



17014

September 26, 2017

Carla Nixon, AICP  
Planning Director  
Planning Department  
Town of Cumberland  
290 Tuttle Road  
Cumberland, ME 04021

**Preliminary & Final Application - Major Subdivision and Site Plan**  
**Higbee Notch Apartments**  
**251 Gray Road**  
**Cumberland, Maine**  
**Cumberland Assessor's Map U21 Lot 18**  
**Denise Morgan, Megan Morgan and Nathan Pelsinski**  
**Response to Comments and Final Application Materials**

Dear Carla,

We appreciated the opportunity to present Higbee Notch Apartments to the Planning Board on September 19, 2017. We have prepared the enclosed updated materials in response to the feedback received during the recent Planning Board meeting, along with the comments contained in your review memo, as well as the peer review comments received to date regarding the proposed Higbee Notch Apartments.

As discussed during their September 19, 2017 meeting, the Planning Board seemed comfortable with consideration of Preliminary and Final Approvals at the same meeting. As such, we have assembled the enclosed materials in support of the Planning Board's consideration of Preliminary and Final Approval for this project at their next meeting on October 17, 2017. This package provides updates and additional supporting information regarding the Preliminary Submittal materials, as well as information in support of a Final Application.

**Requested Waivers**

As you know, during the Planning Board meeting, there were a number of items for which the Applicants had requested waivers. As part of the Planning Board's deliberations and in response to comments received from you and the Town's peer review engineer, we have provided additional information to address the waiver requests.

The Applicants are requesting waivers of the following items:

- **Underdrains in the approximately 105' long Higbee Lane** - As discussed during the Planning Board meeting on September 19, 2017, the Applicants are requesting a waiver of to eliminate underdrains in the approximately 105' long section of Higbee Lane. The typical roadway section noted in the Ordinance includes relatively shallow ditches (approximately 12" deep) and underdrains to drain the road section.

In lieu of underdrains, our office has designed a deeper ditch section (approximately 30" deep along Higbee Lane) to allow the subgrade to drain to daylight (please note that the ditch depth has been increased to 30" in this area to accommodate the thicker municipal roadway section appropriate for a residential access road serving greater than 50 vehicle trips per day - as noted in Sevee & Maher Engineer's (SME's) peer review comments).

Given the vertical relief of the site past the end of Higbee Lane, we are confident that this configuration will provide appropriate drainage without the need for installation of underdrains. As such, the Applicants are respectfully requesting that deepened ditches be permitted in lieu of installation of underdrains along Higbee Lane. Based on the feedback provided during the Planning Board meeting, it appeared that most Planning Board members felt generally comfortable with granting this waiver.

**Overhead Utilities** – As discussed during the Planning Board meeting, the Applicants are proposing to provide overhead utilities from the overhead lines on Route 100 into the site. As noted in SME's peer review comments, this overhead line requires a waiver. Based on the comments made during the Planning Board meeting, it appeared that most Planning Board members felt generally comfortable with granting this waiver.

Since the Planning Board meeting, the Applicants have coordinated directly with Central Maine Power Company to discuss the power supply configuration for this site. CMP has indicated that they will require a pole placed approximately 200' to 220' from Route 100, with a support pole approximately 20' from the new pole. From this point the service would be underground to an approximately 4' by 4' pad mounted transformer, which will provide underground services to each apartment building.

This updated service configuration is shown on the enclosed revised plans. This reduces the extent of overhead line length by approximately 80' to 100' from that which was shown on the prior plans. Although the extent of overhead utility lines has been reduced, the Applicant must still seek a waiver on this item.

- **Nitrate Study** – As we had noted in our prior application materials, the Applicants are seeking a waiver regarding preparation of a Nitrate Study for the site. Based on the Maine Subsurface Wastewater Disposal Rules for Multifamily Dwelling units, the anticipated design capacity for each subsurface disposal system is 720 gpd, which is well below the 2,000 gpd threshold for which an engineered system design is required.

Individual wells will be drilled for each building at the time of construction. Proposed well locations have been added to the enclosed Plans. These wells have been sited to comply with the setback criteria from subsurface disposal systems. Well exclusion zones have been shown 100' outside of the proposed subsurface disposal areas.

Given the centralized site layout and the setting, coupled with the relatively small system sizes in the context of the overall site size, the applicants are respectfully requesting a waiver on a Nitrate Study for the project.

In response to general feedback gathered during the recent Planning Board meeting, the Applicants contacted Mark Cenci, a Certified Geologist to review their proposed project and site data. Mr. Cenci is an experienced geologist, who is familiar with this region and who has previously prepared numerous Nitrate Impact Evaluations on other projects throughout the area.

Mr. Cenci has reviewed the site information and soils test pit data and has issued the enclosed letter in support of the Applicants' waiver request. As Mr. Cenci notes, the plan and site conditions are such that a waiver on a Nitrate Analysis is warranted. His letter states that *"these site features are exactly what works best in planning the development of on-site wastewater disposal and a waiver from further study is warranted."*

We are respectfully requesting that the staff and Planning Board consider Mr. Cenci's professional opinion letter when evaluating the Applicant's waiver request on this item.

- **Landscape Plan** - As discussed during the Planning Board meeting, the Applicants are proposing foundation plantings along the fronts of each building, similar to a typical residential building construction, but a formal Landscaping Plan prepared by a Landscape Architect is not proposed. Extensive areas of the site will be left in their natural state which will supplement the proposed plantings around the apartment buildings.

These proposed plantings are shown on the enclosed Plans and include a mix of flowering shrubs, evergreens and hardy perennials. Plants have been selected based on their local availability, and suitability for light and shade areas on the site. The selected varieties have been chosen to provide seasonal color variation, to offer visual interest with varying forms and texture, as well as ease of maintenance. Plantings include Rhododendrons, Euonymus, Astilbe, as well as Daylilies, and Hostas.

The applicant is hereby respectfully requesting that the enclosed planting plan be considered in lieu of submittal of a formal Landscape Design Plan.

- **Lighting/Photometric Plan** – As we discussed during the prior Planning Board meetings, the two proposed new buildings will include building mounted residential scale lighting fixtures at doorway entrances, similar to any residential home. No pole mounted lights are proposed. The fixtures will be shielded to direct the light downward to reduce potential sky glow.

The Applicants have provided the enclosed catalog cut sheets for the proposed building mounted fixtures to demonstrate that the fixtures will be shielded to only direct light downward to the intended area to be illuminated.



As the enclosed cut sheets show, there are two types of building mounted fixtures proposed. The NDR Electric Ultra-Thin LED Razor series light fixture is a recessed light fixture which will be installed in the roof overhangs of the entrance doors at the front of each apartment unit.

The Progress Lighting wall mounted cylinder light will be installed at each of the rear doors to the apartments. As the manufacturer's product data indicates, this fixture also provides LED lighting for energy efficiency. As the enclosed information shows, these lights include a cutoff to prevent skyglow.

Given the limited nature of the site lighting program, the applicant is respectfully requesting a waiver of the requirement for a formal Site Lighting and Photometric Plan and that the manufacturer's fixture information provided be sufficient to address lighting for this site.

- **Stormwater Management** – The Applicants had previously requested a waiver of the requirement to conduct a Stormwater Management Evaluation. As discussed during the Planning Board meeting this waiver request was not supported by the Town's peer reviewer.

As we had previously discussed, the site discharges directly to the Piscataqua River and is not located in an urban impaired watershed. In addition, the site is not within the identified urban area of Cumberland and does not discharge into the municipal separate storm sewer system (MS4).

At the State level, the project is required by the MDEP to meet only the Basic Standards (i.e. provisions for General Housekeeping and Erosion and Sediment Control Measures). The project is not required to address the General Standards (i.e. Water Quality Treatment) or Flooding Standards (i.e. Pre- and Post-Development Stormwater Modeling) under MDEP's Chapter 500 Stormwater Standards. Given the project size, the project qualifies under the MDEP Chapter 500 standards for a Stormwater Permit by Rule.

As noted during the Planning Board meeting, it was agreed that a pre- and post-development watershed analysis would be conducted for the site. Our office has prepared the enclosed Stormwater Management Evaluation, which includes HydroCAD modeling of the pre- and post-development conditions within the watersheds on or adjacent to the project site.

As the Stormwater Management Evaluation demonstrates, three Study Points were considered as part of the HydroCAD modeling analysis. Study Point 1 is located along the southerly property limit and considers the point at which runoff from the site enters onto the abutting property prior to reaching the Piscataqua River. Study Points 2 and 3 are both located within the project site and consider the points at which runoff from the site enters directly into the Piscataqua River.

The following table is included in the Stormwater Management Report and summarizes the pre-and post-development stormwater modeling results:

<b>Stormwater Modeling Results</b>				
<b>Storm Event</b>	<b>Pre</b>	<b>Post</b>	<b>Net Change</b>	<b>% Change</b>
Study Point 1				
2-Yr	2.50 cfs	2.28 cfs	-0.22 cfs	-8.8%
25-Yr	6.54 cfs	5.98 cfs	-0.56 cfs	-8.6%
Study Point 2				
2-Yr	1.39 cfs	1.42 cfs	0.03 cfs	2.2%
25-Yr	3.85 cfs	3.94 cfs	0.09 cfs	2.3%
Study Point 3				
2-Yr	2.2 cfs	3.07 cfs	0.87 cfs	39.6%
25-Yr	6.22 cfs	8.46 cfs	2.24 cfs	36.0%

In order to further evaluate the predicted increases in peak discharge at Study Points 2 and 3 in the context of the receiving water body (i.e. the Piscataqua River), our office used the USGS StreamStats online model to identify the Piscataqua River's upstream watershed area that is tributary to this location, as well as the peak flow statistics for the river, during varying storm events.

Based on the StreamStats data, the Piscataqua River receives runoff from an approximately 5.5 square mile (3,520 acres) upstream watershed area prior to reaching the project site.

Based on the StreamStats data for this area, the flow in the Piscataqua River is expected to be approximately 164 cfs in the 2 year event and approximately 423 cfs in the 25 year storm event. These rates are considerably higher than the predicted flows from the project site.

As noted above, based on our modeling data for the 2 year storm event, the net change in predicted post-development peak discharge from the site is expected to be a decrease of 0.22 cfs at Study Point 1, and an increase of 0.03 cfs at Study Point 2 and 0.87 cfs at Study Point 3. Combined, these predicted changes in peak flows represent a net increase in peak discharge in this area of approximately 0.68 cfs. In comparison to the 164 cfs flows in the river during the 2 year storm, this predicted increase is very small and equates to an approximately 0.41% change in predicted flows in the river.

Based on the StreamStats data for the 25 year flood event, the flow in the Piscataqua River at this location is expected to be approximately 423 cfs. The modeling data for the 25 year storm event predicts the following changes in post-development peak discharge from the site: a decrease of 0.56 cfs at Study Point 1, an increase of 0.09 cfs at Study Point 2 and an increase of 2.24 cfs at Study Point 3. Combined, these predicted changes in peak flows represent a net increase in peak discharge in this area of approximately 1.77 cfs. In comparison to the 423 cfs flows in the river during the 25 year storm, this equates to an approximately 0.42% change in predicted flows in the river.

As the discussion above demonstrates, although the modeling data does show a predicted overall increase in post-development peak discharge rates entering the river, these predicted changes represent less than a half of a percent of the overall flow rates in the Piscataqua River at this location during each of the storm events studied.

In addition, the predicted increases only occur at the Study Points within the site that directly abut the river (i.e. Study Points 2 and 3). As the modeling data demonstrates, the post-development peak discharge rates at Study Point 1 (where runoff leaves the site and flows onto an abutting property) are actually slightly lower than the peak discharge rates calculated in the pre-development model.

Given these conditions, the Applicants are respectfully requesting a waiver to allow the predicted increases in Post-development peak discharge rates at Study Points 2 and 3, to occur without the need for on-site detention storage, given the fact that the increased site runoff directly enters the river (without crossing any abutting properties) and represents collectively less than half a percent change in the river's flow in this area.

The alternative to this waiver request would necessitate the construction of on-site detention areas in Subcatchments 2 and 3 to provide attenuation of the peak flows from the site. This involves additional clearing and land disturbance in the overall project area and will potentially generate an increase in thermal impacts to the flows from the site.

In consideration of the reduction in land disturbance associated with this waiver request and the fact that the receiving water body has the capacity to carry flows from such an extensive upstream watershed area, the Applicants are respectfully requesting that a waiver be granted to allow the predicted increases in peak discharge from the site at Study Points 2 and 3.

- **Separate Erosion Control Plan Narrative** – As noted during the Planning Board meeting, the Erosion and Sediment Control Information included in the Plan set has been deemed sufficient by the Town's peer review engineer such that a waiver of this item is no longer necessary. This waiver request has been respectfully withdrawn.

### **Response to Comments**

We have prepared the enclosed revised plans in response to your September 15, 2017 e-mail comments issued on the application materials filed (on August 22, 2017) in support of Denise Morgan, Megan Morgan & Nathan Pelsinski's proposed Higbee Notch Apartments. In addition, the enclosed plans reflect Sevee & Maher Engineers' (SME's) peer review comments dated September 14, 2017.

For ease of review, we have listed the review comments contained in your September 15, 2017 email in italics below. Our responses follow each comment.

### **Town Planner's Review:**

1. *Fire Chief's review required.*

On September 20, 2017 the Applicants and our office met with the Cumberland Fire Chief informally to discuss the proposed site plan in the context of fire protection. At this initial meeting, the Chief indicated that a Knox Box is recommended but not required for the buildings on the site. In addition, a monitored alarm system was recommended but not required.

As previously noted, the terminus of Higbee Lane is within 1000' of the nearest public hydrant. In reviewing the Fire Protection Ordinance, a fire suppression system is not required for the buildings.

Based on information provided to the Applicants by the Town's Code Enforcement Officer, Bill Longley, the local Building Code requirements require measures to address fire protection. In accordance with recommendations provided by the Applicants' architect, the Applicants are proposing the construction of a 2 hour fire-rated wall between each pair of units in each building. This fire-rated wall will divide the building into two two-unit sections to address the Building Code requirements regarding fire protection. This fire rated wall will extend from the basement slab to the roof sheathing.

*2. Trash to be stored outside, but no dumpster is proposed. Explain.*

As noted during the Planning Board presentation on September 19, 2017, in Phase 1, the residents' trash and recyclables will be placed off the southeast corner of the turnaround at Higbee Lane on the designated weekly pick-up day. This location is approximately 100' off Route 100. In Phase 1 there will be only four apartments on the site, one of which will be the Applicants'.

An easement will be offered to the municipality to allow the waste hauler to use Higbee Lane for weekly collection. This will allow the waste hauler to enter Higbee Lane, collect the residents' waste from the designated spot, and turn around using the hammerhead in Higbee Lane in order to exit back onto Route 100 and continue their normal collection route.

As discussed during the Planning Board presentation, at the time of construction of the building in Phase 2 (when there will be a total of 8 apartments on the site), this area will be formalized with the construction of a concrete pad and enclosure, as shown on the enclosed plans.

*3. MDOT Entrance Permit required.*

William Bray of Traffic Solutions has filed the request for an MDOT Entrance Permit for this site. Application materials are under review by MDOT and the new Entrance Permit is expected to be received before the upcoming Planning Board presentation

on October 17, 2017. As discussed during the Planning Board meeting, the MDOT previously issued an entrance permit for this site to the prior landowner. It is our understanding that this entrance permit was previously obtained to allow trucks hauling fill into the site to access Route 100.

*4. Why are there two concrete walls proposed on each building?*

As the enclosed plans demonstrate, the grading along the edge of each building has been revised slightly to reduce the extent of the proposed block retaining walls. These walls are provided to accommodate changes in grade along the rear of the building (to provide for daylight basements) and to aid in diversion of the ditches to the rear of the sites, away from the buildings. The proposed wall heights typically have a maximum of 2' reveal and are stepped to conform with the site contours.

It is envisioned that these walls will be constructed using Recycled Concrete Blocks with a Decorative Stone Face, as manufactured locally by Auburn Concrete, or an approved equal, such as a modular block available at most suppliers of hardscape materials.

The recycled concrete blocks are made from excess concrete returning from jobsites which Auburn Concrete recycles to form these inter-locking blocks. The exterior face of the block has a pattern that mimics smaller cut stones. Each block's nominal dimensions are 2' by 2' by 6', and are solid concrete. Smaller blocks are available to allow the wall to be constructed to meet dimensional requirements of a particular site. There is a finished concrete capstone that is placed at the top of the wall. The capstone has a slight crown to deflect runoff and has an approximately 1" overhang over the edge of the stone as a decorative finish.

*5. Show potential well locations that meet the 100' septic separation requirement.*

The two proposed well locations (one on each lot) are shown on the enclosed plans. The suggested well locations are based on maintaining a minimum 100' separation distance from the proposed subsurface disposal systems on each lot, and a 10' minimum separation from any property line.



In addition, on September 20, 2017 the Applicants contacted a local well driller, Stanley E. Hillock Well Drilling in Gorham, to discuss anticipated well depths and potential yields based on their well-drilling experience in the area. The well driller indicated that drilled well depths can range from 130' deep to 480' feet deep, with a typical average drilled depth of around 300'. Anticipated well yields can range from 5 to 20 gpm, with a typical average flow rate of around 9 gpm.

In addition, our office has approximated the locations of the wells for the nearby residences to the south of the site along Route 100. These wells are located between the existing residences and Route 100, and are shown on the enclosed plans. Our office was not able to identify the specific location of the well for the residence to the north of the site entrance (at Route 100) however there is a planter area at the front of the abutting lot which may contain the well. A visual review of the rear yard did not reveal any apparent wells behind the home. In addition, the well for the recently constructed residence at the end of Neba Way was not readily visible, but a possible location appears to be to the northeast of the new home, and appears to be well in excess of 100' from the site limits.

*6. Financial capacity letter is only for the first four unit building.*

As discussed during the September 19, 2017 Planning Board meeting, the Applicants have provided a letter regarding the financial capacity associated with the construction of Phase 1 of the project.

The Applicants are respectfully requesting that the project approvals include a condition that prior to commencement of the construction of Phase 2, an updated Financial Capacity Letter be provided to address the Phase 2 improvements.

Based on the discussions during the Planning Board meeting, it appeared that Planning Board members were receptive to this approach, and that this had been a similar condition on other projects in the community in the past.

**Town Engineer's Review: Jeff Read, P.E. 9-15-17 (Sevee & Maher Engineers)**

**Chapter 250: Subdivision of Land**

*SME has reviewed the applicable sections of Chapter 250 and has provided comments for those sections not found to be addressed by the Application. The remaining sections have been reviewed and found to comply with Chapter 250 requirements.*

*Section 250-27 – Utilities*

1. *Utilities shall be installed underground except as otherwise approved by the Board. Plans include approximately 300 lf of overhead electric and telephone service into the property. SME recommends the Board review the proposed installation prior to approval.*

Please see the discussion above regarding the requested waiver to allow installation of overhead utilities and the Applicants' follow-up with Central Maine Power Company.

*Section 250-27 – Utilities*

2. *SME recommends that proposed well locations and/or well exclusion zones be shown on the project plans.*

This information has been shown on the enclosed plans. Please see the discussion above regarding proposed wells and anticipated depths and yields. As noted, to the extent that the neighboring wells are visible, the approximate locations of abutting wells have been shown on the plans as well.

*Section 250-32 through 250-34 – Street Design and Construction standards*

3. *Private streets are permitted only when the average daily traffic is less than 50. The anticipated daily traffic is 8 trips per dwelling unit (64 trips total) by the Town standard and 53 daily trips as calculated by the Applicant's traffic consultant. This would require a reclassification of Higbee Lane to a "Residential Access Road." SME recommends the Applicant confirm that Higbee Lane will remain a Private Way and/or meet the required Geometric Standards for this level of service.*

As was discussed at the Planning Board meeting, Higbee Lane is intended to be constructed as a Residential Access Road, conforming to the municipal standards cited in the Ordinance.

The design of the approximately 105' long Higbee Lane has updated to reflect the Ordinance's geometric standards for a residential access road serving in excess of 50 vehicle trips per day (our prior design had been based on the standards for a residential access road serving less than 50 vehicle trips per day). This includes an approximately 25" thick road section (pavement, base and subbase gravels). The detail for the cross-section of Higbee Lane has been updated to reflect these dimensions.

In addition, the ditchline grading along Higbee Lane has been increased to approximately 30" deep to accommodate the requested waiver for installation of underdrains. Spot grades have been added to the grading plan as well to clarify the requisite ditch depths along Higbee Lane.

The proposed pavement width of Higbee Lane is 22' wide with 2' gravel shoulders on each side. The road crown has been designed at 2%, and the shoulder crown is noted at 4%. No curbs or sidewalks exist in the area along Route 100 and these features are not proposed along Higbee Lane.

4. *SME recommends the road construction details be updated to require an 18-inch gravel base (MaineDOT Type D) and 3-inch crushed gravel surface (MaineDOT Type A) per Town requirements.*

These details have been updated accordingly, for the shared gravel access drive.

5. *Sight distance looking left from the proposed entrance intersection does not meet minimum town requirements. SME recommends sight distances be added to the project plan set.*

As was discussed during the Planning Board meeting, Mr. Bray has measured the sight distance looking in each direction along Route 100 (Gray Road). As recommended, this information has been shown on the enclosed updated plans.

As noted during the discussions with the Planning Board, Mr. Bray's report notes the fact that the available sight distance looking northerly (towards Gray) is well in excess of MDOT requirements, the available sight distance looing southerly (towards Falmouth) does not meet the MDOT's standards for a mobility highway, but does meet the MDOT standards for a non-mobility highway. In the prior MDOT entrance

permit issued for this property, a waiver was granted on this item. Mr. Bray is seeking a similar waiver with the Entrance Permit application currently under review by the MDOT.

*Section 250-40 – Storm Drainage Design Standard*

6. *Applications for projects which will expose more than 60,000 square feet of soil or which will produce more than 10,000 square feet of additional impervious surface must include a stormwater management plan submitted to the Planning Board for its review and approval. SME recommends the Applicant provide a Stormwater Management Plan and pre- and post- development stormwater calculations for this project to ensure the project meets Town Stormwater Design Standards.*

In accordance with this recommendation, the enclosed Stormwater Management Evaluation has been prepared and a pre- and post-development HydroCAD stormwater model has been created to consider the peak discharge rates leaving the site.

7. *Survey data near the intersection of Higbee Land and Gray Road is minimal. No cross culverts are shown on the plan. Please confirm a culvert is not required at the intersection of Higbee Land and Gray Road.*

There is no existing ditch along Route 100 (Gray Road) in this area. A culvert is not necessary at the site entrance. Ditches along either side of Higbee Lane will convey runoff from the entrance along the new roadway to the site's outlets toward the river.

8. *Please confirm level spreaders or other energy dissipation devices are not required at the downstream limits of proposed drainage systems to minimize channelization of stormwater runoff and prevent eroded soil from entering water bodies and freshwater wetlands.*

As previously discussed, permanent stone check dams are proposed within the ditch lines along each side of the proposed shared gravel access drive where the ditch slopes are approximately 7%. These stone check dams aid in reducing flow velocities and trapping sediments within the ditch line along the shared gravel access drive.

The MDEP Erosion and Sediment Control Manual's design specifications for vegetated waterways indicates that in a 10 year storm event, the maximum permissible velocity in a vegetated waterway cannot exceed the values cited in Appendix B of the manual for vegetated soils. Appendix B indicates that the maximum permissible velocity for Hollis Soils is approximately 3.5 fps.

Based on the data within the HydroCAD model, during the 10 year storm event, the velocities at the downstream ends of the ditches are expected to be approximately 2.04 fps in the ditchline behind Building 1 and 3.16 fps at the outlet for the ditch behind Building 2.

Since the flow velocities at the ditch outlets are below the maximum permissible velocities for a grassed waterway, and the runoff passes over an extensive section of grassed area at the rear of each building before reaching the wooded areas adjacent to the river, no additional dispersion or energy dissipation devices are proposed.

#### *Section 250-44 – Fire Protection*

9. *Please provide information on fire protection for the proposed apartments.*

As discussed in an earlier section of this letter, an initial meeting was conducted with the Cumberland Fire Chief to discuss the proposed site plan in the context of fire protection. In addition, the Bill Longley, the Town's Code Enforcement Officer provided information to the Applicant regarding the building code requirements for a multi-unit apartment building.

During our meeting with the Fire Chief, a Knox Box and monitored alarm system was recommended but is not required for the buildings on the site. Based on the local Fire Protection Ordinance, a fire suppression system is not required.

Based on information provided by the Applicants' architect, in order to address the local Building Code requirements, the Applicants are proposing the construction of a 2 hour fire-rated wall between each pair of units in each building. This fire rated wall will extend from the basement slab to the roof sheathing.

#### *Section 250-49 – Waivers and modifications.*

10. *Underdrains in Higbee Lane – SME recommends the Applicant specify a minimum depth-of-ditch dimension to ensure proper subgrade drainage prior to the Board considering this waiver.*

Spot grades and detailed ditch grading have been added to the plans to provide a minimum depth of ditch dimension of 30” in the section of Higbee Lane, and 24” minimum ditch depth along the shared gravel access drive. Based on the cross sectional information for Higbee Lane, the 30” minimum ditch depth will allow the road subgrade beneath the 25” road section to drain to daylight. Likewise, the 24” deep ditch section along the shared gravel access drive will allow the subgrade beneath the 21” gravel road section to drain to daylight as well. Please see the discussion regarding the waivers of underdrains in Higbee Lane presented earlier in this letter.

11. *Nitrate Study – SME recommends the Applicant provide proposed well locations and locations for wells on abutting properties prior to the Board considering this waiver.*

The two proposed wells have been located on the enclosed updated plans. These wells have been sited based on a minimum 100’ separation distance from the proposed subsurface disposal locations and 10’ from any property lines. In addition, to the extent practicable, the abutting well locations have been approximated on the enclosed plans.

For more information, please see the discussion regarding the proposed wells and the existing wells identified on the abutting properties as discussed earlier in this letter (i.e. Planning staff comment #5).

Please also see the discussion regarding the requested waiver on the requirement for a Nitrate Study and the enclosed correspondence from Mark Cenci, Certified Geologist regarding his review of the site and support for the waiver request.

12. *Landscape Plan – SME recommends the Applicant provide additional information regarding existing vegetation on site and to ensure buffer requirements are met for adjacent properties prior to the Board considering this waiver.*



The proposed planting plan is included in the drawing set. The existing and proposed tree lines are shown on the enclosed plans based on the proposed grading limits. The abutting residences are also shown on the enclosed plans for general context of separation distances from the proposed site improvements.

In addition, during the September 19, 2017 Planning Board presentation an aerial photo was shown which identified the locations of the abutting residences in the context of the proposed site improvements. This aerial also showed the extent of vegetation on the abutting parcels. As the site grading plan demonstrates, there is an approximately 12' change in elevation between the location of the nearby homes on Route 100 and the proposed finish floor elevation of both buildings.

13. *Lighting/Photometric Plan – The Applicant should provide manufacturer cut sheets for proposed light fixtures to verify fixture shielding meets the requirements of the Ordinance prior to the Board considering this waiver.*

As discussed above, the Applicants have obtained the enclosed Catalog cut for the proposed building mounted fixture to demonstrate proper shielding to prevent sky glow and light trespass.

14. *Stormwater Management – SME does not recommend granting of this waiver and requests the Applicant provide additional information as described in Comments #6 through #8.*

As discussed, our office has prepared the enclosed Stormwater Management Evaluation including HydroCAD calculations to evaluate the pre- and post-development runoff conditions in the project area. Please see our responses to Comments #6 through #8 above.

15. *Erosion Control Plan Narrative – The Applicant has provided Erosion Control Notes and Details in the plan set to meet the requirements of the Ordinance. A waiver is not required.*

We appreciate your review of these materials.

**General Comments**

16. *Mark Hampton's name is misspelled on the cover sheet for the project plan set and should be corrected*

This has been corrected. Thank you for alerting us to this typographic error.

17. *Please confirm the road design conforms to Town geometric design standards.*

As discussed above in our response to comment #3, the design of Higbee Lane is intended to meet the geometric standards for a residential access road serving in excess of 50 vehicle trips per day. In order to address this, the ditch depths along Higbee Lane have been increased to approximately 30" to accommodate subgrade drainage of a 25" road section (as required by the Ordinance for this level of service). The cross-sectional detail for Higbee Lane has also been updated to reflect the Ordinance standards for a residential access road serving in excess of 50 vehicle trips per day.

The shared gravel driveway extending from the terminus of Higbee Lane is intended to remain private and reflects an approximately 21" thick gravel road section.

18. *Easements are outlined in the project plan set, but are not included on the Application form. Please update the application to reflect all easements and deed restrictions.*

Easements are proposed to address the shared access drive and shared maneuvering areas for the parking on each site. As noted in our discussion regarding weekly trash collection, an easement will be provided to the Town over the entire extent of the right of way for Higbee Lane for trash collection purposes until or if the Town accepts Higbee Lane as public. In addition, in accordance with the recommended conditions of Preliminary Approval, a 25' wide landscaping easement, benefitting the Town, is shown along the Route 100 frontage for future use, if desired.

Please note that there will be no Homeowners Association, since all of the proposed units are apartments. All necessary upkeep, including plowing, road and ditch maintenance and grounds care will be conducted by the Applicants, or will be

contracted through a maintenance company hired by the Applicants. Please see the discussion below regarding the Open Space area shown on the plans.

19. *The delineation between usable lot area and designated open space is not clear in the project plan set. Please clarify.*

The area set aside as Open Space occurs along the entire river frontage along the easterly end of the site. The limits of the Open Space are roughly 100' upland of the edge of the wetlands along the river. For clarity, this area has been shaded on the site.

The area is intended to remain wooded, and generally left in its natural state to allow for the residents' passive use of the area and for access to the river. Normal forest management activities, such as clearing to remove dead, dying or diseased trees or to promote understory growth and general maintenance to remove hazards shall be permitted in this area.

### **Supporting Materials**

In addition to this Cover letter and response to comments, we have enclosed the following Final Plan information:

- Planning Board Site Plan Review Application Form (Appendix C)
- Major Subdivision Checklist
- Letter from Mark Cenci regarding a waiver of a Nitrate Study
- Catalog Cut for Wall Mounted Light Fixture
- Stormwater Management Report
- HydroCAD Modeling Data (3 copies)
- Final Plan set showing the proposed two new four-unit apartment buildings

### **Closure**

With the submittal of the information contained herein, we respectfully request your consideration of this material for placement on the Planning Board's October 17th Planning Board agenda for Preliminary and Final Plan approval.

On behalf of Denise Morgan, Megan Morgan and Nathan Pelsinski, we look forward to the opportunity to continue our discussions on this matter with you and the other municipal staff members and peer reviewers as you complete your review of the enclosed materials.

In the interim, if you have any questions or comments, or require any additional information, please contact me. We are available at your convenience to meet with you, and other staff members, as well as your peer review engineer, to review the enclosed Responses to Comments and Final Application materials in further detail.

We look forward to hearing from you.

Sincerely,

ST.CLAIR ASSOCIATES

A handwritten signature in black ink, reading "Nancy J. St. Clair". The signature is fluid and cursive, with the first letters of each name being capitalized and prominent.

Nancy J. St.Clair, P.E.,

Vice President

NJS/njs

Encl.

C: Denise Morgan, Megan Morgan and Nathan Pelsinski

## APPENDIX "C"

### PLANNING BOARD SITE PLAN REVIEW APPLICATION

Applicant's Name: \_\_\_\_\_

Applicant's Address: \_\_\_\_\_

Cell Phone: \_\_\_\_\_ Home Phone \_\_\_\_\_ Office Phone \_\_\_\_\_

Project Address \_\_\_\_\_

Project Name \_\_\_\_\_

Describe Project \_\_\_\_\_

Number of employees \_\_\_\_\_

Days and Hours of operation \_\_\_\_\_

Project Review and Notice Fee \_\_\_\_\_

Name of Representative: \_\_\_\_\_

Contact Information: Cell: \_\_\_\_\_ Office: \_\_\_\_\_

#### **PLEASE SUBMIT 15 COPIES OF ENTIRE SUBMISSION PACKET**

**DEADLINE IS 3 WEEKS PRIOR TO NEXT SCHEDULED PLANNING BOARD MEETING WHICH IS USUALLY HELD ON THE 3<sup>RD</sup> TUESDAY OF EACH MONTH.**

What is the applicant's interest in the property?

Own \_\_\_\_\_ Lease \_\_\_\_\_ Purchase and Sale agreement \_\_\_\_\_ (provide copy of document)

#### **Boundary Survey**

Submitted?: yes \_\_\_\_\_ no \_\_\_\_\_

Are there any deed restrictions or easements? yes \_\_\_\_\_ no \_\_\_\_\_ If yes, provide information and show easement location on site plan.

#### **Building Information:**

Are there existing buildings on the site? yes \_\_\_\_\_ no \_\_\_\_\_ Number: \_\_\_\_\_

Will they be removed? yes \_\_\_\_\_ no \_\_\_\_\_ (note: a demolition permit is required 10 days prior to demolition)

Will a new structure(s) be built on the site? yes \_\_\_\_\_ no \_\_\_\_\_

Describe: \_\_\_\_\_

Number of new buildings \_\_\_\_\_

Square footage \_\_\_\_\_

Number of floor levels including basement \_\_\_\_\_

**Parking:**

Number of existing parking spaces \_\_\_\_\_  
Number of new parking spaces \_\_\_\_\_  
Number of handicapped spaces \_\_\_\_\_

**Entrance:**

Location: \_\_\_\_\_  
Width \_\_\_\_\_ Length \_\_\_\_\_  
Is it paved? \_\_\_\_\_ yes: \_\_\_\_\_ no: \_\_\_\_\_ if not, do you plan to paved it?  
Where will snow storage for entrance and parking be located? Show on site plan.

**Utilities:**

**Water:** Public Water \_\_\_\_\_ Well \_\_\_\_\_ (Show location on site plan)

**Sewer/Septic:** Public sewer \_\_\_\_\_ Private septic \_\_\_\_\_ (Show location on site plan and submit HHE-200 septic design or location of passing test pit locations if new system is proposed. Also show any wells on abutting properties within 200' of the site.

**Electric:** On site? yes \_\_\_\_\_ no \_\_\_\_\_

Show location of existing and proposed utilities on the site plan and indicate if they are above or below ground.

**Signs:**

Number: \_\_\_\_\_

Size: \_\_\_\_\_

Material: \_\_\_\_\_

Submit sign design and completed sign application.

Will the sign be lighted? \_\_\_\_\_ Submit information on type and wattage of lights.

Show location of sign(s) on the site plan.

**Natural Features:**

Show location of any of the following on the site plan:

river \_\_\_\_\_ stream \_\_\_\_\_ wetland \_\_\_\_\_ pond \_\_\_\_\_ lake \_\_\_\_\_ stone walls \_\_\_\_\_ are there any other historic or natural features? \_\_\_\_\_

**Lighting:**

Will there be any exterior lights? yes \_\_\_\_\_ no \_\_\_\_\_ Show location on site plan (e.g., pole fixtures, wall packs on building) and provide fixture and lumen information and photometric plan.

**Trees:**

Show location of existing trees on the site plan and indicate if any are to be removed.

**Landscaping:**

Is there existing landscaping on the site? yes \_\_\_\_\_ no \_\_\_\_\_ Show type and location on site plan.

Is new landscaping proposed? (Note: if property has frontage on Route 100, a 25' landscape easement to the Town is required)

**Buffering:**

Show any existing or proposed buffering measures for adjacent properties, e.g., plantings, fences.



**Erosion Control:**

Has an erosion and sedimentation control plan been submitted: yes \_\_\_\_\_ no \_\_\_\_\_

**Stormwater Management Plan**

Provided stormwater information for both pre and post development of the site. Show location of any detention areas and/or culverts on the site plan.

**Fire Protection**

Location of nearest hydrant \_\_\_\_\_ sprinklers? yes \_\_\_\_\_ no \_\_\_\_\_

Do you plan to have an alarm system? yes \_\_\_\_\_ no \_\_\_\_\_ Please contact the Fire Department at 829-4573 to discuss any town or state requirements (829-4573)

**Trash**

Will trash be stored inside \_\_\_\_\_ outside \_\_\_\_\_. If outside, will a dumpster be used? yes \_\_\_\_\_ no \_\_\_\_\_. Show location on site plan and show type of screening proposed (e.g., fencing, plantings)

**Technical Capacity**

List and provide contact information for all consultants who worked on the project, for example: licensed land surveyor, licensed soils evaluator, professional engineer, attorney, etc. \_\_\_\_\_

---

**Financial Capacity**

Please indicate how project will be financed. If obtaining a bank loan, provide a letter from the bank \_\_\_\_\_

---

**Zoning District:** \_\_\_\_\_

**Minimum Lot Size:** \_\_\_\_\_ **Classification of proposed use:** \_\_\_\_\_

**Parcel Size:** \_\_\_\_\_ **Frontage:** \_\_\_\_\_

**Setbacks: Front** \_\_\_\_\_ **Side** \_\_\_\_\_ **Rear** \_\_\_\_\_

**Is Board of Appeals Required?** \_\_\_\_\_

**Tax Map** \_\_\_\_\_ **Lot** \_\_\_\_\_ **Deed Book** \_\_\_\_\_ **Deed Page** \_\_\_\_\_

**Floodplain map number** \_\_\_\_\_ **Designation** \_\_\_\_\_

Vernal Pool Identified? no

Is parcel in a subdivision? no

Outside Agency Permits Required:

MDEP Tier 1        MDEP Tier 2        Army Corps of Engineers       

MDEP General Construction (stormwater) Permit (for disturbance of 1 acre or more) X

MDOT Entrance Permit X

MDOT Traffic Movement Permit       


Traffic Study Required X

Hydrogeologic Evaluation X

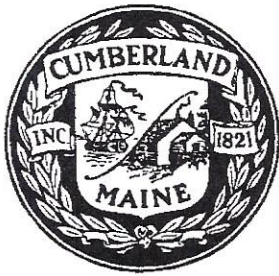
Market Study       

Route 1 Design Guidelines?

Route 100, VMU, or TCD Design Standards? N/A

Applicant's Signature 

Submission Date: July 25, 2017



PLANNING DEPARTMENT  
TOWN OF CUMBERLAND, MAINE

Dear Subdivision Applicant:

It is the sincere goal of the Town of Cumberland and its Planning Department to provide a fair, thorough and timely review of all applications. To this end, I would like to provide you with a quick overview of the process and a copy of a checklist that lists the information that will be required for the review.

I encourage you to call me to set up an appointment to discuss your project. I will arrange for our Code Enforcement Officer, Bill Longley to join us. Bill's presence will help ensure that the land use requirements for lot size, frontage, setbacks and uses are correct. Sometimes a proposal will need to secure Board of Appeals approval prior to coming to the Planning Board; Bill staffs that Board and can help you with that process. At this initial meeting, Bill will classify your proposed subdivision as either major (more than 4 lots) or minor (4 or less lots). Requirements vary based on that classification.

Sketch plan presentations to the Board are encouraged for minor subdivisions and are required for major subdivisions. By meeting with the Board prior to the detailed engineering work being done, both time and money could be saved.

The Cumberland Planning Board meets once a month on the third Tuesday of the month at 7:00 p.m. in the Town Council Chambers at Town Hall. The meetings are televised on Channel 2 and replayed throughout the month.

Please note that the deadline for applications is 21 days prior to the next scheduled Planning Board meeting. Incomplete applications will not be brought to the Board for initial review.

The Town contracts with a peer review engineer of the Town's choice for each project. The fees for this review are paid by the applicant. An initial review fee is collected at the time of application and any additional fees must be paid by the applicant prior to the issuance of a building permit.

If you have any questions, please do not hesitate to call me at 829-2206 or email me at [cnixon@cumberlandmaine.com](mailto:cnixon@cumberlandmaine.com). Pam Bosarge is the administrative assistant to me and the Planning Board. Please contact her if I am not available and she will assist you.

I look forward to working with you.

Sincerely,

Carla Nixon  
Cumberland Planning Director

# **SUBDIVISION AND SITE PLAN PROCESSES**

***NOTE: Planning Board meetings are held on the third Tuesday of each month. All submission materials MUST be delivered to the Planning Office by 5:00 p.m. no later than 21 days prior to the meeting date. Any submission requirements not included in application must either be listed as requested waivers with justification or else the application will not be placed on the next meeting agenda.***

## **Minor Site Plan Process**

1. Application Completeness determined by Planner.
2. Optional site walk
3. Public hearing and reviews for as many months as needed.
4. Outside agency permits on file
5. Public hearing: Final Approval

## **Major Site Plan Process**

1. Inventory and Analysis to Planning Board
2. Optional site walk
3. Application Completeness determined by Planner
4. Public hearing and reviews for as many months as needed.
5. Outside agency permits on file
6. Public hearing: Final Approval

## **Minor Subdivision**

1. Sketch Plan Review Preferred
2. Site walk
3. Application Completeness determined by Planner
4. Public hearing and reviews for as many months as needed.
5. Outside Agency permits on file.
6. Public hearing: Final Approval

## **Major Subdivision**

1. Sketch Plan Review
2. Site walk
3. Application Completeness determined by Planner
4. Public hearing and reviews for as many months as needed.
5. Preliminary Approval with Findings of Fact
6. Outside Agency permits on file.
7. Public hearing: Final Approval

**COMPLETION CHECKLIST**  
**BASED ON APPENDIX C**  
**MINOR SUBDIVISION SUBMISSION REQUIREMENTS**

---

	YES/NO	NOTES/COMMENTS
15 copies of plans		
Scale 1"=40'		
Proposed name of town & subdivision		
Date of submission, north point, graphic map scale		
Names & address of record owner and subdivider		
Names of adjoining property owners		
Names of existing/proposed streets, easements & bldg. lines		
Boundaries & designations of zoning districts, parks, public spaces		
Field survey with bearings and distances certified by LLS. Monuments shown.		
Dimensions & areas of each proposed lot		
Location, dimension, bearing of every lot line.		
Survey to an accuracy of 1' to 5,000'.		
2' contours		
Surface drainage patterns, channels and watershed areas.		
Soils report w/boundaries superimposed on the plan		
Plan submitted to CCSWCS		
On-site public sewer and water shown horiz and vert (Hydro-geol study?)		
Surface drainage plan or stormwater mgmt plan		
Electrical facilities		
Covenants or deed restrictions		



**Town of Cumberland**  
**Major Subdivision Submission Checklist**  
BASED ON APPENDIX D  
MAJOR SUBDIVISION SUBMISSION REQUIREMENTS

---

Subdivision Name \_\_\_\_\_

Applicant's Name \_\_\_\_\_ Date \_\_\_\_\_

Per Section 4.1 *General Procedures*, please note: *The Code Enforcement Officer will first determine if the project will be classified as a major or minor subdivision. Classification will determine submission requirements.*

***YOU MUST REVIEW THE PROPOSED PLAN WITH THE CODE ENFORCEMENT OFFICER AND TOWN PLANNER PRIOR SUBMITTING APPLICATION TO RECEIVE THE APPROPRIATE CLASSIFICATION.***

Major subdivision \_\_\_\_\_ Minor Subdivision \_\_\_\_\_

-----  
The following is intended to provide a summary of the submission requirements for subdivision review and for the provision of evidence for Findings of Fact. For precise requirements, please refer to the Town of Cumberland Subdivision Ordinance.

