



Meeting of the Mashpee Planning Board

Wednesday, May 18, 2022

Waquoit Meeting Room

Mashpee Town Hall

16 Great Neck Road North

Mashpee, MA 02649

7:00 PM

Broadcast Live on Local Channel 18

Streamed Live on the Town of Mashpee Website: <https://www.mashpeema.gov/channel-18>

Call Meeting to Order

- Pledge of Allegiance

Approval of Minutes

- Review of Meeting Minutes from May 4, 2022 and May 12, 2022

Public Discussion

Public Hearing

7:10 PM (Continued from May 4, 2022)

Applicant: Marcello Mallegni, Forestdale Road, LLC

Location: 523 Main Street (Map 26, Block 6)

Request: The applicant requests consideration for approval of a 9 lot definitive subdivision plan of land consisting of approximately 18.05 acres located on Main Street (Route 130) between Nicoletta's Way and Echo Road

New Business

- Sign signatory page for the Barnstable County Registry of Deeds and Barnstable Land Court Registry
- Sign Oldham Circle Road Taking Plan pursuant to Town Meeting acceptance of the layout

Old Business

- Status of Local Comprehensive Plan Update with Weston & Sampson

Chairman's Report

- HAC/APCC Grow Smart Maps

Town Planner Report

- Update on Popponessett Overlay District
- Floodplain Bylaw amendments
- Cottage Court Zoning



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Board Member Committee Reports

- Cape Cod Commission, Community Preservation Committee, Design Review, Plan Review, Environmental Oversight Committee, Historic District Commission, Military Civilian Advisory Council.

Correspondence

- Town of Falmouth Notices
- Town of Sandwich Notices
- Town of Barnstable Notices
- March 2022 Discharge Monitoring Report for South Cape Village – N= 4.0
- February 2022 Discharge Monitoring Report for South Cape Village – N= 3.6
- January 2022 Discharge Monitoring Report for South Cape Village – N=2.1

Reorganization of the Board

- Nomination and Election of Chair, Vice-chair, and Clerk
- Nomination and appointment of members to serve on Community Preservation Committee, Design Review, Environmental Oversight Committee, Historic District Commission, Military Civilian Advisory Council.

Additional Topics (not reasonably anticipated by Chair)

Adjournment



Town of Mashpee *Planning Board*

*16 Great Neck Road North
Mashpee, Massachusetts 02649*

**Mashpee Planning Board
Minutes of Meeting
Wednesday, May 04, 2022 at 7:00PM
Mashpee Town Hall - Waquoit Meeting Room
16 Great Neck Road North
Mashpee, Ma 02649**

**Broadcast Live on Local Channel 18
Call-in Conference Number: (508)-539-1400 x 8585
Streamed Live on the Town of Mashpee website <https://www.mashpeeema.gov/channel -18>**

Present: Chairman John Fulone, Mary Waygan, Joseph Callahan, Dennis Balzarini, Robert (Rob) Hansen

Also Present: Evan Lehrer – Town Planner, Ed Pesce - Consulting Engineer. John Rodrigues – General Contractor, Jack McElhinney – Attorney for Willowbend, Troy Miller – Chief Director Southworth Properties

Virtually Present: Caroline Wells – Weston & Sampson, Blake Martin – Weston & Sampson

CALL TO ORDER

Chairman Fulone called the meeting of the Planning Board to order at 7:00P.M. The Pledge of Allegiance was recited.

APPROVAL OF MINUTES – April 20, 2022

There were no comments regarding the meeting minutes.

MOTION:

Mr. Balzarini moved to accept the meeting minutes for April 20, 2022 as written. Seconded by Ms. Waygan. All in favor.

PUBLIC DISCUSSION

Lynne Barbee- She would like to address Mr. Chairman because he wasn't able to hear in person from residents on April 20th. Hopefully he took time to reflect. At the previous meeting she promised to hold her comments until this evening. There were more than two elected officials at the kickoff, but he only attacked two. That wreaks of prejudice. None of these people tainted the results despite allegations. We are not uninformed puppets, maybe he didn't need to insult us. She hopes he will apologize to all who did come whether elected or not. Now she hopes the real focus can be on the LCP.

Mr. Fulone inquired about other elected officials there.



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Ms. Barbee stated it was someone at her table, Mary Leclair, and there was one other. There are people who are elected who aren't only on the Select or Planning Boards. Each and every one of us got a lot out of that and she thanked the Board. She looks forward to May 14th.

Arden Russell- She is here to comment on the 532 Main St. proposal and she has important information to share. 532 Main St. is an 18 acre undisturbed parcel of land which abuts Route 130 and Nicoletta's Way, a little north of Heritage Park. The applicant is seeking to subdivide into 9 industrial and buildable lots and build a new road to serve those lots, which will intersect onto Rt. 130. When she first learned of this she was concerned about the curb cut onto Rt. 130. After doing more research she discovered there are many additional issues that need evaluation. This is an 18 acre unfragmented forest that acts as a significant natural resource area for wildlife. The parcel is within the boundaries of the Mashpee Wildlife Refuge. The parcel is located within a sensitive water shed that discharges into Mashpee River, which is a degraded body of water due to nutrient overload. It is also a potential public water supply. This also abuts Main Street that carries high volumes of traffic. Main St. is our gateway into the Town of Mashpee. This proposal needs approval from the town for curb cuts. The Select Board has guidelines for approval. Guideline number 10 states no curb cut within 200 feet of another intersection. This proposal is within 150 feet of a busy intersection and directly opposite another intersection. There are a number of residential driveways in close proximity. There are two additional intersections with heavy industrial traffic. The proposed cut will exit directly where the bike path crosses, a crosswalk already impossible to safely cross. For these reasons, an additional curb cut would be dangerous for the town. Policy 10F recommends additional technical review by a consultant for curb cuts that generate more than 30 vehicles per day. This curb cut clearly will. When and by whom will this consultant review be initiated? The review should be conducted and findings will undergo full Planning Board review before any approval for the subdivision be made. The guidelines state a permit will be granted if proposed work is in the best interest of the town and inhabitants, and this is definitely not. The property has a regulatory history that was not discussed or mentioned. In 2002, 2.7 acres of this parcel were illegally clear-cut. There is a Cape Cod Commission Development of Regional Impact decision. This decision requires mitigation for the impacts of clear cutting 2.7 acres of land through preservation of 4 acres of open space. This preservation of open space was never completed. A certificate of compliance shall be obtained by the applicant prior to the sale or issue of any permits. The parcel was conveyed in 2010 without a certificate of compliance. No further review of this request should be undertaken until this open space issue is resolved. Every day we talk about environment protections, restoring our degraded waterways, the nutrient overload, and trying to maintain Mashpee's character. Are we all talk and no action? Everyone wants to say the right thing but are not willing to do the right thing. Development proposals must be reviewed to determine if it is in the best interest of town and not developer's bank account. The facts speak for themselves and this subdivision should not be approved.

PUBLIC HEARING

7:10PM (Continue from April 6, 2022)



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Applicant: Marcello Mallegni, Forestdale Road, LLC
Location: 523 Main Street (Map 26, Block 6)
Request: The applicant requests consideration for approval of a 9 lot definitive subdivision plan of land consisting of approximately 18.05 acres located on Main Street (Route 130) between Nicoletta's Way and Echo Road.

Mr. Fulone received correspondence from the applicant's Attorney requesting a continuance to allow for continued discussions between the owners regarding Nicoletta's Way access to subdivision.

Mr. Lehrer spoke to the Cape Cod Commission staff and when the Public Hearing opens they will deliver a thorough report.

Mr. Pesce received revised plans and he wants to state for abutters, the nearest road looking at Nicoletta's is well over 200 ft.

Ms. Russell asked if that included Sturgis Lane.

Ms. Waygan stated there is a lot of interest in this and when things are of interest there is usually a webpage.

MOTION:

**Ms. Waygan made a motion to continue this Public Hearing until May 18, 2022 at 7:10p.m.
Seconded by Mr. Callahan. All in favor.**

NEW BUSINESS

Sign special permit modification decision approving the request of Michael and Lisa Cannata to increase the allowed number of seats from 12- 35 in a food establishment at 2 Center Street.

Mr. Lehrer stated there are no appeals and he is requesting the Board sign.

Discussion relative to anticipated request for covenant release for properties addressed as 17 Silverleaf Lane – Mr. John Rodrigues

Mr. Lehrer wants to preface, this is for an anticipated request for covenant release. This is the final remaining portion for the entire subdivision to have a completed road way system. In his time as Planner he has never addressed any of this with the Board. He wanted to discuss expectations and he met Mr. Pesce on site with Mr. Rodrigues. They reviewed plans on record and he wants Mr. Pesce to give his opinions prior to giving Mr. Rodrigues the Boards findings.

Mr. Pesce made a site visit and they discussed what was there and what needed to be added. His initial feeling is let's make it safe and reasonable for occupants of the road. Mr. Rodrigues is trying to build a house on a parcel that's getting ready to apply for a building permit. He would like to be



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respectful to those people and what they will end up with when the project is complete. Silverleaf Lane has been partially paved and part of the infrastructure has been solved. The 1972 plans aren't detailed except for a Land Court Plan that shows lot layouts. There are additional plots and an investigation into that should be done. Mr. Rodrigues had a surveyor do some investigating and they found an additional pair of catch basins buried and filled with dirt. His recommendation is there is an area of the road that has never been paved. Mr. Rodrigues has agreed to pave the road in front of his parcel and that leaves the remaining from the edge of his lot to Old Sandwich Road. There are already a pair of basins that aren't buried. The road would be rebuilt and prepared for new asphalt. There will be two inches of binding and he has also agreed to do that. Balfour Lane has existing pavement and he has agreed to do all that. Prior they should at least augment drainage there. The catch basins are probably old and leaching and they have agreed to open them up and clean them out to see what's there. He suggested overflow pipe and leaching capacity or pit with stone. There is an existing catch basin opposite near Balfour that doesn't have a companion. He has agreed to add a catch basin there. As far as containments and treatment, it will be a combination of old code and new code that will make that road function better for drainage. He doesn't want the runoff to affect the people at the bottom of the hill. He will repair the road to the frontage that he owns and get closer to finishing the entire project. Mr. Rodrigues also agreed to have a plan drawn up and Mr. Pesce will guide them with inspections that will be required.

Mr. Lehrer commented about the level of detail on the plan. There will need to be an engineered plan prior to releasing the covenant for clear guidance to Mr. Rodrigues.

Mr. Balzarini has a lot of experience with this. If you bring all the drainage that surrounds this lot up to standards he is fine with this. If it is only one lot he is okay with that.

Mr. Pesce stated Mr. Rodrigues is going to upgrade the catch basins that were discovered that aren't on his lot, and it benefits everyone. A reasonable compromise would be if you decide you want to go another 20 feet of pavement, that would be better, but we can discuss it further.

Ms. Waygan asked if that part of South Sandwich Road will ever be done.

Mr. Rodrigues noted there are two buildable lots there.

Mr. Lehrer commented there is a small area left to be paved, but those two lots are under covenant.

Mr. Rodrigues stated they will be applying to release that one at the end of the street.

Ms. Waygan is fine with the suggestions from Mr. Pesce, Consulting Engineer. She is also requesting to see an engineered plan.

Mr. Pesce will work with their team to let them know what he will accept. We saw where the basins used to be and should have been. They will add capacity for emergencies. People at the bottom of the



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hill will benefit. He wants to put a new binder and take down 4-6 inches. The gravel base should be fine it just has to be reshaped a compacted.

Mr. Lehrer would need them to provide his office with the initial cost estimate. It will need to be modified. When there is clarity around the details and Mr. Pesce has reviewed the cost estimate, it would be his suggestion to grant Mr. Rodrigues release of the covenant.

Mr. Pesce would like to agree not to move forward with anything until the construction is through.

OLD BUSINESS

Status of Local Comprehensive Plan Update with Weston & Sampson

Ms. Wells stated Ms. Sweet is away at a conference so this evening Blake Martin is present.

Mr. Lehrer spoke with them this morning regarding the status of the plan, goals achieved, and next steps. He will continue to make everyone aware the next workshop is May 14th being held at the Mashpee Public Library. He noted the high school had some acoustical challenges. He did meet with the Director to ensure no there were no capacity challenges. The focus will be Community Systems. Then we will focus on Natural and Built Systems.

Chairman Fulone asked what time the event will start.

Mr. Lehrer commented the workshop will start at 10:00a.m. and run until 1:00p.m. He noticed the webpage had an error on the start time. There will be a PSA and further information on www.planmashpee.com. He got some sign ups from Town Meeting. He is working on mailers to drive additional traffic by direct mailer engagement.

Ms. Wells clarified Community Systems are really about social activities and qualities of Mashpee. It can include cost of living but it focuses on what people need to live. Social networks, housing, social services, economic development, The Chamber, cultural and preservation, and recreation and open space. It's a very broad topic. Conversations will be people focused with what people need to live well and have a quality of life. She briefly recapped from April 9th, the results are tallied from the groups and are posted online. There is an e-mail newsletter. There was a tremendous boost in online subscriptions at 250, but Mashpee consists of a lot more.

Mr. Fulone inquired if there was a Facebook page for this.

Mr. Lehrer is currently just using the town's page as well as the police page.

Ms. Wells reiterated it is generating traffic through other people's pages. Coming out of the workshop they would normally draft a revised vision statement then hand to the Planning Board for comments and edits. Does that need to be in group discussion?



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Ms. Waygan stated there is nothing in the packet to review. She isn't sure if they had a chance to listen to the last meeting, and if not she instructed them to watch. There were some important things that were discussed, and it's very important to listen to what happened. She was promised they would have materials to review beforehand so things that happened before will not happen again. She doesn't know how to express but she feels like she and the residents of Mashpee haven't been listened to. This spilled over into the Select Board and it took up over an hour in the meeting, some critical stuff. It touched into the heart and soul of this town and we really made progress as a group. Today is May 4th, the next event is in 10 days. She has no materials to look over for review. This made the regional newspaper. She asked if they read the Cape Cod Times article. She does not want to have to repeat it, but something big happened. She isn't seeing a changed map. Are we going to have a special meeting next week?

Mr. Lehrer assured her they are committed to making sure the Planning Board vets all materials. The question for the Board is with May 14th being the Community Systems event and the next Planning Board meeting is May 18th, would you consider a special meeting?

Ms. Wells said this is more of a listening session for chief stakeholders, unlike the visioning session, this is really about gathering. She doesn't anticipate much material to review.

Ms. Waygan inquired how they could have a listening session when they aren't listening to the town.

Mr. Balzarini was not at the kickoff event, but according to the residents, they didn't feel listened to. He stated change the map to include the Tribe. He also encouraged them to watch the video Ms. Waygan is referring to.

Mr. Lehrer felt there was a lot of progress made and felt motivated and inspired to conduct a thoughtful and thorough process. He does not think it's fair to consider the consultants have no intent or there is a perception that they are not listening.

Ms. Waygan stated if not them then who is not listening? Someone is not listening. The issue from the last meeting when she listed off several items. Nobody has changed course or made any change to correct. Tell me, how are we going to change based on the last meeting? Just go to action steps.

Mr. Lehrer commented the first action after the meeting was the accomplishment of the map series.

Ms. Waygan would like to pull up the map. It needs to be in the official public packet.

Mr. Lehrer stated the documents in the packet are just a summary of the kickoff.

Ms. Waygan inquired where the map was located that showed the Native American resources.

Mr. Lehrer pointed to the pink markings on every single map.



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Ms. Waygan is also looking for the materials for the next workshop.

Mr. Lehrer has heard loud and clear and he wants to correct this. He did not consider the fact that the scheduled meeting on May 18th is before the May 14th event. He is owning the blame for the scheduling error. They can have a special meeting. He also noted of the consultants are not ignorant to the realities and the occurrences of the previous meeting. He reminded Ms. Wells to watch the last Planning Board meeting.

Mr. Martin assured everyone that they are very concerned and they hear everything. Mashpee has been a town that has spent years doing work. They are very familiar with David Weeden and meet with him independently. They watched the Select Board meeting and saw the issues and understand tensions were high. They are committed to listen to any survey or interaction and paperwork is vetted. They cannot produce materials if it is solely a listening session. It may only be an agenda. Again, they will follow the direction of the Planning Board. The map was fixed they are doing everything they can to hear everyone who has a voice. They need to move towards working together, if at any time you want to call him and speak directly to him his number is 617-899-6194. They have talked exhaustively and hope to meet that goal of where to go. There is no mal intent here and he is available to listen and produce documents and do their best to produce them in a timely fashion, but they need time to do it.

Mr. Fulone stated they will need to see an agenda, or anything that will be handed out. We understand it may not be much as it's just a listening session. Is there time between now and May 14th or does the event need to be moved. He would prefer to not move the date.

Mr. Lehrer's number one goal for this process is for it to be functional. He is looking to the Board for direction, he is not going to facilitate something that is dysfunctional. Is it critical that we move the meeting, he doesn't think so, but he is not the Planning Board. He doesn't want to lose the ability to carry through the progress that has been made. Do these materials need to be reviewed in a public meeting or can he provide it in an e-mail.

Ms. Waygan would like to discuss the materials in public session.

Mr. Fulone is asking if the Board wants a public session to review the agenda and materials at the next listening session.

Mr. Lehrer stated this should be a conversation for clarity. Do surveys need to be vetted? What's the threshold?

Ms. Waygan commented that everything needs to be at this point. This place could have imploded, and we got ourselves back on track. If the next session has a faux pas, we don't know what will happen. We can get together and it can take a half hour to an hour. We are going to have to do this at a special meeting.



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Mr. Fulone asked how much time Weston & Sampson would need for discussions of materials and agenda.

Mr. Lehrer asked the consultants if there was enough time to produce those materials or should they consider moving the date.

Mr. Martin stated they can have the draft ready for this Friday.

Mr. Fulone suggested having a special meeting next Wednesday.

Ms. Barbee stated in her conversations with Mr. Lehrer, she was told copies of the old plan and surveys would be ready for approval as well as additional meetings. Those are two items that people discussed which was agreed would happen.

Mr. Fulone stated if the materials were received by Friday and reviewed by the Board, we could provide comments for Monday and hold a special meeting next Wednesday.

Ms. Waygan stated she can take time off Wednesday or Thursday morning.

Mr. Fulone commented he is also available for Wednesday or Thursday morning.

Mr. Lehrer will review the calendar to hold a special meeting next week to proceed with the next date for the Community Systems. He inquired about the Board finding time to have a working session. His thought would be for the first meeting in June, and additionally holding a work session relative to exiting producing all of the draft surveys with a draft schedule for release.

Mr. Fulone would like to schedule that for June 1, 2022. He also stated the newsletter that went out was well done and very helpful. To Ms. Barbee's point, how much of what was asked for, i.e. the existing plan, updated maps, etc., how much of that is uploaded?

Mr. Lehrer will make copies available at the library workshop. He will give a thorough review of action plans for each element. It's a heavy lift and he has already made department heads aware he will conduct thorough interviews to go over records. It is underway and he is planning on having drafts of those assessments for the June 1st meeting. There is a transportation element, coastal resources, open space plan, housing production, those are the significant chapters in the scope that have not been updated. The Human Services chapter is simple. Those are his immediate focus.

Ms. Waygan asked if it was feasible to do all those topics in one night.

Mr. Lehrer will have provided assessments by then, it gives him a month.

Ms. Waygan asked what the session on June 1st would cover?



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Mr. Lehrer commented we need to review existing conditions, break them down into logical categories. Do any if the consultants have thoughts on this?

Ms. Wells stated it would be helpful if everyone came to that session already having read and commented on conditions. There's a point where we aren't looking back anymore, but we start looking forward. Everyone has already digested existing conditions. The work in the next sessions should be about the work going forward.

Mr. Fulone restated it is our homework to review the existing conditions. The June 1st meeting will be lengthy, should we start at 6:00p.m.?

Mr. Lehrer reminded the Board he has only heard from one Board member regarding the existing conditions.

Ms. Waygan would like to match the chapters that fall under Community Systems. The listening session on May 14th will be fresh in our minds.

Mr. Fulone instructed people to visit the site as the maps and survey results are loaded.

Ms. Waygan wanted a reminder of what chapters from the old plan he is prioritizing.

Mr. Lehrer noted transportation, coastal, and open space are immediate. Second tier is housing, economic development, public facilities, and public safety. The heritage reservation won't affect Human Services. Energy is ranked mid-tier.

Mr. Fulone reiterated a working draft will be available by Friday, comments need to be made by Monday, and we will meet either Wednesday or Thursday at 9:00a.m.

Ms. Wells noted that now through August there will be something happening every week.

Mr. Hansen asked Mr. Lehrer about the decision made on Monday at the Town Meeting affirming the town center is located in this vicinity. Could that be shown on the large map, identifying this as the town center?

Mr. Lehrer commented he will make sure there is a star there.

CHAIRMAN'S REPORT

Chairman thanked Mr. Callahan for his service on the Planning Board as this is his last meeting.

Mr. Callahan thanked everyone for the learning opportunity. He wished everyone well and good luck with the LCP.



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TOWN PLANNER REPORT

**Update on Popponeset Overlay District **

No update.

Floodplain Bylaw amendments

No update.

Cottage Court Zoning

Mr. Lehrer provided updated graphics for conversations relative to the proposal. He has a strong grasp of the dimensional criteria and reviewed best practices for Cottage Court typologies. With a little dialogue he hopes the draft ready for scrutiny can be made avail be in the next meeting or two. This is not a goal pertaining to a single site but will be able to accommodate other similar developments in the future.

Jack McElhinney, Attorney for Southworth Mashpee Properties, is here tonight with the Chief of Development Troy Miller. He approached Mr. Lehrer a couple of months ago. They have a site with five acres, it is the hole in the donut in the property. It is not part of the Special Permit and it is located in the middle of the 400 acres. He approached Mr. Lehrer as a way to explore ways to develop the more intensive part of R3 zoning. Currently they are permitted for 3 single family homes. He would like to do something better fit for the town and Willowbend. The goal was to work with Mr. Lehrer to find a template for Willowbend but also as a way to infill development on orphaned parcels around town.

Troy Miller, CDO for Southworth commented that the existing home was on a septic. They will take this property and put it on wastewater. In talking with Mr. Lehrer, creating a different product and form that could be useful throughout the town. They could use this as a model that will achieve more walkability and shared open space. There is a shared village green. It provides an opportunity to think about housing at different levels in a form that is attractive and able to provide more density in areas. He is happy to take questions or comments on the style.

Mr. Balzarini asked if there was access to the golf course. He doesn't see these as affordable housing, but is there any chance that off-site you can do affordable. We are giving you more housing, he would like the town to get something in return.

Mr. Miller stated they will have access to golf and it will be connected via cart path to the rest of the community.

Mr. McElhinney stated there would be an in lieu payment, it is not his intent to do an affordable project, but they both recognize the need and understand that will be part of the equation, they are open to that.

Mr. Lehrer commented that is something to be discussed down the road. He just wanted to provide a general update of where we are and let you know it is his intent to work on this more thoroughly.



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Mr. Miller wanted to address affordability, and as an employer they recognize the need for that. He is happy to talk about an offsite component and happy to talk about opportunities for that workforce and affordable component.

Mr. McElhinney reminded the Board of their recent purchase of the Santuit Inn and their intent to make it workforce housing.

Mr. Miller alluded to the project at Willow Circle where they took a house or two and tied it into the wastewater.

Mr. Fulone inquired the rough square footage.

Mr. Miller commented 1,600 s.f. and two story. These provide for slightly different floor plans.

Mr. Lehrer discussed it is his intent to provide a proposal that focuses on form based approach. It will define minimums and maximums. He encourages range of dimensions relational to the street and architectural features consistent with the floor plan of the structure. This will provide flexibility to accommodate not only Willowbend but other parcels.

Ms. Waygan is concerned about increasing density without proffers for the town. This could be done on Chapter 40b, but 20% of units would be affordable. You want to zone up and she wants to see something being zoned down. We need to think about open space. She is getting a lot of feedback from people asking her why, during this water crisis, the Planning Board would even think about increasing density. You have a plan to deal with flushes and nitrogen, but you need to get this through Town Meeting with a 2/3 vote. Open space and affordable housing will get it through.

Mr. McElhinney appreciates the heads up and is aware reclaiming some areas such as bogs to revegetate improvement to water quality.

Ms. Waygan clarified the use of public open space. There is some work being done, check with Conservation, to restore wetlands and rivers. There are some cool projects that also fall into municipal vulnerability preparedness. Helping the town needs in combating the impacts of climate.

Mr. Miller had conversations and mitigations with Conservation, and the idea of taking these bogs to naturalize stream conditions are better for the overall eco system.

COMMITTEE REPORTS

Cape Cod Commission-

She went to the subcommittee meeting on Twin Brooks, it's very interesting. The next meeting is May 17th. It was brought up about lands being impacted, already perceived as open space, such as ball fields, and some people



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Community Preservation Committee-

Design Review-

Plan Review-

Environmental Oversight Committee-

Historic District Commission-

Military Civilian Advisory Council-

saying redevelopment and some saying new development.

We will see how that plays out.

Town Meeting approved \$50,000 for HPP and all other CPA applications.

Route 151 Shell station, the owners are taking on a family convenience, signage approved.

Conventional contractor bay building for landscaper, simple design. 100% compliant with zoning with Special Permit from ZBA. He will be recommending approval.

No Meeting

No Meeting

There was a meeting, but no report.

Mr. Pesce wanted to note Willow Circle has been cleared, the building is 80-90% demolished. They will be conducting inspections next week for sewer. Also, Casper Circle is finishing with a new road and sign. Gravel will be placed on Monday and Tuesday with paving in the next couple weeks.

ADJOURNMENT

MOTION:

Mr. Callahan made a motion to adjourn the meeting of the Planning Board at 8:32p.m. Seconded by Mr. Balzarini. All in favor.

The meeting ended at 8:32p.m.

Next Meeting: Special meeting Thursday, May 12, 2022 at 9:00a.m.

Next Regular Meeting: Wednesday, May 18, 2022 at 7:00p.m.

Respectfully Submitted,

Christine M. MacDonald
Board Secretary



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LIST OF DOCUMENTS

Additional documents may be available in the Planning Department.

- Town of Falmouth Notices
- Town of Sandwich Notices
- Town of Barnstable Notices
- March 2022 Discharge Monitoring Report for South Cape Village – N= 4.0
- February 2022 Discharge Monitoring Report for South Cape Village – N= 3.6
- January 2022 Discharge Monitoring Report for South Cape Village – N= 2.1

DRAFT



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**Mashpee Planning Board
Minutes of Meeting
Wednesday, May 12, 2022 at 9:00AM
Mashpee Town Hall - Waquoit Meeting Room
16 Great Neck Road North
Mashpee, Ma 02649**

Call-in Conference Number: (508)-539-1400 x 8585

Present: Chairman John Fulone, Karen Faulkner, Dennis Balzarini, Mike Richardson, Robert (Rob) Hansen

Also Present: Evan Lehrer – Town Planner

Virtually Present: Mary Waygan, Caroline Wells – Weston & Sampson, Ashley Sweet – Weston & Sampson, Blake Martin – Weston & Sampson

CALL TO ORDER

Chairman Fulone called the special meeting of the Planning Board to order at 9:00A.M.

Mr. Fulone thanked the Consultants for delivering the materials in a timely manner. He also welcomed and congratulated Mike Richardson and Karen Faulkner, the newly elected members of the Board.

Mr. Lehrer stated his department sent out invitations for stakeholders and the community at large.

NEW BUSINESS

Go over Agenda for the Community Systems workshop

What are Mashpee's Community Systems?

Mr. Lehrer discussed he is following the framework laid out by the Cape Cod Commission's RPP, they will focus the engagement around that framework. The education up front will be crucial and it will be a way to clarify the intentions and goals of the day.

The meeting will start with an understanding of what the conversations will be centered around: people, housing, cultural, quality of life, etc. He would like to lead the meeting by giving a presentation with another Board member as the Planning Board is leading the process so it is a good way to welcome folks.

This is not a complex program, just a way to focus discussions with stakeholders and residents on the Community Systems.



Town of Mashpee

Planning Board

16 Great Neck Road North
Mashpee, Massachusetts 02649

Ms. Wells doesn't know how many people will be there, she is hoping acoustics are better at the library. She will assume 50-60 attendees. If there are more or less it can be accommodated. Tables of 5-7, they can handle up to 15 if need be.

Ms. Wells stated they are getting 20-30 sign ups per day for the website. The first session is about the identification of Community Systems and it is very broadly interpreted. Recreation or cultural, doesn't necessarily have to be what exists, it could be a need. The high school age students were particularly good at identifying needs.

The second goal would be to get people thinking about the need for each topic identified. This is called a force-field analysis, a need we see for the community that we either have or we don't. What does Mashpee have to support that, and what is resisting that system? Also, what is in place that impedes on this system from doing well? She is hopeful for positive community dialogue.

Mr. Lehrer noted the library is closed on Saturday. They will be taking advantage of the event space, conference room, main lobby, children's area, and atrium. He will go over the prep in the event there will be more people. The presentation will occur in the event room then breakout throughout the first floor.

Mr. Lehrer has the Cape Cod Coffee all set for refreshments.

Mr. Fulone asked for questions about the agenda in front of them.

Mr. Lehrer will start by getting into the concept of systems relating to the Regional Policy Plan and educate people on why they are using this framework and what it means. He will go over what Community Systems are, and briefly touch on the two other systems, then identify the goals of the workshop.

Mr. Richardson asked what the role of the Planning Board should be.

Mr. Lehrer commented the Planning Board acts as stewards of the plan. He advised members to be cognizant of their role in the plans development. It's not that you cannot or should not participate. There will be less facilitation of staff, so Board members may be needed to assist in taking notes. Your jobs will be to monitor, remain active listeners, and stay cognizant of participation.

Mr. Lehrer stated the merging of chapters will be provided in the next packet. He will be merging Municipal and Facilities, Public Safety, and Health and Human Services all to one chapter. All of the data should be separate. People want to know what the action plan is, what the community engagement was, and its findings. Data needs to be accessible and easy to understand. The plan should be focused solely on the goals instead of technical data and burying action plans deep in the text. It is important we keep structured around the framework instead of battling the Commission about compliance. The Commission simplified their RPP and the way we structure the engagement is consistent. People also assume housing is a Built System, it's a Community framework. It touches on



Town of Mashpee

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16 Great Neck Road North
Mashpee, Massachusetts 02649

cost of living, affordability, diversity, and housing stock. This is one thing we will make clear and continue to discuss.

Ms. Waygan stated as long as you keep pushing out the Community Systems is housing, people, economy, cultural, heritage, and recreation. They are used to individual chapters, you might want to add the three systems concepts after you do the three systems. Have that short list of concepts for them because people may be sidetracked.

Mr. Fulone asked if it would be helpful to discuss those in the presentation.

Ms. Waygan asked if there was a takeaway sheet in case anybody missed the meeting.

Ms. Wells did create a cheat sheet for people, as the Systems concept is hard to wrap around. Take the cheat sheet to combine with a feedback form. She is proposing to exclude the map and expand space for people to write more text.

Ms. Waygan knows five people who will not be able to attend. She would be grateful if there could be takeaways. She also had requests from people to have the PowerPoint presentation printed out.

Mr. Fulone asked what is needed for Saturday to be a success.

Mr. Lehrer noted turn out and participants are crucial to have productive dialogue. Come with the intent for meaningful contributions.

Mr. Richardson stated that after the session people could comment on their feedback. Then we could share some of that feedback with *The Enterprise*.

Mr. Lehrer identified driving people to the website as being the best way to communicate directly and offer any feedback on elements or the process. He is pleased with the traffic and happy about the mailer that went out last week. Outside of surveys and workshops, if you have a thought or idea and you don't have a way to get there, send an e-mail or comment on the site.

Mr. Fulone inquired if the town had a resident email list.

Ms. Waygan has been taking the mailer around to stores and getting them to post it. It doesn't have any town seal so she had to really convince one store it was the town of Mashpee.

Mr. Lehrer also mentioned the approval of the new town seal.

Mr. Hansen asked about the public stakeholders, are we able to send each one an e-mail invite, which could trickle down to sub stakeholders.



Town of Mashpee

Planning Board

*16 Great Neck Road North
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Mr. Lehrer said it's already been done. Aside from adding the new town seal, are there any other issues? Also, the Board had discussed a working session, he wanted to give copies of items to prepare for those conversations. Some items given out today are for your review to later be discussed in the working session.

Mr. Fulone asked for a motion to proceed with the documents.

MOTION:

Mr. Richardson made a motion to approve the use of the documents for the workshop on May 14, 2022. Seconded by Mr. Balzarini. All in favor.

ADJOURNMENT

MOTION:

Mr. Balzarini made a motion to adjourn the meeting. Seconded by Ms. Waygan. All in favor.

DEFINITIVE SUBDIVISION PLAN

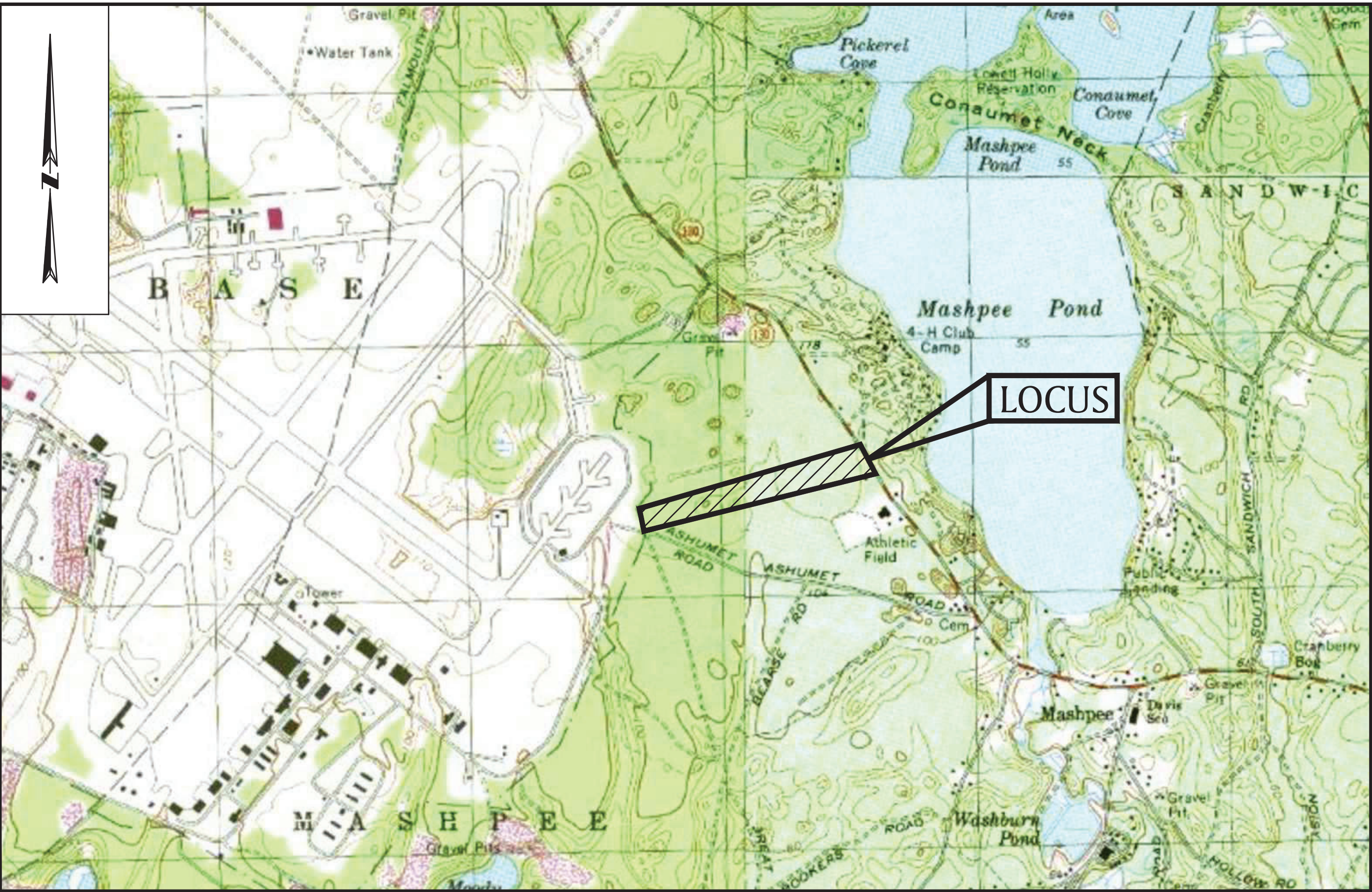
LEAMAR DRIVE

532 MAIN STREET (ROUTE 130)
MASHPEE, MASSACHUSETTS

AUGUST 27, 2021

REVISED: APRIL 29, 2022

ZONING COMPLIANCE TABLE				
ZONING DISTRICT: C3, I1, & R5				
	C3	I1	R5	
MINIMUM LOT SIZE	40,000 S.F.	40,000± S.F.	80,000± S.F.	
MINIMUM LOT FRONTAGE	200'	200'	150'	
MINIMUM BUILDING FRONT YARD SETBACK	75'	75'	40'	
MINIMUM BUILDING SIDE YARD SETBACK	20'	50'	15'	
MINIMUM BUILDING REAR YARD SETBACK	20'	30'	15'	
LOT COVERAGE	20%	25%	20%	
MAXIMUM BUILDING HEIGHT (STORIES)	2-1/2 STORIES	2 STORIES	2-1/2 STORIES	
MAXIMUM BUILDING HEIGHT (FEET)	35'	35'	35'	



LOCUS MAP

SCALE: 1" = 1,200'

INDEX OF DRAWINGS

- 1 TITLE SHEET
- 2 OVERALL LOT PLAN
- 3-4 PLAN & PROFILE
- 5 EROSION & SEDIMENT CONTROL PLAN
- 6 SIGHT DISTANCE & TURNING PLAN
- 7-8 DETAIL SHEETS

PREPARED FOR:

MARCELLO MALLEGNI
80 AIRPORT ROAD
HYANNIS, MA 02601



4/29/22

ISSUED FOR PERMITTING
NOT FOR CONSTRUCTION

PREPARED BY:

 **BSC GROUP**
349 Main Street - Route 28
W. Yarmouth, Massachusetts
02673

CURRENT OWNER: FORESDALE ROAD, LLC

TITLE REFERENCE: DEED BOOK 24390, PAGE 193

PLAN REFERENCE: PLAN BOOK 272, PAGE 49

ASSESSORS MAP: 26
PARCEL: 6

ZONING DISTRICT:	C3	I1	R5
SETBACKS:	FRONT 75'	75'	40'
	SIDE 20'	50'	15'
	REAR 20'	30'	15'

MINIMUM LOT SIZE: 40,000 S.F. 40,000 S.F. 80,000 S.F.

MINIMUM FRONTAGE: 200' 200' 150'

TOTAL LOT AREA: 18.04± ACRES

TOXIC SUBSTANCE SENSITIVE ZONE: ZONE II (PARTIAL STATE)

FEMA FLOOD ZONE DISTRICT: "X"

OVERLAY DISTRICT: GROUNDWATER PROTECTIVE OVERLAY DISTRICT (PARTIALLY)
LIGHT INDUSTRIAL OVERLAY DISTRICT (PARTIALLY)

TURN AROUND: 120' DIAMETER

HEAD END STREET: 800' (P.B. DECISION ALLOWED)

PROPOSED: 1,804±' PROPOSED

ROAD WIDTH: 50' (INDUSTRIAL)



DEFINITIVE SUBDIVISION PLAN

532 MAIN STREET (ROUTE 130)

IN
MASHPEE
MASSACHUSETTS
(BARNSTABLE COUNTY)

OVERALL LOT PLAN

AUGUST 27, 2021

REVISIONS:

NO.	DATE	DESC.
1	2/11/22	PER PLANNING BOARD
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PREPARED FOR:
CARCELLO MALLENGI
10 AIRPORT ROAD
LYNNIS, MA 02601



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West Yarmouth, Massachusetts
02673
508 778 8919

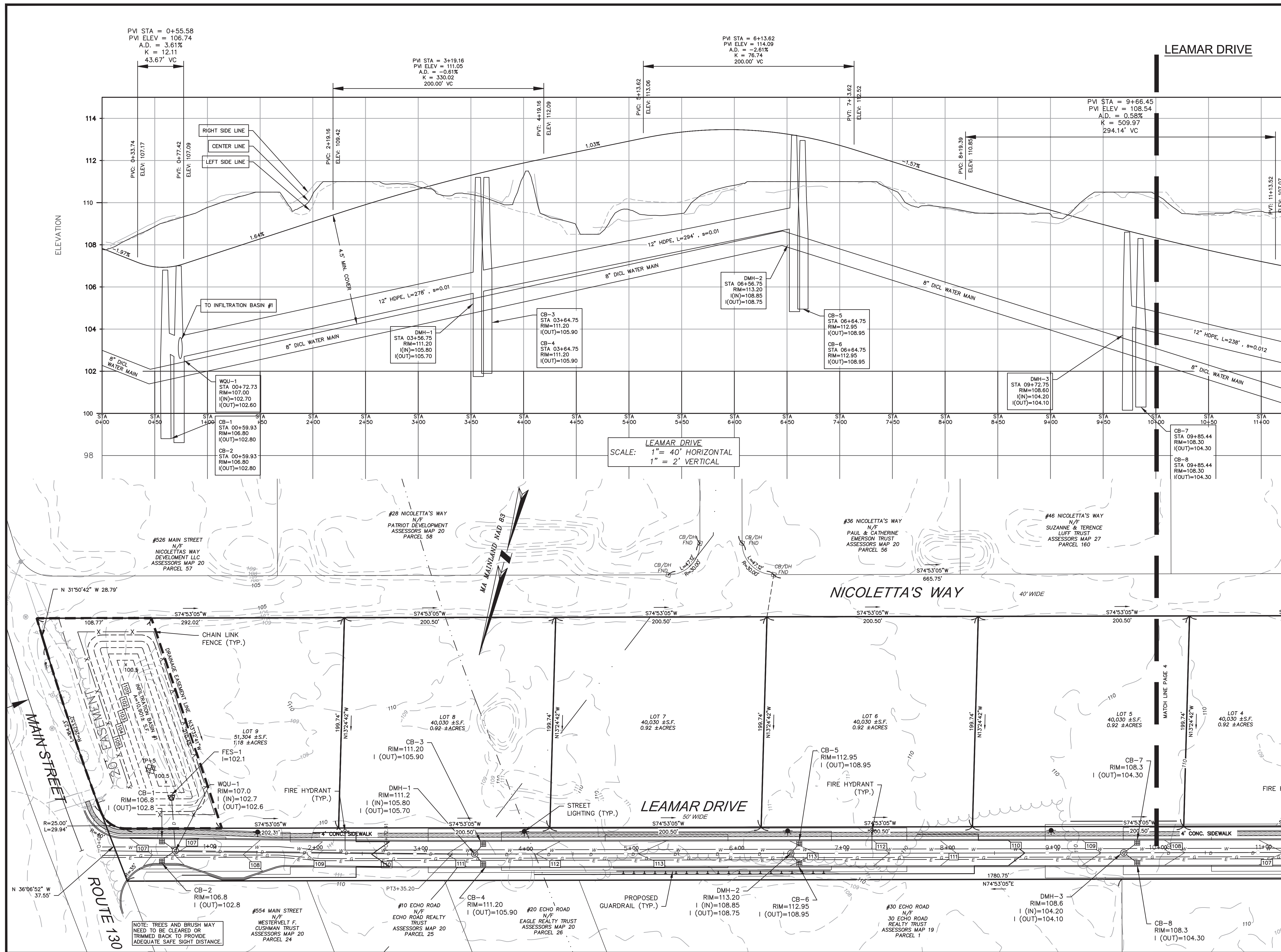
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SCALE: 1" = 100'



FILE: Projects-YAR\50474.00\C\D\50474.00-PP.dwg

JOB. NO: 5-0474.00	SHEET 2 OF 8
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4/29/22

BRIAN G. YERGATIAN
PROFESSIONAL ENGINEER

DATE

DEFINITIVE SUBDIVISION PLAN

532 MAIN STREET (ROUTE 130)

IN
MASHPEE
MASSACHUSETTS
(BARNSTABLE COUNTY)

PLAN & PROFILE LEAMAR DRIVE

AUGUST 27, 2021

REVISIONS:

NO.	DATE	DESC.
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PREPARED FOR:
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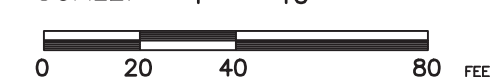


349 Main Street - Route 28
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02673

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SCALE: 1" = 40'



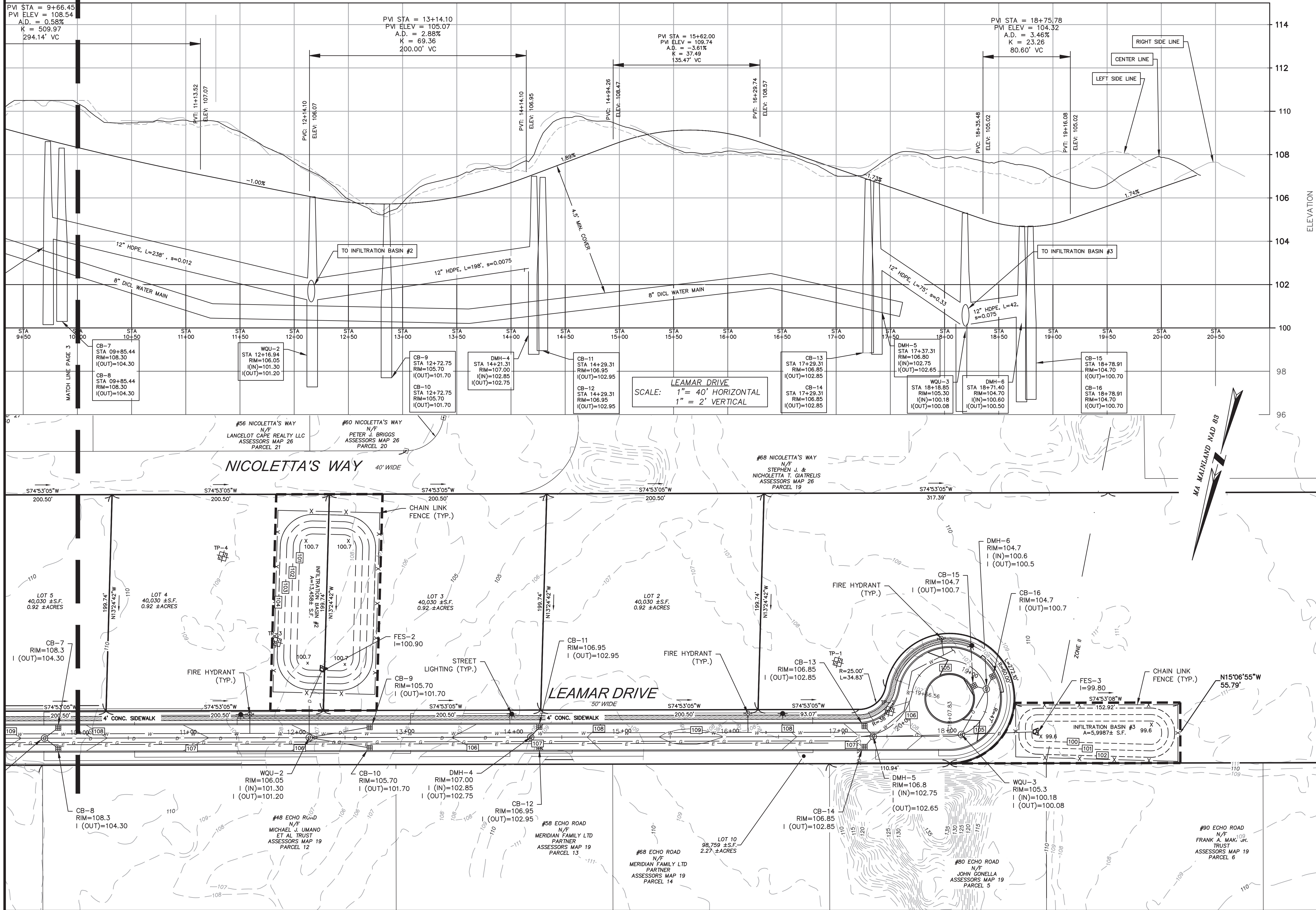
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DWG:

JOB. NO: 5-0474.00

SHEET 3 OF 8

LEAMAR DRIVE



BRIAN G. YERGATIAN
PROFESSIONAL ENGINEER

DEFINITIVE SUBDIVISION PLAN

532 MAIN STREET (ROUTE 130)

IN
MASHPEE
MASSACHUSETTS
(BARNSTABLE COUNTY)

PLAN & PROFILE LEAMAR DRIVE

AUGUST 27, 2021

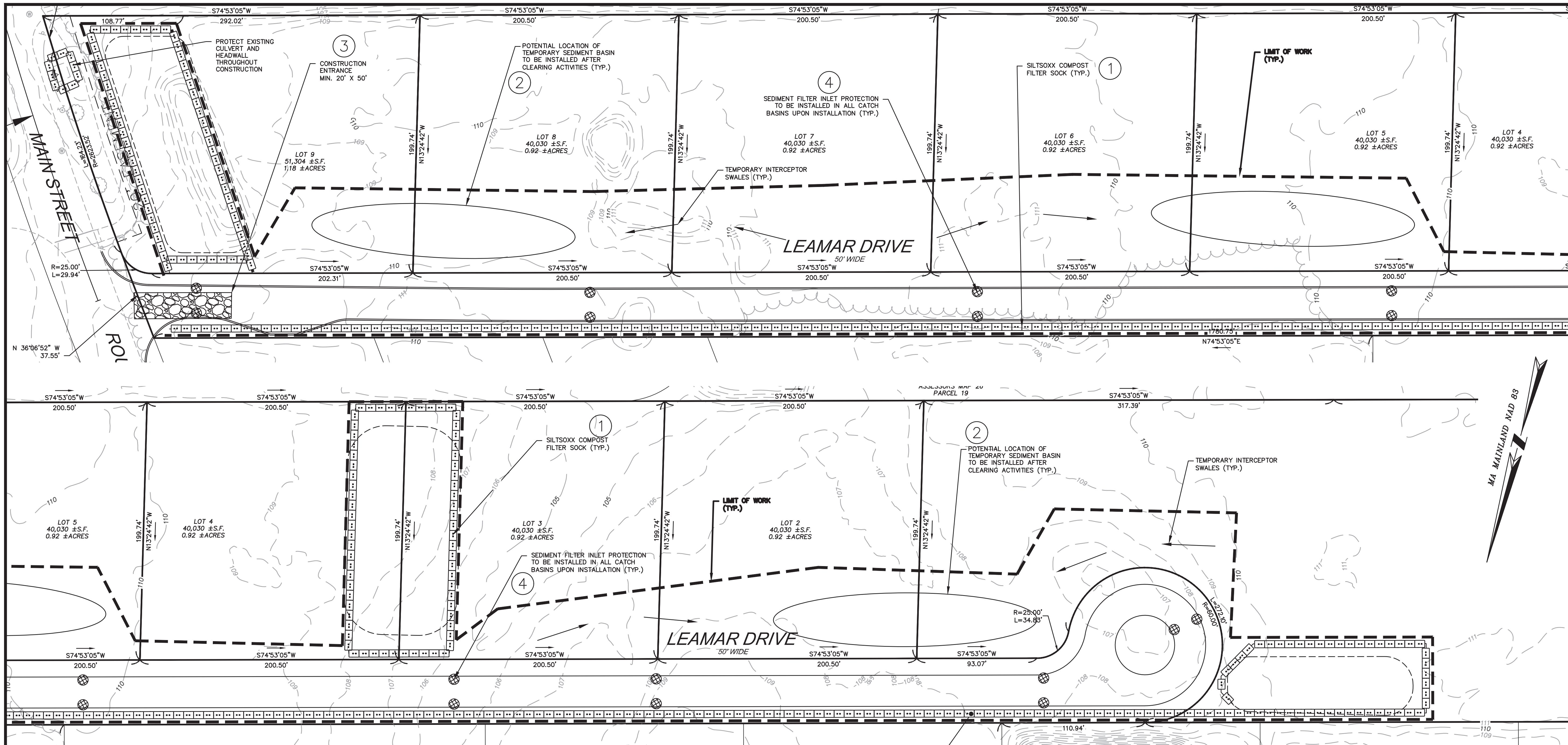
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SCALE: 1" = 40'
0 20 40 80 FEET
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DWG:
JOB. NO: 5-0474.00 SHEET 4 OF 7



LEGEND

- SILTSOXX COMPOST FILTER SOCK
- LIMIT OF WORK

BEST MANAGEMENT PRACTICES (BMPs)

- ① SILTSOXX COMPOST FILTER SOCK
- ② TEMPORARY SEDIMENT BASIN WITH INTERCEPTOR SWALES
- ③ CONSTRUCTION ENTRANCE/EXIT
- ④ SEDIMENT FILTER INLET PROTECTION (CATCH BASINS)

EROSION AND SEDIMENT CONTROL NOTES:

- PRIOR TO ANY LAND DISTURBANCE ACTIVITIES COMMENCING ON THE SITE, THE DEVELOPER SHALL PHYSICALLY MARK LIMITS OF NO LAND DISTURBANCE ON THE SITE WITH TAPE, SIGNS, OR ORANGE CONSTRUCTION FENCE, SO THAT WORKERS CAN SEE THE AREAS TO BE PROTECTED. THE PHYSICAL MARKERS SHALL REMAIN IN PLACE UNTIL A CERTIFICATE OF COMPLETION HAS BEEN ISSUED.
- APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED PRIOR TO SOIL DISTURBANCE. MEASURES SHALL BE TAKEN TO CONTROL EROSION WITHIN THE PROJECT AREA. SEDIMENT IN RUNOFF WATER SHALL BE TRAPPED AND RETAINED WITHIN THE PROJECT AREA. WETLAND AREAS AND SURFACE WATERS SHALL BE PROTECTED FROM SEDIMENT.
- MINIMIZE TOTAL AREA OF DISTURBANCE AND PROTECT NATURAL FEATURES AND SOIL.
- THE CONTRACTOR SHALL SEQUENCE ALL ACTIVITIES TO MINIMIZE SIMULTANEOUS AREAS OF DISTURBANCE. MASS CLEARING AND GRADING OF THE ENTIRE SITE SHALL BE AVOIDED.
- MINIMIZE SOIL EROSION AND CONTROL SEDIMENTATION DURING CONSTRUCTION.
- DIVERT UNCONTAMINATED WATER AROUND DISTURBED AREAS.
- INSTALL AND MAINTAIN ALL EROSION AND SEDIMENT CONTROL MEASURES IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS AND GOOD ENGINEERING PRACTICES OR IN ACCORDANCE WITH THE 2017 EPA CONSTRUCTION GENERAL PERMIT.
- PROTECT AND MANAGE ON AND OFF-SITE MATERIAL STORAGE AREAS (OVERBURDEN AND STOCKPILES OF DIRT, BORROW AREAS, OR OTHER AREAS USED SOLELY BY THE PERMITTED PROJECT ARE CONSIDERED A PART OF THE PROJECT).
- COMPLY WITH APPLICABLE FEDERAL, STATE AND LOCAL LAWS AND REGULATIONS INCLUDING WASTE DISPOSAL, SANITARY OR SEWER REGULATIONS, AND AIR QUALITY REQUIREMENTS, INCLUDING DUST CONTROL.
- SEDIMENT SHALL BE REMOVED ONCE THE VOLUME REACHES 1/4 TO 1/2 THE HEIGHT OF THE EROSION CONTROL DEVICE. SEDIMENT SHALL BE REMOVED FROM SILT FENCE PRIOR TO REACHING THE LOAD-BEARING CAPACITY OF THE SILT FENCE WHICH MAY BE LOWER THAN 1/4 TO 1/2 THE HEIGHT.
- SEDIMENT FROM SEDIMENT TRAPS OR SEDIMENTATION PONDS SHALL BE REMOVED WHEN DESIGN CAPACITY HAS BEEN REDUCED BY 50 PERCENT.
- BMPs TO BE USED FOR INFILTRATION AFTER CONSTRUCTION SHALL NOT BE USED AS BMPs DURING CONSTRUCTION UNLESS OTHERWISE APPROVED IN WRITING BY THE ENGINEER AND THE TOWN OF BOURNE. MANY INFILTRATION TECHNOLOGIES ARE NOT DESIGNED TO HANDLE THE HIGH CONCENTRATIONS OF SEDIMENTS TYPICALLY FOUND IN CONSTRUCTION RUNOFF, AND THUS MUST BE PROTECTED FROM CONSTRUCTION RELATED SEDIMENT LOADINGS.
- SOIL STOCKPILES MUST BE STABILIZED OR COVERED AT THE END OF EACH WORKDAY. STOCKPILE SIDE SLOPES SHALL NOT BE GREATER THAN 2:1. ALL STOCKPILES SHALL BE SURROUNDED BY SEDIMENT CONTROLS.
- FOR ACTIVE CONSTRUCTION AREAS SUCH AS BORROW OR STOCKPILE AREAS, ROADWAY IMPROVEMENTS AND AREAS WITHIN 50 FEET OF A BUILDING UNDER CONSTRUCTION, A PERIMETER SEDIMENT CONTROL SYSTEM SHALL BE INSTALLED AND MAINTAINED TO CONTAIN SOIL.
- A TRACKING PAD OR OTHER APPROVED STABILIZATION METHOD SHALL BE CONSTRUCTED AT ALL ENTRANCE/EXITS POINTS OF THE SITE TO REDUCE THE AMOUNT OF SOIL CARRIED ONTO ROADWAYS AND OFF THE SITE.
- ON THE CUT SIDE OF ROADS, DITCHES SHALL BE STABILIZED IMMEDIATELY WITH ROCK RIP-RAP OR OTHER NON-ERODIBLE LINERS, OR WHERE APPROPRIATE, VEGETATIVE MEASURES SUCH AS HYDROSEEDING OR JUTE MATTING.
- PERMANENT SEEDING SHALL BE UNDERTAKEN IN THE SPRING FROM MARCH THROUGH MAY, AND IN LATE SUMMER AND EARLY FALL FROM AUGUST TO OCTOBER 15. DURING THE PEAK SUMMER MONTHS AND IN THE FALL AFTER OCTOBER 15, WHEN SEEDING IS FOUND TO BE IMPRACTICAL, APPROPRIATE TEMPORARY STABILIZATION SHALL BE APPLIED. PERMANENT SEEDING MAY BE UNDERTAKEN DURING THE SUMMER IF PLANS PROVIDE FOR ADEQUATE MULCHING AND WATERING.
- ALL SLOPES STEEPER THAN 3:1 (H:V, 33.3%), AS WELL AS PERIMETER DIKES, SEDIMENT BASINS OR TRAPS, AND EMBANKMENTS MUST, UPON COMPLETION, BE IMMEDIATELY STABILIZED WITH SOO, SEED AND ANCHORED STRAW MULCH, OR OTHER APPROVED STABILIZATION MEASURES. AREAS OUTSIDE OF THE PERIMETER SEDIMENT CONTROL SYSTEM MUST NOT BE DISTURBED.
- TEMPORARY SEDIMENT TRAPPING DEVICES MUST NOT BE REMOVED UNTIL PERMANENT STABILIZATION IS ESTABLISHED IN ALL CONTRIBUTORY DRAINAGE AREAS.
- ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED AFTER FINAL SITE STABILIZATION. DISTURBED SOIL AREAS RESULTING FROM THE REMOVAL OF TEMPORARY MEASURES SHALL BE PERMANENTLY STABILIZED WITHIN 30 DAYS OF REMOVAL.
- PROPERLY MANAGE ON-SITE CONSTRUCTION AND WASTE MATERIALS.
- PREVENT OFF-SITE VEHICLE TRACKING OF SEDIMENTS.
- DUST SHALL BE CONTROLLED AT THE SITE.
- ALL PREVIOUSLY DISTURBED LAND SHALL BE STABILIZED BY APPROVED METHODS AFTER 14 DAYS IF LEFT UNDISTURBED, THIS INCLUDES STOCKPILES, CONSTRUCTION ENTRANCES, GRADED AREAS AND OTHER CONSTRUCTION ACTIVITY RELATED CLEARING.
- IF WORK IS HALTED OVER WINTER MONTHS THE CONTRACTOR SHALL BE RESPONSIBLE FOR STABILIZING THE AREA THROUGH GROUND COVER PRACTICES.



4/29/22

BRIAN G. YERGATIAN
PROFESSIONAL ENGINEER

DATE

DEFINITIVE
SUBDIVISION
PLAN

532 MAIN STREET (ROUTE 130)

IN
MASHPEE
MASSACHUSETTS
(BARNSTABLE COUNTY)

EROSION & SEDIMENT
CONTROL PLAN

AUGUST 27, 2021

REVISIONS:

NO.	DATE	DESC.
1	2/11/22	PER PLANNING BOARD
2	4/29/22	ENGINEERING REVIEW

PREPARED FOR:

MARCELLO MALLEGNI
80 AIRPORT ROAD
HYANNIS, MA 02601

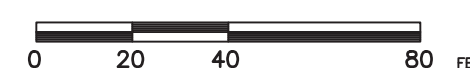


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02673

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SCALE: 1" = 40'

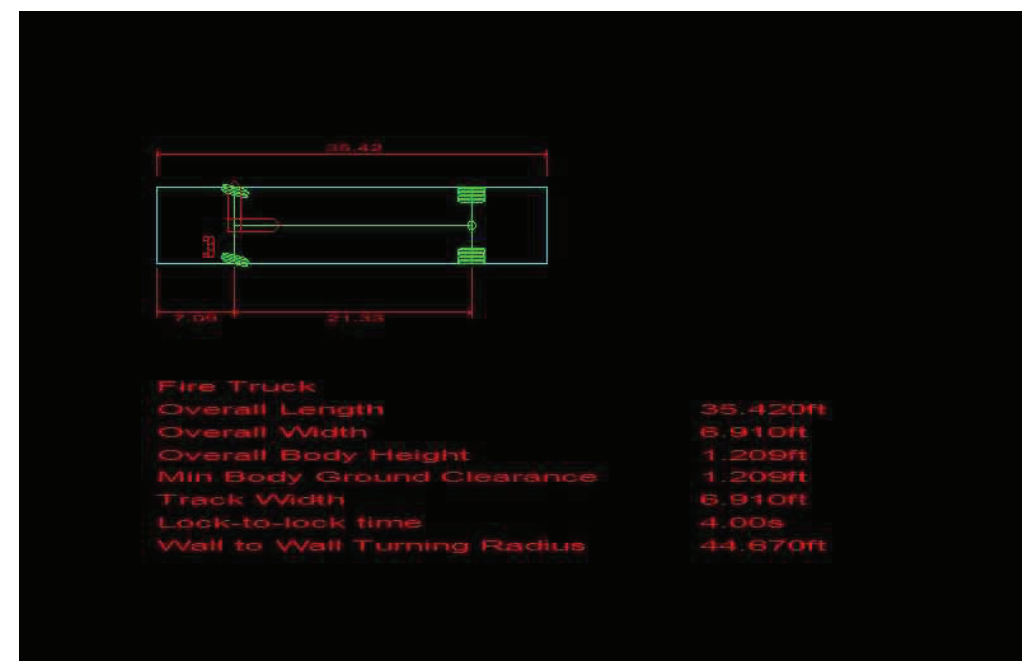
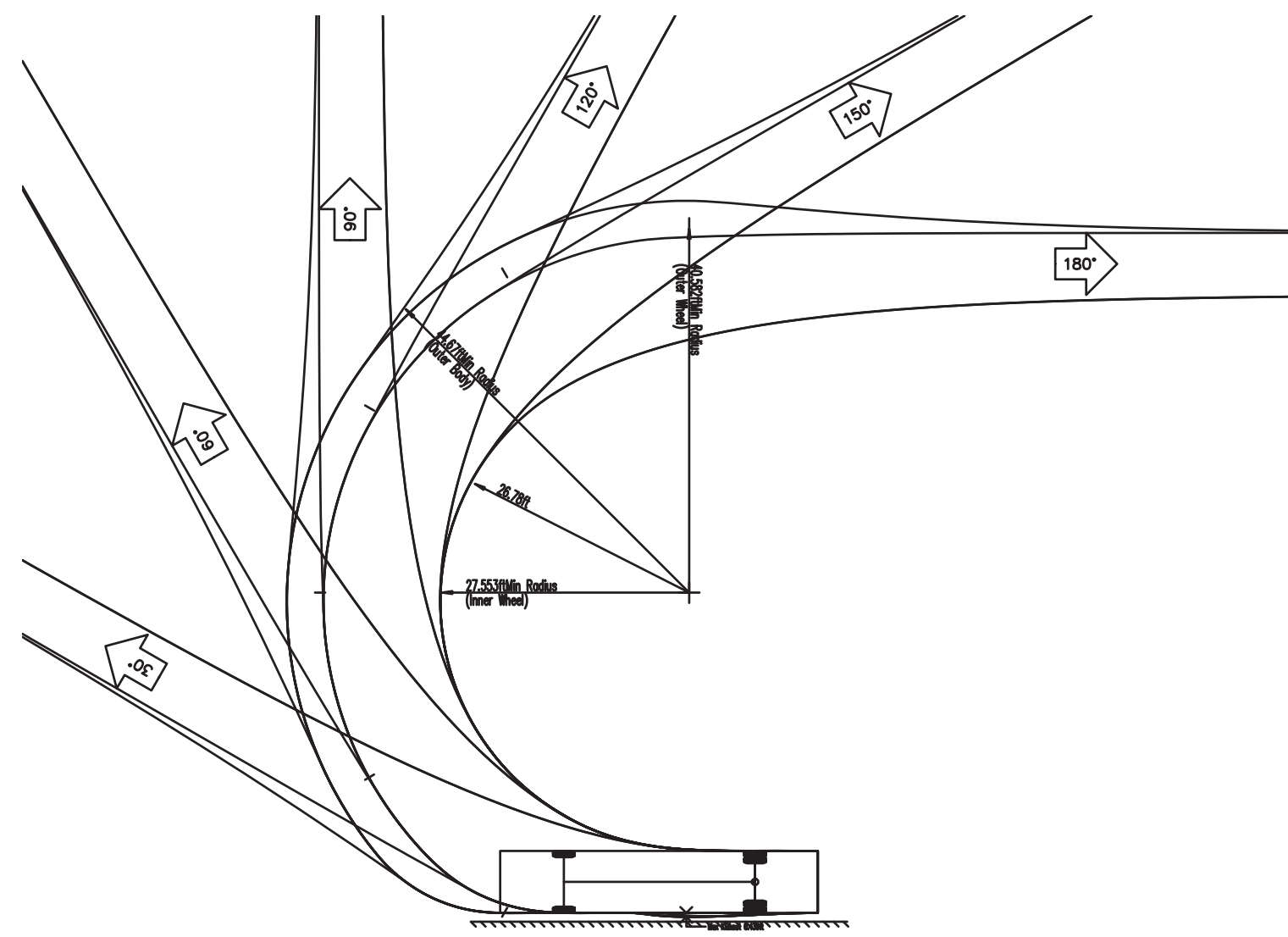
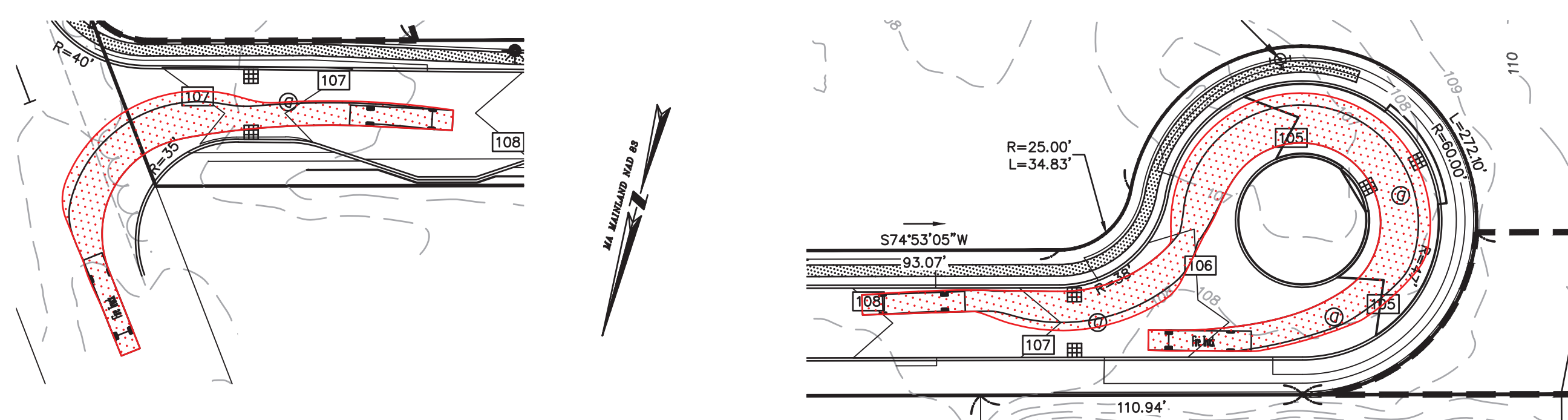


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DWG: JOB. NO: 5-0474.00 SHEET 5 OF 8

FIRE TRUCK TURNING PLAN

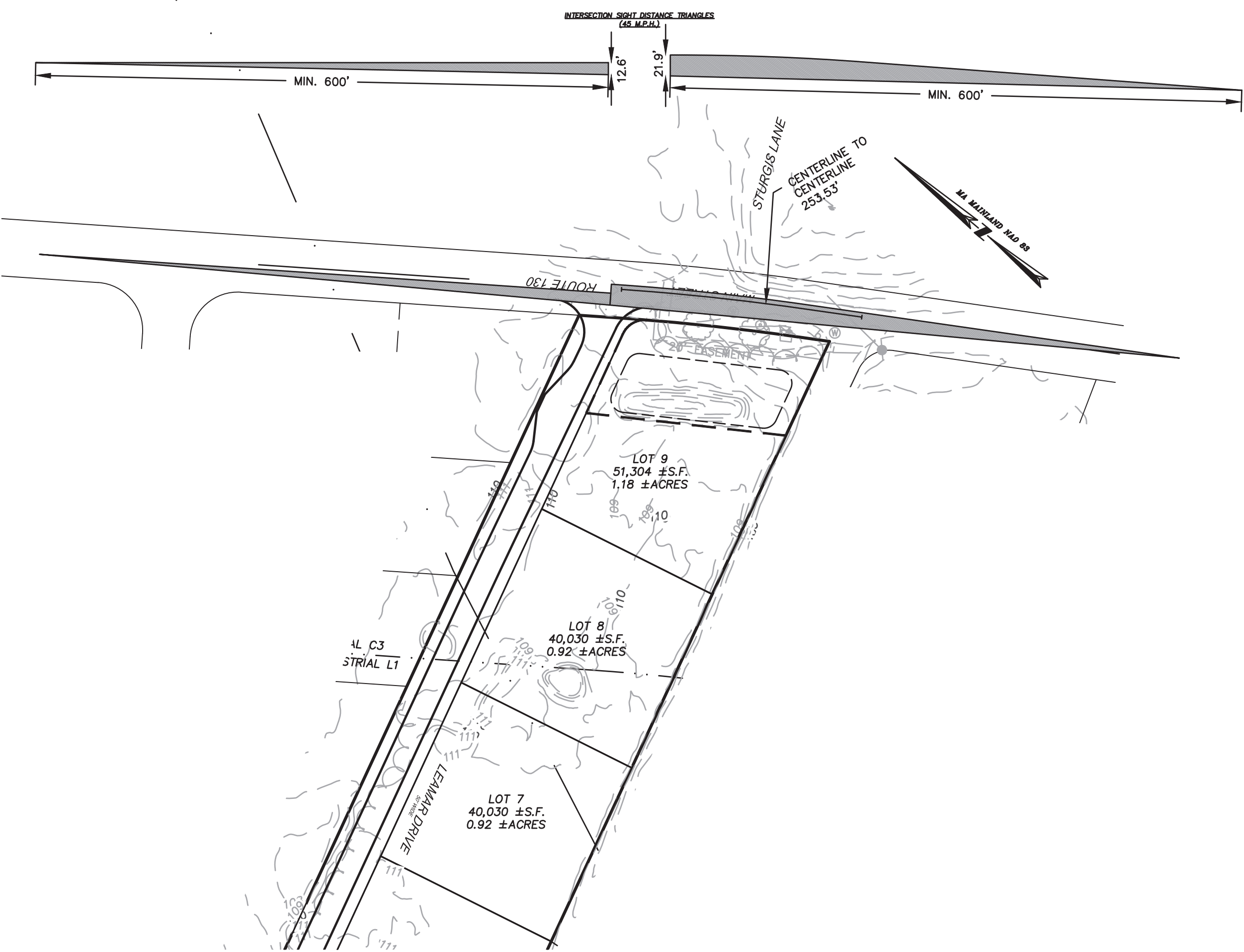
SCALE: 1" = 40'



SIGHT DISTANCE PLAN

SCALE: 1" = 100'

0 50 100 200 FEET



ISSUED FOR PERMITTING
NOT FOR CONSTRUCTION



4/29/22

BRIAN G. YERGATIAN
PROFESSIONAL ENGINEER

DATE

DEFINITIVE
SUBDIVISION
PLAN

532 MAIN STREET (ROUTE 130)

IN
MASHPEE
MASSACHUSETTS
(BARNSTABLE COUNTY)

SIGHT DISTANCE &
TURNING PLAN

AUGUST 27, 2021

REVISIONS:

NO.	DATE	DESC.
1	2/11/22	PER PLANNING BOARD
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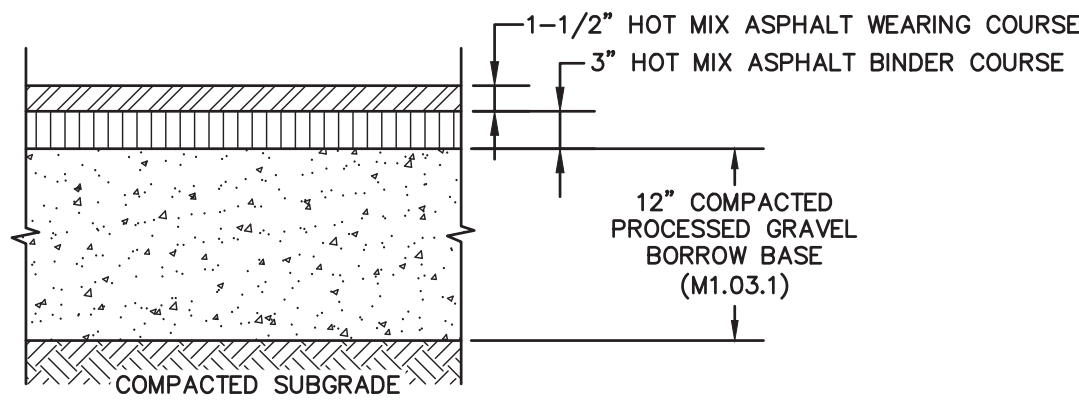
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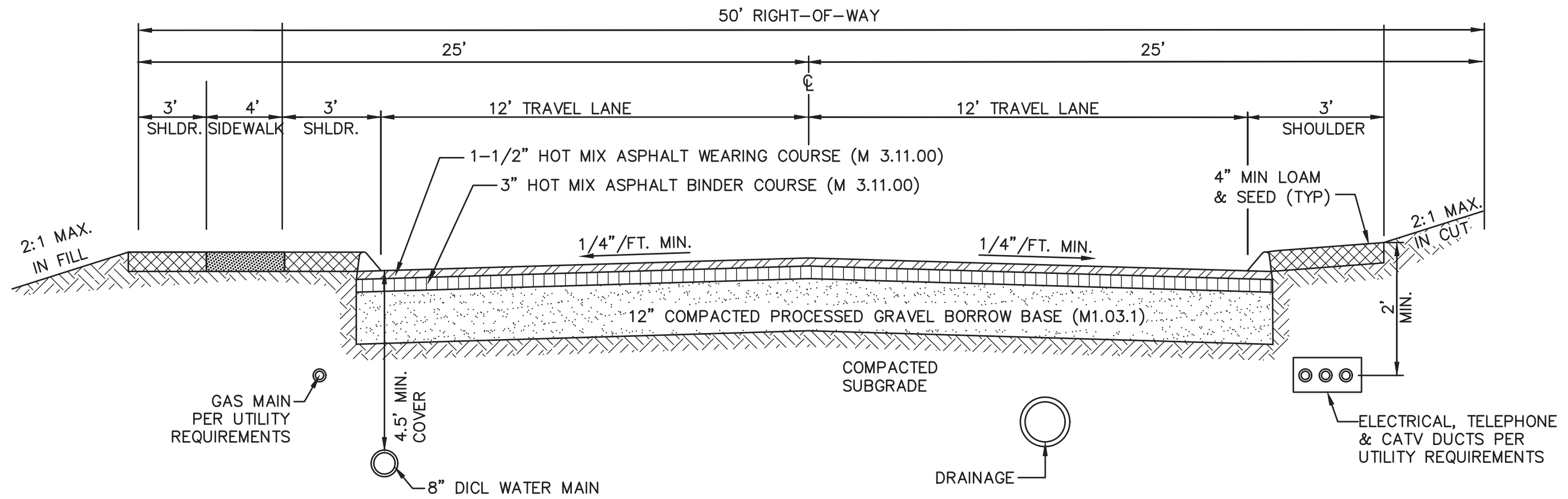
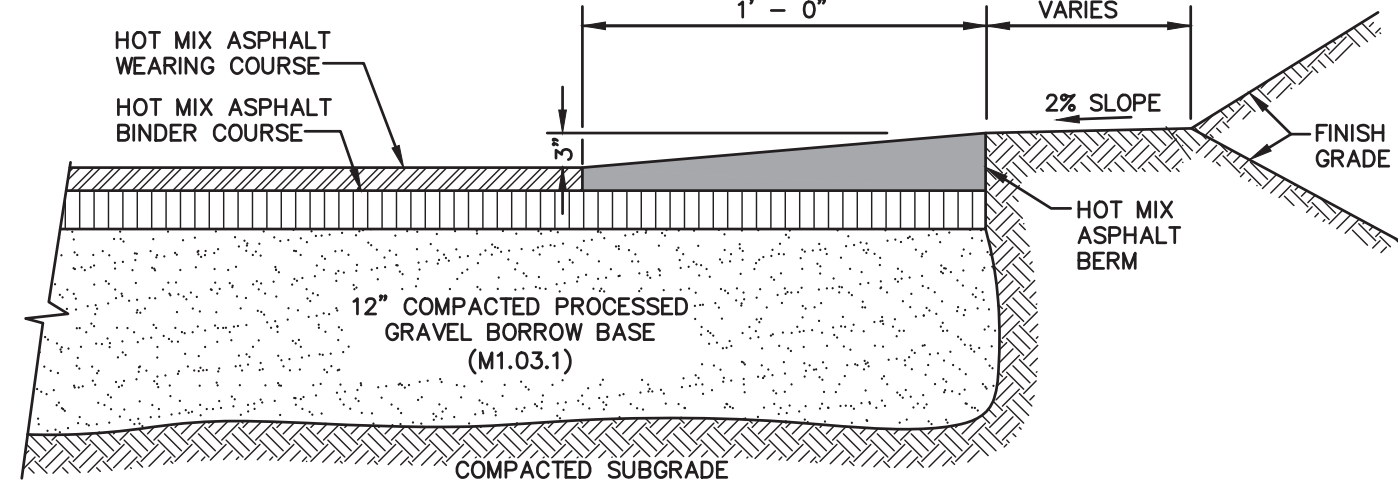
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JOB. NO: 5-0474.00

SHEET 6 OF 8



HEAVY DUTY FLEXIBLE PAVEMENT

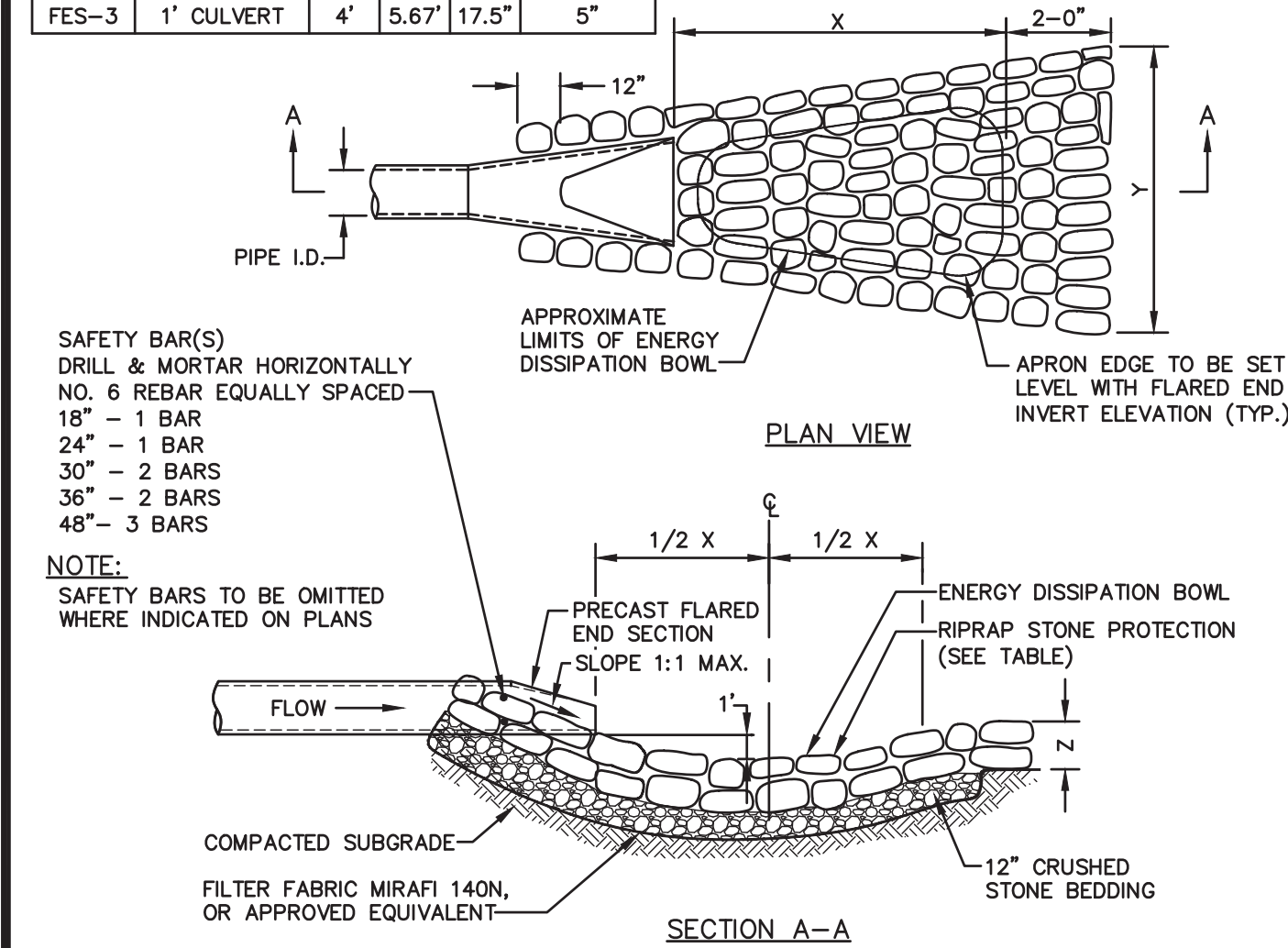


NOTE:
PAVEMENT SECTIONS ARE SUBJECT TO CHANGE AND WILL BE
BASED ON THE RESULTS OF GEOTECHNICAL INVESTIGATIONS

HOT MIX ASPHALT PAVEMENT SECTIONS

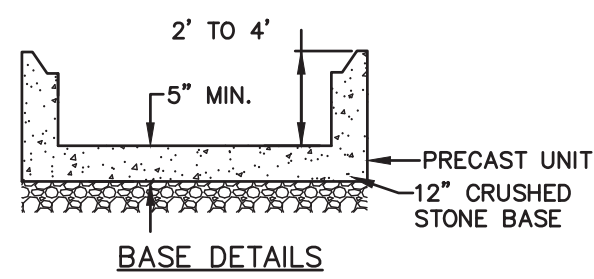
SCALE: NONE

OUTLET NO.		X	Y	Z	STONE DIA. (D50)
FES-1	1' CULVERT	5'	6.33'	20"	10"
FES-2	1.25' CULVERT	8'	8.75'	30.8"	14"
FES-3	1' CULVERT	4'	5.67'	17.5"	5"

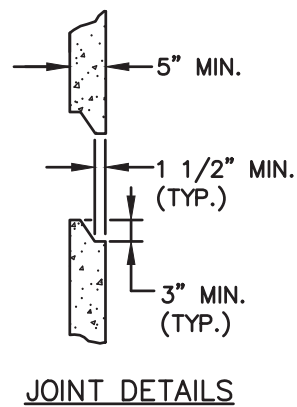


FLARED END SECTION W/ STONE PROTECTION (DISSIPATION BOWL)

SCALE: NONE



BASE DETAILS



JOINT DETAILS

NOTES:

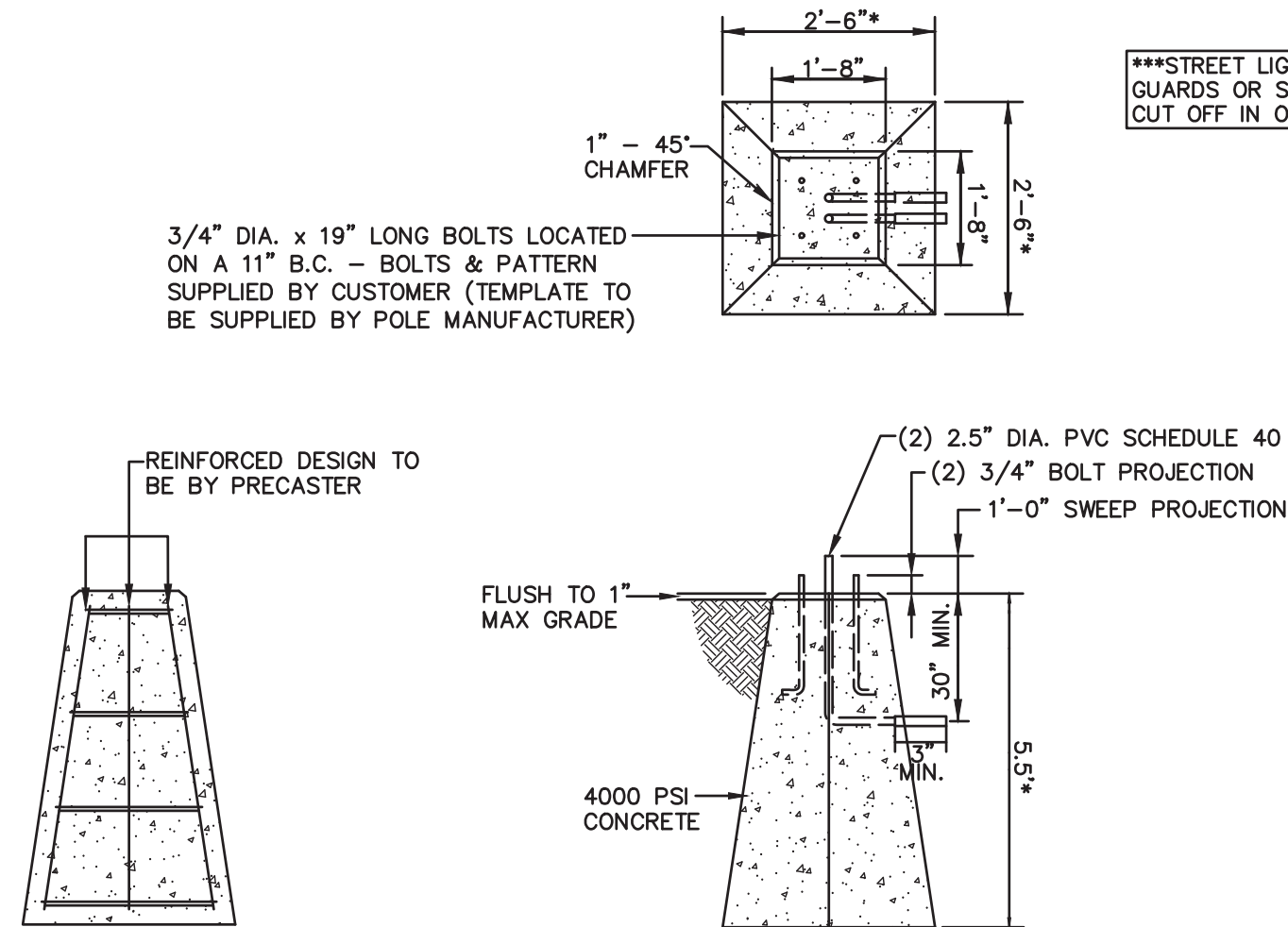
1. ALL PRECAST JOINTS TO BE SEALED WITH BUTYL RUBBER.
2. DESIGN TO CONFORM TO H-20 LOADING.
3. CONTRACTOR HAS THE OPTION TO USE ALTERNATE TOP SLAB.

