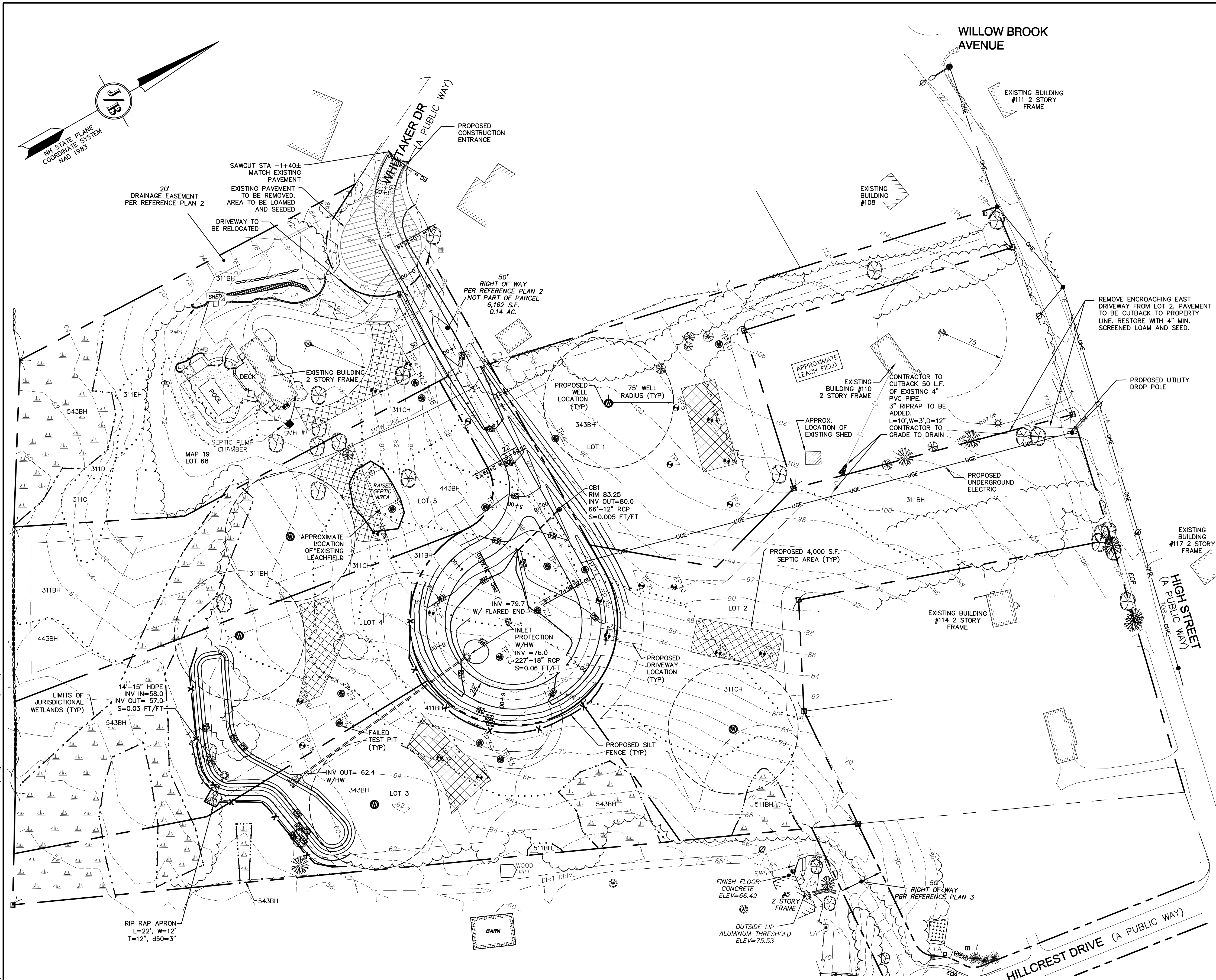
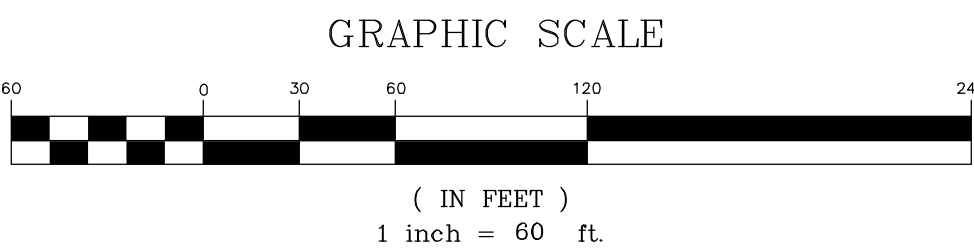


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GRADING AND DRAINAGE NOTES:

- UNDERGROUND FACILITIES, UTILITIES AND STRUCTURES HAVE BEEN PLOTTED FROM FIELD OBSERVATION AND THEIR LOCATION MUST BE CONSIDERED APPROXIMATE ONLY. NEITHER JONES & BEACH ENGINEERS, INC., NOR ANY OF THEIR EMPLOYEES TAKE RESPONSIBILITY FOR THE LOCATION OF ANY UNDERGROUND STRUCTURES AND/OR UTILITIES NOT SHOWN THAT MAY EXIST. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE ALL UNDERGROUND STRUCTURES AND/OR UTILITIES LOCATED PRIOR TO EXCAVATION WORK BY CALLING 888-DIG-SAFE (888-344-7233).
- ALL BENCHMARKS AND TOPOGRAPHY SHOULD BE FIELD VERIFIED BY THE CONTRACTOR.
- SITE GRADING SHALL NOT PROCEED UNTIL EROSION CONTROL MEASURES HAVE BEEN INSTALLED. SEE CONSTRUCTION SEQUENCE ON SHEET E1.
- PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR IS REQUIRED TO HAVE THE PROJECT'S LAND SURVEYOR STAKE OR FLAG CLEARING LIMITS. A MINIMUM OF 48 HOURS NOTICE IS REQUIRED.
- ALL SWALES AND ANY SLOPES GREATER THAN 3:1 SHALL BE STABILIZED WITH NORTH AMERICAN GREEN S75 EROSION CONTROL BLANKETS (OR AN EQUIVALENT APPROVED IN WRITING BY THE ENGINEER), UNLESS OTHERWISE SPECIFIED.
- ALL DRAINAGE STRUCTURES AND STORM SEWER PIPES SHALL MEET HEAVY DUTY TRAFFIC H20 LOADING AND SHALL BE INSTALLED ACCORDINGLY.
- IN AREAS WHERE CONSTRUCTION IS PROPOSED ADJACENT TO ABUTTING PROPERTIES, THE CONTRACTOR SHALL INSTALL ORANGE CONSTRUCTION FENCING ALONG PROPERTY LINES IN ALL AREAS WHERE SILT FENCING IS NOT REQUIRED.
- ALL DRAINAGE PIPE SHALL BE NON-PERFORATED ADS N-12 OR APPROVED EQUAL.
- LAND DISTURBING ACTIVITIES SHALL NOT COMMENCE UNTIL APPROVAL TO DO SO HAS BEEN RECEIVED BY ALL GOVERNING AUTHORITIES. THE GENERAL CONTRACTOR SHALL STRICTLY ADHERE TO THE EPA SWPPP DURING CONSTRUCTION OPERATIONS.
- NO LAND CLEARING OR GRADING SHALL BEGIN UNTIL ALL EROSION CONTROL MEASURES HAVE BEEN INSTALLED.
- ALL EXPOSED AREAS SHALL BE SEEDED AS SPECIFIED WITHIN 3 DAYS OF FINAL GRADING.
- SHOULD CONSTRUCTION STOP FOR LONGER THAN 3 DAYS, THE SITE SHALL BE SEEDED AS SPECIFIED.
- MAINTAIN EROSION CONTROL MEASURES AFTER EACH RAIN EVENT OF 0.25" OR GREATER IN A 24 HOUR PERIOD AND AT LEAST ONCE A WEEK.
- THIS PLAN SHALL NOT BE CONSIDERED ALL INCLUSIVE, AS THE GENERAL CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PREVENT SEDIMENT FROM LEAVING THE SITE.
- CONSTRUCTION VEHICLES SHALL UTILIZE THE STABILIZED CONSTRUCTION ENTRANCE TO THE EXTENT POSSIBLE THROUGHOUT CONSTRUCTION.
- IF INSTALLATION OF STORM DRAINAGE SYSTEM SHOULD BE INTERRUPTED BY WEATHER OR NIGHTFALL, THE PIPE ENDS SHALL BE COVERED WITH FILTER FABRIC.
- THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE TO TAKE WHATEVER MEANS NECESSARY TO ESTABLISH PERMANENT SOIL STABILIZATION.
- SEDIMENT SHALL BE REMOVED FROM ALL SEDIMENT BASINS BEFORE THEY ARE 25% FULL.
- ALL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH PROJECT SPECIFICATIONS.
- ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED, IF DEEMED NECESSARY BY ON-SITE INSPECTION BY ENGINEER AND/OR REGULATORY OFFICIALS.
- SEE ALSO EROSION AND SEDIMENT CONTROL SPECIFICATIONS ON SHEET E1.
- EACH NEW LOT SHALL HAVE A STONE DRIP EDGE AROUND EACH HOUSE, AND A RAIN GARDEN AT DRIVEWAY LOW POINT. SEE DETAILS ON SHEET D2. THESE FEATURES SHALL BE SHOWN ON THE SUBSURFACE EFFLUENT DISPOSAL SYSTEM PLAN PREPARED FOR EACH LOT PRIOR TO ISSUANCE OF A BUILDING PERMIT.



PROJECT PARCEL
TOWN OF STRATHAM, NH
MAP 19, LOT 68

APPLICANT/OWNER
ROBIN SULLIVAN
8 WHITTAKER DRIVE
STRATHAM, NH 03885
BK 4199 PG 2969

TOTAL LOT AREA
14.99 ACRES

Design: JSR Draft: PLB Date: 6/26/13
Checked: JSR Scale: AS NOTED Project No.: 13070.1
Drawing Name: 13070-PLAN.dwg

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4	11/16/17	REVISED PER PLANNING BOARD	LAZ
3	10/5/17	REVISED PER PLANNING BOARD	PLB
2	8/16/17	REVISED PER PLANNING BOARD	LAZ
1	7/5/17	REVISED PER TOWN PLANNER	RMN
0	6/29/17	REVISED FOR PLANNING BOARD	PLB
REV.	DATE	REVISION	BY

J/B Jones & Beach Engineers, Inc.
Civil Engineering Services
85 Portsmouth Ave. PO Box 219 Stratham, NH 03885
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

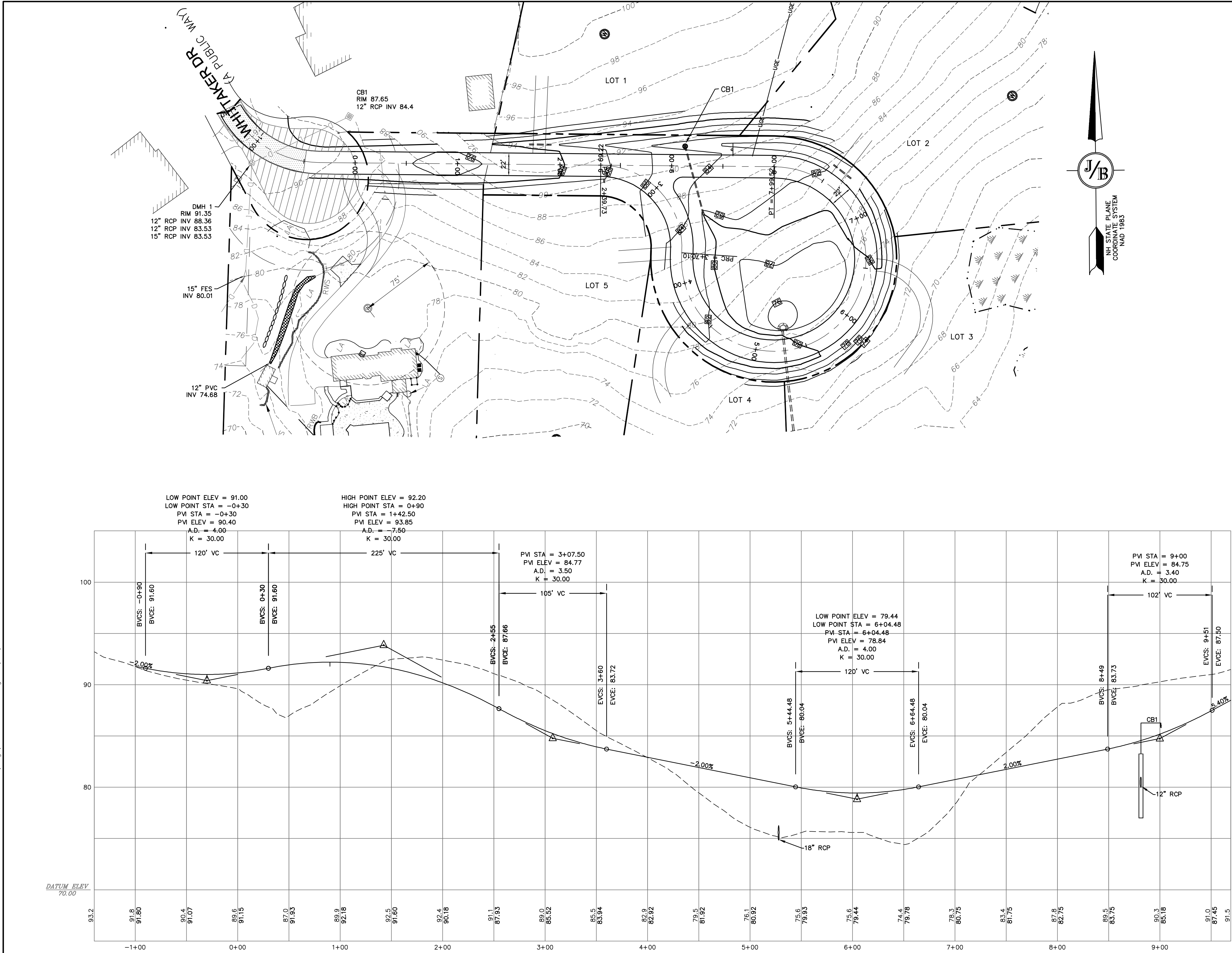
Plan Name:	GRADING AND DRAINAGE PLAN
Project:	SULLIVAN SUBDIVISION 8 WHITTAKER DRIVE, STRATHAM, NH 03885
Owner of Record:	ROBIN SULLIVAN 8 WHITTAKER DRIVE, STRATHAM, NH 03885

DRAWING No.

