TOWN OF STRATHAM

Incorporated 1716
10 Bunker Hill Avenue · Stratham, NH 03885
Town Clerk/Tax Collector 603-772-4741
Select Board's Office/Administration/Assessing 603-772-7391
Code Enforcement/Building Inspections/Planning 603-772-7391

PLANNING BOARD MEETING AGENDA
March 6, 2024, 7:00 pm
Stratham Municipal Center
10 Bunker Hill Avenue, Stratham NH

1. **Call to Order/Roll Call**

2. **Review and Approval of Minutes:**

   a. February 21, 2024 Planning Board Minutes

3. **Public Hearing (New Business):**

   a. Chinburg Properties, Inc. (Applicant), Lanzillo Irrevocable Trust (Owner) - Request for approval of a proposed conventional subdivision of 189 Bunker Hill Avenue, Tax Map 6, Lot 167, into six buildable lots served by a new road. The parcel is Zoned Residential/Agricultural. Application submitted by Beals Associates, 70 Portsmouth Avenue, Stratham, NH 03885.

4. **Public Meeting:**

   a. Other Business:
      1. Legislative Updates (as necessary)
      2. Planning Board Goals for 2024/2025

5. **Adjournment**

No new agenda items will be heard after 10:00 pm subject to the discretion of the Planning Board Chair. Full text of the agenda and related information can be found on file with the Stratham Planning Department and posted on the Town website at https://www.strathamnh.gov/planning-board . All interested persons may be heard. Persons needing special accommodations and /or those interested inviewing the application materials should contact the Stratham Planning Department at (603) 772-7391 ext. 180.

Stratham Planning Board Meeting Minutes
February 21, 2024
Stratham Municipal Center
Time: 7:00 pm

Members Present: Thomas House, Chair
Mike Houghton, Select Board's Representative
Chris Zaremba, Regular Member
John Kunowski, Regular Member
Nate Allison, Alternate Member

Members Absent: David Canada, Vice Chair

Staff Present: Mark Connors, Director of Planning and Community Development

1. Call to Order/Roll Call

Mr. House called the meeting to order at 6:59 pm and took roll call.

2. Approval of Minutes

a. January 17, 2024

Mr. Zaremba made a motion to approve the January 17, 2024 meeting minutes. Mr. Kunowski seconded the motion. All voted in favor and the motion passed.

3. Public Meeting:

a. Lindt & Sprungli USA, Inc. (Applicant & Owner) - Request for approval of an Expedited Site Plan Review Application to construct a proposed 600-foot addition to an existing manufacturing and office use at One Fine Chocolate Place, Tax Map 3, Lot 1, Zoned Industrial. Applicant is represented by The H.L Turner Group, 27 Locke Road, Concord, NH.

Mr. Connors introduced the application. The Lindt facility is the largest commercial/industrial use in town. This project is a small addition on the front side of the building closest to Marin Way. He stated this is a secure facility and the addition will likely not be visible from the right of way. Due to the size of the building and the lack of needed waivers, this project meets the requirements for expedited Site Plan Review which does not require a public hearing.

Douglas Brodeur from the HL Turner Group spoke on behalf of the Applicant. He directed the Board's attention to the cover sheet and described the location of the project as well shielded from any residential abutters and will also be difficult to see from the right of way. Mr. Brodeur stated there is one change from the submitted plans. Two inches was added to one side of the building and four inches to the other side for a total of 12 square feet. The purpose of the addition is to

house mechanical equipment for the processing. As such there will be no additional employees, traffic, or parking. Regarding stormwater the Applicant does not believe it is necessary to perform an analysis as this is only an additional 630 square feet of roof to an existing million and a half square feet of impervious area. It will drain to the front fire pond that was approved for stormwater treatment as a retention basin. Mr. Brodeur added that the capacity of the basin was reviewed during the last application and there is excess capacity available for this project. The building will be single story, about 12 feet inside, and about 15 feet on the exterior roofs. There is a fourth transformer pad adjacent to the building along with some relocation of water lines and there will be no mechanical equipment mounted on the roof or exterior.

Mr. Houghton asked if there are any exhaust fans. Mr. Brodeur replied his understanding is there is nothing.

Mr. Kunowski asked if the pumps to be housed in the space are being relocated from another part of the facility or if they are additional pumps. Mr. Brodeur replied they are additional in order to bring some new manufacturing lines into the facility. Mr. Kunowski asked if any demolition is proposed. Mr. Brodeur replied there will be some selective demolition for penetrations to the existing wall for piping. There is a small pump house on one side of the building that is about 6 feet by 6 feet, that is for the future doorway to go between the existing building and into this one. There is equipment currently in that space that will be relocated in the future.

Mr. House asked if there will be any noise generation. Mr. Brodeur replied that there will be insulated metal panels like in the existing facilities and they are very sound attenuating. Mr. Houghton asked if they are four or six inch walls. Mr. Brodeur replied he thinks they are six inch walls that are made out of sheet metal with spray foam on the interior.

There were no further questions from the Board and Mr. House requested a motion to open the meeting to the public.

Mr. Zaremba made a motion to open the meeting to the public. Mr. Kunowski seconded the motion. All voted in favor and the motion passed.

Mr. House announced that no members of the public were present.

Mr. Zaremba made a motion to close the meeting to the public. Mr. Kunowski seconded the motion. All voted in favor and the motion passed.

Mr. Zaremba asked if all construction will be done during normal business hours. Mr. Brodeur replied that he assumes so. Mr. Zaremba asked Mr. Connors if the Town has a requirement for that. Mr. Connors replied that we don't have a specific ordinance for construction, but the general noise ordinance would apply. Mr. Houghton suggested that be included as a condition of approval.

Mr. Connors presented the following conditions of approval:

1. A note shall be added to the plan that the proposed addition is for a utility room and will not directly incur any additional employees or traffic to the facility.
2. The applicant shall work with the Town Planner to incorporate minor technical revisions into the plans.
3. The applicant shall work with the Town Planner to ensure the application meets the letter, spirit, and intent of the Town's Stormwater Regulations.

4. The applicant shall be responsible to obtain any associated state or federal permits and the permit numbers shall be noted on the plan.

Mr. Houghton stated that condition 5 should be that construction will take place during normal business hours. Mr. Connors suggested 7:00 am to 7:00 pm.

Mr. House asked if there will be any new landscaping. There will be some grass to the sidewalks. Mr. House asked if the transformer location was approved by the utility company. Mr. Brodeur replied yes.

Mr. House called for a motion if there are no additional questions.

Mr. Kunowski made a motion that the Planning Board approve the Expedited Site Plan Review application to construct a 600 square foot addition to the existing manufacturing office use at 1 Fine Chocolate Place, Tax Map 3, Lot 1, Zoned Industrial, consistent with the site plan and associated materials submitted by Turner Group subject to the following binding conditions:

1. A note shall be added to the plan that the proposed addition is for a utility room and will not directly incur any additional employees or traffic to the facility.

2. The applicant shall work with a town planner to incorporate minor technical revisions into the plans.

3. The applicant shall work with the Town Planner to ensure the application meets the letter of spirit and intent of the Town's stormwater regulations.

4. The applicant shall be responsible to obtain any associated state and federal permits and the permit number shall be noted on the plan.

5. Construction will be limited to the hours of 7am and 7pm.

Mr. Zaremba seconded the motion. All voted in favor and the motion passed.

b. Other Business:

1. Stratham RPC TAC Member Recommendation

Mr. Connors explained that the TAC is the advisory committee of the Regional Planning Commission and every town is assigned a member. The committee that meets monthly. Stratham's representative has typically been the town planner. The new term expires on December 31, 2025 and the Planning Board needs to nominate someone to serve in this role. Mr. Connors is happy to continue in the role and Susan Connors, the Planning Project Assistant would serve as the alternate.

Mr. House made a motion to nominate Mark Connors to serve as Stratham's TAC member of the Regional Planning Commission with Susan Connors as the alternate. Mr. Houghton seconded the motion. All voted in favor and the motion passed.

2. Legislative Update

Mr. Connors presented some proposed Legislations that are only in the early stages.

House Bill 1291 relates to Accessory Dwelling Units and would require Towns to allow two ADUs per property. One would be detached which Stratham already allows. One ADU would be allowed by right and the second would require a Conditional Use Permit or a Special Exception. There is

some text in the bill that says towns could establish a minimum lot size of half an acre. There is a committee hearing on March 8.

House Bill 1359 would expand the definition of abutter. Currently, we are required to notify anyone who whose property touches or is across the street from the subject property. The bill would define abutters to those within 50 feet of the property boundaries. It would also allow abutters to appeal a ZBA application. Currently an abutter must raise an objection at the hearing to be able to appeal the decision.

House Bill 1399 would allow the conversion of single family homes to duplexes without discretionary review or hearing if the conversion does not involve demolition and more than 25% of exterior walls. This would affect Stratham because we have a higher minimum lot size for duplexes. With this bill if a property owner had only two acres, they could convert to a duplex where currently they could not in Stratham. Mr. Houghton asked if that would be only in Zones that allow duplexes. Mr. Connors replied yes. Mr. Zaremba asked if we can still require the larger lot size. Mr. Connors replied no as long as they are not dramatically changing the exterior of the building.

Senate Bill 538 is a miscellaneous group of changes. It would allow the Select Board to approve amendments to the Zoning Ordinance instead of having to go to ballot. It would also extend property tax relief, incentives to the conversion of office space to residential uses. And it would provide some density bonuses for workforce housing if the town does not already have them on the books, which Stratham does.

House bill 1567 would require municipalities to permit home based care (family care and group family care) by right including an accessory use to primary residential and not subject to Site Plan review in residential districts

Senate Bill 471 would establish a 45 mile per hour speed limit on rural highways. Mr. Connors is not sure exactly of the definition of rural highways, but he suspects that Route 33 would qualify north of the traffic circle.

House Bill 1483 would allow municipalities to include provisions to ensure there's adequate water supply to support existing or anticipated future land uses, including minimum private well testing. The committee hearing for that was today so Mr. Connors is not sure of the outcome.

House Bill 1215 would exempt subdivision plats, site plans, and building permits from changes to local ordinances and state building codes after they are approved.

Senate Bill 364 would establish a historic housing preservation tax program administered by the Housing Finance Authority. This bill has gone through the committee and has sought to pass recommendation from the Senate Committee.

HB 1602 would expand the authority of the Housing Appeals Board to hear appeals state agency permits where it is currently limited to municipal decisions.

3. Draft Open Space & Connectivity Plan Update

Mr. Connors presented the draft Open Space and Connectivity Plan. It is in a story map format that

is designed to be read online. It can be downloaded as a pdf but it is more effective to be viewed online as there are some interactive features. The Town is accepting comments on the draft for 30 days.

4. Staff Request for Third Party Engineering Review: 189 Bunker Hill Avenue six-lot subdivision application

Mr. Connors stated that the formal application was submitted for this project and the public hearing is scheduled for early March. He recommends that the Board not get into a discussion about the project at this meeting as the abutters are in the process of being notified. But he would like to get started on third party review with the Town's consulting engineer and he is seeking the Board's approval for that.

Mr. Houghton asked who the town is using. Mr. Connors suggested CMA out of Portsmouth.

Mr. Allison asked if they are a municipal engineering firm. Mr. Connors replied they are an engineering firm that does a lot of third party work for municipalities.

Mr. Zaremba asked Mr. Connors if this process is proposed to be changed at Town Meeting so that the Town Planner does not need approval from the Board for third party review. Mr. Connors replied no.

Mr. Kunowski asked if the review would be completed prior to the March 6th meeting. Mr. Connors replied no but they would have some preliminary input and he does not anticipate the Board making a decision at the March meeting.

Mr. Zaremba asked if this is normal for a subdivision. Mr. Houghton replied not for all, but it is typical.

Mr. House made a motion to authorize the Planning Director to obtain the services of the town consulting engineer to engage in a comprehensive third-party engineering review of the plans and associated materials for the pending subdivision application at 189 Bunker Hill Avenue. Mr. Allison seconded the motion. All voted in favor and the motion passed.

5. 13-15 Stoneybrook ZBA decision

Mr. Connors stated that the Select Board requested a rehearing of the Stoneybrook decision by the Zoning Board next Tuesday. They have two options, deny the rehearing which the Select Board could subsequently appeal or they can approve the rehearing which starts the whole process over again with abutter notification. And the Zoning Board would not be impacted at all by their earlier decision.

4. Adjournment

Mr. Zaremba made a motion to adjourn the meeting at 7:36 pm. Mr. Kunowski seconded the motion. All voted in favor and the motion passed.

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Fax (All Offices) 603-775-0517

TO: Planning Board Members

FROM: Mark Connors, Planning & Community Development Director

FOR: March 6, 2024

RE: Chinburg Properties, Inc. (Applicant), Lanzillo Irrevocable Trust (Owner) - Request for a apprvoal of a proposed subdivision of 189 Bunker Hill Avenue, Tax Map 6, Lot 167, into six buildable lots served by a new road. The parcel is Zoned Residential/Agricultural. Application submitted by Beals Associates PLLC, 70 Portsmouth Avenue, Stratham, NH 03885.

BACKGROUND INFORMATION:

The subject parcel is 13.19 acres and currently includes a single-family residence dating to 1958, a detached two-story garage, and a smaller outbuilding. The lot is located a short distance from the North Hampton town line and abuts the Hersey Lane, Wedgewood, and Montrose condominium developments. The parcel is somewhat irregular shaped and has an arrowhead like configuration, reaching its widest dimensions (approximately 720-feet) in the vicinity of the existing residence before gradually narrowing to a point that is approximately 1,600-feet from the frontage with Bunker Hill Avenue. The parcel is gently sloping with the highest elevations in the vicinity of the existing residence (approximately 106') and the lowest elevations in the far northeastern part of the parcel (82'). The parcel is almost entirely dry with the exception of a brook that flows across the southeasternmost point of the property adjacent to the Bunker Hill Avenue frontage.

This application was before the Planning Board, in preliminary form, on December 6, 2023. At that time, several abutting property owners provided comments related to the potential subdivision of the application. For the Board's reference, a copy of the December 6 meeting minutes is included in the meeting packets.

APPLICATION INFORMATION:

The applicant is proposing to subdivide the parcel to create six buildable lots (or five additional buildable lots from current conditions) served by a new cul-de-sac road. The plan shows all of the lots meeting and closely tracking with the Town's 2-acre minimum lot size requirement with the lots ranging in size from 2.00 acres to 2.17 acres. All of the lots meet the Town's minimum 200-foot road frontage requirement. The table on Page 2 outlines the size and frontage of each lot in the development:

Parcel	Size (in acres)	Road frontage
Lot 1	2.00	474'
Lot 2	2.00	389'
Lot 3	2.17	222'
Lot 4	2.02	341'
Lot 5	2.02	303'
Lot 6	2.00	705'

The Dimensional Requirements of the Zoning Ordinance (Table 4.2) does require a 150-foot minimum lot depth, defined as the mean distance from the frontage line to the rear lot line when measured on a line halfway between the two side lot lines. The subdivision plan should be updated to show the depth of each proposed lot in the development. However because of the irregularity of the parcel shape, the side and rear property lines for some parcels may not be entirely straight-forward.

The plan shows a new road serving the development located approximately 200-feet to the west of the existing driveway location close The road serving the development is proposed for a relatively straight section of Bunker Hill Avenue, though there is a slight jog in the road to the south at the point where the existing driveway intersects with the road. Staff would recommend that the plan be revised to show potential driveway locations for the new lots to show that all driveways can meet the Town's site distance requirements. Bunker Hill Avenue does include a pronounced curve approximately 800-feet to the east over the town line in North Hampton. More information should be provided regarding the proposed road, including the total length of the road, whether a Town road or private road is proposed, and the proposed treatment for the interior of the cul-de-sac.

The plan proposes two stormwater infiltration ponds. A smaller pond is proposed for Lot 6 while a much larger pond with a sediment forebay is proposed on Lot 3 in the lowest lying part of the parcel east of the proposed cul-de-sac and in close proximity to the property boundary with Lot . The plans note that the infiltration ponds will be protected by easements, though it is not clear yet who the easements would benefit and what activities would be regulated within the easement areas.

In the past, the Planning Board has sought opportunities to obtain right-of-way access adjacent to cul-de-sac roads to facilitate future road connections. In this context, there are no obvious possibilities for road connections, or at least none that would require obtaining access rights from only one property owner. It is notable however that 195 Bunker Hill Avenue, at 13 acres, abuts the property and could be developed to serve a similar use as the proposed development.

The parcel is mostly cleared and consists of rolling fields though there are some notable mature trees located on the property, particularly in the vicinity of the existing residence and lining the existing driveway. Some of these trees are shown on Page 3 of the Plan Set. It would be beneficial if at least a few of the mature trees could be retained and incorporated into the development. Photos of the site can be found beginning on Page 5 of the staff memo. Additionally, there is a vegetated buffer that extends along many of the exterior lot boundaries that would be helpful to retain where possible.

The frontage of Lot 1 includes a swath of land between the road frontage for the proposed road and the property boundary with 181 Bunker Hill Avenue that extends approximately 200-feet into

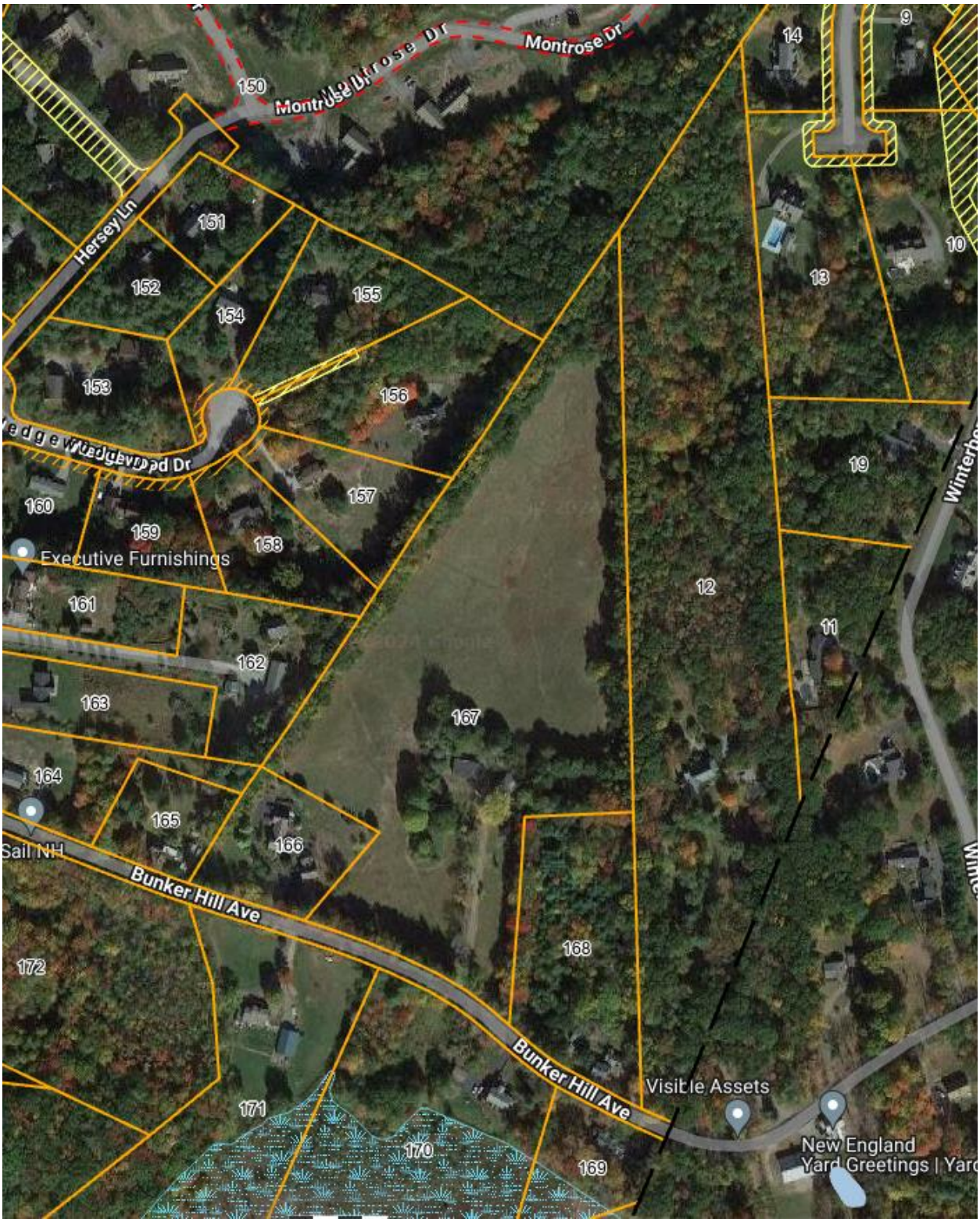
the development. This area does not appear to be buildable for new structures due to the Town's setback requirements. In staff's view, this would be a good location for landscaping to help provide screening to 181 Bunker Hill Avenue, which appears to be the property most impacted by the proposed development. Unlike other areas of the property, there is not an existing vegetated area already in place to help provide screening to this property. Other areas where landscaping screening may be helpful include between the infiltration ponds and the abutting properties as these facilities are proposed within close proximity of the exterior property boundaries.

Because the existing residence on the property is more than 50 years old, the demolition of the building would need to be reviewed by the Town's Demolition Review Committee. Staff has drawn up a series of more minor or technical comments for the applicant to consider and respond to

The Planning Board did receive written comments from the abutters at 188 Bunker Hill Avenue (also included in the packets). The abutters express concerns regarding drainage impacts, traffic safety, and the potential for conflicts between motorists and wildlife crossings.

RECOMMENDED ACTIONS:

The Town is awaiting formal comments from the Town's consulting engineer. Staff would recommend opening the public hearing and providing abutters and other member of the public the opportunity to provide comments or to pose questions. Additionally, the Planning Board may wish to schedule a site walk. The Board should discuss whether it believes a site walk would be helpful and staff can coordinate that with the applicants. Staff would recommend tabling consideration of the application to the Board's April 3, 2024 meeting.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Stratham Planning Board Meeting Minutes
December 6, 2023
Stratham Municipal Center
Time: 7:00 pm

Members Present: Thomas House, Chair
Mike Houghton, Select Board's Representative
David Canada, Vice Chair
Chris Zaremba, Regular Member
John Kunowski, Regular Member
Nate Allison, Alternate Member

Members Absent: None

Staff Present: Mark Connors, Director of Planning and Community Development

1. Call to Order/Roll Call

Mr. House called the meeting to order at 7:01 pm and took roll call.

2. Approval of Minutes

a. November 1, 2023

Mr. Zaremba made a motion to approve the November 1, 2023 meeting minutes. Mr. Kunowski seconded the motion. All voted in favor and the motion was approved.

b. November 15, 2023

Mr. House requested a correction to strike the sentence in Call to Order/Roll Call appointing Mr. Allison as a voting member as it is a carry-over from the previous meeting minutes. **Mr. Zaremba made a motion to approve the meeting minutes from November 15, 2023 with the aforementioned change. Mr. Kunowski seconded the motion. All voted in favor and the motion was approved.**

3. Public Meeting:

a. Chinburg Properties, Inc. (Applicant), Lanzillo Irrevocable Trust (Owner) - Request for a Preliminary Consultation of a proposed subdivision of 189 Bunker Hill Avenue, Tax Map 6, Lot 167, into six buildable lots served by a new road. The parcel is Zoned Residential/Agricultural. Application submitted by Beals Associates PLLC, 70 Portsmouth Avenue, Stratham, NH 03885.

Mr. Connors introduced the project. This is a preliminary application so the Board will not take any action tonight. The discussion is non-binding. Subject to recent changes in the land use

regulations, the abutters were notified of the application. Mr. Connors recommended to the Board that even though this is not a public hearing, they open the discussion for public comment. This is a conventional subdivision with minimum two acres and will need to meet frontage requirements. The plan is straight forward but it is not a fully engineered plan so it is unknown if any waivers are required. The road will be built to town specifications in order to be accepted as a public road.

Mr. House invited the Applicant to speak. Justin Pasay, an attorney with DTC Lawyers, spoke on behalf of the Applicant. Mr. Pasay introduced Christian Smith with Beals Associates; Ken and Betty Lanzillo, Trustees of the Trust that owns the property; and members of the Gove Real Estate Group particularly Alexx Monastiero. They are presenting a design review for an internally vetted six lot subdivision. The Applicant is working with abutters to the property at 193 Bunker Hill Avenue which is owned by the sister of Betty Lanzillo. That process has been collaborative and productive and has yielded some alterations to the plan to include a relocation of the proposed right of way into the subdivision to accommodate more of a buffer. It has also spurred the hiring of Jeff Hyland of Ironwood Landscape Architecture to look at not only the landscaping for the proposed subdivision but to also look at the existing landscaping and the greater preservation of landscaping. The team has considered other uses of the properties including duplexes, but ultimately decided on the six-lot single family subdivision.

Mr. Smith presented the plan. He stated that they have not yet completed a full boundary or topographic survey. However, they have completed witnessed test pits for septic systems and potential drainage areas with Mike Cuomo from Rockingham County Conservation District. Gove Environmental has done a sweep of property for wetlands and determined there are no wetlands, but they have not completed the site specific or high intensity soils mapping. The property is approximately 14 acres and is in the Residential-Agricultural Zone. There will be approximately 820 linear feet of roadway with a 60-foot right of way and the required 88-foot right of way radius on the cul-de-sac. No wetlands impacts are proposed. They expect to need State subdivision approval and an NHDOT driveway permit but no other State approvals are anticipated to be required. Mr. Smith welcomes input from the Board on the design.

Mr. Houghton asked if any waivers are contemplated. Mr. Smith replied not at this time.

Mr. House suggested that the Applicant touch base with the police and fire departments specifically regarding the cul-de-sac. Mr. Smith agreed and expects that a fire cistern will be required. Mr. House added that septic systems will need to be located for the next plan. Mr. Smith replied that wells, septic systems, driveway cuts, etc. will be added when they receive the field located test pits from the surveyor. Mr. House asked if there will be shared septic systems. Mr. Smith replied no, there will be one for each lot and they will have a full existing conditions plan. Mr. Houghton asked for Mr. Smith to describe the location of the existing home. Mr. Smith described it is as towards the northwesterly corner.

Mr. Allison commented that the proposed lots are displayed to the hundredth of an acre and without a survey they don't really know what they have. Mr. Smith agreed and replied they did the best they could with publicly available boundary information. Mr. Allison commented that the lots are odd shaped but he understands why (to utilize the property to its maximum extent), but in the process of doing that, looking at the first lot, it has considerably less usable space than the other lots. He asked what are the squares depicted within the lot lines on the plan as some appear to be within the setbacks. Mr. Smith replied that the Ordinance requires a 150-foot by 150-foot square for planning purposes be fitted on each lot and does not state that it has to meet building setbacks.

Mr. Allison repeated his comment that the first lot still appears to have substantially less usable property. Mr. Smith appreciates the comment and there was a previous iteration where the road was tucked up against that property line and would have eliminated a feature described by Mr. Allison however in meetings with the abutter and what might be best for site distance, etc., they gave a 50-foot buffer to that lot. Mr. Smith believes there is still a very good building envelope for that parcel. Mr. Allison commented that the road design includes two reverse curves very close together and for safety and sight he thinks it would be better to straighten them out. Mr. Smith replied that might come to fruition once they have a boundary survey. Mr. Allison asked what the seasonal high water table at the property is. Mr. Smith replied 18 inches to 3 feet and they will all be mounded systems. Mr. Allison asked if that will require a good amount of material to be trucked in. Mr. Smith replied doubtful. He thinks the soil is fairly good and he believes there will be plenty of excavated material from the road construction. There may be some import but they will use as much as they can from onsite. Mr. Allison asked if the septic systems will be gravity. Mr. Smith replied that's the plan. Mr. Allison commented that with regards to cover, if a bed is 2 feet above the surface and it has to go uphill to the house, then that will require quite a bit of fill. Mr. Smith agreed that it could.

Mr. House asked if sidewalks are proposed. Mr. Smith replied that they have not considered that as there are no sidewalks on Bunker Hill Avenue and that area would be for drainage swales and 4 foot gravel shoulders. Mr. House commented that there is about a 16-foot drop from the existing house to the back and stormwater will need to be addressed. Mr. Smith replied that the grade benefits the project as they can collect it all in one place. He added they expect to have two or three BMPs for stormwater. Mr. House added snow removal needs to be addressed in the next plan.

Mr. House asked Mr. Connors if the Board needs to formally open the meeting to the public to hear the neighbors. Mr. Connors replied a vote is not needed.

Mr. House asked if any members of the public would like to speak.

George Philbrick of 188 Bunker Hill Ave spoke. He has a major concern with any water coming towards his property as he is downhill from the parcel. When Rollins Farm was constructed he did not expect to see any impact to his property but it has affected the water table. The pond that receives runoff from Rollins Hill also receives runoff from his property along with another abutter. The pond is a problem due to beaver dams and that problem is complicated because the pond is in Stratham and the beaver dam is either on the town line or in North Hampton. This is a major concern to himself and one other abutter. Mr. House replied that a lot of the slope is to the rear of the property and they are aware that they have to meet the regulations for stormwater. Mr. Philbrick commented that there were recent tax increases this year due to the schools and this development will bring more of it. He also said there used to be a dangerous passing lane on the Bunker Hill Ave that was addressed years ago but people still pass there. Mr. House asked Mr. Smith to insure they have proper sight line when they complete the plan. Mr. Smith replied of course and that NH DOT will also review it and require 400 feet and may require deceleration lanes for vehicles heading north. Mr. Philbrick's last statement is that wetlands should not be considered, but if there is no water coming his way, he understands that.

John Stevens of 195 Bunker Hill Avenue spoke. He owns about 15 acres next to the property and is concerned with the potential decreased value of his property because of the loss of privacy. Currently there are about 200 feet of trees that block his home from the existing home. There is also an animal trail for deer, turkey, foxes, and coyotes that he is concerned will be affected by Lot

3. He also has concerns with his property value due to loss of privacy. He thinks the subdivision looks crowded. Mr. House replied that the proposal meets the two-acre minimum lot size. Mr. Stevens replied that there is no space other than the lots and driving down Bunker Hill Avenue, other recent places are wide open with lots of trees. It changes what he has been used to for 20 years in Stratham. He is concerned that he only heard about this project three days ago and believes he needs to hire a lawyer, an engineer, and a real estate agent to find out what the impact will be on his property and he needs time to assess that and he doesn't know when the next meeting will be. Mr. House replied the next meeting will depend on the Applicant's schedule and that abutters will be notified two weeks ahead of the meeting. Mr. Connors added that abutters will be sent notices by certified and regular mail. Mr. Stevens complained about mail delivery in Stratham. Mr. Canada replied it will also be posted on the website. Mr. Stevens replied that he will stay in touch but he asked when the Applicant thinks they will be ready. Mr. Smith replied they don't know when the survey will be completed and once that is done they need to complete soils mapping so he cannot predict when the subdivision application will be submitted. Mr. Stevens asked if they know what the target price per home will be, basically will it lower or raise the value of the neighborhood. Mr. House said that question is not in the purview of the Board but requested that the Applicant review the wildlife comment. Mr. House asked if the property is currently wooded. Mr. Smith replied most of the property is open field. Mr. Stevens corrected that the majority of lot 3 is wooded. Mr. Smith replied that he will include the existing tree line on the existing conditions plan.

David Ward of 6 Wedgewood Drive voiced concerns with drainage from the development towards his property. He pointed out on a map significant wet areas in the spring after snowmelt and rainfall. He commented that mounding septic systems could block the drainage. He requested assurance that there will be no interference with the drainage from Wedgewood Drive and Hersey Lane.

Donna Grant of 194 Bunker Hill Avenue voiced concerns with current drainage from 189 Bunker Hill Avenue onto her property. Currently there is a culvert under the road onto her property. When it rains her front yard is flooded and that water floods her back yard as well.

Jeff Sonneborn of 4 Wedgewood Drive shares similar concerns with drainage and added that the area of his property that abuts 189 Bunker Hill Avenue is very wet. He added that he has about 15 feet of trees on his property, then a stone wall, and many more trees in the subject property. He has seen in some developments a guarantee that a tree buffer be maintained on the property to be developed.

Dori Wiggin, of 179 Bunker Hill Avenue, asked for a representative to point out on the plan where the new road will go in relation to the existing driveway. Mr. Smith pointed to an approximate location. Ms. Wiggin asked for confirmation that they are not using the existing driveway. Mr. Smith replied correct and that he does not think there is adequate sight distance for the existing driveway. Ms. Wiggin asked the scale of the plan. Mr. Smith replied one inch is equal to 60 feet. Ms. Wiggin asked what the size of the houses is. Mr. Smith replied he does not know but he suspects they will be three and four bedroom homes. He added he has not seen any architectural drawings and this is very preliminary. Ms. Wiggin asked if there have been any pre-application meetings with the State for Alteration of Terrain, etc. Mr. Smith replied it will not need an Alteration of Terrain permit.

Jim Melfie of 6 Hersey Lane voiced concerns with drainage and if septic systems are above the

ground then a lot of dirt will be brought in to raise the elevation of the property resulting in a lot of drainage towards his property from the development. He pointed to the plan certain areas that are very wet in the spring and where it currently drains. He asked if people will construct fences and if there will be actual lot lines. Mr. Connors replied that fences require building permits and that they are usually allowed on individual properties. Mr. Melfie asked if the septic systems will be in the front or back yards. Mr. Smith replied that it is too early to determine that. Mr. Melfie replied that the further they are put from the boundary lines, the better the abutters will like it. He added that water always flows downhill. He asked for clarification on some of the boundary lines and asked if the project could add more like in Rollins Farm where they added 30 or 40 housing units where there was supposed to be six. Mr. House replied there will not be 30 houses on this property.

Michael Cole of 10 Wedgewood Drive asked if the 150-foot boxes on the plan are showing where the houses will go. Mr. House replied no that is to show that the lot is buildable; it does not show that a house or septic system will go there, it just means that the lot is large enough to fit that size box. Mr. Cole replied that he has concerns with water on the boundary for Lot 3. He added that's a long skinny lot and he asked where the house will be roughly on that lot. He asked if those are the final lot lines. Mr. Smith replied they could change based on what the final survey shows. Mr. Cole requested that through routes for wildlife be preserved.

George Philbrick of 188 Bunker Hill Avenue commented that the road is proposed to come out directly across from his house. In addition to the road concerns with speed, traffic, and two curves, he has concerns with headlights coming into his property. Mr. House replied that the Planning Board will review that as part of the formal application.

Rick Chellman of TND Engineering spoke on behalf of Leah Gray of 181 Bunker Hill Avenue. He stated they will reserve comments until there is more information but they have already met with the Applicant who has been very cooperative and they look forward to having additional meetings with them. There are some mature trees around the property that Ms. Gray would like to have preserved and they will work with the Applicant on that request.

Mr. Stevens provided one additional comment that all of the neighbors have problems with left turns from Bunker Hill Avenue onto Portsmouth Avenue and wondered if the Applicant could be induced to help with that. Mr. Connors replied that a traffic signal at that intersection is in the NHDOT 10-Year Plan and is slated for construction in 2027.

Mr. Houghton reminded the Applicant that the road name will need approval from the Select Board. Mr. Smith understands and added that after that he assumes it will go to the 911 Committee for addressing.

Mr. Stevens added it would be helpful for the site plan to be superimposed over Google Earth so the tree line is visible.

Mr. House stated this is not the last time the Planning Board will review this project and that the public is welcome to come back when the Applicant submits a formal application. Mr. Connors described the public notice process.

There were no additional comments from the Board members.

4. Public Hearing:

a. Sousa Signs, LLC (Applicant), NP Stratham, LLC (Owner), 20 Portsmouth Avenue, Stratham, NH, Tax Map 4 Lot 14, Zoned Gateway Commercial Business District - Request for approval of a Conditional Use Permit (CUP) under Section 7, Signs, to permit a backlit halo-style illuminated building-mounted sign at the site.

Mr. Houghton recused himself from the Board due to a relationship with the Applicant. Mr. House appointed Mr. Allison as a voting member for this application.

Jason Gagnon of Sousa Signs introduced himself and Melissa Fawcett from Pet Supplies Plus (PSP) and presented the application. They are requesting approval of a CUP with a lighting system that typically falls into a grey area when it comes to this illumination method. The new sign ordinance passed this year relies heavily on external illumination with down lighting systems and calls out that backlit signage is prohibited. Mr. Gagnon continued that this is where an interpretation of halo lighting as internally or externally illuminated is debated. He has been working with municipalities all over New England for 18 years and the label for this type of lighting has never been determined one way or the other. Traditional downtown zoned properties rely heavily on a down lighting system for aesthetics, but halo illumination has been accepted as an alternative lighting condition for those districts. As Pet Supplies Plus lies in a commercialized zoning district, having a sign that is both legible and viewable from a distance is extremely important for them. On the main challenges with down lighting is that a store front has a limited area for the sign and as a result, the business may need to reduce the size of their sign in order to have room for exterior lighting. Additionally down lighting can cast some shadows that makes the sign more difficult to read from a distance. The store front for PSP is about 275 feet from the road with additional buildings between the road and PSP. Having a sign that is visible that can be read from a far distance is needed. Halo illumination will allow the size to remain as one that is allowed by code and will also give the sign's night view a cleaner and more uniform lighting source. Halo lighting helps control light pollution which can be an issue with internal illumination. One benefit of halo lighting is that the amount of light that comes out from behind the letters is dictated by how far the letters are installed out from the wall; typically that is between three-quarters of an inch to two inches. In conclusion, they are only seeking approval of the lighting style. The size of the sign will remain within code as well as the time of illumination. Mr. Gagnon brought a sample sign and provided a demonstration.

Mr. House asked Mr. Connors if he wanted to add anything. Mr. Connors confirmed that the matter before the board is to allow back lighting and that the size is compliant with the Town regulations.

Mr. Gagnon proceeded with his demonstration and added that there is a sign permit approved for a non-illuminated letter set. However, with this sign set back so far in the strip mall and with the surrounding signs being internally illuminated, having a down lit lighting system will cause the sign to "stand out" (in a bad way) and will be hard for their sign to be distinguished amongst the other existing, internally illuminated signs. Internal illumination has the best visibility, but halo illumination has very good visibility and it does bring class to the district. Mr. Gagnon described the details of the sample product he brought for demonstration and the details of the proposed PSP sign.

Mr. House asked if there is any light coming through the letters. Mr. Gagnon replied no. Mr. House asked for confirmation that the sign is white during the day time. Mr. Gagnon confirmed it is a

solid aluminum fabricated letter and no light ever penetrates through. Mr. Gagnon turned on the sample product and explained that the sample has more LED lights than typical.

Mr. Zaremba asked Mr. Gagnon to explain how they determine how far from the wall a sign will be installed. Mr. Gagnon replied that at night only the light around the letters is visible and the sign should not be too far from the wall in order to achieve a soft glow and defined light around the letters.

Mr. House commented that the application states the sign will be 1.5 inches off the wall and if they want to get closer to the wall they will need to revise the documents. Mr. Gagnon understands.

Mr. Connors asked if the letters will look black when illuminated. Mr. Gagnon replied yes, it is supposed to, but with the parking lot lights they might get some overcast.

Mr. Zaremba asked if gooseneck lighting could be installed above the sign. Mr. Gagnon replied that if goosenecks were used, they would have to install the sign lower and then the area available for the sign would be smaller. Mr. Zaremba asked for confirmation that basically due to the existing construction of the building, it doesn't bode well for down lighting. Mr. Gagnon replied correct.

Mr. Allison commented that the proposal is almost like a downward fixture and there is no leakage through the letters and that all of the light seems to cast onto the front of the building similar to a downward facing fixture. He is not endorsing it, just commenting on how it seems to operate, that it is not lit from within with the letters shining towards the road. The problem he has with it is that it is a new requirement in town and when the Board makes exceptions then that can escalate. He acknowledges that it does have something in common with downward lighting.

Mr. Kunowski asked if the Loyal Companion sign under the banner was internally illuminated. Mr. Gagnon replied yes and his understanding is the new code was adopted in April and the Planet Fitness has up-lighting for that unit and is one of the only non-internally illuminated signs on that building. Mr. Canada asked if up-lighting is allowed. Mr. House replied that is must be pre-existing non-forming and that the light does not really shine up the Planet Fitness sign, maybe just the bottom few inches. Ms. Fawcett added that at night it is very difficult to see the Planet Fitness sign.

Mr. House asked what the hexagons are representing in the sign package. Mr. Gagnon replied that Blair is the designer for the sign package and Sousa signs is the local contractor working on permitting and installation. The first page is the standard corporate branding and colors for Pet Supplies Plus. Mr. Zaremba asked for confirmation that they are only using white and bronze and not green. Mr. Sousa replied correct.

Mr. Allison asked if there is a sign for the shopping center that will also have PSP listed. Mr. Gagnon replied yes. Ms. Fawcett added that it is poorly operating and very dimly lit. Mr. Allison asked what the hours of operation are. Ms. Fawcett replied 9:00 am to 7:00 pm with hopes of expanding as they grow the business. This time of year when it gets dark around 4:00 pm they had customers coming in saying they had no idea the business was open so sign recognition makes a difference. In comparison they just had their Portland Maine sign installed six weeks ago and they saw a 5% increase in sales. They know that won't happen in every market but brand recognition is important. Mr. Allison commented that there would be a sign with downward lighting, it just wouldn't be where they would want it to be. Mr. Gagnon added that the size of the sign would also be reduced.

Mr. Canada commented that he agrees with Mr. Allison that he is hesitant to start exempting what they now require. One thing that speaks in their favor is that other business have illuminated signs and the previous sign was illuminated. He asked Mr. Connors why this sign isn't considered pre-existing, non-conforming. Mr. Connors replied that new signs even at the same location have to meet the new requirements. Mr. Canada asked why this is a CUP application and not an application for the Zoning Board of Adjustment (ZBA). Mr. Connors replied that as part of the sign ordinance overhaul, a CUP application is required for relief from the ordinance; the former process required a variance.

Mr. House commented that the application package should have included a letter from the owner of the property stating the Applicant has approval to represent the property owner in the application and he doesn't see a letter. Ms. Fawcett replied she is the representative of the franchise. Mr. House replied that she is not the property owner. Mr. Gagnon stated there was a letter in the package. Mr. Connors stated that the property owner signed the application.

Mr. House asked Mr. Connors if he thought the application was complete. Mr. Connors replied yes. Mr. House asked for a motion to accept the application as complete. **Mr. Zaremba made a motion to accept the application as complete. Mr. Kunowski seconded the motion. All voted in favor and the motion was approved.**

Mr. House asked for any more comments from the Board. Mr. Zaremba asked Mr. Connors if the CUP process for signs can include internal illumination. Mr. Connors replied yes and there has to be a relief mechanism so for signs it is to the Planning Board instead of the ZBA.

Mr. Zaremba made a motion to open the hearing to the public. Mr. Kunowski seconded the motion. All voted in favor and the motion was approved.

Mr. House noted there are no members of the public present other than Mr. Houghton who recused himself and had no comments.

Mr. Zaremba made a motion to close the public hearing. Mr. Kunowski seconded the motion. All voted in favor and the motion was approved.

Mr. House read aloud each of the CUP criteria from the application and Mr. Gagnon read aloud each of the application responses. Mr. House requested comments from the Board regarding the application meeting the criteria.

Mr. Kunowski commented that he doesn't want to create an undue hardship for the Applicant given the existing conditions of the shopping center. That essentially this Applicant is being held to a higher standard than the existing tenants. He added if this was new construction from the ground up, he would not feel the same way and he thinks in those cases, the sign ordinance would need to be complied with.

Mr. Allison commented that this option is almost like a downward facing fixture in that it is lighting up the face of the building. He still has concerns that if approved, it opens the flood gates for additional applications, but he understands how this can be a hardship for this application, especially considering the other existing signs on the building. He doesn't have a problem approving it but believes it could be problematic for the Board long term. He added that in his opinion, if they comply with the new ordinance and had to move the sign down or shrink the letters,

they would still have reasonable exposure at night. Mr. Zaremba agreed it is a slippery slope to grant an exemption, but they have to start somewhere any time the Town changes a requirement. He added that the Board spent a lot of time on the new ordinance and halo lighting was discussed and it was determined that the Board would not allow it, but since the strip mall currently has existing internally lit signs, it is hard to say no and he believes the application meets the criteria.

Mr. Canada stated that a decision to allow this should include reference to the sign being pre-existing, non-conforming and how this sign will fit into the entire building. He added that he believes the application addressed the criteria.

Mr. House called for a motion to approve or deny the application.

Mr. Zaremba made a motion that the Planning Board approve the Conditional Use Permit application to allow a backlit halo-style illuminated sign at 20 Portsmouth Avenue, Tax Map 4, Lot 14, Zoned Gateway Commercial Business District, consistent with the application materials submitted by Sousa Signs, LLC, as the Board has determined that the application meets all of the Conditional Use Permit outlined in Section 7.3.d of the Zoning Ordinance per the Board's deliberations. Mr. Kunowski seconded the motion. All voted in favor and the motion was approved.

5. Other Business:

a. Proposed 2024 zoning amendments and dates of the two public hearings.

Mr. Connors presented to the Board a copy of ballot language for proposed zoning amendments and also redlined edits to the Ordinance. He stated that the Board has reviewed the redlined edits at previous meetings, but he will highlight a couple of new items. At the first public hearing the Board can make edits. Mr. Connors briefly stepped through each amendment:

Article II is a housekeeping amendment to the definitions and the Table of Uses to include new definitions and property uses that are not defined under the Ordinance (adding half story and mixed-use development and amending the definition of structure).

Article III clarifies the circumstances in which the Building Inspector may require that a plan prepared and stamped by a licensed land surveyor or certified wetland scientist be submitted with a building permit application. Mr. Canada asked for confirmation that an Applicant could appeal that decision to the ZBA. Mr. Connors replied correct.

Article IV clarifies the requirements associated with home occupations.

Article V consolidates the number of criteria the Planning Board considers for Conditional Use Permit applications from 11 to 7.

Article VI incorporates four major changes to the requirements associated with residential cluster developments including: reducing the minimum lot size for cluster developments, establishing minimum lot sizes for individual lots, requiring that open space parcels meet additional minimum requirements, and requiring that historical and scenic resources be preserved and incorporated into such developments whenever practicable. The historic resource preservation requirement is a new change for the Board to review. Mr. Connors stated that he believes the Town can include that

requirement because a cluster-subdivision is an option, not a requirement. This could not be included as part of the conventional subdivision requirements as it could be considered a taking, but he believes it can be done for clusters because they are an optional path. Regarding reducing the available lot size for Cluster Subdivisions from 20 acres to 12 acres, Mr. Houghton and Mr. Canada asked why the Town would want to do that. Mr. Canada noted that the Ordinance already allows the Planning Board the authority to allow a reduction of the minimum open-space cluster development acreage to ten acres for a plan with guarantees a designated percentage of workforce housing. He commented that the proposed amendment takes away the encouragement for workforce housing which the Board has previously deemed as important. He questions if it is the right thing to do. Mr. Allison commented that the project looked at earlier tonight is only 14 acres and he questions whether that would be a suitable for a cluster development. Mr. Houghton added that if this amendment passes, that might very well be what ends up in that project. Mr. Zaremba asked how many houses could be established in a 12-acre cluster development. Mr. Canada replied they are approved for six but then it would depend on bonuses. Mr. Allison commented that he assumes the 20 acres was established assuming there would be buffers left over, but as the size gets below that, he thinks there will be less left over for common land. He understands the enthusiasm for workforce housing, but he questions whether the 12 acres will work. Mr. Canada commented that he heard from Lucy Cushman, who was on the Planning Board when Cluster Subdivisions were passed, stress that a feature to emphasize and encourage was to keep the front lots along the street with no houses on them, so when driving down the street it looked like old Stratham with a development tucked away and in a case like they saw tonight, it wouldn't be possible. He added that 10 or 12 acres does not give them enough land to do that. Mr. Houghton commented that in that project, they could take the lot near the road, reserve it as open space and then have 24 houses on half-acre lots. Mr. Canada stated that would meet the intent. Mr. Houghton questioned is that was the Town wants. He added that the addition of more houses is the addition of more costs to serve to the community from a tax point of view. All board members agreed to keep the minimum size at 20 acres.

The Board discussed the proposed requirement that no more than 40% of the open space shall be made up of wetlands. Mr. Houghton stated 40% is a big number. Mr. Allison commented that the problem is that if there are large areas of wetlands that are represented as common land to be used by the community, that's not true when it comes to wetlands. The tactic often used in development is to take the unusable and undesirable land and make it public land. That defeats the purpose of having land that can be used by the community. He thinks it is reasonable to say no more than 40% is reasonable. Mr. Houghton asked Mr. Allison if he thinks 40% is a good number. Mr. Allison replied yes. Mr. Houghton said he'd be inclined to say 20%. He added that typically developers target the wetlands to be Open Space, so they get all the buildable land. The spirit of the cluster development is that it contain open space for the enjoyment of residents who do not have 2-acre lots. The developer needs to maximize the use of the lands to put foundations in the ground. Mr. House asked Mr. Houghton if he is suggesting a lower percentage. Mr. Houghton replied his opinion is it should be less than 40%. Mr. Canada and Mr. Zaremba agree with a lower percentage. Mr. Kunowski commented if the current ordinance allows 100% then he is comfortable with a 40-60 split. Mr. Allison commented that there is a specific community in town that in addition to having wetlands that can't be utilized, it was determined that the entire area within the wellhead radius cannot be used by the community. That is another issue that hasn't been discussed and he thinks that 20% might be reasonable. Mr. Houghton asked if it was the Homeowner's Association that created that limitation. Mr. Allison replied yes but they deferred it to state requirements because of people that might be abusing the privilege. Mr. House summarized that 20% is a more reasonable revision. Mr. Houghton stated that as Mr. Canada noted, if the development commits

to workforce housing, they can have a whole lot more, so this is providing an incentive for developers to consider. Mr. House asked if Mr. Houghton was suggesting an exception to the open space/wetlands language for workforce housing. Mr. Houghton replied no that he was referring to the minimum 10-acre development size for workforce housing.

Article VII creates a new sub-section for small accessory structures in order to provide for reduced side, rear, and wetland setbacks for small sheds or accessory structures under 120 square-feet provided that the structure meets a number of criteria. There were no questions on this amendment.

Article VII amends the Dimensional Regulations to clarify that non-buildable areas, including wetlands, steep slopes, and areas protected by conservation easements or deed restrictions cannot be incorporated into maximum residential density calculations. This amendment would also reduce the maximum residential density in the Route 33 Heritage District from three units per acre to two units per acre. Mr. Connors stated that he believes the non-buildable area requirement should apply to all of the Commercial Districts and not just the Heritage District. He proposes a change for the density in the Heritage District but also added language that the non-buildable area calculation applies to all of the districts in the section. Mr. Kunowski commented that he lived in California where houses are built on lots with very steep slopes. He realizes it is not optimal, but he wants to be careful that we are potentially excluding steep slopes as unbuildable area as engineering will allow building on a steep slope. Mr. Connors replied that the amendment doesn't prohibit building on a steep slope just that when computing density that those areas are not included. Mr. Kunowski replied okay. Mr. Connors described an example that if there was a steep slope and another flat area, that just the slope would be excluded. Mr. Allison summarized that this is for the purpose of calculating density so if there was one small piece in the middle of a large property, then it can't be counted towards density, but it could be re-engineered during construction and wouldn't need to be saved. Mr. Connors confirmed.

Article IX will allow small-scale ground-mount solar energy systems by right if they meet a number of minimum criteria. Mr. Connors stated that he did not propose a change to the maximum size of a "small-scale" system because he reviewed other communities and the size seems standard. Mr. Canada asked what size are the ones on Stratham Heights Road and Boat Club Drive. Mr. Connors replied small. Mr. Zaremba asked for confirmation that someone could get a usable system that is small. Mr. Connors replied yes and that most seen on single family lots are small. He added that the array at Stratham Green is medium sized. Mr. Connors reviewed the proposed criteria and presented photographs of examples. Mr. Kunowski asked if the side yard is defined as everything behind the front corner of the house. Mr. House replied that if the house is setback 100 feet and the front setback is 50 feet, then the side yard is from the 50-foot line back, not from where the house is located. Mr. Kunowski replied okay. Mr. Connors demonstrated that the side yard would be behind the front corner of the house. Mr. Kunowski asked for confirmation that the side yard would never be beyond the front corner of the house. Mr. Connors confirmed. Mr. Allison stated the definition would be the front corner of the house as opposed to the setback line. Mr. Connors presented photographs of a 10 kW solar array that is about 1,700 square feet. The Board discussed how size is calculated for an array and determined it is the surface area of the panels and not the footprint. Mr. Canada suggested increasing the size to 2,500 square feet which would be a 50 by 50 foot square and if someone wants to use their backyard for solar, it's their prerogative. Mr. Houghton is not as concerned with the backyard but thinks that is a large array for the side yard. Mr. House asked if this is just for residential. Mr. Connors replied that it could be for commercial, but solar projects on commercial properties would require site plan review per the regulations. Mr. Zaremba and Mr. Houghton have concerns with arrays on the side yard. Mr.

Allison commented that as an example, a 40' by 40' array would be a big collection of panels and in many cases would be too large for the side yard. He added that if it was on the side yard, it would have to meet setbacks and he believes in most cases it would be physically impossible on the side yard. Mr. House asked if the arrays have to located within the side yard or just take up part of the side yard. Mr. Connors replied that he thinks the board members are looking to remove the ability to place them in the side yard. Mr. House commented that could be hard as most rear yards are wooded. Mr. Connors asked the Board if they want to limit panels permitted by right to just the rear yard and are there any proposed changes to the definition of small-scale array. Mr. Zaremba asked regarding the definition, what is the average size needed for a four bedroom house. If the answer is greater than the definition of small scale then it seems too restrictive, but if it is well below then it seems reasonable. Mr. Allison commented that he had a 10 kW generator in his previous home and it was not enough to use the air conditioner and the dryer, but it was enough to cover basic items. He suspects that 10 kW is a reasonable number. Mr. Zaremba asked if the definition is by size or by wattage. Mr. Connors replied the requirement focuses on size and he read aloud the current definition. Mr. Houghton stated that this is what they are allowing by right and if someone wants something different, they would submit an application to the Planning Board. He is comfortable with the rear yard, 10 kW, and a 1,750 square feet system by right. Mr. Houghton commented the proposed language stating that small scale systems "may be" subject to the Site Plan Regulations is weak." Mr. Connors suggested a change to "shall". Mr. House asked if the proposed language related to a minimum of 50 feet from the front property boundary and 35 feet from the side or rear property boundaries needs to be adjusted if they are removing the option for side yard installation. Mr. Connors replied no because those setbacks would still apply to the side boundaries in the backyard.

Article X amends the Building Ordinance in order to enact a Fire Alarm Ordinance. The purpose of this amendment is to require new commercial and multi-family developments or major renovations in such facilities to include fire alarm systems. Mr. Connors stated that the Fire Chief requested this amendment. Mr. Connors discussed the proposal with the Town's attorney whose advice was to pass it through the Town ballot. Mr. Allison asked what a fire alarm ordinance is. Mr. Connors replied that is a requirement that alarms be installed that notify dispatch. Mr. Canada commented that it is late in the year to consider this. Mr. Houghton agreed it is a considerable request. Mr. Zaremba asked if there are any requirements today. Mr. House stated that this is covered under building code. Mr. Connors and Mr. Canada replied that it is not a current requirement. Mr. House replied this is an alarm (electrical) and not sprinklers. Mr. Canada replied that different communities have different standards. Mr. Zaremba commented he believes it is important, but above his expertise, and arguably a large burden and he doesn't want to rush something through the process. Mr. Kunowski asked what doesn't require a fire alarm. Mr. Houghton asked what the source of the information is and he asked for confirmation that the building code has requirements for fire alarms. Mr. House replied that the building code references NEC 70 which is the electrical code and includes fire alarms. He added that NFPA 101 is the standard for life safety. The board decided that they need more information before proceeding with the proposed amendments. Mr. Connors summarized that he will let the Fire Chief know that the Board wants to have a dialogue with him but they don't think there is enough time this year to capture amendments for 2024.

Mr. Connors presented an email from the Sprucewood Homeowner's Association complaining about a large, steel storage container on a property at the entrance of their subdivision that is not part of the HOA. Mr. House asked if it was part of the construction of the home. Mr. Connors replied he does not know and there is nothing in the zoning prohibiting it. He added they could be

required to obtain a building permit for the container, but it meets the setbacks and there is nothing in the ordinance that restricts them. Mr. Canada and Mr. Houghton were surprised that there is no regulation on storage containers. Mr. Connors stated he can draft a question for the public hearing, that the language does not need to be finalized tonight, and the Board can debate the language at the hearing. He added that because it is late in the process they can also defer it to next year. Mr. Zaremba asked if it is common for towns to prohibit these. Mr. Connors presented a photo of the storage container in question. Mr. Canada replied that a lot of towns would not allow them. Mr. Zaremba is in favor of looking into it this year. Mr. Canada agreed and added that it could be refined next year. Mr. Allison commented that it is similar to a shed and should need a permit. Mr. Connors agreed that the Town can require a permit but because it meets the setbacks, it would be allowed. Mr. Canada asked in the absence of a building permit, would this example be grandfathered. Mr. Connors replied no. Mr. Connors asked the Board if he should include this in the 2024 amendments. Mr. Canada, Mr. Houghton, and Mr. Zaremba replied yes.

Mr. Canada made a motion to post the proposed amendments to the Zoning and Building Ordinances, Articles II through X as discussed, for public hearings on January 3rd and 17th, 2024. Mr. Houghton seconded the motion. All voted in favor and the motion was approved.

b. Pending Land Use Applications

Mr. Connors updated the Board on some pending land use applications. The Stoneybrook project will go before the ZBA next week for a variance. Mr. Connors spoke with the applicant's attorney who clarified ZBA review is not for density or design and is solely to allow a single-family residential use. Mr. Canada asked if the variance is granted by the ZBA will the project come before the Planning Board for site review. Mr. Connors replied yes. Mr. Zaremba asked if they are going before the ZBA for permit by right. Mr. House replied it is for a variance for single-family residential as that use is not allowed at all. Mr. Canada commented that this is the Town's last large undeveloped commercial area and he has not seen any research that the land is not practical for commercial. Mr. Canada stated he has some concerns with setting aside all of that commercially-zoned land for a single-family residential use. Mr. Allison agreed. Mr. Zaremba questioned whether such a large change would be more appropriate as a zoning question so that voters at Town Meeting could have a say in the process.

Mr. Canada said he would like to see the Planning Board communicate to the ZBA it has concerns regarding the variance application. Mr. Zaremba asked if the Planning Board is permitted to do that. Mr. Houghton noted that there has been joint meetings with the ZBA in the past. Mr. Connors suggested to Mr. Canada that the Planning Board could request a joint meeting with the ZBA. Mr. Zaremba asked if the ZBA needs to agree to that. Mr. Connors replied yes. He believes that decision is up to the Chair. Mr. Allison stated the joint meeting would just be for the purpose of providing some additional thoughts and information that the ZBA may consider. Mr. Connors suggested that the Board make a motion to authorize Mr. House to write a letter to the ZBA requesting a joint meeting with the Planning Board. Mr. House recused himself from that process. Mr. Canada asked if the responsibility falls to him as vice-chair to make the request. Mr. Connors replied yes.

Mr. Zaremba made a motion to authorize David Canada, as acting Chair, to reach out to the ZBA to request a joint meeting on the Stoneybrook application currently in front of the ZBA. Mr. Houghton seconded the motion. Mr. House abstained and all others voted in favor and the motion was approved.

c. Miscellaneous Community Planning Issues

Mr. Houghton asked for an update on 275 Portsmouth Avenue. Mr. Connors replied that the Town has been in Superior Court with the owner asking for a series of compliance items to be addressed. The owner has addressed enough of these items that the Town is no longer pursuing the lawsuit against him. Mr. Houghton asked if that is only for existing uses. Mr. Connors replied yes. Mr. Houghton asked if there is a lock on introducing new tenants. Mr. Connors replied the owner has signed a document that he will not rent out the other units without going before the Planning Board.

Mr. Connors stated that at the next Planning Board meeting there will be a large cluster subdivision with 54 units on Winnicutt Road to review. Mr. Houghton asked if this is a preliminary consult. Mr. Connors replied yes but abutters are notified so there could be a significant turnout.

6. Adjournment

Mr. Canada made a motion to adjourn the meeting at 9:51 pm. Mr. Zaremba seconded the motion. All voted in favor and the motion was approved.

TRANSMITTAL

Town of Stratham
Planning Department
10 Bunker Hill Ave.
Stratham, NH 03885

Date: Feb. 6, 2024
Project: NH-1500
Location: Lovering Road
Via: Hand Deliver

We are sending you the following items:

Items:

Attached: For Subdivision

We are sending you the following items:

1 – Completed Subdivision Application
6 – Copies of Full-size Plans
9 – Copies Reduced Plans 11 x 17 Plans
9 – Letter of Authorization to represent
1 – List of Abutters w/3 labels for each
1 - Check payable to Town of Stratham
3 - Copies of Drainage report
9 – Copy Lot Sizing by Soil Type
9 - Copy Stamped Test Pits
9 – Copy Soils report prepared by Gove Environmental

Please feel free to call me if you have any comments, or if anything further is required.

Transmitted by: **Christian O. Smith, PE.**

TOWN OF STRATHAM

10 Bunker Hill Avenue, Stratham NH 03885
Planning Department (603) 772-7391
www.strathamnh.gov

SUBDIVISION APPLICATION

1. CHECKLIST SUMMARY:

1. This completed application (including all application package contents noted in the Site Plan Review Checklist) must be filed with the Planning Board's Agent no later than 12:00 PM on the deadline day published in the Planning Board's Schedule of Regular Board Meetings.
2. Fees (cash or check). Make checks payable to the Town of Stratham.

Application: (check one)

- ☐ **Preliminary Consultation**
- ☐ **Lot Line Revision**
- ☐ **Minor Subdivision Review***
- ■ **Major Subdivision Review****

*A minor subdivision is one that will not create more than 3 lots and does not require construction of a road.
**A major subdivision is one that creates more than 3 lots or includes construction of a road.

Please complete this application thoroughly and accurately, and attach the required exhibits as indicated in the Site Plan Review Checklist. Please note that an incomplete application will not be accepted for processing.

2. APPLICANT AND PROPERTY OWNER INFORMATION:

APPLICANT NAME:	Chinburg Properties Inc.		
Phone #:	(603) 868-5995 x31	Email Address:	ssammis@chinburg.com
Mailing Address:	3 Penstock Way, Newmarket, NH 03857		
PROPERTY OWNER NAME (If different from Applicant):	LANZILLO IRREVOCABLE TRUST		
Phone #:		Email Address:	
Mailing Address:	OCEAN BLVD UNIT 3 HAMPTON, NH 03842		

3. PROPERTY/PROJECT INFORMATION:

Tax Map:	06	Property Deed Information:	Book: 4624 Page: 2000		
Lot(s):	167	Total parcel area (SF):	606024	Total parcel area (acres):	13

Zoning District(s): Check all that apply.

- ☐ Commercial/Light Industrial/Office
- ☐ Flexible/Mixed Use Development
- ☐ Gateway Commercial Business
- ☐ Industrial
- ☐ Manufactured Housing/Mobile Home
- ☐ Professional/Residential
- ■ Residential/Agricultural
- ☐ Retirement Planned Community
- ☐ Route 33 Legacy Highway Heritage
- ☐ Special Commercial
- ☐ Town Center

Overlay District(s): Check all that apply.

- ☐ Aquifer Protection
- ☐ Floodplain Management
- ☐ Shoreline Protection
- ☐ Wetland Conservation

4. PROFESSIONAL SUPPORT: (Include additional sheets if necessary.)

COMPANY NAME:	Beals Associates	Contact:	Christian Smith
Phone #:	603-583-4860	Email Address:	csmith@bealsassociates.com
Mailing Address:	70 Portsmouth Ave, 3rd Flr, Unit 2, Stratham, NH		
COMPANY NAME:	Northam Survey, LLC	Contact:	ERIC SALOVITCH
Phone #:	(603) 953-3164	Email Address:	eric@northamsurvey.com
Mailing Address:	686 Central Ave, Suite 100 Dover, NH 03820		

5. PROJECT DESCRIPTION:

Briefly describe your existing and proposed use(s):

The proposal is to remove the existing home on the 14 acre parcel and subdivide the land into 6 residential lots with a proposed road.

Existing Number of Lots:	1	Existing Total Impervious Surface Area (SF):	9032
Proposed Number of Lots:	6	Proposed Total Impervious Surface Area (SF):	36180

6. APPLICANT'S CERTIFICATION:

I/We declare under penalty of perjury that all of the submitted information is true and correct to the best of my knowledge and belief. I/We have read and agree to abide by the regulations of the Town of Stratham. I/We understand that any misrepresentations of submitted data may invalidate any approval of this application. If the use is not operated in compliance with these regulations, the permit may be revoked by the Code Enforcement Officer or the Zoning Board of Adjustment.

By signing this application, you are agreeing to all rules and regulations of the Town of Stratham, and are agreeing to allow agents of the Town of Stratham to conduct inspections, during normal town business hours, or your property, to ensure compliance with all Stratham Zoning, Subdivision and/or Site Plan Review regulations while your application is under consideration. The Town accepts electronic signatures on this application. Electronic signatures carry the same validity, enforceability and admissibility, as handwritten signatures.

I/We authorize Beals Associates to submit this application to the Stratham Planning Board and to act as the professional and primary contact representing this application before the Stratham Planning Board. Communications related to this application, including those from the Stratham Planning Department, will be directed to this representative.

Signature of Applicant	**Print Applicant's Name**	**Date**
	SHAWNA SAMMIS, CHINBURG DEVELOPMENT	2 FEB 2024
(See Letter of Authorization, attached).		
Signature of Owner	**Print Owner's Name**	**Date**

SCHEDULE OF FEES FOR PLAN SUBMISSION

Fees will be calculated by Planning Department Staff with payment due at the time of final plan submission for the following:

Preliminary Consultation $75.00
Lot Line Revision (plus notice costs) $150.00
Minor Subdivision (plus notice costs) ..... $150.00 for the first lot, plus $100.00 for each lot or unit thereafter
Major Subdivision (plus notice costs)..... $250.00 for the first lot, plus $100.00 for each lot or unit thereafter
Notice Costs.....$150.00 plus $8.00 per abutter and per applicant

Please note that additional Special Investigative, Recording, and Municipal Review costs may apply. Review the Site Plan Review Regulations for more information and contact the Town Planner with questions.