PRECAST CONCRETE CATCH BASIN

SCALE: NONE

MODIFIED CAPE COD BERM

SCALE: NONE

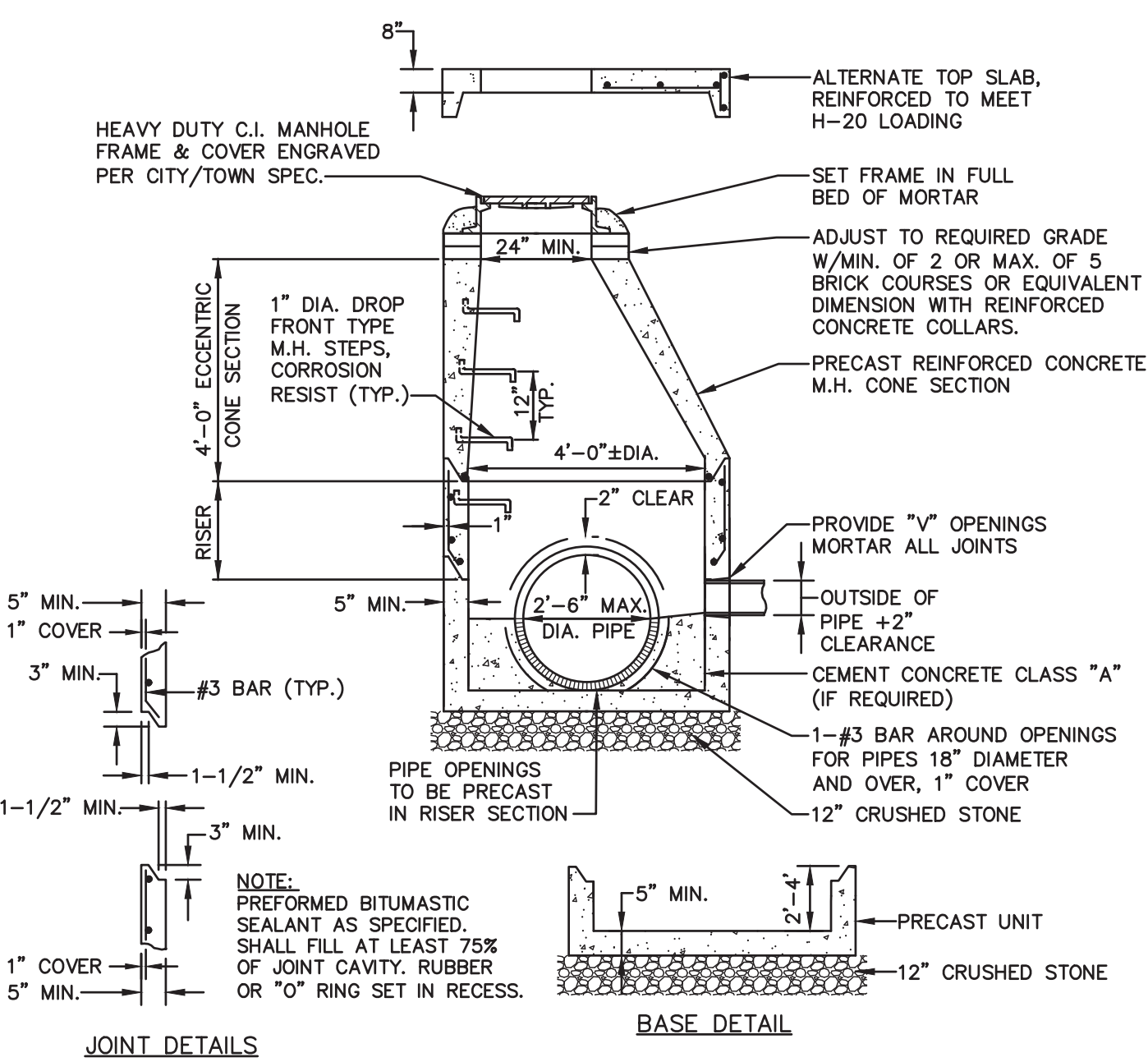


*PROJECT MANAGER TO CONFIRM DIMENSIONS WITH STRUCTURAL ENGINEER FOR SOIL CONDITIONS, POLE HEIGHT AND FIXTURE STYLE PRIOR TO PLACING DETAIL ON PLANS.

FOR USE IN LAWN AREAS

PRECAST LIGHT POLE BASE – FLUSH SURFACE

SCALE: NONE



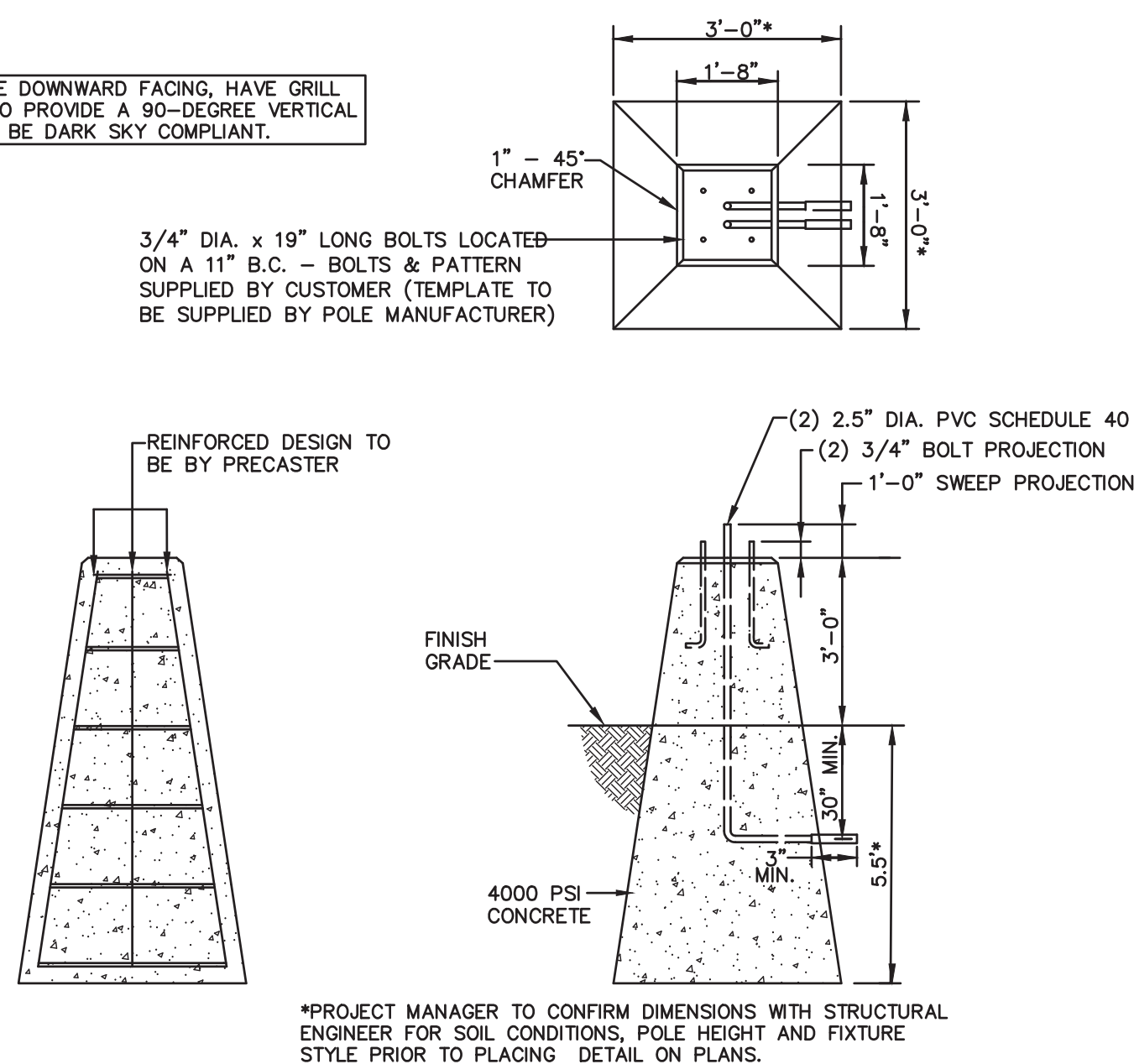
JOINT DETAILS

PRECAST CONCRETE DMH

SCALE: NONE

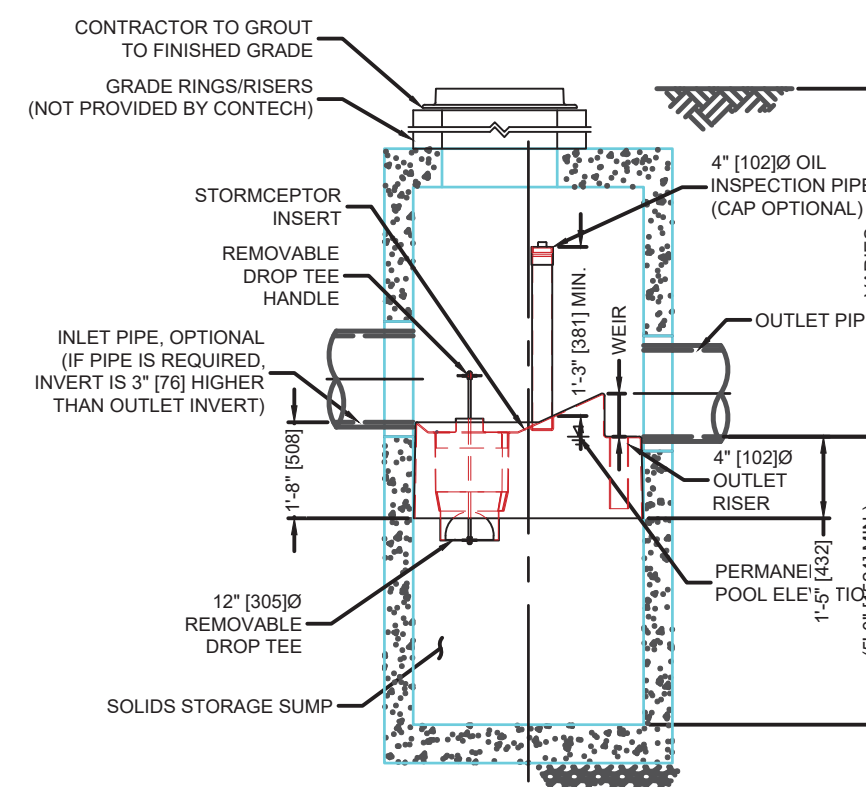
TYPICAL ROADWAY PAVEMENT SECTION

SCALE: NONE



*PROJECT MANAGER TO CONFIRM DIMENSIONS WITH STRUCTURAL ENGINEER FOR SOIL CONDITIONS, POLE HEIGHT AND FIXTURE STYLE PRIOR TO PLACING DETAIL ON PLANS.

FOR USE IN PAVED AREAS



SECTION A-A

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 LLC REPRESENTATIVE: www.contechES.com
3. STORMCEPTOR 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. STORMCEPTOR STRUCTURE SHALL MEET AASHTO H20-44 LOAD RATING, ASSUMING EARTH COVER OF 0' - 2' (610) AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M308 AND BE CAST WITH THE CONTECH LOGO.
5. STORMCEPTOR STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C475 AND AASHTO LOAD FACTOR DESIGN METHOD. ALTERNATE UNITS ARE SHOWN IN MILLIMETERS (mm).

STORMCEPTOR SC450i

SCALE: NONE



4/29/22

BRIAN G. YERGATIAN
PROFESSIONAL ENGINEER

DATE

DEFINITIVE SUBDIVISION PLAN

532 MAIN STREET (ROUTE 130)

IN

MASHPEE
MASSACHUSETTS
(BARNSTABLE COUNTY)

DETAIL SHEET I

AUGUST 27, 2021

REVISIONS:

NO.	DATE	DESC.
1	2/11/22	PER PLANNING BOARD
2	4/29/22	ENGINEERING REVIEW

PREPARED FOR:

MARCELLO MALLEGNI
80 AIRPORT ROAD
HYANNIS, MA 02601



349 Main Street - Route 28
West Yarmouth, Massachusetts
02673

508 778 8919

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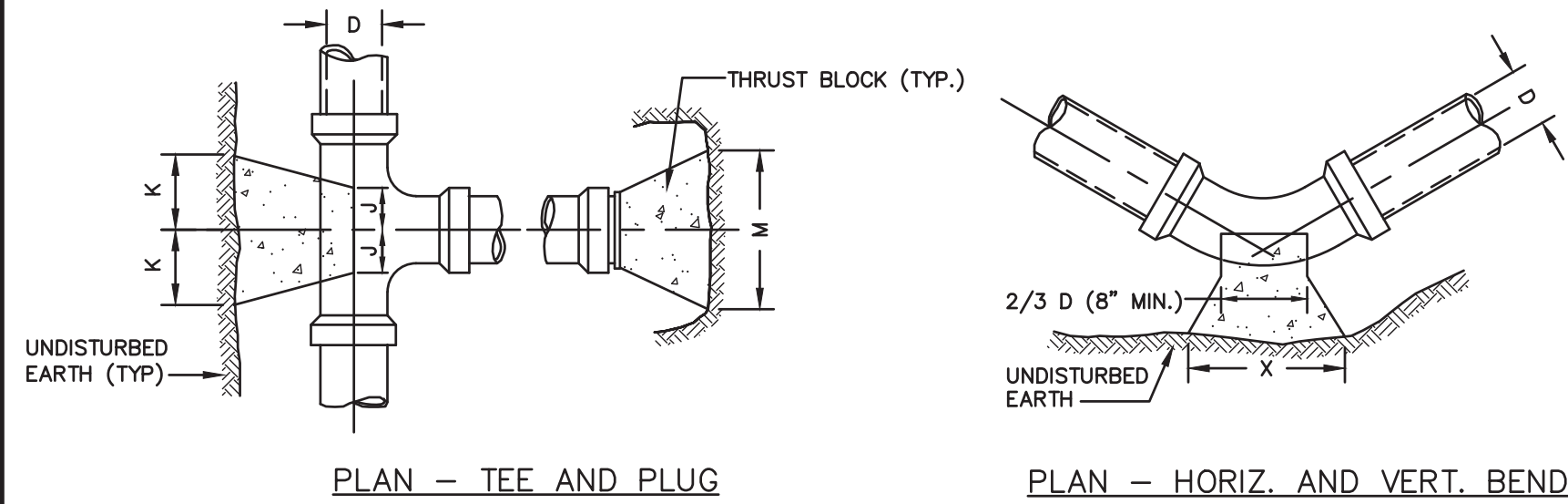
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DWG.:

JOB. NO: 5-0474.00

SHEET 7 OF 8

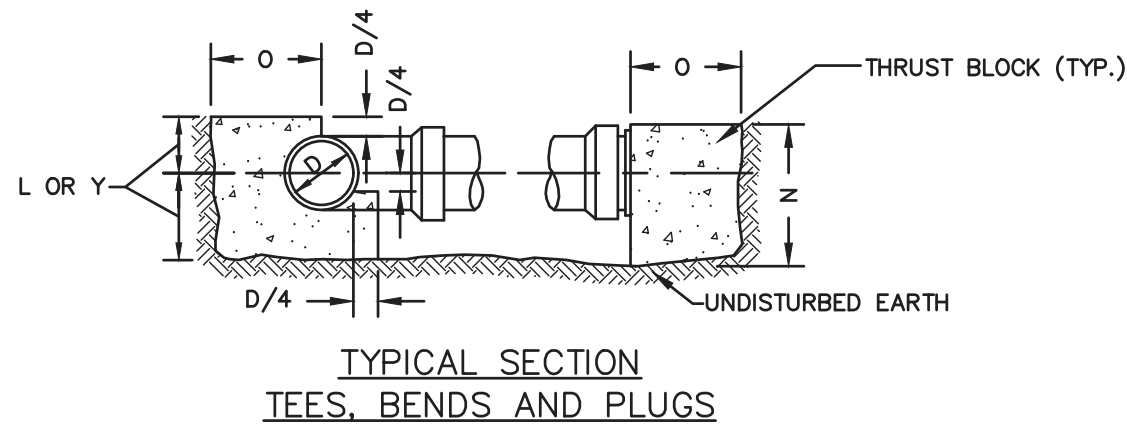


SIZE OF BRANCH	J	K	L	M	N	O
4" THRU 8"	10"	10"	1'-0"	2'-0"	1'-6"	10"
10" THRU 16"	1'-0"	1'-6"	1'-8"	3'-10"	2'-10"	1'-6"
24"	1'-4"	2'-0"	2'-6"	5'-0"	3'-6"	1'-8"

TEES AND PLUGS

	90 & 45 BENDS	22 1/2 & 11 1/4
D	4" TO 8" 10" TO 16" 24"	4" TO 8" 10" TO 16" 24"
X	1'-8" 3'-4" 3'-6"	1'-4" 2'-0" 3'-6"
Y	1'-2" 1'-8" 2'-4"	1'-0" 1'-2" 2'-4"

BENDS

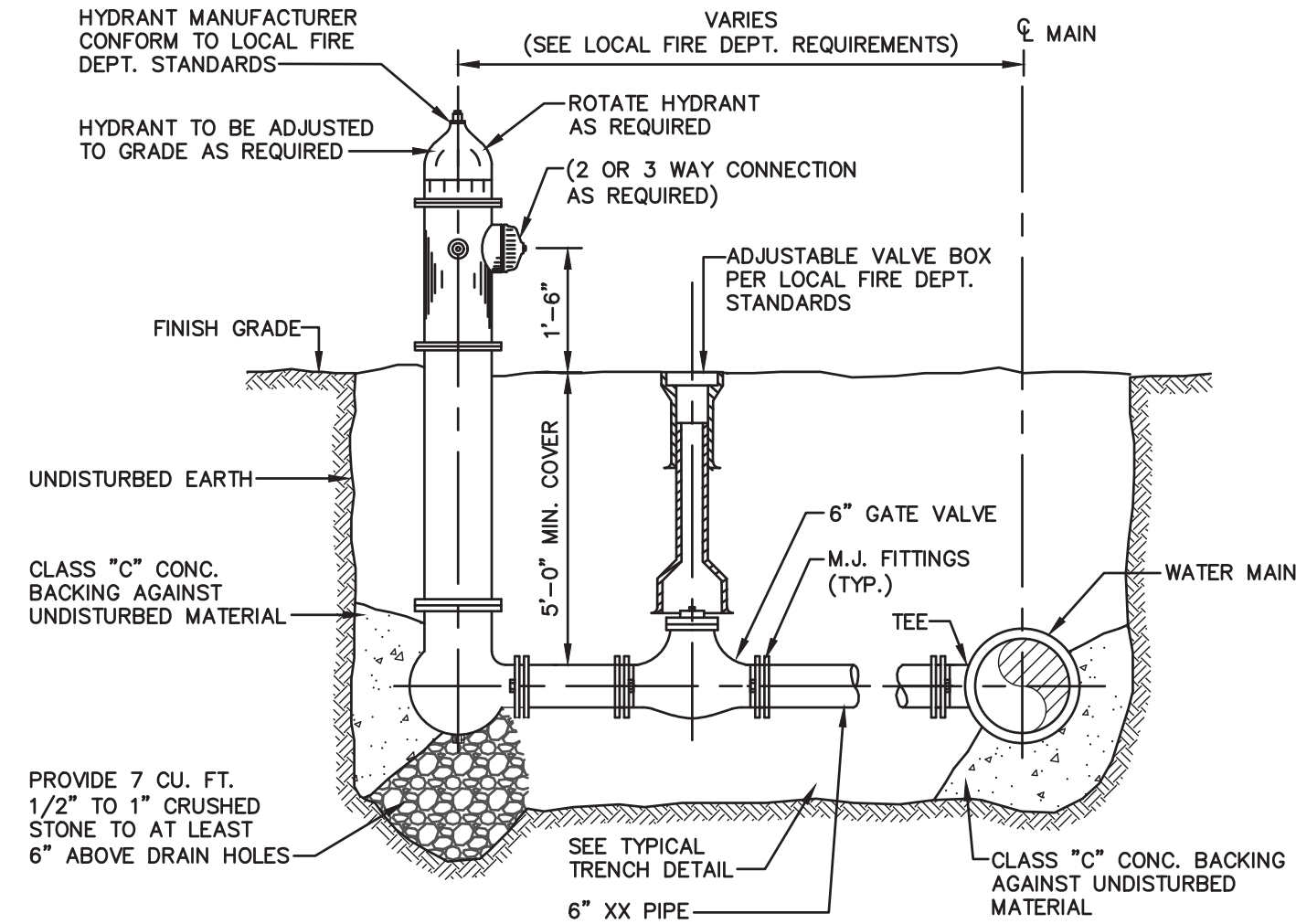


NOTES:

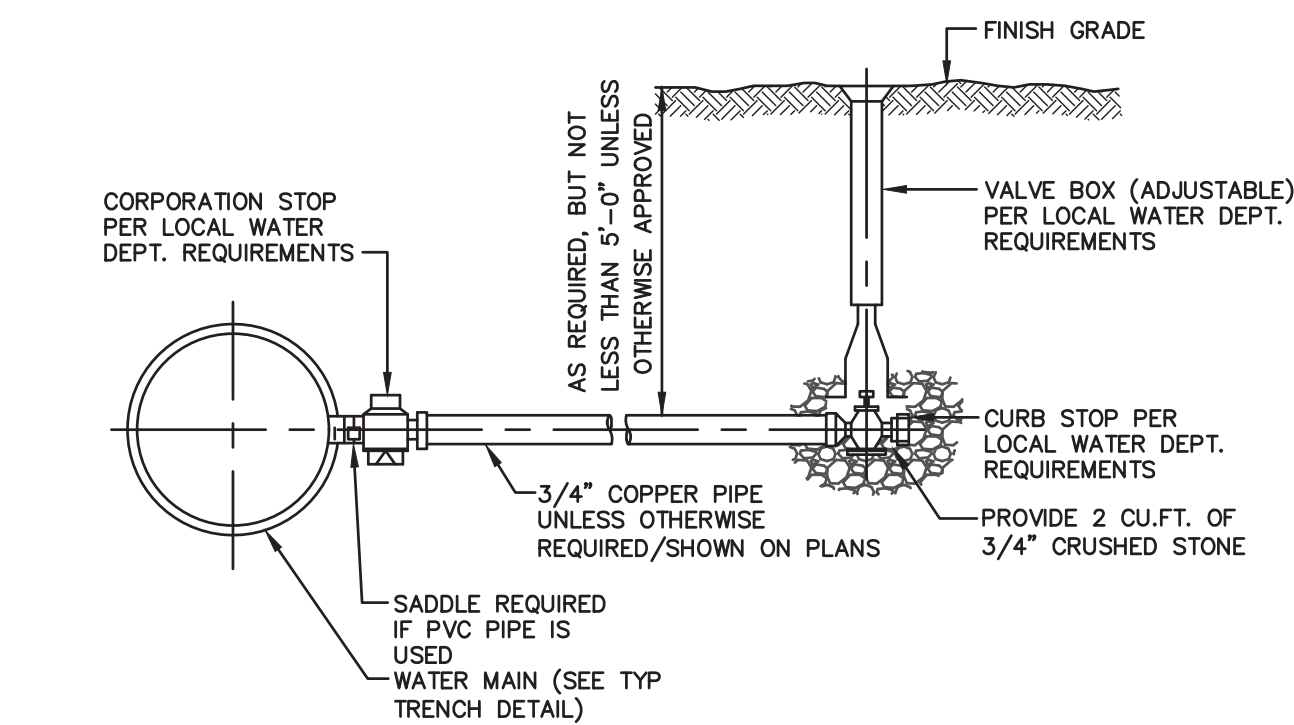
1. PROVIDE 3000 psi CONCRETE THRUST BLOCKS AT ALL BENDS, DEAD ENDS, & TEES UNLESS OTHERWISE DIRECTED. CONCRETE FOR ALL THRUST BLOCKS TO BE PLACED AGAINST FIRM, UNDISTURBED SOIL. PROVIDE APPROVED ANCHOR HARNESS RODS & SOCKET CLAMPS AS SPECIFIED & IN ACCORDANCE WITH PIPE MANUFACTURERS RECOMMENDATIONS WHERE SOIL HAS BEEN DISTURBED OR THRUST BLOCKS CANNOT BE USED, AS DIRECTED BY THE ENGINEER.
2. ALL SOCKET CLAMP METAL SHALL BE COATED WITH BLACK ASPHALTUM OR OTHER WATER DEPARTMENT APPROVED COATINGS.
3. CONCRETE THRUST BLOCKS POURED BEHIND 3-WAY TEE & HYDRANT SHOE TO BE USED WITH SOCKET CLAMPS.
4. NO CONCRETE SHALL COVER PIPE JOINTS, FITTING JOINTS, BOLTS OR HYDRANT DRAINS.

CONCRETE THRUST BLOCK FOR PRESSURE PIPE

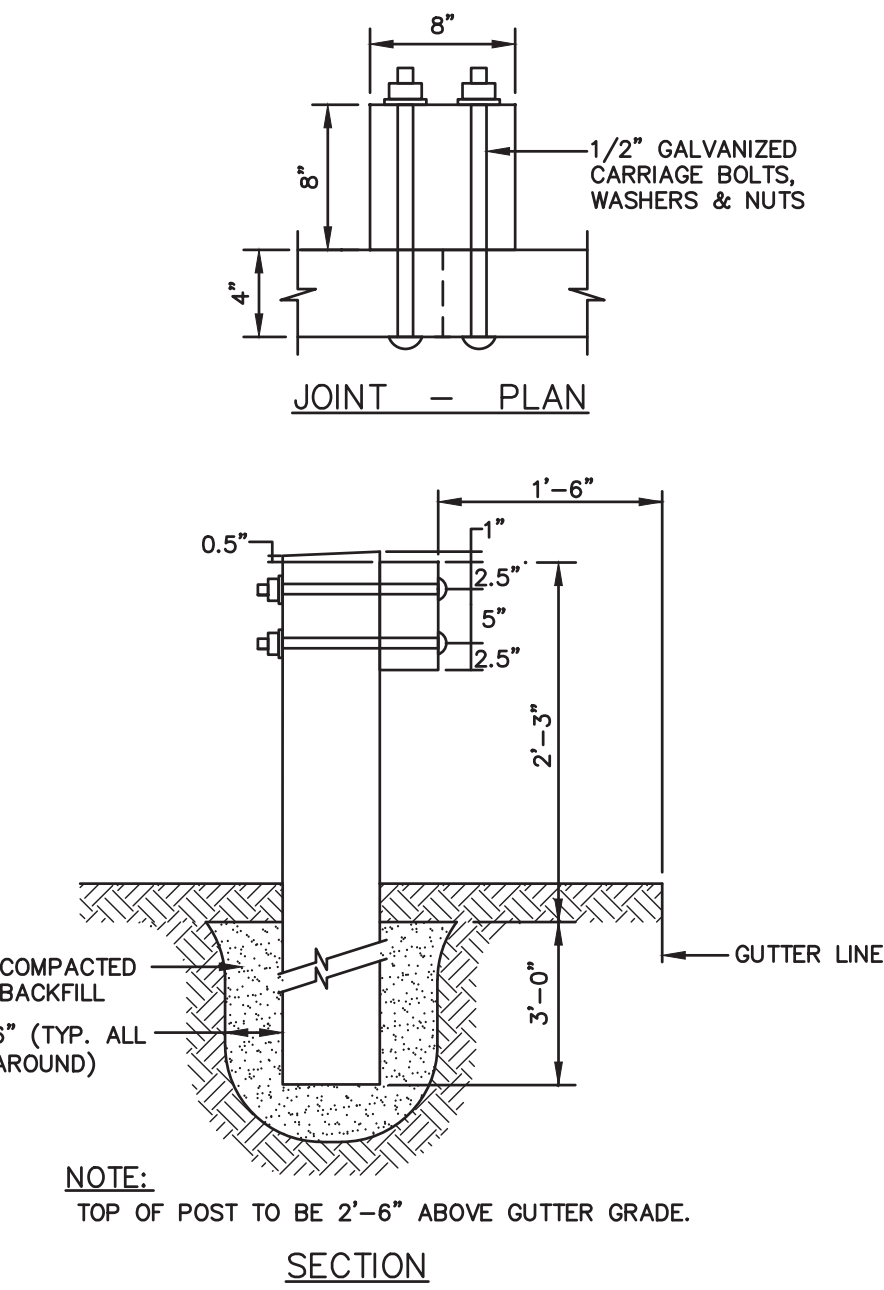
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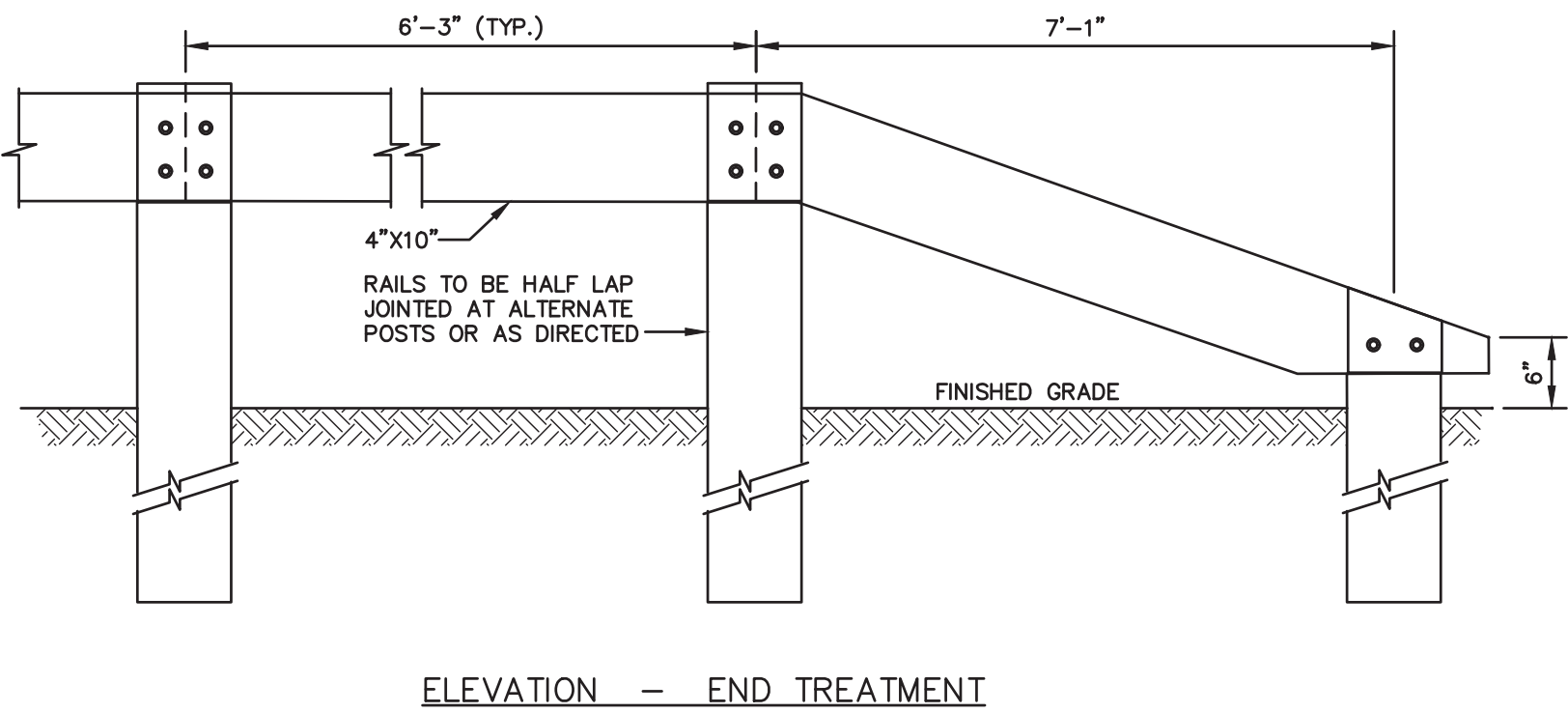


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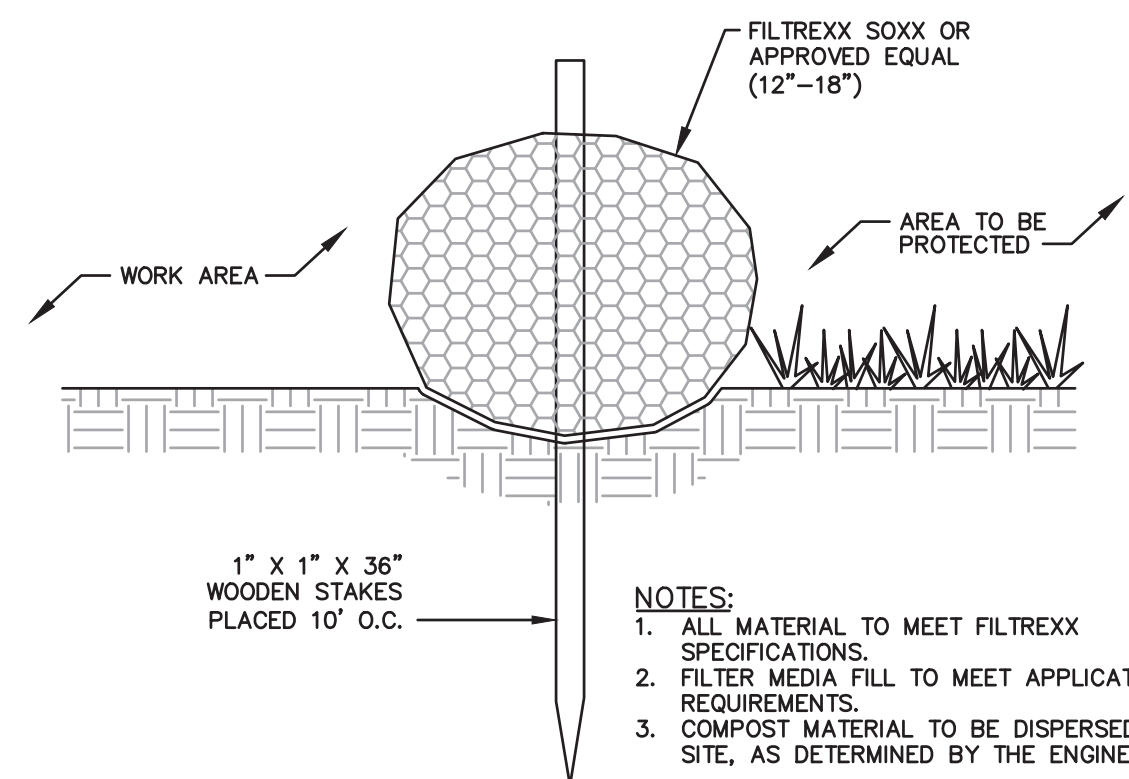
SINGLE FACE WOOD GUARD RAIL

SCALE: NONE



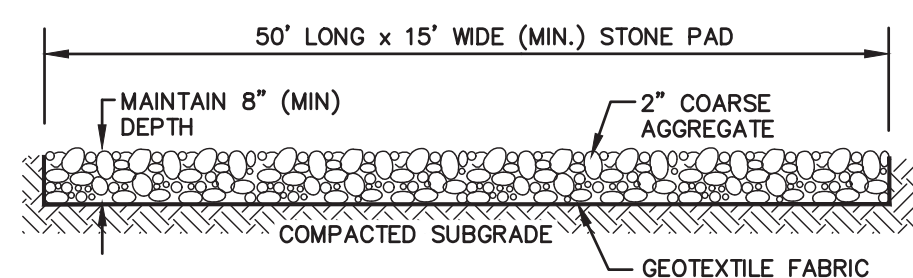
CONSTRUCTION NOTES:

1. WOOD RAILS AND POSTS TO BE SOUTHERN YELLOW PINE STRUCTURAL GRADE OR BETTER.
2. TIMBER PRESERVATIVES SHALL CONFORM TO THE REQUIREMENTS OF AASHTO 14-133 AND THE AMERICAN WOOD PRESERVERS ASSOCIATION STANDARDS C1, C2, AND C3. ANY CUTS MADE IN THE FIELD SHALL BE PAINTED WITH TWO BRUSH COATS OF TIMBER PRESERVATIVE.



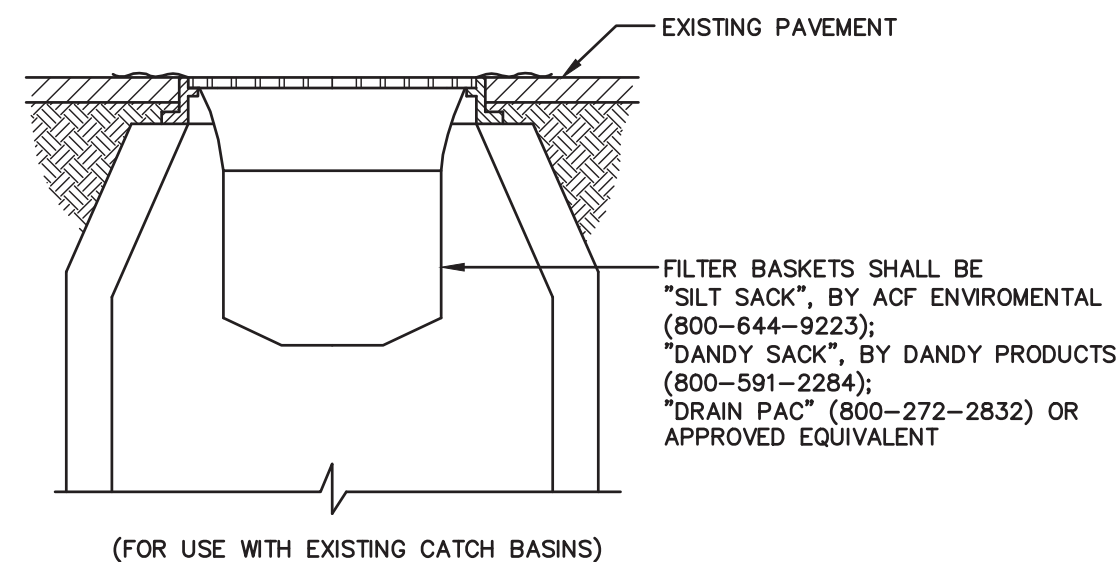
SILTSOXX COMPOST FILTER SOCK

SCALE: NONE



TEMPORARY CONSTRUCTION ENTRANCE

SCALE: NONE



- NOTE:
1. FILTER BASKETS TO BE PLACED IN ALL CATCH BASINS IN THE VICINITY OF NEW CONSTRUCTION. CATCH BASINS ARE TO BE PROTECTED AS SHOWN, WITH MINIMUM WEEKLY MAINTENANCE, OR AS REQUIRED AND REPLACED IF NECESSARY.

SEDIMENT FILTER INLET PROTECTION

SCALE: NONE



4/29/22

BRIAN G. YERGATIAN
PROFESSIONAL ENGINEER

DATE

DEFINITIVE
SUBDIVISION
PLAN

532 MAIN STREET (ROUTE 130)

IN

MASHPEE
MASSACHUSETTS
(BARNSTABLE COUNTY)

DETAIL SHEET II

AUGUST 27, 2021

REVISIONS:

NO.	DATE	DESC.
1	2/11/22	PER PLANNING BOARD
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PREPARED FOR:

MARCELLO MALLEGNI
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DWG: SHEET 8 OF 8

JOB. NO: 5-0474.00

STORMWATER REPORT

DEFINITIVE SUBDIVISION

532 MAIN STREET (ROUTE 130)

MASHPEE, MA 02571

FEBRUARY 2022

REVISED: APRIL 2022

Owner/Applicant:

MARCELLO MALLEGNI

80 Airport Road

Hyannis, MA 02601

BSC Job Number: 5-0474.00

Prepared by:



349 Main Street
West Yarmouth, MA 02673

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SECTION 1.0

PROJECT INFORMATION

1.01 PROJECT DESCRIPTION

The proposed subdivision at 532 Main Street (Route 130) is located on 18.05± of land in Mashpee, Massachusetts. There are no known wetland resource areas on the site. The existing site is entirely wooded other than a 20' easement containing a sidewalk that is along Main Street (Route 130). The project contains approximately 2,035 linear feet of pavement containing a cul-de-sac and 9 lots.

1.02 PRE-DEVELOPMENT CONDITIONS

The pre-development conditions include wooded areas with slopes generally 0-3%. There are 4 subcatchment areas that have been identified in the Pre-Development drainage analysis. There are areas that flow off-site to towards Main Street, off-site to the north, off-site to the south, and retained on-site in natural depressions.

NRCS Web Soil Survey has identified two classifications of soil underlying the site. The soil map units that have been identified are 254A Merrimac fine sandy loam, 0 to 3 percent slopes (5.7% of area) and 265A Enfield silt loam, 0 to 3 percent slopes (94.3% of area).

In August of 2020, BSC Group conducted exploratory test pits on the site. All of the test pits were conducted within Map Unit 265A, and in the approximate location of the proposed stormwater management facilities. The result of the test pits indicated a parent material of medium sand and no groundwater was encountered. As such the site has been modeled as Hydrologic Soil Group A. For additional information regarding the test holes, refer to Appendix D – Soil Test Pit Logs.

1.03 POST-DEVELOPMENT CONDITIONS

The proposed stormwater management system has been designed in a manner that will exceed the provisions of the Massachusetts Department of Environmental Protection (MassDEP) Stormwater Management Policy for a new construction project. The design is also in conformance the with Town of Mashpee Zoning Bylaws.

The subdivision roadway is designed to contain all stormwater on-site from the roadway surface, plus additional land area from the proposed lots. There are three proposed infiltration basins that will serve to infiltrate the stormwater that is collected on-site. There are 8 pairs of catch basins that collect the stormwater from the roadway. All stormwater collected from paved areas will run through a Stormceptor unit for pre-treatment and flared end sections before entering the drainage basins. Specifics of the project's compliance with the MassDEP Stormwater Management Standards are discussed in detail in the following sections.

SECTION 2.0

DRAINAGE SUMMARY

2.01 Stormwater Standard 1 – New Stormwater Conveyances

Per MassDEP Stormwater Management Standard #1, no new outfalls may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth. There are no known stormwater outfalls in this development and no new outfalls are proposed.

2.02 Stormwater Standard 2 – Stormwater Runoff Rates

Watershed modeling was performed using HydroCAD Stormwater Modeling Software version 10.0, a computer aided design program that combines SCS runoff methodology with standard hydraulic calculations. A model of the site's hydrology was developed for both pre- and post-development conditions to assess the effects of the proposed development surrounding areas.

The stormwater management systems for the project has been designed such that the post-development conditions do not increase the peak runoff rates or runoff volumes for the 2-year, 10-year, 25-year and 100-year, 24-hour storm events, as detailed in the tables below.

Peak Flow Discharge Rates and Volumes

Peak Runoff - Node 1R – Off-site – Route 130

Storm Event	Pre-Development Peak Discharge Rate (cfs)	Post-Development Peak Discharge Rate (cfs)	Change in Peak Discharge Rate (cfs)
2-Year	0.00	0.00	+0.00
10-Year	0.00	0.04	+0.04
25-Year	0.02	0.10	+0.08
100-Year	0.17	0.20	+0.03

Runoff Volume - Node 1R – Off-site – Route 130

Storm Event	Pre-Development Runoff Volume (af)	Post-Development Runoff Volume (af)	Change in Runoff Volume (af)
2-Year	0.000	0.002	+0.002
10-Year	0.003	0.007	+0.004
25-Year	0.016	0.012	-0.004
100-Year	0.051	0.021	-0.030

Peak Runoff - Node 2R – Off-site – North

Storm Event	Pre-Development Peak Discharge Rate (cfs)	Post-Development Peak Discharge Rate (cfs)	Change in Peak Discharge Rate (cfs)
2-Year	0.00	0.00	0.00
10-Year	0.00	0.00	0.00
25-Year	0.02	0.00	-0.02
100-Year	0.12	0.01	-0.11

Runoff Volume - Node 2R – Off-site – North

Storm Event	Pre-Development Runoff Volume (af)	Post-Development Runoff Volume (af)	Change in Runoff Volume (af)
2-Year	0.000	0.000	0.000
10-Year	0.001	0.000	-0.001
25-Year	0.014	0.001	-0.013
100-Year	0.060	0.005	-0.055

Peak Runoff - Node 3R – Off-site – South

Storm Event	Pre-Development Peak Discharge Rate (cfs)	Post-Development Peak Discharge Rate (cfs)	Change in Peak Discharge Rate (cfs)
2-Year	0.00	0.00	0.00
10-Year	0.01	0.00	-0.01
25-Year	0.05	0.01	-0.04
100-Year	0.26	0.10	-0.16

Runoff Volume - Node 3R – Off-site – South

Storm Event	Pre-Development Runoff Volume (af)	Post-Development Runoff Volume (af)	Change in Runoff Volume (af)
2-Year	0.000	0.000	0.000
10-Year	0.002	0.001	-0.001
25-Year	0.032	0.010	-0.022
100-Year	0.137	0.043	-0.094

Peak Runoff - Node 4R – Retained On-site

Storm Event	Pre-Development Peak Discharge Rate (cfs)	Post-Development Peak Discharge Rate (cfs)	Change in Peak Discharge Rate (cfs)
2-Year	0.00	0.00	0.00
10-Year	0.01	0.00	-0.01
25-Year	0.08	0.00	-0.08
100-Year	0.43	0.00	-0.43

Runoff Volume - Node 4R – Retained On-site

Storm Event	Pre-Development Runoff Volume (af)	Post-Development Runoff Volume (af)	Change in Runoff Volume (af)
2-Year	0.000	0.000	0.000
10-Year	0.004	0.000	-0.004
25-Year	0.054	0.000	-0.054
100-Year	0.234	0.000	-0.234

2.03 Stormwater Standard 3 – Groundwater Recharge

The ground water recharge is estimated based on the Massachusetts Stormwater Management Standard #3, as follows:

$$R_v = F \times \text{impervious area}$$

R_v = Required Recharge Volume, expressed in Ft³, cubic yards, or acre-feet
 F = Target Depth Factor associated with each Hydrologic Soil Group
 Impervious Area = pavement and rooftop area on site

Table 1.2 Recharge Target Depth by Hydrologic Soil Group

NRCS HYDROLOGIC SOIL TYPE	APPROX. SOIL TEXTURE	TARGET DEPTH FACTOR (F)
A	sand	0.60-inch
B	loam	0.35-inch
C	silty loam	0.25-inch
D	clay	0.10-inch

The Natural Resources Conservation Service (NRCS) has classified the soils underlying the project site as a combination of soil groups 254A (5.7%) and 265A (94.3%). The entire roadway and proposed drainage locations are located in Group 265A, Enfiled silt loam, 0-3 percent slopes. Additionally, test pits were performed in the approximate location of the proposed drainage areas, and based on the results of the test pits, the site is classified as Hydrologic Soil Type A.

To determine the recharge volume provided in the recharge system, the *Static Method* was used as described in the

DEP's Massachusetts Stormwater Handbook, Volume 3. A drawdown calculation was performed in accordance with the DEP's Massachusetts Stormwater Handbook, Volume 3, to verify that the proposed recharge systems would drain completely within 72-hours. This drawdown calculation along with calculations to determine the recharge required are provided in Section 7.0 of this report.

2.04 Stormwater Standard 4 – TSS Removal

As a new development, the Project stormwater management system will achieve a TSS removal greater than 80%. The proposed stormwater management system has been designed to provide treatment of runoff in order to reduce suspended solids prior to discharge off-site through the implementation of the following best management practices:

- Stormceptor Water Quality Units (or approved equal) (Pre-treatment)
- Infiltration Basin (80% TSS removal)

The water quality volume is defined as the runoff volume requiring TSS Removal for the site and is equal to 1-inch of runoff over the total impervious area of the post-development site. The required water quality volume required for the project is calculated below based on the post-development impervious area:

$$WQV = 1.0 \cancel{\text{in}} \times \frac{1 \text{ ft}}{12 \cancel{\text{in}}} \times 1.292 \text{ ac} \times 43,560 \text{ ft}^2 = 4,690 \text{ ft}^3$$

∴ Water Quality Volume = 4,690 cubic feet

The underground infiltration systems have been sized to treat the required water quality volume and calculation are included in Section 7.0 of this Report.

A long-term pollution prevention plan complying with the requirements of Standard 4 is included in Section 5.0 of this Report.

2.05 Stormwater Standard 5 – Land Uses with Higher Potential Pollutant Loads

The Project will not generate over a 1,000 Vehicle Trips per day, therefore this Standard does not apply.

2.06 Stormwater Standard 6 – Stormwater Discharges to a Critical Area

The project is not subject to Standard 6. There are no discharges to any Critical Area, as defined by the Massachusetts Stormwater Handbook.

2.07 Stormwater Standard 7 – Redevelopment Projects

This project has been designed to fully comply with the MassDEP Stormwater Management Standards.

2.08 Stormwater Standard 8 – Sedimentation and Erosion Control Plan

Erosion and sedimentation controls are shown on the Project Plans. Additionally, a Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan is included in Section 4.0 of this Report.

2.09 Stormwater Standard 9 – Long Term Operation and Maintenance Plan

A Long Term Operation and Maintenance Plan is included in Section 5.0 of this Report.

2.10 Stormwater Standard 10 – Illicit Discharges

There are no known illicit discharges on the project site, and none are proposed. A signed, illicit discharge compliance statement will be submitted prior to the start of construction.

2.11 Conclusion

The Project has been designed to meet the applicable provisions of the Stormwater Management Standards. The use of infiltration basins, along with pre-treatment such as water quality units will attenuate peak runoff rates, provide treatment to stormwater prior to discharge, and promote infiltration to groundwater. The project will protect the adjacent wetlands and meet the requirements of the MassDEP Stormwater Management Standards.

SECTION 3.0

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION CHECKLIST FOR STORMWATER REPORT



Checklist for Stormwater Report

A. Introduction

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the [Massachusetts Stormwater Handbook](#). The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.¹ This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8²
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

¹ The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

² For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.



Checklist for Stormwater Report

B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature



02/11/2022

Signature and Date

Checklist

Project Type: Is the application for new development, redevelopment, or a mix of new and redevelopment?

- ☒ New development
- ☐ Redevelopment
- ☐ Mix of New Development and Redevelopment



Checklist for Stormwater Report

Checklist (continued)

LID Measures: Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

- ☒ No disturbance to any Wetland Resource Areas
- ☐ Site Design Practices (e.g. clustered development, reduced frontage setbacks)
- ☐ Reduced Impervious Area (Redevelopment Only)
- ☐ Minimizing disturbance to existing trees and shrubs
- ☐ LID Site Design Credit Requested:
 - ☐ Credit 1
 - ☐ Credit 2
 - ☐ Credit 3
- ☐ Use of "country drainage" versus curb and gutter conveyance and pipe
- ☐ Bioretention Cells (includes Rain Gardens)
- ☐ Constructed Stormwater Wetlands (includes Gravel Wetlands designs)
- ☐ Treebox Filter
- ☐ Water Quality Swale
- ☐ Grass Channel
- ☐ Green Roof
- ☐ Other (describe): _____

Standard 1: No New Untreated Discharges

- ☒ No new untreated discharges
- ☐ Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth
- ☐ Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.



Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

- ☐ Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.
- ☐ Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.
- ☒ Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

- ☒ Soil Analysis provided.
- ☒ Required Recharge Volume calculation provided.
- ☐ Required Recharge volume reduced through use of the LID site Design Credits.
- ☒ Sizing the infiltration, BMPs is based on the following method: Check the method used.
 - ☒ Static
 - ☐ Simple Dynamic
 - ☐ Dynamic Field¹
- ☒ Runoff from all impervious areas at the site discharging to the infiltration BMP.
- ☐ Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.
- ☒ Recharge BMPs have been sized to infiltrate the Required Recharge Volume.
- ☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:
 - ☐ Site is comprised solely of C and D soils and/or bedrock at the land surface
 - ☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
 - ☐ Solid Waste Landfill pursuant to 310 CMR 19.000
 - ☐ Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.
- ☒ Calculations showing that the infiltration BMPs will drain in 72 hours are provided.
- ☐ Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

¹ 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.



Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

- ☐ The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.
- ☐ Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
 - Provisions for storing materials and waste products inside or under cover;
 - Vehicle washing controls;
 - Requirements for routine inspections and maintenance of stormwater BMPs;
 - Spill prevention and response plans;
 - Provisions for maintenance of lawns, gardens, and other landscaped areas;
 - Requirements for storage and use of fertilizers, herbicides, and pesticides;
 - Pet waste management provisions;
 - Provisions for operation and management of septic systems;
 - Provisions for solid waste management;
 - Snow disposal and plowing plans relative to Wetland Resource Areas;
 - Winter Road Salt and/or Sand Use and Storage restrictions;
 - Street sweeping schedules;
 - Provisions for prevention of illicit discharges to the stormwater management system;
 - Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
 - Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
 - List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.
- ☒ A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.
 - ☐ Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:
 - ☐ is within the Zone II or Interim Wellhead Protection Area
 - ☐ is near or to other critical areas
 - ☐ is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
 - ☐ involves runoff from land uses with higher potential pollutant loads.
 - ☐ The Required Water Quality Volume is reduced through use of the LID site Design Credits.
 - ☒ Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.



Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

- ☒ The BMP is sized (and calculations provided) based on:
 - ☒ The ½" or 1" Water Quality Volume or
 - ☐ The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.
- ☐ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.
- ☐ A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

- ☐ The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.
- ☐ The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted **prior to** the discharge of stormwater to the post-construction stormwater BMPs.
- ☒ The NPDES Multi-Sector General Permit does **not** cover the land use.
- ☐ LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.
- ☐ All exposure has been eliminated.
- ☐ All exposure has **not** been eliminated and all BMPs selected are on MassDEP LUHPPL list.
- ☐ The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

- ☐ The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.
- ☐ Critical areas and BMPs are identified in the Stormwater Report.



Checklist for Stormwater Report

Checklist (continued)

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

- ☐ The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:
 - ☐ Limited Project
 - ☐ Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
 - ☐ Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
 - ☐ Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
 - ☐ Bike Path and/or Foot Path
 - ☐ Redevelopment Project
 - ☐ Redevelopment portion of mix of new and redevelopment.
- ☐ Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.
- ☐ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
 - Construction Period Operation and Maintenance Plan;
 - Names of Persons or Entity Responsible for Plan Compliance;
 - Construction Period Pollution Prevention Measures;
 - Erosion and Sedimentation Control Plan Drawings;
 - Detail drawings and specifications for erosion control BMPs, including sizing calculations;
 - Vegetation Planning;
 - Site Development Plan;
 - Construction Sequencing Plan;
 - Sequencing of Erosion and Sedimentation Controls;
 - Operation and Maintenance of Erosion and Sedimentation Controls;
 - Inspection Schedule;
 - Maintenance Schedule;
 - Inspection and Maintenance Log Form.
- ☒ A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.



Checklist for Stormwater Report

Checklist (continued)

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

- ☐ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has **not** been included in the Stormwater Report but will be submitted **before** land disturbance begins.
- ☐ The project is **not** covered by a NPDES Construction General Permit.
- ☐ The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.
- ☒ The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

- ☒ The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:
 - ☒ Name of the stormwater management system owners;
 - ☒ Party responsible for operation and maintenance;
 - ☒ Schedule for implementation of routine and non-routine maintenance tasks;
 - ☒ Plan showing the location of all stormwater BMPs maintenance access areas;
 - ☒ Description and delineation of public safety features;
 - ☒ Estimated operation and maintenance budget; and
 - ☒ Operation and Maintenance Log Form.
- ☐ The responsible party is **not** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:
 - ☐ A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
 - ☐ A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

- ☐ The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;
- ☐ An Illicit Discharge Compliance Statement is attached;
- ☒ NO Illicit Discharge Compliance Statement is attached but will be submitted **prior to** the discharge of any stormwater to post-construction BMPs.

SECTION 4.0

CONSTRUCTION PERIOD POLLUTION PREVENTION AND EROSION AND SEDIMENTATION CONTROL PLAN

4.0 CONSTRUCTION PERIOD POLLUTION PREVENTION AND EROSION AND SEDIMENTATION CONTROL PLAN

This Section specifies requirements and suggestions for implementation of a Stormwater Pollution Prevention Plan (SWPPP) for the proposed subdivision located at 532 Main Street (Route 130). The SWPPP shall be provided and maintained on-site by the Contractor(s) during all construction activities. The SWPPP shall be updated as required to reflect changes to construction activity.

The stormwater pollution prevention measures contained in the SWPPP shall be at least the minimum required by Local Regulations. The Contractor shall provide additional measures to prevent pollution from stormwater discharges in compliance with the National Pollution Discharge Elimination System (NPDES) Phase II permit requirements and all other local, state and federal requirements.

The SWPPP shall include provisions for, but not be limited to, the following:

1. Construction Trailers
2. Lay-down Areas
3. Equipment Storage Areas
4. Stockpile Areas
5. Disturbed Areas

The Contractor shall NOT begin construction without submitting evidence that a NPDES Notice of Intent (NOI) governing the discharge of stormwater from the construction site for the entire construction period has been filed **at least fourteen (14) days prior to construction**. It is the Contractor's responsibility to complete and file the NOI, unless otherwise determined by the project team.

The cost of any fines, construction delays and remedial actions resulting from the Contractor's failure to comply with all provisions of local regulations and Federal NPDES permit requirements shall be paid for by the Contractor at no additional cost to the Owner.

As a requirement of the EPA's NPDES permitting program, each Contractor and Subcontractor responsible for implementing and maintaining stormwater Best Management Practices shall execute a Contractor's Certification form.

Erosion and Sedimentation Control

The Contractor shall be solely responsible for erosion and sedimentation control at the site. The Contractor shall utilize a system of operations and all necessary erosion and sedimentation control measures, even if not specified herein or elsewhere, to minimize erosion damage at the site to prevent the migration of sediment into environmentally sensitive areas. Environmentally sensitive areas include all wetland resource areas within, and downstream of, the site, and those areas of the site that are not being altered.

Erosion and sedimentation control shall be in accordance with this Section, the design drawings, and the following:

- ❑ "National Pollutant Discharge Elimination System General Permit for Discharges from Construction Activities (EPA Construction General Permit February 16, 2017).
- ❑ Massachusetts Stormwater Management Policy Handbook issued by the Massachusetts Department of Environmental Protection, January 2008.
- ❑ Massachusetts Erosion and Sediment Control Guidelines for Urban and Suburban Areas, A Guide for Planners, Designers and Municipal Officials, March 1997.

The BMP's presented herein should be used as a guide for erosion and sedimentation control and are not intended to be considered specifications for construction. The most important BMP is maintaining a rapid

construction process, resulting in prompt stabilization of surfaces, thereby reducing erosion potential. Given the primacy of rapid construction, these guidelines have been designed to allow construction to progress with essentially no hindrance by the erosion control methods prescribed. These guidelines have also been designed with sufficient flexibility to allow the Contractor to modify the suggested methods as required to suit seasonal, atmospheric, and site-specific physical constraints.

Another important BMP is the prevention of concentrated water flow. Sheet flow does not have the erosive potential of a concentrated rivulet. These guidelines recommend construction methods that allow localized erosion control and a system of construction, which inhibits the development of shallow concentrated flow. These BMP's shall be maintained throughout the construction process.

CONTACT INFORMATION AND RESPONSIBLE PARTIES

The following is a list of all project-associated parties:

Owner

Marcello Mallegni
80 Airport Road
Hyannis, MA 02601

Contractor

To be determined

Environmental Consultant

BSC Group, Inc.
349 Route 28, Unit D
West Yarmouth, MA 02673

Contact: Brian G. Yergatian, P.E.
Phone: (617) 896-4590
Email: byergatian@bscgroup.com

Qualified SWPPP Inspectors

To Be Determined

4.1 Procedural Conditions of the Construction General Permit (CGP)

The following list outlines the stormwater responsibilities for all construction operators working on the Project. The operators below agree through a cooperative agreement to abide by the following conditions throughout the duration of the construction project, effective the date of signature of the required SWPPP. These conditions apply to all operators on the project site.

The project is subject to EPA's NPDES General Permit through the CGP. The goal of this permit is to prevent the discharge of pollutants associated with construction activity from entering the existing and proposed storm drain system or surface waters.

All contractors/operators involved in clearing, grading and excavation construction activities must sign the appropriate certification statement required, which will remain with the SWPPP. The owner must also sign a certification, which is to remain with the SWPPP in accordance with the signatory requirements of the SWPPP.

Once the SWPPP is finalized, a signed copy, plus supporting documents, must be held at the project site during construction. A copy must remain available to EPA, State and Local agencies, and other interested parties during normal business hours.

The following items associated with this SWPPP must be posted in a prominent place at the construction site until final stabilization has been achieved:

- The completed/submitted NOI form
- Location where the public can view the SWPPP during normal business hours
- A copy of the signed/submitted NOI, permit number issued by the EPA and a copy of the current CGP.

Project specific SWPPP documents are not submitted to the US EPA unless the agency specifically requests a copy for review. SWPPP documents requested by a permitting authority, the permittee(s) will submit it in a timely manner.

EPA inspectors will be allowed free and unrestricted access to the project site and all related documentation and records kept under the conditions of the permit.

The permittee is expected to keep all BMP's and Stormwater controls operating correctly and maintained regularly.

Any additions to the project which will significantly change the anticipated discharges of pollutants, must be reported to the EPA. The EPA should also be notified in advance of any anticipated events of noncompliance. The permittee must also orally inform the EPA of any discharge, which may endanger health or the environment within 24 hours, with a written report following within 5 days.

In maintaining the SWPPP, all records and supporting documents will be compiled together in an orderly fashion. Inspection reports and amendments to the SWPPP must remain with the document. Federal regulations require permittee(s) to keep their Project Specific SWPPP and all reports and documents for at least three (3) years after the project is complete.

4.2 Project Description and Intended Construction Sequence

The site is currently comprised of one residential home, woods and wetland areas. The proposed activities will include the following major components:

- The construction of a road for access to the subdivision. The subdivision contains 9 lots
- The construction of stormwater management systems.
- Site grading, utility installation, and landscape areas.

The installation of the roadway and associated drainage features will disturb 3.735± acres.

Soil disturbing activities will include site demolition, clearing and grubbing, installing stabilized construction exits, installation of erosion and sedimentation controls, grading, storm drain inlets, stormwater management systems, utilities, building foundations, construction of site driveways and preparation for final landscaping. Please refer to Table 1 for the projects anticipated construction timetable. A description of BMP's associated with project timetable and construction-phasing elements is provided in this Erosion and Sediment Control Plan.

Table 1 – Anticipated Construction Timetable

Construction Phasing Activity	Anticipated Timetable
Demolition, Grubbing and Stripping of Limits of Construction Phase	To be determined
Rough Site Grading and Site Utilities	To be determined
Utility Plan Construction	To be determined
Landscaping	To be determined

4.3 Potential Sources of Pollution

Any project site activities that have the potential to add pollutants to runoff are subject to the requirements of the SWPPP. Listed below are a description of potential sources of pollution from both sedimentation to Stormwater runoff, and pollutants from sources other than sedimentation.

Table 2 – Potential Sources of Sediment to Stormwater Runoff

Potential Source	Activities/Comments
Construction Site Entrance and Site Vehicles	Vehicles leaving the site can track soils onto public roadways. Site Vehicles can readily transport exposed soils throughout the site and off-site areas.
Grading Operations	Exposed soils have the potential for erosion and discharge of sediment to off-site areas.
Material Excavation, Relocation, and Stockpiling	Stockpiling of materials during excavation and relocation of soils can contribute to erosion and sedimentation. In addition fugitive dust from stockpiled material, vehicle transport and site grading can be deposited in wetlands and waterway.
Landscaping Operations	Landscaping operations specifically associated with exposed soils can contribute to erosion and sedimentation. Hydroseeding, if not properly applied, can runoff to adjacent wetlands and waterways.

Table 3 – Potential Pollutants and Sources, other than Sediment to Stormwater Runoff

Potential Source	Activities/Comments
Staging Areas and Construction Vehicles	Vehicle refueling, minor equipment maintenance, sanitary facilities and hazardous waste storage
Materials Storage Area	General building materials, solvents, adhesives, paving materials, paints, aggregates, trash, etc.
Construction Activities	Construction, paving, curb/gutter installation, concrete pouring/mortar/stucco

4.4 Erosion and Sedimentation Control Best Management Practices

The project site is characterized by primarily pervious surface. All construction activities will implement Best Management Practices (BMP's) in order to minimize overall site disturbance and impacts to the sites natural features. Please refer to the following sections for a detailed description of site specific BMP's. In addition, an Erosion and Sedimentation Control Plan is provided in the Site Plans.

4.5 Timetable and Construction Phasing

This section provides the Owner and Contractor with a suggested order of construction that shall minimize erosion and the transport of sediments. The individual objectives of the construction techniques described herein shall be considered an integral component of the project design intent of each project phase. The construction sequence is not intended to prescribe definitive construction methods and should not be interpreted as a construction specification document. However, the Contractor shall follow the general construction phase principles provided below:

- Protect and maintain existing vegetation wherever possible.
- Minimize the area of disturbance.
- To the extent possible, route unpolluted flows around disturbed areas.
- Install mitigation devices as early as possible.
- Minimize the time disturbed areas are left unstabilized.
- Maintain siltation control devices in proper condition.
- The contractor should use the suggested sequence and techniques as a general guide and modify the suggested methods and procedures as required to best suit seasonal, atmospheric, and site specific physical constraints for the purpose of minimizing the environmental impact of construction.

Demolition, Grubbing and Stripping of Limits of Construction Phase

- Install Temporary Erosion Control (TEC) devices as required to prevent sediment transport into resource areas.
- Place a ring of silt socks and/or haybales around stockpiles.
- Stabilize all exposed surfaces that will not be under immediate construction.
- Store and/or dispose all pavement and building demolition debris as indicated in accordance with all applicable local, state, and federal regulations.

Driveway Area Sub-base Construction

- Install temporary culverts and diversion ditches and additional TEC devices as required by individual construction area constraints to direct potential runoff toward detention areas designated for the current construction phase.
- Compact gravel as work progresses to control erosion potential.
- Apply water to control air suspension of dust.
- Avoid creating an erosive condition due to over-watering.
- Install piped utility systems as required as work progresses, keeping all inlets sealed until all downstream drainage system components are functional.

Binder Construction

- Fine grade gravel base and install processed gravel to the design grades.
- Compact pavement base as work progresses.
- Install pavement binder coat starting from the downhill end of the site and work toward the top.

Finish Paving

- Repair and stabilize damaged side slopes.
- Clean inverts of drainage structures.
- Install final top coat of pavement.

Final Clean-up

- Clean inverts of culverts and catch basins.
- Remove sediment and debris from rip-rap outlet areas.
- Remove TEC devices only after permanent vegetation and erosion control has been fully established.

4.6 Site Stabilization

Grubbing Stripping and Grading

- Erosion control devices shall be in place as shown on the design plans before grading commences.
- Stripping shall be done in a manner, which will not concentrate runoff. If precipitation is expected, earthen berms shall be constructed around the area being stripped, with a silt sock, silt fence or haybale dike situated in an arc at the low point of the berm.
- If intense precipitation is anticipated, silt socks, haybales, dikes and /or silt fences shall be used as required to prevent erosion and sediment transport. The materials required shall be stored on site at all time.
- If water is required for soil compaction, it shall be added in a uniform manner that does not allow excess water to flow off the area being compacted.
- Dust shall be held at a minimum by sprinkling exposed soil with an appropriate amount of water.

Maintenance of Disturbed Surfaces

- Runoff shall be diverted from disturbed side slopes in both cut and fill.
- Mulching may be used for temporary stabilization.
- Silt sock, haybale or silt fences shall be set where required to trap products of erosion and shall be maintained on a continuing basis during the construction process.

Loaming and Seeding

- Loam shall not be placed unless it is to be seeded directly thereafter.
- All disturbed areas shall have a minimum of 4" of loam placed before seeded and mulched.
- Consideration shall be given to hydro-mulching, especially on slopes in excess of 3 to 1.
- Loamed and seeded slopes shall be protected from washout by mulching or other acceptable slope protection until vegetation begins to grow.

Stormwater Collection System Installation

- The Stormwater drainage system shall be installed from the downstream end up and in a manner which will not allow runoff from disturbed areas to enter pipes.
- Excavation for the drainage system shall not be left open when rainfall is expected overnight. If left open under other circumstances, pipe ends shall be closed by a staked board or by an equivalent method.
- All catch basin openings shall be covered by a silt bag between the grate and the frame or protected from sediment by silt fence surrounding the catch basin grate.

Completion of Paved Areas

- During the placement of sub-base and pavement, the entrance to the Stormwater drainage systems shall be sealed when rain is expected. When these entrances are closed, consideration must be given to the direction of run-off and measures shall be undertaken to minimize erosion and to provide for the collection of sediment.
- In some situations it may be necessary to keep catch basins open.

- Appropriate arrangements shall be made downstream to remove all sediment deposition.

Stabilization of Surfaces

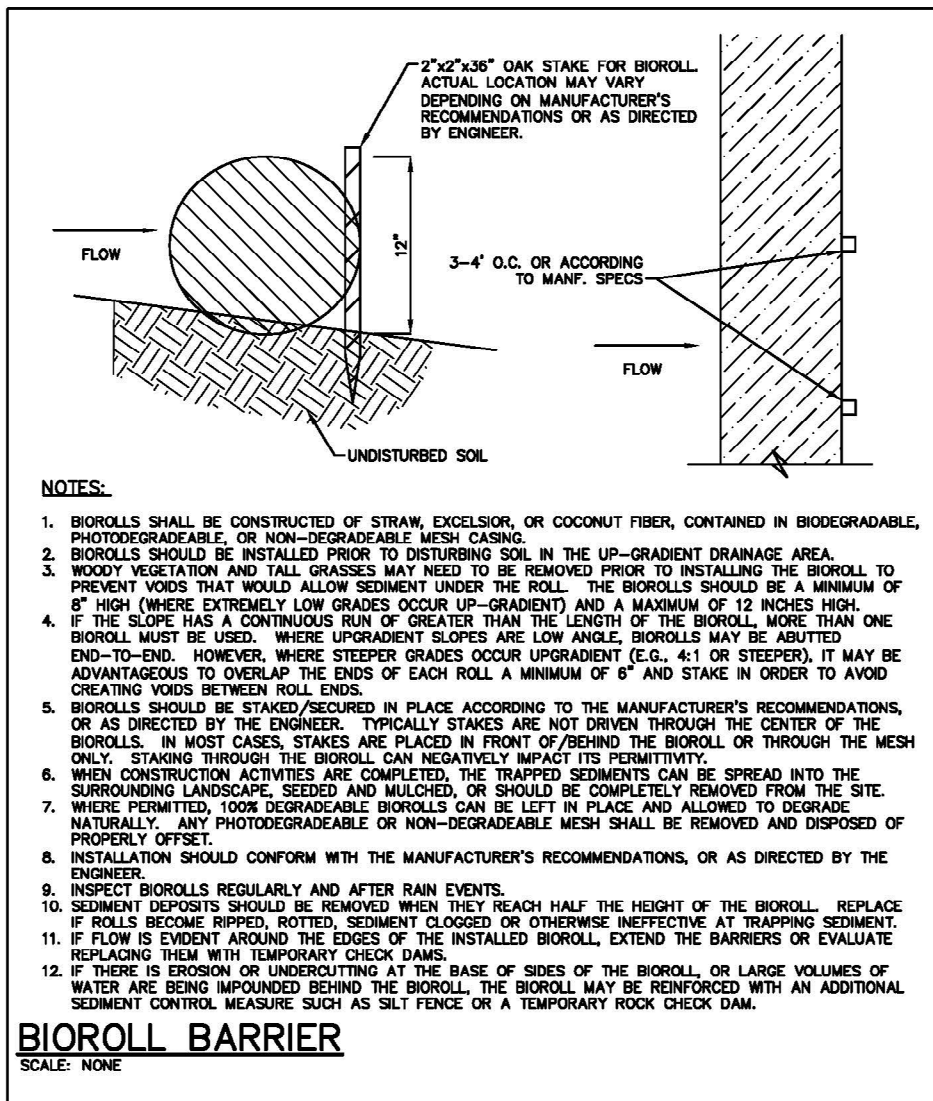
- Stabilization of surfaces includes the placement of pavement, rip-rap, wood bark mulch and the establishment of vegetated surfaces.
- Upon completion of construction, all surfaces shall be stabilized even though it is apparent that future construction efforts will cause their disturbance.
- Vegetated cover shall be established during the proper growing season and shall be enhanced by soil adjustment for proper pH, nutrients and moisture content.
- Surfaces that are disturbed by erosion processes or vandalism shall be stabilized as soon as possible.
- Areas where construction activities have permanently or temporarily ceased shall be stabilized within 14 days from the last construction activity, except when construction activity will resume within 21 days (e.g., the total time period that construction activity is temporarily ceased is less than 21 days).
- Hydro-mulching of grass surfaces is recommended, especially if seeding of the surfaces is required outside the normal growing season.
- Hay mulch is an effective method of temporarily stabilizing surfaces, but only if it is properly secured by branches, weighted snow fences or weighted chicken wire.

4.7 Temporary Structural Erosion Control Measures

Temporary erosion control measures serve to minimize construction-associated impacts to wetland resource and undisturbed areas. Please refer to the following sections for a description of temporary erosion control measures implemented as part of the project and this sample SWPPP.

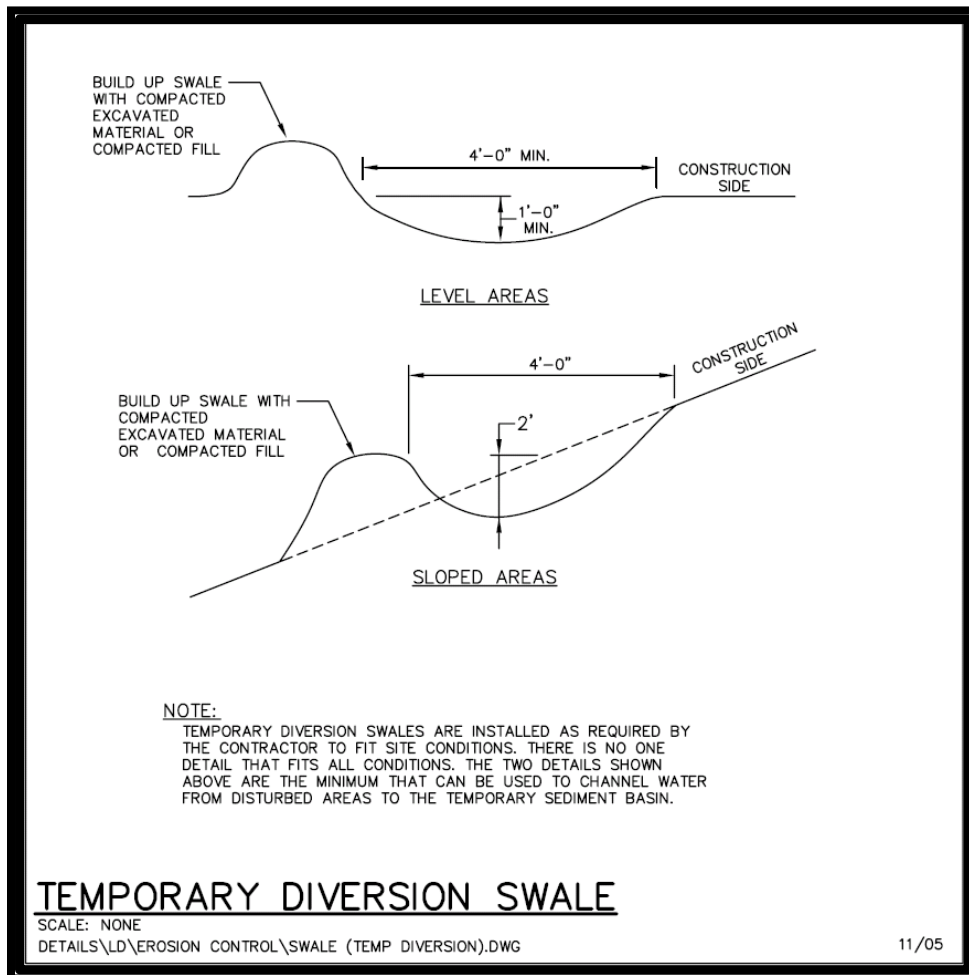
4.7.1 Staked Straw Wattles and/or Silt Fencing

The siltation barriers will demarcate the limit of work, form a work envelope and provide additional assurance that construction equipment will not enter the adjacent wetlands or undisturbed portions of the site. All barriers will remain in place until disturbed areas are stabilized.



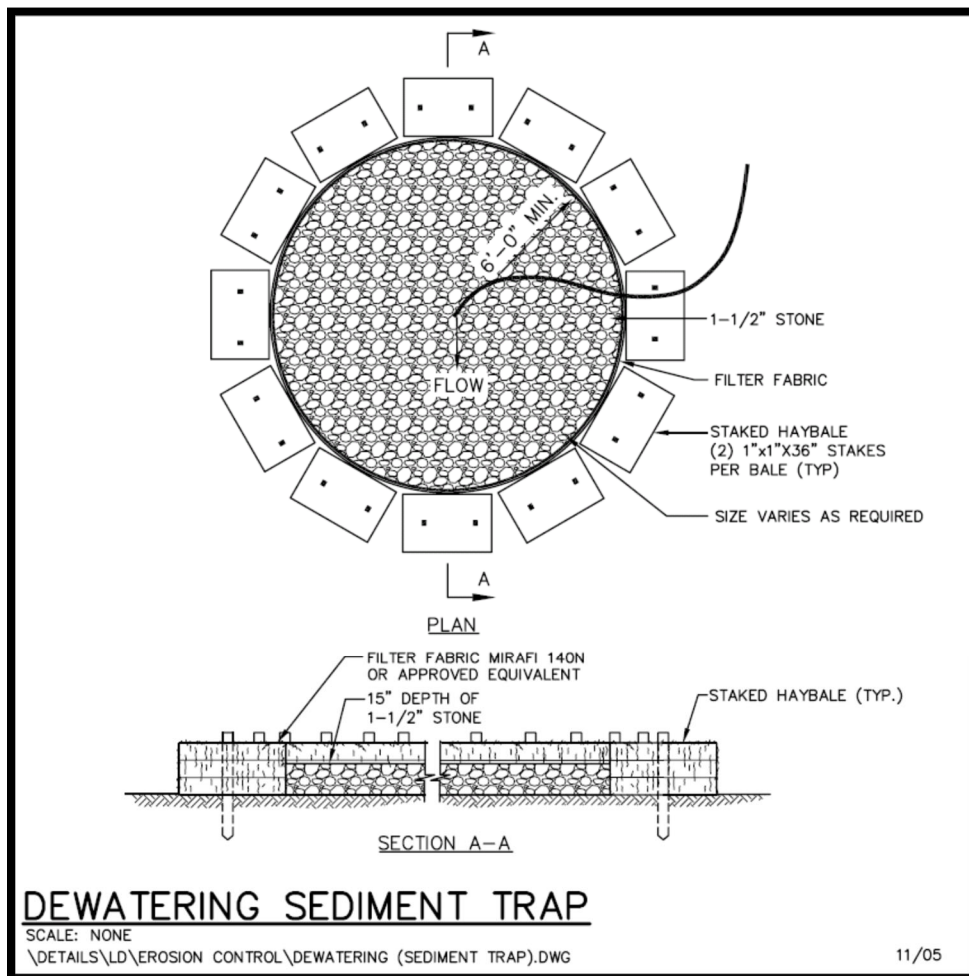
4.7.2 Temporary Stormwater Diversion Swale

A temporary diversion swale is an effective practice for temporarily diverting stormwater flows and to reduce stormwater runoff velocities during storm events. The swale channel can be installed before infrastructure construction begins at the site, or as needed throughout the construction process. The diversion swale should be routinely compacted or seeded to minimize the amount of exposed soil.