**THE TOWN PLANNER SHALL DETERMINE IF THE APPLICATION COMPLETE OR INCOMPLETE. ONLY COMPLETE APPLICATIONS SHALL BE REVIEWED BY THE PLANNING BOARD.**

***Waivers:*** Please make a check in the *Waiver Request* column for any requested waivers. Attach a separate sheet citing the Subdivision Ordinance section number, description, and reason for request. (Section 15.1)

**Specify below the location of information,  
i.e., plan #, narrative, binder section...**

	Yes or No	Location of Information?	Waiver Requested?
<b>General Submissions:</b>			
15 copies of plans and materials. All sheet sized to be 24" x 36"			
1"=100' scale for general plan			
1"=40' scale for construction of required improvements			
Traffic Info?			
Capacity to Serve letters?			
Financial and Technical Capacity (Sec.14)			



Sewer user permits required? Status?			
Deed restrictions, if any, describe			
<b>Cover Sheet:</b>			
Proposed subd. name & name of municipality			
Name & address of record owner, subdivider, and designer of preliminary plan			
<b>Location Map:</b>			
▪ Scale 1"=1000'			
▪ Shows area 1000' from property lines			
▪ All existing subdivisions			
Approximate tract lines of adjacent parcels			
Approximate tract lines of parcels directly across street			
Location of existing & proposed streets, easements, lot lines & bldg. lines of proposed subd. & adjacent properties.			
<b>Existing Conditions Plan</b>			
Existing buildings			
Watercourses			
Legend			
Wetlands			
existing physical features (trees 10" diameter or more. Stone walls			
Trail System?			
<b>Subdivision Plan:</b>			
Date of plan submission, true north & graphic scale			

Net residential acreage calculations			
Legend			
Trail (connecting?)			
<i>Widths</i> of existing/proposed streets, easements & bldg. lines			
<i>Names</i> of existing/proposed streets, easements & bldg. lines			
Boundaries & designations of zoning districts, parks, public spaces			
Outline of proposed subd. w/ street system			
Future probable street system of remaining portion of tract.			
Opportunities for Connecting Road(s) (13.2D)			
Space & setback of district			
Classification of road			
Width of road(s)			
Drainage type (open, closed, mix)			
Type of byway provided (8.4D)			
Names of adj. subdivisions			
Names of owners of record of adjacent acreage			
Any zoning districts boundaries affecting subd.			
Location & size of existing or proposed sewers, water mains, culverts, hydrants and drains on property			
Connections w/existing sewer or water systems			
Private water supply shown			
Private septic shown			
Hydro-geologic study			

(option for Board)			
Test pit locations			
Well locations			
Signature & lic. # of site evaluator			
Existing streets: location, name(s), widths w/in and abutting			
Proposed streets: location, name(s), widths w/in and abutting			
The above for any highways, easements, bldg. lines, alleys, parks, other open spaces w/in and abutting			
Grades & street profiles of all streets, sidewalks or other public ways proposed			
2' contour lines			
High intensity soil survey by cert. soil scientist			
Soil boundaries & names superimposed on plot plan			
Deed reference & map of survey of tract boundary by reg. land surveyor tied to established reference points			
Surface drainage or stormwater mgmt plan w/profiles & cross sections by a P.E. showing prelim. design and conveyances			
Proposed lot lines w/ dimensions and suggested bldg. locations.			
Location of temp. markers in field			
All parcels proposed to be dedicated to public use and conditions of such.			
Location of all natural features or site elements to be preserved			
Street lighting details			
Landscaping and grading plan including natural features to be preserved			

Survey stamped by P.E.			
Soil surveys w/# of soil scientist			
Septic plan w/ # of prof. site evaluator			
Geological evals w/ reg. geologists number			
Architect's seal			
For Rt. One: 75' undisturbed buffer applicable to all buildings, structures, parking areas, drainage facilities and uses.			
Open Space?			
Any part of parcel in a shoreland zone?			
Flood Map Number and rating?			
Stormwater Report?			
Rivers, ponds, wetlands?			
Historic, archeological features?			
Solid waste disposal?			
<b>Required Notes on Plan:</b>			
Fire Department notes			
Clearing limits note			
<i>Re: approval limit of 90 days before recording or null p. 10</i>			
<b>Final Plan Submissions:</b>	<i>See Appendix D</i>		
Actual field survey of boundary lines w/ monumentation shown			
Assessor's approval of street names and assignment of lot numbers.			
Designation of all open spaces w/ notes on ownership			
Copies of declarations, agreements or other documents showing the manner in which open space or easements are to			



be held and maintained.			
Written offer for any conveyance to the Town of open space or easements along with written evidence that the Council is willing to accept such offer			
Evidence of Outside Agency Approvals			

*As per Section 7.2 - REVIEW AND APPROVAL BY OTHER AGENCIES:*

- A. Where review and approval of any subdivisions or site plan by any other governmental agency is required, such approval shall be submitted to the Planning Board in writing prior to the submission of the Final Plan.*

Please list below all outside agency approvals that are required for this subdivision.

**Maine Department of Environmental Protection:** *List type of permit(s) required (e.g., SLODA, NRPA (tier type?), Maine Construction General Permit, etc.)*

**US Army Corps of Engineers:**

**Maine Department of Transportation:** *List type of permit(s) required.*

**Maine Department of Inland Fisheries and Wildlife:**

**Other:** (List)





September 25, 2017

Nancy St. Clair  
St. Clair Associates  
34 Forest Lane  
Cumberland, ME 04021

RE: Nitrate analysis, Higbee Notch Apartments

Nancy:

I reviewed the *Boundary & Topographic Survey* and the *Site and Subdivision Plan*, Sheets 2 and 3 of your submission, and also the soil test pit logs of Mark Hampton. The plan and site conditions are such that a waiver from the Planning Board for a nitrate analysis is warranted.

The septic disposal areas are sited on sandy loam soils with restrictive horizons in the subsurface, which act to keep wastewater perched in the upper soil horizons as it moves down gradient and not in direct contact with the bedrock surface. This is protective of the bedrock groundwater aquifer, which is the source of potable water in the neighborhood.

The direction of movement of wastewater is away from any existing or planned water wells. I see the setback distances of existing water wells is in excess of the 100 foot minimum required by the *Maine Subsurface Wastewater Disposal Rules*.

Additionally, there are extensive wetlands developed at the base of the hill, which will serve to remove nitrogen and other nutrients from the groundwater and the wastewater plumes before it moves into the river.

These site features are exactly what works best in planning the development of on-site wastewater disposal and a waiver from further study is warranted.

Please contact me with any questions or concerns.

Mark Cenci, C.G. #467



# CYLINDER

Wall mounted • Wet location listed



## Specifications:

### Description:

The P5674 Series are ideal for a wide variety of interior and exterior applications including residential and commercial. The Cylinders feature a 120V alternating current source and eliminates the need for a traditional LED driver. This modular approach results in an encapsulated luminaire that unites performance, cost and safety benefits.

### Construction:

Antique Bronze (-20) (powdercoat)  
 Die cast and extruded aluminum construction  
 metal shade  
 Flicker-free dimming to 10% brightness with most ELV type dimmers  
 (See Dimming Notes)  
 Back plate covers a standard 4" hexagonal recessed outlet box  
 4-1/2" sq. Mounting plate for outlet box included  
 6" of wire supplied  
 Wet location listed

### Performance:

Number of Modules	1
Input Power	17W
Input Voltage	120V
Input Frequency	60Hz
Lumens/LPW	788/46 (LM-79) per module
CCT	3000K
CRI	90
Life	60,000 (L70/TM-21)
EMI/RFI	FCC Title 47, Part 15, Class B
Min. Start Temp	-30° C
Max. Operating Temp	30° C
Warranty	5 year warranty
Labels	cCSAus Wet location listed

## P5674-20/30K

### Images:



### Dimensions:

Width: 5"  
 Height: 7-1/2"  
 Depth: 8"  
 H/CTR: 2-1/2"

### Catalog number:

Base	Finish	Color Temp	CRI
<b>P5674</b>	<b>20 - Antique Bronze</b>	<b>30K - 3000K</b>	<b>Blank- 90 CRI</b>

# CYLINDER

Wall mounted • Wet location listed



## P5674-20/30K

### Dimming Notes:

---

P5674 is designed to be compatible with many Electronic Low Voltage (ELV-Reverse Phase) controls.

The following is a partial list of known compatible dimmer controls:

#### Electronic Low Voltage ELV Reverse Phase Controls

Lutron	Diva Series	(Part Number DVELV-300P)
Lutron	Nova T Series	(Part Number NTELV-300)
Lutron	Vierti Series	(Part Number VTELV-600)
Lutron		(Part Number MAELV-600)
Lutron		(Part Number SPELV-600)
Leviton		(Part Number AWRMG-EAW)
Leviton		(Part Number 6615-P)

Digital type dimmers are not recommended.

Dimming capabilities will vary depending on the dimmer control, load, and circuit installation.

Always refer to dimmer manufacturer instructions or a controls specialist for specific requirements.

Dimmer control brand names where identified above are trade names or registered trademarks of each respective company.

# CYLINDER

wall mounted • Wet location listed

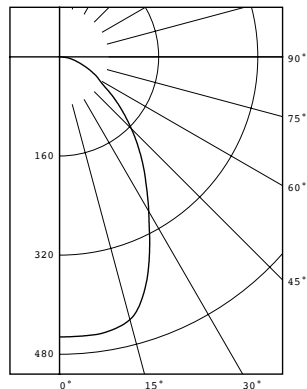


## Photometrics:

## P5674-20/30K

ELECTRICAL DATA	P5674-20/30K
Input Voltage	120V
Input Frequency	60Hz
Input Current	0.11A
Input Power	17W
Power Factor	>0.90
THD	<20%
EMI Filtering	FCC Title 47, Part 15, Class B
Operating Temperature	-30° C to 30° C
Dimming	Yes*
Over-voltage, over-current, short-circuit protected	
*See Dimming Notes for more information	

P5674-20/30K  
LED Light Engine: 3000K 90 CRI  
System Wattage: 16.4  
Fixture delivered lumens: 785  
Fixture Efficacy: 48.0  
Spacing Criteria: 1.0



CANDELA DISTRIBUTION	
DEG	CANDELA
0	452
5	452
15	439
25	344
35	242
45	164
55	97
65	58
75	29
85	9
90	0

ZONAL LUMEN SUMMARY		
ZONE	LUMENS	%LUMINAIRE
0-30	323	41.0%
0-40	475	60.2%
0-60	690	87.5%
0-90	788	100.0%
90-180	0	0.0%
0-180	788	100.0%

## COEFFICIENTS OF UTILIZATION

Zonal Cavity Method

Room Cavity Ratio	% Effective Ceiling Cavity Reflectance															
	80%				70%				50%				30%			
	20% Effective Floor Cavity Reflectance															
	% Wall Reflectance															
	70	50	30	10	70	50	30	10	50	30	10	50				
1	98	94	91	87	90	81	74	69	61	58	50	49				
3	83	74	67	61	76	58	58	50	49	43	38	33				
5	70	59	51	46	65	43	47	38	40	33	28	24				
7	60	49	41	36	56	34	39	30	34	27	22	19				
9	52	41	33	29	48	27	33	24	29	22	17	14				

Test No. 16.00019

Tested at 25°C Ambient in accordance to IESNA LM-79-2008

P5674-20/30K

Test No. 16.00019



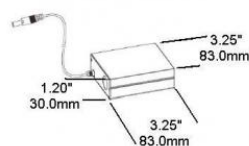
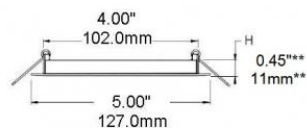
WHITE



BLACK



SATIN  
CHROME



\*\*Height including clip  
\*\*Hauteur avec pince  
1.08"  
28mm

## RZR-LED-400

### 4.00" ULTRA THIN LED RAZOR SERIES - 9W

#### Product codes

RZR-400-9W-27K-WH : WHITE - 27K  
RZR-400-9W-3K-WH : WHITE - 3K  
RZR-400-9W-3K-BLK : BLACK - 3K  
RZR-400-9W-3K-SC : SATIN CHROME - 3K  
RZR-400-9W-4K-WH : WHITE - 4K  
RZR-400-9W-4K-BLK : BLACK - 4K  
RZR-400-9W-4K-SC : SATIN CHROME - 4K

This ultra-thin recessed unit is IC and AIR TIGHT rated and with its thin profile allows installation in almost any location. It is suitable for wet locations, such as a shower and outdoors in soffits. Included with the unit is a junction box with driver, pressure fit clips and Quick Connect wire connectors for quick and easy installation. The junction box has integrated screw holes to allow the box to be secured to studs or joists, if needed. The maximum number of the 9W fixtures that can be installed with a standard 150W LED dimmer is 16 units. The 27K, 3K & 4K models replace a 600 lumen 50W halogen style bulb. This product is CSA certified in Canada and the US, conforms to UL standard 1598 and CSA standard C22.2 NO. 250.0. A complete listing of compatible dimmers may be found in our "Product Knowledge" section of our site. Although this product is AIR-TIGHT rated, some municipalities will require the use of a vapor barrier. Verify local building codes prior to installation.

#### Technical information

Cutting hole	4.25" (108.0 mm)
Beam Angle	107°
Color Temperature	27K / 3K / 4K
CRI	>80
Dimmable	Y
LED Life	50,000hrs
Mounting Plate	MP/AMP/MPHB 425
Light Output - Lumen	600LM (3K/4K) 575LM(2.7K)
Operating Temperature	-20°c + 40°c
Voltage	120V
Warranty (Years)	5
Watt	9W



17014

September 26, 2017

## **Stormwater Management Evaluation**

### **Higbee Notch Apartments**

**251 Gray Road**

**Cumberland, Maine**

**Cumberland Assessor's Map U21 Lot 18**

On behalf of Denise Morgan, Megan Morgan and Nathan Pelsinski, we have prepared this Stormwater Management Evaluation in support of Higbee Notch Apartments, located at 251 Gray Road. The record owner of the property is Denise Morgan, who purchased the property in April of 2017.

Mrs. Morgan's daughter, Megan Morgan, and Nathan Pelsinski are proposing to construct the Apartments on the property. One of the apartment units will be Ms. Morgan and Mr. Pelsinski's home. The proposed apartments will be offered as market-rate rental units.

### **Project Overview**

The Applicants propose an 8 unit apartment site, which includes two four-unit buildings, to be constructed in two phases, on the Applicants' approximately 5.85 acre parcel. Phase 1 will include the construction of Higbee Lane and the shared driveway to access the apartment building on Lot 1. Parking for the four apartments within Building 1 will be provided at the ratio of 2 spaces per unit.

As part of Phase 2, the second four unit apartment building will be constructed. This new building is located on Lot 2 and will use Higbee Lane and the shared driveway for its access. Eight new parking spaces will be constructed on Lot 2 to provide a parking ratio of two spaces per unit. In addition, Phase 2 will include the construction of a concrete pad and enclosure for trash near the turn-around for Higbee Lane.

**Setting**

The site is located off the easterly side of Gray Road (Route 100). The approximately 5.85 acre property is shown on Cumberland Assessor's Map U21 as Lot 18. The parcel is located in the VOC I Zoning District. It is generally "T" shaped, with the development area located approximately 300' easterly of Route 100.

The parcel has approximately 97.8 feet of frontage on Route 100. This strip of frontage extends approximately 300' off Route 100, to the point at which the parcel then widens out to approximately 475' to provide the proposed development area.

The easterly end of the parcel abuts the Piscataqua River. The mapped wetlands along the river identify the limits of the Special Flood Hazard Area. The upland area within 250' of the wetlands along the River is subject to the Shoreland Overlay District.

As the enclosed Plans demonstrate, the applicants are proposing some improvements in the Shoreland Overlay District; however, these improvements are outside of the 100' building setback, and at full build out remain well below the 20% allowable impervious area within the portion of the lot that is subject to Shoreland Overlay.

The Open Space for Stonegate Estates Subdivision is located to the east of the site, on the opposite side of the River. Residential properties are generally located to the north and south of the site, along Route 100. The homes on these abutting properties are located closer to Route 100 than the proposed new residences on the project site.

This site is in the rural area of Cumberland and is outside of the Urban Area. The site discharges directly to an existing drainage way (i.e. the Piscataqua River) and does not enter into the Town's stormwater drainage system.

**Existing Conditions**

An Existing Condition Survey was completed by St.Clair Associates. The topographic data shown on the site is based on a combination of limited field survey conducted by our office in 2017 (within the previously disturbed areas of the site) coupled with LIDAR topographic data in the areas that had not been previously cleared on the site.

As the Survey demonstrates, the approximately 5.85 acre property has a relatively small amount of frontage along Route 100 (Gray Road), while the primary development area is located roughly 300' off Route 100. As discussed above, the easterly property line is formed by the meandering Piscataqua River.

The old Interurban Rail line previously crossed the lower portion of the site, generally parallel to the River. The relatively level area is evident across the site, but no rails or other features of this abandoned facility remain.

Based on our site observations there are no well-defined trails through the site that demonstrate recent activity. The prior landowners had begun construction of an access road to the rear of the site by doing some site clearing and filling. The approximate extent of the prior clearing is shown on the enclosed plans. The remainder of the site is wooded with a mix of evergreen and deciduous trees.

There is an approximately 46' total change in elevation from the highest point of the site, located at the Route 100 frontage, to the lowest point of the site at the River. The primary development area is situated roughly 16'-20' below the elevation of the site's entrance at Route 100.

There is an outcrop of ledge in the development area that has been integrated into the site design. The extent of existing subsurface bedrock is not fully known at present. However, test pits have been conducted in the general location of the proposed access drive and the primary development area for the new buildings and parking.

Based on these test pits, and the proposed site grading, it is expected that the buildings and site improvements can generally be constructed with little risk of encountering extensive ledge. The applicant's goal is to avoid the need to do extensive ledge excavation.

### **Natural Resources**

Mark Hampton Associates has conducted a Natural Resource evaluation of the site, which includes a Wetland Delineation and Vernal Pool assessment of the site during this year's breeding season. The wetland areas delineated by Mr. Hampton are primarily along the easterly property limits and include areas adjacent to the Piscataqua River.

There is also a pocketed wetland area on the southeasterly corner of the site that was presumably created by an impoundment associated with the old Interurban rail line. The mapped wetland areas are shown on the enclosed plans, based on GPS data provided by Mr. Hampton.



Mr. Hampton's Vernal Pool Assessment specifically observed the impounded wetland area for the potential presence of indicator species for identification of a Vernal Pool. No Vernal Pools were identified on the site. As the enclosed plans demonstrate, no wetland impacts are proposed.

### **Development Description**

As noted, the Applicants propose an 8 unit apartment site, which includes two four-unit buildings, to be constructed in two phases, on the Applicants' approximately 5.85 acre parcel.

The Applicants have established a development approach that provides a site layout and design features that are compatible with the natural setting, and generally focus the improvements to the area previously disturbed on the site. The site has been designed to offer a simple layout with convenient access to each individual apartment, while allowing large portions of the site to remain open and in their natural state. This provides an extensive buffer and ample area for the residents to enjoy the setting along the river, while minimizing the extent of impervious areas on the site.

The enclosed Plans focus the site improvements to the central portion of the property, allowing for larger open areas around the perimeter of the site. The short section of roadway, with a hammerhead turn-around and the proposed shared gravel driveway also reduces the overall extent of sitework and additional land disturbance necessary to provide access to the apartment units.

The Applicants are proposing to divide the approximately 5.85 acre site into two lots, in order to accommodate project phasing. Both lots will have frontage on a proposed 50' wide right of way off Route 100, called Higbee Lane. Higbee Lane is a short section of paved roadway (approximately 105 feet long) off of Route 100, which will provide the requisite minimum 75' of frontage for each lot. A hammerhead turn-around is provided at the end of the proposed roadway. From the terminus of the right of way, an approximately 240' long shared private gravel driveway will provide access to the 8 new apartments.

One four-unit apartment building is proposed on each of the two lots. Each approximately 80' long by 28' deep (2,240 sf each) townhouse style apartment building will be two stories tall with four apartments within it. Each apartment will have two bedrooms, and will have provisions for daylight basements based on the site grading. Each unit will have its own deck area for residents' outdoor use.

In accordance with the Ordinance standards for multiplex dwellings, 50% of the parcel is set aside as Open Space for use as recreational, agricultural or other outdoor living purposes and for preserving natural features. The easterly portion of the site has been identified as Open Space and slightly exceeds 50% of the parcel area.

The proposed Higbee Lane will be constructed to meet municipal standards for a Residential Access drive, and will include a 22' wide pavement section with 2' gravel shoulders, with open swales (approximately 30" deep) on either side. Higbee Lane extends approximately 105' off Route 100 and includes a hammerhead turn around.

A shared gravel driveway will be constructed off the end of Higbee Lane. This shared gravel driveway will be 22' wide with 2' gravel shoulders on each side. The ditch depth along the shared gravel driveway is 24" minimum to provide open drainage of the approximately 21" deep gravel section. From the terminus of Higbee Lane, the 22' wide shared gravel access drive will extend approximately 204' to the proposed location of the parking area for the two four-unit apartment buildings. This shared gravel driveway will be located in an access easement on both of the proposed lots.

Parking for the apartments will be provided along the front of each building and will be provided at a ratio of two spaces per unit, for a total of 16 proposed parking spaces. Each parking space will be paved, with a 5' sidewalk and greenspace between the parking and building. A 24' wide shared gravel maneuvering area will be provided between the parking areas in front of each building. A turn around area is provided at the end of the parking area. Utilities for the site include on-site drilled wells and subsurface disposal systems for each building.

### **NRCS Soils Information**

Using the Natural Resources Conservation Service (NRCS) Web Soil Survey (WSS), the predominant soil types on the parcel and in the project vicinity are as follows:

Soil Name	HS G	Notes
Paxton Fine Sandy Loam, 3-8% slopes (PbB)	C	Higbee Lane, near Route 100
Paxton Fine Sandy Loam, 8-15% slopes (PbC)	C	Northerly edge of the site
Paxton Very Stony Fine Sandy Loam 3-8% slopes (PfB)	C	Northeasterly corner of the site
Hollis Fine Sandy Loam, 3-8% slopes (HrB)	D	Along shared gravel driveway
Hollis Very Rocky Fine Sandy Loam, 8-20% slopes (HsC)	D	Central site development area
Sebago Mucky Peat (Sp)	D	In wetlands along the river

According to the NRCS WSS, the predominant soils in the development area of the site are Hollis Very Rocky Fine Sandy Loam which is in a D Hydrologic Soil Group (HSG). The mapped soils along the shared gravel driveway are also in the Hollis Soil Series (with a HSG of D) but are in the category of Fine Sandy Loam. Soils in the area of Higbee Lane are Paxton Fine Sandy Loam which are in a C category. As previously noted, the former landowner had filled a portion of the site, in the general area of the proposed new apartment buildings. Test pits excavated in this area generally show that the site fills consisted of a mix of primarily clay fill, with limited granular materials.

Given the proposed site design, the shared driveway and parking areas, and a portion of the new apartments will be constructed in the areas of the prior site fills. The site improvements that are located outside of the prior fill areas will be constructed primarily in the Hollis Very Rocky Fine Sandy Loam (HSG D). For the purposes of this stormwater evaluation, given the prior site disturbance (i.e. primarily clay fills), the soils in the development area have been assumed to be in the HSG D series.

The predominant soils in the Open Space areas are a mix of the Hollis Very Rocky Fine Sandy Loam, with Sebago Mucky Peat along the river. These soil types are HSG D Soils. There are areas of Paxton soils along the northerly end of the Open Space, these soils are HSG C soils. Given that these soils are in the proposed Open Space, they are outside of the limits of work.

Abutting properties within the overall area are generally located in a mix of primarily Paxton (to the north and along Route 100), and Hollis (to the west and south of the site). As noted above, Paxton Soils are in HSG C, and Hollis is in HSG D. The Piscataqua River is to the east of the site.

### **Watershed Information**

This site is within the watershed of the Piscataqua River. This watershed is not identified as an Urban Impaired Stream Watershed by the MDEP. For the purposes of this analysis, the study points have been selected at the locations where the site runoff either crosses the property line or reaches the edge of the Piscataqua River. Areas on the opposite side of the river, and the upstream offsite watershed tributary to this segment of the river have not been included in this analysis.

## **Watershed Modeling**

### **Pre-Development**

In the pre-development condition, the Study Area has been divided into three Subcatchments (Subcatchments 1S-3S). The overall limits of the subcatchments are based on a review of LIDAR topography available for the Cumberland area, coupled with on-site topography gathered in the previously disturbed areas of the site. LIDAR topography was used within the wooded areas of the site that were not disturbed by the prior landowner.

Subcatchment 1S is located on the southerly end of the site and includes the abutting homes located southerly of the site along Route 100, along with a small portion of Route 100 itself. The runoff from these abutting properties enters into the project site from the rear yards of these abutting residences. Stormwater passes through the southerly portion of the site and flows in a general easterly to southeasterly direction (i.e. towards the river) to the existing wetland pocket located along the southerly property line. Discharge from this wetland area crosses the southerly property line onto an abutting parcel and appears to generally pass through an offsite wetland area prior to reaching the river. A Study Point (SP1) has been identified at the point the runoff leaves the site at the southerly property line.

Subcatchment 2S generally includes the northerly section of the site and the majority of the abutting residential house lot to the north of the site along Route 100, as well as a very small portion of Route 100. The runoff from this abutting property enters into the project site from the rear yard of the residence. Stormwater passes through the northerly portion of the site and flows in a general easterly to northeasterly direction (i.e. towards the river) to the edge of the river. Study Point 2 (SP2) is located at the edge of the river.

Subcatchment 3S is centrally located within the site and begins at the ledge outcrop just to the east of the primary development area of the site. Runoff in this subcatchment flows from the ledge outcrop toward the river in a generally easterly direction to the site outlet at the edge of the Piscataqua River. Study Point 3 (SP3) is located at the edge of the river.

### Post Development

In the post-development condition, the proposed site improvements alter portions of the three watersheds within the project site. In order to evaluate the proposed site improvements in the context of the three study points, the limits of the three watersheds have been adjusted in the post-development condition.

In the Post-Development Condition, Subcatchment 1S is altered by the construction of Higbee Lane and the shared gravel access drive. Specifically, the northerly limit of Post-Development Subcatchment 1S has been identified as the centerline of Higbee Lane and the gravel access drive. This subcatchment also includes the southerly rooftop of Building 1 and the rear lawn area associated with this building. The proposed construction of the subsurface disposal area for Building 1 also occurs within Subcatchment 1S.

Subcatchment 2S is also altered by the construction of Higbee Lane and the shared gravel access drive. The southerly limit of Post-development Subcatchment 2S follows along the centerline of Higbee Lane and the shared gravel access drive. The rear rooftop of Building 2, as well as the rear yard area for this building (to be constructed in Phase 2) is also tributary to Post-development Subcatchment 2S. The proposed Phase 2 construction of the subsurface disposal system for Building 2 is also included as part of the post-development Subcatchment 2S.

Based on the site grading plan, the post-development Subcatchment 3S expands slightly to include the parking and maneuvering areas associated with both buildings, as well as the roof runoff from the fronts of Buildings 1 and 2.

### Modeling Assumptions

The estimated impervious area associated with this project includes the construction of two new four-unit apartment buildings, and the associated site improvements including the construction of Higbee Lane, the shared gravel access drive, and parking and maneuvering areas for 16 parking spaces, and 5' sidewalks along the frontage of each apartment building. Impervious areas are considered rooftops, paved areas as well as the gravel access drive and gravel maneuvering areas.

The estimated developed areas include the impervious areas described above, as well as the areas disturbed in association with the construction of the two subsurface disposal systems, lawn areas, and grading associated with the ditches and swales to address stormwater.

### **Overall Project's Impervious and Developed Area**

The total anticipated developed area is approximately 66,211 sf (1.52 ac.), and the anticipated amount of impervious area is approximately 17,741 sf (0.41 ac.). Based on this amount of impervious and developed area, this project requires a Stormwater Permit by Rule (PBR) and must comply with the Basic Standards identified in the Stormwater Rules.

This PBR includes a 14 day review period prior to the start of construction. The PBR has been filed, and is expected to be received prior to receipt of final subdivision approval.

### **Applicable Standards**

Based on the anticipated levels of impervious area and estimated developed area for this project, the applicable MDEP Chapter 500 Standards include only the Basic Standards.

In support of the Basic Standards as described in the Chapter 500, Plan Notes addressing Erosion and Sediment Control, Inspection and Maintenance, and Housekeeping have been prepared to address the proposed activities during construction. Notes and plan details have been included in the drawing set to aid the contractor in addressing proper Erosion and Sediment Control measures and Housekeeping requirements.

### **MDEP Requirements for Stormwater Treatment and Attenuation**

Based on the MDEP Chapter 500 Standards, a project of this scale is not required to provide stormwater treatment (i.e. the General Standards) or to provide stormwater management facilities to attenuate post-development peak discharge rates (i.e. the Flooding Standard).



In support of the municipal requirements for a pre- and post-development stormwater analysis, a HydroCAD model has been established for the site, and this Stormwater Management Evaluation has been prepared to consider the pre-and post-development peak discharge rates in the 2 and 25 year storm event.

Since this site is outside of the Urban area of Cumberland and discharges directly to an existing drainage course and does not enter into the municipal separate storm sewer system (MS4), the standards of Chapter 242 Articles I (Stormwater Discharge) and II (Post-Construction Stormwater Management) are not applicable.

### **Stormwater System Modeling**

In order to evaluate the anticipated effects of the two proposed new apartment buildings on this parcel during storm events, a HydroCAD model has been created to evaluate the post-development subcatchments associated with this site, in the context of the pre-development watershed areas.

In accordance with the Cumberland Ordinance criteria, stormwater modeling has been conducted to evaluate the 2 and 25 year events. The stormwater modeling uses a Type III Storm Distribution.

Precipitation data used as part of the modeling is based on rainfall data cited in the Maine Department of Environmental Protection (MDEP) Chapter 500 standards (which were based on the Natural Resource Conservation Commission's (NRCC's) data obtained by the MDEP in June of 2014). Specifically, the MDEP provides the following 24-hour duration rainfall amounts:

Event	1 YR	2-YR	10-YR	25-YR	100-Yr
24-Hour Rainfall (inches)	2.6	3.1	4.6	5.8	8.1

As noted, the Study Area limits were identified as the point at which flows from this site either cross the property line or enter into the Piscataqua River which forms the site's easterly boundary.

A review of the USGS StreamStats data for this site shows that the upstream watershed area tributary to the Piscataqua River at this location is approximately 5.5 square miles (3,520 acres).

The table below provides a summary and comparison of the Pre- and Post-Development Results based on the HydroCAD model created for this project.

Stormwater Modeling Results				
Storm Event	Pre	Post	Net Change	% Change
Study Point 1				
2-Yr	2.50 cfs	2.28 cfs	-0.22 cfs	-8.8%
25-Yr	6.54 cfs	5.98 cfs	-0.56 cfs	-8.6%
Study Point 2				
2-Yr	1.39 cfs	1.42 cfs	0.03 cfs	2.2%
25-Yr	3.85 cfs	3.94 cfs	0.09 cfs	2.3%
Study Point 3				
2-Yr	2.2 cfs	3.07 cfs	0.87 cfs	39.6%
25-Yr	6.22 cfs	8.46 cfs	2.24 cfs	36.0%

As the table above demonstrates, based on the modeling results, the anticipated post-development peak discharge rates at Study Point 1 are lower than the pre-development peaks for both the 2 and 25 year storm events. As noted, Study Point 1 is located along the southerly property line and evaluates the point at which runoff from the site enters the abutting property before reaching the river.

At Study Point 2, the modeling data shows a slight increase in predicted post-development peak discharge rates (in both the 2 and 25 year storm events) as runoff from the site directly enters the Piscataqua River. This represents slightly over a 2% increase over the pre-development peak discharge rates entering the river at this point.

At Study Point 3, the model identifies a predicted increase in peak discharge which ranges from 0.87 cfs in the 2 year storm event to approximately 2.24 cfs in the 25 year storm event. Study Point 3 is centrally located within the site and represents the location where the central site runoff directly enters into the Piscataqua River.

In order to further evaluate the predicted increases in peak discharge at Study Points 2 and 3 in the context of the receiving water body (i.e. the Piscataqua River), our office used the USGS StreamStats online model to identify the Piscataqua River's upstream watershed area that is tributary to this location. In addition, the peak flow statistics for the river, during varying storm events, were reviewed in the area of the project site.

As noted above, based on the StreamStats data, the Piscataqua River receives runoff from an approximately 5.5 square mile (3,520 acres) upstream watershed area prior to reaching the project site.

Based on the StreamStats data, during the 2 year flood event, the flow in the Piscataqua River at this location is expected to be approximately 164 cfs. As noted above, based on our modeling data for the 2 year storm event, the net change in predicted post-development peak discharge from the site is expected to be a decrease of 0.22 cfs at Study Point 1, and an increase of 0.03 cfs at Study Point 2 and 0.87 cfs at Study Point 3.

Combined, these predicted changes in peak flows represent a net increase in peak discharge in this area of approximately 0.68 cfs. In comparison to the 164 cfs flows in the river during the 2 year storm, this predicted increase is very small and equates to an approximately 0.41% change in predicted flows in the river.

Based on the StreamStats data, during the 25 year flood event, the flow in the Piscataqua River at this location is expected to be approximately 423 cfs. As shown in the table above, the modeling data for the 25 year storm event predicts the following changes in post-development peak discharge from the site: a decrease of 0.56 cfs at Study Point 1, an increase of 0.09 cfs at Study Point 2 and an increase of 2.24 cfs at Study Point 3.

Combined, these predicted changes in peak flows represent a net increase in peak discharge in this area of approximately 1.77 cfs. In comparison to the 423 cfs flows in the river during the 25 year storm, this equates to an approximately 0.42% change in predicted flows in the river.

As the discussion above demonstrates, although the modeling data does show a predicted overall increase in post-development peak discharge rates entering the river, these predicted changes represent less than a half of a percent of the overall flow rates in the Piscataqua River at this location during each of the storm events studied.

In addition, the predicted increases only occur at the Study Points within the site that directly abut the river (i.e. Study Points 2 and 3). As the modeling data demonstrates, the post-development peak discharge rates at Study Point 1 (where runoff leaves the site and flows onto an abutting property) are actually slightly lower than the peak discharge rates calculated in the pre-development model.

Given these conditions, the Applicants are respectfully requesting a waiver to allow the predicted increases in Post-development peak discharge rates at Study Points 2 and 3, to occur without the need for on-site detention storage, given the fact that the increased site runoff directly enters the river (without crossing any abutting properties) and represents collectively less than half a percent change in the river's flow in this area.

The alternative to this waiver request would necessitate the construction of on-site detention areas in Subcatchments 2 and 3 to provide attenuation of the peak flows from the site. This involves additional clearing and land disturbance in the overall project area and will potentially generate an increase in thermal impacts to the flows from the site.

In consideration of the reduction in land disturbance associated with this waiver request and the fact that the receiving water body has the capacity to carry flows from such an extensive upstream watershed area, the Applicants are respectfully requesting that a waiver be granted.

### **Low Impact Design**

As the enclosed plans demonstrate, to the extent practicable, the development of this site has been focused on the areas of the parcel that have been previously disturbed. The two-building layout shares a common access drive and maneuvering areas for the parking provided for each apartment unit. This reduces the overall footprint of developed area on the site.

The grading design incorporates open swales that transition to larger grassed areas prior to entering the wooded sections of the site. Preservation of the existing wooded areas along the river (with the thermal benefits provided by the existing tree cover and natural sediment removal in the forest duff and understory vegetation) provides beneficial treatment to runoff from the site as well.

The entire easterly section of the site has been set aside as Open Space to create a defined block of natural area to be kept intact along the river. This separates the developed areas on the site from the most sensitive resources on the parcel. The Open Space also provides a common link to other Open Space areas nearby on the opposite side of the river.

Preservation of the areas on the site (i.e. along the river) protect the most sensitive sections of the site and the most valuable natural resources.

These measures are consistent with the recommendations included as part of Low Impact Development (LID) strategies.

### Summary

As the enclosed HydroCAD Calculations demonstrate, it is anticipated that the increased stormwater runoff associated with the construction of the two proposed new apartment buildings, Higbee Lane, the shared gravel driveway and the 16 new parking spaces, along with the disturbed areas necessary to accommodate the on-site utilities and lawn areas can reasonably be accommodated by integrating the design elements shown on the enclosed plans, including the installation of permanent stone check dams within the ditches that disperse the flows from the roadway to the rear yards and ultimately to the Open Space areas of the site.

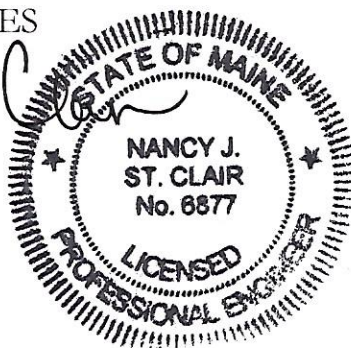
By incorporating the low impact provisions cited above, coupled with the proposed approach to address stormwater as described and detailed herein, we are confident that this project can comply with the intent of the applicable local standards for stormwater management and is consistent with the MDEP Standards for Stormwater as included in Chapter 500.

Prepared by,

ST.CLAIR ASSOCIATES

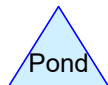
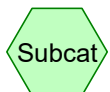
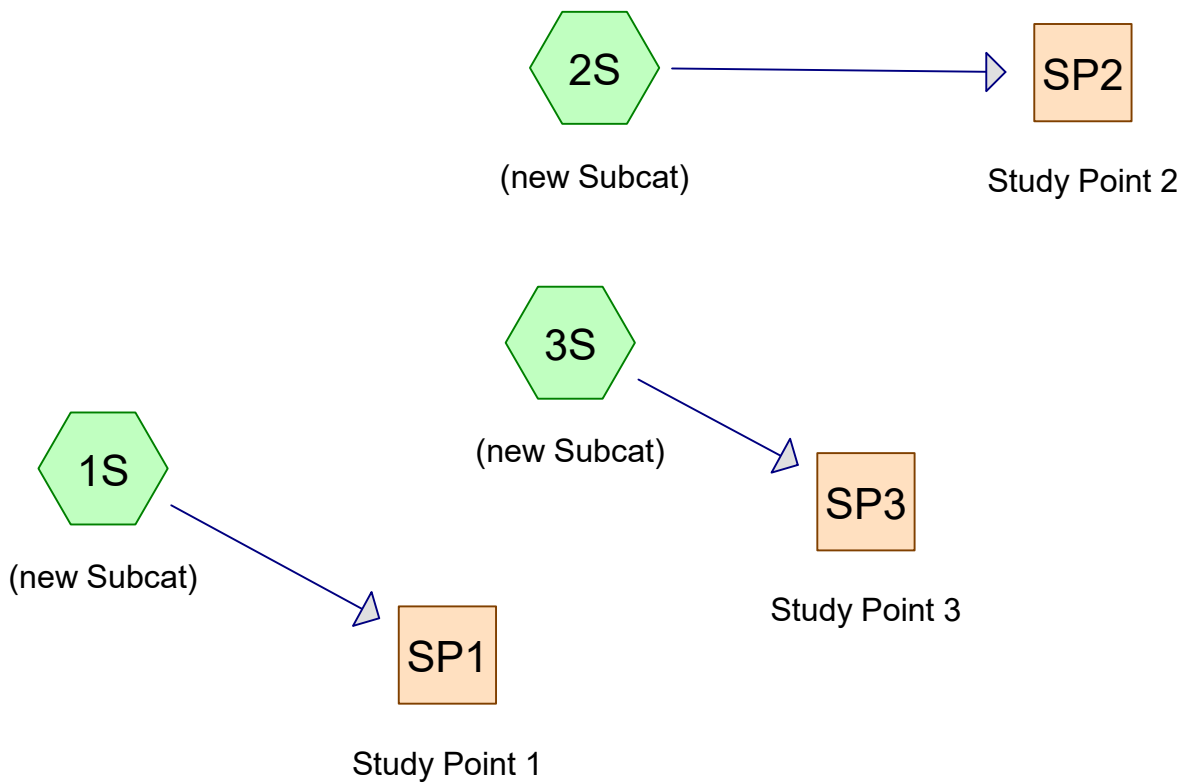


Nancy J. St.Clair, P.E.  
Vice President



NJS:njs

C: Applicant





**17014 Pre Development 9-26-17**

Prepared by St.Clair Associates

HydroCAD® 10.00-14 s/n 07350 © 2015 HydroCAD Software Solutions LLC

17014 Higbee Notch Apartments  
Type III 24-hr 2 yr MDEP Rainfall=3.10"

Printed 9/26/2017

Page 2

**Summary for Subcatchment 1S: (new Subcat)**

Runoff = 2.50 cfs @ 12.65 hrs, Volume= 0.357 af, Depth&gt; 1.33"

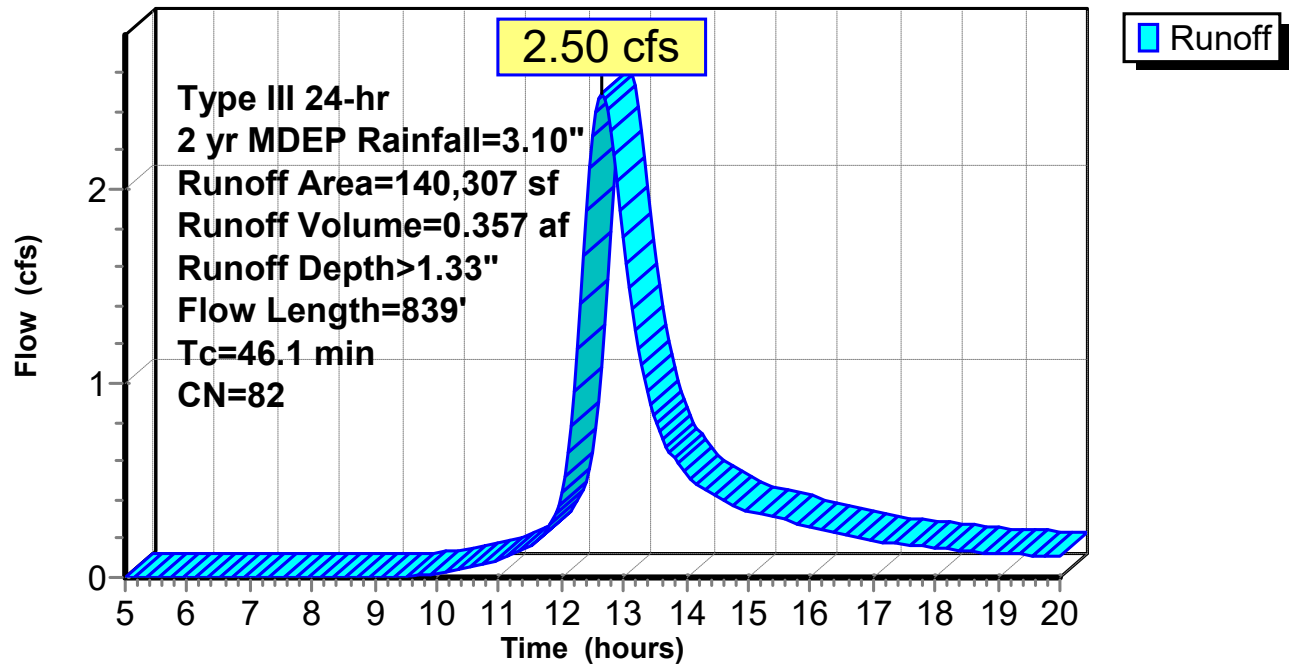
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 2 yr MDEP Rainfall=3.10"

	Area (sf)	CN	Description
*	1,771	98	Impervious C Soil
	7,885	79	50-75% Grass cover, Fair, HSG C
*	3,927	98	Impervious D Soil
*	981	98	Existing Rooftop
	16,889	84	50-75% Grass cover, Fair, HSG D
	17,540	79	Woods, Fair, HSG D
*	12,642	98	Impervious D Soil
	78,672	79	Woods, Fair, HSG D
	140,307	82	Weighted Average
	120,986		86.23% Pervious Area
	19,321		13.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
34.9	150	0.0050	0.07		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.10"
1.4	128	0.0500	1.57		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
0.3	38	0.1800	2.12		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
2.0	160	0.0700	1.32		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
0.7	94	0.2200	2.35		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
2.5	66	0.0300	0.43		<b>Shallow Concentrated Flow,</b> Forest w/Heavy Litter Kv= 2.5 fps
4.3	203	0.1000	0.79		<b>Shallow Concentrated Flow,</b> Forest w/Heavy Litter Kv= 2.5 fps
46.1	839	Total			

Subcatchment 1S: (new Subcat)

Hydrograph



**17014 Pre Development 9-26-17**

Prepared by St.Clair Associates

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17014 Higbee Notch Apartments  
Type III 24-hr 2 yr MDEP Rainfall=3.10"

Printed 9/26/2017

Page 4

**Summary for Subcatchment 2S: (new Subcat)**

Runoff = 1.39 cfs @ 12.83 hrs, Volume= 0.230 af, Depth&gt; 1.20"

