for hydrograph development and the TR-55 methodology for Time of Concentration (Tc) determination. The Dynamic-Storage-Indicating method for reach and pond routing was utilized. Type III, 24-hour hydrographs were developed for the 2-year, 10-year, 25-year, and 50-year storm events, corresponding to rainfall events of 3.09", 4.66", 5.91", and 7.06" respectively.

Existing topography and site features were obtained through aerial topography and on-ground topography completed by Jones & Beach Engineers. Existing soil conditions were derived from the NRCS Web Soil Survey.

10.3 EXISTING CONDITIONS ANALYSIS

The study area consists of the subject property and upstream contributing area. The study area contains 3.96 acres including offsite contributing areas. The existing site is currently undeveloped and is mostly forested. All soils for this site are described as Hydrological Soils "A". The existing site contains a high point located to the north of the subject parcel. The site drains from north to south from this high point resulting in the Analysis Points as defined below.

Three (3) Analysis Points (AP's) were defined for this project. Analysis Points are described as below:

Analysis Point #1 is defined as the wetland boundary located on the northwest side of the subject parcel. Stormwater from the local high point drains overland to this point.

Analysis Point #2 is defined as discharge from the existing swale located near Calef highway at the northeast corner of the site. Stormwater south of the ridgeline central to the site drain to this point.

Analysis Point #3 is defined as the northwest property line. A small portion of the study area drains to this point.

10.4 PROPOSED CONDITIONS ANALYSIS

The purpose of this project is to construct a commercial welding and repair facility on Town of Barrington Tax Map 265, Lots 11 and 12. The proposed development will contain one 3,600 sq.ft. building, with associated parking, drainage, and utilities.

The addition of the proposed impervious paved areas and buildings causes an increase in the curve number (C_n) and a decrease in the time of concentration (T_c), the net result being a potential increase in peak rates of runoff from the site. To mitigate the potential increase in the peak rate of runoff and to effectively treat the subsequent stormwater runoff the following Best Management Practices (BMP's) have been employed at the Analysis Points as follows:

The gravel pad located in the northwest portion of the site is crowned and swales line both sides. The eastern swale drains to P-201 which conveys stormwater to Forebay #1 (F1). The western swale drains to P-202 which conveys stormwater to Forebay #1. The parking area at the southern end of the development is superelevated and stormwater flows overland directly to Forebay #1. Forebay #1 drains to Infiltration Basin #1 (P1). Infiltration Basin #1 is released by Outlet Structure #1 to Analysis Point #1.

A portion of the site near the proposed entrance along Calef Highway is downgrade of the proposed drainage system. Stormwater drains overland directly to Analysis Point #2.

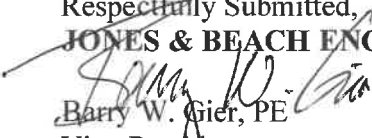
The western portion of the site contributing to Analysis Point #3 remains mostly unchanged.

10.5 CONCLUSION

This proposed site development will have minimal adverse effect on abutting infrastructures or properties by way of stormwater runoff or siltation if properly constructed in accordance with this Drainage Analysis and approved project plan set. The post-construction peak rate of runoff for the site will be lower than the existing conditions for all analyzed storm events, with the exception of AP-2 and AP-1 at the 2-year and 25-year storm event respectively*. Appropriate steps will be taken to control erosion and sedimentation; these will be accomplished through the construction of a drainage system consisting of site grading, piping, vegetated treatment swales, an infiltration basin, and riprap outlet protection aprons. The use of Best Management Practices developed by the State of New Hampshire have been utilized in the design of this system and their application will be enforced with regular inspections throughout the construction process.

* Minor increase in post-construction peak rate of runoff is the result of stormwater downgrade of the proposed drainage system. All proposed development area is directed to the stormwater treatment and infiltration system. No stormwater is discharged from the stormwater treatment features at the 2, 10, and 25-year storm event.

Respectfully Submitted,
JONES & BEACH ENGINEERS, INC.



Barry W. Gier, PE
Vice-President

14.6 DRAINAGE CALCUALTIONS

PRE-DEVELOPMENT CONDITIONS ANALYSIS

- 14.6.1 2-Year 24-Hour Summary Analysis
- 14.6.2 10-Year 24-Hour Complete Analysis
- 14.6.3 25-Year 24-Hour Summary Analysis
- 14.6.4 50-Year 24-Hour Summary Analysis



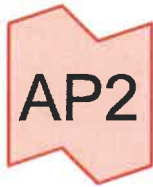
EX-WS-1S



AP-1



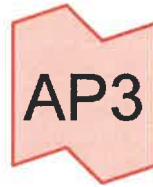
EX-WS-2S



AP-2



EX-WS-3S



AP-3



21206-EX-DRAINAGE

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Page 2

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
38,561	39	>75% Grass cover, Good, HSG A (1S, 2S, 3S)
9,821	96	Gravel surface, HSG A (1S, 2S)
10,778	98	Paved parking, HSG A (1S, 2S)
113,390	30	Woods, Good, HSG A (1S, 2S, 3S)
172,550	40	TOTAL AREA

21206-EX-DRAINAGE

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
172,550	HSG A	1S, 2S, 3S
0	HSG B	
0	HSG C	
0	HSG D	
0	Other	
172,550		TOTAL AREA

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Type III 24-hr 2-YR Rainfall=3.09"

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Page 4

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: EX-WS-1S

Runoff Area=124,623 sf 4.22% Impervious Runoff Depth=0.00"
Flow Length=650' Tc=19.1 min CN=36 Runoff=0.00 cfs 0 cf

Subcatchment 2S: EX-WS-2S

Runoff Area=34,331 sf 16.09% Impervious Runoff Depth>0.29"
Flow Length=230' Tc=10.0 min CN=59 Runoff=0.13 cfs 820 cf

Subcatchment 3S: EX-WS-3S

Runoff Area=13,596 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=298' Tc=12.5 min CN=31 Runoff=0.00 cfs 0 cf

Link AP1: AP-1

Inflow=0.00 cfs 0 cf
Primary=0.00 cfs 0 cf

Link AP2: AP-2

Inflow=0.13 cfs 820 cf
Primary=0.13 cfs 820 cf

Link AP3: AP-3

Inflow=0.00 cfs 0 cf
Primary=0.00 cfs 0 cf

Total Runoff Area = 172,550 sf Runoff Volume = 820 cf Average Runoff Depth = 0.06"
93.75% Pervious = 161,772 sf 6.25% Impervious = 10,778 sf

21206-EX-DRAINAGE

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Type III 24-hr 10-YR Rainfall=4.66"

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Page 1

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: EX-WS-1S

Runoff Area=124,623 sf 4.22% Impervious Runoff Depth>0.04"
Flow Length=650' Tc=19.1 min CN=36 Runoff=0.02 cfs 438 cf

Subcatchment 2S: EX-WS-2S

Runoff Area=34,331 sf 16.09% Impervious Runoff Depth>0.94"
Flow Length=230' Tc=10.0 min CN=59 Runoff=0.71 cfs 2,679 cf

Subcatchment 3S: EX-WS-3S

Runoff Area=13,596 sf 0.00% Impervious Runoff Depth>0.00"
Flow Length=298' Tc=12.5 min CN=31 Runoff=0.00 cfs 0 cf

Link AP1: AP-1

Inflow=0.02 cfs 438 cf
Primary=0.02 cfs 438 cf

Link AP2: AP-2

Inflow=0.71 cfs 2,679 cf
Primary=0.71 cfs 2,679 cf

Link AP3: AP-3

Inflow=0.00 cfs 0 cf
Primary=0.00 cfs 0 cf

Total Runoff Area = 172,550 sf Runoff Volume = 3,117 cf Average Runoff Depth = 0.22"
93.75% Pervious = 161,772 sf 6.25% Impervious = 10,778 sf

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Type III 24-hr 10-YR Rainfall=4.66"

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Page 2

Summary for Subcatchment 1S: EX-WS-1S

Runoff = 0.02 cfs @ 15.55 hrs, Volume= 438 cf, Depth> 0.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.66"

Area (sf)	CN	Description
5,254	98	Paved parking, HSG A
20,866	39	>75% Grass cover, Good, HSG A
2,506	96	Gravel surface, HSG A
95,997	30	Woods, Good, HSG A
124,623	36	Weighted Average
119,369		95.78% Pervious Area
5,254		4.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	100	0.1600	0.18		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.09"
1.7	216	0.1800	2.12		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.0	84	0.0200	0.71		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
5.9	250	0.0200	0.71		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
19.1	650	Total			

Summary for Subcatchment 2S: EX-WS-2S

Runoff = 0.71 cfs @ 12.16 hrs, Volume= 2,679 cf, Depth> 0.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.66"

Area (sf)	CN	Description
5,524	98	Paved parking, HSG A
16,279	39	>75% Grass cover, Good, HSG A
7,315	96	Gravel surface, HSG A
5,213	30	Woods, Good, HSG A
34,331	59	Weighted Average
28,807		83.91% Pervious Area
5,524		16.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	100	0.1800	0.18		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.09"
0.9	130	0.2200	2.35		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
10.0	230	Total			

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Type III 24-hr 10-YR Rainfall=4.66"

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Page 3

Summary for Subcatchment 3S: EX-WS-3S

[73] Warning: Peak may fall outside time span

Runoff = 0.00 cfs @ 20.00 hrs, Volume= 0 cf, Depth> 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.66"

Area (sf)	CN	Description
1,416	39	>75% Grass cover, Good, HSG A
12,180	30	Woods, Good, HSG A
13,596	31	Weighted Average
13,596		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.7	100	0.1200	0.16		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.09"
1.8	198	0.1400	1.87		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
12.5	298	Total			

Summary for Link AP1: AP-1

Inflow Area = 124,623 sf, 4.22% Impervious, Inflow Depth > 0.04" for 10-YR event
 Inflow = 0.02 cfs @ 15.55 hrs, Volume= 438 cf
 Primary = 0.02 cfs @ 15.55 hrs, Volume= 438 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link AP2: AP-2