PLEASE DO NOT WRITE BELOW THIS LINE – FOR PLANNING DEPARMENT USE ONLY

Application Received Date:_____ Date of Public Hearing Notice:_____

Application Fee:_____ Check Number:_____

Public Notice Fee:_____ Check Amount:_____

Abutter Notice Fee:_____ Check Payor:_____

Letter of Authorization

I, Kenneth F Lanzillo Jr., Trustee of the Kenneth F Lanzillo Revocable Trust, owner of 14 acres located at 189 Bunker Hill Ave in Stratham, NH, do hereby authorize the following parties to act as agents on our behalf for the above-described property in order to apply for any necessary state and local applications or permits relative to the development of said lot:

Chinburg Development and their agents to include but not limited to :

Beals Associates PLLC, 70 Portsmouth Ave, Stratham, NH

Gove Environmental, 8 Continental Drive Exeter, NH

as agents to act on my behalf in matters to be discussed with the Town of Stratham, State Departments and other Land Use Boards concerning the property previously mentioned.

I hereby appoint the above referenced parties as my agent to act on my behalf in the review process, to include any required signatures.

Kenneth F Lanzillo Jr. Trustee dotloop verified 10/10/23 3:29 PM EDT JANR-BDUR-NLWV-RJXP

Kenneth F. Lanzillo Jr, Trustee

Date

Kenneth F Lanzillo Irrevocable Trust

ABUTTERS LIST
FOR
NH- 1500 Chinburg - Stratham, NH
DATE February 5, 2024

SUBJECT PARCEL

TAX MAP/LOT	OWNER OF RECORD
06-167	LANZILLO IRREVOCABLE TRUST LANZILLO, KENNETH F. - TRUSTEE LANZILLO, KENNETH F. JR - TRUS 939 OCEAN BLVD UNIT 3 HAMPTON, NH 03842

ABUTTERS

TAX MAP/LOT	OWNER OF RECORD
06-150	MONTROSE CONDO ASSOC. C/O EVERGREEN HARVARD GROUP 72 PORTSMOUTH AVENUE SUITE 201 STRATHAM, NH 03885
06-150-012	COOK, SARAH L. 12 MONTROSE DRIVE STRATHAM, NH 03885
06-150-027	FREDERICK, DONNA 27 MONTROSE DRIVE STRATHAM, NH 03885
06-150-072	GILL, DAVID W. GILL, SHARON L. 72 MONTROSE DRIVE STRATHAM, NH 03885
06-156	COLE, MICHAEL R. COLE, CELESTE A. 10 WEDGEWOOD DRIVE STRATHAM, NH 03885
06-157	SONNEBORN, JEFFREY J. SONNEBORN, KATHERIN A. 8 WEDGEWOOD DRIVE STRATHAM, NH 03885

ABUTTERS LIST
FOR
NH- 1500 Chinburg - Stratham, NH
DATE February 5, 2024

06-158	WARD, DAVID J. WARD, JOANNE A. 6 WEDGEWOOD DRIVE STRATHAM, NH 03885
06-162	MELFI FAMILY REVOCABLE TRUST MELFI, JAMES I., -TRUSTEE 6 HERSEY LANE STRATHAM, NH 03885
06-163	LAPIERRE, RICHARD 4 HERSEY LANE STRATHAM, NH 03885
06-164-001	KREMER, SARAH 2A HERSEY LANE STRATHAM, NH 03885
06-164-002	WINSLOW, SHANE 2B HERSEY LANE STRATHAM, NH 03885
06-165	WIGGIN, PETER E. WIGGIN, DORI A. P. O. BOX 1193 PORTSMOUTH, NH 03801
06-166	GRAY, CHRISTOPHER & LEAH TRUST CHRISTOPHER D & LEAH C GRAY 181 BUNKER HILL AVENUE STRATHAM, NH 03885
06-168	THOMAS, DANNY E. 193 BUNKER HILL AVENUE STRATHAM, NH 03885
06-170	STONE, DAVID ABBOTT, ROY & SANDRA 194 BUNKER HILL AVENUE STRATHAM, NH 03885

ABUTTERS LIST
FOR
NH- 1500 Chinburg - Stratham, NH
DATE February 5, 2024

06-171	PHILBRICK, GEORGE & SUSAN REV. PHILBRICK, SUSAN C.-TRUSTEE PHILBRICK, GEORGE R. SR.-TRUST 188 BUNKER HILL AVENUE STRATHAM, NH 03885
07-012	STEVENS, JOHN K. STEVENS, RENATA PIKALIS 195 BUNKER HILL AVENUE STRATHAM, NH 03885

PROFESSIONALS

ENGINEERING FIRM	BEALS ASSOCIATES, PLLC. 70 PORTSMOUTH AVE. 3RD FLOOR STRATHAM, NH 03885
SOIL SCIENTIST	GOVE ENVIRONMENTAL 8 CONTINENTAL DR. BLDG. 2 UNIT H EXETER, NH 03833
SURVEYOR	NORTHAM SURVEY, LLC 686 CENTRAL AVE, SUITE 100 DOVER, NH 03820
DEVELOPERS	CHINBURG BUILDERS 3 PENSTOCK WAY NEWMARKET, NH 03857

NH-1500 – 189 Bunker Hill Ave, Stratham, NH
Test Pits – Christian Smith, P.E. of Beals Associates, PLLC- #1543

11/08/2023
Witness: Mike Cuomo

Test Pit #1

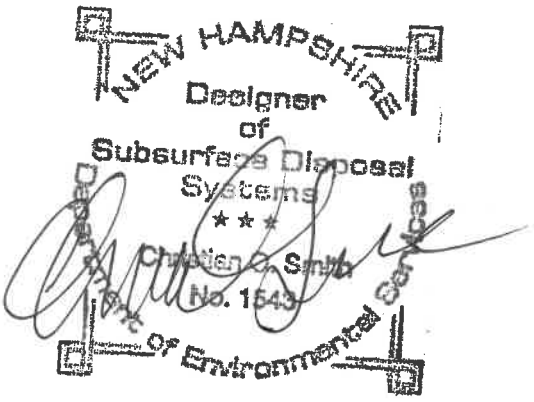
0" – 10"	10YR 3/3	Dark Brown Fine, Sandy, Loam Platy, Friable
10" - 20"	10YR 5 /6	Yellowish Brown Fine, Sandy, Loam Blocky, Friable
20" – 63"	2.5Y 4/4	Olive Brown Very Fine, Sandy Loam Blocky, Firm

ESHWT = 20"
Observed Ground Water –None
Restrictive Layer: 20 Inches
Refusal: None to 63"
Roots to 25 Inches
Perc Rate 8 min/inch @18"

Test Pit #2

0" – 10"	10YR 3 /4	Dark Yellowish Brown Fine, Sandy, Loam Platy, Friable
10" - 34"	10YR 4 /6	Dark Yellowish Brown Fine, Sandy, Loam Blocky, Friable
34" – 60"	2.5Y 4/4	Olive Brown Very Fine Silt Loam Blocky, Firm Redox-Common 2-20%

ESHWT = 34"
Observed Ground Water – None
Restrictive Layer: 34 Inches
Refusal: None
Roots to 6 Inches
Perc Rate 10 min/inch @23"



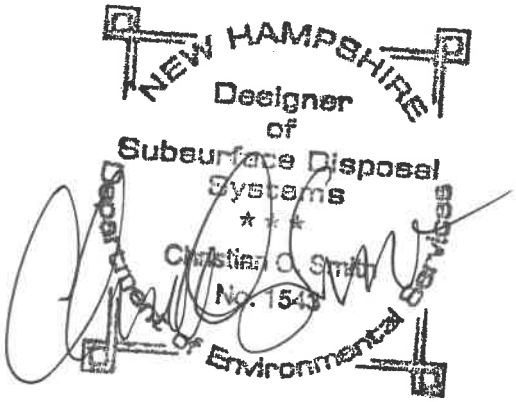
NH-1500 – 189 Bunker Hill Ave, Stratham, NH
Test Pits – Christian Smith, P.E. of Beals Associates, PLLC- #1543

11/08/2023
Witness: Mike Cuomo

Test Pit #3

0" – 10"	10YR 3 /4	Dark Yellowish Brown Fine, Sandy, Loam Platy, Friable
10" - 18"	10YR 4 /6	Dark Yellowish Brown Fine, Sandy, Loam Blocky, Friable
18" –62"	2.5Y 4/6	Olive Brown Very Fine, Sandy Loam Blocky, Firm Redox-Common 2-20%

ESHWT = 18"
Observed Ground Water – None
Restrictive Layer: 18 Inches
Refusal: None to 62"
Roots to 12 Inches
Perc Rate 8 min/inch @15"



Test Pit #4

0" –9"	10YR 3 /4	Dark Yellowish Brown Fine, Sandy, Loam Blocky, Friable
9" - 22"	10YR 4 /6	Dark Yellowish Brown Fine, Sandy, Loam Blocky, Friable
22" – 63"	2.5Y 4/4	Olive Brown Very Fine, Sandy Loam Blocky, Firm Redox-Common 2-20%

ESHWT = 22"
Observed Ground Water – None
Restrictive Layer: 22 Inches
Refusal: None to 63"
Roots to 6 Inches
Perc Rate 8 min/inch @15"

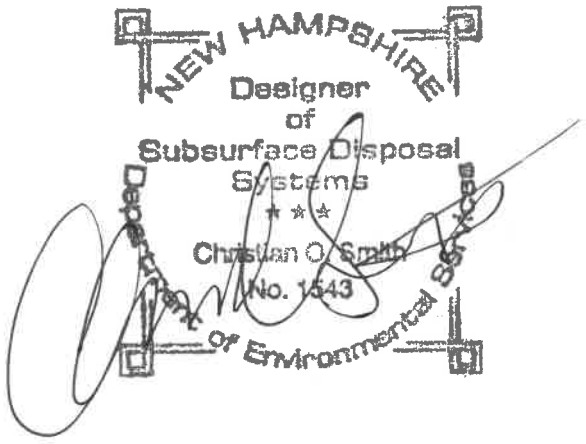
NH-1500 – 189 Bunker Hill Ave, Stratham, NH
Test Pits – Christian Smith, P.E. of Beals Associates, PLLC- #1543

11/08/2023
Witness: Mike Cuomo

Test Pit #5

0" – 10"	10YR 4/3	Brown Fine, Sandy, Loam Blocky, Friable
10" -26"	10YR 4 /6	Dark Yellowish Brown Fine, Sandy, Loam Blocky, Friable
26" – 62"	2.5Y 4/4	Olive Brown Fine, Loamy Sand Blocky, Firm Redox-Common 2-20%

ESHWT = 26"
Observed Ground Water – None
Restrictive Layer: 26 Inches
Refusal: None to 62"
Roots to 6 Inches
Perc Rate 8 min/inch @22"



Test Pit #6

0" – 14"	10YR 4 /4	Dark Yellowish Brown Fine, Sandy, Loam Blocky, Friable
14" - 32"	10YR 4 /6	Dark Yellowish Brown Fine, Sandy, Loam Blocky, Friable
32" –62"	2.5Y 4/4	Olive Brown Medium, Loamy Sand Massive, Firm Redox-Common 2-20%

ESHWT = 32"
Observed Ground Water – None
Restrictive Layer: 32 Inches
Refusal: None – 62 Inches
Roots to 6 Inches
Perc Rate 7 min/inch @26"

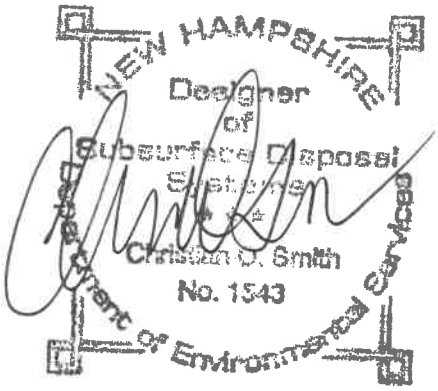
NH-1500 – 189 Bunker Hill Ave, Stratham, NH
Test Pits – Christian Smith, P.E. of Beals Associates, PLLC- #1543

11/08/2023
Witness: Mike Cuomo

Test Pit #7

0" – 9"	10YR 3/4	Dark Yellowish Brown Fine, Sandy, Loam Granular, Friable
9" - 18"	10YR 5 /6	Yellowish Brown Fine, Sandy, Loam Platy, Friable
18" – 62"	2.5Y 5/4	Light Olive Brown Silt Loam Platy, Firm Redox-Common 2-20%

ESHWT = 18"
Observed Ground Water – None
Restrictive Layer: 18 Inches
Refusal: None to 62"
Roots to 26 Inches
Perc Rate 10 min/inch @15"



Test Pit #8

0" – 8"	10YR 3 /4	Dark Yellowish Brown Fine, Sandy, Loam Blocky, Friable
8" - 23"	10YR 5 /4	Yellowish Brown Fine, Sandy, Loam Platy, Friable
23" – 62"	2.5Y 4/4	Olive Brown Silt Loam Platy, Firm Redox-Common 2-20%

ESHWT = 23"
Observed Ground Water – None
Restrictive Layer: 23 Inches
Refusal: None to 62"
Roots to 21 Inches
Perc Rate 10 min/inch @18"

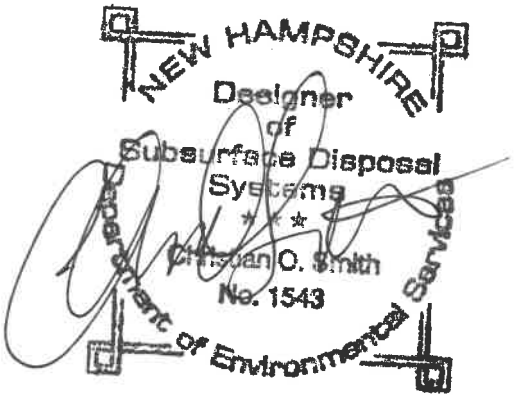
NH-1500 – 189 Bunker Hill Ave, Stratham, NH
Test Pits – Christian Smith, P.E. of Beals Associates, PLLC- #1543

11/08/2023
Witness: Mike Cuomo

Test Pit #9

0" – 9"	10YR 3 /4	Dark Yellowish Brown Fine, Sandy, Loam Granular, Friable
9" - 23"	10YR 5 /4	Yellowish Brown Fine, Sandy, Loam Platy, Friable
23"-63"	2.5Y 5/4	Light Olive Brown Loamy, Sand Massive, Firm Redox-Common 2-20%

ESHWT = 23"
Observed Ground Water – None
Restrictive Layer: 23 Inches
Refusal: None to 63"
Roots to 4 Inches
Perc Rate 7 min/inch @20"



Test Pit #10

0" – 8"	10YR 4/4	Dark Yellowish Brown Fine, Sandy, Loam Platy, Friable
8" - 21"	10YR 4/6	Dark Yellowish Brown Fine, Sandy, Loam Blocky, Friable/Very Stoney
21" – 61"	2.5Y 4/4	Olive Brown Loamy Sand Massive, Firm/Very Stoney Redox-Common 2-20%

ESHWT = 21"
Observed Ground Water – None
Restrictive Layer: 21 Inches
Refusal: None to 61"
Roots to 8 Inches
Perc Rate 8 min/inch @18"

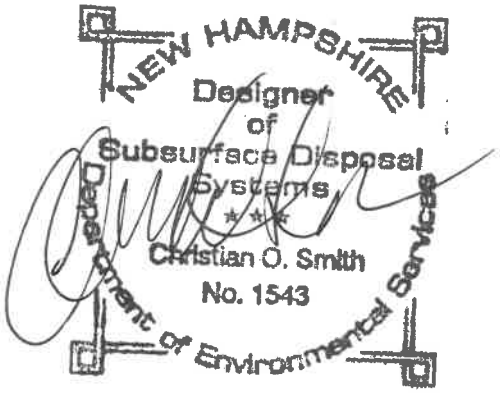
NH-1500 – 189 Bunker Hill Ave, Stratham, NH
Test Pits – Christian Smith, P.E. of Beals Associates, PLLC- #1543

11/08/2023
Witness: Mike Cuomo

Test Pit #11

0" – 10"	10YR 3 /4	Dark Yellowish Brown Fine, Sandy, Loam Blocky, Friable
10" - 27"	10YR 5 /6	Yellowish Brown Fine, Sandy, Loam Blocky, Friable/Stoney
27" – 64"	2.5Y 5/4	Light Olive Brown Loamy Sand Blocky, Firm/Stoney Redox-Common 2-20%

ESHWT = 27"
Observed Ground Water – None
Restrictive Layer: 27 Inches
Refusal: None – 64 Inches
Roots to 6 Inches
Perc Rate 8 min/inch @22"



Test Pit #12

0" – 12"	10YR 3 /4	Dark Yellowish Brown Fine, Sandy, Loam Blocky, Friable
12" - 37"	10YR 5 /4	Yellowish Brown Fine, Sandy, Loam Blocky, Friable
37" – 62"	2.5Y 4/4	Olive Brown Loamy Sand Massive, Firm/Stoney Redox-Common 2-20%

ESHWT = 37"
Observed Ground Water – None
Restrictive Layer: 37 Inches
Refusal: None – 62 Inches
Roots to 6 Inches
Perc Rate 8 min/inch @25"

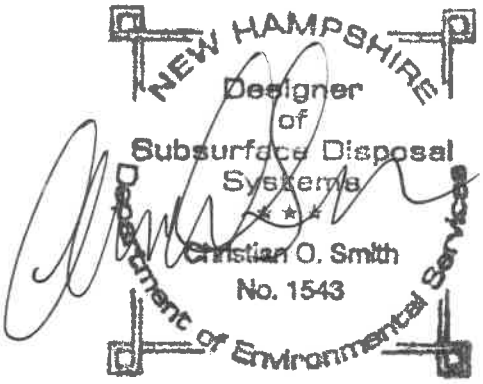
NH-1500 – 189 Bunker Hill Ave, Stratham, NH
Test Pits – Christian Smith, P.E. of Beals Associates, PLLC- #1543

11/08/2023
Witness: Mike Cuomo

Test Pit #13

0" – 10"	10YR 3/4	Dark Yellowish Brown Fine, Sandy, Loam Granular, Friable
10" - 23"	10YR 4/6	Dark Yellowish Brown Fine, Sandy, Loam Blocky, Friable
23" – 62"	2.5Y 5/4	Light Olive Brown Silt Loam Platy, Firm Redox-Common 2-20%

ESHWT = 23"
Observed Ground Water – None
Restrictive Layer: 23 Inches
Refusal: None to 62 Inches
Roots to 23 Inches
Perc Rate 10 min/inch @20"



Test Pit #14

0" – 18"	10YR 3 /4	Dark Yellowish Brown Fine, Sandy, Loam Granular, Friable
18" - 21"	10YR 4/ 4	Dark Yellowish Brown Fine Sandy Loam Blocky, Friable
21" – 64"	2.5Y 4/4	Olive Brown Silt, Loam Blocky, Firm Redox-Common 2-20%

ESHWT = 21"
Observed Ground Water – None
Restrictive Layer: 21 Inches
Refusal: None - 64 Inches
Roots to 32 Inches
Perc Rate 10 min/inch @18"

Test Pit #D1

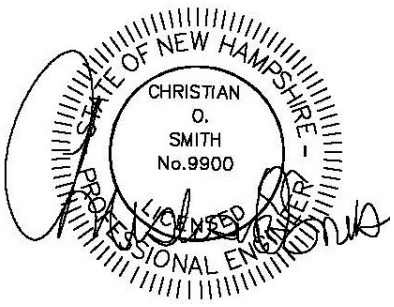
0" – 12"	10YR 4 /4	Dark Yellowish Brown Fine, Sandy, Loam Granular, Friable
12" - 28"	10YR 5/ 4	Yellowish Brown Fine, Sandy, Loam Blocky, Friable
28" – 68"	2.5Y 4/3	Olive Brown Silt, Loam Platy, Firm Redox-Common 2-20%

ESHWT = 28"
Observed Ground Water – 42 inches
Restrictive Layer: 28 Inches
Refusal: None
Roots to 26 Inches

Test Pit #D2

0" – 10"	10YR 4 /4	Dark Yellowish Brown Fine, Sandy, Loam Granular, Friable
10" - 18"	10YR 5/ 3	Brown Fine, Sandy, Loam Blocky, Friable
18" – 68"	2.5Y 5/2	Grayish Brown Silt, Loam Blocky, Firm Redox-Common 2-20%

ESHWT = 18"
Observed Ground Water – 38 inches
Restrictive Layer: 18 Inches
Refusal: None
Roots to 6 Inches

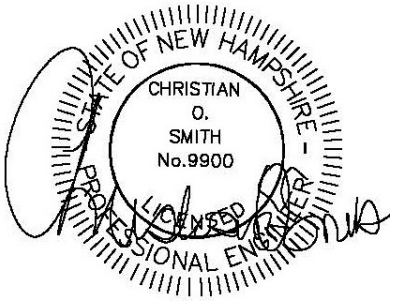


NH-1500 – 189 Bunker Hill 01/23/2024
Test Pits – Christian Smith, P.E. of Beals Associates, PLLC- #1543 Witness:

Test Pit #D3

0" – 12"	10YR 4 /4	Dark Yellowish Brown Fine, Sandy, Loam Granular, Friable
12" - 18"	10YR 5/ 3	Brown Fine, Sandy, Loam Blocky, Friable
18" – 60"	2.5Y 5/4	Light Olive Brown Silt, Loam Platy, Firm Redox-Common 2-20%

ESHWT = 18"
Observed Ground Water – 24 inches
Restrictive Layer: 18 Inches
Refusal: None
Roots to 6 Inches



DRAINAGE ANALYSIS
&
SEDIMENT AND EROSION CONTROL PLAN

Prepared for:

CHINBURG PROPERTIES INC
WINDSONG PLACE
RESIDENTIAL SUBDIVISION

Prepared by:

BEALS ASSOCIATES, PLLC
70 PORTSMOUTH AVENUE
STRATHAM, NH 03885

Project Number:
NH-1500
Bunker Hill Road
Stratham, New Hampshire
February 1, 2024

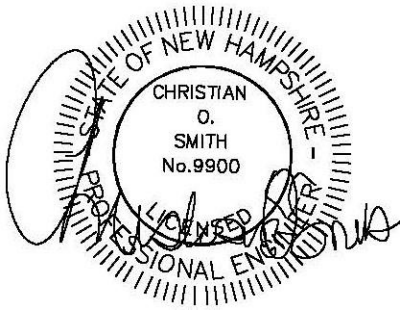


Table of Contents

1.0 ANALYSIS SUMMARY

Chinburg Properties Inc proposes to construct a residential site plan to establish a subdivision on a 13.9+/- acre parcel of land located off Bunker Hill Road in Stratham, New Hampshire. A drainage analysis of 28.6+/- acres of the proposed site improvement was conducted for the purpose of estimating the peak rate of stormwater run-off and to subsequently design adequate drainage structures. Two models were compiled: one for the area in its existing (pre-construction) condition and a second for its proposed (post-construction) condition. The analysis was conducted using Extreme Precipitation data provided by Cornell University for the following 24-hour duration storm events:

Storm Event	Rainfall Depth (inches)
2-Year	3.25
10-Year	4.94
25Year	6.28

These storm events use the USDA SCS TR-20 method within the HydroCAD Stormwater Modeling System environment to model the rainfall and predict stormwater runoff flows and volumes. A Type III storm pattern was used in the model. The purpose of this analysis is to estimate the peak rates of run-off from the site for detention adequacy purposes, and to compare the peak rate of run-off between the existing and proposed conditions.

Peak Rate of Discharge

		Component Peak Rate of Discharge (CFS)		
Analysis Point # Analysis Point Description	**Condition**	**2-Year**	**10-Year**	**25-Year**
Reach #<100>	Existing	5.92	14.30	22.93
Flow to Northeast	Proposed	1.31	9.34	20.42
Reach #<200>	Existing	3.11	6.58	9.65
Flow to South	Proposed	2.48	4.87	6.98
Reach #<300>	Existing	1.67	3.67	5.42
Flow to Southeast	Proposed	1.45	3.33	4.97

The proposed 6 lot residential subdivision includes a paved roadway into the subdivision ending in a cul-de-sac. The proposed improvement area includes three different subcatchments. The peak rate of run-off in the proposed conditions is decreased from that of the existing conditions, due to the addition of two infiltration ponds. All paved roadway runoff receives treatment from grass-lined swales, a forebay, and an infiltration pond prior to discharging overland. In addition, the potential for increased erosion and sedimentation is handled by way of silt barriers surrounding the disturbed areas. The use of Best Management Practices per the Rockingham Conservation District / DES Handbook have been applied to the design of these structures and will be observed during all stages of construction. All land disturbed during construction will be stabilized within 30 days of groundbreaking. Existing wetlands and abutters will suffer no adverse effects resulting from this proposed development.

2.0 EXISTING CONDITIONS ANALYSIS

The existing property is located on a parcel consisting of woodlands, a residential home, and extensive lawn areas. The existing topography is such that the site analysis is divided into three subcatchments within the area proposed to be improved, and includes a large area of contributing off-site area comprised of residential houses. Final Reach #<100> flows towards the northeast of the proposed improvement area, Final Reach #<200> flows towards the South, and Reach #300 flows toward the east of the proposed improvement area.

Classified by a combination of Site-Specific and NRCS Soil Mapping, the land of the site is composed of relatively flat slopes and soils categorized into the Hydrologic Soil Groups (HSG) A, B, C, and D (See appendix for Hiss/HSG designations). The majority of the area to be developed is comprised of Eldrige and Scituate soils.

3.0 PROPOSED CONDITIONS ANALYSIS

The addition of the impervious area, clearing of trees, and grading of slopes causes an increase in the curve number (Cn) and a decrease in the time of concentration (Tc) which results in a potential increase in peak rates of run-off from the site. To reduce these flows to pre-development conditions, various stormwater management systems will be proposed. A pipe network consisting of catchbasins with deep sumps and oil-debris separators combined with grass-lined swales controls the conveyance of stormwater. The proposed development divides the site into several different post-construction subcatchments, but ultimately the three main subcatchments match the pre-construction analysis. The run-off is directed to off-site areas through HydroCAD “reaches” and “ponds”, consisting of a two infiltration ponds.

In an effort to prevent the sedimentation of abutting properties, the paved roadway will be graded to flow into a closed drainage system, grass-lined swales, a sediment forebay prior to flowing towards an infiltration pond. During construction, appropriate Best Management Practices (BMP's) will be applied so as to negate the potential for sediment-laden run-off to discharge off-site prior to the final stabilization of the proposed grading. The structures outlined in this proposal provide for adequate treatment of stormwater run-off for sediment control.

4.0 SEDIMENT & EROSION CONTROL PLANS BEST MANAGEMENT PRACTICES (BMP’s)

The proposed site development is protected from erosion and the roadways and abutting properties are protected from sediment by the use of Best Management Practices as outlined in the New Hampshire Stormwater Manual. Any area disturbed by construction will be re-stabilized within 30 days, and abutting properties and wetlands will not be adversely affected by this development. All swales and drainage structures will be constructed and stabilized prior to having run-off directed to them.

4.1 Silt Barrier / Construction Fence

The plan set demonstrates the location of silt barriers for sediment control. Sheet E-1, Erosion and Sediment Control Details, has the specifications for installation and maintenance of the silt barriers selected for the site. In areas where the limits of construction need to be emphasized to operators, construction fence for added visibility will be installed. Orange construction fence will be VISI Perimeter Fence by Conwed Plastic Fencing, or approved equal. The four-foot construction fencing is to be installed using six-foot posts buried at least two feet into the ground spaced six to eight feet apart.

4.2 Vegetated Stabilization

All areas that are disturbed during construction will be stabilized with vegetated material within 30 days of disturbance. Construction will be managed in such a manner that erosion is prevented and that no abutter's property will be subjected to any siltation, unless otherwise permitted. All areas to be planted with grass for long-term cover will follow the specifications on Sheet E-1 using the seeding mixture below:

Mixture C	**Pounds per Acre**	**Pounds per 1,000 sf**
Tall Fescue	20	0.45
Creeping Red Fescue	20	0.45
Birdsfoot Trefoil	8	0.20
Total	**48**	**1.10**

4.3 Stabilized Construction Entrance/Exit

A temporary gravel construction entrance/exit provides an area where mud can be dislodged from tires before the vehicle leaves the construction site to reduce the amount of mud and sediment transported onto paved municipal and state roads. The stone size for the gravel pad should be between 1- and 2-inch coarse aggregate and the pad itself constructed to a minimum length of 50' for the full width of the access road. The aggregate should be placed at least six inches thick. Plan and profile view details are shown on Sheet E1 - Sediment and Erosion Control Detail Plan.

4.2 Drainage Swales / Stormwater Conveyance Channels

Drainage swales will be stabilized with vegetation for long term cover as outlined below using seed mixture C. As a general rule, velocities in the swale should not exceed 3.0 feet per second for a vegetated swale although velocities as high as 4.5 FPS are allowed under certain soil conditions.

4.5 Level Spreaders

Level spreaders enable any run-off directed towards them to be spread evenly into sheet flow prior to discharge into wetlands or treatment by a filter strip, thus allowing for better filter strip efficiency and a lesser potential for erosion.

4.6 Vegetated Buffers

Vegetated buffers are areas of land with natural or planted vegetation designed to receive sheet run-off from upgradient development. These natural areas, preferably wooded, are effective in removing sediment and sediment-laden pollutants from such run-off, although their effectiveness is severely diminished when forced to deal with concentrated flow and must therefore be equipped with a level-spreading device. Vegetated buffers should not have a slope exceeding fifteen percent and have a minimum length of seventy-five feet.

4.6 Filter Strips

Filter strips are areas of land with natural or planted vegetation designed to receive sheet run-off from upgradient development. These natural areas, preferably wooded, are effective in removing sediment and sediment-laden pollutants from such run-off, although their effectiveness is severely diminished when forced to deal with concentrated flow and must therefore be equipped with a level-spreading device. Filter strips should not have a slope exceeding fifteen percent and have a minimum length of seventy-five feet.

4.4 Environmental Dust Control

Dust will be controlled on the site using multiple Best Management Practices. Mulching and temporary seeding will be the first line of protection to be utilized where problems occur. If dust problems are not solved by these applications, the use of water and calcium chloride can be applied. Calcium chloride will be applied at a rate that will keep the surface moist but not cause pollution.

4.5 Construction Sequence

1. Cut and remove trees in construction areas as directed or required.

2. Construct and/or install temporary and permanent sediment erosion and detention control facilities, as required. Erosion, sediment, and facilities shall be installed and stabilized prior to any earth moving operation, and prior to directing run-off to them.

3. Clear, cut, grub, and dispose of debris in approved facilities.

4. Excavate and stockpile topsoil / loam. All disturbed areas shall be stabilized immediately after grading.

5. Construct the roadway and its associated drainage structures.

6. Begin permanent and temporary seeding and mulching. All cut and fill slopes and disturbed areas shall be seeded and mulched as required or directed.

7. Daily, or as required, construct temporary berms, drainage ditches, sediment traps, etc. to prevent erosion on the site and prevent any siltation of abutting waters or property.

8. Inspect and maintain all erosion and sediment control measures during construction.

9. Complete permanent seeding and landscaping.

10. Remove temporary erosion control measures after seeding areas have established themselves and site improvements are complete. Smooth and re-vegetate all disturbed areas.

11. All swales and drainage structures will be constructed and stabilized prior to having run-off being directed to them.

12. Finish paving all roadways.

4.6 Temporary Erosion Control Measures

1. The smallest practical area of land shall be exposed at any one time.

2. Erosion and sediment control measures shall be installed as shown on the plans and at locations as required, or directed by the engineer.

3. All disturbed areas shall be returned to original grades and elevations. Disturbed areas shall be loamed with a minimum of 4” of loam and seeded with not less than 1.10 pound of seed per 1,000 square feet (48 pounds per acre) of area.

4. Silt barriers shall be inspected periodically and after every rainstorm during the life of the project. All damaged areas shall be repaired and sediment deposits shall periodically be removed and properly disposed of.

5. After all disturbed areas have been stabilized, the temporary erosion control measures are to be removed and the area disturbed by the removal smoothed and revegetated.

6. Areas must be seeded and mulched within 5 days of final grading, permanently stabilized within 15 days of final grading, or temporarily stabilized within 30 days of initial disturbance of soil.

4.7 Inspection and Maintenance Schedule

Silt barriers shall be inspected during and after storm events to ensure that the fence still has integrity and is not allowing sediment to pass.

5.0 CONCLUSION

This proposed site development off of Bunker Hill Road in Stratham, NH will have no adverse effect on the abutting property owners by way of stormwater run-off or siltation. The post-construction peak rates of run-off for the site will be lower than the existing conditions for the storm events, as shown in the tables above. Appropriate steps will be taken to eliminate erosion and sedimentation; these will be accomplished through the construction of a drainage system consisting of a forebay and two infiltration ponds. The Best Management Practices developed by the State of New Hampshire have been utilized in the design of this system and these applications will be enforced throughout the construction process.

An Alteration of Terrain Permit (RSA 485: A-17) is not required for this project due to the area of disturbance being less than 100,000 square feet.

Respectfully Submitted,

BEALS ASSOCIATES, *PLLC.*

Christian O. Smith

Christian O Smith, PE
Principal

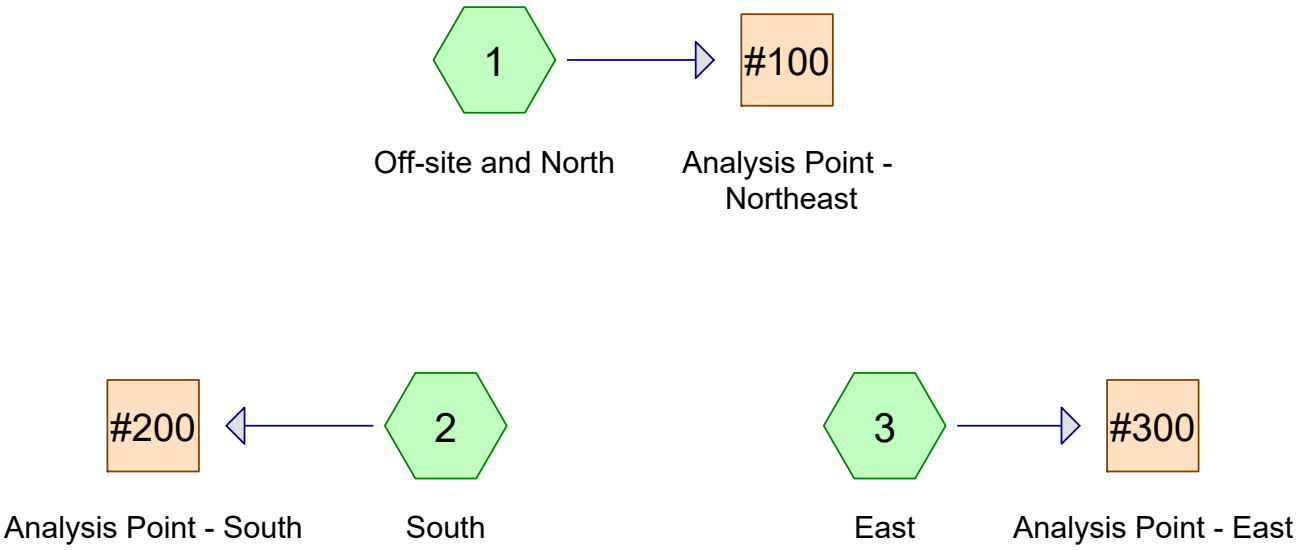
Appendix I

Existing Conditions Analysis

2-Year 24-Hour Summary

10-Year 24-Hour Complete

25-Year 24-Hour Summary



Subcat Reach Pond Link

Routing Diagram for NH-1500 Existing
Prepared by Beals Associates, PLLC, Printed 1/25/2024

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
9.753	46	2 acre lots, 12% imp, HSG A (1)
2.766	77	2 acre lots, 12% imp, HSG C (1)
0.397	82	2 acre lots, 12% imp, HSG D (1)
1.201	39	>75% Grass cover, Good, HSG A (2)
10.338	74	>75% Grass cover, Good, HSG C (1, 2, 3)
0.029	30	Brush, Good, HSG A (2)
0.027	65	Brush, Good, HSG C (2)
0.192	98	Paved parking, HSG A (2)
0.190	98	Paved parking, HSG C (2, 3)
0.093	98	Roofs, HSG A (2)
0.070	98	Roofs, HSG C (3)
0.203	30	Woods, Good, HSG A (2)
3.385	70	Woods, Good, HSG C (1, 2, 3)
28.643	**63**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
11.471	HSG A	1, 2
0.000	HSG B	
16.775	HSG C	1, 2, 3
0.397	HSG D	1
0.000	Other	
28.643		**TOTAL AREA**

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: Off-site and North Runoff Area=946,088 sf 7.14% Impervious Runoff Depth=0.63"
Flow Length=2,139' Tc=56.1 min CN=WQ Runoff=5.92 cfs 1.139 af

Subcatchment 2: South Runoff Area=183,613 sf 7.93% Impervious Runoff Depth=0.84"
Flow Length=533' Tc=12.1 min CN=WQ Runoff=3.11 cfs 0.296 af

Subcatchment 3: East Runoff Area=118,007 sf 7.76% Impervious Runoff Depth=1.15"
Flow Length=496' Tc=39.1 min CN=WQ Runoff=1.67 cfs 0.259 af

Reach #100: Analysis Point - Northeast Inflow=5.92 cfs 1.139 af
Outflow=5.92 cfs 1.139 af

Reach #200: Analysis Point - South Inflow=3.11 cfs 0.296 af
Outflow=3.11 cfs 0.296 af

Reach #300: Analysis Point - East Inflow=1.67 cfs 0.259 af
Outflow=1.67 cfs 0.259 af

Total Runoff Area = 28.643 ac Runoff Volume = 1.695 af Average Runoff Depth = 0.71"
92.69% Pervious = 26.549 ac 7.31% Impervious = 2.094 ac

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: Off-site and North Runoff Area=946,088 sf 7.14% Impervious Runoff Depth=1.50"
Flow Length=2,139' Tc=56.1 min CN=WQ Runoff=14.30 cfs 2.715 af

Subcatchment 2: South Runoff Area=183,613 sf 7.93% Impervious Runoff Depth=1.75"
Flow Length=533' Tc=12.1 min CN=WQ Runoff=6.58 cfs 0.613 af

Subcatchment 3: East Runoff Area=118,007 sf 7.76% Impervious Runoff Depth=2.39"
Flow Length=496' Tc=39.1 min CN=WQ Runoff=3.67 cfs 0.539 af

Reach #100: Analysis Point - Northeast Inflow=14.30 cfs 2.715 af
Outflow=14.30 cfs 2.715 af

Reach #200: Analysis Point - South Inflow=6.58 cfs 0.613 af
Outflow=6.58 cfs 0.613 af

Reach #300: Analysis Point - East Inflow=3.67 cfs 0.539 af
Outflow=3.67 cfs 0.539 af

Total Runoff Area = 28.643 ac Runoff Volume = 3.868 af Average Runoff Depth = 1.62"
92.69% Pervious = 26.549 ac 7.31% Impervious = 2.094 ac

Summary for Subcatchment 1: Off-site and North

Runoff = 14.30 cfs @ 12.80 hrs, Volume= 2.715 af, Depth= 1.50"
Routed to Reach #100 : Analysis Point - Northeast

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.94"

Area (sf)	CN	Description
424,852	46	2 acre lots, 12% imp, HSG A
120,469	77	2 acre lots, 12% imp, HSG C
17,315	82	2 acre lots, 12% imp, HSG D
94,122	70	Woods, Good, HSG C
289,330	74	>75% Grass cover, Good, HSG C
946,088		Weighted Average
878,572		92.86% Pervious Area
67,516		7.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0400	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.92"
13.9	910	0.0242	1.09		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
23.4	514	0.0214	0.37		**Shallow Concentrated Flow,** Forest w/Heavy Litter Kv= 2.5 fps
2.1	106	0.0140	0.83		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.1	73	0.0550	0.59		**Shallow Concentrated Flow,** Forest w/Heavy Litter Kv= 2.5 fps
10.1	486	0.0130	0.80		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
56.1	2,139	Total			

Summary for Subcatchment 2: South

Runoff = 6.58 cfs @ 12.17 hrs, Volume= 0.613 af, Depth= 1.75"
Routed to Reach #200 : Analysis Point - South

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.94"

Area (sf)	CN	Description
1,254	30	Brush, Good, HSG A
8,850	30	Woods, Good, HSG A
52,307	39	>75% Grass cover, Good, HSG A
8,362	98	Paved parking, HSG A
4,038	98	Roofs, HSG A
1,177	65	Brush, Good, HSG C
12,506	70	Woods, Good, HSG C
92,955	74	>75% Grass cover, Good, HSG C
2,164	98	Paved parking, HSG C
183,613		Weighted Average
169,049		92.07% Pervious Area
14,564		7.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	50	0.0800	0.25		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.92"
8.7	483	0.0176	0.93		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
12.1	533	Total			

Summary for Subcatchment 3: East

Runoff = 3.67 cfs @ 12.55 hrs, Volume= 0.539 af, Depth= 2.39"
Routed to Reach #300 : Analysis Point - East

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.94"

Area (sf)	CN	Description
40,802	70	Woods, Good, HSG C
68,052	74	>75% Grass cover, Good, HSG C
6,098	98	Paved parking, HSG C
3,055	98	Roofs, HSG C
118,007		Weighted Average
108,854		92.24% Pervious Area
9,153		7.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	50	0.0240	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.92"
33.6	446	0.0010	0.22		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
39.1	496	Total			

Summary for Reach #100: Analysis Point - Northeast

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 21.719 ac, 7.14% Impervious, Inflow Depth = 1.50" for 10-YR event
Inflow = 14.30 cfs @ 12.80 hrs, Volume= 2.715 af
Outflow = 14.30 cfs @ 12.80 hrs, Volume= 2.715 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Reach #200: Analysis Point - South

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 4.215 ac, 7.93% Impervious, Inflow Depth = 1.75" for 10-YR event
Inflow = 6.58 cfs @ 12.17 hrs, Volume= 0.613 af
Outflow = 6.58 cfs @ 12.17 hrs, Volume= 0.613 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Reach #300: Analysis Point - East

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 2.709 ac, 7.76% Impervious, Inflow Depth = 2.39" for 10-YR event
Inflow = 3.67 cfs @ 12.55 hrs, Volume= 0.539 af
Outflow = 3.67 cfs @ 12.55 hrs, Volume= 0.539 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: Off-site and North Runoff Area=946,088 sf 7.14% Impervious Runoff Depth=2.34"
Flow Length=2,139' Tc=56.1 min CN=WQ Runoff=22.93 cfs 4.240 af

Subcatchment 2: South Runoff Area=183,613 sf 7.93% Impervious Runoff Depth=2.59"
Flow Length=533' Tc=12.1 min CN=WQ Runoff=9.65 cfs 0.910 af

Subcatchment 3: East Runoff Area=118,007 sf 7.76% Impervious Runoff Depth=3.49"
Flow Length=496' Tc=39.1 min CN=WQ Runoff=5.42 cfs 0.788 af

Reach #100: Analysis Point - Northeast Inflow=22.93 cfs 4.240 af
Outflow=22.93 cfs 4.240 af

Reach #200: Analysis Point - South Inflow=9.65 cfs 0.910 af
Outflow=9.65 cfs 0.910 af

Reach #300: Analysis Point - East Inflow=5.42 cfs 0.788 af
Outflow=5.42 cfs 0.788 af

Total Runoff Area = 28.643 ac Runoff Volume = 5.938 af Average Runoff Depth = 2.49"
92.69% Pervious = 26.549 ac 7.31% Impervious = 2.094 ac

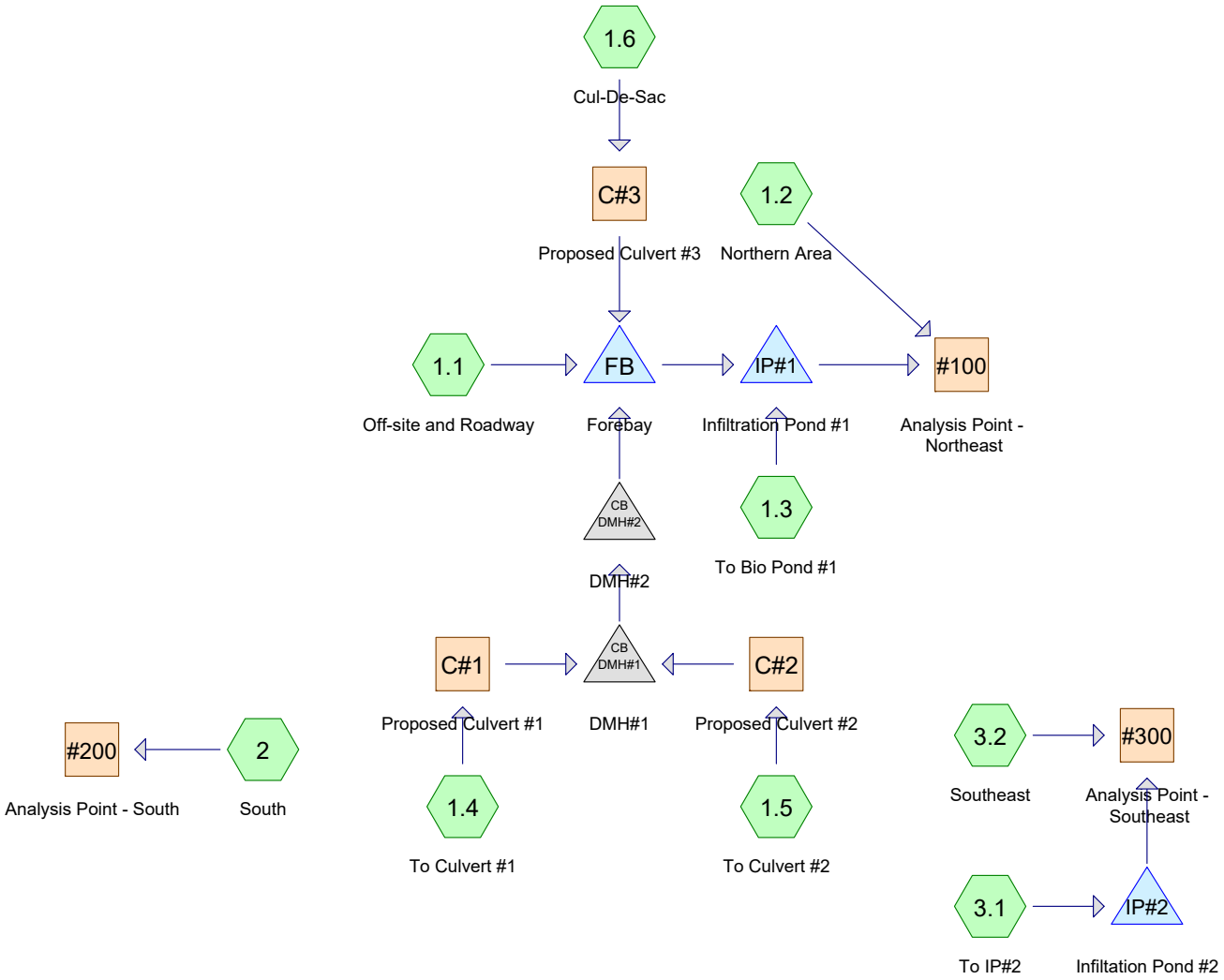
Appendix II

Proposed Conditions Analysis

2-Year 24-Hour Summary

10-Year 24-Hour Complete

25-Year 24-Hour Summary



Subcat Reach Pond Link

Routing Diagram for NH-1500 Proposed
Prepared by Beals Associates, PLLC, Printed 1/31/2024

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
9.753	46	2 acre lots, 12% imp, HSG A (1.1)
10.809	77	2 acre lots, 12% imp, HSG C (1.1, 1.2, 1.3, 1.5, 2, 3.1, 3.2)
0.397	82	2 acre lots, 12% imp, HSG D (1.1)
1.201	39	>75% Grass cover, Good, HSG A (2)
2.323	74	>75% Grass cover, Good, HSG C (1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 2, 3.2)
0.029	30	Brush, Good, HSG A (2)
0.022	65	Brush, Good, HSG C (1.5, 2)
0.192	98	Paved parking, HSG A (2)
0.674	98	Paved parking, HSG C (1.1, 1.4, 1.5, 2)
0.093	98	Roofs, HSG A (2)
0.203	30	Woods, Good, HSG A (2)
2.947	70	Woods, Good, HSG C (1.1, 1.2, 1.3, 1.5, 2, 3.1, 3.2)
28.643	**64**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
11.471	HSG A	1.1, 2
0.000	HSG B	
16.775	HSG C	1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 2, 3.1, 3.2
0.397	HSG D	1.1
0.000	Other	
28.643		**TOTAL AREA**

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1.1: Off-site and Roadway Runoff Area=830,642 sf 13.10% Impervious Runoff Depth=0.67"
Flow Length=2,087' Tc=55.6 min CN=WQ Runoff=5.59 cfs 1.061 af

Subcatchment 1.2: Northern Area Runoff Area=86,916 sf 2.19% Impervious Runoff Depth=0.97"
Flow Length=336' Tc=24.0 min CN=WQ Runoff=1.31 cfs 0.162 af

Subcatchment 1.3: To Bio Pond #1 Runoff Area=24,538 sf 3.69% Impervious Runoff Depth=1.12"
Flow Length=314' Tc=25.4 min CN=WQ Runoff=0.43 cfs 0.053 af

Subcatchment 1.4: To Culvert #1 Runoff Area=14,366 sf 29.54% Impervious Runoff Depth=1.65"
Flow Length=318' Tc=8.2 min CN=WQ Runoff=0.53 cfs 0.045 af

Subcatchment 1.5: To Culvert #2 Runoff Area=34,830 sf 21.89% Impervious Runoff Depth=1.44"
Flow Length=325' Tc=8.3 min CN=WQ Runoff=1.15 cfs 0.096 af

Subcatchment 1.6: Cul-De-Sac Runoff Area=9,503 sf 0.00% Impervious Runoff Depth=1.07"
Flow Length=97' Slope=0.0210 '/' Tc=6.6 min CN=74 Runoff=0.25 cfs 0.019 af

Subcatchment 2: South Runoff Area=142,777 sf 13.97% Impervious Runoff Depth=0.85"
Flow Length=533' Tc=12.1 min CN=WQ Runoff=2.48 cfs 0.231 af

Subcatchment 3.1: To IP#2 Runoff Area=31,503 sf 11.63% Impervious Runoff Depth=1.24"
Flow Length=211' Tc=7.8 min CN=WQ Runoff=0.94 cfs 0.074 af

Subcatchment 3.2: Southeast Runoff Area=72,623 sf 5.81% Impervious Runoff Depth=1.06"
Flow Length=411' Tc=15.2 min CN=WQ Runoff=1.45 cfs 0.148 af

Reach #100: Analysis Point - Northeast Inflow=1.31 cfs 0.162 af
Outflow=1.31 cfs 0.162 af

Reach #200: Analysis Point - South Inflow=2.48 cfs 0.231 af
Outflow=2.48 cfs 0.231 af

Reach #300: Analysis Point - Southeast Inflow=1.45 cfs 0.148 af
Outflow=1.45 cfs 0.148 af

Reach C#1: Proposed Culvert #1 Avg. Flow Depth=0.15' Max Vel=7.01 fps Inflow=0.53 cfs 0.045 af
12.0" Round Pipe n=0.012 L=25.0' S=0.0756 '/' Capacity=10.61 cfs Outflow=0.53 cfs 0.045 af

Reach C#2: Proposed Culvert #2 Avg. Flow Depth=0.18' Max Vel=11.73 fps Inflow=1.15 cfs 0.096 af
12.0" Round Pipe n=0.012 L=11.0' S=0.1718 '/' Capacity=16.00 cfs Outflow=1.15 cfs 0.096 af

Reach C#3: Proposed Culvert #3 Avg. Flow Depth=0.21' Max Vel=2.05 fps Inflow=0.25 cfs 0.019 af
12.0" Round Pipe n=0.013 L=50.0' S=0.0050 '/' Capacity=2.52 cfs Outflow=0.25 cfs 0.019 af

Pond DMH#1: DMH#1 Peak Elev=91.72' Inflow=1.68 cfs 0.141 af
15.0" Round Culvert n=0.013 L=325.0' S=0.0050 '/' Outflow=1.68 cfs 0.141 af

Pond DMH#2: DMH#2 Peak Elev=89.99' Inflow=1.68 cfs 0.141 af
15.0" Round Culvert n=0.013 L=300.0' S=0.0050 '/' Outflow=1.68 cfs 0.141 af

Pond FB: Forebay Peak Elev=82.65' Storage=5,990 cf Inflow=5.88 cfs 1.221 af
Outflow=5.87 cfs 1.096 af

Pond IP#1: Infiltration Pond #1 Peak Elev=81.63' Storage=24,587 cf Inflow=6.08 cfs 1.149 af
Discarded=0.85 cfs 1.149 af Primary=0.00 cfs 0.000 af Outflow=0.85 cfs 1.149 af

Pond IP#2: Infiltation Pond #2 Peak Elev=94.43' Storage=954 cf Inflow=0.94 cfs 0.074 af
Discarded=0.16 cfs 0.074 af Primary=0.00 cfs 0.000 af Outflow=0.16 cfs 0.074 af

Total Runoff Area = 28.643 ac Runoff Volume = 1.889 af Average Runoff Depth = 0.79"
87.87% Pervious = 25.169 ac 12.13% Impervious = 3.474 ac

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1.1: Off-site and Roadway Runoff Area=830,642 sf 13.10% Impervious Runoff Depth=1.52"
Flow Length=2,087' Tc=55.6 min CN=WQ Runoff=12.62 cfs 2.419 af

Subcatchment 1.2: Northern Area Runoff Area=86,916 sf 2.19% Impervious Runoff Depth=2.17"
Flow Length=336' Tc=24.0 min CN=WQ Runoff=3.11 cfs 0.360 af

Subcatchment 1.3: To Bio Pond #1 Runoff Area=24,538 sf 3.69% Impervious Runoff Depth=2.39"
Flow Length=314' Tc=25.4 min CN=WQ Runoff=0.95 cfs 0.112 af

Subcatchment 1.4: To Culvert #1 Runoff Area=14,366 sf 29.54% Impervious Runoff Depth=3.02"
Flow Length=318' Tc=8.2 min CN=WQ Runoff=1.00 cfs 0.083 af

Subcatchment 1.5: To Culvert #2 Runoff Area=34,830 sf 21.89% Impervious Runoff Depth=2.78"
Flow Length=325' Tc=8.3 min CN=WQ Runoff=2.29 cfs 0.185 af

Subcatchment 1.6: Cul-De-Sac Runoff Area=9,503 sf 0.00% Impervious Runoff Depth=2.32"
Flow Length=97' Slope=0.0210 '/' Tc=6.6 min CN=74 Runoff=0.57 cfs 0.042 af

Subcatchment 2: South Runoff Area=142,777 sf 13.97% Impervious Runoff Depth=1.68"
Flow Length=533' Tc=12.1 min CN=WQ Runoff=4.87 cfs 0.460 af

Subcatchment 3.1: To IP#2 Runoff Area=31,503 sf 11.63% Impervious Runoff Depth=2.55"
Flow Length=211' Tc=7.8 min CN=WQ Runoff=2.01 cfs 0.154 af

Subcatchment 3.2: Southeast Runoff Area=72,623 sf 5.81% Impervious Runoff Depth=2.30"
Flow Length=411' Tc=15.2 min CN=WQ Runoff=3.33 cfs 0.319 af

Reach #100: Analysis Point - Northeast Inflow=9.34 cfs 1.590 af
Outflow=9.34 cfs 1.590 af

Reach #200: Analysis Point - South Inflow=4.87 cfs 0.460 af
Outflow=4.87 cfs 0.460 af

Reach #300: Analysis Point - Southeast Inflow=3.33 cfs 0.319 af
Outflow=3.33 cfs 0.319 af

Reach C#1: Proposed Culvert #1 Avg. Flow Depth=0.21' Max Vel=8.47 fps Inflow=1.00 cfs 0.083 af
12.0" Round Pipe n=0.012 L=25.0' S=0.0756 '/' Capacity=10.61 cfs Outflow=1.00 cfs 0.083 af

Reach C#2: Proposed Culvert #2 Avg. Flow Depth=0.26' Max Vel=14.37 fps Inflow=2.29 cfs 0.185 af
12.0" Round Pipe n=0.012 L=11.0' S=0.1718 '/' Capacity=16.00 cfs Outflow=2.29 cfs 0.185 af

Reach C#3: Proposed Culvert #3 Avg. Flow Depth=0.32' Max Vel=2.59 fps Inflow=0.57 cfs 0.042 af
12.0" Round Pipe n=0.013 L=50.0' S=0.0050 '/' Capacity=2.52 cfs Outflow=0.57 cfs 0.042 af

Pond DMH#1: DMH#1 Peak Elev=92.09' Inflow=3.29 cfs 0.268 af
15.0" Round Culvert n=0.013 L=325.0' S=0.0050 '/' Outflow=3.29 cfs 0.268 af

Pond DMH#2: DMH#2 Peak Elev=90.35' Inflow=3.29 cfs 0.268 af
15.0" Round Culvert n=0.013 L=300.0' S=0.0050 '/' Outflow=3.29 cfs 0.268 af

Pond FB: Forebay Peak Elev=82.76' Storage=6,414 cf Inflow=13.15 cfs 2.729 af
Outflow=13.14 cfs 2.604 af

Pond IP#1: Infiltration Pond #1 Peak Elev=82.56' Storage=36,455 cf Inflow=13.57 cfs 2.716 af
Discarded=0.94 cfs 1.487 af Primary=8.71 cfs 1.230 af Outflow=9.65 cfs 2.716 af

Pond IP#2: Infiltation Pond #2 Peak Elev=95.09' Storage=2,672 cf Inflow=2.01 cfs 0.154 af
Discarded=0.20 cfs 0.154 af Primary=0.00 cfs 0.000 af Outflow=0.20 cfs 0.154 af

Total Runoff Area = 28.643 ac Runoff Volume = 4.134 af Average Runoff Depth = 1.73"
87.87% Pervious = 25.169 ac 12.13% Impervious = 3.474 ac

Summary for Subcatchment 1.1: Off-site and Roadway

Runoff = 12.62 cfs @ 12.79 hrs, Volume= 2.419 af, Depth= 1.52"
Routed to Pond FB : Forebay

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.94"

Area (sf)	CN	Description
424,852	46	2 acre lots, 12% imp, HSG A
309,852	77	2 acre lots, 12% imp, HSG C
17,315	82	2 acre lots, 12% imp, HSG D
33,389	70	Woods, Good, HSG C
26,661	74	>75% Grass cover, Good, HSG C
18,573	98	Paved parking, HSG C
830,642		Weighted Average
721,827		86.90% Pervious Area
108,815		13.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0400	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.92"
13.9	910	0.0242	1.09		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
23.4	514	0.0214	0.37		**Shallow Concentrated Flow,** Forest w/Heavy Litter Kv= 2.5 fps
2.1	106	0.0140	0.83		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.1	73	0.0550	0.59		**Shallow Concentrated Flow,** Forest w/Heavy Litter Kv= 2.5 fps
9.6	434	0.0115	0.75		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
55.6	2,087	Total			

Summary for Subcatchment 1.2: Northern Area

Runoff = 3.11 cfs @ 12.35 hrs, Volume= 0.360 af, Depth= 2.17"
Routed to Reach #100 : Analysis Point - Northeast

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.94"

Area (sf)	CN	Description
53,051	70	Woods, Good, HSG C
17,967	74	>75% Grass cover, Good, HSG C
15,898	77	2 acre lots, 12% imp, HSG C
86,916		Weighted Average
85,008		97.81% Pervious Area
1,908		2.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.2	50	0.0260	0.04		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 2.92"
3.8	286	0.0320	1.25		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
24.0	336	Total			

Summary for Subcatchment 1.3: To Bio Pond #1

Runoff = 0.95 cfs @ 12.36 hrs, Volume= 0.112 af, Depth= 2.39"
Routed to Pond IP#1 : Infiltration Pond #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.94"

Area (sf)	CN	Description
616	70	Woods, Good, HSG C
16,375	74	>75% Grass cover, Good, HSG C
7,547	77	2 acre lots, 12% imp, HSG C
24,538		Weighted Average
23,632		96.31% Pervious Area
906		3.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.0	50	0.0210	0.04		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 2.92"
3.4	264	0.0352	1.31		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
25.4	314	Total			

Summary for Subcatchment 1.4: To Culvert #1

Runoff = 1.00 cfs @ 12.12 hrs, Volume= 0.083 af, Depth= 3.02"
Routed to Reach C#1 : Proposed Culvert #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.94"

Area (sf)	CN	Description
10,122	74	>75% Grass cover, Good, HSG C
4,244	98	Paved parking, HSG C
14,366		Weighted Average
10,122		70.46% Pervious Area
4,244		29.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0500	0.20		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.92"
4.1	268	0.0240	1.08		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.2	318	Total			

Summary for Subcatchment 1.5: To Culvert #2

Runoff = 2.29 cfs @ 12.12 hrs, Volume= 0.185 af, Depth= 2.78"
Routed to Reach C#2 : Proposed Culvert #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.94"

Area (sf)	CN	Description
612	65	Brush, Good, HSG C
3,633	70	Woods, Good, HSG C
6,643	74	>75% Grass cover, Good, HSG C
18,542	77	2 acre lots, 12% imp, HSG C
5,400	98	Paved parking, HSG C
34,830		Weighted Average
27,205		78.11% Pervious Area
7,625		21.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0500	0.20		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.92"
4.2	275	0.0240	1.08		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.3	325	Total			

Summary for Subcatchment 1.6: Cul-De-Sac

Runoff = 0.57 cfs @ 12.10 hrs, Volume= 0.042 af, Depth= 2.32"
Routed to Reach C#3 : Proposed Culvert #3

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.94"

Area (sf)	CN	Description
9,503	74	>75% Grass cover, Good, HSG C
9,503		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	50	0.0210	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.92"
0.8	47	0.0210	1.01		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
6.6	97	Total			

Summary for Subcatchment 2: South

Runoff = 4.87 cfs @ 12.17 hrs, Volume= 0.460 af, Depth= 1.68"
Routed to Reach #200 : Analysis Point - South

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.94"

Area (sf)	CN	Description
1,254	30	Brush, Good, HSG A
8,850	30	Woods, Good, HSG A
52,307	39	>75% Grass cover, Good, HSG A
8,362	98	Paved parking, HSG A
4,038	98	Roofs, HSG A
329	65	Brush, Good, HSG C
4,476	70	Woods, Good, HSG C
8,681	74	>75% Grass cover, Good, HSG C
53,329	77	2 acre lots, 12% imp, HSG C
1,151	98	Paved parking, HSG C
142,777		Weighted Average
122,827		86.03% Pervious Area
19,950		13.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	50	0.0800	0.25		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.92"
8.7	483	0.0176	0.93		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
12.1	533	Total			

Summary for Subcatchment 3.1: To IP#2

Runoff = 2.01 cfs @ 12.11 hrs, Volume= 0.154 af, Depth= 2.55"
Routed to Pond IP#2 : Infiltation Pond #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.94"

Area (sf)	CN	Description
983	70	Woods, Good, HSG C
30,520	77	2 acre lots, 12% imp, HSG C
31,503		Weighted Average
27,841		88.37% Pervious Area
3,662		11.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	50	0.0180	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.92"
1.7	161	0.0497	1.56		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.8	211	Total			

Summary for Subcatchment 3.2: Southeast

Runoff = 3.33 cfs @ 12.22 hrs, Volume= 0.319 af, Depth= 2.30"
Routed to Reach #300 : Analysis Point - Southeast

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.94"

Area (sf)	CN	Description
32,217	70	Woods, Good, HSG C
5,233	74	>75% Grass cover, Good, HSG C
35,173	77	2 acre lots, 12% imp, HSG C
72,623		Weighted Average
68,402		94.19% Pervious Area
4,221		5.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	50	0.0180	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.92"
9.1	361	0.0090	0.66		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
15.2	411	Total			

Summary for Reach #100: Analysis Point - Northeast

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 22.975 ac, 12.34% Impervious, Inflow Depth = 0.83" for 10-YR event
Inflow = 9.34 cfs @ 13.20 hrs, Volume= 1.590 af
Outflow = 9.34 cfs @ 13.20 hrs, Volume= 1.590 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Reach #200: Analysis Point - South

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 3.278 ac, 13.97% Impervious, Inflow Depth = 1.68" for 10-YR event
Inflow = 4.87 cfs @ 12.17 hrs, Volume= 0.460 af
Outflow = 4.87 cfs @ 12.17 hrs, Volume= 0.460 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Reach #300: Analysis Point - Southeast

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 2.390 ac, 7.57% Impervious, Inflow Depth = 1.60" for 10-YR event
Inflow = 3.33 cfs @ 12.22 hrs, Volume= 0.319 af
Outflow = 3.33 cfs @ 12.22 hrs, Volume= 0.319 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Reach C#1: Proposed Culvert #1

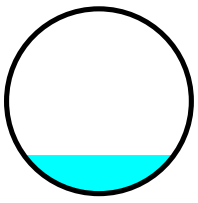
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.330 ac, 29.54% Impervious, Inflow Depth = 3.02" for 10-YR event
Inflow = 1.00 cfs @ 12.12 hrs, Volume= 0.083 af
Outflow = 1.00 cfs @ 12.12 hrs, Volume= 0.083 af, Atten= 0%, Lag= 0.0 min
Routed to Pond DMH#1 : DMH#1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.47 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.72 fps, Avg. Travel Time= 0.2 min

Peak Storage= 3 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.21' , Surface Width= 0.81'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 10.61 cfs

12.0" Round Pipe
n= 0.012 Concrete pipe, finished
Length= 25.0' Slope= 0.0756 '/'
Inlet Invert= 93.00', Outlet Invert= 91.11'



Summary for Reach C#2: Proposed Culvert #2

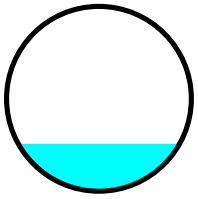
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.800 ac, 21.89% Impervious, Inflow Depth = 2.78" for 10-YR event
Inflow = 2.29 cfs @ 12.12 hrs, Volume= 0.185 af
Outflow = 2.29 cfs @ 12.12 hrs, Volume= 0.185 af, Atten= 0%, Lag= 0.0 min
Routed to Pond DMH#1 : DMH#1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 14.37 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 4.46 fps, Avg. Travel Time= 0.0 min

Peak Storage= 2 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.26' , Surface Width= 0.87'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 16.00 cfs

12.0" Round Pipe
n= 0.012 Concrete pipe, finished
Length= 11.0' Slope= 0.1718 '/'
Inlet Invert= 93.00', Outlet Invert= 91.11'