4.7.3 Dewatering Basins

Dewatering may be required during stormwater system, foundation construction and utility installation. Should the need for dewatering arise, groundwater will be pumped directly into a temporary settling basin, which will act as a sediment trap during construction. All temporary settling basins will be located within close proximity of daily work activities. Prior to discharge, all groundwater will be treated by means of the settling basin or acceptable substitute. Discharges from sediment basins will be free of visible floating, suspended and settleable solids that would impair the functions of a wetland or degrade the chemical composition of the wetland resource area receiving ground or surface water flows and will be to the combined system.



4.7.4 Material Stockpiling Locations

Piping and trench excavate associated with the subsurface utility work will be contained with a single row of silt socks and/or haybales.

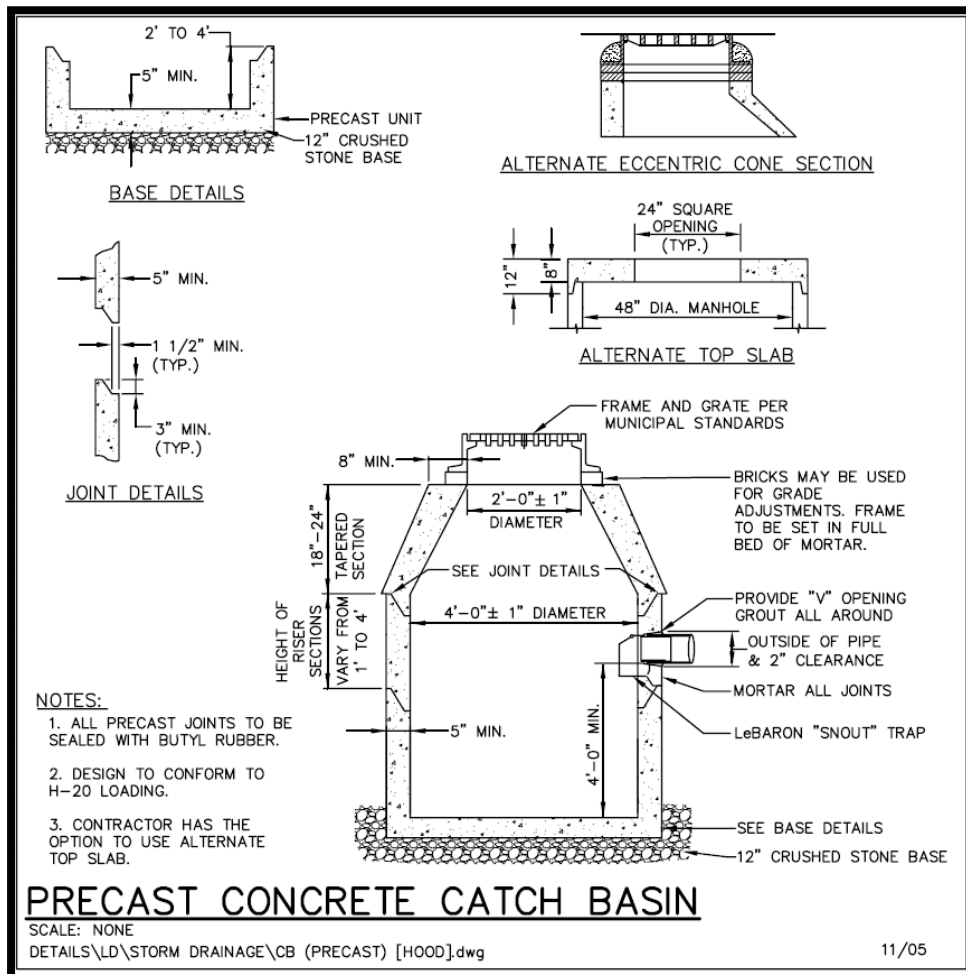
4.8 Permanent Structural Erosion Control Measures

Permanent erosion control measures serve to minimize post-construction impacts to wetland resource areas and undisturbed areas. Please refer to the following sections for a description of permanent erosion control measures implemented as part of the project and this SWPPP.

4.8.1 Catch Basins with Deep Sumps and Hooded Traps

Driveways will be bermed (or curbed) and provided with catch basins to collect runoff. The entire drainage system for each respective project phase will be installed during the initial phases of construction. The collection system will be installed from the downstream end up, and in a manner which will not allow runoff from disturbed areas to enter the pipes.

The catch basins will be inspected and cleaned as necessary (sediment depth of 12") at least two times per year. The optimum time for cleaning is during the period just after the snowmelt of late winter and prior to the onset of heavy spring precipitation. All sediments and hydrocarbons will be properly handled and disposed of in accordance with local state and federal guidelines and regulations.



4.9 Good Housekeeping Best Management Practices

4.9.1 Material Handling and Waste Management

Solid waste generation during the construction period will be primarily construction debris. The debris will include scrap lumber (used forming and shoring pallets and other shipping containers), waste packaging materials (plastic sheeting and cardboard), scrap cable and wire, roll-off containers (or dumpsters) and will be removed by a contract hauler to a properly licensed landfill. The roll-off containers will be covered with

a properly secured tarp before the hauler exits the site. In addition to construction debris, the construction work force will generate some amount of household-type wastes (food packing, soft drink containers, and other paper). Trash containers for these wastes will be located around the site and will be emptied regularly so as to prevent wind-blown litter. This waste will also be removed by a contract hauler.

All hazardous waste material such as oil filters, petroleum products, paint and equipment maintenance fluids will be stored in structurally sound and sealed shipping containers in the hazardous-materials storage area and segregated from other non-waste materials. Secondary containment will be provided for all materials in the hazardous materials storage area and will consist of commercially available spill pallets. Additionally, all hazardous materials will be disposed of in accordance with federal, state and municipal regulations.

Two temporary sanitary facilities (portable toilets) will be provided at the site in the combined staging area. The toilets will be away from a concentrated flow path and traffic flow and will have collection pans underneath as secondary treatment. All sanitary waste will be collected from an approved party at a minimum of three times per week.

4.9.2 Building Material Staging Areas

Construction equipment and maintenance materials will be stored at the combined staging area and materials storage areas. Silt fence will be installed around the perimeter to designate the staging and materials storage area. A watertight shipping container will be used to store hand tools, small parts and other construction materials.

Non-hazardous building materials such as packaging material (wood, plastic and glass) and construction scrap material (brick, wood, steel, metal scraps, and pine cuttings) will be stored in a separate covered storage facility adjacent to other stored materials. All hazardous-waste materials such as oil filters, petroleum products, paint and equipment maintenance fluids will be stored in structurally sound and sealed containers under cover within the hazardous materials storage area.

Large items such as framing materials and stockpiled lumber will be stored in the open storage area. Such materials will be elevated on wood blocks to minimize contact with runoff.

The combined storage areas are expected to remain clean, well-organized and equipped with ample cleaning supplies as appropriate for the materials being stored. Perimeter controls such as containment structures, covers and liners will be repaired or replaced as necessary to maintain proper function.

4.9.3 Designated Washout Areas

Designated temporary, below-ground concrete washout areas will be constructed, as required, to minimize the pollution potential associated with concrete, paint, stucco, mixers etc. Signs will, if required, be posted marking the location of the washout area to ensure that concrete equipment operators use the proper facility. Concrete pours will not be conducted during or before an anticipated precipitation event. All excess concrete and concrete washout slurries from the concrete mixer trucks and chutes will be discharged to the washout area or hauled off-site for disposal.

4.9.4 Equipment/Vehicle Maintenance and Fueling Areas

Several types of vehicles and equipment will be used on-site throughout the project including graders, scrapers, excavators, loaders, paving equipment, rollers, trucks and trailers, backhoes and forklifts. All major equipment/vehicle fueling and maintenance will be performed off-site. A small, 20-gallon pickup bed fuel tank will be kept on-site in the combined staging area. When vehicle fueling must occur on-site, the fueling activity will occur in the staging area. Only minor equipment maintenance will occur on-site. All equipment fluids generated from maintenance activities will be disposed of into designated drums stored on spill pallets. Absorbent, spill-cleanup materials and spill kits will be available at the combined staging

and materials storage area. Drip pans will be placed under all equipment receiving maintenance and vehicles and equipment parked overnight.

4.9.5 Equipment/Vehicle Wash down Area

All equipment and vehicle washing will be performed off-site.

4.9.6 Spill Prevention Plan

A spill containment kit will be kept on-site in the Contractor's trailer and/or the designated staging area throughout the duration of construction. Should there be an accidental release of petroleum product into a resource area, the appropriate agencies will be immediately notified.

4.9.7 Inspections

Maintenance of existing and proposed BMP's to address stormwater management facilities during construction is an on-going process. The purpose of the inspections is to observe all sources of stormwater or non-stormwater discharge as identified in the SWPPP as well as the status of the receiving waters and fulfill the requirements of the Order of Conditions. The following sections describe the appropriate inspection measures to adequately implement the project's SWPPP. A blank inspection form is provided at the end of this section. Completed inspection forms are to be maintained on site.

Inspection Personnel

The owner's appointed representative will be responsible for performing regular inspections of erosion controls and ordering repairs as necessary.

Inspection Frequency

Inspections will be performed by qualified personnel once every 7 days and within 24-hours after a storm event of greater than one-quarter inch, in accordance with the CGP. The inspections must be documented on the inspection form provided at the end of this section, and completed forms will be provided to the on-site supervisor and maintained at the Owner's office throughout the entire duration of construction.

Inspection Reporting

Each inspection report will summarize the scope of the inspection, name(s) and qualifications of personnel making the inspection, and major observations relating to the implementation of the SWPPP, including compliance and non-compliance items. Completed inspection reports will remain with the completed SWPPP on site.

4.9.8 Amendment Requirements

The final SWPPP is intended to be a working document that is utilized regularly on the construction site, and provides guidance to the Contractor. It must reflect changes made to the originally proposed plan and will be updated to include project specific activities and ensure that they are in compliance with the NPDES General Permit and state and local laws and regulations. It should be amended whenever there is a change in design, construction, operation or maintenance that affects discharge of pollutants. The following items should be addressed should an amendment to the SWPPP occur:

- Dates of certain construction activities such as major grading activities, clearing and initiation of and completion of stabilization measures should be recorded.
- Future amendments to the SWPPP will be recorded as required. As this SWPPP is amended, all amendments will be kept on site and made part of the SWPPP.

- Upon completion of site stabilization (completed as designed and/or 70% background vegetative cover), it can be documented and marked on the plans. Inspections are no longer required at this time.
- Inspections often identify areas not included in the original SWPPP, which will require the SWPPP to be amended. These updates should be made within seven days of being recognized by the inspector.

4.10 SWPPP Inspection and Maintenance Report

The following form is an example to be used for SWPPP Inspection Reporting.

Stormwater Construction Site Inspection and Maintenance Report

TO BE COMPLETED AT LEAST EVERY 7 DAYS AND WITHIN 24 HOURS OF A STORM EVENT OF AT LEAST 0.25 INCHES. AFTER SITE STABILIZATION, TO BE COMPLETED AT LEAST ONCE PER MONTH FOR THREE YEARS OR UNTIL A NOTICE OF TERMINATION IS FILED (IF APPLICABLE).

General Information			
Project Name	Leamar Drive (532 Main Street (Route 130)) – Mashpee, MA		
NPDES Tracking No. (if applicable)		Location	532 Main Street (Route 130) Mashpee, MA
Date of Inspection		Start/End Time	
Inspector's Name(s)			
Inspector's Title(s)			
Inspector's Contact Information			
Inspector's Qualifications			
Describe present phase of construction			
Type of Inspection: <input type="checkbox"/> Regular <input type="checkbox"/> Pre-storm event <input type="checkbox"/> During storm event <input type="checkbox"/> Post-storm event			
Weather Information			
Has there been a storm event since the last inspection? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, provide: Storm Start Date & Time: Storm Duration (hrs): Approximate Amount of Precipitation (in):			
Weather at time of this inspection? <input type="checkbox"/> Clear <input type="checkbox"/> Cloudy <input type="checkbox"/> Rain <input type="checkbox"/> Sleet <input type="checkbox"/> Fog <input type="checkbox"/> Snowing <input type="checkbox"/> High Winds <input type="checkbox"/> Other: Temperature:			
Have any discharges occurred since the last inspection? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, describe:			
Are there any discharges at the time of inspection? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, describe:			

Site-specific BMPs

- *Number the structural and non-structural BMPs identified in your SWPPP on your site map and list them below (add as many BMPs as necessary). Carry a copy of the numbered site map with you during your inspections. This list will ensure that you are inspecting all required BMPs at your site.*
- *Describe corrective actions initiated, date completed, and note the person that completed the work in the Corrective Action Log.*

	BMP	BMP Installed?	BMP Maintenance Required?	Corrective Action Needed and Notes Action required by whom and when
1	Catch Basin Protection	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
2	Haybale & Silt Fencing	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
3	Straw Wattles	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
4	Construction Entrance	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
5	Sediment Basins	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
6	Dewatering Pit	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	

Overall Site Issues

Below are some general site issues that should be assessed during inspections. Customize this list as needed for conditions at your site.

	BMP/activity	Implemented?	Maintenance Required?	Corrective Action Needed and Notes Action required by whom and when
1	Are all slopes and disturbed areas not actively being worked properly stabilized?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
2	Are natural resource areas (e.g., streams, wetlands, mature trees, etc.) protected with barriers or similar BMPs?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
3	Are perimeter controls and sediment barriers adequately installed (keyed into substrate) and maintained?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
4	Are discharge points and receiving waters free of any sediment deposits?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
5	Are storm drain inlets properly protected?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
6	Is the construction exit preventing sediment from being tracked into the street?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
7	Is trash/litter from work areas collected and placed in covered dumpsters?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
8	Are washout facilities (e.g., paint, stucco, concrete) available, clearly marked, and maintained?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
9	Are vehicle and equipment fueling, cleaning, and maintenance areas free of spills, leaks, or any other deleterious material?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	Vehicle Maintenance not allowed on site
10	Are materials that are potential stormwater	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	

	BMP/activity	Implemented?	Maintenance Required?	Corrective Action Needed and Notes Action required by whom and when
	contaminants stored inside or under cover?			
11	Are non-stormwater discharges (e.g., wash water, dewatering) properly controlled?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	
12	(Other)	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	

Non-Compliance

Describe any incidents of non-compliance not described above:

CERTIFICATION STATEMENT

“I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.”

Print name and title: _____
(Qualified Person Performing the Inspection)

Signature: _____ **Date:** _____

Print name and title: _____
(Contractor/Operator)

Signature: _____ **Date:** _____

SECTION 5.0

LONG-TERM POLLUTION PREVENTION & OPERATION AND MAINTENANCE PLAN

5.0 LONG-TERM POLLUTION PREVENTION & OPERATION AND MAINTENANCE PLAN

As required by Standard #4 of the Stormwater Management Policy, this Long-Term Pollution Prevention Plan has been developed for source control and pollution prevention at the site after construction.

MAINTENANCE RESPONSIBILITY

Ensuring that the provisions of the Long-Term Pollution Prevention Plan are followed will be the responsibility of The Owner/Applicant/Homeowners Association.

Print name and title: _____
(Owner/Applicant/Homeowners Association)

Signature: _____ **Date:** _____

GOOD HOUSEKEEPING PRACTICES

The site to be kept clean of trash and debris at all times. Trash, junk, etc. is not to be left outside.

VEHICLE WASHING CONTROLS

The following BMP's, or equivalent measures, methods or practices are required if you are engaged in vehicle washing and/or steam cleaning:

It is allowable to rinse down the body or a vehicle, including the bed of a truck, with just water without doing any wash water control BMP's.

If you wash (with mild detergents) on an area that infiltrates water, such as gravel, grass, or loose soil, it is acceptable to let the wash water infiltrate as long as you only wash the body of vehicles.

However, if you wash on a paved area and use detergents or other cleansers, or if you wash/rinse the engine compartment or the underside of vehicles, you must take the vehicles to a commercial vehicle wash.

REQUIREMENTS FOR ROUTINE INSPECTIONS AND MAINTENANCE OF STORMWATER BMPs

All stormwater BMPs are to be inspected and maintain as follows;

Straw Wattles, Silt Fence, and other temporary measures

The temporary erosion control measures will be installed up gradient of any wetland resource area where any disturbance or alteration might otherwise allow for erosion or sedimentation. They will be regularly inspected to ensure that they are functioning adequately. Additional supplies of these temporary measures will be stockpiled on site for any immediate needs or routine replacement.

Water Quality Treatment Units, Deep Sump Hooded Catch Basins, and Drain Manholes

Regular maintenance is essential. Catch basins remain effective at removing pollutants only if they are cleaned out frequently. Inspect or clean basins at least four times per year and at the end of the foliage and snow removal seasons. Sediments must also be removed four times per year or whenever the depth of the deposits in the catch basin sump is greater than or equal to one half the depth from the bottom of the invert of the lowest pipe in the basin.

Infiltration Basins

Infiltration Basins are prone to clogging and failure, so it is imperative to develop and implement aggressive maintenance schedules. Installing the required pretreatment BMPs will significantly reduce maintenance requirements for the basin.

The Operation and Maintenance Plan required by Standard 9 must include inspections and preventative maintenance at least twice a year, and after every time drainage discharges through the high outlet orifice. The Plan must require inspecting the pretreatment BMPs in accordance with the minimal requirements specified for those practices and after every major storm event. A major storm event defined as a storm that is equal to or greater than the 2-year, 24-hour storm (generally 2.9 to 3.6 inches in a 24-hour period, depending on geographic location in Massachusetts).

Once the basin is in use, inspect after every major storm for the first few months to ensure it is stabilized and functioning properly and if necessary, take corrective action. Note how long water remains standing in the basin after a storm; standing water within the basin 48 to 72 hours after a storm indicates that the infiltration capacity may have been overestimated. If the ponding is due to clogging, immediately address the reasons for the clogging (such as upland sediment erosion, excessive compaction of soils, or low spots).

Thereafter, inspect the infiltration basin at least twice per year. Important items to check during the inspection include signs of differential settlement, cracking, erosion, leakage in the embankments, tree growth on the embankments, condition of riprap, sediment accumulation, and the health of the turf.

At least twice a year, mow the buffer area, side slopes, and basin bottom. Remove grass clippings and accumulated organic matter to prevent an impervious organic mat from forming. Remove trash and debris at the same time. Use deep tilling to break up clogged surfaces and revegetate immediately.

Remove sediment from the basin as necessary but wait until the floor of the basin is thoroughly dry. Use light equipment to remove the top layer so as to not compact the underlying soil. Deeply till the remaining soil and revegetate as soon as possible. Inspect and clean pretreatment devices associated with basins at least twice a year, and ideally every other month.

PROVISIONS FOR MAINTENANCE OF LAWNS, GARDENS AND OTHER LANDSCAPE AREAS

Suggested Maintenance Operations

A. Trees and Shrubs

Disease and Pest Management - Prevention of disease or infestation is the first step of Pest Management. A plant that is in overall good health is far less susceptible to disease. Good general landscape maintenance can reduce problems from disease.

Inspections of plant materials for signs of disease or infestation are to be performed monthly by the Landscape Maintenance Contractor's Certified Arborist. This is a critical step for early diagnosis. Trees and Shrubs that have been diagnosed to have a plant disease or an infestation of insect pests are to be treated promptly with an appropriate material by a licensed applicator.

Fertilization - Trees and shrubs live outside their natural environment and should be given proper care to maintain health and vigor. Fertilizing trees and shrubs provides the plants with nutrients needed to resist insect attack, to resist drought and to grow thicker foliage. Fertilizing of new and old trees may be done in one of three ways, in either the early spring or the late fall.

- Systemic Injection of new and existing trees on trees 2 inches or greater in diameter. You must be licensed to apply this method.
- Soil Injection – a liquid fertilizer with a product such as Arbor Green or Rapid Grow injected into the soil under the drip zone of a tree or shrub. Material must be used according to manufacturers' specifications to be effective. Outside contracting is recommended.

- Punch Bar Method – a dry fertilizer such as 10-10-10, may be used by punched holes in the drip zone of the tree 12-18” deep, two feet apart around the circumference, to the edge of the drip line. Three pounds of fertilizer should be used per diameter inch for trees with trunks six inches or more in diameter.
- Fertilizer of shrubs – use a fertilizer such as 10-10-10, broadcast over the planting area according to the manufacturers’ rate and water in.
- All fertilization must be noted on daily maintenance log.

Watering - Trees and Shrubs will need supplemental watering to remain in vigorous health. All new plants need to be watered once a week in cool weather, twice a week during warm weather, and up to three times in a week during periods of extreme heat and drought. Trees and shrubs should be watered in such a manner as to totally saturate the soil in the root zone area. Over-watering or constant saturation of the soil must be avoided as this could lead to root rot and other disease problems. The use of a soil moisture meter can help you monitor the soil’s water intake.

Plant Replacement - Unhealthy plants that may cause widespread infestation of other nearby plants shall be immediately removed from the site. Any vegetation removed from the site must be recorded and submitted with the daily maintenance log. The area shall be treated to prevent further infestation. The plant shall then be replaced with a healthy specimen of the same species and size. This work shall have a pre-established budget allowance for the year.

A spring inspection of all plant materials shall be performed to identify those plant materials that are not in vigorously healthy condition. Unhealthy plant materials shall be evaluated. If the problem is determined to be minor the plant material shall be given appropriate restorative care in accordance with this maintenance guideline until it is restored to a vigorously healthy condition. Unhealthy plant materials that do not respond to restorative care or are determined to be beyond saving shall be replaced with a healthy specimen of the same species and size. In the case of the necessity of replacing extremely large plant materials the Landscape Architect shall determine the size of the replacement plant.

Pruning - Proper pruning is the selective removal of branches without changing the plant’s natural appearance, or habit of growth. All tree pruning is to be performed by a licensed Arborist. All branches that are dead, broken, scared or crossing should be removed. All cuts should be made at the collar and not cut flush with the base.

Pruning on the site shall be done for the following purposes;

- To maintain or reduce the size of a tree or shrub
- To remove dead, diseased or damaged branches
- To rejuvenate old shrubs and encourage new growth
- To stimulate future flower and fruit development
- To maximize the visibility of twig color
- To prevent damage and reduce hazards to people and properties

All shrubs are recommended to be pruned on an annual basis to prevent the shrub from becoming overgrown and eliminate the need for drastic pruning. There are several types of pruning for deciduous shrubs. Hand snips should be used to maintain a more natural look or hand shears can be used for a more formal appearance.

Winter Protection - All trees and shrubs are to be watered, fertilized, and mulched before the first frost. All stakes should be checked and ties adjusted. Damaged branches should be pruned.

Broadleaf and Coniferous Evergreen plant materials are to be sprayed with an anti-desiccant product to prevent winter burn. The application shall be repeated during a suitable mid-winter thaw.

Shrubs located in areas likely to be piled with snow during snow removal (but not designated as Snow Storage Areas) shall be marked by six-foot high poles with bright green banner flags. Stockpiles of snow are not to be located in these areas due to potential damage to the plant materials from both the weight of the snow and the snow melting chemicals.

At the fall landscape maintenance conference parameters will be discussed between the Landscape Maintenance Contractor and the snow removal contractor to assure minimal damage and loss of landscape amenities during the winter season.

Seasonal Clean Up - A thorough spring cleanup is to be performed. This includes the removal and replacement of dead or unhealthy plant materials and the cleanup of plant debris and any general debris that has accumulated over the winter season. Mulch is to be lightly raked to clean debris from the surface without removing any mulch. Twigs and debris are to be removed from the planting beds throughout the growing season.

Mulching - Planting beds shall be mulched with a treated shredded hardwood mulch free from dirt, debris, and insects. A sample of this mulch shall be given to the Owner for approval prior to installation.

Maintain a 2-3" maximum depth and keep free of weeds either by hand weeding or by the use of a pre-emergent weed control such as Treflan or Serfian. Seasonal re-mulching shall occur as necessary in the spring and the fall to maintain this minimum depth. When new mulch is added to the planting bed it shall be spread to create a total depth of no more than three inches. Edges should be maintained in a cleanly edged fashion.

Mulch shall not be placed directly against the trunk of any tree or shrub.

B. *Groundcover and Perennials*

Disease and Pest Management – Pesticides and herbicides should be applied only as problems occur, with the proper chemical applied only by a trained professional or in the case of pesticide, a Certified Pesticide Applicator. Plants should be monitored weekly and treated accordingly.

Fertilizer – The health of the plants can be maintained or improved, and their growth encouraged by an application of complete fertilizer. Apply a fertilizer such as 4-12-4 as growth becomes apparent and before mulching. Apply to all groundcover and perennial planting areas by hand and avoid letting the fertilizer come in contact with the foliage, or use a liquid fertilizer and apply by soaking the soil. Apply according to the manufacturers' specifications.

Fertilization shall stop at the end of July.

Water – Groundcovers and Perennials will need supplemental watering in order to become established, healthy plants. All new plants need to be watered once a week in cool weather, twice a week during warm weather, and up to three times in a week during periods of extreme heat and drought. Until established, groundcovers and perennials should be watered in such a manner as to totally saturate the soil in the root zone area, to a depth of 6 inches. Once established, perennials shall continue to be watered as necessary to maintain them in a vigorous healthy condition. Over-watering or constant saturation of the soil must be avoided as this could lead to root rot and other disease problems. The use of a soil moisture meter can help you monitor the soil's water intake.

On-site water shall be furnished by the Owner. Hose and other watering equipment shall be furnished by the Landscape Maintenance Contractor.

Replacement – Any unhealthy plant/s that may cause widespread infestation of other nearby plants shall be immediately removed from the site. Any vegetation removed from the site must be recorded and submitted with the landscape maintenance log. The area shall be treated to prevent further infestation. The plant/s shall then be replaced with healthy specimen/s of the same species and size. Old Forge shall have a pre-established budget allowance for this type of replacement, each year.

Plant material that is damaged as a result of other landscape maintenance activities, such as mowing, shall be replaced with healthy specimens of the same species and size, at no additional cost to the owner.

Deadheading – Perennials shall be checked on a weekly basis and dead-headed once flowers have faded or as necessary based on plant type and duration of flower. Spent flowers can be pinched off with the thumb and forefinger. Continue to remove all faded flowers until Fall. All associated debris shall be removed from site daily.

Staking – Upright-growing perennials need support especially when in flower. Use of bamboo stakes, galvanized wire hoops or mesh may be necessary for their support. Supports should be put in place before they have become too difficult to handle. The supports should not be taller than the mature height of the perennial plant.

Division of Perennials – Two or three year-old perennials are easily divided in the spring if more plants are needed. To divide, cut out the entire section of plant to be divided, including roots. The larger divisions (those with three or more shoots), can be set out immediately in their permanent location, where they can be expected to bloom the same season. Smaller divisions are best planted in an out-of-the-way planting bed until the following autumn or spring, when they can be moved to their permanent location.

Weeding – All planting beds should be kept weed-free. Weed either by hand or with a pre-emergent herbicide such as Treflen used according to manufacturers' specifications. Manual weeding is to be used in combination with the use of spot applications of herbicides. Both live and dead weeds are to be pulled and removed from the site.

All herbicide applications shall be documented in the Landscape Maintenance Log. The actual product label or the manufacturer's product specification sheet for the specific product shall also be included in the Log.

Only personnel with appropriate applicator licenses shall supervise and/or perform the application of pesticide products requiring a license.

Winterizing – Perennial gardens should be cleaned-up when growth ceases in the fall. Remove foliage of plants that normally die down to the ground. Divide and replant over-grown clumps.

C. Lawn Areas - Turf Systems

Mowing – Proper mowing is an integral part of any good turf maintenance program. Without it, the finest in fertilization, watering and other vital maintenance practices would be completely ineffective. Proper mowing will help control dicot weeds; help the turf survive during periods of extreme heat, and gain strength and vigor to resist disease and other infestations.

Mowing height – The proper mowing height will vary somewhat according to the type of grass. The most common type of seed & sod lawns contain a mixture of bluegrass, fine fescue and perennial rye, which should be mowed at 2-3 inches.

Mowing frequency – The basic rule of thumb for mowing frequency is to never remove more than 1/3 of the grass blade in one mowing. Example: if you want to mow your turf at 2 inches, you should cut it when it reaches 3 inches. Removing more than 1/2 of the grass plant at a time can put the plant into shock, thus making it more susceptible to stress disease and weed infestation.

Mowing frequency will vary with the growing season and should be set by the plant height and not a set date. It will often be necessary to mow twice a week during periods of surge growth to help maintain plant health and color. Mowing should be cut back during periods of stress.

Grass clippings should be removed whenever they are thick enough to layer the turf. The return of clippings to the soil actually adds nutrients and helps retain moisture. Heavily clumped grass clippings are a sign of infrequent mowing, calling for an adjustment in the mowing schedule.

When mowing any area, try to alternate mowing patterns. This tends to keep grass blades more erect and assures an even cut. A dull mower will cause color loss due to tearing of the turf plant, and since mowing will ultimately determine the appearance of any turf area there is an absolute necessity for a clean sharp cut.

Weed & Pest Control and Fertilizing- In order to maintain turf grass health, vigor color, and nutrients, fertilizer must be added to the soil. Recommendations for fertilization of lawn areas are as follows; fertilize at the rate of one (1) pound of nitrogen per thousand square feet, per year is optimum. Fertilizer should be a balanced slow release, sulfur coated type fertilizer.

Weed Control - All turf areas will require some weed control, for both weed grasses and dicot weeds. Weeds should be treated at the appropriate time and with a material labeled for the target weed. Please refer to the fertilizer weed and pest schedule for timing.

Pest Control - All turf areas will require some pest control. Pests should be treated at the appropriate time with a material labeled for the target pest. Please refer to the fertilizer, weed and pest schedule for timing.

Lime - A common cause for an unhealthy lawn is acidic soil. When the PH is below the neutral range (between 6-7) vital plant nutrients become fixed in the soil and cannot be absorbed by the grass plant. Lime corrects an acid soil condition, supplies calcium for plant growth and improves air and water circulation. Limestone applied at the rate of 50 lbs. per thousand square feet will adjust the soil PH one point over a period of 6-9 months.

D. Fertilizer, Weed & Pest Control Schedule – Turf Systems

Spring - Fertilize one (1) pound of nitrogen per 1,000 square feet
(April) Pre-emergent weed grass control
Broadleaf weed control

Late Spring - Fertilize one (1) pound of nitrogen per 1,000 square feet
(June) Pre-emergent weed grass control
Broadleaf weed control
Insect Control (if needed)

*Summer - Fertilize one (1) pound of nitrogen per 1,000 square feet
(August) Broadleaf weed control (if needed)
Insect Control (if needed)

Fall - Fertilize one (1) pound of nitrogen per 1,000 square feet
(September)

*Omit if area is not to be irrigated

Lawn Maintenance Task Schedule

MARCH (Weather permitting)

- Clean up winter debris, sand, leaves, trash etc.
- Re-edge mulch beds, maintain at 2-3" maximum.
- Fertilize plants
- Aerate and thatch turf (conditions permitting)

APRIL

- Reseed or sod all areas needing attention.
- Fertilize and weed control
- Lime
- Start mowing when grass reaches 2-1/2", mow to 2"

MAY

- Mow turf to 2-2-1/2"
- Weed as necessary.
- Check for disease and pest problems in both turf and plants.

JUNE

- Mow turf to 2-1/2" – 3"
- Fertilize and weed control.
- Weed
- Check for disease and pest problems in both turf and plants, treat as necessary.

PROVISIONS FOR SOLID WASTE MANAGEMENT (SITE TRASH)

Trash will be placed in on-site dumpsters and the Owner will make provisions for its regular and timely removal.

SNOW DISPOSAL AND PLOWING PLANS

The purpose of the snow and snowmelt management plan is to provide guidelines regarding snow disposal site selection, site preparation and maintenance that are acceptable to the Department of Environmental Protection. For the areas that require snow removal, snow storage onsite will largely be accomplished by using pervious areas along the shoulder of the roadway and development as windrowed by plows.

- Avoid dumping of snow into any water body, including rivers, ponds, or wetlands. In addition to water quality impacts and flooding, snow disposed of in open water can cause navigational hazards when it freezes into ice blocks.
- Avoid disposing of snow on top of storm drain catch basins or in stormwater basins. Snow combined with sand and debris may block a storm drainage system, causing localized flooding. A high volume of sand, sediment, and litter released from melting snow also may be quickly transported through the system into surface water.
- In significant storm events, the melting or off-site trucking of snow may be implemented. These activities shall be conducted in accordance with all local, state and federal regulations.

WINTER ROAD SALT AND/OR SAND USE AND STORAGE RESTRICTIONS

The applicant will be responsible for sanding and salting the site. No storage on site.

STREET SWEEPING SCHEDULES

There are three types of sweepers: Mechanical, Regenerative Air, and Vacuum Filter.

- 1) Mechanical: Mechanical sweepers use brooms or rotary brushes to scour the pavement.
- 2) Regenerative Air: These sweepers blow air onto the road or parking lot surface, causing fines to rise where they are vacuumed.
- 3) Vacuum filter: These sweepers remove fines along roads. Two general types of vacuum filter sweepers are available - wet and dry. The dry type uses a broom in combination with the vacuum. The wet type uses water for dust suppression

Regardless of the type chosen, the efficiency of street sweeping is increased when sweepers are operated in tandem.

This project has not included street sweeping as part of the TSS removal calculations. However, it is recommended that street sweeping of the parking areas occur four times a year, including once after the spring snow melt.

Reuse and Disposal of Street Sweepings

Once removed from paved surfaces, the sweepings must be handled and disposed of properly. Mass DEP's Bureau of Waste Prevention has issued a written policy regarding the reuse and disposal of street sweepings. These sweepings are regulated as a solid waste, and can be used in three ways:

- In one of the ways already approved by Mass DEP (e.g., daily cover in a landfill, additive to compost, fill in a public way)
- If approved under a Beneficial Use Determination
- Disposed in a landfill

TRAINING OF STAFF OR PERSONNEL INVOLVED WITH IMPLEMENTING LONG-TERM POLLUTION PREVENTION PLAN

The Long-Term Pollution Prevention Plan is to be implemented by property owner of the site. Trained and, if required, licensed Professionals are to be hired by the owner as applicable to implement the Long-Term Pollution Prevention Plan.

LIST OF EMERGENCY CONTACTS FOR IMPLEMENTING LONG-TERM POLLUTION PREVENTION PLAN

The applicant will be required to implement the Long-Term Pollution Prevention Plan and will create and maintain a list of emergency contacts.

Emergency Contact (to be updated shall there be a change in ownership):

Applicant:

Marcello Mallegni

(508) 735-8079

POST CONSTRUCTION PHASE INSPECTION SCHEDULE AND EVALUATION CHECKLIST

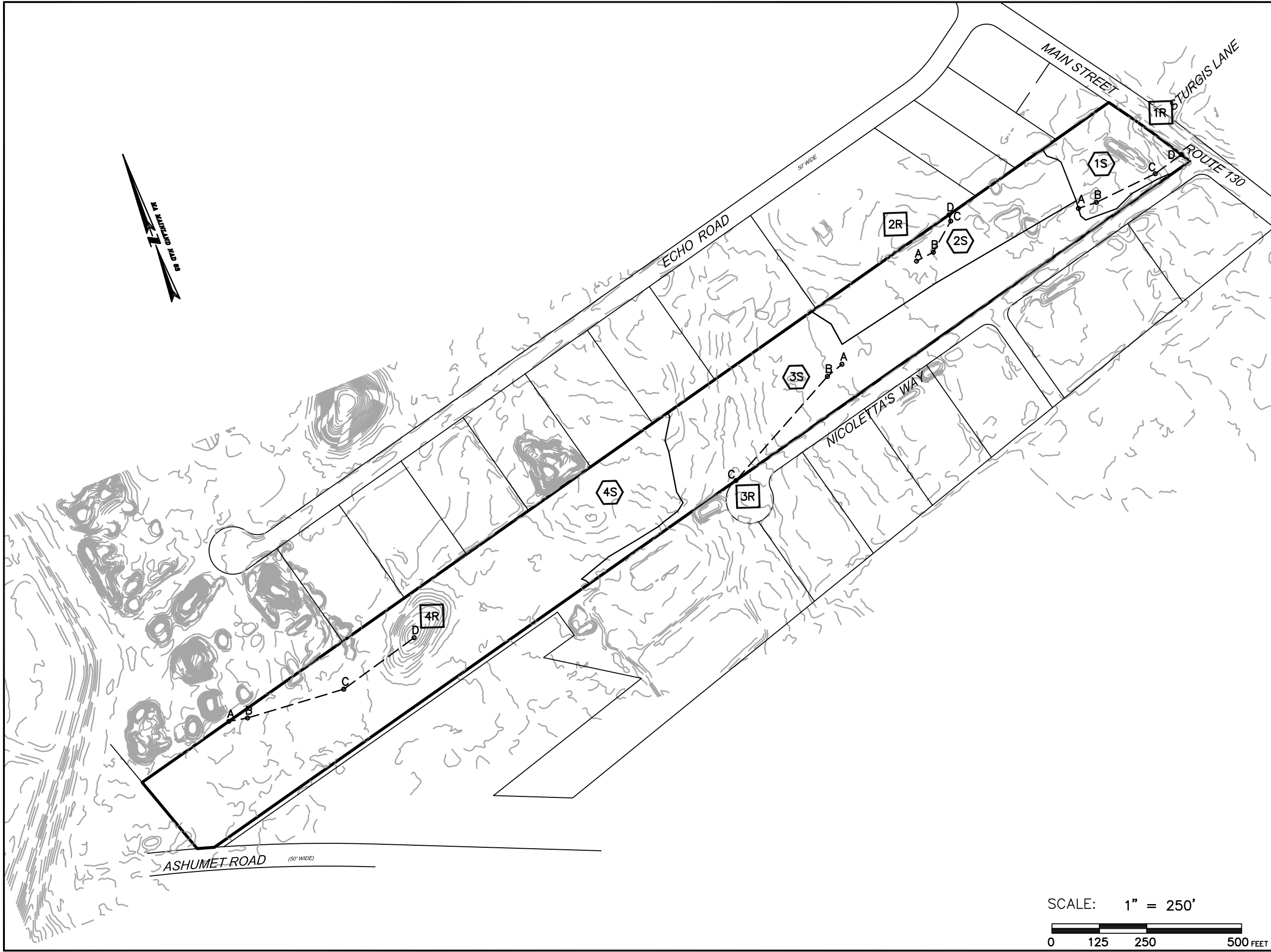
Inspection Date	Inspector	BMP Inspected	Inspection Frequency Requirements	Comments	Recommendation	Follow-up Inspection Required (yes/no)
		Catch Basin	Four times a year			
		Water Quality Units	Four times a year			
		Infiltration Basin	Twice a year			
		Pipe Outlet Protection	Once a year			

1. Refer to the Massachusetts Stormwater Handbook Volume Two: Stormwater Technical Handbook (February 2008) for recommendations regarding frequency for inspections and maintenance of specific BMP's
2. Inspections to be conducted by a qualified professional such as an environmental scientist or civil engineer.
3. Limited or no use of sodium chloride salts, fertilizers or pesticides recommended.
4. Other Notes: (Include deviations from Conservation Commission Approvals, Planning Board Approvals and Approved Plans)

SECTION 6.0

HYDROLOGY CALCULATIONS

6.01 EXISTING WATERSHED PLAN



LEMEAR DRIVE

532 MAIN ST (ROUTE 130)

MASHPEE
MASSACHUSETTS
(BARNSTABLE COUNTY)

PRE-DEVELOPMENT WATERSHED PLAN

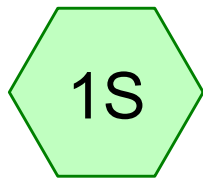
FEBRUARY 11, 2022

PREPARED
FOR: MARCELLO MALLEGNI
80 AIRPORT ROAD
HYANNIS, MA 02601

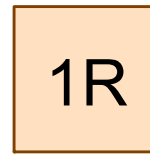
 **BSC GROUP**
349 Main Street - Route 28
West Yarmouth, Massachusetts
02673
508 778 8919

Job No.: 5-0474.00 Date: 2/4/22
Scale: 1" = 250' Revised: _____
Dwg No: _____
File: Projects-YAR\5047400\C\5047400-PP.dwg

6.02 EXISTING HYDROLOGY CALCULATIONS (HYDROCAD™ PRINTOUTS)



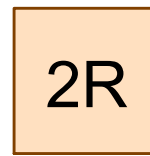
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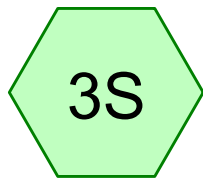
Off-site - Route 130



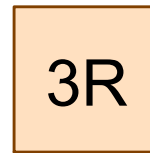
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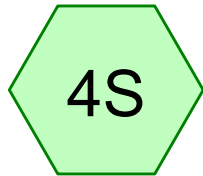
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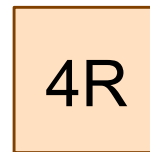
Area 3



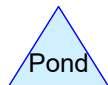
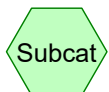
Off-site South



Area 4



Retained On-site



Routing Diagram for 5047400-Pre

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Page 2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.036	98	Paved parking, HSG A (1S)
18.006	30	Woods, Good, HSG A (1S, 2S, 3S, 4S)
18.043	30	TOTAL AREA

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532 Main Street (Route 130) - Mashpee, MA

Type III 24-hr 2-year Rainfall=3.44"

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Page 3

Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Area 1Runoff Area=60,850 sf 2.60% Impervious Runoff Depth=0.00"
Flow Length=307' Tc=17.1 min CN=32 Runoff=0.00 cfs 0.000 af**Subcatchment2S: Area 2**Runoff Area=100,817 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=161' Slope=0.0200 '/' Tc=14.2 min CN=30 Runoff=0.00 cfs 0.000 af**Subcatchment3S: Area 3**Runoff Area=230,191 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=415' Slope=0.0200 '/' Tc=20.2 min CN=30 Runoff=0.00 cfs 0.000 af**Subcatchment4S: Area 4**Runoff Area=394,080 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=545' Tc=21.2 min CN=30 Runoff=0.00 cfs 0.000 af**Reach 1R: Off-site - Route 130**Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af**Reach 2R: Off-site North**Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af**Reach 3R: Off-site South**Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af**Reach 4R: Retained On-site**Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af**Total Runoff Area = 18.043 ac Runoff Volume = 0.000 af Average Runoff Depth = 0.00"**
99.80% Pervious = 18.006 ac 0.20% Impervious = 0.036 ac

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532 Main Street (Route 130) - Mashpee, MA

Type III 24-hr 2-year Rainfall=3.44"

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Page 4

Summary for Subcatchment 1S: Area 1

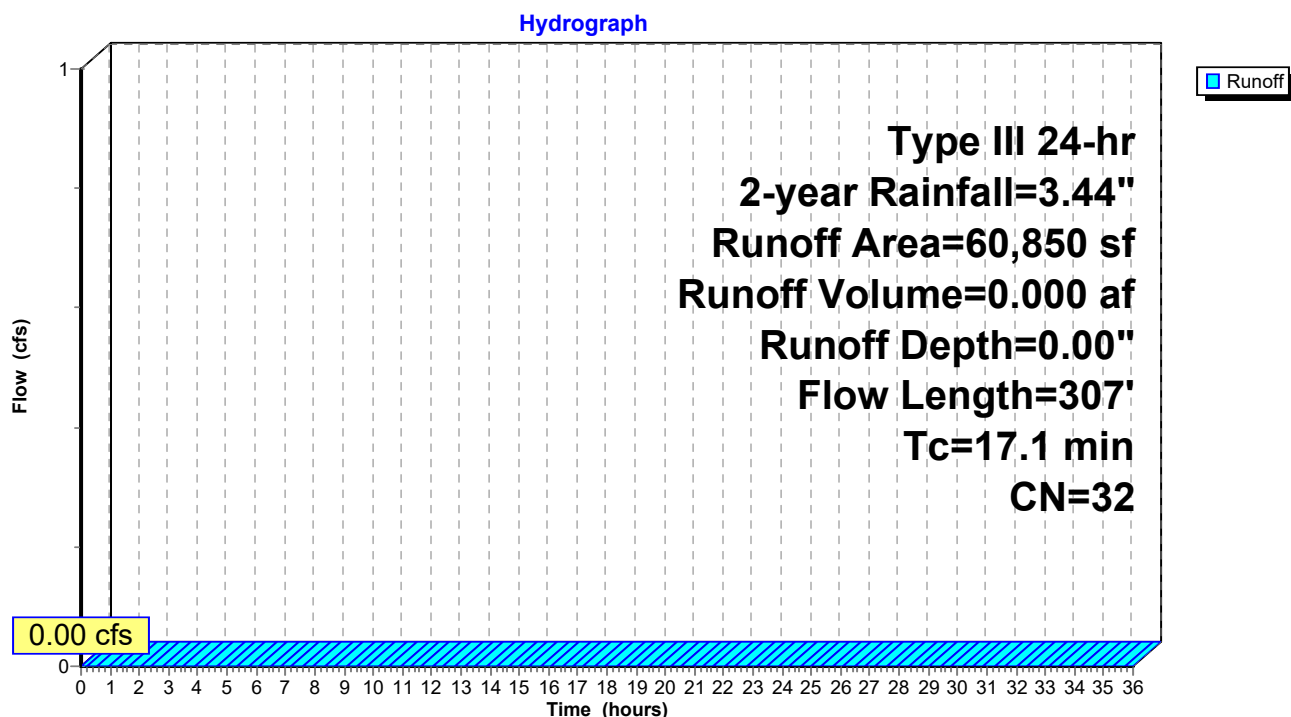
[45] Hint: Runoff=Zero

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.44"

Area (sf)	CN	Description
1,584	98	Paved parking, HSG A
59,266	30	Woods, Good, HSG A
60,850	32	Weighted Average
59,266		97.40% Pervious Area
1,584		2.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	50	0.0200	0.07		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.60"
4.1	172	0.0200	0.71		Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps
1.4	85	0.0400	1.00		Shallow Concentrated Flow, C-D Woodland Kv= 5.0 fps
17.1	307	Total			

Subcatchment 1S: Area 1

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532 Main Street (Route 130) - Mashpee, MA

Type III 24-hr 2-year Rainfall=3.44"

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Summary for Subcatchment 2S: Area 2

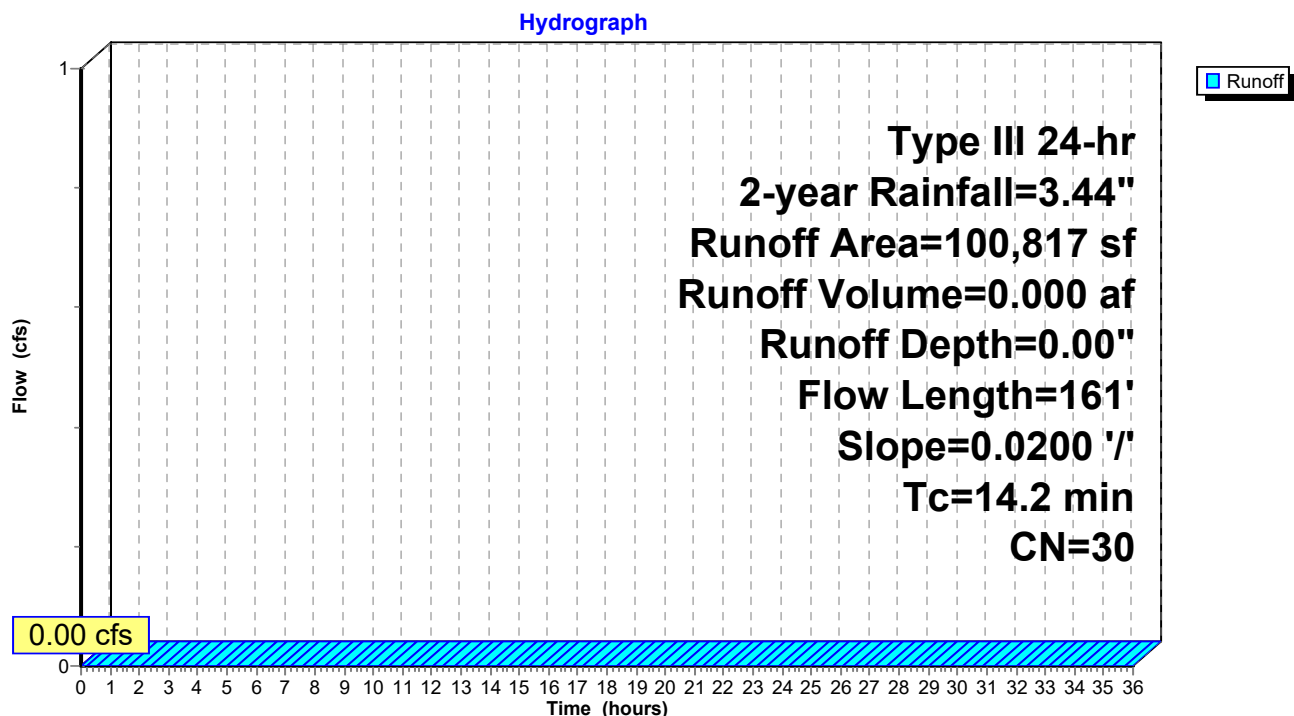
[45] Hint: Runoff=Zero

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.44"

Area (sf)	CN	Description
100,817	30	Woods, Good, HSG A
100,817		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	50	0.0200	0.07		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.60"
2.2	94	0.0200	0.71		Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps
0.4	17	0.0200	0.71		Shallow Concentrated Flow, C-D Woodland Kv= 5.0 fps
14.2	161	Total			

Subcatchment 2S: Area 2

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532 Main Street (Route 130) - Mashpee, MA

Type III 24-hr 2-year Rainfall=3.44"

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Summary for Subcatchment 3S: Area 3

[45] Hint: Runoff=Zero

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

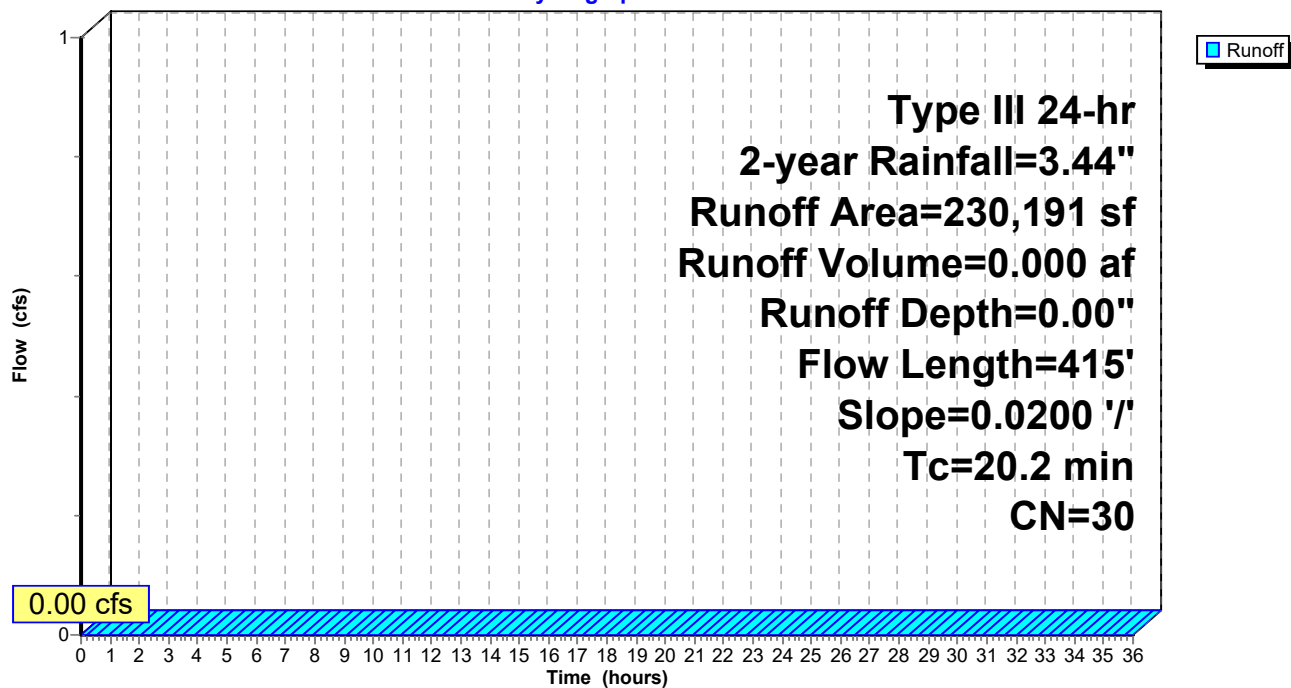
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.44"

Area (sf)	CN	Description
230,191	30	Woods, Good, HSG A
230,191		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	50	0.0200	0.07		Sheet Flow, A-B
					Woods: Light underbrush n= 0.400 P2= 3.60"
8.6	365	0.0200	0.71		Shallow Concentrated Flow, B-C
					Woodland Kv= 5.0 fps
20.2	415	Total			

Subcatchment 3S: Area 3

Hydrograph



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532 Main Street (Route 130) - Mashpee, MA

Type III 24-hr 2-year Rainfall=3.44"

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Summary for Subcatchment 4S: Area 4

[45] Hint: Runoff=Zero

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

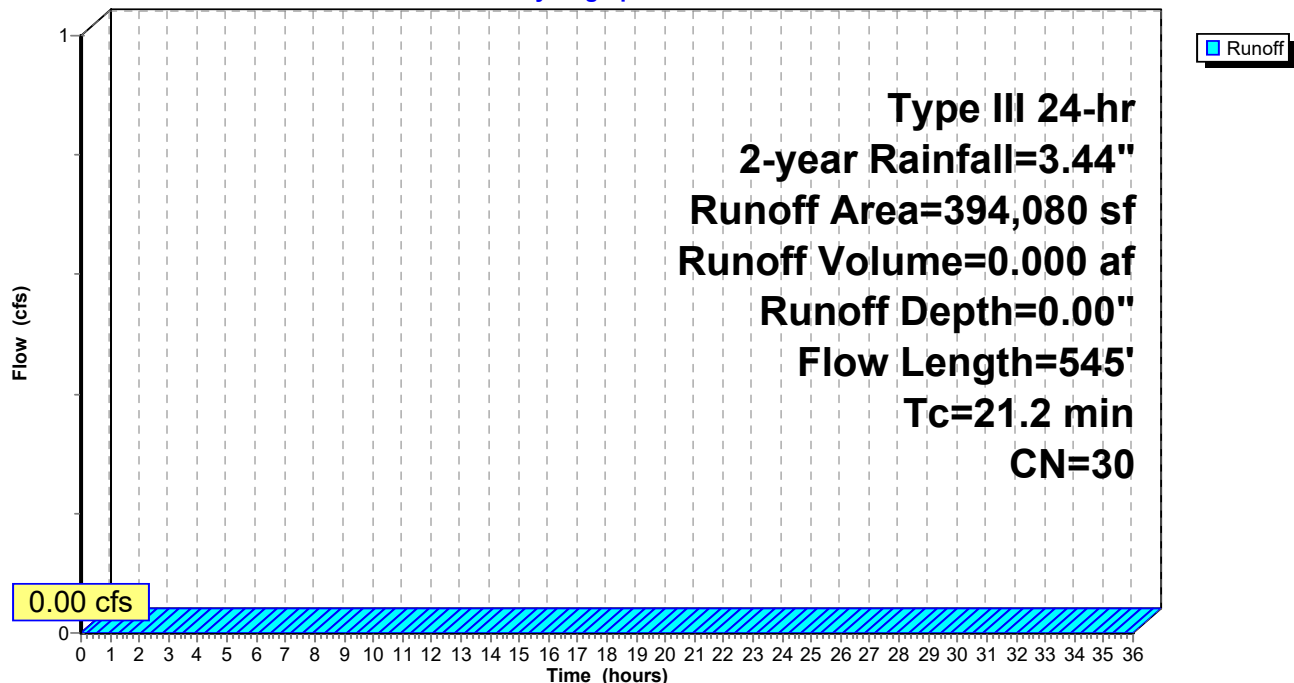
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.44"

Area (sf)	CN	Description
394,080	30	Woods, Good, HSG A
394,080		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	50	0.0200	0.07		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.60"
6.2	265	0.0200	0.71		Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps
3.4	230	0.0500	1.12		Shallow Concentrated Flow, C-D Woodland Kv= 5.0 fps
21.2	545	Total			

Subcatchment 4S: Area 4

Hydrograph

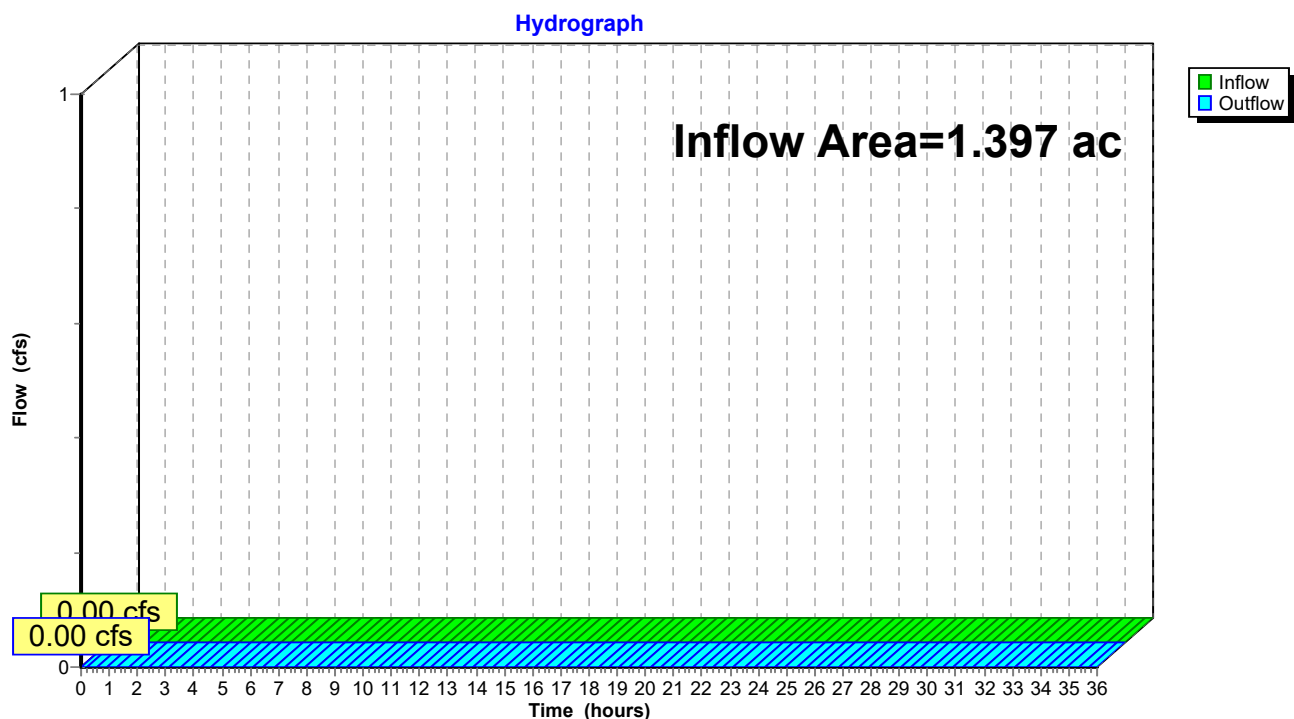


Summary for Reach 1R: Off-site - Route 130

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

Inflow Area = 1.397 ac, 2.60% Impervious, Inflow Depth = 0.00" for 2-year event
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

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

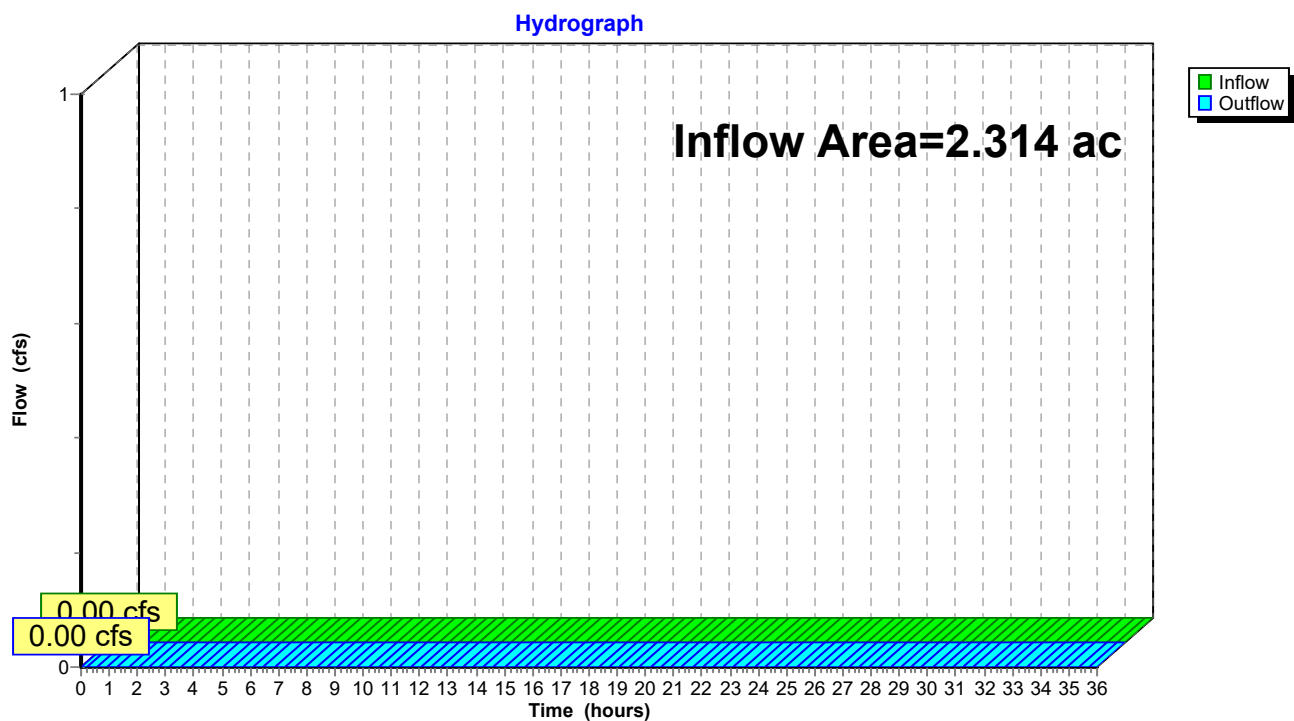
Reach 1R: Off-site - Route 130

Summary for Reach 2R: Off-site North

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

Inflow Area = 2.314 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-year event
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

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

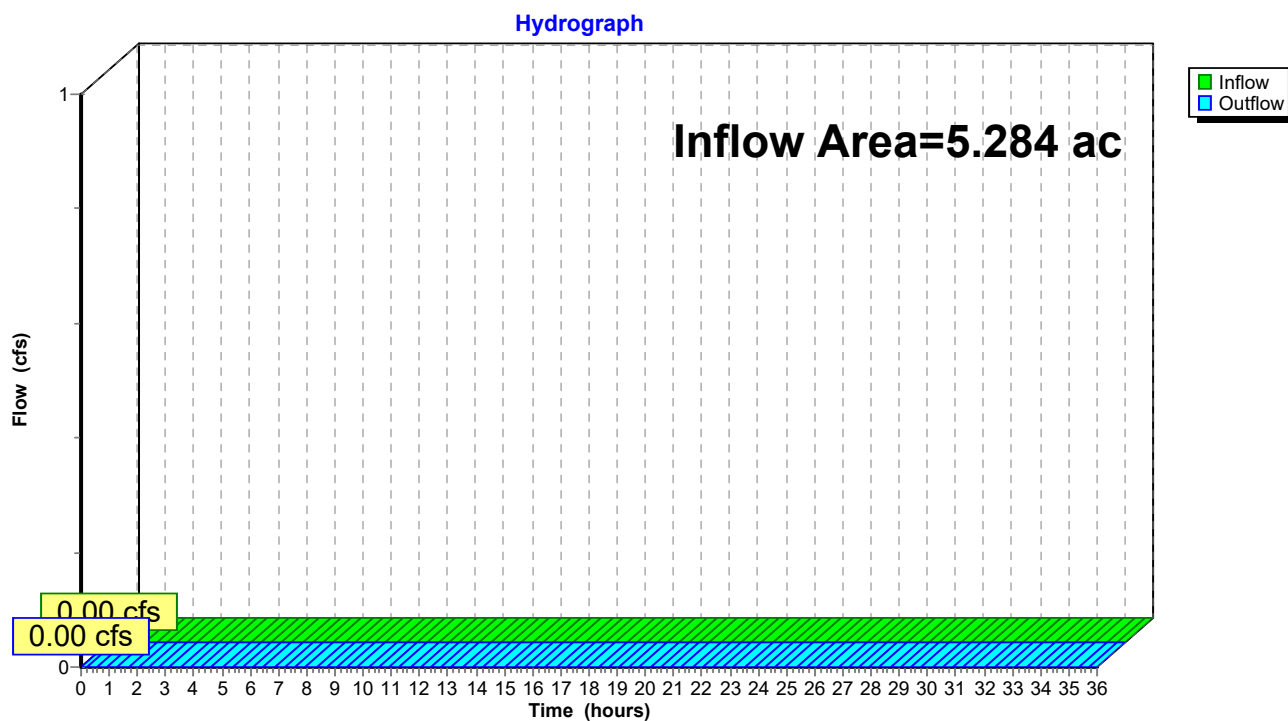
Reach 2R: Off-site North

Summary for Reach 3R: Off-site South

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

Inflow Area = 5.284 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-year event
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

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

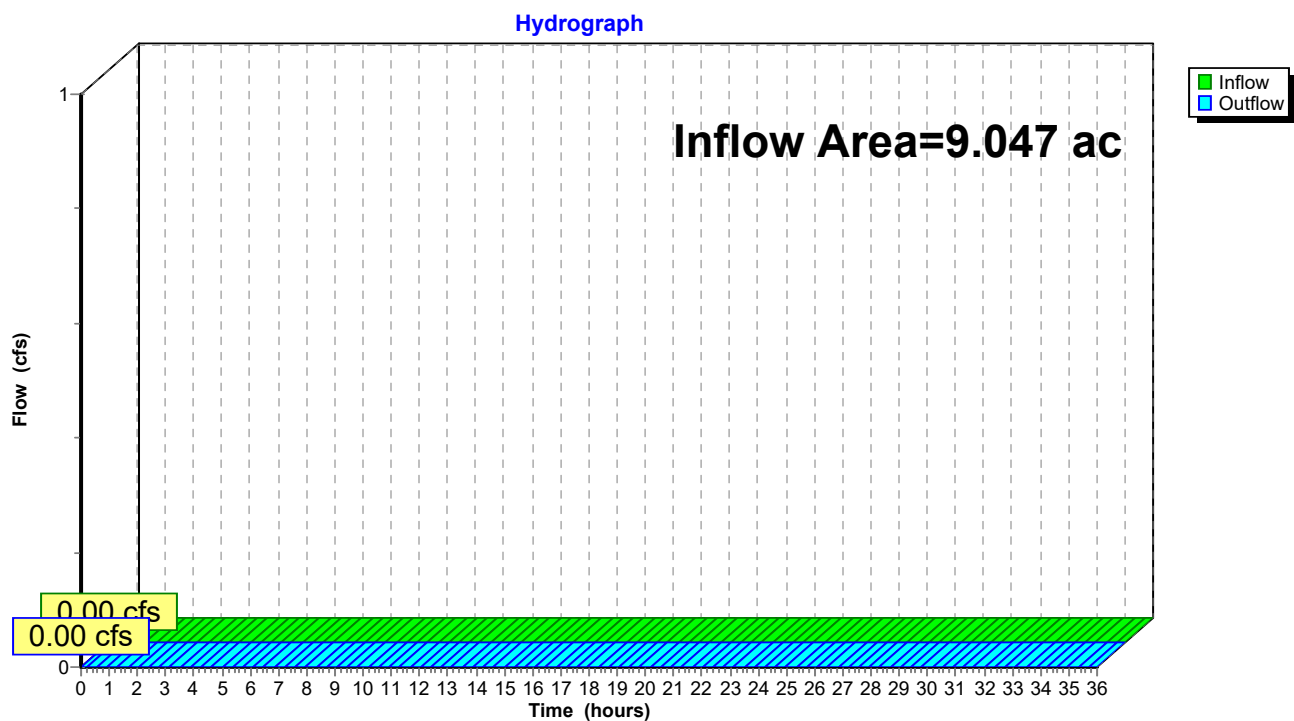
Reach 3R: Off-site South

Summary for Reach 4R: Retained On-site

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

Inflow Area = 9.047 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-year event
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

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Reach 4R: Retained On-site

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532 Main Street (Route 130) - Mashpee, MA

Type III 24-hr 10-year Rainfall=5.02"

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Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Area 1Runoff Area=60,850 sf 2.60% Impervious Runoff Depth=0.03"
Flow Length=307' Tc=17.1 min CN=32 Runoff=0.00 cfs 0.003 af**Subcatchment2S: Area 2**Runoff Area=100,817 sf 0.00% Impervious Runoff Depth=0.01"
Flow Length=161' Slope=0.0200 '/' Tc=14.2 min CN=30 Runoff=0.00 cfs 0.001 af**Subcatchment3S: Area 3**Runoff Area=230,191 sf 0.00% Impervious Runoff Depth=0.01"
Flow Length=415' Slope=0.0200 '/' Tc=20.2 min CN=30 Runoff=0.01 cfs 0.002 af**Subcatchment4S: Area 4**Runoff Area=394,080 sf 0.00% Impervious Runoff Depth=0.01"
Flow Length=545' Tc=21.2 min CN=30 Runoff=0.01 cfs 0.004 af**Reach 1R: Off-site - Route 130**Inflow=0.00 cfs 0.003 af
Outflow=0.00 cfs 0.003 af**Reach 2R: Off-site North**Inflow=0.00 cfs 0.001 af
Outflow=0.00 cfs 0.001 af**Reach 3R: Off-site South**Inflow=0.01 cfs 0.002 af
Outflow=0.01 cfs 0.002 af**Reach 4R: Retained On-site**Inflow=0.01 cfs 0.004 af
Outflow=0.01 cfs 0.004 af**Total Runoff Area = 18.043 ac Runoff Volume = 0.010 af Average Runoff Depth = 0.01"**
99.80% Pervious = 18.006 ac 0.20% Impervious = 0.036 ac

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532 Main Street (Route 130) - Mashpee, MA

Type III 24-hr 10-year Rainfall=5.02"

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Summary for Subcatchment 1S: Area 1

Runoff = 0.00 cfs @ 21.26 hrs, Volume= 0.003 af, Depth= 0.03"

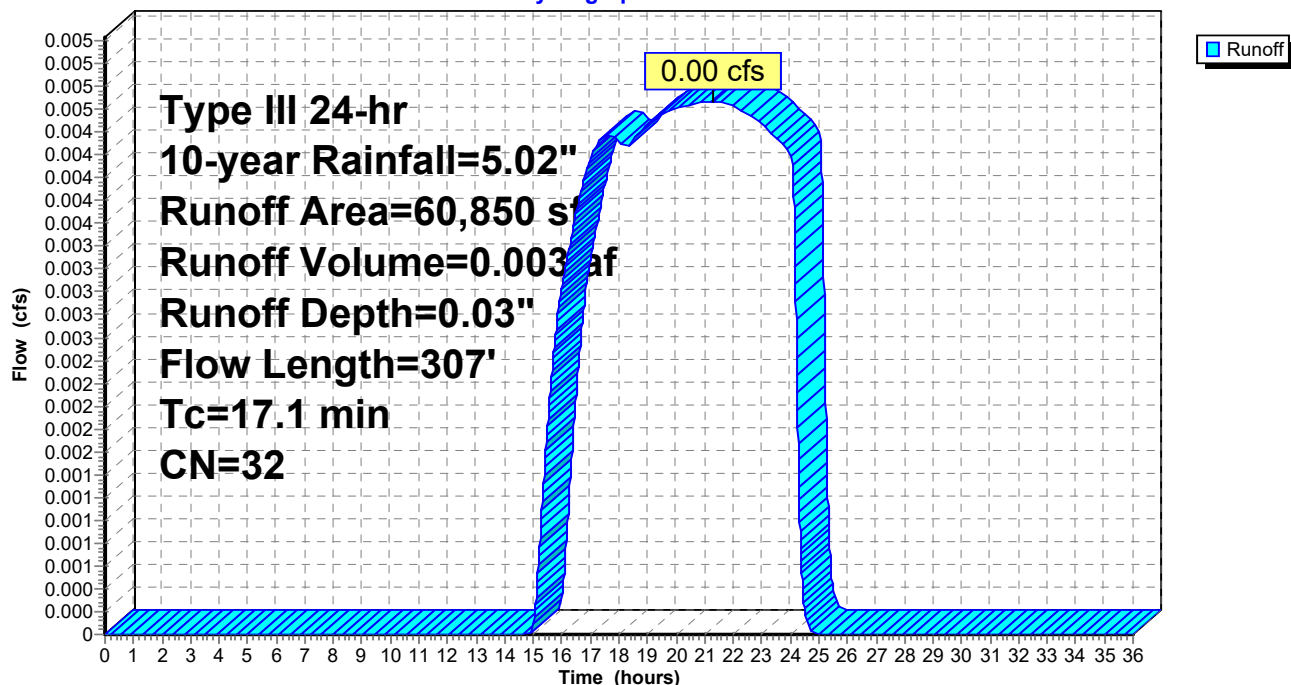
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=5.02"

Area (sf)	CN	Description
1,584	98	Paved parking, HSG A
59,266	30	Woods, Good, HSG A
60,850	32	Weighted Average
59,266		97.40% Pervious Area
1,584		2.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	50	0.0200	0.07		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.60"
4.1	172	0.0200	0.71		Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps
1.4	85	0.0400	1.00		Shallow Concentrated Flow, C-D Woodland Kv= 5.0 fps
17.1	307	Total			

Subcatchment 1S: Area 1

Hydrograph



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Type III 24-hr 10-year Rainfall=5.02"

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Summary for Subcatchment 2S: Area 2

Runoff = 0.00 cfs @ 23.87 hrs, Volume= 0.001 af, Depth= 0.01"

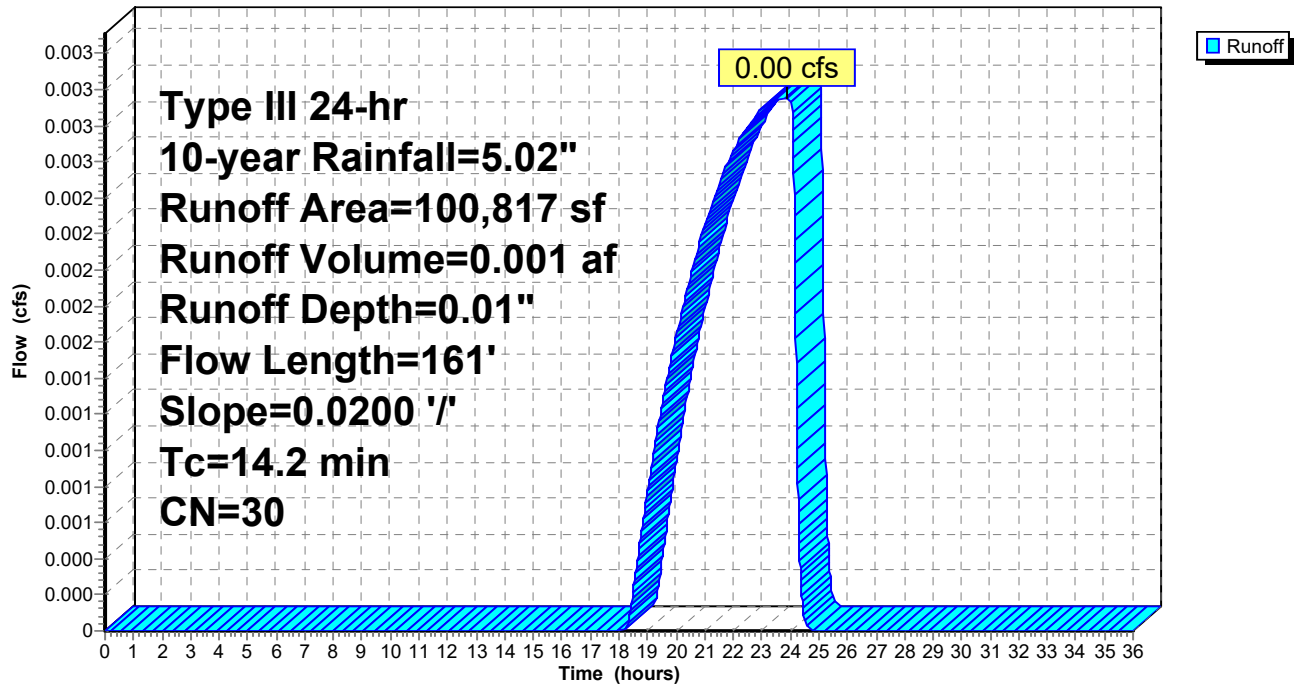
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=5.02"

Area (sf)	CN	Description
100,817	30	Woods, Good, HSG A
100,817		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	50	0.0200	0.07		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.60"
2.2	94	0.0200	0.71		Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps
0.4	17	0.0200	0.71		Shallow Concentrated Flow, C-D Woodland Kv= 5.0 fps
14.2	161	Total			

Subcatchment 2S: Area 2

Hydrograph



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532 Main Street (Route 130) - Mashpee, MA

Type III 24-hr 10-year Rainfall=5.02"

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Summary for Subcatchment 3S: Area 3

Runoff = 0.01 cfs @ 23.99 hrs, Volume= 0.002 af, Depth= 0.01"

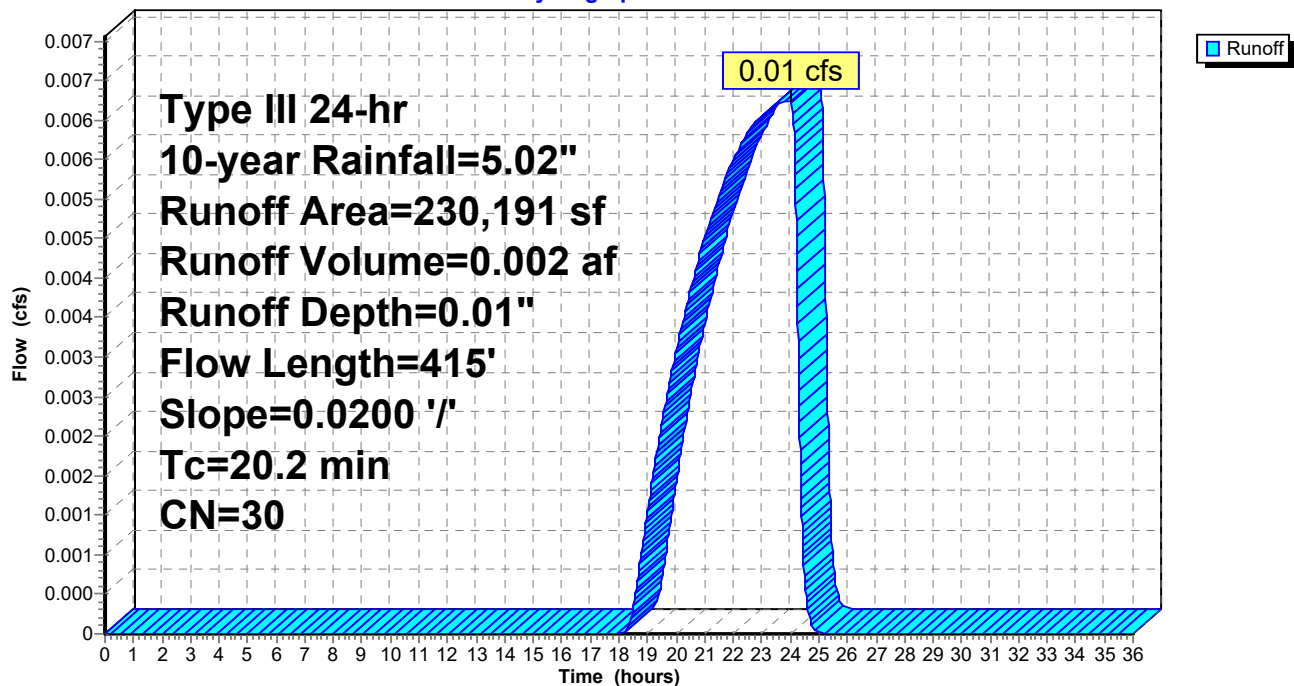
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=5.02"

Area (sf)	CN	Description
230,191	30	Woods, Good, HSG A
230,191		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	50	0.0200	0.07		Sheet Flow, A-B
					Woods: Light underbrush n= 0.400 P2= 3.60"
8.6	365	0.0200	0.71		Shallow Concentrated Flow, B-C
					Woodland Kv= 5.0 fps
20.2	415	Total			

Subcatchment 3S: Area 3

Hydrograph



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532 Main Street (Route 130) - Mashpee, MA

Type III 24-hr 10-year Rainfall=5.02"

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Summary for Subcatchment 4S: Area 4

Runoff = 0.01 cfs @ 24.00 hrs, Volume= 0.004 af, Depth= 0.01"

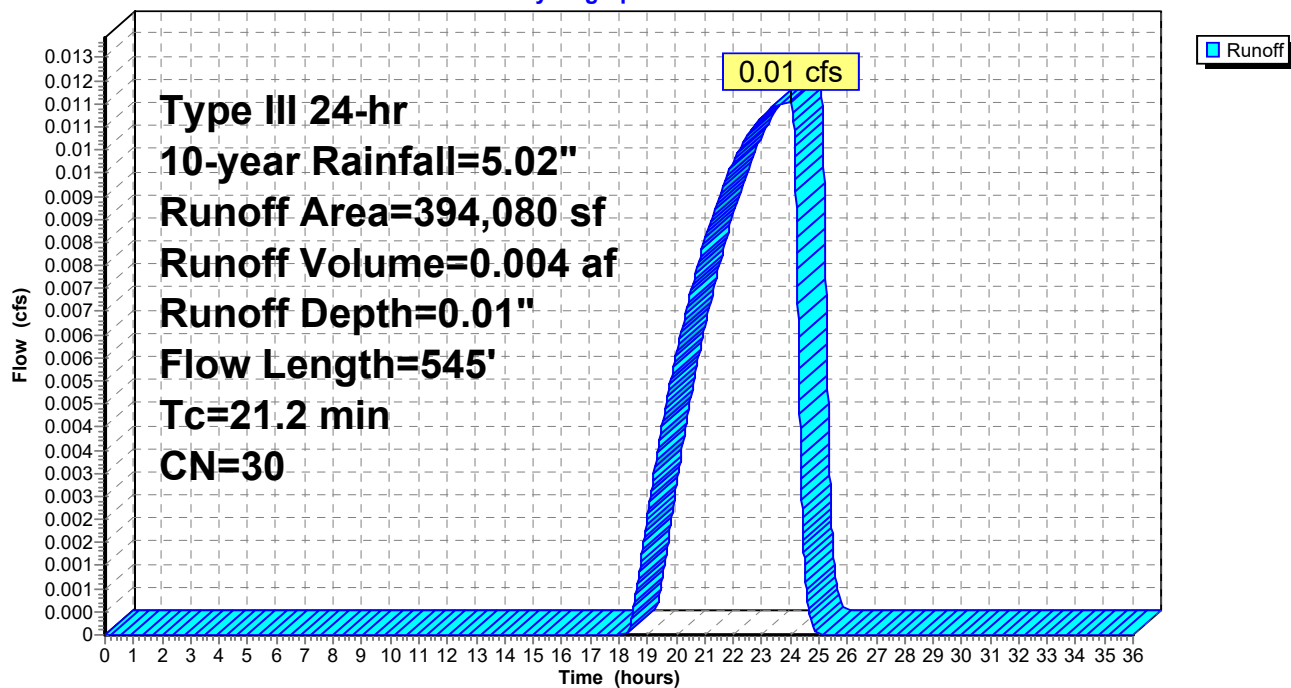
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=5.02"