Inflow Area = 34,331 sf, 16.09% Impervious, Inflow Depth > 0.94" for 10-YR event
 Inflow = 0.71 cfs @ 12.16 hrs, Volume= 2,679 cf
 Primary = 0.71 cfs @ 12.16 hrs, Volume= 2,679 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link AP3: AP-3

Inflow Area = 13,596 sf, 0.00% Impervious, Inflow Depth > 0.00" for 10-YR event
 Inflow = 0.00 cfs @ 20.00 hrs, Volume= 0 cf
 Primary = 0.00 cfs @ 20.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

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Type III 24-hr 25-YR Rainfall=5.91"

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Page 5

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: EX-WS-1S

Runoff Area=124,623 sf 4.22% Impervious Runoff Depth>0.22"
Flow Length=650' Tc=19.1 min CN=36 Runoff=0.15 cfs 2,261 cf

Subcatchment 2S: EX-WS-2S

Runoff Area=34,331 sf 16.09% Impervious Runoff Depth>1.62"
Flow Length=230' Tc=10.0 min CN=59 Runoff=1.32 cfs 4,625 cf

Subcatchment 3S: EX-WS-3S

Runoff Area=13,596 sf 0.00% Impervious Runoff Depth>0.06"
Flow Length=298' Tc=12.5 min CN=31 Runoff=0.00 cfs 69 cf

Link AP1: AP-1

Inflow=0.15 cfs 2,261 cf
Primary=0.15 cfs 2,261 cf

Link AP2: AP-2

Inflow=1.32 cfs 4,625 cf
Primary=1.32 cfs 4,625 cf

Link AP3: AP-3

Inflow=0.00 cfs 69 cf
Primary=0.00 cfs 69 cf

Total Runoff Area = 172,550 sf Runoff Volume = 6,954 cf Average Runoff Depth = 0.48"
93.75% Pervious = 161,772 sf 6.25% Impervious = 10,778 sf

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Type III 24-hr 50-YR Rainfall=7.06"

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Page 6

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: EX-WS-1S

Runoff Area=124,623 sf 4.22% Impervious Runoff Depth>0.48"
Flow Length=650' Tc=19.1 min CN=36 Runoff=0.60 cfs 4,998 cf

Subcatchment 2S: EX-WS-2S

Runoff Area=34,331 sf 16.09% Impervious Runoff Depth>2.33"
Flow Length=230' Tc=10.0 min CN=59 Runoff=1.96 cfs 6,667 cf

Subcatchment 3S: EX-WS-3S

Runoff Area=13,596 sf 0.00% Impervious Runoff Depth>0.21"
Flow Length=298' Tc=12.5 min CN=31 Runoff=0.01 cfs 242 cf

Link AP1: AP-1

Inflow=0.60 cfs 4,998 cf
Primary=0.60 cfs 4,998 cf

Link AP2: AP-2

Inflow=1.96 cfs 6,667 cf
Primary=1.96 cfs 6,667 cf

Link AP3: AP-3

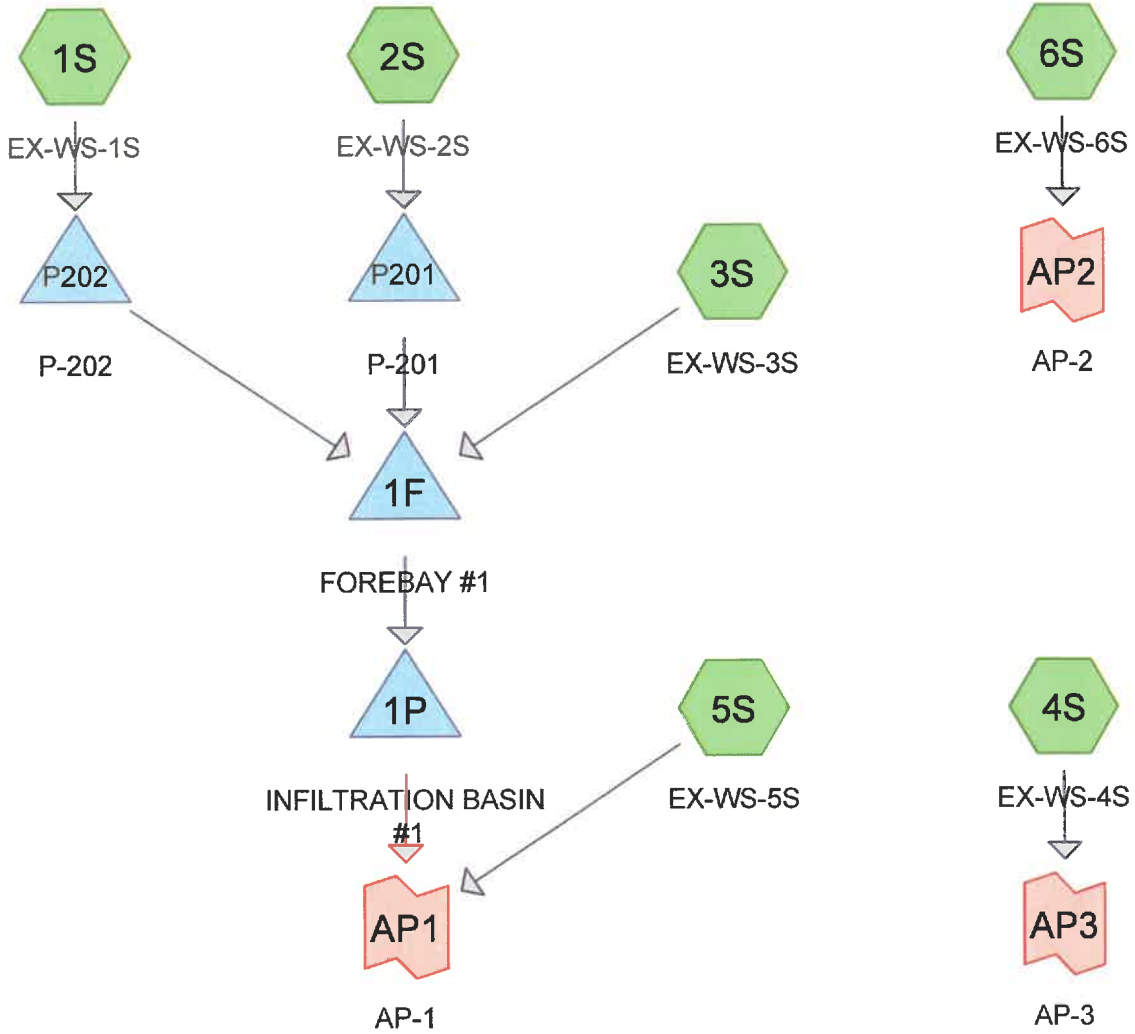
Inflow=0.01 cfs 242 cf
Primary=0.01 cfs 242 cf

Total Runoff Area = 172,550 sf Runoff Volume = 11,907 cf Average Runoff Depth = 0.83"
93.75% Pervious = 161,772 sf 6.25% Impervious = 10,778 sf

14.7 APPENDIX II

POST-DEVELOPMENT CONDITIONS ANALYSIS

- 14.7.1 2-Year 24-Hour Summary Analysis
- 14.7.2 10-Year 24-Hour Complete Analysis
- 14.7.3 25-Year 24-Hour Summary Analysis
- 14.7.4 50-Year 24-Hour Summary Analysis



Routing Diagram for 21206-PR-DRAINAGE
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Page 2

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
66,732	39	>75% Grass cover, Good, HSG A (1S, 2S, 3S, 5S, 6S)
19,554	96	Gravel surface, HSG A (1S, 2S)
14,299	98	Paved roads w/curbs & sewers, HSG A (3S, 5S, 6S)
3,862	98	Roofs, HSG A (1S, 2S)
68,103	30	Woods, Good, HSG A (2S, 3S, 4S, 5S)
172,550	48	TOTAL AREA

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Page 3

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
172,550	HSG A	1S, 2S, 3S, 4S, 5S, 6S
0	HSG B	
0	HSG C	
0	HSG D	
0	Other	
172,550		TOTAL AREA

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Type III 24-hr 2-YR Rainfall=3.09"

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Page 4

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Pond 1F: FOREBAY #1 Peak Elev=200.56' Storage=341 cf Inflow=0.25 cfs 1,576 cf
 Outflow=0.14 cfs 1,253 cf

Pond 1P: INFILTRATIONBASIN #1 Peak Elev=199.01' Storage=34 cf Inflow=0.14 cfs 1,253 cf
 Discarded=0.12 cfs 1,247 cf Primary=0.00 cfs 0 cf Secondary=0.00 cfs 0 cf Outflow=0.12 cfs 1,247 cf

Subcatchment 1S: EX-WS-1S Runoff Area=24,227 sf 7.97% Impervious Runoff Depth>0.48"
 Flow Length=397' Tc=7.6 min CN=65 Runoff=0.25 cfs 979 cf

Subcatchment 2S: EX-WS-2S Runoff Area=39,526 sf 4.89% Impervious Runoff Depth>0.18"
 Flow Length=591' Tc=31.0 min CN=55 Runoff=0.05 cfs 589 cf

Subcatchment 3S: EX-WS-3S Runoff Area=15,736 sf 11.60% Impervious Runoff Depth>0.01"
 Tc=7.0 min CN=43 Runoff=0.00 cfs 9 cf

Subcatchment 4S: EX-WS-4S Runoff Area=12,571 sf 0.00% Impervious Runoff Depth=0.00"
 Flow Length=298' Tc=12.2 min CN=30 Runoff=0.00 cfs 0 cf

Subcatchment 5S: EX-WS-5S Runoff Area=65,561 sf 8.12% Impervious Runoff Depth=0.00"
 Flow Length=283' Tc=16.9 min CN=38 Runoff=0.00 cfs 0 cf

Subcatchment 6S: EX-WS-6S Runoff Area=14,929 sf 47.89% Impervious Runoff Depth>0.56"
 Flow Length=283' Tc=16.9 min CN=67 Runoff=0.15 cfs 696 cf