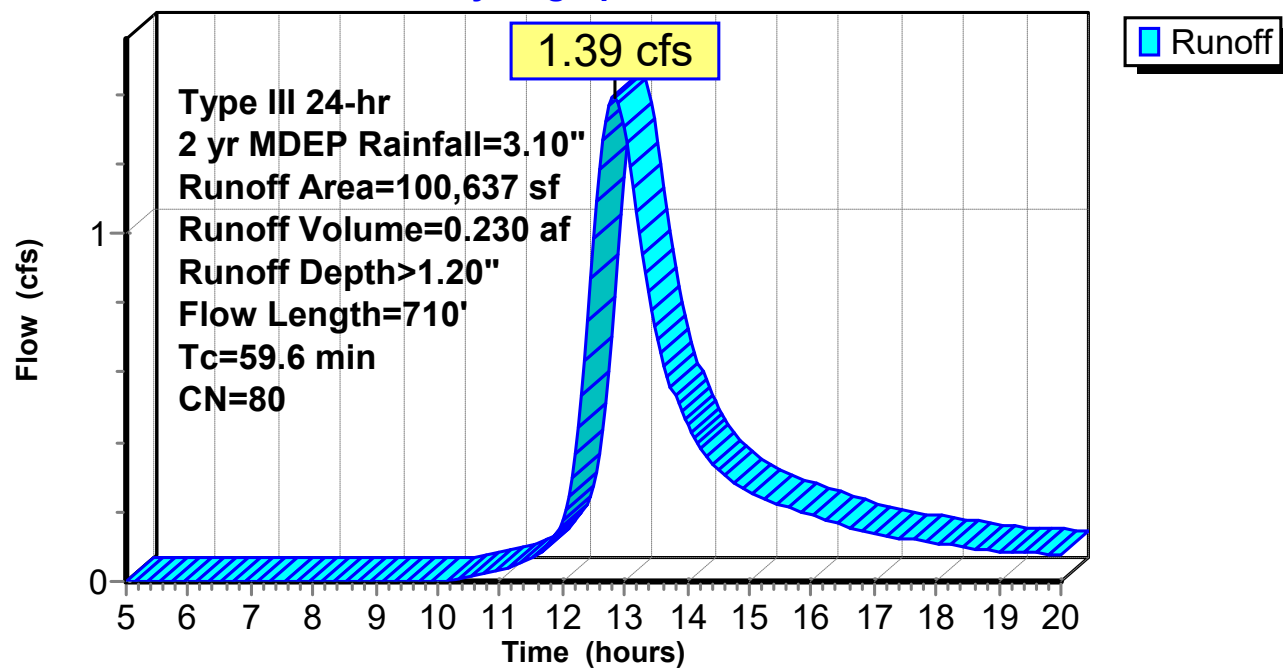
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 2 yr MDEP Rainfall=3.10"

	Area (sf)	CN	Description
*	4,164	98	Impervious C Soil
	3,479	73	Woods, Fair, HSG C
	6,306	79	50-75% Grass cover, Fair, HSG C
*	1,838	98	Existing Rooftop
	5,346	79	50-75% Grass cover, Fair, HSG C
	27,189	73	Woods, Fair, HSG C
	30	79	50-75% Grass cover, Fair, HSG C
*	313	98	Existing Rooftop
	8,642	84	50-75% Grass cover, Fair, HSG D
	5,793	79	Woods, Fair, HSG D
*	5,078	98	Impervious D soil
*	3,017	98	Impervious D soil
	2,350	84	50-75% Grass cover, Fair, HSG D
	26,888	79	Woods, Fair, HSG D
*	204	98	Impervious D Soil
	100,637	80	Weighted Average
	86,023		85.48% Pervious Area
	14,614		14.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
34.9	150	0.0050	0.07		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.10"
3.0	64	0.0050	0.35		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
1.4	125	0.0900	1.50		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
0.5	33	0.2000	1.12		<b>Shallow Concentrated Flow,</b> Forest w/Heavy Litter Kv= 2.5 fps
3.3	123	0.0600	0.61		<b>Shallow Concentrated Flow,</b> Forest w/Heavy Litter Kv= 2.5 fps
3.0	151	0.1100	0.83		<b>Shallow Concentrated Flow,</b> Forest w/Heavy Litter Kv= 2.5 fps
13.5	64	0.0010	0.08		<b>Shallow Concentrated Flow,</b> Forest w/Heavy Litter Kv= 2.5 fps
59.6	710	Total			

Subcatchment 2S: (new Subcat)

Hydrograph



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*Type III 24-hr 2 yr MDEP Rainfall=3.10"*

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**Summary for Subcatchment 3S: (new Subcat)**

Runoff = 2.20 cfs @ 12.41 hrs, Volume= 0.250 af, Depth&gt; 1.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Type III 24-hr 2 yr MDEP Rainfall=3.10"

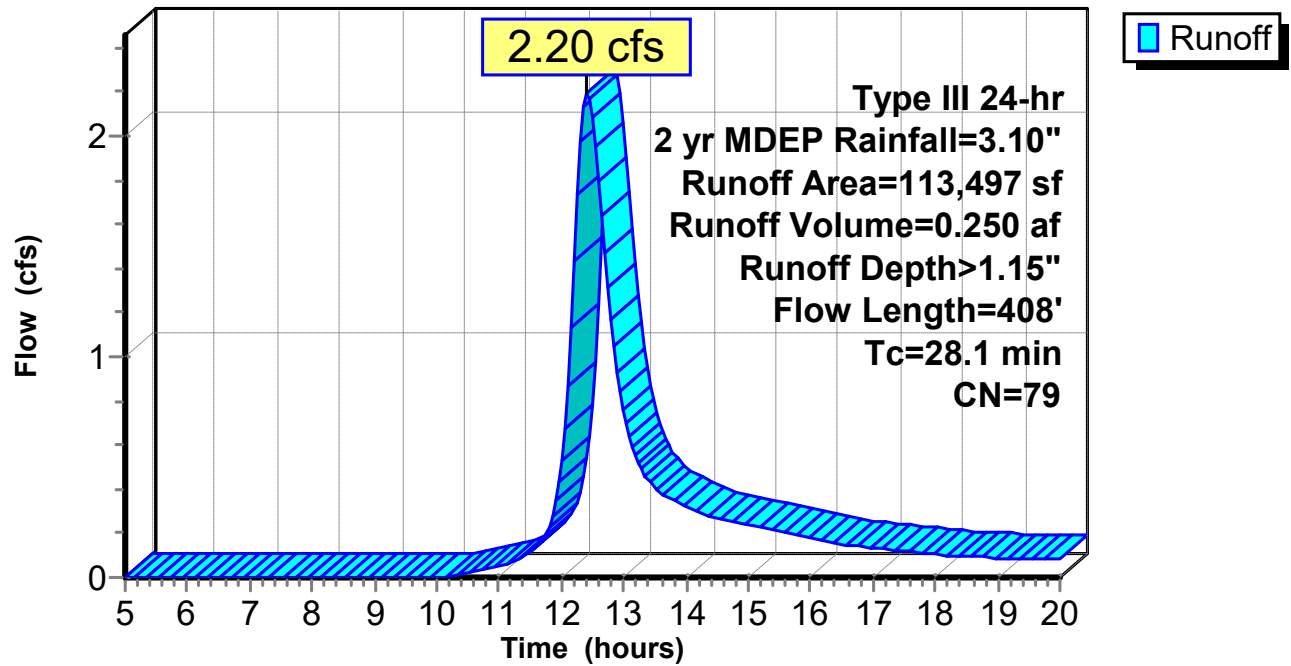
	Area (sf)	CN	Description
*	616	98	Ledge Outcrop D Soil
	109,852	79	Woods, Fair, HSG D
	3,029	73	Woods, Fair, HSG C
	113,497	79	Weighted Average
	112,881		99.46% Pervious Area
	616		0.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.9	135	0.0600	0.13		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.10"
1.8	15	0.2200	0.14		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.10"
1.1	68	0.1600	1.00		<b>Shallow Concentrated Flow,</b> Forest w/Heavy Litter Kv= 2.5 fps
7.3	190	0.0300	0.43		<b>Shallow Concentrated Flow,</b> Forest w/Heavy Litter Kv= 2.5 fps
28.1	408	Total			

Subcatchment 3S: (new Subcat)

Hydrograph





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Type III 24-hr 2 yr MDEP Rainfall=3.10"

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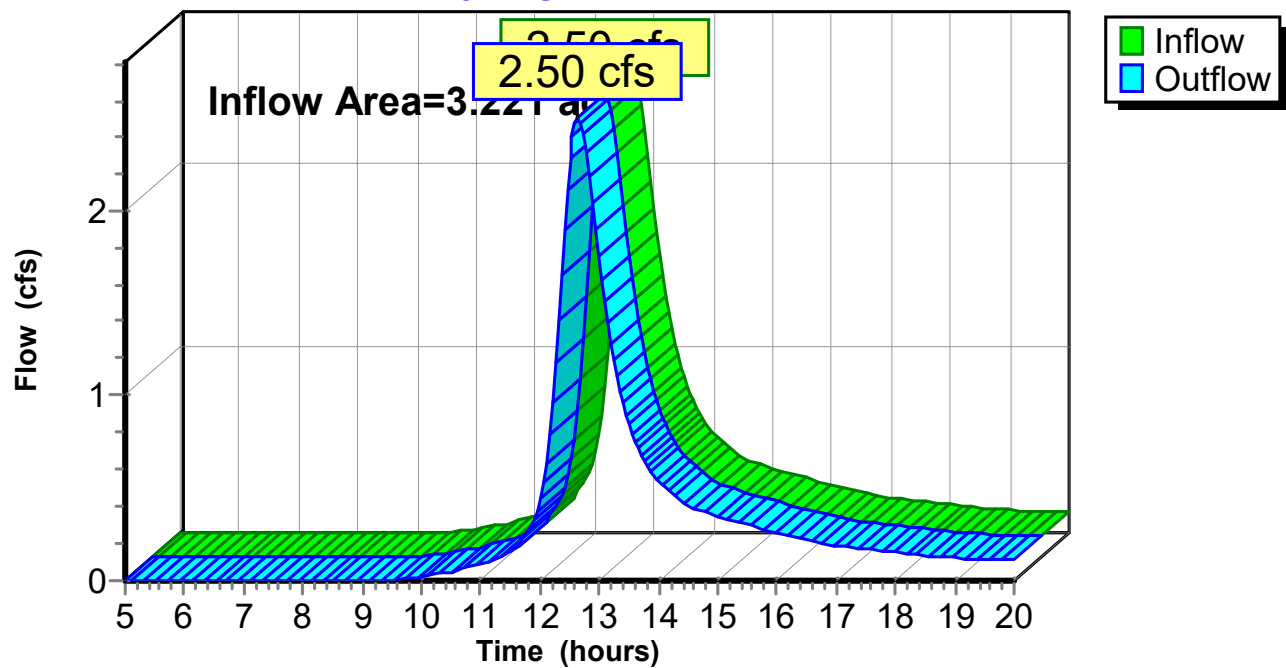
### Summary for Reach SP1: Study Point 1

Inflow Area = 3.221 ac, 13.77% Impervious, Inflow Depth > 1.33" for 2 yr MDEP event  
Inflow = 2.50 cfs @ 12.65 hrs, Volume= 0.357 af  
Outflow = 2.50 cfs @ 12.65 hrs, Volume= 0.357 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

### Reach SP1: Study Point 1

#### Hydrograph



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Type III 24-hr 2 yr MDEP Rainfall=3.10"

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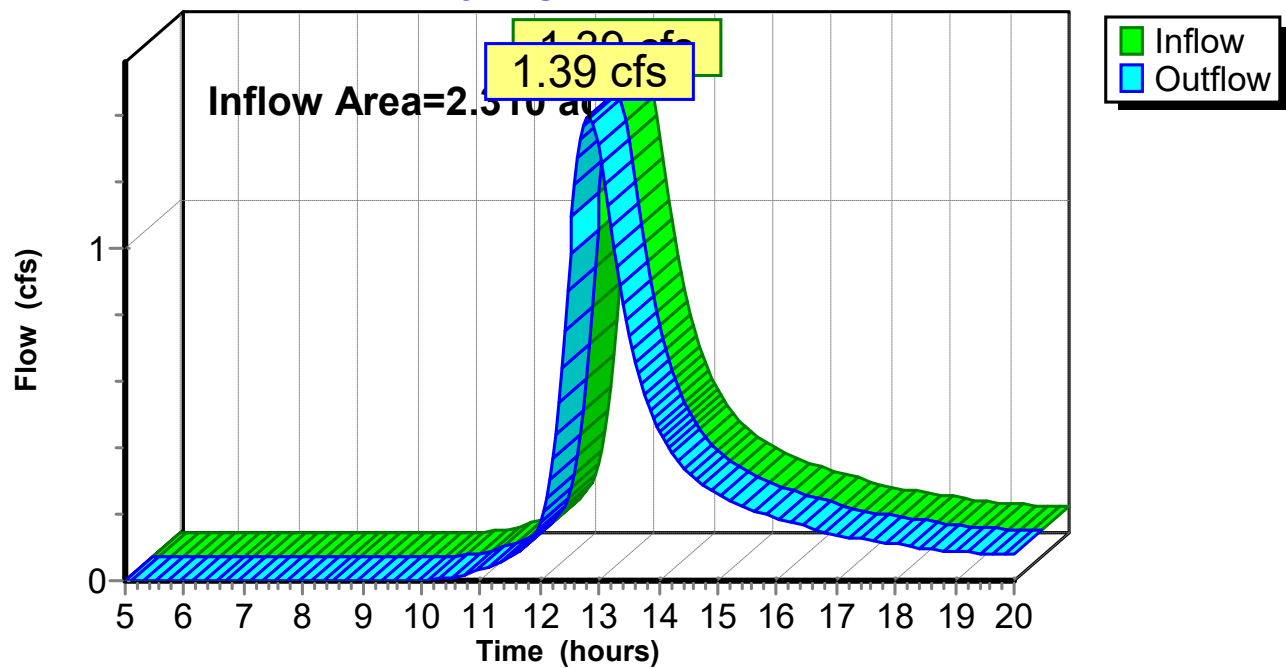
### Summary for Reach SP2: Study Point 2

Inflow Area = 2.310 ac, 14.52% Impervious, Inflow Depth > 1.20" for 2 yr MDEP event  
Inflow = 1.39 cfs @ 12.83 hrs, Volume= 0.230 af  
Outflow = 1.39 cfs @ 12.83 hrs, Volume= 0.230 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

### Reach SP2: Study Point 2

#### Hydrograph



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Type III 24-hr 2 yr MDEP Rainfall=3.10"

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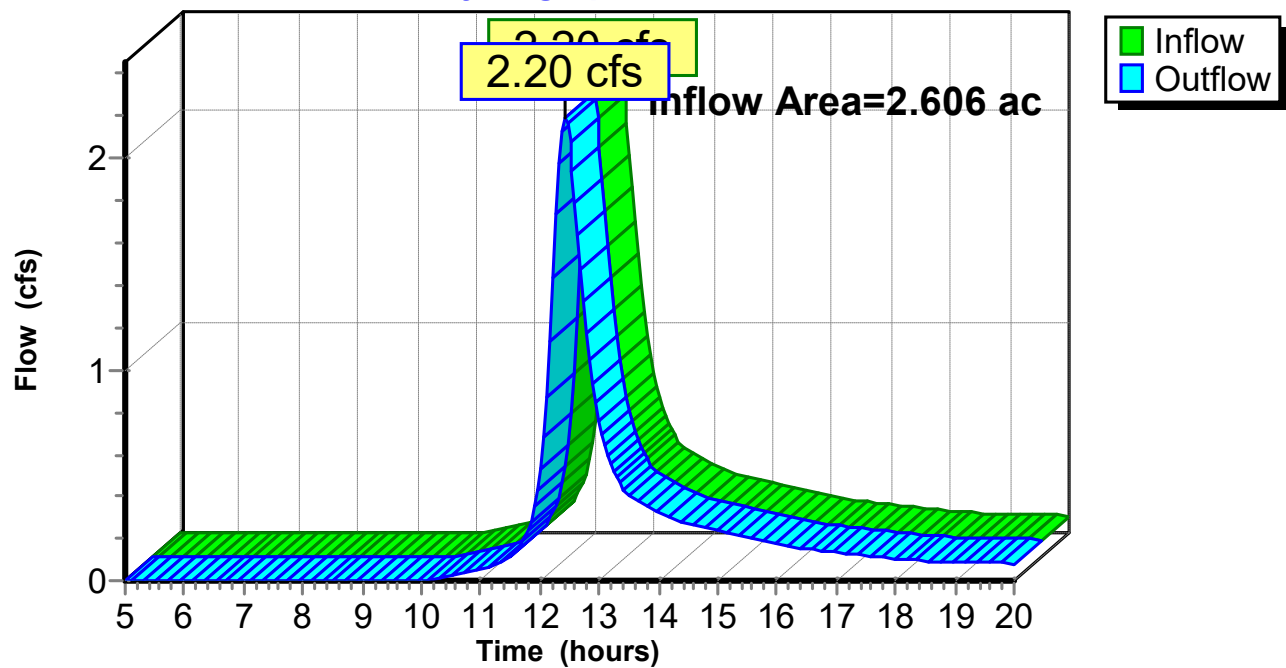
### Summary for Reach SP3: Study Point 3

Inflow Area = 2.606 ac, 0.54% Impervious, Inflow Depth > 1.15" for 2 yr MDEP event  
Inflow = 2.20 cfs @ 12.41 hrs, Volume= 0.250 af  
Outflow = 2.20 cfs @ 12.41 hrs, Volume= 0.250 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

### Reach SP3: Study Point 3

#### Hydrograph



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Type III 24-hr 10 yr MDEP Rainfall=4.60"

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**Summary for Subcatchment 1S: (new Subcat)**

Runoff = 4.70 cfs @ 12.63 hrs, Volume= 0.675 af, Depth&gt; 2.51"

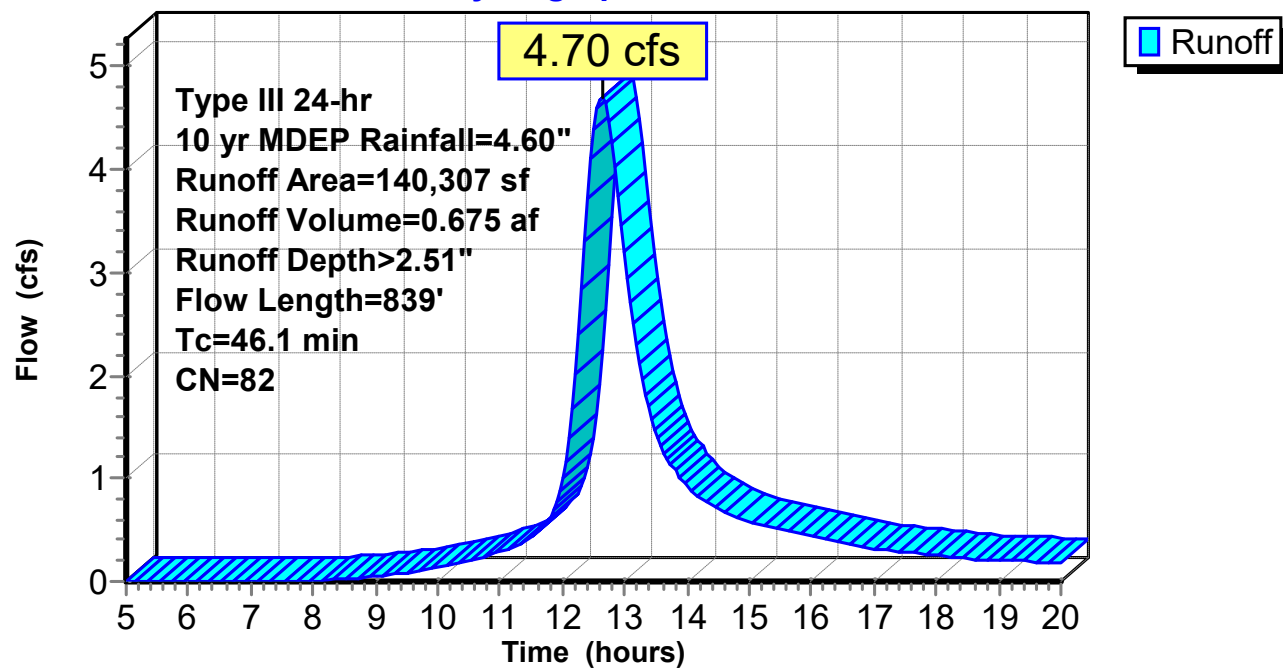
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 10 yr MDEP Rainfall=4.60"

	Area (sf)	CN	Description
*	1,771	98	Impervious C Soil
	7,885	79	50-75% Grass cover, Fair, HSG C
*	3,927	98	Impervious D Soil
*	981	98	Existing Rooftop
	16,889	84	50-75% Grass cover, Fair, HSG D
	17,540	79	Woods, Fair, HSG D
*	12,642	98	Impervious D Soil
	78,672	79	Woods, Fair, HSG D
	140,307	82	Weighted Average
	120,986		86.23% Pervious Area
	19,321		13.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
34.9	150	0.0050	0.07		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.10"
1.4	128	0.0500	1.57		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
0.3	38	0.1800	2.12		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
2.0	160	0.0700	1.32		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
0.7	94	0.2200	2.35		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
2.5	66	0.0300	0.43		<b>Shallow Concentrated Flow,</b> Forest w/Heavy Litter Kv= 2.5 fps
4.3	203	0.1000	0.79		<b>Shallow Concentrated Flow,</b> Forest w/Heavy Litter Kv= 2.5 fps
46.1	839	Total			

Subcatchment 1S: (new Subcat)

Hydrograph



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Type III 24-hr 10 yr MDEP Rainfall=4.60"

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**Summary for Subcatchment 2S: (new Subcat)**

Runoff = 2.73 cfs @ 12.81 hrs, Volume= 0.449 af, Depth&gt; 2.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 10 yr MDEP Rainfall=4.60"

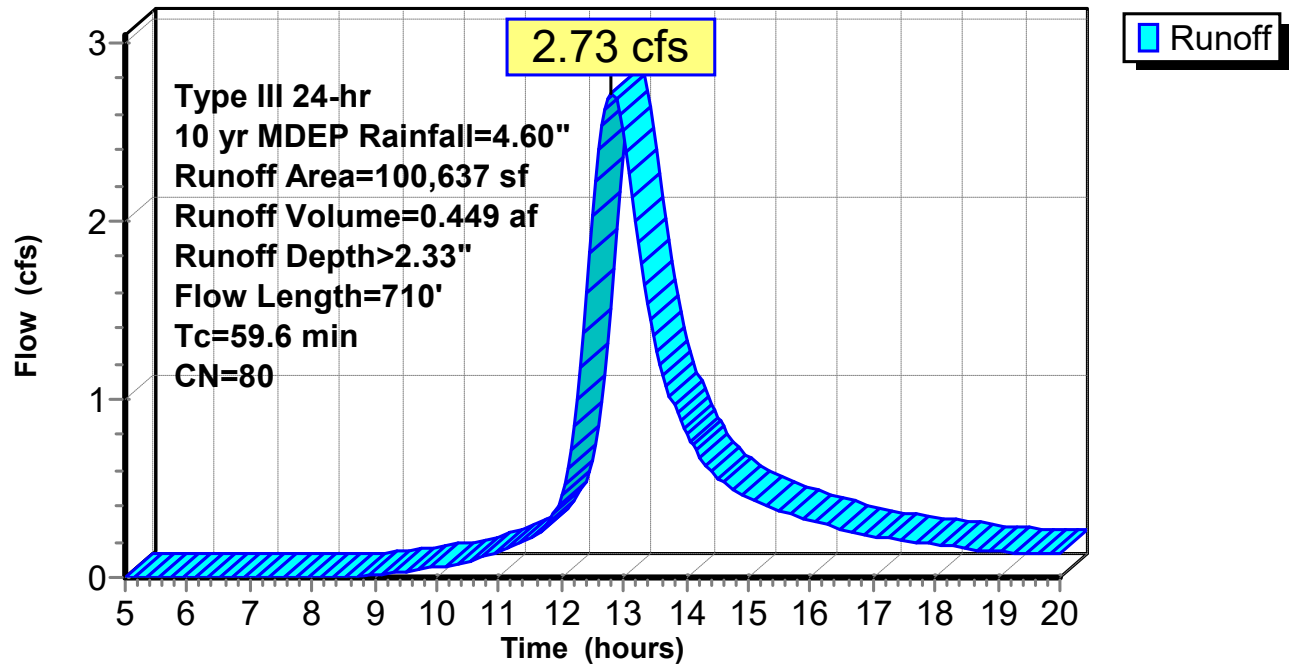
	Area (sf)	CN	Description
*	4,164	98	Impervious C Soil
	3,479	73	Woods, Fair, HSG C
	6,306	79	50-75% Grass cover, Fair, HSG C
*	1,838	98	Existing Rooftop
	5,346	79	50-75% Grass cover, Fair, HSG C
	27,189	73	Woods, Fair, HSG C
	30	79	50-75% Grass cover, Fair, HSG C
*	313	98	Existing Rooftop
	8,642	84	50-75% Grass cover, Fair, HSG D
	5,793	79	Woods, Fair, HSG D
*	5,078	98	Impervious D soil
*	3,017	98	Impervious D soil
	2,350	84	50-75% Grass cover, Fair, HSG D
	26,888	79	Woods, Fair, HSG D
*	204	98	Impervious D Soil
	100,637	80	Weighted Average
	86,023		85.48% Pervious Area
	14,614		14.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
34.9	150	0.0050	0.07		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.10"
3.0	64	0.0050	0.35		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
1.4	125	0.0900	1.50		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
0.5	33	0.2000	1.12		<b>Shallow Concentrated Flow,</b> Forest w/Heavy Litter Kv= 2.5 fps
3.3	123	0.0600	0.61		<b>Shallow Concentrated Flow,</b> Forest w/Heavy Litter Kv= 2.5 fps
3.0	151	0.1100	0.83		<b>Shallow Concentrated Flow,</b> Forest w/Heavy Litter Kv= 2.5 fps
13.5	64	0.0010	0.08		<b>Shallow Concentrated Flow,</b> Forest w/Heavy Litter Kv= 2.5 fps
59.6	710	Total			



Subcatchment 2S: (new Subcat)

Hydrograph



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*Type III 24-hr 10 yr MDEP Rainfall=4.60"*

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**Summary for Subcatchment 3S: (new Subcat)**

Runoff = 4.37 cfs @ 12.40 hrs, Volume= 0.494 af, Depth&gt; 2.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 10 yr MDEP Rainfall=4.60"

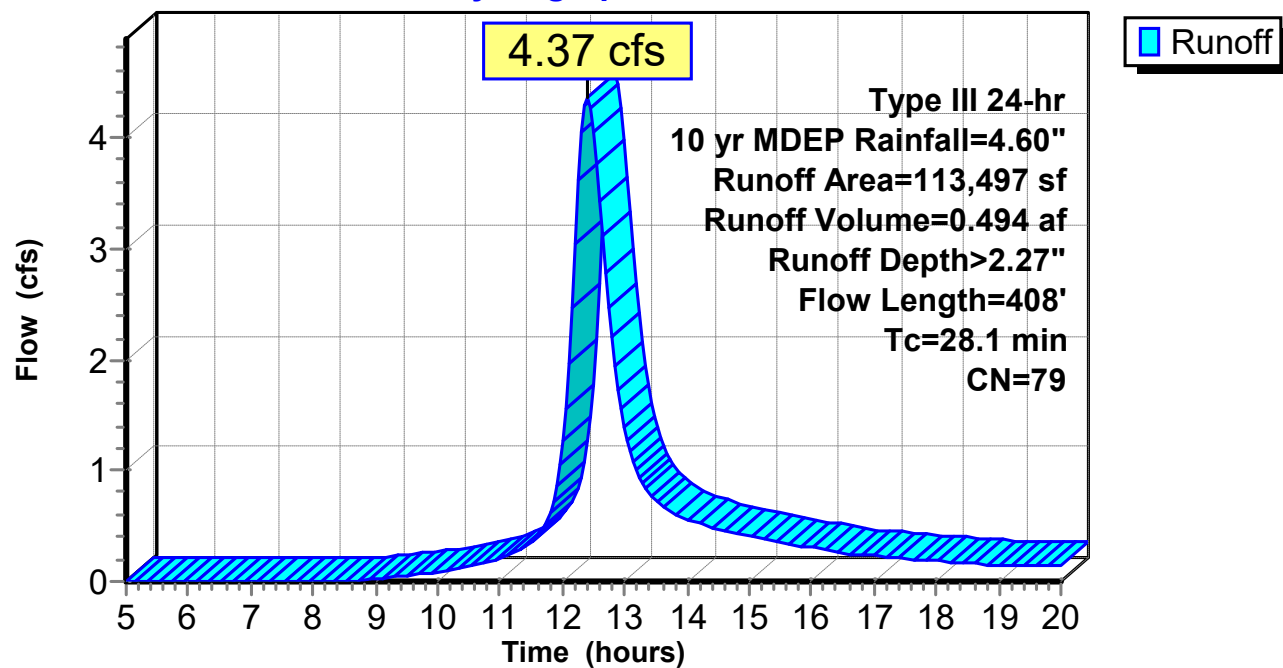
	Area (sf)	CN	Description
*	616	98	Ledge Outcrop D Soil
	109,852	79	Woods, Fair, HSG D
	3,029	73	Woods, Fair, HSG C
	113,497	79	Weighted Average
	112,881		99.46% Pervious Area
	616		0.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.9	135	0.0600	0.13		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.10"
1.8	15	0.2200	0.14		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.10"
1.1	68	0.1600	1.00		<b>Shallow Concentrated Flow,</b> Forest w/Heavy Litter Kv= 2.5 fps
7.3	190	0.0300	0.43		<b>Shallow Concentrated Flow,</b> Forest w/Heavy Litter Kv= 2.5 fps
28.1	408	Total			

Subcatchment 3S: (new Subcat)

Hydrograph



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Type III 24-hr 10 yr MDEP Rainfall=4.60"

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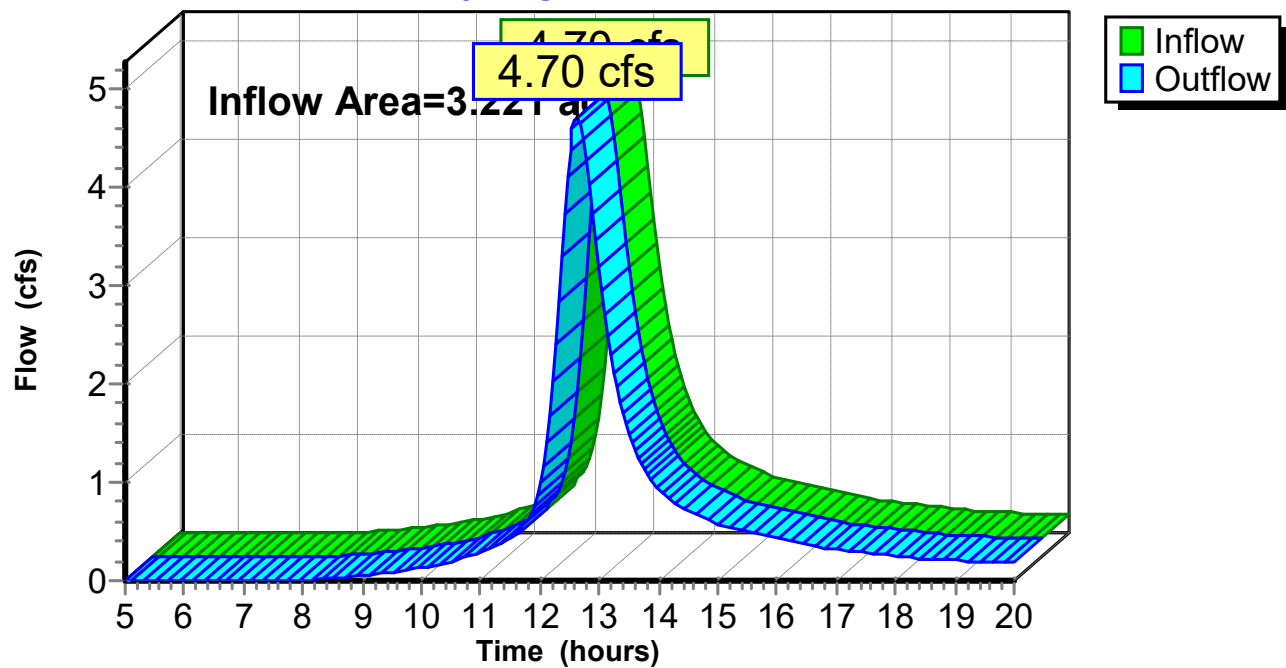
### Summary for Reach SP1: Study Point 1

Inflow Area = 3.221 ac, 13.77% Impervious, Inflow Depth > 2.51" for 10 yr MDEP event  
Inflow = 4.70 cfs @ 12.63 hrs, Volume= 0.675 af  
Outflow = 4.70 cfs @ 12.63 hrs, Volume= 0.675 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

### Reach SP1: Study Point 1

#### Hydrograph



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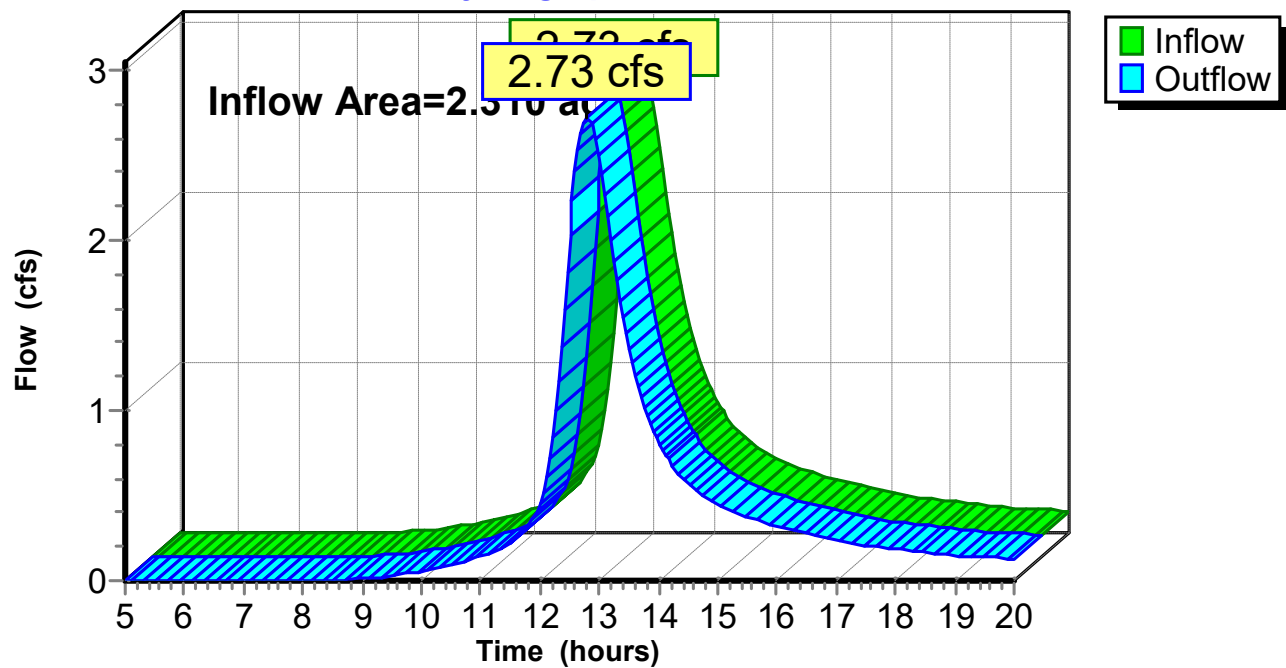
### Summary for Reach SP2: Study Point 2

Inflow Area = 2.310 ac, 14.52% Impervious, Inflow Depth > 2.33" for 10 yr MDEP event  
Inflow = 2.73 cfs @ 12.81 hrs, Volume= 0.449 af  
Outflow = 2.73 cfs @ 12.81 hrs, Volume= 0.449 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

### Reach SP2: Study Point 2

#### Hydrograph



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Type III 24-hr 10 yr MDEP Rainfall=4.60"

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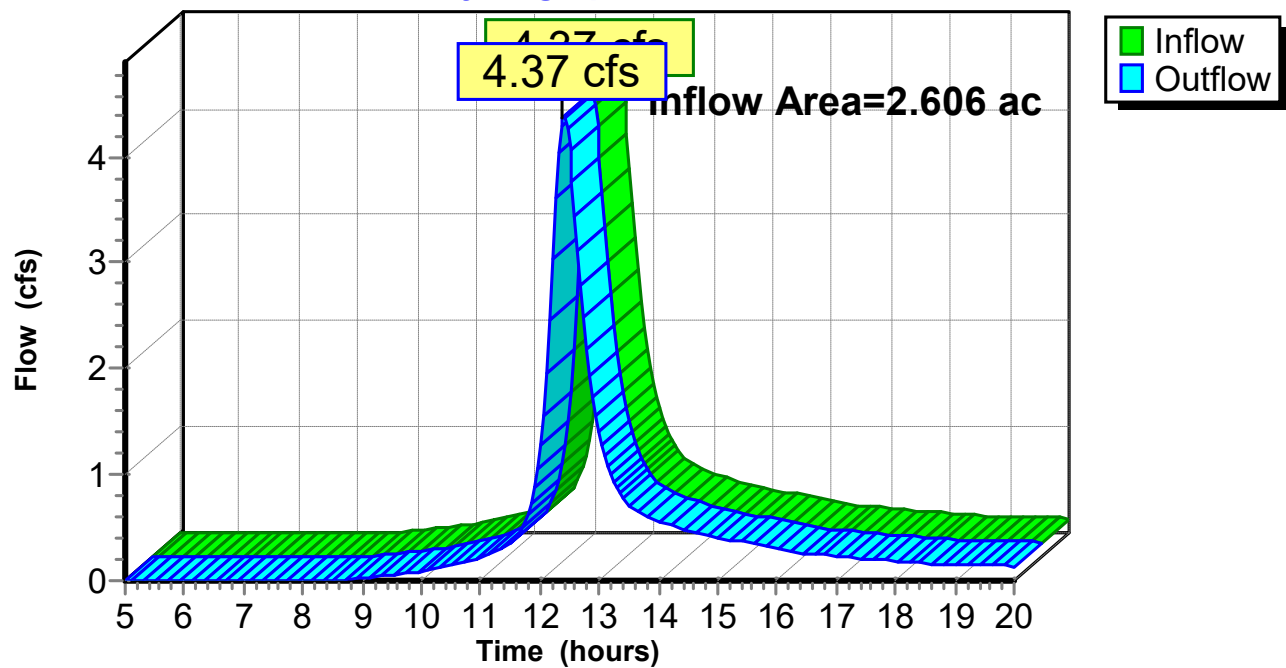
### Summary for Reach SP3: Study Point 3

Inflow Area = 2.606 ac, 0.54% Impervious, Inflow Depth > 2.27" for 10 yr MDEP event  
Inflow = 4.37 cfs @ 12.40 hrs, Volume= 0.494 af  
Outflow = 4.37 cfs @ 12.40 hrs, Volume= 0.494 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

### Reach SP3: Study Point 3

#### Hydrograph





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Type III 24-hr 25 yr MDEP Rainfall=5.80"

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**Summary for Subcatchment 1S: (new Subcat)**

Runoff = 6.54 cfs @ 12.63 hrs, Volume= 0.947 af, Depth&gt; 3.53"

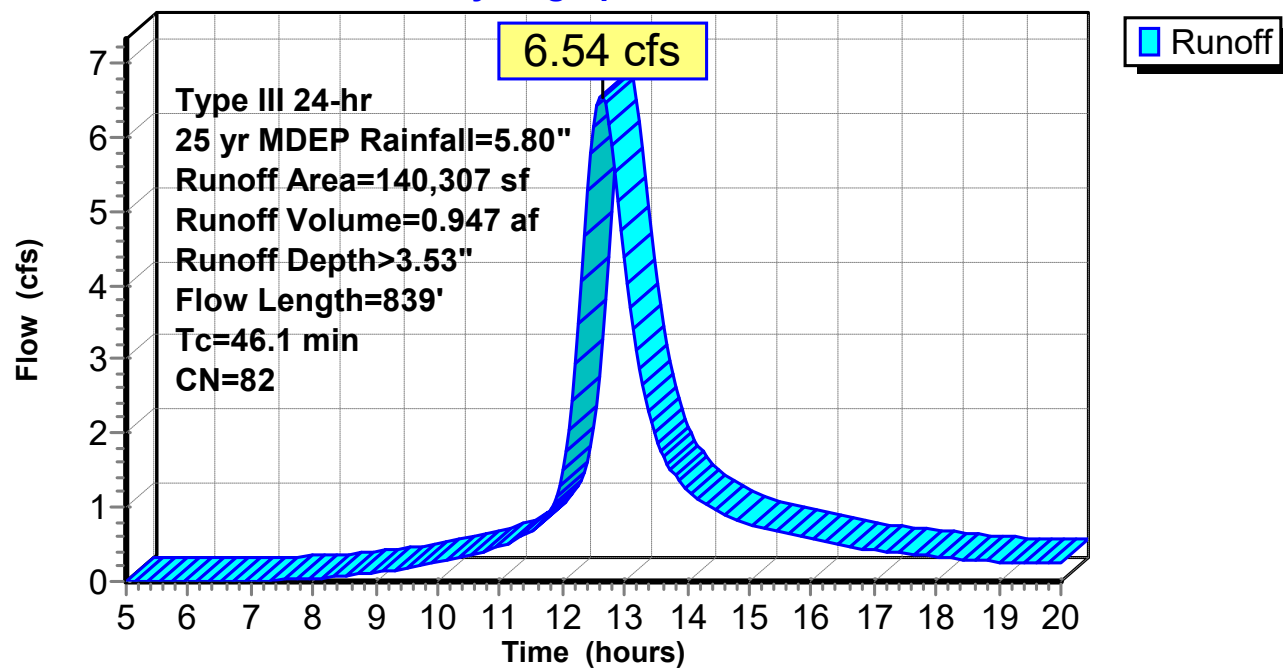
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 25 yr MDEP Rainfall=5.80"

	Area (sf)	CN	Description
*	1,771	98	Impervious C Soil
	7,885	79	50-75% Grass cover, Fair, HSG C
*	3,927	98	Impervious D Soil
*	981	98	Existing Rooftop
	16,889	84	50-75% Grass cover, Fair, HSG D
	17,540	79	Woods, Fair, HSG D
*	12,642	98	Impervious D Soil
	78,672	79	Woods, Fair, HSG D
	140,307	82	Weighted Average
	120,986		86.23% Pervious Area
	19,321		13.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
34.9	150	0.0050	0.07		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.10"
1.4	128	0.0500	1.57		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
0.3	38	0.1800	2.12		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
2.0	160	0.0700	1.32		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
0.7	94	0.2200	2.35		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
2.5	66	0.0300	0.43		<b>Shallow Concentrated Flow,</b> Forest w/Heavy Litter Kv= 2.5 fps
4.3	203	0.1000	0.79		<b>Shallow Concentrated Flow,</b> Forest w/Heavy Litter Kv= 2.5 fps
46.1	839	Total			

Subcatchment 1S: (new Subcat)

Hydrograph



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**Summary for Subcatchment 2S: (new Subcat)**

Runoff = 3.85 cfs @ 12.80 hrs, Volume= 0.638 af, Depth&gt; 3.31"

