



TOWN GRAY
PLANNING BOARD
AGENDA • APRIL 8, 2021

Planning Board
Regular Meeting

Online Via Microsoft Teams
Link Posted to graymaine.org Day of Meeting

7:00 PM

I. MEETING COMMENCES

Roll Call

II. MINUTES APPROVAL

Planning Board - Regular Meeting - March 11, 2021 7:00 PM

III. INFORMATION EXCHANGE

a. Comprehensive Plan Implementation Discussion

b. Update on Planning Board & Town Council Joint Workshop

IV. PUBLIC HEARINGS

a. Stillwater Pines Open Space Subdivision

A request by Birch Point Properties, LLC & A.H. Grover, Inc. for Preliminary Plan Review for Phase I of a proposed subdivision (Stillwater Pines) consisting of 13 open space subdivision lots on 68 +/- acres on an extension of Woodcock Drive off Yarmouth Road as shown on Tax Map 44, Lot 32-11. The subject parcel is in a Town Council adopted Contract Zoning Agreement, formerly in a Medium Density Zoning District.

b. Shaker Road Subdivision

A request by Ralph Vance Land Development, for an Amendment to a previously approved subdivision (8-9-1984) to create an additional lot and allow for the construction of two duplexes on a parcel currently owned by Adam M. Wilson near 164 Shaker Road, as shown on Tax Map 20, Lot 45-15 in a Rural, Residential & Agricultural Zoning District.

c. Proposed Updates to Chapter 402: Zoning Ordinance, Solar Array

An opportunity for Public and Planning Board input regarding amendments to the existing Commercial Solar Energy Systems Overlay District (402.8.10) in the Zoning Ordinance. Amendments include the following: adjusting definitions, new performance and review standards, and adding a 100-acre parcel accessed from Hillcrest Drive (Tax Map 36, lot 33-1) to the Overlay District.

V. ADJOURNMENT

** The Town of Gray is an equal opportunity employer and complies with all applicable equal access to public accommodations law. If you are planning to attend a Town Council or Town committee or board meeting and need assistance with a physical disability, please contact the Town Manager's office at least 48 hours in advance of the meeting to have the Town assist you. 657-3339. TTY 657-3931.*

Town of Gray Planning Board Minutes

March 11, 2021



Regular Meeting

Henry Pennell Municipal Complex

7:00 PM

24 Main Street, Gray, ME 04039

I. MEETING COMMENCED AT 7:00pm

This meeting was held online.

| Attendee Name | Title | Status | Arrived |
|-------------------|--------------|---------|---------|
| Don Hutchings | Chair | Present | |
| Dan Cobb | Vice Chair | Present | |
| Peter Gellerson | Board Member | Present | |
| Charlie Abrams | Board Member | Present | |
| Joseph Caminiti | Board Member | Absent | |
| Catherine Caswell | Alternate | Present | |
| Andrew Watson | Alternate | Absent | |
| Dan Maguire | Liaison | Present | |
| Kathy Tombarelli | Town Planner | Present | |

Motion to appoint Catherine Caswell as a voting member for this meeting.

| | |
|----------------|------------------------------------|
| RESULT: | APPROVED [UNANIMOUS] |
| MOVER: | Peter Gellerson, Board Member |
| AYES: | Hutchings, Cobb, Gellerson, Abrams |

II. MINUTES APPROVAL

1. Planning Board Minutes - Regular Meeting – February 11, 2021

Motion to approve the Planning Board Minutes of February 11, 2021

| | |
|------------------|---|
| RESULT: | APPROVED AS AMENDED [UNANIMOUS] |
| MOVER: | Peter Gellerson, Board Member |
| SECONDER: | Dan Cobb, Vice Chair |
| AYES: | Hutchings, Cobb, Gellerson, Abrams, Caswell |

Peter Gellerson requested edits to the density bonus topic on page 4 of the February 11, 2021 Planning Board minutes. Kathy Tombarelli confirmed the minutes should have stated “as being provided for all the lots” (not 12 of 14) and the second statement needs to be stricken from the record.

(from page 4 of February 11, 2021 Planning Board Minutes)

Density Bonuses

- **10% for Public Water – Staff is supportive of this density bonus since public water is not required for this site and it is being provided for all of the lots. 12 of the 14 lots.**

A plan note will be required on the face of the SD plan noting that lots 13 & 14 will be served by private wells and sprinklers are required meeting NFPA & Gray Fire Rescue Standards.

III. INFORMATION EXCHANGE

a. Comprehensive Plan Implementation Discussion

Dan Maguire stated he hasn't heard back from everyone yet regarding how the Comprehensive Plan will impact the work of the Planning Board. Kathy Tombarelli put examples into their packets of what other committees have submitted. She will send out a similar spreadsheet template to the board members so they can enter their ideas.

Chair Hutchings would like to have a workshop to discuss the ideas. Other board members were agreeable to having a workshop. Mr. Maguire hopes to receive their comments by early/mid April.

b. Joint Planning Board & Town Council Workshop Update

Kathy Tombarelli explained that Councilor Maguire and Town Council Chair Carder have spoken with GPCOG regarding a joint training session. She said Tony Plante and Kristen Egan of GPCOG will provide dates and the agenda for an upcoming training. Councilor Maguire said they may receive some items to read prior to the training.

In reference to the request of Chair Hutchings for a meeting between the Planning Board and the Town Council, the wish is still to meet in person as soon as feasible.

c. (added item regarding Verrill Farms)

Kathy Tombarelli added this item as new information was just received, after the agenda was posted. She shared with the Planning Board that Paul Hollis/Ambrosia LLC called and emailed to state they are formally withdrawing their subdivision application. The property has been sold to another party and will probably only have two homes built there.

V. PUBLIC HEARINGS

a. West Gray Road Child Care Expansion

A request by Chase Custom Homes & Finance, Inc. for an Amendment to a previously approved Site Plan for an expansion to the existing day care center, located at 322 West Gray Road as shown on Tax Map 56, lot 17-12 in the Rural Residential & Agricultural and Resource Protection (Shoreland) Zoning Districts.

Kathy Tombarelli explained that the applicant called and requested the application be tabled until the April Planning Board meeting. Conversations with the State Fire Marshall may or may not lead to changes to the Site Plan or structure.

| | |
|------------------|---|
| RESULT: | TABLED [UNANIMOUS] |
| MOVER: | Dan Cobb, Vice Chair |
| SECONDER: | Charlie Abrams, Board Member |
| AYES: | Hutchings, Cobb, Gellerson, Abrams, Caswell |

b. Stillwater Pines Contract Zone Agreement Proposal

A proposed Contract Zoning Agreement (CZA) between the Town of Gray and Birch Point Properties, LLC & A. H. Grover Inc, to include a phased residential subdivision, adjusted road standards, and a donation of a 12 +/- acre parcel to the Town to be used for public recreation as shown on Tax Map 44, lot 32-112 in a Medium Density Zoning District.

Kathy Tombarelli explained the CZA language was in the board packet and she referenced the following modifications/variations (referencing page 2&3 of the CZA) from the Subdivision Ordinance and the proposed benefits to the town. She also stated for the record that a component of this is to resolve the conversion of the tennis court issue stemming from the fact that property wasn't abandoned properly when it was paved over for parking and this land donation may resolve the issue.

Modifications/variations from Subdivision ordinance:

- 401.13.16.B.2- Exceed maximum number of homes/dwelling units on a dead-end street. The CZA allows for an additional 50 dwelling units beyond the existing DUs on Woodcock Road. Input/sign off from both PW and GFR was part of the CZA process. The applicant is bringing Public water to the development.
- 401.13.16.B.2.f.ii – Exceed maximum length of dead-end road (beyond 3,000 feet)
- Existing Woodcock Road be constructed per 4.a (page 3 of CZA). This standard is “higher” than what would have been required on an existing substandard road. Per 401.13.16.A.7 new subdivisions on existing substandard roads must be improved/upgraded to meet the Rural Public Easement Standard (18’ paved, 2’ gravel shoulder). The proposal for the Existing portion of Woodcock Road is for 18’ paved travel way, 2’ paved shoulders + 5’ paved sidewalk flush with paved shoulder – delineated with pavement striping.
- Woodcock Road extension to be constructed at a “lower” standard than what would have been required by reducing the travel way from 20’ to 18’ and reducing the paved shoulder from the required 4’ to 2’ paved. There will be a 4’ wide esplanade and 5’ wide paved sidewalk on one side of the new road segment.

The project will still be subject to Subdivision review by the Planning Board– see page 6 of CZA. Approval of the agreement is not a waiver from Subdivision review AND except as expressly modified herein.... the development of property shall be governed by all other applicable Town Standards.

Proposed Town Benefits:

- 12.9-acre parcel donated to the Town.
- Multi-purpose field constructed by developer w/ parking for 20 vehicles.
- Stream crossing to field to be constructed by the developer.
- Potential future connection to Portland Road and/or Yarmouth Road.
- Existing trails and any future trails in open space to remain accessible to the public.

In reference to questions from Planning Board members, Kathy Tombarelli clarified lot 14 is currently open space. She explained that a CZA is an agreement between the town and a developer in which there needs to be a benefit to the town. Applicants will still need to come to subdivision review by the Planning Board. She explained that the CZA is a lengthy nine step process, one step which is tonight's Planning Board public hearing.

Peter Gellerson asked how they plan 50 homes with 31 lots. Charlie Burnham, of Atlantic Resource Consultants, explained they are not saying they will do 50 units, just that the road standard is good up to that level.

Dan Maguire explained that the road which would have been required would have been massive and have impacted the residents of Woodcock. He also said the open space will be a great benefit for the town. The tennis court situation puts us in violation and the town cannot apply for similar grants until it is resolved.

Dan Cobb shared several comments after his review of the proposed agreement. He asked/suggested:

- a) Someone from the state should review to determine if this will resolve the tennis court issue.
- b) Move info to the recitals section so it is abundantly clear it is an important topic (make it a whereas statement).
- c) Who from the town was involved with decisions to modify the ordinances? Kathy Tombarelli explained both the Fire Chief and Alex Dodd were involved.
- d) Section 4 items D&E seem open ended so language should be tighter regarding number and road length so there aren't different expectations in the future.
- e) Section 5 should be clarified that it be "potentially" accepted.
- f) The access easement for perpetuity over the "entire" length of the road should be clarified.
- g) Concerns with size of field as it is not quite large enough for standard size of soccer field. Also had concerns with crowning of field, drainage, grading, and that 3 inches of loam might not be enough.
- h) In reference to motorized vehicles not being allowed, he stated they should clarify so motorized wheelchairs are not excluded.

Mr. Cobb also stated his concern with a relatively large public use facility at the end of private road. He knows the town needs open space and playing fields but is sensitive to the needs of those who bought homes on a private road, now with potentially heavy use of a public area at end of their private road. He recommended that the Planning Board should really think about this and take into consideration who is already there.

Dan Maguire explained the contract zone is between town and developers; not the state. The town attorney wanted to remove language that we are looking to clear the tennis court debt. The Town Council was clear they wanted language in there.

Peter Gellerson raised concerns of maintenance of the field with current lack of resources in the Parks & Rec. department. Mr. Maguire explained Dean Bennett has been involved regarding the field and specs of field size. There is not a commitment at this time to using it a playing field, it is currently open space. He said councilors also had questions whether the three inches of loam would be enough.

Mr. Gellerson also pointed out concerns of current residents during their site walk. He wanted to note there is resistance from some neighbors. Mr. Maguire acknowledged comments have been received; not all residents are happy about it, but the Town Council has done a good job making sure they are informed and have had opportunities to comment.

Mr. Gellerson also asked if there has been any investigation of the existing gravel road regarding quality and thickness. Charlie Burnham said they have not checked it yet.

Chair Hutchings explained the purpose for it on the agenda tonight is just for informational purposes and they will delve deeper when it comes back for approval. He opened the public hearing at 8:09pm. There were no public comments.

Kathy Tombarelli also explained that Doug Beck from the state has reviewed this and has indicated to the Town Manager Nate Rudy it will be acceptable language to start the process of conversion. She said it is the intent of the town to resolve the tennis court issue, but it will ultimately be up to Land & Water Conservation/NPS (the original grant funder) to make the decision.

She also explained that in section 4, items D&E were intentionally left as is since the length of the road is unknown at this point and the Planning Board will have input. Also, if it becomes a through road, it will be up to the Town Council to determine whether or not to accept the road. She said the field use, once determined, the Town will likely trigger a site plan so the Planning Board will have future input on this, and also where new trails will be.

Motion to Adjourn at 8:17 p.m.

RESULT:

APPROVED [UNANIMOUS]

MOVER:

Peter Gellerson, Board Member

SECONDER:

Dan Cobb, Vice Chair

AYES:

Hutchings, Cobb, Gellerson, Abrams, Caswell

STILLWATER PINES SUBDIVISION

TOWN OF GRAY, MAINE SUBDIVISION APPLICATION

Prepared For:

Construction Aggregates, Inc
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Prepared By:

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March 2021



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- Attachment 6 – Spillway Analysis
- Attachment 7 – Culvert Sizing Calculations
- Attachment 8 – Plan Set

ATTACHMENT 1

1. *What is the source of the topography? Source should be noted on the plans. If source of topography is GIS/LIDAR, we recommend that field-surveyed topography be obtained at the location of stormwater management BMPs, such as UDSF-1 and 2. Our experience is that use of GIS/LIDAR topography, especially on wooded sites, may result in significant changes in grading during construction. An alternative would be to require a plan note that requires the contractor to schedule a site visit with the Design Engineer and Town Engineer after staking out the UDSFs in the field to confirm that topographic conditions align with GIS/LIDAR topography shown on the plans.*

The source of the Topography is Lidar. A note requiring field confirmation has been added to the plans.

2. *The Applicant stated that an ability to serve letter from Gray Water District has been requested.*

The capacity to serve letter is still pending.

3. *Design Engineer should coordinate with the Water District and Fire Department and show fire hydrant locations on the final plans.*

A meeting with the Water District occurred a few weeks ago and the Fire Department will be sent an updated Plan prior to sign off for final approval.

4. *The erosion and sedimentation control narrative references 2018 for scheduling. Update the scheduling dates.*

The updated Erosion and Sedimentation Control narrative has been included as Attachment 3.

5. *Show subsurface disposal system test pits on the plans.*

Test Pits have been added to the Subdivision Layout and Utilities Plan (C-101).

6. *Revise building envelopes to exclude wetland areas.*

Building Envelopes have been updated on the Subdivision Layout and Utilities Plan (C-101).

7. *The solid waste narrative notes that clearing and construction debris will be disposed of at "one of the following locations" but doesn't list the locations.*

Section 1 – Performance and Design Standards have been updated and included as Attachment 2.

8. *Delineate the proposed wetland impact areas and square footages on the plans.*

Wetland impacts have been added to Subdivision Layout and Utilities Plan (C-101).

9. Section 401.13.12 of the Subdivision ordinance requires compliance with the MDEP Chapter 500 requirements.

According to MDEP Chapter 500 requirements this project would require no treatment as it is less than an acre of new impervious. However, as we anticipate additional development it is our intent to design to Chapter 500 Standards.

- a. *It appears that lot development was included in the post-development peak flow comparison for the flooding standard. Revise peak flow comparison due to paved shoulder revision (see comment 10).*

The updated Stormwater narrative has been updated and included as Attachment 4. The developed area was removed from the analysis.

- b. *Revise stormwater narrative to compare the 2, 10, and 25-year storms in peak flow comparison. The narrative indicates that the peak flow for the 25-year storm is decreased, however, the table shows an increase of more than 1 cfs.*

The updated Stormwater narrative has been updated and included as Attachment 4.

- c. *Revise rainfall for the 2, 10, and 25-year storms to values listed in Chapter 500, which are 3.1", 4.6", and 5.8"*

The rainfall has been updated to the proper regional storms. The updated Stormwater narrative has been updated and included as Attachment 4.

- d. *The stormwater narrative should be revised to note which standards are met for water quality treatment percentages.*
- e. *The Ordinance requires that water quality treatment be provided for the subdivision lots. Provide proposed treatment.*

A note requiring roof dripline filters has been included in the grading and erosion control plan.

- f. *Revise the grading at UDSF 2 to tie in all existing contours.*

Contours have been tied into existing contours.

- g. *Designate the UDSF berm width on the details.*

A minimum berm width has been added to the details.

- h. *Provide a spec and gradation for the underdrain gravel.*

The notes have been updated on the UDSF detail to include the specs and gradation.

- i. *Provide a planting spec for the filter surface.*

The notes have been updated on the UDSF detail to planting specs.

- j. Designate the surface treatment at the spillway.

A detail has been added to the UDSF showing the surface treatment at the spillway.

- k. Provide an outlet apron at the underdrain outlets.

An outlet apron has been added to both underdrain outlet details.

- l. Revise discrepancies in spillway elevation, width, and breadth between the plans and the HydroCad model.

Spillway elevation has been changed in the Hydrocad model to show the same the elevation as the plans.

- m. Provide a spillway analysis to show the spillway as the sole outlet for the 25-year storm.

A spillway analysis for both UDSF's have been included.

- n. Provide 1 foot of freeboard between the flow elevation from the spillway analysis and the top of berm.

