TOWN OF EXETER, NEW HAMPSHIRE

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LEGAL NOTICE
EXETER PLANNING BOARD
AGENDA

The Exeter Planning Board will meet on Thursday, March 27, 2025 at 7:00 P.M. in the Nowak Room of the Town Office building located at 10 Front Street, Exeter, New Hampshire, to consider the following:

APPROVAL OF MINUTES: February 27 and March 13, 2025

NEW BUSINESS: PUBLIC HEARINGS

Continued public hearing on the application of Green & Company for site plan review and Wetlands Conditional Use Permit (CUP) for a proposed Mixed-Use Neighborhood Development (MUND) project consisting of a townhouse development (off Haven Lane) with thirty-two (32) three-bedroom units, a four-story mixed-use building on Portsmouth Avenue having 4,418 S.F. commercial use on the first floor and thirty-six (36) one-bedroom units above, and one separate duplex structure with three-bedroom units on Haven Lane, along with associated site improvements. The subject property is located at 76 Portsmouth Avenue, in the C-2, Highway Commercial zoning district, Tax Map Parcel #65-118. PB Case #24-8.

Continued public hearing on the application of StoneArch Development for site plan review of a proposal for the redevelopment of the property located at 112 Front Street. The proposal includes the demolition of the existing buildings and new construction of seventeen (17) townhouse style condominium units and associated site improvements. The subject property is located in the C-1, Central Area Commercial zoning district and identified as Tax Map Parcel #73-14. PB Case #24-17.

The application of StoneArch Development for a multi-family site plan review for the proposed construction of a six (6) unit townhouse style residential condominium development along with associated parking and site improvements. The subject property is located at 57 Portsmouth Avenue, in the C-2, Highway Commercial zoning district. Tax Map Parcel #73-14. PB Case #25-1.

OTHER BUSINESS

- Master Plan Discussion
- Land Use Regulations Review
- Field Modifications
- Bond and/or Letter of Credit Reductions and Releases

EXETER PLANNING BOARD
Langdon J. Plumer, Chairman

Posted 03/14/25: Exeter Town Office and Town of Exeter website

TOWN OF EXETER
PLANNING BOARD
NOWAK ROOM
10 FRONT STREET
FEBRUARY 27, 2025
DRAFT MINUTES
7:00 PM

I. PRELIMINARIES:

BOARD MEMBERS PRESENT BY ROLL CALL: Chair Langdon Plumer, Clerk, John Grueter, Gwen English, Nancy Belanger Select Board Representative, Alternate Mary Kennedy and Alternate Dean Hubbard

STAFF PRESENT: Town Planner Dave Sharples

II. CALL TO ORDER: Chair Plumer called the meeting to order at 7:00 PM and introduced the members.

III. NEW BUSINESS:

1. The application of Willey Creek Company for site plan review, lot line adjustment and Wetlands and Shoreland conditional use permits for the proposed relocation of Building D of the Ray Farm Condominium development and associated site improvements off of Ray Farmstead Road. The subject properties are located in the C-3, Epping Road Highway Commercial zoning district and are identified as Tax Map Parcel #47-8 and #47-8.1. PB Case #22-3.

Chair Plumer announced that the Board has received a letter from the applicant requesting a continuance.

Ms. English motioned to approve the request of Willey Creek Company, Planning Board Case #22-3 for a continuance to the April 24, 2025 Planning Board meeting at 7 PM in the Nowak Room at Exeter Town Offices. Mr. Grueter seconded the motion. A vote was taken, all were in favor, the motion passed 4-0-0.

Chair Plumer advised the two remaining applicants and the abutters that the Board would hear each of their applications for one and a half hours, until 8:30 PM for the application of Green & Company and until 10 PM for Stonearch Dev.

2. Continued public hearing on the application of Green & Company for site plan review and Wetlands Conditional Use Permit (CUP) for a proposed Mixed-Use Neighborhood Development (MUND) project consisting of a townhouse development (off Haven Lane) with thirty-two (32) three-bedroom units, a four-story mixed-use building on Portsmouth Avenue having 4,418 S.F. commercial use on the first floor and thirty-six (36) one-bedroom units above, and one separate duplex structure with three-bedroom

units on Haven Lane, along with associated site improvements. The subject property is located at 76 Portsmouth Avenue, in the C-2, Highway Commercial zoning district, Tax Map Parcel #65-118. PB Case #24-8.

Chair Plumer read the Public Hearing Notice out loud.

Mr. Sharples reviewed that the application was proposed to the Board on December 19th, and numerous comments and concerns were raised by the Board and abutters. A site walk was held on January 9, 2025 and the applicant was scheduled to return to the Board at their January 23, 2025 meeting. The applicant appeared at the Conservation Commission's January 14, 2025 meeting and requested a continuance to reassess the project design and the Commission's concerns. The applicant appeared at the Commission's February 11, 2025 meeting to present their redesigned plans and the Commission voted that they had no objection to the application with two conditions of approval. Mr. Sharples referenced a memo from the Commission dated February 12, 2025. The applicant submitted revised plans and supporting documents dated February 14, 2025 to the Planning Board. Staff is in process of reviewing the redesigned plans and documents. There was another Technical Review Committee meeting this morning with a host of comments. Plans will be revised and resubmitted. The TRC will issue another comment letter and Underwood Engineers (UEI) gave approval this morning issuing their third comment letter.

Alternate, Marty Kennedy, recused himself from this application and left the meeting table to sit with the public as he did traffic consulting work for the Town.

Attorney John Bosum of DTC Lawyers presented the application on behalf of Green & Company. He indicated the application was for site plan review and wetlands conditional use permit in the mixed-use neighborhood development or MUND. He noted the traffic engineer was present as well as Jenna Green and John O'Neil.

Attorney Bosum reviewed the project changes that elapsed, reducing the number of units to 36 one-bedrooms in the first phase after hearing concerns from abutters concerning traffic and building height and from the site walk. He noted the Conservation Commission on February 11 had no objection to the conditional use permit after reviewing the revised plans which are before the Board this evening. He noted that while the proposal could be a large hotel or car dealership and generate more traffic the design proposed a nice transition o townhomes on Haven to taller structures on Portsmouth Avenue. He reviewed the density of the rear of the parcel as one unit for 7,200 SF compared to Jady Hill with one unit for 8,000 SF and noted MUND has no density requirement.

Paige Libbey of Jones & Beach Engineers, Inc. indicated that the second access to Haven was added and looped. A building was moved across the road out of the wetland buffer. Parking will be across the street for three buildings to reduce buffer impact. There will be green space behind the mail house for recreational purposes. There will be pedestrian access to Portsmouth Avenue. There are two crossings requiring state wetlands approval and drainage and utilities. She noted the section of porous pavement, filtration drip edges for treatment of roof runoff and the landscaping plan with 8' fence on the property line of adjacent abutters with buffered plantings. She noted two waivers are requested one for

driveway radius for the right of way not wide enough which meets Haven which is wider; and one waiver for grading within five feet of the property line. She discussed restoration after construction.

Ms. Libbey reviewed the traffic memo submitted in January which was reviewed by VHB and that the engineer indicated the number of trips per hour proposed met the minimum number of trips and felt a traffic study would not tell them more than they know now, and the expense could be put toward intersection improvements where there are already issues at Alumni and Green Hill Road. The applicant would contribute to the DPW road improvement and lights could be better coordinated. Ms. Libbey indicated that in phase two there will be a reduction in some cases or so slight that a traffic study is not warranted. Kim, the traffic engineer, reviewed the number of trips per peak house in the morning on a weekday and on Saturday and noted no notable or significant impact or different flow or impact on safety. He referenced the numbers in table one to one car per six minutes one way and going the other. All turn left, a low volume with some going down Bonny, starting on Haven and splitting out.

Mr. Grueter asked who had the stop sign – at the end of Bonny Drive. Ms. Belanger asked if the second loop could be gated since it is for emergency. Ms. Libbey will reach out to the fire department. Ms. Belanger indicated she would be concerned with that waiver.

Ms. English asked about stormwater and Unit 6 at Building 2 which was no longer there. Ms. Libbey explained the building was pulled closer to the roadway to reduce buffer impact. Space was lost for the fifth unit and swapped.

Ms. English asked about parking and Ms. Libbey noted there was excess parking, more than required and some had spaces in front of the garage.

Ms. English asked about building 4 being close to a ditch that floods and whether that was moved or reduced. Ms. Libbey indicated there was originally another unit but shifted back and pulled away. She indicated pedestrian access was added, drainage connection and the large culvert runs parallel to the stream.

Chair Plumer asked if the culvert was upgraded as discussed. Ms. Libbey indicated there was a blocked culvert on the adjacent Thirsty Moose property and they have contacted the owner to get the culvert upgraded.

Mr. Grueter asked about trash removal and Chair Plumer noted it would be stored in the garage until picked up.

Mr. Grueter asked about the retaining wall and Ms. Libbey confirmed it would be part of phase 1.

Ms. English asked the rationale of not having the roadway access on Portsmouth Avenue and Ms. Libbey explained there were concerns about traffic cutting through the Jady Hill neighborhood to downtown.

Ms. English asked about height reduction of the buildings as the plans say 40.' Ms. Libbey indicated the plans will be revised to show 35.'

Ms. English asked if there were architectural drawings of the town homes and Ms. Libbey indicated no. Ms. English and Mr. Grueter noted those would be nice to see.

Chair Plumer noted that a pocket neighborhood was being created and compared the aesthetics of building 3 to a New Jersey motel. He asked if that could be more in character with the neighborhood and if building 1 could be staggered to give the town homes some personality. He questioned if a unit could be taken out of building 3 so that there is more elbow room and if there could be more green space.

Ms. English stated that there are buildings in the 75' setback a couple of units almost entirely, some half. She stated that it was too much, at capacity. She questioned if a couple of units could be eliminated, and the height adjusted with unit 1 and 34 that are closer to Haven so they would have a lower profile. She noted there are no two stories home on Bonny Drive. Chair Plumer noted the same for Building 6. Ms. English indicated she was not in favor of that much infringement on the setbacks. Only one parking space is required per unit.

Ms. Libbey indicated the buffer was discussed at length with the Conservation Commission and Gove Environmental discussed the function and values of the eastern wetland. Impervious surface was reduced by 70%. Those wetlands were determined to have very limited function and value. Ms. English noted she appreciated the changes but did not agree that the buffers serve a purpose.

Ms. Belanger asked about the pedestrian bridge and the leased building on Portsmouth Avenue's parking lot. Ms. Libbey indicated that the portion of the property was leased and there will not be public parking there. Mr. Green indicated that Federated Auto leases the space and their parking lot was the biggest issue with the adjacent Thirsty Moose restaurant, and they don't want anyone using their parking lot for other than their own business and are on top of enforcing that.

Mr. Grueter asked about the 10% requirement of MUND for affordable housing. Mr. Sharples indicated note 6 shows 4 units in phase one and four units in phase two, proportionally for each phase and in total.

Chair Plumer announced there had been letters received from the Thomases at 28 Haven Lane, email from the Boudreau and Gaudette at 11 Bonny, from Michael Hauck and Danielle Frank at 3 Haven, Daniel Halleren at 32 Haven, Rachel Gross at 9, Joan Hayes and a detailed letter from Ryan O'Brien at 20 Haven with comments the Board has heard before. He asked that the public comment be limited to new concerns and not repeat what the Board has heard already, in the interest of time.

Craig Boudreau of 11 Bonny Drive showed his house and asked why the proposed fence could continue. Ms. Libbey indicated the tree line would remain. Mr. Boudreau indicated concerns people will park in front of his home and cut through because there is no fence. Chair Plumer noted it is private property. Mr. Boudreau indicated people cut through all the time and noted the number of places where fence is being put and asked for the same.

(inaudible) showed a photo of the lot buffer taken out and expressed concerns with noise and the lost view.

Ryan O'Brien read a letter on behalf of Inga Newcomb of 14 Haven Lane that she doesn't want to live on a busy road and wants to keep the green buffer and single building above the residences with no access. She wanted access to be on Portsmouth Avenue.

Mr. O'Brien expressed concerns with density, the homes being built in a depression, water, long-term problems and wanted to know who will be liable and responsible when the sewer backs up. He noted concerns with MUND conditions, using MUND to create a disconnected neighborhood and the delay of phase 2 with the commercial phase done years later. He expressed generally concerns with the MUND component itself allowing bigger and closer direct conflict in opposition to the intent of the master plan which promotes protection of light and air and would like to see the ordinance changed. He discussed the shadow cast on buildings by the higher buildings and would like mature trees to remain to break up the line of buildings so abutters don't see clear through to Portsmouth Ave.

Diane of 5 Bonny Drive expressed concerns with traffic and deliveries.

Michael Hauck expressed concerns with buffers and screening and noise and light pollution. Ms. Frank expressed concerns with fencing, shrubs and wanting 4" caliper trees to the height of the building included in the condo documents for maintenance. She noted two petitions were handed in from 9 abutting owners and 70 residents of the Jady Hill community concerning noise during construction for so many hours and with property values, traffic, loss of forest and reduced quality of life.

Chair Plumer asked about construction times and Mr. Sharples indicated that is set by the Select Board, Chapter 7 and the Planning Board has no authority to restrict construction times and all properties must be treated equally.

Mr. Francheski of 36 Haven Lane expressed concerns with stormwater in heavy rain, water damage and the road pitching to his house. He commented that if the road is extended the stormwater will no longer go to the ravine.

Christine Tindle of 12 Bonny Drive expressed concerns with traffic and no stop sign on Haven the blind turn and four way stop. She requested stop signs at both ends of Bonny Drive and will take concerns for the speed limit and speed bumps to the Select Board.

Mr. Sharples indicated at this point the application is on day 70 and an extension needs to be agreed to by the applicant.

Ms. Belanger discussed having a traffic study and expressed concerns about if the Federated Auto business lease was transferred. Mr. Sharples noted a traffic study would not address parking. She felt the huge, underutilized parking lot could affect Portsmouth Avenue and have more impact on Jady Hill which the Board is being asked to approve ten years from now and how MUND could be approved in phase two is not happening.

Chair Plumer agreed he had concerns with approving something not being built for ten years. Ms. English agreed and questioned what happens if there is a MUND with no commercial. Ms. Libbey indicated there is commercial use there now. Mr. Sharples recommended living in the regulations and not thinking hypothetically and agreed there is commercial use there now.

Michael Green addressed the traffic memo and low volume and while he agreed intersections need stop signs and turning lights this was discussed at TRC and the Board has not yet seen those comments. There are existing issues not caused by this development. He noted he originally had tow 50' buildings and is now at 34 units doing 10% affordable and he keeps hearing take away, take away but there is a limit. The units have been decreased significantly from 80 to 34 with significantly less impact to traffic and people.

Mr. Sharples noted that this morning the traffic engineer called VHB (the 3rd party review) and spoke to Jason Plourde and agreed the analysis is not warranted, beyond existing problems and spending $25,000 on a study would be better invested solving issues that exist today. Ms. Belanger indicated she was surprised TRC had no concern with that many units and it seems low. Mr. Sharples explained the IT standards are based on average trips. Ms. Belanger questioned if Jason would be available for the next meeting. Mr. Sharples will reach out to him.

Ms. Belanger motioned to table Planning Board Case #24-8 to the March 13, 2025 Planning Board meeting at 7 PM in the Nowak Room. Ms. English seconded the motion. A vote was taken, all were in favor, the motion passed 4-0-0.

3. The application of StoneArch Development for site plan review of a proposal for the redevelopment of the property located at 112 Front Street. The proposal includes the demolition of the existing buildings and new construction of seventeen (17) townhouse style condominium units and associated site improvements.
C-1, Central Area Commercial zoning district
Tax Map Parcel #73-14
PB Case #24-17.

Mr. Kennedy returned to the meeting table and Chair Plumer activated the alternates.

Chair Plumer read out loud the Public Hearing Notice.

Mr. Sharples noted that the applicant appeared before the Board at the January 23, 2025 meeting to present their plans for the redevelopment of the property. Public comment was opened, and a site walk was held on February 6, 2025 and the applicant indicated they were developing a landscaping plan prior to the Feb. 13, 2025 meeting which was not completed so an extension was requested to allow them time to address issues raised during the site walk and the UEI comments. The applicant submitted plans and supporting documents dated Feb. 19, 2025. Staff is still reviewing materials. The applicant is requesting three waivers. Numerous letters and emails were received and were provided to the Board.

Christian Smith of Beals Assoc. presented the application. He reviewed changes to the plans and moted all units have two parking spaces in front of the garages. The is less impervious pavement. He reviewed the stormwater catch basin and engineer request from the town for an 8" pipe. He reviewed drainage calculations. He referenced the landscape design plan and showed the plan with a vinyl fence, existing mature trees and two stormwater ponds, pervious pavement and walkway.

Chair Plumer asked about stormwater from the buildings and Mr. Smith explained the layer of pervious pavement.

Ms. Belanger asked about fencing at the cemetery and Mr. Sharples indicated the cemetery had a 6' fence on their side.

Ms. English asked about the two colors of the fence, gray and white. Mr. Sharples explained that the abutter of lot 106 preferred that color.

Chair Plumer asked if the driveway closed to the property line could be taken out. Ms. English and Ms. Belanger agreed. Mr. Kennedy questioned if they would still need the waiver. Mr. Smith indicated there would still be grading within 5.' Mr. Kennedy asked if the distance could be shown on the plan. Mr. Grueter asked if sidewalks could reach both ends of the parking lot. Mr. Smith indicated the landscape designer wanted to save a couple of trees and add more plantings.

Ms. English asked about the entry and Mr. Smith indicated from the garage most often.

Chair Plumer asked if the town homes could be individualized, stagged to give it a neighborhood feel and get away from the hotel look. Mr. Smith indicated the only difficulty would be with the front building. Mr. Grueter asked if a unit could be removed and building two and three turned to face each other to have a bigger grass area. He noted the side of the building might be better to look at than the garage. Mr. Sharples indicated it may violate the setbacks.

Chair Plumer opened the hearing to questions and comments from the public at 9:21 PM.

Jim of 5 Gill Street expressed concerns with the history of the neighborhood, design, density, traffic and character of the neighborhood. He opposed the three waivers and asked to keep the driveway away from his property.

Charlie French of 9 Gill Street expressed concerns with the scale of the project and density with the surrounding neighborhood and character, with screening and noted flipping the buildings would put the road closer with less screening.

Jeff of 111 Front Street expressed concerns with there being any waivers and with the scale, with parking and density and history of the lot. He recommended taking away 4-5 units. He expressed concerns with zoning and how this parcel became commercially zoned. He reviewed the history of the zoning ,and research by the Planning Office. He noted there was a warrant article approved in 1988 to make properties with multiple zoning into one zone and there is no information on how this became

commercial, the tax card says R-2, there is no legal decision. He questioned whether the town homes would be condominiums or apartments. He expressed concerns with parking.

Ms. Belanger indicated there was commercial use, an art gallery, a grocery store, some residential use, some commercial. Ms. English noted the town planner at the time lives across from the library and he could be asked.

David H. of 114 Front Street expressed concerns with the size of the project and asked if it could be shrunk to fit in with the neighborhood. He expressed concerns with density and fire hazards and asked if the fire department signed off on it. He expressed concerns with headlights into his home 20' away and the character of the neighborhood with a towering 35' building. He expressed concerns with traffic and would like a traffic analysis. He indicated Front Street is a nightmare and snow blocks the view now.

Bill Campbell of 7 Riverwoods Drive asked if there were a workforce component – no. He referenced a Seacoast article which stated the project would fit in nicely with the stately homes there. He noted the master plan intent to have density be reasonable and 17 units on 1.6 acres not being in character of the town.

Dana of 9 Gill Street expressed concerns with conversations and promises made by the developer at the site walk not being kept, with regard to the 6' cedar fence she was promised.

Rory Morisette of 12 & 14 Parker expressed concerns with the size of the project, traffic, snow piles, pipes, heavy rain water, pooling, grading, density and stated that he also understood there would be a cedar fence. He noted school was close by. He stated there were never any commercial businesses there when he was growing up.

(unidentified) stated that he did talk about fencing and would need to remove trees. He indicated he worked with all abutters, and referenced the Academy buildings which have a similar federal design. He noted he worked with Julie Gilman at the Heritage Committee. Mr. Grueter disagreed and noted the Committee only talked about saving the existing historical Merrill House.

S. Nelson of Gill Street expressed concerns with density, traffic and the proximity of the driveway.

Mr. Sharples explained the difference between a traffic memo and a traffic analysis which does actual traffic counts and concludes what if any improvements could be made.

Adele Robertson of 106 Front Street expressed concerns with church, on Sunday and the time of year factored in to when school is open.

Marie Carr of 4 Cross Road indicated she is not an abutter, but that Nancy Merrill wrote the book on Exeter. She expressed concerns with density and questioned if the home in front could be preserved and a larger home built in back.

Mr. Sharples recommended the Board providing the applicant a feel on the three waivers before continuing the hearing to the next available date.

Mr. Smith addressed pavement width of 22' and the bulk of impervious, grading within 5,' and the conventional pavement use the first 150' with catch basin and pipe. He referenced the support media beneath including filtration and stone which is designed to support vehicle traffic and was reviewed by the TRC and fire department.

Mr. Kennedy questioned the wavier for 5' and the proximity of the driveway and property line. Ms. Belanger agreed. Mr. Sharples explained there are instances when there is a low volume, of little or no impact when the town engineer will allow the connection to drainage and Mr. Smith feels it is fair because of the town engineer recommending the conventional pavement at the drive entrance/exit. Mr. Grueter agreed the measurements should be double-checked and provided.

Ms. Belanger motioned to table Planning Board Case #24-17 to the March 13, 2025 meeting of the Planning Board at the Nowak Room at 7 PM. Mr. Kennedy seconded the motion. A vote was taken, all were in favor, the motion passed 6-0-0.

IV. OLD BUSINESS

APPROVAL OF MINUTES

February 13, 2025

Ms. Belanger, Mr. Kennedy, and Ms. English recommended edits.

Ms. Belanger motioned to approve the February 13, 2025 meeting minutes, as amended. Ms. English seconded the motion. A vote was taken, all were in favor, the motion passed 6-0-0.

V. OTHER BUSINESS

- Master Plan Discussion
- Field Modifications
- Bond and/or Letter of Credit Reductions and Release

VI. TOWN PLANNER'S ITEMS

VII. CHAIRPERSON'S ITEMS

VIII. PB REPRESENTATIVE'S REPORT ON "OTHER COMMITTEE ACTIVITY"

Ms. Belanger reported that the Select Board is looking at the parking situation at Pickpocket Road.

IX. ADJOURN

Ms. Belanger motioned to adjourn the meeting at 10:30 PM. Mr. Grueter seconded the motion. A vote was taken and passed unanimously.

Respectfully submitted.

Daniel Hoijer,
Recording Secretary (Via Exeter TV)

TOWN OF EXETER
PLANNING BOARD
NOWAK ROOM
10 FRONT STREET
MARCH 13, 2025
DRAFT MINUTES
7:00 PM

I. PRELIMINARIES:

BOARD MEMBERS PRESENT BY ROLL CALL: Chair Langdon Plumer, Vice-Chair Aaron Brown, John Grueter, Clerk, Jen Martel, Nancy Belanger Select Board Representative, and Alternate Marty Kennedy

STAFF PRESENT: Town Planner Dave Sharples

II. CALL TO ORDER: Chair Plumer called the meeting to order at 7:00 PM and introduced the members.

III. NEW BUSINESS:

1. Continued public hearing on the application of Green & Company for site plan review and Wetlands Conditional Use Permit (CUP) for a proposed Mixed-Use Neighborhood Development (MUND) project consisting of a townhouse development (off Haven Lane) with thirty-two (32) three-bedroom units, a four-story mixed-use building on Portsmouth Avenue having 4,418 S.F. commercial use on the first floor and thirty-six (36) one-bedroom units above, and one separate duplex structure with three-bedroom units on Haven Lane, along with associated site improvements. The subject property is located at 76 Portsmouth Avenue, in the C-2, Highway Commercial zoning district, Tax Map Parcel #65-118. PB Case #24-8.

Chair Plumer read the Public Hearing Notice out loud.

Mr. Sharples reviewed that the application was proposed to the Board on December 19t, and numerous comments and concerns were raised by the Board and abutters. A site walk was held on January 9, 2025 and the applicant was scheduled to return to the Board at their January 23, 2025 meeting. The applicant appeared at the Conservation Commission's January 14, 2025 meeting and requested a continuance to reassess the project design and the Commission's concerns. The applicant appeared at the Commission's February 11, 2025 meeting to present their redesigned plans and the Commission voted that they had no objection to the wetland Conditional Use Permit (CUP) application with two conditions of approval. Mr. Sharples referenced a memo from the Commission dated February 12, 2025.

Mr. Sharples noted that the applicant submitted revised plans and supporting documents dated February 14, 2025 to the Planning Board. There was another Technical Review Committee meeting on February 27, 2025. Plan changes were submitted but revised plans are yet to be submitted. The TRC

issued another comment letter on March 5, 2025 and Underwood Engineers (UEI) provided comments in their March 4 letter. There are two waivers being requested as outlined in the waiver request letter from Jones & Beach dated January 13, 2025.

Mr. Sharples noted that Jason Plourde, the town's third-party review traffic engineer, will be available via Zoom for discussions concerning the traffic memo.

Alternate, Marty Kennedy, recused himself from this application and left the meeting table to sit with the public as he did traffic consulting work for the Town.

Paige Libbey of Jones & Beach Engineers, Inc. indicated that at the last meeting the Board had concerns with traffic which will be addressed tonight. She noted that the applicant made changes to break up two of the buildings into four units and three units. Any buildings with four or more units had horizontal jogs added to break up the façade. She noted changes to parking for buildings 2, 3 and 11 with the road widened for a better turn radius from garages without backing into the travel lane. She provided a handout showing the proposed changes. She noted changes to architectural elevations for buildings 8, 1 and 11 which will have the height decreased from 35' to 30.' She noted the applicant is working on addressing the comments from the most recent UEI letter.

Ms. Libbey noted that their traffic engineer had conversations with the town's 3rd party review engineer, Jason, and with town staff, and heard from abutters about existing issues and felt it would be more beneficial to make a contribution to address those issues rather than do a traffic study which would tell us what we already know.

Jason Plourde of VHB appeared remotely. He noted he reviewed Dr. Kim's memo and per trip generation which were in accordance with the Inst. of Traffic Engineers and NH Department of Transportation standards and had no issues with that. Mr. Plourde noted that while the 50-100 vehicles per hour will generally have no significant impact, given existing issues the addition of one more car would be considered exacerbation of the existing issues. He therefore noted that while the development is not exceeding recommendations, the location of the development has existing issues. He referenced Portsmouth Avenue, Alumni drive, Green Hill Road with traffic signals outdated and not talking to each other. He referenced the limited site on Bonny Drive and Greenhill at Clover Street. He noted issues with queuing beyond intersections of Portsmouth Avenue. He referenced the lack of stop signs on Bonny Drive or Haven Lane and recommended the Select Board and Department of Public Works be contacted. He referenced the Manual of Traffic Control Engineers and limited site lines when on Bonny Drive at Haven Lane. He referenced Bonny Drive at Greenhill Road, Clover Street at Bonny Drive having offset angles. He noted that if signals functioned properly vehicle queues may be resolved. Issues on Portsmouth Avenue are known, and he indicated he would be in favor of contribution of funds by the applicant rather than additional traffic study and review. Side street safety should be looked at as well.

Vice-Chair Brown asked if impact after development would be better than currently. Mr. Plourde noted that it is not the volume, but the location. The intersection is already operating with deficiency. This

development does not trigger the threshold but existing conditions on Portsmouth Avenue and safety on Haven Lane and Bonny Drive are adding to the existing problem.

Ms. Belanger asked about phase two being 4-10 years away. Mr. Plourde noted there could be more than one development during that time period and would be hard to predict. Ms. Belanger noted the purview of the Board is in the here and now.

Ms. Martel asked how the contribution would work and expressed concerns that a contribution doesn't guarantee improvement anytime in the near future. Mr. Sharples noted that exaction by the Planning Board is imposed on the developer outside of the Select Board for improvements. In this case to fix issues similar to Continental Drive. The funds would be held in escrow until the project is done. Portsmouth Avenue is already in the town's capital improvement plan (CIP). The signals could potentially be done, if funds were found. As part of Rockingham Planning Commission's Complete Street study traffic will be looked at. Ms. Martel asked what year and Mr. Sharples indicated 2029 but stop signs are in the Select Board's purview along with the police department and DPW. The Planning Board could recommend that DPW weighs in. Ms. Martel noted that the problem is exacerbated. Mr. Brown questioned if any development should not be allowed until the lights are resolved? He questioned the cost for the repair. Mr. Plourde recommended having the contractor open the signal cabinets and look at the equipment to allow them to be able to talk to each other. Mr. Sharples will look into this. He noted that a specific purpose for the exaction funds would be attached like with Riverwoods for example – "for public safety use."

(unidentified) stated the number of cars is tripling in the neighborhood. Mr. Brown noted the impact may be significant to the abutters.

(unidentified) indicated 50-100 cars is the general rule of thumb for increase but if already deficient that threshold is thrown out the window and noted narrow roads. Mr. Plourde indicated he looked at the aerial widths and Bonny and Haven are built to town standards and exceed site plan review and subdivision regulations minimum 24.'

Mr. Francheski expressed concerns with traffic jams after the second phase of construction.

Mr. Plourde noted synchronizing the signals will keep the entrance functional. Three or four movements affected, Alumni Drive and Greenhill Road would be stuck as well. If updated and synchronized volumes along the corridor would progress and not be stuck between two signals.

(unidentified) asked if there would be another traffic study to make sure its working. Mr. Plourde noted that the town would be conducting traffic analysis, so a separate study is not recommended specific to this project. Mr. Brown noted it is in the master plan to have further direction for Portsmouth Avenue.

Susan Taylor noted she is a bus driver, and the problem persists from High Street to downtown.

Ms. Belanger noted that correct timing could get traffic moving and possibly stop people from cutting through Jady Hill.

Cathy Boudreau indicated when there is a parking ban people have to park somewhere and noted there are children playing.

Ms. Belanger questioned whether the Board could approve something so far out and expressed concerns with the underutilized parking lot of the existing business and making sure with the pedestrian bridge that parking there is only for their business.

Christina Tindle noted the development is permitted because of MUND (Mixed Use Neighborhood Development) but the commercial part of the project is disconnected in phase 2. Mr. Brown noted there is an existing commercial use there now.

Noel of 11 Bonny Drive indicated she is an abutter and would like a fence and questioned how wetlands become commercial property. She asked who is liable for water issues. Mr. Sharples noted the property has been zoned commercial as long as he has been here. Ms. Libbey noted they are dealing with buffers and setbacks. Chair Plumer noted they have to have a stormwater management plan, 90% of the projects in Exeter have wetlands and the Conservation Commission reviewed the application thoroughly and the Board listens to their recommendations.

Ryan O'Brien expressed concerns with phasing and the walkway to Portsmouth Avenue.

Michael Hauck and Danielle Frank requested overlay renderings on Haven Lane with our homes in the foreground, on Bonny Drive and Portsmouth Ave with the Federated business and townhomes, the completed project. She asked about construction hours and the neighborhood having to deal with that for two years and requested the Select Board limit construction hours. Mr. Sharples noted the change would need to be town-wide for the Select Board but he could talk to the developer and see what their plans are.

Lisa Medlock of 11 Haven Drive asked about the effects of two years of construction on their homes. Mr. Brown noted there are pre-blasting surveys to protect against damage, but Mr. Green noted blasting is doubtful.

Steve Taylor expressed concerns with the entrances and fire truck loop. Ms. Libbey indicated the truck turning plans are in the plan set and the fire department weighed in, that the extra entrance is needed. Ms. Belanger asked if it could be gated and Ms. Libbey noted if gated there is nowhere to pull up, back up or turn around accessible to everyday and would need to be two-way, not one way. Mrs. Taylor agreed with turning concerns. Mr. Sharples explained the process and noted Jason from the Fire Department provides the dimensions and creates a template which is reviewed by the fire department.

Ms. Martel asked about considering a landscaped island in building 1 and 11.

Mr. Sharples asked the Board their feelings on exaction versus a traffic analysis and Ms. Martel, Chair Plumer agreed the analysis was not needed. Mr. Brown noted the exaction made sense and would like to see the problem resolved if the Town Planner could make some calls. He noted the traffic study is

not going to provide anything additional. Ms. Belanger agreed and will raise the issue of stop signs at the Select Board meeting.

The Board discussed the parameters for the visual rendering including views from Portsmouth Avenue, the neighborhood from the inside and outside in. Ms. Libbey will bring renderings to the next meeting but won't have them a week before. Vice-Chair Brown indicated the scale could be shown of the existing homes.

Vice-Chair Brown motioned to table Planning Board Case #24-8 to the March 27, 2025 Planning Board meeting at 7 PM in the Nowak Room. Ms. Belanger seconded the motion. A vote was taken, all were in favor, the motion passed 5-0-0.

3. The continued application of StoneArch Development for site plan review of a proposal for the redevelopment of the property located at 112 Front Street. The proposal includes the demolition of the existing buildings and new construction of seventeen (17) townhouse style condominium units and associated site improvements.
C-1, Central Area Commercial zoning district
Tax Map Parcel #73-14
PB Case #24-17.

Mr. Kennedy returned to the meeting table and Chair Plumer activated the alternates.

Chair Plumer read out loud the Public Hearing Notice.

Mr. Sharples noted that the applicant appeared before the Board at the January 23, 2025 meeting to present their plans for the redevelopment of the property. Public comment was opened, and a site walk was held on February 6, 2025 The applicant submitted plans and supporting documents dated Feb. 19, 2025 and appeared at the February 27, 2025 meeting to address concerns raised during the site walk and of UEI dated February 20, 2025. Revised plans and supporting documents were submitted on March 5, 2025. The applicant is requesting two waivers. The previous waiver for grading within 5' is no longer necessary as the entranceway has moved 5.5' off the easterly property line.

Christian Smith of Beals Assoc. presented the changes to the plans and moted all units have two parking spaces in front of the garages. He noted they looked at staggering the buildings, but it was messy. He added architectural changes to the exterior of the buildings, bay windows, dormers and gables. The proposed landscaping plan was provided and final UEI comments addressed.

Chair Plumer asked if moving the driveway would affect the front of the building. Mr. Smith indicated the building position will not change as 1' was removed from each end.

Chair Plumer asked about fencing and Ms. Smith showed the plantings and fences. Mr. Brown noted there were breaks to preserve tree roots. He requested the fence details be added to the plans.

Ms. Martel questioned sheets a1a and a1b and the hip roof. She noted the buildings seem backward with the garages facing each other. Mr. O'Neil noted the function of the two car garages and the purview of the Board with respect to architecture. Mr. Smith noted the front would be pleasing to abutters.

Dale Atkins expressed concerns with the size of the buildings compared to surrounding homes and opined that there should be ten units at most.

Bill Campbell of 7 Riverwoods Drive asked why 17 units be jammed into this lot and expressed concerns with height, density and character. He asked if the Board could recommend renditions from Gill Street.

Randy Daley the Cemetery Custodian asked about the fence. Mr. O'Neil noted the Cemetery owns the existing 6' chain link fence and that will be surrounded by landscaping. Mr. Sharples noted the cemetery fence continues to Linden Street. Mr. Daley expressed concerns with sound during construction or a funeral. Ms. Martel noted there is not a lot of screening and recommended doubling it up with larger species.

Mr. Grueter asked if there was a well for irrigation and Mr. O'Neil indicated yes.

Sarah Nelson of 8 Gill Street expressed concerns with density and referenced Article 1, Section 1.2 purposes of the zoning ordinance to lessen congestion in the street and to prevent overcrowding of land and undue concentration of population and Article 10 – Growth Management, aesthetics and scenic beauty and greenspace and with the driveway and number of homes. She asked about snow storage and snow melt into neighbor's yards and if removal is part of the equation.

Rory Morissette of 12 and 14 Parker expressed concerns with density of plantings on the Parker Street side and additional runoff.

Chair Plumer noted that he would like to see reduction. The project is very dense and not compatible, the height is noticeable and will be interested to see the renderings. Mr. O'Neil noted the developer has the right to utilize yield. Mr. Sharples reviewed the yield in the zone, which is 3500 SF of lot area per dwelling unit removing the driveway. 69,349 SF minus the 9,687 SF of driveway. 59,661 SF/3500 is 17.05 units. Mr. Smith noted a ¼ acre parcel with a duplex at 11 Gill Street.

David Harrington stated that he sent a letter and expressed concerns with density being overwhelming for neighbors and would like something to block headlights.

Jim Kneeland of Gill Street expressed concerns with density and character of the neighborhood and the master plan. Ms. Belanger noted the Board has to go by the zoning ordinance.

Mr. Campbell noted if the lots on Gill Street were compared to the quarter acre units they would get six. Ms. Smith noted he referenced a duplex not a single-family home.

Jeff of 111 Front Street expressed concerns with density and guest parking. Mr. Smith noted there is parking behind garage doors, two 9'x9' spaces, four total. He stated that he doesn't think the parcel should be zoned commercial. Mr. Sharples noted the official zoning map has shown the parcel as commercial for 40 years. It was bifurcated before the vote and the town relies on the map created after which no one appealed. Mr. Smith noted it was very plain, commercial bifurcations were zoned commercial after the vote.

Sam Makarkur noted the buildings could be 50' high. The use is allowed with no zoning relief and they have been through Technical Review Committee (TRC), architect, landscaping, fencing and modifications to break up the buildings. The property height abuts multi-family residences and 111-113 Front Street is multi-family across the street with a modern parking garage. This is not a historic district, but they worked with the Heritage Commission. There is a lot of multi-family on Front Street. Keeping the front of the Merrill Building was not feasible. The developer has gone above and beyond with no legal obligation to do so.

Chair Plumer asked about snow removal and Mr. Smith noted if full. There is no additional runoff leaving to abutting property.

Jim Davis of 115 Front Street asked about maintenance of the porous pavement. Mr. Smith noted the Homeowner's Association or Management Company. A plow with rubberized blade would be used. He referenced the grassed area and that there would be no snow on Front Street. Mr. Sharples noted the conditions of approval would address stormwater manual and inspection requirements annually. UEI does third party inspections and bmps (best management practices) have to be met during construction.

Mr. Kennedy asked about the parking area not being considered part of the driveway and Mr. Sharples explained how the ordinance reads.

(unidentified) asked about apartments or transient housing and Mr. Sharples noted the type of ownership doesn't change anything whether individual or homeowners, with regard to maintenance and submission requirements.

Ms. Martel reviewed the lighting plan and requested more information on the plan.

David H. asked about several motion lights all going off at once if an animal walks past. Mr. Brown noted the lighting on the plan won't go off the property.

Ms. Martel recommended changes to plantings in the snow storage area.

Ms. Martel asked about curbs and trash removal. Mr. O'Neil noted no curbs and private trash removal.

Ms. Martel requested the diseased tree be replaced with a significant specimen tree with a big mulch area.

Vice-Chair Brown motioned to table Planning Board Case #24-17 to the March 27, 2025 meeting of the Planning Board at the Nowak Room at 7 PM. Ms. Belanger seconded the motion. A vote was taken, all were in favor, the motion passed 6-0-0.

IV. OLD BUSINESS

APPROVAL OF MINUTES

February 27, 2025

Ms. Belanger motioned to table approval of the February 27, 2025 meeting minutes. Mr. Grueter seconded the motion. A vote was taken, all were in favor, the motion passed 6-0-0.

V. OTHER BUSINESS

- Master Plan Discussion
- Field Modifications
- Bond and/or Letter of Credit Reductions and Release

VI. TOWN PLANNER'S ITEMS

VII. CHAIRPERSON'S ITEMS

VIII. PB REPRESENTATIVE'S REPORT ON "OTHER COMMITTEE ACTIVITY"

IX. ADJOURN

Mr. Grueter motioned to adjourn the meeting at 10:39 PM. Mr. Belanger seconded the motion. A vote was taken and passed unanimously.

Respectfully submitted.

Daniel Hoijer,
Recording Secretary (Via Exeter TV)

TOWN OF EXETER

Planning and Building Department

10 FRONT STREET • EXETER, NH • 03833-3792 • (603) 778-0591 •FAX 772-4709

www.exeternh.gov

Date: **March 20, 2025**

To: **Planning Board**

From: **Dave Sharples, Town Planner**

Re: **PB Case #24-8** **Green & Company**

The Applicant has submitted applications for site plan review and a Wetlands Conditional Use Permit (CUP) for a proposed Mixed-Use Neighborhood Development (MUND) on the property located at 76 Portsmouth Avenue (the current site of the Federated Auto Parts building). The proposal originally consisted of a townhouse development off Haven Lane, a four-story mixed-use building on Portsmouth Avenue having commercial use on the first floor and residential units above, and one separate duplex structure on Haven Lane, along with associated site improvements. The subject property is located in the C-2, Highway Commercial zoning district and is identified as Tax Map Parcel #65-118.

The Applicant presented their proposal to the Planning Board originally at the December 19th, meeting where numerous comments and concerns were raised by the Board and abutters. A site walk was conducted on January 9, 2025, and the Applicant returned to the Board at the February 27th and March 13th, 2025 meetings for continued discussion.

As previously noted, the Applicant returned to the Conservation Commission at their February 11th, 2025 meeting and presented their redesigned plans. The Commission voted that they had no objection to the Wetlands CUP application and recommended two conditions of approval. A memo from CC Chairman Dave Short, dated 2/12/25, has been provided to the Board with previous meeting materials.

A second Technical Review Committee (TRC) meeting was conducted on 2/27/25 and comment letters from UEI and the TRC were provided to the Applicant, and were included in the Board's last meeting packet. The Applicant has submitted revised plans and supporting documents, dated 3/19/25, and these materials are enclosed for your review.

At the prior Planning Board meeting, several items were discussed that included traffic, sidewalk access, construction hours, hydrant location, one access point vs two access points. Regarding traffic, the Planning Board agreed to forego a full traffic impact analysis and instead impose an exaction as agreed by the applicant to offset some of the cost to coordinate the three (3) traffic signals on Portsmouth Ave between High St and Alumni Drive. I spoke with Electric Light who does our signal work and they estimated that connecting the three signals (equipment and labor), preparing a timing plan, and implementing said plan would be approximately $7-10K per signal. To this end, the applicant has agreed to provide the town with $20,000 toward this effort and I believe this is more than fair. While the applicant is going to save this and possibly more by doing a full traffic impact analysis, I believe $20,000 easily represents their proportional share.

Sidewalk access was discussed. It appeared that there was a concern that the lease in the front of the parcel could prohibit pedestrian access on the proposed sidewalk that runs from the Haven Lane side of the development to Portsmouth Ave. I will be prepared with a condition of approval if needed to address this matter.

Construction hours were also discussed by an abutter and it was requested that the Planning Board restrict the construction hours to beyond the Town's current ordinance. I told the board that while I do not believe the planning board should impose any condition regarding construction hours, I did say I would reach out to the applicant to see if they would voluntarily restrict the hours. They have agreed to restrict the hours from 7am to 7pm daily and only inside work on Sundays.

Regarding the hydrant location, the Fire Department is reviewing the latest location shown on the plans and will get back to me if that location is acceptable. I will update the board on this at the meeting. I also spoke to the Fire Department about the two access points on Haven Lane and they prefer this configuration over the one access point and dead turnaround.

The Applicant is requesting two waivers from the Board's Site Plan Review & Subdivision Regulations, as outlined in the Waiver Request letter from Jones & Beach Engineers, dated 1/13/25, previously provided, but also included in the enclosed materials.

I will be prepared with conditions of approval at the meeting, should the Board decide to take action on the application.

Waiver Motions:

Grading within 5 feet of exterior property line waiver motion: After reviewing the criteria for granting waivers, I move that the request of Green & Company (PB Case #24-8) for a waiver from Section 9.3.6.4. of the Site Plan Review and Subdivision Regulations regarding grading within 5 feet of an exterior property line be APPROVED / APPROVED WITH THE FOLLOWING CONDITIONS / TABLED / DENIED.

Standard Specifications for Construction - Section E(III)(D)(1) - Curb Radius Intersections (DPW construction standards) motion: After reviewing the criteria for granting waivers, I move that the request of Green & Company (PB Case #24-8) for a waiver from the standard specifications for construction relative to curb radius be APPROVED / APPROVED WITH THE FOLLOWING CONDITIONS / TABLED / DENIED

Planning Board Motions:

Table Motion: I move that the application of Green & Company (PB Case #24-8) be TABLED to the (date/time/place) Planning Board meeting and revised plans/documents shall be submitted to the Planning Office at least eight (8) days prior to the meeting or the application may remain on the table to a future meeting.

Conditional Use Permit (Wetlands) Motion: After reviewing the criteria for a Wetlands Conditional Use permit, I move that the request of Green & Company (PB #24-8) for a Conditional Use Permit be APPROVED / APPROVED WITH THE FOLLOWING CONDITIONS / TABLED / DENIED.

Multi-Family Site Plan Motion: I move that the request of Green & Company (PB #24-8) for Multi-Family Site Plan approval be APPROVED / APPROVED WITH THE FOLLOWING CONDITIONS / TABLED / DENIED.

Thank you.
Enclosures

JONES & BEACH ENGINEERS INC.
85 Portsmouth Avenue, PO Box 219, Stratham, NH 03885
603.772.4746 - JonesandBeach.com

March 19, 2025

Exeter Planning Board
Attn. Langdon Plumer, Chair
10 Front Street
Exeter, NH 03833

RE: Response Letter 2
PB Case # 24-8
76 Portsmouth Avenue, Exeter, NH
Tax Map 65, Lot 118
JBE Project No. 24029

Dear Mr. Plumer,

We are in receipt of comments from Allison M. Rees, P.E and Robert J. Saunders, P.E, Underwood Engineers, dated March 4, 2025, and TRC comments from Dave Sharples, Exeter Town Planner dated March 5, 2025. Original comments are below with our responses in bold.

Underwood Engineers Comments:

New Comments on Redesign:

51. The proposed driveway flare at the entrance onto Portsmouth Ave extends (significantly) beyond the plane of the abutting property line. NHDOT regulation does not allow for driveway flares (within the ROW) to break the plane across property boundaries.
RESPONSE: The Technical Review Committee indicated at their meeting on February 27th that they find this approach acceptable for the driveway radius as the driveway being on the far side from the building allows for the parking to have direct sidewalk access and leaves the option for potential future connection to the Thirsty Moose.

52. The Portsmouth Ave and interior sidewalk are disconnected (at grade) for at least 7 feet, while the flare pushes the proposed sidewalk tip down westerly along Portsmouth Ave over 18'.
RESPONSE: The interior sidewalk adjacent to the building has been removed. We are instead proposing to replace the existing sidewalk along Portsmouth Ave. with an 8 feet wide concrete sidewalk in the frontage of the subject parcel and provide 5' walkways from that sidewalk to each door that faces Portsmouth Ave on the proposed building to be more in line with MUND zoning.

53. The stop sign is positioned in the disconnected "at grade" sidewalk.
RESPONSE: The stop sign has been moved back, out of the existing "at grade" sidewalk.

54. A waiver is required for grading within 5' of the property line, as shown in several places.
RESPONSE: A waiver was previously requested for grading within 5' of the property line and the waiver request letter is again included with this resubmission.

55. Snow storage is proposed behind guardrail.
RESPONSE: The snow storage area shown behind guardrail has been removed.

56. Please show locations of perimeter drain outlets and retaining wall drains on the grading and drainage plan.
RESPONSE: Locations of perimeter drain outlets and retaining wall drains are shown on the revised grading and drainage plan. See labels in plan view as well as note #28 on Sheet C3 and the label on the retaining wall detail stating that there shall be a drain pipe outlet every 20' along the length of retaining walls.

57. Provide buoyancy calculations for the pump station and sewer manholes with floating potential.
RESPONSE: Buoyancy calculations for the pump station, valve pit, and sewer manholes are included with this resubmission.

58. Buildings 2, 5 and 6 are exposed to impact from vehicles and plows, consider bollards or other protective/delineating devices.
RESPONSE: The pavement has been widened by six feet in front of these buildings and the first floor of these buildings has been bumped back so that the upper levels will be cantilevered over the pavement by two feet.

59. Revise the clearing limits to reflect construction needs, including area needed to maneuver equipment and materials behind buildings, excavation, backfill and drain installation behind retaining walls, etc.
RESPONSE: Clearing limits have been revised as needed for constructability.

60. Revise the clearing limit at the end of Haven Lane to provide sufficient room for snow storage. Remove the VGC at the end of the road.
RESPONSE: The vertical granite curb has been removed from the end of Haven Lane and the area is now pitched into the site. The clearing limits have been revised at the end of Haven Lane to provide room for snow storage.

61. There may be backfill/material requirement conflicts between the drip edge and the retaining wall at the southernmost unit of Building 3.
RESPONSE: The retaining wall has been pushed back to create a 2' gap between the drip edge and the retaining wall.

> *a. One end of the retaining wall has TOW elevation of 35.25, with the 36' contour appearing to terminate at the wall.*
> **RESPONSE: The top of wall elevation has been revised.**

62. UE is struggling to reconcile the constructability of Building 7/Retaining Walls without (additional) disturbance to the adjacent wetland.
RESPONSE: The dimensions of the northern unit on Building 8 (formerly Building 7, before Building 3 was split, increasing each building number by one) has been made 20'x40' and Building 8 has been shifted to the north, away from the wetland. This allows us to maintain approximately 8' of separation from the closest building wall to the edge of the wetland and eliminates the need for the retaining wall in this area.

63. Stormwater O&M requirements will be intense and frequent since there are multiple types of treatment with various requirements. Some of BMPs proposed are prone to clogging, so the functioning of the BMPs depends on the upkeep of the systems, What kind of assurances will be in place for O&M?
RESPONSE: As stated in Section A.1 of the stormwater operations and maintenance manual, an annual report and certification shall be submitted to the Town Planner annually to ensure that the Association is following its inspection and maintenance requirements.

64. Porous pavement:

a. It appears that where the project is proposing porous pavement it is doing so for drive aisles and parking spaces alike. In general, this practice will show deterioration and premature failure in the drive aisles and have increased life cycle costs over alternative pavement arrangements such as using conventional pavement in the high traffic areas and limiting the use of porous pavement to lighter loaded traffic areas.
RESPONSE: We anticipate that the drive aisles will not be subjected to high levels of traffic, and that people will be driving relatively slowly through the site and therefore we are not concerned about heavy traffic compromising the effectiveness of the porous pavement. It will be the responsibility of the Association to maintain and hire a qualified individual to inspect the condition of the porous pavement, and to submit an annual inspection report to the Town. If the effectiveness of the porous pavement begins to noticeably deteriorate in the future, these procedures are in place to ensure that it will be repaired. It is not feasible to restrict porous areas to only the driveways and parking spaces in this development where, in order to have adequate recreation space and avoid more wetland buffer impact than is necessary, no other stormwater treatment BMPs are proposed for the roadways

b. We note plow drivers will need to know where to change plowing and sanding/salting methods in multiple locations. Show locations of signs directing the winter maintenance activities regarding porous pavement.
RESPONSE: Porous pavement maintenance signs are proposed at the transition points between standard and porous pavement. These are the standard porous pavement maintenance signs per NHDES with an added note stating "Porous asphalt for stormwater management beyond this point". Sign locations are shown on Sheet C2 and a detail for the sign has been added to Sheet D8.

c. Add a porous pavement sign detail to the detail sheets and depict the proposed sign locations on the plans.
RESPONSE: See response to comment 64b.

d. The patchwork nature of the porous pavement will put the onus on the homeowner's association differing treatment, maintenance, repair and repaving requirements in the future.
RESPONSE: See responses below.

i. It appears to UE that the small islands of conventional pavement are being driven by high bottom in the profile for the structural box, please confirm.
RESPONSE: Correct.

ii. It appears to UE that only minor adjustments to subgrade are required to remove the islands of conventional pavement.
RESPONSE: Rather than adjust the subgrade to make full infiltration work in these areas, we are proposing to make these areas porous but line and underdrain them and outlet the underdrain into the full infiltration areas.

iii. It appears to UE that additional (minor) adjustments to subgrade could extend porous pavement to station 2+50
RESPONSE: We are hesitant to do this because test pit 6007 indicates a depth to seasonal high water table of 5" in this area. We can start the porous pavement just before Station 3+00 with sufficient fill but if we start it any earlier along Road 2, we risk the bottom of stone intercepting the seasonal high water table. This area is designated as a water supply intake protection area, so the filter course needs to be 18" thick in this section, further complicating any extension to the porous pavement.

e. The effectiveness of the porous pavement in front of building 4 will likely be reduced due to the increased proposed slope of the area.
RESPONSE: Given that the slope of the road at the nearby crosswalk location needs to be 2% at most, that adequate separation to seasonal high water table needs to be maintained along the porous pavement that is proposed over the existing steep slope, and that the slope along the centerline of the roadway in front of Building 6 cannot be too steep in order to ensure a driveable cross slope between the roadway centerline and the garage doors on building 6, there is not much that can be done to change the design of the roadway in this area without introducing excessive fills. However, we are proposing to install subgrade clay dams in this area in order to maintain the effectiveness of the porous pavement in this area to the extent practicable. The locations of the clay dams are noted on Sheet C3 and a detail for these features has been added to Sheet D8.

f. We note installation and maintenance of the porous pavement between the curbed islands and the structures in front of buildings 3, 4, 8, and 9 will be difficult. How will these area be maintained, specifically, vacuumed?
RESPONSE: Porous pavement vacuums are designed to fit in tight areas and can likely be moved by hand to fit in these spaces. Furthermore, as long as the remainder of the porous pavement can be vacuumed and continues to function as intended, we are not concerned about these small areas being inaccessible for maintenance. Also, these spots are only subject to foot traffic.

65. Water comments:

a. Is each Building's 1" potable service at each fire suppression service metered?
RESPONSE: Yes.

b. The project proposes 6" DI water main throughout. UE recommends that the new water infrastructure be 8" DI throughout.
RESPONSE: The TRC finds a 6" DI main through the site to be acceptable and furthermore, the existing water main along Haven Lane that we are tying into is 6" AC.

c. The project proposes a 6" tapping sleeve at the mid-section take-off along Haven Lane. Avoidance of the use of tapping sleeve valves is preferable wherever possible. UE recommends that that the connection be made with an 8" tee with (3) 8" gate valves, flanking 8x6 reducers and Romex reducing couplings to connect the 6" DI to the 6" AC water main. UE does note there appears to be an inline valve immediately east of the proposed water tie-in, confirm with Exeter DPW that it is functional.
RESPONSE: The tapping sleeves have been removed and we are instead now proposing a tapping tee with three gate valves at both the Haven Lane and Portsmouth Ave water main connections. We have contacted DPW to confirm whether or not the inline valve is still functional and are awaiting their response.

d. It is unclear if the valve at the end of Haven Lane is an inline valve or a hydrant valve? If it is a hydrant valve and there is no existing inline valve at that location, review the final configuration with Exeter DPW for concurrence.

RESPONSE: This appears to be a hydrant valve. We have reconfigured the proposed water main to tap the existing water main just before the valve rather than continue straight past the fire hydrant. We have contacted DPW to confirm the type of valve and are awaiting their response.

e. Confirm that a 4" fire suppression main is adequate for Building 3, others?
RESPONSE: A 4" fire suppression main for each building is adequate and typical for this type of development. Building 3 is no longer proposed as a 7-unit building; it has been split up into one four-unit and one 3-unit building with separate fire services, which will reduce the load on the 4" fire suppression line to each of these buildings. A fire protection engineer will provide the final fire suppression design.

f. Confirm hydrant placement(s) with Exeter Fire Department, aside from being the only proposed location in the campus, the hydrant off the westerly corner of Building 3 is limited in its ability to assist in fire protection.
RESPONSE: After contacting the fire department, we have moved the hydrant to be near Building 10 instead and we have added a blowoff at the end of the line where the hydrant was proposed originally.

g. Per comment e above, the hydrant main off the westerly end of Building 3 supplies 3 water services. In the interest of improved water quality, consider revising the three water services to come off the main at the intersection between Buildings 2 and 3.
RESPONSE: The fire hydrant has been revised to tee off of the water main near building 10 per the fire department as explained in response to 65f and the services have been kept where they were, as discussed as TRC.

h. Review water system for placement of gate valves for isolation and testing. A tri-valve arrangement at the intersection between buildings 4 & 9 is recommended as the minimum.
RESPONSE: Additional gate valves have been added at the water main intersection between buildings 5&10 (building numbers changed) and at the water main intersection beneath the intersection of Roads 1&2.

66. Sewer Comments:

a. The sewer services are presented with a dot in the service run. It is unclear if the dots are intended to be clean-outs or observation Tee w/plugs per the details.
RESPONSE: These are intended to be observation tees with plugs.

i. If intended to be clean-outs, many are improperly placed relative to angle points in the line.
RESPONSE: These are intended to be observation tees, not cleanouts.

ii. If observation tee w/plugs, confirm with Exeter the need for them as the runs are short, generally straight, almost all in pavement and privately owned.
RESPONSE: We have contacted DPW to confirm this and are awaiting their response.

iii. In this application, it appears that clean-outs, as required by code, might best be placed interior to the building, within the garage slabs. Removing them from the driveway (Porous) pavement will assist in longer life of the pavement and cleanout and again, the runs are short and generally straight.
RESPONSE: Cleanouts will be placed interior to the buildings.

iv. Revise details as appropriate.

RESPONSE: Details have been revised as needed.

67. Landscaping Plan:

a. The underground utilities have not been added to the landscaping plan. Please resubmit plan with the utilities shown so conflicts can be reviewed. For example, proposed trees are shown in the vicinity of the sewer pump station and generator.
RESPONSE: Virtually all of the underground utilities are proposed underneath pavement and therefore don't need to be shown on the landscaping plan. However, the utility infrastructure that does need to be shown on the landscaping plan (pull boxes, transformers, generators, and manhole covers) have been added to Sheet L1.

b. A number of trees are shown at the edge of porous pavement. Consider minimizing the planting of trees, or at least the planting of deciduous trees, near porous pavement reduce maintenance and potential clogging.
RESPONSE: The proposed trees have been moved further away from the porous pavement.

68. Forcemain should discharge into a length of gravity sewer prior to the sewer manhole. Add a detail for the forcemain to manhole connection.
RESPONSE: A "Forcemain terminus into new manhole" detail has been added to Sheet D3 showing a 10' long 8" diameter gravity sewer stub at the end of the forcemain. This is shown in the profile in Sheet P5 as well.

69. UE notes a number of inconsistencies with the architectural drawings and the building footprints on the site plans, number of changes in foundation, total building lengths; all potentially affecting parking, walkways and drainage.
RESPONSE: The architectural plans and site plan have been reviewed and revised as needed.

70. UE also notes the use of 8' garage doors for many of the units and 16' for some others.

a. 8' garage doors are challenging for many drivers/vehicles.
RESPONSE: 8' garage doors are typical for these types of developments and additional maneuvering space has been added in front of the units that do not have driveways.

b. Vehicles backing out of the garages at Buildings 2, 5, and 6 will be backing directly into the traffic lanes.
RESPONSE: The paved roadway has been widened in front of these buildings so that there will be visibility along the roadway. As stated above, the pavement in front of these buildings has been widened by 6' and the first floors of these buildings have been bumped back so that the upper levels will be cantilevered over the pavement by two feet. We anticipate that drivers will be driving at a relatively low speed through the site.

71. Confirm that the 48" outfall is adequate to pass the combined flow from the 12", 15" and 48" inlets as well as the entire watershed that feeds into it.
RESPONSE: A Manning's full flow analysis is included with the drainage report demonstrating that the 48" HDPE outfall at 0.02 ft/ft slope has more than enough capacity to pass the theoretical full flow from the upstream 48" CMP pipe at 0.008 ft/ft slope as well as the 50-year peak flow from the proposed 12" and 18" pipes. In fact, Manning's full flow equation demonstrates that the 48" outfall pipe is flowing at less than half capacity in this scenario as the friction and low slope of the upstream 48" CMP pipe restricts the amount of flow that can reach the 48" outfall in the first place.

72. PTAP Database: The PTAP entry is reviewed in conjunction with the projects proposed stormwater treatment. Waiting until the project is approved to do so is contrary to the design process as an unbalanced PTAP entry at that stage is too late for drainage design changes.
RESPONSE: A preliminary PTAP submission has been filed and is included with this resubmission.

TRC Comments:

1. *Show the location of all existing easements, rights-of-way, and other encumbrances in accordance with Section 7.4.17. Note #8 on the existing conditions plan states that there could be encumbrances etc. and these may be unknown. Revise this to be more definitive as discussed at the TRC.*
   RESPONSE: The intent of Note 8 as shown on the Existing Conditions Plan is not to circumvent the requirement to show all easements and rights of way. Easements that were found in the public record during title research are shown where possible, or noted if not able to be shown. Site conditions and evidence of unwritten interests in the land that were observed at the time of the survey, to the extent that they have a physical effect on the land, are shown. Since it is always possible that additional easements, rights, or interests may exist, including those that may have come into existence since the date of the survey, a more definitive statement that "all easements are shown" cannot be made.

2. *Prior comment: Provide monumentation in accordance with Section 9.25 of the Site Plan Review and Subdivision Regulations. New comment: The plans do not appear to fully satisfy this provision, please review and revise accordingly.*
   RESPONSE: The plans have been revised to provide all required monumentation.

3. *Please add bicycle and pedestrian facilities (such as benches and bike racks) to the plans per Section 6.19.5.E.*
   RESPONSE: The landscaping plan has been revised to show benches, street trees, and bicycle racks in the frontage of the site in order to conform with Section 6.19.5.E of the Zoning Ordinance.

4. *Curbed planting aisles are required between every 10-15 parking spaces per Section 9.7.5.5. Revise plans accordingly.*
   RESPONSE: Curbed landscaped islands are shown after every 15 parking spaces.

5. *Prior comment: The elevations still do not appear to meet Section 6.19.5.J-O. Suggest architect revisit MUND guidelines and provide narrative on how the building and site meets the criteria in these sections. No Narrative was provided and they still do not meet the guidelines. Please provide narrative from the architect describing each provision and how the drawings satisfy the requirement.*
   RESPONSE: A narrative from the architect is included with this submission.

6. *Discuss loading zone and how it will work, it is odd shaped and the location blocks the access.*
   RESPONSE: The loading zone has been relocated to the end of the parking lot.

7. *Architectural rendering does not match landscaping plan. These documents should match each other.*
   RESPONSE: Proposed landscaping has been removed from the architectural renderings.

8. *Lawn/turf areas should be avoided per 6.19.5.F. revise plans accordingly and provide seeding specifications on the plans.*
   RESPONSE: The landscaping plan has been revised to show the limits of lawn/turf and mulched areas and hydroseeding instructions for the lawn areas have been added.

9. *The pedestrian connection appears to go onto private property before reaching Portsmouth Ave. Please clarify this and provide a direct connection to the sidewalk on Portsmouth Ave that avoids encroachment onto private land. This comment was discussed at the TRC and it appears that the subject parcel juts outward toward Portsmouth Ave more than the adjoining properties. Consider dedication of right-of-way as discussed at the TRC.*
   RESPONSE: We have revised the proposed sidewalk on the southwest edge of the parking area to terminate approximately 32' back from the existing right of way line in Phase 2 and added a crosswalk to connect the two sidewalks on each side of the parking area. This creates a walkable path between the proposed sidewalk along the edge of the parking area and the existing sidewalk along Portsmouth Avenue without encroaching on to the Thirsty Moose property. We are open to dedicating the strip of Portsmouth Ave that is on the subject parcel to be part of the public right of way.

10. *Proposed lighting at the westerly access on to Haven Lane appears to spill over onto the abutting property. Please adjust lighting placement to avoid any light spillover.*
    RESPONSE: The light pole at the westerly access to Haven Lane has been removed.

PUBLIC WORKS COMMENTS – No further comments have been provided.

FIRE DEPARTMENT COMMENTS – No further comments have been provided.

NATURAL RESOURCE PLANNER COMMENTS:

1. *No further comments provided. Con Com voted to recommend approval of the Wetland CUP at their February 11th, 2025 meeting.*
   RESPONSE: No response necessary.

CODE ENFORCEMENT OFFICER COMMENTS:

1. *The plans have been reviewed for compliance with the Town's Zoning Ordinance. It has been determined that the plans, as presented, conform to all zoning regulations and therefore, no zoning relief is necessary.*
   RESPONSE: No response necessary.

The following are included with this Response Letter:

1. Waiver Request Letters.
2. Sewer Structure Buoyancy Calculations.
3. Narrative from Architect.
4. PDF Copy of Preliminary PTAPP Submission.
5. Two (2) Revised Drainage Analysis.
6. Fifteen (15) Half Size Revised Architectural Plans.
7. Seven (7) Full Size Revised Plan Sets.
8. Fifteen (15) Half Size Revised Plan Sets.

If you have any questions or need any additional information, please feel free to contact our office. Thank you very much for your time.

Very truly yours,
JONES & BEACH ENGINEERS, INC.



Paige Libbey, P.E.
Associate Principal

cc: Jenna Green, Green & Company (via email)
Michael Green, Green & Company (via email)
John O'Neill, Stonearch Communities (via email)
Brenden McNamara, Stonearch Communities (via email)
John Tuttle, TW Designs (via email)
Adam DiMauro, FSM Drawings, LLC (via email)
Jim Gove, Gove Environmental Services (via email)
Allison Rees, P.E., Underwood Engineers (via email & U.S. Mail)

JONES & BEACH ENGINEERS INC.
85 Portsmouth Avenue, PO Box 219, Stratham, NH 03885
603.772.4746 - JonesandBeach.com

January 13, 2025

Exeter Planning Board
Attn: Langdon Plumer, Chair
10 Front Street
Exeter, NH 03833

RE: Waiver Request
76 Portsmouth Ave, Exeter, NH
Tax Map 65, Lot 118
JBE Project No. 24029

Dear Mr. Plumer,

On behalf of the client, Green & Company, Jones & Beach Engineers, Inc. respectfully requests waivers from the Town of Exeter Site Plan Regulations for the following:

Site Plan Regulations Section 9.3.6(4) – Grading within 5' of exterior property line.

Jones & Beach Engineers request a waiver from this section as the proposal is a Mixed Use Neighborhood Development (MUND). The MUND Zoning has no setbacks to property lines for buildings and therefore it seems likely that building in close proximity and therefore grading are expected as part of MUND Developments. In addition, this particular site has wetlands and portions of the site are encumbered by wetland buffers, so in order to keep wetland buffer impacts as minimal as possible we have kept the proposed roadways closer to the property lines wherever feasible. The section of property where the main access will be off of Haven Lane is only 40' wide, so it is not possible to construct a road without grading within 5' of the property line. Silt fence and construction fencing will be placed along the property lines during construction to prevent sediment from leaving the property and all areas will be stabilized via pavement or sidewalk or restored to vegetation following construction.

Standard Specifications for Construction Section E(III)(D)(1) – Curb Radius Intersections for 90 degree intersections – 25'.

Jones & Beach Engineers request a waiver from this section as the paved roadway in Haven Lane is almost 30' wide, which is 6' wider than is typically required for a road per the town regulations. With the paved road taking up most of its right of way, and the existing right of way for this property being only 40' wide, the maximum available radius without encroaching on abutters is 10'. However, all vehicle turning templates, including a fire truck, work with the proposed 10' radii and (2) accesses to Haven Lane are now provided. Additionally, the wide paved road for Haven Lane provides additional turning space onto the proposed road. A 25' radius between the proposed road and a theoretical 24' wide paved road (if Haven Lane was the typical width) would

result in a similar amount of paved turning area as the proposed 10’ radius between the proposed road and Haven Lane since Haven Lane is so wide.

We look forward to discussing these waiver requests at the Planning Board Hearing. Thank you very much for your time.

Very truly yours,
JONES & BEACH ENGINEERS, INC.

Paige Libbey, P.E.
Associate Principal

JONES & BEACH ENGINEERS, INC.
85 Portsmouth Ave, P.O. Box 219
Stratham, NH 03885

Project: Lilac Place
Location: 76 Portsmouth Ave., Exeter, NH
Subject: WET WELL ANTI-FLOTATION CALCULATIONS
By: DJM
Date: 03/11/25
Project #: 24029

DESIGN CRITERIA FOR WETWELL

ASSUME:
WATER AT TOP OF EMPTY WETWELL
BACKFILL STONE =120 lb/cf
CONCRETE =150 lb/cf

1) WEIGHT OF WETWELL:	8	FOOT ID WETWELL=	41,472 LBS
	0.67	FOOT ANTIFLOTATION RING	
	13.9	FEET TOTAL HEIGHT	

2) WEIGHT OF BACKFILL:

WEIGHT OF STONE ABOVE ANITFLOAT SLAB=		32,176 LBS
TOTAL DOWN FORCE WEIGHT=		**73,648** LBS

3) WEIGHT OF DISPLACED WATER:

VOLUME OF TANK= HxPIxR^2	**881** C.F.	
WEIGHT OF WATER=Vx62.4 lbs/C.F.		**54,953** LBS
TOTAL WEIGHT OF WATER DISPLACED=		**54,953** LBS

4) CONCLUSION:

TOTAL DOWN FORCE WEIGHT=	**73,648** LBS
TOTAL WEIGHT OF WATER DISPLACED=	**54,953** LBS
SAFETY FACTOR=	**1.34**

SAFETY FACTOR >1.2 TANK WILL NOT FLOAT

JONES & BEACH ENGINEERS, INC.
85 Portsmouth Ave, P.O. Box 219
Stratham, NH 03885

Project: Lilac Place
Location: 76 Portsmouth Ave., Exeter, NH
Subject: VALVE PIT ANTI-FLOTATION CALCULATIONS
By: DJM
Date: 03/11/25
Project #: 24029

DESIGN CRITERIA FOR VALVE PIT

ASSUME:

WATER AT TOP OF EMPTY VALVE PIT
BACKFILL STONE =120 lb/cf
CONCRETE =150 lb/cf

1) WEIGHT OF WETWELL:	5	FOOT ID VALVE PIT =	19,493 LBS
	0.33	FOOT ANTIFLOTATION RING	
	10.1	FEET TOTAL HEIGHT	

2) WEIGHT OF BACKFILL:

WEIGHT OF STONE ABOVE ANITFLOAT SLAB=	7,423 LBS
TOTAL DOWN FORCE WEIGHT=	**26,916** LBS

3) WEIGHT OF DISPLACED WATER:

VOLUME OF TANK= HxPIxR^2	**285** C.F.	
WEIGHT OF WATER=Vx62.4 lbs/C.F.		**17,811** LBS
TOTAL WEIGHT OF WATER DISPLACED=		**17,811** LBS

4) CONCLUSION:

TOTAL DOWN FORCE WEIGHT=	**26,916** LBS
TOTAL WEIGHT OF WATER DISPLACED=	**17,811** LBS
SAFETY FACTOR=	**1.51**

SAFETY FACTOR >1.2 TANK WILL NOT FLOAT

JONES & BEACH ENGINEERS, INC.
85 Portsmouth Ave, P.O. Box 219
Stratham, NH 03885

Project: Lilac Place
Location: 76 Portsmouth Ave., Exeter, NH
Subject: SEWER MANHOLE 1 ANTI-FLOTATION CALCULATIONS
By: DJM
Date: 03/11/25
Project #: 24029

DESIGN CRITERIA FOR SEWER MANHOLE 1

ASSUME:

WATER AT TOP OF EMPTY SEWER MANHOLE
BACKFILL STONE =120 lb/cf
CONCRETE =150 lb/cf

1) WEIGHT OF WETWELL:	4 FOOT ID SMH =		11,908 LBS
	0.00 FOOT ANTIFLOTATION RING		
	6.9 FEET TOTAL HEIGHT		

2) WEIGHT OF BACKFILL:

WEIGHT OF STONE ABOVE ANITFLOAT SLAB=		0 LBS
TOTAL DOWN FORCE WEIGHT=		**11,908** LBS

3) WEIGHT OF DISPLACED WATER:

VOLUME OF TANK= HxPIxR^2	**135** C.F.	
WEIGHT OF WATER=Vx62.4 lbs/C.F.		**8,450** LBS
TOTAL WEIGHT OF WATER DISPLACED=		**8,450** LBS

4) CONCLUSION:

TOTAL DOWN FORCE WEIGHT=	**11,908** LBS
TOTAL WEIGHT OF WATER DISPLACED=	**8,450** LBS
SAFETY FACTOR=	**1.41**

SAFETY FACTOR >1.2 TANK WILL NOT FLOAT

JONES & BEACH ENGINEERS, INC.
85 Portsmouth Ave, P.O. Box 219
Stratham, NH 03885

Project: Lilac Place
Location: 76 Portsmouth Ave., Exeter, NH
Subject: SEWER MANHOLE 2 ANTI-FLOTATION CALCULATIONS
By: DJM
Date: 03/11/25
Project #: 24029

DESIGN CRITERIA FOR SEWER MANHOLE 2

ASSUME:
WATER AT TOP OF EMPTY SEWER MANHOLE
BACKFILL STONE =120 lb/cf
CONCRETE =150 lb/cf

1) WEIGHT OF WETWELL:	4 FOOT ID SMH =		13,551 LBS
	0.00 FOOT ANTIFLOTATION RING		
	8.5 FEET TOTAL HEIGHT		

2) WEIGHT OF BACKFILL:

WEIGHT OF STONE ABOVE ANITFLOAT SLAB=		0 LBS
TOTAL DOWN FORCE WEIGHT=		**13,551** LBS

3) WEIGHT OF DISPLACED WATER:

VOLUME OF TANK= HxPIxR^2	**166** C.F.	
WEIGHT OF WATER=Vx62.4 lbs/C.F.		**10,348** LBS
TOTAL WEIGHT OF WATER DISPLACED=		**10,348** LBS

4) CONCLUSION:

TOTAL DOWN FORCE WEIGHT=	**13,551** LBS
TOTAL WEIGHT OF WATER DISPLACED=	**10,348** LBS
SAFETY FACTOR=	**1.31**

SAFETY FACTOR >1.2 TANK WILL NOT FLOAT

JONES & BEACH ENGINEERS, INC.
85 Portsmouth Ave, P.O. Box 219
Stratham, NH 03885

Project: Lilac Place
Location: 76 Portsmouth Ave., Exeter, NH
Subject: SEWER MANHOLE 3 ANTI-FLOTATION CALCULATIONS
By: DJM
Date: 03/11/25
Project #: 24029

DESIGN CRITERIA FOR SEWER MANHOLE 3

ASSUME:
WATER AT TOP OF EMPTY SEWER MANHOLE
BACKFILL STONE =120 lb/cf
CONCRETE =150 lb/cf

1) WEIGHT OF WETWELL:	4 FOOT ID SMH =		12,756 LBS
	0.00 FOOT ANTIFLOTATION RING		
	7.7 FEET TOTAL HEIGHT		

2) WEIGHT OF BACKFILL:

WEIGHT OF STONE ABOVE ANITFLOAT SLAB=		0 LBS
TOTAL DOWN FORCE WEIGHT=		**12,756** LBS

3) WEIGHT OF DISPLACED WATER:

VOLUME OF TANK= HxPIxR^2	**151** C.F.	
WEIGHT OF WATER=Vx62.4 lbs/C.F.		**9,429** LBS
TOTAL WEIGHT OF WATER DISPLACED=		**9,429** LBS

4) CONCLUSION:

TOTAL DOWN FORCE WEIGHT=	**12,756** LBS
TOTAL WEIGHT OF WATER DISPLACED=	**9,429** LBS
SAFETY FACTOR=	**1.35**

SAFETY FACTOR >1.2 TANK WILL NOT FLOAT

JONES & BEACH ENGINEERS, INC.
85 Portsmouth Ave, P.O. Box 219
Stratham, NH 03885

Project: Lilac Place
Location: 76 Portsmouth Ave., Exeter, NH
Subject: SEWER MANHOLE 4 ANTI-FLOTATION CALCULATIONS
By: DJM
Date: 03/11/25
Project #: 24029

DESIGN CRITERIA FOR SEWER MANHOLE 4

ASSUME:
WATER AT TOP OF EMPTY SEWER MANHOLE
BACKFILL STONE =120 lb/cf
CONCRETE =150 lb/cf

1) WEIGHT OF WETWELL:	4 FOOT ID SMH =		11,802 LBS
	0.00 FOOT ANTIFLOTATION RING		
	6.8 FEET TOTAL HEIGHT		

2) WEIGHT OF BACKFILL:

WEIGHT OF STONE ABOVE ANITFLOAT SLAB=		0 LBS
TOTAL DOWN FORCE WEIGHT=		**11,802** LBS

3) WEIGHT OF DISPLACED WATER:

VOLUME OF TANK= HxPIxR^2	**133** C.F.	
WEIGHT OF WATER=Vx62.4 lbs/C.F.		**8,327** LBS
TOTAL WEIGHT OF WATER DISPLACED=		**8,327** LBS

4) CONCLUSION:

TOTAL DOWN FORCE WEIGHT=	**11,802** LBS
TOTAL WEIGHT OF WATER DISPLACED=	**8,327** LBS
SAFETY FACTOR=	**1.42**

SAFETY FACTOR >1.2 TANK WILL NOT FLOAT

JONES & BEACH ENGINEERS, INC.
85 Portsmouth Ave, P.O. Box 219
Stratham, NH 03885

Project: Lilac Place
Location: 76 Portsmouth Ave., Exeter, NH
Subject: SEWER MANHOLE 5 ANTI-FLOTATION CALCULATIONS
By: DJM
Date: 03/11/25
Project #: 24029

DESIGN CRITERIA FOR SEWER MANHOLE 5

ASSUME:

WATER AT TOP OF EMPTY SEWER MANHOLE
BACKFILL STONE =120 lb/cf
CONCRETE =150 lb/cf

1) WEIGHT OF WETWELL:	4	FOOT ID SMH =	12,756 LBS
	0.00	FOOT ANTIFLOTATION RING	
	7.7	FEET TOTAL HEIGHT	

2) WEIGHT OF BACKFILL:

WEIGHT OF STONE ABOVE ANITFLOAT SLAB=		0 LBS
TOTAL DOWN FORCE WEIGHT=		**12,756** LBS

3) WEIGHT OF DISPLACED WATER:

VOLUME OF TANK= HxPIxR^2	**151** C.F.	
WEIGHT OF WATER=Vx62.4 lbs/C.F.		**9,429** LBS
TOTAL WEIGHT OF WATER DISPLACED=		**9,429** LBS

4) CONCLUSION:

TOTAL DOWN FORCE WEIGHT=	**12,756** LBS
TOTAL WEIGHT OF WATER DISPLACED=	**9,429** LBS
SAFETY FACTOR=	**1.35**

SAFETY FACTOR >1.2 TANK WILL NOT FLOAT

JONES & BEACH ENGINEERS, INC.
85 Portsmouth Ave, P.O. Box 219
Stratham, NH 03885

Project: Lilac Place
Location: 76 Portsmouth Ave., Exeter, NH
Subject: SEWER MANHOLE 6 ANTI-FLOTATION CALCULATIONS
By: DJM
Date: 03/11/25
Project #: 24029

DESIGN CRITERIA FOR SEWER MANHOLE 6

ASSUME:

WATER AT TOP OF EMPTY SEWER MANHOLE
BACKFILL STONE =120 lb/cf
CONCRETE =150 lb/cf

1) WEIGHT OF WETWELL:	4 FOOT ID SMH =		13,975 LBS
	0.00 FOOT ANTIFLOTATION RING		
	8.9 FEET TOTAL HEIGHT		

2) WEIGHT OF BACKFILL:

WEIGHT OF STONE ABOVE ANITFLOAT SLAB=		0 LBS
TOTAL DOWN FORCE WEIGHT=		**13,975** LBS

3) WEIGHT OF DISPLACED WATER:

VOLUME OF TANK= HxPIxR^2	**174** C.F.	
WEIGHT OF WATER=Vx62.4 lbs/C.F.		**10,838** LBS
TOTAL WEIGHT OF WATER DISPLACED=		**10,838** LBS

4) CONCLUSION:

TOTAL DOWN FORCE WEIGHT=	**13,975** LBS
TOTAL WEIGHT OF WATER DISPLACED=	**10,838** LBS
SAFETY FACTOR=	**1.29**

SAFETY FACTOR >1.2 TANK WILL NOT FLOAT

JONES & BEACH ENGINEERS, INC.
85 Portsmouth Ave, P.O. Box 219
Stratham, NH 03885

Project: Lilac Place
Location: 76 Portsmouth Ave., Exeter, NH
Subject: SEWER MANHOLE 7 ANTI-FLOTATION CALCULATIONS
By: DJM
Date: 03/11/25
Project #: 24029

DESIGN CRITERIA FOR SEWER MANHOLE 7

ASSUME:

WATER AT TOP OF EMPTY SEWER MANHOLE
BACKFILL STONE =120 lb/cf
CONCRETE =150 lb/cf

1) WEIGHT OF WETWELL:	4 FOOT ID SMH =		15,511 LBS
	0.00 FOOT ANTIFLOTATION RING		
	10.3 FEET TOTAL HEIGHT		

2) WEIGHT OF BACKFILL:

WEIGHT OF STONE ABOVE ANITFLOAT SLAB=		0 LBS
TOTAL DOWN FORCE WEIGHT=		**15,511** LBS

3) WEIGHT OF DISPLACED WATER:

VOLUME OF TANK= HxPIxR^2	**202** C.F.	
WEIGHT OF WATER=Vx62.4 lbs/C.F.		**12,613** LBS
TOTAL WEIGHT OF WATER DISPLACED=		**12,613** LBS

4) CONCLUSION:

TOTAL DOWN FORCE WEIGHT=	**15,511** LBS
TOTAL WEIGHT OF WATER DISPLACED=	**12,613** LBS
SAFETY FACTOR=	**1.23**

SAFETY FACTOR >1.2 TANK WILL NOT FLOAT

JONES & BEACH ENGINEERS, INC.
85 Portsmouth Ave, P.O. Box 219
Stratham, NH 03885

Project: Lilac Place
Location: 76 Portsmouth Ave., Exeter, NH
Subject: SEWER MANHOLE 8 ANTI-FLOTATION CALCULATIONS
By: DJM
Date: 03/11/25
Project #: 24029

DESIGN CRITERIA FOR SEWER MANHOLE 8

ASSUME:

WATER AT TOP OF EMPTY SEWER MANHOLE
BACKFILL STONE =120 lb/cf
CONCRETE =150 lb/cf

1) WEIGHT OF WETWELL:	4 FOOT ID SMH =		12,279 LBS
	0.00 FOOT ANTIFLOTATION RING		
	7.3 FEET TOTAL HEIGHT		

2) WEIGHT OF BACKFILL:

WEIGHT OF STONE ABOVE ANITFLOAT SLAB=		0 LBS
TOTAL DOWN FORCE WEIGHT=		**12,279** LBS

3) WEIGHT OF DISPLACED WATER:

VOLUME OF TANK= HxPIxR^2	**142** C.F.	
WEIGHT OF WATER=Vx62.4 lbs/C.F.		**8,878** LBS
TOTAL WEIGHT OF WATER DISPLACED=		**8,878** LBS

4) CONCLUSION:

TOTAL DOWN FORCE WEIGHT=	**12,279** LBS
TOTAL WEIGHT OF WATER DISPLACED=	**8,878** LBS
SAFETY FACTOR=	**1.38**

SAFETY FACTOR >1.2 TANK WILL NOT FLOAT

JONES & BEACH ENGINEERS, INC.
85 Portsmouth Ave, P.O. Box 219
Stratham, NH 03885

Project: Lilac Place
Location: 76 Portsmouth Ave., Exeter, NH
Subject: SEWER MANHOLE 9 ANTI-FLOTATION CALCULATIONS
By: DJM
Date: 03/11/25
Project #: 24029

DESIGN CRITERIA FOR SEWER MANHOLE 9

ASSUME:

WATER AT TOP OF EMPTY SEWER MANHOLE
BACKFILL STONE =120 lb/cf
CONCRETE =150 lb/cf

1) WEIGHT OF WETWELL:	4 FOOT ID SMH =		12,597 LBS
	0.00 FOOT ANTIFLOTATION RING		
	7.6 FEET TOTAL HEIGHT		

2) WEIGHT OF BACKFILL:

WEIGHT OF STONE ABOVE ANITFLOAT SLAB=		0 LBS
TOTAL DOWN FORCE WEIGHT=		**12,597** LBS

3) WEIGHT OF DISPLACED WATER:

VOLUME OF TANK= HxPIxR^2	**148** C.F.	
WEIGHT OF WATER=Vx62.4 lbs/C.F.		**9,246** LBS
TOTAL WEIGHT OF WATER DISPLACED=		**9,246** LBS

4) CONCLUSION:

TOTAL DOWN FORCE WEIGHT=	**12,597** LBS
TOTAL WEIGHT OF WATER DISPLACED=	**9,246** LBS
SAFETY FACTOR=	**1.36**

SAFETY FACTOR >1.2 TANK WILL NOT FLOAT

Design Narrative

76 Portsmouth Ave

Date: March 18, 2025

Re: 76 Portsmouth Ave.

To Whom It May Concern:

Thank you for the opportunity to share our design philosophy behind the revised exterior appearance of the proposed 76 Portsmouth Avenue mixed-use building.

The project at 76 Portsmouth Avenue represents a new four-story, 13,580-square-foot structure thoughtfully designed to harmonize with Exeter's architectural vernacular while accommodating modern mixed-use functionality. The ground floor will host mercantile shops facing Portsmouth Avenue, while the upper three levels will provide 36 one-bedroom apartment units, offering a total of 12 units per floor. This property is subject to the Exeter MUND (Mixed Use Neighborhood Development) Design Standards, and our approach reflects a careful balance of these guidelines with a vision for timeless, contextual architecture.

Design Philosophy by MUND Standards

J – Building Form

1. The revised design clearly articulates a base, middle, and top, achieved through the strategic use of materials: robust masonry at the base provides a sense of stability, while lighter clapboard and Board-n-Batten materials above introduce a residential scale and texture.
2. An 11-foot floor-to-ceiling height on the ground floor is maintained for the mercantile level, while the upper floors adopt a 9'-10" floor-to-floor height. This configuration ensures the building remains under the 50-foot height limit.

3. The street façade is visually dynamic, incorporating protrusions, varying material heights, and recessed entrances to create a diverse and engaging streetscape.
4. The building's front is prominently articulated through accent gables, which define the pedestrian experience along Portsmouth Avenue.

K – Building Entranceways

1. Multiple principal entry points along the street-facing façade distinguish individual mercantile units, reinforcing the pedestrian-focused design.
2. Recessed entries, detailed with colonial wood panels, contrast with flat-roof canopies supported by diagonal rods, creating visual interest and emphasizing storefront individuality.

L – Roofline Form

1. A variety of roof forms, including accent gables, hip roofs, and doghouse dormers, contribute to a textured, visually engaging silhouette.
2. The use of architectural shingles reflects traditional New England character, while flat canopies over shop entrances provide subtle contrast.
3. Flat commercial-style roofs were intentionally avoided to preserve the design's residential and historic integrity.
4. Downspouts and gutters, if utilized, will be carefully integrated to complement the façade and maintain visual clarity.
5. Any visible mechanical elements will be concealed from the street view in subsequent detailed engineering stages.

M – Dormers

Doghouse dormers, designed with historic proportions, are thoughtfully placed to add rhythm and diversity to the roofline while maintaining a scale consistent with traditional architecture.

N – Fenestration

1. Double-hung windows were selected for their classic New England aesthetic, with proportions adhering to a width-to-height ratio of 1:2 or greater.
2. A 6-over-6 mullion pattern reinforces the traditional character.
3. Storefront windows integrate a blend of glazed wood panel assemblies and contrasting aluminum systems, providing texture and differentiation across the ground level.

4. All glazing remains clear to enhance transparency, avoiding tinted finishes.
5. Careful attention ensures greater than 50% transparency at the street level, enriching the pedestrian experience.

O – Building Materials

1. The façade incorporates a rich palette of traditional New England materials, including red brick, clapboard, and board-n-batten accents.
2. Heavier materials at the base transition to lighter textures above, creating a balanced vertical progression.
3. The darker, historically inspired color palette reinforces a sense of permanence and ties the design to Exeter's colonial-era context.

Conclusion

We believe the design strikes a deliberate balance between timeless New England charm and functional modernity. By addressing the MUND standards with careful attention to detail, the proposal seamlessly integrates into the neighborhood while enhancing the surrounding streetscape. This design aspires to endure beyond trends, standing as a thoughtful contribution to Exeter's architectural legacy.

Lilac Place

Submission ID

- 599

Approval Status

- New Submission

Map No.

- 65

Lot No.

- 118

Property Owner

- RAP Realty Manchester LLC

This project is for a municipality

- No

This project is inside MS-4 Permit Area

- Yes

Project is within the 200 meter coastal zone or stream buffer zone

- No

Discharges to an impaired waterbody

- Yes

Offsite mitigation

- No

By submitting this form, I certify all information is true and correct to the best of my knowledge and professional judgement.

- Yes

Town

- Exeter

Land Use Type

- Other

Hydrologic Unit Code (HUC)-10

- 0106000308 – Exeter Squamscott River

Last Updated By

- dmeditz

Report Submitted By

- dmeditz

Last Updated On

- Fri, 03/14/2025 - 15:44

Report Submitted

- Fri, 03/14/2025 - 14:27

Impervious Surface Management Table - Structural BMPs

Structural BMP	Impervious Surface Managed (ac)	Runoff Volume Storage at Design Capacity (ft^3)	Design Storm Depth (")	Infiltration Rate (in/hr)
Porous Pavement	1.19	10621.00	2.3	1.02
Porous Pavement	0.02	409.00	4.7	1.02
Bio-filtration	0.21	31.00	0.0	N/A
Bio-filtration	0.06	218.00	1.0	N/A
Bio-filtration	0.05	194.00	1.1	N/A
Bio-filtration	0.04	138.00	1.0	N/A
Bio-filtration	0.03	102.00	1.0	N/A
Bio-filtration	0.03	90.00	1.0	N/A
Bio-filtration	0.03	90.00	1.0	N/A
Bio-filtration	0.03	90.00	1.0	N/A
Bio-filtration	0.02	90.00	1.0	N/A
Bio-filtration	0.04	133.00	1.0	N/A
Bio-filtration	0.02	90.00	1.0	N/A
Infiltration Trench	0.06	574.00	2.5	1.02
Other	0.32	1.00	1.0	N/A
Other	0.22	1.00	1.0	N/A
Total Impervious Cover (acres)	2.37			
Total Management (acres)	2.37			
Effective Impervious Cover (acres)	0.00			

Impervious Surface Management Table - Non-Structural BMPs

Non-Structural BMP	Amount	Unit	Description
BMP Operation and Maintenance	0.00		Regular maintenance activities and annual inspection reporting of stormwater infrastructure in accordance with Stormwater O&M Manual

Land Use Conversion Table

Soils		Existing Conditions			Future Conditions		
Hydrologic Group	Acres	Land Use Type	Acres	Impervious and/or Paved Surfaces Acres	Land Use Type	Acres	Impervious and/or Paved Surfaces Acres
D	0.59	Wetlands	0.59	0.00	Wetlands	0.59	0.00
C	6.11	Wetlands	0.70	0.00	Wetlands	0.68	0.00
		Commercial/Institutional	0.80	0.79	Residential	2.56	1.58
		Forest	4.61	0.00	Forest	1.93	0.00
					Commercial/Institutional	0.94	0.80
Totals	6.7		6.7	0.79		6.7	2.38

Wastewater Management Table

Existing Conditions			Future Conditions		
Management Option	Discharge (GPD)	Description	Management Option	Discharge (GDP)	Description
Sewered	78.00	Per Metcalf & Eddy Table 3-3: Shopping center, 20 parking spaces, 1.5 GPD per parking space on average. Number of employees is unkown, 6 assumed on a given shift @ 8 GPD/employee. 1.5*20+6*8= 78 GPD.	Sewered	9732.00	Per Metcalf & Eddy Tables 3-2 & 3-3: 34 Three-bedroom units & 36 One-bedroom units @ 70 GPD/bedroom, plus shopping center with 16 parking spaces @ 1.5 GPD/space and 6 employees @ 8 GPD/employee. 34*3*70 + 36*1*70 + 16*1.5 + 6*8 = 7140+2520+24+48 = 9,732 GPD.
Totals	78			9732	

MIXED USE NEIGHBORHOOD DEVELOPMENT
"LILAC PLACE"
TAX MAP 65 LOT 118
76 PORTSMOUTH AVENUE, EXETER, NH

Know what's **below** **811** **before you dig**

GENERAL LEGEND

EXISTING	PROPOSED	DESCRIPTION
		PROPERTY LINES
		SETBACK LINES
		CENTERLINE
		FRESHWATER WETLANDS LINE
		STREAM CHANNEL
		TREE LINE
		STONEWALL
		FENCE
		STOCKADE FENCE
		SOIL BOUNDARY
		ZONELINE
		EASEMENT
100	100	MAJOR CONTOUR
98	98	MINOR CONTOUR
VGC	VGC	EDGE OF PAVEMENT
SGC	SGC	VERTICAL GRANITE CURB
X	X	SLOPE GRANITE CURB
D	D	SILT FENCE
S	S	DRAINAGE LINE
FM	FM	SEWER LINE
G	G	SEWER FORCE MAIN
W	W	GAS LINE
WS	WS	WATER LINE
OHE	OHE	WATER SERVICE
UGE	UGE	OVERHEAD ELECTRIC
		UNDERGROUND ELECTRIC
UD	UD	GUARDRAIL
F	F	UNDERDRAIN
	W	FIRE PROTECTION LINE
		THRUST BLOCK
		IRON PIPE/IRON ROD
		DRILL HOLE
		IRON ROD/DRILL HOLE
		STONE/GRANITE BOUND
100x0	100x0	SPOT GRADE
100.00	100.00	PAVEMENT SPOT GRADE
100.00 / 99.50	100.00 / 99.50	CURB SPOT GRADE
		BENCHMARK (TBM)
		DOUBLE POST SIGN
		SINGLE POST SIGN
TP1		TEST PIT
PT		PERC TEST
1		PHOTO LOCATION
		TREES AND BUSHES
		UTILITY POLE
		LIGHT POLES
D	D	DRAIN MANHOLE
S	S	SEWER MANHOLE
		HYDRANT
		WATER GATE
		WATER SHUT OFF
		REDUCER
		SINGLE GRATE CATCH BASIN
		DOUBLE GRATE CATCH BASIN
		TRANSFORMER
		CULVERT W/WINGWALLS
		CULVERT W/FLARED END SECTION
		CULVERT W/STRAIGHT HEADWALL
		STONE CHECK DAM
		DRAINAGE FLOW DIRECTION
		WETLAND BUFFER IMPACT
		VEGETATED FILTER STRIP
		RIPRAP
		PAVEMENT HATCH
		OPEN WATER
		FRESHWATER WETLANDS
		STABILIZED CONSTRUCTION ENTRANCE
		CONCRETE
		GRAVEL
		SNOW STORAGE
		RETAINING WALL



LOCUS MAP
SCALE 1" = 2000'

SHEET INDEX

CS	COVER SHEET
C1	EXISTING CONDITIONS PLAN
D1	DEMOLITION PLAN
PH1	PHASING PLAN
OV1	OVERVIEW SITE PLAN
C2	SITE PLAN
C3	GRADING AND DRAINAGE PLAN
WB1	WETLAND AND BUFFER IMPACT PLAN
C4	UTILITY PLAN
L1	LANDSCAPE PLAN (BY LM LAND DESIGN, LLC)
L2	LANDSCAPE DETAIL PLAN
L3	LIGHTING PLAN
T1-T4	TRUCK TURNING PLAN
P1-P2	ROADWAY PLAN AND PROFILE
P3-P5	SEWER PLAN AND PROFILE
D1-D8	DETAIL SHEETS
E1-E2	EROSION AND SEDIMENT CONTROL DETAILS

PERMITS

TYPE OF PERMIT	STATUS
NHDES ALTERATION OF TERRAIN PERMIT: NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES - WATER DIVISION 29 HAZEN DRIVE, P.O. BOX 95 CONCORD, NEW HAMPSHIRE 03302-0095 (603) 271-3503 RESPONSIBLE CONSULTANT: JONES & BEACH ENGINEERS, INC.	SUBMITTED: FEBRUARY 27, 2025 PERMIT NO. DATED: EXPIRATION:
NHDES WETLAND PERMIT: NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES - WATER DIVISION 29 HAZEN DRIVE, P.O. BOX 95 CONCORD, NEW HAMPSHIRE 03302-0095 (603) 271-3503 RESPONSIBLE CONSULTANT: JONES & BEACH ENGINEERS, INC.	SUBMITTED: PERMIT NO. DATED: EXPIRATION:
NHDES WASTEWATER CONNECTION PERMIT: NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES - WATER DIVISION 29 HAZEN DRIVE, P.O. BOX 95 CONCORD, NEW HAMPSHIRE 03302-0095 (603) 271-3503 RESPONSIBLE CONSULTANT:	SUBMITTED: FEBRUARY 19, 2025 PERMIT NO. DATED: EXPIRATION:
USEPA NPDES PHASE II CONSTRUCTION GENERAL PERMIT, NOTICE OF INTENT (NOI), AND NOTICE OF TERMINATION (NOT) TO BE FILED IN ACCORDANCE WITH FEDERAL AND LOCAL REGULATIONS PRIOR TO AND FOLLOWING CONSTRUCTION: EPA STORMWATER NOTICE PROCESSING CENTER MAIL CODE 4203M, US EPA 1200 PENNSYLVANIA AVENUE, NW WASHINGTON, DC 20460 RESPONSIBLE CONSULTANT: JONES & BEACH ENGINEERS, INC.	

CIVIL ENGINEER / SURVEYOR
JONES & BEACH ENGINEERS, INC.
85 PORTSMOUTH AVENUE
PO BOX 219
STRATHAM, NH 03885
(603) 772-4746
CONTACT: PAIGE LIBBEY, P.E.
E-MAIL: PLIBBEY@JONESANDBEACH.COM

TRAFFIC ENGINEER
TEPP LLC
93 STILES ROAD, SUITE 201
SALEM, NH 03079
(603) 212-9133
EMAIL: TEPP@TEPPLLC.COM
CONTACT: KIM HAZARVARTIAN, P.E., PhD

SOILS CONSULTANT
GOVE ENVIRONMENTAL SERVICES
8 CONTINENTAL DRIVE, UNIT H
EXETER, NH 03833-7507
(603) 778-0644
CONTACT: JAMES GOVE, CWS, CSS

WETLAND CONSULTANT
JOHN HAYES, CWS
7 LIMESTONE WAY
NORTH HAMPTON, NH 03862
(603) 205-4396
EMAIL: JOHNPHAYES@COMCAST.NET

LANDSCAPE DESIGNER
LM LAND DESIGN, LLC
11 SOUTH ROAD
BRENTWOOD, NH 03833
(603) 770-7728
CONTACT: LISE MCNAUGHTON

WATER & SEWER
EXETER PUBLIC WORKS
13 NEWFIELDS ROAD
EXETER, NH 03833
(603) 773-6157
ATTN: STEVE DALTON

LIGHTING DESIGN
EXPOSURE LIGHTING
501 ISLINGTON STREET, UNIT 1A
PORTSMOUTH, NH 03801
(603) 601-8080
CONTACT: KEN SWEENEY

ELECTRIC
EVERSOURCE
265 CALEF HIGHWAY
EPPING, NH 03042
(800) 662-7764

TELEPHONE
CONSOLIDATED COMMUNICATIONS
1575 GREENLAND ROAD
GREENLAND, NH 03840
(603) 427-5525

PROJECT PARCEL
TOWN OF EXETER
TAX MAP 65, LOT 118

APPLICANT
GREEN & COMPANY
11 LAFAYETTE RD
PO BOX 1297
NORTH HAMPTON, NH 03862

TOTAL LOT AREA
291,630 SQ. FT.
6.7 ACRES

APPROVED – EXETER, NH
PLANNING BOARD

DATE:

Design: DJM	Draft: KDR	Date: 3/15/24
Checked: PSL	Scale: AS NOTED	Project No.: 24029
Drawing Name: 24029-PLAN.dwg		

THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION FROM JONES & BEACH ENGINEERS, INC. (JBE). ANY ALTERATIONS, AUTHORIZED OR OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO JBE.

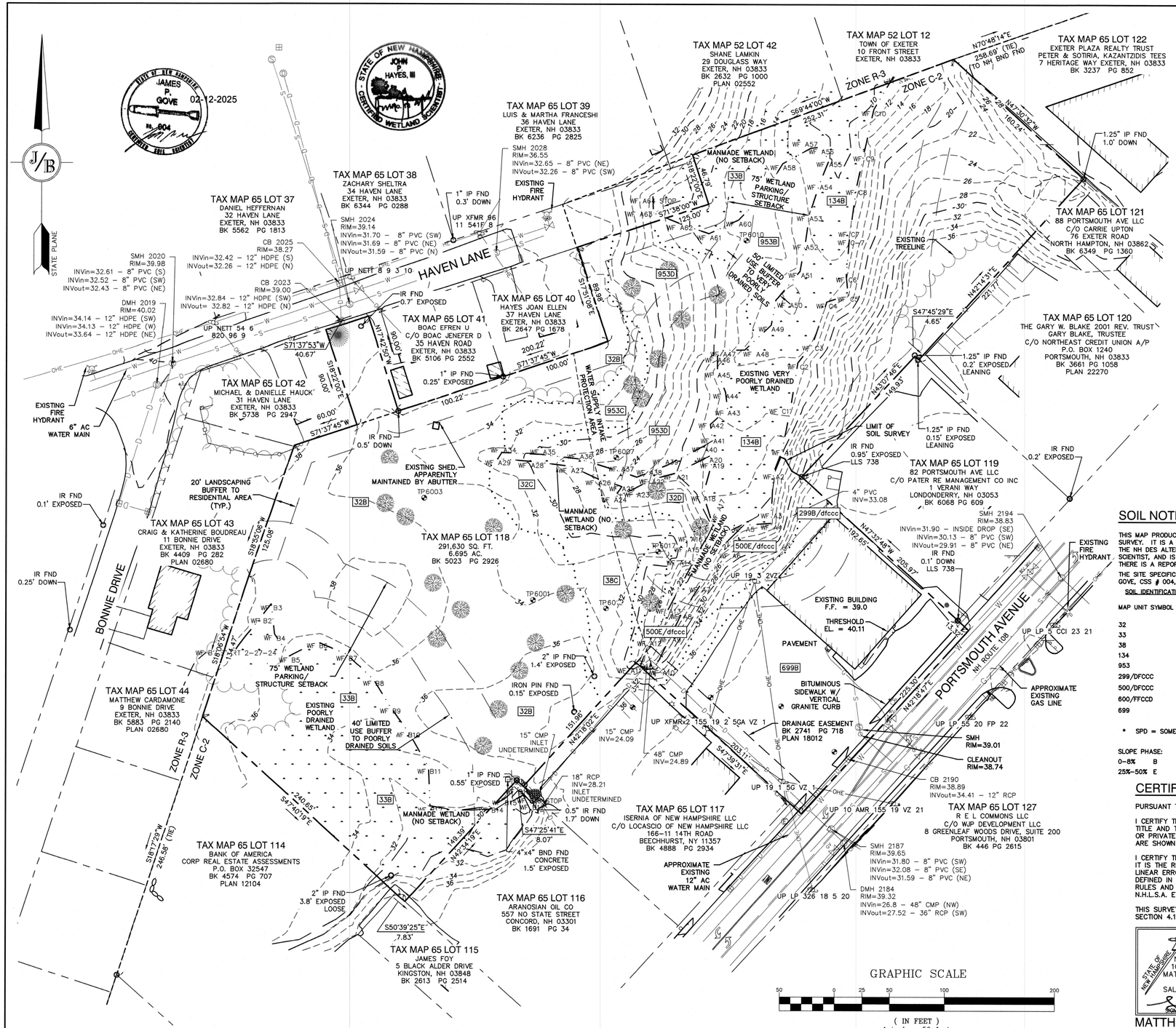
PAIGE S. LIBBEY No.16670 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE 03/18/2025

REV.	DATE	REVISION	BY
10	3/18/25	REVISED PER TOWN ENGINEER & TRC COMMENTS	DJM
9	2/13/25	FULL DESIGN FOR REVISED LAYOUT	DJM
8	1/31/25	REVISED LAYOUT PER CONSERVATION COMMISSION	DJM
7	1/13/25	REVISED PER TOWN ENGINEER & TRC COMMENTS	DJM
6	1/6/25	GRADING PLAN FOR CONSERVATION COMMISSION	DJM

Designed and Produced in NH
Jones & Beach Engineers, Inc.
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
Civil Engineering Services
603-772-4746
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	COVER SHEET
Project:	"LILAC PLACE" 76 PORTSMOUTH AVE, EXETER, NH
Owner of Record:	RAP REALTY MANCHESTER LLC 50 ATLANTIC AVE, SEABROOK, NH

DRAWING No.
CS
SHEET 1 OF 31
JBE PROJECT NO. 24029



PLAN REFERENCES

1. "PLAN OF DRAINAGE EASEMENT, EXETER, NH, PREPARED FOR EXETER HOSPITAL" BY KIMBALL CHASE, DATED MAY 23, 1988. R.C.R.D. PLAN 18012.
2. "LOT LINE CHANGE FOR GARY W. BLAKE, EXETER, NH" BY PARKER SURVEY ASSOC., INC., DATED JANUARY 12, 1984. R.C.R.D. PLAN 12104.
3. "SUBDIVISION OF LAND FOR JOHN W. FLYNN, EXETER, NH" BY KIMBALL CHASE COMPANY, INC., DATED FEBUARY 11, 1988. R.C.R.D. PLAN 17605.
4. "BOUNDARY AND TOPOGRAPHIC PLAN FOR STAR ENTERPRISE, EXETER, NH" BY STORCH ASSOCIATES, DATED JUNE 15, 1999. R.C.R.D. PLAN 22270.
5. "PLAN OF LAND FOR HENRY & ROBERTA A. SHEPARD AND CHARLES A. & EVA S. KOIRTH, EXETER, NH" BY JOHN W. DURGIN CIVIL ENGINEERS, DATED JULY 17, 1963. R.C.R.D. PLAN 00108.
6. "PLAN OF LOTS, PROPERTY OF J. EVERETT TOWLE, EXETER, NH" BY ARTHUR W. DUDLEY, C.E., DATED 1924. R.C.R.D. PLAN 0671.
7. "A PORTION OF THE LAND OF JEAN AND SUE PULVER, EXETER, NH" BY LEACH AND HUNTER, DATED OCTOBER 4, 1949. R.C.R.D. PLAN 01721.
8. "PLOT OF LAND FOR CARROLS DEVELOPMENT CORP & CHICAGO TITLE COMPANY, EXETER, NH" BY UNITED SURVEYORS & ENGRS., DATED MARCH 20, 1970. R.C.R.D. PLAN 1726.
9. "PLAN OF LAND FOR JEAN A. & SUE E PULVER, EXETER, NH" BY JOHN W. DURGIN CIVIL ENGINEERS, DATED AUGUST 1951. R.C.R.D. PLAN 01823.
10. "PLAN OF LAND FOR JEAN A. & SUE E. PULVER, EXETER, NH" BY JOHN W. DURGIN CIVIL ENGINEERS, DATED AUGUST 1951. R.C.R.D. PLAN 02551.
11. "PART OF COUNTRY CLUB ESTATES, SCALE: 1 IN = 40 FT" BY JOHN W. DURGIN CIVIL ENGINEERS, DATED AUGUST 4TH, 1955. R.C.R.D. PLAN 02552.
12. "PLOT PLAN FOR HENRY SHEPARD & CHARLES KOIRTH, EXETER, NH" BY T.A. NOWAK, DATED APRIL 1958. R.C.R.D. PLAN 02680.
13. "SUBDIVISION OF LAND, SIMONS TO ROCKINGHAM NATIONAL BANK, EXETER, NH" BY JOHN W. DURGIN CIVIL ENGINEERS, DATED MAY 2, 1972. R.C.R.D. PLAN 2924.
14. "PLAN OF LAND IN EXETER, N.H. PREPARED FOR FRIENDLY ICE CREAM CORP." DATED AUGUST 12, 1974. PREPARED BY THOMAS F. MORAN INC. NOT RECORDED.
15. "PLAT OF LAND FOR M.H.K. REALTY IN EXETER, N.H." DATED NOVEMBER 1988. PREPARED BY PARKER SURVEY ASSOCIATES. NOT RECORDED.
16. STATE OF NEW HAMPSHIRE DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS, PLANS OF PROPOSED FEDERAL AID PRIMARY PROJECT F 018-2(1) N.H. NO. P-2428. ON FILE WITH THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION.

SOIL NOTE:

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 10-22-2024, 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
32	BOXFORD SILT LOAM	353	C
33	SCITICO SILT LOAM	553	C
38	ELDRIDGE LOAMY SAND	343	C
134	MAYBID MUCKY SILT LOAM	653	D
953	BOXFORD SPD*	453	C
299/DFCCC	UDORTHENTS, SMOOTHED	363	C
500/DFCCC	UDORTHENTS, LOAMY	363	C
600/FFCCD	ENDOAQUENTS, LOAMY	563	D
699	URBAN LAND	N/A	N/A

* SPD = SOMEWHAT POORLY DRAINED

SLOPE PHASE:

0–8%	B	8–15%	C	15–25%	D
25%–50%	E	50%+	F		

CERTIFICATION:

PURSUANT TO RSA 676:18-III AND RSA 672:14

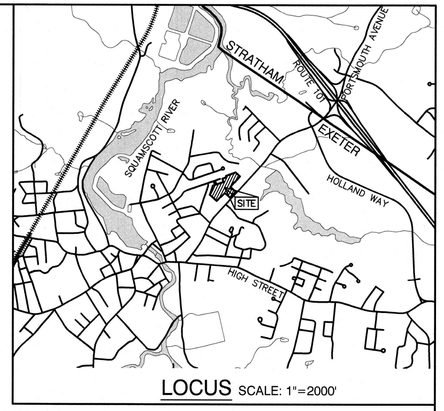
I CERTIFY THAT THIS SURVEY PLAT IS NOT A SUBDIVISION PURSUANT TO THIS TITLE AND THAT THE LINES OF STREETS AND WAYS SHOWN ARE THOSE OF PUBLIC OR PRIVATE STREETS OR WAYS ALREADY ESTABLISHED AND THAT NO NEW WAYS ARE SHOWN.

I CERTIFY THAT THIS PLAT WAS PREPARED UNDER MY DIRECT SUPERVISION, THAT IT IS THE RESULT OF A FIELD SURVEY BY THIS OFFICE AND HAS AN UNADJUSTED LINEAR ERROR OF CLOSURE THAT EXCEED BOTH THE MINIMUM OF 1:10,000 AS DEFINED IN SECTION 503.04 OF THE NEW HAMPSHIRE CODE OF ADMINISTRATIVE RULES AND THE MINIMUM OF 1:15,000 AS DEFINED IN SECTION 4.2 OF THE N.H.L.S.A. ETHICS AND STANDARDS.

THIS SURVEY CONFORMS TO A CATEGORY 1 CONDITION 1 SURVEY AS DEFINED IN SECTION 4.1 OF THE N.H.L.S.A. ETHICS AND STANDARDS.

STATE OF NEW HAMPSHIRE No. 1030 MATTHEW J. SALVUCCI LICENSED LAND SURVEYOR SIGNATURE

MATTHEW J. SALVUCCI, LLS 1030 — DATE: 3/18/25
ON BEHALF OF JONES & BEACH ENGINEERS, INC.



LOCUS SCALE: 1"=2000'

NOTES:

1. THE INTENT OF THIS PLAN IS TO SHOW THE BOUNDARY AND EXISTING CONDITIONS OF LOT 118 AS SHOWN ON TOWN OF EXETER TAX MAP 65.
2. ZONING DISTRICT: C2
   LOT AREA MINIMUM = 20,000 SF
   LOT WIDTH MINIMUM = 150'
   LOT DEPTH MINIMUM = 100'
   MINIMUM LOT AREA/ DWELLING UNIT = 5,000 S.F.
   BUILDING SETBACKS (MINIMUM):
   FRONT SETBACK = 50'
   SIDE SETBACK = 20' ON ONE SIDE, 40' ON THE OTHER
   REAR SETBACK = 50'
   MAX. BUILDING HEIGHT = 35'
   MAX. BUILDING COVERAGE = 30%
   MIN. OPEN SPACE = 15%
   TOWN WETLAND BUFFER = 40' LIMITED USE BUFFER TO P.D. SOILS, 75' PARKING AND STRUCTURE SETBACK
3. THE UTILITY LOCATIONS SHOWN HEREON WERE DETERMINED BY OBSERVED ABOVE GROUND EVIDENCE AND SHALL BE CONSIDERED APPROXIMATE IN LOCATION ONLY. LOCATION, DEPTH, SIZE, TYPE, EXISTENCE OR NONEXISTENCE OF UNDERGROUND UTILITIES AND/OR UNDERGROUND STORAGE TANKS WAS NOT VERIFIED BY THIS SURVEY. ALL CONTRACTORS SHALL NOTIFY IN WRITING ALL UTILITY COMPANIES AND GOVERNMENT AGENCIES PRIOR TO ANY EXCAVATION WORK OR CALL DIG-SAFE AT 1-888-DIG-SAFE.
4. THE SUBJECT PARCEL IS NOT LOCATED WITHIN AN AREA HAVING A SPECIAL FLOOD HAZARD ZONE DESIGNATION BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA), ON FLOOD INSURANCE RATE MAP NOs. 33015C0402E AND 33015C0406E, BOTH WITH EFFECTIVE DATE OF MAY 17, 2005.
5. BASIS OF BEARING: HORIZONTAL – NH STATE PLANE. VERTICAL – NAVD88.
6. ALL BOOK AND PAGE NUMBERS REFER TO THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
7. THE TAX MAP AND LOT NUMBERS ARE BASED ON THE TOWN OF EXETER TAX RECORDS AND ARE SUBJECT TO CHANGE.
8. THIS SURVEY IS NOT A CERTIFICATION TO OWNERSHIP OR TITLE OF LANDS SHOWN. OWNERSHIP AND ENCUMBRANCES ARE MATTERS OF TITLE EXAMINATION NOT OF A BOUNDARY SURVEY. THE INTENT OF THIS PLAN IS TO RETRACE THE BOUNDARY LINES OF DEEDS REFERENCED HEREON. OWNERSHIP OF ADJOINING PROPERTIES IS ACCORDING TO ASSESSOR'S RECORDS. THIS PLAN MAY OR MAY NOT INDICATE ALL ENCUMBRANCES EXPRESSED, IMPLIED OR PRESCRIPTIVE.
9. ANY USE OF THIS PLAN AND OR ACCOMPANYING DESCRIPTIONS SHALL BE DONE WITH LEGAL COUNSEL, TO BE CERTAIN THAT TITLES ARE CLEAR, THAT INFORMATION IS CURRENT, AND THAT ANY NECESSARY CERTIFICATES ARE IN PLACE FOR A PARTICULAR CONVEYANCE, OR OTHER USES.
10. THE LIMITS OF JURISDICTIONAL WETLANDS WERE DELINEATED BY JACK HAYES, APRIL 1, 2024 IN ACCORDANCE WITH THE FOLLOWING GUIDANCE DOCUMENTS:
    A. THE CORPS OF ENGINEERS FEDERAL MANUAL FOR IDENTIFYING AND DELINEATING JURISDICTIONAL WETLANDS.
    B. THE NORTH CENTRAL & NORTHEAST REGIONAL SUPPLEMENT TO THE FEDERAL MANUAL.
    C. THE CURRENT VERSION OF THE FIELD INDICATORS FOR IDENTIFYING HYDRIC SOILS IN NEW ENGLAND, AS PUBLISHED BY THE NEW ENGLAND INTERSTATE WATER POLLUTION CONTROL COMMISSION AND/OR THE CURRENT VERSION OF THE FIELD INDICATORS OF HYDRIC SOILS IN THE UNITED STATES, AS PUBLISHED BY THE USDA, NRCS, AS APPROPRIATE.
    D. THE CURRENT NATIONAL LIST OF PLANT SPECIES THAT OCCUR IN WETLANDS, AS PUBLISHED BY THE US FISH AND WILDLIFE SERVICE.
11. TEST PITS PERFORMED BY JAMES GOVE, GOVE ENVIRONMENTAL SERVICES, INC., 7/2/24.
12. SURVEY TIE LINES SHOWN HEREON ARE NOT BOUNDARY LINES. THEY SHALL ONLY BE USED TO LOCATE THE PARCEL SURVEYED FROM THE FOUND MONUMENTS SHOWN AND LOCATED BY THIS SURVEY.
13. THE SURVEYED PROPERTY MAY BE SUBJECT TO EASEMENT IN BOOK 2096 PAGE 211. LOCATION IS UNABLE TO BE DETERMINED AT THIS TIME.

PROJECT PARCEL
TOWN OF EXETER
TAX MAP 65, LOT 118

APPLICANT
GREEN & COMPANY
11 LAFAYETTE RD
PO BOX 1297
NORTH HAMPTON, NH 03862

TOTAL LOT AREA
291,630 SQ. FT.
6.7 ACRES

Design: DJM	Draft: KDR	Date: 3/15/24
Checked: PSL	Scale: AS SHOWN	Project No.: 24029
Drawing Name: 24029-PLAN.dwg		

THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION FROM JONES & BEACH ENGINEERS, INC. (JBE). ANY ALTERATIONS, AUTHORIZED OR OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO JBE.

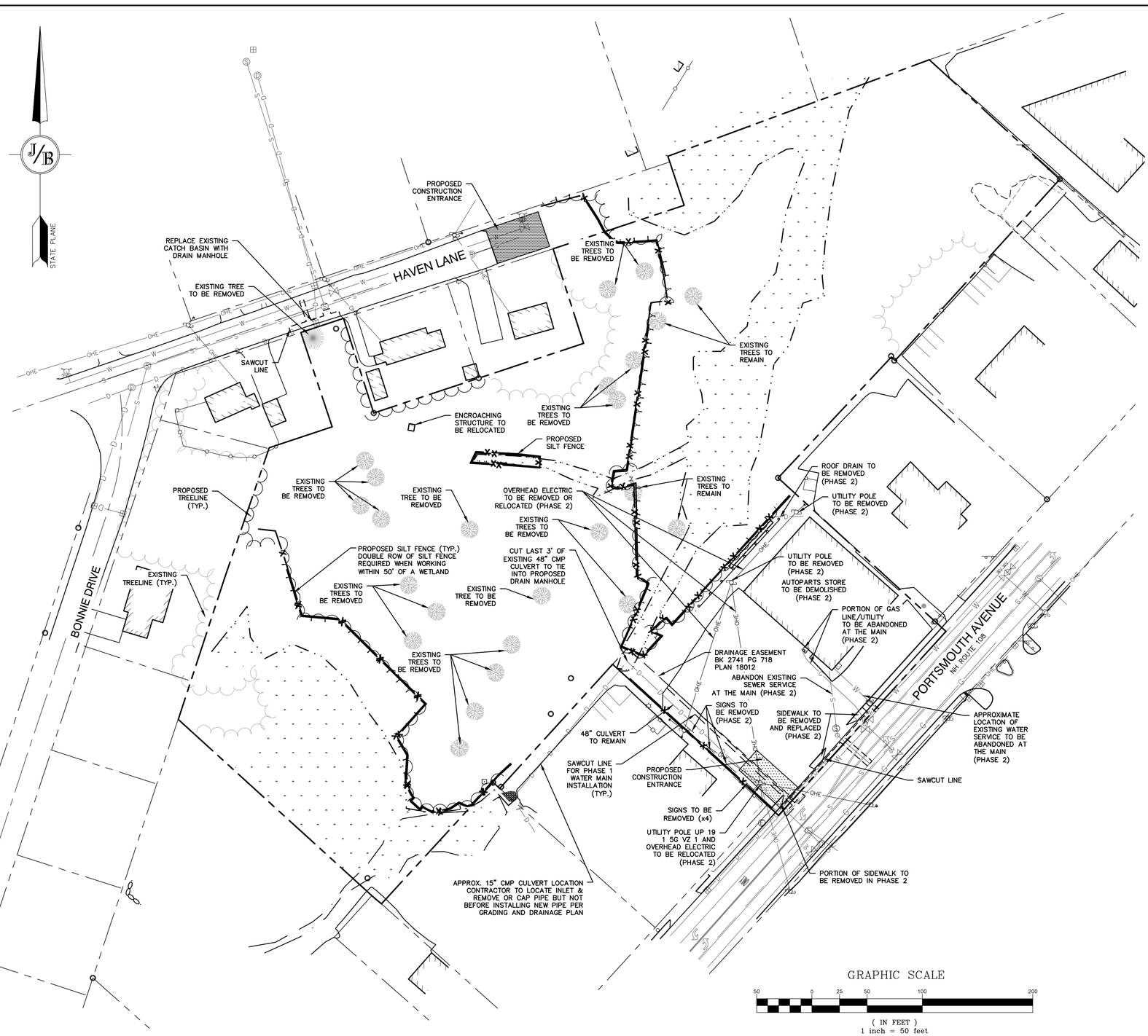
STATE OF NEW HAMPSHIRE PAIGE S. LIBBEY No. 16670 LICENSED PROFESSIONAL ENGINEER

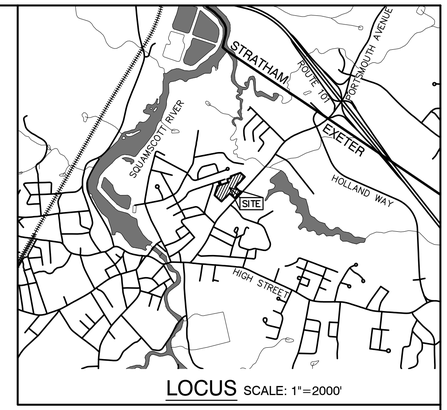
REV.	DATE	REVISION	BY
10	3/18/25	REVISED PER TOWN ENGINEER & TRC COMMENTS	DJM
9	2/13/25	FULL DESIGN FOR REVISED LAYOUT	DJM
8	1/31/25	REVISED LAYOUT PER CONSERVATION COMMISSION	DJM
7	1/13/25	REVISED PER TOWN ENGINEER & TRC COMMENTS	DJM
6	1/6/25	GRADING PLAN FOR CONSERVATION COMMISSION	DJM

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

Plan Name:	EXISTING CONDITIONS PLAN
Project:	"LILAC PLACE" 76 PORTSMOUTH AVE, EXETER, NH
Owner of Record:	RAP REALTY MANCHESTER LLC 50 ATLANTIC AVE, SEABROOK, NH

DRAWING No.
C1
SHEET 2 OF 31
JBE PROJECT NO. 24029





LOCUS SCALE: 1"=2000'

DEMOLITION NOTES:

1. THIS PLAN IS INTENDED TO PROVIDE MINIMUM GUIDELINES FOR SITE DEMOLITION. IT SHALL BE NOTED THAT ALL MANMADE FEATURES, PAVEMENT, SIGNS, POLES, CURBING, CONCRETE WALKS, UTILITIES, ETC., SHALL BE REMOVED AS NECESSARY TO CONSTRUCT WORK, UNLESS OTHERWISE NOTED TO REMAIN. THROUGHOUT THE CONSTRUCTION PROCESS, THE CONTRACTOR SHALL INFORM THE ENGINEER IMMEDIATELY OF ANY FIELD DISCREPANCIES FROM DATA AS SHOWN ON 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.
2. PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR IS REQUIRED TO HAVE THE PROJECT LAND SURVEYOR STAKE OR FLAG CLEARING LIMITS. A MINIMUM OF 48 HOURS NOTICE IS REQUIRED. CLEARING LIMITS ARE THE EDGE OF THE PROPERTY AND THE LIMITS OF WORK.
3. ALL EXISTING STRUCTURES WITHIN THE CONSTRUCTION AREA, UNLESS OTHERWISE NOTED TO REMAIN, SHALL BE REMOVED AND DISPOSED OF OFF-SITE IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL GUIDELINES. ANY BURNING ON-SITE SHALL BE SUBJECT TO LOCAL ORDINANCES.
4. ALL EXISTING UTILITIES SHALL BE TERMINATED AT THE MAIN, UNLESS OTHERWISE NOTED ON THE PLANS, IN CONFORMANCE WITH LOCAL, STATE AND UTILITY COMPANY STANDARDS, SPECIFICATIONS AND DETAILS. THE CONTRACTOR SHALL COORDINATE UTILITY SERVICE DISCONNECTS WITH THE UTILITY REPRESENTATIVES PRIOR TO THE START OF WORK.
5. EXISTING WATER SERVICE TO BE REMOVED SHALL BE CAPPED AT EXISTING WATERMAIN.
6. EXISTING GAS SERVICE LINES TO BE PARTIALLY REMOVED AND REROUTED TO PROPOSED BUILDING.
7. ALL CURBING, CONCRETE, PAVEMENT, BUILDINGS AND SUBBASE MATERIALS LOCATED WITHIN PROPOSED LANDSCAPED AREAS SHALL BE REMOVED AND REPLACED WITH LOAM MATERIALS SUITABLE FOR LANDSCAPING IN ACCORDANCE WITH TECHNICAL SPECIFICATIONS. (SEE ALSO LANDSCAPE PLAN).
8. IN AREAS WHERE CONSTRUCTION IS PROPOSED ADJACENT TO ABUTTING PROPERTIES, THE CONTRACTOR SHALL INSTALL ORANGE CONSTRUCTION FENCING ALONG PROPERTY LINES IN ALL AREAS WHERE SILT FENCING IS NOT REQUIRED.
9. EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO CONSTRUCTION AND ANY EARTH MOVING OPERATIONS. SILT FENCE SHALL BE INSTALLED AT THE LIMITS OF IMPACT AREAS ACCORDING TO THE DETAILS SHOWN ON SHEET E1.
10. EXCAVATED MATERIALS WILL BE PLACED WITHIN UPLAND AREAS AS FILL MATERIAL OR HAULED OFF-SITE FOR DISPOSAL IN AN APPROPRIATE UPLAND LOCATION.

PROJECT PARCEL
TOWN OF EXETER
TAX MAP 65, LOT 118

APPLICANT
GREEN & COMPANY
11 LAFAYETTE RD
PO BOX 1297
NORTH HAMPTON, NH 03862

TOTAL LOT AREA
291,630 SQ. FT.
6.7 ACRES

Design: DJM	Draft: KDR	Date: 3/15/24
Checked: PSL	Scale: AS SHOWN	Project No.: 24029
Drawing Name: 24029-PLAN.dwg		

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STATE OF NEW HAMPSHIRE – PAIGE S. LIBBEY No.16670 – LICENSED PROFESSIONAL ENGINEER – DATE: 3/15/24

REV.	DATE	REVISION	BY
10	3/18/25	REVISED PER TOWN ENGINEER & TRC COMMENTS	DJM
9	2/13/25	FULL DESIGN FOR REVISED LAYOUT	DJM
8	1/31/25	REVISED LAYOUT PER CONSERVATION COMMISSION	DJM
7	1/13/25	REVISED PER TOWN ENGINEER & TRC COMMENTS	DJM
6	1/6/25	GRADING PLAN FOR CONSERVATION COMMISSION	DJM

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

Plan Name:	DEMOLITION PLAN
Project:	"LILAC PLACE" 76 PORTSMOUTH AVE, EXETER, NH
Owner of Record:	RAP REALTY MANCHESTER LLC 50 ATLANTIC AVE, SEABROOK, NH

DRAWING No.
DM-1
SHEET 3 OF 31
JBE PROJECT NO. 24029



PROJECT PARCEL
TOWN OF EXETER
TAX MAP 65, LOT 118

APPLICANT
GREEN & COMPANY
11 LAFAYETTE RD
PO BOX 1297
NORTH HAMPTON, NH 03862

TOTAL LOT AREA
291,630 SQ. FT.
6.7 ACRES

Design: DJM	Draft: KDR	Date: 3/15/24	
Checked: PSL	Scale: AS SHOWN	Project No.: 24029	
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STATE OF NEW HAMPSHIRE – PAIGE S. LIBBEY No. 16670 – LICENSED PROFESSIONAL ENGINEER – 09/18/2025

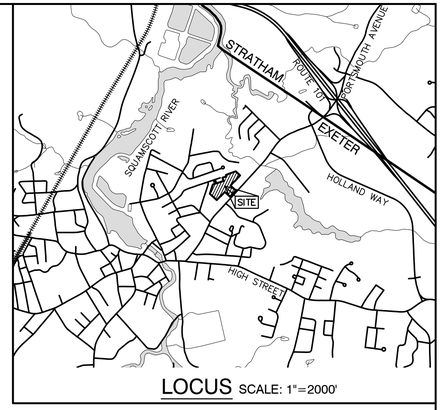
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Civil Engineering Services
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
603-772-4746
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	PHASE 1 PLAN
Project:	"LILAC PLACE" 76 PORTSMOUTH AVE, EXETER, NH
Owner of Record:	RAP REALTY MANCHESTER LLC 50 ATLANTIC AVE, SEABROOK, NH

DRAWING No.
PH1
SHEET 4 OF 31
JBE PROJECT NO. 24029





NOTES:

1. THE INTENT OF THIS PLAN IS TO SHOW A MIXED USE NEIGHBORHOOD DEVELOPMENT (MUND) CONSISTING OF A TOWNHOUSE DEVELOPMENT OFF HAVEN LANE WITH (34) 3-BEDROOM UNITS AND A 4 STORY MIXED USE BUILDING ON PORTSMOUTH AVENUE HAVING COMMERCIAL USE ON THE FIRST FLOOR AND (36) ONE BEDROOM UNITS ABOVE.
2. ZONING DISTRICT: C2
   LOT AREA MINIMUM = 20,000 SF
   LOT WIDTH MINIMUM = 150'
   LOT DEPTH MINIMUM = 100'
   MINIMUM LOT AREA/ DWELLING UNIT = 5,000 S.F.
   BUILDING SETBACKS (MINIMUM):
   FRONT SETBACK = 50'
   SIDE SETBACK = 20' ON ONE SIDE, 40' ON THE OTHER
   REAR SETBACK = 50'
   MAX. BUILDING HEIGHT = 35'
   MAX. BUILDING COVERAGE = 30%; BUILDING COVERAGE PROVIDED = 45,200 S.F. (15.5%)
   MIN. OPEN SPACE = 15%; OPEN SPACE PROVIDED = 52,794 S.F. (18.1%)
   TOWN WETLAND BUFFER = 40' LIMITED USE BUFFER TO P.D. SOILS, 75' PARKING AND STRUCTURE SETBACK
   ZONING DISTRICT: MIXED USE NEIGHBORHOOD DEVELOPMENT (MUND)
   FRONT SETBACK = 0' MIN, 25' MAX
   MAXIMUM BUILDING HEIGHT = 50' OR FOUR STORIES
   AREA PER DWELLING UNIT REQUIREMENT SHALL NOT APPLY TO MUND APPLICATIONS
3. RECREATION AREA REQUIRED (SITE PLAN REGULATIONS SECTION 9.6.3.) = 10% OF PROPERTY (29,163 S.F.)
   RECREATION AREA PROVIDED = 29,940 S.F. (10.3%)
4. PARKING CALCULATIONS
   PORTSMOUTH AVENUE DEVELOPMENT:
   MIXED USE NEIGHBORHOOD DISTRICT (MUND) PARKING REQUIREMENTS = 1 SPACE/RESIDENTIAL UNIT + COMMERCIAL PARKING AT 50% OF TOWN OF EXETER SITE PLAN REGULATIONS
   REQUIRED PARKING = 1 SPACE/300 S.F. X 4,418 S.F. COMMERCIAL SPACE X 50% = 8 SPACES REQUIRED
   +1 SPACE/ RESIDENTIAL UNIT = 36 SPACES REQUIRED
   TOTAL REQUIRED PARKING = 44 SPACES
   PARKING PROVIDED = 45 SPACES
   TOWNHOUSE DEVELOPMENT:
   1 SPACE PER UNIT REQUIRED
   34 UNITS / 1 SPACE PER UNIT = 34 SPACES REQUIRED
   PARKING PROVIDED = 120 PARKING SPACES
5. THIS PROJECT IS TO BE CONSTRUCTED IN TWO PHASES. PHASE 1 IS TO BE BUILT FIRST WHICH SHALL CONSIST OF ALL THE SIDEWALKS, UTILITIES & TOWNHOUSES ACCESSED OFF OF HAVEN LANE. PHASE 1 WILL ALSO INCLUDE THE WETLAND IMPACT/SIDEWALK AND WATERMAIN CONNECTION TO PORTSMOUTH AVENUE AND DRAINAGE IMPROVEMENTS TO EXISTING CULVERTS AT 72 AND 76 PORTSMOUTH AVENUE. PHASE 2 IS TO BE CONSTRUCTED LAST IS THE REMAINDER OF THE MIXED USE COMMERCIAL/RESIDENTIAL DEVELOPMENT ON PORTSMOUTH AVENUE. SEE SHEET PH1.
6. AFFORDABLE UNITS REQUIRED = 10% OF TOTAL PROPOSED UNITS.
   PHASE 1 TOTAL UNITS (36) * .1 = 3.6 ≈ 4
   4 UNITS REQUIRED, 4 UNITS PROPOSED
   PHASE 2 TOTAL UNITS (34) * .1 = 3.4 ≈ 4
   4 UNITS REQUIRED, 4 UNITS PROPOSED
7. REQUIRED LANDSCAPED AREA = 10% OF PARKING AREA
   PARKING AREA (16,005 S.F.) * .1 = 1,601 S.F. REQUIRED LANDSCAPE AREA
   2,623 S.F. OF LANDSCAPED AREA PROVIDED
8. THE LIMITS OF JURISDICTIONAL WETLANDS WERE DELINEATED BY JOHN HAYES, DURING APRIL, 2024 IN ACCORDANCE WITH THE FOLLOWING GUIDANCE DOCUMENTS:
   a. THE CORPS OF ENGINEERS FEDERAL MANUAL FOR IDENTIFYING AND DELINEATING JURISDICTIONAL WETLANDS.
   b. THE NORTH CENTRAL & NORTHEAST REGIONAL SUPPLEMENT TO THE FEDERAL MANUAL.
   c. THE CURRENT VERSION OF THE FIELD INDICATORS FOR IDENTIFYING HYDRIC SOILS IN NEW ENGLAND, AS PUBLISHED BY THE NEW ENGLAND INTERSTATE WATER POLLUTION CONTROL COMMISSION AND/OR THE CURRENT VERSION OF THE FIELD INDICATORS OF HYDRIC SOILS IN THE UNITED STATES, AS PUBLISHED BY THE USDA, NRCS, AS APPROPRIATE.
   d. THE CURRENT NATIONAL LIST OF PLANT SPECIES THAT OCCUR IN WETLANDS, AS PUBLISHED BY THE US FISH AND WILDLIFE SERVICE.
9. ALL WATER, SEWER, ROAD AND DRAINAGE WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH SECTION 9.3 STORMWATER MANAGEMENT STANDARDS, STORMWATER MANAGEMENT PLAN, STORMWATER POLLUTION PREVENTION PLAN, AND EROSION AND SEDIMENT CONTROL STANDARDS AND THE STANDARD SPECIFICATIONS FOR CONSTRUCTION OF PUBLIC UTILITIES IN EXETER, NEW HAMPSHIRE.
10. THIS PLAN SET HAS BEEN PREPARED BY JONES & BEACH ENGINEERS, INC., FOR MUNICIPAL AND STATE APPROVALS AND FOR CONSTRUCTION BASED ON DATA OBTAINED FROM ON-SITE FIELD SURVEY AND EXISTING MUNICIPAL RECORDS. THROUGHOUT THE CONSTRUCTION PROCESS, THE CONTRACTOR SHALL INFORM THE ENGINEER IMMEDIATELY OF ANY FIELD DISCREPANCY FROM DATA AS SHOWN ON THE DESIGN PLANS, INCLUDING ANY UNFORESEEN CONDITIONS, SUBSURFACE OR OTHERWISE, FOR EVALUATION AND RECOMMENDATIONS. ANY CONTRADICTION BETWEEN ITEMS ON THIS PLAN/PLAN SET, OR BETWEEN THE PLANS AND ON-SITE CONDITIONS, MUST BE RESOLVED BEFORE RELATED CONSTRUCTION HAS BEEN INITIATED. CONTRACTOR TO ALWAYS CONTACT DIG SAFE PRIOR TO DIGGING ONSITE OR OFFSITE TO ENSURE SAFETY AND OBEY THE LAW.
11. ALL CONSTRUCTION SHALL CONFORM TO TOWN STANDARDS AND REGULATIONS, AND NHDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, WHICHEVER IS MORE STRINGENT.
12. THE SUBJECT PARCEL IS NOT LOCATED WITHIN AN AREA HAVING A SPECIAL FLOOD HAZARD ZONE DESIGNATION BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA), ON FLOOD INSURANCE RATE MAP NOs. 33015C0402E AND 33015C0406E, BOTH WITH EFFECTIVE DATE OF MAY 17, 2005.
13. LANDOWNERS ARE RESPONSIBLE FOR COMPLYING WITH ALL APPLICABLE LOCAL, STATE AND FEDERAL WETLAND REGULATIONS, INCLUDING PERMITTING REQUIRED UNDER THESE REGULATIONS.
14. ALL CONSTRUCTION ACTIVITIES SHALL BE PERFORMED IN ACCORDANCE WITH THE STORMWATER POLLUTION PREVENTION PLAN (S.W.P.P.P.). THIS DOCUMENT IS TO BE KEPT ONSITE AT ALL TIMES AND UPDATED AS REQUIRED.
15. THE CONTRACTOR SHALL READ AND FOLLOW ALL RECOMMENDATIONS MADE IN THE SITE GEOTECHNICAL ENGINEER REPORT, PREPARED BY GEOTECHNICAL SERVICES, INC., DATED JULY 12, 2024.
16. PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR SHALL COORDINATE WITH THE ENGINEER, ARCHITECT AND/OR OWNER, IN ORDER TO OBTAIN AND/OR PAY ALL THE NECESSARY LOCAL PERMITS, FEES AND BONDS.
17. ALL PROPOSED SIGNAGE SHALL CONFORM WITH THE TOWN ZONING REGULATIONS, UNLESS A VARIANCE IS OTHERWISE REQUESTED.
18. ALL SIGNAGE AND PAVEMENT MARKINGS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (M.U.T.C.D.) AND NHDOT STANDARDS AND SPECIFICATIONS (NON-REFLECTORIZED PAVEMENT MARKINGS), UNLESS OTHERWISE NOTED.
19. ALL PARKING STALLS SHALL BE SEPARATED USING 4" WDE SOLID STRIPES. STRIPING SHALL BE 100% ACRYLIC TYPE, LOW VOC, FAST DRYING, IN A COLOR OF WHITE.
20. ALL STOP BARS SHALL BE 18" IN WIDTH IN A COLOR OF WHITE; ALL TRAFFIC ARROWS SHALL BE PAINTED IN A COLOR OF WHITE.
21. ALL CURBING TO BE SLOPED GRANITE WITH A MINIMUM RADIUS OF 2', UNLESS OTHERWISE NOTED.
22. ALL BUILDING DIMENSIONS SHALL BE VERIFIED WITH THE ARCHITECTURAL AND STRUCTURAL PLANS PROVIDED BY THE OWNER. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER AND OWNER PRIOR TO THE START OF CONSTRUCTION. BUILDING DIMENSIONS AND AREAS TO BE TO OUTSIDE OF MASONRY, UNLESS OTHERWISE NOTED.
23. SNOW TO BE STORED AT EDGE OF PAVEMENT AND IN AREAS SHOWN ON THE PLANS, OR TRUCKED OFFSITE TO AN APPROVED SNOW DUMPING LOCATION.
24. ROOF TOP HEATING AND AIR CONDITIONING UNITS (RTU's ON THE MIXED USE BUILDING) SHALL BE DESIGNED TO VENT UPWARDS AND AIR INTAKES SHALL BE DIRECTED AWAY FROM ABUTTING NEIGHBORS. AND SHALL BE SCREENED FROM PUBLIC VIEW.
25. ALL ARCHITECTURAL BLOCK RETAINING WALLS ARE TO BE DESIGNED AND STAMPED BY THE MANUFACTURER'S STRUCTURAL ENGINEER. CONTRACTOR TO COORDINATE WITH APPROVED MANUFACTURER PRIOR TO INSTALLATION.
26. ALL CONSTRUCTION ACTIVITIES SHALL CONFORM TO LABOR OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) RULES AND REGULATIONS.
27. ALL PRECAST CONCRETE PRODUCTS WILL BE SOURCED FROM MANUFACTURING FACILITIES IN COMPLIANCE WITH THE NATIONAL PRECAST CONCRETE ASSOCIATION (NPCA) PLANT CERTIFICATION PROGRAM. EVIDENCE OF COMPLIANCE WILL BE PROVIDED FOR THE CURRENT CALENDAR YEAR THE PRODUCTS WERE MANUFACTURED WITHIN.
28. CONTRACTOR SHALL SUBMIT A TRAFFIC CONTROL TOWN TO APPROPRIATE TOWN DEPARTMENTS PRIOR TO COMMENCEMENT OF CONSTRUCTION.