C2

SHEET 4 OF 8
JBE PROJECT NO. 13070.1

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- NOTES:
- THIS SITE WILL REQUIRE A USEPA NPDES PERMIT FOR STORMWATER DISCHARGE FOR THE CONSTRUCTION SITE. THE CONSTRUCTION SITE OPERATOR SHALL DEVELOP AND IMPLEMENT A CONSTRUCTION STORM WATER POLLUTION PREVENTION PLAN (SWPPP), WHICH SHALL REMAIN ON SITE AND BE MADE ACCESSIBLE TO THE PUBLIC. THE CONSTRUCTION SITE OPERATOR SHALL SUBMIT A NOTICE OF INTENT (NOI) TO THE EPA REGIONAL OFFICE SEVEN DAYS PRIOR TO COMMENCEMENT OF ANY WORK ON SITE. EPA WILL POST THE NOI AT [HTTP://CFPUB1.EPA.GOV/NPDES/STORMWATER/NOI/NOISEARCH.CFM](http://cfpub1.epa.gov/npdes/stormwater/noi/noisearch.cfm). AUTHORIZATION IS GRANTED UNDER THE PERMIT ONCE THE NOI IS SHOWN IN "ACTIVE" STATUS ON THIS WEBSITE. A COMPLETED NOTICE OF TERMINATION SHALL BE SUBMITTED TO THE NPDES PERMITTING AUTHORITY WITHIN 30 DAYS AFTER EITHER OF THE FOLLOWING CONDITIONS HAVE BEEN MET:
 - FINAL STABILIZATION HAS BEEN ACHIEVED ON ALL PORTIONS OF THE SITE FOR WHICH THE PERMITTEE IS RESPONSIBLE; OR
 - ANOTHER OPERATOR/PERMITTEE HAS ASSUMED CONTROL OVER ALL AREAS OF THE SITE THAT HAVE NOT BEEN FINALLY STABILIZED. PROVIDE DPW WITH A COPY OF THE NOTICE OF TERMINATION (NOT).
 - ALL ROAD AND DRAINAGE WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR THE TOWN, AND NHDOT SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, WHICHEVER IS MORE STRINGENT.
 - AS-BUILT PLANS TO BE SUBMITTED TO THE TOWN PRIOR TO ACCEPTANCE OF THE ROADWAY.
 - DEVELOPER IS RESPONSIBLE FOR COMPLYING WITH ALL APPLICABLE LOCAL, STATE AND FEDERAL WETLAND REGULATIONS, INCLUDING ANY PERMITTING AND SETBACK REQUIREMENTS REQUIRED UNDER THESE REGULATIONS.
 - CONTRACTOR TO COORDINATE AND COMPLETE ALL WORK REQUIRED FOR THE RELOCATION AND/OR INSTALLATION OF ELECTRIC, CATV AND TELEPHONE PER UTILITY DESIGN AND STANDARDS. LOCATIONS SHOWN ARE APPROXIMATE. LOW PROFILE STRUCTURES SHALL BE USED TO THE GREATEST EXTENT POSSIBLE.
 - THIS PLAN HAS BEEN PREPARED BY JONES & BEACH ENGINEERS, INC. FOR MUNICIPAL AND STATE APPROVALS AND FOR CONSTRUCTION BASED ON DATA OBTAINED FROM ON-SITE FIELD SURVEY AND EXISTING MUNICIPAL RECORDS. THROUGHOUT THE CONSTRUCTION PROCESS, THE CONTRACTOR SHALL INFORM THE ENGINEER IMMEDIATELY OF ANY FIELD DISCREPANCY FROM DATA SHOWN ON THE DESIGN PLANS. THIS INCLUDES ANY UNFORESEEN CONDITIONS, SUBSURFACE OR OTHERWISE, FOR EVALUATION AND RECOMMENDATIONS. ANY CONTRADICTION BETWEEN ITEMS OF THIS PLAN/PLAN SET, OR BETWEEN THE PLANS AND ON-SITE CONDITIONS MUST BE RESOLVED BEFORE RELATED CONSTRUCTION HAS BEEN INITIATED.
 - SILTATION AND EROSION CONTROLS SHALL BE INSTALLED PRIOR TO CONSTRUCTION, SHALL BE MAINTAINED DURING CONSTRUCTION, AND SHALL REMAIN UNTIL SITE HAS BEEN STABILIZED WITH PERMANENT VEGETATION. SEE DETAIL SHEET E1 FOR ADDITIONAL NOTES ON EROSION CONTROL.
 - ALL DISTURBED AREAS NOT STABILIZED BY NOVEMBER 1st SHALL BE COVERED WITH AN EROSION CONTROL BLANKET. PRODUCT TO BE SPECIFIED BY THE ENGINEER.
 - FINAL DRAINAGE, GRADING AND EROSION PROTECTION MEASURES SHALL CONFORM TO REGULATIONS OF THE PUBLIC WORKS DEPARTMENT.
 - CONTRACTOR TO VERIFY EXISTING UTILITIES AND TO NOTIFY ENGINEER OF ANY DISCREPANCY IMMEDIATELY.
 - 6" PERFORATED ADS UNDER DRAIN PLACEMENT TO BE DETERMINED BY THE ENGINEER DURING TIME OF SUBGRADE INSPECTION. CONTRACTOR TO ADJUST LOCATION IN THE FIELD ONLY WITH PRIOR APPROVAL OF PROJECT ENGINEER OR PUBLIC WORKS DEPARTMENT. CONTRACTOR TO INCLUDE 1000 LF IN BID PRICE.
 - ALL DRIVEWAYS TO BE CONSTRUCTED MAXIMUM 10% SLOPE. SEE DETAIL SHEET. ALL DRIVEWAYS TO HAVE CULVERTS UNLESS APPROVED BY THE TOWN ROAD AGENT.
 - DRAINAGE INSPECTION AND MAINTENANCE SCHEDULE: SILT FENCING WILL BE INSPECTED DURING AND AFTER STORM EVENTS TO ENSURE THAT THE FENCE STILL HAS INTEGRITY AND IS NOT ALLOWING SEDIMENT TO PASS. SEDIMENT BUILD UP IN SWALES WILL BE REMOVED IF IT IS DEEPER THAN SIX INCHES, AND IS TO BE REMOVED FROM SUMPS BELOW THE INLET OF CULVERTS SEMIANNUALLY, AS WELL AS FROM CATCH BASINS.
 - ALL DRAINAGE INFRASTRUCTURE SHALL BE INSTALLED AND STABILIZED PRIOR TO DIRECTING ANY RUNOFF TO IT.
 - DETENTION PONDS REQUIRE TIMELY MAINTENANCE AND SHOULD BE INSPECTED AFTER EVERY MAJOR STORM EVENT, AS WELL AS 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 THE DETENTION 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. 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 BORROWS SHOULD BE REPAIRED IMMEDIATELY AND THE ANIMALS SHOULD BE TRAPPED AND RELOCATED IF THE PROBLEM PERSISTS.
 - THE DETENTION PONDS ARE TO BE CONSTRUCTED PRIMARILY THROUGH EXCAVATION. IN THOSE AREAS WHERE THE BERMS MUST BE CONSTRUCTED BY THE PLACEMENT OF FILL, THE ENTIRE EMBANKMENT AREA OF THE DETENTION PONDS SHALL BE EXCAVATED TO PROPOSED GRADE, STRIPPED OF ALL ORGANIC MATERIALS, COMPACTED TO AT LEAST 95% AND SCARIFIED PRIOR TO THE PLACEMENT OF THE EMBANKMENT MATERIAL. IN THE EVENT THE FOUNDATION MATERIAL EXPOSED DOES NOT ALLOW THE SPECIFIED COMPACTION, AN ADDITIONAL ONE FOOT (1') OF EXCAVATION AND THE PLACEMENT OF A ONE FOOT (1') THICK, TWELVE FOOT (12') WIDE PAD OF THE MATERIAL DESCRIBED IN THE NOTE BELOW, COMPACTED TO 95% OF ASTM D-1557 MAY BE NECESSARY. PLACEMENT AND COMPACTION SHOULD OCCUR AT A MOISTURE CONTENT OF OPTIMUM PLUS OR MINUS 3%, AND NO FROZEN OR ORGANIC MATERIAL SHOULD BE PLACED WITHIN FOR ANY REASON.
 - COMPACTION TESTING SERVICES (I.E. NUCLEAR DENSITY TESTS) ARE TO BE PERFORMED BY AN INDEPENDENT GEOTECHNICAL ENGINEER RETAINED BY THE CONTRACTOR FOR ROADWAY CONSTRUCTION AND ON EVERY LIFT OF NEWLY PLACED MATERIAL.
 - NO IRRIGATION PIPES OR SPRINKLER HEADS SHALL BE LOCATED WITHIN TOWN RIGHT OF WAY.
 - EACH NEW LOT SHALL HAVE A STONE DRIP EDGE AROUND EACH HOUSE, AND A RAIN GARDEN AT DRIVEWAY LOW POINT. SEE DETAILS ON SHEET D2. THESE FEATURES SHALL BE SHOWN ON THE SUBSURFACE EFFLUENT DISPOSAL SYSTEM PLAN PREPARED FOR EACH LOT PRIOR TO ISSUANCE OF A BUILDING PERMIT.