A spillway analysis for both UDSF's have been included.

- o. Per MDEP BMP's, the use of the filter soil as storage is permitted for bioretention ponds but is not permitted for underdrained soil filters. Revise calculations to determine storage from the surface of the filter.

The filter storage has been removed from the stormwater model.

- p. Provide sediment forebay for culvert/ditch inlet to UDSF-1.

Sediment forebay has been provided for UDSF-1 and UDSF-2.

- q. UDSFs appear to be lined. Maine DEP requires test pits at UDSF locations to identify the seasonal high water/bedrock elevation. We recommend test pits as required by Maine DEP. Also, underdrains may be needed below the UDSF liners to prevent the filters from "floating". Provide floatation calculations to show that lined UDSFs will not float without the additional underdrains, unless test pits show the SHWT is below the bottom of the liners.

A 4" perforated underdrain has been added to the side of the UDSF to prevent any floating.

- r. How will maintenance access to UDSF-2 be provided?

There will be a road cleared to UDSF-2 and all the land will be maintained by owner, so that if maintenance is required a machine could walk back there.

- 10. Add a note for anticipated lot driveway culvert sizes. Minimum driveway culvert size shall be 15" as required by the Ordinance. Calculations should be provided to determine if larger driveway culverts are needed at any lot driveway.

A note dictating that a 15" culvert will be installed at each driveway has been added to the C-101 drawing. The areas draining to each ditch are minimal as the site is running along a ridge. The 15" culvert will be sufficient for each lot.

11. Show sight distance and sight distance clearing easement on plans.

The site distance easement will be included on the final subdivision plan.

12. In accordance with the subdivision performance standards, the roadway in an MD District is required to meet the Village Public Street Standard which requires paved shoulders. Revise plans to depict the Village Public Street Standards.

Road standard has been modified as part of a CZA. The proposed road meets the requirements set forth in the CZA.

13. Revise typical roadway section to depict a two-foot bottom width of the ditch.

Road standard has been modified as part of a CZA. The proposed road meets the requirements set forth in the CZA.

14. Confirm that proposed road grading provides the required ditch invert depth (6" below bottom of subbase gravel).

The grading has been changed to show 2' deep ditch.

15. Provide the proposed disturbed area for the roadway construction.

The total disturbed area for the construction of the road is approximately 1.9 acres.

16. Show driveway access for each lot.

17. The Developed area for each lot has been listed, designate the Impervious area limit for each lot.

There is no limit for impervious for each lot outside of what is already established in the zoning ordinance.

18. Provide inverts and sizes of roadway culverts.

A note indicating minimum culvert size and slope has been added to the plan.

19. Provide culvert sizing calculation for 50-year storm.

A culvert sizing calculation has been added as Attachment 7.

20. Show inlet and outlet aprons at culverts.

A note specifying inlet and outlet protection for all culverts as been added to the plans.

21. Show proposed water main in roadway profile.

The proposed water main has been added to the roadway profile.

22. Show proposed water service to each lot.

Water services have been added to the plans.

23. Show proposed electric service and transformer locations.

Transformers and electric services have been added to the plans.

24. Provide a Subdivision plan with the final application. Subdivision plan should be sealed by Maine licensed professional engineer and Maine licensed professional surveyor.

A Subdivision Plan will be included with the Final Application.

25. Show stone or precast concrete monuments at roadway in accordance with the Ordinance requirements.

The monuments have been changed to show stone/precast concrete monuments along the roadway.

26. *Provide a Boundary Survey sealed by a Maine licensed professional surveyor.*

A boundary survey has been included as Attachment 8.

27. The Stormwater maintenance section of the submission states that a homeowner's association will provide maintenance of the stormwater bmp's. Provide draft homeowners association document with final submission.

The homeowner's association documents will be included with the final submission.

28. *Provide a Sand and Gravel Aquifer map for the area to determine if a hydrogeologic assessment is warranted.*

A Sand and Gravel Aquifer map has been included as Attachment 5. The site is marked with a black dot in the center of it.

29. The Applicant has asked for waivers of the following:
- a. High Intensity Soil Survey.
 - b. Hydrogeologic assessment.
 - c. Traffic Impact Analysis

We have no technical objections to these waiver requests with the exception of the Hydrogeologic assessment pending receipt of a Sand and Gravel Aquifer map as noted in comment 25.

ATTACHMENT 2

STILLWATER PINES SUBDIVISION

TOWN OF GRAY, MAINE MAJOR SUBDIVISION APPLICATION

**PREPARED FOR:
A.H. GROVER**

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March 2021



PROJECT DESCRIPTION

The following package is an application for a Workshop with the Town of Gray Planning Board.

The applicant is requesting approval to divide an approximately 67-acre parcel at Woodcock Drive into thirteen residential lots with the rest being retained for possible future development. Each lot will have over 150 feet of street frontage on Woodcock Drive and be served by Public Water. 30% of the area has been set aside as Open Space with existing trails throughout. The project will include improvements to the 1,200 feet of existing Road and an additional 1,100 feet of new road. Stormwater will be controlled and treated by two small under drained soil filters.

Our desire for the Workshop is to discuss the applicable road standard. The only new material regarding this application is a Sketch Plan showing the Town's typical road sections along with a hybrid road section. We have included the Overall Site Plan along with the Sketch Plan to help provide context.

Section 1 gives a quick rundown of the Performance and Design Standards to facilitate any additional conversations/concerns about the project.

SECTION I – PERFORMANCE AND DESIGN STANDARDS

Attached to this section are the approvals required in Chapter 401 Article 13 of the Town of Gray Ordinances.

Public Water – A meeting was held with Jim Foster to discuss tying on the 12” main along the side of Yarmouth Road. Capacity was not a concern and we are awaiting a letter of confirmation.

Drinking Water – Water will be provided by the Gray Water District. A letter of confirmation is still waiting, but there has been verbal approval from Jim Foster.

Fire Protection – Included is the correspondence with the Fire Chief regarding fire protection for the proposed lots. (Attachment 4)

Erosion and Sedimentation Control – An Erosion Control Plan has been provided in previous applications but is not applicable for this workshop.

Sewage Disposal – Individual septic systems are proposed for each lot. Test pits have been dug and the soils were deemed acceptable for subsurface wastewater disposal systems. The soils report is in previous applications but is not applicable for this workshop.

Solid Waste – There will be common residential waste as part of the subdivision. Clearing and Construction debris will be disposed of in one of the following locations:

 Maine Waste-to-Energy – Auburn, Maine

 Ecomaine – Portland, Maine

 Riverside Recycling – Portland, Maine

Impact on Natural Beauty – The correspondence with the MHPC and NAP are included in previous applications but is not applicable for this workshop.

Financial and Technical Capacity – A letter including the contractor’s estimate and the banks letter of good standing has been provided in previous applications but is not applicable for this workshop.

Impact on Groundwater Quality or Quantity – A soils report is included as Attachment 5. There are no negative impacts on groundwater quality or quantity anticipated for this project.

Floodplain – The proposed subdivision has been designed to meet the standards set forth by the Maine Department of Environmental Protection (DEP). There will be negligible impacts to any flood plains.

Wetlands – The wetlands and streams have been identified for the entire 67+ acre parcel. Impacts have been minimized to the greatest extent possible and are below 5,000 square feet under any DEP thresholds. The wetlands have been set aside as part of the open space to the greatest extent possible to minimize impacts. And wetlands on individual lots will be protected as forested buffers.

Stormwater Management – A Stormwater Management Plan has been provided in previous applications but is not applicable for this workshop.

Traffic – The addition of only 13 residential lots does not trigger any traffic studies and will have a negligible impact on Yarmouth Road. A clearing easement was negotiated with the neighbor to maintain the required site distance at the end of Woodcock Drive. The easement and associated figure have been included as Attachment 8.

Road Design – TBD

ATTACHMENT 3

SOIL EROSION AND SEDIMENTATION CONTROL

Introduction

The project is a 13-lot open space residential subdivision. The site is located at the end of Woodcock Drive in Gray, Maine. The existing road will need to be brought up to the current road standards. The property is approximately 67 acres, with a few patches of forested wetlands and a stream that runs along the south-eastern corner. The site work will occur on the northwestern corner, opposite the stream.

Site History and Existing Site Conditions

The existing site is predominantly wooded with on-site soils of primarily Paxtons. The Medium Intensity Soil Survey (see Section 11), as provided by the NRCS has the site being Croghan and Naumburg, which are both sandy soils. Test pits were performed on-site by Longview Partners, which revealed well-draining sandy soils in all locations (see Attachment 5).

The site is divided by a gradual ridge that runs from the southwest corner to the northeast. The runoff all eventually makes it to a large wetland. The southwestern portion of the site drains to the Pleasant River before entering the wetland. The northeastern corner drains in a less defined manner.

The exiting road (Woodcock Drive) drains around the north side of the ridge and enters the Pleasant River.

Existing Erosion Problems

There are no existing erosion problems evident at the site.

Critical Areas

The critical areas in the proximity of the site are Pleasant River and the surrounding forested wetlands.

Protected Natural Resources

Forested wetlands on the Site have been identified and mapped by Mark Hampton and are shown on the drawings that accompany this submission.

Soil Erosion and Sedimentation Control Measures

The primary goals of the Erosion and Sediment Control Plan for the project are to minimize exposure of native soil materials during construction, to prevent soil erosion and sediment transport to downstream areas, receiving waters and natural resources. Measures will also be taken to ensure sediment is not tracked onto adjacent streets and that stockpiles of imported construction materials are protected from potential contamination. The susceptibility of soils to erosion is indicated on a relative "K" scale of values over a range of 0.02 to 0.69. The "K" value is frequently used with the universal soil loss equation. The higher values are indicative of the more erodible soils. The project area consists of made land with pavements and building slabs covering about one-half of the site. The rear portion of the site is natural forest. Assuming the site overlays soils with similar characteristics to those found on adjacent areas, the relative K values of the underlying material would be as follows:

| Soil Name | Soil Description | K Value |
|------------|-----------------------|---------|
| Paxton | Fine Sandy loam | 0.17 |
| Woodbridge | Very Stony Sandy loam | 0.17 |

Based on a review of the K values, the onsite soils in the area exhibit low to moderately susceptible to erosion after the cover material is stripped.

The primary emphasis of the Erosion and Sedimentation Control Plan to be implemented for this project is as follows:

- Construction Schedule – Major earth moving activities at the site will be scheduled for the summer and will be started when a suitable weather window has been identified. This will minimize the potential for exposure of bare soil to inclement weather.
- Temporary Measures – Planning the project to have erosion resistant measures in place with measures to prevent erosion from occurring. The plan includes measures to intercept and convey runoff to temporary sediment control devices as the construction of the project occurs.
- Stabilization of areas denuded to underlying parent material to minimize the period of soil exposure.
- Stabilization of drainage paths to avoid rill and gully erosion.
- The use of on-site measures to capture sediment (hay bales/silt fence, etc.) before it is conveyed to sediment sumps.

Description and Location of Limits of All Proposed Earth Movements

The proposed project will require stripping and grubbing for the construction of the road. The native sandy soil material is suitable for re-use as fill on the site. This will minimize import/export quantities. The topography is relatively flat, but some leveling and grade adjustment will be required.

Erosion/Sedimentation Control Devices

As part of the site development, the Contractor will be obligated to implement the following erosion and sediment control devices. These devices shall be installed as indicated on the plans or as described within this report. For further reference on these devices, see the *Maine Erosion and Sediment Control Best Management Practices (BMPs) Manual for Designers and Engineers, Maine DEP, October 2016*.

1. Silt fence shall be installed down slope of any disturbed areas to trap runoff borne sediments. The silt fence shall be installed per the detail provided in the plan set and inspected immediately after each rainfall, and at least weekly in the absence of significant rainfall. The Contractor shall make repairs immediately if there are any signs of erosion or sedimentation below the fence line. If such erosion is observed, the Contractor shall take proactive action to identify the cause of the erosion and take action to avoid its reoccurrence. Proper placement of stakes and keying the bottom of the fabric into the ground is critical to the fence's effectiveness. If there are signs of undercutting at the center or the edges, or impounding of large volumes of water behind the fence, the barrier shall be replaced with a stone check dam and measures taken to avoid the concentration of flows not intended to be directed to the silt fence.
2. Twin rows of siltation fence with hay bales shall be installed at the foot of steep slopes and adjacent to protected natural resources (wetland areas).
3. Silt fence shall be installed along the downgradient side of construction work areas, with locations being adjusted along with the construction phasing areas. The Contractor may use erosion mix in place of single silt fence barrier.
4. Silt fence will be installed along the upstream perimeter of the work area as shown on the plans, to divert run-on from upslope areas and prevent surface water from entering the construction area. If necessary, and at the direction of the Project Engineer, interception trenches shall be constructed to prevent shallow groundwater from flowing into construction areas
5. Temporary sediment sumps will provide sedimentation control for stormwater runoff from disturbed areas during construction until stabilization has been achieved.
6. A construction entrance will be constructed at all access points onto the site to prevent tracking of soil onto adjacent local roads and streets and the existing parking lot.

7. Stone sediment traps or a premanufactured SiltSack™ and a sediment bag will be installed at catch basin inlets to prevent silt from entering the storm drain system. Installation details are provided in the plan set on the erosion control detail sheets.
8. Dirtbags™ will be required to be on site and available for construction dewatering. The Contractor will be required to provide four Dirtbags™ with one prepared for operation prior to commencing any trenching operations.
9. Silt logs are an option for stone check dams and may be substituted provided the devices are well anchored.

Temporary Erosion/Sedimentation Control Measures

The following are planned as temporary erosion/sedimentation control measures during construction:

The primary and most effective soil erosion and sediment control measure is proactive work scheduling to minimize exposure of erodible soils. The Contractor will make every effort to promptly stabilize and disturbed areas on the site, after removal of existing vegetation, by placing imported granular material over disturbed areas. This will limit exposure of native soils and fill materials and provide a stable surface with minimal erosion potential.

1. It is anticipated that work on the site will begin in the Spring of 2021. This will allow for the earthwork to be undertaken in the early and mid-summer months when the risk of inclement weather is significantly lower. Scheduling of the field work will be critical to minimizing potential soil erosion impacts. The Contractor will be responsible for selecting an appropriate weather window in which to commence the work to minimize erosion and sediment transport risk.
2. Crushed stone-stabilized construction entrances will be placed at any construction access points from adjacent streets. The locations of the construction entrances shown on the drawings should be considered illustrative and will need to be adjusted as appropriate and located at any area where there is the potential for tracking of mud and debris onto existing roads or streets. Stone stabilized construction entrances will require the stone to be removed and replaced, as it becomes covered or filled with mud and material tracked by vehicles exiting the site.
3. Silt fence shall be installed along the downgradient side of the proposed improvement areas. The silt fence will remain in place and properly maintained until the site is acceptably stabilized. Silt fence needs to be checked to ensure the bottom is properly keyed in and inspected after significant rains. Wood chips from clearing can be used in front of the silt fence to provide an extra margin of safety and security for the silt fence. This practice is encouraged, provided the chips are removed when the fence is removed.
4. Silt fencing with a maximum stake spacing of 6 feet should be used, unless the fence is supported by wire fence reinforcement of minimum 14 gauge and with a maximum mesh spacing of 6 inches, in which case stakes may be spaced a maximum of 10 feet apart. The bottom of the fence should be properly anchored a minimum of 6" per the plan detail and backfilled. Any silt fence identified by the owner or reviewing agencies as not being properly installed during construction shall be immediately repaired in accordance with the installation details.
5. Dirtbags™ shall be installed in accordance with the details in the plan set. The Dirtbags™ function on the project is to receive any water pumped from excavations during construction. A Dirtbag™ shall be installed and prepared for operation prior to any trenching on site. When Dirtbags™ are observed to be at 50% capacity, they shall be cleaned or replaced. Stone under the Dirtbag™ shall be removed and replaced concurrently with the replacement of the Dirtbag™.
6. Stone check dams, silt logs, or hay bale barriers will be installed at any evident concentrated flow discharge points during construction and earthwork operations
7. Storm drain catch basin inlet protection shall be provided through the use of stone sediment barriers or a premanufactured SiltSack™ as distributed by A. H. Harris Company, Portland, Maine. Stone sediment barrier installation details are provided in the plan set. The barriers or

SiltSacks™ shall be inspected after each rainfall and repairs made as necessary, including the removal of sediment. Sediment shall be removed and the barrier or SiltSack™ restored to its original dimensions when the sediment has accumulated to one-half the design depth of the barrier. Sediment shall be removed from SiltSacks™ as necessary. Inlet protection shall be removed when the tributary drainage area has been stabilized.

8. All slopes steeper than 4:1 shall receive erosion control blankets.
9. Areas of visible erosion and the temporary sediment sumps shall be stabilized with crushed stone. The size of the stone shall be determined by the contractor's designated representative in consultation with the Owner.