Summary for Reach C#3: Proposed Culvert #3

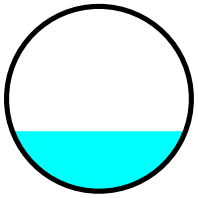
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.218 ac, 0.00% Impervious, Inflow Depth = 2.32" for 10-YR event
Inflow = 0.57 cfs @ 12.10 hrs, Volume= 0.042 af
Outflow = 0.57 cfs @ 12.11 hrs, Volume= 0.042 af, Atten= 0%, Lag= 0.2 min
Routed to Pond FB : Forebay

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.59 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 0.95 fps, Avg. Travel Time= 0.9 min

Peak Storage= 11 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.32' , Surface Width= 0.94'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.52 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 50.0' Slope= 0.0050 '/'
Inlet Invert= 80.90', Outlet Invert= 80.65'



Summary for Pond DMH#1: DMH#1

[62] Hint: Exceeded Reach C#1 OUTLET depth by 0.76' @ 12.15 hrs
[62] Hint: Exceeded Reach C#2 OUTLET depth by 0.72' @ 12.15 hrs

Inflow Area = 1.129 ac, 24.13% Impervious, Inflow Depth = 2.85" for 10-YR event
Inflow = 3.29 cfs @ 12.12 hrs, Volume= 0.268 af
Outflow = 3.29 cfs @ 12.12 hrs, Volume= 0.268 af, Atten= 0%, Lag= 0.0 min
Primary = 3.29 cfs @ 12.12 hrs, Volume= 0.268 af
Routed to Pond DMH#2 : DMH#2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 92.09' @ 12.13 hrs
Flood Elev= 95.10'

Device	Routing	Invert	Outlet Devices
#1	Primary	91.01'	**15.0" Round Culvert** L= 325.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 91.01' / 89.38' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=3.12 cfs @ 12.12 hrs HW=92.07' TW=90.33' (Dynamic Tailwater)
1=Culvert (Outlet Controls 3.12 cfs @ 3.78 fps)

Summary for Pond DMH#2: DMH#2

Inflow Area = 1.129 ac, 24.13% Impervious, Inflow Depth = 2.85" for 10-YR event
Inflow = 3.29 cfs @ 12.12 hrs, Volume= 0.268 af
Outflow = 3.29 cfs @ 12.12 hrs, Volume= 0.268 af, Atten= 0%, Lag= 0.0 min
Primary = 3.29 cfs @ 12.12 hrs, Volume= 0.268 af
Routed to Pond FB : Forebay

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 90.35' @ 12.12 hrs
Flood Elev= 101.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	89.28'	**15.0" Round Culvert** L= 300.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 89.28' / 87.78' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=3.20 cfs @ 12.12 hrs HW=90.33' TW=82.66' (Dynamic Tailwater)
1=Culvert (Barrel Controls 3.20 cfs @ 3.92 fps)

Summary for Pond FB: Forebay

[63] Warning: Exceeded Reach C#3 INLET depth by 1.74' @ 12.85 hrs

Inflow Area = 20.416 ac, 13.57% Impervious, Inflow Depth = 1.60" for 10-YR event
Inflow = 13.15 cfs @ 12.79 hrs, Volume= 2.729 af
Outflow = 13.14 cfs @ 12.80 hrs, Volume= 2.604 af, Atten= 0%, Lag= 0.8 min
Primary = 13.14 cfs @ 12.80 hrs, Volume= 2.604 af
Routed to Pond IP#1 : Infiltration Pond #1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 82.76' @ 12.80 hrs Surf.Area= 4,108 sf Storage= 6,414 cf
Flood Elev= 83.00' Surf.Area= 4,806 sf Storage= 7,478 cf

Plug-Flow detention time= 40.9 min calculated for 2.604 af (95% of inflow)
Center-of-Mass det. time= 15.6 min (895.9 - 880.3)

Volume	Invert	Avail.Storage	Storage Description
#1	79.00'	7,478 cf	**Custom Stage Data (Conic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
79.00	634	0	0	634
80.00	1,032	825	825	1,045
82.00	2,251	3,205	4,030	2,296
83.00	4,806	3,449	7,478	4,859

Device	Routing	Invert	Outlet Devices
#1	Primary	82.50'	**40.0' long x 8.0' 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) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Primary OutFlow Max=13.14 cfs @ 12.80 hrs HW=82.76' TW=81.95' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 13.14 cfs @ 1.26 fps)

Summary for Pond IP#1: Infiltration Pond #1

Inflow Area = 20.980 ac, 13.30% Impervious, Inflow Depth = 1.55" for 10-YR event
Inflow = 13.57 cfs @ 12.78 hrs, Volume= 2.716 af
Outflow = 9.65 cfs @ 13.21 hrs, Volume= 2.716 af, Atten= 29%, Lag= 25.4 min
Discarded = 0.94 cfs @ 13.21 hrs, Volume= 1.487 af
Primary = 8.71 cfs @ 13.21 hrs, Volume= 1.230 af
Routed to Reach #100 : Analysis Point - Northeast

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 82.56' @ 13.21 hrs Surf.Area= 13,574 sf Storage= 36,455 cf
Flood Elev= 83.00' Surf.Area= 14,258 sf Storage= 42,643 cf

Plug-Flow detention time= 227.5 min calculated for 2.716 af (100% of inflow)
Center-of-Mass det. time= 227.6 min (1,121.7 - 894.1)

Volume	Invert	Avail.Storage	Storage Description
#1	79.30'	42,643 cf	**Custom Stage Data (Conic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
79.30	8,936	0.0	0	0	8,936
80.00	9,883	100.0	6,584	6,584	9,913
82.00	12,743	100.0	22,566	29,149	12,870
83.00	14,258	100.0	13,493	42,643	14,440

Device	Routing	Invert	Outlet Devices
#1	Discarded	79.30'	**3.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	80.20'	**12.0" Round Culvert X 2.00** L= 24.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 80.20' / 80.00' S= 0.0083 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#3	Device 2	81.70'	**24.0" Vert. Horizontal Grate X 2.00** C= 0.600 Limited to weir flow at low heads
#4	Primary	82.50'	**20.0' long x 8.0' 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) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Discarded OutFlow Max=0.94 cfs @ 13.21 hrs HW=82.55' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.94 cfs)

Primary OutFlow Max=8.69 cfs @ 13.21 hrs HW=82.55' TW=0.00' (Dynamic Tailwater)
└**2=Culvert** (Passes 8.07 cfs of 10.30 cfs potential flow)
└**3=Horizontal Grate** (Orifice Controls 8.07 cfs @ 3.15 fps)
└**4=Broad-Crested Rectangular Weir** (Weir Controls 0.62 cfs @ 0.57 fps)

Summary for Pond IP#2: Infiltation Pond #2

Inflow Area = 0.723 ac, 11.63% Impervious, Inflow Depth = 2.55" for 10-YR event
Inflow = 2.01 cfs @ 12.11 hrs, Volume= 0.154 af
Outflow = 0.20 cfs @ 13.16 hrs, Volume= 0.154 af, Atten= 90%, Lag= 63.0 min
Discarded = 0.20 cfs @ 13.16 hrs, Volume= 0.154 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach #300 : Analysis Point - Southeast

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 95.09' @ 13.16 hrs Surf.Area= 2,857 sf Storage= 2,672 cf
Flood Elev= 95.75' Surf.Area= 3,369 sf Storage= 4,727 cf

Plug-Flow detention time= 128.9 min calculated for 0.154 af (100% of inflow)
Center-of-Mass det. time= 128.9 min (961.2 - 832.4)

Volume	Invert	Avail.Storage	Storage Description
#1	94.00'	4,727 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
94.00	2,068	0	0	2,068
95.00	2,791	2,420	2,420	2,812
95.75	3,369	2,307	4,727	3,408

Device	Routing	Invert	Outlet Devices
#1	Discarded	94.00'	**3.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	95.25'	**10.0' 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

Discarded OutFlow Max=0.20 cfs @ 13.16 hrs HW=95.09' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.20 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=94.00' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1.1: Off-site and Roadway Runoff Area=830,642 sf 13.10% Impervious Runoff Depth=2.35"
Flow Length=2,087' Tc=55.6 min CN=WQ Runoff=19.98 cfs 3.733 af

Subcatchment 1.2: Northern Area Runoff Area=86,916 sf 2.19% Impervious Runoff Depth=3.24"
Flow Length=336' Tc=24.0 min CN=WQ Runoff=4.70 cfs 0.538 af

Subcatchment 1.3: To Bio Pond #1 Runoff Area=24,538 sf 3.69% Impervious Runoff Depth=3.51"
Flow Length=314' Tc=25.4 min CN=WQ Runoff=1.41 cfs 0.165 af

Subcatchment 1.4: To Culvert #1 Runoff Area=14,366 sf 29.54% Impervious Runoff Depth=4.20"
Flow Length=318' Tc=8.2 min CN=WQ Runoff=1.40 cfs 0.115 af

Subcatchment 1.5: To Culvert #2 Runoff Area=34,830 sf 21.89% Impervious Runoff Depth=3.93"
Flow Length=325' Tc=8.3 min CN=WQ Runoff=3.25 cfs 0.262 af

Subcatchment 1.6: Cul-De-Sac Runoff Area=9,503 sf 0.00% Impervious Runoff Depth=3.42"
Flow Length=97' Slope=0.0210 '/' Tc=6.6 min CN=74 Runoff=0.85 cfs 0.062 af

Subcatchment 2: South Runoff Area=142,777 sf 13.97% Impervious Runoff Depth=2.47"
Flow Length=533' Tc=12.1 min CN=WQ Runoff=6.98 cfs 0.676 af

Subcatchment 3.1: To IP#2 Runoff Area=31,503 sf 11.63% Impervious Runoff Depth=3.70"
Flow Length=211' Tc=7.8 min CN=WQ Runoff=2.91 cfs 0.223 af

Subcatchment 3.2: Southeast Runoff Area=72,623 sf 5.81% Impervious Runoff Depth=3.39"
Flow Length=411' Tc=15.2 min CN=WQ Runoff=4.97 cfs 0.472 af

Reach #100: Analysis Point - Northeast Inflow=20.42 cfs 3.138 af
Outflow=20.42 cfs 3.138 af

Reach #200: Analysis Point - South Inflow=6.98 cfs 0.676 af
Outflow=6.98 cfs 0.676 af

Reach #300: Analysis Point - Southeast Inflow=4.97 cfs 0.500 af
Outflow=4.97 cfs 0.500 af

Reach C#1: Proposed Culvert #1 Avg. Flow Depth=0.25' Max Vel=9.33 fps Inflow=1.40 cfs 0.115 af
12.0" Round Pipe n=0.012 L=25.0' S=0.0756 '/' Capacity=10.61 cfs Outflow=1.40 cfs 0.115 af

Reach C#2: Proposed Culvert #2 Avg. Flow Depth=0.31' Max Vel=15.91 fps Inflow=3.25 cfs 0.262 af
12.0" Round Pipe n=0.012 L=11.0' S=0.1718 '/' Capacity=16.00 cfs Outflow=3.25 cfs 0.262 af

Reach C#3: Proposed Culvert #3 Avg. Flow Depth=0.40' Max Vel=2.89 fps Inflow=0.85 cfs 0.062 af
12.0" Round Pipe n=0.013 L=50.0' S=0.0050 '/' Capacity=2.52 cfs Outflow=0.85 cfs 0.062 af

Pond DMH#1: DMH#1 Peak Elev=92.46' Inflow=4.66 cfs 0.377 af
15.0" Round Culvert n=0.013 L=325.0' S=0.0050 '/' Outflow=4.66 cfs 0.377 af

Pond DMH#2: DMH#2 Peak Elev=90.70' Inflow=4.66 cfs 0.377 af
15.0" Round Culvert n=0.013 L=300.0' S=0.0050 '/' Outflow=4.66 cfs 0.377 af

Pond FB: Forebay Peak Elev=82.92' Storage=7,090 cf Inflow=20.71 cfs 4.173 af
Outflow=20.18 cfs 4.048 af

Pond IP#1: Infiltration Pond #1 Peak Elev=82.80' Storage=39,785 cf Inflow=20.95 cfs 4.212 af
Discarded=0.97 cfs 1.613 af Primary=19.01 cfs 2.599 af Outflow=19.97 cfs 4.212 af

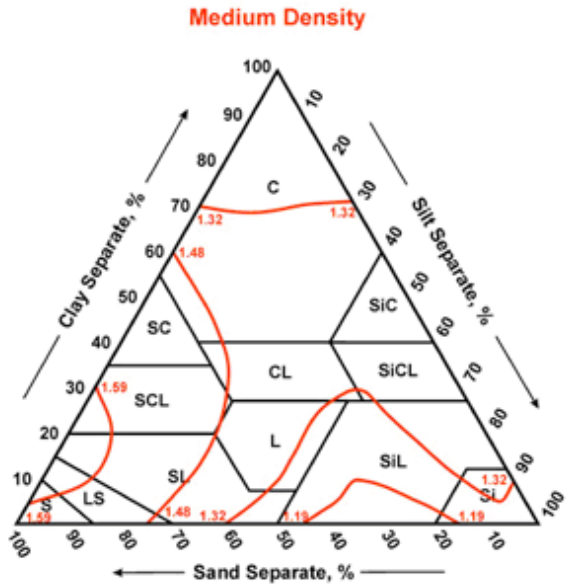
Pond IP#2: Infiltation Pond #2 Peak Elev=95.35' Storage=3,448 cf Inflow=2.91 cfs 0.223 af
Discarded=0.21 cfs 0.194 af Primary=0.77 cfs 0.029 af Outflow=0.98 cfs 0.223 af

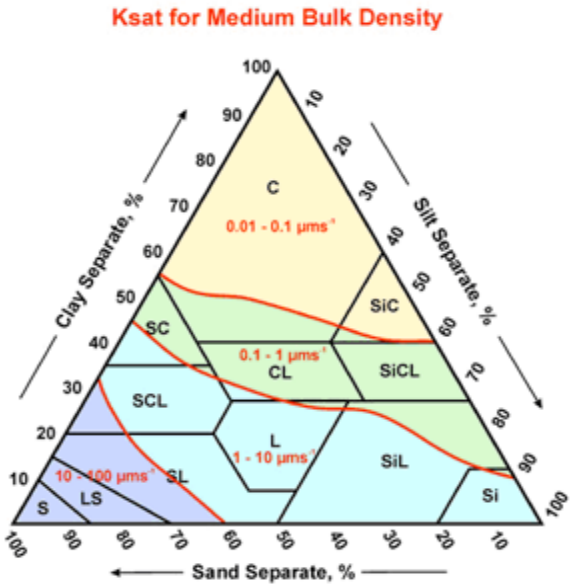
Total Runoff Area = 28.643 ac Runoff Volume = 6.246 af Average Runoff Depth = 2.62"
87.87% Pervious = 25.169 ac 12.13% Impervious = 3.474 ac

Appendix III

Charts, Graphs, and Calculations

K_{sat} VALUES
FOR
NEW HAMPSHIRE SOILS
(Including Hydrologic and DES Soil Lot Sizing Groups)





From: Guide for Estimating Ksat from Soil Properties (**Exhibit 618-9**). (http://soils.usda.gov/technical/handbook/contents/part618ex.html)

Sponsored by the Society of Soil Scientists of Northern New England
SSSNNE Special Publication No. 5
September, 2009

Soil Series	legend number	Ksat low - B in/hr	Ksat high - B in/hr	Ksat low - C in/hr	Ksat high - C in/hr	Hyd. Grp.	Group	Land Form	Temp.	Soil Textures	Spodosol ?	Other
Abenaki	501	0.6	2.0	6.00	99.0	B	2	Outwash and Stream Terraces	frigid	loamy over sandy-skeletal	no	loamy over gravelly
Acton	146	2.0	20.0	2.00	20.0	B	3	Loose till, sandy textures	mesic	sandy-skeletal	no	cobbly loamy sand
Adams	36	6.0	20.0	20.00	99.0	A	1	Outwash and Stream Terraces	frigid	sandy	yes	
Agawam	24	6.0	20.0	20.00	100.0	B	2	Outwash and Stream Terraces	mesic	loamy over sandy	no	loamy over sand/gravel
Allagash	127	0.6	2.0	6.00	20.0	B	2	Outwash and Stream Terraces	frigid	loamy over sandy	yes	loamy over sandy
Au Gres	516					B	5	Outwash and Stream Terraces	frigid	sandy	yes	single grain, loose
Bangor	572	0.6	2.0	0.60	2.0	B	2	Friable till, silty, schist & phyllite	frigid	loamy	yes	silt loam
Becket	56	0.6	2.0	0.06	0.6	C	3	Firm, platy, sandy till	frigid	loamy	yes	gravelly sandy loam in Cd
Belgrade	532	0.6	2.0	0.06	2.0	B	3	Terraces and glacial lake plains	mesic	silty	no	strata of fine sand
Bemis	224	0.6	0.2	0.00	0.2	C	5	Firm, platy, loamy till	cryic	loamy	no	
Berkshire	72	0.6	6.0	0.60	6.0	B	2	Loose till, loamy textures	frigid	loamy	yes	fine sandy loam
Bernardston	330	0.6	2.0	0.06	0.2	C	3	Firm, platy, silty till, schist & phyllite	mesic	loamy	no	channery silt loam in Cd
Bice	226	0.6	6.0	0.60	6.0	B	2	Loose till, loamy textures	frigid	loamy	no	sandy loam
Biddeford	234	0.0	0.2	0.00	0.2	D	6	Silt and Clay Deposits	frigid	fine	no	organic over clay
Binghamville	534	0.2	2.0	0.06	0.2	D	5	Terraces and glacial lake plains	mesic	silty	no	
Boscawen	220	6.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	frigid	sandy-skeletal	no	loamy cap
Boxford	32	0.1	0.2	0.00	0.2	C	3	Silt and Clay Deposits	mesic	fine	no	silty clay loam
Brayton	240	0.6	2.0	0.06	0.6	C	5	Firm, platy, silty till, schist & phyllite	frigid	loamy	no	
Buckland	237	0.6	2.0	0.06	0.2	C	3	Firm, platy, loamy till	frigid	loamy	no	loam in Cd
Bucksport	895					D	6	Organic Materials - Freshwater	frigid	sapric	no	deep organic
Burnham	131	0.2	6.0	0.02	0.2	D	6	Firm, platy, silty till, schist & phylitte	frigid	loamy	no	organic over silt
Buxton	232	0.1	0.6	0.00	0.2	C	3	Silt and Clay Deposits	frigid	fine	no	silty clay
Cabot	589	0.6	2.0	0.06	0.2	D	5	Firm, platy, silty till, schist & phyllite	frigid	loamy	no	
Caesar	526	20.0	100.0	20.00	100.0	A	1	Outwash and Stream Terraces	mesic	coarse sand	no	
Canaan	663	2.0	20.0	2.00	20.0	C	4	Weathered Bedrock Till	frigid	loamy-skeletal	yes	less than 20 in. deep
Canterbury	166	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	no	loam in Cd
Canton	42	2.0	6.0	6.00	20.0	B	2	Loose till, sandy textures	mesic	loamy over sandy	no	loamy over loamy sand
Cardigan	357	0.6	2.0	0.60	2.0	B	4	Friable till, silty, schist & phyllite	mesic	loamy	no	20 to 40 in. deep
Catden	296					A/D	6	Organic Materials - Freshwater	mesic	sapric	no	deep organic
Champlain	35	6.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	frigid	gravelly sand	no	
Charles	209	0.6	100.0	0.60	100.0	C	5	Flood Plain (Bottom Land)	frigid	silty	no	
Charlton	62	0.6	6.0	0.60	6.0	B	2	Loose till, loamy textures	mesic	loamy	no	fine sandy loam
Chatfield	89	0.6	6.0	0.60	6.0	B	4	Loose till, bedrock	mesic	loamy	no	20 to 40 in. deep
Chatfield Var.	289	0.6	6.0	0.60	6.0	B	3	Loose till, bedrock	mesic	loamy	no	mwd to swpd
Chesuncook	126	0.6	2.0	0.02	0.2	C	3	Firm, platy, silty till, schist & phyllite	frigid	loamy	yes	channery silt loam in Cd
Chichester	442	0.6	2.0	2.00	6.0	B		Loose till, sandy textures	frigid	loamy over sandy	no	loamy over loamy sand
Chocorua	395			6.00	20.0	D	6	Organic Materials - Freshwater	frigid	sandy or sandy-skeletal	no	organic over sand
Cohas	505	0.6	2.0	0.60	100.0	C	5	Flood Plain (Bottom Land)	frigid	co. loamy over sandy (skeletal)	no	
Colonel	927	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	yes	loam in Cd
Colton	22	6.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	
Colton, gravelly	21	6.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	gravelly surface
Croghan	613	20.0	100.0	20.00	100.0	B	3	Outwash and Stream Terraces	frigid	sandy	yes	single grain in C
Dartmouth	132	0.6	2.0	0.06	0.6	B	3	Terraces and glacial lake plains	mesic	silty	no	thin strata silty clay loam
Deerfield	313	6.0	20.0	20.00	100.0	B	3	Outwash and Stream Terraces	mesic	sandy	no	single grain in C
Dixfield	378	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	yes	fine sandy loam in Cd
Dixmont	578	0.6	2.0	0.60	2.0	C	3	Friable till, silty, schist & phyllite	frigid	loamy	yes	silt loam, platy in C
Duane	413	6.0	20.0	6.00	20.0	B	3	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	cemented (ortstein)
Dutchess	366	0.6	2.0	0.60	2.0	B	2	Friable till, silty, schist & phyllite	mesic	loamy	no	very channery
Eldridge	38	6.0	20.0	0.06	0.6	C	3	Sandy/loamy over silt/clay	mesic	sandy over loamy	no	
Elliottsville	128	0.6	2.0	0.60	2.0	B	4	Friable till, silty, schist & phyllite	frigid	loamy	yes	20 to 40 in. deep
Elmridge	238	2.0	6.0	0.00	0.2	C	3	Sandy/loamy over silt/clay	mesic	loamy over clayey	no	
Elmwood	338	2.0	6.0	0.00	0.2	C	3	Sandy/loamy over silt/clay	frigid	loamy over clayey	no	
Finch	116					C	3	Outwash and Stream Terraces	frigid	sandy	yes	cemented (ortstein)

Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Metadata for Point	
Smoothing	Yes
State	New Hampshire
Location	New Hampshire, United States
Latitude	42.991 degrees North
Longitude	70.879 degrees West
Elevation	30 feet
Date/Time	Thu Jan 18 2024 14:18:44 GMT-0500 (Eastern Standard Time)

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.26	0.40	0.50	0.66	0.82	1.04	**1yr**	0.71	0.99	1.22	1.58	2.05	2.70	2.95	**1yr**	2.39	2.83	3.25	3.96	4.60	**1yr**
2yr	0.32	0.50	0.62	0.82	1.03	1.31	**2yr**	0.89	1.18	1.52	1.95	2.51	3.25	3.60	**2yr**	2.87	3.47	3.97	4.72	5.38	**2yr**
5yr	0.38	0.58	0.73	0.98	1.26	1.62	**5yr**	1.08	1.47	1.90	2.45	3.17	4.12	4.63	**5yr**	3.65	4.45	5.10	6.01	6.79	**5yr**
10yr	0.42	0.65	0.83	1.12	1.46	1.91	**10yr**	1.26	1.74	2.25	2.93	3.80	4.94	5.60	**10yr**	4.37	5.39	6.16	7.22	8.10	**10yr**
25yr	0.48	0.77	0.98	1.35	1.79	2.37	**25yr**	1.55	2.16	2.81	3.68	4.81	6.28	7.21	**25yr**	5.56	6.93	7.91	9.21	10.24	**25yr**
50yr	0.54	0.87	1.12	1.56	2.10	2.80	**50yr**	1.81	2.55	3.34	4.39	5.76	7.53	8.72	**50yr**	6.67	8.39	9.56	11.06	12.23	**50yr**
100yr	0.61	0.98	1.27	1.80	2.45	3.31	**100yr**	2.12	3.01	3.97	5.25	6.90	9.04	10.56	**100yr**	8.00	10.16	11.56	13.31	14.61	**100yr**
200yr	0.69	1.12	1.45	2.08	2.88	3.91	**200yr**	2.48	3.56	4.70	6.25	8.25	10.85	12.79	**200yr**	9.60	12.30	13.99	16.01	17.47	**200yr**
500yr	0.82	1.34	1.75	2.54	3.55	4.86	**500yr**	3.06	4.44	5.89	7.88	10.46	13.82	16.47	**500yr**	12.23	15.84	17.99	20.45	22.13	**500yr**

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.23	0.36	0.44	0.60	0.73	0.89	**1yr**	0.63	0.87	0.93	1.30	1.61	2.30	2.61	**1yr**	2.04	2.51	2.90	3.30	4.00	**1yr**
2yr	0.32	0.49	0.60	0.82	1.01	1.19	**2yr**	0.87	1.17	1.37	1.82	2.33	3.12	3.53	**2yr**	2.76	3.39	3.89	4.62	5.17	**2yr**
5yr	0.36	0.55	0.68	0.93	1.19	1.42	**5yr**	1.02	1.39	1.62	2.12	2.73	3.87	4.32	**5yr**	3.42	4.16	4.79	5.67	6.40	**5yr**
10yr	0.39	0.60	0.75	1.05	1.35	1.62	**10yr**	1.17	1.59	1.82	2.40	3.07	4.47	5.05	**10yr**	3.96	4.85	5.62	6.60	7.40	**10yr**
25yr	0.45	0.69	0.86	1.22	1.61	1.94	**25yr**	1.39	1.89	2.12	2.77	3.56	4.90	6.18	**25yr**	4.33	5.94	6.92	8.06	8.96	**25yr**
50yr	0.50	0.76	0.95	1.36	1.84	2.22	**50yr**	1.58	2.17	2.37	3.09	3.98	5.54	7.19	**50yr**	4.91	6.92	8.10	9.38	10.37	**50yr**
100yr	0.56	0.85	1.06	1.54	2.11	2.54	**100yr**	1.82	2.49	2.65	3.44	4.42	6.25	8.36	**100yr**	5.53	8.04	9.50	10.91	11.96	**100yr**
200yr	0.63	0.94	1.20	1.73	2.41	2.91	**200yr**	2.08	2.84	2.96	3.82	4.90	7.03	9.74	**200yr**	6.22	9.36	11.15	12.69	13.83	**200yr**
500yr	0.74	1.10	1.41	2.05	2.91	3.50	**500yr**	2.51	3.42	3.44	4.37	5.65	8.18	11.89	**500yr**	7.24	11.43	13.78	15.48	16.73	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.29	0.44	0.54	0.72	0.89	1.08	**1yr**	0.77	1.06	1.27	1.73	2.19	3.01	3.13	**1yr**	2.66	3.01	3.60	4.38	5.07	**1yr**
2yr	0.33	0.52	0.64	0.86	1.06	1.27	**2yr**	0.92	1.24	1.48	1.95	2.50	3.44	3.70	**2yr**	3.04	3.55	4.08	4.86	5.68	**2yr**
5yr	0.40	0.62	0.77	1.05	1.34	1.62	**5yr**	1.16	1.59	1.88	2.51	3.20	4.38	4.93	**5yr**	3.88	4.74	5.42	6.38	7.17	**5yr**
10yr	0.47	0.73	0.90	1.26	1.62	1.98	**10yr**	1.40	1.94	2.27	3.06	3.87	5.42	6.15	**10yr**	4.80	5.91	6.74	7.87	8.77	**10yr**
25yr	0.58	0.89	1.10	1.57	2.07	2.57	**25yr**	1.79	2.52	2.94	4.00	5.00	7.79	8.24	**25yr**	6.90	7.93	8.99	10.42	11.48	**25yr**
50yr	0.68	1.03	1.29	1.85	2.49	3.13	**50yr**	2.15	3.06	3.57	4.89	6.10	9.77	10.30	**50yr**	8.65	9.90	11.19	12.89	14.06	**50yr**
100yr	0.80	1.21	1.51	2.19	3.00	3.81	**100yr**	2.59	3.72	4.34	6.00	7.44	12.25	12.87	**100yr**	10.85	12.38	13.92	15.97	17.24	**100yr**
200yr	0.94	1.41	1.79	2.58	3.60	4.65	**200yr**	3.11	4.54	5.30	7.36	9.07	15.41	16.11	**200yr**	13.64	15.49	17.33	19.77	21.15	**200yr**
500yr	1.16	1.73	2.22	3.23	4.59	6.03	**500yr**	3.96	5.89	6.87	9.68	11.82	20.89	21.66	**500yr**	18.48	20.82	23.13	26.26	27.76	**500yr**

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United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Rockingham County, New Hampshire

January 16, 2024

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

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 1:24,000.

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: Rockingham County, New Hampshire
Survey Area Data: Version 26, Aug 22, 2023

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

Date(s) aerial images were photographed: May 22, 2022—Jun 5, 2022

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
32A	Boxford silt loam, 0 to 3 percent slopes	13.6	11.6%
33A	Scitico silt loam, 0 to 5 percent slopes	8.7	7.4%
66B	Paxton fine sandy loam, 3 to 8 percent slopes	4.4	3.8%
115	Scarboro muck, coastal lowland, 0 to 3 percent slopes	2.8	2.4%
140B	Chatfield-Hollis-Canton complex, 0 to 8 percent slopes, rocky	9.8	8.4%
140C	Chatfield-Hollis-Canton complex, 8 to 15 percent slopes, rocky	0.0	0.0%
298	Pits, sand and gravel	4.5	3.8%
299	Udorthents, smoothed	0.0	0.0%
313A	Deerfield loamy fine sand, 0 to 3 percent slopes	3.8	3.2%
313B	Deerfield loamy fine sand, 3 to 8 percent slopes	3.4	2.9%
495	Natchaug mucky peat, 0 to 2 percent slopes	5.3	4.5%
510A	Hoosic gravelly fine sandy loam, 0 to 3 percent slopes	1.0	0.9%
510B	Hoosic gravelly fine sandy loam, 3 to 8 percent slopes	54.6	46.7%
538A	Squamscott fine sandy loam, 0 to 5 percent slopes	4.9	4.2%
Totals for Area of Interest		**116.8**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class.

Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The

pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Rockingham County, New Hampshire

32A—Boxford silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 9cn3
Elevation: 0 to 1,000 feet
Mean annual precipitation: 30 to 55 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 120 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Boxford and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Boxford

Setting

Parent material: Glaciomarine

Typical profile

H1 - 0 to 2 inches: silt loam
H2 - 2 to 13 inches: silt loam
H3 - 13 to 23 inches: silty clay loam
H4 - 23 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: D
Ecological site: F144AY018NY - Moist Lake Plain
Hydric soil rating: No

Minor Components

Scitico

Percent of map unit: 10 percent
Landform: Marine terraces
Hydric soil rating: Yes

Eldridge

Percent of map unit: 5 percent

Hydric soil rating: No

Squamscott

Percent of map unit: 5 percent
Landform: Marine terraces
Hydric soil rating: Yes

33A—Scitico silt loam, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 9cn6
Elevation: 0 to 180 feet
Mean annual precipitation: 47 to 49 inches
Mean annual air temperature: 48 degrees F
Frost-free period: 155 to 165 days
Farmland classification: Farmland of local importance

Map Unit Composition

Scitico and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Scitico

Setting

Landform: Marine terraces

Typical profile

H1 - 0 to 6 inches: silt loam
H2 - 6 to 12 inches: silty clay loam
H3 - 12 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C/D
Ecological site: F144AY019NH - Wet Lake Plain
Hydric soil rating: Yes

Minor Components

Maybid
Percent of map unit: 5 percent
Landform: Marine terraces
Hydric soil rating: Yes

Squamscott
Percent of map unit: 5 percent
Landform: Marine terraces
Hydric soil rating: Yes

Boxford
Percent of map unit: 5 percent
Hydric soil rating: No

66B—Paxton fine sandy loam, 3 to 8 percent slopes

Map Unit Setting
National map unit symbol: 2t2qp
Elevation: 0 to 1,570 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Paxton and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Paxton

Setting
Landform: Hills, drumlins, ground moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Crest, nose slope, side slope
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile
Ap - 0 to 8 inches: fine sandy loam
Bw1 - 8 to 15 inches: fine sandy loam
Bw2 - 15 to 26 inches: fine sandy loam
Cd - 26 to 65 inches: gravelly fine sandy loam

Properties and qualities
Slope: 3 to 8 percent
Depth to restrictive feature: 18 to 39 inches to densic material

Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 18 to 37 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: C
Ecological site: F144AY007CT - Well Drained Dense Till Uplands
Hydric soil rating: No

Minor Components

Woodbridge

Percent of map unit: 9 percent
Landform: Hills, drumlins, ground moraines
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Ridgebury

Percent of map unit: 6 percent
Landform: Drainageways, hills, ground moraines, depressions
Landform position (two-dimensional): Backslope, footslope, toeslope
Landform position (three-dimensional): Head slope, base slope, dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Charlton

Percent of map unit: 5 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

115—Scarboro muck, coastal lowland, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2svkw
Elevation: 0 to 650 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F

Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Scarboro, coastal lowland, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Scarboro, Coastal Lowland

Setting

Landform: Drainageways, outwash terraces, outwash deltas, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, tread, dip
Down-slope shape: Concave
Across-slope shape: Linear, concave
Parent material: Sandy glaciofluvial deposits derived from schist and/or gneiss and/or granite

Typical profile

Oa - 0 to 8 inches: muck
A - 8 to 14 inches: mucky fine sandy loam
Cg1 - 14 to 22 inches: sand
Cg2 - 22 to 65 inches: gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (1.42 to 14.17 in/hr)
Depth to water table: About 0 to 2 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 6.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: F144AY031MA - Very Wet Outwash
Hydric soil rating: Yes

Minor Components

Swansea

Percent of map unit: 10 percent
Landform: Swamps, bogs
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Mashpee

Percent of map unit: 5 percent

Landform: Drainageways, terraces, depressions
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

140B—Chatfield-Hollis-Canton complex, 0 to 8 percent slopes, rocky

Map Unit Setting

National map unit symbol: 2w82m
Elevation: 380 to 1,070 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Chatfield, very stony, and similar soils: 35 percent
Canton, very stony, and similar soils: 25 percent
Hollis, very stony, and similar soils: 25 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chatfield, Very Stony

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
A - 1 to 2 inches: fine sandy loam
Bw - 2 to 30 inches: gravelly fine sandy loam
2R - 30 to 40 inches: bedrock

Properties and qualities

Slope: 0 to 8 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 20 to 41 inches to lithic bedrock
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches

Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Description of Canton, Very Stony

Setting

Landform: Ridges, hills, moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Coarse-loamy over sandy melt-out till derived from gneiss, granite, and/or schist

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
A - 2 to 5 inches: fine sandy loam
Bw1 - 5 to 16 inches: fine sandy loam
Bw2 - 16 to 22 inches: gravelly fine sandy loam
2C - 22 to 67 inches: gravelly loamy sand

Properties and qualities

Slope: 0 to 8 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 19 to 39 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Description of Hollis, Very Stony

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Summit, shoulder, backslope

Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
A - 2 to 7 inches: gravelly fine sandy loam
Bw - 7 to 16 inches: gravelly fine sandy loam
2R - 16 to 26 inches: bedrock

Properties and qualities

Slope: 0 to 8 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 8 to 23 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Very low (about 2.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: F144AY033MA - Shallow Dry Till Uplands
Hydric soil rating: No

Minor Components

Freetown

Percent of map unit: 5 percent
Landform: Swamps, kettles, bogs, depressions, marshes
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Newfields, very stony

Percent of map unit: 5 percent
Landform: Moraines, hills, ground moraines
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

Walpole, very stony

Percent of map unit: 3 percent
Landform: Outwash terraces, depressions, outwash plains, depressions, deltas
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave

Hydric soil rating: Yes

Rock outcrop

Percent of map unit: 2 percent
Landform: Hills, ridges
Hydric soil rating: Unranked

140C—Chatfield-Hollis-Canton complex, 8 to 15 percent slopes, rocky

Map Unit Setting

National map unit symbol: 2w82s
Elevation: 0 to 980 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Chatfield, very stony, and similar soils: 35 percent
Canton, very stony, and similar soils: 25 percent
Hollis, very stony, and similar soils: 25 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chatfield, Very Stony

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
A - 1 to 2 inches: fine sandy loam
Bw - 2 to 30 inches: gravelly fine sandy loam
2R - 30 to 40 inches: bedrock

Properties and qualities

Slope: 8 to 15 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 20 to 41 inches to lithic bedrock
Drainage class: Well drained
Runoff class: High

Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Description of Hollis, Very Stony

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
A - 2 to 7 inches: gravelly fine sandy loam
Bw - 7 to 16 inches: gravelly fine sandy loam
2R - 16 to 26 inches: bedrock

Properties and qualities

Slope: 8 to 15 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 8 to 23 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Very low (about 2.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: F144AY033MA - Shallow Dry Till Uplands
Hydric soil rating: No

Description of Canton, Very Stony

Setting

Landform: Ridges, hills, moraines

Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Coarse-loamy over sandy melt-out till derived from gneiss, granite, and/or schist

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
A - 2 to 5 inches: fine sandy loam
Bw1 - 5 to 16 inches: fine sandy loam
Bw2 - 16 to 22 inches: gravelly fine sandy loam
2C - 22 to 67 inches: gravelly loamy sand

Properties and qualities

Slope: 8 to 15 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 19 to 39 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Newfields, very stony

Percent of map unit: 5 percent
Landform: Hills, ground moraines, moraines
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

Freetown

Percent of map unit: 5 percent
Landform: Swamps, kettles, bogs, depressions, marshes
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Scarboro, very stony

Percent of map unit: 3 percent
Landform: Outwash deltas, drainageways, outwash terraces, depressions

Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave, linear
Hydric soil rating: Yes

Rock outcrop
Percent of map unit: 2 percent
Landform: Hills, ridges
Hydric soil rating: Unranked

298—Pits, sand and gravel

Map Unit Composition
Pits: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

299—Udorthents, smoothed

Map Unit Setting
National map unit symbol: 9cmt
Elevation: 0 to 840 feet
Mean annual precipitation: 44 to 49 inches
Mean annual air temperature: 48 degrees F
Frost-free period: 155 to 165 days
Farmland classification: Not prime farmland

Map Unit Composition
Udorthents and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents

Properties and qualities
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

313A—Deerfield loamy fine sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2xfg8
Elevation: 0 to 1,100 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Farmland of local importance

Map Unit Composition

Deerfield and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Deerfield

Setting

Landform: Kame terraces, outwash plains, outwash deltas, outwash terraces
Landform position (three-dimensional): Tread
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Parent material: Sandy outwash derived from granite, gneiss, and/or quartzite

Typical profile

Ap - 0 to 9 inches: loamy fine sand
Bw - 9 to 25 inches: loamy fine sand
BC - 25 to 33 inches: fine sand
Cg - 33 to 60 inches: sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: About 15 to 37 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Sodium adsorption ratio, maximum: 11.0
Available water supply, 0 to 60 inches: Moderate (about 6.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: A
Ecological site: F144AY027MA - Moist Sandy Outwash
Hydric soil rating: No

Minor Components

Windsor

Percent of map unit: 7 percent
Landform: Outwash plains, outwash deltas, kame terraces, outwash terraces
Landform position (three-dimensional): Tread
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Hydric soil rating: No

Wareham

Percent of map unit: 5 percent
Landform: Depressions, drainageways
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Sudbury

Percent of map unit: 2 percent
Landform: Outwash terraces, outwash deltas, kame terraces, outwash plains
Landform position (three-dimensional): Tread
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Hydric soil rating: No

Ninigret

Percent of map unit: 1 percent
Landform: Outwash terraces, outwash plains, kame terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear, convex
Across-slope shape: Concave, convex
Hydric soil rating: No

313B—Deerfield loamy fine sand, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2xfg9
Elevation: 0 to 1,190 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Deerfield and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Deerfield

Setting

Landform: Kame terraces, outwash plains, outwash terraces, outwash deltas
Landform position (three-dimensional): Tread
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Parent material: Sandy outwash derived from granite, gneiss, and/or quartzite

Typical profile

Ap - 0 to 9 inches: loamy fine sand
Bw - 9 to 25 inches: loamy fine sand
BC - 25 to 33 inches: fine sand
Cg - 33 to 60 inches: sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: About 15 to 37 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Sodium adsorption ratio, maximum: 11.0
Available water supply, 0 to 60 inches: Moderate (about 6.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: A
Ecological site: F144AY027MA - Moist Sandy Outwash
Hydric soil rating: No

Minor Components

Windsor

Percent of map unit: 7 percent
Landform: Outwash deltas, kame terraces, outwash plains, outwash terraces
Landform position (three-dimensional): Tread
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Hydric soil rating: No

Wareham

Percent of map unit: 5 percent
Landform: Depressions, drainageways
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Sudbury

Percent of map unit: 2 percent
Landform: Outwash plains, outwash terraces, outwash deltas, kame terraces
Landform position (three-dimensional): Tread

Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Hydric soil rating: No

Ninigret

Percent of map unit: 1 percent
Landform: Kame terraces, outwash terraces, outwash plains
Landform position (three-dimensional): Tread
Down-slope shape: Convex, linear
Across-slope shape: Convex, concave
Hydric soil rating: No

495—Natchaug mucky peat, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2w691
Elevation: 0 to 910 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Natchaug and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Natchaug

Setting

Landform: Depressions, depressions, depressions
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Moderately decomposed organic material over loamy glaciofluvial deposits and/or loamy glaciolacustrine deposits and/or loamy till

Typical profile

Oe1 - 0 to 12 inches: mucky peat
Oe2 - 12 to 31 inches: mucky peat
2Cg1 - 31 to 39 inches: silt loam
2Cg2 - 39 to 79 inches: fine sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.01 to 14.17 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None

Frequency of ponding: Frequent
Calcium carbonate, maximum content: 25 percent
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Very high (about 14.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8w
Hydrologic Soil Group: B/D
Ecological site: F144AY042NY - Semi-Rich Organic Wetlands
Hydric soil rating: Yes

Minor Components

Walpole

Percent of map unit: 4 percent
Landform: Outwash terraces, depressions, outwash plains, depressions, deltas
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Scarboro

Percent of map unit: 4 percent
Landform: Outwash deltas, drainageways, outwash terraces, depressions
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Maybid

Percent of map unit: 2 percent
Landform: Depressions, depressions
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

510A—Hoosic gravelly fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 9cp3
Elevation: 100 to 1,100 feet
Mean annual precipitation: 30 to 50 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 135 to 190 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Hoosic and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hoosic

Setting

Parent material: Outwash

Typical profile

H1 - 0 to 8 inches: gravelly fine sandy loam
H2 - 8 to 15 inches: very gravelly fine sandy loam
H3 - 15 to 60 inches: very gravelly coarse sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (2.00 to 20.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F144AY022MA - Dry Outwash
Hydric soil rating: No

Minor Components

Not named

Percent of map unit: 10 percent
Hydric soil rating: No

510B—Hoosic gravelly fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9cp4
Elevation: 100 to 1,100 feet
Mean annual precipitation: 30 to 50 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 135 to 190 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Hoosic and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hoosic

Setting

Parent material: Outwash

Typical profile

H1 - 0 to 8 inches: gravelly fine sandy loam
H2 - 8 to 15 inches: very gravelly fine sandy loam
H3 - 15 to 60 inches: very gravelly coarse sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (2.00 to 20.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F144AY022MA - Dry Outwash
Hydric soil rating: No

Minor Components

Not named

Percent of map unit: 10 percent
Hydric soil rating: No

538A—Squamscott fine sandy loam, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 9cp9
Elevation: 0 to 1,000 feet
Mean annual precipitation: 30 to 55 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 120 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Squamscott and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Squamscott

Setting

Landform: Marine terraces

Typical profile

H1 - 0 to 4 inches: fine sandy loam
H2 - 4 to 12 inches: loamy sand
H3 - 12 to 19 inches: fine sand
H4 - 19 to 65 inches: silt loam

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.60 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C/D
Ecological site: F144AY019NH - Wet Lake Plain
Hydric soil rating: Yes

Minor Components

Maybid

Percent of map unit: 5 percent
Landform: Marine terraces
Hydric soil rating: Yes

Scitico

Percent of map unit: 5 percent
Landform: Marine terraces
Hydric soil rating: Yes

Eldridge

Percent of map unit: 5 percent
Hydric soil rating: No

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NH-1500 – 189 Bunker Hill Ave, Stratham, NH
Test Pits – Christian Smith, P.E. of Beals Associates, PLLC- #1543

11/08/2023
Witness: Mike Cuomo

Test Pit #1

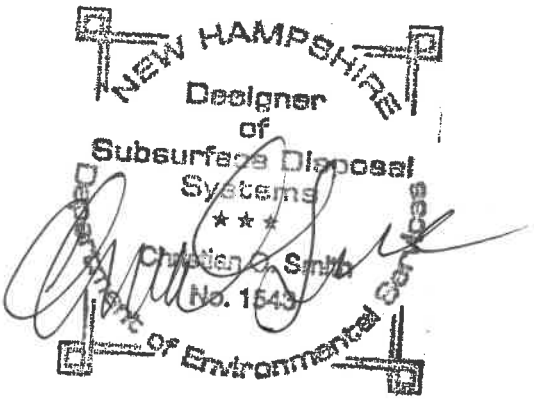
0" – 10"	10YR 3/3	Dark Brown Fine, Sandy, Loam Platy, Friable
10" - 20"	10YR 5 /6	Yellowish Brown Fine, Sandy, Loam Blocky, Friable
20" – 63"	2.5Y 4/4	Olive Brown Very Fine, Sandy Loam Blocky, Firm

ESHWT = 20"
Observed Ground Water –None
Restrictive Layer: 20 Inches
Refusal: None to 63"
Roots to 25 Inches
Perc Rate 8 min/inch @18"

Test Pit #2

0" – 10"	10YR 3 /4	Dark Yellowish Brown Fine, Sandy, Loam Platy, Friable
10" - 34"	10YR 4 /6	Dark Yellowish Brown Fine, Sandy, Loam Blocky, Friable
34" – 60"	2.5Y 4/4	Olive Brown Very Fine Silt Loam Blocky, Firm Redox-Common 2-20%

ESHWT = 34"
Observed Ground Water – None
Restrictive Layer: 34 Inches
Refusal: None
Roots to 6 Inches
Perc Rate 10 min/inch @23"



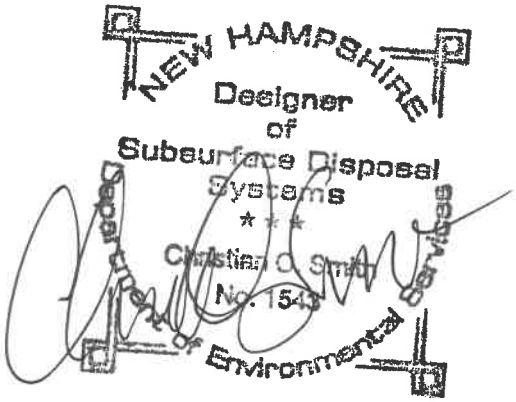
NH-1500 – 189 Bunker Hill Ave, Stratham, NH
Test Pits – Christian Smith, P.E. of Beals Associates, PLLC- #1543

11/08/2023
Witness: Mike Cuomo

Test Pit #3

0" – 10"	10YR 3 /4	Dark Yellowish Brown Fine, Sandy, Loam Platy, Friable
10" - 18"	10YR 4 /6	Dark Yellowish Brown Fine, Sandy, Loam Blocky, Friable
18" –62"	2.5Y 4/6	Olive Brown Very Fine, Sandy Loam Blocky, Firm Redox-Common 2-20%

ESHWT = 18"
Observed Ground Water – None
Restrictive Layer: 18 Inches
Refusal: None to 62"
Roots to 12 Inches
Perc Rate 8 min/inch @15"



Test Pit #4

0" –9"	10YR 3 /4	Dark Yellowish Brown Fine, Sandy, Loam Blocky, Friable
9" - 22"	10YR 4 /6	Dark Yellowish Brown Fine, Sandy, Loam Blocky, Friable
22" – 63"	2.5Y 4/4	Olive Brown Very Fine, Sandy Loam Blocky, Firm Redox-Common 2-20%

ESHWT = 22"
Observed Ground Water – None
Restrictive Layer: 22 Inches
Refusal: None to 63"
Roots to 6 Inches
Perc Rate 8 min/inch @15"

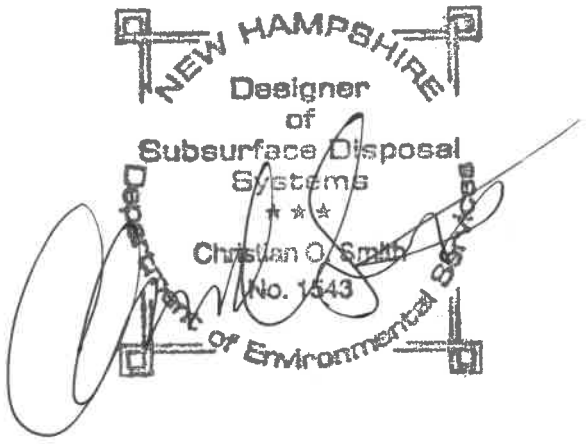
NH-1500 – 189 Bunker Hill Ave, Stratham, NH
Test Pits – Christian Smith, P.E. of Beals Associates, PLLC- #1543

11/08/2023
Witness: Mike Cuomo

Test Pit #5

0" – 10"	10YR 4/3	Brown Fine, Sandy, Loam Blocky, Friable
10" -26"	10YR 4 /6	Dark Yellowish Brown Fine, Sandy, Loam Blocky, Friable
26" – 62"	2.5Y 4/4	Olive Brown Fine, Loamy Sand Blocky, Firm Redox-Common 2-20%

ESHWT = 26"
Observed Ground Water – None
Restrictive Layer: 26 Inches
Refusal: None to 62"
Roots to 6 Inches
Perc Rate 8 min/inch @22"



Test Pit #6

0" – 14"	10YR 4 /4	Dark Yellowish Brown Fine, Sandy, Loam Blocky, Friable
14" - 32"	10YR 4 /6	Dark Yellowish Brown Fine, Sandy, Loam Blocky, Friable
32" –62"	2.5Y 4/4	Olive Brown Medium, Loamy Sand Massive, Firm Redox-Common 2-20%

ESHWT = 32"
Observed Ground Water – None
Restrictive Layer: 32 Inches
Refusal: None – 62 Inches
Roots to 6 Inches
Perc Rate 7 min/inch @26"

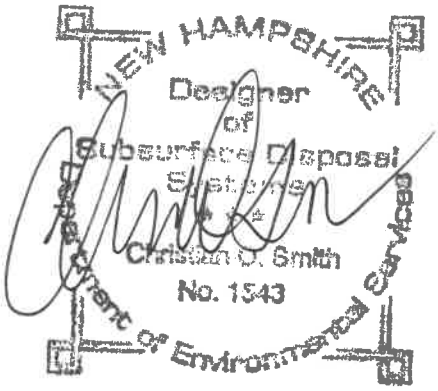
NH-1500 – 189 Bunker Hill Ave, Stratham, NH
Test Pits – Christian Smith, P.E. of Beals Associates, PLLC- #1543

11/08/2023
Witness: Mike Cuomo

Test Pit #7

0" – 9"	10YR 3/4	Dark Yellowish Brown Fine, Sandy, Loam Granular, Friable
9" - 18"	10YR 5 /6	Yellowish Brown Fine, Sandy, Loam Platy, Friable
18" – 62"	2.5Y 5/4	Light Olive Brown Silt Loam Platy, Firm Redox-Common 2-20%

ESHWT = 18"
Observed Ground Water – None
Restrictive Layer: 18 Inches
Refusal: None to 62"
Roots to 26 Inches
Perc Rate 10 min/inch @15"



Test Pit #8

0" – 8"	10YR 3 /4	Dark Yellowish Brown Fine, Sandy, Loam Blocky, Friable
8" - 23"	10YR 5 /4	Yellowish Brown Fine, Sandy, Loam Platy, Friable
23" – 62"	2.5Y 4/4	Olive Brown Silt Loam Platy, Firm Redox-Common 2-20%

ESHWT = 23"
Observed Ground Water – None
Restrictive Layer: 23 Inches
Refusal: None to 62"
Roots to 21 Inches
Perc Rate 10 min/inch @18"

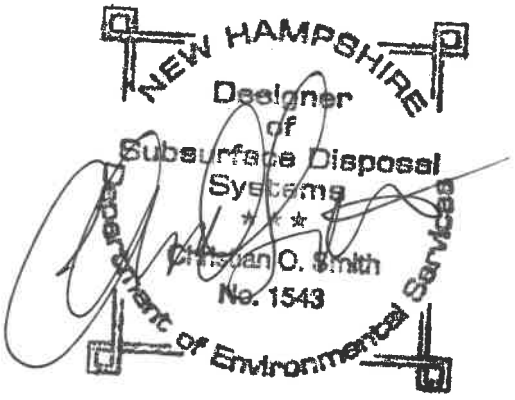
NH-1500 – 189 Bunker Hill Ave, Stratham, NH
Test Pits – Christian Smith, P.E. of Beals Associates, PLLC- #1543

11/08/2023
Witness: Mike Cuomo

Test Pit #9

0" – 9"	10YR 3 /4	Dark Yellowish Brown Fine, Sandy, Loam Granular, Friable
9" - 23"	10YR 5 /4	Yellowish Brown Fine, Sandy, Loam Platy, Friable
23"-63"	2.5Y 5/4	Light Olive Brown Loamy, Sand Massive, Firm Redox-Common 2-20%

ESHWT = 23"
Observed Ground Water – None
Restrictive Layer: 23 Inches
Refusal: None to 63"
Roots to 4 Inches
Perc Rate 7 min/inch @20"



Test Pit #10

0" – 8"	10YR 4/4	Dark Yellowish Brown Fine, Sandy, Loam Platy, Friable
8" - 21"	10YR 4/6	Dark Yellowish Brown Fine, Sandy, Loam Blocky, Friable/Very Stoney
21" – 61"	2.5Y 4/4	Olive Brown Loamy Sand Massive, Firm/Very Stoney Redox-Common 2-20%

ESHWT = 21"
Observed Ground Water – None
Restrictive Layer: 21 Inches
Refusal: None to 61"
Roots to 8 Inches
Perc Rate 8 min/inch @18"

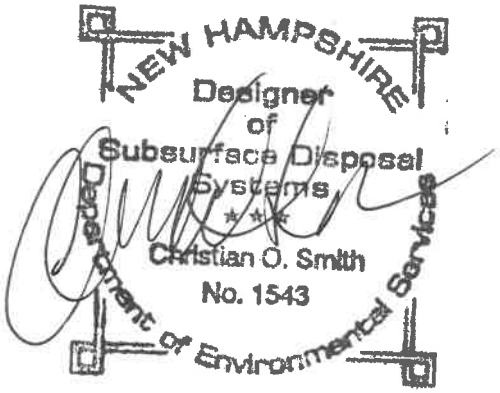
NH-1500 – 189 Bunker Hill Ave, Stratham, NH
Test Pits – Christian Smith, P.E. of Beals Associates, PLLC- #1543

11/08/2023
Witness: Mike Cuomo

Test Pit #11

0" – 10"	10YR 3 /4	Dark Yellowish Brown Fine, Sandy, Loam Blocky, Friable
10" - 27"	10YR 5 /6	Yellowish Brown Fine, Sandy, Loam Blocky, Friable/Stoney
27" – 64"	2.5Y 5/4	Light Olive Brown Loamy Sand Blocky, Firm/Stoney Redox-Common 2-20%

ESHWT = 27"
Observed Ground Water – None
Restrictive Layer: 27 Inches
Refusal: None – 64 Inches
Roots to 6 Inches
Perc Rate 8 min/inch @22"



Test Pit #12

0" – 12"	10YR 3 /4	Dark Yellowish Brown Fine, Sandy, Loam Blocky, Friable
12" - 37"	10YR 5 /4	Yellowish Brown Fine, Sandy, Loam Blocky, Friable
37" – 62"	2.5Y 4/4	Olive Brown Loamy Sand Massive, Firm/Stoney Redox-Common 2-20%

ESHWT = 37"
Observed Ground Water – None
Restrictive Layer: 37 Inches
Refusal: None – 62 Inches
Roots to 6 Inches
Perc Rate 8 min/inch @25"

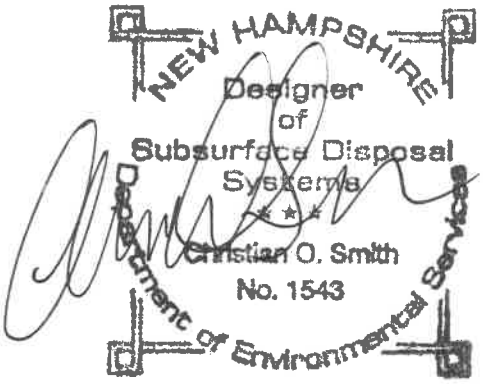
NH-1500 – 189 Bunker Hill Ave, Stratham, NH
Test Pits – Christian Smith, P.E. of Beals Associates, PLLC- #1543

11/08/2023
Witness: Mike Cuomo

Test Pit #13

0" – 10"	10YR 3/4	Dark Yellowish Brown Fine, Sandy, Loam Granular, Friable
10" - 23"	10YR 4/6	Dark Yellowish Brown Fine, Sandy, Loam Blocky, Friable
23" – 62"	2.5Y 5/4	Light Olive Brown Silt Loam Platy, Firm Redox-Common 2-20%

ESHWT = 23"
Observed Ground Water – None
Restrictive Layer: 23 Inches
Refusal: None to 62 Inches
Roots to 23 Inches
Perc Rate 10 min/inch @20"



Test Pit #14

0" – 18"	10YR 3 /4	Dark Yellowish Brown Fine, Sandy, Loam Granular, Friable
18" - 21"	10YR 4/ 4	Dark Yellowish Brown Fine Sandy Loam Blocky, Friable
21" – 64"	2.5Y 4/4	Olive Brown Silt, Loam Blocky, Firm Redox-Common 2-20%

ESHWT = 21"
Observed Ground Water – None
Restrictive Layer: 21 Inches
Refusal: None - 64 Inches
Roots to 32 Inches
Perc Rate 10 min/inch @18"

Test Pit #D1

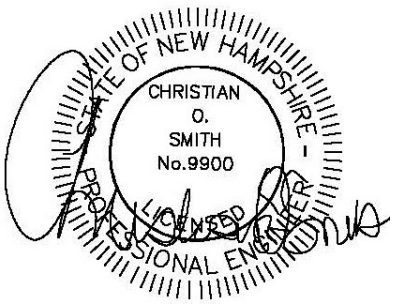
0" – 12"	10YR 4 /4	Dark Yellowish Brown Fine, Sandy, Loam Granular, Friable
12" - 28"	10YR 5/ 4	Yellowish Brown Fine, Sandy, Loam Blocky, Friable
28" – 68"	2.5Y 4/3	Olive Brown Silt, Loam Platy, Firm Redox-Common 2-20%

ESHWT = 28"
Observed Ground Water – 42 inches
Restrictive Layer: 28 Inches
Refusal: None
Roots to 26 Inches

Test Pit #D2

0" – 10"	10YR 4 /4	Dark Yellowish Brown Fine, Sandy, Loam Granular, Friable
10" - 18"	10YR 5/ 3	Brown Fine, Sandy, Loam Blocky, Friable
18" – 68"	2.5Y 5/2	Grayish Brown Silt, Loam Blocky, Firm Redox-Common 2-20%

ESHWT = 18"
Observed Ground Water – 38 inches
Restrictive Layer: 18 Inches
Refusal: None
Roots to 6 Inches

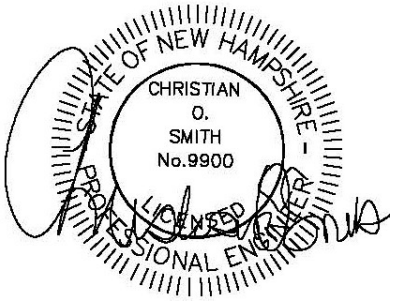


NH-1500 – 189 Bunker Hill 01/23/2024
Test Pits – Christian Smith, P.E. of Beals Associates, PLLC- #1543 Witness:

Test Pit #D3

0" – 12"	10YR 4 /4	Dark Yellowish Brown Fine, Sandy, Loam Granular, Friable
12" - 18"	10YR 5/ 3	Brown Fine, Sandy, Loam Blocky, Friable
18" – 60"	2.5Y 5/4	Light Olive Brown Silt, Loam Platy, Firm Redox-Common 2-20%

ESHWT = 18"
Observed Ground Water – 24 inches
Restrictive Layer: 18 Inches
Refusal: None
Roots to 6 Inches



STORMWATER MANAGEMENT / BMP
INSPECTION & MAINTENANCE PLAN

Chinburg Properties Inc
Windsong Place
Stratham, New Hampshire
NH-1500
January 2024

Proper construction, inspections, maintenance, and repairs are key elements in maintaining a successful stormwater management program on a developed property. Routine inspections ensure permit compliance and reduce the potential for deterioration of infrastructure or reduced water quality.

For the purpose of this Stormwater Management Program, a significant rainfall event is considered an event of three (3) inches or more in a 24-hour period or at least 0.5 inches in a one-hour period. During construction, inspections should be conducted every two weeks or after a 0.25" rainfall event in a 24-hour period per the EPA NPDES Phase II SWPPP, until the entire disturbed area is fully restabilized. Upon full stabilization of the project and filing of an NOI, inspections need only be conducted after a significant rainfall event as described above or as described in the maintenance guidelines below.

During construction activities Chinburg Properties Inc with an address of 3 Penstock Way, Newmarket, NH 03857 and a phone of 603.868.5995 or their heirs and/or assigns, shall be responsible for inspections and maintenance activities for the above project site. The individual homeowners shall be responsible for *ongoing inspection and maintenance* of the sediment forebay and infiltration ponds. The Town of Stratham DPW shall be responsible for *ongoing inspection and maintenance* of the catchbasins and manholes within the right-of-way.

The owner is responsible to ensure that any subsequent owner has copies of the Log Form and Annual Report records and fully understands the responsibilities of this plan. The grantor owner(s) will ensure this document is provided to the grantee owner(s) by duplicating the Ownership Responsibility Sheet which is found toward the back of this document, which will be maintained with the Inspection & Maintenance Logs and provided to the Town of Stratham upon request.

Documentation:
A maintenance log (i.e., report) will be kept summarizing inspections, maintenance, and any corrective actions taken. The log will include the date on which each inspection or maintenance task was performed, a description of the inspection findings or maintenance completed, and the name of the inspector or maintenance personnel performing the task (see Stormwater System Operation and Maintenance Plan Inspection & Maintenance Manual Checklist attached). If a maintenance task requires the clean-out of any sediments or debris, the location where the sediment and debris was disposed after removal shall be indicated.

Best Management Practices (BMP) Maintenance Guidelines

The following provides a list of recommendations and guidelines for managing the Stormwater facilities. The cited areas, facilities, and measures will be inspected and the identified deficiencies will be corrected. Clean-out must include the removal and legal disposal of any accumulated sediments and debris.

DURING CONSTRUCTION

1. Stabilized Construction Entrance

A temporary gravel construction entrance provides an area where mud can be dislodged from tires before the vehicle leaves the construction site to reduce the amount of mud and sediment transported onto paved municipal and state roads. The stone size for the pad should be between 1 and 2-inch coarse aggregate, and the pad itself constructed to a minimum length of 50' for the full width of the access road. The aggregate should be placed at least six inches thick. A plan view and profile are shown on Sheet E1 - Sediment and Erosion Control Detail Plan.

2. Dust Control

Dust will be controlled on the site using multiple BMPs. Mulching and temporary seeding will be the first line of protection to be utilized where problems occur. If dust problems are not solved by these applications, the use of water and calcium chloride can be applied. Calcium chloride will be applied at a rate that will keep the surface moist but not cause pollution.

3. Temporary Erosion and Sediment Control Devices / Barriers

Function – Temporary erosion and sediment control devices are utilized during construction period to divert, store and filter stormwater from non-stabilized surfaces. These devices include, but are not limited to: silt fences, hay bales, filters, sediment traps, stone check dams, mulch and erosion control blankets.

Maintenance – Temporary erosion and sediment control devices shall be inspected and maintained on a weekly basis and following a significant storm event (>0.5-inch rain event) throughout the construction period to ensure that they still have integrity and are not allowing sediment to pass. Sediment build-up in swales will be removed if it is deeper than six inches. Sediment is to be removed from sumps in the catch basin semi-annually. Refer to the Site Plan drawings for the maintenance of temporary erosion and sediment control devices.

4. Invasive Species

THE NH COMMISSIONER OF AGRICULTURE PROHIBITS THE COLLECTION, POSSESSION, IMPORTATION, TRANSPORTATION, SALE, PROPAGATION, TRANSPLANTATION, OR CULTIVATION OF PLANTS BANNED BY NH LAW RSA 430:53 AND NH CODE ADMINISTRATIVE RULES AGR 3800. THE PROJECT

SHALL MEET ALL REQUIREMENTS AND THE INTENT OF. RSA 430:53 AND AGR 3800 RELATIVE TO INVASIVE SPECIES.

POST CONSTRUCTION / LONG TERM MAINTENANCE:

5. Catch Basins/Manholes

Inspect catch basins 2 times per year (preferably in spring and fall) to ensure that the catch basins are working in their intended fashion and that they are free of debris. Clean structures when sediment depths reach 2" from invert of outlet. If the basin outlet is designed with a hood to trap floatable materials (i.e. Snout), check to ensure watertight seal is working. Remove floating debris and hydrocarbons at the time of the inspection.

6. Culverts

Inspect culverts 2 times per year (preferably in spring and fall) to ensure that the culverts are working in their intended fashion and that they are free of debris. Remove any obstructions to flow; remove accumulated sediments and debris at the inlet, at the outlet, and within the conduit and to repair any erosion damage at the culvert's inlet and outlet. Repair/replace culvert if it becomes crushed or deteriorated.

7. Vegetated Areas

Inspect slopes and embankments early in the growing season to identify active or potential erosion problems. Replant bare areas or areas with sparse growth. Where rill erosion is evident, armor the area with an appropriate lining or divert the erosive flows to on-site areas able to withstand the concentrated flows. The facilities will be inspected after major storms and any identified deficiencies will be corrected.

8. Roadways and Paved Surfaces

Clear accumulations of winter sand along roadways at least once a year, preferably in the spring. Accumulations on pavement may be removed by pavement sweeping. Accumulations of sand along road shoulders may be removed by grading excess sand to the pavement edge and removing it manually or by a front-end loader.

9. Pretreatment Structures/Sediment Forebays

Inspect all upstream pre-treatment measures (forebays, etc.) for sediment and floatables accumulation. Remove and dispose of sediments, debris, or woody vegetation as needed. Remove sediment as needed when average depths reach 6". Mow embankments at least two times annually.