Area (sf)	CN	Description
394,080	30	Woods, Good, HSG A
394,080		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	50	0.0200	0.07		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.60"
6.2	265	0.0200	0.71		Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps
3.4	230	0.0500	1.12		Shallow Concentrated Flow, C-D Woodland Kv= 5.0 fps
21.2	545	Total			

Subcatchment 4S: Area 4

Hydrograph



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Type III 24-hr 10-year Rainfall=5.02"

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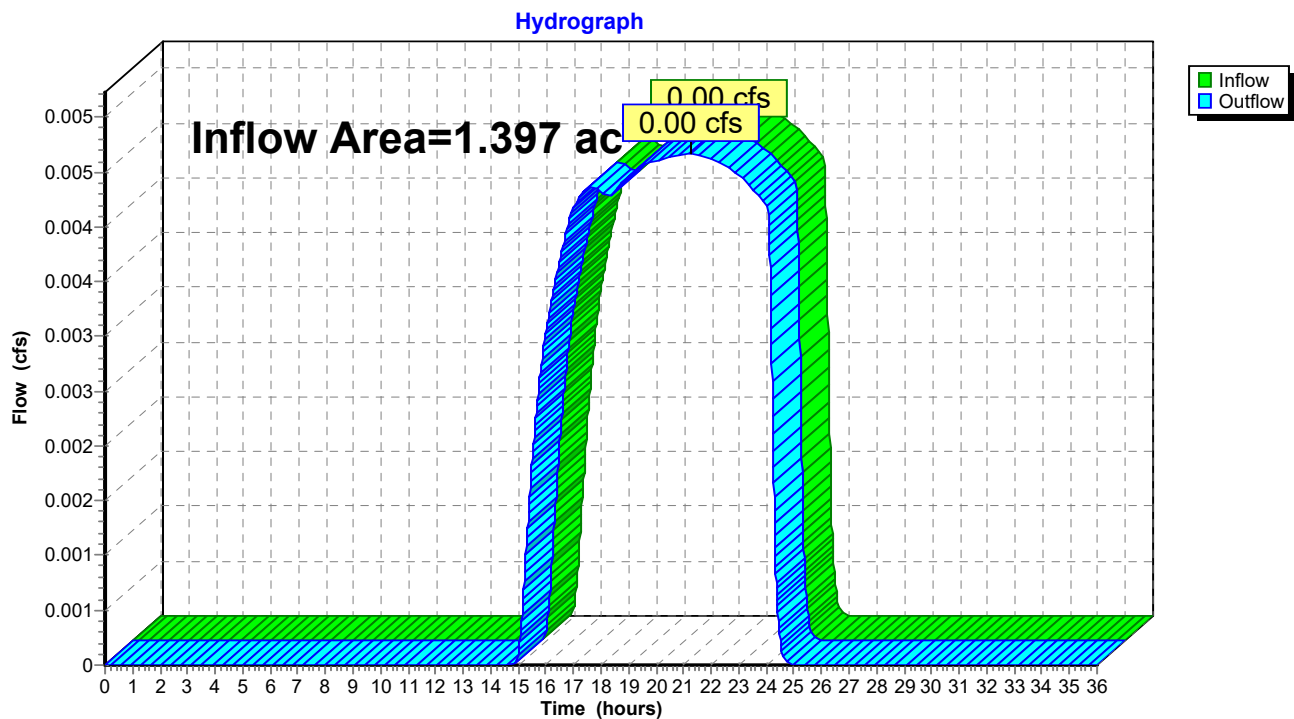
Summary for Reach 1R: Off-site - Route 130

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

Inflow Area = 1.397 ac, 2.60% Impervious, Inflow Depth = 0.03" for 10-year event
Inflow = 0.00 cfs @ 21.26 hrs, Volume= 0.003 af
Outflow = 0.00 cfs @ 21.26 hrs, Volume= 0.003 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Reach 1R: Off-site - Route 130

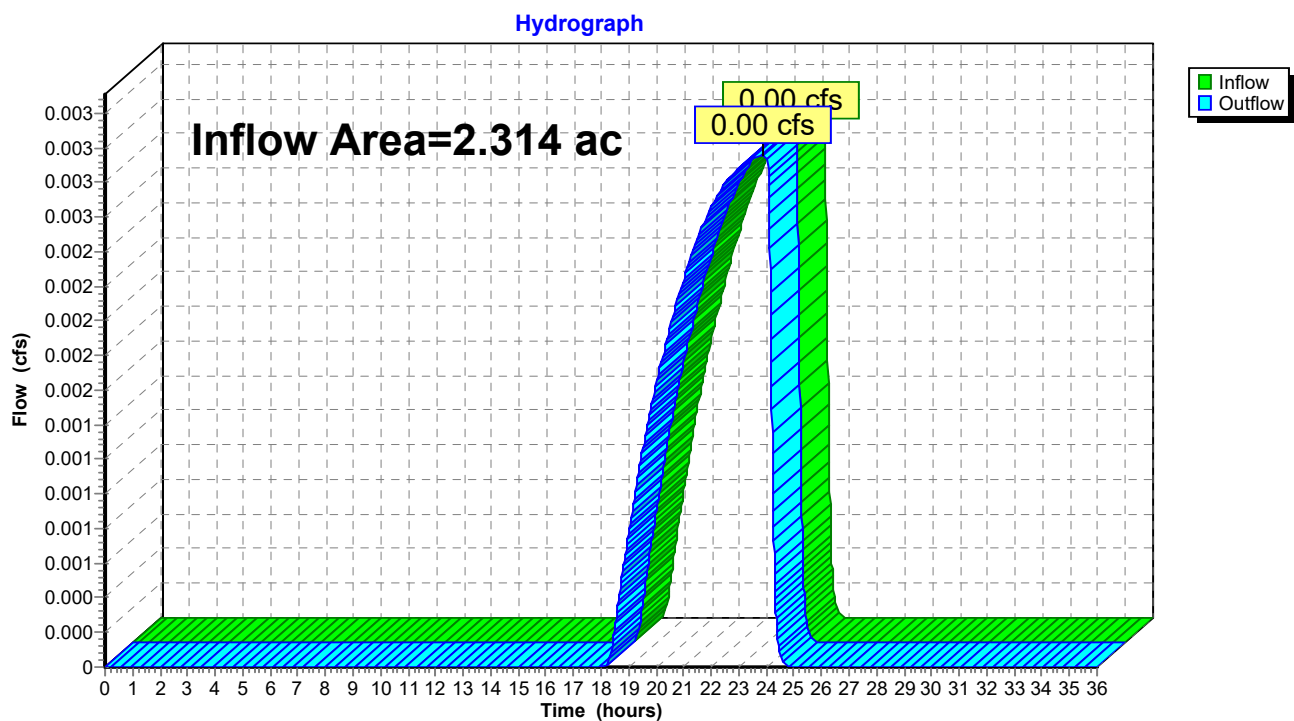


Summary for Reach 2R: Off-site North

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

Inflow Area = 2.314 ac, 0.00% Impervious, Inflow Depth = 0.01" for 10-year event
Inflow = 0.00 cfs @ 23.87 hrs, Volume= 0.001 af
Outflow = 0.00 cfs @ 23.87 hrs, Volume= 0.001 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Reach 2R: Off-site North

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Type III 24-hr 10-year Rainfall=5.02"

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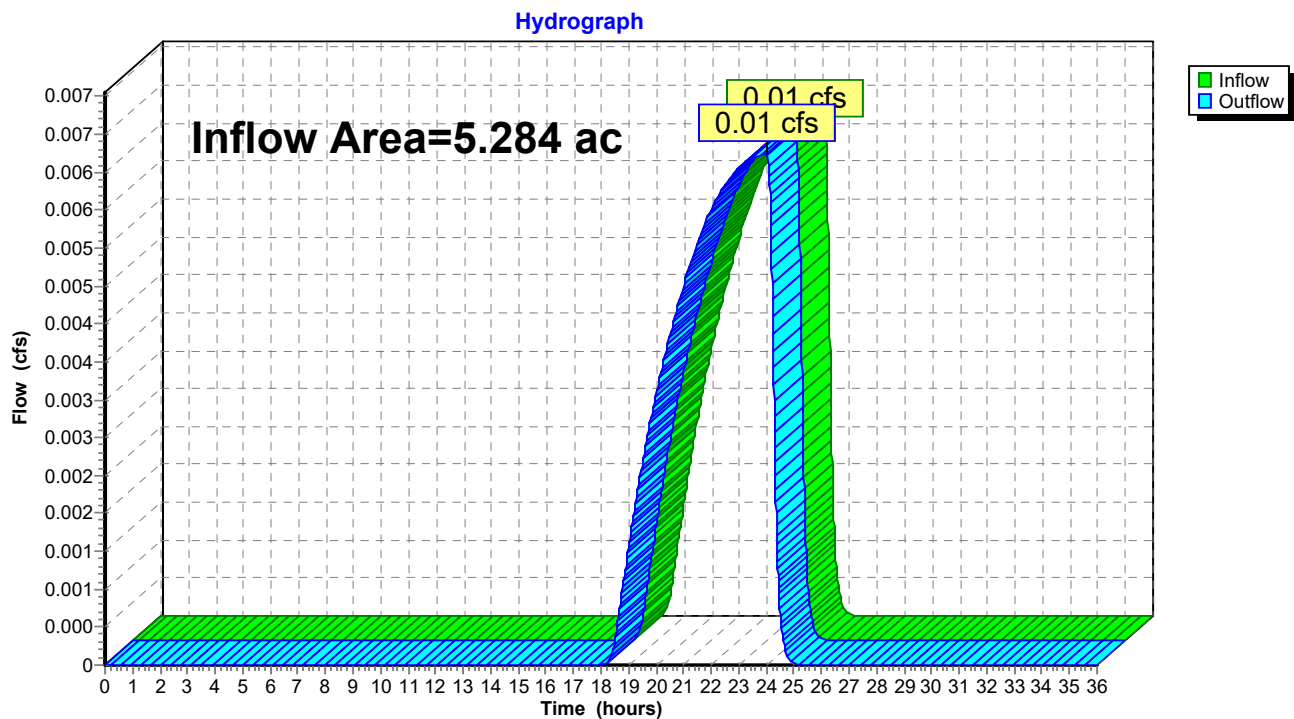
Summary for Reach 3R: Off-site South

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

Inflow Area = 5.284 ac, 0.00% Impervious, Inflow Depth = 0.01" for 10-year event
Inflow = 0.01 cfs @ 23.99 hrs, Volume= 0.002 af
Outflow = 0.01 cfs @ 23.99 hrs, Volume= 0.002 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Reach 3R: Off-site South



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Type III 24-hr 10-year Rainfall=5.02"

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Summary for Reach 4R: Retained On-site

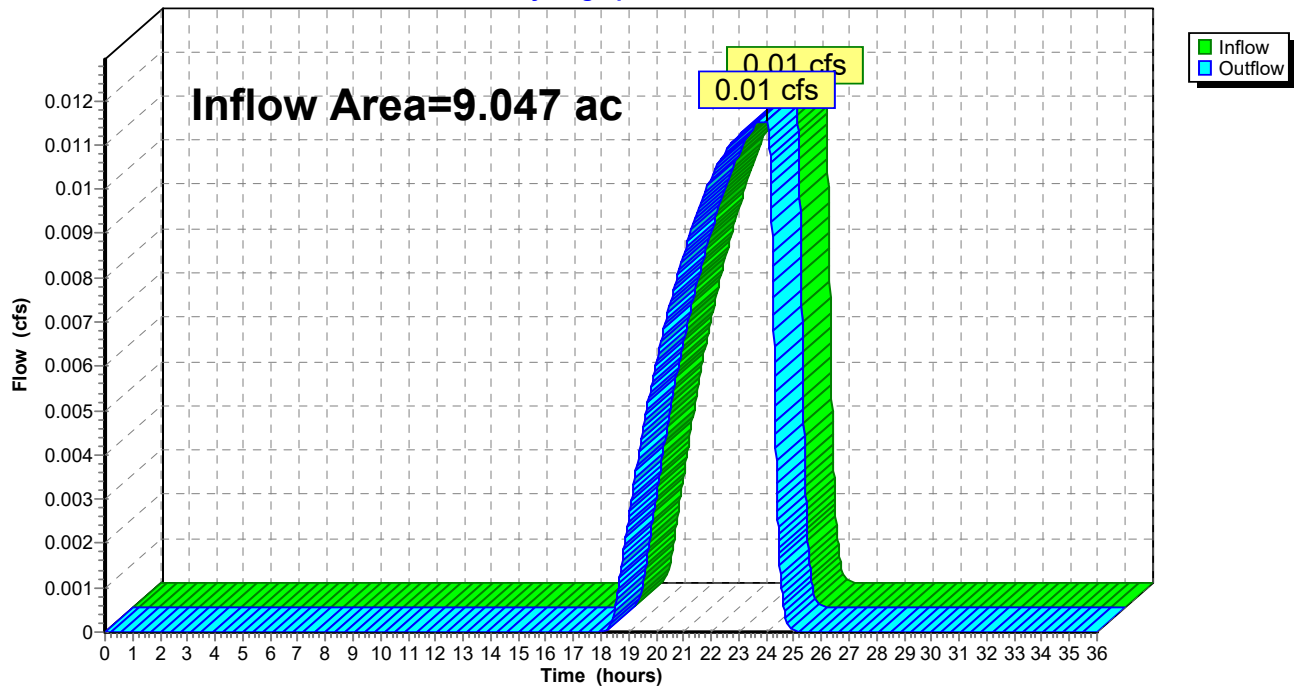
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 9.047 ac, 0.00% Impervious, Inflow Depth = 0.01" for 10-year event
Inflow = 0.01 cfs @ 24.00 hrs, Volume= 0.004 af
Outflow = 0.01 cfs @ 24.00 hrs, Volume= 0.004 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Reach 4R: Retained On-site

Hydrograph



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Type III 24-hr 25-year Rainfall=6.00"

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Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Area 1Runoff Area=60,850 sf 2.60% Impervious Runoff Depth=0.13"
Flow Length=307' Tc=17.1 min CN=32 Runoff=0.02 cfs 0.016 af**Subcatchment2S: Area 2**Runoff Area=100,817 sf 0.00% Impervious Runoff Depth=0.07"
Flow Length=161' Slope=0.0200 '/' Tc=14.2 min CN=30 Runoff=0.02 cfs 0.014 af**Subcatchment3S: Area 3**Runoff Area=230,191 sf 0.00% Impervious Runoff Depth=0.07"
Flow Length=415' Slope=0.0200 '/' Tc=20.2 min CN=30 Runoff=0.05 cfs 0.032 af**Subcatchment4S: Area 4**Runoff Area=394,080 sf 0.00% Impervious Runoff Depth=0.07"
Flow Length=545' Tc=21.2 min CN=30 Runoff=0.08 cfs 0.054 af**Reach 1R: Off-site - Route 130**Inflow=0.02 cfs 0.016 af
Outflow=0.02 cfs 0.016 af**Reach 2R: Off-site North**Inflow=0.02 cfs 0.014 af
Outflow=0.02 cfs 0.014 af**Reach 3R: Off-site South**Inflow=0.05 cfs 0.032 af
Outflow=0.05 cfs 0.032 af**Reach 4R: Retained On-site**Inflow=0.08 cfs 0.054 af
Outflow=0.08 cfs 0.054 af**Total Runoff Area = 18.043 ac Runoff Volume = 0.115 af Average Runoff Depth = 0.08"**
99.80% Pervious = 18.006 ac 0.20% Impervious = 0.036 ac

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Type III 24-hr 25-year Rainfall=6.00"

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Summary for Subcatchment 1S: Area 1

Runoff = 0.02 cfs @ 14.99 hrs, Volume= 0.016 af, Depth= 0.13"

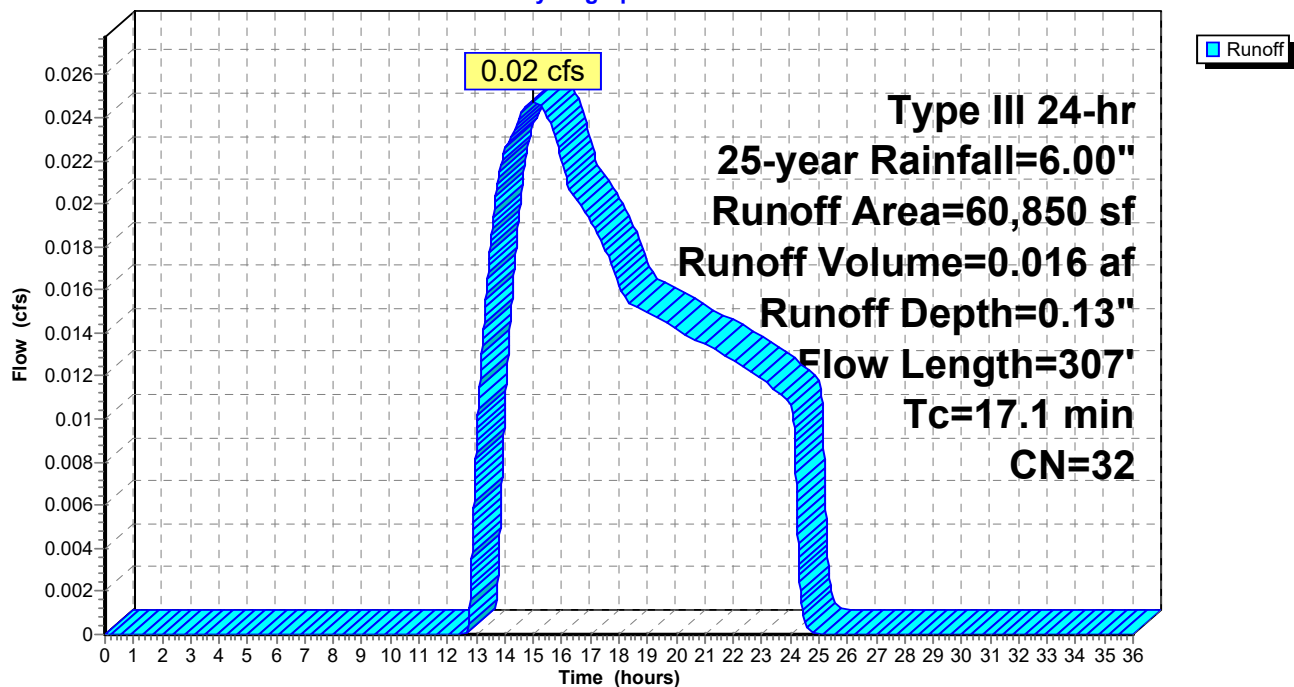
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-year Rainfall=6.00"

Area (sf)	CN	Description
1,584	98	Paved parking, HSG A
59,266	30	Woods, Good, HSG A
60,850	32	Weighted Average
59,266		97.40% Pervious Area
1,584		2.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	50	0.0200	0.07		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.60"
4.1	172	0.0200	0.71		Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps
1.4	85	0.0400	1.00		Shallow Concentrated Flow, C-D Woodland Kv= 5.0 fps
17.1	307	Total			

Subcatchment 1S: Area 1

Hydrograph



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Type III 24-hr 25-year Rainfall=6.00"

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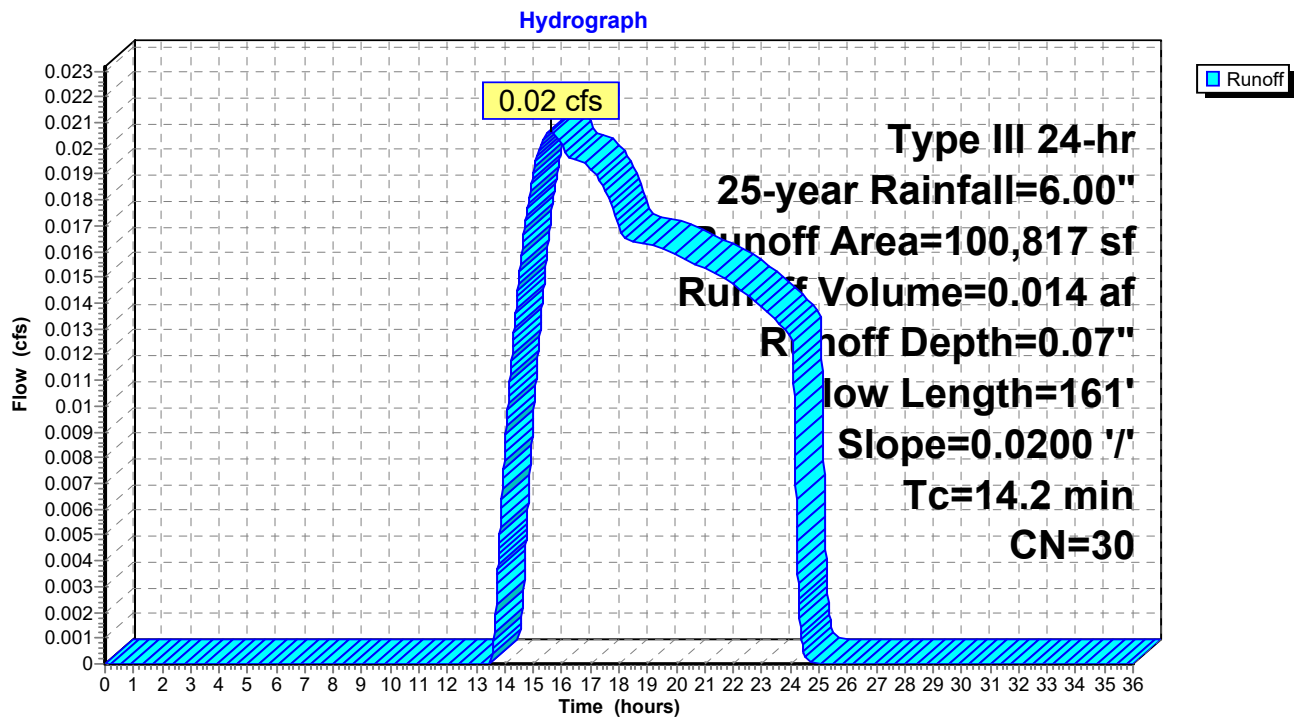
Summary for Subcatchment 2S: Area 2

Runoff = 0.02 cfs @ 15.64 hrs, Volume= 0.014 af, Depth= 0.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-year Rainfall=6.00"

Area (sf)	CN	Description
100,817	30	Woods, Good, HSG A
100,817		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	50	0.0200	0.07		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.60"
2.2	94	0.0200	0.71		Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps
0.4	17	0.0200	0.71		Shallow Concentrated Flow, C-D Woodland Kv= 5.0 fps
14.2	161	Total			

Subcatchment 2S: Area 2

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Type III 24-hr 25-year Rainfall=6.00"

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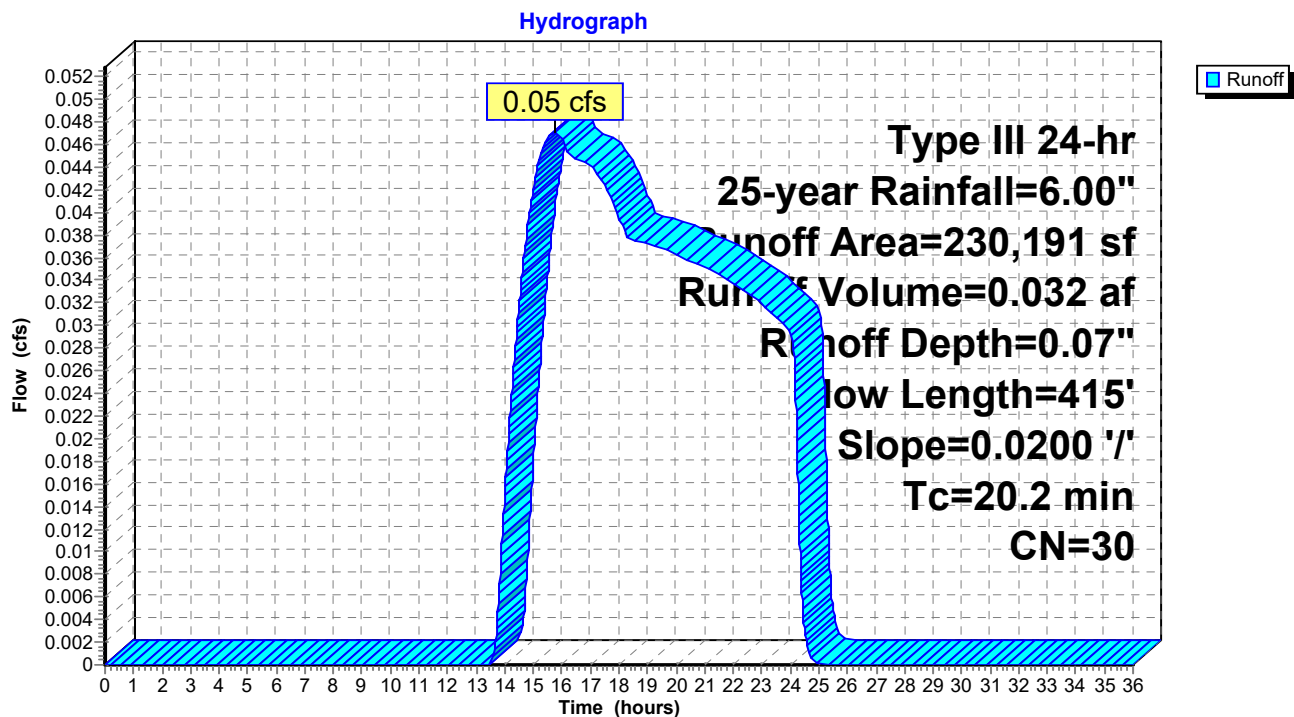
Summary for Subcatchment 3S: Area 3

Runoff = 0.05 cfs @ 15.73 hrs, Volume= 0.032 af, Depth= 0.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-year Rainfall=6.00"

Area (sf)	CN	Description
230,191	30	Woods, Good, HSG A
230,191		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	50	0.0200	0.07		Sheet Flow, A-B
					Woods: Light underbrush n= 0.400 P2= 3.60"
8.6	365	0.0200	0.71		Shallow Concentrated Flow, B-C
					Woodland Kv= 5.0 fps
20.2	415	Total			

Subcatchment 3S: Area 3

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Type III 24-hr 25-year Rainfall=6.00"

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Summary for Subcatchment 4S: Area 4

Runoff = 0.08 cfs @ 15.76 hrs, Volume= 0.054 af, Depth= 0.07"

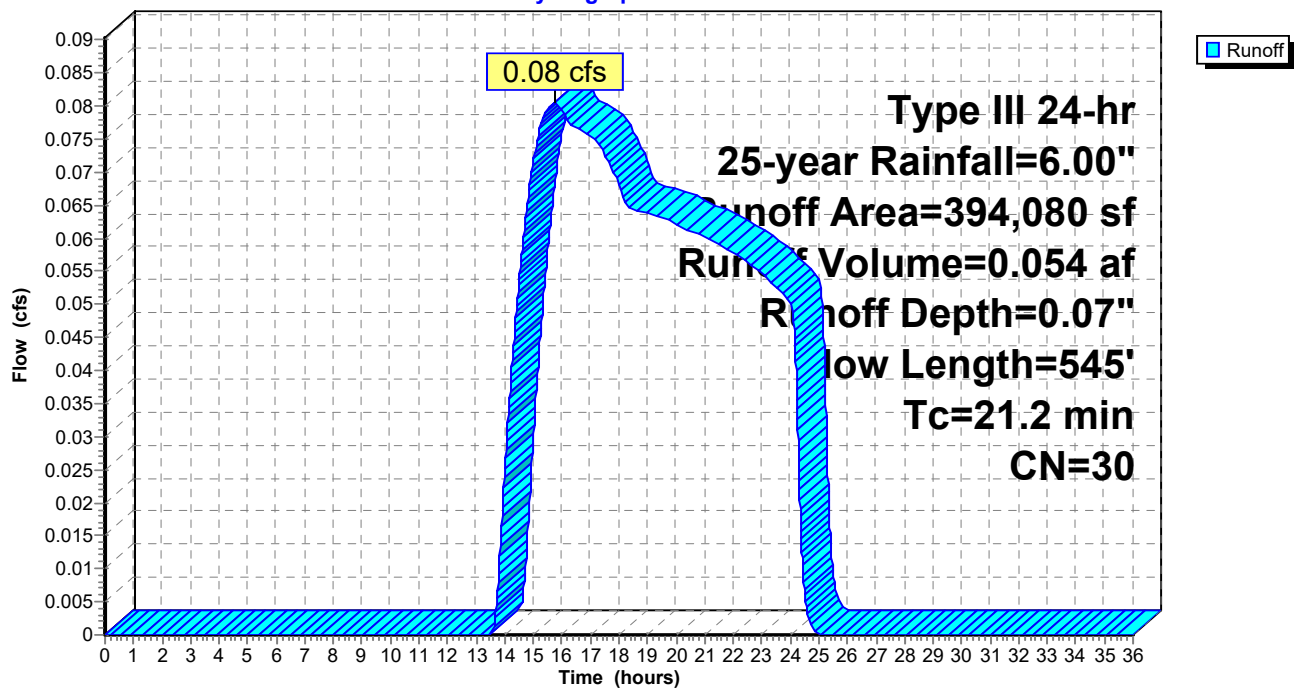
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-year Rainfall=6.00"

Area (sf)	CN	Description
394,080	30	Woods, Good, HSG A
394,080		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	50	0.0200	0.07		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.60"
6.2	265	0.0200	0.71		Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps
3.4	230	0.0500	1.12		Shallow Concentrated Flow, C-D Woodland Kv= 5.0 fps
21.2	545	Total			

Subcatchment 4S: Area 4

Hydrograph



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Type III 24-hr 25-year Rainfall=6.00"

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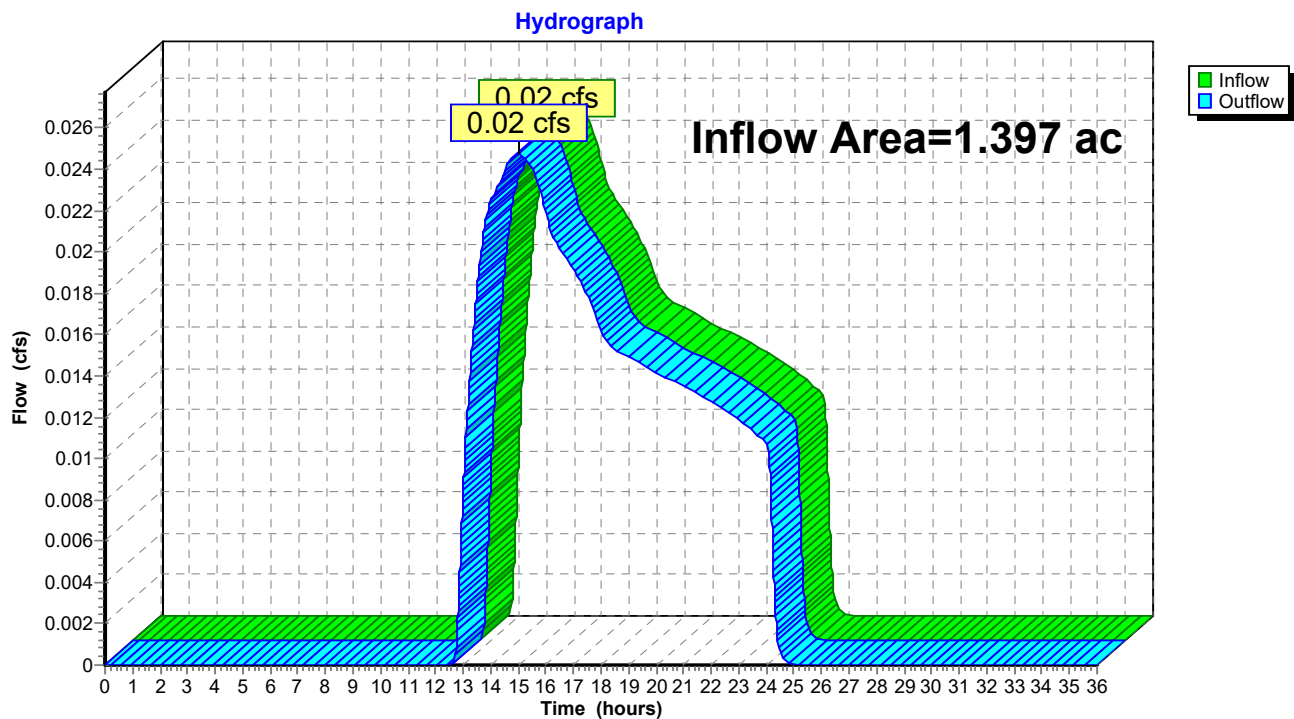
Summary for Reach 1R: Off-site - Route 130

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

Inflow Area = 1.397 ac, 2.60% Impervious, Inflow Depth = 0.13" for 25-year event
Inflow = 0.02 cfs @ 14.99 hrs, Volume= 0.016 af
Outflow = 0.02 cfs @ 14.99 hrs, Volume= 0.016 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Reach 1R: Off-site - Route 130



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Type III 24-hr 25-year Rainfall=6.00"

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Summary for Reach 2R: Off-site North

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

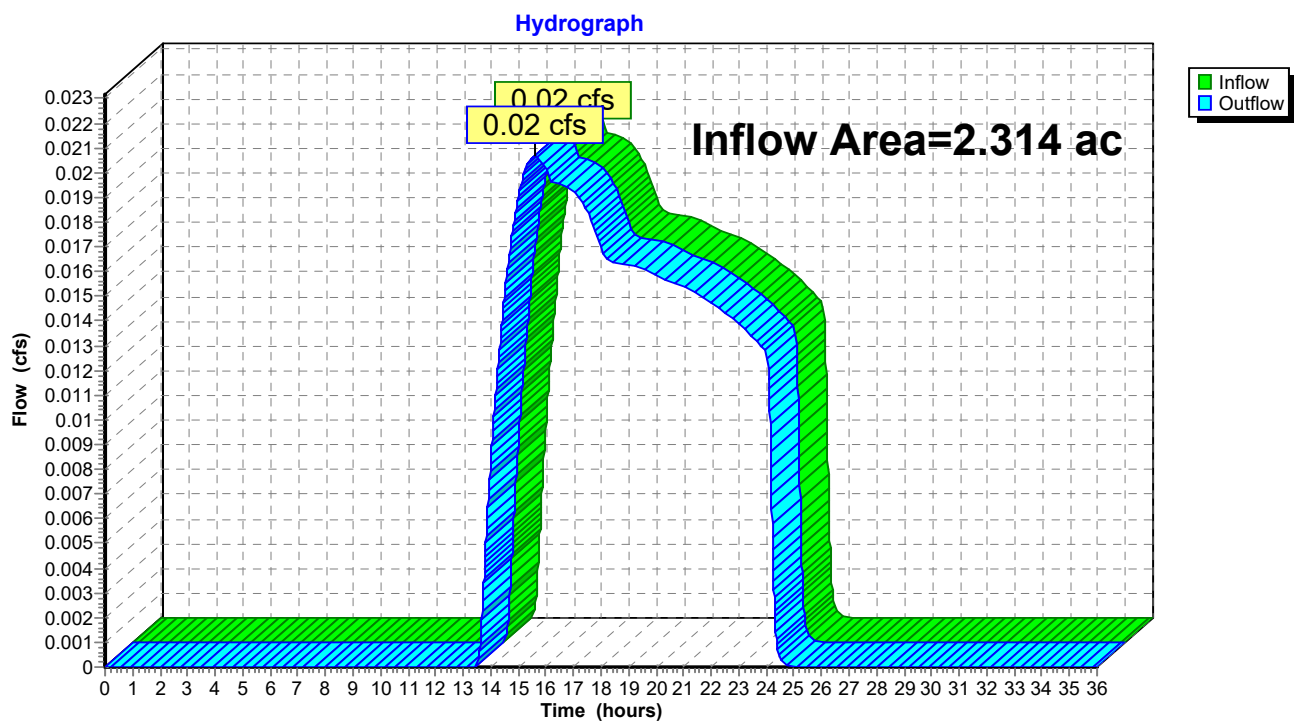
Inflow Area = 2.314 ac, 0.00% Impervious, Inflow Depth = 0.07" for 25-year event

Inflow = 0.02 cfs @ 15.64 hrs, Volume= 0.014 af

Outflow = 0.02 cfs @ 15.64 hrs, Volume= 0.014 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Reach 2R: Off-site North

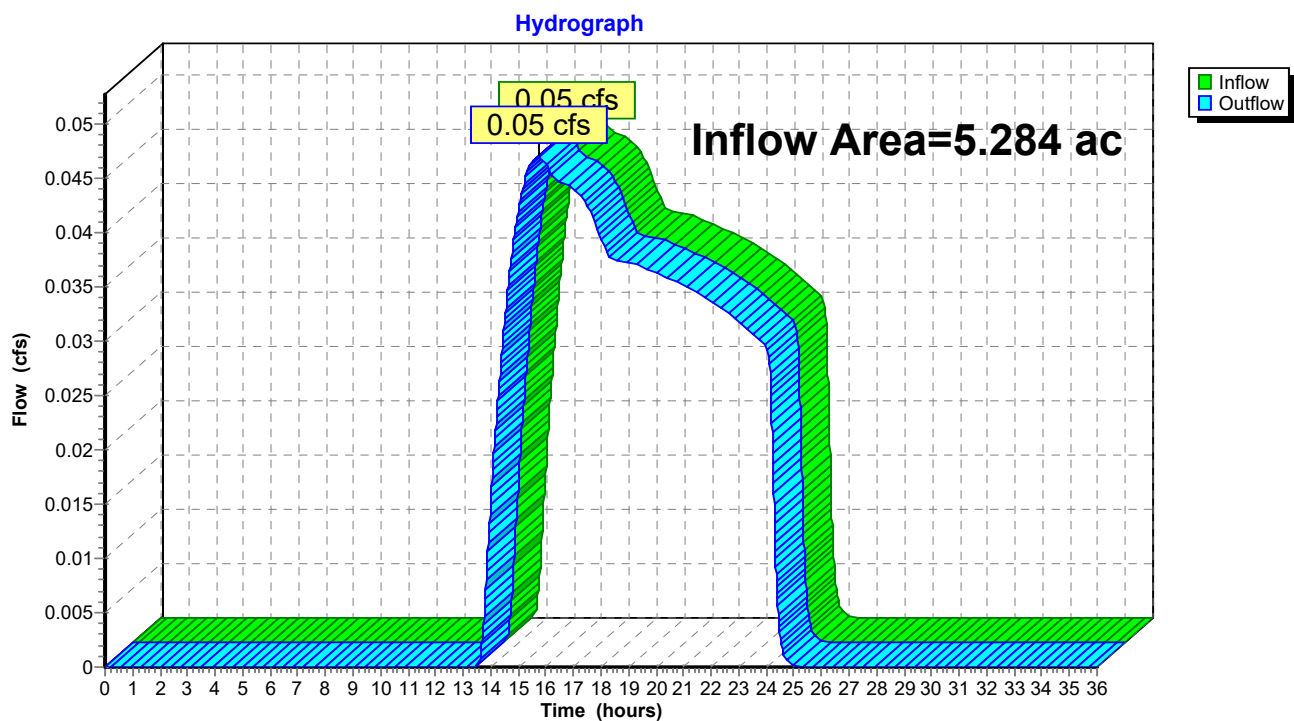


Summary for Reach 3R: Off-site South

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

Inflow Area = 5.284 ac, 0.00% Impervious, Inflow Depth = 0.07" for 25-year event
Inflow = 0.05 cfs @ 15.73 hrs, Volume= 0.032 af
Outflow = 0.05 cfs @ 15.73 hrs, Volume= 0.032 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Reach 3R: Off-site South

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Type III 24-hr 25-year Rainfall=6.00"

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Summary for Reach 4R: Retained On-site

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

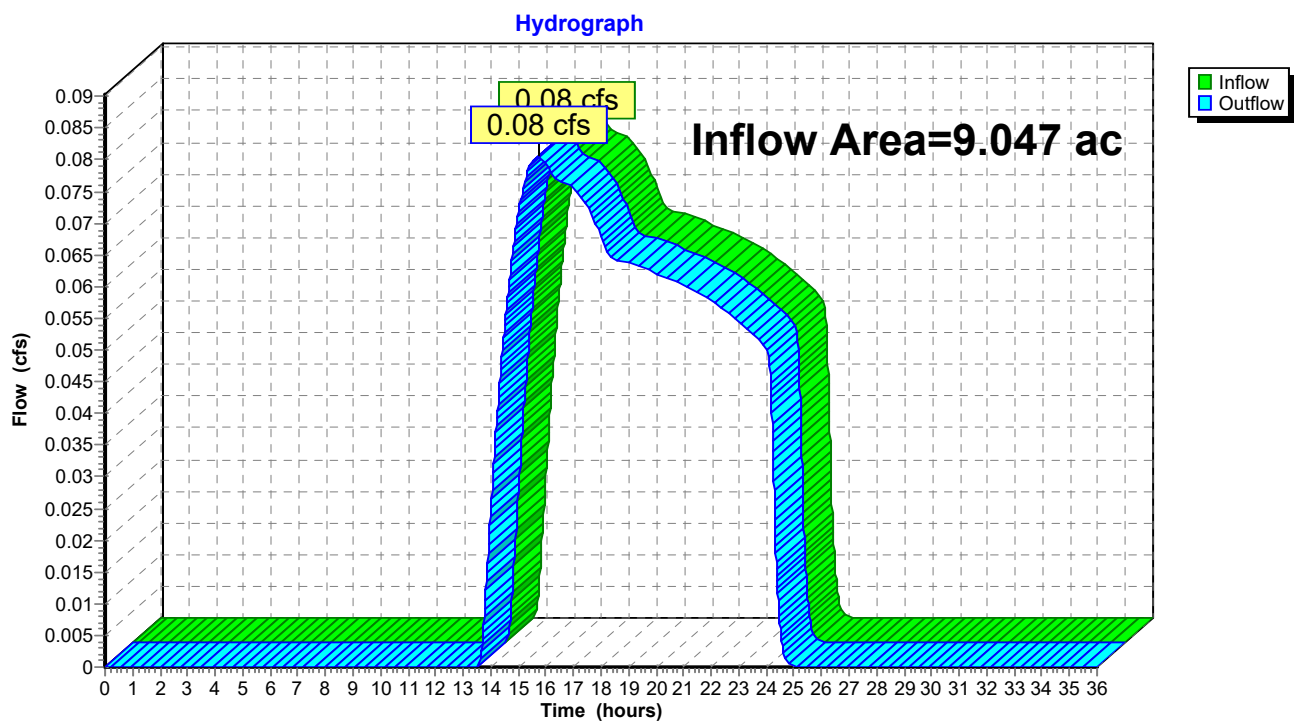
Inflow Area = 9.047 ac, 0.00% Impervious, Inflow Depth = 0.07" for 25-year event

Inflow = 0.08 cfs @ 15.76 hrs, Volume= 0.054 af

Outflow = 0.08 cfs @ 15.76 hrs, Volume= 0.054 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Reach 4R: Retained On-site



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532 Main Street (Route 130) - Mashpee, MA

Type III 24-hr 100-year Rainfall=7.52"

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Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Area 1Runoff Area=60,850 sf 2.60% Impervious Runoff Depth=0.44"
Flow Length=307' Tc=17.1 min CN=32 Runoff=0.17 cfs 0.051 af**Subcatchment2S: Area 2**Runoff Area=100,817 sf 0.00% Impervious Runoff Depth=0.31"
Flow Length=161' Slope=0.0200 '/' Tc=14.2 min CN=30 Runoff=0.12 cfs 0.060 af**Subcatchment3S: Area 3**Runoff Area=230,191 sf 0.00% Impervious Runoff Depth=0.31"
Flow Length=415' Slope=0.0200 '/' Tc=20.2 min CN=30 Runoff=0.26 cfs 0.137 af**Subcatchment4S: Area 4**Runoff Area=394,080 sf 0.00% Impervious Runoff Depth=0.31"
Flow Length=545' Tc=21.2 min CN=30 Runoff=0.43 cfs 0.234 af**Reach 1R: Off-site - Route 130**Inflow=0.17 cfs 0.051 af
Outflow=0.17 cfs 0.051 af**Reach 2R: Off-site North**Inflow=0.12 cfs 0.060 af
Outflow=0.12 cfs 0.060 af**Reach 3R: Off-site South**Inflow=0.26 cfs 0.137 af
Outflow=0.26 cfs 0.137 af**Reach 4R: Retained On-site**Inflow=0.43 cfs 0.234 af
Outflow=0.43 cfs 0.234 af**Total Runoff Area = 18.043 ac Runoff Volume = 0.482 af Average Runoff Depth = 0.32"**
99.80% Pervious = 18.006 ac 0.20% Impervious = 0.036 ac

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Summary for Subcatchment 1S: Area 1

Runoff = 0.17 cfs @ 12.56 hrs, Volume= 0.051 af, Depth= 0.44"

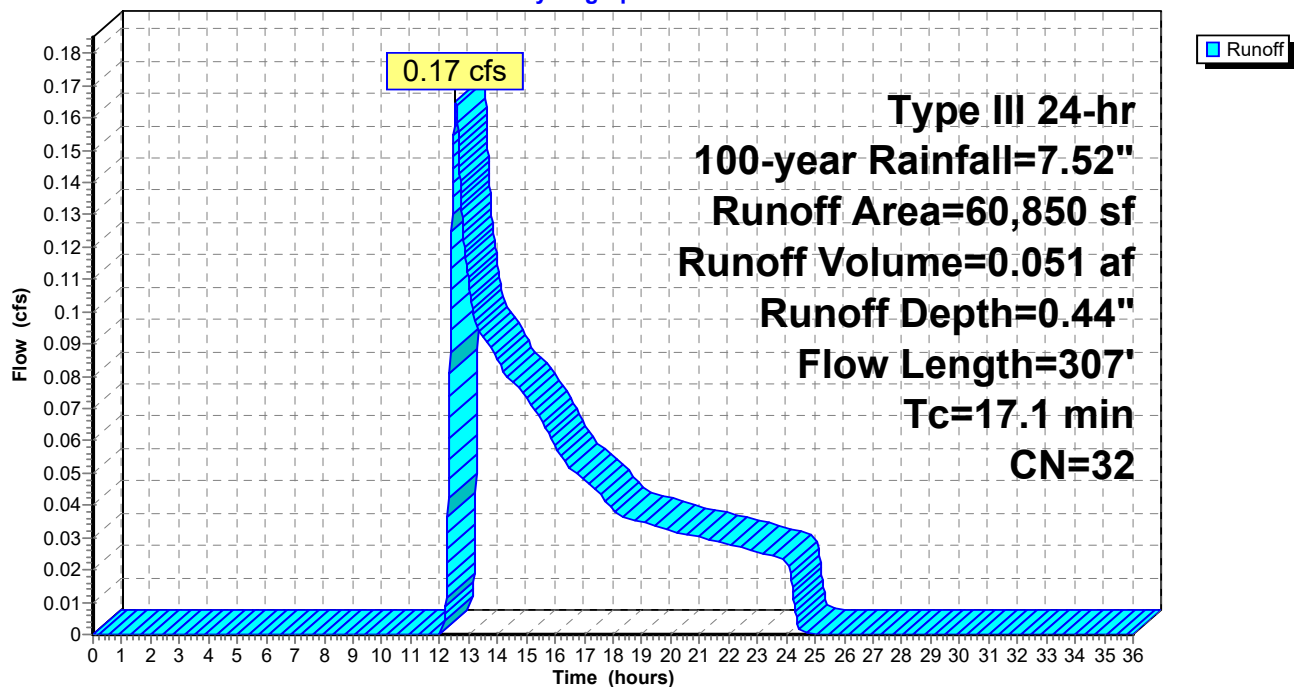
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=7.52"

Area (sf)	CN	Description
1,584	98	Paved parking, HSG A
59,266	30	Woods, Good, HSG A
60,850	32	Weighted Average
59,266		97.40% Pervious Area
1,584		2.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	50	0.0200	0.07		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.60"
4.1	172	0.0200	0.71		Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps
1.4	85	0.0400	1.00		Shallow Concentrated Flow, C-D Woodland Kv= 5.0 fps
17.1	307	Total			

Subcatchment 1S: Area 1

Hydrograph



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Type III 24-hr 100-year Rainfall=7.52"

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Summary for Subcatchment 2S: Area 2

Runoff = 0.12 cfs @ 12.60 hrs, Volume= 0.060 af, Depth= 0.31"

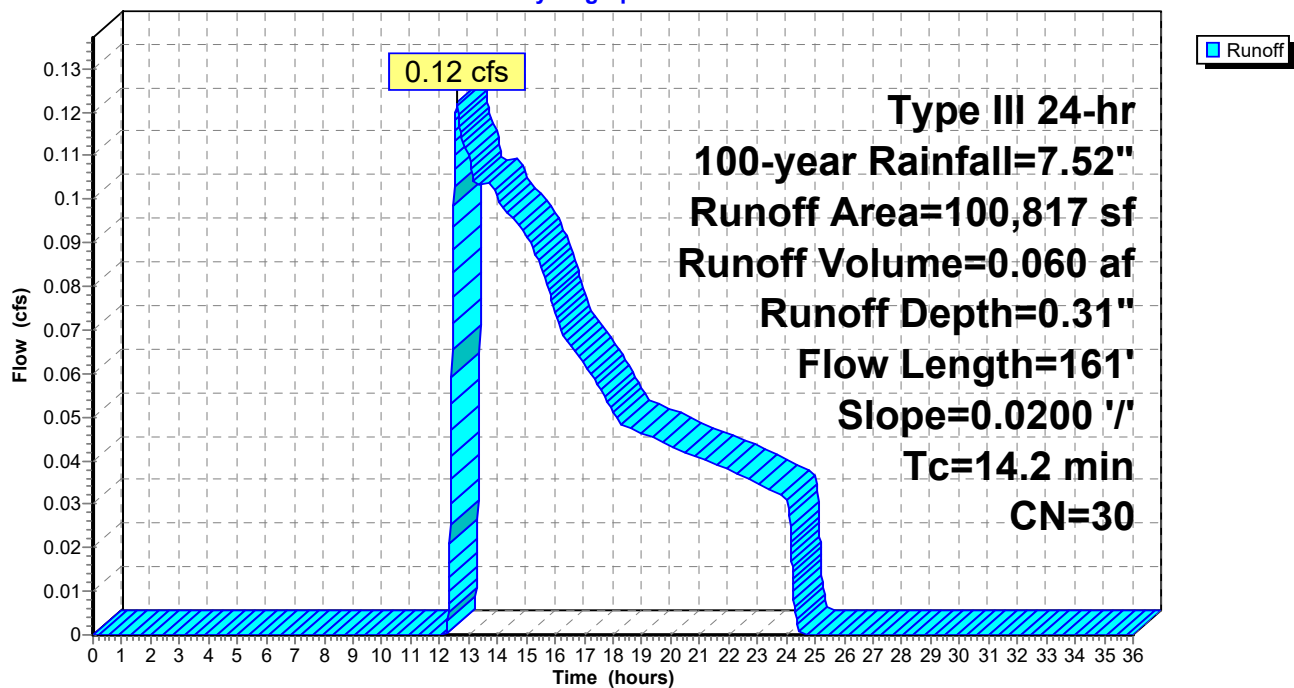
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=7.52"

Area (sf)	CN	Description
100,817	30	Woods, Good, HSG A
100,817		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	50	0.0200	0.07		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.60"
2.2	94	0.0200	0.71		Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps
0.4	17	0.0200	0.71		Shallow Concentrated Flow, C-D Woodland Kv= 5.0 fps
14.2	161	Total			

Subcatchment 2S: Area 2

Hydrograph



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Type III 24-hr 100-year Rainfall=7.52"

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Summary for Subcatchment 3S: Area 3

Runoff = 0.26 cfs @ 12.73 hrs, Volume= 0.137 af, Depth= 0.31"

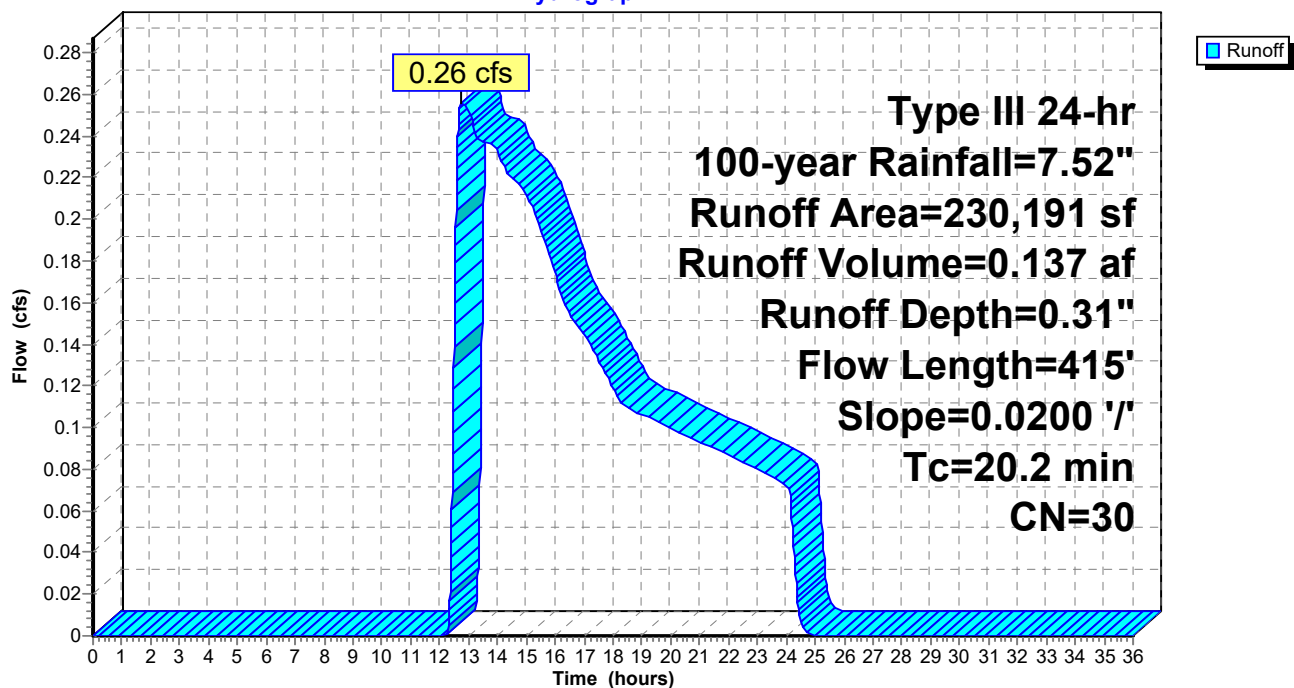
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=7.52"

Area (sf)	CN	Description
230,191	30	Woods, Good, HSG A
230,191		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	50	0.0200	0.07		Sheet Flow, A-B
					Woods: Light underbrush n= 0.400 P2= 3.60"
8.6	365	0.0200	0.71		Shallow Concentrated Flow, B-C
					Woodland Kv= 5.0 fps
20.2	415	Total			

Subcatchment 3S: Area 3

Hydrograph



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Type III 24-hr 100-year Rainfall=7.52"

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Summary for Subcatchment 4S: Area 4

Runoff = 0.43 cfs @ 12.79 hrs, Volume= 0.234 af, Depth= 0.31"

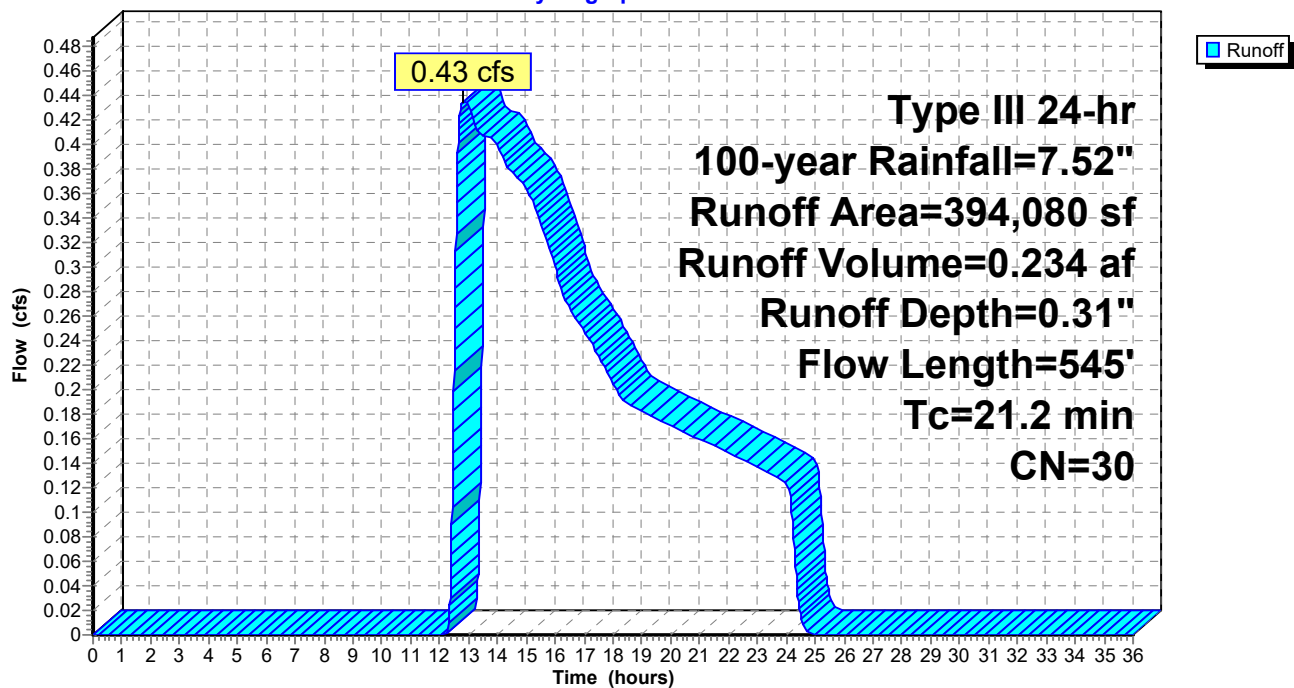
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=7.52"

Area (sf)	CN	Description
394,080	30	Woods, Good, HSG A
394,080		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	50	0.0200	0.07		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.60"
6.2	265	0.0200	0.71		Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps
3.4	230	0.0500	1.12		Shallow Concentrated Flow, C-D Woodland Kv= 5.0 fps
21.2	545	Total			

Subcatchment 4S: Area 4

Hydrograph



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Type III 24-hr 100-year Rainfall=7.52"

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Summary for Reach 1R: Off-site - Route 130

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

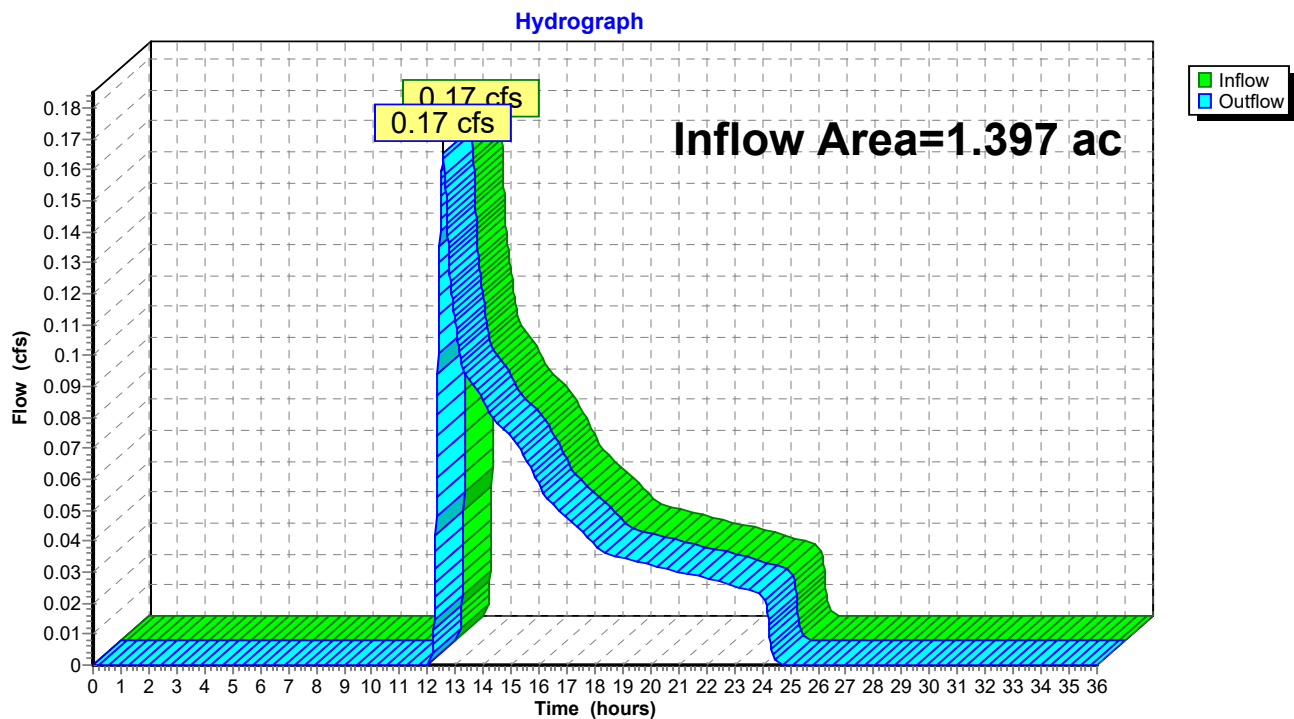
Inflow Area = 1.397 ac, 2.60% Impervious, Inflow Depth = 0.44" for 100-year event

Inflow = 0.17 cfs @ 12.56 hrs, Volume= 0.051 af

Outflow = 0.17 cfs @ 12.56 hrs, Volume= 0.051 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Reach 1R: Off-site - Route 130



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Type III 24-hr 100-year Rainfall=7.52"

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Summary for Reach 2R: Off-site North

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

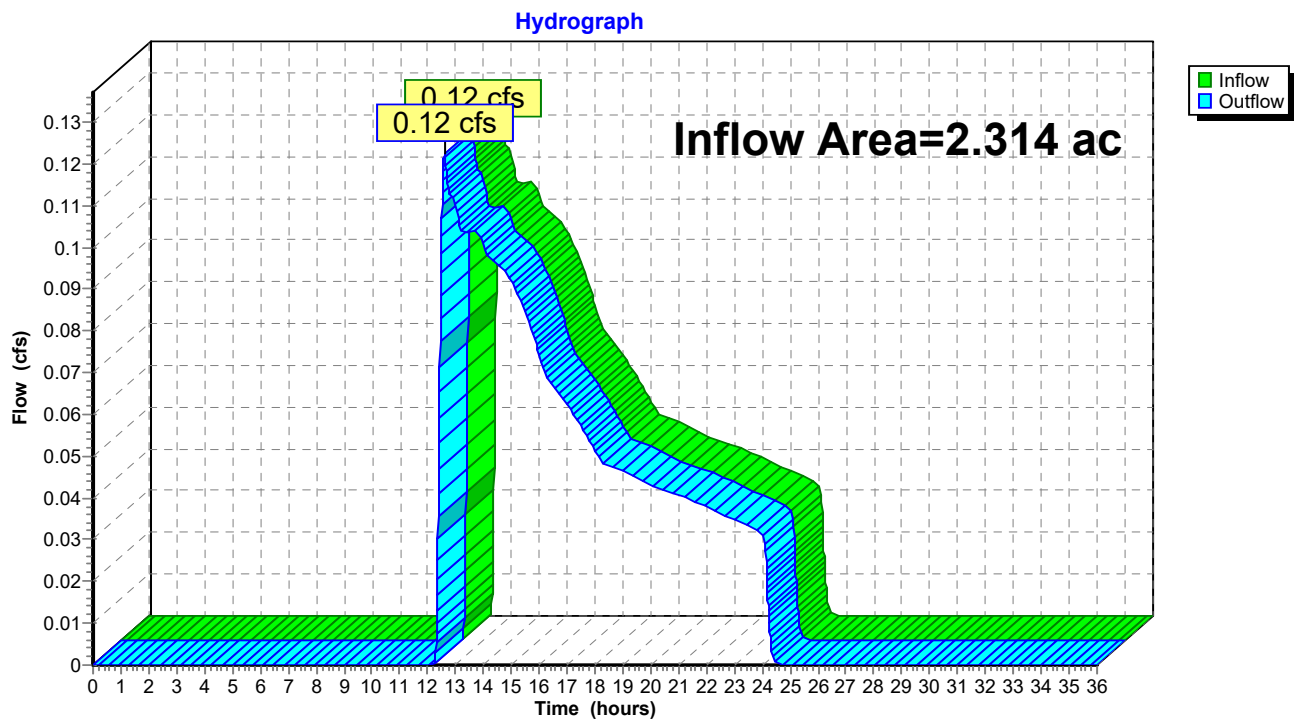
Inflow Area = 2.314 ac, 0.00% Impervious, Inflow Depth = 0.31" for 100-year event

Inflow = 0.12 cfs @ 12.60 hrs, Volume= 0.060 af

Outflow = 0.12 cfs @ 12.60 hrs, Volume= 0.060 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Reach 2R: Off-site North



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Type III 24-hr 100-year Rainfall=7.52"

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Summary for Reach 3R: Off-site South

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

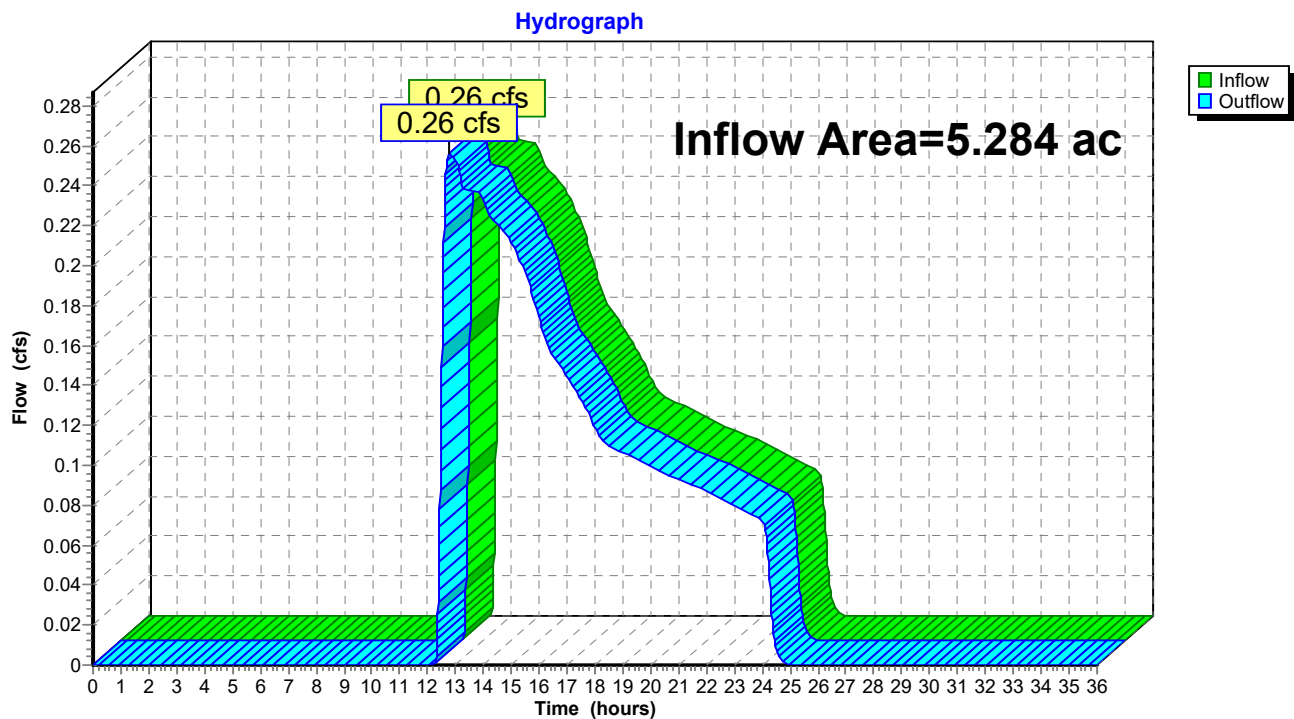
Inflow Area = 5.284 ac, 0.00% Impervious, Inflow Depth = 0.31" for 100-year event

Inflow = 0.26 cfs @ 12.73 hrs, Volume= 0.137 af

Outflow = 0.26 cfs @ 12.73 hrs, Volume= 0.137 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Reach 3R: Off-site South



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532 Main Street (Route 130) - Mashpee, MA

Type III 24-hr 100-year Rainfall=7.52"

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Summary for Reach 4R: Retained On-site

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

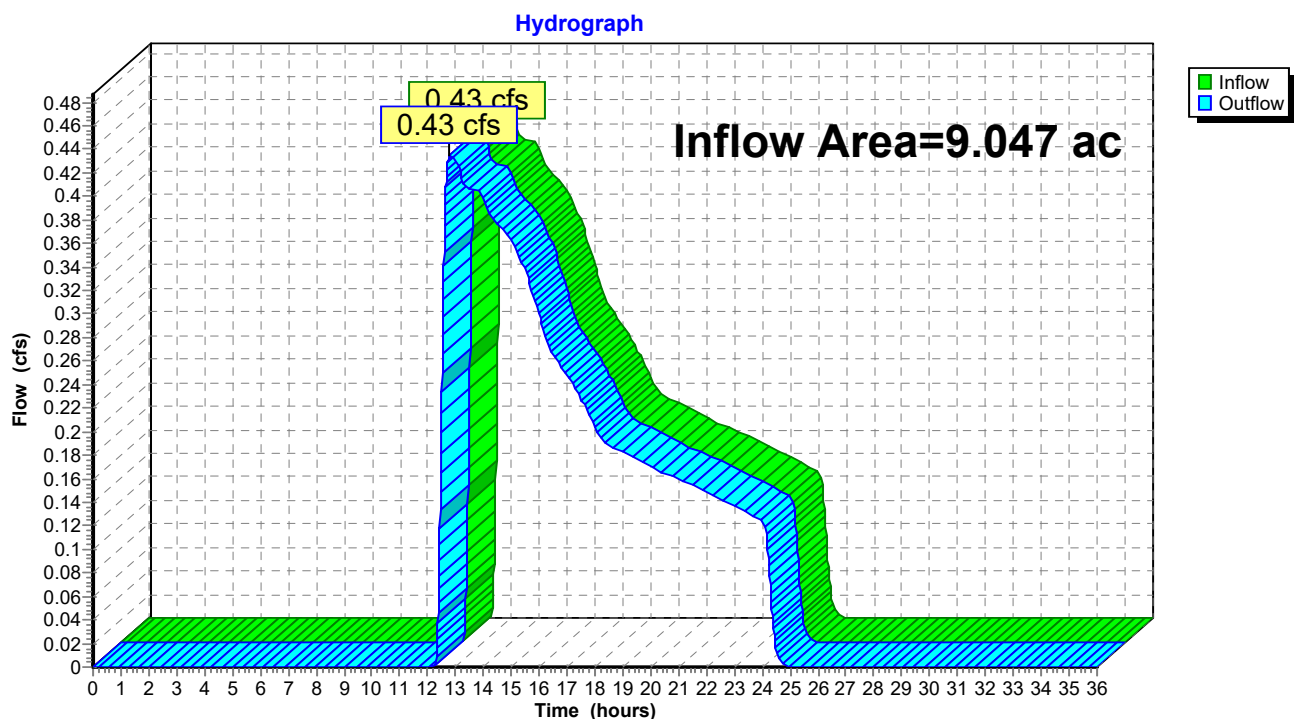
Inflow Area = 9.047 ac, 0.00% Impervious, Inflow Depth = 0.31" for 100-year event

Inflow = 0.43 cfs @ 12.79 hrs, Volume= 0.234 af

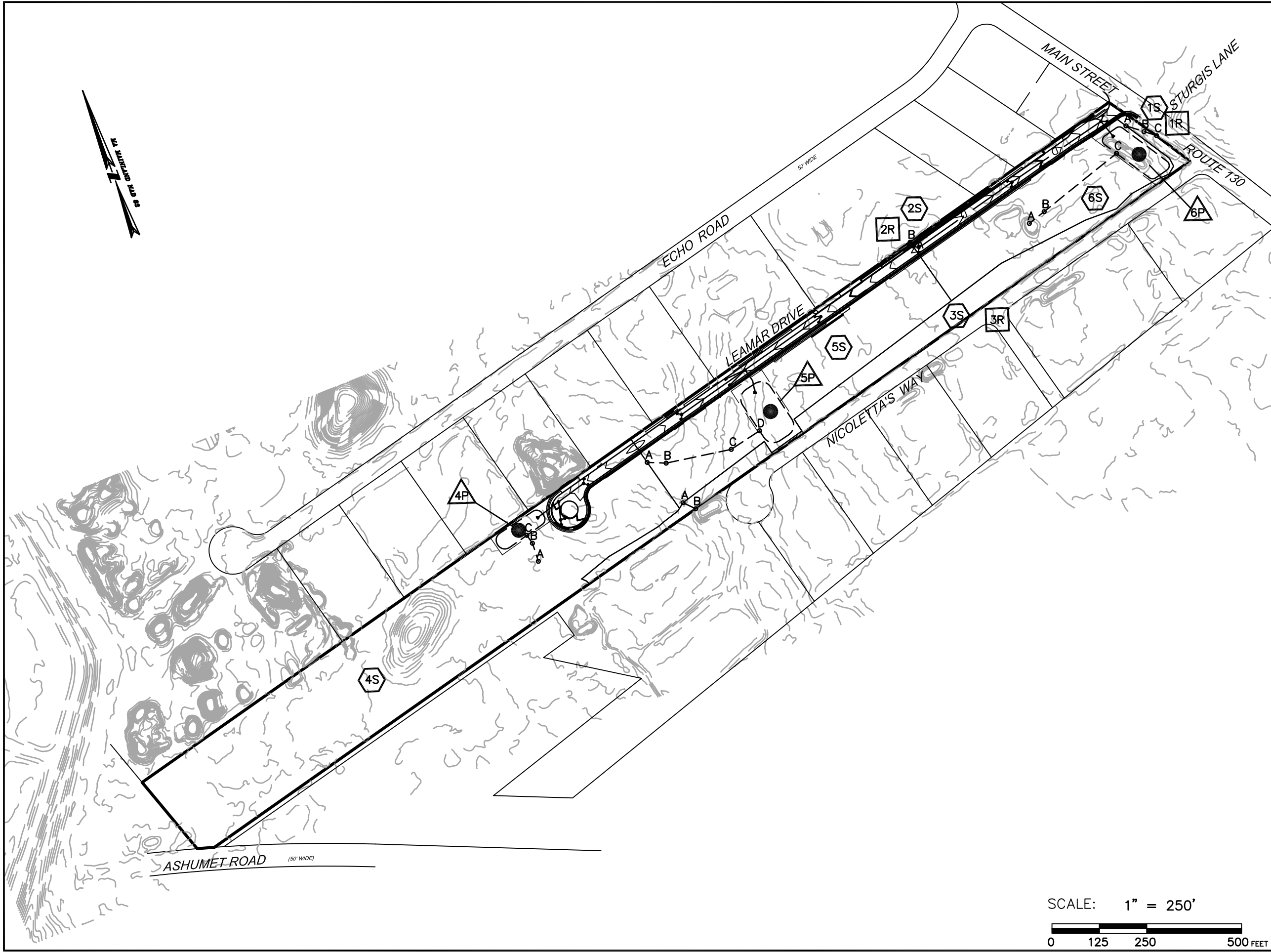
Outflow = 0.43 cfs @ 12.79 hrs, Volume= 0.234 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Reach 4R: Retained On-site



6.03 PROPOSED WATERSHED PLAN



LEMEAR DRIVE

532 MAIN ST (ROUTE 130)

MASHPEE
MASSACHUSETTS
(BARNSTABLE COUNTY)

POST-DEVELOPMENT WATERSHED PLAN

FEBRUARY 11, 2022

PREPARED
FOR: MARCELLO MALLEGNI
80 AIRPORT ROAD
HYANNIS, MA 02601



349 Main Street - Route 28
West Yarmouth, Massachusetts
02673

508 778 8919

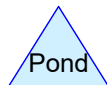
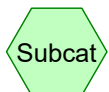
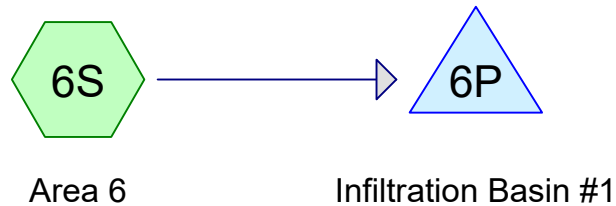
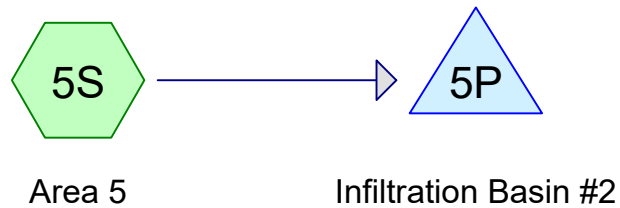
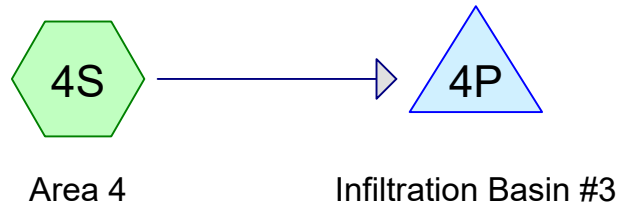
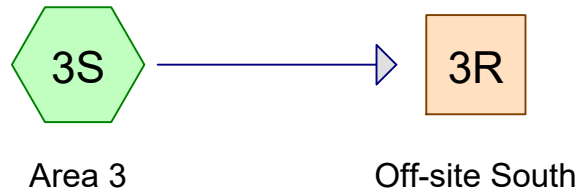
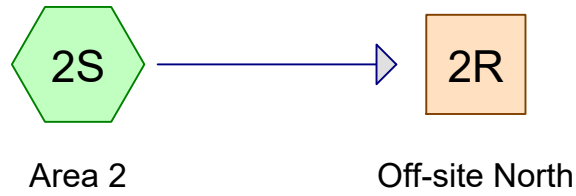
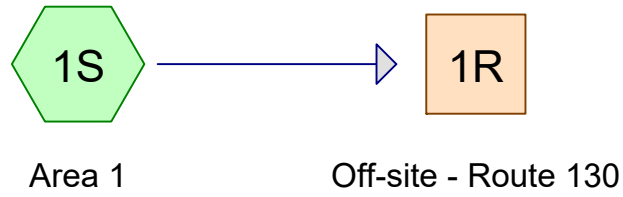
Job No.: 5-0474.00 Date: 2/4/22

Scale: 1" = 250' Revised: _____

Dwg No: _____

File: Projects-YAR\5047400\C\5047400-PP.dwg

6.04 PROPOSED HYDROLOGY CALCULATIONS (HYDROCAD™ PRINTOUTS)



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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
8.028	57	1/3 acre lots, 30% imp, HSG A (4S, 5S, 6S)
1.292	98	Paved parking, HSG A (1S, 4S, 5S, 6S)
8.722	30	Woods, Good, HSG A (1S, 2S, 3S, 4S)
18.043	47	TOTAL AREA

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Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Area 1 Runoff Area=6,144 sf 25.78% Impervious Runoff Depth=0.13"
Flow Length=85' Slope=0.0200 '/' Tc=12.4 min CN=48 Runoff=0.00 cfs 0.002 af

Subcatchment2S: Area 2 Runoff Area=8,894 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=13' Slope=0.0200 '/' Tc=6.0 min CN=30 Runoff=0.00 cfs 0.000 af

Subcatchment3S: Area 3 Runoff Area=71,718 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=37' Slope=0.0200 '/' Tc=9.1 min CN=30 Runoff=0.00 cfs 0.000 af

Subcatchment4S: Area 4 Runoff Area=382,748 sf 9.27% Impervious Runoff Depth=0.00"
Flow Length=76' Slope=0.0200 '/' Tc=12.2 min CN=38 Runoff=0.01 cfs 0.001 af

Subcatchment5S: Area 5 Runoff Area=182,954 sf 38.96% Impervious Runoff Depth=0.59"
Flow Length=314' Slope=0.0200 '/' Tc=7.3 min CN=62 Runoff=2.03 cfs 0.206 af

Subcatchment6S: Area 6 Runoff Area=133,475 sf 39.60% Impervious Runoff Depth=0.63"
Flow Length=295' Slope=0.0200 '/' Tc=7.1 min CN=63 Runoff=1.67 cfs 0.161 af

Reach 1R: Off-site - Route 130 Inflow=0.00 cfs 0.002 af
Outflow=0.00 cfs 0.002 af

Reach 2R: Off-site North Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Reach 3R: Off-site South Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Pond 4P: Infiltration Basin #3 Peak Elev=99.60' Storage=1 cf Inflow=0.01 cfs 0.001 af
Outflow=0.01 cfs 0.001 af

Pond 5P: Infiltration Basin #2 Peak Elev=100.82' Storage=698 cf Inflow=2.03 cfs 0.206 af
Outflow=1.16 cfs 0.206 af

Pond 6P: Infiltration Basin #1 Peak Elev=101.34' Storage=1,460 cf Inflow=1.67 cfs 0.161 af
Outflow=0.48 cfs 0.161 af

Total Runoff Area = 18.043 ac Runoff Volume = 0.370 af Average Runoff Depth = 0.25"
79.49% Pervious = 14.342 ac 20.51% Impervious = 3.700 ac

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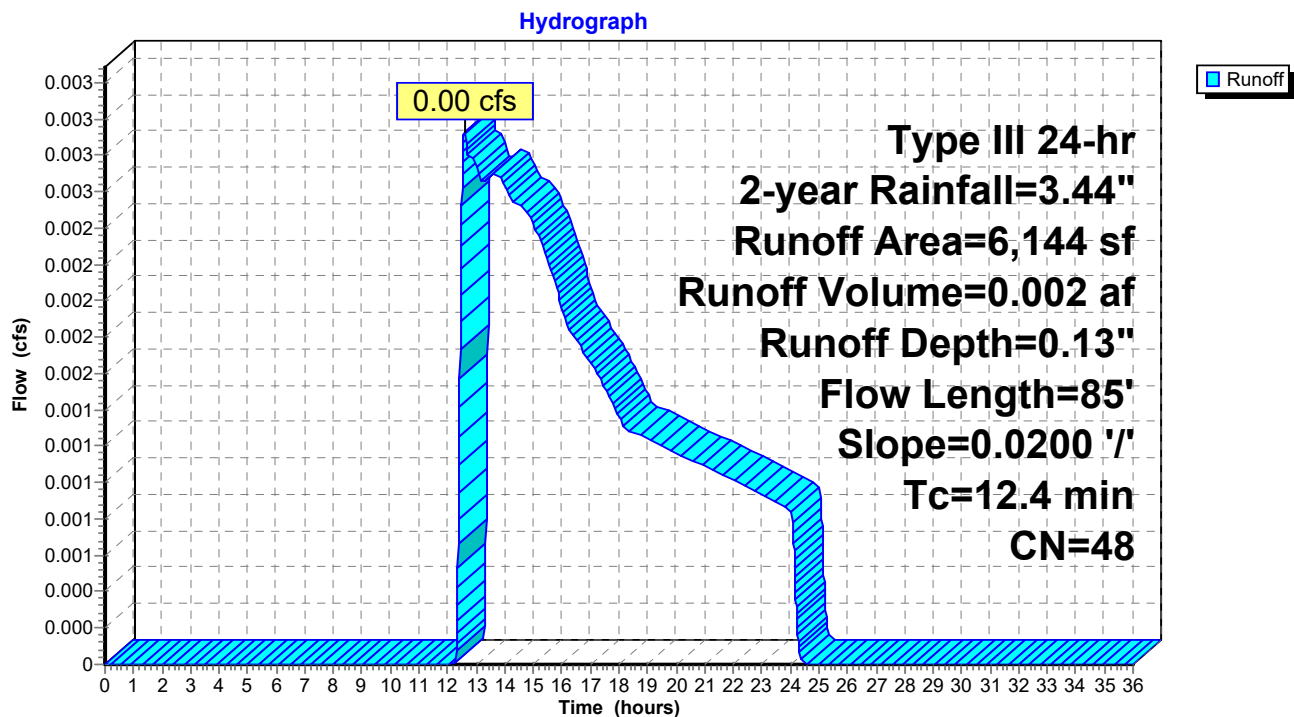
Summary for Subcatchment 1S: Area 1