APPROVED – EXETER, NH
PLANNING BOARD

DATE:

PROJECT PARCEL
TOWN OF EXETER
TAX MAP 65, LOT 118

APPLICANT
GREEN & COMPANY
11 LAFAYETTE RD
PO BOX 1297
NORTH HAMPTON, NH 03862

TOTAL LOT AREA
291,630 SQ. FT.
6.7 ACRES

Design: DJM	Draft: KDR
Checked: PSL	Scale: AS SHOWN
Drawing Name: 24029-PLAN.dwg	Date: 3/15/24
	Project No.: 24029

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STATE OF NEW HAMPSHIRE – PAIGE S. LIBBEY No.16670 – PROFESSIONAL ENGINEER – LICENSED – 07/08/2025

REV.	DATE	REVISION	BY
10	3/18/25	REVISED PER TOWN ENGINEER & TRC COMMENTS	DJM
9	2/13/25	FULL DESIGN FOR REVISED LAYOUT	DJM
8	1/31/25	REVISED LAYOUT PER CONSERVATION COMMISSION	DJM
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6	1/6/25	GRADING PLAN FOR CONSERVATION COMMISSION	DJM

Designed and Produced in NH
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85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
Civil Engineering Services
603-772-4746
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	OVERVIEW SITE PLAN
Project:	"LILAC PLACE" 76 PORTSMOUTH AVE, EXETER, NH
Owner of Record:	RAP REALTY MANCHESTER LLC 50 ATLANTIC AVE, SEABROOK, NH

DRAWING No.
OV1
SHEET 5 OF 31
JBE PROJECT NO. 24029

TAX MAP 65 LOT 39
LUIS & MARTHA FRANCESHI
36 HAVEN LANE
EXETER, NH 03833
BK 6236 PG 2825

TAX MAP 65 LOT 38
ZACHARY SHELTRA
34 HAVEN LANE
EXETER, NH 03833
BK 6344 PG 0288

TAX MAP 65 LOT 37
DANIEL HEFFERNAN
32 HAVEN LANE
EXETER, NH 03833
BK 5562 PG 1813

HAVEN LANE

TAX MAP 65 LOT 40
HAYES JOAN ELLEN
37 HAVEN LANE
EXETER, NH 03833
BK 2647 PG 1678

TAX MAP 65 LOT 41
BOAC EFREN U
C/O BOAC JENEFER D
35 HAVEN ROAD
EXETER, NH 03833
BK 5106 PG 2552

TAX MAP 65 LOT 42
MICHAEL & DANIELLE HAUCK
31 HAVEN LANE
EXETER, NH 03833
BK 5738 PG 2947

TAX MAP 65 LOT 43
CRAIG & KATHERINE BOUDREAU
11 BONNIE DRIVE
EXETER, NH 03833
BK 4409 PG 282
PLAN 02680

TAX MAP 65 LOT 44
MATTHEW CARDAMONE
9 BONNIE DRIVE
EXETER, NH 03833
BK 5883 PG 2140
PLAN 02680

TAX MAP 65 LOT 117
ISERNIA OF NEW HAMPSHIRE LLC
C/O LOCASCIO OF NEW HAMPSHIRE LLC
166-11 14TH ROAD
BEECHHURST, NY 11357
BK 4888 PG 2934

TAX MAP 65 LOT 119
82 PORTSMOUTH AVE LLC
C/O PATER RE MANAGEMENT CO INC
1 VERANI WAY
LONDONDERRY, NH 03053
BK 6068 PG 609

BONNIE DRIVE

PORTSMOUTH AVENUE
NH ROUTE 108

ZONE R-3

ZONE C-2

BUILDING 1 (12' x 32', 6' x 32')
BUILDING 2 (24' (TYP.) x 34' (TYP.))
BUILDING 3 (34' (TYP.) x 42')
BUILDING 4 (24' x 42')
BUILDING 5 (24' x 42')
BUILDING 6 (24' x 42')
BUILDING 7 (24' x 42')
BUILDING 8 (24' x 42')
BUILDING 9 (24' x 42')
BUILDING 10 (24' x 42')
BUILDING 11 (24' x 42')

PROPOSED STOP SIGN WITH STOP BAR
PROPOSED 8' WOODEN STOCKADE FENCE
END 8' STOCKADE FENCE
BEGIN SGC
END SGC
BEGIN VGC
END VGC
TIP DOWN
CONCRETE PAD FOR TRANSFORMER (TYP., SEE SHEET C4)
MONUMENT TO BE SET (TYP.)
5' WIDE IMPERVIOUS CONCRETE SIDEWALK W/ VGC (TYP.)
SNOW STORAGE
POROUS PAVEMENT MAINTENANCE SIGN
BREAK VGC AT WALKWAY INTERSECTION
6' DEEP X UNIT WIDTH DECK (TYP.)
BEGIN 8' STOCKADE FENCE
PROPOSED GUARDRAIL
POROUS PAVEMENT IN HATCHED AREA
20' LANDSCAPING BUFFER TO RESIDENTIAL AREA (TYP.)
PARKING STRIPES IN FRONT OF TOWNHOUSES FOR DIMENSIONAL USE ONLY AND ARE NOT TO BE PAINTED (TYP.)
75' WETLAND PARKING/ STRUCTURE SETBACK
SEE PAVEMENT HATCH LEGEND ON THIS SHEET FOR DESIGNATIONS OF STANDARD, LINED POROUS, AND UNLINED POROUS PAVEMENT AREAS (TYP.)
EXISTING POORLY DRAINED WETLAND
40' LIMITED USE BUFFER TO POORLY DRAINED SOILS
"WETLAND AREA – NO SNOW DUMPING" SIGN
6' DEEP x UNIT WIDTH DECKS OVER DRIVEWAY (TYP.)
PROPOSED 9' LONG CONCRETE BLOCK RETAINING WALL (X2)
208' LONG, 5' WIDE POROUS CONCRETE WALKWAY (AREA WITH CROSS HATCH)
WATER SUPPLY PROTECTION AREA
INTAKE
POROUS PAVEMENT IN HATCHED AREA
PROPOSED 5' WIDE BRICK PAVER CROSSWALK (TYP.)
CONTINUE VGC ALONG NORTHEAST SIDE OF CONCRETE SIDEWALK UP TO PROPOSED ROAD
MAINMDE WETLAND (NO SETBACK)
EXISTING VERY POORLY DRAINED WETLAND
CONTINUE VGC ALONG SOUTH SIDE OF CONCRETE SIDEWALK (DO NOT PLACE AGAINST PAVEMENT BEYOND HERE)
INSTALL WETLAND BUFFER PLACARDS EVERY 50' ALONG LIMITED USE BUFFER OR OTHERWISE ALONG TREELINE WHERE DEVELOPMENT ENCROACHES LIMITED USE BUFFER (TYP.)
MAILBOX KIOSK
INSTALL STAIRS IN RETAINING WALL
PROPOSED CONCRETE BLOCK RETAINING WALL (TYP.)
RECREATION AREA = 600 S.F.
5,600 S.F. 407' L.F. PROPOSED TRAIL
50' LIMITED USE BUFFER TO VERY POORLY DRAINED SOILS
STRIPED LOADING ZONE
2:1 TAPER
5' WIDE BRICK PAVER CROSSWALK
5' WIDE CONCRETE SIDEWALK
MIXED USE BUILDING COMMERCIAL USE ON FIRST FLOOR. (36) RESIDENTIAL UNITS ABOVE.
5' WIDE CONCRETE SIDEWALK W/ VGC
STORAGE/ELEVATORS/ STAIRS/UTILITIES/ TRASH AREA
COMMERCIAL SPACE 4,416 S.F.
HANDICAP PARKING SIGN
5' WIDE CONCRETE WALKWAY CONNECTING SIDEWALK ALONG PORTSMOUTH AVE. TO SIDEWALK ALONG BUILDING (TYP.)
REMOVE EXISTING ASPHALT SIDEWALK AND CONSTRUCT 8' WIDE CONCRETE SIDEWALK SEE LANDSCAPE PLAN FOR SPECIAL FEATURES IN AND ADJACENT TO SIDEWALK
FILL IN EXISTING CURB CUT WITH 8' WIDE CONCRETE SIDEWALK W/ VGC ALONG PORTSMOUTH AVE.
VAN ACCESSIBLE HANDICAP PARKING SIGN
TRANSITION SGC TO VGC
TIP DOWN (TYP.)
PROPOSED 5' WIDE CONCRETE SIDEWALK W/ VGC
4.75' WIDE CURB BREAK AND PAVED APRON FOR DRAINAGE
PROPOSED STOP SIGN WITH STOP BAR
5' WIDE BRICK PAVER CROSSWALK

S71°37'53"W 40.67'
S71°37'45"W 100.22'
S71°38'00"W 125.00'
S71°37'45"W 100.00'
S71°37'45"W 60.00'
S18°22'00"E 90.00'
N17°42'50"W 90.00'
S17°51'08"E 89.98'
S18°05'06"W 125.08'
S18°06'54"W 134.47'
S47°40'19"E 240.65'
S47°39'31"E 203.11'
N42°18'09"E 151.96'
N42°18'47"E 225.25'
N47°32'45"W 205.97'
N43°01'46"E 149.93'
S47°45'29"E 4.65'

PAVEMENT HATCH LEGEND:
STANDARD ASPHALT
UNLINED POROUS PAVEMENT
LINED POROUS PAVEMENT

MONUMENTS LEGEND:
EXISTING PROPOSED
IRON ROD / IRON PIPE
DRILL HOLE
GRANITE BOUND

PROJECT PARCEL
TOWN OF EXETER
TAX MAP 65, LOT 118

APPLICANT
GREEN & COMPANY
11 LAFAYETTE RD
PO BOX 1297
NORTH HAMPTON, NH 03862

TOTAL LOT AREA
291,630 SQ. FT.
6.7 ACRES

GRAPHIC SCALE
30 0 15 30 60 120
(IN FEET)
1 inch = 30 feet

Design: DJM	Draft: KDR	Date: 3/15/24
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Drawing Name: 24029-PLAN.dwg		

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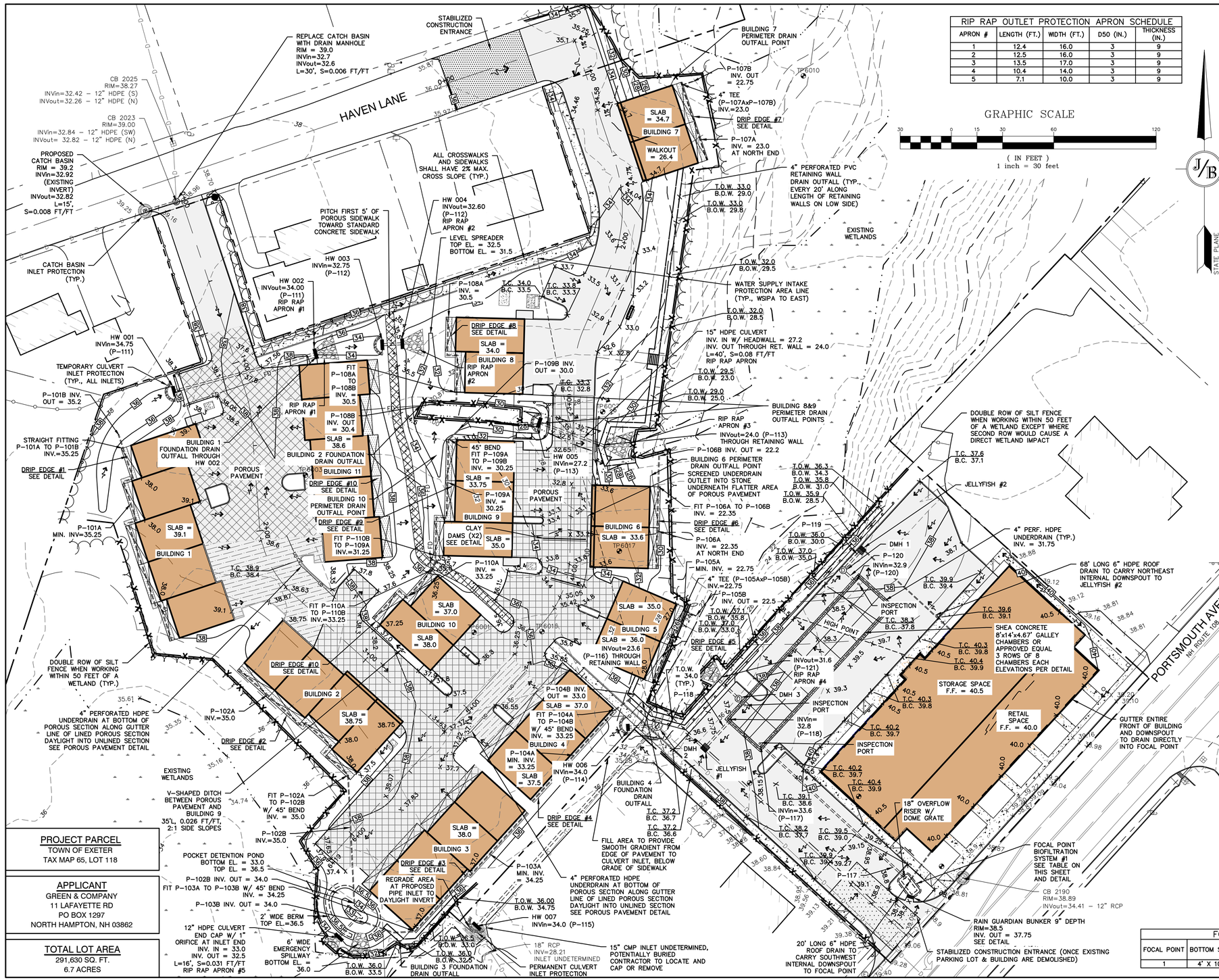
STATE OF NEW HAMPSHIRE – PAIGE S. LIBBEY No. 16670 – PROFESSIONAL ENGINEER – LICENSED – 09/18/2025

REV.	DATE	REVISION	BY
10	3/18/25	REVISED PER TOWN ENGINEER & TRC COMMENTS	DJM
9	2/13/25	FULL DESIGN FOR REVISED LAYOUT	DJM
8	1/31/25	REVISED LAYOUT PER CONSERVATION COMMISSION	DJM
7	1/13/25	REVISED PER TOWN ENGINEER & TRC COMMENTS	DJM
6	1/6/25	GRADING PLAN FOR CONSERVATION COMMISSION	DJM

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

Plan Name: SITE PLAN
Project: "LILAC PLACE" 76 PORTSMOUTH AVE, EXETER, NH
Owner of Record: RAP REALTY MANCHESTER LLC 50 ATLANTIC AVE, SEABROOK, NH

DRAWING No.
C2
SHEET 6 OF 31
JBE PROJECT NO. 24029



RIP RAP OUTLET PROTECTION APRON SCHEDULE				
APRON #	LENGTH (FT.)	WIDTH (FT.)	D50 (IN.)	THICKNESS (IN.)
1	12.4	16.0	3	9
2	12.5	16.0	3	9
3	13.5	17.0	3	9
4	10.4	14.0	3	9
5	7.1	10.0	3	9

GRADING AND DRAINAGE NOTES:

1. UNDERGROUND FACILITIES, UTILITIES AND STRUCTURES HAVE BEEN PLOTTED FROM FIELD OBSERVATION AND THEIR LOCATION MUST BE CONSIDERED APPROXIMATE ONLY. NEITHER JONES & BEACH ENGINEERS, INC., NOR ANY OF THEIR EMPLOYEES TAKE RESPONSIBILITY FOR THE LOCATION OF ANY UNDERGROUND STRUCTURES AND/OR UTILITIES NOT SHOWN THAT MAY EXIST. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE ALL UNDERGROUND STRUCTURES AND/OR UTILITIES LOCATED PRIOR TO EXCAVATION WORK BY CALLING 888–DIG–SAFE (888–344–7233).
2. VERTICAL DATUM: NAVD88.
3. ALL BENCHMARKS AND TOPOGRAPHY SHALL BE FIELD VERIFIED BY THE CONTRACTOR.
4. SITE GRADING SHALL NOT PROCEED UNTIL EROSION CONTROL MEASURES HAVE BEEN INSTALLED. SEE CONSTRUCTION SEQUENCE ON SHEET E1.
5. PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR IS REQUIRED TO HAVE THE PROJECT'S LAND SURVEYOR STAKE OR FLAG CLEARING LIMITS. A MINIMUM OF 48 HOURS NOTICE IS REQUIRED.
6. ALL EXTERIOR ROOF DOWNSPOUTS ARE TO BE INSTALLED WITH OVERFLOW DEVICES.
7. ALL SWALES AND DETENTION PONDS ARE TO BE STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM.
8. PROPOSED RIM ELEVATIONS OF DRAINAGE STRUCTURES ARE APPROXIMATE. FINAL ELEVATIONS ARE TO BE SET FLUSH WITH FINISH GRADES.
9. ALL SWALES AND ANY SLOPES GREATER THAN 3:1 SHALL BE STABILIZED WITH NORTH AMERICAN GREEN SC150BN EROSION CONTROL BLANKETS (OR AN EQUIVALENT APPROVED IN WRITING BY THE ENGINEER), UNLESS OTHERWISE SPECIFIED.
10. ALL DRAINAGE AND SANITARY STRUCTURE INTERIOR DIAMETERS (4' MIN) SHALL BE DETERMINED BY THE MANUFACTURER BASED ON THE PIPE CONFIGURATIONS SHOWN ON THESE PLANS. CATCH BASINS SHALL HAVE 3' DEEP SUMPS WITH GREASE HOODS, UNLESS OTHERWISE NOTED.
11. ALL DRAINAGE STRUCTURES SHALL BE PRECAST, UNLESS OTHERWISE SPECIFIED. SEE DRAINAGE DETAILS ON DETAIL SHEETS.
12. ALL DRAINAGE STRUCTURES AND STORMWATER PIPES SHALL MEET HEAVY DUTY TRAFFIC H20 LOADING AND SHALL BE INSTALLED ACCORDINGLY.
13. IMMEDIATELY APPLY AND COMPACT STONE BASE FOR BUILDING PAD TO +/–½" PRIOR TO EXCAVATING INTERIOR AND PERIMETER FOOTINGS.
14. IN AREAS WHERE CONSTRUCTION IS PROPOSED ADJACENT TO ABUTTING PROPERTIES, THE CONTRACTOR SHALL INSTALL ORANGE CONSTRUCTION FENCING ALONG PROPERTY LINES IN ALL AREAS WHERE SILT FENCING IS NOT REQUIRED.
15. ALL DRAINAGE PIPE SHALL BE NON–PERFORATED ADS N–12 OR APPROVED EQUAL, UNLESS OTHERWISE NOTED.
16. STONE INLET PROTECTION SHALL BE PLACED AT ALL CATCH BASINS. SEE DETAIL WITHIN THE DETAIL SHEETS.
17. LAND DISTURBING ACTIVITIES SHALL NOT COMMENCE UNTIL APPROVAL TO DO SO HAS BEEN RECEIVED BY ALL GOVERNING AUTHORITIES. THE GENERAL CONTRACTOR SHALL STRICTLY ADHERE TO THE EPA SWPPP DURING CONSTRUCTION OPERATIONS.
18. ALL EXPOSED AREAS SHALL BE SEEDED AS SPECIFIED WITHIN 3 DAYS OF FINAL GRADING AND ANYTIME CONSTRUCTION STOPS FOR LONGER THAN 3 DAYS.
19. MAINTAIN EROSION CONTROL MEASURES AFTER EACH RAIN EVENT OF 0.25" OR GREATER IN A 24 HOUR PERIOD AND AT LEAST ONCE A WEEK.
20. THIS PLAN SHALL NOT BE CONSIDERED ALL INCLUSIVE, AS THE GENERAL CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PREVENT SEDIMENT FROM LEAVING THE SITE.
21. CONSTRUCTION VEHICLES SHALL UTILIZE THE STABILIZED CONSTRUCTION ENTRANCE TO THE EXTENT POSSIBLE THROUGHOUT CONSTRUCTION.
22. IF INSTALLATION OF STORM DRAINAGE SYSTEM SHALL BE INTERRUPTED BY WEATHER OR NIGHTFALL, THE PIPE ENDS SHALL BE COVERED WITH FILTER FABRIC.
23. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE TO TAKE WHATEVER MEANS NECESSARY TO ESTABLISH PERMANENT SOIL STABILIZATION.
24. SEDIMENT SHALL BE REMOVED FROM ALL SEDIMENT BASINS BEFORE THEY ARE 25% FULL.
25. ALL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH PROJECT SPECIFICATIONS.
26. ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED, IF DEEMED NECESSARY BY ON–SITE INSPECTION BY ENGINEER AND/OR REGULATORY OFFICIALS.
27. SEE ALSO EROSION AND SEDIMENT CONTROL SPECIFICATIONS ON SHEET E1.
28. OUTLET BUILDING 5 PERIMETER DRAIN BELOW BUILDING 5 WALKOUT ELEVATION.
29. TOTAL DISTURBANCE = 166,000 S.F.

DRAINAGE STRUCTURE SCHEDULE

DMH 1
RIM = 37.2
15" HDPE INV. IN =33.1 (P–119)
15" HDPE INV. OUT = 33.0 (P–120)

6' DIA. DMH 2
RIM = 37.0
INVin=33.5 (P–114)
INVin=26.2 (P–115)
EX. 48" CMP INVin = 24.89
INVout=23.7 (P–116)

DMH 3 (CHAMBER SYSTEM OUTLET CONTROL STRUCTURE; SEE DETAIL SHEET)
RIM = 37.6
INVout=31.75 (P–121)

JELLYFISH #1 (JFSI0404 SURFACE INLET CONFIGURATION OR APPROVED EQUAL)
RIM = 36.5
INVout=33.15 (P–118)

JELLYFISH #2 (JFSI0404 SURFACE INLET CONFIGURATION OR APPROVED EQUAL)
RIM = 36.6
INVin=34.0 (6" HDPE ROOF DRAIN)
INVout=33.25 (P–119)

18" FOCAL POINT OVERFLOW RISER W/ DOME GRATE
RIM = 37.75
INVout=34.50 (P–117)

DRAINAGE PIPE SCHEDULE				
PIPE ID	INSIDE DIAMETER (in.)	MATERIAL	LENGTH (FT.)	SLOPE (FT/FT)
P–101A	4	PERF. HDPE	131	LEVEL
P–101B	4	SOLID HDPE	8	0.006
P–102A	4	PERF. HDPE	98	LEVEL
P–102B	4	SOLID HDPE	75	0.013
P–103A	4	PERF. HDPE	98	LEVEL
P–103B	4	SOLID HDPE	30	0.008
P–104A	4	PERF. HDPE	72	LEVEL
P–104B	4	SOLID HDPE	15	0.017
P–105A	4	PERF. HDPE	48	LEVEL
P–105B	4	SOLID HDPE	8	0.031
P–106A	4	PERF. HDPE	48	LEVEL
P–106B	4	SOLID HDPE	18	0.008
P–107A	4	PERF. HDPE	48	LEVEL
P–107B	4	SOLID HDPE	6	0.042
P–108A	4	PERF. HDPE	50	LEVEL
P–108B	4	SOLID HDPE	5	0.020
P–109A	4	PERF. HDPE	74	LEVEL
P–109B	4	SOLID HDPE	8	0.031
P–110A	4	PERF. HDPE	50	LEVEL
P–110B	4	SOLID HDPE	15	0.133
P–111	15	SOLID HDPE	86	0.009
P–112	15	SOLID HDPE	12	0.013
P–113	15	SOLID HDPE	40	0.080
P–114	12	SOLID HDPE	14	0.036
P–115	18	SOLID HDPE	160	0.005
P–116	48	SOLID HDPE	5	0.020
P–117	12	SOLID HDPE	113	0.008
P–118	15	SOLID HDPE	20	0.018
P–119	15	SOLID HDPE	12	0.013
P–120	15	SOLID HDPE	8	0.013
P–121	15	SOLID HDPE	13	0.012

FOCAL POINT SCHEDULE						
FOCAL POINT	BOTTOM SIZE	SIDE SLOPES	BERM EL.	TOP OF FILTER COURSE	BOTTOM OF FILTER COURSE	R–TANK UNDERDRAIN INVERT
1	4' X 10'	3:1	38.25	37.50	35.25	34.50

PROJECT PARCEL
TOWN OF EXETER
TAX MAP 65, LOT 118

APPLICANT
GREEN & COMPANY
11 LAFAYETTE RD
PO BOX 1297
NORTH HAMPTON, NH 03862

TOTAL LOT AREA
291,630 SQ. FT.
6.7 ACRES

Design: DJM	Draft: KDR	Date: 3/15/24
Checked: PSL	Scale: AS SHOWN	Project No.: 24029
Drawing Name: 24029-PLAN.dwg		

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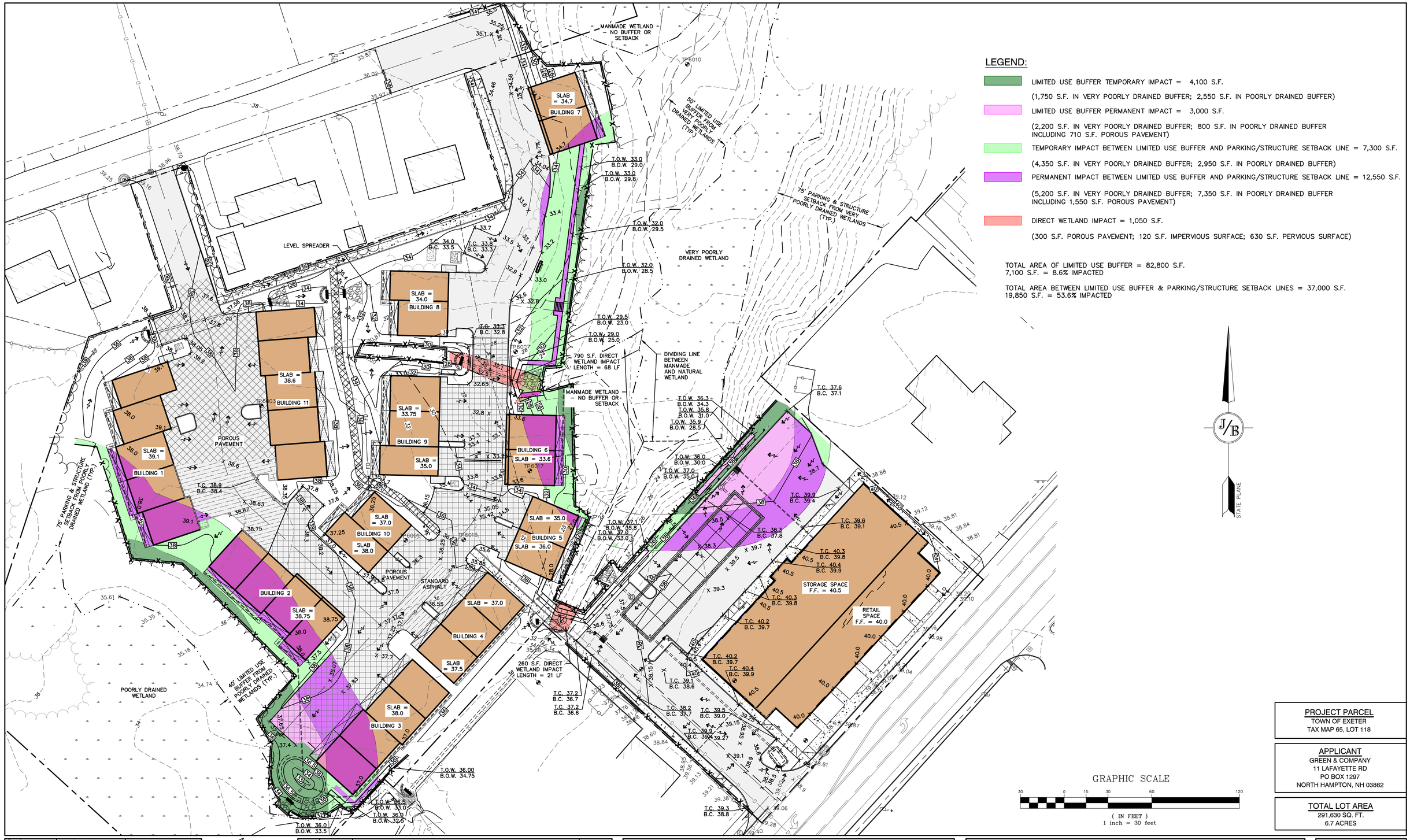
STATE OF NEW HAMPSHIRE – PAIGE S. LIBBEY No.16670 – LICENSED PROFESSIONAL ENGINEER – 03/18/2025

REV.	DATE	REVISION	BY
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Designed and Produced in NH
J/B Jones & Beach Engineers, Inc.
Civil Engineering Services
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
603-772-4746
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name: GRADING AND DRAINAGE PLAN
Project: "LILAC PLACE" 76 PORTSMOUTH AVE, EXETER, NH
Owner of Record: RAP REALTY MANCHESTER LLC 50 ATLANTIC AVE, SEABROOK, NH

DRAWING No.
C3
SHEET 7 OF 31
JBE PROJECT NO. 24029



PROJECT PARCEL
TOWN OF EXETER
TAX MAP 65, LOT 118

APPLICANT
GREEN & COMPANY
11 LAFAYETTE RD
PO BOX 1297
NORTH HAMPTON, NH 03862

TOTAL LOT AREA
291,630 SQ. FT.
6.7 ACRES

Design: DJM	Draft: KDR	Date: 3/15/24	
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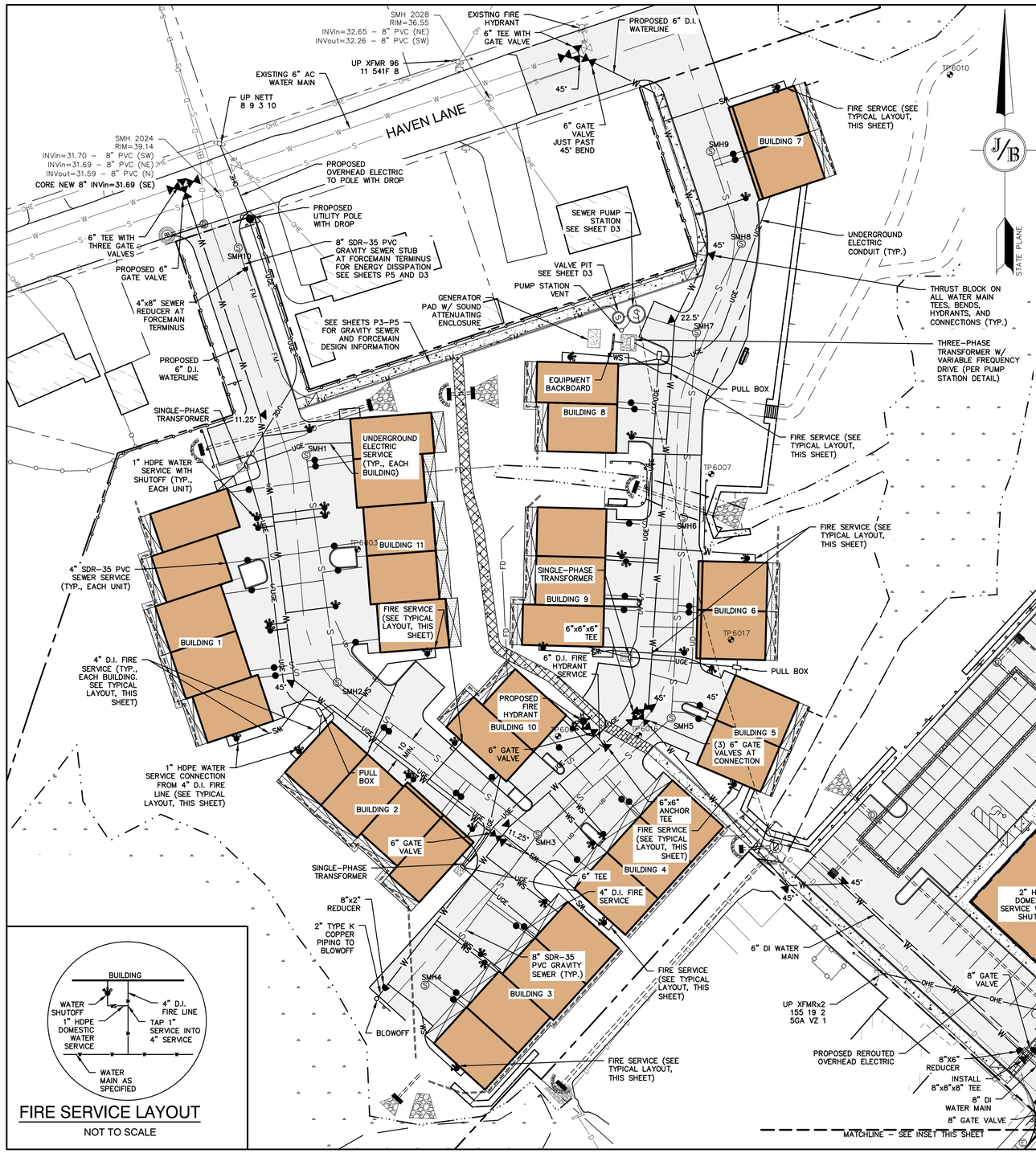
I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF NEW HAMPSHIRE
PAIGE S. LIBBEY No. 16670 LICENSED PROFESSIONAL ENGINEER
10/9/2025

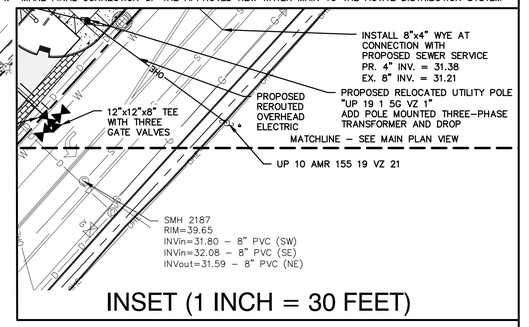
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6	1/6/25	GRADING PLAN FOR CONSERVATION COMMISSION	DJM

Designed and Produced in NH
Jones & Beach Engineers, Inc.
Civil Engineering Services
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
603-772-4746
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name: WETLAND AND BUFFER IMPACT PLAN
Project: "LILAC PLACE" 76 PORTSMOUTH AVE, EXETER, NH
Owner of Record: RAP REALTY MANCHESTER LLC 50 ATLANTIC AVE, SEABROOK, NH

DRAWING No.
WB1
SHEET 8 OF 31
JBE PROJECT NO. 24029





INSET (1 INCH = 30 FEET)

FIRE SERVICE LAYOUT

NOT TO SCALE

UTILITY NOTES:

1. PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR SHALL COORDINATE WITH THE ENGINEER, ARCHITECT AND/OR OWNER, IN ORDER TO OBTAIN AND/OR PAY ALL THE NECESSARY LOCAL PERMITS, CONNECTION FEES AND BONDS.
2. THE CONTRACTOR SHALL PROVIDE A MINIMUM NOTICE OF FOURTEEN (14) DAYS TO ALL CORPORATIONS, COMPANIES AND/OR LOCAL AUTHORITIES OWNING OR HAVING A JURISDICTION OVER UTILITIES RUNNING TO, THROUGH OR ACROSS PROJECT AREAS PRIOR TO DEMOLITION AND/OR CONSTRUCTION ACTIVITIES.
3. THE LOCATION, SIZE, DEPTH AND SPECIFICATIONS FOR CONSTRUCTION OF PROPOSED PRIVATE UTILITY SERVICES SHALL BE TO THE STANDARDS AND REQUIREMENTS OF THE RESPECTIVE UTILITY COMPANY (ELECTRIC, TELEPHONE, CABLE TELEVISION, FIRE ALARM, GAS, WATER, AND SEWER).
4. A PRECONSTRUCTION MEETING SHALL BE HELD WITH THE OWNER, ENGINEER, ARCHITECT, CONTRACTOR, LOCAL OFFICIALS, AND ALL PROJECT–RELATED UTILITY COMPANIES (PUBLIC AND PRIVATE) PRIOR TO START OF CONSTRUCTION.
5. ALL CONSTRUCTION SHALL CONFORM TO THE TOWN STANDARDS AND REGULATIONS, AND NHDES STANDARDS AND SPECIFICATIONS, WHICHEVER ARE MORE STRINGENT, UNLESS OTHERWISE SPECIFIED.
6. ALL CONSTRUCTION ACTIVITIES SHALL CONFORM TO LABOR OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) RULES AND REGULATIONS.
7. BUILDING TO BE SERVICED BY UNDERGROUND UTILITIES UNLESS OTHERWISE NOTED.
8. THE CONTRACTOR IS TO VERIFY LOCATION AND DEPTH OF ALL EXISTING UTILITY STUBS PRIOR TO CONSTRUCTION AND DISCONNECT ALL EXISTING SERVICE CONNECTIONS AT THEIR RESPECTIVE MAINS IN ACCORDANCE WITH THE RESPECTIVE UTILITY COMPANY'S STANDARDS AND SPECIFICATIONS. ENGINEER TO BE NOTIFIED.
9. AS–BUILT PLANS SHALL BE SUBMITTED TO DEPARTMENT OF PUBLIC WORKS.
10. INVERTS AND SHELVES: MANHOLES SHALL HAVE A BRICK PAVED SHELF AND INVERT, CONSTRUCTED TO CONFORM TO THE SIZE OF PIPE AND FLOW AT CHANGES IN DIRECTION. THE INVERTS SHALL BE LAID OUT IN CURVES OF THE LONGEST RADIUS POSSIBLE TANGENT TO THE CENTER LINE OF THE SEWER PIPES. SHELVES SHALL BE CONSTRUCTED TO THE ELEVATION OF THE THROUGH CHANNEL UNDERLAYMENT OF INVERT, AND SHELF SHALL CONSIST OF BRICK MASONRY.
11. FRAMES AND COVERS: MANHOLE FRAMES AND COVERS SHALL BE OF HEAVY DUTY DESIGN AND PROVIDE A 30 INCH DIA, CLEAR OPENING. THE WORD "SEWER" OR DRAIN" SHALL BE CAST INTO THE CENTER OF THE UPPER FACE OF EACH COVER WITH RAISED, 3" LETTERS.
12. SHALLOW MANHOLE: IN LIEU OF A CONE SECTION, WHEN MANHOLE DEPTH IS LESS THAN 6 FEET, A REINFORCED CONCRETE SLAB COVER MAY BE USED HAVING AN ECCENTRIC ENTRANCE OPENING AND CAPABLE OF SUPPORTING H20 LOADS.
13. CONTRACTOR SHALL PLACE 2" WIDE METAL WIRE IMPREGNATED RED PLASTIC WARNING TAPE OVER ENTIRE LENGTH OF ALL GRAVITY SEWERS, SERVICES, AND FORCE MAINS.
14. SANITARY SEWER FLOW CALCULATIONS PER METCALF & EDDY:
    HOUSING UNITS FLOW
    34 – THREE BEDROOM UNITS @ 70 GPD/BEDROOM = 7,140 GPD
    36 – ONE BEDROOM UNITS @ 70 GPD/BEDROOM = 2,520 GPD
    COMMERCIAL USE FLOW: (SHOPPING CENTER)
    1 – SHOPPING CENTER WITH 16 PARKING SPACES @ 1.5 GPD PER SPACE = 24 GPD
    6 – EMPLOYEES @ 8 GPD = 48 GPD
    TOTAL FLOW = 9,732 GPD
15. ALL SANITARY STRUCTURE INTERIOR DIAMETERS (4' MIN) SHALL BE DETERMINED BY THE MANUFACTURER BASED ON THE PIPE CONFIGURATIONS SHOWN ON THESE PLANS.
16. PROPOSED RIM ELEVATIONS OF DRAINAGE AND SANITARY MANHOLES ARE APPROXIMATE. FINAL ELEVATIONS ARE TO BE SET FLUSH WITH FINISH GRADES. ADJUST ALL OTHER RIM ELEVATIONS OF MANHOLES, WATER GATES, GAS GATES AND OTHER UTILITIES TO FINISH GRADE AS SHOWN ON THE GRADING AND DRAINAGE PLAN.
17. ALL WATER MAINS AND SERVICE PIPES SHALL HAVE A MINIMUM 12" VERTICAL AND 24" HORIZONTAL SEPARATION TO MANHOLES, OR CONTRACTOR SHALL INSTALL BOARD INSULATION FOR FREEZING PROTECTION.
18. WATER MAINS SHALL BE HYDROSTATICALLY PRESSURE TESTED FOR LEAKAGE PRIOR TO ACCEPTANCE. WATERMAINS SHALL BE TESTED AT 1.5 TIMES THE WORKING PRESSURE OR 150 PSI, WHICH EVER IS GREATER. TESTING SHALL BE CONDUCTED IN ACCORDANCE WITH SECTION 4 OF AWWA STANDARD C 600. WATERMAINS SHALL BE DISINFECTED AFTER THE ACCEPTANCE OF THE PRESSURE AND LEAKAGE TESTS ACCORDING TO AWWA STANDARD C 651.
19.
20. ALL WATER AND SANITARY LEADS TO BUILDING(S) SHALL END 5' OUTSIDE THE BUILDING LIMITS AS SHOWN ON PLANS AND SHALL BE PROVIDED WITH A TEMPORARY PLUG AND WITNESS AT END.
21. IF THE BUILDING IS REQUIRED TO HAVE A SPRINKLER SYSTEM, A PRECONSTRUCTION MEETING SHALL BE HELD BETWEEN THE CONTRACTOR, OWNER, ARCHITECT AND THE LOCAL FIRE DEPARTMENT PRIOR TO THE INSTALLATION.
22. THRUST BLOCKS SHALL BE PROVIDED AT ALL BENDS, TEES, MECHANICAL JOINTS AND FIRE HYDRANTS.
23. DIMENSIONS ARE SHOWN TO CENTERLINE OF PIPE OR FITTING.
24. CONTRACTOR TO FURNISH SHOP DRAWINGS FOR UTILITY RELATED ITEMS TO ENSURE CONFORMANCE WITH THE PLANS AND SPECIFICATIONS. SHOP DRAWINGS SHALL BE SENT IN TRIPLICATE TO THE DESIGN ENGINEER FOR REVIEW AND APPROVAL PRIOR TO INSTALLATION.
25. EXISTING UTILITIES SHALL BE DIGSAFED BEFORE CONSTRUCTION.
26. ALL WATER LINES SHALL HAVE TESTABLE BACKFLOW PREVENTERS AT THE ENTRANCE TO EACH BUILDING.
27. ALL GRAVITY SEWER PIPE, MANHOLES, AND FORCE MAINS SHALL BE TESTED ACCORDING TO NHDES STANDARDS OF DESIGN AND CONSTRUCTION FOR SEWAGE AND WASTEWATER TREATMENT FACILITIES, CHAPTER ENV–WQ 700. ADOPTED ON 10–15–14.
28. ENV–WQ 704.06 GRAVITY SEWER PIPE TESTING: GRAVITY SEWERS SHALL BE TESTED FOR WATER TIGHTNESS BY USE OF LOW–PRESSURE AIR TESTS CONFORMING WITH ASTM F1417–92(2005) OR UNI–BELL PVC PIPE ASSOCIATION UNI–B–6. LINES SHALL BE CLEANED AND VISUALLY INSPECTED AND TRUE TO LINE AND GRADE. DEFLECTION TESTS SHALL TAKE PLACE AFTER 30 DAYS FOLLOWING INSTALLATION AND THE MAXIMUM ALLOWABLE DEFLECTION OF FLEXIBLE SEWER PIPE SHALL BE 5% OF AVERAGE INSIDE DIAMETER. A RIGID BALL OR MANDREL WITH A DIAMETER OF AT LEAST 95% OF THE AVERAGE INSIDE PIPE DIAMETER SHALL BE USED FOR TESTING PIPE DEFLECTION. THE DEFLECTION TEST SHALL BE CONDUCTED WITHOUT MECHANICAL PULLING DEVICES.
29. ENV–WQ 704.09 FORCE MAIN AND PRESSURE SEWER TESTING: FORCE MAINS AND PRESSURE SEWERS SHALL BE TESTED IN ACCORDANCE WITH SECTION 5 OF HTE AWWA C600, "INSTALLATION OF CAST IRON WATER MAINS AND THEIR APPURTENANCES" STANDARD IN EFFECT WHEN THE TEST IS CONDUCTED, AVAILABLE AS NOTED IN APPENDIX D, AT A PRESSURE EQUAL TO THE GREATER OF 150 PERCENT OF THE DESIGN OPERATING DYNAMIC HEAD OR AT LEAST 100 PSI
30. ENV–WQ 704.17 SEWER MANHOLE TESTING: SHALL BE TESTED FOR LEAKAGE USING A VACUUM TEST PRIOR TO BACKFILLING AND PLACEMENT OF SHELVES AND INVERTS.
31. SANITARY SEWER LINES SHALL BE LOCATED AT LEAST TEN (10) FEET HORIZONTALLY FROM AN EXISTING OR PROPOSED WATER LINE. WHEN A SEWER LINE CROSSES UNDER A WATER LINE, THE SEWER PIPE JOINTS SHALL BE LOCATED AT LEAST 6 FEET HORIZONTALLY FROM THE WATERMAIN. THE SEWER LINE SHALL ALSO MAINTAIN A VERTICAL SEPARATION OF NOT LESS THAN 18 INCHES.
32. SEWERS SHALL BE BURIED TO A MINIMUM DEPTH OF 6 FEET BELOW GRADE IN ALL ROADWAY LOCATIONS, AND TO A MINIMUM DEPTH OF 4 FEET BELOW GRADE IN ALL CROSS–COUNTRY LOCATIONS. PROVIDE TWO–INCHES OF R–10 FOAM BOARD INSULATION 2–FOOT WIDE TO BE INSTALLED 6–INCHES OVER SEWER PIPE IN AREAS WHERE DEPTH IS NOT ACHIEVED. A WAIVER FROM THE DEPARTMENT OF ENVIRONMENTAL SERVICES WASTEWATER ENGINEERING BUREAU IS REQUIRED PRIOR TO INSTALLING SEWER AT LESS THAN MINIMUM COVER.
33. THE CONTRACTOR SHALL MINIMIZE THE DISRUPTIONS TO THE EXISTING SEWER FLOWS AND THOSE INTERRUPTIONS SHALL BE LIMITED TO FOUR (4) HOURS OR LESS AS DESIGNATED BY THE TOWN SEWER DEPARTMENT.
34. LIGHTING CONDUIT SHALL BE SCHEDULE 40 PVC, AND SHALL BE INSTALLED IN CONFORMANCE WITH THE NATIONAL ELECTRIC CODE. CONTRACTOR SHALL PROVIDE EXCAVATION AND BACKFILL.
35. ALL TRENCHING, PIPE LAYING, AND BACKFILLING SHALL BE IN ACCORDANCE WITH FEDERAL OSHA REGULATIONS.
36. DISINFECTION OF WATER MAINS SHALL BE CARRIED OUT IN STRICT ACCORDANCE WITH AWWA STANDARD C651, LATEST EDITION. THE BASIC PROCEDURE TO BE FOLLOWED FOR DISINFECTING WATER MAINS IS AS FOLLOWS:
    a. PREVENT CONTAMINATING MATERIALS FROM ENTERING THE WATER MAIN DURING STORAGE, CONSTRUCTION, OR REPAIR.
    b. REMOVE, BY FLUSHING OR OTHER MEANS, THOSE MATERIALS THAT MAY HAVE ENTERED THE WATER MAINS.
    c. CHLORINATE ANY RESIDUAL CONTAMINATION THAT MAY REMAIN, AND FLUSH THE CHLORINATED WATER FROM THE MAIN.
    d. PROTECT THE EXISTING DISTRIBUTION SYSTEM FROM BACKFLOW DUE TO HYDROSTATIC PRESSURE TEST AND DISINFECTION PROCEDURES.
    e. DETERMINE THE BACTERIOLOGICAL QUALITY BY LABORATORY TEST AFTER DISINFECTION.
    f. MAKE FINAL CONNECTION OF THE APPROVED NEW WATER MAIN TO THE ACTIVE DISTRIBUTION SYSTEM

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 feet

PROJECT PARCEL
TOWN OF EXETER
TAX MAP 65, LOT 118

APPLICANT
GREEN & COMPANY
11 LAFAYETTE RD
PO BOX 1297
NORTH HAMPTON, NH 03862

TOTAL LOT AREA
291,630 SQ. FT.
6.7 ACRES

Design: DJM	Draft: KDR	Date: 3/15/24
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Drawing Name: 24029-PLAN.dwg		

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STATE OF NEW HAMPSHIRE – PAIGE S. LIBBEY No.16670 – LICENSED PROFESSIONAL ENGINEER – 03/10/2025

REV.	DATE	REVISION	BY
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8	1/31/25	REVISED LAYOUT PER CONSERVATION COMMISSION	DJM
7	1/13/25	REVISED PER TOWN ENGINEER & TRC COMMENTS	DJM
6	1/6/25	GRADING PLAN FOR CONSERVATION COMMISSION	DJM

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

Plan Name: UTILITY PLAN
Project: "LILAC PLACE" 76 PORTSMOUTH AVE, EXETER, NH
Owner of Record: RAP REALTY MANCHESTER LLC 50 ATLANTIC AVE, SEABROOK, NH

DRAWING No.
C4
SHEET 9 OF 31
JBE PROJECT NO. 24029



PLANTING NOTES:

THE LANDSCAPE INSTALLATION CONTRACTOR SHALL LOCATE AND VERIFY ALL EXISTING UTILITIES PRIOR TO STARTING WORK.

THE CONTRACTOR SHALL CONFORM TO THE GUIDELINES ESTABLISHED BY THE CURRENT AMERICAN STANDARD FOR NURSERY STOCK PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN.

THE DEVELOPER SHALL PLANT A MINIMUM OF THE AMOUNT OF SHRUBS AND TREES SHOWN ON THE PLANT LIST, BUT EXACT SPECIES MAY VARY BASED ON AVAILABILITY. ALL PLANT MATERIAL SHALL BE GUARANTEED BY THE CONTRACTOR FOR ONE FULL YEAR FROM THE TIME OF OWNER ACCEPTANCE.

ALL PLANT MATERIAL SHALL BE WATERED THOROUGHLY DURING THE FIRST 24 HOUR PERIOD AFTER PLANTED. PLANTS SHALL BE WATERED WEEKLY OR MORE AS NECESSARY DURING THE FIRST GROWING YEAR.

ALL TREES, SHRUBS AND PERENNIALS SHALL BE PLANTED IN DECORATIVE STONE MULCH BEDS EXCEPT WHERE SPECIFIED ON THE PLAN. ALL MULCH AREAS SHALL RECEIVE A 3 INCH LAYER OF STONE MULCH OVER A CONSTRUCTION GRADE WEED MAT BARRIER.

ALL DISTURBED AREAS TO BE LANDSCAPED SHALL BE REPLACED WITH 6" MINIMUM DEPTH OF SUITABLE TOPSOIL. LAWN AREAS SHALL UTILIZE TALL FESCUE HYDROSEED AS MOST DROUGHT TOLERANT COOL-SEASON LAWN GRASS.

THIS PLAN SHEET IS INTENDED FOR LANDSCAPING PURPOSES ONLY. REFER TO CIVIL AND SITE SHEETS FOR ALL OTHER SITE CONSTRUCTION INFORMATION.

LILAC PLACE PLANT LIST

Plants

Quantity	Botanical Name		Common Name	Size
	TREES			
14	**Acer rubrum 'October Glory'**	**	**OCTOBER GLORY RED MAPLE**	**3 Inch Caliper**
6	**Amelanchier x grandiflora 'Robin Hill'**	**	**ROBIN HILL SERVICEBERRY**	**15 Gallon**
4	**Cercidiphyllum japonicum**		**KATSURA TREE**	**2.5 Inch Caliper**
5	**Chionanthus virginicus 'Spring Fleecing'**	**	**WHITE FRINGE TREE**	**2 Inch Caliper**
6	**Cornus florida f. rubra**	**	**PINK FLOWERING DOGWOOD**	**2 Inch Caliper**
2	**Ginkgo biloba 'Spring Grove'**		**SPRING GROVE GINKGO**	**3 Inch Caliper**
13	**Juniperus scopulorum 'Wichita Blue'**		**WICHITA BLUE MT JUNIPER**	**7-8 Ft. Ht.**
24	**Juniperus virginiana 'Emerald Sentinel™'**	**	**EMERALD SENTINEL RED CEDAR**	**7-8 Ft. Ht.**
13	**Liquidambar styraciflua 'Slender Silhouette'**	**	**SILHOUETTE SWEETGUM**	**3 Inch Caliper**
14	**Liriodendron tulipifera**	**	**TULIP TREE**	**3 Inch Caliper**
17	**Malus x 'Prairifire'**		**PRAIRIFIRE CRABAPPLE**	**15 Gallon**
9	**Picea glauca**	**	**WHITE SPRUCE**	**8-10 Ft. Ht.**
13	**Thuja occidentalis 'Nigra'**	**	**DARK AMERICAN ARBORVITAE**	**7-8 Ft. Ht.**
17	**Thuja occidentalis 'Smaragd Emerald'**	**	**EMERALD GREEN ARBORVITAE**	**6-7 Ft. Ht.**
3	**Tilia americana**	**	**AMERICAN LINDEN**	**3 Inch Caliper**
	SHRUBS			
3	**Cephalanthus occidentalis**	**	**BUTTONBUSH**	**5 Gallon**
6	**Clethra alnifolia**	**	**SUMMER SWEET**	**5 Gallon**
6	**Hydrangea paniculata 'Bobo'**		**BOBO PANICLE HYDRANGEA**	**5 Gallon**
15	**Ilex glabra**	**	**GALLBERRY HOLLY**	**5 Gallon**
6	**Ilex glabra 'Shamrock'**	**	**SHAMROCK INKBERRY HOLLY**	**5 Gallon**
2	**Itea virginica 'Henry's Garnet'**		**HENRY'S GARNET SWEETSPIRE**	**5 Gallon**
4	**Kalmia latifolia 'Raspberry Glow'**	**	**RASPBERRY GLOW MT LAUREL**	**5 Gallon**
12	**Myrica gale**	**	**SWEET GALE**	**3 Gallon**
4	**Rhododendron 'Olga Mezitt'**		**OLGA MEZITT RHODODENDRON**	**5 Gallon**
17	**Syringa 'Penda'**		**BLOOMERANG PURPLE LILAC**	**5 Gallon**
17	**Syringa vulgaris 'Sensation'**		**SENSATION COMMON LILAC**	**5 Gallon**
15	**Vaccinium angustifolium**	**	**LOWBUSH BLUEBERRY**	**3 Gallon**
3	**Viburnum dentatum 'Autumn Jazz'**	**	**AUTUMN JAZZ VIBURNUM**	**5 Gallon**
	PERENNIALS			
27	**Aster novae-angliae 'Purple Dome'**	**	**PURPLE DOME NE ASTER**	**1 Gallon**
44	**Calamagrostis x acutiflora 'Karl Foerster'**		**KARL FOERSTER REED GRASS**	**2 Gallon**
14	**Hemerocallis 'Happy Returns'**		**HAPPY RETURNS DAYLILY**	**1 Gallon**
1	**Iris sibirica 'Caesar's Brother'**		**CAESAR'S BROTHER IRIS**	**1 Gallon**
22	**Miscanthus sinensis 'Morning Light'**		**MORNING LIGHT MAIDEN GRASS**	**2 Gallon**
45	**Panicum virgatum 'Heavy Metal'**	**	**HEAVY METAL SWITCH GRASS**	**2 Gallon**
60	**Pennisetum alopecuroides 'Hamelin'**		**HAMELIN FOUNTAIN GRASS**	**1 Gallon**
2	**Rudbeckia fulgida var. 'Goldsturm'**		**GOLDSTURM CONEFLOWER**	**1 Gallon**
15	**Sedum 'Autumn Joy'**		**AUTUMN JOY SEDUM**	**1 Gallon**

Note ** **Denotes plant species native to North East region.**

PLANT CONTAINER SIZES AND VARIETIES MAY VARY BASE ON AVAILABILITY.

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 feet

PROJECT PARCEL
TOWN OF EXETER
TAX MAP 65, LOT 118

APPLICANT
GREEN & COMPANY
11 LAFAYETTE RD
PO BOX 1297
NORTH HAMPTON, NH 03862

TOTAL LOT AREA
291,630 SQ. FT.
6.7 ACRES

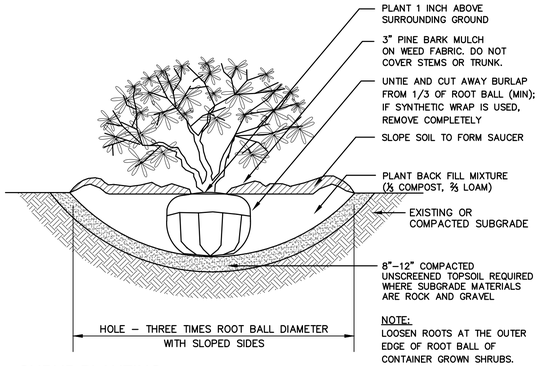
DESIGN: LMM	DRAFT: LMM	DATE: 11/ 5/ 2024
	SCALE: 1"=30'-0"	PROJECT NO: 24029
DRAWING NAME: 24029 LILAC PLACE L-1		

REV.	DATE	REVISION	BY
3	3/14/25	LANDSCAPE PLAN REVISED BUILDING LAYOUT & UTILITIES LOCATED	LMM
2	2/12/25	LANDSCAPE PLAN REVISED BUILDING LAYOUT & WALKWAY	LMM
1	1/9/25	LANDSCAPE PLAN FOR COM COMM	LMM

LANDSCAPE DESIGN BY:
LM Land Design, LLC
11 South Road
Brentwood, NH 03833
LMLandDesign.com
603-770-7728

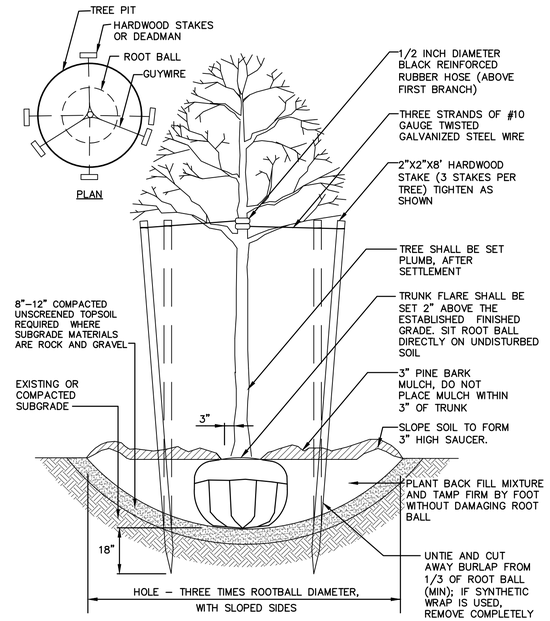
Plan Name: LANDSCAPE PLAN
Project: LILAC PLACE
76 PORTSMOUTH AVE, EXETER, NH
Owner of Record: RAP REALTY MANCHESTER LLC
50 ATLANTIC AVE, SEABROOK, NH

DRAWING No.
L-1
JBE PROJECT NO. 24029



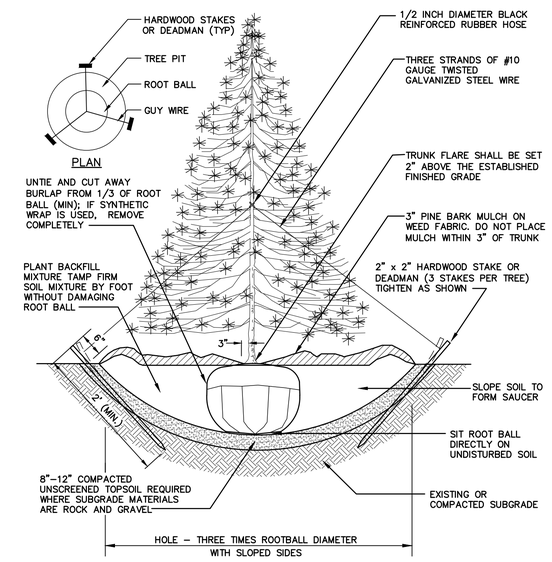
SHRUB PLANTING

NOT TO SCALE



TREE PLANTING (FOR TREES UNDER 4" CALIPER)

NOT TO SCALE



EVERGREEN PLANTING

NOT TO SCALE

LANDSCAPE NOTES:

1. THE CONTRACTOR SHALL LOCATE AND VERIFY THE EXISTENCE OF ALL UTILITIES PRIOR TO STARTING WORK.
2. THE CONTRACTOR SHALL SUPPLY ALL PLANT MATERIALS IN QUANTITIES SUFFICIENT TO COMPLETE THE PLANTINGS SHOWN ON THE DRAWINGS.
3. ALL MATERIAL SHALL CONFORM TO THE GUIDELINES ESTABLISHED BY THE CURRENT AMERICAN STANDARD FOR NURSERY STOCK PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN.
4. ALL PLANT SUBSTITUTIONS MUST BE APPROVED THE LANDSCAPE DESIGNER.
5. ALL PLANT MATERIALS SHALL BE EXACTLY AS SPECIFIED BY THE LANDSCAPE ARCHITECT. IF PLANT SPECIES CULTIVARS ARE FOUND TO VARY FROM THAT SPECIFIED AT ANY TIME DURING THE GUARANTEE PERIOD, THE LANDSCAPE DESIGNER RESERVES THE RIGHT TO HAVE THE CONTRACTOR REPLACE THAT PLANT MATERIAL.
6. PLANTS SHALL BE SUBJECT TO INSPECTION AND APPROVAL AT THE PLACE OF GROWTH, UPON DELIVERY OR AT THE JOB SITE WHILE WORK IS ON–GOING FOR CONFORMITY TO SPECIFIED QUALITY, SIZE AND VARIETY.
7. PLANTS FURNISHED IN CONTAINERS SHALL HAVE THE ROOTS WELL ESTABLISHED IN THE SOIL MASS AND SHALL HAVE AT LEAST ONE (1) GROWING SEASON. ROOT–BOUND PLANTS OR INADEQUATELY SIZED CONTAINERS TO SUPPORT THE PLANT MAY BE DEEMED UNACCEPTABLE.
8. NO PLANT SHALL BE PUT IN THE GROUND BEFORE GRADING HAS BEEN COMPLETED.
9. ALL WORK AND PLANTS SHALL BE DONE, INSTALLED AND DETAILED IN STRICT ACCORDANCE WITH PROJECT SPECIFICATIONS.
10. ALL PLANTS SHALL BE WATERED THOROUGHLY TWICE DURING THE FIRST 24–HOUR PERIOD AFTER PLANTING. ALL PLANTS SHALL BE WATERED WEEKLY, OR MORE OFTEN IF NECESSARY, DURING THE FIRST GROWING SEASON.
11. ALL PLANTS SHALL BE GUARANTEED BY THE CONTRACTOR FOR NOT LESS THAN ONE FULL YEAR FROM THE TIME OF PROVISIONAL ACCEPTANCE. DURING THIS TIME, THE OWNER SHALL MAINTAIN ALL PLANT MATERIALS IN THE ABOVE MANNER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO INSPECT THE PLANTS TO ENSURE PROPER CARE. IF THE CONTRACTOR IS DISSATISFIED WITH THE CARE GIVEN, HE SHALL IMMEDIATELY, AND IN SUFFICIENT TIME TO PERMIT THE CONDITION TO BE RECTIFIED, NOTIFY THE LANDSCAPE DESIGNER IN WRITING OR OTHERWISE FORFEIT HIS CLAIM.
12. FINAL ACCEPTANCE BY THE LANDSCAPE ARCHITECT WILL BE MADE UPON THE CONTRACTOR'S REQUEST AFTER ALL CORRECTIVE WORK HAS BEEN COMPLETED.
13. BY THE END OF THE GUARANTEE PERIOD, THE CONTRACTOR SHALL HAVE REPLACED ANY PLANT MATERIAL THAT IS MISSING, NOT TRUE TO SIZE AS SPECIFIED, THAT HAS DIED, LOST NATURAL SHAPE DUE TO DEAD BRANCHES, EXCESSIVE PRUNING OR INADEQUATE OR IMPROPER CARE, OR THAT IS, IN THE OPINION OF THE LANDSCAPE DESIGNER, IN UNHEALTHY OR UNSIGHTLY CONDITION.
14. THE CONTRACTOR SHALL REMOVE WEEDS, ROCKS, CONSTRUCTION ITEMS, ETC. FROM ANY LANDSCAPE AREA SO DESIGNATED TO REMAIN, WHETHER ON OR OFF–SITE. GRASS SEED OR PINE BARK MULCH SHALL BE APPLIED AS DEPICTED ON PLANS.
15. FINISHED GRADES IN LANDSCAPED ISLANDS SHALL BE INSTALLED SO THAT THEY ARE 1" HIGHER THAN THE TOP OF THE SURROUNDING CURB.
16. ALL LANDSCAPING SHALL MEET THE TOWN STANDARDS AND REGULATIONS.
17. ALL MULCH AREAS SHALL RECEIVE A 3" LAYER OF SHREDDED PINE BARK MULCH OVER A 10 MIL WEED MAT EQUAL TO 'WEEDBLOCK' BY EASY GARDENER OR DEWITT WEED BARRIER.
18. ALL LANDSCAPED AREAS SHALL HAVE SELECT MATERIALS REMOVED TO A DEPTH OF AT LEAST 9" BELOW FINISH GRADE. THE RESULTING VOID IS TO BE FILLED WITH A MINIMUM OF 9" HIGH–QUALITY SCREENED LOAM AMENDED WITH 3" OF AGED ORGANIC COMPOST.
19. THIS PLAN IS INTENDED FOR LANDSCAPING PURPOSES ONLY. REFER TO CIVIL/SITE DRAWINGS FOR OTHER SITE CONSTRUCTION INFORMATION.
20. IRRIGATION PIPING SYSTEM SHALL BE REVIEWED AND APPROVED BY OWNER AND ENGINEER PRIOR TO INSTALLATION.
21. FOCAL POINT STORMWATER TREATMENT AREAS TO BE PLANTED WITH PERENNIAL GRASSES, CONEFLOWERS, DAYLILIES, BUTTERFLY MILKWEED, BEE BALM, BLUE FLAG IRIS, AND JOE PYE WEED. PLANT IN RANDOM GROUPINGS OF 10–12 PLANTS APPROXIMATELY 3 FEET ON CENTER.

PROJECT PARCEL
TOWN OF EXETER
TAX MAP 65, LOT 118

APPLICANT
GREEN & COMPANY
11 LAFAYETTE RD
PO BOX 1297
NORTH HAMPTON, NH 03862

TOTAL LOT AREA
291,630 SQ. FT.
6.7 ACRES

Design: DJM	Draft: KDR	Date: 3/15/24
Checked: PSL	Scale: AS SHOWN	Project No.: 24029
Drawing Name: 24029-PLAN.dwg		

THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION FROM JONES & BEACH ENGINEERS, INC. (JBE). ANY ALTERATIONS, AUTHORIZED OR OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO JBE.

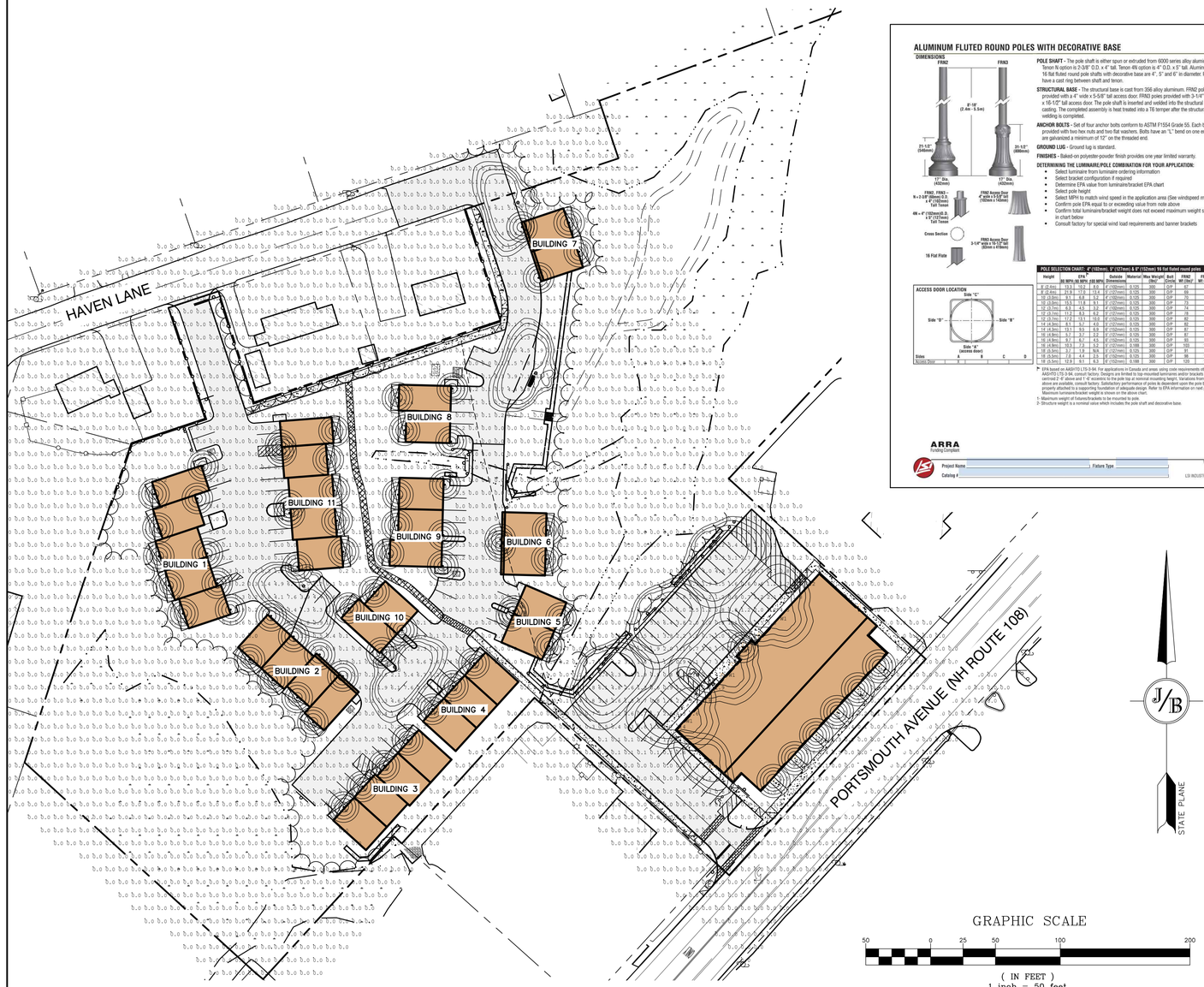
I HEREBY CERTIFY THAT IT IS IN THE PUBLIC INTEREST TO GRANT THE REQUESTED WAIVER(S) AND THAT SUCH WAIVER(S) WILL NOT BE CONTRARY TO THE SPIRIT AND INTENT OF THE REGULATIONS IN THIS ORDINANCE.
STATE OF NEW HAMPSHIRE
PAIGE S. LIBBEY No.16670 LICENSED PROFESSIONAL ENGINEER
05/18/2025

REV.	DATE	REVISION	BY
10	3/18/25	REVISED PER TOWN ENGINEER & TRC COMMENTS	DJM
9	2/13/25	FULL DESIGN FOR REVISED LAYOUT	DJM
8	1/31/25	REVISED LAYOUT PER CONSERVATION COMMISSION	DJM
7	1/13/25	REVISED PER TOWN ENGINEER & TRC COMMENTS	DJM
6	1/6/25	GRADING PLAN FOR CONSERVATION COMMISSION	DJM

Designed and Produced in NH
Jones & Beach Engineers, Inc.
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
Civil Engineering Services
603-772-4746
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	LANDSCAPE PLAN
Project:	"LILAC PLACE" 76 PORTSMOUTH AVE, EXETER, NH
Owner of Record:	RAP REALTY MANCHESTER LLC 50 ATLANTIC AVE, SEABROOK, NH

DRAWING No.
L2
SHEET 11 OF 31
JBE PROJECT NO. 24029



GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 feet

LIGHTING AND ELECTRICAL NOTES:

1. SITE ELECTRICAL CONTRACTOR SHALL COORDINATE LOCATION OF EASEMENTS, UNDERGROUND UTILITIES AND DRAINAGE BEFORE DRILLING POLE BASES.
2. CONTRACTOR SHALL INSTALL PROPOSED LIGHT POLES ACCORDING TO TOWN REGULATIONS.
3. ALL OUTDOOR LIGHTING SYSTEMS SHALL BE EQUIPPED WITH TIMERS TO REDUCE ILLUMINATION LEVELS TO NON-OPERATIONAL VALUES PER TOWN REGULATIONS.
4. LIGHTING CONDUIT SHALL BE SCHEDULE 40 PVC, AND SHALL BE INSTALLED IN CONFORMANCE WITH THE NATIONAL ELECTRICAL CODE. CONTRACTOR SHALL PROVIDE EXCAVATION AND BACKFILL.
5. ILLUMINATION READINGS SHOWN ARE BASED ON A TOTAL LLF OF 0.75 AT GRADE. ILLUMINATION READINGS SHOWN ARE IN UNITS OF FOOT-CANDLES.
6. LIGHTING CALCULATIONS SHOWN ARE NOT A SUBSTITUTE FOR INDEPENDENT ENGINEERING ANALYSIS OF LIGHTING SYSTEM AND SAFETY.
7. ALL LIGHTING FIXTURES SHALL BE FULL CUT-OFF DARK-SKY COMPLIANT, UNLESS OTHERWISE NOTED.
8. NL INDICATES THAT THIS LUMINAIRE SHALL BE ON A NIGHT LIGHT CIRCUIT. FL INDICATES THAT THIS LUMINAIRE SHALL BE A FLOOD LIGHT FIXTURE. THESE DESIGNATIONS INDICATE WHAT PHASE LIGHTS ARE WIRED TO (TYP).
9. THE PROPOSED LIGHTING CALCULATIONS AND DESIGN WAS PERFORMED BY EXPOSURE LIGHTING, 501 ISLINGTON STREET, UNIT 1A, PORTSMOUTH, NH 03801, ATTENTION KEN SWEENEY. ALL LIGHTS SHALL BE PURCHASED FROM THIS COMPANY, OR AN EQUAL LIGHTING DESIGN SHALL BE SUBMITTED FOR REVIEW IF EQUAL SUBSTITUTIONS ARE PROPOSED BY THE CONTRACTOR OR OWNER.

Luminaire Schedule

Symbol	Qty	Label	Arrangement	Description	Tag	[MANUFAC]
	6	C	Single	RELE411208SRRWH-3500K	CANOPY MOUNTED, COMMERCIAL	NICOR,Inc.
	4	S3	Single	LXM4-PT-3-LED-10L-30-UNV-BLK-ALBCS1-IL / 4FRN2-A125-12-4N-BLK	12' POLE	LSI INDUSTRIES, INC.
	3	S4	Single	LXM4-PT-FT-LED-10L-30-UNV-BLK-ALBCS1-IL / 4FRN2-A125-12-4N-BLK	12' POLE	LSI INDUSTRIES, INC.
	62	W	Single	P5623-2030K9	WALL MOUNTED, RESIDENTIAL	PROGRESS
	3	W1	Single	XWS-LED-06L-SIL-FT-UNV-DIM-30-70CRI-ALBM1LR-BLK	WALL MOUNTED 12' AFG, COMMERCIAL	LSI INDUSTRIES, INC.
	1	W2	Single	XWS-LED-02L-SIL-2-UNV-DIM-30-70CRI-ALBMR1LR-BLK	WALL MOUNTED12' AFG, COMMERCIAL	LSI INDUSTRIES, INC.

PROJECT PARCEL
TOWN OF EXETER
TAX MAP 65, LOT 118

APPLICANT
GREEN & COMPANY
11 LAFAYETTE RD
PO BOX 1297
NORTH HAMPTON, NH 03862

TOTAL LOT AREA
291,630 SQ. FT.
6.7 ACRES

Design: DJM	Draft: KDR	Date: 3/15/24	
Checked: PSL	Scale: AS SHOWN	Project No.: 24029	
Drawing Name: 24029-PLAN.dwg			

THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION FROM JONES & BEACH ENGINEERS, INC. (JBE). ANY ALTERATIONS, AUTHORIZED OR OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO JBE.

STATE OF NEW HAMPSHIRE – PAIGE S. LIBBEY No.16670 – LICENSED PROFESSIONAL ENGINEER

REV.	DATE	REVISION	BY
10	3/18/25	REVISED PER TOWN ENGINEER & TRC COMMENTS	DJM
9	2/13/25	FULL DESIGN FOR REVISED LAYOUT	DJM
8	1/31/25	REVISED LAYOUT PER CONSERVATION COMMISSION	DJM
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6	1/6/25	GRADING PLAN FOR CONSERVATION COMMISSION	DJM

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

Plan Name:	LIGHTING PLAN
Project:	"LILAC PLACE" 76 PORTSMOUTH AVE, EXETER, NH
Owner of Record:	RAP REALTY MANCHESTER LLC 50 ATLANTIC AVE, SEABROOK, NH

DRAWING No.
L3
SHEET 12 OF 31
JBE PROJECT NO. 24029

ALUMINUM FLUTED ROUND POLES WITH DECORATIVE BASE

DIMENSIONS

POLE SHAFT - The pole shaft is either spun or extruded from 6000 series alloy aluminum. Tenon fit option is 2-3/8" O.D. x 4" tall. Tenon 4R option is 4" O.D. x 5" tall. Aluminum 16 flat fluted round pole shafts with decorative base are 4", 5" and 6" in diameter. Poles have a cast ring between shaft and tenon.

STRUCTURAL BASE - The structural base is cast from 356 alloy aluminum. FRN2 poles provided with a 4" wide x 5-5/8" tall access door. FRN3 poles provided with 3-1/4" wide x 16-1/2" tall access door. The pole shaft is inserted and welded into the structural base casting. The completed assembly is heat treated into a T6 temper after the structural welding is completed.

ANCHOR BOLTS - Set of four anchor bolts conform to ASTM F1554 Grade 55. Each bolt is provided with two hex nuts and two flat washers. Bolts have an "L" bend on one end and are galvanized a minimum of 12" on the threaded end.

GROUND LUG - Ground lug is standard.

FINISHES - Baked-on polyester-powder finish provides one year limited warranty.

DETERMINING THE LUMINAIRE/POLE COMBINATION FOR YOUR APPLICATION:

- Select luminaire from luminaire ordering information
- Select bracket configuration if required
- Determine EPA value from luminaire/bracket EPA chart
- Select pole height
- Select MPH to match wind speed in the application area (See windspeed map).
- Confirm pole EPA equal to or exceeding value from note above
- Confirm total luminaire/bracket weight does not exceed maximum weight shown in chart below.
- Consult factory for special wind load requirements and banner brackets

POLE SELECTION CHART - 4" (102mm), 5" (127mm) & 6" (152mm) Y6 flat fluted round poles

Height	EPA* (@ 90°)	EPA* (@ 60°)	EPA* (@ 30°)	Outside Diameter	Material	Max Weight* (lbs)	Bolt Circle	FRN2 Base	FRN3 Base
8' (2.4m)	13.7	12.7	8.0	4" (102mm)	0.125	300	O/P	70	76
8' (2.4m)	21.9	17.6	11.4	5" (127mm)	0.125	300	O/P	69	76
10' (3.0m)	8.5	8.0	5.2	4" (102mm)	0.125	300	O/P	70	78
10' (3.0m)	13.3	11.8	9.1	5" (127mm)	0.125	300	O/P	73	81
10' (3.0m)	8.5	8.5	5.9	6" (152mm)	0.125	300	O/P	74	81
12' (3.7m)	11.2	8.3	5.2	5" (127mm)	0.125	300	O/P	78	85
12' (3.7m)	14.4	12.3	8.8	6" (152mm)	0.125	300	O/P	80	87
14' (4.3m)	8.1	5.1	4.0	5" (127mm)	0.125	300	O/P	82	90
14' (4.3m)	11.3	9.7	6.8	6" (152mm)	0.125	300	O/P	84	92
16' (4.9m)	9.1	5.7	3.2	5" (127mm)	0.125	300	O/P	87	94
16' (4.9m)	9.7	6.7	4.5	6" (152mm)	0.125	300	O/P	93	98
18' (5.5m)	10.1	7.2	5.2	6" (152mm)	0.188	300	O/P	103	109
18' (5.5m)	3.7	1.9	N/A	6" (152mm)	0.125	300	O/P	91	99
18' (5.5m)	7.6	4.4	2.5	6" (152mm)	0.125	300	O/P	98	104
18' (5.5m)	12.9	8.1	6.3	6" (152mm)	0.188	300	O/P	120	125

* EPA based on AASHTO LTS-3-94. For applications in Canada and areas using code requirements other than AASHTO LTS-3-94, consult factory. Designs are limited to top-mounted luminaires and/or brackets having a zero rake, 0° elbow and 0° tenon to maintain the pole top at nominal mounting height. Variations from sizes pictured above, consult factory. Installation performance of poles is dependent upon the pole being properly installed to ensure adequate embedment or anchorage. Refer to EPA information on next page. Maximum luminaire/bracket weight is shown on the above chart.

1- Maximum weight of fixtures/brackets to be mounted to pole.
2- Structure weight is a nominal value which includes the pole shaft and decorative base.

ARRA
Ordering Template

Project Name _____ Fixture Type _____
Catalog # _____

150515
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LSI INDUSTRIES INC.

Catalog #: _____ Project: _____ Type: _____
Prepared By: _____ Date: _____

Lexington (LXM4)

LED Decorative Post Top & Area Light



OVERVIEW	
Lumen Package (lm)	4,000 - 27,000
Wattage Range (W)	39 - 228
Efficacy Range (LPW)	100 - 140
Weight lbs (kg)	64 (29)

QUICK LINKS
Ordering Guide | Performance | Photometrics | Dimensions

FEATURES & SPECIFICATIONS

Construction
- Rugged die-cast aluminum housing.
- Cast aluminum wiring access door located in lower hub/fitter.
- Rigid die-cast aluminum arms for consistency and strength.
- Precision die-cast aluminum heatsink and optical frame.
- Removable spun aluminum cap/driver enclosure is retained by captive stainless steel fasteners and safety cables. Housing and top cap interface is sealed with a one-piece extruded silicone gasket. Tool-less entry option is available.
- All exposed fasteners are black oxide coated stainless steel. Internal fasteners are stainless steel or zinc electroplated steel.
- IP65 rated luminaire protects integral components from harsh environments.
- 1.5G rated for ANSI C136.31 high vibration applications
- Fixtures are finished with LSI's DuraGrip® polyester powder coat finishing process. The DuraGrip finish withstands extreme weather changes without cracking or peeling. Other standard LSI finishes available. Consult factory.

Optical System
- State-of-the-art one piece silicone optic sheet delivers industry leading optical control with an integrated gasket to provide IP66 rated sealed optical chamber in 1 component.
- Proprietary silicone refractor optics provide exceptional coverage and uniformity in IES Types 2, 3, SW and FT.
- Silicone optical material does not yellow or crack with age and provides a minimum light transmittance of 93%.
- Optical distributions are field rotatable (in 90° increments).
- Available in 5000K, 4000K, and 3000K (+/- 275K) color temperatures.
- Minimum CRI of 70. Consult Factory for Higher CRI requirements.
- Integral Louver (IL) option available for improved back-light control without sacrificing street side performance.

Electrical
- High-performance driver features over-voltage, under-voltage, short-circuit and over temperature protection.
- 0-10V dimming (10% - 100%) standard.
- Standard Universal Voltage (120-277 Vac) Input 50/60 Hz or optional High Voltage (347-480 Vac).
- L70 Calculated Life: >100k Hours (See Lumen Maintenance on Page 2)
- Total harmonic distortion: <20%
- Operating temperature: - -40°C to +50°C (-40°F to +122°F)
- Power factor: >.90
- Input power stays constant over life.
- Field replaceable surge protection device meets a minimum Category C Low operation (per ANSI/IEEE C62.41.2).
- High-efficacy LEDs mounted to metal-core circuit board to maximize heat dissipation
- Terminal block provided accepts up to 10ga wire, however the luminaire is supplied with a 32' 3 conductor wire harness.
- Components are fully encased in potting material for moisture resistance. Driver complies with FCC standards. Driver and key electronic components can easily be accessed.

Controls
- Optional integral passive infrared Bluetooth™ motion and photocell sensor. Fixtures operate independently and can be commissioned via IOS or Android configuration app (See controls page for more detail).

Installation
- Mounts to 4" O.D. pole or tenon.
- Secures to pole with 6 stainless steel set screws.
- 32' wire leads are provided bundled in the slip fitter hub for ease of wiring.

Warranty
- LSI luminaires carry a 5-year limited warranty. Refer to https://www.lsicorp.com/resources/terms-conditions-warranty/ for more information.

Listings
- Listed to UL 1598 and UL 8750
- State of California Title 24
- IDA compliant; with 3000K color temperature selection.
- Meets Buy American Act requirements
- Suitable For wet Locations
- IP65 rated Luminaire. IP66 rated optical chamber.
- 1.5G rated for ANSI C136.31 high vibration applications

Catalog #: _____ Project: _____ Type: _____
Prepared By: _____ Date: _____

Mirada Small Silicone (XWS SIL)

Outdoor Wall Sconce



OVERVIEW	
Lumen Package (lm)	1,000 - 8,000
Wattage Range (W)	10 - 61
Efficacy Range (LPW)	126 - 152
Weight lbs (kg)	10 (4.5)
Control Options	IMSBT, ALB, ALS, PCI

QUICK LINKS
Ordering Guide | Performance | Photometrics | Dimensions

FEATURES & SPECIFICATIONS

Construction
- Rugged die-cast aluminum housing.
- Fixtures are finished with LSI's DuraGrip® polyester powder coat finishing process. The DuraGrip finish withstands extreme weather changes without cracking or peeling. Other standard LSI finishes available. Consult factory.
- Extended housing available with 1/2" threaded hubs for surface conduit and rated wire.
- Standard luminaire shipping weight: TBD lbs in carton.
- Max luminaire shipping weight: 12 lbs in carton (20 lbs w/EH option)

Optical System
- State-of-the-Art one piece silicone optic provides industry leading optical control while also acting as an integrated gasket reducing system complexity and improving fixture reliability.
- Proprietary silicone refractor optics provide exceptional coverage and uniformity in distribution types 2, 3, and FT.
- Silicone optical material does not yellow or crack with age and provides a typical light transmittance of 93%.
- Zero uplight.
- Available in 5000K, 4000K, and 3000K color temperatures per ANSI C78.377. Also available in Phosphor Converted Amber with peak wavelength at 610nm.
- Minimum CRI of 70

Electrical
- High-performance programmable driver features over-voltage, under-voltage, short circuit and over temperature protection. Custom lumen and wattage packages available.
- 0-10V dimming (10% - 100%) standard.
- Standard Universal Voltage (120-277 VAC) Input 50/60 Hz or optional High Voltage (347-480 VAC)
- L80 Calculated Life: >100k Hours
- Total harmonic distortion (THD): <20%
- 3L to 12L operating temperature: -40°C to +50°C (-40°F to +122°F)
- 15L operating temperature: -40°C to +45°C (-40°F to +113°F).
- 18L operating temperature: -40°C to +40°C (-40°F to +104°F).
- 21L operating temperature: -40°C to +35°C (-40°F to + 95°F).
- Power factor (PF): >.90
- Input power stays constant over life.
- Optional 10kV surge protection device meets a minimum Category C Low operation (per ANSI/IEEE C62.41.2).
- High-efficacy LEDs mounted to metal-core circuit board to maximize heat dissipation
- Components are fully encased in potting material for moisture resistance. Driver complies with FCC standards. Driver and key electronic components can easily be accessed via hinged door.
- Optional integral emergency battery pack provides 90-minutes of constant power to the LED system, ensuring code compliance. A test switch/indicator button is installed on the housing for ease of maintenance. The fixture delivers 1500 lumens during emergency mode.

Controls
- Integral passive infrared Bluetooth® motion sensor options. Fixtures operate independently and can be commissioned via an iOS or Android configuration app. Updates and modifications to the control strategy are easily implemented via an intuitive app.
- LSI's AirLink™ Blue lighting control system is a simple feature rich wireless Bluetooth mesh network. The integrated fixture sensor module provides wireless control of grouped fixtures based on motion sensors, daylight or a fully customizable schedule.

Installation
- Universal wall mounting plate easily mounts directly to 4" octagonal or square junction box.
- 2 fasteners secure the hinged door underneath the housing and provide quick & easy access to the electrical compartment for installing/servicing.
- Optional terminal block accepts up to 12 ga wire.

Warranty
- LSI luminaires carry a 5-year limited warranty. Refer to https://www.lsicorp.com/resources/terms-conditions-warranty/ for more information.

Listings
- Listed to UL 1598 and UL 8750.
- Meets Buy American Act requirements.
- IDA compliant; with 3000K color temperature selection.
- Title 24 Compliant; see local ordinance for qualification information.
- Suitable for wet locations.
- IP65 rated luminaire per IEC 60598-1.
- 3G rated for ANSI C136.31 high vibration applications when pole mounted (using optional XPMA bracket) or wall mounted.
- IK08 rated luminaire per IEC 62262 mechanical impact code.
- DesignLights Consortium® (DLC) Premium qualified product; Not all versions of this product may be DLC Premium qualified. Please check the DLC Qualified Products List at www.designlights.org/QPL to confirm which versions are qualified.

RELS-R

Edge Lit Recessed LED Downlight (Regressed)

Product Description

The REL Regressed Edge Lit Downlight offers a regressed design using baffles to bring depth and a clean aesthetic to any room. The edge-lit technology makes it a practical solution with high performance and five CCT selectability (2700K, 3000K, 3500K, 4000K, and 5000K) for ultimate customization. Adjustable spring-loaded retention tabs allow a secure fit for easy installation in both new construction and remodel applications. The REL-R is an ideal solution for multi-family dwellings such as apartment buildings, condos, townhomes, and commercial applications.

Construction
- Extruded aluminum housing routes heat away from electrical components
- Edge-lit technology allows for extremely thin fixture depth
- Adjustable, spring loaded retention tabs ensure secure fixture retention
- Off-board driver minimizes installation height and maximizes fixture life through improved heat management

Optical System
- Precision engineered optical stack creates uniform light distribution that maximizes lumen output
- Offered with SCCT selection of 2700K, 3000K, 3500K, 4000K, and 5000K
- Binned within 4-step MacAdams with duv <±0.003
- Utilizes high performing LEDs with 90+ CRI and an R9 > 50

Electrical
- Input voltage of 120VAC
- Dimmable to 5% with compatible leading edge (TRIAC) or trailing edge (ELV) dimmers
- Operating temperature rating of -4°F to 104°F (-20°C to 40°C)

Finish
- White powder coat finish standard

Mounting and Installation
- Spring loaded retention tabs allow for easy installation into ceilings up to ¾" thick with no need for a recessed housing
- Off-board driver/junction box includes three 1/2" KOs and three-port poke-in connectors
- Included paper cut-out template
- Accessory recessed rough-in frames and templates available
- Accessory extension power cables (2' & 10') available
- For installations where power surge may be possible, NICOR recommends installing additional surge protection at the electrical distribution panel

Listings
- Rated for 1598 Classified for wet locations
- Energystar listed
- CA Title 24 compliant (JA8)
- Certified for direct contact with insulation (IC-Rated)
- Meets Air Tight requirements per ASTM E283
- Compliant with NFPA® 70, NEC® Section 410.16 (A)(3) and 410.16 (C)(3) for closet use
- RoHS Compliant: Free from harmful and hazardous materials
- Meets FCC Part 15, Subpart B, Class B standards for conducted and radiated emissions
- LED lumen maintenance: L70(6k)>54,000 hrs
- LM-79, LM-80 testing performed in accordance with IESNA standards

Warranty
- 5 year limited system warranty standard
- Warranty does not cover product failure due to an overvoltage event (power surge)

Project: _____
Fixture Type: _____
Catalog: _____
Type: _____
Date: _____



REL-R
4", and 6" Regressed Edgelit
LED Downlight
600, 800, 950 lumen

PROGRESS LIGHTING

Project: _____
Fixture Type: _____
Location: _____
Contact: _____

District LED

Wall Mounted - Wet Location Listed PROGRESS LED

Description:

District Collection LED Large Wall Lantern

Specifications:
- Antique Bronze, Painted White Inside Aluminum Shade
- White Acrylic Diffuser
- Dimmable to 10% Brightness (See Dimming Notes)
- Back plate covers a standard 4" recessed outlet box; 3.125 in W., 1.625 in ht., 3.125 in depth
- Mounting strap for outlet box included
- 6 in of wire supplied

Performance:

Number of Modules	1
Input Power	9 W
Input Voltage	120 V
Input Frequency	60 Hz
Lumens/LPW (Source)	623/69.2 (LM-82)
Lumens/LPW (Delivered)	479/61.1 (LM-79)
CCT	3000 K
CRI	90 CRI
Life (hours)	60000 (L70/TM-21)
EMI/RFI	Meets FCC Title 47, Part 15 Class B
Max. Operating Temp	35 °C
Warranty	5-year Limited Warranty
Labels	cCSAus Wet Location Listed

P5623-2030K9



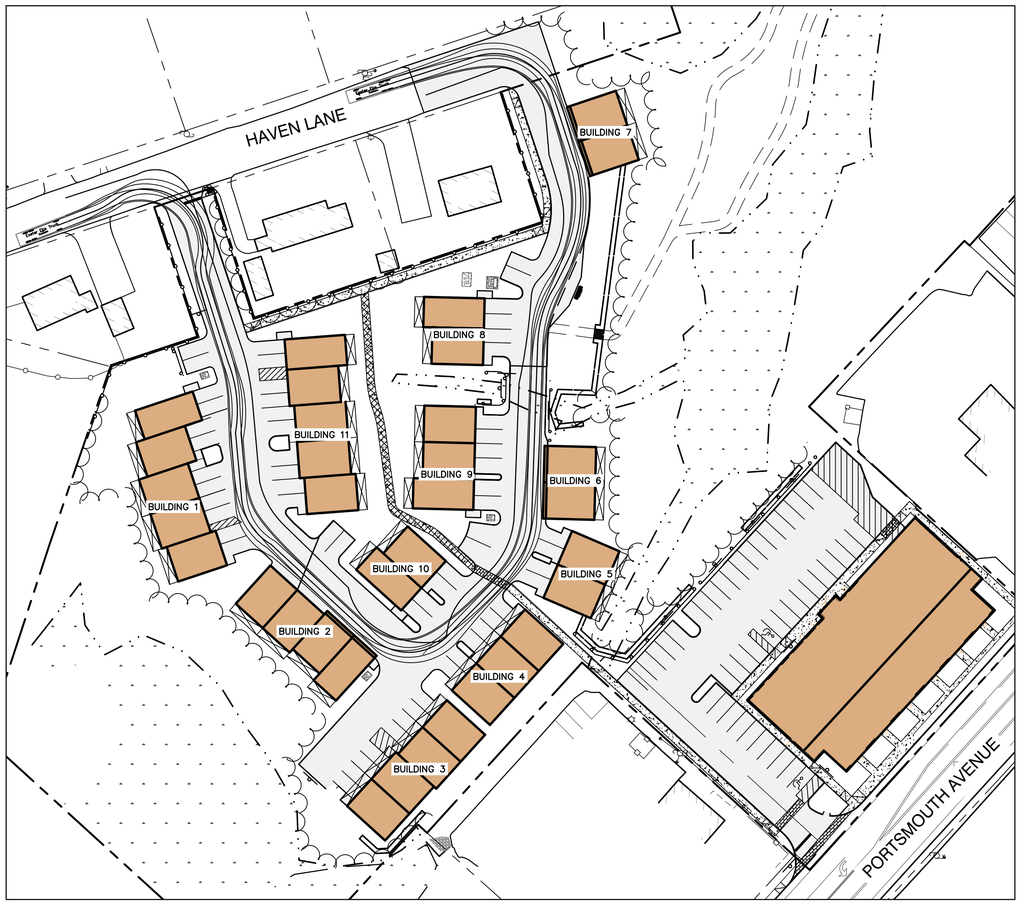
Dimensions:

Width: 12 in
Height: 10-1/2 in
Depth: 19-1/4 in
H/CTR: 5 in

Antique Bronze, Painted White Inside Aluminum Shade
Width: 12 in
Height: 7-15/16 in

White Acrylic Diffuser
Width: 2-7/8 in
Height: 6-13/16 in



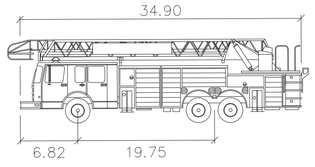


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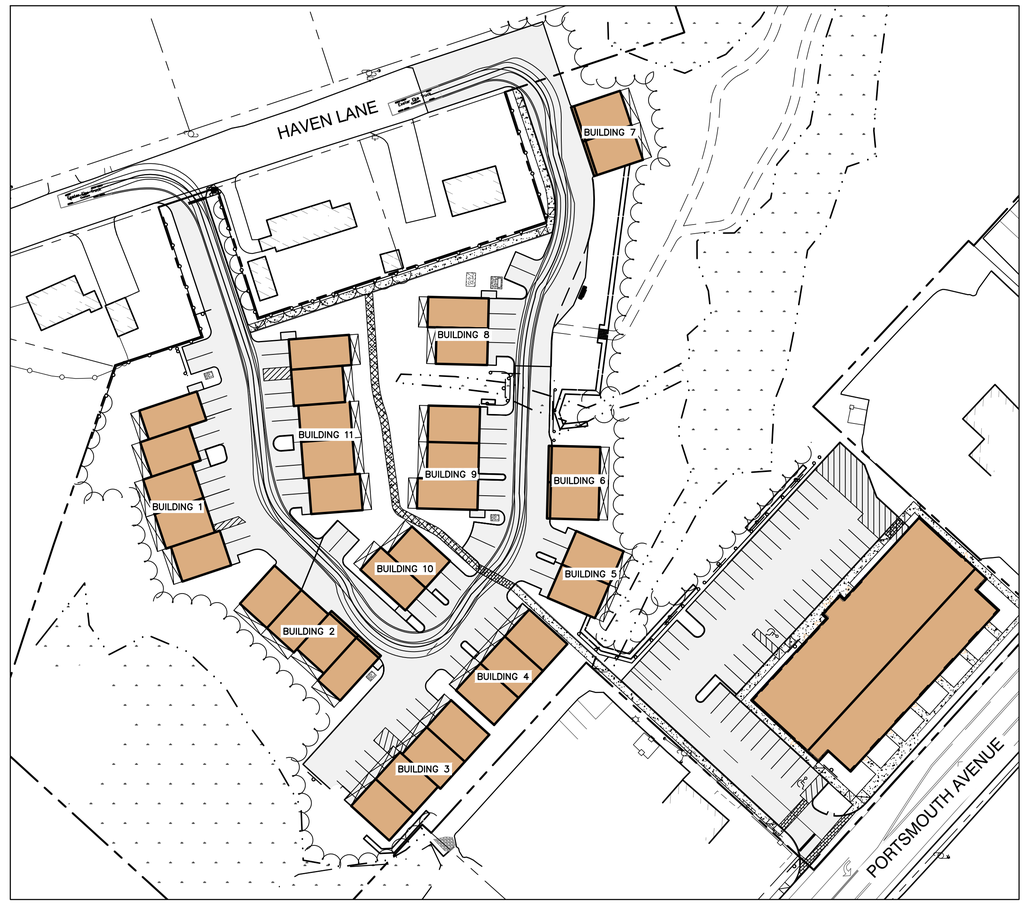
(IN FEET)
1" = 50'

VEHICLE INFORMATION



Exeter Fire Truck

Width	: 8.50
Track	: 6.50
Lock to Lock Time	: 6.00
Steering Angle	: 33.90

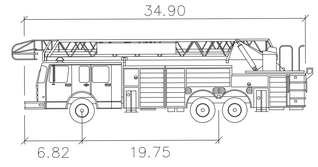


GRAPHIC SCALE

-50 0 25 50 100 200

(IN FEET)
1" = 50'

VEHICLE INFORMATION



Exeter Fire Truck

Width	: 8.50
Track	: 6.50
Lock to Lock Time	: 6.00
Steering Angle	: 33.90

PROJECT PARCEL
TOWN OF EXETER
TAX MAP 65, LOT 118

APPLICANT
GREEN & COMPANY
11 LAFAYETTE RD
PO BOX 1297
NORTH HAMPTON, NH 03862

TOTAL LOT AREA
291,630 SQ. FT.
6.7 ACRES

Design: DJM	Draft: KDR	Date: 3/15/24
Checked: PSL	Scale: AS SHOWN	Project No.: 24029
Drawing Name: 24029-PLAN.dwg		

THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION FROM JONES & BEACH ENGINEERS, INC. (JBE). ANY ALTERATIONS, AUTHORIZED OR OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO JBE.

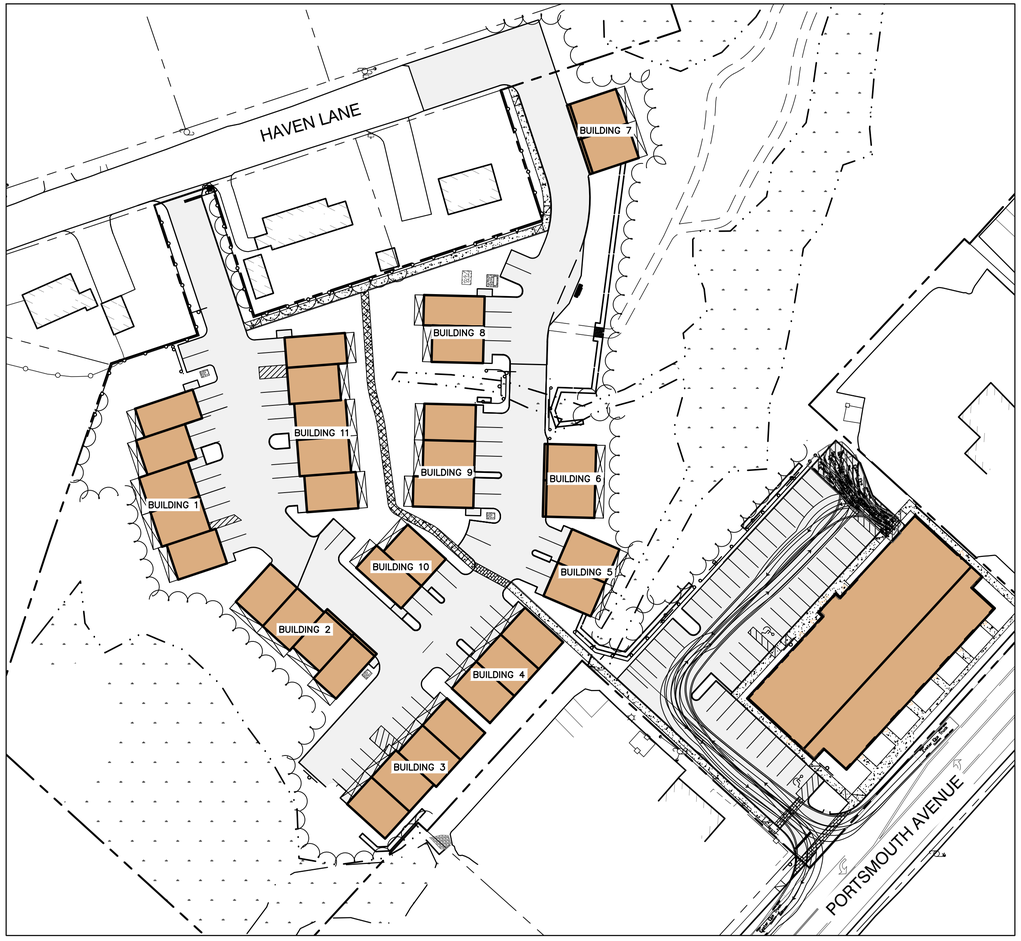
STATE OF NEW HAMPSHIRE – PAIGE S. LIBBEY No.16670 – LICENSED PROFESSIONAL ENGINEER – OCTOBER 25

REV.	DATE	REVISION	BY
10	3/18/25	REVISED PER TOWN ENGINEER & TRC COMMENTS	DJM
9	2/13/25	FULL DESIGN FOR REVISED LAYOUT	DJM
8	1/31/25	REVISED LAYOUT PER CONSERVATION COMMISSION	DJM
7	1/13/25	REVISED PER TOWN ENGINEER & TRC COMMENTS	DJM
6	1/6/25	GRADING PLAN FOR CONSERVATION COMMISSION	DJM

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

Plan Name:	TRUCK TURNING PLAN
Project:	"LILAC PLACE" 76 PORTSMOUTH AVE, EXETER, NH
Owner of Record:	RAP REALTY MANCHESTER LLC 50 ATLANTIC AVE, SEABROOK, NH

DRAWING No.
T1
SHEET 13 OF 31
JBE PROJECT NO. 24029

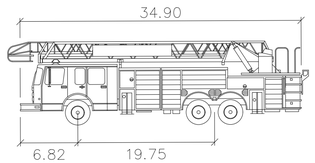


GRAPHIC SCALE

60 0 30 60 120 240

(IN FEET)
1 inch = 60 feet

VEHICLE INFORMATION



Exeter Fire Truck

Width	: 8.50
Track	: 6.50
Lock to Lock Time	: 6.00
Steering Angle	: 33.90

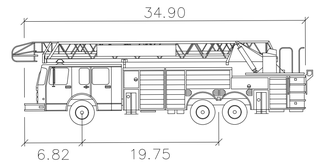


GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 feet

VEHICLE INFORMATION



Exeter Fire Truck

Width	: 8.50
Track	: 6.50
Lock to Lock Time	: 6.00
Steering Angle	: 33.90

PROJECT PARCEL
TOWN OF EXETER
TAX MAP 65, LOT 118

APPLICANT
GREEN & COMPANY
11 LAFAYETTE RD
PO BOX 1297
NORTH HAMPTON, NH 03862

TOTAL LOT AREA
291,630 SQ. FT.
6.7 ACRES

Design: DJM	Draft: KDR	Date: 3/15/24
Checked: PSL	Scale: AS SHOWN	Project No.: 24029
Drawing Name: 24029-PLAN.dwg		

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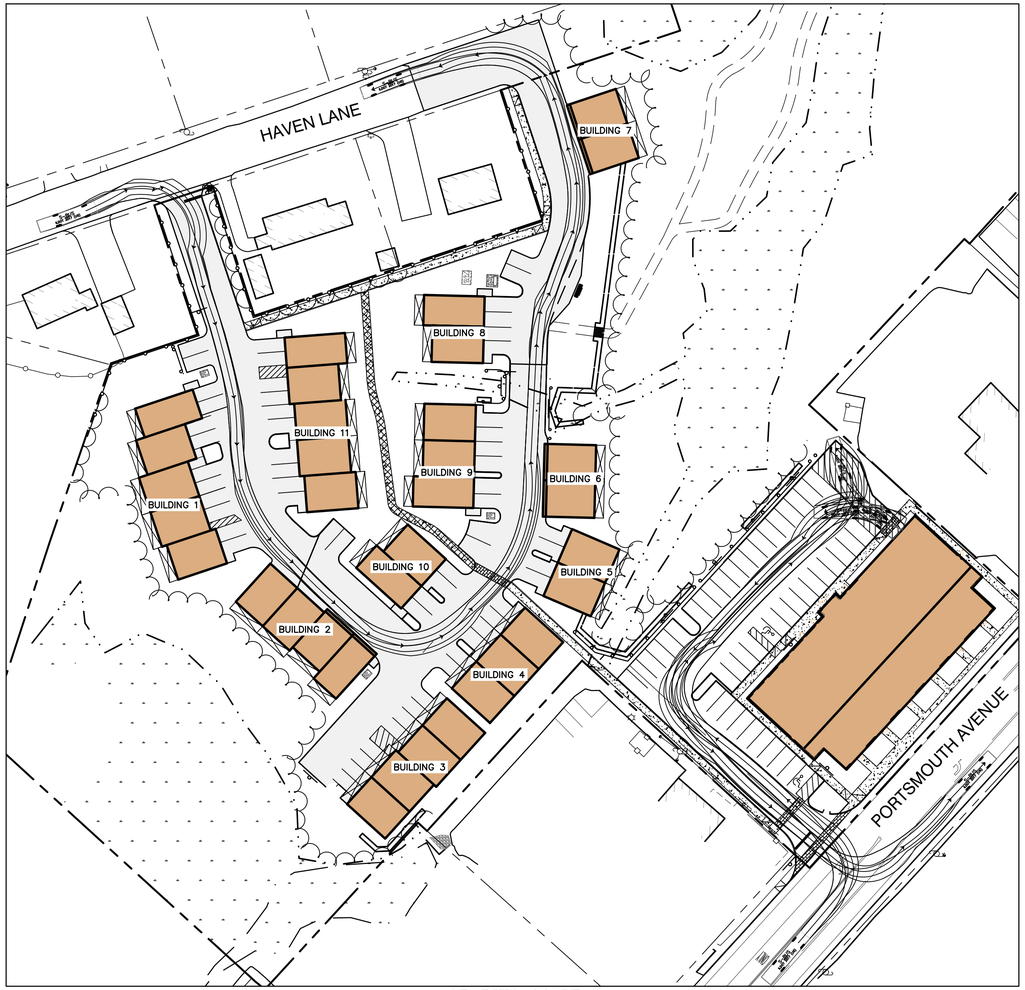
STATE OF NEW HAMPSHIRE – PAIGE S. LIBBEY No.16670 – LICENSED PROFESSIONAL ENGINEER

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10	3/18/25	REVISED PER TOWN ENGINEER & TRC COMMENTS	DJM
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Designed and Produced in NH
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85 Portsmouth Ave.
PO Box 219
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603-772-4746
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	TRUCK TURNING PLAN
Project:	"LILAC PLACE" 76 PORTSMOUTH AVE, EXETER, NH
Owner of Record:	RAP REALTY MANCHESTER LLC 50 ATLANTIC AVE, SEABROOK, NH

DRAWING No.
T2
SHEET 14 OF 31
JBE PROJECT NO. 24029

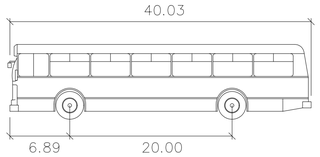


GRAPHIC SCALE

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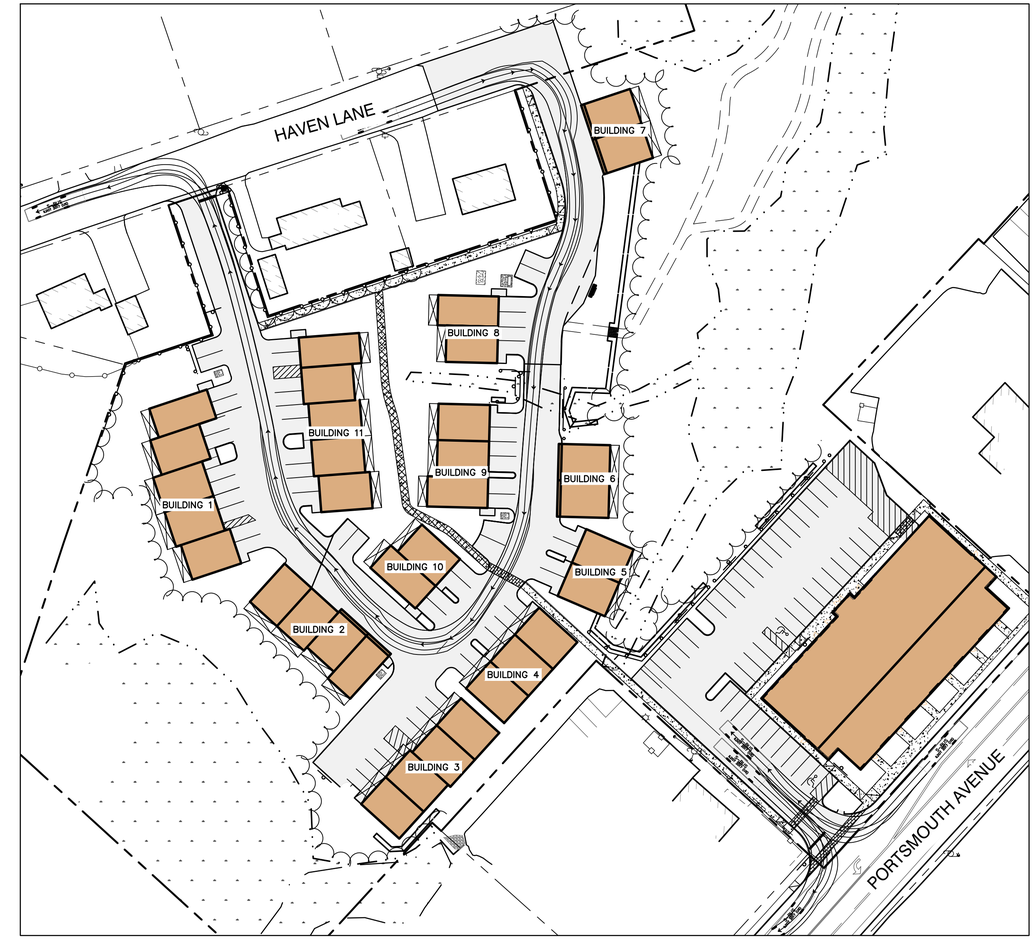
(IN FEET)
1 inch = 60 feet

VEHICLE INFORMATION



S-BUS
feet

Width	: 7.87
Track	: 7.87
Lock to Lock Time	: 6.0
Steering Angle	: 33.7

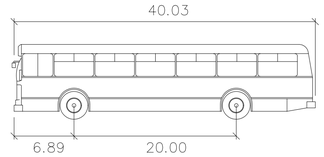


GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 feet

VEHICLE INFORMATION



S-BUS
feet

Width	: 7.87
Track	: 7.87
Lock to Lock Time	: 6.0
Steering Angle	: 33.7

PROJECT PARCEL
TOWN OF EXETER
TAX MAP 65, LOT 118

APPLICANT
GREEN & COMPANY
11 LAFAYETTE RD
PO BOX 1297
NORTH HAMPTON, NH 03862

TOTAL LOT AREA
291,630 SQ. FT.
6.7 ACRES

Design: DJM	Draft: KDR	Date: 3/15/24
Checked: PSL	Scale: AS SHOWN	Project No.: 24029
Drawing Name: 24029-PLAN.dwg		

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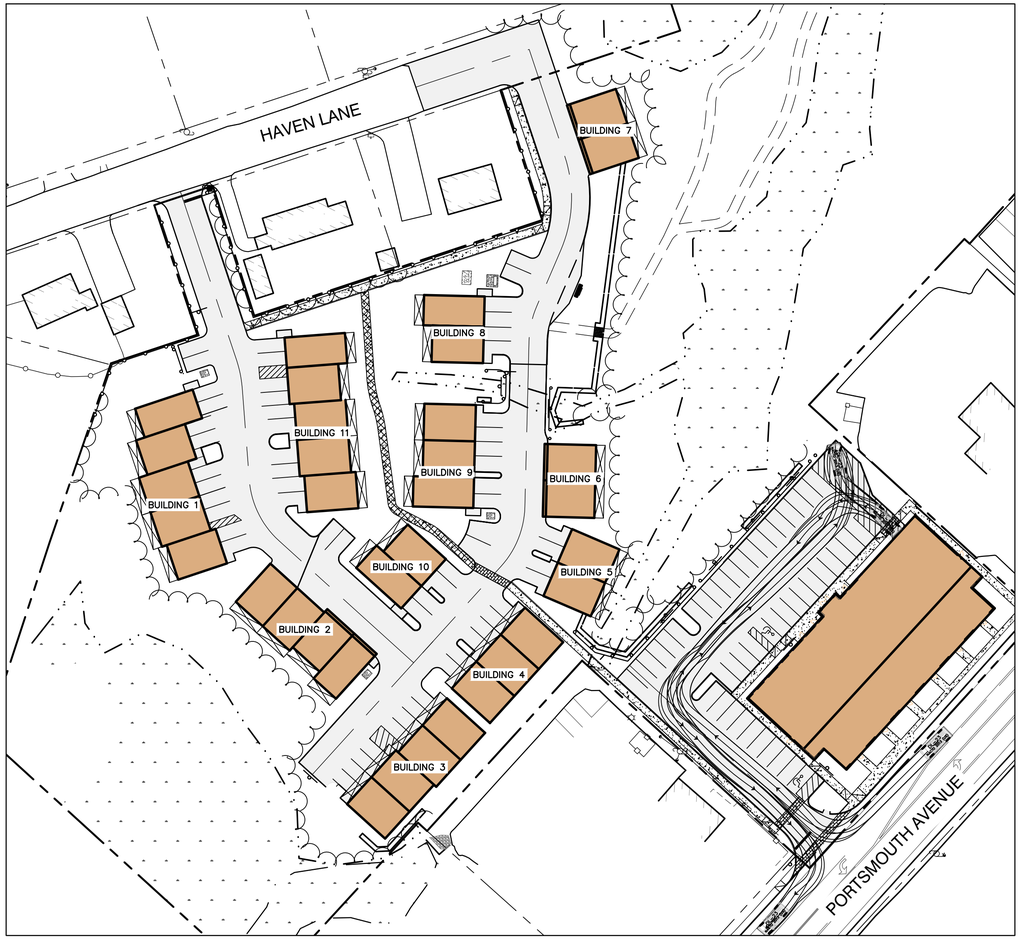
STATE OF NEW HAMPSHIRE – PAIGE S. LIBBEY No.16670 – LICENSED PROFESSIONAL ENGINEER – GRAPHIC

REV.	DATE	REVISION	BY
10	3/18/25	REVISED PER TOWN ENGINEER & TRC COMMENTS	DJM
9	2/13/25	FULL DESIGN FOR REVISED LAYOUT	DJM
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6	1/6/25	GRADING PLAN FOR CONSERVATION COMMISSION	DJM

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

Plan Name:	TRUCK TURNING PLAN
Project:	"LILAC PLACE" 76 PORTSMOUTH AVE, EXETER, NH
Owner of Record:	RAP REALTY MANCHESTER LLC 50 ATLANTIC AVE, SEABROOK, NH

DRAWING No.
T3
SHEET 15 OF 31
JBE PROJECT NO. 24029

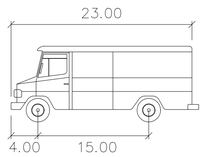


GRAPHIC SCALE

60 0 30 60 120 240

(IN FEET)
1 inch = 60 feet

VEHICLE INFORMATION



DL–23

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 40.4

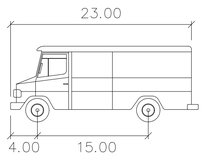


GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 feet

VEHICLE INFORMATION



DL–23

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 40.4

PROJECT PARCEL
TOWN OF EXETER
TAX MAP 65, LOT 118

APPLICANT
GREEN & COMPANY
11 LAFAYETTE RD
PO BOX 1297
NORTH HAMPTON, NH 03862

TOTAL LOT AREA
291,630 SQ. FT.
6.7 ACRES

Design: DJM	Draft: KDR	Date: 3/15/24
Checked: PSL	Scale: AS SHOWN	Project No.: 24029
Drawing Name: 24029-PLAN.dwg		

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STATE OF NEW HAMPSHIRE – PAIGE S. LIBBEY No.16670 – LICENSED PROFESSIONAL ENGINEER

REV.	DATE	REVISION	BY
10	3/18/25	REVISED PER TOWN ENGINEER & TRC COMMENTS	DJM
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6	1/6/25	GRADING PLAN FOR CONSERVATION COMMISSION	DJM

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

Plan Name:	TRUCK TURNING PLAN
Project:	"LILAC PLACE" 76 PORTSMOUTH AVE, EXETER, NH
Owner of Record:	RAP REALTY MANCHESTER LLC 50 ATLANTIC AVE, SEABROOK, NH

DRAWING No.
T4
SHEET 16 OF 31
JBE PROJECT NO. 24029



NOTES:

1. THIS SITE WILL REQUIRE A USEPA NPDES PERMIT FOR STORMWATER DISCHARGE FOR THE CONSTRUCTION SITE. THE CONSTRUCTION SITE OPERATOR SHALL DEVELOP AND IMPLEMENT A CONSTRUCTION STORM WATER POLLUTION PREVENTION PLAN (SWPPP), WHICH SHALL REMAIN ON SITE AND BE MADE ACCESSIBLE TO THE PUBLIC. THE CONSTRUCTION SITE OPERATOR SHALL SUBMIT A NOTICE OF INTENT (NOI) TO THE EPA REGIONAL OFFICE SEVEN DAYS PRIOR TO COMMENCEMENT OF ANY WORK ON SITE. EPA WILL POST THE NOI AT HTTP://CFPUB1.EPA.GOV/NPDES/STORMWATER/NOI/NOISEARCH.CFM. AUTHORIZATION IS GRANTED UNDER THE PERMIT ONCE THE NOI IS SHOWN IN "ACTIVE" STATUS ON THIS WEBSITE. A COMPLETED NOTICE OF TERMINATION SHALL BE SUBMITTED TO THE NPDES PERMITTING AUTHORITY WITHIN 30 DAYS AFTER EITHER OF THE FOLLOWING CONDITIONS HAVE BEEN MET:
   A. FINAL STABILIZATION HAS BEEN ACHIEVED ON ALL PORTIONS OF THE SITE FOR WHICH THE PERMITTEE IS RESPONSIBLE; OR
   B. ANOTHER OPERATOR/PERMITTEE HAS ASSUMED CONTROL OVER ALL AREAS OF THE SITE THAT HAVE NOT BEEN FINALLY STABILIZED. PROVIDE DPW WITH A COPY OF THE NOTICE OF TERMINATION (NOT).
2. ALL ROAD AND DRAINAGE WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR THE TOWN, AND NHDOT SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, WHICHEVER IS MORE STRINGENT.
3. AS-BUILT PLANS TO BE SUBMITTED TO THE TOWN PRIOR TO ACCEPTANCE OF THE ROADWAY.
4. DEVELOPER IS RESPONSIBLE FOR COMPLYING WITH ALL APPLICABLE LOCAL, STATE AND FEDERAL WETLAND REGULATIONS, INCLUDING ANY PERMITTING AND SETBACK REQUIREMENTS REQUIRED UNDER THESE REGULATIONS.
5. CONTRACTOR TO COORDINATE AND COMPLETE ALL WORK REQUIRED FOR THE RELOCATION AND/OR INSTALLATION OF ELECTRIC, CATV, TELEPHONE, AND FIRE ALARM PER UTILITY DESIGN AND STANDARDS. LOCATIONS SHOWN ARE APPROXIMATE. LOW PROFILE STRUCTURES SHALL BE USED TO THE GREATEST EXTENT POSSIBLE.
6. THIS PLAN HAS BEEN PREPARED BY JONES & BEACH ENGINEERS, INC. FOR MUNICIPAL AND STATE APPROVALS AND FOR CONSTRUCTION BASED ON DATA OBTAINED FROM ON-SITE FIELD SURVEY AND EXISTING MUNICIPAL RECORDS. THROUGHOUT THE CONSTRUCTION PROCESS, THE CONTRACTOR SHALL INFORM THE ENGINEER IMMEDIATELY OF ANY FIELD DISCREPANCY FROM DATA SHOWN ON THE DESIGN PLANS. THIS INCLUDES ANY UNFORESEEN CONDITIONS, SUBSURFACE OR OTHERWISE, FOR EVALUATION AND RECOMMENDATIONS. ANY CONTRADICTION BETWEEN ITEMS OF THIS PLAN/PLAN SET, OR BETWEEN THE PLANS AND ON-SITE CONDITIONS MUST BE RESOLVED BEFORE RELATED CONSTRUCTION HAS BEEN INITIATED.
7. SILTATION AND EROSION CONTROLS SHALL BE INSTALLED PRIOR TO CONSTRUCTION, SHALL BE MAINTAINED DURING CONSTRUCTION, AND SHALL REMAIN UNTIL SITE HAS BEEN STABILIZED WITH PERMANENT VEGETATION. SEE DETAIL SHEET E1 FOR ADDITIONAL NOTES ON EROSION CONTROL.
8. ALL DISTURBED AREAS NOT STABILIZED BY OCTOBER 15TH SHALL BE COVERED WITH AN EROSION CONTROL BLANKET. PRODUCT TO BE SPECIFIED BY THE ENGINEER.
9. FINAL DRAINAGE, GRADING AND EROSION PROTECTION MEASURES SHALL CONFORM TO REGULATIONS OF THE PUBLIC WORKS DEPARTMENT.
10. CONTRACTOR TO VERIFY EXISTING UTILITIES AND TO NOTIFY ENGINEER OF ANY DISCREPANCY IMMEDIATELY.
11. RETAINING WALLS GREATER THAN 4 FEET IN HEIGHT SHALL BE DESIGNED AND STAMPED BY A LICENSED PROFESSIONAL ENGINEER. CONTRACTOR SHALL COORDINATE WITH MANUFACTURER PRIOR TO INSTALLATION.
12. ALL DRAINAGE INFRASTRUCTURE SHALL BE INSTALLED AND STABILIZED PRIOR TO DIRECTING ANY RUNOFF TO IT.

GRAPHIC SCALE
(IN FEET)
1 inch = 30 ft Horiz.
1 inch = 3 ft Vert.
0 30 60
0 3 6

Design: DJM	Draft: KDR	Date: 3/15/24
Checked: PSL	Scale: AS SHOWN	Project No.: 24029
Drawing Name: 24029-PLAN.dwg		

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PAIGE S. LIBBEY No.16670 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE 03/18/2025

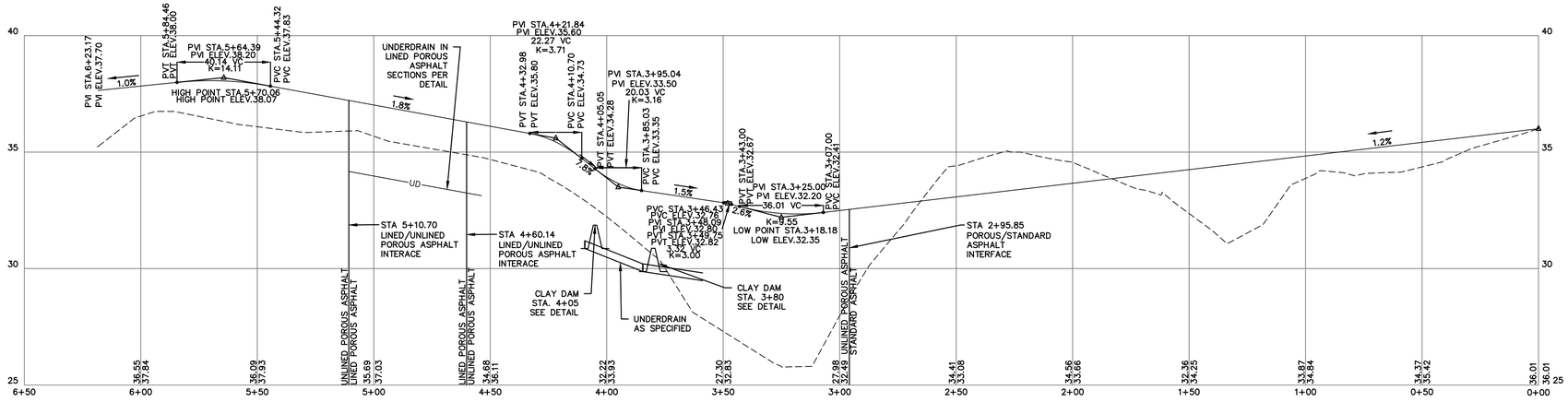
REV.	DATE	REVISION	BY
10	3/18/25	REVISED PER TOWN ENGINEER & TRC COMMENTS	DJM
9	2/13/25	FULL DESIGN FOR REVISED LAYOUT	DJM
8	1/31/25	REVISED LAYOUT PER CONSERVATION COMMISSION	DJM
7	1/13/25	REVISED PER TOWN ENGINEER & TRC COMMENTS	DJM
6	1/6/25	GRADING PLAN FOR CONSERVATION COMMISSION	DJM

Designed and Produced in NH
Jones & Beach Engineers, Inc.
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
Civil Engineering Services
603-772-4746
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	ROAD PROFILE
Project:	"LILAC PLACE" 76 PORTSMOUTH AVE, EXETER, NH
Owner of Record:	RAP REALTY MANCHESTER LLC 50 ATLANTIC AVE, SEABROOK, NH

DRAWING No.
P1
SHEET 17 OF 31
JBE PROJECT NO. 24029





GRAPHIC SCALE
(IN FEET)
1 inch = 30 ft Horiz.
1 inch = 3 ft Vert.

Design: DJM	Draft: KDR	Date: 3/15/24
Checked: PSL	Scale: AS SHOWN	Project No.: 24029
Drawing Name: 24029-PLAN.dwg		

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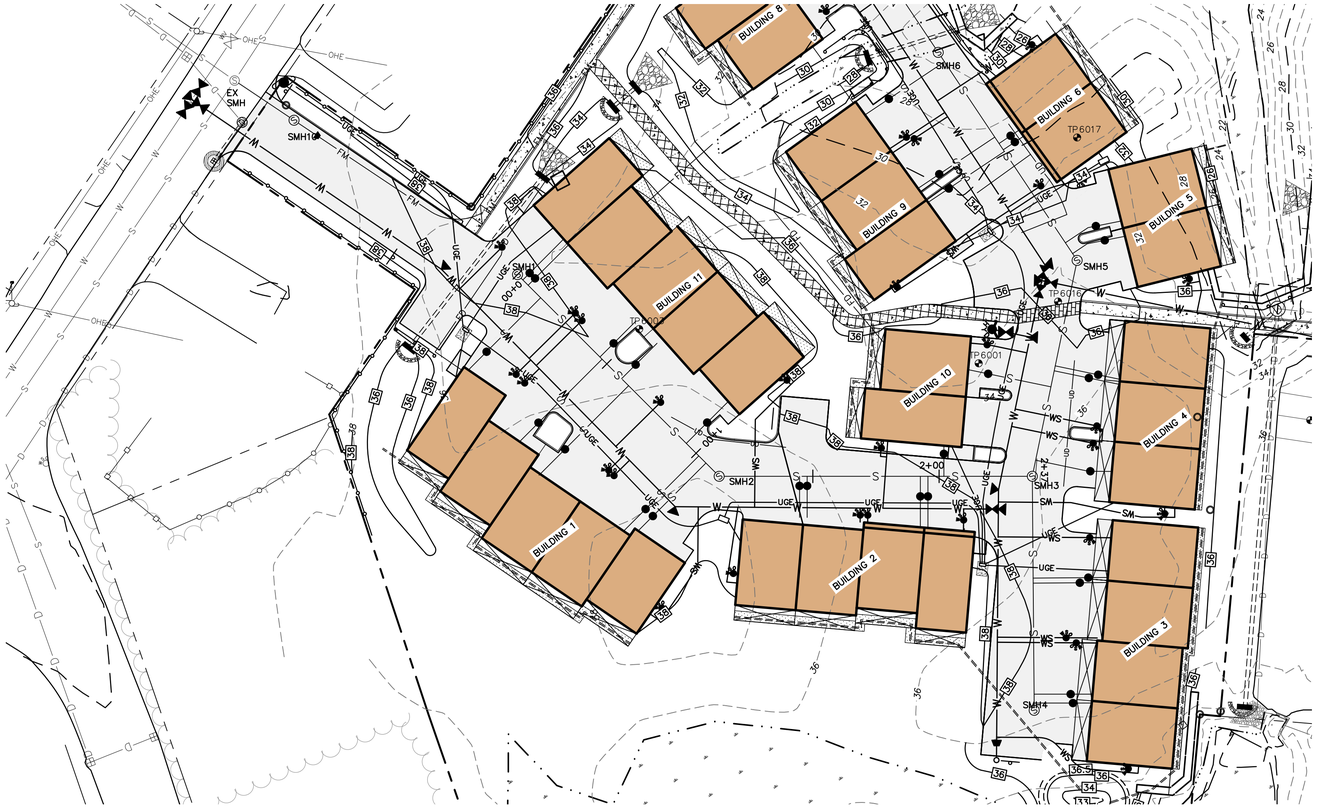
PAIGE S. LIBBEY No.16670 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE 03/18/2025

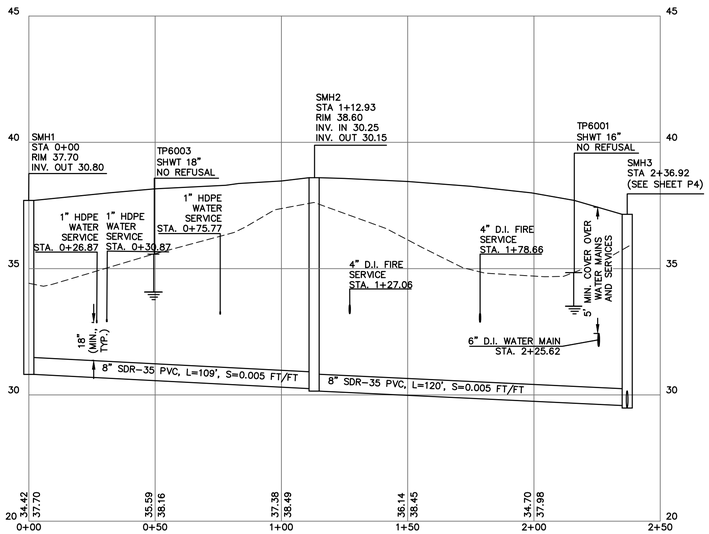
REV.	DATE	REVISION	BY
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9	2/13/25	FULL DESIGN FOR REVISED LAYOUT	DJM
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6	1/6/25	GRADING PLAN FOR CONSERVATION COMMISSION	DJM

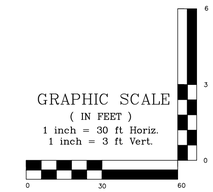
Designed and Produced in NH
Jones & Beach Engineers, Inc.
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
Civil Engineering Services
603-772-4746
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	ROAD PROFILE
Project:	"LILAC PLACE" 76 PORTSMOUTH AVE, EXETER, NH
Owner of Record:	RAP REALTY MANCHESTER LLC 50 ATLANTIC AVE, SEABROOK, NH

DRAWING No.
P2
SHEET 18 OF 31
JBE PROJECT NO. 24029







Design: DJM	Draft: KDR	Date: 3/15/24
Checked: PSL	Scale: AS SHOWN	Project No.: 24029
Drawing Name: 24029-PLAN.dwg		

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PAIGE S. LIBBEY No.16670 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE

REV.	DATE	REVISION	BY
10	3/18/25	REVISED PER TOWN ENGINEER & TRC COMMENTS	DJM
9	2/13/25	FULL DESIGN FOR REVISED LAYOUT	DJM
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6	1/6/25	GRADING PLAN FOR CONSERVATION COMMISSION	DJM

Designed and Produced in NH
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603-772-4746
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	SEWER PLAN AND PROFILE
Project:	"LILAC PLACE" 76 PORTSMOUTH AVE, EXETER, NH
Owner of Record:	RAP REALTY MANCHESTER LLC 50 ATLANTIC AVE, SEABROOK, NH

DRAWING No.

P3

SHEET 19 OF 31
JBE PROJECT NO. 24029



GRAPHIC SCALE
(IN FEET)
1 inch = 30 ft Horiz.
1 inch = 3 ft Vert.

Design: DJM	Draft: KDR	Date: 3/15/24
Checked: PSL	Scale: AS SHOWN	Project No.: 24029
Drawing Name: 24029-PLAN.dwg		

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STATE OF NEW HAMPSHIRE – PAIGE S. LIBBEY No.16670 – PROFESSIONAL ENGINEER – LICENSED – 03/18/2025

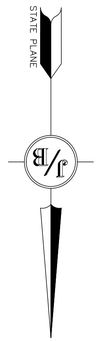
REV.	DATE	REVISION	BY
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6	1/6/25	GRADING PLAN FOR CONSERVATION COMMISSION	DJM

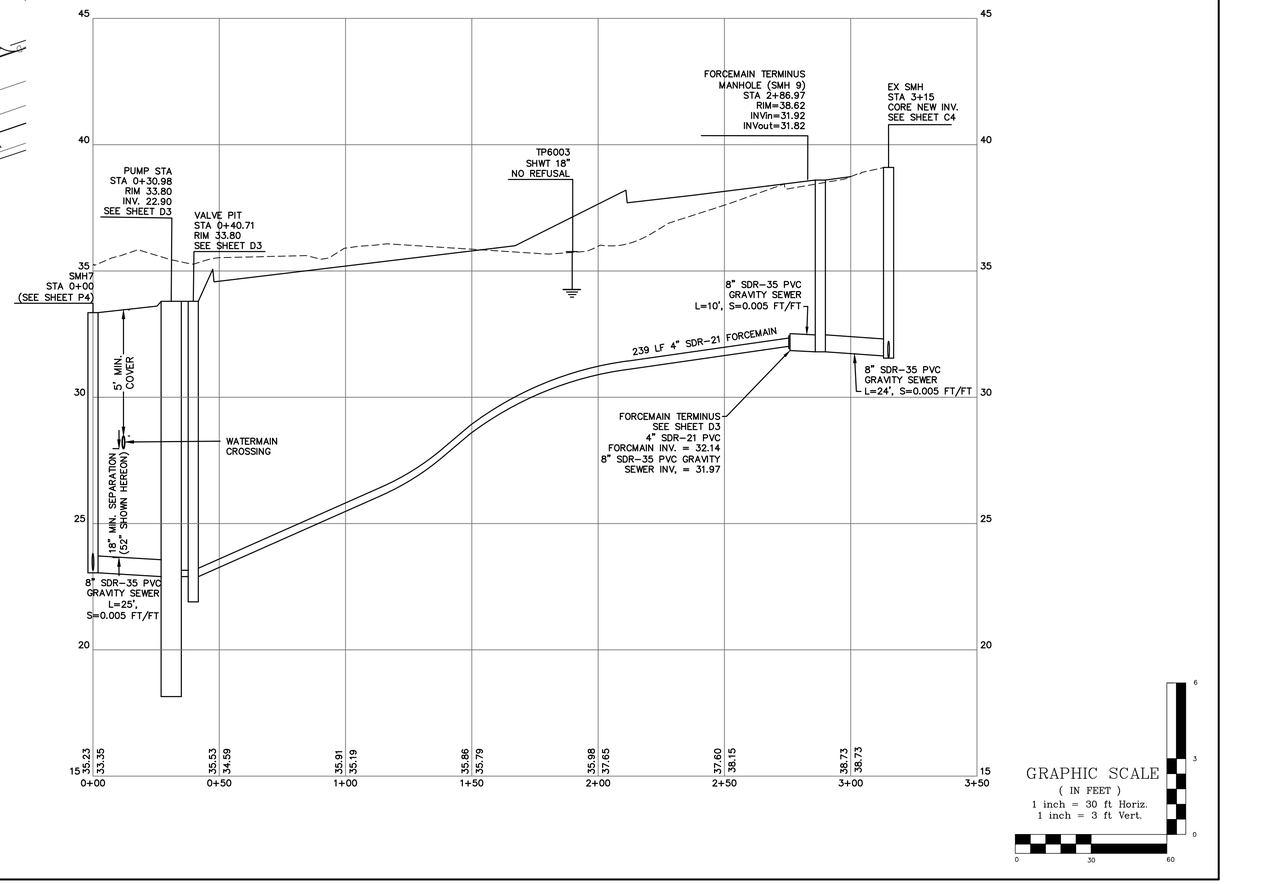
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Jones & Beach Engineers, Inc.
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PO Box 219
Stratham, NH 03885
Civil Engineering Services
603-772-4746
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	SEWER PLAN AND PROFILE
Project:	"LILAC PLACE" 76 PORTSMOUTH AVE, EXETER, NH
Owner of Record:	RAP REALTY MANCHESTER LLC 50 ATLANTIC AVE, SEABROOK, NH

DRAWING No.
P4
SHEET 20 OF 31
JBE PROJECT NO. 24029







GRAPHIC SCALE
(IN FEET)
1 inch = 30 ft Horiz.
1 inch = 3 ft Vert.

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Checked: PSL	Scale: AS SHOWN	Project No.: 24029
Drawing Name: 24029-PLAN.dwg		

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PAIGE S. LIBBEY No.16670 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE 03/18/2025

REV.	DATE	REVISION	BY
10	3/18/25	REVISED PER TOWN ENGINEER & TRC COMMENTS	DJM
9	2/13/25	FULL DESIGN FOR REVISED LAYOUT	DJM
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6	1/6/25	GRADING PLAN FOR CONSERVATION COMMISSION	DJM

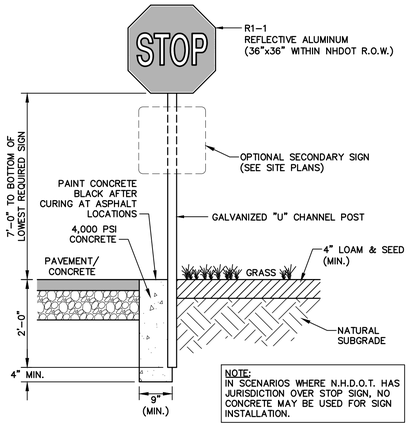
Designed and Produced in NH
Jones & Beach Engineers, Inc.
Civil Engineering Services
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
603-772-4746
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	FORCEMAIN PLAN AND PROFILE
Project:	"LILAC PLACE" 76 PORTSMOUTH AVE, EXETER, NH
Owner of Record:	RAP REALTY MANCHESTER LLC 50 ATLANTIC AVE, SEABROOK, NH

DRAWING No.

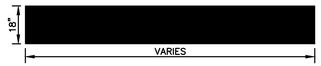
P5

SHEET 21 OF 31
JBE PROJECT NO. 24029



STOP SIGN (R1-1)

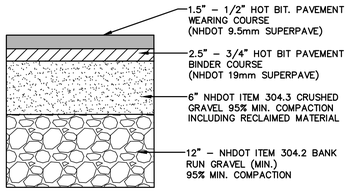
NOT TO SCALE



NOTES:
1. ALL STOP BARS TO BE SOLID WHITE REFLECTIVE TRAFFIC PAINT AS PER DIMENSIONS ABOVE.

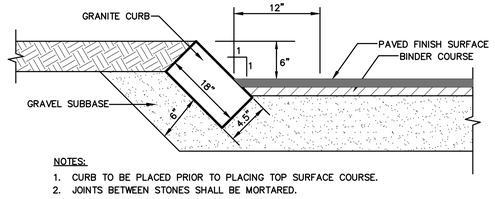
STOP BAR

NOT TO SCALE



TYPICAL BITUMINOUS PAVEMENT

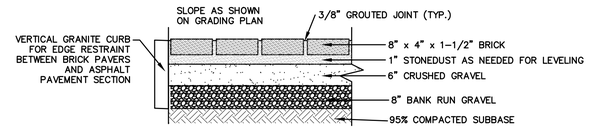
NOT TO SCALE



NOTES:
1. CURB TO BE PLACED PRIOR TO PLACING TOP SURFACE COURSE.
2. JOINTS BETWEEN STONES SHALL BE MORTARED.

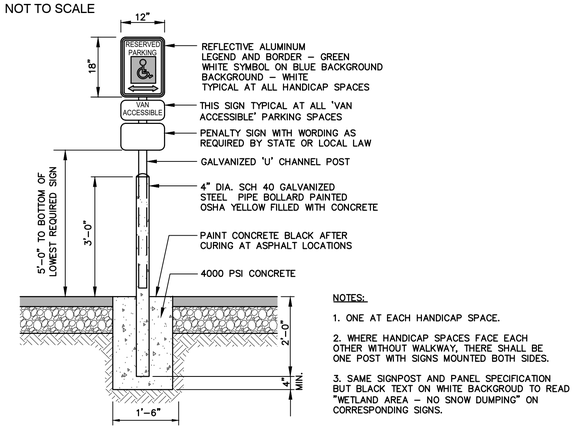
SLOPE GRANITE CURB

NOT TO SCALE



STANDARD BRICK PAVER

NOT TO SCALE

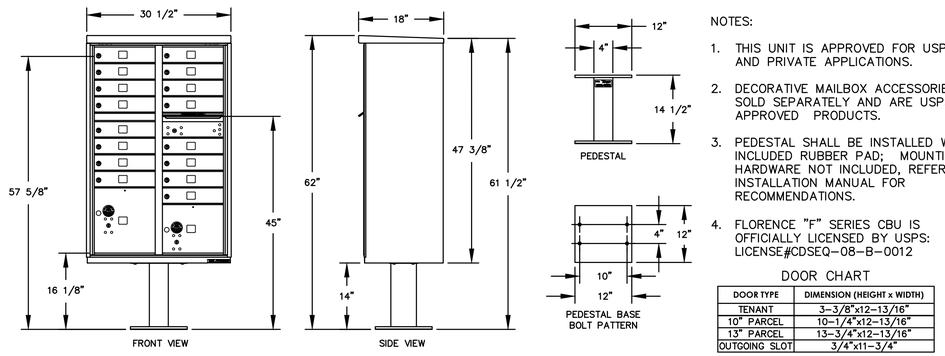


NOTES:
1. ONE AT EACH HANDICAP SPACE.
2. WHERE HANDICAP SPACES FACE EACH OTHER WITHOUT WALKWAY, THERE SHALL BE ONE POST WITH SIGNS MOUNTED BOTH SIDES.
3. SAME SIGNPOST AND PANEL SPECIFICATION BUT BLACK TEXT ON WHITE BACKGROUD TO READ "WETLAND AREA – NO SNOW DUMPING" ON CORRESPONDING SIGNS.

HANDICAP PARKING SIGN (R7-8)

NOT TO SCALE

vital™ Cluster Box Unit - Type III



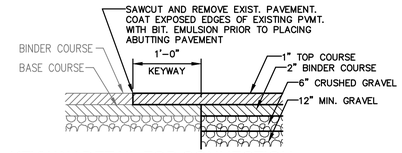
NOTES:
1. THIS UNIT IS APPROVED FOR USPS AND PRIVATE APPLICATIONS.
2. DECORATIVE MAILBOX ACCESSORIES SOLD SEPARATELY AND ARE USPS APPROVED PRODUCTS.
3. PEDESTAL SHALL BE INSTALLED WITH INCLUDED RUBBER PAD; MOUNTING HARDWARE NOT INCLUDED, REFER TO INSTALLATION MANUAL FOR RECOMMENDATIONS.
4. FLORENCE "F" SERIES CBU IS OFFICIALLY LICENSED BY USPS: LICENSE#CDSEQ-08-B-0012

DOOR CHART

DOOR TYPE	DIMENSION (HEIGHT x WIDTH)
TENANT	3-3/8"x12-13/16"
10" PARCEL	10-1/4"x12-13/16"
13" PARCEL	13-3/4"x12-13/16"
OUTGOING SLOT	3/4"x11-3/4"

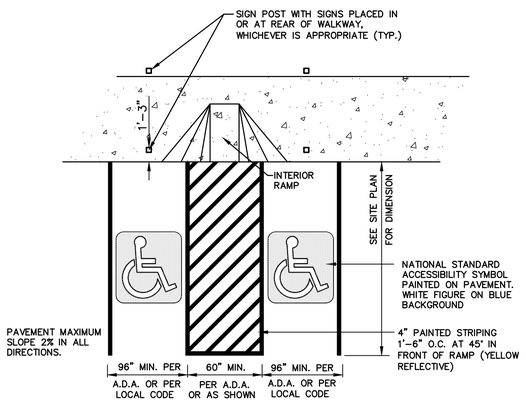
MAIL BOX KIOSK DETAIL - AF FLORENCE MANUFACTURING COMPANY (MODEL 1570-16)

NOT TO SCALE



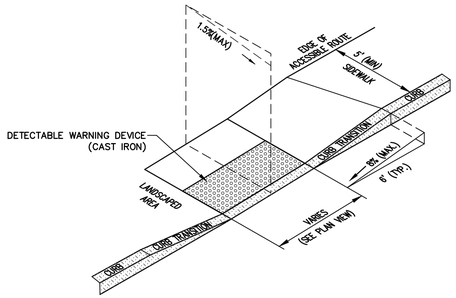
KEYWAY DETAIL FOR CONNECTION TO EXISTING PAVEMENT

NOT TO SCALE



HANDICAP PARKING LAYOUT

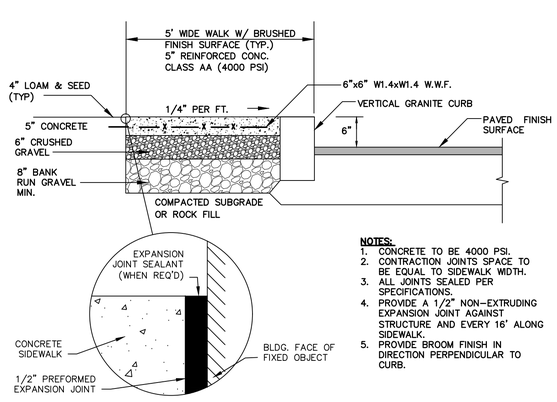
NOT TO SCALE



NOTES:
1. THE MAXIMUM ALLOWABLE CROSS SLOPE OF ACCESSIBLE ROUTE (SIDEWALK) AND CURB SHALL BE 1.5%.
2. THE MAXIMUM ALLOWABLE SLOPE OF ACCESSIBLE ROUTE EXCLUDING CURB RAMPS SHALL BE 5%.
3. THE MAXIMUM ALLOWABLE SLOPE OF ACCESSIBLE ROUTE (SIDEWALK) CURB RAMPS SHALL BE 8%.
4. A MINIMUM OF 4 FEET CLEAR SHALL BE MAINTAINED AT ANY PERMANENT OBSTACLE IN ACCESSIBLE ROUTE (i.e., HYDRANTS, UTILITY POLES, TREE WELLS, SIGNS, ETC.).
5. CURB TREATMENT VARIES, SEE PLANS FOR CURB TYPE.
6. BASE OF RAMP SHALL BE GRADED TO PREVENT PONDING.
7. SEE TYPICAL SECTION FOR RAMP CONSTRUCTION.

ACCESSIBLE CURB RAMP (TYPE 'I')

NOT TO SCALE



NOTES:
1. CONCRETE TO BE 4000 PSI.
2. CONTRACTION JOINTS SPACE TO BE EQUAL TO SIDEWALK WIDTH.
3. ALL JOINTS SEALED PER SPECIFICATIONS.
4. PROVIDE A 1/2" NON-EXTRUDING EXPANSION JOINT AGAINST STRUCTURE AND EVERY 16' ALONG SIDEWALK.
5. PROVIDE BROOM FINISH IN DIRECTION PERPENDICULAR TO CURB.

CONCRETE SIDEWALK W/ VERTICAL GRANITE CURB

NOT TO SCALE

Design: DJM	Draft: KDR	Date: 3/15/24	
Checked: PSL	Scale: AS NOTED	Project No.: 24029	
Drawing Name: 24029-PLAN.dwg			

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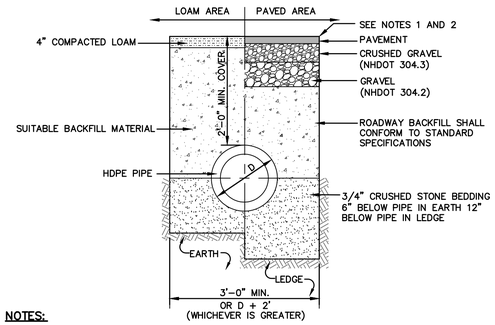
STATE OF NEW HAMPSHIRE – PAIGE S. LIBBEY No.16670 – LICENSED PROFESSIONAL ENGINEER – 07/09/2025

REV.	DATE	REVISION	BY
10	3/18/25	REVISED PER TOWN ENGINEER & TRC COMMENTS	DJM
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6	1/6/25	GRADING PLAN FOR CONSERVATION COMMISSION	DJM

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

Plan Name:	DETAIL SHEET
Project:	"LILAC PLACE" 76 PORTSMOUTH AVE, EXETER, NH
Owner of Record:	RAP REALTY MANCHESTER LLC 50 ATLANTIC AVE, SEABROOK, NH

DRAWING No.
D1
SHEET 22 OF31
JBE PROJECT NO. 24029

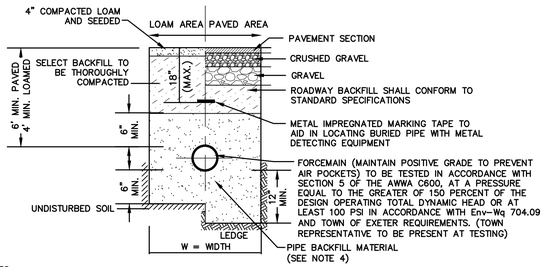


NOTES:

1. PAVEMENT REPAIR IN EXISTING ROADWAYS SHALL CONFORM TO STREET OPENING REGULATIONS.
2. NEW ROADWAY CONSTRUCTION SHALL CONFORM WITH PROJECT AND TOWN SPECIFICATIONS.
3. ALL MATERIALS ARE TO BE COMPACTED TO 95% OF ASTM D-1557.

DRAINAGE TRENCH

NOT TO SCALE

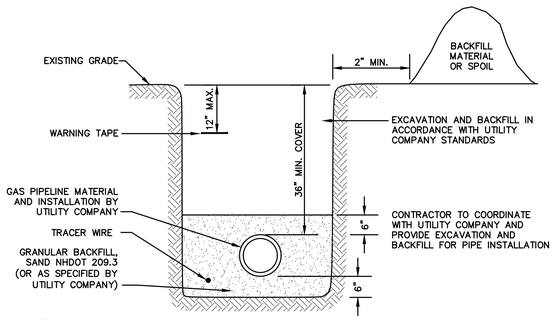


NOTES:

1. PAVEMENT REPAIR IN EXISTING ROADWAYS SHALL CONFORM TO STREET OPENING REGULATIONS.
2. NEW ROADWAY CONSTRUCTION SHALL CONFORM TO SUBDIVISION SPECIFICATIONS.
3. W=MAXIMUM ALLOWABLE TRENCH WIDTH TO A PLANE 12" INCHES ABOVE THE PIPE. W SHALL BE NO MORE THAN 36"
4. SAND BEDDING AND BLANKET SHALL BE CLEAN SAND FREE FROM ORGANIC MATTER, SO GRADED THAT 100% PASSES A 1/2 INCH SIEVE AND NO MORE THAN 15% WILL PASS A #200 SIEVE. TRENCH CONSTRUCTION SHALL BE IN ACCORDANCE WITH Env-Wq 704.11.
5. PVC PIPE USED FOR FORCE MAIN SHALL BE CERTIFIED BY ITS MANUFACTURER AS CONFORMING TO THE ASTM D2241 OR ASTM D1785 STANDARDS IN EFFECT WHEN THE PIPE IS MANUFACTURED PER ENV-WQ 704.08(C).