10. Drainage Swales/Stormwater Conveyances

Drainage swales will be stabilized with vegetation for long term cover as outlined below, and on Sheet E-1 using seed mixture C. As a general rule, velocities in the swale should not

exceed 3.0 feet per second for a vegetated swale although velocities as high as 4.5 FPS are allowed under certain soil conditions.

Maintenance

- 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.

11. Stormwater Infiltration Facilities

- Inspect all upstream pre-treatment measures for sediment and floatables accumulation. Remove and dispose of sediments or debris as needed.
- The infiltration facility will be inspected within the first three months after construction.
- After the initial three months, the infiltration facility will be inspected 2 times per year to ensure that the filter is draining within 72 hours of a rain event equivalent to 1/2" or more.
- Failure to drain in 72 hours will require part or all of the top 3 inches of the infiltration area to be removed and replaced with new like material. If the infiltration system does not drain within 72-hours following a rainfall event, then a qualified professional should assess the condition of the facility to determine measures required to restore infiltration function.
- Vegetated infiltration ponds or swales will be mowed at least annually or otherwise maintained to control the growth of woody vegetation and to control the accumulation of sediments in order to maintain the water quality volume. Any woody vegetation or accumulated sediment must be removed.
- The facilities will be inspected after major storms and any identified deficiencies will be corrected.

12. Riprap Weir – Maintenance

- Inspect at least once annually for accumulation of sediment and debris and for signs of erosion within weir or down-slope of the spreader.
- Remove debris whenever observed during inspection.
- Mow as required by landscaping design. At a minimum, mow annually to control woody vegetation.
- Repair any erosion and re-grade or replace stone berm material, as warranted by inspection.
- Reconstruct the spreader if down-slope channelization indicates that the spreader is not level or that discharge has become concentrated, and corrections cannot be made through minor re-grading.

14. Invasive Species

Background

Invasive plants are introduced, alien, or non-native plants, which have been moved by people from their native habitat to a new area. Some exotic plants are imported for human use such as landscaping, erosion control, or food crops. They also can arrive as "hitchhikers" among shipments of other plants, seeds, packing materials, or fresh produce. Some exotic plants become invasive and cause harm by:

- Becoming weedy and overgrown;
- Killing established shade trees;
- Obstructing pipes and drainage systems;
- Forming dense beds in water;
- Lowering water levels in lakes, streams, and wetlands;
- Destroying natural communities;
- Promoting erosion on stream banks and hillsides; and
- Resisting control except by hazardous chemical.

During maintenance activities, check for the presence of invasive plants and remove in a safe manner. They should be controlled as described on the following fact sheet prepared by the University of New Hampshire Cooperative Extension entitled Methods for Disposing Non-Native Invasive Plant dated January 2010.

In the event that invasive species are noticed growing in any of the stormwater management practices, the invasive vegetation shall be removed completely to include root matter and disposed of properly. Prior to disposal, the vegetation shall be placed on and completely cover with a plastic tarp for a period of two – three weeks until plants are completely dead. If necessary or to expedite the process, spray only the invasive vegetation and roots with a systemic nonselective herbicide after placement on the tarp (to prevent chemical migration) and then cover.

Annual Report

Description: The owner is responsible to keep an **Inspection & Maintenance Activity Log** that documents inspection, maintenance, and repairs to the storm water management system, and a **Deicing Log** to track the amount and type of deicing material applied to the site. The original owner is responsible to ensure that any subsequent owner (s) have copies of the Stormwater System Operation and Maintenance Plan & Inspection and Maintenance Manual, copies of past logs and check lists. This includes any owner association for potential condominium conversion of the property. The Annual Report will be prepared and submitted to the Town of Stratham DPW upon request.

Disposal Requirements

Disposal of debris, trash, sediment, and other waste materials should be done at suitable disposal/recycling sites and in compliance with all applicable local, state, and federal waste regulations.

STORMWATER SYSTEM OPERATION AND MAINTENANCE PLAN

Inspection & Maintenance Manual Checklist

Residential Development
Chinburg Properties Inc – Windsong Place
Stratham, NH

BMP / System	Minimum Inspection Frequency	Minimum Inspection Requirements	Maintenance / Cleanout Threshold
Stabilized Construction Entrance	Weekly	Inspect adjacent roadway for sediment tracking Inspect stone for sediment accumulation	Sweep adjacent roadways as soon as sediment is tracked Top dress with additional stone when necessary to prevent tracking
Sediment Control Devices / Barriers	Weekly	Inspect accumulated sediment level, rips, and tears	Repair or replace damaged lengths Remove and dispose of accumulated sediment once level reaches 1/3 of barrier height
Pavement Sweeping	Spring and Fall	Removal of sand and litter from impervious areas	N/A
Litter/Trash Removal	Routinely	Inspect dumpsters, outdoor waste receptacles area, and yard areas, as well as ponds and swale areas.	Site will be free of litter/trash.
Landscaping	Maintained as required and mulched each Spring	N/A	Trash/debris and weed removal
Drainage Pipes, Catchbasins & Drain Manholes	Spring and Fall	Check for sediment accumulation & clogging.	More than 2" sediment depth

Sediment Forebay	Spring and Fall	Sediment accumulation. Inspect embankments, inlet and outlet structures, and appurtenances.	Remove sediment as needed. Remove trash & debris from system and appurtenances. Mow embankment and remove woody vegetation.
Infiltration Basin	Spring and Fall and after every 2.5" of rain or greater in a 24-hour period	Monitoring and evaluation of wetland vegetation, inspection of sediment on pond surface, inlet/outlet and appurtenance structure evaluation. 72-Hour drawdown time evaluation and vegetation evaluation.	Remove dead & diseased vegetation along with all debris; take corrective measures, reseed and repair inlet/outlet structures and appurtenances if required. Mow embankments and remove woody vegetation. Restore infiltration by removing accumulated sediments and reconstruction of the infiltration basin as necessary.
Drainage Swales	Annually	Inspect for erosion, sediment accumulation, vegetation loss, and presence of invasive species.	Remove sediment & debris when exceeds 3". Repair eroded areas. Remove invasive species and dead vegetation. Reseed as warranted.
	Spring and Fall	Inspect height of vegetation	Mow when necessary – allow length of vegetation to remain at least 4" high
Riprap Outlet Protection/Level Spreaders	Spring and Fall and after every 2.5" of rain or greater in a 24-hour period	Check for sediment buildup and displaced stones. Inspect for torn or visible fabric.	Remove excess sediment and trash/debris. Immediately repair and replace stone and/or fabric as necessary.
Annual Report	1 time per year	Submit Annual Report to Town of Stratham Inspector upon request	

Inspection Notes:

STORMWATER SYSTEM OPERATION AND MAINTENANCE PLAN

Inspection & Maintenance Manual Log Form

Residential Development
Chinburg Properties Inc – Windsong Place
Stratham, NH

BMP / System	Date Inspected	Inspected By	Cleaning/Repair (List Items & Comments)	Date Repaired	Repairs Performed By

INSPECTION CHECKLIST AND MAINTENANCE GUIDANCE

INFILTRATION POND - INSPECTION CHECKLIST

Location: _____

Owner Change Since Last Inspection? Y N

Owner Name, Address, Phone: _____

Date:_____Time:_____Site Conditions: _____

Inspection Items	Satisfactory (S) or Unsatisfactory (U)	Comments/Corrective Action
Sand Filter Inspection List		
Complete drainage of the filter in about 40 hours after a rain event?		
Clogging of filter surface?		
Clogging of inlet/outlet structures?		
Clogging of filter fabric?		
Clear of debris and functional?		
Leaks or seeps in filter?		
Obstructions of spillway(s)?		
Animal burrows in filter?		
Sediment accumulation in filter bed (less than 50% is acceptable)?		
Cracking, spalling, bulging or deterioration of concrete?		
Erosion in area draining to sand filter?		
Erosion around inlets, filter bed, or outlets?		
Pipes and other structures in good		
Undesirable vegetation growth?		
Other (describe)?		
Hazards		
Have there been complaints from residents?		
Public hazards noted?		

If any of the above inspection items are **UNSATISFACTORY**, list corrective actions and the corresponding completion dates below:

Corrective Action Needed	Due Date

Inspector Signature:_____

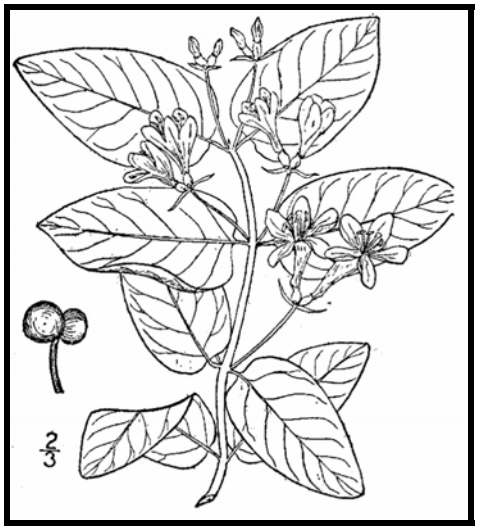
Inspector Name (printed):_____

Date:_____

University of New Hampshire Cooperative Extension

Methods for Disposing Non-Native Invasive Plants

Prepared by the Invasives Species Outreach Group, volunteers interested in helping people control invasive plants. Assistance provided by the Piscataquog Land Conservancy and the NH Invasives Species Committee. Edited by Karen Bennett, Extension Forestry Professor and Specialist.



Tatarian honeysuckle
Lonicera tatarica
USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. *An illustrated flora of the northern United States, Canada and the British Possessions*. Vol. 3: 282.

Non-native invasive plants crowd out natives in natural and managed landscapes. They cost taxpayers billions of dollars each year from lost agricultural and forest crops, decreased biodiversity, impacts to natural resources and the environment, and the cost to control and eradicate them.

Invasive plants grow well even in less than desirable conditions such as sandy soils along roadsides, shaded wooded areas, and in wetlands. In ideal conditions, they grow and spread even faster. There are many ways to remove these non-native invasives, but once removed, care is needed to dispose the removed plant material so the plants don't grow where disposed.

Knowing how a particular plant reproduces indicates its method of spread and helps determine the appropriate disposal method. Most are spread by seed and are dispersed by wind, water, animals, or people. Some reproduce by vegetative means from pieces of stems or roots forming new plants. Others spread through both seed and vegetative means.

Because movement and disposal of viable plant parts is restricted (see NH Regulations), viable invasive parts can't be brought to most transfer stations in the state. Check with your transfer station to see if there is an approved, designated area for invasives disposal. This fact sheet gives recommendations for rendering plant parts non-viable.

Control of invasives is beyond the scope of this fact sheet. For information about control visit www.nhinvasives.org or contact your UNH Cooperative Extension office.

New Hampshire Regulations

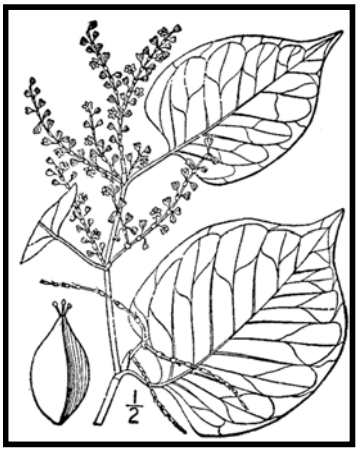
Prohibited invasive species shall only be disposed of in a manner that renders them nonliving and nonviable. (Agr. 3802.04)

No person shall collect, transport, import, export, move, buy, sell, distribute, propagate or transplant any living and viable portion of any plant species, which includes all of their cultivars and varieties, listed in Table 3800.1 of the New Hampshire prohibited invasive species list. (Agr 3802.01)

How and When to Dispose of Invasives?

To prevent seed from spreading remove invasive plants before seeds are set (produced). Some plants continue to grow, flower and set seed even after pulling or cutting. Seeds can remain viable in the ground for many years. If the plant has flowers or seeds, place the flowers and seeds in a heavy plastic bag "head first" at the weeding site and transport to the disposal site. The following are general descriptions of disposal methods. See the chart for recommendations by species.

Burning: Large woody branches and trunks can be used as firewood or burned in piles. For outside burning, a written fire permit from the local forest fire warden is required unless the ground is covered in snow. Brush larger than 5 inches in diameter can't be burned. Invasive plants with easily airborne seeds like black swallow-wort with mature seed pods (indicated by their brown color) shouldn't be burned as the seeds may disperse by the hot air created by the fire.



Japanese knotweed
Polygonum cuspidatum
USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. *An illustrated flora of the northern United States, Canada and the British Possessions*. Vol. 1: 676.

Bagging (solarization): Use this technique with softer-tissue plants. Use heavy black or clear plastic bags (contractor grade), making sure that no parts of the plants poke through. Allow the bags to sit in the sun for several weeks and on dark pavement for the best effect.

Tarping and Drying: Pile material on a sheet of plastic and cover with a tarp, fastening the tarp to the ground and monitoring it for escapes. Let the material dry for several weeks, or until it is clearly nonviable.

Chipping: Use this method for woody plants that don't reproduce vegetatively.

Burying: This is risky, but can be done with watchful diligence. Lay thick plastic in a deep pit before placing the cut up plant material in the hole. Place the material away from the edge of the plastic before covering it with more heavy plastic. Eliminate as much air as possible and toss in soil to weight down the material in the pit. Note that the top of the buried material should be at least three feet underground. Japanese knotweed should be at least 5 feet underground!

Drowning: Fill a large barrel with water and place soft-tissue plants in the water. Check after a few weeks and look for rotted plant material (roots, stems, leaves, flowers). Well-rotted plant material may be composted. A word of caution- seeds may still be viable after using this method. Do this before seeds are set. This method isn't used often. Be prepared for an awful stink!

Composting: Invasive plants can take root in compost. Don't compost any invasives unless you know there is no viable (living) plant material left. Use one of the above techniques (bagging, tarping, drying, chipping, or drowning) to render the plants nonviable before composting. Closely examine the plant before composting and avoid composting seeds.

Be diligent looking for seedlings for *years* in areas where removal and disposal took place.

Suggested Disposal Methods for Non-Native Invasive Plants

This table provides information concerning the disposal of removed invasive plant material. If the infestation is treated with herbicide and left in place, these guidelines don't apply. Don't bring invasives to a local transfer station, unless there is a designated area for their disposal, or they have been rendered non-viable. This listing includes wetland and upland plants from the New Hampshire Prohibited Invasive Species List. The disposal of aquatic plants isn't addressed.

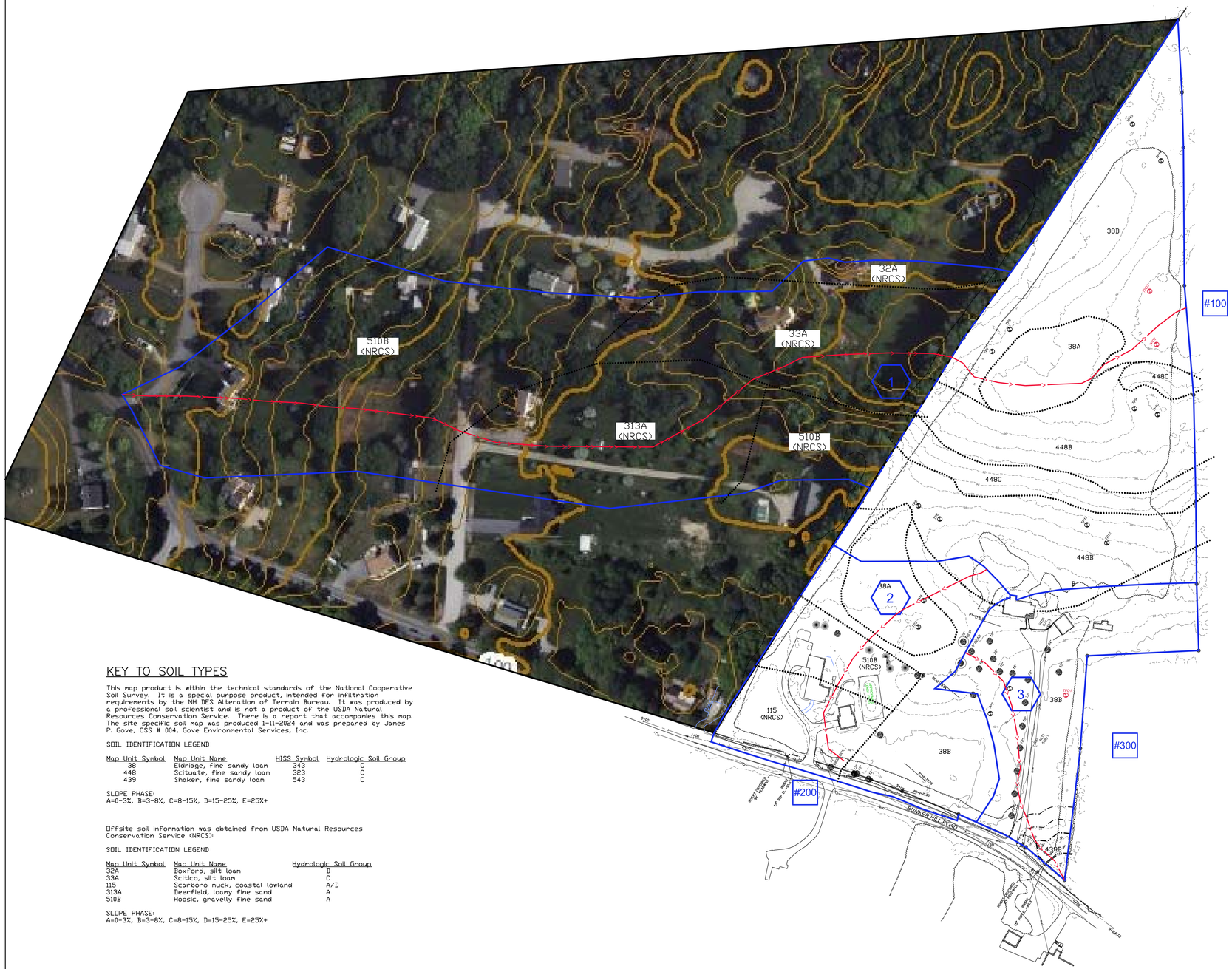
<table>
<tr><th>Woody Plants</th><th>Method of Reproducing</th><th>Methods of Disposal</th></tr>
<tr><td rowspan="2">Norway maple
(Acer platanoides)
European barberry
(Berberis vulgaris)
Japanese barberry
(Berberis thunbergii)
autumn olive
(Elaeagnus umbellata)
burning bush
(Euonymus alatus)
Morrow's honeysuckle
(Lonicera morrowii)
Tatarian honeysuckle
(Lonicera tatarica)
showy bush honeysuckle
(Lonicera x bella)
common buckthorn
(Rhamnus cathartica)
glossy buckthorn
(Frangula alnus)</td><td rowspan="2">Fruit and Seeds
  </td><td>Prior to fruit/seed ripening
Seedlings and small plants
▪ Pull or cut and leave on site with roots exposed. No special care needed.
Larger plants
▪ Use as firewood.
▪ Make a brush pile.
▪ Chip.
▪ Burn.</td></tr>
<tr><td>After fruit/seed is ripe
Don't remove from site.
▪ Burn.
▪ Make a covered brush pile.
▪ Chip once all fruit has dropped from branches.
▪ Leave resulting chips on site and monitor.</td></tr>
<tr><td rowspan="2">oriental bittersweet
(Celastrus orbiculatus)
multiflora rose
(Rosa multiflora)</td><td rowspan="2">Fruits, Seeds, Plant Fragments
  </td><td>Prior to fruit/seed ripening
Seedlings and small plants
▪ Pull or cut and leave on site with roots exposed. No special care needed.
Larger plants
▪ Make a brush pile.
▪ Burn.</td></tr>
<tr><td>After fruit/seed is ripe
Don't remove from site.
▪ Burn.
▪ Make a covered brush pile.
▪ Chip – only after material has fully dried (1 year) and all fruit has dropped from branches. Leave resulting chips on site and monitor.</td></tr>
</table>

Non-Woody Plants	Method of Reproducing	Methods of Disposal
garlic mustard *(Alliaria petiolata)* spotted knapweed *(Centaurea maculosa)* ▪ Sap of related knapweed can cause skin irritation and tumors. Wear gloves when handling. black swallow-wort *(Cynanchum nigrum)* ▪ May cause skin rash. Wear gloves and long sleeves when handling. pale swallow-wort *(Cynanchum rossicum)* giant hogweed *(Heracleum mantegazzianum)* ▪ Can cause major skin rash. Wear gloves and long sleeves when handling. dame's rocket *(Hesperis matronalis)* perennial pepperweed *(Lepidium latifolium)* purple loosestrife *(Lythrum salicaria)* Japanese stilt grass *(Microstegium vimineum)* mile-a-minute weed *(Polygonum perfoliatum)*	**Fruits and Seeds** 	**Prior to flowering** Depends on scale of infestation Small infestation ▪ Pull or cut plant and leave on site with roots exposed. Large infestation ▪ Pull or cut plant and pile. (You can pile onto or cover with plastic sheeting). ▪ Monitor. Remove any re-sprouting material. **During and following flowering** Do nothing until the following year or remove flowering heads and bag and let rot. Small infestation ▪ Pull or cut plant and leave on site with roots exposed. Large infestation ▪ Pull or cut plant and pile remaining material. (You can pile onto plastic or cover with plastic sheeting). ▪ Monitor. Remove any re-sprouting material.
common reed (*Phragmites australis*) Japanese knotweed *(Polygonum cuspidatum)* Bohemian knotweed *(Polygonum x bohemicum)*	**Fruits, Seeds, Plant Fragments** Primary means of spread in these species is by plant parts. Although all care should be given to preventing the dispersal of seed during control activities, the presence of seed doesn't materially influence disposal activities.	**Small infestation** ▪ Bag all plant material and let rot. ▪ Never pile and use resulting material as compost. ▪ Burn. **Large infestation** ▪ Remove material to unsuitable habitat (dry, hot and sunny or dry and shaded location) and scatter or pile. ▪ Monitor and remove any sprouting material. ▪ Pile, let dry, and burn.

January 2010

Appendix IV

Plans



KEY TO SOIL TYPES

This map product is within the technical standards of the National Cooperative Soil Survey. It is a special purpose product, intended for infiltration requirements by the NH DES Alteration of Terrain Bureau. It was produced by a professional soil scientist and is not a product of the USDA Natural Resources Conservation Service. There is a report that accompanies this map. The site specific soil map was produced 1-11-2024 and was prepared by James P. Gove, CSS # 004, Gove Environmental Services, Inc.

SOIL IDENTIFICATION LEGEND

Map Unit Symbol	Map Unit Name	HISS Symbol	Hydrologic Soil Group
38	Eldridge, fine sandy loam	343	C
448	Scituate, fine sandy loam	323	C
439	Shaker, fine sandy loam	543	C

SLOPE PHASE:
A=0-3%, B=3-8%, C=8-15%, D=15-25%, E=25%+

Offsite soil information was obtained from USDA Natural Resources Conservation Service (NRCS)

SOIL IDENTIFICATION LEGEND

Map Unit Symbol	Map Unit Name	Hydrologic Soil Group
32A	Boxford, silt loam	D
33A	Scitico, silt loam	C
115	Scarboro muck, coastal lowland	A/D
313A	Deerfield, loamy fine sand	A
510B	Hoosic, gravelly fine sand	A

SLOPE PHASE:
A=0-3%, B=3-8%, C=8-15%, D=15-25%, E=25%+

PREPARED FOR:

CHINBURG PROPERTIES INC
3 PENSTOCK WAY
NEWMARKET, NH 03857

BEALS ASSOCIATES, PLLC
70 PORTSMOUTH AVE,
THIRD FLOOR, SUITE 2
STRATHAM, N.H. 03885
PHONE: 603-583-4860,
FAX. 603-583-4863

** THIS DRAWING IS FOR DRAINAGE PURPOSES ONLY **

WATERSHED LEGEND

- 4 — SUBCATCHMENT
- 4 — REACH
- 4 — POND
- LIMIT OF SUBCATCHMENT
- FLOW PATH

LEGEND

- UTILITY POLE
- TP#1A — TEST PIT W/ NO.
- SURFACE LEDGE
- STONE WALL
- TREE LINE
- EXISTING CONTOUR – 10'
- EXISTING CONTOUR – 2'
- WETLAND BOUNDARY
- SOILS BOUNDARY LINE
- ABUTTING PROPERTY LINE
- EXISTING PROPERTY LINE

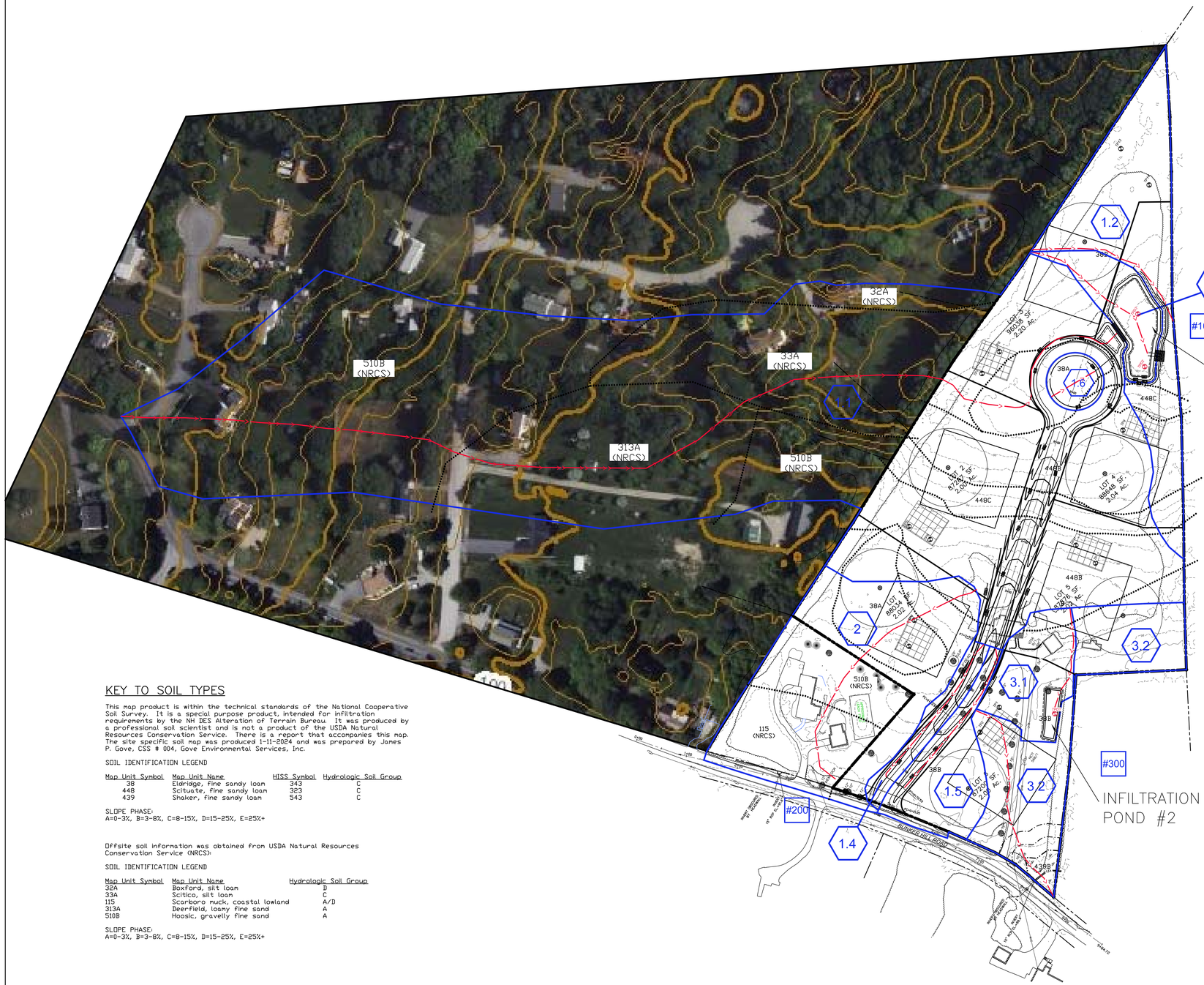
0 100 200 300

REVISIONS:	DATE:

EXISTING WATERSHED PLAN

PLAN FOR:
RESIDENTIAL DEVELOPMENT
BUNKER HILL AVE
STRATHAM, NH

DATE:	JAN. 2024	SCALE:	1"=100'
PROJ. N0:	NH-1500	SHEET NO.	WS-1



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SOIL IDENTIFICATION LEGEND

Map Unit Symbol	Map Unit Name	HISS Symbol	Hydrologic Soil Group
38	Eldridge, fine sandy loam	343	C
448	Scituate, fine sandy loam	323	C
439	Shaker, fine sandy loam	543	C

SLOPE PHASE:
A=0-3%, B=3-8%, C=8-15%, D=15-25%, E=25%+

Offsite soil information was obtained from USDA Natural Resources Conservation Service (NRCS)

SOIL IDENTIFICATION LEGEND

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32A	Boxford, silt loam	D
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313A	Deerfield, loamy fine sand	A
510B	Hoosic, gravelly fine sand	A

SLOPE PHASE:
A=0-3%, B=3-8%, C=8-15%, D=15-25%, E=25%+

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- TP#1A — TEST PIT W/ NO.
- SURFACE LEDGE
- STONE WALL
- TREE LINE
- EXISTING CONTOUR – 10'
- EXISTING CONTOUR – 2'
- WETLAND BOUNDARY
- SOILS BOUNDARY LINE
- ABUTTING PROPERTY LINE
- EXISTING PROPERTY LINE
- PROPOSED PROPERTY LINE

0 100 200 300

REVISIONS:	DATE:

PROPOSED WATERSHED PLAN

PLAN FOR:
RESIDENTIAL DEVELOPMENT
BUNKER HILL AVE
STRATHAM, NH

DATE:	JAN. 2024	SCALE:	1"=100'
PROJ. N0:	NH-1500	SHEET NO.	WS-2

GOVE ENVIRONMENTAL SERVICES, INC

SITE-SPECIFIC SOIL SURVEY REPORT
For
189 Bunker Hill Avenue, Stratham NH
By
GES, Inc.
Project # 2023139
Date: 1-11-2024

1. MAPPING STANDARDS

Site-Specific Soil Mapping Standards for New Hampshire and Vermont. SSSNNE Special Publication No. 3, Version 7.0, July, 2021.

This map product is within the technical standards of the National Cooperative Soil Survey. It is a special purpose product, intended for infiltration requirements by the NH DES Alteration of Terrain Bureau. The soil map was produced by a professional soil scientist and is not a product of the USDA Natural Resources Conservation Service. This report accompanies the soil map.

The site-specific soil map (SSSM) was produced 1-11-2024; prepared by JP Gove, CSS #004, GES, Inc.

Soils were identified with the New Hampshire State-wide Numerical Soils Legend, USDA NRCS, Durham, NH. Issue # 10, January 2011.

Hydrologic Soil Group was determined using SSSNNE Special Publication No. 5, Ksat Values for New Hampshire Soils, September 2009.

High Intensity Soil Map symbols, based upon SSSNNE Special Publication 1, December 2017, were added to the Soil Legend.

Scale of soil map: Approximately 1" = 60'.

Contours Interval: 2 feet

2. LANDFORMS & EXISTING CONDITIONS:

The site is located on a rolling landform that is a mix of parent materials: glacial till and marine sediments. The land is a primarily a field that has been mowed yearly. An old farmhouse is still present on the site.

3. DATE SOIL MAP PRODUCED

Date(s) of on-site field work: 10-18-2023

Date(s) of test pits: 11-08-2023

Test pits recorded by: Christian Smith #1543, Beals Associates, and witnessed by Michael Cuomo of the Rockingham Conservation District and as Town if Stratham reviewer.

4. GEOGRAPHIC LOCATION AND SIZE OF SITE

City or town where soil mapping was conducted: Stratham

Location: Tax Map 6, Lot 167

Size of area: Approximately 13.19 acres

Was the map for the entire lot? Yes

If no, where was the mapping conducted on the parcel: n/a

5. PURPOSE OF THE SOIL MAP

Was the map prepared to meet the requirement of Alteration of Terrain? Yes

If no, what was the purpose of the map? n/a

Who was the map prepared for? Beals Associates, PLLC

6. SOIL IDENTIFICATION LEGEND

Map Unit Symbol	Map Unit Name	HISS Symbol	Hydrologic Soil Group

38	Eldridge, fine sandy loam	343	C
448	Scituate, fine sandy loam	323	C
439	Shaker, fine sandy loam	543	C

SLOPE PHASE:

0-8%	B	8-15%	C	15-25%	D
25%-50%	E	50%+	F		

7. NARRATIVE MAP UNIT DESCRIPTIONS

SITE-SPECIFIC MAP UNIT: 38

CORRELATED SOIL SERIES: Eldridge, fine sandy loam

LANDSCAPE SETTING: Lower elevations and valleys

CHARACTERISTIC SURFACE FEATURES: Open field, no surface rocks

DRAINAGE CLASS: Moderately well drained

PARENT MATERIAL: Sands over marine silts and clays

NATURE OF DISSIMILAR INCLUSIONS: Boxford where the sand is too thin to classify and is primarily silts of silty clay. Scituate where the dense glacial till substratum is within 40 inches of the surface, but overlain with sands and silts. Both soils are moderately well drained.

ESTIMATED PERCENTAGE OF DISSIMILAR INCLUSIONS: 5%

SOIL PROFILE DESCRIPTIONS- horizon designation, depth, soil texture, Munsell color notation, Munsell color of redox features, soil structure, soil consistence, estimated coarse fragments, estimated seasonal high water table (ESHWT), observed water table (OBSWT), kind of water table (perched, apparent, or both), depth to lithic or paralithic contact:

Ap, 0 to 9 inches, fine sandy loam, 10YR3/2, granular, friable, less than 5% coarse fragments.

Bw1, 9 to 24 inches, fine sandy loam, 10YR5/6, granular, friable, less than 5% coarse fragments.

Bw2, 24 to 38 inches, loamy sand, 10YR5/4, massive, friable, less than 5% coarse fragments, 5YR5/8 redox features, ESHWT 24 inches, no OBSWT, perched, no lithic contact.

2C, 38 to 63 inches, silty clay loam, 2.5Y5/3, blocky, firm, less than 5% coarse fragments, 5YR5/8 redox features, no OBSWT, no lithic contact.

SITE-SPECIFIC MAP UNIT: 448

CORRELATED SOIL SERIES: Scituate, fine sandy loam

LANDSCAPE SETTING: Higher elevations and hills

CHARACTERISTIC SURFACE FEATURES: Open field, no surface rocks

DRAINAGE CLASS: Moderately well drained

PARENT MATERIAL: Dense glacial till

NATURE OF DISSIMILAR INCLUSIONS: Eldridge found along the transition between the Eldridge fine sandy loam map unit and the Scituate fine sandy loam map unit.

ESTIMATED PERCENTAGE OF DISSIMILAR INCLUSIONS: 5%

SOIL PROFILE DESCRIPTIONS- horizon designation, depth, soil texture, Munsell color notation, Munsell color of redox features, soil structure, soil consistence, estimated coarse fragments, estimated seasonal

high water table (ESHWT), observed water table (OBSWT), kind of water table (perched, apparent, or both), depth to lithic or paralithic contact:

Ap, 0 to 12 inches, fine sandy loam, 10YR3/2, granular, friable, 10% gravel coarse fragments.

Bw, 12 to 20 inches, fine sandy loam, 10YR5/6, granular, friable, 10% gravel coarse fragments.

Cd, 20 to 52 inches, fine sandy loam, 2.5Y5/4, blocky, firm, 10% gravel coarse fragments, 5YR5/8 and 2.5Y5/2 redox features, ESHWT 20 inches, no OBSWT, perched, no lithic contact.

SITE-SPECIFIC MAP UNIT: 439

CORRELATED SOIL SERIES: Shaker, fine sandy loam

LANDSCAPE SETTING: Low area near the road on southern edge of the site

CHARACTERISTIC SURFACE FEATURES: Forested, drains to the south under the road.

DRAINAGE CLASS: Poorly drained

PARENT MATERIAL: Sands over marine silts and clays

NATURE OF DISSIMILAR INCLUSIONS: Scitico silt loam where the sand is too shallow over the silts to classify as Shaker. This inclusion is also poorly drained.

ESTIMATED PERCENTAGE OF DISSIMILAR INCLUSIONS: 5%

SOIL PROFILE DESCRIPTIONS- horizon designation, depth, soil texture, Munsell color notation, Munsell color of redox features, soil structure, soil consistence, estimated coarse fragments, estimated seasonal high water table (ESHWT), observed water table (OBSWT), kind of water table (perched, apparent, or both), depth to lithic or paralithic contact:

Ap, 0 to 6 inches, fine sandy loam, 10YR2/2, granular, friable, less than 5% coarse fragments.

Cg, 9 to 24 inches, loamy sand, 2.5Y5/2, massive, friable, less than 5% coarse fragments. 5YR5/8 redox features, ESHWT 9 inches, ODSWT 9 inches, perched, no lithic contact.

2Cg, 24 to 30 inches, silty clay loam, 2.5Y5/2, blocky, firm, less than 5% coarse fragments, 5YR5/8 redox features.

---

8. RESPONSIBLE SOIL SCIENTIST

Name: James Gove

Certified Soil Scientist Number: 004

9. OTHER DISTINGUISHING FEATURES OF SITE

Is the site in a natural condition? Altered by plowing.

If no, what is the nature of the disturbance? Normal agricultural activities

Lot Size By Soil Type
WINDSONG PLACE
Stratham, New Hampshire
February 5, 2024

Soil SSS	Soil Name	Soil HISS	Soil sf Quantities	Town Required	Town Percentage
Lot 1					
38A	Eldridge	343BH	33,309	54,500	61%
38B	Eldridge	343CH	45,249	54,500	83%
448B	Scituate	323BH	8,715	77,000	11%
Total			87,273		155%
Lot 2					
38A	Eldridge	343BH	10,206	54,500	19%
38B	Eldridge	343CH	6,490	54,500	12%
448B	Scituate	323BH	54,698	77,000	71%
448C	Scituate	323CH	15,847	89,000	18%
Total			87,241		119%
Lot 3					
38A	Eldridge	343BH	5,368	54,500	10%
38B	Eldridge	343CH	89,272	54,500	164%
Total			94,640		174%
Lot 4					
38B	Eldridge	343CH	38,576	54,500	71%
448B	Scituate	323BH	37,149	77,000	48%
448C	Scituate	323CH	12,317	89,000	14%
Total			88,042		133%
Lot 5					
38B	Eldridge	343CH	39,468	54,500	72%
448B	Scituate	323BH	41,437	77,000	54%
448C	Scituate	323CH	6,971	89,000	8%
Total			87,876		134%
Lot 6					
38B	Eldridge	343CH	83,723	54,500	154%
439B	Shaker	543BH	3,477	106,000	3%
Total			87,200		157%

TOWN OF STRATHAM

10 Bunker Hill Avenue, Stratham NH 03885
Planning Department (603) 772-7391
www.strathamnh.gov

SUBDIVISION APPLICATION

1. CHECKLIST SUMMARY:

1. This completed application (including all application package contents noted in the Site Plan Review Checklist) must be filed with the Planning Board's Agent no later than 12:00 PM on the deadline day published in the Planning Board's Schedule of Regular Board Meetings.
2. Fees (cash or check). Make checks payable to the Town of Stratham.

Application: (check one)

- ☐ **Preliminary Consultation**
- ☐ **Lot Line Revision**
- ☐ **Minor Subdivision Review***
- ■ **Major Subdivision Review****

*A minor subdivision is one that will not create more than 3 lots and does not require construction of a road.
**A major subdivision is one that creates more than 3 lots or includes construction of a road.

Please complete this application thoroughly and accurately, and attach the required exhibits as indicated in the Site Plan Review Checklist. Please note that an incomplete application will not be accepted for processing.

2. APPLICANT AND PROPERTY OWNER INFORMATION:

APPLICANT NAME:	Chinburg Properties Inc.		
Phone #:	(603) 868-5995 x31	Email Address:	ssammis@chinburg.com
Mailing Address:	3 Penstock Way, Newmarket, NH 03857		
PROPERTY OWNER NAME (If different from Applicant):	LANZILLO IRREVOCABLE TRUST		
Phone #:		Email Address:	
Mailing Address:	OCEAN BLVD UNIT 3 HAMPTON, NH 03842		

3. PROPERTY/PROJECT INFORMATION:

Tax Map:	06	Property Deed Information:	Book: 4624 Page: 2000		
Lot(s):	167	Total parcel area (SF):	606024	Total parcel area (acres):	13

Zoning District(s): Check all that apply.

- ☐ Commercial/Light Industrial/Office
- ☐ Flexible/Mixed Use Development
- ☐ Gateway Commercial Business
- ☐ Industrial
- ☐ Manufactured Housing/Mobile Home
- ☐ Professional/Residential
- ■ Residential/Agricultural
- ☐ Retirement Planned Community
- ☐ Route 33 Legacy Highway Heritage
- ☐ Special Commercial
- ☐ Town Center

Overlay District(s): Check all that apply.

- ☐ Aquifer Protection
- ☐ Floodplain Management
- ☐ Shoreline Protection
- ☐ Wetland Conservation

4. PROFESSIONAL SUPPORT: (Include additional sheets if necessary.)

COMPANY NAME:	Beals Associates	Contact:	Christian Smith
Phone #:	603-583-4860	Email Address:	csmith@bealsassociates.com
Mailing Address:	70 Portsmouth Ave, 3rd Flr, Unit 2, Stratham, NH		
COMPANY NAME:	Northam Survey, LLC	Contact:	ERIC SALOVITCH
Phone #:	(603) 953-3164	Email Address:	eric@northamsurvey.com
Mailing Address:	686 Central Ave, Suite 100 Dover, NH 03820		

5. PROJECT DESCRIPTION:

Briefly describe your existing and proposed use(s):

The proposal is to remove the existing home on the 14 acre parcel and subdivide the land into 6 residential lots with a proposed road.

Existing Number of Lots:	1	Existing Total Impervious Surface Area (SF):	9032
Proposed Number of Lots:	6	Proposed Total Impervious Surface Area (SF):	36180

6. APPLICANT'S CERTIFICATION:

I/We declare under penalty of perjury that all of the submitted information is true and correct to the best of my knowledge and belief. I/We have read and agree to abide by the regulations of the Town of Stratham. I/We understand that any misrepresentations of submitted data may invalidate any approval of this application. If the use is not operated in compliance with these regulations, the permit may be revoked by the Code Enforcement Officer or the Zoning Board of Adjustment.

By signing this application, you are agreeing to all rules and regulations of the Town of Stratham, and are agreeing to allow agents of the Town of Stratham to conduct inspections, during normal town business hours, or your property, to ensure compliance with all Stratham Zoning, Subdivision and/or Site Plan Review regulations while your application is under consideration. The Town accepts electronic signatures on this application. Electronic signatures carry the same validity, enforceability and admissibility, as handwritten signatures.

I/We authorize Beals Associates to submit this application to the Stratham Planning Board and to act as the professional and primary contact representing this application before the Stratham Planning Board. Communications related to this application, including those from the Stratham Planning Department, will be directed to this representative.

Signature of Applicant	**Print Applicant's Name**	**Date**
	SHAWNA SAMMIS, CHINBURG DEVELOPMENT	2 FEB 2024
(See Letter of Authorization, attached).		
Signature of Owner	**Print Owner's Name**	**Date**

SCHEDULE OF FEES FOR PLAN SUBMISSION

Fees will be calculated by Planning Department Staff with payment due at the time of final plan submission for the following:

Preliminary Consultation $75.00
Lot Line Revision (plus notice costs) $150.00
Minor Subdivision (plus notice costs) ..... $150.00 for the first lot, plus $100.00 for each lot or unit thereafter
Major Subdivision (plus notice costs)..... $250.00 for the first lot, plus $100.00 for each lot or unit thereafter
Notice Costs.....$150.00 plus $8.00 per abutter and per applicant

Please note that additional Special Investigative, Recording, and Municipal Review costs may apply. Review the Site Plan Review Regulations for more information and contact the Town Planner with questions.

PLEASE DO NOT WRITE BELOW THIS LINE – FOR PLANNING DEPARMENT USE ONLY

Application Received Date:_____ Date of Public Hearing Notice:_____

Application Fee:_____ Check Number:_____

Public Notice Fee:_____ Check Amount:_____

Abutter Notice Fee:_____ Check Payor:_____

Letter of Authorization

I, Kenneth F Lanzillo Jr., Trustee of the Kenneth F Lanzillo Revocable Trust, owner of 14 acres located at 189 Bunker Hill Ave in Stratham, NH, do hereby authorize the following parties to act as agents on our behalf for the above-described property in order to apply for any necessary state and local applications or permits relative to the development of said lot:

Chinburg Development and their agents to include but not limited to :

Beals Associates PLLC, 70 Portsmouth Ave, Stratham, NH

Gove Environmental, 8 Continental Drive Exeter, NH

as agents to act on my behalf in matters to be discussed with the Town of Stratham, State Departments and other Land Use Boards concerning the property previously mentioned.

I hereby appoint the above referenced parties as my agent to act on my behalf in the review process, to include any required signatures.

Kenneth F Lanzillo Jr. Trustee dotloop verified 10/10/23 3:29 PM EDT JANR-BDUR-NLWV-RJXP

Kenneth F. Lanzillo Jr, Trustee

Date

Kenneth F Lanzillo Irrevocable Trust

ABUTTERS LIST
FOR
NH- 1500 Chinburg - Stratham, NH
DATE February 5, 2024

SUBJECT PARCEL

TAX MAP/LOT	OWNER OF RECORD
06-167	LANZILLO IRREVOCABLE TRUST LANZILLO, KENNETH F. - TRUSTEE LANZILLO, KENNETH F. JR - TRUS 939 OCEAN BLVD UNIT 3 HAMPTON, NH 03842

ABUTTERS

TAX MAP/LOT	OWNER OF RECORD
06-150	MONTROSE CONDO ASSOC. C/O EVERGREEN HARVARD GROUP 72 PORTSMOUTH AVENUE SUITE 201 STRATHAM, NH 03885
06-150-012	COOK, SARAH L. 12 MONTROSE DRIVE STRATHAM, NH 03885
06-150-027	FREDERICK, DONNA 27 MONTROSE DRIVE STRATHAM, NH 03885
06-150-072	GILL, DAVID W. GILL, SHARON L. 72 MONTROSE DRIVE STRATHAM, NH 03885
06-156	COLE, MICHAEL R. COLE, CELESTE A. 10 WEDGEWOOD DRIVE STRATHAM, NH 03885
06-157	SONNEBORN, JEFFREY J. SONNEBORN, KATHERIN A. 8 WEDGEWOOD DRIVE STRATHAM, NH 03885

ABUTTERS LIST
FOR
NH- 1500 Chinburg - Stratham, NH
DATE February 5, 2024

06-158	WARD, DAVID J. WARD, JOANNE A. 6 WEDGEWOOD DRIVE STRATHAM, NH 03885
06-162	MELFI FAMILY REVOCABLE TRUST MELFI, JAMES I., -TRUSTEE 6 HERSEY LANE STRATHAM, NH 03885
06-163	LAPIERRE, RICHARD 4 HERSEY LANE STRATHAM, NH 03885
06-164-001	KREMER, SARAH 2A HERSEY LANE STRATHAM, NH 03885
06-164-002	WINSLOW, SHANE 2B HERSEY LANE STRATHAM, NH 03885
06-165	WIGGIN, PETER E. WIGGIN, DORI A. P. O. BOX 1193 PORTSMOUTH, NH 03801
06-166	GRAY, CHRISTOPHER & LEAH TRUST CHRISTOPHER D & LEAH C GRAY 181 BUNKER HILL AVENUE STRATHAM, NH 03885
06-168	THOMAS, DANNY E. 193 BUNKER HILL AVENUE STRATHAM, NH 03885
06-170	STONE, DAVID ABBOTT, ROY & SANDRA 194 BUNKER HILL AVENUE STRATHAM, NH 03885

ABUTTERS LIST
FOR
NH- 1500 Chinburg - Stratham, NH
DATE February 5, 2024

06-171	PHILBRICK, GEORGE & SUSAN REV. PHILBRICK, SUSAN C.-TRUSTEE PHILBRICK, GEORGE R. SR.-TRUST 188 BUNKER HILL AVENUE STRATHAM, NH 03885
07-012	STEVENS, JOHN K. STEVENS, RENATA PIKALIS 195 BUNKER HILL AVENUE STRATHAM, NH 03885

PROFESSIONALS

ENGINEERING FIRM	BEALS ASSOCIATES, PLLC. 70 PORTSMOUTH AVE. 3RD FLOOR STRATHAM, NH 03885
SOIL SCIENTIST	GOVE ENVIRONMENTAL 8 CONTINENTAL DR. BLDG. 2 UNIT H EXETER, NH 03833
SURVEYOR	NORTHAM SURVEY, LLC 686 CENTRAL AVE, SUITE 100 DOVER, NH 03820
DEVELOPERS	CHINBURG BUILDERS 3 PENSTOCK WAY NEWMARKET, NH 03857

Test Pit #D1

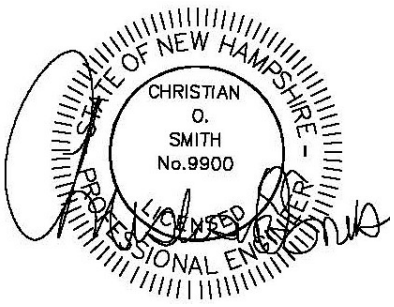
0" – 12"	10YR 4 /4	Dark Yellowish Brown Fine, Sandy, Loam Granular, Friable
12" - 28"	10YR 5/ 4	Yellowish Brown Fine, Sandy, Loam Blocky, Friable
28" – 68"	2.5Y 4/3	Olive Brown Silt, Loam Platy, Firm Redox-Common 2-20%

ESHWT = 28"
Observed Ground Water – 42 inches
Restrictive Layer: 28 Inches
Refusal: None
Roots to 26 Inches

Test Pit #D2

0" – 10"	10YR 4 /4	Dark Yellowish Brown Fine, Sandy, Loam Granular, Friable
10" - 18"	10YR 5/ 3	Brown Fine, Sandy, Loam Blocky, Friable
18" – 68"	2.5Y 5/2	Grayish Brown Silt, Loam Blocky, Firm Redox-Common 2-20%

ESHWT = 18"
Observed Ground Water – 38 inches
Restrictive Layer: 18 Inches
Refusal: None
Roots to 6 Inches

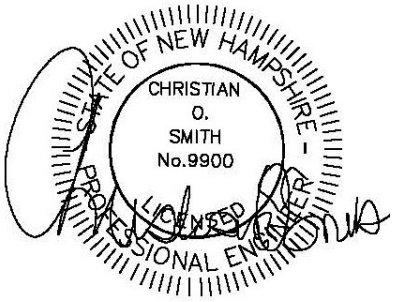


NH-1500 – 189 Bunker Hill 01/23/2024
Test Pits – Christian Smith, P.E. of Beals Associates, PLLC- #1543 Witness:

Test Pit #D3

0" – 12"	10YR 4 /4	Dark Yellowish Brown Fine, Sandy, Loam Granular, Friable
12" - 18"	10YR 5/ 3	Brown Fine, Sandy, Loam Blocky, Friable
18" – 60"	2.5Y 5/4	Light Olive Brown Silt, Loam Platy, Firm Redox-Common 2-20%

ESHWT = 18"
Observed Ground Water – 24 inches
Restrictive Layer: 18 Inches
Refusal: None
Roots to 6 Inches



DRAINAGE ANALYSIS
&
SEDIMENT AND EROSION CONTROL PLAN

Prepared for:

CHINBURG PROPERTIES INC
WINDSONG PLACE
RESIDENTIAL SUBDIVISION

Prepared by:

BEALS ASSOCIATES, PLLC
70 PORTSMOUTH AVENUE
STRATHAM, NH 03885

Project Number:
NH-1500
Bunker Hill Road
Stratham, New Hampshire
February 1, 2024

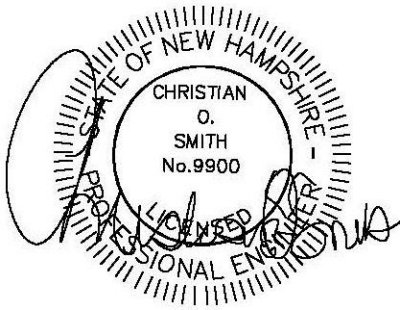


Table of Contents

1.0 ANALYSIS SUMMARY

Chinburg Properties Inc proposes to construct a residential site plan to establish a subdivision on a 13.9+/- acre parcel of land located off Bunker Hill Road in Stratham, New Hampshire. A drainage analysis of 28.6+/- acres of the proposed site improvement was conducted for the purpose of estimating the peak rate of stormwater run-off and to subsequently design adequate drainage structures. Two models were compiled: one for the area in its existing (pre-construction) condition and a second for its proposed (post-construction) condition. The analysis was conducted using Extreme Precipitation data provided by Cornell University for the following 24-hour duration storm events:

Storm Event	Rainfall Depth (inches)
2-Year	3.25
10-Year	4.94
25Year	6.28

These storm events use the USDA SCS TR-20 method within the HydroCAD Stormwater Modeling System environment to model the rainfall and predict stormwater runoff flows and volumes. A Type III storm pattern was used in the model. The purpose of this analysis is to estimate the peak rates of run-off from the site for detention adequacy purposes, and to compare the peak rate of run-off between the existing and proposed conditions.

Peak Rate of Discharge

		Component Peak Rate of Discharge (CFS)		
Analysis Point # Analysis Point Description	**Condition**	**2-Year**	**10-Year**	**25-Year**
Reach #<100>	Existing	5.92	14.30	22.93
Flow to Northeast	Proposed	1.31	9.34	20.42
Reach #<200>	Existing	3.11	6.58	9.65
Flow to South	Proposed	2.48	4.87	6.98
Reach #<300>	Existing	1.67	3.67	5.42
Flow to Southeast	Proposed	1.45	3.33	4.97

The proposed 6 lot residential subdivision includes a paved roadway into the subdivision ending in a cul-de-sac. The proposed improvement area includes three different subcatchments. The peak rate of run-off in the proposed conditions is decreased from that of the existing conditions, due to the addition of two infiltration ponds. All paved roadway runoff receives treatment from grass-lined swales, a forebay, and an infiltration pond prior to discharging overland. In addition, the potential for increased erosion and sedimentation is handled by way of silt barriers surrounding the disturbed areas. The use of Best Management Practices per the Rockingham Conservation District / DES Handbook have been applied to the design of these structures and will be observed during all stages of construction. All land disturbed during construction will be stabilized within 30 days of groundbreaking. Existing wetlands and abutters will suffer no adverse effects resulting from this proposed development.

2.0 EXISTING CONDITIONS ANALYSIS

The existing property is located on a parcel consisting of woodlands, a residential home, and extensive lawn areas. The existing topography is such that the site analysis is divided into three subcatchments within the area proposed to be improved, and includes a large area of contributing off-site area comprised of residential houses. Final Reach #<100> flows towards the northeast of the proposed improvement area, Final Reach #<200> flows towards the South, and Reach #300 flows toward the east of the proposed improvement area.

Classified by a combination of Site-Specific and NRCS Soil Mapping, the land of the site is composed of relatively flat slopes and soils categorized into the Hydrologic Soil Groups (HSG) A, B, C, and D (See appendix for Hiss/HSG designations). The majority of the area to be developed is comprised of Eldrige and Scituate soils.

3.0 PROPOSED CONDITIONS ANALYSIS

The addition of the impervious area, clearing of trees, and grading of slopes causes an increase in the curve number (Cn) and a decrease in the time of concentration (Tc) which results in a potential increase in peak rates of run-off from the site. To reduce these flows to pre-development conditions, various stormwater management systems will be proposed. A pipe network consisting of catchbasins with deep sumps and oil-debris separators combined with grass-lined swales controls the conveyance of stormwater. The proposed development divides the site into several different post-construction subcatchments, but ultimately the three main subcatchments match the pre-construction analysis. The run-off is directed to off-site areas through HydroCAD “reaches” and “ponds”, consisting of a two infiltration ponds.

In an effort to prevent the sedimentation of abutting properties, the paved roadway will be graded to flow into a closed drainage system, grass-lined swales, a sediment forebay prior to flowing towards an infiltration pond. During construction, appropriate Best Management Practices (BMP's) will be applied so as to negate the potential for sediment-laden run-off to discharge off-site prior to the final stabilization of the proposed grading. The structures outlined in this proposal provide for adequate treatment of stormwater run-off for sediment control.

4.0 SEDIMENT & EROSION CONTROL PLANS BEST MANAGEMENT PRACTICES (BMP’s)

The proposed site development is protected from erosion and the roadways and abutting properties are protected from sediment by the use of Best Management Practices as outlined in the New Hampshire Stormwater Manual. Any area disturbed by construction will be re-stabilized within 30 days, and abutting properties and wetlands will not be adversely affected by this development. All swales and drainage structures will be constructed and stabilized prior to having run-off directed to them.

4.1 Silt Barrier / Construction Fence

The plan set demonstrates the location of silt barriers for sediment control. Sheet E-1, Erosion and Sediment Control Details, has the specifications for installation and maintenance of the silt barriers selected for the site. In areas where the limits of construction need to be emphasized to operators, construction fence for added visibility will be installed. Orange construction fence will be VISI Perimeter Fence by Conwed Plastic Fencing, or approved equal. The four-foot construction fencing is to be installed using six-foot posts buried at least two feet into the ground spaced six to eight feet apart.

4.2 Vegetated Stabilization

All areas that are disturbed during construction will be stabilized with vegetated material within 30 days of disturbance. Construction will be managed in such a manner that erosion is prevented and that no abutter's property will be subjected to any siltation, unless otherwise permitted. All areas to be planted with grass for long-term cover will follow the specifications on Sheet E-1 using the seeding mixture below:

Mixture C	**Pounds per Acre**	**Pounds per 1,000 sf**
Tall Fescue	20	0.45
Creeping Red Fescue	20	0.45
Birdsfoot Trefoil	8	0.20
Total	**48**	**1.10**

4.3 Stabilized Construction Entrance/Exit

A temporary gravel construction entrance/exit provides an area where mud can be dislodged from tires before the vehicle leaves the construction site to reduce the amount of mud and sediment transported onto paved municipal and state roads. The stone size for the gravel pad should be between 1- and 2-inch coarse aggregate and the pad itself constructed to a minimum length of 50' for the full width of the access road. The aggregate should be placed at least six inches thick. Plan and profile view details are shown on Sheet E1 - Sediment and Erosion Control Detail Plan.

4.2 Drainage Swales / Stormwater Conveyance Channels

Drainage swales will be stabilized with vegetation for long term cover as outlined below using seed mixture C. As a general rule, velocities in the swale should not exceed 3.0 feet per second for a vegetated swale although velocities as high as 4.5 FPS are allowed under certain soil conditions.

4.5 Level Spreaders

Level spreaders enable any run-off directed towards them to be spread evenly into sheet flow prior to discharge into wetlands or treatment by a filter strip, thus allowing for better filter strip efficiency and a lesser potential for erosion.

4.6 Vegetated Buffers

Vegetated buffers are areas of land with natural or planted vegetation designed to receive sheet run-off from upgradient development. These natural areas, preferably wooded, are effective in removing sediment and sediment-laden pollutants from such run-off, although their effectiveness is severely diminished when forced to deal with concentrated flow and must therefore be equipped with a level-spreading device. Vegetated buffers should not have a slope exceeding fifteen percent and have a minimum length of seventy-five feet.

4.6 Filter Strips

Filter strips are areas of land with natural or planted vegetation designed to receive sheet run-off from upgradient development. These natural areas, preferably wooded, are effective in removing sediment and sediment-laden pollutants from such run-off, although their effectiveness is severely diminished when forced to deal with concentrated flow and must therefore be equipped with a level-spreading device. Filter strips should not have a slope exceeding fifteen percent and have a minimum length of seventy-five feet.

4.4 Environmental Dust Control

Dust will be controlled on the site using multiple Best Management Practices. Mulching and temporary seeding will be the first line of protection to be utilized where problems occur. If dust problems are not solved by these applications, the use of water and calcium chloride can be applied. Calcium chloride will be applied at a rate that will keep the surface moist but not cause pollution.

4.5 Construction Sequence

1. Cut and remove trees in construction areas as directed or required.

2. Construct and/or install temporary and permanent sediment erosion and detention control facilities, as required. Erosion, sediment, and facilities shall be installed and stabilized prior to any earth moving operation, and prior to directing run-off to them.

3. Clear, cut, grub, and dispose of debris in approved facilities.

4. Excavate and stockpile topsoil / loam. All disturbed areas shall be stabilized immediately after grading.

5. Construct the roadway and its associated drainage structures.

6. Begin permanent and temporary seeding and mulching. All cut and fill slopes and disturbed areas shall be seeded and mulched as required or directed.

7. Daily, or as required, construct temporary berms, drainage ditches, sediment traps, etc. to prevent erosion on the site and prevent any siltation of abutting waters or property.

8. Inspect and maintain all erosion and sediment control measures during construction.

9. Complete permanent seeding and landscaping.

10. Remove temporary erosion control measures after seeding areas have established themselves and site improvements are complete. Smooth and re-vegetate all disturbed areas.

11. All swales and drainage structures will be constructed and stabilized prior to having run-off being directed to them.

12. Finish paving all roadways.

4.6 Temporary Erosion Control Measures

1. The smallest practical area of land shall be exposed at any one time.

2. Erosion and sediment control measures shall be installed as shown on the plans and at locations as required, or directed by the engineer.

3. All disturbed areas shall be returned to original grades and elevations. Disturbed areas shall be loamed with a minimum of 4” of loam and seeded with not less than 1.10 pound of seed per 1,000 square feet (48 pounds per acre) of area.

4. Silt barriers shall be inspected periodically and after every rainstorm during the life of the project. All damaged areas shall be repaired and sediment deposits shall periodically be removed and properly disposed of.

5. After all disturbed areas have been stabilized, the temporary erosion control measures are to be removed and the area disturbed by the removal smoothed and revegetated.

6. Areas must be seeded and mulched within 5 days of final grading, permanently stabilized within 15 days of final grading, or temporarily stabilized within 30 days of initial disturbance of soil.

4.7 Inspection and Maintenance Schedule

Silt barriers shall be inspected during and after storm events to ensure that the fence still has integrity and is not allowing sediment to pass.

5.0 CONCLUSION

This proposed site development off of Bunker Hill Road in Stratham, NH will have no adverse effect on the abutting property owners by way of stormwater run-off or siltation. The post-construction peak rates of run-off for the site will be lower than the existing conditions for the storm events, as shown in the tables above. Appropriate steps will be taken to eliminate erosion and sedimentation; these will be accomplished through the construction of a drainage system consisting of a forebay and two infiltration ponds. The Best Management Practices developed by the State of New Hampshire have been utilized in the design of this system and these applications will be enforced throughout the construction process.

An Alteration of Terrain Permit (RSA 485: A-17) is not required for this project due to the area of disturbance being less than 100,000 square feet.