Runoff = 0.00 cfs @ 12.58 hrs, Volume= 0.002 af, Depth= 0.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.44"

Area (sf)	CN	Description
1,584	98	Paved parking, HSG A
4,560	30	Woods, Good, HSG A
6,144	48	Weighted Average
4,560		74.22% Pervious Area
1,584		25.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	50	0.0200	0.07		Sheet Flow, A-B
					Woods: Light underbrush n= 0.400 P2= 3.60"
0.8	35	0.0200	0.71		Shallow Concentrated Flow, B-C
					Woodland Kv= 5.0 fps
12.4	85	Total			

Subcatchment 1S: Area 1

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Summary for Subcatchment 2S: Area 2

[45] Hint: Runoff=Zero

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

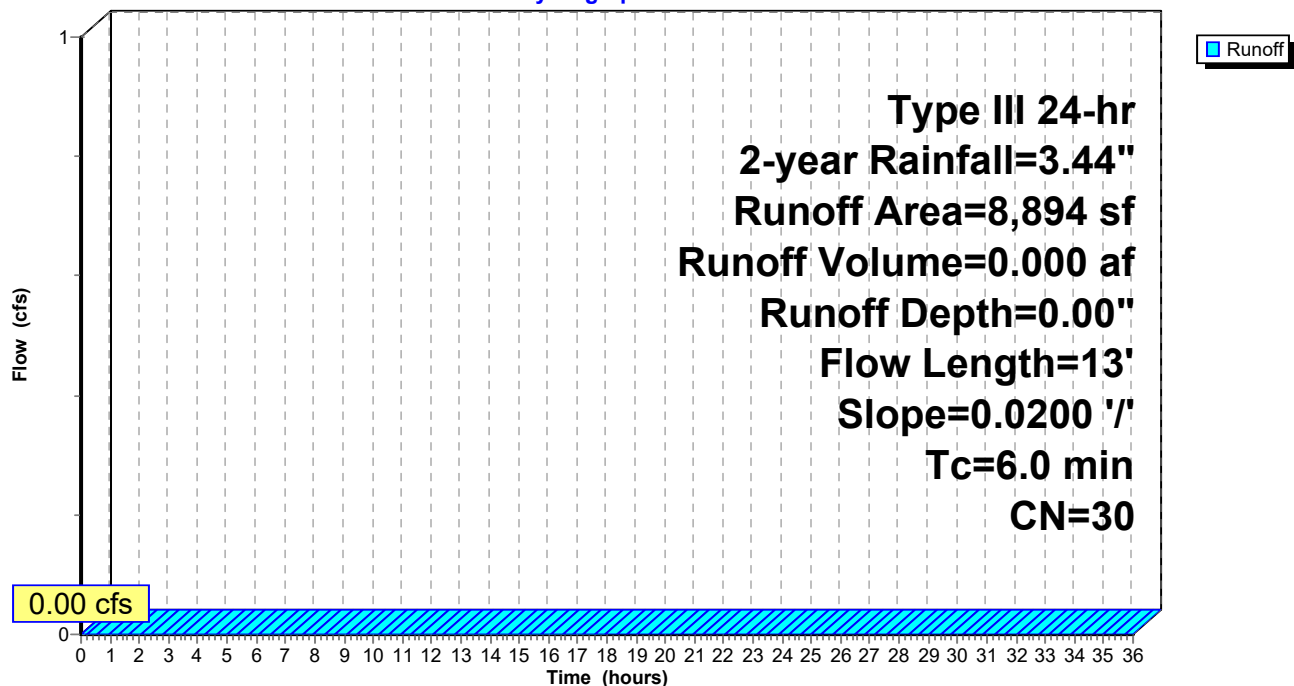
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.44"

Area (sf)	CN	Description
8,894	30	Woods, Good, HSG A
8,894		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	13	0.0200	0.05		Sheet Flow, A-B
					Woods: Light underbrush n= 0.400 P2= 3.60"
2.0					Direct Entry,
6.0	13	Total			

Subcatchment 2S: Area 2

Hydrograph



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Summary for Subcatchment 3S: Area 3

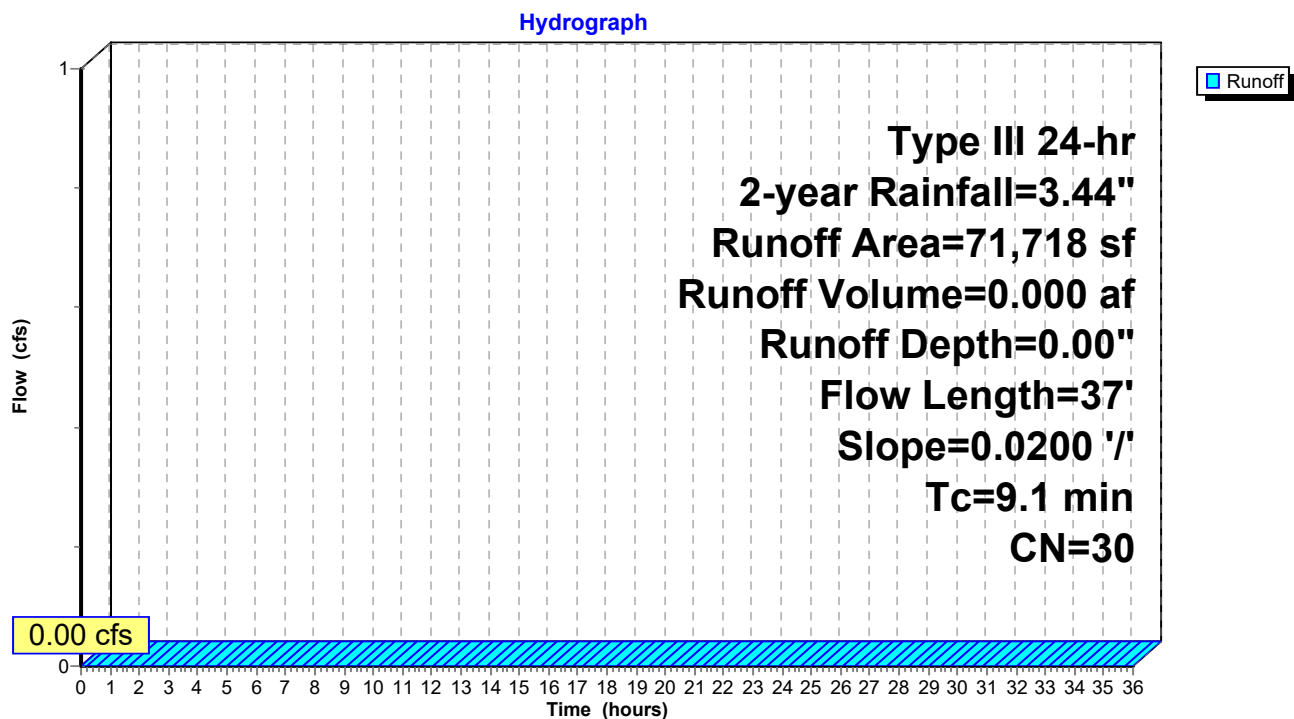
[45] Hint: Runoff=Zero

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.44"

Area (sf)	CN	Description
71,718	30	Woods, Good, HSG A
71,718		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	37	0.0200	0.07		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.60"

Subcatchment 3S: Area 3

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Summary for Subcatchment 4S: Area 4

Runoff = 0.01 cfs @ 24.01 hrs, Volume= 0.001 af, Depth= 0.00"

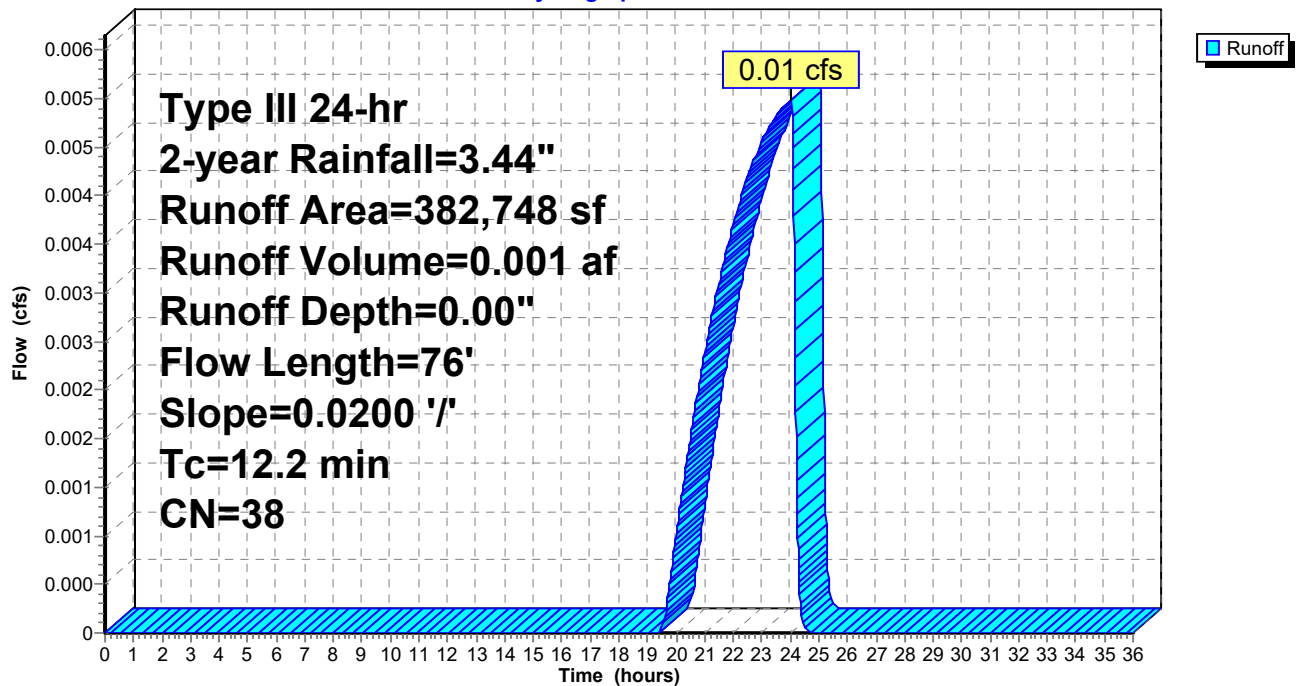
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.44"

Area (sf)	CN	Description
12,975	98	Paved parking, HSG A
75,000	57	1/3 acre lots, 30% imp, HSG A
294,773	30	Woods, Good, HSG A
382,748	38	Weighted Average
347,273		90.73% Pervious Area
35,475		9.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	50	0.0200	0.07		Sheet Flow, A-B
					Woods: Light underbrush n= 0.400 P2= 3.60"
0.6	26	0.0200	0.71		Shallow Concentrated Flow, B-C
					Woodland Kv= 5.0 fps
12.2	76	Total			

Subcatchment 4S: Area 4

Hydrograph



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Summary for Subcatchment 5S: Area 5

Runoff = 2.03 cfs @ 12.13 hrs, Volume= 0.206 af, Depth= 0.59"

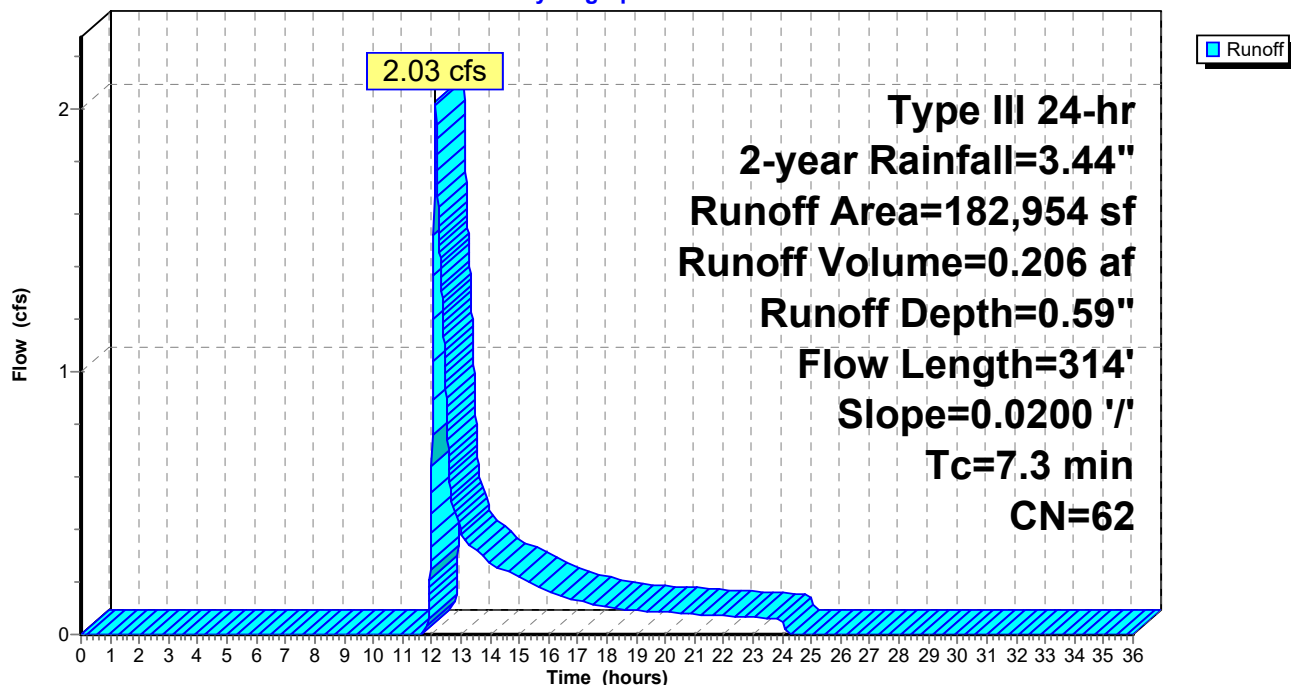
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.44"

Area (sf)	CN	Description
23,422	98	Paved parking, HSG A
159,532	57	1/3 acre lots, 30% imp, HSG A
182,954	62	Weighted Average
111,672		61.04% Pervious Area
71,282		38.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	50	0.0200	0.16		Sheet Flow, A-B Grass: Short n= 0.150 P2= 3.60"
1.3	175	0.0200	2.28		Shallow Concentrated Flow, B-C Unpaved Kv= 16.1 fps
0.7	89	0.0200	2.28		Shallow Concentrated Flow, C-D Unpaved Kv= 16.1 fps
7.3	314	Total			

Subcatchment 5S: Area 5

Hydrograph



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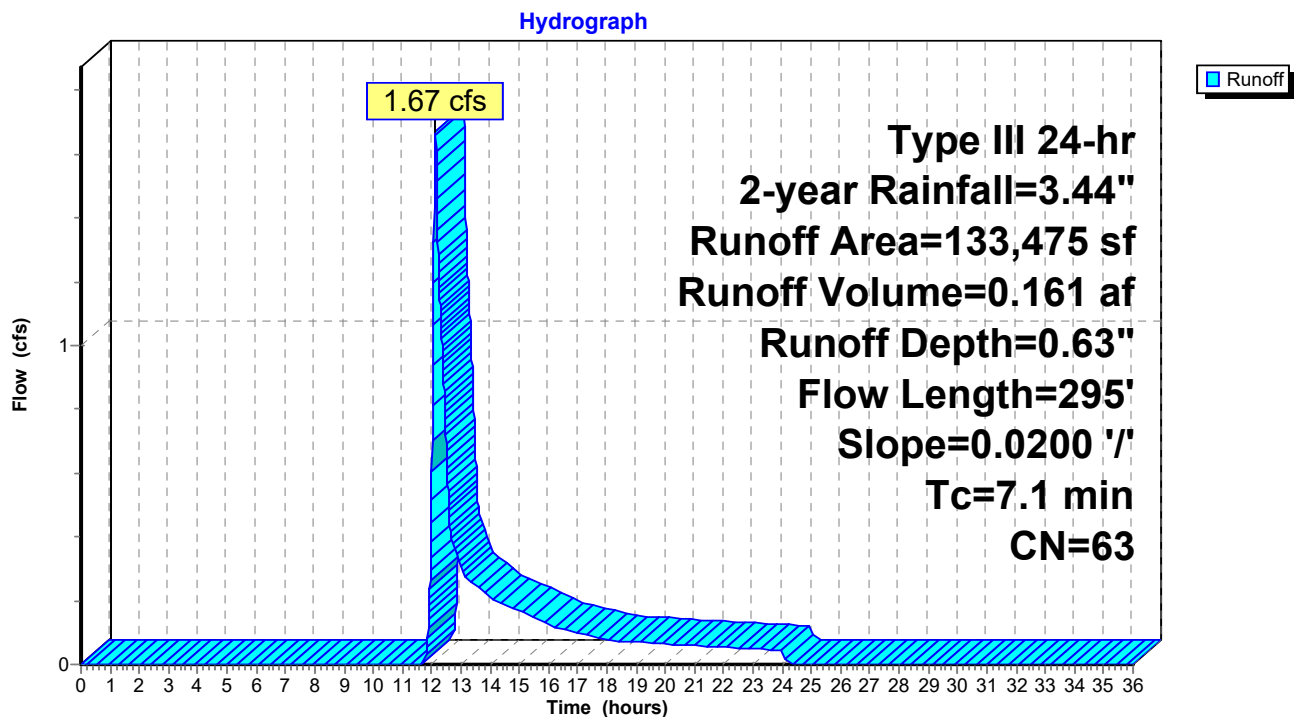
Summary for Subcatchment 6S: Area 6

Runoff = 1.67 cfs @ 12.12 hrs, Volume= 0.161 af, Depth= 0.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.44"

Area (sf)	CN	Description
18,300	98	Paved parking, HSG A
115,175	57	1/3 acre lots, 30% imp, HSG A
133,475	63	Weighted Average
80,623		60.40% Pervious Area
52,853		39.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	50	0.0200	0.16		Sheet Flow, A-B
					Grass: Short n= 0.150 P2= 3.60"
1.8	245	0.0200	2.28		Shallow Concentrated Flow, B-C
					Unpaved Kv= 16.1 fps
7.1	295	Total			

Subcatchment 6S: Area 6

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Summary for Reach 1R: Off-site - Route 130

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

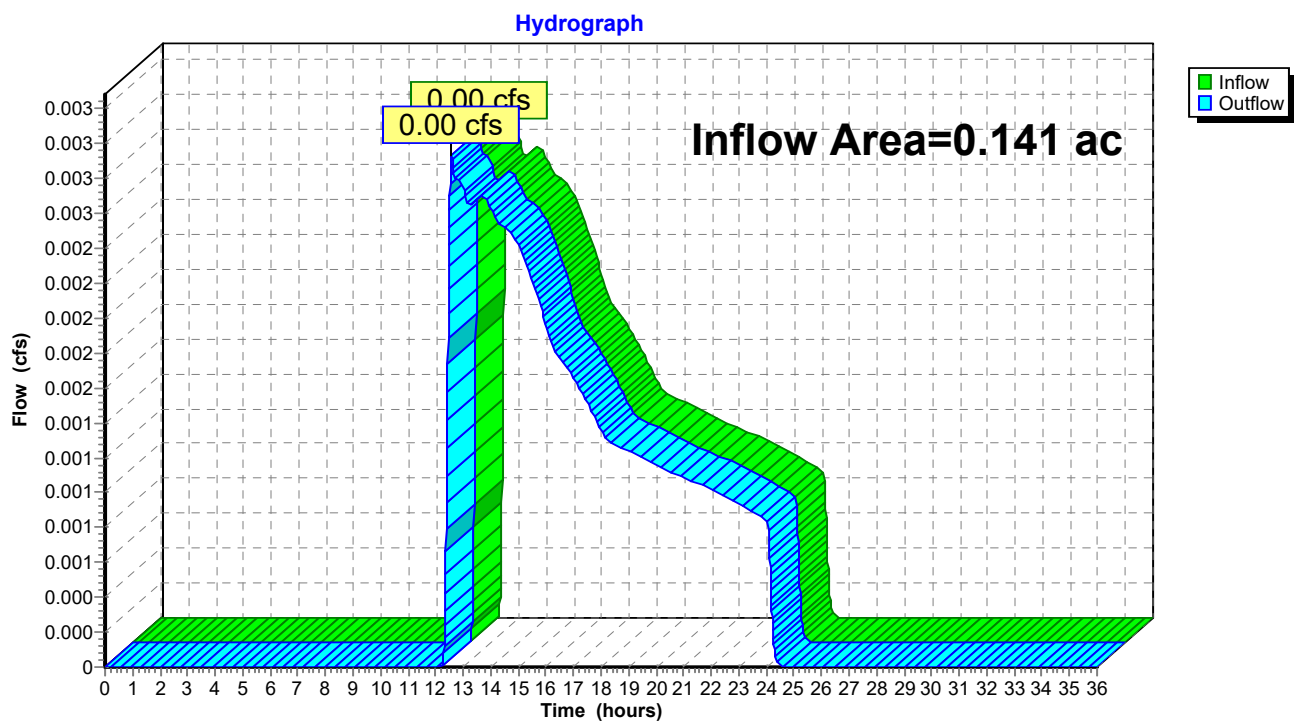
Inflow Area = 0.141 ac, 25.78% Impervious, Inflow Depth = 0.13" for 2-year event

Inflow = 0.00 cfs @ 12.58 hrs, Volume= 0.002 af

Outflow = 0.00 cfs @ 12.58 hrs, Volume= 0.002 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Reach 1R: Off-site - Route 130



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Summary for Reach 2R: Off-site North

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

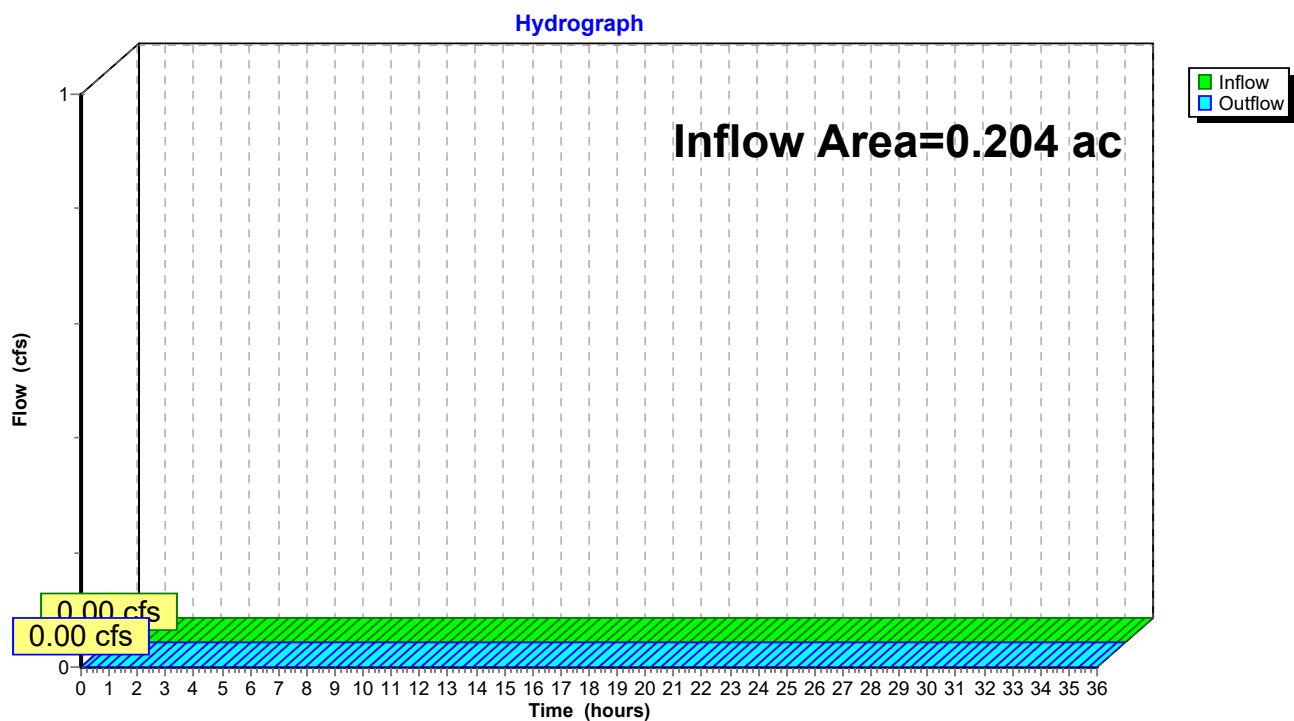
Inflow Area = 0.204 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-year event

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

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Reach 2R: Off-site North



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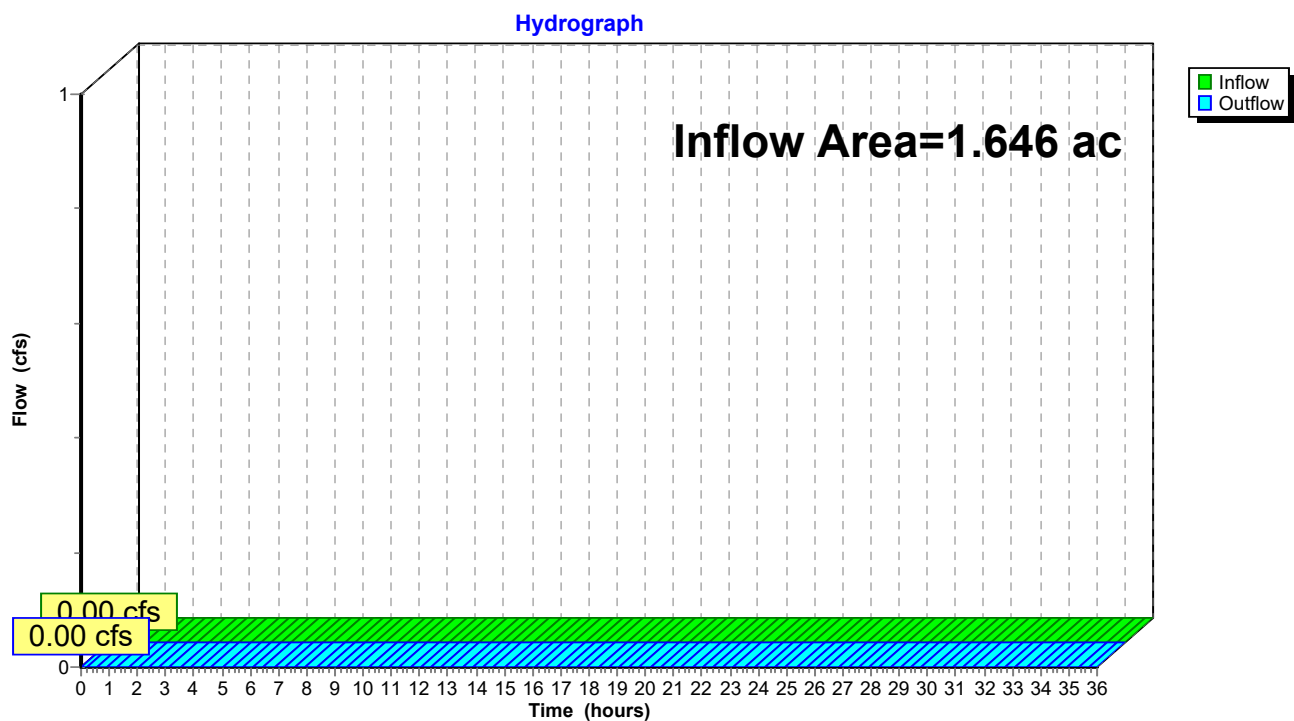
Summary for Reach 3R: Off-site South

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

Inflow Area = 1.646 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-year event
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

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Reach 3R: Off-site South



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Summary for Pond 4P: Infiltration Basin #3

Inflow Area = 8.787 ac, 9.27% Impervious, Inflow Depth = 0.00" for 2-year event
 Inflow = 0.01 cfs @ 24.01 hrs, Volume= 0.001 af
 Outflow = 0.01 cfs @ 24.03 hrs, Volume= 0.001 af, Atten= 0%, Lag= 1.0 min
 Discarded = 0.01 cfs @ 24.03 hrs, Volume= 0.001 af

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Peak Elev= 99.60' @ 24.03 hrs Surf.Area= 1,878 sf Storage= 1 cf

Plug-Flow detention time= 2.1 min calculated for 0.001 af (100% of inflow)

Center-of-Mass det. time= 2.1 min (1,349.2 - 1,347.1)

Volume	Invert	Avail.Storage	Storage Description
#1	99.60'	9,006 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)
99.60	1,878	255.2	0	0	1,878
100.00	2,348	266.5	843	843	2,359
101.00	4,060	304.2	3,165	4,009	4,094
102.00	5,998	341.9	4,998	9,006	6,059

Device	Routing	Invert	Outlet Devices
#1	Discarded	99.60'	8.270 in/hr Exfiltration over Horizontal area Conductivity to Groundwater Elevation = 80.00'

Discarded OutFlow Max=0.36 cfs @ 24.03 hrs HW=99.60' (Free Discharge)↑**1=Exfiltration** (Controls 0.36 cfs)

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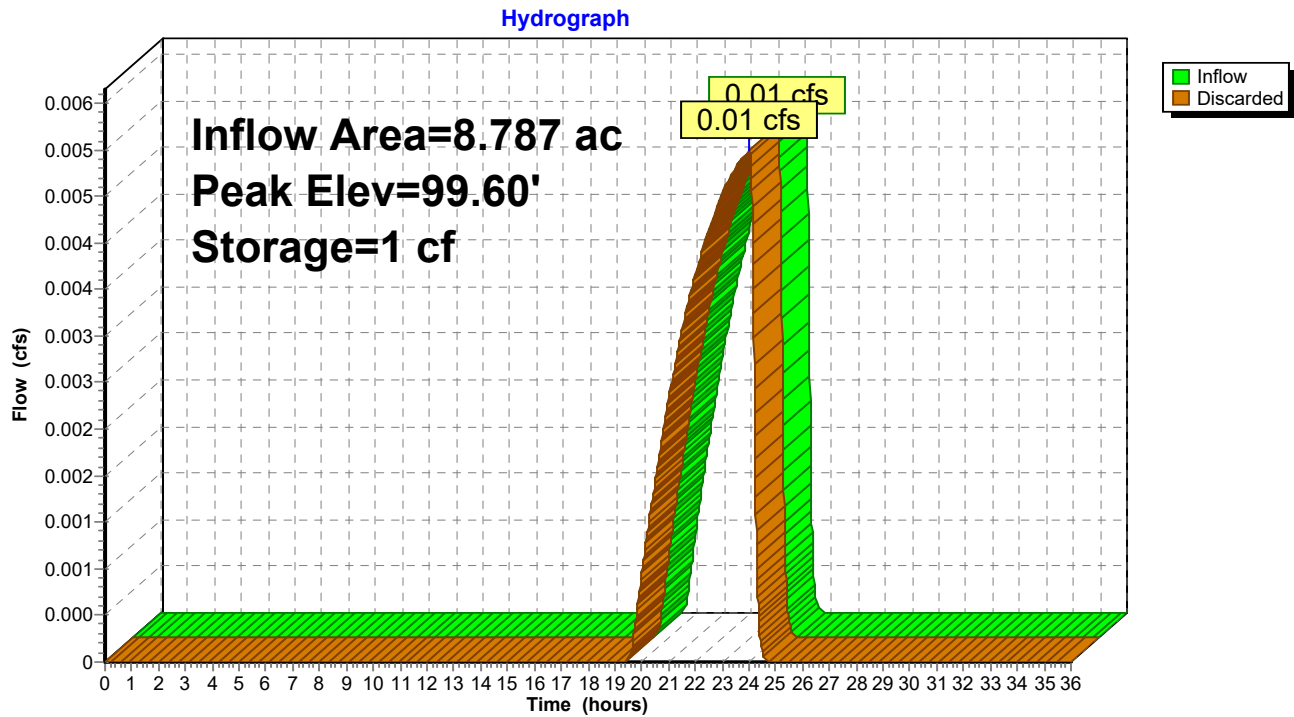
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Pond 4P: Infiltration Basin #3



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Summary for Pond 5P: Infiltration Basin #2

Inflow Area = 4.200 ac, 38.96% Impervious, Inflow Depth = 0.59" for 2-year event
 Inflow = 2.03 cfs @ 12.13 hrs, Volume= 0.206 af
 Outflow = 1.16 cfs @ 12.41 hrs, Volume= 0.206 af, Atten= 43%, Lag= 16.6 min
 Discarded = 1.16 cfs @ 12.41 hrs, Volume= 0.206 af

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 100.82' @ 12.41 hrs Surf.Area= 6,050 sf Storage= 698 cf

Plug-Flow detention time= 4.3 min calculated for 0.206 af (100% of inflow)
 Center-of-Mass det. time= 4.3 min (906.8 - 902.5)

Volume	Invert	Avail.Storage	Storage Description		
#1	100.70'	31,116 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)
100.70	5,821	323.5	0	0	5,821
101.00	6,413	334.8	1,834	1,834	6,421
102.00	8,535	372.5	7,449	9,283	8,572
103.00	10,883	410.2	9,685	18,968	10,953
104.00	13,458	447.9	12,148	31,116	13,563

Device	Routing	Invert	Outlet Devices
#1	Discarded	100.70'	8.270 in/hr Exfiltration over Horizontal area Conductivity to Groundwater Elevation = 80.00'

Discarded OutFlow Max=1.16 cfs @ 12.41 hrs HW=100.82' (Free Discharge)

↑**1=Exfiltration** (Controls 1.16 cfs)

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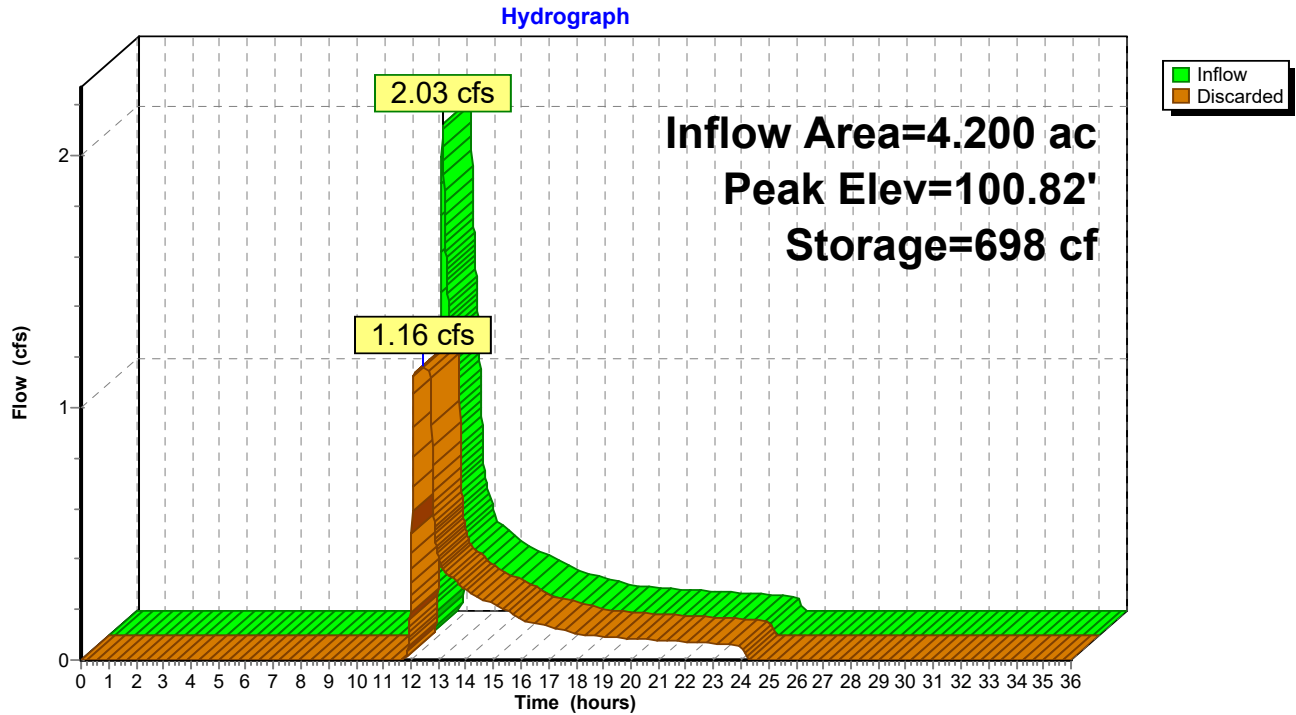
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Pond 5P: Infiltration Basin #2



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Summary for Pond 6P: Infiltration Basin #1

Inflow Area = 3.064 ac, 39.60% Impervious, Inflow Depth = 0.63" for 2-year event
 Inflow = 1.67 cfs @ 12.12 hrs, Volume= 0.161 af
 Outflow = 0.48 cfs @ 12.59 hrs, Volume= 0.161 af, Atten= 71%, Lag= 28.0 min
 Discarded = 0.48 cfs @ 12.59 hrs, Volume= 0.161 af

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 101.34' @ 12.59 hrs Surf.Area= 2,440 sf Storage= 1,460 cf

Plug-Flow detention time= 24.4 min calculated for 0.161 af (100% of inflow)
 Center-of-Mass det. time= 24.4 min (922.3 - 897.8)

Volume	Invert	Avail.Storage	Storage Description		
#1	100.50'	24,860 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)
100.50	1,068	258.2	0	0	1,068
101.00	1,881	283.5	728	728	2,167
102.00	3,733	334.0	2,755	3,482	4,668
103.00	5,885	380.3	4,768	8,251	7,324
104.00	8,280	418.0	7,049	15,299	9,752
105.00	10,901	455.7	9,561	24,860	12,409

Device	Routing	Invert	Outlet Devices
#1	Discarded	100.50'	8.270 in/hr Exfiltration over Horizontal area Conductivity to Groundwater Elevation = 80.00'

Discarded OutFlow Max=0.48 cfs @ 12.59 hrs HW=101.34' (Free Discharge)
 ↑1=Exfiltration (Controls 0.48 cfs)

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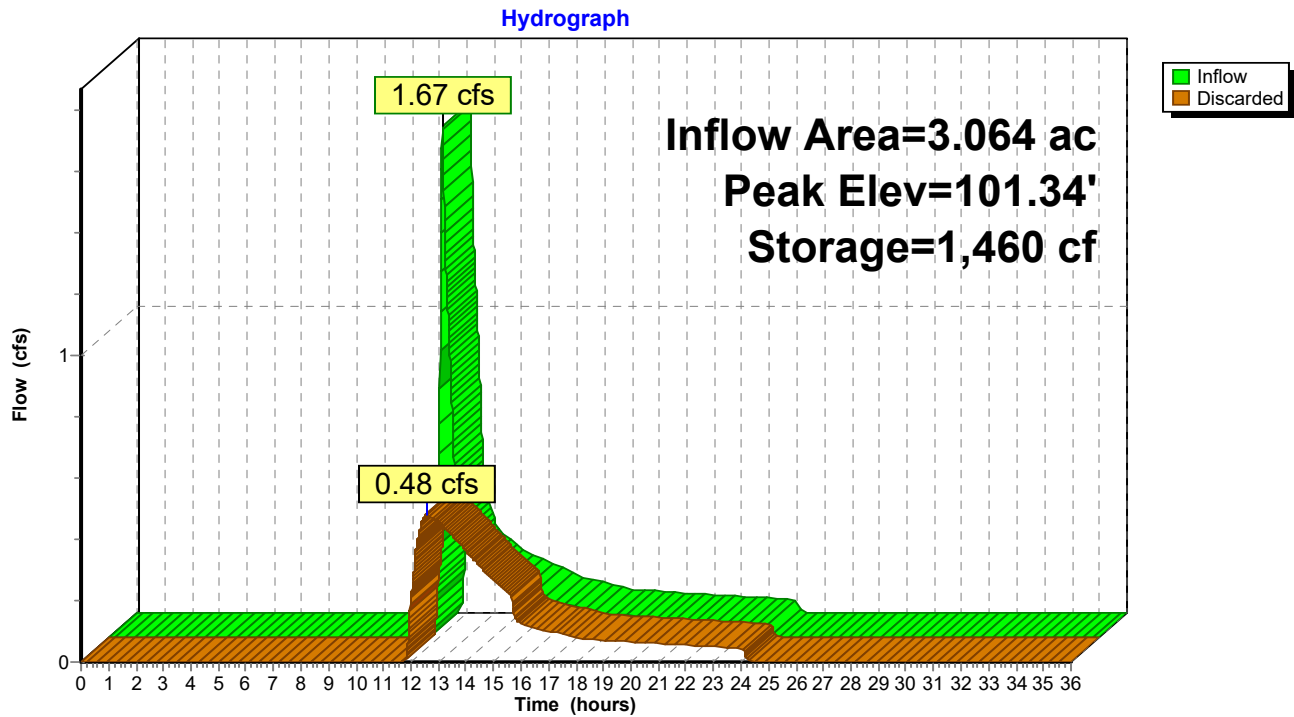
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Type III 24-hr 2-year Rainfall=3.44"

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Pond 6P: Infiltration Basin #1



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532 Main Street (Route 130) - Mashpee, MA

Type III 24-hr 10-year Rainfall=5.02"

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Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Area 1 Runoff Area=6,144 sf 25.78% Impervious Runoff Depth=0.59"
Flow Length=85' Slope=0.0200 '/' Tc=12.4 min CN=48 Runoff=0.04 cfs 0.007 af

Subcatchment2S: Area 2 Runoff Area=8,894 sf 0.00% Impervious Runoff Depth=0.01"
Flow Length=13' Slope=0.0200 '/' Tc=6.0 min CN=30 Runoff=0.00 cfs 0.000 af

Subcatchment3S: Area 3 Runoff Area=71,718 sf 0.00% Impervious Runoff Depth=0.01"
Flow Length=37' Slope=0.0200 '/' Tc=9.1 min CN=30 Runoff=0.00 cfs 0.001 af

Subcatchment4S: Area 4 Runoff Area=382,748 sf 9.27% Impervious Runoff Depth=0.17"
Flow Length=76' Slope=0.0200 '/' Tc=12.2 min CN=38 Runoff=0.21 cfs 0.125 af

Subcatchment5S: Area 5 Runoff Area=182,954 sf 38.96% Impervious Runoff Depth=1.45"
Flow Length=314' Slope=0.0200 '/' Tc=7.3 min CN=62 Runoff=6.29 cfs 0.508 af

Subcatchment6S: Area 6 Runoff Area=133,475 sf 39.60% Impervious Runoff Depth=1.52"
Flow Length=295' Slope=0.0200 '/' Tc=7.1 min CN=63 Runoff=4.91 cfs 0.389 af

Reach 1R: Off-site - Route 130 Inflow=0.04 cfs 0.007 af
Outflow=0.04 cfs 0.007 af

Reach 2R: Off-site North Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Reach 3R: Off-site South Inflow=0.00 cfs 0.001 af
Outflow=0.00 cfs 0.001 af

Pond 4P: Infiltration Basin #3 Peak Elev=99.61' Storage=26 cf Inflow=0.21 cfs 0.125 af
Outflow=0.21 cfs 0.125 af

Pond 5P: Infiltration Basin #2 Peak Elev=101.51' Storage=5,379 cf Inflow=6.29 cfs 0.508 af
Outflow=1.48 cfs 0.508 af

Pond 6P: Infiltration Basin #1 Peak Elev=102.43' Storage=5,255 cf Inflow=4.91 cfs 0.389 af
Outflow=0.93 cfs 0.389 af

Total Runoff Area = 18.043 ac Runoff Volume = 1.029 af Average Runoff Depth = 0.68"
79.49% Pervious = 14.342 ac 20.51% Impervious = 3.700 ac

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532 Main Street (Route 130) - Mashpee, MA

Type III 24-hr 10-year Rainfall=5.02"

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Summary for Subcatchment 1S: Area 1

Runoff = 0.04 cfs @ 12.30 hrs, Volume= 0.007 af, Depth= 0.59"

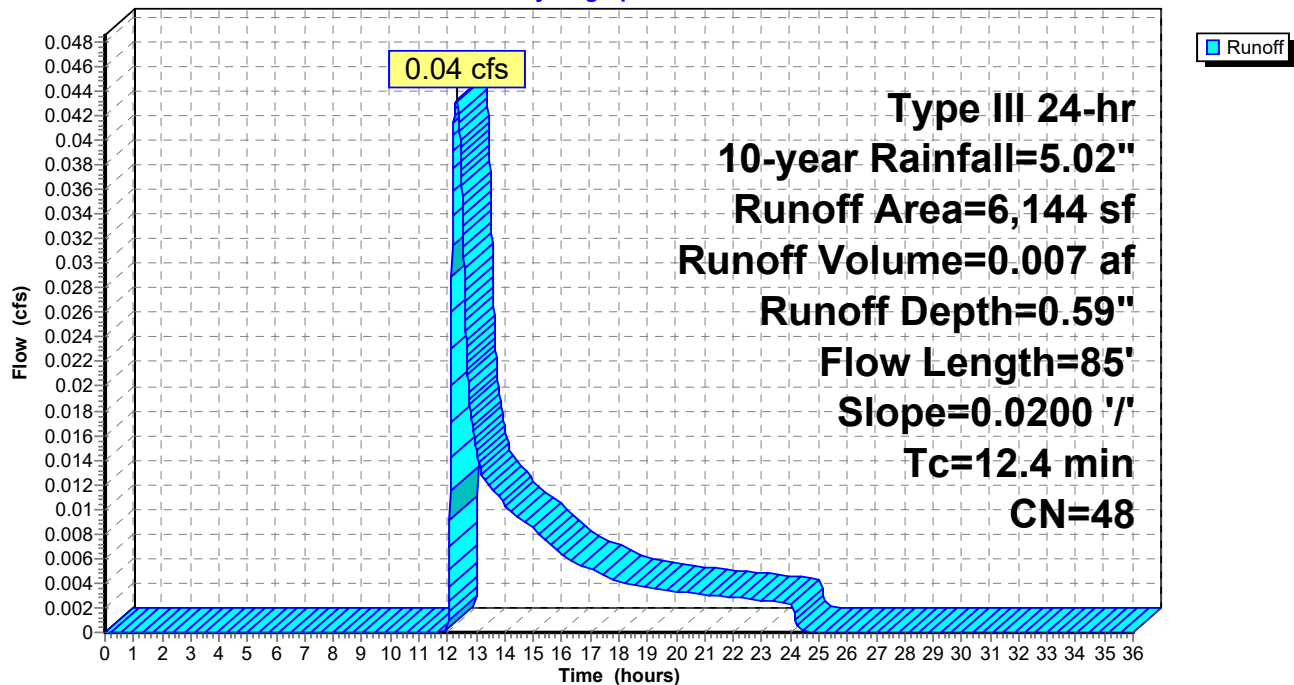
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=5.02"

Area (sf)	CN	Description
1,584	98	Paved parking, HSG A
4,560	30	Woods, Good, HSG A
6,144	48	Weighted Average
4,560		74.22% Pervious Area
1,584		25.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	50	0.0200	0.07		Sheet Flow, A-B
					Woods: Light underbrush n= 0.400 P2= 3.60"
0.8	35	0.0200	0.71		Shallow Concentrated Flow, B-C
					Woodland Kv= 5.0 fps
12.4	85	Total			

Subcatchment 1S: Area 1

Hydrograph



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Type III 24-hr 10-year Rainfall=5.02"

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Summary for Subcatchment 2S: Area 2

Runoff = 0.00 cfs @ 23.78 hrs, Volume= 0.000 af, Depth= 0.01"

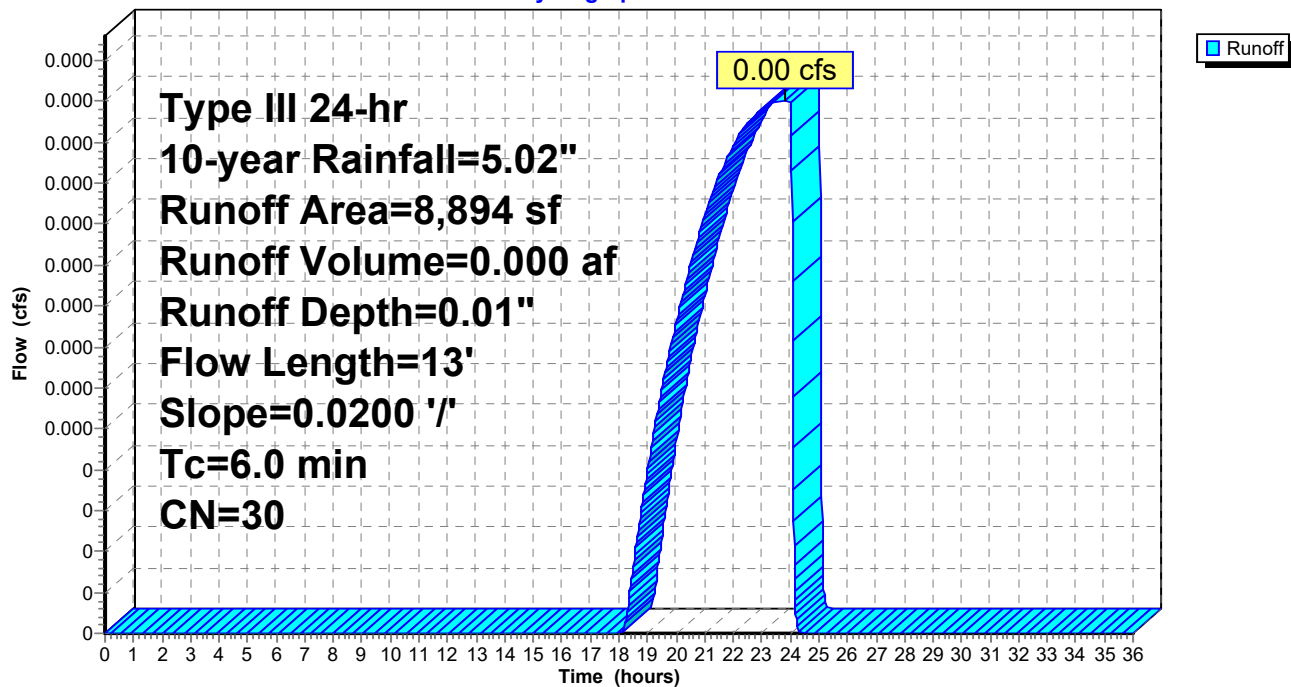
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=5.02"

Area (sf)	CN	Description
8,894	30	Woods, Good, HSG A
8,894		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	13	0.0200	0.05		Sheet Flow, A-B
					Woods: Light underbrush n= 0.400 P2= 3.60"
2.0					Direct Entry,
6.0	13	Total			

Subcatchment 2S: Area 2

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Type III 24-hr 10-year Rainfall=5.02"

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Summary for Subcatchment 3S: Area 3

Runoff = 0.00 cfs @ 23.83 hrs, Volume= 0.001 af, Depth= 0.01"

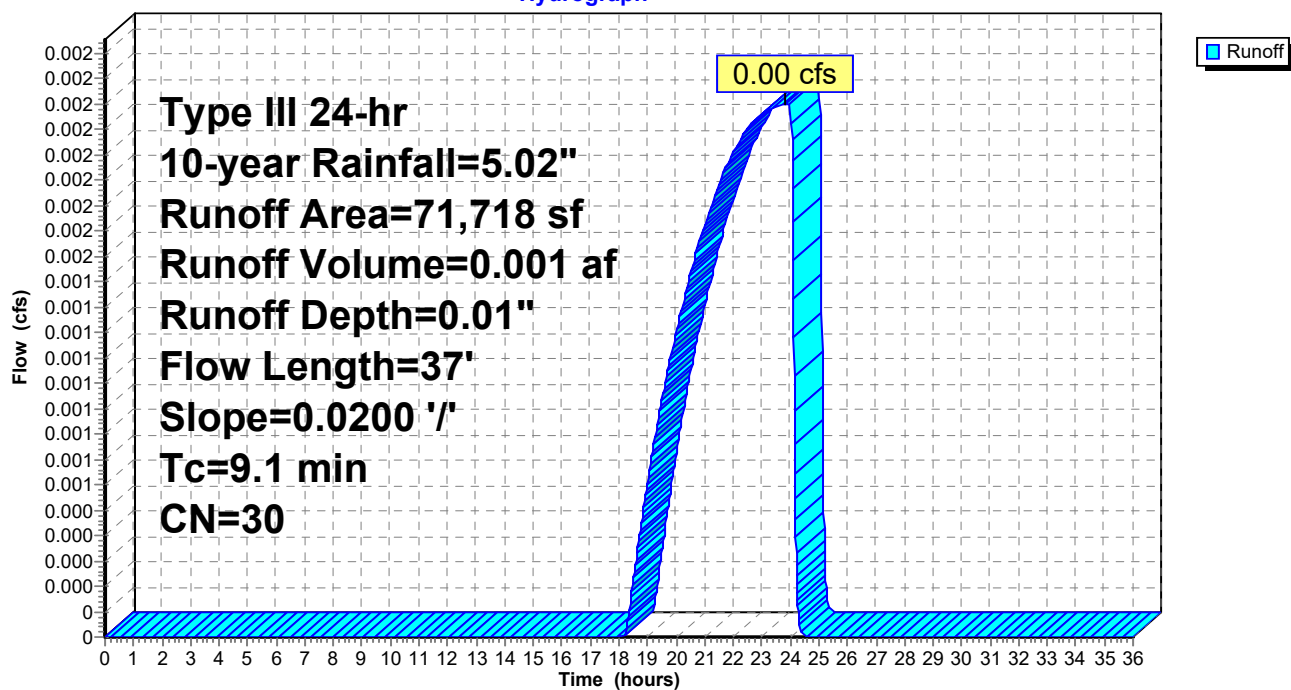
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=5.02"

Area (sf)	CN	Description
71,718	30	Woods, Good, HSG A
71,718		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	37	0.0200	0.07		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.60"

Subcatchment 3S: Area 3

Hydrograph



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Type III 24-hr 10-year Rainfall=5.02"

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Summary for Subcatchment 4S: Area 4

Runoff = 0.21 cfs @ 13.76 hrs, Volume= 0.125 af, Depth= 0.17"

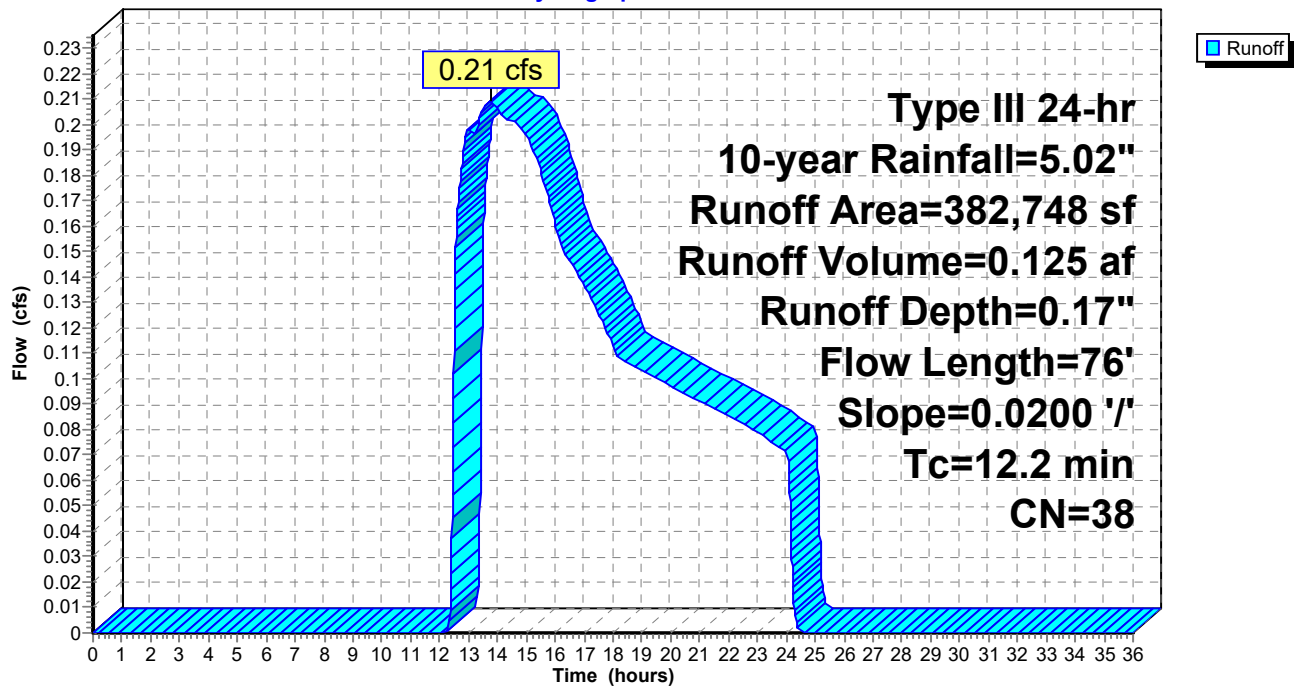
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=5.02"

Area (sf)	CN	Description
12,975	98	Paved parking, HSG A
75,000	57	1/3 acre lots, 30% imp, HSG A
294,773	30	Woods, Good, HSG A
382,748	38	Weighted Average
347,273		90.73% Pervious Area
35,475		9.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	50	0.0200	0.07		Sheet Flow, A-B
					Woods: Light underbrush n= 0.400 P2= 3.60"
0.6	26	0.0200	0.71		Shallow Concentrated Flow, B-C
					Woodland Kv= 5.0 fps
12.2	76	Total			

Subcatchment 4S: Area 4

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Type III 24-hr 10-year Rainfall=5.02"

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Summary for Subcatchment 5S: Area 5

Runoff = 6.29 cfs @ 12.11 hrs, Volume= 0.508 af, Depth= 1.45"

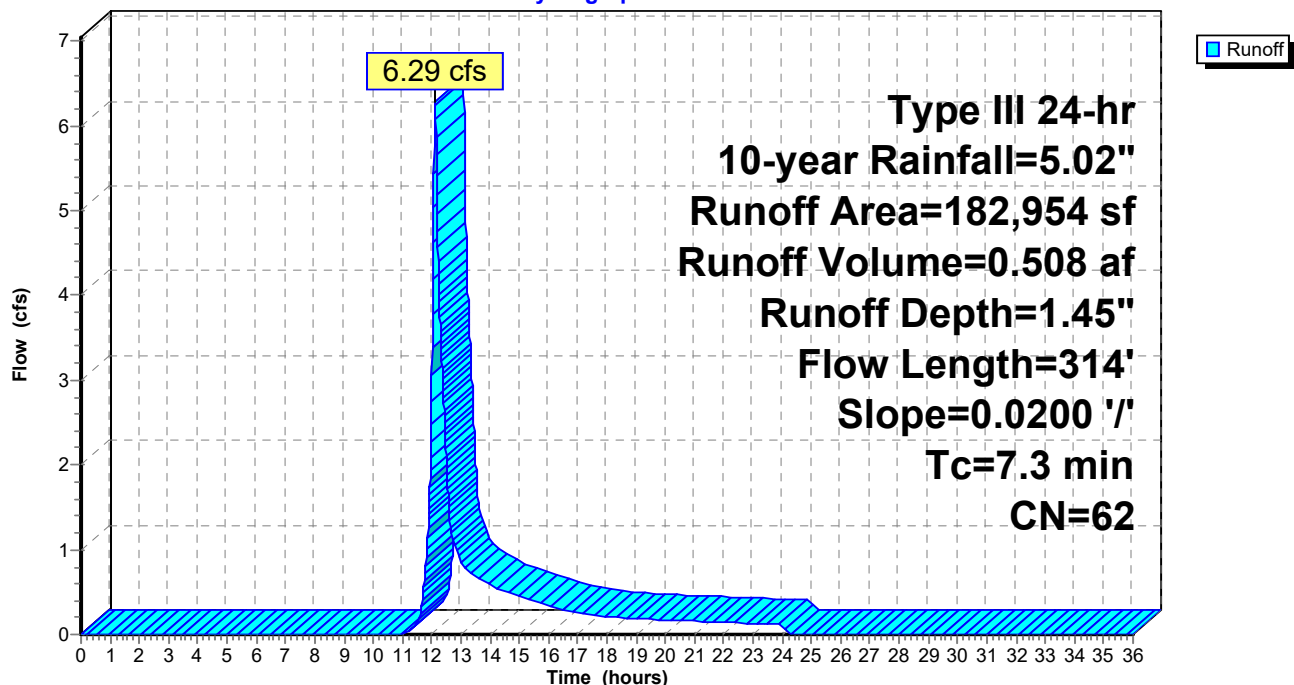
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=5.02"

Area (sf)	CN	Description
23,422	98	Paved parking, HSG A
159,532	57	1/3 acre lots, 30% imp, HSG A
182,954	62	Weighted Average
111,672		61.04% Pervious Area
71,282		38.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	50	0.0200	0.16		Sheet Flow, A-B Grass: Short n= 0.150 P2= 3.60"
1.3	175	0.0200	2.28		Shallow Concentrated Flow, B-C Unpaved Kv= 16.1 fps
0.7	89	0.0200	2.28		Shallow Concentrated Flow, C-D Unpaved Kv= 16.1 fps
7.3	314	Total			

Subcatchment 5S: Area 5

Hydrograph



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Type III 24-hr 10-year Rainfall=5.02"

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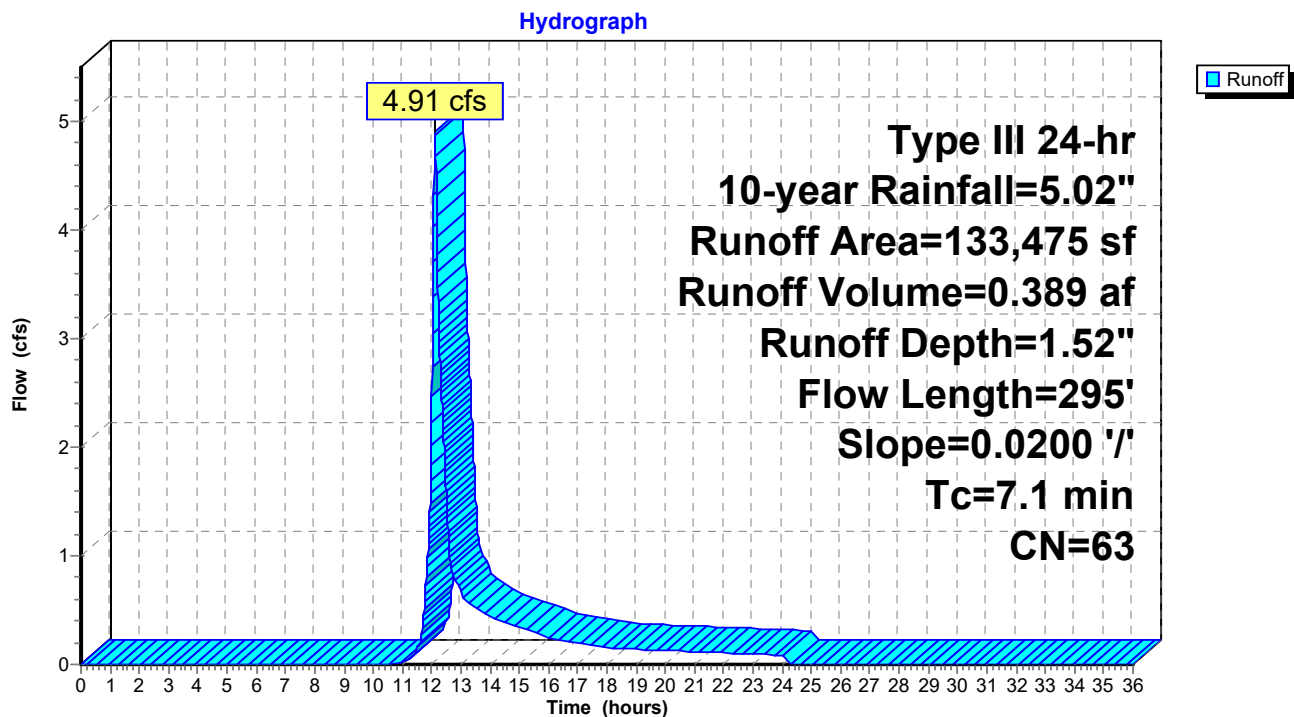
Summary for Subcatchment 6S: Area 6

Runoff = 4.91 cfs @ 12.11 hrs, Volume= 0.389 af, Depth= 1.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=5.02"

Area (sf)	CN	Description
18,300	98	Paved parking, HSG A
115,175	57	1/3 acre lots, 30% imp, HSG A
133,475	63	Weighted Average
80,623		60.40% Pervious Area
52,853		39.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	50	0.0200	0.16		Sheet Flow, A-B
					Grass: Short n= 0.150 P2= 3.60"
1.8	245	0.0200	2.28		Shallow Concentrated Flow, B-C
					Unpaved Kv= 16.1 fps
7.1	295	Total			

Subcatchment 6S: Area 6

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Type III 24-hr 10-year Rainfall=5.02"

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Summary for Reach 1R: Off-site - Route 130

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

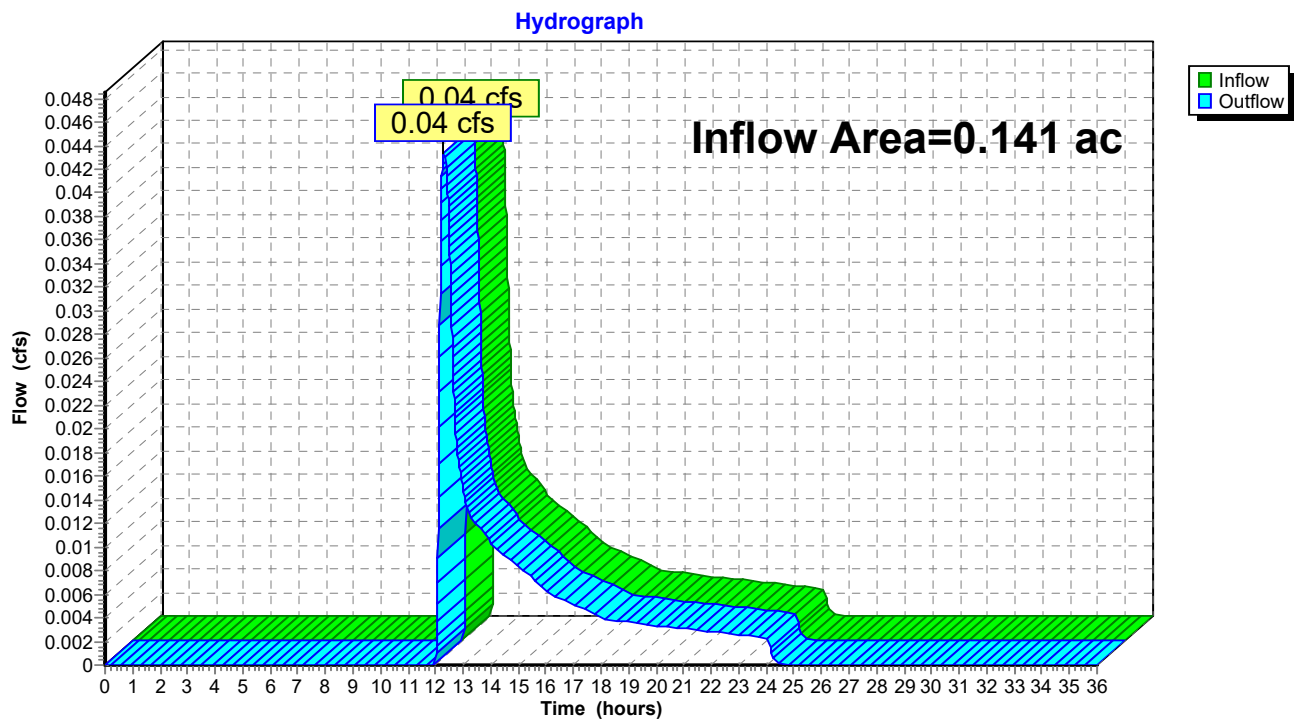
Inflow Area = 0.141 ac, 25.78% Impervious, Inflow Depth = 0.59" for 10-year event

Inflow = 0.04 cfs @ 12.30 hrs, Volume= 0.007 af

Outflow = 0.04 cfs @ 12.30 hrs, Volume= 0.007 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Reach 1R: Off-site - Route 130



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532 Main Street (Route 130) - Mashpee, MA

Type III 24-hr 10-year Rainfall=5.02"

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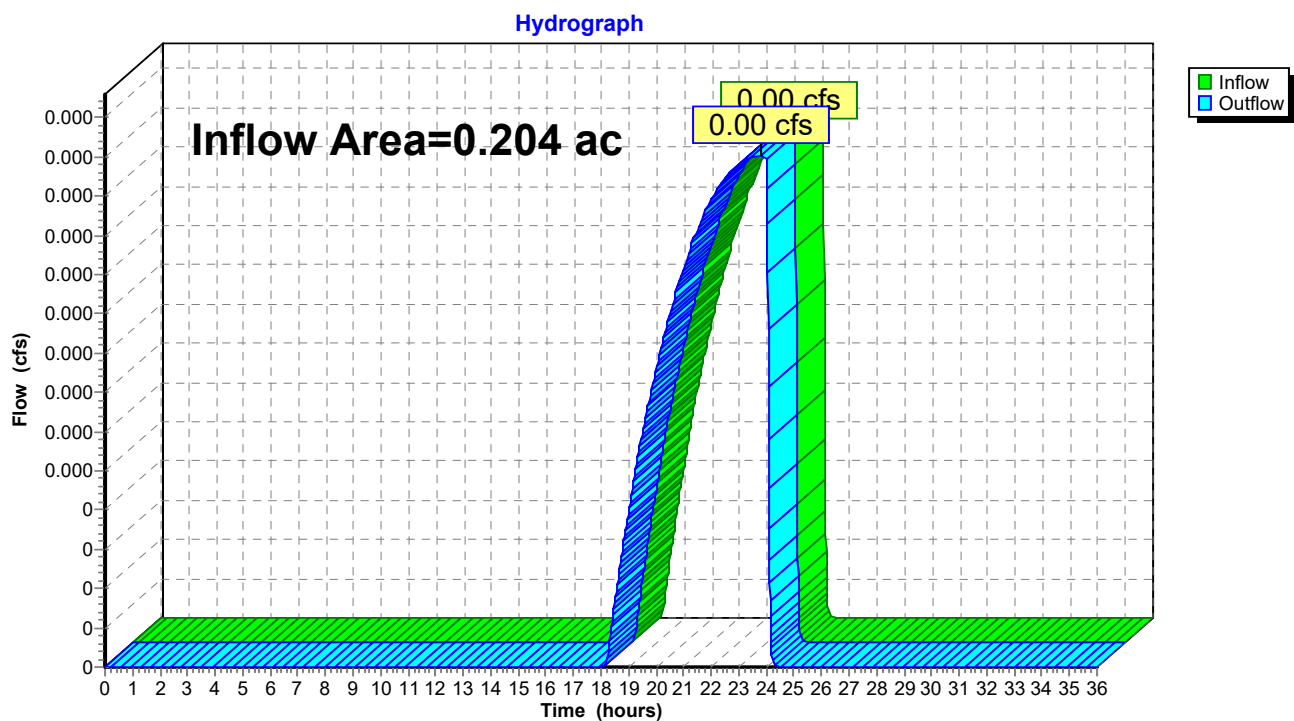
Summary for Reach 2R: Off-site North

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

Inflow Area = 0.204 ac, 0.00% Impervious, Inflow Depth = 0.01" for 10-year event
Inflow = 0.00 cfs @ 23.78 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 23.78 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Reach 2R: Off-site North



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Type III 24-hr 10-year Rainfall=5.02"

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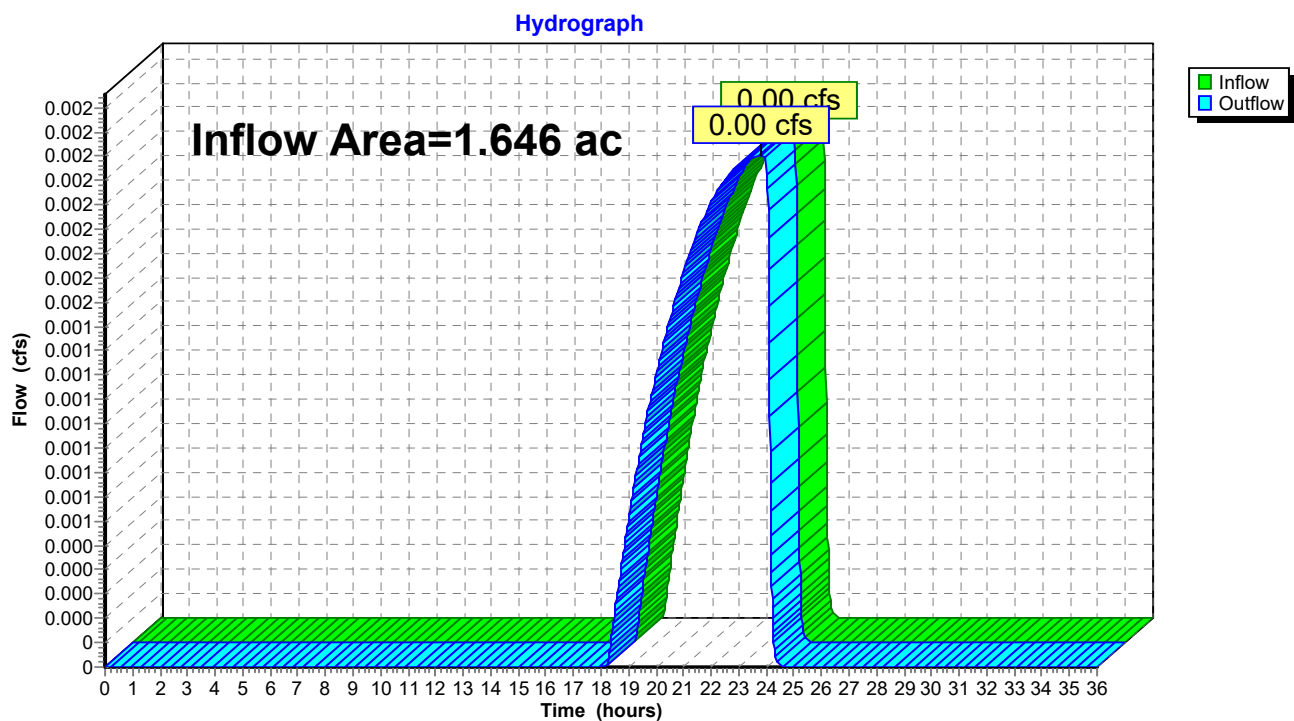
Summary for Reach 3R: Off-site South

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

Inflow Area = 1.646 ac, 0.00% Impervious, Inflow Depth = 0.01" for 10-year event
Inflow = 0.00 cfs @ 23.83 hrs, Volume= 0.001 af
Outflow = 0.00 cfs @ 23.83 hrs, Volume= 0.001 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Reach 3R: Off-site South



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Type III 24-hr 10-year Rainfall=5.02"

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Summary for Pond 4P: Infiltration Basin #3

Inflow Area = 8.787 ac, 9.27% Impervious, Inflow Depth = 0.17" for 10-year event
 Inflow = 0.21 cfs @ 13.76 hrs, Volume= 0.125 af
 Outflow = 0.21 cfs @ 13.79 hrs, Volume= 0.125 af, Atten= 0%, Lag= 2.0 min
 Discarded = 0.21 cfs @ 13.79 hrs, Volume= 0.125 af

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Peak Elev= 99.61' @ 13.79 hrs Surf.Area= 1,893 sf Storage= 26 cf

Plug-Flow detention time= 2.1 min calculated for 0.125 af (100% of inflow)

Center-of-Mass det. time= 2.1 min (1,032.4 - 1,030.3)

Volume	Invert	Avail.Storage	Storage Description
#1	99.60'	9,006 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)
99.60	1,878	255.2	0	0	1,878
100.00	2,348	266.5	843	843	2,359
101.00	4,060	304.2	3,165	4,009	4,094
102.00	5,998	341.9	4,998	9,006	6,059

Device	Routing	Invert	Outlet Devices
#1	Discarded	99.60'	8.270 in/hr Exfiltration over Horizontal area Conductivity to Groundwater Elevation = 80.00'

Discarded OutFlow Max=0.36 cfs @ 13.79 hrs HW=99.61' (Free Discharge)↑**1=Exfiltration** (Controls 0.36 cfs)

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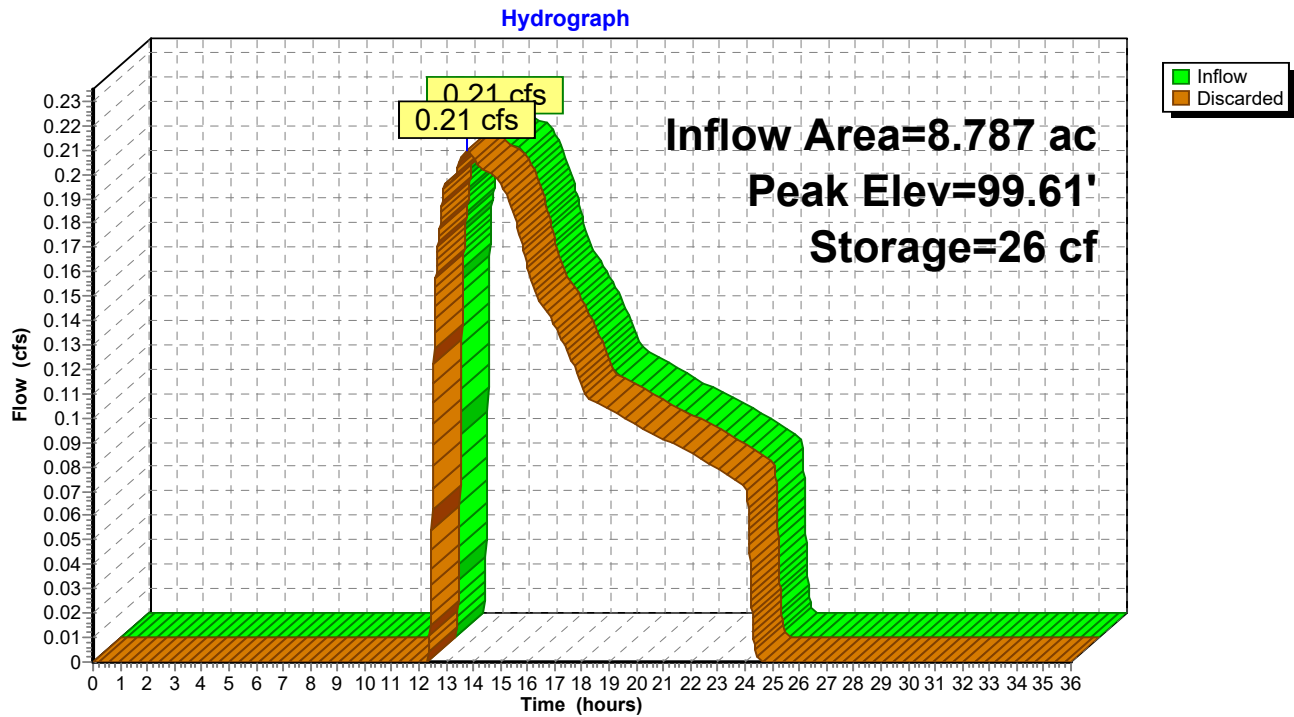
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Type III 24-hr 10-year Rainfall=5.02"

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Pond 4P: Infiltration Basin #3



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Type III 24-hr 10-year Rainfall=5.02"

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Summary for Pond 5P: Infiltration Basin #2

Inflow Area = 4.200 ac, 38.96% Impervious, Inflow Depth = 1.45" for 10-year event
 Inflow = 6.29 cfs @ 12.11 hrs, Volume= 0.508 af
 Outflow = 1.48 cfs @ 12.59 hrs, Volume= 0.508 af, Atten= 77%, Lag= 28.3 min
 Discarded = 1.48 cfs @ 12.59 hrs, Volume= 0.508 af

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 101.51' @ 12.59 hrs Surf.Area= 7,460 sf Storage= 5,379 cf

Plug-Flow detention time= 25.8 min calculated for 0.508 af (100% of inflow)
 Center-of-Mass det. time= 25.8 min (896.1 - 870.3)

Volume	Invert	Avail.Storage	Storage Description		
#1	100.70'	31,116 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)
100.70	5,821	323.5	0	0	5,821
101.00	6,413	334.8	1,834	1,834	6,421
102.00	8,535	372.5	7,449	9,283	8,572
103.00	10,883	410.2	9,685	18,968	10,953
104.00	13,458	447.9	12,148	31,116	13,563

Device	Routing	Invert	Outlet Devices
#1	Discarded	100.70'	8.270 in/hr Exfiltration over Horizontal area Conductivity to Groundwater Elevation = 80.00'

Discarded OutFlow Max=1.48 cfs @ 12.59 hrs HW=101.51' (Free Discharge)

↑**1=Exfiltration** (Controls 1.48 cfs)

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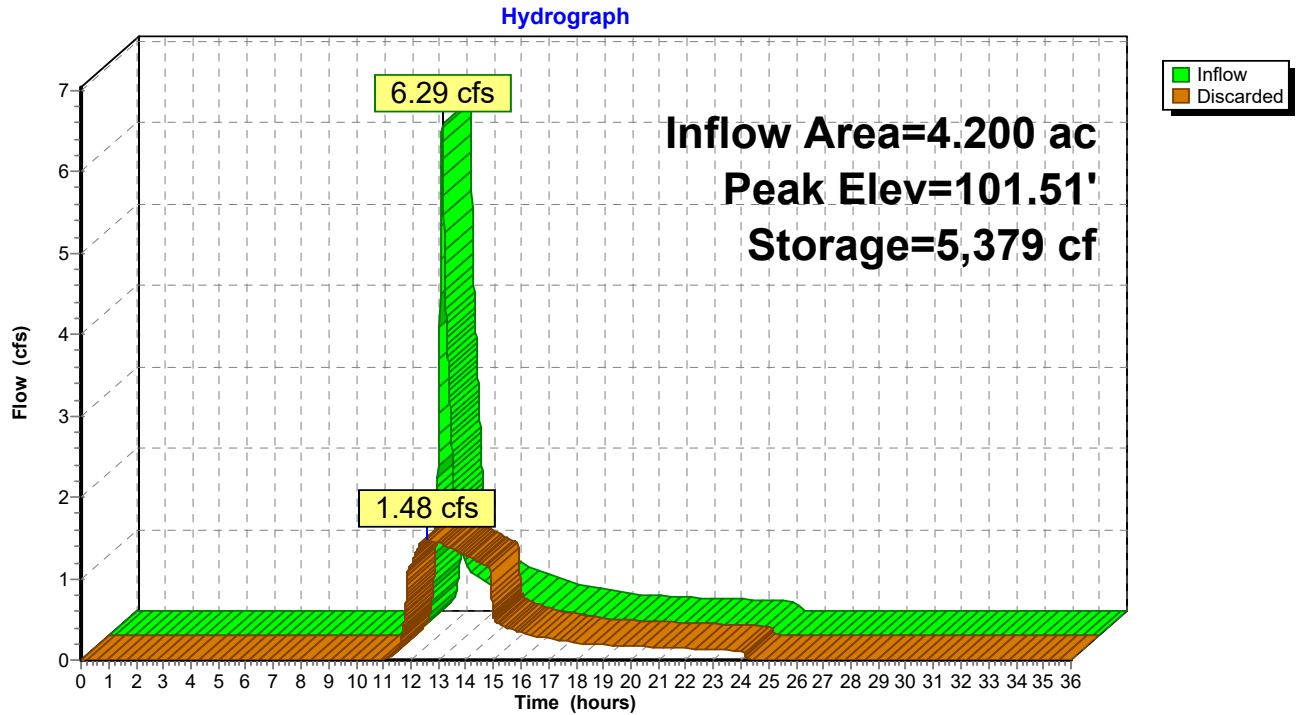
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Type III 24-hr 10-year Rainfall=5.02"