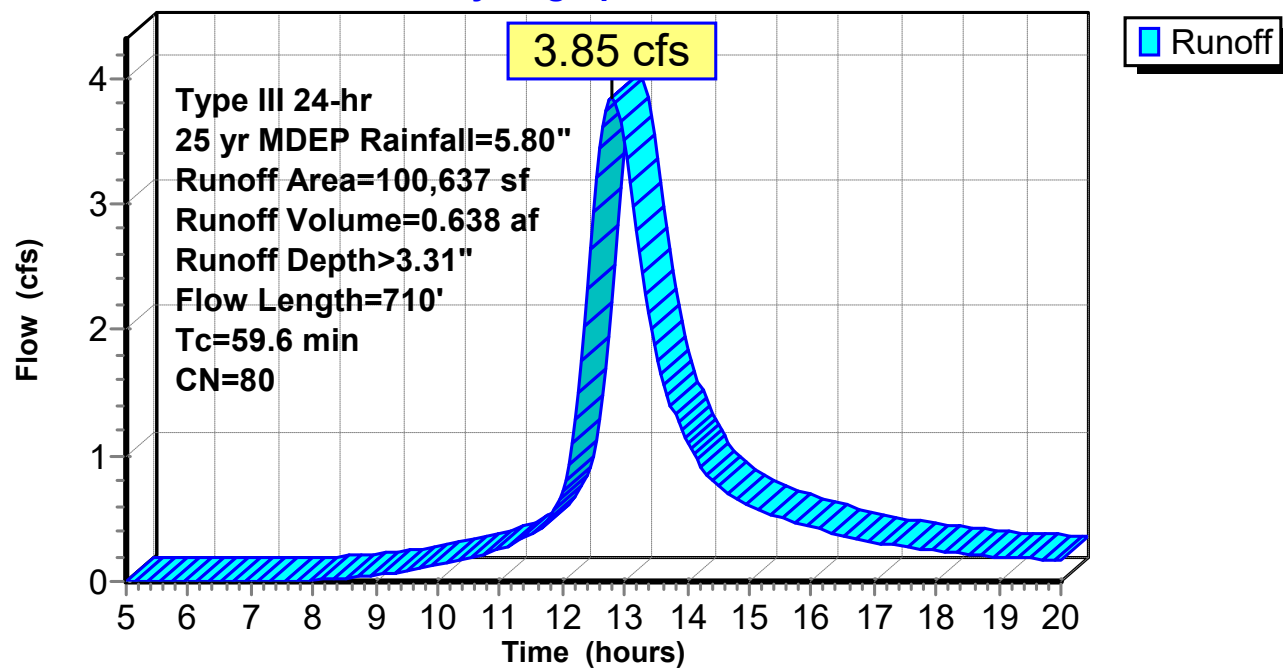
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 25 yr MDEP Rainfall=5.80"

	Area (sf)	CN	Description
*	4,164	98	Impervious C Soil
	3,479	73	Woods, Fair, HSG C
	6,306	79	50-75% Grass cover, Fair, HSG C
*	1,838	98	Existing Rooftop
	5,346	79	50-75% Grass cover, Fair, HSG C
	27,189	73	Woods, Fair, HSG C
	30	79	50-75% Grass cover, Fair, HSG C
*	313	98	Existing Rooftop
	8,642	84	50-75% Grass cover, Fair, HSG D
	5,793	79	Woods, Fair, HSG D
*	5,078	98	Impervious D soil
*	3,017	98	Impervious D soil
	2,350	84	50-75% Grass cover, Fair, HSG D
	26,888	79	Woods, Fair, HSG D
*	204	98	Impervious D Soil
	100,637	80	Weighted Average
	86,023		85.48% Pervious Area
	14,614		14.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
34.9	150	0.0050	0.07		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.10"
3.0	64	0.0050	0.35		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
1.4	125	0.0900	1.50		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
0.5	33	0.2000	1.12		<b>Shallow Concentrated Flow,</b> Forest w/Heavy Litter Kv= 2.5 fps
3.3	123	0.0600	0.61		<b>Shallow Concentrated Flow,</b> Forest w/Heavy Litter Kv= 2.5 fps
3.0	151	0.1100	0.83		<b>Shallow Concentrated Flow,</b> Forest w/Heavy Litter Kv= 2.5 fps
13.5	64	0.0010	0.08		<b>Shallow Concentrated Flow,</b> Forest w/Heavy Litter Kv= 2.5 fps
59.6	710	Total			

Subcatchment 2S: (new Subcat)

Hydrograph



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**Summary for Subcatchment 3S: (new Subcat)**

Runoff = 6.22 cfs @ 12.39 hrs, Volume= 0.706 af, Depth&gt; 3.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 25 yr MDEP Rainfall=5.80"

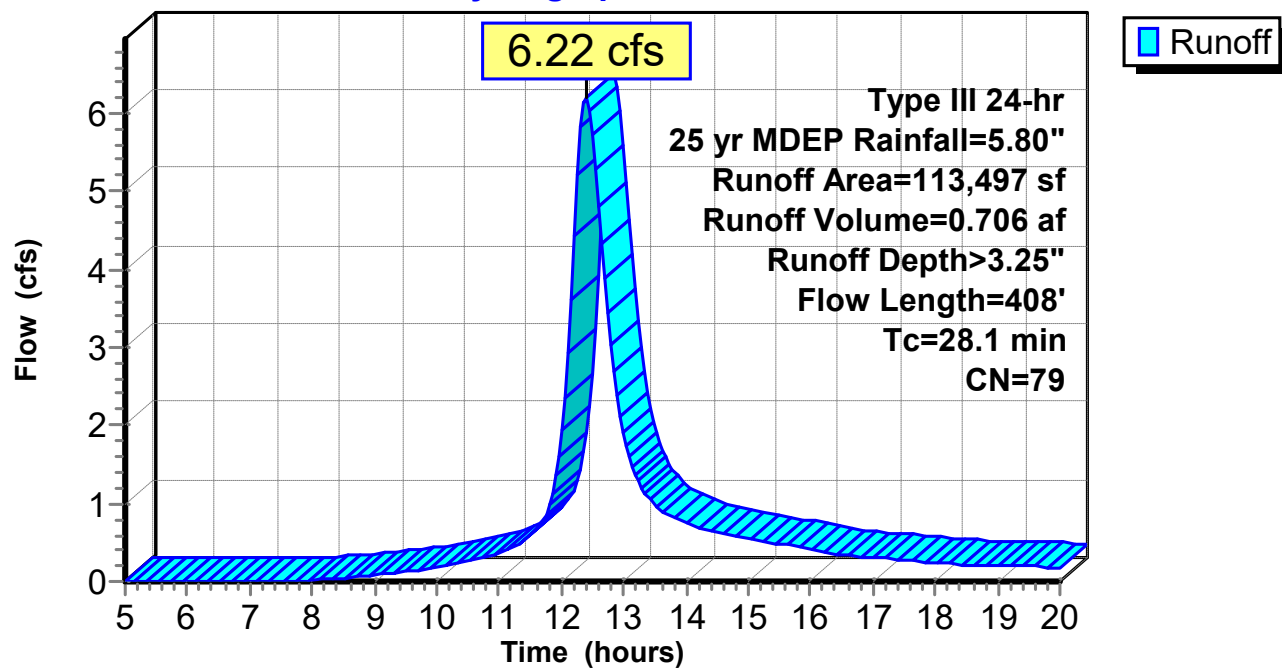
	Area (sf)	CN	Description
*	616	98	Ledge Outcrop D Soil
	109,852	79	Woods, Fair, HSG D
	3,029	73	Woods, Fair, HSG C
	113,497	79	Weighted Average
	112,881		99.46% Pervious Area
	616		0.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.9	135	0.0600	0.13		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.10"
1.8	15	0.2200	0.14		<b>Sheet Flow,</b> Woods: Light underbrush n= 0.400 P2= 3.10"
1.1	68	0.1600	1.00		<b>Shallow Concentrated Flow,</b> Forest w/Heavy Litter Kv= 2.5 fps
7.3	190	0.0300	0.43		<b>Shallow Concentrated Flow,</b> Forest w/Heavy Litter Kv= 2.5 fps
28.1	408	Total			

Subcatchment 3S: (new Subcat)

Hydrograph





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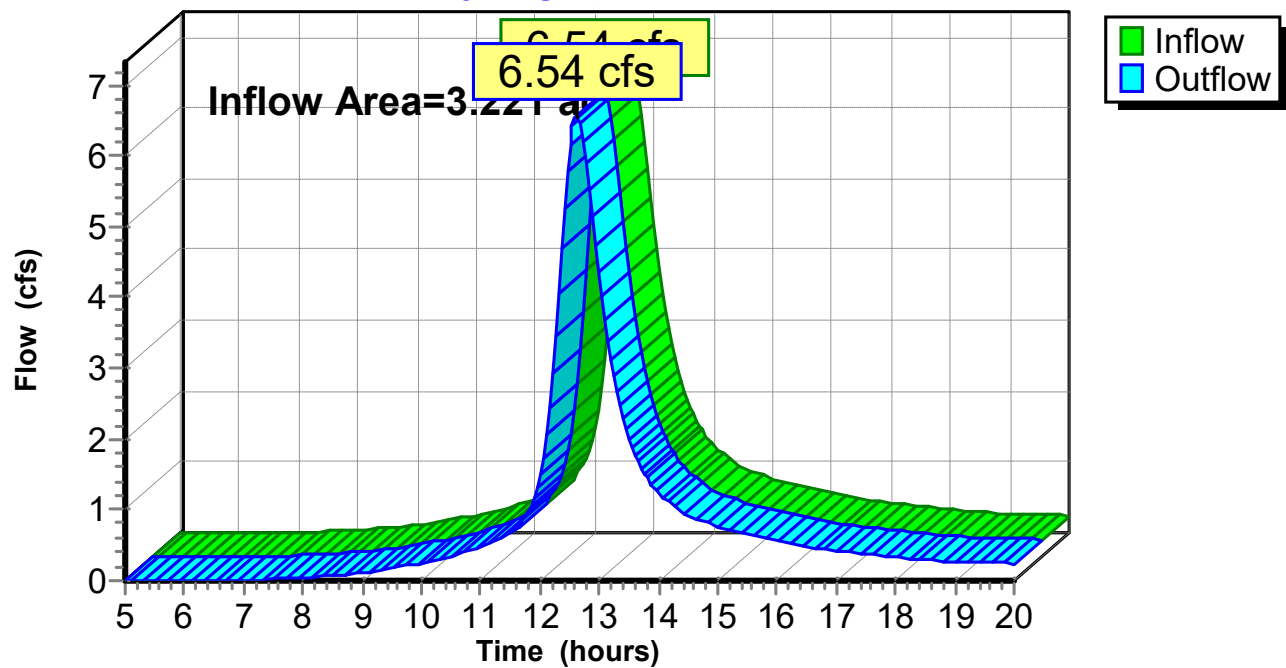
### Summary for Reach SP1: Study Point 1

Inflow Area = 3.221 ac, 13.77% Impervious, Inflow Depth > 3.53" for 25 yr MDEP event  
Inflow = 6.54 cfs @ 12.63 hrs, Volume= 0.947 af  
Outflow = 6.54 cfs @ 12.63 hrs, Volume= 0.947 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

### Reach SP1: Study Point 1

#### Hydrograph



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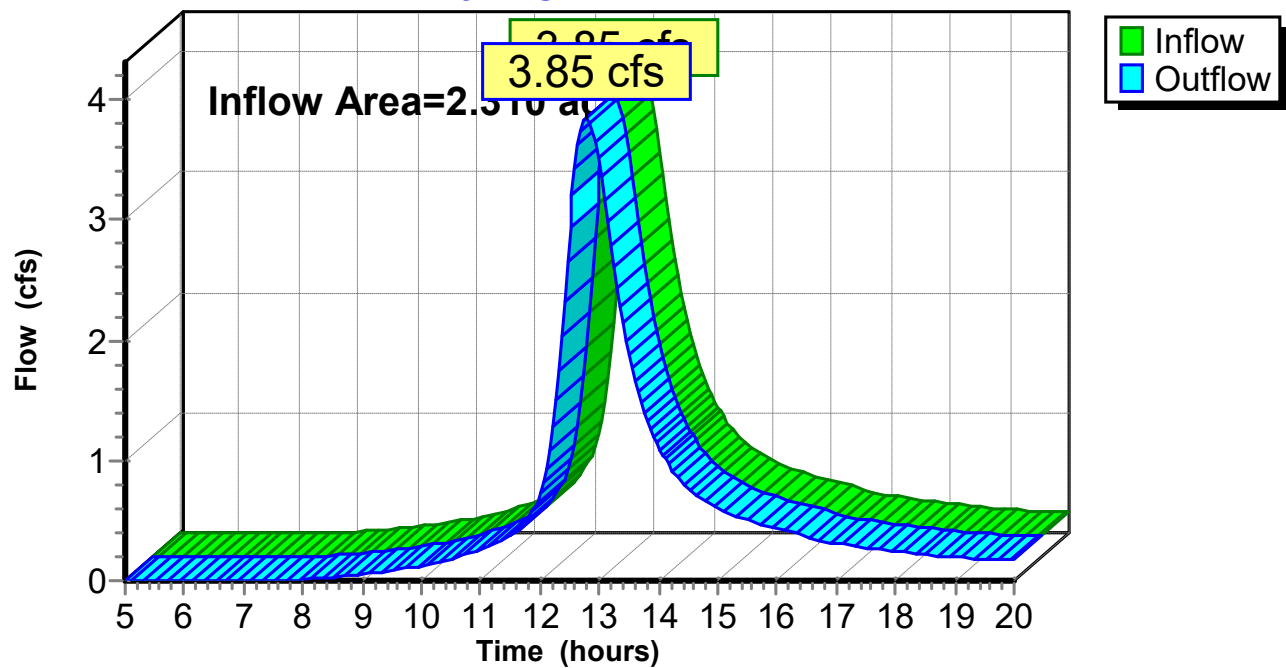
### Summary for Reach SP2: Study Point 2

Inflow Area = 2.310 ac, 14.52% Impervious, Inflow Depth > 3.31" for 25 yr MDEP event  
Inflow = 3.85 cfs @ 12.80 hrs, Volume= 0.638 af  
Outflow = 3.85 cfs @ 12.80 hrs, Volume= 0.638 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

### Reach SP2: Study Point 2

#### Hydrograph



## 17014 Pre Development 9-26-17

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17014 Higbee Notch Apartments  
Type III 24-hr 25 yr MDEP Rainfall=5.80"

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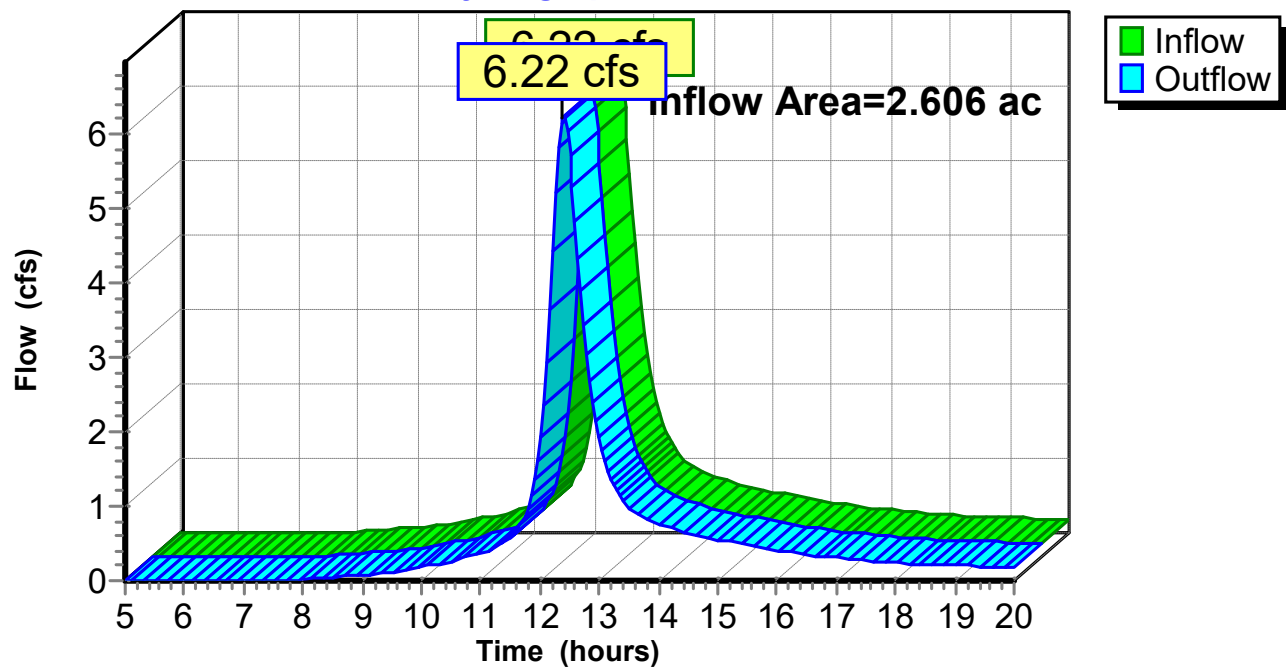
### Summary for Reach SP3: Study Point 3

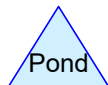
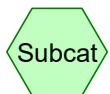
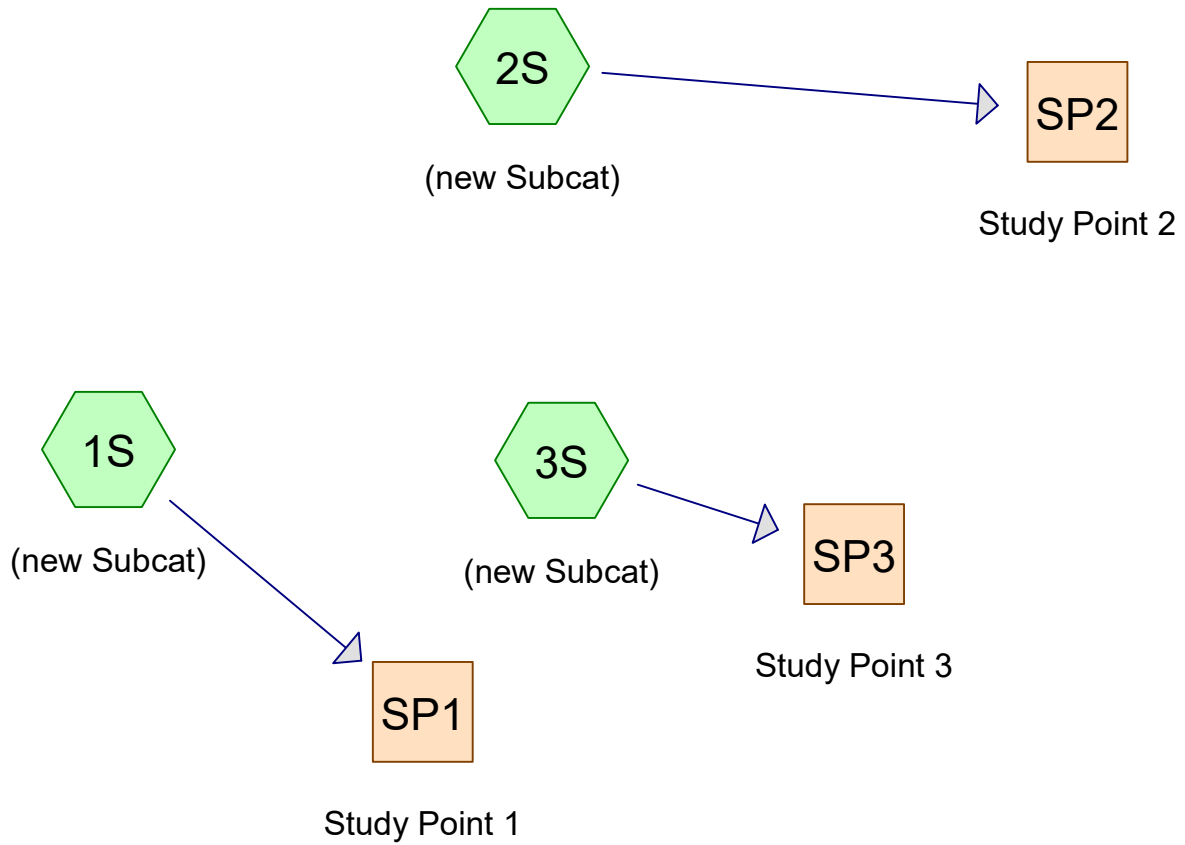
Inflow Area = 2.606 ac, 0.54% Impervious, Inflow Depth > 3.25" for 25 yr MDEP event  
Inflow = 6.22 cfs @ 12.39 hrs, Volume= 0.706 af  
Outflow = 6.22 cfs @ 12.39 hrs, Volume= 0.706 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

### Reach SP3: Study Point 3

#### Hydrograph





**17014 Post Development 9-26-17**

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17014 Higbee Notch Apartments

Type III 24-hr 2 yr MDEP Rainfall=3.10"

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**Summary for Subcatchment 1S: (new Subcat)**

Runoff = 2.28 cfs @ 12.67 hrs, Volume= 0.334 af, Depth&gt; 1.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Type III 24-hr 2 yr MDEP Rainfall=3.10"

	Area (sf)	CN	Description
*	4,139	98	Impervious area C soil
	7,800	79	50-75% Grass cover, Fair, HSG C
*	3,092	98	Impervious area D Soil
	19,211	84	50-75% Grass cover, Fair, HSG D
*	981	98	Rooftop D soil
	16,555	79	Woods, Fair, HSG D
	62,936	79	Woods, Fair, HSG D
	15,275	84	50-75% Grass cover, Fair, HSG D
*	1,163	98	Rooftop D
*	25	98	Pavement D
	131,177	82	Weighted Average
	121,777		92.83% Pervious Area
	9,400		7.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.0	70	0.0050	0.06		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.10"
0.9	12	0.3300	0.23		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.10"
18.5	68	0.0050	0.06		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.10"
0.8	77	0.0130	1.71		<b>Shallow Concentrated Flow,</b> Grassed Waterway Kv= 15.0 fps
0.4	125	0.0700	4.97	59.65	<b>Trap/Vee/Rect Channel Flow,</b> Bot.W=1.00' D=2.00' Z= 3.0 & 2.0 '/' Top.W=11.00' n= 0.080 Earth, long dense weeds
0.5	76	0.0200	2.66	31.88	<b>Trap/Vee/Rect Channel Flow,</b> Bot.W=1.00' D=2.00' Z= 3.0 & 2.0 '/' Top.W=11.00' n= 0.080 Earth, long dense weeds
0.1	22	0.0400	2.55	17.86	<b>Trap/Vee/Rect Channel Flow,</b> Bot.W=2.00' D=1.00' Z= 8.0 & 2.0 '/' Top.W=12.00' n= 0.080 Earth, long dense weeds
0.6	78	0.0200	2.04	29.56	<b>Trap/Vee/Rect Channel Flow,</b> Bot.W=8.00' D=1.00' Z= 10.0 & 3.0 '/' Top.W=21.00' n= 0.080 Earth, long dense weeds
0.4	45	0.1600	2.00		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
2.6	96	0.0600	0.61		<b>Shallow Concentrated Flow,</b> Forest w/Heavy Litter Kv= 2.5 fps
4.3	203	0.1000	0.79		<b>Shallow Concentrated Flow,</b> Forest w/Heavy Litter Kv= 2.5 fps

# 17014 Post Development 9-26-17

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Type III 24-hr 2 yr MDEP Rainfall=3.10"

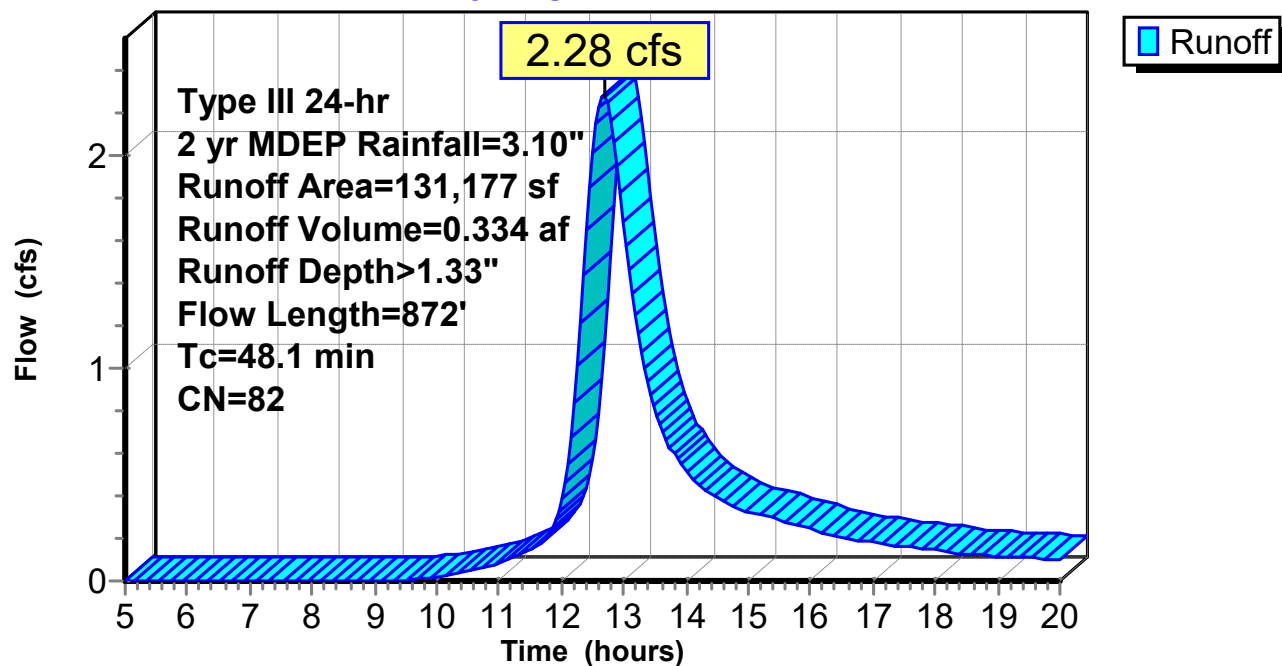
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48.1 872 Total

## Subcatchment 1S: (new Subcat)

### Hydrograph



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17014 Higbee Notch Apartments

*Type III 24-hr 2 yr MDEP Rainfall=3.10"*

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**Summary for Subcatchment 2S: (new Subcat)**

Runoff = 1.43 cfs @ 12.77 hrs, Volume= 0.225 af, Depth&gt; 1.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Type III 24-hr 2 yr MDEP Rainfall=3.10"

	Area (sf)	CN	Description
*	2,280	98	Impervious C Soil
	8,145	79	50-75% Grass cover, Fair, HSG C
	1,234	73	Woods, Fair, HSG C
*	1,838	98	Rooftop C Soil
	30	79	50-75% Grass cover, Fair, HSG C
	5,346	79	50-75% Grass cover, Fair, HSG C
	2,350	84	50-75% Grass cover, Fair, HSG D
	8,642	84	50-75% Grass cover, Fair, HSG D
	4,566	79	Woods, Fair, HSG D
	3,957	84	50-75% Grass cover, Fair, HSG D
*	2,440	98	Pavement D Soil
*	625	98	Pavement D Soil
	12,830	84	50-75% Grass cover, Fair, HSG D
*	1,156	98	Rooftop D Soil
	10,199	79	Woods, Fair, HSG D
	4,752	79	Woods, Fair, HSG D
	26,925	73	Woods, Fair, HSG C
	269	79	50-75% Grass cover, Fair, HSG C
*	313	98	Rooftop D Soil
*	212	98	Impervious D Soil
	98,109	80	Weighted Average
	89,245		90.97% Pervious Area
	8,864		9.03% Impervious Area



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17014 Higbee Notch Apartments  
Type III 24-hr 2 yr MDEP Rainfall=3.10"

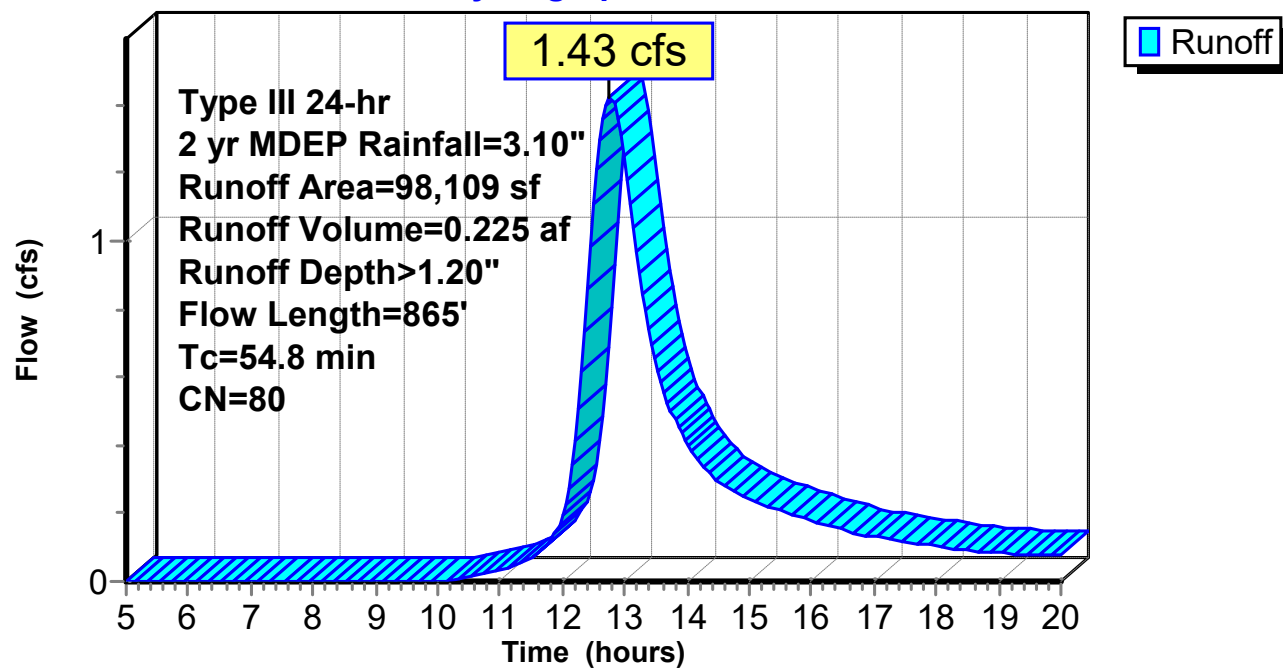
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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	34	0.0050	0.05		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.10"
0.7	10	0.3300	0.22		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.10"
28.9	106	0.0040	0.06		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.10"
0.5	26	0.0040	0.95		<b>Shallow Concentrated Flow,</b> Grassed Waterway Kv= 15.0 fps
0.6	169	0.0700	4.97	59.65	<b>Trap/Vee/Rect Channel Flow,</b> Bot.W=1.00' D=2.00' Z= 2.0 & 3.0 '/' Top.W=11.00' n= 0.080 Earth, long dense weeds
0.0	22	0.2000	8.40	100.83	<b>Trap/Vee/Rect Channel Flow,</b> Bot.W=1.00' D=2.00' Z= 2.0 & 3.0 '/' Top.W=11.00' n= 0.080 Earth, long dense weeds
0.1	22	0.0400	3.76	45.09	<b>Trap/Vee/Rect Channel Flow,</b> Bot.W=1.00' D=2.00' Z= 2.0 & 3.0 '/' Top.W=11.00' n= 0.080 Earth, long dense weeds
0.3	60	0.0600	3.16	33.17	<b>Trap/Vee/Rect Channel Flow,</b> Bot.W=3.00' D=1.00' Z= 10.0 & 5.0 '/' Top.W=18.00' n= 0.080 Earth, long dense weeds
1.4	133	0.0500	1.57		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
1.9	108	0.1400	0.94		<b>Shallow Concentrated Flow,</b> Forest w/Heavy Litter Kv= 2.5 fps
2.3	86	0.0600	0.61		<b>Shallow Concentrated Flow,</b> Forest w/Heavy Litter Kv= 2.5 fps
0.1	10	0.2000	1.12		<b>Shallow Concentrated Flow,</b> Forest w/Heavy Litter Kv= 2.5 fps
7.4	79	0.0050	0.18		<b>Shallow Concentrated Flow,</b> Forest w/Heavy Litter Kv= 2.5 fps
54.8	865	Total			

Subcatchment 2S: (new Subcat)

Hydrograph



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Type III 24-hr 2 yr MDEP Rainfall=3.10"

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**Summary for Subcatchment 3S: (new Subcat)**

Runoff = 3.07 cfs @ 12.26 hrs, Volume= 0.291 af, Depth&gt; 1.22"

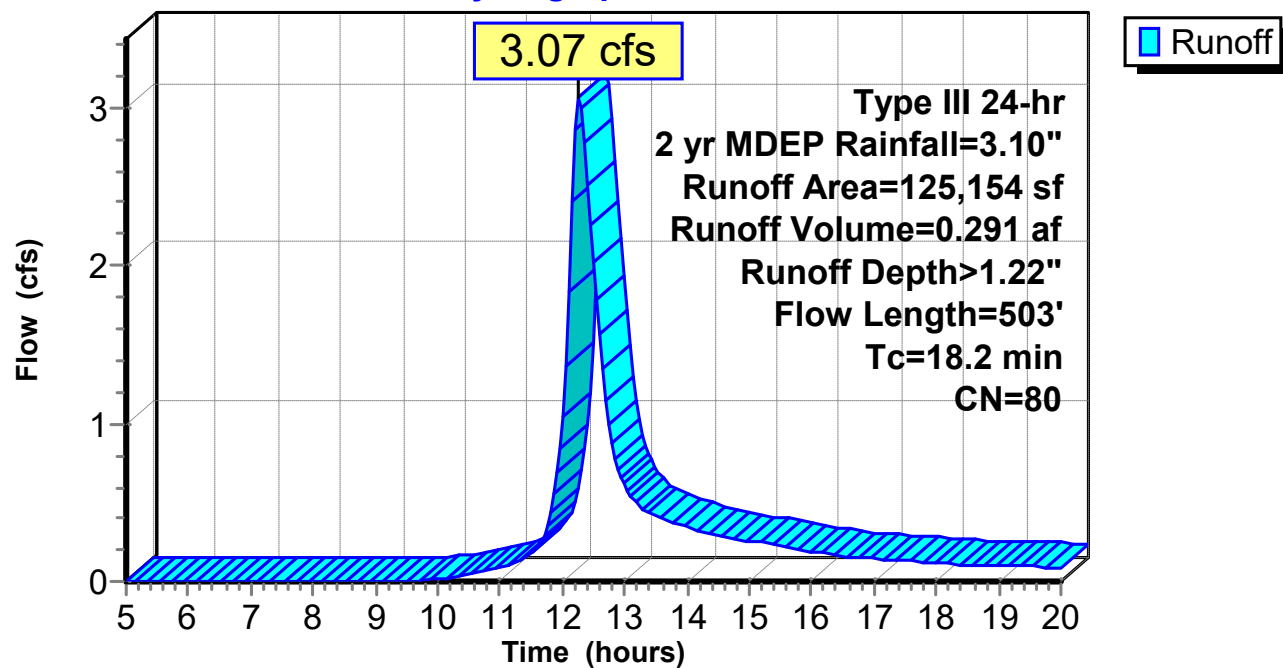
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 2 yr MDEP Rainfall=3.10"

Area (sf)	CN	Description
3,030	73	Woods, Fair, HSG C
106,902	79	Woods, Fair, HSG D
* 615	98	Rock Outcrop D Soil
5,924	84	50-75% Grass cover, Fair, HSG D
* 5,869	98	Pavement D Soil
* 2,240	98	Rooftop D Soil
337	84	50-75% Grass cover, Fair, HSG D
* 237	98	Impervious
125,154	80	Weighted Average
116,193		92.84% Pervious Area
8,961		7.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	90	0.0100	1.00		<b>Sheet Flow,</b> Smooth surfaces n= 0.011 P2= 3.10"
3.0	33	0.1100	0.18		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.10"
4.3	27	0.0300	0.10		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.10"
0.7	70	0.1100	1.66		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
0.3	25	0.0800	1.41		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
1.1	68	0.1600	1.00		<b>Shallow Concentrated Flow,</b> Forest w/Heavy Litter Kv= 2.5 fps
7.3	190	0.0300	0.43		<b>Shallow Concentrated Flow,</b> Forest w/Heavy Litter Kv= 2.5 fps
18.2	503	Total			

Subcatchment 3S: (new Subcat)

Hydrograph



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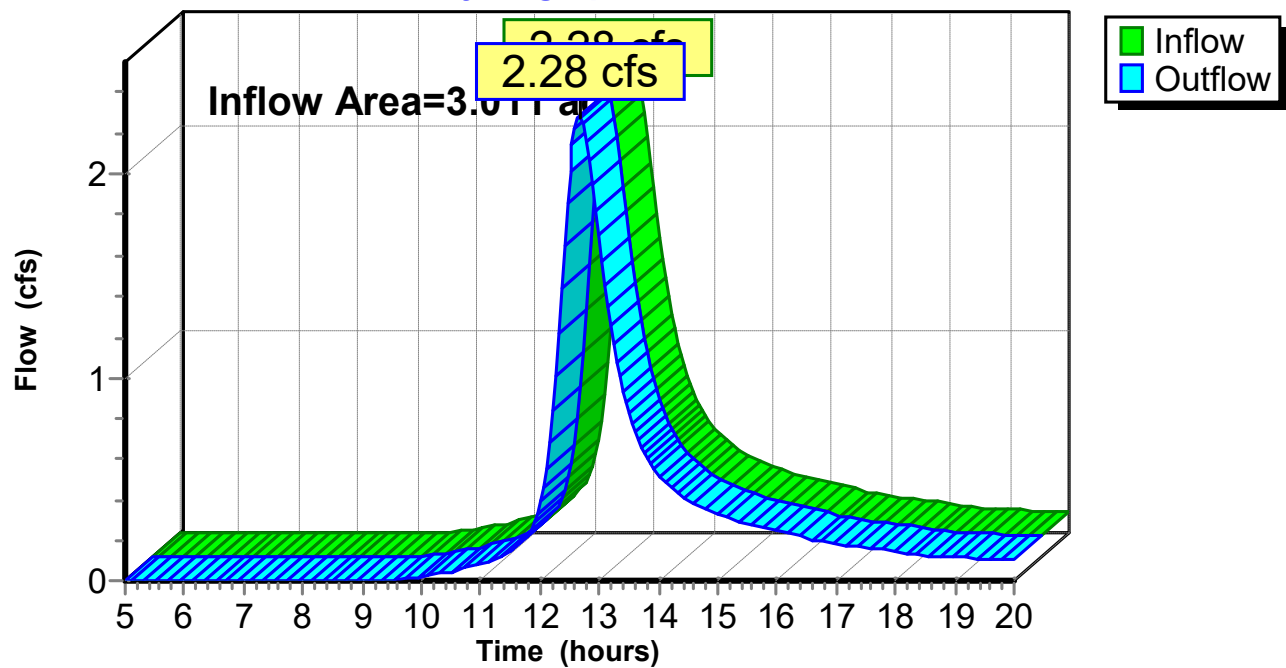
### Summary for Reach SP1: Study Point 1

Inflow Area = 3.011 ac, 7.17% Impervious, Inflow Depth > 1.33" for 2 yr MDEP event  
Inflow = 2.28 cfs @ 12.67 hrs, Volume= 0.334 af  
Outflow = 2.28 cfs @ 12.67 hrs, Volume= 0.334 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

### Reach SP1: Study Point 1

#### Hydrograph



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Type III 24-hr 2 yr MDEP Rainfall=3.10"

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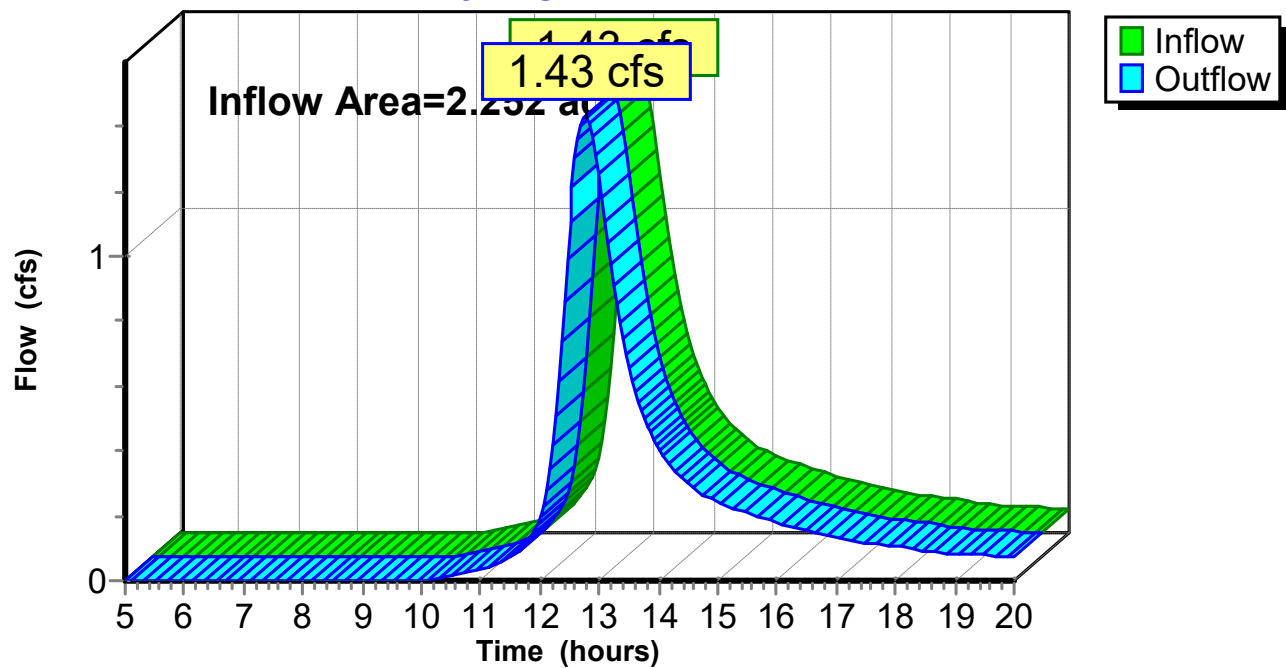
### Summary for Reach SP2: Study Point 2

Inflow Area = 2.252 ac, 9.03% Impervious, Inflow Depth > 1.20" for 2 yr MDEP event  
Inflow = 1.43 cfs @ 12.77 hrs, Volume= 0.225 af  
Outflow = 1.43 cfs @ 12.77 hrs, Volume= 0.225 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

### Reach SP2: Study Point 2

#### Hydrograph



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Type III 24-hr 2 yr MDEP Rainfall=3.10"

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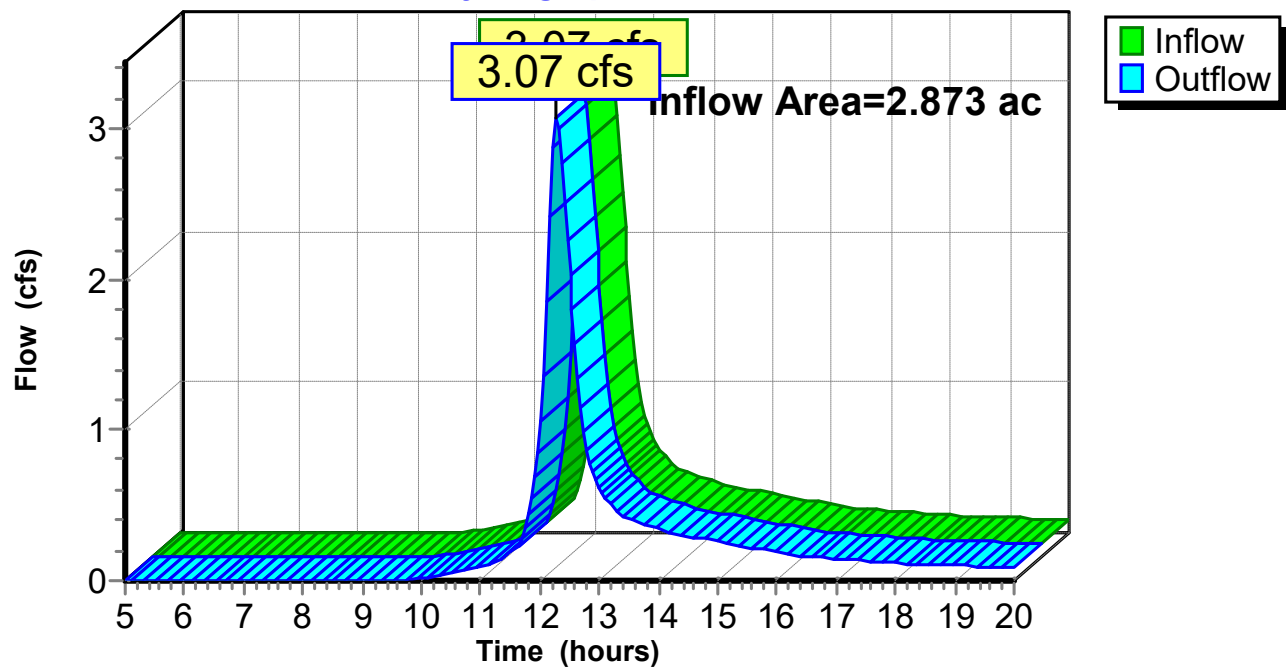
### Summary for Reach SP3: Study Point 3