Respectfully Submitted,

BEALS ASSOCIATES, *PLLC.*

Christian O. Smith

Christian O Smith, PE
Principal

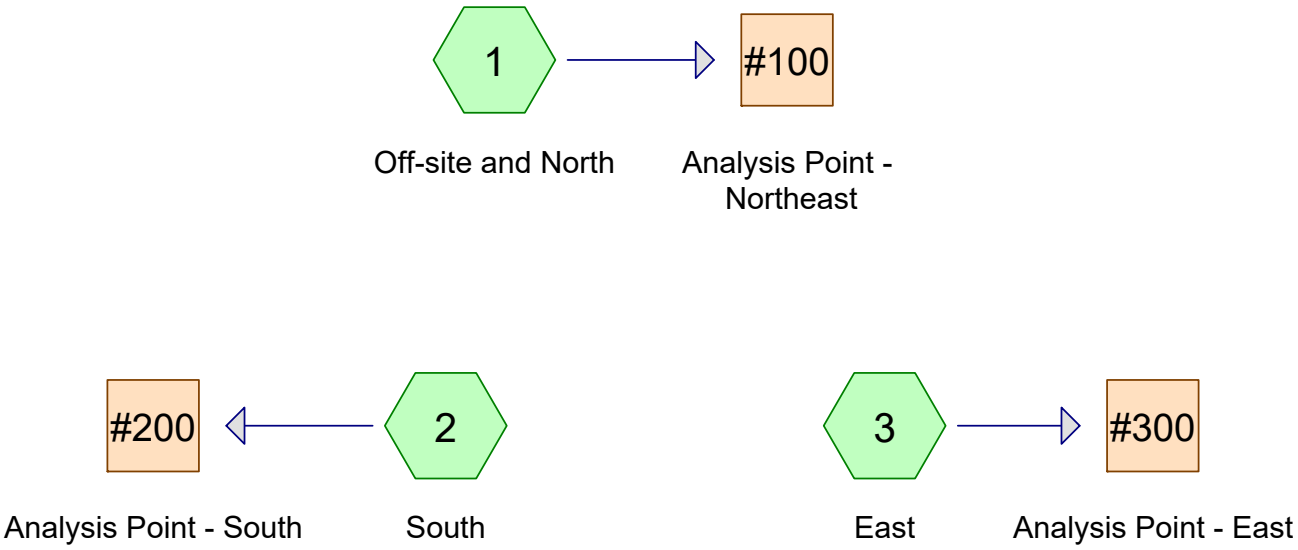
Appendix I

Existing Conditions Analysis

2-Year 24-Hour Summary

10-Year 24-Hour Complete

25-Year 24-Hour Summary



Subcat Reach Pond Link

Routing Diagram for NH-1500 Existing
Prepared by Beals Associates, PLLC, Printed 1/25/2024

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
9.753	46	2 acre lots, 12% imp, HSG A (1)
2.766	77	2 acre lots, 12% imp, HSG C (1)
0.397	82	2 acre lots, 12% imp, HSG D (1)
1.201	39	>75% Grass cover, Good, HSG A (2)
10.338	74	>75% Grass cover, Good, HSG C (1, 2, 3)
0.029	30	Brush, Good, HSG A (2)
0.027	65	Brush, Good, HSG C (2)
0.192	98	Paved parking, HSG A (2)
0.190	98	Paved parking, HSG C (2, 3)
0.093	98	Roofs, HSG A (2)
0.070	98	Roofs, HSG C (3)
0.203	30	Woods, Good, HSG A (2)
3.385	70	Woods, Good, HSG C (1, 2, 3)
28.643	**63**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
11.471	HSG A	1, 2
0.000	HSG B	
16.775	HSG C	1, 2, 3
0.397	HSG D	1
0.000	Other	
28.643		**TOTAL AREA**

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: Off-site and North Runoff Area=946,088 sf 7.14% Impervious Runoff Depth=0.63"
Flow Length=2,139' Tc=56.1 min CN=WQ Runoff=5.92 cfs 1.139 af

Subcatchment 2: South Runoff Area=183,613 sf 7.93% Impervious Runoff Depth=0.84"
Flow Length=533' Tc=12.1 min CN=WQ Runoff=3.11 cfs 0.296 af

Subcatchment 3: East Runoff Area=118,007 sf 7.76% Impervious Runoff Depth=1.15"
Flow Length=496' Tc=39.1 min CN=WQ Runoff=1.67 cfs 0.259 af

Reach #100: Analysis Point - Northeast Inflow=5.92 cfs 1.139 af
Outflow=5.92 cfs 1.139 af

Reach #200: Analysis Point - South Inflow=3.11 cfs 0.296 af
Outflow=3.11 cfs 0.296 af

Reach #300: Analysis Point - East Inflow=1.67 cfs 0.259 af
Outflow=1.67 cfs 0.259 af

Total Runoff Area = 28.643 ac Runoff Volume = 1.695 af Average Runoff Depth = 0.71"
92.69% Pervious = 26.549 ac 7.31% Impervious = 2.094 ac

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: Off-site and North Runoff Area=946,088 sf 7.14% Impervious Runoff Depth=1.50"
Flow Length=2,139' Tc=56.1 min CN=WQ Runoff=14.30 cfs 2.715 af

Subcatchment 2: South Runoff Area=183,613 sf 7.93% Impervious Runoff Depth=1.75"
Flow Length=533' Tc=12.1 min CN=WQ Runoff=6.58 cfs 0.613 af

Subcatchment 3: East Runoff Area=118,007 sf 7.76% Impervious Runoff Depth=2.39"
Flow Length=496' Tc=39.1 min CN=WQ Runoff=3.67 cfs 0.539 af

Reach #100: Analysis Point - Northeast Inflow=14.30 cfs 2.715 af
Outflow=14.30 cfs 2.715 af

Reach #200: Analysis Point - South Inflow=6.58 cfs 0.613 af
Outflow=6.58 cfs 0.613 af

Reach #300: Analysis Point - East Inflow=3.67 cfs 0.539 af
Outflow=3.67 cfs 0.539 af

Total Runoff Area = 28.643 ac Runoff Volume = 3.868 af Average Runoff Depth = 1.62"
92.69% Pervious = 26.549 ac 7.31% Impervious = 2.094 ac

Summary for Subcatchment 1: Off-site and North

Runoff = 14.30 cfs @ 12.80 hrs, Volume= 2.715 af, Depth= 1.50"
Routed to Reach #100 : Analysis Point - Northeast

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.94"

Area (sf)	CN	Description
424,852	46	2 acre lots, 12% imp, HSG A
120,469	77	2 acre lots, 12% imp, HSG C
17,315	82	2 acre lots, 12% imp, HSG D
94,122	70	Woods, Good, HSG C
289,330	74	>75% Grass cover, Good, HSG C
946,088		Weighted Average
878,572		92.86% Pervious Area
67,516		7.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0400	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.92"
13.9	910	0.0242	1.09		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
23.4	514	0.0214	0.37		**Shallow Concentrated Flow,** Forest w/Heavy Litter Kv= 2.5 fps
2.1	106	0.0140	0.83		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.1	73	0.0550	0.59		**Shallow Concentrated Flow,** Forest w/Heavy Litter Kv= 2.5 fps
10.1	486	0.0130	0.80		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
56.1	2,139	Total			

Summary for Subcatchment 2: South

Runoff = 6.58 cfs @ 12.17 hrs, Volume= 0.613 af, Depth= 1.75"
Routed to Reach #200 : Analysis Point - South

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.94"

Area (sf)	CN	Description
1,254	30	Brush, Good, HSG A
8,850	30	Woods, Good, HSG A
52,307	39	>75% Grass cover, Good, HSG A
8,362	98	Paved parking, HSG A
4,038	98	Roofs, HSG A
1,177	65	Brush, Good, HSG C
12,506	70	Woods, Good, HSG C
92,955	74	>75% Grass cover, Good, HSG C
2,164	98	Paved parking, HSG C
183,613		Weighted Average
169,049		92.07% Pervious Area
14,564		7.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	50	0.0800	0.25		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.92"
8.7	483	0.0176	0.93		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
12.1	533	Total			

Summary for Subcatchment 3: East

Runoff = 3.67 cfs @ 12.55 hrs, Volume= 0.539 af, Depth= 2.39"
Routed to Reach #300 : Analysis Point - East

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.94"

Area (sf)	CN	Description
40,802	70	Woods, Good, HSG C
68,052	74	>75% Grass cover, Good, HSG C
6,098	98	Paved parking, HSG C
3,055	98	Roofs, HSG C
118,007		Weighted Average
108,854		92.24% Pervious Area
9,153		7.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	50	0.0240	0.15		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.92"
33.6	446	0.0010	0.22		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
39.1	496	Total			

Summary for Reach #100: Analysis Point - Northeast

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 21.719 ac, 7.14% Impervious, Inflow Depth = 1.50" for 10-YR event
Inflow = 14.30 cfs @ 12.80 hrs, Volume= 2.715 af
Outflow = 14.30 cfs @ 12.80 hrs, Volume= 2.715 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Reach #200: Analysis Point - South

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 4.215 ac, 7.93% Impervious, Inflow Depth = 1.75" for 10-YR event
Inflow = 6.58 cfs @ 12.17 hrs, Volume= 0.613 af
Outflow = 6.58 cfs @ 12.17 hrs, Volume= 0.613 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Reach #300: Analysis Point - East

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 2.709 ac, 7.76% Impervious, Inflow Depth = 2.39" for 10-YR event
Inflow = 3.67 cfs @ 12.55 hrs, Volume= 0.539 af
Outflow = 3.67 cfs @ 12.55 hrs, Volume= 0.539 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: Off-site and North Runoff Area=946,088 sf 7.14% Impervious Runoff Depth=2.34"
Flow Length=2,139' Tc=56.1 min CN=WQ Runoff=22.93 cfs 4.240 af

Subcatchment 2: South Runoff Area=183,613 sf 7.93% Impervious Runoff Depth=2.59"
Flow Length=533' Tc=12.1 min CN=WQ Runoff=9.65 cfs 0.910 af

Subcatchment 3: East Runoff Area=118,007 sf 7.76% Impervious Runoff Depth=3.49"
Flow Length=496' Tc=39.1 min CN=WQ Runoff=5.42 cfs 0.788 af

Reach #100: Analysis Point - Northeast Inflow=22.93 cfs 4.240 af
Outflow=22.93 cfs 4.240 af

Reach #200: Analysis Point - South Inflow=9.65 cfs 0.910 af
Outflow=9.65 cfs 0.910 af

Reach #300: Analysis Point - East Inflow=5.42 cfs 0.788 af
Outflow=5.42 cfs 0.788 af

Total Runoff Area = 28.643 ac Runoff Volume = 5.938 af Average Runoff Depth = 2.49"
92.69% Pervious = 26.549 ac 7.31% Impervious = 2.094 ac

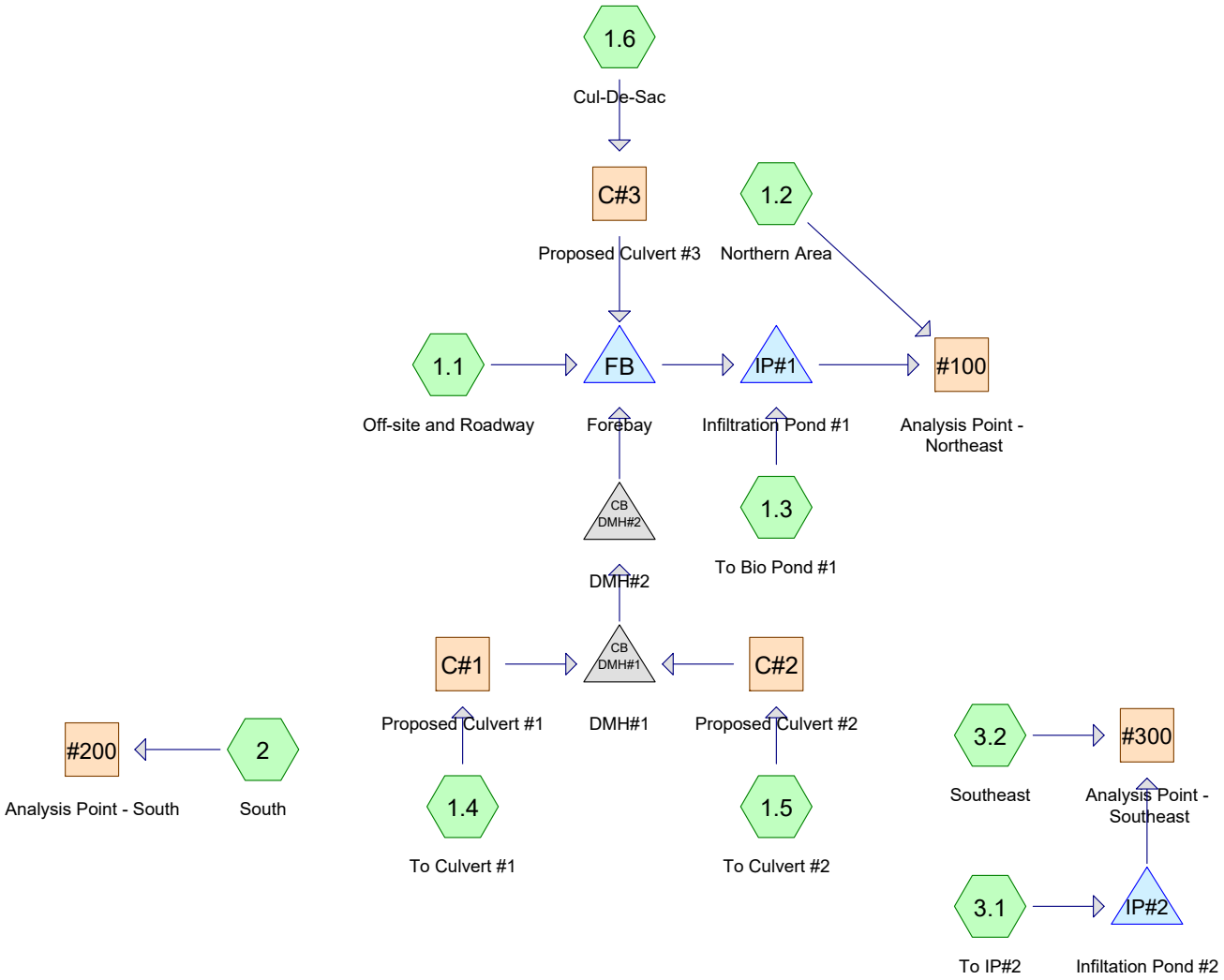
Appendix II

Proposed Conditions Analysis

2-Year 24-Hour Summary

10-Year 24-Hour Complete

25-Year 24-Hour Summary



Subcat Reach Pond Link

Routing Diagram for NH-1500 Proposed
Prepared by Beals Associates, PLLC, Printed 1/31/2024

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
9.753	46	2 acre lots, 12% imp, HSG A (1.1)
10.809	77	2 acre lots, 12% imp, HSG C (1.1, 1.2, 1.3, 1.5, 2, 3.1, 3.2)
0.397	82	2 acre lots, 12% imp, HSG D (1.1)
1.201	39	>75% Grass cover, Good, HSG A (2)
2.323	74	>75% Grass cover, Good, HSG C (1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 2, 3.2)
0.029	30	Brush, Good, HSG A (2)
0.022	65	Brush, Good, HSG C (1.5, 2)
0.192	98	Paved parking, HSG A (2)
0.674	98	Paved parking, HSG C (1.1, 1.4, 1.5, 2)
0.093	98	Roofs, HSG A (2)
0.203	30	Woods, Good, HSG A (2)
2.947	70	Woods, Good, HSG C (1.1, 1.2, 1.3, 1.5, 2, 3.1, 3.2)
28.643	**64**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
11.471	HSG A	1.1, 2
0.000	HSG B	
16.775	HSG C	1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 2, 3.1, 3.2
0.397	HSG D	1.1
0.000	Other	
28.643		**TOTAL AREA**

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1.1: Off-site and Roadway Runoff Area=830,642 sf 13.10% Impervious Runoff Depth=0.67"
Flow Length=2,087' Tc=55.6 min CN=WQ Runoff=5.59 cfs 1.061 af

Subcatchment 1.2: Northern Area Runoff Area=86,916 sf 2.19% Impervious Runoff Depth=0.97"
Flow Length=336' Tc=24.0 min CN=WQ Runoff=1.31 cfs 0.162 af

Subcatchment 1.3: To Bio Pond #1 Runoff Area=24,538 sf 3.69% Impervious Runoff Depth=1.12"
Flow Length=314' Tc=25.4 min CN=WQ Runoff=0.43 cfs 0.053 af

Subcatchment 1.4: To Culvert #1 Runoff Area=14,366 sf 29.54% Impervious Runoff Depth=1.65"
Flow Length=318' Tc=8.2 min CN=WQ Runoff=0.53 cfs 0.045 af

Subcatchment 1.5: To Culvert #2 Runoff Area=34,830 sf 21.89% Impervious Runoff Depth=1.44"
Flow Length=325' Tc=8.3 min CN=WQ Runoff=1.15 cfs 0.096 af

Subcatchment 1.6: Cul-De-Sac Runoff Area=9,503 sf 0.00% Impervious Runoff Depth=1.07"
Flow Length=97' Slope=0.0210 '/' Tc=6.6 min CN=74 Runoff=0.25 cfs 0.019 af

Subcatchment 2: South Runoff Area=142,777 sf 13.97% Impervious Runoff Depth=0.85"
Flow Length=533' Tc=12.1 min CN=WQ Runoff=2.48 cfs 0.231 af

Subcatchment 3.1: To IP#2 Runoff Area=31,503 sf 11.63% Impervious Runoff Depth=1.24"
Flow Length=211' Tc=7.8 min CN=WQ Runoff=0.94 cfs 0.074 af

Subcatchment 3.2: Southeast Runoff Area=72,623 sf 5.81% Impervious Runoff Depth=1.06"
Flow Length=411' Tc=15.2 min CN=WQ Runoff=1.45 cfs 0.148 af

Reach #100: Analysis Point - Northeast Inflow=1.31 cfs 0.162 af
Outflow=1.31 cfs 0.162 af

Reach #200: Analysis Point - South Inflow=2.48 cfs 0.231 af
Outflow=2.48 cfs 0.231 af

Reach #300: Analysis Point - Southeast Inflow=1.45 cfs 0.148 af
Outflow=1.45 cfs 0.148 af

Reach C#1: Proposed Culvert #1 Avg. Flow Depth=0.15' Max Vel=7.01 fps Inflow=0.53 cfs 0.045 af
12.0" Round Pipe n=0.012 L=25.0' S=0.0756 '/' Capacity=10.61 cfs Outflow=0.53 cfs 0.045 af

Reach C#2: Proposed Culvert #2 Avg. Flow Depth=0.18' Max Vel=11.73 fps Inflow=1.15 cfs 0.096 af
12.0" Round Pipe n=0.012 L=11.0' S=0.1718 '/' Capacity=16.00 cfs Outflow=1.15 cfs 0.096 af

Reach C#3: Proposed Culvert #3 Avg. Flow Depth=0.21' Max Vel=2.05 fps Inflow=0.25 cfs 0.019 af
12.0" Round Pipe n=0.013 L=50.0' S=0.0050 '/' Capacity=2.52 cfs Outflow=0.25 cfs 0.019 af

Pond DMH#1: DMH#1 Peak Elev=91.72' Inflow=1.68 cfs 0.141 af
15.0" Round Culvert n=0.013 L=325.0' S=0.0050 '/' Outflow=1.68 cfs 0.141 af

Pond DMH#2: DMH#2 Peak Elev=89.99' Inflow=1.68 cfs 0.141 af
15.0" Round Culvert n=0.013 L=300.0' S=0.0050 '/' Outflow=1.68 cfs 0.141 af

Pond FB: Forebay Peak Elev=82.65' Storage=5,990 cf Inflow=5.88 cfs 1.221 af
Outflow=5.87 cfs 1.096 af

Pond IP#1: Infiltration Pond #1 Peak Elev=81.63' Storage=24,587 cf Inflow=6.08 cfs 1.149 af
Discarded=0.85 cfs 1.149 af Primary=0.00 cfs 0.000 af Outflow=0.85 cfs 1.149 af

Pond IP#2: Infiltation Pond #2 Peak Elev=94.43' Storage=954 cf Inflow=0.94 cfs 0.074 af
Discarded=0.16 cfs 0.074 af Primary=0.00 cfs 0.000 af Outflow=0.16 cfs 0.074 af

Total Runoff Area = 28.643 ac Runoff Volume = 1.889 af Average Runoff Depth = 0.79"
87.87% Pervious = 25.169 ac 12.13% Impervious = 3.474 ac

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1.1: Off-site and Roadway Runoff Area=830,642 sf 13.10% Impervious Runoff Depth=1.52"
Flow Length=2,087' Tc=55.6 min CN=WQ Runoff=12.62 cfs 2.419 af

Subcatchment 1.2: Northern Area Runoff Area=86,916 sf 2.19% Impervious Runoff Depth=2.17"
Flow Length=336' Tc=24.0 min CN=WQ Runoff=3.11 cfs 0.360 af

Subcatchment 1.3: To Bio Pond #1 Runoff Area=24,538 sf 3.69% Impervious Runoff Depth=2.39"
Flow Length=314' Tc=25.4 min CN=WQ Runoff=0.95 cfs 0.112 af

Subcatchment 1.4: To Culvert #1 Runoff Area=14,366 sf 29.54% Impervious Runoff Depth=3.02"
Flow Length=318' Tc=8.2 min CN=WQ Runoff=1.00 cfs 0.083 af

Subcatchment 1.5: To Culvert #2 Runoff Area=34,830 sf 21.89% Impervious Runoff Depth=2.78"
Flow Length=325' Tc=8.3 min CN=WQ Runoff=2.29 cfs 0.185 af

Subcatchment 1.6: Cul-De-Sac Runoff Area=9,503 sf 0.00% Impervious Runoff Depth=2.32"
Flow Length=97' Slope=0.0210 '/' Tc=6.6 min CN=74 Runoff=0.57 cfs 0.042 af

Subcatchment 2: South Runoff Area=142,777 sf 13.97% Impervious Runoff Depth=1.68"
Flow Length=533' Tc=12.1 min CN=WQ Runoff=4.87 cfs 0.460 af

Subcatchment 3.1: To IP#2 Runoff Area=31,503 sf 11.63% Impervious Runoff Depth=2.55"
Flow Length=211' Tc=7.8 min CN=WQ Runoff=2.01 cfs 0.154 af

Subcatchment 3.2: Southeast Runoff Area=72,623 sf 5.81% Impervious Runoff Depth=2.30"
Flow Length=411' Tc=15.2 min CN=WQ Runoff=3.33 cfs 0.319 af

Reach #100: Analysis Point - Northeast Inflow=9.34 cfs 1.590 af
Outflow=9.34 cfs 1.590 af

Reach #200: Analysis Point - South Inflow=4.87 cfs 0.460 af
Outflow=4.87 cfs 0.460 af

Reach #300: Analysis Point - Southeast Inflow=3.33 cfs 0.319 af
Outflow=3.33 cfs 0.319 af

Reach C#1: Proposed Culvert #1 Avg. Flow Depth=0.21' Max Vel=8.47 fps Inflow=1.00 cfs 0.083 af
12.0" Round Pipe n=0.012 L=25.0' S=0.0756 '/' Capacity=10.61 cfs Outflow=1.00 cfs 0.083 af

Reach C#2: Proposed Culvert #2 Avg. Flow Depth=0.26' Max Vel=14.37 fps Inflow=2.29 cfs 0.185 af
12.0" Round Pipe n=0.012 L=11.0' S=0.1718 '/' Capacity=16.00 cfs Outflow=2.29 cfs 0.185 af

Reach C#3: Proposed Culvert #3 Avg. Flow Depth=0.32' Max Vel=2.59 fps Inflow=0.57 cfs 0.042 af
12.0" Round Pipe n=0.013 L=50.0' S=0.0050 '/' Capacity=2.52 cfs Outflow=0.57 cfs 0.042 af

Pond DMH#1: DMH#1 Peak Elev=92.09' Inflow=3.29 cfs 0.268 af
15.0" Round Culvert n=0.013 L=325.0' S=0.0050 '/' Outflow=3.29 cfs 0.268 af

Pond DMH#2: DMH#2 Peak Elev=90.35' Inflow=3.29 cfs 0.268 af
15.0" Round Culvert n=0.013 L=300.0' S=0.0050 '/' Outflow=3.29 cfs 0.268 af

Pond FB: Forebay Peak Elev=82.76' Storage=6,414 cf Inflow=13.15 cfs 2.729 af
Outflow=13.14 cfs 2.604 af

Pond IP#1: Infiltration Pond #1 Peak Elev=82.56' Storage=36,455 cf Inflow=13.57 cfs 2.716 af
Discarded=0.94 cfs 1.487 af Primary=8.71 cfs 1.230 af Outflow=9.65 cfs 2.716 af

Pond IP#2: Infiltation Pond #2 Peak Elev=95.09' Storage=2,672 cf Inflow=2.01 cfs 0.154 af
Discarded=0.20 cfs 0.154 af Primary=0.00 cfs 0.000 af Outflow=0.20 cfs 0.154 af

Total Runoff Area = 28.643 ac Runoff Volume = 4.134 af Average Runoff Depth = 1.73"
87.87% Pervious = 25.169 ac 12.13% Impervious = 3.474 ac

Summary for Subcatchment 1.1: Off-site and Roadway

Runoff = 12.62 cfs @ 12.79 hrs, Volume= 2.419 af, Depth= 1.52"
Routed to Pond FB : Forebay

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.94"

Area (sf)	CN	Description
424,852	46	2 acre lots, 12% imp, HSG A
309,852	77	2 acre lots, 12% imp, HSG C
17,315	82	2 acre lots, 12% imp, HSG D
33,389	70	Woods, Good, HSG C
26,661	74	>75% Grass cover, Good, HSG C
18,573	98	Paved parking, HSG C
830,642		Weighted Average
721,827		86.90% Pervious Area
108,815		13.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.5	50	0.0400	0.19		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.92"
13.9	910	0.0242	1.09		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
23.4	514	0.0214	0.37		**Shallow Concentrated Flow,** Forest w/Heavy Litter Kv= 2.5 fps
2.1	106	0.0140	0.83		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.1	73	0.0550	0.59		**Shallow Concentrated Flow,** Forest w/Heavy Litter Kv= 2.5 fps
9.6	434	0.0115	0.75		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
55.6	2,087	Total			

Summary for Subcatchment 1.2: Northern Area

Runoff = 3.11 cfs @ 12.35 hrs, Volume= 0.360 af, Depth= 2.17"
Routed to Reach #100 : Analysis Point - Northeast

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.94"

Area (sf)	CN	Description
53,051	70	Woods, Good, HSG C
17,967	74	>75% Grass cover, Good, HSG C
15,898	77	2 acre lots, 12% imp, HSG C
86,916		Weighted Average
85,008		97.81% Pervious Area
1,908		2.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.2	50	0.0260	0.04		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 2.92"
3.8	286	0.0320	1.25		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
24.0	336	Total			

Summary for Subcatchment 1.3: To Bio Pond #1

Runoff = 0.95 cfs @ 12.36 hrs, Volume= 0.112 af, Depth= 2.39"
Routed to Pond IP#1 : Infiltration Pond #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.94"

Area (sf)	CN	Description
616	70	Woods, Good, HSG C
16,375	74	>75% Grass cover, Good, HSG C
7,547	77	2 acre lots, 12% imp, HSG C
24,538		Weighted Average
23,632		96.31% Pervious Area
906		3.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.0	50	0.0210	0.04		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 2.92"
3.4	264	0.0352	1.31		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
25.4	314	Total			

Summary for Subcatchment 1.4: To Culvert #1

Runoff = 1.00 cfs @ 12.12 hrs, Volume= 0.083 af, Depth= 3.02"
Routed to Reach C#1 : Proposed Culvert #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.94"

Area (sf)	CN	Description
10,122	74	>75% Grass cover, Good, HSG C
4,244	98	Paved parking, HSG C
14,366		Weighted Average
10,122		70.46% Pervious Area
4,244		29.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0500	0.20		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.92"
4.1	268	0.0240	1.08		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.2	318	Total			

Summary for Subcatchment 1.5: To Culvert #2

Runoff = 2.29 cfs @ 12.12 hrs, Volume= 0.185 af, Depth= 2.78"
Routed to Reach C#2 : Proposed Culvert #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.94"

Area (sf)	CN	Description
612	65	Brush, Good, HSG C
3,633	70	Woods, Good, HSG C
6,643	74	>75% Grass cover, Good, HSG C
18,542	77	2 acre lots, 12% imp, HSG C
5,400	98	Paved parking, HSG C
34,830		Weighted Average
27,205		78.11% Pervious Area
7,625		21.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0500	0.20		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.92"
4.2	275	0.0240	1.08		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.3	325	Total			

Summary for Subcatchment 1.6: Cul-De-Sac

Runoff = 0.57 cfs @ 12.10 hrs, Volume= 0.042 af, Depth= 2.32"
Routed to Reach C#3 : Proposed Culvert #3

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.94"

Area (sf)	CN	Description
9,503	74	>75% Grass cover, Good, HSG C
9,503		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	50	0.0210	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.92"
0.8	47	0.0210	1.01		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
6.6	97	Total			

Summary for Subcatchment 2: South

Runoff = 4.87 cfs @ 12.17 hrs, Volume= 0.460 af, Depth= 1.68"
Routed to Reach #200 : Analysis Point - South

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.94"

Area (sf)	CN	Description
1,254	30	Brush, Good, HSG A
8,850	30	Woods, Good, HSG A
52,307	39	>75% Grass cover, Good, HSG A
8,362	98	Paved parking, HSG A
4,038	98	Roofs, HSG A
329	65	Brush, Good, HSG C
4,476	70	Woods, Good, HSG C
8,681	74	>75% Grass cover, Good, HSG C
53,329	77	2 acre lots, 12% imp, HSG C
1,151	98	Paved parking, HSG C
142,777		Weighted Average
122,827		86.03% Pervious Area
19,950		13.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	50	0.0800	0.25		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.92"
8.7	483	0.0176	0.93		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
12.1	533	Total			

Summary for Subcatchment 3.1: To IP#2

Runoff = 2.01 cfs @ 12.11 hrs, Volume= 0.154 af, Depth= 2.55"
Routed to Pond IP#2 : Infiltation Pond #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.94"

Area (sf)	CN	Description
983	70	Woods, Good, HSG C
30,520	77	2 acre lots, 12% imp, HSG C
31,503		Weighted Average
27,841		88.37% Pervious Area
3,662		11.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	50	0.0180	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.92"
1.7	161	0.0497	1.56		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.8	211	Total			

Summary for Subcatchment 3.2: Southeast

Runoff = 3.33 cfs @ 12.22 hrs, Volume= 0.319 af, Depth= 2.30"
Routed to Reach #300 : Analysis Point - Southeast

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.94"

Area (sf)	CN	Description
32,217	70	Woods, Good, HSG C
5,233	74	>75% Grass cover, Good, HSG C
35,173	77	2 acre lots, 12% imp, HSG C
72,623		Weighted Average
68,402		94.19% Pervious Area
4,221		5.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	50	0.0180	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.92"
9.1	361	0.0090	0.66		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
15.2	411	Total			

Summary for Reach #100: Analysis Point - Northeast

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 22.975 ac, 12.34% Impervious, Inflow Depth = 0.83" for 10-YR event
Inflow = 9.34 cfs @ 13.20 hrs, Volume= 1.590 af
Outflow = 9.34 cfs @ 13.20 hrs, Volume= 1.590 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Reach #200: Analysis Point - South

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 3.278 ac, 13.97% Impervious, Inflow Depth = 1.68" for 10-YR event
Inflow = 4.87 cfs @ 12.17 hrs, Volume= 0.460 af
Outflow = 4.87 cfs @ 12.17 hrs, Volume= 0.460 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Reach #300: Analysis Point - Southeast

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 2.390 ac, 7.57% Impervious, Inflow Depth = 1.60" for 10-YR event
Inflow = 3.33 cfs @ 12.22 hrs, Volume= 0.319 af
Outflow = 3.33 cfs @ 12.22 hrs, Volume= 0.319 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Reach C#1: Proposed Culvert #1

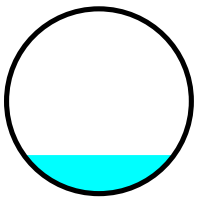
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.330 ac, 29.54% Impervious, Inflow Depth = 3.02" for 10-YR event
Inflow = 1.00 cfs @ 12.12 hrs, Volume= 0.083 af
Outflow = 1.00 cfs @ 12.12 hrs, Volume= 0.083 af, Atten= 0%, Lag= 0.0 min
Routed to Pond DMH#1 : DMH#1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.47 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.72 fps, Avg. Travel Time= 0.2 min

Peak Storage= 3 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.21' , Surface Width= 0.81'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 10.61 cfs

12.0" Round Pipe
n= 0.012 Concrete pipe, finished
Length= 25.0' Slope= 0.0756 '/'
Inlet Invert= 93.00', Outlet Invert= 91.11'



Summary for Reach C#2: Proposed Culvert #2

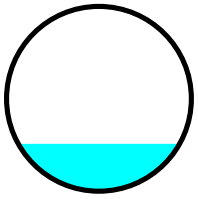
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.800 ac, 21.89% Impervious, Inflow Depth = 2.78" for 10-YR event
Inflow = 2.29 cfs @ 12.12 hrs, Volume= 0.185 af
Outflow = 2.29 cfs @ 12.12 hrs, Volume= 0.185 af, Atten= 0%, Lag= 0.0 min
Routed to Pond DMH#1 : DMH#1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 14.37 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 4.46 fps, Avg. Travel Time= 0.0 min

Peak Storage= 2 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.26' , Surface Width= 0.87'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 16.00 cfs

12.0" Round Pipe
n= 0.012 Concrete pipe, finished
Length= 11.0' Slope= 0.1718 '/'
Inlet Invert= 93.00', Outlet Invert= 91.11'



Summary for Reach C#3: Proposed Culvert #3

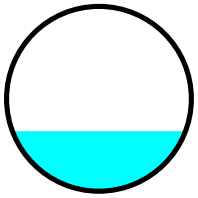
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.218 ac, 0.00% Impervious, Inflow Depth = 2.32" for 10-YR event
Inflow = 0.57 cfs @ 12.10 hrs, Volume= 0.042 af
Outflow = 0.57 cfs @ 12.11 hrs, Volume= 0.042 af, Atten= 0%, Lag= 0.2 min
Routed to Pond FB : Forebay

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.59 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 0.95 fps, Avg. Travel Time= 0.9 min

Peak Storage= 11 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.32' , Surface Width= 0.94'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.52 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 50.0' Slope= 0.0050 '/'
Inlet Invert= 80.90', Outlet Invert= 80.65'



Summary for Pond DMH#1: DMH#1

[62] Hint: Exceeded Reach C#1 OUTLET depth by 0.76' @ 12.15 hrs
[62] Hint: Exceeded Reach C#2 OUTLET depth by 0.72' @ 12.15 hrs

Inflow Area = 1.129 ac, 24.13% Impervious, Inflow Depth = 2.85" for 10-YR event
Inflow = 3.29 cfs @ 12.12 hrs, Volume= 0.268 af
Outflow = 3.29 cfs @ 12.12 hrs, Volume= 0.268 af, Atten= 0%, Lag= 0.0 min
Primary = 3.29 cfs @ 12.12 hrs, Volume= 0.268 af
Routed to Pond DMH#2 : DMH#2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 92.09' @ 12.13 hrs
Flood Elev= 95.10'

Device	Routing	Invert	Outlet Devices
#1	Primary	91.01'	**15.0" Round Culvert** L= 325.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 91.01' / 89.38' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=3.12 cfs @ 12.12 hrs HW=92.07' TW=90.33' (Dynamic Tailwater)
1=Culvert (Outlet Controls 3.12 cfs @ 3.78 fps)

Summary for Pond DMH#2: DMH#2

Inflow Area = 1.129 ac, 24.13% Impervious, Inflow Depth = 2.85" for 10-YR event
Inflow = 3.29 cfs @ 12.12 hrs, Volume= 0.268 af
Outflow = 3.29 cfs @ 12.12 hrs, Volume= 0.268 af, Atten= 0%, Lag= 0.0 min
Primary = 3.29 cfs @ 12.12 hrs, Volume= 0.268 af
Routed to Pond FB : Forebay

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 90.35' @ 12.12 hrs
Flood Elev= 101.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	89.28'	**15.0" Round Culvert** L= 300.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 89.28' / 87.78' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=3.20 cfs @ 12.12 hrs HW=90.33' TW=82.66' (Dynamic Tailwater)
1=Culvert (Barrel Controls 3.20 cfs @ 3.92 fps)

Summary for Pond FB: Forebay

[63] Warning: Exceeded Reach C#3 INLET depth by 1.74' @ 12.85 hrs

Inflow Area = 20.416 ac, 13.57% Impervious, Inflow Depth = 1.60" for 10-YR event
Inflow = 13.15 cfs @ 12.79 hrs, Volume= 2.729 af
Outflow = 13.14 cfs @ 12.80 hrs, Volume= 2.604 af, Atten= 0%, Lag= 0.8 min
Primary = 13.14 cfs @ 12.80 hrs, Volume= 2.604 af
Routed to Pond IP#1 : Infiltration Pond #1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 82.76' @ 12.80 hrs Surf.Area= 4,108 sf Storage= 6,414 cf
Flood Elev= 83.00' Surf.Area= 4,806 sf Storage= 7,478 cf

Plug-Flow detention time= 40.9 min calculated for 2.604 af (95% of inflow)
Center-of-Mass det. time= 15.6 min (895.9 - 880.3)

Volume	Invert	Avail.Storage	Storage Description
#1	79.00'	7,478 cf	**Custom Stage Data (Conic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
79.00	634	0	0	634
80.00	1,032	825	825	1,045
82.00	2,251	3,205	4,030	2,296
83.00	4,806	3,449	7,478	4,859

Device	Routing	Invert	Outlet Devices
#1	Primary	82.50'	**40.0' long x 8.0' 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) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Primary OutFlow Max=13.14 cfs @ 12.80 hrs HW=82.76' TW=81.95' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 13.14 cfs @ 1.26 fps)

Summary for Pond IP#1: Infiltration Pond #1

Inflow Area = 20.980 ac, 13.30% Impervious, Inflow Depth = 1.55" for 10-YR event
Inflow = 13.57 cfs @ 12.78 hrs, Volume= 2.716 af
Outflow = 9.65 cfs @ 13.21 hrs, Volume= 2.716 af, Atten= 29%, Lag= 25.4 min
Discarded = 0.94 cfs @ 13.21 hrs, Volume= 1.487 af
Primary = 8.71 cfs @ 13.21 hrs, Volume= 1.230 af
Routed to Reach #100 : Analysis Point - Northeast

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 82.56' @ 13.21 hrs Surf.Area= 13,574 sf Storage= 36,455 cf
Flood Elev= 83.00' Surf.Area= 14,258 sf Storage= 42,643 cf

Plug-Flow detention time= 227.5 min calculated for 2.716 af (100% of inflow)
Center-of-Mass det. time= 227.6 min (1,121.7 - 894.1)

Volume	Invert	Avail.Storage	Storage Description
#1	79.30'	42,643 cf	**Custom Stage Data (Conic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
79.30	8,936	0.0	0	0	8,936
80.00	9,883	100.0	6,584	6,584	9,913
82.00	12,743	100.0	22,566	29,149	12,870
83.00	14,258	100.0	13,493	42,643	14,440

Device	Routing	Invert	Outlet Devices
#1	Discarded	79.30'	**3.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	80.20'	**12.0" Round Culvert X 2.00** L= 24.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 80.20' / 80.00' S= 0.0083 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#3	Device 2	81.70'	**24.0" Vert. Horizontal Grate X 2.00** C= 0.600 Limited to weir flow at low heads
#4	Primary	82.50'	**20.0' long x 8.0' 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) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Discarded OutFlow Max=0.94 cfs @ 13.21 hrs HW=82.55' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.94 cfs)

Primary OutFlow Max=8.69 cfs @ 13.21 hrs HW=82.55' TW=0.00' (Dynamic Tailwater)
└**2=Culvert** (Passes 8.07 cfs of 10.30 cfs potential flow)
└**3=Horizontal Grate** (Orifice Controls 8.07 cfs @ 3.15 fps)
└**4=Broad-Crested Rectangular Weir** (Weir Controls 0.62 cfs @ 0.57 fps)

Summary for Pond IP#2: Infiltation Pond #2

Inflow Area = 0.723 ac, 11.63% Impervious, Inflow Depth = 2.55" for 10-YR event
Inflow = 2.01 cfs @ 12.11 hrs, Volume= 0.154 af
Outflow = 0.20 cfs @ 13.16 hrs, Volume= 0.154 af, Atten= 90%, Lag= 63.0 min
Discarded = 0.20 cfs @ 13.16 hrs, Volume= 0.154 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach #300 : Analysis Point - Southeast

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 95.09' @ 13.16 hrs Surf.Area= 2,857 sf Storage= 2,672 cf
Flood Elev= 95.75' Surf.Area= 3,369 sf Storage= 4,727 cf

Plug-Flow detention time= 128.9 min calculated for 0.154 af (100% of inflow)
Center-of-Mass det. time= 128.9 min (961.2 - 832.4)

Volume	Invert	Avail.Storage	Storage Description
#1	94.00'	4,727 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
94.00	2,068	0	0	2,068
95.00	2,791	2,420	2,420	2,812
95.75	3,369	2,307	4,727	3,408

Device	Routing	Invert	Outlet Devices
#1	Discarded	94.00'	**3.000 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	95.25'	**10.0' 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

Discarded OutFlow Max=0.20 cfs @ 13.16 hrs HW=95.09' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.20 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=94.00' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1.1: Off-site and Roadway Runoff Area=830,642 sf 13.10% Impervious Runoff Depth=2.35"
Flow Length=2,087' Tc=55.6 min CN=WQ Runoff=19.98 cfs 3.733 af

Subcatchment 1.2: Northern Area Runoff Area=86,916 sf 2.19% Impervious Runoff Depth=3.24"
Flow Length=336' Tc=24.0 min CN=WQ Runoff=4.70 cfs 0.538 af

Subcatchment 1.3: To Bio Pond #1 Runoff Area=24,538 sf 3.69% Impervious Runoff Depth=3.51"
Flow Length=314' Tc=25.4 min CN=WQ Runoff=1.41 cfs 0.165 af

Subcatchment 1.4: To Culvert #1 Runoff Area=14,366 sf 29.54% Impervious Runoff Depth=4.20"
Flow Length=318' Tc=8.2 min CN=WQ Runoff=1.40 cfs 0.115 af

Subcatchment 1.5: To Culvert #2 Runoff Area=34,830 sf 21.89% Impervious Runoff Depth=3.93"
Flow Length=325' Tc=8.3 min CN=WQ Runoff=3.25 cfs 0.262 af

Subcatchment 1.6: Cul-De-Sac Runoff Area=9,503 sf 0.00% Impervious Runoff Depth=3.42"
Flow Length=97' Slope=0.0210 '/' Tc=6.6 min CN=74 Runoff=0.85 cfs 0.062 af

Subcatchment 2: South Runoff Area=142,777 sf 13.97% Impervious Runoff Depth=2.47"
Flow Length=533' Tc=12.1 min CN=WQ Runoff=6.98 cfs 0.676 af

Subcatchment 3.1: To IP#2 Runoff Area=31,503 sf 11.63% Impervious Runoff Depth=3.70"
Flow Length=211' Tc=7.8 min CN=WQ Runoff=2.91 cfs 0.223 af

Subcatchment 3.2: Southeast Runoff Area=72,623 sf 5.81% Impervious Runoff Depth=3.39"
Flow Length=411' Tc=15.2 min CN=WQ Runoff=4.97 cfs 0.472 af

Reach #100: Analysis Point - Northeast Inflow=20.42 cfs 3.138 af
Outflow=20.42 cfs 3.138 af

Reach #200: Analysis Point - South Inflow=6.98 cfs 0.676 af
Outflow=6.98 cfs 0.676 af

Reach #300: Analysis Point - Southeast Inflow=4.97 cfs 0.500 af
Outflow=4.97 cfs 0.500 af

Reach C#1: Proposed Culvert #1 Avg. Flow Depth=0.25' Max Vel=9.33 fps Inflow=1.40 cfs 0.115 af
12.0" Round Pipe n=0.012 L=25.0' S=0.0756 '/' Capacity=10.61 cfs Outflow=1.40 cfs 0.115 af

Reach C#2: Proposed Culvert #2 Avg. Flow Depth=0.31' Max Vel=15.91 fps Inflow=3.25 cfs 0.262 af
12.0" Round Pipe n=0.012 L=11.0' S=0.1718 '/' Capacity=16.00 cfs Outflow=3.25 cfs 0.262 af

Reach C#3: Proposed Culvert #3 Avg. Flow Depth=0.40' Max Vel=2.89 fps Inflow=0.85 cfs 0.062 af
12.0" Round Pipe n=0.013 L=50.0' S=0.0050 '/' Capacity=2.52 cfs Outflow=0.85 cfs 0.062 af

Pond DMH#1: DMH#1 Peak Elev=92.46' Inflow=4.66 cfs 0.377 af
15.0" Round Culvert n=0.013 L=325.0' S=0.0050 '/' Outflow=4.66 cfs 0.377 af

Pond DMH#2: DMH#2 Peak Elev=90.70' Inflow=4.66 cfs 0.377 af
15.0" Round Culvert n=0.013 L=300.0' S=0.0050 '/' Outflow=4.66 cfs 0.377 af

Pond FB: Forebay Peak Elev=82.92' Storage=7,090 cf Inflow=20.71 cfs 4.173 af
Outflow=20.18 cfs 4.048 af

Pond IP#1: Infiltration Pond #1 Peak Elev=82.80' Storage=39,785 cf Inflow=20.95 cfs 4.212 af
Discarded=0.97 cfs 1.613 af Primary=19.01 cfs 2.599 af Outflow=19.97 cfs 4.212 af

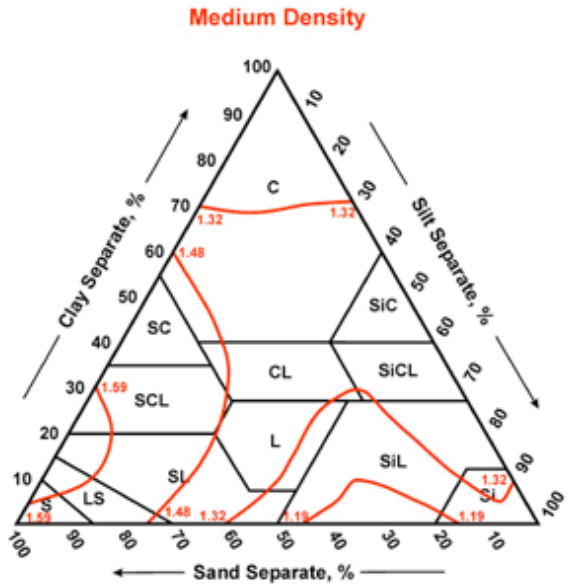
Pond IP#2: Infiltation Pond #2 Peak Elev=95.35' Storage=3,448 cf Inflow=2.91 cfs 0.223 af
Discarded=0.21 cfs 0.194 af Primary=0.77 cfs 0.029 af Outflow=0.98 cfs 0.223 af

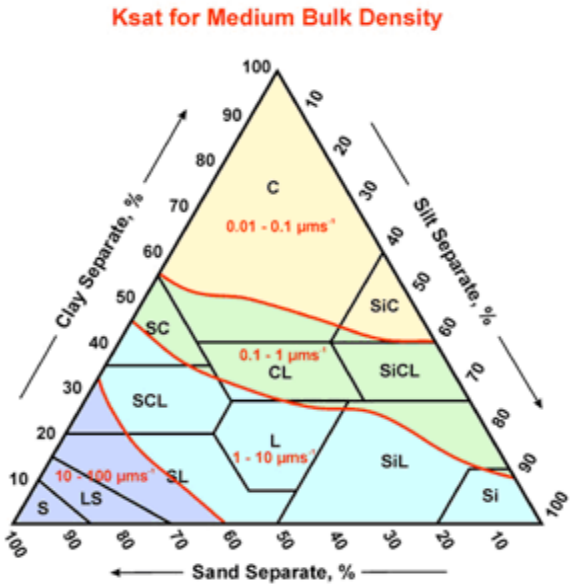
Total Runoff Area = 28.643 ac Runoff Volume = 6.246 af Average Runoff Depth = 2.62"
87.87% Pervious = 25.169 ac 12.13% Impervious = 3.474 ac

Appendix III

Charts, Graphs, and Calculations

K_{sat} VALUES
FOR
NEW HAMPSHIRE SOILS
(Including Hydrologic and DES Soil Lot Sizing Groups)





From: Guide for Estimating Ksat from Soil Properties (**Exhibit 618-9**). (http://soils.usda.gov/technical/handbook/contents/part618ex.html)

Sponsored by the Society of Soil Scientists of Northern New England
SSSNNE Special Publication No. 5
September, 2009

Soil Series	legend number	Ksat low - B in/hr	Ksat high - B in/hr	Ksat low - C in/hr	Ksat high - C in/hr	Hyd. Grp.	Group	Land Form	Temp.	Soil Textures	Spodosol ?	Other
Abenaki	501	0.6	2.0	6.00	99.0	B	2	Outwash and Stream Terraces	frigid	loamy over sandy-skeletal	no	loamy over gravelly
Acton	146	2.0	20.0	2.00	20.0	B	3	Loose till, sandy textures	mesic	sandy-skeletal	no	cobbly loamy sand
Adams	36	6.0	20.0	20.00	99.0	A	1	Outwash and Stream Terraces	frigid	sandy	yes	
Agawam	24	6.0	20.0	20.00	100.0	B	2	Outwash and Stream Terraces	mesic	loamy over sandy	no	loamy over sand/gravel
Allagash	127	0.6	2.0	6.00	20.0	B	2	Outwash and Stream Terraces	frigid	loamy over sandy	yes	loamy over sandy
Au Gres	516					B	5	Outwash and Stream Terraces	frigid	sandy	yes	single grain, loose
Bangor	572	0.6	2.0	0.60	2.0	B	2	Friable till, silty, schist & phyllite	frigid	loamy	yes	silt loam
Becket	56	0.6	2.0	0.06	0.6	C	3	Firm, platy, sandy till	frigid	loamy	yes	gravelly sandy loam in Cd
Belgrade	532	0.6	2.0	0.06	2.0	B	3	Terraces and glacial lake plains	mesic	silty	no	strata of fine sand
Bemis	224	0.6	0.2	0.00	0.2	C	5	Firm, platy, loamy till	cryic	loamy	no	
Berkshire	72	0.6	6.0	0.60	6.0	B	2	Loose till, loamy textures	frigid	loamy	yes	fine sandy loam
Bernardston	330	0.6	2.0	0.06	0.2	C	3	Firm, platy, silty till, schist & phyllite	mesic	loamy	no	channery silt loam in Cd
Bice	226	0.6	6.0	0.60	6.0	B	2	Loose till, loamy textures	frigid	loamy	no	sandy loam
Biddeford	234	0.0	0.2	0.00	0.2	D	6	Silt and Clay Deposits	frigid	fine	no	organic over clay
Binghamville	534	0.2	2.0	0.06	0.2	D	5	Terraces and glacial lake plains	mesic	silty	no	
Boscawen	220	6.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	frigid	sandy-skeletal	no	loamy cap
Boxford	32	0.1	0.2	0.00	0.2	C	3	Silt and Clay Deposits	mesic	fine	no	silty clay loam
Brayton	240	0.6	2.0	0.06	0.6	C	5	Firm, platy, silty till, schist & phyllite	frigid	loamy	no	
Buckland	237	0.6	2.0	0.06	0.2	C	3	Firm, platy, loamy till	frigid	loamy	no	loam in Cd
Bucksport	895					D	6	Organic Materials - Freshwater	frigid	sapric	no	deep organic
Burnham	131	0.2	6.0	0.02	0.2	D	6	Firm, platy, silty till, schist & phylitte	frigid	loamy	no	organic over silt
Buxton	232	0.1	0.6	0.00	0.2	C	3	Silt and Clay Deposits	frigid	fine	no	silty clay
Cabot	589	0.6	2.0	0.06	0.2	D	5	Firm, platy, silty till, schist & phyllite	frigid	loamy	no	
Caesar	526	20.0	100.0	20.00	100.0	A	1	Outwash and Stream Terraces	mesic	coarse sand	no	
Canaan	663	2.0	20.0	2.00	20.0	C	4	Weathered Bedrock Till	frigid	loamy-skeletal	yes	less than 20 in. deep
Canterbury	166	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	no	loam in Cd
Canton	42	2.0	6.0	6.00	20.0	B	2	Loose till, sandy textures	mesic	loamy over sandy	no	loamy over loamy sand
Cardigan	357	0.6	2.0	0.60	2.0	B	4	Friable till, silty, schist & phyllite	mesic	loamy	no	20 to 40 in. deep
Catden	296					A/D	6	Organic Materials - Freshwater	mesic	sapric	no	deep organic
Champlain	35	6.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	frigid	gravelly sand	no	
Charles	209	0.6	100.0	0.60	100.0	C	5	Flood Plain (Bottom Land)	frigid	silty	no	
Charlton	62	0.6	6.0	0.60	6.0	B	2	Loose till, loamy textures	mesic	loamy	no	fine sandy loam
Chatfield	89	0.6	6.0	0.60	6.0	B	4	Loose till, bedrock	mesic	loamy	no	20 to 40 in. deep
Chatfield Var.	289	0.6	6.0	0.60	6.0	B	3	Loose till, bedrock	mesic	loamy	no	mwd to swpd
Chesuncook	126	0.6	2.0	0.02	0.2	C	3	Firm, platy, silty till, schist & phyllite	frigid	loamy	yes	channery silt loam in Cd
Chichester	442	0.6	2.0	2.00	6.0	B		Loose till, sandy textures	frigid	loamy over sandy	no	loamy over loamy sand
Chocorua	395			6.00	20.0	D	6	Organic Materials - Freshwater	frigid	sandy or sandy-skeletal	no	organic over sand
Cohas	505	0.6	2.0	0.60	100.0	C	5	Flood Plain (Bottom Land)	frigid	co. loamy over sandy (skeletal)	no	
Colonel	927	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	yes	loam in Cd
Colton	22	6.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	
Colton, gravelly	21	6.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	gravelly surface
Croghan	613	20.0	100.0	20.00	100.0	B	3	Outwash and Stream Terraces	frigid	sandy	yes	single grain in C
Dartmouth	132	0.6	2.0	0.06	0.6	B	3	Terraces and glacial lake plains	mesic	silty	no	thin strata silty clay loam
Deerfield	313	6.0	20.0	20.00	100.0	B	3	Outwash and Stream Terraces	mesic	sandy	no	single grain in C
Dixfield	378	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	yes	fine sandy loam in Cd
Dixmont	578	0.6	2.0	0.60	2.0	C	3	Friable till, silty, schist & phyllite	frigid	loamy	yes	silt loam, platy in C
Duane	413	6.0	20.0	6.00	20.0	B	3	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	cemented (ortstein)
Dutchess	366	0.6	2.0	0.60	2.0	B	2	Friable till, silty, schist & phyllite	mesic	loamy	no	very channery
Eldridge	38	6.0	20.0	0.06	0.6	C	3	Sandy/loamy over silt/clay	mesic	sandy over loamy	no	
Elliottsville	128	0.6	2.0	0.60	2.0	B	4	Friable till, silty, schist & phyllite	frigid	loamy	yes	20 to 40 in. deep
Elmridge	238	2.0	6.0	0.00	0.2	C	3	Sandy/loamy over silt/clay	mesic	loamy over clayey	no	
Elmwood	338	2.0	6.0	0.00	0.2	C	3	Sandy/loamy over silt/clay	frigid	loamy over clayey	no	
Finch	116					C	3	Outwash and Stream Terraces	frigid	sandy	yes	cemented (ortstein)

Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Metadata for Point	
Smoothing	Yes
State	New Hampshire
Location	New Hampshire, United States
Latitude	42.991 degrees North
Longitude	70.879 degrees West
Elevation	30 feet
Date/Time	Thu Jan 18 2024 14:18:44 GMT-0500 (Eastern Standard Time)

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.26	0.40	0.50	0.66	0.82	1.04	**1yr**	0.71	0.99	1.22	1.58	2.05	2.70	2.95	**1yr**	2.39	2.83	3.25	3.96	4.60	**1yr**
2yr	0.32	0.50	0.62	0.82	1.03	1.31	**2yr**	0.89	1.18	1.52	1.95	2.51	3.25	3.60	**2yr**	2.87	3.47	3.97	4.72	5.38	**2yr**
5yr	0.38	0.58	0.73	0.98	1.26	1.62	**5yr**	1.08	1.47	1.90	2.45	3.17	4.12	4.63	**5yr**	3.65	4.45	5.10	6.01	6.79	**5yr**
10yr	0.42	0.65	0.83	1.12	1.46	1.91	**10yr**	1.26	1.74	2.25	2.93	3.80	4.94	5.60	**10yr**	4.37	5.39	6.16	7.22	8.10	**10yr**
25yr	0.48	0.77	0.98	1.35	1.79	2.37	**25yr**	1.55	2.16	2.81	3.68	4.81	6.28	7.21	**25yr**	5.56	6.93	7.91	9.21	10.24	**25yr**
50yr	0.54	0.87	1.12	1.56	2.10	2.80	**50yr**	1.81	2.55	3.34	4.39	5.76	7.53	8.72	**50yr**	6.67	8.39	9.56	11.06	12.23	**50yr**
100yr	0.61	0.98	1.27	1.80	2.45	3.31	**100yr**	2.12	3.01	3.97	5.25	6.90	9.04	10.56	**100yr**	8.00	10.16	11.56	13.31	14.61	**100yr**
200yr	0.69	1.12	1.45	2.08	2.88	3.91	**200yr**	2.48	3.56	4.70	6.25	8.25	10.85	12.79	**200yr**	9.60	12.30	13.99	16.01	17.47	**200yr**
500yr	0.82	1.34	1.75	2.54	3.55	4.86	**500yr**	3.06	4.44	5.89	7.88	10.46	13.82	16.47	**500yr**	12.23	15.84	17.99	20.45	22.13	**500yr**

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.23	0.36	0.44	0.60	0.73	0.89	**1yr**	0.63	0.87	0.93	1.30	1.61	2.30	2.61	**1yr**	2.04	2.51	2.90	3.30	4.00	**1yr**
2yr	0.32	0.49	0.60	0.82	1.01	1.19	**2yr**	0.87	1.17	1.37	1.82	2.33	3.12	3.53	**2yr**	2.76	3.39	3.89	4.62	5.17	**2yr**
5yr	0.36	0.55	0.68	0.93	1.19	1.42	**5yr**	1.02	1.39	1.62	2.12	2.73	3.87	4.32	**5yr**	3.42	4.16	4.79	5.67	6.40	**5yr**
10yr	0.39	0.60	0.75	1.05	1.35	1.62	**10yr**	1.17	1.59	1.82	2.40	3.07	4.47	5.05	**10yr**	3.96	4.85	5.62	6.60	7.40	**10yr**
25yr	0.45	0.69	0.86	1.22	1.61	1.94	**25yr**	1.39	1.89	2.12	2.77	3.56	4.90	6.18	**25yr**	4.33	5.94	6.92	8.06	8.96	**25yr**
50yr	0.50	0.76	0.95	1.36	1.84	2.22	**50yr**	1.58	2.17	2.37	3.09	3.98	5.54	7.19	**50yr**	4.91	6.92	8.10	9.38	10.37	**50yr**
100yr	0.56	0.85	1.06	1.54	2.11	2.54	**100yr**	1.82	2.49	2.65	3.44	4.42	6.25	8.36	**100yr**	5.53	8.04	9.50	10.91	11.96	**100yr**
200yr	0.63	0.94	1.20	1.73	2.41	2.91	**200yr**	2.08	2.84	2.96	3.82	4.90	7.03	9.74	**200yr**	6.22	9.36	11.15	12.69	13.83	**200yr**
500yr	0.74	1.10	1.41	2.05	2.91	3.50	**500yr**	2.51	3.42	3.44	4.37	5.65	8.18	11.89	**500yr**	7.24	11.43	13.78	15.48	16.73	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.29	0.44	0.54	0.72	0.89	1.08	**1yr**	0.77	1.06	1.27	1.73	2.19	3.01	3.13	**1yr**	2.66	3.01	3.60	4.38	5.07	**1yr**
2yr	0.33	0.52	0.64	0.86	1.06	1.27	**2yr**	0.92	1.24	1.48	1.95	2.50	3.44	3.70	**2yr**	3.04	3.55	4.08	4.86	5.68	**2yr**
5yr	0.40	0.62	0.77	1.05	1.34	1.62	**5yr**	1.16	1.59	1.88	2.51	3.20	4.38	4.93	**5yr**	3.88	4.74	5.42	6.38	7.17	**5yr**
10yr	0.47	0.73	0.90	1.26	1.62	1.98	**10yr**	1.40	1.94	2.27	3.06	3.87	5.42	6.15	**10yr**	4.80	5.91	6.74	7.87	8.77	**10yr**
25yr	0.58	0.89	1.10	1.57	2.07	2.57	**25yr**	1.79	2.52	2.94	4.00	5.00	7.79	8.24	**25yr**	6.90	7.93	8.99	10.42	11.48	**25yr**
50yr	0.68	1.03	1.29	1.85	2.49	3.13	**50yr**	2.15	3.06	3.57	4.89	6.10	9.77	10.30	**50yr**	8.65	9.90	11.19	12.89	14.06	**50yr**
100yr	0.80	1.21	1.51	2.19	3.00	3.81	**100yr**	2.59	3.72	4.34	6.00	7.44	12.25	12.87	**100yr**	10.85	12.38	13.92	15.97	17.24	**100yr**
200yr	0.94	1.41	1.79	2.58	3.60	4.65	**200yr**	3.11	4.54	5.30	7.36	9.07	15.41	16.11	**200yr**	13.64	15.49	17.33	19.77	21.15	**200yr**
500yr	1.16	1.73	2.22	3.23	4.59	6.03	**500yr**	3.96	5.89	6.87	9.68	11.82	20.89	21.66	**500yr**	18.48	20.82	23.13	26.26	27.76	**500yr**

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Northeast Regional Climate Center

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Rockingham County, New Hampshire

January 16, 2024

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

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 1:24,000.

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: Rockingham County, New Hampshire
Survey Area Data: Version 26, Aug 22, 2023

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

Date(s) aerial images were photographed: May 22, 2022—Jun 5, 2022

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
32A	Boxford silt loam, 0 to 3 percent slopes	13.6	11.6%
33A	Scitico silt loam, 0 to 5 percent slopes	8.7	7.4%
66B	Paxton fine sandy loam, 3 to 8 percent slopes	4.4	3.8%
115	Scarboro muck, coastal lowland, 0 to 3 percent slopes	2.8	2.4%
140B	Chatfield-Hollis-Canton complex, 0 to 8 percent slopes, rocky	9.8	8.4%
140C	Chatfield-Hollis-Canton complex, 8 to 15 percent slopes, rocky	0.0	0.0%
298	Pits, sand and gravel	4.5	3.8%
299	Udorthents, smoothed	0.0	0.0%
313A	Deerfield loamy fine sand, 0 to 3 percent slopes	3.8	3.2%
313B	Deerfield loamy fine sand, 3 to 8 percent slopes	3.4	2.9%
495	Natchaug mucky peat, 0 to 2 percent slopes	5.3	4.5%
510A	Hoosic gravelly fine sandy loam, 0 to 3 percent slopes	1.0	0.9%
510B	Hoosic gravelly fine sandy loam, 3 to 8 percent slopes	54.6	46.7%
538A	Squamscott fine sandy loam, 0 to 5 percent slopes	4.9	4.2%
Totals for Area of Interest		**116.8**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class.

Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The

pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Rockingham County, New Hampshire

32A—Boxford silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 9cn3
Elevation: 0 to 1,000 feet
Mean annual precipitation: 30 to 55 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 120 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Boxford and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Boxford

Setting

Parent material: Glaciomarine

Typical profile

H1 - 0 to 2 inches: silt loam
H2 - 2 to 13 inches: silt loam
H3 - 13 to 23 inches: silty clay loam
H4 - 23 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: D
Ecological site: F144AY018NY - Moist Lake Plain
Hydric soil rating: No

Minor Components

Scitico

Percent of map unit: 10 percent
Landform: Marine terraces
Hydric soil rating: Yes

Eldridge

Percent of map unit: 5 percent

Hydric soil rating: No

Squamscott

Percent of map unit: 5 percent
Landform: Marine terraces
Hydric soil rating: Yes

33A—Scitico silt loam, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 9cn6
Elevation: 0 to 180 feet
Mean annual precipitation: 47 to 49 inches
Mean annual air temperature: 48 degrees F
Frost-free period: 155 to 165 days
Farmland classification: Farmland of local importance

Map Unit Composition

Scitico and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Scitico

Setting

Landform: Marine terraces

Typical profile

H1 - 0 to 6 inches: silt loam
H2 - 6 to 12 inches: silty clay loam
H3 - 12 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 7.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C/D
Ecological site: F144AY019NH - Wet Lake Plain
Hydric soil rating: Yes

Minor Components

Maybid
Percent of map unit: 5 percent
Landform: Marine terraces
Hydric soil rating: Yes

Squamscott
Percent of map unit: 5 percent
Landform: Marine terraces
Hydric soil rating: Yes

Boxford
Percent of map unit: 5 percent
Hydric soil rating: No

66B—Paxton fine sandy loam, 3 to 8 percent slopes

Map Unit Setting
National map unit symbol: 2t2qp
Elevation: 0 to 1,570 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Paxton and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Paxton

Setting
Landform: Hills, drumlins, ground moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Crest, nose slope, side slope
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile
Ap - 0 to 8 inches: fine sandy loam
Bw1 - 8 to 15 inches: fine sandy loam
Bw2 - 15 to 26 inches: fine sandy loam
Cd - 26 to 65 inches: gravelly fine sandy loam

Properties and qualities
Slope: 3 to 8 percent
Depth to restrictive feature: 18 to 39 inches to densic material

Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 18 to 37 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: C
Ecological site: F144AY007CT - Well Drained Dense Till Uplands
Hydric soil rating: No

Minor Components

Woodbridge

Percent of map unit: 9 percent
Landform: Hills, drumlins, ground moraines
Landform position (two-dimensional): Summit, backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Ridgebury

Percent of map unit: 6 percent
Landform: Drainageways, hills, ground moraines, depressions
Landform position (two-dimensional): Backslope, footslope, toeslope
Landform position (three-dimensional): Head slope, base slope, dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Charlton

Percent of map unit: 5 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

115—Scarboro muck, coastal lowland, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2svkw
Elevation: 0 to 650 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F

Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Scarboro, coastal lowland, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Scarboro, Coastal Lowland

Setting

Landform: Drainageways, outwash terraces, outwash deltas, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, tread, dip
Down-slope shape: Concave
Across-slope shape: Linear, concave
Parent material: Sandy glaciofluvial deposits derived from schist and/or gneiss and/or granite

Typical profile

Oa - 0 to 8 inches: muck
A - 8 to 14 inches: mucky fine sandy loam
Cg1 - 14 to 22 inches: sand
Cg2 - 22 to 65 inches: gravelly sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (1.42 to 14.17 in/hr)
Depth to water table: About 0 to 2 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 6.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: A/D
Ecological site: F144AY031MA - Very Wet Outwash
Hydric soil rating: Yes

Minor Components

Swansea

Percent of map unit: 10 percent
Landform: Swamps, bogs
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Mashpee

Percent of map unit: 5 percent

Landform: Drainageways, terraces, depressions
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

140B—Chatfield-Hollis-Canton complex, 0 to 8 percent slopes, rocky

Map Unit Setting

National map unit symbol: 2w82m
Elevation: 380 to 1,070 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Chatfield, very stony, and similar soils: 35 percent
Canton, very stony, and similar soils: 25 percent
Hollis, very stony, and similar soils: 25 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chatfield, Very Stony

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
A - 1 to 2 inches: fine sandy loam
Bw - 2 to 30 inches: gravelly fine sandy loam
2R - 30 to 40 inches: bedrock

Properties and qualities

Slope: 0 to 8 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 20 to 41 inches to lithic bedrock
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches

Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Description of Canton, Very Stony

Setting

Landform: Ridges, hills, moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Coarse-loamy over sandy melt-out till derived from gneiss, granite, and/or schist

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
A - 2 to 5 inches: fine sandy loam
Bw1 - 5 to 16 inches: fine sandy loam
Bw2 - 16 to 22 inches: gravelly fine sandy loam
2C - 22 to 67 inches: gravelly loamy sand

Properties and qualities

Slope: 0 to 8 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 19 to 39 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Description of Hollis, Very Stony

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Summit, shoulder, backslope

Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
A - 2 to 7 inches: gravelly fine sandy loam
Bw - 7 to 16 inches: gravelly fine sandy loam
2R - 16 to 26 inches: bedrock

Properties and qualities

Slope: 0 to 8 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 8 to 23 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Very low (about 2.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: F144AY033MA - Shallow Dry Till Uplands
Hydric soil rating: No

Minor Components

Freetown

Percent of map unit: 5 percent
Landform: Swamps, kettles, bogs, depressions, marshes
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Newfields, very stony

Percent of map unit: 5 percent
Landform: Moraines, hills, ground moraines
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

Walpole, very stony

Percent of map unit: 3 percent
Landform: Outwash terraces, depressions, outwash plains, depressions, deltas
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave

Hydric soil rating: Yes

Rock outcrop

Percent of map unit: 2 percent
Landform: Hills, ridges
Hydric soil rating: Unranked

140C—Chatfield-Hollis-Canton complex, 8 to 15 percent slopes, rocky

Map Unit Setting

National map unit symbol: 2w82s
Elevation: 0 to 980 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Chatfield, very stony, and similar soils: 35 percent
Canton, very stony, and similar soils: 25 percent
Hollis, very stony, and similar soils: 25 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chatfield, Very Stony

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
A - 1 to 2 inches: fine sandy loam
Bw - 2 to 30 inches: gravelly fine sandy loam
2R - 30 to 40 inches: bedrock

Properties and qualities

Slope: 8 to 15 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 20 to 41 inches to lithic bedrock
Drainage class: Well drained
Runoff class: High

Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Description of Hollis, Very Stony

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
A - 2 to 7 inches: gravelly fine sandy loam
Bw - 7 to 16 inches: gravelly fine sandy loam
2R - 16 to 26 inches: bedrock

Properties and qualities

Slope: 8 to 15 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 8 to 23 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Very low (about 2.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: F144AY033MA - Shallow Dry Till Uplands
Hydric soil rating: No

Description of Canton, Very Stony

Setting

Landform: Ridges, hills, moraines

Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Coarse-loamy over sandy melt-out till derived from gneiss, granite, and/or schist

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
A - 2 to 5 inches: fine sandy loam
Bw1 - 5 to 16 inches: fine sandy loam
Bw2 - 16 to 22 inches: gravelly fine sandy loam
2C - 22 to 67 inches: gravelly loamy sand

Properties and qualities

Slope: 8 to 15 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 19 to 39 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Newfields, very stony

Percent of map unit: 5 percent
Landform: Hills, ground moraines, moraines
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

Freetown

Percent of map unit: 5 percent
Landform: Swamps, kettles, bogs, depressions, marshes
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Scarboro, very stony

Percent of map unit: 3 percent
Landform: Outwash deltas, drainageways, outwash terraces, depressions

Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave, linear
Hydric soil rating: Yes

Rock outcrop
Percent of map unit: 2 percent
Landform: Hills, ridges
Hydric soil rating: Unranked

298—Pits, sand and gravel

Map Unit Composition
Pits: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

299—Udorthents, smoothed

Map Unit Setting
National map unit symbol: 9cmt
Elevation: 0 to 840 feet
Mean annual precipitation: 44 to 49 inches
Mean annual air temperature: 48 degrees F
Frost-free period: 155 to 165 days
Farmland classification: Not prime farmland

Map Unit Composition
Udorthents and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents

Properties and qualities
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

313A—Deerfield loamy fine sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2xfg8
Elevation: 0 to 1,100 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Farmland of local importance

Map Unit Composition

Deerfield and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Deerfield

Setting

Landform: Kame terraces, outwash plains, outwash deltas, outwash terraces
Landform position (three-dimensional): Tread
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Parent material: Sandy outwash derived from granite, gneiss, and/or quartzite

Typical profile

Ap - 0 to 9 inches: loamy fine sand
Bw - 9 to 25 inches: loamy fine sand
BC - 25 to 33 inches: fine sand
Cg - 33 to 60 inches: sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: About 15 to 37 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Sodium adsorption ratio, maximum: 11.0
Available water supply, 0 to 60 inches: Moderate (about 6.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: A
Ecological site: F144AY027MA - Moist Sandy Outwash
Hydric soil rating: No

Minor Components

Windsor

Percent of map unit: 7 percent
Landform: Outwash plains, outwash deltas, kame terraces, outwash terraces
Landform position (three-dimensional): Tread
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Hydric soil rating: No

Wareham

Percent of map unit: 5 percent
Landform: Depressions, drainageways
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Sudbury

Percent of map unit: 2 percent
Landform: Outwash terraces, outwash deltas, kame terraces, outwash plains
Landform position (three-dimensional): Tread
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Hydric soil rating: No

Ninigret

Percent of map unit: 1 percent
Landform: Outwash terraces, outwash plains, kame terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear, convex
Across-slope shape: Concave, convex
Hydric soil rating: No

313B—Deerfield loamy fine sand, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2xfg9
Elevation: 0 to 1,190 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Deerfield and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Deerfield

Setting

Landform: Kame terraces, outwash plains, outwash terraces, outwash deltas
Landform position (three-dimensional): Tread
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Parent material: Sandy outwash derived from granite, gneiss, and/or quartzite

Typical profile

Ap - 0 to 9 inches: loamy fine sand
Bw - 9 to 25 inches: loamy fine sand
BC - 25 to 33 inches: fine sand
Cg - 33 to 60 inches: sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: About 15 to 37 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Sodium adsorption ratio, maximum: 11.0
Available water supply, 0 to 60 inches: Moderate (about 6.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: A
Ecological site: F144AY027MA - Moist Sandy Outwash
Hydric soil rating: No

Minor Components

Windsor

Percent of map unit: 7 percent
Landform: Outwash deltas, kame terraces, outwash plains, outwash terraces
Landform position (three-dimensional): Tread
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Hydric soil rating: No

Wareham

Percent of map unit: 5 percent
Landform: Depressions, drainageways
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Sudbury

Percent of map unit: 2 percent
Landform: Outwash plains, outwash terraces, outwash deltas, kame terraces
Landform position (three-dimensional): Tread

Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Hydric soil rating: No

Ninigret

Percent of map unit: 1 percent
Landform: Kame terraces, outwash terraces, outwash plains
Landform position (three-dimensional): Tread
Down-slope shape: Convex, linear
Across-slope shape: Convex, concave
Hydric soil rating: No

495—Natchaug mucky peat, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2w691
Elevation: 0 to 910 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Natchaug and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Natchaug

Setting

Landform: Depressions, depressions, depressions
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Moderately decomposed organic material over loamy glaciofluvial deposits and/or loamy glaciolacustrine deposits and/or loamy till

Typical profile

Oe1 - 0 to 12 inches: mucky peat
Oe2 - 12 to 31 inches: mucky peat
2Cg1 - 31 to 39 inches: silt loam
2Cg2 - 39 to 79 inches: fine sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.01 to 14.17 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None

Frequency of ponding: Frequent
Calcium carbonate, maximum content: 25 percent
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Very high (about 14.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8w
Hydrologic Soil Group: B/D
Ecological site: F144AY042NY - Semi-Rich Organic Wetlands
Hydric soil rating: Yes

Minor Components

Walpole

Percent of map unit: 4 percent
Landform: Outwash terraces, depressions, outwash plains, depressions, deltas
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Scarboro

Percent of map unit: 4 percent
Landform: Outwash deltas, drainageways, outwash terraces, depressions
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Maybid

Percent of map unit: 2 percent
Landform: Depressions, depressions
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

510A—Hoosic gravelly fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 9cp3
Elevation: 100 to 1,100 feet
Mean annual precipitation: 30 to 50 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 135 to 190 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Hoosic and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hoosic

Setting

Parent material: Outwash

Typical profile

H1 - 0 to 8 inches: gravelly fine sandy loam
H2 - 8 to 15 inches: very gravelly fine sandy loam
H3 - 15 to 60 inches: very gravelly coarse sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (2.00 to 20.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F144AY022MA - Dry Outwash
Hydric soil rating: No

Minor Components

Not named

Percent of map unit: 10 percent
Hydric soil rating: No

510B—Hoosic gravelly fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9cp4
Elevation: 100 to 1,100 feet
Mean annual precipitation: 30 to 50 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 135 to 190 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Hoosic and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hoosic

Setting

Parent material: Outwash

Typical profile

H1 - 0 to 8 inches: gravelly fine sandy loam
H2 - 8 to 15 inches: very gravelly fine sandy loam
H3 - 15 to 60 inches: very gravelly coarse sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (2.00 to 20.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F144AY022MA - Dry Outwash
Hydric soil rating: No

Minor Components

Not named

Percent of map unit: 10 percent
Hydric soil rating: No

538A—Squamscott fine sandy loam, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 9cp9
Elevation: 0 to 1,000 feet
Mean annual precipitation: 30 to 55 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 120 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Squamscott and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Squamscott

Setting

Landform: Marine terraces

Typical profile

H1 - 0 to 4 inches: fine sandy loam
H2 - 4 to 12 inches: loamy sand
H3 - 12 to 19 inches: fine sand
H4 - 19 to 65 inches: silt loam

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.60 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C/D
Ecological site: F144AY019NH - Wet Lake Plain
Hydric soil rating: Yes

Minor Components

Maybid

Percent of map unit: 5 percent
Landform: Marine terraces
Hydric soil rating: Yes

Scitico

Percent of map unit: 5 percent
Landform: Marine terraces
Hydric soil rating: Yes

Eldridge

Percent of map unit: 5 percent
Hydric soil rating: No

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NH-1500 – 189 Bunker Hill Ave, Stratham, NH
Test Pits – Christian Smith, P.E. of Beals Associates, PLLC- #1543

11/08/2023
Witness: Mike Cuomo

Test Pit #1

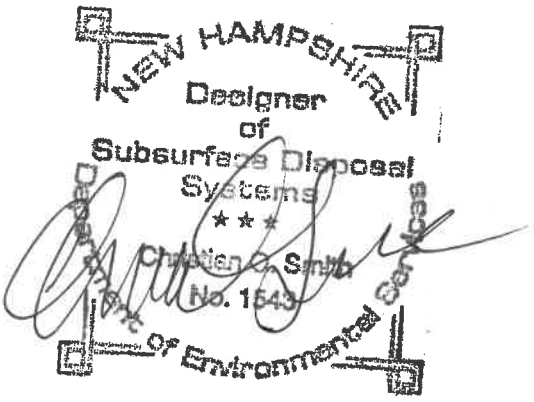
0" – 10"	10YR 3/3	Dark Brown Fine, Sandy, Loam Platy, Friable
10" - 20"	10YR 5 /6	Yellowish Brown Fine, Sandy, Loam Blocky, Friable
20" – 63"	2.5Y 4/4	Olive Brown Very Fine, Sandy Loam Blocky, Firm

ESHWT = 20"
Observed Ground Water –None
Restrictive Layer: 20 Inches
Refusal: None to 63"
Roots to 25 Inches
Perc Rate 8 min/inch @18"

Test Pit #2

0" – 10"	10YR 3 /4	Dark Yellowish Brown Fine, Sandy, Loam Platy, Friable
10" - 34"	10YR 4 /6	Dark Yellowish Brown Fine, Sandy, Loam Blocky, Friable
34" – 60"	2.5Y 4/4	Olive Brown Very Fine Silt Loam Blocky, Firm Redox-Common 2-20%

ESHWT = 34"
Observed Ground Water – None
Restrictive Layer: 34 Inches
Refusal: None
Roots to 6 Inches
Perc Rate 10 min/inch @23"



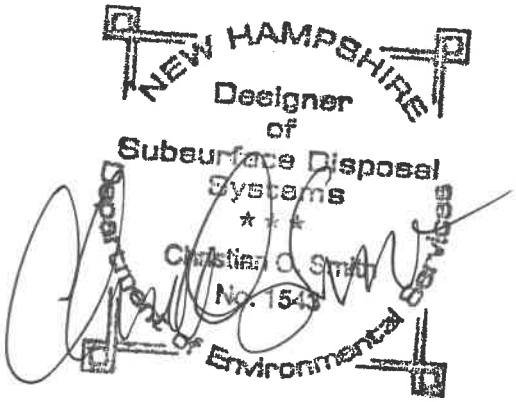
NH-1500 – 189 Bunker Hill Ave, Stratham, NH
Test Pits – Christian Smith, P.E. of Beals Associates, PLLC- #1543

11/08/2023
Witness: Mike Cuomo

Test Pit #3

0" – 10"	10YR 3 /4	Dark Yellowish Brown Fine, Sandy, Loam Platy, Friable
10" - 18"	10YR 4 /6	Dark Yellowish Brown Fine, Sandy, Loam Blocky, Friable
18" –62"	2.5Y 4/6	Olive Brown Very Fine, Sandy Loam Blocky, Firm Redox-Common 2-20%

ESHWT = 18"
Observed Ground Water – None
Restrictive Layer: 18 Inches
Refusal: None to 62"
Roots to 12 Inches
Perc Rate 8 min/inch @15"



Test Pit #4

0" –9"	10YR 3 /4	Dark Yellowish Brown Fine, Sandy, Loam Blocky, Friable
9" - 22"	10YR 4 /6	Dark Yellowish Brown Fine, Sandy, Loam Blocky, Friable
22" – 63"	2.5Y 4/4	Olive Brown Very Fine, Sandy Loam Blocky, Firm Redox-Common 2-20%

ESHWT = 22"
Observed Ground Water – None
Restrictive Layer: 22 Inches
Refusal: None to 63"
Roots to 6 Inches
Perc Rate 8 min/inch @15"

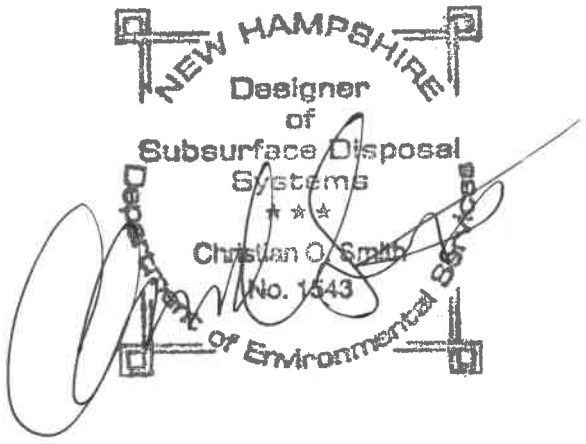
NH-1500 – 189 Bunker Hill Ave, Stratham, NH
Test Pits – Christian Smith, P.E. of Beals Associates, PLLC- #1543

11/08/2023
Witness: Mike Cuomo

Test Pit #5

0" – 10"	10YR 4/3	Brown Fine, Sandy, Loam Blocky, Friable
10" -26"	10YR 4 /6	Dark Yellowish Brown Fine, Sandy, Loam Blocky, Friable
26" – 62"	2.5Y 4/4	Olive Brown Fine, Loamy Sand Blocky, Firm Redox-Common 2-20%

ESHWT = 26"
Observed Ground Water – None
Restrictive Layer: 26 Inches
Refusal: None to 62"
Roots to 6 Inches
Perc Rate 8 min/inch @22"



Test Pit #6

0" – 14"	10YR 4 /4	Dark Yellowish Brown Fine, Sandy, Loam Blocky, Friable
14" - 32"	10YR 4 /6	Dark Yellowish Brown Fine, Sandy, Loam Blocky, Friable
32" –62"	2.5Y 4/4	Olive Brown Medium, Loamy Sand Massive, Firm Redox-Common 2-20%

ESHWT = 32"
Observed Ground Water – None
Restrictive Layer: 32 Inches
Refusal: None – 62 Inches
Roots to 6 Inches
Perc Rate 7 min/inch @26"

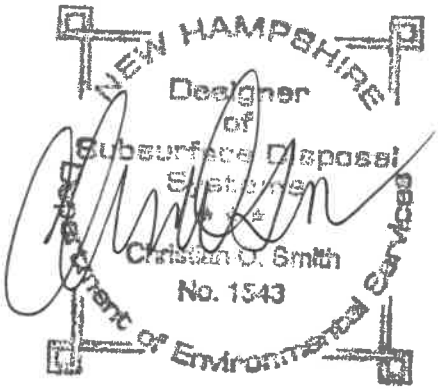
NH-1500 – 189 Bunker Hill Ave, Stratham, NH
Test Pits – Christian Smith, P.E. of Beals Associates, PLLC- #1543

11/08/2023
Witness: Mike Cuomo

Test Pit #7

0" – 9"	10YR 3/4	Dark Yellowish Brown Fine, Sandy, Loam Granular, Friable
9" - 18"	10YR 5 /6	Yellowish Brown Fine, Sandy, Loam Platy, Friable
18" – 62"	2.5Y 5/4	Light Olive Brown Silt Loam Platy, Firm Redox-Common 2-20%

ESHWT = 18"
Observed Ground Water – None
Restrictive Layer: 18 Inches
Refusal: None to 62"
Roots to 26 Inches
Perc Rate 10 min/inch @15"



Test Pit #8

0" – 8"	10YR 3 /4	Dark Yellowish Brown Fine, Sandy, Loam Blocky, Friable
8" - 23"	10YR 5 /4	Yellowish Brown Fine, Sandy, Loam Platy, Friable
23" – 62"	2.5Y 4/4	Olive Brown Silt Loam Platy, Firm Redox-Common 2-20%

ESHWT = 23"
Observed Ground Water – None
Restrictive Layer: 23 Inches
Refusal: None to 62"
Roots to 21 Inches
Perc Rate 10 min/inch @18"

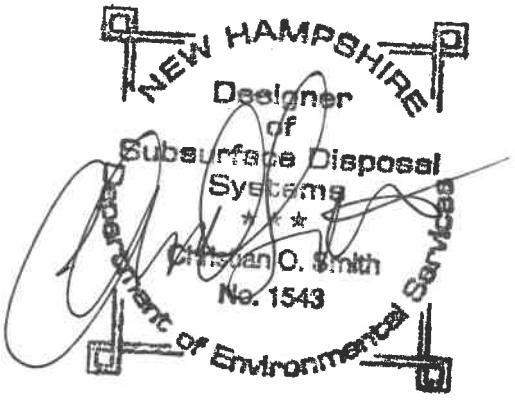
NH-1500 – 189 Bunker Hill Ave, Stratham, NH
Test Pits – Christian Smith, P.E. of Beals Associates, PLLC- #1543

11/08/2023
Witness: Mike Cuomo

Test Pit #9

0" – 9"	10YR 3 /4	Dark Yellowish Brown Fine, Sandy, Loam Granular, Friable
9" - 23"	10YR 5 /4	Yellowish Brown Fine, Sandy, Loam Platy, Friable
23"-63"	2.5Y 5/4	Light Olive Brown Loamy, Sand Massive, Firm Redox-Common 2-20%

ESHWT = 23"
Observed Ground Water – None
Restrictive Layer: 23 Inches
Refusal: None to 63"
Roots to 4 Inches
Perc Rate 7 min/inch @20"



Test Pit #10

0" – 8"	10YR 4/4	Dark Yellowish Brown Fine, Sandy, Loam Platy, Friable
8" - 21"	10YR 4/6	Dark Yellowish Brown Fine, Sandy, Loam Blocky, Friable/Very Stoney
21" – 61"	2.5Y 4/4	Olive Brown Loamy Sand Massive, Firm/Very Stoney Redox-Common 2-20%

ESHWT = 21"
Observed Ground Water – None
Restrictive Layer: 21 Inches
Refusal: None to 61"
Roots to 8 Inches
Perc Rate 8 min/inch @18"

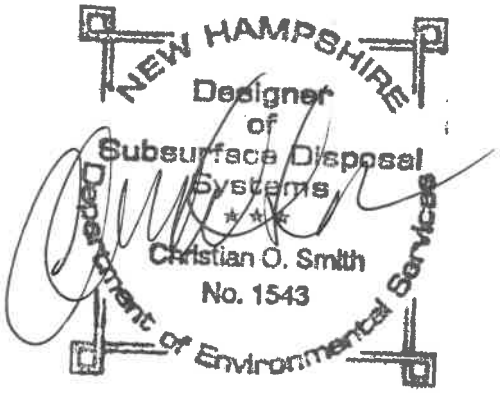
NH-1500 – 189 Bunker Hill Ave, Stratham, NH
Test Pits – Christian Smith, P.E. of Beals Associates, PLLC- #1543

11/08/2023
Witness: Mike Cuomo

Test Pit #11

0" – 10"	10YR 3 /4	Dark Yellowish Brown Fine, Sandy, Loam Blocky, Friable
10" - 27"	10YR 5 /6	Yellowish Brown Fine, Sandy, Loam Blocky, Friable/Stoney
27" – 64"	2.5Y 5/4	Light Olive Brown Loamy Sand Blocky, Firm/Stoney Redox-Common 2-20%

ESHWT = 27"
Observed Ground Water – None
Restrictive Layer: 27 Inches
Refusal: None – 64 Inches
Roots to 6 Inches
Perc Rate 8 min/inch @22"



Test Pit #12

0" – 12"	10YR 3 /4	Dark Yellowish Brown Fine, Sandy, Loam Blocky, Friable
12" - 37"	10YR 5 /4	Yellowish Brown Fine, Sandy, Loam Blocky, Friable
37" – 62"	2.5Y 4/4	Olive Brown Loamy Sand Massive, Firm/Stoney Redox-Common 2-20%

ESHWT = 37"
Observed Ground Water – None
Restrictive Layer: 37 Inches
Refusal: None – 62 Inches
Roots to 6 Inches
Perc Rate 8 min/inch @25"

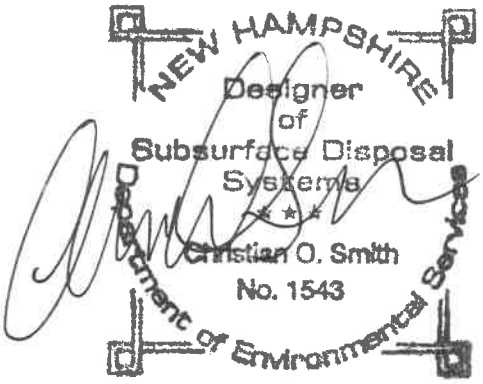
NH-1500 – 189 Bunker Hill Ave, Stratham, NH
Test Pits – Christian Smith, P.E. of Beals Associates, PLLC- #1543

11/08/2023
Witness: Mike Cuomo

Test Pit #13

0" – 10"	10YR 3/4	Dark Yellowish Brown Fine, Sandy, Loam Granular, Friable
10" - 23"	10YR 4/6	Dark Yellowish Brown Fine, Sandy, Loam Blocky, Friable
23" – 62"	2.5Y 5/4	Light Olive Brown Silt Loam Platy, Firm Redox-Common 2-20%

ESHWT = 23"
Observed Ground Water – None
Restrictive Layer: 23 Inches
Refusal: None to 62 Inches
Roots to 23 Inches
Perc Rate 10 min/inch @20"



Test Pit #14

0" – 18"	10YR 3 /4	Dark Yellowish Brown Fine, Sandy, Loam Granular, Friable
18" - 21"	10YR 4/ 4	Dark Yellowish Brown Fine Sandy Loam Blocky, Friable
21" – 64"	2.5Y 4/4	Olive Brown Silt, Loam Blocky, Firm Redox-Common 2-20%

ESHWT = 21"
Observed Ground Water – None
Restrictive Layer: 21 Inches
Refusal: None - 64 Inches
Roots to 32 Inches
Perc Rate 10 min/inch @18"

Test Pit #D1

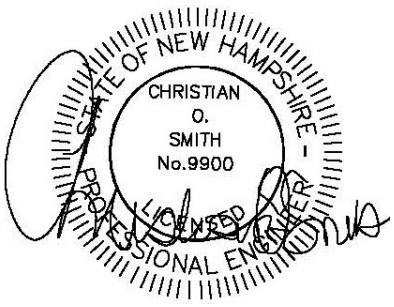
0" – 12"	10YR 4 /4	Dark Yellowish Brown Fine, Sandy, Loam Granular, Friable
12" - 28"	10YR 5/ 4	Yellowish Brown Fine, Sandy, Loam Blocky, Friable
28" – 68"	2.5Y 4/3	Olive Brown Silt, Loam Platy, Firm Redox-Common 2-20%

ESHWT = 28"
Observed Ground Water – 42 inches
Restrictive Layer: 28 Inches
Refusal: None
Roots to 26 Inches

Test Pit #D2

0" – 10"	10YR 4 /4	Dark Yellowish Brown Fine, Sandy, Loam Granular, Friable
10" - 18"	10YR 5/ 3	Brown Fine, Sandy, Loam Blocky, Friable
18" – 68"	2.5Y 5/2	Grayish Brown Silt, Loam Blocky, Firm Redox-Common 2-20%

ESHWT = 18"
Observed Ground Water – 38 inches
Restrictive Layer: 18 Inches
Refusal: None
Roots to 6 Inches

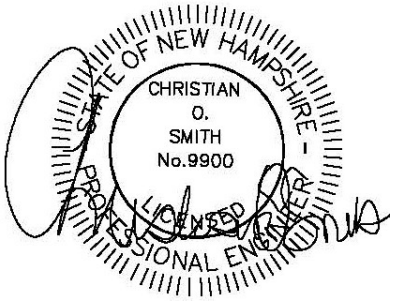


NH-1500 – 189 Bunker Hill 01/23/2024
Test Pits – Christian Smith, P.E. of Beals Associates, PLLC- #1543 Witness:

Test Pit #D3

0" – 12"	10YR 4 /4	Dark Yellowish Brown Fine, Sandy, Loam Granular, Friable
12" - 18"	10YR 5/ 3	Brown Fine, Sandy, Loam Blocky, Friable
18" – 60"	2.5Y 5/4	Light Olive Brown Silt, Loam Platy, Firm Redox-Common 2-20%

ESHWT = 18"
Observed Ground Water – 24 inches
Restrictive Layer: 18 Inches
Refusal: None
Roots to 6 Inches



STORMWATER MANAGEMENT / BMP
INSPECTION & MAINTENANCE PLAN

Chinburg Properties Inc
Windsong Place
Stratham, New Hampshire
NH-1500
January 2024

Proper construction, inspections, maintenance, and repairs are key elements in maintaining a successful stormwater management program on a developed property. Routine inspections ensure permit compliance and reduce the potential for deterioration of infrastructure or reduced water quality.

For the purpose of this Stormwater Management Program, a significant rainfall event is considered an event of three (3) inches or more in a 24-hour period or at least 0.5 inches in a one-hour period. During construction, inspections should be conducted every two weeks or after a 0.25" rainfall event in a 24-hour period per the EPA NPDES Phase II SWPPP, until the entire disturbed area is fully restabilized. Upon full stabilization of the project and filing of an NOI, inspections need only be conducted after a significant rainfall event as described above or as described in the maintenance guidelines below.

During construction activities Chinburg Properties Inc with an address of 3 Penstock Way, Newmarket, NH 03857 and a phone of 603.868.5995 or their heirs and/or assigns, shall be responsible for inspections and maintenance activities for the above project site. The individual homeowners shall be responsible for *ongoing inspection and maintenance* of the sediment forebay and infiltration ponds. The Town of Stratham DPW shall be responsible for *ongoing inspection and maintenance* of the catchbasins and manholes within the right-of-way.

The owner is responsible to ensure that any subsequent owner has copies of the Log Form and Annual Report records and fully understands the responsibilities of this plan. The grantor owner(s) will ensure this document is provided to the grantee owner(s) by duplicating the Ownership Responsibility Sheet which is found toward the back of this document, which will be maintained with the Inspection & Maintenance Logs and provided to the Town of Stratham upon request.

Documentation:
A maintenance log (i.e., report) will be kept summarizing inspections, maintenance, and any corrective actions taken. The log will include the date on which each inspection or maintenance task was performed, a description of the inspection findings or maintenance completed, and the name of the inspector or maintenance personnel performing the task (see Stormwater System Operation and Maintenance Plan Inspection & Maintenance Manual Checklist attached). If a maintenance task requires the clean-out of any sediments or debris, the location where the sediment and debris was disposed after removal shall be indicated.

Best Management Practices (BMP) Maintenance Guidelines

The following provides a list of recommendations and guidelines for managing the Stormwater facilities. The cited areas, facilities, and measures will be inspected and the identified deficiencies will be corrected. Clean-out must include the removal and legal disposal of any accumulated sediments and debris.

DURING CONSTRUCTION

1. Stabilized Construction Entrance

A temporary gravel construction entrance provides an area where mud can be dislodged from tires before the vehicle leaves the construction site to reduce the amount of mud and sediment transported onto paved municipal and state roads. The stone size for the pad should be between 1 and 2-inch coarse aggregate, and the pad itself constructed to a minimum length of 50' for the full width of the access road. The aggregate should be placed at least six inches thick. A plan view and profile are shown on Sheet E1 - Sediment and Erosion Control Detail Plan.

2. Dust Control

Dust will be controlled on the site using multiple BMPs. Mulching and temporary seeding will be the first line of protection to be utilized where problems occur. If dust problems are not solved by these applications, the use of water and calcium chloride can be applied. Calcium chloride will be applied at a rate that will keep the surface moist but not cause pollution.

3. Temporary Erosion and Sediment Control Devices / Barriers

Function – Temporary erosion and sediment control devices are utilized during construction period to divert, store and filter stormwater from non-stabilized surfaces. These devices include, but are not limited to: silt fences, hay bales, filters, sediment traps, stone check dams, mulch and erosion control blankets.

Maintenance – Temporary erosion and sediment control devices shall be inspected and maintained on a weekly basis and following a significant storm event (>0.5-inch rain event) throughout the construction period to ensure that they still have integrity and are not allowing sediment to pass. Sediment build-up in swales will be removed if it is deeper than six inches. Sediment is to be removed from sumps in the catch basin semi-annually. Refer to the Site Plan drawings for the maintenance of temporary erosion and sediment control devices.

4. Invasive Species

THE NH COMMISSIONER OF AGRICULTURE PROHIBITS THE COLLECTION, POSSESSION, IMPORTATION, TRANSPORTATION, SALE, PROPAGATION, TRANSPLANTATION, OR CULTIVATION OF PLANTS BANNED BY NH LAW RSA 430:53 AND NH CODE ADMINISTRATIVE RULES AGR 3800. THE PROJECT

SHALL MEET ALL REQUIREMENTS AND THE INTENT OF. RSA 430:53 AND AGR 3800 RELATIVE TO INVASIVE SPECIES.

POST CONSTRUCTION / LONG TERM MAINTENANCE:

5. Catch Basins/Manholes

Inspect catch basins 2 times per year (preferably in spring and fall) to ensure that the catch basins are working in their intended fashion and that they are free of debris. Clean structures when sediment depths reach 2" from invert of outlet. If the basin outlet is designed with a hood to trap floatable materials (i.e. Snout), check to ensure watertight seal is working. Remove floating debris and hydrocarbons at the time of the inspection.

6. Culverts

Inspect culverts 2 times per year (preferably in spring and fall) to ensure that the culverts are working in their intended fashion and that they are free of debris. Remove any obstructions to flow; remove accumulated sediments and debris at the inlet, at the outlet, and within the conduit and to repair any erosion damage at the culvert's inlet and outlet. Repair/replace culvert if it becomes crushed or deteriorated.

7. Vegetated Areas

Inspect slopes and embankments early in the growing season to identify active or potential erosion problems. Replant bare areas or areas with sparse growth. Where rill erosion is evident, armor the area with an appropriate lining or divert the erosive flows to on-site areas able to withstand the concentrated flows. The facilities will be inspected after major storms and any identified deficiencies will be corrected.

8. Roadways and Paved Surfaces

Clear accumulations of winter sand along roadways at least once a year, preferably in the spring. Accumulations on pavement may be removed by pavement sweeping. Accumulations of sand along road shoulders may be removed by grading excess sand to the pavement edge and removing it manually or by a front-end loader.

9. Pretreatment Structures/Sediment Forebays

Inspect all upstream pre-treatment measures (forebays, etc.) for sediment and floatables accumulation. Remove and dispose of sediments, debris, or woody vegetation as needed. Remove sediment as needed when average depths reach 6". Mow embankments at least two times annually.

10. Drainage Swales/Stormwater Conveyances

Drainage swales will be stabilized with vegetation for long term cover as outlined below, and on Sheet E-1 using seed mixture C. As a general rule, velocities in the swale should not

exceed 3.0 feet per second for a vegetated swale although velocities as high as 4.5 FPS are allowed under certain soil conditions.

Maintenance

- 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.

11. Stormwater Infiltration Facilities

- Inspect all upstream pre-treatment measures for sediment and floatables accumulation. Remove and dispose of sediments or debris as needed.
- The infiltration facility will be inspected within the first three months after construction.
- After the initial three months, the infiltration facility will be inspected 2 times per year to ensure that the filter is draining within 72 hours of a rain event equivalent to 1/2" or more.
- Failure to drain in 72 hours will require part or all of the top 3 inches of the infiltration area to be removed and replaced with new like material. If the infiltration system does not drain within 72-hours following a rainfall event, then a qualified professional should assess the condition of the facility to determine measures required to restore infiltration function.
- Vegetated infiltration ponds or swales will be mowed at least annually or otherwise maintained to control the growth of woody vegetation and to control the accumulation of sediments in order to maintain the water quality volume. Any woody vegetation or accumulated sediment must be removed.
- The facilities will be inspected after major storms and any identified deficiencies will be corrected.

12. Riprap Weir – Maintenance

- Inspect at least once annually for accumulation of sediment and debris and for signs of erosion within weir or down-slope of the spreader.
- Remove debris whenever observed during inspection.
- Mow as required by landscaping design. At a minimum, mow annually to control woody vegetation.
- Repair any erosion and re-grade or replace stone berm material, as warranted by inspection.
- Reconstruct the spreader if down-slope channelization indicates that the spreader is not level or that discharge has become concentrated, and corrections cannot be made through minor re-grading.

14. Invasive Species

Background

Invasive plants are introduced, alien, or non-native plants, which have been moved by people from their native habitat to a new area. Some exotic plants are imported for human use such as landscaping, erosion control, or food crops. They also can arrive as "hitchhikers" among shipments of other plants, seeds, packing materials, or fresh produce. Some exotic plants become invasive and cause harm by:

- Becoming weedy and overgrown;
- Killing established shade trees;
- Obstructing pipes and drainage systems;
- Forming dense beds in water;
- Lowering water levels in lakes, streams, and wetlands;
- Destroying natural communities;
- Promoting erosion on stream banks and hillsides; and
- Resisting control except by hazardous chemical.

During maintenance activities, check for the presence of invasive plants and remove in a safe manner. They should be controlled as described on the following fact sheet prepared by the University of New Hampshire Cooperative Extension entitled Methods for Disposing Non-Native Invasive Plant dated January 2010.

In the event that invasive species are noticed growing in any of the stormwater management practices, the invasive vegetation shall be removed completely to include root matter and disposed of properly. Prior to disposal, the vegetation shall be placed on and completely cover with a plastic tarp for a period of two – three weeks until plants are completely dead. If necessary or to expedite the process, spray only the invasive vegetation and roots with a systemic nonselective herbicide after placement on the tarp (to prevent chemical migration) and then cover.

Annual Report

Description: The owner is responsible to keep an **Inspection & Maintenance Activity Log** that documents inspection, maintenance, and repairs to the storm water management system, and a **Deicing Log** to track the amount and type of deicing material applied to the site. The original owner is responsible to ensure that any subsequent owner (s) have copies of the Stormwater System Operation and Maintenance Plan & Inspection and Maintenance Manual, copies of past logs and check lists. This includes any owner association for potential condominium conversion of the property. The Annual Report will be prepared and submitted to the Town of Stratham DPW upon request.

Disposal Requirements

Disposal of debris, trash, sediment, and other waste materials should be done at suitable disposal/recycling sites and in compliance with all applicable local, state, and federal waste regulations.

STORMWATER SYSTEM OPERATION AND MAINTENANCE PLAN

Inspection & Maintenance Manual Checklist

Residential Development
Chinburg Properties Inc – Windsong Place
Stratham, NH

BMP / System	Minimum Inspection Frequency	Minimum Inspection Requirements	Maintenance / Cleanout Threshold
Stabilized Construction Entrance	Weekly	Inspect adjacent roadway for sediment tracking Inspect stone for sediment accumulation	Sweep adjacent roadways as soon as sediment is tracked Top dress with additional stone when necessary to prevent tracking
Sediment Control Devices / Barriers	Weekly	Inspect accumulated sediment level, rips, and tears	Repair or replace damaged lengths Remove and dispose of accumulated sediment once level reaches 1/3 of barrier height
Pavement Sweeping	Spring and Fall	Removal of sand and litter from impervious areas	N/A
Litter/Trash Removal	Routinely	Inspect dumpsters, outdoor waste receptacles area, and yard areas, as well as ponds and swale areas.	Site will be free of litter/trash.
Landscaping	Maintained as required and mulched each Spring	N/A	Trash/debris and weed removal
Drainage Pipes, Catchbasins & Drain Manholes	Spring and Fall	Check for sediment accumulation & clogging.	More than 2" sediment depth

Sediment Forebay	Spring and Fall	Sediment accumulation. Inspect embankments, inlet and outlet structures, and appurtenances.	Remove sediment as needed. Remove trash & debris from system and appurtenances. Mow embankment and remove woody vegetation.
Infiltration Basin	Spring and Fall and after every 2.5" of rain or greater in a 24-hour period	Monitoring and evaluation of wetland vegetation, inspection of sediment on pond surface, inlet/outlet and appurtenance structure evaluation. 72-Hour drawdown time evaluation and vegetation evaluation.	Remove dead & diseased vegetation along with all debris; take corrective measures, reseed and repair inlet/outlet structures and appurtenances if required. Mow embankments and remove woody vegetation. Restore infiltration by removing accumulated sediments and reconstruction of the infiltration basin as necessary.
Drainage Swales	Annually	Inspect for erosion, sediment accumulation, vegetation loss, and presence of invasive species.	Remove sediment & debris when exceeds 3". Repair eroded areas. Remove invasive species and dead vegetation. Reseed as warranted.
	Spring and Fall	Inspect height of vegetation	Mow when necessary – allow length of vegetation to remain at least 4" high
Riprap Outlet Protection/Level Spreaders	Spring and Fall and after every 2.5" of rain or greater in a 24-hour period	Check for sediment buildup and displaced stones. Inspect for torn or visible fabric.	Remove excess sediment and trash/debris. Immediately repair and replace stone and/or fabric as necessary.
Annual Report	1 time per year	Submit Annual Report to Town of Stratham Inspector upon request	

Inspection Notes:

STORMWATER SYSTEM OPERATION AND MAINTENANCE PLAN

Inspection & Maintenance Manual Log Form

Residential Development
Chinburg Properties Inc – Windsong Place
Stratham, NH

BMP / System	Date Inspected	Inspected By	Cleaning/Repair (List Items & Comments)	Date Repaired	Repairs Performed By

INSPECTION CHECKLIST AND MAINTENANCE GUIDANCE

INFILTRATION POND - INSPECTION CHECKLIST

Location: _____

Owner Change Since Last Inspection? Y N

Owner Name, Address, Phone: _____

Date:_____Time:_____Site Conditions: _____

Inspection Items	Satisfactory (S) or Unsatisfactory (U)	Comments/Corrective Action
Sand Filter Inspection List		
Complete drainage of the filter in about 40 hours after a rain event?		
Clogging of filter surface?		
Clogging of inlet/outlet structures?		
Clogging of filter fabric?		
Clear of debris and functional?		
Leaks or seeps in filter?		
Obstructions of spillway(s)?		
Animal burrows in filter?		
Sediment accumulation in filter bed (less than 50% is acceptable)?		
Cracking, spalling, bulging or deterioration of concrete?		
Erosion in area draining to sand filter?		
Erosion around inlets, filter bed, or outlets?		
Pipes and other structures in good		
Undesirable vegetation growth?		
Other (describe)?		
Hazards		
Have there been complaints from residents?		
Public hazards noted?		

If any of the above inspection items are **UNSATISFACTORY**, list corrective actions and the corresponding completion dates below:

Corrective Action Needed	Due Date

Inspector Signature:_____

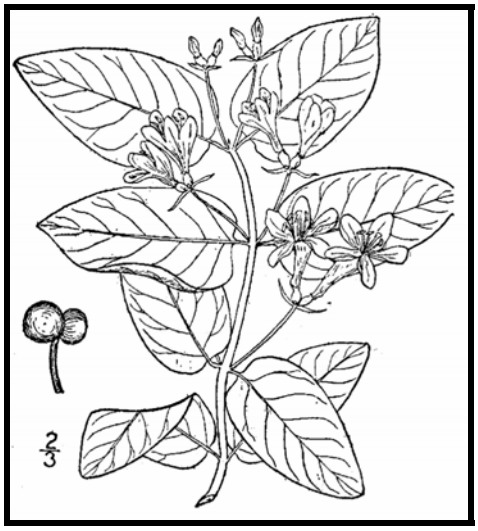
Inspector Name (printed):_____

Date:_____

University of New Hampshire Cooperative Extension

Methods for Disposing Non-Native Invasive Plants

Prepared by the Invasives Species Outreach Group, volunteers interested in helping people control invasive plants. Assistance provided by the Piscataquog Land Conservancy and the NH Invasives Species Committee. Edited by Karen Bennett, Extension Forestry Professor and Specialist.



Tatarian honeysuckle
Lonicera tatarica
USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. *An illustrated flora of the northern United States, Canada and the British Possessions*. Vol. 3: 282.

Non-native invasive plants crowd out natives in natural and managed landscapes. They cost taxpayers billions of dollars each year from lost agricultural and forest crops, decreased biodiversity, impacts to natural resources and the environment, and the cost to control and eradicate them.

Invasive plants grow well even in less than desirable conditions such as sandy soils along roadsides, shaded wooded areas, and in wetlands. In ideal conditions, they grow and spread even faster. There are many ways to remove these non-native invasives, but once removed, care is needed to dispose the removed plant material so the plants don't grow where disposed.

Knowing how a particular plant reproduces indicates its method of spread and helps determine the appropriate disposal method. Most are spread by seed and are dispersed by wind, water, animals, or people. Some reproduce by vegetative means from pieces of stems or roots forming new plants. Others spread through both seed and vegetative means.

Because movement and disposal of viable plant parts is restricted (see NH Regulations), viable invasive parts can't be brought to most transfer stations in the state. Check with your transfer station to see if there is an approved, designated area for invasives disposal. This fact sheet gives recommendations for rendering plant parts non-viable.

Control of invasives is beyond the scope of this fact sheet. For information about control visit www.nhinvasives.org or contact your UNH Cooperative Extension office.

New Hampshire Regulations

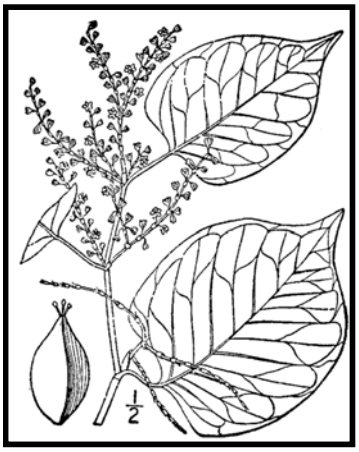
Prohibited invasive species shall only be disposed of in a manner that renders them nonliving and nonviable. (Agr. 3802.04)

No person shall collect, transport, import, export, move, buy, sell, distribute, propagate or transplant any living and viable portion of any plant species, which includes all of their cultivars and varieties, listed in Table 3800.1 of the New Hampshire prohibited invasive species list. (Agr 3802.01)

How and When to Dispose of Invasives?

To prevent seed from spreading remove invasive plants before seeds are set (produced). Some plants continue to grow, flower and set seed even after pulling or cutting. Seeds can remain viable in the ground for many years. If the plant has flowers or seeds, place the flowers and seeds in a heavy plastic bag "head first" at the weeding site and transport to the disposal site. The following are general descriptions of disposal methods. See the chart for recommendations by species.

Burning: Large woody branches and trunks can be used as firewood or burned in piles. For outside burning, a written fire permit from the local forest fire warden is required unless the ground is covered in snow. Brush larger than 5 inches in diameter can't be burned. Invasive plants with easily airborne seeds like black swallow-wort with mature seed pods (indicated by their brown color) shouldn't be burned as the seeds may disperse by the hot air created by the fire.



Japanese knotweed
Polygonum cuspidatum
USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. *An illustrated flora of the northern United States, Canada and the British Possessions*. Vol. 1: 676.

Bagging (solarization): Use this technique with softer-tissue plants. Use heavy black or clear plastic bags (contractor grade), making sure that no parts of the plants poke through. Allow the bags to sit in the sun for several weeks and on dark pavement for the best effect.

Tarping and Drying: Pile material on a sheet of plastic and cover with a tarp, fastening the tarp to the ground and monitoring it for escapes. Let the material dry for several weeks, or until it is clearly nonviable.

Chipping: Use this method for woody plants that don't reproduce vegetatively.

Burying: This is risky, but can be done with watchful diligence. Lay thick plastic in a deep pit before placing the cut up plant material in the hole. Place the material away from the edge of the plastic before covering it with more heavy plastic. Eliminate as much air as possible and toss in soil to weight down the material in the pit. Note that the top of the buried material should be at least three feet underground. Japanese knotweed should be at least 5 feet underground!

Drowning: Fill a large barrel with water and place soft-tissue plants in the water. Check after a few weeks and look for rotted plant material (roots, stems, leaves, flowers). Well-rotted plant material may be composted. A word of caution- seeds may still be viable after using this method. Do this before seeds are set. This method isn't used often. Be prepared for an awful stink!

Composting: Invasive plants can take root in compost. Don't compost any invasives unless you know there is no viable (living) plant material left. Use one of the above techniques (bagging, tarping, drying, chipping, or drowning) to render the plants nonviable before composting. Closely examine the plant before composting and avoid composting seeds.

Be diligent looking for seedlings for *years* in areas where removal and disposal took place.

Suggested Disposal Methods for Non-Native Invasive Plants

This table provides information concerning the disposal of removed invasive plant material. If the infestation is treated with herbicide and left in place, these guidelines don't apply. Don't bring invasives to a local transfer station, unless there is a designated area for their disposal, or they have been rendered non-viable. This listing includes wetland and upland plants from the New Hampshire Prohibited Invasive Species List. The disposal of aquatic plants isn't addressed.

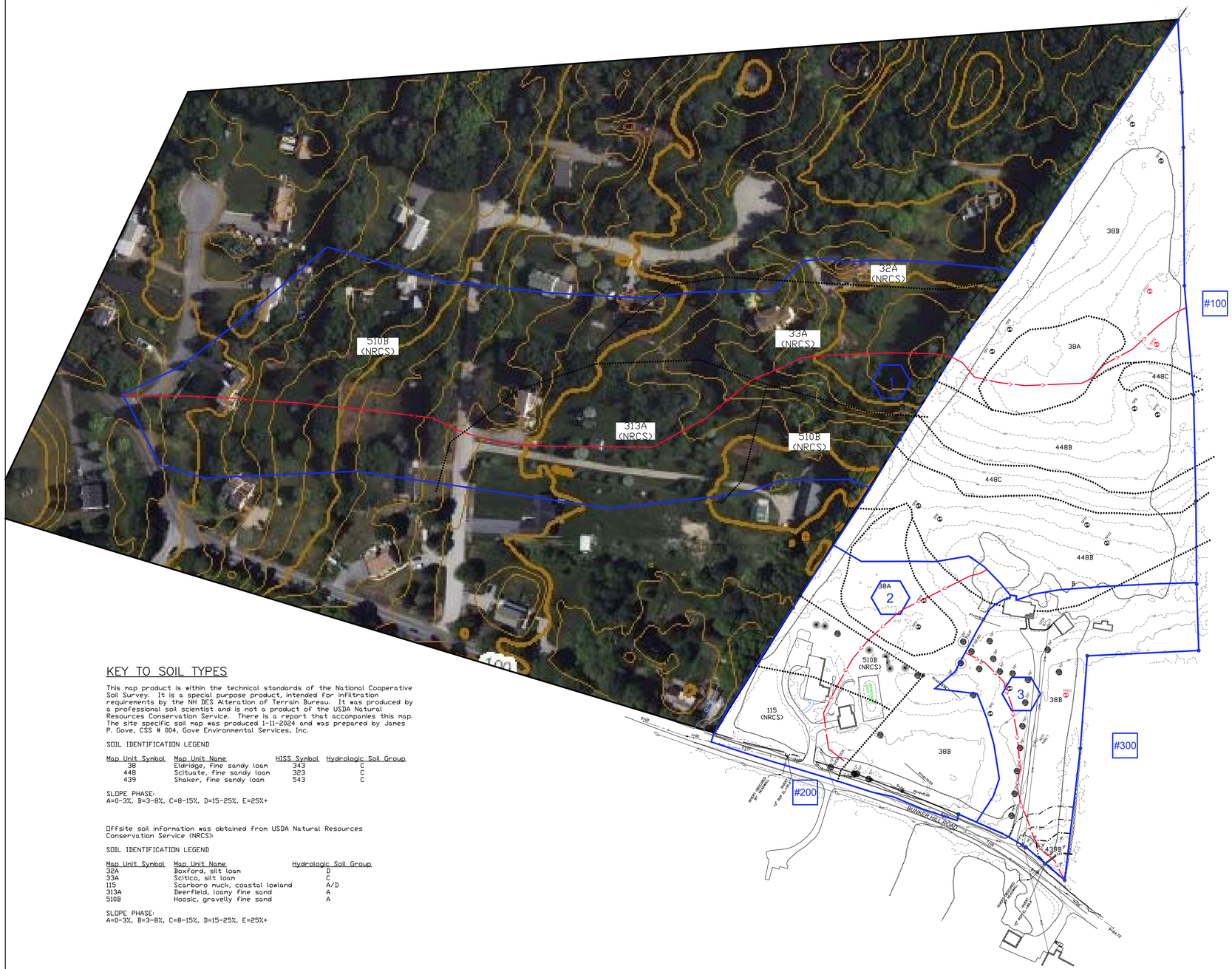
<table>
<tr><th>Woody Plants</th><th>Method of Reproducing</th><th>Methods of Disposal</th></tr>
<tr><td rowspan="2">Norway maple
(Acer platanoides)
European barberry
(Berberis vulgaris)
Japanese barberry
(Berberis thunbergii)
autumn olive
(Elaeagnus umbellata)
burning bush
(Euonymus alatus)
Morrow's honeysuckle
(Lonicera morrowii)
Tatarian honeysuckle
(Lonicera tatarica)
showy bush honeysuckle
(Lonicera x bella)
common buckthorn
(Rhamnus cathartica)
glossy buckthorn
(Frangula alnus)</td><td rowspan="2">Fruit and Seeds
  </td><td>Prior to fruit/seed ripening
Seedlings and small plants
▪ Pull or cut and leave on site with roots exposed. No special care needed.
Larger plants
▪ Use as firewood.
▪ Make a brush pile.
▪ Chip.
▪ Burn.</td></tr>
<tr><td>After fruit/seed is ripe
Don't remove from site.
▪ Burn.
▪ Make a covered brush pile.
▪ Chip once all fruit has dropped from branches.
▪ Leave resulting chips on site and monitor.</td></tr>
<tr><td rowspan="2">oriental bittersweet
(Celastrus orbiculatus)
multiflora rose
(Rosa multiflora)</td><td rowspan="2">Fruits, Seeds, Plant Fragments
  </td><td>Prior to fruit/seed ripening
Seedlings and small plants
▪ Pull or cut and leave on site with roots exposed. No special care needed.
Larger plants
▪ Make a brush pile.
▪ Burn.</td></tr>
<tr><td>After fruit/seed is ripe
Don't remove from site.
▪ Burn.
▪ Make a covered brush pile.
▪ Chip – only after material has fully dried (1 year) and all fruit has dropped from branches. Leave resulting chips on site and monitor.</td></tr>
</table>

Non-Woody Plants	Method of Reproducing	Methods of Disposal
garlic mustard *(Alliaria petiolata)* spotted knapweed *(Centaurea maculosa)* ▪ Sap of related knapweed can cause skin irritation and tumors. Wear gloves when handling. black swallow-wort *(Cynanchum nigrum)* ▪ May cause skin rash. Wear gloves and long sleeves when handling. pale swallow-wort *(Cynanchum rossicum)* giant hogweed *(Heracleum mantegazzianum)* ▪ Can cause major skin rash. Wear gloves and long sleeves when handling. dame's rocket *(Hesperis matronalis)* perennial pepperweed *(Lepidium latifolium)* purple loosestrife *(Lythrum salicaria)* Japanese stilt grass *(Microstegium vimineum)* mile-a-minute weed *(Polygonum perfoliatum)*	**Fruits and Seeds** 	**Prior to flowering** Depends on scale of infestation Small infestation ▪ Pull or cut plant and leave on site with roots exposed. Large infestation ▪ Pull or cut plant and pile. (You can pile onto or cover with plastic sheeting). ▪ Monitor. Remove any re-sprouting material. **During and following flowering** Do nothing until the following year or remove flowering heads and bag and let rot. Small infestation ▪ Pull or cut plant and leave on site with roots exposed. Large infestation ▪ Pull or cut plant and pile remaining material. (You can pile onto plastic or cover with plastic sheeting). ▪ Monitor. Remove any re-sprouting material.
common reed (*Phragmites australis*) Japanese knotweed *(Polygonum cuspidatum)* Bohemian knotweed *(Polygonum x bohemicum)*	**Fruits, Seeds, Plant Fragments** Primary means of spread in these species is by plant parts. Although all care should be given to preventing the dispersal of seed during control activities, the presence of seed doesn't materially influence disposal activities.	**Small infestation** ▪ Bag all plant material and let rot. ▪ Never pile and use resulting material as compost. ▪ Burn. **Large infestation** ▪ Remove material to unsuitable habitat (dry, hot and sunny or dry and shaded location) and scatter or pile. ▪ Monitor and remove any sprouting material. ▪ Pile, let dry, and burn.

January 2010

Appendix IV

Plans



KEY TO SOIL TYPES

This map product is within the technical standards of the National Cooperative Soil Survey. It is a special purpose product, intended for infiltration requirements by the NH DES Alteration of Terrain Bureau. It was produced by a professional soil scientist and is not a product of the USDA Natural Resources Conservation Service. There is a report that accompanies this map. The site specific soil map was produced 1-11-2024 and was prepared by James P. Gove, CSS # 004, Gove Environmental Services, Inc.

SOIL IDENTIFICATION LEGEND

Map Unit Symbol	Map Unit Name	HISS Symbol	Hydrologic Soil Group
38	Eldridge, fine sandy loam	343	C
448	Scituate, fine sandy loam	323	C
439	Shaker, fine sandy loam	543	C

SLOPE PHASE:
A=0-3%, B=3-8%, C=8-15%, D=15-25%, E=25%+

Offsite soil information was obtained from USDA Natural Resources Conservation Service (NRCS)

SOIL IDENTIFICATION LEGEND

Map Unit Symbol	Map Unit Name	Hydrologic Soil Group
32A	Boxford, silt loam	D
33A	Scitico, silt loam	C
115	Scarboro muck, coastal lowland	A/D
313A	Deerfield, loamy fine sand	A
510B	Hoosic, gravelly fine sand	A

SLOPE PHASE:
A=0-3%, B=3-8%, C=8-15%, D=15-25%, E=25%+

PREPARED FOR:

CHINBURG PROPERTIES INC
3 PENSTOCK WAY
NEWMARKET, NH 03857

BEALS ASSOCIATES, PLLC
70 PORTSMOUTH AVE,
THIRD FLOOR, SUITE 2
STRATHAM, N.H. 03885
PHONE: 603-583-4860,
FAX. 603-583-4863

** THIS DRAWING IS FOR DRAINAGE PURPOSES ONLY **

WATERSHED LEGEND

- 4 — SUBCATCHMENT
- 4 — REACH
- 4 — POND
- LIMIT OF SUBCATCHMENT
- FLOW PATH

LEGEND

- UTILITY POLE
- TP#1A — TEST PIT W/ NO.
- SURFACE LEDGE
- STONE WALL
- TREE LINE
- EXISTING CONTOUR – 10'
- EXISTING CONTOUR – 2'
- WETLAND BOUNDARY
- SOILS BOUNDARY LINE
- ABUTTING PROPERTY LINE
- EXISTING PROPERTY LINE

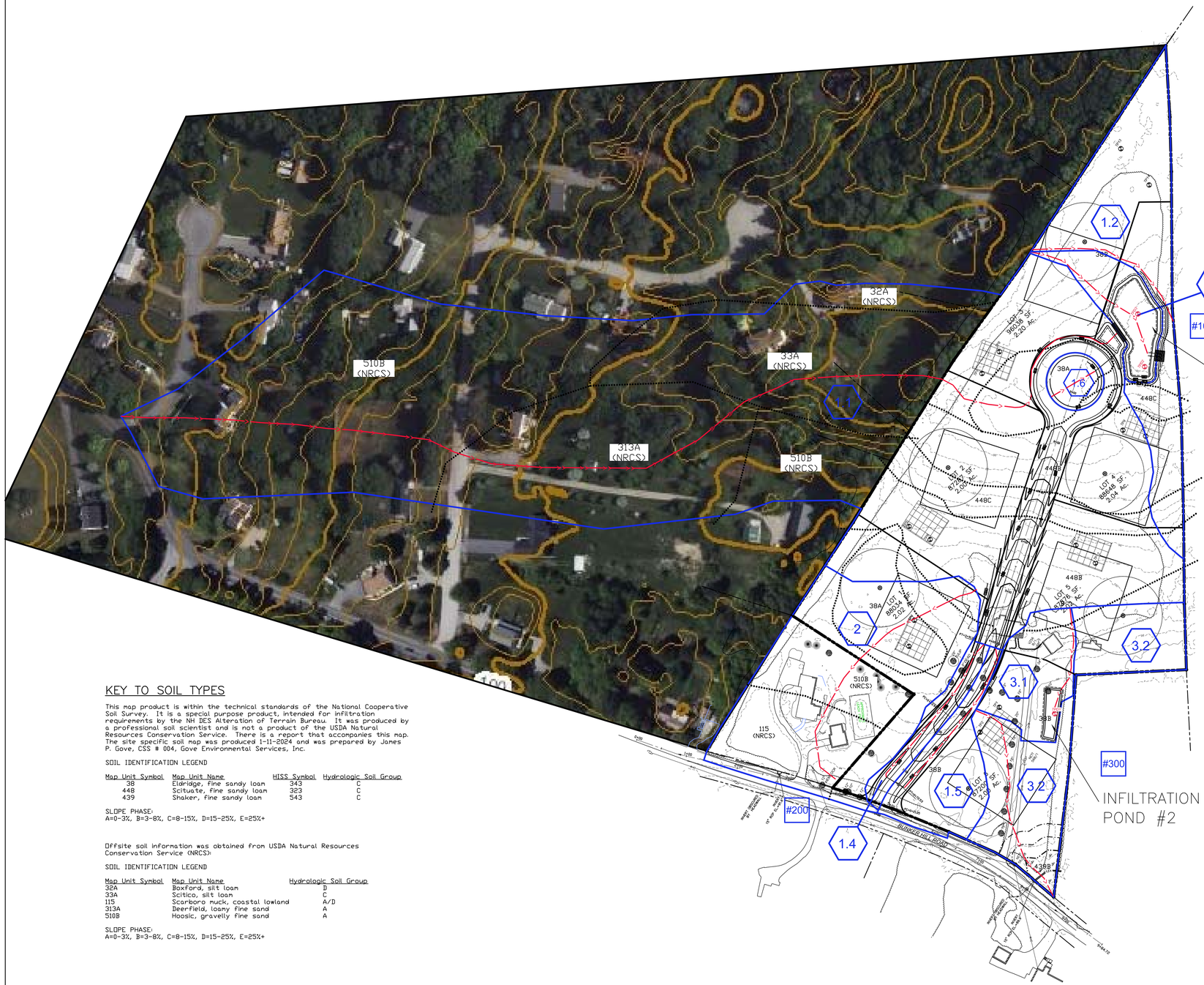
0 100 200 300

REVISIONS:	DATE:

EXISTING WATERSHED PLAN

PLAN FOR:
RESIDENTIAL DEVELOPMENT
BUNKER HILL AVE
STRATHAM, NH

DATE:	JAN. 2024	SCALE:	1"=100'
PROJ. N0:	NH-1500	SHEET NO.	WS-1



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439	Shaker, fine sandy loam	543	C

SLOPE PHASE:
A=0-3%, B=3-8%, C=8-15%, D=15-25%, E=25%+

Offsite soil information was obtained from USDA Natural Resources Conservation Service (NRCS)

SOIL IDENTIFICATION LEGEND

Map Unit Symbol	Map Unit Name	Hydrologic Soil Group
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33A	Scitico, silt loam	C
115	Scarboro muck, coastal lowland	A/D
313A	Deerfield, loamy fine sand	A
510B	Hoosic, gravelly fine sand	A

SLOPE PHASE:
A=0-3%, B=3-8%, C=8-15%, D=15-25%, E=25%+

PREPARED FOR:

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** THIS DRAWING IS FOR DRAINAGE PURPOSES ONLY **

WATERSHED LEGEND

- 4 — SUBCATCHMENT
- 4 — REACH
- 4 — POND
- LIMIT OF SUBCATCHMENT
- FLOW PATH

LEGEND

- UTILITY POLE
- TP#1A — TEST PIT W/ NO.
- SURFACE LEDGE
- STONE WALL
- TREE LINE
- EXISTING CONTOUR – 10'
- EXISTING CONTOUR – 2'
- WETLAND BOUNDARY
- SOILS BOUNDARY LINE
- ABUTTING PROPERTY LINE
- EXISTING PROPERTY LINE
- PROPOSED PROPERTY LINE

0 100 200 300

REVISIONS:	DATE:

PROPOSED WATERSHED PLAN

PLAN FOR:
RESIDENTIAL DEVELOPMENT
BUNKER HILL AVE
STRATHAM, NH

DATE:	JAN. 2024	SCALE:	1"=100'
PROJ. N0:	NH-1500	SHEET NO.	WS-2

GOVE ENVIRONMENTAL SERVICES, INC

SITE-SPECIFIC SOIL SURVEY REPORT
For
189 Bunker Hill Avenue, Stratham NH
By
GES, Inc.
Project # 2023139
Date: 1-11-2024

1. MAPPING STANDARDS

Site-Specific Soil Mapping Standards for New Hampshire and Vermont. SSSNNE Special Publication No. 3, Version 7.0, July, 2021.

This map product is within the technical standards of the National Cooperative Soil Survey. It is a special purpose product, intended for infiltration requirements by the NH DES Alteration of Terrain Bureau. The soil map was produced by a professional soil scientist and is not a product of the USDA Natural Resources Conservation Service. This report accompanies the soil map.

The site-specific soil map (SSSM) was produced 1-11-2024; prepared by JP Gove, CSS #004, GES, Inc.

Soils were identified with the New Hampshire State-wide Numerical Soils Legend, USDA NRCS, Durham, NH. Issue # 10, January 2011.

Hydrologic Soil Group was determined using SSSNNE Special Publication No. 5, Ksat Values for New Hampshire Soils, September 2009.

High Intensity Soil Map symbols, based upon SSSNNE Special Publication 1, December 2017, were added to the Soil Legend.

Scale of soil map: Approximately 1" = 60'.

Contours Interval: 2 feet

2. LANDFORMS & EXISTING CONDITIONS:

The site is located on a rolling landform that is a mix of parent materials: glacial till and marine sediments. The land is a primarily a field that has been mowed yearly. An old farmhouse is still present on the site.

3. DATE SOIL MAP PRODUCED

Date(s) of on-site field work: 10-18-2023

Date(s) of test pits: 11-08-2023

Test pits recorded by: Christian Smith #1543, Beals Associates, and witnessed by Michael Cuomo of the Rockingham Conservation District and as Town if Stratham reviewer.

4. GEOGRAPHIC LOCATION AND SIZE OF SITE

City or town where soil mapping was conducted: Stratham

Location: Tax Map 6, Lot 167

Size of area: Approximately 13.19 acres

Was the map for the entire lot? Yes

If no, where was the mapping conducted on the parcel: n/a

5. PURPOSE OF THE SOIL MAP

Was the map prepared to meet the requirement of Alteration of Terrain? Yes

If no, what was the purpose of the map? n/a

Who was the map prepared for? Beals Associates, PLLC

6. SOIL IDENTIFICATION LEGEND

Map Unit Symbol	Map Unit Name	HISS Symbol	Hydrologic Soil Group

38	Eldridge, fine sandy loam	343	C
448	Scituate, fine sandy loam	323	C
439	Shaker, fine sandy loam	543	C

SLOPE PHASE:

0-8%	B	8-15%	C	15-25%	D
25%-50%	E	50%+	F		

7. NARRATIVE MAP UNIT DESCRIPTIONS

SITE-SPECIFIC MAP UNIT: 38

CORRELATED SOIL SERIES: Eldridge, fine sandy loam

LANDSCAPE SETTING: Lower elevations and valleys

CHARACTERISTIC SURFACE FEATURES: Open field, no surface rocks

DRAINAGE CLASS: Moderately well drained

PARENT MATERIAL: Sands over marine silts and clays

NATURE OF DISSIMILAR INCLUSIONS: Boxford where the sand is too thin to classify and is primarily silts of silty clay. Scituate where the dense glacial till substratum is within 40 inches of the surface, but overlain with sands and silts. Both soils are moderately well drained.

ESTIMATED PERCENTAGE OF DISSIMILAR INCLUSIONS: 5%

SOIL PROFILE DESCRIPTIONS- horizon designation, depth, soil texture, Munsell color notation, Munsell color of redox features, soil structure, soil consistence, estimated coarse fragments, estimated seasonal high water table (ESHWT), observed water table (OBSWT), kind of water table (perched, apparent, or both), depth to lithic or paralithic contact:

Ap, 0 to 9 inches, fine sandy loam, 10YR3/2, granular, friable, less than 5% coarse fragments.

Bw1, 9 to 24 inches, fine sandy loam, 10YR5/6, granular, friable, less than 5% coarse fragments.

Bw2, 24 to 38 inches, loamy sand, 10YR5/4, massive, friable, less than 5% coarse fragments, 5YR5/8 redox features, ESHWT 24 inches, no OBSWT, perched, no lithic contact.

2C, 38 to 63 inches, silty clay loam, 2.5Y5/3, blocky, firm, less than 5% coarse fragments, 5YR5/8 redox features, no OBSWT, no lithic contact.

SITE-SPECIFIC MAP UNIT: 448

CORRELATED SOIL SERIES: Scituate, fine sandy loam

LANDSCAPE SETTING: Higher elevations and hills

CHARACTERISTIC SURFACE FEATURES: Open field, no surface rocks

DRAINAGE CLASS: Moderately well drained

PARENT MATERIAL: Dense glacial till

NATURE OF DISSIMILAR INCLUSIONS: Eldridge found along the transition between the Eldridge fine sandy loam map unit and the Scituate fine sandy loam map unit.

ESTIMATED PERCENTAGE OF DISSIMILAR INCLUSIONS: 5%

SOIL PROFILE DESCRIPTIONS- horizon designation, depth, soil texture, Munsell color notation, Munsell color of redox features, soil structure, soil consistence, estimated coarse fragments, estimated seasonal

high water table (ESHWT), observed water table (OBSWT), kind of water table (perched, apparent, or both), depth to lithic or paralithic contact:

Ap, 0 to 12 inches, fine sandy loam, 10YR3/2, granular, friable, 10% gravel coarse fragments.

Bw, 12 to 20 inches, fine sandy loam, 10YR5/6, granular, friable, 10% gravel coarse fragments.

Cd, 20 to 52 inches, fine sandy loam, 2.5Y5/4, blocky, firm, 10% gravel coarse fragments, 5YR5/8 and 2.5Y5/2 redox features, ESHWT 20 inches, no OBSWT, perched, no lithic contact.

SITE-SPECIFIC MAP UNIT: 439

CORRELATED SOIL SERIES: Shaker, fine sandy loam

LANDSCAPE SETTING: Low area near the road on southern edge of the site

CHARACTERISTIC SURFACE FEATURES: Forested, drains to the south under the road.

DRAINAGE CLASS: Poorly drained

PARENT MATERIAL: Sands over marine silts and clays

NATURE OF DISSIMILAR INCLUSIONS: Scitico silt loam where the sand is too shallow over the silts to classify as Shaker. This inclusion is also poorly drained.