Link AP1: AP-1 Inflow=0.00 cfs 0 cf
 Primary=0.00 cfs 0 cf

Link AP2: AP-2 Inflow=0.15 cfs 696 cf
 Primary=0.15 cfs 696 cf

Link AP3: AP-3 Inflow=0.00 cfs 0 cf
 Primary=0.00 cfs 0 cf

Pond P201: P-201 Peak Elev=199.13' Storage=0 cf Inflow=0.05 cfs 589 cf
 12.0" Round Culvert n=0.012 L=62.0' S=0.0050 ' /' Outflow=0.05 cfs 589 cf

Pond P202: P-202 Peak Elev=200.26' Storage=1 cf Inflow=0.25 cfs 979 cf
 12.0" Round Culvert n=0.012 L=68.0' S=0.0221 ' /' Outflow=0.25 cfs 979 cf

Total Runoff Area = 172,550 sf Runoff Volume = 2,272 cf Average Runoff Depth = 0.16"
89.47% Pervious = 154,389 sf 10.53% Impervious = 18,161 sf

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Type III 24-hr 10-YR Rainfall=4.66"

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Page 1

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Pond 1F: FOREBAY #1 Peak Elev=200.70' Storage=403 cf Inflow=0.86 cfs 5,255 cf
 Outflow=0.86 cfs 4,926 cf

Pond 1P: INFILTRATION BASIN #1 Peak Elev=199.40' Storage=1,259 cf Inflow=0.86 cfs 4,926 cf
 Discarded=0.26 cfs 4,911 cf Primary=0.00 cfs 0 cf Secondary=0.00 cfs 0 cf Outflow=0.26 cfs 4,911 cf

Subcatchment 1S: EX-WS-1S Runoff Area=24,227 sf 7.97% Impervious Runoff Depth>1.30"
 Flow Length=397' Tc=7.6 min CN=65 Runoff=0.81 cfs 2,628 cf

Subcatchment 2S: EX-WS-2S Runoff Area=39,526 sf 4.89% Impervious Runoff Depth>0.71"
 Flow Length=591' Tc=31.0 min CN=55 Runoff=0.37 cfs 2,344 cf

Subcatchment 3S: EX-WS-3S Runoff Area=15,736 sf 11.60% Impervious Runoff Depth>0.22"
 Tc=7.0 min CN=43 Runoff=0.03 cfs 283 cf

Subcatchment 4S: EX-WS-4S Runoff Area=12,571 sf 0.00% Impervious Runoff Depth=0.00"
 Flow Length=298' Tc=12.2 min CN=30 Runoff=0.00 cfs 0 cf

Subcatchment 5S: EX-WS-5S Runoff Area=65,561 sf 8.12% Impervious Runoff Depth>0.08"
 Flow Length=283' Tc=16.9 min CN=38 Runoff=0.02 cfs 436 cf

Subcatchment 6S: EX-WS-6S Runoff Area=14,929 sf 47.89% Impervious Runoff Depth>1.43"
 Flow Length=283' Tc=16.9 min CN=67 Runoff=0.43 cfs 1,776 cf

Link AP1: AP-1 Inflow=0.02 cfs 436 cf
 Primary=0.02 cfs 436 cf

Link AP2: AP-2 Inflow=0.43 cfs 1,776 cf
 Primary=0.43 cfs 1,776 cf

Link AP3: AP-3 Inflow=0.00 cfs 0 cf
 Primary=0.00 cfs 0 cf

Pond P201: P-201 Peak Elev=199.35' Storage=2 cf Inflow=0.37 cfs 2,344 cf
 12.0" Round Culvert n=0.012 L=62.0' S=0.0050 '/' Outflow=0.37 cfs 2,344 cf

Pond P202: P-202 Peak Elev=200.49' Storage=4 cf Inflow=0.81 cfs 2,628 cf
 12.0" Round Culvert n=0.012 L=68.0' S=0.0221 '/' Outflow=0.81 cfs 2,628 cf

Total Runoff Area = 172,550 sf Runoff Volume = 7,467 cf Average Runoff Depth = 0.52"
89.47% Pervious = 154,389 sf 10.53% Impervious = 18,161 sf

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Type III 24-hr 10-YR Rainfall=4.66"

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Page 2

Summary for Pond 1F: FOREBAY #1

[88] Warning: Qout>Qin may require smaller dt or Finer Routing

[81] Warning: Exceeded Pond P201 by 1.56' @ 12.10 hrs

[81] Warning: Exceeded Pond P202 by 0.46' @ 19.95 hrs

Inflow Area = 79,489 sf, 7.16% Impervious, Inflow Depth > 0.79" for 10-YR event
 Inflow = 0.86 cfs @ 12.13 hrs, Volume= 5,255 cf
 Outflow = 0.86 cfs @ 12.16 hrs, Volume= 4,926 cf, Atten= 0%, Lag= 1.7 min
 Primary = 0.86 cfs @ 12.16 hrs, Volume= 4,926 cf

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 200.70' @ 12.16 hrs Surf.Area= 458 sf Storage= 403 cf

Plug-Flow detention time= 30.6 min calculated for 4,926 cf (94% of inflow)
 Center-of-Mass det. time= 10.2 min (855.5 - 845.3)

Volume	Invert	Avail.Storage	Storage Description
#1	199.00'	555 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
199.00	81	46.9	0	0	81
200.00	250	65.8	158	158	260
201.00	565	143.4	397	555	1,556

Device	Routing	Invert	Outlet Devices
#1	Primary	200.50'	4.0' long x 4.0' 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) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.84 cfs @ 12.16 hrs HW=200.70' (Free Discharge)

↑=Broad-Crested Rectangular Weir (Weir Controls 0.84 cfs @ 1.06 fps)

Summary for Pond 1P: INFILTRATION BASIN #1

Inflow Area = 79,489 sf, 7.16% Impervious, Inflow Depth > 0.74" for 10-YR event
 Inflow = 0.86 cfs @ 12.16 hrs, Volume= 4,926 cf
 Outflow = 0.26 cfs @ 13.24 hrs, Volume= 4,911 cf, Atten= 70%, Lag= 64.6 min
 Discarded = 0.26 cfs @ 13.24 hrs, Volume= 4,911 cf
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0 cf
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 199.40' @ 13.24 hrs Surf.Area= 3,372 sf Storage= 1,259 cf

Plug-Flow detention time= 46.1 min calculated for 4,894 cf (99% of inflow)
 Center-of-Mass det. time= 44.9 min (900.4 - 855.5)

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Type III 24-hr 10-YR Rainfall=4.66"

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Page 3

Volume	Invert	Avail.Storage	Storage Description
#1	199.00'	7,999 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
199.00	2,992	325.4	0	0	2,992
200.00	3,997	344.3	3,482	3,482	4,053
201.00	5,058	363.0	4,517	7,999	5,164

Device	Routing	Invert	Outlet Devices
#1	Discarded	199.00'	3.000 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 196.00'
#2	Secondary	200.50'	4.0' long x 4.0' breadth EMERGENCY OVERFLOW 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) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#3	Primary	200.50'	4.0' long TOP OF WEIR Cv= 2.62 (C= 3.28)
#4	Primary	200.00'	2.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.26 cfs @ 13.24 hrs HW=199.40' (Free Discharge)
 ↳1=Exfiltration (Controls 0.26 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=199.00' (Free Discharge)
 ↳3=TOP OF WEIR (Controls 0.00 cfs)
 ↳4=Orifice/Grate (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=199.00' (Free Discharge)
 ↳2=EMERGENCY OVERFLOW (Controls 0.00 cfs)

Summary for Subcatchment 1S: EX-WS-1S

Runoff = 0.81 cfs @ 12.12 hrs, Volume= 2,628 cf, Depth> 1.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-YR Rainfall=4.66"

Area (sf)	CN	Description
0	98	Paved roads w/curbs & sewers, HSG A
13,283	39	>75% Grass cover, Good, HSG A
9,013	96	Gravel surface, HSG A
1,931	98	Roofs, HSG A
0	30	Woods, Good, HSG A
24,227	65	Weighted Average
22,296		92.03% Pervious Area
1,931		7.97% Impervious Area

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Type III 24-hr 10-YR Rainfall=4.66"

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Page 4

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	45	0.3300	0.30		Sheet Flow, Grass: Dense n= 0.240 P2= 3.09"
1.0	55	0.0100	0.91		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.09"
0.7	70	0.0100	1.61		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
3.4	227	0.0260	1.13		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
7.6	397	Total			

Summary for Subcatchment 2S: EX-WS-2S

Runoff = 0.37 cfs @ 12.54 hrs, Volume= 2,344 cf, Depth> 0.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.66"

Area (sf)	CN	Description
0	98	Paved roads w/curbs & sewers, HSG A
19,917	39	>75% Grass cover, Good, HSG A
10,541	96	Gravel surface, HSG A
1,931	98	Roofs, HSG A
7,137	30	Woods, Good, HSG A
39,526	55	Weighted Average
37,595		95.11% Pervious Area
1,931		4.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.8	100	0.0100	0.06		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.09"
0.2	125	0.3300	8.62		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
2.0	366	0.0430	3.11		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
31.0	591	Total			

Summary for Subcatchment 3S: EX-WS-3S

Runoff = 0.03 cfs @ 12.42 hrs, Volume= 283 cf, Depth> 0.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.66"

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Type III 24-hr 10-YR Rainfall=4.66"

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Page 5

Area (sf)	CN	Description
1,826	98	Paved roads w/curbs & sewers, HSG A
8,728	39	>75% Grass cover, Good, HSG A
5,182	30	Woods, Good, HSG A
15,736	43	Weighted Average
13,910		88.40% Pervious Area
1,826		11.60% Impervious Area

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

Summary for Subcatchment 4S: EX-WS-4S

[45] Hint: Runoff=Zero

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.66"

Area (sf)	CN	Description
12,571	30	Woods, Good, HSG A
12,571		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.7	100	0.1200	0.16		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.09"
1.5	198	0.2000	2.24		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
12.2	298	Total			