Special Measures for Summer Construction

The summer period is generally optimum for construction in Maine, but it is also the period when intense short duration storms are most common, making denuded areas very susceptible to erosion, when dust control needs to be the most stringent, and when the potential to establish vegetation is often restricted by moisture deficit. During these periods, the Contractor must:

1. Implement a program to apply dust control measures on a daily basis except those days where precipitation is sufficient to suppress dust formation. This program shall extend to and include adjacent streets.
2. Spray any mulches with water after anchoring to dampen the soil and encourage early growth. Spraying may be required several times. Temporary seed may be required until the late summer seeding season.
3. Cover stockpiles of fine-grained materials, or excavated soils which are susceptible to erosion. To protect from the intense, short-duration storms which are more prevalent in the summer months.
4. Take additional steps needed, including watering, or covering excavated materials to control fugitive dust emissions to minimize reductions in visibility and the airborne disbursement of fine-grained soils. This is particularly important given the potential presence of soil contaminants, and the proximity of along the adjacent streets and properties.
5. These measures may also be required in the spring and fall during the drier periods of these seasons.

Permanent Erosion Control Measures

The following permanent erosion control measures have been designed as part of the Erosion/Sedimentation Control Plan:

1. The drainage conveyance systems have been designed to intercept and convey the 25-year storm.
2. All areas disturbed during construction, but not subject to other restoration (paving, riprap, etc.), will be loamed, limed, fertilized, mulched, and seeded. Fabric netting, anchored with staples, shall be placed over the mulch in areas where the finish grade slope is greater than 10 percent. Native topsoil shall be stockpiled and temporarily stabilized with seed and mulch and reused for final restoration when it is of sufficient quality.
3. Catch basins shall be provided with sediment sumps for all outlet pipes that are 12" in diameter or greater or where winter sand use is contemplated. A sediment collection bag shall be installed in all basins.

Timing and Sequence of Erosion/Sedimentation Control Measures

The following construction sequence shall be required to ensure the effectiveness of the erosion and sedimentation control measures is optimized.

The following construction sequence is required:

1. Install construction entrances.
2. Install safety and construction fence to secure the site for demolition.
3. Install all perimeter siltation fence and erosion control barriers. Particular attention shall be paid to areas upstream of protected natural resources and in the vicinity of the two streams at the project site. Signs shall be erected periodically along these perimeter barriers indicating that the downstream areas are off limits to all construction activities.
4. Conduct demolition activities including salvage of materials that can be used for site work aggregate.
5. Construct activities on the site to optimize the handling of materials and restrict the denuded areas to the time stipulated.
6. Construct stabilized pads for foundation and building construction.
7. Maintain stabilized site access and working areas during building construction.
8. Install binder pavement.
9. Landscape (loam and seed).
10. Install surface pavements.
11. Install striping, signage, and miscellaneous site improvements.
12. Review and punch the site.
13. Remove any temporary erosion control measures.

It is anticipated that site construction on the project will be completed by the end of summer 2021, with some building finishing work extending into the fall. The site will be stabilized prior to October 1st and there will be no Winter Site Construction work.

Maine Construction General Permit Requirements

The project will be constructed by a General Contractor under contract to the Owner/Applicant. The Contractor will submit a detailed schedule for the completion of the work at the start of construction.

The work will be conducted in sections which will limit the amount of exposed area to those areas in which work is expected to be undertaken during the next 30 days. Exposed areas will be covered and stabilized as rapidly as practical. All areas will be permanently stabilized within 7 days of final grading and temporarily stabilized within 7 days of initial disturbance or before a predicted storm event of over ½" of rain. The area of denuded, non-stabilized construction shall be limited to the minimum area practicable. An area shall be considered to be denuded until the subbase gravel is installed in parking areas, or the areas of future loam and seed have been loamed, seeded, and mulched, or stabilized with erosion control blanket.

The Contractor must maintain an accurate set of record drawings indicating the date when an area is first denuded, the date of temporary stabilization, and the date of final stabilization. On October 1 of any calendar year, the Contractor shall submit a detailed plan for stabilizing the site for the winter and a description of what activities are planned during the winter.

The Contractor must install any added measures which may be necessary to control erosion/sedimentation and fugitive dust emissions from the site, with adjustments made dependent upon forecasted and actual site and weather conditions.

Maintenance of the Erosion/Sedimentation Control Features

The project will be contracted by the Owner. The Contractor shall prepare a list and designate by name, address and telephone number all individuals who will be responsible for implementation, inspection, and maintenance of all erosion control measures identified within this section and as contained in the Erosion and Sedimentation Control Plan of the contract drawings. Specific responsibilities of the inspector(s) will include:

Execution of the Contractor/Subcontractor Certification contained in Attachment B by any and all parties responsible for erosion control measures on the site.

A weekly certification stating compliance, any deviations, and corrective measures necessary to comply with the erosion control requirements of this section shall be prepared and signed by the inspector(s). In addition to the weekly certifications, the inspector(s) shall maintain written reports recording construction activities on site which include:

1. Dates when major grading activities occur in a particular area.
2. Dates when major construction activities cease in a particular area, either temporarily or permanently.
3. Dates when an area is stabilized.
4. Inspection of this project work site on a weekly basis and after each significant rainfall event (0.25 inch or more within any consecutive 24-hour period) during construction until permanent erosion control measures have been properly installed and the site has been stabilized.

Inspection of the project work site shall include:

1. Identification of proper erosion control measure installation in accordance with the erosion control detail sheet or as specified in this section.
2. Determine whether each erosion control measure is properly operating. If not, identify damage to the control device and determine remedial measures.
3. Identify areas which appear vulnerable to erosion and determine additional erosion control measures which should be used to improve conditions.
4. Inspect areas of recent seeding to determine percent catch of grass. A minimum catch of 90 percent is required prior to removal of erosion control measures.
5. All erosion controls shall be removed within 30 days of permanent stabilization except for mulch and netting not detrimental to the project. Removals shall include but not be limited to all silt fence, hay bales, inlet protection, and stone check dams.
6. Accumulated silt/sediment should be removed when the depth of sediment reaches 50 percent of the barrier height. Accumulated silt/sediment should be removed from behind silt fencing when the depth of the sediment reaches 6 inches.
7. Silt sacks should be removed and replaced at least every three months and at any time where the weekly inspection reveals that siltation has significantly retarded the rate of flow through the silt sack.
8. If inspection of the site indicates a change should be made to the erosion control plan, to either improve effectiveness or correct a site-specific deficiency, the inspector shall immediately implement the corrective measure and notify the Owner of the change.

All certifications, inspection forms, and written reports prepared by the inspector(s) shall be filed with the Owner, and the Permit File contained on the project site. All written certifications, inspection forms, and written reports must be filed within one (1) week of the inspection date.

The Contractor has sole responsibility for complying with the erosion/sediment control report, including control of fugitive dust, and shall be responsible for any monetary penalties resulting from failure to comply with these standards.

Once construction has been completed, long-term maintenance of the stormwater management system will be the responsibility of the applicant. Operations & Maintenance items with a list of maintenance requirements and frequency are listed at the end of Section 12 of the Maine DEP Permit Application.

Preconstruction Conference

Prior to any construction at the site, representatives of the Contractor, the Architect, the Owner, and the site design engineer shall meet to discuss the scheduling of the site construction and the designation of the responsible parties for implementing the plan. The Contractor shall be responsible for scheduling the meeting. Prior to the meeting, the Contractor will prepare a detailed schedule and a marked-up site plan indicating areas and components of the work and key dates showing date of disturbance and completion of the work. The Contractor shall conduct a meeting with employees and sub-contractors to review the erosion control plan, the construction techniques which will be employed to implement the plan and provide a list of attendees and items discussed at the meeting to the Owner. Three copies of the schedule, the Contractor's meeting minutes, and marked-up site plan shall be provided to the Owner.

Attachments

Attachment A –Sample Erosion Control Compliance Certification and Inspection Forms

ATTACHMENT A

**Sample Erosion Control Compliance Certification and Inspection
Forms**

ATTACHMENT 4

**STORMWATER MANAGEMENT REPORT
STILLWATER PINES SUBDIVISION
GRAY, MAINE
JULY 2020**

INTRODUCTION

The project is a 13-lot open space residential subdivision. The project is located off the end of Woodcock Drive in Gray. The property is approximately 67 acres, with a few patches of forested wetlands and a stream that runs along the southeastern corner.

This report discusses the Site's hydrological conditions and quantifies the stormwater runoff generated in the existing and proposed conditions.

DATA COLLECTION AND ASSUMPTIONS

Site Data was gathered from field observations as well as AutoCAD files and drawings. Site contour information was provided by a combination of field survey in the project area and GIS contours outside of the project area. Soils information, vernal pool assessment, BMP test pits and wetlands delineation was provided by Mark Hampton. Calculations were performed to create a HydroCAD stormwater model, which is based on the United States Department of Agriculture's (USDA) Technical Release 20 (TR-20) and Technical Release 55 (TR-55) hydraulic programs.

Curve numbers (CN's) assigned to differing land cover and soil types were taken from tables within the HydroCAD software, which are from the SCS TR-55 manual, revised 1986. 24-hour rainfall depths were taken from the 'Stormwater Management for Maine: Volume III BMP's Technical Design Manual, January 2006'. Time of concentrations were calculated with the HydroCAD software using the TR-55 methodologies including direct entry.

EXISTING SITE CONDITIONS

The existing site is predominantly wooded with on-site soils of primarily Paxtons and Woodbridge. The Medium Intensity Soil Survey (see Attachment 5), as provided by the NRCS. Test pits were performed on-site by Mark Hampton, which revealed well-draining sandy soils in all locations (see Attachment 5).

The site generally drains to the south, with slopes ranging from shallow (0 to 4 percent) and medium (slopes of 5 to 20%). The site is bisected by a USGS stream (Pleasant River).

The entire property drains to the large wetland the runs along Route 100 in Gray, which will be represented by Analysis Point #1.

PROPOSED SITE CONDITIONS

The proposed improvements will include rebuilding approximately 1,300 feet of Woodcock Drive and an additional 1,000 feet of new road. The road will be 20 feet wide with 4 foot shoulders and ditches on either side. There is a wetland crossing where runoff will be directed to a single culvert to limit the impacts through that area. This will be the only portion of the road that isn't treated.

The improvements don't trigger any Maine Department of Environmental Protection permits, but the project is still being designed to Chapter 500 standards.

All points of analysis have been retained from the pre development conditions.

In order to achieve stormwater quantity and quality mitigation, two Underdrained Soil Filters (UDSF) have been designed to both attenuate and treat stormwater run-off flows.

WATER QUANTITY & QUALITY

Water Quality and Quantity mitigation will be achieved through the installation of the aforementioned stormwater BMP. The soil filters intercepts the vast majority of stormwater from the developed areas. A summary comparison of stormwater peak flows can be found below:

| POA | 2 YR -PRE (cfs) | 2 YR - POST (cfs) | 10 YR - PRE (cfs) | 10 YR – POST (cfs) | 25 YR – PRE (cfs) | 25 YR – POST (cfs) |
|-----|-----------------|-------------------|-------------------|--------------------|-------------------|--------------------|
| #1 | 44.48 | 34.45 | 95.71 | 82.24 | 140.56 | 125.40 |

The peak flows are decreased for the 2 year and 10-year storms. During a 25-year storm the peak runoff increases 0.5%, which we would consider negligible for a watershed of this size.

Stormwater quality mitigation is achieved through the use of the underdrained soil filter BMP. A summary of stormwater treatment percentages can be found as Attachment D. **Total project treatment results in the treatment 79% of impervious area and 92% of total developed area. Which meets the General Standards for a linear project.**

All construction will be in accordance with the most current Maine Erosion and Sedimentation Control Best Management Practices. These measures include temporary and permanent seeding, sediment barriers, and stabilized construction entrance. These

measures are described on the enclosed Drawing C-300, "Erosion & Sedimentation Control Notes & Details."

CONCLUSIONS

This project will use long-term and short-term erosion control measures that will mitigate environmental impacts from stormwater. This project will not have any significant adverse impacts on downstream properties as a result of stormwater.

ATTACHMENTS

Attachment A – Pre and Post Development Hydrologic Calculations
Attachment B – Stormwater Quality Sizing Calculations
Attachment C - Stormwater Treatment Summary
Attachment D – Stormwater Maintenance Plan
Attachment E – Pre and Post Development Watershed Maps

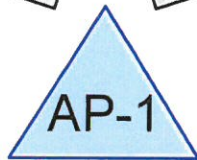
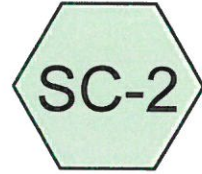
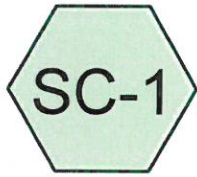
ADDITIONAL REFERENCES

Soil Survey - Attachment 5

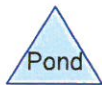
ATLANTIC RESOURCE CONSULTANTS

Charles E. Burnham, PE

Attachment A – Pre and Post Development Hydrologic Calculations



Wetland



Routing Diagram for Pre Developed
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Area Listing (all nodes)

| Area (acres) | CN | Description (subcatchment-numbers) |
|-----------------|-----------|--|
| 35.416 | 79 | 1 acre lots, 20% imp, HSG C (SC-1, SC-2) |
| 11.076 | 80 | 1/2 acre lots, 25% imp, HSG C (SC-2) |
| 1.993 | 98 | Impervious (SC-1, SC-2) |
| 59.750 | 73 | Woods, Fair, HSG C (SC-1) |
| 5.238 | 70 | Woods, Good, HSG C (SC-2) |
| 113.474 | 76 | TOTAL AREA |

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Soil Listing (all nodes)

| Area (acres) | Soil Group | Subcatchment Numbers |
|-----------------|---------------|-------------------------|
| 0.000 | HSG A | |
| 0.000 | HSG B | |
| 111.480 | HSG C | SC-1, SC-2 |
| 0.000 | HSG D | |
| 1.993 | Other | SC-1, SC-2 |
| 113.474 | | TOTAL AREA |

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Ground Covers (all nodes)

| HSG-A (acres) | HSG-B (acres) | HSG-C (acres) | HSG-D (acres) | Other (acres) | Total (acres) | Ground Cover | Subcatchment Numbers |
|------------------|------------------|------------------|------------------|------------------|------------------|------------------------|-------------------------|
| 0.000 | 0.000 | 35.416 | 0.000 | 0.000 | 35.416 | 1 acre lots, 20% imp | SC-1, SC-2 |
| 0.000 | 0.000 | 11.076 | 0.000 | 0.000 | 11.076 | 1/2 acre lots, 25% imp | SC-2 |
| 0.000 | 0.000 | 0.000 | 0.000 | 1.993 | 1.993 | Impervious | SC-1, SC-2 |
| 0.000 | 0.000 | 59.750 | 0.000 | 0.000 | 59.750 | Woods, Fair | SC-1 |
| 0.000 | 0.000 | 5.238 | 0.000 | 0.000 | 5.238 | Woods, Good | SC-2 |
| 0.000 | 0.000 | 111.480 | 0.000 | 1.993 | 113.474 | TOTAL AREA | |

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Type III 24-hr 2-Year Rainfall=3.10"

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Time span=0.00-40.00 hrs, dt=0.02 hrs, 2001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment SC-1:

Runoff Area=2,901,962 sf 2.29% Impervious Runoff Depth=0.97"
Flow Length=3,105' Tc=55.0 min CN=74 Runoff=29.39 cfs 5.398 af

Subcatchment SC-2:

Runoff Area=2,040,957 sf 22.03% Impervious Runoff Depth=1.26"
Flow Length=5,973' Tc=94.3 min CN=79 Runoff=19.93 cfs 4.928 af

Pond AP-1: Wetland

Inflow=44.48 cfs 10.326 af
Primary=44.48 cfs 10.326 af

Total Runoff Area = 113.474 ac Runoff Volume = 10.326 af Average Runoff Depth = 1.09"
89.56% Pervious = 101.628 ac 10.44% Impervious = 11.846 ac

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Type III 24-hr 2-Year Rainfall=3.10"

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Summary for Subcatchment SC-1:

Runoff = 29.39 cfs @ 12.79 hrs, Volume= 5.398 af, Depth= 0.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Year Rainfall=3.10"

| Area (sf) | CN | Description |
|-----------|----|-----------------------------|
| 290,981 | 79 | 1 acre lots, 20% imp, HSG C |
| 2,602,709 | 73 | Woods, Fair, HSG C |
| * 8,272 | 98 | Impervious |
| 2,901,962 | 74 | Weighted Average |
| 2,835,494 | | 97.71% Pervious Area |
| 66,468 | | 2.29% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|---|
| 21.1 | 100 | 0.0200 | 0.08 | | Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.30" |
| 33.1 | 1,803 | 0.0330 | 0.91 | | Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps |
| 0.8 | 1,202 | 0.0400 | 25.65 | 5,770.86 | Channel Flow, C-D Area= 225.0 sf Perim= 71.0' r= 3.17' n= 0.025 Earth, clean & winding |
| 55.0 | 3,105 | Total | | | |

Summary for Subcatchment SC-2:

Runoff = 19.93 cfs @ 13.31 hrs, Volume= 4.928 af, Depth= 1.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Year Rainfall=3.10"

| Area (sf) | CN | Description |
|-----------|----|-------------------------------|
| 482,464 | 80 | 1/2 acre lots, 25% imp, HSG C |
| 1,251,755 | 79 | 1 acre lots, 20% imp, HSG C |
| 228,177 | 70 | Woods, Good, HSG C |
| * 78,561 | 98 | Impervious |
| 2,040,957 | 79 | Weighted Average |
| 1,591,429 | | 77.97% Pervious Area |
| 449,528 | | 22.03% Impervious Area |