ESTIMATED PERCENTAGE OF DISSIMILAR INCLUSIONS: 5%

SOIL PROFILE DESCRIPTIONS- horizon designation, depth, soil texture, Munsell color notation, Munsell color of redox features, soil structure, soil consistence, estimated coarse fragments, estimated seasonal high water table (ESHWT), observed water table (OBSWT), kind of water table (perched, apparent, or both), depth to lithic or paralithic contact:

Ap, 0 to 6 inches, fine sandy loam, 10YR2/2, granular, friable, less than 5% coarse fragments.

Cg, 9 to 24 inches, loamy sand, 2.5Y5/2, massive, friable, less than 5% coarse fragments. 5YR5/8 redox features, ESHWT 9 inches, ODSWT 9 inches, perched, no lithic contact.

2Cg, 24 to 30 inches, silty clay loam, 2.5Y5/2, blocky, firm, less than 5% coarse fragments, 5YR5/8 redox features.

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8. RESPONSIBLE SOIL SCIENTIST

Name: James Gove

Certified Soil Scientist Number: 004

9. OTHER DISTINGUISHING FEATURES OF SITE

Is the site in a natural condition? Altered by plowing.

If no, what is the nature of the disturbance? Normal agricultural activities

NH-1500 – 189 Bunker Hill Ave, Stratham, NH
Test Pits – Christian Smith, P.E. of Beals Associates, PLLC- #1543

11/08/2023
Witness: Mike Cuomo

Test Pit #1

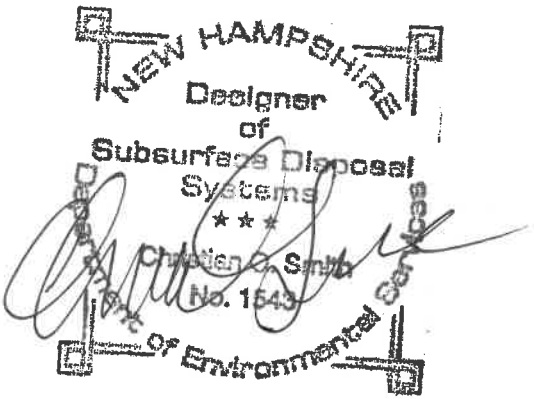
0" – 10"	10YR 3/3	Dark Brown Fine, Sandy, Loam Platy, Friable
10" - 20"	10YR 5 /6	Yellowish Brown Fine, Sandy, Loam Blocky, Friable
20" – 63"	2.5Y 4/4	Olive Brown Very Fine, Sandy Loam Blocky, Firm

ESHWT = 20"
Observed Ground Water –None
Restrictive Layer: 20 Inches
Refusal: None to 63"
Roots to 25 Inches
Perc Rate 8 min/inch @18"

Test Pit #2

0" – 10"	10YR 3 /4	Dark Yellowish Brown Fine, Sandy, Loam Platy, Friable
10" - 34"	10YR 4 /6	Dark Yellowish Brown Fine, Sandy, Loam Blocky, Friable
34" – 60"	2.5Y 4/4	Olive Brown Very Fine Silt Loam Blocky, Firm Redox-Common 2-20%

ESHWT = 34"
Observed Ground Water – None
Restrictive Layer: 34 Inches
Refusal: None
Roots to 6 Inches
Perc Rate 10 min/inch @23"



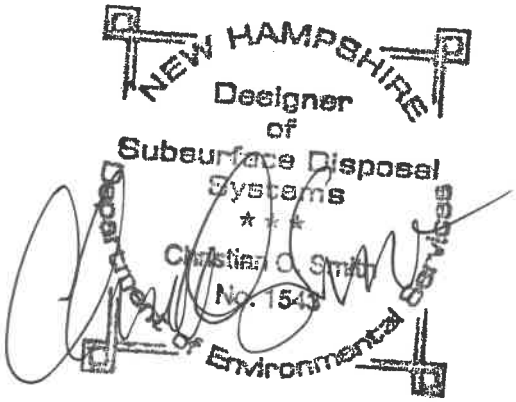
NH-1500 – 189 Bunker Hill Ave, Stratham, NH
Test Pits – Christian Smith, P.E. of Beals Associates, PLLC- #1543

11/08/2023
Witness: Mike Cuomo

Test Pit #3

0" – 10"	10YR 3 /4	Dark Yellowish Brown Fine, Sandy, Loam Platy, Friable
10" - 18"	10YR 4 /6	Dark Yellowish Brown Fine, Sandy, Loam Blocky, Friable
18" –62"	2.5Y 4/6	Olive Brown Very Fine, Sandy Loam Blocky, Firm Redox-Common 2-20%

ESHWT = 18"
Observed Ground Water – None
Restrictive Layer: 18 Inches
Refusal: None to 62"
Roots to 12 Inches
Perc Rate 8 min/inch @15"



Test Pit #4

0" –9"	10YR 3 /4	Dark Yellowish Brown Fine, Sandy, Loam Blocky, Friable
9" - 22"	10YR 4 /6	Dark Yellowish Brown Fine, Sandy, Loam Blocky, Friable
22" – 63"	2.5Y 4/4	Olive Brown Very Fine, Sandy Loam Blocky, Firm Redox-Common 2-20%

ESHWT = 22"
Observed Ground Water – None
Restrictive Layer: 22 Inches
Refusal: None to 63"
Roots to 6 Inches
Perc Rate 8 min/inch @15"

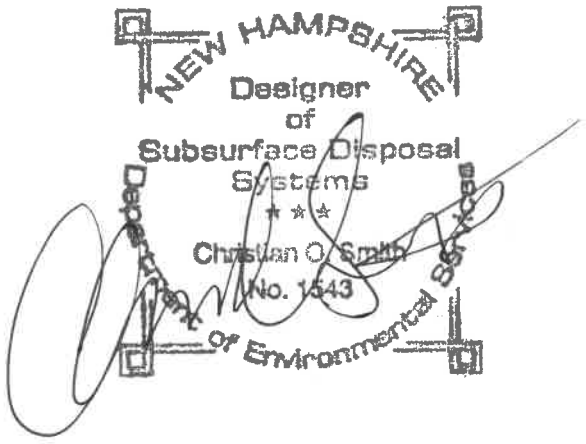
NH-1500 – 189 Bunker Hill Ave, Stratham, NH
Test Pits – Christian Smith, P.E. of Beals Associates, PLLC- #1543

11/08/2023
Witness: Mike Cuomo

Test Pit #5

0" – 10"	10YR 4/3	Brown Fine, Sandy, Loam Blocky, Friable
10" -26"	10YR 4 /6	Dark Yellowish Brown Fine, Sandy, Loam Blocky, Friable
26" – 62"	2.5Y 4/4	Olive Brown Fine, Loamy Sand Blocky, Firm Redox-Common 2-20%

ESHWT = 26"
Observed Ground Water – None
Restrictive Layer: 26 Inches
Refusal: None to 62"
Roots to 6 Inches
Perc Rate 8 min/inch @22"



Test Pit #6

0" – 14"	10YR 4 /4	Dark Yellowish Brown Fine, Sandy, Loam Blocky, Friable
14" - 32"	10YR 4 /6	Dark Yellowish Brown Fine, Sandy, Loam Blocky, Friable
32" –62"	2.5Y 4/4	Olive Brown Medium, Loamy Sand Massive, Firm Redox-Common 2-20%

ESHWT = 32"
Observed Ground Water – None
Restrictive Layer: 32 Inches
Refusal: None – 62 Inches
Roots to 6 Inches
Perc Rate 7 min/inch @26"

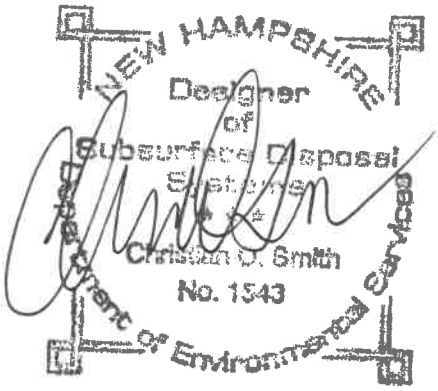
NH-1500 – 189 Bunker Hill Ave, Stratham, NH
Test Pits – Christian Smith, P.E. of Beals Associates, PLLC- #1543

11/08/2023
Witness: Mike Cuomo

Test Pit #7

0" – 9"	10YR 3/4	Dark Yellowish Brown Fine, Sandy, Loam Granular, Friable
9" - 18"	10YR 5 /6	Yellowish Brown Fine, Sandy, Loam Platy, Friable
18" – 62"	2.5Y 5/4	Light Olive Brown Silt Loam Platy, Firm Redox-Common 2-20%

ESHWT = 18"
Observed Ground Water – None
Restrictive Layer: 18 Inches
Refusal: None to 62"
Roots to 26 Inches
Perc Rate 10 min/inch @15"



Test Pit #8

0" – 8"	10YR 3 /4	Dark Yellowish Brown Fine, Sandy, Loam Blocky, Friable
8" - 23"	10YR 5 /4	Yellowish Brown Fine, Sandy, Loam Platy, Friable
23" – 62"	2.5Y 4/4	Olive Brown Silt Loam Platy, Firm Redox-Common 2-20%

ESHWT = 23"
Observed Ground Water – None
Restrictive Layer: 23 Inches
Refusal: None to 62"
Roots to 21 Inches
Perc Rate 10 min/inch @18"

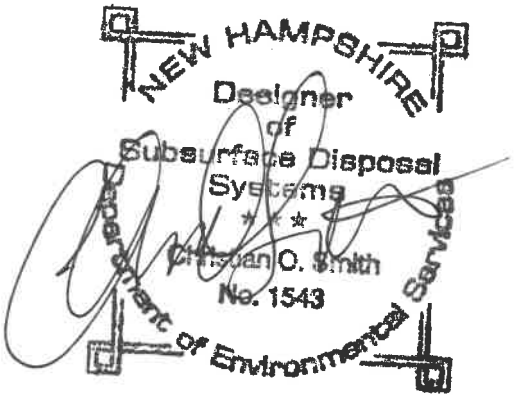
NH-1500 – 189 Bunker Hill Ave, Stratham, NH
Test Pits – Christian Smith, P.E. of Beals Associates, PLLC- #1543

11/08/2023
Witness: Mike Cuomo

Test Pit #9

0" – 9"	10YR 3 /4	Dark Yellowish Brown Fine, Sandy, Loam Granular, Friable
9" - 23"	10YR 5 /4	Yellowish Brown Fine, Sandy, Loam Platy, Friable
23"-63"	2.5Y 5/4	Light Olive Brown Loamy, Sand Massive, Firm Redox-Common 2-20%

ESHWT = 23"
Observed Ground Water – None
Restrictive Layer: 23 Inches
Refusal: None to 63"
Roots to 4 Inches
Perc Rate 7 min/inch @20"



Test Pit #10

0" – 8"	10YR 4/4	Dark Yellowish Brown Fine, Sandy, Loam Platy, Friable
8" - 21"	10YR 4/6	Dark Yellowish Brown Fine, Sandy, Loam Blocky, Friable/Very Stoney
21" – 61"	2.5Y 4/4	Olive Brown Loamy Sand Massive, Firm/Very Stoney Redox-Common 2-20%

ESHWT = 21"
Observed Ground Water – None
Restrictive Layer: 21 Inches
Refusal: None to 61"
Roots to 8 Inches
Perc Rate 8 min/inch @18"

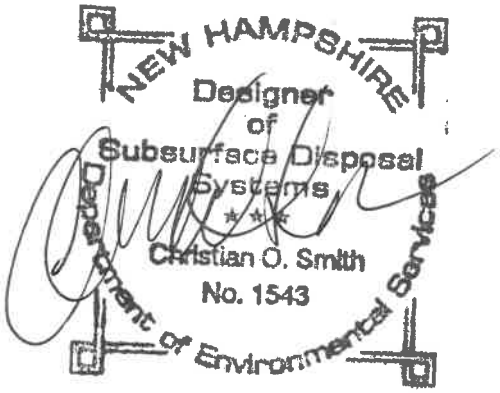
NH-1500 – 189 Bunker Hill Ave, Stratham, NH
Test Pits – Christian Smith, P.E. of Beals Associates, PLLC- #1543

11/08/2023
Witness: Mike Cuomo

Test Pit #11

0" – 10"	10YR 3 /4	Dark Yellowish Brown Fine, Sandy, Loam Blocky, Friable
10" - 27"	10YR 5 /6	Yellowish Brown Fine, Sandy, Loam Blocky, Friable/Stoney
27" – 64"	2.5Y 5/4	Light Olive Brown Loamy Sand Blocky, Firm/Stoney Redox-Common 2-20%

ESHWT = 27"
Observed Ground Water – None
Restrictive Layer: 27 Inches
Refusal: None – 64 Inches
Roots to 6 Inches
Perc Rate 8 min/inch @22"



Test Pit #12

0" – 12"	10YR 3 /4	Dark Yellowish Brown Fine, Sandy, Loam Blocky, Friable
12" - 37"	10YR 5 /4	Yellowish Brown Fine, Sandy, Loam Blocky, Friable
37" – 62"	2.5Y 4/4	Olive Brown Loamy Sand Massive, Firm/Stoney Redox-Common 2-20%

ESHWT = 37"
Observed Ground Water – None
Restrictive Layer: 37 Inches
Refusal: None – 62 Inches
Roots to 6 Inches
Perc Rate 8 min/inch @25"

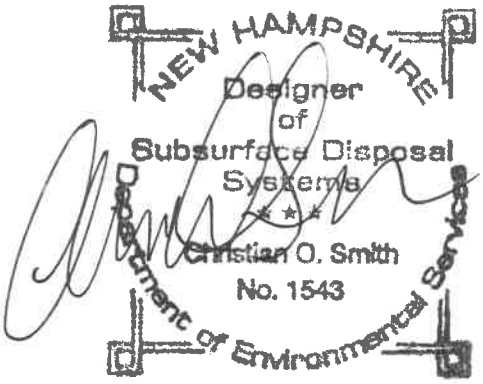
NH-1500 – 189 Bunker Hill Ave, Stratham, NH
Test Pits – Christian Smith, P.E. of Beals Associates, PLLC- #1543

11/08/2023
Witness: Mike Cuomo

Test Pit #13

0" – 10"	10YR 3/4	Dark Yellowish Brown Fine, Sandy, Loam Granular, Friable
10" - 23"	10YR 4/6	Dark Yellowish Brown Fine, Sandy, Loam Blocky, Friable
23" – 62"	2.5Y 5/4	Light Olive Brown Silt Loam Platy, Firm Redox-Common 2-20%

ESHWT = 23"
Observed Ground Water – None
Restrictive Layer: 23 Inches
Refusal: None to 62 Inches
Roots to 23 Inches
Perc Rate 10 min/inch @20"



Test Pit #14

0" – 18"	10YR 3 /4	Dark Yellowish Brown Fine, Sandy, Loam Granular, Friable
18" - 21"	10YR 4/ 4	Dark Yellowish Brown Fine Sandy Loam Blocky, Friable
21" – 64"	2.5Y 4/4	Olive Brown Silt, Loam Blocky, Firm Redox-Common 2-20%

ESHWT = 21"
Observed Ground Water – None
Restrictive Layer: 21 Inches
Refusal: None - 64 Inches
Roots to 32 Inches
Perc Rate 10 min/inch @18"

Lot Size By Soil Type
WINDSONG PLACE
Stratham, New Hampshire
February 5, 2024

Soil SSS	Soil Name	Soil HISS	Soil sf Quantities	Town Required	Town Percentage
Lot 1					
38A	Eldridge	343BH	33,309	54,500	61%
38B	Eldridge	343CH	45,249	54,500	83%
448B	Scituate	323BH	8,715	77,000	11%
Total			87,273		155%
Lot 2					
38A	Eldridge	343BH	10,206	54,500	19%
38B	Eldridge	343CH	6,490	54,500	12%
448B	Scituate	323BH	54,698	77,000	71%
448C	Scituate	323CH	15,847	89,000	18%
Total			87,241		119%
Lot 3					
38A	Eldridge	343BH	5,368	54,500	10%
38B	Eldridge	343CH	89,272	54,500	164%
Total			94,640		174%
Lot 4					
38B	Eldridge	343CH	38,576	54,500	71%
448B	Scituate	323BH	37,149	77,000	48%
448C	Scituate	323CH	12,317	89,000	14%
Total			88,042		133%
Lot 5					
38B	Eldridge	343CH	39,468	54,500	72%
448B	Scituate	323BH	41,437	77,000	54%
448C	Scituate	323CH	6,971	89,000	8%
Total			87,876		134%
Lot 6					
38B	Eldridge	343CH	83,723	54,500	154%
439B	Shaker	543BH	3,477	106,000	3%
Total			87,200		157%

TRANSMITTAL

Town of Stratham
Planning Department
10 Bunker Hill Ave.
Stratham, NH 03885

Date: Feb. 6, 2024
Project: NH-1500
Location: Lovering Road
Via: Hand Deliver

We are sending you the following items:

Items:

Attached: For Subdivision

We are sending you the following items:

1 – Completed Subdivision Application
6 – Copies of Full-size Plans
9 – Copies Reduced Plans 11 x 17 Plans
9 – Letter of Authorization to represent
1 – List of Abutters w/3 labels for each
1 - Check payable to Town of Stratham
3 - Copies of Drainage report
9 – Copy Lot Sizing by Soil Type
9 - Copy Stamped Test Pits
9 – Copy Soils report prepared by Gove Environmental

Please feel free to call me if you have any comments, or if anything further is required.

Transmitted by: **Christian O. Smith, PE.**

Town of Stratham Planning Board
10 Bunker Hill Ave
Stratham, NH 03885

RE: Chinburg Propeties/Lanzillo Subdivision at 189 Bunker Hill Ave

2.23.2024

Board Members.

Could you please read our letter of concerns at the Public Hearing on Wednesday March 6 2024 as we will be away.

Our property, 188 Bunker Hill Ave, is across the street from the proposed subdivision.

1. Will any construction of roads, driveways, septic systems or buildings raise the water table in and around 188 Bunker Hill Ave? Will any runoff reach our property? Will there be any under road drainage onto our property or our abutters which directly affects us?

2. This section of Bunker Hill Ave is one of the more dangerous sections of road to walk or bike due to the speed of cars and the blind and hilly corners. We believe adding an intersection along here will only create a more dangerous section of road. Based upon the preliminary conversations on December 6, 2023, it appeared the road from the subdivision would be directly across from the eastern portion of our property where cars would be coming in and out just beside a blind curve where cars already start to speed up knowing there is a straight away once they leave this blind corner.

3. At our eastern boundary is a major game trail that crosses Bunker Hill Ave. Deer, turkey, fox, coyote and bobcats cross there regularly. This development would make this winding corner even more dangerous to cars and the wildlife.

Based upon these concerns, we oppose this development.

Thank you,

Rick and Sue Philbrick

Rick and Susan Philbrick
188 Bunker Hill Ave
Stratham, NH 03885

NOT FOR CONSTRUCTION

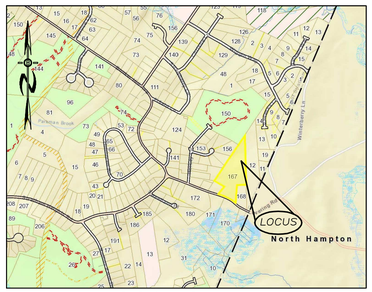
WINDSONG PLACE
BUNKER HILL AVE
TAX MAP 6, LOT 167

CIVIL ENGINEERS:

BA BEALS ASSOCIATES, PLLC

70 PORTSMOUTH AVE,
THIRD FLOOR, SUITE 2
STRATHAM, N.H. 03885
PHONE: 603-583-4860,
FAX. 603-583-4863

STATE OF NEW HAMPSHIRE
CHRISTIAN O. SMITH
No.9900
PROFESSIONAL ENGINEER



LOCATION MAP
NTS

LAND SURVEYORS:

NORTHAM SURVEY LLC

686 Central Ave, Ste 100, Dover NH 03820 (603) 953-3164 www.northamsurvey.com

WETLAND / SOIL CONSULTANT:

GOVE ENVIRONMENTAL SERVICES INC.
8 CONTINENTAL DRIVE,
BLDG 2 UNIT H
EXETER, NH 03833
1-603-778-0644

STATE OF NEW HAMPSHIRE
JAMES P. GOVE
No. 604
1-17-2024
WETLAND SOIL SCIENTIST

PLAN SET LEGEND

5/8" REBAR	●	DRAINAGE LINE	D D
DRILL HOLE	◉	OVERHEAD ELEC. LINE	OHE
CONC. BOUND	⊡	STONE WALL	
UTILITY POLE		TREE LINE	
DRAIN MANHOLE	Ⓓ	SOIL LINES	
EXISTING LIGHT POLE	☼	WETLAND SETBACK	
EXISTING CATCH BASIN	□	BUILDING SETBACK LINES	
PROPOSED CATCH BASIN	⊞	EXIST. CONTOUR	100
PINES, ETC.		PROP. CONTOUR	100
MAPLES, ETC.		ABUT. PROPERTY LINES	
EXIST. SPOT GRADE	96x69	EXIST. PROPERTY LINES	
SINGLE POST SIGN		PROP. PROPERTY LINES	
4000 SF SEPTIC RESERVE AREA		PROP. WELL W/ 75' PROTECTIVE RAD.	W

RECORD OWNER

LANZILLO IRREVOCABLE
TRUSTLANZILLO, KENNETH F. -
TRUSTEE LANZILLO, KENNETH F.
JR - TRUS 939 OCEAN BLVD UNIT 3
HAMPTON, NH 03842

APPLICANT:

CHINBURG PROPERTIES INC
3 PENSTOCK WAY
NEWMARKET, NH 03857

REQUIRED PERMITS

NHDES SUBDIVISION APPROVAL #: SA 2024...
NPDES APPROVAL NUMBER:
NHDOT DRIVEWAY PERMIT

	REVISIONS:	DATE:

NH-1500 WINDSONG PLACE ISSUED FEB. 2024

NOTES:

1. SUBJECT PARCEL: TAX MAP 6 LOT 167
189 BUNKER HILL AVENUE
STRATHAM, NEW HAMPSHIRE
NS PROJECT #992

2. OWNER OF RECORD: KENNETH F. LANZILLO IRREVOCABLE TRUST
KENNETH F. LANZILLO & KENNETH F. LANZILLO, JR., TRUSTEES
939 OCEAN BOULEVARD, UNIT 3
HAMPTON, NEW HAMPSHIRE
R.C.R.D. BOOK 4624, PAGE 2000

3. PARCEL AREA: 606,024 S.F. OR 13.1924 AC

4.

4. DIMENSIONAL REQUIREMENTS: ZONE: RESIDENTIAL/AGRICULTURE (RA)

MIN LOT AREA:	2.0 AC.
MIN LOT FRONTAGE:	200'
MIN FRONT SETBACK:	30'
MIN SIDE/REAR SETBACK	20'
MAX BUILDING HEIGHT:	35'
MAX % BUILDING COVER:	20%
MIN % OPEN SPACE:	60%
WETLAND SETBACK:	50'
WETLAND NO DISTURB BUFFER:	25'

ZONING INFORMATION SHOWN HEREON IS PER THE TOWN OF STRATHAM ZONING ORDINANCE LAST AMENDED MARCH 2023. ADDITIONAL REGULATIONS APPLY, THE LAND OWNER IS RESPONSIBLE FOR COMPLYING WITH ALL APPLICABLE TOWN, STATE, AND FEDERAL REGULATIONS.

5. FLOOD HAZARD ZONE: "X" "AREA OF MINIMAL FLOOD HAZARD", PER FIRM MAP #33015C0410F, DATED JANUARY 29, 2021.

NOTES (CONT.):

6. THE INTENT OF THIS PLAN IS TO SHOW THE LOCATION OF BOUNDARIES IN ACCORDANCE WITH THE CURRENT LEGAL DESCRIPTIONS. IT IS NOT AN ATTEMPT TO DEFINE UNWRITTEN RIGHTS, DETERMINE THE EXTENT OF OWNERSHIP, OR DEFINE THE LIMITS OF TITLE.

7. FIELD SURVEY COMPLETED BY NORTHAM SURVEY, LLC IN DECEMBER 2023 USING A TRIMBLE S5 TOTAL STATION WITH A TRIMBLE TSC3 DATA COLLECTOR, A TRIMBLE R12 GPS RECEIVER AND A SOKKIA B31 AUTO LEVEL.

8. HORIZONTAL DATUM IS NAD83(2011) NEW HAMPSHIRE STATE PLANE COORDINATES PER STATIC GPS OBSERVATIONS.

9. THE VERTICAL DATUM IS NAVD88 PER STATIC GPS OBSERVATIONS.

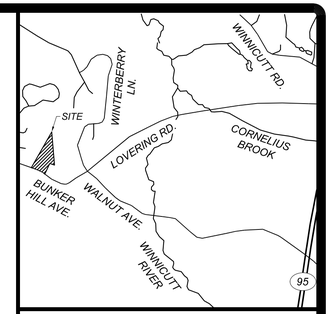
10. EASEMENTS, RIGHTS, AND RESTRICTIONS SHOWN OR IDENTIFIED ARE THOSE WHICH WERE FOUND DURING RESEARCH PERFORMED AT THE ROCKINGHAM COUNTY REGISTRY OF DEEDS. OTHER RIGHTS, EASEMENTS, OR RESTRICTIONS MAY EXIST WHICH A TITLE EXAMINATION OF SUBJECT PARCEL(S) WOULD DETERMINE.

11. THE LOCATION OF UNDERGROUND UTILITY INFORMATION SHOWN ON THIS PLAN IS APPROXIMATE. NORTHAM SURVEY LLC MAKES NO CLAIM TO THE ACCURACY OR COMPLETENESS OF UNDERGROUND UTILITIES SHOWN. PRIOR TO ANY EXCAVATION ON SITE THE CONTRACTOR SHALL CONTACT DIG SAFE.

12. THE PURPOSE OF THIS PLAN IS TO SHOW A SIX LOT SUBDIVISION OF THE SUBJECT PARCEL.

NOTES (CONT.):

14. US ARMY CORPS OF ENGINEERS WETLANDS DELINEATION MANUAL, TECHNICAL REPORT Y-87-1 (JAN 1987). AND REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION, VERSION 2.0, JANUARY 2012 AND FIELD INDICATORS FOR IDENTIFYING HYDRIC SOILS IN NEW ENGLAND, VERSION 4, NEW ENGLAND HYDRIC SOILS TECHNICAL COMMITTEE..
WETLANDS DELINEATED BY GOVE ENVIRONMENTAL SERVICES, INC. STAFF: JAMES P. GOVE, CWS 051, CSS 004



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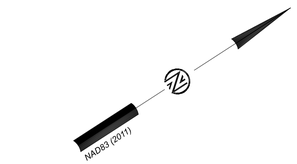
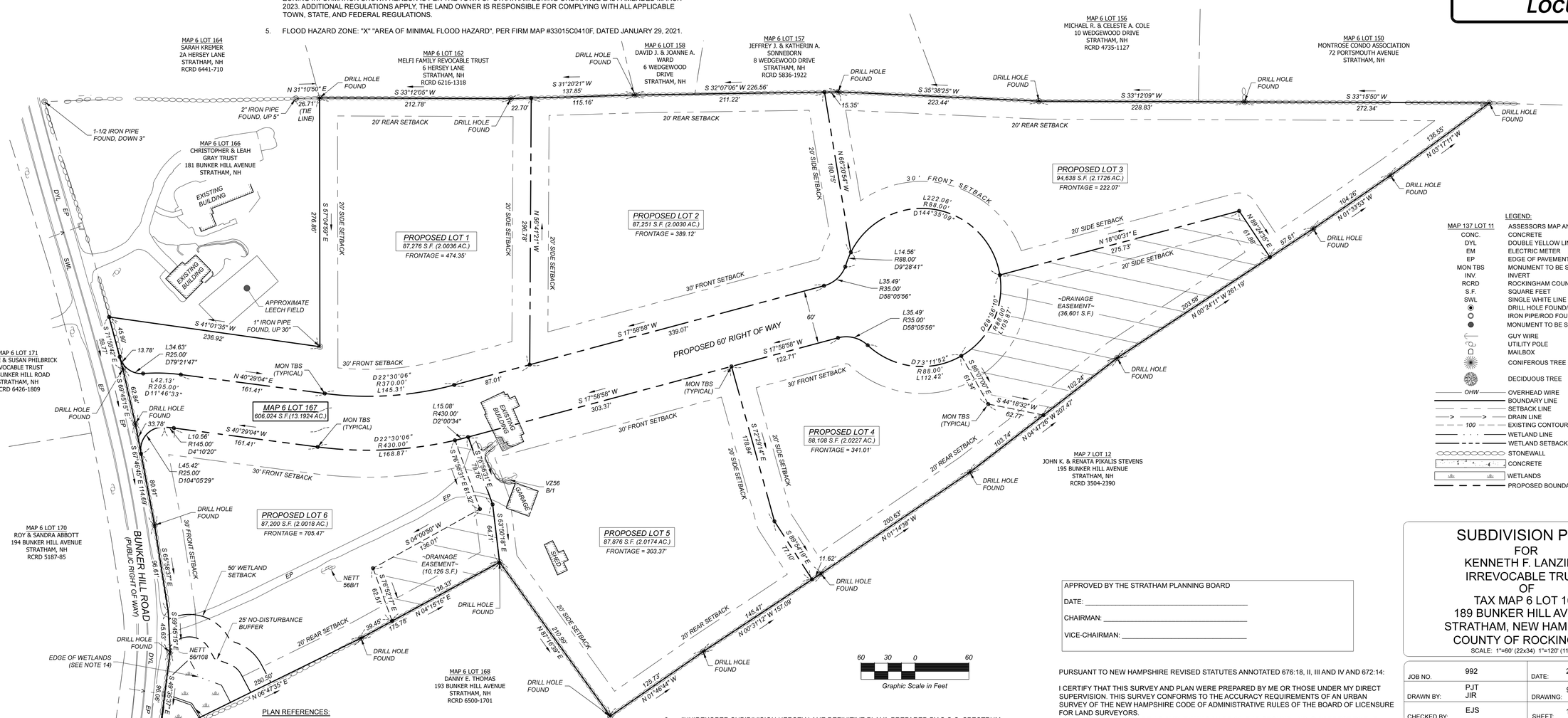




60 30 0 60

Graphic Scale in Feet

PLAN REFERENCES:

1. "SUBDIVISION PLAN FOR FAY & KENNETH LANZILLO, 189 BUNKER HILL AVENUE, STRATHAM, N.H." PREPARED BY GARY FLAHERTY AND ASSOC., DATED OCTOBER 8, 1991. RECORDED AT THE RCRD AS PLAN D-21503.
2. "SITE PLAN FOR TWO HERSEY LANE CONDOMINIUM FOR WILLIAM R. KROOSS, BUNKER HILL AVENUE & HERSEY LANE, STRATHAM, NEW HAMPSHIRE" PREPARED BY DOUCET SURVEY, INC. DATED JULY 27, 1999. RECORDED AT THE RCRD AS PLAN D-27427.
3. "PLAN OF LAND FOR FAY & KENNETH LANZILLO, 193 BUNKER HILL AVENUE, STRATHAM, N.H." PREPARED BY GARY FLAHERTY AND ASSOC. DATED OCTOBER 18, 1991. RECORDED AT THE RCRD AS PLAN D-21529.
4. "PLAN OF LAND FOR DONALD L. & LINDA E. STEVENS". PREPARED BY N. W. DURGIN ASSOCIATES. DATED JULY 1975. RECORDED AT THE RCRD AS PLAN D-12962.
5. "WEDGEWOOD SUBDIVISIONTRATHAM N.H. DEFINITIVE PLAN". PREPARED BY S.O.C. SPECTRUM DEVELOPMENT CORPORATION. DATED AUGUST 4, 1986. RECORDED AT THE RCRD AS PLAN D-15677.

PLAN REFERENCES (CONT.):

6. "HUIDEKOPER SUBIDIVISION HERSEY LANE DEFINITIVE PLAN". PREPARED BY S.O.C. SPECTRUM DEVELOPMENT CORPORATION. RECORDED AT THE RCRD AS PLAN C-18302.
7. "SUBDIVISION OF LAND FOR CURTIST & LESLYE BOUCHARD". PREPARD BY BRUCE L. POHOPEK, LAND SURVEYOR. RECORDED AT THE RCRD AS PLAN C-13255.
8. "SUBDIVISION OF LAND FOR LESLYE BOUCHARD". PREPARED BY BRUCE L. POHOPEK, LAND SURVEYOR. DATED JUNE 14, 1983. RECORDED AT THE RCRD AS PLAN C-12360.
9. "PLAN OF LAND OF HAROLD H. & DORIS C. SCHNEIDER". PREPARED BY MOULTON ENGINEERING CO. DATED APRIL 20, 1976. RECORDED AT THE RCRD AS PLAN C-5933.

LEGEND:

MAP 137 LOT 11	ASSESSORS MAP AND LOT NUMBER
CONC.	CONCRETE
DYL	DOUBLE YELLOW LINE
EM	ELECTRIC METER
EP	EDGE OF PAVEMENT
MON TBS	MONUMENT TO BE SET
INV.	INVERT
RCRD	ROCKINGHAM COUNTY REGISTRY OF DEEDS
S.F.	SQUARE FEET
SWL	SINGLE WHITE LINE
	DRILL HOLE FOUND/SET
	IRON PIPE/ROD FOUND
	MONUMENT TO BE SET
	GUY WIRE
	UTILITY POLE
	MAILBOX
	CONIFEROUS TREE
	DECIDUOUS TREE
OHW	OVERHEAD WIRE
	BOUNDARY LINE
	SETBACK LINE
	DRAIN LINE
100	EXISTING CONTOUR
	WETLAND LINE
	WETLAND SETBACK
	STONEWALL
	CONCRETE
	WETLANDS
	PROPOSED BOUNDARY LINE

APPROVED BY THE STRATHAM PLANNING BOARD

DATE: _____

CHAIRMAN: _____

VICE-CHAIRMAN: _____

PURSUANT TO NEW HAMPSHIRE REVISED STATUTES ANNOTATED 676:18, II, III AND IV AND 672:14:

I CERTIFY THAT THIS SURVEY AND PLAN WERE PREPARED BY ME OR THOSE UNDER MY DIRECT SUPERVISION. THIS SURVEY CONFORMS TO THE ACCURACY REQUIREMENTS OF AN URBAN SURVEY OF THE NEW HAMPSHIRE CODE OF ADMINISTRATIVE RULES OF THE BOARD OF LICENSURE FOR LAND SURVEYORS.
I FURTHER CERTIFY THAT THIS SURVEY WAS MADE ON THE GROUND AND IS CORRECT TO THE BEST OF MY PROFESSIONAL KNOWLEDGE. RANDOM SURVEY BY GLOBAL POSITIONING SYSTEM WITH A LEAST SQUARES ADJUSTMENT AT A 95% CONFIDENCE LEVEL, MEETING THE 1:10,000 REQUIREMENTS FOR AN URBAN CLASSIFIED SURVEY.

STATE OF NEW HAMPSHIRE — No. 1052 — ERIC J. SALOVITCH — LICENSED LAND SURVEYOR — SIGNATURE

_____
LICENSED LAND SURVEYOR

FEBRUARY 2, 2024
_____
DATE

SUBDIVISION PLAN
FOR
KENNETH F. LANZILLO
IRREVOCABLE TRUST
OF
TAX MAP 6 LOT 167
189 BUNKER HILL AVENUE
STRATHAM, NEW HAMPSHIRE
COUNTY OF ROCKINGHAM
SCALE: 1"=60' (22x34) 1"=120' (11x17)

JOB NO.	992	DATE:	2-2-24
DRAWN BY:	PJT JIR	DRAWING:	992 SURVEY.DWG
CHECKED BY:	EJS	SHEET:	1 OF 1

NO.	DATE	DESCRIPTION	BY

NORTHAM SURVEY LLC
686 Central Ave, Ste 100, Dover, NH 03820 | (603) 953-3164 | www.northamsurvey.com

NOTES:

1. SUBJECT PARCEL: TAX MAP 6 LOT 167
189 BUNKER HILL AVENUE
STRATHAM, NEW HAMPSHIRE
NS PROJECT #992

2. OWNER OF RECORD: KENNETH F. LANZILLO IRREVOCABLE TRUST
KENNETH F. LANZILLO & KENNETH F. LANZILLO, JR., TRUSTEES
939 OCEAN BOULEVARD, UNIT 3
HAMPTON, NEW HAMPSHIRE
R.C.R.D. BOOK 4624, PAGE 2000

3. PARCEL AREA: 606,024 S.F. OR 13.1924 AC

4.

4. DIMENSIONAL REQUIREMENTS: ZONE: RESIDENTIAL/AGRICULTURE (RA)

MIN LOT AREA:	2.0 AC.
MIN LOT FRONTAGE:	200'
MIN FRONT SETBACK:	30'
MIN SIDE/REAR SETBACK	20'
MAX BUILDING HEIGHT:	35'
MAX % BUILDING COVER:	20%
MIN % OPEN SPACE:	60%
WETLAND SETBACK:	50'
WETLAND NO DISTURB BUFFER:	25'

ZONING INFORMATION SHOWN HEREON IS PER THE TOWN OF STRATHAM ZONING ORDINANCE LAST AMENDED MARCH 2023. ADDITIONAL REGULATIONS APPLY, THE LAND OWNER IS RESPONSIBLE FOR COMPLYING WITH ALL APPLICABLE TOWN, STATE, AND FEDERAL REGULATIONS.

5. FLOOD HAZARD ZONE: "X" "AREA OF MINIMAL FLOOD HAZARD", PER FIRM MAP #33015C0410F, DATED JANUARY 29, 2021.

NOTES (CONT.):

6. THE INTENT OF THIS PLAN IS TO SHOW THE LOCATION OF BOUNDARIES IN ACCORDANCE WITH THE CURRENT LEGAL DESCRIPTIONS. IT IS NOT AN ATTEMPT TO DEFINE UNWRITTEN RIGHTS, DETERMINE THE EXTENT OF OWNERSHIP, OR DEFINE THE LIMITS OF TITLE.

7. FIELD SURVEY COMPLETED BY NORTHAM SURVEY, LLC IN DECEMBER 2023 USING A TRIMBLE S5 TOTAL STATION WITH A TRIMBLE TSC5 DATA COLLECTOR, A TRIMBLE R12 GPS RECEIVER AND A DJI M350 LIDAR DRONE.

8. HORIZONTAL DATUM IS NAD83(2011) NEW HAMPSHIRE STATE PLANE COORDINATES PER STATIC GPS OBSERVATIONS.

9. THE VERTICAL DATUM IS NAVD88 PER STATIC GPS OBSERVATIONS. THE CONTOUR INTERVAL IS 2 FEET.

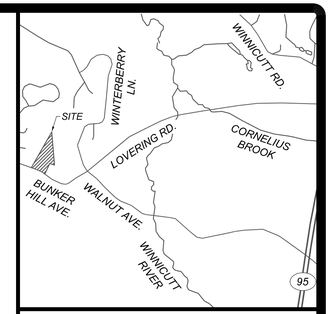
10. EASEMENTS, RIGHTS, AND RESTRICTIONS SHOWN OR IDENTIFIED ARE THOSE WHICH WERE FOUND DURING RESEARCH PERFORMED AT THE ROCKINGHAM COUNTY REGISTRY OF DEEDS. OTHER RIGHTS, EASEMENTS, OR RESTRICTIONS MAY EXIST WHICH A TITLE EXAMINATION OF SUBJECT PARCEL(S) WOULD DETERMINE.

11. THE LOCATION OF UNDERGROUND UTILITY INFORMATION SHOWN ON THIS PLAN IS APPROXIMATE. NORTHAM SURVEY LLC MAKES NO CLAIM TO THE ACCURACY OR COMPLETENESS OF UNDERGROUND UTILITIES SHOWN. PRIOR TO ANY EXCAVATION ON SITE THE CONTRACTOR SHALL CONTACT DIG SAFE.

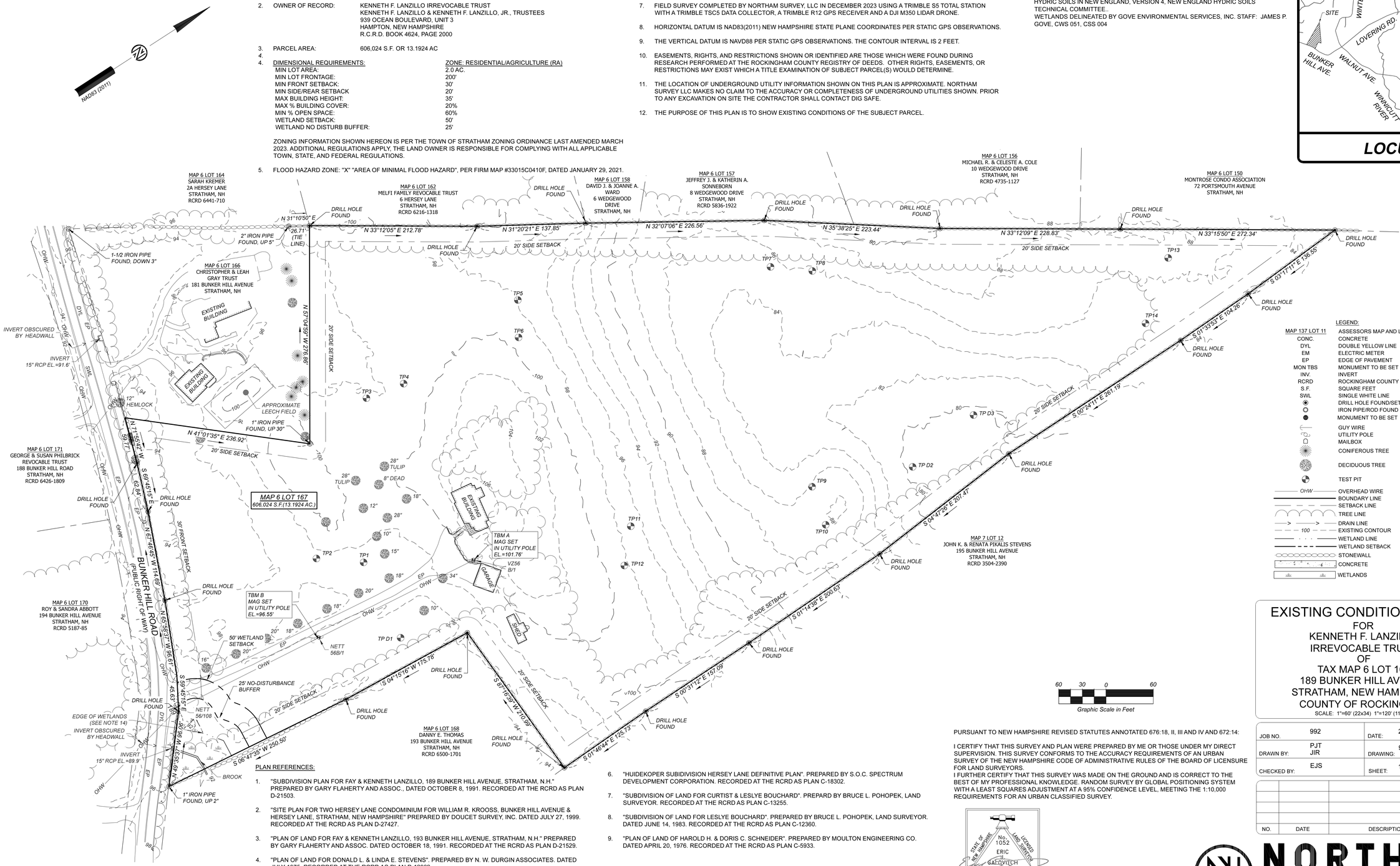
12. THE PURPOSE OF THIS PLAN IS TO SHOW EXISTING CONDITIONS OF THE SUBJECT PARCEL.

NOTES (CONT.):

14. US ARMY CORPS OF ENGINEERS WETLANDS DELINEATION MANUAL, TECHNICAL REPORT Y-87-1 (JAN 1987). AND REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION, VERSION 2.0, JANUARY 2012 AND FIELD INDICATORS FOR IDENTIFYING HYDRIC SOILS IN NEW ENGLAND, VERSION 4, NEW ENGLAND HYDRIC SOILS TECHNICAL COMMITTEE..
WETLANDS DELINEATED BY GOVE ENVIRONMENTAL SERVICES, INC. STAFF: JAMES P. GOVE, CWS 051, CSS 004



LOCUS



LEGEND:	
MAP 137 LOT 11	ASSESSORS MAP AND LOT NUMBER
CONC.	CONCRETE
DYL	DOUBLE YELLOW LINE
EM	ELECTRIC METER
EP	EDGE OF PAVEMENT
MON TBS	MONUMENT TO BE SET
INV.	INVERT
RCRD	ROCKINGHAM COUNTY REGISTRY OF DEEDS
S.F.	SQUARE FEET
SWL	SINGLE WHITE LINE
⦿	DRILL HOLE FOUND/SET
○	IRON PIPE/ROD FOUND
●	MONUMENT TO BE SET
	GUY WIRE
	UTILITY POLE
	MAILBOX
	CONIFEROUS TREE
	DECIDUOUS TREE
	TEST PIT
OHW	OVERHEAD WIRE
	BOUNDARY LINE
	SETBACK LINE
	TREE LINE
	DRAIN LINE
100	EXISTING CONTOUR
	WETLAND LINE
	WETLAND SETBACK
	STONEWALL
	CONCRETE
	WETLANDS

60 30 0 60

Graphic Scale in Feet

PLAN REFERENCES:

1. "SUBDIVISION PLAN FOR FAY & KENNETH LANZILLO, 189 BUNKER HILL AVENUE, STRATHAM, N.H." PREPARED BY GARY FLAHERTY AND ASSOC., DATED OCTOBER 8, 1991. RECORDED AT THE RCRD AS PLAN D-21503.
2. "SITE PLAN FOR TWO HERSEY LANE CONDOMINIUM FOR WILLIAM R. KROOSS, BUNKER HILL AVENUE & HERSEY LANE, STRATHAM, NEW HAMPSHIRE" PREPARED BY DOUCET SURVEY, INC. DATED JULY 27, 1999. RECORDED AT THE RCRD AS PLAN D-27427.
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5. "WEDGEWOOD SUBDIVISIONTRATHAM N.H. DEFINITIVE PLAN". PREPARED BY S.O.C. SPECTRUM DEVELOPMENT CORPORATION. DATED AUGUST 4, 1986. RECORDED AT THE RCRD AS PLAN D-15677.

PLAN REFERENCES (CONT.):

6. "HUIDEKOPER SUBIDIVISION HERSEY LANE DEFINITIVE PLAN". PREPARED BY S.O.C. SPECTRUM DEVELOPMENT CORPORATION. RECORDED AT THE RCRD AS PLAN C-18302.
7. "SUBDIVISION OF LAND FOR CURTIST & LESLYE BOUCHARD". PREPARD BY BRUCE L. POHOPEK, LAND SURVEYOR. RECORDED AT THE RCRD AS PLAN C-13255.
8. "SUBDIVISION OF LAND FOR LESLYE BOUCHARD". PREPARED BY BRUCE L. POHOPEK, LAND SURVEYOR. DATED JUNE 14, 1983. RECORDED AT THE RCRD AS PLAN C-12360.
9. "PLAN OF LAND OF HAROLD H. & DORIS C. SCHNEIDER". PREPARED BY MOULTON ENGINEERING CO. DATED APRIL 20, 1976. RECORDED AT THE RCRD AS PLAN C-5933.

EXISTING CONDITIONS PLAN

FOR
KENNETH F. LANZILLO
IRREVOCABLE TRUST
OF
TAX MAP 6 LOT 167
189 BUNKER HILL AVENUE
STRATHAM, NEW HAMPSHIRE
COUNTY OF ROCKINGHAM

SCALE: 1"=60' (22x34) 1"=120' (11x17)

JOB NO.	992	DATE:	2024-02-02
DRAWN BY:	PJT JIR	DRAWING:	992 SURVEY.DWG
CHECKED BY:	EJS	SHEET:	1 OF 1

NO.	DATE	DESCRIPTION	BY

PURSUANT TO NEW HAMPSHIRE REVISED STATUTES ANNOTATED 676:18, II, III AND IV AND 672:14:

I CERTIFY THAT THIS SURVEY AND PLAN WERE PREPARED BY ME OR THOSE UNDER MY DIRECT SUPERVISION. THIS SURVEY CONFORMS TO THE ACCURACY REQUIREMENTS OF AN URBAN SURVEY OF THE NEW HAMPSHIRE CODE OF ADMINISTRATIVE RULES OF THE BOARD OF LICENSURE FOR LAND SURVEYORS.
I FURTHER CERTIFY THAT THIS SURVEY WAS MADE ON THE GROUND AND IS CORRECT TO THE BEST OF MY PROFESSIONAL KNOWLEDGE. RANDOM SURVEY BY GLOBAL POSITIONING SYSTEM WITH A LEAST SQUARES ADJUSTMENT AT A 95% CONFIDENCE LEVEL, MEETING THE 1:10,000 REQUIREMENTS FOR AN URBAN CLASSIFIED SURVEY.

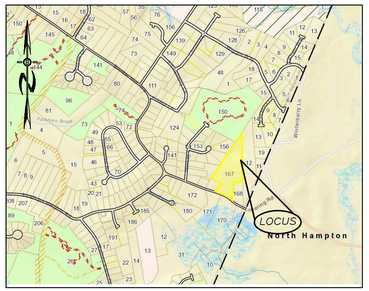
STATE OF NEW HAMPSHIRE — No. 1052 — ERIC SALOVITCH — LICENSED LAND SURVEYOR

SIGNATURE

LICENSED LAND SURVEYOR

FEBRUARY 2, 2024
DATE

NORTHAM SURVEY LLC
686 Central Ave, Ste 100, Dover, NH 03820 | (603) 953-3164 | www.northamsurvey.com



LOCATION MAP
NTS

WETLAND NOTES

THE LIMITS OF JURISDICTIONAL WETLANDS AS SHOWN ON THIS PLAN WERE DELINEATED BY GOVE ENVIRONMENTAL SERVICES, INC., IN ACCORDANCE WITH:

1. US ARMY CORPS OF ENGINEERS REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION, TECHNICAL REPORT ERDC/EL TR-12-1, JANUARY 2012, VERSION 2.0
2. FIELD INDICATORS OF HYDRIC SOILS IN THE UNITED STATES, A GUIDE FOR IDENTIFYING AND DELINEATING HYDRIC SOILS, VERSION 7.0. UNITED STATES DEPARTMENT OF AGRICULTURE (2010).
3. NORTH AMERICAN DIGITAL FLORA: NATIONAL WETLAND PLANT LIST, VERSION 2.2.1 (2009).

4. HIGH INTENSITY SOIL MAPPING WAS PERFORMED BY G.E.S. USING THE STANDARDS OF THE SOCIETY OF SOIL SCIENTISTS OF NORTHERN NEW ENGLAND SPECIAL PUBLICATION NUMBER 1, HIGH INTENSITY SOIL MAPS FOR NEW HAMPSHIRE STANDARDS, JAN 1994

This map product is within the technical standards of the National Cooperative Soil Survey. It is a special purpose product, intended for infiltration requirements by the NH DES Alteration of Terrain Bureau. It was produced by a professional soil scientist and is not a product of the USDA Natural Resources Conservation Service. There is a report that accompanies this map.
The site specific soil map was produced 1-11-2024 and was prepared by James P. Gove, CSS # 004, Gove Environmental Services, Inc.
SOIL IDENTIFICATION LEGEND

Map Unit Symbol	Map Unit Name	HISS Symbol	Hydrologic Soil Group
38	Eldridge, fine sandy loam	343	C
448	Scituate, fine sandy loam	323	C
439	Shaker, fine sandy loam	543	C

SLOPE PHASE:
A=0-3%, B=3-8%, C=8-15%, D=15-25%, E=25%+

STATE OF NEW HAMPSHIRE
JAMES P. GOVE
No. 004
CERTIFIED SOIL SCIENTIST
1-17-2024

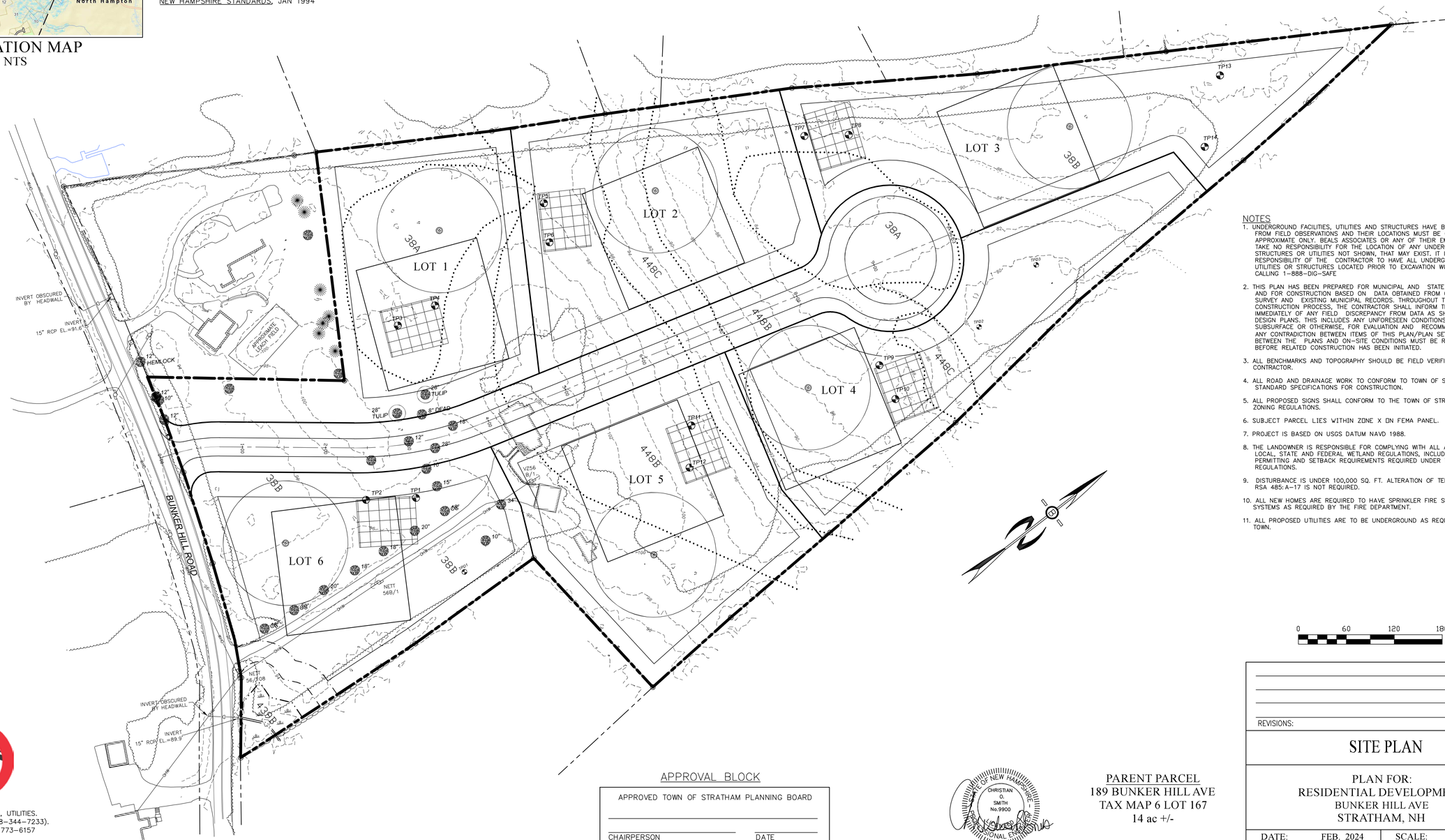
ZONING REQUIREMENTS

ZONE	R/A
LOT AREA MIN.	2 ACRE
LOT FRONTAGE	200 FT.
FRONT YARD	50 FT.
SIDE & REAR YARD	50 FT.
WETLAND SETBACK	50 FT. HYDRIC B & 75 FT. HYDRIC A
BUILDING HEIGHT	34 FT.

PREPARED FOR:

CHINBURG PROPERTIES INC
3 PENSTOCK WAY
NEWMARKET, NH 03857

BA BEALS ASSOCIATES, PLLC
70 PORTSMOUTH AVE,
THIRD FLOOR, SUITE 2
STRATHAM, N.H. 03885
PHONE: 603-583-4860,
FAX. 603-583-4863



0 60 120 180

NOTES

1. UNDERGROUND FACILITIES, UTILITIES AND STRUCTURES HAVE BEEN LOCATED FROM FIELD OBSERVATIONS AND THEIR LOCATIONS MUST BE CONSIDERED APPROXIMATE ONLY. BEALS ASSOCIATES OR ANY OF THEIR EMPLOYEES TAKE NO RESPONSIBILITY FOR THE LOCATION OF ANY UNDERGROUND STRUCTURES OR UTILITIES NOT SHOWN, THAT MAY EXIST. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE ALL UNDERGROUND UTILITIES OR STRUCTURES LOCATED PRIOR TO EXCAVATION WORK BY CALLING 1-888-DIG-SAFE
2. THIS PLAN HAS BEEN PREPARED 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 AS 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.
3. ALL BENCHMARKS AND TOPOGRAPHY SHOULD BE FIELD VERIFIED BY THE CONTRACTOR.
4. ALL ROAD AND DRAINAGE WORK TO CONFORM TO TOWN OF STRATHAM STANDARD SPECIFICATIONS FOR CONSTRUCTION.
5. ALL PROPOSED SIGNS SHALL CONFORM TO THE TOWN OF STRATHAM ZONING REGULATIONS.
6. SUBJECT PARCEL LIES WITHIN ZONE X ON FEMA PANEL.
7. PROJECT IS BASED ON USGS DATUM NAVD 1988.
8. THE LANDOWNER IS RESPONSIBLE FOR COMPLYING WITH ALL APPLICABLE LOCAL, STATE AND FEDERAL WETLAND REGULATIONS, INCLUDING ANY PERMITTING AND SETBACK REQUIREMENTS REQUIRED UNDER THESE REGULATIONS.
9. DISTURBANCE IS UNDER 100,000 SQ. FT. ALTERATION OF TERRIAN PERMIT RSA 485: A-17 IS NOT REQUIRED.
10. ALL NEW HOMES ARE REQUIRED TO HAVE SPRINKLER FIRE SUPPRESSION SYSTEMS AS REQUIRED BY THE FIRE DEPARTMENT.
11. ALL PROPOSED UTILITIES ARE TO BE UNDERGROUND AS REQUIRED BY THE TOWN.

UNDERGROUND FACILITIES, UTILITIES.
1-888-DIG-SAFE (1-888-344-7233).
AND EXETER DPW (603) 773-6157

APPROVAL BLOCK

APPROVED TOWN OF STRATHAM PLANNING BOARD

CHAIRPERSON _____ DATE _____

STATE OF NEW HAMPSHIRE
CHRISTIAN O. SMITH
No. 9900
LICENSED PROFESSIONAL ENGINEER

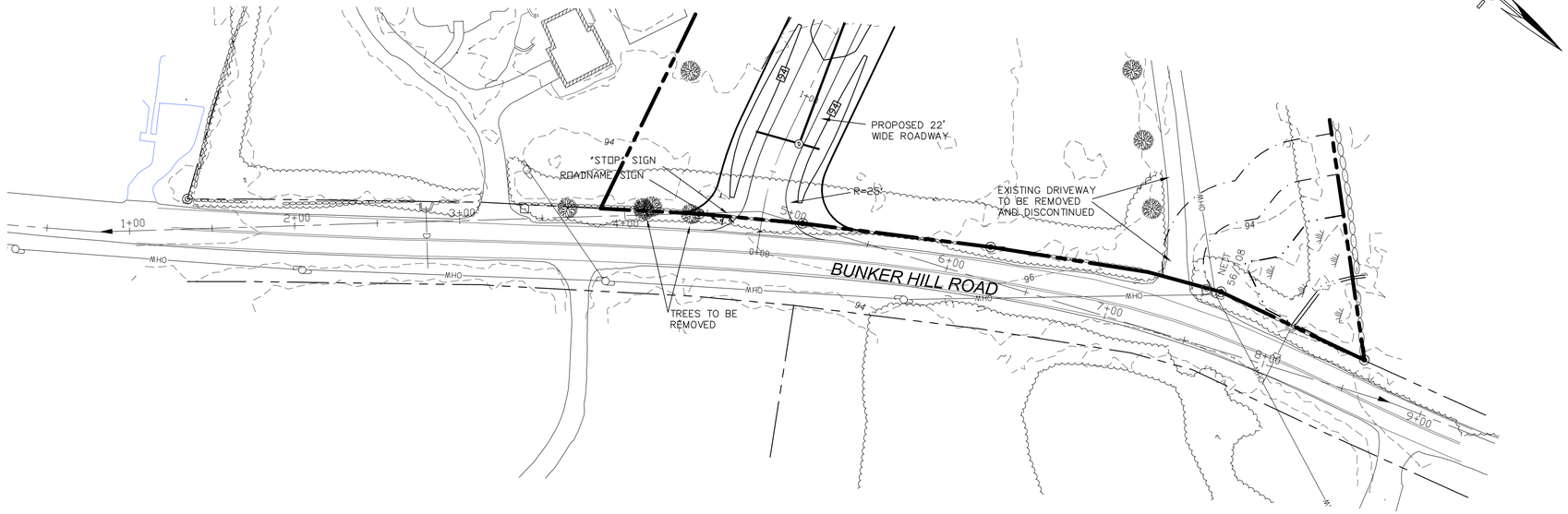
PARENT PARCEL
189 BUNKER HILL AVE
TAX MAP 6 LOT 167
14 ac +/-

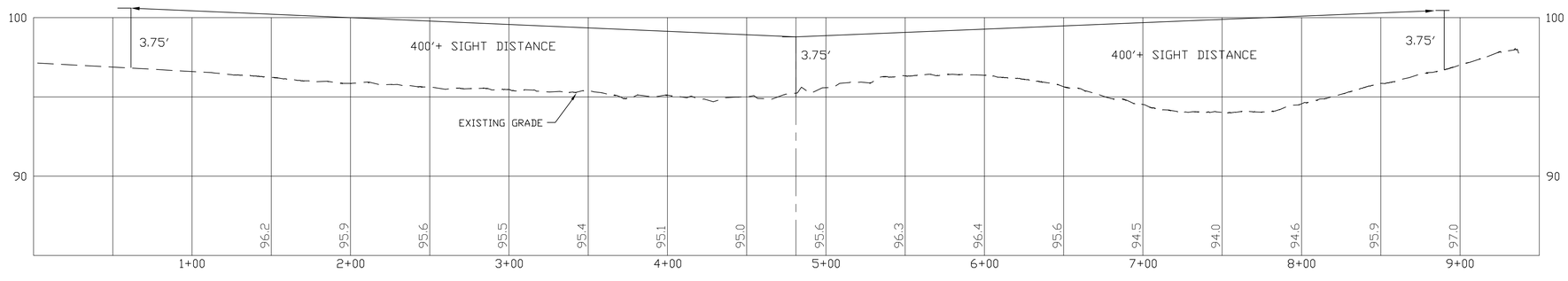
REVISIONS:	DATE:

SITE PLAN

PLAN FOR:
RESIDENTIAL DEVELOPMENT
BUNKER HILL AVE
STRATHAM, NH

DATE:	FEB. 2024	SCALE:	1"=60'
PROJ. NO:	NH-1500	SHEET NO.	3





PREPARED FOR:

CHINBURG PROPERTIES INC
3 PENSTOCK WAY
NEWMARKET, NH 03857

BEALS ASSOCIATES, PLLC
70 PORTSMOUTH AVE,
THIRD FLOOR, SUITE 2
STRATHAM, N.H. 03885
PHONE: 603-583-4860,
FAX. 603-583-4863

NOTES

1. ALL ELECTRICAL, TELEPHONE, CABLE TELEVISION AND ALARM LINES TO BE UNDERGROUND. THE SIZE AND LOCATION IS TO BE DETERMINED BY APPROPRIATE UTILITY COMPANY.
2. ALL BENCHMARKS AND TOPOGRAPHY SHOULD BE FIELD VERIFIED BY THE CONTRACTOR, ENGINEER TO BE NOTIFIED IMMEDIATELY OF ANY DISCREPANCY.
3. ALL CONSTRUCTION METHODS AND MATERIALS WILL CONFORM TO THE TOWN STANDARD SPECIFICATIONS AND TO N.H.D.O.T. STANDARDS AND REGULATIONS.
4. ALL DRAINAGE STRUCTURE AND SWALES WILL BE BUILT AND STABILIZED PRIOR TO HAVING RUN-OFF DIRECTED TO THEM.
5. SEE DETAIL SHEETS FOR STANDARD CONSTRUCTION NOTES AND DETAILS.
6. PROPOSED UNDER DRAINS TO BE INSTALLED AS SHOWN ON THE TYPICAL ROAD CROSS SECTION DETAIL AND TIE INTO DRAINAGE STRUCTURES.