GRAPHIC SCALE
(IN FEET)

1 inch = 50 ft Horiz.
1 inch = 5 ft Vert.

Design: JSR	Draft: PLB	Date: 6/26/13
Checked: JSR	Scale: AS NOTED	Project No.: 13070.1
Drawing Name: 13070-PLAN.dwg		
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REV.	DATE	REVISION	BY

Designed and Produced in NH

J/B Jones & Beach Engineers, Inc.

85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885

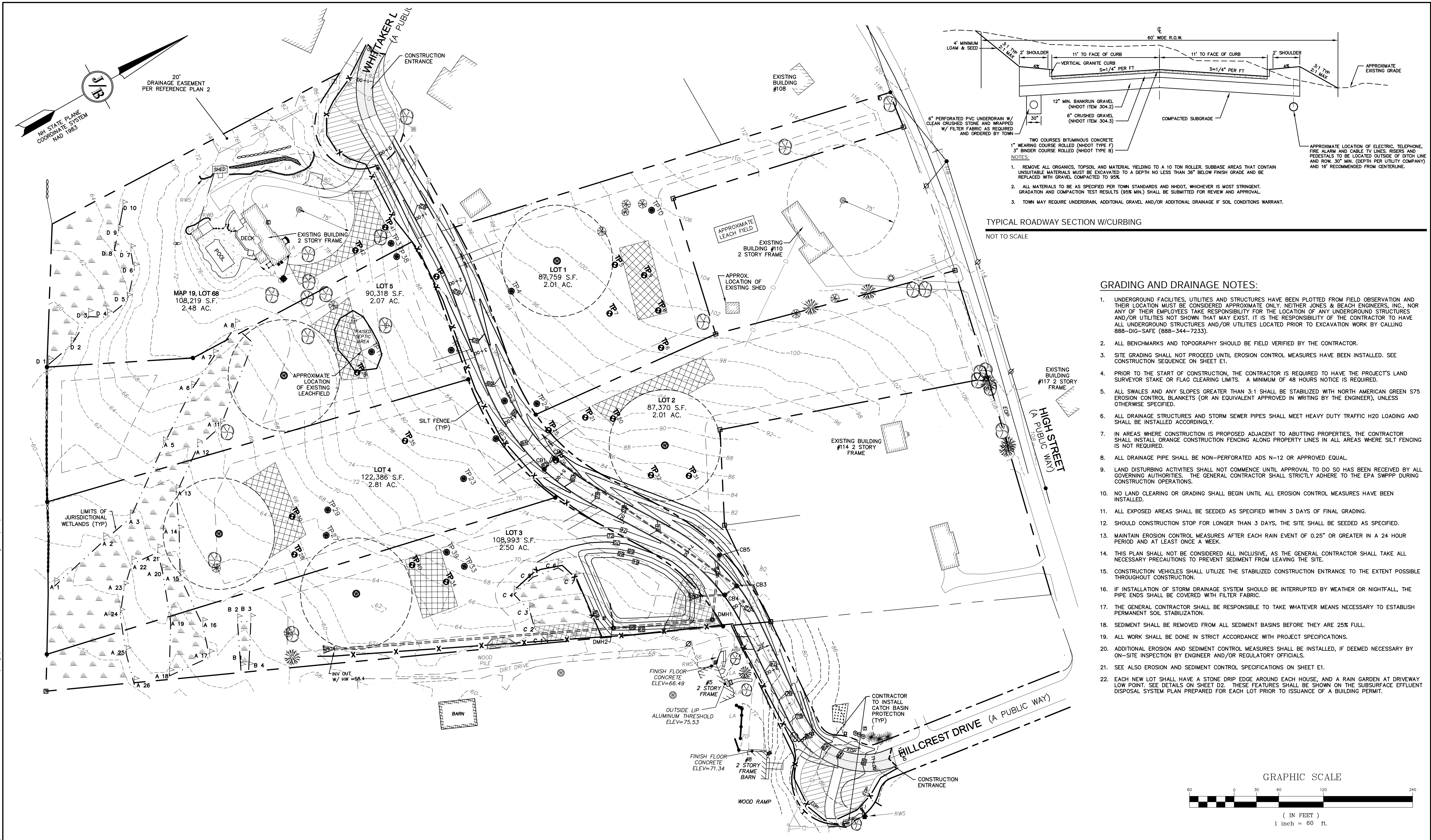
Civil Engineering Services

603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	PLAN AND PROFILE
Project:	SULLIVAN SUBDIVISION 8 WHITTAKER DRIVE, STRATHAM, NH 03885
Owner of Record:	ROBIN SULLIVAN 8 WHITTAKER DRIVE, STRATHAM, NH 03885