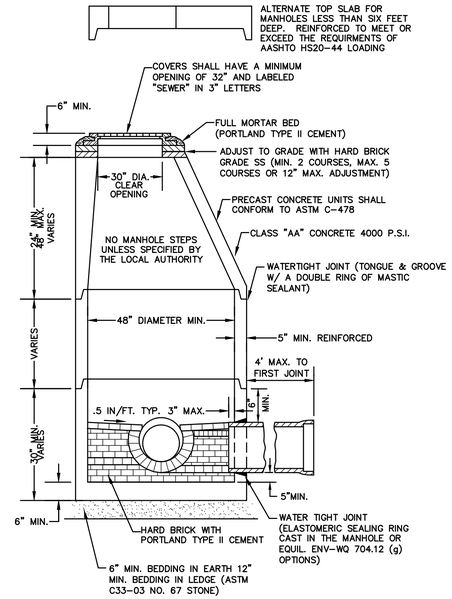
FORCE MAIN SEWER TRENCH

NOT TO SCALE



GAS TRENCH

NOT TO SCALE



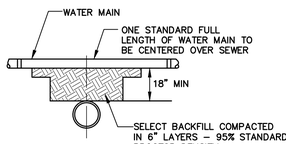
NOTES:

1. PER NHDES ENV-WQ 704.13(C), MORTAR USED IN MANHOLE CONSTRUCTION SHALL COMPLY WITH THE FOLLOWING:
   a. MORTAR SHALL BE COMPOSED OF TYPE II PORTLAND CEMENT AND SAND WITH OR WITHOUT HYDRATED LIME ADDITION
   b. PROPORTIONS IN MORTAR OF PARTS BY VOLUMES SHALL BE PER TABLE 704-4:
      (1) 4.5 PARTS SAND AND 1.5 PARTS CEMENT; OR
      (2) 4.5 PARTS SAND, ONE PART CEMENT AND 0.5 PART HYDRATED LIME;
   c. CEMENT SHALL BE TYPE II PORTLAND CEMENT THAT IS CERTIFIED BY ITS MANUFACTURER AS CONFORMING TO THE ASTM C150/C150M STANDARD IN EFFECT AT THE TIME THE CEMENT WAS MANUFACTURED
   d. HYDRATED LIME SHALL BE TYPE S THAT IS CERTIFIED BY ITS MANUFACTURER AS CONFORMING TO THE ASTM C207 STANDARD IN EFFECT AT THE TIME THE HYDRATED LIME WAS PROCESSED
   e. SAND SHALL CONSIST OF INERT NATURAL SAND THAT IS CERTIFIED BY ITS SUPPLIER AS CONFORMING TO THE ASTM C33 STANDARD IN EFFECT AT THE TIME THE SAND IS PROCESSED BY STANDARD SPECIFICATIONS FOR CONCRETE, FINE AGGREGATES
   f. CONCRETE FOR DROP SUPPORTS SHALL CONFORM TO THE REQUIREMENT FOR CLASS AAA CONCRETE OF THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION'S STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION AS AVAILABLE AT:

   HTTP: //WWW.NH.GOV/DOT/ORG/PROJECTDEVELOPMENT/HIGHWAYDESIGN/SPECIFICATIONS/INDEX.HTM
2. SHELVES SHALL BE CONSTRUCTED TO THE ELEVATION OF THE HIGHEST PIPE CROWN AND SLOPED TO DRAIN TOWARD THE FLOWING THROUGH CHANNEL IN ACCORDANCE WITH ENV-WQ 704.12 (K).
3. ALL MANHOLES SHALL BE TESTED FOR LEAKAGE IN ACCORDANCE WITH ENV-WQ 704.17 (a) THROUGH (e).
4. SEWER MANHOLE COVERS SHALL CONFORM TO ASTM A48/48M WITH A CASTING EQUAL TO CLASS 30 IN ACCORDANCE WITH ENV-WQ 704.13 (a) (8).
5. ALL PRECAST SECTIONS SHALL BE COATED ON THE EXTERIOR WITH A BITUMINOUS DAMP-PROOFING COATING IN ACCORDANCE WITH ENV-WQ 704.12 (J).
6. ALL PRECAST SECTIONS AND BASES SHALL HAVE THE DATE OF MANUFACTURE AND THE NAME OR TRADEMARK OF THE MANUFACTURER IMPRESSED OR INDELIBLY MARKED ON THE INSIDE WALL PER ENV-WQ 704.12(I).
7. BRICK MASONRY SHALL CONFORM TO ASTM C32 (ENV-WQ 704.12(a)(9))

SEWER MANHOLE

NOT TO SCALE

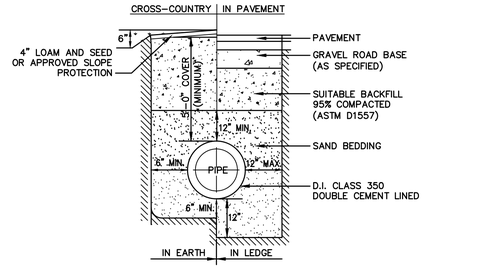


SEPARATION NOTES:

1. WATER MAINS SHALL BE LAID AT LEAST 10 FEET HORIZONTALLY FROM ANY EXISTING OR PROPOSED SEWERS. THE DISTANCE SHALL BE MEASURED EDGE TO EDGE.
2. WATER MAINS CROSSING SEWERS SHALL BE LAID TO PROVIDE A MINIMUM VERTICAL DISTANCE OF 18 INCHES BETWEEN PIPES. SEWER PIPE JOINTS SHALL BE LOCATED AT LEAST 6 FEET HORIZONTALLLY FROM THE WATER MAIN.

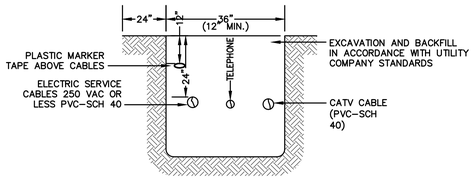
TYPICAL WATER / SEWER SEPARATION

NOT TO SCALE



WATER SYSTEM TRENCH

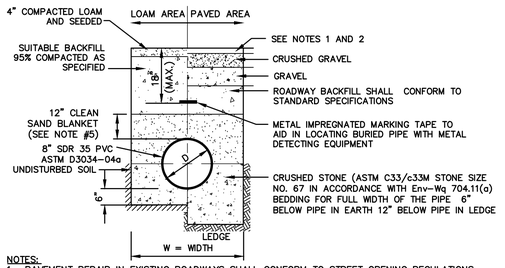
NOT TO SCALE



NOTE: ALL UTILITIES SHALL BE REVIEWED AND APPROVED BY APPROPRIATE UTILITY COMPANY.

UTILITY TRENCH

NOT TO SCALE

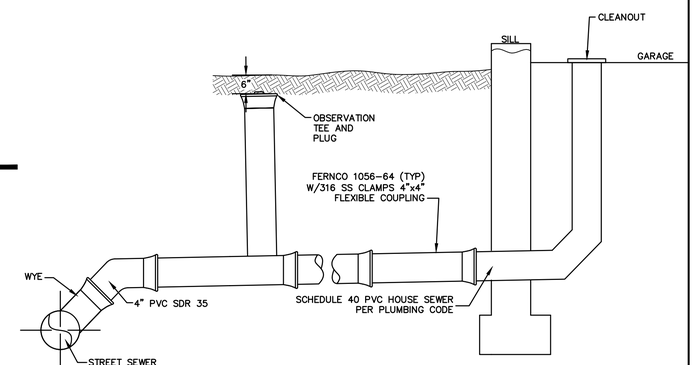


NOTES:

1. PAVEMENT REPAIR IN EXISTING ROADWAYS SHALL CONFORM TO STREET OPENING REGULATIONS.
2. NEW ROADWAY CONSTRUCTION SHALL CONFORM TO SUBDIVISION SPECIFICATIONS.
3. TRENCH BACKFILL SHALL CONFORM WITH ENV. Wq 704.11(h) AND BE FREE OF DEBRIS, PAVEMENT, ORGANIC MATTER, TOP SOIL, WET OR SOFT MUCK, PEAT OR CLAY, EXCAVATED LEDGE OR ROCKS OVER SIX INCHES.
4. W= MAXIMUM ALLOWABLE TRENCH WIDTH TO A PLANE 12" INCHES ABOVE THE PIPE. FOR PIPES 15 INCHES NOMINAL DIAMETER OR LESS, W SHALL BE NO MORE THAN 36"; FOR PIPES GREATER THAN 15 INCHES NOMINAL DIAMETER, W SHALL BE 24 INCHES PLUS PIPE O.D. W SHALL ALSO BE THE PAYMENT WIDTH FOR LEDGE EXCAVATION AND FOR ORDERED EXCAVATION BELOW GRADE.
5. RIGID FOAM INSULATION TO BE PROVIDED WHERE COVER IN THE ROADWAY IS LESS THAN 6' AND CROSS COUNTRY IS LESS THAN 4', PURSUANT TO DES WAIVER BEING ISSUED.
6. PIPE SAND BLANKET MATERIAL SHALL BE GRADED SAND, FREE FROM ORGANIC MATERIALS, GRADED SUCH THAT 100% PASSES A 1/2 " SIEVE AND A MAXIMUM OF 15% PASSES A #200 SIEVE IN ACCORDANCE WITH Env-Wq 704.11(b).
7. JOINT SEALS FOR PVC PIPE SHALL BE OIL RESISTANT COMPRESSION RINGS OF ELASTOMERIC MATERIAL AND CERTIFIED BY THE MANUFACTURER AS CONFORMING TO THE ASTM D3212 STANDARD IN EFFECT WHEN THE JOINT SEALS WERE MANUFACTRED, AND SHALL BE PUSH-ON, BELL-AND-SPIGOT TYPE PER Env-Wq 704.05 (e).

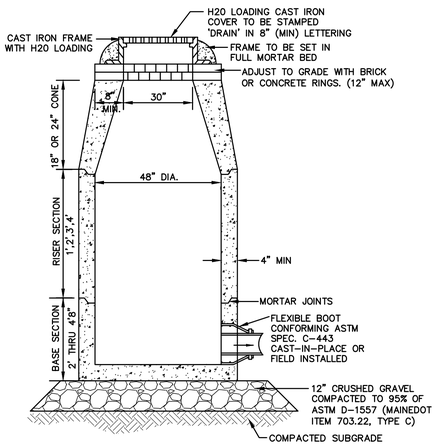
SEWER TRENCH

NOT TO SCALE



HOUSE SEWER SERVICE

NOT TO SCALE



NOTES:

1. BASE SECTION SHALL BE MONOLITHIC WITH 48" INSIDE DIAMETER.
2. ALL SECTIONS SHALL BE DESIGNED FOR H20 LOADING.
3. CONCRETE SHALL BE COMPRESSIVE STRENGTH 4000 PSI, TYPE II CEMENT.
4. FRAMES AND GRATES SHALL BE HEAVY DUTY AND DESIGNED FOR H20 LOADING.
5. PROVIDE "V" KNOCKOUTS FOR PIPES WITH 2" MAX. CLEARANCE TO OUTSIDE OF PIPE. MORTAR ALL PIPE CONNECTIONS SO AS TO BE WATERTIGHT.
6. JOINT SEALANT BETWEEN PRECAST SECTIONS SHALL BE BUTYL RUBBER.
7. ALL DRAIN MANHOLE FRAMES AND GRATES SHALL BE NEENAH R-1798 OR APPROVED EQUAL (30" DIA. TYPICAL).
8. STANDARD FRAME(S) AND GRATE(S) SHALL BE SET IN FULL MORTAR BED. ADJUST TO GRADE WITH CLAY BRICK AND MORTAR (2 BRICK COURSES TYPICALLY, 5 BRICK COURSES MAXIMUM, BUT NO MORE THAN 12"), OR PRECAST CONCRETE 'DONUTS'.

DRAIN MANHOLE (4' DIAM.)

NOT TO SCALE

Design: DJM	Draft: KDR
Checked: PSL	Scale: AS NOTED
Date: 3/15/24	Project No.: 24029
Drawing Name: 24029-PLAN.dwg	

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STATE OF NEW HAMPSHIRE — PAIGE S. LIBBEY No.16670 — LICENSED PROFESSIONAL ENGINEER — 03/18/2025

REV.	DATE	REVISION	BY
10	3/18/25	REVISED PER TOWN ENGINEER & TRC COMMENTS	DJM
9	2/13/25	FULL DESIGN FOR REVISED LAYOUT	DJM
8	1/31/25	REVISED LAYOUT PER CONSERVATION COMMISSION	DJM
7	1/13/25	REVISED PER TOWN ENGINEER & TRC COMMENTS	DJM
6	1/6/25	GRADING PLAN FOR CONSERVATION COMMISSION	DJM

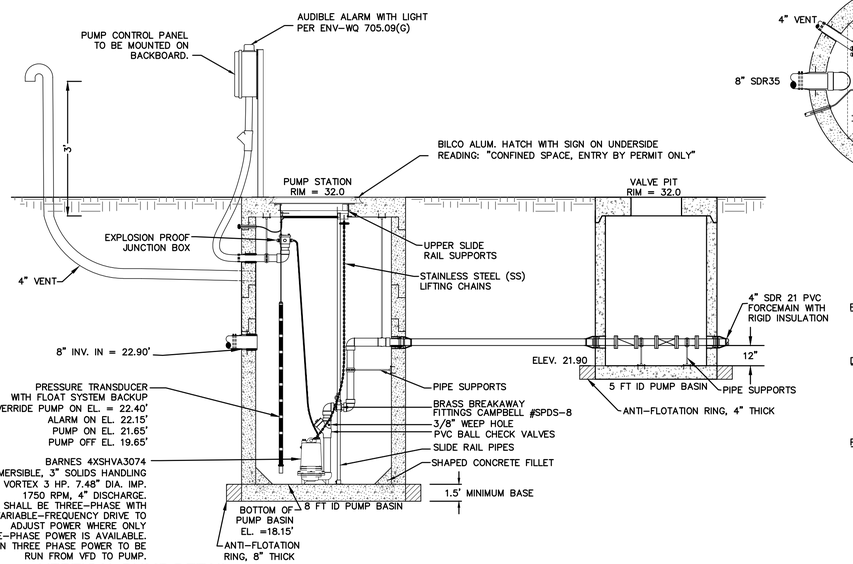
Designed and Produced in NH
Jones & Beach Engineers, Inc.
85 Portsmouth Ave. Civil Engineering Services 603-772-4746
PO Box 219
Stratham, NH 03885
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	DETAIL SHEET
Project:	"LILAC PLACE" 76 PORTSMOUTH AVE, EXETER, NH
Owner of Record:	RAP REALTY MANCHESTER LLC 50 ATLANTIC AVE, SEABROOK, NH

DRAWING No.

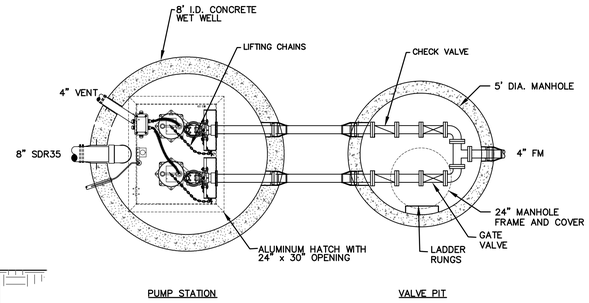
D2

SHEET 23 OF 31
JBE PROJECT NO. 24029



VERTICAL PUMP DETAIL

NOT TO SCALE



PUMP INFORMATION:

ELEV. HEAD:	12.49'
FRICTION HEAD:	3.09'
VELOCITY HEAD:	0.21'
TOTAL HEAD:	15.79'

DOSING INFORMATION:

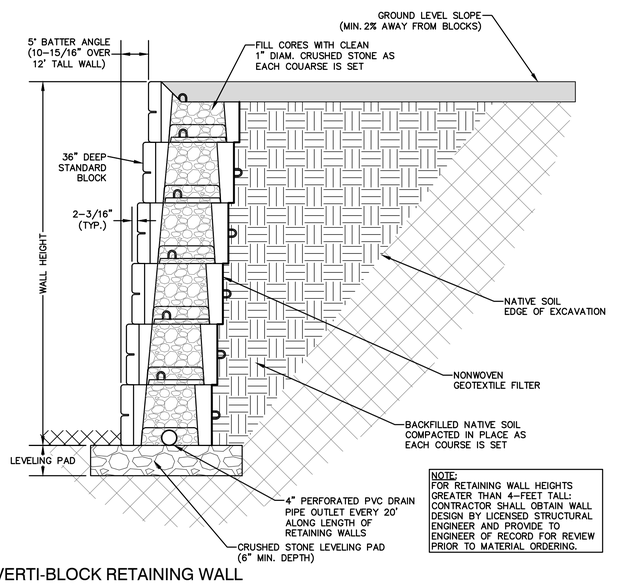
DESIGN FLOW: 120 GPM
VOLUME OF DOSE = 752 GALLONS
NO. OF DOSES/PUMP = 9.5 DOSES/DAY
PUMPING TIME = 6.3 MINUTES
VELOCITY IN DISCHARGE LINES = 3.71 FPS
EACH PUMP TO MAINTAIN MIN. PUMP RATE OF 120 GPM

PUMP STATION NOTES:

1. ALL JOINTS SHALL BE SEALED WITH A BUTYL JOINT SEALENT.
2. PUMPS TO BE WIRED TO DOSE AT ALTERNATING INTERVALS.
3. SEPARATE ELECTRICAL CIRCUITS SHALL BE PROVIDED FOR EACH OF THE PUMPS (SEPARATELY) AND ALARM SYSTEMS. ALL TO BE WIRED TO THE STAND-BY GENERATOR, AS REQUIRED.
4. RUN SINGLE-PHASE ELECTRIC CONDUIT TO A VARIABLE-FREQUENCY DRIVE, THEN THREE PHASE POWER TO BE RUN FROM VFD TO PUMP.

NOTES:

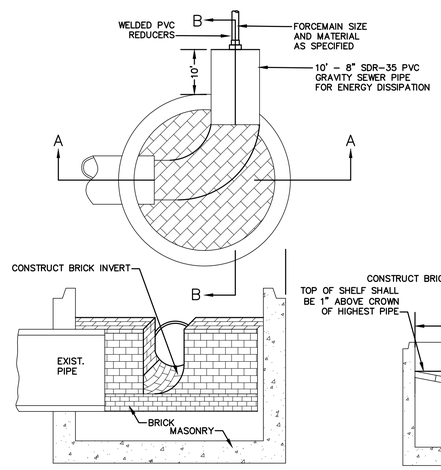
1. ALL COMPONENT PARTS OF MANHOLE STRUCTURES SHALL HAVE THE STRENGTH, LEAK RESISTANCE AND SPACE NECESSARY FOR THE INTENDED SERVICE.
2. THERE IS NO NEARBY BASE FLOOD ELEVATION FOR THE PROJECT. SEE SHEET OV-1, NOTE 9.
3. MANHOLE STRUCTURES SHALL HAVE A LIFE EXPECTANCY OF AT LEAST 25 YEARS.
4. MANHOLE STRUCTURES SHALL BE DESIGNED TO WITHSTAND HS-20 LOADING AND SHALL NOT LEAK IN EXCESS OF ONE GPD PER VERTICAL FOOT OF MANHOLE FOR THE LIFE OF THE STRUCTURE.
5. BASE SECTIONS SHALL BE OF MONOLITHIC CONSTRUCTION TO A POINT AT LEAST 6 INCHES ABOVE THE CROWN OF THE INCOMING PIPE.
6. HORIZONTAL JOINTS BETWEEN SECTIONS OF PRECAST CONCRETE BARRELS SHALL BE OF AN OVERLAPPING TYPE SEALED FOR WATER TIGHTNESS USING A DOUBLE ROW OF AN ELASTOMERIC OR MASTIC-LIKE SEALANT.
7. PER NHDES ENV-WQ 704.13(C), MORTAR USED IN MANHOLE CONSTRUCTION SHALL COMPLY WITH THE FOLLOWING:
   (1) MORTAR SHALL BE COMPOSED OF TYPE II PORTLAND CEMENT AND SAND WITH OR WITHOUT HYDRATED LIME ADDITION
   (2) PROPORTIONS IN MORTAR OF PARTS BY VOLUMES SHALL BE PER TABLE 704-4:
      A. 4.5 PARTS SAND AND 1.5 PARTS CEMENT; OR
      B. 4.5 PARTS SAND, ONE PART CEMENT AND 0.5 PART HYDRATED LIME;
   (1) CEMENT SHALL BE TYPE II PORTLAND CEMENT THAT IS CERTIFIED BY ITS MANUFACTURER AS CONFORMING TO THE ASTM C150/C150M STANDARD IN EFFECT AT THE TIME THE CEMENT WAS MANUFACTURED
   (2) HYDRATED LIME SHALL BE TYPE S THAT IS CERTIFIED BY ITS MANUFACTURER AS CONFORMING TO THE ASTM C207 STANDARD IN EFFECT AT THE TIME THE HYDRATED LIME WAS PROCESSED
   (3) SAND SHALL CONSIST OF INERT NATURAL SAND THAT IS CERTIFIED BY ITS SUPPLIER AS CONFORMING TO THE ASTM C33 STANDARD IN EFFECT AT THE TIME THE SAND IS PROCESSED BY 'STANDARD SPECIFICATIONS FOR CONCRETE, FINE AGGREGATES
   (4) CONCRETE FOR DROP SUPPORTS SHALL CONFORM TO THE REQUIREMENT FOR CLASS AAA CONCRETE OF THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION'S 'STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION AS AVAILABLE AT: HTTP://WWW.NH.GOV/DOT/ORG/PROJECTDEVELOPMENT/HIGHWAYDESIGN/SPECIFICATIONS/INDEX.HTM
7. ALL MANHOLES SHALL BE TESTED FOR LEAKAGE IN ACCORDANCE WITH ENV-WQ 704.17 (a) THROUGH (e). WET WELLS SHALL BE TESTED FOR LEAKAGE IN ACCORDANCE WITH ENV-WQ 705.02(i).
8. ALL PRECAST SECTIONS SHALL BE COATED ON THE EXTERIOR WITH A BITUMINOUS DAMP-PROOFING COATING IN ACCORDANCE WITH ENV-WQ 704.12 (J).
9. ALL PRECAST SECTIONS AND BASES SHALL HAVE THE DATE OF MANUFACTURE AND THE NAME OR TRADEMARK OF THE MANUFACTURER IMPRESSED OR INDELIBLY MARKED ON THE INSIDE WALL PER Env-Wq 704.12(i).
10. ALL PRESSURE PVC PIPES TO CONFORM TO ASTM D2241 PER ENV-WQ 704.08(C), AS APPLICABLE.
11. PUMPS AND ELECTRICAL COMPONENTS IN THE WET WELL SHALL BE DESIGNED FOR CLASS I DIVISION 1 LOCATIONS.
12. PUMP CONTROL PANEL TO HAVE INDIVIDUAL PUMP RUN METERS.
13. PUMP STATION ALARM CONDITIONS
    a. HIGH WATER ALARM
    b. LOW WATER ALARM
    c. PHASE LOSS
13. WITHIN 60 DAYS OF SUBSTANTIAL PROJECT COMPLETION AND A FINAL OWNER/OPERATOR IS DETERMINED, THE ENGINEER WILL SUBMIT AN EMERGENCY OPERATIONS PLAN AND PROCEDURES PER ENV-WQ 705.10.
14. A PERMANENT GENERATOR FOR BACK-UP POWER SUPPLY WITH A SOUND ATTENUATING ENCLOSURE SHALL BE INSTALLED.
15. SHOP DRAWINGS MUST BE SUBMITTED TO TOWN OF EXETER AND THE PROJECT'S THIRD PARTY INSPECTOR FOR REVIEW.



NOTE:
FOR RETAINING WALL HEIGHTS GREATER THAN 4-FEET TALL: CONTRACTOR SHALL OBTAIN WALL DESIGN BY LICENSED STRUCTURAL ENGINEER AND PROVIDE TO ENGINEER OF RECORD FOR REVIEW PRIOR TO MATERIAL ORDERING.

VERTI-BLOCK RETAINING WALL

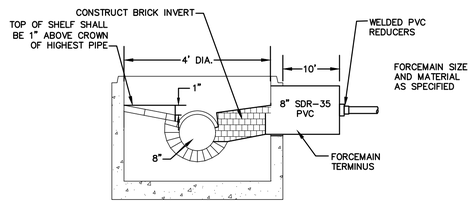
NOT TO SCALE



SECTION A-A

NOTES:

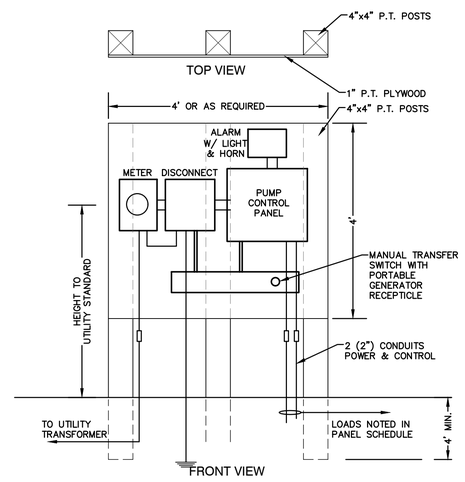
1. CARE SHALL BE TAKEN TO INSURE THAT THE BRICK INVERT IS A SMOOTH CONTINUATION OF THE SEWER INVERT. INVERT BRICKS SHALL BE LAID ON EDGE
2. INVERT AND SHELF TO BE PLACED AFTER LEAKAGE TEST.



SECTION B-B

FORCEMAIN TERMINUS INTO NEW MANHOLE

NOT TO SCALE



EQUIPMENT BACKBOARD

NOT TO SCALE

Design: DJM	Draft: KDR	Date: 3/15/24
Checked: PSL	Scale: AS NOTED	Project No.: 24029
Drawing Name: 24029-PLAN.dwg		

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PAIGE S. LIBBEY No.16670 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE 03/18/2025

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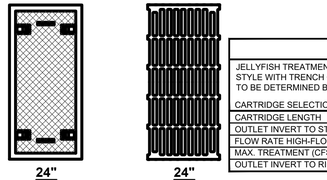
Designed and Produced in NH
Jones & Beach Engineers, Inc.
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
Civil Engineering Services
603-772-4746
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	DETAIL SHEET
Project:	"LILAC PLACE" 76 PORTSMOUTH AVE, EXETER, NH
Owner of Record:	RAP REALTY MANCHESTER LLC 50 ATLANTIC AVE, SEABROOK, NH

DRAWING No.

D3

SHEET 24 OF 31
JBE PROJECT NO. 24029



24" TRENCH COVER

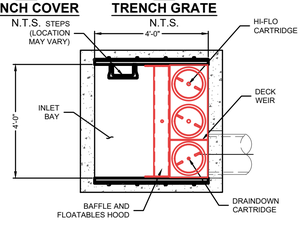
24" TRENCH GRATE

JELLYFISH DESIGN NOTES

JELLYFISH TREATMENT CAPACITY IS A FUNCTION OF THE CARTRIDGE LENGTH AND THE NUMBER OF CARTRIDGES. THE STANDARD SURFACE INLET STYLE WITH TRENCH GRATE AND COVER IS SHOWN. ALTERNATE CURB INLET OR PIPE INLET OPTIONS ARE AVAILABLE. PEAK CONVEYANCE CAPACITY TO BE DETERMINED BY ENGINEER OF RECORD.

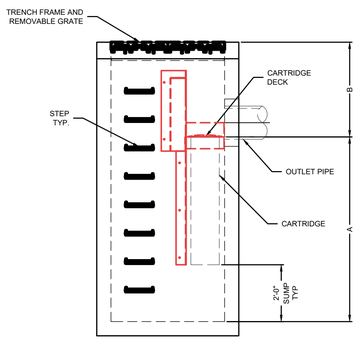
CARTRIDGE SELECTION

CARTRIDGE LENGTH	54"	40"	27"	15"
OUTLET INVERT TO STRUCTURE INVERT (A)	6'-6"	5'-4"	4'-3"	3'-3"
FLOW RATE HIGH-FLO / DRAINDOWN (CFS) (PER CART)	0.178 / 0.089	0.133 / 0.067	0.089 / 0.045	0.049 / 0.025
MAX. TREATMENT (CFS)	0.45	0.33	0.22	0.12
OUTLET INVERT TO RIM (MIN) (B)	3'-4"	3'-4"	3'-4"	3'-4"



PLAN VIEW
(TOP SLAB NOT SHOWN FOR CLARITY)

SITE SPECIFIC DATA REQUIREMENTS		
STRUCTURE ID	#1	#2
WATER QUALITY FLOW RATE (cfs)	0.34	0.22
PEAK FLOW RATE (cfs)	2.72	1.84
RETURN PERIOD OF PEAK FLOW (yrs)	50	50
# OF CARTRIDGES REQUIRED (HF / DD)	2/1	2/1
CARTRIDGE LENGTH	40"	27"
PIPE DATA: SEE GRADING AND DRAINAGE PLAN		
SEE GENERAL NOTES 6-7 FOR INLET AND OUTLET HYDRAULIC AND SIZING REQUIREMENTS.		
RIM ELEVATION	SEEPLAN	
NOTES/SPECIAL REQUIREMENTS:		
* PER ENGINEER OF RECORD		



ELEVATION VIEW

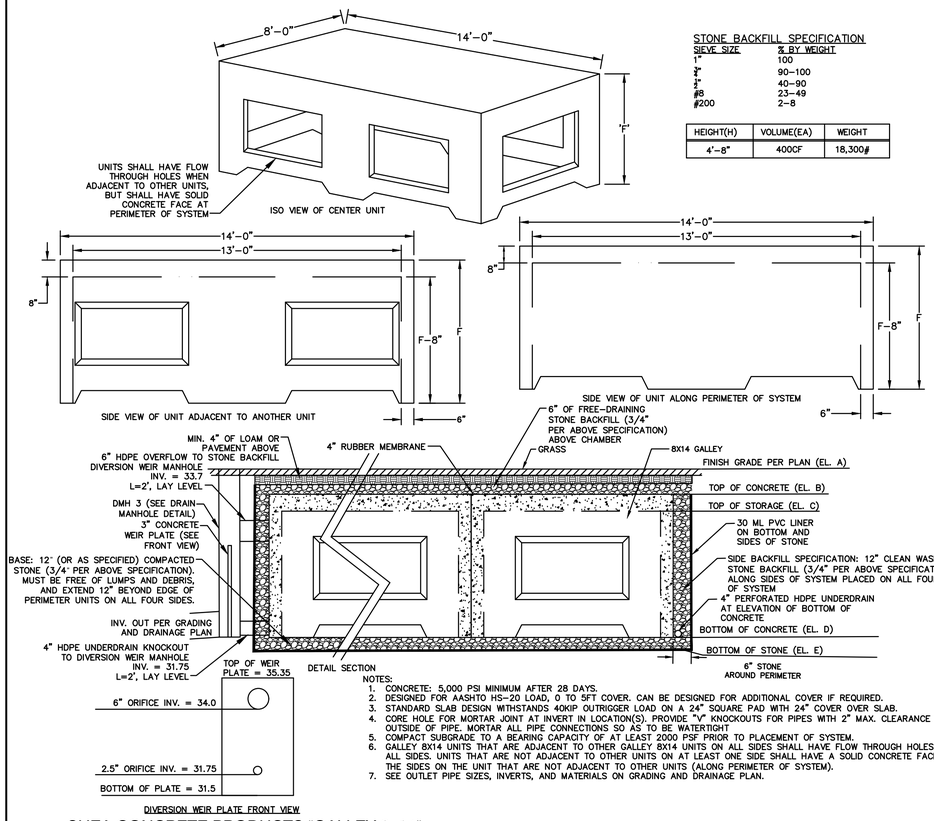
GENERAL NOTES:
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. FOR SITE SPECIFIC DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS REPRESENTATIVE. www.ContechES.com
3. JELLYFISH WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
4. STRUCTURE SHALL MEET AASHTO HS-20 OR PER APPROVING JURISDICTION REQUIREMENTS, WHICHEVER IS MORE STRINGENT, ASSUMING EARTH COVER OF 0', AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 LOAD RATING AND BE CAST WITH THE CONTECH LOGO.
5. STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C-857, ASTM C-918, AND AASHTO LOAD FACTOR DESIGN METHOD.
6. OUTLET PIPE INVERT IS EQUAL TO THE CARTRIDGE DECK ELEVATION.
7. THE OUTLET PIPE DIAMETER FOR NEW INSTALLATIONS IS RECOMMENDED TO BE ONE PIPE SIZE LARGER THAN THE INLET PIPE (WHERE APPLICABLE) AT EQUAL OR GREATER SLOPE.
8. NO PRODUCT SUBSTITUTIONS SHALL BE ACCEPTED UNLESS SUBMITTED 10 DAYS PRIOR TO PROJECT BID DATE, OR AS DIRECTED BY THE ENGINEER OF RECORD.

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STRUCTURE.
C. CONTRACTOR WILL INSTALL AND LEVEL THE STRUCTURE, SEALING THE JOINTS, LINE ENTRY AND EXIT POINTS (NON-SHRINK GROUT WITH APPROVED WATERSTOP OR FLEXIBLE BOOT).
D. CARTRIDGE INSTALLATION, BY CONTECH, SHALL OCCUR ONLY AFTER SITE HAS BEEN STABILIZED AND THE JELLYFISH UNIT IS CLEAN AND FREE OF DEBRIS. CONTACT CONTECH TO COORDINATE CARTRIDGE INSTALLATION WITH SITE STABILIZATION.

Jellyfish® Filter
THIS PRODUCT MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING: U.S. PATENTS 7,425,262; 7,470,366; 7,704,393; 8,277,647; 8,303,811; 8,512,561; 8,790,515; 9,095,792; 9,162,166; 9,227,151; 9,339,741; 9,352,256; 9,358,484; 9,375,661; 9,382,708; 9,457,301; 9,504,941; 9,643,107; 9,656,190; 9,675,911; 9,675,912; 9,675,913; 9,675,914; 9,675,915; 9,675,916; 9,675,917; 9,675,918; 9,675,919; 9,675,920; 9,675,921; 9,675,922; 9,675,923; 9,675,924; 9,675,925; 9,675,926; 9,675,927; 9,675,928; 9,675,929; 9,675,930; 9,675,931; 9,675,932; 9,675,933; 9,675,934; 9,675,935; 9,675,936; 9,675,937; 9,675,938; 9,675,939; 9,675,940; 9,675,941; 9,675,942; 9,675,943; 9,675,944; 9,675,945; 9,675,946; 9,675,947; 9,675,948; 9,675,949; 9,675,950;

CONTRACTOR ORDER SCHEDULE						
	FLOW-THROUGH HOLES ON ALL SIDES	NO FLOW-THROUGH HOLES ON ONE 8' SIDE	NO FLOW-THROUGH HOLES ON ONE 14' SIDE	NO FLOW-THROUGH HOLES ON ONE 8' AND ONE 14' SIDE	NO FLOW-THROUGH HOLES ON TWO 8' SIDES	NO FLOW-THROUGH HOLES ON TWO 8' AND ONE 14' SIDE
SYSTEM A	6	2	12	4	0	0

ELEVATION SCHEDULE						
	EL. A	EL. B	EL. C	EL. D	EL. E	F (HEIGHT)
SYSTEM A	>37.5	36.42	35.75	31.75	30.75	4.67'



STONE BACKFILL SPECIFICATION

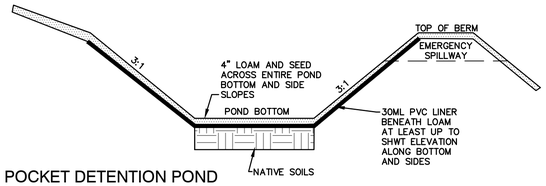
SIEVE SIZE	% BY WEIGHT
1"	100
¾"	90–100
⅜"	40–90
#8	23–49
#200	2–8

HEIGHT(H)	VOLUME(EA)	WEIGHT
4'-8"	400CF	18,300#

NOTES:
1. CONCRETE: 5,000 PSI MINIMUM AFTER 28 DAYS.
2. DESIGNED FOR AASHTO HS-20 LOAD, 0 TO 5FT COVER. CAN BE DESIGNED FOR ADDITIONAL COVER IF REQUIRED.
3. STANDARD SLAB DESIGN WITHSTANDS 40KIP OUTRIGGER LOAD ON A 24" SQUARE PAD WITH 24" COVER OVER SLAB.
4. CORE HOLE FOR MORTAR JOINT AT INVERT IN LOCATION(S). PROVIDE "V" KNOCKOUTS FOR PIPES WITH 2" MAX. CLEARANCE TO OUTSIDE OF PIPE. MORTAR ALL PIPE CONNECTIONS SO AS TO BE WATERTIGHT
5. COMPACT SUBGRADE TO A BEARING CAPACITY OF AT LEAST 2000 PSF PRIOR TO PLACEMENT OF SYSTEM.
6. GALLEY 8X14 UNITS THAT ARE ADJACENT TO OTHER GALLEY 8X14 UNITS ON ALL SIDES SHALL HAVE FLOW THROUGH HOLES ON ALL SIDES. UNITS THAT ARE NOT ADJACENT TO OTHER UNITS ON AT LEAST ONE SIDE SHALL HAVE A SOLID CONCRETE FACE ON THE SIDES ON THE UNIT THAT ARE NOT ADJACENT TO OTHER UNITS (ALONG PERIMETER OF SYSTEM).
7. SEE OUTLET PIPE SIZES, INVERTS, AND MATERIALS ON GRADING AND DRAINAGE PLAN.

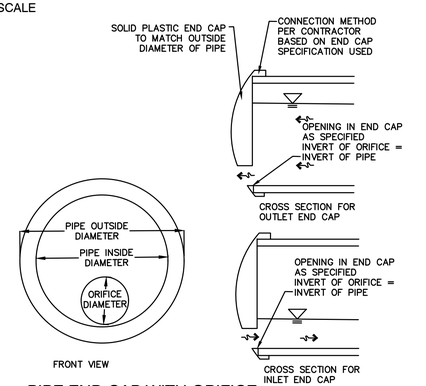
SHEA CONCRETE PRODUCTS "GALLEY 8x14"

NOT TO SCALE



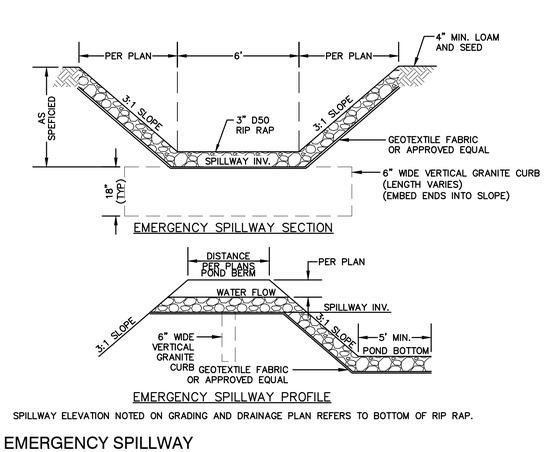
POCKET DETENTION POND

NOT TO SCALE



PIPE END CAP WITH ORIFICE

NOT TO SCALE

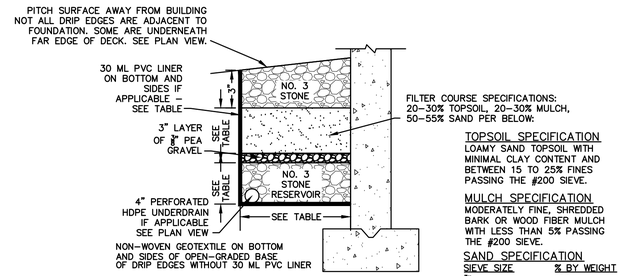


SPILLWAY ELEVATION NOTED ON GRADING AND DRAINAGE PLAN REFERS TO BOTTOM OF RIP RAP.

EMERGENCY SPILLWAY

NOT TO SCALE

DRIP EDGE SPECIFICATIONS SCHEDULE									
BUILDING#	LENGTH (FT.)	WIDTH (FT.)	TOTAL DEPTH (FT.)	FILTER COURSE DEPTH (IN.)	STONE RESERVOIR DEPTH (IN.)	MIN. TOP EL.	MIN. BOTTOM EL.	STONE OR FILTRATION	LINED AND UNDERDRAINED?
1	131	3.25	2.75	18	9	38.0	35.25	FILTRATION	YES
2	101	3.75	2.75	18	9	37.75	35.0	FILTRATION	YES
3	120	3.0	2.75	18	9	37.0	34.25	FILTRATION	YES
4	72	2.75	2.75	18	9	36.0	33.25	FILTRATION	YES
5	48	3.5	3.25	24	9	26.0	22.75	FILTRATION	YES
6	48	3.5	3.25	24	9	25.6	22.35	FILTRATION	YES
7	48	3.5	3.25	24	9	26.25	23.00	FILTRATION	YES
8	50	3.5	2.75	18	9	33.25	30.50	FILTRATION	YES
9	74	3.5	2.75	18	9	33.0	30.25	FILTRATION	YES
10	50	3.5	2.75	18	9	36.0	33.25	FILTRATION	YES
11	116	5.5	2.25	N/A	N/A	37.5	35.25	STONE	NO



TOPSOIL SPECIFICATION
LOAMY SAND TOPSOIL WITH MINIMAL CLAY CONTENT AND BETWEEN 15 TO 25% FINES PASSING THE #200 SIEVE.

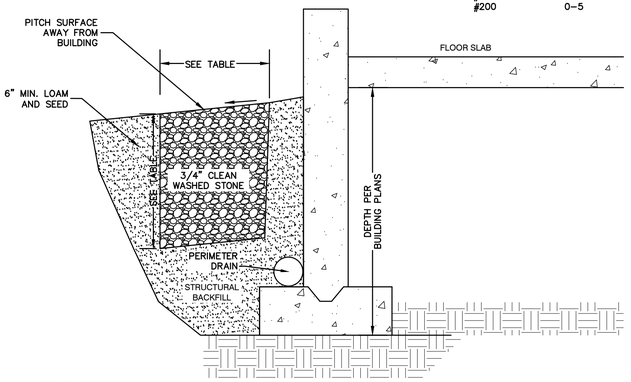
MULCH SPECIFICATION
MODERATELY FINE, SHREDDED BARK OR WOOD FIBER MULCH WITH LESS THAN 5% PASSING THE #200 SIEVE.

SAND SPECIFICATION

SIEVE SIZE	% BY WEIGHT
⅜"	100
#4	95–100
#8	80–100
#16	50–85
#30	25–60
#60	10–30
#100	2–10
#200	0–5

FILTRATION DRIP EDGE DETAIL

NOT TO SCALE



PLACE STONE DRIP EDGE UNDERNEATH DECK WITH ADEQUATE SEPARATION TO BUILDING WALL TO AVOID INFILTRATION TO PERIMETER DRAIN

STONE DRIP EDGE DETAIL

NOT TO SCALE

Design: DJM	Draft: KDR	Date: 3/15/24	
Checked: PSL	Scale: AS NOTED	Project No.: 24029	
Drawing Name: 24029-PLAN.dwg			

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STATE OF NEW HAMPSHIRE – PAIGE S. LIBBEY No.16670 – LICENSED PROFESSIONAL ENGINEER – 03/28/2025

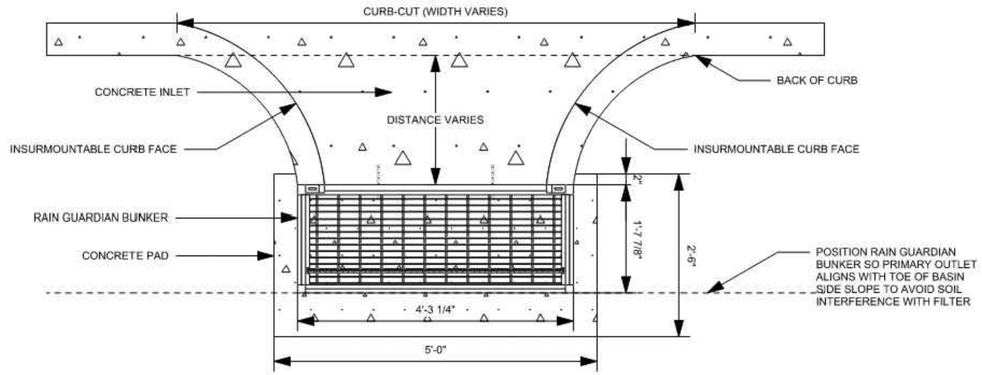
REV.	DATE	REVISION	BY
10	3/18/25	REVISED PER TOWN ENGINEER & TRC COMMENTS	DJM
9	2/13/25	FULL DESIGN FOR REVISED LAYOUT	DJM
8	1/31/25	REVISED LAYOUT PER CONSERVATION COMMISSION	DJM
7	1/13/25	REVISED PER TOWN ENGINEER & TRC COMMENTS	DJM
6	1/6/25	GRADING PLAN FOR CONSERVATION COMMISSION	DJM

Designed and Produced in NH
Jones & Beach Engineers, Inc.
85 Portsmouth Ave. Civil Engineering Services 603-772-4746
PO Box 219
Stratham, NH 03885
E-MAIL: JBE@JONESANDBEACH.COM

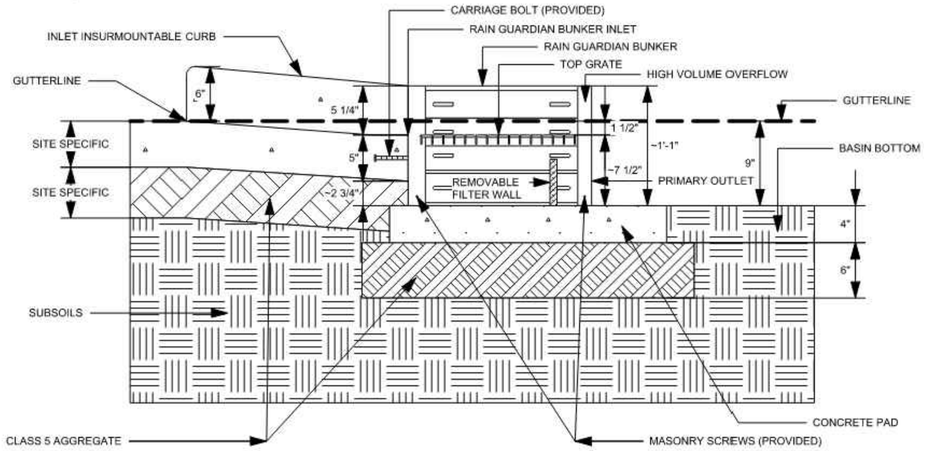
Plan Name:	DETAIL SHEET
Project:	"LILAC PLACE" 76 PORTSMOUTH AVE, EXETER, NH
Owner of Record:	RAP REALTY MANCHESTER LLC 50 ATLANTIC AVE, SEABROOK, NH

DRAWING No.
D5
SHEET 26 OF 31
JBE PROJECT NO. 24029

PLAN VIEW



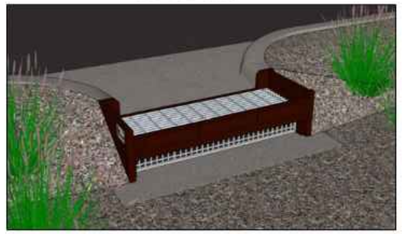
ELEVATION VIEW



PLAN VIEW NOTES

1. INLET WIDTH AND DISTANCE BETWEEN BACK OF CURB AND RAIN GUARDIAN BUNKER MAY VARY WITH SITE CONDITIONS. INSTALLATION FLUSH WITH THE BACK OF THE CURB CAN ALSO BE COMPLETED WITH THE RAIN GUARDIAN BUNKER.
2. CONCRETE PAD EXTENDS BEYOND THE FILTER WALL OF THE RAIN GUARDIAN BUNKER TO SERVE AS A SPLASH DISSIPATOR.

3D VIEWS





ELEVATION VIEW NOTES

1. THE TOP OF THE CLASS 5 BASE (COMPACTED TO 95% STANDARD PROCTOR) IS PRECISELY 1' 1" BELOW THE GUTTERLINE ELEVATION.
2. THE TOP OF THE CONCRETE PAD IS PRECISELY 9" BELOW THE GUTTERLINE.

SPECIFICATIONS

1. CHAMBER CONSTRUCTED OF RECYCLED PLASTIC LUMBER (95%+) MANUFACTURED AND DESIGNED TO ASTM C1028, D6108, D6109, D6111, D6117, AND D6341 (54 LBS).
2. TOP GALVANIZED METAL GRATE (35 LBS, 1" THICK) - 316 LB CONCENTRATED LOAD OR 158 LB/SQ-FT UNIFORM LOAD.

INSTALLATION NOTES

1. INSTALL THE CONCRETE PAD WITH A 1' 10" OFFSET FROM THE BACK OF THE CURB TO ACCOMMODATE THE CONCRETE INLET. THIS DISTANCE MAY VARY BASED ON SITE CONDITIONS, BUT CONSIDERATIONS SHOULD INCLUDE SLOPE OF THE INLET AND BASIN SIDE SLOPES ADJACENT TO THE RAIN GUARDIAN BUNKER. POSITION RAIN GUARDIAN BUNKER SO PRIMARY OUTLET ALIGNS WITH TOE OF BASIN SIDE SLOPE TO AVOID SOIL INTERFERENCE WITH REMOVABLE FILTER WALL. THE CONCRETE PAD SHOULD BE REINFORCED WITH REBAR.
2. EXCAVATE 1' 7" BELOW THE GUTTERLINE ELEVATION (I.E. THE BIORETENTION OVERFLOW ELEVATION) TO ACCOMMODATE THE 9" PONDING DEPTH, 6" CLASS 5 AGGREGATE, AND 4" CONCRETE PAD TO WHICH THE RAIN GUARDIAN BUNKER WILL BE SECURED. THEREFORE, THE TOP OF THE FINISHED CONCRETE PAD IS PRECISELY 9" BELOW THE GUTTERLINE ELEVATION. THE TOP OF THE RAIN GUARDIAN BUNKER METAL GRATE WILL BE 7-1/2" ABOVE THE TOP OF THE CONCRETE PAD AND 1-1/2" BELOW THE GUTTERLINE ELEVATION TO ACCOMMODATE A SLOPED INLET FROM THE GUTTER TO THE RAIN GUARDIAN BUNKER.
3. THE RAIN GUARDIAN BUNKER SHOULD BE POSITIONED 2" FROM THE EDGE OF THE CONCRETE PAD CLOSEST TO THE BACK OF THE CURB. THEREFORE, THE RAIN GUARDIAN BUNKER WILL BE 2' FROM THE BACK OF THE CURB.
4. USING THE PILOT HOLE IN EACH OF THE FOUR CORNER POSTS, PREDRILL 5/32" HOLES INTO THE CONCRETE PAD WITH A 4-1/2" MASONRY BIT AND HAMMER DRILL.
5. SECURE RAIN GUARDIAN BUNKER TO CONCRETE PAD WITH FOUR 3/16" X 2-3/4" MASONRY SCREWS (PROVIDED).
6. INSTALL FRAMING FOR INLET BETWEEN RAIN GUARDIAN BUNKER AND BACK OF CURB. TOP ELEVATIONS OF THE FRAMING SHOULD MATCH THE TOP OF THE CURB ON THE STREET SIDE AND THE TOP OF THE RAIN GUARDIAN BUNKER ON THE BIORETENTION SIDE.
7. WHEN POURING THE CONCRETE INLET, ENSURE THE CARRIAGE BOLTS ON THE RAIN GUARDIAN BUNKER ARE SURROUNDED BY AT LEAST 2" OF CONCRETE ON ALL SIDES.
8. SIDE CURBS OF THE POURED INLET MUST HAVE AN INSURMOUNTABLE PROFILE TO PREVENT WATER FLOW FROM OVERTOPPING THE DOWNSTREAM SIDE OF THE INLET.
9. WRAP CABLE THROUGH TOP METAL GRATE AND SECURE WITH PROVIDED CLAMP. ENSURE SUFFICIENT SLACK EXISTS IN CABLE TO ALLOW FOR GRATE REMOVAL AND PLACEMENT IN CONCRETE INLET DURING CLEANING. REMOVABLE FILTER WALL SHOULD BE INSTALLED WITH FILTER FABRIC FACING THE RAIN GUARDIAN BUNKER INLET.

RAIN GUARDIAN
U.S. PATENT NOS. 8,501,016 AND 8,858,804
PRETREATMENT FOR BIORETENTION
Rain Gardens • Swales • Filtration Basins • Infiltration Basins
www.RainGuardian.biz

NOTE: THE 9" RAIN GUARDIAN BUNKER IS A NON-STANDARD PRODUCT AND REQUIRES ADVANCED NOTICE WHEN ORDERING.

RAIN GUARDIAN BUNKER
PRETREATMENT CHAMBER
BIORETENTION PONDING DEPTH: 9"
TYPICAL DETAIL

REVISION HISTORY

REV	BY	DATE	DESCRIPTION
A	MDH	02/22/2022	BUNKER - 9"
SCALE		VARIABLE	
U.S. PATENT NOS.		8,501,016 AND 8,858,804	

DEVELOPED/MANUFACTURED BY:
ANOKA CONSERVATION DISTRICT

Design: DJM	Draft: KDR	Date: 3/15/24	
Checked: PSL	Scale: AS NOTED	Project No.: 24029	
Drawing Name: 24029-PLAN.dwg			

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STATE OF NEW HAMPSHIRE - PAIGE S LIBBEY No.16670 - LICENSED PROFESSIONAL ENGINEER - 03/18/2025

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Designed and Produced in NH
J/B Jones & Beach Engineers, Inc.
Civil Engineering Services
85 Portsmouth Ave.
PO Box 219
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603-772-4746
E-MAIL: JBE@JONESANDBEACH.COM

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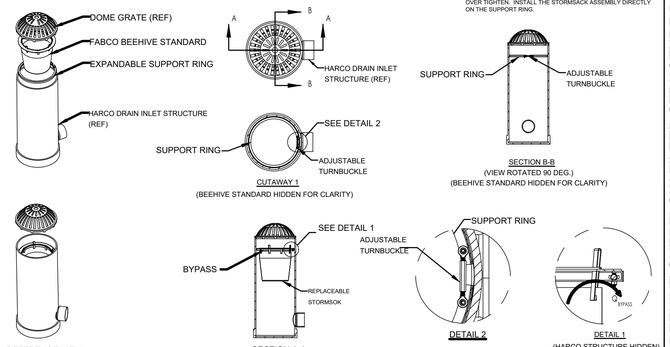
DRAWING No.
D7
SHEET 27 OF 31
JBE PROJECT NO. 24029

STRUCTURE DIAMETER (IN.)	DEBRIS CAPACITY (CU.FT)	FILTERED FLOWRATE (CFS)	BYPASS FLOWRATE (CFS)
12	0.66	1.7	1.0
15	1.0	2.1	1.3
18	1.2	2.3	1.4
24	2.8	3.9	2.2
30	2.8	3.9	2.2

NOTES:
1. MATERIAL:
   A) SUPPORT FLANGE: ALUMINUM ALLOY PLATE, 5000 SERIES
   B) STORMSOK: WOVEN POLYPROPYLENE GEOTEXTILE
   C) EXPANSION RING: ALUMINUM ALLOY CHANNEL, 6000 SERIES
   D) HARDWARE: STAINLESS STEEL
2. RECOMMENDED MINIMUM VAULT DEPTH: 2-IN BELOW STORMSOK
3. USE ONLY WITH FABCO REPLACEABLE STORMSOK

GENERAL INSTALLATION:

ADJUST THE TURNBUCKLE DOWN TO GIVE THE SMALLEST RING DIAMETER AND LOCATE THE EXPANSION RING INTO THE HARCO STRUCTURE MINIMUM OF 6-IN DOWN FROM THE TOP OPENING AS SHOWN. BEGIN OPENING THE TURNBUCKLE UNTIL THE EXPANSION RING IS SELF SUPPORTING, THEN VERIFY THE RING IS LEVEL AND PLUMB TO THE HARCO STRUCTURE. USING A CALIBRATED TORQUE WRENCH, CONTINUE TO OPEN THE TURNBUCKLE TO GIVEN TORQUE (MODEL-SPECIFIC). DO NOT OVER TIGHTEN. INSTALL THE STORMSACK ASSEMBLY DIRECTLY ON THE SUPPORT RING.



ACF BEEHIVE OVERFLOW FILTER STRUCTURE DETAILS

FOR MORE INFORMATION CONTACT ACF ENVIRONMENTAL
WWW.ACFENVIRONMENTAL.COM
800.448.3636

FocalPoint
FOR A FOCUS ON SYSTEMS

REVISED
AUG 2020

FOCALPOINT HP PERFORMANCE SPECIFICATION:

HIGH PERFORMANCE MEDIA

HIGH PERFORMANCE MEDIA MUST MEET A MINIMUM OF 100" PER HOUR INFILTRATION RATE.

HIGH PERFORMANCE STRUCTURAL UNDERDRAIN

MUST HAVE A MINIMUM OF 19 SQUARE INCHES OF ORIFICE OPENING PER SQUARE FOOT.
MUST MEET H20 LOADING REQUIREMENTS.
MUST BE MODULAR IN NATURE AND ASSEMBLED ON SITE.
MUST HAVE MINIMUM 90% INTERIOR VOID SPACE.

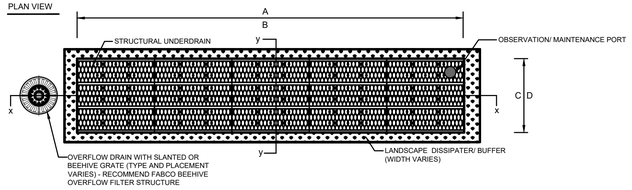
PLANT COMPONENT

SUPPLIER SHALL PROVIDE LIST OF ACCEPTABLE PLANTS
IF PLANTS ARE NOT INCLUDED IN THE LANDSCAPE CONTRACT/PLANS. SITE CONTRACTOR SHALL PROVIDE PLANTS.
PLANTS SHALL BE INSTALLED AT THE TIME THE SYSTEM IS COMMISSIONED FOR USE. PLANTING OUTSIDE THIS TIME REQUIRES APPROVAL BY THE ENGINEER/LANDSCAPE ARCHITECT OF RECORD.
SEE FOCALPOINT INSTALLATION GUIDE FOR PLANT SPACING, PLANTING PROCEDURES ETC.

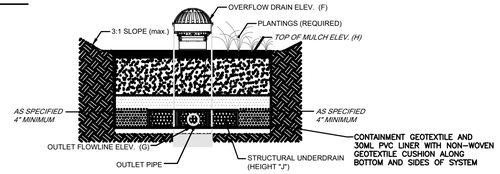
FOCALPOINT HP CONSTRUCTION GUIDE

A	FOCALPOINT LENGTH	SEE PLANS
B	# UNDERDRAIN LONG	SEE PLANS
C	FOCALPOINT WIDTH	SEE PLANS
D	# UNDERDRAIN WIDE	SEE PLANS
E	WATER QUALITY VOLUME	VARIES
F	OVERFLOW ELEVATION	SEE PLANS
G	OUTLET FLOWLINE	SEE PLANS
H	TOP OF MULCH	SEE PLANS
I	TOP OF GABION (OPTIONAL)	NO GABION
J	UNDERDRAIN HEIGHT	SEE PLANS

PLAN VIEW



SECTION Y-Y



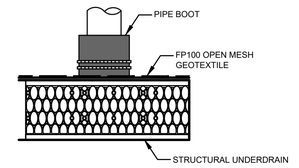
FOCALPOINT HP CONSTRUCTION GUIDE

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WWW.ACFENVIRONMENTAL.COM
800.448.3636

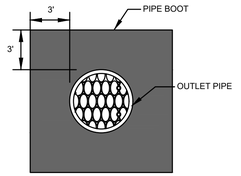
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AUG 2020

OBSERVATION/ MAINTENANCE PORT CONNECTION

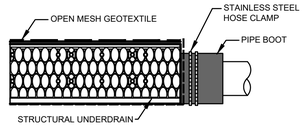


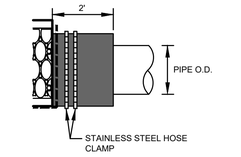
PIPE BOOT DETAIL



FRONT VIEW

OUTLET/ INLET PIPE CONNECTION





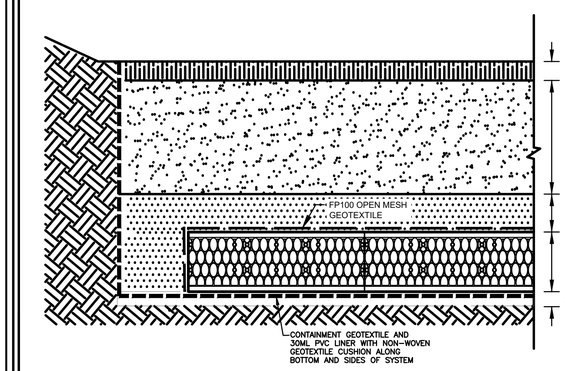
SIDE VIEW

FOCALPOINT PIPE CONNECTION

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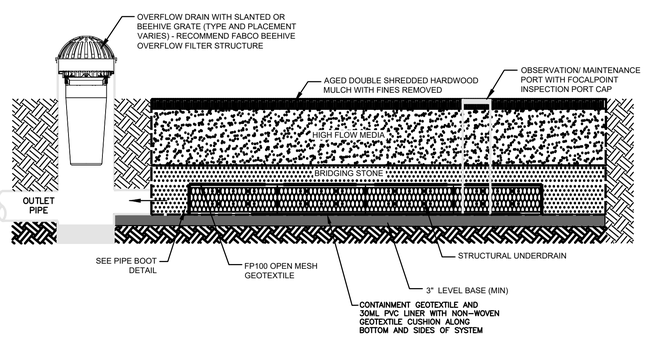


FOCALPOINT HP DETAILED CROSS SECTION

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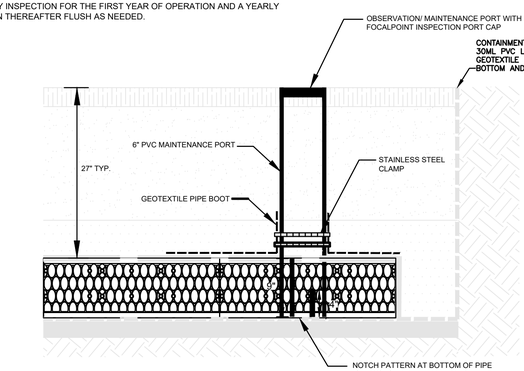
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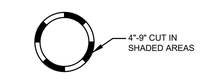
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AUG 2020

OBSERVATION/ MAINTENANCE PORT

PORT USED FOR INSPECTION PURPOSES AND FOR SYSTEM MAINTENANCE AS REQUIRED. WATER SHALL BE PUMPED INTO THE SYSTEM AND RESUSPEND ACCUMULATED SEDIMENT. MINIMUM REQUIRED MAINTENANCE INCLUDES A QUARTERLY INSPECTION FOR THE FIRST YEAR OF OPERATION AND A YEARLY INSPECTION THEREAFTER FLUSH AS NEEDED.



PIPE NOTCH PATTERN DETAIL



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Checked: PSL	Scale: AS NOTED
Drawing Name: 24029-PLAN.dwg	Date: 3/15/24
	Project No.: 24029

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I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER IN THE STATE OF NEW HAMPSHIRE
PAIGE S. LIBBEY No.16670 LICENSED PROFESSIONAL ENGINEER
03/18/2025

REV.	DATE	REVISION	BY
10	3/18/25	REVISED PER TOWN ENGINEER & TRC COMMENTS	DJM
9	2/13/25	FULL DESIGN FOR REVISED LAYOUT	DJM
8	1/31/25	REVISED LAYOUT PER CONSERVATION COMMISSION	DJM
7	1/13/25	REVISED PER TOWN ENGINEER & TRC COMMENTS	DJM
6	1/6/25	GRADING PLAN FOR CONSERVATION COMMISSION	DJM

Designed and Produced in NH
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Plan Name:	DETAIL SHEET
Project:	"LILAC PLACE" 76 PORTSMOUTH AVE, EXETER, NH
Owner of Record:	RAP REALTY MANCHESTER LLC 50 ATLANTIC AVE, SEABROOK, NH

DRAWING No.

D7

SHEET 28 OF 31
JBE PROJECT NO. 24029

CONSTRUCTION SPECIFICATIONS FOR POROUS ASPHALT

REFERENCE DOCUMENT: UNHSC DESIGN SPECIFICATIONS FOR POROUS ASPHALT PAVEMENT AND INFILTRATION BEDS, UNH STORMWATER CENTER, FEBRUARY, 2014, REVISED SEPTEMBER, 2016

INSTALLATION RECOMMENDATIONS

THE FOLLOWING RECOMMENDATIONS WILL HELP ASSURE THAT THE POROUS ASPHALT PAVEMENT IS PROPERLY INSTALLED.

1. THE FULL PAVEMENT SPECIFICATION MUST BE FOLLOWED CONSCIENTIOUSLY DURING CONSTRUCTION. IT IS BASED ON UNHSC DESIGN SPECIFICATIONS FOR POROUS ASPHALT PAVEMENT AND INFILTRATION BEDS. THE UNH SPECIFICATION INCLUDE NUMEROUS VITAL PROVISIONS FOR AGGREGATE AND BITUMINOUS MATERIALS, THEIR PLACEMENT, AND QUALITY CONTROL. AMONG ITS NOTABLE PROVISIONS ARE THE FOLLOWING EXAMPLES:
   - OPEN-GRADED AGGREGATE TO MAKE ALL PAVEMENT LAYERS POROUS AND PERMEABLE;
   - STIFF ASPHALT BINDER TO ADHERE TO THE AGGREGATE PARTICLES AND RESIST "DRAINDOWN" THROUGH THE PAVEMENT'S PORES, ENHANCING THE MATERIAL'S PERFORMANCE AND DURABILITY;
   - A SPECIFIC LIMIT ON ALLOWABLE DRAINDOWN, AND ADDITION OF A STYRENE-BUTADIENE-STYRENE (SBS) POLYMER ADDITIVE TO HELP MEET THAT REQUIREMENT;
   - THE POROUS PAVEMENT IS TO BE INSTALLED ONLY AFTER MAJOR CONSTRUCTION IS COMPLETED, SO THAT CONSTRUCTION TRAFFIC WILL NOT TRACK POTENTIALLY CLOGGING SEDIMENT ONTO THE PAVEMENT SURFACE. FOR CONSTRUCTION ACCESS, A TEMPORARY SURFACE WILL BE INSTALLED, SIMILAR IN CONSTRUCTION TO A STANDARD STABILIZED CONSTRUCTION ENTRANCE. THIS TYPE OF SURFACE CAN BEAR CONSTRUCTION TRAFFIC WITHOUT ERODING.
   - PROMINENT AND REPEATED STATEMENTS OF THE SPECIAL NATURE AND PURPOSE OF POROUS PAVEMENT, AND THE NECESSITY OF COMPLYING STRICTLY WITH THESE DISTINCTIVE SPECIFICATIONS.
   - PROTECTION OF THE FINISHED POROUS ASPHALT SURFACE FROM TRACKING OF CONSTRUCTION SEDIMENT.
2. THOROUGH COMMUNICATION WITH THE POROUS ASPHALT SUPPLIER AND PAVEMENT INSTALLER IS ESSENTIAL. THEY MUST UNDERSTAND THE POROUS PAVEMENT'S SPECIAL OBJECTIVES, THE SPECIAL MATERIALS AND PROCEDURES NECESSARY TO MAKE IT EFFECTIVE, AND WHY COMPLIANCE WITH SPECIFICATIONS IS ESSENTIAL. TO THIS END, THE SPECIFICATIONS STATE PROMINENTLY AND REPEATEDLY THE SPECIAL NATURE AND PURPOSE OF THE POROUS MATERIALS. IN ADDITION, THE PROJECT ENGINEER SHALL MEET WITH THE CONTRACTORS IN PERSON TO REVIEW THE SPECIFICATIONS AND MAKE SURE THE CONTRACTORS UNDERSTAND THE OBJECTIVES. HE SHALL OBSERVE THE CONTRACTORS ON-SITE FREQUENTLY, TO MAKE SURE THE OBJECTIVES ARE CARRIED OUT. HE SHALL MAINTAIN A WRITTEN RECORD DOCUMENTING REVIEW AND APPROVAL AT CRITICAL PROJECT STAGES SUCH AS EXCAVATION OF THE SUB GRADE AND QUALITY CHECKS OF BASE AND SURFACE MATERIALS. HE SHALL INSPECT THE SITE TO MAKE SURE CONSTRUCTION VEHICLES ARE NOT ALLOWED TO TRAVERSE EXCAVATED SUB GRADE OR THE PAVEMENT STRUCTURE AT ANY INAPPROPRIATE STAGE. HE SHALL FORBID CONSTRUCTION TRAFFIC FROM TRACKING SOIL ONTO THE FINISHED PAVEMENT SURFACE.

INSTALLATION

A. PERCOLATION BEDS
   1. OWNER SHALL BE NOTIFIED AT LEAST 24 HOURS PRIOR TO ALL PERCOLATION BED AND POROUS PAVING WORK.
   2. SUB GRADE PREPARATION
      a. EXISTING SUB GRADE UNDER BED AREAS SHALL NOT BE COMPACTED OR SUBJECT TO EXCESSIVE CONSTRUCTION EQUIPMENT TRAFFIC PRIOR TO STONE BED PLACEMENT.
      b. WHERE EROSION OF SUB GRADE HAS CAUSED ACCUMULATION OF FINE MATERIALS AND/OR SURFACE PONDING, THIS MATERIAL SHALL BE REMOVED WITH LIGHT EQUIPMENT AND THE UNDERLYING SOILS SCARIFIED TO A MINIMUM DEPTH OF 6 INCHES WITH A YORK RAKE OR EQUIVALENT AND LIGHT TRACTOR.
      c. BRING SUB GRADE OF STONE PERCOLATION BED TO LINE, GRADE, AND ELEVATIONS INDICATED. FILL AND LIGHTLY REGRADE ANY AREAS DAMAGED BY EROSION, PONDING, OR TRAFFIC COMPACTION BEFORE THE PLACING OF STONE. ALL BED BOTTOMS ARE LEVEL GRADE.
      d. WHERE PARKING LOT BASE IS NOT LEVEL, INTERNAL DAMS ARE TO BE INSTALLED EVERY 100 YARDS ALONG CONTOUR LINES IN THE COARSE SUBBASE MATERIALS (CRUSHED STONE). A SUBDRAIN SHALL BE LOCATED IMMEDIATELY UPSTREAM OF INTERNAL DAMS. DAMS ARE TO BE MADE OF OVERLYING FILTER COARSE OR MEDIUM TO FINE SAND EQUIVALENT.
   3. RECHARGE BED INSTALLATION
      a. UPON COMPLETION OF SUB GRADE WORK, THE ENGINEER SHALL BE NOTIFIED AND SHALL INSPECT AT HIS DISCRETION BEFORE PROCEEDING WITH PERCOLATION BED INSTALLATION.
      b. PERCOLATION BED AGGREGATE SHALL BE PLACED IMMEDIATELY AFTER APPROVAL OF SUB GRADE PREPARATION. ANY ACCUMULATION OF DEBRIS OR SEDIMENT WHICH HAS TAKEN PLACE AFTER APPROVAL OF SUB GRADE SHALL BE REMOVED PRIOR TO INSTALLATION OF AGGREGATE AT NO EXTRA COST TO THE OWNER.
      c. INSTALL COARSE AGGREGATE (CRUSHED STONE) IN 8-INCH MAXIMUM LIFTS, TO A MAXIMUM OF 95% STANDARD PROCTOR COMPACTION, KEEPING EQUIPMENT MOVEMENT OVER STORAGE BED SUBGRADES TO A MINIMUM. INSTALL AGGREGATE TO GRADES INDICATED ON THE DRAWINGS.
      d. INSTALL FILTER COARSE (BANK RUN GRAVEL) IN 8-INCH MAXIMUM LIFTS, TO A MAXIMUM OF 95% STANDARD PROCTOR COMPACTION, KEEPING EQUIPMENT MOVEMENT OVER STORAGE BED SUBGRADES TO A MINIMUM. INSTALL AGGREGATE TO GRADES INDICATED ON THE DRAWINGS.
      e. INSTALL CHOKER BASE COURSE (SEE MATERIALS SECTION) AGGREGATE EVENLY OVER SURFACE OF STONE BED, SUFFICIENT TO ALLOW PLACEMENT OF PAVEMENT, AND NOTIFY ENGINEER FOR APPROVAL. CHOKER BASE COURSE SHALL BE SUFFICIENT TO ALLOW FOR EVEN PLACEMENT OF ASPHALT BUT NO LESS THAN 4-INCH IN DEPTH.
   4. SURROUNDING AREAS
      a. BEFORE THE POROUS PAVEMENT IS INSTALLED, ADJACENT SOIL AREAS SHALL BE SLOPED AWAY FROM ALL PAVEMENT EDGES, TO PREVENT POTENTIAL SEDIMENT FROM WASHING ONTO THE PAVEMENT SURFACE.
      b. TO ACCOMPLISH THIS, A SEQUENCE OF SWALES SHALL BE EXCAVATED INTO ALL EARTHEN (UNPAVED) AREAS AT LEAST ON THE UPHILL SIDES OF THE PAVEMENT, AND WHERE NECESSARY, TO BELOW THE CURB OR PAVEMENT ELEVATION. ITS SHAPE AND PLANTINGS CAN BE INTEGRATED WITH THE PROJECT'S ARCHITECTURE AND LANDSCAPE, AND DESIGNED TO MAXIMIZE INFILTRATION. SWALE OVERFLOW, WHEN IT OCCURS, CAN BE DISCHARGED FROM ONE SWALE TO ANOTHER BY CONNECTING PIPES UNDER DRIVEWAYS.
      c. BUILDING BASEMENTS AND FOUNDATIONS SHALL BE WATERPROOFED AS NECESSARY, WHERE THE POROUS PAVEMENT ABUTS BUILDINGS.

B. POROUS ASPHALT
   1. TRANSPORTING MATERIAL
      a. TRANSPORTING OF MIX TO THE SITE SHALL BE IN VEHICLES WITH SMOOTH, CLEAN DUMP BEDS THAT HAVE BEEN SPRAYED WITH A NON-PETROLEUM RELEASE AGENT.
      b. THE MIX SHALL BE COVERED DURING TRANSPORT TO CONTROL COOLING.
   2. POROUS BITUMINOUS ASPHALT SHALL NOT BE STORED IN EXCESS OF 90 MINUTES BEFORE PLACEMENT.
   3. ASPHALT PLACEMENT
      a. THE POROUS BITUMINOUS SURFACE COURSE SHALL BE LAID IN ONE OR TWO LIFTS DIRECTLY OVER THE CHOKER COARSE, FILTER COARSE, AND CRUSHED STONE BASE COURSE TO DEPTH INDICATED. IF LAID IN TWO LIFTS THE PAVEMENT SHALL BE CLEANED AND INSPECTED BY THE ENGINEER BEFORE PLACEMENT OF THE SECOND LIFT.
      b. THE LAYING TEMPERATURE OF THE BITUMINOUS MIX SHALL BE BETWEEN 275 DEGREES FAHRENHEIT AND 325 DEGREES FAHRENHEIT (BASED ON THE RECOMMENDATIONS OF THE ASPHALT SUPPLIER).
      c. INSTALLATION SHALL TAKE PLACE WHEN AMBIENT TEMPERATURES ARE 55 DEGREES FAHRENHEIT OR ABOVE, WHEN MEASURED IN THE SHADE AWAY FROM ARTIFICIAL HEAT.
      d. THE USE OF A REMIXING MATERIAL TRANSFER DEVICE BETWEEN THE TRUCKS AND THE PAVER IS HIGHLY RECOMMENDED TO ELIMINATE COLD LUMPS IN THE MIX.
      e. THE POLYMER-MODIFIED ASPHALT IS VERY DIFFICULT TO RAKE, A WELL-HEATED SCREED SHALL BE USED TO MINIMIZE THE NEED FOR RAKING.
      f. COMPACTION OF THE SURFACE COURSE SHALL TAKE PLACE WHEN THE SURFACE IS COOL ENOUGH TO RESIST AN 8-12-TON ROLLER. BREAKDOWN ROLLING SHALL OCCUR WHEN THE MIX TEMPERATURE IS BETWEEN 275 DEGREES FAHRENHEIT AND 325 DEGREES FAHRENHEIT. INTERMEDIATE ROLLING SHALL OCCUR WHEN THE MIX TEMPERATURE IS BETWEEN 150 DEGREES FAHRENHEIT AND 200 DEGREES FAHRENHEIT. THE CESSATION TEMPERATURE OCCURS AT APPROXIMATELY 175 DEGREES FAHRENHEIT, AT WHICH POINT THE MIX BECOMES RESISTANT TO COMPACTION. IF COMPACTION HAS NOT BEEN DONE AT TEMPERATURES GREATER THAN THE CESSATION TEMPERATURE, THE PAVEMENT WILL NOT ACHIEVE ADEQUATE DURABILITY.
   4. IN THE EVENT CONSTRUCTION SEDIMENT IS INADVERTENTLY DEPOSITED ON THE FINISHED POROUS SURFACE, IT MUST BE IMMEDIATELY REMOVED BY VACUUMING.
   5. AFTER FINAL ROLLING, NO VEHICULAR TRAFFIC OF ANY KIND SHALL BE PERMITTED ON THE SURFACE UNTIL COOLING AND HARDENING HAS TAKEN PLACE, AND IN NO CASE WITHIN THE FIRST 48 HOURS. PROVIDE BARRIERS AS NECESSARY AT NO EXTRA COST TO THE OWNER TO PREVENT VEHICULAR USE; REMOVE AT THE DISCRETION OF THE ENGINEER.
   6. STRIPING PAINT FOR TRAFFIC LANES AND PARKING BAYS SHALL BE CHLORINATED RUBBER BASE, FACTORY MIXED, NON-BLEEDING, FAST DRYING, BEST QUALITY, WHITE TRAFFIC PAINT WITH A LIFE EXPECTANCY OF TWO YEARS UNDER NORMAL TRAFFIC USE.
      a. PAVEMENT-MARKING PAINT; LATEX, WATER-BASE EMULSION, READY-MIXED, COMPLYING WITH PS TT-P-1952.
      b. SWEEP AND CLEAN SURFACE TO ELIMINATE LOOSE MATERIAL AND DUST.
      c. PAINT 4 INCH WIDE PARKING STRIPING AND TRAFFIC LANE STRIPING IN ACCORDANCE WITH LAYOUTS OF PLAN. APPLY PAINT WITH MECHANICAL EQUIPMENT TO PRODUCE UNIFORM STRAIGHT EDGES. APPLY IN TWO COATS AT MANUFACTURER'S RECOMMENDED RATES. PROVIDE CLEAR, SHARP LINES USING WHITE TRAFFIC PAINT, INSTALLED IN ACCORDANCE WITH NHDOT SPECIFICATIONS.
   7. WORK SHALL BE DONE EXPERTLY THROUGHOUT, WITHOUT STAINING OR INJURY TO OTHER WORK. TRANSITION TO ADJACENT IMPERVIOUS BITUMINOUS PAVING SHALL BE MERGED NEATLY WITH FLUSH, CLEAN LINE. FINISHED PAVING SHALL BE EVEN, WITHOUT POCKETS, AND GRADED TO ELEVATIONS SHOWN ON DRAWING.
   8. POROUS PAVEMENT BEDS SHALL NOT BE USED FOR EQUIPMENT OR MATERIALS STORAGE DURING CONSTRUCTION, AND UNDER NO CIRCUMSTANCES SHALL VEHICLES BE ALLOWED TO DEPOSIT SOIL ON PAVED POROUS SURFACES.
   9. REPAIR OF DAMAGED PAVING
      a. ANY EXISTING PAVING ON OR ADJACENT TO THE SITE THAT HAS BEEN DAMAGED AS A RESULT OF CONSTRUCTION WORK SHALL HE REPAIRED TO THE SATISFACTION OF THE OWNER WITHOUT ADDITIONAL COST TO THE OWNER.
   10. FIELD QUALITY CONTROL
      a. THE FULL PERMEABILITY OF THE PAVEMENT SURFACE SHALL BE TESTED BY APPLICATION OF CLEAN WATER AT THE RATE OF AT LEAST 5 GPM OVER THE SURFACE, USING A HOSE OR OTHER DISTRIBUTION DEVISE. WATER USED FOR THE TEST SHALL BE CLEAN, FREE OF SUSPENDED SOLIDS AND DELETERIOUS LIQUIDS AND WILL BE PROVIDED AT NO EXTRA COST TO THE OWNER. ALL APPLIED WATER SHALL INFILTRATE DIRECTLY WITHOUT PUDDLE FORMATION OR SURFACE RUNOFF, AND SHALL BE OBSERVED BY THE ENGINEER AND OWNER.
      b. TEST IN-PLACE BASE AND SURFACE COURSE FOR COMPLIANCE WITH REQUIREMENTS FOR THICKNESS AND SURFACE SMOOTHNESS. REPAIR OR REMOVE AND REPLACE UNACCEPTABLE WORK AS DIRECTED BY THE OWNER.
      c. SURFACE SMOOTHNESS: TEST FINISHED SURFACE FOR SMOOTHNESS AND EVEN DRAINAGE, USING A TEN-FOOT TO CENTERLINE OF PAVED AREA. SURFACE WILL NOT BE ACCEPTED IF GAPS OR RIDGES EXCEED 3/16 OF AN INCH.

MAINTENANCE SPECIFICATIONS FOR POROUS ASPHALT

THE FOLLOWING RECOMMENDATIONS WILL HELP ASSURE THAT THE PAVEMENT IS MAINTAINED TO PRESERVE ITS HYDROLOGIC EFFECTIVENESS.

WINTER MAINTENANCE:

1. PLOW AFTER EACH STORM. SPECIAL PLOW BLADES MAY BE USED TO PREVENT SCARRING. DO NOT RAISE BLADE OF PLOW. ICE AND LIGHT SNOW ACCUMULATION ARE GENERALLY NOT AS PROBLEMATIC AS FOR STANDARD ASPHALT. SNOW WILL ACCUMULATE DURING HEAVIER STORMS AND SHALL BE PLOWED AFTER 2 TO 4 INCHES OF SNOW ACCUMULATION.
2. SANDING FOR WINTER TRACTION IS PROHIBITED. DEICING IS PERMITTED (NaCl, $MgCl_2$, OR EQUIVALENT). REDUCE SALT APPLICATION OF 75% OVER TRADITIONAL PAVEMENT APPLICATION RATES. NONTOXIC, ORGANIC DEICERS, APPLIED EITHER AS BLENDED, MAGNESIUM CHLORIDE-BASED LIQUID PRODUCTS OR AS PRETREATED SALT, ARE PREFERABLE. EXCESS SALT APPLICATION MAY BE NEEDED DURING CHALLENGING STORM EVENTS. SALT REDUCTIONS TYPICALLY OCCUR BETWEEN STORM EVENTS WITH NO BLACK ICE FORMATION
3. APPLY ANTI-ICING TREATMENTS PRIOR TO STORMS. ANTI-ICING HAS THE POTENTIAL TO PROVIDE THE BENEFIT OF INCREASED TRAFFIC SAFETY AT THE LOWEST COST AND WITH LESS ENVIRONMENTAL IMPACT.
4. APPLY DEICING TREATMENTS DURING AND AFTER STORMS AS NECESSARY TO CONTROL COMPACT SNOW AND ICE NOT REMOVED BY PLOWING.

ROUTINE MAINTENANCE:

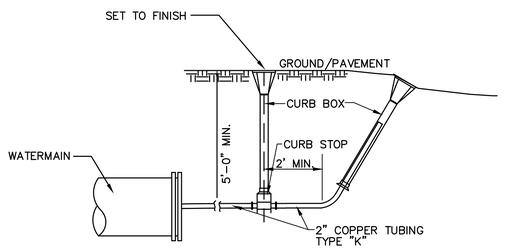
1. ASPHALT SEAL COATING MUST BE ABSOLUTELY FORBIDDEN. SURFACE SEAL COATING IS NOT REVERSIBLE.
2. THE PAVEMENT SURFACE SHALL BE VACUUMED 2 TO 4 TIMES PER YEAR, ESPECIALLY AFTER WINTER AND FALL SEASONS, AND AT ANY ADDITIONAL TIMES SEDIMENT IS SPILLED, ERODED, OR TRACKED ONTO THE SURFACE.
3. PLANTED AREAS ADJACENT TO PERVIOUS PAVEMENT SHALL BE WELL MAINTAINED TO PREVENT SOIL WASHOUT ONTO THE PAVEMENT. IF ANY BARE SPOTS OR ERODED AREAS ARE OBSERVED WITHIN THE PLANTED AREAS, THEY SHALL BE REPLANTED AND/OR STABILIZED AT ONCE.
4. IMMEDIATELY CLEAN ANY SOIL DEPOSITED ON PAVEMENT. SUPERFICIAL DIRT DOES NOT NECESSARILY CLOG THE PAVEMENT VOIDS. HOWEVER, DIRT THAT IS GROUND IN REPEATEDLY BY TIRES CAN LEAD TO CLOGGING. THEREFORE, TRUCKS OR OTHER HEAVY VEHICLES SHALL BE PREVENTED FROM TRACKING OR SPILLING DIRT ONTO THE PAVEMENT.
5. DO NOT ALLOW CONSTRUCTION STAGING, SOIL/MULCH STORAGE, ETC. ON UNPROTECTED PAVEMENT SURFACE
6. REPAIRS: FOR THE POROUS ASPHALT PARKING LOT, POTHOLES OF LESS THAN 50 SQUARE FEET CAN BE PATCHED BY ANY MEANS SUITABLE WITH STANDARD PAVEMENT OR A PERVIOUS MIX IS PREFERRED. FOR AREAS GREATER THAN 50 SQ. FT. IS IN NEED OF REPAIR, APPROVAL OF PATCH TYPE SHALL BE SOUGHT FROM A QUALIFIED ENGINEER. ANY REQUIRED REPAIR OF DRAINAGE STRUCTURES SHALL BE DONE PROMPTLY TO ENSURE CONTINUED PROPER FUNCTIONING OF THE SYSTEM. REPAIRS TO THE POROUS ASPHALT SIDEWALK SHALL BE MADE WITH A PERVIOUS MIX.
7. WRITTEN AND VERBAL COMMUNICATION TO THE POROUS PAVEMENT'S FUTURE OWNER SHALL MAKE CLEAR THE PAVEMENT'S SPECIAL PURPOSE AND SPECIAL MAINTENANCE REQUIREMENTS SUCH AS THOSE LISTED HERE.
8. A PERMANENT SIGN SHALL BE ADDED AT THE ENTRANCE AND END OF THE POROUS ASPHALT PARKING AREA TO INFORM RESIDENTS AND MAINTENANCE STAFF OF THE SPECIAL NATURE AND PURPOSE OF THE PAVEMENT, AND ITS SPECIAL MAINTENANCE REQUIREMENTS. SIGNS ARE NOT REQUIRED FOR THE POROUS SIDEWALKS.

MIX SUMMARY

1. POROUS ASPHALT PAVEMENT MIX PER THE CURRENT UNH STORM WATER CENTER DESIGN SPECIFICATIONS FOR POROUS ASPHALT PAVEMENT AND INFILTRATION BEDS MANUAL.

2. NO WORK SHALL BE STARTED UNTIL THE CONTRACTOR HAS SUBMITTED AND THE ENGINEER HAS APPROVED A MIX DESIGN INCLUDING THE PERCENTAGE OF EACH INGREDIENT INCLUDING BINDER, POLYMER, AND THE JOB-MIX FORMULA FROM SUCH A COMBINATION. THE JOB-MIX FORMULA SHALL ESTABLISH A SINGLE PERCENTAGE OF AGGREGATE PASSING SIEVE AND A SINGLE PERCENTAGE OF BITUMINOUS MATERIAL TO BE ADDED TO THE AGGREGATE. NO CHANGE IN THE JOB-MIX FORMULA MAY BE MADE WITHOUT WRITTEN APPROVAL OF THE ENGINEER. THE JOB-MIX FORMULA MUST FALL WITH THE MASTER RANGE SPECIFIED IN COMPOSITION OF MIXTURE TABLE.

TRANSPORTING MATERIAL: SEE CONSTRUCTION AND INSTALL SPECIFICATIONS



TYPICAL WATER MAIN BLOWOFF

NOT TO SCALE

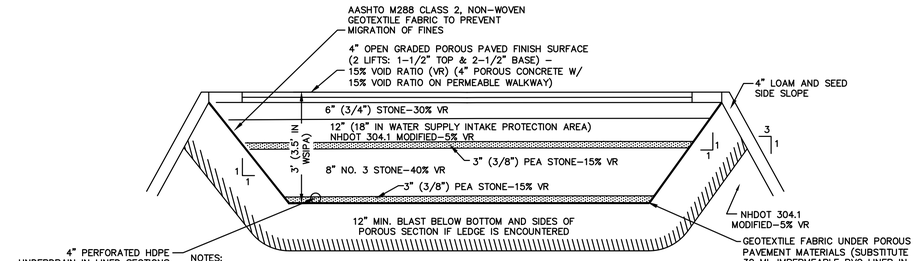
POROUS ASPHALT FOR STORMWATER MANAGEMENT
BEYOND THIS POINT

MAINTENANCE REQUIREMENTS:

DO NOT RAISE BLADE OF PLOW
SANDING OF SURFACE PROHIBITED
DEICING PERMITTED ($NaCl$, $MgCl_2$ OR EQUIVALENT)
SEAL-COATING PROHIBITED
CLEANING BY PRESSURIZED AIR OR WATER PROHIBITED
DRY VACUUM SEMIANNUALLY

TYPICAL POROUS ASPHALT PAVEMENT MAINTENANCE SIGN

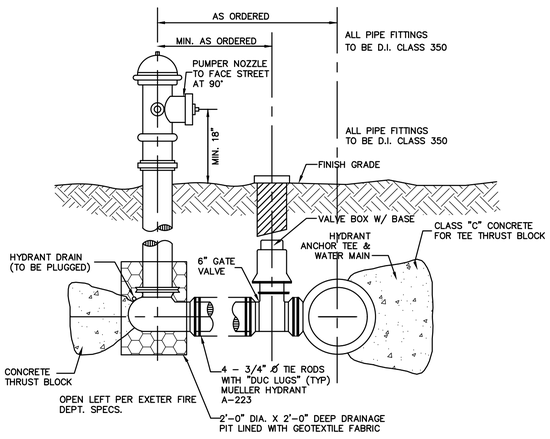
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NOTES:
1. CONTRACTOR IS TO REMOVE THE EXISTING BURIED LAYER OF ORIGINAL LOAM DURING THE EXCAVATION OF THE GRAVELS FOR THE ROADWAY AND WHENEVER ENCOUNTERED IN TRENCHES.
2. DESIGN ENGINEER TO INSPECT SITE PREPARATION AND INSTALLATION OF POROUS PAVEMENT.
3. THE TOP LAYER (WEARING COURSE) SHALL BE PRE-BLENDED PG 76-28 MODIFIED WITH SBS. THE BASE COURSE SHALL BE, AT A MINIMUM, PG 64-28 WITH 5 POUNDS OF FIBER PER TON OF ASPHALT MIX. IF SUFFICIENT STAGING OR USE OF THE BASE COURSE SECTION WILL BE REQUIRED PRIOR TO THE APPLICATION OF THE WEARING COURSE, THE ENGINEER MAY DECIDE TO USE PRE-BLENDED PG 76-28 MODIFIED WITH SBS ON BOTH COURSES.
4. THE POROUS PAVEMENT SYSTEM SHALL BE LOCATED ONE FOOT ABOVE LEDGE AND THE SHWT.
5. INTERFACE FROM 12" FILTER COURSE TO 18" FILTER COURSE AT WATER SUPPLY INTAKE PROTECTION AREA (WSIPA) LINE AS SHOWN ON GRADING AND DRAINAGE PLAN.
6. SECTIONS OF POROUS ASPHALT PAVEMENT AND CONCRETE DESIGNATED AS UNLINED SHALL NOT BE LINED WITH AN IMPERMEABLE LINER OR UNDERDRAINED.

TYPICAL POROUS ASPHALT PAVEMENT OR CONCRETE SECTION

NOT TO SCALE



HYDRANT TO BE MANUFACTURED AND INSTALLED ACCORDING TO TOWN OF EXETER FIRE DEPARTMENT AND "STANDARD SPECIFICATIONS FOR CONSTRUCTION OF PUBLIC UTILITIES IN EXETER, NH"

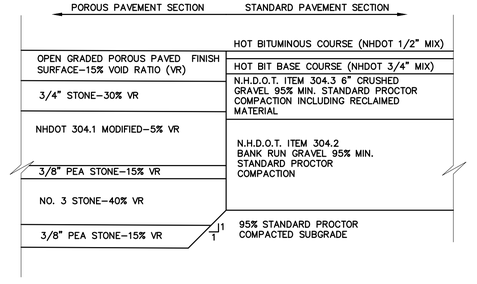
HYDRANT INSTALLATION DETAIL

NOT TO SCALE

NOTES
1. UNDERDRAINS SHALL BE INSTALLED AND SPACED EVERY 25' ALONG ROADWAY IN SECTIONS WITH GREATER THAN 5% LONGITUDINAL SLOPE.
2. INSTALL CLAY DAMS DIRECTLY DOWNSTREAM OF UNDERDRAINS.
3. CLAY DAMS TO BE WRAPPED IN NON-WOVEN GEOTEXTILE FABRIC TO PREVENT MIGRATION OF FINES AS SHOWN.
4. TO BE USED IN POROUS PAVEMENT SECTIONS WITH LONGITUDINAL SLOPE OF GREATER THAN 5% DAYLIGHT UNDERDRAINS ADJACENT TO CLAY DAMS INTO POROUS PAVEMENT SECTION WITH LONGITUDINAL SLOPE OF LESS THAN 5%

POROUS PAVEMENT CLAY DAM DETAIL

NOT TO SCALE



POROUS TO STANDARD PAVEMENT INTERFACE DETAIL

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STATE OF NEW HAMPSHIRE — PAIGE S. LIBBEY No.16670 — LICENSED PROFESSIONAL ENGINEER — 03/18/2025

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Plan Name:	DETAIL SHEET
Project:	"LILAC PLACE" 76 PORTSMOUTH AVE, EXETER, NH
Owner of Record:	RAP REALTY MANCHESTER LLC 50 ATLANTIC AVE, SEABROOK, NH

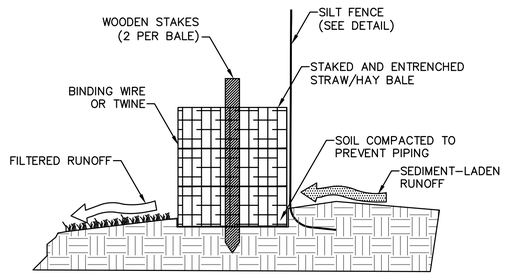
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SHEET 29 OF 31
JBE PROJECT NO. 24029

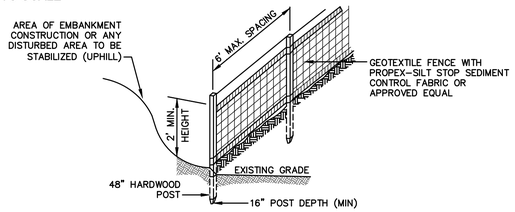
TEMPORARY EROSION CONTROL NOTES

1. THE SMALLEST PRACTICAL AREA OF LAND SHALL BE EXPOSED AT ANY ONE TIME. AT NO TIME SHALL AN AREA IN EXCESS OF 5 ACRES BE EXPOSED AT ANY ONE TIME BEFORE DISTURBED AREAS ARE STABILIZED.
2. EROSION, SEDIMENT AND DETENTION MEASURES SHALL BE INSTALLED AS SHOWN ON THE PLANS AND AT LOCATIONS AS REQUIRED, DIRECTED BY THE ENGINEER.
3. ALL DISTURBED AREAS SHALL BE RETURNED TO PROPOSED GRADES AND ELEVATIONS. DISTURBED AREAS SHALL BE LOAMED WITH A MINIMUM OF 6" OF SCREENED ORGANIC LOAM AND SEEDED WITH SEED MIXTURE 'C' AT A RATE NOT LESS THAN 1.10 POUNDS OF SEED PER 1,000 S.F. OF AREA (48 LBS. / ACRE).
4. SILT FENCES AND OTHER BARRIERS SHALL BE INSPECTED EVERY SEVEN CALENDAR DAYS AND WITHIN 24 HOURS OF A RAINFALL OF 0.25" OR GREATER. ALL DAMAGED AREAS SHALL BE REPAIRED, AND SEDIMENT DEPOSITS SHALL PERIODICALLY BE REMOVED AND DISPOSED OF.
5. AFTER ALL DISTURBED AREAS HAVE BEEN STABILIZED, THE TEMPORARY EROSION CONTROL MEASURES SHALL BE REMOVED AND THE AREA DISTURBED BY THE REMOVAL SMOOTHED AND RE-VEGETATED.
6. AREAS MUST BE SEEDED AND MULCHED OR OTHERWISE PERMANENTLY STABILIZED WITHIN 3 DAYS OF FINAL GRADING, OR TEMPORARILY STABILIZED WITHIN 14 DAYS OF THE INITIAL DISTURBANCE OF SOIL. ALL AREAS SHALL BE STABILIZED WITHIN 45 DAYS OF INITIAL DISTURBANCE.
7. ALL PROPOSED VEGETATED AREAS THAT DO NOT EXHIBIT A MINIMUM OF 85 PERCENT VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED BY SEEDING AND INSTALLING NORTH AMERICAN GREEN S75 EROSION CONTROL BLANKETS (OR AN EQUIVALENT APPROVED IN WRITING BY THE ENGINEER) ON SLOPES GREATER THAN 3:1, AND SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING, ELSEWHERE. THE INSTALLATION OF EROSION CONTROL BLANKETS OR MULCH AND NETTING SHALL NOT OCCUR OVER ACCUMULATED SNOW OR ON FROZEN GROUND AND SHALL BE COMPLETED IN ADVANCE OF THAW OR SPRING MELT EVENTS.
8. ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85 PERCENT VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED TEMPORARILY WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS.
9. AFTER OCTOBER 15th, INCOMPLETE ROAD OR PARKING SURFACES, WHERE WORK HAS STOPPED FOR THE WINTER SEASON, SHALL BE PROTECTED WITH A MINIMUM OF 3" OF CRUSHED GRAVEL PER NHDOT ITEM 304.3.
10. AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:
    a. BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED;
    b. A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED;
    c. A MINIMUM OF 3" OF NON-EROSIVE MATERIAL SUCH STONE OR RIPRAP HAS BEEN INSTALLED; OR
    d. EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.
11. FUGITIVE DUST CONTROL IS REQUIRED TO BE CONTROLLED IN ACCORDANCE WITH ENV-A 1000, AND THE PROJECT IS TO MEET THE REQUIREMENTS AND INTENT OF RSA 430:53 AND AGR 3800 RELATIVE TO INVASIVE SPECIES.
12. PRIOR TO BEGINNING CONSTRUCTION, THE CONTRACTOR'S NAME, ADDRESS, AND PHONE NUMBER SHALL BE SUBMITTED TO DES VIA EMAIL (RIDGELY MAUCK AT RIDGELY.MAUCK@DES.NH.GOV).



HAYBALE DETAIL

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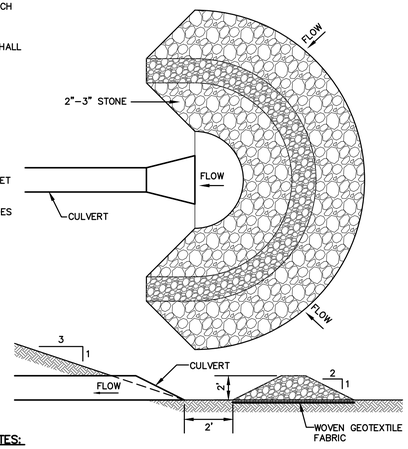


CONSTRUCTION SPECIFICATIONS:

1. WOVEN FABRIC FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES. FILTER CLOTH SHALL BE FASTENED TO WOVEN WIRE EVERY 24" AT TOP, MID AND BOTTOM AND EMBEDDED IN THE GROUND A MINIMUM OF 8" AND THEN COVERED WITH SOIL.
2. THE FENCE POSTS SHALL BE A MINIMUM OF 48" LONG, SPACED A MAXIMUM 6' 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 6", FOLDED AND STAPLED TO PREVENT SEDIMENT FROM BY-PASSING.
4. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND SEDIMENT REMOVED AND PROPERLY DISPOSED OF WHEN IT IS 6" DEEP OR VISIBLE 'BULGES' DEVELOP IN THE SILT FENCE.
5. PLACE THE ENDS OF THE SILT FENCE UP CONTOUR TO PROVIDE FOR SEDIMENT STORAGE.
6. SILT FENCE SHALL REMAIN IN PLACE FOR 24 MONTHS.

SILT FENCE

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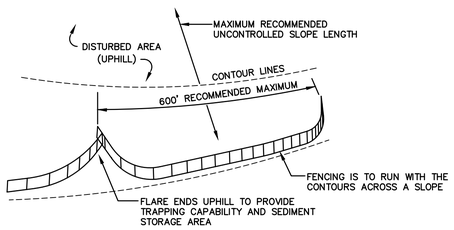


NOTES:

1. TEMPORARY CULVERT INLET PROTECTION CHECK DAMS SHALL BE CONSTRUCTED OF 2-3" STONE OVER WOVEN GEOTEXTILE FABRIC.
2. INLET PROTECTION MEASURES SHALL BE INSTALLED AT THE OPENINGS OF ALL EXISTING AND PROPOSED CULVERTS LOCATED BELOW (DOWNSTREAM) FROM AND WITHIN 100' OF THE PROJECT SITE.
3. SEDIMENT SHALL BE REMOVED FROM BEHIND THE STRUCTURE WHEN IT HAS ACCUMULATED TO ONE HALF THE ORIGINAL HEIGHT OF THE STRUCTURE.
4. STRUCTURES SHALL BE REMOVED WHEN THE SITE IS STABILIZED WITH VEGETATION AND THE CHANNEL SHALL BE SMOOTHED AND REVEGETATED.

TEMPORARY CULVERT INLET PROTECTION CHECK DAM

NOT TO SCALE



7. 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 REVEGETATED.

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 DONE IMMEDIATELY.
2. IF THE FABRIC ON A SILT FENCE SHALL DECOMPOSE OR BECOME INEFFECTIVE DURING THE EXPECTED LIFE OF THE FENCE, THE FABRIC SHALL BE REPLACED PROMPTLY.
3. SEDIMENT DEPOSITS SHALL BE INSPECTED AFTER EVERY STORM EVENT. THE DEPOSITS SHALL 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.

SEEDING SPECIFICATIONS

1. GRADING AND SHAPING
   A. SLOPES SHALL NOT BE STEEPER THAN 2:1 WITHOUT APPROPRIATE EROSION CONTROL MEASURES AS SPECIFIED ON THE PLANS (3:1 SLOPES OR FLATTER ARE PREFERRED).
   B. WHERE MOWING WILL BE DONE, 3:1 SLOPES OR FLATTER ARE RECOMMENDED.
2. SEEDBED PREPARATION
   A. SURFACE AND SEEPAGE WATER SHALL BE DRAINED OR DIVERTED FROM THE SITE TO PREVENT DROWNING OR WINTER KILLING OF THE PLANTS.
   B. STONES LARGER THAN 4 INCHES AND TRASH SHALL BE REMOVED BECAUSE THEY INTERFERE WITH SEEDING AND FUTURE MAINTENANCE OF THE AREA. WHERE FEASIBLE, THE SOIL SHALL BE TILLED TO A DEPTH OF ABOUT 4 INCHES TO PREPARE A SEEDBED AND FERTILIZER AND LIME MIXED INTO THE SOIL. THE SEEDBED SHALL BE LEFT IN A REASONABLY FIRM AND SMOOTH CONDITION. THE LAST TILLAGE OPERATION SHALL BE PERFORMED ACROSS THE SLOPE WHEREVER PRACTICAL.
3. ESTABLISHING A STAND
   A. LIME AND FERTILIZER SHALL BE APPLIED PRIOR TO OR AT THE TIME OF SEEDING AND INCORPORATED INTO THE SOIL. TYPES AND AMOUNTS OF LIME AND FERTILIZER SHALL BE BASED ON AN EVALUATION OF SOIL TESTS. WHEN A SOIL TEST IS NOT AVAILABLE, THE FOLLOWING MINIMUM AMOUNTS SHALL 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 SHALL 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 THE 'SEEDING GUIDE' AND 'SEEDING RATES' TABLES ON THIS SHEET FOR APPROPRIATE SEED MIXTURES AND RATES OF SEEDING. ALL LEGUMES (CROWNVETCH, BIRDSFOOT, TREFOIL AND FLATPEA) MUST BE INOCULATED WITH THEIR SPECIFIC INOCULANT PRIOR TO THEIR INTRODUCTION TO THE SITE.
   D. WHEN SEEDED AREAS ARE MULCHED, PLANTINGS MAY BE MADE FROM EARLY SPRING TO EARLY OCTOBER. WHEN SEEDED AREAS ARE NOT MULCHED, PLANTINGS SHALL BE MADE FROM EARLY SPRING TO MAY 20th OR FROM AUGUST 10th TO SEPTEMBER 1st.
4. MULCH
   A. HAY, STRAW, OR OTHER MULCH, WHEN NEEDED, SHALL 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 S.F.
5. MAINTENANCE TO ESTABLISH A STAND
   A. PLANTED AREAS SHALL BE PROTECTED FROM DAMAGE BY FIRE, GRAZING, TRAFFIC, AND DENSE WEED GROWTH.
   B. FERTILIZATION NEEDS SHALL BE DETERMINED BY ONSITE INSPECTIONS. SUPPLEMENTAL FERTILIZER IS USUALLY THE KEY TO FULLY COMPLETE THE ESTABLISHMENT OF THE STAND BECAUSE MOST PERENNIALS TAKE 2 TO 3 YEARS TO BECOME FULLY ESTABLISHED.
   C. IN WATERWAYS, CHANNELS, OR SWALES WHERE UNIFORM FLOW CONDITIONS ARE ANTICIPATED, ANNUAL MOWING MAY BE NECESSARY TO CONTROL GROWTH OF WOODY VEGETATION.

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	EXCELLENT	EXCELLENT	POOR
WATERWAYS, EMERGENCY SPILLWAYS, AND OTHER CHANNELS WITH FLOWING WATER.	A	GOOD	GOOD	GOOD	FAIR
	C	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
PLAY AREAS AND ATHLETIC FIELDS. (TOPSOIL IS ESSENTIAL FOR GOOD TURF.)	E	FAIR	EXCELLENT	EXCELLENT	2/
	F	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 BELOW.
2/ POORLY DRAINED SOILS ARE NOT DESIRABLE FOR USE AS PLAYING AREA AND ATHLETIC FIELDS.

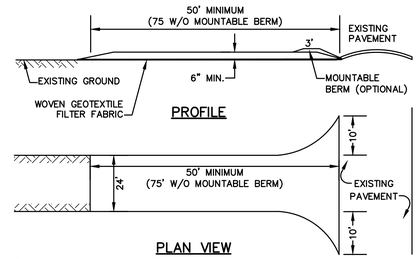
NOTE: TEMPORARY SEED MIX FOR STABILIZATION OF TURF SHALL BE WINTER RYE OR OATS AT A RATE OF 2.5 LBS. PER 1000 S.F. AND SHALL BE PLACED PRIOR TO OCTOBER 15th, IF PERMANENT SEEDING NOT YET COMPLETE.

SEEDING GUIDE

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	15	0.35
OR		
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.

SEEDING RATES



NOTES:

1. STONE FOR 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, 75' WITHOUT A MOUNTABLE BERM, AND EXCEPT FOR A SINGLE RESIDENTIAL LOT WHERE A 30 FOOT MINIMUM LENGTH WOULD APPLY.
3. 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, WHICHEVER IS GREATER.
5. GEOTEXTILE FILTER FABRIC SHALL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING THE STONE. FILTER FABRIC IS NOT REQUIRED FOR A SINGLE FAMILY RESIDENTIAL 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 STONE 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 THE PUBLIC RIGHT-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 THE PUBLIC RIGHT-OF-WAY MUST BE REMOVED PROMPTLY.

STABILIZED CONSTRUCTION ENTRANCE

NOT TO SCALE

CONSTRUCTION SEQUENCE

1. PRIOR TO THE START OF ANY ACTIVITY, IT IS THE RESPONSIBILITY OF THE SITE'S SITE DEVELOPER (OR OWNER) TO FILE A NOTICE OF INTENT (NOI) FORM WITH THE ENVIRONMENTAL PROTECTION AGENCY (EPA) IN ORDER TO GAIN COVERAGE UNDER THE NPDES GENERAL PERMIT FOR STORM WATER DISCHARGES FROM CONSTRUCTION ACTIVITIES. A PRE CONSTRUCTION MEETING IS TO BE HELD WITH ALL DEPARTMENT HEADS PRIOR TO THE START OF CONSTRUCTION.
2. WETLAND BOUNDARIES ARE TO BE CLEARLY MARKED PRIOR TO THE START OF CONSTRUCTION.
3. CUT AND REMOVE TREES IN CONSTRUCTION AREA AS REQUIRED OR DIRECTED.
4. INSTALL PERIMETER CONTROLS, HAY BALES AND CONSTRUCTION ENTRANCES PRIOR TO THE START OF CONSTRUCTION. THESE ARE TO BE MAINTAINED UNTIL THE FINAL PAVEMENT SURFACING AND LANDSCAPING AREAS ARE ESTABLISHED.
5. INSTALL INLET PROTECTION AT ALL EXISTING CATCH BASINS AS SHOWN ON SHEET C3 IN ACCORDANCE WITH DETAILS.
6. CLEAR, CUT, GRUB AND DISPOSE OF DEBRIS IN APPROVED FACILITIES. THIS INCLUDES ANY REQUIRED DEMOLITION OF EXISTING STRUCTURES, UTILITIES, ETC.
7. CONSTRUCT AND/OR INSTALL TEMPORARY OR PERMANENT SEDIMENT AND/OR DETENTION BASIN(S) AS REQUIRED. THESE FACILITIES SHALL BE INSTALLED AND STABILIZED PRIOR TO DIRECTING RUN-OFF TO THEM.
8. STRIP LOAM AND PAVEMENT PER THE RECOMMENDATIONS OF THE PROJECT ENGINEER AND STOCKPILE EXCESS MATERIAL. STABILIZE STOCKPILE AS NECESSARY.
9. PERFORM PRELIMINARY SITE GRADING IN ACCORDANCE WITH THE PLANS, INCLUDING THE CONSTRUCTION OF ANY RETAINING WALLS AND SOUND WALLS.
10. PREPARE BUILDING PAD(S) TO ENABLE BUILDING CONSTRUCTION TO BEGIN.
11. INSTALL THE SEWER AND DRAINAGE SYSTEMS FIRST, THEN ANY OTHER UTILITIES IN ACCORDANCE WITH THE PLAN AND DETAILS. ANY CONFLICTS BETWEEN UTILITIES ARE TO BE RESOLVED WITH THE INVOLVEMENT AND APPROVAL OF THE ENGINEER.
12. ALL SWALES AND DRAINAGE STRUCTURES ARE TO BE CONSTRUCTED AND STABILIZED PRIOR TO HAVING RUN-OFF DIRECTED TO THEM.
13. DAILY, OR AS REQUIRED, CONSTRUCT TEMPORARY BERMS, DRAINAGE DITCHES, CHECK DAMS, SEDIMENT TRAPS, ETC., TO PREVENT EROSION ON THE SITE AND PREVENT ANY SILTATION OF ABUTTING WATERS AND/OR PROPERTY.
14. PERFORM FINAL FINE GRADING, INCLUDING PLACEMENT OF 'SELECT' SUBGRADE MATERIALS.
15. PAVE ALL PARKING LOTS, DRIVEWAYS, AND ROADWAYS WITH INITIAL 'BASE COURSE'.
16. PERFORM ALL REMAINING SITE CONSTRUCTION (i.e. BUILDING, CURBING, UTILITY CONNECTIONS, ETC.).
17. LOAM AND SEED ALL DISTURBED AREAS AND INSTALL ANY REQUIRED SEDIMENT AND EROSION CONTROL FACILITIES (i.e. RIP RAP, EROSION CONTROL BLANKETS, ETC.).
18. FINISH PAVING ALL PARKING LOTS, DRIVEWAYS, AND ROADWAYS WITH 'FINISH' COURSE.
19. ALL PARKING LOTS, DRIVEWAYS, AND ROADWAYS SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
20. ALL CUT AND FILL SLOPES SHALL BE SEEDED/LOAMED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
21. COMPLETE PERMANENT SEEDING AND LANDSCAPING.
22. REMOVE TEMPORARY EROSION CONTROL MEASURES AFTER SEEDING AREAS HAVE BEEN 75%-85% ESTABLISHED AND SITE IMPROVEMENTS ARE COMPLETE. SMOOTH AND RE-VEGETATE ALL DISTURBED AREAS.
23. CLEAN SITE AND ALL DRAINAGE STRUCTURES, PIPES AND SUMPS OF ALL SILT AND DEBRIS.
24. INSTALL ALL PAINTED PAVEMENT MARKINGS AND SIGNAGE PER THE PLANS AND DETAILS.
25. ALL EROSION CONTROLS SHALL BE INSPECTED WEEKLY AND AFTER EVERY HALF-INCH OF RAINFALL.
26. UPON COMPLETION OF CONSTRUCTION, IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO NOTIFY ANY RELEVANT PERMITTING AGENCIES THAT THE CONSTRUCTION HAS BEEN FINISHED IN A SATISFACTORY MANNER.

Design: DJM	Draft: KDR	Date: 3/15/24
Checked: PSL	Scale: AS NOTED	Project No.: 24029
Drawing Name: 24029-PLAN.dwg		

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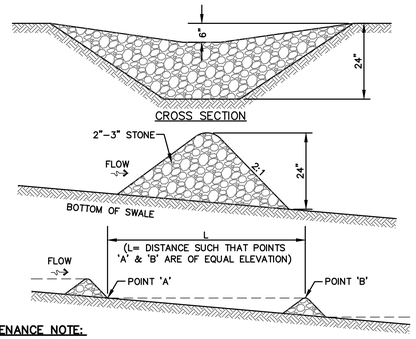
PAIGE S. LIBBEY No.16670 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE 03/18/2025

REV.	DATE	REVISION	BY
10	3/18/25	REVISED PER TOWN ENGINEER & TRC COMMENTS	DJM
9	2/13/25	FULL DESIGN FOR REVISED LAYOUT	DJM
8	1/31/25	REVISED LAYOUT PER CONSERVATION COMMISSION	DJM
7	1/13/25	REVISED PER TOWN ENGINEER & TRC COMMENTS	DJM
6	1/6/25	GRADING PLAN FOR CONSERVATION COMMISSION	DJM

Designed and Produced in NH
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Plan Name:	EROSION AND SEDIMENT CONTROL DETAILS
Project:	"LILAC PLACE" 76 PORTSMOUTH AVE, EXETER, NH
Owner of Record:	RAP REALTY MANCHESTER LLC 50 ATLANTIC AVE, SEABROOK, NH

DRAWING No.
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SHEET 30 OF 31
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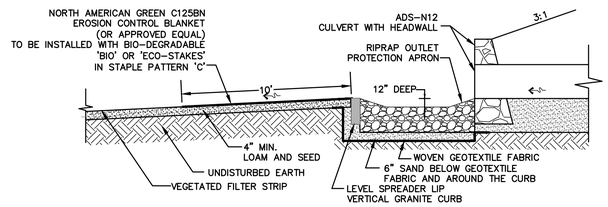


MAINTENANCE NOTE:

1. STONE CHECK DAMS SHALL BE CHECKED AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY NECESSARY REPAIRS SHALL BE MADE IMMEDIATELY. PARTICULAR ATTENTION SHALL BE GIVEN TO END RUN AND EROSION AT THE DOWNSTREAM TOE OF THE STRUCTURE. WHEN THE STRUCTURES ARE REMOVED, THE DISTURBED PORTION SHALL BE BROUGHT TO THE EXISTING CHANNEL GRADE AND THE AREAS PREPARED, SEEDED AND MULCHED. WHILE THIS PRACTICE IS NOT INTENDED TO BE USED PRIMARILY FOR SEDIMENT TRAPPING, SOME SEDIMENT WILL ACCUMULATE BEHIND THE STRUCTURES. SEDIMENT SHALL BE REMOVED FROM BEHIND THE STRUCTURES WHEN IT HAS ACCUMULATED TO ONE HALF OF THE ORIGINAL HEIGHT OF THE STRUCTURE.

STONE CHECK DAM

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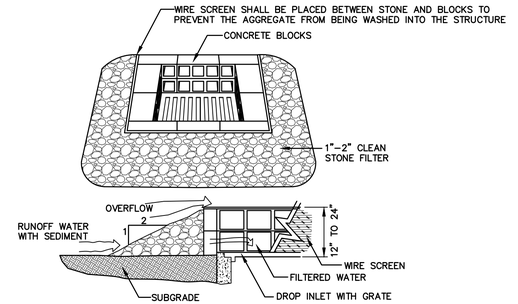


NOTES:

1. CONSTRUCT LEVEL SPREADER LIP ON ZERO PERCENT GRADE TO INSURE UNIFORM SPREADING OF RUNOFF.
2. VERTICAL GRANITE CURB SHALL BE PLACED A MINIMUM OF SIX INCHES DEEP AND EXTEND ENTIRE LENGTH OF LIP.
3. THE RIP RAP APRON PRIOR TO THE LEVEL SPREADER SHALL NOT EXCEED A 0 PERCENT GRADE.
4. THE FLOW FROM THE LEVEL SPREADER SHALL OUTLET ONTO STABILIZED AREAS. WATER MUST NOT RECONCENTRATE IMMEDIATELY BELOW THE SPREADER.
5. PERIODIC INSPECTION AND REQUIRED MAINTENANCE SHALL BE PERFORMED.
6. MAINTENANCE: LEVEL SPREADER SHALL BE CHECKED PERIODICALLY AND AFTER EVERY MAJOR STORM TO DETERMINE IF THE SPREADER HAS BEEN DAMAGED. SEDIMENT DEEPER THAN FOUR INCHES ACCUMULATION SHALL BE REMOVED. IF RILLING HAS TAKEN PLACE ON LIP, THEN DAMAGE SHALL BE REPAIRED AND REVEGETATED. VEGETATION SHALL BE MOWED OCCASIONALLY TO CONTROL WEEDS AND ENCROACHMENT OF WOODY VEGETATION. CLIPPINGS SHALL BE REMOVED AND DISPOSED OF OUTSIDE SPREADER AND AWAY FROM OUTLET AREA. FERTILIZATION SHALL BE DONE AS NECESSARY TO KEEP VEGETATION HEALTHY AND DENSE.

LEVEL SPREADER AT CULVERT OUTLET

NOT TO SCALE

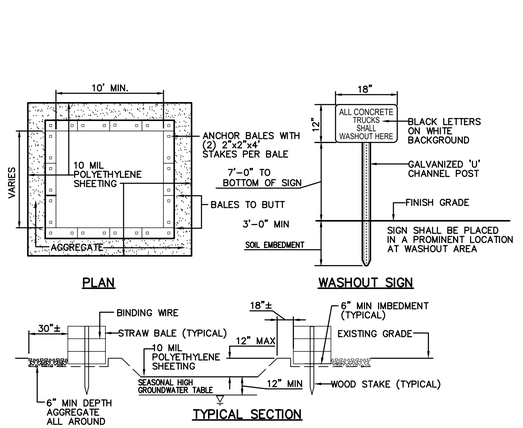


MAINTENANCE NOTE:

1. ALL STRUCTURES SHALL BE INSPECTED AFTER EVERY RAINFALL AND REPAIRS MADE AS NECESSARY. SEDIMENT SHALL BE REMOVED FROM TRAPPING DEVICES AFTER THE SEDIMENT HAS REACHED A MAXIMUM OF ONE HALF THE DEPTH OF THE TRAP. THE SEDIMENT SHALL BE DISPOSED IN A SUITABLE UPLAND AREA AND PROTECTED FROM EROSION BY EITHER STRUCTURE OR VEGETATIVE MEANS. THE TEMPORARY TRAPS SHALL BE REMOVED AND THE AREA REPAIRED AS SOON AS THE CONTRIBUTING DRAINAGE AREA TO THE INLET HAS BEEN COMPLETELY STABILIZED.

TEMPORARY CATCH BASIN INLET PROTECTION (Block and Gravel Drop Inlet Sediment Filter)

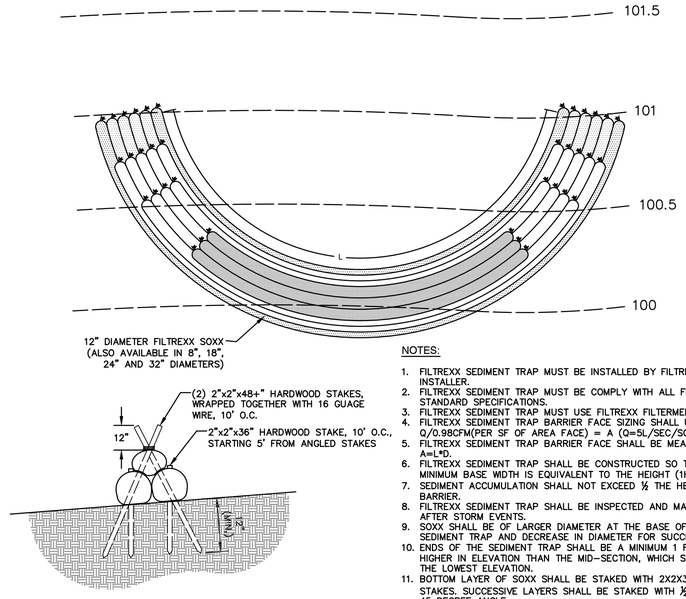
NOT TO SCALE



1. CONTAINMENT MUST BE STRUCTURALLY SOUND AND LEAK FREE AND CONTAIN ALL LIQUID WASTES.
2. CONTAINMENT DEVICES MUST BE OF SUFFICIENT QUANTITY OR VOLUME TO COMPLETELY CONTAIN THE LIQUID WASTES GENERATED.
3. WASHOUT MUST BE CLEANED OR NEW FACILITIES CONSTRUCTED AND READY TO USE ONCE WASHOUT IS 75% FULL.
4. WASHOUT AREA(S) SHALL BE INSTALLED IN A LOCATION EASILY ACCESSIBLE BY CONCRETE TRUCKS.
5. ONE OR MORE AREAS MAY BE INSTALLED ON THE CONSTRUCTION SITE AND MAY BE RELOCATED AS CONSTRUCTION PROGRESSES.
6. AT LEAST WEEKLY REMOVE ACCUMULATION OF SAND AND AGGREGATE AND DISPOSE OF PROPERLY.

CONCRETE WASHOUT AREA

NOT TO SCALE



GENERAL NOTES:

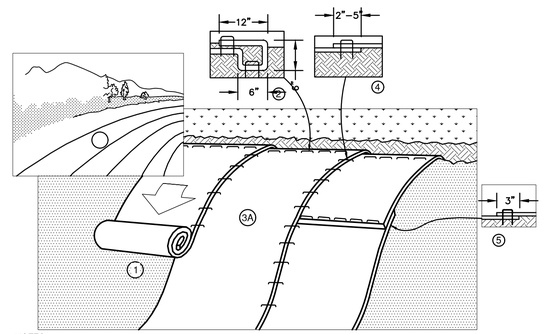
1. THE TRAP SHALL BE INSTALLED AS CLOSE TO THE DISTURBED AREA OR SOURCE OF SEDIMENT AS POSSIBLE.
2. THE MAXIMUM CONTRIBUTING DRAINAGE AREA TO THE TRAP SHALL BE LESS THAN 5 ACRES.
3. THE MINIMUM VOLUME OF THE TRAP SHALL BE 3,600 CUBIC FEET OF STORAGE FOR EACH ACRE OF DRAINAGE AREA.
4. THE SIDE SLOPES OF THE TRAP SHALL BE 3:1 OR FLATTER, AND SHALL BE STABILIZED IMMEDIATELY AFTER THEIR CONSTRUCTION.
5. THE OUTLET OF THE TRAP SHALL BE A MINIMUM OF ONE FOOT BELOW THE CREST OF THE TRAP AND SHALL DISCHARGE TO A STABILIZED AREA.
6. THE TRAP SHALL BE CLEANED WHEN 50% OF THE ORIGINAL VOLUME IS FILLED.
7. THE MATERIALS REMOVED FROM THE TRAP SHALL BE PROPERLY DISPOSED OFF AND STABILIZED.

NOTES:

1. FILTREXX SEDIMENT TRAP MUST BE INSTALLED BY FILTREXX CERTIFIED INSTALLER.
2. FILTREXX SEDIMENT TRAP MUST BE COMPLY WITH ALL FILTREXX STANDARD SPECIFICATIONS.
3. FILTREXX SEDIMENT TRAP MUST USE FILTREXX FILTERMEDIA.
4. FILTREXX SEDIMENT TRAP BARRIER FACE SIZING SHALL USE Q/0.98CFM(PER SF OF AREA FACE) = A (Q=5L/SEC/SQ.M)
5. FILTREXX SEDIMENT TRAP BARRIER FACE SHALL BE MEASURED AS A=L*D.
6. FILTREXX SEDIMENT TRAP SHALL BE CONSTRUCTED SO THAT THE MINIMUM BASE WIDTH IS EQUIVALENT TO THE HEIGHT (1H:1V).
7. SEDIMENT ACCUMULATION SHALL NOT EXCEED ½ THE HEIGHT OF THE BARRIER.
8. FILTREXX SEDIMENT TRAP SHALL BE INSPECTED AND MAINTAINED AFTER STORM EVENTS.
9. SOXX SHALL BE OF LARGER DIAMETER AT THE BASE OF THE SEDIMENT TRAP AND DECREASE IN DIAMETER FOR SUCCESSIVE LAYERS.
10. ENDS OF THE SEDIMENT TRAP SHALL BE A MINIMUM 1 FT (30 CM) HIGHER IN ELEVATION THAN THE MID–SECTION, WHICH SHALL BE AT THE LOWEST ELEVATION.
11. BOTTOM LAYER OF SOXX SHALL BE STAKED WITH 2X2X36" WOODEN STAKES. SUCCESSIVE LAYERS SHALL BE STAKED WITH ½" REBAR AT A 45 DEGREE ANGLE.

FILTREXX SEDIMENT TRAP DETAIL

NOT TO SCALE



NOTES:

1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED. NOTE: WHEN USING CELL–O–SEED DO NOT SEED PREPARED AREA. CELL–O–SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN A 6" DEEP BY 6" WIDE TRENCH WITH APPROXIMATELY 12" OF BLANKET EXTENDED BEYOND THE UP–SLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE BLANKET.
3. ROLL THE BLANKETS (A) DOWN OR (B) HORIZONTALLY ACROSS THE SLOPE. BLANKETS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL BLANKETS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING OPTIONAL DOT SYSTEM™, STAPLES/STAKES SHALL BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
4. THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH APPROXIMATELY 2"–5" OVERLAP DEPENDING ON BLANKET TYPE. TO ENSURE PROPER SEAM ALIGNMENT, PLACE THE EDGE OF THE OVERLAPPING BLANKET (BLANKET BEING INSTALLED ON TOP) EVEN WITH THE COLORED SEAM STITCH ON THE PREVIOUSLY INSTALLED BLANKET.
5. CONSECUTIVE BLANKETS SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART ACROSS ENTIRE BLANKET WIDTH. NOTE: IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" MAY BE NECESSARY TO PROPERLY SECURE THE BLANKETS.

NORTH AMERICAN GREEN
14649 HIGHWAY 41 NORTH
EVANSVILLE, INDIANA 47725
1–800–772–2040

EROSION CONTROL BLANKET SLOPE INSTALLATION (North American Green SC150BN)

NOT TO SCALE

Design: DJM	Draft: KDR	Date: 3/15/24
Checked: PSL	Scale: AS NOTED	Project No.: 24029
Drawing Name: 24029-PLAN.dwg		

THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION FROM JONES & BEACH ENGINEERS, INC. (JBE). ANY ALTERATIONS, AUTHORIZED OR OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO JBE.

STATE OF NEW HAMPSHIRE – PAIGE S. LIBBEY No.16670 – LICENSED PROFESSIONAL ENGINEER

REV.	DATE	REVISION	BY
10	3/18/25	REVISED PER TOWN ENGINEER & TRC COMMENTS	DJM
9	2/13/25	FULL DESIGN FOR REVISED LAYOUT	DJM
8	1/31/25	REVISED LAYOUT PER CONSERVATION COMMISSION	DJM
7	1/13/25	REVISED PER TOWN ENGINEER & TRC COMMENTS	DJM
6	1/6/25	GRADING PLAN FOR CONSERVATION COMMISSION	DJM

Designed and Produced in NH
Jones & Beach Engineers, Inc.
85 Portsmouth Ave. PO Box 219 Stratham, NH 03885
Civil Engineering Services
603-772-4746
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name: EROSION AND SEDIMENT CONTROL DETAILS

Project: "LILAC PLACE" 76 PORTSMOUTH AVE, EXETER, NH

Owner of Record: RAP REALTY MANCHESTER LLC 50 ATLANTIC AVE, SEABROOK, NH

DRAWING No.

E2


Soup
Stop
Craft
Loft
Coffee on the Grind
the Book Nook
Gift
Cards
Shop
Here



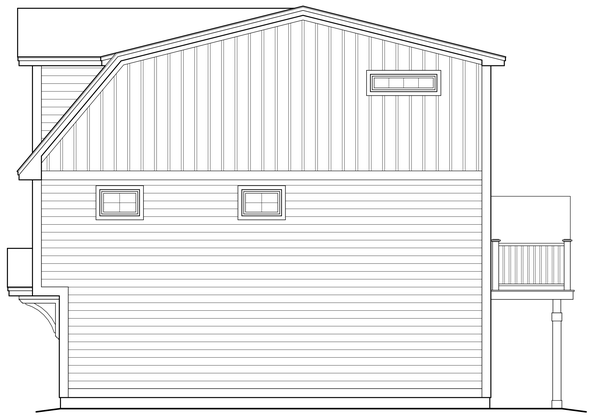
FRONT ELEVATION

SCALE: 1/4" = 1'-0"



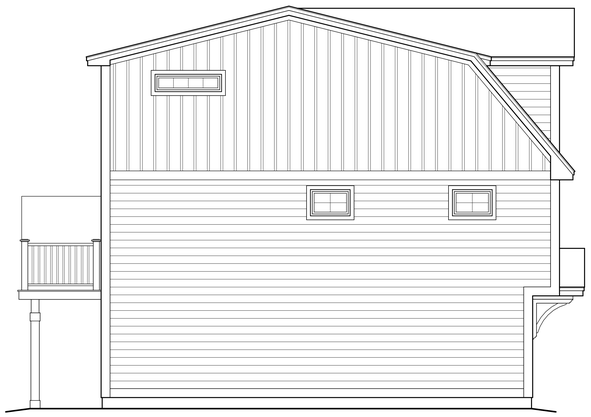
REAR ELEVATION

SCALE: 1/4" = 1'-0"



RIGHT ELEVATION

SCALE: 1/4" = 1'-0"



LEFT ELEVATION

SCALE: 1/4" = 1'-0"

StoneArch Development

REVISIONS

NO.	DATE	REVISION
1	3/14/25	DEVELOPMENT OF ELEVATIONS FOR BUILDING 7

ELEVATIONS

DRAIN BY:	AD
CHECKED BY:	MM
DATE ISSUED:	3/14/25
SCALE:	PER PAGE
JOB NO.	2500MF

76 PORTSMOUTH AVE, EXETER, N.H.
LILAC PLACE BUILDING 7



FRONT ELEVATION

SCALE: 1/4" = 1'-0"



REAR ELEVATION

SCALE: 1/4" = 1'-0"



RIGHT ELEVATION

SCALE: 1/4" = 1'-0"



LEFT ELEVATION

SCALE: 1/4" = 1'-0"

STONEARCH
Development

REVISIONS

NO.	DATE	REVISION
1	3/17/25	DEVELOPMENT OF ELEVATIONS FOR BUILDING 8

ELEVATIONS

DRAIN BY:	AD
CHECKED BY:	MM
DATE ISSUED:	3/17/25
SCALE:	PER PAGE
JOB NO.	2500MF

76 PORTSMOUTH AVE, EXETER, N.H.
LILAC PLACE BUILDING 8



BUILDING 7 (2 - UNIT)

SCALE: 1/4" = 1'-0"



BUILDING 8 (2 - UNIT)

SCALE: 1/4" = 1'-0"



BUILDING 11 (5 - UNIT)

SCALE: 1/4" = 1'-0"



BUILDING 1 (5 - UNIT)

SCALE: 1/4" = 1'-0"

StoneArch Development

REVISIONS

NO.	DATE	REVISION
4	3/12/25	REVISIONS TO NEW ELEVATIONS FOR MULTI UNITS
2	1/1/24	REVISED ELEVATIONS RELEASED FOR RENDERING
3	1/15/25	NEW ELEVATIONS DEVELOPED FOR 2 UNIT
4	3/3/25	REVISIONS TO NEW ELEVATIONS FOR 2 UNIT
5	3/11/25	REVISIONS TO NEW ELEVATIONS FOR MULTI UNITS

ELEVATIONS

DRAIN BY:	AD
CHECKED BY:	MM
DATE ISSUED:	3/12/25
SCALE:	PER PAGE
JOB NO:	2500PP

76 PORTSMOUTH AVE, EXETER, N.H.
LILAC PLACE FRONT ELEVATIONS

76 Port Ave.

76 Portsmouth Ave.
Exeter, NH

Approved SD
NFC - 03/10/25

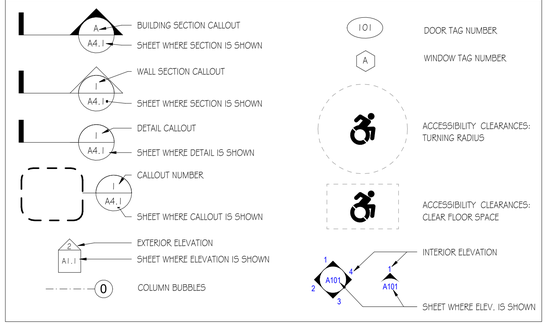
LOCUS MAP: (N.T.S.)



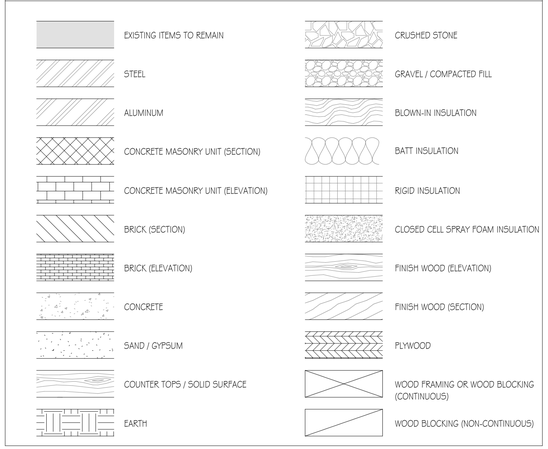
MASTER ABBREVIATION KEY:

AB	ANCHOR BOLT
AC	AIR CONDITIONER
ACI	AMERICAN CONCRETE INSTITUTE
ACOUST	ACOUSTIC
AFF	ABOVE FINISH FLOOR
ALT	ALTERNATE
ALUM	ALUMINUM
ANCH	ANCHOR
ANOD	ANODIZED
ASTM	AMERICAN SOCIETY FOR TESTING MATERIALS
BD	BOARD
BIT	BITUMINOUS
BL	BUILDING LINE
BLDG	BUILDING
BLK	BLOCK
BLKG	BLOCKING
BM	BEAM
BOC	BOTTOM OF CURB
BOF	BOTTOM OF FOOTING ELEVATION
BOT	BOTTOM
BRG	BEARING
BRK	BRICK
BSMT	BASEMENT
BTW	BETWEEN
BUR	BUILT-UP ROOF
CAB	CABINET
CB	CATCH BASIN
CER	CERAMIC
CF	CUBIC FOOT
CI	CAST IRON
CJ	CONTROL JOINT
CL	CLOSET
CLCB	CURBLESS CATCH BASIN
CLG	CEILING
CM	CONTRACT MANAGER
CMU	CONCRETE MASONRY UNIT
CO	CLEAN OUT
COL	COLUMN
COMP	COMPACTED (COMPOSITION)
CONC	CONCRETE
CONST	CONSTRUCTION
CONT	CONTINUOUS
CONTR	CONTRACTOR
CORR	CORRUGATED
CP	CONTROL PANEL
CSG	CASING
CSMT	CASEMENT
CT	CERAMIC TILE
CTR	CENTER
CY	CUBIC YARD
DF	DRINKING FOUNTAIN
DIA	DIAMETER
DIAG	DIAGONAL
DIM	DIMENSION
DL	DEAD LOAD
DN	DOWN
DR	DOOR
DS	DOWNSPOUT
DS/C	DRIVE SIDE OF CURB
DTL	DETAIL
DWG	DRAWING
E	EAST
EJ	EXPANSION JOINT
EJC	EXPANSION JOINT COVER
EL	ELEVATION
ELEC	ELECTRICAL
ELEV	ELEVATOR
EQ	EQUAL
EQUIP	EQUIPMENT
ER	EMERGENCY ROOM
EST	ESTIMATE
EWC	ELECTRICAL WATER COOLER
EXH	EXHAUST
EXIST	EXISTING
EXP	EXPANSION
EXPD	EXPANDED
EXT	EXTERIOR
F/F	FACE OF FOUNDATION WALL
FA	FRESH AIR
FAP	FIRE ALARM PANEL
FD	FLOOR DRAIN
FE	FIRE EXTINGUISHER
FEC	FIRE EXTINGUISHER CABINET
FIN	FINISH
FL	FLOW LINE
FLR	FLOOR
FND	FOUNDATION
FOF	FACE OF FINISH
FOM	FACE OF MASONRY
FOS	FACE OF STUD
FR	FIRE RATED
FS	FULL SIZE
FT	FOOT
FTG	FOOTING
FUR	FURRED (FURRING)
FVC	FIRE VALVE CABINET
GA	GAUGE
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GEN	GENERAL
GL	GLASS
GLZ	GLAZING
GRD	GRADE
GYP	GYPSUM
H4V	HEATING & VENTILATING
HC	HANDICAP
HDWD	HARDWOOD
HGT	HEIGHT
HM	HOLLOW METAL
HP	HIGH POINT
HVAC	HEATING, VENTILATION, AIR CONDITIONING
HWH	HOT WATER HEATER
ID	INSIDE DIAMETER
IN	INCH
INSUL	INSULATION
INT	INTERIOR
INV	INVERT
JC	JANITOR'S CLOSET
JST	JOIST
JT	JOINT
LAM	LAMINATE
LAV	LAVATORY
MAS	MASONRY
MAT	MATERIAL
MAX	MAXIMUM
MECH	MECHANICAL
MEM	MEMBRANE
MEP	MECHANICAL, ELECTRICAL, PLUMBING
METTP	METAL TOILET PARTITION
MFR	MANUFACTURER
MH	MANHOLE
MIN	MINIMUM
MISC	MISCELLANEOUS
MO	MASONRY OPENING
MTL	METAL
MULL	MULLION
N	NORTH
NAT	NATURAL
NEC	NECESSARY
NIC	NOT IN CONTRACT
NOM	NOMINAL
NRC	NOISE REDUCTION COEFFICIENT
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DIAMETER
OF/C	OUTSIDE FACE OF CONCRETE
OH	OVERHEAD
OPG	OPENING
OPP	OPPOSITE
OR	OPERATING ROOM
PBD	PARTICLE BOARD
PCF	POUNDS PER CUBIC FOOT
PL	PROPERTY LINE
PLAM	PLASTIC LAMINATE
PLAS	PLASTER
PLYWD	PLYWOOD
PNL	PANEL
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PT	PAINT
PTD	PAINTED
PTN	PARTITION
PVC	POLYVINYL CHLORIDE
QT	QUARRY TILE
R	RADIUS
R/A	RETURN AIR
RC	REINFORCED CONCRETE
RD	ROOF DRAIN
REF	REFERENCE
REFR	REFRIGERATOR
REINF	REINFORCE
REQD	REQUIRED
RGH	ROUGH
RL	RAIN LEADER
RM	ROOM
RO	ROUGH OPENING
ROW	RIGHT OF WAY
RQMT	REQUIREMENT
S	SOUTH
S-TRAP	SEDIMENT TRAP
SC	SOLID CORE
SCED	SCHEDULE
SD	STORM DRAIN
SF	SQUARE FOOT
SH	SHOWER
SHT	SHEET
SIM	SIMILAR
SL	SLIDING
SMR	SINGLE PLY MEMBRANE ROOF
SP/PT/FIN	SPECIAL PAINT FINISH
SPEC	SPECIFICATION
SPKR	SPEAKER
SQ	SQUARE
SS	STAINLESS STEEL
STA	STATION
STD	STANDARD
STL	STEEL
STOR	STORAGE
STRG	STRINGER
STRUCT	STRUCTURAL
SU	SITE UTILITY
SUSP	SUSPEND (SUSPENDED)
SYMM	SYMMETRICAL
SYS	SYSTEM
T	TREAD
T&G	TONGUE & GROOVED
T/FRM	TOP OF FRAME
T/SLB	TOP OF SLAB
TB	TACKBOARD
TEL	TELEPHONE
TEMP	TEMPORARY
TERR	TERRAZZO
THK	THICK
THLD	THRESHOLD
TOC	TOP OF CURB
TOF	TOP OF FOUNDATION
TOS	TOP OF SLAB
TOW	TOP OF WALL ELEVATION
TR	TO REMAIN
TYP	TYPICAL
UH	UNIT HEATER
UL	UNDERWRITERS LABORATORIES, INC.
UOD	UNDERSIDE OF DECK
UON	UNLESS OTHERWISE NOTED
UR	URINAL
UV	UNIT VENTILATOR
VAR	VARIES OR VARIABLE
VB	VINYL BASE
VCT	VINYL COMPOSITION TILE
VERT	VERTICAL
VEST	VESTIBULE
VIF	VERIFY IN FIELD
VNR	VENEER
VOL	VOLUME
W	WEST
W/	WITH
WC	WATER CLOSET
WD	WOOD
WDW	WINDOW
WGL	WIRE GLASS
WP	WEATHERPROOF (WATERPROOFING)
WWF	WELDED WIRE FABRIC

GRAPHIC SYMBOLS LEGEND



MATERIAL LEGEND



DRAWING SHEET INDEX:

Sheet	Sheet Name	Issued	Revision	Revision Date
PCS	*PROJECT COVER SHEET*	*NFC - 03/10/25*		
A1.1	*OVERALL FLOOR PLAN*	*NFC - 03/10/25*		
A1.2	*OVERALL FLOOR PLAN*	*NFC - 03/10/25*		
A1.3	*ROOF PLAN*	*NFC - 03/10/25*		
A1.4	*UNIT FLOOR PLAN*	*NFC - 03/10/25*		
A3.1	*EXTERIOR ELEVATIONS*	*NFC - 03/10/25*		
A7.3	*RESIDENCE ENTRANCE*	*NFC - 03/10/25*		

GENERAL NOTES:

1. DO NOT SCALE DRAWING OR DIMENSIONS. FOR MISSING DIMENSIONS OR DIMENSIONS IN CONFLICT, CONTACT THE CONTRACTOR IMMEDIATELY BEFORE CONTINUING WITH WORK.
2. ANY DISCREPANCIES IN THESE PLANS WILL BE BROUGHT TO THE CONTRACTOR'S ATTENTION IN WRITING IMMEDIATELY
3. REFER TO MECHANICAL, ELECTRICAL, PLUMBING, AND FIRE PROTECTION DESIGN-BUILD PLANS AND SPECIFICATION FOR LOCATIONS OF ALL BLOCK OUTS, INSERTS, OPENINGS, CURBS, BASES, & PADS THAT ARE NOT DIMENSIONED OR SHOWN ON CONTRACTOR'S DWG'S. OR STRUCTURAL DWG'S.
4. STRUCTURAL STEEL, MECHANICAL, ELECTRICAL, PLUMBING, AND FIRE PROTECTION PLANS AND SPECIFICATION SHALL BE PROVIDED AND ARE THE RESPONSIBILITY OF THERE RESPECTIVE SUBCONTRACTORS IF NOT CARRIED IN ARCHITECTURAL SERVICES
5. ALL CONSTRUCTION SHALL CONFORM TO AND BE IN ACCORDANCE WITH THE REGULATOR REQUIREMENTS MANDATED BY ALL FEDERAL, STATE AND LOCAL AUTHORITIES HAVING JURISDICTION IN ACCORDANCE TO THE STATE IN WHICH THE WORK IS PERFORMED (STATE BUILDING CODE, STATE LIFE SAFETY & FIRE CODE ETC.)
6. THE CONTRACTOR SHALL REVIEW ALL DOCUMENTS AND VERIFY ALL DIMENSIONS AND FIELD CONDITIONS, AND SHALL CONFIRM WORK IS BUILDABLE AS SHOWN. ANY CONFLICTS OR OMISSIONS, ETC. SHALL BE IMMEDIATELY REPORTED IN WRITING TO THE ARCHITECT FOR CLARIFICATION
7. DIMENSIONS ARE FROM EXTERIOR FACE OF FOUNDATION, VENEER, OR WALL STUD AND TO CENTER OF ALL INTERIOR STUD WALLS OR FACE OF INTERIOR MASONRY. UNLESS NOTED OTHERWISE.
8. CLEAR DIMENSIONS ARE FROM FACE TO FACE OF WALL FINISH. UNLESS NOTED OTHERWISE
9. REFER TO MECHANICAL DRAWINGS / SPEC. FOR ALL SIZES AND LOCATIONS OF MECHANICAL DUCT WORK.
10. UNLESS OBVIOUSLY SHOWN OTHERWISE, DOOR LOCATIONS NOT DESIGNATED BY WRITTEN DIMENSION SHALL BE CENTERED IN THE WALL OR SHALL BE LOCATED FOUR (4) INCHES FROM FINISH WALL TO EDGE OF DOOR JAMB. PER PLAN.
11. PROVIDE METAL CORNER BEAD AT ALL OUTSIDE CORNERS OF PLASTERED OR DRYWALL SURFACES, UNLESS NOTED OTHERWISE.
12. PENETRATIONS OF ALL FIRE RATED ASSEMBLIES SHALL BE PROTECTED BY LIKE RATED CONSTRUCTION DAMPERS, SEALANTS, COLLARS, ETC., TYPICAL.
13. CONTRACTOR SHALL FURNISH, LOCATE AND INSTALL ALL ACCESS PANELS AS REQUIRED AFTER INSTALLATION OF MECHANICAL DUCTS, PLUMBING AND ELECTRICAL WORK, FIRE RATED AS REQUIRED.
14. FURNISH AND INSTALL SOLID BLOCKING BEHIND ALL WALL HUNG MILLWORK ITEMS, RAILS, FIXTURES,GRAB BARS, ETC., WHERE INDICATED OR REQUIRED.
15. CONTRACTOR SHALL LAYOUT OR MARK, ALL EQUIPMENT, SYSTEMS AND MILLWORK ON THE FLOOR FOR ARCHITECT OR OWNER'S APPROVAL PRIOR TO BEGINNING CEILING / OVER HEAD WORK.
16. ALL SPRINKLER HEAD LOCATIONS, MAINS, BRANCHES AND RISER PIPE LOCATIONS MUST BE COORDINATED WITH THE DESIGN / BUILD CONTRACTOR PRIOR TO WORK.
17. FURNISH AND INSTALL FIRE EXTINGUISHERS IN TYPE, QUANTITY, AND LOCATION PER LOCAL FIRE DEPARTMENT. TYPICAL
18. CONTRACTOR SHALL VERIFY, COORDINATE LOCATION WITH THE ARCHITECT ANY SMOKE, CARBON MONOXIDE DETECTOR OR FIRE ALARM DEVICE AS REQUIRED BY THE LOCAL FIRE DEPARTMENT.
19. FURNISH & INSTALL FIRE DAMPERS WITH FUSIBLE LOUVER WHEREVER DUCT WORK PENETRATES ONE OR TWO HOUR CEILINGS OR WALLS. TYPICAL UNLESS NOTED OTHERWISE.
20. PROVIDE PLASTER AND GYPSUM WALL BOARD CONTROL JOINTS AT 30'-0" ON CENTER FROM FLOOR TO CEILING, OR AS NOTED ON THE CONSTRUCTION DOCUMENTS. VERIFY IN FEILD WITH ARCHITECT PRIOR TO WORK.