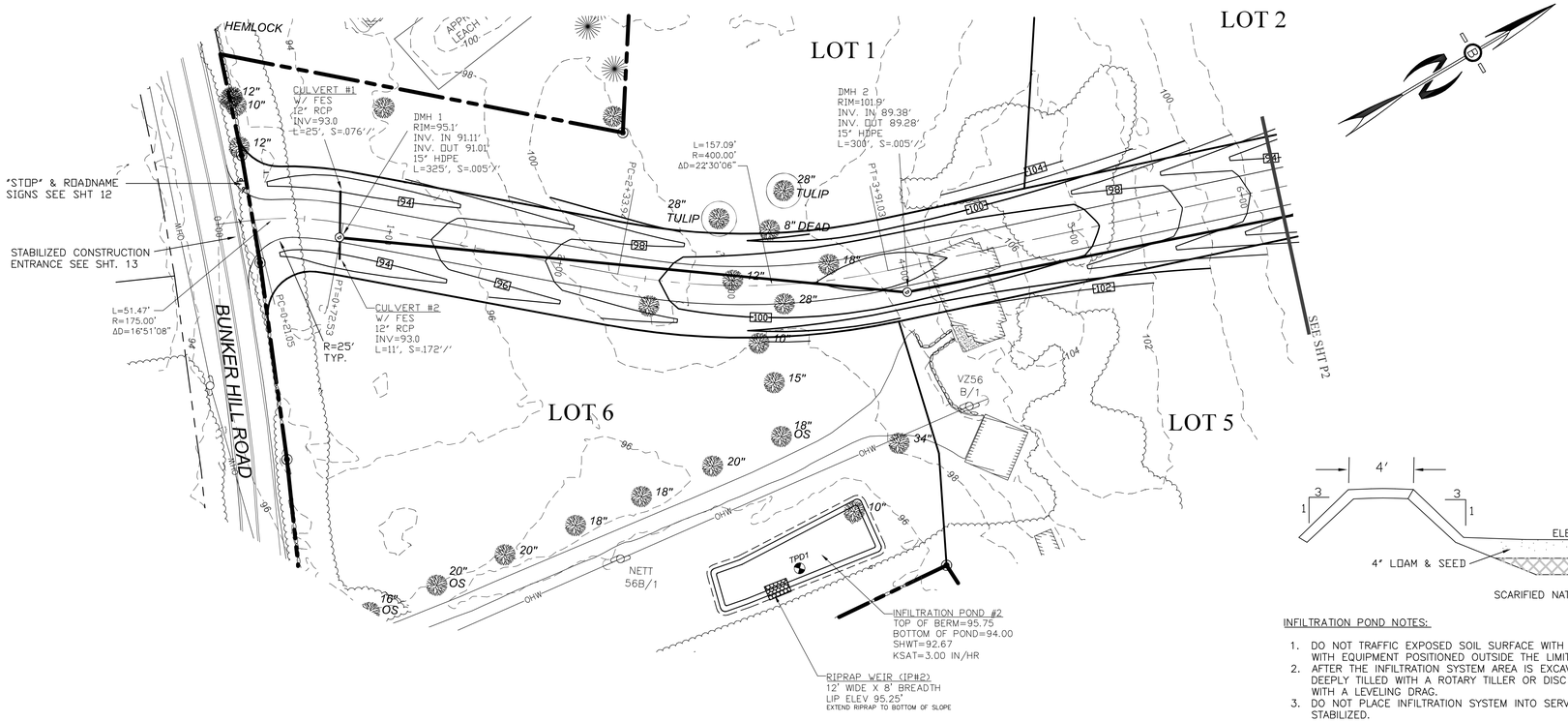
STATE OF NEW HAMPSHIRE
CHRISTIAN O. SMITH
No.9900
PROFESSIONAL ENGINEER

PROFILE SCALES:
HORIZONTAL: 1"=40' VERTICAL: 1"=4'

ROADWAY ACCESS PLAN

PLAN FOR:
RESIDENTIAL DEVELOPMENT
BUNKER HILL AVE
STRATHAM, NH

DATE:	FEB. 2024	SCALE	1" = 40'
PROJ. N0:	NH-1500	SHEET NO.	4



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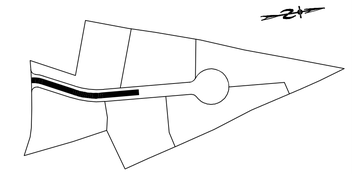
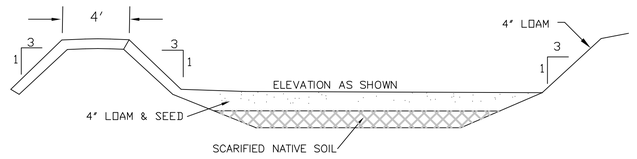


LOCATION LEGEND

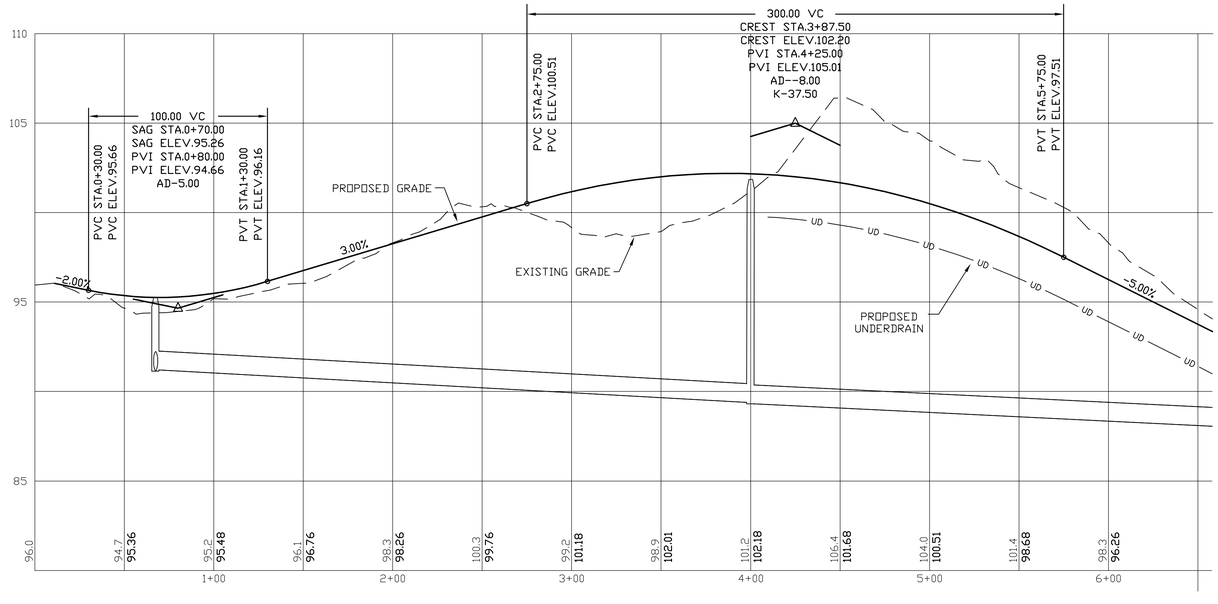


INFILTRATION POND NOTES:

1. DO NOT TRAFFIC EXPOSED SOIL SURFACE WITH CONSTRUCTION EQUIPMENT. IF FEASIBLE, PERFORM EXCAVATION WITH EQUIPMENT POSITIONED OUTSIDE THE LIMITS OF THE INFILTRATION SYSTEM.
2. AFTER THE INFILTRATION SYSTEM AREA IS EXCAVATED TO THE FINAL DESIGN ELEVATION, THE FLOOR SHOULD BE DEEPLY TILLED WITH A ROTARY TILLER OR DISC HARROW TO RESTORE INFILTRATION RATES, FOLLOWED BY A PASS WITH A LEVELING DRAG.
3. DO NOT PLACE INFILTRATION SYSTEM INTO SERVICE UNTIL THE CONTRIBUTING AREAS HAVE BEEN FULLY STABILIZED.

INFILTRATION POND DETAIL

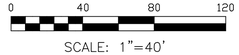
NOT TO SCALE



NOTES

1. ALL ELECTRICAL, TELEPHONE, CABLE TELEVISION AND ALARM LINES TO BE UNDERGROUND. THE SIZE AND LOCATION IS TO BE DETERMINED BY APPROPRIATE UTILITY COMPANY.
2. ALL BENCHMARKS AND TOPOGRAPHY SHOULD BE FIELD VERIFIED BY THE CONTRACTOR, ENGINEER TO BE NOTIFIED IMMEDIATELY OF ANY DISCREPANCY.
3. ALL CONSTRUCTION METHODS AND MATERIALS WILL CONFORM TO THE TOWN STANDARD SPECIFICATIONS AND TO N.H.D.O.T. STANDARDS AND REGULATIONS.
4. ALL DRAINAGE STRUCTURE AND SWALES WILL BE BUILT AND STABILIZED PRIOR TO HAVING RUN-OFF DIRECTED TO THEM.
5. SEE DETAIL SHEETS FOR STANDARD CONSTRUCTION NOTES AND DETAILS.

PROFILE SCALES:
HORIZONTAL: 1"=40' VERTICAL: 1"=4'



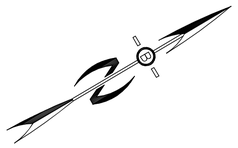
SCALE: 1"=40'

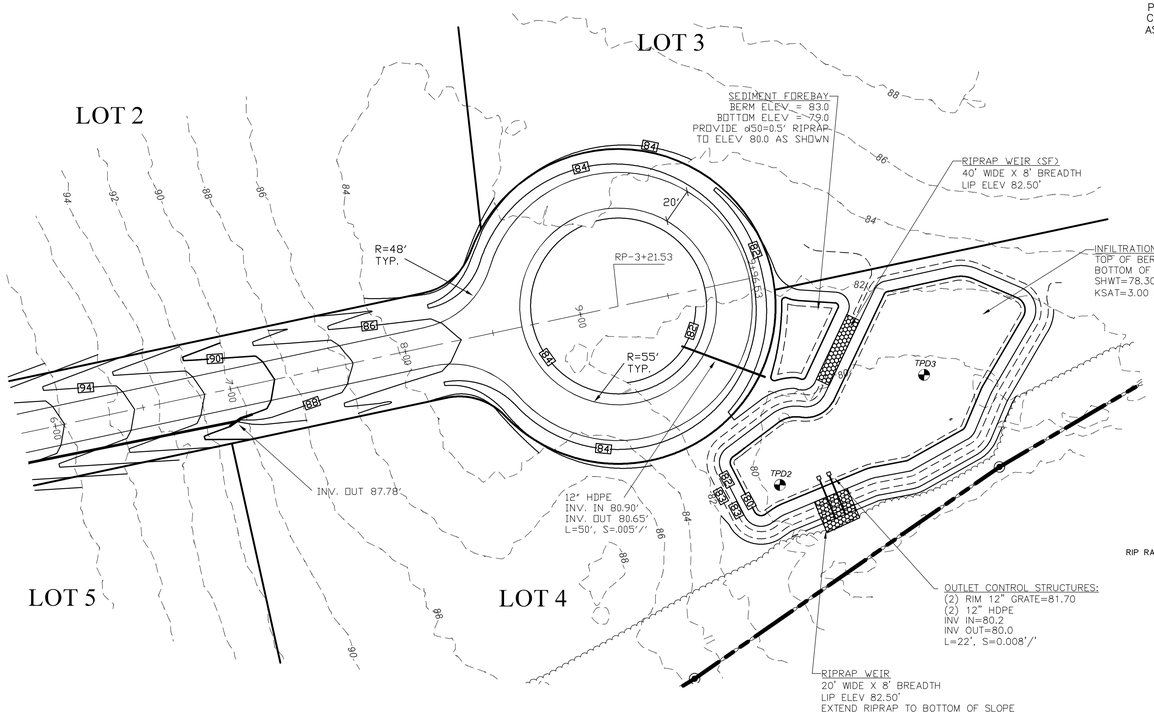
REVISIONS:	DATE:

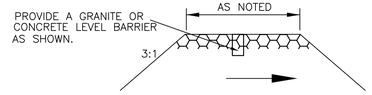
PLAN AND PROFILE

PLAN FOR:
RESIDENTIAL DEVELOPMENT
BUNKER HILL AVE
STRATHAM, NH

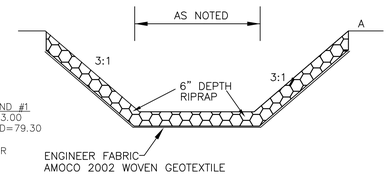
DATE:	FEB. 2024	SCALE:	1" =40'
PROJ. N0:	NH-1500	SHEET NO.	5







RIPRAP SPILLWAY PROFILE



RIPRAP SPILLWAY DETAILS

PREPARED FOR:

CHINBURG PROPERTIES INC
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NEWMARKET, NH 03857

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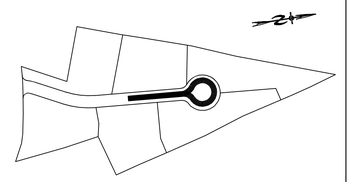
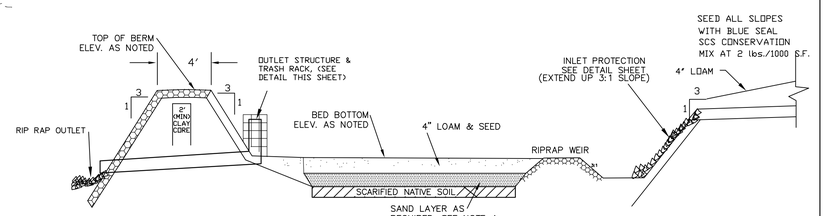


LOCATION LEGEND



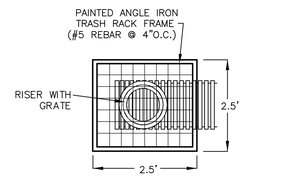
CROSS SECTION OF INFILTRATION BASIN
NOT TO SCALE

INFILTRATION BASIN NOTES:

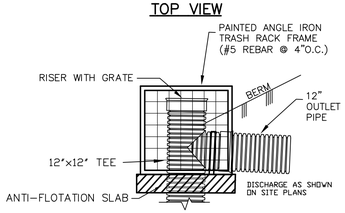
1. DO NOT TRAFFIC EXPOSED SOIL SURFACE WITH CONSTRUCTION EQUIPMENT. IF FEASIBLE, PERFORM EXCAVATION WITH EQUIPMENT POSITIONED OUTSIDE THE LIMITS OF THE INFILTRATION SYSTEM.
2. AFTER THE INFILTRATION SYSTEM AREA IS EXCAVATED TO THE FINAL DESIGN ELEVATION, THE FLOOR SHOULD BE DEEPLY TILLED WITH A ROTARY TILLER OR DISC HARROW TO RESTORE INFILTRATION RATES. FOLLOWED BY A PASS WITH A LEVELING DRAG.
3. DO NOT PLACE INFILTRATION SYSTEM INTO SERVICE UNTIL THE CONTRIBUTING AREAS HAVE BEEN FULLY STABILIZED.
4. REMOVE LOAM AND ORGANICS FROM EXISTING SOILS. IF NECESSARY, REPLACE WITH MATERIAL MEETING ASTM C-33 SPECIFICATIONS TO REQUIRED ELEVATION BELOW BED BOTTOM LOAM AND SEED.

Construction Sequence
Protect Infiltration basin area from compaction prior to installation.
1. After installation, protect sediment-laden water from entering inlets and pipes.
2. Install and maintain proper Erosion and Sediment Control Measures during construction.
3. If necessary, excavate Infiltration basin bottom to an uncompacted subgrade free from rocks and debris. Do NOT compact subgrade.
4. Install Outlet Control Structures.
5. Seed and stabilize topsoil. (Vegetate if appropriate with native plantings.)
6. Do not remove Inlet Protection or other Erosion and Sediment Control measures until site is fully stabilized.
7. Any sediment that enters inlets during construction is to be removed within 24 hours.

Maintenance and Inspection
- Catch Basins and Inlets (upgradient of infiltration basin) should be inspected and cleaned on an annual basis.
- The vegetation along the surface of the Infiltration basin should be maintained in good condition, and any bare spots immediately revegetated.
- Vehicles should not be parked or driven on an Infiltration Basin, and care should be taken to avoid excessive compaction by mowers.
- Inspect the completed basin and make sure that runoff drains down within 72 hours.
- Also inspect for accumulation of sediment, damage to outlet control structures, erosion control measures, signs of water contamination/spills, and slope stability in the berms.
- Mosquito's should not be a problem if the water drains in 72 hours. Mosquitoes require a considerably long breeding period with relatively static water levels.
- Mow only as appropriate for vegetative cover species.
- Remove sediment from basin accumulations. Restore original cross section and infiltration rate. Properly dispose of sediment.



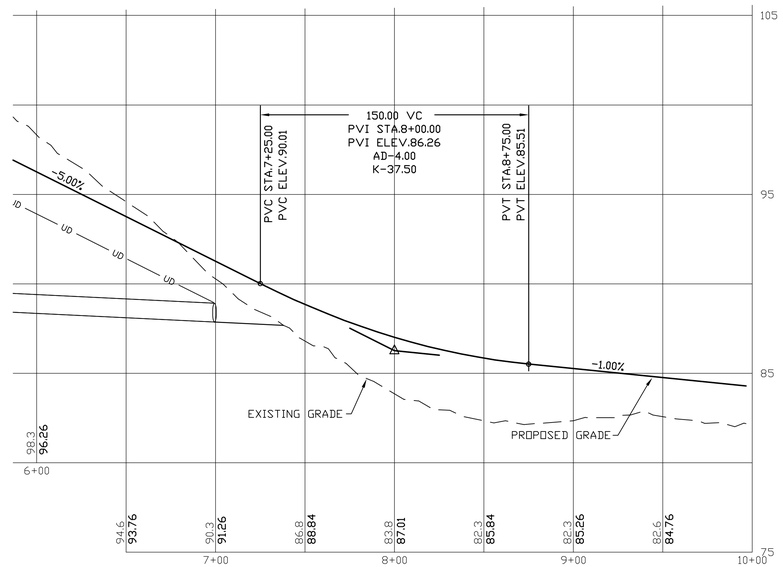
TOP VIEW



SIDE VIEW

NOTES:
PROVIDE 3'X3'X6" CONCRETE ANTI-FLOTATION SLAB WITH NON-CORROSIVE HOLDING STRAPS AND GASKETED 12" DIA CENTERED RECEIVING HOLE FOR RISER EXTENSION INTO GRAVEL LAYERS.

OUTLET CONTROL STRUCTURE
NOT TO SCALE



PROFILE SCALES:
HORIZONTAL: 1"=40' VERTICAL: 1"=4'

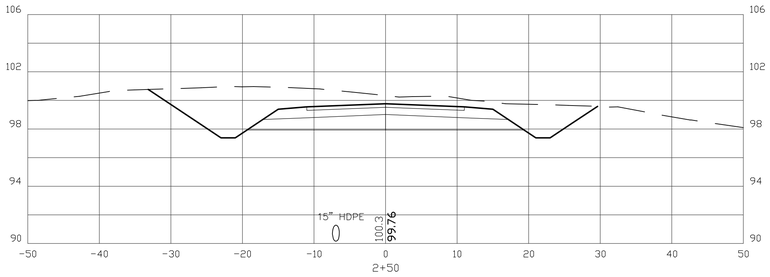
SCALE: 1"=40'

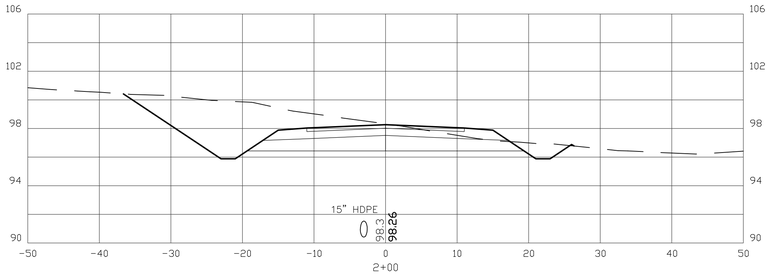
REVISIONS:	DATE:

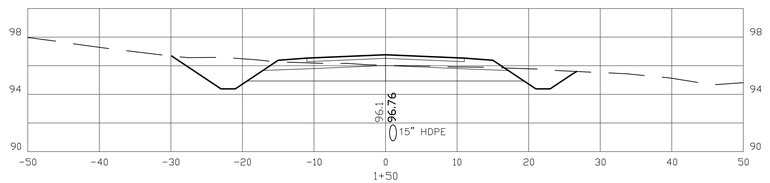
PLAN AND PROFILE

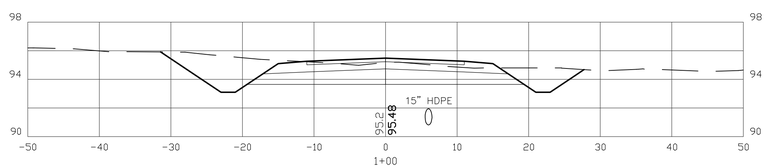
PLAN FOR:
RESIDENTIAL DEVELOPMENT
BUNKER HILL AVE
STRATHAM, NH

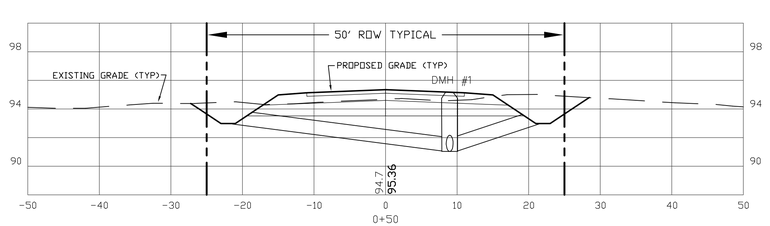
DATE:	FEB. 2024	SCALE:	1" =40'
PROJ. N0:	NH-1500	SHEET NO.	6

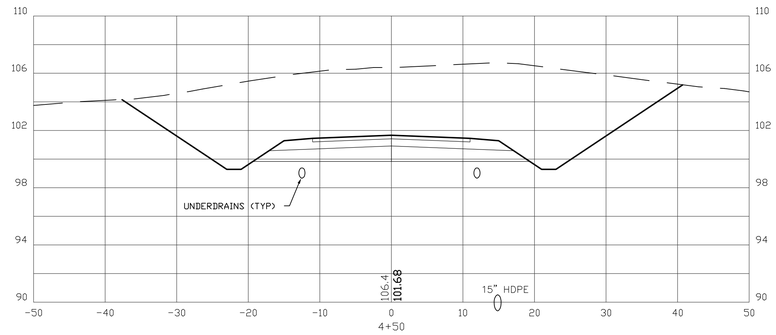


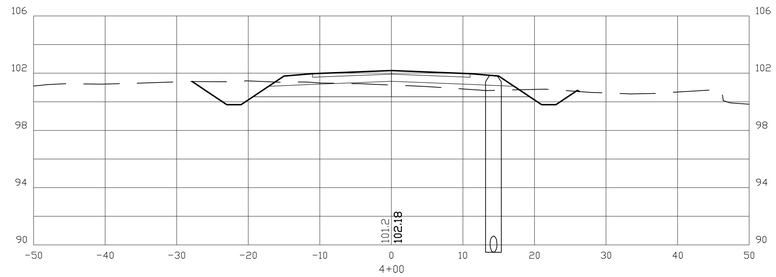


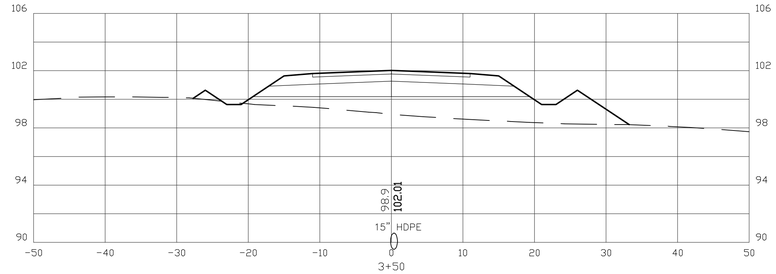


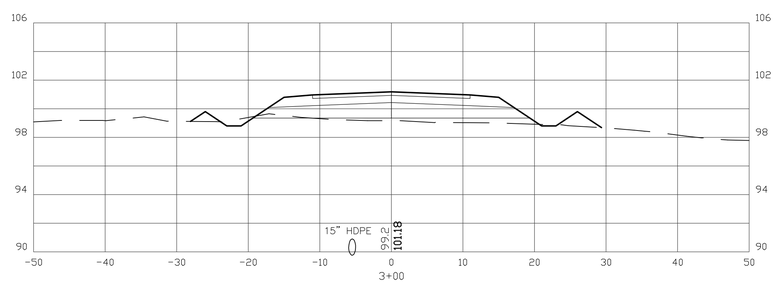












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PHONE: 603-583-4860,
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STATE OF NEW HAMPSHIRE
CHRISTIAN O. SMITH
No.9900
PROFESSIONAL ENGINEER

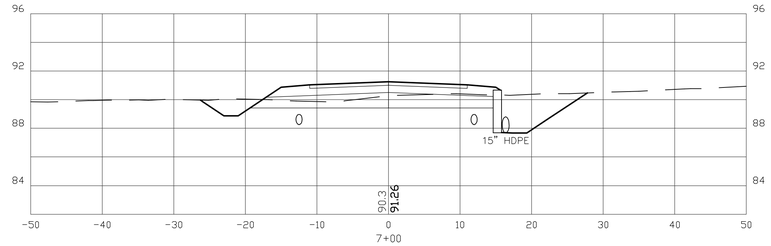
CROSS SECTION SCALES:
HORIZONTAL: 1"=10' VERTICAL: 1"=5'

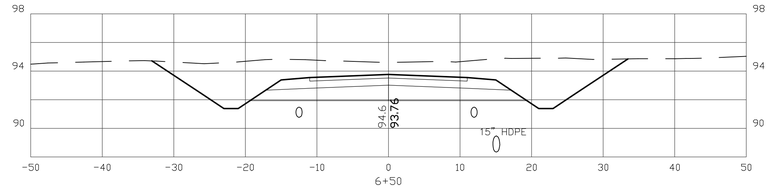
REVISIONS:	DATE:

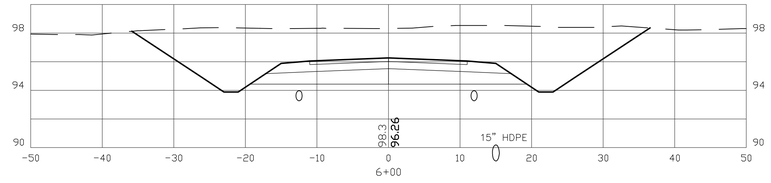
ROAD CROSS SECTIONS X1

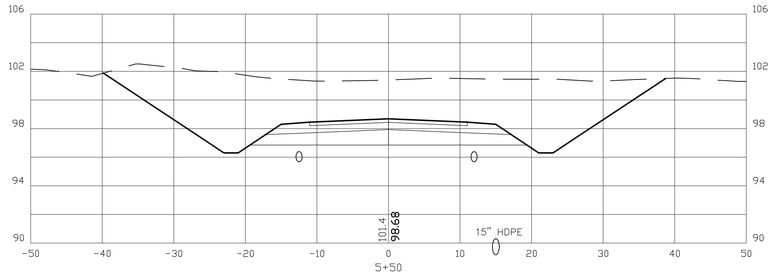
PLAN FOR:
RESIDENTIAL DEVELOPMENT
BUNKER HILL AVE
STRATHAM, NH

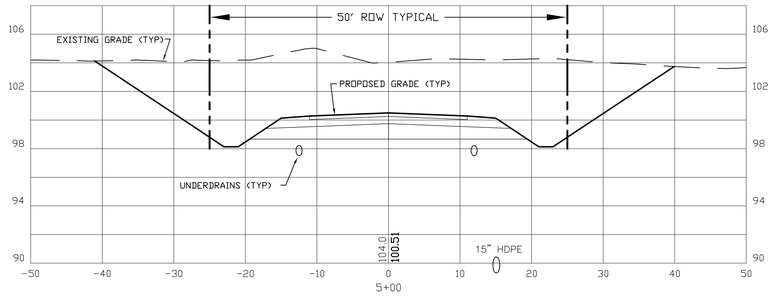
DATE:	FEB. 2024	SCALE:	1" = 10'
PROJ. N0:	NH-1500	SHT NO.	7

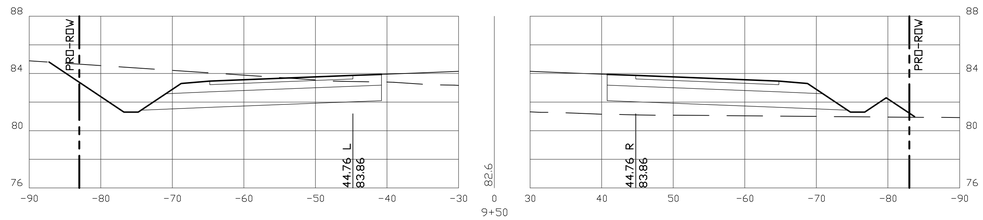


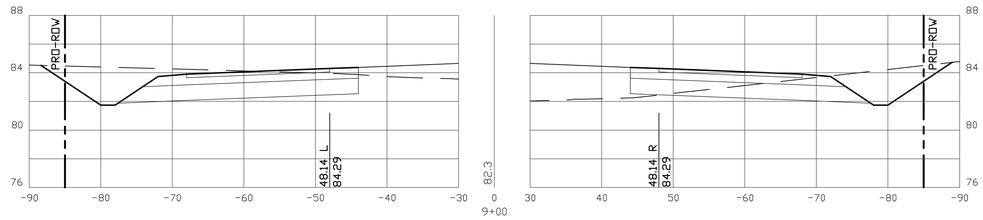


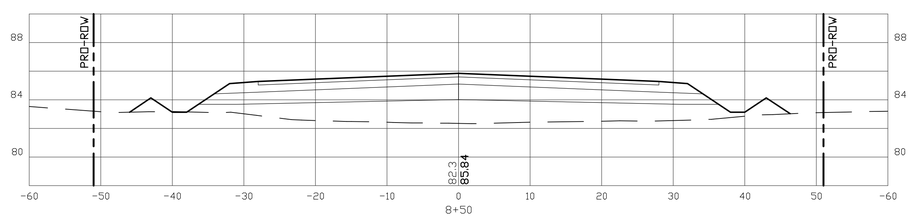


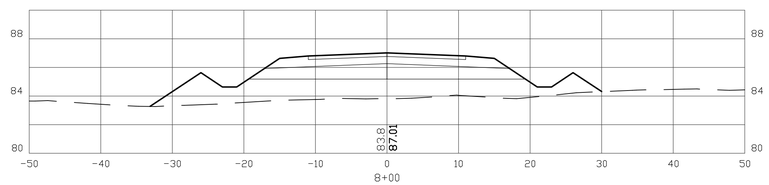


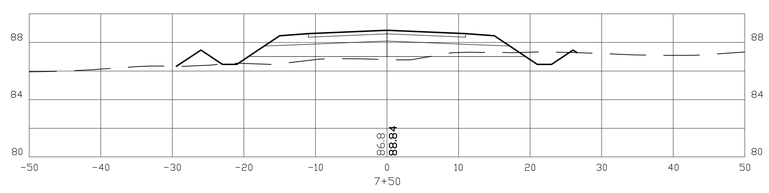












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BA BEALS ASSOCIATES, PLLC

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STATE OF NEW HAMPSHIRE
CHRISTIAN O. SMITH
No. 9900
LICENSED PROFESSIONAL ENGINEER

CROSS SECTION SCALES:
HORIZONTAL: 1"=10' VERTICAL: 1"=5'

REVISIONS:	DATE:

ROAD CROSS SECTIONS X2

PLAN FOR:
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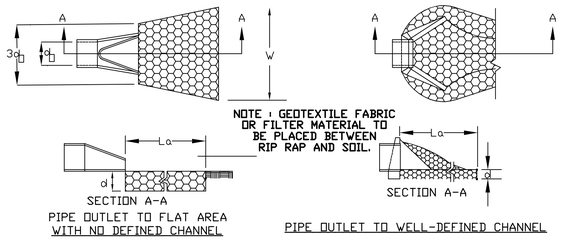
DATE:	FEB. 2024	SCALE:	1" = 10'
PROJ. N0:	NH-1500	SHT NO.	8

TABLE 7-24--RECOMMENDED RIP RAP GRADATION RANGES		
THICKNESS OF RIP RAP = 1.12 FEET		
d50 SIZE= 0.50	FEET 6	INCHES
% OF WEIGHT SMALLER THAN THE GIVEN d50 SIZE	SIZE OF STONE (INCHES) FROM	TO
100%	9	12
85%	8	11
50%	6	9
15%	2	3



CONSTRUCTION SPECIFICATIONS

1. THE SUB GRADE FOR THE FILTER MATERIAL, GEOTEXTILE FABRIC, AND RIP RAP SHALL BE PREPARED TO THE LINES AND GRADES SHOWN ON THE PLANS.
2. THE ROCK OR GRAVEL USED FOR FILTER OF RIP RAP SHALL CONFORM TO THE SPECIFIED GRADATION. 3. GEOTEXTILE FABRICS SHALL BE PROTECTED FROM PUNCTURE OR TEARING DURING THE PLACEMENT OF THE ROCK RIP RAP. DAMAGED AREAS IN THE FABRIC SHALL BE REPAIRED BY PLACING A PIECE OF FABRIC OVER THE DAMAGED AREA OR BY COMPLETE REPLACEMENT OF THE FABRIC. ALL OVERLAPS REQUIRED FOR REPAIRS OR JOINING TWO PIECES OF FABRIC SHALL BE A MINIMUM OF 12 INCHES.
4. STONE FOR THE RIP RAP MAY BE PLACED BY EQUIPMENT AND SHALL BE CONSTRUCTED TO THE FULL LAYER THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO PREVENT SEGREGATION OF THE STONE SIZES.
5. STONE FOR RIRAP SHALL BE ANGULAR OR SUBANGULAR. THE STONES SHOULD BE SHAPED SO THAT THE LEAST DIMENSION OF THE STONE FRAGMENT SHALL BE NOT LESS THAN ONE-THIRD OF THE GREATEST DIMENSION OF THE FRAGMENT.
6. FLAT ROCKS SHALL NOT USED FOR RIP RAP. VOIDS IN THE ROCK RIPRAP SHOULD BE FILLED WITH SPALLS AND SMALLER ROCKS.

MAINTENANCE

1. THE OUTLET PROTECTION SHOULD BE CHECKED AT LEAST ANNUALLY AND AFTER EVERY MAJOR STORM. IF THE RIP RAP HAS BEEN DISPLACED, UNDERMINED OR DAMAGED, IT SHOULD BE REPAIRED IMMEDIATELY. THE CHANNEL IMMEDIATELY BELOW THE OUTLET SHOULD BE CHECKED TO SEE THAT EROSION IS NOT OCCURRING. THE DOWNSTREAM CHANNEL SHOULD BE KEPT CLEAR OF OBSTRUCTIONS SUCH AS FALLEN TREES, DEBRIS, AND SEDIMENT THAT COULD CHANGE FLOW PATTERNS AND/OR TAILWATER DEPTHS ON THE PIPES. REPAIRS MUST BE CARRIED OUT IMMEDIATELY TO AVOID ADDITIONAL DAMAGE TO OUTLET PROTECTION.

PIPE OUTLET PROTECTION

TRAFFIC CONTROL SCHEDULE

SIGN NUMBER	SIGN	SIZE OF SIGN WIDTH	SIZE OF SIGN HEIGHT	DESCRIPTION	MOUNT TYPE	MOUNT HEIGHT
R1-1	STOP	30"	30"	WHITE ON RED	CHANNEL	7'-0"
R2-1	SPEED LIMIT 25	18"	24"	BLACK ON WHITE	CHANNEL	7'-0"
W14-2	NO OUTLET	24"	24"	BLACK ON YELLOW	CHANNEL	7'-0"

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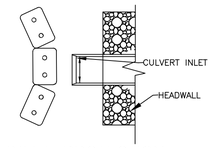
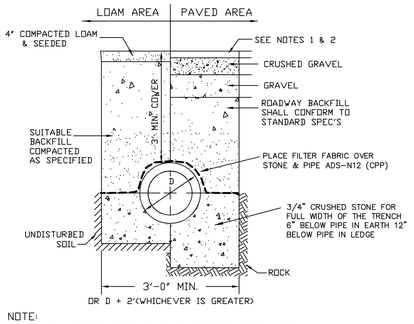
CONSTRUCTION SPECIFICATIONS
FOR STRAW OR HAY BALE BARRIERS

1. STRUCTURES SHALL BE INSTALLED ACCORDING TO THE DIMENSIONS SHOWN ON THE PLANS AT THE APPROPRIATE SPACING.
2. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER SO THAT EROSION AND AIR AND WATER POLLUTION WILL BE MINIMIZED.
3. WHEN HAY BALES ARE USED, THE BALES SHALL BE EMBEDDED AT LEAST 4 INCHES INTO THE SOIL. WHEN TIMBER STRUCTURES ARE USED, THE TIMBER SHALL EXTEND AT LEAST 18 INCHES INTO THE SOIL.
4. HAY OR STRAW BALES SHALL BE ANCHORED INTO THE SOIL USING 2" X 2" STAKES DRIVEN THROUGH THE BALES AND AT LEAST 18 INCHES INTO THE SOIL.
5. SEEDING, FERTILIZING, AND MULCHING SHALL CONFORM TO THE RECOMMENDATIONS IN THE APPROPRIATE VEGETATIVE BMP.
6. STRUCTURES SHALL BE REMOVED FROM THE CHANNEL WHEN THEIR USEFUL LIFE HAS BEEN COMPLETED.

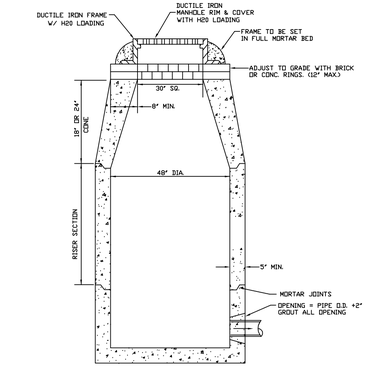


INLET PROTECTION
NORMAL USE AT CULVERT INLETS
NOT TO SCALE

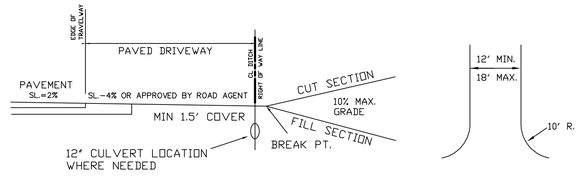


NOTE:
1. PAVEMENT REPAIR IN EXISTING ROADWAYS SHALL CONFORM TO STREET OPENING REGULATIONS.
2. NEW ROADWAY CONSTRUCTION SHALL CONFORM TO SUBDIVISION SPEC'S.

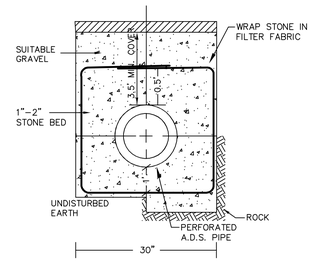
TYPICAL DRAINAGE TRENCH DETAIL



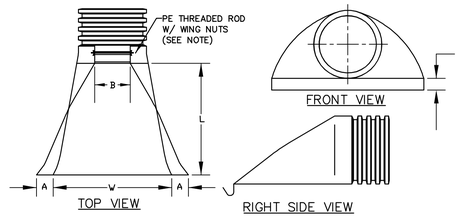
PRECAST DRAIN MANHOLE
NOT TO SCALE



TYPICAL RURAL DRIVEWAY - CROSS SECTION
NOT TO SCALE



UNDERDRAIN TRENCH DETAIL
NOT TO SCALE



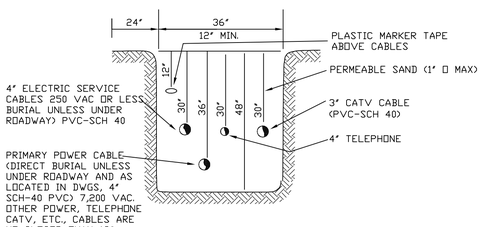
PART No.	PIPE SIZE	A	B(MAX)	H	L	W
1510-NP	15" 375 mm	6.5" 165 mm	10" 254 mm	6.5" 165 mm	25" 635 mm	29" 735 mm
1810-NP	18" 450 mm	7.5" 190 mm	15" 380 mm	6.5" 165 mm	32" 812 mm	35" 890 mm
2410-NP	24" 600 mm	7.5" 190 mm	18" 450 mm	6.5" 165 mm	36" 900 mm	45" 1140 mm
3010-NP	30" 750 mm	10.5" 266 mm	N/A	7.0" 178 mm	53" 1345 mm	68" 1725 mm
3610-NP	36" 900 mm	10.5" 266 mm	N/A	7.0" 178 mm	53" 1345 mm	68" 1725 mm

NOTE: PE THREADED ROD W/ WING NUTS PROVIDED FOR END SECTIONS 15"-24". 30" & 36" END SECTIONS TO BE WELDED PER MANUFACTURER'S RECOMMENDATIONS.

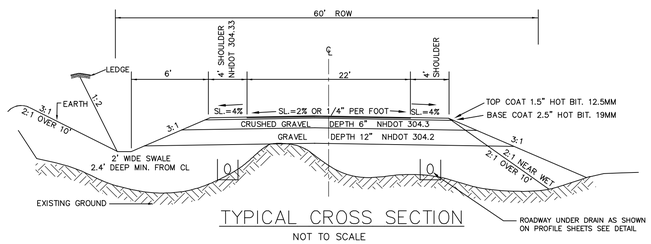
ADS N-12 FLARED END SECTIONS
NOT TO SCALE (ALL DIMENSIONS ARE NOMINAL)

NOTE: ALL UTILITIES SHALL BE REVIEWED AND APPROVED BY APPROPRIATE UTILITY COMPANY.

SERVICE BOX CONNECTIONS SHALL BE "FLUSH MOUNT" TO GREATEST EXTENT POSSIBLE AND LOCATED AT PROPERTY LINE CORNERS.



UTILITY TRENCH DETAIL



TYPICAL CROSS SECTION
NOT TO SCALE

REVISIONS:	DATE:

CONSTRUCTION DETAILS D1

PLAN FOR:
RESIDENTIAL DEVELOPMENT
BUNKER HILL AVE
STRATHAM, NH

DATE:	FEB. 2024	SCALE	NTS'
PROJ. NO:	NH-1500	SHEET NO.	9

WINTER MAINTENANCE

1. ALL DISTURBED AREAS THAT DO NOT HAVE AT LEAST 85% VEGETATIVE COVERAGE PRIOR TO OCTOBER 15TH, SHALL BE STABILIZED BY APPLYING MULCH AT A RATE OF 3–4 TONS PER ACRE. ALL SIDE SLOPES, STEEPER THAN 4:1, THAT ARE NOT DIRECTED TO SWALES OR DETENTION BASINS, SHALL BE LINED WITH BIODEGRADABLE/PHOTODEGRADABLE "JUTE MATTING" (EXCELSIOR'S CURLEX II OR EQUAL). ALL OTHER SLOPES SHALL BE MULCHED AND TACKED AT A RATE OF 3–4 TONS PER ACRE. THE APPLICATION OF MULCH AND/OR JUTE MATTING SHALL NOT OCCUR OVER EXISTING SNOW COVER. IF THE SITE IS ACTIVE AFTER NOVEMBER 15TH, ANY SNOW THAT ACCUMULATES ON DISTURBED AREAS SHALL BE REMOVED. PRIOR TO SPRING THAW ALL AREAS WILL BE STABILIZED, AS DIRECTED ABOVE.

2. ALL SWALES THAT DO NOT HAVE FULLY ESTABLISHED VEGETATION SHALL BE EITHER LINED WITH TEMPORARY JUTE MATTING OR TEMPORARY STONE CHECK DAMS (APPROPRIATELY SPACED). STONE CHECK DAMS WILL BE MAINTAINED THROUGHOUT THE WINTER MONTHS. IF THE SWALES ARE TO BE MATTED WITH PERMANENT LINERS OR RIPRAP WITH ENGINEERING FABRIC, THIS SHALL BE COMPLETED PRIOR TO WINTER SHUTDOWN OR AS SOON AS THEY ARE PROPERLY GRADED AND SHAPED.

3. PRIOR TO OCT. 15TH ALL ROADWAY AND PARKING AREAS SHALL BE BROUGHT UP TO AND THROUGH THE BANK RUN GRAVEL APPLICATION. IF THESE AREAS' ELEVATIONS ARE PROPOSED TO REMAIN BELOW THE PROPOSED SUBGRADE ELEVATION, THE SUBGRADE MATERIAL SHALL BE ROUGHLY CROWNED AND A 3" LAYER OF CRUSHED GRAVEL SHALL BE PLACED AND COMPACTED. THIS WILL ALLOW THE SUBGRADE TO SHED RUNOFF AND WILL REDUCE ROADWAY EROSION. THIS CRUSHED GRAVEL DOES NOT HAVE TO CONFORM TO NH DOT 304.3, BUT SHALL HAVE BETWEEN 15–25% PASSING THE #200 SIEVE AND THE LARGEST STONE SIZE SHALL BE 2". IF THE SITE IS ACTIVE AFTER NOVEMBER 15TH, ANY ACCUMULATED SNOW SHALL BE REMOVED FROM ALL ROADWAY AND PARKING AREAS.

4. AFTER OCTOBER 15TH, THE END OF NEW HAMPSHIRE'S AVERAGE GROWING SEASON, NO ADDITIONAL LOAM SHALL BE SPREAD ON SIDE SLOPES AND SWALES. THE STOCKPILES THAT WILL BE LEFT UNDISTURBED UNTIL SPRING SHALL BE SEEDED BY THIS DATE. AFTER OCTOBER 15TH, ANY NEW OR DISTURBED PILES SHALL BE MULCHED AT A RATE OF 3–4 TONS PER ACRE. ALL STOCKPILES THAT WILL REMAIN THROUGHOUT THE WINTER SHALL BE SURROUNDED WITH SILT FENCING.

TEMPORARY EROSION CONTROL MEASURES

1. THE SMALLEST PRACTICAL AREA SHALL BE DISTURBED DURING CONSTRUCTION, BUT NO MORE THAN 5 ACRES OF LAND SHALL BE EXPOSED BEFORE DISTURBED AREAS ARE STABILIZED*.
2. EROSION, SEDIMENT AND DETENTION MEASURES SHALL BE INSTALLED AS SHOWN ON THE PLANS AND AT LOCATIONS AS REQUIRED OR DIRECTED BY THE ENGINEER ALL DISTURBED AREAS SHALL BE RETURNED TO ORIGINAL GRADES AND ELEVATIONS.
3. DISTURBED AREAS SHALL BE LOAMED WITH A MINIMUM OF 4" OF LOAM AND SEEDED WITH NOT LESS THAN 1.10 POUNDS OF SEED PER 1000 SQUARE FEET OF AREA. (48 POUNDS PER ACRE) SEE SEED SPECIFICATIONS THIS SHEET.
4. SILT FENCES AND OTHER EROSION CONTROLS SHALL BE INSPECTED WEEKLY AND AFTER EVERY RAIN EVENT GREATER THAN 0.5" DURING THE LIFE OF THE PROJECT. ALL DAMAGED AREAS SHALL BE REPAIRED, SEDIMENT DEPOSITS SHALL PERIODICALLY BE REMOVED AND DISPOSED OF.
5. AFTER ALL DISTURBED AREAS HAVE BEEN STABILIZED, THE TEMPORARY EROSION CONTROL MEASURES ARE TO BE REMOVED AND THE AREA DISTURBED BY THE REMOVAL SMOOTHED AND RE-VEGETATED.
6. AREAS MUST BE SEEDED AND MULCHED WITHIN 3 DAYS OF FINAL GRADING, PERMANENTLY STABILIZED WITHIN 15 DAYS OF FINAL GRADING, OR TEMPORARILY STABILIZED WITHIN 30 DAYS OF INITIAL DISTURBANCE OF SOIL.

* AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:

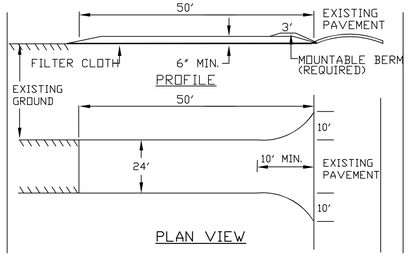
- BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED.
- A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED.
- A MINIMUM OF 3 INCHES OF NON-EROSIVE MATERIAL SUCH AS RIPRAP HAS BEEN INSTALLED.
- EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.

CONSTRUCTION SPECIFICATIONS

1. STRUCTURES SHALL BE INSTALLED ACCORDING TO THE DIMENSIONS SHOWN ON THE PLANS AT THE APPROPRIATE SPACING.
2. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER SO THAT EROSION AND AIR AND WATER POLLUTION WILL BE MINIMIZED.
3. WHEN TIMBER STRUCTURES ARE USED, THE TIMBER SHALL EXTEND AT LEAST 18" INTO THE SOIL.
4. STRAW BALES SHALL BE ANCHORED INTO THE SOIL USING 2" X 2" STAKES DRIVEN THROUGH THE BALES AND AT LEAST 18 INCHES IN TO THE SOIL.
5. SEEDING, FERTILIZING, AND MULCHING SHALL CONFORM TO THE RECOMMENDATIONS IN THE APPROPRIATED VEGETATIVE BMP.
6. STRUCTURES SHALL BE REMOVED FROM THE CHANNEL WHEN THEIR USEFUL LIFE HAS BEEN COMPLETED.
7. THROUGHOUT THE DURATION OF CONSTRUCTION ACTIVITIES THE CONTRACTOR SHALL TAKE PRECAUTIONS AND INSTRUCTIONS FROM THE PLANNING DEPARTMENT IN ORDER TO PREVENT, ABATE AND CONTROL THE EMISSION OF FUGITIVE DUST INCLUDING BUT NOT LIMITED TO WETTING, COVERING, SHIELDING, OR VACUUMING.
8. THE NH COMMISSIONER OF AGRICULTURE PROHIBITS THE COLLECTION, POSSESSION, IMPORTATION, TRANSPORTATION, SALE, PROPAGATION, TRANSPLANTATION, OR CULTIVATION OF PLANTS BANNED BY NH LAW RSA 430:53 AND NH CODE ADMINISTRATIVE RULES AGR 3800. THE PROJECT SHALL MEET ALL REQUIREMENTS AND THE INTENT OF . RSA 430:53 AND AGR 3800 RELATIVE TO INVASIVE SPECIES
9. THE CONSTRUCTION SITE OPERATOR AND OWNER SHALL SUBMIT A NOTICE OF INTENT (NOI) TO USEPA, WASHINGTON, DC, STORMWATER NOTICE PROCESSING CENTER AT LEAST FORTEEN DAYS PRIOR TO COMMENCEMENT OF WORK ON SITE. EPA WILL POST THE NOI AT http://cfpubl.epa.gov/npdes/stormwater/noi/noisearch.cfm. AUTHORIZATION IS GRANTED UNDER THE PERMIT ONCE THE NOI IS SHOWN IN "ACTIVE STATUS".

CONSTRUCTION SEQUENCE

1. CUT AND REMOVE TREES IN CONSTRUCTION AREAS AS REQUIRED OR DIRECTED.
2. CONSTRUCT AND/OR INSTALL TEMPORARY AND PERMANENT SEDIMENT EROSION AND DETENTION CONTROL FACILITIES AS REQUIRED. EROSION, SEDIMENT AND DETENTION CONTROL FACILITIES SHALL BE INSTALLED AND STABILIZED PRIOR TO ANY EARTH MOVING OPERATION AND PRIOR TO DIRECTING RUNOFF TO THEM. RUNOFF MUST BE DIRECTED TO TEMPORARY PRACTICES UNTIL STORMWATER BMP'S ARE STABILIZED.
3. CLEAR, CUT, GRUB AND DISPOSE OF DEBRIS IN APPROVED FACILITIES. STUMPS AND DEBRIS ARE TO BE REMOVED FROM SITE AND DISPOSED OF PER STATE AND LOCAL REGULATIONS.
4. EXCAVATE AND STOCKPILE TOPSOIL /LOAM. ALL AREAS SHALL BE STABILIZED IMMEDIATELY AFTER GRADING.
5. CONSTRUCT TEMPORARY CULVERTS AS REQUIRED OR DIRECTED.
6. CONSTRUCT THE ROADWAY/DRIVEWAYS AND ITS ASSOCIATED DRAINAGE STRUCTURES. ALL ROADWAYS, PARKING AREAS, AND CUT/FILL SLOPES SHALL BE STABILIZED AND/OR LOAMED AND SEEDED WITHIN 72–HOURS OF ACHIEVING FINISH GRADE AS APPLICABLE.
7. INSTALL PIPE AND CONSTRUCTION ASSOCIATED APPURTENANCES AS REQUIRED OR DIRECTED. ALL DISTURBED AREAS SHALL STABILIZED IMMEDIATELY AFTER GRADING.
8. BEGIN PERMANENT AND TEMPORARY SEEDING AND MULCHING. ALL CUT AND FILL SLOPES AND DISTURBED AREAS SHALL BE SEEDED OR MULCHED AS REQUIRED, OR DIRECTED.
9. DAILY OR AS REQUIRED, CONSTRUCT TEMPORARY BERMS, DRAINAGE CHECK DAMS, DITCHES, SEDIMENT TRAPS, ETC. TO PREVENT EROSION ON THE SITE AND PREVENT ANY SILTATION OF ABUTTING WATERS OR PROPERTY.
10. INSPECT AND MAINTAIN ALL EROSION AND SEDIMENT CONTROL MEASURES DURING CONSTRUCTION
11. COMPLETE PERMANENT SEEDING AND LANDSCAPING
12. REMOVE TEMPORARY EROSION CONTROL MEASURES AFTER SEEDING AREAS HAVE ESTABLISHED THEMSELVES AND SITE IMPROVEMENTS ARE COMPLETE. SMOOTH AND REVEGETATE ALL DISTURBED AREAS.
13. ALL SWALES AND DRAINAGE STRUCTURES WILL BE CONSTRUCTED AND STABILIZED PRIOR TO HAVING RUNOFF DIRECTED TO THEM.
14. FINISH PAVING ALL ROADWAYS/DRIVEWAYS.
15. LOT DISTURBANCE OTHER THAN THAT SHOWN ON THE APPROVED PLANS SHALL NOT COMMENCE UNTIL THE ROADWAY HAS THE BASE COURSE TO DESIGN ELEVATION AND THE ASSOCIATED DRAINAGE IS COMPLETE AND STABLE.



1. STONE FOR A STABILIZED CONSTRUCTION ENTRANCE SHALL BE 3 INCH STONE, RECLAIMED STONE, OR RECYCLED CONCRETE EQUIVALENT.
2. THE LENGTH OF THE STABILIZED ENTRANCE SHALL NOT BE LESS THAN 50 FEET, EXCEPT FOR A SINGLE RESIDENTIAL LOT WHERE A 30 FOOT MINIMUM LENGTH WOULD APPLY.
3. THE THICKNESS OF THE STONE FOR THE STABILIZED ENTRANCE SHALL NOT BE LESS THAN 6 INCHES.
4. THE WIDTH OF THE ENTRANCE SHALL NOT BE LESS THAN THE FULL WIDTH OF THE ENTRANCE WHERE INGRESS OR EGRESS OCCURS OR 10 FEET, WHICH EVER IS GREATER. 5. GEOTEXTILE FILTER CLOTH SHALL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING THE STONE. FILTER CLOTH IS NOT REQUIRED FOR A SINGLE FAMILY RESIDENCE LOT.
6. ALL SURFACE WATER THAT IS FLOWING TO OR DIVERTED TOWARD THE CONSTRUCTION ENTRANCE SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A BERM WITH 5:1 SLOPES THAT CAN BE CROSSED BY VEHICLES MAY BE SUBSTITUTED FOR THE PIPE.
7. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEAN OUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, WASHED, OR TRACKED ONTO PUBLIC RIGHT-OF-WAY MUST BE REMOVED PROMPTLY.

STABILIZED CONSTRUCTION ENTRANCE

SEEDING SPECIFICATIONS

1. GRADING AND SHAPING
   - A. SLOPES SHALL NOT BE STEEPER THAN 2:1;3:1 SLOPES OR FLATTER ARE PREFERRED. WHERE MOWING WILL BE DONE, 3:1 SLOPES OR FLATTER ARE RECOMMENDED.
2. SEEDBED PREPARATION
   - A. SURFACE AND SEEPAGE WATER SHOULD BE DRAINED OR DIVERTED FROM THE SITE TO PREVENT DROWNING OR WINTER KILLING OF THE PLANTS.
   - B. STONES LARGER THAN 4 INCHES AND TRASH SHOULD BE REMOVED BECAUSE THEY INTERFERE WITH SEEDING AND FUTURE MAINTENANCE OF THE AREA. WHERE FEASIBLE, THE SOIL SHOULD BE TILLED TO A DEPTH OF ABOUT 4 INCHES TO PREPARE A SEEDBED AND MIX FERTILIZER AND LIME INTO THE SOIL. THE SEEDBED SHOULD BE LEFT IN REASONABLY FIRM AND SMOOTH CONDITION. THE LAST TILLAGE OPERATION SHOULD BE PERFORMED ACROSS THE SLOPE WHEREVER PRACTICAL.
3. ESTABLISHING A STAND
   - A. LIME AND FERTILIZER SHOULD BE APPLIED PRIOR TO OR AT THE TIME OF SEEDING AND INCORPORATED INTO THE SOIL KINDS AND AMOUNTS OF LIME AND FERTILIZER SHOULD BE BASED ON AN EVALUATION OF SOIL TESTS. WHEN A SOIL TEST IS NOT AVAILABLE, THE FOLLOWING MINIMUM AMOUNTS SHOULD BE APPLIED:

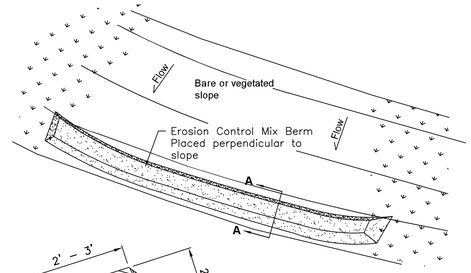
     AGRICULTURAL LIMESTONE, 2 TONS PER ACRE OR 100 LBS PER 1,000 SQ. FT.…

     NITROGEN(N), 50 LBS PER ACRE OR 1. 1 LBS PER 1,000 SQ.FT.

     PHOSPHATE(P2O5), 100 LBS PER ACRE OR 2. 2 LBS PER 1,000 SQ.FT.

     POTASH(K2O), 100 LBS PER ACRE OR 2. 2 LBS PER 1,000 SQ.FT.

     (NOTE: THIS IS THE EQUIVALENT OF 500 LBS PER ACRE OF 10-20-20 FERTILIZER OR 1,000 LBS PER ACRE OF 5-10-10.)
   - B. SEED SHOULD BE SPREAD UNIFORMLY BY THE METHOD MOST APPROPRIATE FOR THE SITE. METHODS INCLUDE BROADCASTING, DRILLING AND HYDROSEEDING. WHERE BROADCASTING IS USED, COVER SEED WITH .25 INCH OF SOIL OR LESS, BY CULTIPACKING OR RAKING.
   - C. REFER TO TABLE(G-E1 THIS SHEET) FOR APPROPRIATE SEED MIXTURES AND TABLE(H-E1 THIS SHEET) FOR RATES OF SEEDING. ALL LEGUMES (CROWN VETCH, BIRDS FOOT TREFOIL, AND FLAT PEA) MUST BE INOCULATED WITH THEIR SPECIFIC INOCULANT.
   - D. WHEN SEEDED AREAS ARE MULCHED, PLANTINGS MAY BE MADE FROM EARLY SPRING TO EARLY OCTOBER. WHEN SEEDED AREAS ARE NOT MULCHED, PLANTINGS SHOULD BE MADE FROM EARLY SPRING TO MAY 20 OR FROM AUGUST 10 TO SEPTEMBER 1.
4. MULCH
   - A. HAY, STRAW, OR OTHER MULCH, WHEN NEEDED, SHOULD BE APPLIED IMMEDIATELY AFTER SEEDING.
   - B. MULCH WILL BE HELD IN PLACE USING APPROPRIATE TECHNIQUES FROM THE BEST MANAGEMENT PRACTICE FOR MULCHING. HAY OR STRAW MULCH SHALL BE PLACED AT A RATE OF 90 LBS PER 1000 SQ. FT.
5. MAINTENANCE TO ESTABLISH A STAND
   - A. PLANTED AREA SHOULD BE PROTECTED FROM DAMAGE BY FIRE, GRAZING, TRAFFIC, AND DENSE WEED GROWTH.
   - B. FERTILIZATION NEEDS SHOULD BE DETERMINED BY ONSITE INSPECTIONS. SUPPLEMENTAL FERTILIZER IS USUALLY THE KEY TO FULLY COMPLETE THE ESTABLISHMENT OF THE STAND BECAUSE MOST PERENNIAL STAKE 2 TO 3 YEARS TO BECOME ESTABLISHED.
   - C. IN WATERWAYS, CHANNELS, OR SWALES WHERE UNIFORM FLOW CONDITIONS ARE ANTICIPATED, OCCASIONAL MOWING MAY BE NECESSARY TO CONTROL GROWTH OF WOODY VEGETATION.



Mix material should consist of 30–50% large (1–3") particles. The organic matter content should be 25%–65%, dry weight basis. The organic matter may originate from a variety of vegetative sources, but needs to be fibrous and elongated. The mix shall be free of silt, clay, fine sand, refuse and contaminants or any material toxic to plant growth.

Erosion Control Mix berms are effective filters for overland flow conditions and should not be used to filter concentrated flow such as that found in drainage ditchs, streams, etc.

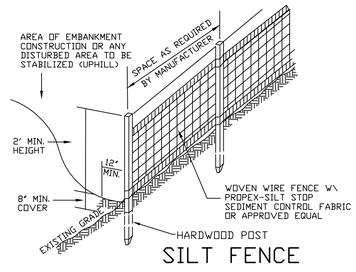
Erosion Control Mix Berm

CONSTRUCTION SPECIFICATIONS

1. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES AND FILTER CLOTH SHALL BE FASTENED TO WOVEN WIRE EVERY 24" AT TOP MID AND BOTTOM SECTIONS AND BE EMBEDDED INTO GROUND A MINIMUM OF 8". 2. THE FENCE POSTS SHALL BE A MINIMUM 48" LONG, SPACED A MAXIMUM 10' APART, AND DRIVEN A MINIMUM OF 16" INTO THE GROUND.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER, THE ENDS OF THE FABRIC SHALL BE OVERLAPPED BY SIX INCHES, FOLDED AND STAPLED TO PREVENT SEDIMENT FROM BY-PASSING.
4. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND SEDIMENT REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE AND PROPERLY DISPOSED OF.
5. PLACE THE ENDS OF THE SILT FENCE UP CONTOUR TO PROVIDE FOR SEDIMENT STORAGE.
6. SILT FENCES SHALL BE REMOVED WHEN NO LONGER NEEDED AND THE SEDIMENT COLLECTED SHALL BE DISPOSED AS DIRECTED BY THE ENGINEER. THE AREA DISTURBED BY THE REMOVAL SHALL BE SMOOTHED AND RE-VEGETATED

MAINTENANCE

1. SILT FENCES SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REPAIRS THAT ARE REQUIRED SHALL BE MADE IMMEDIATELY.
2. IF THE FABRIC ON A SILT FENCE SHOULD DECOMPOSE OR BECOME INEFFECTIVE DURING THE EXPECTED LIFE OF THE FENCE, THE FABRIC SHALL BE REPLACED PROMPTLY.
3. SEDIMENT DEPOSITS SHOULD BE INSPECTED AFTER EVERY STORM EVENT. THE DEPOSITS SHOULD BE REMOVED WHEN THEY REACH APPROXIMATELY ONE HALF THE HEIGHT OF THE BARRIER.
4. SEDIMENT DEPOSITS THAT ARE REMOVED OR LEFT IN PLACE AFTER THE FABRIC HAS BEEN REMOVED SHALL BE GRADED TO CONFORM WITH THE EXISTING TOPOGRAPHY AND VEGETATED.



SILT FENCE

SEEDING GUIDE

USE	SEEDING MIXTURE 1/	DROUGHTY	WELL DRAINED	MODERATELY WELL DRAINED	POORLY DRAINED
STEEP CUTS AND FILLS, BORROW AND DISPOSAL AREAS	A	FAIR	GOOD	GOOD	FAIR
	B	POOR	GOOD	FAIR	FAIR
	C	POOR	GOOD	EXCELLENT	GOOD
	D	FAIR	FAIR	GOOD	EXCELLENT
	E	FAIR	EXCELLENT	EXCELLENT	POOR
WATERWAYS, EMERGENCY SPILLWAYS, AND OTHER CHANNELS WITH FLOWING WATER.	A	GOOD	GOOD	GOOD	FAIR
	C	GOOD	EXCELLENT	EXCELLENT	FAIR
	D	GOOD	EXCELLENT	EXCELLENT	FAIR
LIGHTLY USED PARKING LOTS, ODD AREAS, UNUSED LANDS, AND LOW INTENSITY USE RECREATION SITES.	A	GOOD	GOOD	GOOD	FAIR
	B	GOOD	GOOD	FAIR	POOR
	C	GOOD	EXCELLENT	EXCELLENT	FAIR
	D	FAIR	GOOD	GOOD	EXCELLENT
PLAY AREAS AND ATHLETIC FIELDS. (TOPSOIL IS ESSENTIAL FOR GOOD TURF.)	F	FAIR	EXCELLENT	EXCELLENT	2/
	G	FAIR	EXCELLENT	EXCELLENT	2/

GRAVEL PIT, SEE NH-PM-24 IN APPENDIX FOR RECOMMENDATION REGARDING RECLAMATION OF SAND AND GRAVEL PITS.

1/ REFER TO SEEDING MIXTURES AND RATES IN TABLE 7-36.
2/ POORLY DRAINED SOILS ARE NOT DESIRABLE FOR USE AS PLAYING AREA AND ATHLETIC FIELDS.

NOTE: TEMPORARY SEED MIX FOR STABILIZATION OF TURF SHALL BE WINTER RYE OR OATS AT A RATE OF 2.5 LBS. PER 1000 S.F. AND SHALL BE PLACED PRIOR TO OCT. 15, IF PERMANENT SEEDING NOT YET COMPLETE.

SEEDING RATES

MIXTURE	POUNDS PER ACRE	POUNDS PER 1,000 Sq. Ft.
A. TALL FESCUE	20	0.45
CREEPING RED FESCUE	20	0.45
RED TOP	2	0.05
TOTAL	42	0.95
B. TALL FESCUE	15	0.35
CREEPING RED FESCUE	10	0.25
CROWN VETCH OR	15	0.35
FLAT PEA	30	0.75
TOTAL	40 OR 55	0.95 OR 1.35
C. TALL FESCUE	20	0.45
CREEPING RED FESCUE	20	0.45
BIRDS FOOT TREFOIL	8	0.20
TOTAL	48	1.10
D. TALL FESCUE	20	0.45
FLAT PEA	30	0.75
TOTAL	50	1.20
E. CREEPING RED FESCUE 1/	50	1.15
KENTUCKY BLUEGRASS 1/	50	1.15
TOTAL	100	2.30
F. TALL FESCUE 1	150	3.60

1/ FOR HEAVY USE ATHLETIC FIELDS CONSULT THE UNIVERSITY OF NEW HAMPSHIRE COOPERATIVE EXTENSION TURF SPECIALIST FOR CURRENT VARIETIES AND SEEDING RATES.

PREPARED FOR:

CHINBURG PROPERTIES INC
3 PENSTOCK WAY
NEWMARKET, NH 03857

BEALS ASSOCIATES, PLLC
70 PORTSMOUTH AVE,
THIRD FLOOR, SUITE 2
STRATHAM, N.H. 03885
PHONE: 603-583-4860,
FAX. 603-583-4863

REVISIONS:	DATE:

EROSION & SEDIMENTATION

PLAN FOR:
RESIDENTIAL DEVELOPMENT
BUNKER HILL AVE
STRATHAM, NH

DATE:	FEB. 2024	SCALE	NTS
PROJ. NO:	NH-1500	SHEET NO.	10