Inflow Area = 2.873 ac, 7.16% Impervious, Inflow Depth > 1.22" for 2 yr MDEP event  
Inflow = 3.07 cfs @ 12.26 hrs, Volume= 0.291 af  
Outflow = 3.07 cfs @ 12.26 hrs, Volume= 0.291 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

### Reach SP3: Study Point 3

#### Hydrograph





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Type III 24-hr 10 yr MDEP Rainfall=4.60"

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**Summary for Subcatchment 1S: (new Subcat)**

Runoff = 4.30 cfs @ 12.66 hrs, Volume= 0.630 af, Depth&gt; 2.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 10 yr MDEP Rainfall=4.60"

	Area (sf)	CN	Description
*	4,139	98	Impervious area C soil
	7,800	79	50-75% Grass cover, Fair, HSG C
*	3,092	98	Impervious area D Soil
	19,211	84	50-75% Grass cover, Fair, HSG D
*	981	98	Rooftop D soil
	16,555	79	Woods, Fair, HSG D
	62,936	79	Woods, Fair, HSG D
	15,275	84	50-75% Grass cover, Fair, HSG D
*	1,163	98	Rooftop D
*	25	98	Pavement D
	131,177	82	Weighted Average
	121,777		92.83% Pervious Area
	9,400		7.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.0	70	0.0050	0.06		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.10"
0.9	12	0.3300	0.23		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.10"
18.5	68	0.0050	0.06		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.10"
0.8	77	0.0130	1.71		<b>Shallow Concentrated Flow,</b> Grassed Waterway Kv= 15.0 fps
0.4	125	0.0700	4.97	59.65	<b>Trap/Vee/Rect Channel Flow,</b> Bot.W=1.00' D=2.00' Z= 3.0 & 2.0 '/' Top.W=11.00' n= 0.080 Earth, long dense weeds
0.5	76	0.0200	2.66	31.88	<b>Trap/Vee/Rect Channel Flow,</b> Bot.W=1.00' D=2.00' Z= 3.0 & 2.0 '/' Top.W=11.00' n= 0.080 Earth, long dense weeds
0.1	22	0.0400	2.55	17.86	<b>Trap/Vee/Rect Channel Flow,</b> Bot.W=2.00' D=1.00' Z= 8.0 & 2.0 '/' Top.W=12.00' n= 0.080 Earth, long dense weeds
0.6	78	0.0200	2.04	29.56	<b>Trap/Vee/Rect Channel Flow,</b> Bot.W=8.00' D=1.00' Z= 10.0 & 3.0 '/' Top.W=21.00' n= 0.080 Earth, long dense weeds
0.4	45	0.1600	2.00		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
2.6	96	0.0600	0.61		<b>Shallow Concentrated Flow,</b> Forest w/Heavy Litter Kv= 2.5 fps
4.3	203	0.1000	0.79		<b>Shallow Concentrated Flow,</b> Forest w/Heavy Litter Kv= 2.5 fps

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Type III 24-hr 10 yr MDEP Rainfall=4.60"

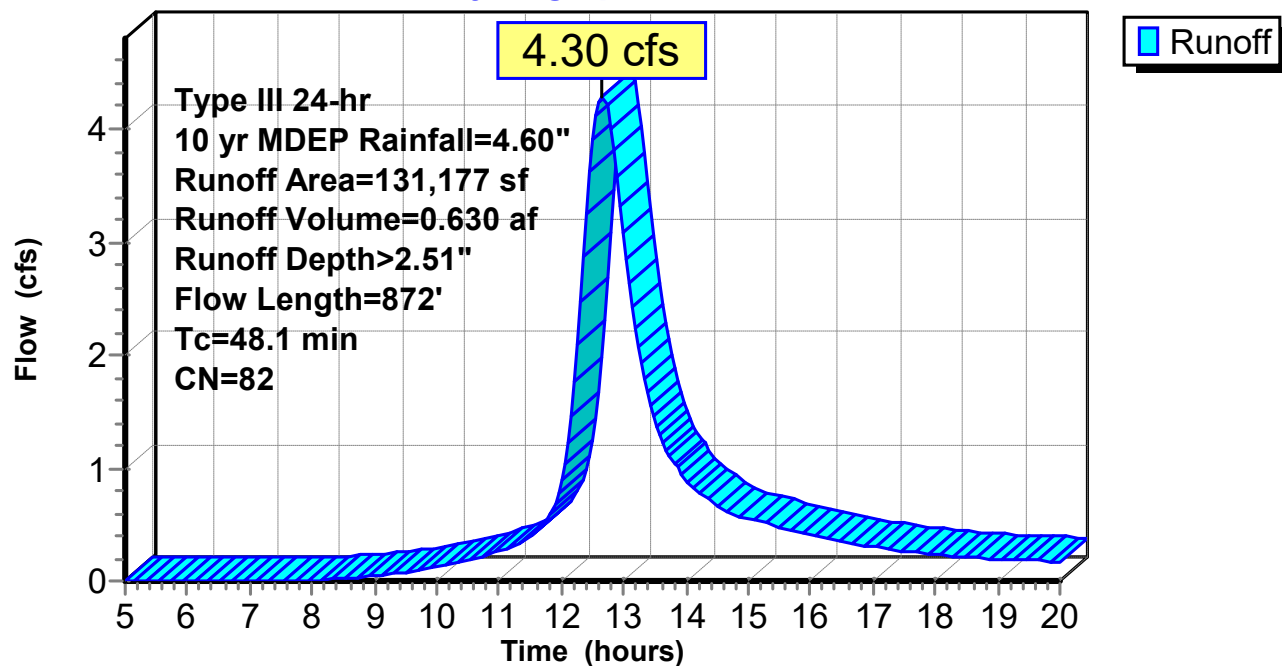
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48.1 872 Total

## Subcatchment 1S: (new Subcat)

### Hydrograph



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*Type III 24-hr 10 yr MDEP Rainfall=4.60"*

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**Summary for Subcatchment 2S: (new Subcat)**

Runoff = 2.79 cfs @ 12.75 hrs, Volume= 0.438 af, Depth&gt; 2.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 10 yr MDEP Rainfall=4.60"

	Area (sf)	CN	Description
*	2,280	98	Impervious C Soil
	8,145	79	50-75% Grass cover, Fair, HSG C
	1,234	73	Woods, Fair, HSG C
*	1,838	98	Rooftop C Soil
	30	79	50-75% Grass cover, Fair, HSG C
	5,346	79	50-75% Grass cover, Fair, HSG C
	2,350	84	50-75% Grass cover, Fair, HSG D
	8,642	84	50-75% Grass cover, Fair, HSG D
	4,566	79	Woods, Fair, HSG D
	3,957	84	50-75% Grass cover, Fair, HSG D
*	2,440	98	Pavement D Soil
*	625	98	Pavement D Soil
	12,830	84	50-75% Grass cover, Fair, HSG D
*	1,156	98	Rooftop D Soil
	10,199	79	Woods, Fair, HSG D
	4,752	79	Woods, Fair, HSG D
	26,925	73	Woods, Fair, HSG C
	269	79	50-75% Grass cover, Fair, HSG C
*	313	98	Rooftop D Soil
*	212	98	Impervious D Soil
	98,109	80	Weighted Average
	89,245		90.97% Pervious Area
	8,864		9.03% Impervious Area

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Type III 24-hr 10 yr MDEP Rainfall=4.60"

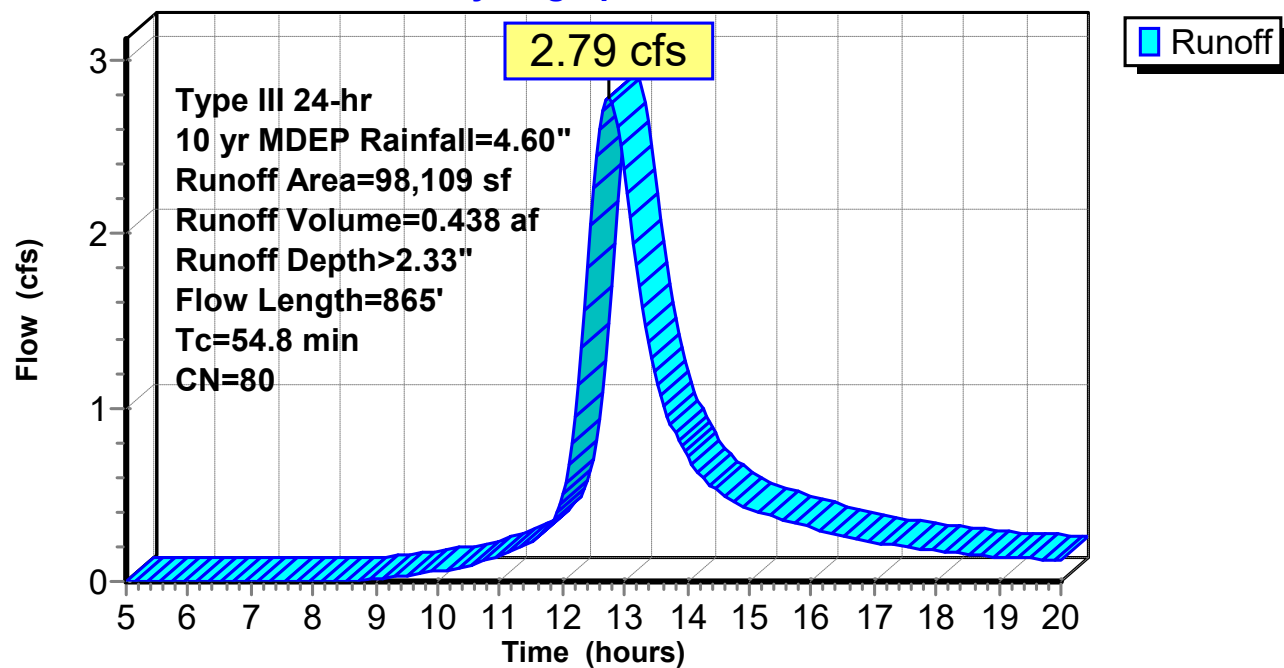
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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	34	0.0050	0.05		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.10"
0.7	10	0.3300	0.22		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.10"
28.9	106	0.0040	0.06		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.10"
0.5	26	0.0040	0.95		<b>Shallow Concentrated Flow,</b> Grassed Waterway Kv= 15.0 fps
0.6	169	0.0700	4.97	59.65	<b>Trap/Vee/Rect Channel Flow,</b> Bot.W=1.00' D=2.00' Z= 2.0 & 3.0 '/' Top.W=11.00' n= 0.080 Earth, long dense weeds
0.0	22	0.2000	8.40	100.83	<b>Trap/Vee/Rect Channel Flow,</b> Bot.W=1.00' D=2.00' Z= 2.0 & 3.0 '/' Top.W=11.00' n= 0.080 Earth, long dense weeds
0.1	22	0.0400	3.76	45.09	<b>Trap/Vee/Rect Channel Flow,</b> Bot.W=1.00' D=2.00' Z= 2.0 & 3.0 '/' Top.W=11.00' n= 0.080 Earth, long dense weeds
0.3	60	0.0600	3.16	33.17	<b>Trap/Vee/Rect Channel Flow,</b> Bot.W=3.00' D=1.00' Z= 10.0 & 5.0 '/' Top.W=18.00' n= 0.080 Earth, long dense weeds
1.4	133	0.0500	1.57		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
1.9	108	0.1400	0.94		<b>Shallow Concentrated Flow,</b> Forest w/Heavy Litter Kv= 2.5 fps
2.3	86	0.0600	0.61		<b>Shallow Concentrated Flow,</b> Forest w/Heavy Litter Kv= 2.5 fps
0.1	10	0.2000	1.12		<b>Shallow Concentrated Flow,</b> Forest w/Heavy Litter Kv= 2.5 fps
7.4	79	0.0050	0.18		<b>Shallow Concentrated Flow,</b> Forest w/Heavy Litter Kv= 2.5 fps
54.8	865	Total			

Subcatchment 2S: (new Subcat)

Hydrograph



**17014 Post Development 9-26-17**

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17014 Higbee Notch Apartments  
Type III 24-hr 10 yr MDEP Rainfall=4.60"

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**Summary for Subcatchment 3S: (new Subcat)**

Runoff = 5.99 cfs @ 12.25 hrs, Volume= 0.566 af, Depth&gt; 2.37"

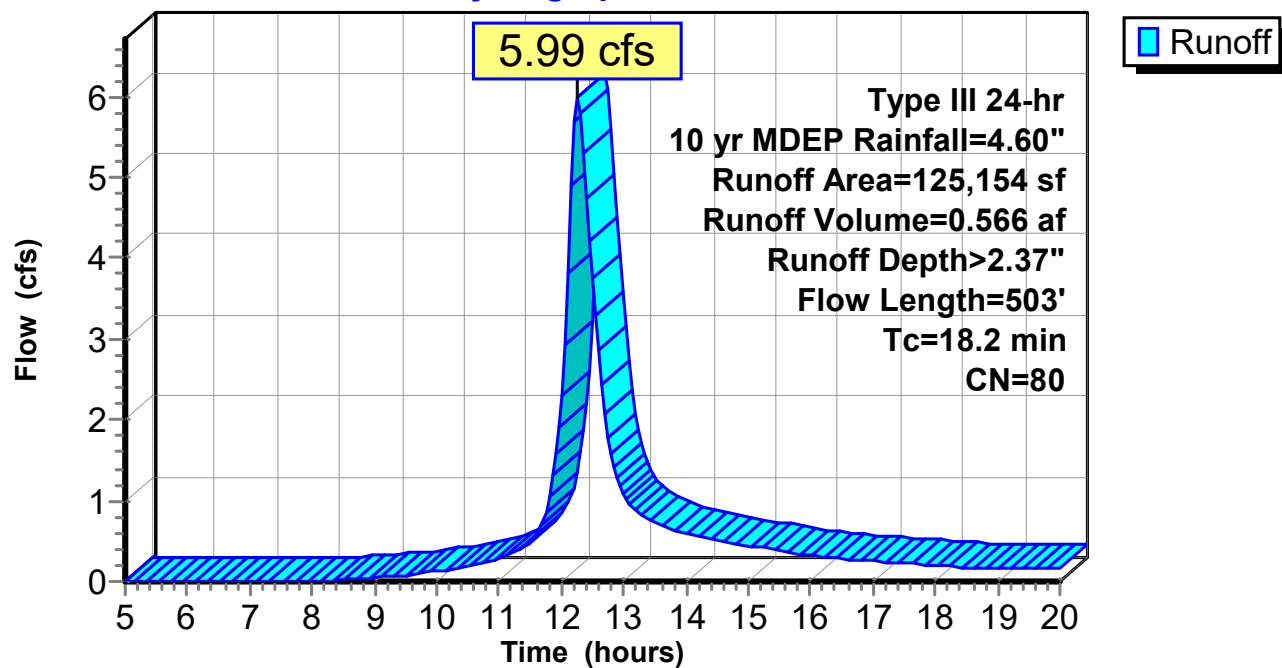
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 10 yr MDEP Rainfall=4.60"

Area (sf)	CN	Description
3,030	73	Woods, Fair, HSG C
106,902	79	Woods, Fair, HSG D
* 615	98	Rock Outcrop D Soil
5,924	84	50-75% Grass cover, Fair, HSG D
* 5,869	98	Pavement D Soil
* 2,240	98	Rooftop D Soil
337	84	50-75% Grass cover, Fair, HSG D
* 237	98	Impervious
125,154	80	Weighted Average
116,193		92.84% Pervious Area
8,961		7.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	90	0.0100	1.00		<b>Sheet Flow,</b> Smooth surfaces n= 0.011 P2= 3.10"
3.0	33	0.1100	0.18		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.10"
4.3	27	0.0300	0.10		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.10"
0.7	70	0.1100	1.66		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
0.3	25	0.0800	1.41		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
1.1	68	0.1600	1.00		<b>Shallow Concentrated Flow,</b> Forest w/Heavy Litter Kv= 2.5 fps
7.3	190	0.0300	0.43		<b>Shallow Concentrated Flow,</b> Forest w/Heavy Litter Kv= 2.5 fps
18.2	503	Total			

Subcatchment 3S: (new Subcat)

Hydrograph



## 17014 Post Development 9-26-17

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17014 Higbee Notch Apartments  
Type III 24-hr 10 yr MDEP Rainfall=4.60"

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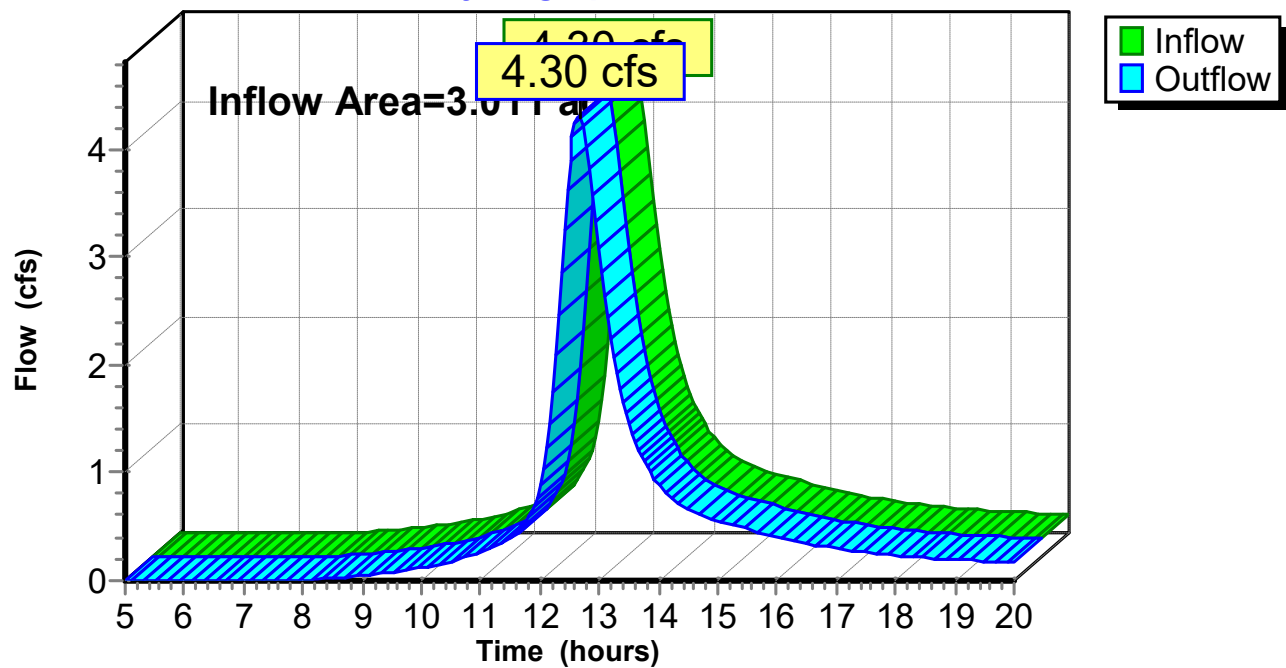
### Summary for Reach SP1: Study Point 1

Inflow Area = 3.011 ac, 7.17% Impervious, Inflow Depth > 2.51" for 10 yr MDEP event  
Inflow = 4.30 cfs @ 12.66 hrs, Volume= 0.630 af  
Outflow = 4.30 cfs @ 12.66 hrs, Volume= 0.630 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

### Reach SP1: Study Point 1

#### Hydrograph





## 17014 Post Development 9-26-17

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17014 Higbee Notch Apartments  
Type III 24-hr 10 yr MDEP Rainfall=4.60"

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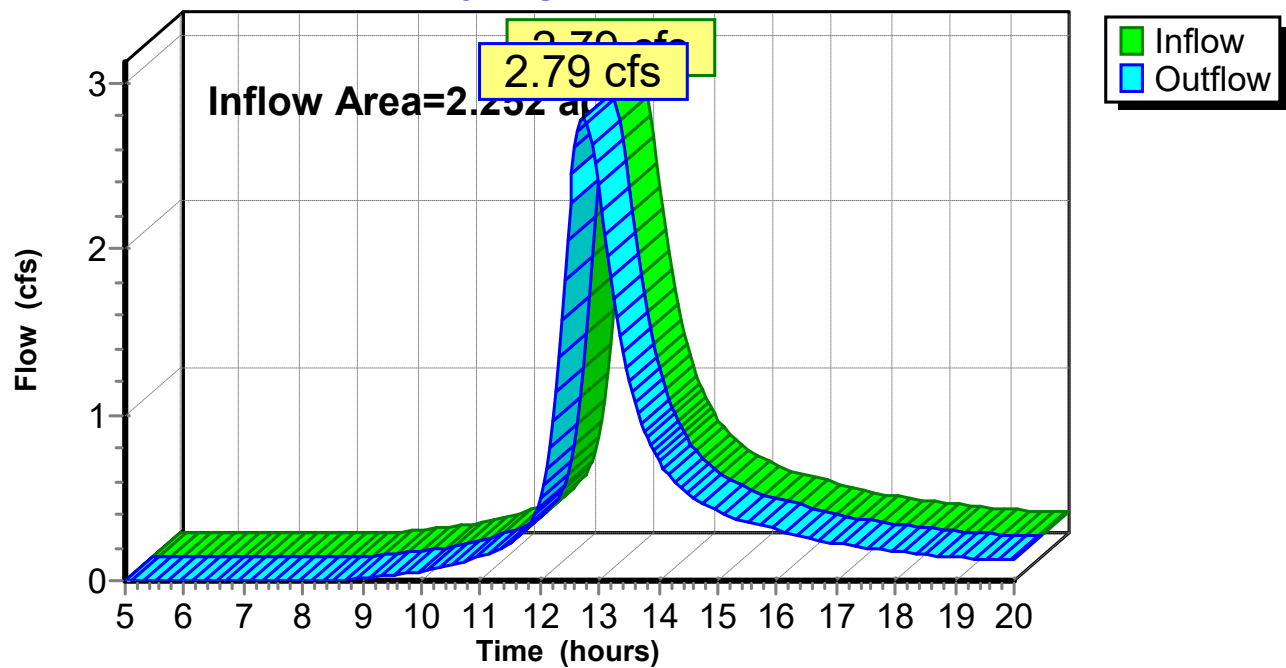
### Summary for Reach SP2: Study Point 2

Inflow Area = 2.252 ac, 9.03% Impervious, Inflow Depth > 2.33" for 10 yr MDEP event  
Inflow = 2.79 cfs @ 12.75 hrs, Volume= 0.438 af  
Outflow = 2.79 cfs @ 12.75 hrs, Volume= 0.438 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

### Reach SP2: Study Point 2

#### Hydrograph



## 17014 Post Development 9-26-17

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17014 Higbee Notch Apartments  
Type III 24-hr 10 yr MDEP Rainfall=4.60"

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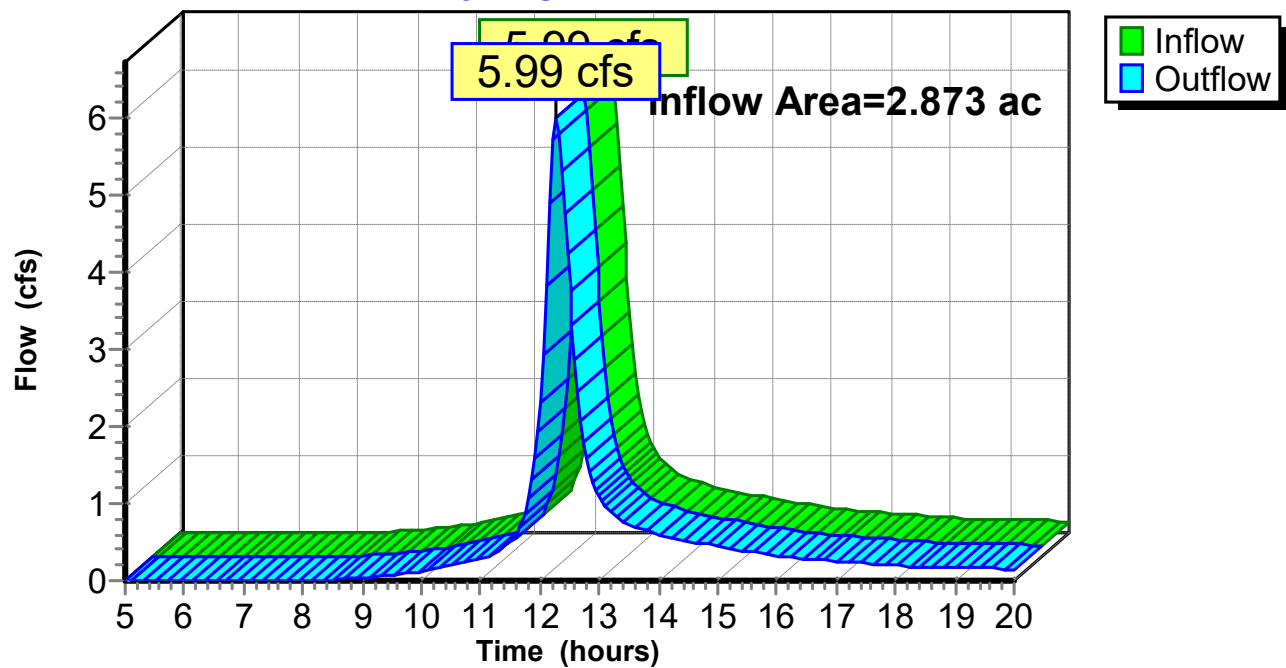
### Summary for Reach SP3: Study Point 3

Inflow Area = 2.873 ac, 7.16% Impervious, Inflow Depth > 2.37" for 10 yr MDEP event  
Inflow = 5.99 cfs @ 12.25 hrs, Volume= 0.566 af  
Outflow = 5.99 cfs @ 12.25 hrs, Volume= 0.566 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

### Reach SP3: Study Point 3

#### Hydrograph



**17014 Post Development 9-26-17**

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17014 Higbee Notch Apartments  
Type III 24-hr 25 yr MDEP Rainfall=5.80"

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**Summary for Subcatchment 1S: (new Subcat)**

Runoff = 5.98 cfs @ 12.65 hrs, Volume= 0.884 af, Depth&gt; 3.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 25 yr MDEP Rainfall=5.80"

	Area (sf)	CN	Description
*	4,139	98	Impervious area C soil
	7,800	79	50-75% Grass cover, Fair, HSG C
*	3,092	98	Impervious area D Soil
	19,211	84	50-75% Grass cover, Fair, HSG D
*	981	98	Rooftop D soil
	16,555	79	Woods, Fair, HSG D
	62,936	79	Woods, Fair, HSG D
	15,275	84	50-75% Grass cover, Fair, HSG D
*	1,163	98	Rooftop D
*	25	98	Pavement D
	131,177	82	Weighted Average
	121,777		92.83% Pervious Area
	9,400		7.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.0	70	0.0050	0.06		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.10"
0.9	12	0.3300	0.23		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.10"
18.5	68	0.0050	0.06		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.10"
0.8	77	0.0130	1.71		<b>Shallow Concentrated Flow,</b> Grassed Waterway Kv= 15.0 fps
0.4	125	0.0700	4.97	59.65	<b>Trap/Vee/Rect Channel Flow,</b> Bot.W=1.00' D=2.00' Z= 3.0 & 2.0 '/' Top.W=11.00' n= 0.080 Earth, long dense weeds
0.5	76	0.0200	2.66	31.88	<b>Trap/Vee/Rect Channel Flow,</b> Bot.W=1.00' D=2.00' Z= 3.0 & 2.0 '/' Top.W=11.00' n= 0.080 Earth, long dense weeds
0.1	22	0.0400	2.55	17.86	<b>Trap/Vee/Rect Channel Flow,</b> Bot.W=2.00' D=1.00' Z= 8.0 & 2.0 '/' Top.W=12.00' n= 0.080 Earth, long dense weeds
0.6	78	0.0200	2.04	29.56	<b>Trap/Vee/Rect Channel Flow,</b> Bot.W=8.00' D=1.00' Z= 10.0 & 3.0 '/' Top.W=21.00' n= 0.080 Earth, long dense weeds
0.4	45	0.1600	2.00		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
2.6	96	0.0600	0.61		<b>Shallow Concentrated Flow,</b> Forest w/Heavy Litter Kv= 2.5 fps
4.3	203	0.1000	0.79		<b>Shallow Concentrated Flow,</b> Forest w/Heavy Litter Kv= 2.5 fps

**17014 Post Development 9-26-17**

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17014 Higbee Notch Apartments  
*Type III 24-hr 25 yr MDEP Rainfall=5.80"*

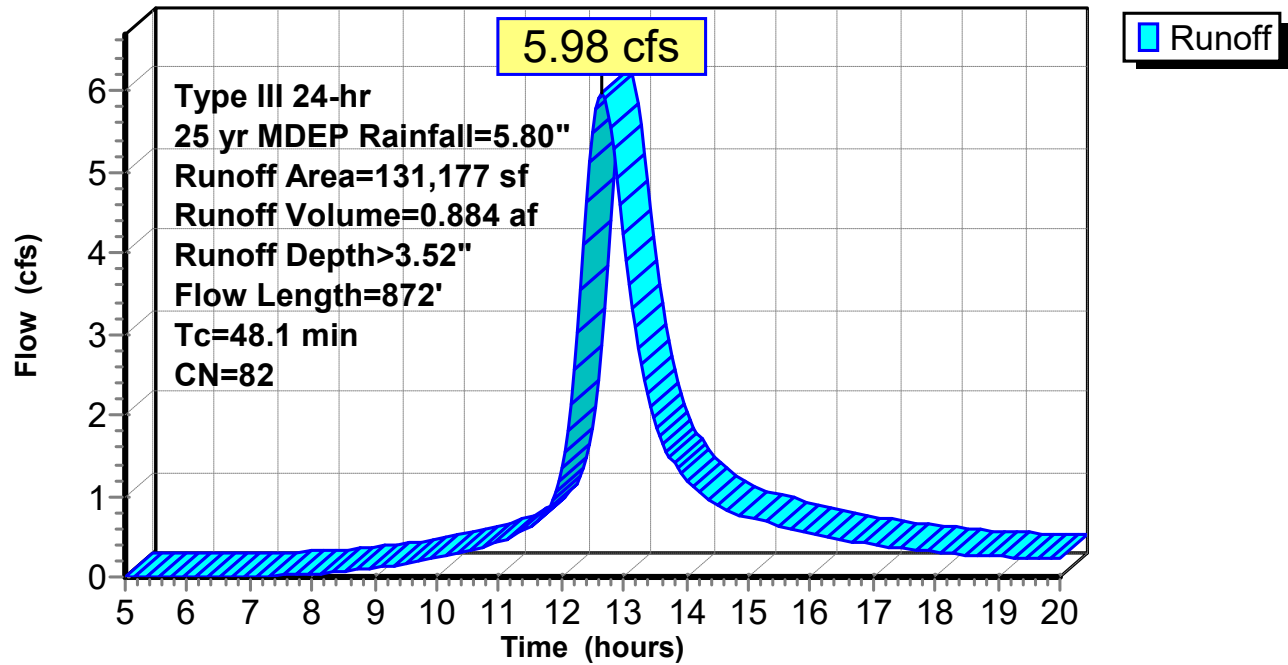
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48.1      872    Total

**Subcatchment 1S: (new Subcat)**

**Hydrograph**



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17014 Higbee Notch Apartments  
*Type III 24-hr 25 yr MDEP Rainfall=5.80"*

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**Summary for Subcatchment 2S: (new Subcat)**

Runoff = 3.94 cfs @ 12.74 hrs, Volume= 0.623 af, Depth&gt; 3.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 25 yr MDEP Rainfall=5.80"

	Area (sf)	CN	Description
*	2,280	98	Impervious C Soil
	8,145	79	50-75% Grass cover, Fair, HSG C
	1,234	73	Woods, Fair, HSG C
*	1,838	98	Rooftop C Soil
	30	79	50-75% Grass cover, Fair, HSG C
	5,346	79	50-75% Grass cover, Fair, HSG C
	2,350	84	50-75% Grass cover, Fair, HSG D
	8,642	84	50-75% Grass cover, Fair, HSG D
	4,566	79	Woods, Fair, HSG D
	3,957	84	50-75% Grass cover, Fair, HSG D
*	2,440	98	Pavement D Soil
*	625	98	Pavement D Soil
	12,830	84	50-75% Grass cover, Fair, HSG D
*	1,156	98	Rooftop D Soil
	10,199	79	Woods, Fair, HSG D
	4,752	79	Woods, Fair, HSG D
	26,925	73	Woods, Fair, HSG C
	269	79	50-75% Grass cover, Fair, HSG C
*	313	98	Rooftop D Soil
*	212	98	Impervious D Soil
	98,109	80	Weighted Average
	89,245		90.97% Pervious Area
	8,864		9.03% Impervious Area

**17014 Post Development 9-26-17**

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17014 Higbee Notch Apartments  
Type III 24-hr 25 yr MDEP Rainfall=5.80"

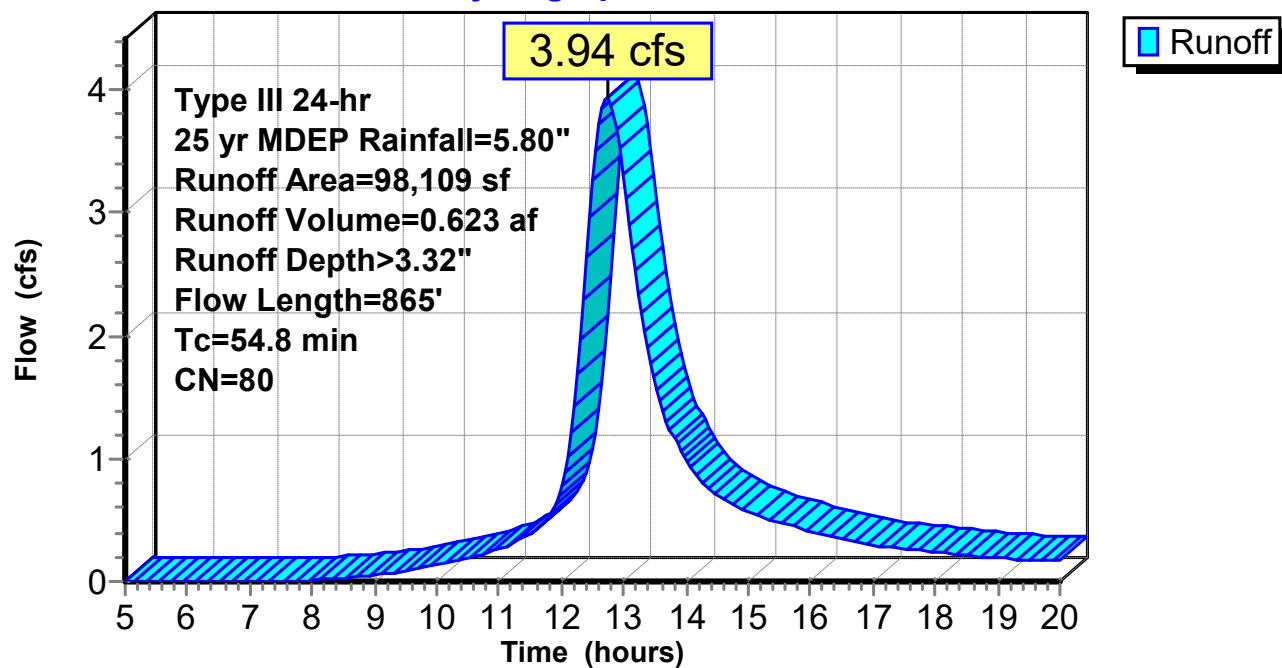
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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.6	34	0.0050	0.05		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.10"
0.7	10	0.3300	0.22		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.10"
28.9	106	0.0040	0.06		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.10"
0.5	26	0.0040	0.95		<b>Shallow Concentrated Flow,</b> Grassed Waterway Kv= 15.0 fps
0.6	169	0.0700	4.97	59.65	<b>Trap/Vee/Rect Channel Flow,</b> Bot.W=1.00' D=2.00' Z= 2.0 & 3.0 '/' Top.W=11.00' n= 0.080 Earth, long dense weeds
0.0	22	0.2000	8.40	100.83	<b>Trap/Vee/Rect Channel Flow,</b> Bot.W=1.00' D=2.00' Z= 2.0 & 3.0 '/' Top.W=11.00' n= 0.080 Earth, long dense weeds
0.1	22	0.0400	3.76	45.09	<b>Trap/Vee/Rect Channel Flow,</b> Bot.W=1.00' D=2.00' Z= 2.0 & 3.0 '/' Top.W=11.00' n= 0.080 Earth, long dense weeds
0.3	60	0.0600	3.16	33.17	<b>Trap/Vee/Rect Channel Flow,</b> Bot.W=3.00' D=1.00' Z= 10.0 & 5.0 '/' Top.W=18.00' n= 0.080 Earth, long dense weeds
1.4	133	0.0500	1.57		<b>Shallow Concentrated Flow,</b> Short Grass Pasture Kv= 7.0 fps
1.9	108	0.1400	0.94		<b>Shallow Concentrated Flow,</b> Forest w/Heavy Litter Kv= 2.5 fps
2.3	86	0.0600	0.61		<b>Shallow Concentrated Flow,</b> Forest w/Heavy Litter Kv= 2.5 fps
0.1	10	0.2000	1.12		<b>Shallow Concentrated Flow,</b> Forest w/Heavy Litter Kv= 2.5 fps
7.4	79	0.0050	0.18		<b>Shallow Concentrated Flow,</b> Forest w/Heavy Litter Kv= 2.5 fps
54.8	865	Total			

Subcatchment 2S: (new Subcat)

Hydrograph



**17014 Post Development 9-26-17**

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17014 Higbee Notch Apartments  
Type III 24-hr 25 yr MDEP Rainfall=5.80"

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**Summary for Subcatchment 3S: (new Subcat)**

Runoff = 8.46 cfs @ 12.25 hrs, Volume= 0.805 af, Depth&gt; 3.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
Type III 24-hr 25 yr MDEP Rainfall=5.80"

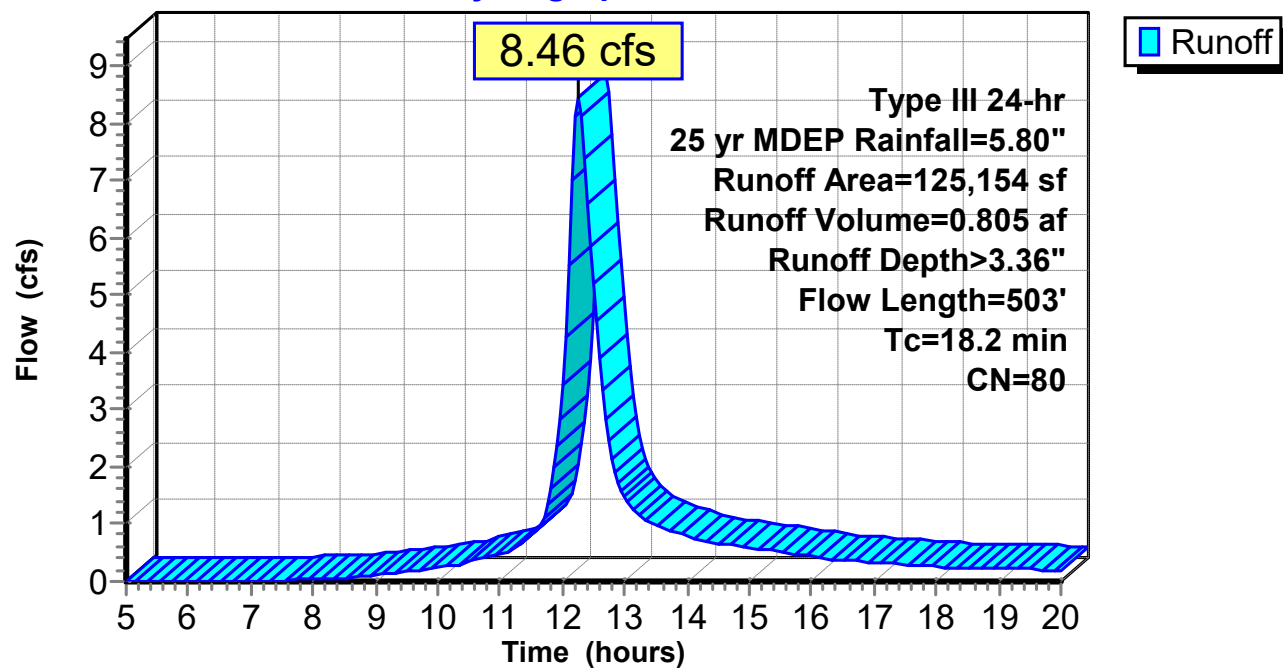
Area (sf)	CN	Description
3,030	73	Woods, Fair, HSG C
106,902	79	Woods, Fair, HSG D
* 615	98	Rock Outcrop D Soil
5,924	84	50-75% Grass cover, Fair, HSG D
* 5,869	98	Pavement D Soil
* 2,240	98	Rooftop D Soil
337	84	50-75% Grass cover, Fair, HSG D
* 237	98	Impervious
125,154	80	Weighted Average
116,193		92.84% Pervious Area
8,961		7.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	90	0.0100	1.00		<b>Sheet Flow,</b> Smooth surfaces n= 0.011 P2= 3.10"
3.0	33	0.1100	0.18		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.10"
4.3	27	0.0300	0.10		<b>Sheet Flow,</b> Grass: Dense n= 0.240 P2= 3.10"
0.7	70	0.1100	1.66		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
0.3	25	0.0800	1.41		<b>Shallow Concentrated Flow,</b> Woodland Kv= 5.0 fps
1.1	68	0.1600	1.00		<b>Shallow Concentrated Flow,</b> Forest w/Heavy Litter Kv= 2.5 fps
7.3	190	0.0300	0.43		<b>Shallow Concentrated Flow,</b> Forest w/Heavy Litter Kv= 2.5 fps
18.2	503	Total			



Subcatchment 3S: (new Subcat)

Hydrograph



## 17014 Post Development 9-26-17

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17014 Higbee Notch Apartments  
Type III 24-hr 25 yr MDEP Rainfall=5.80"

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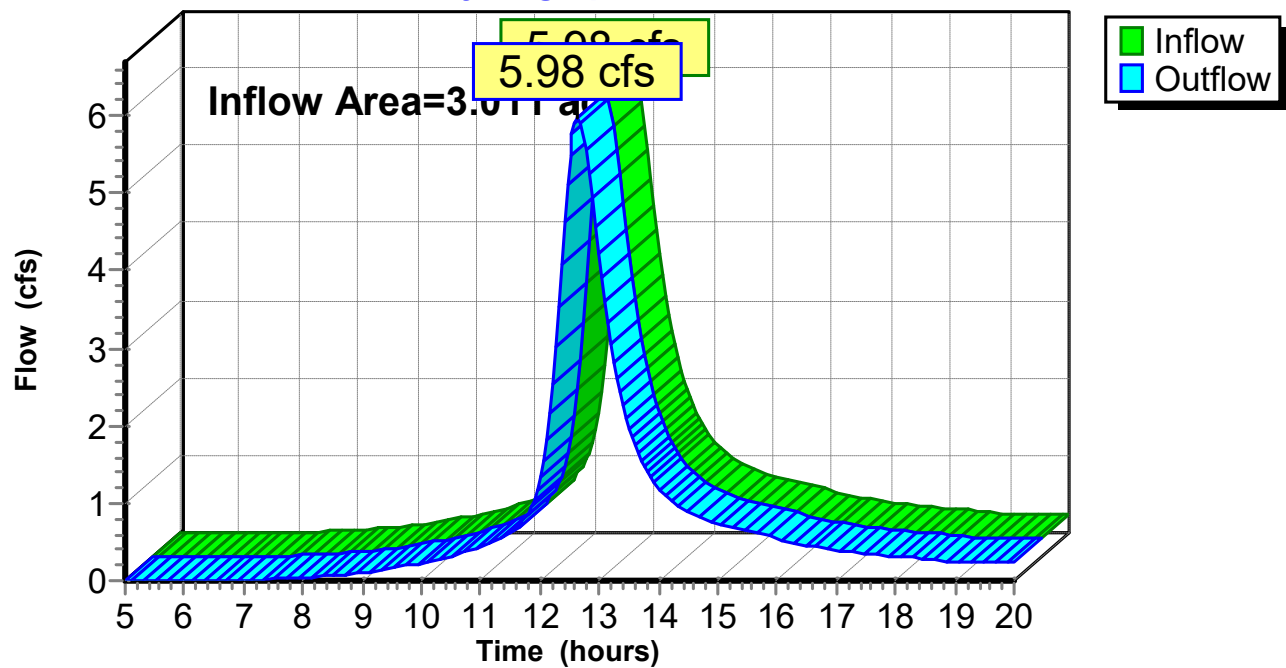
### Summary for Reach SP1: Study Point 1