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Type III 24-hr 2-Year Rainfall=3.10"

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| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|-------------|------------------|------------------|----------------------|-------------------|--|
| 21.1 | 100 | 0.0200 | 0.08 | | Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.30" |
| 71.2 | 3,238 | 0.0230 | 0.76 | | Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps |
| 2.0 | 2,635 | 0.0080 | 21.68 | 30,899.48 | Channel Flow, C-D Area= 1,425.0 sf Perim= 173.0' r= 8.24' n= 0.025 |
| 94.3 | 5,973 | Total | | | |

Summary for Pond AP-1: Wetland

Inflow Area = 113.474 ac, 10.44% Impervious, Inflow Depth = 1.09" for 2-Year event
 Inflow = 44.48 cfs @ 12.93 hrs, Volume= 10.326 af
 Primary = 44.48 cfs @ 12.93 hrs, Volume= 10.326 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.02 hrs

Pre Developed

Type III 24-hr 10-Year Rainfall=4.60"

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Time span=0.00-40.00 hrs, dt=0.02 hrs, 2001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment SC-1:

Runoff Area=2,901,962 sf 2.29% Impervious Runoff Depth=2.05"
Flow Length=3,105' Tc=55.0 min CN=74 Runoff=65.55 cfs 11.378 af

Subcatchment SC-2:

Runoff Area=2,040,957 sf 22.03% Impervious Runoff Depth=2.46"
Flow Length=5,973' Tc=94.3 min CN=79 Runoff=39.88 cfs 9.607 af

Pond AP-1: Wetland

Inflow=95.71 cfs 20.986 af
Primary=95.71 cfs 20.986 af

Total Runoff Area = 113.474 ac Runoff Volume = 20.986 af Average Runoff Depth = 2.22"
89.56% Pervious = 101.628 ac 10.44% Impervious = 11.846 ac

Pre Developed

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Type III 24-hr 10-Year Rainfall=4.60"

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Summary for Subcatchment SC-1:

Runoff = 65.55 cfs @ 12.77 hrs, Volume= 11.378 af, Depth= 2.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Year Rainfall=4.60"

| Area (sf) | CN | Description |
|-----------|----|-----------------------------|
| 290,981 | 79 | 1 acre lots, 20% imp, HSG C |
| 2,602,709 | 73 | Woods, Fair, HSG C |
| * 8,272 | 98 | Impervious |
| 2,901,962 | 74 | Weighted Average |
| 2,835,494 | | 97.71% Pervious Area |
| 66,468 | | 2.29% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|---|
| 21.1 | 100 | 0.0200 | 0.08 | | Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.30" |
| 33.1 | 1,803 | 0.0330 | 0.91 | | Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps |
| 0.8 | 1,202 | 0.0400 | 25.65 | 5,770.86 | Channel Flow, C-D Area= 225.0 sf Perim= 71.0' r= 3.17' n= 0.025 Earth, clean & winding |
| 55.0 | 3,105 | Total | | | |

Summary for Subcatchment SC-2:

Runoff = 39.88 cfs @ 13.30 hrs, Volume= 9.607 af, Depth= 2.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Year Rainfall=4.60"

| Area (sf) | CN | Description |
|-----------|----|-------------------------------|
| 482,464 | 80 | 1/2 acre lots, 25% imp, HSG C |
| 1,251,755 | 79 | 1 acre lots, 20% imp, HSG C |
| 228,177 | 70 | Woods, Good, HSG C |
| * 78,561 | 98 | Impervious |
| 2,040,957 | 79 | Weighted Average |
| 1,591,429 | | 77.97% Pervious Area |
| 449,528 | | 22.03% Impervious Area |

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Type III 24-hr 10-Year Rainfall=4.60"

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| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|-------------|------------------|------------------|----------------------|-------------------|--|
| 21.1 | 100 | 0.0200 | 0.08 | | Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.30" |
| 71.2 | 3,238 | 0.0230 | 0.76 | | Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps |
| 2.0 | 2,635 | 0.0080 | 21.68 | 30,899.48 | Channel Flow, C-D Area= 1,425.0 sf Perim= 173.0' r= 8.24' n= 0.025 |
| 94.3 | 5,973 | Total | | | |

Summary for Pond AP-1: Wetland

Inflow Area = 113.474 ac, 10.44% Impervious, Inflow Depth = 2.22" for 10-Year event
 Inflow = 95.71 cfs @ 12.89 hrs, Volume= 20.986 af
 Primary = 95.71 cfs @ 12.89 hrs, Volume= 20.986 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.02 hrs

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Type III 24-hr 25-Year Rainfall=5.80"

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Time span=0.00-40.00 hrs, dt=0.02 hrs, 2001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment SC-1:

Runoff Area=2,901,962 sf 2.29% Impervious Runoff Depth=3.02"
Flow Length=3,105' Tc=55.0 min CN=74 Runoff=97.52 cfs 16.752 af

Subcatchment SC-2:

Runoff Area=2,040,957 sf 22.03% Impervious Runoff Depth=3.50"
Flow Length=5,973' Tc=94.3 min CN=79 Runoff=56.89 cfs 13.672 af

Pond AP-1: Wetland

Inflow=140.56 cfs 30.424 af
Primary=140.56 cfs 30.424 af

Total Runoff Area = 113.474 ac Runoff Volume = 30.424 af Average Runoff Depth = 3.22"
89.56% Pervious = 101.628 ac 10.44% Impervious = 11.846 ac

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Type III 24-hr 25-Year Rainfall=5.80"

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Summary for Subcatchment SC-1:

Runoff = 97.52 cfs @ 12.77 hrs, Volume= 16.752 af, Depth= 3.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Year Rainfall=5.80"

| Area (sf) | CN | Description |
|-----------|----|-----------------------------|
| 290,981 | 79 | 1 acre lots, 20% imp, HSG C |
| 2,602,709 | 73 | Woods, Fair, HSG C |
| * 8,272 | 98 | Impervious |
| 2,901,962 | 74 | Weighted Average |
| 2,835,494 | | 97.71% Pervious Area |
| 66,468 | | 2.29% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|---|
| 21.1 | 100 | 0.0200 | 0.08 | | Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.30" |
| 33.1 | 1,803 | 0.0330 | 0.91 | | Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps |
| 0.8 | 1,202 | 0.0400 | 25.65 | 5,770.86 | Channel Flow, C-D Area= 225.0 sf Perim= 71.0' r= 3.17' n= 0.025 Earth, clean & winding |
| 55.0 | 3,105 | Total | | | |

Summary for Subcatchment SC-2:

Runoff = 56.89 cfs @ 13.29 hrs, Volume= 13.672 af, Depth= 3.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Year Rainfall=5.80"

| Area (sf) | CN | Description |
|-----------|----|-------------------------------|
| 482,464 | 80 | 1/2 acre lots, 25% imp, HSG C |
| 1,251,755 | 79 | 1 acre lots, 20% imp, HSG C |
| 228,177 | 70 | Woods, Good, HSG C |
| * 78,561 | 98 | Impervious |
| 2,040,957 | 79 | Weighted Average |
| 1,591,429 | | 77.97% Pervious Area |
| 449,528 | | 22.03% Impervious Area |

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Type III 24-hr 25-Year Rainfall=5.80"

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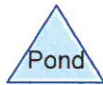
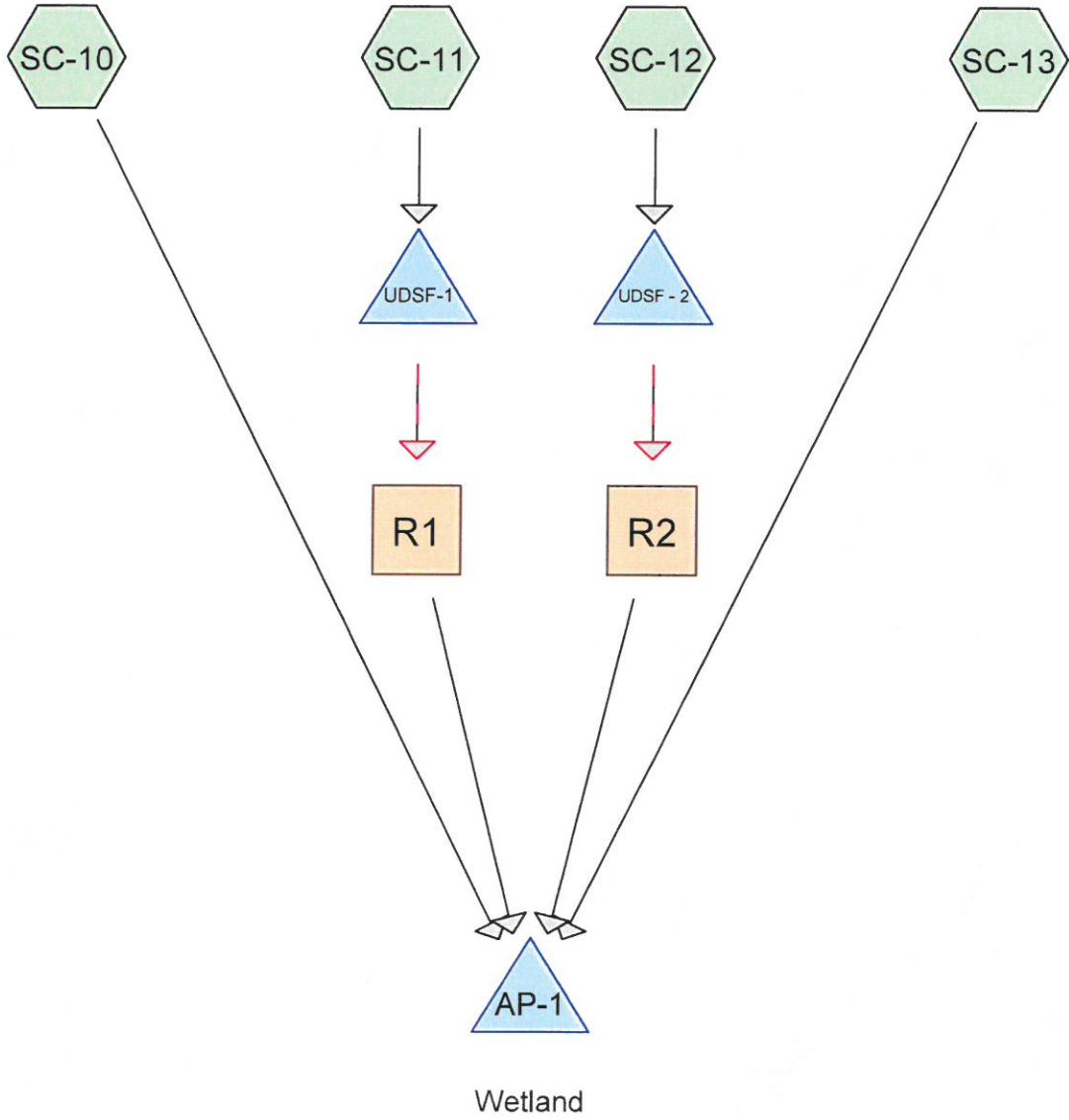
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| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|-------------|------------------|------------------|----------------------|-------------------|--|
| 21.1 | 100 | 0.0200 | 0.08 | | Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.30" |
| 71.2 | 3,238 | 0.0230 | 0.76 | | Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps |
| 2.0 | 2,635 | 0.0080 | 21.68 | 30,899.48 | Channel Flow, C-D Area= 1,425.0 sf Perim= 173.0' r= 8.24' n= 0.025 |
| 94.3 | 5,973 | Total | | | |

Summary for Pond AP-1: Wetland

Inflow Area = 113.474 ac, 10.44% Impervious, Inflow Depth = 3.22" for 25-Year event
 Inflow = 140.56 cfs @ 12.88 hrs, Volume= 30.424 af
 Primary = 140.56 cfs @ 12.88 hrs, Volume= 30.424 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.02 hrs



Routing Diagram for Developed
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Area Listing (all nodes)

| Area (acres) | CN | Description (subcatchment-numbers) |
|-----------------|-----------|---|
| 13.901 | 79 | 1 acre lots, 20% imp, HSG C (SC-10, SC-12, SC-13) |
| 11.076 | 80 | 1/2 acre lots, 25% imp, HSG C (SC-13) |
| 2.981 | 98 | Impervious (SC-10, SC-11, SC-12, SC-13) |
| 2.060 | 73 | Woods, Fair, HSG C (SC-11) |
| 83.457 | 70 | Woods, Good, HSG C (SC-10, SC-12, SC-13) |
| 113.474 | 73 | TOTAL AREA |

Developed

Soil Listing (all nodes)

| Area (acres) | Soil Group | Subcatchment Numbers |
|-----------------|---------------|----------------------------|
| 0.000 | HSG A | |
| 0.000 | HSG B | |
| 110.493 | HSG C | SC-10, SC-11, SC-12, SC-13 |
| 0.000 | HSG D | |
| 2.981 | Other | SC-10, SC-11, SC-12, SC-13 |
| 113.474 | | TOTAL AREA |

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Ground Covers (all nodes)

| HSG-A (acres) | HSG-B (acres) | HSG-C (acres) | HSG-D (acres) | Other (acres) | Total (acres) | Ground Cover | Subcatchment Numbers |
|------------------|------------------|------------------|------------------|------------------|------------------|------------------------|-------------------------------------|
| 0.000 | 0.000 | 13.901 | 0.000 | 0.000 | 13.901 | 1 acre lots, 20% imp | SC-10, SC-12, SC-13 |
| 0.000 | 0.000 | 11.076 | 0.000 | 0.000 | 11.076 | 1/2 acre lots, 25% imp | SC-13 |
| 0.000 | 0.000 | 0.000 | 0.000 | 2.981 | 2.981 | Impervious | SC-10, SC-11, SC-12, SC-13 |
| 0.000 | 0.000 | 2.060 | 0.000 | 0.000 | 2.060 | Woods, Fair | SC-11 |
| 0.000 | 0.000 | 83.457 | 0.000 | 0.000 | 83.457 | Woods, Good | SC-10, SC-12, SC-13 |
| 0.000 | 0.000 | 110.493 | 0.000 | 2.981 | 113.474 | TOTAL AREA | |

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Type III 24-hr 2-Year Rainfall=3.10"

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Time span=0.00-40.00 hrs, dt=0.02 hrs, 2001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment SC-10: Runoff Area=2,674,510 sf 2.71% Impervious Runoff Depth=0.82"
Flow Length=3,105' Tc=55.0 min CN=71 Runoff=21.82 cfs 4.188 af

Subcatchment SC-11: Runoff Area=116,805 sf 23.19% Impervious Runoff Depth=1.26"
Flow Length=772' Tc=30.9 min CN=79 Runoff=2.17 cfs 0.282 af

Subcatchment SC-12: Runoff Area=116,498 sf 19.24% Impervious Runoff Depth=1.14"
Tc=0.0 min CN=77 Runoff=4.19 cfs 0.254 af

Subcatchment SC-13: Runoff Area=2,035,112 sf 12.26% Impervious Runoff Depth=1.03"
Flow Length=5,973' Tc=94.3 min CN=75 Runoff=15.57 cfs 3.998 af

Reach R1: Avg. Flow Depth=0.02' Max Vel=2.46 fps Inflow=0.48 cfs 0.282 af
n=0.025 L=1,105.0' S=0.0398 '/' Capacity=25,292.70 cfs Outflow=0.48 cfs 0.282 af

Reach R2: Avg. Flow Depth=0.02' Max Vel=2.49 fps Inflow=0.45 cfs 0.254 af
n=0.025 L=736.0' S=0.0408 '/' Capacity=25,590.09 cfs Outflow=0.45 cfs 0.254 af

Pond AP-1: Wetland Inflow=34.45 cfs 8.722 af
Primary=34.45 cfs 8.722 af

Pond UDSF - 2: Peak Elev=35.00' Storage=4,124 cf Inflow=4.19 cfs 0.254 af
Primary=0.45 cfs 0.254 af Secondary=0.00 cfs 0.000 af Outflow=0.45 cfs 0.254 af

Pond UDSF-1: Peak Elev=49.25' Storage=4,695 cf Inflow=2.17 cfs 0.282 af
Primary=0.48 cfs 0.282 af Secondary=0.00 cfs 0.000 af Outflow=0.48 cfs 0.282 af

Total Runoff Area = 113.474 ac Runoff Volume = 8.722 af Average Runoff Depth = 0.92"
92.48% Pervious = 104.944 ac 7.52% Impervious = 8.530 ac

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Type III 24-hr 2-Year Rainfall=3.10"

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Summary for Subcatchment SC-10:

Runoff = 21.82 cfs @ 12.83 hrs, Volume= 4.188 af, Depth= 0.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Year Rainfall=3.10"

| Area (sf) | CN | Description |
|-----------|----|-----------------------------|
| 290,987 | 79 | 1 acre lots, 20% imp, HSG C |
| 2,369,166 | 70 | Woods, Good, HSG C |
| * 14,357 | 98 | Impervious |
| 2,674,510 | 71 | Weighted Average |
| 2,601,956 | | 97.29% Pervious Area |
| 72,554 | | 2.71% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|---|
| 21.1 | 100 | 0.0200 | 0.08 | | Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.30" |
| 33.1 | 1,803 | 0.0330 | 0.91 | | Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps |
| 0.8 | 1,202 | 0.0400 | 25.65 | 5,770.86 | Channel Flow, C-D Area= 225.0 sf Perim= 71.0' r= 3.17' n= 0.025 Earth, clean & winding |
| 55.0 | 3,105 | Total | | | |

Summary for Subcatchment SC-11:

Runoff = 2.17 cfs @ 12.45 hrs, Volume= 0.282 af, Depth= 1.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Year Rainfall=3.10"

| Area (sf) | CN | Description |
|-----------|----|------------------------|
| 89,716 | 73 | Woods, Fair, HSG C |
| * 27,089 | 98 | Impervious |
| 116,805 | 79 | Weighted Average |
| 89,716 | | 76.81% Pervious Area |
| 27,089 | | 23.19% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 21.1 | 100 | 0.0200 | 0.08 | | Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.30" |
| 9.5 | 405 | 0.0200 | 0.71 | | Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps |
| 0.3 | 267 | 0.0400 | 14.10 | 225.65 | Channel Flow, C-D Area= 16.0 sf Perim= 15.0' r= 1.07' n= 0.022 |
| 30.9 | 772 | Total | | | |

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Type III 24-hr 2-Year Rainfall=3.10"

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Summary for Subcatchment SC-12:

Runoff = 4.19 cfs @ 12.00 hrs, Volume= 0.254 af, Depth= 1.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Year Rainfall=3.10"

| Area (sf) | CN | Description |
|-----------|----|-----------------------------|
| 62,772 | 79 | 1 acre lots, 20% imp, HSG C |
| 43,872 | 70 | Woods, Good, HSG C |
| * 9,854 | 98 | Impervious |
| 116,498 | 77 | Weighted Average |
| 94,090 | | 80.76% Pervious Area |
| 22,408 | | 19.24% Impervious Area |

Summary for Subcatchment SC-13:

Runoff = 15.57 cfs @ 13.32 hrs, Volume= 3.998 af, Depth= 1.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.02 hrs
Type III 24-hr 2-Year Rainfall=3.10"

| Area (sf) | CN | Description |
|-----------|----|-------------------------------|
| 482,464 | 80 | 1/2 acre lots, 25% imp, HSG C |
| 251,755 | 79 | 1 acre lots, 20% imp, HSG C |
| 1,222,332 | 70 | Woods, Good, HSG C |
| * 78,561 | 98 | Impervious |
| 2,035,112 | 75 | Weighted Average |
| 1,785,584 | | 87.74% Pervious Area |
| 249,528 | | 12.26% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 21.1 | 100 | 0.0200 | 0.08 | | Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.30" |
| 71.2 | 3,238 | 0.0230 | 0.76 | | Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps |
| 2.0 | 2,635 | 0.0080 | 21.68 | 30,899.48 | Channel Flow, C-D Area= 1,425.0 sf Perim= 173.0' r= 8.24' n= 0.025 |
| 94.3 | 5,973 | Total | | | |

Summary for Reach R1:

Inflow Area = 2.681 ac, 23.19% Impervious, Inflow Depth > 1.26" for 2-Year event
 Inflow = 0.48 cfs @ 13.41 hrs, Volume= 0.282 af
 Outflow = 0.48 cfs @ 13.70 hrs, Volume= 0.282 af, Atten= 0%, Lag= 17.2 min

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Type III 24-hr 2-Year Rainfall=3.10"

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Routing by Stor-Ind+Trans method, Time Span= 0.00-40.00 hrs, dt= 0.02 hrs
Max. Velocity= 2.46 fps, Min. Travel Time= 7.5 min
Avg. Velocity = 2.46 fps, Avg. Travel Time= 7.5 min

Peak Storage= 215 cf @ 13.57 hrs
Average Depth at Peak Storage= 0.02'
Bank-Full Depth= 10.00' Flow Area= 700.0 sf, Capacity= 25,292.70 cfs

10.00' x 10.00' deep channel, n= 0.025
Side Slope Z-value= 6.0 '/' Top Width= 130.00'
Length= 1,105.0' Slope= 0.0398 '/'
Inlet Invert= 44.00', Outlet Invert= 0.00'



Summary for Reach R2:

| | |
|---------------|--|
| Inflow Area = | 2.674 ac, 19.24% Impervious, Inflow Depth = 1.14" for 2-Year event |
| Inflow = | 0.45 cfs @ 12.80 hrs, Volume= 0.254 af |
| Outflow = | 0.45 cfs @ 12.97 hrs, Volume= 0.254 af, Atten= 0%, Lag= 10.2 min |

Routing by Stor-Ind+Trans method, Time Span= 0.00-40.00 hrs, dt= 0.02 hrs
Max. Velocity= 2.49 fps, Min. Travel Time= 4.9 min
Avg. Velocity = 2.49 fps, Avg. Travel Time= 4.9 min

Peak Storage= 133 cf @ 12.89 hrs
Average Depth at Peak Storage= 0.02'
Bank-Full Depth= 10.00' Flow Area= 700.0 sf, Capacity= 25,590.09 cfs

10.00' x 10.00' deep channel, n= 0.025
Side Slope Z-value= 6.0 '/' Top Width= 130.00'
Length= 736.0' Slope= 0.0408 '/'
Inlet Invert= 30.00', Outlet Invert= 0.00'



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Type III 24-hr 2-Year Rainfall=3.10"

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Summary for Pond AP-1: Wetland

Inflow Area = 113.474 ac, 7.52% Impervious, Inflow Depth = 0.92" for 2-Year event
Inflow = 34.45 cfs @ 12.98 hrs, Volume= 8.722 af
Primary = 34.45 cfs @ 12.98 hrs, Volume= 8.722 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.02 hrs

Summary for Pond UDSF - 2:

Inflow Area = 2.674 ac, 19.24% Impervious, Inflow Depth = 1.14" for 2-Year event
Inflow = 4.19 cfs @ 12.00 hrs, Volume= 0.254 af
Outflow = 0.45 cfs @ 12.80 hrs, Volume= 0.254 af, Atten= 89%, Lag= 48.0 min
Primary = 0.45 cfs @ 12.80 hrs, Volume= 0.254 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.02 hrs
Peak Elev= 35.00' @ 12.80 hrs Surf.Area= 4,965 sf Storage= 4,124 cf

Plug-Flow detention time= 97.6 min calculated for 0.254 af (100% of inflow)
Center-of-Mass det. time= 97.6 min (946.2 - 848.6)

| Volume | Invert | Avail.Storage | Storage Description |
|------------------|-------------------|------------------------|--|
| #1 | 33.00' | 15,697 cf | Custom Stage Data (Prismatic) Listed below (Recalc) |
| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
| 33.00 | 790 | 0 | 0 |
| 34.00 | 1,250 | 1,020 | 1,020 |
| 36.00 | 8,688 | 9,938 | 10,958 |
| 36.50 | 10,267 | 4,739 | 15,697 |

| Device | Routing | Invert | Outlet Devices |
|--------|-----------|--------|--|
| #1 | Primary | 33.00' | 4.0" Round Culvert L= 20.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 33.00' / 30.83' S= 0.1085 ' / ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf |
| #2 | Secondary | 35.00' | 4.0' long x 5.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88 |

Primary OutFlow Max=0.45 cfs @ 12.80 hrs HW=35.00' (Free Discharge)
↑1=Culvert (Inlet Controls 0.45 cfs @ 5.15 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=33.00' (Free Discharge)
↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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Summary for Pond UDSF-1:

Inflow Area = 2.681 ac, 23.19% Impervious, Inflow Depth = 1.26" for 2-Year event
 Inflow = 2.17 cfs @ 12.45 hrs, Volume= 0.282 af
 Outflow = 0.48 cfs @ 13.41 hrs, Volume= 0.282 af, Atten= 78%, Lag= 57.5 min
 Primary = 0.48 cfs @ 13.41 hrs, Volume= 0.282 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.02 hrs
 Peak Elev= 49.25' @ 13.41 hrs Surf.Area= 3,879 sf Storage= 4,695 cf

Plug-Flow detention time= 111.9 min calculated for 0.282 af (100% of inflow)
 Center-of-Mass det. time= 112.0 min (982.8 - 870.8)

| Volume | Invert | Avail.Storage | Storage Description |
|------------------|-------------------|------------------------|--|
| #1 | 47.00' | 14,574 cf | Custom Stage Data (Prismatic) Listed below (Recalc) |
| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
| 47.00 | 1,215 | 0 | 0 |
| 48.00 | 1,486 | 1,351 | 1,351 |
| 50.00 | 5,325 | 6,811 | 8,162 |
| 51.00 | 7,500 | 6,413 | 14,574 |

| Device | Routing | Invert | Outlet Devices |
|--------|-----------|--------|--|
| #1 | Primary | 47.00' | 4.0" Round Culvert L= 20.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 47.00' / 44.33' S= 0.1335 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf |
| #2 | Secondary | 49.50' | 6.0' long x 4.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32 |

Primary OutFlow Max=0.48 cfs @ 13.41 hrs HW=49.25' (Free Discharge)
 ↖1=Culvert (Inlet Controls 0.48 cfs @ 5.48 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=47.00' (Free Discharge)
 ↖2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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Time span=0.00-40.00 hrs, dt=0.02 hrs, 2001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment SC-10: Runoff Area=2,674,510 sf 2.71% Impervious Runoff Depth=1.82"
Flow Length=3,105' Tc=55.0 min CN=71 Runoff=52.87 cfs 9.307 af

Subcatchment SC-11: Runoff Area=116,805 sf 23.19% Impervious Runoff Depth=2.46"
Flow Length=772' Tc=30.9 min CN=79 Runoff=4.30 cfs 0.550 af

Subcatchment SC-12: Runoff Area=116,498 sf 19.24% Impervious Runoff Depth=2.29"
Tc=0.0 min CN=77 Runoff=8.66 cfs 0.511 af

Subcatchment SC-13: Runoff Area=2,035,112 sf 12.26% Impervious Runoff Depth=2.13"
Flow Length=5,973' Tc=94.3 min CN=75 Runoff=34.05 cfs 8.289 af

Reach R1: Avg. Flow Depth=0.10' Max Vel=2.46 fps Inflow=2.95 cfs 0.550 af
n=0.025 L=1,105.0' S=0.0398 '/' Capacity=25,292.70 cfs Outflow=2.59 cfs 0.550 af

Reach R2: Avg. Flow Depth=0.11' Max Vel=2.64 fps Inflow=3.07 cfs 0.511 af
n=0.025 L=736.0' S=0.0408 '/' Capacity=25,590.09 cfs Outflow=2.97 cfs 0.511 af

Pond AP-1: Wetland Inflow=82.24 cfs 18.657 af
Primary=82.24 cfs 18.657 af

Pond UDSF - 2: Peak Elev=35.40' Storage=6,439 cf Inflow=8.66 cfs 0.511 af
Primary=0.50 cfs 0.362 af Secondary=2.57 cfs 0.149 af Outflow=3.07 cfs 0.511 af

Pond UDSF-1: Peak Elev=49.80' Storage=7,131 cf Inflow=4.30 cfs 0.550 af
Primary=0.54 cfs 0.418 af Secondary=2.41 cfs 0.132 af Outflow=2.95 cfs 0.550 af

Total Runoff Area = 113.474 ac Runoff Volume = 18.657 af Average Runoff Depth = 1.97"
92.48% Pervious = 104.944 ac 7.52% Impervious = 8.530 ac

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Summary for Subcatchment SC-10:

Runoff = 52.87 cfs @ 12.78 hrs, Volume= 9.307 af, Depth= 1.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Year Rainfall=4.60"

| Area (sf) | CN | Description |
|-----------|----|-----------------------------|
| 290,987 | 79 | 1 acre lots, 20% imp, HSG C |
| 2,369,166 | 70 | Woods, Good, HSG C |
| * 14,357 | 98 | Impervious |
| 2,674,510 | 71 | Weighted Average |
| 2,601,956 | | 97.29% Pervious Area |
| 72,554 | | 2.71% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 21.1 | 100 | 0.0200 | 0.08 | | Sheet Flow, A-B |
| | | | | | Woods: Light underbrush n= 0.400 P2= 3.30" |
| 33.1 | 1,803 | 0.0330 | 0.91 | | Shallow Concentrated Flow, B-C |
| | | | | | Woodland Kv= 5.0 fps |
| 0.8 | 1,202 | 0.0400 | 25.65 | 5,770.86 | Channel Flow, C-D |
| | | | | | Area= 225.0 sf Perim= 71.0' r= 3.17' |
| | | | | | n= 0.025 Earth, clean & winding |
| 55.0 | 3,105 | Total | | | |

Summary for Subcatchment SC-11:

Runoff = 4.30 cfs @ 12.43 hrs, Volume= 0.550 af, Depth= 2.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Year Rainfall=4.60"

| Area (sf) | CN | Description |
|-----------|----|------------------------|
| 89,716 | 73 | Woods, Fair, HSG C |
| * 27,089 | 98 | Impervious |
| 116,805 | 79 | Weighted Average |
| 89,716 | | 76.81% Pervious Area |
| 27,089 | | 23.19% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 21.1 | 100 | 0.0200 | 0.08 | | Sheet Flow, A-B |
| | | | | | Woods: Light underbrush n= 0.400 P2= 3.30" |
| 9.5 | 405 | 0.0200 | 0.71 | | Shallow Concentrated Flow, B-C |
| | | | | | Woodland Kv= 5.0 fps |
| 0.3 | 267 | 0.0400 | 14.10 | 225.65 | Channel Flow, C-D |
| | | | | | Area= 16.0 sf Perim= 15.0' r= 1.07' n= 0.022 |
| 30.9 | 772 | Total | | | |

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Summary for Subcatchment SC-12:

Runoff = 8.66 cfs @ 12.00 hrs, Volume= 0.511 af, Depth= 2.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Year Rainfall=4.60"

| Area (sf) | CN | Description |
|-----------|----|-----------------------------|
| 62,772 | 79 | 1 acre lots, 20% imp, HSG C |
| 43,872 | 70 | Woods, Good, HSG C |
| * 9,854 | 98 | Impervious |
| 116,498 | 77 | Weighted Average |
| 94,090 | | 80.76% Pervious Area |
| 22,408 | | 19.24% Impervious Area |

Summary for Subcatchment SC-13:

Runoff = 34.05 cfs @ 13.30 hrs, Volume= 8.289 af, Depth= 2.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.02 hrs
Type III 24-hr 10-Year Rainfall=4.60"

| Area (sf) | CN | Description |
|-----------|----|-------------------------------|
| 482,464 | 80 | 1/2 acre lots, 25% imp, HSG C |
| 251,755 | 79 | 1 acre lots, 20% imp, HSG C |
| 1,222,332 | 70 | Woods, Good, HSG C |
| * 78,561 | 98 | Impervious |
| 2,035,112 | 75 | Weighted Average |
| 1,785,584 | | 87.74% Pervious Area |
| 249,528 | | 12.26% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 21.1 | 100 | 0.0200 | 0.08 | | Sheet Flow, A-B |
| | | | | | Woods: Light underbrush n= 0.400 P2= 3.30" |
| 71.2 | 3,238 | 0.0230 | 0.76 | | Shallow Concentrated Flow, B-C |
| | | | | | Woodland Kv= 5.0 fps |
| 2.0 | 2,635 | 0.0080 | 21.68 | 30,899.48 | Channel Flow, C-D |
| | | | | | Area= 1,425.0 sf Perim= 173.0' r= 8.24' n= 0.025 |
| 94.3 | 5,973 | Total | | | |

Summary for Reach R1:

Inflow Area = 2.681 ac, 23.19% Impervious, Inflow Depth = 2.46" for 10-Year event
 Inflow = 2.95 cfs @ 12.72 hrs, Volume= 0.550 af
 Outflow = 2.59 cfs @ 12.99 hrs, Volume= 0.550 af, Atten= 12%, Lag= 16.0 min

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Routing by Stor-Ind+Trans method, Time Span= 0.00-40.00 hrs, dt= 0.02 hrs
Max. Velocity= 2.46 fps, Min. Travel Time= 7.5 min
Avg. Velocity = 2.46 fps, Avg. Travel Time= 7.5 min

Peak Storage= 1,163 cf @ 12.86 hrs
Average Depth at Peak Storage= 0.10'
Bank-Full Depth= 10.00' Flow Area= 700.0 sf, Capacity= 25,292.70 cfs

10.00' x 10.00' deep channel, n= 0.025
Side Slope Z-value= 6.0 '/' Top Width= 130.00'
Length= 1,105.0' Slope= 0.0398 '/'
Inlet Invert= 44.00', Outlet Invert= 0.00'



Summary for Reach R2:

| | | |
|---------------|---|-----------------------------------|
| Inflow Area = | 2.674 ac, 19.24% Impervious, Inflow Depth = 2.29" | for 10-Year event |
| Inflow = | 3.07 cfs @ 12.22 hrs, Volume= | 0.511 af |
| Outflow = | 2.97 cfs @ 12.38 hrs, Volume= | 0.511 af, Atten= 3%, Lag= 9.2 min |