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Pond 5P: Infiltration Basin #2



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Type III 24-hr 10-year Rainfall=5.02"

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Summary for Pond 6P: Infiltration Basin #1

Inflow Area = 3.064 ac, 39.60% Impervious, Inflow Depth = 1.52" for 10-year event
 Inflow = 4.91 cfs @ 12.11 hrs, Volume= 0.389 af
 Outflow = 0.93 cfs @ 12.65 hrs, Volume= 0.389 af, Atten= 81%, Lag= 32.4 min
 Discarded = 0.93 cfs @ 12.65 hrs, Volume= 0.389 af

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 102.43' @ 12.65 hrs Surf.Area= 4,591 sf Storage= 5,255 cf

Plug-Flow detention time= 58.5 min calculated for 0.389 af (100% of inflow)
 Center-of-Mass det. time= 58.5 min (925.7 - 867.2)

Volume	Invert	Avail.Storage	Storage Description		
#1	100.50'	24,860 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)
100.50	1,068	258.2	0	0	1,068
101.00	1,881	283.5	728	728	2,167
102.00	3,733	334.0	2,755	3,482	4,668
103.00	5,885	380.3	4,768	8,251	7,324
104.00	8,280	418.0	7,049	15,299	9,752
105.00	10,901	455.7	9,561	24,860	12,409

Device	Routing	Invert	Outlet Devices
#1	Discarded	100.50'	8.270 in/hr Exfiltration over Horizontal area Conductivity to Groundwater Elevation = 80.00'

Discarded OutFlow Max=0.93 cfs @ 12.65 hrs HW=102.43' (Free Discharge)
 ↑1=Exfiltration (Controls 0.93 cfs)

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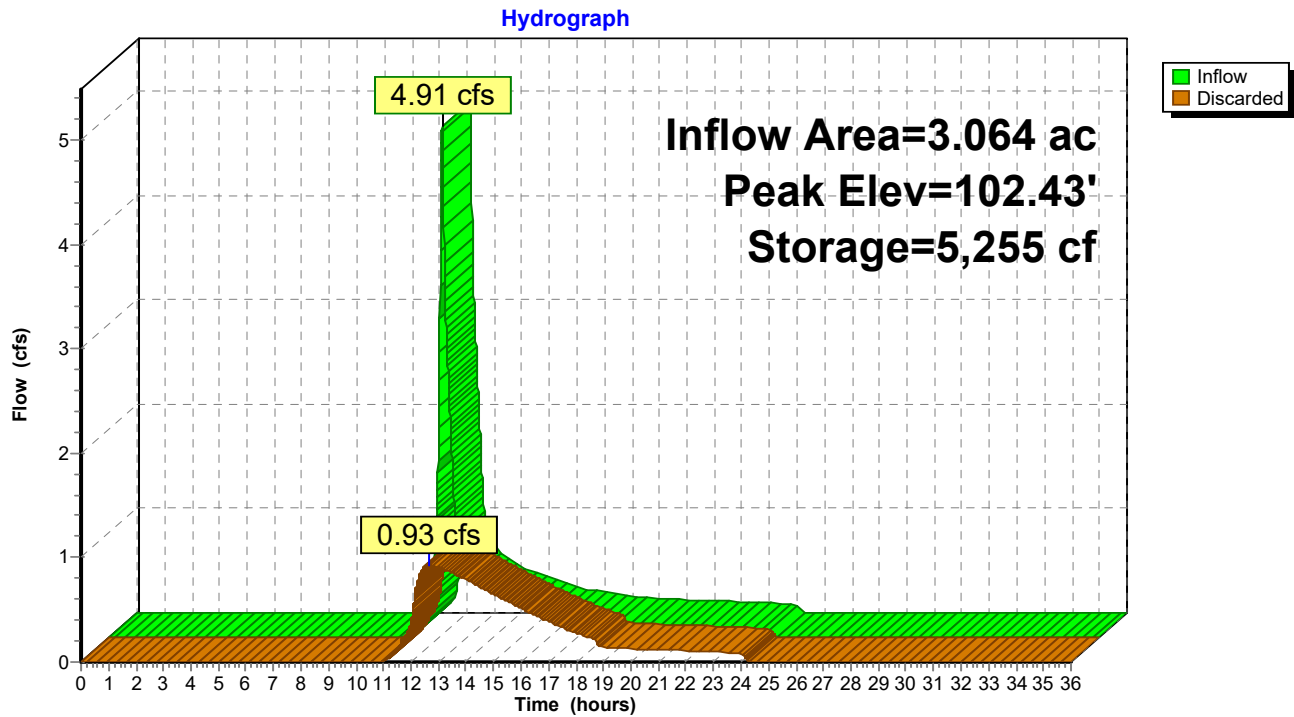
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Type III 24-hr 10-year Rainfall=5.02"

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Pond 6P: Infiltration Basin #1



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532 Main Street (Route 130) - Mashpee, MA

Type III 24-hr 25-year Rainfall=6.00"

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Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Area 1 Runoff Area=6,144 sf 25.78% Impervious Runoff Depth=1.00"
Flow Length=85' Slope=0.0200 '/ Tc=12.4 min CN=48 Runoff=0.10 cfs 0.012 af

Subcatchment2S: Area 2 Runoff Area=8,894 sf 0.00% Impervious Runoff Depth=0.07"
Flow Length=13' Slope=0.0200 '/ Tc=6.0 min CN=30 Runoff=0.00 cfs 0.001 af

Subcatchment3S: Area 3 Runoff Area=71,718 sf 0.00% Impervious Runoff Depth=0.07"
Flow Length=37' Slope=0.0200 '/ Tc=9.1 min CN=30 Runoff=0.01 cfs 0.010 af

Subcatchment4S: Area 4 Runoff Area=382,748 sf 9.27% Impervious Runoff Depth=0.39"
Flow Length=76' Slope=0.0200 '/ Tc=12.2 min CN=38 Runoff=1.15 cfs 0.288 af

Subcatchment5S: Area 5 Runoff Area=182,954 sf 38.96% Impervious Runoff Depth=2.09"
Flow Length=314' Slope=0.0200 '/ Tc=7.3 min CN=62 Runoff=9.44 cfs 0.732 af

Subcatchment6S: Area 6 Runoff Area=133,475 sf 39.60% Impervious Runoff Depth=2.18"
Flow Length=295' Slope=0.0200 '/ Tc=7.1 min CN=63 Runoff=7.27 cfs 0.556 af

Reach 1R: Off-site - Route 130 Inflow=0.10 cfs 0.012 af
Outflow=0.10 cfs 0.012 af

Reach 2R: Off-site North Inflow=0.00 cfs 0.001 af
Outflow=0.00 cfs 0.001 af

Reach 3R: Off-site South Inflow=0.01 cfs 0.010 af
Outflow=0.01 cfs 0.010 af

Pond 4P: Infiltration Basin #3 Peak Elev=100.15' Storage=1,210 cf Inflow=1.15 cfs 0.288 af
Outflow=0.50 cfs 0.288 af

Pond 5P: Infiltration Basin #2 Peak Elev=102.02' Storage=9,428 cf Inflow=9.44 cfs 0.732 af
Outflow=1.73 cfs 0.732 af

Pond 6P: Infiltration Basin #1 Peak Elev=103.01' Storage=8,329 cf Inflow=7.27 cfs 0.556 af
Outflow=1.21 cfs 0.556 af

Total Runoff Area = 18.043 ac Runoff Volume = 1.598 af Average Runoff Depth = 1.06"
79.49% Pervious = 14.342 ac 20.51% Impervious = 3.700 ac

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Type III 24-hr 25-year Rainfall=6.00"

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Summary for Subcatchment 1S: Area 1

Runoff = 0.10 cfs @ 12.22 hrs, Volume= 0.012 af, Depth= 1.00"

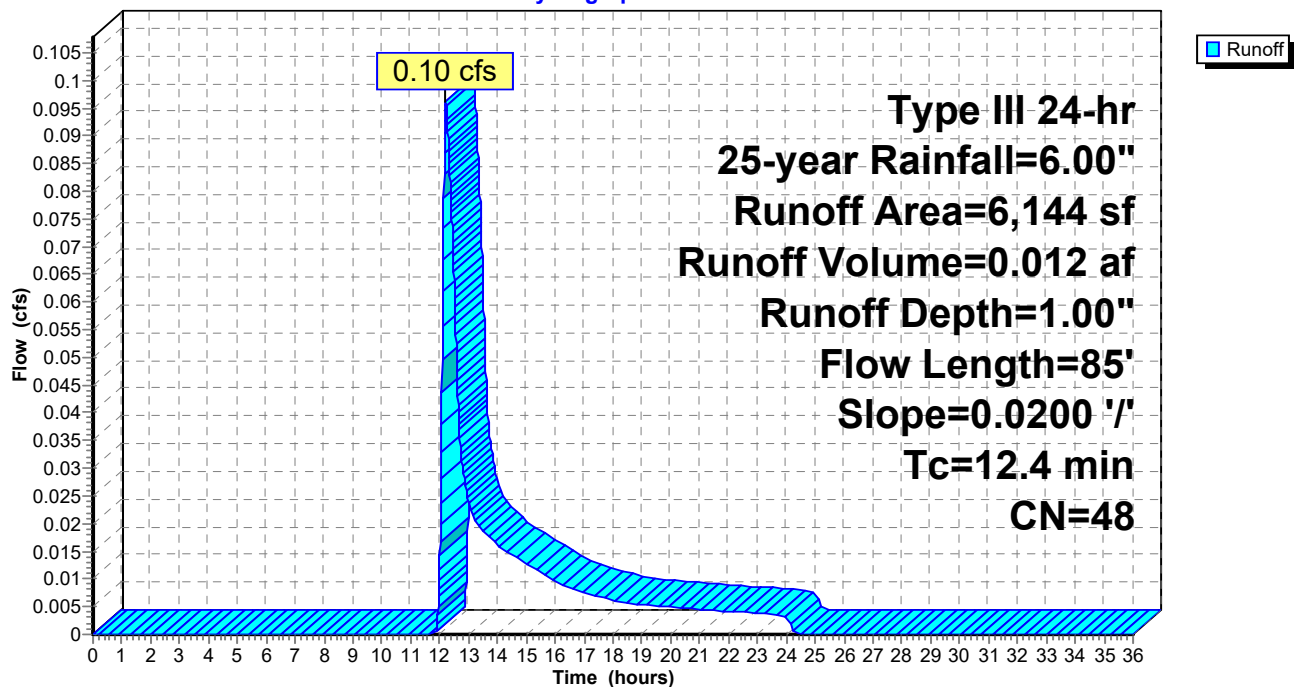
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-year Rainfall=6.00"

Area (sf)	CN	Description
1,584	98	Paved parking, HSG A
4,560	30	Woods, Good, HSG A
6,144	48	Weighted Average
4,560		74.22% Pervious Area
1,584		25.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	50	0.0200	0.07		Sheet Flow, A-B
					Woods: Light underbrush n= 0.400 P2= 3.60"
0.8	35	0.0200	0.71		Shallow Concentrated Flow, B-C
					Woodland Kv= 5.0 fps
12.4	85	Total			

Subcatchment 1S: Area 1

Hydrograph



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Type III 24-hr 25-year Rainfall=6.00"

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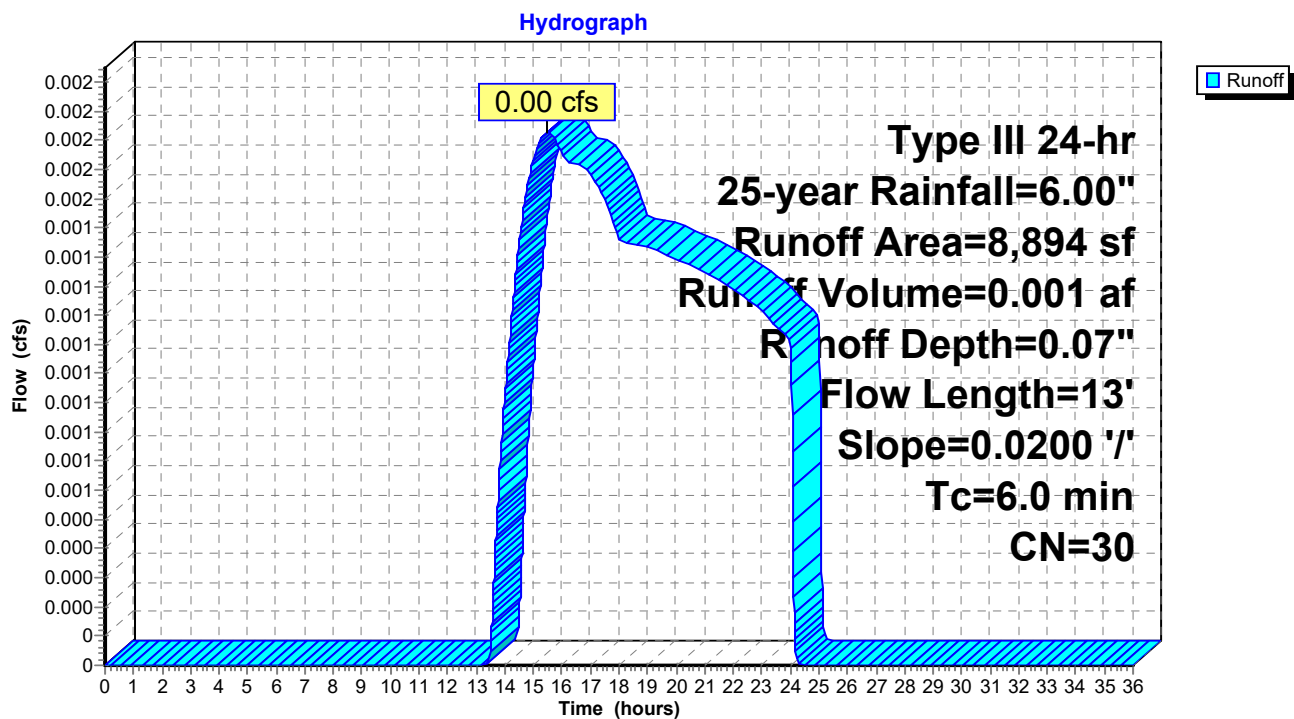
Summary for Subcatchment 2S: Area 2

Runoff = 0.00 cfs @ 15.50 hrs, Volume= 0.001 af, Depth= 0.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-year Rainfall=6.00"

Area (sf)	CN	Description
8,894	30	Woods, Good, HSG A
8,894		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	13	0.0200	0.05		Sheet Flow, A-B
					Woods: Light underbrush n= 0.400 P2= 3.60"
2.0					Direct Entry,
6.0	13	Total			

Subcatchment 2S: Area 2

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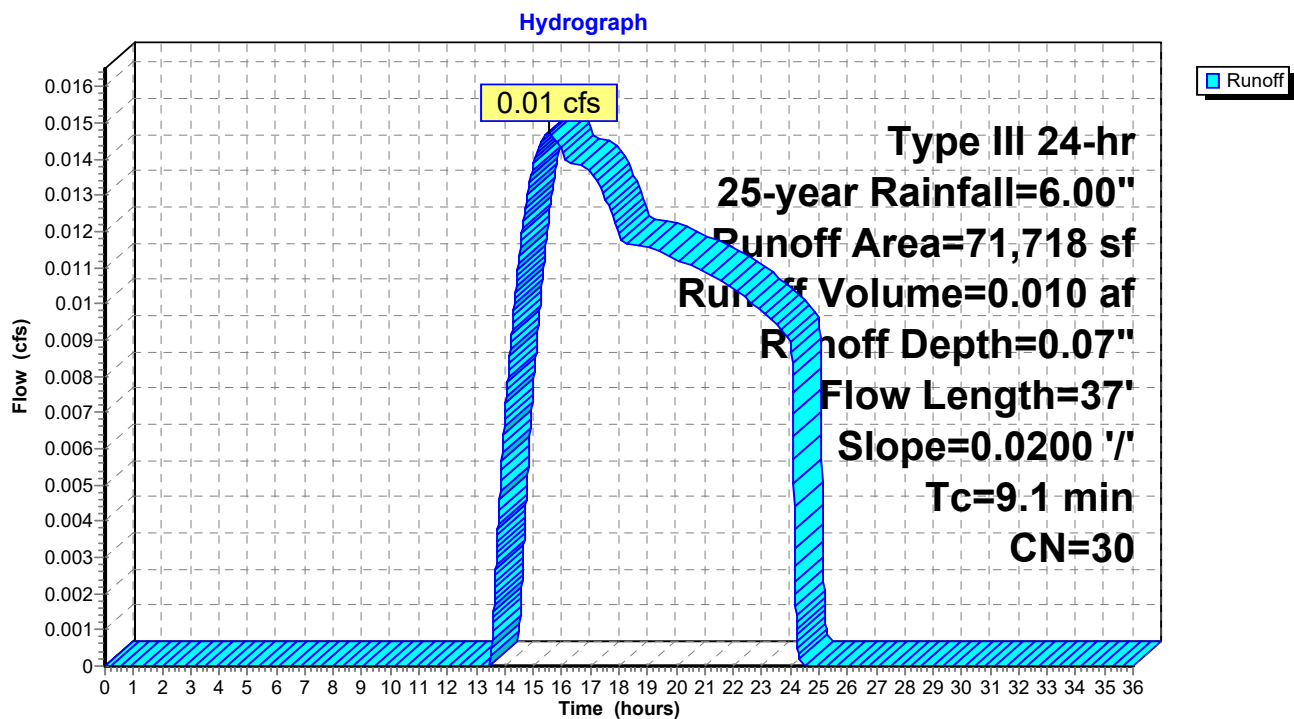
Summary for Subcatchment 3S: Area 3

Runoff = 0.01 cfs @ 15.54 hrs, Volume= 0.010 af, Depth= 0.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-year Rainfall=6.00"

Area (sf)	CN	Description
71,718	30	Woods, Good, HSG A
71,718		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	37	0.0200	0.07		Sheet Flow, A-B
Woods: Light underbrush n= 0.400 P2= 3.60"					

Subcatchment 3S: Area 3

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Summary for Subcatchment 4S: Area 4

Runoff = 1.15 cfs @ 12.46 hrs, Volume= 0.288 af, Depth= 0.39"

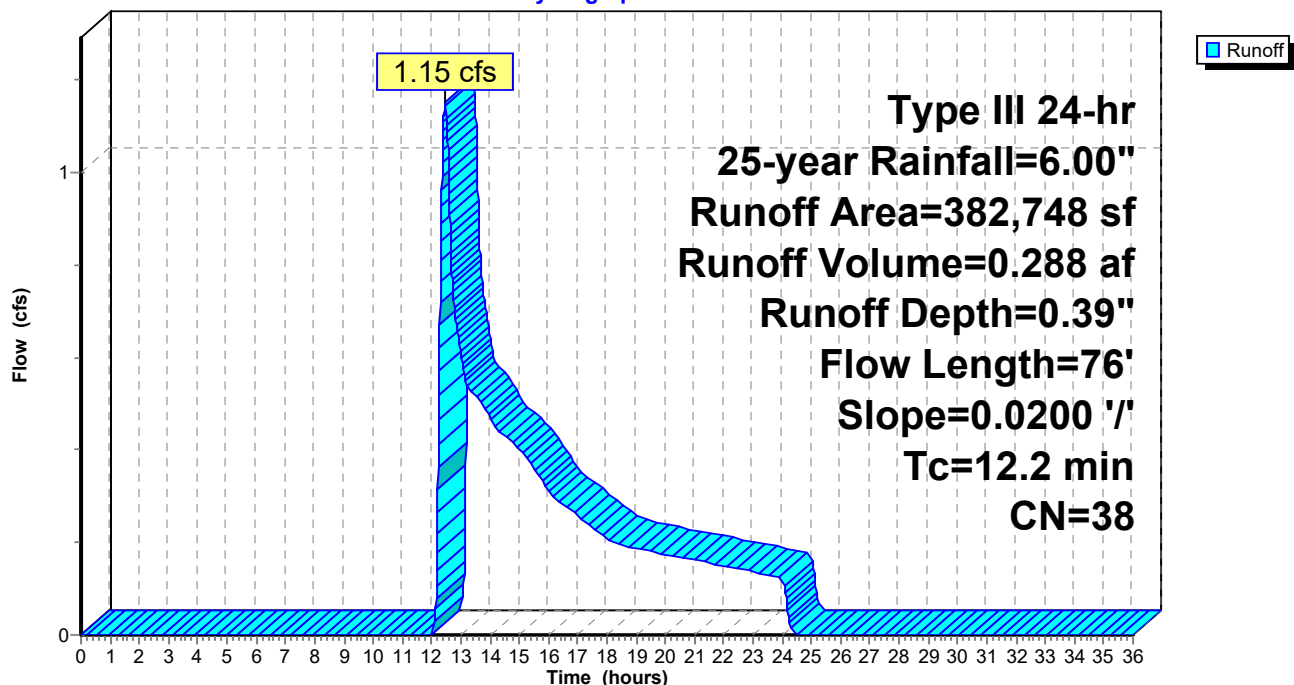
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-year Rainfall=6.00"

Area (sf)	CN	Description
12,975	98	Paved parking, HSG A
75,000	57	1/3 acre lots, 30% imp, HSG A
294,773	30	Woods, Good, HSG A
382,748	38	Weighted Average
347,273		90.73% Pervious Area
35,475		9.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	50	0.0200	0.07		Sheet Flow, A-B
					Woods: Light underbrush n= 0.400 P2= 3.60"
0.6	26	0.0200	0.71		Shallow Concentrated Flow, B-C
					Woodland Kv= 5.0 fps
12.2	76	Total			

Subcatchment 4S: Area 4

Hydrograph



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Type III 24-hr 25-year Rainfall=6.00"

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Summary for Subcatchment 5S: Area 5

Runoff = 9.44 cfs @ 12.11 hrs, Volume= 0.732 af, Depth= 2.09"

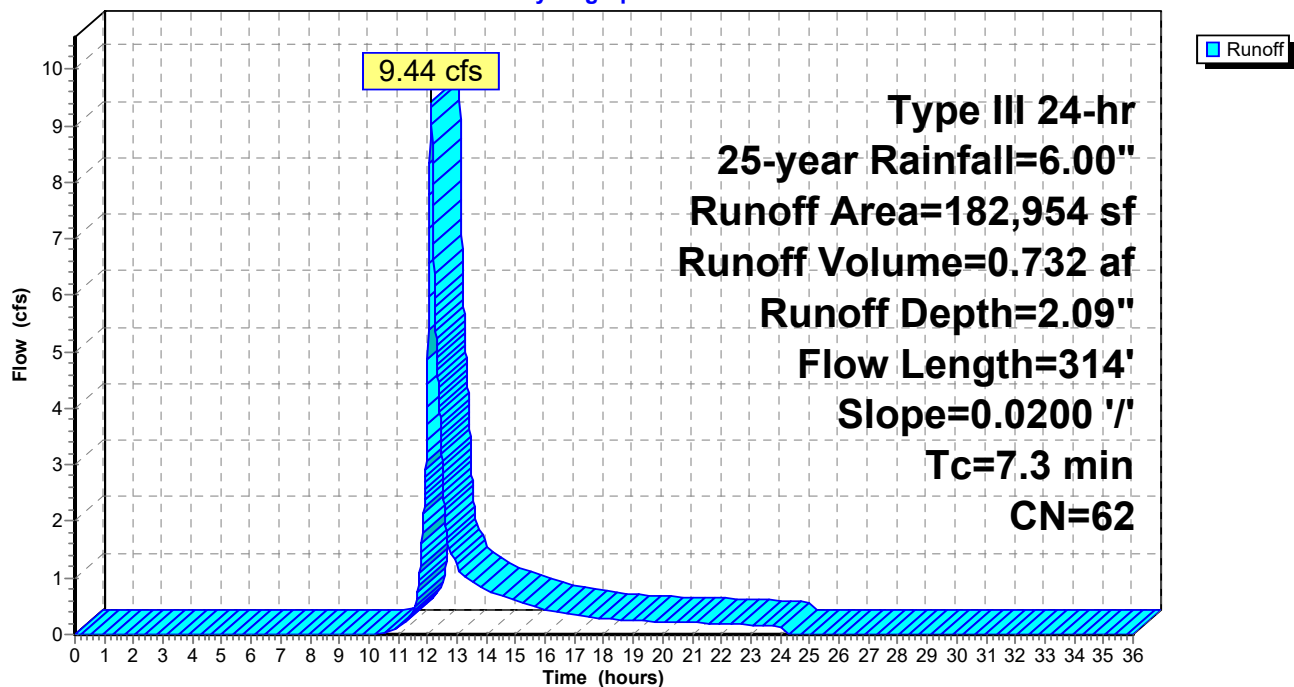
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-year Rainfall=6.00"

Area (sf)	CN	Description
23,422	98	Paved parking, HSG A
159,532	57	1/3 acre lots, 30% imp, HSG A
182,954	62	Weighted Average
111,672		61.04% Pervious Area
71,282		38.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	50	0.0200	0.16		Sheet Flow, A-B Grass: Short n= 0.150 P2= 3.60"
1.3	175	0.0200	2.28		Shallow Concentrated Flow, B-C Unpaved Kv= 16.1 fps
0.7	89	0.0200	2.28		Shallow Concentrated Flow, C-D Unpaved Kv= 16.1 fps
7.3	314	Total			

Subcatchment 5S: Area 5

Hydrograph



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Type III 24-hr 25-year Rainfall=6.00"

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Summary for Subcatchment 6S: Area 6

Runoff = 7.27 cfs @ 12.11 hrs, Volume= 0.556 af, Depth= 2.18"

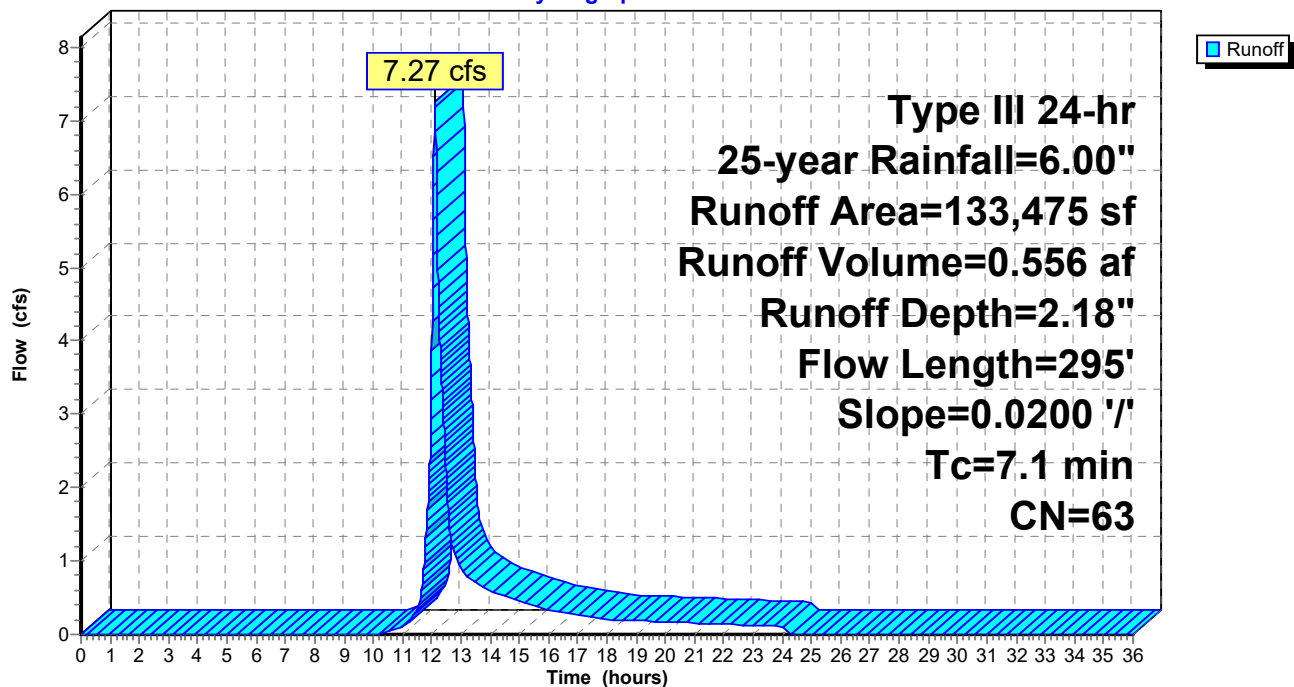
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-year Rainfall=6.00"

Area (sf)	CN	Description
18,300	98	Paved parking, HSG A
115,175	57	1/3 acre lots, 30% imp, HSG A
133,475	63	Weighted Average
80,623		60.40% Pervious Area
52,853		39.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	50	0.0200	0.16		Sheet Flow, A-B
					Grass: Short n= 0.150 P2= 3.60"
1.8	245	0.0200	2.28		Shallow Concentrated Flow, B-C
					Unpaved Kv= 16.1 fps
7.1	295	Total			

Subcatchment 6S: Area 6

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Summary for Reach 1R: Off-site - Route 130

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

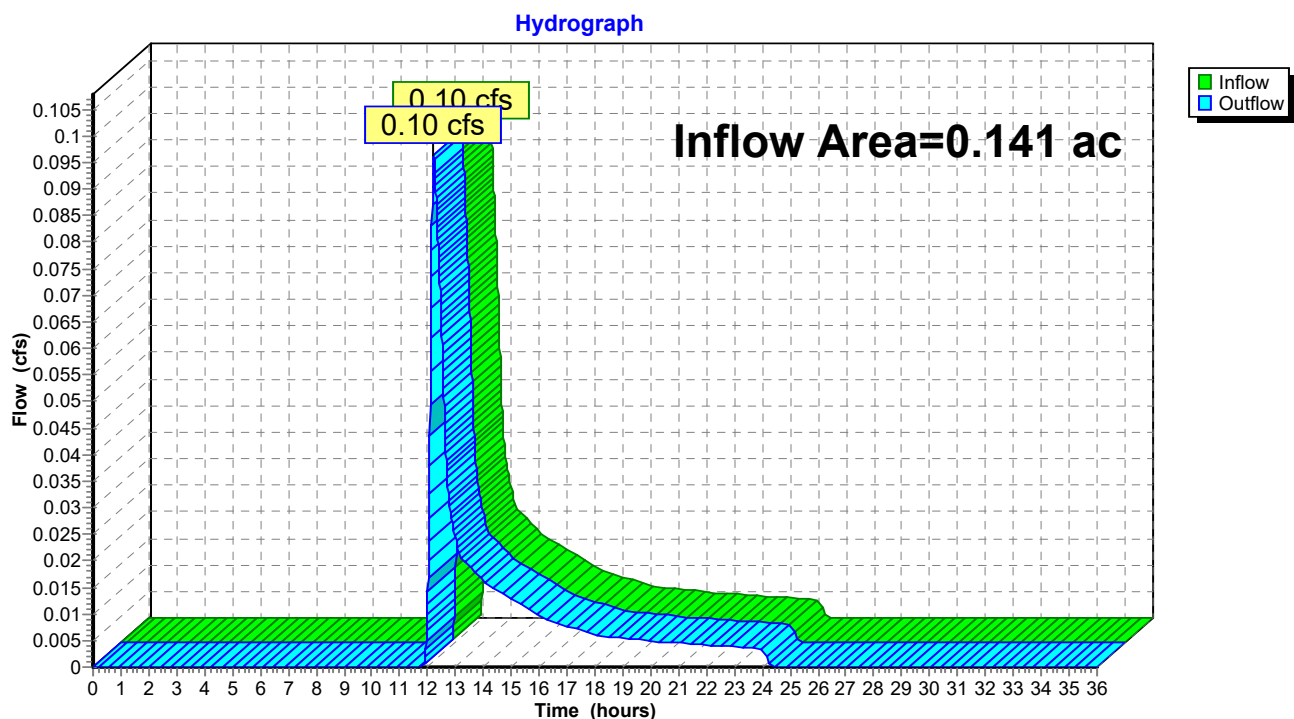
Inflow Area = 0.141 ac, 25.78% Impervious, Inflow Depth = 1.00" for 25-year event

Inflow = 0.10 cfs @ 12.22 hrs, Volume= 0.012 af

Outflow = 0.10 cfs @ 12.22 hrs, Volume= 0.012 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Reach 1R: Off-site - Route 130



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Type III 24-hr 25-year Rainfall=6.00"

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Summary for Reach 2R: Off-site North

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

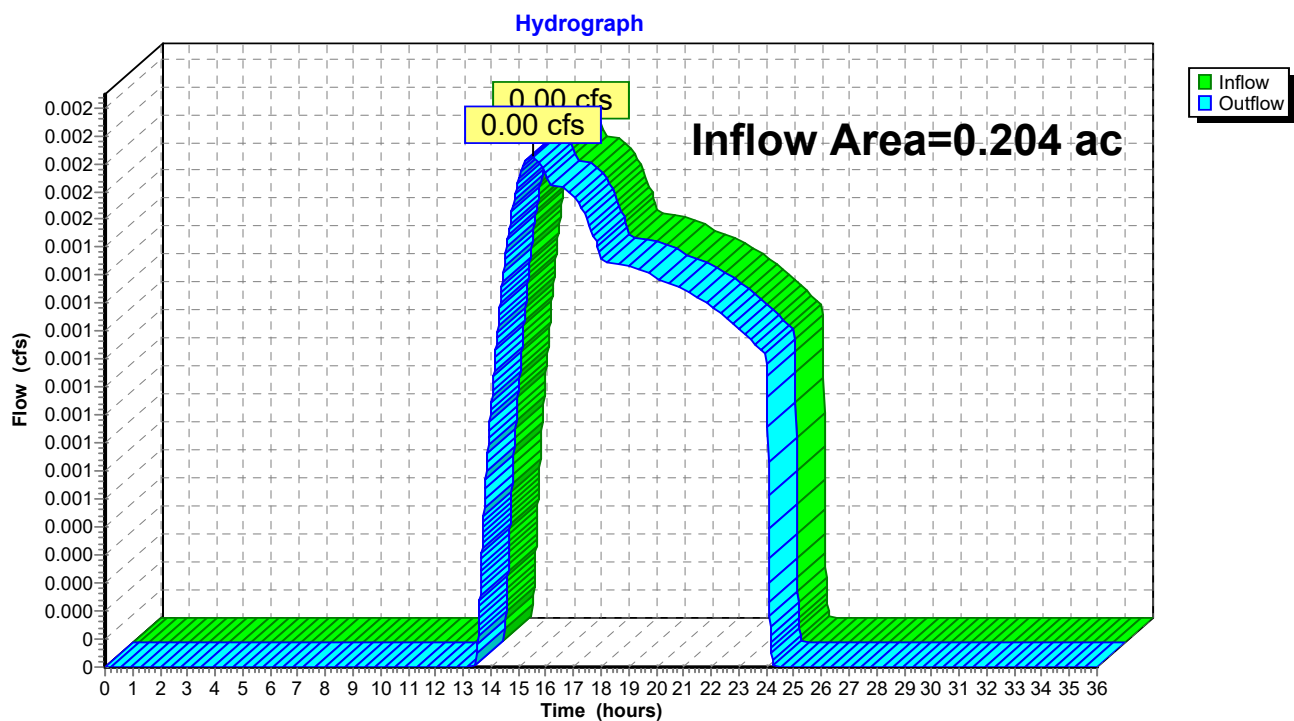
Inflow Area = 0.204 ac, 0.00% Impervious, Inflow Depth = 0.07" for 25-year event

Inflow = 0.00 cfs @ 15.50 hrs, Volume= 0.001 af

Outflow = 0.00 cfs @ 15.50 hrs, Volume= 0.001 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Reach 2R: Off-site North



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Type III 24-hr 25-year Rainfall=6.00"

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Summary for Reach 3R: Off-site South

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

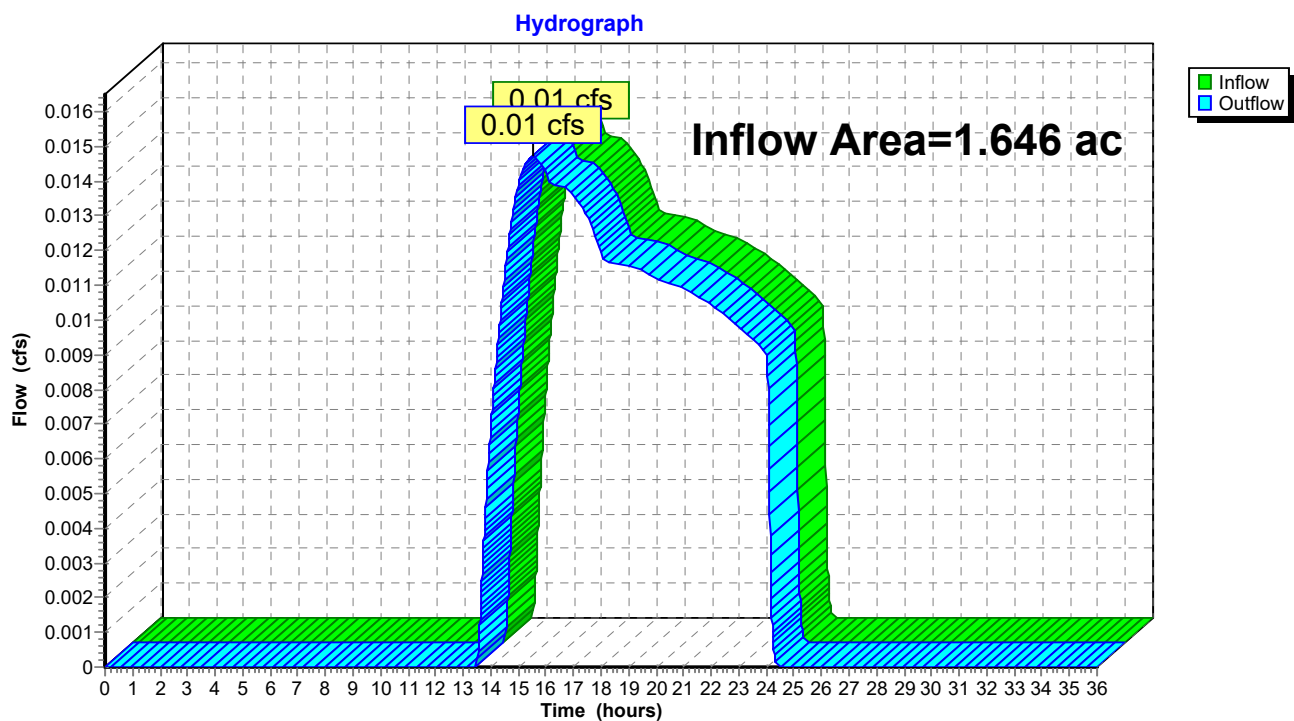
Inflow Area = 1.646 ac, 0.00% Impervious, Inflow Depth = 0.07" for 25-year event

Inflow = 0.01 cfs @ 15.54 hrs, Volume= 0.010 af

Outflow = 0.01 cfs @ 15.54 hrs, Volume= 0.010 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Reach 3R: Off-site South



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Type III 24-hr 25-year Rainfall=6.00"

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Summary for Pond 4P: Infiltration Basin #3

Inflow Area = 8.787 ac, 9.27% Impervious, Inflow Depth = 0.39" for 25-year event
 Inflow = 1.15 cfs @ 12.46 hrs, Volume= 0.288 af
 Outflow = 0.50 cfs @ 13.68 hrs, Volume= 0.288 af, Atten= 56%, Lag= 72.8 min
 Discarded = 0.50 cfs @ 13.68 hrs, Volume= 0.288 af

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 100.15' @ 13.68 hrs Surf.Area= 2,574 sf Storage= 1,210 cf

Plug-Flow detention time= 20.3 min calculated for 0.288 af (100% of inflow)
 Center-of-Mass det. time= 20.3 min (995.3 - 975.1)

Volume	Invert	Avail.Storage	Storage Description
#1	99.60'	9,006 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)
99.60	1,878	255.2	0	0	1,878
100.00	2,348	266.5	843	843	2,359
101.00	4,060	304.2	3,165	4,009	4,094
102.00	5,998	341.9	4,998	9,006	6,059

Device	Routing	Invert	Outlet Devices
#1	Discarded	99.60'	8.270 in/hr Exfiltration over Horizontal area Conductivity to Groundwater Elevation = 80.00'

Discarded OutFlow Max=0.50 cfs @ 13.68 hrs HW=100.15' (Free Discharge)
 ↑1=Exfiltration (Controls 0.50 cfs)

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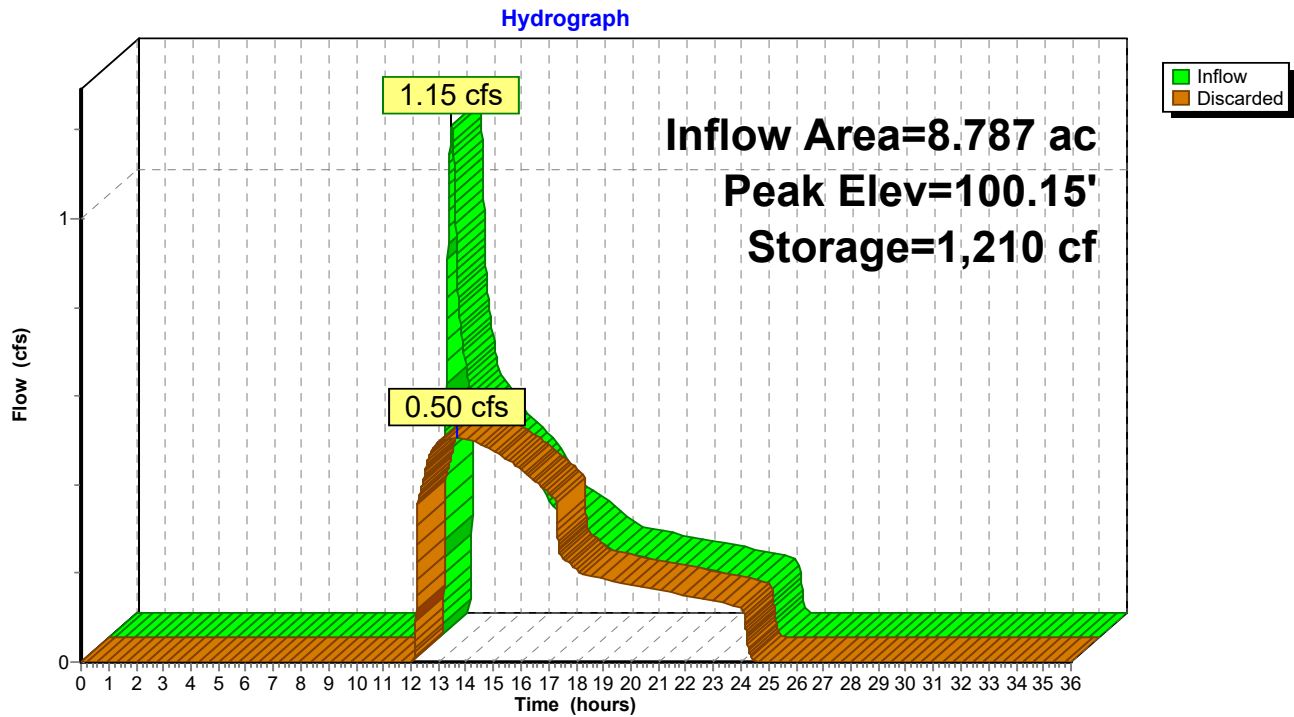
532 Main Street (Route 130) - Mashpee, MA

Type III 24-hr 25-year Rainfall=6.00"

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Pond 4P: Infiltration Basin #3



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Summary for Pond 5P: Infiltration Basin #2

Inflow Area = 4.200 ac, 38.96% Impervious, Inflow Depth = 2.09" for 25-year event
 Inflow = 9.44 cfs @ 12.11 hrs, Volume= 0.732 af
 Outflow = 1.73 cfs @ 12.65 hrs, Volume= 0.732 af, Atten= 82%, Lag= 32.1 min
 Discarded = 1.73 cfs @ 12.65 hrs, Volume= 0.732 af

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 102.02' @ 12.65 hrs Surf.Area= 8,573 sf Storage= 9,428 cf

Plug-Flow detention time= 45.3 min calculated for 0.731 af (100% of inflow)
 Center-of-Mass det. time= 45.3 min (904.1 - 858.8)

Volume	Invert	Avail.Storage	Storage Description		
#1	100.70'	31,116 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)
100.70	5,821	323.5	0	0	5,821
101.00	6,413	334.8	1,834	1,834	6,421
102.00	8,535	372.5	7,449	9,283	8,572
103.00	10,883	410.2	9,685	18,968	10,953
104.00	13,458	447.9	12,148	31,116	13,563

Device	Routing	Invert	Outlet Devices
#1	Discarded	100.70'	8.270 in/hr Exfiltration over Horizontal area Conductivity to Groundwater Elevation = 80.00'

Discarded OutFlow Max=1.73 cfs @ 12.65 hrs HW=102.02' (Free Discharge)

↑**1=Exfiltration** (Controls 1.73 cfs)

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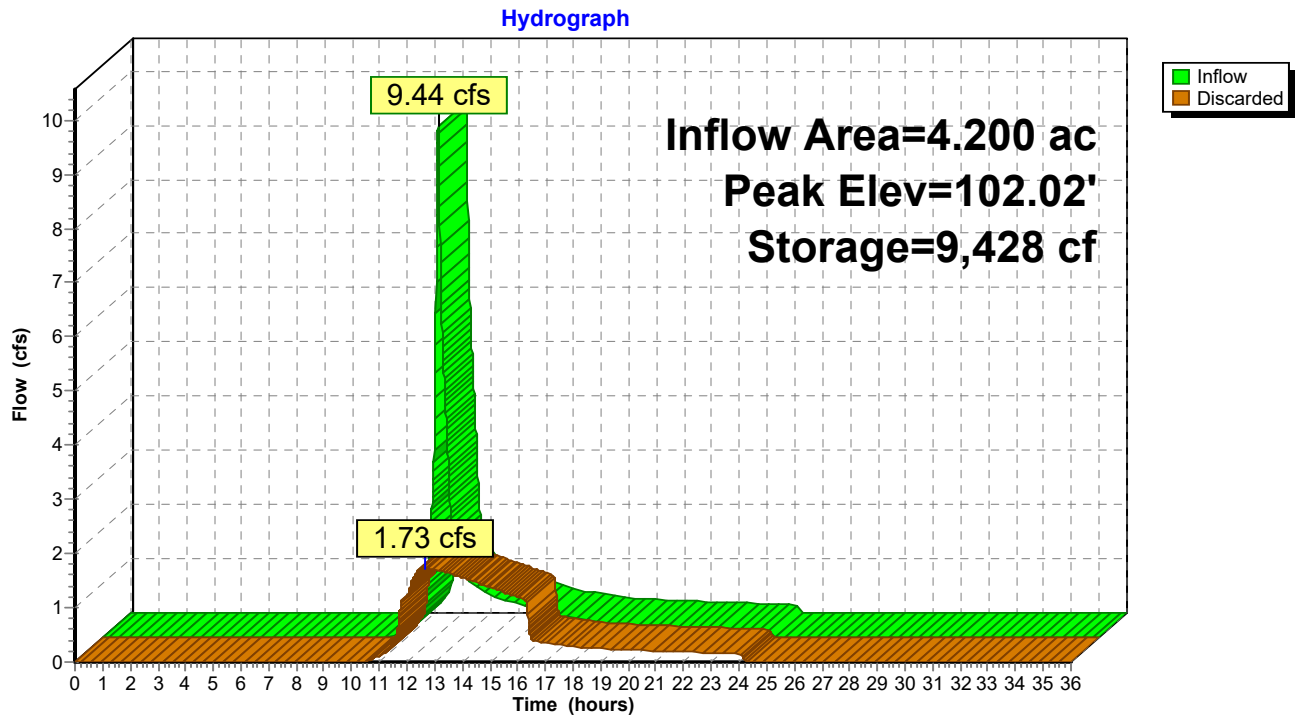
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Type III 24-hr 25-year Rainfall=6.00"

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Pond 5P: Infiltration Basin #2



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Type III 24-hr 25-year Rainfall=6.00"

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Summary for Pond 6P: Infiltration Basin #1

Inflow Area = 3.064 ac, 39.60% Impervious, Inflow Depth = 2.18" for 25-year event
 Inflow = 7.27 cfs @ 12.11 hrs, Volume= 0.556 af
 Outflow = 1.21 cfs @ 12.69 hrs, Volume= 0.556 af, Atten= 83%, Lag= 35.0 min
 Discarded = 1.21 cfs @ 12.69 hrs, Volume= 0.556 af

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 103.01' @ 12.69 hrs Surf.Area= 5,914 sf Storage= 8,329 cf

Plug-Flow detention time= 75.6 min calculated for 0.556 af (100% of inflow)
 Center-of-Mass det. time= 75.6 min (931.7 - 856.1)

Volume	Invert	Avail.Storage	Storage Description		
#1	100.50'	24,860 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)
100.50	1,068	258.2	0	0	1,068
101.00	1,881	283.5	728	728	2,167
102.00	3,733	334.0	2,755	3,482	4,668
103.00	5,885	380.3	4,768	8,251	7,324
104.00	8,280	418.0	7,049	15,299	9,752
105.00	10,901	455.7	9,561	24,860	12,409

Device	Routing	Invert	Outlet Devices
#1	Discarded	100.50'	8.270 in/hr Exfiltration over Horizontal area Conductivity to Groundwater Elevation = 80.00'

Discarded OutFlow Max=1.21 cfs @ 12.69 hrs HW=103.01' (Free Discharge)
 ↑1=Exfiltration (Controls 1.21 cfs)

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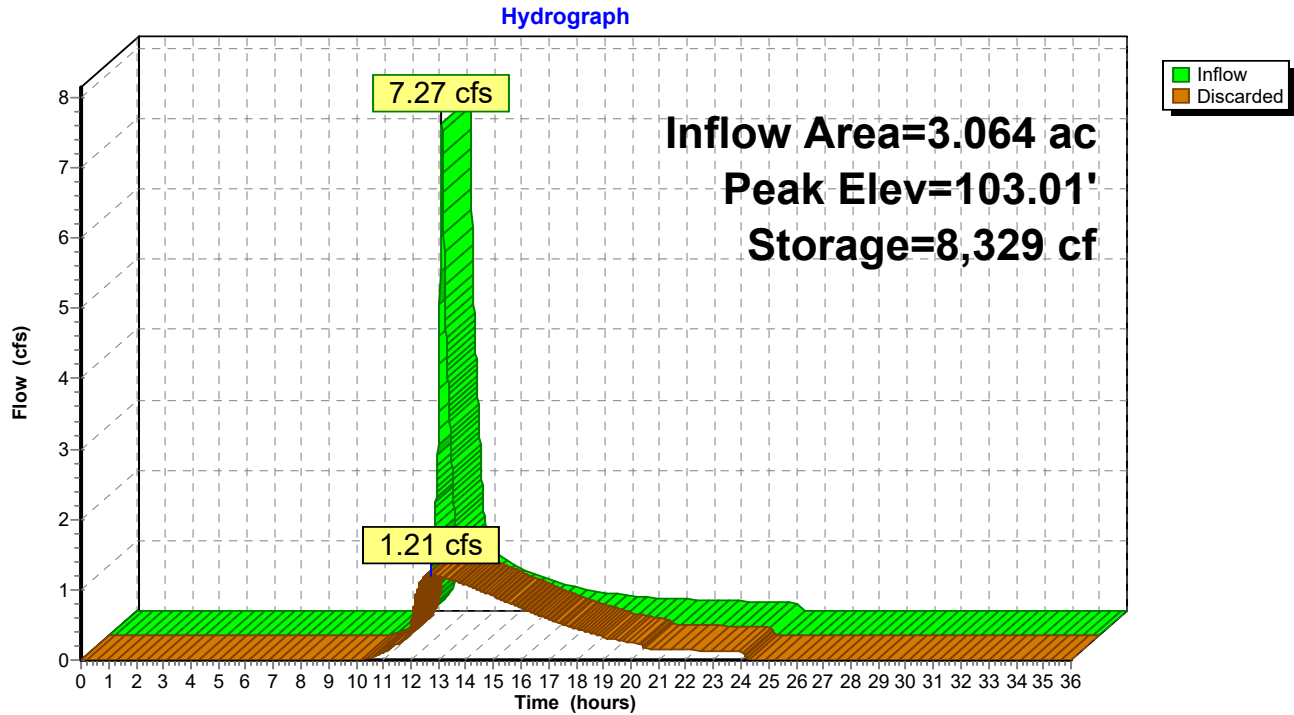
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Type III 24-hr 25-year Rainfall=6.00"

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Pond 6P: Infiltration Basin #1



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Type III 24-hr 100-year Rainfall=7.52"

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Time span=0.00-36.00 hrs, dt=0.01 hrs, 3601 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Area 1 Runoff Area=6,144 sf 25.78% Impervious Runoff Depth=1.77"
 Flow Length=85' Slope=0.0200 '/' Tc=12.4 min CN=48 Runoff=0.20 cfs 0.021 af

Subcatchment2S: Area 2 Runoff Area=8,894 sf 0.00% Impervious Runoff Depth=0.31"
 Flow Length=13' Slope=0.0200 '/' Tc=6.0 min CN=30 Runoff=0.01 cfs 0.005 af

Subcatchment3S: Area 3 Runoff Area=71,718 sf 0.00% Impervious Runoff Depth=0.31"
 Flow Length=37' Slope=0.0200 '/' Tc=9.1 min CN=30 Runoff=0.10 cfs 0.043 af

Subcatchment4S: Area 4 Runoff Area=382,748 sf 9.27% Impervious Runoff Depth=0.88"
 Flow Length=76' Slope=0.0200 '/' Tc=12.2 min CN=38 Runoff=3.97 cfs 0.645 af

Subcatchment5S: Area 5 Runoff Area=182,954 sf 38.96% Impervious Runoff Depth=3.19"
 Flow Length=314' Slope=0.0200 '/' Tc=7.3 min CN=62 Runoff=14.80 cfs 1.116 af

Subcatchment6S: Area 6 Runoff Area=133,475 sf 39.60% Impervious Runoff Depth=3.30"
 Flow Length=295' Slope=0.0200 '/' Tc=7.1 min CN=63 Runoff=11.27 cfs 0.841 af

Reach 1R: Off-site - Route 130 Inflow=0.20 cfs 0.021 af
 Outflow=0.20 cfs 0.021 af

Reach 2R: Off-site North Inflow=0.01 cfs 0.005 af
 Outflow=0.01 cfs 0.005 af

Reach 3R: Off-site South Inflow=0.10 cfs 0.043 af
 Outflow=0.10 cfs 0.043 af

Pond 4P: Infiltration Basin #3 Peak Elev=101.54' Storage=6,464 cf Inflow=3.97 cfs 0.645 af
 Outflow=1.03 cfs 0.645 af

Pond 5P: Infiltration Basin #2 Peak Elev=102.80' Storage=16,840 cf Inflow=14.80 cfs 1.116 af
 Outflow=2.14 cfs 1.116 af

Pond 6P: Infiltration Basin #1 Peak Elev=103.83' Storage=13,934 cf Inflow=11.27 cfs 0.841 af
 Outflow=1.63 cfs 0.841 af

Total Runoff Area = 18.043 ac Runoff Volume = 2.671 af Average Runoff Depth = 1.78"
79.49% Pervious = 14.342 ac 20.51% Impervious = 3.700 ac

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Type III 24-hr 100-year Rainfall=7.52"

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Summary for Subcatchment 1S: Area 1

Runoff = 0.20 cfs @ 12.19 hrs, Volume= 0.021 af, Depth= 1.77"

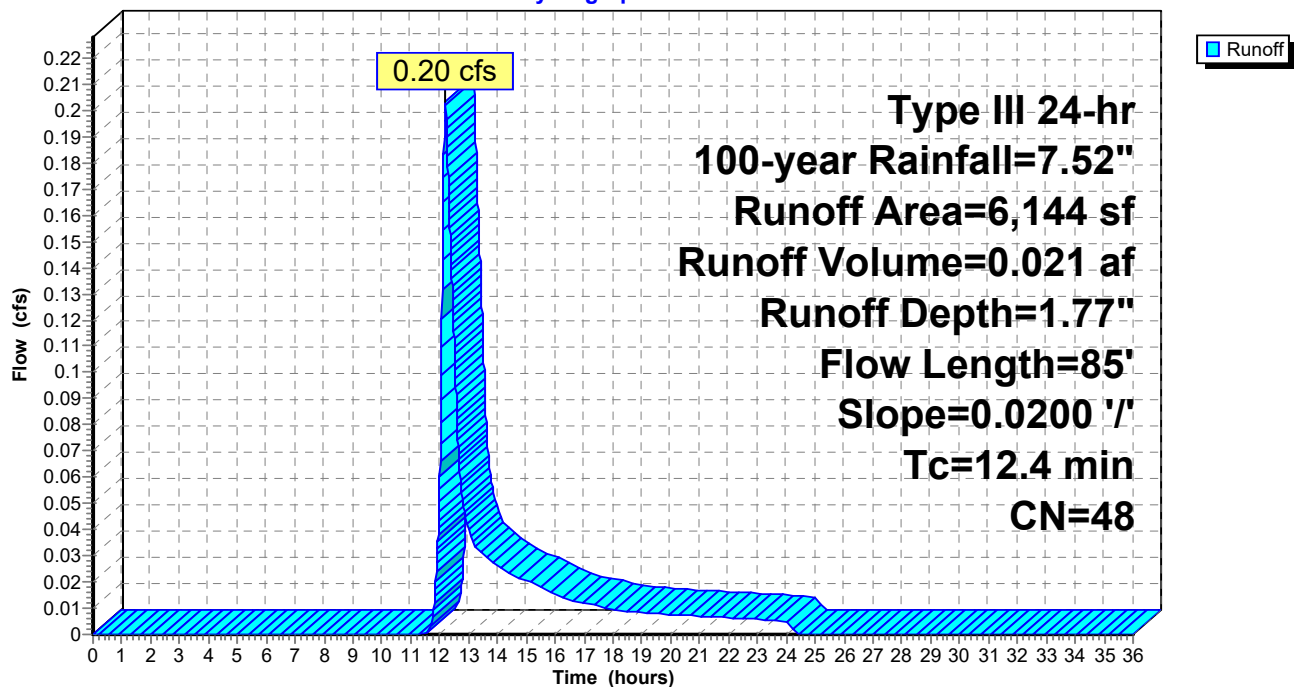
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=7.52"

Area (sf)	CN	Description
1,584	98	Paved parking, HSG A
4,560	30	Woods, Good, HSG A
6,144	48	Weighted Average
4,560		74.22% Pervious Area
1,584		25.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	50	0.0200	0.07		Sheet Flow, A-B
					Woods: Light underbrush n= 0.400 P2= 3.60"
0.8	35	0.0200	0.71		Shallow Concentrated Flow, B-C
					Woodland Kv= 5.0 fps
12.4	85	Total			

Subcatchment 1S: Area 1

Hydrograph



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Type III 24-hr 100-year Rainfall=7.52"

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Summary for Subcatchment 2S: Area 2

Runoff = 0.01 cfs @ 12.47 hrs, Volume= 0.005 af, Depth= 0.31"

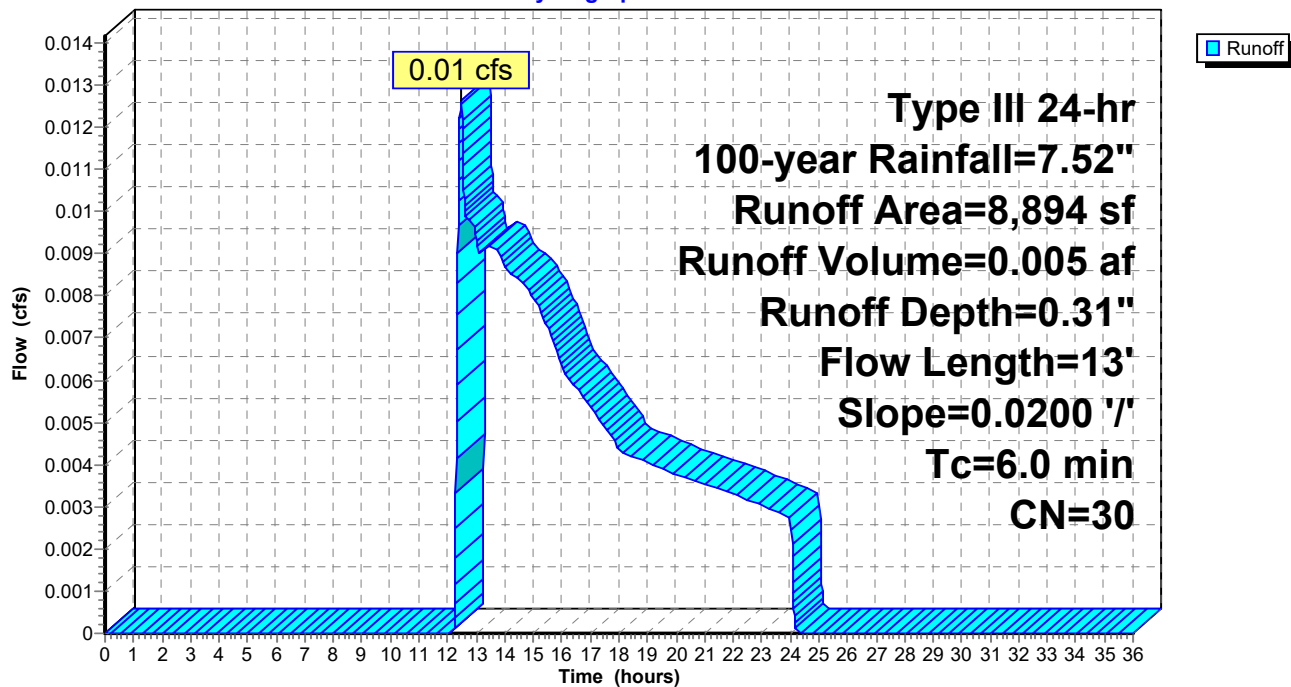
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=7.52"

Area (sf)	CN	Description
8,894	30	Woods, Good, HSG A
8,894		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	13	0.0200	0.05		Sheet Flow, A-B
					Woods: Light underbrush n= 0.400 P2= 3.60"
2.0					Direct Entry,
6.0	13	Total			

Subcatchment 2S: Area 2

Hydrograph



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532 Main Street (Route 130) - Mashpee, MA

Type III 24-hr 100-year Rainfall=7.52"

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Summary for Subcatchment 3S: Area 3

Runoff = 0.10 cfs @ 12.51 hrs, Volume= 0.043 af, Depth= 0.31"

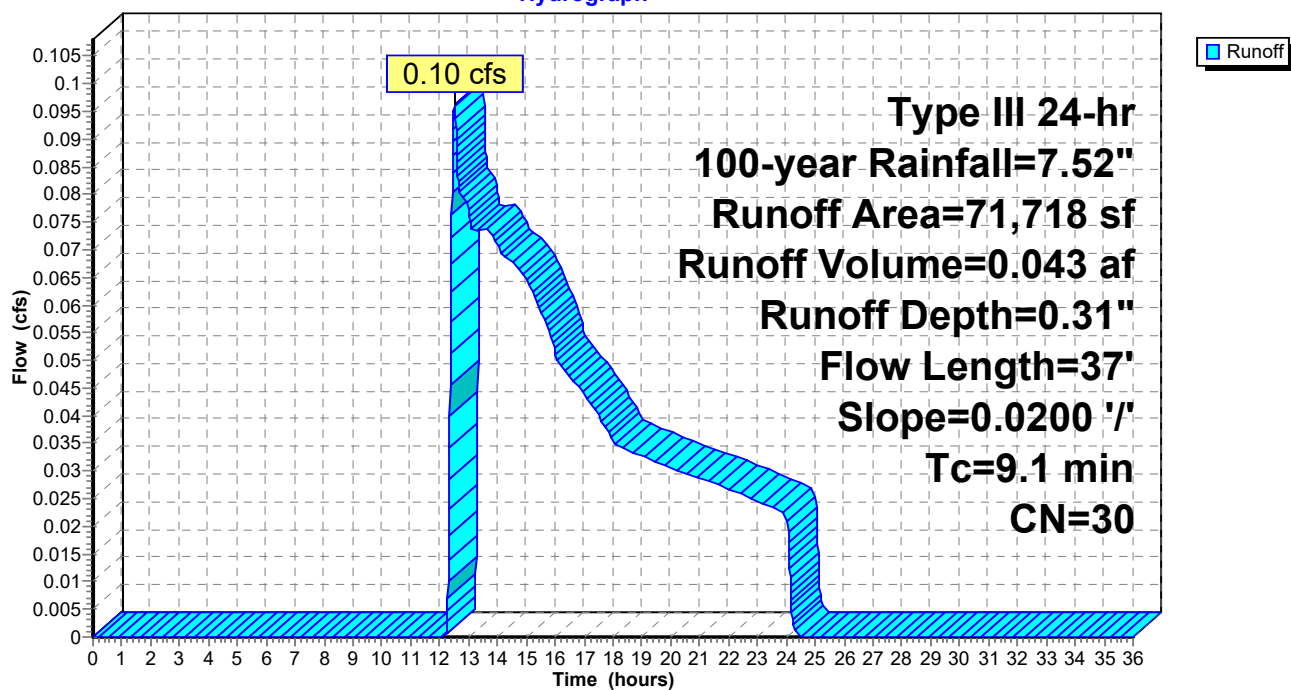
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=7.52"

Area (sf)	CN	Description
71,718	30	Woods, Good, HSG A
71,718		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	37	0.0200	0.07		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.60"

Subcatchment 3S: Area 3

Hydrograph



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Type III 24-hr 100-year Rainfall=7.52"

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Summary for Subcatchment 4S: Area 4

Runoff = 3.97 cfs @ 12.29 hrs, Volume= 0.645 af, Depth= 0.88"

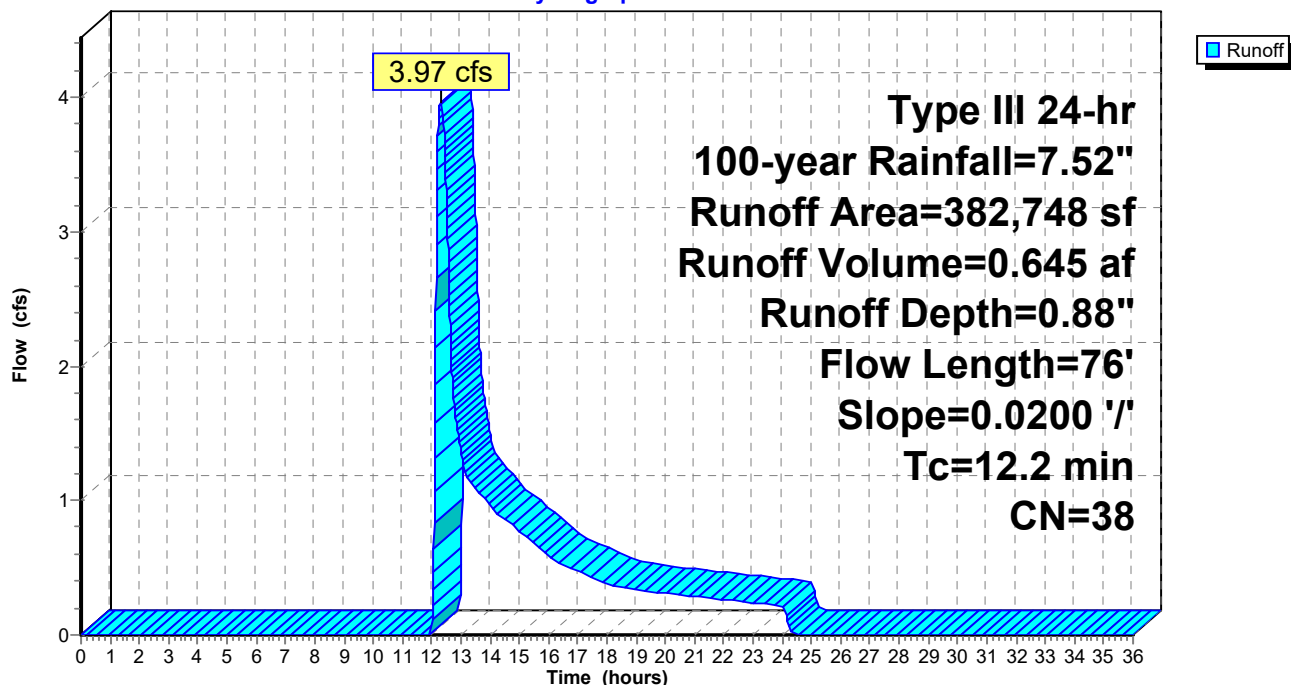
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=7.52"

Area (sf)	CN	Description
12,975	98	Paved parking, HSG A
75,000	57	1/3 acre lots, 30% imp, HSG A
294,773	30	Woods, Good, HSG A
382,748	38	Weighted Average
347,273		90.73% Pervious Area
35,475		9.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	50	0.0200	0.07		Sheet Flow, A-B
					Woods: Light underbrush n= 0.400 P2= 3.60"
0.6	26	0.0200	0.71		Shallow Concentrated Flow, B-C
					Woodland Kv= 5.0 fps
12.2	76	Total			

Subcatchment 4S: Area 4

Hydrograph



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Type III 24-hr 100-year Rainfall=7.52"

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Summary for Subcatchment 5S: Area 5

Runoff = 14.80 cfs @ 12.11 hrs, Volume= 1.116 af, Depth= 3.19"

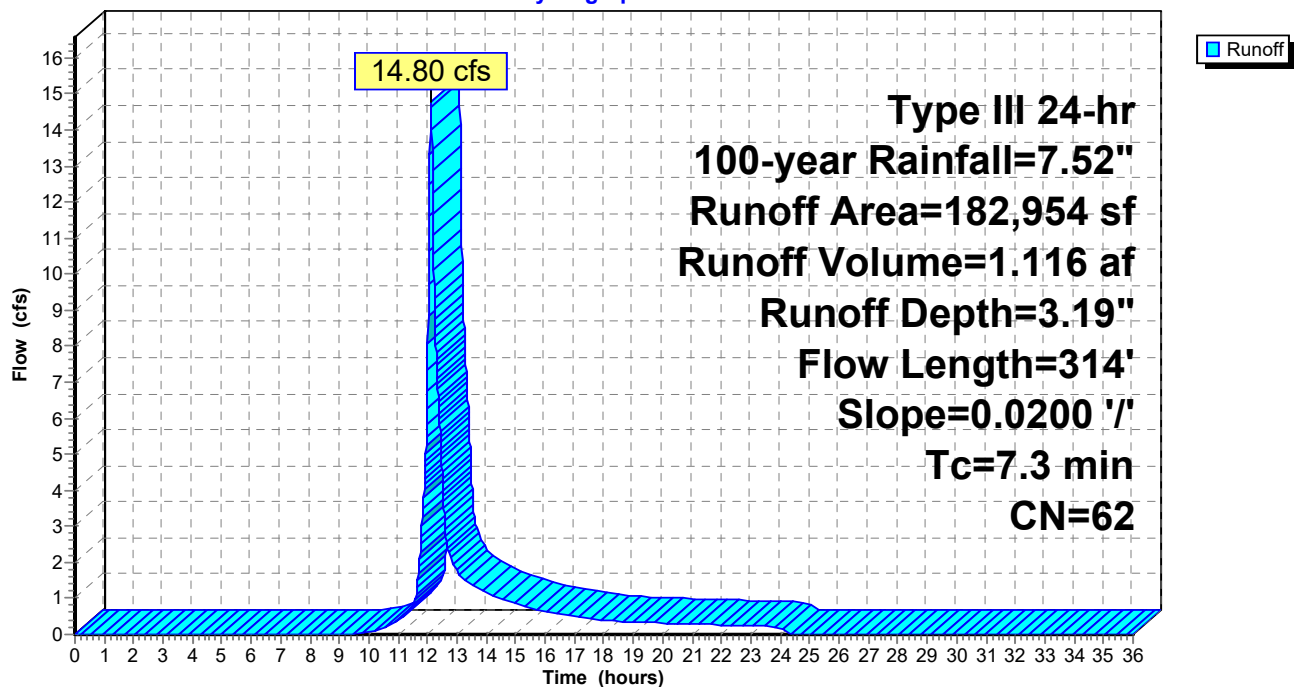
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=7.52"

Area (sf)	CN	Description
23,422	98	Paved parking, HSG A
159,532	57	1/3 acre lots, 30% imp, HSG A
182,954	62	Weighted Average
111,672		61.04% Pervious Area
71,282		38.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	50	0.0200	0.16		Sheet Flow, A-B Grass: Short n= 0.150 P2= 3.60"
1.3	175	0.0200	2.28		Shallow Concentrated Flow, B-C Unpaved Kv= 16.1 fps
0.7	89	0.0200	2.28		Shallow Concentrated Flow, C-D Unpaved Kv= 16.1 fps
7.3	314	Total			

Subcatchment 5S: Area 5

Hydrograph



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Type III 24-hr 100-year Rainfall=7.52"

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Summary for Subcatchment 6S: Area 6

Runoff = 11.27 cfs @ 12.11 hrs, Volume= 0.841 af, Depth= 3.30"

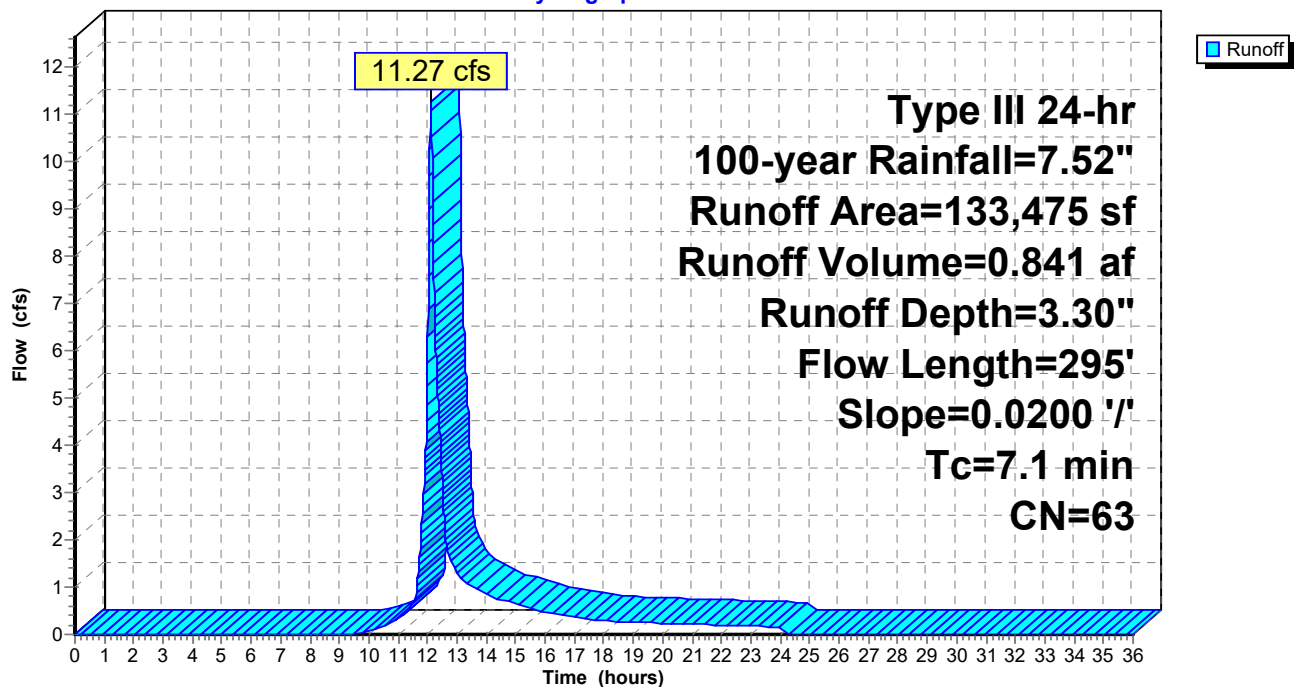
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=7.52"

Area (sf)	CN	Description
18,300	98	Paved parking, HSG A
115,175	57	1/3 acre lots, 30% imp, HSG A
133,475	63	Weighted Average
80,623		60.40% Pervious Area
52,853		39.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	50	0.0200	0.16		Sheet Flow, A-B
					Grass: Short n= 0.150 P2= 3.60"
1.8	245	0.0200	2.28		Shallow Concentrated Flow, B-C
					Unpaved Kv= 16.1 fps
7.1	295	Total			

Subcatchment 6S: Area 6

Hydrograph



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Summary for Reach 1R: Off-site - Route 130

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

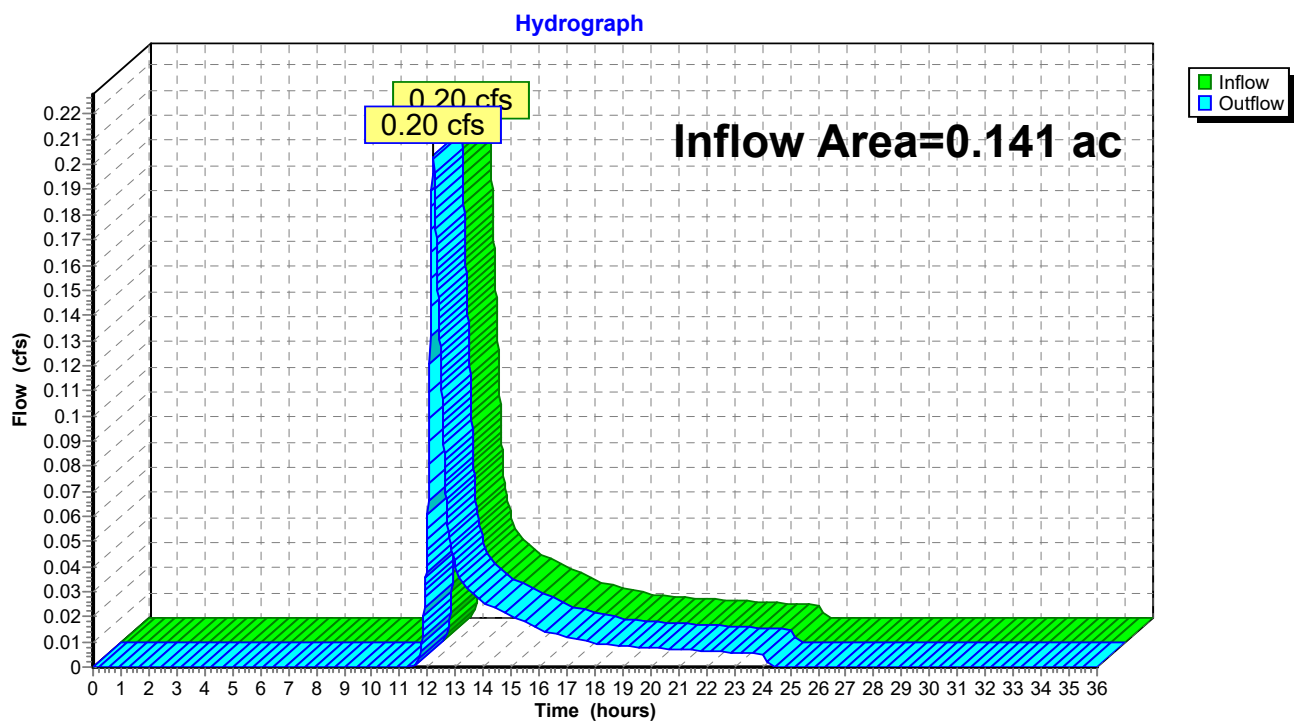
Inflow Area = 0.141 ac, 25.78% Impervious, Inflow Depth = 1.77" for 100-year event

Inflow = 0.20 cfs @ 12.19 hrs, Volume= 0.021 af

Outflow = 0.20 cfs @ 12.19 hrs, Volume= 0.021 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Reach 1R: Off-site - Route 130



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Type III 24-hr 100-year Rainfall=7.52"

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Summary for Reach 2R: Off-site North

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

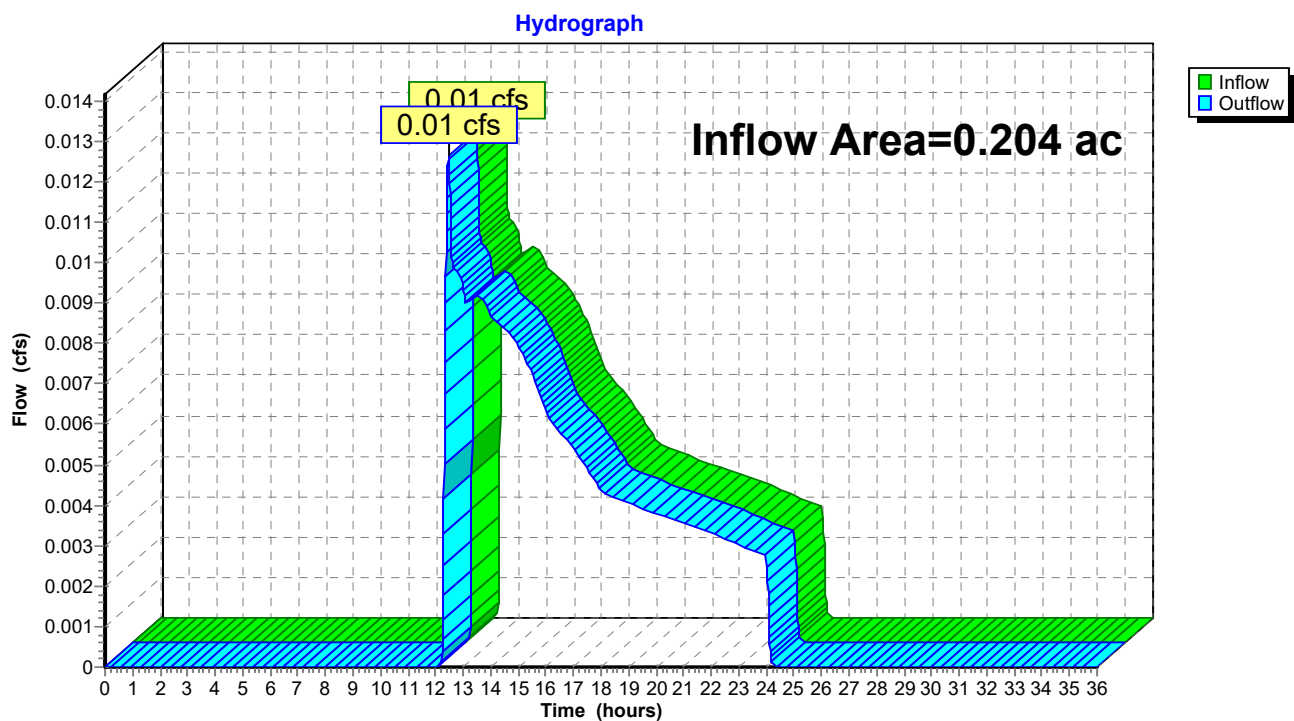
Inflow Area = 0.204 ac, 0.00% Impervious, Inflow Depth = 0.31" for 100-year event

Inflow = 0.01 cfs @ 12.47 hrs, Volume= 0.005 af

Outflow = 0.01 cfs @ 12.47 hrs, Volume= 0.005 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Reach 2R: Off-site North