Inflow Area = 3.011 ac, 7.17% Impervious, Inflow Depth > 3.52" for 25 yr MDEP event  
Inflow = 5.98 cfs @ 12.65 hrs, Volume= 0.884 af  
Outflow = 5.98 cfs @ 12.65 hrs, Volume= 0.884 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

### Reach SP1: Study Point 1

#### Hydrograph



## 17014 Post Development 9-26-17

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17014 Higbee Notch Apartments  
Type III 24-hr 25 yr MDEP Rainfall=5.80"

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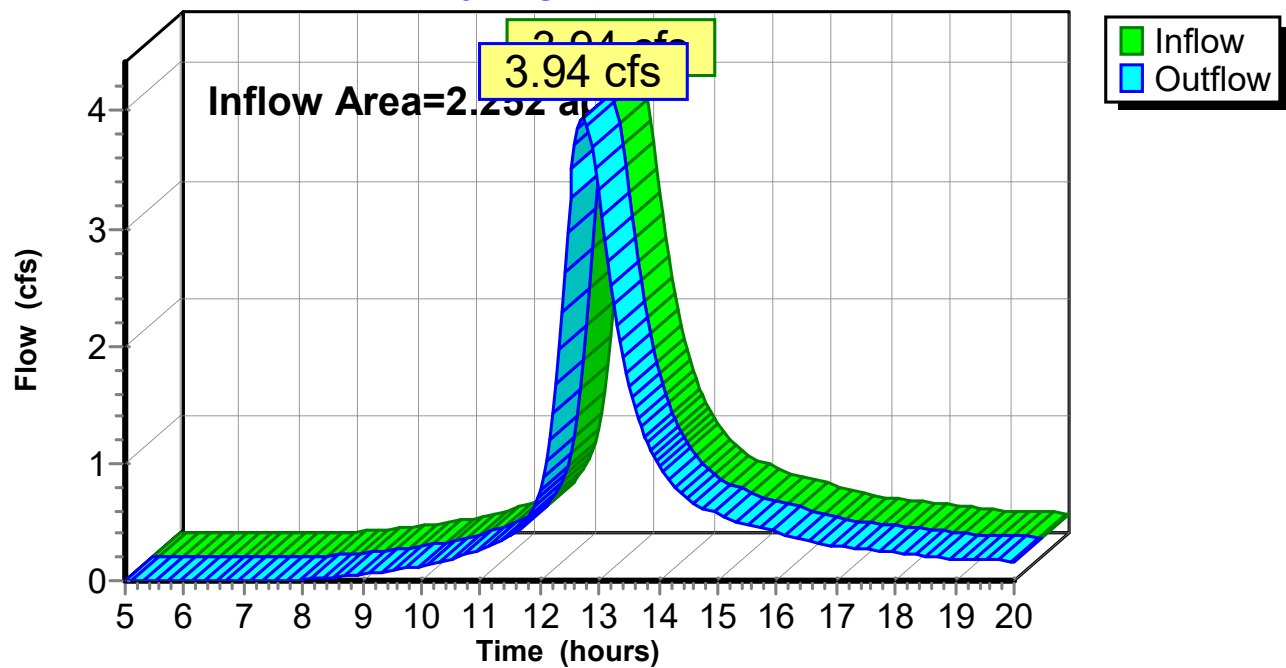
### Summary for Reach SP2: Study Point 2

Inflow Area = 2.252 ac, 9.03% Impervious, Inflow Depth > 3.32" for 25 yr MDEP event  
Inflow = 3.94 cfs @ 12.74 hrs, Volume= 0.623 af  
Outflow = 3.94 cfs @ 12.74 hrs, Volume= 0.623 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

### Reach SP2: Study Point 2

#### Hydrograph



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17014 Higbee Notch Apartments  
Type III 24-hr 25 yr MDEP Rainfall=5.80"

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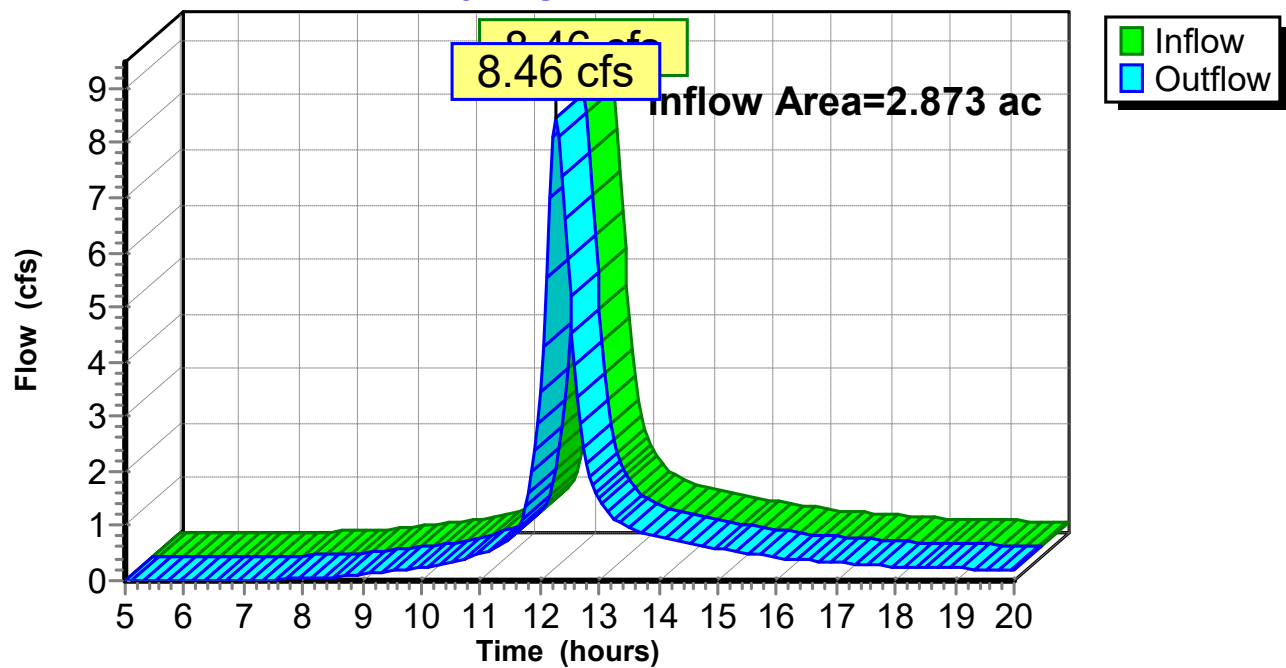
### Summary for Reach SP3: Study Point 3

Inflow Area = 2.873 ac, 7.16% Impervious, Inflow Depth > 3.36" for 25 yr MDEP event  
Inflow = 8.46 cfs @ 12.25 hrs, Volume= 0.805 af  
Outflow = 8.46 cfs @ 12.25 hrs, Volume= 0.805 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

### Reach SP3: Study Point 3

#### Hydrograph





17014

February 8, 2018

Carla Nixon, AICP  
Planning Director  
Planning Department  
Town of Cumberland  
290 Tuttle Road  
Cumberland, ME 04021

**Preliminary & Final Application - Major Subdivision and Site Plan**  
**Higbee Notch Apartments**  
**251 Gray Road**  
**Cumberland, Maine**  
**Cumberland Assessor's Map U21 Lot 18**  
**Denise Morgan, Megan Morgan and Nathan Pelsinski**  
**Submittal of MDOT and MDEP Permits and Additional Materials**

Dear Carla,

As you know, the last time this project was presented to the Planning Board was on September 19, 2017, when a public hearing was conducted, and the Board voted to table the application until additional information was available.

On September 26, 2017 our office submitted an application package containing our response to review comments as well as additional Application materials in support of placement on the Planning Board's October 17, 2017 agenda to seek Preliminary and Final approvals for this project.

With the submittal of the enclosed materials, we are respectfully requesting placement on the Planning Board's March 20, 2018 meeting for continued review in support of obtaining Preliminary and Final Approvals for Higbee Notch Apartments.

At the time of filing our application package to seek placement on the Planning Board's October 17, 2017 agenda, a few items remained outstanding which precluded placement of this item on the Planning Board's agenda. The most notable outstanding item was the MDOT Driveway/Entrance permit for the site.

### **MDOT Driveway Entrance Permit**

As you know, the Applicants' Traffic Engineer had filed a request for an MDOT Entrance Permit for this site prior to our last meeting with the Planning Board. As discussed during the Planning Board meeting, the MDOT previously issued an entrance permit for this site to the prior landowner.

It has been a very lengthy review process at the MDOT, much more than anyone anticipated. But as you know, the Applicants have finally received their permit from the MDOT.

Copies of the MDOT's Driveway/Entrance Permit and Waiver, issued on January 29, 2018, are enclosed. This permit has also been recorded at the Cumberland County Registry of Deeds. As the enclosed Permit indicates, Mobility Arterial waivers were granted by the MDOT including an allowance for driveway separation distances and the measured sight distance looking in a southerly direction (to the left).

The MDOT Permit also has a special condition which limits the number of apartments to eight. As you know, this is consistent with the amount of apartments that the Applicants are proposing.

### **MDEP Stormwater Permit by Rule**

In addition, at the time of our filing of materials in September of last year, the MDEP Stormwater Permit by Rule (PBR) was under review, and was expected to have its 14-day review period completed before the October meeting with the Planning Board. The MDEP Stormwater PBR was approved on October 5, 2017. Copies of this MDEP approval are included as part of our application package as well.

### **Staff and Peer Review Comments**

At the time of our September 26, 2017 submittal, we provided a formal response to staff and peer review comments that had been received to date.

As you know, after we made that submittal to you, we met with you and Jeff Read on October 10, 2017, to discuss Higbee Notch Apartments. The meeting was a good opportunity to go over the details of the Final Application materials that were filed with your office on September 26, 2017 and to discuss any outstanding items, particularly with regard to the Applicants' prior waiver requests.

We have prepared the enclosed letter to you which addresses our second response to staff and peer review comments and discusses the items we reviewed at the meeting with you and Mr. Read. This letter is a separate document included as part of the enclosed application materials.

In addition, we have included updated plans that reflect the feedback received during our meeting with you and Jeff Read on October 10, 2017.

### **Supporting Materials**

In addition to this Cover letter, we have enclosed the following Final Plan information:

- MDOT Driveway/Entrance Permit and Waivers issued January 29, 2018
- Copy of Approved MDEP Stormwater PBR approved October 5, 2017
- Response to Comments #2 dated February 8, 2018
- Final Plan set showing the proposed two new four-unit apartment buildings

### **Closure**

With the submittal of the information contained herein, we respectfully request your consideration of this material for placement on the Planning Board's March 20th Planning Board agenda for Preliminary and Final Plan approval.

In the interim, if you have any questions or comments, or require any additional information, please contact me.

We will be out of town during the upcoming weeks, but will be checking in on emails. The Applicants are available during this time period and can assist you as well.

Please let me know if you have any questions as you review the enclosed information.

Cumberland Planning

~ 4 ~

February 8, 2018

We look forward to hearing from you.

Sincerely,

ST.CLAIR ASSOCIATES

A handwritten signature in black ink, reading "Nancy J. St. Clair". The signature is fluid and cursive, with the first name "Nancy" being the most prominent.

Nancy J. St.Clair, P.E.,

Vice President

NJS/njs

Encl.

C: Denise Morgan, Megan Morgan and Nathan Pelsinski





Paul R. LePage  
GOVERNOR

STATE OF MAINE  
DEPARTMENT OF TRANSPORTATION  
REGION 1  
P.O. BOX 358  
SCARBOROUGH, MAINE 04070-0358

David Bernhardt  
COMMISSIONER

January 29, 2018

Denise Morgan  
2 Forest Lane  
Cumberland, ME 04021

Re: Entrance Permit Waiver # 25275

Dear Ms. Morgan:

Enclosed, please find a Memorandum of Highway Entrance Permit Waiver in regards to your property (Tax Map U21, Lot 18) located on Route 100 in Cumberland, Maine. This waiver must be recorded at the Cumberland County Registry of Deeds within 90 days from the date of issue. Once it has been recorded, a copy of the recorded waiver must then be returned to the MaineDOT Regional Office in Scarborough.

The entrance permit is valid upon delivery; however, **failure to record the waiver within 90 days will render the permit invalid.**

If you have any questions, feel free to contact me at (207) 885-7040.

Sincerely,

Anthony Fontaine  
MaineDOT Permit Field Specialist

Enclosures

cc: Traffic Solutions / William Bray



PRINTED ON RECYCLED PAPER

**MEMORANDUM OF  
HIGHWAY DRIVEWAY / ENTRANCE PERMIT WAIVER**

Pursuant to 23 M.R.S.A. § 704 and the Driveway and Entrance Rules promulgated hereunder, 17-229 CMR Chapter 299, the **Maine Department of Transportation** has granted a waiver that allows the access to the highway from the parcel of land, all as described below.

Owner(s) of Parcel: **Denise Morgan**  
2 Forest Lane  
Cumberland, ME 04021

Applicant(s): **William Bray**  
235 Bancroft Street  
Portland, ME 04102

Permit number: 25275

Parcel Description:

Location: **Cumberland**, Cumberland County, on the easterly side of **Route 100**  
Deed Reference: Cumberland County, Book # 33961, Page # 238 - 240  
Street Address: Route 100, Cumberland  
Tax Map Reference: Map U21, Lot 18

Entrance Description:

Location: **In the town of Cumberland on the easterly side of Route 100 / Gray Road, the centerline being approximately 265 feet northerly of the centerline of Old Gray Road and approximately 25 feet northerly of utility pole 46. (N 43.82450, W -70.31622)**

Type: Entrance 22 feet in width plus radii.

Use: To serve eight or fewer apartment units (dwellings).

Special Waiver Conditions:

W-1) The Mobility Arterial spacing standard for driveway separation distance has been reduced from 350 feet to 82 feet to the right (northerly direction) and from 350 feet to 121 feet to the left (southerly direction).

W-2) The Mobility Arterial sight distance standard has been reduced from 840 feet to 501 feet to the left (southerly direction).

Special Conditions:

- S-1) This Permit limits the number of apartment units (dwellings) to eight (8). More than 8 units will invalidate this Permit and require the submittal and approval of a new MaineDOT Entrance Permit application. The Property Owner is advised that approval of a Permit for more than 8 apartment units will require highway mitigation, the extent of which will be determined at the time of application submittal..

Date: 1-29-2018

Maine Department of Transportation



By: Kyle A Hall, P.E.

Southern Maine, Region Manager

STATE OF MAINE

County of Cumberland

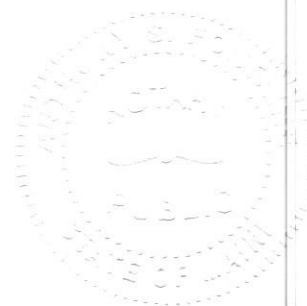
Date: 1-29-2018

Personally appeared the above named Kyle A Hall and acknowledged the foregoing instrument to be his free act and deed in his said capacity.

  
Notary Public

Print Name: Anthony S Fontaine

My Commission Expires: January 12, 2019







**Paul R. LePage**  
Governor

## Maine Department of Transportation

### Driveway/Entrance Permit

**David Bernhardt, P.E.**  
Commissioner

Permit Number: 25275 - Entrance ID: 1

#### LOCATION

**OWNER**  
Name: **Denise Morgan**  
Address: **2 Forest Lane**  
**Cumberland, ME 04021**  
Telephone: **(207)838-8326**

Route: **0100X, Gray Road**  
Municipality: **Cumberland**  
County: **Cumberland**  
Tax Map: **U21 Lot Number: 18**  
Culvert Size: **inches**  
Culvert Type: **N/R**  
Culvert Length: **feet**  
Date of Permit: **January 26, 2018**  
Approved Entrance Width: **22 feet**

Date Printed: **January 26, 2018**

In accordance with rules promulgated under 23 M.R.S.A., Chapter 13, Subchapter I, Section 704, the Maine Department of Transportation (MaineDOT) approves a permit and grants permission to perform the necessary grading to construct, in accordance with sketch or attached plan, **an Entrance to Eight (8) or fewer apartment units (dwellings)** at a point **265 feet North** from **Old Gray Road**, subject to the Chapter 299 Highway Driveway and Entrance Rules, standard conditions and special conditions (if any) listed below.

#### Conditions of Approval:

This Permittee acknowledges and agrees to comply with the Standard Conditions and Approval attached hereto and to any Specific Conditions of Approval shown here.

(G = GPS Location; W = Waiver; S = Special Condition)

G - THE ENTRANCE SHALL BE LOCATED AT GPS COORDINATES: 43.824500N, -70.316220W.

W - The Mobility Arterial spacing standard for driveway separation distance has been reduced from 350 feet to 82 feet to the right (northerly direction) and from 350 feet to 121 feet to the left (southerly direction).

W - The Mobility Arterial sight distance standard has been reduced from 840 feet to 501 feet to the left (southerly direction).

S - In the town of Cumberland on the easterly side of Route 100 / Gray Road, the centerline being approximately 265 feet northerly of the centerline of Old Gray Road and approximately 25 feet northerly of utility pole 46.

S - The driveway shall be paved, at a minimum, from the edge of the existing highway pavement to the edge of the highway right-of-way.

S - This Permit limits the number of apartment units (dwellings) to eight (8). More than 8 units will invalidate this Permit and require the submittal and approval of a new MaineDOT Entrance Permit application. The Property Owner is advised that approval of a Permit for more than 8 apartment units will require highway mitigation, the extent of which will be determined at the time of application submittal.

The MaineDOT has determined that:

1. The waiver will not significantly detract from public safety,
2. The proposed driveway/entrance meets the standards to the maximum extent practicable, and
3. There is no feasible alternative.

A notarized, written waiver determination has been sent to the owner. The owner shall record the waiver determination in the Registry of Deeds in the County in which the property is located within 90 days of the date of the waiver, or the waiver will be null and void and the permit will expire.

Approved by: Anthony Fontaine Date: 1-29-2018

## STANDARD CONDITIONS AND APPROVAL

1. Provide, erect and maintain all necessary barricades, lights, warning signs and other devices as directed by MaineDOT to properly safeguard traffic while the construction is in progress.
2. At no time cause the highway to be closed to traffic
3. Where the driveway is located within a curb, curb and gutter, and/or sidewalk section, completely remove the existing curb, curb and gutter, and/or sidewalk as may be required to create the driveway and restore drainage. All driveways abutting sidewalk sections shall meet the requirements set forth in the Americans with Disabilities Act of 1990, 42 U.S.C. Sec. 12131 et seq.
4. Obtain, have delivered to the site, and install any culverts and/or drainage structures which may be necessary for drainage, the size, type and length as called for in the permit pursuant to 23 M.R.S.A. Sec. 705. All culverts and/or drainage structures shall be new.
5. Start construction of the proposed driveway within twenty-four (24) months of the date of permit issuance and substantially complete construction of the proposed driveway within twelve months of commencement of construction.
6. Comply with all applicable federal, state and municipal regulations and ordinances.
7. Do not alter, without the express written consent of the MaineDOT, any culverts or drainage swales within the MaineDOT right of way.
8. File a copy of the approved driveway permit with the affected municipality or LURC, as appropriate within 5 business days of receiving the MaineDOT approval.
9. Construct and maintain the driveway side slopes to be no steeper than the adjacent roadway side slopes, but in no case to be steeper than 3 horizontal to 1 vertical, unless the side slope is behind existing roadway guardrail, in which case it shall be no steeper than 2 horizontal to 1 vertical.
10. Notify the MaineDOT of a proposed change of use served by the driveway when increase in traffic flow is expected to occur. This does not exempt the need for obtaining a Traffic Movement Permit (TMP) if trip generation meets or exceeds 100 passenger car equivalents (PCE) during the peak hour of the day.
11. Construct or implement and maintain erosion and sedimentation measures sufficient to protect MaineDOT facilities.
12. Driveways shall be designed such that all maneuvering and parking of any vehicles will take place outside the highway right-of-way and where vehicles will exit the premises without backing onto the highway traveled way or shoulders. All driveways will have a turnaround area to accommodate vehicles using the premises.

## FURTHER CONDITION OF THE PERMIT

The owner shall assume, the defense of, and pay all damages, fines, and penalties for which he/she shall become liable, and shall indemnify and safe harmless said Department, its representatives, agents and employees from liability, actions against all suits, claims, damages for wrongful death, personal injuries or property damage suffered by any person or association which results from the willful or negligent action or inaction of the owner/applicant (agent) and in proceedings of every kind arising out of the construction and maintenance of said entrance(s), including snow removal.

Nothing herein shall, nor is intended to, waive any defense, immunity or limitation of liability which may be available to the MaineDOT, their officers, agents or employees under the Maine Tort Claims Act or any other privileges and/or immunities provided by law. It is a further condition that the owner will agree to keep the right of way inviolate for public highway purposes and no signs (other than traffic signs and signals), posters, billboards, roadside stands, culvert end walls or private installations shall be permitted within Right of Way limits.



## STORMWATER PBR APPLICATION FORM

PLEASE TYPE OR PRINT IN INK ONLY

Page 1

02/14

<b>1. Name of Applicant:</b> Megan Morgan, Nathan Pelsinski		<b>5. Name of Agent:</b> (if applicable) St.Clair Associates	
<b>2. Applicant's Mailing Address:</b> 2 Forest Lane Cumberland, ME 04021		<b>6. Agent's Mailing Address:</b> 34 Forest Lane Cumberland, ME 04021	
<b>3. Applicant's Daytime Phone #:</b> 207-807-0921 (Megan)		<b>7. Agent's Daytime Phone #:</b> 207-829-6623	
<b>4. Applicant's email address:</b> mm082005@aol.com		<b>8. Agent's email address:</b> nancy@stclairassociatesmaine.com	
<b>9. Location of Project:</b> (Road, Street, Rt.#) 251 Gray Road		<b>10. Town:</b> Cumberland	
		<b>11. County:</b> Cumberland	
<b>12. Is this PBR for renewal of an individual stormwater permit? If yes, skip to Block 27 and signature page.</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
<b>13. Type of Direct Watershed:</b> (Check all that apply) <input type="checkbox"/> Lake not most at risk <input type="checkbox"/> Lake most at risk <input type="checkbox"/> Lake most at risk, severely blooming <input checked="" type="checkbox"/> River, stream or brook <input type="checkbox"/> Urban impaired stream <input type="checkbox"/> Freshwater wetland <input type="checkbox"/> Coastal wetland <input type="checkbox"/> Wellhead of public water supply		<b>14. Amount of Developed Area:</b> <input type="checkbox"/> Total # of 1.52 acres OR <input type="checkbox"/> Total # of _____ square feet <b>15. Amount of Impervious Area:</b> <input type="checkbox"/> Total # of 0.41 acres OR <input type="checkbox"/> Total # of _____ square feet	
<b>16. Creating a common plan of development or sale?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		<b>17. Is this activity part of a larger project?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
<b>18. Name of waterbody (ies) drained to</b> Piscataqua River		<b>19. Name of impaired Waterbody, if applicable</b>	
<b>20. Brief Project Description:</b> The applicant is proposing to construct 2 new 4-unit apartment buildings.			
<b>21. Size of Lot or Parcel and UTM locations, if known:</b> <input type="checkbox"/> _____ square feet OR <input type="checkbox"/> 5.85 acres		<b>UTM Northing, if known:</b>  <b>UTM Easting, if known:</b>	
<b>22. Deed Reference Numbers:</b> Book#: 33961 Page#: 238		<b>23. Map and Lot Numbers:</b> Map #: U21 Lot #: 18	
<b>24. DEP Staff Previously contacted</b>		<b>25. Project started prior to application?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
<b>26. Resubmission of PBR Application?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		<b>If yes, prior application #:</b>  <b>Prior project manager:</b>	
<b>27. Written Notice of Violation?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		<b>If yes, name of DEP enforcement staff involved:</b>	
<b>28. Detailed Directions to the Project Site:</b> (Attach separate sheet if necessary)		From Exit 53 on 95, turn left on Route 100. Follow for 7.3 miles. Site will be on the right.	
<b>29. Renewal of individual stormwater permit</b>		DEP Permit#: _____ Project Manager: _____	
<b>30. SUBMISSIONS ▼</b>			
<input checked="" type="checkbox"/> This form (signed and dated) <input checked="" type="checkbox"/> Fee <input type="checkbox"/> Dept. of Inland Fisheries and Wildlife Approval (if in Essential Habitat)		<input checked="" type="checkbox"/> Photos of Area <input checked="" type="checkbox"/> ESC Plan <input checked="" type="checkbox"/> Location Map <input checked="" type="checkbox"/> Site Plan <b>For Renewal of an individual Stormwater permit only:</b> <input type="checkbox"/> This form (signed and dated) <input type="checkbox"/> Copy of original stormwater permit <input type="checkbox"/> Fee	
<b>Does the agent have an interest in this project? If yes, what is the interest?</b>		no	

CERTIFICATIONS AND SIGNATURES LOCATED ON PAGE 2

SW PBR  
# 64741#1040  
\$63.009/26/2017  
8accepted: 10/5/17  
staff: A. Arbo

## CERTIFICATIONS / SIGNATURES

## Applicant's Statement:

I am applying for a Stormwater PBR and have attached the required PBR submissions. I have read the requirements herein and I affirm that my project satisfies the applicable stormwater management standards. I authorize staff of State and Federal agencies having jurisdiction over this activity, to access the project site for the purpose of determining compliance with the rules.

Signed: Date: 9/25/17Notice of Intent to Comply  
with Maine Construction  
General Permit

With this Stormwater PBR notification form and my signature below, I am filing notice of my intent to carry out work which meets the requirements of the Maine Construction General Permit. I have read and will comply with all of the MCGP standards. In addition, I will file a Notice of Termination (NOT) within 20 days of project completion.

If this form is not being signed by the landowner or lessee of the property, attach documentation showing authorization to sign.

Signed: Date: 9/25/17



17014

February 8, 2018

Carla Nixon, AICP, Planning Director  
Planning Department  
Town of Cumberland  
290 Tuttle Road  
Cumberland, ME 04021

**Major Subdivision and Site Plan – Second Response to Comments**

**Higbee Notch Apartments**

**251 Gray Road**

**Cumberland, Maine**

**Cumberland Assessor's Map U21 Lot 18**

**Denise Morgan, Megan Morgan and Nathan Pelsinski**

Dear Carla,

We appreciated the opportunity to meet with you and Jeff Read on October 10, 2017 to discuss Higbee Notch Apartments. The meeting was useful to review the details of the Final Application materials that were filed with your office on September 26, 2017 and to discuss our responses to staff and peer review comments.

We have prepared the enclosed updated materials in response to the feedback received during the meeting with you and Jeff Read. The outline for discussion topics used during the meeting was our initial response to comments filed as part of our September 26, 2017 request for placement on the Planning Board's agenda.

As you know, during our meeting with you and Mr. Read, we also reviewed the specifics of the items for which the Applicants had requested waivers. As part of the discussions with you and Mr. Read, we were able to further clarify the waiver requests. In response to comments received from you and the Town's peer review engineer, we have provided the following additional information to clarify the waiver requests.



**Requested Waivers**

The Applicants had requested waivers of the following items:

- **Underdrains in the approximately 105' long Higbee Lane** - As discussed during the Planning Board meeting on September 19, 2017, the Applicants had requested a waiver of to eliminate underdrains in the approximately 105' long section of Higbee Lane. The typical roadway section noted in the Ordinance includes relatively shallow ditches (approximately 12" deep) and underdrains to drain the road section.

In lieu of underdrains, our office had previously designed a deeper ditch section along Higbee Lane (approximately 30" deep) to allow the subgrade to drain to daylight. The Applicants had requested a waiver of the requirement for underdrains and that deepened ditches be permitted in lieu of installation of the underdrains along the approximately 105' long section of Higbee Lane.

As discussed during the meeting with you and Mr. Read, the Applicants have reviewed the cost implications with their earthworks contractor and have agreed to modify the design of Higbee Lane to install underdrains along the 105' length of the roadway. This eliminates the need for the waiver on underdrains. The enclosed updated plans reflect the addition of underdrains on both sides of the approximately 105' long Higbee Lane.

With the addition of underdrains along each side of Higbee Lane, the ditch depths in this area have been adjusted to approximately 12" deep. This decreases the extent of grading necessary on either side of Higbee Lane and allows for additional natural vegetation to remain in this area.

The underdrains on each side of Higbee Lane "daylight" into the approximately 30" deep ditches on each side of the shared gravel drive that extends down to the two buildings on the site. The downstream ends of both of the underdrains contain riprapped outlets, as they enter the ditches, as requested.

With the submittal of the enclosed revised plans (which have been updated to show proposed underdrains on both sides of Higbee Lane), the Applicant is hereby respectfully withdrawing their prior request for a waiver on underdrains in the approximately 105' section of Higbee Lane.

**Overhead Utilities** –As we noted in our September 26, 2017 submittal to you, the Applicants have coordinated directly with Central Maine Power Company to discuss the power supply configuration for this site. As you know, as part of our prior presentations to the Planning Board, we had indicated that the Applicants were seeking a waiver to allow the installation of overhead utilities on the site.

CMP has indicated that they will require a pole placed approximately 200' to 220' from Route 100, with a support pole approximately 20' from the new pole. From this point the service would be underground to an approximately 4' by 4' pad mounted transformer, which will provide underground services to each apartment building.

This reduced the extent of overhead line length by approximately 80' to 100' from that which was shown on the prior plans. Although the extent of overhead utility lines has been reduced, the Applicant must still seek a waiver on this item for the approximately 200' to 220' run of overhead lines from the existing overhead lines along Route 100 to the new pole on the site.

Based on the comments made during the Planning Board meeting, it appeared that most Planning Board members felt generally comfortable with granting this waiver request.

- **Nitrate Study** – As we had noted in our prior application materials, including the information submitted to your office as part of our September 26, 2017 application package, the Applicants are seeking a waiver regarding preparation of a Nitrate Study for the site.

In support of the waiver request, the Applicants contacted Mark Cenci, a Certified Geologist, to review the project, including the existing conditions of the property, including information on the wells in the area, and the design plans for Higbee Notch.

Mr. Cenci reviewed the site information and soils test pit data and issued a letter in support of the Applicants' waiver request. As you know, we included Mark Cenci's letter as part of our September 26, 2017 application package to the Town.

As Mr. Cenci notes, the plan and site conditions are such that a waiver on a Nitrate Analysis is warranted. His letter states that *“these site features are exactly what works best in planning the development of on-site wastewater disposal and a waiver from further study is warranted.”*

When we met with you and Mr. Read, we discussed Mr. Cenci’s letter, and our efforts to identify the locations of the wells on the nearby properties. The approximate locations of the wells on the abutting properties have been identified to the extent practicable and were reviewed with you and Mr. Read during our meeting.

Based on the discussions during that meeting, it is our understanding that Mr. Read was comfortable with the data presented in support of the waiver request. He did ask that the proposed well for Building 1 be located more up-gradient on the site. The enclosed Plans reflect this change, the well for Building 1 is now located westerly of the building, on the southerly side of the shared gravel driveway.

With the information provided on the abutting well locations and the letter from Mr. Cenci (along with the relocation of the proposed new well for Building 1), that the Applicants would still need to seek a partial waiver of the requirement for a Nitrate Study. It is our understanding from our meeting with you and Mr. Read, that staff is comfortable with this partial waiver request.

- **Landscape Plan** - As part of our September 26, 2017 submittal package our office included a planting plans which showed foundation plantings along the fronts of each building, similar to a typical residential building construction. Extensive areas of the site will be left in their natural state which will supplement the proposed plantings around the apartment buildings.

As the Plans show, the proposed plantings include a mix of flowering shrubs, evergreens and hardy perennials. Plant selection has been based on local availability, suitability for the setting, and ease of maintenance. The plantings are intended to provide visual interest with varying forms and texture, as well as seasonal variation of color.

The applicant has requested that the planting plan be considered in lieu of submittal of a formal Landscape Design Plan. Thus, a partial landscaping waiver would be necessary, but it is our understanding that staff is generally comfortable with the planting plan as proposed.

- **Lighting/Photometric Plan** – As you know, the two proposed new buildings will include building mounted residential scale lighting fixtures at doorway entrances, similar to any residential home. No pole mounted lights are proposed. The fixtures will be shielded to direct the light downward to reduce potential sky glow.

Catalog cut sheets for the proposed building mounted fixtures were provided as part of our September 26, 2017 Application package. These materials demonstrate that the fixtures will be shielded to only direct light downward to the intended area to be illuminated.

Based on our discussions with you and Mr. Read during our meeting, it is our understanding that a partial waiver on lighting/photometrics would be required in lieu of submittal of a formal Photometric Plan. It is our understanding that staff is comfortable with the materials provided and is supportive of this partial waiver request, given the residential scale of the proposed lighting program.

- **Stormwater Management** – As you know, when the project was last presented to the Planning Board, the Applicants had previously requested a waiver of the requirement to conduct a Stormwater Management Evaluation. That waiver request was not supported by the Town's Peer review engineer, Mr. Read.

Our September 26, 2017 application materials contained a Stormwater Management Evaluation for the project. Our Evaluation included HydroCAD modeling calculations of the pre- and post-development conditions. This submittal included the stormwater modeling results and a summary of the analysis, along with a discussion of the peak flow rates at each study point. In addition, our Stormwater Management Evaluation considered the site runoff in the context of the peak flow rates in the abutting receiving water body (i.e. the Piscataqua River).

As we discussed during our review of the stormwater modeling analysis with you and Mr. Read during our October 10, 2017 meeting, the modeling predicts increases in Post-development peak discharge rates at Study Points 2 and 3. A decrease in peak discharge is predicted at Study Point 1. The site runoff at Study Points 2 and 3 directly enters the river (without crossing any abutting properties) and represents collectively less than half a percent change in the river's flow in this area.

During our meeting with you and Mr. Read on October 10, 2017, we discussed the results of the Stormwater Management Evaluation conducted for the site. It is our understanding that Mr. Read is generally comfortable with the analysis and our approach, and would be supportive of the Applicant's request for a waiver, given the very small percentage of change this represents in the overall watershed of the abutting river.

- **Curbing at the Entrance on Route 100**

It is our understanding from discussions at our meeting with you and Mr. Read that a waiver will be necessary to construct the entrance off Route 100 without curbing. Since there is no curbing in this area of Route 100, the Applicants are respectfully requesting that the entrance to Higbee Lane be allowed to be constructed as shown on the enclosed Plans, with no curbing.

- **Sight Distance** – As was discussed during the meeting with you and Mr. Read, the project has been reviewed by the Maine Department of Transportation. In Mr. Bray's August 17, 2017 Traffic Evaluation for the site, he identified sight distances looking right (northerly) in excess of approximately 1,000'. Looking to the left (southerly) Mr. Bray identified the sight distance as approximately 495'.

As part of the MDOT's review of this entrance location, the MDOT staff visited the site and measured the sight distances in each direction on Route 100. Looking to the left (in the southerly direction) on Route 100, the MDOT measured the available sight distance as 501'. This is below the MDOT threshold for a mobility corridor, but as part of the recent approval of the Applicant's Driveway/Entrance permit, the MDOT granted a waiver which stated that "the Mobility Arterial sight distance standard has been reduced from 840 feet to 501 feet to the left (southerly direction)."

The Applicants are respectfully requesting that the Planning Board grant a similar waiver on the sight distance looking to the left (southerly direction). As noted above, the MDOT has already granted a similar waiver for this location.

### **Summary of Waiver Requests**

The following table summarizes the Applicant's waiver requests discussed above:

<b>Description</b>	<b>Status</b>
<b>Underdrains in Higbee Lane</b>	No longer needed
<b>Overhead Utilities</b>	Waiver to allow approximately 220' of overhead lines, as coordinated with CMP.
<b>Nitrate Study</b>	Waiver of Nitrate Study in light of information provided, including a letter from Mark Cenci, Certified Geologist.
<b>Landscape Plan</b>	Partial Waiver to allow the Planting Plan, as submitted, in lieu of Landscape Architect's plan.
<b>Lighting/Photometric Plan</b>	Partial Waiver request to allow lighting information as submitted in lieu of Photometric Plan.
<b>Stormwater Management</b>	Waiver to allow slight increase in peak discharge to the river. This increase is less than half a percent of the flow in the river.
<b>Curbing at Route 100 Entrance</b>	Waiver to allow construction of entrance with no curbing since no curbing exists on Route 100 in the area.
<b>Sight Distance</b>	Waiver to allow sight distance as approved by MDOT

### **Additional Items**

In addition to the waivers, there were a few additional items that were discussed with you and Mr. Read during our October 10, 2017 meeting.

- **Water Supply** – During our meeting, you asked that the Applicant provide additional information regarding the well data obtained for the existing wells in the area. This data was obtained from the Maine Geological Survey Well Database. The website address is:

<http://maine.gov/dacf/mgs/pubs/digital/well.htm>

The Applicant has gathered data for the wells in the area that are represented in the MGS Well Database. Copies of this information are included in the attachments to this letter.



- **Financial Capacity** – As we discussed during our meeting, the Financial Capacity letter submitted as part of the application materials addresses only the first phase of the construction. This includes the construction of Building 1 and its associated site improvements, including Higbee Lane and the shared gravel drive to access the building.

The Applicants are respectfully requesting that the project approvals include a condition that an updated Financial Capacity letter will need to be filed with the Town for staff review prior to issuance of building permits to move forward with the construction of Phase 2 (i.e. Building 2 and its associated site improvements).

- **Possible Future Dumpster** – As recommended, the note identifying the approximate location of the municipal trash pickup (which indicated that a pad and enclosure would be constructed in Phase 2) has been updated to also indicate that a dumpster may be installed within the enclosure as part of Phase 2.
- **Easements** – As requested, our office has added the metes and bounds information for the proposed easements to the enclosed Site and Subdivision Plan. In addition, draft descriptions have been prepared for these easements and are included as part of this submittal. Actual easements will be prepared by the Applicants' attorney using the mathematical information contained in the draft easements prepared by our office and shown on the enclosed plans.

### Closure

With the submittal of the information contained herein, we respectfully request your consideration of this follow-up to our October 10, 2017 meeting with you and Mr. Read.

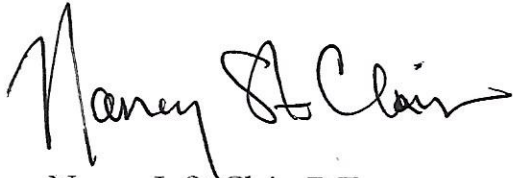
We look forward to the opportunity to continue our discussions on this matter with you both, as you complete your review of the enclosed materials.

With the submittal of the enclosed materials, we look forward to placement on the Planning Board's March 20th Planning Board agenda for Preliminary and Final Plan approval.

In the interim, if you have any questions or comments, or require any additional information, please contact me. We look forward to hearing from you.

Sincerely,

ST.CLAIR ASSOCIATES

A handwritten signature in black ink that reads "Nancy St. Clair". The signature is fluid and cursive, with a long horizontal stroke at the end.

Nancy J. St.Clair, P.E.,

Vice President

NJS/njs

Encl.