Summary for Subcatchment 5S: EX-WS-5S

Runoff = 0.02 cfs @ 14.93 hrs, Volume= 436 cf, Depth> 0.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.66"

Area (sf)	CN	Description
5,324	98	Paved roads w/curbs & sewers, HSG A
17,024	39	>75% Grass cover, Good, HSG A
43,213	30	Woods, Good, HSG A
65,561	38	Weighted Average
60,237		91.88% Pervious Area
5,324		8.12% Impervious Area

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Type III 24-hr 10-YR Rainfall=4.66"

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Page 6

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.6	100	0.0800	0.13		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.09"
4.3	183	0.0200	0.71		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
16.9	283	Total			

Summary for Subcatchment 6S: EX-WS-6S

Runoff = 0.43 cfs @ 12.25 hrs, Volume= 1,776 cf, Depth> 1.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.66"

Area (sf)	CN	Description
7,149	98	Paved roads w/curbs & sewers, HSG A
7,780	39	>75% Grass cover, Good, HSG A
14,929	67	Weighted Average
7,780		52.11% Pervious Area
7,149		47.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.6	100	0.0800	0.13		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.09"
4.3	183	0.0200	0.71		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
16.9	283	Total			

Summary for Link AP1: AP-1Inflow Area = 145,050 sf, 7.59% Impervious, Inflow Depth > 0.04" for 10-YR event
Inflow = 0.02 cfs @ 14.93 hrs, Volume= 436 cf
Primary = 0.02 cfs @ 14.93 hrs, Volume= 436 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link AP2: AP-2Inflow Area = 14,929 sf, 47.89% Impervious, Inflow Depth > 1.43" for 10-YR event
Inflow = 0.43 cfs @ 12.25 hrs, Volume= 1,776 cf
Primary = 0.43 cfs @ 12.25 hrs, Volume= 1,776 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

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Type III 24-hr 10-YR Rainfall=4.66"

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Page 7

Summary for Link AP3: AP-3

Inflow Area = 12,571 sf, 0.00% Impervious, Inflow Depth = 0.00" for 10-YR event
 Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0 cf
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Pond P201: P-201

Inflow Area = 39,526 sf, 4.89% Impervious, Inflow Depth > 0.71" for 10-YR event
 Inflow = 0.37 cfs @ 12.54 hrs, Volume= 2,344 cf
 Outflow = 0.37 cfs @ 12.54 hrs, Volume= 2,344 cf, Atten= 0%, Lag= 0.1 min
 Primary = 0.37 cfs @ 12.54 hrs, Volume= 2,344 cf

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 199.35' @ 12.54 hrs Surf.Area= 13 sf Storage= 2 cf

Plug-Flow detention time= 0.1 min calculated for 2,336 cf (100% of inflow)
 Center-of-Mass det. time= 0.1 min (863.9 - 863.8)

Volume #1	Invert	Avail.Storage	Storage Description			
	199.00'	437 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
199.00	2	3.4	0	0	2	
200.00	59	36.2	24	24	107	
201.00	194	59.7	120	144	293	
202.00	406	80.8	294	437	539	

Device	Routing	Invert	Outlet Devices	
#1	Primary	199.00'	12.0" Round P-201 L= 62.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 199.00' / 198.69' S= 0.0050 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf	

Primary OutFlow Max=0.37 cfs @ 12.54 hrs HW=199.35' (Free Discharge)
 ↖1=P-201 (Barrel Controls 0.37 cfs @ 2.28 fps)

Summary for Pond P202: P-202

Inflow Area = 24,227 sf, 7.97% Impervious, Inflow Depth > 1.30" for 10-YR event
 Inflow = 0.81 cfs @ 12.12 hrs, Volume= 2,628 cf
 Outflow = 0.81 cfs @ 12.12 hrs, Volume= 2,628 cf, Atten= 0%, Lag= 0.1 min
 Primary = 0.81 cfs @ 12.12 hrs, Volume= 2,628 cf

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 200.49' @ 12.12 hrs Surf.Area= 14 sf Storage= 4 cf

Plug-Flow detention time= 0.1 min calculated for 2,628 cf (100% of inflow)

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Type III 24-hr 25-YR Rainfall=5.91"

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Page 5

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Pond 1F: FOREBAY #1 Peak Elev=200.81' Storage=452 cf Inflow=1.66 cfs 9,259 cf
 Outflow=1.66 cfs 8,926 cf

Pond 1P: INFILTRATION BASIN #1 Peak Elev=199.97' Storage=3,348 cf Inflow=1.66 cfs 8,926 cf
 Discarded=0.35 cfs 8,674 cf Primary=0.00 cfs 0 cf Secondary=0.00 cfs 0 cf Outflow=0.35 cfs 8,674 cf

Subcatchment 1S: EX-WS-1S Runoff Area=24,227 sf 7.97% Impervious Runoff Depth>2.10"
 Flow Length=397' Tc=7.6 min CN=65 Runoff=1.36 cfs 4,238 cf

Subcatchment 2S: EX-WS-2S Runoff Area=39,526 sf 4.89% Impervious Runoff Depth>1.30"
 Flow Length=591' Tc=31.0 min CN=55 Runoff=0.77 cfs 4,296 cf

Subcatchment 3S: EX-WS-3S Runoff Area=15,736 sf 11.60% Impervious Runoff Depth>0.55"
 Tc=7.0 min CN=43 Runoff=0.12 cfs 725 cf

Subcatchment 4S: EX-WS-4S Runoff Area=12,571 sf 0.00% Impervious Runoff Depth>0.04"
 Flow Length=298' Tc=12.2 min CN=30 Runoff=0.00 cfs 41 cf

Subcatchment 5S: EX-WS-5S Runoff Area=65,561 sf 8.12% Impervious Runoff Depth>0.30"
 Flow Length=283' Tc=16.9 min CN=38 Runoff=0.16 cfs 1,648 cf

Subcatchment 6S: EX-WS-6S Runoff Area=14,929 sf 47.89% Impervious Runoff Depth>2.26"
 Flow Length=283' Tc=16.9 min CN=67 Runoff=0.70 cfs 2,811 cf

Link AP1: AP-1 Inflow=0.16 cfs 1,648 cf
 Primary=0.16 cfs 1,648 cf

Link AP2: AP-2 Inflow=0.70 cfs 2,811 cf
 Primary=0.70 cfs 2,811 cf

Link AP3: AP-3 Inflow=0.00 cfs 41 cf
 Primary=0.00 cfs 41 cf

Pond P201: P-201 Peak Elev=199.52' Storage=5 cf Inflow=0.77 cfs 4,296 cf
 12.0" Round Culvert n=0.012 L=62.0' S=0.0050 '/' Outflow=0.77 cfs 4,296 cf

Pond P202: P-202 Peak Elev=200.66' Storage=7 cf Inflow=1.36 cfs 4,238 cf
 12.0" Round Culvert n=0.012 L=68.0' S=0.0221 '/' Outflow=1.36 cfs 4,238 cf

Total Runoff Area = 172,550 sf Runoff Volume = 13,760 cf Average Runoff Depth = 0.96"
89.47% Pervious = 154,389 sf 10.53% Impervious = 18,161 sf

21206-PR-DRAINAGE

Type III 24-hr 50-YR Rainfall=7.06"

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Page 6

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Pond 1F: FOREBAY #1 Peak Elev=200.90' Storage=501 cf Inflow=2.57 cfs 13,544 cf
 Outflow=2.58 cfs 13,207 cf

Pond 1P: INFILTRATION BASIN #1 Peak Elev=200.48' Storage=5,496 cf Inflow=2.58 cfs 13,207 cf
 Discarded=0.43 cfs 10,871 cf Primary=0.07 cfs 759 cf Secondary=0.00 cfs 0 cf Outflow=0.50 cfs 11,630 cf

Subcatchment 1S: EX-WS-1S Runoff Area=24,227 sf 7.97% Impervious Runoff Depth>2.91"
 Flow Length=397' Tc=7.6 min CN=65 Runoff=1.90 cfs 5,873 cf

Subcatchment 2S: EX-WS-2S Runoff Area=39,526 sf 4.89% Impervious Runoff Depth>1.94"
 Flow Length=591' Tc=31.0 min CN=55 Runoff=1.20 cfs 6,403 cf

Subcatchment 3S: EX-WS-3S Runoff Area=15,736 sf 11.60% Impervious Runoff Depth>0.97"
 Tc=7.0 min CN=43 Runoff=0.30 cfs 1,269 cf

Subcatchment 4S: EX-WS-4S Runoff Area=12,571 sf 0.00% Impervious Runoff Depth>0.17"
 Flow Length=298' Tc=12.2 min CN=30 Runoff=0.01 cfs 177 cf

Subcatchment 5S: EX-WS-5S Runoff Area=65,561 sf 8.12% Impervious Runoff Depth>0.61"
 Flow Length=283' Tc=16.9 min CN=38 Runoff=0.47 cfs 3,327 cf

Subcatchment 6S: EX-WS-6S Runoff Area=14,929 sf 47.89% Impervious Runoff Depth>3.10"
 Flow Length=283' Tc=16.9 min CN=67 Runoff=0.96 cfs 3,852 cf

Link AP1: AP-1 Inflow=0.47 cfs 4,086 cf
 Primary=0.47 cfs 4,086 cf

Link AP2: AP-2 Inflow=0.96 cfs 3,852 cf
 Primary=0.96 cfs 3,852 cf

Link AP3: AP-3 Inflow=0.01 cfs 177 cf
 Primary=0.01 cfs 177 cf

Pond P201: P-201 Peak Elev=199.67' Storage=9 cf Inflow=1.20 cfs 6,403 cf
 12.0" Round Culvert n=0.012 L=62.0' S=0.0050 ' /' Outflow=1.20 cfs 6,403 cf

Pond P202: P-202 Peak Elev=200.83' Storage=11 cf Inflow=1.90 cfs 5,873 cf
 12.0" Round Culvert n=0.012 L=68.0' S=0.0221 ' /' Outflow=1.90 cfs 5,873 cf

Total Runoff Area = 172,550 sf Runoff Volume = 20,902 cf Average Runoff Depth = 1.45"
89.47% Pervious = 154,389 sf 10.53% Impervious = 18,161 sf

Project Name:

JBE #: 21206

Town/City: BARRINGTON, NH

Date: 3/1/2022

Rip Rap Outlet Protection Calculation

Outlet Designation: P-202

Pipe Size (Do): 12 in. 1 ft

Q25 (cfs): 1.36 cfs

Tailwater Elevation (TW)(ft): 0.25 if TW = 0, assume 3"

Apron Length (La):

TW < Do YES $La = 1.8Q/Do^{1.5} + 7Do$
La = 9.45 ft

TW > Do No $La = 3.0Q/Do^{1.5} + 7Do$
La =

Apron Width (W₂)

TW < Do $W_2 = 3Do + La$
W₂ = 12.45 ft.