DRAWING No.
P1
SHEET 5 OF 8 JBE PROJECT NO. 13070.1

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Design: JSR	Draft: LAZ	Date: 6/26/13
Checked: JSR	Scale: AS SHOWN	Project No.: 13070.1
Drawing Name: 13070-DESIGN-HILLCREST.DWG		
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REV.	DATE	REVISION	BY
2	11/16/17	REVISED PROFILE	LAZ
1	10/5/17	MINOR REVISIONS	LAZ
0	7/12/17	ISSUED FOR REVIEW	LAZ

Designed and Produced in NH

J/B Jones & Beach Engineers, Inc.

Civil Engineering Services

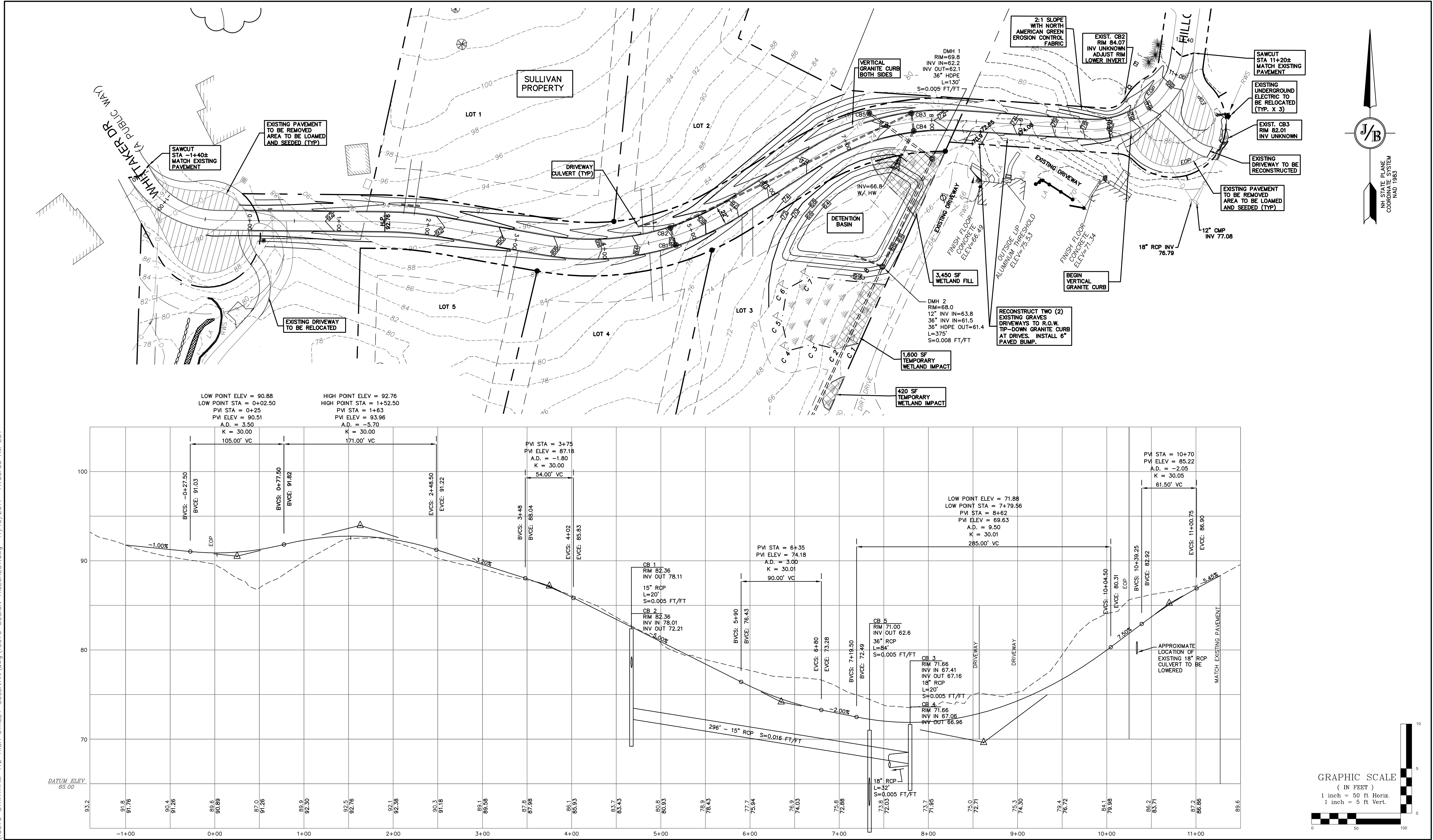
85 Portsmouth Ave. PO Box 219 Stratham, NH 03885

603-772-4746 FAX: 603-772-0227 E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	GRADING AND DRAINAGE PLAN
Project:	SULLIVAN SUBDIVISION 8 WHITTAKER DRIVE, STRATHAM, NH 03885
Owner of Record:	ROBIN SULLIVAN 8 WHITTAKER DRIVE, STRATHAM, NH 03885

DRAWING No.	C2
SHEET 2 OF 2	JBE PROJECT NO. 13070.1

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Drawing Name: 13070-DESIGN-HILLCREST.DWG		
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REV.	DATE	REVISION	BY
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1	10/5/17	MINOR REVISIONS	LAZ
0	7/12/17	ISSUED FOR REVIEW	LAZ

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85 Portsmouth Ave.
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Stratham, NH 03885
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E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	HILLCREST CONCEPT PLAN AND PROFILE
Project:	SULLIVAN SUBDIVISION 8 WHITTAKER DRIVE, STRATHAM, NH 03885
Owner of Record:	ROBIN SULLIVAN 8 WHITTAKER DRIVE, STRATHAM, NH 03885

DRAWING No.	CPP3
SHEET 1 OF 2	JBE PROJECT NO. 13070.1

JONES & BEACH ENGINEERS INC.