TW DESIGNS
254 Drake Hill Rd. Strafford, NH
TW-Designs.com | 603.664.2181

Project Info:

76 Port Ave.
76 Portsmouth Ave.
Exeter, NH
Approved SD

Architect of Record:

T | W Designs, LLC
254 Drake Hill Rd.
Strafford, NH 03884
603-664-2181

Civil Engineer:

XXX

Structural Engineer:

XXX

Electrical Engineer:

XXX

Mechanical Engineer:

XXX

Plumbing Engineer:

XXX

Fire Protection Eng.:

XXX

Contractor of Record:

XXX

Revision Schedule

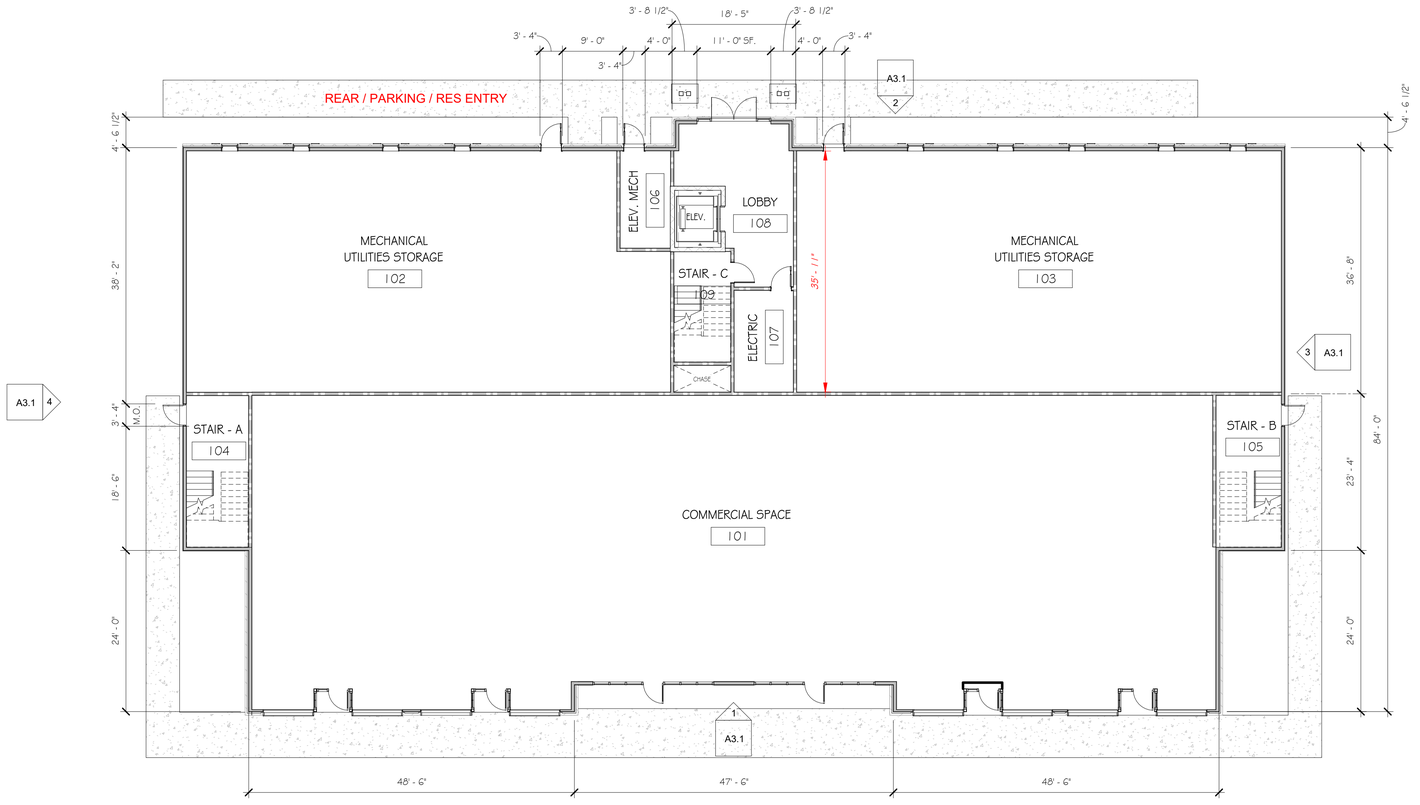
No.	Description	Date

PROJECT COVER SHEET

SHEET NUMBER

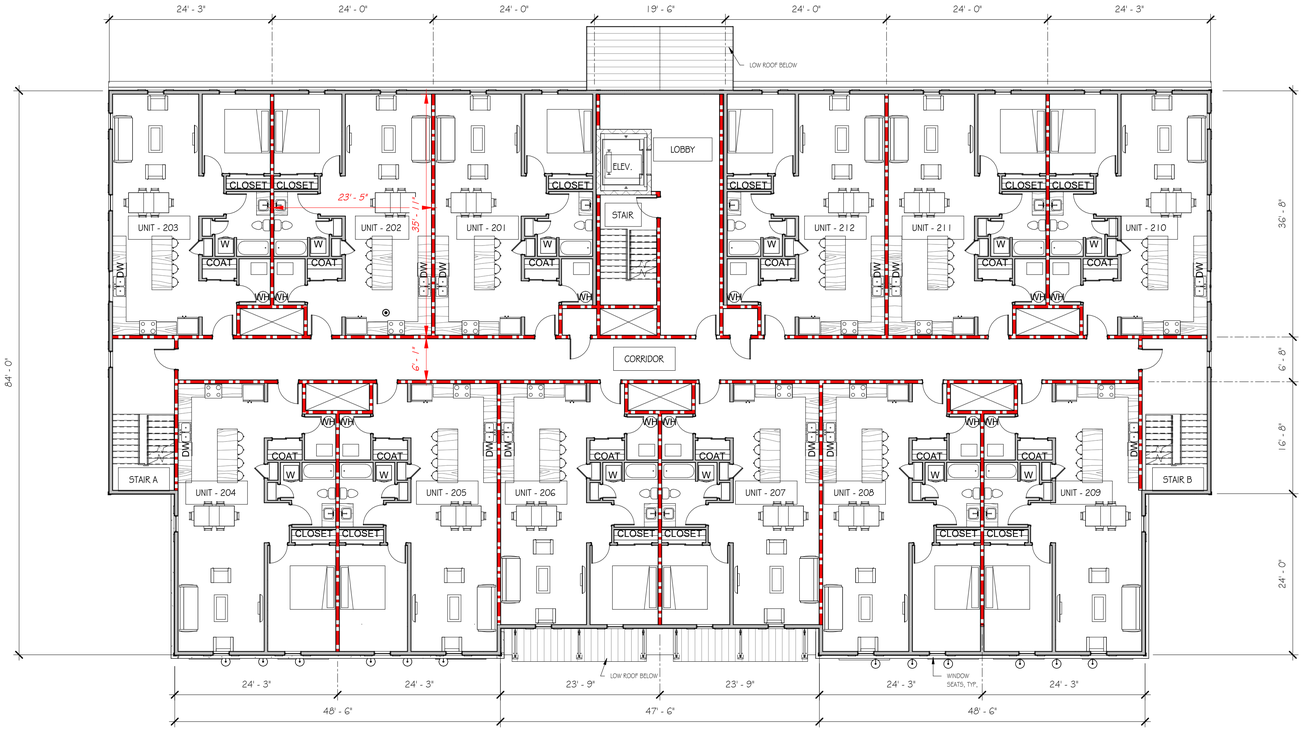
PCS

TW DESIGNS, LLC
254 DRAKE HILL RD. STRAFFORD, NH
P: 603.664.2181 | F: 603.664.9508



1 FIRST FLOOR PLAN
3/32" = 1'-0"

FRONT STREET SCAPE COMMERCIAL SPACE



2 SECOND FLOOR PLAN
3/32" = 1'-0"

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No.	Description	Date

Revision Schedule

Project Info:

76 Port Ave.

76 Portsmouth Ave.
Exeter, NH

Sheet Status:

Latest Release:
Issued For: Approved SD
Org. Issue Date: NFC - 03/10/25

JOB NO:
DRAFTED: HL
CHECKED: JMT
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Sheet Title:

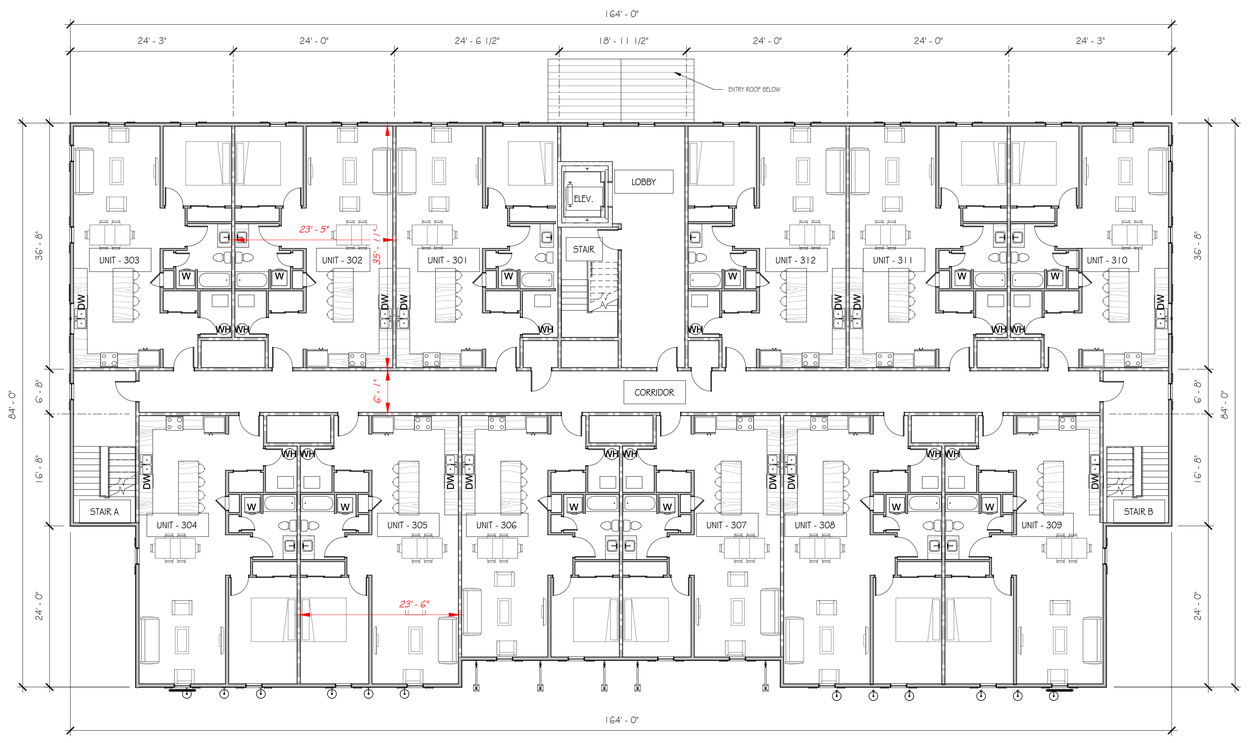
OVERALL FLOOR PLAN

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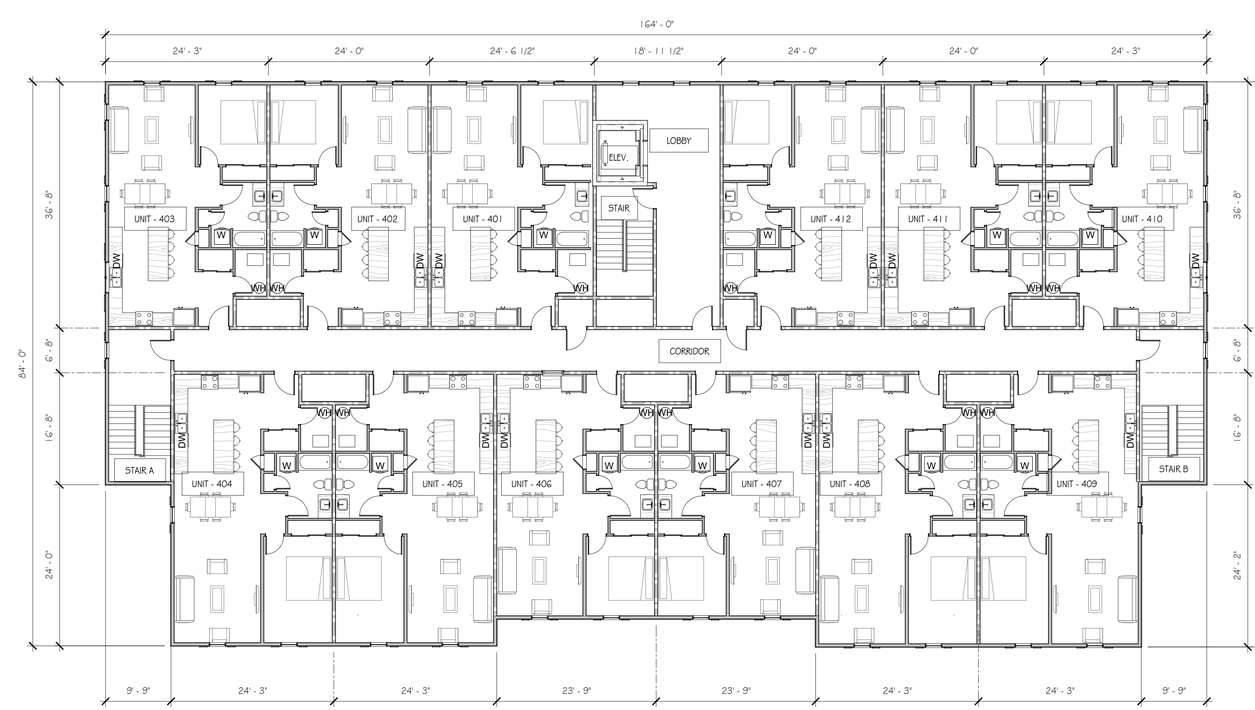
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3/10/2025
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2 THIRD FLOOR PLAN
3/32" = 1'-0"



1 FOURTH FLOOR PLAN
3/32" = 1'-0"

TW DESIGNS LLC
254 DRAKE HILL RD. STRAFFORD, NH
P: 603.664.2181 | F: 603.664.9508

No. Description Date

Revision Schedule

Project Info:

76 Port Ave.

76 Portsmouth Ave.
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JOB NO:
DRAFTED: HL
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SCALE: 3/32" = 1'-0"

Sheet Title:

OVERALL FLOOR PLAN

Sheet Number:

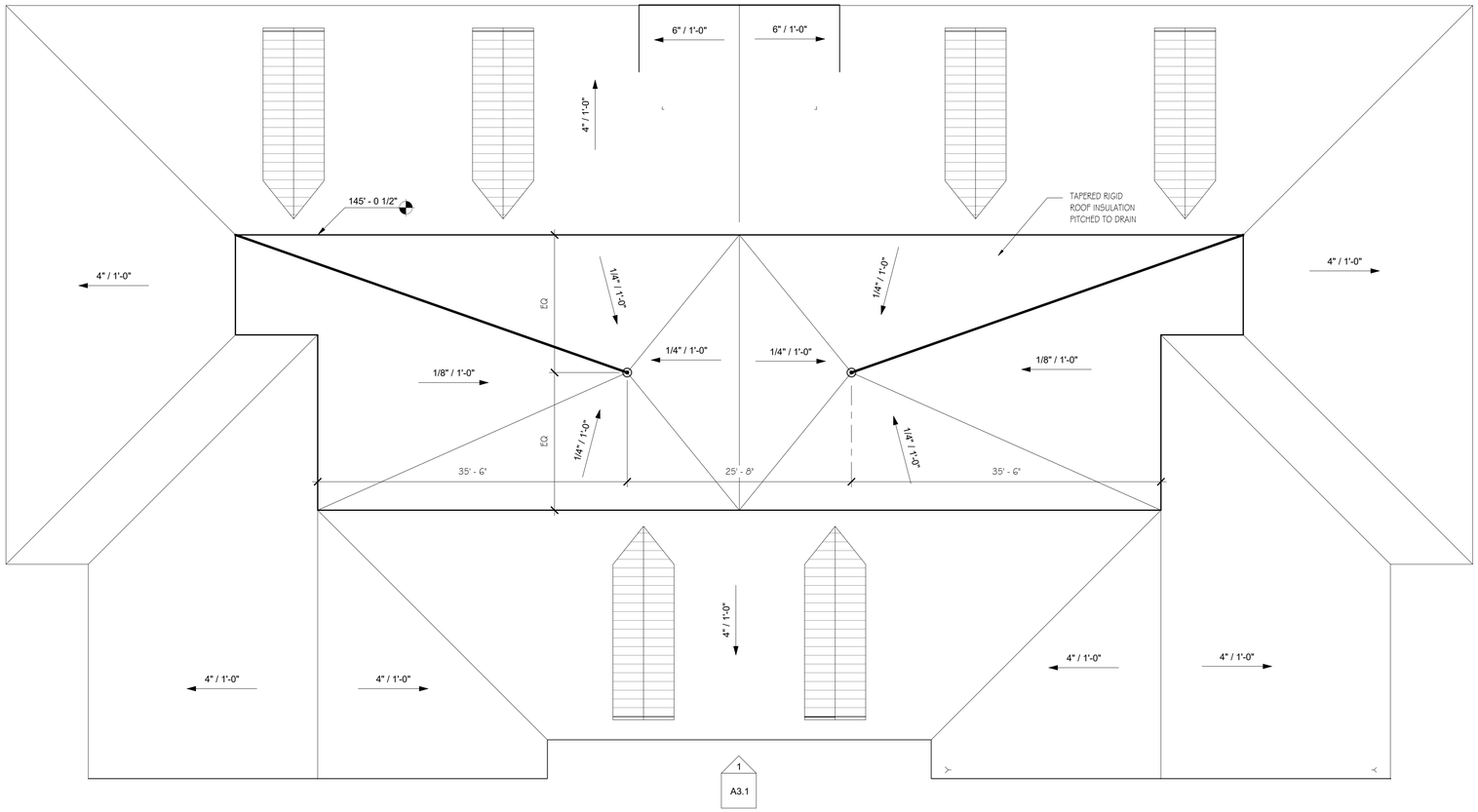
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TW DESIGNS LLC
254 DRAKE HILL RD. STRAFFORD, NH
P: 603.664.2181 | F: 603.664.9508



1 ROOF LEVEL
1/8" = 1'-0"

GENERAL ROOF PLAN NOTES:
1. ALL ROOF SLOPES ARE 4" PER FOOT MIN.
2. HATCH INDICATES EXTENT OF SLOPED ROOF INSULATION
3. ALL RUBBER ROOFS TO BE 60 MIL FULLY ADHERED E.P.D.M.
4. MIN. ROOF INSULATION THICKNESS SHALL BE 3"

ROOF LEGEND:

R.D. = ROOF DRAIN

= INDICATES TAPERED INSULATION

= STANDING SEAM MTL. ROOF @ P.E.B.

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3/10/2025
11:22:43 AM

No. Description Date

Revision Schedule

Project Info:
76 Port Ave.

76 Portsmouth Ave.
Exeter, NH

Sheet Status:
Latest Release:
Issued For: Approved SD
Org. Issue Date: NFC - 03/10/25

JOB NO:
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SCALE: As indicated

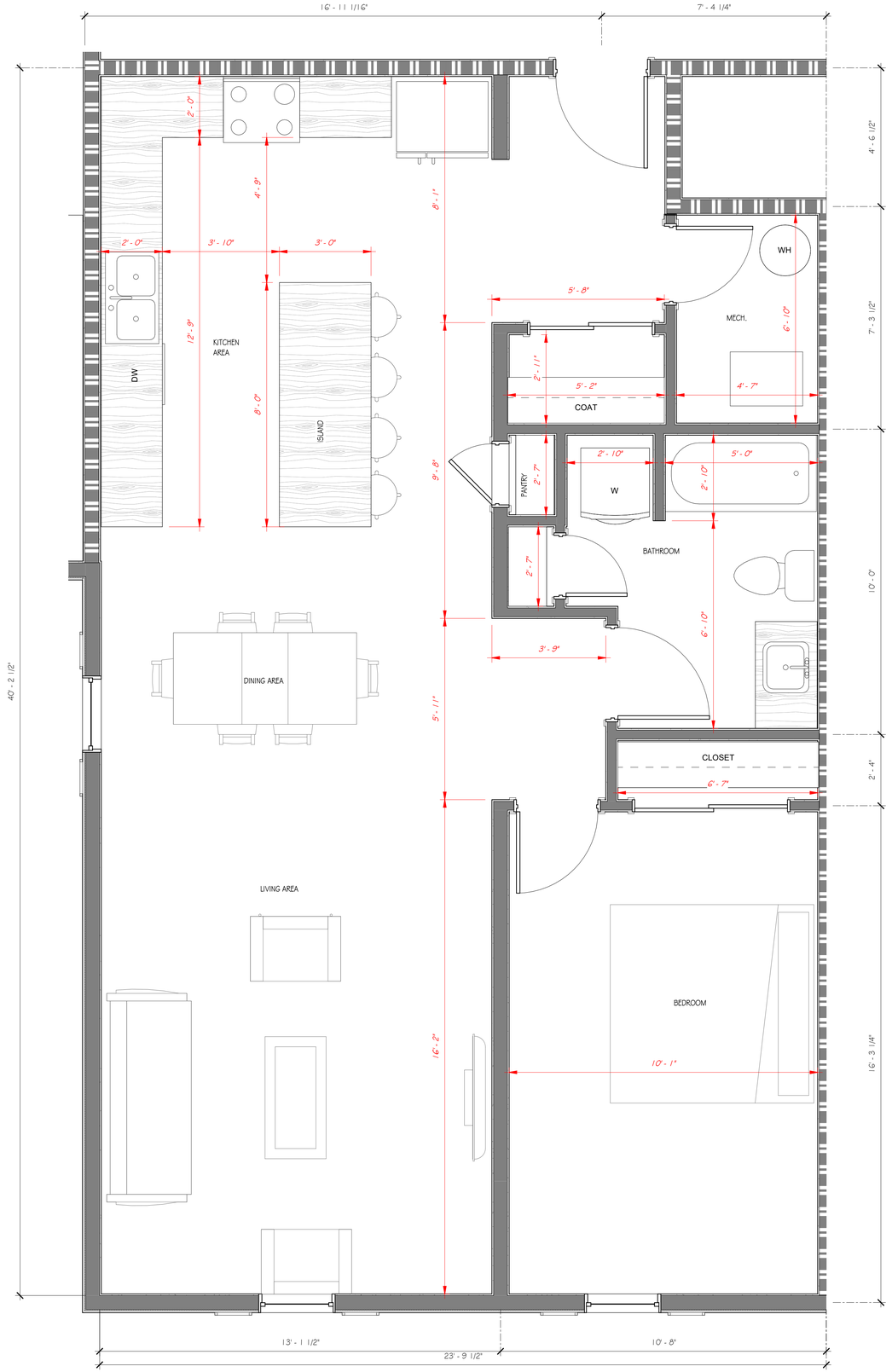
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ROOF PLAN

Sheet Number:
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254 DRAKE HILL RD. STRAFFORD, NH
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1 ENLARGED TYPICAL UNIT FLOOR PLAN
1/2" = 1'-0"

SQUARE FOOTAGE

UNIT FLOOR AREA - 889 S.F.

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3/10/2025
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No. Description Date

Revision Schedule

Project Info:

76 Port Ave.

76 Portsmouth Ave.
Exeter, NH

Sheet Status:

Latest Release:
Issued For: Approved SD
Org. Issue Date: NFC - 03/10/25

JOB NO:
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CHECKED: JMT
SCALE: 1/2" = 1'-0"

Sheet Title:

UNIT FLOOR PLAN

Sheet Number:

A1.4

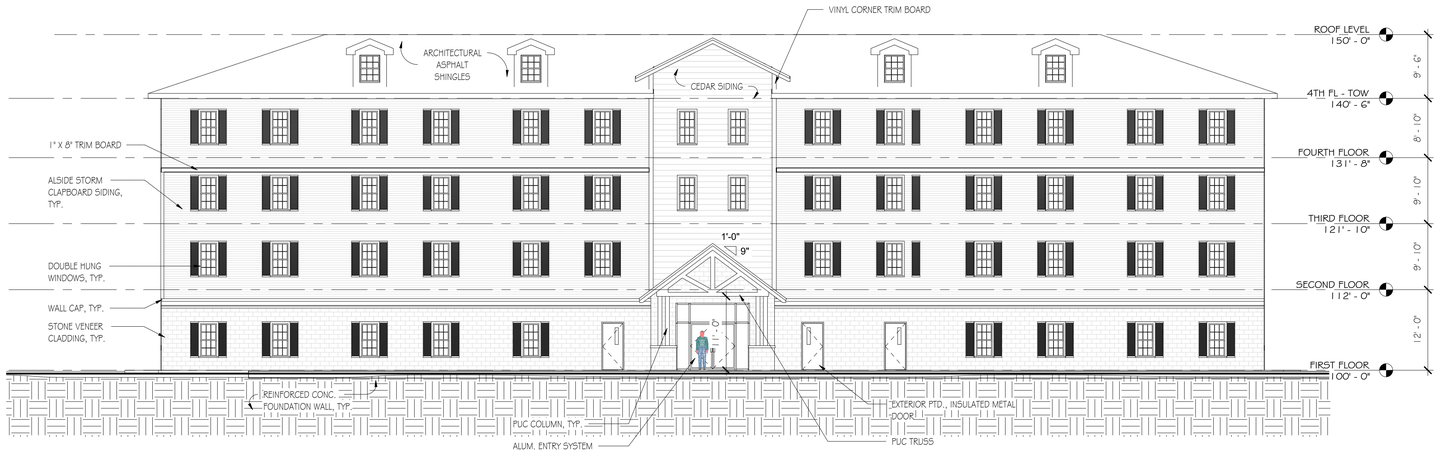
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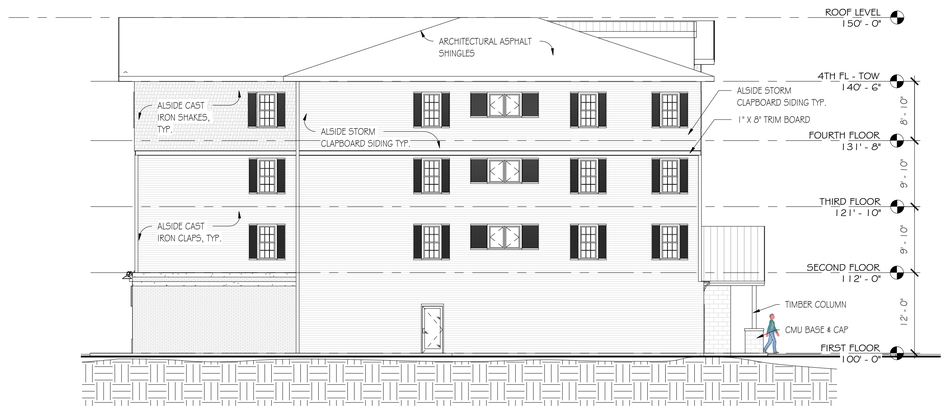
TW DESIGNS LLC
254 DRAKE HILL RD. STRAFFORD, NH
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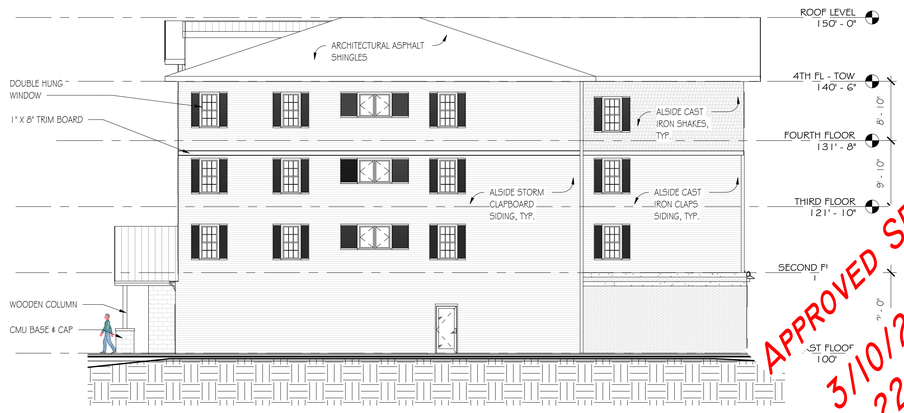
1 FRONT / STREET SIDE EXTERIOR ELEVATION
3/32" = 1'-0"



2 REAR EXTERIOR ELEVATION
3/32" = 1'-0"



3 RIGHT SIDE EXTERIOR ELEVATION
3/32" = 1'-0"



4 LEFT SIDE EXTERIOR ELEVATION
3/32" = 1'-0"

APPROVED SD
3/10/2025
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No. Description Date

Revision Schedule

Project Info:
76 Port Ave.

76 Portsmouth Ave.
Exeter, NH

Sheet Status:
Latest Release:
Issued For: Approved SD
Org. Issue Date: NFC - 03/10/25

JOB NO:
DRAFTED: HL
CHECKED: JMT

SCALE: 3/32" = 1'-0"

Sheet Title:
EXTERIOR ELEVATIONS

Sheet Number:
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31 Haven Lane
Exeter, NH 03833
March 19, 2025

Exeter Planning Board
10 Front Street
Exeter, NH 03833

Dear Exeter Planning Board,

We have been following the process of this development since July. We want to urge the Planning Board to address the following issues and incorporate solutions into site plans before waivers, motions and approval are considered.

Due to the number of concerns that have not been addressed, we request the Board
- table decisions on both waiver motions
- table decisions on both Planning Board motions

until abutters concerns are addressed directly and in detail.

Outstanding concerns about the development are as follow.

BUFFERS:
We anticipate seeing a detailed landscaping plan at the upcoming meeting. We request buffers, including but not limited to:
- low growing plants
- adequate fencing that matches the aesthetics of the existing neighborhood
- shrubbery and evergreens that will grow tall and dense
- tightly foliaged trees with a minimum caliper of 4" that will grow to a minimum of the building height of the townhouses at maturity
- verbiage in the condo docs that guarantees the maintenance, upkeep and care of all plantings and fencing on an ongoing basis

WATER DAMAGE LIABILITY & REMEDIATION:
Written assurances from Green and Company as well as the Town of Exeter that the well-documented issues with water in and around Jady Hill will be made no worse by the project. We need a formalized means of remedy for any flooding or damage experienced by residents due to this new development. Whatever the solution, it must require that the parties responsible for the development are liable for any financial burden required to repair Jady Hill homes and properties and restore them to their previous water shedding capacity.

CONSTRUCTION HOURS:
We would like to continue the conversation regarding noise from construction. Per our petitions, we, residents of Jady Hill, request the Planning Board make recommendation to the Select Board to impose specific days and times when work is permitted on site. Please recommend site work:
- only be allowed 8AM to 5PM

- only be permissible Monday through Friday
- not be permitted on weekends
- never be allowed on federal or local holidays

This is an established, quiet neighborhood of people who report to their jobs around the clock: first, second **and** third shifts, ranging in age from less than a year to over 90. **Ongoing, noisy construction for 2 years** (per the builder), **seven days a week, fifteen hours a day is an untenable burden**.

HEIGHT:
We are happy to see the height adjustments made to 5 of the 32 townhouses, but we are asking the townhouses closest to abutters be removed from the plan. **Even at 30 feet they are half again as tall as *tallest* of the abutters' homes**. In lieu of that, we would like to know the details of how the height changes were made and if this change can be rolled out over the entirety of buildings 1, 11 and 8 as they were on building 7. This would bring 14 of the units to a 30' height, leaving more than half remaining at 35'.

This request regarding height and proximity is made explicitly per Exeter's Zoning Ordinances 1.2 and 10.1.D which require that development "promote health and the general welfare [of residents]..provide adequate light and air" and that the Town "control its growth, size and nature to achieve the following objectives…to protect the health, safety convenience, property and general welfare of its inhabitants." Please see the ZO attachments provided. In addition, per the MUND, the development needs to be "consistent with the scale and historic character of these neighborhoods."

Please do not green light this project as is, resulting in a reduction in our quality of life and our property values. Please take time to work out the details, require the changes and parameters outlined above and then make decisions on the four motions.

With thanks,

Michael Hauck & Danielle Frank
31 Haven Lane

Article 1. AUTHORITY AND PURPOSE

1.1 SHORT TITLE

This ordinance may be referred to as the Exeter Zoning Ordinance.

1.2 PURPOSES

The purposes of the Exeter Zoning Ordinance are to lessen congestion in the streets; to secure safety from fires, panic and other dangers; to promote health and the general welfare; to provide adequate light and air; to prevent the overcrowding of land; to avoid undue concentration of population; and to facilitate the adequate provision of transportation, water, sewerage, schools, parks and other public requirements.

Article 10. GROWTH MANAGEMENT ORDINANCE

10.1 PREAMBLE

10.1.1 The Town of Exeter deems it desirable to control its growth, size and nature to achieve the following objectives:

A. To promote the development of an economically sound and environmentally stable "small town" residential community;

B. To preserve the scenic beauty and present aesthetic values of the Town;

C. To prevent scattered or premature development of the land;

D. To protect the health, safety, convenience, property and general welfare of its inhabitants;

E. To insure that the rate of growth of the Town does not unreasonably interfere with the Town's capacity for planned, orderly and sensible expansion of its services to accommodate such growth;

F. To promote development harmonious with land capabilities within the Town;

G. To prevent too rapid a pace of growth that tends to thwart the planning process and escalate too rapidly the growth and costs of municipal services, especially of schools;

H. To allow the shared goals, plans and objectives of the Town, its planning officials and its citizens to be realized in a comprehensive fashion as set forth in the Exeter Master Plan.

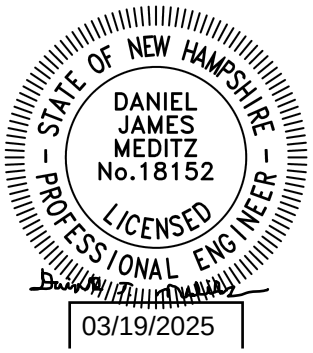
DRAINAGE ANALYSIS

SEDIMENT AND EROSION CONTROL PLAN

"Lilac Place"
76 Portsmouth Ave.
Exeter, NH 03833
Tax Map 137, Lots 4 & 75

Prepared for:

Green & Company
11 Lafayette Road
North Hampton, NH 03862



Prepared by:
Jones & Beach Engineers, Inc.
85 Portsmouth Avenue
P.O. Box 219
Stratham, NH 03885
(603) 772-4746
November 4, 2024
Revised January 13, 2025
Revised February 14, 2025
Revised March 14, 2025
JBE Project No. 24029

EXECUTIVE SUMMARY

Green & Company proposes to construct a mixed-use commercial and residential development on the subject parcel as shown on the design plans with access from Portsmouth Ave. & Haven Lane in Exeter, NH.

In general, the Town of Exeter has similar stormwater regulations to the AOT Bureau, with the additional stipulation that runoff from impervious surfaces shall be treated to achieve at least 80% removal of total suspended solids and 60% removal of both total nitrogen and total phosphorous for all impervious surfaces. Through the use of several stormwater management devices including porous pavement, modified stone drip edges constructed with an internal filter course, focal points, Jellyfish systems, and underground detention chambers, we are able to meet all applicable Town and State stormwater regulations for this project.

A drainage analysis of the entire site as well as offsite contributing watershed area was conducted for the purpose of estimating the peak rate of stormwater runoff and to subsequently design adequate drainage structures so that the above-mentioned requirements could be met. Two models were compiled, one for this area in its existing (pre-construction) condition, and a second for the area in its proposed (post-construction) condition. The analysis was conducted using data for the 2 Year – 24 Hour (3.70”), 10 Year – 24 Hour (5.65”), 25 Year – 24 Hour (7.18"), and 50 Year – 24 Hour (8.61") storm events using the USDA SCS TR-20 method within the HydroCAD Stormwater Modeling System environment. These rainfall data were taken from the Extreme Precipitation Tables developed by the Northeast Regional Climate Center (NRCC) and the extreme precipitation estimates were increased by 15% due to the project’s location in a Coastal/Great Bay Community. A summary of the existing and proposed conditions peak rates of runoff toward the six analysis points in units of cubic feet per second (cfs) is as follows:

Analysis Point	2 Year		10 Year		25 Year		50 Year	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Analysis Point #1	15.86	15.84	26.83	26.59	35.64	35.45	43.88	43.87
Analysis Point #2	0.79	0.73	1.41	1.21	1.90	1.57	2.36	1.91
Analysis Point #3	10.87	10.69	19.20	18.85	25.75	25.54	31.85	31.67
Analysis Point #4	0.87	0.30	1.33	0.51	1.70	0.67	2.04	0.83
Analysis Point #5	0.37	0.02	0.57	0.03	0.73	0.05	0.87	0.06
Analysis Point #6	0.45	0.42	0.76	0.73	1.01	0.97	1.24	1.20

A similar summary of the existing and proposed conditions runoff volumes discharged over a 72-hour time span resultant to the modelled 24-hour storms toward the six analysis points in units of acre-feet (ac-ft) is as follows:

Analysis Point	2 Year		10 Year		25 Year		50 Year	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Analysis Point #1	2.458	2.343	4.600	4.251	6.371	5.815	8.064	7.305
Analysis Point #2	0.072	0.063	0.130	0.107	0.178	0.141	0.223	0.174
Analysis Point #3	1.291	1.295	2.312	2.313	3.141	3.140	3.926	3.923
Analysis Point #4	0.071	0.022	0.111	0.038	0.143	0.051	0.172	0.064
Analysis Point #5	0.030	0.001	0.048	0.002	0.061	0.003	0.074	0.005
Analysis Point #6	0.039	0.037	0.069	0.065	0.092	0.088	0.115	0.109

NHDES AOT Channel Protection requirements, which are additionally copied into the stormwater regulations of the Town of Exeter, are met if the 2-year 24-hour runoff volume toward a wetland or waterbody from a particular development is reduced or increased by less than 0.1 acre-feet post-construction. Per the above table, runoff volumes are reduced toward all analysis points with the exception of Analysis Point 3 during all analyzed storms post-construction. However, even toward Analysis Point 3, the increase in runoff volume during any storm event is minimal and is far under 0.1 acre-feet. Therefore, this project meets and exceeds channel protection requirements. Analysis Points 2 and 3 are both upstream of Analysis Point 1, which represents a wetland just upstream of Wheelwright Creek that then drains toward the Squamscott River.

Best Management Practices per the NHDES Stormwater Manual have been applied to the design of this stormwater management system and will be observed during all stages of construction. All land disturbed during construction will be stabilized within thirty days of groundbreaking and abutting property owners will suffer minimal adversity resultant to this development.

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2.0 Existing Conditions Analysis

3.0 Proposed Conditions Analysis

4.0 Conclusion

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2 Year - 24 Hour Summary
10 Year - 24 Hour Complete
25 Year - 24 Hour Complete
50 Year - 24 Hour Summary

Appendix II Proposed Conditions Analysis

2 Year - 24 Hour Summary
10 Year - 24 Hour Complete
25 Year - 24 Hour Complete
50 Year - 24 Hour Summary

Appendix III Test Pit Logs
Appendix IV Site Specific Soil Survey and Map
Appendix V NRCS Soil Map
Appendix VI Extreme Precipitation Estimates
Appendix VII Manning's Full-Flow Equation for Existing 48" CMP and Proposed 48" HDPE
Appendix VIII Rip Rap Design Calculations
Appendix IX BMP and GRV Worksheets
Appendix X Infiltration Testing Data
Appendix XI BMP Pollutant Removal Efficiency Data and Calculations
Appendix XII Stormwater Operations and Maintenance Manual
Appendix XIII Pre- and Post-Construction Watershed Plans

1.0 RAINFALL CHARACTERISTICS

This drainage report includes an existing conditions analysis of the area involved in the proposed development, as well as a proposed condition, or post-construction analysis, of the same area. These analyses were accomplished using the USDA SCS TR-20 Method within the HydroCAD 10.20-3c Stormwater Modeling System and a time span of 0-72 hours was utilized. The curve numbers were developed using the SCS TR-55 Runoff Curve numbers for Urban Areas. A Type III SCS 24-hour rainfall distribution was utilized in analyzing the data for the the 2 Year – 24 Hour (3.70"), 10 Year – 24 Hour (5.65"), 25 Year – 24 Hour (7.18"), and 50 Year – 24 Hour (8.61") storm events using the USDA SCS TR-20 method within the HydroCAD Stormwater Modeling System environment. These rainfall data were taken from the Extreme Precipitation Tables developed by the Northeast Regional Climate Center (NRCC) and the extreme precipitation estimates were increased by 15% due to the project's location in a Coastal/Great Bay Community.

Peak rates of runoff will be reduced from the existing condition and channel protection as well as groundwater recharge requirements will be met, thereby minimizing any potential for a negative impact on wetlands or abutting properties. This is accomplished through treatment of stormwater runoff and attenuation of peak flows and volumes resulting from storm events.

2.0 EXISTING CONDITIONS ANALYSIS

In the existing condition, the front of the site is developed and consists of an Auto Parts business while the rear of the site is wooded. A deep gully separates these two parts of the subject parcel. Runoff from the area of proposed development as well as upstream contributing watershed area, collectively referred to from this point forward as the "study area", was considered in this analysis.

The existing topography as well as existing drainage features divide the study area into 6 subcatchments, draining toward six analysis points. Subcatchment 1S consists of the bulk of the existing auto parts store development, as well as the majority of on-site woods and some offsite contributing watershed. Runoff from Subcatchment 1S drains through on-site wetlands directly toward Analysis Point 1, which is the ultimate discharge point from most of the subject parcel toward the Wheelwright Creek which drains toward the Squamscott River.

Subcatchment 2S consists of the back parking lot and roof of the neighboring Thirsty Moose as well as some on-site wooded area. This subcatchment drains directly to Analysis Point 2. Analysis Point 2 is a stormwater collection point at the beginning of the aforementioned deep gully that separates the front, developed and the back, wooded sections of the subject parcel. This was modelled as an Analysis Point in order to ensure that runoff from the proposed development does not negatively impact the existing Thirsty Moose site. From Analysis Point 2, runoff follows a series of reaches, labelled as 2Ra, 2Rb, and 2Rc, toward downstream Analysis Point 1.

Subcatchment 3S consists of some wooded and wetland area in the southwestern periphery of the subject parcel as well as significant offsite contributing watershed area. This drains toward Analysis Point 3, which is modelled as a pond due to existing closed contours. Due to the existence of a 15" CMP outlet near AP2, it is assumed that a 15" CMP inlet exists as an outlet for the pond modelled as AP3 and is either buried or hidden. As noted on the project plans, the contractor shall uncover this inlet during construction and notify the engineer of record if it is not found. However, the culvert is modelled in the existing conditions drainage analysis as we assume that it does in fact exist. Discharge from the pond modelled as Analysis Point 3 is routed through the aforementioned culvert toward the

same series of reaches (2Ra-2Rc) that ultimately drain toward Analysis Point 1 as previously mentioned in the paragraph describing Subcatchment 2S.

Subcatchment 4S represents the far front area of the existing Auto Parts site, which is mostly paved and drains directly into Portsmouth Avenue. The edge of pavement for Portsmouth Avenue is modelled as Analysis Point 3, downstream of Subcatchment 4S.

Subcatchment 5S consists of the northeastern half of the existing Auto Parts store roof, which drains on to the abutting Verani Realty business, modelled as Analysis Point 5. Runoff from Analysis Point 5 is routed toward Reach 2Rb and ultimately toward downstream Analysis Point 1.

Finally, Subcatchment 6S consists of a stretch of Haven Lane as well as existing abutting house lots that drain toward an existing catch basin, modelled as Analysis Point 6. This catch basin is scheduled to be relocated for the proposed development. The closed drainage system that this catch basin is a part of outlets far enough north of the development site that it will not impact the proposed development, but this subcatchment needed to be modelled in order to ensure that peak rates of runoff into the closed drainage system are being reduced and therefore the closed drainage system will not be negatively impacted by the proposed development.

It should be noted that there is a hill just to the west of the edge of the intersection of Haven Lane and Bonnie Drive, which just to the northwest of the northwestern corner of the subject parcel. However, it appears that the runoff from this hill does not flow on to the subject parcel. Instead, it flows through the inlet grate of a catch basin and discharges through an offsite closed drainage network toward the Wheelwright Creek.

Existing soil types were determined through a Site Specific Soil Survey conducted by a Certified Soil Scientist. Several different soil types were identified, with Hydrologic Soil Groups C and D. The soil types where infiltration systems are proposed are primarily Scitico silt loam (HSG C, SSSM symbol 33) and Boxford somewhat poorly drained (SSSM symbol 953). of Soil Scientists of Northern New England (SSSNNE), Scitico soils have a saturated hydraulic conductivity (Ksat) range of 0.0-0.2 inches per hour in both the B and C horizons, and Boxford soils have a Ksat range of 0.1-0.2 inches per hour in the B horizon and 0.00 to 0.2 inches per hour in the C horizon. Soil types per the Site-Specific Soil Survey were used for onsite areas and soil types per NRCS Web Soil Survey were used for offsite areas, which includes some areas represented as HSG B.

Ostensibly these values indicate little to no capacity for infiltration. For this reason, infiltration testing was performed on site using a Compact Constant Head Permeameter (CCHP, also known as an amoozemeter) on October 24, 2024 in order to verify the actual infiltration rate of the in-situ soils. An auger was used in order to dig test holes to the C horizon and three tests were performed in each of three locations throughout the subject parcel for a total of nine tests. These three locations corresponded with the locations of test pits 6001, 6007, and 6010.

Standard size auger holes, 4 cm in diameter were dug to the C horizon in order to obtain an accurate permeability reading below the bottom of the proposed infiltration systems. Water was then discharged through the soil and the drop in water level on the tube in which the water was stored before being discharged was recorded at several time intervals. The comparison between the drop in water level and the elapsed time from the start of the test was used to calculate the Ksat value. For example, if the water level dropped 3 cm after 5 minutes and 5 cm after 10 minutes, this was recorded and used as data to calculate the Ksat using the formulas listed in the data spreadsheets in the appendix of this report.

The Ksat values from each time increment were then averaged to determine the mean Ksat, and average of the mean Ksat values between the three tests at each location was divided by a factor of safety of two in order to determine the saturated hydraulic conductivity to use for design purposes.

One outlier was recorded – A much higher mean Ksat was recorded for the first test near test pit 6010 than on the other two. This occurred because the amoozemeter was perched on top of a 2-foot high bucket, so there was too much head differential between the amoozemeter and the bottom of the test hole. For the remainder of the tests, the amoozemeter was kept at or near grade, but the results of this one test were discarded from the mean Ksat calculation.

The results of the permeability testing are as summarized below:

Test	Ksat (in/hr)
TP 6010 – Test #1	*4.92 (discarded)*
TP 6010 – Test #2	1.50
TP 6010 – Test #3	2.54
TP 6010 – Mean Ksat	**2.0**
TP 6007 – Test #1	1.78
TP 6007 – Test #2	3.40
TP 6007 – Test #3	3.61
TP 6007 – Mean Ksat	**2.9**
TP 6001 – Test #1	3.41
TP 6001 – Test #2	3.07
TP 6001 – Test #3	3.48
TP 6001 – Mean Ksat	**3.3**

A further breakdown of the data used to arrive at the final Ksat values is included in the appendix of this report. Applying a factor of safety of two, this comes out to a saturated hydraulic conductivity of **1.0 in/hr** near test pit 6010, **1.45 in/hr** near test pit 6007, and **1.65 in/hr** near test pit 6001. Due to these results, an infiltration rate of 1.0 in/hr was used in general to design infiltration practices around the site, except for one stone drip edge near test pit 6007 for which an infiltration rate of 1.45 in/hr was utilized.

3.0 PROPOSED CONDITIONS ANALYSIS

The proposed development divides the subject parcel into 26 subcatchments, all draining toward the same six analysis points as previously described. Subcatchments 1S-6S are functionally the same as in the existing conditions analysis in terms of their hydrologic routing, but their outlines, areas, and surface covers are altered due to the grading associated with the proposed development.

Beyond this, pond node numbers have been assigned for each of the proposed stormwater management devices, and a corresponding subcatchment for the land that drains to it has been developed if applicable as well. The same reaches from the existing conditions analysis have been maintained in the proposed conditions analysis, and additional reaches have been added to model overland flow from the outfall points of proposed stormwater management devices toward existing reaches or analysis points.

The primary stormwater management methodology for the townhouse development section of the site consists of a porous pavement section toward which the remainder of the impervious pavement and

sidewalk areas would drain, a permeable concrete sidewalk stretch, and a drip edge on each of the eleven townhouse buildings. The porous concrete and most of the porous pavement will be unlined and will not have underdrains; therefore, groundwater recharge will be achieved using these practices. Two small sections of porous pavement will need to be lined and underdrained as the bottom of the stone underlaying the porous pavement cannot be kept above the seasonal high water table in these areas. Ten of the eleven drip edges will contain an internal filter course and function similarly to bioretention systems as filtration practices, while the drip edge used for Building #11 will have sufficient separation to the seasonal high water table to be designed as an infiltration practice. This one drip edge will not have a filter course and instead water will be treated through clean fill installed between existing grade and the bottom of the stone drip edge, and through native soils below that. There will be three feet of separation between the SHWT and the bottom of this stone drip edge, as required. Due to high groundwater tables through most of the site, the filtration drip edges will all be lined and underdrained, and groundwater recharge will not be possible using these devices.

The stormwater management system for the front section of the site with a proposed mixed-use building will be separate from that of the proposed townhouse development and will consist of a Focal Point high flow biofiltration system and two Jellyfish filtration devices designed for treatment as well as a chamber system designed for peak flow attenuation downstream of these three treatment devices.

There is a known flooding issue related to the pond modelled as AP3. Because of this, we have been given permission by the owners of the neighboring Thirsty Moose restaurant to replace the existing 15" CMP culvert, which runs through their property, with a new 18" HDPE culvert. This will reduce flood stages in the post construction condition during all analyzed storm events. The aforementioned chamber system has been designed to offset any flow increase related to increasing the pipe size and switching to a pipe material with lower friction leaving the ponded wetland. At the very least, this will represent an improvement over the existing situation. A comparison in pre-development and post-development peak elevations within Pond AP3 during analyzed storm events, as modelled, is as follows:

Storm Event	Existing Peak Elevation in Pond AP3 (ft.)	Post-Construction Peak Elevation in Pond AP3 (ft.)
2-Year 24-Hour Storm	31.38	29.79
10-Year 24-Hour Storm	33.12	31.61
25-Year 24-Hour Storm	33.99	32.66
50-Year 24-Hour Storm	34.60	33.40

Additionally, a pedestrian passageway is proposed in order to connect the proposed townhouse development with the proposed mixed-use building. In order to avoid needing a box culvert and a larger wetland impact, this has been placed just at the beginning of the aforementioned wet gulley. However, in the existing condition two CMP culverts – one with a 15" diameter and one with a 48" diameter – outlet at the location where the retaining wall adjacent to the sidewalk would be proposed. For this reason, a 6' diameter drain manhole has been designed just to the northeast of the proposed sidewalk. The 48" CMP culvert will be cut back to outlet into the proposed drain manhole, and as previously explained, the 15" CMP culvert is being removed and replaced with an 18" HDPE culvert that will tie into the proposed drain manhole. Additionally, a 12" HDPE culvert is proposed in order to capture the water that would otherwise be impounded by the proposed sidewalk and convey it safely into the drain manhole as well. A 48" HDPE pipe is proposed at the outlet of this drain manhole in

order to discharge the stormwater from these three pipes into the channel represented as Reach 2Ra, as was described in the existing conditions analysis.

The exact watershed of the existing 48" CMP culvert is unknown. There is a closed drainage system upstream of it which extends up Alumni Drive and down Portsmouth Avenue. However, by assuming that the CMP culvert is operating at peak flow we can verify that the 48" HDPE that we are proposing at the outlet of the proposed drain manhole downstream of the existing 48" CMP is capable of passing the flows directed toward it. A full-flow Manning's equation analysis of the existing and proposed 48" pipes is included in the appendix of this report, demonstrating that the proposed 48" HDPE culvert with a slope of 0.02 ft/ft is capable of simultaneously passing the full flow out of the existing 48" CMP culvert with a slope of 0.008 ft/ft as well as the 50-year 24-hour peak flow from the upstream 12" HDPE pipe from Analysis Point 2 and from the upstream 18" HDPE pipe from Analysis Point 3.

As a result of the implementation of this stormwater management system, peak flow rates are reduced toward all six analysis points during all analyzed storm events in the proposed condition as compared with the existing condition. Additionally, channel protection requirements of both the Town of Exeter and the AOT Bureau are met as explained in the executive summary. Groundwater recharge volume requirements are met as well. A GRV worksheet is available in the appendix of the report to demonstrate this. Each stormwater management device treats either the water quality volume or water quality flow of runoff directed toward it as required. All post-construction impervious surfaces on the subject parcel are directed toward a treatment device.

Additionally, the pollutant removal requirements of the Town of Exeter are met through the implementation of this stormwater management system. A breakdown of pollutant removal efficiencies for each BMP used as well as a spreadsheet containing pollutant removal calculations are included within the appendix of this report in order to demonstrate that at least 80% TSS removal and at least 60% removal of both TN and TP is achieved.

5.0 CONCLUSION

This proposed site development will have minimal adverse effect on abutting infrastructures, properties, and downstream wetlands by way of stormwater runoff or siltation. Appropriate steps will be taken to eliminate erosion and sedimentation; this will be accomplished through the construction of the aforementioned stormwater management system as well as site grading, rip rap, and temporary erosion control measures including but not limited to silt fence, erosion control blankets, culvert inlet protection check dams, and a stabilized construction entrance. Best Management Practices developed by the State of New Hampshire have been utilized in the design of this stormwater management system and their application will be enforced throughout the construction process.

This project results in more than 100,000 S.F. of disturbance and therefore it will require a NHDES Alteration of Terrain Permit.

Respectfully Submitted,
JONES & BEACH ENGINEERS, INC.

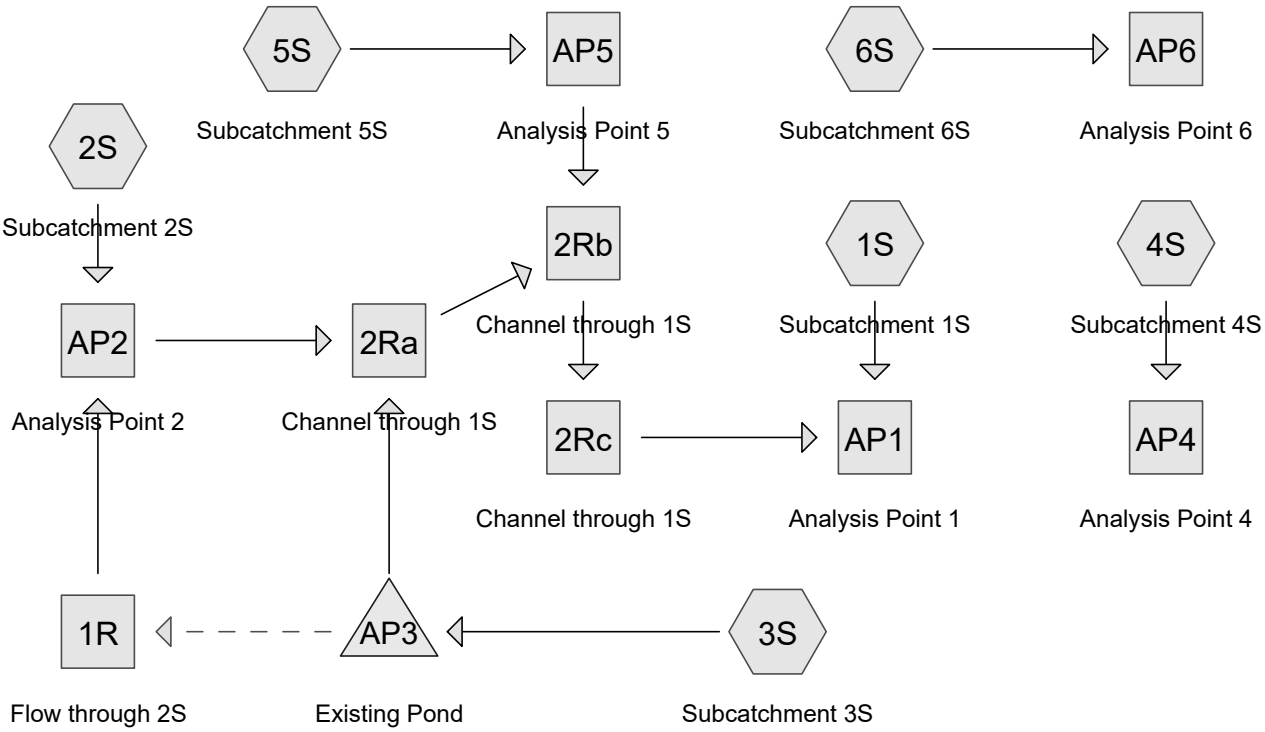
Daniel Meditz

Daniel Meditz, P.E
Project Engineer

APPENDIX I

EXISTING CONDITIONS DRAINAGE ANALYSIS

Summary 2 YEAR
Complete 10 YEAR
Complete 25 YEAR
Summary 50 YEAR



Subcat Reach Pond Link

Routing Diagram for 24029 EX CONDITION

Prepared by Jones & Beach Engineers Inc, Printed 3/14/2025

HydroCAD® 10.20-6a s/n 00762 © 2024 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.616	83	1/4 acre lots, 38% imp, HSG C (1S, 3S)
0.549	74	>75% Grass cover, Good, HSG C (1S, 2S, 3S, 6S)
0.247	98	Paved parking, HSG C (4S)
0.022	98	Paved roads w/curbs & sewers, HSG B (1S)
4.559	98	Paved roads w/curbs & sewers, HSG C (1S, 2S, 3S, 6S)
0.741	98	Roofs, HSG C (1S, 2S, 3S, 5S, 6S)
0.119	98	Water Surface, 0% imp, HSG D (3S)
0.076	55	Woods, Good, HSG B (1S)
6.712	70	Woods, Good, HSG C (1S, 2S, 3S)
0.841	77	Woods, Good, HSG D (1S, 3S)
15.480	**82**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.098	HSG B	1S
14.423	HSG C	1S, 2S, 3S, 4S, 5S, 6S
0.959	HSG D	1S, 3S
0.000	Other	
15.480		**TOTAL AREA**

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Subcatchment1S Runoff Area=337,085 sf 26.17% Impervious Runoff Depth=1.65"
Flow Length=919' Tc=21.9 min CN=78 Runoff=9.58 cfs 1.065 af

Subcatchment2S: Subcatchment2S Runoff Area=17,152 sf 51.10% Impervious Runoff Depth=2.19"
Flow Length=142' Tc=13.6 min CN=85 Runoff=0.79 cfs 0.072 af

Subcatchment3S: Subcatchment3S Runoff Area=296,381 sf 51.37% Impervious Runoff Depth=2.28"
Flow Length=604' Tc=26.3 min CN=86 Runoff=10.87 cfs 1.291 af

Subcatchment4S: Subcatchment4S Runoff Area=10,753 sf 100.00% Impervious Runoff Depth=3.47"
Tc=6.0 min CN=98 Runoff=0.87 cfs 0.071 af

Subcatchment5S: Subcatchment5S Runoff Area=4,596 sf 100.00% Impervious Runoff Depth=3.47"
Tc=6.0 min CN=98 Runoff=0.37 cfs 0.030 af

Subcatchment6S: Subcatchment6S Runoff Area=8,360 sf 56.70% Impervious Runoff Depth=2.45"
Flow Length=173' Tc=12.2 min CN=88 Runoff=0.45 cfs 0.039 af

Reach 1R: Flow through 2S Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.030 L=236.0' S=0.0233 '/' Capacity=430.82 cfs Outflow=0.00 cfs 0.000 af

Reach 2Ra: Channel through 1S Avg. Flow Depth=0.54' Max Vel=3.24 fps Inflow=6.42 cfs 1.363 af
n=0.040 L=136.0' S=0.0294 '/' Capacity=1,586.21 cfs Outflow=6.42 cfs 1.363 af

Reach 2Rb: Channel through 1S Avg. Flow Depth=0.15' Max Vel=2.10 fps Inflow=6.49 cfs 1.393 af
n=0.040 L=153.0' S=0.0392 '/' Capacity=4,170.50 cfs Outflow=6.49 cfs 1.393 af

Reach 2Rc: Channel through 1S Avg. Flow Depth=0.20' Max Vel=1.60 fps Inflow=6.49 cfs 1.393 af
n=0.040 L=303.0' S=0.0165 '/' Capacity=2,705.34 cfs Outflow=6.49 cfs 1.393 af

Reach AP1: Analysis Point 1 Inflow=15.86 cfs 2.458 af
Outflow=15.86 cfs 2.458 af

Reach AP2: Analysis Point 2 Inflow=0.79 cfs 0.072 af
Outflow=0.79 cfs 0.072 af

Reach AP4: Analysis Point 4 Inflow=0.87 cfs 0.071 af
Outflow=0.87 cfs 0.071 af

Reach AP5: Analysis Point 5 Inflow=0.37 cfs 0.030 af
Outflow=0.37 cfs 0.030 af

Reach AP6: Analysis Point 6 Inflow=0.45 cfs 0.039 af
Outflow=0.45 cfs 0.039 af

Pond AP3: Existing Pond Peak Elev=31.38' Storage=6,873 cf Inflow=10.87 cfs 1.291 af
Primary=6.18 cfs 1.291 af Secondary=0.00 cfs 0.000 af Outflow=6.18 cfs 1.291 af

Total Runoff Area = 15.480 ac Runoff Volume = 2.568 af Average Runoff Depth = 1.99"
60.06% Pervious = 9.298 ac 39.94% Impervious = 6.183 ac

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Subcatchment1S Runoff Area=337,085 sf 26.17% Impervious Runoff Depth=3.27"
Flow Length=919' Tc=21.9 min CN=78 Runoff=19.22 cfs 2.110 af

Subcatchment2S: Subcatchment2S Runoff Area=17,152 sf 51.10% Impervious Runoff Depth=3.97"
Flow Length=142' Tc=13.6 min CN=85 Runoff=1.41 cfs 0.130 af

Subcatchment3S: Subcatchment3S Runoff Area=296,381 sf 51.37% Impervious Runoff Depth=4.08"
Flow Length=604' Tc=26.3 min CN=86 Runoff=19.20 cfs 2.312 af

Subcatchment4S: Subcatchment4S Runoff Area=10,753 sf 100.00% Impervious Runoff Depth=5.41"
Tc=6.0 min CN=98 Runoff=1.33 cfs 0.111 af

Subcatchment5S: Subcatchment5S Runoff Area=4,596 sf 100.00% Impervious Runoff Depth=5.41"
Tc=6.0 min CN=98 Runoff=0.57 cfs 0.048 af

Subcatchment6S: Subcatchment6S Runoff Area=8,360 sf 56.70% Impervious Runoff Depth=4.29"
Flow Length=173' Tc=12.2 min CN=88 Runoff=0.76 cfs 0.069 af

Reach 1R: Flow through 2S Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.030 L=236.0' S=0.0233 '/' Capacity=430.82 cfs Outflow=0.00 cfs 0.000 af

Reach 2Ra: Channel through 1S Avg. Flow Depth=0.59' Max Vel=3.37 fps Inflow=7.42 cfs 2.442 af
n=0.040 L=136.0' S=0.0294 '/' Capacity=1,586.21 cfs Outflow=7.42 cfs 2.442 af

Reach 2Rb: Channel through 1S Avg. Flow Depth=0.17' Max Vel=2.22 fps Inflow=7.62 cfs 2.490 af
n=0.040 L=153.0' S=0.0392 '/' Capacity=4,170.50 cfs Outflow=7.62 cfs 2.490 af

Reach 2Rc: Channel through 1S Avg. Flow Depth=0.22' Max Vel=1.70 fps Inflow=7.62 cfs 2.490 af
n=0.040 L=303.0' S=0.0165 '/' Capacity=2,705.34 cfs Outflow=7.61 cfs 2.490 af

Reach AP1: Analysis Point 1 Inflow=26.83 cfs 4.600 af
Outflow=26.83 cfs 4.600 af

Reach AP2: Analysis Point 2 Inflow=1.41 cfs 0.130 af
Outflow=1.41 cfs 0.130 af

Reach AP4: Analysis Point 4 Inflow=1.33 cfs 0.111 af
Outflow=1.33 cfs 0.111 af

Reach AP5: Analysis Point 5 Inflow=0.57 cfs 0.048 af
Outflow=0.57 cfs 0.048 af

Reach AP6: Analysis Point 6 Inflow=0.76 cfs 0.069 af
Outflow=0.76 cfs 0.069 af

Pond AP3: Existing Pond Peak Elev=33.12' Storage=22,235 cf Inflow=19.20 cfs 2.312 af
Primary=7.01 cfs 2.312 af Secondary=0.00 cfs 0.000 af Outflow=7.01 cfs 2.312 af

Total Runoff Area = 15.480 ac Runoff Volume = 4.780 af Average Runoff Depth = 3.71"
60.06% Pervious = 9.298 ac 39.94% Impervious = 6.183 ac

Summary for Subcatchment 1S: Subcatchment 1S

Runoff = 19.22 cfs @ 12.30 hrs, Volume= 2.110 af, Depth= 3.27"
Routed to Reach AP1 : Analysis Point 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Storm Rainfall=5.65"

Area (sf)	CN	Description
3,301	55	Woods, Good, HSG B
960	98	Paved roads w/curbs & sewers, HSG B
16,400	98	Roofs, HSG C
61,667	98	Paved roads w/curbs & sewers, HSG C
10,167	74	>75% Grass cover, Good, HSG C
199,491	70	Woods, Good, HSG C
24,168	83	1/4 acre lots, 38% imp, HSG C
20,931	77	Woods, Good, HSG D
337,085	78	Weighted Average
248,874		73.83% Pervious Area
88,211		26.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	50	0.0183	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.70"
2.8	114	0.0183	0.68		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.9	88	0.0227	0.75		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.0	56	0.0357	0.94		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.5	73	0.0274	0.83		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.7	136	0.0735	1.36		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	99	0.0392	8.51	312.68	**Trap/Vee/Rect Channel Flow, Assumed 1.5' flow depth - Channel** Bot.W=20.00' D=1.50' Z= 4.0 & 2.0 '/' Top.W=29.00' n= 0.040 Winding stream, pools & shoals
0.9	303	0.0165	5.52	202.86	**Trap/Vee/Rect Channel Flow, Assumed 1.5' flow depth - Channel** Bot.W=20.00' D=1.50' Z= 4.0 & 2.0 '/' Top.W=29.00' n= 0.040 Winding stream, pools & shoals
21.9	919	Total			

Summary for Subcatchment 2S: Subcatchment 2S

Runoff = 1.41 cfs @ 12.19 hrs, Volume= 0.130 af, Depth= 3.97"
Routed to Reach AP2 : Analysis Point 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Storm Rainfall=5.65"

Area (sf)	CN	Description
7,339	98	Paved roads w/curbs & sewers, HSG C
1,425	98	Roofs, HSG C
923	74	>75% Grass cover, Good, HSG C
7,465	70	Woods, Good, HSG C
17,152	85	Weighted Average
8,388		48.90% Pervious Area
8,764		51.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.2	50	0.0172	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.70"
0.9	37	0.0172	0.66		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	19	0.1053	1.62		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.3	36	0.2222	2.36		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.6	142	Total			

Summary for Subcatchment 3S: Subcatchment 3S

Runoff = 19.20 cfs @ 12.36 hrs, Volume= 2.312 af, Depth= 4.08"
Routed to Pond AP3 : Existing Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Storm Rainfall=5.65"

Area (sf)	CN	Description
125,302	98	Paved roads w/curbs & sewers, HSG C
9,379	98	Roofs, HSG C
9,203	74	>75% Grass cover, Good, HSG C
85,401	70	Woods, Good, HSG C
46,241	83	1/4 acre lots, 38% imp, HSG C
15,690	77	Woods, Good, HSG D
5,165	98	Water Surface, 0% imp, HSG D
296,381	86	Weighted Average
144,128		48.63% Pervious Area
152,253		51.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.5	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.70"
3.5	119	0.0126	0.56		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.5	74	0.0270	0.82		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.6	107	0.0187	0.68		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
5.7	180	0.0111	0.53		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.5	74	0.0270	0.82		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
26.3	604	Total			

Summary for Subcatchment 4S: Subcatchment 4S

Runoff = 1.33 cfs @ 12.09 hrs, Volume= 0.111 af, Depth= 5.41"
Routed to Reach AP4 : Analysis Point 4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Storm Rainfall=5.65"

Area (sf)	CN	Description
10,753	98	Paved parking, HSG C
10,753		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, 6 minute minimum Tc per TR-55**

Summary for Subcatchment 5S: Subcatchment 5S

Runoff = 0.57 cfs @ 12.09 hrs, Volume= 0.048 af, Depth= 5.41"
Routed to Reach AP5 : Analysis Point 5

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Storm Rainfall=5.65"

Area (sf)	CN	Description
4,596	98	Roofs, HSG C
4,596		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, 6 minute minimum Tc per TR-55**

Summary for Subcatchment 6S: Subcatchment 6S

Runoff = 0.76 cfs @ 12.16 hrs, Volume= 0.069 af, Depth= 4.29"
Routed to Reach AP6 : Analysis Point 6

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Storm Rainfall=5.65"

Area (sf)	CN	Description
4,261	98	Paved roads w/curbs & sewers, HSG C
479	98	Roofs, HSG C
3,620	74	>75% Grass cover, Good, HSG C
8,360	88	Weighted Average
3,620		43.30% Pervious Area
4,740		56.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.9	50	0.0041	0.08		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
1.7	47	0.0041	0.45		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.6	76	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
12.2	173	Total			

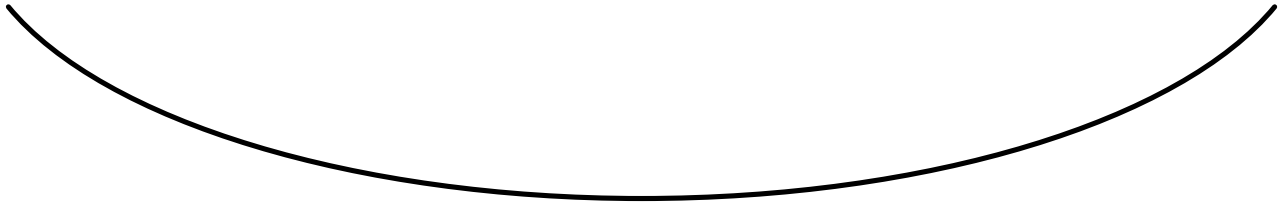
Summary for Reach 1R: Flow through 2S

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
Routed to Reach AP2 : Analysis Point 2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 1.00' Flow Area= 74.7 sf, Capacity= 430.82 cfs

112.00' x 1.00' deep Parabolic Channel, n= 0.030 Earth, grassed & winding
Length= 236.0' Slope= 0.0233 '/'
Inlet Invert= 35.50', Outlet Invert= 30.00'



‡

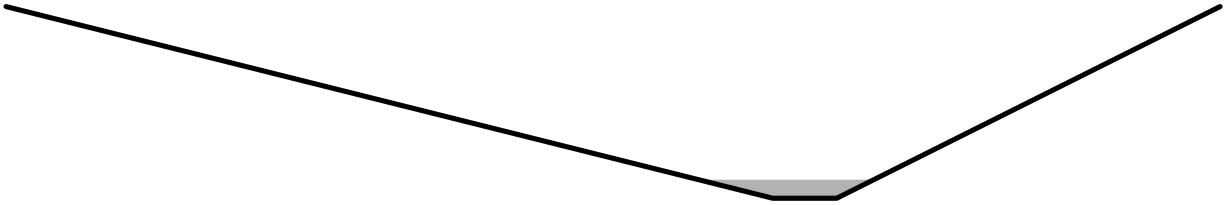
Summary for Reach 2Ra: Channel through 1S

Inflow Area = 7.198 ac, 51.36% Impervious, Inflow Depth = 4.07" for 10-Year Storm event
Inflow = 7.42 cfs @ 12.44 hrs, Volume= 2.442 af
Outflow = 7.42 cfs @ 12.45 hrs, Volume= 2.442 af, Atten= 0%, Lag= 0.5 min
Routed to Reach 2Rb : Channel through 1S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 3.37 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 1.77 fps, Avg. Travel Time= 1.3 min

Peak Storage= 299 cf @ 12.45 hrs
Average Depth at Peak Storage= 0.59' , Surface Width= 5.51'
Bank-Full Depth= 6.00' Flow Area= 120.0 sf, Capacity= 1,586.21 cfs

2.00' x 6.00' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 4.0 2.0 '/' Top Width= 38.00'
Length= 136.0' Slope= 0.0294 '/'
Inlet Invert= 24.00', Outlet Invert= 20.00'



Summary for Reach 2Rb: Channel through 1S

[61] Hint: Exceeded Reach 2Ra outlet invert by 0.17' @ 12.30 hrs

Inflow Area = 7.303 ac, 52.06% Impervious, Inflow Depth = 4.09" for 10-Year Storm event
Inflow = 7.62 cfs @ 12.27 hrs, Volume= 2.490 af
Outflow = 7.62 cfs @ 12.28 hrs, Volume= 2.490 af, Atten= 0%, Lag= 1.0 min
Routed to Reach 2Rc : Channel through 1S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 2.22 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 1.25 fps, Avg. Travel Time= 2.0 min

Peak Storage= 525 cf @ 12.28 hrs
Average Depth at Peak Storage= 0.17' , Surface Width= 21.00'
Bank-Full Depth= 6.00' Flow Area= 228.0 sf, Capacity= 4,170.50 cfs

20.00' x 6.00' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 4.0 2.0 '/' Top Width= 56.00'
Length= 153.0' Slope= 0.0392 '/'
Inlet Invert= 20.00', Outlet Invert= 14.00'



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Summary for Reach 2Rc: Channel through 1S

[62] Hint: Exceeded Reach 2Rb OUTLET depth by 0.06' @ 14.65 hrs

Inflow Area = 7.303 ac, 52.06% Impervious, Inflow Depth = 4.09" for 10-Year Storm event
Inflow = 7.62 cfs @ 12.28 hrs, Volume= 2.490 af
Outflow = 7.61 cfs @ 12.33 hrs, Volume= 2.490 af, Atten= 0%, Lag= 2.8 min
Routed to Reach AP1 : Analysis Point 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 1.70 fps, Min. Travel Time= 3.0 min
Avg. Velocity = 0.85 fps, Avg. Travel Time= 5.9 min

Peak Storage= 1,357 cf @ 12.33 hrs
Average Depth at Peak Storage= 0.22' , Surface Width= 21.30'
Bank-Full Depth= 6.00' Flow Area= 228.0 sf, Capacity= 2,705.34 cfs

20.00' x 6.00' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 4.0 2.0 '/' Top Width= 56.00'
Length= 303.0' Slope= 0.0165 '/'
Inlet Invert= 14.00', Outlet Invert= 9.00'



‡

Summary for Reach AP1: Analysis Point 1

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

Inflow Area = 15.042 ac, 38.74% Impervious, Inflow Depth = 3.67" for 10-Year Storm event
Inflow = 26.83 cfs @ 12.31 hrs, Volume= 4.600 af
Outflow = 26.83 cfs @ 12.31 hrs, Volume= 4.600 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP2: Analysis Point 2

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

Inflow Area = 0.394 ac, 51.10% Impervious, Inflow Depth = 3.97" for 10-Year Storm event
Inflow = 1.41 cfs @ 12.19 hrs, Volume= 0.130 af
Outflow = 1.41 cfs @ 12.19 hrs, Volume= 0.130 af, Atten= 0%, Lag= 0.0 min
Routed to Reach 2Ra : Channel through 1S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP4: Analysis Point 4

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

Inflow Area = 0.247 ac,100.00% Impervious, Inflow Depth = 5.41" for 10-Year Storm event
Inflow = 1.33 cfs @ 12.09 hrs, Volume= 0.111 af
Outflow = 1.33 cfs @ 12.09 hrs, Volume= 0.111 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP5: Analysis Point 5

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

Inflow Area = 0.106 ac,100.00% Impervious, Inflow Depth = 5.41" for 10-Year Storm event
Inflow = 0.57 cfs @ 12.09 hrs, Volume= 0.048 af
Outflow = 0.57 cfs @ 12.09 hrs, Volume= 0.048 af, Atten= 0%, Lag= 0.0 min
Routed to Reach 2Rb : Channel through 1S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP6: Analysis Point 6

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

Inflow Area = 0.192 ac, 56.70% Impervious, Inflow Depth = 4.29" for 10-Year Storm event
Inflow = 0.76 cfs @ 12.16 hrs, Volume= 0.069 af
Outflow = 0.76 cfs @ 12.16 hrs, Volume= 0.069 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3

Summary for Pond AP3: Existing Pond

15" CMP culvert inlet is buried. Contractor to uncover culvert inlet and replace with 18" HDPE culvert.

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[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=8)

Inflow Area = 6.804 ac, 51.37% Impervious, Inflow Depth = 4.08" for 10-Year Storm event
Inflow = 19.20 cfs @ 12.36 hrs, Volume= 2.312 af
Outflow = 7.01 cfs @ 12.86 hrs, Volume= 2.312 af, Atten= 63%, Lag= 30.2 min
Primary = 7.01 cfs @ 12.86 hrs, Volume= 2.312 af
Routed to Reach 2Ra : Channel through 1S
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach 1R : Flow through 2S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 33.12' @ 12.86 hrs Surf.Area= 13,498 sf Storage= 22,235 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 19.0 min (837.7 - 818.7)

Volume	Invert	Avail.Storage	Storage Description
#1	27.00'	104,428 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
27.00	20	5.7	0	0	20
28.00	37	24.0	28	28	66
30.00	2,236	218.0	1,707	1,735	3,810
32.00	7,294	444.0	9,046	10,781	15,734
34.00	19,719	933.0	26,004	36,785	69,335
35.50	43,192	1,107.0	46,047	82,832	97,623
36.00	43,192	1,107.0	21,596	104,428	98,177

Device	Routing	Invert	Outlet Devices
#1	Primary	27.00'	**15.0" Round Culvert** L= 156.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 27.00' / 24.09' S= 0.0187 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.23 sf
#2	Secondary	35.50'	**24.0' long + 3.0 '/' SideZ x 24.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=7.01 cfs @ 12.86 hrs HW=33.12' TW=24.58' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 7.01 cfs @ 5.71 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=27.00' TW=35.50' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Subcatchment1S Runoff Area=337,085 sf 26.17% Impervious Runoff Depth=4.64"
Flow Length=919' Tc=21.9 min CN=78 Runoff=27.15 cfs 2.991 af

Subcatchment2S: Subcatchment2S Runoff Area=17,152 sf 51.10% Impervious Runoff Depth=5.42"
Flow Length=142' Tc=13.6 min CN=85 Runoff=1.90 cfs 0.178 af

Subcatchment3S: Subcatchment3S Runoff Area=296,381 sf 51.37% Impervious Runoff Depth=5.54"
Flow Length=604' Tc=26.3 min CN=86 Runoff=25.75 cfs 3.141 af

Subcatchment4S: Subcatchment4S Runoff Area=10,753 sf 100.00% Impervious Runoff Depth=6.94"
Tc=6.0 min CN=98 Runoff=1.70 cfs 0.143 af

Subcatchment5S: Subcatchment5S Runoff Area=4,596 sf 100.00% Impervious Runoff Depth=6.94"
Tc=6.0 min CN=98 Runoff=0.73 cfs 0.061 af

Subcatchment6S: Subcatchment6S Runoff Area=8,360 sf 56.70% Impervious Runoff Depth=5.77"
Flow Length=173' Tc=12.2 min CN=88 Runoff=1.01 cfs 0.092 af

Reach 1R: Flow through 2S Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.030 L=236.0' S=0.0233 '/' Capacity=430.82 cfs Outflow=0.00 cfs 0.000 af

Reach 2Ra: Channel through 1S Avg. Flow Depth=0.61' Max Vel=3.46 fps Inflow=8.17 cfs 3.319 af
n=0.040 L=136.0' S=0.0294 '/' Capacity=1,586.21 cfs Outflow=8.17 cfs 3.319 af

Reach 2Rb: Channel through 1S Avg. Flow Depth=0.18' Max Vel=2.30 fps Inflow=8.54 cfs 3.380 af
n=0.040 L=153.0' S=0.0392 '/' Capacity=4,170.50 cfs Outflow=8.53 cfs 3.380 af

Reach 2Rc: Channel through 1S Avg. Flow Depth=0.23' Max Vel=1.77 fps Inflow=8.53 cfs 3.380 af
n=0.040 L=303.0' S=0.0165 '/' Capacity=2,705.34 cfs Outflow=8.51 cfs 3.380 af

Reach AP1: Analysis Point 1 Inflow=35.64 cfs 6.371 af
Outflow=35.64 cfs 6.371 af

Reach AP2: Analysis Point 2 Inflow=1.90 cfs 0.178 af
Outflow=1.90 cfs 0.178 af

Reach AP4: Analysis Point 4 Inflow=1.70 cfs 0.143 af
Outflow=1.70 cfs 0.143 af

Reach AP5: Analysis Point 5 Inflow=0.73 cfs 0.061 af
Outflow=0.73 cfs 0.061 af

Reach AP6: Analysis Point 6 Inflow=1.01 cfs 0.092 af
Outflow=1.01 cfs 0.092 af

Pond AP3: Existing Pond Peak Elev=33.99' Storage=36,595 cf Inflow=25.75 cfs 3.141 af
Primary=7.39 cfs 3.141 af Secondary=0.00 cfs 0.000 af Outflow=7.39 cfs 3.141 af

Total Runoff Area = 15.480 ac Runoff Volume = 6.606 af Average Runoff Depth = 5.12"
60.06% Pervious = 9.298 ac 39.94% Impervious = 6.183 ac

Summary for Subcatchment 1S: Subcatchment 1S

Runoff = 27.15 cfs @ 12.30 hrs, Volume= 2.991 af, Depth= 4.64"
Routed to Reach AP1 : Analysis Point 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Storm Rainfall=7.18"

Area (sf)	CN	Description
3,301	55	Woods, Good, HSG B
960	98	Paved roads w/curbs & sewers, HSG B
16,400	98	Roofs, HSG C
61,667	98	Paved roads w/curbs & sewers, HSG C
10,167	74	>75% Grass cover, Good, HSG C
199,491	70	Woods, Good, HSG C
24,168	83	1/4 acre lots, 38% imp, HSG C
20,931	77	Woods, Good, HSG D
337,085	78	Weighted Average
248,874		73.83% Pervious Area
88,211		26.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	50	0.0183	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.70"
2.8	114	0.0183	0.68		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.9	88	0.0227	0.75		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.0	56	0.0357	0.94		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.5	73	0.0274	0.83		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.7	136	0.0735	1.36		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	99	0.0392	8.51	312.68	**Trap/Vee/Rect Channel Flow, Assumed 1.5' flow depth - Channel** Bot.W=20.00' D=1.50' Z= 4.0 & 2.0 '/' Top.W=29.00' n= 0.040 Winding stream, pools & shoals
0.9	303	0.0165	5.52	202.86	**Trap/Vee/Rect Channel Flow, Assumed 1.5' flow depth - Channel** Bot.W=20.00' D=1.50' Z= 4.0 & 2.0 '/' Top.W=29.00' n= 0.040 Winding stream, pools & shoals
21.9	919	Total			

Summary for Subcatchment 2S: Subcatchment 2S

Runoff = 1.90 cfs @ 12.18 hrs, Volume= 0.178 af, Depth= 5.42"
Routed to Reach AP2 : Analysis Point 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Storm Rainfall=7.18"

Area (sf)	CN	Description
7,339	98	Paved roads w/curbs & sewers, HSG C
1,425	98	Roofs, HSG C
923	74	>75% Grass cover, Good, HSG C
7,465	70	Woods, Good, HSG C
17,152	85	Weighted Average
8,388		48.90% Pervious Area
8,764		51.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.2	50	0.0172	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.70"
0.9	37	0.0172	0.66		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	19	0.1053	1.62		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.3	36	0.2222	2.36		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.6	142	Total			

Summary for Subcatchment 3S: Subcatchment 3S

Runoff = 25.75 cfs @ 12.35 hrs, Volume= 3.141 af, Depth= 5.54"
Routed to Pond AP3 : Existing Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Storm Rainfall=7.18"

Area (sf)	CN	Description
125,302	98	Paved roads w/curbs & sewers, HSG C
9,379	98	Roofs, HSG C
9,203	74	>75% Grass cover, Good, HSG C
85,401	70	Woods, Good, HSG C
46,241	83	1/4 acre lots, 38% imp, HSG C
15,690	77	Woods, Good, HSG D
5,165	98	Water Surface, 0% imp, HSG D
296,381	86	Weighted Average
144,128		48.63% Pervious Area
152,253		51.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.5	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.70"
3.5	119	0.0126	0.56		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.5	74	0.0270	0.82		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.6	107	0.0187	0.68		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
5.7	180	0.0111	0.53		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.5	74	0.0270	0.82		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
26.3	604	Total			

Summary for Subcatchment 4S: Subcatchment 4S

Runoff = 1.70 cfs @ 12.09 hrs, Volume= 0.143 af, Depth= 6.94"
Routed to Reach AP4 : Analysis Point 4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Storm Rainfall=7.18"

Area (sf)	CN	Description
10,753	98	Paved parking, HSG C
10,753		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, 6 minute minimum Tc per TR-55**

Summary for Subcatchment 5S: Subcatchment 5S

Runoff = 0.73 cfs @ 12.09 hrs, Volume= 0.061 af, Depth= 6.94"
Routed to Reach AP5 : Analysis Point 5

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Storm Rainfall=7.18"

Area (sf)	CN	Description
4,596	98	Roofs, HSG C
4,596		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, 6 minute minimum Tc per TR-55**

Summary for Subcatchment 6S: Subcatchment 6S

Runoff = 1.01 cfs @ 12.16 hrs, Volume= 0.092 af, Depth= 5.77"
Routed to Reach AP6 : Analysis Point 6

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Storm Rainfall=7.18"

Area (sf)	CN	Description
4,261	98	Paved roads w/curbs & sewers, HSG C
479	98	Roofs, HSG C
3,620	74	>75% Grass cover, Good, HSG C
8,360	88	Weighted Average
3,620		43.30% Pervious Area
4,740		56.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.9	50	0.0041	0.08		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
1.7	47	0.0041	0.45		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.6	76	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
12.2	173	Total			

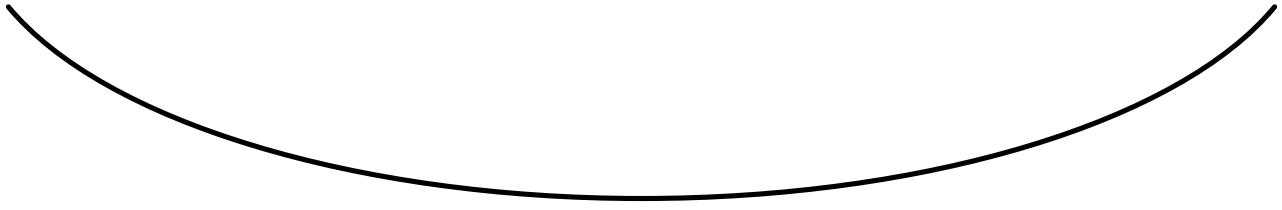
Summary for Reach 1R: Flow through 2S

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
Routed to Reach AP2 : Analysis Point 2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 1.00' Flow Area= 74.7 sf, Capacity= 430.82 cfs

112.00' x 1.00' deep Parabolic Channel, n= 0.030 Earth, grassed & winding
Length= 236.0' Slope= 0.0233 '/'
Inlet Invert= 35.50', Outlet Invert= 30.00'



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Summary for Reach 2Ra: Channel through 1S

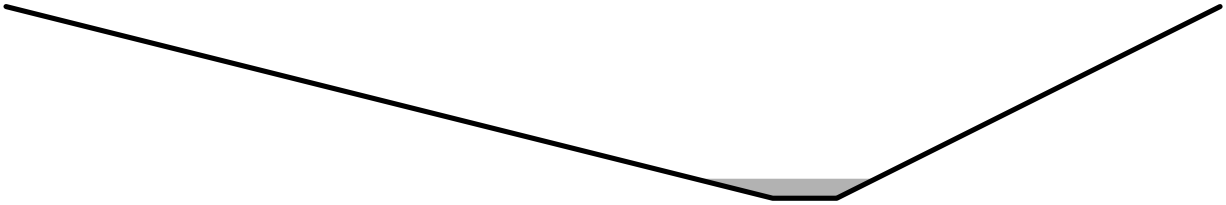
[90] Warning: Qout>Qin may require smaller dt or Finer Routing

Inflow Area = 7.198 ac, 51.36% Impervious, Inflow Depth = 5.53" for 25-Year Storm event
Inflow = 8.17 cfs @ 12.25 hrs, Volume= 3.319 af
Outflow = 8.17 cfs @ 12.25 hrs, Volume= 3.319 af, Atten= 0%, Lag= 0.5 min
Routed to Reach 2Rb : Channel through 1S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 3.46 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 1.92 fps, Avg. Travel Time= 1.2 min

Peak Storage= 321 cf @ 12.25 hrs
Average Depth at Peak Storage= 0.61' , Surface Width= 5.69'
Bank-Full Depth= 6.00' Flow Area= 120.0 sf, Capacity= 1,586.21 cfs

2.00' x 6.00' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 4.0 2.0 '/' Top Width= 38.00'
Length= 136.0' Slope= 0.0294 '/'
Inlet Invert= 24.00', Outlet Invert= 20.00'



Summary for Reach 2Rb: Channel through 1S

[61] Hint: Exceeded Reach 2Ra outlet invert by 0.18' @ 12.25 hrs

Inflow Area = 7.303 ac, 52.06% Impervious, Inflow Depth = 5.55" for 25-Year Storm event
Inflow = 8.54 cfs @ 12.22 hrs, Volume= 3.380 af
Outflow = 8.53 cfs @ 12.24 hrs, Volume= 3.380 af, Atten= 0%, Lag= 1.0 min
Routed to Reach 2Rc : Channel through 1S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 2.30 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 1.30 fps, Avg. Travel Time= 2.0 min

Peak Storage= 567 cf @ 12.24 hrs
Average Depth at Peak Storage= 0.18' , Surface Width= 21.08'
Bank-Full Depth= 6.00' Flow Area= 228.0 sf, Capacity= 4,170.50 cfs

20.00' x 6.00' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 4.0 2.0 '/' Top Width= 56.00'
Length= 153.0' Slope= 0.0392 '/'
Inlet Invert= 20.00', Outlet Invert= 14.00'



‡

Summary for Reach 2Rc: Channel through 1S

[62] Hint: Exceeded Reach 2Rb OUTLET depth by 0.06' @ 15.65 hrs

Inflow Area = 7.303 ac, 52.06% Impervious, Inflow Depth = 5.55" for 25-Year Storm event
Inflow = 8.53 cfs @ 12.24 hrs, Volume= 3.380 af
Outflow = 8.51 cfs @ 12.27 hrs, Volume= 3.380 af, Atten= 0%, Lag= 2.1 min
Routed to Reach AP1 : Analysis Point 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 1.77 fps, Min. Travel Time= 2.9 min
Avg. Velocity = 0.91 fps, Avg. Travel Time= 5.6 min

Peak Storage= 1,459 cf @ 12.27 hrs
Average Depth at Peak Storage= 0.23' , Surface Width= 21.40'
Bank-Full Depth= 6.00' Flow Area= 228.0 sf, Capacity= 2,705.34 cfs

20.00' x 6.00' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 4.0 2.0 '/' Top Width= 56.00'
Length= 303.0' Slope= 0.0165 '/'
Inlet Invert= 14.00', Outlet Invert= 9.00'



‡

Summary for Reach AP1: Analysis Point 1

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

Inflow Area = 15.042 ac, 38.74% Impervious, Inflow Depth = 5.08" for 25-Year Storm event
Inflow = 35.64 cfs @ 12.30 hrs, Volume= 6.371 af
Outflow = 35.64 cfs @ 12.30 hrs, Volume= 6.371 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP2: Analysis Point 2

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

Inflow Area = 0.394 ac, 51.10% Impervious, Inflow Depth = 5.42" for 25-Year Storm event
Inflow = 1.90 cfs @ 12.18 hrs, Volume= 0.178 af
Outflow = 1.90 cfs @ 12.18 hrs, Volume= 0.178 af, Atten= 0%, Lag= 0.0 min
Routed to Reach 2Ra : Channel through 1S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP4: Analysis Point 4

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

Inflow Area = 0.247 ac,100.00% Impervious, Inflow Depth = 6.94" for 25-Year Storm event
Inflow = 1.70 cfs @ 12.09 hrs, Volume= 0.143 af
Outflow = 1.70 cfs @ 12.09 hrs, Volume= 0.143 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP5: Analysis Point 5

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

Inflow Area = 0.106 ac,100.00% Impervious, Inflow Depth = 6.94" for 25-Year Storm event
Inflow = 0.73 cfs @ 12.09 hrs, Volume= 0.061 af
Outflow = 0.73 cfs @ 12.09 hrs, Volume= 0.061 af, Atten= 0%, Lag= 0.0 min
Routed to Reach 2Rb : Channel through 1S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP6: Analysis Point 6

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

Inflow Area = 0.192 ac, 56.70% Impervious, Inflow Depth = 5.77" for 25-Year Storm event
Inflow = 1.01 cfs @ 12.16 hrs, Volume= 0.092 af
Outflow = 1.01 cfs @ 12.16 hrs, Volume= 0.092 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3

Summary for Pond AP3: Existing Pond

15" CMP culvert inlet is buried. Contractor to uncover culvert inlet and replace with 18" HDPE culvert.

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[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=9)

Inflow Area = 6.804 ac, 51.37% Impervious, Inflow Depth = 5.54" for 25-Year Storm event
Inflow = 25.75 cfs @ 12.35 hrs, Volume= 3.141 af
Outflow = 7.39 cfs @ 12.95 hrs, Volume= 3.141 af, Atten= 71%, Lag= 36.1 min
Primary = 7.39 cfs @ 12.95 hrs, Volume= 3.141 af
Routed to Reach 2Ra : Channel through 1S
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach 1R : Flow through 2S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 33.99' @ 12.95 hrs Surf.Area= 19,645 sf Storage= 36,595 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 32.0 min (842.3 - 810.2)

Volume	Invert	Avail.Storage	Storage Description
#1	27.00'	104,428 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
27.00	20	5.7	0	0	20
28.00	37	24.0	28	28	66
30.00	2,236	218.0	1,707	1,735	3,810
32.00	7,294	444.0	9,046	10,781	15,734
34.00	19,719	933.0	26,004	36,785	69,335
35.50	43,192	1,107.0	46,047	82,832	97,623
36.00	43,192	1,107.0	21,596	104,428	98,177

Device	Routing	Invert	Outlet Devices
#1	Primary	27.00'	**15.0" Round Culvert** L= 156.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 27.00' / 24.09' S= 0.0187 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.23 sf
#2	Secondary	35.50'	**24.0' long + 3.0 '/' SideZ x 24.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=7.39 cfs @ 12.95 hrs HW=33.99' TW=24.59' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 7.39 cfs @ 6.02 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=27.00' TW=35.50' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Subcatchment1S Runoff Area=337,085 sf 26.17% Impervious Runoff Depth=5.96"
Flow Length=919' Tc=21.9 min CN=78 Runoff=34.66 cfs 3.842 af

Subcatchment2S: Subcatchment2S Runoff Area=17,152 sf 51.10% Impervious Runoff Depth=6.80"
Flow Length=142' Tc=13.6 min CN=85 Runoff=2.36 cfs 0.223 af

Subcatchment3S: Subcatchment3S Runoff Area=296,381 sf 51.37% Impervious Runoff Depth=6.92"
Flow Length=604' Tc=26.3 min CN=86 Runoff=31.85 cfs 3.926 af

Subcatchment4S: Subcatchment4S Runoff Area=10,753 sf 100.00% Impervious Runoff Depth=8.37"
Tc=6.0 min CN=98 Runoff=2.04 cfs 0.172 af

Subcatchment5S: Subcatchment5S Runoff Area=4,596 sf 100.00% Impervious Runoff Depth=8.37"
Tc=6.0 min CN=98 Runoff=0.87 cfs 0.074 af

Subcatchment6S: Subcatchment6S Runoff Area=8,360 sf 56.70% Impervious Runoff Depth=7.17"
Flow Length=173' Tc=12.2 min CN=88 Runoff=1.24 cfs 0.115 af

Reach 1R: Flow through 2S Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.030 L=236.0' S=0.0233 '/' Capacity=430.82 cfs Outflow=0.00 cfs 0.000 af

Reach 2Ra: Channel through 1S Avg. Flow Depth=0.64' Max Vel=3.54 fps Inflow=8.89 cfs 4.149 af
n=0.040 L=136.0' S=0.0294 '/' Capacity=1,586.21 cfs Outflow=8.87 cfs 4.149 af

Reach 2Rb: Channel through 1S Avg. Flow Depth=0.19' Max Vel=2.39 fps Inflow=9.35 cfs 4.223 af
n=0.040 L=153.0' S=0.0392 '/' Capacity=4,170.50 cfs Outflow=9.34 cfs 4.223 af

Reach 2Rc: Channel through 1S Avg. Flow Depth=0.25' Max Vel=1.83 fps Inflow=9.34 cfs 4.223 af
n=0.040 L=303.0' S=0.0165 '/' Capacity=2,705.34 cfs Outflow=9.31 cfs 4.223 af

Reach AP1: Analysis Point 1 Inflow=43.88 cfs 8.064 af
Outflow=43.88 cfs 8.064 af

Reach AP2: Analysis Point 2 Inflow=2.36 cfs 0.223 af
Outflow=2.36 cfs 0.223 af

Reach AP4: Analysis Point 4 Inflow=2.04 cfs 0.172 af
Outflow=2.04 cfs 0.172 af

Reach AP5: Analysis Point 5 Inflow=0.87 cfs 0.074 af
Outflow=0.87 cfs 0.074 af

Reach AP6: Analysis Point 6 Inflow=1.24 cfs 0.115 af
Outflow=1.24 cfs 0.115 af

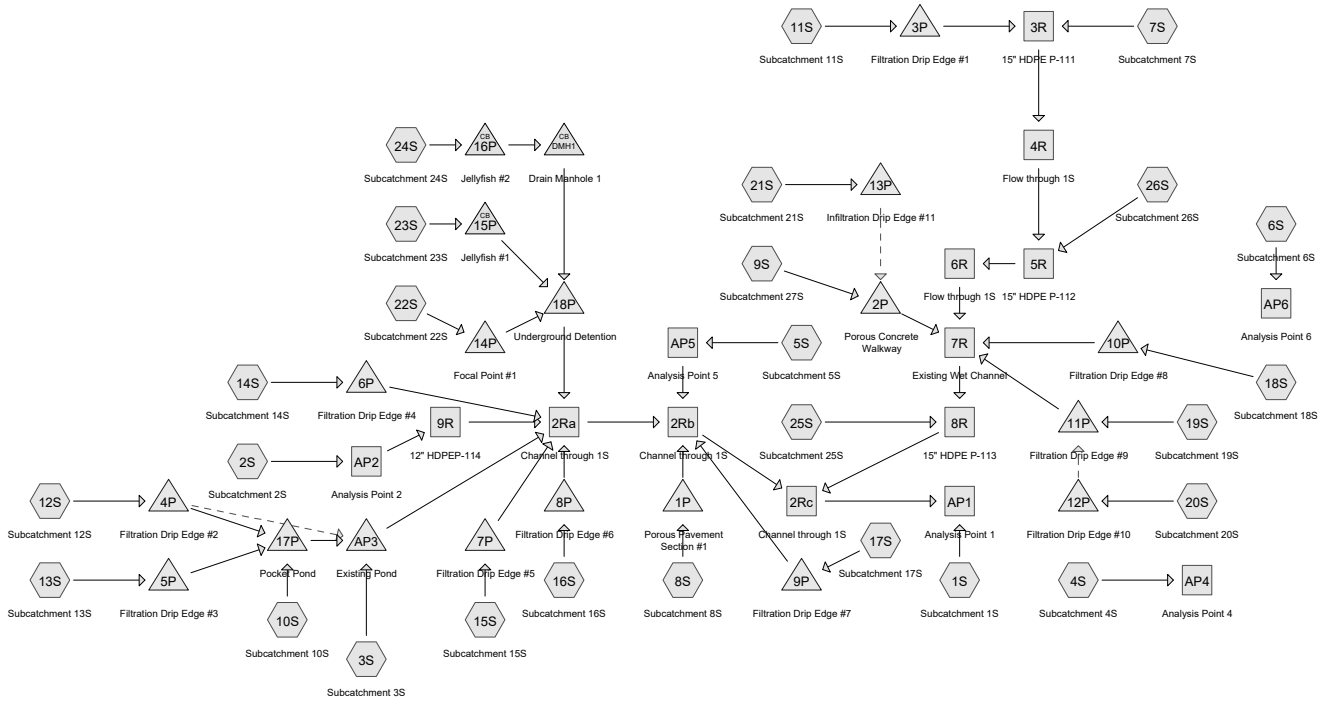
Pond AP3: Existing Pond Peak Elev=34.60' Storage=51,124 cf Inflow=31.85 cfs 3.926 af
Primary=7.65 cfs 3.926 af Secondary=0.00 cfs 0.000 af Outflow=7.65 cfs 3.926 af

Total Runoff Area = 15.480 ac Runoff Volume = 8.351 af Average Runoff Depth = 6.47"
60.06% Pervious = 9.298 ac 39.94% Impervious = 6.183 ac

APPENDIX II

PROPOSED CONDITIONS DRAINAGE ANALYSIS

Summary 2 YEAR
Complete 10 YEAR
Complete 25 YEAR
Summary 50 YEAR



Subcat Reach Pond Link

Routing Diagram for 24029 PR CONDITION

Prepared by Jones & Beach Engineers Inc, Printed 3/14/2025

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.616	83	1/4 acre lots, 38% imp, HSG C (3S, 7S, 8S)
1.569	74	>75% Grass cover, Good, HSG C (1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 22S, 23S, 24S, 25S, 26S)
0.403	98	Paved parking, HSG C (4S, 22S, 23S)
0.022	98	Paved roads w/curbs & sewers, HSG B (1S)
5.304	98	Paved roads w/curbs & sewers, HSG C (1S, 2S, 3S, 6S, 7S, 8S, 9S, 24S)
1.531	98	Roofs, HSG C (1S, 2S, 3S, 6S, 8S, 11S, 12S, 13S, 14S, 15S, 16S, 17S, 18S, 19S, 20S, 21S, 22S, 23S, 24S)
0.014	98	Water Surface, 0% imp, HSG C (11S, 12S, 13S, 14S, 18S, 19S, 20S)
0.119	98	Water Surface, 0% imp, HSG D (3S)
0.076	55	Woods, Good, HSG B (1S)
3.986	70	Woods, Good, HSG C (1S, 2S, 3S, 7S)
0.841	77	Woods, Good, HSG D (1S, 3S)
15.480	**85**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.098	HSG B	1S
14.423	HSG C	1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S, 13S, 14S, 15S, 16S, 17S, 18S, 19S, 20S, 21S, 22S, 23S, 24S, 25S, 26S
0.959	HSG D	1S, 3S
0.000	Other	
15.480		**TOTAL AREA**

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Subcatchment1S Runoff Area=180,817 sf 28.87% Impervious Runoff Depth=1.72"
Flow Length=577' Tc=13.9 min CN=79 Runoff=6.44 cfs 0.596 af

Subcatchment2S: Subcatchment2S Runoff Area=12,083 sf 72.53% Impervious Runoff Depth=2.73"
Flow Length=106' Tc=10.9 min CN=91 Runoff=0.73 cfs 0.063 af

Subcatchment3S: Subcatchment3S Runoff Area=290,437 sf 52.42% Impervious Runoff Depth=2.28"
Flow Length=604' Tc=26.3 min CN=86 Runoff=10.65 cfs 1.265 af

Subcatchment4S: Subcatchment4S Runoff Area=4,647 sf 58.90% Impervious Runoff Depth=2.45"
Tc=6.0 min CN=88 Runoff=0.30 cfs 0.022 af

Subcatchment5S: Subcatchment5S Runoff Area=430 sf 0.00% Impervious Runoff Depth=1.38"
Tc=6.0 min CN=74 Runoff=0.02 cfs 0.001 af

Subcatchment6S: Subcatchment6S Runoff Area=8,122 sf 55.43% Impervious Runoff Depth=2.36"
Flow Length=149' Tc=12.0 min CN=87 Runoff=0.42 cfs 0.037 af

Subcatchment7S: Subcatchment7S Runoff Area=29,318 sf 12.60% Impervious Runoff Depth=1.45"
Flow Length=200' Tc=15.8 min CN=75 Runoff=0.82 cfs 0.081 af

Subcatchment8S: Subcatchment8S Runoff Area=83,551 sf 80.82% Impervious Runoff Depth=2.93"
Tc=144.0 min CN=93 Runoff=1.43 cfs 0.468 af

Subcatchment9S: Subcatchment27S Runoff Area=4,764 sf 21.83% Impervious Runoff Depth=1.72"
Tc=144.0 min CN=79 Runoff=0.05 cfs 0.016 af

Subcatchment10S: Subcatchment10S Runoff Area=951 sf 0.00% Impervious Runoff Depth=1.38"
Tc=6.0 min CN=74 Runoff=0.03 cfs 0.003 af

Subcatchment11S: Subcatchment11S Runoff Area=2,774 sf 98.34% Impervious Runoff Depth=3.47"
Tc=6.0 min CN=98 Runoff=0.22 cfs 0.018 af

Subcatchment12S: Subcatchment12S Runoff Area=2,207 sf 98.60% Impervious Runoff Depth=3.47"
Tc=6.0 min CN=98 Runoff=0.18 cfs 0.015 af

Subcatchment13S: Subcatchment13S Runoff Area=1,902 sf 85.80% Impervious Runoff Depth=3.47"
Tc=6.0 min CN=98 Runoff=0.15 cfs 0.013 af

Subcatchment14S: Subcatchment14S Runoff Area=1,422 sf 86.08% Impervious Runoff Depth=3.47"
Tc=6.0 min CN=98 Runoff=0.11 cfs 0.009 af

Subcatchment15S: Subcatchment15S Runoff Area=1,104 sf 100.00% Impervious Runoff Depth=3.47"
Tc=6.0 min CN=98 Runoff=0.09 cfs 0.007 af

Subcatchment16S: Subcatchment16S Runoff Area=1,104 sf 100.00% Impervious Runoff Depth=3.47"
Tc=6.0 min CN=98 Runoff=0.09 cfs 0.007 af

Subcatchment17S: Subcatchment17S Runoff Area=1,104 sf 100.00% Impervious Runoff Depth=3.47"
Tc=6.0 min CN=98 Runoff=0.09 cfs 0.007 af

Subcatchment18S: Subcatchment18S Runoff Area=1,093 sf 98.08% Impervious Runoff Depth=3.47"
Tc=6.0 min CN=98 Runoff=0.09 cfs 0.007 af

Subcatchment19S: Subcatchment19S Runoff Area=1,645 sf 98.72% Impervious Runoff Depth=3.47"
Tc=6.0 min CN=98 Runoff=0.13 cfs 0.011 af

Subcatchment20S: Subcatchment20S Runoff Area=1,093 sf 98.08% Impervious Runoff Depth=3.47"
Tc=6.0 min CN=98 Runoff=0.09 cfs 0.007 af

Subcatchment21S: Subcatchment21S Runoff Area=2,728 sf 100.00% Impervious Runoff Depth=3.47"
Tc=6.0 min CN=98 Runoff=0.22 cfs 0.018 af

Subcatchment22S: Subcatchment22S Runoff Area=9,860 sf 94.21% Impervious Runoff Depth=3.35"
Tc=6.0 min CN=97 Runoff=0.79 cfs 0.063 af

Subcatchment23S: Subcatchment23S Runoff Area=14,386 sf 97.80% Impervious Runoff Depth=3.35"
Tc=6.0 min CN=97 Runoff=1.15 cfs 0.092 af

Subcatchment24S: Subcatchment24S Runoff Area=9,757 sf 95.92% Impervious Runoff Depth=3.35"
Tc=6.0 min CN=97 Runoff=0.78 cfs 0.063 af

Subcatchment25S: Subcatchment25S Runoff Area=5,889 sf 0.00% Impervious Runoff Depth=1.38"
Flow Length=158' Tc=6.4 min CN=74 Runoff=0.21 cfs 0.016 af

Subcatchment26S: Subcatchment26S Runoff Area=1,141 sf 0.00% Impervious Runoff Depth=1.38"
Tc=6.0 min CN=74 Runoff=0.04 cfs 0.003 af

Reach 2Ra: Channel through 1S Avg. Flow Depth=0.69' Max Vel=3.68 fps Inflow=10.32 cfs 1.597 af
n=0.040 L=136.0' S=0.0294 '/' Capacity=1,586.21 cfs Outflow=10.33 cfs 1.597 af

Reach 2Rb: Channel through 1S Avg. Flow Depth=0.20' Max Vel=2.50 fps Inflow=10.36 cfs 1.605 af
n=0.040 L=153.0' S=0.0392 '/' Capacity=4,170.50 cfs Outflow=10.35 cfs 1.605 af

Reach 2Rc: Channel through 1S Avg. Flow Depth=0.27' Max Vel=1.96 fps Inflow=11.15 cfs 1.747 af
n=0.040 L=303.0' S=0.0165 '/' Capacity=2,705.34 cfs Outflow=11.14 cfs 1.747 af

Reach 3R: 15" HDPE P-111 Avg. Flow Depth=0.33' Max Vel=3.82 fps Inflow=0.98 cfs 0.099 af
15.0" Round Pipe n=0.012 L=86.0' S=0.0087 '/' Capacity=6.54 cfs Outflow=0.98 cfs 0.099 af

Reach 4R: Flow through 1S Avg. Flow Depth=0.23' Max Vel=2.54 fps Inflow=0.98 cfs 0.099 af
n=0.030 L=40.0' S=0.0313 '/' Capacity=23.40 cfs Outflow=0.98 cfs 0.099 af

Reach 5R: 15" HDPE P-112 Avg. Flow Depth=0.30' Max Vel=4.37 fps Inflow=1.00 cfs 0.102 af
15.0" Round Pipe n=0.012 L=12.0' S=0.0125 '/' Capacity=7.82 cfs Outflow=1.01 cfs 0.102 af

Reach 6R: Flow through 1S Avg. Flow Depth=0.23' Max Vel=2.58 fps Inflow=1.01 cfs 0.102 af
n=0.030 L=53.0' S=0.0321 '/' Capacity=23.71 cfs Outflow=1.00 cfs 0.102 af

Reach 7R: Existing Wet Channel Avg. Flow Depth=0.14' Max Vel=2.37 fps Inflow=1.21 cfs 0.126 af
n=0.030 L=65.0' S=0.0554 '/' Capacity=88.27 cfs Outflow=1.21 cfs 0.126 af

Reach 8R: 15" HDPE P-113 Avg. Flow Depth=0.22' Max Vel=9.22 fps Inflow=1.35 cfs 0.142 af
15.0" Round Pipe n=0.012 L=40.0' S=0.0800 '/' Capacity=19.79 cfs Outflow=1.35 cfs 0.142 af

Reach 9R: 12" HDPEP-114 Avg. Flow Depth=0.22' Max Vel=5.62 fps Inflow=0.73 cfs 0.063 af
12.0" Round Pipe n=0.013 L=14.0' S=0.0357 '/' Capacity=6.73 cfs Outflow=0.73 cfs 0.063 af

Reach AP1: Analysis Point 1 Inflow=15.84 cfs 2.343 af
Outflow=15.84 cfs 2.343 af

Reach AP2: Analysis Point 2 Inflow=0.73 cfs 0.063 af
Outflow=0.73 cfs 0.063 af

Reach AP4: Analysis Point 4 Inflow=0.30 cfs 0.022 af
Outflow=0.30 cfs 0.022 af

Reach AP5: Analysis Point 5 Inflow=0.02 cfs 0.001 af
Outflow=0.02 cfs 0.001 af

Reach AP6: Analysis Point 6 Inflow=0.42 cfs 0.037 af
Outflow=0.42 cfs 0.037 af

Pond 1P: Porous Pavement Section #1 Peak Elev=33.22' Storage=2,591 cf Inflow=1.43 cfs 0.468 af
Discarded=1.03 cfs 0.468 af Primary=0.00 cfs 0.000 af Outflow=1.03 cfs 0.468 af

Pond 2P: Porous Concrete Walkway Peak Elev=31.69' Storage=32 cf Inflow=0.05 cfs 0.016 af
Discarded=0.04 cfs 0.016 af Primary=0.00 cfs 0.000 af Outflow=0.04 cfs 0.016 af

Pond 3P: Filtration Drip Edge #1 Peak Elev=35.61' Storage=0.001 af Inflow=0.22 cfs 0.018 af
Outflow=0.19 cfs 0.018 af

Pond 4P: Filtration Drip Edge #2 Peak Elev=35.36' Storage=0.001 af Inflow=0.18 cfs 0.015 af
Primary=0.15 cfs 0.015 af Secondary=0.00 cfs 0.000 af Outflow=0.15 cfs 0.015 af

Pond 5P: Filtration Drip Edge #3 Peak Elev=35.28' Storage=0.003 af Inflow=0.15 cfs 0.013 af
Outflow=0.06 cfs 0.013 af

Pond 6P: Filtration Drip Edge #4 Peak Elev=33.52' Storage=0.000 af Inflow=0.11 cfs 0.009 af
Outflow=0.11 cfs 0.009 af

Pond 7P: Filtration Drip Edge #5 Peak Elev=24.69' Storage=0.001 af Inflow=0.09 cfs 0.007 af
Outflow=0.09 cfs 0.006 af

Pond 8P: Filtration Drip Edge #6 Peak Elev=24.69' Storage=0.002 af Inflow=0.09 cfs 0.007 af
Outflow=0.09 cfs 0.006 af

Pond 9P: Filtration Drip Edge #7 Peak Elev=23.23' Storage=0.000 af Inflow=0.09 cfs 0.007 af
Outflow=0.08 cfs 0.007 af

Pond 10P: Filtration Drip Edge #8 Peak Elev=30.98' Storage=0.001 af Inflow=0.09 cfs 0.007 af
Outflow=0.08 cfs 0.007 af

Pond 11P: Filtration Drip Edge #9 Peak Elev=31.30' Storage=0.002 af Inflow=0.21 cfs 0.018 af
Outflow=0.20 cfs 0.017 af

Pond 12P: Filtration Drip Edge #10 Peak Elev=33.48' Storage=0.000 af Inflow=0.09 cfs 0.007 af
Outflow=0.08 cfs 0.007 af

Pond 13P: Infiltration Drip Edge #11 Peak Elev=36.46' Storage=0.007 af Inflow=0.22 cfs 0.018 af
Discarded=0.02 cfs 0.018 af Secondary=0.00 cfs 0.000 af Outflow=0.02 cfs 0.018 af

Pond 14P: Focal Point #1 Peak Elev=37.86' Storage=38 cf Inflow=0.79 cfs 0.063 af
Outflow=0.79 cfs 0.063 af

Pond 15P: Jellyfish #1 Peak Elev=33.78' Inflow=1.15 cfs 0.092 af
15.0" Round Culvert n=0.012 L=20.0' S=0.0175 '/' Outflow=1.15 cfs 0.092 af

Pond 16P: Jellyfish #2 Peak Elev=33.78' Inflow=0.78 cfs 0.063 af
15.0" Round Culvert n=0.012 L=12.0' S=0.0125 '/' Outflow=0.78 cfs 0.063 af

Pond 17P: Pocket Pond Peak Elev=35.27' Storage=354 cf Inflow=0.22 cfs 0.030 af
Outflow=0.04 cfs 0.030 af

Pond 18P: Underground Detention Peak Elev=33.78' Storage=4,863 cf Inflow=2.72 cfs 0.218 af
Outflow=0.23 cfs 0.218 af

Pond AP3: Existing Pond Peak Elev=29.79' Storage=1,302 cf Inflow=10.69 cfs 1.295 af
18.0" Round Culvert n=0.013 L=160.0' S=0.0050 '/' Outflow=9.74 cfs 1.295 af

Pond DMH1: Drain Manhole 1 Peak Elev=33.78' Inflow=0.78 cfs 0.063 af
15.0" Round Culvert n=0.012 L=8.0' S=0.0125 '/' Outflow=0.78 cfs 0.063 af

Total Runoff Area = 15.480 ac Runoff Volume = 2.908 af Average Runoff Depth = 2.25"
49.13% Pervious = 7.606 ac 50.87% Impervious = 7.874 ac

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Subcatchment1S Runoff Area=180,817 sf 28.87% Impervious Runoff Depth=3.37"
Flow Length=577' Tc=13.9 min CN=79 Runoff=12.68 cfs 1.165 af

Subcatchment2S: Subcatchment2S Runoff Area=12,083 sf 72.53% Impervious Runoff Depth=4.62"
Flow Length=106' Tc=10.9 min CN=91 Runoff=1.21 cfs 0.107 af

Subcatchment3S: Subcatchment3S Runoff Area=290,437 sf 52.42% Impervious Runoff Depth=4.08"
Flow Length=604' Tc=26.3 min CN=86 Runoff=18.81 cfs 2.266 af

Subcatchment4S: Subcatchment4S Runoff Area=4,647 sf 58.90% Impervious Runoff Depth=4.29"
Tc=6.0 min CN=88 Runoff=0.51 cfs 0.038 af

Subcatchment5S: Subcatchment5S Runoff Area=430 sf 0.00% Impervious Runoff Depth=2.89"
Tc=6.0 min CN=74 Runoff=0.03 cfs 0.002 af

Subcatchment6S: Subcatchment6S Runoff Area=8,122 sf 55.43% Impervious Runoff Depth=4.18"
Flow Length=149' Tc=12.0 min CN=87 Runoff=0.73 cfs 0.065 af

Subcatchment7S: Subcatchment7S Runoff Area=29,318 sf 12.60% Impervious Runoff Depth=2.99"
Flow Length=200' Tc=15.8 min CN=75 Runoff=1.74 cfs 0.167 af

Subcatchment8S: Subcatchment8S Runoff Area=83,551 sf 80.82% Impervious Runoff Depth=4.84"
Tc=144.0 min CN=93 Runoff=2.32 cfs 0.773 af

Subcatchment9S: Subcatchment27S Runoff Area=4,764 sf 21.83% Impervious Runoff Depth=3.37"
Tc=144.0 min CN=79 Runoff=0.10 cfs 0.031 af

Subcatchment10S: Subcatchment10S Runoff Area=951 sf 0.00% Impervious Runoff Depth=2.89"
Tc=6.0 min CN=74 Runoff=0.07 cfs 0.005 af

Subcatchment11S: Subcatchment11S Runoff Area=2,774 sf 98.34% Impervious Runoff Depth=5.41"
Tc=6.0 min CN=98 Runoff=0.34 cfs 0.029 af

Subcatchment12S: Subcatchment12S Runoff Area=2,207 sf 98.60% Impervious Runoff Depth=5.41"
Tc=6.0 min CN=98 Runoff=0.27 cfs 0.023 af

Subcatchment13S: Subcatchment13S Runoff Area=1,902 sf 85.80% Impervious Runoff Depth=5.41"
Tc=6.0 min CN=98 Runoff=0.24 cfs 0.020 af

Subcatchment14S: Subcatchment14S Runoff Area=1,422 sf 86.08% Impervious Runoff Depth=5.41"
Tc=6.0 min CN=98 Runoff=0.18 cfs 0.015 af

Subcatchment15S: Subcatchment15S Runoff Area=1,104 sf 100.00% Impervious Runoff Depth=5.41"
Tc=6.0 min CN=98 Runoff=0.14 cfs 0.011 af

Subcatchment16S: Subcatchment16S Runoff Area=1,104 sf 100.00% Impervious Runoff Depth=5.41"
Tc=6.0 min CN=98 Runoff=0.14 cfs 0.011 af

Subcatchment17S: Subcatchment17S Runoff Area=1,104 sf 100.00% Impervious Runoff Depth=5.41"
Tc=6.0 min CN=98 Runoff=0.14 cfs 0.011 af

Subcatchment18S: Subcatchment18S Runoff Area=1,093 sf 98.08% Impervious Runoff Depth=5.41"
Tc=6.0 min CN=98 Runoff=0.14 cfs 0.011 af

Subcatchment19S: Subcatchment19S Runoff Area=1,645 sf 98.72% Impervious Runoff Depth=5.41"
Tc=6.0 min CN=98 Runoff=0.20 cfs 0.017 af

Subcatchment20S: Subcatchment20S Runoff Area=1,093 sf 98.08% Impervious Runoff Depth=5.41"
Tc=6.0 min CN=98 Runoff=0.14 cfs 0.011 af

Subcatchment21S: Subcatchment21S Runoff Area=2,728 sf 100.00% Impervious Runoff Depth=5.41"
Tc=6.0 min CN=98 Runoff=0.34 cfs 0.028 af

Subcatchment22S: Subcatchment22S Runoff Area=9,860 sf 94.21% Impervious Runoff Depth=5.30"
Tc=6.0 min CN=97 Runoff=1.22 cfs 0.100 af

Subcatchment23S: Subcatchment23S Runoff Area=14,386 sf 97.80% Impervious Runoff Depth=5.30"
Tc=6.0 min CN=97 Runoff=1.77 cfs 0.146 af

Subcatchment24S: Subcatchment24S Runoff Area=9,757 sf 95.92% Impervious Runoff Depth=5.30"
Tc=6.0 min CN=97 Runoff=1.20 cfs 0.099 af

Subcatchment25S: Subcatchment25S Runoff Area=5,889 sf 0.00% Impervious Runoff Depth=2.89"
Flow Length=158' Tc=6.4 min CN=74 Runoff=0.44 cfs 0.033 af

Subcatchment26S: Subcatchment26S Runoff Area=1,141 sf 0.00% Impervious Runoff Depth=2.89"
Tc=6.0 min CN=74 Runoff=0.09 cfs 0.006 af

Reach 2Ra: Channel through 1S Avg. Flow Depth=0.81' Max Vel=4.04 fps Inflow=14.59 cfs 2.799 af
n=0.040 L=136.0' S=0.0294 '/' Capacity=1,586.21 cfs Outflow=14.59 cfs 2.799 af

Reach 2Rb: Channel through 1S Avg. Flow Depth=0.25' Max Vel=2.84 fps Inflow=14.62 cfs 2.813 af
n=0.040 L=153.0' S=0.0392 '/' Capacity=4,170.50 cfs Outflow=14.62 cfs 2.813 af

Reach 2Rc: Channel through 1S Avg. Flow Depth=0.34' Max Vel=2.25 fps Inflow=15.99 cfs 3.086 af
n=0.040 L=303.0' S=0.0165 '/' Capacity=2,705.34 cfs Outflow=15.98 cfs 3.086 af

Reach 3R: 15" HDPE P-111 Avg. Flow Depth=0.47' Max Vel=4.66 fps Inflow=1.99 cfs 0.196 af
15.0" Round Pipe n=0.012 L=86.0' S=0.0087 '/' Capacity=6.54 cfs Outflow=1.99 cfs 0.196 af

Reach 4R: Flow through 1S Avg. Flow Depth=0.33' Max Vel=3.09 fps Inflow=1.99 cfs 0.196 af
n=0.030 L=40.0' S=0.0313 '/' Capacity=23.40 cfs Outflow=1.99 cfs 0.196 af

Reach 5R: 15" HDPE P-112 Avg. Flow Depth=0.44' Max Vel=5.35 fps Inflow=2.04 cfs 0.203 af
15.0" Round Pipe n=0.012 L=12.0' S=0.0125 '/' Capacity=7.82 cfs Outflow=2.04 cfs 0.203 af

Reach 6R: Flow through 1S Avg. Flow Depth=0.33' Max Vel=3.14 fps Inflow=2.04 cfs 0.203 af
n=0.030 L=53.0' S=0.0321 '/' Capacity=23.71 cfs Outflow=2.04 cfs 0.203 af

Reach 7R: Existing Wet Channel Avg. Flow Depth=0.19' Max Vel=2.91 fps Inflow=2.35 cfs 0.240 af
n=0.030 L=65.0' S=0.0554 '/' Capacity=88.27 cfs Outflow=2.35 cfs 0.240 af

Reach 8R: 15" HDPE P-113 Avg. Flow Depth=0.31' Max Vel=11.21 fps Inflow=2.64 cfs 0.273 af
15.0" Round Pipe n=0.012 L=40.0' S=0.0800 '/' Capacity=19.79 cfs Outflow=2.64 cfs 0.273 af

Reach 9R: 12" HDPEP-114 Avg. Flow Depth=0.29' Max Vel=6.49 fps Inflow=1.21 cfs 0.107 af
12.0" Round Pipe n=0.013 L=14.0' S=0.0357 '/' Capacity=6.73 cfs Outflow=1.21 cfs 0.107 af

Reach AP1: Analysis Point 1 Inflow=26.59 cfs 4.251 af
Outflow=26.59 cfs 4.251 af

Reach AP2: Analysis Point 2 Inflow=1.21 cfs 0.107 af
Outflow=1.21 cfs 0.107 af

Reach AP4: Analysis Point 4 Inflow=0.51 cfs 0.038 af
Outflow=0.51 cfs 0.038 af

Reach AP5: Analysis Point 5 Inflow=0.03 cfs 0.002 af
Outflow=0.03 cfs 0.002 af

Reach AP6: Analysis Point 6 Inflow=0.73 cfs 0.065 af
Outflow=0.73 cfs 0.065 af

Pond 1P: Porous Pavement Section #1 Peak Elev=33.57' Storage=6,378 cf Inflow=2.32 cfs 0.773 af
Discarded=1.48 cfs 0.773 af Primary=0.00 cfs 0.000 af Outflow=1.48 cfs 0.773 af

Pond 2P: Porous Concrete Walkway Peak Elev=32.01' Storage=151 cf Inflow=0.10 cfs 0.031 af
Discarded=0.08 cfs 0.031 af Primary=0.00 cfs 0.000 af Outflow=0.08 cfs 0.031 af

Pond 3P: Filtration Drip Edge #1 Peak Elev=35.82' Storage=0.002 af Inflow=0.34 cfs 0.029 af
Outflow=0.27 cfs 0.029 af

Pond 4P: Filtration Drip Edge #2 Peak Elev=35.99' Storage=0.003 af Inflow=0.27 cfs 0.023 af
Primary=0.14 cfs 0.023 af Secondary=0.00 cfs 0.000 af Outflow=0.14 cfs 0.023 af

Pond 5P: Filtration Drip Edge #3 Peak Elev=35.98' Storage=0.003 af Inflow=0.24 cfs 0.020 af
Outflow=0.20 cfs 0.020 af

Pond 6P: Filtration Drip Edge #4 Peak Elev=33.64' Storage=0.001 af Inflow=0.18 cfs 0.015 af
Outflow=0.16 cfs 0.015 af

Pond 7P: Filtration Drip Edge #5 Peak Elev=24.84' Storage=0.002 af Inflow=0.14 cfs 0.011 af
Outflow=0.14 cfs 0.010 af

Pond 8P: Filtration Drip Edge #6 Peak Elev=24.84' Storage=0.002 af Inflow=0.14 cfs 0.011 af
Outflow=0.14 cfs 0.010 af

Pond 9P: Filtration Drip Edge #7 Peak Elev=23.31' Storage=0.000 af Inflow=0.14 cfs 0.011 af
Outflow=0.13 cfs 0.011 af

Pond 10P: Filtration Drip Edge #8 Peak Elev=31.10' Storage=0.001 af Inflow=0.14 cfs 0.011 af
Outflow=0.12 cfs 0.011 af

Pond 11P: Filtration Drip Edge #9 Peak Elev=31.89' Storage=0.002 af Inflow=0.33 cfs 0.028 af
Outflow=0.32 cfs 0.027 af

Pond 12P: Filtration Drip Edge #10 Peak Elev=33.56' Storage=0.000 af Inflow=0.14 cfs 0.011 af
Outflow=0.13 cfs 0.011 af

Pond 13P: Infiltration Drip Edge #11 Peak Elev=37.35' Storage=0.012 af Inflow=0.34 cfs 0.028 af
Discarded=0.03 cfs 0.028 af Secondary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.028 af

Pond 14P: Focal Point #1 Peak Elev=37.91' Storage=42 cf Inflow=1.22 cfs 0.100 af
Outflow=1.22 cfs 0.100 af

Pond 15P: Jellyfish #1 Peak Elev=34.66' Inflow=1.77 cfs 0.146 af
15.0" Round Culvert n=0.012 L=20.0' S=0.0175 '/' Outflow=1.77 cfs 0.146 af

Pond 16P: Jellyfish #2 Peak Elev=34.66' Inflow=1.20 cfs 0.099 af
15.0" Round Culvert n=0.012 L=12.0' S=0.0125 '/' Outflow=1.20 cfs 0.099 af

Pond 17P: Pocket Pond Peak Elev=35.98' Storage=653 cf Inflow=0.40 cfs 0.048 af
Outflow=0.05 cfs 0.048 af

Pond 18P: Underground Detention Peak Elev=34.66' Storage=6,973 cf Inflow=4.20 cfs 0.344 af
Outflow=0.88 cfs 0.344 af

Pond AP3: Existing Pond Peak Elev=31.61' Storage=8,160 cf Inflow=18.85 cfs 2.313 af
18.0" Round Culvert n=0.013 L=160.0' S=0.0050 '/' Outflow=13.32 cfs 2.313 af

Pond DMH1: Drain Manhole 1 Peak Elev=34.66' Inflow=1.20 cfs 0.099 af
15.0" Round Culvert n=0.012 L=8.0' S=0.0125 '/' Outflow=1.20 cfs 0.099 af

Total Runoff Area = 15.480 ac Runoff Volume = 5.191 af Average Runoff Depth = 4.02"
49.13% Pervious = 7.606 ac 50.87% Impervious = 7.874 ac

Summary for Subcatchment 1S: Subcatchment 1S

Runoff = 12.68 cfs @ 12.19 hrs, Volume= 1.165 af, Depth= 3.37"
Routed to Reach AP1 : Analysis Point 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Storm Rainfall=5.65"

Area (sf)	CN	Description
3,301	55	Woods, Good, HSG B
960	98	Paved roads w/curbs & sewers, HSG B
11,268	98	Roofs, HSG C
39,974	98	Paved roads w/curbs & sewers, HSG C
23,873	74	>75% Grass cover, Good, HSG C
80,510	70	Woods, Good, HSG C
20,931	77	Woods, Good, HSG D
180,817	79	Weighted Average
128,615		71.13% Pervious Area
52,202		28.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	39	0.0204	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.70"
2.9	11	0.0294	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.70"
0.4	23	0.0294	0.86		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.1	48	0.0294	5.69	55.51	**Trap/Vee/Rect Channel Flow, Assumed 1.5' flow depth - Channel** Bot.W=2.00' D=1.50' Z= 4.0 & 2.0 '/' Top.W=11.00' n= 0.040 Winding stream, pools & shoals
0.3	153	0.0392	8.51	312.68	**Trap/Vee/Rect Channel Flow, Assumed 1.5' flow depth - Channel** Bot.W=20.00' D=1.50' Z= 4.0 & 2.0 '/' Top.W=29.00' n= 0.040 Winding stream, pools & shoals
0.9	303	0.0165	5.52	202.86	**Trap/Vee/Rect Channel Flow, Assumed 1.5' flow depth - Channel** Bot.W=20.00' D=1.50' Z= 4.0 & 2.0 '/' Top.W=29.00' n= 0.040 Winding stream, pools & shoals
13.9	577	Total			

Summary for Subcatchment 2S: Subcatchment 2S

Runoff = 1.21 cfs @ 12.15 hrs, Volume= 0.107 af, Depth= 4.62"
Routed to Reach AP2 : Analysis Point 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Storm Rainfall=5.65"

Area (sf)	CN	Description
7,339	98	Paved roads w/curbs & sewers, HSG C
1,425	98	Roofs, HSG C
1,971	74	>75% Grass cover, Good, HSG C
1,348	70	Woods, Good, HSG C
12,083	91	Weighted Average
3,319		27.47% Pervious Area
8,764		72.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	35	0.0225	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.70"
1.9	15	0.0225	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
0.8	56	0.0274	1.16		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.9	106	Total			

Summary for Subcatchment 3S: Subcatchment 3S

Runoff = 18.81 cfs @ 12.36 hrs, Volume= 2.266 af, Depth= 4.08"
Routed to Pond AP3 : Existing Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Storm Rainfall=5.65"

Area (sf)	CN	Description
125,302	98	Paved roads w/curbs & sewers, HSG C
9,379	98	Roofs, HSG C
14,300	74	>75% Grass cover, Good, HSG C
74,360	70	Woods, Good, HSG C
46,241	83	1/4 acre lots, 38% imp, HSG C
15,690	77	Woods, Good, HSG D
5,165	98	Water Surface, 0% imp, HSG D
290,437	86	Weighted Average
138,184		47.58% Pervious Area
152,253		52.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.5	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.70"
3.5	119	0.0126	0.56		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.5	74	0.0270	0.82		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.6	107	0.0187	0.68		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
5.7	180	0.0111	0.53		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.5	74	0.0270	0.82		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
26.3	604	Total			

Summary for Subcatchment 4S: Subcatchment 4S

Runoff = 0.51 cfs @ 12.09 hrs, Volume= 0.038 af, Depth= 4.29"
Routed to Reach AP4 : Analysis Point 4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Storm Rainfall=5.65"

Area (sf)	CN	Description
2,737	98	Paved parking, HSG C
1,910	74	>75% Grass cover, Good, HSG C
4,647	88	Weighted Average
1,910		41.10% Pervious Area
2,737		58.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, 6 minute minimum Tc per TR-55**

Summary for Subcatchment 5S: Subcatchment 5S

Runoff = 0.03 cfs @ 12.09 hrs, Volume= 0.002 af, Depth= 2.89"
Routed to Reach AP5 : Analysis Point 5

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Storm Rainfall=5.65"

Area (sf)	CN	Description
430	74	>75% Grass cover, Good, HSG C
430		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, 6 minute minimum Tc per TR-55**

Summary for Subcatchment 6S: Subcatchment 6S

Runoff = 0.73 cfs @ 12.16 hrs, Volume= 0.065 af, Depth= 4.18"
Routed to Reach AP6 : Analysis Point 6

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Storm Rainfall=5.65"

Area (sf)	CN	Description
4,023	98	Paved roads w/curbs & sewers, HSG C
479	98	Roofs, HSG C
3,620	74	>75% Grass cover, Good, HSG C
8,122	87	Weighted Average
3,620		44.57% Pervious Area
4,502		55.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.9	50	0.0041	0.08		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
1.7	47	0.0041	0.45		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.4	52	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
12.0	149	Total			

Summary for Subcatchment 7S: Subcatchment 7S

Runoff = 1.74 cfs @ 12.22 hrs, Volume= 0.167 af, Depth= 2.99"
Routed to Reach 3R : 15" HDPE P-111

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Storm Rainfall=5.65"

Area (sf)	CN	Description
1,632	98	Paved roads w/curbs & sewers, HSG C
4,849	74	>75% Grass cover, Good, HSG C
17,413	70	Woods, Good, HSG C
5,424	83	1/4 acre lots, 38% imp, HSG C
29,318	75	Weighted Average
25,625		87.40% Pervious Area
3,693		12.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	50	0.0183	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.70"
0.2	7	0.0183	0.68		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.6	91	0.0134	0.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.1	52	0.0134	0.81		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
15.8	200	Total			

Summary for Subcatchment 8S: Subcatchment 8S

Runoff = 2.32 cfs @ 13.88 hrs, Volume= 0.773 af, Depth= 4.84"
Routed to Pond 1P : Porous Pavement Section #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Storm Rainfall=5.65"

Area (sf)	CN	Description
46,596	98	Paved roads w/curbs & sewers, HSG C
4,422	74	>75% Grass cover, Good, HSG C
13,824	98	Roofs, HSG C
18,709	83	1/4 acre lots, 38% imp, HSG C
83,551	93	Weighted Average
16,022		19.18% Pervious Area
67,529		80.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
144.0					**Direct Entry, Assuming 5 in/hr through 12" filter course**

Summary for Subcatchment 9S: Subcatchment 27S

Runoff = 0.10 cfs @ 13.91 hrs, Volume= 0.031 af, Depth= 3.37"
Routed to Pond 2P : Porous Concrete Walkway

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Storm Rainfall=5.65"

Area (sf)	CN	Description
1,040	98	Paved roads w/curbs & sewers, HSG C
3,724	74	>75% Grass cover, Good, HSG C
4,764	79	Weighted Average
3,724		78.17% Pervious Area
1,040		21.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
144.0					**Direct Entry, Assuming 5 in/hr through 12" filter course**

Summary for Subcatchment 10S: Subcatchment 10S

Runoff = 0.07 cfs @ 12.09 hrs, Volume= 0.005 af, Depth= 2.89"
Routed to Pond 17P : Pocket Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Storm Rainfall=5.65"

Area (sf)	CN	Description
951	74	>75% Grass cover, Good, HSG C
951		100.00% Pervious Area

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

Summary for Subcatchment 11S: Subcatchment 11S

Runoff = 0.34 cfs @ 12.09 hrs, Volume= 0.029 af, Depth= 5.41"
Routed to Pond 3P : Filtration Drip Edge #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Storm Rainfall=5.65"

Area (sf)	CN	Description
2,728	98	Roofs, HSG C
46	98	Water Surface, 0% imp, HSG C
2,774	98	Weighted Average
46		1.66% Pervious Area
2,728		98.34% Impervious Area

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

Summary for Subcatchment 12S: Subcatchment 12S

Runoff = 0.27 cfs @ 12.09 hrs, Volume= 0.023 af, Depth= 5.41"
Routed to Pond 4P : Filtration Drip Edge #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Storm Rainfall=5.65"

Area (sf)	CN	Description
2,176	98	Roofs, HSG C
31	98	Water Surface, 0% imp, HSG C
2,207	98	Weighted Average
31		1.40% Pervious Area
2,176		98.60% Impervious Area

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

Summary for Subcatchment 13S: Subcatchment 13S

Runoff = 0.24 cfs @ 12.09 hrs, Volume= 0.020 af, Depth= 5.41"
Routed to Pond 5P : Filtration Drip Edge #3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Storm Rainfall=5.65"

Area (sf)	CN	Description
1,632	98	Roofs, HSG C
270	98	Water Surface, 0% imp, HSG C
1,902	98	Weighted Average
270		14.20% Pervious Area
1,632		85.80% Impervious Area

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

Summary for Subcatchment 14S: Subcatchment 14S

Runoff = 0.18 cfs @ 12.09 hrs, Volume= 0.015 af, Depth= 5.41"
Routed to Pond 6P : Filtration Drip Edge #4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Storm Rainfall=5.65"

Area (sf)	CN	Description
1,224	98	Roofs, HSG C
198	98	Water Surface, 0% imp, HSG C
1,422	98	Weighted Average
198		13.92% Pervious Area
1,224		86.08% Impervious Area

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

Summary for Subcatchment 15S: Subcatchment 15S

Runoff = 0.14 cfs @ 12.09 hrs, Volume= 0.011 af, Depth= 5.41"
Routed to Pond 7P : Filtration Drip Edge #5

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Storm Rainfall=5.65"

Area (sf)	CN	Description
1,104	98	Roofs, HSG C
1,104		100.00% Impervious Area

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

Summary for Subcatchment 16S: Subcatchment 16S

Runoff = 0.14 cfs @ 12.09 hrs, Volume= 0.011 af, Depth= 5.41"
Routed to Pond 8P : Filtration Drip Edge #6

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Storm Rainfall=5.65"

Area (sf)	CN	Description
1,104	98	Roofs, HSG C
1,104		100.00% Impervious Area

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

Summary for Subcatchment 17S: Subcatchment 17S

Runoff = 0.14 cfs @ 12.09 hrs, Volume= 0.011 af, Depth= 5.41"
Routed to Pond 9P : Filtration Drip Edge #7

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Storm Rainfall=5.65"

Area (sf)	CN	Description
1,104	98	Roofs, HSG C
1,104		100.00% Impervious Area

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

Summary for Subcatchment 18S: Subcatchment 18S

Runoff = 0.14 cfs @ 12.09 hrs, Volume= 0.011 af, Depth= 5.41"
Routed to Pond 10P : Filtration Drip Edge #8

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Storm Rainfall=5.65"

Area (sf)	CN	Description
1,072	98	Roofs, HSG C
21	98	Water Surface, 0% imp, HSG C
1,093	98	Weighted Average
21		1.92% Pervious Area
1,072		98.08% Impervious Area

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

Summary for Subcatchment 19S: Subcatchment 19S

Runoff = 0.20 cfs @ 12.09 hrs, Volume= 0.017 af, Depth= 5.41"
Routed to Pond 11P : Filtration Drip Edge #9

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Storm Rainfall=5.65"

Area (sf)	CN	Description
1,624	98	Roofs, HSG C
21	98	Water Surface, 0% imp, HSG C
1,645	98	Weighted Average
21		1.28% Pervious Area
1,624		98.72% Impervious Area

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

Summary for Subcatchment 20S: Subcatchment 20S

Runoff = 0.14 cfs @ 12.09 hrs, Volume= 0.011 af, Depth= 5.41"
Routed to Pond 12P : Filtration Drip Edge #10

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Storm Rainfall=5.65"

Area (sf)	CN	Description
1,072	98	Roofs, HSG C
21	98	Water Surface, 0% imp, HSG C
1,093	98	Weighted Average
21		1.92% Pervious Area
1,072		98.08% Impervious Area

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

Summary for Subcatchment 21S: Subcatchment 21S

Runoff = 0.34 cfs @ 12.09 hrs, Volume= 0.028 af, Depth= 5.41"
Routed to Pond 13P : Infiltration Drip Edge #11

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Storm Rainfall=5.65"

Area (sf)	CN	Description
2,728	98	Roofs, HSG C
2,728		100.00% Impervious Area

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

Summary for Subcatchment 22S: Subcatchment 22S

Runoff = 1.22 cfs @ 12.09 hrs, Volume= 0.100 af, Depth= 5.30"
Routed to Pond 14P : Focal Point #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Storm Rainfall=5.65"

Area (sf)	CN	Description
6,099	98	Roofs, HSG C
3,190	98	Paved parking, HSG C
571	74	>75% Grass cover, Good, HSG C
9,860	97	Weighted Average
571		5.79% Pervious Area
9,289		94.21% Impervious Area

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

Summary for Subcatchment 23S: Subcatchment 23S

Runoff = 1.77 cfs @ 12.09 hrs, Volume= 0.146 af, Depth= 5.30"
Routed to Pond 15P : Jellyfish #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Storm Rainfall=5.65"

Area (sf)	CN	Description
2,460	98	Roofs, HSG C
11,609	98	Paved parking, HSG C
317	74	>75% Grass cover, Good, HSG C
14,386	97	Weighted Average
317		2.20% Pervious Area
14,069		97.80% Impervious Area

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

Summary for Subcatchment 24S: Subcatchment 24S

Runoff = 1.20 cfs @ 12.09 hrs, Volume= 0.099 af, Depth= 5.30"
Routed to Pond 16P : Jellyfish #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Storm Rainfall=5.65"

Area (sf)	CN	Description
398	74	>75% Grass cover, Good, HSG C
4,210	98	Roofs, HSG C
5,149	98	Paved roads w/curbs & sewers, HSG C
9,757	97	Weighted Average
398		4.08% Pervious Area
9,359		95.92% Impervious Area

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

Summary for Subcatchment 25S: Subcatchment 25S

Runoff = 0.44 cfs @ 12.10 hrs, Volume= 0.033 af, Depth= 2.89"
Routed to Reach 8R : 15" HDPE P-113

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Storm Rainfall=5.65"

Area (sf)	CN	Description
5,889	74	>75% Grass cover, Good, HSG C
5,889		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	40	0.0250	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
1.2	10	0.0288	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
0.6	42	0.0288	1.19		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.2	20	0.1000	2.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.4	46	0.0652	1.79		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
6.4	158	Total			

Summary for Subcatchment 26S: Subcatchment 26S

Runoff = 0.09 cfs @ 12.09 hrs, Volume= 0.006 af, Depth= 2.89"
Routed to Reach 5R : 15" HDPE P-112

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Storm Rainfall=5.65"

Area (sf)	CN	Description
1,141	74	>75% Grass cover, Good, HSG C
1,141		100.00% Pervious Area

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

Summary for Reach 2Ra: Channel through 1S

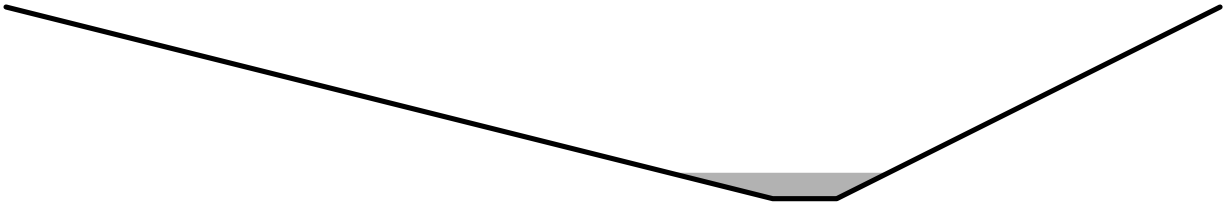
[80] Warning: Exceeded Pond 7P by 1.25' @ 0.00 hrs (0.35 cfs 0.408 af)
[80] Warning: Exceeded Pond 8P by 1.65' @ 0.00 hrs (0.40 cfs 0.492 af)

Inflow Area = 7.925 ac, 58.22% Impervious, Inflow Depth = 4.24" for 10-Year Storm event
Inflow = 14.59 cfs @ 12.54 hrs, Volume= 2.799 af
Outflow = 14.59 cfs @ 12.55 hrs, Volume= 2.799 af, Atten= 0%, Lag= 0.4 min
Routed to Reach 2Rb : Channel through 1S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 4.04 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 1.19 fps, Avg. Travel Time= 1.9 min

Peak Storage= 492 cf @ 12.55 hrs
Average Depth at Peak Storage= 0.81' , Surface Width= 6.88'
Bank-Full Depth= 6.00' Flow Area= 120.0 sf, Capacity= 1,586.21 cfs

2.00' x 6.00' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 4.0 2.0 '/' Top Width= 38.00'
Length= 136.0' Slope= 0.0294 '/'
Inlet Invert= 24.00', Outlet Invert= 20.00'



Summary for Reach 2Rb: Channel through 1S

[61] Hint: Exceeded Reach 2Ra outlet invert by 0.25' @ 12.55 hrs

Inflow Area = 9.878 ac, 62.66% Impervious, Inflow Depth = 3.42" for 10-Year Storm event
Inflow = 14.62 cfs @ 12.54 hrs, Volume= 2.813 af
Outflow = 14.62 cfs @ 12.55 hrs, Volume= 2.813 af, Atten= 0%, Lag= 0.6 min
Routed to Reach 2Rc : Channel through 1S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 2.84 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 1.16 fps, Avg. Travel Time= 2.2 min

Peak Storage= 788 cf @ 12.55 hrs
Average Depth at Peak Storage= 0.25' , Surface Width= 21.49'
Bank-Full Depth= 6.00' Flow Area= 228.0 sf, Capacity= 4,170.50 cfs

20.00' x 6.00' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 4.0 2.0 '/' Top Width= 56.00'
Length= 153.0' Slope= 0.0392 '/'
Inlet Invert= 20.00', Outlet Invert= 14.00'



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Summary for Reach 2Rc: Channel through 1S

[62] Hint: Exceeded Reach 2Rb OUTLET depth by 0.10' @ 12.25 hrs

Inflow Area = 10.949 ac, 58.66% Impervious, Inflow Depth = 3.38" for 10-Year Storm event
Inflow = 15.99 cfs @ 12.45 hrs, Volume= 3.086 af
Outflow = 15.98 cfs @ 12.47 hrs, Volume= 3.086 af, Atten= 0%, Lag= 1.4 min
Routed to Reach AP1 : Analysis Point 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 2.25 fps, Min. Travel Time= 2.2 min
Avg. Velocity = 0.78 fps, Avg. Travel Time= 6.5 min

Peak Storage= 2,155 cf @ 12.47 hrs
Average Depth at Peak Storage= 0.34' , Surface Width= 22.03'
Bank-Full Depth= 6.00' Flow Area= 228.0 sf, Capacity= 2,705.34 cfs

20.00' x 6.00' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 4.0 2.0 '/' Top Width= 56.00'
Length= 303.0' Slope= 0.0165 '/'
Inlet Invert= 14.00', Outlet Invert= 9.00'



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Summary for Reach 3R: 15" HDPE P-111