TW > Do $W_2 = 3Do + .4La$
W₂ = ft.

Rip-Rap Diameter (D₅₀):

D₅₀: $D_{50} = 0.02Q^{1.3}/TW*Do$
D₅₀ = 0.12 ft. 1.43 in.

Use 3" minimum D₅₀ ==> D50 = 4.0 in.

Rip-Rap Thickness (T):

$T = 2.5*D_{50}$
T = 10.0 in.

Apron Width (W₁):

$W_1 = 3*Do$
W₁ = 3.00 ft.

Project Name:

JBE #: 21206

Town/City: BARRINGTON, NH

Date: 3/1/2022

Rip Rap Outlet Protection Calculation

Outlet Designation: OS1

Pipe Size (Do): 24 in. 2 ft

Q25 (cfs): 0.07 cfs

Tailwater Elevation (TW)(ft): 0.25 if TW = 0, assume 3"

Apron Length (La):

TW < Do YES $La = 1.8Q/Do^{1.5} + 7Do$
La = 14.04 ft

TW > Do No $La = 3.0Q/Do^{1.5} + 7Do$
La =

Apron Width (W₂):

TW < Do $W_2 = 3Do + La$
W₂ = 20.04 ft.

TW > Do $W_2 = 3Do + .4La$
W₂ = ft.

Rip-Rap Diameter (D₅₀):

D₅₀: $D_{50} = 0.02Q^{1.3}/TW*Do$
D₅₀ = 0.00 ft. 0.02 in.

Use 3" minimum D₅₀ ==> D50 = 4.0 in.

Rip-Rap Thickness (T):

$T = 2.5*D_{50}$
T = 10.0 in.

Apron Width (W₁):

$W_1 = 3*Do$
W₁ = 6.00 ft.

STORMWATER MANAGEMENT OPERATION AND MAINTENANCE MANUAL

Prepared for:

**ROCK IRON REPAIR
Project Tax Map 265 / Lot 11 & 12
Calef Highway
Barrington, NH**

**3/2/2022
JBE Project No. 21206**

Inspection and Maintenance of Facilities and Property

A. Maintenance of Common Facilities or Property

1. Rock Iron Repair, future owners and assigns are responsible to perform the maintenance obligations or hire a Professional Engineer to review the site on an annual basis for maintenance and certification of the stormwater system. The owner shall keep receipts and records of all maintenance companies hired throughout the year to submit along with the following form.

B. General Inspection and Maintenance Requirements

- a. Permanent stormwater and sediment and erosion control facilities to be maintained on the site include, but are not limited to, the following:
 - a. Culverts
 - b. Vegetation and landscaping
 - c. Parking lots and roadways
 - d. Riprap inlet and outlet protection aprons
- b. Maintenance of permanent measures shall follow the following schedule:
 - a. Normal winter roadway and parking lot maintenance including plowing and snow removal.
 - b. Road and parking lot sweeping at the end of every winter, preferably at the start of the spring rain season.
 - c. **Inspection** of culvert inlets and outlets at least **once per month** during the rainy season (March to November). Any debris is to be removed and disposed of properly by owner or contractor.
 - d. **Annual inspection** of the site for erosion, destabilization, settling, and sloughing. Any needed repairs are to be conducted immediately.
 - e. **Annual inspection** of site's vegetation and landscaping. Any areas that are bare shall be reseeded and mulched with hay or, if the case is extreme, loamed and seeded or sodded to ensure adequate vegetative cover. Landscape specimens shall be replaced in kind, if they are found to be dead or dying.
 - f. **Annual inspection** of catch basins and drain manholes to determine if they need to be cleaned. Catch basins are to be cleaned if the depth of deposits is greater than one-half the depth from the basin bottom to the invert of the lowest pipe or opening into or out of the basin. If a catch basin significantly exceeds the one-half depth standard during the inspection, then it should be cleaned more frequently. If woody debris or trash accumulates in a catch basin, then it should be cleaned on a weekly basis. Manholes should be cleaned of any material upon inspection. Catch basins and manholes can be cleaned either manually or by specially designed equipment including, but not limited to, bucket loaders and vacuum pumps. Before any materials can be disposed, it is necessary to perform a detailed chemical analysis to determine if the materials meet the EPA criteria for hazardous waste. This will help determine how the materials should be stored,

treated, and disposed. Grease hoods are to be wiped clean and the rags disposed of properly. Debris obscuring the grate inlet should also be removed.

- g. Permanent stone check dams should be **inspected annually** in order to ensure that they are in good condition. Any sediment accumulated behind them shall be removed if it is deeper than six inches.
- h. Rock riprap should be **inspected annually** in order to ensure that it has not been displaced, undermined, or otherwise damaged. Displaced rock should be replaced, or additional rock added in order to maintain the structure(s) in their undamaged state. Woody vegetation should not be allowed to become established in riprap areas, and/or any debris removed from the void spaces between the rocks. If the riprap is adjacent to a stream or other waterbody, the water should be kept clear of obstructions, debris, and sediment deposits.
- i. Cleaning Criteria for all Sedimentation Forebays: Sediment should be removed from the sedimentation chamber (forebay) when it accumulates to a depth of more than 12 inches (30 cm) or 10 percent of the pretreatment volume. The sedimentation forebay should be cleaned of vegetation if persistent standing water and wetland vegetation becomes dominant. The cleaning interval is once every year. A dry sedimentation forebay is the optimal condition while in practice this condition is rarely achieved. The sedimentation chamber, forebay, and treatment cell outlet devices should be cleaned when drawdown times exceed 60 to 72 hours. Materials can be removed with heavy construction equipment; however this equipment should not track on the wetland surface. Revegetation of disturbed areas as necessary. Removed sediments should be dewatered (if necessary) and disposed of in an acceptable manner.

j. Treatment Swales:

Inspect annually for erosion, sediment accumulation, vegetation loss, and presence of invasive species. Perform periodic mowing; frequency depends on location and type of grass. Do not cut shorter than Water Quality Flow depth (maximum 4-inches). Remove debris and accumulated sediment, based on inspection. Repair eroded areas, remove invasive species and dead vegetation, and reseed with applicable grass mix as warranted by inspection.

k. Vegetated Buffers:

Inspect buffer at least annually for signs of erosion, sediment buildup, or vegetation loss. If a meadow buffer, provide periodic mowing as needed to maintain a healthy stand of herbaceous vegetation. If a forested buffer, then the buffer should be maintained in an undisturbed condition, unless erosion occurs. If erosion of the buffer (forested or meadow) occurs, eroded areas should be repaired and replanted with vegetation similar to the remaining buffer. Corrective action should include eliminating the source of the erosion problem, and may require retrofit with a level spreader. Remove debris and accumulated sediment, based on inspection.

- n. Detention ponds should require little maintenance, but should be inspected frequently during the first year of operation, and annually thereafter. Every five years, the services of a professional engineer should be retained to perform a thorough inspection of all the aspects of the pond and its infrastructure. Any debris and sediment accumulations should be removed from the outlet structure(s) and emergency spillway(s) and disposed of properly. Inspect outlet structure for deterioration and or clogging. Detention pond berms should be mowed at least once annually so as to prevent the establishment of woody vegetation – trees should *never* be allowed to grow on a

detention pond berm, as they may destabilize the structure and increase the potential for failure. Areas showing signs of erosion or thin or dying vegetation should be repaired immediately by whatever means necessary, *with the exception of fertilizer*. Rodent burrows are to be repaired immediately and the suspect animals apprehended with non-lethal traps if the problem persists.

o. Infiltration Basin:

Infiltration Basins should be inspected twice annually and after every rainfall event of 2.5" or greater within a 24-hour period at a minimum. The infiltration basin areas designed to collect and infiltrate stormwater will need only minimal maintenance. Traffic over the basin areas should be kept to a minimum prior to construction to prevent compaction of the soil reducing infiltration.

Basins shall be inspected for effectiveness at a minimum of twice annually. If basin has not completely drained 72-hours after a rainfall event, the existing clogged layer of soil shall be removed and replaced with new material as specified within the design plans.

See attached sample forms as a guideline.

Any inquiries in regards to the design, function, and/or maintenance of any one of the above mentioned facilities or tasks shall be directed to the project engineer:

Jones & Beach Engineers, Inc.
85 Portsmouth Avenue
P.O. Box 219
Stratham, NH 03885

T#: (603) 772-4746
F#: (603) 772-0227

Commitment to maintenance requirements

I agree to complete and/or observe all of the required maintenance practices and their respective schedules as outlined above.