85 Portsmouth Avenue, PO Box 219, Stratham, NH 03885
603.772.4746 - JonesandBeach.com

Hillcrest Drive Issues
Sullivan Subdivision
8 Whittaker Drive, Stratham, NH
JBE Project No. 13070.1
November 16, 2017

1. Total road length 1,280' vs. 1,110' for Whittaker Drive extension cul-de-sac.
2. 22' wide road for each option.
3. Hillcrest 50' wide R.O.W. is narrow.
4. Relocate 340' of existing underground utilities at Hillcrest cul-de-sac. Exact location unknown, so cost may be higher. (\$10,200)
5. Deepen catch basin and 140' of existing 18" pipe at Hillcrest cul-de-sac. (\$5,060)
6. Reconstruct two (2) driveways to Graves property, plus one abutter. (\$2,663.75)
7. 2' wide shoulder behind vertical granite curb from Station 8+00 to 10+40 left and right.
8. No ditch line Station 8+00 to 10+40 left, so drainage flows directly across 2' shoulder onto pavement.
9. 2:1 Slope from Station 9+00 to 10+40 left.
10. Vertical granite curb to control drainage both sides of road, which requires five (5) catch basins, two drain manholes, and 970' of drainage pipe. (\$111,798)
11. Wetland fill of 5,470 S.F. for road slope, detention pond berm, drainage pipe necessary at low point elevation of through road. (\$3,500 Permit)
12. Preliminary Construction Cost Estimates (see attached):
 - a. Hillcrest Through Road \$467,072
 - b. Whittaker Cul-de-Sac \$225,277
13. Most abutters are opposed to through road connection.
14. Revise street mailing addresses for abutters.
15. Potential contamination of two (2) Graves dug wells.
16. Possible legal right-of-way issue to secure ability to construct Hillcrest connection on 50' R.O.W. never deeded to the Town. Is 1986 developer Robert C. Wilkins able to convey the property?
17. Possible upgrade all underground utilities for Whittaker and Hillcrest abutters. (UNITIL)
18. Possible Abutter appeal.

J/B		CONSTRUCTION COST ESTIMATE				J/B
Sullivan Subdivision 8 Whittaker Drive Stratham, NH JBE Project No. 13070.1 Total Length of Road = 1,280 lin. ft. (THROUGH)		Jones & Beach Engineers, Inc. 85 Portsmouth Avenue P.O. Box 219 Stratham, NH 03885 November 14, 2017 (PLB)				
ITEM DESCRIPTION		UNIT	QTY	UNIT COST	TOTAL COST	SUBTOTAL
GENERAL CONSTRUCTION						
Clearing and Grubbing	AC	2	\$	5,000.00	\$ 10,000.00	
Stump Disposal	AC	2	\$	3,000.00	\$ 6,000.00	
Common Excavation	CY	17670	\$	4.00	\$ 70,680.00	
Sawcut Pavement	LF	50	\$	2.00	\$ 100.00	
Asphalt Removal	SY	1900	\$	6.00	\$ 11,400.00	
Bank Run Gravel - Roadway	CY	1200	\$	17.00	\$ 20,400.00	
Crushed Gravel - Roadway	CY	600	\$	20.00	\$ 12,000.00	
Top Course - Roadway	TON	176	\$	65.00	\$ 11,440.00	
Binder Course - Roadway	TON	528	\$	60.00	\$ 31,680.00	
Bank Run Gravel - (1 Driveways)	CY	40	\$	16.00	\$ 640.00	
Crushed Gravel - (1 Driveways)	CY	20	\$	19.00	\$ 380.00	
Top Course - (1 Driveways)	TON	3.75	\$	65.00	\$ 243.75	
Binder Course - (1 Driveways)	TON	7.5	\$	60.00	\$ 450.00	
Bank Run Gravel - (2 Driveway Sections)	CY	27	\$	16.00	\$ 426.67	
Crushed Gravel - (2 Driveway Sections)	CY	13	\$	19.00	\$ 253.33	
Regrade Cul-De-Sac	EA	2	\$	7,000.00	\$ 14,000.00	
Construction Entrance	LS	2	\$	1,500.00	\$ 3,000.00	
Vertical Granite Curbing	LF	2060	\$	30.00	\$ 61,800.00	
Loam and Seed Slopes	SY	605	\$	5.00	\$ 3,025.00	
North American Green Erosion Control	SY	9100	\$	2.50	\$ 22,750.00	
Striping	LS	1	\$	1,000.00	\$ 1,000.00	\$ 281,669
GENERAL CONSTRUCTION SUBTOTAL						
DRAINAGE SYSTEM						
6" Perf ADS Drainpipe underdrain	LF	1600	\$	16.00	\$ 25,600.00	
12" ADS-N12 Culvert	LF	30	\$	24.00	\$ 720.00	
36" ADS-N12 Culvert	LF	505	\$	50.00	\$ 25,250.00	
15" RCP Culvert type III	LF	316	\$	30.00	\$ 9,480.00	
18" RCP Culvert type III	LF	52	\$	34.00	\$ 1,768.00	
Relocate existing 18" RCP Culvert	LF	140	\$	34.00	\$ 4,760.00	
36" RCP Culvert type III	LF	84	\$	55.00	\$ 4,620.00	
Catch Basin	EA	3	\$	1,500.00	\$ 4,500.00	
Deeper Catch Basins	EA	2	\$	3,000.00	\$ 6,000.00	
Catch Basin Rim to be Adjusted	EA	1	\$	300.00	\$ 300.00	
Drain Manhole	EA	2	\$	1,500.00	\$ 3,000.00	
Standard Headwall	EA	2	\$	650.00	\$ 1,300.00	
Detention Pond	LS	1	\$	5,000.00	\$ 5,000.00	
Rip Rap Erosion Control	CY	8	\$	18.00	\$ 144.00	
Silt Fence	LF	1200	\$	4.00	\$ 4,800.00	
Obtain Permit for Wetland Impacts	LS	1	\$	3,500.00	\$ 3,500.00	\$ 100,742
DRAINAGE SYSTEM SUBTOTAL						
UTILITIES						

J/B		CONSTRUCTION COST ESTIMATE				J/B
Sullivan Subdivision 8 Whittaker Drive Stratham, NH JBE Project No. 13070.1 Total Length of Road = 1,280 lin. ft. (THROUGH)		Jones & Beach Engineers, Inc. 85 Portsmouth Avenue P.O. Box 219 Stratham, NH 03885 November 14, 2017 (PLB)				
ITEM DESCRIPTION		UNIT	QTY	UNIT COST	TOTAL COST	SUBTOTAL
Drop Utility Pole		EA	1	\$ 2,000.00	\$ 2,000.00	
Underground Conduit to be relocated		LF	340	\$ 30.00	\$ 10,200.00	
Underground Conduit		LF	1000	\$ 30.00	\$ 30,000.00	\$ 42,200
UTILITIES SUBTOTAL						
						\$ 424,611
SUBTOTAL						\$ 42,461
10% CONTINGENCY						
						\$ 467,072
GRAND TOTAL						