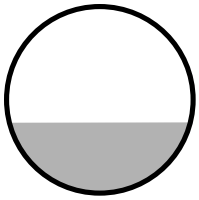
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.737 ac, 20.01% Impervious, Inflow Depth = 3.20" for 10-Year Storm event
Inflow = 1.99 cfs @ 12.21 hrs, Volume= 0.196 af
Outflow = 1.99 cfs @ 12.22 hrs, Volume= 0.196 af, Atten= 0%, Lag= 0.2 min
Routed to Reach 4R : Flow through 1S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 4.66 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.38 fps, Avg. Travel Time= 1.0 min

Peak Storage= 37 cf @ 12.22 hrs
Average Depth at Peak Storage= 0.47' , Surface Width= 1.21'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 6.54 cfs

15.0" Round Pipe
n= 0.012
Length= 86.0' Slope= 0.0087 '/'
Inlet Invert= 34.75', Outlet Invert= 34.00'



Summary for Reach 4R: Flow through 1S

[61] Hint: Exceeded Reach 3R outlet invert by 0.32' @ 12.20 hrs

Inflow Area = 0.737 ac, 20.01% Impervious, Inflow Depth = 3.20" for 10-Year Storm event
Inflow = 1.99 cfs @ 12.22 hrs, Volume= 0.196 af
Outflow = 1.99 cfs @ 12.22 hrs, Volume= 0.196 af, Atten= 0%, Lag= 0.1 min
Routed to Reach 5R : 15" HDPE P-112

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 3.09 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 0.89 fps, Avg. Travel Time= 0.7 min

Peak Storage= 26 cf @ 12.22 hrs
Average Depth at Peak Storage= 0.33' , Surface Width= 2.95'
Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 23.40 cfs

1.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 3.0 '/' Top Width= 7.00'
Length= 40.0' Slope= 0.0313 '/'
Inlet Invert= 34.00', Outlet Invert= 32.75'



Summary for Reach 5R: 15" HDPE P-112

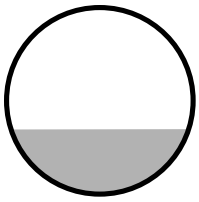
[52] Hint: Inlet/Outlet conditions not evaluated
[62] Hint: Exceeded Reach 4R OUTLET depth by 0.11' @ 12.20 hrs

Inflow Area = 0.763 ac, 19.32% Impervious, Inflow Depth = 3.19" for 10-Year Storm event
Inflow = 2.04 cfs @ 12.22 hrs, Volume= 0.203 af
Outflow = 2.04 cfs @ 12.22 hrs, Volume= 0.203 af, Atten= 0%, Lag= 0.0 min
Routed to Reach 6R : Flow through 1S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 5.35 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.60 fps, Avg. Travel Time= 0.1 min

Peak Storage= 5 cf @ 12.22 hrs
Average Depth at Peak Storage= 0.44' , Surface Width= 1.19'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 7.82 cfs

15.0" Round Pipe
n= 0.012
Length= 12.0' Slope= 0.0125 '/'
Inlet Invert= 32.75', Outlet Invert= 32.60'



Summary for Reach 6R: Flow through 1S

[61] Hint: Exceeded Reach 5R outlet invert by 0.23' @ 12.20 hrs

Inflow Area = 0.763 ac, 19.32% Impervious, Inflow Depth = 3.19" for 10-Year Storm event
Inflow = 2.04 cfs @ 12.22 hrs, Volume= 0.203 af
Outflow = 2.04 cfs @ 12.22 hrs, Volume= 0.203 af, Atten= 0%, Lag= 0.2 min
Routed to Reach 7R : Existing Wet Channel

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 3.14 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 0.91 fps, Avg. Travel Time= 1.0 min

Peak Storage= 34 cf @ 12.22 hrs
Average Depth at Peak Storage= 0.33' , Surface Width= 2.96'
Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 23.71 cfs

1.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 3.0 '/' Top Width= 7.00'
Length= 53.0' Slope= 0.0321 '/'
Inlet Invert= 32.50', Outlet Invert= 30.80'



Summary for Reach 7R: Existing Wet Channel

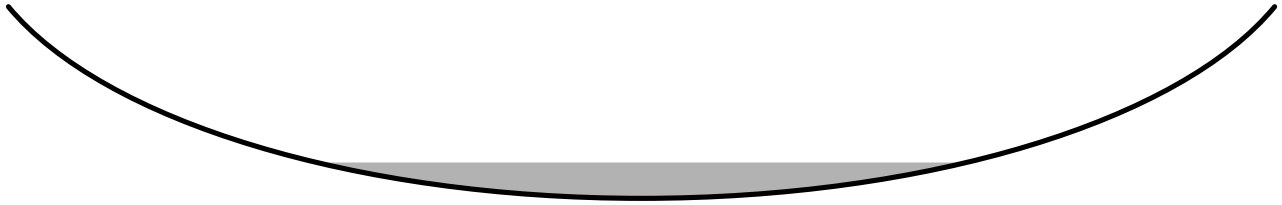
[90] Warning: Qout>Qin may require smaller dt or Finer Routing
[62] Hint: Exceeded Reach 6R OUTLET depth by 0.01' @ 24.70 hrs
[80] Warning: Exceeded Pond 10P by 0.30' @ 0.00 hrs (0.12 cfs 0.128 af)
[80] Warning: Exceeded Pond 11P by 0.55' @ 0.00 hrs (0.21 cfs 0.099 af)

Inflow Area = 0.935 ac, 24.93% Impervious, Inflow Depth = 3.08" for 10-Year Storm event
Inflow = 2.35 cfs @ 12.20 hrs, Volume= 0.240 af
Outflow = 2.35 cfs @ 12.21 hrs, Volume= 0.240 af, Atten= 0%, Lag= 0.3 min
Routed to Reach 8R : 15" HDPE P-113

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 2.91 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 0.85 fps, Avg. Travel Time= 1.3 min

Peak Storage= 53 cf @ 12.21 hrs
Average Depth at Peak Storage= 0.19' , Surface Width= 6.49'
Bank-Full Depth= 1.00' Flow Area= 10.0 sf, Capacity= 88.27 cfs

15.00' x 1.00' deep Parabolic Channel, n= 0.030 Earth, grassed & winding
Length= 65.0' Slope= 0.0554 '/'
Inlet Invert= 30.80', Outlet Invert= 27.20'



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Summary for Reach 8R: 15" HDPE P-113

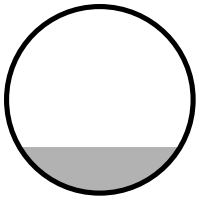
[52] Hint: Inlet/Outlet conditions not evaluated
[62] Hint: Exceeded Reach 7R OUTLET depth by 0.12' @ 12.15 hrs

Inflow Area = 1.070 ac, 21.79% Impervious, Inflow Depth = 3.06" for 10-Year Storm event
Inflow = 2.64 cfs @ 12.19 hrs, Volume= 0.273 af
Outflow = 2.64 cfs @ 12.19 hrs, Volume= 0.273 af, Atten= 0%, Lag= 0.0 min
Routed to Reach 2Rc : Channel through 1S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 11.21 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.51 fps, Avg. Travel Time= 0.2 min

Peak Storage= 9 cf @ 12.19 hrs
Average Depth at Peak Storage= 0.31' , Surface Width= 1.08'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 19.79 cfs

15.0" Round Pipe
n= 0.012
Length= 40.0' Slope= 0.0800 '/'
Inlet Invert= 27.20', Outlet Invert= 24.00'



Summary for Reach 9R: 12" HDPEP-114

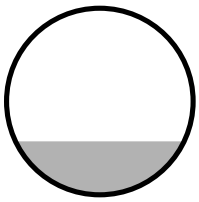
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.277 ac, 72.53% Impervious, Inflow Depth = 4.62" for 10-Year Storm event
Inflow = 1.21 cfs @ 12.15 hrs, Volume= 0.107 af
Outflow = 1.21 cfs @ 12.15 hrs, Volume= 0.107 af, Atten= 0%, Lag= 0.0 min
Routed to Reach 2Ra : Channel through 1S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 6.49 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.22 fps, Avg. Travel Time= 0.1 min

Peak Storage= 3 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.29' , Surface Width= 0.90'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 6.73 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 14.0' Slope= 0.0357 '/'
Inlet Invert= 34.00', Outlet Invert= 33.50'



Summary for Reach AP1: Analysis Point 1

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

Inflow Area = 15.100 ac, 50.47% Impervious, Inflow Depth = 3.38" for 10-Year Storm event
Inflow = 26.59 cfs @ 12.23 hrs, Volume= 4.251 af
Outflow = 26.59 cfs @ 12.23 hrs, Volume= 4.251 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP2: Analysis Point 2

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

Inflow Area = 0.277 ac, 72.53% Impervious, Inflow Depth = 4.62" for 10-Year Storm event
Inflow = 1.21 cfs @ 12.15 hrs, Volume= 0.107 af
Outflow = 1.21 cfs @ 12.15 hrs, Volume= 0.107 af, Atten= 0%, Lag= 0.0 min
Routed to Reach 9R : 12" HDPEP-114

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP4: Analysis Point 4

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

Inflow Area = 0.107 ac, 58.90% Impervious, Inflow Depth = 4.29" for 10-Year Storm event
Inflow = 0.51 cfs @ 12.09 hrs, Volume= 0.038 af
Outflow = 0.51 cfs @ 12.09 hrs, Volume= 0.038 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP5: Analysis Point 5

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

Inflow Area = 0.010 ac, 0.00% Impervious, Inflow Depth = 2.89" for 10-Year Storm event
Inflow = 0.03 cfs @ 12.09 hrs, Volume= 0.002 af
Outflow = 0.03 cfs @ 12.09 hrs, Volume= 0.002 af, Atten= 0%, Lag= 0.0 min
Routed to Reach 2Rb : Channel through 1S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP6: Analysis Point 6

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

Inflow Area = 0.186 ac, 55.43% Impervious, Inflow Depth = 4.18" for 10-Year Storm event
Inflow = 0.73 cfs @ 12.16 hrs, Volume= 0.065 af
Outflow = 0.73 cfs @ 12.16 hrs, Volume= 0.065 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3

Summary for Pond 1P: Porous Pavement Section #1

Inflow Area = 1.918 ac, 80.82% Impervious, Inflow Depth = 4.84" for 10-Year Storm event
Inflow = 2.32 cfs @ 13.88 hrs, Volume= 0.773 af
Outflow = 1.48 cfs @ 14.93 hrs, Volume= 0.773 af, Atten= 36%, Lag= 63.1 min
Discarded = 1.48 cfs @ 14.93 hrs, Volume= 0.773 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach 2Rb : Channel through 1S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 33.57' @ 14.93 hrs Surf.Area= 22,647 sf Storage= 6,378 cf

Plug-Flow detention time= 38.6 min calculated for 0.773 af (100% of inflow)
Center-of-Mass det. time= 38.6 min (941.3 - 902.7)

Volume	Invert	Avail.Storage	Storage Description
#1	32.82'	13,871 cf	**Custom Stage Data - Unlined Section (Prismatic)** Listed below (Recalc)
#2	32.82'	2,683 cf	**Custom Stage Data - Lined Section (Prismatic)** Listed below (Recalc) -Imper
		16,554 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
32.82	22,647	0.0	0	0
32.83	22,647	15.0	34	34
33.07	22,647	15.0	815	849
33.08	22,647	40.0	91	940
33.74	22,647	40.0	5,979	6,919
33.75	22,647	15.0	34	6,953
33.99	22,647	15.0	815	7,768
34.00	22,647	5.0	11	7,779
34.99	22,647	5.0	1,121	8,900
35.00	22,647	30.0	68	8,968
35.49	22,647	30.0	3,329	12,297
35.50	22,647	15.0	34	12,331
35.82	22,647	15.0	1,087	13,418
35.83	22,647	100.0	226	13,645
35.84	22,647	100.0	226	13,871

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
32.82	4,380	0.0	0	0
32.83	4,380	15.0	7	7
33.07	4,380	15.0	158	164
33.08	4,380	40.0	18	182
33.74	4,380	40.0	1,156	1,338
33.75	4,380	15.0	7	1,345
33.99	4,380	15.0	158	1,502
34.00	4,380	5.0	2	1,505
34.99	4,380	5.0	217	1,721
35.00	4,380	30.0	13	1,734
35.49	4,380	30.0	644	2,378
35.50	4,380	15.0	7	2,385
35.82	4,380	15.0	210	2,595
35.83	4,380	100.0	44	2,639
35.84	4,380	100.0	44	2,683

Device	Routing	Invert	Outlet Devices
#1	Primary	35.83'	**100.0' long x 50.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60

Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#2 Discarded 32.82' **1.000 in/hr Exfiltration over Surface area**
Conductivity to Groundwater Elevation = 32.41' Phase-In= 0.01'

Discarded OutFlow Max=1.48 cfs @ 14.93 hrs HW=33.57' (Free Discharge)
↑—**2=Exfiltration** (Controls 1.48 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=32.82' TW=20.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 2P: Porous Concrete Walkway

Inflow Area = 0.109 ac, 21.83% Impervious, Inflow Depth = 3.37" for 10-Year Storm event
Inflow = 0.10 cfs @ 13.91 hrs, Volume= 0.031 af
Outflow = 0.08 cfs @ 14.65 hrs, Volume= 0.031 af, Atten= 20%, Lag= 44.4 min
Discarded = 0.08 cfs @ 14.65 hrs, Volume= 0.031 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach 7R : Existing Wet Channel

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 32.01' @ 14.65 hrs Surf.Area= 1,040 sf Storage= 151 cf

Plug-Flow detention time= 17.0 min calculated for 0.031 af (100% of inflow)
Center-of-Mass det. time= 17.0 min (964.1 - 947.1)

Volume	Invert	Avail.Storage	Storage Description
#1	31.49'	637 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
31.49	1,040	0.0	0	0
31.50	1,040	15.0	2	2
31.74	1,040	15.0	37	39
31.75	1,040	40.0	4	43
32.41	1,040	40.0	275	318
32.42	1,040	15.0	2	319
32.66	1,040	15.0	37	357
32.67	1,040	5.0	1	357
33.66	1,040	5.0	51	409
33.67	1,040	30.0	3	412
34.16	1,040	30.0	153	565
34.17	1,040	15.0	2	566
34.49	1,040	15.0	50	616
34.50	1,040	100.0	10	627
34.51	1,040	100.0	10	637

Device	Routing	Invert	Outlet Devices
#1	Primary	34.50'	**100.0' long x 50.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#2	Discarded	31.49'	**1.000 in/hr Exfiltration over Surface area**

Conductivity to Groundwater Elevation = 31.25' Phase-In= 0.01'

Discarded OutFlow Max=0.08 cfs @ 14.65 hrs HW=32.01' (Free Discharge)
↑—**2=Exfiltration** (Controls 0.08 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=31.49' TW=30.80' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond 3P: Filtration Drip Edge #1

Inflow Area = 0.064 ac, 98.34% Impervious, Inflow Depth = 5.41" for 10-Year Storm event
Inflow = 0.34 cfs @ 12.09 hrs, Volume= 0.029 af
Outflow = 0.27 cfs @ 12.16 hrs, Volume= 0.029 af, Atten= 23%, Lag= 4.2 min
Primary = 0.27 cfs @ 12.16 hrs, Volume= 0.029 af
Routed to Reach 3R : 15" HDPE P-111

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 35.82' @ 12.16 hrs Surf.Area= 0.010 ac Storage= 0.002 af

Plug-Flow detention time= 12.7 min calculated for 0.029 af (100% of inflow)
Center-of-Mass det. time= 13.0 min (759.1 - 746.1)

Volume	Invert	Avail.Storage	Storage Description
#1	37.75'	0.001 af	**3.25'W x 131.00'L x 0.25'H Prismatoid** 0.002 af Overall x 40.0% Voids
#2	36.25'	0.001 af	**3.25'W x 131.00'L x 1.50'H Prismatoid** 0.015 af Overall x 5.0% Voids
#3	36.00'	0.000 af	**3.25'W x 131.00'L x 0.25'H Prismatoid** 0.002 af Overall x 15.0% Voids
#4	35.25'	0.003 af	**3.25'W x 131.00'L x 0.75'H Prismatoid** 0.007 af Overall x 40.0% Voids
		0.005 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#0	Primary	38.00'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	35.25'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.26 cfs @ 12.16 hrs HW=35.81' TW=35.20' (Dynamic Tailwater)
↑—**1=Orifice/Grate** (Orifice Controls 0.26 cfs @ 3.03 fps)

Summary for Pond 4P: Filtration Drip Edge #2

Inflow Area = 0.051 ac, 98.60% Impervious, Inflow Depth = 5.41" for 10-Year Storm event
Inflow = 0.27 cfs @ 12.09 hrs, Volume= 0.023 af
Outflow = 0.14 cfs @ 12.06 hrs, Volume= 0.023 af, Atten= 48%, Lag= 0.0 min
Primary = 0.14 cfs @ 12.06 hrs, Volume= 0.023 af
Routed to Pond 17P : Pocket Pond
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond AP3 : Existing Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3

Peak Elev= 35.99' @ 13.06 hrs Surf.Area= 0.017 ac Storage= 0.003 af

Plug-Flow detention time= 50.6 min calculated for 0.023 af (100% of inflow)
Center-of-Mass det. time= 50.0 min (796.0 - 746.1)

Volume	Invert	Avail.Storage	Storage Description
#1	37.50'	0.001 af	**3.75'W x 101.00'L x 0.25'H Prismatoid**
			0.002 af Overall x 40.0% Voids
#2	36.00'	0.001 af	**3.75'W x 101.00'L x 1.50'H Prismatoid**
			0.013 af Overall x 5.0% Voids
#3	35.75'	0.000 af	**3.75'W x 101.00'L x 0.25'H Prismatoid**
			0.002 af Overall x 15.0% Voids
#4	35.00'	0.003 af	**3.75'W x 101.00'L x 0.75'H Prismatoid**
			0.007 af Overall x 40.0% Voids
		0.004 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#0	Secondary	37.75'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	35.00'	**4.0" Round Culvert**
			L= 75.0' CPP, projecting, no headwall, Ke= 0.900
			Inlet / Outlet Invert= 35.00' / 34.00' S= 0.0133 '/' Cc= 0.900
			n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf
#2	Device 1	35.00'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.13 cfs @ 12.06 hrs HW=35.44' TW=35.01' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 0.13 cfs @ 1.52 fps)
↑—**2=Orifice/Grate** (Passes 0.13 cfs of 0.22 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=35.00' TW=27.00' (Dynamic Tailwater)

Summary for Pond 5P: Filtration Drip Edge #3

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=1)

Inflow Area = 0.044 ac, 85.80% Impervious, Inflow Depth = 5.41" for 10-Year Storm event
Inflow = 0.24 cfs @ 12.09 hrs, Volume= 0.020 af
Outflow = 0.20 cfs @ 12.13 hrs, Volume= 0.020 af, Atten= 17%, Lag= 2.4 min
Primary = 0.20 cfs @ 12.13 hrs, Volume= 0.020 af
Routed to Pond 17P : Pocket Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 35.98' @ 13.13 hrs Surf.Area= 0.025 ac Storage= 0.003 af

Plug-Flow detention time= 86.9 min calculated for 0.020 af (100% of inflow)
Center-of-Mass det. time= 87.3 min (833.3 - 746.1)

Volume	Invert	Avail.Storage	Storage Description
#1	36.75'	0.001 af	**3.00'W x 120.00'L x 0.25'H Prismatoid**
			0.002 af Overall x 40.0% Voids
#2	35.25'	0.001 af	**3.00'W x 120.00'L x 1.50'H Prismatoid**
			0.012 af Overall x 5.0% Voids
#3	35.00'	0.000 af	**3.00'W x 120.00'L x 0.25'H Prismatoid**
			0.002 af Overall x 15.0% Voids
#4	34.25'	0.002 af	**3.00'W x 120.00'L x 0.75'H Prismatoid**
			0.006 af Overall x 40.0% Voids
		0.004 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#0	Primary	37.00'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	34.25'	**4.0" Round Culvert**
			L= 30.0' CPP, projecting, no headwall, Ke= 0.900
			Inlet / Outlet Invert= 34.25' / 34.00' S= 0.0083 '/' Cc= 0.900
			n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf
#2	Device 1	34.25'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.19 cfs @ 12.13 hrs HW=35.70' TW=35.26' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 0.19 cfs @ 2.17 fps)
↑—**2=Orifice/Grate** (Passes 0.19 cfs of 0.28 cfs potential flow)

Summary for Pond 6P: Filtration Drip Edge #4

Inflow Area = 0.033 ac, 86.08% Impervious, Inflow Depth = 5.41" for 10-Year Storm event
Inflow = 0.18 cfs @ 12.09 hrs, Volume= 0.015 af
Outflow = 0.16 cfs @ 12.13 hrs, Volume= 0.015 af, Atten= 11%, Lag= 2.6 min
Primary = 0.16 cfs @ 12.13 hrs, Volume= 0.015 af
Routed to Reach 2Ra : Channel through 1S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 33.64' @ 12.13 hrs Surf.Area= 0.005 ac Storage= 0.001 af

Plug-Flow detention time= 8.9 min calculated for 0.015 af (100% of inflow)
Center-of-Mass det. time= 9.2 min (755.2 - 746.1)

Volume	Invert	Avail.Storage	Storage Description
#1	35.75'	0.000 af	**2.75'W x 72.00'L x 0.25'H Prismatoid**
			0.001 af Overall x 40.0% Voids
#2	34.25'	0.000 af	**2.75'W x 72.00'L x 1.50'H Prismatoid**
			0.007 af Overall x 5.0% Voids
#3	34.00'	0.000 af	**2.75'W x 72.00'L x 0.25'H Prismatoid**
			0.001 af Overall x 15.0% Voids
#4	33.25'	0.001 af	**2.75'W x 72.00'L x 0.75'H Prismatoid**
			0.003 af Overall x 40.0% Voids
		0.002 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#0	Primary	36.00'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	33.25'	**4.0" Round Culvert** L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 33.25' / 33.00' S= 0.0167 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf
#2	Device 1	33.25'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.15 cfs @ 12.13 hrs HW=33.63' TW=24.69' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 0.15 cfs @ 1.76 fps)
↑—**2=Orifice/Grate** (Passes 0.15 cfs of 0.19 cfs potential flow)

Summary for Pond 7P: Filtration Drip Edge #5

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=93)

Inflow Area = 0.025 ac,100.00% Impervious, Inflow Depth = 5.41" for 10-Year Storm event
Inflow = 0.14 cfs @ 12.09 hrs, Volume= 0.011 af
Outflow = 0.14 cfs @ 12.09 hrs, Volume= 0.010 af, Atten= 1%, Lag= 0.4 min
Primary = 0.14 cfs @ 12.09 hrs, Volume= 0.010 af
Routed to Reach 2Ra : Channel through 1S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 24.84' @ 12.11 hrs Surf.Area= 0.012 ac Storage= 0.002 af

Plug-Flow detention time= 108.4 min calculated for 0.010 af (88% of inflow)
Center-of-Mass det. time= 52.6 min (798.6 - 746.1)

Volume	Invert	Avail.Storage	Storage Description
#1	25.75'	0.000 af	**3.50'W x 48.00'L x 0.25'H Prismatoid** 0.001 af Overall x 40.0% Voids
#2	23.75'	0.000 af	**3.50'W x 48.00'L x 2.00'H Prismatoid** 0.008 af Overall x 5.0% Voids
#3	23.50'	0.000 af	**3.50'W x 48.00'L x 0.25'H Prismatoid** 0.001 af Overall x 15.0% Voids
#4	22.75'	0.001 af	**3.50'W x 48.00'L x 0.75'H Prismatoid** 0.003 af Overall x 40.0% Voids
		0.002 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#0	Primary	26.00'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	22.75'	**4.0" Round Culvert** L= 8.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 22.75' / 22.50' S= 0.0313 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf
#2	Device 1	22.75'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.13 cfs @ 12.09 hrs HW=24.82' TW=24.66' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 0.13 cfs @ 1.53 fps)
↑—**2=Orifice/Grate** (Passes 0.13 cfs of 0.17 cfs potential flow)

Summary for Pond 8P: Filtration Drip Edge #6

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=77)

Inflow Area = 0.025 ac,100.00% Impervious, Inflow Depth = 5.41" for 10-Year Storm event
Inflow = 0.14 cfs @ 12.09 hrs, Volume= 0.011 af
Outflow = 0.14 cfs @ 12.09 hrs, Volume= 0.010 af, Atten= 1%, Lag= 0.4 min
Primary = 0.14 cfs @ 12.09 hrs, Volume= 0.010 af
Routed to Reach 2Ra : Channel through 1S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 24.84' @ 12.11 hrs Surf.Area= 0.012 ac Storage= 0.002 af

Plug-Flow detention time= 112.0 min calculated for 0.010 af (88% of inflow)
Center-of-Mass det. time= 54.7 min (800.7 - 746.1)

Volume	Invert	Avail.Storage	Storage Description
#1	25.35'	0.000 af	**3.50'W x 48.00'L x 0.25'H Prismatoid** 0.001 af Overall x 40.0% Voids
#2	23.35'	0.000 af	**3.50'W x 48.00'L x 2.00'H Prismatoid** 0.008 af Overall x 5.0% Voids
#3	23.10'	0.000 af	**3.50'W x 48.00'L x 0.25'H Prismatoid** 0.001 af Overall x 15.0% Voids
#4	22.35'	0.001 af	**3.50'W x 48.00'L x 0.75'H Prismatoid** 0.003 af Overall x 40.0% Voids
		0.002 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#0	Primary	25.60'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	22.35'	**4.0" Round Culvert** L= 18.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 22.35' / 22.20' S= 0.0083 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf
#2	Device 1	22.35'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.13 cfs @ 12.09 hrs HW=24.82' TW=24.66' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 0.13 cfs @ 1.53 fps)
↑—**2=Orifice/Grate** (Passes 0.13 cfs of 0.17 cfs potential flow)

Summary for Pond 9P: Filtration Drip Edge #7

Inflow Area = 0.025 ac,100.00% Impervious, Inflow Depth = 5.41" for 10-Year Storm event
Inflow = 0.14 cfs @ 12.09 hrs, Volume= 0.011 af
Outflow = 0.13 cfs @ 12.12 hrs, Volume= 0.011 af, Atten= 6%, Lag= 1.9 min
Primary = 0.13 cfs @ 12.12 hrs, Volume= 0.011 af
Routed to Reach 2Rb : Channel through 1S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 23.31' @ 12.12 hrs Surf.Area= 0.004 ac Storage= 0.000 af

Plug-Flow detention time= 8.5 min calculated for 0.011 af (100% of inflow)

Center-of-Mass det. time= 8.7 min (754.8 - 746.1)

Volume	Invert	Avail.Storage	Storage Description
#1	26.00'	0.000 af	**3.50'W x 48.00'L x 0.25'H Prismatoid** 0.001 af Overall x 40.0% Voids
#2	24.00'	0.000 af	**3.50'W x 48.00'L x 2.00'H Prismatoid** 0.008 af Overall x 5.0% Voids
#3	23.75'	0.000 af	**3.50'W x 48.00'L x 0.25'H Prismatoid** 0.001 af Overall x 15.0% Voids
#4	23.00'	0.001 af	**3.50'W x 48.00'L x 0.75'H Prismatoid** 0.003 af Overall x 40.0% Voids
		0.002 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#0	Primary	26.25'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	23.00'	**4.0" Round Culvert** L= 6.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 23.00' / 22.75' S= 0.0417 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf
#2	Device 1	23.00'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.13 cfs @ 12.12 hrs HW=23.31' TW=20.20' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 0.13 cfs @ 1.49 fps)
↑—**2=Orifice/Grate** (Passes 0.13 cfs of 0.16 cfs potential flow)

Summary for Pond 10P: Filtration Drip Edge #8

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=7)

Inflow Area = 0.025 ac, 98.08% Impervious, Inflow Depth = 5.41" for 10-Year Storm event
Inflow = 0.14 cfs @ 12.09 hrs, Volume= 0.011 af
Outflow = 0.12 cfs @ 12.12 hrs, Volume= 0.011 af, Atten= 12%, Lag= 2.0 min
Primary = 0.12 cfs @ 12.12 hrs, Volume= 0.011 af
Routed to Reach 7R : Existing Wet Channel

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 31.10' @ 12.14 hrs Surf.Area= 0.004 ac Storage= 0.001 af

Plug-Flow detention time= 56.3 min calculated for 0.011 af (96% of inflow)
Center-of-Mass det. time= 30.5 min (776.6 - 746.1)

Volume	Invert	Avail.Storage	Storage Description
#1	33.00'	0.000 af	**3.50'W x 50.00'L x 0.25'H Prismatoid** 0.001 af Overall x 40.0% Voids
#2	31.50'	0.000 af	**3.50'W x 50.00'L x 1.50'H Prismatoid** 0.006 af Overall x 5.0% Voids
#3	31.25'	0.000 af	**3.50'W x 50.00'L x 0.25'H Prismatoid** 0.001 af Overall x 15.0% Voids
#4	30.50'	0.001 af	**3.50'W x 50.00'L x 0.75'H Prismatoid** 0.003 af Overall x 40.0% Voids
		0.002 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#0	Primary	33.25'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	30.50'	**4.0" Round Culvert** L= 5.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 30.50' / 30.40' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf
#2	Device 1	30.50'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.12 cfs @ 12.12 hrs HW=31.10' TW=30.97' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 0.12 cfs @ 1.34 fps)
↑—**2=Orifice/Grate** (Passes 0.12 cfs of 0.15 cfs potential flow)

Summary for Pond 11P: Filtration Drip Edge #9

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=3)

Inflow Area = 0.038 ac, 98.72% Impervious, Inflow Depth = 9.01" for 10-Year Storm event
Inflow = 0.33 cfs @ 12.10 hrs, Volume= 0.028 af
Outflow = 0.32 cfs @ 12.12 hrs, Volume= 0.027 af, Atten= 3%, Lag= 1.1 min
Primary = 0.32 cfs @ 12.12 hrs, Volume= 0.027 af
Routed to Reach 7R : Existing Wet Channel

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 31.89' @ 12.12 hrs Surf.Area= 0.018 ac Storage= 0.002 af

Plug-Flow detention time= 56.8 min calculated for 0.027 af (95% of inflow)
Center-of-Mass det. time= 28.2 min (777.9 - 749.7)

Volume	Invert	Avail.Storage	Storage Description
#1	32.75'	0.001 af	**3.50'W x 74.00'L x 0.25'H Prismatoid** 0.001 af Overall x 40.0% Voids
#2	31.25'	0.000 af	**3.50'W x 74.00'L x 1.50'H Prismatoid** 0.009 af Overall x 5.0% Voids
#3	31.00'	0.000 af	**3.50'W x 74.00'L x 0.25'H Prismatoid** 0.001 af Overall x 15.0% Voids
#4	30.25'	0.002 af	**3.50'W x 74.00'L x 0.75'H Prismatoid** 0.004 af Overall x 40.0% Voids
		0.003 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#0	Primary	33.00'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	30.25'	**4.0" Round Culvert** L= 8.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 30.25' / 30.00' S= 0.0313 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf
#2	Device 1	30.25'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.31 cfs @ 12.12 hrs HW=31.85' TW=30.97' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 0.31 cfs @ 3.56 fps)
↑—**2=Orifice/Grate** (Passes 0.31 cfs of 0.39 cfs potential flow)

Summary for Pond 12P: Filtration Drip Edge #10

Inflow Area = 0.025 ac, 98.08% Impervious, Inflow Depth = 5.41" for 10-Year Storm event
Inflow = 0.14 cfs @ 12.09 hrs, Volume= 0.011 af
Outflow = 0.13 cfs @ 12.12 hrs, Volume= 0.011 af, Atten= 7%, Lag= 1.9 min
Secondary = 0.13 cfs @ 12.12 hrs, Volume= 0.011 af
Routed to Pond 11P : Filtration Drip Edge #9

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 33.56' @ 12.12 hrs Surf.Area= 0.004 ac Storage= 0.000 af

Plug-Flow detention time= 8.9 min calculated for 0.011 af (100% of inflow)
Center-of-Mass det. time= 9.1 min (755.2 - 746.1)

Volume	Invert	Avail.Storage	Storage Description
#1	35.75'	0.000 af	**3.50'W x 50.00'L x 0.25'H Prismatoid** 0.001 af Overall x 40.0% Voids
#2	34.25'	0.000 af	**3.50'W x 50.00'L x 1.50'H Prismatoid** 0.006 af Overall x 5.0% Voids
#3	34.00'	0.000 af	**3.50'W x 50.00'L x 0.25'H Prismatoid** 0.001 af Overall x 15.0% Voids
#4	33.25'	0.001 af	**3.50'W x 50.00'L x 0.75'H Prismatoid** 0.003 af Overall x 40.0% Voids
		0.002 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#0	Secondary	36.00'	**Automatic Storage Overflow** (Discharged without head)
#1	Secondary	33.25'	**4.0" Round Culvert** L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 33.25' / 31.25' S= 0.1333 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf
#2	Device 1	33.25'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Secondary OutFlow Max=0.12 cfs @ 12.12 hrs HW=33.55' TW=31.84' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 0.12 cfs @ 1.48 fps)
↑**2=Orifice/Grate** (Passes 0.12 cfs of 0.16 cfs potential flow)

Summary for Pond 13P: Infiltration Drip Edge #11

Inflow Area = 0.063 ac,100.00% Impervious, Inflow Depth = 5.41" for 10-Year Storm event
Inflow = 0.34 cfs @ 12.09 hrs, Volume= 0.028 af
Outflow = 0.03 cfs @ 13.20 hrs, Volume= 0.028 af, Atten= 93%, Lag= 66.7 min
Discarded = 0.03 cfs @ 13.20 hrs, Volume= 0.028 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 2P : Porous Concrete Walkway

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 37.35' @ 13.20 hrs Surf.Area= 0.015 ac Storage= 0.012 af

Plug-Flow detention time= 201.4 min calculated for 0.028 af (100% of inflow)
Center-of-Mass det. time= 201.2 min (947.2 - 746.1)

Volume	Invert	Avail.Storage	Storage Description
#1	35.25'	0.013 af	**5.50'W x 116.00'L x 2.25'H Prismatoid** 0.033 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#0	Secondary	37.50'	**Automatic Storage Overflow** (Discharged without head)
#1	Discarded	35.25'	**1.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 32.25' Phase-In= 0.10'

Discarded OutFlow Max=0.03 cfs @ 13.20 hrs HW=37.35' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.03 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=35.25' TW=31.49' (Dynamic Tailwater)

Summary for Pond 14P: Focal Point #1

[90] Warning: Qout>Qin may require smaller dt or Finer Routing
[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=5)

Inflow Area = 0.226 ac, 94.21% Impervious, Inflow Depth = 5.30" for 10-Year Storm event
Inflow = 1.22 cfs @ 12.09 hrs, Volume= 0.100 af
Outflow = 1.22 cfs @ 12.09 hrs, Volume= 0.100 af, Atten= 0%, Lag= 0.2 min
Primary = 1.22 cfs @ 12.09 hrs, Volume= 0.100 af
Routed to Pond 18P : Underground Detention

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 37.91' @ 12.09 hrs Surf.Area= 120 sf Storage= 42 cf

Plug-Flow detention time= 0.8 min calculated for 0.100 af (100% of inflow)
Center-of-Mass det. time= 0.8 min (754.1 - 753.3)

Volume	Invert	Avail.Storage	Storage Description
#1	35.25'	18 cf	**4.00'W x 10.00'L x 2.25'H Focal Point** 90 cf Overall x 20.0% Voids
#2	37.50'	58 cf	**Surface Bowl (Prismatic)**Listed below (Recalc)
		76 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
37.50	40	0	0
38.00	89	32	32
38.25	119	26	58

Device	Routing	Invert	Outlet Devices
#1	Primary	34.50'	**12.0" Round Culvert** L= 113.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 34.50' / 33.60' S= 0.0080 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	35.25'	**100.000 in/hr Exfiltration over Surface area** Phase-In= 0.10'
#3	Device 1	37.75'	**18.0" Horiz. Orifice/Grate** C= 0.600

Limited to weir flow at low heads

Primary OutFlow Max=1.19 cfs @ 12.09 hrs HW=37.90' TW=33.82' (Dynamic Tailwater)
└─**1=Culvert** (Passes 1.19 cfs of 5.09 cfs potential flow)
  ├─**2=Exfiltration** (Exfiltration Controls 0.28 cfs)
  └─**3=Orifice/Grate** (Weir Controls 0.92 cfs @ 1.28 fps)

Summary for Pond 15P: Jellyfish #1

Inflow Area = 0.330 ac, 97.80% Impervious, Inflow Depth = 5.30" for 10-Year Storm event
Inflow = 1.77 cfs @ 12.09 hrs, Volume= 0.146 af
Outflow = 1.77 cfs @ 12.09 hrs, Volume= 0.146 af, Atten= 0%, Lag= 0.0 min
Primary = 1.77 cfs @ 12.09 hrs, Volume= 0.146 af
Routed to Pond 18P : Underground Detention

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 34.66' @ 12.50 hrs
Flood Elev= 36.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	33.15'	**15.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 33.15' / 32.80' S= 0.0175 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=1.77 cfs @ 12.09 hrs HW=34.04' TW=33.80' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 1.77 cfs @ 2.64 fps)

Summary for Pond 16P: Jellyfish #2

Inflow Area = 0.224 ac, 95.92% Impervious, Inflow Depth = 5.30" for 10-Year Storm event
Inflow = 1.20 cfs @ 12.09 hrs, Volume= 0.099 af
Outflow = 1.20 cfs @ 12.09 hrs, Volume= 0.099 af, Atten= 0%, Lag= 0.0 min
Primary = 1.20 cfs @ 12.09 hrs, Volume= 0.099 af
Routed to Pond DMH1 : Drain Manhole 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 34.66' @ 12.50 hrs
Flood Elev= 36.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	33.25'	**15.0" Round Culvert** L= 12.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 33.25' / 33.10' S= 0.0125 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=1.20 cfs @ 12.09 hrs HW=34.05' TW=33.91' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 1.20 cfs @ 1.44 fps)

Summary for Pond 17P: Pocket Pond

Inflow Area = 0.116 ac, 75.26% Impervious, Inflow Depth = 4.94" for 10-Year Storm event
Inflow = 0.40 cfs @ 12.12 hrs, Volume= 0.048 af
Outflow = 0.05 cfs @ 13.16 hrs, Volume= 0.048 af, Atten= 89%, Lag= 62.5 min
Primary = 0.05 cfs @ 13.16 hrs, Volume= 0.048 af
Routed to Pond AP3 : Existing Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 35.98' @ 13.16 hrs Surf.Area= 509 sf Storage= 653 cf

Plug-Flow detention time= 130.7 min calculated for 0.048 af (100% of inflow)
Center-of-Mass det. time= 130.7 min (946.0 - 815.3)

Volume	Invert	Avail.Storage	Storage Description
#1	33.00'	953 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
33.00	20	24.0	0	0	20
34.00	127	46.0	66	66	147
36.00	514	83.0	598	663	549
36.50	646	93.0	289	953	695

Device	Routing	Invert	Outlet Devices
#1	Primary	33.00'	**12.0" Round Culvert** L= 16.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 33.00' / 32.50' S= 0.0313 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	33.00'	**1.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	36.00'	**6.0' long + 3.0 '/' SideZ x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.05 cfs @ 13.16 hrs HW=35.98' TW=28.17' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.05 cfs of 4.70 cfs potential flow)
└─**2=Orifice/Grate** (Orifice Controls 0.05 cfs @ 8.31 fps)
└─**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 18P: Underground Detention

Inflow Area = 0.781 ac, 96.22% Impervious, Inflow Depth = 5.30" for 10-Year Storm event
Inflow = 4.20 cfs @ 12.09 hrs, Volume= 0.344 af
Outflow = 0.88 cfs @ 12.51 hrs, Volume= 0.344 af, Atten= 79%, Lag= 25.2 min
Primary = 0.88 cfs @ 12.51 hrs, Volume= 0.344 af
Routed to Reach 2Ra : Channel through 1S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3

Peak Elev= 34.66' @ 12.51 hrs Surf.Area= 2,688 sf Storage= 6,973 cf

Plug-Flow detention time= 250.0 min calculated for 0.344 af (100% of inflow)
Center-of-Mass det. time= 250.7 min (1,004.2 - 753.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	31.75'	0 cf	**24.00'W x 112.00'L x 4.67'H Field A** 12,553 cf Overall - 12,553 cf Embedded = 0 cf x 40.0% Voids
#2A	31.75'	9,600 cf	**Shea Leaching Chamber 8x14x4.7**x 24 Inside #1 Inside= 84.0"W x 48.0"H => 30.77 sf x 13.00'L = 400.0 cf Outside= 96.0"W x 56.0"H => 37.36 sf x 14.00'L = 523.0 cf 24 Chambers in 3 Rows
		9,600 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	31.75'	**15.0" Round Culvert** L= 13.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 31.75' / 31.60' S= 0.0115 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Device 1	31.75'	**2.5" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 2	31.75'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	34.00'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 1	35.35'	**4.0' long x 0.40' rise Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=0.88 cfs @ 12.51 hrs HW=34.65' TW=24.81' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.88 cfs of 7.04 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 0.27 cfs @ 8.06 fps)
    - **3=Orifice/Grate** (Passes 0.27 cfs of 0.70 cfs potential flow)
  - **4=Orifice/Grate** (Orifice Controls 0.60 cfs @ 3.06 fps)
  - **5=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond AP3: Existing Pond

15" CMP culvert inlet is buried. Contractor to uncover culvert inlet and replace with 18" HDPE.

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[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=7)

Inflow Area = 6.784 ac, 52.81% Impervious, Inflow Depth = 4.09" for 10-Year Storm event
Inflow = 18.85 cfs @ 12.36 hrs, Volume= 2.313 af
Outflow = 13.32 cfs @ 12.60 hrs, Volume= 2.313 af, Atten= 29%, Lag= 14.5 min
Primary = 13.32 cfs @ 12.60 hrs, Volume= 2.313 af
Routed to Reach 2RA : Channel through 1S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 31.61' @ 12.60 hrs Surf.Area= 6,072 sf Storage= 8,160 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 3.0 min (824.3 - 821.3)

Volume	Invert	Avail.Storage	Storage Description
#1	27.00'	104,428 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
27.00	20	5.7	0	0	20
28.00	37	24.0	28	28	66
30.00	2,236	218.0	1,707	1,735	3,810
32.00	7,294	444.0	9,046	10,781	15,734
34.00	19,719	933.0	26,004	36,785	69,335
35.50	43,192	1,107.0	46,047	82,832	97,623
36.00	43,192	1,107.0	21,596	104,428	98,177

Device	Routing	Invert	Outlet Devices
#1	Primary	27.00'	**18.0" Round Culvert** L= 160.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 27.00' / 26.20' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=13.32 cfs @ 12.60 hrs HW=31.61' TW=24.81' (Dynamic Tailwater)
1=Culvert (Barrel Controls 13.32 cfs @ 7.54 fps)

Summary for Pond DMH1: Drain Manhole 1

Inflow Area = 0.224 ac, 95.92% Impervious, Inflow Depth = 5.30" for 10-Year Storm event
Inflow = 1.20 cfs @ 12.09 hrs, Volume= 0.099 af
Outflow = 1.20 cfs @ 12.09 hrs, Volume= 0.099 af, Atten= 0%, Lag= 0.0 min
Primary = 1.20 cfs @ 12.09 hrs, Volume= 0.099 af
Routed to Pond 18P : Underground Detention

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 34.66' @ 12.50 hrs
Flood Elev= 37.20'

Device	Routing	Invert	Outlet Devices
#1	Primary	33.00'	**15.0" Round Culvert** L= 8.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 33.00' / 32.90' S= 0.0125 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=1.20 cfs @ 12.09 hrs HW=33.91' TW=33.80' (Dynamic Tailwater)
1=Culvert (Inlet Controls 1.20 cfs @ 1.26 fps)

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Subcatchment1S Runoff Area=180,817 sf 28.87% Impervious Runoff Depth=4.75"
Flow Length=577' Tc=13.9 min CN=79 Runoff=17.77 cfs 1.643 af

Subcatchment2S: Subcatchment2S Runoff Area=12,083 sf 72.53% Impervious Runoff Depth=6.12"
Flow Length=106' Tc=10.9 min CN=91 Runoff=1.57 cfs 0.141 af

Subcatchment3S: Subcatchment3S Runoff Area=290,437 sf 52.42% Impervious Runoff Depth=5.54"
Flow Length=604' Tc=26.3 min CN=86 Runoff=25.23 cfs 3.078 af

Subcatchment4S: Subcatchment4S Runoff Area=4,647 sf 58.90% Impervious Runoff Depth=5.77"
Tc=6.0 min CN=88 Runoff=0.67 cfs 0.051 af

Subcatchment5S: Subcatchment5S Runoff Area=430 sf 0.00% Impervious Runoff Depth=4.20"
Tc=6.0 min CN=74 Runoff=0.05 cfs 0.003 af

Subcatchment6S: Subcatchment6S Runoff Area=8,122 sf 55.43% Impervious Runoff Depth=5.65"
Flow Length=149' Tc=12.0 min CN=87 Runoff=0.97 cfs 0.088 af

Subcatchment7S: Subcatchment7S Runoff Area=29,318 sf 12.60% Impervious Runoff Depth=4.31"
Flow Length=200' Tc=15.8 min CN=75 Runoff=2.51 cfs 0.242 af

Subcatchment8S: Subcatchment8S Runoff Area=83,551 sf 80.82% Impervious Runoff Depth=6.35"
Tc=144.0 min CN=93 Runoff=3.00 cfs 1.015 af

Subcatchment9S: Subcatchment27S Runoff Area=4,764 sf 21.83% Impervious Runoff Depth=4.75"
Tc=144.0 min CN=79 Runoff=0.13 cfs 0.043 af

Subcatchment10S: Subcatchment10S Runoff Area=951 sf 0.00% Impervious Runoff Depth=4.20"
Tc=6.0 min CN=74 Runoff=0.11 cfs 0.008 af

Subcatchment11S: Subcatchment11S Runoff Area=2,774 sf 98.34% Impervious Runoff Depth=6.94"
Tc=6.0 min CN=98 Runoff=0.44 cfs 0.037 af

Subcatchment12S: Subcatchment12S Runoff Area=2,207 sf 98.60% Impervious Runoff Depth=6.94"
Tc=6.0 min CN=98 Runoff=0.35 cfs 0.029 af

Subcatchment13S: Subcatchment13S Runoff Area=1,902 sf 85.80% Impervious Runoff Depth=6.94"
Tc=6.0 min CN=98 Runoff=0.30 cfs 0.025 af

Subcatchment14S: Subcatchment14S Runoff Area=1,422 sf 86.08% Impervious Runoff Depth=6.94"
Tc=6.0 min CN=98 Runoff=0.22 cfs 0.019 af

Subcatchment15S: Subcatchment15S Runoff Area=1,104 sf 100.00% Impervious Runoff Depth=6.94"
Tc=6.0 min CN=98 Runoff=0.17 cfs 0.015 af

Subcatchment16S: Subcatchment16S Runoff Area=1,104 sf 100.00% Impervious Runoff Depth=6.94"
Tc=6.0 min CN=98 Runoff=0.17 cfs 0.015 af

Subcatchment17S: Subcatchment17S Runoff Area=1,104 sf 100.00% Impervious Runoff Depth=6.94"
Tc=6.0 min CN=98 Runoff=0.17 cfs 0.015 af

Subcatchment18S: Subcatchment18S Runoff Area=1,093 sf 98.08% Impervious Runoff Depth=6.94"
Tc=6.0 min CN=98 Runoff=0.17 cfs 0.015 af

Subcatchment19S: Subcatchment19S Runoff Area=1,645 sf 98.72% Impervious Runoff Depth=6.94"
Tc=6.0 min CN=98 Runoff=0.26 cfs 0.022 af

Subcatchment20S: Subcatchment20S Runoff Area=1,093 sf 98.08% Impervious Runoff Depth=6.94"
Tc=6.0 min CN=98 Runoff=0.17 cfs 0.015 af

Subcatchment21S: Subcatchment21S Runoff Area=2,728 sf 100.00% Impervious Runoff Depth=6.94"
Tc=6.0 min CN=98 Runoff=0.43 cfs 0.036 af

Subcatchment22S: Subcatchment22S Runoff Area=9,860 sf 94.21% Impervious Runoff Depth=6.82"
Tc=6.0 min CN=97 Runoff=1.55 cfs 0.129 af

Subcatchment23S: Subcatchment23S Runoff Area=14,386 sf 97.80% Impervious Runoff Depth=6.82"
Tc=6.0 min CN=97 Runoff=2.26 cfs 0.188 af

Subcatchment24S: Subcatchment24S Runoff Area=9,757 sf 95.92% Impervious Runoff Depth=6.82"
Tc=6.0 min CN=97 Runoff=1.54 cfs 0.127 af

Subcatchment25S: Subcatchment25S Runoff Area=5,889 sf 0.00% Impervious Runoff Depth=4.20"
Flow Length=158' Tc=6.4 min CN=74 Runoff=0.65 cfs 0.047 af

Subcatchment26S: Subcatchment26S Runoff Area=1,141 sf 0.00% Impervious Runoff Depth=4.20"
Tc=6.0 min CN=74 Runoff=0.13 cfs 0.009 af

Reach 2Ra: Channel through 1S Avg. Flow Depth=0.87' Max Vel=4.18 fps Inflow=16.70 cfs 3.770 af
n=0.040 L=136.0' S=0.0294 '/' Capacity=1,586.21 cfs Outflow=16.70 cfs 3.770 af

Reach 2Rb: Channel through 1S Avg. Flow Depth=0.27' Max Vel=3.00 fps Inflow=16.74 cfs 3.788 af
n=0.040 L=153.0' S=0.0392 '/' Capacity=4,170.50 cfs Outflow=16.74 cfs 3.788 af

Reach 2Rc: Channel through 1S Avg. Flow Depth=0.37' Max Vel=2.38 fps Inflow=18.77 cfs 4.172 af
n=0.040 L=303.0' S=0.0165 '/' Capacity=2,705.34 cfs Outflow=18.76 cfs 4.172 af

Reach 3R: 15" HDPE P-111 Avg. Flow Depth=0.57' Max Vel=5.12 fps Inflow=2.82 cfs 0.278 af
15.0" Round Pipe n=0.012 L=86.0' S=0.0087 '/' Capacity=6.54 cfs Outflow=2.82 cfs 0.278 af

Reach 4R: Flow through 1S Avg. Flow Depth=0.39' Max Vel=3.39 fps Inflow=2.82 cfs 0.278 af
n=0.030 L=40.0' S=0.0313 '/' Capacity=23.40 cfs Outflow=2.82 cfs 0.278 af

Reach 5R: 15" HDPE P-112 Avg. Flow Depth=0.53' Max Vel=5.89 fps Inflow=2.89 cfs 0.288 af
15.0" Round Pipe n=0.012 L=12.0' S=0.0125 '/' Capacity=7.82 cfs Outflow=2.89 cfs 0.288 af

Reach 6R: Flow through 1S Avg. Flow Depth=0.39' Max Vel=3.45 fps Inflow=2.89 cfs 0.288 af
n=0.030 L=53.0' S=0.0321 '/' Capacity=23.71 cfs Outflow=2.89 cfs 0.288 af

Reach 7R: Existing Wet Channel Avg. Flow Depth=0.22' Max Vel=3.23 fps Inflow=3.31 cfs 0.337 af
n=0.030 L=65.0' S=0.0554 '/' Capacity=88.27 cfs Outflow=3.31 cfs 0.337 af

Reach 8R: 15" HDPE P-113 Avg. Flow Depth=0.37' Max Vel=12.37 fps Inflow=3.72 cfs 0.384 af
15.0" Round Pipe n=0.012 L=40.0' S=0.0800 '/' Capacity=19.79 cfs Outflow=3.72 cfs 0.384 af

Reach 9R: 12" HDPEP-114 Avg. Flow Depth=0.33' Max Vel=6.99 fps Inflow=1.57 cfs 0.141 af
12.0" Round Pipe n=0.013 L=14.0' S=0.0357 '/' Capacity=6.73 cfs Outflow=1.57 cfs 0.141 af

Reach AP1: Analysis Point 1 Inflow=35.45 cfs 5.815 af
Outflow=35.45 cfs 5.815 af

Reach AP2: Analysis Point 2 Inflow=1.57 cfs 0.141 af
Outflow=1.57 cfs 0.141 af

Reach AP4: Analysis Point 4 Inflow=0.67 cfs 0.051 af
Outflow=0.67 cfs 0.051 af

Reach AP5: Analysis Point 5 Inflow=0.05 cfs 0.003 af
Outflow=0.05 cfs 0.003 af

Reach AP6: Analysis Point 6 Inflow=0.97 cfs 0.088 af
Outflow=0.97 cfs 0.088 af

Pond 1P: Porous Pavement Section #1 Peak Elev=33.97' Storage=9,206 cf Inflow=3.00 cfs 1.015 af
Discarded=2.00 cfs 1.015 af Primary=0.00 cfs 0.000 af Outflow=2.00 cfs 1.015 af

Pond 2P: Porous Concrete Walkway Peak Elev=32.34' Storage=290 cf Inflow=0.20 cfs 0.047 af
Discarded=0.11 cfs 0.047 af Primary=0.00 cfs 0.000 af Outflow=0.11 cfs 0.047 af

Pond 3P: Filtration Drip Edge #1 Peak Elev=36.02' Storage=0.003 af Inflow=0.44 cfs 0.037 af
Outflow=0.33 cfs 0.037 af

Pond 4P: Filtration Drip Edge #2 Peak Elev=37.36' Storage=0.004 af Inflow=0.35 cfs 0.029 af
Primary=0.25 cfs 0.029 af Secondary=0.00 cfs 0.000 af Outflow=0.25 cfs 0.029 af

Pond 5P: Filtration Drip Edge #3 Peak Elev=36.51' Storage=0.003 af Inflow=0.30 cfs 0.025 af
Outflow=0.26 cfs 0.025 af

Pond 6P: Filtration Drip Edge #4 Peak Elev=33.76' Storage=0.001 af Inflow=0.22 cfs 0.019 af
Outflow=0.19 cfs 0.019 af

Pond 7P: Filtration Drip Edge #5 Peak Elev=25.02' Storage=0.002 af Inflow=0.17 cfs 0.015 af
Outflow=0.17 cfs 0.013 af

Pond 8P: Filtration Drip Edge #6 Peak Elev=25.02' Storage=0.002 af Inflow=0.17 cfs 0.015 af
Outflow=0.17 cfs 0.013 af

Pond 9P: Filtration Drip Edge #7 Peak Elev=23.39' Storage=0.001 af Inflow=0.17 cfs 0.015 af
Outflow=0.16 cfs 0.015 af

Pond 10P: Filtration Drip Edge #8 Peak Elev=31.21' Storage=0.001 af Inflow=0.17 cfs 0.015 af
Outflow=0.15 cfs 0.014 af

Pond 11P: Filtration Drip Edge #9 Peak Elev=32.42' Storage=0.002 af Inflow=0.41 cfs 0.036 af
Outflow=0.40 cfs 0.035 af

Pond 12P: Filtration Drip Edge #10 Peak Elev=33.64' Storage=0.001 af Inflow=0.17 cfs 0.015 af
Outflow=0.16 cfs 0.015 af

Pond 13P: Infiltration Drip Edge #11 Peak Elev=37.50' Storage=0.013 af Inflow=0.43 cfs 0.036 af
Discarded=0.03 cfs 0.032 af Secondary=0.17 cfs 0.004 af Outflow=0.20 cfs 0.036 af

Pond 14P: Focal Point #1 Peak Elev=37.94' Storage=45 cf Inflow=1.55 cfs 0.129 af
Outflow=1.55 cfs 0.129 af

Pond 15P: Jellyfish #1 Peak Elev=35.34' Inflow=2.26 cfs 0.188 af
15.0" Round Culvert n=0.012 L=20.0' S=0.0175 '/' Outflow=2.26 cfs 0.188 af

Pond 16P: Jellyfish #2 Peak Elev=35.34' Inflow=1.54 cfs 0.127 af
15.0" Round Culvert n=0.012 L=12.0' S=0.0125 '/' Outflow=1.54 cfs 0.127 af

Pond 17P: Pocket Pond Peak Elev=36.08' Storage=704 cf Inflow=0.58 cfs 0.062 af
Outflow=0.36 cfs 0.062 af

Pond 18P: Underground Detention Peak Elev=35.33' Storage=8,591 cf Inflow=5.35 cfs 0.444 af
Outflow=1.29 cfs 0.443 af

Pond AP3: Existing Pond Peak Elev=32.66' Storage=16,731 cf Inflow=25.54 cfs 3.140 af
18.0" Round Culvert n=0.013 L=160.0' S=0.0050 '/' Outflow=15.02 cfs 3.140 af

Pond DMH1: Drain Manhole 1 Peak Elev=35.34' Inflow=1.54 cfs 0.127 af
15.0" Round Culvert n=0.012 L=8.0' S=0.0125 '/' Outflow=1.54 cfs 0.127 af

Total Runoff Area = 15.480 ac Runoff Volume = 7.053 af Average Runoff Depth = 5.47"
49.13% Pervious = 7.606 ac 50.87% Impervious = 7.874 ac

Summary for Subcatchment 1S: Subcatchment 1S

Runoff = 17.77 cfs @ 12.19 hrs, Volume= 1.643 af, Depth= 4.75"
Routed to Reach AP1 : Analysis Point 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Storm Rainfall=7.18"

Area (sf)	CN	Description
3,301	55	Woods, Good, HSG B
960	98	Paved roads w/curbs & sewers, HSG B
11,268	98	Roofs, HSG C
39,974	98	Paved roads w/curbs & sewers, HSG C
23,873	74	>75% Grass cover, Good, HSG C
80,510	70	Woods, Good, HSG C
20,931	77	Woods, Good, HSG D
180,817	79	Weighted Average
128,615		71.13% Pervious Area
52,202		28.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	39	0.0204	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.70"
2.9	11	0.0294	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.70"
0.4	23	0.0294	0.86		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.1	48	0.0294	5.69	55.51	**Trap/Vee/Rect Channel Flow, Assumed 1.5' flow depth - Channel** Bot.W=2.00' D=1.50' Z= 4.0 & 2.0 '/' Top.W=11.00' n= 0.040 Winding stream, pools & shoals
0.3	153	0.0392	8.51	312.68	**Trap/Vee/Rect Channel Flow, Assumed 1.5' flow depth - Channel** Bot.W=20.00' D=1.50' Z= 4.0 & 2.0 '/' Top.W=29.00' n= 0.040 Winding stream, pools & shoals
0.9	303	0.0165	5.52	202.86	**Trap/Vee/Rect Channel Flow, Assumed 1.5' flow depth - Channel** Bot.W=20.00' D=1.50' Z= 4.0 & 2.0 '/' Top.W=29.00' n= 0.040 Winding stream, pools & shoals
13.9	577	Total			

Summary for Subcatchment 2S: Subcatchment 2S

Runoff = 1.57 cfs @ 12.15 hrs, Volume= 0.141 af, Depth= 6.12"
Routed to Reach AP2 : Analysis Point 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Storm Rainfall=7.18"

Area (sf)	CN	Description
7,339	98	Paved roads w/curbs & sewers, HSG C
1,425	98	Roofs, HSG C
1,971	74	>75% Grass cover, Good, HSG C
1,348	70	Woods, Good, HSG C
12,083	91	Weighted Average
3,319		27.47% Pervious Area
8,764		72.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.2	35	0.0225	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.70"
1.9	15	0.0225	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
0.8	56	0.0274	1.16		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.9	106	Total			

Summary for Subcatchment 3S: Subcatchment 3S

Runoff = 25.23 cfs @ 12.35 hrs, Volume= 3.078 af, Depth= 5.54"
Routed to Pond AP3 : Existing Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Storm Rainfall=7.18"

Area (sf)	CN	Description
125,302	98	Paved roads w/curbs & sewers, HSG C
9,379	98	Roofs, HSG C
14,300	74	>75% Grass cover, Good, HSG C
74,360	70	Woods, Good, HSG C
46,241	83	1/4 acre lots, 38% imp, HSG C
15,690	77	Woods, Good, HSG D
5,165	98	Water Surface, 0% imp, HSG D
290,437	86	Weighted Average
138,184		47.58% Pervious Area
152,253		52.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.5	50	0.0200	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.70"
3.5	119	0.0126	0.56		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.5	74	0.0270	0.82		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.6	107	0.0187	0.68		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
5.7	180	0.0111	0.53		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.5	74	0.0270	0.82		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
26.3	604	Total			

Summary for Subcatchment 4S: Subcatchment 4S

Runoff = 0.67 cfs @ 12.09 hrs, Volume= 0.051 af, Depth= 5.77"
Routed to Reach AP4 : Analysis Point 4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Storm Rainfall=7.18"

Area (sf)	CN	Description
2,737	98	Paved parking, HSG C
1,910	74	>75% Grass cover, Good, HSG C
4,647	88	Weighted Average
1,910		41.10% Pervious Area
2,737		58.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, 6 minute minimum Tc per TR-55**

Summary for Subcatchment 5S: Subcatchment 5S

Runoff = 0.05 cfs @ 12.09 hrs, Volume= 0.003 af, Depth= 4.20"
Routed to Reach AP5 : Analysis Point 5

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Storm Rainfall=7.18"

Area (sf)	CN	Description
430	74	>75% Grass cover, Good, HSG C
430		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, 6 minute minimum Tc per TR-55**

Summary for Subcatchment 6S: Subcatchment 6S

Runoff = 0.97 cfs @ 12.16 hrs, Volume= 0.088 af, Depth= 5.65"
Routed to Reach AP6 : Analysis Point 6

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Storm Rainfall=7.18"

Area (sf)	CN	Description
4,023	98	Paved roads w/curbs & sewers, HSG C
479	98	Roofs, HSG C
3,620	74	>75% Grass cover, Good, HSG C
8,122	87	Weighted Average
3,620		44.57% Pervious Area
4,502		55.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.9	50	0.0041	0.08		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
1.7	47	0.0041	0.45		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.4	52	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
12.0	149	Total			

Summary for Subcatchment 7S: Subcatchment 7S

Runoff = 2.51 cfs @ 12.22 hrs, Volume= 0.242 af, Depth= 4.31"
Routed to Reach 3R : 15" HDPE P-111

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Storm Rainfall=7.18"

Area (sf)	CN	Description
1,632	98	Paved roads w/curbs & sewers, HSG C
4,849	74	>75% Grass cover, Good, HSG C
17,413	70	Woods, Good, HSG C
5,424	83	1/4 acre lots, 38% imp, HSG C
29,318	75	Weighted Average
25,625		87.40% Pervious Area
3,693		12.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	50	0.0183	0.07		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.70"
0.2	7	0.0183	0.68		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.6	91	0.0134	0.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.1	52	0.0134	0.81		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
15.8	200	Total			

Summary for Subcatchment 8S: Subcatchment 8S

Runoff = 3.00 cfs @ 13.88 hrs, Volume= 1.015 af, Depth= 6.35"
Routed to Pond 1P : Porous Pavement Section #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Storm Rainfall=7.18"

Area (sf)	CN	Description
46,596	98	Paved roads w/curbs & sewers, HSG C
4,422	74	>75% Grass cover, Good, HSG C
13,824	98	Roofs, HSG C
18,709	83	1/4 acre lots, 38% imp, HSG C
83,551	93	Weighted Average
16,022		19.18% Pervious Area
67,529		80.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
144.0					**Direct Entry, Assuming 5 in/hr through 12" filter course**

Summary for Subcatchment 9S: Subcatchment 27S

Runoff = 0.13 cfs @ 13.90 hrs, Volume= 0.043 af, Depth= 4.75"
Routed to Pond 2P : Porous Concrete Walkway

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Storm Rainfall=7.18"

Area (sf)	CN	Description
1,040	98	Paved roads w/curbs & sewers, HSG C
3,724	74	>75% Grass cover, Good, HSG C
4,764	79	Weighted Average
3,724		78.17% Pervious Area
1,040		21.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
144.0					**Direct Entry, Assuming 5 in/hr through 12" filter course**

Summary for Subcatchment 10S: Subcatchment 10S

Runoff = 0.11 cfs @ 12.09 hrs, Volume= 0.008 af, Depth= 4.20"
Routed to Pond 17P : Pocket Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Storm Rainfall=7.18"

Area (sf)	CN	Description
951	74	>75% Grass cover, Good, HSG C
951		100.00% Pervious Area

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

Summary for Subcatchment 11S: Subcatchment 11S

Runoff = 0.44 cfs @ 12.09 hrs, Volume= 0.037 af, Depth= 6.94"
Routed to Pond 3P : Filtration Drip Edge #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Storm Rainfall=7.18"

Area (sf)	CN	Description
2,728	98	Roofs, HSG C
46	98	Water Surface, 0% imp, HSG C
2,774	98	Weighted Average
46		1.66% Pervious Area
2,728		98.34% Impervious Area

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

Summary for Subcatchment 12S: Subcatchment 12S

Runoff = 0.35 cfs @ 12.09 hrs, Volume= 0.029 af, Depth= 6.94"
Routed to Pond 4P : Filtration Drip Edge #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Storm Rainfall=7.18"

Area (sf)	CN	Description
2,176	98	Roofs, HSG C
31	98	Water Surface, 0% imp, HSG C
2,207	98	Weighted Average
31		1.40% Pervious Area
2,176		98.60% Impervious Area

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

Summary for Subcatchment 13S: Subcatchment 13S

Runoff = 0.30 cfs @ 12.09 hrs, Volume= 0.025 af, Depth= 6.94"
Routed to Pond 5P : Filtration Drip Edge #3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Storm Rainfall=7.18"

Area (sf)	CN	Description
1,632	98	Roofs, HSG C
270	98	Water Surface, 0% imp, HSG C
1,902	98	Weighted Average
270		14.20% Pervious Area
1,632		85.80% Impervious Area

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

Summary for Subcatchment 14S: Subcatchment 14S

Runoff = 0.22 cfs @ 12.09 hrs, Volume= 0.019 af, Depth= 6.94"
Routed to Pond 6P : Filtration Drip Edge #4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Storm Rainfall=7.18"

Area (sf)	CN	Description
1,224	98	Roofs, HSG C
198	98	Water Surface, 0% imp, HSG C
1,422	98	Weighted Average
198		13.92% Pervious Area
1,224		86.08% Impervious Area

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

Summary for Subcatchment 15S: Subcatchment 15S

Runoff = 0.17 cfs @ 12.09 hrs, Volume= 0.015 af, Depth= 6.94"
Routed to Pond 7P : Filtration Drip Edge #5

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Storm Rainfall=7.18"

Area (sf)	CN	Description
1,104	98	Roofs, HSG C
1,104		100.00% Impervious Area

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

Summary for Subcatchment 16S: Subcatchment 16S

Runoff = 0.17 cfs @ 12.09 hrs, Volume= 0.015 af, Depth= 6.94"
Routed to Pond 8P : Filtration Drip Edge #6

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Storm Rainfall=7.18"

Area (sf)	CN	Description
1,104	98	Roofs, HSG C
1,104		100.00% Impervious Area

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

Summary for Subcatchment 17S: Subcatchment 17S

Runoff = 0.17 cfs @ 12.09 hrs, Volume= 0.015 af, Depth= 6.94"
Routed to Pond 9P : Filtration Drip Edge #7

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Storm Rainfall=7.18"

Area (sf)	CN	Description
1,104	98	Roofs, HSG C
1,104		100.00% Impervious Area

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

Summary for Subcatchment 18S: Subcatchment 18S

Runoff = 0.17 cfs @ 12.09 hrs, Volume= 0.015 af, Depth= 6.94"
Routed to Pond 10P : Filtration Drip Edge #8

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Storm Rainfall=7.18"

Area (sf)	CN	Description
1,072	98	Roofs, HSG C
21	98	Water Surface, 0% imp, HSG C
1,093	98	Weighted Average
21		1.92% Pervious Area
1,072		98.08% Impervious Area

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

Summary for Subcatchment 19S: Subcatchment 19S

Runoff = 0.26 cfs @ 12.09 hrs, Volume= 0.022 af, Depth= 6.94"
Routed to Pond 11P : Filtration Drip Edge #9

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Storm Rainfall=7.18"

Area (sf)	CN	Description
1,624	98	Roofs, HSG C
21	98	Water Surface, 0% imp, HSG C
1,645	98	Weighted Average
21		1.28% Pervious Area
1,624		98.72% Impervious Area

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

Summary for Subcatchment 20S: Subcatchment 20S

Runoff = 0.17 cfs @ 12.09 hrs, Volume= 0.015 af, Depth= 6.94"
Routed to Pond 12P : Filtration Drip Edge #10

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Storm Rainfall=7.18"

Area (sf)	CN	Description
1,072	98	Roofs, HSG C
21	98	Water Surface, 0% imp, HSG C
1,093	98	Weighted Average
21		1.92% Pervious Area
1,072		98.08% Impervious Area

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

Summary for Subcatchment 21S: Subcatchment 21S

Runoff = 0.43 cfs @ 12.09 hrs, Volume= 0.036 af, Depth= 6.94"
Routed to Pond 13P : Infiltration Drip Edge #11

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Storm Rainfall=7.18"

Area (sf)	CN	Description
2,728	98	Roofs, HSG C
2,728		100.00% Impervious Area

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

Summary for Subcatchment 22S: Subcatchment 22S

Runoff = 1.55 cfs @ 12.09 hrs, Volume= 0.129 af, Depth= 6.82"
Routed to Pond 14P : Focal Point #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Storm Rainfall=7.18"

Area (sf)	CN	Description
6,099	98	Roofs, HSG C
3,190	98	Paved parking, HSG C
571	74	>75% Grass cover, Good, HSG C
9,860	97	Weighted Average
571		5.79% Pervious Area
9,289		94.21% Impervious Area

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

Summary for Subcatchment 23S: Subcatchment 23S

Runoff = 2.26 cfs @ 12.09 hrs, Volume= 0.188 af, Depth= 6.82"
Routed to Pond 15P : Jellyfish #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Storm Rainfall=7.18"

Area (sf)	CN	Description
2,460	98	Roofs, HSG C
11,609	98	Paved parking, HSG C
317	74	>75% Grass cover, Good, HSG C
14,386	97	Weighted Average
317		2.20% Pervious Area
14,069		97.80% Impervious Area

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

Summary for Subcatchment 24S: Subcatchment 24S

Runoff = 1.54 cfs @ 12.09 hrs, Volume= 0.127 af, Depth= 6.82"
Routed to Pond 16P : Jellyfish #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Storm Rainfall=7.18"

Area (sf)	CN	Description
398	74	>75% Grass cover, Good, HSG C
4,210	98	Roofs, HSG C
5,149	98	Paved roads w/curbs & sewers, HSG C
9,757	97	Weighted Average
398		4.08% Pervious Area
9,359		95.92% Impervious Area

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

Summary for Subcatchment 25S: Subcatchment 25S

Runoff = 0.65 cfs @ 12.10 hrs, Volume= 0.047 af, Depth= 4.20"
Routed to Reach 8R : 15" HDPE P-113

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Storm Rainfall=7.18"

Area (sf)	CN	Description
5,889	74	>75% Grass cover, Good, HSG C
5,889		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	40	0.0250	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
1.2	10	0.0288	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
0.6	42	0.0288	1.19		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.2	20	0.1000	2.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.4	46	0.0652	1.79		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
6.4	158	Total			

Summary for Subcatchment 26S: Subcatchment 26S

Runoff = 0.13 cfs @ 12.09 hrs, Volume= 0.009 af, Depth= 4.20"
Routed to Reach 5R : 15" HDPE P-112

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Storm Rainfall=7.18"

Area (sf)	CN	Description
1,141	74	>75% Grass cover, Good, HSG C
1,141		100.00% Pervious Area

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

Summary for Reach 2Ra: Channel through 1S

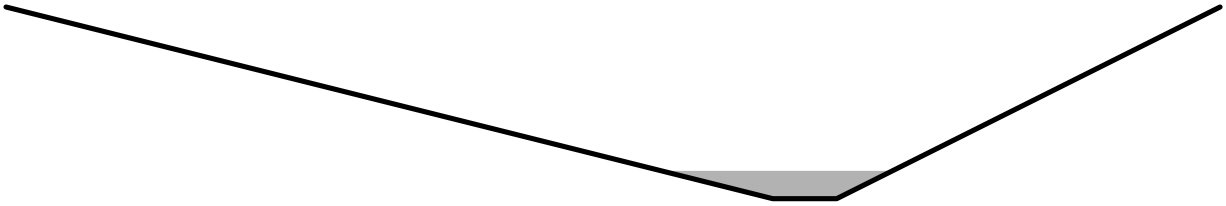
[80] Warning: Exceeded Pond 7P by 1.25' @ 0.00 hrs (0.35 cfs 0.380 af)
[80] Warning: Exceeded Pond 8P by 1.65' @ 0.00 hrs (0.40 cfs 0.460 af)

Inflow Area = 7.925 ac, 58.22% Impervious, Inflow Depth = 5.71" for 25-Year Storm event
Inflow = 16.70 cfs @ 12.56 hrs, Volume= 3.770 af
Outflow = 16.70 cfs @ 12.57 hrs, Volume= 3.770 af, Atten= 0%, Lag= 0.4 min
Routed to Reach 2Rb : Channel through 1S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 4.18 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 1.24 fps, Avg. Travel Time= 1.8 min

Peak Storage= 543 cf @ 12.57 hrs
Average Depth at Peak Storage= 0.87' , Surface Width= 7.20'
Bank-Full Depth= 6.00' Flow Area= 120.0 sf, Capacity= 1,586.21 cfs

2.00' x 6.00' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 4.0 2.0 '/' Top Width= 38.00'
Length= 136.0' Slope= 0.0294 '/'
Inlet Invert= 24.00', Outlet Invert= 20.00'



Summary for Reach 2Rb: Channel through 1S

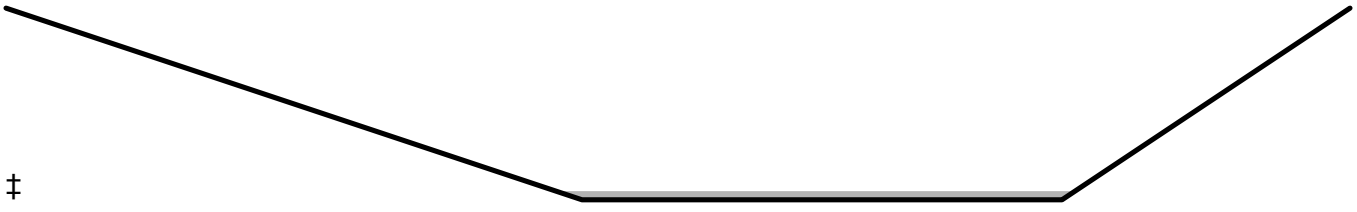
[61] Hint: Exceeded Reach 2Ra outlet invert by 0.27' @ 12.55 hrs

Inflow Area = 9.878 ac, 62.66% Impervious, Inflow Depth = 4.60" for 25-Year Storm event
Inflow = 16.74 cfs @ 12.56 hrs, Volume= 3.788 af
Outflow = 16.74 cfs @ 12.57 hrs, Volume= 3.788 af, Atten= 0%, Lag= 0.5 min
Routed to Reach 2Rc : Channel through 1S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 3.00 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 1.18 fps, Avg. Travel Time= 2.2 min

Peak Storage= 855 cf @ 12.57 hrs
Average Depth at Peak Storage= 0.27' , Surface Width= 21.61'
Bank-Full Depth= 6.00' Flow Area= 228.0 sf, Capacity= 4,170.50 cfs

20.00' x 6.00' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 4.0 2.0 '/' Top Width= 56.00'
Length= 153.0' Slope= 0.0392 '/'
Inlet Invert= 20.00', Outlet Invert= 14.00'



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Summary for Reach 2Rc: Channel through 1S

[62] Hint: Exceeded Reach 2Rb OUTLET depth by 0.12' @ 12.25 hrs

Inflow Area = 10.949 ac, 58.66% Impervious, Inflow Depth = 4.57" for 25-Year Storm event
Inflow = 18.77 cfs @ 12.39 hrs, Volume= 4.172 af
Outflow = 18.76 cfs @ 12.41 hrs, Volume= 4.172 af, Atten= 0%, Lag= 1.3 min
Routed to Reach AP1 : Analysis Point 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 2.38 fps, Min. Travel Time= 2.1 min
Avg. Velocity = 0.80 fps, Avg. Travel Time= 6.3 min

Peak Storage= 2,385 cf @ 12.41 hrs
Average Depth at Peak Storage= 0.37' , Surface Width= 22.24'
Bank-Full Depth= 6.00' Flow Area= 228.0 sf, Capacity= 2,705.34 cfs

20.00' x 6.00' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 4.0 2.0 '/' Top Width= 56.00'
Length= 303.0' Slope= 0.0165 '/'
Inlet Invert= 14.00', Outlet Invert= 9.00'



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Summary for Reach 3R: 15" HDPE P-111

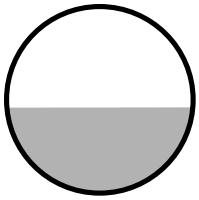
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.737 ac, 20.01% Impervious, Inflow Depth = 4.54" for 25-Year Storm event
Inflow = 2.82 cfs @ 12.21 hrs, Volume= 0.278 af
Outflow = 2.82 cfs @ 12.22 hrs, Volume= 0.278 af, Atten= 0%, Lag= 0.2 min
Routed to Reach 4R : Flow through 1S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 5.12 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.52 fps, Avg. Travel Time= 0.9 min

Peak Storage= 47 cf @ 12.22 hrs
Average Depth at Peak Storage= 0.57' , Surface Width= 1.25'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 6.54 cfs

15.0" Round Pipe
n= 0.012
Length= 86.0' Slope= 0.0087 '/'
Inlet Invert= 34.75', Outlet Invert= 34.00'



Summary for Reach 4R: Flow through 1S

[61] Hint: Exceeded Reach 3R outlet invert by 0.38' @ 12.20 hrs

Inflow Area = 0.737 ac, 20.01% Impervious, Inflow Depth = 4.54" for 25-Year Storm event
Inflow = 2.82 cfs @ 12.22 hrs, Volume= 0.278 af
Outflow = 2.82 cfs @ 12.22 hrs, Volume= 0.278 af, Atten= 0%, Lag= 0.1 min
Routed to Reach 5R : 15" HDPE P-112

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 3.39 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 0.98 fps, Avg. Travel Time= 0.7 min

Peak Storage= 33 cf @ 12.22 hrs
Average Depth at Peak Storage= 0.39' , Surface Width= 3.31'
Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 23.40 cfs

1.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 3.0 '/' Top Width= 7.00'
Length= 40.0' Slope= 0.0313 '/'
Inlet Invert= 34.00', Outlet Invert= 32.75'



Summary for Reach 5R: 15" HDPE P-112

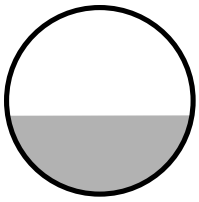
[52] Hint: Inlet/Outlet conditions not evaluated
[62] Hint: Exceeded Reach 4R OUTLET depth by 0.14' @ 12.20 hrs

Inflow Area = 0.763 ac, 19.32% Impervious, Inflow Depth = 4.52" for 25-Year Storm event
Inflow = 2.89 cfs @ 12.22 hrs, Volume= 0.288 af
Outflow = 2.89 cfs @ 12.22 hrs, Volume= 0.288 af, Atten= 0%, Lag= 0.0 min
Routed to Reach 6R : Flow through 1S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 5.89 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.76 fps, Avg. Travel Time= 0.1 min

Peak Storage= 6 cf @ 12.22 hrs
Average Depth at Peak Storage= 0.53' , Surface Width= 1.23'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 7.82 cfs

15.0" Round Pipe
n= 0.012
Length= 12.0' Slope= 0.0125 '/'
Inlet Invert= 32.75', Outlet Invert= 32.60'



Summary for Reach 6R: Flow through 1S

[61] Hint: Exceeded Reach 5R outlet invert by 0.29' @ 12.20 hrs

Inflow Area = 0.763 ac, 19.32% Impervious, Inflow Depth = 4.52" for 25-Year Storm event
Inflow = 2.89 cfs @ 12.22 hrs, Volume= 0.288 af
Outflow = 2.89 cfs @ 12.22 hrs, Volume= 0.288 af, Atten= 0%, Lag= 0.2 min
Routed to Reach 7R : Existing Wet Channel

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 3.45 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.00 fps, Avg. Travel Time= 0.9 min

Peak Storage= 44 cf @ 12.22 hrs
Average Depth at Peak Storage= 0.39' , Surface Width= 3.32'
Bank-Full Depth= 1.00' Flow Area= 4.0 sf, Capacity= 23.71 cfs

1.00' x 1.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 3.0 '/' Top Width= 7.00'
Length= 53.0' Slope= 0.0321 '/'
Inlet Invert= 32.50', Outlet Invert= 30.80'



Summary for Reach 7R: Existing Wet Channel

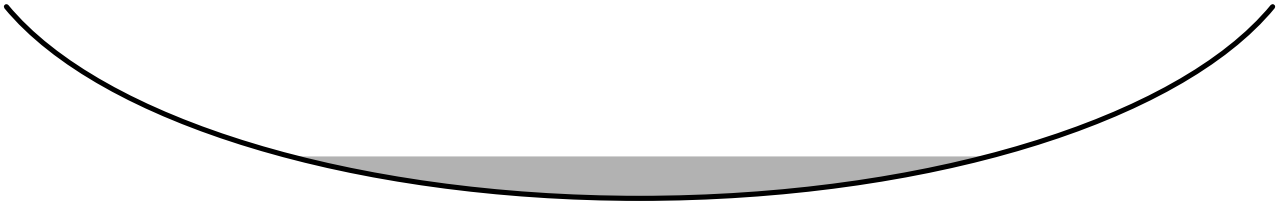
[62] Hint: Exceeded Reach 6R OUTLET depth by 0.01' @ 25.00 hrs
[80] Warning: Exceeded Pond 10P by 0.30' @ 0.00 hrs (0.12 cfs 0.119 af)
[80] Warning: Exceeded Pond 11P by 0.55' @ 0.00 hrs (0.21 cfs 0.083 af)

Inflow Area = 0.935 ac, 24.93% Impervious, Inflow Depth = 4.32" for 25-Year Storm event
Inflow = 3.31 cfs @ 12.20 hrs, Volume= 0.337 af
Outflow = 3.31 cfs @ 12.21 hrs, Volume= 0.337 af, Atten= 0%, Lag= 0.2 min
Routed to Reach 8R : 15" HDPE P-113

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 3.23 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 0.93 fps, Avg. Travel Time= 1.2 min

Peak Storage= 67 cf @ 12.21 hrs
Average Depth at Peak Storage= 0.22' , Surface Width= 7.02'
Bank-Full Depth= 1.00' Flow Area= 10.0 sf, Capacity= 88.27 cfs

15.00' x 1.00' deep Parabolic Channel, n= 0.030 Earth, grassed & winding
Length= 65.0' Slope= 0.0554 '/'
Inlet Invert= 30.80', Outlet Invert= 27.20'



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Summary for Reach 8R: 15" HDPE P-113

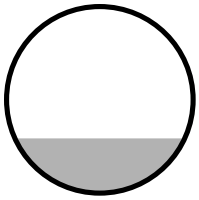
[52] Hint: Inlet/Outlet conditions not evaluated
[62] Hint: Exceeded Reach 7R OUTLET depth by 0.15' @ 12.15 hrs

Inflow Area = 1.070 ac, 21.79% Impervious, Inflow Depth = 4.31" for 25-Year Storm event
Inflow = 3.72 cfs @ 12.19 hrs, Volume= 0.384 af
Outflow = 3.72 cfs @ 12.19 hrs, Volume= 0.384 af, Atten= 0%, Lag= 0.0 min
Routed to Reach 2Rc : Channel through 1S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 12.37 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.85 fps, Avg. Travel Time= 0.2 min

Peak Storage= 12 cf @ 12.19 hrs
Average Depth at Peak Storage= 0.37' , Surface Width= 1.14'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 19.79 cfs

15.0" Round Pipe
n= 0.012
Length= 40.0' Slope= 0.0800 '/'
Inlet Invert= 27.20', Outlet Invert= 24.00'



Summary for Reach 9R: 12" HDPEP-114

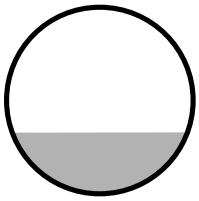
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.277 ac, 72.53% Impervious, Inflow Depth = 6.12" for 25-Year Storm event
Inflow = 1.57 cfs @ 12.15 hrs, Volume= 0.141 af
Outflow = 1.57 cfs @ 12.15 hrs, Volume= 0.141 af, Atten= 0%, Lag= 0.0 min
Routed to Reach 2Ra : Channel through 1S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 6.99 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.39 fps, Avg. Travel Time= 0.1 min

Peak Storage= 3 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.33' , Surface Width= 0.94'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 6.73 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 14.0' Slope= 0.0357 '/'
Inlet Invert= 34.00', Outlet Invert= 33.50'



Summary for Reach AP1: Analysis Point 1

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

Inflow Area = 15.100 ac, 50.47% Impervious, Inflow Depth = 4.62" for 25-Year Storm event
Inflow = 35.45 cfs @ 12.21 hrs, Volume= 5.815 af
Outflow = 35.45 cfs @ 12.21 hrs, Volume= 5.815 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP2: Analysis Point 2

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

Inflow Area = 0.277 ac, 72.53% Impervious, Inflow Depth = 6.12" for 25-Year Storm event
Inflow = 1.57 cfs @ 12.15 hrs, Volume= 0.141 af
Outflow = 1.57 cfs @ 12.15 hrs, Volume= 0.141 af, Atten= 0%, Lag= 0.0 min
Routed to Reach 9R : 12" HDPEP-114

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP4: Analysis Point 4

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

Inflow Area = 0.107 ac, 58.90% Impervious, Inflow Depth = 5.77" for 25-Year Storm event
Inflow = 0.67 cfs @ 12.09 hrs, Volume= 0.051 af
Outflow = 0.67 cfs @ 12.09 hrs, Volume= 0.051 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP5: Analysis Point 5

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

Inflow Area = 0.010 ac, 0.00% Impervious, Inflow Depth = 4.20" for 25-Year Storm event
Inflow = 0.05 cfs @ 12.09 hrs, Volume= 0.003 af
Outflow = 0.05 cfs @ 12.09 hrs, Volume= 0.003 af, Atten= 0%, Lag= 0.0 min
Routed to Reach 2Rb : Channel through 1S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3

Summary for Reach AP6: Analysis Point 6

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

Inflow Area = 0.186 ac, 55.43% Impervious, Inflow Depth = 5.65" for 25-Year Storm event
Inflow = 0.97 cfs @ 12.16 hrs, Volume= 0.088 af
Outflow = 0.97 cfs @ 12.16 hrs, Volume= 0.088 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3

Summary for Pond 1P: Porous Pavement Section #1

Inflow Area = 1.918 ac, 80.82% Impervious, Inflow Depth = 6.35" for 25-Year Storm event
Inflow = 3.00 cfs @ 13.88 hrs, Volume= 1.015 af
Outflow = 2.00 cfs @ 14.86 hrs, Volume= 1.015 af, Atten= 33%, Lag= 58.8 min
Discarded = 2.00 cfs @ 14.86 hrs, Volume= 1.015 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach 2Rb : Channel through 1S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 33.97' @ 14.86 hrs Surf.Area= 22,647 sf Storage= 9,206 cf

Plug-Flow detention time= 47.7 min calculated for 1.014 af (100% of inflow)
Center-of-Mass det. time= 47.6 min (943.7 - 896.1)

Volume	Invert	Avail.Storage	Storage Description
#1	32.82'	13,871 cf	**Custom Stage Data - Unlined Section (Prismatic)** Listed below (Recalc)
#2	32.82'	2,683 cf	**Custom Stage Data - Lined Section (Prismatic)** Listed below (Recalc) -Imper
		16,554 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
32.82	22,647	0.0	0	0
32.83	22,647	15.0	34	34
33.07	22,647	15.0	815	849
33.08	22,647	40.0	91	940
33.74	22,647	40.0	5,979	6,919
33.75	22,647	15.0	34	6,953
33.99	22,647	15.0	815	7,768
34.00	22,647	5.0	11	7,779
34.99	22,647	5.0	1,121	8,900
35.00	22,647	30.0	68	8,968
35.49	22,647	30.0	3,329	12,297
35.50	22,647	15.0	34	12,331
35.82	22,647	15.0	1,087	13,418
35.83	22,647	100.0	226	13,645
35.84	22,647	100.0	226	13,871

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
32.82	4,380	0.0	0	0
32.83	4,380	15.0	7	7
33.07	4,380	15.0	158	164
33.08	4,380	40.0	18	182
33.74	4,380	40.0	1,156	1,338
33.75	4,380	15.0	7	1,345
33.99	4,380	15.0	158	1,502
34.00	4,380	5.0	2	1,505
34.99	4,380	5.0	217	1,721
35.00	4,380	30.0	13	1,734
35.49	4,380	30.0	644	2,378
35.50	4,380	15.0	7	2,385
35.82	4,380	15.0	210	2,595
35.83	4,380	100.0	44	2,639
35.84	4,380	100.0	44	2,683

Device	Routing	Invert	Outlet Devices
#1	Primary	35.83'	**100.0' long x 50.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60

Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#2 Discarded 32.82' **1.000 in/hr Exfiltration over Surface area**
Conductivity to Groundwater Elevation = 32.41' Phase-In= 0.01'

Discarded OutFlow Max=2.00 cfs @ 14.86 hrs HW=33.97' (Free Discharge)
↑—**2=Exfiltration** (Controls 2.00 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=32.82' TW=20.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 2P: Porous Concrete Walkway

Inflow Area = 0.109 ac, 21.83% Impervious, Inflow Depth = 5.18" for 25-Year Storm event
Inflow = 0.20 cfs @ 12.32 hrs, Volume= 0.047 af
Outflow = 0.11 cfs @ 14.59 hrs, Volume= 0.047 af, Atten= 44%, Lag= 136.4 min
Discarded = 0.11 cfs @ 14.59 hrs, Volume= 0.047 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach 7R : Existing Wet Channel

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 32.34' @ 14.59 hrs Surf.Area= 1,040 sf Storage= 290 cf

Plug-Flow detention time= 27.3 min calculated for 0.047 af (100% of inflow)
Center-of-Mass det. time= 27.2 min (949.3 - 922.0)

Volume	Invert	Avail.Storage	Storage Description
#1	31.49'	637 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
31.49	1,040	0.0	0	0
31.50	1,040	15.0	2	2
31.74	1,040	15.0	37	39
31.75	1,040	40.0	4	43
32.41	1,040	40.0	275	318
32.42	1,040	15.0	2	319
32.66	1,040	15.0	37	357
32.67	1,040	5.0	1	357
33.66	1,040	5.0	51	409
33.67	1,040	30.0	3	412
34.16	1,040	30.0	153	565
34.17	1,040	15.0	2	566
34.49	1,040	15.0	50	616
34.50	1,040	100.0	10	627
34.51	1,040	100.0	10	637

Device	Routing	Invert	Outlet Devices
#1	Primary	34.50'	**100.0' long x 50.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#2	Discarded	31.49'	**1.000 in/hr Exfiltration over Surface area**

Conductivity to Groundwater Elevation = 31.25' Phase-In= 0.01'

Discarded OutFlow Max=0.11 cfs @ 14.59 hrs HW=32.34' (Free Discharge)
↑—**2=Exfiltration** (Controls 0.11 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=31.49' TW=30.80' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond 3P: Filtration Drip Edge #1

Inflow Area = 0.064 ac, 98.34% Impervious, Inflow Depth = 6.94" for 25-Year Storm event
Inflow = 0.44 cfs @ 12.09 hrs, Volume= 0.037 af
Outflow = 0.33 cfs @ 12.16 hrs, Volume= 0.037 af, Atten= 26%, Lag= 4.5 min
Primary = 0.33 cfs @ 12.16 hrs, Volume= 0.037 af
Routed to Reach 3R : 15" HDPE P-111

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 36.02' @ 12.16 hrs Surf.Area= 0.020 ac Storage= 0.003 af

Plug-Flow detention time= 11.6 min calculated for 0.037 af (100% of inflow)
Center-of-Mass det. time= 11.9 min (754.5 - 742.6)

Volume	Invert	Avail.Storage	Storage Description
#1	37.75'	0.001 af	**3.25'W x 131.00'L x 0.25'H Prismatoid** 0.002 af Overall x 40.0% Voids
#2	36.25'	0.001 af	**3.25'W x 131.00'L x 1.50'H Prismatoid** 0.015 af Overall x 5.0% Voids
#3	36.00'	0.000 af	**3.25'W x 131.00'L x 0.25'H Prismatoid** 0.002 af Overall x 15.0% Voids
#4	35.25'	0.003 af	**3.25'W x 131.00'L x 0.75'H Prismatoid** 0.007 af Overall x 40.0% Voids
		0.005 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#0	Primary	38.00'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	35.25'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.32 cfs @ 12.16 hrs HW=36.00' TW=35.30' (Dynamic Tailwater)
↑—**1=Orifice/Grate** (Orifice Controls 0.32 cfs @ 3.69 fps)

Summary for Pond 4P: Filtration Drip Edge #2

Inflow Area = 0.051 ac, 98.60% Impervious, Inflow Depth = 6.94" for 25-Year Storm event
Inflow = 0.35 cfs @ 12.09 hrs, Volume= 0.029 af
Outflow = 0.25 cfs @ 12.17 hrs, Volume= 0.029 af, Atten= 29%, Lag= 4.7 min
Primary = 0.25 cfs @ 12.17 hrs, Volume= 0.029 af
Routed to Pond 17P : Pocket Pond
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond AP3 : Existing Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3

Peak Elev= 37.36' @ 12.17 hrs Surf.Area= 0.026 ac Storage= 0.004 af

Plug-Flow detention time= 45.6 min calculated for 0.029 af (100% of inflow)
Center-of-Mass det. time= 45.9 min (788.6 - 742.6)

Volume	Invert	Avail.Storage	Storage Description
#1	37.50'	0.001 af	**3.75'W x 101.00'L x 0.25'H Prismatoid**
			0.002 af Overall x 40.0% Voids
#2	36.00'	0.001 af	**3.75'W x 101.00'L x 1.50'H Prismatoid**
			0.013 af Overall x 5.0% Voids
#3	35.75'	0.000 af	**3.75'W x 101.00'L x 0.25'H Prismatoid**
			0.002 af Overall x 15.0% Voids
#4	35.00'	0.003 af	**3.75'W x 101.00'L x 0.75'H Prismatoid**
			0.007 af Overall x 40.0% Voids
		0.004 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#0	Secondary	37.75'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	35.00'	**4.0" Round Culvert**
			L= 75.0' CPP, projecting, no headwall, Ke= 0.900
			Inlet / Outlet Invert= 35.00' / 34.00' S= 0.0133 '/' Cc= 0.900
			n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf
#2	Device 1	35.00'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.24 cfs @ 12.17 hrs HW=37.25' TW=35.83' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 0.24 cfs @ 2.75 fps)
↑—**2=Orifice/Grate** (Passes 0.24 cfs of 0.50 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=35.00' TW=27.00' (Dynamic Tailwater)

Summary for Pond 5P: Filtration Drip Edge #3

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=1)

Inflow Area = 0.044 ac, 85.80% Impervious, Inflow Depth = 6.94" for 25-Year Storm event
Inflow = 0.30 cfs @ 12.09 hrs, Volume= 0.025 af
Outflow = 0.26 cfs @ 12.11 hrs, Volume= 0.025 af, Atten= 12%, Lag= 1.4 min
Primary = 0.26 cfs @ 12.11 hrs, Volume= 0.025 af
Routed to Pond 17P : Pocket Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 36.51' @ 12.15 hrs Surf.Area= 0.025 ac Storage= 0.003 af

Plug-Flow detention time= 77.3 min calculated for 0.025 af (100% of inflow)
Center-of-Mass det. time= 77.7 min (820.3 - 742.6)

Volume	Invert	Avail.Storage	Storage Description
#1	36.75'	0.001 af	**3.00'W x 120.00'L x 0.25'H Prismatoid**
			0.002 af Overall x 40.0% Voids
#2	35.25'	0.001 af	**3.00'W x 120.00'L x 1.50'H Prismatoid**
			0.012 af Overall x 5.0% Voids
#3	35.00'	0.000 af	**3.00'W x 120.00'L x 0.25'H Prismatoid**
			0.002 af Overall x 15.0% Voids
#4	34.25'	0.002 af	**3.00'W x 120.00'L x 0.75'H Prismatoid**
			0.006 af Overall x 40.0% Voids
		0.004 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#0	Primary	37.00'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	34.25'	**4.0" Round Culvert**
			L= 30.0' CPP, projecting, no headwall, Ke= 0.900
			Inlet / Outlet Invert= 34.25' / 34.00' S= 0.0083 '/' Cc= 0.900
			n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf
#2	Device 1	34.25'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.26 cfs @ 12.11 hrs HW=36.42' TW=35.60' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 0.26 cfs @ 2.98 fps)
↑—**2=Orifice/Grate** (Passes 0.26 cfs of 0.38 cfs potential flow)

Summary for Pond 6P: Filtration Drip Edge #4

Inflow Area = 0.033 ac, 86.08% Impervious, Inflow Depth = 6.94" for 25-Year Storm event
Inflow = 0.22 cfs @ 12.09 hrs, Volume= 0.019 af
Outflow = 0.19 cfs @ 12.14 hrs, Volume= 0.019 af, Atten= 14%, Lag= 2.9 min
Primary = 0.19 cfs @ 12.14 hrs, Volume= 0.019 af
Routed to Reach 2Ra : Channel through 1S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 33.76' @ 12.14 hrs Surf.Area= 0.005 ac Storage= 0.001 af

Plug-Flow detention time= 9.1 min calculated for 0.019 af (100% of inflow)
Center-of-Mass det. time= 8.3 min (750.9 - 742.6)

Volume	Invert	Avail.Storage	Storage Description
#1	35.75'	0.000 af	**2.75'W x 72.00'L x 0.25'H Prismatoid**
			0.001 af Overall x 40.0% Voids
#2	34.25'	0.000 af	**2.75'W x 72.00'L x 1.50'H Prismatoid**
			0.007 af Overall x 5.0% Voids
#3	34.00'	0.000 af	**2.75'W x 72.00'L x 0.25'H Prismatoid**
			0.001 af Overall x 15.0% Voids
#4	33.25'	0.001 af	**2.75'W x 72.00'L x 0.75'H Prismatoid**
			0.003 af Overall x 40.0% Voids
		0.002 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#0	Primary	36.00'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	33.25'	**4.0" Round Culvert** L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 33.25' / 33.00' S= 0.0167 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf
#2	Device 1	33.25'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.19 cfs @ 12.14 hrs HW=33.75' TW=24.77' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 0.19 cfs @ 2.19 fps)
↑—**2=Orifice/Grate** (Passes 0.19 cfs of 0.24 cfs potential flow)

Summary for Pond 7P: Filtration Drip Edge #5

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=132)

Inflow Area = 0.025 ac,100.00% Impervious, Inflow Depth = 6.94" for 25-Year Storm event
Inflow = 0.17 cfs @ 12.09 hrs, Volume= 0.015 af
Outflow = 0.17 cfs @ 12.09 hrs, Volume= 0.013 af, Atten= 2%, Lag= 0.5 min
Primary = 0.17 cfs @ 12.09 hrs, Volume= 0.013 af
Routed to Reach 2Ra : Channel through 1S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 25.02' @ 12.11 hrs Surf.Area= 0.012 ac Storage= 0.002 af

Plug-Flow detention time= 92.6 min calculated for 0.013 af (91% of inflow)
Center-of-Mass det. time= 45.6 min (788.2 - 742.6)

Volume	Invert	Avail.Storage	Storage Description
#1	25.75'	0.000 af	**3.50'W x 48.00'L x 0.25'H Prismatoid** 0.001 af Overall x 40.0% Voids
#2	23.75'	0.000 af	**3.50'W x 48.00'L x 2.00'H Prismatoid** 0.008 af Overall x 5.0% Voids
#3	23.50'	0.000 af	**3.50'W x 48.00'L x 0.25'H Prismatoid** 0.001 af Overall x 15.0% Voids
#4	22.75'	0.001 af	**3.50'W x 48.00'L x 0.75'H Prismatoid** 0.003 af Overall x 40.0% Voids
		0.002 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#0	Primary	26.00'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	22.75'	**4.0" Round Culvert** L= 8.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 22.75' / 22.50' S= 0.0313 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf
#2	Device 1	22.75'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.17 cfs @ 12.09 hrs HW=25.00' TW=24.74' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 0.17 cfs @ 1.94 fps)
↑—**2=Orifice/Grate** (Passes 0.17 cfs of 0.21 cfs potential flow)

Summary for Pond 8P: Filtration Drip Edge #6

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=104)

Inflow Area = 0.025 ac,100.00% Impervious, Inflow Depth = 6.94" for 25-Year Storm event
Inflow = 0.17 cfs @ 12.09 hrs, Volume= 0.015 af
Outflow = 0.17 cfs @ 12.09 hrs, Volume= 0.013 af, Atten= 2%, Lag= 0.5 min
Primary = 0.17 cfs @ 12.09 hrs, Volume= 0.013 af
Routed to Reach 2Ra : Channel through 1S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 25.02' @ 12.11 hrs Surf.Area= 0.012 ac Storage= 0.002 af

Plug-Flow detention time= 96.3 min calculated for 0.013 af (90% of inflow)
Center-of-Mass det. time= 47.7 min (790.3 - 742.6)

Volume	Invert	Avail.Storage	Storage Description
#1	25.35'	0.000 af	**3.50'W x 48.00'L x 0.25'H Prismatoid** 0.001 af Overall x 40.0% Voids
#2	23.35'	0.000 af	**3.50'W x 48.00'L x 2.00'H Prismatoid** 0.008 af Overall x 5.0% Voids
#3	23.10'	0.000 af	**3.50'W x 48.00'L x 0.25'H Prismatoid** 0.001 af Overall x 15.0% Voids
#4	22.35'	0.001 af	**3.50'W x 48.00'L x 0.75'H Prismatoid** 0.003 af Overall x 40.0% Voids
		0.002 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#0	Primary	25.60'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	22.35'	**4.0" Round Culvert** L= 18.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 22.35' / 22.20' S= 0.0083 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf
#2	Device 1	22.35'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.17 cfs @ 12.09 hrs HW=25.00' TW=24.74' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 0.17 cfs @ 1.94 fps)
↑—**2=Orifice/Grate** (Passes 0.17 cfs of 0.21 cfs potential flow)

Summary for Pond 9P: Filtration Drip Edge #7

Inflow Area = 0.025 ac,100.00% Impervious, Inflow Depth = 6.94" for 25-Year Storm event
Inflow = 0.17 cfs @ 12.09 hrs, Volume= 0.015 af
Outflow = 0.16 cfs @ 12.12 hrs, Volume= 0.015 af, Atten= 10%, Lag= 2.3 min
Primary = 0.16 cfs @ 12.12 hrs, Volume= 0.015 af
Routed to Reach 2Rb : Channel through 1S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 23.39' @ 12.12 hrs Surf.Area= 0.004 ac Storage= 0.001 af

Plug-Flow detention time= 7.7 min calculated for 0.015 af (100% of inflow)

Center-of-Mass det. time= 7.8 min (750.4 - 742.6)

Volume	Invert	Avail.Storage	Storage Description
#1	26.00'	0.000 af	**3.50'W x 48.00'L x 0.25'H Prismatoid** 0.001 af Overall x 40.0% Voids
#2	24.00'	0.000 af	**3.50'W x 48.00'L x 2.00'H Prismatoid** 0.008 af Overall x 5.0% Voids
#3	23.75'	0.000 af	**3.50'W x 48.00'L x 0.25'H Prismatoid** 0.001 af Overall x 15.0% Voids
#4	23.00'	0.001 af	**3.50'W x 48.00'L x 0.75'H Prismatoid** 0.003 af Overall x 40.0% Voids
		0.002 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#0	Primary	26.25'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	23.00'	**4.0" Round Culvert** L= 6.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 23.00' / 22.75' S= 0.0417 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf
#2	Device 1	23.00'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.15 cfs @ 12.12 hrs HW=23.38' TW=20.23' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 0.15 cfs @ 1.77 fps)
↑—**2=Orifice/Grate** (Passes 0.15 cfs of 0.20 cfs potential flow)

Summary for Pond 10P: Filtration Drip Edge #8

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=1)

Inflow Area = 0.025 ac, 98.08% Impervious, Inflow Depth = 6.94" for 25-Year Storm event
Inflow = 0.17 cfs @ 12.09 hrs, Volume= 0.015 af
Outflow = 0.15 cfs @ 12.13 hrs, Volume= 0.014 af, Atten= 14%, Lag= 2.3 min
Primary = 0.15 cfs @ 12.13 hrs, Volume= 0.014 af
Routed to Reach 7R : Existing Wet Channel

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 31.21' @ 12.14 hrs Surf.Area= 0.004 ac Storage= 0.001 af

Plug-Flow detention time= 47.2 min calculated for 0.014 af (97% of inflow)
Center-of-Mass det. time= 26.2 min (768.8 - 742.6)

Volume	Invert	Avail.Storage	Storage Description
#1	33.00'	0.000 af	**3.50'W x 50.00'L x 0.25'H Prismatoid** 0.001 af Overall x 40.0% Voids
#2	31.50'	0.000 af	**3.50'W x 50.00'L x 1.50'H Prismatoid** 0.006 af Overall x 5.0% Voids
#3	31.25'	0.000 af	**3.50'W x 50.00'L x 0.25'H Prismatoid** 0.001 af Overall x 15.0% Voids
#4	30.50'	0.001 af	**3.50'W x 50.00'L x 0.75'H Prismatoid** 0.003 af Overall x 40.0% Voids
		0.002 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#0	Primary	33.25'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	30.50'	**4.0" Round Culvert**
			L= 5.0' CPP, projecting, no headwall, Ke= 0.900
			Inlet / Outlet Invert= 30.50' / 30.40' S= 0.0200 '/' Cc= 0.900
			n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf
#2	Device 1	30.50'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.15 cfs @ 12.13 hrs HW=31.20' TW=31.00' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 0.15 cfs @ 1.67 fps)
↑—**2=Orifice/Grate** (Passes 0.15 cfs of 0.19 cfs potential flow)

Summary for Pond 11P: Filtration Drip Edge #9

Inflow Area = 0.038 ac, 98.72% Impervious, Inflow Depth = 11.55" for 25-Year Storm event
Inflow = 0.41 cfs @ 12.10 hrs, Volume= 0.036 af
Outflow = 0.40 cfs @ 12.12 hrs, Volume= 0.035 af, Atten= 4%, Lag= 1.4 min
Primary = 0.40 cfs @ 12.12 hrs, Volume= 0.035 af
Routed to Reach 7R : Existing Wet Channel

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 32.42' @ 12.12 hrs Surf.Area= 0.018 ac Storage= 0.002 af

Plug-Flow detention time= 46.3 min calculated for 0.035 af (96% of inflow)
Center-of-Mass det. time= 24.1 min (770.0 - 745.9)

Volume	Invert	Avail.Storage	Storage Description
#1	32.75'	0.001 af	**3.50'W x 74.00'L x 0.25'H Prismatoid**
			0.001 af Overall x 40.0% Voids
#2	31.25'	0.000 af	**3.50'W x 74.00'L x 1.50'H Prismatoid**
			0.009 af Overall x 5.0% Voids
#3	31.00'	0.000 af	**3.50'W x 74.00'L x 0.25'H Prismatoid**
			0.001 af Overall x 15.0% Voids
#4	30.25'	0.002 af	**3.50'W x 74.00'L x 0.75'H Prismatoid**
			0.004 af Overall x 40.0% Voids
		0.003 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#0	Primary	33.00'	**Automatic Storage Overflow** (Discharged without head)
#1	Primary	30.25'	**4.0" Round Culvert**
			L= 8.0' CPP, projecting, no headwall, Ke= 0.900
			Inlet / Outlet Invert= 30.25' / 30.00' S= 0.0313 '/' Cc= 0.900
			n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf
#2	Device 1	30.25'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.39 cfs @ 12.12 hrs HW=32.36' TW=31.00' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 0.39 cfs @ 4.43 fps)
↑—**2=Orifice/Grate** (Passes 0.39 cfs of 0.49 cfs potential flow)

Summary for Pond 12P: Filtration Drip Edge #10

Inflow Area = 0.025 ac, 98.08% Impervious, Inflow Depth = 6.94" for 25-Year Storm event
Inflow = 0.17 cfs @ 12.09 hrs, Volume= 0.015 af
Outflow = 0.16 cfs @ 12.13 hrs, Volume= 0.015 af, Atten= 10%, Lag= 2.3 min
Secondary = 0.16 cfs @ 12.13 hrs, Volume= 0.015 af
Routed to Pond 11P : Filtration Drip Edge #9

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 33.64' @ 12.13 hrs Surf.Area= 0.004 ac Storage= 0.001 af

Plug-Flow detention time= 8.0 min calculated for 0.015 af (100% of inflow)
Center-of-Mass det. time= 8.2 min (750.8 - 742.6)

Volume	Invert	Avail.Storage	Storage Description
#1	35.75'	0.000 af	**3.50'W x 50.00'L x 0.25'H Prismatoid** 0.001 af Overall x 40.0% Voids
#2	34.25'	0.000 af	**3.50'W x 50.00'L x 1.50'H Prismatoid** 0.006 af Overall x 5.0% Voids
#3	34.00'	0.000 af	**3.50'W x 50.00'L x 0.25'H Prismatoid** 0.001 af Overall x 15.0% Voids
#4	33.25'	0.001 af	**3.50'W x 50.00'L x 0.75'H Prismatoid** 0.003 af Overall x 40.0% Voids
		0.002 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#0	Secondary	36.00'	**Automatic Storage Overflow** (Discharged without head)
#1	Secondary	33.25'	**4.0" Round Culvert** L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 33.25' / 31.25' S= 0.1333 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf
#2	Device 1	33.25'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Secondary OutFlow Max=0.15 cfs @ 12.13 hrs HW=33.63' TW=32.36' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 0.15 cfs @ 1.75 fps)
↑**2=Orifice/Grate** (Passes 0.15 cfs of 0.19 cfs potential flow)

Summary for Pond 13P: Infiltration Drip Edge #11

Inflow Area = 0.063 ac,100.00% Impervious, Inflow Depth = 6.94" for 25-Year Storm event
Inflow = 0.43 cfs @ 12.09 hrs, Volume= 0.036 af
Outflow = 0.20 cfs @ 12.32 hrs, Volume= 0.036 af, Atten= 55%, Lag= 13.8 min
Discarded = 0.03 cfs @ 12.25 hrs, Volume= 0.032 af
Secondary = 0.17 cfs @ 12.32 hrs, Volume= 0.004 af
Routed to Pond 2P : Porous Concrete Walkway

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 37.50' @ 12.25 hrs Surf.Area= 0.015 ac Storage= 0.013 af

Plug-Flow detention time= 193.9 min calculated for 0.036 af (100% of inflow)
Center-of-Mass det. time= 193.9 min (936.5 - 742.6)

Volume	Invert	Avail.Storage	Storage Description
#1	35.25'	0.013 af	**5.50'W x 116.00'L x 2.25'H Prismatoid** 0.033 af Overall x 40.0% Voids

Device	Routing	Invert	Outlet Devices
#0	Secondary	37.50'	**Automatic Storage Overflow** (Discharged without head)
#1	Discarded	35.25'	**1.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 32.25' Phase-In= 0.10'

Discarded OutFlow Max=0.03 cfs @ 12.25 hrs HW=37.50' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.03 cfs)

Secondary OutFlow Max=0.00 cfs @ 12.32 hrs HW=37.50' TW=31.67' (Dynamic Tailwater)

Summary for Pond 14P: Focal Point #1

[90] Warning: Qout>Qin may require smaller dt or Finer Routing
[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=8)

Inflow Area = 0.226 ac, 94.21% Impervious, Inflow Depth = 6.82" for 25-Year Storm event
Inflow = 1.55 cfs @ 12.09 hrs, Volume= 0.129 af
Outflow = 1.55 cfs @ 12.09 hrs, Volume= 0.129 af, Atten= 0%, Lag= 0.2 min
Primary = 1.55 cfs @ 12.09 hrs, Volume= 0.129 af
Routed to Pond 18P : Underground Detention

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 37.94' @ 12.09 hrs Surf.Area= 123 sf Storage= 45 cf

Plug-Flow detention time= 0.9 min calculated for 0.129 af (100% of inflow)
Center-of-Mass det. time= 0.9 min (749.8 - 748.9)

Volume	Invert	Avail.Storage	Storage Description
#1	35.25'	18 cf	**4.00'W x 10.00'L x 2.25'H Focal Point** 90 cf Overall x 20.0% Voids
#2	37.50'	58 cf	**Surface Bowl (Prismatic)**Listed below (Recalc)
		76 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
37.50	40	0	0
38.00	89	32	32
38.25	119	26	58

Device	Routing	Invert	Outlet Devices
#1	Primary	34.50'	**12.0" Round Culvert** L= 113.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 34.50' / 33.60' S= 0.0080 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	35.25'	**100.000 in/hr Exfiltration over Surface area** Phase-In= 0.10'
#3	Device 1	37.75'	**18.0" Horiz. Orifice/Grate** C= 0.600

Limited to weir flow at low heads

Primary OutFlow Max=1.52 cfs @ 12.09 hrs HW=37.94' TW=34.45' (Dynamic Tailwater)
└─**1=Culvert** (Passes 1.52 cfs of 5.12 cfs potential flow)
  ├─**2=Exfiltration** (Exfiltration Controls 0.28 cfs)
  └─**3=Orifice/Grate** (Weir Controls 1.23 cfs @ 1.41 fps)

Summary for Pond 15P: Jellyfish #1

Inflow Area = 0.330 ac, 97.80% Impervious, Inflow Depth = 6.82" for 25-Year Storm event
Inflow = 2.26 cfs @ 12.09 hrs, Volume= 0.188 af
Outflow = 2.26 cfs @ 12.09 hrs, Volume= 0.188 af, Atten= 0%, Lag= 0.0 min
Primary = 2.26 cfs @ 12.09 hrs, Volume= 0.188 af
Routed to Pond 18P : Underground Detention

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 35.34' @ 12.45 hrs
Flood Elev= 36.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	33.15'	**15.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 33.15' / 32.80' S= 0.0175 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=2.20 cfs @ 12.09 hrs HW=34.66' TW=34.43' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 2.20 cfs @ 1.80 fps)

Summary for Pond 16P: Jellyfish #2

Inflow Area = 0.224 ac, 95.92% Impervious, Inflow Depth = 6.82" for 25-Year Storm event
Inflow = 1.54 cfs @ 12.09 hrs, Volume= 0.127 af
Outflow = 1.54 cfs @ 12.09 hrs, Volume= 0.127 af, Atten= 0%, Lag= 0.0 min
Primary = 1.54 cfs @ 12.09 hrs, Volume= 0.127 af
Routed to Pond DMH1 : Drain Manhole 1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 35.34' @ 12.46 hrs
Flood Elev= 36.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	33.25'	**15.0" Round Culvert** L= 12.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 33.25' / 33.10' S= 0.0125 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=1.51 cfs @ 12.09 hrs HW=34.64' TW=34.53' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 1.51 cfs @ 1.23 fps)

Summary for Pond 17P: Pocket Pond

Inflow Area = 0.116 ac, 75.26% Impervious, Inflow Depth = 6.43" for 25-Year Storm event
Inflow = 0.58 cfs @ 12.14 hrs, Volume= 0.062 af
Outflow = 0.36 cfs @ 12.31 hrs, Volume= 0.062 af, Atten= 37%, Lag= 10.4 min
Primary = 0.36 cfs @ 12.31 hrs, Volume= 0.062 af
Routed to Pond AP3 : Existing Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 36.08' @ 12.31 hrs Surf.Area= 533 sf Storage= 704 cf

Plug-Flow detention time= 119.9 min calculated for 0.062 af (100% of inflow)
Center-of-Mass det. time= 119.8 min (925.2 - 805.4)

Volume	Invert	Avail.Storage	Storage Description
#1	33.00'	953 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
33.00	20	24.0	0	0	20
34.00	127	46.0	66	66	147
36.00	514	83.0	598	663	549
36.50	646	93.0	289	953	695

Device	Routing	Invert	Outlet Devices
#1	Primary	33.00'	**12.0" Round Culvert** L= 16.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 33.00' / 32.50' S= 0.0313 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	33.00'	**1.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	36.00'	**6.0' long + 3.0 '/' SideZ x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.35 cfs @ 12.31 hrs HW=36.08' TW=31.52' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.05 cfs of 4.79 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 0.05 cfs @ 8.44 fps)
- **3=Broad-Crested Rectangular Weir** (Weir Controls 0.30 cfs @ 0.65 fps)

Summary for Pond 18P: Underground Detention

Inflow Area = 0.781 ac, 96.22% Impervious, Inflow Depth = 6.82" for 25-Year Storm event
Inflow = 5.35 cfs @ 12.09 hrs, Volume= 0.444 af
Outflow = 1.29 cfs @ 12.47 hrs, Volume= 0.443 af, Atten= 76%, Lag= 22.9 min
Primary = 1.29 cfs @ 12.47 hrs, Volume= 0.443 af
Routed to Reach 2Ra : Channel through 1S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3

Peak Elev= 35.33' @ 12.47 hrs Surf.Area= 2,688 sf Storage= 8,591 cf

Plug-Flow detention time= 224.3 min calculated for 0.443 af (100% of inflow)
Center-of-Mass det. time= 225.1 min (974.2 - 749.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	31.75'	0 cf	**24.00'W x 112.00'L x 4.67'H Field A** 12,553 cf Overall - 12,553 cf Embedded = 0 cf x 40.0% Voids
#2A	31.75'	9,600 cf	**Shea Leaching Chamber 8x14x4.7**x 24 Inside #1 Inside= 84.0"W x 48.0"H => 30.77 sf x 13.00'L = 400.0 cf Outside= 96.0"W x 56.0"H => 37.36 sf x 14.00'L = 523.0 cf 24 Chambers in 3 Rows
		9,600 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	31.75'	**15.0" Round Culvert** L= 13.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 31.75' / 31.60' S= 0.0115 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Device 1	31.75'	**2.5" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 2	31.75'	**4.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	34.00'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Device 1	35.35'	**4.0' long x 0.40' rise Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=1.29 cfs @ 12.47 hrs HW=35.33' TW=24.86' (Dynamic Tailwater)
- **1=Culvert** (Passes 1.29 cfs of 8.02 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 0.31 cfs @ 8.97 fps)
    - **3=Orifice/Grate** (Passes 0.31 cfs of 0.78 cfs potential flow)
  - **4=Orifice/Grate** (Orifice Controls 0.98 cfs @ 5.00 fps)
  - **5=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond AP3: Existing Pond

15" CMP culvert inlet is buried. Contractor to uncover culvert inlet and replace with 18" HDPE.

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[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=10)

Inflow Area = 6.784 ac, 52.81% Impervious, Inflow Depth = 5.55" for 25-Year Storm event
Inflow = 25.54 cfs @ 12.35 hrs, Volume= 3.140 af
Outflow = 15.02 cfs @ 12.67 hrs, Volume= 3.140 af, Atten= 41%, Lag= 19.1 min
Primary = 15.02 cfs @ 12.67 hrs, Volume= 3.140 af
Routed to Reach 2RA : Channel through 1S

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 32.66' @ 12.67 hrs Surf.Area= 10,746 sf Storage= 16,731 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 5.8 min (818.3 - 812.5)

Volume	Invert	Avail.Storage	Storage Description
#1	27.00'	104,428 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
27.00	20	5.7	0	0	20
28.00	37	24.0	28	28	66
30.00	2,236	218.0	1,707	1,735	3,810
32.00	7,294	444.0	9,046	10,781	15,734
34.00	19,719	933.0	26,004	36,785	69,335
35.50	43,192	1,107.0	46,047	82,832	97,623
36.00	43,192	1,107.0	21,596	104,428	98,177

Device	Routing	Invert	Outlet Devices
#1	Primary	27.00'	**18.0" Round Culvert** L= 160.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 27.00' / 26.20' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=15.01 cfs @ 12.67 hrs HW=32.66' TW=24.86' (Dynamic Tailwater)
↳**1=Culvert** (Barrel Controls 15.01 cfs @ 8.50 fps)

Summary for Pond DMH1: Drain Manhole 1

Inflow Area = 0.224 ac, 95.92% Impervious, Inflow Depth = 6.82" for 25-Year Storm event
Inflow = 1.54 cfs @ 12.09 hrs, Volume= 0.127 af
Outflow = 1.54 cfs @ 12.09 hrs, Volume= 0.127 af, Atten= 0%, Lag= 0.0 min
Primary = 1.54 cfs @ 12.09 hrs, Volume= 0.127 af
Routed to Pond 18P : Underground Detention

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 35.34' @ 12.46 hrs
Flood Elev= 37.20'

Device	Routing	Invert	Outlet Devices
#1	Primary	33.00'	**15.0" Round Culvert** L= 8.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 33.00' / 32.90' S= 0.0125 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=1.49 cfs @ 12.09 hrs HW=34.53' TW=34.43' (Dynamic Tailwater)
↳**1=Culvert** (Inlet Controls 1.49 cfs @ 1.22 fps)

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Subcatchment1S Runoff Area=180,817 sf 28.87% Impervious Runoff Depth=6.08"
Flow Length=577' Tc=13.9 min CN=79 Runoff=22.57 cfs 2.103 af

Subcatchment2S: Subcatchment2S Runoff Area=12,083 sf 72.53% Impervious Runoff Depth=7.53"
Flow Length=106' Tc=10.9 min CN=91 Runoff=1.91 cfs 0.174 af

Subcatchment3S: Subcatchment3S Runoff Area=290,437 sf 52.42% Impervious Runoff Depth=6.92"
Flow Length=604' Tc=26.3 min CN=86 Runoff=31.21 cfs 3.847 af

Subcatchment4S: Subcatchment4S Runoff Area=4,647 sf 58.90% Impervious Runoff Depth=7.17"
Tc=6.0 min CN=88 Runoff=0.83 cfs 0.064 af

Subcatchment5S: Subcatchment5S Runoff Area=430 sf 0.00% Impervious Runoff Depth=5.47"
Tc=6.0 min CN=74 Runoff=0.06 cfs 0.005 af

Subcatchment6S: Subcatchment6S Runoff Area=8,122 sf 55.43% Impervious Runoff Depth=7.04"
Flow Length=149' Tc=12.0 min CN=87 Runoff=1.20 cfs 0.109 af

Subcatchment7S: Subcatchment7S Runoff Area=29,318 sf 12.60% Impervious Runoff Depth=5.60"
Flow Length=200' Tc=15.8 min CN=75 Runoff=3.25 cfs 0.314 af

Subcatchment8S: Subcatchment8S Runoff Area=83,551 sf 80.82% Impervious Runoff Depth=7.77"
Tc=144.0 min CN=93 Runoff=3.64 cfs 1.242 af

Subcatchment9S: Subcatchment27S Runoff Area=4,764 sf 21.83% Impervious Runoff Depth=6.08"
Tc=144.0 min CN=79 Runoff=0.17 cfs 0.055 af

Subcatchment10S: Subcatchment10S Runoff Area=951 sf 0.00% Impervious Runoff Depth=5.47"
Tc=6.0 min CN=74 Runoff=0.14 cfs 0.010 af

Subcatchment11S: Subcatchment11S Runoff Area=2,774 sf 98.34% Impervious Runoff Depth=8.37"
Tc=6.0 min CN=98 Runoff=0.53 cfs 0.044 af

Subcatchment12S: Subcatchment12S Runoff Area=2,207 sf 98.60% Impervious Runoff Depth=8.37"
Tc=6.0 min CN=98 Runoff=0.42 cfs 0.035 af

Subcatchment13S: Subcatchment13S Runoff Area=1,902 sf 85.80% Impervious Runoff Depth=8.37"
Tc=6.0 min CN=98 Runoff=0.36 cfs 0.030 af

Subcatchment14S: Subcatchment14S Runoff Area=1,422 sf 86.08% Impervious Runoff Depth=8.37"
Tc=6.0 min CN=98 Runoff=0.27 cfs 0.023 af

Subcatchment15S: Subcatchment15S Runoff Area=1,104 sf 100.00% Impervious Runoff Depth=8.37"
Tc=6.0 min CN=98 Runoff=0.21 cfs 0.018 af

Subcatchment16S: Subcatchment16S Runoff Area=1,104 sf 100.00% Impervious Runoff Depth=8.37"
Tc=6.0 min CN=98 Runoff=0.21 cfs 0.018 af

Subcatchment17S: Subcatchment17S Runoff Area=1,104 sf 100.00% Impervious Runoff Depth=8.37"
Tc=6.0 min CN=98 Runoff=0.21 cfs 0.018 af

Subcatchment18S: Subcatchment18S Runoff Area=1,093 sf 98.08% Impervious Runoff Depth=8.37"
Tc=6.0 min CN=98 Runoff=0.21 cfs 0.018 af

Subcatchment19S: Subcatchment19S Runoff Area=1,645 sf 98.72% Impervious Runoff Depth=8.37"
Tc=6.0 min CN=98 Runoff=0.31 cfs 0.026 af

Subcatchment20S: Subcatchment20S Runoff Area=1,093 sf 98.08% Impervious Runoff Depth=8.37"
Tc=6.0 min CN=98 Runoff=0.21 cfs 0.018 af

Subcatchment21S: Subcatchment21S Runoff Area=2,728 sf 100.00% Impervious Runoff Depth=8.37"
Tc=6.0 min CN=98 Runoff=0.52 cfs 0.044 af

Subcatchment22S: Subcatchment22S Runoff Area=9,860 sf 94.21% Impervious Runoff Depth=8.25"
Tc=6.0 min CN=97 Runoff=1.86 cfs 0.156 af

Subcatchment23S: Subcatchment23S Runoff Area=14,386 sf 97.80% Impervious Runoff Depth=8.25"
Tc=6.0 min CN=97 Runoff=2.72 cfs 0.227 af

Subcatchment24S: Subcatchment24S Runoff Area=9,757 sf 95.92% Impervious Runoff Depth=8.25"
Tc=6.0 min CN=97 Runoff=1.84 cfs 0.154 af

Subcatchment25S: Subcatchment25S Runoff Area=5,889 sf 0.00% Impervious Runoff Depth=5.47"
Flow Length=158' Tc=6.4 min CN=74 Runoff=0.84 cfs 0.062 af

Subcatchment26S: Subcatchment26S Runoff Area=1,141 sf 0.00% Impervious Runoff Depth=5.47"
Tc=6.0 min CN=74 Runoff=0.16 cfs 0.012 af

Reach 2Ra: Channel through 1S Avg. Flow Depth=0.91' Max Vel=4.30 fps Inflow=18.60 cfs 4.688 af
n=0.040 L=136.0' S=0.0294 '/' Capacity=1,586.21 cfs Outflow=18.62 cfs 4.688 af

Reach 2Rb: Channel through 1S Avg. Flow Depth=0.29' Max Vel=3.12 fps Inflow=18.72 cfs 4.711 af
n=0.040 L=153.0' S=0.0392 '/' Capacity=4,170.50 cfs Outflow=18.70 cfs 4.711 af

Reach 2Rc: Channel through 1S Avg. Flow Depth=0.42' Max Vel=2.56 fps Inflow=22.89 cfs 5.202 af
n=0.040 L=303.0' S=0.0165 '/' Capacity=2,705.34 cfs Outflow=22.76 cfs 5.202 af

Reach 3R: 15" HDPE P-111 Avg. Flow Depth=0.66' Max Vel=5.46 fps Inflow=3.61 cfs 0.358 af
15.0" Round Pipe n=0.012 L=86.0' S=0.0087 '/' Capacity=6.54 cfs Outflow=3.61 cfs 0.358 af

Reach 4R: Flow through 1S Avg. Flow Depth=0.43' Max Vel=3.62 fps Inflow=3.61 cfs 0.358 af
n=0.030 L=40.0' S=0.0313 '/' Capacity=23.40 cfs Outflow=3.62 cfs 0.358 af

Reach 5R: 15" HDPE P-112 Avg. Flow Depth=0.61' Max Vel=6.29 fps Inflow=3.71 cfs 0.370 af
15.0" Round Pipe n=0.012 L=12.0' S=0.0125 '/' Capacity=7.82 cfs Outflow=3.71 cfs 0.370 af

Reach 6R: Flow through 1S Avg. Flow Depth=0.44' Max Vel=3.69 fps Inflow=3.71 cfs 0.370 af
n=0.030 L=53.0' S=0.0321 '/' Capacity=23.71 cfs Outflow=3.72 cfs 0.370 af

Reach 7R: Existing Wet Channel Avg. Flow Depth=0.25' Max Vel=3.49 fps Inflow=4.26 cfs 0.430 af
n=0.030 L=65.0' S=0.0554 '/' Capacity=88.27 cfs Outflow=4.26 cfs 0.430 af

Reach 8R: 15" HDPE P-113 Avg. Flow Depth=0.42' Max Vel=13.29 fps Inflow=4.80 cfs 0.491 af
15.0" Round Pipe n=0.012 L=40.0' S=0.0800 '/' Capacity=19.79 cfs Outflow=4.80 cfs 0.491 af

Reach 9R: 12" HDPEP-114 Avg. Flow Depth=0.36' Max Vel=7.38 fps Inflow=1.91 cfs 0.174 af
12.0" Round Pipe n=0.013 L=14.0' S=0.0357 '/' Capacity=6.73 cfs Outflow=1.91 cfs 0.174 af

Reach AP1: Analysis Point 1 Inflow=43.87 cfs 7.305 af
Outflow=43.87 cfs 7.305 af

Reach AP2: Analysis Point 2 Inflow=1.91 cfs 0.174 af
Outflow=1.91 cfs 0.174 af

Reach AP4: Analysis Point 4 Inflow=0.83 cfs 0.064 af
Outflow=0.83 cfs 0.064 af

Reach AP5: Analysis Point 5 Inflow=0.06 cfs 0.005 af
Outflow=0.06 cfs 0.005 af

Reach AP6: Analysis Point 6 Inflow=1.20 cfs 0.109 af
Outflow=1.20 cfs 0.109 af

Pond 1P: Porous Pavement Section #1 Peak Elev=34.76' Storage=10,314 cf Inflow=3.64 cfs 1.242 af
Discarded=3.01 cfs 1.242 af Primary=0.00 cfs 0.000 af Outflow=3.01 cfs 1.242 af

Pond 2P: Porous Concrete Walkway Peak Elev=32.94' Storage=372 cf Inflow=0.36 cfs 0.064 af
Discarded=0.17 cfs 0.064 af Primary=0.00 cfs 0.000 af Outflow=0.17 cfs 0.064 af

Pond 3P: Filtration Drip Edge #1 Peak Elev=36.55' Storage=0.003 af Inflow=0.53 cfs 0.044 af
Outflow=0.45 cfs 0.044 af

Pond 4P: Filtration Drip Edge #2 Peak Elev=37.75' Storage=0.004 af Inflow=0.42 cfs 0.035 af
Primary=0.26 cfs 0.035 af Secondary=0.00 cfs 0.000 af Outflow=0.26 cfs 0.035 af

Pond 5P: Filtration Drip Edge #3 Peak Elev=36.89' Storage=0.004 af Inflow=0.36 cfs 0.030 af
Outflow=0.27 cfs 0.030 af

Pond 6P: Filtration Drip Edge #4 Peak Elev=33.89' Storage=0.001 af Inflow=0.27 cfs 0.023 af
Outflow=0.23 cfs 0.023 af

Pond 7P: Filtration Drip Edge #5 Peak Elev=25.19' Storage=0.002 af Inflow=0.21 cfs 0.018 af
Outflow=0.21 cfs 0.016 af

Pond 8P: Filtration Drip Edge #6 Peak Elev=25.19' Storage=0.002 af Inflow=0.21 cfs 0.018 af
Outflow=0.21 cfs 0.016 af

Pond 9P: Filtration Drip Edge #7 Peak Elev=23.48' Storage=0.001 af Inflow=0.21 cfs 0.018 af
Outflow=0.19 cfs 0.018 af

Pond 10P: Filtration Drip Edge #8 Peak Elev=31.34' Storage=0.001 af Inflow=0.21 cfs 0.018 af
Outflow=0.19 cfs 0.017 af

Pond 11P: Filtration Drip Edge #9 Peak Elev=32.83' Storage=0.003 af Inflow=0.49 cfs 0.044 af
Outflow=0.45 cfs 0.043 af

Pond 12P: Filtration Drip Edge #10 Peak Elev=33.72' Storage=0.001 af Inflow=0.21 cfs 0.018 af
Outflow=0.18 cfs 0.018 af

Pond 13P: Infiltration Drip Edge #11 Peak Elev=37.50' Storage=0.013 af Inflow=0.52 cfs 0.044 af
Discarded=0.03 cfs 0.035 af Secondary=0.33 cfs 0.009 af Outflow=0.35 cfs 0.044 af

Pond 14P: Focal Point #1 Peak Elev=37.97' Storage=48 cf Inflow=1.86 cfs 0.156 af
Outflow=1.87 cfs 0.156 af

Pond 15P: Jellyfish #1 Peak Elev=35.70' Inflow=2.72 cfs 0.227 af
15.0" Round Culvert n=0.012 L=20.0' S=0.0175 '/' Outflow=2.72 cfs 0.227 af

Pond 16P: Jellyfish #2 Peak Elev=35.69' Inflow=1.84 cfs 0.154 af
15.0" Round Culvert n=0.012 L=12.0' S=0.0125 '/' Outflow=1.84 cfs 0.154 af

Pond 17P: Pocket Pond Peak Elev=36.12' Storage=726 cf Inflow=0.67 cfs 0.076 af
Outflow=0.65 cfs 0.076 af

Pond 18P: Underground Detention Peak Elev=35.61' Storage=9,259 cf Inflow=6.43 cfs 0.537 af
Outflow=3.11 cfs 0.536 af

Pond AP3: Existing Pond Peak Elev=33.40' Storage=26,355 cf Inflow=31.67 cfs 3.923 af
18.0" Round Culvert n=0.013 L=160.0' S=0.0050 '/' Outflow=16.10 cfs 3.923 af

Pond DMH1: Drain Manhole 1 Peak Elev=35.64' Inflow=1.84 cfs 0.154 af
15.0" Round Culvert n=0.012 L=8.0' S=0.0125 '/' Outflow=1.84 cfs 0.154 af

Total Runoff Area = 15.480 ac Runoff Volume = 8.823 af Average Runoff Depth = 6.84"
49.13% Pervious = 7.606 ac 50.87% Impervious = 7.874 ac

APPENDIX III

Test Pit Logs

GOVE ENVIRONMENTAL SERVICES, INC.

TEST PIT DATA

Project 76 Portsmouth Ave, Exeter, NH
Client Green & Co.
GES Project No. 2024047
MM/DD/YY Staff 07-2-2024 James Gove, CSS#004

Test Pit No.	**6001**	Soils Series: Boxford	
ESHWT::	16”	Landscape: Forested	
Termination @	60”	Slope: B	
Refusal:	No	Parent Material: Marine	
Obs. Water:	None	Hydrologic Soil Group:	C

Horizon	Color (Munsell)	Texture	Structure-Consistence-Redox
A 0-7”	10YR3/2	silt loam	granular-friable-none
Bw 7-16”	10YR4/4	silt loam	granular-friable-none
Cd 16-60”	2.5Y5/3	silty clay loam	blocky-firm-5% Conc.

Test Pit No.	**6003**	Soils Series: Boxford	
ESHWT::	18”	Landscape: Forested	
Termination @	68”	Slope: B	
Refusal:	No	Parent Material: Marine	
Obs. Water:	None	Hydrologic Soil Group:	C

Horizon	Color (Munsell)	Texture	Structure-Consistence-Redox
A 0-7”	10YR3/2	silt loam	granular-friable-none
Bw 7-18”	10YR4/4	silt loam	granular-friable-none
Cd 18-68”	2.5Y5/3	silty clay loam	blocky-firm-5% Conc.

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Test Pit No.	**6007**	Soils Series: Scitico	
ESHWT::	5”	Landscape: Forested	
Termination @	60”	Slope: C	
Refusal:	No	Parent Material: Marine	
Obs. Water:	None	Hydrologic Soil Group:	C

Horizon	Color (Munsell)	Texture	Structure-Consistence-Redox
A 0-5”	10YR3/2	silt loam	blocky-friable-none
Cd 5-60”	2.5Y5/3	silty clay loam	blocky-firm-5% Conc.

Test Pit No.	**6010**	Soils Series: Scitico	
ESHWT::	10”	Landscape: Forested	
Termination @	40”	Slope: B	
Refusal:	No	Parent Material: Marine	
Obs. Water:	None	Hydrologic Soil Group:	C

Horizon	Color (Munsell)	Texture	Structure-Consistence-Redox
A 0-10”	10YR3/2	silt loam	granular-friable-none
Cd 10-40”	2.5Y5/32	silty clay loam	blocky-firm-5% Conc.

Test Pit No.	**6016**	Soils Series: Eldridge	
ESHWT::	26”	Landscape: Forested	
Termination @	60”	Slope: B	
Refusal:	No	Parent Material: Marine	
Obs. Water:	None	Hydrologic Soil Group:	C

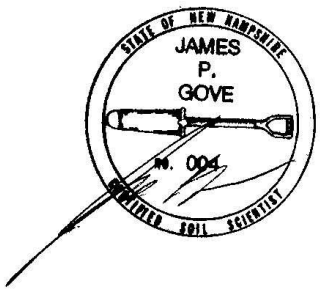
Horizon	Color (Munsell)	Texture	Structure-Consistence-Redox
A 0-9”	10YR3/2	sand	granular-friable-none
Bw1 9-26”	10YR5/8	sand	massive-friable-none
Bw1 26-31	10YR5/8	sand	massive-friable-10% Conc.
Cd 31-60”	2.5Y5/3	silty clay loam	blocky-firm-10% Conc.

Test Pit No.	**6017**	Soils Series: Eldridge	
ESHWT::	19”	Landscape: Forested	
Termination @	55”	Slope: B	
Refusal:	No	Parent Material: Marine	
Obs. Water:	None	Hydrologic Soil Group:	C

Horizon	Color (Munsell)	Texture	Structure-Consistence-Redox
A 0-6”	10YR3/2	loamy sand	granular-friable-none
Bw 6-19”	10YR4/4	loamy sand	granular-friable-none
Cd 19-55”	2.5Y5/3	silty clay loam	blocky-firm-5% Conc.

Test Pit No.	**SB**	Soils Series: Boxford	
ESHWT::	20”	Landscape: Forested	
Termination @	70”	Slope: B	
Refusal:	No	Parent Material: Marine	
Obs. Water:	None	Hydrologic Soil Group:	C

Horizon	Color (Munsell)	Texture	Structure-Consistence-Redox
A 0-6”	10YR3/2	silt loam	granular-friable-none
Bw 6-20”	10YR4/6	silt loam	granular-friable-none
Cd 20-70”	2.5Y5/3	silty clay loam	blocky-firm-10% Conc.


STATE OF NEW HAMPSHIRE
JAMES
P.
GOVE
NO. 004
CERTIFIED SOIL SCIENTIST

APPENDIX IV

Site Specific Soil Survey Report and Map

GOVE ENVIRONMENTAL SERVICES, INC

SITE-SPECIFIC SOIL SURVEY REPORT
For
79 Portsmouth Avenue, Exeter, NH
By
GES, Inc.
Project # 2024047
Date: 10-22-2024

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 10-22-2024; 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" = 50"

Contours Interval: 2 feet

2. LANDFORMS & EXISTING CONDITIONS:

The site is located on both developed areas and forested areas. The developed areas are virtually all pavement for building. The forested areas are relatively natural with the exception of old agricultural ditching, some of which are man-made wetlands. The largest wetlands are natural, a with the upland forest areas. All of the soils show signs of past agricultural activities, like plowing and the ditching noted above. At this point, the forested upland areas support a diverse mix of mature trees.

3. DATE SOIL MAP PRODUCED

Date(s) of on-site field work: 7-2-2024 (Wetlands flagged by others).

Date(s) of test pits: 7-2-2024

Test pits recorded by: James Gove, CSS#004

4. GEOGRAPHIC LOCATION AND SIZE OF SITE

City or town where soil mapping was conducted: Exeter

Location: Tax Map 65, Lot 118

Size of area: Approximately 6.7 acres

Was the map for the entire lot? No

If no, where was the mapping conducted on the parcel: On the development portion.

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? Jones and Beach Engineers, Inc.

6. SOIL IDENTIFICATION LEGEND

Map Unit Symbol	Map Unit Name	HISS Symbol	Hydrologic Soil Group
32	Boxford silt loam	353	C
33	Scitico silt loam	553	C
38	Eldridge loamy sand	343	C
134	Maybid mucky silt loam	653	D
953	Boxford SWPD	453	C
299/dfccc	Udorthents, smoothed	363	C
500/dfccc	Udorthents, loamy	363	C
600/ffccd	Endoaquents, loamy	563	D
699	Urban Land	n/a	n/a

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: 32

CORRELATED SOIL SERIES: Boxford

LANDSCAPE SETTING: Hill and hill side

CHARACTERISTIC SURFACE FEATURES: Smoothed, forested, ditched

DRAINAGE CLASS: Moderately well drained

PARENT MATERIAL: Marine Silt and Clay

NATURE OF DISSIMILAR INCLUSIONS: Somewhat 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:

Horizon	Color (Munsell)	Texture	Structure-Consistence-Redox
A 0-7”	10YR3/2	silt loam	granular-friable-none
Bw 7-18”	10YR4/4	silt loam	granular-friable-none
Cd 18-68”	2.5Y5/3	silty clay loam	blocky-firm-5% Conc. 5YR5/6

ESHWT = 18”, OBSWT = none, Coarse fragments = none, Water table = perched, Lithic contact = none

SITE-SPECIFIC MAP UNIT: 33

CORRELATED SOIL SERIES: Scitico

LANDSCAPE SETTING: Wetlands, depressions and drainages

CHARACTERISTIC SURFACE FEATURES: Forested, pit and mound

DRAINAGE CLASS: Poorly Drained

PARENT MATERIAL: Marine Silt and Clays

NATURE OF DISSIMILAR INCLUSIONS: Maybid

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:

Horizon	Color (Munsell)	Texture	Structure-Consistence-Redox
A 0-5”	10YR3/2	silt loam	blocky-friable-none
Cd 5-60”	2.5Y5/2	silty clay loam	blocky-firm-5% Conc. 5YR5/6

ESHWT = 0”, OBSWT = none, Water table = perched, Coarse fragments = none,

Lithic contact = none

SITE-SPECIFIC MAP UNIT: 38

CORRELATED SOIL SERIES: Eldridge

LANDSCAPE SETTING: Hill top and side

CHARACTERISTIC SURFACE FEATURES: Forested, smoothed.

DRAINAGE CLASS: Moderately well drained

PARENT MATERIAL: Sand/loam over silt/clay

NATURE OF DISSIMILAR INCLUSIONS: Boxford

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:

Horizon	Color (Munsell)	Texture	Structure-Consistence-Redox
A 0-9”	10YR3/2	sand	granular-friable-none
Bw1 9-26”	10YR5/8	sand	massive-friable-none
Bw1 26-31	10YR5/8	sand	massive-friable-10% Conc. 5YR5/6
Cd 31-60”	2.5Y5/3	silty clay loam	blocky-firm-10% Conc. 5YR5/6

ESHWT = 26”, OBSWT = none, Water table = perched, Coarse fragments = none, Lithic contact = none

SITE-SPECIFIC MAP UNIT: 134

CORRELATED SOIL SERIES: Maybid

LANDSCAPE SETTING: Low depression

CHARACTERISTIC SURFACE FEATURES: Pit and mound, small trees, soft soil

DRAINAGE CLASS: Very poorly drained

PARENT MATERIAL: Marine silt and clays

NATURE OF DISSIMILAR INCLUSIONS: Scitico

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:

Oa 0-5", muck. 10YR2/1, massive, friable

A 5-10", silt, 10YR2/1, massive, friable

C 10-20", silty clay loam, 2.5Y5/1, massive, firm, redox 2.5YR5/8

ESHWT = 0", OBSWT = 10", Water table = perched, Coarse fragments = none, Lithic contact = none

SITE-SPECIFIC MAP UNIT: 953

CORRELATED SOIL SERIES: Boxford somewhat poorly drained

LANDSCAPE SETTING: Lower hill slopes

CHARACTERISTIC SURFACE FEATURES: Smoothed, forested

DRAINAGE CLASS: Somewhat poorly drained

PARENT MATERIAL: Marine silts and clays

NATURE OF DISSIMILAR INCLUSIONS: Boxford

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:

Horizon	Color (Munsell)	Texture	Structure-Consistence-Redox
A 0-5”	10YR3/2	silt loam	blocky-friable-none
B/C 5-15”	2.5Y5/3	silt loam	blocky-friable- 5% Conc. 5YR5/6
Cd 15-60”	2.5Y5/2	silty clay loam	blocky-firm-5% Conc. %YR5/8

ESHWT = 5”, OBSWT = none, Water table – perched, Coarse fragments = none, Lithic contact = none

299/dfccc Udorhents, smoothed

Moderately well drained (d), marine silt and clay deposits (f), mineral restrictive layer of silty clay loam (c), estimated Ksat low (c), hydrologic soil group C (c), man-made land adjacent to urban land.

500/dfccc Udorthents, loamy

Moderately well drained (d), marine silt and clay deposits (f), mineral restrictive layer of silty clay loam (c), estimated Ksat low (c), hydrologic soil group C (c), man-made land – cut slope.

600/ffccd Endoaquents, loamy

Poorly drained (f), marine silt and clay deposits (f), mineral restrictive layer of silty clay loam and dense glacial till (c), estimated Ksat low (c), hydrologic soil group (d), man-made land – ditch.

699 Urban land --- pavement/building

8. RESPONSIBLE SOIL SCIENTIST

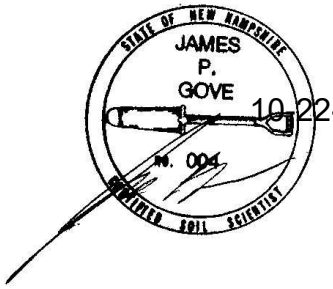
Name: James Gove

Certified Soil Scientist Number: 004

9. OTHER DISTINGUISHING FEATURES OF SITE

Old farmland that has developed into forest.