Signature

Print Name

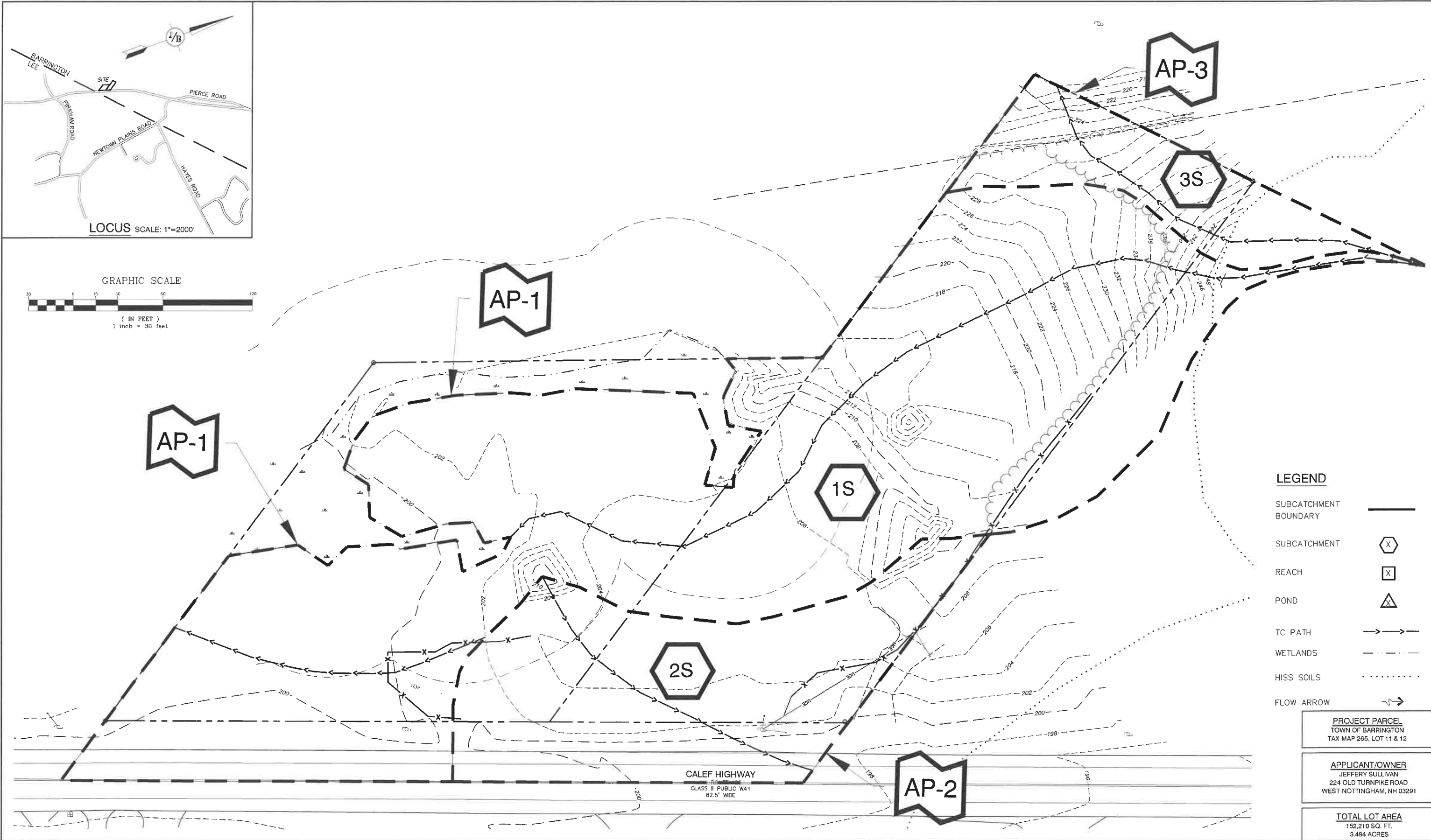
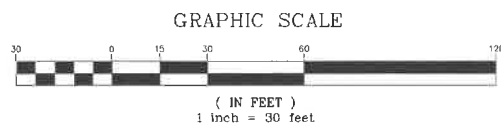
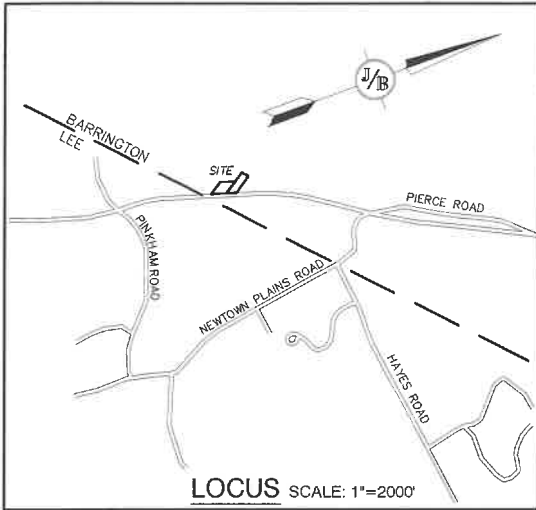
Title

Date

Annual Operations and Maintenance Report

Rock Iron Repair, future owners and assigns are responsible to perform the maintenance obligations or hire a Professional Engineer to review the site on an annual basis for maintenance and certification of the stormwater system. The owner shall keep receipts and records of all maintenance companies hired throughout the year to submit along with the following form.

Construction Activity	Date of Inspection	Who Inspected	Findings of Inspector
Culverts			
Swales & Plunge Pools			
Vegetation and landscaping			
Parking lots and roadways			



LEGEND

- SUBCATCHMENT BOUNDARY
- SUBCATCHMENT
- REACH
- POND
- TC PATH
- WETLANDS
- HISS SOILS
- FLOW ARROW

PROJECT PARCEL
TOWN OF BARRINGTON
TAX MAP 265, LOT 11 & 12

APPLICANT/OWNER
JEFFREY SULLIVAN
224 OLD TURNPIKE ROAD
WEST NOTTINGHAM, NH 03291

TOTAL LOT AREA
152,210 SQ. FT.
3.494 ACRES

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Design: BWG	Draft: DFP	Date: 03/09/22
Checked: BWG	Scale: AS NOTED	Project No.: 21206
Drawing Name: 21206-WATERSHED.dwg		
THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION FROM JONES & BEACH ENGINEERS, INC. (JBE). ANY ALTERATIONS, AUTHORIZED OR OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO JBE.		

REV.	DATE	REVISION	BY
0	—	ISSUED FOR REVIEW	—

Designed and Produced in NH

J/B Jones & Beach Engineers, Inc.

Civil Engineering Services

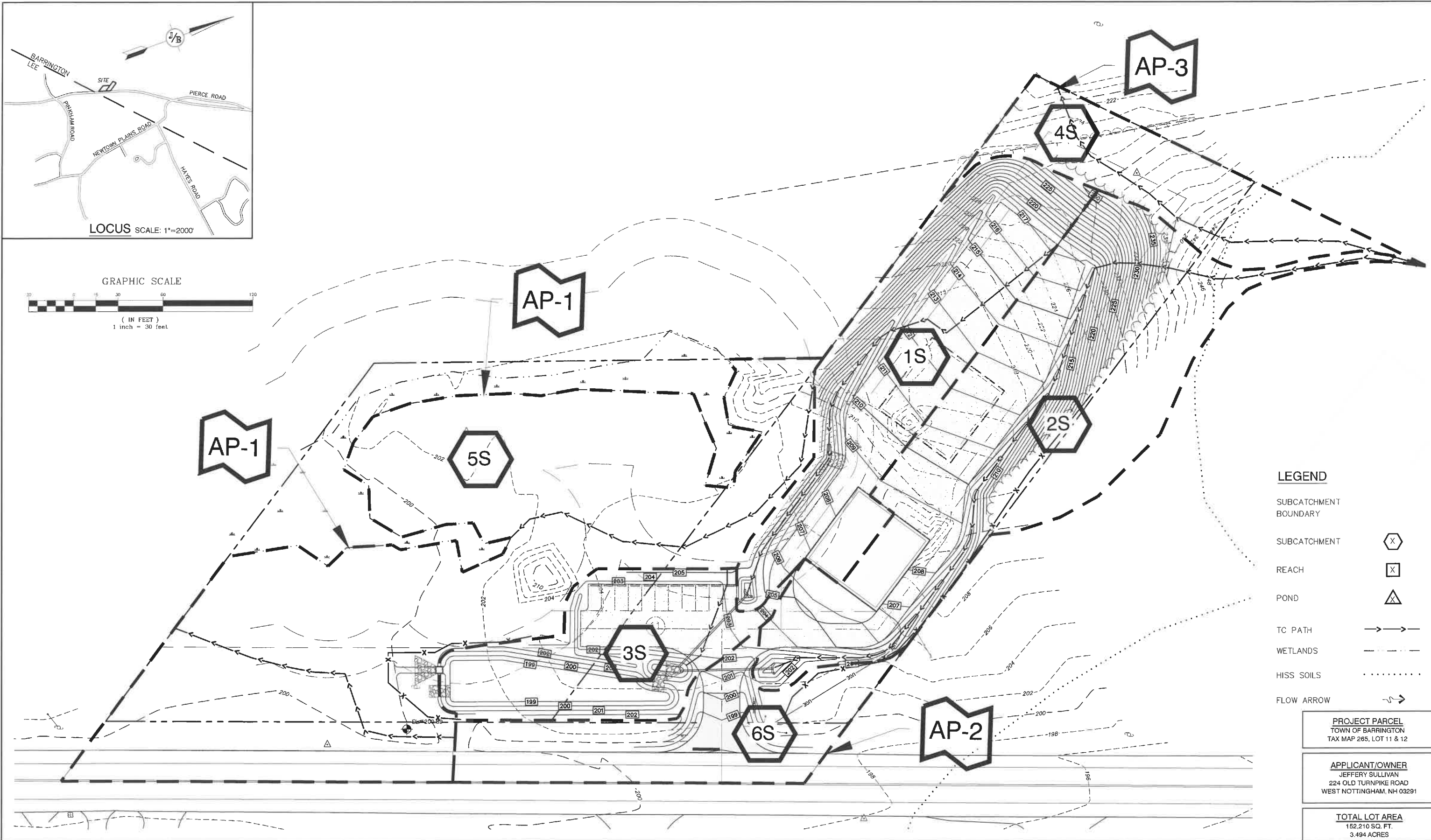
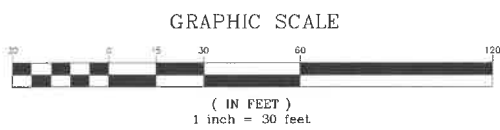
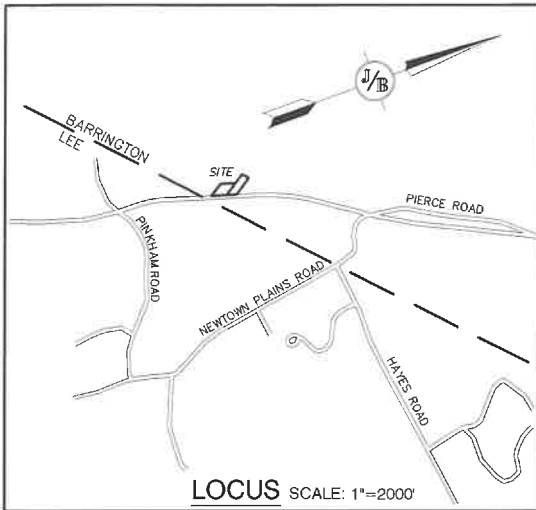
85 Portsmouth Ave. 603-772-4746
 PO Box 219 FAX: 603-772-0227
 Stratham, NH 03885 E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	EXISTING WATERSHED PLAN
Project:	ROCK IRON REPAIR CALEF HIGHWAY, BARRINGTON, NH
Owner of Record:	JEFFREY SULLIVAN 224 OLD TURNPIKE RD., WEST NOTTINGHAM, NH 03291

DRAWING No.