J/B		CONSTRUCTION COST ESTIMATE				J/B
Sullivan Subdivision 8 Whittaker Drive Stratham, NH JBE Project No. 13070.1 Total Length of Road = 1,110 lin. ft. (CUL-DE-SAC)			Jones & Beach Engineers, Inc. 85 Portsmouth Avenue P.O. Box 219 Stratham, NH 03885 November 14, 2017 (PLB)			
ITEM DESCRIPTION		UNIT	QTY	UNIT COST	TOTAL COST	SUBTOTAL
GENERAL CONSTRUCTION						
Clearing and Grubbing		AC	2	\$ 5,000.00	\$ 10,000.00	
Stump Disposal		AC	2	\$ 3,000.00	\$ 6,000.00	
Common Excavation		CY	5553	\$ 4.00	\$ 22,212.00	
Sawcut Pavement		LF	25	\$ 2.00	\$ 50.00	
Asphalt Removal		SY	725	\$ 6.00	\$ 4,350.00	
Bank Run Gravel - Roadway		CY	1183	\$ 17.00	\$ 20,111.00	
Crushed Gravel - Roadway		CY	592	\$ 20.00	\$ 11,840.00	
Top Course - Roadway		TON	147	\$ 65.00	\$ 9,585.06	
Binder Course - Roadway		TON	442	\$ 60.00	\$ 26,543.25	
Construction Entrance		LS	1	\$ 1,500.00	\$ 1,500.00	
Loam and Seed Slopes		SY	1600	\$ 5.00	\$ 8,000.00	
North American Green Erosion Control		SY	4680	\$ 2.50	\$ 11,700.00	
Striping		LS	1	\$ 1,000.00	\$ 1,000.00	
GENERAL CONSTRUCTION SUBTOTAL						\$ 132,891
DRAINAGE SYSTEM						
6" Perf ADS Drainpipe underdrain		LF	1000	\$ 16.00	\$ 16,000.00	
12" RCP Culvert type III		LF	66	\$ 30.00	\$ 1,980.00	
15" HDPE Culvert		LF	14	\$ 26.00	\$ 364.00	
18" RCP Culvert type III		LF	227	\$ 34.00	\$ 7,718.00	
Catch Basin		EA	1	\$ 1,500.00	\$ 1,500.00	
12" Flared End Section		EA	1	\$ 350.00	\$ 350.00	
Standard Headwall		EA	1	\$ 650.00	\$ 650.00	
Detention Pond		LS	1	\$ 5,000.00	\$ 5,000.00	
Rip Rap Erosion Control		CY	8	\$ 18.00	\$ 144.00	
Silt Fence		LF	800	\$ 4.00	\$ 3,200.00	
DRAINAGE SYSTEM SUBTOTAL						\$ 36,906
UTILITIES						
Drop Utility Pole		EA	1	\$ 2,000.00	\$ 2,000.00	
Underground Conduit		LF	1100	\$ 30.00	\$ 33,000.00	
UTILITIES SUBTOTAL						\$ 35,000
SUBTOTAL						\$ 204,797
10% CONTINGENCY						\$ 20,480
GRAND TOTAL						\$ 225,277

CIVILWORKS NEW ENGLAND

181 WATSON ROAD
P.O. BOX 1166
DOVER, NH 03821-1166
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November 28, 2017

Stratham Planning Board
10 Bunker Hill Avenue
Stratham, NH 03885

Attn: Tavis Austin, Town Planner
(via email): TAustin@strathamNH.gov

Re: Subdivision Plan Review – Sullivan
Tax Map 19, Lot No. 68
112 High Street, Stratham, NH
Our Reference No. 1768

Dear Mr. Austin:

At your request, we have reviewed revised and additional subdivision plans of the proposed Sullivan subdivision submitted by Jones & Beach Engineers, Inc. (JBE) in support of their application for Planning Board approval under subdivision review. The titles of the submitted plan sheets are listed below and are dated as noted:

PLAN NO.	TITLE	DATE	REV.
C2 4 of 8	Grading and Drainage Plan	11-16-17	4
P1 5 of 8	Plan and Profile	11-16-17	4
CPP3 1 of 2	Hillcrest Concept Plan and Profile	11-16-17	2
C2 2 of 2	Grading and Drainage Plan	11-16-17	2

All plan sheets have been prepared by JBE. Also submitted were:

1. Construction Cost Estimate, dated: Nov. 14, 2017, for 1,110 lin. ft. (CUL-DE-SAC)
2. Construction Cost Estimate, dated: Nov. 14, 2017, for 1,280 lin. ft. (THROUGH)
3. "Hillcrest Drive Issues", dated: Nov. 16, 2017, containing 18 "points" of data.

The scope of our review is not comprehensive; rather, it is with narrow focus on the submitted documents, Section 4.4.3(a.) of the Subdivision Regulations, and how each proposal most closely aligns with the intent and spirit of said Section of the Regulations.

Section 4.4.3(a.) of the Regulations states:

- a. Platting of Streets: Insofar as the Master Plan or Official Map does not indicate the size, location, direction and extent of a street, and subject to the regulations hereinafter specified regarding definite minimum widths, the arrangements of streets in a subdivision shall provide for the continuation of the principal street existing in the adjoining subdivisions, or of their proper projection when adjoining property is not subdivided, and shall be of a width of at least as great as that of such existing streets, but no less than a sixty (60) foot right-of-way. Where, in the opinion of the Board, topographical conditions make such continuance or conformity impractical, the Board may permit dead-end streets as described below.

OUR REVIEW COMMENTS:

1. The proposed 1,280 L.F. "THROUGH" road is consistent with the requirements of Section 4.4.3(a.). It provides for the "continuation of the principal street existing in the adjoining subdivision(s)".
2. The proposed "THROUGH" road is only 170 L.F. longer than the proposed "CUL-DE-SAC" road.
3. It appears as if a stormwater drainage culvert should be installed under the proposed road at STA 0+50.
4. We are not certain why vertical granite curbing is specified on both sides of the proposed "THROUGH" road between STA 0+00 and STA 7+00. If same were eliminated, CB1 and CB2 along with 316' of 15" RCP storm drain pipe could also be eliminated. Pipe, catch basin, and granite curbing elimination could save approximately \$57,480 in construction costs.
5. We are not certain as to why 340 L.F. of existing underground utilities would have to be relocated at Hillcrest Drive. If they do not require relocation, approximately \$10,200 in construction costs could be saved.

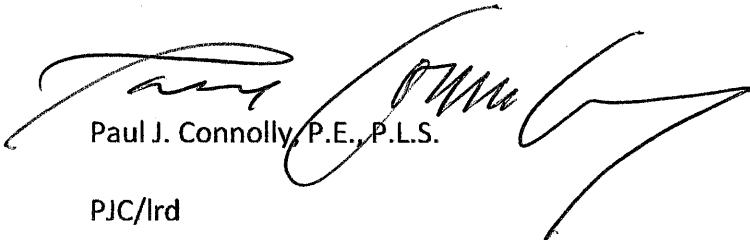
6. The overall length of the proposed cul-de-sac (to its "throat") is over 800'. The maximum length allowed in Section 4.4.3,a.,ii. Is 800'. A WAIVER from the Regulations has been requested to allow for this.
7. We are not certain as to why "most abutters are opposed to through road connection".
8. We do not see where "..... topographical conditions make such (through road) continuance or conformity impractical". JBE has demonstrated on their most recent plans that a through road connection is possible, albeit at some additional cost.
9. Between the proposed "THROUGH" road STA 3+70 and STA 5+50 and also, between STA 9+80 and STA 11+25, the centerline road profile grade is more than 4% on a horizontal curve. A WAIVER from ADDENDUM A, TABLE 1; of the Subdivision Regulations will be required to allow this proposed roadway vertical alignment.