Routing by Stor-Ind+Trans method, Time Span= 0.00-40.00 hrs, dt= 0.02 hrs
Max. Velocity= 2.64 fps, Min. Travel Time= 4.6 min
Avg. Velocity = 2.49 fps, Avg. Travel Time= 4.9 min

Peak Storage= 829 cf @ 12.30 hrs
Average Depth at Peak Storage= 0.11'
Bank-Full Depth= 10.00' Flow Area= 700.0 sf, Capacity= 25,590.09 cfs

10.00' x 10.00' deep channel, n= 0.025
Side Slope Z-value= 6.0 '/' Top Width= 130.00'
Length= 736.0' Slope= 0.0408 '/'
Inlet Invert= 30.00', Outlet Invert= 0.00'



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Type III 24-hr 10-Year Rainfall=4.60"

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Summary for Pond AP-1: Wetland

Inflow Area = 113.474 ac, 7.52% Impervious, Inflow Depth = 1.97" for 10-Year event
 Inflow = 82.24 cfs @ 12.90 hrs, Volume= 18.657 af
 Primary = 82.24 cfs @ 12.90 hrs, Volume= 18.657 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.02 hrs

Summary for Pond UDSF - 2:

Inflow Area = 2.674 ac, 19.24% Impervious, Inflow Depth = 2.29" for 10-Year event
 Inflow = 8.66 cfs @ 12.00 hrs, Volume= 0.511 af
 Outflow = 3.07 cfs @ 12.22 hrs, Volume= 0.511 af, Atten= 65%, Lag= 13.3 min
 Primary = 0.50 cfs @ 12.22 hrs, Volume= 0.362 af
 Secondary = 2.57 cfs @ 12.22 hrs, Volume= 0.149 af

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.02 hrs
 Peak Elev= 35.40' @ 12.22 hrs Surf.Area= 6,471 sf Storage= 6,439 cf

Plug-Flow detention time= 80.9 min calculated for 0.511 af (100% of inflow)
 Center-of-Mass det. time= 81.1 min (909.1 - 828.1)

| Volume | Invert | Avail.Storage | Storage Description |
|------------------|-------------------|------------------------|--|
| #1 | 33.00' | 15,697 cf | Custom Stage Data (Prismatic) Listed below (Recalc) |
| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
| 33.00 | 790 | 0 | 0 |
| 34.00 | 1,250 | 1,020 | 1,020 |
| 36.00 | 8,688 | 9,938 | 10,958 |
| 36.50 | 10,267 | 4,739 | 15,697 |

| Device | Routing | Invert | Outlet Devices |
|--------|-----------|--------|--|
| #1 | Primary | 33.00' | 4.0" Round Culvert L= 20.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 33.00' / 30.83' S= 0.1085 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf |
| #2 | Secondary | 35.00' | 4.0' long x 5.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88 |

Primary OutFlow Max=0.50 cfs @ 12.22 hrs HW=35.40' (Free Discharge)
 ↖ **1=Culvert** (Inlet Controls 0.50 cfs @ 5.69 fps)

Secondary OutFlow Max=2.57 cfs @ 12.22 hrs HW=35.40' (Free Discharge)
 ↖ **2=Broad-Crested Rectangular Weir** (Weir Controls 2.57 cfs @ 1.59 fps)

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Summary for Pond UDSF-1:

Inflow Area = 2.681 ac, 23.19% Impervious, Inflow Depth = 2.46" for 10-Year event
 Inflow = 4.30 cfs @ 12.43 hrs, Volume= 0.550 af
 Outflow = 2.95 cfs @ 12.72 hrs, Volume= 0.550 af, Atten= 31%, Lag= 17.2 min
 Primary = 0.54 cfs @ 12.72 hrs, Volume= 0.418 af
 Secondary = 2.41 cfs @ 12.72 hrs, Volume= 0.132 af

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.02 hrs
 Peak Elev= 49.80' @ 12.72 hrs Surf.Area= 4,939 sf Storage= 7,131 cf

Plug-Flow detention time= 105.7 min calculated for 0.549 af (100% of inflow)
 Center-of-Mass det. time= 105.9 min (957.1 - 851.3)

| Volume | Invert | Avail.Storage | Storage Description |
|---------------------|----------------------|---------------------------|--|
| #1 | 47.00' | 14,574 cf | Custom Stage Data (Prismatic) Listed below (Recalc) |
| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
| 47.00 | 1,215 | 0 | 0 |
| 48.00 | 1,486 | 1,351 | 1,351 |
| 50.00 | 5,325 | 6,811 | 8,162 |
| 51.00 | 7,500 | 6,413 | 14,574 |

| Device | Routing | Invert | Outlet Devices |
|--------|-----------|--------|--|
| #1 | Primary | 47.00' | 4.0" Round Culvert L= 20.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 47.00' / 44.33' S= 0.1335 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf |
| #2 | Secondary | 49.50' | 6.0' long x 4.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32 |

Primary OutFlow Max=0.54 cfs @ 12.72 hrs HW=49.80' (Free Discharge)
 ↖1=Culvert (Inlet Controls 0.54 cfs @ 6.17 fps)

Secondary OutFlow Max=2.41 cfs @ 12.72 hrs HW=49.80' (Free Discharge)
 ↖2=Broad-Crested Rectangular Weir (Weir Controls 2.41 cfs @ 1.34 fps)

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Time span=0.00-40.00 hrs, dt=0.02 hrs, 2001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment SC-10: Runoff Area=2,674,510 sf 2.71% Impervious Runoff Depth=2.74"
Flow Length=3,105' Tc=55.0 min CN=71 Runoff=81.12 cfs 14.011 af

Subcatchment SC-11: Runoff Area=116,805 sf 23.19% Impervious Runoff Depth=3.50"
Flow Length=772' Tc=30.9 min CN=79 Runoff=6.13 cfs 0.782 af

Subcatchment SC-12: Runoff Area=116,498 sf 19.24% Impervious Runoff Depth=3.31"
Tc=0.0 min CN=77 Runoff=12.50 cfs 0.737 af

Subcatchment SC-13: Runoff Area=2,035,112 sf 12.26% Impervious Runoff Depth=3.11"
Flow Length=5,973' Tc=94.3 min CN=75 Runoff=50.30 cfs 12.117 af

Reach R1: Avg. Flow Depth=0.14' Max Vel=3.26 fps Inflow=5.36 cfs 0.782 af
n=0.025 L=1,105.0' S=0.0398 '/ Capacity=25,292.70 cfs Outflow=5.08 cfs 0.782 af

Reach R2: Avg. Flow Depth=0.16' Max Vel=3.46 fps Inflow=6.29 cfs 0.737 af
n=0.025 L=736.0' S=0.0408 '/ Capacity=25,590.09 cfs Outflow=5.94 cfs 0.737 af

Pond AP-1: Wetland Inflow=125.40 cfs 27.648 af
Primary=125.40 cfs 27.648 af

Pond UDSF - 2: Peak Elev=35.66' Storage=8,210 cf Inflow=12.50 cfs 0.737 af
Primary=0.52 cfs 0.429 af Secondary=5.76 cfs 0.308 af Outflow=6.29 cfs 0.737 af

Pond UDSF-1: Peak Elev=49.96' Storage=7,940 cf Inflow=6.13 cfs 0.782 af
Primary=0.55 cfs 0.489 af Secondary=4.81 cfs 0.294 af Outflow=5.36 cfs 0.782 af

Total Runoff Area = 113.474 ac Runoff Volume = 27.648 af Average Runoff Depth = 2.92"
92.48% Pervious = 104.944 ac 7.52% Impervious = 8.530 ac

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Summary for Subcatchment SC-10:

Runoff = 81.12 cfs @ 12.77 hrs, Volume= 14.011 af, Depth= 2.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Year Rainfall=5.80"

| Area (sf) | CN | Description |
|-----------|----|-----------------------------|
| 290,987 | 79 | 1 acre lots, 20% imp, HSG C |
| 2,369,166 | 70 | Woods, Good, HSG C |
| * 14,357 | 98 | Impervious |
| 2,674,510 | 71 | Weighted Average |
| 2,601,956 | | 97.29% Pervious Area |
| 72,554 | | 2.71% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|---|
| 21.1 | 100 | 0.0200 | 0.08 | | Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.30" |
| 33.1 | 1,803 | 0.0330 | 0.91 | | Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps |
| 0.8 | 1,202 | 0.0400 | 25.65 | 5,770.86 | Channel Flow, C-D Area= 225.0 sf Perim= 71.0' r= 3.17' n= 0.025 Earth, clean & winding |
| 55.0 | 3,105 | Total | | | |

Summary for Subcatchment SC-11:

Runoff = 6.13 cfs @ 12.42 hrs, Volume= 0.782 af, Depth= 3.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Year Rainfall=5.80"

| Area (sf) | CN | Description |
|-----------|----|------------------------|
| 89,716 | 73 | Woods, Fair, HSG C |
| * 27,089 | 98 | Impervious |
| 116,805 | 79 | Weighted Average |
| 89,716 | | 76.81% Pervious Area |
| 27,089 | | 23.19% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 21.1 | 100 | 0.0200 | 0.08 | | Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.30" |
| 9.5 | 405 | 0.0200 | 0.71 | | Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps |
| 0.3 | 267 | 0.0400 | 14.10 | 225.65 | Channel Flow, C-D Area= 16.0 sf Perim= 15.0' r= 1.07' n= 0.022 |
| 30.9 | 772 | Total | | | |

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Summary for Subcatchment SC-12:

Runoff = 12.50 cfs @ 12.00 hrs, Volume= 0.737 af, Depth= 3.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Year Rainfall=5.80"

| Area (sf) | CN | Description |
|-----------|----|-----------------------------|
| 62,772 | 79 | 1 acre lots, 20% imp, HSG C |
| 43,872 | 70 | Woods, Good, HSG C |
| * 9,854 | 98 | Impervious |
| 116,498 | 77 | Weighted Average |
| 94,090 | | 80.76% Pervious Area |
| 22,408 | | 19.24% Impervious Area |

Summary for Subcatchment SC-13:

Runoff = 50.30 cfs @ 13.30 hrs, Volume= 12.117 af, Depth= 3.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.02 hrs
Type III 24-hr 25-Year Rainfall=5.80"

| Area (sf) | CN | Description |
|-----------|----|-------------------------------|
| 482,464 | 80 | 1/2 acre lots, 25% imp, HSG C |
| 251,755 | 79 | 1 acre lots, 20% imp, HSG C |
| 1,222,332 | 70 | Woods, Good, HSG C |
| * 78,561 | 98 | Impervious |
| 2,035,112 | 75 | Weighted Average |
| 1,785,584 | | 87.74% Pervious Area |
| 249,528 | | 12.26% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|--|
| 21.1 | 100 | 0.0200 | 0.08 | | Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.30" |
| 71.2 | 3,238 | 0.0230 | 0.76 | | Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps |
| 2.0 | 2,635 | 0.0080 | 21.68 | 30,899.48 | Channel Flow, C-D Area= 1,425.0 sf Perim= 173.0' r= 8.24' n= 0.025 |
| 94.3 | 5,973 | Total | | | |

Summary for Reach R1:

Inflow Area = 2.681 ac, 23.19% Impervious, Inflow Depth = 3.50" for 25-Year event
 Inflow = 5.36 cfs @ 12.58 hrs, Volume= 0.782 af
 Outflow = 5.08 cfs @ 12.76 hrs, Volume= 0.782 af, Atten= 5%, Lag= 10.8 min

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Type III 24-hr 25-Year Rainfall=5.80"

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Routing by Stor-Ind+Trans method, Time Span= 0.00-40.00 hrs, dt= 0.02 hrs
Max. Velocity= 3.26 fps, Min. Travel Time= 5.6 min
Avg. Velocity = 2.47 fps, Avg. Travel Time= 7.5 min

Peak Storage= 1,721 cf @ 12.67 hrs
Average Depth at Peak Storage= 0.14'
Bank-Full Depth= 10.00' Flow Area= 700.0 sf, Capacity= 25,292.70 cfs

10.00' x 10.00' deep channel, n= 0.025
Side Slope Z-value= 6.0 '/' Top Width= 130.00'
Length= 1,105.0' Slope= 0.0398 '/'
Inlet Invert= 44.00', Outlet Invert= 0.00'



Summary for Reach R2:

Inflow Area = 2.674 ac, 19.24% Impervious, Inflow Depth = 3.30" for 25-Year event
Inflow = 6.29 cfs @ 12.09 hrs, Volume= 0.737 af
Outflow = 5.94 cfs @ 12.22 hrs, Volume= 0.737 af, Atten= 6%, Lag= 7.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-40.00 hrs, dt= 0.02 hrs
Max. Velocity= 3.46 fps, Min. Travel Time= 3.5 min
Avg. Velocity = 2.50 fps, Avg. Travel Time= 4.9 min

Peak Storage= 1,263 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.16'
Bank-Full Depth= 10.00' Flow Area= 700.0 sf, Capacity= 25,590.09 cfs

10.00' x 10.00' deep channel, n= 0.025
Side Slope Z-value= 6.0 '/' Top Width= 130.00'
Length= 736.0' Slope= 0.0408 '/'
Inlet Invert= 30.00', Outlet Invert= 0.00'



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Type III 24-hr 25-Year Rainfall=5.80"

Printed 4/1/2021

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Summary for Pond AP-1: Wetland

Inflow Area = 113.474 ac, 7.52% Impervious, Inflow Depth = 2.92" for 25-Year event
 Inflow = 125.40 cfs @ 12.88 hrs, Volume= 27.648 af
 Primary = 125.40 cfs @ 12.88 hrs, Volume= 27.648 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.02 hrs

Summary for Pond UDSF - 2:

Inflow Area = 2.674 ac, 19.24% Impervious, Inflow Depth = 3.31" for 25-Year event
 Inflow = 12.50 cfs @ 12.00 hrs, Volume= 0.737 af
 Outflow = 6.29 cfs @ 12.09 hrs, Volume= 0.737 af, Atten= 50%, Lag= 5.3 min
 Primary = 0.52 cfs @ 12.09 hrs, Volume= 0.429 af
 Secondary = 5.76 cfs @ 12.09 hrs, Volume= 0.308 af

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.02 hrs
 Peak Elev= 35.66' @ 12.09 hrs Surf.Area= 7,419 sf Storage= 8,210 cf

Plug-Flow detention time= 70.4 min calculated for 0.736 af (100% of inflow)
 Center-of-Mass det. time= 70.6 min (888.1 - 817.5)

| Volume | Invert | Avail.Storage | Storage Description |
|---------------------|----------------------|---------------------------|--|
| #1 | 33.00' | 15,697 cf | Custom Stage Data (Prismatic) Listed below (Recalc) |
| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
| 33.00 | 790 | 0 | 0 |
| 34.00 | 1,250 | 1,020 | 1,020 |
| 36.00 | 8,688 | 9,938 | 10,958 |
| 36.50 | 10,267 | 4,739 | 15,697 |

| Device | Routing | Invert | Outlet Devices |
|--------|-----------|--------|--|
| #1 | Primary | 33.00' | 4.0" Round Culvert L= 20.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 33.00' / 30.83' S= 0.1085 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf |
| #2 | Secondary | 35.00' | 4.0' long x 5.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88 |

Primary OutFlow Max=0.52 cfs @ 12.09 hrs HW=35.66' (Free Discharge)
 ↖1=Culvert (Inlet Controls 0.52 cfs @ 6.00 fps)

Secondary OutFlow Max=5.75 cfs @ 12.09 hrs HW=35.66' (Free Discharge)
 ↖2=Broad-Crested Rectangular Weir (Weir Controls 5.75 cfs @ 2.19 fps)

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Type III 24-hr 25-Year Rainfall=5.80"

Prepared by Full Version

Printed 4/1/2021

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Summary for Pond UDSF-1:

Inflow Area = 2.681 ac, 23.19% Impervious, Inflow Depth = 3.50" for 25-Year event
 Inflow = 6.13 cfs @ 12.42 hrs, Volume= 0.782 af
 Outflow = 5.36 cfs @ 12.58 hrs, Volume= 0.782 af, Atten= 13%, Lag= 9.5 min
 Primary = 0.55 cfs @ 12.58 hrs, Volume= 0.489 af
 Secondary = 4.81 cfs @ 12.58 hrs, Volume= 0.294 af

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.02 hrs
 Peak Elev= 49.96' @ 12.58 hrs Surf.Area= 5,244 sf Storage= 7,940 cf

Plug-Flow detention time= 90.8 min calculated for 0.782 af (100% of inflow)
 Center-of-Mass det. time= 90.7 min (931.9 - 841.2)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|--------|---------------|--|
| #1 | 47.00' | 14,574 cf | Custom Stage Data (Prismatic) Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|------------------|-------------------|------------------------|------------------------|
| 47.00 | 1,215 | 0 | 0 |
| 48.00 | 1,486 | 1,351 | 1,351 |
| 50.00 | 5,325 | 6,811 | 8,162 |
| 51.00 | 7,500 | 6,413 | 14,574 |

| Device | Routing | Invert | Outlet Devices |
|--------|-----------|--------|--|
| #1 | Primary | 47.00' | 4.0" Round Culvert L= 20.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 47.00' / 44.33' S= 0.1335 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf |
| #2 | Secondary | 49.50' | 6.0' long x 4.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32 |