C: Denise Morgan, Megan Morgan and Nathan Pelsinski



## Nancy St.Clair

---

**From:** Megan Morgan <MM082005@aol.com>  
**Sent:** Wednesday, October 18, 2017 1:57 PM  
**To:** Nancy St. Clair  
**Subject:** Well Drilling Info

Good afternoon,  
Attached are pictures from the website.  
<http://maine.gov/dacf/mgs/pubs/digital/well.htm>  
Thanks Nate and Megan



Well Number	101076
Town	CUMBERLAND
Well Address	242 GRAY RD
Tax Map No	U21
Tax Map Lot No	2
Drill Date	November 8, 2001
Drill Date Estimated	
Driller	HANSEN'S WELL DRILLING, INC.
Well Use	DOMESTIC
Well Type	BEDROCK
Well Construction	
Well Development	
Casing Length (ft)	20.0
Overburden Thickness (ft)	2.0
Well Depth (ft)	300.0
Yield Modifier	
Yield (gpm)	7.00
Yield Date	November 8, 2001
Static Level (ft)	
Static Level Date	
Vein1 Depth (ft)	0.00
Vein1 Yield (gpm)	0.00

Find address or place	
Well Number	95001
Town	CUMBERLAND
Well Address	
Tax Map No	U21
Tax Map Lot No	17
Drill Date	August 13, 2000
Drill Date Estimated	
Driller	AFFORDABLE WELL DRILLING
Well Use	DOMESTIC
Well Type	BEDROCK
Well Construction	
Well Development	
Casing Length (ft)	20.0
Overburden Thickness (ft)	5.0
Well Depth (ft)	230.0
Yield Modifier	
Yield (gpm)	6.00
Yield Date	August 13, 2000
Static Level (ft)	
Static Level Date	
Vein1 Depth (ft)	0.00
Vein1 Yield (gpm)	0.00
Well Number	127407
Town	CUMBERLAND
Well Address	265 GRAY ROAD
Tax Map No	
Tax Map Lot No	
Drill Date	October 5, 2005
Drill Date Estimated	
Driller	AFFORDABLE WELL DRILLING
Well Use	DOMESTIC
Well Type	BEDROCK
Well Construction	
Well Development	
Casing Length (ft)	20.0
Overburden Thickness (ft)	13.0
Well Depth (ft)	130.0
Yield Modifier	
Yield (gpm)	20.00
Yield Date	October 5, 2005
Static Level (ft)	
Static Level Date	



Find address or place



## Well Depth (feet)

Well Number	4998
Town	CUMBERLAND
Well Address	RTE 100
Tax Map No	
Tax Map Lot No	
Drill Date	December 31, 1971
Drill Date Estimated	
Driller	
Well Use	DOMESTIC
Well Type	BEDROCK
Well Construction	DRILLED
Well Development	
Casing Length (ft)	
Overburden Thickness (ft)	6.0
Well Depth (ft)	130.0
Yield Modifier	
Yield (gpm)	20.00
Yield Date	
Static Level (ft)	27.00
Static Level Date	

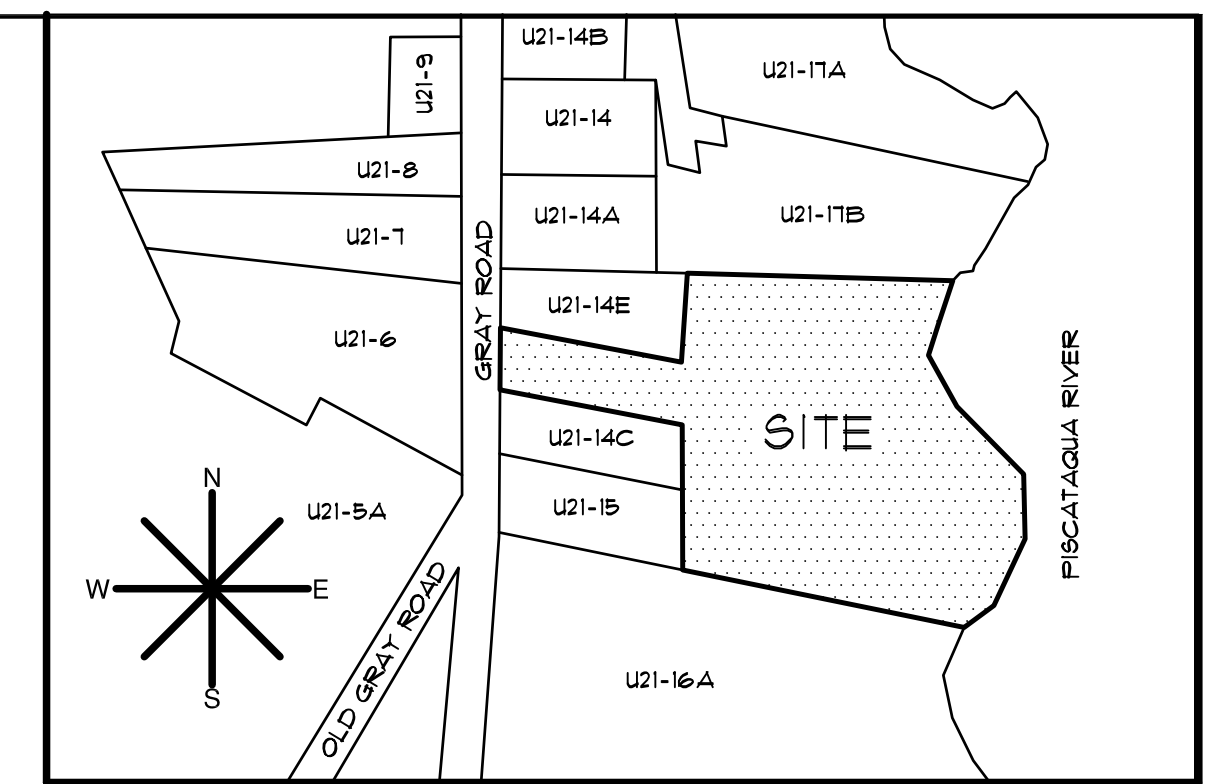


Find address or place

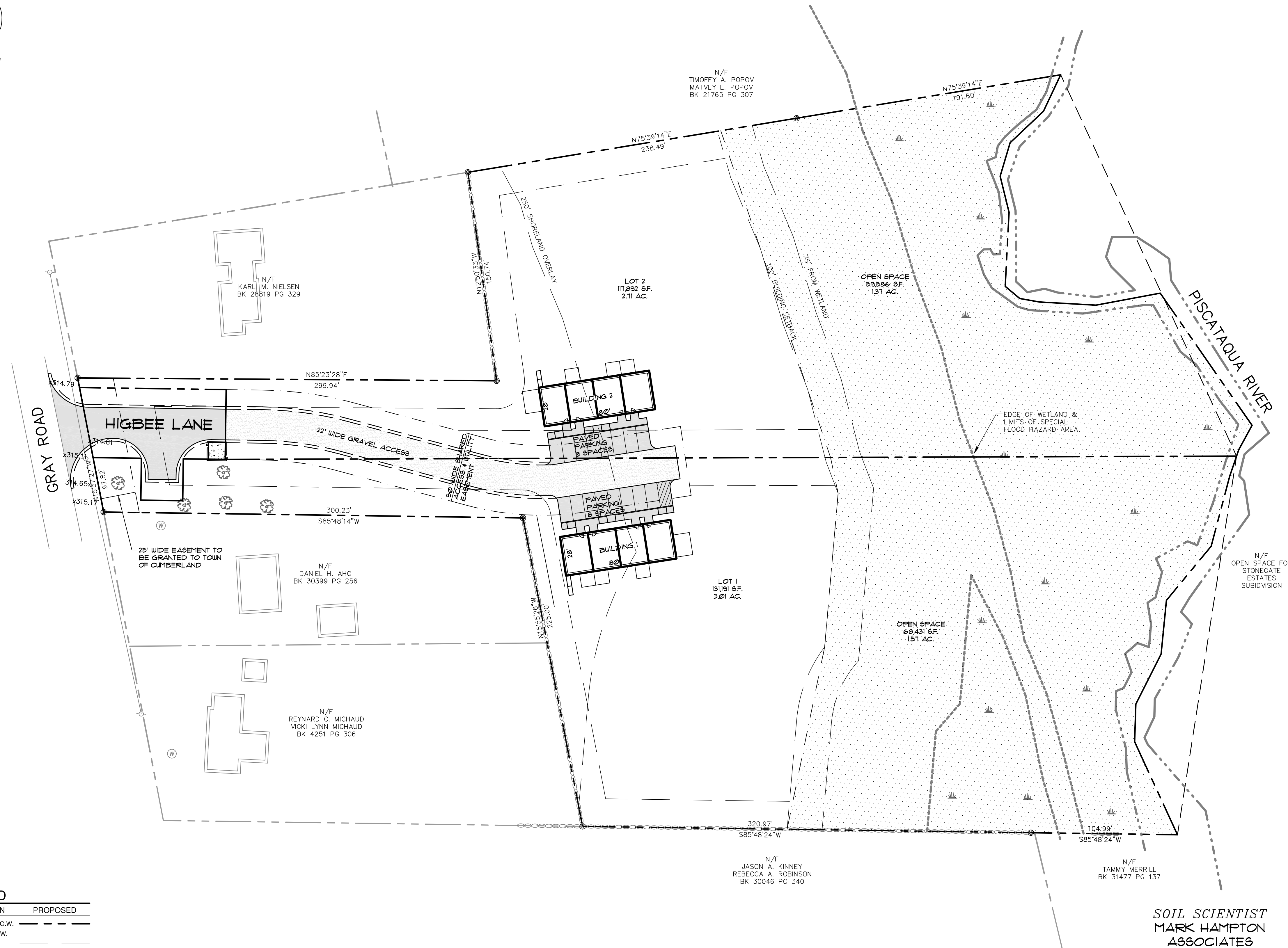
Well Number	75485
Town	CUMBERLAND
Well Address	217 GRAY RAOD
Tax Map No	U-20
Tax Map Lot No	68
Drill Date	November 6, 1996
Drill Date Estimated	
Driller	HANSEN'S WELL DRILLING, INC.
Well Use	DOMESTIC
Well Type	BEDROCK
Well Construction	
Well Development	
Casing Length (ft)	40.0
Overburden Thickness (ft)	35.0
Well Depth (ft)	260.0
Yield Modifier	
Yield (gpm)	5.00
Yield Date	November 6, 1996
Static Level (ft)	
Static Level Date	
Vein1 Depth (ft)	0.00

# SUBDIVISION PLAN

## HIGBEE NOTCH SUBDIVISION



LOCATION MAP N.T.S.



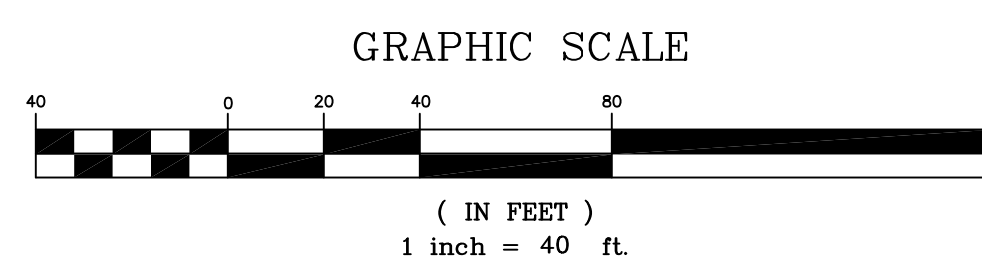
**APPLICANT:**  
**DENISE MORGAN**  
**MEGAN MORGAN**  
**NATHAN PELSINSKI**  
**2 FOREST LANE**  
**CUMBERLAND, ME 04021**

**CIVIL ENGINEER**  
**LAND SURVEYOR:**  
**ST. CLAIR ASSOCIATES**  
**34 FOREST LANE**  
**CUMBERLAND, ME 04021**

### SHEET INDEX:

SHEET	DESCRIPTION
1	COVER SHEET
2	BOUNDARY SURVEY
3	SUBDIVISION PLAN
4	SITE & LANDSCAPE PLAN
5	PLAN & PROFILE
6-7	DETAIL SHEETS
8	PRE-DEVELOPMENT WATERSHED MAP
9	POST-DEVELOPMENT WATERSHED MAP

EXISTING	DESCRIPTION	PROPOSED
---	BOUNDARY LINE/R.O.W.	---
---	ABUTTER LINE/R.O.W.	---
---	SETBACK	---
---	EASEMENT	---
---	MONUMENT	---
---	IRON PIPE/ROD	---
TP-1	TEST PIT	---
---	BUILDING	---
---	WETLANDS	---
---	EDGE WETLAND	---
---	OVERHEAD	---
---	ELEC. & TEL.	---
---	UTILITY POLE	---



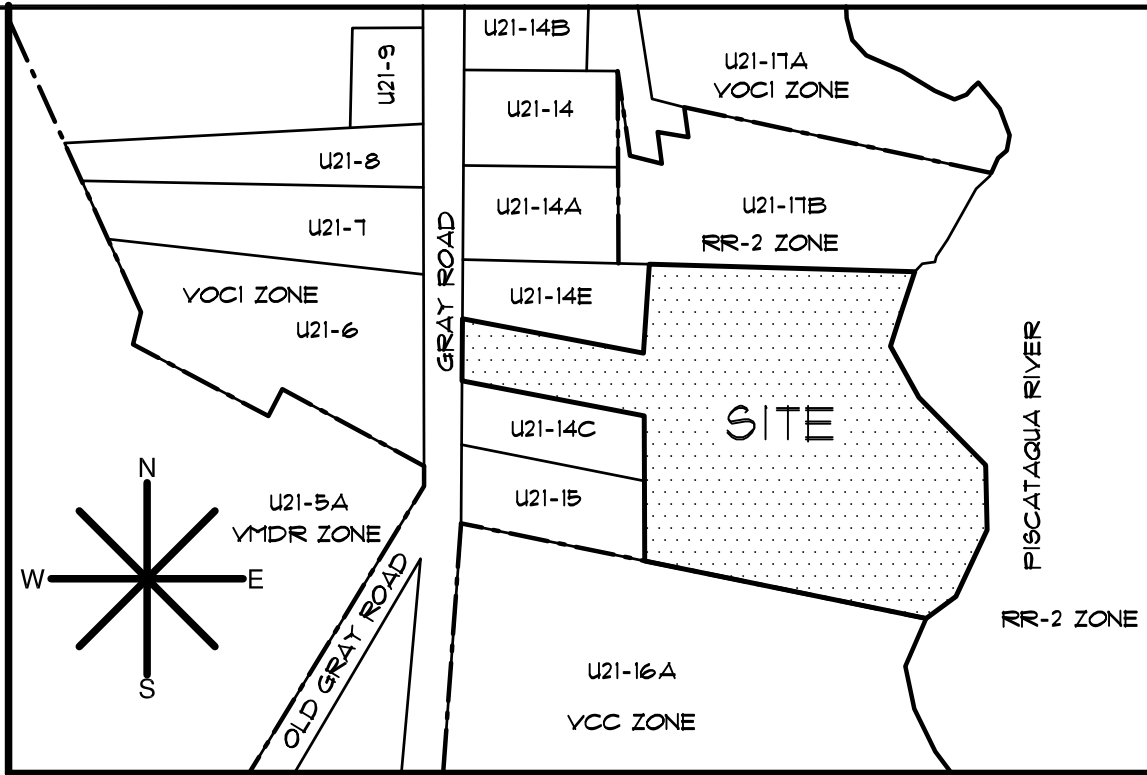
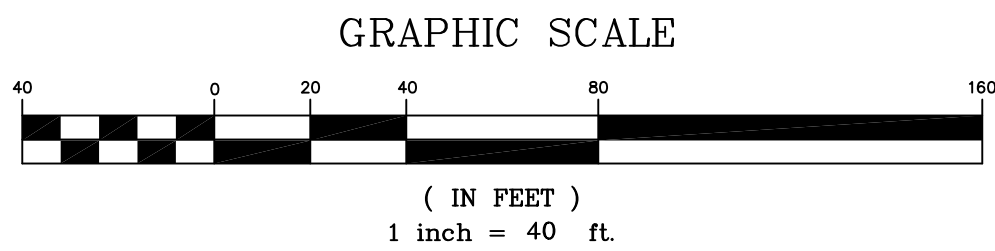
**SOIL SCIENTIST**  
**MARK HAMPTON**  
**ASSOCIATES**  
**P.O. BOX 1931**  
**PORTLAND, ME 04104**

**TRAFFIC:**  
**WILLIAM J. BRAY**  
**235 BANCROFT ST.**  
**PORTLAND, ME 04102**





EXISTING	DESCRIPTION	PROPOSED
---	BOUNDARY LINE/R.O.W.	---
---	ABUTTER LINE/R.O.W.	---
---	SETBACK	---
---	EASEMENT	---
---	CENTERLINE	---
---	IRON PIPE/ROD	---
---	SOILS BOUNDARY	---
TP-1	TEST PIT	TP-1
---	BUILDING	---
---	WETLANDS	---
---	EDGE WETLAND	---
---	SIGN	---
---	ROCK OUTCROP	---
---	EDGE PAVEMENT	---
---	PAVEMENT PAINT	---
---	EDGE OF GRAVEL	---
---	EDGE WATER	---
---	TREELINE	---
---	CONTOURS	---
---	SPOT GRADE	---
---	OVERHEAD ELEC. & TEL.	---
---	UTILITY POLE	---
---	STONE WALL	---
---	SOILS BOUNDARY	---

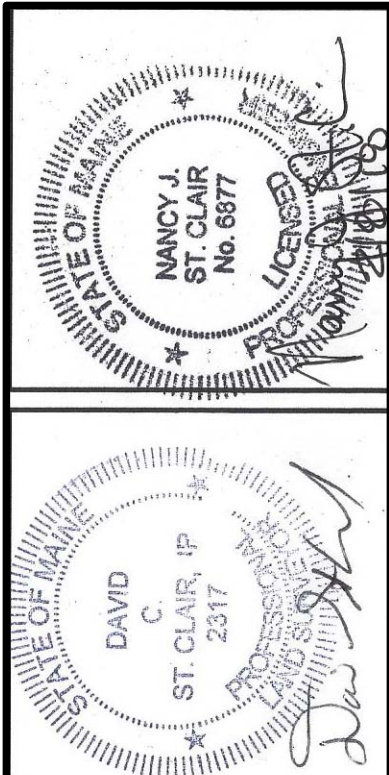


### GENERAL NOTES

- THE RECORD OWNER OF THE PROPERTY IS DENISE E. MORGAN AS DESCRIBED IN A DEED RECORDED AT THE CUMBERLAND COUNTY REGISTRY OF DEEDS IN BOOK 33961 PAGE 238.
- THE PROPERTY IS LOCATED ON THE TOWN OF CUMBERLAND TAX MAP U21 BEING DEPICTED AS LOT 18.
- THE BEARINGS AND NORTH ORIENTATION SHOWN HEREON ARE BASED UPON GRID NORTH, NORTH AMERICAN DATUM OF 1983 MAINE WEST ZONE.
- THE CONTOURS AND ELEVATIONS SHOWN HEREON ARE BASED IN PART ON A FIELD SURVEY COMPLETED BY ST. CLAIR ASSOCIATES DURING MAY OF 2017 AND ON 2-FT LIDAR TOPOGRAPHY AVAILABLE ON THE STATE OF MAINE GIS DATABASE. THE CONTOURS ARE BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).
- PLAN REFERENCES:
  - STANDARD BOUNDARY SURVEY ON ROUTE 100 IN CUMBERLAND, MAINE FOR DENISE ALLEN DATED APRIL, 2000 BY WAYNE T. WOOD & CO.
  - THE WETLANDS SHOWN HEREON WERE DELINEATED BY MARK HAMPTON ASSOCIATES DURING APRIL OF 2017.
  - A PORTION OF THE PROPERTY SHOWN HEREON DOES FALL WITHIN A SPECIAL FLOOD HAZARD AREA AS SHOWN ON THE TOWN OF CUMBERLAND FIRM FLOOD HAZARD MAP 230162 0010 D DATED MAY 19, 1981. THE LOCATION OF THE SPECIAL FLOOD AREA APPEARS TO BE LOCATED WITHIN THE WETLAND AREA SHOWN HEREON.
  - THIS PLAN IS BASED UPON A SURVEY TO TIE INTO THE BOUNDARY SURVEY REFERENCED IN NOTE 4A ABOVE. THE FIELD SURVEY COMPLETED BY ST. CLAIR ASSOCIATES WAS PERFORMED IN ACCORDANCE WITH THE STATE OF MAINE BOARD OF LICENSURE FOR PROFESSIONAL LAND SURVEYORS STANDARDS OF PRACTICE WITH THE EXCEPTION THAT NO REPORT OF SURVEY HAS BEEN PREPARED AND NO NEW LEGAL DESCRIPTION HAS BEEN PREPARED.
  - THE NEAREST FIRE HYDRANT IS LOCATED APPROXIMATELY 840 FEET SOUTHERLY OF THE PROPERTY ON THE WESTERLY SIDE OF GRAY ROAD (STATE ROUTE 100).
  - THE EXISTING TEST PIT LOCATION SHOWN HEREON WERE OBSERVED BY MARK HAMPTON ASSOCIATES AND IDENTIFY AREAS SUITABLE FOR SUBSURFACE WASTE WATER DISPOSAL SYSTEMS.
  - THE EXISTING SOILS MAPPING SHOWN HEREON IS BASED UPON THE USDA NRCS WEB BASED SOILS MAPPING DATABASE FOR THIS AREA.
  - THE LOCATION OF THE EXISTING BUILDINGS ON ADJUTING PROPERTY SHOWN HEREON ARE BASED UPON AERIAL IMAGERY AND VISUAL OBSERVATIONS. THE LOCATION OF THESE BUILDINGS WERE NOT SURVEY LOCATED BY THE SIGNING PROFESSIONAL.

### SOILS LEGEND

1) DRAINAGE CLASS		
EXCESSIVELY WELL DRAINED	EWD	
WELL DRAINED	WD	
MODERATELY WELL DRAINED	MOD	
SOMEWHAT POORLY DRAINED	SPD	
POORLY DRAINED	PD	
VERY POORLY DRAINED	VPD	
2) SLOPE DESIGNATION		
0-3%	A	
3-8%	B	
8-15%	C	
15-25%	D	
>25%	E	
3) SOIL NAME		
NAME	SYMBOL	HYDROLOGIC SOIL GROUP (HSG)
PAXTON FINE SANDY LOAM	PbB	C
PAXTON FINE SANDY LOAM	PbC	C
PAXTON VERY STONY FINE SANDY LOAM	PtB	C
HOLLIS FINE SANDY LOAM	HbC	D
SEBAGO MUCKY PEAT	Sp	D



REV.	BY:	DATE:	STATUS:
1	DCS	2-08-18	SUBMITTED FOR REVIEW
2	DCS	9-26-17	SUBMITTED FOR REVIEW
3	DCS	8-21-17	SUBMITTED FOR REVIEW

ST. CLAIR ASSOCIATES			
LAND SURVEYING AND CIVIL ENGINEERING			
34 Forest Lane Cumberland, ME 04021 Tel (207) 899-5558			
PROJECT NO.	FIELD BOOK	DESIGN	DRAWN
17014			DCS

BOUNDARY & TOPOGRAPHIC SURVEY	
OF:	HIGBEE NOTCH APARTMENTS
31 GRAY ROAD	CUMBERLAND MAINE
FOR RECORD OWNER:	DENISE MORGAN
2 FOREST LANE	CUMBERLAND, ME 04021

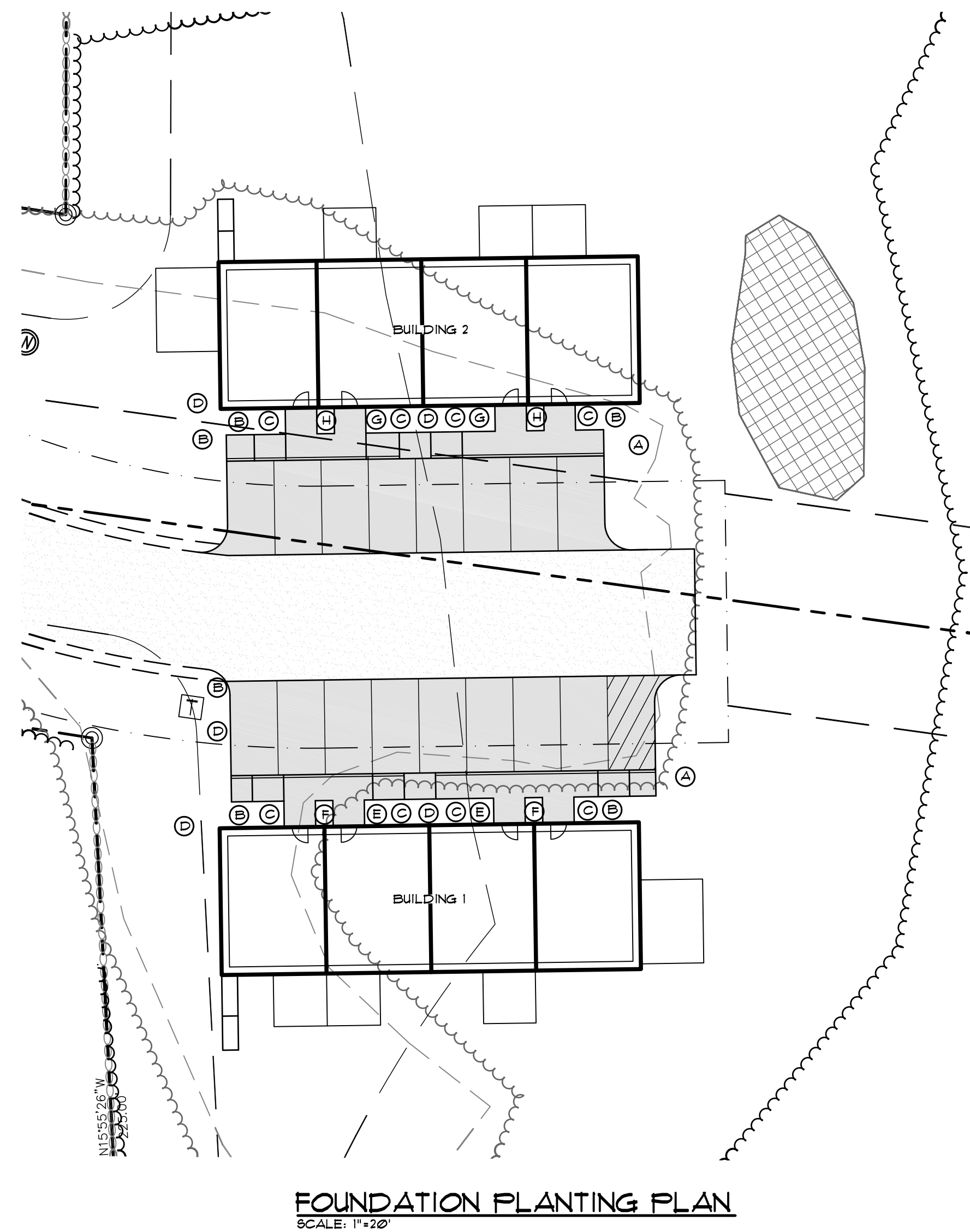
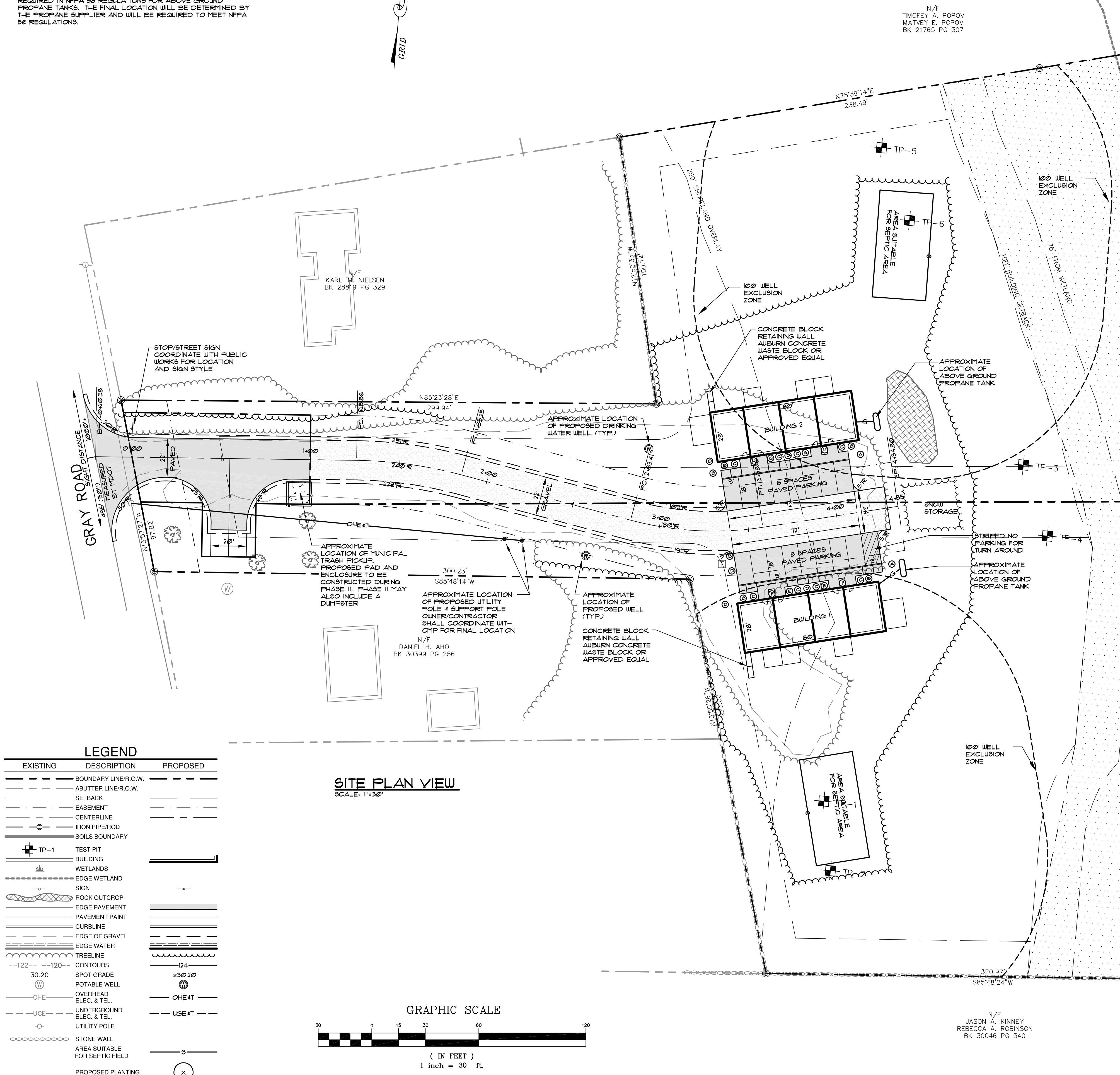
DATE	SCALE
4-02-17	1"=40'







- 1) A CONSTRUCTION ENTRANCE IS REQUIRED AT THE INTERSECTION OF HIGBEE LANE AND GRAY ROAD.
- 2) TURF REINFORCEMENT MAT (IF REQUIRED) SHALL BE ROLLMAX V-MAX SC2520 TURF REINFORCEMENT OR APPROVED EQUAL (TYP.)
- 3) THE UNDERGROUND ELECTRICAL, TELEPHONE & CABLE TV UTILITY SHOWN HEREON IS SCHEMATIC AND HAS NOT BEEN REVIEWED OR APPROVED BY CENTRAL MAINE POWER COMPANY.
- 4) THE APPROXIMATE LOCATION OF ABOVE GROUND PROPANE TANKS HAVE BEEN SHOWN TO MEET THE MINIMUM SETBACK REQUIRED IN NFPA 58 REGULATIONS FOR ABOVE GROUND PROPANE TANKS. THE FINAL LOCATION WILL BE DETERMINED BY THE PROPANE SUPPLIER AND WILL BE REQUIRED TO MEET NFPA 58 REGULATIONS.



PLANTING SCHEDULE				
KEY	BOTANICAL NAME	COMMON NAME	PROP SIZE	
A	RHO.DOPENDRON "OLGA MEZITT"	OLGA MEZITT RHO.DOPENDRON	15	CONTAINER
C	EUNYTTUS ALATA "RUDY"	RUDY HAAG EUNYTTUS	18"-24" E/B	
D	EUNYTTUS F. "EMERALD GAITY"	EMERALD GAITY EUNYTTUS	2	CONTAINER
F	RHO.DOPENDRON "PJH"	PJH RHO.DOPENDRON	18"-24"	
C	ASTILBE SIMPLICIFOLIA "KEY WEST"	KEY WEST ASTILBE	2	CONTAINER
F	HOSTA CAPTAIN KIRK PLANTAIN LILY	CAPTAIN KIRK HOSTA	2 GAL. CONTAINER	
C	HETEROCALLIS "WISCONSIN"	WISCONSIN HETEROCALLIS	2	CONTAINER
F	HETEROCALLIS "SPARKLING ORANGE"	SPARKLING ORANGE HETEROCALLIS	2	CONTAINER

**ST. CLAIR ASSOCIATES**

LAND SURVEYING AND CIVIL ENGINEERING  
34 Forest Lane  
Cumberland, ME 04021  
Tel (207) 829-5558

PROJECT NO.	FIELD BOOK	DESIGN	CHKD	DRAWN
17014			DCS	DCS

**SITE & LANDSCAPE PLAN**  
OF:  
**HIGBEE NOTCH APARTMENTS**

251 GRAY ROAD  
CUMBERLAND, MAINE  
FOR RECORD OWNER:

**DENISE MORGAN**  
2 FOREST LANE

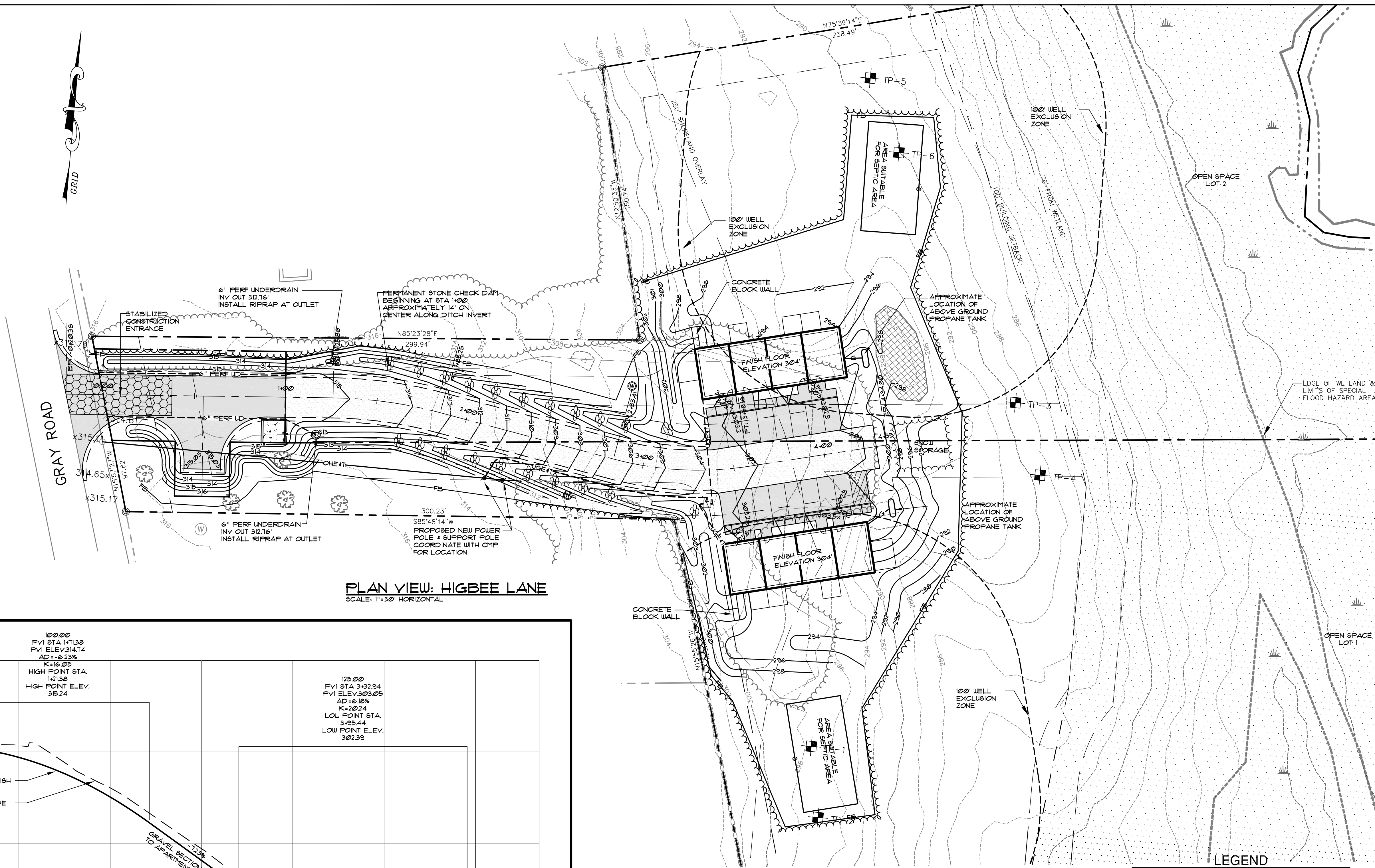
CLIMBERI AND ME 04021

DATE	SCALE
4-02-17	AS-NOTED

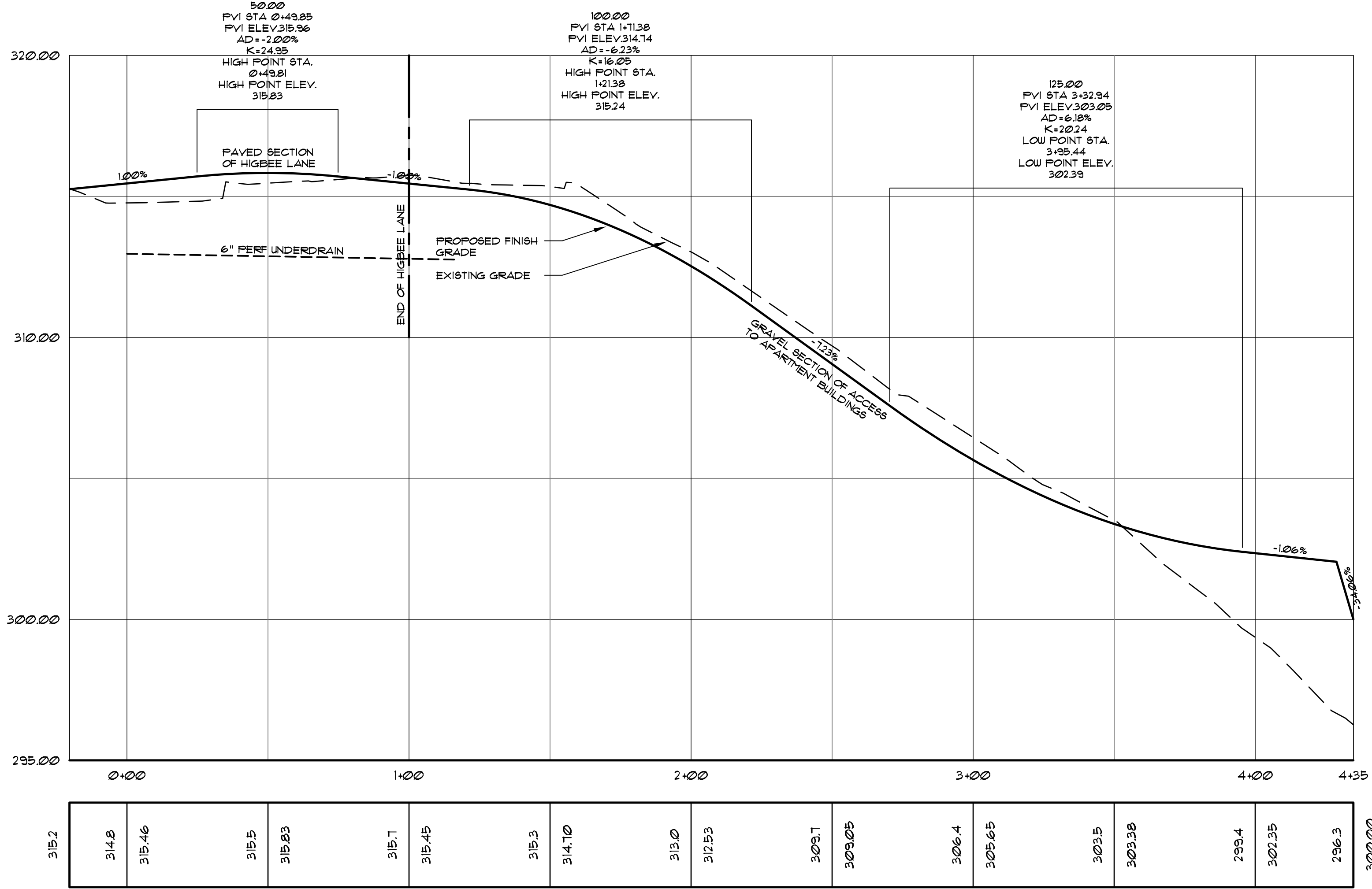


GENERAL NOTES

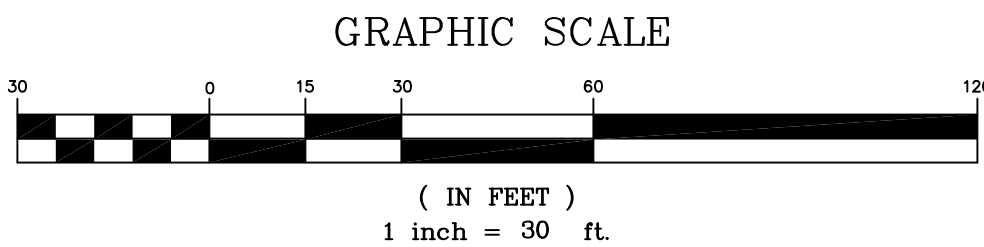
- 1) A CONSTRUCTION ENTRANCE IS REQUIRED AT THE INTERSECTION OF HIGBEE LANE AND GRAY ROAD.
- 2) TURF REINFORCEMENT MAT (IF REQUIRED) SHALL BE ROLLMAX V-MAX 50250 TURF REINFORCEMENT OR APPROVED EQUAL (TYP.)
- 3) THE UNDERGROUND ELECTRICAL, TELEPHONE & CABLE TV UTILITY SHOWN HEREON IS SCHEMATIC AND HAS NOT BEEN REVIEWED OR APPROVED BY CENTRAL MAINE POWER COMPANY.
- 4) THE APPROXIMATE LOCATION OF ABOVE GROUND PROPANE TANKS HAVE BEEN SHOWN TO MEET THE MINIMUM SETBACK REQUIRED IN NFPA 58 REGULATIONS FOR ABOVE GROUND PROPANE TANKS. THE FINAL LOCATION WILL BE DETERMINED BY THE PROPANE SUPPLIER AND WILL BE REQUIRED TO MEET NFPA 58 REGULATIONS.