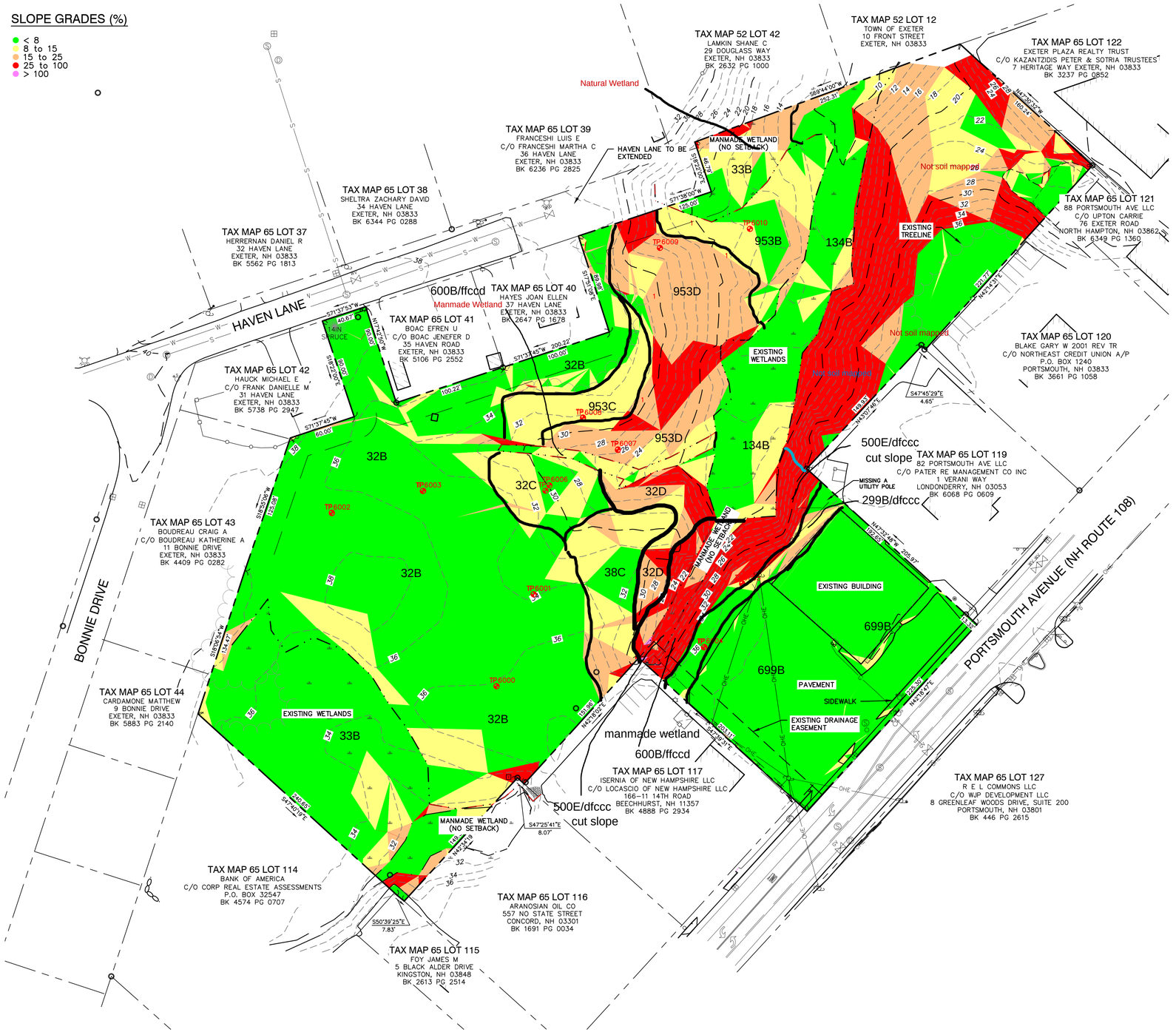
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STATE OF NEW HAMPSHIRE
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10-22-2024
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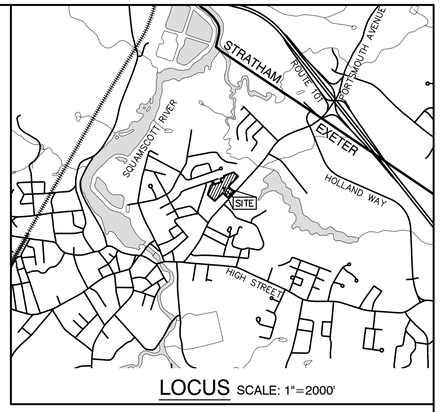
SLOPE GRADES (%)

- < 8
- 8 to 15
- 15 to 25
- 25 to 100
- > 100



PLAN REFERENCES

1. "PLAN OF DRAINAGE EASEMENT, EXETER, NH, PREPARED FOR EXETER HOSPITAL" BY KIMBALL CHASE, DATED MAY 23, 1988. R.C.R.D. PLAN #D-18012.
2. "LOT LINE CHANGE FOR GARY W. BLAKE, EXETER, NH" BY PARKER SURVEY ASSOC., INC., DATED JANUARY 12, 1984. R.C.R.D. PLAN #C-12104.
3. "SUBDIVISION OF LAND FOR JOHN W. FLYNN, EXETER, NH" BY KIMBALL CHASE COMPANY, INC., DATED FEBUARY 11, 1988. R.C.R.D. PLAN #D-17605.
4. "BOUNDARY AND TOPOGRAPHIC PLAN FOR STAR ENTERPRISE, EXETER, NH" BY STORCH ASSOCIATES, DATED JUNE 15, 1999. R.C.R.D. PLAN #D-22270.
5. "EASEMENT PLAN FOR COLLISHAW – FOY AGENCY INC., EXETER, NH" BY CORNERSTONE ASSOCIATES INC., DATED OCTOBER 31, 1995. R.C.R.D. PLAN #C-24287.
6. "PLAN OF LAND FOR HENRY & ROBERTA A. SHEPARD AND CHARLES A. & EVA S. KOIRTH, EXETER, NH" BY JOHN W. DURGIN CIVIL ENGINEERS, DATED JULY 17, 1963. PLAN #108.
7. "PLAN OF LOTS, PROPERTY OF J. EVERETT TOWLE, EXETER, NH" BY ARTHUR W. DUDLEY, C.E., DATED 1924. PLAN #0671.
8. "PROPOSED SEWER EASEMENT, ACROSS LAND OF JEAN & SUE E. PULVER, EXETER, NH" BY JOHN W. DURGIN CIVIL ENGINEERS, DATED JULY 1952. NR–PLAN.
9. "PLAN OF COUNTRY CLUB ESTATES FOR DOUGLAS E. HUNTER, EXETER, NH" BY CHESTER A. LEACH, C.E., DATED JUNE 14, 1950. NR–PLAN #01481.
10. "A PORTION OF THE LAND OF JEAN AND SUE PULVER, EXETER, NH" BY LEACH AND HUNTER, DATED OCTOBER 4, 1949. NR–PLAN #01721.
11. "PLOT OF LAND FOR CARROLS DEVELOPMENT CORP & CHICAGO TITLE COMPANY, EXETER, NH" BY UNITED SURVEYORS & ENGRS., DATED MARCH 20, 1970. R.C.R.D. PLAN #1726.
12. "PLAN OF LAND FOR JEAN A. & SUE E PULVER, EXETER, NH" BY JOHN W. DURGIN CIVIL ENGINEERS, DATED AUGUST 1951. NR–PLAN #01823.
13. "PLAN OF LAND FOR JEAN A. & SUE E. PULVER, EXETER, NH" BY JOHN W. DURGIN CIVIL ENGINEERS, DATED AUGUST 1951. NR–PLAN #02551.
14. "PART OF COUNTRY CLUB ESTATES, SCALE: 1 IN = 40 FT" BY JOHN W. DURGIN CIVIL ENGINEERS, DATED AUGUST 4TH, 1955. NR–PLAN #02552.
15. "PLOT PLAN FOR HENRY SHEPARD & CHARLES KOIRTH, EXETER, NH" BY T.A. NOWAK, DATED APRIL 1958. NR–PLAN #02680.
16. "SUBDIVISION OF LAND, SIMONS TO ROCKINGHAM NATIONAL BANK, EXETER, NH" BY JOHN W. DURGIN CIVIL ENGINEERS, DATED MAY 2, 1972. R.C.R.D. PLAN #D–2924.
17. "PLAN OF LOTS FOR JEAN A. & SUE E. PULVER, EXETER, NH" BY JOHN W. DURGIN CIVIL ENGINEERS, DATED MAY, 1950. NR–R.C.R.D. #10339.
18. "THE STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION, RIGHT OF WAY PLANS, PROPOSED FEDERAL AID PROJECT, FEDERAL PROJECT NO.: STP–X–5153(005), NH PROJECT NO.10025B, NH ROUTE 108" BY NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION. NR–PLAN #3447.



LOCUS SCALE: 1"=2000'

EXISTING CONDITIONS NOTES:

1. UNDERGROUND FACILITIES, UTILITIES AND STRUCTURES HAVE BEEN PLOTTED FROM FIELD OBSERVATION AND THEIR LOCATION MUST BE CONSIDERED APPROXIMATE ONLY. NEITHER JONES & BEACH ENGINEERS, INC., NOR ANY OF THEIR EMPLOYEES TAKE RESPONSIBILITY FOR THE LOCATION OF ANY UNDERGROUND STRUCTURES OR UTILITIES NOT SHOWN THAT MAY EXIST. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE ALL UNDERGROUND STRUCTURES AND/OR UTILITIES LOCATED PRIOR TO EXCAVATION WORK BY CALLING 1–888–DIG–SAFE (1–888–344–7233).
2. VERTICAL DATUM: XXXXXX, HORIZONTAL DATUM: XXXXXX
3. BASE ELEVATION WAS ESTABLISHED THROUGH MULTIPLE GPS POST PROCESS OBSERVATIONS AND WAS REDUCED TO THE NAVD88 DATUM BY THE NATIONAL GEODETIC SURVEY OPUS SOFTWARE.
4. SUBJECT PROPERTY LOCATED WITHIN FEDERALLY DESIGNATED FLOOD HAZARD ZONE. REFERENCE FEMA COMMUNITY PANEL NO. 33015C0406E, DATED 5/16/2005.
5. THE LIMITS OF JURISDICTIONAL WETLANDS WERE DELINEATED BY (FILL IN NAME)(ZZZ) DURING SPRING, 2010, USING (EQUIPMENT) AND IN ACCORDANCE WITH THE FOLLOWING GUIDANCE DOCUMENTS:

   a. THE CORPS OF ENGINEERS FEDERAL MANUAL FOR IDENTIFYING AND DELINEATING JURISDICTIONAL WETLANDS.

   b. THE NORTH CENTRAL & NORTHEAST REGIONAL SUPPLEMENT TO THE FEDERAL MANUAL.

   c. THE CURRENT VERSION OF THE FIELD INDICATORS FOR IDENTIFYING HYDRIC SOILS IN NEW ENGLAND, AS PUBLISHED BY THE NEW ENGLAND INTERSTATE WATER POLLUTION CONTROL COMMISSION AND/OR THE CURRENT VERSION OF THE FIELD INDICATORS OF HYDRIC SOILS IN THE UNITED STATES, AS PUBLISHED BY THE USDA, NRCS, AS APPROPRIATE.

   d. THE CURRENT NATIONAL LIST OF PLANT SPECIES THAT OCCUR IN WETLANDS, AS PUBLISHED BY THE US FISH AND WILDLIFE SERVICE.
7. HIGH INTENSITY SOIL MAPPING WAS PERFORMED BY (FILL IN NAME)(ZZZ), DURING SPRING, 2010, TO THE STANDARDS OF HIGH INTENSITY SOIL MAPS FOR NEW HAMPSHIRE: STANDARDS (2002: SOCIETY OF SOIL SCIENTISTS OF NORTHERN NEW ENGLAND).
8. SITE–SPECIFIC SOIL MAPPING WAS PERFORMED BY GOVE ENVIRONMENTAL SERVICES, INC. DURING SPRING, 2010, AND IS BASED ON THE STANDARDS OF SITE–SPECIFIC SOIL MAPPING STANDARDS FOR NEW HAMPSHIRE AND VERMONT, VERSION 2.0 (1999: SOCIETY OF SOIL SCIENTISTS OF NORTHERN NEW ENGLAND). THE MAP IS WITHIN THE TECHNICAL STANDARDS OF THE NATIONAL COOPERATIVE SOIL SURVEY. IT IS A SPECIAL PURPOSE PRODUCT INTENDED FOR THE USE(S) REQUIRING THE SITE SPECIFIC SOIL SURVEY AND IS PRODUCED BY A CERTIFIED SOIL SCIENTIST. IT IS NOT A PRODUCT OF THE USDA NATURAL RESOURCES CONSERVATION SERVICE. A NARRATIVE REPORT IS A COMPONENT OF THE MAP.
9. A TEMPORARY CULVERT AND ROADBED SHALL BE IN PLACE PRIOR TO ANY USE OF A WETLAND CROSSING.
10. WETLAND IMPACTS SHALL NOT OCCUR UNTIL ALL PERMITS HAVE BEEN ACQUIRED AND IMPACT MITIGATION REQUIREMENTS HAVE BEEN SATISFIED.
11. TEST PITS PERFORMED BY JAMES GOVE, GOVE ENVIRONMENTAL SERVICES, INC., 7/2/24.
12. WETLAND BOUNDARIES AND CONSTRUCTION LIMITS ARE TO BE CLEARLY MARKED PRIOR TO THE START OF CONSTRUCTION.

REFERENCE

PROJECT PARCEL
TOWN OF EXETER
TAX MAP 65, LOT 118

APPLICANT
GREEN & COMPANY
11 LAFAYETTE RD
PO BOX 1297
NORTH HAMPTON, NH 03862

TOTAL LOT AREA
291,630 SQ. FT.
6.7 ACRES

Design: MLS	Draft: GDR
Checked: WGM	Scale: 1"=50'
Date: 3/15/24	Project No.: 24029
Drawing Name: 24029-CONCEPT-6.dwg	

THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION FROM JONES & BEACH ENGINEERS, INC. (JBE). ANY ALTERATIONS, AUTHORIZED OR OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO JBE.

REV.	DATE	REVISION	BY
3	8/19/24	PLAN SET	KDR
2	7/29/24	CONCEPT 3	KDR
1	6/6/24	REVISED PER CLIENT	PSL
0	4/11/24	ISSUED FOR REVIEW	PSL

Designed and Produced in NH
Jones & Beach Engineers, Inc.
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
Civil Engineering Services
603-772-4746
E-MAIL: JBE@JONESANDBEACH.COM

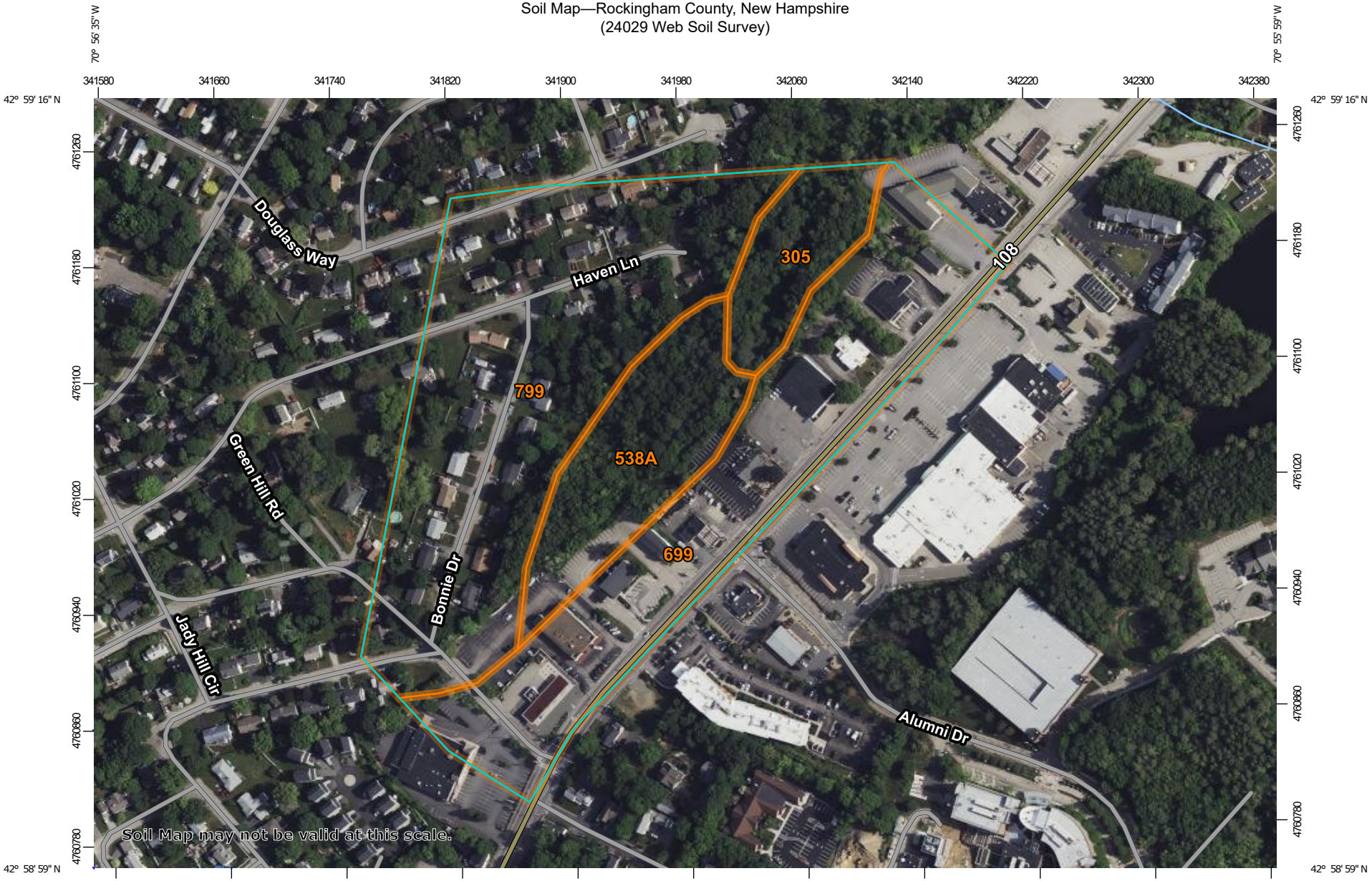
Plan Name:	EXISTING CONDITIONS PLAN
Project:	NAME OF PROJECT 76 PORTSMOUTH AVE, EXETER, NH
Owner of Record:	RAP REALTY MANCHESTER LLC 50 ATLANTIC AVE, SEABROOK, NH

DRAWING No.
C1
SHEET 2 OF12
JBE PROJECT NO. 24029

APPENDIX V

NRCS Soil Map

Soil Map—Rockingham County, New Hampshire
(24029 Web Soil Survey)



Map Scale: 1:3,740 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 150 300 600 900

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

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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 27, Sep 3, 2024

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
305	Lim-Pootatuck complex	2.1	7.5%
538A	Squamscott fine sandy loam, 0 to 5 percent slopes	3.8	13.9%
699	Urban land	9.4	33.8%
799	Urban land-Canton complex, 3 to 15 percent slopes	12.4	44.8%
Totals for Area of Interest		**27.8**	**100.0%**

APPENDIX VI

Extreme Precipitation Estimates

Extreme Precipitation in New York & New England

An Interactive Web Tool for Extreme Precipitation Analysis

About this Project | Data & Products | Daily Monitoring | Documentation

Select Product

- Extreme Precipitation Tables - HTML
- Extreme Precipitation Tables - Text/CSV
- Partial Duration Series - by Point
- Partial Duration Series - by Station
- Distribution Curves - Graphical
- Distribution Curves - Text/TBL
- Intensity Frequency Duration Graphs
- Precipitation Frequency Duration Graphs
- GIS Data Files
- Regional/State Maps

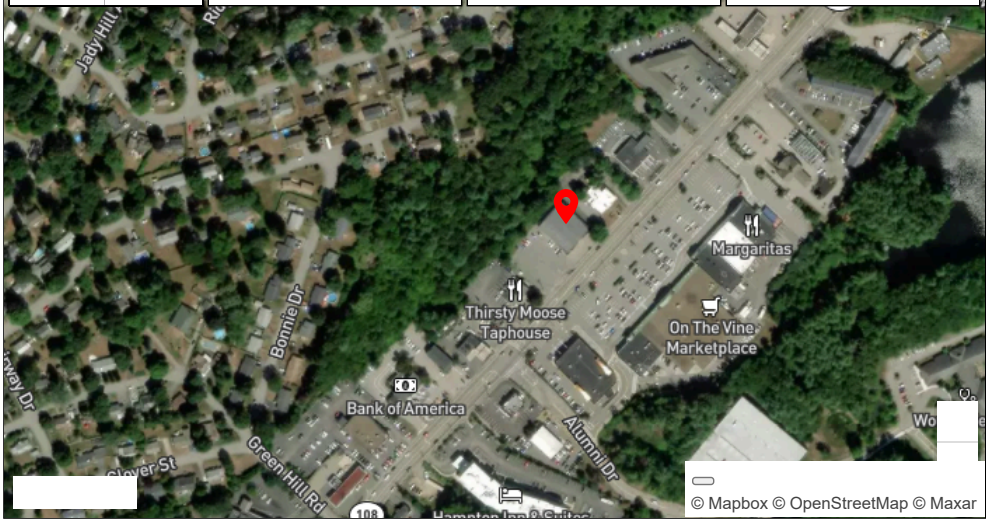
Select Location *Double-click map to place a marker, or enter address or latitude/longitude.*

Hybrid | Map | Satellite | Terrain

Locate by Address: 76 Portsmouth Avenue,

Locate by Lat/Lon: 42.98(°N -70.93 °W

Locate by State/County:



Select Options

Smoothing: Yes

Delivery: Popup

Submit

Version 2.0 Copyright 2010-2022

This project is a joint collaboration between:

Northeast Regional Climate Center (NRCC) | Natural Resources Conservation Service (NRCS)

Cornell University

Contact: precip@cornell.edu

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	
Location	
Latitude	42.986 degrees North
Longitude	70.937 degrees West
Elevation	10 feet
Date/Time	Tue Oct 22 2024 11:45:48 GMT-0400 (Eastern Daylight Time)

Added 15% to precipitation estimates due to location in Great Bay / Coastal Community
1 Year: 2.68*1.15 = 3.08 in
2 Year: 3.22*1.15 = 3.70 in
10 Year: 4.91*1.15 = 5.65 in
25 Year: 6.24*1.15 = 7.18 in
50 Year: 7.49*1.15 = 8.61 in

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7d
1yr	0.26	0.40	0.50	0.66	0.82	1.04	**1yr**	0.71	0.99	1.22	1.57	2.05	2.68	2.91	**1yr**	2.37	2.80	3.21	3.
2yr	0.32	0.50	0.62	0.82	1.02	1.30	**2yr**	0.88	1.18	1.52	1.94	2.49	3.22	3.57	**2yr**	2.85	3.43	3.94	4.
5yr	0.37	0.58	0.73	0.98	1.25	1.62	**5yr**	1.08	1.47	1.90	2.45	3.16	4.09	4.59	**5yr**	3.62	4.41	5.05	5.
10yr	0.41	0.65	0.83	1.12	1.46	1.90	**10yr**	1.26	1.73	2.25	2.92	3.78	4.91	5.56	**10yr**	4.34	5.34	6.09	7.
25yr	0.48	0.77	0.98	1.35	1.79	2.36	**25yr**	1.55	2.15	2.80	3.67	4.79	6.24	7.15	**25yr**	5.52	6.88	7.80	9.
50yr	0.54	0.87	1.11	1.56	2.10	2.79	**50yr**	1.81	2.54	3.33	4.38	5.74	7.49	8.66	**50yr**	6.63	8.33	9.42	11
100yr	0.61	0.98	1.27	1.80	2.45	3.30	**100yr**	2.12	3.00	3.96	5.24	6.88	9.00	10.49	**100yr**	7.96	10.09	11.37	13
200yr	0.69	1.12	1.45	2.08	2.87	3.90	**200yr**	2.48	3.55	4.70	6.24	8.23	10.81	12.71	**200yr**	9.56	12.23	13.73	16
500yr	0.82	1.34	1.75	2.54	3.55	4.86	**500yr**	3.06	4.43	5.88	7.87	10.44	13.77	16.39	**500yr**	12.19	15.76	17.62	20

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7d
1yr	0.24	0.37	0.45	0.60	0.74	0.89	**1yr**	0.64	0.87	0.95	1.26	1.55	2.28	2.54	**1yr**	2.02	2.44	2.89	3.
2yr	0.32	0.49	0.60	0.81	1.00	1.19	**2yr**	0.87	1.16	1.37	1.82	2.33	3.11	3.50	**2yr**	2.75	3.36	3.85	4.
5yr	0.36	0.55	0.68	0.93	1.19	1.42	**5yr**	1.03	1.39	1.62	2.12	2.74	3.82	4.28	**5yr**	3.38	4.11	4.72	5.
10yr	0.39	0.61	0.75	1.05	1.35	1.63	**10yr**	1.17	1.59	1.82	2.40	3.07	4.41	4.97	**10yr**	3.90	4.78	5.49	6.
25yr	0.45	0.69	0.86	1.23	1.61	1.95	**25yr**	1.39	1.90	2.12	2.78	3.58	4.90	6.06	**25yr**	4.34	5.82	6.68	7.
50yr	0.50	0.77	0.95	1.37	1.85	2.24	**50yr**	1.59	2.19	2.36	3.12	4.01	5.54	7.02	**50yr**	4.91	6.75	7.76	9.
100yr	0.57	0.85	1.07	1.55	2.12	2.57	**100yr**	1.83	2.51	2.65	3.48	4.48	6.25	8.12	**100yr**	5.53	7.81	9.00	10
200yr	0.63	0.95	1.20	1.74	2.43	2.95	**200yr**	2.10	2.88	2.95	3.88	4.99	7.01	9.65	**200yr**	6.21	9.28	10.45	12
500yr	0.74	1.11	1.42	2.07	2.94	3.56	**500yr**	2.54	3.48	3.42	4.48	5.80	8.14	11.77	**500yr**	7.20	11.32	12.71	14

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7d
1yr	0.28	0.44	0.54	0.72	0.89	1.08	**1yr**	0.76	1.06	1.26	1.71	2.17	2.97	3.10	**1yr**	2.63	2.98	3.57	4.
2yr	0.33	0.51	0.63	0.86	1.05	1.26	**2yr**	0.91	1.23	1.48	1.95	2.49	3.40	3.66	**2yr**	3.01	3.52	4.05	4.
5yr	0.40	0.62	0.77	1.05	1.34	1.61	**5yr**	1.16	1.58	1.87	2.49	3.17	4.37	4.92	**5yr**	3.87	4.73	5.40	6.
10yr	0.47	0.73	0.90	1.26	1.63	1.97	**10yr**	1.41	1.93	2.26	3.03	3.82	5.44	6.16	**10yr**	4.81	5.92	6.76	7.
25yr	0.59	0.89	1.11	1.58	2.08	2.56	**25yr**	1.80	2.50	2.93	3.93	4.90	7.66	8.32	**25yr**	6.78	8.00	9.07	10
50yr	0.68	1.04	1.30	1.86	2.51	3.11	**50yr**	2.17	3.04	3.56	4.79	5.94	9.60	10.45	**50yr**	8.49	10.05	11.36	13
100yr	0.81	1.22	1.53	2.21	3.02	3.78	**100yr**	2.61	3.69	4.33	5.86	7.21	12.03	13.14	**100yr**	10.65	12.64	14.21	16
200yr	0.95	1.42	1.80	2.61	3.64	4.60	**200yr**	3.14	4.50	5.28	7.17	8.73	15.14	16.17	**200yr**	13.40	15.55	17.81	20
500yr	1.18	1.75	2.25	3.27	4.65	5.96	**500yr**	4.01	5.83	6.86	9.37	11.28	20.53	21.82	**500yr**	18.17	20.98	23.97	27

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Northeast Regional Climate Center

APPENDIX VII

Manning's Full-Flow Equation for Existing 48" CMP and Proposed 48" HDPE

Using Manning's Qfull Equation to verify that the proposed 48" HDPE pipe is appropriately sized.
Where the flow through the existing upstream 48" CMP is unknown, it is assumed to be flowing at full capacity.

Manning's Qfull Equation (Existing 48" CMP)	Diameter (ft)	Slope (ft/ft)	Pipe Material	n value	Qfull (cfs)
Q=[(0.463D^(8/3))(S^1/2)]/n	4	0.008	CMP	0.025	66.78505

Q= flow in cfs
D= pipe diameter in feet
S= pipe slope in ft/ft
n= Manning's number for pipe material

Manning's Qfull Equation (Proposed 48" ADS-N12 HDPE)	Diameter (ft)	Slope (ft/ft)	Pipe Material	n value	Qfull (cfs)
Q=[(0.463D^(8/3))(S^1/2)]/n	4	0.02	ADS-N12 HDPE	0.013	203.0701

Q= flow in cfs
D= pipe diameter in feet
S= pipe slope in ft/ft
n= Manning's number for pipe material

50-Year Peak Flow from upstream 12" HDPE (9R in Post-Construction HydroCAD Model) = 1.91 cfs
50-Year Peak Flow from upstream 18" HDPE (AP3 in Post-Construction HydroCAD Model) = 16.10 cfs
Peak flow through proposed 48" HDPE pipe = 66.79+1.91+16.10 = **84.80 cfs < 203.07 cfs Qfull**

APPENDIX VIII

Rip Rap Design Calculations

RIP RAP CALCULATIONS
"Lilac Place"
76 Portsmouth Avenue
Exeter, NH

Jones & Beach Engineers, Inc.
P.O. Box 219
Stratham, NH 03885
11/2/2024 REVISED 1/10/2025 REVISED 2/12/2025 REVISED 3/13/2025

Rip Rap equations were obtained from the *Stormwater Management and Erosion Control Handbook for Urban and Developing Areas in New Hampshire.*
Aprons are sized for the 25-Year storm event.

TAILWATER < HALF THE D_o

$L_a = (1.8 \times Q) / D_0^{3/2} + (7 \times D_o)$
$W = L_a + (3 \times D_o)$ or defined channel width
$d_{50} = (0.02 \times Q^{4/3}) / (T_w \times D_0)$

Culvert or Catch Basin (Sta. No.)	Tailwater (Feet) T_w	Discharge (C.F.S.) Q	Diameter of Pipe D_o	Length of Rip Rap L_a (feet)	Width of Rip Rap W (feet)	d_{50}-Median Stone Rip Rap d50 (feet)
3R - 15" HDPE (#1)	0.57	2.82	1.25	12.4	16	0.11
5R - 15" HDPE (#2)	0.53	2.89	1.25	12.5	16	0.12
8R - 15" HDPE (#3)	0.37	3.72	1.25	13.5	17	0.25
18P - 15" HDPE (#4)	0.36	1.29	1.25	10.4	14	0.06
17P - 12" HDPE (#5) *	0.06	0.05	1	7.1	10	0.01

Although the 25-year peak discharge from 17P is 0.14 cfs, 0.09 cfs outlets through the spillway and only 0.05 cfs outlets through the 12" HDPE pipe upstream of rip rap apron #5.

TAILWATER > HALF THE D_o

$L_a = (3.0 \times Q) / D_0^{3/2} + (7 \times D_o)$
$W = (0.4 \times L_a) + (3 \times D_o)$ or defined channel width
$d_{50} = (0.02 \times Q^{4/3}) / (T_w \times D_0)$

Culvert or Catch Basin (Sta. No.)	Tailwater (Feet) T_w	Discharge (C.F.S.) Q	Diameter of Pipe D_o	Length of Rip Rap L_a (feet)	Width of Rip Rap W (feet)	d_{50}-Median Stone Rip Rap d50 (feet)
				#DIV/0!	#DIV/0!	#DIV/0!

Table 7-24 -- Recommended Rip Rap Gradation Ranges				
d_{50} Size =	0.25	Feet	3	Inches
% of Weight Smaller		Size of Stone (Inches)		
Than the Given d_{50} Size		From		To
100%		5		6
85%		4		5
50%		3		5
15%		1		2

Table 7-24 -- Recommended Rip Rap Gradation Ranges				
d_{50} Size =	0.5	Feet	6	Inches
% of Weight Smaller		Size of Stone (Inches)		
Than the Given d_{50} Size		From		To
100%		9		12
85%		8		11
50%		6		9
15%		2		3

APPENDIX IX

BMP and GRV Worksheets

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

	ac	Area of HSG A soil that was replaced by impervious cover	0.40"
	ac	Area of HSG B soil that was replaced by impervious cover	0.25"
1.69	ac	Area of HSG C soil that was replaced by impervious cover	0.10"
	ac	Area of HSG D soil or impervious cover that was replaced by impervious cover	0.0"
0.10	inches	Rd = Weighted groundwater recharge depth	
0.1691	ac-in	GRV = AI * Rd	
614	cf	GRV conversion (ac-in x 43,560 sf/ac x 1ft/12”)	

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

Porous Pavement: 16,554 cf GRV provided

Porous Concrete Walkway: 637 cf GRV provided

Building 11 Stone Drip Edge: 574 cf GRV provided

16554+637+574 = 17,765 cf GRV Provided >>> 614 cf GRV required.

FILTRATION PRACTICE DESIGN CRITERIA
(Env-Wq 1508.07)

Type/Node Name: **Porous Pavement Area #1 / 1P**

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

Yes		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.07(a).	
1.92	ac	A = Area draining to the practice	
1.55	ac	A_I = Impervious area draining to the practice	
0.81	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.78	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
1.49	ac-in	WQV= 1" x Rv x A	
5,412	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
1,353	cf	25% x WQV (check calc for sediment forebay volume)	
4,059	cf	75% x WQV (check calc for surface sand filter volume)	
N/A - Porous		Method of Pretreatment? (not required for clean or roof runoff)	
	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	**≥ 25%WQV**
Calculate time to drain if system IS NOT underdrained:			
22,647	sf	A_{SA} = Surface area of the practice	
1.00	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
		If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided?	
N/A	Yes/No	(Use the calculations below)	
2.9	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	**≤ 72-hrs**
Calculate time to drain if system IS underdrained:			
	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
-	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	**≤ 72-hrs**
34.00	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
N/A	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
32.83	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
30.00	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
#VALUE!	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	**≥ 1'**
4.00	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	**≥ 1'**
1.17	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	**≥ 1'**
34.76	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
35.83	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	**← yes**
If a surface sand filter or underground sand filter is proposed:			
YES	ac	Drainage Area check.	**< 10 ac**
	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ 75%WQV**
	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course specification.	
	Yes/No	Access grate provided?	**← yes**

If a bioretention area is proposed:			
YES	ac	Drainage Area no larger than 5 ac?	**← yes**
	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ WQV**
	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course specification	
	:1	Pond side slopes	**≥ 3:1**
Sheet		Note what sheet in the plan set contains the planting plans and surface cover	
If porous pavement is proposed:			
Porous Asphalt		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
0.5	acres	A_{SA} = Surface area of the pervious pavement	
3.7	:1	Ratio of the contributing area to the pervious surface area	**≤ 5:1**
12" *	inches	D_{FC} = Filter course thickness	**12", or 18" if within GPA mod. 304.1 (see spec)**
Sheet	D8	Note what sheet in the plan set contains the filter course spec.	

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

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

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

Designer's Notes:

* Filter course thickness is 12" through most of the practice but is 18" for the small section that is in a WSIPA.

Point of interest (where top of pavement is closest to existing grade) is between buildings 4&5

Nearby TP 6016 reveals 26" depth to SHWT and dug to 60" depth without encountering bedrock

Existing grade = 35.0 so SHWT = 35.0-26/12 = 32.83

Lowest elevation of test pit = 35.0-5 = 30.0

Stage-Area-Storage for Pond 1P: Porous Pavement Section #1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
32.82	**22,647**	0
32.87	22,647	203
32.92	22,647	405
32.97	22,647	608
33.02	22,647	811
33.07	22,647	1,014
33.12	22,647	1,554
33.17	22,647	2,095
33.22	22,647	2,635
33.27	22,647	3,176
33.32	22,647	3,716
33.37	22,647	4,257
33.42	22,647	4,797
33.47	22,647	5,338
33.52	22,647	5,878
33.57	22,647	6,419
33.62	22,647	6,959
33.67	22,647	7,500
33.72	22,647	8,041
33.77	22,647	8,378
33.82	22,647	8,581
33.87	22,647	8,784
33.92	22,647	8,986
33.97	22,647	9,189
34.02	22,647	9,311
34.07	22,647	9,378
34.12	22,647	9,446
34.17	22,647	9,514
34.22	22,647	9,581
34.27	22,647	9,649
34.32	22,647	9,716
34.37	22,647	9,784
34.42	22,647	9,851
34.47	22,647	9,919
34.52	22,647	9,986
34.57	22,647	10,054
34.62	22,647	10,122
34.67	22,647	10,189
34.72	22,647	10,257
34.77	22,647	10,324
34.82	22,647	10,392
34.87	22,647	10,459
34.92	22,647	10,527
34.97	22,647	10,595
35.02	22,647	10,865
35.07	22,647	11,270
35.12	22,647	11,676
35.17	22,647	12,081
35.22	22,647	12,486
35.27	22,647	12,892
35.32	22,647	13,297
35.37	22,647	13,703
35.42	22,647	14,108
35.47	22,647	14,513
35.52	22,647	14,797
35.57	22,647	15,000
35.62	22,647	15,203
35.67	22,647	15,405
35.72	22,647	15,608
35.77	22,647	15,811
35.82	22,647	**16,013**

FILTRATION PRACTICE DESIGN CRITERIA
(Env-Wq 1508.07)

Type/Node Name: **Porous Concrete Walkway / 2P**

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

Yes		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.07(a).	
0.11	ac	A = Area draining to the practice	
0.02	ac	A_I = Impervious area draining to the practice	
0.22	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.25	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.03	ac-in	WQV= 1" x Rv x A	
98	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
24	cf	25% x WQV (check calc for sediment forebay volume)	
73	cf	75% x WQV (check calc for surface sand filter volume)	
N/A - Porous		Method of Pretreatment? (not required for clean or roof runoff)	
	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	**≥ 25%WQV**
Calculate time to drain if system IS NOT underdrained:			
1,040	sf	A_{SA} = Surface area of the practice	
1.00	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
		If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided?	
N/A	Yes/No	(Use the calculations below)	
1.1	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	**≤ 72-hrs**
Calculate time to drain if system IS underdrained:			
	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
-	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	**≤ 72-hrs**
32.67	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
N/A	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
31.50	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
28.00	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
#VALUE!	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	**≥ 1'**
4.67	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	**≥ 1'**
1.17	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	**≥ 1'**
32.94	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
34.50	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	**← yes**
If a surface sand filter or underground sand filter is proposed:			
YES	ac	Drainage Area check.	**< 10 ac**
	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ 75%WQV**
	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course specification.	
	Yes/No	Access grate provided?	**← yes**

If a bioretention area is proposed:			
YES	ac	Drainage Area no larger than 5 ac?	**← yes**
	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ WQV**
	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course specification	
	:1	Pond side slopes	**≥ 3:1**
Sheet		Note what sheet in the plan set contains the planting plans and surface cover	
If porous pavement is proposed:			
Porous Concrete		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
0.0	acres	A_{SA} = Surface area of the pervious pavement	
4.6	:1	Ratio of the contributing area to the pervious surface area	**≤ 5:1**
12.0	inches	D_{FC} = Filter course thickness	**12", or 18" if within GPA mod. 304.1 (see spec)**
Sheet	D8	Note what sheet in the plan set contains the filter course spec.	

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

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

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

Designer's Notes:

Test pit 6003 used for SHWT determination.

Top of concrete = 34.5 so bottom of stone = 31.5

Ex. Grade = 33.0, 18" SHWT depth and 68" to bottom of test pit.

SHWT = 33.0-18/12 = 31.5, bottom of test pit = 33.0-68/12 = 27.33

SHWT cannot be modelled directl yat bottom of stone. Modelled 3" below to ensure that proximity of SHWT to bottom of stone is not yielding inaccurate results. SHWT modelled at el. 31.25

Stage-Area-Storage for Pond 2P: Porous Concrete Walkway

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
31.49	**1,040**	0
31.54	1,040	8
31.59	1,040	16
31.64	1,040	23
31.69	1,040	31
31.74	1,040	39
31.79	1,040	60
31.84	1,040	81
31.89	1,040	101
31.94	1,040	122
31.99	1,040	143
32.04	1,040	164
32.09	1,040	185
32.14	1,040	205
32.19	1,040	226
32.24	1,040	247
32.29	1,040	268
32.34	1,040	289
32.39	1,040	309
32.44	1,040	322
32.49	1,040	330
32.54	1,040	338
32.59	1,040	346
32.64	1,040	354
32.69	1,040	358
32.74	1,040	361
32.79	1,040	363
32.84	1,040	366
32.89	1,040	369
32.94	1,040	371
32.99	1,040	374
33.04	1,040	376
33.09	1,040	379
33.14	1,040	382
33.19	1,040	384
33.24	1,040	387
33.29	1,040	389
33.34	1,040	392
33.39	1,040	395
33.44	1,040	397
33.49	1,040	400
33.54	1,040	402
33.59	1,040	405
33.64	1,040	408
33.69	1,040	418
33.74	1,040	434
33.79	1,040	449
33.84	1,040	465
33.89	1,040	480
33.94	1,040	496
33.99	1,040	512
34.04	1,040	527
34.09	1,040	543
34.14	1,040	558
34.19	1,040	569
34.24	1,040	577
34.29	1,040	585
34.34	1,040	593
34.39	1,040	601
34.44	1,040	608
34.49	1,040	**616**

FILTRATION PRACTICE DESIGN CRITERIA
(Env-Wq 1508.07)

Type/Node Name: **Filtration Drip Edge #1 / 3P**

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

Yes		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.07(a).	
0.06	ac	A = Area draining to the practice	
0.06	ac	A_I = Impervious area draining to the practice	
0.98	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.94	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.06	ac-in	WQV= 1" x Rv x A	
217	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
54	cf	25% x WQV (check calc for sediment forebay volume)	
163	cf	75% x WQV (check calc for surface sand filter volume)	
N/A - Roof Runoff		Method of Pretreatment? (not required for clean or roof runoff)	
	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	**≥ 25%WQV**
Calculate time to drain if system IS NOT underdrained:			
	sf	A_{SA} = Surface area of the practice	
	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
	Yes/No	If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided? (Use the calculations below)	
-	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	**≤ 72-hrs**
Calculate time to drain if system IS underdrained:			
37.99	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
0.67	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
0.18	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	**≤ 72-hrs**
36.25	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
35.25	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
N/A	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
N/A	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
1.00	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	**≥ 1'**
#VALUE!	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	**≥ 1'**
#VALUE!	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	**≥ 1'**
36.55	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
38.00	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	**← yes**
If a surface sand filter or underground sand filter is proposed:			
YES	ac	Drainage Area check.	**< 10 ac**
	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ 75%WQV**
	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course specification.	
	Yes/No	Access grate provided?	**← yes**

If a bioretention area is proposed:			
YES	ac	Drainage Area no larger than 5 ac?	**← yes**
218	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ WQV**
18.0	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet	D5	Note what sheet in the plan set contains the filter course specification	
3.0	:1	Pond side slopes	**> 3:1**
Sheet	D5	Note what sheet in the plan set contains the planting plans and surface cover	
If porous pavement is proposed:			
		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
	acres	A_{SA} = Surface area of the pervious pavement	
	:1	Ratio of the contributing area to the pervious surface area	**≤ 5:1**
	inches	D_{FC} = Filter course thickness	**12", or 18" if within GPA mod. 304.1 (see spec)**
Sheet		Note what sheet in the plan set contains the filter course spec.	

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

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

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

Designer's Notes: Filtration Drip Edge is similar to bioretention system - See AOT-2662 approved documents

Coarse stone layer: 3.25*131*0.75*.4 = 127.7 cf

Pea stone layer: 3.25*131*0.25*0.15 = 16.0 cf (Cumulative = 127.7+16.0 = 143.7 cf)

Filter course: 3.25*131*1.5*0.05 = 31.9 cf (Cumulative = 143.7+31.9 = 175.6 cf)

Top stone layer: 3.25*131*0.25*0.4 = 42.6 cf (Cumulative = 175.6+42.6 = 218.2 cf)

Determination of WQV Elevation:

Total storage volume - Required WQV = 218.5-217 = 1.5 cf

1.5/(3.25*131*.4) = 0.01 ft

E(WQV) = 38-0.01 = 37.99

Stage-Area-Storage for Pond 3P: Filtration Drip Edge #1

Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
35.25	0.000	36.29	0.003	37.33	0.004
35.27	0.000	36.31	0.003	37.35	0.004
35.29	0.000	36.33	0.003	37.37	0.004
35.31	0.000	36.35	0.003	37.39	0.004
35.33	0.000	36.37	0.003	37.41	0.004
35.35	0.000	36.39	0.003	37.43	0.004
35.37	0.000	36.41	0.003	37.45	0.004
35.39	0.001	36.43	0.003	37.47	0.004
35.41	0.001	36.45	0.003	37.49	0.004
35.43	0.001	36.47	0.003	37.51	0.004
35.45	0.001	36.49	0.003	37.53	0.004
35.47	0.001	36.51	0.003	37.55	0.004
35.49	0.001	36.53	0.003	37.57	0.004
35.51	0.001	36.55	0.003	37.59	0.004
35.53	0.001	36.57	0.003	37.61	0.004
35.55	0.001	36.59	0.003	37.63	0.004
35.57	0.001	36.61	0.003	37.65	0.004
35.59	0.001	36.63	0.003	37.67	0.004
35.61	0.001	36.65	0.003	37.69	0.004
35.63	0.001	36.67	0.004	37.71	0.004
35.65	0.002	36.69	0.004	37.73	0.004
35.67	0.002	36.71	0.004	37.75	0.004
35.69	0.002	36.73	0.004	37.77	0.004
35.71	0.002	36.75	0.004	37.79	0.004
35.73	0.002	36.77	0.004	37.81	0.004
35.75	0.002	36.79	0.004	37.83	0.004
35.77	0.002	36.81	0.004	37.85	0.004
35.79	0.002	36.83	0.004	37.87	0.005
35.81	0.002	36.85	0.004	37.89	0.005
35.83	0.002	36.87	0.004	37.91	0.005
35.85	0.002	36.89	0.004	37.93	0.005
35.87	0.002	36.91	0.004	37.95	0.005
35.89	0.003	36.93	0.004	37.97	0.005
35.91	0.003	36.95	0.004	37.99	**0.005**
35.93	0.003	36.97	0.004		
35.95	0.003	36.99	0.004		
35.97	0.003	37.01	0.004		
35.99	0.003	37.03	0.004		
36.01	0.003	37.05	0.004		
36.03	0.003	37.07	0.004		
36.05	0.003	37.09	0.004		
36.07	0.003	37.11	0.004		
36.09	0.003	37.13	0.004		
36.11	0.003	37.15	0.004		
36.13	0.003	37.17	0.004		
36.15	0.003	37.19	0.004		
36.17	0.003	37.21	0.004		
36.19	0.003	37.23	0.004		
36.21	0.003	37.25	0.004		
36.23	0.003	37.27	0.004		
36.25	0.003	37.29	0.004		
36.27	0.003	37.31	0.004		

See storage volume and WQV elevation calculations on BMP worksheet E(WQV)=37.99

Stage-Discharge for Pond 3P: Filtration Drip Edge #1

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
35.25	0.00	36.29	0.39	37.33	0.58
35.27	0.00	36.31	0.40	37.35	0.58
35.29	0.00	36.33	0.40	37.37	0.59
35.31	0.01	36.35	0.41	37.39	0.59
35.33	0.02	36.37	0.41	37.41	0.59
35.35	0.02	36.39	0.41	37.43	0.60
35.37	0.03	36.41	0.42	37.45	0.60
35.39	0.04	36.43	0.42	37.47	0.60
35.41	0.06	36.45	0.43	37.49	0.61
35.43	0.07	36.47	0.43	37.51	0.61
35.45	0.08	36.49	0.44	37.53	0.61
35.47	0.10	36.51	0.44	37.55	0.61
35.49	0.11	36.53	0.44	37.57	0.62
35.51	0.13	36.55	0.45	37.59	0.62
35.53	0.14	36.57	0.45	37.61	0.62
35.55	0.15	36.59	0.46	37.63	0.63
35.57	0.17	36.61	0.46	37.65	0.63
35.59	0.17	36.63	0.46	37.67	0.63
35.61	0.18	36.65	0.47	37.69	0.63
35.63	0.19	36.67	0.47	37.71	0.64
35.65	0.20	36.69	0.47	37.73	0.64
35.67	0.21	36.71	0.48	37.75	0.64
35.69	0.22	36.73	0.48	37.77	0.64
35.71	0.23	36.75	0.49	37.79	0.65
35.73	0.24	36.77	0.49	37.81	0.65
35.75	0.24	36.79	0.49	37.83	0.65
35.77	0.25	36.81	0.50	37.85	0.66
35.79	0.26	36.83	0.50	37.87	0.66
35.81	0.26	36.85	0.50	37.89	0.66
35.83	0.27	36.87	0.51	37.91	0.66
35.85	0.28	36.89	0.51	37.93	0.67
35.87	0.28	36.91	0.51	37.95	0.67
35.89	0.29	36.93	0.52	37.97	0.67
35.91	0.30	36.95	0.52	37.99	**0.67**
35.93	0.30	36.97	0.52		
35.95	0.31	36.99	0.53		
35.97	0.31	37.01	0.53		
35.99	0.32	37.03	0.53		
36.01	0.32	37.05	0.54		
36.03	0.33	37.07	0.54		
36.05	0.33	37.09	0.54		
36.07	0.34	37.11	0.55		
36.09	0.34	37.13	0.55		
36.11	0.35	37.15	0.55		
36.13	0.35	37.17	0.56		
36.15	0.36	37.19	0.56		
36.17	0.36	37.21	0.56		
36.19	0.37	37.23	0.57		
36.21	0.37	37.25	0.57		
36.23	0.38	37.27	0.57		
36.25	0.38	37.29	0.58		
36.27	0.39	37.31	0.58		

E(WQV)=37.99
Q(WQV)=0.67 cfs

FILTRATION PRACTICE DESIGN CRITERIA
(Env-Wq 1508.07)

Type/Node Name: **Filtration Drip Edge #2 / 4P**

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

Yes		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.07(a).	
0.05	ac	A = Area draining to the practice	
0.05	ac	A_I = Impervious area draining to the practice	
0.99	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.94	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.05	ac-in	WQV= 1" x Rv x A	
172	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
43	cf	25% x WQV (check calc for sediment forebay volume)	
129	cf	75% x WQV (check calc for surface sand filter volume)	
N/A - Roof Runoff		Method of Pretreatment? (not required for clean or roof runoff)	
	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	**≥ 25%WQV**
Calculate time to drain if system IS NOT underdrained:			
	sf	A_{SA} = Surface area of the practice	
	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
	Yes/No	If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided? (Use the calculations below)	
-	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	**≤ 72-hrs**
Calculate time to drain if system IS underdrained:			
37.60	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
0.36	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
0.27	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	**≤ 72-hrs**
36.00	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
35.00	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
N/A	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
N/A	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
1.00	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	**≥ 1'**
#VALUE!	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	**≥ 1'**
#VALUE!	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	**≥ 1'**
37.75	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
37.75	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	**← yes**
If a surface sand filter or underground sand filter is proposed:			
YES	ac	Drainage Area check.	**< 10 ac**
	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ 75%WQV**
	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course specification.	
	Yes/No	Access grate provided?	**← yes**

If a bioretention area is proposed:			
YES	ac	Drainage Area no larger than 5 ac?	**← yes**
194	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ WQV**
18.0	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet	D5	Note what sheet in the plan set contains the filter course specification	
3.0	:1	Pond side slopes	**> 3:1**
Sheet	D5	Note what sheet in the plan set contains the planting plans and surface cover	
If porous pavement is proposed:			
		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
	acres	A_{SA} = Surface area of the pervious pavement	
	:1	Ratio of the contributing area to the pervious surface area	**≤ 5:1**
	inches	D_{FC} = Filter course thickness	**12", or 18" if within GPA mod. 304.1 (see spec)**
Sheet		Note what sheet in the plan set contains the filter course spec.	

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

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

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

Designer's Notes: Filtration Drip Edge is similar to bioretention system - See AOT-2662 approved documents

Coarse stone layer: 3.75*101*0.75*.4 = 113.6 cf

Pea stone layer: 3.75*101*0.25*0.15 = 14.2 cf (Cumulative = 113.6+14.2 = 127.8 cf)

Filter course: 3.75*101*1.5*0.05 = 28.4 cf (Cumulative = 127.8+28.4 = 156.2 cf)

Top stone layer: 3.75*101*0.25*0.4 = 37.9 cf (Cumulative = 156.2+37.9 = 194.1 cf)

Determination of WQV Elevation:

Total storage volume - Required WQV = 194.1-172 = 22.1 cf

22.1/(3.75*101*.4) = 0.15 ft

E(WQV) = 37.75-0.15 = 37.60

Stage-Area-Storage for Pond 4P: Filtration Drip Edge #2

Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
35.00	0.000	36.04	0.003	37.08	0.003
35.02	0.000	36.06	0.003	37.10	0.003
35.04	0.000	36.08	0.003	37.12	0.003
35.06	0.000	36.10	0.003	37.14	0.003
35.08	0.000	36.12	0.003	37.16	0.003
35.10	0.000	36.14	0.003	37.18	0.003
35.12	0.000	36.16	0.003	37.20	0.003
35.14	0.000	36.18	0.003	37.22	0.003
35.16	0.001	36.20	0.003	37.24	0.003
35.18	0.001	36.22	0.003	37.26	0.003
35.20	0.001	36.24	0.003	37.28	0.003
35.22	0.001	36.26	0.003	37.30	0.003
35.24	0.001	36.28	0.003	37.32	0.004
35.26	0.001	36.30	0.003	37.34	0.004
35.28	0.001	36.32	0.003	37.36	0.004
35.30	0.001	36.34	0.003	37.38	0.004
35.32	0.001	36.36	0.003	37.40	0.004
35.34	0.001	36.38	0.003	37.42	0.004
35.36	0.001	36.40	0.003	37.44	0.004
35.38	0.001	36.42	0.003	37.46	0.004
35.40	0.001	36.44	0.003	37.48	0.004
35.42	0.001	36.46	0.003	37.50	0.004
35.44	0.002	36.48	0.003	37.52	0.004
35.46	0.002	36.50	0.003	37.54	0.004
35.48	0.002	36.52	0.003	37.56	0.004
35.50	0.002	36.54	0.003	37.58	0.004
35.52	0.002	36.56	0.003	37.60	0.004
35.54	0.002	36.58	0.003	37.62	0.004
35.56	0.002	36.60	0.003	37.64	0.004
35.58	0.002	36.62	0.003	37.66	0.004
35.60	0.002	36.64	0.003	37.68	0.004
35.62	0.002	36.66	0.003	37.70	0.004
35.64	0.002	36.68	0.003	37.72	0.004
35.66	0.002	36.70	0.003	37.74	**0.004**
35.68	0.002	36.72	0.003	37.76	**0.004**
35.70	0.002	36.74	0.003	37.78	0.004
35.72	0.003	36.76	0.003		
35.74	0.003	36.78	0.003		
35.76	0.003	36.80	0.003		
35.78	0.003	36.82	0.003		
35.80	0.003	36.84	0.003		
35.82	0.003	36.86	0.003		
35.84	0.003	36.88	0.003		
35.86	0.003	36.90	0.003		
35.88	0.003	36.92	0.003		
35.90	0.003	36.94	0.003		
35.92	0.003	36.96	0.003		
35.94	0.003	36.98	0.003		
35.96	0.003	37.00	0.003		
35.98	0.003	37.02	0.003		
36.00	0.003	37.04	0.003		
36.02	0.003	37.06	0.003		

See storage volume and WQV elevation calculations on BMP worksheet E(WQV)=37.60

Stage-Discharge for Pond 4P: Filtration Drip Edge #2

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
35.00	0.00	0.00	**0.00**
35.05	0.00	0.00	0.00
35.10	0.02	0.02	0.00
35.15	0.04	0.04	0.00
35.20	0.07	0.07	0.00
35.25	0.09	0.09	0.00
35.30	0.12	0.12	0.00
35.35	0.14	0.14	0.00
35.40	0.16	0.16	0.00
35.45	0.18	0.18	0.00
35.50	0.19	0.19	0.00
35.55	0.21	0.21	0.00
35.60	0.22	0.22	0.00
35.65	0.23	0.23	0.00
35.70	0.24	0.24	0.00
35.75	0.24	0.24	0.00
35.80	0.24	0.24	0.00
35.85	0.25	0.25	0.00
35.90	0.25	0.25	0.00
35.95	0.26	0.26	0.00
36.00	0.26	0.26	0.00
36.05	0.26	0.26	0.00
36.10	0.27	0.27	0.00
36.15	0.27	0.27	0.00
36.20	0.28	0.28	0.00
36.25	0.28	0.28	0.00
36.30	0.28	0.28	0.00
36.35	0.29	0.29	0.00
36.40	0.29	0.29	0.00
36.45	0.29	0.29	0.00
36.50	0.30	0.30	0.00
36.55	0.30	0.30	0.00
36.60	0.30	0.30	0.00
36.65	0.31	0.31	0.00
36.70	0.31	0.31	0.00
36.75	0.31	0.31	0.00
36.80	0.32	0.32	0.00
36.85	0.32	0.32	0.00
36.90	0.32	0.32	0.00
36.95	0.33	0.33	0.00
37.00	0.33	0.33	0.00
37.05	0.33	0.33	0.00
37.10	0.34	0.34	0.00
37.15	0.34	0.34	0.00
37.20	0.34	0.34	0.00
37.25	0.34	0.34	0.00
37.30	0.35	0.35	0.00
37.35	0.35	0.35	0.00
37.40	0.35	0.35	0.00
37.45	0.36	0.36	0.00
37.50	0.36	0.36	0.00
37.55	0.36	0.36	0.00
37.60	0.36	0.36	0.00
37.65	0.37	0.37	0.00
37.70	0.37	0.37	0.00
37.75	**0.37**	**0.37**	0.00

E(WQV)=37.60
Q(WQV)=0.36 cfs

FILTRATION PRACTICE DESIGN CRITERIA
(Env-Wq 1508.07)

Type/Node Name: **Filtration Drip Edge #3 / 5P**

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

Yes		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.07(a).	
0.04	ac	A = Area draining to the practice	
0.04	ac	A_I = Impervious area draining to the practice	
0.86	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.82	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.04	ac-in	WQV= 1" x Rv x A	
130	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
33	cf	25% x WQV (check calc for sediment forebay volume)	
98	cf	75% x WQV (check calc for surface sand filter volume)	
N/A - Roof Runoff		Method of Pretreatment? (not required for clean or roof runoff)	
	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	**≥ 25%WQV**
Calculate time to drain if system IS NOT underdrained:			
	sf	A_{SA} = Surface area of the practice	
	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
	Yes/No	If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided? (Use the calculations below)	
-	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	**≤ 72-hrs**
Calculate time to drain if system IS underdrained:			
36.92	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
0.46	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
0.16	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	**≤ 72-hrs**
35.25	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
34.25	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
N/A	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
N/A	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
1.00	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	**≥ 1'**
#VALUE!	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	**≥ 1'**
#VALUE!	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	**≥ 1'**
36.89	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
37.00	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	**← yes**
If a surface sand filter or underground sand filter is proposed:			
YES	ac	Drainage Area check.	**< 10 ac**
	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ 75%WQV**
	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course specification.	
	Yes/No	Access grate provided?	**← yes**

If a bioretention area is proposed:			
YES	ac	Drainage Area no larger than 5 ac?	**← yes**
138	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ WQV**
18.0	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet	D5	Note what sheet in the plan set contains the filter course specification	
3.0	:1	Pond side slopes	**> 3:1**
Sheet	D5	Note what sheet in the plan set contains the planting plans and surface cover	
If porous pavement is proposed:			
		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
	acres	A_{SA} = Surface area of the pervious pavement	
	:1	Ratio of the contributing area to the pervious surface area	**≤ 5:1**
	inches	D_{FC} = Filter course thickness	**12", or 18" if within GPA mod. 304.1 (see spec)**
Sheet		Note what sheet in the plan set contains the filter course spec.	

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

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

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

Designer's Notes: Filtration Drip Edge is similar to bioretention system - See AOT-2662 approved documents

Coarse stone layer: 2.75*98*0.75*.4 = 80.9 cf

Pea stone layer: 2.75*98*0.25*0.15 = 10.1 cf (Cumulative = 80.9+10.1 = 91.0 cf)

Filter course: 2.75*98*1.5*0.05 = 20.2 cf (Cumulative = 91.0+20.2 = 111.2 cf)

Top stone layer: 2.75*98*0.25*0.4 = 27.0 cf (Cumulative = 111.2+27.0 = 138.2 cf)

Determination of WQV Elevation:

Total storage volume - Required WQV = 138.2-130 = 8.2 cf

8.2/(2.75*98*.4) = 0.08 ft

E(WQV) = 37.0-0.08 = 36.92

Stage-Area-Storage for Pond 5P: Filtration Drip Edge #3

Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
34.25	0.000	35.29	0.003	36.33	0.003
34.27	0.000	35.31	0.003	36.35	0.003
34.29	0.000	35.33	0.003	36.37	0.003
34.31	0.000	35.35	0.003	36.39	0.003
34.33	0.000	35.37	0.003	36.41	0.003
34.35	0.000	35.39	0.003	36.43	0.003
34.37	0.000	35.41	0.003	36.45	0.003
34.39	0.000	35.43	0.003	36.47	0.003
34.41	0.001	35.45	0.003	36.49	0.003
34.43	0.001	35.47	0.003	36.51	0.003
34.45	0.001	35.49	0.003	36.53	0.003
34.47	0.001	35.51	0.003	36.55	0.003
34.49	0.001	35.53	0.003	36.57	0.003
34.51	0.001	35.55	0.003	36.59	0.003
34.53	0.001	35.57	0.003	36.61	0.003
34.55	0.001	35.59	0.003	36.63	0.003
34.57	0.001	35.61	0.003	36.65	0.003
34.59	0.001	35.63	0.003	36.67	0.003
34.61	0.001	35.65	0.003	36.69	0.003
34.63	0.001	35.67	0.003	36.71	0.003
34.65	0.001	35.69	0.003	36.73	0.003
34.67	0.001	35.71	0.003	36.75	0.003
34.69	0.001	35.73	0.003	36.77	0.003
34.71	0.002	35.75	0.003	36.79	0.004
34.73	0.002	35.77	0.003	36.81	0.004
34.75	0.002	35.79	0.003	36.83	0.004
34.77	0.002	35.81	0.003	36.85	0.004
34.79	0.002	35.83	0.003	36.87	0.004
34.81	0.002	35.85	0.003	36.89	0.004
34.83	0.002	35.87	0.003	36.91	0.004
34.85	0.002	35.89	0.003	36.93	0.004
34.87	0.002	35.91	0.003	36.95	0.004
34.89	0.002	35.93	0.003	36.97	0.004
34.91	0.002	35.95	0.003	36.99	**0.004**
34.93	0.002	35.97	0.003		
34.95	0.002	35.99	0.003		
34.97	0.002	36.01	0.003		
34.99	0.002	36.03	0.003		
35.01	0.002	36.05	0.003		
35.03	0.003	36.07	0.003		
35.05	0.003	36.09	0.003		
35.07	0.003	36.11	0.003		
35.09	0.003	36.13	0.003		
35.11	0.003	36.15	0.003		
35.13	0.003	36.17	0.003		
35.15	0.003	36.19	0.003		
35.17	0.003	36.21	0.003		
35.19	0.003	36.23	0.003		
35.21	0.003	36.25	0.003		
35.23	0.003	36.27	0.003		
35.25	0.003	36.29	0.003		
35.27	0.003	36.31	0.003		

See storage volume and WQV elevation calculations on BMP worksheet E(WQV)=36.92

Stage-Discharge for Pond 5P: Filtration Drip Edge #3

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
34.25	0.00	35.29	0.28	36.33	0.40
34.27	0.00	35.31	0.28	36.35	0.41
34.29	0.00	35.33	0.29	36.37	0.41
34.31	0.01	35.35	0.29	36.39	0.41
34.33	0.01	35.37	0.29	36.41	0.41
34.35	0.02	35.39	0.29	36.43	0.41
34.37	0.03	35.41	0.30	36.45	0.42
34.39	0.03	35.43	0.30	36.47	0.42
34.41	0.04	35.45	0.30	36.49	0.42
34.43	0.05	35.47	0.31	36.51	0.42
34.45	0.07	35.49	0.31	36.53	0.42
34.47	0.08	35.51	0.31	36.55	0.43
34.49	0.09	35.53	0.31	36.57	0.43
34.51	0.10	35.55	0.32	36.59	0.43
34.53	0.11	35.57	0.32	36.61	0.43
34.55	0.12	35.59	0.32	36.63	0.43
34.57	0.13	35.61	0.32	36.65	0.44
34.59	0.14	35.63	0.33	36.67	0.44
34.61	0.15	35.65	0.33	36.69	0.44
34.63	0.15	35.67	0.33	36.71	0.44
34.65	0.16	35.69	0.33	36.73	0.44
34.67	0.17	35.71	0.34	36.75	0.45
34.69	0.17	35.73	0.34	36.77	0.45
34.71	0.18	35.75	0.34	36.79	0.45
34.73	0.18	35.77	0.34	36.81	0.45
34.75	0.18	35.79	0.35	36.83	0.45
34.77	0.19	35.81	0.35	36.85	0.45
34.79	0.19	35.83	0.35	36.87	0.46
34.81	0.20	35.85	0.35	36.89	0.46
34.83	0.20	35.87	0.36	36.91	0.46
34.85	0.21	35.89	0.36	36.93	0.46
34.87	0.21	35.91	0.36	36.95	0.46
34.89	0.21	35.93	0.36	36.97	0.47
34.91	0.22	35.95	0.36	36.99	**0.47**
34.93	0.22	35.97	0.37		
34.95	0.23	35.99	0.37		
34.97	0.23	36.01	0.37		
34.99	0.23	36.03	0.37		
35.01	0.24	36.05	0.38		
35.03	0.24	36.07	0.38		
35.05	0.24	36.09	0.38		
35.07	0.25	36.11	0.38		
35.09	0.25	36.13	0.38		
35.11	0.25	36.15	0.39		
35.13	0.26	36.17	0.39		
35.15	0.26	36.19	0.39		
35.17	0.26	36.21	0.39		
35.19	0.27	36.23	0.39		
35.21	0.27	36.25	0.40		
35.23	0.27	36.27	0.40		
35.25	0.27	36.29	0.40		
35.27	0.28	36.31	0.40		

E(WQV)=36.92
Q(WQV)=0.46 cfs

FILTRATION PRACTICE DESIGN CRITERIA
(Env-Wq 1508.07)

Type/Node Name: **Filtration Drip Edge #4 / 6P**

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

Yes		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.07(a).	
0.03	ac	A = Area draining to the practice	
0.03	ac	A_I = Impervious area draining to the practice	
0.86	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.82	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.03	ac-in	WQV= 1" x Rv x A	
98	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
24	cf	25% x WQV (check calc for sediment forebay volume)	
73	cf	75% x WQV (check calc for surface sand filter volume)	
N/A - Roof Runoff		Method of Pretreatment? (not required for clean or roof runoff)	
	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	**≥ 25%WQV**
Calculate time to drain if system IS NOT underdrained:			
	sf	A_{SA} = Surface area of the practice	
	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
	Yes/No	If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided? (Use the calculations below)	
-	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	**≤ 72-hrs**
Calculate time to drain if system IS underdrained:			
35.95	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
0.53	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
0.10	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	**≤ 72-hrs**
34.25	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
33.25	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
N/A	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
N/A	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
1.00	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	**≥ 1'**
#VALUE!	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	**≥ 1'**
#VALUE!	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	**≥ 1'**
33.89	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
36.00	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	**← yes**
If a surface sand filter or underground sand filter is proposed:			
YES	ac	Drainage Area check.	**< 10 ac**
	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ 75%WQV**
	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course specification.	
	Yes/No	Access grate provided?	**← yes**

If a bioretention area is proposed:			
YES	ac	Drainage Area no larger than 5 ac?	**← yes**
102	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ WQV**
18.0	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet	D5	Note what sheet in the plan set contains the filter course specification	
3.0	:1	Pond side slopes	**> 3:1**
Sheet	D5	Note what sheet in the plan set contains the planting plans and surface cover	
If porous pavement is proposed:			
		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
	acres	A_{SA} = Surface area of the pervious pavement	
	:1	Ratio of the contributing area to the pervious surface area	**≤ 5:1**
	inches	D_{FC} = Filter course thickness	**12", or 18" if within GPA mod. 304.1 (see spec)**
Sheet		Note what sheet in the plan set contains the filter course spec.	

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

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

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

Designer's Notes: Filtration Drip Edge is similar to bioretention system - See AOT-2662 approved documents

Coarse stone layer: 2.75*72*0.75*.4 = 60.0 cf

Pea stone layer: 2.75*72*0.25*0.15 = 7.4 cf (Cumulative = 60.0+7.4 = 67.4 cf)

Filter course: 2.75*72*1.5*0.05 = 14.9 cf (Cumulative = 67.4+14.9 = 82.3 cf)

Top stone layer: 2.75*72*0.25*0.4 = 19.8 cf (Cumulative = 82.3+19.8 = 102.1 cf)

Determination of WQV Elevation:

Total storage volume - Required WQV = 102.1-98 = 4.1 cf

4.1/(2.75*72*.4) = 0.05 ft

E(WQV) = 36.0-0.05 = 35.95

Stage-Area-Storage for Pond 6P: Filtration Drip Edge #4

Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
33.25	0.000	34.29	0.002	35.33	0.002
33.27	0.000	34.31	0.002	35.35	0.002
33.29	0.000	34.33	0.002	35.37	0.002
33.31	0.000	34.35	0.002	35.39	0.002
33.33	0.000	34.37	0.002	35.41	0.002
33.35	0.000	34.39	0.002	35.43	0.002
33.37	0.000	34.41	0.002	35.45	0.002
33.39	0.000	34.43	0.002	35.47	0.002
33.41	0.000	34.45	0.002	35.49	0.002
33.43	0.000	34.47	0.002	35.51	0.002
33.45	0.000	34.49	0.002	35.53	0.002
33.47	0.000	34.51	0.002	35.55	0.002
33.49	0.000	34.53	0.002	35.57	0.002
33.51	0.000	34.55	0.002	35.59	0.002
33.53	0.001	34.57	0.002	35.61	0.002
33.55	0.001	34.59	0.002	35.63	0.002
33.57	0.001	34.61	0.002	35.65	0.002
33.59	0.001	34.63	0.002	35.67	0.002
33.61	0.001	34.65	0.002	35.69	0.002
33.63	0.001	34.67	0.002	35.71	0.002
33.65	0.001	34.69	0.002	35.73	0.002
33.67	0.001	34.71	0.002	35.75	0.002
33.69	0.001	34.73	0.002	35.77	0.002
33.71	0.001	34.75	0.002	35.79	0.002
33.73	0.001	34.77	0.002	35.81	0.002
33.75	0.001	34.79	0.002	35.83	0.002
33.77	0.001	34.81	0.002	35.85	0.002
33.79	0.001	34.83	0.002	35.87	0.002
33.81	0.001	34.85	0.002	35.89	0.002
33.83	0.001	34.87	0.002	35.91	0.002
33.85	0.001	34.89	0.002	35.93	0.002
33.87	0.001	34.91	0.002	35.95	0.002
33.89	0.001	34.93	0.002	35.97	0.002
33.91	0.001	34.95	0.002	35.99	**0.002**
33.93	0.001	34.97	0.002		
33.95	0.001	34.99	0.002		
33.97	0.001	35.01	0.002		
33.99	0.001	35.03	0.002		
34.01	0.001	35.05	0.002		
34.03	0.001	35.07	0.002		
34.05	0.001	35.09	0.002		
34.07	0.001	35.11	0.002		
34.09	0.001	35.13	0.002		
34.11	0.001	35.15	0.002		
34.13	0.001	35.17	0.002		
34.15	0.001	35.19	0.002		
34.17	0.001	35.21	0.002		
34.19	0.001	35.23	0.002		
34.21	0.002	35.25	0.002		
34.23	0.002	35.27	0.002		
34.25	0.002	35.29	0.002		
34.27	0.002	35.31	0.002		

See storage volume and WQV elevation calculations on BMP worksheet E(WQV)=35.95

Stage-Discharge for Pond 6P: Filtration Drip Edge #4

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
33.25	0.00	34.29	0.31	35.33	0.46
33.27	0.00	34.31	0.31	35.35	0.46
33.29	0.00	34.33	0.32	35.37	0.46
33.31	0.01	34.35	0.32	35.39	0.47
33.33	0.01	34.37	0.32	35.41	0.47
33.35	0.02	34.39	0.33	35.43	0.47
33.37	0.03	34.41	0.33	35.45	0.47
33.39	0.03	34.43	0.33	35.47	0.48
33.41	0.04	34.45	0.34	35.49	0.48
33.43	0.05	34.47	0.34	35.51	0.48
33.45	0.07	34.49	0.34	35.53	0.48
33.47	0.08	34.51	0.35	35.55	0.48
33.49	0.09	34.53	0.35	35.57	0.49
33.51	0.10	34.55	0.35	35.59	0.49
33.53	0.11	34.57	0.36	35.61	0.49
33.55	0.12	34.59	0.36	35.63	0.49
33.57	0.13	34.61	0.36	35.65	0.50
33.59	0.14	34.63	0.37	35.67	0.50
33.61	0.15	34.65	0.37	35.69	0.50
33.63	0.15	34.67	0.37	35.71	0.50
33.65	0.16	34.69	0.37	35.73	0.50
33.67	0.17	34.71	0.38	35.75	0.51
33.69	0.17	34.73	0.38	35.77	0.51
33.71	0.18	34.75	0.38	35.79	0.51
33.73	0.19	34.77	0.39	35.81	0.51
33.75	0.19	34.79	0.39	35.83	0.52
33.77	0.20	34.81	0.39	35.85	0.52
33.79	0.20	34.83	0.39	35.87	0.52
33.81	0.21	34.85	0.40	35.89	0.52
33.83	0.21	34.87	0.40	35.91	0.52
33.85	0.22	34.89	0.40	35.93	0.53
33.87	0.22	34.91	0.41	35.95	0.53
33.89	0.23	34.93	0.41	35.97	0.53
33.91	0.23	34.95	0.41	35.99	**0.53**
33.93	0.24	34.97	0.41		
33.95	0.24	34.99	0.42		
33.97	0.25	35.01	0.42		
33.99	0.25	35.03	0.42		
34.01	0.26	35.05	0.42		
34.03	0.26	35.07	0.43		
34.05	0.26	35.09	0.43		
34.07	0.27	35.11	0.43		
34.09	0.27	35.13	0.43		
34.11	0.28	35.15	0.44		
34.13	0.28	35.17	0.44		
34.15	0.28	35.19	0.44		
34.17	0.29	35.21	0.44		
34.19	0.29	35.23	0.45		
34.21	0.30	35.25	0.45		
34.23	0.30	35.27	0.45		
34.25	0.30	35.29	0.45		
34.27	0.31	35.31	0.46		

E(WQV)=35.95
Q(WQV)=0.53 cfs

FILTRATION PRACTICE DESIGN CRITERIA
(Env-Wq 1508.07)

Type/Node Name: **Filtration Drip Edge #5 / 7P**

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

Yes		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.07(a).	
0.03	ac	A = Area draining to the practice	
0.03	ac	A_I = Impervious area draining to the practice	
1.00	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.95	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.02	ac-in	WQV= 1" x Rv x A	
87	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
22	cf	25% x WQV (check calc for sediment forebay volume)	
66	cf	75% x WQV (check calc for surface sand filter volume)	
N/A - Roof Runoff		Method of Pretreatment? (not required for clean or roof runoff)	
	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	**≥ 25%WQV**
Calculate time to drain if system IS NOT underdrained:			
	sf	A_{SA} = Surface area of the practice	
	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
	Yes/No	If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided? (Use the calculations below)	
-	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	**≤ 72-hrs**
Calculate time to drain if system IS underdrained:			
25.95	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
0.46	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
0.11	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	**≤ 72-hrs**
23.75	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
22.75	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
N/A	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
N/A	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
1.00	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	**≥ 1'**
#VALUE!	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	**≥ 1'**
#VALUE!	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	**≥ 1'**
25.19	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
26.00	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	**← yes**
If a surface sand filter or underground sand filter is proposed:			
YES	ac	Drainage Area check.	**< 10 ac**
	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ 75%WQV**
	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course specification.	
	Yes/No	Access grate provided?	**← yes**

If a bioretention area is proposed:			
YES	ac	Drainage Area no larger than 5 ac?	**← yes**
90	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ WQV**
24.0	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet	D5	Note what sheet in the plan set contains the filter course specification	
3.0	:1	Pond side slopes	**> 3:1**
Sheet	D5	Note what sheet in the plan set contains the planting plans and surface cover	
If porous pavement is proposed:			
		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
	acres	A_{SA} = Surface area of the pervious pavement	
	:1	Ratio of the contributing area to the pervious surface area	**≤ 5:1**
	inches	D_{FC} = Filter course thickness	**12", or 18" if within GPA mod. 304.1 (see spec)**
Sheet		Note what sheet in the plan set contains the filter course spec.	

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

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

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

Designer's Notes: Filtration Drip Edge is similar to bioretention system - See AOT-2662 approved documents

Coarse stone layer: 3.5*48*0.75*.4 = 50.4 cf

Pea stone layer: 3.5*48*0.25*0.15 = 6.3 cf (Cumulative = 50.4+6.3 = 56.7 cf)

Filter course: 3.5*48*2*0.05 = 16.8 cf (Cumulative = 56.7+16.8 = 73.5 cf)

Top stone layer: 3.5*48*0.25*0.4 = 16.8 cf (Cumulative = 73.5+16.8 = 90.3 cf)

Determination of WQV Elevation:

Total storage volume - Required WQV = 90.3-87 = 3.3 cf

3.3/(3.5*48*0.4) = 0.05 ft

E(WQV) = 26.0-0.05 = 25.95

Stage-Area-Storage for Pond 7P: Filtration Drip Edge #5

Elevation (feet)	Storage (acre-feet)
22.75	0.000
22.80	0.000
22.85	0.000
22.90	0.000
22.95	0.000
23.00	0.000
23.05	0.000
23.10	0.001
23.15	0.001
23.20	0.001
23.25	0.001
23.30	0.001
23.35	0.001
23.40	0.001
23.45	0.001
23.50	0.001
23.55	0.001
23.60	0.001
23.65	0.001
23.70	0.001
23.75	0.001
23.80	0.001
23.85	0.001
23.90	0.001
23.95	0.001
24.00	0.001
24.05	0.001
24.10	0.001
24.15	0.001
24.20	0.001
24.25	0.001
24.30	0.001
24.35	0.001
24.40	0.001
24.45	0.001
24.50	0.001
24.55	0.001
24.60	0.001
24.65	0.001
24.70	0.001
24.75	0.001
24.80	0.002
24.85	0.002
24.90	0.002
24.95	0.002
25.00	0.002
25.05	0.002
25.10	0.002
25.15	0.002
25.20	0.002
25.25	0.002
25.30	0.002
25.35	0.002
25.40	0.002
25.45	0.002
25.50	0.002
25.55	0.002
25.60	0.002
25.65	0.002
25.70	0.002
25.75	0.002
25.80	0.002
25.85	0.002
25.90	0.002
25.95	0.002
26.00	**0.002**

See storage volume and WQV elevation calculations on BMP worksheet E(WQV)=25.95

Stage-Discharge for Pond 7P: Filtration Drip Edge #5

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
22.75	0.00	23.79	0.00	24.83	0.30	25.87	0.45
22.77	0.00	23.81	0.00	24.85	0.31	25.89	0.46
22.79	0.00	23.83	0.00	24.87	0.31	25.91	0.46
22.81	0.00	23.85	0.00	24.89	0.31	25.93	0.46
22.83	0.00	23.87	0.00	24.91	0.32	25.95	0.46
22.85	0.00	23.89	0.00	24.93	0.32	25.97	0.47
22.87	0.00	23.91	0.00	24.95	0.32	25.99	**0.47**
22.89	0.00	23.93	0.00	24.97	0.33		
22.91	0.00	23.95	0.00	24.99	0.33		
22.93	0.00	23.97	0.00	25.01	0.33		
22.95	0.00	23.99	0.00	25.03	0.34		
22.97	0.00	24.01	0.03	25.05	0.34		
22.99	0.00	24.03	0.06	25.07	0.34		
23.01	0.00	24.05	0.07	25.09	0.35		
23.03	0.00	24.07	0.09	25.11	0.35		
23.05	0.00	24.09	0.10	25.13	0.35		
23.07	0.00	24.11	0.11	25.15	0.36		
23.09	0.00	24.13	0.12	25.17	0.36		
23.11	0.00	24.15	0.13	25.19	0.36		
23.13	0.00	24.17	0.14	25.21	0.36		
23.15	0.00	24.19	0.14	25.23	0.37		
23.17	0.00	24.21	0.15	25.25	0.37		
23.19	0.00	24.23	0.16	25.27	0.37		
23.21	0.00	24.25	0.17	25.29	0.38		
23.23	0.00	24.27	0.17	25.31	0.38		
23.25	0.00	24.29	0.18	25.33	0.38		
23.27	0.00	24.31	0.18	25.35	0.39		
23.29	0.00	24.33	0.19	25.37	0.39		
23.31	0.00	24.35	0.20	25.39	0.39		
23.33	0.00	24.37	0.20	25.41	0.39		
23.35	0.00	24.39	0.21	25.43	0.40		
23.37	0.00	24.41	0.21	25.45	0.40		
23.39	0.00	24.43	0.22	25.47	0.40		
23.41	0.00	24.45	0.22	25.49	0.40		
23.43	0.00	24.47	0.23	25.51	0.41		
23.45	0.00	24.49	0.23	25.53	0.41		
23.47	0.00	24.51	0.24	25.55	0.41		
23.49	0.00	24.53	0.24	25.57	0.42		
23.51	0.00	24.55	0.25	25.59	0.42		
23.53	0.00	24.57	0.25	25.61	0.42		
23.55	0.00	24.59	0.25	25.63	0.42		
23.57	0.00	24.61	0.26	25.65	0.43		
23.59	0.00	24.63	0.26	25.67	0.43		
23.61	0.00	24.65	0.27	25.69	0.43		
23.63	0.00	24.67	0.27	25.71	0.43		
23.65	0.00	24.69	0.28	25.73	0.44		
23.67	0.00	24.71	0.28	25.75	0.44		
23.69	0.00	24.73	0.28	25.77	0.44		
23.71	0.00	24.75	0.29	25.79	0.44		
23.73	0.00	24.77	0.29	25.81	0.45		
23.75	0.00	24.79	0.29	25.83	0.45		
23.77	0.00	24.81	0.30	25.85	0.45		

E(WQV)=25.95
Q(WQV)=0.46 cfs

FILTRATION PRACTICE DESIGN CRITERIA
(Env-Wq 1508.07)

Type/Node Name: **Filtration Drip Edge #6 / 8P**

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

Yes		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.07(a).	
0.03	ac	A = Area draining to the practice	
0.03	ac	A_I = Impervious area draining to the practice	
1.00	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.95	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.02	ac-in	WQV= 1" x Rv x A	
87	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
22	cf	25% x WQV (check calc for sediment forebay volume)	
66	cf	75% x WQV (check calc for surface sand filter volume)	
N/A - Roof Runoff		Method of Pretreatment? (not required for clean or roof runoff)	
	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	**≥ 25%WQV**
Calculate time to drain if system IS NOT underdrained:			
	sf	A_{SA} = Surface area of the practice	
	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
	Yes/No	If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided? (Use the calculations below)	
-	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	**≤ 72-hrs**
Calculate time to drain if system IS underdrained:			
25.55	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
0.41	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
0.12	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	**≤ 72-hrs**
23.35	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
22.35	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
N/A	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
N/A	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
1.00	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	**≥ 1'**
#VALUE!	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	**≥ 1'**
#VALUE!	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	**≥ 1'**
25.19	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
25.60	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	**← yes**
If a surface sand filter or underground sand filter is proposed:			
YES	ac	Drainage Area check.	**< 10 ac**
	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ 75%WQV**
	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course specification.	
	Yes/No	Access grate provided?	**← yes**

If a bioretention area is proposed:			
YES	ac	Drainage Area no larger than 5 ac?	**← yes**
90	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ WQV**
24.0	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet	D5	Note what sheet in the plan set contains the filter course specification	
3.0	:1	Pond side slopes	**> 3:1**
Sheet	D5	Note what sheet in the plan set contains the planting plans and surface cover	
If porous pavement is proposed:			
		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
	acres	A_{SA} = Surface area of the pervious pavement	
	:1	Ratio of the contributing area to the pervious surface area	**≤ 5:1**
	inches	D_{FC} = Filter course thickness	**12", or 18" if within GPA mod. 304.1 (see spec)**
Sheet		Note what sheet in the plan set contains the filter course spec.	

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

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

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

Designer's Notes: Filtration Drip Edge is similar to bioretention system - See AOT-2662 approved documents

Coarse stone layer: 3.5*48*0.75*.4 = 50.4 cf

Pea stone layer: 3.5*48*0.25*0.15 = 6.3 cf (Cumulative = 50.4+6.3 = 56.7 cf)

Filter course: 3.5*48*2*0.05 = 16.8 cf (Cumulative = 56.7+16.8 = 73.5 cf)

Top stone layer: 3.5*48*0.25*0.4 = 16.8 cf (Cumulative = 73.5+16.8 = 90.3 cf)

Determination of WQV Elevation:

Total storage volume - Required WQV = 90.3-87 = 3.3 cf

3.3/(3.5*48*0.4) = 0.05 ft

E(WQV) = 25.6-0.05 = 25.55

Stage-Area-Storage for Pond 8P: Filtration Drip Edge #6

Elevation (feet)	Storage (acre-feet)
22.35	0.000
22.40	0.000
22.45	0.000
22.50	0.000
22.55	0.000
22.60	0.000
22.65	0.000
22.70	0.001
22.75	0.001
22.80	0.001
22.85	0.001
22.90	0.001
22.95	0.001
23.00	0.001
23.05	0.001
23.10	0.001
23.15	0.001
23.20	0.001
23.25	0.001
23.30	0.001
23.35	0.001
23.40	0.001
23.45	0.001
23.50	0.001
23.55	0.001
23.60	0.001
23.65	0.001
23.70	0.001
23.75	0.001
23.80	0.001
23.85	0.001
23.90	0.001
23.95	0.001
24.00	0.001
24.05	0.001
24.10	0.001
24.15	0.001
24.20	0.001
24.25	0.001
24.30	0.001
24.35	0.001
24.40	0.002
24.45	0.002
24.50	0.002
24.55	0.002
24.60	0.002
24.65	0.002
24.70	0.002
24.75	0.002
24.80	0.002
24.85	0.002
24.90	0.002
24.95	0.002
25.00	0.002
25.05	0.002
25.10	0.002
25.15	0.002
25.20	0.002
25.25	0.002
25.30	0.002
25.35	0.002
25.40	0.002
25.45	0.002
25.50	0.002
25.55	0.002
25.60	**0.002**

See storage volume and WQV elevation calculations on BMP worksheet E(WQV)=25.55

Stage-Discharge for Pond 8P: Filtration Drip Edge #6

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
22.35	0.00	23.39	0.00	24.43	0.22	25.47	0.40
22.37	0.00	23.41	0.00	24.45	0.22	25.49	0.40
22.39	0.00	23.43	0.00	24.47	0.23	25.51	0.41
22.41	0.00	23.45	0.00	24.49	0.23	25.53	0.41
22.43	0.00	23.47	0.00	24.51	0.24	25.55	0.41
22.45	0.00	23.49	0.00	24.53	0.24	25.57	0.42
22.47	0.00	23.51	0.00	24.55	0.25	25.59	**0.42**
22.49	0.00	23.53	0.00	24.57	0.25		
22.51	0.00	23.55	0.00	24.59	0.25		
22.53	0.00	23.57	0.00	24.61	0.26		
22.55	0.00	23.59	0.00	24.63	0.26		
22.57	0.00	23.61	0.00	24.65	0.27		
22.59	0.00	23.63	0.00	24.67	0.27		
22.61	0.00	23.65	0.00	24.69	0.28		
22.63	0.00	23.67	0.00	24.71	0.28		
22.65	0.00	23.69	0.00	24.73	0.28		
22.67	0.00	23.71	0.00	24.75	0.29		
22.69	0.00	23.73	0.00	24.77	0.29		
22.71	0.00	23.75	0.00	24.79	0.29		
22.73	0.00	23.77	0.00	24.81	0.30		
22.75	0.00	23.79	0.00	24.83	0.30		
22.77	0.00	23.81	0.00	24.85	0.31		
22.79	0.00	23.83	0.00	24.87	0.31		
22.81	0.00	23.85	0.00	24.89	0.31		
22.83	0.00	23.87	0.00	24.91	0.32		
22.85	0.00	23.89	0.00	24.93	0.32		
22.87	0.00	23.91	0.00	24.95	0.32		
22.89	0.00	23.93	0.00	24.97	0.33		
22.91	0.00	23.95	0.00	24.99	0.33		
22.93	0.00	23.97	0.00	25.01	0.33		
22.95	0.00	23.99	0.00	25.03	0.34		
22.97	0.00	24.01	0.03	25.05	0.34		
22.99	0.00	24.03	0.06	25.07	0.34		
23.01	0.00	24.05	0.07	25.09	0.35		
23.03	0.00	24.07	0.09	25.11	0.35		
23.05	0.00	24.09	0.10	25.13	0.35		
23.07	0.00	24.11	0.11	25.15	0.36		
23.09	0.00	24.13	0.12	25.17	0.36		
23.11	0.00	24.15	0.13	25.19	0.36		
23.13	0.00	24.17	0.14	25.21	0.36		
23.15	0.00	24.19	0.14	25.23	0.37		
23.17	0.00	24.21	0.15	25.25	0.37		
23.19	0.00	24.23	0.16	25.27	0.37		
23.21	0.00	24.25	0.17	25.29	0.38		
23.23	0.00	24.27	0.17	25.31	0.38		
23.25	0.00	24.29	0.18	25.33	0.38		
23.27	0.00	24.31	0.18	25.35	0.39		
23.29	0.00	24.33	0.19	25.37	0.39		
23.31	0.00	24.35	0.20	25.39	0.39		
23.33	0.00	24.37	0.20	25.41	0.39		
23.35	0.00	24.39	0.21	25.43	0.40		
23.37	0.00	24.41	0.21	25.45	0.40		

E(WQV)=25.55
Q(WQV)=0.41 cfs

FILTRATION PRACTICE DESIGN CRITERIA
(Env-Wq 1508.07)

Type/Node Name: **Filtration Drip Edge #7 / 9P**

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

Yes		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.07(a).	
0.03	ac	A = Area draining to the practice	
0.03	ac	A_I = Impervious area draining to the practice	
1.00	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.95	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.02	ac-in	WQV= 1" x Rv x A	
87	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
22	cf	25% x WQV (check calc for sediment forebay volume)	
66	cf	75% x WQV (check calc for surface sand filter volume)	
N/A - Roof Runoff		Method of Pretreatment? (not required for clean or roof runoff)	
	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	**≥ 25%WQV**
Calculate time to drain if system IS NOT underdrained:			
	sf	A_{SA} = Surface area of the practice	
	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
	Yes/No	If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided? (Use the calculations below)	
-	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	**≤ 72-hrs**
Calculate time to drain if system IS underdrained:			
26.20	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
0.58	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
0.08	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	**≤ 72-hrs**
24.00	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
23.00	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
N/A	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
N/A	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
1.00	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	**≥ 1'**
#VALUE!	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	**≥ 1'**
#VALUE!	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	**≥ 1'**
23.48	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
26.25	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	**← yes**
If a surface sand filter or underground sand filter is proposed:			
YES	ac	Drainage Area check.	**< 10 ac**
	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ 75%WQV**
	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course specification.	
	Yes/No	Access grate provided?	**← yes**

If a bioretention area is proposed:			
YES	ac	Drainage Area no larger than 5 ac?	**← yes**
90	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ WQV**
24.0	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet	D5	Note what sheet in the plan set contains the filter course specification	
3.0	:1	Pond side slopes	**> 3:1**
Sheet	D5	Note what sheet in the plan set contains the planting plans and surface cover	
If porous pavement is proposed:			
		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
	acres	A_{SA} = Surface area of the pervious pavement	
	:1	Ratio of the contributing area to the pervious surface area	**≤ 5:1**
	inches	D_{FC} = Filter course thickness	**12", or 18" if within GPA mod. 304.1 (see spec)**
Sheet		Note what sheet in the plan set contains the filter course spec.	

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

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

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

Designer's Notes: Filtration Drip Edge is similar to bioretention system - See AOT-2662 approved documents

Coarse stone layer: 3.5*48*0.75*.4 = 50.4 cf

Pea stone layer: 3.5*48*0.25*0.15 = 6.3 cf (Cumulative = 50.4+6.3 = 56.7 cf)

Filter course: 3.5*48*2*0.05 = 16.8 cf (Cumulative = 56.7+16.8 = 73.5 cf)

Top stone layer: 3.5*48*0.25*0.4 = 16.8 cf (Cumulative = 73.5+16.8 = 90.3 cf)

Determination of WQV Elevation:

Total storage volume - Required WQV = 90.3-87 = 3.3 cf

3.3/(3.5*48*0.4) = 0.05 ft

E(WQV) = 26.25-0.05 = 26.20

Stage-Area-Storage for Pond 9P: Filtration Drip Edge #7

Elevation (feet)	Storage (acre-feet)
23.00	0.000
23.05	0.000
23.10	0.000
23.15	0.000
23.20	0.000
23.25	0.000
23.30	0.000
23.35	0.001
23.40	0.001
23.45	0.001
23.50	0.001
23.55	0.001
23.60	0.001
23.65	0.001
23.70	0.001
23.75	0.001
23.80	0.001
23.85	0.001
23.90	0.001
23.95	0.001
24.00	0.001
24.05	0.001
24.10	0.001
24.15	0.001
24.20	0.001
24.25	0.001
24.30	0.001
24.35	0.001
24.40	0.001
24.45	0.001
24.50	0.001
24.55	0.001
24.60	0.001
24.65	0.001
24.70	0.001
24.75	0.001
24.80	0.001
24.85	0.001
24.90	0.001
24.95	0.001
25.00	0.001
25.05	0.002
25.10	0.002
25.15	0.002
25.20	0.002
25.25	0.002
25.30	0.002
25.35	0.002
25.40	0.002
25.45	0.002
25.50	0.002
25.55	0.002
25.60	0.002
25.65	0.002
25.70	0.002
25.75	0.002
25.80	0.002
25.85	0.002
25.90	0.002
25.95	0.002
26.00	0.002
26.05	0.002
26.10	0.002
26.15	0.002
26.20	0.002
26.25	**0.002**

See storage volume and WQV elevation calculations on BMP worksheet E(WQV)=26.20

Stage-Discharge for Pond 9P: Filtration Drip Edge #7

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
23.00	0.00	24.04	0.31	25.08	0.46	26.12	0.57
23.02	0.00	24.06	0.31	25.10	0.46	26.14	0.57
23.04	0.00	24.08	0.32	25.12	0.46	26.16	0.57
23.06	0.01	24.10	0.32	25.14	0.47	26.18	0.58
23.08	0.01	24.12	0.32	25.16	0.47	26.20	0.58
23.10	0.02	24.14	0.33	25.18	0.47	26.22	0.58
23.12	0.03	24.16	0.33	25.20	0.47	26.24	**0.58**
23.14	0.03	24.18	0.33	25.22	0.48		
23.16	0.04	24.20	0.34	25.24	0.48		
23.18	0.05	24.22	0.34	25.26	0.48		
23.20	0.07	24.24	0.34	25.28	0.48		
23.22	0.08	24.26	0.35	25.30	0.48		
23.24	0.09	24.28	0.35	25.32	0.49		
23.26	0.10	24.30	0.35	25.34	0.49		
23.28	0.11	24.32	0.36	25.36	0.49		
23.30	0.12	24.34	0.36	25.38	0.49		
23.32	0.13	24.36	0.36	25.40	0.50		
23.34	0.14	24.38	0.37	25.42	0.50		
23.36	0.15	24.40	0.37	25.44	0.50		
23.38	0.15	24.42	0.37	25.46	0.50		
23.40	0.16	24.44	0.37	25.48	0.50		
23.42	0.17	24.46	0.38	25.50	0.51		
23.44	0.17	24.48	0.38	25.52	0.51		
23.46	0.18	24.50	0.38	25.54	0.51		
23.48	0.19	24.52	0.39	25.56	0.51		
23.50	0.19	24.54	0.39	25.58	0.52		
23.52	0.20	24.56	0.39	25.60	0.52		
23.54	0.20	24.58	0.39	25.62	0.52		
23.56	0.21	24.60	0.40	25.64	0.52		
23.58	0.21	24.62	0.40	25.66	0.52		
23.60	0.22	24.64	0.40	25.68	0.53		
23.62	0.22	24.66	0.41	25.70	0.53		
23.64	0.23	24.68	0.41	25.72	0.53		
23.66	0.23	24.70	0.41	25.74	0.53		
23.68	0.24	24.72	0.41	25.76	0.53		
23.70	0.24	24.74	0.42	25.78	0.54		
23.72	0.25	24.76	0.42	25.80	0.54		
23.74	0.25	24.78	0.42	25.82	0.54		
23.76	0.26	24.80	0.42	25.84	0.54		
23.78	0.26	24.82	0.43	25.86	0.54		
23.80	0.26	24.84	0.43	25.88	0.55		
23.82	0.27	24.86	0.43	25.90	0.55		
23.84	0.27	24.88	0.43	25.92	0.55		
23.86	0.28	24.90	0.44	25.94	0.55		
23.88	0.28	24.92	0.44	25.96	0.55		
23.90	0.28	24.94	0.44	25.98	0.56		
23.92	0.29	24.96	0.44	26.00	0.56		
23.94	0.29	24.98	0.45	26.02	0.56		
23.96	0.30	25.00	0.45	26.04	0.56		
23.98	0.30	25.02	0.45	26.06	0.56		
24.00	0.30	25.04	0.45	26.08	0.57		
24.02	0.31	25.06	0.46	26.10	0.57		

E(WQV)=26.20
Q(WQV)=0.58 cfs

FILTRATION PRACTICE DESIGN CRITERIA
(Env-Wq 1508.07)

Type/Node Name: **Filtration Drip Edge #8 / 10P**

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

Yes		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.07(a).	
0.03	ac	A = Area draining to the practice	
0.02	ac	A_I = Impervious area draining to the practice	
0.98	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.93	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.02	ac-in	WQV= 1" x Rv x A	
85	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
21	cf	25% x WQV (check calc for sediment forebay volume)	
64	cf	75% x WQV (check calc for surface sand filter volume)	
N/A - Roof Runoff		Method of Pretreatment? (not required for clean or roof runoff)	
	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	**≥ 25%WQV**
Calculate time to drain if system IS NOT underdrained:			
	sf	A_{SA} = Surface area of the practice	
	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
	Yes/No	If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided? (Use the calculations below)	
-	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	**≤ 72-hrs**
Calculate time to drain if system IS underdrained:			
33.17	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
0.51	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
0.09	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	**≤ 72-hrs**
31.50	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
30.50	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
N/A	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
N/A	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
1.00	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	**≥ 1'**
#VALUE!	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	**≥ 1'**
#VALUE!	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	**≥ 1'**
31.34	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
33.25	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	**← yes**
If a surface sand filter or underground sand filter is proposed:			
YES	ac	Drainage Area check.	**< 10 ac**
	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ 75%WQV**
	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course specification.	
	Yes/No	Access grate provided?	**← yes**

If a bioretention area is proposed:			
YES	ac	Drainage Area no larger than 5 ac?	**← yes**
90	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ WQV**
18.0	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet	D5	Note what sheet in the plan set contains the filter course specification	
3.0	:1	Pond side slopes	**> 3:1**
Sheet	D5	Note what sheet in the plan set contains the planting plans and surface cover	
If porous pavement is proposed:			
		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
	acres	A_{SA} = Surface area of the pervious pavement	
	:1	Ratio of the contributing area to the pervious surface area	**≤ 5:1**
	inches	D_{FC} = Filter course thickness	**12", or 18" if within GPA mod. 304.1 (see spec)**
Sheet		Note what sheet in the plan set contains the filter course spec.	

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

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

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

Designer's Notes: Filtration Drip Edge is similar to bioretention system - See AOT-2662 approved documents

Coarse stone layer: 3.5*50*0.75*.4 = 52.5 cf

Pea stone layer: 3.5*50*0.25*0.15 = 6.6 cf (Cumulative = 52.5+6.6 = 59.1 cf)

Filter course: 3.5*50*1.5*0.05 = 13.1 cf (Cumulative = 59.1+13.1 = 72.2 cf)

Top stone layer: 3.5*50*0.25*0.4 = 17.5 cf (Cumulative = 72.2+17.5 = 89.7 cf)

Determination of WQV Elevation:

Total storage volume - Required WQV = 89.7-85 = 4.7 cf

4.7/(3.5*50*0.4) = 0.07 ft

E(WQV) = 33.25-0.08 = 33.17

Stage-Area-Storage for Pond 10P: Filtration Drip Edge #8

Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
30.50	0.000	31.54	0.001	32.58	0.002
30.52	0.000	31.56	0.001	32.60	0.002
30.54	0.000	31.58	0.001	32.62	0.002
30.56	0.000	31.60	0.001	32.64	0.002
30.58	0.000	31.62	0.001	32.66	0.002
30.60	0.000	31.64	0.001	32.68	0.002
30.62	0.000	31.66	0.001	32.70	0.002
30.64	0.000	31.68	0.001	32.72	0.002
30.66	0.000	31.70	0.001	32.74	0.002
30.68	0.000	31.72	0.001	32.76	0.002
30.70	0.000	31.74	0.001	32.78	0.002
30.72	0.000	31.76	0.001	32.80	0.002
30.74	0.000	31.78	0.001	32.82	0.002
30.76	0.000	31.80	0.001	32.84	0.002
30.78	0.000	31.82	0.001	32.86	0.002
30.80	0.000	31.84	0.001	32.88	0.002
30.82	0.001	31.86	0.001	32.90	0.002
30.84	0.001	31.88	0.001	32.92	0.002
30.86	0.001	31.90	0.001	32.94	0.002
30.88	0.001	31.92	0.001	32.96	0.002
30.90	0.001	31.94	0.001	32.98	0.002
30.92	0.001	31.96	0.001	33.00	0.002
30.94	0.001	31.98	0.001	33.02	0.002
30.96	0.001	32.00	0.001	33.04	0.002
30.98	0.001	32.02	0.001	33.06	0.002
31.00	0.001	32.04	0.001	33.08	0.002
31.02	0.001	32.06	0.001	33.10	0.002
31.04	0.001	32.08	0.001	33.12	0.002
31.06	0.001	32.10	0.001	33.14	0.002
31.08	0.001	32.12	0.001	33.16	0.002
31.10	0.001	32.14	0.001	33.18	0.002
31.12	0.001	32.16	0.001	33.20	0.002
31.14	0.001	32.18	0.001	33.22	0.002
31.16	0.001	32.20	0.001	33.24	**0.002**
31.18	0.001	32.22	0.002		
31.20	0.001	32.24	0.002		
31.22	0.001	32.26	0.002		
31.24	0.001	32.28	0.002		
31.26	0.001	32.30	0.002		
31.28	0.001	32.32	0.002		
31.30	0.001	32.34	0.002		
31.32	0.001	32.36	0.002		
31.34	0.001	32.38	0.002		
31.36	0.001	32.40	0.002		
31.38	0.001	32.42	0.002		
31.40	0.001	32.44	0.002		
31.42	0.001	32.46	0.002		
31.44	0.001	32.48	0.002		
31.46	0.001	32.50	0.002		
31.48	0.001	32.52	0.002		
31.50	0.001	32.54	0.002		
31.52	0.001	32.56	0.002		

See storage volume and WQV elevation calculations on BMP worksheet E(WQV)=33.17

Stage-Discharge for Pond 10P: Filtration Drip Edge #8

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
30.50	0.00	31.54	0.29	32.58	0.44
30.52	0.00	31.56	0.29	32.60	0.45
30.54	0.00	31.58	0.29	32.62	0.45
30.56	0.00	31.60	0.30	32.64	0.45
30.58	0.00	31.62	0.30	32.66	0.45
30.60	0.00	31.64	0.30	32.68	0.45
30.62	0.00	31.66	0.31	32.70	0.46
30.64	0.00	31.68	0.31	32.72	0.46
30.66	0.00	31.70	0.31	32.74	0.46
30.68	0.00	31.72	0.32	32.76	0.46
30.70	0.00	31.74	0.32	32.78	0.47
30.72	0.00	31.76	0.33	32.80	0.47
30.74	0.00	31.78	0.33	32.82	0.47
30.76	0.00	31.80	0.33	32.84	0.47
30.78	0.00	31.82	0.34	32.86	0.48
30.80	0.00	31.84	0.34	32.88	0.48
30.82	0.05	31.86	0.34	32.90	0.48
30.84	0.07	31.88	0.34	32.92	0.48
30.86	0.08	31.90	0.35	32.94	0.49
30.88	0.09	31.92	0.35	32.96	0.49
30.90	0.10	31.94	0.35	32.98	0.49
30.92	0.11	31.96	0.36	33.00	0.49
30.94	0.12	31.98	0.36	33.02	0.49
30.96	0.13	32.00	0.36	33.04	0.50
30.98	0.14	32.02	0.37	33.06	0.50
31.00	0.15	32.04	0.37	33.08	0.50
31.02	0.16	32.06	0.37	33.10	0.50
31.04	0.16	32.08	0.38	33.12	0.51
31.06	0.17	32.10	0.38	33.14	0.51
31.08	0.18	32.12	0.38	33.16	0.51
31.10	0.18	32.14	0.38	33.18	0.51
31.12	0.19	32.16	0.39	33.20	0.51
31.14	0.19	32.18	0.39	33.22	0.52
31.16	0.20	32.20	0.39	33.24	**0.52**
31.18	0.20	32.22	0.40		
31.20	0.21	32.24	0.40		
31.22	0.21	32.26	0.40		
31.24	0.22	32.28	0.40		
31.26	0.22	32.30	0.41		
31.28	0.23	32.32	0.41		
31.30	0.23	32.34	0.41		
31.32	0.24	32.36	0.41		
31.34	0.24	32.38	0.42		
31.36	0.25	32.40	0.42		
31.38	0.25	32.42	0.42		
31.40	0.26	32.44	0.42		
31.42	0.26	32.46	0.43		
31.44	0.27	32.48	0.43		
31.46	0.27	32.50	0.43		
31.48	0.27	32.52	0.44		
31.50	0.28	32.54	0.44		
31.52	0.28	32.56	0.44		

E(WQV)=33.17
Q(WQV)=0.51 cfs

FILTRATION PRACTICE DESIGN CRITERIA
(Env-Wq 1508.07)

Type/Node Name: **Filtration Drip Edge #9 / 11P**

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

Yes		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.07(a).	
0.04	ac	A = Area draining to the practice	
0.04	ac	A_I = Impervious area draining to the practice	
0.99	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.94	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.04	ac-in	WQV= 1" x Rv x A	
129	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
32	cf	25% x WQV (check calc for sediment forebay volume)	
96	cf	75% x WQV (check calc for surface sand filter volume)	
N/A - Roof Runoff		Method of Pretreatment? (not required for clean or roof runoff)	
	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	**≥ 25%WQV**
Calculate time to drain if system IS NOT underdrained:			
	sf	A_{SA} = Surface area of the practice	
	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
	Yes/No	If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided? (Use the calculations below)	
-	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	**≤ 72-hrs**
Calculate time to drain if system IS underdrained:			
32.96	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
0.49	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
0.15	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	**≤ 72-hrs**
31.25	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
30.25	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
N/A	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
N/A	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
1.00	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	**≥ 1'**
#VALUE!	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	**≥ 1'**
#VALUE!	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	**≥ 1'**
32.83	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
33.00	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	**← yes**
If a surface sand filter or underground sand filter is proposed:			
YES	ac	Drainage Area check.	**< 10 ac**
	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ 75%WQV**
	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course specification.	
	Yes/No	Access grate provided?	**← yes**

If a bioretention area is proposed:			
YES	ac	Drainage Area no larger than 5 ac?	**← yes**
133	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ WQV**
18.0	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet	D5	Note what sheet in the plan set contains the filter course specification	
3.0	:1	Pond side slopes	**> 3:1**
Sheet	D5	Note what sheet in the plan set contains the planting plans and surface cover	
If porous pavement is proposed:			
		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
	acres	A_{SA} = Surface area of the pervious pavement	
	:1	Ratio of the contributing area to the pervious surface area	**≤ 5:1**
	inches	D_{FC} = Filter course thickness	**12", or 18" if within GPA mod. 304.1 (see spec)**
Sheet		Note what sheet in the plan set contains the filter course spec.	

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

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

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

Designer's Notes: Filtration Drip Edge is similar to bioretention system - See AOT-2662 approved documents

Coarse stone layer: 3.5*74*0.75*.4 = 77.7 cf

Pea stone layer: 3.5*74*0.25*0.15 = 9.7 cf (Cumulative = 77.7+9.7 = 87.4 cf)

Filter course: 3.5*74*1.5*0.05 = 19.4 cf (Cumulative = 87.4+19.4 = 106.8 cf)

Top stone layer: 3.5*74*0.25*0.4 = 25.9 cf (Cumulative = 106.8+25.9 = 132.7 cf)

Determination of WQV Elevation:

Total storage volume - Required WQV = 132.7-129 = 3.7 cf

3.7/(3.5*74*0.4) = 0.04 ft

E(WQV) = 33.0-0.04 = 32.96

Stage-Area-Storage for Pond 11P: Filtration Drip Edge #9

Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
30.25	0.000	31.29	0.002	32.33	0.002
30.27	0.000	31.31	0.002	32.35	0.002
30.29	0.000	31.33	0.002	32.37	0.002
30.31	0.000	31.35	0.002	32.39	0.002
30.33	0.000	31.37	0.002	32.41	0.002
30.35	0.000	31.39	0.002	32.43	0.002
30.37	0.000	31.41	0.002	32.45	0.002
30.39	0.000	31.43	0.002	32.47	0.002
30.41	0.000	31.45	0.002	32.49	0.002
30.43	0.000	31.47	0.002	32.51	0.002
30.45	0.000	31.49	0.002	32.53	0.002
30.47	0.001	31.51	0.002	32.55	0.002
30.49	0.001	31.53	0.002	32.57	0.002
30.51	0.001	31.55	0.002	32.59	0.002
30.53	0.001	31.57	0.002	32.61	0.002
30.55	0.001	31.59	0.002	32.63	0.002
30.57	0.001	31.61	0.002	32.65	0.002
30.59	0.001	31.63	0.002	32.67	0.002
30.61	0.001	31.65	0.002	32.69	0.002
30.63	0.001	31.67	0.002	32.71	0.002
30.65	0.001	31.69	0.002	32.73	0.002
30.67	0.001	31.71	0.002	32.75	0.002
30.69	0.001	31.73	0.002	32.77	0.003
30.71	0.001	31.75	0.002	32.79	0.003
30.73	0.001	31.77	0.002	32.81	0.003
30.75	0.001	31.79	0.002	32.83	0.003
30.77	0.001	31.81	0.002	32.85	0.003
30.79	0.001	31.83	0.002	32.87	0.003
30.81	0.001	31.85	0.002	32.89	0.003
30.83	0.001	31.87	0.002	32.91	0.003
30.85	0.001	31.89	0.002	32.93	0.003
30.87	0.001	31.91	0.002	32.95	0.003
30.89	0.002	31.93	0.002	32.97	0.003
30.91	0.002	31.95	0.002	32.99	**0.003**
30.93	0.002	31.97	0.002		
30.95	0.002	31.99	0.002		
30.97	0.002	32.01	0.002		
30.99	0.002	32.03	0.002		
31.01	0.002	32.05	0.002		
31.03	0.002	32.07	0.002		
31.05	0.002	32.09	0.002		
31.07	0.002	32.11	0.002		
31.09	0.002	32.13	0.002		
31.11	0.002	32.15	0.002		
31.13	0.002	32.17	0.002		
31.15	0.002	32.19	0.002		
31.17	0.002	32.21	0.002		
31.19	0.002	32.23	0.002		
31.21	0.002	32.25	0.002		
31.23	0.002	32.27	0.002		
31.25	0.002	32.29	0.002		
31.27	0.002	32.31	0.002		

See storage volume and WQV elevation calculations on BMP worksheet E(WQV)=32.96

Stage-Discharge for Pond 11P: Filtration Drip Edge #9

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
30.25	0.00	31.29	0.23	32.33	0.41
30.27	0.00	31.31	0.24	32.35	0.41
30.29	0.00	31.33	0.24	32.37	0.42
30.31	0.00	31.35	0.25	32.39	0.42
30.33	0.00	31.37	0.25	32.41	0.42
30.35	0.00	31.39	0.25	32.43	0.42
30.37	0.00	31.41	0.26	32.45	0.43
30.39	0.00	31.43	0.26	32.47	0.43
30.41	0.00	31.45	0.27	32.49	0.43
30.43	0.00	31.47	0.27	32.51	0.43
30.45	0.00	31.49	0.28	32.53	0.44
30.47	0.00	31.51	0.28	32.55	0.44
30.49	0.00	31.53	0.28	32.57	0.44
30.51	0.00	31.55	0.29	32.59	0.44
30.53	0.00	31.57	0.29	32.61	0.45
30.55	0.00	31.59	0.29	32.63	0.45
30.57	0.00	31.61	0.30	32.65	0.45
30.59	0.00	31.63	0.30	32.67	0.45
30.61	0.00	31.65	0.31	32.69	0.46
30.63	0.00	31.67	0.31	32.71	0.46
30.65	0.00	31.69	0.31	32.73	0.46
30.67	0.00	31.71	0.32	32.75	0.46
30.69	0.00	31.73	0.32	32.77	0.47
30.71	0.00	31.75	0.32	32.79	0.47
30.73	0.00	31.77	0.33	32.81	0.47
30.75	0.00	31.79	0.33	32.83	0.47
30.77	0.00	31.81	0.33	32.85	0.47
30.79	0.00	31.83	0.34	32.87	0.48
30.81	0.03	31.85	0.34	32.89	0.48
30.83	0.06	31.87	0.34	32.91	0.48
30.85	0.07	31.89	0.35	32.93	0.48
30.87	0.09	31.91	0.35	32.95	0.49
30.89	0.10	31.93	0.35	32.97	0.49
30.91	0.11	31.95	0.36	32.99	**0.49**
30.93	0.12	31.97	0.36		
30.95	0.13	31.99	0.36		
30.97	0.14	32.01	0.36		
30.99	0.14	32.03	0.37		
31.01	0.15	32.05	0.37		
31.03	0.16	32.07	0.37		
31.05	0.17	32.09	0.38		
31.07	0.17	32.11	0.38		
31.09	0.18	32.13	0.38		
31.11	0.18	32.15	0.39		
31.13	0.19	32.17	0.39		
31.15	0.20	32.19	0.39		
31.17	0.20	32.21	0.39		
31.19	0.21	32.23	0.40		
31.21	0.21	32.25	0.40		
31.23	0.22	32.27	0.40		
31.25	0.22	32.29	0.40		
31.27	0.23	32.31	0.41		

E(WQV)=32.96
Q(WQV)=0.49 cfs

FILTRATION PRACTICE DESIGN CRITERIA
(Env-Wq 1508.07)

Type/Node Name: **Filtration Drip Edge #10 / 12P**

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

Yes		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.07(a).	
0.03	ac	A = Area draining to the practice	
0.02	ac	A_I = Impervious area draining to the practice	
0.98	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.93	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.02	ac-in	WQV= 1" x Rv x A	
85	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
21	cf	25% x WQV (check calc for sediment forebay volume)	
64	cf	75% x WQV (check calc for surface sand filter volume)	
N/A - Roof Runoff		Method of Pretreatment? (not required for clean or roof runoff)	
	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	**≥ 25%WQV**
Calculate time to drain if system IS NOT underdrained:			
	sf	A_{SA} = Surface area of the practice	
	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
	Yes/No	If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided? (Use the calculations below)	
-	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	**≤ 72-hrs**
Calculate time to drain if system IS underdrained:			
35.93	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
0.53	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
0.09	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	**≤ 72-hrs**
34.25	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
33.25	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
N/A	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
N/A	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
1.00	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	**≥ 1'**
#VALUE!	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	**≥ 1'**
#VALUE!	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	**≥ 1'**
33.72	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
36.00	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	**← yes**
If a surface sand filter or underground sand filter is proposed:			
YES	ac	Drainage Area check.	**< 10 ac**
	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ 75%WQV**
	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course specification.	
	Yes/No	Access grate provided?	**← yes**

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

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

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

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

Designer's Notes: Filtration Drip Edge is similar to bioretention system - See AOT-2662 approved documents

Coarse stone layer: 3.5*50*0.75*.4 = 52.5 cf

Pea stone layer: 3.5*50*0.25*0.15 = 6.6 cf (Cumulative = 52.5+6.6 = 59.1 cf)

Filter course: 3.5*50*1.5*0.05 = 13.1 cf (Cumulative = 59.1+13.1 = 72.2 cf)

Top stone layer: 3.5*50*0.25*0.4 = 17.5 cf (Cumulative = 72.2+17.5 = 89.7 cf)

Determination of WQV Elevation:

Total storage volume - Required WQV = 89.7-85 = 4.7 cf

4.7/(3.5*50*0.4) = 0.07 ft

E(WQV) = 36.0-0.07 = 35.93

Stage-Area-Storage for Pond 12P: Filtration Drip Edge #10

Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
33.25	0.000	34.29	0.001	35.33	0.002
33.27	0.000	34.31	0.001	35.35	0.002
33.29	0.000	34.33	0.001	35.37	0.002
33.31	0.000	34.35	0.001	35.39	0.002
33.33	0.000	34.37	0.001	35.41	0.002
33.35	0.000	34.39	0.001	35.43	0.002
33.37	0.000	34.41	0.001	35.45	0.002
33.39	0.000	34.43	0.001	35.47	0.002
33.41	0.000	34.45	0.001	35.49	0.002
33.43	0.000	34.47	0.001	35.51	0.002
33.45	0.000	34.49	0.001	35.53	0.002
33.47	0.000	34.51	0.001	35.55	0.002
33.49	0.000	34.53	0.001	35.57	0.002
33.51	0.000	34.55	0.001	35.59	0.002
33.53	0.000	34.57	0.001	35.61	0.002
33.55	0.000	34.59	0.001	35.63	0.002
33.57	0.001	34.61	0.001	35.65	0.002
33.59	0.001	34.63	0.001	35.67	0.002
33.61	0.001	34.65	0.001	35.69	0.002
33.63	0.001	34.67	0.001	35.71	0.002
33.65	0.001	34.69	0.001	35.73	0.002
33.67	0.001	34.71	0.001	35.75	0.002
33.69	0.001	34.73	0.001	35.77	0.002
33.71	0.001	34.75	0.001	35.79	0.002
33.73	0.001	34.77	0.001	35.81	0.002
33.75	0.001	34.79	0.001	35.83	0.002
33.77	0.001	34.81	0.001	35.85	0.002
33.79	0.001	34.83	0.001	35.87	0.002
33.81	0.001	34.85	0.001	35.89	0.002
33.83	0.001	34.87	0.001	35.91	0.002
33.85	0.001	34.89	0.001	35.93	0.002
33.87	0.001	34.91	0.001	35.95	0.002
33.89	0.001	34.93	0.001	35.97	0.002
33.91	0.001	34.95	0.001	35.99	**0.002**
33.93	0.001	34.97	0.002		
33.95	0.001	34.99	0.002		
33.97	0.001	35.01	0.002		
33.99	0.001	35.03	0.002		
34.01	0.001	35.05	0.002		
34.03	0.001	35.07	0.002		
34.05	0.001	35.09	0.002		
34.07	0.001	35.11	0.002		
34.09	0.001	35.13	0.002		
34.11	0.001	35.15	0.002		
34.13	0.001	35.17	0.002		
34.15	0.001	35.19	0.002		
34.17	0.001	35.21	0.002		
34.19	0.001	35.23	0.002		
34.21	0.001	35.25	0.002		
34.23	0.001	35.27	0.002		
34.25	0.001	35.29	0.002		
34.27	0.001	35.31	0.002		

See storage volume and WQV elevation calculations on BMP worksheet E(WQV)=35.93

Stage-Discharge for Pond 12P: Filtration Drip Edge #10

Elevation (feet)	Secondary (cfs)	Elevation (feet)	Secondary (cfs)	Elevation (feet)	Secondary (cfs)
33.25	0.00	34.29	0.31	35.33	0.46
33.27	0.00	34.31	0.31	35.35	0.46
33.29	0.00	34.33	0.32	35.37	0.46
33.31	0.01	34.35	0.32	35.39	0.47
33.33	0.01	34.37	0.32	35.41	0.47
33.35	0.02	34.39	0.33	35.43	0.47
33.37	0.03	34.41	0.33	35.45	0.47
33.39	0.03	34.43	0.33	35.47	0.48
33.41	0.04	34.45	0.34	35.49	0.48
33.43	0.05	34.47	0.34	35.51	0.48
33.45	0.07	34.49	0.34	35.53	0.48
33.47	0.08	34.51	0.35	35.55	0.48
33.49	0.09	34.53	0.35	35.57	0.49
33.51	0.10	34.55	0.35	35.59	0.49
33.53	0.11	34.57	0.36	35.61	0.49
33.55	0.12	34.59	0.36	35.63	0.49
33.57	0.13	34.61	0.36	35.65	0.50
33.59	0.14	34.63	0.37	35.67	0.50
33.61	0.15	34.65	0.37	35.69	0.50
33.63	0.15	34.67	0.37	35.71	0.50
33.65	0.16	34.69	0.37	35.73	0.50
33.67	0.17	34.71	0.38	35.75	0.51
33.69	0.17	34.73	0.38	35.77	0.51
33.71	0.18	34.75	0.38	35.79	0.51
33.73	0.19	34.77	0.39	35.81	0.51
33.75	0.19	34.79	0.39	35.83	0.52
33.77	0.20	34.81	0.39	35.85	0.52
33.79	0.20	34.83	0.39	35.87	0.52
33.81	0.21	34.85	0.40	35.89	0.52
33.83	0.21	34.87	0.40	35.91	0.52
33.85	0.22	34.89	0.40	35.93	0.53
33.87	0.22	34.91	0.41	35.95	0.53
33.89	0.23	34.93	0.41	35.97	0.53
33.91	0.23	34.95	0.41	35.99	**0.53**
33.93	0.24	34.97	0.41		
33.95	0.24	34.99	0.42		
33.97	0.25	35.01	0.42		
33.99	0.25	35.03	0.42		
34.01	0.26	35.05	0.42		
34.03	0.26	35.07	0.43		
34.05	0.26	35.09	0.43		
34.07	0.27	35.11	0.43		
34.09	0.27	35.13	0.43		
34.11	0.28	35.15	0.44		
34.13	0.28	35.17	0.44		
34.15	0.28	35.19	0.44		
34.17	0.29	35.21	0.44		
34.19	0.29	35.23	0.45		
34.21	0.30	35.25	0.45		
34.23	0.30	35.27	0.45		
34.25	0.30	35.29	0.45		
34.27	0.31	35.31	0.46		

E(WQV)=35.93
Q(WQV)=0.53 cfs

INFILTRATION PRACTICE CRITERIA
(Env-Wq 1508.06)

Type/Node Name: **Stone Drip Edge #11 / 13P**

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

Yes		Have you reviewed Env-Wq 1508.06(a) to ensure that infiltration is allowed?	← yes
0.06	ac	A = Area draining to the practice	
0.06	ac	A_I = Impervious area draining to the practice	
1.00	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.95	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.06	ac-in	WQV= 1" x Rv x A	
217	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
54	cf	25% x WQV (check calc for sediment forebay volume)	
N/A - Roof		Method of pretreatment? (not required for clean or roof runoff)	
	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	≥ 25%WQV
574	cf	V = Volume[1] (attach a stage-storage table)	≥ WQV
638	sf	A_{SA} = Surface area of the bottom of the pond	
1.00	iph	$Ksat_{DESIGN}$ = Design infiltration rate[2]	
4.1	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	≤ 72-hrs
35.25	feet	E_{BTM} = Elevation of the bottom of the basin	
32.25	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
28.08	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
3.00	feet	D_{SHWT} = Separation from SHWT	≥ *[3]
7.2	feet	D_{ROCK} = Separation from bedrock	≥ *[3]
N/A	ft	D_{amend} = Depth of amended soil, if applicable due high infiltation rate	≥ 24"
N/A	ft	D_T = Depth of trench, if trench proposed	4 - 10 ft
N/A	Yes/No	If a trench or underground system is proposed, has observation well been provided?	←yes
N/A		If a trench is proposed, does materialmeet Env-Wq 1508.06(k)(2) requirements.[4]	← yes
N/A	Yes/No	If a basin is proposed, Is the perimeter curvilinear, and basin floor flat?	← yes
N/A	:1	If a basin is proposed, pond side slopes.	≥3:1
37.35	ft	Peak elevation of the 10-year storm event (infiltration can be used in analysis)	
37.50	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
37.50	ft	Elevation of the top of the practice (if a basin, this is the elevation of the berm)	
YES		10 peak elevation ≤ Elevation of the top of the trench?[5]	← yes
YES		If a basin is proposed, 50-year peak elevation ≤ Elevation of berm?	← yes

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

Designer's Notes:

Assumed that stone drip edges need to infiltrate 10-year storm similarly to an infiltration trench.

5.5*116*2.25*0.4 = 574.2 cf storage provided

Stage-Area-Storage for Pond 13P: Infiltration Drip Edge #11

Elevation (feet)	Surface (acres)	Storage (acre-feet)
35.25	**0.015**	0.000
35.30	0.015	0.000
35.35	0.015	0.001
35.40	0.015	0.001
35.45	0.015	0.001
35.50	0.015	0.001
35.55	0.015	0.002
35.60	0.015	0.002
35.65	0.015	0.002
35.70	0.015	0.003
35.75	0.015	0.003
35.80	0.015	0.003
35.85	0.015	0.004
35.90	0.015	0.004
35.95	0.015	0.004
36.00	0.015	0.004
36.05	0.015	0.005
36.10	0.015	0.005
36.15	0.015	0.005
36.20	0.015	0.006
36.25	0.015	0.006
36.30	0.015	0.006
36.35	0.015	0.006
36.40	0.015	0.007
36.45	0.015	0.007
36.50	0.015	0.007
36.55	0.015	0.008
36.60	0.015	0.008
36.65	0.015	0.008
36.70	0.015	0.008
36.75	0.015	0.009
36.80	0.015	0.009
36.85	0.015	0.009
36.90	0.015	0.010
36.95	0.015	0.010
37.00	0.015	0.010
37.05	0.015	0.011
37.10	0.015	0.011
37.15	0.015	0.011
37.20	0.015	0.011
37.25	0.015	0.012
37.30	0.015	0.012
37.35	0.015	0.012
37.40	0.015	0.013
37.45	0.015	0.013
37.50	0.015	**0.013**

See storage volume calculation on BMP worksheet
Volume = 574 cf

GENERAL CALCULATIONS - WQV and WQF
(optional worksheet)

This worksheet may be useful when designing a BMP **that does not fit into one of the specific worksheets already provided** (i.e. for a technology which is not a stormwater wetland, infiltration practice, etc.)

Water Quality Volume (WQV)

0.23	ac	A = Area draining to the practice
0.21	ac	A_I = Impervious area draining to the practice
0.94	decimal	I = Percent impervious area draining to the practice, in decimal form
0.90	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)
0.20	ac-in	WQV= 1" x Rv x A
737	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")

Water Quality Flow (WQF)

1	inches	P = Amount of rainfall. For WQF in NH, P = 1".
0.90	inches	Q = Water quality depth. Q = WQV/A
99	unitless	CN = Unit peak discharge curve number. $CN = 1000/(10+5P+10Q-10*[Q^2 + 1.25*Q*P]^{0.5})$
0.1	inches	S = Potential maximum retention. S = (1000/CN) - 10
0.018	inches	Ia = Initial abstraction. Ia = 0.2S
6.0	minutes	T_c = Time of Concentration
700.0	$cfs/mi^2/in$	q_u is the unit peak discharge. Obtain this value from TR-55 exhibits 4-II and 4-III.
0.222	cfs	WQF = q_u x WQV. Conversion: to convert "$cfs/mi^2/in$ * ac-in" to "cfs" multiply by $1mi^2/640ac$.

Designer's Notes:

For sizing of Focal Point #1 (Pond 13P) in conjunction with Focal Point design worksheet

DESIGN WORKSHEET

FOCALPOINT

NEW HAMPSHIRE AOT PROJECTS

1. **Determine FocalPoint bed area (minimum 174 sf/acre of impervious area - ex: 0.2 acres = 35 sf)**
   See step 2 to determine if minimum size is appropriate.
   - Tributary impervious area: = 0.213 ac **(A)**
   - Tributary pervious area: = 0.013 ac **(B)**
   - Minimum FocalPoint bed area required: **= ((A x 1.0) + (B x 0.4)) * 174** = 37.9 sf
   - FocalPoint bed area provided: = 40 sf
   - Dimensions of proposed FocalPoint: = 4 ft x 10 ft

2. **Model a Type II & III 24-hr rainfall event that generates the water quality volume to demonstrate that the entire storm volume is treated prior to activation of the overflow (typically set at 6 - 12 in above the mulch). Note: a 1.2 - 1.3 in rainfall event usually generates 1.0 in of runoff.**
   Contact ACF for a sample HydroCAD node.
   - Water quality volume (WQv) goal: = 737 ft^3
   - Type II & III 24-hr rainfall depth to generate WQv: = 1.31 in
   - Temporary storage depth provided: = 3.0 in
     (typically 6 - 12 in)
   - Temporary storage volume provided at above depth: = 31 ft^3
   - Peak ponding depth from Type III 24-hr storm event: = 2.16 in

3. **Size the Harco PVC domed overflow riser.**
   Note: ACF recommends installation of a Fabco domed overflow filter kit for overflow protection.
   - Domed overflow riser diameter: = 18 in
   - Rim elevation of overflow riser: = 37.75
     (typically 6 - 12 in above mulch surface)
   - 6 in invert in elevation from FocalPoint: = 34.50
     (typically 3 ft below mulch surface)
   - 12 in invert out elevation: = 34.50

4. **Flood control - peak flow attenuation of major storms**
   The treated flow and bypass flow can be routed to a detention system such as an open pond or a subsurface solution like an expanded R-Tank system. (contact ACF for additional information on designing expanded R-Tank systems)

5. **Prepare a landscape plan for the FocalPoint bed area** ☑

6. **Design review and installation oversight by manufacturer's representative**
   - The design has been reviewed by ACF Environmental ☑
   - Engineer will coordinate installation inspection with ACF Environmental ☑

Contact Rob Woodman - Senior Stormwater Engineer
Cell: 207.272.4431 | Email: rwoodman@acfenv.com

ACF ENVIRONMENTAL

DESIGNING WITH FOCALPOINT IN NEW HAMPSHIRE

The New Hampshire Department of Environmental Services has approved the FocalPoint (High Performance Modular Biofiltration System) for use on AoT site development projects in the State of New Hampshire.

SIZING CRITERIA SUMMARY

- The surface area of the media within FocalPoint must be a minimum of 174 sf per 1.0 acre of impervious area (26 sf per 0.15 acres). The thickness of the media is to be no less than 1.5 ft (18 in).
- The system must be modelled in HydroCAD (or similar TR-55 modeling software) to demonstrate that the entire volume of a 1.22 in Type II or III 24-hr storm is treated prior to activation of the bypass/overflow (typically set at 6 - 12 in above the mulch surface). Note: A 1.22 in rainfall event typically generates 1.0 in of runoff.
- The R-Tank modular underdrain can be expanded beyond the footprint of the FocalPoint media bed for expanded infiltration and peak flow attenuation/detention post treatment.

FOCALPOINT SYSTEMS:






FOCALPOINT ACCESSORIES:



Pretreatment - Rain Guardian Turret



Pretreatment - Rain Guardian Foxhole



Pretreatment - PreTx



Bypass protection - Domed overflow with filter insert

For additional information please visit: www.acfenvironmental.com

Contact Rob Woodman - Senior Stormwater Engineer
Cell: 207.272.4431 | Email: rwoodman@acfenv.com

Summary for Pond 14P: Focal Point #1

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=7)

Inflow Area = 0.226 ac, 94.21% Impervious, Inflow Depth = 1.00" for FP1 WQF event
Inflow = 0.25 cfs @ 12.09 hrs, Volume= 0.019 af
Outflow = 0.23 cfs @ 12.13 hrs, Volume= 0.019 af, Atten= 10%, Lag= 2.3 min
Primary = 0.23 cfs @ 12.13 hrs, Volume= 0.019 af
Routed to Pond 18P : Underground Detention

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 37.68' @ 12.13 hrs Surf.Area= 98 sf Storage= 27 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.8 min (793.6 - 792.8)

Volume	Invert	Avail.Storage	Storage Description
#1	35.25'	18 cf	**4.00'W x 10.00'L x 2.25'H Focal Point** 90 cf Overall x 20.0% Voids
#2	37.50'	58 cf	**Surface Bowl (Prismatic)**Listed below (Recalc)
		76 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
37.50	40	0	0
38.00	89	32	32
38.25	119	26	58

Device	Routing	Invert	Outlet Devices
#1	Primary	34.50'	**12.0" Round Culvert** L= 113.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 34.50' / 33.60' S= 0.0080 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	35.25'	**100.000 in/hr Exfiltration over Surface area** Phase-In= 0.10'
#3	Device 1	37.75'	**18.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.22 cfs @ 12.13 hrs HW=37.66' TW=32.15' (Dynamic Tailwater)
↑**1=Culvert** (Passes 0.22 cfs of 4.87 cfs potential flow)
↑**2=Exfiltration** (Exfiltration Controls 0.22 cfs)
3=Orifice/Grate (Controls 0.00 cfs)

Stage-Area-Storage for Pond 14P: Focal Point #1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
35.25	40	0
35.30	40	0
35.35	40	1
35.40	40	1
35.45	40	2
35.50	40	2
35.55	40	2
35.60	40	3
35.65	40	3
35.70	40	4
35.75	40	4
35.80	40	4
35.85	40	5
35.90	40	5
35.95	40	6
36.00	40	6
36.05	40	6
36.10	40	7
36.15	40	7
36.20	40	8
36.25	40	8
36.30	40	8
36.35	40	9
36.40	40	9
36.45	40	10
36.50	40	10
36.55	40	10
36.60	40	11
36.65	40	11
36.70	40	12
36.75	40	12
36.80	40	12
36.85	40	13
36.90	40	13
36.95	40	14
37.00	40	14
37.05	40	14
37.10	40	15
37.15	40	15
37.20	40	16
37.25	40	16
37.30	40	16
37.35	40	17
37.40	40	17
37.45	40	18
37.50	80	18
37.55	85	20
37.60	90	22
37.65	95	25
37.70	100	28
37.75	105	31
37.80	109	34
37.85	114	38
37.90	119	42
37.95	124	46
38.00	129	50
38.05	135	55
38.10	141	60
38.15	147	65
38.20	153	70
38.25	**159**	**76**

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

GENERAL CALCULATIONS - WQV and WQF (optional worksheet)

This worksheet may be useful when designing a BMP **that does not fit into one of the specific worksheets already provided** (i.e. for a technology which is not a stormwater wetland, infiltration practice, etc.)

Water Quality Volume (WQV)

0.33	ac	A = Area draining to the practice
0.32	ac	A_I = Impervious area draining to the practice
0.98	decimal	I = Percent impervious area draining to the practice, in decimal form
0.93	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)
0.31	ac-in	WQV= 1" x Rv x A
1,114	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")

Water Quality Flow (WQF)

1	inches	P = Amount of rainfall. For WQF in NH, P = 1".
0.93	inches	Q = Water quality depth. Q = WQV/A
99	unitless	CN = Unit peak discharge curve number. $CN = 1000/(10+5P+10Q-10*[Q^2 + 1.25*Q*P]^{0.5})$
0.1	inches	S = Potential maximum retention. S = (1000/CN) - 10
0.012	inches	Ia = Initial abstraction. Ia = 0.2S
6.0	minutes	T_c = Time of Concentration
700.0	$cfs/mi^2/in$	q_u is the unit peak discharge. Obtain this value from TR-55 exhibits 4-II and 4-III.
0.336	cfs	WQF = q_u x WQV. Conversion: to convert "$cfs/mi^2/in$ * ac-in" to "cfs" multiply by $1mi^2/640ac$.

Designer's Notes:

For sizing of Jellyfish #1 (15P). See detail sheet within plan set.

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

GENERAL CALCULATIONS - WQV and WQF (optional worksheet)

This worksheet may be useful when designing a BMP **that does not fit into one of the specific worksheets already provided** (i.e. for a technology which is not a stormwater wetland, infiltration practice, etc.)

Water Quality Volume (WQV)

0.22	ac	A = Area draining to the practice
0.21	ac	A_I = Impervious area draining to the practice
0.96	decimal	I = Percent impervious area draining to the practice, in decimal form
0.91	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)
0.20	ac-in	WQV= 1" x Rv x A
743	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")

Water Quality Flow (WQF)

1	inches	P = Amount of rainfall. For WQF in NH, P = 1".
0.91	inches	Q = Water quality depth. Q = WQV/A
99	unitless	CN = Unit peak discharge curve number. $CN = 1000/(10+5P+10Q-10*[Q^2 + 1.25*Q*P]^{0.5})$
0.1	inches	S = Potential maximum retention. S = (1000/CN) - 10
0.015	inches	Ia = Initial abstraction. Ia = 0.2S
6.0	minutes	T_c = Time of Concentration
700.0	$cfs/mi^2/in$	q_u is the unit peak discharge. Obtain this value from TR-55 exhibits 4-II and 4-III.
0.224	cfs	WQF = q_u x WQV. Conversion: to convert "$cfs/mi^2/in$ * ac-in" to "cfs" multiply by $1mi^2/640ac$.

Designer's Notes:

For sizing of Jellyfish #2 (16P). See detail sheet within plan set.

APPENDIX X

Infiltration Testing Data

AMOOZEMETER DATA SHEET

JONES & BEACH ENGINEERS, INC.

Project #: 24029
Test Pit #: 6010
Permeameter Test #: 1/3
Date: 10/29/24
Location: Exeter
Soil Map Unit Series: Scituate
Horizon: B / C (circle one)

Outflow Chamber(s) Used (circle one) :
Associated Conversion Factor:

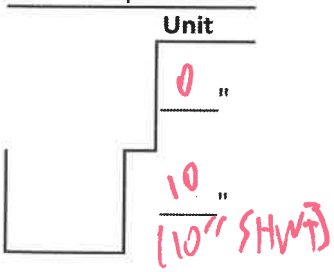
Small ("1 on")	Both ("2 on")
(= 20.0cm^2)	(= 105.0 cm^2)

Used constant for one tube – '2 on' was producing unrealistic results (typ.)

Data Collection Interval (circle one) :

30 Sec. | 1 Min. | 2 Min.

Test hole profile:



Calculation Formulas:

D = (AxB)/C

E = D x 0.001056

F = E / 2.54

Notes: Mulitply "D" by 0.001056 for a conversion from cm^3/hr to cm/hr
Multiply "E" by 0.393701 for conversion fro cm/hr to in/hr



AMOOZEMETER DATA SHEET

JONES & BEACH ENGINEERS INC.

Project #: 24029
Test Pit #: 6010
Permeameter Test #: 2/3
Date: 10/24/24
Location: Exeter
Soil Map Unit Series: Scituate
Horizon: B / C (circle one)

Outflow Chamber(s) Used (circle one) :
Associated Conversion Factor:

Small ("1 on")	Both ("2 on")
(= 20.0cm^2)	(= 105.0 cm^2)

Used constant for one tube – 2 on' was producing unrealistic results (typ.)

Data Collection Interval (circle one) :

30 Sec. **1 Min.** **2 Min.**

Test hole profile:

Unit

"

10 "



Calculation Formulas:

D = (AxB)/C

E = D x 0.001056

F = E / 2.54

Notes: Mulitply "D" by 0.001056 for a conversion from cm^3/hr to cm/hr

Multiply "E" by 0.393701 for conversion fro cm/hr to in/hr

AMOOZEMETER DATA SHEET

JONES&BEACH ENGINEERS INC.

Project #: 24029
Test Pit #: 601D
Permeameter Test #: 3/3
Date: 10/24/24
Location: Exeter
Soil Map Unit Series: Scituate
Horizon: B / C (circle one)

Outflow Chamber(s) Used (circle one) :
Associated Conversion Factor:

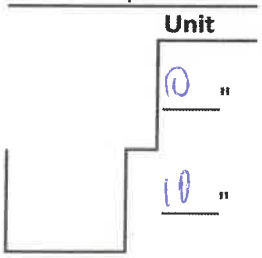
Small ("1 on")	Both ("2 on")
(= 20.0cm^2)	(= 105.0 cm^2)

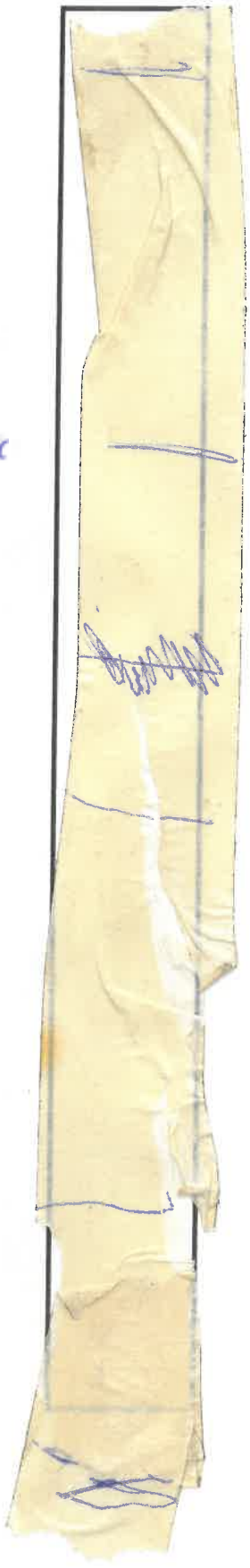
Used constant for one tube – 2 on' has producing unrealistic results (typ.)

Data Collection Interval (circle one) :

30 Sec. **1 Min.** **2 Min.**

Test hole profile:





Calculation Formulas:

D = (AxB)/C

E = D x 0.001056

F = E / 2.54

Notes: Mulitply "D" by 0.001056 for a conversion from cm^3/hr to cm/hr
Multiply "E" by 0.393701 for conversion fro cm/hr to in/hr

AMOOZEMETER DATA SHEET

JONES&BEACH ENGINEERS INC

Project #: 24029
Test Pit #: 6007
Permeameter Test #: 1/3
Date: 10/29/24
Location: Exeter
Soil Map Unit Series: Scituate
Horizon: B / C (circle one)

Outflow Chamber(s) Used (circle one) :
Associated Conversion Factor:

Small ("1 on") (= 20.0cm^2)

Both ("2 on") (= 105.0 cm^2)

Used constant for one tube – 2 on' was producing unrealistic results (typ.)

Data Collection Interval (circle one) :

30 Sec. 1 Min. 2 Min.

Test hole profile:

Unit

"

6 "



Calculation Formulas:

D = (AxB)/C

E = D x 0.001056

F = E / 2.54

Notes: Mulitply "D" by 0.001056 for a conversion from cm^3/hr to cm/hr

Multiply "E" by 0.393701 for conversion fro cm/hr to in/hr

AMOOZEMETER DATA SHEET

JONES&BEA
ENGINEERS

Project #: 24029
Test Pit #: 6007
Permeameter Test #: 2/3
Date: 10/24/24
Location: Exeter
Soil Map Unit Series: Boxford
Horizon: B / C (circle one)

Outflow Chamber(s) Used (circle one) :
Associated Conversion Factor:

Small ("1 on")
(= 20.0cm^2)

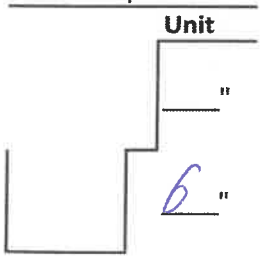
Both ("2 on")
(= 105.0 cm^2)

Used constant for one tube – 2 on' was producing unrealistic results (typ.)

Data Collection Interval (circle one) :

30 Sec. **1 Min.** **2 Min.**

Test hole profile:



Calculation Formulas:

D = (AxB)/C

E = D x 0.001056

F = E / 2.54

Notes: Mulitply "D" by 0.001056 for a conversion from cm^3/hr to cm/hr
Multiply "E" by 0.393701 for conversion fro cm/hr to in/hr

AMOOZEMETER DATA SHEET

JONES & BEACH ENGINEERS

Project #: 24029
Test Pit #: 6007
Permeameter Test #: 3/3
Date: 10/29/24
Location: Exeter
Soil Map Unit Series: Boxford
Horizon: B / C (circle one)

Outflow Chamber(s) Used (circle one) :
Associated Conversion Factor:

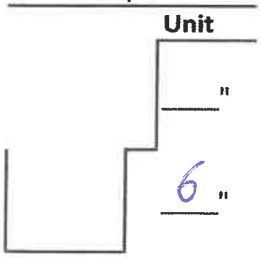
Small ("1 on")	Both ("2 on")
(= 20.0cm^2)	(= 105.0 cm^2)

Used constant for one tube – 2 on' was producing unrealistic results (typ.)

Data Collection Interval (circle one) :

30 Sec. 1 Min. 2 Min.

Test hole profile:



Calculation Formulas:

D = (AxB)/C

E = D x 0.001056

F = E / 2.54

Notes: Mulitply "D" by 0.001056 for a conversion from cm^3/hr to cm/hr

Multiply "E" by 0.393701 for conversion fro cm/hr to in/hr

AMOOZEMETER DATA SHEET

JONES&B… ENGINEER… INC

Project #: 24029
Test Pit #: 6001
Permeameter Test #: 1/3
Date: 10/24/24
Location: Exeter
Soil Map Unit Series: Boxford
Horizon: B / C (circle one)

Outflow Chamber(s) Used (circle one) :
Associated Conversion Factor:

Small ("1 on") **(= 20.0cm^2)**

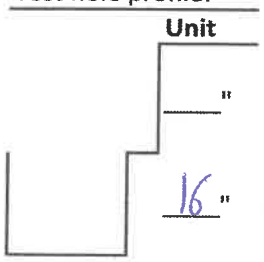
Both ("2 on") **(= 105.0 cm^2)**

Used constant for one tube – 2 on' has producing unrealistic results (typ.)

Data Collection Interval (circle one) :

30 Sec. **1 Min.** **2 Min.**

Test hole profile:





Calculation Formulas:

D = (AxB)/C

E = D x 0.001056

F = E / 2.54

Notes: Mulitply "D" by 0.001056 for a conversion from cm^3/hr to cm/hr

Multiply "E" by 0.393701 for conversion fro cm/hr to in/hr

AMOOZEMETER DATA SHEET

JONES&BEACH ENGINEERS INC.

Project #: 24029
Test Pit #: 6001
Permeameter Test #: 2/3
Date: 10/24/24
Location: ~~Enfield~~
Soil Map Unit Series: Bartolo
Horizon: B / C (circle one)

Outflow Chamber(s) Used (circle one) :
Associated Conversion Factor:

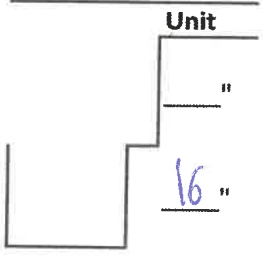
Small ("1 on")	Both ("2 on")
(= 20.0cm^2)	(= 105.0 cm^2)

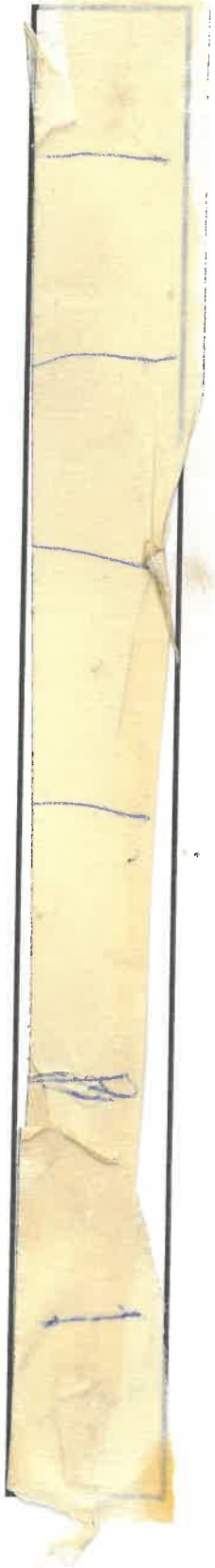
Used constant for one tube – 2 on' was producing unrealistic results (typ.)

Data Collection Interval (circle one) :

30 Sec. **1 Min.** **2 Min.**

Test hole profile:





Calculation Formulas:

D = (AxB)/C

E = D x 0.001056

F = E / 2.54

Notes: Mulitply "D" by 0.001056 for a conversion from cm^3/hr to cm/hr
Multiply "E" by 0.393701 for conversion fro cm/hr to in/hr

AMOOZEMETER DATA SHEET

JONES&BEACH ENGINEERS INC.