Primary OutFlow Max=0.55 cfs @ 12.58 hrs HW=49.96' (Free Discharge)
 ↖1=Culvert (Inlet Controls 0.55 cfs @ 6.35 fps)

Secondary OutFlow Max=4.80 cfs @ 12.58 hrs HW=49.96' (Free Discharge)
 ↖2=Broad-Crested Rectangular Weir (Weir Controls 4.80 cfs @ 1.75 fps)

ATTACHMENT 5

ATTACHMENT 6

Developed

Type III 24-hr 25-Year Rainfall=5.80"

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Page 1

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 Primary = 0.55 cfs @ 12.58 hrs, Volume= 0.489 af
 Secondary = 4.81 cfs @ 12.58 hrs, Volume= 0.294 af

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.02 hrs
 Peak Elev= 49.96' @ 12.58 hrs Surf.Area= 5,244 sf Storage= 7,940 cf

Plug-Flow detention time= 90.8 min calculated for 0.782 af (100% of inflow)
 Center-of-Mass det. time= 90.7 min (931.9 - 841.2)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|--------|---------------|--|
| #1 | 47.00' | 14,574 cf | Custom Stage Data (Prismatic) Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|------------------|-------------------|------------------------|------------------------|
| 47.00 | 1,215 | 0 | 0 |
| 48.00 | 1,486 | 1,351 | 1,351 |
| 50.00 | 5,325 | 6,811 | 8,162 |
| 51.00 | 7,500 | 6,413 | 14,574 |

| Device | Routing | Invert | Outlet Devices |
|--------|-----------|--------|--|
| #1 | Primary | 47.00' | 4.0" Round Culvert L= 20.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 47.00' / 44.33' S= 0.1335 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf |
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Primary OutFlow Max=0.55 cfs @ 12.58 hrs HW=49.96' (Free Discharge)
 ↑1=Culvert (Inlet Controls 0.55 cfs @ 6.35 fps)

Secondary OutFlow Max=4.80 cfs @ 12.58 hrs HW=49.96' (Free Discharge)
 ↑2=Broad-Crested Rectangular Weir (Weir Controls 4.80 cfs @ 1.75 fps)

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Type III 24-hr 25-Year Rainfall=5.80"

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Page 1

Summary for Pond UDSF - 2:

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 Peak Elev= 35.66' @ 12.09 hrs Surf.Area= 7,419 sf Storage= 8,210 cf

Plug-Flow detention time= 70.4 min calculated for 0.736 af (100% of inflow)
 Center-of-Mass det. time= 70.6 min (888.1 - 817.5)

| Volume | Invert | Avail.Storage | Storage Description |
|------------------|-------------------|------------------------|--|
| #1 | 33.00' | 15,697 cf | Custom Stage Data (Prismatic) Listed below (Recalc) |
| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
| 33.00 | 790 | 0 | 0 |
| 34.00 | 1,250 | 1,020 | 1,020 |
| 36.00 | 8,688 | 9,938 | 10,958 |
| 36.50 | 10,267 | 4,739 | 15,697 |

| Device | Routing | Invert | Outlet Devices |
|--------|-----------|--------|--|
| #1 | Primary | 33.00' | 4.0" Round Culvert L= 20.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 33.00' / 30.83' S= 0.1085 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf |
| #2 | Secondary | 35.00' | 4.0' long x 5.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88 |

Primary OutFlow Max=0.52 cfs @ 12.09 hrs HW=35.66' (Free Discharge)
 ↖1=Culvert (Inlet Controls 0.52 cfs @ 6.00 fps)

Secondary OutFlow Max=5.75 cfs @ 12.09 hrs HW=35.66' (Free Discharge)
 ↖2=Broad-Crested Rectangular Weir (Weir Controls 5.75 cfs @ 2.19 fps)

ATTACHMENT 7

CULVERT SIZING CALCULATION

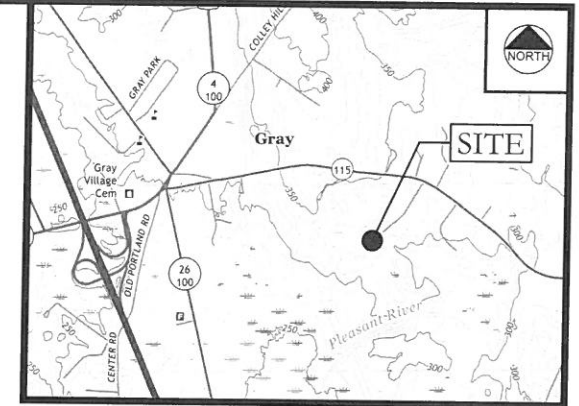
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|-----------------------|--------|--------|-------------|
| 50-Year Peak Flow: | 5.78 | cfs | |
| Culvert Length: | 36 | ft | |
| Slope: | 0.006 | ft/ft | |
| Culvert Nominal Size: | 16 | inches | |
| Culvert Rating: | SDR 21 | | |
| Interior Diameter: | 14.385 | inches | |
| Pipe Capacity: | 6.15 | cfs | @ 5.45 ft/s |

ATTACHMENT 8

STILLWATER PINES SUBDIVISION

MAP: 44 LOT: 32-112

GRAY, MAINE 04039

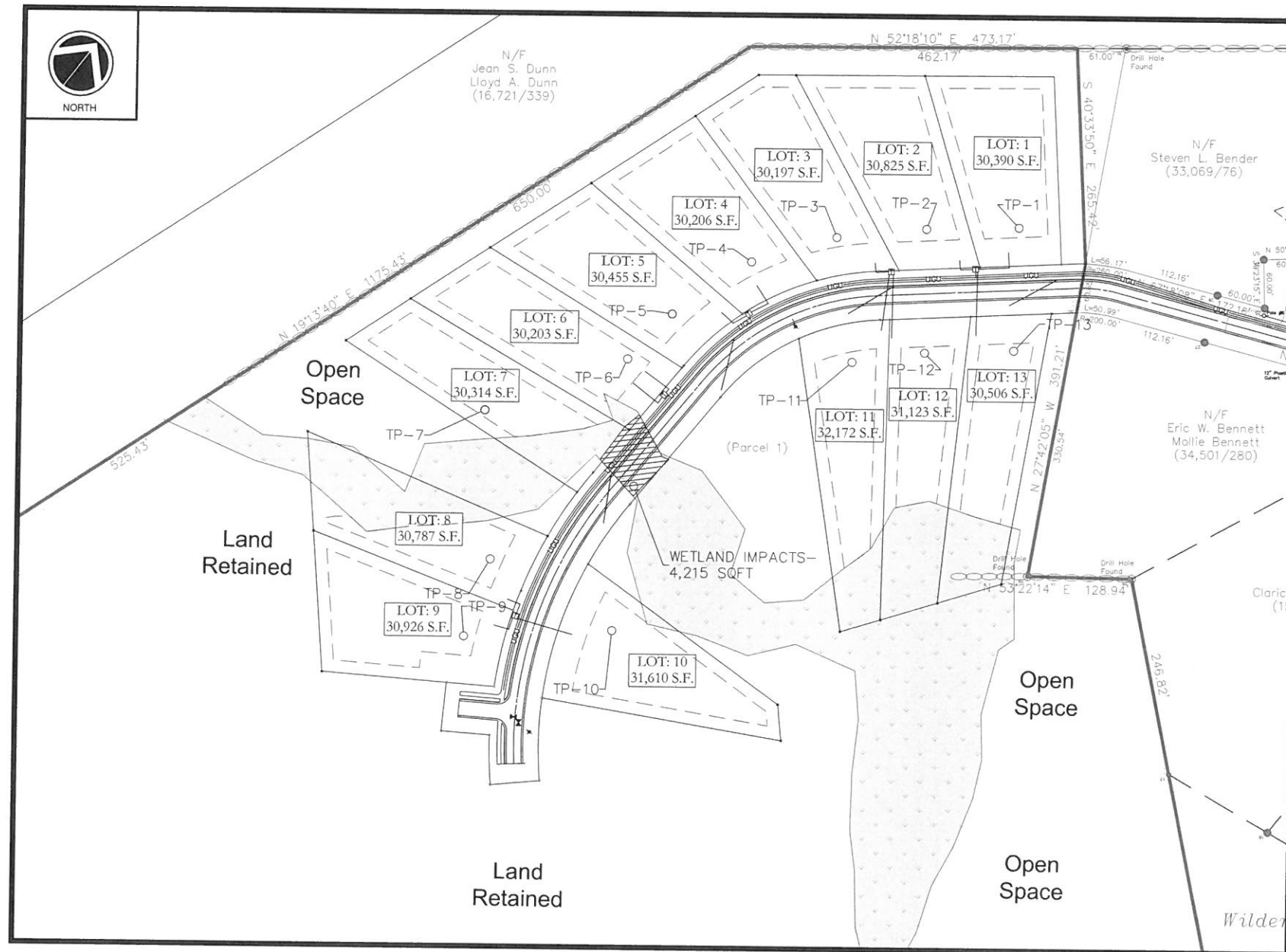


LOCATION MAP

SCALE: 1" = 1500'

OWNER/DEVELOPER:
ALLEN HAMILTON & BEN GROVER
170 SHAKER ROAD
GRAY, MAINE 04039

CIVIL ENGINEER:
 **Atlantic Resource Consultants**
Engineering Strategies and Solutions
541 US ROUTE ONE, SUITE 21
FREEPORT, MAINE 04032



PLAN VIEW

SCALE 1" = 80'

SHEET INDEX

| COVER | SHEET SET COVER |
|-------|---|
| C-100 | OVERALL EXISTING CONDITIONS PLAN |
| C-101 | SUBDIVISION LAYOUT AND UTILITIES PLAN |
| C-102 | EROSION & SEDIMENTATION CONTROL PLAN |
| C-103 | ACCESS IMPROVEMENTS PLAN |
| C-200 | ROADWAY PLAN AND PROFILE I |
| C-201 | ROADWAY PLAN & PROFILE II |
| C-300 | EROSION & SEDIMENTATION CONTROL NOTES |
| C-301 | EROSION & SEDIMENTATION CONTROL DETAILS |
| C-302 | SITE CIVIL DETAILS I |
| C-303 | SITE CIVIL DETAILS II |
| C-304 | SITE CIVIL DETAILS III |
| C-305 | SITE CIVIL DETAILS IV |

SUBMITTED FOR
PRELIMINARY PLAN
REVIEW

ISSUED: JULY 28, 2020

GENERAL NOTES:

- OWNERS OF RECORD ARE BIRCHPOINT PROPERTIES, LLC AND A. H. GROVER, INC. BY DEED RECORDED IN THE CUMBERLAND COUNTY REGISTRY OF DEEDS IN BOOK 36,348 PAGE 165.
- AREA RETAINED FOR FUTURE PHASES CANNOT BE SOLD OR DEVELOPED WITHOUT A SITE LOCATION OF DEVELOPMENT PERMIT FROM THE MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION.
- ALL BEARINGS ARE REFERENCED TO MAGNETIC NORTH OF THE YEAR 1988 AS PER THE PLAN IN REFERENCE 5 AND CALCULATED FROM ANGLES OF AN ACTUAL ON THE GROUND SURVEY.
- THIS PROPERTY IS SHOWN AS LOT 32-112 ON TAX MAP 44 AND IS IN THE MEDIUM DENSITY (MD) AND THE RURAL RESIDENTIAL AND AGRICULTURAL (RRA) ZONING DISTRICTS.
- THIS PLAN REFERENCE A PLAN BY WAYNE WOOD AND CO. GRAY, MAINE 04039. PLAN TITLE: PLAN OF LAND ON HODDOKK DRIVE FOR GRAY, MAINE ALLEN HAMILTON 170 SHAKER ROAD - GRAY, MAINE 04039. APRIL 2020. JOB NO. 22002. BY WTW/MLV. SCALE: 1" = 100'. DRAWING NO. 1 OF 1.
- ALL WETLANDS WILL BE PROTECTED AS FORESTED BUFFERS, INCLUDING SIGNS PROHIBITING ANY CLEARING OR DISTURBANCE BEYOND THE WETLAND LIMITS.
- EACH BUILDABLE LOT IS ALLOCATED 12,000 SQUARE FEET FOR DISTURBANCE.



ZONING SUMMARY:

CURRENT USE: UNDEVELOPED LAND
 PROPOSED USE: SINGLE FAMILY DWELLING (DETACHED)
 ZONE - MD MEDIUM DENSITY DISTRICT (WITH PUBLIC WATER)

| APPLICABLE SPACE AND BULK REGULATIONS | MINIMUM | PROVIDED |
|---------------------------------------|-------------|---------------|
| LOT AREA | 30,000 S.F. | > 30,000 S.F. |
| STREET FRONTAGE | 100' | > 100' |
| CUL-DE-SAC FRONTAGE | N/A | N/A |
| LOT WIDTH | 100' | > 100' |
| PRINCIPAL STRUCTURE | | |
| FRONT SETBACK | 35 FT. | 35 FT. |
| SIDE SETBACK | 15 FT. | 15 FT. |
| REAR SETBACK | 15 FT. | 15 FT. |
| ACCESSORY STRUCTURE | | |
| FRONT SETBACK | 35 FT. | 35 FT. |
| SIDE SETBACK | 15 FT. | 15 FT. |
| REAR SETBACK | 15 FT. | 15 FT. |
| BUILDING COVERAGE | | |
| BUILDING HEIGHT | 20% | <20% |
| ACCESSORY STRUCTURE HEIGHT | 35 FT. | 35 FT. |
| | 35 FT. | 35 FT. |

NET DEVELOPMENT DENSITY CALCULATION:

| | |
|--|----------------|
| TOTAL PARCEL AREA | 2,310,376 S.F. |
| AREAS UNSUITABLE IN NATURAL STATE | 178,727 S.F. |
| - WETLANDS/WATERCOURSES & FLOODPLAIN | 0 S.F. |
| - STEEP SLOPES OVER 30% | 0 S.F. |
| AREAS REMOVED FOR: | 127,488 S.F. |
| - ACCESS ROAD/O.W. | 0 S.F. |
| - EASEMENTS | 2,004,161 S.F. |
| REMAINING LAND | |
| MINIMUM LOT AREA IN MEDIUM DENSITY DISTRICT WITH PUBLIC WATER= 30,000 S.F. | |
| NET DEVELOPMENT DENSITY CALCULATION: 2,004,161/30,000 = 50 UNITS | |
| PROPOSED LOTS = 13 UNITS | |

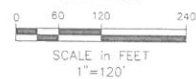
LEGEND

| EXISTING | DESCRIPTION | PROPOSED |
|----------|----------------------|----------|
| --- | BOUNDARY LINE/R.O.W. | --- |
| --- | ABUTTER LINE/R.O.W. | --- |
| --- | SETBACK | --- |
| --- | EASEMENT | --- |
| --- | IRON PIPE/ROD | --- |
| --- | BUILDING | --- |
| --- | WETLAND | --- |
| --- | SIGN | --- |
| --- | EDGE PAVEMENT | --- |
| --- | EDGE CONCRETE | --- |
| --- | PAVEMENT PAINT | --- |
| --- | GRAVEL ROAD | --- |
| --- | CURLINE | --- |
| --- | TREELINE | --- |
| --- | CONTOURS | --- |
| --- | SPOT GRADE | --- |
| --- | STORMWATER FLOW | --- |
| --- | STORM DRAIN | --- |
| --- | WATER MAIN/SERVICE | --- |
| --- | UNDERGROUND UTILITY | --- |
| --- | UTILITY | --- |
| --- | OVERHEAD UTILITY | --- |
| --- | UTILITY POLE | --- |
| --- | TRANSFORMER | --- |