W1

SHEET 1 OF 2
JBE PROJECT NO. 21206



LEGEND

- SUBCATCHMENT BOUNDARY
- SUBCATCHMENT
- REACH
- POND
- TC PATH
- WETLANDS
- HISS SOILS
- FLOW ARROW

PROJECT PARCEL TOWN OF BARRINGTON TAX MAP 265, LOT 11 & 12
APPLICANT/OWNER JEFFERY SULLIVAN 224 OLD TURNPIKE ROAD WEST NOTTINGHAM, NH 03291
TOTAL LOT AREA 152,210 SQ. FT. 3.494 ACRES

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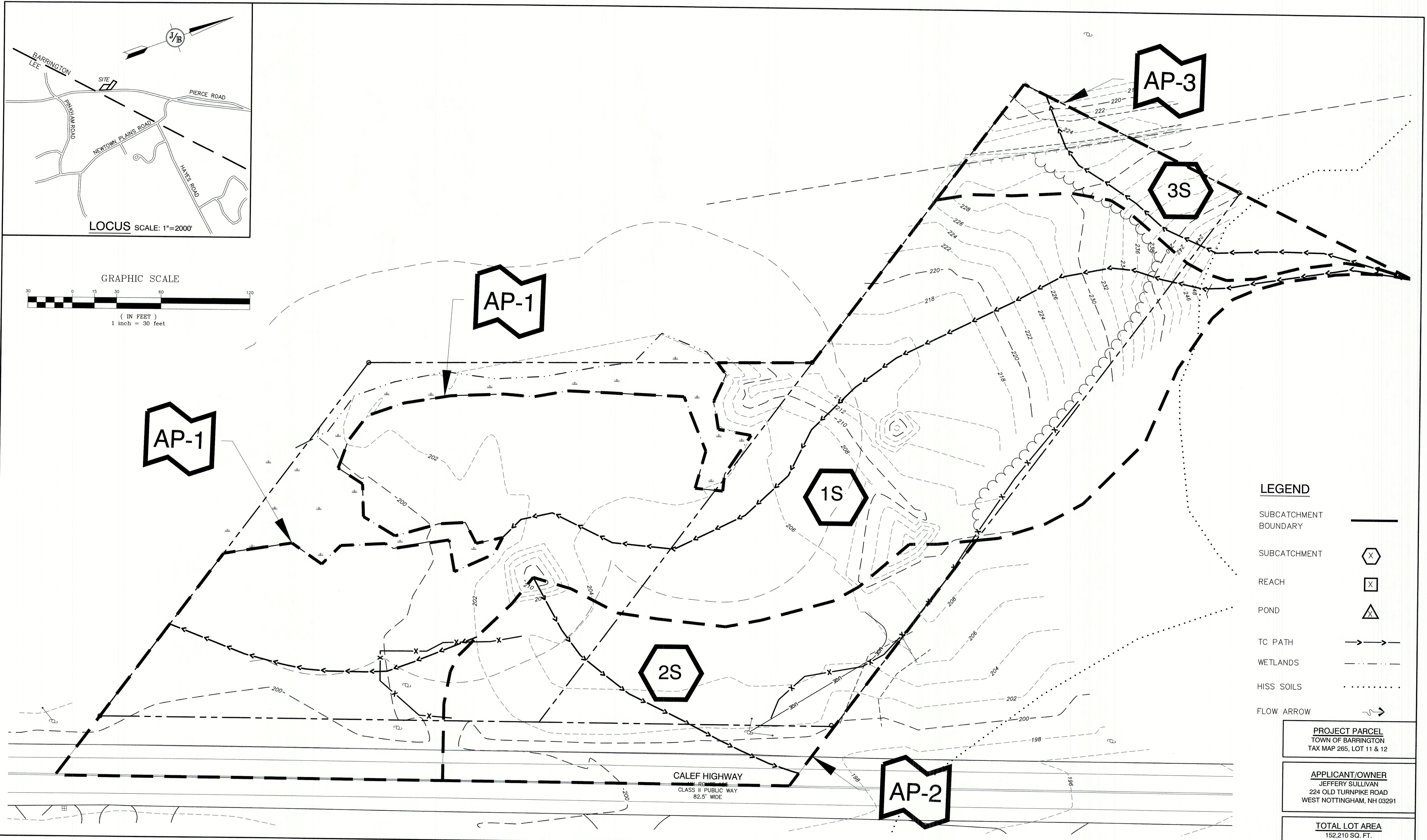
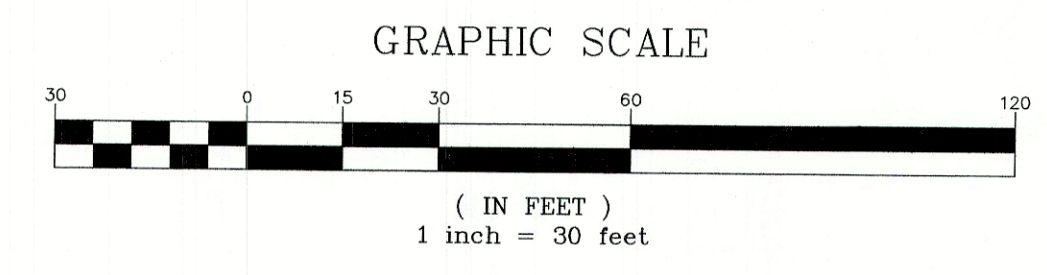
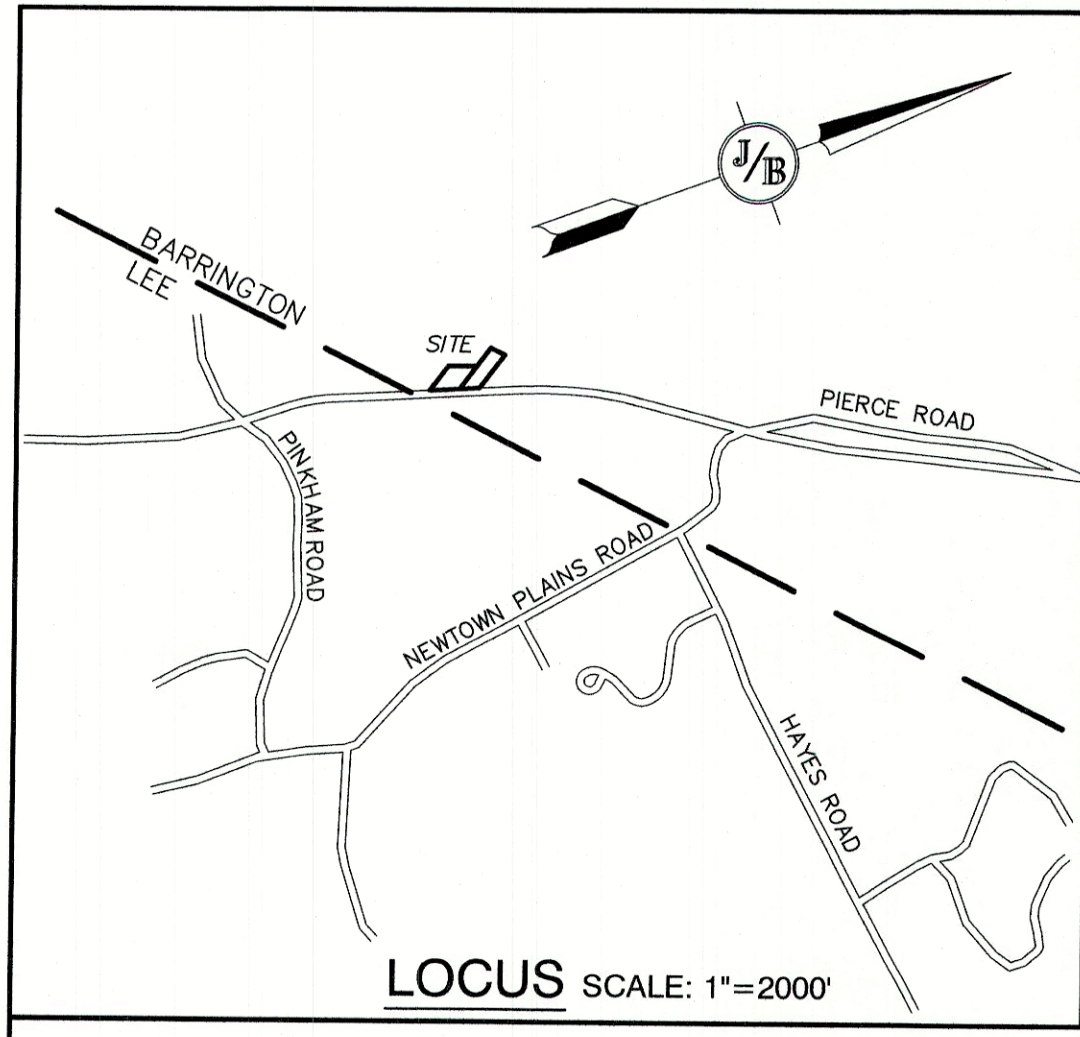
85 Portsmouth Ave. Civil Engineering Services 603-772-4748
 PO Box 219 Stratham, NH 03885 FAX: 603-772-0227
 E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	PROPOSED WATERSHED PLAN
Project:	ROCK IRON REPAIR CALEF HIGHWAY, BARRINGTON, NH
Owner of Record:	JEFFERY SULLIVAN 224 OLD TURNPIKE RD., WEST NOTTINGHAM, NH 03291

DRAWING No.