RECOMMENDATIONS:

The Board may wish to have the applicant address the comments contained herein prior to taking any action on the disposition of the plans.

Please feel free to contact me if there are any questions or comments regarding this subdivision review.

Very truly yours,
CIVILWORKS, INC.



Paul J. Connolly, P.E., P.L.S.

PJC/lrd

cc: Jonathan Ring, P.E. (JBE), via email: jring@Jonesandbeach.com



TOWN OF STRATHAM

Incorporated 1716

10 Bunker Hill Avenue · Stratham, NH 03885

Town Clerk/Tax Collector 603-772-4741

Selectmen's Office/ Administration/ Assessing 603-772-7391

Code Enforcement/ Building Inspections/ Planning 603-772-7391

Fax (All Offices) 603-775-0517

To: Planning Board

From: Tavis Austin, AICP, Town Planner

RE: **6-Lot Subdivision Application** to create five (5) new building lots at 8 Whittaker Drive, Stratham NH 03885, Map 19 Lot 68 submitted by Jonathan S. Ring, PE, Jones & Beach Engineers, Inc., PO Box 219, Stratham, NH 03885.

Date: **Formal Subdivision Application – December 06, 2017** (*Second Review*)

I. PROJECT DESCRIPTION:

While Town Staff have maintained throughout this project's review that a 'through road' design for this project best complies with the Town Master Plan and the Zoning and Subdivision Regulations of the Town, there have been many statements and generalized assumptions made by both the applicant and some members of the public that such a connection will or cannot work. More specifically, there has been expressed distaste for a through road from some project abutters. While the Planning Board may desire to balance the regulations and the public input, the function of the Planning Board is to ensure compliance with the Regulations as adopted by the Town. Accordingly, the Planning Board requested additional information that would provide design metrics and engineered concepts so that a determination of Subdivision Regulations Section 4.4.3 can be made.

Recall, the applicant, Robin Sullivan, is before the Planning Board for a formal subdivision application to complete a six (6) lot subdivision application to create five (5) single-family lots; the proposed lots as submitted will conform with the Residential/Agricultural Zoning District requirements for lot frontage (200+ feet) and acreage (2+AC) by definition. This proposed subdivision is bounded to the east and west by established subdivisions with Town Roads, Whittaker Drive (west) and Hillcrest Drive (east), that each provide for future roadway connections; the mapped 50' rights-of-way illustrated on the respective Subdivision Plats and on the Town Assessing Maps.

This review is prepared upon receipt of new information related to two roadway designs related to the furtherance of review for the aforementioned project. The purpose of the two submissions, hereafter referred to as the Whittaker Extension or "*cul-de-sac*" and a through road design that connects Whittaker Drive to Hillcrest Drive or "*through road*," was to provide the Planning Board supplemental information on which to base a determination on Subdivision Regulation 4.4.3, as provided here:

4.4.3 Streets:

- a. *Platting of Streets: Insofar as the Master Plan or Official Map does not indicate the size, location, direction and extent of a street, and subject to the regulations hereinafter specified regarding definite minimum widths, the arrangements of streets in a subdivision shall provide for the continuation of the principal street existing in the adjoining subdivisions, or of their proper projection when adjoining property is not subdivided, and shall be of a width at least as great as that of such existing streets but no less than a sixty (60) foot right-of-way. Where, in the opinion of the Board, topographical conditions make such continuance or conformity impractical, the Board may permit dead-end streets as described below...*

As discussed previously, there have been many rather qualitative discussions as to the practicality or impracticality of a through road premised largely on the applicant's preference to construct a cul-de-sac. This was originally presented as a new road cut off of High Street and later modified to an extension of Whittaker. It became clear to both Staff and the Planning Board that a quantifiable determinant would be more helpful; hence the two plans submitted for review tonight. The Planning Board has held, throughout this project's review, that only those plans reviewed by the Town's Third-Party Engineer would be considered by the Planning Board. Such review has occurred (see attached report from CivilWorks dated 11/28/17) and therefore Staff supports Planning Board review of the submitted plans in concert with the third party review in effort to make their required determination related to 4.4.3 of the Subdivision Regulations.

Staff further directs the Planning Board's attention specifically to page three of the report for "Our Review Comments" #8 which speaks directly to Section 4.4.3 from an engineering perspective. In so far as Civilworks provides a both a qualitative and quantitative review of applicant submitted design plans before the Planning Board for consideration, Staff supports and recommends the Planning Board make a determination stating that the applicant has not demonstrated that topographical conditions which make continuation of the principal street existing in the adjoining subdivisions impractical.

Upon making this determination, Staff recommends the Planning Board then move to either deny the application as submitted or permit the applicant to further the application predicated on development of the through road as demonstrated on those materials as submitted and reviewed by CivilWorks. The Planning Board should also understand that further CivilWorks review will be required as *neither* of the plan sets submitted for this review, to date, are complete for Planning Board Review; again, this submission was only made for the purposes of consideration of Subdivision Regulation 4.4.3. Recommended Findings for a determination related to the Subdivision Regulations 4.4.3 and, if required for denial of the submitted subdivision application are offered below.

Recommended Findings for Determination related to Subdivision Regulation 4.4.3:

1. The Stratham Master Plan calls for an interconnected road network that minimizes the number of dead-end, or single access point developments.
2. Both the Whittaker Drive and Hillcrest Drive developments were approved with Town Roads by the Town Planning Board with 50' right-of-ways for future roadway extension to the project parcel thereby effectively establishing a *Master Plan* or *Official Map*.
3. The applicant has demonstrated that a through road can be developed within the existing rights-of-ways from Whittaker and Hillcrest Drives.
4. The applicant has not, in the opinion of the Planning Board or the Town's third party review engineer, demonstrated that topographical conditions exist which make continuation of the principal street existing in the adjoining subdivisions impractical as specified in Subdivision Regulation 4.4.3.
5. The Planning Board may only consider dead-end road development if topographical conditions which make continuation of the principal street existing in the adjoining subdivisions impractical.

Recommended Findings for Denial of Subdivision Application:

1. Both the Whittaker Drive and Hillcrest Drive developments, both adjacent to the project parcel, were approved with Town Roads by the Town Planning Board with 50' right-of-ways for future roadway extension to the project parcel thereby effectively establishing a *Master Plan* or *Official Map*, and;
2. The proposed subdivision proposes establishment of a cul-de-sac where site conditions are ripe for through-road construction in accordance with the adopted *Master Plan* or *Official Map*, and as provided by the applicant's through road design (as submitted), and;
3. The Planning Board may only consider dead-end road development if topographical conditions which make continuation of the principal street existing in the adjoining subdivisions impractical, and therefore;
4. The applicant has not proposed a subdivision that is compliant with the Subdivision Regulations.