Project #: 24029
Test Pit #: 6001
Permeameter Test #: 3/3
Date: 10/24/24
Location: Exeter
Soil Map Unit Series: Boxford
Horizon: B / C (circle one)

Outflow Chamber(s) Used (circle one) :
Associated Conversion Factor:

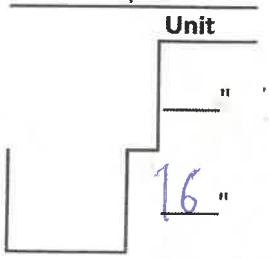
Small ("1 on")	Both ("2 on")
(= 20.0cm^2)	(= 105.0 cm^2)

Used constant for one tube – 2 on' was producing unrealistic results (typ.)

Data Collection Interval (circle one) :

30 Sec. **1 Min.** **2 Min.**

Test hole profile:





Calculation Formulas:

D = (AxB)/C

E = D x 0.001056

F = E / 2.54

Notes: Mulitply "D" by 0.001056 for a conversion from cm^3/hr to cm/hr

Multiply "E" by 0.393701 for conversion fro cm/hr to in/hr

TP 6010 - Test #1

Height	Constant	Time		Outflow	Rate (K_{sat})	
cm	cm^2	Minutes	Hours	cm^3/hr	cm/hr	in/hr
0						
12	20	1	0.016667	14400.0	15.2064	5.9868
19.2	20	2	0.033333	11520.0	12.1651	4.7894
24	20	3	0.05	9600.0	10.1376	3.9912

Outlier due to experimental error - Discard this test

Mean	**4.9225**
σ (Std. Dev.)	**0.8201**

Constant	20	cm^2
Glover Coefficient:	0.001056	$1/cm^2$

Calculations:

Constant = 20 cm^2 for one tube, 105 cm^2 for two tubes two tubes used)

Hours = Minutes / 60

Outflow = (Height*Constant)/Hours

Ksat = Outflow*Glover Coefficient

Average of Tests 2&3 = 2.0 iph

With factor of safety of two = **1.0** iph

TP 6010 - Test #2

Height	Constant	Time		Outflow	Rate (K_{sat})	
cm	cm^2	Minutes	Hours	cm^3/hr	cm/hr	in/hr
0						
2.8	20	1	0.016667	3360.0	3.5482	1.3969
6.1	20	2	0.033333	3660.0	3.8650	1.5216
9.3	20	3	0.05	3720.0	3.9283	1.5466
12.4	20	4	0.066667	3720.0	3.9283	1.5466
15	20	5	0.083333	3600.0	3.8016	1.4967

Mean	**1.5017**
σ (Std. Dev.)	**0.0655**

Constant	20	cm^2
Glover Coefficient:	0.001056	$1/cm^2$

Calculations:

Constant = 20 cm^2 for one tube, 105 cm^2 for two tubes (two tubes used)

Hours = Minutes / 60

Outflow = (Height*Constant)/Hours

Ksat = Outflow*Glover Coefficient

Average of Tests 2&3 = 2.0 iph

With factor of safety of two = **1.0** iph

TP 6010 - Test 3

Height	Constant	Time		Outflow	Rate (K_{sat})	
cm	cm^2	Minutes	Hours	cm^3/hr	cm/hr	in/hr
0						
5.8	20	1	0.016667	6960.0	7.3498	2.8936
11.3	20	2	0.033333	6780.0	7.1597	2.8188
17.1	20	3	0.05	6840.0	7.2230	2.8437
21.4	20	4	0.066667	6420.0	6.7795	2.6691
15	20	5	0.083333	3600.0	3.8016	1.4967

Mean	**2.5444**
σ (Std. Dev.)	**0.0311**

Constant	20	cm^2
Glover Coefficient:	0.001056	$1/cm^2$

Calculations:

Constant = 20 cm^2 for one tube, 105 cm^2 for two tubes (two tubes used)

Hours = Minutes / 60

Outflow = (Height*Constant)/Hours

Ksat = Outflow*Glover Coefficient

Average of Tests 2&3 = 2.0 iph

With factor of safety of two = **1.0** iph

TP 6007 - Test 1

Height	Constant	Time		Outflow	Rate (K_{sat})	
cm	cm^2	Minutes	Hours	cm^3/hr	cm/hr	in/hr
0						
2	20	0.5	0.008333	4800.0	5.0688	1.9956
3.7	20	1	0.016667	4440.0	4.6886	1.8459
5.4	20	1.5	0.025	4320.0	4.5619	1.7960
6.6	20	2	0.033333	3960.0	4.1818	1.6464
8.1	20	2.5	0.041667	3888.0	4.1057	1.6164

Mean	**1.7801**
σ (Std. Dev.)	**0.0848**

Constant	20	cm^2
Glover Coefficient:	0.001056	$1/cm^2$

Calculations:

Constant = 20 cm^2 for one tube, 105 cm^2 for two tubes (two tubes used)

Hours = Minutes / 60

Outflow = (Height*Constant)/Hours

Ksat = Outflow*Glover Coefficient

Average mean Ksat = 2.9 iph

With factor of safety of two = **1.45** iph

TP 6007 - Test 2

Height	Constant	Time		Outflow	Rate (K_{sat})	
cm	cm^2	Minutes	Hours	cm^3/hr	cm/hr	in/hr
0						
3.8	20	0.5	0.008333	9120.0	9.6307	3.7916
7.5	20	1	0.016667	9000.0	9.5040	3.7417
9.8	20	1.5	0.025	7840.0	8.2790	3.2595
12.5	20	2	0.033333	7500.0	7.9200	3.1181
15.6	20	2.5	0.041667	7488.0	7.9073	3.1131

Mean	**3.4048**
σ (Std. Dev.)	**0.2400**

Constant	20	cm^2
Glover Coefficient:	0.001056	$1/cm^2$

Calculations:

Constant = 20 cm^2 for one tube, 105 cm^2 for two tubes (two tubes used)

Hours = Minutes / 60

Outflow = (Height*Constant)/Hours

Ksat = Outflow*Glover Coefficient

Average mean Ksat = 2.9 iph

With factor of safety of two = **1.45** iph

TP 6007 - Test 3

Height	Constant	Time		Outflow	Rate (K_{sat})	
cm	cm^2	Minutes	Hours	cm^3/hr	cm/hr	in/hr
0						
3.9	20	0.5	0.008333	9360.0	9.8842	3.8914
7.1	20	1	0.016667	8520.0	8.9971	3.5422
10.6	20	1.5	0.025	8480.0	8.9549	3.5255
14.4	20	2	0.033333	8640.0	9.1238	3.5921
17.5	20	2.5	0.041667	8400.0	8.8704	3.4923

Mean	**3.6087**
σ (Std. Dev.)	**0.1687**

Constant	20	cm^2
Glover Coefficient:	0.001056	$1/cm^2$

Calculations:

Constant = 20 cm^2 for one tube, 105 cm^2 for two tubes (two tubes used)

Hours = Minutes / 60

Outflow = (Height*Constant)/Hours

Ksat = Outflow*Glover Coefficient

Average mean Ksat = 2.9 iph

With factor of safety of two = **1.45** iph

TP 6001 - Test 1

Height	Constant	Time		Outflow	Rate (K_{sat})	
cm	cm^2	Minutes	Hours	cm^3/hr	cm/hr	in/hr
0						
3.9	20	0.5	0.008333	9360.0	9.8842	3.8914
6.7	20	1	0.016667	8040.0	8.4902	3.3426
9.8	20	1.5	0.025	7840.0	8.2790	3.2595
13.1	20	2	0.033333	7860.0	8.3002	3.2678
16.5	20	2.5	0.041667	7920.0	8.3635	3.2927

Mean	**3.4108**
σ (Std. Dev.)	**0.2804**

Constant	20	cm^2
Glover Coefficient:	0.001056	$1/cm^2$

Calculations:

Constant = 20 cm^2 for one tube, 105 cm^2 for two tubes (two tubes used)

Hours = Minutes / 60

Outflow = (Height*Constant)/Hours

Ksat = Outflow*Glover Coefficient

Average mean Ksat = 3.3 iph

With factor of safety of two = **1.65** iph

TP 6001 - Test 2

Height	Constant	Time		Outflow	Rate (K_{sat})	
cm	cm^2	Minutes	Hours	cm^3/hr	cm/hr	in/hr
0						
3	20	0.5	0.008333	7200.0	7.6032	2.9934
5.8	20	1	0.016667	6960.0	7.3498	2.8936
9.1	20	1.5	0.025	7280.0	7.6877	3.0266
13	20	2	0.033333	7800.0	8.2368	3.2428
16.1	20	2.5	0.041667	7728.0	8.1608	3.2129

Mean	**3.0739**
σ (Std. Dev.)	**0.0565**

Constant	20	cm^2
Glover Coefficient:	0.001056	$1/cm^2$

Calculations:

Constant = 20 cm^2 for one tube, 105 cm^2 for two tubes (two tubes used)

Hours = Minutes / 60

Outflow = (Height*Constant)/Hours

Ksat = Outflow*Glover Coefficient

Average mean Ksat = 3.3 iph

With factor of safety of two = **1.65** iph

TP 6001 - Test 3

Height	Constant	Time		Outflow	Rate (K_{sat})	
cm	cm^2	Minutes	Hours	cm^3/hr	cm/hr	in/hr
0						
3.8	20	0.5	0.008333	9120.0	9.6307	3.7916
6.8	20	1	0.016667	8160.0	8.6170	3.3925
10.1	20	1.5	0.025	8080.0	8.5325	3.3592
13.7	20	2	0.033333	8220.0	8.6803	3.4174
17.2	20	2.5	0.041667	8256.0	8.7183	3.4324

Mean	**3.4786**
σ (Std. Dev.)	**0.1965**

Constant	20	cm^2
Glover Coefficient:	0.001056	$1/cm^2$

Calculations:

Constant = 20 cm^2 for one tube, 105 cm^2 for two tubes (two tubes used)

Hours = Minutes / 60

Outflow = (Height*Constant)/Hours

Ksat = Outflow*Glover Coefficient

Average mean Ksat = 3.3 iph

With factor of safety of two = **1.65** iph

APPENDIX XI

BMP Pollutant Removal Efficiency Data and Calculations

Pollutant Removal Efficiencies for Best Management Practices for Use in Pollutant Loading Analysis				Values Accepted for Loading Analyses		
BMP Type	**BMP**	**Notes**	**Lit. Ref.**	**TSS**	**TN**	**TP**
Stormwater Ponds	Wet Pond		B, F	70%	35%	45%
	Wet Extended Detention Pond		A, B	80%	55%	68%
	Micropool Extended Detention Pond	TBA				
	Multiple Pond System	TBA				
	Pocket Pond	TBA				
Stormwater Wetlands	Shallow Wetland		A, B, F, I	80%	55%	45%
	Extended Detention Wetland		A, B, F, I	80%	55%	45%
	Pond/Wetland System	TBA				
	Gravel Wetland		H	95%	85%	64%
Infiltration Practices	Infiltration Trench (≥75 ft from surface water)		B, D, I	90%	55%	60%
	Infiltration Trench (<75 ft from surface water)		B, D, I	90%	10%	60%
	Infiltration Basin (≥75 ft from surface water)		A, F, B, D, I	90%	60%	65%
	Infiltration Basin (<75 ft from surface water)		A, F, B, D, I	90%	10%	65%
	Dry Wells			90%	55%	60%
	Drip Edges			90%	55%	60%
Filtering Practices	Aboveground or Underground Sand Filter that infiltrates WQV (≥75 ft from surface water)		A, F, B, D, I	90%	60%	65%
	Aboveground or Underground Sand Filter that infiltrates WQV (<75 ft from surface water)		A, F, B, D, I	90%	10%	65%
	Aboveground or Underground Sand Filter with underdrain		A, I, F, G, H	85%	10%	45%
	Tree Box Filter	TBA				
	Bioretention System		I, G, H	90%	65%	65%
	Permeable Pavement that infiltrates WQV (≥75 ft from surface water)		A, F, B, D, I	90%	60%	65%
	Permeable Pavement that infiltrates WQV (<75 ft from surface water)		A, F, B, D, I	90%	10%	65%
	Permeable Pavement with underdrain		Use TN and TP values for sand filter w/ underdrain and outlet pipe	90%	10%	45%

For standard stone drip edge

Drip edge with filter course is similar to a bioretention system for residential roof runoff

Pollutant Removal Efficiencies for Best Management Practices for Use in Pollutant Loading Analysis				Values Accepted for Loading Analyses		
BMP Type	**BMP**	**Notes**	**Lit. Ref.**	**TSS**	**TN**	**TP**
Treatment Swales	Flow Through Treatment Swale	TBA				
Vegetated Buffers	Vegetated Buffers		A, B, I	73%	40%	45%
Pre-Treatment Practices	Sediment Forebay	TBA				
	Vegetated Filter Strip		A, B, I	73%	40%	45%
	Vegetated Swale		A, B, C, F, H, I	65%	20%	25%
	Flow-Through Device - Hydrodynamic Separator		A, B, G, H	35%	10%	5%
	Flow-Through Device - ADS Underground Multichamber Water Quality Unit (WQU)		G, H	72%	10%	9%
	Other Flow-Through Devices	TBA				
	Off-line Deep Sump Catch Basin		J, K, L, M	15%	5%	5%

REGION 1
BOSTON, MA 02109
Dated by Signature

MEMORANDUM

SUBJECT: FocalPoint Crediting Direction

FROM: Damien Houlihan, Stormwater Permits Section
Water Division

TO: Robert J. Woodman
Director - Engineering and Green Stormwater Infrastructure
Ferguson Waterworks

On June 7, 2021, Ferguson Waterworks (Ferguson) submitted a request to EPA Region 1 regarding the use of the FocalPoint biofiltration system (also known also as the High Performance Modular Biofiltration System, hereinafter "FocalPoint biofiltration system"). Based on the review of documents submitted by Ferguson, EPA Region 1 finds that entities wishing to deploy the FocalPoint biofiltration system may calculate phosphorus and nitrogen reductions under the 2016 Massachusetts Municipal Separate Storm Sewer Permit (MA MS4 Permit) and the 2017 New Hampshire Municipal Separate Storm Sewer Permit (NH MS4 Permit) using the performance quantification for Enhanced Biofiltration found on Table 3-20 and Figure 3-15 of Attachment 3 to Appendix F of the MA MS4 permit and Table 3-20 and Figure 3-15 of Attachment 3 to Appendix F of the NH MS4 permit (also attached to this document for reference) provided the following standard FocalPoint design requirements and other conditions are met:

1. Ferguson's FocalPoint biofiltration systems are to be designed with pretreatment to remove coarse sediment and debris before they reach and prematurely close the filter bed. Pretreatment measures must be designed to dissipate velocities and spread water out over a 2 to 4 ft width.
2. Ferguson's FocalPoint biofiltration systems are to be designed with a minimum and maximum surface ponding depths of 3 inches and 18 inches, respectively.
3. Ferguson's FocalPoint biofiltration systems are to be separated or otherwise isolated from the groundwater table to ensure that groundwater does not inundate the filter bed either using an impermeable liner or physical separation.
4. Ferguson's FocalPoint biofiltration systems are to be designed such that the system bed area is sized to be a minimum of 174 square feet per acre of tributary area. Stormwater modelling software shall be used to demonstrate that the runoff volume goal is treated prior to bypass.
5. System maintenance of Ferguson's FocalPoint biofiltration systems should occur once every 6 months, at a minimum, and filter media and pretreatment measures shall be replaced such that the performance of the systems are maintained as originally designed.

6. Stormwater quality monitoring must be used to ensure system performance has not declined over time. EPA recommends this monitoring commence once the filter bed media reaches two (2) years in age to ensure system performance has not declined. All monitoring data must be submitted to EPA by the entity claiming pollution reduction credit for the FocalPoint biofiltration system and filter media shall be replaced if monitoring data shows a decline in performance from original design.

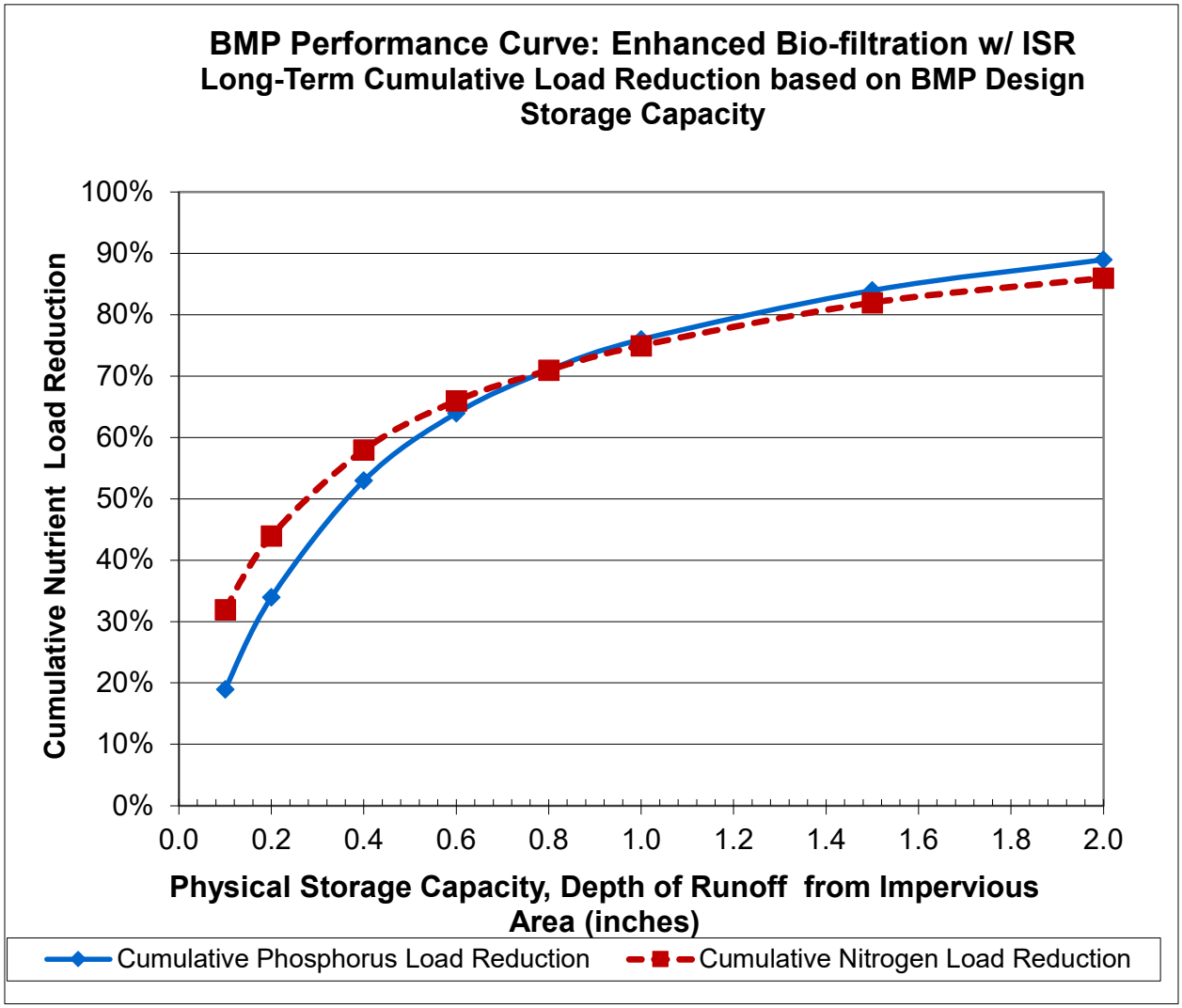
This pollution reduction crediting of the FocalPoint biofiltration system is consistent with the Alternative Methods request process contained in Attachment 3 to Appendix F in the MA MS4 Permit and Attachment 3 to Appendix F of the NH MS4 Permit and may be used unless EPA Region 1 requires an alternative pollution reduction crediting methodology based on new or additional modeling of high-flow-rate filtering systems in a future NPDES permit. All stormwater quality monitoring data shall be submitted to EPA consistent with the requirements of the MA MS4 Permit or the NH MS4 Permit.

Table 3- 20: Enhanced Bio-filtration* with Internal Storage Reservoir (ISR) BMP Performance Table

Enhanced Bio-filtration* w/ ISR BMP Performance Table: Long-Term Phosphorus & Nitrogen Load Reduction								
BMP Capacity: Depth of Runoff from Impervious Area (inches)	0.1	0.2	0.4	0.6	0.8	1.0	1.5	2.0
Cumulative Phosphorus Load Reduction	19%	34%	53%	64%	71%	76%	84%	89%
Cumulative Nitrogen Load Reduction	32%	44%	58%	66%	71%	75%	82%	86%

***Filter media augmented with phosphorus sorbing materials to enhance phosphorus removal.**

Figure 3-15: BMP Performance Curve: Enhanced Bio-filtration with Internal Storage Reservoir (ISR) BMP Performance Table



11. Data Quality Assessment

Data was analyzed using statistical methods in accordance with guidelines in the **TARP Protocol for Stormwater Best Management Practice Demonstrations**, and the **VTAP Guidance for Evaluating Stormwater Manufactured Treatment Devices**. Data was examined by statistical and regression analysis, ANOVA statistics, non-parametric analysis, correlations, probability distributions of data, normality testing, standards, and physical data replication.

Data integrity in the laboratory was addressed in a multi-level review process for all analyses conducted. The initial step in this review process was conducted by each lab analyst as tests were conducted. Calibration values and procedures were checked against previous tests to alert the analyst to in case of malfunction in equipment or test errors.

The second level of review was conducted by the lab director who collected results and entered these values into the tabular spreadsheets for each test. Each of the results was checked for accuracy of input as well as to appropriateness for the samples which were analyzed. All results were overseen or conducted personally by the lab manager. All preliminary calculations were reviewed.

The final level of review was conducted by the project manager who reviewed all results generated within the laboratory.

12. Conclusions

Field testing of an Imbrium Systems' Jellyfish® Filter model JF4-2-1 with second-generation filtration cartridges was conducted in accordance with the TARP and VTAP field test protocols. The physical modeling campaign was carried out on the University of Florida campus with the full-scale unit loaded by rainfall-runoff from a surface parking watershed. A total of 25 monitored storm events, with 15 inches of cumulative rainfall depth, were treated by the JF4 during this study. Of the 25 storms treated, two storms generated flows exceeding the maximum design flow of 200 gpm. No maintenance was required or conducted during the 13-month monitoring period from May 28, 2010 to June 27, 2011.

Treatment results generated median SSC and TSS removal efficiency results of 99% and 89%, respectively. Median removal efficiency was 59% for Total Phosphorus and 51% for Total Nitrogen. For Total Copper, Zinc, Lead and Chromium median removal efficiencies were 90, 70, 81, and 36%, respectively. The d_{50} for influent and effluent particle sizes were 82 and 3 μm, respectively. Median head loss never exceeded 8.4 inches (21.4 cm) for any event and across the entire monitoring campaign the median head loss was 3.3 inches (8.3 cm). Dry basis particulate matter (PM) recovered from the treatment unit totaled 166 pounds, and the JF4-2-1 had a volumetric capacity to retain a significantly larger mass of PM. Median and peak head losses were driven predominately by flow rate and to a much lesser degree by filter cartridge ripening which was muted. At the completion of the monitoring campaign, a 95% mass balance was obtained on particulate matter (PM) which validates the testing methods used throughout this study. This mass balance on PM is an independent requirement to validate the influent and effluent monitoring and validates the most rigorous unit operation and process physical modeling available. The results obtained in this field study demonstrate that the Jellyfish Filter's particulate removal performance is reasonably insensitive to incoming particle size distribution (PSD) and runoff event duration.

(JBE): 51% TN removal was observed in this study. Updated testing has resulted in a 75% TP removal efficiency for the Jellyfish as noted on Contech's website. No published TN removal value was available for the Jellyfish.

Jellyfish Filter Performance Testing Results

Pollutant of Concern	% Removal
Total Suspended Solids (TSS)	85%
Total Phosphorus (TP)	75%
Total Copper (TCu)	67%
Total Zinc (TZn)	60%

Source:
WA DOE TAPE Testing: https://fortress.wa.gov/ ecy/ezshare/wq/tape/use_designations/ JELLYFISHfilterIMBRIUMguld.pdf

Select Jellyfish Filter Certifications

- Washington State Department of Ecology (TAPE) GULD – Basic, Phosphorus
- New Jersey Corporation for Advanced Technology (NJCAT)
- Virginia Department of Environmental Quality (VA DEQ)
- Texas Commission on Environmental Quality (TCEQ)
- Canada ISO 14034 Environmental Management - Environmental Technology Verification (ETV)
- Philadelphia Water District (PWD)
- Maryland Department of the Environment (MD DOE)
- Virginia Department of Environmental Quality (VA DEQ)

Jellyfish Filter Configurations

The Jellyfish Filter can be can be configured in a variety of systems; manhole, catch basin, vault, or custom configuration. Typically, 18 inches (457 mm) of driving head is designed into the system. For low drop sites, the designed driving head can be less.

Jellyfish Filter Maintenance

- Jellyfish Filter cartridges are lightweight, easy to use, and reusable
- Maintenance of the filter cartridges is performed by removing, rinsing and reusing the cartridge tentacles.
- Vacuum extraction of captured pollutants in the sump is recommended at the same time.
- Full cartridge replacement intervals differ by site due to varying pollutant loading and type, and maintenance frequency. Replacement is anticipated every 2-5 years.
- Contech has created a network of **Certified Maintenance Providers** to provide maintenance on stormwater BMP's.

POLLUTANT REMOVAL CALCULATIONS

BMP	Filter Drip Edge	Porous	Focal Point	Jellyfish	Stone Drip Edge	Total	Required
Acres Impervious	0.341	1.574	0.213	0.538	0.063	2.728	
TSS Removal (%)	90%	90%	90%	85%	90%	**89%**	**80%**
TN Removal (%)	65%	60%	76%	51%	55%	**60%**	**60%**
TP Removal (%)	65%	65%	75%	75%	60%	**68%**	**60%**

Calculations are based on post-construction impervious surfaces on the subject parcels.
Pervious areas within the watersheds draining to stormwater features are excluded from these calculations.

Pollutant removal efficiencies are per the New Hampshire Stormwater Manual, Volume 2, or are otherwise based on proprietary information from the manufacturer.

TSS removal of 89% provided exceeds 80% requirement
TN removal of 60% provided meets 60% requirement
TP removal of 68% provided exceeds 60% requriement

APPENDIX XII

Stormwater Operations and Maintenance Manual

STORMWATER MANAGEMENT OPERATIONS AND MAINTENANCE MANUAL

"Lilac Place"
76 Portsmouth Ave.
Exeter, NH 03833
Tax Map 137, Lots 4 & 75

Prepared for:

Green & Company
11 Lafayette Road
North Hampton, NH 03862

Prepared by:
Jones & Beach Engineers, Inc.
85 Portsmouth Avenue
P.O. Box 219
Stratham, NH 03885
(603) 772-4746
November 4, 2024
Revised January 10, 2025
Revised February 12, 2025
Revised March 14, 2025
JBE Project No. 24029

JONES&BEACH ENGINEERS INC.

Inspection and Maintenance of Facilities and Property

A. Maintenance of Common Facilities or Property

1. The Condominium Association, future owners and assigns are responsible to perform the maintenance obligations or hire a Professional Engineer to review the site on an annual basis for maintenance and certification of the stormwater system. The Association, future owners and assigns shall keep receipts and records of all maintenance companies hired throughout the year to submit along with the following form. The annual report and certification shall be submitted with three copies to the Town Planner by January 31st of each year.

B. General Inspection and Maintenance Requirements

1. Permanent stormwater and sediment and erosion control facilities to be maintained on the site include, but are not limited to, the following:

    a. Paved surfaces
    b. Vegetation and landscaping
    c. Porous Pavement
    d. Drain Manholes
    e. Drip Edges
    f. Culverts
    g. Rip-Rap Outlet Protection Aprons
    h. Yard Drains
    i. Pocket Pond
    j. Pre-Tx
    k. Focal Point
    l. Contech Jellyfish
    m. Underground Detention Chambers

2. Maintenance of permanent measures shall follow the following schedule:

    a. Normal winter pavement maintenance including plowing and snow removal. Pavement sweeping at the end of every winter, preferably before the start of the spring rain season.

    b. **Annual inspection** of the site for erosion, destabilization, settling, and sloughing. Any needed repairs are to be conducted immediately. **Annual inspection** of site's vegetation and landscaping. Any areas that are bare shall be reseeded and mulched with hay or, if the case is extreme, loamed and seeded or sodded to ensure adequate vegetative cover. Landscape specimens shall be replaced in kind, if they are found to be dead or dying.

    c. Porous Asphalt:

    The following criteria will help assure that the pavement is maintained to preserve its hydrologic effectiveness.

    Winter maintenance:

    - Sanding for winter traction is prohibited. Deicing is permitted (NaCl, $MgCl_2$, or equivalent). Reduced salt application is possible and can be a cost savings for winter

maintenance. Nontoxic, organic deicers, applied either as blended, magnesium chloride-based liquid products or as pretreated salt, are preferable.

- Plowing is allowed, blade should be set approximately 1" above road surface. Ice and light snow accumulation are generally not as problematic as for standard asphalt. Snow will accumulate during heavier storms and should be plowed. (more than usual, about an inch).

Routine maintenance:

- Asphalt seal coating is absolutely forbidden. Surface seal coating is not reversible.
- The pavement surface should be vacuumed 2 or 3 times per year, and at any additional times sediment is spilled, eroded, or tracked onto the surface.
- Planted areas adjacent to pervious pavement shall be well maintained to prevent soil washout onto the pavement. If any bare spots or eroded areas are observed within the planted areas, they shall be replanted and/or stabilized at once.
- Immediately clean any soil deposited on pavement. Superficial dirt does not necessarily clog the pavement voids. However, dirt that is ground in repeatedly by tires can lead to clogging. Therefore, avoid tracking or spilling dirt onto the pavement with trucks or heavy equipment.
- Do not allow construction staging, soil/mulch storage, etc. on unprotected pavement surface. Contractor to laydown tarps, plywood or removable item and take care not to track material onto unprotected pavement.
- Repairs: potholes of less than 50 square feet can be patched by any means suitable with standard pavement or a pervious mix is preferred. For areas greater than 50 sq. ft. is in need of repair, approval of patch type shall be sought from a qualified engineer. Any required repair of drainage structures should be done promptly to ensure continued proper functioning of the system.
- Written and verbal communication to the porous pavement's future owner shall make clear the pavement's special purpose and special maintenance requirements such as those listed here.

d. **Annual inspection** of drain manholes to determine if they need to be cleaned. Manholes shall be cleaned of any material upon inspection. Manholes can be cleaned either manually or by specially designed equipment including, but not limited to, bucket loaders and vacuum pumps. Before any materials can be disposed, it is necessary to perform a detailed chemical analysis to determine if the materials meet the EPA criteria for hazardous waste. This will help determine how the materials shall be stored, treated, and disposed.

e. Roof drip edges:

The following course of action will help assure that the roof drip edges are maintained to preserve its effectiveness.

In the spring and fall, visually inspect the area around the edges and repair any erosion. Use small stones to stabilize erosion along drainage paths. Inspect stone area to ensure that it has not been displaced, undermined, or otherwise damaged. Displaced rock shall be replaced, or additional rock added in order to maintain the structure(s) in their undamaged state. Woody vegetation shall not be allowed to become established in stone areas, and/or any debris removed from the void spaces between the stones

f. **Inspection** of culvert inlets and outlets at least **once per month** during the rainy season (March to November). Any debris is to be removed and disposed of properly.

g. Rock riprap shall be **inspected annually** in order to ensure that it has not been displaced, undermined, or otherwise damaged. Displaced rock shall be replaced, or additional rock added in order to maintain the structure(s) in their undamaged state. Woody vegetation must not be allowed to become established in riprap areas, and/or any debris removed from the void spaces between the rocks. If the riprap is adjacent to a stream or other waterbody, the water shall be kept clear of obstructions, debris, and sediment deposits

h. **Annual inspection** of yard drains to determine if they need to be cleaned. Yard drains are to be cleaned if the depth of deposits is greater than one-half the depth from the basin bottom to the invert of the lowest pipe or opening into or out of the basin. If a yard drain significantly exceeds the one-half depth standard during the inspection, then it shall be cleaned more frequently. If woody debris or trash accumulates in the yard drain, then it shall be cleaned on a weekly basis. The yard drain can be cleaned either manually or by specially designed equipment including, but not limited to, bucket loaders and vacuum pumps. Before any materials can be disposed, it is necessary to perform a detailed chemical analysis to determine if the materials meet the EPA criteria for hazardous waste. This will help determine how the materials shall be stored, treated, and disposed. Grease hoods are to be wiped clean and the rags disposed of properly. Debris obscuring the grate inlet shall also be removed

i. Pocket Pond: Regularly mow this BMP. If the detention pond does not drain within 72 hours following a rainfall event, then a Professional Engineer shall assess the condition of the facility to determine measures required to restore function, including but not limited to removal of accumulated sediments or reconstruction of the basin.

j. Rain Guardian Bunker: See attached inspection and maintenance guidance document.

k. Focal Point: See attached inspection and maintenance guidance document.

l. Contech Jellyfish: See attached inspection and maintenance guidance document.

m. Underground Detention Chambers: Once annually, open the inspection ports and visually inspect the condition of the stone base. If more than 12” of sediment is observed, plug the outlet and flush the system thoroughly. Pump water into system until at least 1” of standing water covers the system bottom. Repeat at both inspection ports and pump out back-flush water. Capture sediment-laden water for proper disposal according to local state, and EPA regulation. Additionally, vacuum all adjacent manhole structures.

See attached sample forms as a guideline.

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

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

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

Commitment to maintenance requirements

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

_____
Signature

_____
Print Name

_____
Title

_____
Date

Annual Operations and Maintenance Report

The Condominium Association, future owners and assigns are responsible to perform the maintenance obligations or hire a Professional Engineer to review the site on an annual basis for maintenance and certification of the stormwater system. The Association, future owners and assigns shall keep receipts and records of all maintenance companies hired throughout the year to submit along with the following form. The annual report and certification shall be submitted with three copies to the Town Planner by January 31st of each year.

Construction Activity	Date of Inspection	Who Inspected	Findings of Inspector
Paved Surfaces			
Vegetation and Landscaping			
Porous Asphalt / Porous Concrete			
Drain Manhole #1			
Drain Manhole #2			
Drain Manhole #3			

Building #1 Drip Edge			
Building #2 Drip Edge			
Building #3 Drip Edge			
Building #4 Drip Edge			
Building #5 Drip Edge			
Building #6 Drip Edge			
Building #7 Drip Edge			

Building #8 Drip Edge			
Building #9 Drip Edge			
Building #10 Drip Edge			
Building #11 Drip Edge			
Culvert inlet #1			
Culvert inlet #2			
Culvert inlet #3			

Culvert inlet #4			
Culvert inlet #5			
Culvert outlet #1 (All culvert outlet inspections include inspection of respective rip rap apron, if applicable.)			
Culvert outlet #2			
Culvert outlet #3			
Culvert outlet #4			
Culvert outlet #5			

Underdrain outlet #6			
Underdrain outlet #7			
Underdrain outlet #8			
Underdrain outlet #9			
Underdrain outlet #10			
Underdrain outlet #11			
Underdrain outlet #12			

Underdrain outlet #13			
Underdrain outlet #14			
Roof Drain outlet #15			
Culvert outlet #16			
Pocket Pond			
Rain Guardian Bunker			
Focal Point			

Contech Jellyfish #1			
Contech Jellyfish #2			
Underground Detention Chambers			
Other (please note):			
Other (please note):			
Other (please note):			

Deicing Log

Date Applied	Type of Deicing Material	Amount Applied

RAIN GUARDIAN

U.S. PATENT NOS. 8,501,016 AND 8,858,804


TURRET


FOXHOLE


BUNKER

PRETREATMENT FOR BIORETENTION

Rain Gardens • Swales • Filtration Basins • Infiltration Basins

Maintenance Guide

Rain Guardian pretreatment chambers simplify bioretention maintenance by collecting sand, leaves, grass clippings, and other debris in an easy to clean, confined location. Regularly maintaining the Rain Guardian sustains its functionality by maximizing storage and filtration capacities. Maintenance frequency is variable and depends on many factors such as rainfall frequency, drainage area size and land use type, and season of the year. The general cleaning process is similar for all Rain Guardian models (i.e. Bunker, Foxhole, and Turret).

Following rain events, inspect the pretreatment chamber for debris on the top grate, within the chamber, and on the vertical, drop-in filter wall. The maintenance steps described below should be completed if areas of the top grate are clogged, the chamber is >75% full, or the vertical filter wall is clogged. Maintenance should be completed when stormwater has completely drained from the bioretention practice. The filter wall allows the chamber to dry between rain events, which further simplifies maintenance by ensuring removed debris is largely dry. Ensure all debris collected during cleaning of the chamber is completely removed from the site and properly disposed of according to local environmental rules. Once cleaning is complete, reinstall the filter wall with filter fabric facing the inside of the chamber and replace the top grate. For the Foxhole, reinstall the top lid, including optional lid anchor screws if equipped.





Clear Debris from Top Grate

- Foxhole only—remove top lid, including optional lid anchor screws if equipped
- Leaf litter and garbage commonly accumulate on the top grate
- Simply remove and dispose of debris by hand or with a shovel prior to removing top grate





Remove Debris from Inside Chamber

- Remove top grate and place on paved inlet to avoid damage to nearby plants
- Remove and dispose of accumulated debris within chamber using a shovel





Clean Filter Wall

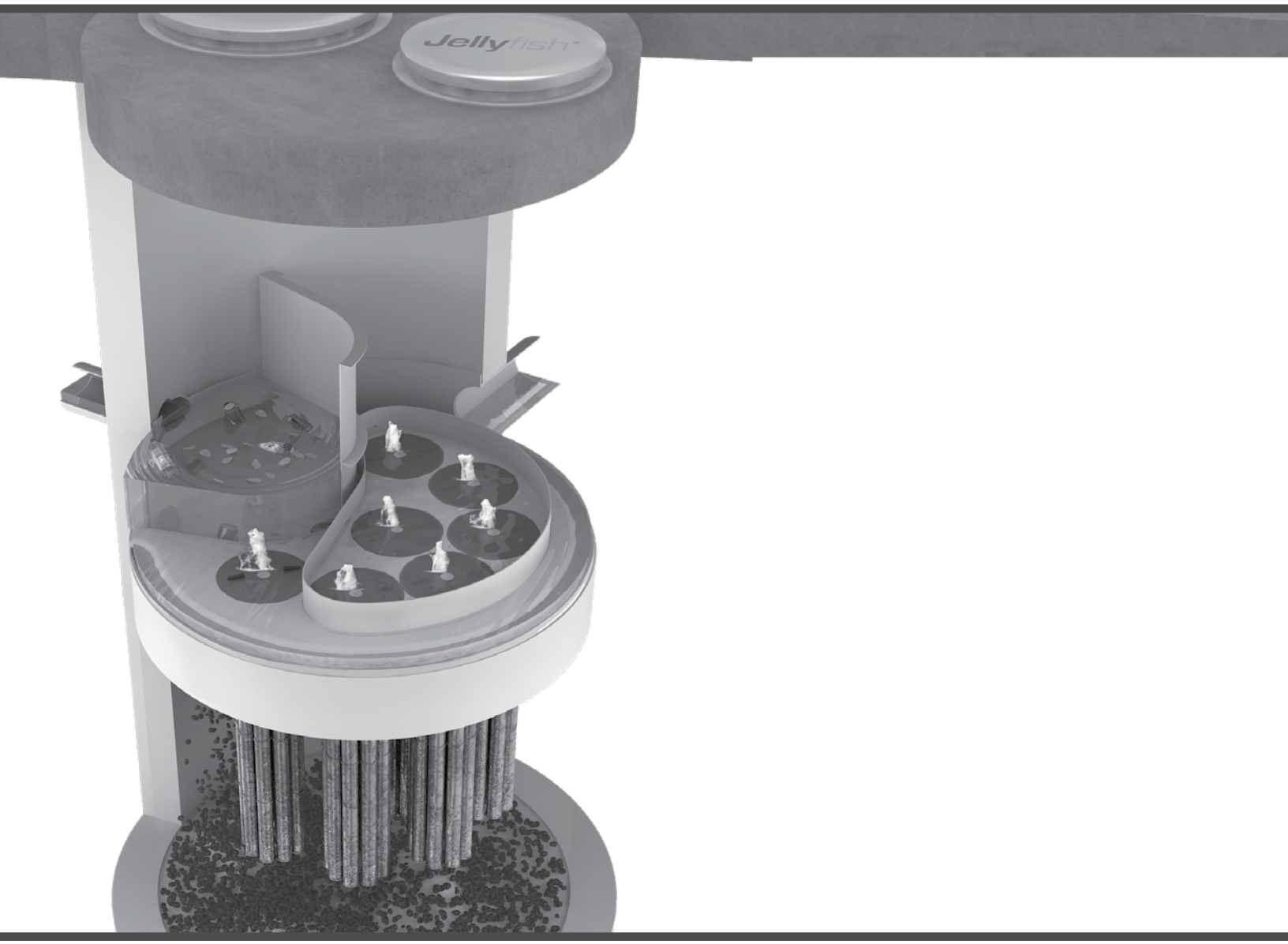
- Remove drop-in filter by lifting vertically
- Clean filter wall with a stiff bristled broom or rinse clean with pressurized water

www.RainGuardian.biz

ANOKA CONSERVATION DISTRICT
1318 McKay Dr. NE, Suite 300
Ham Lake, MN 55304
(763) 434-2030 (M-F 8:00-4:30)

CONTECH®
ENGINEERED SOLUTIONS

Jellyfish® Filter Maintenance Guide



Jellyfish®

JELLYFISH® FILTER
INSPECTION & MAINTENANCE GUIDE

Jellyfish units are often just one of many structures in a more comprehensive stormwater drainage and treatment system.

In order for maintenance of the Jellyfish filter to be successful, it is imperative that all other components be properly maintained. The maintenance and repair of upstream facilities should be carried out prior to Jellyfish maintenance activities.

In addition to considering upstream facilities, it is also important to correct any problems identified in the drainage area. Drainage area concerns may include: erosion problems, heavy oil loading, and discharges of inappropriate materials.

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Inspection Process 7

1.0 Inspection and Maintenance Overview

The primary purpose of the Jellyfish® Filter is to capture and remove pollutants from stormwater runoff. As with any filtration system, these pollutants must be removed to maintain the filter's maximum treatment performance. Regular inspection and maintenance are required to insure proper functioning of the system.

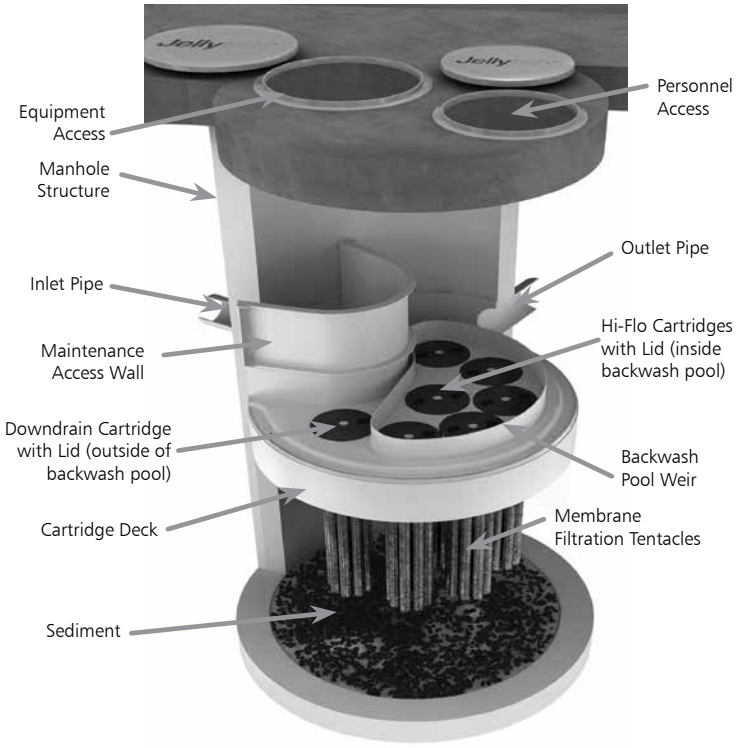
Maintenance frequencies and requirements are site specific and vary depending on pollutant loading. Additional maintenance activities may be required in the event of non-storm event runoff, such as base-flow or seasonal flow, an upstream chemical spill or due to excessive sediment loading from site erosion or extreme runoff events. It is a good practice to inspect the system after major storm events.

Inspection activities are typically conducted from surface observations and include:

- Observe if standing water is present
- Observe if there is any physical damage to the deck or cartridge lids
- Observe the amount of debris in the Maintenance Access Wall (MAW) or inlet bay for vault systems

Maintenance activities include:

- Removal of oil, floatable trash and debris
- Removal of collected sediments
- Rinsing and re-installing the filter cartridges
- Replace filter cartridge tentacles, as needed



Note: Separator Skirt not shown

2.0 Inspection Timing

Inspection of the Jellyfish Filter is key in determining the maintenance requirements for, and to develop a history of, the site's pollutant loading characteristics. In general, inspections should be performed at the times indicated below; *or per the approved project stormwater quality documents (if applicable), whichever is more frequent*.

1. A minimum of quarterly inspections during the first year of operation to assess the sediment and floatable pollutant accumulation, and to ensure proper functioning of the system.
2. Inspection frequency in subsequent years is based on the inspection and maintenance plan developed in the first year of operation. Minimum frequency should be once per year.
3. Inspection is recommended after each major storm event.
4. Inspection is required immediately after an upstream oil, fuel or other chemical spill.

3.0 Inspection Procedure

The following procedure is recommended when performing inspections:

1. Provide traffic control measures as necessary.
2. Inspect the MAW or inlet bay for floatable pollutants such as trash, debris, and oil sheen.
3. Measure oil and sediment depth in several locations, by lowering a sediment probe until contact is made with the floor of the structure. Record sediment depth, and presences of any oil layers.
4. Inspect cartridge lids. Missing or damaged cartridge lids to be replaced.
5. Inspect the MAW (where appropriate), cartridge deck and receptacles, and backwash pool weir, for damaged or broken components.

3.1 Dry weather inspections

- Inspect the cartridge deck for standing water, and/or sediment on the deck.
- No standing water under normal operating conditions.
- Standing water inside the backwash pool, but not outside the backwash pool indicates, that the filter cartridges need to be rinsed.



Inspection Utilizing Sediment Probe

- Standing water outside the backwash pool is not anticipated and may indicate a backwater condition caused by high water elevation in the receiving water body, or possibly a blockage in downstream infrastructure.
- Any appreciable sediment (≥1/16") accumulated on the deck surface should be removed.

3.2 Wet weather inspections

- Observe the rate and movement of water in the unit. Note the depth of water above deck elevation within the MAW or inlet bay.
- Less than 6 inches, flow should be exiting the cartridge lids of each of the draindown cartridges (i.e. cartridges located outside the backwash pool).
- Greater than 6 inches, flow should be exiting the cartridge lids of each of the draindown cartridges and each of the hi-flo cartridges (i.e. cartridges located inside the backwash pool), and water should be overflowing the backwash pool weir.
- 18 inches or greater and relatively little flow is exiting the cartridge lids and outlet pipe, this condition indicates that the filter cartridges need to be rinsed.

4.0 Maintenance Requirements

Required maintenance for the Jellyfish Filter is based upon results of the most recent inspection, historical maintenance records, or the site specific water quality management plan; whichever is more frequent. In general, maintenance requires some combination of the following:

1. Sediment removal for depths reaching 12 inches or greater, or within 3 years of the most recent sediment cleaning, whichever occurs sooner.
2. Floatable trash, debris, and oil removal.
3. Deck cleaned and free from sediment.
4. Filter cartridges rinsed and re-installed as required by the most recent inspection results, or within 12 months of the most recent filter rinsing, whichever occurs sooner.
5. Replace tentacles if rinsing does not restore adequate hydraulic capacity, remove accumulated sediment, or if damaged or missing. It is recommended that tentacles should remain in service no longer than 5 years before replacement.
6. Damaged or missing cartridge deck components must be repaired or replaced as indicated by results of the most recent inspection.
7. The unit must be cleaned out and filter cartridges inspected immediately after an upstream oil, fuel, or chemical spill. Filter cartridge tentacles should be replaced if damaged or compromised by the spill.

5.0 Maintenance Procedure

The following procedures are recommended when maintaining the Jellyfish Filter:

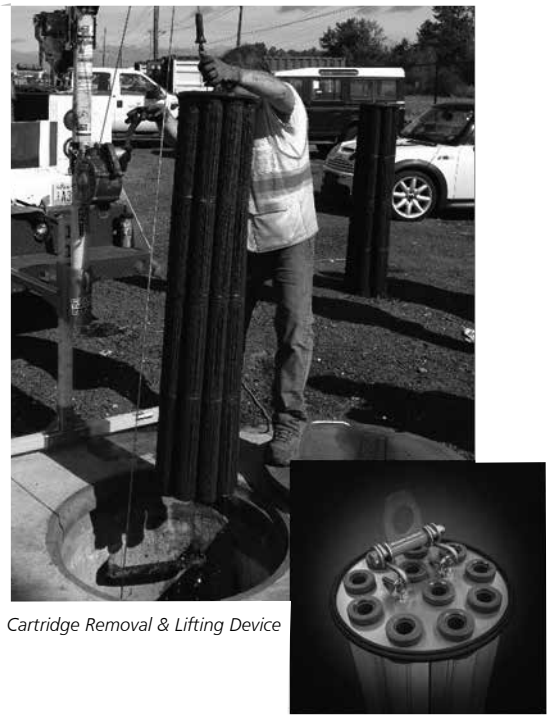
1. Provide traffic control measures as necessary.
2. Open all covers and hatches. Use ventilation equipment as required, according to confined space entry procedures. *Caution: Dropping objects onto the cartridge deck may cause damage*.
3. Perform Inspection Procedure prior to maintenance activity.
4. To access the cartridge deck for filter cartridge service, descend into the structure and step directly onto the deck. Caution: Do not step onto the maintenance access wall (MAW) or backwash pool weir, as damage may result. Note that the cartridge deck may be slippery.
5. Maximum weight of maintenance crew and equipment on the cartridge deck not to exceed 450 lbs.

5.1 Filter Cartridge Removal

1. Remove a cartridge lid.
2. Remove cartridges from the deck using the lifting loops in the cartridge head plate. Rope or a lifting device (available from Contech) should be used. *Caution: Should a snag occur, do not force the cartridge upward as damage to the tentacles may result. Wet cartridges typically weigh between 100 and 125 lbs*.
3. Replace and secure the cartridge lid on the exposed empty receptacle as a safety precaution. Contech does not recommend exposing more than one empty cartridge receptacle at a time.

5.2 Filter Cartridge Rinsing

1. Remove all 11 tentacles from the cartridge head plate. Take care not to lose or damage the O-ring seal as well as the plastic threaded nut and connector.



Cartridge Removal & Lifting Device

2. Position tentacles in a container (or over the MAW), with the threaded connector (open end) facing down, so rinse water is flushed through the membrane and captured in the container.
3. Using the Jellyfish rinse tool (available from Contech) or a low-pressure garden hose sprayer, direct water spray onto the tentacle membrane, sweeping from top to bottom along the length of the tentacle. Rinse until all sediment is removed from the membrane. *Caution: Do not use a high pressure sprayer or focused stream of water on the membrane. Excessive water pressure may damage the membrane*.

4. Collected rinse water is typically removed by vacuum hose.
5. Reassemble cartridges as detailed later in this document. Reuse O-rings and nuts, ensuring proper placement on each tentacle.

5.3 Sediment and Flotables Extraction

1. Perform vacuum cleaning of the Jellyfish Filter only after filter cartridges have been removed from the system. Access the lower chamber for vacuum cleaning only through the maintenance access wall (MAW) opening. Be careful not to damage the flexible plastic separator skirt that is attached to the underside of the deck on manhole systems. Do not lower the vacuum wand through a cartridge receptacle, as damage to the receptacle will result.
2. Vacuum floatable trash, debris, and oil, from the MAW opening or inlet bay. Alternatively, floatable solids may be removed by a net or skimmer.



Vacuuming Sump Through MAW

3. Pressure wash cartridge deck and receptacles to remove all sediment and debris. Sediment should be rinsed into the sump area. Take care not to flush rinse water into the outlet pipe.
4. Remove water from the sump area. Vacuum or pump equipment should only be introduced through the MAW or inlet bay.
5. Remove the sediment from the bottom of the unit through the MAW or inlet bay opening.



Vacuuming Sump Through MAW

6. For larger diameter Jellyfish Filter manholes (≥8-ft) and some vaults complete sediment removal may be facilitated by removing a cartridge lid from an empty receptacle and inserting a jetting wand (not a vacuum wand) through the receptacle. Use the sprayer to rinse loosened sediment toward the vacuum hose in the MAW opening, being careful not to damage the receptacle.

5.4 Filter Cartridge Reinstallation and Replacement

1. Cartridges should be installed after the deck has been cleaned. It is important that the receptacle surfaces be free from grit and debris.
2. Remove cartridge lid from deck and carefully lower the filter cartridge into the receptacle until head plate gasket is seated squarely in receptacle. ***Caution: Do not force the cartridge downward; damage may occur.***
3. Replace the cartridge lid and check to see that both male threads are properly seated before rotating approximately 1/3 of a full rotation until firmly seated. Use of an approved rim gasket lubricant may facilitate installation. See next page for additional details.
4. If rinsing is ineffective in removing sediment from the tentacles, or if tentacles are damaged, provisions must be made to replace the spent or damaged tentacles with new tentacles. Contact Contech to order replacement tentacles.

5.5 Chemical Spills

Caution: If a chemical spill has been captured, do not attempt maintenance. Immediately contact the local hazard response agency and contact Contech.

5.6 Material Disposal

The accumulated sediment found in stormwater treatment and conveyance systems must be handled and disposed of in accordance with regulatory protocols. It is possible for sediments to contain measurable concentrations of heavy metals and organic chemicals (such as pesticides and petroleum products). Areas with the greatest potential for high pollutant loading include industrial areas and heavily traveled roads. Sediments and water must be disposed of in accordance with all applicable waste disposal regulations. When scheduling maintenance, consideration must be made for the disposal of solid and liquid wastes. This typically requires coordination with a local landfill for solid waste disposal. For liquid waste disposal a number of options are available including a municipal vacuum truck decant facility, local waste water treatment plant or on-site treatment and discharge.

Jellyfish Filter Components & Filter Cartridge Assembly and Installation

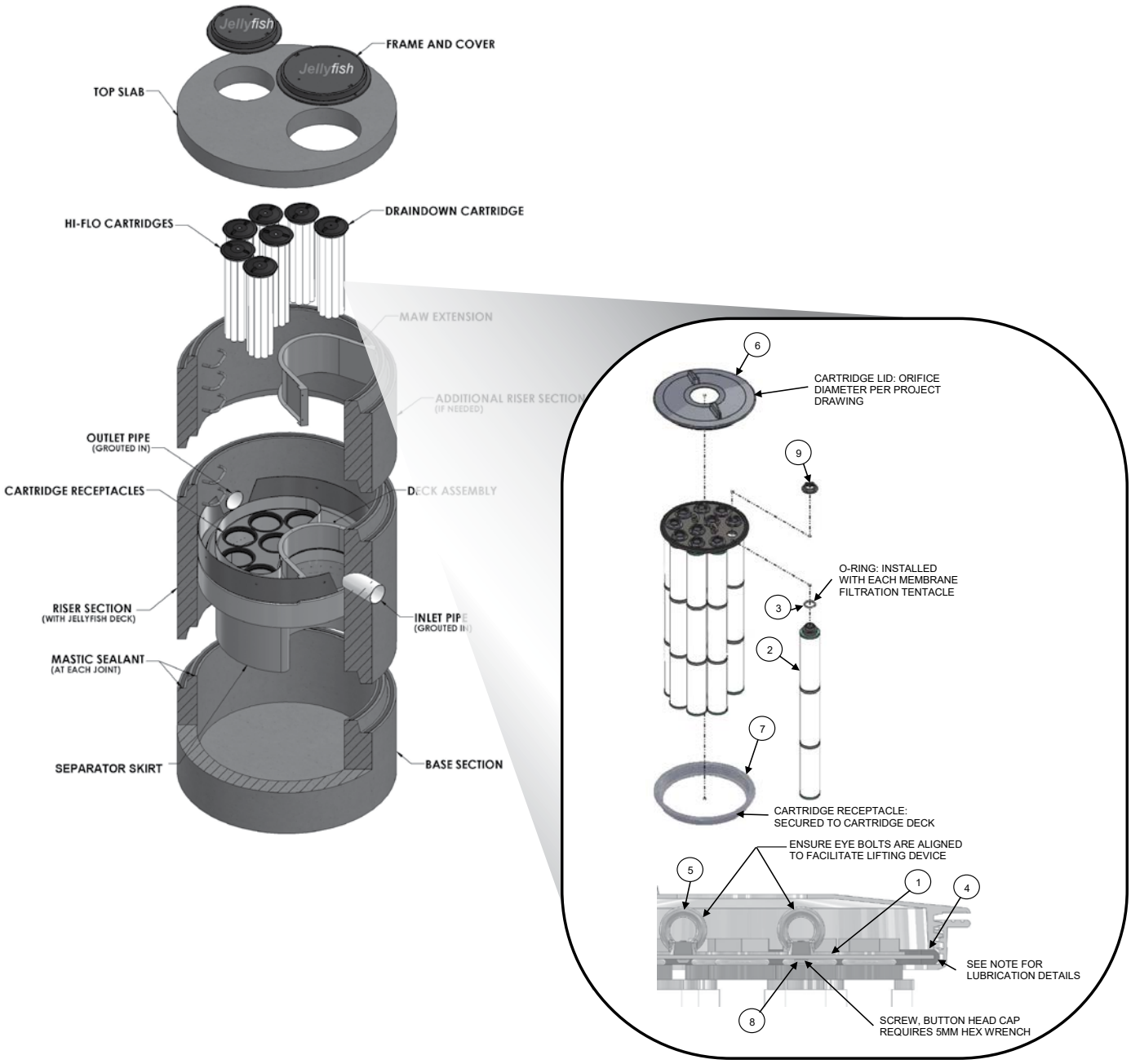


TABLE 1: BOM

ITEM NO.	DESCRIPTION
1	JF HEAD PLATE
2	JF TENTACLE
3	JF O-RING
4	JF HEAD PLATE GASKET
5	JF CARTRIDGE EYELET
6	JF 14IN COVER
7	JF RECEPTACLE
8	BUTTON HEAD CAP SCREW M6X14MM SS
9	JF CARTRIDGE NUT

TABLE 2: APPROVED GASKET LUBRICANTS

PART NO.	MFR	DESCRIPTION
78713	LA-CO	LUBRI-JOINT
40501	HERCULES	DUCK BUTTER
30600	OATEY	PIPE LUBRICANT
PSLUBXL1Q	PROSELECT	PIPE JOINT LUBRICANT

NOTES:

Head Plate Gasket Installation:
Install Head Plate Gasket (Item 4) onto the Head Plate (Item 1) and liberally apply a lubricant from Table 2: Approved Gasket Lubricants onto the gasket where it contacts the Receptacle (Item 7) and Cartridge Lide (ITem 6). Follow Lubricant manufacturer's instructions.

Lid Assembly:
Rotate Cartridge Lid counter-clockwise until both male threads drop down and properly seat. Then rotate Cartridge Lid clock-wise approximately one-third of a full rotation until Cartridge Lid is firmly secured, creating a watertight seal.

Jellyfish Filter Inspection and Maintenance Log

Owner:				Jellyfish Model No:		
Location:				GPS Coordinates:		
Land Use:	Commercial:		Industrial:		Service Station:	
	Roadway/Highway:		Airport:		Residential:	

Date/Time:						
Inspector:						
Maintenance Contractor:						
Visible Oil Present: (Y/N)						
Oil Quantity Removed:						
Floatable Debris Present: (Y/N)						
Floatable Debris Removed: (Y/N)						
Water Depth in Backwash Pool						
Draindown Cartridges externally rinsed and recommissioned: (Y/N)						
New tentacles put on Draindown Cartridges: (Y/N)						
Hi-Flo Cartridges externally rinsed and recommissioned: (Y/N)						
New tentacles put on Hi-Flo Cartridges: (Y/N)						
Sediment Depth Measured: (Y/N)						
Sediment Depth (inches or mm):						
Sediment Removed: (Y/N)						
Cartridge Lids intact: (Y/N)						
Observed Damage:						
Comments:						



Jellyfish®

CONTECH ENGINEERED SOLUTIONS

Support

- Drawings and specifications are available at www.conteches.com/jellyfish.
- Site-specific design support is available from Contech Engineered Solutions.
- Find a Certified Maintenance Provider at www.conteches.com/ccmp

800.338.1122
www.ContechES.com

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FocalPoint

BIOFILTRATION SYSTEMS

HIGH PERFORMANCE MODULAR BIOFILTRATION SYSTEM (HPMBS)

Operations & Maintenance

ACF ENVIRONMENTAL

Customer Focused, Environmentally Committed



GENERAL DESCRIPTION

The following general specifications describe the general operations and maintenance requirements for the FocalPoint® High Performance Modular Biofiltration System (HPMBS). The system utilizes physical, chemical and biological mechanisms of a soil, plant and microbe complex to remove pollutants typically found in urban stormwater runoff. The treatment system is a fully equipped, modular, constructed in place system designed to treat contaminated runoff.

Stormwater enters the FocalPoint® HPMBS, is filtered by the High Flow Biofiltration Media and passes through to the underdrain/storage system where the treated water is detained, retained or infiltrated to sub-soils, prior to discharge to the storm sewer system of any remaining flow.

Higher flows bypass the FocalPoint® HPMBS via a downstream inlet or other overflow conveyance. Maintenance is a simple, inexpensive and safe operation that does not require confined space entry, pumping or vacuum equipment, or specialized tools. Properly trained landscape personnel can effectively maintain FocalPoint® HPMBS by following instructions in this manual.

BASIC OPERATIONS

FocalPoint® is a modular, high performance biofiltration system that often works in tandem with other integrated management practices (IMP). Contaminated stormwater runoff enters the biofiltration bed through a conveyance swale, planter box, or directly through a curb cut or false inlet. Energy is dissipated by a rock or vegetative dissipation device and is absorbed by a 3-inch layer of aged, double shredded hardwood mulch, with fines removed, (when specified) on the surface of the biofiltration media.

As the water passes through the mulch layer, most of the larger sediment particles and heavy metals are removed through sedimentation and chemical reactions with the organic material in the mulch. Water passes through the biofiltration media where the finer particles are removed and numerous chemical reactions take place to immobilize and capture pollutants in the soil media.

The cleansed water passes into the underdrain/storage system and remaining flows are directed to a storm sewer system or other appropriate discharge point. Once the pollutants are in the soil, bacteria begin to break down and metabolize the materials and the plants begin to uptake and metabolize the pollutants. Some pollutants such as heavy metals, which are chemically bound to organic particles in the mulch, are released over time as the organic matter decomposes to release the metals to the feeder roots of the plants and the cells of the bacteria in the soil where they remain and are recycled. Other pollutants such as phosphorus are chemically bound to the soil particles and released slowly back to the plants and bacteria and used in their metabolic processes. Nitrogen goes through a variety of very complex biochemical processes where it can ultimately end up in the plant/bacteria biomass, turned to nitrogen gas or dissolves back into the water column as nitrates depending on soil temperature, pH and the availability of oxygen. The pollutants ultimately are retained in the mulch, soil and biomass with some passing out of the system into the air or back into the water.

DESIGN AND INSTALLATION

Each project presents different scopes for the use of FocalPoint® HPMBS. To ensure the safe and specified function of this stormwater BMP, Convergent Water Technologies and/or its Value Added Resellers (VAR) review each application before supply. Information and design assistance is available to the design engineer during the planning process. Correct FocalPoint® sizing is essential to optimum performance. The engineer shall submit calculations for approval by the local jurisdiction when required. The contractor and/or VAR is responsible for the correct installation of FocalPoint® HPMBS units as described in approved plans. A comprehensive installation manual is available at www.convergentwater.com.



FocalPoint
BIOFILTRATION SYSTEMS

MAINTENANCE

Why Maintain?

All stormwater treatment systems require maintenance for effective operation. This necessity is often incorporated in your property's permitting process as a legally binding BMP maintenance agreement. Other reasons for maintenance include:

- Avoid legal challenges from your jurisdiction's maintenance enforcement program.
- Prolong the lifespan of your FocalPoint® HPMBS.
- Avoid costly repairs.
- Help reduce pollutant loads leaving your property.

Simple maintenance of the FocalPoint® HPMBS is required to continue effective pollutant removal from stormwater runoff before any discharge into downstream waters. This procedure will also extend the longevity of the living biofiltration system. The unit will recycle and accumulate pollutants within the biomass, but may also subjected to other materials entering the surface of the system. This may include trash, silt and leaves etc. which will be contained above the mulch and/or biofiltration media layer. Too much silt may inhibit the FocalPoint's® HPMBS flow rate, which is a primary reason for system maintenance. Removal of accumulated silt/sediment and/or replacement of the mulch layer (when specified), is an important activity that prevents over accumulation of such silt/sediment.

When to Maintain?

Convergent Water Technologies and/or its VAR includes a 1-year maintenance plan with each system purchased. Annual included maintenance consists of two (2) scheduled maintenance visits. Additional maintenance may be necessary depending on sediment and trash loading (by Owner or at additional cost). The start of the maintenance plan begins when the system is activated for full operation. Full operation is defined as when the site is appropriately stabilized, the unit is installed and activated (by VAR), i.e., when mulch (if specified) and plantings are added.

Activation should be avoided until the site is fully stabilized (full landscaping, grass cover, final paving and street sweeping completed). Maintenance visits are scheduled seasonally; the spring visit aims to clean up after winter loads including salts and sands. The fall visit helps the system by removing excessive leaf litter.

A first inspection to determine if maintenance is necessary should be performed at least twice annually after storm events of greater than (1) one inch total depth (subject to regional climate). Please refer to the maintenance checklist for specific conditions that indicate if maintenance is necessary.

It has been found that in regions which receive between 30-50 inches of annual rainfall, (2) two visits are generally required. Regions with less rainfall often only require (1) one visit per annum. Varying land uses can affect maintenance frequency.

Some sites may be subjected to extreme sediment or trash loads, requiring more frequent maintenance visits. This is the reason for detailed notes of maintenance actions per unit, helping the VAR/Maintenance contractor and Owner predict future maintenance frequencies, reflecting individual site conditions.

Owners must promptly notify the VAR/Maintenance contractor of any damage to the plant(s), which constitute(s) an integral part of the biofiltration technology. Owners should also advise other landscape or maintenance contractors to leave all maintenance of the FocalPoint® HPMBS to the VAR/Maintenance contractor (i.e. no pruning or fertilizing).

EXCLUSION OF SERVICES

It is the responsibility of the owner to provide adequate irrigation when necessary to the plant(s) in the FocalPoint® HPMBS.

Clean up due to major contamination such as oils, chemicals, toxic spills, etc. will result in additional costs and are not covered under the VAR/Maintenance contractor maintenance contract. Should a major contamination event occur, the Owner must block off the outlet pipe of the FocalPoint® (where the cleaned runoff drains to, such as drop-inlet) and block off the point where water enters of the FocalPoint® HPMBS. The VAR/Maintenance contractor should be informed immediately.

MAINTENANCE VISIT SUMMARY

Each maintenance visit consists of the following simple tasks (detailed instructions below).

1. Inspection of FocalPoint® HPMBS and surrounding area
2. Removal of debris, trash and mulch
3. Mulch replacement
4. Plant health evaluation (including measurements) and pruning or replacement as necessary
5. Clean area around FocalPoint® HPMBS
6. Complete paperwork, including date stamped photos of the tasks listed above.

MAINTENANCE TOOLS, SAFETY EQUIPMENT AND SUPPLIES

Ideal tools include: camera, bucket, shovel, broom, pruners, hoe/rake, and tape measure. Appropriate Personal Protective Equipment (PPE) should be used in accordance with local or company procedures. This may include impervious gloves where the type of trash is unknown, high visibility clothing and barricades when working in close proximity to traffic and also safety hats and shoes.

MAINTENANCE VISIT PROCEDURE

Inspection of FocalPoint® HPMBS and surrounding area

Record individual unit before maintenance with photograph (numbered). Record on Maintenance Report (see example in this document) the following:

- Standing Water yes | no
- Is Bypass Inlet Clear? yes | no
- Damage to HPMBS System yes | no
- to Overflow conveyance yes | no

Removal of Silt / Sediment / Clay

Dig out silt (if any) and mulch and remove trash & foreign items.

- Silt / Clay Found? yes | no
- Cups / Bags Found? yes | no
- Leaves? yes | no
- Volume of material removed _____ (volume or weight)

Removal of debris, trash and mulch

After removal of mulch and debris, measure distance from the top of the FocalPoint® HPMBS engineered media soil to the flow line elevation of the adjacent overflow conveyance. If this distance is greater than that specified on the plans (typ. 6" - 12"), add media (not top soil or other) to recharge to the distance specified.

- Distance to media surface to flow line of overflow conveyance (inches) _____
- # of Buckets of Media Added _____

Mulch Replacement

Most maintenance visits require only replacement mulch (if utilized) which must be, aged, double shredded hardwood mulch with fines removed. For smaller projects, one cubic foot of mulch will cover four square feet of biofiltration bed, and for larger projects, one cubic yard of mulch will cover 108 square feet of biofiltration bed. Some visits may require additional FocalPoint® HPMBS engineered soil media available from the VAR/Contractor.

- Add double shredded, aged hardwood mulch which has been screened to remove fines, evenly across the entire biofiltration media bed to a depth of 3".
- Clean accumulated sediment from energy dissipation system at the inlet to the FocalPoint® HPMBS to allow for entry of trash during a storm event.

Plant health evaluation and pruning or replacement as necessary

Examine the plant's health and replace if dead or dying.
Prune as necessary to encourage growth in the correct directions

- Height above Grate (feet) _____
- Width at Widest point (feet) _____
- Health alive | dead
- Damage to Plant yes | no

Clean area around FocalPoint® HPMBS

- Clean area around unit and remove all refuse to be disposed of appropriately.

Complete paperwork

- Deliver Maintenance Report and photographs as appropriate.
- Some jurisdictions may require submission of maintenance reports in accordance with approvals.
- It is the responsibility of the Owner to comply with local regulations.

FocalPoint

BIOFILTRATION SYSTEM

FocalPoint Warranty

Seller warrants goods sold hereunder against defects in materials and workmanship only, for a period of (1) year from date the Seller activates the system into service. Seller makes no other warranties, express or implied.

Seller's liability hereunder shall be conditioned upon the Buyer's installation, maintenance, and service of the goods in strict compliance with the written instructions and specifications provided by the Seller. Any deviation from Seller's instructions and specifications or any abuse or neglect shall void warranties.

In the event of any claim upon Seller's warranty, the burden shall be upon the Buyer to prove strict compliance with all instructions and specifications provided by the Seller.

Seller's liability hereunder shall be limited only to the cost or replacement of the goods. Buyer agrees that Seller shall not be liable for any consequential losses arising from the purchase, installation, and/or use of the goods.

Maintenance Checklist

Element	Problem	What To Check	Should Exist	Action
Inlet	Excessive sediment or trash accumulation	Accumulation of sediment or trash impair free flow of water into FocalPoint	Inlet free of obstructions allowing free flow into FocalPoint System	Sediments or trash should be removed
Mulch Cover	Trash and floatable debris accumulation	Excessive trash or debris accumulation.	Minimal trash or other debris on mulch cover	Trash and debris should be removed and mulch cover raked level. Ensure that bark nugget
Mulch Cover	Ponding of water on mulch cover	Ponding in unit could be indicative of clogging due to excessive fine sediment accumulation or spill of petroleum oils	Stormwater should drain freely and evenly over mulch cover.	Contact VAR for advice.
Plants	Plants not growing, or in poor condition	Soil/mulch too wet, evidence of spill. Pest infestation. Vandalism to plants.	Plants should be healthy and pest free.	Contact VAR for advice.
Plants	Plant growth excessive	Plants should be appropriate to the species and location of FocalPoint		Trim/prune plants in accordance with typical landscaping and

CONTROL OF INVASIVE PLANTS

During maintenance activities, check for the presence of invasive plants and remove in a safe manner as described on the following pages. They should be controlled as described on the following pages.

Background:

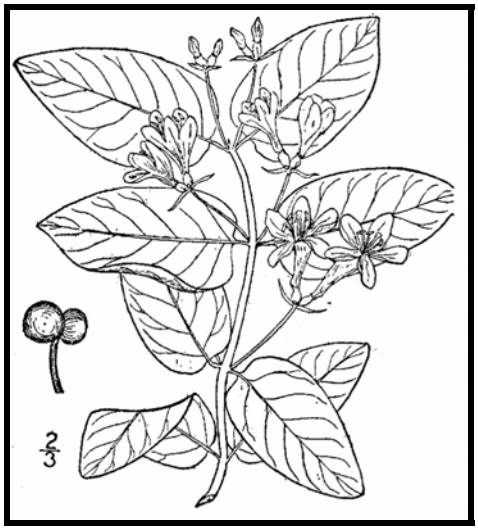
Invasive plants are introduced, alien, or non-native plants, which have been moved by people from their native habitat to a new area. Some exotic plants are imported for human use such as landscaping, erosion control, or food crops. They also can arrive as "hitchhikers" among shipments of other plants,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

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

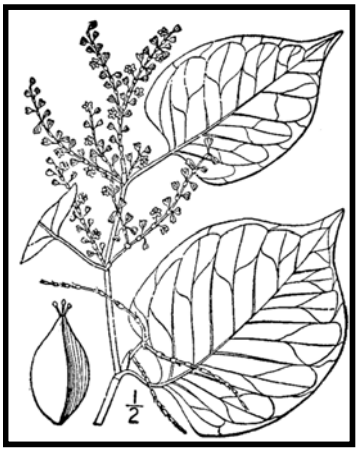
Prohibited invasive species shall only be disposed of in a manner that renders them nonliving and nonviable. (Agr. 3802.04)

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>

<table>
<tr><th>Non-Woody Plants</th><th>Method of Reproducing</th><th>Methods of Disposal</th></tr>
<tr><td rowspan="2">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)</td><td rowspan="2">Fruits and Seeds
  </td><td>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.</td></tr>
<tr><td>During and following flowering
Do nothing until the following year or remove flowering heads and bag and let rot.

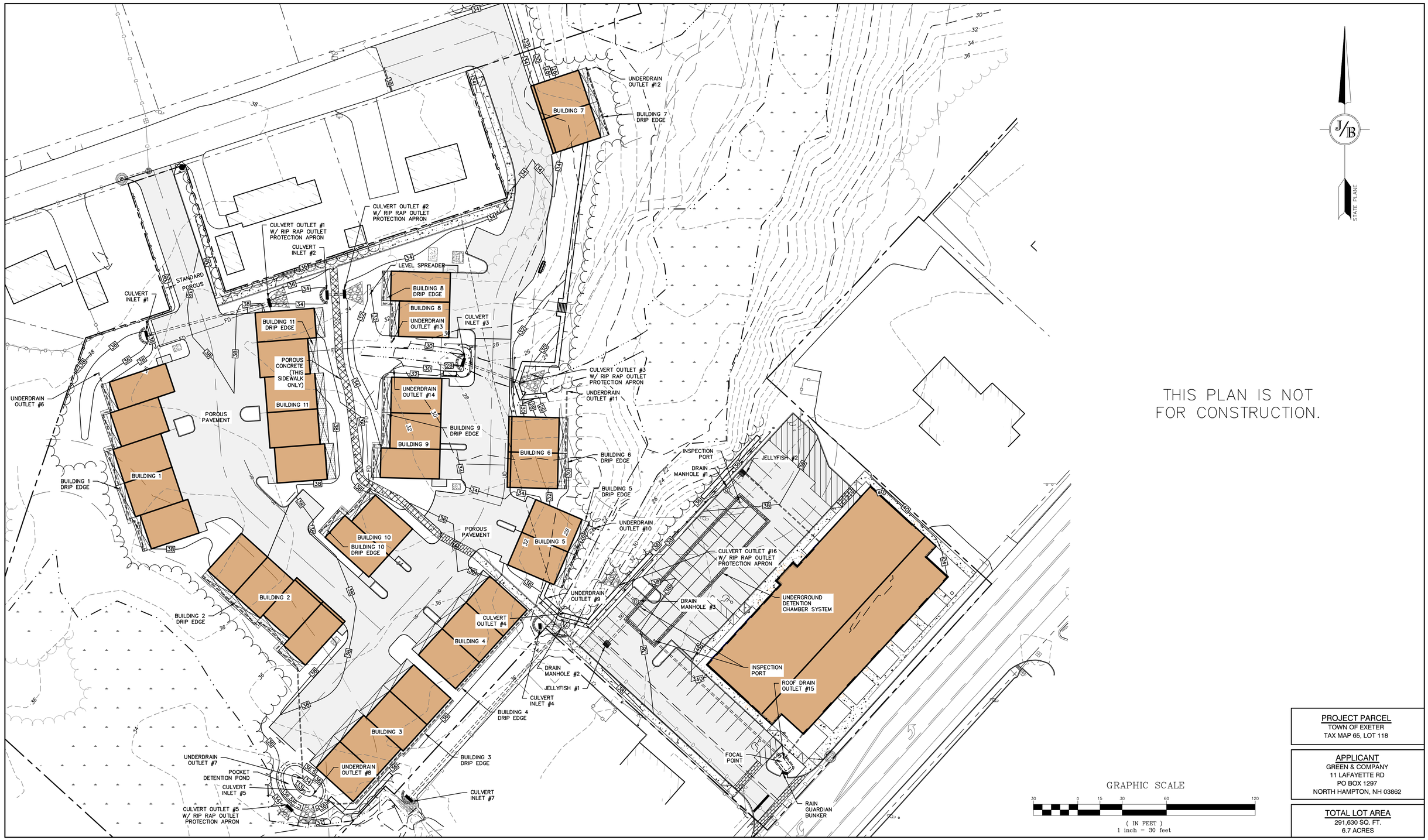
Small infestation
▪ Pull or cut plant and leave on site with roots exposed.

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.</td></tr>
<tr><td>common reed
(Phragmites australis)
Japanese knotweed
(Polygonum cuspidatum)
Bohemian knotweed
(Polygonum x bohemicum)</td><td>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.</td><td>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.</td></tr>
</table>

January 2010

UNH Cooperative Extension programs and policies are consistent with pertinent Federal and State laws and regulations, and prohibits discrimination in its programs, activities and employment on the basis of race, color, national origin, gender, religion, age, disability, political beliefs, sex, sexual orientation, or veteran’s, marital or family status. College of Life Sciences and Agriculture, County Governments, NH Dept. of Resources and Economic Development, Division of Forests and Lands, NH Fish and Game ,and U.S. Dept. of Agriculture cooperating.



THIS PLAN IS NOT FOR CONSTRUCTION.

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 feet

PROJECT PARCEL
TOWN OF EXETER
TAX MAP 65, LOT 118

APPLICANT
GREEN & COMPANY
11 LAFAYETTE RD
PO BOX 1297
NORTH HAMPTON, NH 03862

TOTAL LOT AREA
291,630 SQ. FT.
6.7 ACRES

Design: DJM	Draft: KDR	Date: 3/15/24	
Checked: PSL	Scale: AS SHOWN	Project No.: 24029	
Drawing Name: 24029-PLAN.dwg			

THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION FROM JONES & BEACH ENGINEERS, INC. (JBE). ANY ALTERATIONS, AUTHORIZED OR OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO JBE.

REV.	DATE	REVISION	BY
10	3/18/25	REVISED PER TOWN ENGINEER & TRC COMMENTS	DJM
9	2/13/25	FULL DESIGN FOR REVISED LAYOUT	DJM
8	1/31/25	REVISED LAYOUT PER CONSERVATION COMMISSION	DJM
7	1/13/25	REVISED PER TOWN ENGINEER & TRC COMMENTS	DJM
6	1/6/25	GRADING PLAN FOR CONSERVATION COMMISSION	DJM

Designed and Produced in NH
Jones & Beach Engineers, Inc.
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
Civil Engineering Services
603-772-4746
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name: **INSPECTIONS & MAINTENANCE PLAN**

Project: "LILAC PLACE"
76 PORTSMOUTH AVE, EXETER, NH

Owner of Record: RAP REALTY MANCHESTER LLC
50 ATLANTIC AVE, SEABROOK, NH

DRAWING No.
I&M
SHEET 1 OF 1
JBE PROJECT NO. 24029

APPENDIX XIII

Pre- and Post-Construction Watershed Plans

OFFSITE TOPOGRAPHY SHOWN HEREON IS FROM NH GRANIT LIDAR. NO OFF-SITE FIELD SURVEY HAS BEEN PERFORMED EXCEPT IN THE RIGHT OF WAY.

THIS AREA DRAINS TO WETLANDS ON THE SUBJECT PARCEL BUT NOT THE AREA PROPOSED TO BE DEVELOPED, SO IT IS EXCLUDED FROM THE PROJECT WATERSHED.

REFERENCE

GRAPHIC SCALE

60 0 30 60 120 240

(IN FEET)
1 inch = 60 feet

LEGEND

- SUBCATCHMENT BOUNDARY
- SUBCATCHMENT (X)
- REACH (X)
- POND (X)
- TC PATH
- WETLANDS
- SOILS (SSSM ONSITE) NRCS OFFSITE
- FLOW ARROW

PROJECT PARCEL
TOWN OF EXETER
TAX MAP 65, LOT 118

APPLICANT
GREEN & COMPANY
11 LAFAYETTE RD
PO BOX 1297
NORTH HAMPTON, NH 03862

TOTAL LOT AREA
291,630 SQ. FT.
6.7 ACRES

Design: DJM	Draft: DJM	Date: 10/21/24
Checked: PSL	Scale: AS SHOWN	Project No.: 24029
Drawing Name: 24029-WATERSHED.dwg	

THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION FROM JONES & BEACH ENGINEERS, INC. (JBE). ANY ALTERATIONS, AUTHORIZED OR OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO JBE.

STATE OF NEW HAMPSHIRE
DANIEL JAMES MEDITZ
No. 18152
LICENSED PROFESSIONAL ENGINEER
03/19/2025

REV.	DATE	REVISION	BY
3	3/14/25	REVISED PER TRC AND TOWN REVIEW ENGINEER COMMENTS	DJM
2	2/13/25	REVISED PER NEW SITE LAYOUT	DJM
1	1/13/25	REVISED PER TRC AND TOWN REVIEW ENGINEER COMMENTS	DJM
0	11/4/24	ISSUED FOR REVIEW	DJM

Designed and Produced in NH
Jones & Beach Engineers, Inc.
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
Civil Engineering Services
603-772-4746
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	EXISTING WATERSHED PLAN
Project:	"LILAC PLACE" 76 PORTSMOUTH AVE, EXETER, NH
Owner of Record:	RAP REALTY MANCHESTER LLC 50 ATLANTIC AVE, SEABROOK, NH

DRAWING No.
W1
SHEET 1 OF 2
JBE PROJECT NO. 24029

OFFSITE TOPOGRAPHY SHOWN HEREON IS FROM NH GRANIT LIDAR. NO OFF-SITE FIELD SURVEY HAS BEEN PERFORMED EXCEPT IN THE RIGHT OF WAY.

THIS AREA DRAINS TO WETLANDS ON THE SUBJECT PARCEL BUT NOT THE AREA PROPOSED TO BE DEVELOPED, SO IT IS EXCLUDED FROM THE PROJECT WATERSHED.

REFERENCE

GRAPHIC SCALE

60 0 30 60 120 240

(IN FEET)
1 inch = 60 feet

LEGEND

- SUBCATCHMENT BOUNDARY
- SUBCATCHMENT (X)
- REACH (X)
- POND (X)
- TC PATH
- WETLANDS
- SOILS (SSSM ONSITE) NRCS OFFSITE
- FLOW ARROW

PROJECT PARCEL
TOWN OF EXETER
TAX MAP 65, LOT 118

APPLICANT
GREEN & COMPANY
11 LAFAYETTE RD
PO BOX 1297
NORTH HAMPTON, NH 03862

TOTAL LOT AREA
291,630 SQ. FT.
6.7 ACRES

Design: DJM	Draft: DJM	Date: 10/21/24
Checked: PSL	Scale: AS SHOWN	Project No.: 24029
Drawing Name: 24029-WATERSHED.dwg		

THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION FROM JONES & BEACH ENGINEERS, INC. (JBE). ANY ALTERATIONS, AUTHORIZED OR OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO JBE.

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0	11/4/24	ISSUED FOR REVIEW	DJM

Designed and Produced in NH
Jones & Beach Engineers, Inc.
85 Portsmouth Ave. Civil Engineering Services 603-772-4746
PO Box 219
Stratham, NH 03885
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	PROPOSED WATERSHED PLAN
Project:	"LILAC PLACE" 76 PORTSMOUTH AVE, EXETER, NH
Owner of Record:	RAP REALTY MANCHESTER LLC 50 ATLANTIC AVE, SEABROOK, NH

DRAWING No.
W2
SHEET 2 OF 2
JBE PROJECT NO. 24029

TOWN OF EXETER

Planning and Building Department

10 FRONT STREET • EXETER, NH • 03833-3792 • (603) 778-0591 •FAX 772-4709

www.exeternh.gov

Date: **March 20, 2025**

To: **Planning Board**

From: **Dave Sharples, Town Planner**

Re: **StoneArch Development** **112 Front Street** **PB Case #24-17**

The Applicant has submitted a multi-family site plan review application for the proposed redevelopment of the property located at 112 Front Street. The developer is proposing to demolish the existing buildings on the site and construct seventeen (17) townhouse-style residential condominiums and associated site improvements. The property is located in the C-1, Central Area Commercial zoning district and is identified as Tax Map Parcel #73-14.

The Applicant originally appeared before the Board at the January 23rd, 2025 meeting to present their plans for the redevelopment of the subject property. A site walk was conducted on February 6th, 2025. The Applicant returned to the Planning Board for further discussion at the February 27th and March 13th, 2025 meetings, at which it was tabled to the March 27th, 2025 meeting.

The Applicant has submitted a request for continuance to the April 10th, 2025 meeting to provide them adequate time to address those comments and/or concerns raised at the March 13th, 2025 Planning Board meeting. Please see attached letter from Beals Associates, PLLC, dated 3/19/25.

Planning Board Motions:

Request for Continuance motion: I move that the request of StoneArch Development (PB Case #24-17) for a continuance of their application to the April 10th, 2025 meeting, at 7:00 PM in the Nowak Room be APPROVED / APPROVED WITH THE FOLLOWING CONDITIONS / TABLED / DENIED.

Thank You.
Enclosures

BEALS ASSOCIATES, PLLC

70 Portsmouth Avenue
Stratham, NH 03885
603 – 583 - 4860
Fax: 583 - 4863

March 19, 2025

Chairman
Town of Exeter Planning Board
10 Front Street
Exeter, NH 03833

RE: Request for Continuance
Stonearch Development, LLC
Proposed 17-unit residential townhouse condominium
Tax Map 0073 Lot #: 0014

Dear Mr. Chairman:

Please accept this correspondence as a formal request to be continued to the April 10th Planning Board hearing as the applicant is making design edits to address comments received during the Planning Board hearing on 3-13-25 to address landscaping, fencing, density, etc. The additional time will allow us to make necessary plan edits prior to the next hearing.

Thank you for your consideration.

Very truly yours,
BEALS ASSOCIATES, PLLC

Christian O. Smith

Christian O. Smith P.E.
Principal

Town of Exeter

Barbara Mcevoy <bmcevoy@exeternh.gov>

Letter opposing development at 112 Front Street

1 message

Harriton, Ben <bharriton@exeter.edu> Mon, Mar 17, 2025 at 10:34 AM
To: "bmcevoy@exeternh.gov" <bmcevoy@exeternh.gov>

Benjamin Harriton
114 Front Street
Exeter, NH 03833
(603) 978-0822

3/17/2025

Exeter Planning Board
10 Front Street
Exeter, NH 03833

Dear Members of the Exeter Planning Board,

I'll be brief and to the point. Please carefully read my comments below. I would appreciate it if these concerns were raised by the board in the meeting on 3/27/2025.

Loss of Sunlight and Negative Impact on Property Value:
The proposed building is both excessively tall and positioned too close to my property. If this development proceeds as planned, I will lose a significant amount of sunlight during the day. This will not only affect my ability to enjoy my home, but it will also negatively impact the value of my property. The building's height and proximity to my residence create a situation that will result in permanent, irreversible changes to my living conditions. I urge the board to reconsider the proposed design to minimize these negative effects.

Traffic Safety Concerns:
Our street already has a significant traffic problem that poses a serious threat to public safety. On Sundays, especially during church services, the street is often lined with parked cars, making it difficult for drivers to maneuver safely. There is a recurring issue with speeding, and the road conditions make it hard for pedestrians to cross safely. On any given day, it is challenging to navigate the road, whether by car or on foot, due to the congestion and speeding. In the past year, there have been multiple accidents on this street, underscoring the dangerous nature of the current traffic situation. Adding 17 three-bedroom units, all relying on one narrow access road, will only worsen the problem. The increase in traffic volume will make the road even more congested and hazardous, posing a direct threat to public safety. I strongly urge the board to request a traffic study to better understand the risks to our community and address those safety concerns before proceeding with the development.

Fire Safety Concerns:
I also have serious concerns regarding the adequacy of fire safety provisions for the proposed development. Specifically, I am concerned about the narrowness of the access road, which may pose a significant challenge in the event of an emergency. While I understand that the fire department may have signed off on the design, I am unsure if this approval is based on the developer's agreement to allow the fire department to use the property for training exercises. If this is the case, I believe it raises serious questions about whether the town is giving special treatment to a developer, potentially compromising the safety of our community. I request that the planning board ensure that fire safety is properly addressed and that all necessary precautions are taken to protect the residents of our neighborhood.

Thank you.

TOWN OF EXETER

Planning and Building Department

10 FRONT STREET • EXETER, NH • 03833-3792 • (603) 778-0591 •FAX 772-4709

www.exeternh.gov

Date: **March 20, 2025**

To: **Planning Board**

From: **Dave Sharples, Town Planner**

Re: **StoneArch Development** **57 Portsmouth Avenue** **PB Case #25-1**

The Applicant has submitted a multi-family site plan review application for the proposed development of the vacant property located at 57 Portsmouth Avenue. The developer is proposing the construction of a six (6) unit townhouse style residential condominium development along with associated parking and site improvements. The property is located in the C-2, Highway Commercial zoning district and is identified as Tax Map Parcel #65-137.

Attached please find application, plans and supporting documents, dated 01/28/25 for your review. A Technical Review Committee (TRC) meeting was conducted on February 20th, 2025. A copy of the UEI comment letter, dated 02/18/25, is enclosed for your review. TRC comments from Town departments were minimal and were so noted by the developer and engineer.

The Applicant obtained several variances for the proposed construction of this project from the Zoning Board of Adjustment at their November 19th, 2024 meeting. A copy of the ZBA notice of decision and minutes from that meeting are attached for your review.

The Applicant is requesting two (2) waivers from the Board's Site Plan Review & Subdivision Regulations in conjunction with the application. Please see the waiver request letter from Beals Associates, PLLC, dated 01/28/25, included in the attached materials.

The Applicant has submitted revised plans and supporting documents, dated 03/19/25, and those materials are enclosed for your review.

At a minimum, I would suggest that the Planning Board consider a vote on accepting the plans as complete for review purposes, and, if deemed complete, hold the public hearing to get input from the public and consider scheduling a site walk. I will be prepared with conditions of approval at the meeting should the Board decide to forego a site walk.

Waiver Motions:

Roadway and Fire Lanes Less than 24' Width waiver motion: After reviewing the criteria for granting waivers, I move that the request of StoneArch Development (PB Case #25-1) for a waiver from Section 9.14.9 of the Site Plan Review and Subdivision Regulations to permit proposed roadway and fire lanes to be less than 24' in width be APPROVED / APPROVED WITH THE FOLLOWING CONDITIONS / TABLED / DENIED.

Grading within 5 feet of exterior property line waiver motion: After reviewing the criteria for granting waivers, I move that the request of StoneArch Development (PB Case #25-1) for a waiver from Section 9.3.6.4. of the Site Plan Review and Subdivision Regulations regarding grading within 5 feet of an exterior property line be APPROVED / APPROVED WITH THE FOLLOWING CONDITIONS / TABLED / DENIED.

Planning Board Motions:

Table Motion: I move that the application of StoneArch Development (PB Case #25-1 be TABLED to the (date/time/place) Planning Board meeting and revised plans/documents shall be submitted to the Planning Office at least eight (8) days prior to the meeting or the application may remain on the table to a future meeting.

Multi-Family Site Plan Motion: I move that the request of StoneArch Development (PB Case #25-1) for Multi-Family Site Plan approval be APPROVED / APPROVED WITH THE FOLLOWING CONDITIONS / DENIED.

Thank You.

Enclosures

Town of Exeter

Planning Board Application for Site Plan Review

October 2019

SITE PLAN REVIEW APPLICATION CHECKLIST

A COMPLETED APPLICATION FOR SITE PLAN REVIEW MUST CONTAIN THE FOLLOWING

1. Application for Hearing (✓)
2. Abutter's List Keyed to Tax Map (✓)
   (including the name and business address of every engineer, architect, land surveyor, or soils scientist whose professional seal appears on any plan submitted to the Board)
3. Completed- " Checklist for Site Plan Review" (✓)
4. Letter of Explanation (✓)
5. Written Request for Waiver (s) from " Site Plan Review and Subdivision Regulations" (if applicable) (✓)
6. Completed "Preliminary Application to Connect and /or Discharge to Town of Exeter- Sewer, Water or Storm Water Drainage System(s)"(if applicable) (✓)
7. Planning Board Fees (✓)
8. Seven (7) full-sized copies of Site Plan (✓)
9. Fifteen (15) 11"x17" copies of the final plan to be submitted **TEN DAYS PRIOR** to the public hearing date. (✓)
10. Three (3) pre-printed 1"x 2 5/8" labels for each abutter, the applicant and all consultants. (✓)

NOTES: All required submittals must be presented to the Planning Department office for distribution to other Town departments. Any material submitted directly to other departments will not be considered.

TOWN OF EXETER, NH
APPLICATION FOR SITE PLAN REVIEW

THIS IS AN APPLICATION FOR:

( ) COMMERCIAL SITE PLAN REVIEW
( ) INDUSTRIAL SITE PLAN REVIEW
(✓) MULTI-FAMILY SITE PLAN REVIEW
( ) MINOR SITE PLAN REVIEW
( ) INSTITUTIONAL/NON-PROFIT SPR

OFFICE USE ONLY

_____ APPLICATION #
_____ DATE RECEIVED
_____ APPLICATION FEE
_____ PLAN REVIEW FEE
_____ ABUTTERS FEE
_____ LEGAL NOTICE FEE
_____ TOTAL FEES

_____ INSPECTION FEE
_____ INSPECTION COST
_____ REFUND (IF ANY)

1. **NAME OF LEGAL OWNER OF RECORD:** Blake Properties of NH, LLC

TELEPHONE: ( ) _____

ADDRESS: PO Box 368, Newfields, NH, 03856

2. **NAME OF APPLICANT:** Stonearch Development Corp.

ADDRESS: 42J Dover Point Road, Dover, NH

TELEPHONE: (978) 375-3153

3. **RELATIONSHIP OF APPLICANT TO PROPERTY IF OTHER THAN OWNER:** Under Agreement

(Written permission from Owner is required, please attach.)

4. **DESCRIPTION OF PROPERTY:** Previously developed, now vacant

ADDRESS: 57 Portsmouth Avenue, Exeter, NH

TAX MAP: 65 **PARCEL #:** 137 **ZONING DISTRICT:** C-2

AREA OF ENTIRE TRACT: 0.26 Acres **PORTION BEING DEVELOPED:** 0.24 Acres

5. **ESTIMATED TOTAL SITE DEVELOPMENT COST $**_____

6. **EXPLANATION OF PROPOSAL:** Develop parcel with 6 townhouse style residential condominium units with underground utilities and access drive.

7. **ARE MUNICIPAL SERVICES AVAILABLE?** (YES/NO) Yes

If yes, Water and Sewer Superintendent must grant written approval for connection.
If no, septic system must comply with W.S.P.C.C. requirements.

8. **LIST ALL MAPS, PLANS AND OTHER ACCOMPANYING MATERIAL SUBMITTED WITH THIS APPLICATION:**

ITEM:	NUMBER OF COPIES
A.	
B.	
C.	See Transmittal Letter
D.	
E.	
F.	

9. **ANY DEED RESTRICTIONS AND COVENANTS THAT APPLY OR ARE CONTEMPLATED** (YES/NO) No IF YES, ATTACH COPY.

10. **NAME AND PROFESSION OF PERSON DESIGNING PLAN:**

NAME: Beals Associates, PLLC - Christian O Smith, PE

ADDRESS: 70 Portsmouth Avenue, Third Floor, Stratham, NH 03885

PROFESSION: Civil Engineer **TELEPHONE:** (603) 583-4860

11. **LIST ALL IMPROVEMENTS AND UTILITIES TO BE INSTALLED:**

6 townhouse style residential condominium units (3 units in 2 buildings). Underground electric, cable, gas, drainage, and water services are proposed along with a sewer connection to the main in Portsmouth Avenue for disposal.

12. **HAVE ANY SPECIAL EXCEPTIONS OR VARIANCES BEEN GRANTED BY THE ZONING BOARD OF ADJUSTMENT TO THIS PROPERTY PREVIOUSLY?**

IF YES, DESCRIBE BELOW. **(**Please check with the Planning Department Office to verify)

Article 4, Section 4.4, Schedule III: Front setback less than required 50' to 9 '
Article 4, Section 4.4, Schedule III: Side setback less than required 20' to 7.7'
Article 4, Section 4.4, Schedule III: Rear setback less than required 50' to 8.7'
Article 4, Section 4.4, Schedule III: Density less than 5,000 sf /unit to 1,960 sf
Article 4, Section 4.4, Schedule III: Buidling coverage of 36.7% where 30% maximum is required.

13. **WILL THE PROPOSED PROJECT INVOLVE DEMOLITION OF ANY EXISTING BUILDINGS OR APPURTENANCES?** IF YES, DESCRIBE BELOW.
(Please note that any proposed demolition may require review by the Exeter Heritage Commission in accordance with Article 5, Section 5.3.5 of the Exeter Zoning Ordinance).

No

14. **WILL THE PROPOSED PROJECT REQUIRE A "NOTICE OF INTENT TO EXCAVATE" (State of NH Form PA-38)? IF YES, DESCRIBE BELOW.**

No

NOTICE: I CERTIFY THAT THIS APPLICATION AND THE ACCOMPANYING PLANS AND SUPPORTING INFORMATION HAVE BEEN PREPARED IN CONFORMANCE WITH ALL APPLICABLE REGULATIONS; INCLUDING BUT NOT LIMITED TO THE "SITE PLAN REVIEW AND SUBDIVISION REGULATIONS" AND THE ZONING ORDINANCE. FURTHERMORE, IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION 15.2 OF THE "SITE PLAN REVIEW AND SUBDIVISION REGULATIONS", I AGREE TO PAY ALL COSTS ASSOCIATED WITH THE REVIEW OF THIS APPLICATION.

DATE 1-27-2025 OWNER'S SIGNATURE Christian O Smith for Blake Properties of NH (see attached Letter of Auth.)

ACCORDING TO RSA 676.4.I (c), THE PLANNING BOARD MUST DETERMINE WHETHER THE APPLICATION IS COMPLETE WITHIN 30 DAYS OF SUBMISSION. THE PLANNING BOARD MUST ACT TO APPROVE, CONDITIONALLY APPROVE, OR DENY AN APPLICATION WITHIN SIXTY FIVE (65) DAYS OF ITS ACCEPTANCE BY THE BOARD AS A COMPLETE APPLICATION. A SEPARATE FORM ALLOWING AN EXTENSION OR WAIVER TO THIS REQUIREMENT MAY BE SUBMITTED BY THE APPLICANT.

ABUTTERS: PLEASE LIST ALL PERSONS WHOSE PROPERTY IS LOCATED IN NEW HAMPSHIRE AND ADJOINS OR IS DIRECTLY ACROSS THE STREET OR STREAM FROM THE LAND UNDER CONSIDERATION BY THE BOARD. THIS LIST SHALL BE COMPILED FROM THE EXETER TAX ASSESSOR'S RECORDS.

TAX MAP _____
NAME _____
ADDRESS _____
_____

TAX MAP _____
NAME _____
ADDRESS _____
_____

TAX MAP _____
NAME _____
ADDRESS _____
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TAXMAP_____
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TAX MAP _____
NAME _____
ADDRESS_____
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See Separate Abutter's List

TAXMAP_____
NAME _____
ADDRESS _____
_____

TAX MAP _____
NAME _____
ADDRESS _____
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TAX MAP _____
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TAX MAP _____
NAME _____
ADDRESS _____
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TAX MAP _____
NAME _____
ADDRESS _____
_____

TAX MAP _____
NAME _____
ADDRESS _____
_____

Please attach additional sheets, if needed

SITE PLAN REQUIREMENTS

7.4 Existing Site Conditions Plan

Submission of this plan will not be applicable in all cases. The applicability of such a plan will be considered by the TRC during its review process as outlined in Section 6.5 Technical Review Committee (TRC) of these regulations. The purpose of this plan is to provide general information on the site, its existing conditions, and to provide the base data from which the site plan or subdivision will be designed. The plan shall show the following:

APPLICANT	TRC	REQUIRED EXHIBITS
☑	☐	7.4.1 Names, addresses, and telephone numbers of the owner, applicant, and person(s) or firm(s) preparing the plan.
☑	☐	7.4.2 Location of the site under consideration, together with the current names and addresses of owners of record, of abutting properties and their existing land use.
☑	☐	7.4.3 Title, date, north arrow, scale, and Planning Board Case Number.
☑	☐	7.4.4 Tax map reference for the site under consideration, together with those of abutting properties.
☑	☐	7.4.5 Zoning (including overlay) district references.
☑	☐	7.4.6 A vicinity sketch or aerial photo showing the location of the land/site in relation to the surrounding public street system and other pertinent location features within a distance of 2,000-feet, or larger area if deemed necessary by the Town Planner.
☑	☐	7.4.7 Natural features including watercourses and water bodies, tree lines, significant trees (20-inches or greater in diameter at breast height) and other significant vegetative cover, topographic features, and any other environmental features that are important to the site design process.
☑	☐	7.4.8 Man-made features such as, but not limited to, existing roads, structures, and stonewalls. The plan shall also indicate which features are to be retained and which are to be removed or altered.
☑	☐	7.4.9 Existing contours at intervals not to exceed 2-feet with spot elevations provided when the grade is less than 5%. All datum provided shall reference the latest applicable US Coast and Geodetic Survey datum and should be noted on the plan.
☑	☐	7.4.10 A High Intensity Soil Survey (HISS) of the entire site, or appropriate portion thereof. Such soil surveys shall be prepared by a certified soil scientist in accordance with the standards established by the Rockingham County Conservation District. Any cover letters or explanatory data provided by the certified soil scientist shall also be submitted.

N/A	☐	7.4.11 State and Federally designated wetlands, setback information, total wetlands proposed to be filled, other pertinent information and the following wetlands note: “The landowner is responsible for complying with all applicable local, state, and federal wetlands regulations, including any permitting and setback requirements required under these regulations.”
☑	☐	7.4.12 Surveyed property lines including angles and bearings, distances, monument locations, and size of the entire parcel. A professional land surveyor licensed in New Hampshire must attest to said plan.
☑	☐	7.4.13 The lines of existing abutting streets and driveway locations within 200-feet of the site.
☑	☐	7.4.14 The location, elevation, and layout of existing catch basins and other surface drainage features.
☑	☐	7.4.15 The shape, size, height, location, and use of all existing structures on the site and approximate location of structures within 200-feet of the site.
☑	☐	7.4.16 The size and location of all existing public and private utilities, including off-site utilities to which connection is planned.
☑	☐	7.4.17 The location of all existing easements, rights-of-way, and other encumbrances.
N/A	☐	7.4.18 All floodplain information, including the contours of the 100-year flood elevation, based upon the Flood Insurance Rate Map for Exeter, as prepared by the Federal Emergency Management Agency, dated May 17, 1982.
☑	☐	7.4.19 All other features which would fully explain the existing conditions of the site.
☑	☐	7.4.20 Name of the site plan or subdivision.

7.5 Proposed Site Conditions Plan (Pertains to Site Plans Only)

The purpose of this plan is to illustrate and fully explain the proposed changes taking place within the site. The proposed site conditions plan shall depict the following:

APPLICANT	TRC	REQUIRED EXHIBITS
☑	☐	7.5.1 Proposed grades and topographic contours at intervals not to exceed 2-feet with spot elevations where grade is less than 5%. All datum provided shall reference the latest applicable US Coast and Geodetic Survey datum and should be noted on the plan.
☑	☐	7.5.2 The location and layout of proposed drainage systems and structures including elevations for catch basins.
☑	☐	7.5.3 The shape, size, height, and location of all proposed structures, including expansion of existing structures on the site and first floor elevation(s). Building elevation(s) and a rendering of the proposed structure(s).
☑	☐	7.5.4 High Intensity Soil Survey (HISS) information for the site, including the total area of wetlands proposed to be filled.
N/A	☐	7.5.5 State and Federally designated wetlands, setback information, total wetlands proposed to be filled, other pertinent information and the following wetlands note: "The landowner is responsible for complying with all applicable local, state, and federal wetlands regulations, including any permitting and setback requirements required under these regulations."
N/A	☐	7.5.6 Location and timing patterns of proposed traffic control devices.
☑	☐	7.5.7 The location, width, curbing and paving of all existing and proposed streets, street rights-of-way, easements, alleys, driveways, sidewalks and other public ways. The plan shall indicate the direction of travel for one-way streets. See Section 9.14 – Roadways, Access Points, and Fire Lanes for further guidance.
☑	☐	7.5.8 The location, size and layout of off-street parking, including loading zones. The plan shall indicate the calculations used to determine the number of parking spaces required and provided. See Section 9.13 – Parking Areas for further guidance.
☑	☐	7.5.9 The size and location of all proposed public and private utilities, including but not limited to: water lines, sewage disposal facilities, gas lines, power lines, telephone lines, cable lines, fire alarm connection, and other utilities.
☑	☐	7.5.10 The location, type, and size of all proposed landscaping, screening, green space, and open space areas.
☑	☐	7.5.11 The location and type of all site lighting, including the cone(s) of illumination to a measurement of 0.5-foot-candle.
☑	☐	7.5.12 The location, size, and exterior design of all proposed signs to be located on the site.
☑	☐	7.5.13 The type and location of all solid waste disposal facilities and accompanying screening.

☑	☐	7.5.14 Location of proposed on-site snow storage.
N/A	☐	7.5.15 Location and description of all existing and proposed easement(s) and/or right-of-way.
☑	☐	7.5.16 A note indicating that: "All water, sewer, road (including parking lot), and drainage work shall be constructed in accordance with Section 9.5 Grading, Drainage, and Erosion & Sediment Control and the Standard Specifications for Construction of Public Utilities in Exeter, New Hampshire". See Section 9.14 Roadways, Access Points, and Fire Lanes and Section 9.13 Parking Areas for exceptions.
☑	☐	7.5.17 Signature block for Board approval

OTHER PLAN REQUIREMENTS (See Section indicated)

- N/A 7.7 Construction plan
- ☑ 7.8 Utilities plan
- ☑ 7.9 Grading, drainage and erosion & sediment control plan
- ☑ 7.10 Landscape plan
- ☑ 7.11 Drainage Improvements and Storm Water Management Plan
- N/A 7.12 Natural Resources Plan
- N/A 7.13 Yield Plan

LETTER OF AUTHORIZATION

I, _Gary Blake_ owner of Blake Properties of NH, and the property located at 57 Portsmouth Avenue, Exeter, NH, (Tax Map 65, Lot 137), do hereby authorize Beals Associates, PLLC, of 70 Portsmouth Avenue, Stratham, NH, to act on my behalf in all matters to be discussed at the Exeter Planning Board hearings, other Land Use Board approval hearings, or State Permitting Agencies concerning the property previously mentioned.

I hereby appoint Beals Associates, PLLC to act on my behalf in the permitting process.

Shawna Fournier
Witness

Gary Blake 10.25.24
Owner Date

BEALS · ASSOCIATES *PLLC*

70 Portsmouth Avenue
Stratham, New Hampshire
03885
603 – 583 - 4860
Fax: 583 - 4863

January 28, 2025

Chairman
Town of Exeter Planning Board
10 Front Street
Exeter, NH 03833

RE: Letter of Explanation
Stonearch Development
Proposed Residential Condominium Sie Plan - 57 Portsmouth Avenue
Tax Map 0065 Lot #: 0137

Dear Members of the Board:

The applicant is proposing to create a 6-unit town house style (two 3-unit buildings) residential condominium development on the referenced parcel located at 57 Portsmouth Avenue. The driveway entrance will be expanded, but utilize the existing curb cut on Portsmouth Avenue that served the previously demolished single-family house. The units are proposed to be served by underground utilities, with municipal water and sewer services. A catch basin tie-in to the existing Portsmouth Avenue closed drainage system is proposed.

Thank you for your consideration.

Very truly yours,
BEALS ASSOCIATES, PLLC

Christian O. Smith

Christian O. Smith P.E.
Principal

ABUTTERS LIST
FOR
NH- 1535 EXETER, NH - STONEARCH
DATE JANUARY 23, 2025

SUBJECT PARCEL

TAX MAP/LOT	OWNER OF RECORD
65-137	BLAKE PROPERTIES OF NH LLC PO BOX 368 NEWFIELDS, NH 03856

ABUTTERS

TAX MAP/LOT	OWNER OF RECORD
65-136	CHATHAM EXETER HAS LLC C/O CHATHAM LODGING TRUST 222 LAKEVIEW AVE SUITE 200 WEST PALM BEACH FL. 33401
65-138	KIMBERLY MONTGOMERY 14 HIGHLAND ST. EXETER, NH 03833
65-138-1	RACHEL TRABELSI 12 HIGHLAND ST. EXETER, NH 03833
65-139	J&M EVERGREEN REALTY TRUST MA KEN TRUSTEE 55 PORTSMOUTH AVE. EXETER, NH 03833
65-112	EXETER MOBIL REALTY TRUST YOGENDRA PATEL TRUSTEE 2 REGENCY RIDGE ANDOVER, MA 01810
65-113	GROUP 1 REALTY INC. 800 GESSNER SUITE 500 HOUSTON, TX 77024
65-114	BANK OF AMERICA CORP REAL ESTATE ASSESSMENTS PO BOX 32547 CHARLOTTE, NC 28232

ABUTTERS LIST
FOR
NH- 1535 EXETER, NH - STONEARCH
DATE JANUARY 23, 2025

PROFESSIONALS

ENGINEERING FIRM	BEALS ASSOCIATES, PLLC. 70 PORTSMOUTH AVE. 3RD FLOOR STRATHAM, NH 03885
WETLANDS & SOILS	GOVE ENVIRONMENTAL SERVICES 8 CONTINENTAL DRIVE, UNIT H EXETER, NH 03833
DEVELOPER	STONEARCH DEVELOPMENT 42 DOVER PT RD UNIT J DOVER, NH 03820

TOWN OF EXETER, NEW HAMPSHIRE

10 FRONT STREET • EXETER, NH • 03833-3792 • (603) 778-0591 •FAX 772-4709
www.exeternh.gov

DATE: January 1, 2024

TO: Applicants

FROM: Planning & Building Department

RE: Preliminary Application to Connect and/or Discharge to Town of Exeter Sewer, Water and/or Storm Drainage System(s)

Attached is the "Preliminary Application to Connect and/or Discharge to Town of Exeter Sewer, Water or Storm Water Drainage System(s)". This Application form must be completed by the applicant or the applicant's authorized agent for projects that are subject to Planning Board approval or for a change of use. It is a prerequisite for submission of the "Applications for Sewer Service, Water Service and Storm Drainage Work." All of the application forms referenced above must be completed and approved prior to the issuance of a building permit. This application is intended to address a number of different scenarios and therefore, all sections may not be applicable to your particular situation. Please read the application carefully and fill out as completely as possible. If there are any questions, please feel free to contact the Planning and Building Department Offices. All forms must be submitted to the Planning and Building Department Office for review and distribution.

Please Note: Any approval(s) granted in conjunction with this application will be valid for a period of one (1) year from the date of such approvals(s).

TOWN OF EXETER - DEPARTMENT OF PUBLIC WORKS

PRELIMINARY APPLICATION TO CONNECT AND/OR DISCHARGE TO TOWN OF EXETER SEWER, WATER, AND/OR STORMWATER DRAINAGE SYSTEM(S)

Project Name . 0.213

Project Location . 0.013

Applicant/Owner Name . 37.9

Mailing Address . 40

Phone Number . 4 email . 737

Project Engineer . 1.31

Mailing Address . 3.0

Phone Number . 31 email . 2.16

Type of Discharge/Connection ☐ Sewer ☐ Water ☐ Stormwater

Application completed by

Name . 18

Signature Christian O. Smith Date 01-28-2025

Reviewed and verified by Planning & Building Department

DESIGN FLOWS

The water and sewer design flow shall be based upon the New Hampshire Code of Administrative Rules, Env-Wq 1000 Subdivisions; Individual Sewage Disposal Systems, Table 1008-1 Unit Design Flow Figures (current version) or other methodology which may be deemed acceptable by the Town of Exeter. The minimum fee for a single-family residential unit is based on the design flow for two (2) bedrooms. Existing water and sewer flows may be based on meter readings for the current use.

If the proposed discharge is non-residential or is residential but exceeds 5,000 gallons per day (gpd), Section C must be completed. Certain water and sewer discharges must be approved by the State of New Hampshire Department of Environmental Services by way of permit and plan submittals. It is the responsibility of the applicant to ensure submittals are made to the state through the town is necessary. Final town approval cannot be made without the state's approval if required.

Stormwater design flows are based on the drainage analysis prepared by the applicant using the most current published precipitation data available.

APPROVALS ARE VALID FOR PERIOD OF ONE (1) YEAR FROM DATE OF APPROVAL

SECTION A: PROPOSED NEW CONNECTIONS OR MODIFICATION OF EXISTING CONNECTIONS

SANITARY SEWER

Description of work . 37.75

Title of plan . 34.50

Total design flow (gpd) . 12

**For any non-residential discharge or residential discharge exceeding 5,000 GPS, or for a change of use, complete Section C of this form.*

Approved _____ Date _____

Water & Sewer Managing Engineer

WATER

Description of work . 34.50

Title of plan . Utility Plan

Total design flow (gpd) . 2,700

Approved _____ Date _____

Water & Sewer Managing Engineer

STORMWATER

Description of work . Connection to existing catch basin in Portsmouth Avenue

Title of plan . Grading, Drainage, & Erosion Control Plan

Total design flow (10-year storm, CFS) . 1.24

Approved _____ Date _____

Highway Superintendent

APPROVALS ARE VALID FOR PERIOD OF ONE (1) YEAR FROM DATE OF APPROVAL

SECTION B: IMPACT FEES

Provide the following information to determine if a water and/or sewer impact fee will be required for a new development or a change or increase in use.

Current/prior Use(s)

Describe current use(s) Vacant

Use	Unit Flow (gpd)	Total Existing Flow

Total existing flow 0

Proposed Use(s)

Describe proposed use(s) 6 3-bedroom residential condominium units

Use	Unit Design Flow (gpd)	Total Design Flow
6 3-BR units	450	2,700

Total proposed flow 2,700

Impact Fees (80% of the design flow)

Change in flow rate (gpd) 2,700 x 0.8 = Impact Fee flow rate (gpd) 2,160

If there is a decrease in flow rates, no water or sewer impact fee will be charged. If there is an increase in flow rates, a water and/or sewer impact fee will be charged using the following formula:

Sewer Impact Fee: Flow increase (gpd) 2,160 x $1.81= $3,909.60

Water Impact Fee: Flow increase (gpd) 2,160 X $3.74 = $8,078.40

Approved by Town of Exeter

Town Planner _____ Date _____

Water & Sewer Managing Engineer _____ Date _____

APPROVALS ARE VALID FOR PERIOD OF ONE (1) YEAR FROM DATE OF APPROVAL

SECTION C: SANITARY SEWER CLASSIFICATION AND BASELINE MONITORING

(NON-RESIDENTIAL DISCHARGES OR RESIDENTIAL DISCHARGE OVER 5,000 GPD)

In accordance with Title 40 of the Code of Federal Regulations, Part 403 Section 403.14, information provided herein shall be available to the public without restriction except as specified in 40 CFR Part 2. A discharge permit will be issued on the basis of the information provided in this section.

In accordance with all terms and conditions of the Town of Exeter, New Hampshire Ordinances Chapter 15, all persons discharging wastewater into the town's facilities shall comply with all applicable federal, state, and local Industrial Pre-treatment rules.

PART I - USER INFORMATION

Property Owner Name _____

Owner's Representative _____

Address _____

Phone _____ email _____

Tenant Name _____

Address _____

Phone _____ email _____

PART II - PRODUCT OR SERVICE INFORMATION

Products Manufactured _____

Services Provided _____

SIC Code(s) _____ Building Area (SF) _____

Number of Employees _____ Days/week of operation _____ Shifts per day _____

PART III - CATEGORY OF SEWER DISCHARGE

Type of Discharge ☐ Septic ☐ Proposed ☐ Existing ☐ Change of Use

Water Use (gpd) _____ (from Section A)

Check all that apply:

☐ Domestic waste only (toilets & sinks)

☐ Domestic waste plus some process wastewater

☐ Federal pre-treatment standards (40 CFR) applies

PART IV - CLASSIFICATION DETERMINATION *(to be completed by Town staff)*

CLASS 1 - SIGNIFICANT OR CATEGORICAL INDUSTRIAL USER _____

CLASS 2 - MINOR INDUSTRIAL OR COMMERCIAL USER _____

CLASS 3 - INSIGNIFICANT INDUSTRIAL OR COMMERCIAL USER _____

CLASS 4 - NON-SYSTEM USER, OR DISCONTINUED SERVICE _____

See attached sheet for the basis of the determination.

Determined by _____ Title _____ Date _____

Approved _____ Date _____

Water & Sewer Managing Engineer

PART V - CERTIFICATION

I have personally examined and am familiar with the information submitted in this section for the above name use. The information provided is true, accurate and complete. I am aware that there are significant penalties from federal, state and/or town regulatory agencies for submitting false information, including the possibility of fine and/or imprisonment.

I acknowledge and agree to pay all charges incurred for monitoring, testing and subsequent analysis performed on the Town of Exeter sewer, water and/or stormwater drainage system(s), in the course of determining the town's ability to serve the project. Further, I acknowledge and agree that failure to accurately declare said flow requirements shall be sufficient cause to deny access to the Town of Exeter sewer, water and/or stormwater drainage system(s).

Signature of Applicant John O'Neill Date 1-27-2025

Name of Property Owner Blake Properties of NH, LLC

APPROVALS ARE VALID FOR PERIOD OF ONE (1) YEAR FROM DATE OF APPROVAL

USER CLASSIFICATION SYSTEM FOR INDUSTRIAL DISCHARGE

CLASS 1: SIGNIFICANT INDUSTRIAL USER

Any industry and/or commercial establishment that:

- Is subject to National Pre-treatment standards as outlined in 40 CFR (Code of Federal Regulations) 403.5 (a) (b).
- Discharges a non-domestic waste stream of 5,000 GPD, or more.
- Contributes a non-domestic waste stream totaling 5% or more of the average dry weather hydraulic or organic (BOD<TSS< etc.) capacity of the Town of Exeter Sewer Treatment Facility.
- Has the reasonable potential, in the opinion of the POT Supervisor, to adversely affect the treatment plant, its workers, or the collection system by reason of inhibition, pass- through pollutants, or sludge contamination.

CLASS 2: MINOR INDUSTRIAL USERS

Small industries and commercial establishments (e.g. restaurants, auto repair shops, cleaners, etc.) whose individual discharges do not significantly impact the Town of Exeter Sewer Treatment Facility or systems, degrade receiving water quality or contaminate the sludge. Industries that have the potential to discharge a non-domestic or process waste stream, but at the present time discharge only sanitary waste, may also be included in this class. However, this class shall not include any categorical industries. Industries and commercial establishments in this classification will require a permit and be subject to all inspection, compliance monitoring, enforcement, and reporting requirements of the pretreatment program.

CLASS 3: INSIGNIFICANT INDUSTRIAL USERS

Users which will be eliminated from participation in Exeter's Pretreatment Program. These include industries and/or commercial establishments that discharge only domestic waste (toilets and sinks only) into the municipal sewer system or do not have any reasonable chance of discharging a non-domestic waste stream to the POTW. Class 3 users will be required to notify the Exeter Sewer Division of any change in discharge quantity or character.

CLASS 4: NON-SYSTEM USER

Any industry, business or commercial establishment identified in the Master List of Industrial Users that are not connected to the Exeter Sewer system or which has ceased to discharge to the system.

Industries and/or commercial establishments classified as Class 1 or Class 2 users will be regulated individually and have specific effluent limitations (including conventional pollutants, where necessary) in the discharge permit. All Class 1 and Class 2 users will require a State Discharge Permit, and be subject to all inspection, compliance monitoring, and enforcement and reporting requirements of the pretreatment program.

BA BEALS ASSOCIATES, PLLC

Land Planning · Civil Engineering
Landscape Architecture · Septic Design & Evaluation
Stratham, NH

January 28, 2025
Chairman
Town of Exeter Planning Board
10 Front Street
Exeter, NH 03833

RE: Proposed Residential Development at 57 Portsmouth Avenue – Waiver Requests
Tax Map 65 Lot #: 137

Dear Members of the Board:

This is written to formalize a request for two waivers specific to the design for the referenced subdivision application.

Your petitioner seeks the following relief:

1. We respectfully request a waiver to the Town of Exeter's Site Plan Review and Subdivision Regulations Section 9.14.9 which requires a 24-foot-wide access points and fire lanes to multi-family developments. This requirement can be waived based upon the review and recommendation of the Exeter Department of Public Works.

   We feel the waiver is justified as:

   13.7.1 The proposed design provide adequate access for the Town of Exeter's Aerial Ladder Truck (see Sheet 12) and the reduced width will decrease stormwater flow from the driveway due to the reduction of impervious area. Therefore, granting of the waiver will not be detrimental to public safety, health, or welfare, nor could it be deemed injurious to other property.

   13.7.2 The conditions upon which this request is made expressly due to the fact that the proposed development access to Portsmouth Avenue is in the same location as the existing access. The existing curb cut is being utilized and is unique to the parcel/proposal and not generally applicable to other properties.

   13.7.3 Due to the location of the curb cut for the existing driveway, the proposed driveway was placed in the same location. This would result in a hardship if the strict letter of the regulations is carried out as it would add needless impervious area to the development where access for all potential emergency response vehicles is provided with the proposed reduced width drive without potential conflict.

   13.7.4 The waiver would not be contrary to the spirit and intent of the regulations as the proposed development will result in adequate width for cars to pass each other in

opposite directions as well as the Town of Exeter's largest fire truck (the aerial ladder truck) to maneuver into and out of the property.

13.7.5 The proposed waiver does not propose to vary the provisions of the Zoning Ordinance or Master Plan. This is demonstrated by the facts cited above, particularly the fact that sufficient fire access will be provided as part of this proposed development.

2. We respectfully request a waiver to the Town of Exeter's Site Plan Review and Subdivision Regulations Section 9.3.6.4 which restricts grading within 5 feet of any exterior property line.

   We feel the waiver is justified as:

   13.7.1 The proposed design provides adequate space to work between the proposed disturbance and the property line of the commercial property, therefore granting of the waiver will not be detrimental to public safety, health, or welfare, nor could it be deemed injurious to other property.

   13.7.2 The conditions upon which this request is made expressly due to the fact that the proposed development access to Portsmouth Avenue is in the same location as the existing access. The existing curb cut is being utilized and is unique to the parcel/proposal and not generally applicable to other properties.

   13.7.3 Due to the location of the curb cut for the existing driveway, the proposed driveway was placed in essentially the same location. This would result in a hardship if the strict letter of the regulations is carried out as it would be illogical to move the drive further west off the existing drive location. Care will be taken to ensure no disturbance to the abutting property, and adequate screening will be maintained to the extent possible.

   13.7.4 The waiver would not be contrary to the spirit and intent of the regulations as the proposed development will result in adequate width for construction to take place without causing harm to abutting commercial property.

   13.7.5 The proposed waiver does not propose to vary the provisions of the Zoning Ordinance or Master Plan. This is demonstrated by the facts cited above, as well as the fact that no structures are to be located within 5-feet of the property line.

Thank you for your consideration.
Very truly yours,
BEALS ASSOCIATES, PLLC

Christian O Smith

Christian O. Smith, PE
Principal

John P. Hayes III CSS, CWS
7 Limestone Way
North Hampton, NH 03862
Phone: 603-205-4396
johnphayes@comcast.net

12/9/24
Chris Berry
Berry Surveying and Engineering
335 Second Crown Point Road
Barrington NH 03825

12/9/24
Site Evaluation for Wetlands
Map 65 Lot 137
57 Portsmouth Avenue Exeter, NH

Dear Chris,

This letter is to report the results of a site evaluation for wetlands that was performed by John P. Hayes on the above mentioned property, on December 9, 2024. The parcel is located on the southeast side of Portsmouth Avenue, northwest of Highland Street, and southwest of Alumni Drive, in Exeter, NH. The lot is approximately 0.3 acres in size. The results of the wetland evaluation of this property, and the surrounding area, were that no jurisdictional wetlands, or areas of poorly drained soil, were found on the lot, or within 100 feet of any of the properties boundary lines. Please feel free to contact me if you have any questions, or I can be of any further assistance.

Sincerely.

John P. Hayes III



John P. Hayes III CSS, CWS

TOWN OF EXETER, NEW HAMPSHIRE
10 FRONT STREET • EXETER, NH • 03833-3792 • (603) 778-0591 •FAX 772-4709
www.exeternh.gov

November 20, 2024

Christian O. Smith, P.E., Principal
Beals Associates PLLC
70 Portsmouth Avenue, 3rd Floor
Stratham, New Hampshire 03885

Re: Zoning Board of Adjustment Case #24-10 - Variance Request
57 Portsmouth Avenue, Exeter, N.H.
Tax Map Parcel #65-137

Dear Mr. Smith:

This letter will serve as official notice that the Zoning Board of Adjustment, at its November 19th, 2024 meeting, vote to approve your client's application for a variance from Article 4, Section 4.4 seeking relief from the required minimum front, side and rear setbacks, the minimum density (lot area/unit) requirement and maximum building coverage requirement for the proposed residential development of the property located at 57 Portsmouth Avenue, as presented.

Please be advised that in accordance with Article 12, Section 12.4 of the Town of Exeter Zoning Ordinance entitled "Limits of Approval" that all approvals granted by the Board of Adjustment shall only be valid for a period of three (3) years from the date such approval was granted; therefore, should substantial completion of the improvements, modifications, alterations or changes in the property not occur in this period of time, this approval will expire.

If you should have any questions, please do not hesitate to contact the Building Department office at (603) 773-6112.

Sincerely,

Esther Olson-Murphy
Chairwoman
Exeter Zoning Board of Adjustment

cc: John O'Neill, Stonearch Development Corp., Applicant
Blake Properties of NH, LLC, property owner
Douglas Eastman, Building Inspector/Code Enforcement Officer
Janet Whitten, Town Assessor
Dave Sharples, Town Planner

EOM: bsm

f:\docs\plan'g & build'g dept\zba cases\zba 24-10 let.docx

Town of Exeter
Zoning Board of Adjustment
November 19, 2024, 7 PM
Town Offices Nowak Room
Draft Minutes

I. Preliminaries

Members Present: Chair Esther Olson-Murphy, Vice-Chair Theresa Page, Robert Prior, Martha Pennell - Alternate, and Laura Montagno - Alternate.

Members Absent: Clerk Laura Davies, Kevin Baum, Mark Lemos - Alternate

Call to Order: Chair Esther Olson-Murphy called the meeting to order at 7 PM.

I. New Business

A. The application of 163 Water C-2, LLC for a variance from Article 5, Section 5.6.3 and 5.6.6 OffStreet Parking Schedule to permit no off-street parking to be provided where 14 spaces are required for a proposed change in use from a retail use to a restaurant use. The subject property is located at 163 Water Street, Unit C-2, in the WC-Waterfront Commercial zoning district. Tax Map Parcel #72-17-2. ZBA Case #24-8.

Attorney Briana Matuszco of DTC Lawyers spoke on behalf of applicant 163 Water C-2 LLC and its owner Anthony Callendrello. Justin Corriss, the manager of Vino e Vivo and of the proposed new establishment at 163 Water Street, was also present.

Attorney Matuszco said the applicant proposes to operate a restaurant at 163 Water Street, currently the location of Paws Pet Boutique, whose lease runs out at the end of January 2025. The space is directly above Vine e Vivo, and the new restaurant would be part of Vino e Vivo's license and corporate structure; they would be operating as a single entity. The restaurant will have 40 seats and will be open Tuesday - Thursday from 5 to 10 PM and Friday and Saturday from 5 to 11 PM. The restaurant will have 5-6 employees. There will be no live music and they will strictly enforce last call and a hard out. The applicant intends to restore the historic nature of the space, and construction is slated to begin in March. The proposed opening of the restaurant is in July 2025. The applicant is seeking variance relief to permit no off-street parking where 14 spaces are required. The proposed use does not have enough off-street parking to comply with the zoning ordinances. The property is currently grandfathered for [relief in the amount of] 5 spaces. The zoning requires 14 spaces, so the applicant is requesting relief for 9 spaces.

Attorney Matuszco went through the variance criteria. 1) The variance will not be contrary to the public interest and 2) The spirit of the ordinance will be observed; yes, this will not change the essential character of the locality, which is a mixed retail, office, and residential use, located on a busy main street with free

Ms. Page made a motion to approve the application of Stonearch Development Corp. for a variance from Article 4, Section 4.3 to permit a minor subdivision of the property located at 12A Little River Road with less than the required lot frontage (width) and with frontage on a private right-of-way. The subject property is located in the R-2, Single Family Residential zoning district. Tax Map Parcel #62-90-1. ZBA Case #24-9, as presented, with the condition that sufficient screening be provided between lot 1 and the abutter. Mr. Prior seconded; he suggested the term "additional" in place of "sufficient" screening.

Mr. Prior moved to amend the motion by removing the word "sufficient" and replacing it with the word "additional. Ms. Pennell seconded. Ms. Olson-Murphy, Ms. Page, Mr. Prior, Ms. Pennell, and Ms. Montagno voted aye. The motion passed 5-0.

On the amended motion, Ms. Olson-Murphy, Ms. Page, Mr. Prior, Ms. Pennell, and Ms. Montagno voted aye. The motion passed 5-0.

Mr. Smith mentioned that Mr. O'Neal is already working with that abutter. That was a big tangled mess of invasive weeds and the neighbor has been thrilled that Mr. O'Neal has been working with him on it.

C. The application of Stonearch Development Corp. for variances from Article 4. Section 4.4 seeking relief from the required minimum front, side and rear setbacks, the minimum density (lot area/unit) requirement and maximum building coverage requirement for the proposed residential development of the property located at 57 Portsmouth Avenue. The subject property is located in the C-2, Highway Commercial zoning district. Tax Map Parcel #65-137. ZBA Case #24-10.

Christian Smith of Beals Associates spoke on behalf of John O'Neal of Stonearch Development. Mr. Smith said this property is just south of the Hampton Inn. The existing conditions plan depicts where the house was, but it's now a vacant lot. The applicant is looking to create two triplex buildings on the lot, which creates a lot of requests for relief due to the size and shape of the parcel. This would be a residential condominium development. The driveway entrance will use the existing curb cut on Portsmouth Avenue. It will have municipal water and sewer service, with closed drainage tying into the existing town drainage system.

Mr. Smith went through the variance criteria. 1) The variance will not be contrary to the public interest; yes, the proposed development will provide alternative housing opportunities to single-family residents and will provide additional tax revenue to the municipality. The proposed layout provides parking behind the building, which will result in a much-improved view from Portsmouth Ave as opposed to if the parking were in the front. The setbacks and density are not within the letter of the ordinance, but this type of housing is supported in the Master Plan. 2) The spirit of the ordinance will be observed; yes, the access to

the multi-family district and off-street parking are a permitted use, and multi-family residential use is permitted by special exception. The property was formerly a single-family residential dwelling. 3) Substantial justice is done; yes, there is no gain to the general public that would outweigh the loss to the developer that would result from a strict adherence to the setback and density requirements of the C2 zone, which are targeted at commercial developments. The Master Plan supports this type of housing in this area on Portsmouth Avenue. 4) The value of surrounding properties will not be diminished; yes, the surrounding properties would be enhanced by the addition of quality triplexes that would enhance the street view of the current vacant lot. Enhanced screening and vegetation to the surrounding properties will be provided through the Planning Board site review application. This will provide privacy for abutting parcels as well as the residents of the townhouse units. 5) Literal enforcement of zoning ordinance will result in an unnecessary hardship; yes, due to the size and shape of the parcel, the building envelope would be 828 square feet if the setbacks were applied. These provisions are generally applied to commercial development and need not apply to residential townhouse units. The parcel is in close proximity to the C1 district, and those provisions would eliminate much of the relief needed. The proposed use and density are reasonable in light of the fact that the parcel is served by water and sewer services.

Mr. Prior said the density seems pretty significant. This is a lot with a significant slope, are they going to dig it out and add a retaining wall? Mr. Smith said yes, the back building would be drive-under garages and the front would be at-grade garages. Each of these units would have a garage at ground level, so the back hill would need to be cut into with a retaining wall. That would be slab on grade. There would be a retaining wall/frost wall for the foundation.

Mr. Prior said they haven't asked for parking relief. Mr. Smith said they have 2 spaces in each garage plus a guest space. Mr. Prior said you would need 2 additional spaces. The rule is one space per bedroom plus one per four units.

Ms. Page said it's C2 so the residential uses permitted are mixed-use neighborhood development, which we're not looking at, and residential conversion, which includes not more than 4 units. Ms. Olson-Murphy said it's not a conversion, it's an empty lot. Ms. Page asked when the previous building was taken down. Mr. O'Neal said it's been at least 5 years. Ms. Montagno said she thinks it's been longer than that.

Mr. Smith said regarding the guest spaces, there is 20+ feet in the paved parking section behind the back building, so there are 2 spaces proposed there.

Ms. Olson-Murphy asked about fire accessibility. Mr. Smith said these are going to be sprinklered. The hydrant is not far away from us, so the Fire Department would hook up to the hydrant and fight it from Portsmouth Avenue.

Mr. Prior asked if they have to go through technical review. Mr. Smith said yes, the full site plan review includes technical review. Fire, Police, and DPW will look at it.

Mr. Prior asked if they are concerned about access onto Portsmouth Ave, which is a fairly busy road. Mr. Smith said Mr. O'Neal has engaged a traffic consultant. Mr. Prior asked if exiting the property would be strictly to the right, and Mr. Smith said he assumes that's what the traffic consultant would recommend.

Ms. Pennell asked if each unit has an underground garage, and Mr. Smith said each has a ground-level garage.

Ms. Pennell asked where the front door to the back units is. Mr. O'Neal said there's a garage door and a service door for each of the units. The ground floor is the garage and office space, the first floor is the living area, and the second floor is 3 bedrooms or 2 bedrooms and a study. The foundation wall serves as retainage and allows people to have a patio in the back. Mr. Smith showed a rendering of the proposed building.

Ms. Olson-Murphy asked for public comment.

Ryan O'Brian of 20 Haven Lane said it would be great to see something in this spot which has been vacant for so long. He doesn't have an issue with infringing on the side setbacks, but he has an issue with the separation between residential zones and commercial zones. There are numerous examples of a vapor-thin barrier between residential and commercial along Portsmouth Avenue. There is a residential R2 zone in the back. This is a residential use of the C2 zone but it abuts two single-family units. It's critical to maintain a buffer between the C2 zone and the residential zone. With proposed development in this area, it's likely that Portsmouth Avenue will need to be widened at some point. If this building is that far forward, you're not going to be able to put a second lane there.

Danielle Frank of 31 Haven Lane said she's not opposed to construction at this site. We'd like to see something new in the neighborhood, but this is too much for too small a lot. This was a single family home and the lot size has not changed. This would negatively impact the surrounding neighborhood with overcrowding.

Steve Taylor of 30 Haven Lane said he is concerned about traffic in that area and drainage of water causing flooding on Haven Lane. If you put 6 units in that tight area, the traffic problems would be threefold, especially with the 111 units they want to put on the side where Sanel Auto Parts is. Adding 6 onto that small lot, which has been vacant since 2015, you're going to be overcrowded and you'll have to change those lights.

Kyle Taylor of 30 Haven Lane said Hampton Inn uses this property as overflow parking. They already cannot handle the amount of parking they have.

Mr. Smith said typically an individual dwelling unit will generate 11 or 12 vehicle trips per day. To say that 6 homes here is going to create a threefold problem, the math doesn't work. We're working with a traffic engineer and will get this figured out. We anticipate that it will be a right-out only. These folks wanted an exit from the back but there's no right of way or room. If Hampton Inn is using this property he's not aware of an agreement to do so. There's no allowance for that use in the future. The drainage will connect to a catch basin on the corner of

the sidewalk at Hampton Inn. There are things that can be done on-site to mitigate any concerns that the DPW may have.

Ms. Olson-Murphy said the applicant implied that the setbacks for a commercial area are more aggressive than residential, but the setbacks they're requesting also don't align with any residential setbacks. You're asking for 9 and it's 25 in a residential area. You'd be here even if the build was in a residential zone.

Mr. Prior said he doesn't have a problem with the proposed setbacks. A few years ago we discussed adopting something called "form-based code," and one of the initiatives was to move buildings toward the road and have parking behind. The members of the public here are from Haven Lane, and are not the abutters, who would have been notified of this. He doesn't believe they will necessarily be impacted by the rear setback.

Ms. Olson-Murphy said we heard another application for this property and the rear abutters did come. It was a single building with 8 units of short-term rentals for nurses. Their concerns may have been with the short-term nature of that proposal.

Ms. Montagno said although there's proximity to the C1 district, every building between this property and C1 is residential. It's not residential units going next to commercial units. The difference between the setbacks of C1 and C2 are dramatic. In C1, the setback is 10 feet. Those setbacks are reasonable given what's in proximity. Mr. Prior said we're extending residential one property further north from Highland Ave. Ms. Olson-Murphy said if you meet the setbacks, the lot is not buildable. No matter what goes there, there will be setback relief.

Ms. Page said in C2, residential conversions are permitted, but we're going beyond that to do 6 units instead of 4 and there's no existing home that's being converted. Do we need to consider a variance for the use? Mr. Prior said if there had been one required, Doug [Eastman] would have made it part of the application.

Ms. Olson-Murphy asked if the Board is ok with the setbacks. Mr. Prior said given where it's located, he doesn't have a problem with it. Ms. Page said the Master Plan is consistent with putting buildings closer to the road, especially coming in closer to town from the 101.

Ms. Olson-Murphy asked the Board about the density and building coverage requests. Mr. Prior said the conversation regarding C1 vs C2 has allayed some of his concerns about density. He was concerned about 6 but doesn't necessarily see a benefit to the town or abutters in holding a line and saying they must only have 4. Once you've increased the size of the building envelope, there is sufficient room for 6 townhomes on that parcel. Ms. Olson-Murphy said it still seems significant. It's been a vacant lot for 8 - 10 years so anything is going to look huge there. She's worried about the bulk of it. If it has parking underneath it will have the 35-foot height. Mr. Prior said we were not asked for height relief. Directly across Portsmouth Ave is the two-story Blake

Auto building. Ms. Page said the layering of three and three helps. It's using the lot without crowding all the units together.

The Board reviewed the rendering again. Ms. Olson-Murphy said it looks better than an empty lot. Mr. Prior said it's a big building. The buildings will be more aligned than they are in the rendering. Only at an angle would you be able to see the back building.

Ms. Olson-Murphy asked the Board if they wanted to go through the variance criteria. Mr. Prior said he thinks it's been explained clearly enough. Ms. Montagno said it's been documented in the application. Mr. Prior said he didn't note any places where he disagreed with the conclusions reached. The only condition he would recommend is unnecessary in this case, which is full Planning Board review.

Mr. Prior made a motion to approve the application of Stonearch Development Corp. for variances from Article 4 Section 4.4 seeking relief from the required minimum front, side and rear setbacks, the minimum density (lot area/unit) requirement and maximum building coverage requirement for the proposed residential development of the property located at 57 Portsmouth Avenue as presented. Ms. Pennell seconded. Ms. Olson-Murphy, Ms. Page, Mr. Prior, Ms. Pennell, and Ms. Montagno voted aye. The motion passed 5-0.

II. Other Business

A. Minutes Approval - August 20, 2024

Ms. Olson-Murphy said there are not enough members present [who were in attendance at the August meeting] to review this set of minutes, so it was tabled until the next meeting.

B. Minutes Approval - October 15, 2024

Ms. Page moved to approve the minutes of October 15, 2024 as presented. Mr. Prior seconded. The motion passed 5-0.

III. Adjournment

Mr. Prior moved to adjourn. Ms. Page seconded. The motion passed 5-0 and the meeting was adjourned at 8:30 PM.

Respectfully Submitted,
Joanna Bartell
Recording Secretary

Underwood Engineers

3125.00

February 18, 2025

Mr. David Sharples, Town Planner
Town Planning Office, Town of Exeter
10 Front Street
Exeter, NH 03833

Re: *57 Portsmouth Avenue Residential Development*
Design Review Engineering Services
Exeter, New Hampshire

Site Information:

Review No. 1

Tax Map/Lot#:	65 / 137
Address:	57 Portsmouth Avenue
Lot Area:	0.27 ac
Zoning District:	C2 Highway Commercial
Proposed Use:	Residential
Water:	Municipal
Sewer:	Municipal
Applicant:	Stonearch Development
Design Engineer:	Beals Associates

Documents Reviewed:

- Site plan set entitled "Residential Site Plan 57 Portsmouth Avenue" last revised 1/28/2025, prepared by Beals Associates
- "Drainage Analysis & Sediment and Erosion Control Plan" dated 1/28/2025, prepared by Beals Associates

Dear Mr. Sharples:

Based on our review of the above information, we offer the following in accordance with the Town of Exeter Regulations and standard engineering practice.

Plan Sheets

1. UE notes the project has been granted relief from the Zoning Board for a number of setback conditions, add the effective front, side, and rear setback lines for the project.

2. Architectural drawings were not provided with the submission, however renderings were. UE notes that the renderings:
    - Do not match the building footprints. Revise, as appropriate, such that exact footprints, including front and rear porches and balconies, including posts, are accurately depicted on the plans.
    - Do not depict the embankment to remain off Unit C's northwesterly corner.
3. As shown, the retaining wall along the back and side of units D through F appears to be the building foundation, rather than a separate wall. Please clarify.
4. The front corner and side of Unit D is exposed to vehicle impact.
5. The width of the driveway entrance at the back of the sidewalk is approximately 40'. The fire truck turning template indicates it can likely still make the turn if it reduced to approximately 30' wide.
6. Will a mail kiosk or dumpster be required?
7. Connection to the municipal drainage system is prohibited per Town regulations.
8. It appears the existing stone wall along the backside of the sidewalk along Portsmouth Avenue will remain?
9. Is blasting anticipated for the work at the slopes on the side and rear of the site?
10. The retaining walls appear to hold back as much as 16' of earth with 10' being required for much of the proposed use. The retaining wall will need to be designed by a professional engineer in the State of New Hampshire.
11. We note retaining walls are proposed as close as 4' from the property line and the guy pole supporting Utility Pole 14. Final design of retaining walls often occurs (by others) closer to the time of construction. Due to the proximity of the abutting parcel, the dimensions of the structural elements (and future maintenance) required of the proposed retaining wall need to be considered as part of the overall design approval.
12. Update clearing limits to reflect practical construction needs.
13. A constructed drainage conveyance from the high point off the south corner of Unit F is needed to facilitate a controlled passage of run-off, both:
    - Northwesterly along the retaining wall to relief off of Unit C's northwest corner, and
    - Northeasterly along the rear of Building 1 to relief off of Unit D's southeasterly corner.
14. Indicate a potential concrete washout pit location.

DRAFT

15. UE notes the sprinkler rooms for each building. That being the case, a 6" main is considerably larger than needed and may suffer stagnation from time to time if insufficient water isn't circulating through it.
16. Consider bringing one gravity sewer line into the drive aisle between the buildings and bringing the sewer services from both buildings out to it rather than the two lateral sewer lines with clean-outs as proposed.
17. Label the invert at the sewer cleanouts at the end of each of the service runs.
18. Please add a note that existing water and sewer services must be abandoned at the main by a contractor properly licensed by Exeter Public Works. In addition, specifically label the existing water and sewer connections to be abandoned.
19. Please add a note to direct the Contractor to coordinate traffic control with the Town prior to any work within Portsmouth Avenue and to coordinate bypass pumping of the sewer during installation of the new manhole.
20. Label the size and material of the existing sewer main in Portsmouth Avenue.

Truck Turning Plan

21. The turn into the driveway is a tight fit. Consideration of a mountable type of curb instead of vertical granite curb may be prudent for this location.
22. The truck can only turn around and drive out if the 2 parking spaces next to Unit D are empty.

Details

23. Add details as appropriate to:
    - Address comment 14 above,
    - Address Comment 22 above.

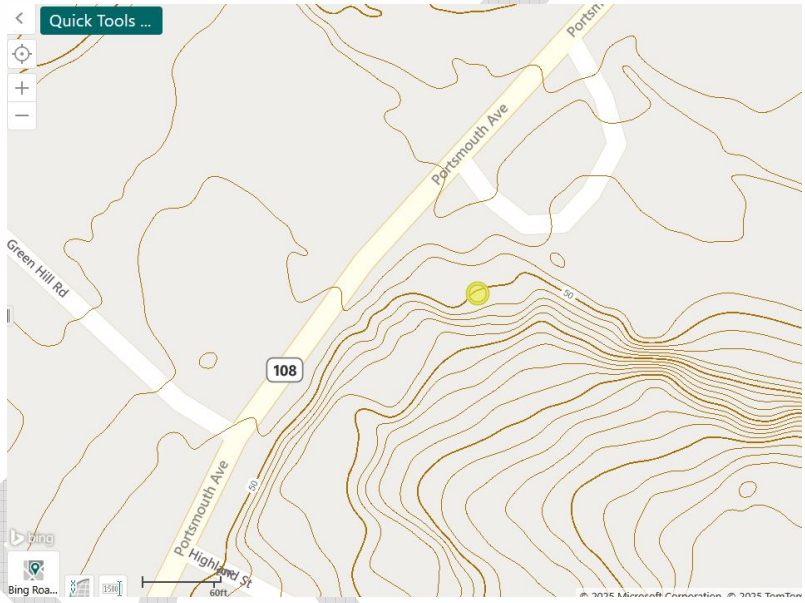
Drainage Analysis

24. No stormwater detention or treatment is proposed for the project.
25. Onsite treatment of stormwater is required per Exeter regulations 9.3.2.....
26. No increase in stormwater leaving the site is allowed per Exeter regulations 9.3.2.....
27. Post- volume and flowrate exceed the pre- values for all evaluated storms. No onsite infiltration or storage is proposed. Almost all run-off flows toward the Town's ROW with most of it piped directly to the Town's drainage system in Portsmouth Ave.
28. The drainage report states the increase in flow leaving the stie would have no impact on the Town's system. Provide information/data to support this statement.

DRAFT

29. A WQV storm model is typically the rainfall event needed to produce the equivalent of 1" of run-off over the drainage area, the precise rainfall varies based on the site specifics, but is typically between 1.6 and 1.9 inches for Urban B/C areas.

30. In reviewing the southeasterly limits of the subcatchment(s), UE notes that the slopes continue far beyond the study area. We acknowledge that the image below represents a macro-view of the area, but if the site is going to direct onsite and offsite drainage to Exeter's drainage system, the area needs to be delineated and the conveyance designed accordingly.



31. **PTAP Database:** The Applicant is requested to enter project related stormwater tracking information contained in the site plan application documents using the Great Bay Pollution Tracking and Accounting Program (PTAP) database (www.unh.edu/unhsc/ptapp).

A written response is required to facilitate future reviews. Please contact us if you have any questions.

Very truly yours,
UNDERWOOD ENGINEERS, INC.