PLAN VIEW: HIGBEE LANE  
SCALE: 1"=30' HORIZONTAL



PROFILE VIEW: HIGBEE LANE  
SCALE: 1"=30' HORIZONTAL  
1"=3' VERTICAL



EXISTING	DESCRIPTION	PROPOSED
---	BOUNDARY LINE/R.O.W.	---
---	ABUTTER LINE/R.O.W.	---
---	SETBACK	---
---	EASEMENT	---
---	CENTERLINE	---
---	IRON PIPE/ROD	---
---	SOILS BOUNDARY	---
TP-1	TEST PIT	TP-1
BUILDING	BUILDING	BUILDING
WETLANDS	WETLANDS	WETLANDS
EDGE WETLAND SIGN	EDGE WETLAND SIGN	EDGE WETLAND SIGN
ROCK OUTCROP	ROCK OUTCROP	ROCK OUTCROP
EDGE PAVEMENT	EDGE PAVEMENT	EDGE PAVEMENT
PAVEMENT PAINT	PAVEMENT PAINT	PAVEMENT PAINT
CURBLINE	CURBLINE	CURBLINE
EDGE OF GRAVEL	EDGE OF GRAVEL	EDGE OF GRAVEL
EDGE WATER	EDGE WATER	EDGE WATER
TREELINE	TREELINE	TREELINE
CONTOURS	CONTOURS	CONTOURS
SPOT GRADE	SPOT GRADE	SPOT GRADE
POTABLE WELL	POTABLE WELL	POTABLE WELL
OVERHEAD ELEC. & TEL	OVERHEAD ELEC. & TEL	OVERHEAD ELEC. & TEL
UNDERGROUND ELEC. & TEL	UNDERGROUND ELEC. & TEL	UNDERGROUND ELEC. & TEL
TRANSFORMER PAD	TRANSFORMER PAD	TRANSFORMER PAD
UTILITY POLE	UTILITY POLE	UTILITY POLE
EG. BLANKET	EG. BLANKET	EG. BLANKET
SILT FENCE	SILT FENCE	SILT FENCE
RIPRAP	RIPRAP	RIPRAP
CHECK DAM	CHECK DAM	CHECK DAM
INLET PROTECTION	INLET PROTECTION	INLET PROTECTION
STONE WALL	STONE WALL	STONE WALL
AREA SUITABLE FOR SEPTIC FIELD	AREA SUITABLE FOR SEPTIC FIELD	AREA SUITABLE FOR SEPTIC FIELD

ST. CLAIR ASSOCIATES

LAND SURVEYING AND CIVIL ENGINEERING  
34 Forest Lane  
Cumberland, ME 04021  
Tel (207) 899-5558

PROJECT NO.	17014
FIELD BOOK	
DESIGN	DCS
CHECK	DCS
DRAWN	DCS

PLAN & PROFILE & SITE LAYOUT PLAN

OF:  
HIGBEE NOTCH APARTMENTS

34 GRAY ROAD  
CUMBERLAND, MAINE  
FOR RECORD OWNER:  
DENISE MORGAN

2 FOREST LANE  
CUMBERLAND, ME 04021

DATE	SCALE
4-02-17	AS-NOTED



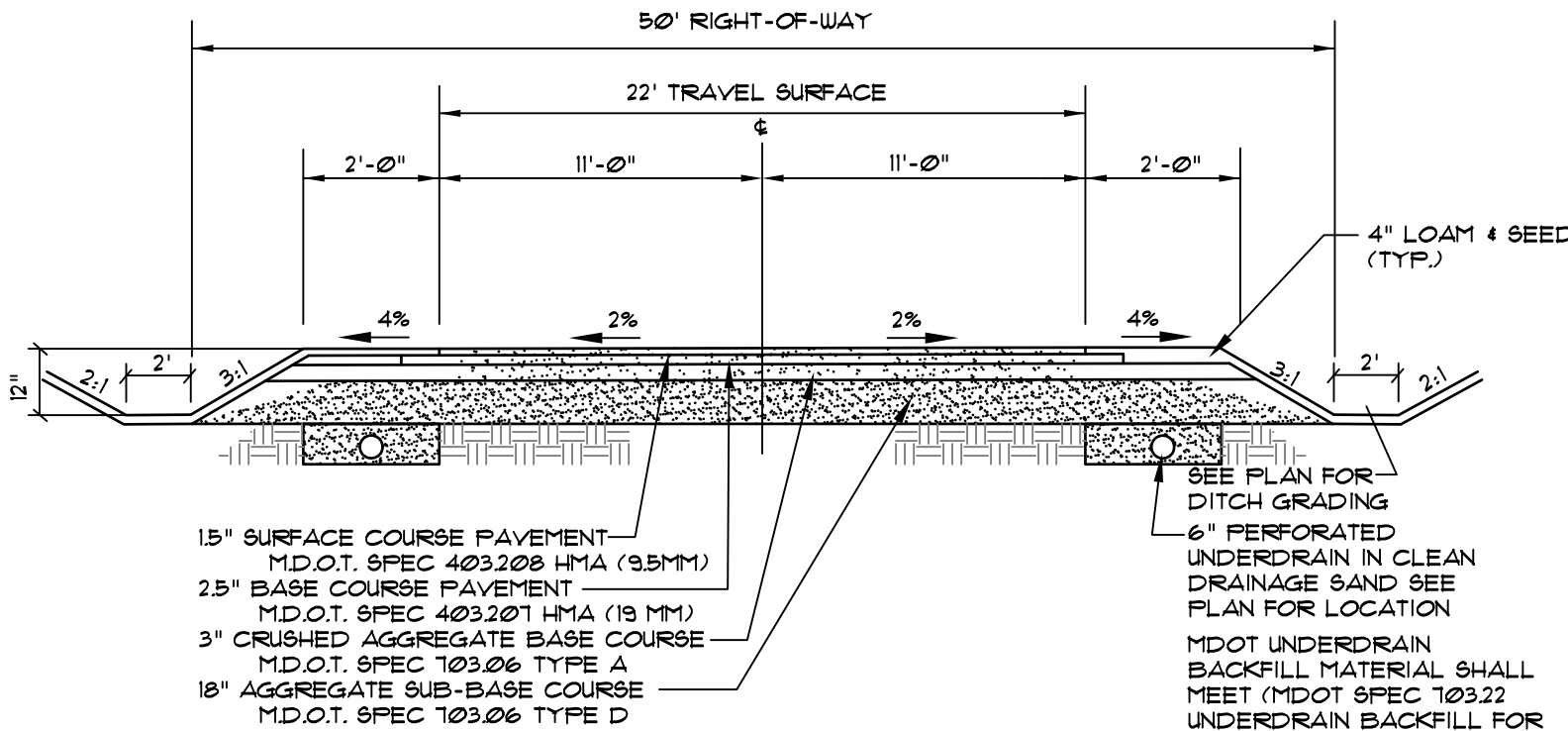




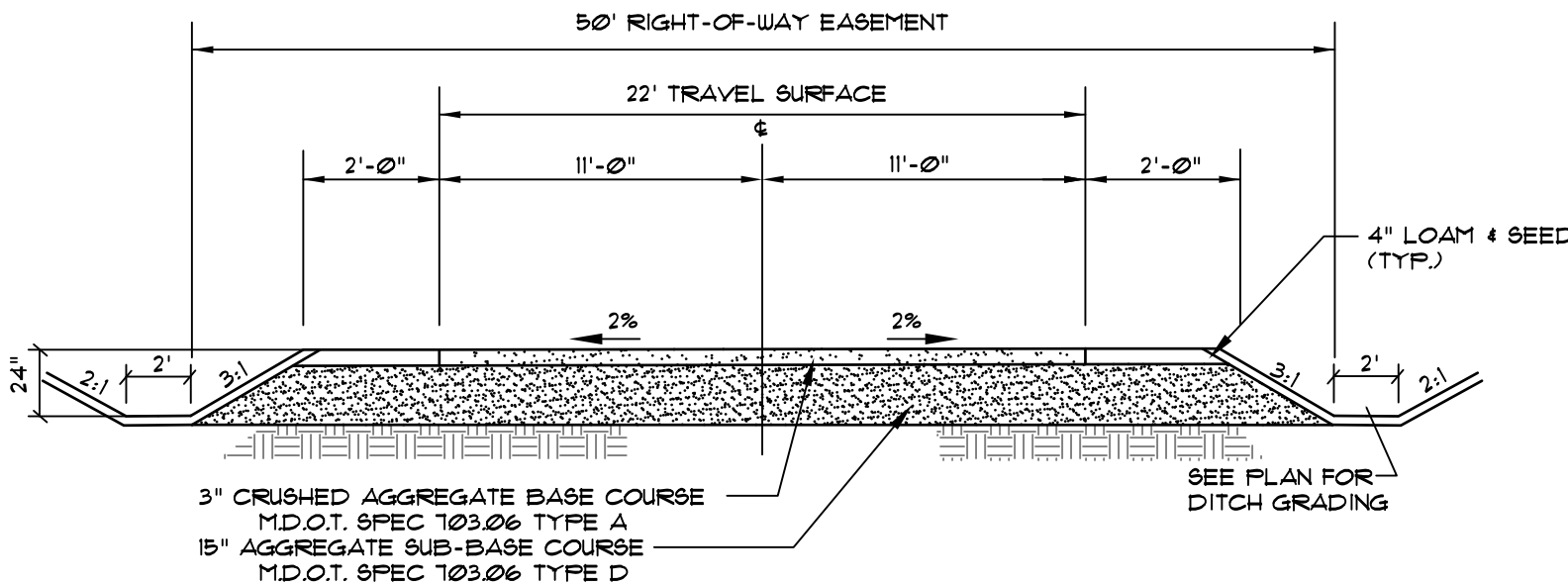
CONSTRUCTION NOTES

1. SITE CONTRACTOR SHALL OBTAIN ALL REQUIRED PERMITS PRIOR TO CONSTRUCTION.
2. ALL WORK SHALL CONFORM TO THE APPLICABLE CODES AND ORDINANCES. ALL WORK PERFORMED BY THE GENERAL CONTRACTOR AND/OR TRADE SUBCONTRACTOR SHALL CONFORM TO THE REQUIREMENTS OF LOCAL, STATE OR FEDERAL LAWS, AS WELL AS ANY OTHER GOVERNING REQUIREMENTS, WHETHER OR NOT SPECIFIED ON THE DRAWINGS.
3. CONTRACTOR SHALL VISIT THE SITE AND FAMILIARIZE HIM OR HERSELF WITH ALL CONDITIONS AFFECTING THE PROPOSED WORK AND SHALL MAKE PROVISIONS AS TO THE COST THEREOF. CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING HIM OR HERSELF WITH ALL CONTRACT DOCUMENTS, FIELD CONDITIONS AND DIMENSIONS AND CONFIRMING THAT THE WORK MAY BE ACCOMPLISHED AS SHOWN PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO THE COMMENCEMENT OF WORK.
4. CONTRACTOR SHALL NOTIFY ENGINEER OF ALL PRODUCTS OR ITEMS NOTED AS "EXISTING" WHICH ARE NOT FOUND IN THE FIELD.
5. THE CONTRACTOR IS HEREBY CAUTIONED THAT ALL SITE FEATURES SHOWN HEREON ARE BASED ON FIELD OBSERVATIONS BY THE SURVEYORS OF VISIBLE STRUCTURES SUCH AS HYDRANTS, VALVES, MANHOLES, ETC. AND BY INFORMATION PROVIDED BY UTILITY COMPANIES AND OTHER DATABASES. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR SHALL CONTACT DIG SAFE (1-888-DIGSAFE) AT LEAST THREE (3) BUT NOT MORE THAN THIRTY (30) DAYS PRIOR TO COMMENCEMENT OF EXCAVATION OR DEMOLITION TO VERIFY HORIZONTAL AND VERTICAL LOCATION OF ALL UTILITIES.
6. CONTRACTOR SHALL BE CAUTIONED THAT DIG SAFE ONLY NOTIFIES ITS "MEMBER" UTILITIES ABOUT THE DIG. OTHER UTILITIES MAY BE PRESENT IN THE WORK AREA. WHEN NOTIFIED, DIG SAFE WILL ADVISE CONTRACTOR OF MEMBER UTILITIES IN THE AREA. CONTRACTOR IS RESPONSIBLE FOR IDENTIFYING AND CONTACTING NON-MEMBER UTILITIES DIRECTLY. NON-MEMBER UTILITIES MAY INCLUDE LOCAL WATER AND SEWER DISTRICTS AND SMALL LOCAL UTILITIES.
7. CONTRACTORS SHALL BE RESPONSIBLE FOR COMPLIANCE WITH THE REQUIREMENTS OF 23 MRS.A 336-B-A (PROTECTION OF UNDERGROUND FACILITIES). IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE WITH THE APPROPRIATE UTILITIES TO OBTAIN AUTHORIZATION PRIOR TO RELOCATION OF ANY EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THESE PLANS. IF A UTILITY CONFLICT ARISES, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE OWNER, THE MUNICIPALITY AND APPROPRIATE UTILITY COMPANY PRIOR TO PROCEEDING WITH ANY RELOCATION.
8. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH "MAINE EROSION AND SEDIMENTATION CONTROL HANDBOOK FOR CONSTRUCTION: BEST MANAGEMENT PRACTICES" PUBLISHED BY THE CUMBERLAND COUNTY SOIL AND WATER CONSERVATION DISTRICT AND MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION, MARCH 2003 OR LATEST EDITION. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO POSSESS A COPY OF THE EROSION CONTROL PLAN AT ALL TIMES.
9. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS IN THE FIELD PRIOR TO FABRICATION AND INSTALLATION OF ANY MATERIAL. ANY UNUSUAL CONDITIONS SHALL BE REPORTED TO THE ATTENTION OF THE ENGINEER.
10. INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND OWNER'S REQUIREMENTS UNLESS SPECIFICALLY OTHERWISE INDICATED OR WHERE LOCAL CODES OR REGULATIONS TAKE PRECEDENCE.
11. CONTRACTOR SHALL INCORPORATE PROVISIONS AS NECESSARY DURING CONSTRUCTION TO PROTECT EXISTING STRUCTURES, PHYSICAL FEATURES, AND MAINTAIN SITE STABILITY. CONTRACTOR SHALL RESTORE ALL AREAS TO ORIGINAL CONDITION AND AS SHOWN ON THE PLANS.
12. CONTRACTOR SHALL CLEAN AND REMOVE DEBRIS AND SEDIMENT DEPOSITED ON PUBLIC STREETS, SIDEWALKS, ADJACENT AREAS, OR OTHER PUBLIC WAYS DUE TO CONSTRUCTION.

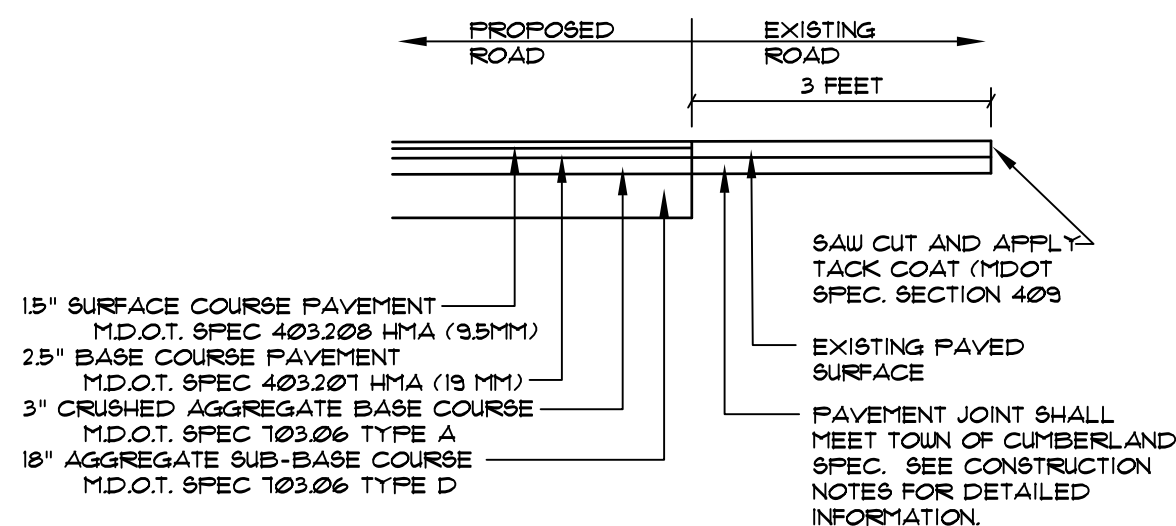
12. CONTRACTOR SHALL CLEAN AND REMOVE DEBRIS AND SEDIMENT DEPOSITED ON PUBLIC STREETS, SIDEWALKS, ADJACENT AREAS, OR OTHER PUBLIC WAYS DUE TO CONSTRUCTION.
13. ALL PAVEMENT MARKINGS AND DIRECTIONAL SIGNAGE SHOWN ON THE PLAN SHALL CONFORM TO THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) STANDARDS.
14. ALL PAVEMENT JOINTS SHALL BE SAWCUT PRIOR TO PAVING TO PROVIDE A DURABLE AND UNIFORM JOINT.
15. NO HOLES, TRENCHES OR STRUCTURES SHALL BE LEFT OPEN OVERNIGHT IN ANY EXCAVATION ACCESSIBLE TO THE PUBLIC OR IN PUBLIC RIGHTS-OF-WAY.
16. ALL WORK WITHIN THE PUBLIC RIGHT-OF-WAY SHALL REQUIRE A M.D.O.T. PERMIT AS WELL AS PERMITS FROM THE MUNICIPALITY AS APPLICABLE.
17. THE PROPOSED LIMITS OF CLEARING SHOWN HEREON ARE APPROXIMATE BASED UPON THE PROPOSED LIMITS OF SITE GRADING OR OTHER SITE WORK. NO GRUBBING OR STUMP REMOVAL SHALL OCCUR OUTSIDE OF THE CLEARING LIMITS, UNLESS OTHERWISE DIRECTED BY THE ENGINEER IN ORDER TO ADDRESS EROSION AND SEDIMENT CONTROL OR STORMWATER MANAGEMENT.
18. IMMEDIATELY UPON COMPLETION OF CUTS/FILLS, THE CONTRACTOR SHALL STABILIZE DISTURBED AREAS IN ACCORDANCE WITH EROSION CONTROL NOTES AND AS SPECIFIED ON PLANS. ALL ERODED AREAS SHALL BE REPAIRED BY THE CONTRACTOR AND THE SURFACE SHALL BE STABILIZED USING THE MEASURES OUTLINED IN THE EROSION AND SEDIMENT CONTROL PLAN AND NARRATIVES INCLUDED AS PART OF THIS CONSTRUCTION SET.
19. THE CONTRACTOR SHALL BE FULLY AND SOLELY RESPONSIBLE FOR THE REMOVAL, REPLACEMENT AND RECTIFICATION OF ALL DAMAGED AND DEFECTIVE MATERIAL AND WORKMANSHIP IN CONNECTION WITH THE CONTRACT WORK. THE CONTRACTOR SHALL REPLACE OR REPAIR AS DIRECTED BY THE OWNER ALL SUCH DAMAGED OR DEFECTIVE MATERIALS WHICH APPEAR WITHIN A PERIOD OF ONE YEAR FROM THE DATE OF SUBSTANTIAL COMPLETION.
20. WHERE THE TERM "APPROVED EQUAL", "OTHER APPROVED", "EQUAL TO", "ACCEPTABLE" OR OTHER GENERAL QUALIFYING TERMS ARE USED IN THESE NOTES, IT SHALL BE UNDERSTOOD THAT REFERENCE IS MADE TO THE RULING AND JUDGEMENT OF ST.CLAIR ASSOCIATES IN CONJUNCTION WITH THE OWNER.
21. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY PROTECTION FOR THE WORK UNTIL TURNED OVER TO THE OWNER.
22. THE CONTRACTOR SHALL MAINTAIN A CURRENT AND COMPLETE SET OF CONSTRUCTION DRAWINGS ON SITE DURING ALL PHASES OF CONSTRUCTION FOR USE OF ALL TRADES.
23. THE CONTRACTOR SHALL TAKE FULL RESPONSIBILITY FOR ANY CHANGES AND DEVIATION OF APPROVED PLANS NOT AUTHORIZED BY THE ENGINEER AND/OR CLIENT/OWNER.
24. DETAILS ARE INTENDED TO SHOW END RESULT OF DESIGN. ANY MODIFICATION TO SUIT FIELD DIMENSION AND CONDITION SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL PRIOR TO ANY WORK.
25. BEFORE THE FINAL ACCEPTANCE OF THE PROJECT, THE CONTRACTOR SHALL REMOVE ALL EQUIPMENT AND MATERIALS, REPAIR OR REPLACE PRIVATE OR PUBLIC PROPERTY WHICH MAY HAVE BEEN DAMAGED OR DESTROYED DURING CONSTRUCTION, CLEAN THE AREAS WITHIN AND ADJACENT TO THE PROJECT WHICH HAVE BEEN OBSTRUCTED BY HIS/HER OPERATIONS, AND LEAVE THE PROJECT AREA NEAT AND PRESENTABLE.
26. DRAIN MANHOLE, CATCHBASIN AND SEWER MANHOLE DIAMETER SIZING SHOWN HEREON REPRESENT CITY/TOWN/SANITARY DEPARTMENT REQUIRED MINIMUM SIZING AND MAY NOT REFLECT ACTUAL FABRICATED SIZE. THE CONTRACTOR IS RESPONSIBLE TO COORDINATE WITH THE REFERRED DRAIN MANHOLE, CATCHBASIN AND SEWER MANHOLE FABRICATOR TO CONFIRM STRUCTURE DIAMETER SIZING PRIOR TO FRICING AND ORDERING STRUCTURES.



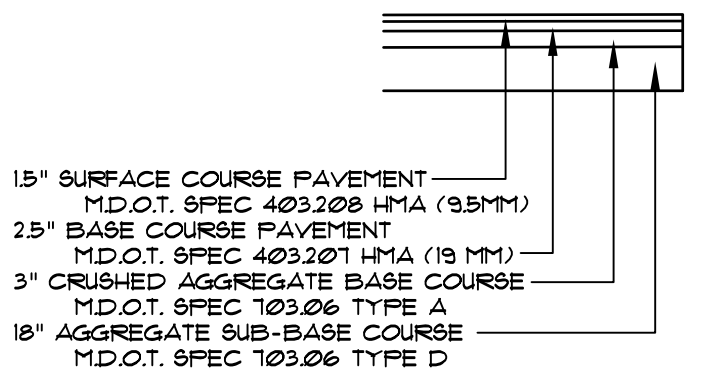
TYPICAL ROAD SECTION  
NOT TO SCALE



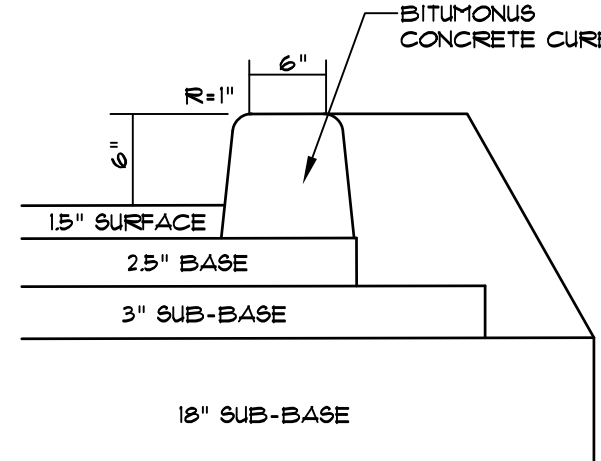
TYPICAL ACCESS DRIVE SECTION  
NOT TO SCALE



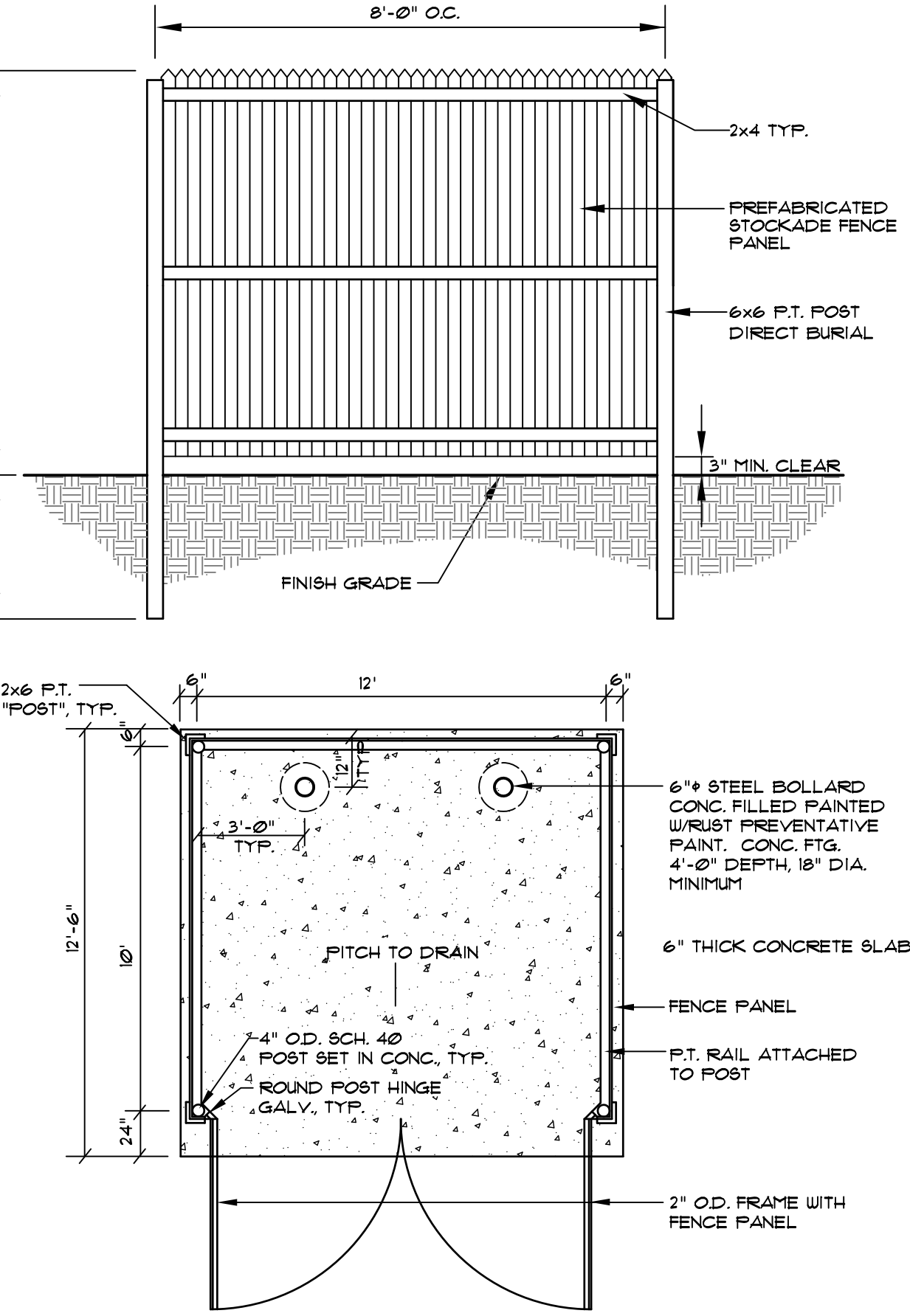
TYPICAL PAVEMENT JOINT  
NOT TO SCALE



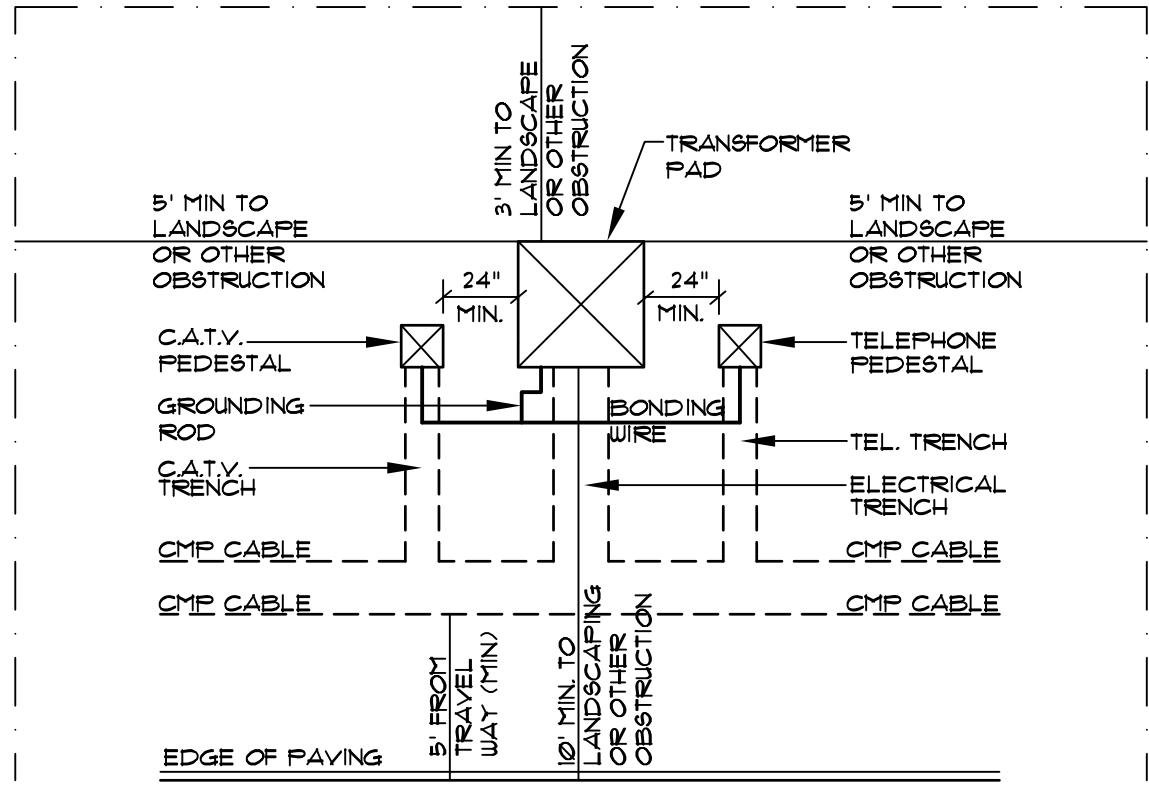
TYPICAL PARKING SECTION  
NOT TO SCALE



CURB DETAIL  
NOT TO SCALE



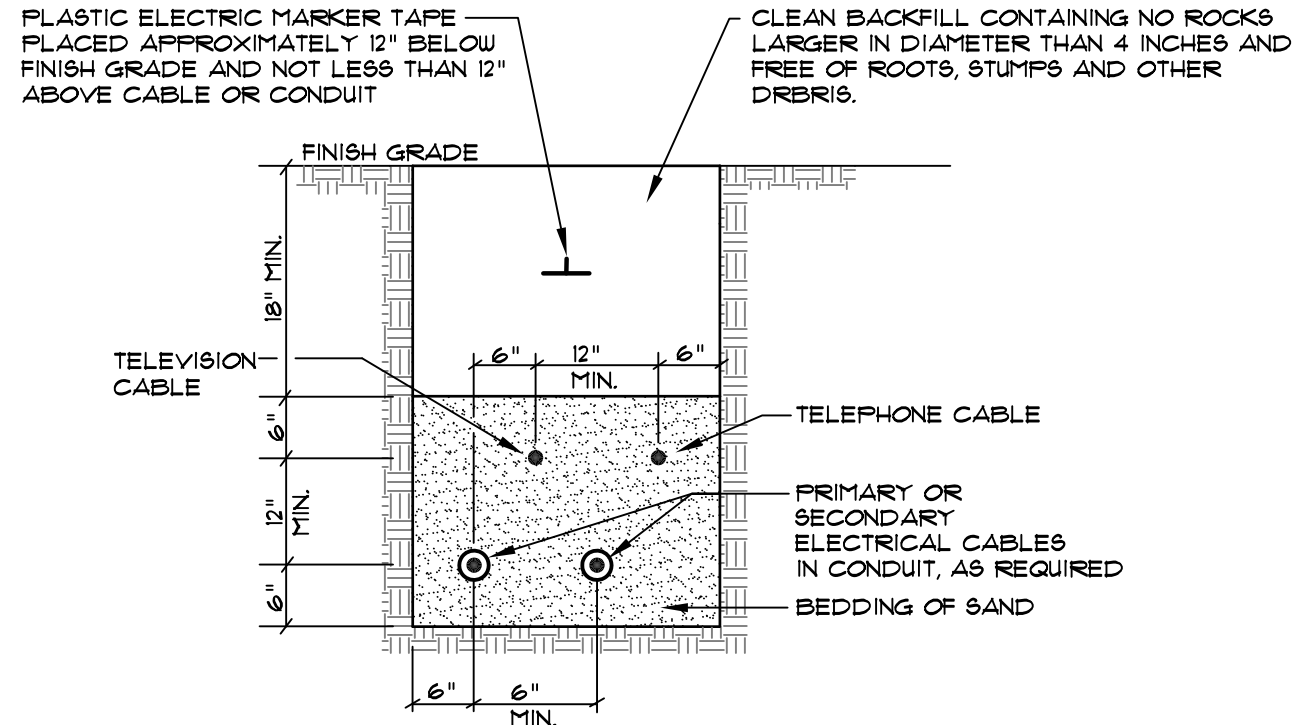
TYPICAL CONCRETE PAD & ENCLOSURE  
NOT TO SCALE



NOTE:  
TRANSFORMER PAD AND COVER TO BE FIBERGLASS OR AS DIRECTED BY C/PF CO. DESIGN ENGINEERS AND MEETING C/PF CO. SPECIFICATIONS.

AT EACH TRANSFORMER LOCATION, A LEVEL 10 FOOT BY 10 FOOT (MINIMUM) AREA WILL BE PROVIDED. THE ELEVATION OF THIS AREA SHALL BE LEVEL AND AT OR ABOVE THE TOP OF ANY NEARBY DITCH SLOPE. THE TRANSFORMER FOUNDATION SHALL BE INSTALLED SO THE TOP OF THE FOUNDATION IS 6 INCHES ABOVE THIS ELEVATION. THE TRANSFORMER FOUNDATION SHALL BE INSTALLED NO MORE THAN 20 FEET FROM A ROAD SURFACE.

PADMOUNT TRANSFORMER  
& CABLE LAYOUT DETAIL  
NOT TO SCALE

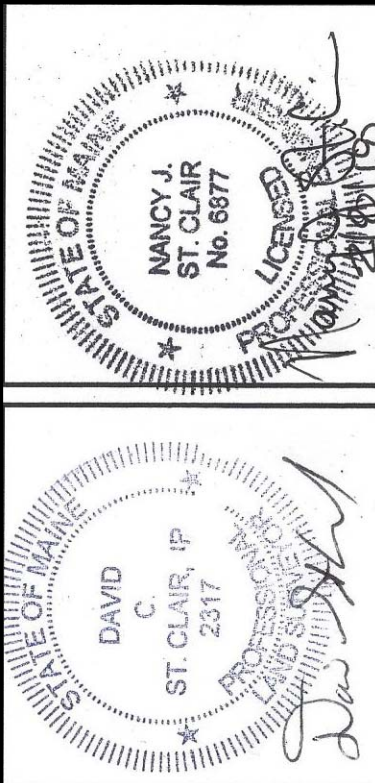


NOTES:  
1) INSTALLATION SHOULD NOT ALLOW THE INTER-TWING OF CABLES.  
2) BEDDING AND BACKFILL SHALL BE FREE OF ROOTS, STUMPS AND OTHER DEBRIS.  
3) COMMUNICATION CABLE AND POWER CABLE SHALL HAVE NO LESS THAN 12-INCHES OF RADIAL SEPARATION.  
4) ELECTRICAL CONDUIT SHALL BE SCHEDULE 40 PVC OR AS DIRECTED BY C/PF CO. DESIGN ENGINEERS.  
5) REFER TO THE C/PF CO. HANDBOOK OF REQUIREMENTS FOR ELECTRIC SERVICE AND INSTALLATIONS, LATEST EDITION FOR ADDITIONAL INFORMATION.

TYPICAL UNDERGROUND  
CABLE INSTALLATION  
NOT TO SCALE

NOTES

- DEWATERING**
- A DEWATERING PLAN IS NEEDED TO ADDRESS EXCAVATION DEWATERING FOLLOWING HEAVY RAINFALL EVENTS OR WHERE THE EXCAVATION MAY INTERCEPT THE GROUNDWATER TABLE DURING CONSTRUCTION. THE COLLECTED WATER NEEDS TREATMENT AND A DISCHARGE POINT THAT WILL NOT CAUSE DOWNGRADIENT EROSION AND OFFSITE SEDIMENTATION OR WITHIN A RESOURCE. PLEASE FOLLOW THE DETAILS OF SUCH A PLAN.
- BASIC STANDARDS - EROSION CONTROL MEASURES**
- MINIMUM EROSION CONTROL MEASURES WILL NEED TO BE IMPLEMENTED AND THE APPLICANT WILL BE RESPONSIBLE TO MAINTAIN ALL COMPONENTS OF THE EROSION CONTROL PLAN UNTIL THE SITE IS FULLY STABILIZED. HOWEVER, BASED ON SITE AND WEATHER CONDITIONS DURING CONSTRUCTION, ADDITIONAL EROSION CONTROL MEASURES MAY NEED TO BE IMPLEMENTED. ALL AREAS OF INSTABILITY AND EROSION MUST BE REPAIRED IMMEDIATELY DURING CONSTRUCTION AND NEED TO BE MAINTAINED UNTIL THE SITE IS FULLY STABILIZED OR VEGETATION IS ESTABLISHED. A CONSTRUCTION LOG MUST BE MAINTAINED FOR THE EROSION AND SEDIMENTATION CONTROL, INSPECTIONS AND MAINTENANCE.



NO.	REVISION	DATE	BY	STATUS
1	REVISED PER REVIEW COMMENT	2-08-18	DCS	FOR REVIEW
2	REVISED PER REVIEW COMMENT	9-26-17	DCS	FOR REVIEW
3	REVISED PER REVIEW COMMENT	8-22-17	DCS	FOR REVIEW

**ST.CLAIR ASSOCIATES**

LAND SURVEYING AND CIVIL ENGINEERING

34 Forest Lane  
Cumberland, ME 04021  
Tel (207) 829-5558

PROJECT NO. FIELD BOOK DESIGN CHKO DRAWN

17014 DCS DCS

**DETAIL SHEET**

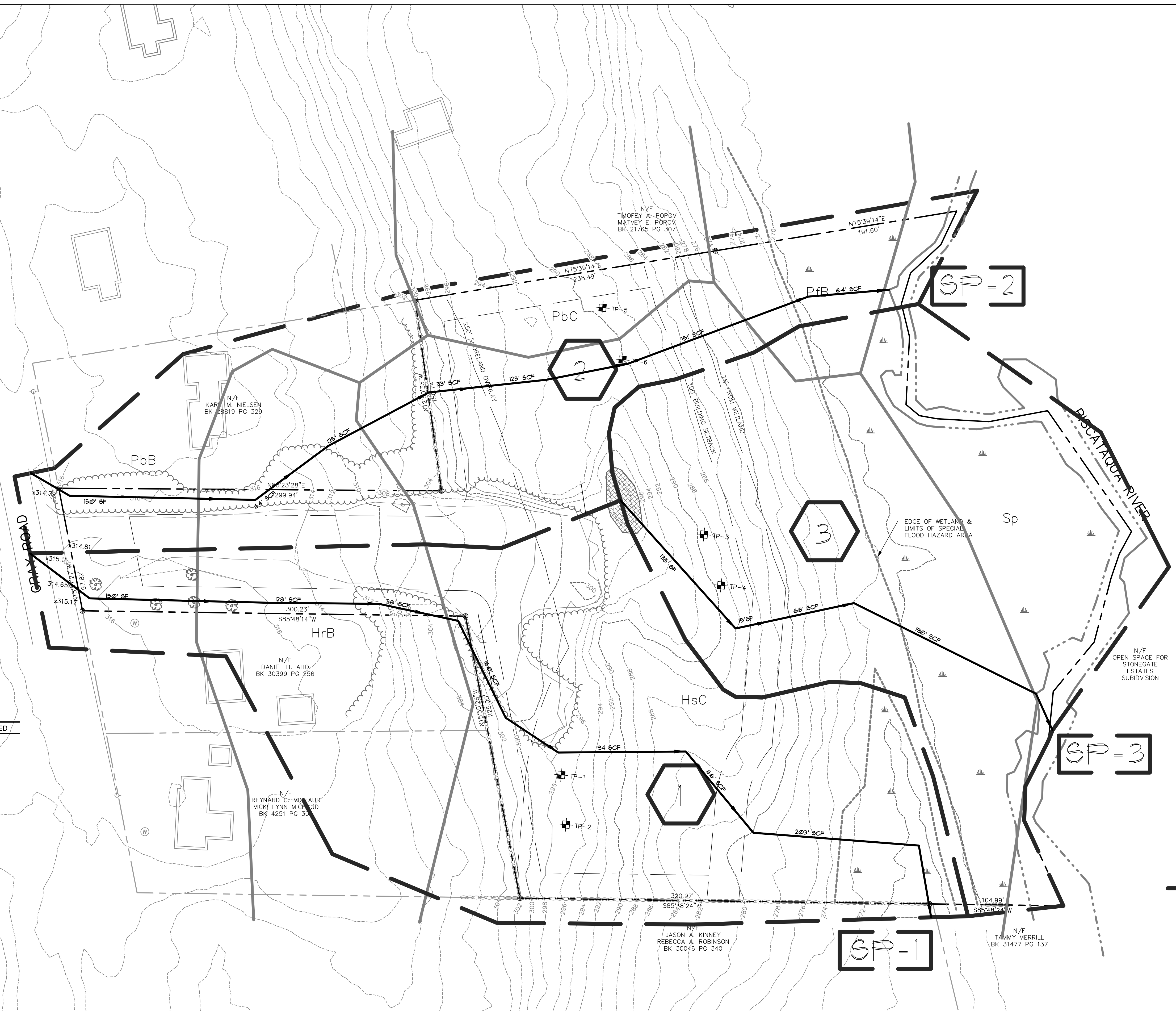
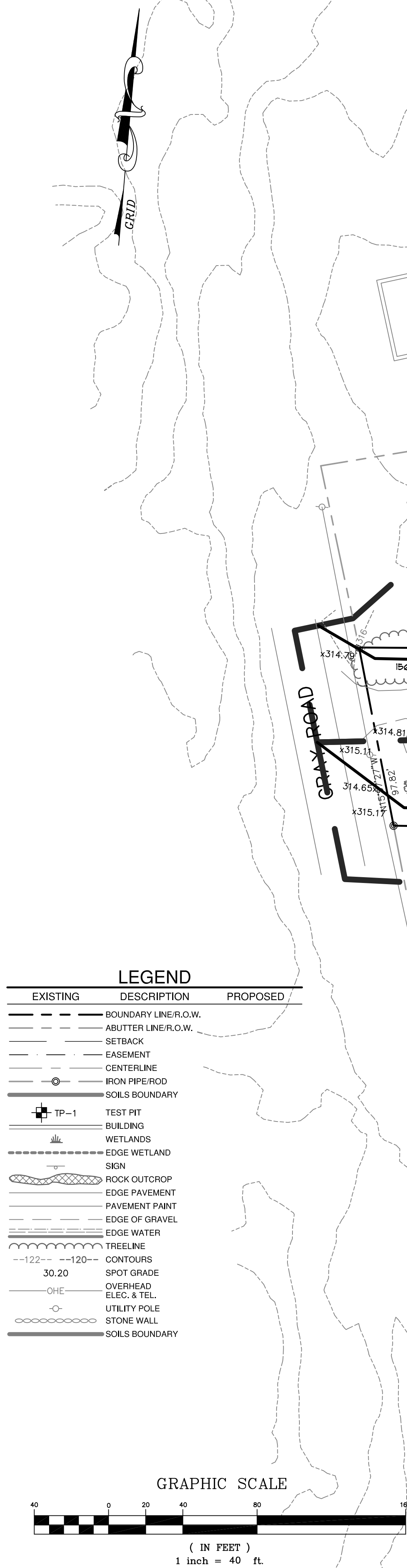
OF: **HIGBEE NOTCH APARTMENTS**

351 GRAY ROAD  
CUMBERLAND, MAINE  
FOR RECORD OWNER:  
**DENISE MORGAN**  
2 FOREST LANE  
CUMBERLAND, ME 04021

DATE	SCALE
4-02-17	NTS

**SHEET 7**





**SOILS LEGEND**

1) DRAINAGE CLASS

EXCESSIVELY WELL DRAINED	EWD
WELL DRAINED	WD
MODERATELY WELL DRAINED	TWD
SOMEWHAT POORLY DRAINED	SFD
POORLY DRAINED	FPD
VERY POORLY DRAINED	VPD

2) SLOPE DESIGNATION

0-3%	A
3-8%	B
8-15%	C
15-25%	D
>25%	E

3) SOIL NAME

NAME	SYMBOL	HYDROLOGIC SOIL GROUP (HSG)
FAXTON FINE SANDY LOAM	FpB	U
FAXTON FINE SANDY LOAM	FpC	U
FAXTON VERY STONY FINE SANDY LOAM	FpB	U
HOLLIS FINE SANDY LOAM	HsC	U
SEBAGO MUCKY PEAT	Sp	U

**LEGEND (WATERSHED MAP)**

EXISTING	DESCRIPTION	PROPOSED
---	TOPATH	---
---	WATERSHED	---
---	SUBCATCHMENT	---
---	STUDY POINT	---

**GENERAL NOTES**

1) MEDIUM INTENSITY SOILS INFORMATION SHOWN HEREON IS BASED UPON THE USDA NATURAL RESOURCES CONSERVATION SERVICES ONLINE DATABASE FOR CUMBERLAND COUNTY MAINE.

**ST. CLAIR ASSOCIATES**

LAND SURVEYING AND CIVIL ENGINEERING

34 Forest Lane  
Cumberland, ME 04021  
Tel (207) 899-5558

PROJECT NO. 17014 FIELD BOOK DESIGN CHKO DCS DRAWN DCS

**PRE-DEVELOPMENT WATERSHED MAP**

OF: HIGBEE NOTCH APARTMENTS

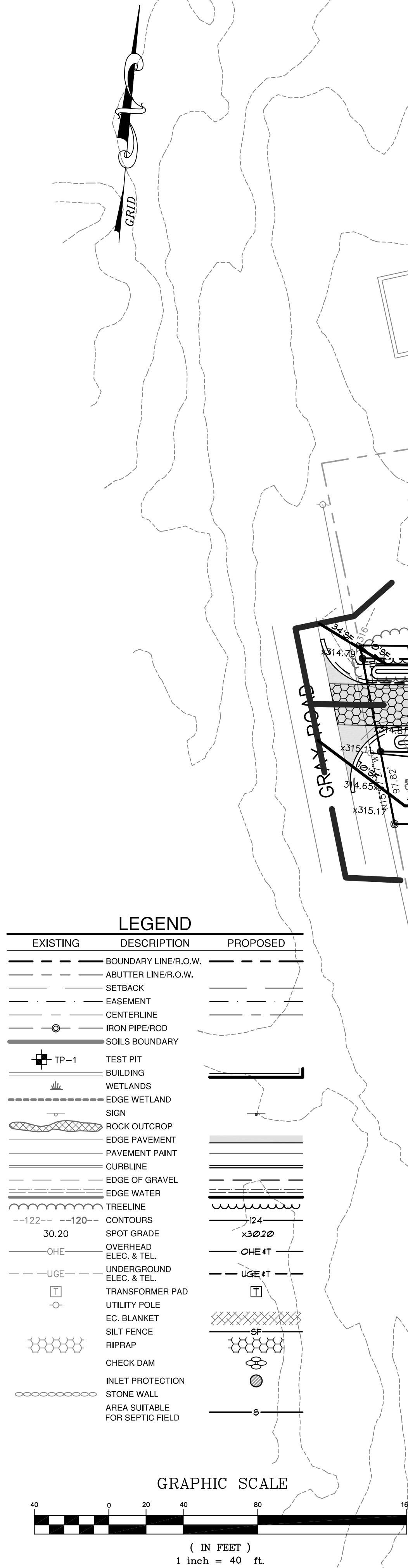
351 GRAY ROAD  
CUMBERLAND MAINE  
FOR RECORD OWNER:  
**DENISE MORGAN**  
2 FOREST LANE  
CUMBERLAND, ME 04021

DATE 4-02-17 SCALE 1"=40'

**SHEET 8**

1701-HSB TAB 17014PPE





**SOILS LEGEND**

1) DRAINAGE CLASS

EXCESSIVELY WELL DRAINED	FIELD
WELL DRAINED	FIELD
MODERATELY WELL DRAINED	FIELD
SOMEWHAT POORLY DRAINED	FIELD
POORLY DRAINED	FIELD
VERY POORLY DRAINED	FIELD

2) SLOPE DESIGNATION

0-3%	A
3-15%	B
15-25%	C
>25%	D

3) SOIL NAME

NAME	SYMBOL	HYDROLOGIC SOIL GROUP (HSG)
PAXTON FINE SANDY LOAM	PbB	U
PAXTON FINE SANDY LOAM	PbC	U
PAXTON VERY STONY FINE SANDY LOAM	PbB	U
HOLLIS FINE SANDY LOAM	HsC	U
SEBAGO MUCKY PEAT	Sp	U

**LEGEND (WATERSHED MAP)**

EXISTING	DESCRIPTION	PROPOSED
---	TOPATH	---
---	WATERSHED	---
---	SUBCATCHMENT	---
---	STUDY POINT	---

**GENERAL NOTES**

1) MEDIUM INTENSITY SOILS INFORMATION SHOWN HEREON IS BASED UPON THE USDA NATURAL RESOURCES CONSERVATION SERVICES ONLINE DATABASE FOR CUMBERLAND COUNTY MAINE.

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34 Forest Lane  
Cumberland, ME 04021  
Tel (207) 899-5558

PROJECT NO. 17014

DESIGN CHDK DCS

DRAWN DCS

**POST-DEVELOPMENT WATERSHED MAP**

OF:

HIGBEE NOTCH APARTMENTS

351 GRAY ROAD

CUMBERLAND MAINE

FOR RECORD OWNER:

DENISE MORGAN

2 FOREST LANE

CUMBERLAND, ME 04021

DATE 4-02-17

SCALE 1"=40'

SHEET 9

17014SB TAB 17014POST