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Type III 24-hr 100-year Rainfall=7.52"

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Summary for Reach 3R: Off-site South

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

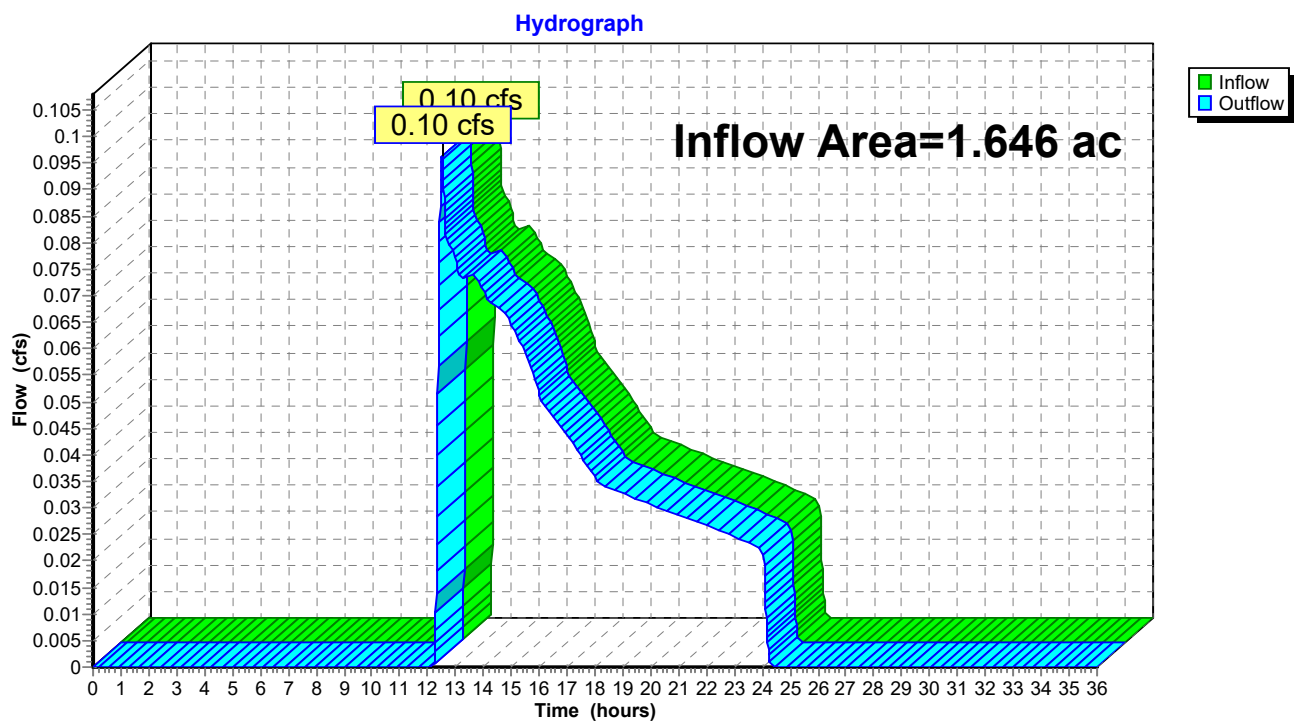
Inflow Area = 1.646 ac, 0.00% Impervious, Inflow Depth = 0.31" for 100-year event

Inflow = 0.10 cfs @ 12.51 hrs, Volume= 0.043 af

Outflow = 0.10 cfs @ 12.51 hrs, Volume= 0.043 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Reach 3R: Off-site South



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Type III 24-hr 100-year Rainfall=7.52"

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Summary for Pond 4P: Infiltration Basin #3

Inflow Area = 8.787 ac, 9.27% Impervious, Inflow Depth = 0.88" for 100-year event
 Inflow = 3.97 cfs @ 12.29 hrs, Volume= 0.645 af
 Outflow = 1.03 cfs @ 13.76 hrs, Volume= 0.645 af, Atten= 74%, Lag= 87.8 min
 Discarded = 1.03 cfs @ 13.76 hrs, Volume= 0.645 af

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 101.54' @ 13.76 hrs Surf.Area= 5,059 sf Storage= 6,464 cf

Plug-Flow detention time= 72.2 min calculated for 0.645 af (100% of inflow)
 Center-of-Mass det. time= 72.2 min (1,004.2 - 932.0)

Volume	Invert	Avail.Storage	Storage Description
#1	99.60'	9,006 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)
99.60	1,878	255.2	0	0	1,878
100.00	2,348	266.5	843	843	2,359
101.00	4,060	304.2	3,165	4,009	4,094
102.00	5,998	341.9	4,998	9,006	6,059

Device	Routing	Invert	Outlet Devices
#1	Discarded	99.60'	8.270 in/hr Exfiltration over Horizontal area Conductivity to Groundwater Elevation = 80.00'

Discarded OutFlow Max=1.03 cfs @ 13.76 hrs HW=101.54' (Free Discharge)
 ↑1=Exfiltration (Controls 1.03 cfs)

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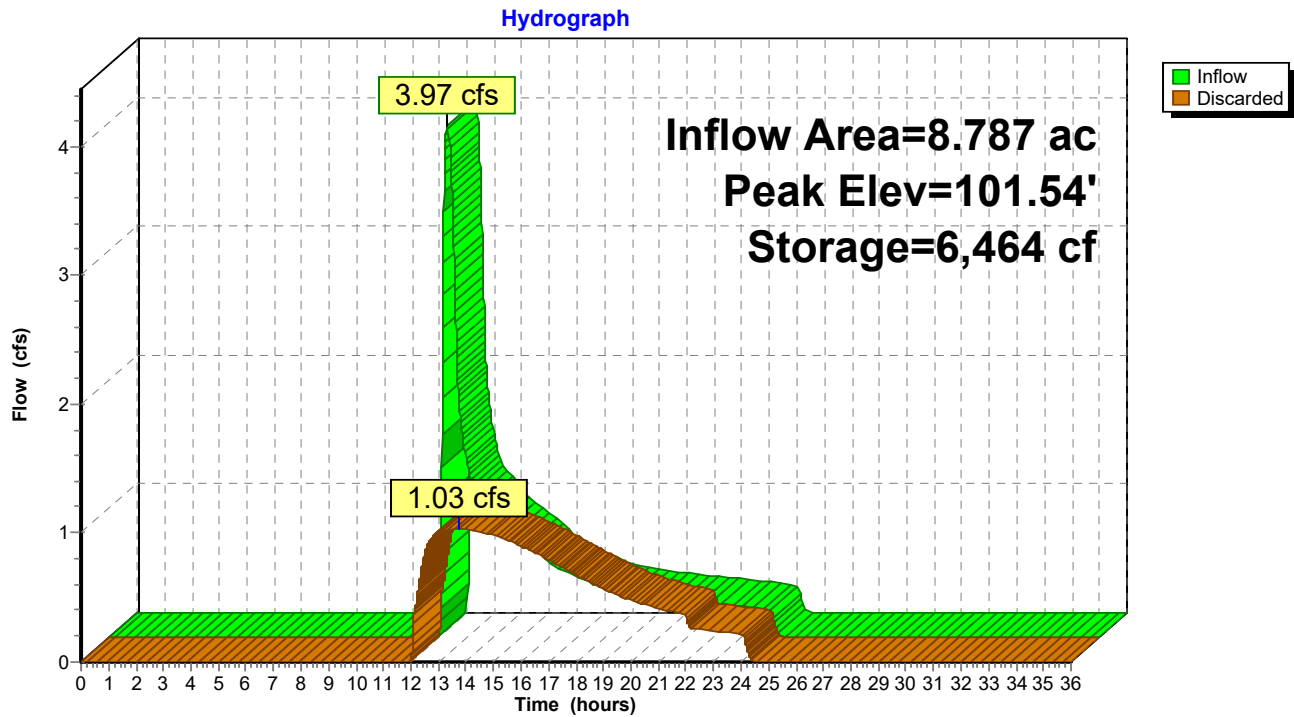
532 Main Street (Route 130) - Mashpee, MA

Type III 24-hr 100-year Rainfall=7.52"

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Pond 4P: Infiltration Basin #3



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Type III 24-hr 100-year Rainfall=7.52"

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Summary for Pond 5P: Infiltration Basin #2

Inflow Area = 4.200 ac, 38.96% Impervious, Inflow Depth = 3.19" for 100-year event
 Inflow = 14.80 cfs @ 12.11 hrs, Volume= 1.116 af
 Outflow = 2.14 cfs @ 12.78 hrs, Volume= 1.116 af, Atten= 86%, Lag= 40.3 min
 Discarded = 2.14 cfs @ 12.78 hrs, Volume= 1.116 af

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 102.80' @ 12.78 hrs Surf.Area= 10,390 sf Storage= 16,840 cf

Plug-Flow detention time= 74.4 min calculated for 1.116 af (100% of inflow)
 Center-of-Mass det. time= 74.4 min (920.6 - 846.2)

Volume	Invert	Avail.Storage	Storage Description		
#1	100.70'	31,116 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)
100.70	5,821	323.5	0	0	5,821
101.00	6,413	334.8	1,834	1,834	6,421
102.00	8,535	372.5	7,449	9,283	8,572
103.00	10,883	410.2	9,685	18,968	10,953
104.00	13,458	447.9	12,148	31,116	13,563

Device	Routing	Invert	Outlet Devices
#1	Discarded	100.70'	8.270 in/hr Exfiltration over Horizontal area Conductivity to Groundwater Elevation = 80.00'

Discarded OutFlow Max=2.14 cfs @ 12.78 hrs HW=102.80' (Free Discharge)

↑**1=Exfiltration** (Controls 2.14 cfs)

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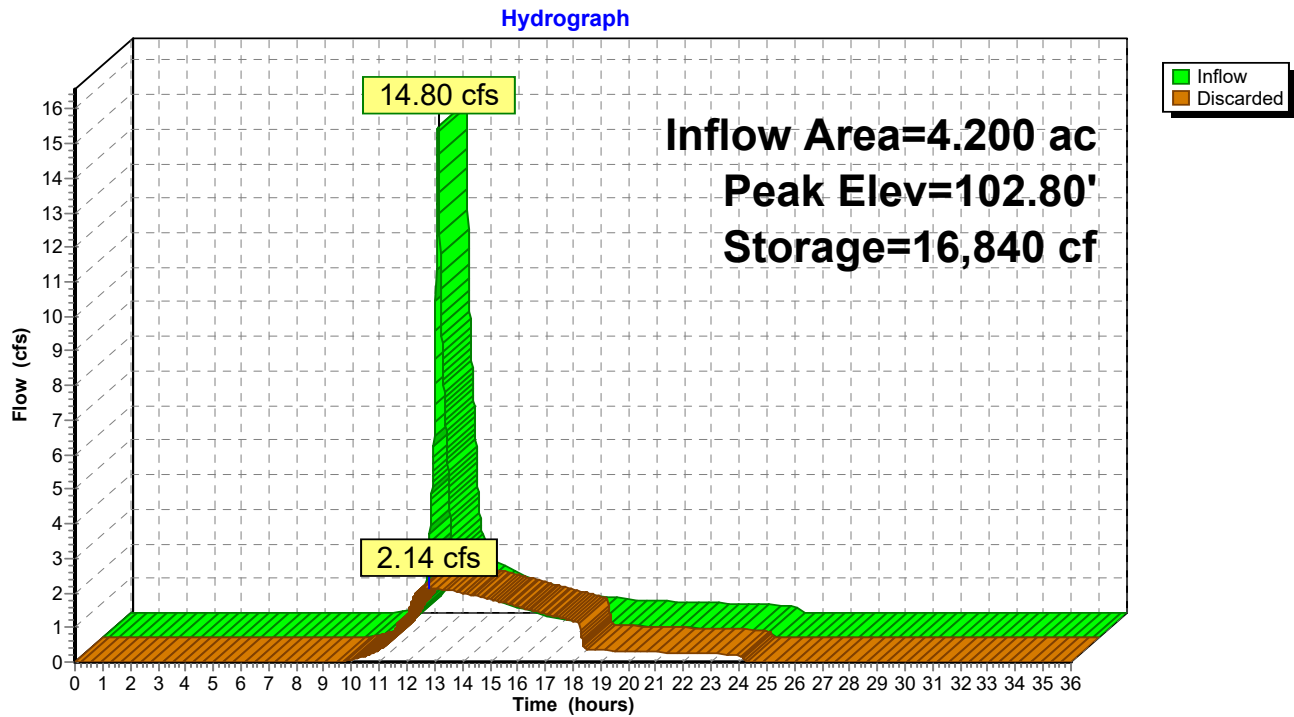
532 Main Street (Route 130) - Mashpee, MA

Type III 24-hr 100-year Rainfall=7.52"

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Pond 5P: Infiltration Basin #2



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Type III 24-hr 100-year Rainfall=7.52"

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Summary for Pond 6P: Infiltration Basin #1

Inflow Area = 3.064 ac, 39.60% Impervious, Inflow Depth = 3.30" for 100-year event
 Inflow = 11.27 cfs @ 12.11 hrs, Volume= 0.841 af
 Outflow = 1.63 cfs @ 12.76 hrs, Volume= 0.841 af, Atten= 86%, Lag= 39.2 min
 Discarded = 1.63 cfs @ 12.76 hrs, Volume= 0.841 af

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 103.83' @ 12.76 hrs Surf.Area= 7,846 sf Storage= 13,934 cf

Plug-Flow detention time= 98.8 min calculated for 0.841 af (100% of inflow)
 Center-of-Mass det. time= 98.7 min (942.5 - 843.8)

Volume	Invert	Avail.Storage	Storage Description		
#1	100.50'	24,860 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)
100.50	1,068	258.2	0	0	1,068
101.00	1,881	283.5	728	728	2,167
102.00	3,733	334.0	2,755	3,482	4,668
103.00	5,885	380.3	4,768	8,251	7,324
104.00	8,280	418.0	7,049	15,299	9,752
105.00	10,901	455.7	9,561	24,860	12,409

Device	Routing	Invert	Outlet Devices
#1	Discarded	100.50'	8.270 in/hr Exfiltration over Horizontal area Conductivity to Groundwater Elevation = 80.00'

Discarded OutFlow Max=1.63 cfs @ 12.76 hrs HW=103.83' (Free Discharge)
 ↑1=Exfiltration (Controls 1.63 cfs)

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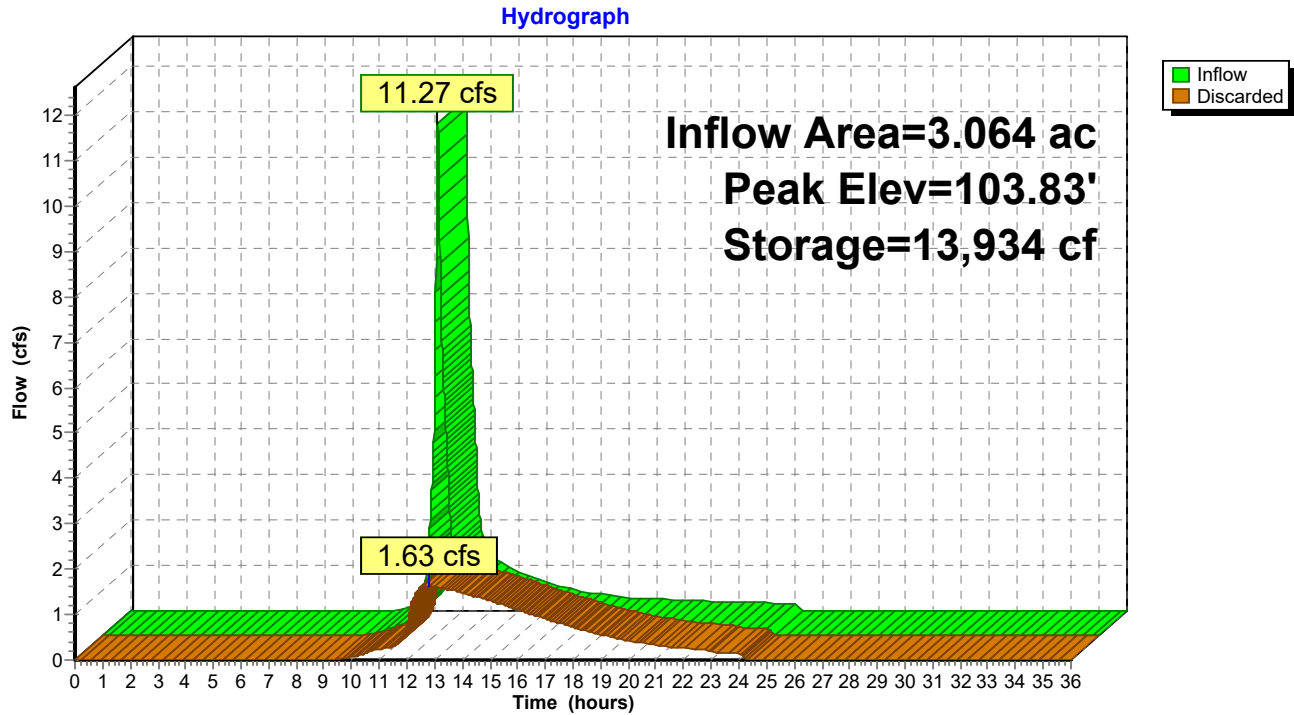
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Type III 24-hr 100-year Rainfall=7.52"

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Pond 6P: Infiltration Basin #1



SECTION 7.0

ADDITIONAL DRAINAGE CALCULATIONS

7.01 TSS REMOVAL CALCULATIONS

TSS Removal Calculation Worksheet

Location: 532 Main Street (Route 130), Mashpee, MA
Project: Leamar Road Subdivision
Prepared By: T. MacDonald
Date: 2/9/2022



A	B	C	D	E
BMP	TSS Removal Rate	Starting TSS Load*	Amount Removed (BxC)	Remaining Load (C-D)
Deep Sump and Hooded Catchbasins	0.25	1.00	0.25	0.75
Stormceptor Water Quality Unit	0.80	0.75	0.60	0.15
Infiltration Basin	0.80	0.15	0.12	0.03

TSS Removal = 0.97

****100% of proposed impervious areas follow this treatment train**

*Equals remaining load from previous BMP (E)

7.02 GROUNDWATER RECHARGE VOLUME CALCULATIONS

Required Recharge Volume

$R_v = F \times \text{Impervious Area}$

Where:

R_v = Recharge Volume

F=Target Depth Factor associated with each Hydrologic Soil Group

(F=0.60-inch for Soil Type A)

Impervious Area = Proposed Pavement area on-site

$$R_v = \left(\frac{0.60 \text{ in}}{12 \text{ in/ft}} \right) (1.292 \text{ ac}) \left(43,560 \frac{\text{sf}}{\text{ac}} \right) = 2,814 \text{ cf}$$

$R_v = 2,814 \text{ cf}$ (required recharge volume)

Structural Storage Provided:

- Infiltration Basin #1 = 12,314 cubic feet provided.
- Infiltration Basin #2 = 14,715 cubic feet provided.
- Infiltration Basin #3 = 4,751 cubic feet provided.
- Total = 31,780 cubic feet provided.

Refer to the HydroCAD calculations for more information.

Drawdown Time

The following formula must be used to demonstrate that each proposed infiltration BMP will drain within 72 hours:

$$Time_{drawdown} = \frac{R_v}{(K)(Bottom\ Area)}$$

R_v = Storage Volume (Required Recharge Volume)

K = Saturated Hydraulic Conductivity For "Static" and "Simple Dynamic" Methods, use Rawls Rate

Bottom Area = Bottom Area of Recharge Structure

Infiltration Basin #1

$$Time_{drawdown} = \frac{915\ ft^3}{(8.27\ in/hr)(1\ ft/12\ in)(1,068\ ft^2)}$$

$$Time_{drawdown} = 1.24\ hours$$

Infiltration Basin #2

$$Time_{drawdown} = \frac{1,172\ ft^3}{(8.27\ in/hr)(1\ ft/12\ in)(5,821\ ft^2)}$$

$$Time_{drawdown} = 0.29\ hours$$

Infiltration Basin #3

$$Time_{drawdown} = \frac{649\ ft^3}{(8.27\ in/hr)(1\ ft/12\ in)(1,878\ ft^2)}$$

$$Time_{drawdown} = 0.50\ hours$$

7.03 STORMCEPTOR SIZING CALCULATIONS

Detailed Stormceptor Sizing Report – WQU-1

Project Information & Location			
Project Name	Subdivision (Leamar Drive)	Project Number	49400
City	Mashpee	State/ Province	Massachusetts
Country	United States of America	Date	2/4/2022
Designer Information		EOR Information (optional)	
Name	Todd MacDonald	Name	
Company	BSC Group	Company	
Phone #	617-896-4409	Phone #	
Email	TMacDonald@BSCGroup.com	Email	

Stormwater Treatment Recommendation

The recommended Stormceptor Model(s) which achieve or exceed the user defined water quality objective for each site within the project are listed in the below Sizing Summary table.

Site Name	WQU-1
Recommended Stormceptor Model	STC 450i
Target TSS Removal (%)	80.0
TSS Removal (%) Provided	84
PSD	Fine Distribution
Rainfall Station	HYANNIS

The recommended Stormceptor model achieves the water quality objectives based on the selected inputs, historical rainfall records and selected particle size distribution.

Stormceptor Sizing Summary	
Stormceptor Model	% TSS Removal Provided
STC 450i	84
STC 900	90
STC 1200	90
STC 1800	90
STC 2400	93
STC 3600	93
STC 4800	95
STC 6000	95
STC 7200	96
STC 11000	97
STC 13000	97
STC 16000	98

Stormceptor

The Stormceptor oil and sediment separator is sized to treat stormwater runoff by removing pollutants through gravity separation and flotation. Stormceptor's patented design generates positive TSS removal for each rainfall event, including large storms. Significant levels of pollutants such as heavy metals, free oils and nutrients are prevented from entering natural water resources and the re-suspension of previously captured sediment (scour) does not occur.

Stormceptor provides a high level of TSS removal for small frequent storm events that represent the majority of annual rainfall volume and pollutant load. Positive treatment continues for large infrequent events, however, such events have little impact on the average annual TSS removal as they represent a small percentage of the total runoff volume and pollutant load.

Design Methodology

Stormceptor is sized using PCSWMM for Stormceptor, a continuous simulation model based on US EPA SWMM. The program calculates hydrology using local historical rainfall data and specified site parameters. With US EPA SWMM's precision, every Stormceptor unit is designed to achieve a defined water quality objective. The TSS removal data presented follows US EPA guidelines to reduce the average annual TSS load. The Stormceptor's unit process for TSS removal is settling. The settling model calculates TSS removal by analyzing:

- Site parameters
- Continuous historical rainfall data, including duration, distribution, peaks & inter-event dry periods
- Particle size distribution, and associated settling velocities (Stokes Law, corrected for drag)
- TSS load
- Detention time of the system

Hydrology Analysis

PCSWMM for Stormceptor calculates annual hydrology with the US EPA SWMM and local continuous historical rainfall data. Performance calculations of Stormceptor are based on the average annual removal of TSS for the selected site parameters. The Stormceptor is engineered to capture sediment particles by treating the required average annual runoff volume, ensuring positive removal efficiency is maintained during each rainfall event, and preventing negative removal efficiency (scour). Smaller recurring storms account for the majority of rainfall events and average annual runoff volume, as observed in the historical rainfall data analyses presented in this section.

Rainfall Station

State/Province	Massachusetts	Total Number of Rainfall Events	1268
Rainfall Station Name	HYANNIS	Total Rainfall (in)	531.6
Station ID #	3821	Average Annual Rainfall (in)	33.2
Coordinates	41°24'0"N, 70°10'47"W	Total Evaporation (in)	30.1
Elevation (ft)	50	Total Infiltration (in)	10.5
Years of Rainfall Data	14	Total Rainfall that is Runoff (in)	491.0

Notes

- Stormceptor performance estimates are based on simulations using PCSWMM for Stormceptor, which uses the EPA Rainfall and Runoff modules.
- Design estimates listed are only representative of specific project requirements based on total suspended solids (TSS) removal defined by the selected PSD, and based on stable site conditions only, after construction is completed.
- For submerged applications or sites specific to spill control, please contact your local Stormceptor representative for further design assistance.

Drainage Area	
Total Area (acres)	0.42
Imperviousness %	98.0

Water Quality Objective	
TSS Removal (%)	80.0
Runoff Volume Capture (%)	
Oil Spill Capture Volume (Gal)	
Peak Conveyed Flow Rate (CFS)	
Water Quality Flow Rate (CFS)	

Up Stream Storage	
Storage (ac-ft)	Discharge (cfs)
0.000	0.000

Up Stream Flow Diversion	
Max. Flow to Stormceptor (cfs)	

Design Details	
Stormceptor Inlet Invert Elev (ft)	102.70
Stormceptor Outlet Invert Elev (ft)	102.60
Stormceptor Rim Elev (ft)	107.00
Normal Water Level Elevation (ft)	
Pipe Diameter (in)	12
Pipe Material	HDPE - plastic
Multiple Inlets (Y/N)	No
Grate Inlet (Y/N)	No

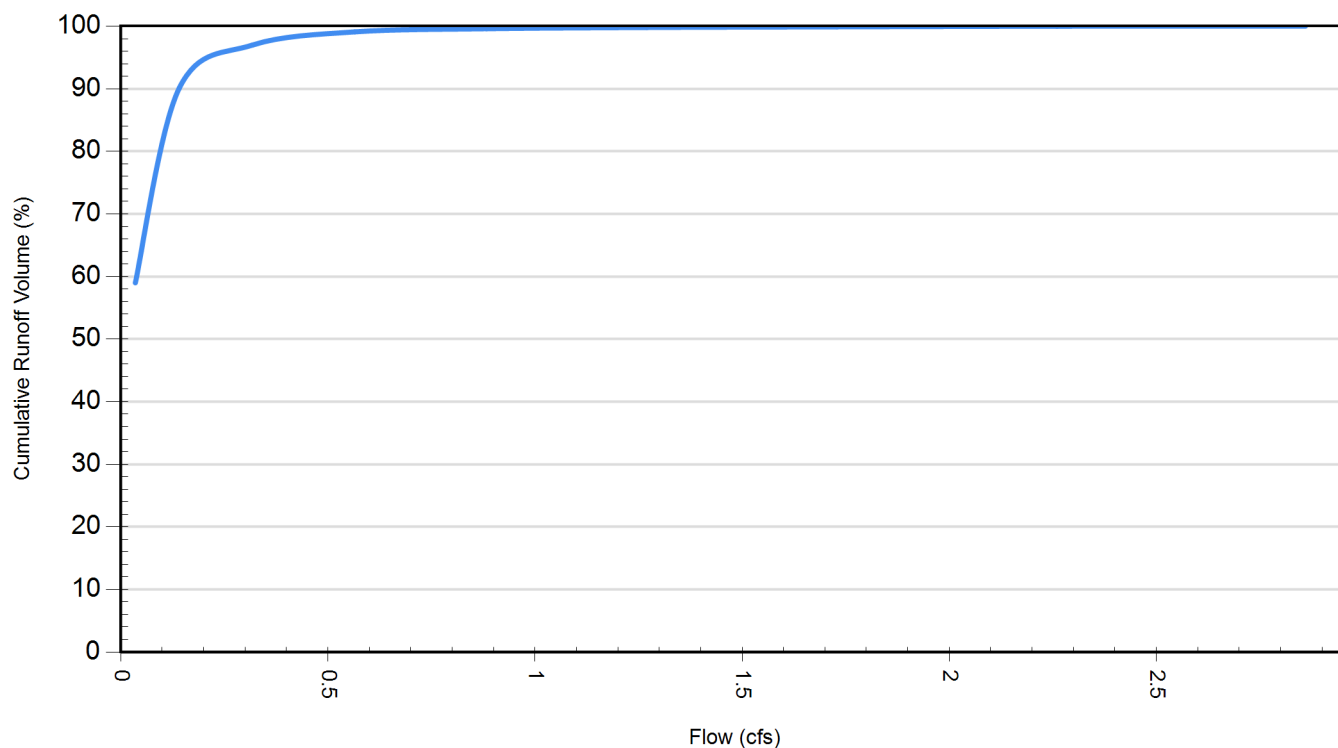
Particle Size Distribution (PSD)		
Removing the smallest fraction of particulates from runoff ensures the majority of pollutants, such as metals, hydrocarbons and nutrients are captured. The table below identifies the Particle Size Distribution (PSD) that was selected to define TSS removal for the Stormceptor design.		
Fine Distribution		
Particle Diameter (microns)	Distribution %	Specific Gravity
20.0	20.0	1.30
60.0	20.0	1.80
150.0	20.0	2.20
400.0	20.0	2.65
2000.0	20.0	2.65

Site Name		WQU-1	
Site Details			
Drainage Area		Infiltration Parameters	
Total Area (acres)	0.42	Horton's equation is used to estimate infiltration	
Imperviousness %	98.0	Max. Infiltration Rate (in/hr)	2.44
Surface Characteristics		Min. Infiltration Rate (in/hr)	0.4
Width (ft)	271.00	Decay Rate (1/sec)	0.00055
Slope %	2	Regeneration Rate (1/sec)	0.01
Impervious Depression Storage (in)	0.02	Evaporation	
Pervious Depression Storage (in)	0.2	Daily Evaporation Rate (in/day)	0.1
Impervious Manning's n	0.015	Dry Weather Flow	
Pervious Manning's n	0.25	Dry Weather Flow (cfs)	0
Maintenance Frequency		Winter Months	
Maintenance Frequency (months) >	12	Winter Infiltration	0
TSS Loading Parameters			
TSS Loading Function			
Buildup/Wash-off Parameters		TSS Availability Parameters	
Target Event Mean Conc. (EMC) mg/L		Availability Constant A	
Exponential Buildup Power		Availability Factor B	
Exponential Washoff Exponent		Availability Exponent C	
		Min. Particle Size Affected by Availability (micron)	

Cumulative Runoff Volume by Runoff Rate			
Runoff Rate (cfs)	Runoff Volume (ft³)	Volume Over (ft³)	Cumulative Runoff Volume (%)
0.035	444116	309073	59.0
0.141	678872	74328	90.1
0.318	730860	22351	97.0
0.565	746185	7025	99.1
0.883	750566	2644	99.6
1.271	752028	1183	99.8
1.730	752494	717	99.9
2.260	752970	240	100.0
2.860	753210	0	100.0

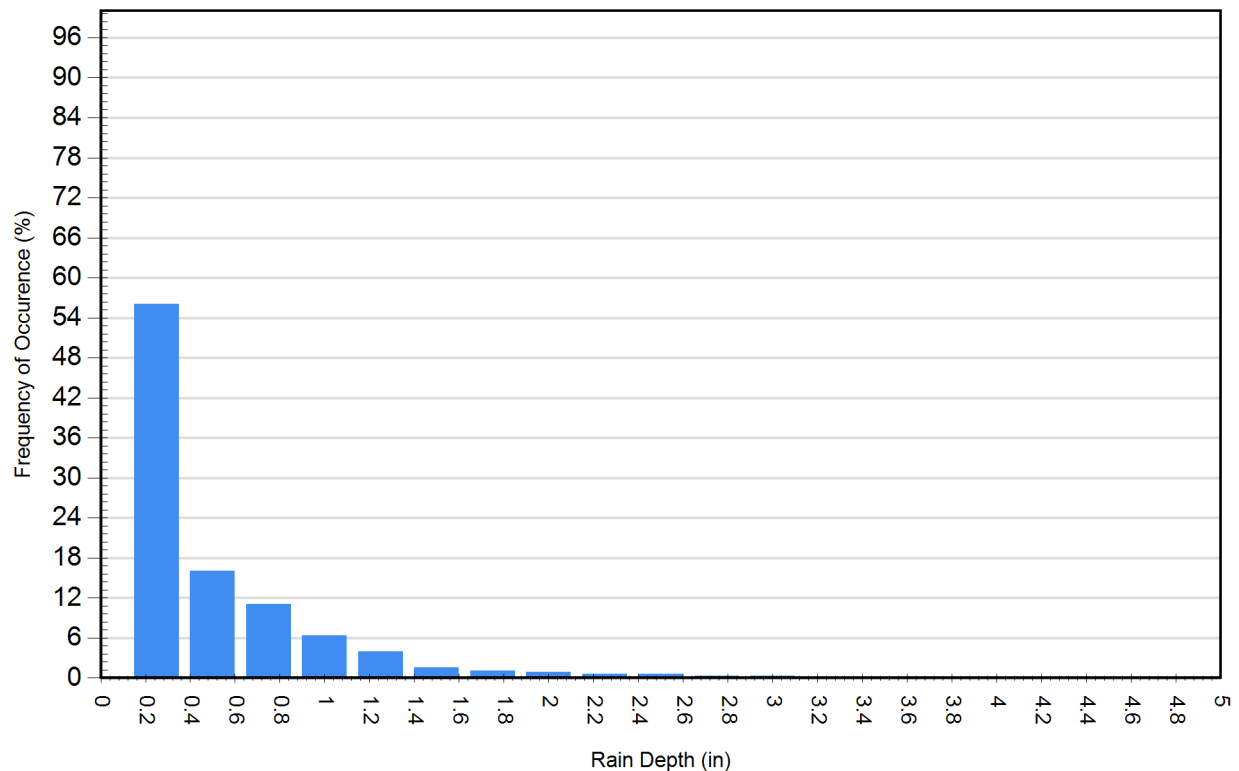
Cumulative Runoff Volume by Runoff Rate

For area: 0.42(ac), imperviousness: 98.0%, rainfall station: HYANNIS



Rainfall Event Analysis				
Rainfall Depth (in)	No. of Events	Percentage of Total Events (%)	Total Volume (in)	Percentage of Annual Volume (%)
0.25	711	56.1	71	13.4
0.50	204	16.1	74	14.0
0.75	141	11.1	88	16.5
1.00	81	6.4	72	13.5
1.25	51	4.0	57	10.7
1.50	20	1.6	28	5.2
1.75	14	1.1	23	4.3
2.00	12	0.9	22	4.2
2.25	7	0.6	15	2.8
2.50	7	0.6	17	3.2
2.75	4	0.3	11	2.0
3.00	4	0.3	12	2.2
3.25	3	0.2	9	1.8
3.50	2	0.2	7	1.3
3.75	2	0.2	7	1.3
4.00	3	0.2	12	2.2
4.25	2	0.2	8	1.6
4.50	0	0.0	0	0.0
4.75	0	0.0	0	0.0

Frequency of Occurrence by Rainfall Depths



For Stormceptor Specifications and Drawings Please Visit:
<https://www.conteches.com/technical-guides/search?filter=1WBC005EYX>

Detailed Stormceptor Sizing Report – WQU-2

Project Information & Location			
Project Name	Subdivision (Leamar Drive)	Project Number	49400
City	Mashpee	State/ Province	Massachusetts
Country	United States of America	Date	2/4/2022
Designer Information		EOR Information (optional)	
Name	Todd MacDonald	Name	
Company	BSC Group	Company	
Phone #	617-896-4409	Phone #	
Email	TMacDonald@BSCGroup.com	Email	

Stormwater Treatment Recommendation

The recommended Stormceptor Model(s) which achieve or exceed the user defined water quality objective for each site within the project are listed in the below Sizing Summary table.

Site Name	WQU-2
Recommended Stormceptor Model	STC 450i
Target TSS Removal (%)	80.0
TSS Removal (%) Provided	82
PSD	Fine Distribution
Rainfall Station	HYANNIS

The recommended Stormceptor model achieves the water quality objectives based on the selected inputs, historical rainfall records and selected particle size distribution.

Stormceptor Sizing Summary	
Stormceptor Model	% TSS Removal Provided
STC 450i	82
STC 900	88
STC 1200	88
STC 1800	89
STC 2400	91
STC 3600	92
STC 4800	94
STC 6000	94
STC 7200	95
STC 11000	97
STC 13000	97
STC 16000	97

Stormceptor

The Stormceptor oil and sediment separator is sized to treat stormwater runoff by removing pollutants through gravity separation and flotation. Stormceptor's patented design generates positive TSS removal for each rainfall event, including large storms. Significant levels of pollutants such as heavy metals, free oils and nutrients are prevented from entering natural water resources and the re-suspension of previously captured sediment (scour) does not occur. Stormceptor provides a high level of TSS removal for small frequent storm events that represent the majority of annual rainfall volume and pollutant load. Positive treatment continues for large infrequent events, however, such events have little impact on the average annual TSS removal as they represent a small percentage of the total runoff volume and pollutant load.

Design Methodology

Stormceptor is sized using PCSWMM for Stormceptor, a continuous simulation model based on US EPA SWMM. The program calculates hydrology using local historical rainfall data and specified site parameters. With US EPA SWMM's precision, every Stormceptor unit is designed to achieve a defined water quality objective. The TSS removal data presented follows US EPA guidelines to reduce the average annual TSS load. The Stormceptor's unit process for TSS removal is settling. The settling model calculates TSS removal by analyzing:

- Site parameters
- Continuous historical rainfall data, including duration, distribution, peaks & inter-event dry periods
- Particle size distribution, and associated settling velocities (Stokes Law, corrected for drag)
- TSS load
- Detention time of the system

Hydrology Analysis

PCSWMM for Stormceptor calculates annual hydrology with the US EPA SWMM and local continuous historical rainfall data. Performance calculations of Stormceptor are based on the average annual removal of TSS for the selected site parameters. The Stormceptor is engineered to capture sediment particles by treating the required average annual runoff volume, ensuring positive removal efficiency is maintained during each rainfall event, and preventing negative removal efficiency (scour). Smaller recurring storms account for the majority of rainfall events and average annual runoff volume, as observed in the historical rainfall data analyses presented in this section.

Rainfall Station

State/Province	Massachusetts	Total Number of Rainfall Events	1268
Rainfall Station Name	HYANNIS	Total Rainfall (in)	531.6
Station ID #	3821	Average Annual Rainfall (in)	33.2
Coordinates	41°24'0"N, 70°10'47"W	Total Evaporation (in)	30.4
Elevation (ft)	50	Total Infiltration (in)	10.5
Years of Rainfall Data	14	Total Rainfall that is Runoff (in)	490.7

Notes

- Stormceptor performance estimates are based on simulations using PCSWMM for Stormceptor, which uses the EPA Rainfall and Runoff modules.
- Design estimates listed are only representative of specific project requirements based on total suspended solids (TSS) removal defined by the selected PSD, and based on stable site conditions only, after construction is completed.
- For submerged applications or sites specific to spill control, please contact your local Stormceptor representative for further design assistance.

Drainage Area	
Total Area (acres)	0.53
Imperviousness %	98.0

Water Quality Objective	
TSS Removal (%)	80.0
Runoff Volume Capture (%)	
Oil Spill Capture Volume (Gal)	
Peak Conveyed Flow Rate (CFS)	
Water Quality Flow Rate (CFS)	

Up Stream Storage	
Storage (ac-ft)	Discharge (cfs)
0.000	0.000

Up Stream Flow Diversion	
Max. Flow to Stormceptor (cfs)	

Design Details	
Stormceptor Inlet Invert Elev (ft)	101.30
Stormceptor Outlet Invert Elev (ft)	101.20
Stormceptor Rim Elev (ft)	106.05
Normal Water Level Elevation (ft)	
Pipe Diameter (in)	12
Pipe Material	HDPE - plastic
Multiple Inlets (Y/N)	No
Grate Inlet (Y/N)	No

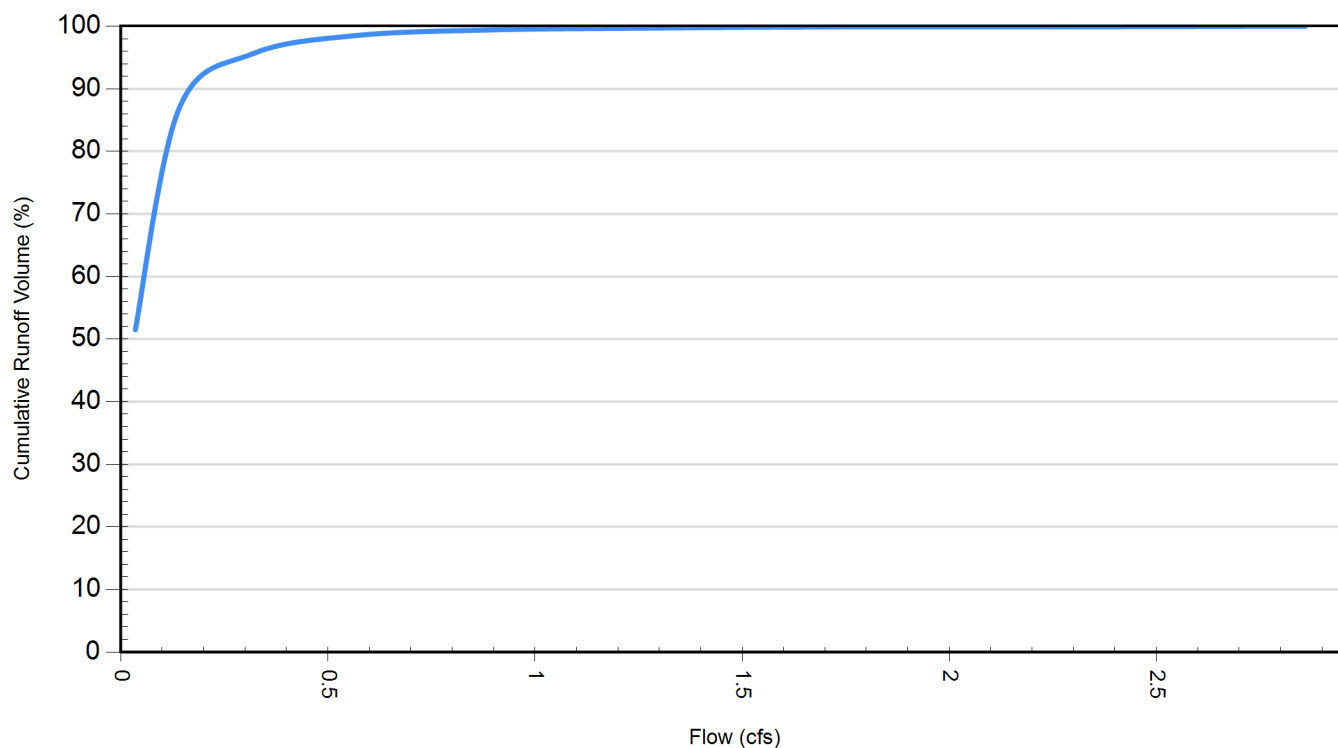
Particle Size Distribution (PSD)		
Removing the smallest fraction of particulates from runoff ensures the majority of pollutants, such as metals, hydrocarbons and nutrients are captured. The table below identifies the Particle Size Distribution (PSD) that was selected to define TSS removal for the Stormceptor design.		
Fine Distribution		
Particle Diameter (microns)	Distribution %	Specific Gravity
20.0	20.0	1.30
60.0	20.0	1.80
150.0	20.0	2.20
400.0	20.0	2.65
2000.0	20.0	2.65

Site Name		WQU-2	
Site Details			
Drainage Area		Infiltration Parameters	
Total Area (acres)	0.53	Horton's equation is used to estimate infiltration	
Imperviousness %	98.0	Max. Infiltration Rate (in/hr)	2.44
Surface Characteristics		Min. Infiltration Rate (in/hr)	0.4
Width (ft)	304.00	Decay Rate (1/sec)	0.00055
Slope %	2	Regeneration Rate (1/sec)	0.01
Impervious Depression Storage (in)	0.02	Evaporation	
Pervious Depression Storage (in)	0.2	Daily Evaporation Rate (in/day)	0.1
Impervious Manning's n	0.015	Dry Weather Flow	
Pervious Manning's n	0.25	Dry Weather Flow (cfs)	0
Maintenance Frequency		Winter Months	
Maintenance Frequency (months) >	12	Winter Infiltration	0
TSS Loading Parameters			
TSS Loading Function			
Buildup/Wash-off Parameters		TSS Availability Parameters	
Target Event Mean Conc. (EMC) mg/L		Availability Constant A	
Exponential Buildup Power		Availability Factor B	
Exponential Washoff Exponent		Availability Exponent C	
		Min. Particle Size Affected by Availability (micron)	

Cumulative Runoff Volume by Runoff Rate			
Runoff Rate (cfs)	Runoff Volume (ft³)	Volume Over (ft³)	Cumulative Runoff Volume (%)
0.035	488754	460985	51.5
0.141	825213	124533	86.9
0.318	908264	41486	95.6
0.565	935550	14201	98.5
0.883	944186	5565	99.4
1.271	947346	2404	99.7
1.730	948440	1311	99.9
2.260	948917	834	99.9
2.860	949457	294	100.0

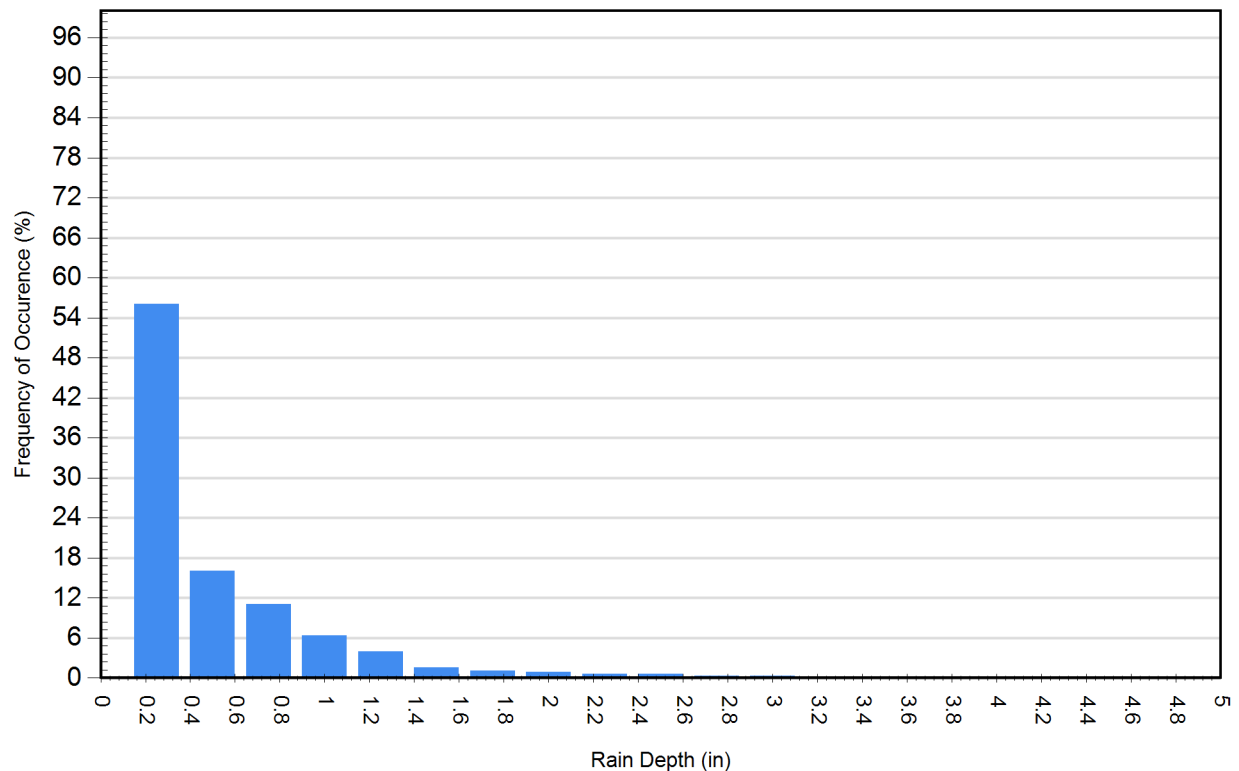
Cumulative Runoff Volume by Runoff Rate

For area: 0.53(ac), imperviousness: 98.0%, rainfall station: HYANNIS



Rainfall Event Analysis				
Rainfall Depth (in)	No. of Events	Percentage of Total Events (%)	Total Volume (in)	Percentage of Annual Volume (%)
0.25	711	56.1	71	13.4
0.50	204	16.1	74	14.0
0.75	141	11.1	88	16.5
1.00	81	6.4	72	13.5
1.25	51	4.0	57	10.7
1.50	20	1.6	28	5.2
1.75	14	1.1	23	4.3
2.00	12	0.9	22	4.2
2.25	7	0.6	15	2.8
2.50	7	0.6	17	3.2
2.75	4	0.3	11	2.0
3.00	4	0.3	12	2.2
3.25	3	0.2	9	1.8
3.50	2	0.2	7	1.3
3.75	2	0.2	7	1.3
4.00	3	0.2	12	2.2
4.25	2	0.2	8	1.6
4.50	0	0.0	0	0.0
4.75	0	0.0	0	0.0

Frequency of Occurrence by Rainfall Depths



For Stormceptor Specifications and Drawings Please Visit:
<https://www.conteches.com/technical-guides/search?filter=1WBC005EYX>

Detailed Stormceptor Sizing Report – WQU-3

Project Information & Location			
Project Name	Subdivision (Leamar Drive)	Project Number	49400
City	Mashpee	State/ Province	Massachusetts
Country	United States of America	Date	2/4/2022
Designer Information		EOR Information (optional)	
Name	Todd MacDonald	Name	
Company	BSC Group	Company	
Phone #	617-896-4409	Phone #	
Email	TMacDonald@BSCGroup.com	Email	

Stormwater Treatment Recommendation

The recommended Stormceptor Model(s) which achieve or exceed the user defined water quality objective for each site within the project are listed in the below Sizing Summary table.

Site Name	WQU-3
Recommended Stormceptor Model	STC 450i
Target TSS Removal (%)	80.0
TSS Removal (%) Provided	84
PSD	Fine Distribution
Rainfall Station	HYANNIS

The recommended Stormceptor model achieves the water quality objectives based on the selected inputs, historical rainfall records and selected particle size distribution.

Stormceptor Sizing Summary	
Stormceptor Model	% TSS Removal Provided
STC 450i	84
STC 900	90
STC 1200	90
STC 1800	90
STC 2400	93
STC 3600	93
STC 4800	95
STC 6000	95
STC 7200	96
STC 11000	97
STC 13000	97
STC 16000	98

Stormceptor

The Stormceptor oil and sediment separator is sized to treat stormwater runoff by removing pollutants through gravity separation and flotation. Stormceptor's patented design generates positive TSS removal for each rainfall event, including large storms. Significant levels of pollutants such as heavy metals, free oils and nutrients are prevented from entering natural water resources and the re-suspension of previously captured sediment (scour) does not occur.

Stormceptor provides a high level of TSS removal for small frequent storm events that represent the majority of annual rainfall volume and pollutant load. Positive treatment continues for large infrequent events, however, such events have little impact on the average annual TSS removal as they represent a small percentage of the total runoff volume and pollutant load.

Design Methodology

Stormceptor is sized using PCSWMM for Stormceptor, a continuous simulation model based on US EPA SWMM. The program calculates hydrology using local historical rainfall data and specified site parameters. With US EPA SWMM's precision, every Stormceptor unit is designed to achieve a defined water quality objective. The TSS removal data presented follows US EPA guidelines to reduce the average annual TSS load. The Stormceptor's unit process for TSS removal is settling. The settling model calculates TSS removal by analyzing:

- Site parameters
- Continuous historical rainfall data, including duration, distribution, peaks & inter-event dry periods
- Particle size distribution, and associated settling velocities (Stokes Law, corrected for drag)
- TSS load
- Detention time of the system

Hydrology Analysis

PCSWMM for Stormceptor calculates annual hydrology with the US EPA SWMM and local continuous historical rainfall data. Performance calculations of Stormceptor are based on the average annual removal of TSS for the selected site parameters. The Stormceptor is engineered to capture sediment particles by treating the required average annual runoff volume, ensuring positive removal efficiency is maintained during each rainfall event, and preventing negative removal efficiency (scour). Smaller recurring storms account for the majority of rainfall events and average annual runoff volume, as observed in the historical rainfall data analyses presented in this section.

Rainfall Station

State/Province	Massachusetts	Total Number of Rainfall Events	1268
Rainfall Station Name	HYANNIS	Total Rainfall (in)	531.6
Station ID #	3821	Average Annual Rainfall (in)	33.2
Coordinates	41°24'0"N, 70°10'47"W	Total Evaporation (in)	30.1
Elevation (ft)	50	Total Infiltration (in)	10.5
Years of Rainfall Data	14	Total Rainfall that is Runoff (in)	491.0

Notes

- Stormceptor performance estimates are based on simulations using PCSWMM for Stormceptor, which uses the EPA Rainfall and Runoff modules.
- Design estimates listed are only representative of specific project requirements based on total suspended solids (TSS) removal defined by the selected PSD, and based on stable site conditions only, after construction is completed.
- For submerged applications or sites specific to spill control, please contact your local Stormceptor representative for further design assistance.

Drainage Area	
Total Area (acres)	0.42
Imperviousness %	98.0

Water Quality Objective	
TSS Removal (%)	80.0
Runoff Volume Capture (%)	
Oil Spill Capture Volume (Gal)	
Peak Conveyed Flow Rate (CFS)	
Water Quality Flow Rate (CFS)	

Up Stream Storage	
Storage (ac-ft)	Discharge (cfs)
0.000	0.000

Up Stream Flow Diversion	
Max. Flow to Stormceptor (cfs)	

Design Details	
Stormceptor Inlet Invert Elev (ft)	100.18
Stormceptor Outlet Invert Elev (ft)	100.08
Stormceptor Rim Elev (ft)	105.30
Normal Water Level Elevation (ft)	
Pipe Diameter (in)	12
Pipe Material	HDPE - plastic
Multiple Inlets (Y/N)	No
Grate Inlet (Y/N)	No

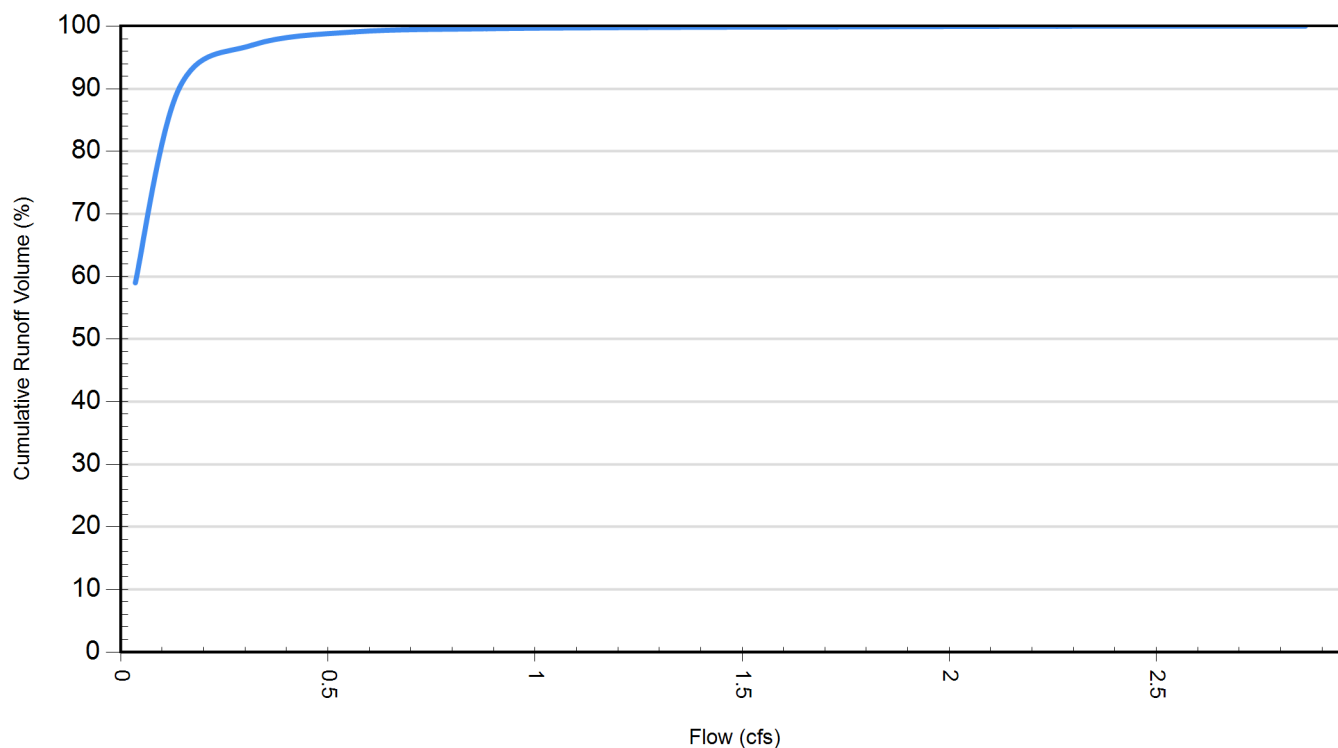
Particle Size Distribution (PSD)		
Removing the smallest fraction of particulates from runoff ensures the majority of pollutants, such as metals, hydrocarbons and nutrients are captured. The table below identifies the Particle Size Distribution (PSD) that was selected to define TSS removal for the Stormceptor design.		
Fine Distribution		
Particle Diameter (microns)	Distribution %	Specific Gravity
20.0	20.0	1.30
60.0	20.0	1.80
150.0	20.0	2.20
400.0	20.0	2.65
2000.0	20.0	2.65

Site Name		WQU-3	
Site Details			
Drainage Area		Infiltration Parameters	
Total Area (acres)	0.42	Horton's equation is used to estimate infiltration	
Imperviousness %	98.0	Max. Infiltration Rate (in/hr)	2.44
Surface Characteristics		Min. Infiltration Rate (in/hr)	0.4
Width (ft)	271.00	Decay Rate (1/sec)	0.00055
Slope %	2	Regeneration Rate (1/sec)	0.01
Impervious Depression Storage (in)	0.02	Evaporation	
Pervious Depression Storage (in)	0.2	Daily Evaporation Rate (in/day)	0.1
Impervious Manning's n	0.015	Dry Weather Flow	
Pervious Manning's n	0.25	Dry Weather Flow (cfs)	0
Maintenance Frequency		Winter Months	
Maintenance Frequency (months) >	12	Winter Infiltration	0
TSS Loading Parameters			
TSS Loading Function			
Buildup/Wash-off Parameters		TSS Availability Parameters	
Target Event Mean Conc. (EMC) mg/L		Availability Constant A	
Exponential Buildup Power		Availability Factor B	
Exponential Washoff Exponent		Availability Exponent C	
		Min. Particle Size Affected by Availability (micron)	

Cumulative Runoff Volume by Runoff Rate			
Runoff Rate (cfs)	Runoff Volume (ft³)	Volume Over (ft³)	Cumulative Runoff Volume (%)
0.035	444116	309073	59.0
0.141	678872	74328	90.1
0.318	730860	22351	97.0
0.565	746185	7025	99.1
0.883	750566	2644	99.6
1.271	752028	1183	99.8
1.730	752494	717	99.9
2.260	752970	240	100.0
2.860	753210	0	100.0

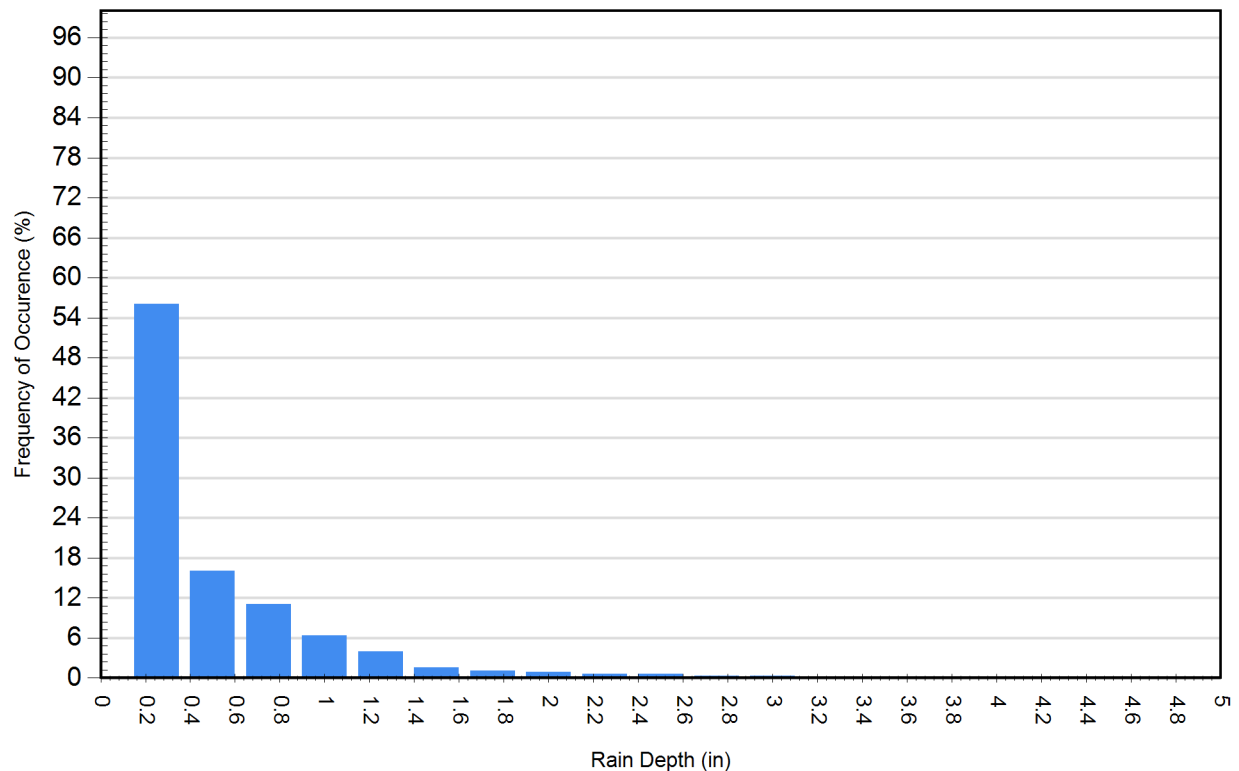
Cumulative Runoff Volume by Runoff Rate

For area: 0.42(ac), imperviousness: 98.0%, rainfall station: HYANNIS



Rainfall Event Analysis				
Rainfall Depth (in)	No. of Events	Percentage of Total Events (%)	Total Volume (in)	Percentage of Annual Volume (%)
0.25	711	56.1	71	13.4
0.50	204	16.1	74	14.0
0.75	141	11.1	88	16.5
1.00	81	6.4	72	13.5
1.25	51	4.0	57	10.7
1.50	20	1.6	28	5.2
1.75	14	1.1	23	4.3
2.00	12	0.9	22	4.2
2.25	7	0.6	15	2.8
2.50	7	0.6	17	3.2
2.75	4	0.3	11	2.0
3.00	4	0.3	12	2.2
3.25	3	0.2	9	1.8
3.50	2	0.2	7	1.3
3.75	2	0.2	7	1.3
4.00	3	0.2	12	2.2
4.25	2	0.2	8	1.6
4.50	0	0.0	0	0.0
4.75	0	0.0	0	0.0

Frequency of Occurrence by Rainfall Depths



For Stormceptor Specifications and Drawings Please Visit:
<https://www.conteches.com/technical-guides/search?filter=1WBC005EYX>

7.04 WATER QUALITY VOLUME CALCULATIONS

Water Quality Volume Calculation

$$V_{WQ} = (D_{WQ}/12 \text{ inches/foot}) * (A_{IMP} \text{ square feet})$$

V_{WQ} = Required Water Quality Volume (in cubic feet)

D_{WQ} = Water Quality Depth: **1.0-inch** used (rapid infiltration rate, greater than 2.4 inches per hour)

A_{IMP} = Total Impervious Area (in acres) used for driveways, parking, etc.

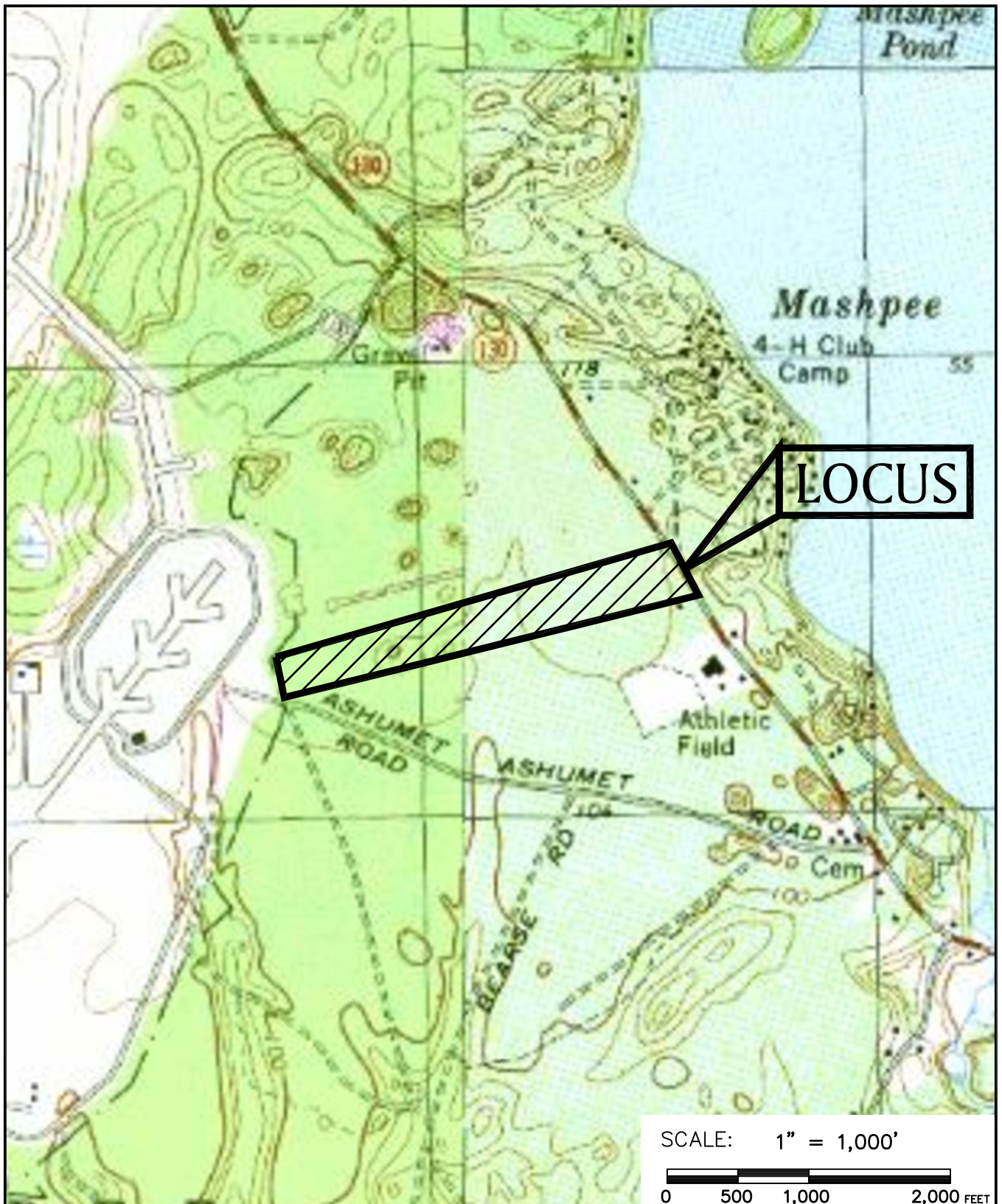
Infiltration Basins #1-#3

$$A_{IMP} = 1.292 \text{ ac}$$

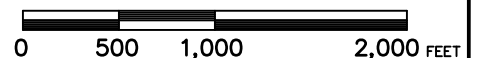
$$V_{WQ} = (1 \text{ inches}/12 \text{ inches/foot}) * (1.292 \text{ ac} \times 43,560 \text{ square feet/ac})$$

$V_{WQ} = 4,690$ cubic feet (required volume), provided volume = 31,780 cubic feet (refer to HydroCAD)

APPENDIX A
USGS LOCUS MAP



SCALE: 1" = 1,000'



PREPARED FOR:

MARCELLO MALLEGNI
80 AIRPORT ROAD
HYANNIS, MA 02601

USGS LOCUS MAP

Source:

LEAMAR DRIVE
532 MAIN STREET
(ROUTE 130)
MASHPEE, MA



349 Main Street - Route 28
West Yarmouth, Massachusetts
02673
508 778 8919

Job No.: 5-0474.00	Date: 2/9/2022
Scale: 1"=1,000'	Revised:
Dwg. No:	Figure:

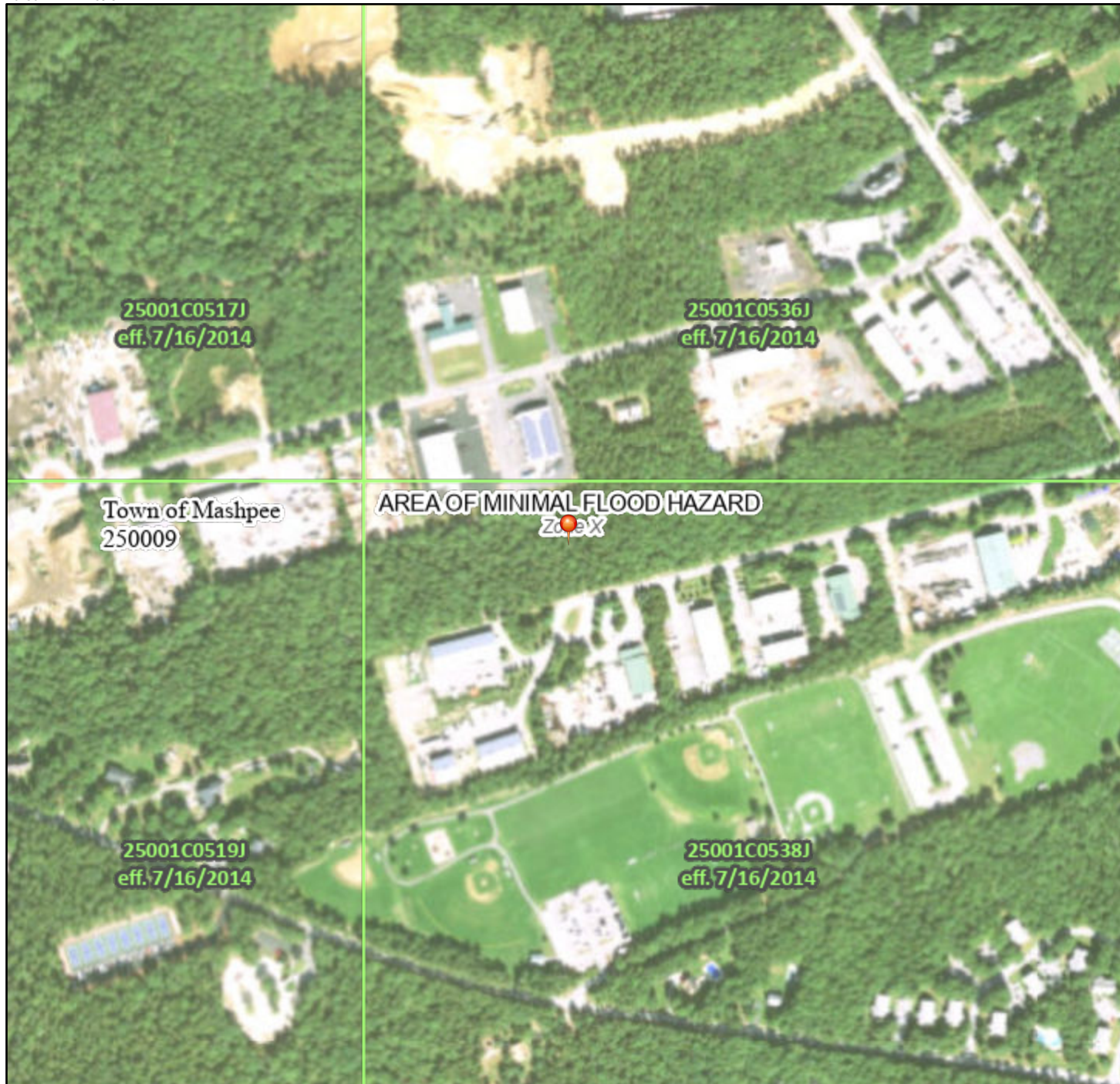
APPENDIX B

FEMA MAP

National Flood Hazard Layer FIRMette



70°30'12"W 41°39'34"N



0 250 500 1,000 1,500 2,000 Feet

1:6,000

70°29'34"W 41°39'8"N

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
GENERAL STRUCTURES		Area of Undetermined Flood Hazard Zone D
		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		Cross Sections with 1% Annual Chance Water Surface Elevation
		Water Surface Elevation
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
MAP PANELS		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature
		Digital Data Available
		No Digital Data Available
		Unmapped
		The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.



This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

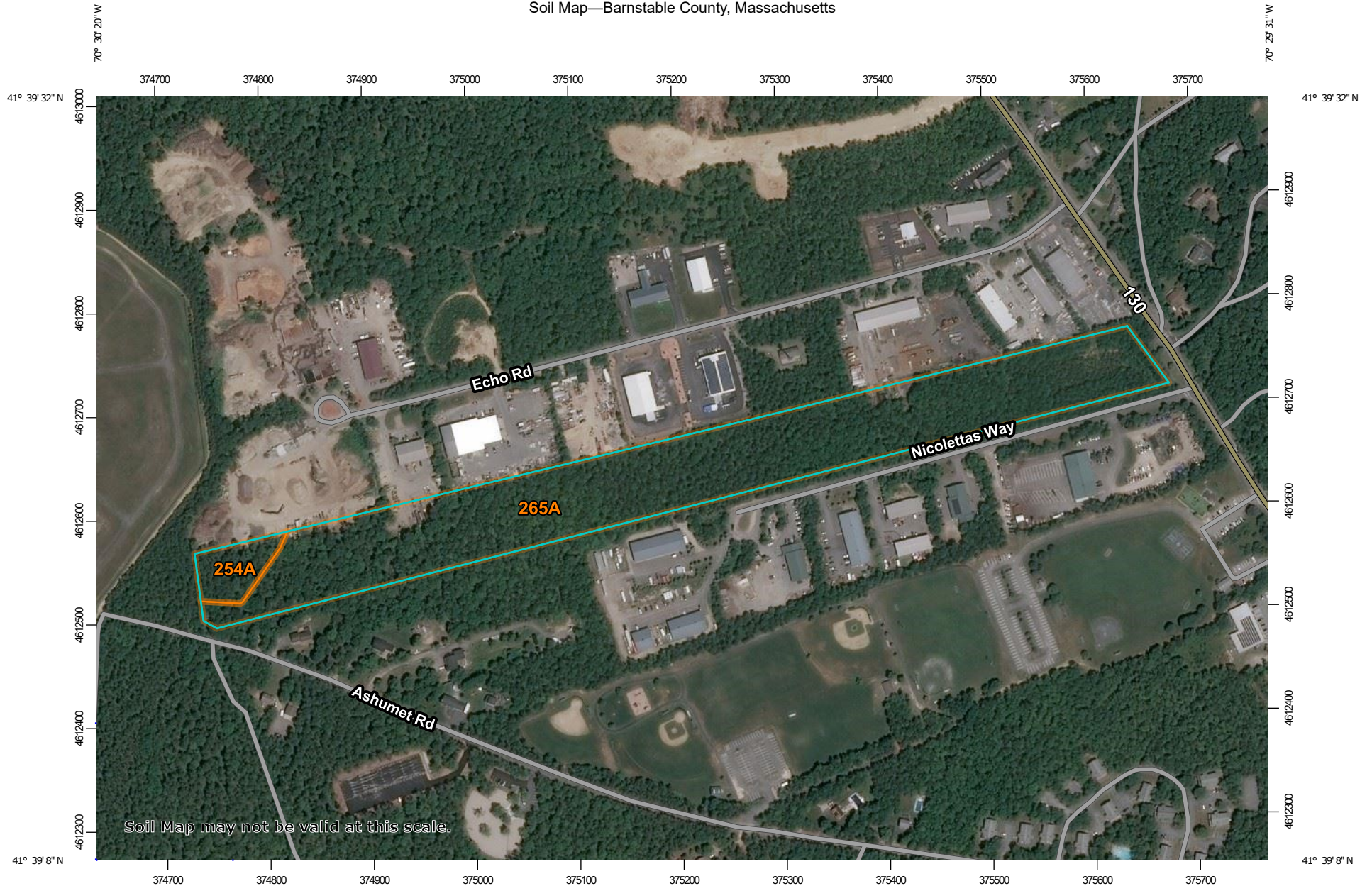
The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on **2/9/2022 at 4:27 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

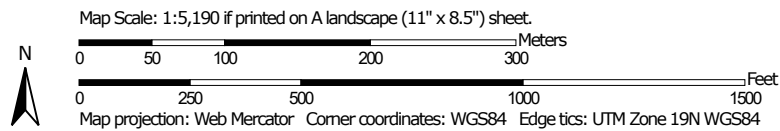
APPENDIX C

WEB SOIL SURVEY

Soil Map—Barnstable County, Massachusetts



Soil Map may not be valid at this scale.



**Natural Resources
Conservation Service**

Web Soil Survey
National Cooperative Soil Survey

2/4/2022
Page 1 of 3

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 1:25,000.

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: Barnstable County, Massachusetts

Survey Area Data: Version 18, Sep 1, 2021

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

Date(s) aerial images were photographed: Jul 10, 2018—Nov 17, 2018

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
254A	Merrimac fine sandy loam, 0 to 3 percent slopes	0.9	5.7%
265A	Enfield silt loam, 0 to 3 percent slopes	15.1	94.3%
Totals for Area of Interest		16.0	100.0%

APPENDIX D
SOIL TEST PIT LOGS



Commonwealth of Massachusetts
City/Town of

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

A. Facility Information

Owner Name

532 MAIN STREET (ROUTE 130)

26 - 6

Street Address

Map/Lot #

Mashpee

MA

02649

City

State

Zip Code

B. Site Information

1. (Check one) ☒ New Construction ☐ Upgrade ☐ Repair
2. Soil Survey Available? ☒ Yes ☐ No If yes: CA Web Soil Survey 265A
Source Soil Map Unit
- Enfield silt loam, 0-3 percent slopes Possible Group B soils
- Soil Name silty, friable loamy eolian deposits over loose
sandy glaciofluvial deposits Soil Limitations
outwash plains
Soil Parent material Landform
3. Surficial Geological Report Available? ☒ Yes ☐ No If yes: 2018 / Stone & DiGiacomo-Cohen Coarse deposits
Year Published/Source Map Unit
- Consists of gravel deposits, sand deposits, and sand+gravel deposits. ***Note: Site is located partially on USGS Maps:
Description of Geologic Map Unit: #172 Falmouth and #175 Cotuit
4. Flood Rate Insurance Map Within a regulatory floodway? ☐ Yes ☒ No
5. Within a velocity zone? ☐ Yes ☒ No
6. Within a Mapped Wetland Area? ☐ Yes ☒ No If yes, MassGIS Wetland Data Layer: N/A
Wetland Type
7. Current Water Resource Conditions (USGS): 08/06/2021 Range: ☐ Above Normal ☐ Normal ☒ Below Normal
Month/Day/ Year ***MA-SDW 253R Sandwich, MA
8. Other references reviewed: Mashpee GIS, OLIVER GIS



C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Soil Log

Additional Notes:



Commonwealth of Massachusetts
City/Town of

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: TP-2 8/6/21 8 AM Clear 80 F
 Hole # Date Time Weather Latitude Longitude:
 1. Land Use: Wooded Area Small Pines Few surface boulders 0-3
 (e.g., woodland, agricultural field, vacant lot, etc.) Vegetation Surface Stones (e.g., cobbles, stones, boulders, etc.) Slope (%)
 Description of Location: Wooded area
 2. Soil Parent Material: Coarse-silty over sandy or sandy-skeletal, mixed, mesic Typic Dystrochrepts outwash plains Summit
 Landform Position on Landscape (SU, SH, BS, FS, TS)
 3. Distances from: Open Water Body 2,500 feet Drainage Way N/A feet Wetlands 2,500 feet
 Property Line 50 feet Drinking Water Well N/A feet Other _____ feet
 4. Unsuitable
 Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock
 5. Groundwater Observed: ☐ Yes ☒ No If yes: _____ Depth Weeping from Pit _____ Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-4	A/O	SL	10YR 2/1	-	-	-	0-1	0-1	Granular	Friable	
4-15	B	LS	10YR 7/6	-	-	-	0-3	0-3	Massive	Friable	
15-32	C1	LS	10YR 7/4	-	-	-	0-3	0-3	Massive	Friable	
32-120	C2	MS	2.5Y 8/2	-	-	-	8-12	2-5	SG	Loose	
											No GW Observed

Additional Notes:



C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Soil Log

Additional Notes:

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (*minimum of two holes required at every proposed primary and reserve disposal area*)

Deep Observation Hole Number:	TP-4	8/6/21	9 AM	Clear 80 F		
	Hole #	Date	Time	Weather	Latitude	Longitude:

1. Land Use:	Wooded Area	Small Pines	Few surface boulders	Long grass
	(e.g., woodland, agricultural field, vacant lot, etc.)	Vegetation	Surface Stones (e.g., cobbles, stones, boulders, etc.)	Slope (%)

Wooded area

2.	Soil Parent Material:	Coarse-silty over sandy or sandy-skeletal, mixed, mesic Typic Dystrochrepts	outwash plains	Summit
			Landform	Position on Landscape (SU, SH, BS, FS, TS)

3. Distances from:

Open Water Body	<u>1,900</u>	feet	Drainage Way	<u>N/A</u>	feet	Wetlands	<u>1,900</u>	feet
Property Line	<u>50</u>	feet	Drinking Water Well	<u>N/A</u>	feet	Other	<u> </u>	feet

4. Unsuitable

Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: Depth Weeping from Pit Depth Standing Water in Hole

Soil Log

[illegible]

Additional Notes:



Commonwealth of Massachusetts
City/Town of

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: tp-5 8/6/21 10 AM Clear 80 F
 Hole # Date Time Weather Latitude Longitude:
 1. Land Use Wooded Area Small Pines Few surface boulders
 (e.g., woodland, agricultural field, vacant lot, etc.) Vegetation Surface Stones (e.g., cobbles, stones, boulders, etc.) Slope (%)
 Description of Location: Wooded area

2. Soil Parent Material: Coarse-silty over sandy or sandy-skeletal, mixed, mesic Typic Dystrichrepts outwash plains Summit
 Landform Position on Landscape (SU, SH, BS, FS, TS)

3. Distances from: Open Water Body 750 feet Drainage Way N/A feet Wetlands 750 feet
 Property Line 50 feet Drinking Water Well N/A feet Other _____ feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: _____ Depth Weeping from Pit _____ Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-5	A/O	SL	10YR 2/1	-	-	-	0-1	0-1	Granular	Friable	
5-9	B	LS	10YR 7/6	-	-	-	0-3	0-3	Massive	Friable	
9-32	C1	LS	10R 7/4	-	-	-	0-3	0-3	Massive	Friable	
32-120	C2	MS	2.5Y 8/2	-	-	-	8-12	2-5	SG	Loose	
											NO GW Observed

Additional Notes:



Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

D. Determination of High Groundwater Elevation

1. Method Used:

☐ Depth observed standing water in observation hole

Obs. Hole # _____

_____ inches

Obs. Hole # _____

_____ inches

☐ Depth weeping from side of observation hole

_____ inches

_____ inches

☐ Depth to soil redoximorphic features (mottles)

_____ inches

_____ inches

☐ Depth to adjusted seasonal high groundwater (S_h)
(USGS methodology)

_____ inches

_____ inches

Index Well Number _____

Reading Date _____

$$S_h = S_c - [S_r \times (OW_c - OW_{max}) / OW_r]$$

Obs. Hole/Well# _____ S_c _____ S_r _____ OW_c _____ OW_{max} _____ OW_r _____ S_h _____

2. Estimated Depth to High Groundwater: >120 inches

No GW Observed in any test hole

E. Depth of Pervious Material

1. Depth of Naturally Occurring Pervious Material

a. Does at least four feet of naturally occurring pervious material exist in all areas observed throughout the area proposed for the soil absorption system?

☒ Yes ☐ No

b. If yes, at what depth was it observed (exclude A and O Horizons)?