Allison M. Rees, P.E. (NH)
Project Manager

Robert J. Saunders, P.E. (NH, ME, VT, PA)
Project Manager









BA BEALS ASSOCIATES, PLLC
Land Planning • Civil Engineering
Landscape Architecture • Septic Design & Evaluation
Stratham, NH

Exeter Planning Board,
David Sharples, Town Planner
Town Planning Office, Town of Exeter
10 Front Street
Exeter, NH 03833

March 19, 2025

Re: 57 Portsmouth Ave. – Residential Development
Response to UEI Comments

Dear Mr. Chairman, Members of the Board, & Mr. Sharples:

We are in receipt of a review letter from Underwood Engineers, dated February 18, 2025 and we offer the following responses to the noted comments. Each comment is followed by our response in **bold**.

Plan Sheets

1. UE notes the project has been granted relief from the Zoning Board for a number of setback conditions, add the effective front, side, and rear setback lines for the project.
   Response: Comment noted.

2. Architectural drawings were not provided with the submission; however renderings were. UE notes that the renderings:
   - Do not match the building footprints. Revise, as appropriate, such that exact footprints, including front and rear porches and balconies, including posts, are accurately depicted on the plans.
   - Do not depict the embankment to remain off Unit C's northwesterly corner.

   Response: Architectural drawings will be provided under separate cover. Final footprints including building appurtenances will be coordinated with those drawings.

3. As shown, the retaining wall along the back and side of units D through F appears to be the building foundation, rather than a separate wall. Please clarify.
   Response: The foundation for the building will be a separate structure with the retaining wall tying into it on each side.

4. The front corner and side of Unit D is exposed to vehicle impact.
   Response: A bollard has been proposed for the building protection.

5. The width of the driveway entrance at the back of the sidewalk is approximately 40'. The fire truck turning template indicates it can likely still make the turn if it reduced to approximately 30' wide.
   Response: The driveway entrance has been revised as requested.

6. Will a mail kiosk or dumpster be required?
Response: A mail kiosk has been added to the plans. A dumpster is not required as noted in Note #12 on Sheet 3.

7. Connection to the municipal drainage system is prohibited per Town regulations.
Response: The connection to the municipal drainage system has been removed.

8. It appears the existing stone wall along the backside of the sidewalk along Portsmouth Avenue will remain?
Response: This is correct.

9. Is blasting anticipated for the work at the slopes on the side and rear of the site?
Response: Blasting is not anticipated for construction.

10. The retaining walls appear to hold back as much as 16' of earth with 10' being required for much of the proposed use. The retaining wall will need to be designed by a professional engineer in the State of New Hampshire.
Response: This is understood and noted on the plans.

11. We note retaining walls are proposed as close as 4' from the property line and the guy pole supporting Utility Pole 14. Final design of retaining walls often occurs (by others) closer to the time of construction. Due to the proximity of the abutting parcel, the dimensions of the structural elements (and future maintenance) required of the proposed retaining wall need to be considered as part of the overall design approval.
Response: This can be discussed with the board as is normally completed post approval.

12. Update clearing limits to reflect practical construction needs.
Response: A proposed tree line has been added for required clearing.

13. A constructed drainage conveyance from the high point off the south corner of Unit F is needed to facilitate a controlled passage of run-off, both:
    - Northwesterly along the retaining wall to relief off of Unit C's northwest corner, and
    - Northeasterly along the rear of Building 1 to relief off of Unit D's southeasterly corner.

Response: Runoff behind the wall will be captured in a combination of the stone infiltration trench and typical stone behind the retaining wall.

14. Indicate a potential concrete washout pit location.
Response: The concrete washout pit has been added to Sheet 3.

15. UE notes the sprinkler rooms for each building. That being the case, a 6" main is considerably larger than needed and may suffer stagnation from time to time if insufficient water isn't circulating through it.
Response: The proposed main has been reduced to 4" however will be reviewed by the water department.

16. Consider bringing one gravity sewer line into the drive aisle between the buildings and bringing the sewer services from both buildings out to it rather than the two lateral sewer lines with clean-outs as

proposed.
Response: A single gravity sewer line has been provided.

17. Label the invert at the sewer cleanouts at the end of each of the service runs.
Response: Invert data has been added as requested.

18. Please add a note that existing water and sewer services must be abandoned at the main by a contractor properly licensed by Exeter Public Works. In addition, specifically label the existing water and sewer connections to be abandoned.
Response: Note #6 on the utility page addresses this requirement.

19. Please add a note to direct the Contractor to coordinate traffic control with the Town prior to any work within Portsmouth Avenue and to coordinate bypass pumping of the sewer during installation of the new manhole.
Response: Note 21 has been added.

20. Label the size and material of the existing sewer main in Portsmouth Avenue.
Response: The existing sewer main has been labeled as 8-inch PVC on Sheet 5.

Truck Turning Plan

21. The turn into the driveway is a tight fit. Consideration of a mountable type of curb instead of vertical granite curb may be prudent for this location.
Response: The onsite curbing has been revised to sloped granite and a detail has been added.

22. The truck can only turn around and drive out if the 2 parking spaces next to Unit D are empty.
Response: In an emergency situation if the spaces are occupied the truck can back out if needed.

Details

23. Add details as appropriate to:
- Address comment 14 above,
- Address Comment 22 above.

Response: Details have been added or revised.

Drainage Analysis

24. No stormwater detention or treatment is proposed for the project.
Response: Stormwater treatment and detention has been provided in the form of a stone infiltration trench behind the retaining wall.

25. Onsite treatment of stormwater is required per Exeter regulations 9.3.2…..

Response: See previous response.

26. No increase in stormwater leaving the site is allowed per Exeter regulations 9.3.2…..

Response: There is only a minimal increase for both the WQV and 2-year storm events, which

will not impact the capacity of the municipal stormwater system.

27. Post- volume and flowrate exceed the pre- values for all evaluated storms. No onsite infiltration or storage is proposed. Almost all run-off flows toward the Town's ROW with most of it piped directly to the Town's drainage system in Portsmouth Ave.
Response: See previous responses.

28. The drainage report states the increase in flow leaving the stie would have no impact on the Town's system. Provide information/data to support this statement.
Response: There is only a minimal increase for both the WQV and 2-year storm events, which will not impact the capacity of the municipal stormwater system.

29. A WQV storm model is typically the rainfall event needed to produce the equivalent of 1" of run- off over the drainage area, the precise rainfall varies based on the site specifics, but is typically between 1.6 and 1.9 inches for Urban B/C areas.
Response: Water Quality Volume is defined by the NH Stormwater Manual as the volume that results from 1-inch of rainfall, not 1-inch of runoff.

30. In reviewing the southeasterly limits of the subcatchment(s), UE notes that the slopes continue far beyond the study area. We acknowledge that the image below represents a macro-view of the area, but if the site is going to direct onsite and offsite drainage to Exeter's drainage system, the area needs to be delineated and the conveyance designed accordingly.
Response: The topography from the survey is a more accurate tool than the macro-view. All offsite stormwater will continue to flow in the direction it currently flows, and the same volume of stormwater from offsite flows will contribute the same amount of volume.

31. PTAP Database: The Applicant is requested to enter project related stormwater tracking information contained in the site plan application documents using the Great Bay Pollution Tracking and Accounting Program (PTAP) database (www.unh.edu/unhsc/ptapp).
Response: This will be completed after local approvals are received.

Thank you for your timely and professional review of the submitted plans. We hope the information provided address your concerns. Please feel free to contact our office if you have any additional question and/or comments.

Very Truly Yours,

BEALS ASSOCIATES, PLLC

Christian O. Smith

Christian O. Smith, PE
Principal

RESIDENTIAL SITE PLAN
57 PORTSMOUTH AVE
(NH ROUTE 108)
TAX MAP 65, LOT 137

JANUARY 28, 2024

NOT FOR CONSTRUCTION

CIVIL ENGINEERS:

BA BEALS ASSOCIATES, PLLC

70 PORTSMOUTH AVE,
THIRD FLOOR, SUITE 2
STRATHAM, N.H. 03885
PHONE: 603-583-4860

STATE OF NEW HAMPSHIRE – CHRISTIAN O. SMITH No.9900 – LICENSED PROFESSIONAL ENGINEER

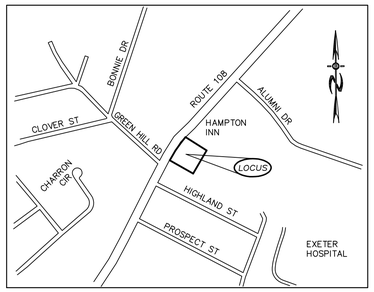
LAND SURVEYORS:

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825
603-332-2863

WETLAND/ENVIRONMENTAL CONSULTANT:

JOHN P. HAYES III CSS, CWS
7 LIMESTONE WAY
NORTH HAMPTON, NH 03862
603-205-4396

LOCATION MAP



SCALE: 1"=500'

DRAWING INDEX

SHEET #	TITLE
	COVER SHEET
1-2	EXISTING CONDITION PLANS (BERRY SURVEY)
3	PARKING & PAVEMENT PLAN
4	GRADING, DRAINAGE, & EROSION CONTROL
5	UTILITY PLAN
6	LIGHTING & LANDSCAPE PLAN
7	EROSION & SEDIMENT CONTROL DETAILS
8-9	CONSTRUCTION DETAILS
10	EXETER LADDER TRUCK MANEUVERING PLAN

RECORD APPLICANT

STONEARCH DEVELOPMENT CORP.
42J DOVER POINT ROAD
DOVER, NEW HAMPSHIRE

RECORD OWNER

BLAKE PROPERTIES OF NH, LLC
PO BOX 368
NEWFIELDS, NEW HAMPSHIRE 03856

PLAN SET LEGEND

5/8" REBAR	●	VGC	VERTICAL GRANITE CURB
DRILL HOLE	◉	OVERHEAD ELEC. LINE	
CONC. BOUND	⊡	FENCING	
UTILITY POLE		DRAINAGE LINE	
DRAIN MANHOLE	Ⓓ	SEWER LINE	
SEWER MANHOLE	Ⓢ	GAS LINE	
EXISTING LIGHT POLE	☼	WATER LINE	
EXISTING CATCH BASIN	□	STONE WALL	
PROPOSED CATCH BASIN	⊞	TREE LINE	
WATER GATE	W	ABUT. PROPERTY LINES	
WATER SHUT OFF	W	EXIST. PROPERTY LINES	
HYDRANT		BUILDING SETBACK LINES	
PINES, ETC.		EXIST. CONTOUR	100
MAPLES, ETC.		PROP. CONTOUR	100
EXIST. SPOT GRADE	96x69	SOIL LINES	
PROP. SPOT GRADE	96x69		
DOUBLE POST SIGN			
SINGLE POST SIGN			

REQUIRED PERMITS

CONSTRUCTION GENERAL PERMIT
NHDES SEWER CONNECTION
NHDES WATER CONNECTION

APPROVED ZONING RELIEF:

Article 4, Section 4.4, Schedule III: Front setback less than required 50' to 9 '
Article 4, Section 4.4, Schedule III: Side setback less than required 20' to 7.7'
Article 4, Section 4.4, Schedule III: Rear setback less than required 50' to 8.7'
Article 4, Section 4.4, Schedule III: Density less than 5,000 sf /unit to 1,960 sf
Article 4, Section 4.4, Schedule III: Buidling coverage of 36.7% where 30% maximum is required.

PB CASE # TBD
CHAIRMAN SIGNATURE:

	REVISIONS:	DATE:
1	REVISED PER REVIEW COMMENTS	03/19/25
2		
3		
4		
5		

NH-1535 PROPOSED RESIDENTIAL PLAN

PLAN REFERENCES:

1.) "PLAN OF LAND, EXETER, NEW HAMPSHIRE, FOR RICHARD P. McCOY & EUGENE O. COLLEY, D/B/A/ EXETER COLLCOY CO."
BY: JOHN W. DURGIN
DATED: FEBRUARY 1976
R.C.R.D. PLAN #C–5867

2.) "A PLAN OF LAND OF LOUIS T. AND IDA A. TARDIFF, PORTSMOUTH AVENUE, EXETER, N.H., CONTAINING 31,760 SQUARE FEET"
BY: GREAT EAST LAND SURVEY CO.
DATED: OCTOBER 13, 1972
R.C.R.D. PLAN #D–3634

3.) "PLAN OF LAND EXETER, NEW HAMPSHIRE, FOR LYMAN E. COLLISHAW"
BY: JOHN W. DURGIN
DATED: DECEMBER 1970
R.C.R.D. PLAN #D–3746

4.) "PLAN OF PROPERTIES IN EXETER, N.H., NO. 59 PORTSMOUTH AVENUE, ROCKINGHAM COUNTY, PREPARED FOR: McDONALD'S CORPORATION, LOCATION 28–0027"
BY: GOLDEN LAND SURVEY, INC.
DATED: DECEMBER 3, 1994
R.C.R.D. PLAN #D–23867

5.) "TAX MAP 65 LOTS 133 & 136, PROPERTY OF BLAKE PROPERTIES OF NH, LLC, 59 PORTSMOUTH AVENUE, COUNTY OF ROCKINGHAM, EXETER, NEW HAMPSHIRE"
BY: MSC CIVIL ENGINEERS & LAND SURVEYORS, INC.
DATED: AUGUST 3, 2009
R.C.R.D. PLAN #D–36048

6.) "TAX MAP 65 LOTS 138 & 139 LOT LINE CHANGE PLAN, OF LAND IN EXETER, NH, OWNED BY: HIGHLAND TRUST AND J&M EVERGREEN REALTY TR."
BY: JAMES M. LAVELLE, LLS
DATED: MAY 23, 2015
R.C.R.D. PLAN #D–38862

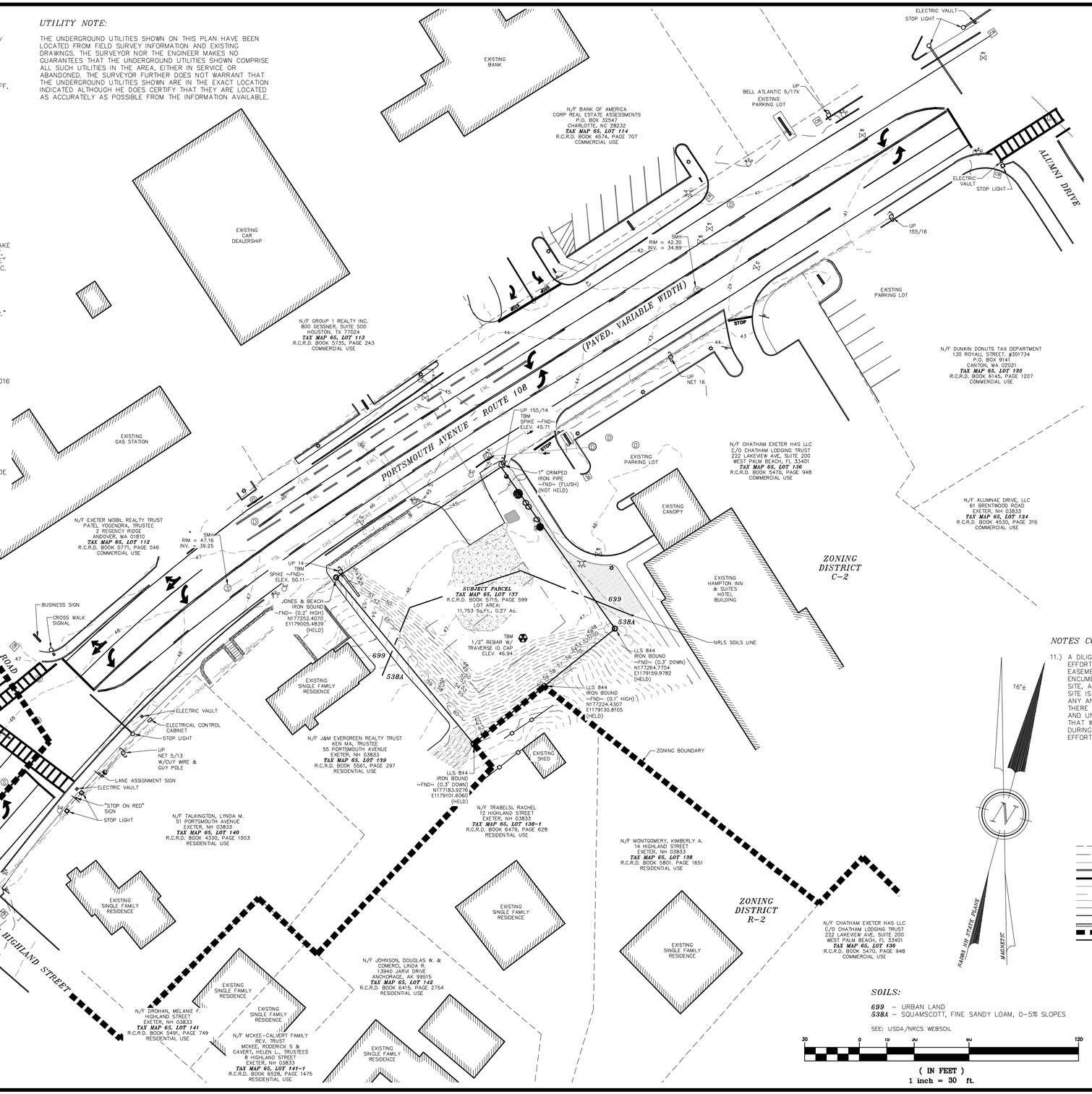
7.) "TAX MAP 65 LOTS 138 & 142 LOT LINE CHANGE PLAN, OF LAND IN EXETER, NH, OWNED BY: JEREMY D. RUSSMAN & DIANNA J. RUSSMAN."
BY: JAMES M. LAVELLE, LLS
DATED: JANUARY 29, 2016, REVISION; APRIL 4, 2016
R.C.R.D. PLAN #D–39395

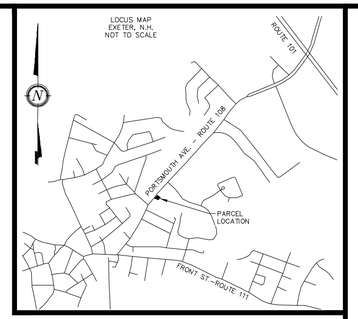
8.) "TAX MAP 65 LOT 138, "HIGHLAND–EXETER" SUBDIVISION, OF LAND IN EXETER, NH, OWNED BY: JEREMY D. RUSSMAN & DIANNA J. RUSSMAN."
BY: JAMES M. LAVELLE, LLS
DATED: JANUARY 29, 2015, REVISION: MARCH 22, 2016, REVISION; APRIL 4, 2016
R.C.R.D. PLAN #D–39396

9.) "PLANS OF PROPOSED FEDERAL AID PRIMARY PROJECT, F018–2(1), N.H. NO. P–2428, SOUTH SIDE ROAD, SHEET #16"
BY: N.H. DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
DATED: APRIL 14, 1955
ON FILE AT THIS OFFICE

UTILITY NOTE:

THE UNDERGROUND UTILITIES SHOWN ON THIS PLAN HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND EXISTING DRAWINGS. THE SURVEYOR NOR THE ENGINEER MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM THE INFORMATION AVAILABLE.





NOTES:

1.) OWNER: BLAKE PROPERTIES OF NH, LLC
P.O. BOX 368
NEWFIELDS, NH 03856

1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
425 DOVER POINT ROAD
DOVER, NH
03820

2.) TAX MAP 65, LOT 137
PROJECT ADDRESS: 57 PORTSMOUTH AVE.

3.) R.C.R.D. BOOK 5715, PAGE 599

4.) LOT AREA: 11,753 Sq.Ft., 0.26 Ac.

5.) ZONING: C–2, HIGHWAY COMMERCIAL DISTRICT
MIN. LOT SIZE: 20,000 Sq.Ft.
MIN. LOT WIDTH: 150'
MIN LOT DEPTH: 100'
MAX. BUILDING HEIGHT: 35'
50' PERMITTED BY SPECIAL EXCEPTION
FRONT BUILDING SETBACK: 50'
SIDE BUILDING SETBACK: 20'
REAR BUILDING SETBACK: 50'
20' PERMITTED BY SPECIAL EXCEPTION
MAX. BUILDING COVERAGE: 30%
MIN. OPEN SPACE: 15%

6.) I HEREBY CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE & BELIEF, THIS PARCEL DOES NOT FALL WITHIN THE FLOOD PLAIN. FLOOD HAZARD REFERENCE: FEMA, COMMUNITY # – 330130, MAP # – 33015C0402E, DATED: MAY 17, 2005.

7.) VERTICAL DATUM BASED ON USGS NAVD88ELEVATIONS. HORIZONTAL COORDINATES BASED ON NAD83, COORDINATES GATHERED USING CARLSON BRX7 SURVEY GRADE GPS RECEIVERS.

8.) THE INTENT OF THIS PLAN IS TO SHOW THE EXISTING CONDITIONS OF EXETER TAX MAP 65, LOT 137 AS OF THE DATE OF THE SURVEY: OCTOBER 2024.

9.) THE LOT IS SERVICED BY MUNICIPAL WATER AND SEWER.

10.) EXISTING IMPERVIOUS AREA:
DRIVEWAY: 644 Sq.Ft., 5.47%
GRAVEL AREA: 1,828 Sq.Ft., 15.56%
TOTAL: 2,472 Sq.Ft., 21.03%

NOTES CONTINUED:

11.) A DILIGENT RESEARCH EFFORT FOUND NO EASEMENTS ENCUMBERING THE PROJECT SITE, AND FOUND THAT THE SITE IS NOT BENEFITED BY ANY ANY EASEMENTS. THERE MAY BE RECORDED AND UNRECORDED RIGHTS THAT WERE NOT FOUND DURING THE RESEARCH EFFORT

SOILS:

699 – URBAN LAND
538A – SQUAMSCOTT, FINE SANDY LOAM, 0–5% SLOPES

SEE: USDA/NRCS WEBSOIL

EXISTING LEGEND:

- IRON BOUND/IRON ROD (FND)
- IRON PIPE (FND)
- UTILITY POLE / GUY WIRE
- SINGLE POST SIGN
- TEMPORARY BENCHMARK (TBM)
- CURB STOP
- GATE VALVE
- FIRE HYDRANT
- GAS VALVE
- CATCH BASIN
- DRAIN MANHOLE
- SEWER MANHOLE
- SEWER CLEAN OUT
- POLE LIGHT
- ELECTRIC MANHOLE
- UNDERGROUND ELECTRIC VAULT
- ABUTTING PROPERTY LINE (APPROXIMATE)
- BUILDING SETBACK LINE
- EXISTING GAS LINE
- EXISTING WATER LINE
- EXISTING SEWER LINE
- EXISTING DRAIN LINE
- OVERHEAD UTILITIES
- EXISTING CONTOUR MINOR
- EXISTING CONTOUR MAJOR
- WOODEN FENCE
- VERTICAL GRANITE CURB (V.G.C.)
- ZONING BOUNDARY
- NRCS SOIL BOUNDARY
- NRCS SOIL LABEL

699 FOUND
TYP TYPICAL
E.O.P. EDGE OF PAVEMENT
S.S.W.L. SINGLE SOLID WHITE LINE
D.S.Y.L. DOUBLE SOLID YELLOW LINE
D.D.Y.L. DOUBLE DASHED YELLOW LINE
R.C.R.D. ROCKINGHAM COUNTY REGISTRY OF DEEDS

I CERTIFY THAT THIS SURVEY PLAT IS NOT A SUBDIVISION PURSUANT TO THIS TITLE AND THAT THE LINES OF STREETS AND WAYS SHOWN ARE THOSE OF PUBLIC OR PRIVATE STREETS OR WAYS ALREADY ESTABLISHED AND THAT NO NEW WAYS ARE SHOWN.

1-24-25
KENNETH A. BERRY L.L.S. 805 DATE

REVISION	DATE	DESCRIPTION
#1	1–24–25	UPDATE UTILITY INFORMATION

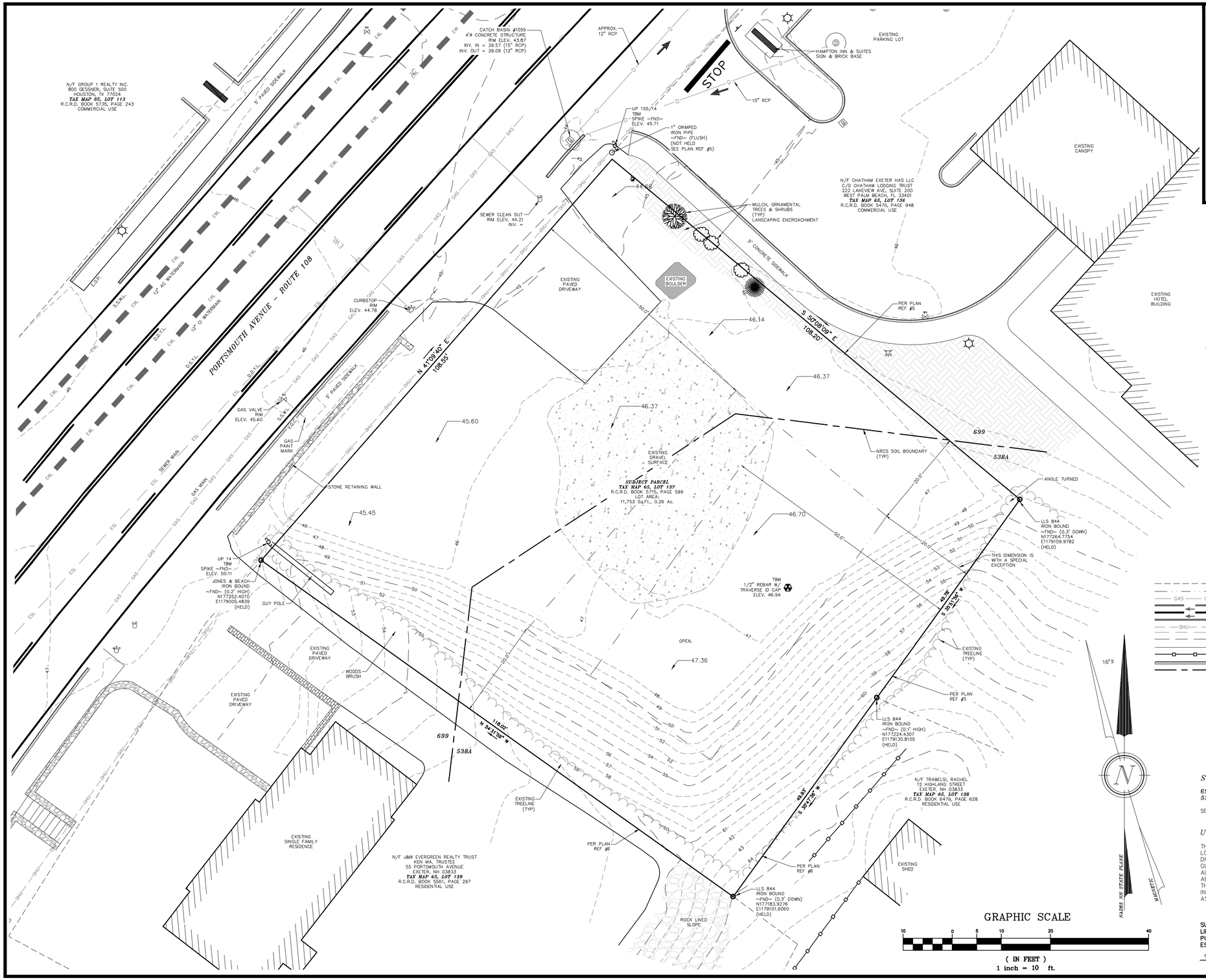
EXISTING CONDITIONS PLAN OVERVIEW
FOR
STONEARCH DEVELOPMENT CORP.
LAND OF
BLAKE PROPERTIES OF NH, LLC
57 PORTSMOUTH AVENUE
EXETER, N.H.
TAX MAP 65, LOT 137

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332–2863

SCALE : 1 IN. EQUALS 30 FT.
DATE : NOVEMBER 25, 2024
FILE NO. : DB 2024 – 109

STATE OF NEW HAMPSHIRE NO. 805 LICENSED LAND SURVEYOR
KENNETH A. BERRY
SIGNATURE

SHEET 1

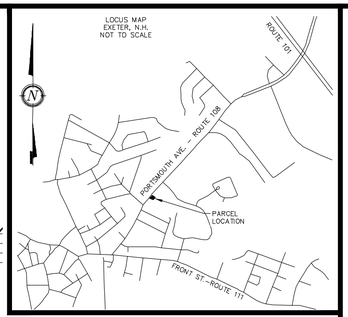


GRAPHIC SCALE

10 0 5 10 20 40

(IN FEET)
1 inch = 10 ft.

LOCUS MAP
EXETER, N.H.
NOT TO SCALE



NOTES:

1.) OWNER: BLAKE PROPERTIES OF NH, LLC
P.O. BOX 368
NEWFIELDS, NH 03856

1A.) APPLICANT: STONEARCH DEVELOPMENT CORP.
425 DOVER POINT ROAD
DOVER, NH 03820

2.) TAX MAP 65, LOT 137

3.) R.C.R.D. BOOK 5715, PAGE 599

4.) LOT AREA: 11,753 Sq.Ft., 0.26 Ac.

5.) THE INTENT OF THIS PLAN IS TO SHOW THE EXISTING CONDITIONS OF EXETER TAX MAP 65, LOT 137 AS OF THE DATE OF THE SURVEY: OCTOBER 2024.

6.) SEE OVERVIEW EXISTING CONDITIONS PAGE FOR COMPLETE NOTES AND ABUTTERS.

EXISTING LEGEND:

- IRON BOUND/IRON ROD (FND)
- IRON PIPE (FND)
- UTILITY POLE / GUY WIRE
- SINGLE POST SIGN
- TEMPORARY BENCHMARK (TBM)
- CURB STOP
- GATE VALVE
- FIRE HYDRANT
- GAS VALVE
- CATCH BASIN
- DRAIN MANHOLE
- SEWER MANHOLE
- SEWER CLEAN OUT
- POLE LIGHT
- ABUTTING PROPERTY LINE (APPROXIMATE)
- BUILDING SETBACK LINE
- EXISTING GAS LINE
- EXISTING WATER LINE
- EXISTING SEWER LINE
- EXISTING DRAIN LINE
- OVERHEAD UTILITIES
- EXISTING CONTOUR MINOR
- EXISTING CONTOUR MAJOR
- SPOT ELEVATION
- WOODEN FENCE
- VERTICAL GRANITE CURB (V.G.C.)
- NRCS SOIL BOUNDARY
- 699 NRCS LABEL
- FND FOUND
- TYP TYPICAL
- E.O.P. EDGE OF PAVEMENT
- S.S.W.L. SINGLE SOLID WHITE LINE
- D.S.Y.L. DOUBLE SOLID YELLOW LINE
- D.D.Y.L. DOUBLE DASHED YELLOW LINE
- R.C.R.D. ROCKINGHAM COUNTY REGISTRY OF DEEDS

SOILS:

699 – URBAN LAND
538A – SQUAMSCOTT, FINE SANDY LOAM, 0–5% SLOPES

SEE: USDA/NRCS WEBSOIL

UTILITY NOTE:

THE UNDERGROUND UTILITIES SHOWN ON THIS PLAN HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND EXISTING DRAWINGS. THE SURVEYOR NOR THE ENGINEER MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM THE INFORMATION AVAILABLE.

I CERTIFY THAT THIS SURVEY PLAT IS NOT A SUBDIVISION PURSUANT TO THIS TITLE AND THAT THE LINES OF STREETS AND WAYS SHOWN ARE THOSE OF PUBLIC OR PRIVATE STREETS OR WAYS ALREADY ESTABLISHED AND THAT NO NEW WAYS ARE SHOWN.

1-24-25
KENNETH A. BERRY L.L.S. 805 DATE

REVISION	DATE	DESCRIPTION
#1	1-24-25	UPDATE UTILITY INFORMATION

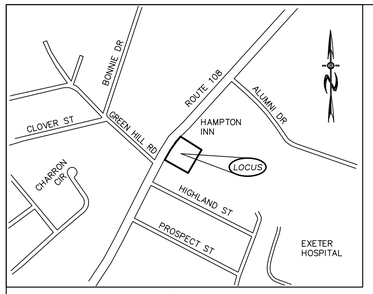
EXISTING CONDITIONS DETAIL PLAN
FOR
STONEARCH DEVELOPMENT CORP.
LAND OF
BLAKE PROPERTIES OF NH, LLC
57 PORTSMOUTH AVENUE
EXETER, N.H.
TAX MAP 65, LOT 137

BERRY SURVEYING & ENGINEERING
335 SECOND CROWN POINT ROAD
BARRINGTON, NH 03825 (603)332-2863

SCALE : 1 IN. EQUALS 10 FT.
DATE : NOVEMBER 25, 2024
FILE NO. : DB 2024 – 109

STATE OF NEW HAMPSHIRE
NO. 805
KENNETH A. BERRY
LICENSED LAND SURVEYOR
SIGNATURE

SHEET 2



LOCATION MAP
1"=500'

ZONING REQUIREMENTS:

ZONING DISTRICT – HIGHWAY COMMERCIAL – C2
MINIMUM LOT AREA = 20,000 S.F.
MINIMUM LOT WIDTH = 150 FT.
MINIMUM LOT DEPTH = 100 FT.
MINIMUM LOT FRONTAGE = 150 FT.
MINIMUM DWELLING UNIT = 5,000 S.F.

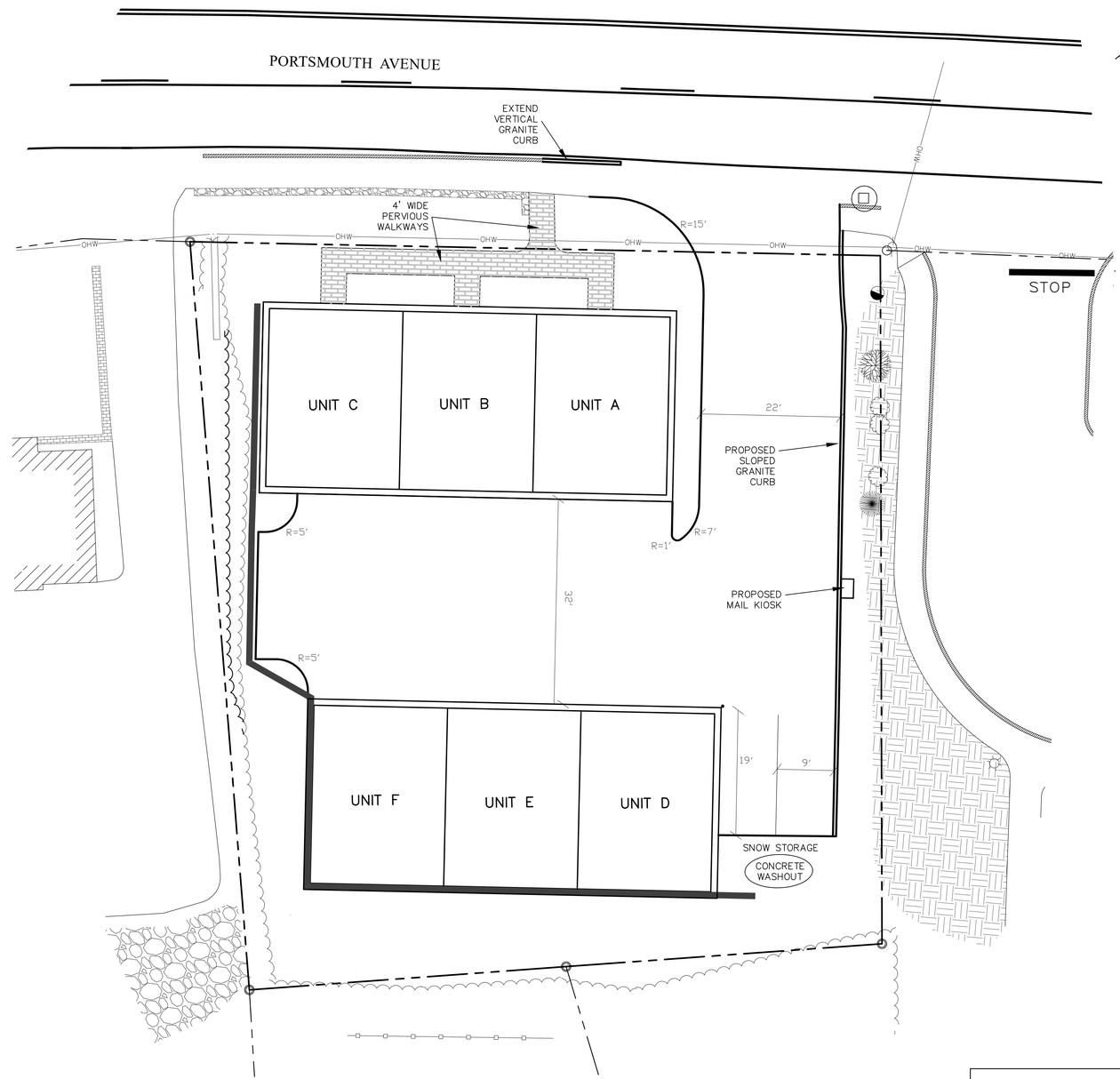
BUILDING SETBACKS:

FRONT = 50 FT.
SIDE = 20 FT.
REAR = 50 FT.
BUILDING HEIGHT = 35 FT.
MAXIMUM BUILDING COVERAGE = 30%
MINIMUM OPEN SPACE = 15%

PARKING CALCULATIONS:

TOTAL NUMBER OF UNITS = 6
2 SPACES PER UNIT AND 1 SPACE PER 4 UNITS FOR VISITOR
TOTAL SPACES REQUIRED = 14

6 UNITS HAVE 2 SPACES = 12
PLUS 2 VISITOR STALLS
TOTAL SPACES PROVIDED = 14



TOWN NOTES

1. THE LANDOWNER IS RESPONSIBLE FOR COMPLYING WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL WETLANDS REGULATIONS, INCLUDING ANY PERMITTING AND SETBACK REQUIREMENTS REQUIRED UNDER THESE REGULATIONS.
2. THE APPLICANT HAS DESIGNED THIS SITE TO SAFELY ACCOMMODATE MAXIMUM SIZE VEHICLES AND TRUCKS, (DESIGN VEHICLE IS THE EXETER LADDER TRUCK OR 35' BOX TRUCK) EITHER DELIVERING TO, OR USING THE PROPERTY.
3. ALL SNOW SHALL BE STORED IN THE AREA(S) DEPICTED ON THIS PLAN AS SNOW STORAGE AREAS. IN THE EVENT THAT THE AREA(S) APPROVED FOR SNOW STORAGE BECOME FULL, THE OWNER SHALL REASONABLY REMOVE EXCESS SNOW FROM THE SITE, AND SHALL NOT ALLOW SNOW TO BE STORED WITHIN TRAVEL AISLES.
4. ALL WASTE MATERIALS AND RECYCLABLE SHALL BE CONTAINED WITHIN THE BUILDING(S) OR APPROVED STORAGE FACILITIES AND SHALL NOT BE OTHERWISE STORED ON THE PROPERTY. REFUSE COLLECTION WILL BE BY DUMPSTER AS NEEDED.
5. ALL WATER, SEWER, ROAD (INCLUDING PARKING LOT), AND DRAINAGE WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH SECTION 9.5 GRADING, DRAINAGE, AND EROSION & SEDIMENT CONTROL AND THE STANDARD SPECIFICATIONS FOR CONSTRUCTION OF PUBLIC UTILITIES IN EXETER, NEW HAMPSHIRE.

PREPARED FOR:

STONEARCH DEVEL. CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

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

NOTES:

1. THE PURPOSE OF THIS PLAN IS TO SHOW 6 TOWN HOUSE UNITS WITH ASSOCIATED PARKING SPACES.
2. ALL CONSTRUCTION SHALL CONFORM TO TOWN OF EXETER STANDARDS AND REGULATIONS.
3. ALL WATER, SEWER, ROAD (INCLUDING PARKING LOT), AND DRAINAGE WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH SECTION 9.3 STORMWATER MANAGEMENT STANDARDS, STORMWATER MANAGEMENT PLAN, STORMWATER POLLUTION PREVENTION PLAN, AND EROSION AND SEDIMENT CONTROL STANDARDS AND THE STANDARD SPECIFICATIONS FOR CONSTRUCTION OF PUBLIC UTILITIES IN EXETER, NEW HAMPSHIRE", SEE SECTION 9.14 ROADWAYS, ACCESS POINTS, AND FIRE LANES AND SECTION 9.13 PARKING AREAS FOR EXCEPTIONS.
4. IN ACCORDANCE WITH SITE PLAN REVIEW & SUBDIVISION REGULATIONS SECTIONS 7.15.10 AND 9.3.4 THE APPLICANT SHALL PROVIDE THE TOWN WITH THREE COPIES OF THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) AND ALSO ENSURE THAT ONE COPY REMAINS ON SITE.
5. ALL PROPOSED SIGNAGE SHALL CONFORM WITH THE TOWN ZONING REGULATIONS UNLESS A VARIANCE IS OTHERWISE REQUESTED.
6. TOTAL PROPOSED DISTURBANCE FOR CONSTRUCTION = 0.24± ACRES.
7. UPON COMPLETION OF CONSTRUCTION AND PRIOR TO RELEASE OF BOND, THE APPLICANT SHALL SUBMIT A LETTER TO THE TOWN, SIGNED AND STAMPED BY THE DESIGN ENGINEER, WHO MUST BE A LICENSED PROFESSIONAL ENGINEER IN NH, STATING CONSTRUCTION HAS BEEN COMPLETED IN CONFORMANCE WITH THE APPROVED PLANS.
8. 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.
9. THIS PLAN HAS BEEN PREPARED FOR MUNICIPAL 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.
10. ALL BENCHMARKS AND TOPOGRAPHY SHOULD BE FIELD VERIFIED BY THE CONTRACTOR.
11. THIS SITE IS NOT LOCATED IN THE 100 YEAR FLOOD ZONE.
12. GARBAGE WILL BE STORED IN TOTER BINS WITHIN GARAGES FOR PRIVATE PICKUP.

WETLAND NOTE:

1. WETLANDS WERE NOT FOUND ON THE LOT OR WITHIN 100 FEET OF ANY PROPERTY BOUNDARY LINES BY JOHN P. HAYES III CSS, CWS DURING A SITE EVALUATION ON DECEMBER 9, 2024.



GRAPHIC SCALE

10 0 5 10 20 40
(IN FEET)
1 inch = 10 ft.

PARKING & PAVEMENT PLAN

RESIDENTIAL DEVELOPMENT
57 PORTSMOUTH AVE.
EXETER, NH
TAX MAP 65, LOT 137

REVISED PER REVIEW COMMENTS	03/19/25
REVISIONS:	DATE:

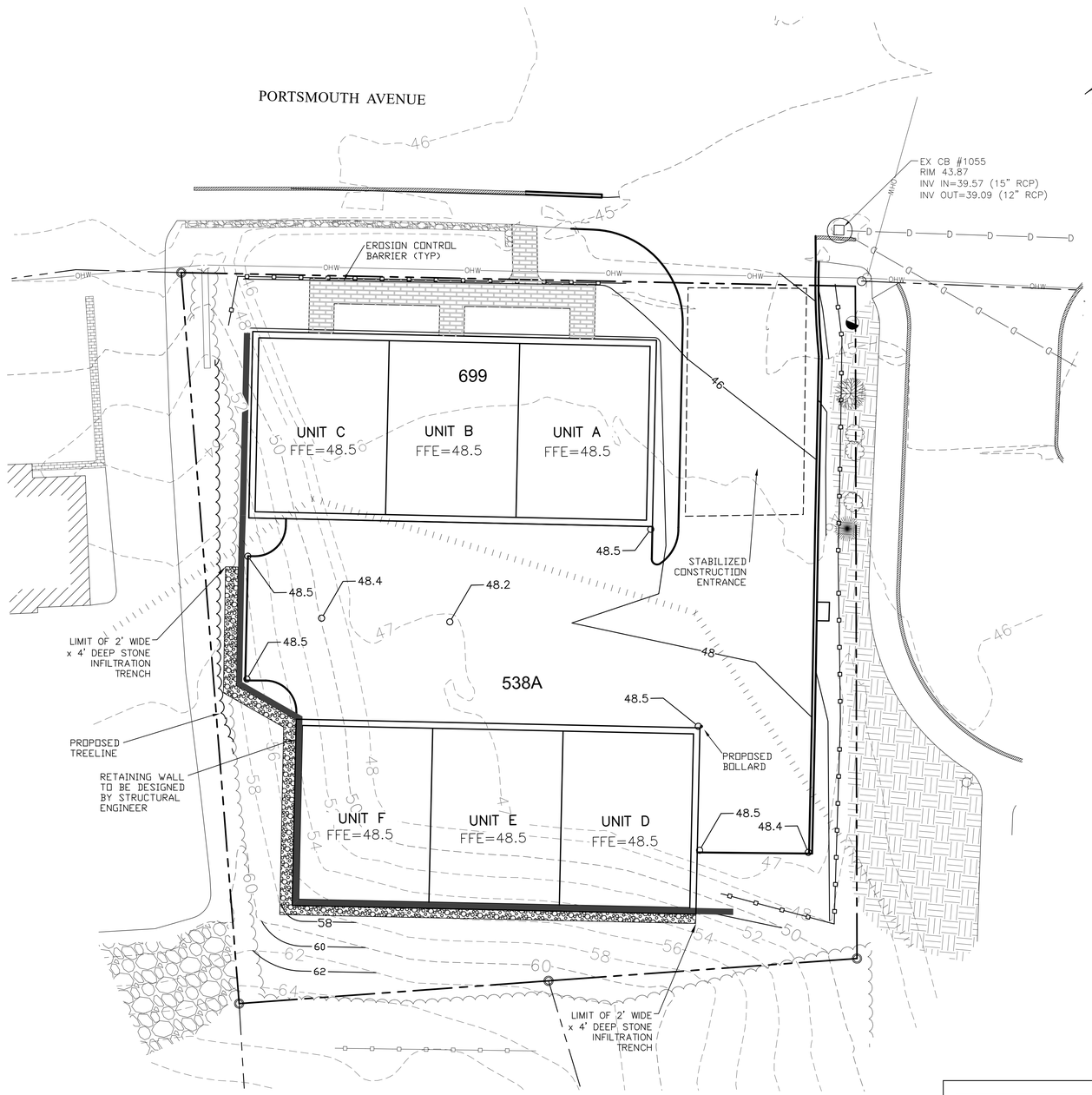
DATE:	JAN 28, 2025	SCALE: 1" = 10'
PROJ. N0:	NH-1535	SHEET NO. 3

SOIL INFORMATION WAS OBTAINED FROM USDA NATURAL RESOURCES CONSERVATION SERVICE (NRCS):

SOIL IDENTIFICATION LEGEND:

MAP UNIT SYMBOL	MAP UNIT NAME	HYDROLOGIC SOIL GROUP
538A	SQUAMSCOTT FINE SANDY LOAM	C/D
699	URBAN LAND	

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



UNDERGROUND FACILITIES, UTILITIES AND STRUCTURES HAVE BEEN PLOTTED FROM FIELD OBSERVATION AND THEIR LOCATION MUST BE CONSIDERED APPROXIMATE ONLY. NEITHER BEALS ASSOCIATES, NOR ANY OF THEIR EMPLOYEES TAKE 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 STRUCTURES AND/OR UTILITIES LOCATED PRIOR TO EXCAVATION WORK BY CALLING 1-888-DIG-SAFE (1-888-344-7233) AND EXETER DPW (603) 773-6157.

PREPARED FOR:

STONEARCH DEVEL. CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

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

NOTES:

1. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER SO THAT EROSION AND AIR AND WATER POLLUTION WILL BE MINIMIZED.
2. 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.
3. SEEDING, FERTILIZING, AND MULCHING SHALL CONFORM TO THE RECOMMENDATIONS IN THE APPROPRIATED VEGETATIVE BMP.
4. 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.
5. 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.
6. THE CONSTRUCTION SITE OPERATOR AND OWNER SHALL SUBMIT A NOTICE OF INTENT (NOI) TO USEPA, WASHINGTON, DC, STORMWATER NOTICE PROCESSING CENTER AT LEAST FOURTEEN 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".
7. ALL DRAINAGE STRUCTURES AND SWALES SHALL BE BUILT AND STABILIZED PRIOR TO HAVING RUNOFF DIRECTED TO THEM.

STATE OF NEW HAMPSHIRE
CHRISTIAN O. SMITH No. 9900
LICENSED PROFESSIONAL ENGINEER

GRAPHIC SCALE

10 0 5 10 20 40

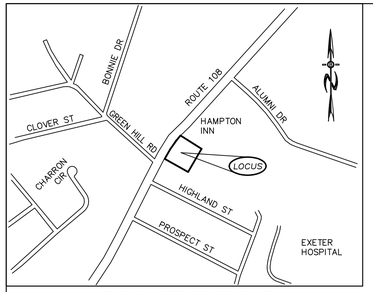
(IN FEET)
1 inch = 10 ft.

REVISED PER REVIEW COMMENTS	03/19/25
REVISIONS:	DATE:

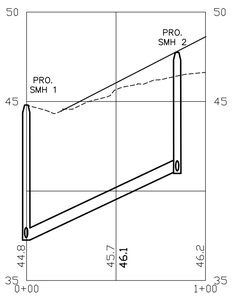
GRADING, DRAINAGE, & EROSION CONTROL PLAN

RESIDENTIAL DEVELOPMENT
57 PORTSMOUTH AVE.
EXETER, NH
TAX MAP 65, LOT 137

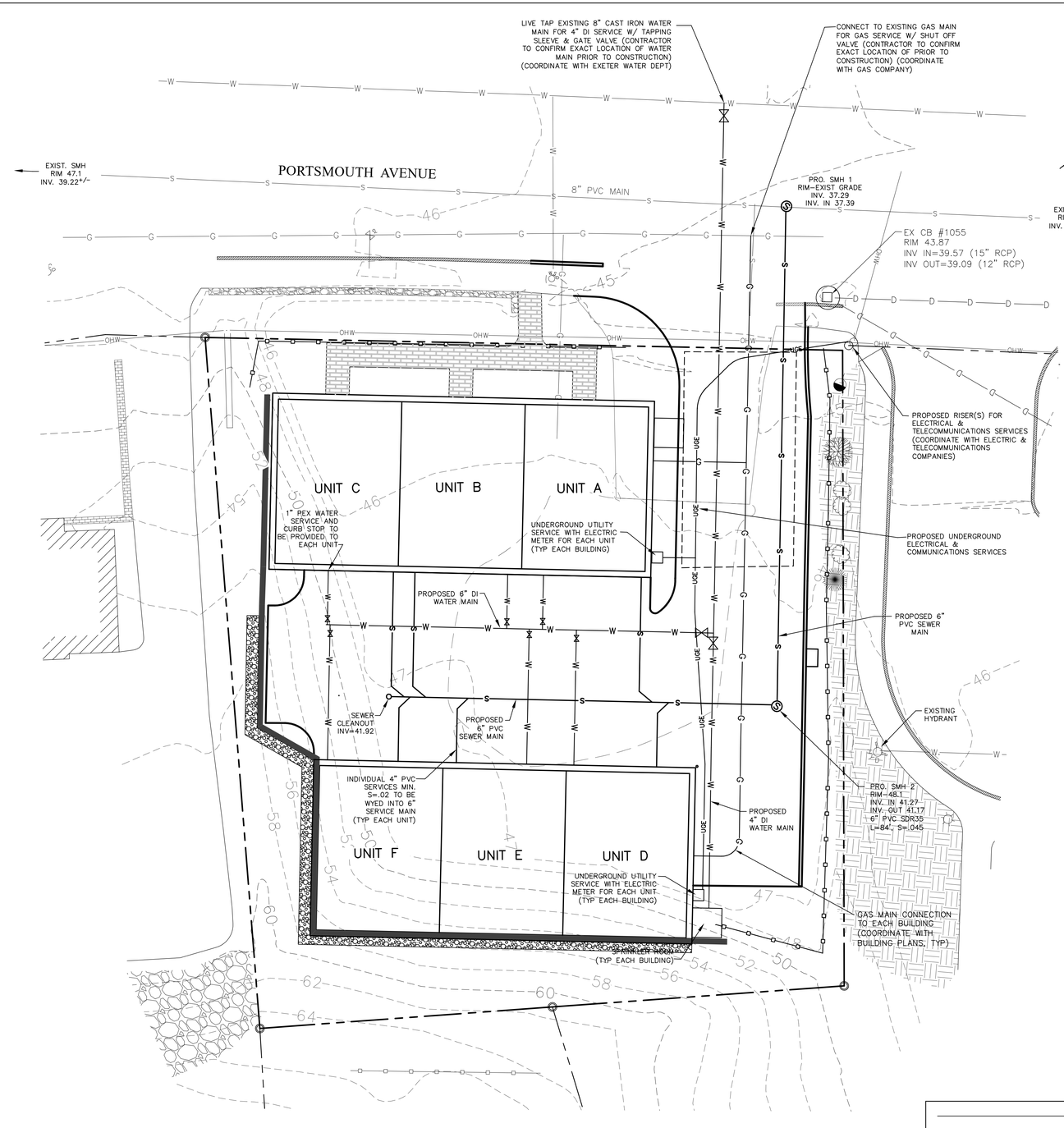
DATE:	JAN 28, 2025	SCALE: 1" = 10'
PROJ. NO:	NH-1535	SHEET NO. 4



LOCATION MAP
1"=500'



SEWER PROFILE
HORIZONTAL: 1"=40'
VERTICAL: 1"=4'



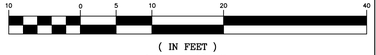
UNDERGROUND FACILITIES, UTILITIES AND STRUCTURES HAVE BEEN PLOTTED FROM FIELD OBSERVATION AND THEIR LOCATION MUST BE CONSIDERED APPROXIMATE ONLY. NEITHER BEALS ASSOCIATES, NOR ANY OF THEIR EMPLOYEES TAKE RESPONSIBILITY FOR THE LOCATION OF ANY UNDERGROUND STRUCTURES OR UTILITIES NOT SHOWN THAT MAY EXIST. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE ALL UNDERGROUND STRUCTURES AND/OR UTILITIES LOCATED PRIOR TO EXCAVATION WORK BY CALLING 1-888-DIG-SAFE (1-888-344-7233) AND EXETER DPW (603) 773-6157.

UTILITY NOTES:

1. PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR SHALL COORDINATE WITH THE ENGINEER, ARCHITECT AND/OR OWNER, IN ORDER TO OBTAIN AND/OR PAY ALL THE NECESSARY LOCAL PERMITS, FEES, AND BONDS.
2. THE CONTRACTOR SHALL PROVIDE NOTICE TO ALL COMPANIES AND LOCAL AUTHORITIES OWNING OR HAVING A JURISDICTION OVER UTILITIES RUNNING TO, THROUGH, OR ACROSS PROJECT AREAS PRIOR TO DEMOLITION AND/OR CONSTRUCTION ACTIVITIES.
3. THE SPECIFICATIONS FOR PROPOSED PRIVATE UTILITY SERVICES SHALL BE TO THE STANDARDS AND REQUIREMENTS OF THE RESPECTIVE UTILITY COMPANY. CONTRACTOR TO COORDINATE WITH UTILITY COMPANIES FOR PROPER UTILITY CROSSING REQUIREMENTS PRIOR TO CONSTRUCTION.
4. PRIOR TO THE PRE-CONSTRUCTION MEETING UGE&T PLANS FROM THE UTILITY COMPANIES NEED TO BE REDRAWN ON THIS SHEET. ADDITIONALLY THE CONTRACTOR NEEDS TO HAVE A COMPLETED SWPPP. A PRE-CONSTRUCTION MEETING SHALL BE HELD WITH THE OWNER, ENGINEER, ARCHITECT, CONTRACTOR, LOCAL OFFICIALS, AND ALL UTILITY COMPANIES (PUBLIC AND PRIVATE) PRIOR TO START OF CONSTRUCTION.
5. ALL CONSTRUCTION SHALL CONFORM TO EXETER STANDARDS AND REGULATIONS, UNLESS OTHERWISE SPECIFIED. ALL CONSTRUCTION ACTIVITIES SHALL CONFORM TO LABOR (OSHA) RULES AND REGULATIONS. BUILDINGS ARE TO BE SERVICED BY UNDERGROUND UTILITIES.
6. THE CONTRACTOR IS TO VERIFY LOCATION AND DEPTH OF ALL EXISTING UTILITY STUBS PRIOR TO CONSTRUCTION AND DISCONNECT ALL EXISTING SERVICE CONNECTIONS AT THEIR RESPECTIVE MAINS (IF REQUIRED) IN ACCORDANCE WITH THE RESPECTIVE UTILITY COMPANY'S STANDARDS AND SPECIFICATIONS.
7. WATER LINE SHALL BE INSTALLED UNDER ALL UTILITY LINES WITH A MINIMUM OF 18" OF VERTICAL CLEARANCE BETWEEN UTILITIES AT CROSSINGS.
8. AN AS-BUILT PLAN IS TO BE PREPARED AND SUBMITTED TO DEPARTMENT OF PUBLIC WORKS IN DIGITAL (.DWG AND .PDF) AND MYLAR FORMATS.
9. THE CONTRACTOR IS RESPONSIBLE FOR PAYMENT OF ALL CONNECTION FEES.
10. SANITARY SEWER FLOW CALCULATIONS:
    6 UNITS AT 3 BEDROOMS EACH = 18 BEDROOMS
    DESIGN FLOW AT 150 GPD/BEDROOM = 2,700 GPD.
11. ALL WATER AND SANITARY LEADS TO BUILDING SHALL END 5' OUTSIDE THE BUILDING LIMITS AS SHOWN ON PLANS AND SHALL BE PROVIDED WITH A TEMPORARY CAP AND WITNESS AT END.
12. THRUST BLOCKS SHALL BE PROVIDED AT ALL WATER LINE BENDS, TEES, AND MECHANICAL JOINTS.
13. CONTRACTOR SHALL MINIMIZE DISRUPTIONS TO EXISTING WATER SERVICES AND ALL REQUIREMENTS OF EXETER WATER DEPARTMENT SHALL BE FOLLOWED REGARDING NOTIFICATION OF INTERRUPTION OF SERVICE (MIN 48 HOURS). TEE INSTALLATION MAY NEED TO BE CONDUCTED AT NIGHT AS DIRECTED BY EXETER WATER DEPT.
14. WATER VALVES ARE TO BE OPERATED ONLY BY MUNICIPAL STAFF.
15. THE INSTALLATION OF SMOKE, HEAT, FIRE, OR CARBON MONOXIDE ALARMS OR SYSTEMS SHALL COMPLY WITH NFPA 72 REQUIREMENTS.
16. ALL SEWER SERVICE BENDS SHALL HAVE CLEANOUTS INSTALLED.
17. ALL WATER, SEWER, ROAD (INCLUDING PARKING LOT), AND DRAINAGE WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH SECTION 9.3 STORMWATER MANAGEMENT STANDARDS, STORMWATER MANAGEMENT PLAN, STORMWATER POLLUTION PREVENTION PLAN, AND EROSION AND SEDIMENT CONTROL STANDARDS AND THE STANDARD SPECIFICATIONS FOR CONSTRUCTION OF PUBLIC UTILITIES IN EXETER, NEW HAMPSHIRE", SEE SECTION 9.14 ROADWAYS, ACCESS POINTS, AND FIRE LANES AND SECTION 9.13 PARKING AREAS FOR EXCEPTIONS.
18. THE CONTRACTOR MUST OBTAIN A VALID UTILITY PIPE INSTALLER'S LICENSE AND THE JOB SUPERVISOR OR FOREMAN MUST BE CERTIFIED BY THE TOWN PRIOR TO WORKING ON ANY WATER, SEWER, OR DRAINAGE PIPES THAT ARE IN A TOWN STREET OR RIGHT OF WAY, OR THAT WILL CONNECT OR MAY BE CONNECTED TO A TOWN WATER, SEWER, OR DRAINAGE SYSTEM. A LICENSED SUPERVISOR OR FOREMAN MUST BE PRESENT AT THE JOB SITE AT ALL TIMES DURING CONSTRUCTION OF THESE UTILITIES.
19. THE DEVELOPER SHALL COORDINATE WITH THE ELECTRIC COMPANY TO ENSURE ANY TREE PLANTINGS ALONG MAIN STREET WILL NOT CONFLICT WITH THE EXISTING OVERHEAD WIRES.
20. THE DEVELOPER SHALL COORDINATE WITH THE ELECTRIC COMPANY TO CONFIRM A DROP POLE ON THE PROPERTY IS NOT REQUIRED.
21. CONTRACTOR TO COORDINATE TRAFFIC CONTROL WITH THE TOWN PRIOR TO ANY WORK WITHIN PORTSMOUTH AVENUE AND TO COORDINATE BYPASS PUMPING OF THE SEWER DURING INSTALLATION OF THE NEW MANHOLE.



GRAPHIC SCALE



(IN FEET)
1 inch = 10 ft.

PREPARED FOR:

STONEARCH DEVEL. CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

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

UTILITY PLAN

RESIDENTIAL DEVELOPMENT
57 PORTSMOUTH AVE.
EXETER, NH
TAX MAP 65, LOT 137

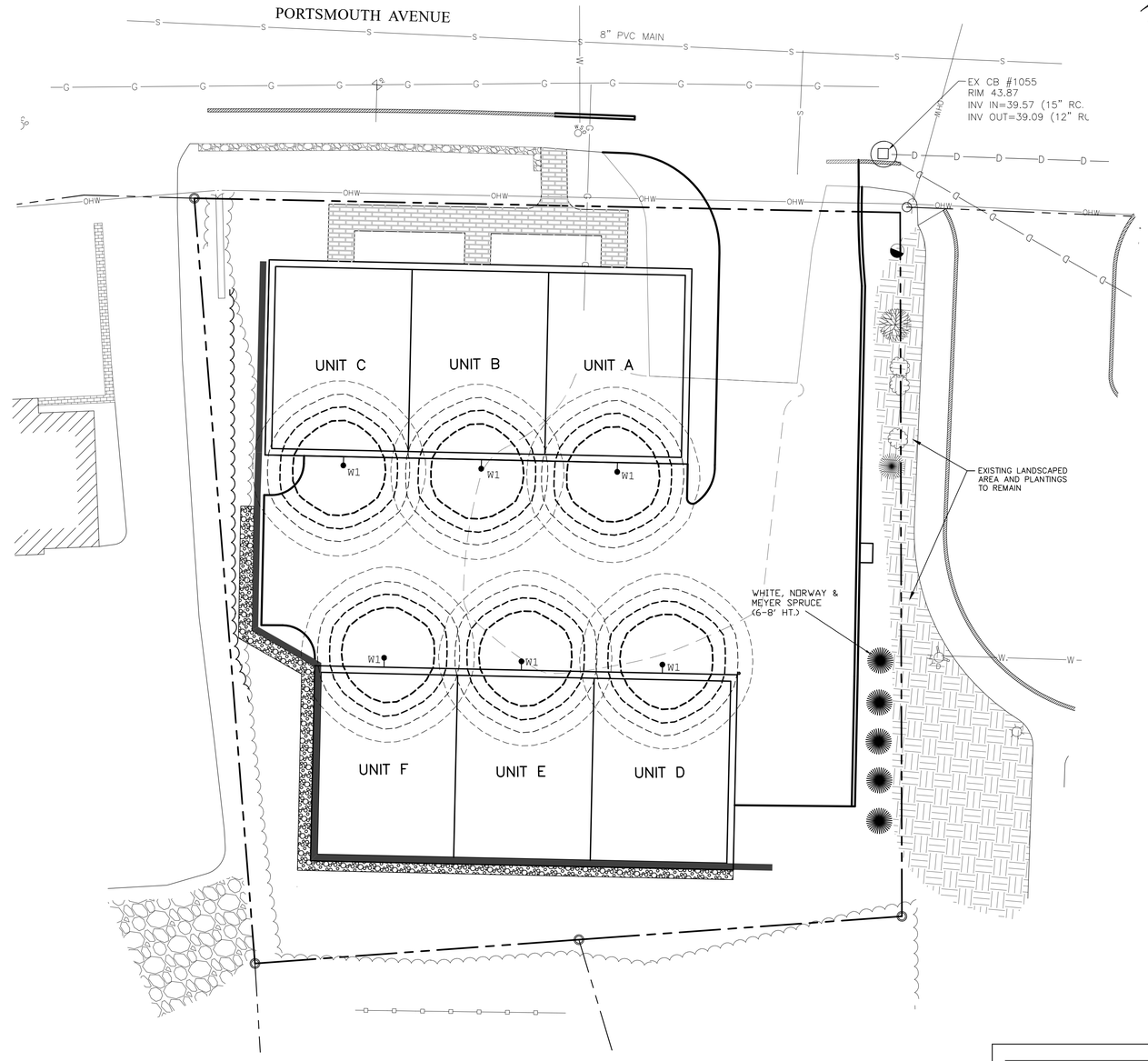
REVISED PER REVIEW COMMENTS	03/19/25
REVISIONS:	DATE:

DATE:	JAN 28, 2025	SCALE: 1" = 10'
PROJ. NO:	NH-1535	SHEET NO. 5



WALL MOUNT

Luminaire Schedule							
Symbol	Qty	Label	Arrangement	Description	Tag	LLF	Luminaire Lumens
—●	6	W1	Single	TMS: 33W-O-15LED-30K-VXX-WM-CXX-DIML	WALL MTD 10' AFG	0.900	1109



STONEARCH DEVEL. CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

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

LIGHTING NOTES:

1. ALL OUTDOOR LIGHTING SHALL BE SO DIRECTED & SHIELDED THAT NO GLARE WILL SPILL OUT ONTO RESIDENTIALLY ZONED ABUTTERS

2. AFTER 10:00 PM ONLY THAT AMOUNT OF LIGHT NECESSARY FOR THE SECURITY OF THE PREMISES SHALL BE PERMITTED.

PLANTING NOTES:

1. NO PLANT MATERIALS SHALL BE INSTALLED UNTIL ALL GRADING AND CONSTRUCTION HAS BEEN COMPLETED IN THE IMMEDIATE AREA.
2. A 4-INCH DEEP SHREDDED PINE BARK SHALL BE INSTALLED UNDER ALL SHRUBS, AND IN ALL PLANTING BEDS, AS DIRECTED BY OWNER.
3. ALL TREES SHALL BE BAILED AND BURLAPPED, UNLESS OTHERWISE NOTED, OR APPROVED BY THE OWNER.
4. ALL PLANT MATERIALS SHALL BE GUARANTEED FOR ONE YEAR FOLLOWING DATE OF FINAL ACCEPTANCE.
5. LOAM AND SEED ALL AREAS NOT OTHERWISE NOTED.
6. DO NOT INSTALL LOAM IN AREAS OF EXISTING TREES TO REMAIN.
7. THE LANDSCAPING OF THE SITE DEPICTED ON THIS PLAN IS INTEGRAL TO THE APPROVAL BY THE EXETER PLANNING BOARD AND SHALL BE REASONABLY MAINTAINED AND WHEN DEAD OR REMOVED, MUST BE REASONABLY REPLACED.

STATE OF NEW HAMPSHIRE
CHRISTIAN O. SMITH
No. 9900
PROFESSIONAL ENGINEER

GRAPHIC SCALE

10 0 5 10 20 40

(IN FEET)
1 inch = 10 ft.

LIGHTING & LANDSCAPE PLAN

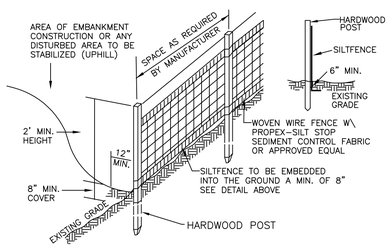
RESIDENTIAL DEVELOPMENT
57 PORTSMOUTH AVE.
EXETER, NH
TAX MAP 65, LOT 137

REVISIONS:	DATE:

DATE:	JAN 28, 2025	SCALE:	1" = 10'
PROJ. N0:	NH-1535	SHEET NO.	6

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.
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 AND ITS ASSOCIATED DRAINAGE STRUCTURES.
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 RE-VEGETATE 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 DRIVEWAYS



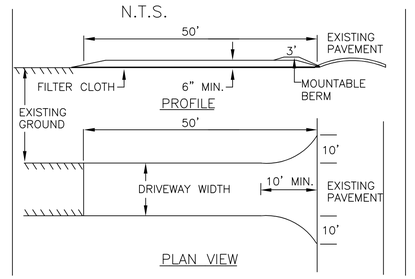
SILT FENCE CONSTRUCTION SPECIFICATIONS

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" THE FENCE POSTS SHALL BE A MINIMUM 48" LONG, SPACED A
2. MAXIMUM 10' APART, AND DRIVEN A MINIMUM OF 16" INTO THE GROUND WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER,
3. THE ENDS OF THE FABRIC SHALL BE OVERLAPPED BY SIX INCHES, FOLDED AND STAPLED TO PREVENT SEDIMENT FROM BYPASSING MAINTENANCE SHALL BE PERFORMED AS NEEDED AND SEDIMENT
4. REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE AND PROPERLY DISPOSED OF PLACE THE ENDS OF THE SILT FENCE UP CONTOUR TO PROVIDE
5. FOR SEDIMENT STORAGE SILT FENCES SHALL BE REMOVED WHEN NO LONGER NEEDED AND
6. THE SEDIMENT COLLECTED SHALL BE DISPOSED AS DIRECTED BY THE ENGINEER. THE AREA DISTURBED BY THE REMOVAL SHALL BE SMOOTHED AND RE-VEGETATED

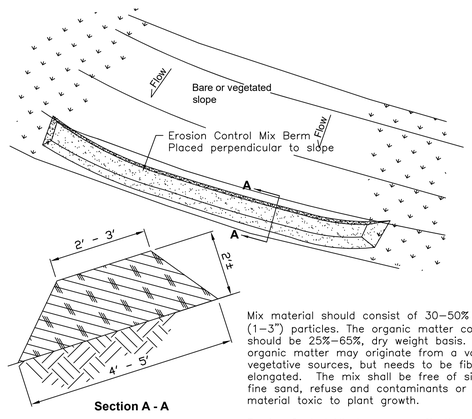
SILT FENCE MAINTENANCE

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 IF THE FABRIC ON A SILT FENCE SHOULD DECOMPOSE OR BECOME
2. INEFFECTIVE DURING THE EXPECTED LIFE OF THE FENCE, THE FABRIC SHALL BE REPLACED PROMPTLY. SEDIMENT DEPOSITS SHOULD BE INSPECTED AFTER EVERY STORM EVENT.
3. THE DEPOSITS SHOULD BE REMOVED WHEN THEY REACH APPROXIMATELY ONE HALF THE HEIGHT OF THE BARRIER. SEDIMENT DEPOSITS THAT ARE REMOVED OR LEFT IN PLACE AFTER THE
4. FABRIC HAS BEEN REMOVED SHALL BE GRADED TO CONFORM WITH THE EXISTING TOPOGRAPHY AND VEGETATED.

STABILIZED CONSTRUCTION ENTRANCE



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,
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.
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.



Section A - A

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

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	15	0.35
OR		
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

TEMPORARY EROSION CONTROL MEASURES

1. NO MORE THAN 0.26 ACRES OF LAND SHALL BE EXPOSED AT ANY ONE TIME.
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.

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 OCTOBER 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.

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(P205), 100 LBS PER ACRE OR 2. 2 LBS PER 1,000 SQ.FT.

      POTASH(K20), 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.

SEEDING GUIDE

USE	SEEDING MIXTURE*	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	EXCELLENT	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	**
	G	FAIR	EXCELLENT	EXCELLENT	**

RECOMMENDED

GRAVEL PIT, SEE NH-PM-24 IN APPENDIX FOR RECOMMENDATION REGARDING RECLAMATION OF SAND AND GRAVEL PITS.

* REFER TO SEEDING MIXTURES AND RATES IN TABLE 7-36.
** POORLY DRAINED SOILS ARE NOT DESIRABLE FOR USE AS PLAY AREAS OR 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.

PREPARED FOR:

STONEARCH DEVEL. CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

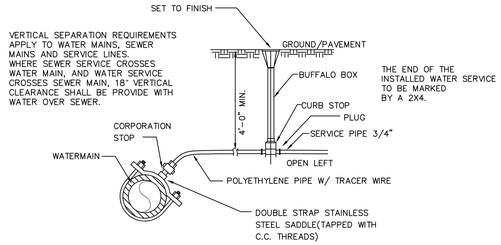
BA BEALS ASSOCIATES, PLLC
70 PORTSMOUTH AVE,
THIRD FLOOR, SUITE 2
STRATHAM, N.H. 03885
PHONE: 603-583-4860

REVISIONS:	DATE:

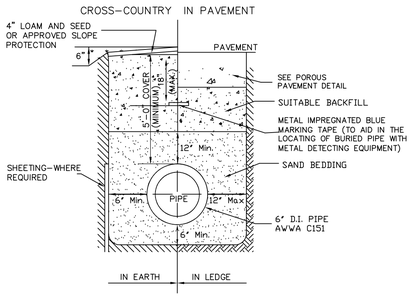
EROSION & SEDIMENT CONTROL DETAILS

RESIDENTIAL DEVELOPMENT
57 PORTSMOUTH AVE.
EXETER, NH
TAX MAP 65, LOT 137

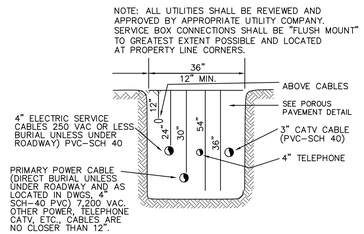
DATE:	JAN 28, 2025	SCALE:	NTS'
PROJ. NO:	NH-1535	SHEET NO.	7



TYPICAL WATER SERVICE CONNECTION



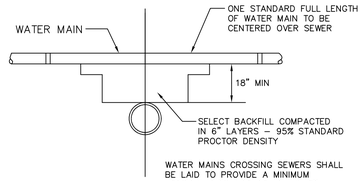
TYPICAL TRENCH DETAIL FOR WATER SYSTEM



UTILITY TRENCH DETAIL

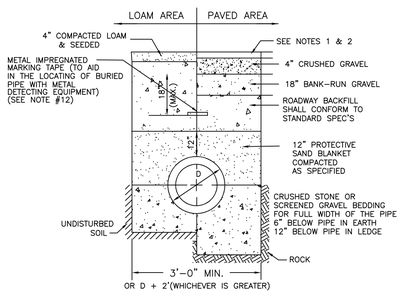
SEPARATION NOTES:

SEWERS CROSSING WATER MAINS SHALL BE LAID TO PROVIDE A MINIMUM VERTICAL DISTANCE OF 18 INCHES (460 MM) BETWEEN THE OUTSIDE OF THE WATER MAIN AND THE OUTSIDE OF THE SEWER. THIS SHALL BE THE CASE WHERE THE WATER MAIN IS EITHER ABOVE OR BELOW THE SEWER. THE CROSSING SHALL BE ARRANGED SO THAT THE SEWER JOINTS WILL BE EQUIDISTANT AND AS FAR AS POSSIBLE FROM THE WATER MAIN JOINTS. WHERE A WATER MAIN CROSSES UNDER A SEWER, ADEQUATE STRUCTURAL SUPPORT SHALL BE PROVIDED FOR THE SEWER TO MAINTAIN LINE AND GRADE.



WATER MAINS CROSSING SEWERS SHALL BE LAID TO PROVIDE A MINIMUM VERTICAL DISTANCE OF 18 INCHES BETWEEN PIPES. WATER MAIN JOINTS WILL BE EQUIDISTANT AND AS FAR AS POSSIBLE FROM THE SEWER JOINTS

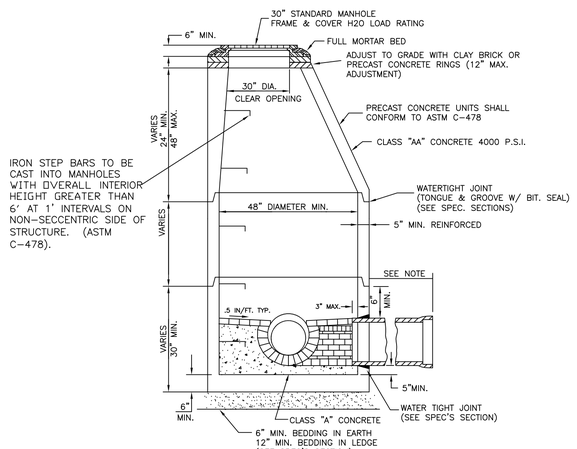
WATER/SEWER MAIN CROSSING



NOTE:
1. PAVEMENT REPAIR IN EXISTING ROADWAYS SHALL CONFORM TO STREET OPENING REGULATIONS.
2. NEW ROADWAY CONSTRUCTION SHALL CONFORM TO SUBDIVISION SPEC'S.

TYPICAL SEWER TRENCH DETAIL

NOT TO SCALE



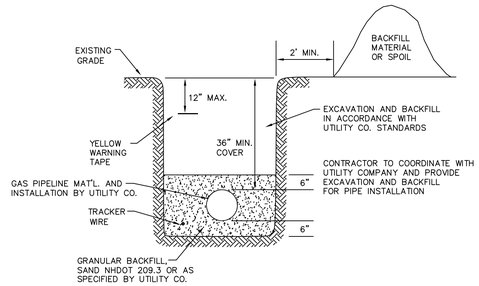
NOTE:

TYPE OF PIPE	SIZE	MAX. DISTANCE TO FIRST JOINT
R.C.P. C.I.	ALL	48"
V.C.	0-12"	18"
V.C.	> 12"	36"

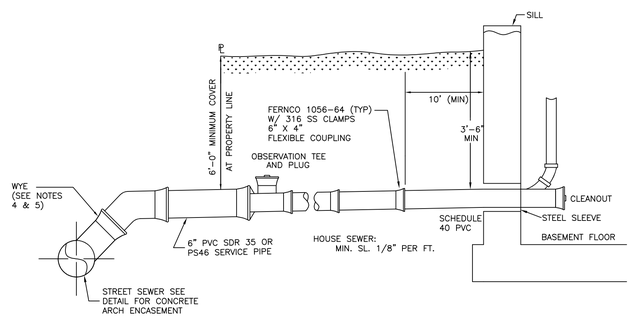
SEWER MANHOLE

TYPICAL SECTION

NOT TO SCALE



GAS TRENCH DETAIL



NOTES:
1) SEWER SERVICE FROM PROPERTY LINE TO 10' OUTSIDE OF BUILDING SHALL BE INSTALLED UNDER THIS CONTRACT ONLY WHEN OUTSIDE THE TRENCH DEWATERING OR LEDGE EXCAVATION IS REQUIRED.
2) PIPE DEPTH AT HOUSE SHALL BE ABOVE THE SEASONAL GROUND WATER LEVEL.
3) SEWER SHALL BE BELOW SLAB ONLY WHEN BASEMENT TOILETS EXIST.
4) JOINTS SHALL BE DEPENDENT UPON A NEOPRENE OR ELASTOMERIC GASKET FOR WATER TIGHTNESS. ALL JOINTS SHALL BE PROPERLY MATCHED WITH THE PIPE MATERIALS USED. WHERE DIFFERING MATERIALS ARE TO BE CONNECTED, AST AT THE STREET SEWER WYE OR, AT THE FOUNDATION WALL, APPROPRIATE MANUFACTURED ADAPTERS SHALL BE USED
5) WYES: WHERE WYE IS NOT AVAILABLE IN THE EXISTING STREET SEWER, AN APPROPRIATE CONNECTION SHALL BE MADE FOLLOWING MANUFACTURERS INSTRUCTIONS USING A BOLTED, CLAMPED, OR EPOXY-CEMENTED SADDLE, TAPPED INTO A SMOOTHLY DRILLED OR SAWN OPENING IN THE SEWER.

DETAIL OF HOUSE SEWER SERVICE

PREPARED FOR:

STONEARCH DEVEL. CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

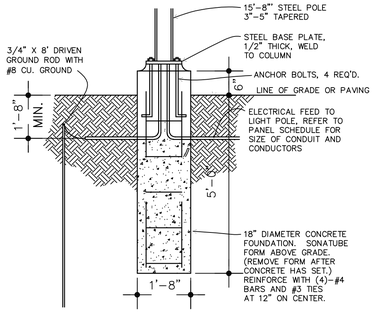
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70 PORTSMOUTH AVE,
THIRD FLOOR, SUITE 2
STRATHAM, N.H. 03885
PHONE: 603-583-4860

REVISIONS:	DATE:
REVISED PER REVIEW COMMENTS	03/19/25

CONSTRUCTION DETAILS

RESIDENTIAL DEVELOPMENT
57 PORTSMOUTH AVE.
EXETER, NH
TAX MAP 65, LOT 137

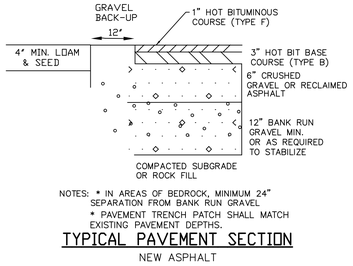
DATE:	JAN 28, 2025	SCALE:	NTS
PROJ. N0:	NH-1535	SHEET NO.	8



POLE FOUNDATION

LIGHT BASE DETAIL

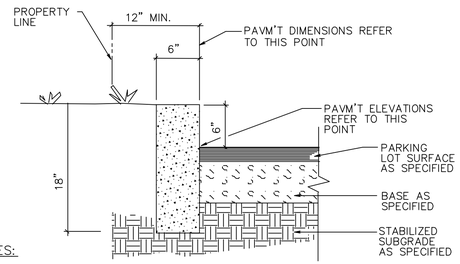
SCALE: NONE



NOTES: * IN AREAS OF BEDROCK, MINIMUM 24" SEPARATION FROM BANK RUN GRAVEL
* PAVEMENT TRENCH PATCH SHALL MATCH EXISTING PAVEMENT DEPTHS.

TYPICAL PAVEMENT SECTION

NEW ASPHALT

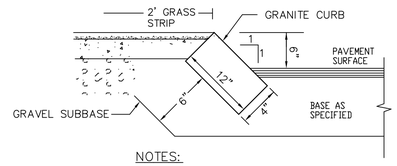


NOTES:

1. EDGING TO BE PLACED PRIOR TO PLACING TOP SURFACE COURSE.
2. JOINTS BETWEEN STONES SHALL BE MORTARED.

6" VERTICAL GRANITE CURB

NOT TO SCALE

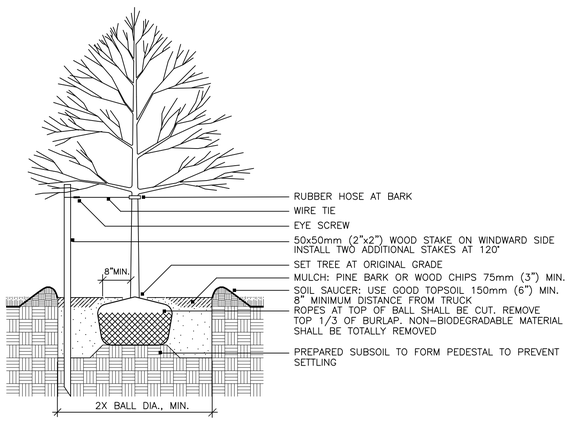


NOTES:

1. EDGING TO BE PLACED PRIOR TO PLACING TOP SURFACE COURSE.
2. JOINTS BETWEEN STONES SHALL BE MORTARED.
3. SALVAGE GRANITE CURBS ON-SITE AND RESET TO THE EXTENT POSSIBLE.

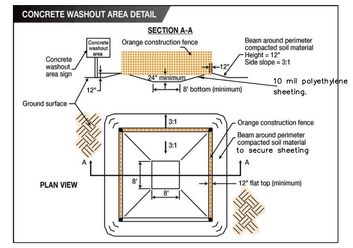
GRANITE SLOPE CURB DETAIL

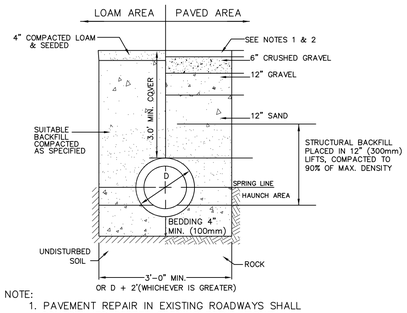
NOT TO SCALE



DECIDUOUS TREE PLANTING WITH STAKE AND WIRE TIE - HEAVY DUTY

NOTE: STAKING TO BE USED IN PARKING ISLANDS AND OTHER CONFINED AREAS AS NECESSARY TO AVOID CONFLICTS WITH PEDESTRIANS

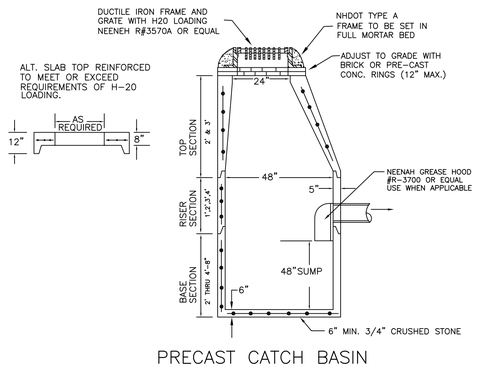




NOTE:

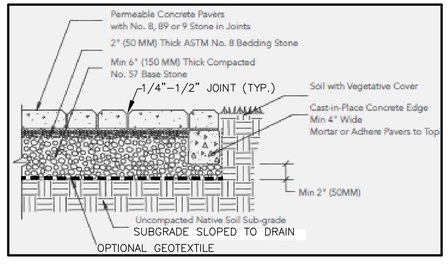
1. PAVEMENT REPAIR IN EXISTING ROADWAYS SHALL CONFORM TO STREET OPENING REGULATIONS.
2. NEW ROADWAY CONSTRUCTION SHALL CONFORM TO SUBDIVISION SPEC'S.

TYPICAL DRAINAGE TRENCH DETAIL



PRECAST CATCH BASIN

NOT TO SCALE



ROUTINE MAINTENANCE: VISUAL INSPECTION OF THE PERVIOUS PAVERS TO ENSURE THAT THEY ARE CLEAN OF DEBRIS AND SEDIMENTS. ROUTINE CLEANING PROCEDURES WOULD INCLUDE BLOWING (WITH LEAF BLOWER OR SIMILAR) IN FALL, TRUCK-SWEEPING AND/OR DRY VACUUMING. ADD STONE TO REFILL JOINT SPACE AFTER SWEEPING/VACUUMING IF NEEDED.

PERVIOUS PAVER DETAIL
TO BE "TREMRON" OR APPROVED EQUAL

NOT TO SCALE

PREPARED FOR:

STONEARCH DEVEL. CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

BA BEALS ASSOCIATES, PLLC

70 PORTSMOUTH AVE,
THIRD FLOOR, SUITE 2
STRATHAM, N.H. 03885
PHONE: 603-583-4860

REVISIONS:	DATE:
REVISED PER REVIEW COMMENTS	03/19/25

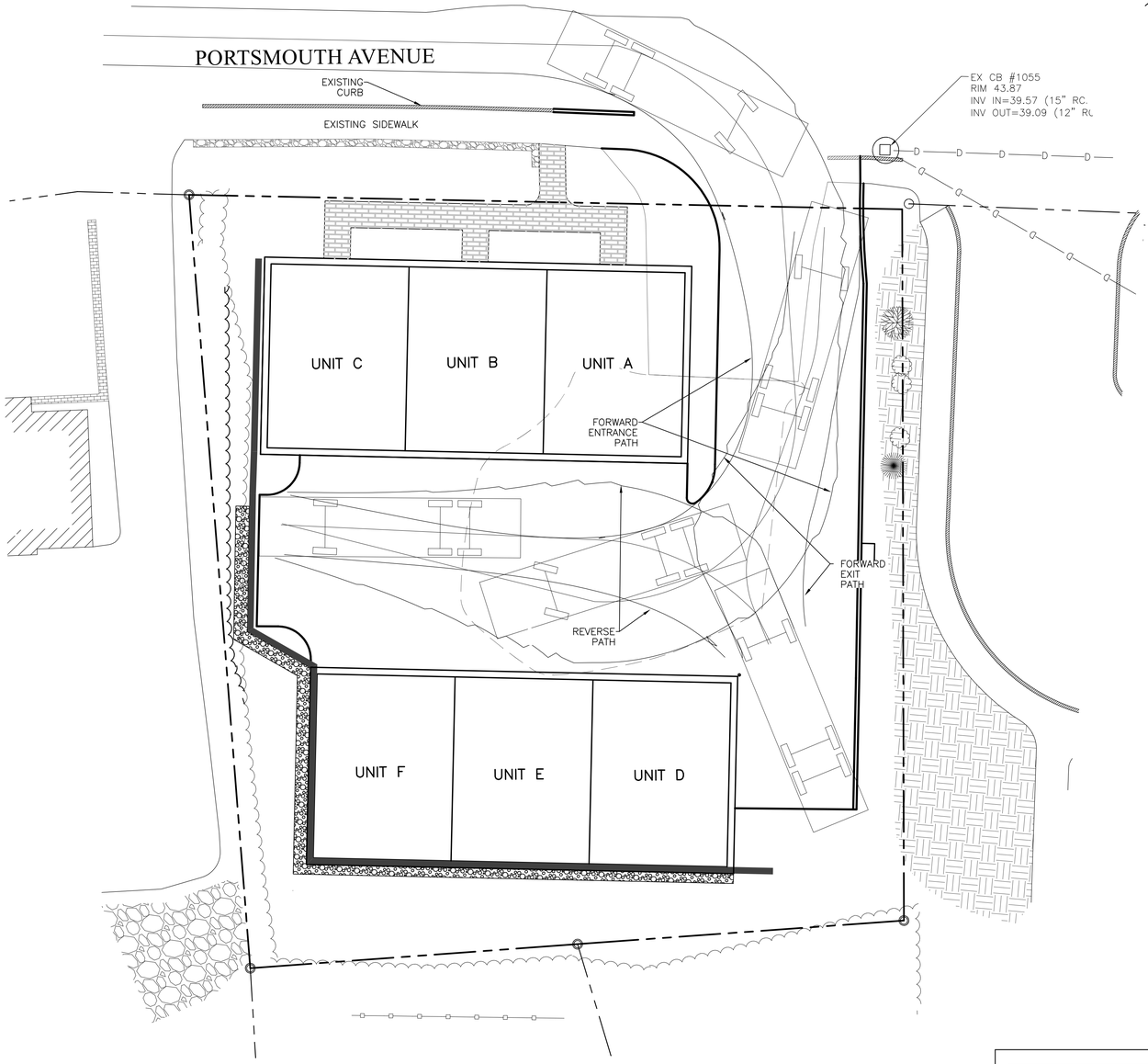
CONSTRUCTION DETAILS

RESIDENTIAL DEVELOPMENT
57 PORTSMOUTH AVE.
EXETER, NH
TAX MAP 65, LOT 137

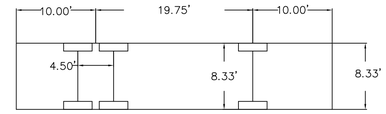
DATE:	JAN 28, 2025	SCALE:	NTS
PROJ. NO:	NH-1535	SHEET NO.	9

STONEARCH DEVEL. CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

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70 PORTSMOUTH AVE,
THIRD FLOOR, SUITE 2
STRATHAM, N.H. 03885
PHONE: 603-583-4860



Exeter Aerial Ladder Truck



Tire Diameter: 3.6 FEET



GRAPHIC SCALE

10 0 5 10 20 40

(IN FEET)
1 inch = 10 ft.

EXETER LADDER TRUCK MANEUVERING PLAN

RESIDENTIAL DEVELOPMENT
57 PORTSMOUTH AVE.
EXETER, NH
TAX MAP 65, LOT 137

REVISIONS:	DATE:

DATE:	JAN 28, 2025	SCALE:	1" = 10'
PROJ. N0:	NH-1535	SHEET NO.	10

DRAINAGE ANALYSIS & SEDIMENT AND EROSION CONTROL PLAN

Prepared for:
RESIDENTIAL DEVELOPMENT
57 PORTSMOUTH AVENUE, LLC

Prepared by:

BEALS ASSOCIATES, PLLC
70 PORTSMOUTH AVENUE
STRATHAM, NH 03885

Project Number:
NH-1535
57 Portsmouth Avenue
Exeter, New Hampshire
January 28, 2025
Revised March 19, 2025

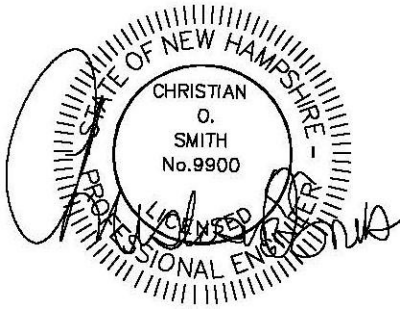


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1.0	Analysis Summary	Page 1
2.0	Existing Conditions Analysis	Page 2
3.0	Proposed Conditions Analysis	Page 2
4.0	Sediment & Erosion Control Best Management Practices	Pages 3-6
5.0	Conclusion	Page 6

Appendix I - Existing Conditions Analysis
WQV (1-Inch) 24-Hour Summary
2-Year 24-Hour Summary
10-Year 24-Hour Complete
25-Year 24-Hour Summary
50-Year 24-Hour Summary

Appendix II - Proposed Conditions Analysis
WQV (1-Inch) 24-Hour Summary
2-Year 24-Hour Summary
10-Year 24-Hour Complete
25-Year 24-Hour Summary
50-Year 24-Hour Summary

Appendix III - Charts, Graphs, and Calculations

Appendix IV - Plans
Sheet W-1 Existing Watershed Plan
Sheet W-2 Proposed Watershed Plan

1.0 ANALYSIS SUMMARY

Stonearch Development Corportation proposes to construct a residential development to establish 6 residential units on a 0.27+/--acre parcel of land located at 57 Portsmouth Avenue in Exeter, New Hampshire. A drainage analysis of 0.32 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)
WQV	1.00
2-Year	3.22
10-Year	4.91
25-Year	6.24
50-Year	7.49

These storm events use the USDA NRCS 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**	**WQV**	**2-Year**	**10-Year**	**25-Year**	**50-Year**
Reach #100 - Existing Catch Basin	Existing	0.05	0.52	0.99	1.38	1.76
	Proposed	0.14	0.60	0.97	1.27	1.55

Channel Protection

Analysis Point # Analysis Point Description	Condition	2-Year Storm Volume (Acre-Feet)
Reach #100 - Existing Catch Basin	Existing	0.041
	Proposed	0.050

Minor increases are shown to Reach #100 for the WQV and 2-Year storm events due to the increase in impervious on the site compared to the vacant lot. The 10-Year, 25-Year, and 50-Year storms all show a reduction in peak discharge rate. While the lot was previously developed, the undeveloped vacant condition was used for the pre- and post-development conditions. The

single analysis point is the existing catch basin in Portsmouth Avenue to the north corner of the development. These minor increases in the lower storms events will have no impact to the existing municipal system.

The proposed residential development includes a driveway off of Portsmouth Avenue at the same location as the previous development on the parcel. The driveway extends into the site and opens to a maneuvering area between the residential buildings. The proposed improvement area includes a single sub-catchment that ends at an existing catch basin to the north in Portsmouth Avenue. In addition to the slight increase in peak rate of runoff for the WQV and 2-Year storm events, the channel protection volume for the 2-year storm event increases 0.009 acre-feet, below the 0.100 allowable threshold.

In addition, the potential for increased erosion and sedimentation is handled by way of silt fence 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 a partial driveway entrance to a gravel area where previous development existed. The developed portion of the property is relatively flat with steep slopes on the west and south sides. The existing topography is such that the site analysis is divided into one sub-catchment within the area proposed to be improved. Final Reach #100 flows to the existing catch basin by the end of the driveway entrance in Portsmouth Avenue where stormwater runoff enters the municipal stormwater system.

Classified by a NRCS Soil Mapping, the land of the site is composed of relatively flat slopes surrounded on two sides by sloping land and soils categorized into a dual Hydrologic Soil Group (HSG) C/D. Per Exeter Site Review Regulations, an HSG of D is used for the analysis.

3.0 PROPOSED CONDITIONS ANALYSIS

The addition of impervious area causes an increase in the curve number (Cn) which results in an increase in peak rates of run-off from the site. The proposed development divides the single sub-catchment from the pre-development condition into two sub-catchments in the post-development condition, with the same catch basin in Portsmouth Avenue used as the analysis point.

In an effort to prevent the sedimentation of abutting properties, all stormwater from roofs, paved areas with the use of curbing, and remainder of the site will be directed towards the catch basin. To reduce runoff and increase infiltration, a stone infiltration trench was provided along the back of the retaining wall. During construction, appropriate Best Management Practices (BMP's) will be applied so as to negate the potential for sediment-laden run-off to discharge towards abutting

properties 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 the Erosion & Sediment Controls Detail plan 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. The Erosion and Sediment Control Details sheet has the plan and profile view details.

4.4 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.

4.7 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.

4.8 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.

4.9 Construction Sequence

1. Construct and/or install temporary and permanent sediment erosion and temporary 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.

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

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 paved area, drainage, and buildings.

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.

4.10 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. 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.

4.11 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 Portsmouth Avenue in Exeter, 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 slightly higher than the existing conditions for the WQV and 2-Year storm events, as shown in the tables above, and will be directed into the municipal drainage system. Appropriate steps will be taken to eliminate erosion and sedimentation; these will be accomplished through the construction of a drainage system consisting of porous pavement and 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

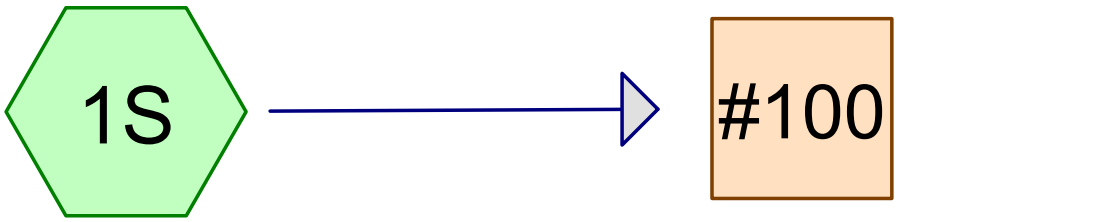
WQV 24-Hour Summary

2-Year 24-Hour Summary

10-Year 24-Hour Complete

25-Year 24-Hour Complete

50-Year 24-Hour Summary



Site Subcat

Analysis Point - Ex CB

Subcat Reach Pond Link

Routing Diagram for NH-1535 Existing
Prepared by Beals Associates, PLLC, Printed 1/23/2025
HydroCAD® 10.20-6a s/n 01754 © 2024 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.220	77	Brush, Fair, HSG D (1S)
0.042	96	Gravel surface, HSG D (1S)
0.023	98	Paved parking, HSG D (1S)
0.031	77	Woods, Good, HSG D (1S)
0.316	**81**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
0.316	HSG D	1S
0.000	Other	
0.316		**TOTAL AREA**

Time span=0.00-72.00 hrs, dt=0.10 hrs, 721 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

Subcatchment1S: Site Subcat Runoff Area=13,746 sf 7.34% Impervious Runoff Depth=0.18"
Tc=6.0 min CN=WQ Runoff=0.05 cfs 0.005 af

Reach #100: Analysis Point - Ex CB Inflow=0.05 cfs 0.005 af
Outflow=0.05 cfs 0.005 af

Total Runoff Area = 0.316 ac Runoff Volume = 0.005 af Average Runoff Depth = 0.18"
92.66% Pervious = 0.292 ac 7.34% Impervious = 0.023 ac

Time span=0.00-72.00 hrs, dt=0.10 hrs, 721 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

Subcatchment1S: Site Subcat Runoff Area=13,746 sf 7.34% Impervious Runoff Depth=1.56"
Tc=6.0 min CN=WQ Runoff=0.52 cfs 0.041 af

Reach #100: Analysis Point - Ex CB Inflow=0.52 cfs 0.041 af
Outflow=0.52 cfs 0.041 af

Total Runoff Area = 0.316 ac Runoff Volume = 0.041 af Average Runoff Depth = 1.56"
92.66% Pervious = 0.292 ac 7.34% Impervious = 0.023 ac

Time span=0.00-72.00 hrs, dt=0.10 hrs, 721 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

Subcatchment1S: Site Subcat Runoff Area=13,746 sf 7.34% Impervious Runoff Depth=2.96"
Tc=6.0 min CN=WQ Runoff=0.99 cfs 0.078 af

Reach #100: Analysis Point - Ex CB Inflow=0.99 cfs 0.078 af
Outflow=0.99 cfs 0.078 af

Total Runoff Area = 0.316 ac Runoff Volume = 0.078 af Average Runoff Depth = 2.96"
92.66% Pervious = 0.292 ac 7.34% Impervious = 0.023 ac

Summary for Subcatchment 1S: Site Subcat

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.99 cfs @ 12.10 hrs, Volume= 0.078 af, Depth= 2.96"
Routed to Reach #100 : Analysis Point - Ex CB

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type III 24-hr 10-YR Rainfall=4.91"

Area (sf)	CN	Description
1,334	77	Woods, Good, HSG D
9,574	77	Brush, Fair, HSG D
1,009	98	Paved parking, HSG D
1,829	96	Gravel surface, HSG D
13,746		Weighted Average
12,737		92.66% Pervious Area
1,009		7.34% Impervious Area

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

Summary for Reach #100: Analysis Point - Ex CB

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

Inflow Area = 0.316 ac, 7.34% Impervious, Inflow Depth = 2.96" for 10-YR event
Inflow = 0.99 cfs @ 12.10 hrs, Volume= 0.078 af
Outflow = 0.99 cfs @ 12.10 hrs, Volume= 0.078 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Time span=0.00-72.00 hrs, dt=0.10 hrs, 721 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

Subcatchment1S: Site Subcat Runoff Area=13,746 sf 7.34% Impervious Runoff Depth=4.14"
Tc=6.0 min CN=WQ Runoff=1.38 cfs 0.109 af

Reach #100: Analysis Point - Ex CB Inflow=1.38 cfs 0.109 af
Outflow=1.38 cfs 0.109 af

Total Runoff Area = 0.316 ac Runoff Volume = 0.109 af Average Runoff Depth = 4.14"
92.66% Pervious = 0.292 ac 7.34% Impervious = 0.023 ac

Time span=0.00-72.00 hrs, dt=0.10 hrs, 721 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

Subcatchment1S: Site Subcat Runoff Area=13,746 sf 7.34% Impervious Runoff Depth=5.28"
Tc=6.0 min CN=WQ Runoff=1.76 cfs 0.139 af

Reach #100: Analysis Point - Ex CB Inflow=1.76 cfs 0.139 af
Outflow=1.76 cfs 0.139 af

Total Runoff Area = 0.316 ac Runoff Volume = 0.139 af Average Runoff Depth = 5.28"
92.66% Pervious = 0.292 ac 7.34% Impervious = 0.023 ac

Appendix II

Proposed Conditions Analysis

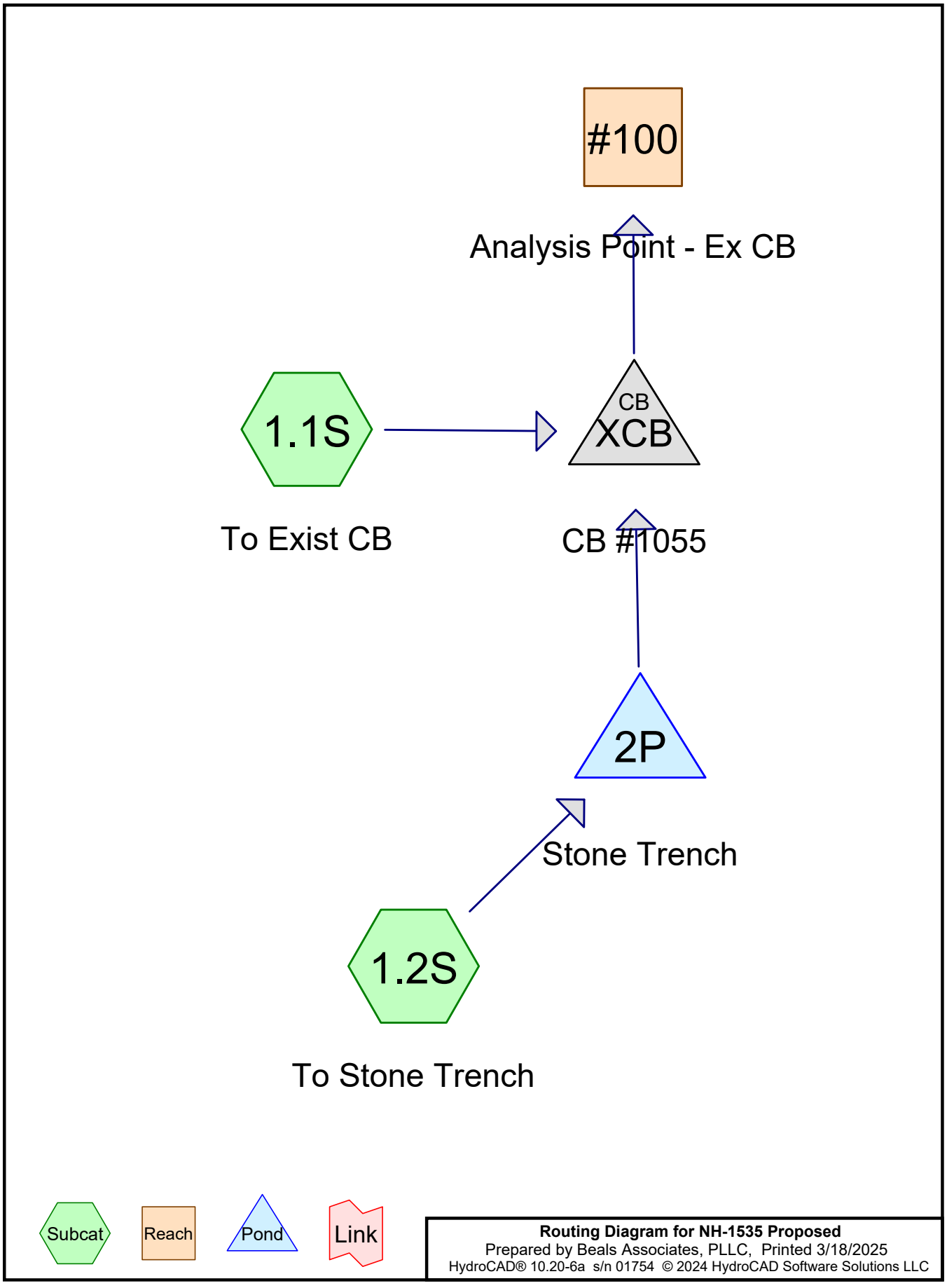
WQV 24-Hour Summary

2-Year 24-Hour Summary

10-Year 24-Hour Complete

25-Year 24-Hour Complete

50-Year 24-Hour Summary



Routing Diagram for NH-1535 Proposed
Prepared by Beals Associates, PLLC, Printed 3/18/2025
HydroCAD® 10.20-6a s/n 01754 © 2024 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.095	80	>75% Grass cover, Good, HSG D (1.1S, 1.2S)
0.103	98	Paved parking, HSG D (1.1S)
0.090	98	Roofs, HSG D (1.1S, 1.2S)
0.028	77	Woods, Good, HSG D (1.1S, 1.2S)
0.316	**91**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
0.316	HSG D	1.1S, 1.2S
0.000	Other	
0.316		**TOTAL AREA**

Time span=0.00-72.00 hrs, dt=0.10 hrs, 721 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

Subcatchment1.1S: To Exist CB Runoff Area=10,423 sf 71.26% Impervious Runoff Depth=0.59"
Tc=6.0 min CN=WQ Runoff=0.14 cfs 0.012 af

Subcatchment1.2S: To Stone Trench Runoff Area=3,323 sf 29.34% Impervious Runoff Depth=0.28"
Tc=6.0 min CN=WQ Runoff=0.02 cfs 0.002 af

Reach #100: Analysis Point - Ex CB Inflow=0.14 cfs 0.012 af
Outflow=0.14 cfs 0.012 af

Pond 2P: Stone Trench Peak Elev=48.00' Storage=0 cf Inflow=0.02 cfs 0.002 af
Discarded=0.02 cfs 0.002 af Primary=0.00 cfs 0.000 af Outflow=0.02 cfs 0.002 af

Pond XCB: CB #1055 Peak Elev=39.26' Inflow=0.14 cfs 0.012 af
15.0" Round Culvert n=0.012 L=50.0' S=0.0100 '/' Outflow=0.14 cfs 0.012 af

Total Runoff Area = 0.316 ac Runoff Volume = 0.013 af Average Runoff Depth = 0.51"
38.88% Pervious = 0.123 ac 61.12% Impervious = 0.193 ac

Time span=0.00-72.00 hrs, dt=0.10 hrs, 721 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

Subcatchment1.1S: To Exist CB Runoff Area=10,423 sf 71.26% Impervious Runoff Depth=2.53"
Tc=6.0 min CN=WQ Runoff=0.60 cfs 0.050 af

Subcatchment1.2S: To Stone Trench Runoff Area=3,323 sf 29.34% Impervious Runoff Depth=1.82"
Tc=6.0 min CN=WQ Runoff=0.14 cfs 0.012 af

Reach #100: Analysis Point - Ex CB Inflow=0.60 cfs 0.050 af
Outflow=0.60 cfs 0.050 af

Pond 2P: Stone Trench Peak Elev=48.00' Storage=0 cf Inflow=0.14 cfs 0.012 af
Discarded=0.14 cfs 0.012 af Primary=0.00 cfs 0.000 af Outflow=0.14 cfs 0.012 af

Pond XCB: CB #1055 Peak Elev=39.45' Inflow=0.60 cfs 0.050 af
15.0" Round Culvert n=0.012 L=50.0' S=0.0100 '/' Outflow=0.60 cfs 0.050 af

Total Runoff Area = 0.316 ac Runoff Volume = 0.062 af Average Runoff Depth = 2.36"
38.88% Pervious = 0.123 ac 61.12% Impervious = 0.193 ac

Time span=0.00-72.00 hrs, dt=0.10 hrs, 721 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

Subcatchment1.1S: To Exist CB Runoff Area=10,423 sf 71.26% Impervious Runoff Depth=4.13"
Tc=6.0 min CN=WQ Runoff=0.97 cfs 0.082 af

Subcatchment1.2S: To Stone Trench Runoff Area=3,323 sf 29.34% Impervious Runoff Depth=3.28"
Tc=6.0 min CN=WQ Runoff=0.26 cfs 0.021 af

Reach #100: Analysis Point - Ex CB Inflow=0.97 cfs 0.082 af
Outflow=0.97 cfs 0.082 af

Pond 2P: Stone Trench Peak Elev=48.00' Storage=0 cf Inflow=0.26 cfs 0.021 af
Discarded=0.26 cfs 0.021 af Primary=0.00 cfs 0.000 af Outflow=0.26 cfs 0.021 af

Pond XCB: CB #1055 Peak Elev=39.56' Inflow=0.97 cfs 0.082 af
15.0" Round Culvert n=0.012 L=50.0' S=0.0100 '/' Outflow=0.97 cfs 0.082 af

Total Runoff Area = 0.316 ac Runoff Volume = 0.103 af Average Runoff Depth = 3.93"
38.88% Pervious = 0.123 ac 61.12% Impervious = 0.193 ac

Summary for Subcatchment 1.1S: To Exist CB

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.97 cfs @ 12.10 hrs, Volume= 0.082 af, Depth= 4.13"
Routed to Pond XCB : CB #1055

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type III 24-hr 10-YR Rainfall=4.91"

Area (sf)	CN	Description
234	77	Woods, Good, HSG D
2,762	80	>75% Grass cover, Good, HSG D
4,502	98	Paved parking, HSG D
2,925	98	Roofs, HSG D
10,423		Weighted Average
2,996		28.74% Pervious Area
7,427		71.26% Impervious Area

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

Summary for Subcatchment 1.2S: To Stone Trench

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.26 cfs @ 12.10 hrs, Volume= 0.021 af, Depth= 3.28"
Routed to Pond 2P : Stone Trench

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Type III 24-hr 10-YR Rainfall=4.91"

Area (sf)	CN	Description
979	77	Woods, Good, HSG D
1,369	80	>75% Grass cover, Good, HSG D
0	98	Paved parking, HSG D
975	98	Roofs, HSG D
3,323		Weighted Average
2,348		70.66% Pervious Area
975		29.34% Impervious Area

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

Summary for Reach #100: Analysis Point - Ex CB

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

Inflow Area = 0.316 ac, 61.12% Impervious, Inflow Depth = 3.13" for 10-YR event
Inflow = 0.97 cfs @ 12.10 hrs, Volume= 0.082 af
Outflow = 0.97 cfs @ 12.10 hrs, Volume= 0.082 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs

Summary for Pond 2P: Stone Trench

Inflow Area = 0.076 ac, 29.34% Impervious, Inflow Depth = 3.28" for 10-YR event
Inflow = 0.26 cfs @ 12.10 hrs, Volume= 0.021 af
Outflow = 0.26 cfs @ 12.10 hrs, Volume= 0.021 af, Atten= 0%, Lag= 0.0 min
Discarded = 0.26 cfs @ 12.10 hrs, Volume= 0.021 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond XCB : CB #1055

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Peak Elev= 48.00' @ 0.00 hrs Surf.Area= 223 sf Storage= 0 cf
Flood Elev= 53.00' Surf.Area= 223 sf Storage= 357 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (793.4 - 793.4)

Volume	Invert	Avail.Storage	Storage Description
#1	48.00'	357 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 892 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
48.00	223	0	0
52.00	223	892	892

Device	Routing	Invert	Outlet Devices
#1	Discarded	48.00'	**3.00 cfs Exfiltration at all elevations**
#2	Primary	51.90'	**4.0' long x 2.0' 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 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Discarded OutFlow Max=0.00 cfs @ 12.10 hrs HW=48.00' (Free Discharge)
↑—**1=Exfiltration** (Passes 0.00 cfs of 3.00 cfs potential flow)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=48.00' TW=39.09' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond XCB: CB #1055

Inflow Area = 0.316 ac, 61.12% Impervious, Inflow Depth = 3.13" for 10-YR event
Inflow = 0.97 cfs @ 12.10 hrs, Volume= 0.082 af
Outflow = 0.97 cfs @ 12.10 hrs, Volume= 0.082 af, Atten= 0%, Lag= 0.0 min
Primary = 0.97 cfs @ 12.10 hrs, Volume= 0.082 af
Routed to Reach #100 : Analysis Point - Ex CB

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.10 hrs
Peak Elev= 39.56' @ 12.09 hrs
Flood Elev= 43.87'

Device	Routing	Invert	Outlet Devices
#1	Primary	39.09'	**15.0" Round Culvert** L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 39.09' / 38.59' S= 0.0100 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.23 sf

Primary OutFlow Max=0.96 cfs @ 12.10 hrs HW=39.55' TW=0.00' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 0.96 cfs @ 2.32 fps)

Time span=0.00-72.00 hrs, dt=0.10 hrs, 721 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

Subcatchment1.1S: To Exist CB Runoff Area=10,423 sf 71.26% Impervious Runoff Depth=5.42"
Tc=6.0 min CN=WQ Runoff=1.27 cfs 0.108 af

Subcatchment1.2S: To Stone Trench Runoff Area=3,323 sf 29.34% Impervious Runoff Depth=4.50"
Tc=6.0 min CN=WQ Runoff=0.36 cfs 0.029 af

Reach #100: Analysis Point - Ex CB Inflow=1.27 cfs 0.108 af
Outflow=1.27 cfs 0.108 af

Pond 2P: Stone Trench Peak Elev=48.00' Storage=0 cf Inflow=0.36 cfs 0.029 af
Discarded=0.36 cfs 0.029 af Primary=0.00 cfs 0.000 af Outflow=0.36 cfs 0.029 af

Pond XCB: CB #1055 Peak Elev=39.63' Inflow=1.27 cfs 0.108 af
15.0" Round Culvert n=0.012 L=50.0' S=0.0100 '/' Outflow=1.27 cfs 0.108 af

Total Runoff Area = 0.316 ac Runoff Volume = 0.137 af Average Runoff Depth = 5.20"
38.88% Pervious = 0.123 ac 61.12% Impervious = 0.193 ac

Time span=0.00-72.00 hrs, dt=0.10 hrs, 721 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

Subcatchment1.1S: To Exist CB Runoff Area=10,423 sf 71.26% Impervious Runoff Depth=6.64"
Tc=6.0 min CN=WQ Runoff=1.55 cfs 0.132 af

Subcatchment1.2S: To Stone Trench Runoff Area=3,323 sf 29.34% Impervious Runoff Depth=5.67"
Tc=6.0 min CN=WQ Runoff=0.45 cfs 0.036 af

Reach #100: Analysis Point - Ex CB Inflow=1.55 cfs 0.132 af
Outflow=1.55 cfs 0.132 af

Pond 2P: Stone Trench Peak Elev=48.00' Storage=0 cf Inflow=0.45 cfs 0.036 af
Discarded=0.45 cfs 0.036 af Primary=0.00 cfs 0.000 af Outflow=0.45 cfs 0.036 af

Pond XCB: CB #1055 Peak Elev=39.70' Inflow=1.55 cfs 0.132 af
15.0" Round Culvert n=0.012 L=50.0' S=0.0100 '/' Outflow=1.55 cfs 0.132 af

Total Runoff Area = 0.316 ac Runoff Volume = 0.168 af Average Runoff Depth = 6.40"
38.88% Pervious = 0.123 ac 61.12% Impervious = 0.193 ac

Appendix III

Charts, Graphs, and Calculations

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	No
State	New Hampshire
Location	New Hampshire, United States
Latitude	42.984 degrees North
Longitude	70.938 degrees West
Elevation	10 feet
Date/Time	Wed Jan 08 2025 12:33:10 GMT-0500 (Eastern Standard Time)

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr
1yr	0.26	0.41	0.50	0.67	0.82	1.01	**1yr**	0.71	0.99	1.14	1.57	2.00	2.68	2.91
2yr	0.32	0.50	0.61	0.83	1.02	1.21	**2yr**	0.88	1.18	1.40	1.85	2.39	3.22	3.57
5yr	0.37	0.58	0.72	0.99	1.25	1.50	**5yr**	1.08	1.47	1.73	2.30	2.93	4.09	4.59
10yr	0.42	0.65	0.81	1.13	1.46	1.77	**10yr**	1.26	1.73	2.04	2.70	3.42	4.91	5.56
25yr	0.50	0.77	0.95	1.36	1.79	2.20	**25yr**	1.55	2.15	2.53	3.35	4.20	6.24	7.15
50yr	0.57	0.87	1.08	1.56	2.10	2.60	**50yr**	1.81	2.54	2.98	3.94	4.91	7.49	8.66
100yr	0.66	0.99	1.24	1.79	2.45	3.07	**100yr**	2.12	3.00	3.52	4.64	5.74	9.00	10.49
200yr	0.75	1.12	1.42	2.06	2.87	3.63	**200yr**	2.48	3.55	4.15	5.47	6.71	10.81	12.71
500yr	0.90	1.33	1.72	2.49	3.55	4.53	**500yr**	3.06	4.43	5.17	6.80	8.27	13.77	16.39

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr
1yr	0.24	0.37	0.45	0.60	0.74	0.89	**1yr**	0.64	0.87	0.95	1.26	1.55	2.28	2.54
2yr	0.32	0.49	0.60	0.81	1.00	1.19	**2yr**	0.87	1.16	1.37	1.82	2.33	3.11	3.50
5yr	0.36	0.55	0.68	0.93	1.19	1.42	**5yr**	1.03	1.39	1.62	2.12	2.74	3.82	4.28
10yr	0.39	0.61	0.75	1.05	1.35	1.63	**10yr**	1.17	1.59	1.82	2.40	3.07	4.41	4.97
25yr	0.45	0.69	0.86	1.23	1.61	1.95	**25yr**	1.39	1.90	2.12	2.78	3.58	4.90	6.06
50yr	0.50	0.77	0.95	1.37	1.85	2.24	**50yr**	1.59	2.19	2.36	3.12	4.01	5.54	7.02
100yr	0.57	0.85	1.07	1.55	2.12	2.57	**100yr**	1.83	2.51	2.65	3.48	4.48	6.25	8.12
200yr	0.63	0.95	1.20	1.74	2.43	2.95	**200yr**	2.10	2.88	2.95	3.88	4.99	7.01	9.65
500yr	0.74	1.11	1.42	2.07	2.94	3.56	**500yr**	2.54	3.48	3.42	4.48	5.80	8.14	11.77

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr
1yr	0.28	0.44	0.54	0.72	0.89	1.08	**1yr**	0.76	1.06	1.26	1.71	2.17	2.97	3.10
2yr	0.33	0.51	0.63	0.86	1.05	1.26	**2yr**	0.91	1.23	1.48	1.95	2.49	3.40	3.66

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 8, 2025

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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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.

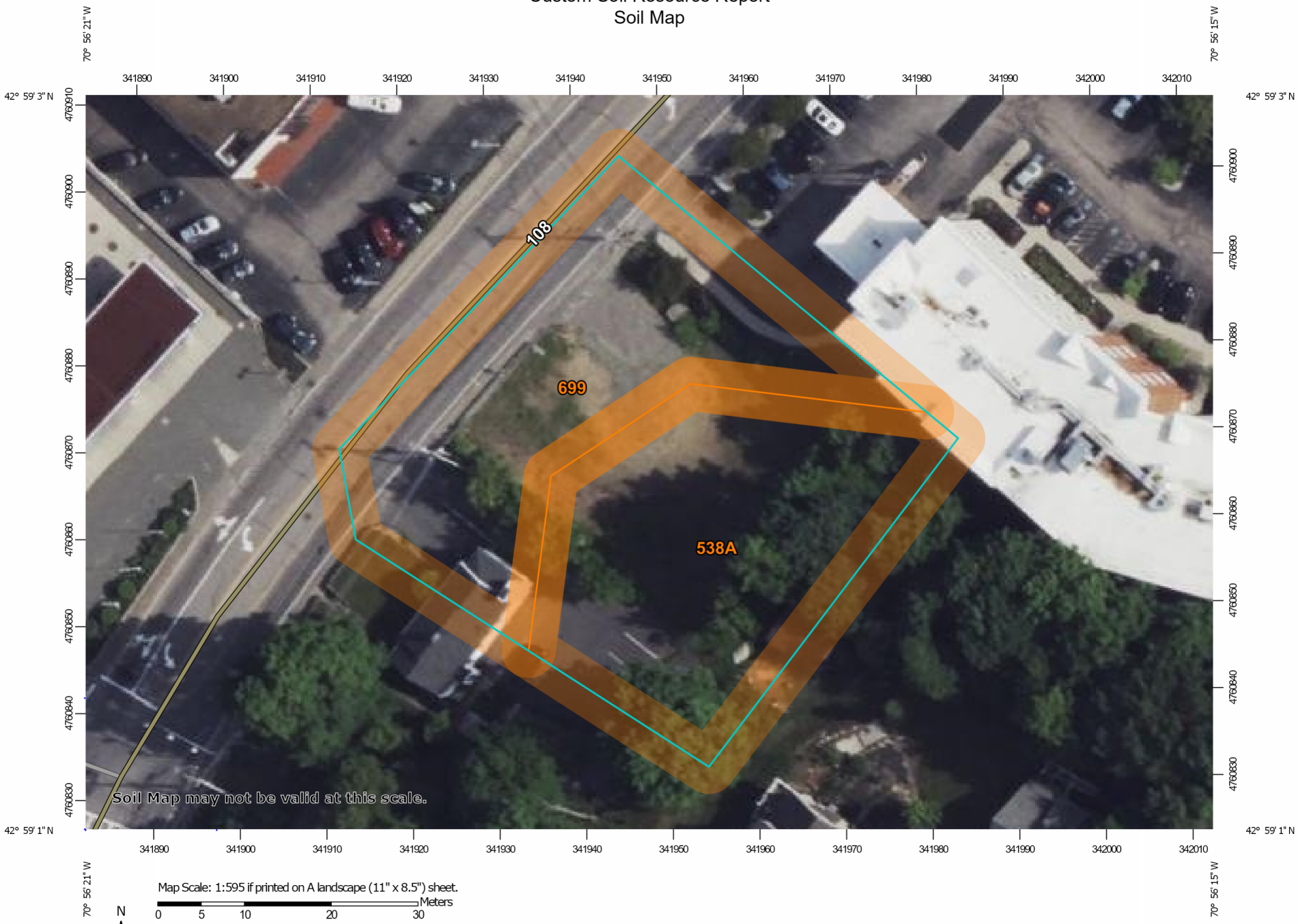
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

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 Scale: 1:595 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 5 10 20 30

Feet
0 25 50 100 150

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

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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 27, Sep 3, 2024

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
538A	Squamscott fine sandy loam, 0 to 5 percent slopes	0.3	48.1%
699	Urban land	0.3	51.9%
Totals for Area of Interest		**0.7**	**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

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

699—Urban land

Map Unit Composition
Urban land: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Minor Components

Not named
Percent of map unit: 15 percent
Hydric soil rating: No

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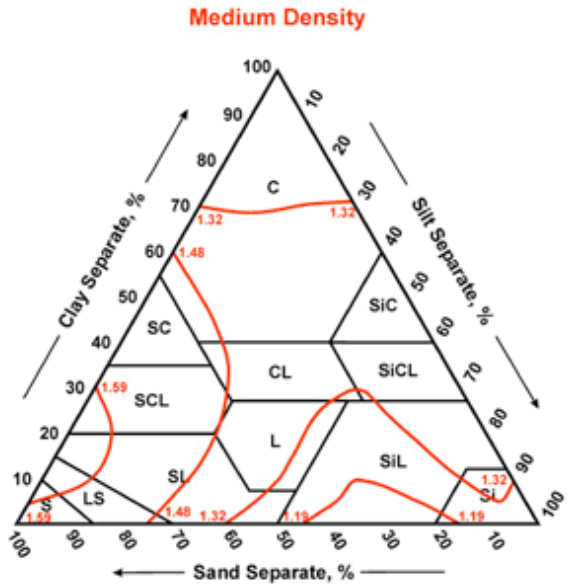
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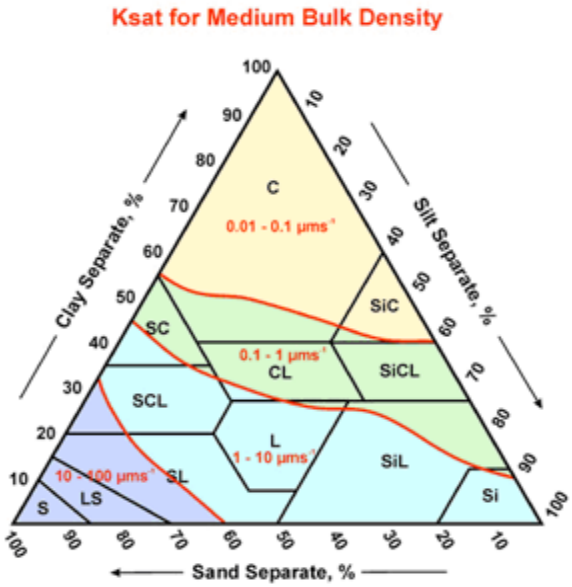
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K_{sat} VALUES
FOR
NEW HAMPSHIRE SOILS
(Including Hydrologic and DES Soil Lot Sizing Groups)





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
Mundal	610	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	yes	gravelly sandy loam in Cd
Natchaug	496			0.20	2.0	D	6	Organic Materials - Freshwater	mesic	loamy	no	organic over loam
Naumburg	214	6.0	20.0	6.00	20.0	C	5	Outwash and Stream Terraces	frigid	sandy	yes	
Newfields	444	0.6	2.0	0.60	2.0	B	3	Loose till, sandy textures	mesic	loamy over sandy	no	sandy or sandy-skeletal
Nicholville	632	0.6	2.0	0.60	2.0	C	3	Terraces and glacial lake plains	frigid	silty	yes	very fine sandy loam
Ninigret	513	0.6	6.0	6.00	20.0	B	3	Outwash and Stream Terraces	mesic	loamy over sandy	no	sandy or sandy-skeletal
Occum	1	0.6	2.0	6.00	20.0	B	2	Flood Plain (Bottom Land)	mesic	loamy	no	loamy over loamy sand
Ondawa	101	0.6	6.0	6.00	20.0	B	2	Flood Plain (Bottom Land)	frigid	loamy	no	loamy over loamy sand
Ondawa	201	0.6	6.0	6.00	20.0	B	2	Flood Plain (Bottom Land)	frigid	loamy	no	occ flood, loamy over l. sand
Ossipee	495			0.20	2.0	D	6	Organic Materials - Freshwater	frigid	loamy	no	organic over loam
Pawcatuck	497			20.00	100.0	D	6	Tidal Flat	mesic	sandy or sandy-skeletal	no	organic over sand
Paxton	66	0.6	2.0	0.00	0.2	C	3	Firm, platy, loamy till	mesic	loamy	no	
Peacham	549	0.6	2.0	0.00	0.2	D	6	Firm, platy, silty till, schist & phylitte	frigid	loamy	no	organic over loam
Pemi	633	0.6	2.0	0.06	0.6	C	5	Terraces and glacial lake plains	frigid	silty	no	
Pennichuck	460	0.6	2.0	0.60	2.0	B	4	Friable till, silty, schist & phyllite	mesic	loamy-skeletal	no	20 to 40 in. deep
Peru	78	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	yes	
Pillsbury	646	0.6	2.0	0.06	0.2	C	5	Firm, platy, loamy till	frigid	silty	no	
Pipestone	314					B	5	Outwash and Stream Terraces	mesic	sandy	yes	
Pittstown	334	0.6	2.0	0.06	0.2	C	3	Firm, platy, silty till, schist & phyllite	mesic	loamy	no	channery silt loam in Cd
Plaisted	563	0.6	2.0	0.06	0.6	C	3	Firm, platy, silty till, schist & phyllite	frigid	loamy	yes	channery silt loam in Cd
Podunk	104	0.6	6.0	6.00	20.0	B	3	Flood Plain (Bottom Land)	frigid	loamy	no	loamy to coarse sand in C
Pondicherry	992			6.00	20.0	D	6	Organic Materials - Freshwater	frigid	sandy or sandy-skeletal	no	organic over sand
Poocham	230	0.6	2.0	0.20	2.0	B	3	Terraces and glacial lake plains	mesic	silty	no	silt loam in C
Pootatuck	4	0.6	6.0	6.00	20.0	B	3	Flood Plain (Bottom Land)	mesic	loamy	no	single grain in C
Quonset	310	2.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	mesic	sandy-skeletal	no	shale
Rawsonville	98	0.6	6.0	0.60	6.0	C	4	Loose till, bedrock	frigid	loamy	yes	20 to 40 in. deep
Raynham	533	0.2	2.0	0.06	0.2	C	5	Terraces and glacial lake plains	mesic	silty	no	
Raypol	540	0.6	2.0	6.00	100.0	D	5	Outwash and Stream Terraces	mesic	co. loamy over sandy (skeletal)	no	
Redstone	665	2.0	6.0	6.00	20.0	A	1	Weathered Bedrock Till	frigid	fragmental	yes	loamy cap
Ricker	674	2.0	6.0	2.00	6.0	A	4	rganic over bedrock (up to 4" of minera	cryic	fibric to hemic	no	well drained, less than 20 in. deep
Ridgebury	656	0.6	6.0	0.00	0.2	C	5	Firm, platy, loamy till	mesic	loamy	no	
Rippowam	5	0.6	6.0	6.00	20.0	C	5	Flood Plain (Bottom Land)	mesic	loamy	no	
Roundabout	333	0.2	2.0	0.06	0.6	C	5	Terraces and glacial lake plains	frigid	silty	no	silt loam in the C
Rumney	105	0.6	6.0	6.00	20.0	C	5	Flood Plain (Bottom Land)	frigid	loamy	no	
Saco	6	0.6	2.0	6.00	20.0	D	6	Flood Plain (Bottom Land)	mesic	silty	no	strata
Saddleback	673	0.6	2.0	0.60	2.0	C/D	4	Loose till, bedrock	cryic	loamy	yes	less than 20 in. deep
Salmon	630	0.6	2.0	0.60	2.0	B	2	Terraces and glacial lake plains	frigid	silty	yes	very fine sandy loam
Saugatuck	16	0.06	0.2	6.00	20.0	C	5	Outwash and Stream Terraces	mesic	sandy	yes	ortstein
Scantic	233	0.0	0.2	0.00	0.2	D	5	Silt and Clay Deposits	frigid	fine	no	
Scarboro	115	6.0	20.0	6.00	20.0	D	6	Outwash and Stream Terraces	mesic	sandy	no	organic over sand, non stony
Scio	531	0.6	2.0	0.60	2.0	B	3	Terraces and glacial lake plains	mesic	silty	no	gravelly sand in 2C
Scitico	33	0.0	0.2	0.00	0.2	C	5	Silt and Clay Deposits	mesic	fine	no	
Scituate	448	0.6	2.0	0.06	0.2	C	3	Firm, platy, sandy till	mesic	loamy	no	loamy sand in Cd
Searsport	15	6.0	20.0	6.00	20.0	D	6	Outwash and Stream Terraces	frigid	sandy	no	organic over sand
Shaker	439	2.0	6.0	0.00	0.2	C	5	Sandy/loamy over silt/clay	mesic	co. loamy over clayey	no	
Shapleigh	136					C/D	4	Sandy Till	mesic	sandy	yes	less than 20 in. deep
Sheepscot	14	6.0	20.0	6.00	20.0	B	3	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	gravelly coarse sand
Sisk	667	0.6	2.0	0.00	0.6	C	3	Firm, platy, loamy till	cryic	loamy	yes	sandy loam in Cd
Skerry	558	0.6	2.0	0.06	0.6	C	3	Firm, platy, sandy till	frigid	loamy	yes	loamy sand in Cd
Squamscott	538	6.0	20.0	0.06	0.6	C	5	Sandy/loamy over silt/clay	mesic	sandy over loamy	yes	
Stetson	523	0.6	6.0	6.00	20.0	B	2	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	loamy over gravelly
Stissing	340	0.6	2.0	0.06	0.2	C	5	Firm, platy, silty till, schist & phyllite	mesic	loamy	no	
Success	154	2.0	6.0	6.00	20.0	A	1	Sandy Till	frigid	sandy-skeletal	yes	cemented
Sudbury	118	2.0	6.0	2.00	20.0	B	3	Outwash and Stream Terraces	mesic	sandy	no	loam over gravelly sand

STORMWATER MANAGEMENT / BMP
INSPECTION & MAINTENANCE PLAN

RESIDENTIAL DEVELOPMENT
57 PORTSMOUTH AVENUE, EXETER, NH

NH-1535
January 2025

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 Stonearch Development Corporation with an address of 42J Dover Point Road, Dover, NH 03820 and a phone of (978) 375-3153 or their heirs and/or assigns, shall be responsible for inspections and maintenance activities for the above project site. Stonearch Development Corporation shall be responsible for *ongoing inspection and maintenance* of the BMP drainage structures and treatment areas.

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 Exeter 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 12" 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. 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 Exeter 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

57 Portsmouth Avenue, Exeter, 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.
Deicing Agents	N/A	N/A	Use salt as the primary agent for roadway safety during winter.
Landscaping	Maintained as required and mulched each Spring	N/A	Trash/debris and weed removal
Drainage Pipes & Catch Basins	Spring and Fall	Check for sediment accumulation & clogging.	More than 12" sediment depth from outlet pipe
Annual Report	1 time per year	Submit Annual Report to Town of Exeter Inspector upon request	

STORMWATER SYSTEM OPERATION AND MAINTENANCE PLAN

Inspection & Maintenance Manual Log Form

Residential Development

57 Portsmouth Avenue, Exeter, NH

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

Inspection Notes:

Anti-icing Route Data Form

Truck Station:

Date:

Air Temperature	Pavement Temperature	Relative Humidity	Dew Point	Sky

Reason for applying:

Route:

Chemical:

Application Time:

Application Amount:

Observation (first day):

Observation (after event):

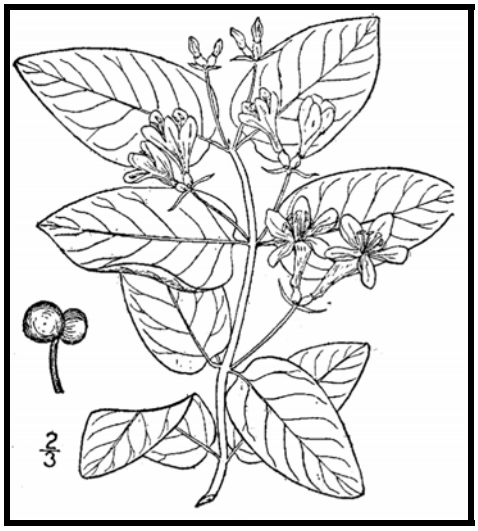
Observation (before next application);

Name:

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

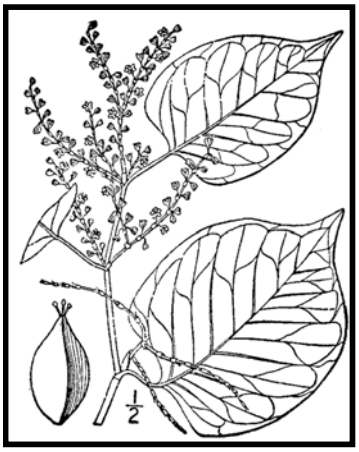
Prohibited invasive species shall only be disposed of in a manner that renders them nonliving and nonviable. (Agr. 3802.04)

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>

<table>
<tr><th>Non-Woody Plants</th><th>Method of Reproducing</th><th>Methods of Disposal</th></tr>
<tr><td rowspan="2">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)</td><td rowspan="2">Fruits and Seeds
  </td><td>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.</td></tr>
<tr><td>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.</td></tr>
<tr><td>common reed
(Phragmites australis)
Japanese knotweed
(Polygonum cuspidatum)
Bohemian knotweed
(Polygonum x bohemicum)</td><td>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.</td><td>Small infestation
▪ Bag all plant material and let rot.
▪ Never pile and use resulting material as compost.
▪ Burn.

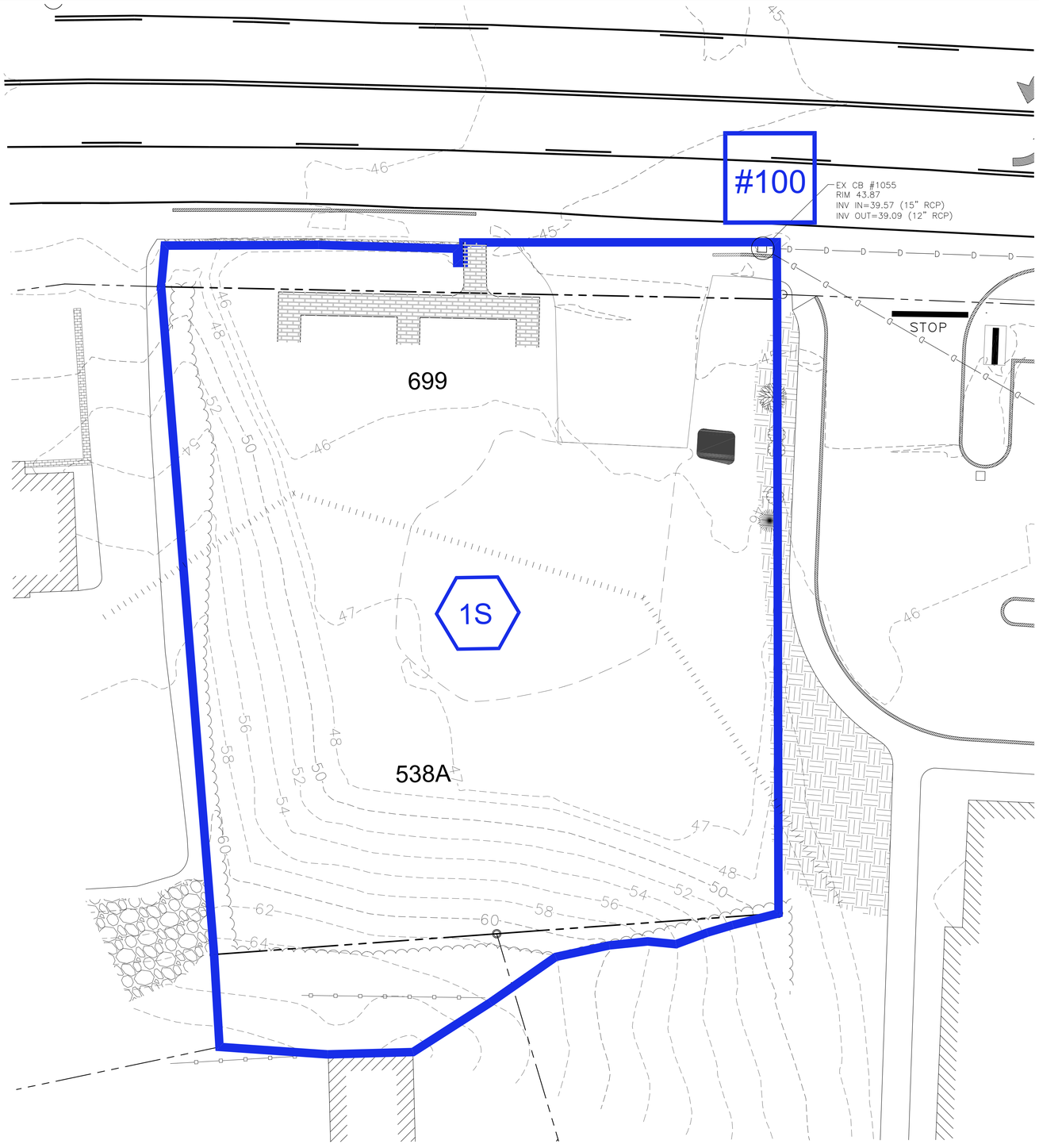
Large infestation
▪ Remove material to unsuitable habitat (dry, hot and sunny or dry and shaded location) and scatter or pile.
▪ Monitor and remove any sprouting material.
▪ Pile, let dry, and burn.</td></tr>
</table>

January 2010

UNH Cooperative Extension programs and policies are consistent with pertinent Federal and State laws and regulations, and prohibits discrimination in its programs, activities and employment on the basis of race, color, national origin, gender, religion, age, disability, political beliefs, sex, sexual orientation, or veteran’s, marital or family status. College of Life Sciences and Agriculture, County Governments, NH Dept. of Resources and Economic Development, Division of Forests and Lands, NH Fish and Game ,and U.S. Dept. of Agriculture cooperating.

Appendix IV

Plans



PREPARED FOR:

STONEARCH DEVEL. CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

BA 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

SOIL INFORMATION WAS OBTAINED FROM USDA NATURAL RESOURCES CONSERVATION SERVICE (NRCS).

SOIL IDENTIFICATION LEGEND:

MAP UNIT SYMBOL	MAP UNIT NAME	HYDROLOGIC SOIL GROUP
538A	SQUAMSCOTT FINE SANDY LOAM	C/D
699	URBAN LAND	

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

STATE OF NEW HAMPSHIRE
CHRISTIAN
O.
SMITH
No.9900
PROFESSIONAL ENGINEER

GRAPHIC SCALE

10 0 5 10 20 40

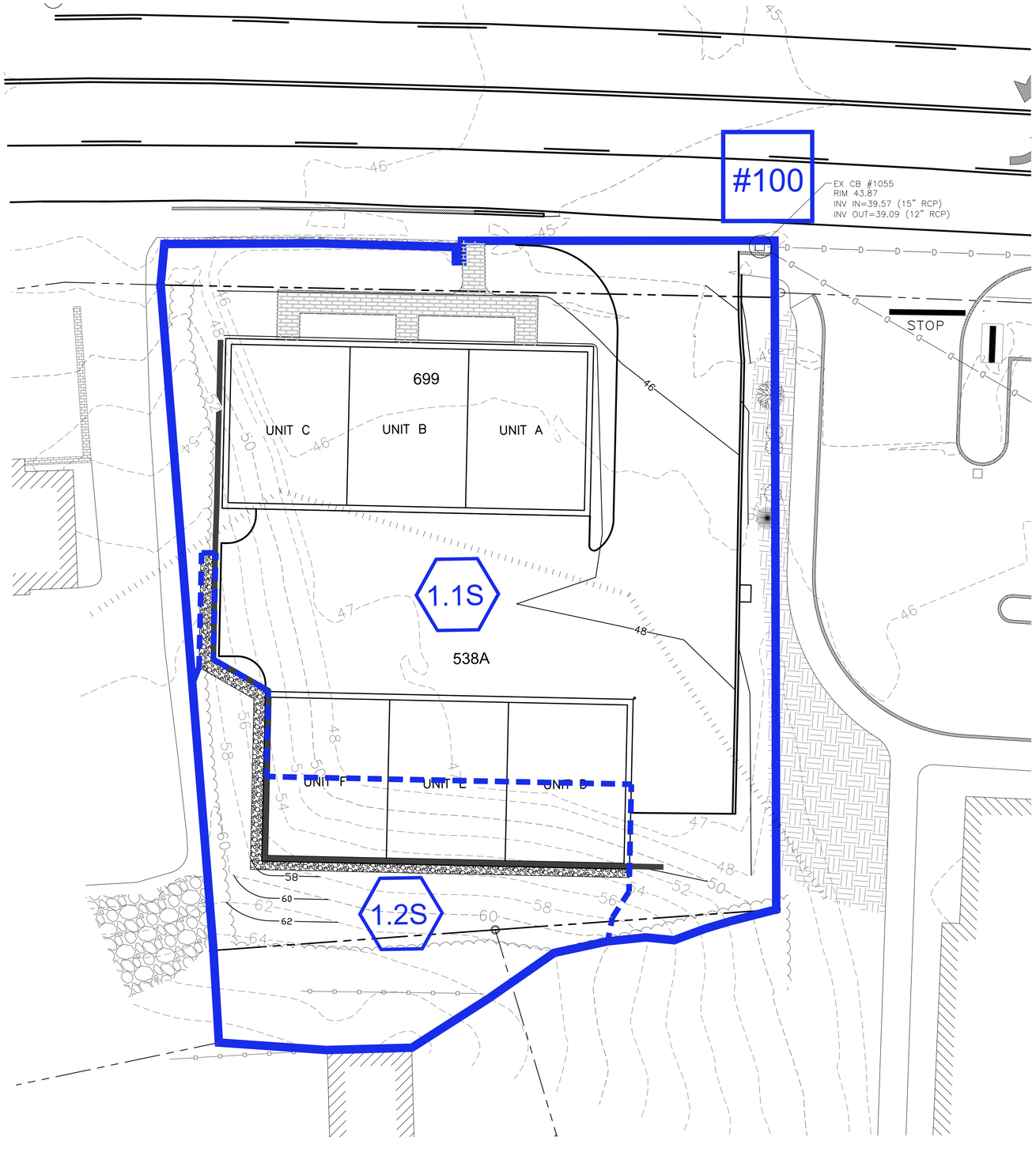
(IN FEET)
1 inch = 10 ft.

EXISTING WATERSHED PLAN

RESIDENTIAL DEVELOPMENT
57 PORTSMOUTH AVE.
EXETER, NH
TAX MAP 65, LOT 137

DATE:	JAN 28, 2025
SCALE:	1" = 10'
PROJ. N0:	NH-1535
SHEET NO.	WS-1

REVISIONS: DATE:



PREPARED FOR:

STONEARCH DEVEL. CORP.
42J DOVER POINT ROAD
DOVER, NH 03820

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

** THIS DRAWING IS FOR DRAINAGE PURPOSES ONLY **

WATERSHED LEGEND

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

SOIL INFORMATION WAS OBTAINED FROM USDA NATURAL RESOURCES CONSERVATION SERVICE (NRCS).

SOIL IDENTIFICATION LEGEND:

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699	URBAN LAND	

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

STATE OF NEW HAMPSHIRE - CHRISTIAN O. SMITH No. 9900 - PROFESSIONAL ENGINEER

GRAPHIC SCALE

10 0 5 10 20 40

(IN FEET)
1 inch = 10 ft.

PROPOSED WATERSHED PLAN

RESIDENTIAL DEVELOPMENT
57 PORTSMOUTH AVE.
EXETER, NH
TAX MAP 65, LOT 137

REVISIONS:	DATE:
REVISED PER REVIEW COMMENTS	03/19/25

DATE:	JAN 28, 2025	SCALE:	1" = 10'
PROJ. NO:	NH-1535	SHEET NO.	WS-2