W2

SHEET 2 OF 2
JBE PROJECT NO. 21206



LEGEND

SUBCATCHMENT BOUNDARY	
SUBCATCHMENT	
REACH	
POND	
TC PATH	
WETLANDS	
HISS SOILS	
FLOW ARROW	

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APPLICANT/OWNER JEFFERY SULLIVAN 224 OLD TURNPIKE ROAD WEST NOTTINGHAM, NH 03291
TOTAL LOT AREA 152,210 SQ. FT. 3.494 ACRES

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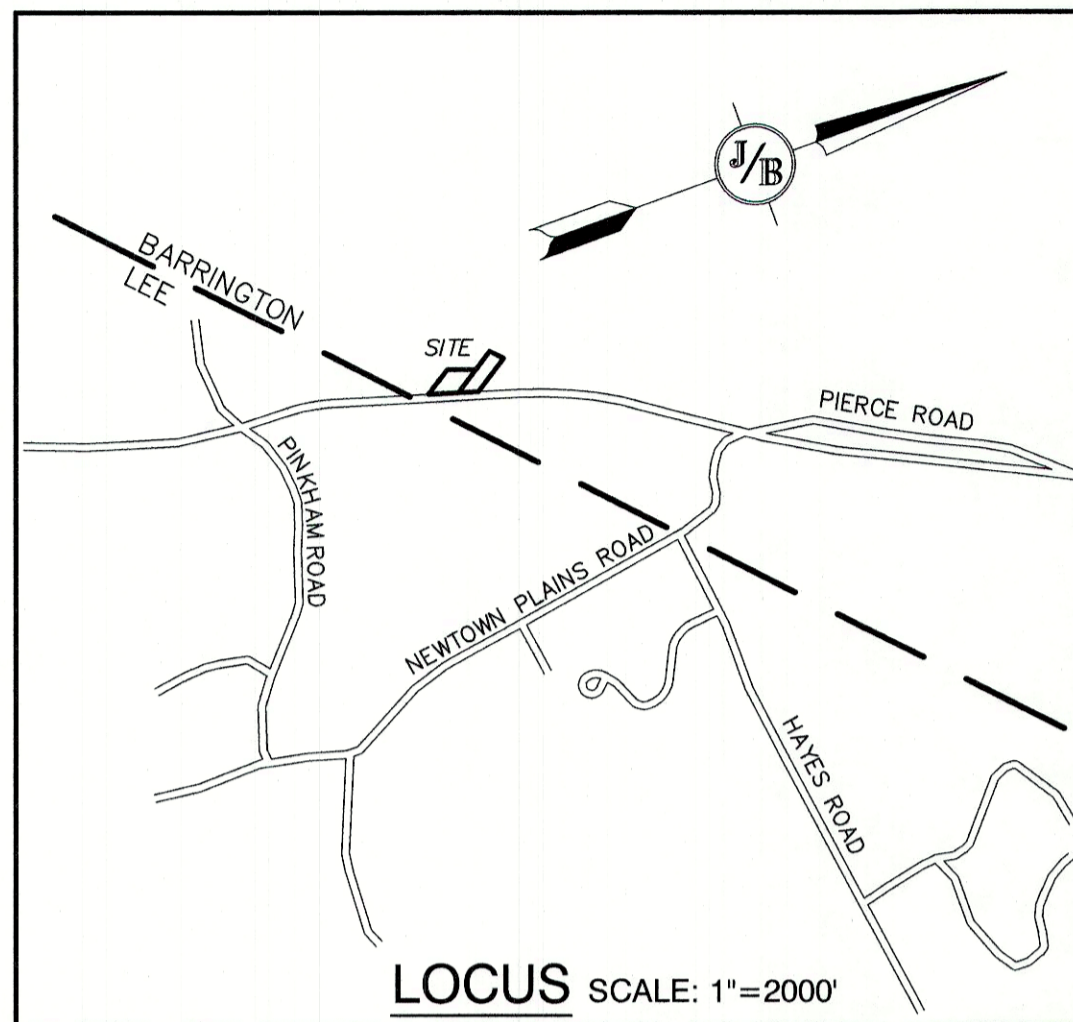
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Plan Name:	EXISTING WATERSHED PLAN
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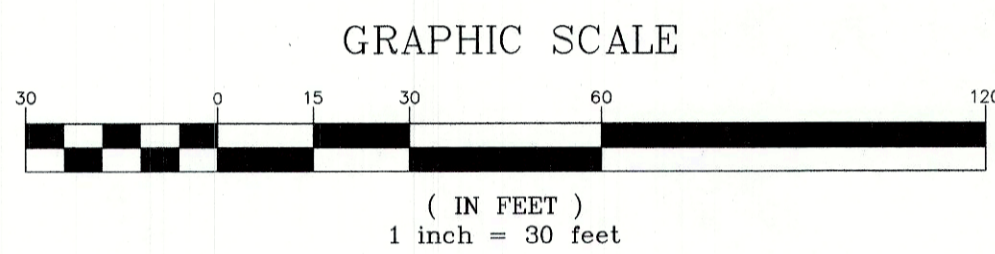
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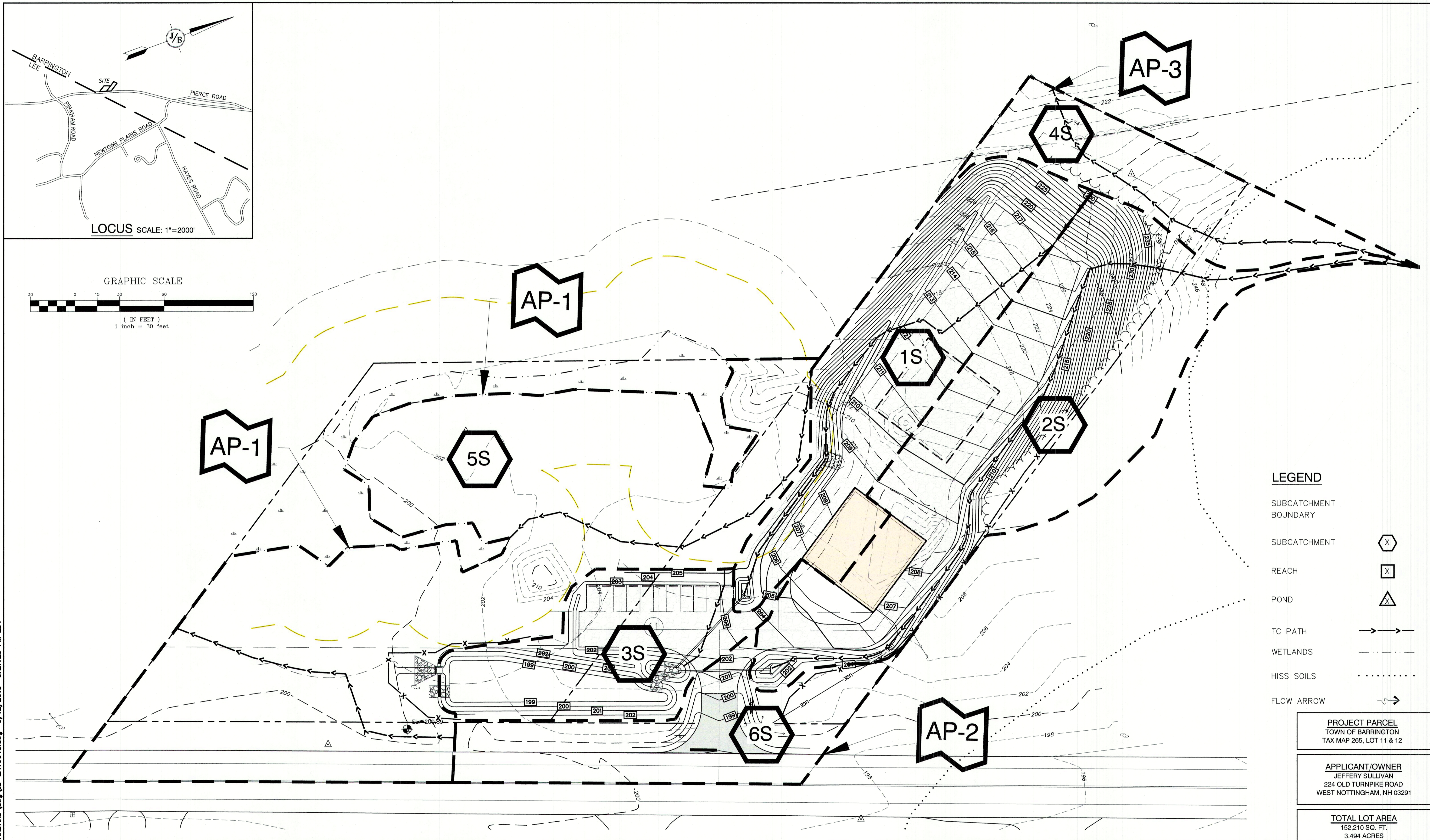
SHEET 1 OF 2
JBE PROJECT NO. 21206



LOCUS SCALE: 1"=2000'



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- SUBCATCHMENT BOUNDARY
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DRAWING No.
W2
SHEET 2 OF 2 JBE PROJECT NO. 21206