Upper boundary: _____

inches

Lower boundary: _____

inches

c. If no, at what depth was impervious material observed?

Upper boundary: _____

inches

Lower boundary: _____

inches



Commonwealth of Massachusetts
City/Town of

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

F. Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct soil evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.100 through 15.107.

Signature of Soil Evaluator

Todd MacDonald / SE# 14157

Typed or Printed Name of Soil Evaluator / License #

N/A

Name of Approving Authority Witness

8/6/2021

Date

6/30/2023

Expiration Date of License

N/A

Approving Authority

Note: In accordance with 310 CMR 15.018(2) this form must be submitted to the approving authority within 60 days of the date of field testing, and to the designer and the property owner with [Percolation Test Form 12](#).

Field Diagrams: Use this area for field diagrams:

See site plan for test pit locations.

APPENDIX E

NOAA ATLAS 14 PRECIPITATION DATA



NOAA Atlas 14, Volume 10, Version 3
Location name: Mashpee, Massachusetts, USA*
Latitude: 41.6566°, Longitude: -70.4958°
Elevation: 107.54 ft**
 * source: ESRI Maps
 ** source: USGS



POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orlan Wilhite

NOAA, National Weather Service, Silver Spring, Maryland

[PF tabular](#) | [PF graphical](#) | [Maps & aerals](#)

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches) ¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.284 (0.233-0.347)	0.355 (0.291-0.434)	0.471 (0.384-0.577)	0.567 (0.459-0.697)	0.700 (0.546-0.894)	0.798 (0.609-1.04)	0.904 (0.668-1.22)	1.03 (0.709-1.39)	1.22 (0.802-1.69)	1.38 (0.885-1.94)
10-min	0.403 (0.330-0.492)	0.503 (0.412-0.615)	0.667 (0.543-0.817)	0.804 (0.651-0.989)	0.992 (0.774-1.27)	1.13 (0.863-1.47)	1.28 (0.947-1.72)	1.46 (1.00-1.97)	1.73 (1.14-2.39)	1.96 (1.25-2.74)
15-min	0.474 (0.388-0.578)	0.592 (0.484-0.723)	0.785 (0.640-0.962)	0.946 (0.766-1.16)	1.17 (0.910-1.49)	1.33 (1.01-1.73)	1.51 (1.11-2.03)	1.72 (1.18-2.32)	2.03 (1.34-2.81)	2.30 (1.48-3.23)
30-min	0.685 (0.562-0.837)	0.856 (0.701-1.05)	1.14 (0.925-1.39)	1.37 (1.11-1.68)	1.69 (1.32-2.15)	1.92 (1.47-2.50)	2.18 (1.61-2.93)	2.48 (1.71-3.35)	2.94 (1.94-4.07)	3.33 (2.14-4.68)
60-min	0.897 (0.735-1.10)	1.12 (0.917-1.37)	1.49 (1.21-1.82)	1.79 (1.45-2.20)	2.21 (1.72-2.82)	2.51 (1.92-3.27)	2.85 (2.11-3.83)	3.25 (2.24-4.38)	3.85 (2.54-5.33)	4.37 (2.80-6.13)
2-hr	1.24 (1.02-1.50)	1.54 (1.27-1.87)	2.03 (1.67-2.48)	2.44 (1.99-2.98)	3.00 (2.37-3.82)	3.42 (2.63-4.42)	3.87 (2.90-5.18)	4.42 (3.07-5.91)	5.26 (3.50-7.21)	5.98 (3.88-8.32)
3-hr	1.47 (1.22-1.78)	1.82 (1.51-2.20)	2.39 (1.97-2.90)	2.86 (2.34-3.48)	3.51 (2.77-4.43)	3.99 (3.09-5.13)	4.51 (3.39-6.00)	5.14 (3.60-6.84)	6.10 (4.09-8.33)	6.93 (4.53-9.59)
6-hr	1.93 (1.61-2.31)	2.35 (1.95-2.82)	3.03 (2.51-3.64)	3.59 (2.96-4.34)	4.37 (3.48-5.48)	4.95 (3.86-6.31)	5.57 (4.22-7.33)	6.31 (4.47-8.33)	7.42 (5.04-10.0)	8.37 (5.54-11.5)
12-hr	2.43 (2.04-2.90)	2.90 (2.43-3.46)	3.67 (3.06-4.39)	4.31 (3.58-5.17)	5.19 (4.16-6.43)	5.85 (4.59-7.36)	6.55 (4.97-8.47)	7.34 (5.26-9.59)	8.48 (5.83-11.4)	9.43 (6.32-12.8)
24-hr	2.92 (2.46-3.45)	3.44 (2.90-4.08)	4.31 (3.62-5.11)	5.02 (4.19-5.98)	6.00 (4.84-7.37)	6.75 (5.32-8.40)	7.52 (5.74-9.60)	8.36 (6.06-10.8)	9.54 (6.64-12.7)	10.5 (7.12-14.1)
2-day	3.38 (2.87-3.97)	3.97 (3.37-4.67)	4.93 (4.17-5.81)	5.73 (4.82-6.78)	6.83 (5.55-8.31)	7.66 (6.10-9.46)	8.52 (6.57-10.8)	9.46 (6.93-12.1)	10.8 (7.58-14.1)	11.8 (8.11-15.7)
3-day	3.70 (3.15-4.33)	4.30 (3.67-5.05)	5.30 (4.50-6.23)	6.13 (5.17-7.22)	7.26 (5.93-8.80)	8.13 (6.50-9.98)	9.02 (6.99-11.3)	9.98 (7.36-12.7)	11.3 (8.03-14.8)	12.4 (8.58-16.4)
4-day	3.97 (3.39-4.63)	4.58 (3.92-5.36)	5.59 (4.76-6.55)	6.43 (5.44-7.55)	7.58 (6.21-9.15)	8.46 (6.79-10.3)	9.36 (7.28-11.7)	10.3 (7.66-13.1)	11.7 (8.34-15.2)	12.8 (8.88-16.9)
7-day	4.66 (4.01-5.42)	5.30 (4.55-6.16)	6.34 (5.43-7.38)	7.20 (6.13-8.41)	8.38 (6.91-10.0)	9.28 (7.50-11.3)	10.2 (7.99-12.7)	11.2 (8.37-14.1)	12.5 (9.02-16.2)	13.6 (9.54-17.8)
10-day	5.31 (4.58-6.14)	5.97 (5.15-6.91)	7.04 (6.05-8.17)	7.93 (6.78-9.24)	9.16 (7.58-10.9)	10.1 (8.19-12.2)	11.1 (8.68-13.6)	12.0 (9.06-15.1)	13.3 (9.69-17.2)	14.4 (10.2-18.7)
20-day	7.26 (6.31-8.34)	8.01 (6.95-9.21)	9.23 (7.99-10.6)	10.3 (8.83-11.9)	11.7 (9.72-13.7)	12.7 (10.4-15.2)	13.8 (10.9-16.8)	14.8 (11.3-18.5)	16.1 (11.9-20.5)	17.1 (12.3-22.1)
30-day	8.92 (7.79-10.2)	9.76 (8.51-11.2)	11.1 (9.67-12.8)	12.3 (10.6-14.1)	13.8 (11.6-16.2)	15.0 (12.3-17.8)	16.2 (12.8-19.5)	17.3 (13.3-21.4)	18.6 (13.8-23.5)	19.5 (14.1-25.0)
45-day	11.1 (9.69-12.6)	12.0 (10.5-13.7)	13.5 (11.8-15.5)	14.8 (12.9-17.0)	16.5 (13.9-19.3)	17.9 (14.8-21.1)	19.2 (15.3-23.0)	20.4 (15.8-25.1)	21.8 (16.3-27.4)	22.6 (16.5-28.9)
60-day	12.9 (11.3-14.6)	13.9 (12.2-15.8)	15.6 (13.6-17.8)	17.0 (14.8-19.4)	18.9 (15.9-21.9)	20.4 (16.9-23.9)	21.8 (17.4-25.9)	23.0 (17.9-28.2)	24.4 (18.4-30.6)	25.3 (18.6-32.2)

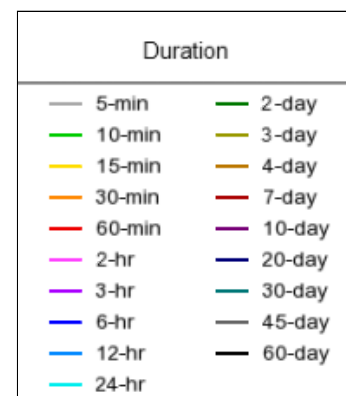
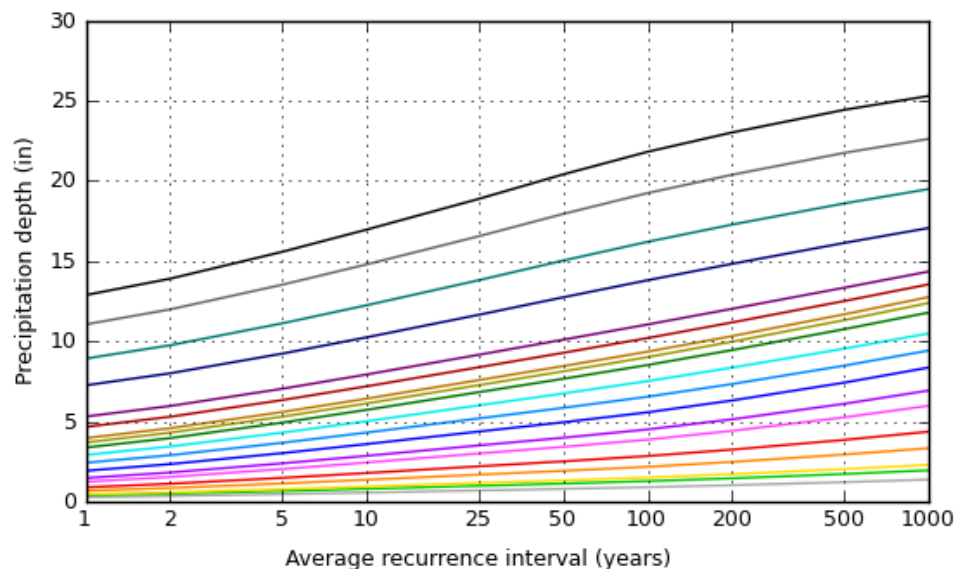
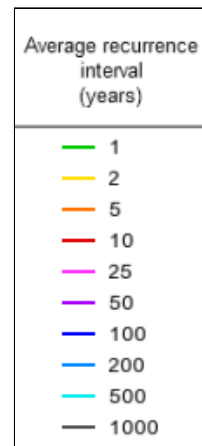
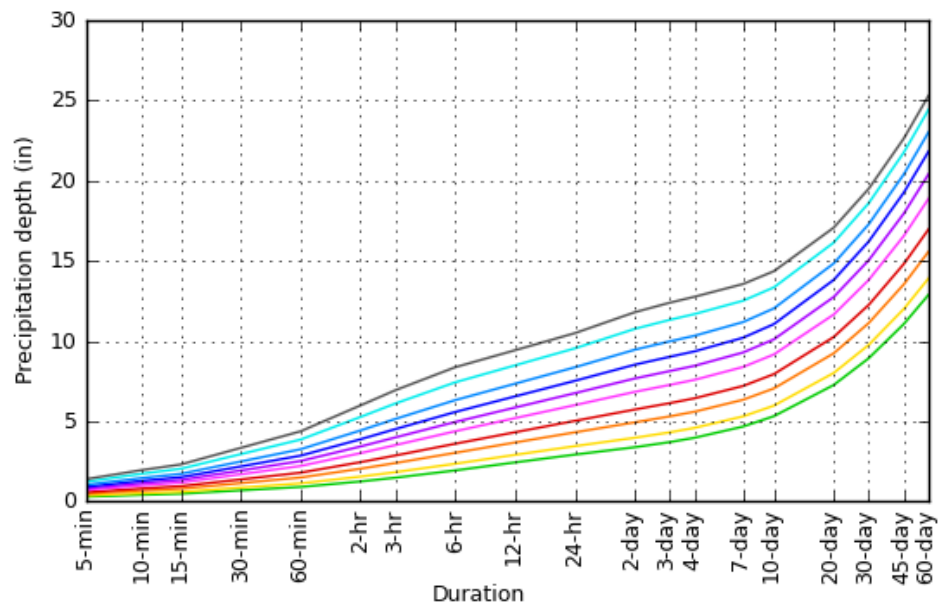
¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).
 Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.
 Please refer to NOAA Atlas 14 document for more information.

[Back to Top](#)

PF graphical

PDS-based depth-duration-frequency (DDF) curves

Latitude: 41.6566°, Longitude: -70.4958°



NOAA Atlas 14, Volume 10, Version 3

Created (GMT): Tue Mar 29 20:28:10 2022

[Back to Top](#)**Maps & arials****Small scale terrain**



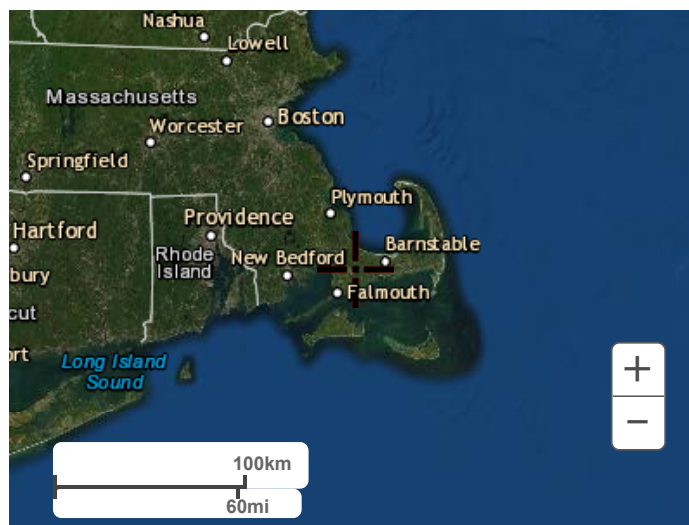
Large scale terrain



Large scale map



Large scale aerial



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[National Oceanic and Atmospheric Administration](#)
[National Weather Service](#)
[National Water Center](#)
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

[Disclaimer](#)



Town of Mashpee

Planning Board

16 Great Neck Road North
Mashpee, Massachusetts 02649

FORM C

APPLICATION FOR APPROVAL OF DEFINITIVE PLAN

Date February 17, 2022

To the Planning Board: The undersigned herewith submits the accompanying Definitive Plan of property located in Mashpee, Massachusetts, for approval as a subdivision as allowed under the requirements of the Subdivision Control Law and the Rules and Regulations Governing the Subdivision of Land of the Planning Board in the Town of Mashpee.

Name of Subdivider Marcello Mallegni Phone 508-735-8079

Address 80 Airport Road, Hyannis, MA

Owner, if different Forestdale Road, LLC, c/o Marcello Mallegni Phone same

Address same

Attach copies of (a) most recent recorded deed and (b) tax bill or Assessors' certification.

Engineer or Surveyor BSC Group, Inc. / Kieran J. Healy, PLS Phone 774-487-0298


Address 349 Route 28, Unit D, W. Yarmouth, MA 02673

Deed of property recorded in Barnstable County Registry Book 24390 Page 49

or Land Court Certificate of Title No. _____

Location and description of property

Mashpee Assessors Map(s) and Block(s) Map 26, Block 6

Signature of Owner or Authorized Representative 

MASHPEE TOWN CLERK

Attach written authorization signed by owner.

A list of names and addresses of the abutters of this subdivision, as appearing on the most recent tax list, is attached.

FEB 22 2022

RECEIVED BY: _____



Town of Mashpee

*30 Great Neck Road North
Mashpee, Massachusetts 01964*

MASHPEE PLANNING BOARD

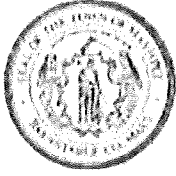
NOTICE OF DECISION

You are hereby notified that the Mashpee Planning Board has filed its decision with the Town Clerk, at the Town Hall, Mashpee, on the petition of _____ for approval of a definitive subdivision plan.

The petition has been granted with conditions as follows:

Plans may be viewed at the office of the Town Clerk. Within 20 days from the date hereon, an appeal may be taken from this decision in Superior Court.

Town Clerk, Date



Town of Mashpee

116 Great Neck Road, North
Mashpee, Massachusetts 02649

DEFINITIVE PLAN CHECKLIST

Applicant: Marcello Mallegni, Forestdale Road, LLC

Subdivision Name: Leamar Drive

Location: 532 Main street - Route 130, Mashpee

Date: February 17, 2022

- ☒ Application Form C (in triplicate).
- ☒ Submission of Required Planning Board Fees (see fee schedule):
 - Filing fee: \$20 per lot, minimum \$200
 - Review fee: \$300 + 15 per lot
 - Inspection fee: \$250 + \$.50 / linear feet of roadway
 - Re-Inspection fee: \$100 per inspection
- ☒ Copies of a) most recent recorded deed and b) tax bill or Assessor's certification.
- ☐ Submission of Covenant form/documentation.
- ☐ Form N: Notice of Filing of Plan to Town Clerk.
- ☒ Original drawing of Definitive Plan plus 6 copies, dark line on white background with perimeter dimensions of 24"x36."
- ☒ Road profiles (3 copies drawn on plan/profile paper with perimeter dimensions of 24"x36").
- ☒ Water Quality Report (3 copies) for subdivisions of 6 lots or more.
- ☐ List of all abutters within 300 feet from Mashpee Assessors, including 2 sets of mailing labels (check the abutters list to ensure all correctly identified parcels have been selected).
- ☐ Written proof of submittal to Board of Health.
- ☒ Minimum frontage.
- ☒ Minimum lot area.
- ☒ Name of owner, applicant (if different from owner), and engineer or surveyor.
- ☒ Signature and seal of Registered Civil Engineer or Registered Land Surveyor.
- ☒ North point, date, scale, legend.
- ☒ Zoning district(s) in which the subject property lies.
- ☒ Assessors reference, Map and Block numbers.
- ☒ Names and addresses of all abutters as determined from the most recent tax list.
- ☒ Existing and proposed lines of streets, ways, lots, easements, and public or common areas within the subdivision. (Lines must be indicated by bearings referred to the Massachusetts Coordinate System where control points on that system are available within 1000 feet of locus.)
- ☒ Proposed names of new streets, names of existing streets labeled public or private.
- ☒ Lot numbers, dimensions, and area, (registered land must use a numbering system approved by the Land Court).
- ☐ Proposed street (postal) numbers for each lot in accordance with the street number plans of the Town of Mashpee.
- ☒ Length and direction of streets, the length and radii, tangents, and angles of all curves, together with the width of streets and ways.
- ☒ Location of all permanent monuments properly identified as to whether existing or proposed.

- ☒ Proposed layout of storm drainage, water supply, and sewer systems, their appurtenances and all easements thereto.
- ☒ Location of all swamp, marsh, low land and other low lying areas, and where the subdivision is adjacent to or affected by tidewater, it shall show 2 foot contours with mean high water in such area.
- ☒ Title block in the lower right-hand corner of the drawing with subdivision name and title "Definitive Subdivision Plan."
- ☒ ¾ inch border.
- ☐ 3 ½ inch square reserved for use by the Registry of Deeds.
- ☐ Area reserved for Planning Board's endorsement of approval under the subdivision control law.
- ☒ Certification by plan preparer that the rules and regulations of the Registers of Deeds have been conformed to in preparing the plan.
- ☐ If applicable, lettering in a location adjacent to the Board's approval as follows:

"This plan subject to covenant dated _____ and attached hereto."

- ☒ Certification block for Mashpee Town Clerk for twenty day appeal period following plan approval.
- ☐ n/a If the plan is submitted under the cluster development exception of the Mashpee Zoning Bylaws, the formula for determining the total number of lots allowed must be shown as follows:

Total Area:		18.04 acres
Less:	Water bodies and wetlands as defined under MGL C. 131, Section 40	0
	Area of existing and proposed Streets, roadway rights-of-way or easements of 20 feet or more in width	
	Overhead utility rights-of-way or easements 20 feet or more in width	
	Total area excluded:	
Allowable Area:		
Lot Area Required:		
Number of Lots Permissible:		

- ☐ Locus map at a scale of 1 inch = 2000 feet.
- ☐ Existing and proposed contours at 2 foot intervals.
- ☐ Digital submission of plans on diskette(s) or CD.

COMMENTS



Town of Mashpee

Planning Board

16 Great Neck Road North
Mashpee, Massachusetts 02649

FORM N

NOTICE OF APPLICATION FILING WITH THE MASHPEE PLANNING BOARD

To the Mashpee Town Clerk:

This is to notify you that on February 18, 2022 an application for

 endorsement of a plan believed not to require approval

 approval of preliminary plan

X approval of definitive plan

was submitted to the Mashpee Planning Board at its public meeting by

Marcello Mallegni, Forestdale Raod, LLC, 80 Airport Road, Hyannis, MA

Applicant name

Applicant address

The land to which the application relates appears on the current Mashpee Assessors Maps

as Map 26, Parcel 6

and is generally described as located

532 Main Street-Route 130, Mashpee, MA

This notice must be submitted to the Town Clerk by delivery or by registered or certified mail, postage prepaid, along with a copy of the application and submitted plans.

Received by Planning Board on _____, 20____.

for Mashpee Planning Board



Town of Mashpee

Planning Board

16 Great Neck Road, North
Mashpee, Massachusetts 02649

FORM D COVENANT

The undersigned _____ of _____
County, Massachusetts, hereinafter called the "Covenantor," having submitted to the Mashpee Planning
Board a definitive plan of a subdivision, entitled _____
dated _____ made by _____, does hereby covenant and
agree with said Planning Board and the successors in office of said Board, pursuant to G.L. (Ter. Ed.) C. 41,
Sec. 81U, as amended, that:

1. The covenantor is the owner of record of the premises shown on said plan;
2. This covenant shall run with the land and be binding upon the executors, administrators, heirs,
assigns of the covenantor, and their successors in title to the premises shown on said plan;
3. The construction of ways and the installation of municipal services shall be provided to serve any lot
in accordance with the applicable Rules and Regulations of said Board before such lot may be built
upon or conveyed, other than by mortgage deed; provided that a mortgagee who acquires title to the
mortgaged premises by foreclosure or otherwise and any succeeding owner of the mortgaged premises
or part thereof may sell any such lot, subject only to that portion of this covenant which provides that
no lot so sold shall be built upon until such ways and services have been provided to serve such lot;
4. Nothing herein shall be deemed to prohibit a conveyance subject to this covenant by a single deed of
the entire parcel of land shown on the subdivision plan or of all lots not previously released by the
Planning Board without first providing such ways and services;
5. This covenant shall take effect upon the approval of said plan;
6. Reference to this covenant shall be entered upon such plan and this covenant shall be recorded when
said plan is recorded.

The undersigned _____
wife, husband of the covenantor hereby agree that such interest as I, we, may have in said premises shall be
subject to the provisions of this covenant and insofar as is necessary release all rights of tenancy by the
courtesy, dower, homestead and other interest therein.

EXECUTED as a sealed instrument this _____ day of _____, 20____.

COMMONWEALTH OF MASSACHUSETTS
County of Barnstable

On this _____ day of _____, 20____, before me, the undersigned notary public, personally
appeared _____, proved to me through satisfactory evidence of
identification, which were _____, to be the person whose name is signed on
the preceding or attached document, and acknowledged to me that he/she signed it voluntarily for its stated
purpose.

Notary Public, Commonwealth of Massachusetts

My Commission expires _____, 20____.

Definitive Subdivision Plan

Usually done by an Engineer. Comes back and needs public hearing. Need to write PHN and notify the following:

- People within 300 feet
- Newspaper, Mashpee Enterprise – give PHN to Terrie and Christine upstairs
- Adjacent towns' planning boards (address' below)
- Cape Cod Commission (address' below)
- Cape Cod Commission, 3225 Main Street, P.O. Box 226, Barnstable, MA 02630
- Town of Falmouth, Planning Board, 59 Town Hall Square, Falmouth, MA 02540
- Town of Bourne, Planning Board, 24 Perry Ave., Buzzards Bay, MA 02532
- Town of Sandwich, Planning Board, 16 Jan Sebastian Drive, Sandwich, MA 02563
- Town of Barnstable, Planning Board, 200 Main Street, Hyannis, MA 02601
- Phil DiMartino, Comm. of MA, Dept. of Housing and Community Dev., 100 Cambridge St., Boston, MA 02202

This plan does not meet requirements for an ANR.

Form Requirements:

- Application form
- Covenant if Subdivision
- Approval from Tax Collector
- Address from Clay
- Letter from owner authorizing power if not present
- Decision form

5 copies including Mylar –

1. Building Dept.
 2. Assessors Dept.
 3. Charlie Rowley
 4. Two for Planning
- Any Public Hearing on proposed **Zoning amendments** does **NOT** need abutters notice but gets posted and published in The Mashpee Enterprise.
 - **Definitive Subdivisions, Special Permits and Road Namings DO NEED** abutters notice.
 - All property owners within 300 feet of **Definitive Subdivisions and Special Permit** projects, as certified by the Assessors, get notice, along with posting and publication twice (with the first notice at least 14 days before the hearing) in The Mashpee Enterprise.
 - **Road Namings:** all people on road get notice, based on Assessors' certified list, along with posting and publication twice (with the first notice at least 14 days before the hearing) in The Mashpee Enterprise.
 - There is **NO** public hearing and thus no notice requirement for **Preliminary Subdivision plans** or **Approval-Not-Required (ANR) Plans**.

MARCELLO MALLEGNI
6 WOLFEN LN
SOUTHBOROUGH, MA 01772

655

53-7075/2113
01

2-22-22
Date

CHECK ARMOR
FRAUD PROTECTION

Pay to the
Order of TOWN OF MASH PEE \$ 200.00
Two hundred and 00/100 Dollars



Main Street
BANK

MARLBOROUGH, MA 01752
BankMainStreet.com

For MALLEGNI FORM C

[Signature]

Photo
Safe
Deposit
Details on back

⑆211370752⑆ 883091118⑆ 0655

MARCELLO MALLEGNI
6 WOLFEN LN
SOUTHBOROUGH, MA 01772

656

53-7075/2113
01

2-22-22
Date

CHECK ARMOR
FRAUD PROTECTION

Pay to the
Order of TOWN OF MASH PEE \$ 11.00
Eleven and 00/100 Dollars



Main Street
BANK

MARLBOROUGH, MA 01752
BankMainStreet.com

For MAILING LABELS

[Signature]

Photo
Safe
Deposit
Details on back

⑆211370752⑆ 883091118⑆ 0656

ARDEN RUSSELL
32 STURGIS LANE, MASHPEE, MA. 02649
arden.cadrin@gmail.com

May 2, 2022

Dear Mashpee Planning Board:

I am writing regarding the proposed subdivision plan at 532 Main Street which is on the May 4, 2022 Planning Board agenda.

I am abutter to this property.

When I first learned of the proposed subdivision, I was concerned about the possible curb cut onto Rte 130 but then, as I did some more research, I discovered the important environmental value of the parcel and that there are actually many additional issues that need evaluation.

532 Main Street is an 18 acre undisturbed, unfragmented forest and is therefore identified as a Significant Natural Resource Area (SNRA). Unfragmented forests are important habitats for wildlife.

This parcel is within the boundaries of the Mashpee National Wildlife Refuge.

The parcel is located in a sensitive watershed that discharges to the Mashpee River which, as we all know, is currently a degraded water body due to nutrient overload. It is also in a potential public water supply area.

This parcel abuts Route 130 - Main Street- which is a regional roadway carrying high volumes of traffic. Route 130 is gateway into the Town of Mashpee.

The Select Board has guidelines for approval of curb-cuts. Guideline # 10 States: "Do not permit curb cuts within 200 feet of an intersection". This proposal is within 150 feet of another very busy intersection.

Additionally, there are a number of residential driveways also in close proximity to the proposed curb cut and two additional intersections with heavy, industrial traffic.

This proposed curb cut will exit directly at the location where the bike path crosses from east side to west side of Rte130; this crosswalk is already, currently nearly impossible to cross safely.

For these reasons, an additional curb cut will create an unsafe situation on Mashpee's Main Street.

Policy # 10 F "recommends additional technical review by a consultant for curb cuts that will generate more than 30 vehicle trips per day"; this curb cut clearly will.

When and by whom will this consultant review be initiated? This review should be conducted and the findings considered by the Planning Board PRIOR to issuing approval of the subdivision road.

Most importantly, the Guidelines state : “A permit will be granted if the proposed work is in the best interest of the Town and its inhabitants.”. Approval of this subdivision with a curb cut onto Rte 130 is definately **not** in the community's best interest.

This property has a regulatory history that was not discussed or even mentioned at the prior meeting. In 2002, 2.7 acres of this parcel were illegally clear cut. As such, there was a Cape Cod Commission Development of Regional Impact decision; this decision required “mitigation for the impacts of clear cutting 2.7 acres of land through the preservation of 4 acres of open space”.

Based on my research, it is evident this preservation of open space was never completed!

The DRI decision states (G6A): “A Certificate of Compliance from the Cape Cod Commission shall be obtained by the applicant prior to the sale or conveyance of any lot, or prior to the issuance of any local permits”. The parcel was conveyed in February 2010 without a Certificate of Compliance.

This community cannot talk about the severity of our degraded waterways while at the same time allowing additional development that negatively impacts and exacerbates the situation. Development proposals must be reviewed in a coordinated, comprehensive way to determine if it is in the best interest of the Town rather than the best interest of the developers bank account.

The facts of this proposal clearly speak for themselves: this subdivision should not be approved.

Sincerely,

Arden Russell

Arden Russell

Sturgis Lane

523 Main Street Development Proposal

To The Planning Board Members

I am against the curb cut on 523
Main St, for this reason,

- is within 150 ft. of the existing
intersection with Nicollellas Way
- is in very close proximity to many
residential driveways
- the proposed road will exit onto
the exact location where the
bike path begins on the south
side of Route 130. have you
ever tried to cross 130 at this
location - impossible,

I have lived at 567 Main St for
at least 49 yrs. I have seen how
much traffic has become.

The bike path is used with a lot of
children on bikes, people walking
their dogs, runners,

If you put a curb cut there,
then it will be a danger to
everyone that uses the bike path.

"Please Don't" okay curb cut.

Forrest Tiexerra

523 Main Street Development Proposal

Jonathan Small <jjsmall514@gmail.com>

Mon 5/2/2022 5:53 PM

To: Evan Lehrer <ELehrer@mashpeema.gov>

WARNING! EXTERNAL EMAIL: : This message originated outside the Town of Mashpee mail system and could be **harmful** ☹. PLEASE DO NOT CLICK ON LINKS OR ATTACHMENTS unless you are absolutely certain the content is safe.

Dear Mashpee Planning Board,

I'm writing to you with significant concerns about the proposal to build a new road with curb cut on Route 130 to service nine lots to be developed at 523 Main Street. There are many complex safety, environmental and access issues to consider with this proposal. Among them:

- The proximity of the proposed curb cut to the existing intersection with Nicoletta's Way (within 150 feet).
- Why do we need to build a completely new road when the parties should/could find a way to use Nicoletta's Way instead?
- What are the implications for the existing crosswalk on the bike path/sidewalk? This would need to be relocated...to where?
- There would be too many intersections in close proximity to one another on a busy road and near the playground.
- This would become an extremely busy intersection, creating general safety concerns about confluence of traffic flow, both on the road and the bike path, and significantly increasing the traffic on Route 130 and around the neighborhood.

As an abutter to this property, I strongly urge the Board to consider all of these issues and the concerns expressed by neighbors before proceeding with this proposal.

Thank you for listening.

Jonathan Small
40 Sturgis Lane

To: Mashpee Planning Board
Town Manager: Rodney Collins
Select Board Chair: Carol Sherman

We understand there is a proposal to build a new road at or near 532 Main St with a possible curb cut onto Rte 130, for the purpose of creating nine commercial and industrial lots.

We are concerned about the proximity of this proposed road to two intersections that already get very busy, Nicoletta's Way and Echo Rd. We are very concerned for the safety of walkers, joggers, and bicycle riders who have to cross Rte 130 near there in order to continue on the bike path. With extra vehicles entering and exiting Rte 130, as this project would create, the likelihood of accidents would increase.

We live on Sturgis Ln and are very grateful for the bike path. We use it regularly along with many others who use it for exercise and to access Heritage Park, the dog park, etc. It is already challenging to cross Rte 130 at Sturgis Ln/Bakers Rd with the current amount of vehicle traffic there.

What would happen to the cross walk that is currently there? Would the bike path be extended on one side of Rte 130? Which side?

We also understand the proposed parcel of land requested for development is within the Mashpee National Wildlife Refuge, designated as a Significant Natural Resource Area, is an important habitat for wildlife and is also a potential future water supply area.

Residents of our abutting neighborhood and the town need answers and more information about all of this. There seems to be many reasons not to build a road and subdivision in this area.

Please, for safety reasons, do not give approval to the DPW to make this curb cut.

It would be a great loss to our neighborhood in particular and the many other neighborhoods and individual homeowners along the bike path from Pickerel Cove to Stratford Ponds.

Sincerely,

Donna McCuish, 22 Sturgis Ln
Michael Shelton, 10 Sturgis Ln
Gennady Konnikov, 16 Sturgis Ln.



PESCE ENGINEERING & ASSOCIATES, INC.

**43 Porter Lane
West Dennis, MA 02670**
Phone: 508-333-7630
epesce@comcast.net

March 28, 2022

Mashpee Planning Board
Attn: Mr. Evan Lehrer, Town Planner
Mashpee Town Hall
16 Great Neck Road North
Mashpee, MA 02649

RE: Engineering Review of the **Proposed Definitive Subdivision (Leamar Drive)**
Located at 532 Main Street (Rt. 130), Mashpee, MA

Dear Mr. Lehrer & Members of the Planning Board:

Pesce Engineering & Associates, Inc. is pleased to provide you this engineering review of the subject definitive subdivision to be located at 532 Main Street (Rt. 130), Mashpee, MA. We have evaluated the plans for consistency with the Town's Zoning Bylaw, the Subdivision Rules & Regulations (SR&R), and conformance with the Massachusetts Stormwater Management Regulations.

In addition to a site visit on March 15th, we have reviewed the following information to prepare this letter report:

- Site Development Plans entitled "Definitive Subdivision Plan Leamar Drive, 532 Main Street (Route 130), Mashpee, Massachusetts," prepared by the BSC Group, 8 Sheets, dated August 27, 2021, and revised February 11, 2022.
- Stormwater Report for Definitive Subdivision, 532 Main Street Route 130), Mashpee, MA 02571, prepared by the BSC Group, dated February 2022.

This project calls for the proposed construction of a new 9-lot subdivision with a subdivision road consisting of a 50' wide right of way, a 24' wide travel lane (paved), and approximately 2,035 ft. in length, including the cul-de-sac. The existing parcel is an 18.04 (+/-) acre generally rectangular strip of land between Echo Road and Nicoletta's Way, located mostly in the Commercial-3 (C3) and Light Industrial (LI) Zoning Districts, with a small portion of Lot 1 on the west side of the site located in the Residential-5 (R5) Zoning District. Note that Lot 1 is a larger lot than the other 8 lots, comprising 8.16 acres.

This parcel is also partially located within a DEP-designated Zone II of a public drinking water supply well. Additionally, it is located within the Ground Water Protection Overlay District (partially), and the Light Industrial Overlay District (partially). The project site is entirely upland area, and is not located within the 100-yr. floodplain. The proposed lots will be serviced by the municipal water system and on-site Title 5 septic systems.

The following are our review comments:

Site Plan, Layout & Utilities

We have the following site plan, layout and utilities comments:

1. We recommend that the Mashpee Fire Dept. review these plans (and provide comments to the Pl. Bd. if they haven't already) regarding the adequacy of emergency vehicle access, and the proposed number of fire hydrants and their locations.
2. From our site visit we noted that trees and brush on the north side of the intersection of the subdivision road with Main Street will need be cleared and trimmed back, in order to provide adequate safe sight distance. We recommend that a note regarding this be added to the plans.
3. We have the following water system design comments:
 - a. We recommend that the water line be added to the roadway profiles.
 - b. On the plans, the water line appears to terminate near DMH-5 before the cul-de-sac. We recommend that this design be revised to show the water main continuing through to the west side of the cul-de-sac (to service this large lot), and possibly ending with another fire hydrant to allow for periodic flushing.
 - c. We recommend that the applicant's engineer discuss with the Mashpee Water District the possibility of connecting to the water main on either Echo Road or Nicoletta's Way. We note that hydrant at the end of Nicoletta's Way is located near the lot line between Lots 2 & 3 at the south end of these lots.

This will allow the water main to be "looped" to provide at least 2 benefits: 1) Improved water quality by looping/connecting the water mains, and 2) Providing an alternate water source for the subdivision in the event of a water main break or other problem.
4. We recommend the construction details shown on sheet 7 of 8 for the "Typical Roadway Pavement Section", "Modified Cape Cod Berm", and "Hot Mix Asphalt Pavement Sections" show the required design thickness of the compacted gravel borrow base.
5. We recommend that a detail for the proposed street light and lamp post be added to the plans. This street light should be downward facing, and have grill guards or shields to provide a 90-degree vertical cut off in order to be "Dark Sky" compliant.

Stormwater Management

This project proposes to mitigate post-development runoff via the use of a new stormwater management system. The runoff from the subdivision road will be collected into several pairs of deep-sump catch basins (with outlet hoods), piped to drain manholes, which discharge to Stormceptor® treatment units to remove additional Total Suspended Solids (TSS) required in a Zone II (Mass. Stormwater Handbook, Standard #6, treatment before infiltration for stormwater discharges within a Zone II), which is then piped to 3 stormwater infiltration basins. These infiltration basins have been sized to accommodate the road runoff from the 100-yr. storm event.

We have the following stormwater management comments:

1. We recommend that the applicant's engineer consider using the design rainfall data based on the NOAA Atlas 14, Volume 10, Version 3 precipitation data. This database is now widely used by many municipalities, as this database reflects precipitation estimates that reflect the latest climate change statistics (for example the 24-hr., 100-yr. storm event for Mashpee, MA is 7.51 inches vs. the 7.10 inches used in the design).
2. The proposed contours for the infiltration basins on the plans need to be labeled for clarity during construction.
3. There is an existing culvert and concrete headwall for a drainage pipe crossing Rt. 130 at the northern end of the site. We recommend that the Erosion & Sediment Control Plan (sheet 5 of 8) show appropriate erosion controls at this inlet for the construction period.
4. We have the following comments regarding the Long-Term Pollution Prevention & Operation and Maintenance Plan (Section 5.0):
 - a. Add page numbers for ease in referencing in the future.
 - b. The "Maintenance Responsibility" section mentions the "Applicant." We recommend that this be changed to "Owner/Applicant/Homeowners Association" in case there is a transfer of ownership in the future, or if a homeowner's association is created.
 - c. Add a line for a name, date, and signature by the Owner/Applicant/Homeowners Association. This will ensure that the owner/applicant/HOA is aware of and understands the recommended maintenance and inspections that will be required in the future.
 - d. The list of emergency contacts is currently blank. We recommend that this list be populated, and a revised Long-Term Pollution Prevention & Operation and Maintenance Plan be provided to the Board prior to the start of construction (at the Board's discretion, this may be added as a Condition in the Decision).

Thank you for this opportunity to assist the Planning Board in their review of this project, and as always, please call or e-mail me if you have any questions or comments.

Sincerely,

PESCE ENGINEERING & ASSOCIATES, INC.



Edward L. Pesce., P.E., LEED ® AP
Principal

cc: Kieran J. Healy, PLS, CFM, BSC Group

MEMORANDUM

To: Mashpee Planning Board
From: Evan Lehrer, Town Planner
Date: May 2, 2022
Re: Zoning and other regulatory considerations for Leamar Drive Definitive

Distance between Echo Road and Nicoletta's Way

Provided: 253.3' (Proposed to Nicoletta's)

Subdivision Rules and Regulations:

There shall not be less than 100' between the centerlines of any roadways (Street Design Standards: Plate #1)

Zoning Bylaw:

174-40 Accessways in Non-Residential Districts:

In the C-1, C-2, C-3 and I-1 zoning districts, **there shall be required a minimum separation of two hundred (200') feet between the centerline of any accessway to Routes 28, 151 or 130 or to Great Neck Road North and any other such accessway or to the sideline of any street intersecting said roadways.** Said minimum separation shall also be maintained between any accessway to a street intersecting said roadways and the sideline of said roadways.

Curb Cut Permit Policy

A curb cut permit for a project that generates more than 30 vehicle trips per day may require additional technical review beyond that which the DPW Director normally provides. The technical consultant will review the application and propose potential mitigating measures.

Local Comprehensive Plan

Requires project proponents to demonstrate, prior to any approvals before the Board, that there will be no degradation of traffic safety prior to the issuance of any approvals or permits.

Further, it requires that proponents demonstrate that the development will not degrade travel times, level of service, intersection delay, volume to capacity ratio, reserve capacity, or any other performance indicators for surrounding roadways.

Prohibits the development of new driveway curb-cuts on major roadways except where no feasible alternative site access is possible.

Cape Cod Commission DRI (2004)

Condition G6 in the Decision reads: "A Certificate of Compliance from the Cape Cod Commission shall be obtained by the Applicant prior to the sale or conveyance of any lot, or ***prior to the issuance of any local permits or any development as defined by the Cape Cod Commission Act, within the 18 acre property*** as described on the plans entitled "Site Sketch Plan, prepared by Coastal Engineering, Inc, dated July 3, 2003 and revised July 21, 2004" or on a subsequent Definitive Plan as approved and endorsed by the Town of Mashpee Planning Board. The restoration landscaping as described under Conditions CC1, CC2, and CC3 and the division of land for proposed open space as described in Condition NR1 are exempt from this Condition."

There are several conditions in the Decision that must be met before the Applicant may obtain a Certificate of Compliance, including the open space contribution.

In terms on the expiration of the Decision, while the development rights under DRI Decisions expire after seven years, the Decision runs with the land and any conditions or restrictions remain in force.

Recommendation:

In consideration of the above cited applicable rules and regulations pertaining to the proposed Learmar Drive the Board should consider the balance between the proponent's right to access the property and right to a curb-cut if no feasible alternative is present.

The minimum distance between Nicoletta's Way and to Echo Road are both compliant with the Mashpee Zoning Bylaw and Subdivision Rules and Regulations however the Comprehensive Plan (1998) discourages new curb cuts on major roadways if alternate site access is feasible.

The best case scenario in terms of mitigating anticipated transportation impacts is access from Nicoletta's Way.

If rights to Nicoletta's Way are not able to be negotiated for access then the Board could consider a traffic study consistent with the suggestions of the LCP and in the Selectmen's curb-cut policy to ascertain, in consideration of the uses common to the district, the peak hour traffic impacts prior to approval.

If the findings of that study demonstrate that the proposed street will not degrade travel times, level of service, intersection delay, volume to capacity ratio, reserve capacity, or any other performance indicators for surrounding roadways nor creates unsafe traffic conditions then the Board could consider approving as proposed.

If the findings adverse, the Board could consider denying the proponent's request to subdivide, but should be cognizant of the likelihood of appeal. Given the property owner's right to access the property,

the Town could consider taking the layout of Nicoletta's Way to avoid the potential transportation impacts the proposed road may cause and while providing access to the lot.

In closing, the Board also needs to consider how to manage the required 4-acre open space contribution as required by the 2004 DRI decision. While the decision is expired, the conditions and restrictions established in that document run with the land. The applicant ought to confer with the Conservation Agent on the most appropriate mechanism to handle that transfer.

Natural Resource Protection and Housing Priority Areas in

MASHPEE

Acknowledging Cape Cod faces serious challenges in providing sufficient housing for its citizens as well as ensuring the protection of its remaining natural resource areas, including the region's water resources, the Association to Preserve Cape Cod (APCC) and Housing Assistance Corporation (HAC) undertook a mapping project to encourage local land use policy discussions to be more productive in addressing the housing crisis and regional environmental challenges.

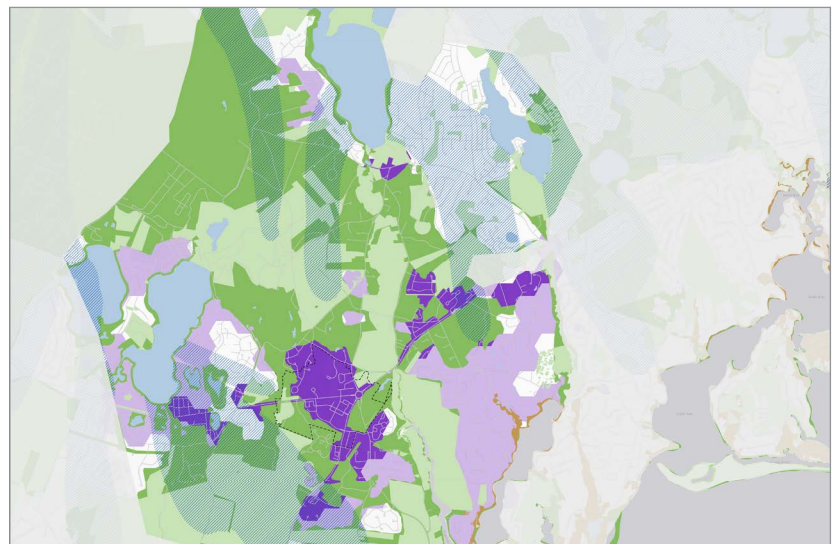
The project supports three goals: highlighting the role of wastewater infrastructure development in helping to improve water quality, fostering housing density and affordability in priority housing areas, and protecting the most critical lands for habitat and other natural resources.



How Maps Were Created and How to Use Them:

By agreeing in advance on the criteria, the project used the best available data and GIS technology to identify priority areas for natural resource protection and priority areas for moderate-density housing that year-rounders can afford. The objective of this mapping project is to focus proactive attention on these identified priority areas. The maps are intended as a discussion and planning tool.

- To identify high priority areas for housing, a set of criteria was created and applied to each of the 15 towns across the Cape. Areas identified as high priority for natural resource protection are consistent with the 2018 Cape Cod Regional Policy Plan's criteria for Natural Areas Placetypes and utilize existing state GIS mapping of natural resource areas.
- Priority natural resources areas, which include critical landscape and habitat areas, Zone II Wellhead Protection Areas for drinking water, wetlands and 100-ft. wetland buffers, vernal pools and 350-ft. vernal pool buffers, permanently protected open space, and FEMA flood zones, are identified for conservation and additional protections.
- Purple areas identify high priority and medium priority areas for moderate-density housing that is affordable and attainable to our year-round population.
- White areas did not rate as high priority for housing or natural resource protection based on the project's criteria for either purpose. The project recognizes that there may be local strategies for natural resource protection and housing in these areas.
- The maps do not provide parcel-specific analysis, but rather focus on larger areas that would be relevant to zoning, regulations, infrastructure and other planning and policy discussions. The maps are not intended to replace the need for appropriate evaluation at the parcel level.

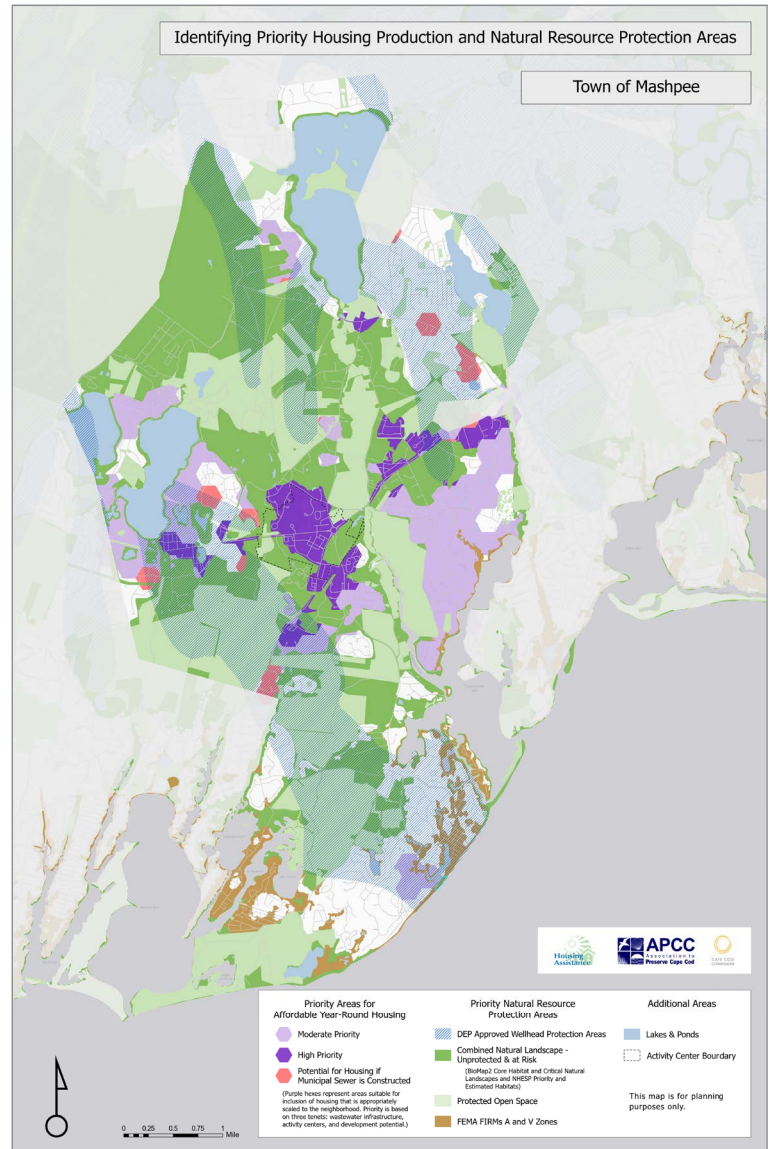
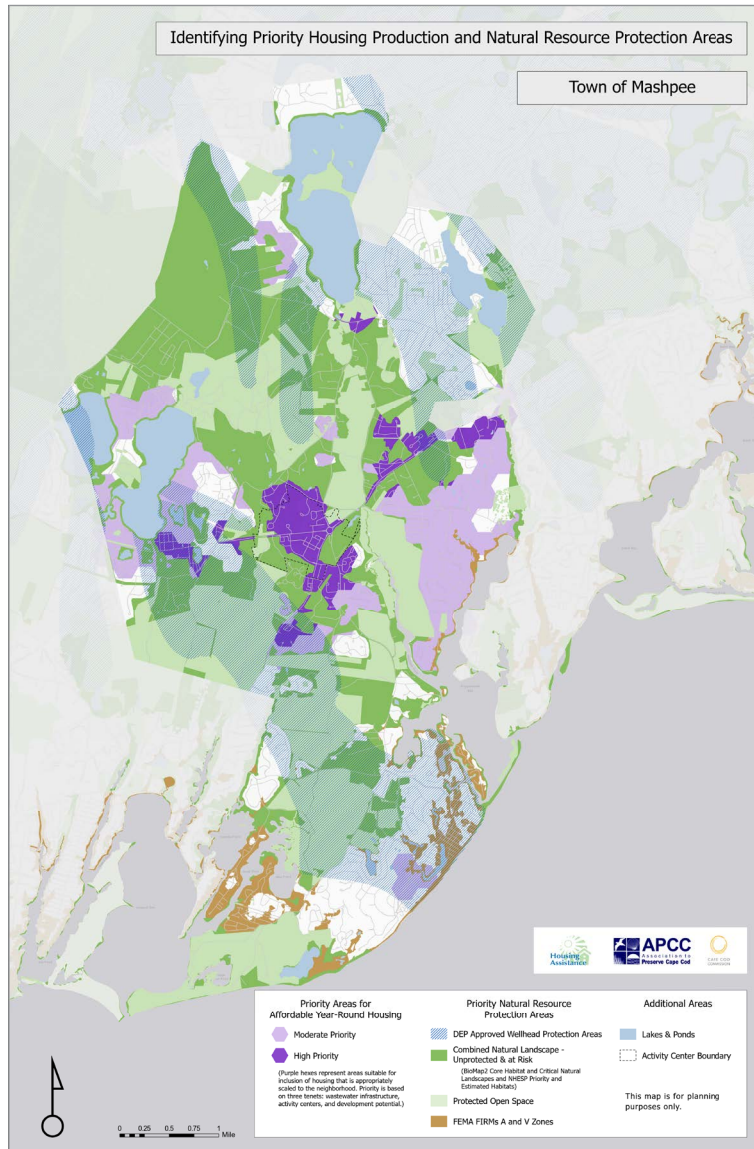


RECOMMENDED ACTIONS:

- 1 Prioritize spending and available funding sources to leverage resources that will be beneficial for housing, wastewater infrastructure development and natural resource protection.
- 2 Direct investments and local planning initiatives toward land identified in priority natural resource areas and priority housing areas by focusing efforts on acquisitions, regulatory requirements and other land use policy decisions for this dual objective.
- 3 Target housing production within identified housing areas and natural resource protection efforts in identified natural resource areas.
- 4 Rezone land within identified priority natural resource areas to reduce development potential and sprawl.
- 5 Rezone identified priority areas for housing to simplify and streamline the development of multi-family housing opportunities that are affordable and attainable to our year-round population.
- 6 Invest in wastewater infrastructure, which improves the affordability of housing construction and benefits water quality significantly.

Natural Resource Protection and Housing Priority Areas in

MASHPEE



A project by the Association to Preserve Cape Cod (APCC) and the Housing Assistance Corporation (HAC). Funding for the project is provided by Barnstable County and its Economic Development Council License Plate Grant Program through the Cape Cod Commission.

Learn More: GrowSmartCapeCod.org

Town of Sandwich
THE OLDEST TOWN ON CAPE COD



Board of Appeals

16 Jan Sebastian Drive
Sandwich, MA 02563
Phone: 508-833-8001
Fax: 508-833-8006
E-mail: planning@sandwichmass.org

**Special Permit
Certificate of Approval**

Petition #	22-10
Current Property Owner(s):	Alberto and Patricia Dimascio
Applicant:	Alberto and Patricia Dimascio
Property Address:	18 State Street
Map, Parcel	82-97

TOWN CLERK
TOWN OF SANDWICH

MAY 04 2022

10 H 04 M AM
RECEIVED & RECORDED

On April 26, 2022, the Board of Appeals voted to approve a special permit from Sections 1330, 2420, 2430 & 4350 of the Sandwich Zoning By-law for property located at 18 State Street as shown on Assessor's Map 82, Parcel 97, for the purpose of reconstructing a non-conforming structure in the flood zone.

The Board of Appeals certifies that the decision attached hereto is a true and correct copy of its decision to approve a special permit and that copies of said decision, and of all plans referred to in the decision, have been filed with the Board of Appeals and the Town Clerk.

The Board of Appeals also calls to the attention of the owner or applicant that General Laws, Chapter 40A, Section 11 provides that no special permit, or any extension, modification or renewal thereof, shall take effect until a copy of the decision bearing the certification of the town clerk that twenty days have elapsed after the decision has been filed in the office of the town clerk and no appeal has been filed or that, if such appeal has been filed, that it has been dismissed or denied, is recorded in the registry of deeds for the county and district in which the land is located and indexed in the grantor index under the name of the owner of record or is recorded and noted on the owner's certificate of title. The owner or applicant shall pay the fee for such recording or registering. A copy of that registered decision shall be returned to the Planning & Development office as proof of filing.

Any person aggrieved by this decision may appeal to the Superior Court or Land Court as in Section 17 of Chapter 40A, M.G.L. by filing a NOTICE OF ACTION AND COMPLAINT with the Town Clerk within twenty (20) days of the date of filing of this decision.



Board of Appeals Member

5/3/22

Date

PROCEDURAL HISTORY

1. Application from sections 1330, 2420, 2430 & 4350 of the Zoning By-Law for property located at 18 State Street was filed on April 1, 2022.
2. After proper notice was given, the public hearing was opened on April 26, 2022 and closed on April 26, 2022.
3. The application was accompanied by a Site Plan entitled:
Proposed Septic System/Site Plan
18 State Street Sandwich MA
Prepared Alberto Dimascio
Dated: November 20, 2021 and revised 03/31/2022
4. The Board reviewed the application and all other materials submitted prior to the close of the public hearing. The Board received and gave due consideration to the testimony given at the public hearing.
5. The following members attended the public hearing:

Erik Van Buskirk
James Killion
Christopher Neeven
Robert Jensen
Chase Terrio
Mary Foley

FINDINGS

The Zoning Board of Appeals finds that:

1. The Board of Appeals finds that this application meets the requirements of Section 9, M.G.L. Chapter 40A.
2. Subject property is located within the R1 Zoning District and the Floodplain Overlay District.
3. Applicant proposes to reconstruct a non-conforming 3 bedroom single family dwelling.
4. The board has previously determined that 16-22 State Street has merged for zoning purposes, see special permit #17-13.
5. The board authorized the construction of 2 single-family homes on 20 and 22 State Street with one existing dwelling on 18 State Street in 2017.
6. The State Street Condominium was created on April 30, 2020
7. On May 11, 2021, the Building Commissioner issued a "Notice to Demolish or Secure". On May 26, 2021, the house was demolished.
8. The lot is located in the FEMA ZONE AE elevation 13.
9. The applicant is proposing to re-site the house so that it is more conforming to current setbacks.
10. The reconstruction of the non-conforming structure is not substantially more detrimental to the neighborhood than the existing nonconforming structure.
11. Section 1330 requirements:

- a) The Board of Appeals does not find that there are conditions peculiar to this case but not generally true for similar permitted uses on other sites in the same district;
- b) The Board of Appeals finds that nuisance, hazard or congestion will not be created;
- c) The Board of Appeals finds that there will not be substantial harm to the neighborhood;
- d) The Board of Appeals finds that there is no derogation from the intent of the bylaw such that the districts' objectives will be satisfied.

12. Section 4350 (2) requirements:

- a) The Board of Appeals finds that susceptibility of the proposed facility and the contents to flood damage and the effect of such damage upon the site and surrounding property is minimal.
- b) The Board of Appeals finds that there are not alternative locations for the proposed use which are not subject to flooding or erosion.
- c) The Board of Appeals finds necessity to the facility of a waterfront location.
- d) Board of Appeals finds that the relief requested is the minimum necessary.

13. No floor level will be below Base Flood Elevation.

14. No changes to the existing grade are proposed.

15. The Board finds that the necessity of the demolition prevented the existing special permit from being exercised.

Motion: I, James Killion, move to adopt these findings as the findings of the Board of Appeals.

Second: Robert Jensen

Vote:	Erik Van Buskirk	Yes
	James Killion	Yes
	Christopher Neeven	Yes
	Robert Jensen	Yes
	Chase Terrio	Yes

CONDITIONS:

At the public hearing, the Board of Appeals considered potential conditions of approval for the special permit. The Board of Appeals voted that the following conditions of approval shall be imposed upon any approval of a special permit and that these conditions are reasonable and that the applicant and its successor-in-interest shall be bound by these conditions:

- 1. Failure to comply with all the conditions set forth in this decision shall terminate the grant of this special permit.

2. Pursuant to the requirements of Sandwich Protective Zoning By-law Section 1330, the grant of special permit shall expire upon:
 - a) Transfer of ownership, prior to initiation of substantial construction on or occupancy of the site unless such transfer is authorized in this permit, or
 - b) If no substantial construction or occupancy takes place within (3) three years of special permit approval, excluding such time required to pursue or await the determination of an appeal referred to in MGL C 40A, Section 17.
3. The special permit shall not take effect until it is recorded at the Barnstable County Registry of Deeds and a copy of the recorded special permit is provided to the Board of Appeals.
4. Erosion controls must be in place prior to construction and maintained throughout.
5. All conditions set forth in special permit #17-13 are still in effect.
6. Applicant shall submit an engineered drainage plan with the building permit application.

Motion: I, James Killion, move to impose the above conditions of approval upon any approval of the special permit.

Second: Robert Jensen

Vote:	Erik Van Buskirk	Yes
	James Killion	Yes
	Christopher Neeven	Yes
	Robert Jensen	Yes
	Chase Terrio	Yes

DECISION:

After reviewing the application, the plan and other materials submitted and after giving due consideration to testimony given at the public hearing, the Board hereby approves the special permit application for property located at 18 State Street as shown on Assessor's Map 82, Parcel 97, for the purpose of reconstructing a non-conforming structure in the flood zone.

Motion: I, James Killion, move to approve the special permit application.

Second: Robert Jensen

Vote:	Erik Van Buskirk	Yes
	James Killion	Yes
	Christopher Neeven	Yes
	Robert Jensen	Yes
	Chase Terrio	Yes

Town of Sandwich
THE OLDEST TOWN ON CAPE COD



Board of Appeals

16 Jan Sebastian Drive
Sandwich, MA 02563
Phone: 508-833-8001
Fax: 508-833-8006
E-mail: planning@sandwichmass.org

**Special Permit
Certificate of Approval**

Petition #	22-09
Current Property Owner(s):	John and Shannon Creedon
Applicant:	John and Shannon Creedon
Property Address:	196 North Shore Boulevard
Map, Parcel	71-49

TOWN CLERK
TOWN OF SANDWICH

MAY 04 2022

10 H 01 M A M
RECEIVED & RECORDED

On April 26, 2022, the Board of Appeals voted to approve a special permit from Sections 1330, 2420 & 4350 of the Sandwich Zoning By-law for property located at 196 North Shore Boulevard as shown on Assessor's Map 71, Parcel 49, for the purpose of demolishing and reconstructing a non-conforming structure in the flood zone.

The Board of Appeals certifies that the decision attached hereto is a true and correct copy of its decision to approve a special permit and that copies of said decision, and of all plans referred to in the decision, have been filed with the Board of Appeals and the Town Clerk.

The Board of Appeals also calls to the attention of the owner or applicant that General Laws, Chapter 40A, Section 11 provides that no special permit, or any extension, modification or renewal thereof, shall take effect until a copy of the decision bearing the certification of the town clerk that twenty days have elapsed after the decision has been filed in the office of the town clerk and no appeal has been filed or that, if such appeal has been filed, that it has been dismissed or denied, is recorded in the registry of deeds for the county and district in which the land is located and indexed in the grantor index under the name of the owner of record or is recorded and noted on the owner's certificate of title. The owner or applicant shall pay the fee for such recording or registering. A copy of that registered decision shall be returned to the Planning & Development office as proof of filing.

Any person aggrieved by this decision may appeal to the Superior Court or Land Court as in Section 17 of Chapter 40A, M.G.L. by filing a NOTICE OF ACTION AND COMPLAINT with the Town Clerk within twenty (20) days of the date of filing of this decision.

Board of Appeals Member

5/3/22

Date

PROCEDURAL HISTORY

1. Application from sections 1330, 2420 & 4350 of the Zoning By-Law for property located at 196 North Shore Boulevard was filed on April 1, 2022.
2. After proper notice was given the public hearing was opened on April 26, 2022 and closed on April 26, 2022.
3. The application was accompanied by a Site Plan entitled:
Proposed Conditions Plan of Land in
Sandwich MA
Prepared for John W.S. Creedon Jr. & Shannon L.F. Creedon
#196 North Shore Boulevard
Dated: August 19, 2021 and revised 02/23/2022
4. The Board reviewed the application and all other materials submitted prior to the close of the public hearing. The Board received and gave due consideration to the testimony given at the public hearing.
5. The following members attended the public hearing:

Erik Van Buskirk
James Killion
Christopher Neeven
Robert Jensen
Chase Terrio
Mary Foley

FINDINGS

The Zoning Board of Appeals finds that:

1. The Board of Appeals finds that this application meets the requirements of Section 9, M.G.L. Chapter 40A.
2. Subject property is located within the Shore Zoning District and the Floodplain Overlay District.
3. Applicant proposes to raze and reconstruct a non-conforming 3 bedroom single family dwelling.
4. The lot is located in the FEMA ZONE AE elevation 14.
5. The proposed addition does not increase the non-conforming nature of the structure by over 30%. The increase is approximately 14%.
6. The applicant is proposing to improve the existing non-conforming front yard setback; 21.6 feet to be improved to 22 feet.
7. The reconstruction of a non-conforming structure is not substantially more detrimental to the neighborhood than the existing nonconforming structure.
8. Section 1330 requirements:
 - a) The Board of Appeals does not find that there are conditions peculiar to this case but not generally true for similar permitted uses on other sites in the same district;

- b) The Board of Appeals finds that nuisance, hazard or congestion will not be created;
- c) The Board of Appeals finds that there will not be substantial harm to the neighborhood;
- d) The Board of Appeals finds that there is no derogation from the intent of the bylaw such that the districts' objectives will be satisfied.

9. Section 4350 (2) requirements:

- a) The Board of Appeals finds that susceptibility of the proposed facility and the contents to flood damage and the effect of such damage upon the site and surrounding property is minimal.
 - b) The Board of Appeals finds that there are not alternative locations for the proposed use which are not subject to flooding or erosion.
 - c) The Board of Appeals finds necessity to the facility of a waterfront location.
 - d) Board of Appeals finds that the relief requested is the minimum necessary.
10. No floor level will be below Base Flood Elevation.
11. The applicant is bringing 1,629 cubic yards of fill on site.
12. No changes to the existing grade are proposed.
13. Applicant states there shall be no increase in the number of bedrooms.

Motion: I, James Killion, move to adopt these findings as the findings of the Board of Appeals.

Second: Robert Jensen

Vote:	Erik Van Buskirk	Yes
	James Killion	Yes
	Christopher Neeven	Yes
	Robert Jensen	Yes
	Mary Foley	Yes

CONDITIONS:

At the public hearing, the Board of Appeals considered potential conditions of approval for the special permit. The Board of Appeals voted that the following conditions of approval shall be imposed upon any approval of a special permit and that these conditions are reasonable and that the applicant and its successor-in-interest shall be bound by these conditions:

- 1. Failure to comply with all the conditions set forth in this decision shall terminate the grant of this special permit.
- 2. Pursuant to the requirements of Sandwich Protective Zoning By-law Section 1330, the grant of special permit shall expire upon:
 - a) Transfer of ownership, prior to initiation of substantial construction on or occupancy of the site unless such transfer is authorized in this permit, or

- b) If no substantial construction or occupancy takes place within (3) three years of special permit approval, excluding such time required to pursue or await the determination of an appeal referred to in MGL C 40A, Section 17.
- 3. The special permit shall not take effect until it is recorded at the Barnstable County Registry of Deeds and a copy of the recorded special permit is provided to the Board of Appeals.
- 4. Erosion controls must be in place prior to construction and maintained throughout.

Motion: I, James Killion, move to impose the above conditions of approval upon any approval of the special permit.

Second: Robert Jensen

Vote:	Erik Van Buskirk	Yes
	James Killion	Yes
	Christopher Neeven	Yes
	Robert Jensen	Yes
	Mary Foley	Yes

DECISION:

After reviewing the application, the plan and other materials submitted and after giving due consideration to testimony given at the public hearing, the Board hereby approves the special permit application for property located at 196 North Shore Boulevard as shown on Assessor's Map 71, Parcel 49, for the purpose of demolishing and reconstructing a pre-existing non-conforming structure in the flood zone.

Motion: I, James Killion, move to approve the special permit application.

Second: Robert Jensen

Vote:	Erik Van Buskirk	Yes
	James Killion	Yes
	Christopher Neeven	Yes
	Robert Jensen	Yes
	Mary Foley	Yes

Town of Sandwich
THE OLDEST TOWN ON CAPE COD



Board of Appeals

16 Jan Sebastian Drive
Sandwich, MA 02563
Phone: 508-833-8001
Fax: 508-833-8006
E-mail: planning@sandwichmass.org

**Special Permit
Certificate of Approval**

Petition # 22-11
Current Property Owner(s): Ryan & Amanda Conlon
Applicant: Ryan & Amanda Conlon
Property Address: 258 Phillips Road
Map, Parcel 96-60

TOWN CLERK
TOWN OF SANDWICH

MAY 04 2022


LOH 61M A-MG
RECEIVED & RECORDED

On April 26, 2022, the Board of Appeals voted to approve a special permit from Sections 1330 & 4340 of the Sandwich Zoning By-law for property located at 258 Phillips Road, as shown on Assessor's Map 96, Parcel 60, for the purpose of constructing an addition in the flood zone.

The Board of Appeals certifies that the decision attached hereto is a true and correct copy of its decision to approve a special permit and that copies of said decision, and of all plans referred to in the decision, have been filed with the Board of Appeals and the Town Clerk.

The Board of Appeals also calls to the attention of the owner or applicant that General Laws, Chapter 40A, Section 11 provides that no special permit, or any extension, modification or renewal thereof, shall take effect until a copy of the decision bearing the certification of the town clerk that twenty days have elapsed after the decision has been filed in the office of the town clerk and no appeal has been filed or that, if such appeal has been filed, that it has been dismissed or denied, is recorded in the registry of deeds for the county and district in which the land is located and indexed in the grantor index under the name of the owner of record or is recorded and noted on the owner's certificate of title. The owner or applicant shall pay the fee for such recording or registering. A copy of that registered decision shall be returned to the Planning & Development office as proof of filing.

Any person aggrieved by this decision may appeal to the Superior Court or Land Court as in Section 17 of Chapter 40A, M.G.L. by filing a NOTICE OF ACTION AND COMPLAINT with the Town Clerk within twenty (20) days of the date of filing of this decision.



Board of Appeals Member

5/3/22

Date

PROCEDURAL HISTORY

1. Application from sections 1330 & 4340 of the Zoning By-Law for property located at 258 Phillips Road was filed on April 5, 2022.
2. After proper notice was given the public hearing was opened on April 26, 2022 and closed on April 26, 2022.
3. The application was accompanied by a Site Plan entitled:
Proposed Site Plan
In Sandwich MA
Prepared for Ryan M. Conlon, Amanda Conlon
#258 Phillips Road
Dated: October 26, 2021 and revised 3/31/22
4. The Board reviewed the application and all other materials submitted prior to the close of the public hearing. The Board received and gave due consideration to the testimony given at the public hearing.
5. The following members attended the public hearing:

Erik Van Buskirk
James Killion
Christopher Neeven
Robert Jensen
Chase Terrio
Mary Foley

FINDINGS

The Zoning Board of Appeals finds that:

1. The Board of Appeals finds that this application meets the requirements of Section 9, M.G.L. Chapter 40A.
2. Subject property is located within the R1 Zoning District and the Flood Plain Overlay District.
3. Applicant is proposing to demolish the existing deck and patio area and to add a new addition on piles to the existing single family home.
4. The lot is located in the FEMA Zone AE elevation 14.
5. Section 1330 requirements:
 - a) The Board of Appeals does not find that there are conditions peculiar to this case but not generally true for similar permitted uses on other sites in the same district;
 - b) The Board of Appeals finds that nuisance, hazard or congestion will not be created;
 - c) The Board of Appeals finds that there will not be substantial harm to the neighborhood;

- d) The Board of Appeals finds that there is no derogation from the intent of the bylaw such that the districts' objectives will be satisfied.

6. Section 4350 (2) requirements:

- a) The Board of Appeals finds that susceptibility of the proposed facility and the contents to flood damage and the effect of such damage upon the site and surrounding property is minimal.
 - b) The Board of Appeals finds that there are not alternative locations for the proposed use which are not subject to flooding or erosion.
 - c) The Board of Appeals finds necessity to the facility of a waterfront location.
 - d) Board of Appeals finds that the relief requested is the minimum necessary.
7. No occupied floor level will be below Base Flood Elevation.
8. No changes to the existing grade are proposed.

Motion: I, James Killion, move to adopt these findings as the findings of the Board of Appeals.

Second: Robert Jensen

Vote:	Erik Van Buskirk	Yes
	James Killion	Yes
	Christopher Neeven	Yes
	Robert Jensen	Yes
	Chase Terrio	Yes

CONDITIONS:

At the public hearing, the Board of Appeals considered potential conditions of approval for the special permit. The Board of Appeals voted that the following conditions of approval shall be imposed upon any approval of a special permit and that these conditions are reasonable and that the applicant and its successor-in-interest shall be bound by these conditions:

1. Failure to comply with all the conditions set forth in this decision shall terminate the grant of this special permit.
2. Pursuant to the requirements of Sandwich Protective Zoning By-law Section 1330, the grant of special permit shall expire upon:
 - a) Transfer of ownership, prior to initiation of substantial construction on or occupancy of the site unless such transfer is authorized in this permit, or
 - b) If no substantial construction or occupancy takes place within (3) three years of special permit approval, excluding such time required to pursue or await the determination of an appeal referred to in MGL C 40A, Section 17.

3. The special permit shall not take effect until it is recorded at the Barnstable County Registry of Deeds and a copy of the recorded special permit is provided to the Board of Appeals.
4. Erosion controls must be in place prior to construction and maintained throughout.

Motion: I, James Killion, move to impose the above conditions of approval upon any approval of the special permit.

Second: Robert Jensen

Vote:	Erik Van Buskirk	Yes
	James Killion	Yes
	Christopher Neeven	Yes
	Robert Jensen	Yes
	Chase Terrio	Yes

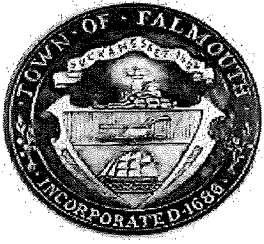
DECISION:

After reviewing the application, the plan and other materials submitted and after giving due consideration to testimony given at the public hearing, the Board hereby approves the special permit for property located at 258 Phillips Road, as shown on Assessor's Map 96, Parcel 60, for the purpose of constructing an addition in the flood zone.

Motion: I, James Killion, move to approve the special permit application.

Second: Chase Terrio

Vote:	Erik Van Buskirk	Yes
	James Killion	Yes
	Christopher Neeven	Yes
	Robert Jensen	Yes
	Chase Terrio	Yes



TOWN OF FALMOUTH

ZONING BOARD OF APPEALS

59 TOWN HALL SQUARE, FALMOUTH, MA 02540
508-495-7460 – FAX 508-495-7463

BOARD OF APPEALS NOTICE OF PUBLIC HEARING

Being all persons deemed affected by the Board of Appeals under Section 11 of Chapter 40A of the Massachusetts General Laws you are hereby notified that:

Application #033-22 Edward and Nancy R. Eskandarian, 18125 SE Village Circle, Jupiter, FL.:
Applied to the Zoning Board of Appeals for a special permit pursuant to section(s) 240-11.3(4) and 240-10.2(A) (formerly 240-69 E. and 240-3 C.) of the Code of Falmouth to allow renovations to include the removal of a portion of the existing garage, remove existing deck and construct additions. The subject property is 11 Tonset Road, North Falmouth, Ma.

Map 13 Section 10 Parcel 000 Lot(s) 020

A public hearing will be given on this application, in the Select Board's Meeting Room, Town Hall, on
Thursday, May 19, 2022 at 6:30PM
You are invited to be present.

By Order of the Board of Appeals,
Chairman, Terrence Hurrie

Plans are available for review prior to the hearing at the Board of Appeals office, Town Hall during the hours of 8:00 AM to 4:00 PM. *Plans are available to review at <https://www.falmouthma.gov/1113/Applications-under-review-by-the-ZBA>



**TOWN OF FALMOUTH
MASSACHUSETTS**

BOARD OF APPEALS

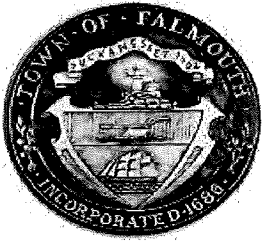
Notice of Decision

Notice is hereby given that the Board of Appeals of the Town of Falmouth has made a decision on a petition by Barbara Good Toohey, 15 Rock Street, North Falmouth, Ma.

(Map 04A Lot 001F) under 240-10.1A of the Zoning By-Law, as amended to **grant** the special permit to construct an addition.

Appeals, if any, shall be made pursuant to the Massachusetts General Laws, Chapter 40A, Section 17, and shall be filed within twenty (20) days after **April 29, 2022** which is the date the Decision was filed in the office of the Town Clerk.

Please contact Noreen Stockman at 508-495-7460
or Noreen.stockman@falmouthma.gov if you have any questions or comments
full text of decision available at <http://www.falmouthmass.us>



TOWN OF FALMOUTH

ZONING BOARD OF APPEALS

59 TOWN HALL SQUARE, FALMOUTH, MA 02540
508-495-7460 – FAX 508-495-7463

BOARD OF APPEALS NOTICE OF PUBLIC HEARING

Being all persons deemed affected by the Board of Appeals under Section 11 of Chapter 40A of the Massachusetts General Laws you are hereby notified that:

Application #031-22 Darmalle Corp., P.O.Box 395, East Falmouth, Ma.: Applied to the Zoning Board of Appeals for a special permit pursuant to section(s) 240-10.2(A) and 240-6.2 (formerly 240-3 C. and 240-51A(5)) of the Code of Falmouth to remove the existing dwelling and detached garage, construct three(3) duplex buildings while maintaining the two(2) commercial buildings and one(1) mixed use building. The subject property is 424 East Falmouth Highway, East Falmouth, Ma.

Map 33 Section 20 Parcel 007 Lot(s) 000

A public hearing will be given on this application, in the Select Board's Meeting Room, Town Hall, on **Thursday, May 19, 2022 at 6:30PM**
You are invited to be present.

By Order of the Board of Appeals,
Chairman, Terrence Hurrie

Plans are available for review prior to the hearing at the Board of Appeals office, Town Hall during the hours of 8:00 AM to 4:00 PM.*Plans are available to review at <https://www.falmouthma.gov/1113/Applications-under-review-by-the-ZBA>



TOWN OF FALMOUTH

ZONING BOARD OF APPEALS

59 TOWN HALL SQUARE, FALMOUTH, MA 02540
508-495-7460 – FAX 508-495-7463

BOARD OF APPEALS NOTICE OF PUBLIC HEARING

Being all persons deemed affected by the Board of Appeals under Section 11 of Chapter 40A of the Massachusetts General Laws you are hereby notified that:

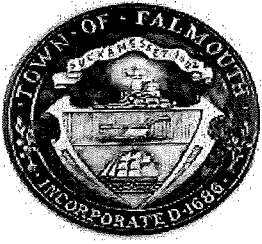
Application #024-22 Lorien LLC, 108 Gansett Road, Woods Hole, Ma.: Applied to the Zoning Board of Appeals for a modification of special permits 075-18 and 021-21 pursuant to section(s) 240-10.1C.(5) and 240-11.4A(1)I (formerly 240-3 A. and 240-68 A(8)) of the Code of Falmouth to allow modifications to previously approved plans. The subject property is 108 Gansett Road, Woods Hole, Ma.

Map 49 Section 03 Parcel 006 Lot(s) 002B

A public hearing will be given on this application, in the Select Board's Meeting Room, Town Hall, on **Thursday, May 5, 2022 at 6:30PM**
You are invited to be present.

By Order of the Board of Appeals,
Chairman, Terrence Hurrie

Plans are available for review prior to the hearing at the Board of Appeals office, Town Hall during the hours of 8:00 AM to 4:00 PM. *Plans are available to review at <https://www.falmouthma.gov/1113/Applications-under-review-by-the-ZBA>



TOWN OF FALMOUTH

ZONING BOARD OF APPEALS

59 TOWN HALL SQUARE, FALMOUTH, MA 02540
508-495-7460 – FAX 508-495-7463

BOARD OF APPEALS NOTICE OF PUBLIC HEARING

Being all persons deemed affected by the Board of Appeals under Section 11 of Chapter 40A of the Massachusetts General Laws you are hereby notified that:

Application #021-22 Robert M. and Nancy J. Kravets, 1164 Central Avenue, Needham, Ma.:

Applied to the Zoning Board of Appeals for a special permit pursuant to section(s) 240-10.2A(4) (formerly 240-3 C.) of the Code of Falmouth to construct an addition, covered deck and extend the existing covered porch on subject property known as 97 Lake Shore Drive, East Falmouth, Ma.

Map 22 Section 07 Parcel 016 Lot(s) 001J

A public hearing will be given on this application, in the Select Board's Meeting Room, Town Hall, on

Thursday, May 5, 2022 at 6:30PM

You are invited to be present.

By Order of the Board of Appeals,
Chairman, Terrence Hurrie

Plans are available for review prior to the hearing at the Board of Appeals office, Town Hall during the hours of 8:00 AM to 4:00 PM. *Plans are available to review at <https://www.falmouthma.gov/1113/Applications-under-review-by-the-ZBA>



**TOWN OF FALMOUTH
MASSACHUSETTS**

BOARD OF APPEALS

Notice of Decision

Notice is hereby given that the Board of Appeals of the Town of Falmouth has made a decision on a petition by Ronald W. and Sharon L. Nunes, Trustees, 23 Oak Street, Teaticket, Ma. (Map 39A Lot 172) under 240-10.2A and 240-11.3A(4) of the Zoning By-Law, as amended to grant the special permit to expand the second floor of the preexisting, nonconforming single family dwelling.

Appeals, if any, shall be made pursuant to the Massachusetts General Laws, Chapter 40A, Section 17, and shall be filed within twenty (20) days after **April 14, 2022** which is the date the Decision was filed in the office of the Town Clerk.

Please contact Noreen Stockman at 508-495-7460
or Noreen.stockman@falmouthma.gov if you have any questions or comments
full text of decision available at <http://www.falmouthmass.us>



**TOWN OF FALMOUTH
MASSACHUSETTS**

BOARD OF APPEALS

Notice of Decision

Notice is hereby given that the Board of Appeals of the Town of Falmouth has made a decision on a petition by ECO Land Development LLC, 0 Percival Road (lot 4), Teaticket, Ma.

(Map 34 Lot 004) under Chapter 40B as amended to **deny** the comprehensive permit to construct sixteen single family dwellings, 4 of which will be affordable.

Appeals, if any, shall be made pursuant to the Massachusetts General Laws, Chapter 40A, Section 17, and shall be filed within twenty (20) days after **May 6, 2022** which is the date the Decision was filed in the office of the Town Clerk.

Please contact Noreen Stockman at 508-495-7460
or Noreen.stockman@falmouthma.gov if you have any questions or comments
full text of decision available at <http://www.falmouthmass.us>

Town of Sandwich
THE OLDEST TOWN ON CAPE COD



Planning Board

16 Jan Sebastian Drive
Sandwich, MA 02563
Phone: 508-833-8001
Fax: 508-833-8006
Email: planning@sandwichmass.org

TOWN OF SANDWICH PUBLIC HEARING NOTICE PLANNING BOARD

The Sandwich Planning Board will hold a Public Hearing on the application of ASD Cotuit MA Solar LLC, Applicant and Property Owner, for a Special Permit Amendment for property located at 180 Cotuit Road, Map #13 Parcel #44, Sandwich, MA, for the purpose of amending construction hours. The Public Hearing will be held on May 17, 2022, at the Sand Hill School Community Center, 16 Dewey Avenue, Sandwich, MA at 7:00 p.m. The public record information can be viewed at the Planning & Development office, 16 Jan Sebastian Drive, Sandwich, MA during normal business hours, Monday – Friday, 8:30 a.m. to 4:30 p.m.

Jeffrey R. Picard, Chair, Sandwich Planning Board
Publication: Sandwich Enterprise
Publication Dates: April 29 and May 6, 2022



BOARD of APPEALS

16 Jan Sebastian Drive
Sandwich, MA 02563
Phone: 508 833 8001
Fax: 508 833 8006
E-mail: planning@sandwichmass.org

**TOWN OF SANDWICH
PUBLIC HEARING NOTICE
BOARD OF APPEALS**

The Sandwich Board of Appeals will hold a Public Hearing on the application of Samuel and Elisa Battles, Applicants and Property Owners, for a Special Permit under Section 3560 of the Sandwich Protective Zoning By-Law for property located at 3 Grace Lane, Forestdale, MA Assessor's Map #6, Parcel #203, for the purpose of installing a fence exceeding six feet. The Public Hearing will be held on May 24, 2022 at the Sand Hill School Community Center, 16 Dewey Ave, Sandwich, MA at 6:00 p.m. The public record information can be viewed at the Planning & Development office, 16 Jan Sebastian Drive, Sandwich, MA, Monday-Friday 8:30 a.m. to 4:30 p.m.

Erik Van Buskirk, Chair
Sandwich Board of Appeals
Publication: Sandwich Enterprise
Publication Dates: May 6 and May 13, 2022