MAP: 44 LOT: 32-112
67.67 Acres
GRAY, MAINE

Total Lot Area
 2,947,455 sq.ft.
 67.66 Acres

SCALE



| REV | DATE | DESCRIPTION |
|-----|------|-------------|
| | | |
| | | |

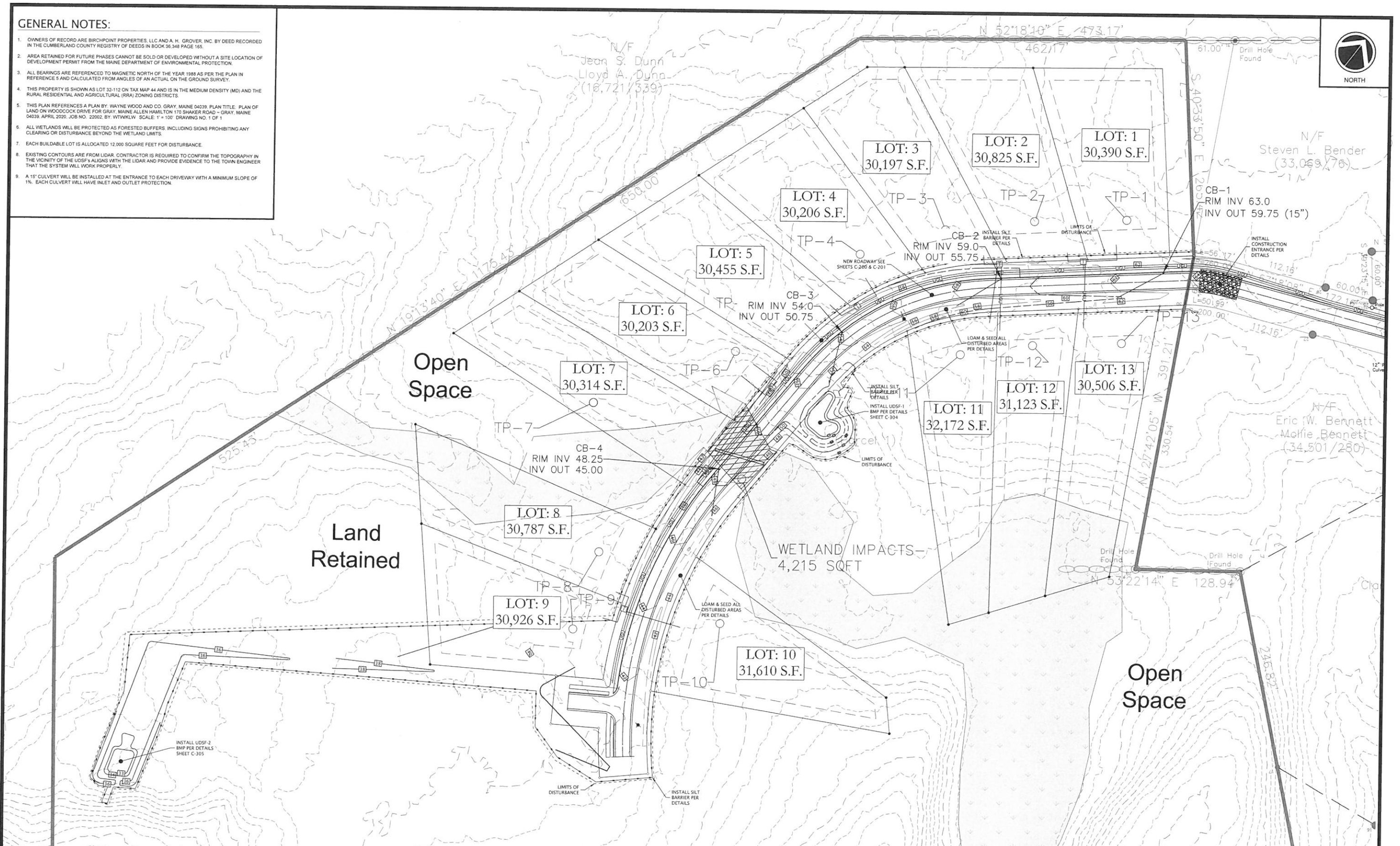
STILLWATER PINES SUBDIVISION
 WOODCOCK DRIVE, MAINE 04261
OVERALL EXISTING
CONDITIONS PLAN
 ALLEN HAMILTON & BEN GROVER
 170 SHAKER ROAD
 GRAY, MAINE 04039

Atlantic Resource Consultants
 541 US Route One
 Freeport, ME 04032
 Tel: 207.869.9050

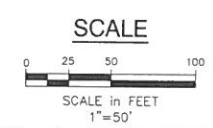
| | |
|-------------------|--------------------|
| DRAWN: MPV/CEB | DATE: JANUARY 2021 |
| DESIGNED: CEB/MPV | SCALE: 1" = 120' |
| CHECKED: JAV/CEB | JOB NO. 20-012 |
| FILE NAME: | |
| SHEET: C-100 | |

GENERAL NOTES:

- OWNERS OF RECORD ARE BIRCHPOINT PROPERTIES, LLC AND A. H. GROVER, INC. BY DEED RECORDED IN THE CUMBERLAND COUNTY REGISTRY OF DEEDS IN BOOK 36,348 PAGE 165.
- AREA RETAINED FOR FUTURE PHASES CANNOT BE SOLD OR DEVELOPED WITHOUT A SITE LOCATION OF DEVELOPMENT PERMIT FROM THE MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION.
- ALL BEARINGS ARE REFERENCED TO MAGNETIC NORTH OF THE YEAR 1988 AS PER THE PLAN IN REFERENCE 5 AND CALCULATED FROM ANGLES OF AN ACTUAL ON THE GROUND SURVEY.
- THIS PROPERTY IS SHOWN AS LOT 32-112 ON TAX MAP 44 AND IS IN THE MEDIUM DENSITY (MD) AND THE RURAL RESIDENTIAL AND AGRICULTURAL (RRA) ZONING DISTRICTS.
- THIS PLAN REFERENCES A PLAN BY WAYNE WOOD AND CO. GRAY, MAINE 04039. PLAN TITLE: PLAN OF LAND ON WOODCOCK DRIVE FOR GRAY, MAINE ALLEN HAMILTON 170 SHAKER ROAD - GRAY, MAINE 04039. APRIL 2020. JOB NO. 22002. BY: WTW/KLW. SCALE: 1" = 100'. DRAWING NO. 1 OF 1.
- ALL WETLANDS WILL BE PROTECTED AS FORESTED BUFFERS, INCLUDING SIGNS PROHIBITING ANY CLEARING OR DISTURBANCE BEYOND THE WETLAND LIMITS.
- EACH BUILDABLE LOT IS ALLOCATED 12,000 SQUARE FEET FOR DISTURBANCE.
- EXISTING CONTOURS ARE FROM LIDAR. CONTRACTOR IS REQUIRED TO CONFIRM THE TOPOGRAPHY IN THE VICINITY OF THE UDSF'S ALIGNS WITH THE LIDAR AND PROVIDE EVIDENCE TO THE TOWN ENGINEER THAT THE SYSTEM WILL WORK PROPERLY.
- A 15" CULVERT WILL BE INSTALLED AT THE ENTRANCE TO EACH DRIVEWAY WITH A MINIMUM SLOPE OF 1%. EACH CULVERT WILL HAVE INLET AND OUTLET PROTECTION.



**SUBMITTED FOR
PRELIMINARY PLAN
REVIEW**



| REV | DATE | DESCRIPTION | REVISIONS |
|-----|------|-------------|-----------|
| | | | |
| | | | |

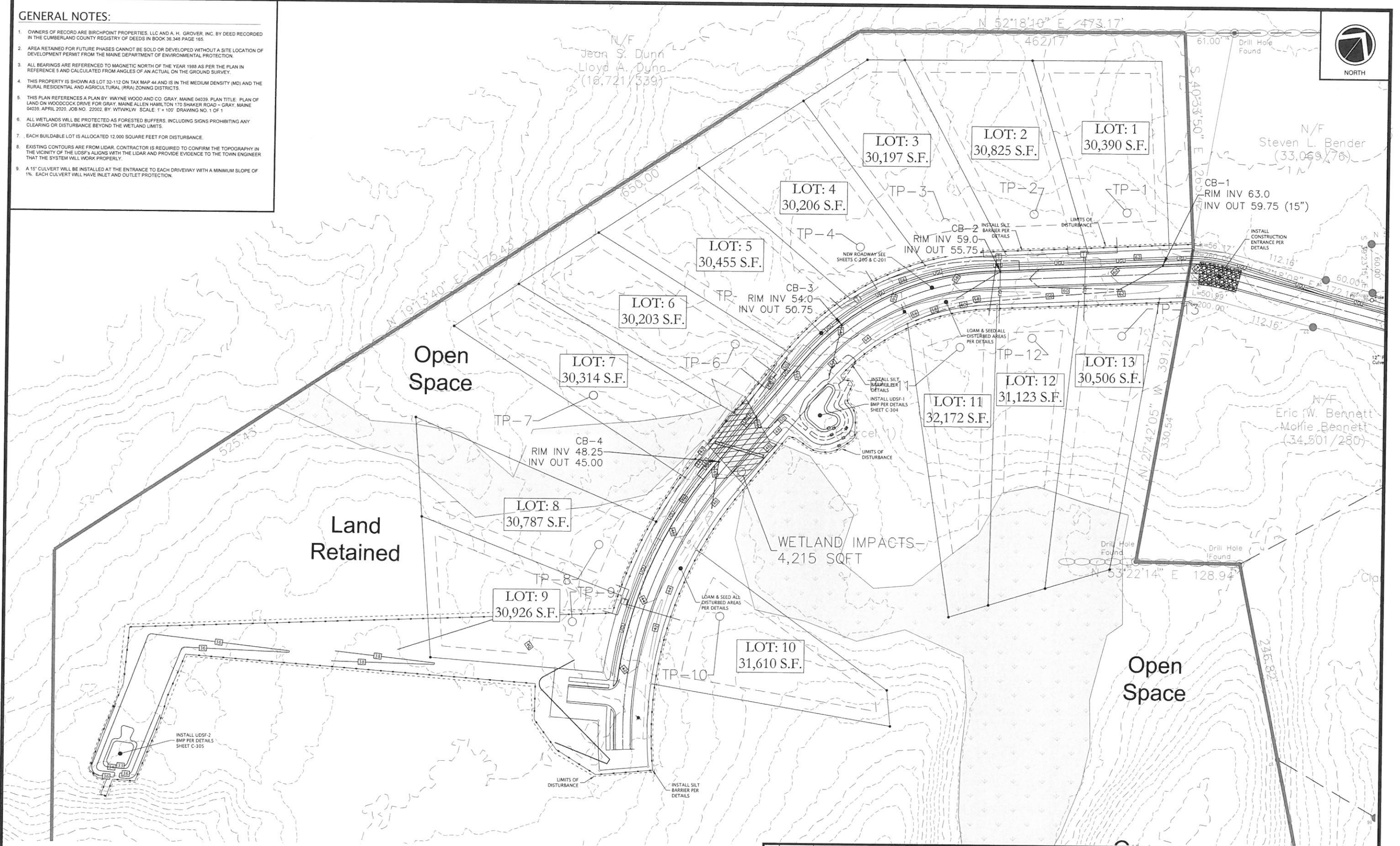
STILLWATER PINES SUBDIVISION
WOODCOCK DRIVE, MAINE 04261
**SITE GRADING &
EROSION CONTROL PLAN**
ALLEN HAMILTON & BEN GROVER
170 SHAKER ROAD
GRAY, MAINE 04039

Atlantic Resource Consultants
541 US Route One
Freeport, ME 04032
Tel: 207.869.9050

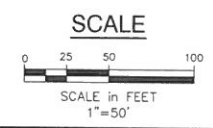
DRAWN: MPV/CEB DATE: JANUARY 2021
DESIGNED: CEB/MPV SCALE: 1" = 50'
CHECKED: JAV/CEB JOB NO. 20-012
FILE NAME:
SHEET: C-102

GENERAL NOTES:

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- EACH BUILDABLE LOT IS ALLOCATED 12,000 SQUARE FEET FOR DISTURBANCE.
- EXISTING CONTOURS ARE FROM LIDAR. CONTRACTOR IS REQUIRED TO CONFIRM THE TOPOGRAPHY IN THE VICINITY OF THE UDSF'S ALIGNS WITH THE LIDAR AND PROVIDE EVIDENCE TO THE TOWN ENGINEER THAT THE SYSTEM WILL WORK PROPERLY.
- A 15" CULVERT WILL BE INSTALLED AT THE ENTRANCE TO EACH DRIVEWAY WITH A MINIMUM SLOPE OF 1%. EACH CULVERT WILL HAVE INLET AND OUTLET PROTECTION.



SUBMITTED FOR
PRELIMINARY PLAN
REVIEW



| REV | DATE | DESCRIPTION | REVISIONS |
|-----|------|-------------|-----------|
| | | | |
| | | | |

STILLWATER PINES SUBDIVISION
WOODCOCK DRIVE, MAINE 04261

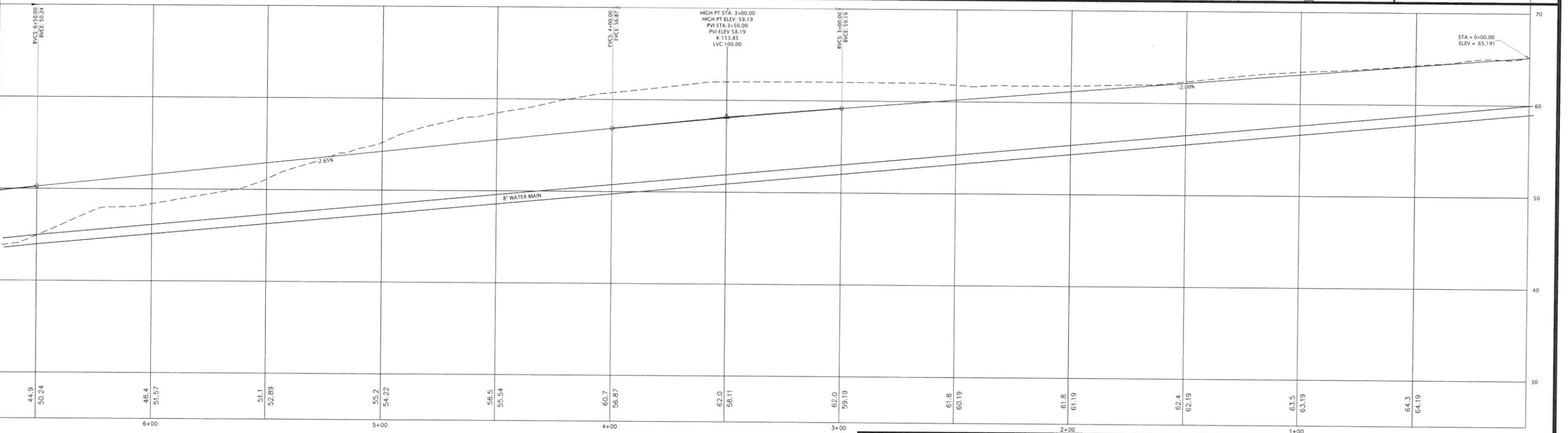
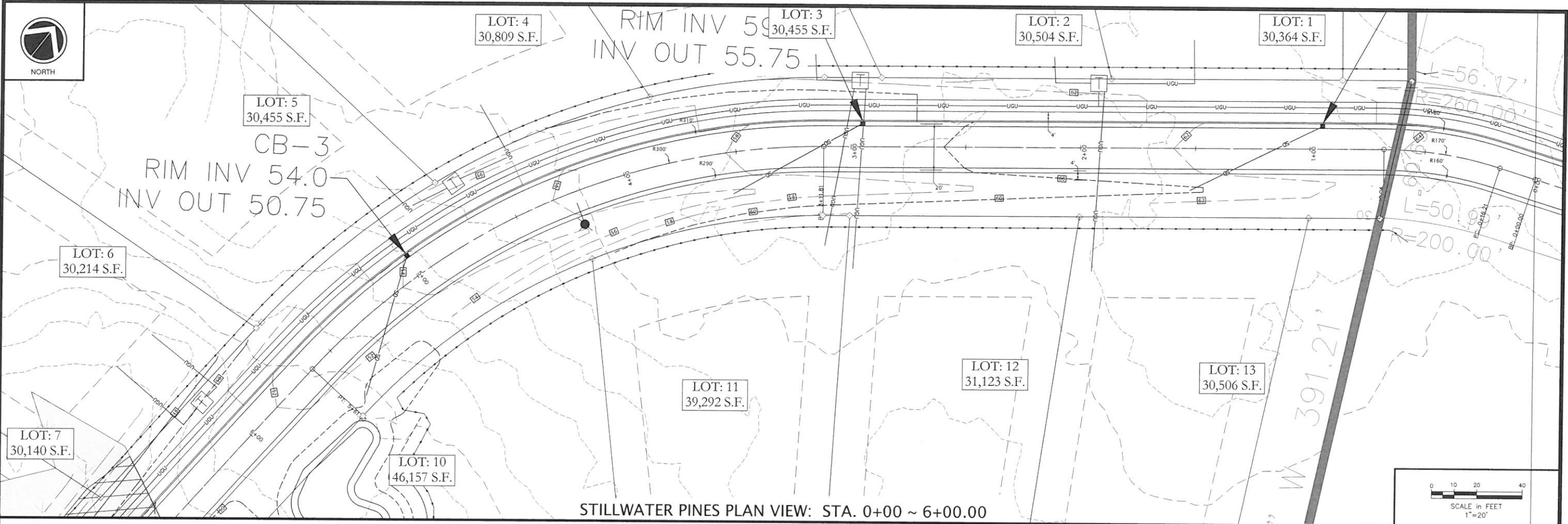
**SITE GRADING &
EROSION CONTROL PLAN**

ALLEN HAMILTON & BEN GROVER
170 SHAKER ROAD
GRAY, MAINE 04039

Atlantic Resource Consultants
541 US Route One
Freeport, ME 04032
Tel: 207.869.9050

DRAWN: MPV/CBB DATE: JANUARY 2021
DESIGNED: CBB/MPV SCALE: 1" = 50'
CHECKED: JAV/CBB JOB NO. 20-012
FILE NAME:
SHEET: C-102

S:\20-012 Woodcock Drive Subdivision\Drawings\20-012 BASE.dwg



SCALE
 VERTICAL - 1" = 5'
 HORIZONTAL - 1" = 20'

STILLWATER PINES PROFILE VIEW: STA. 0+00 ~ 6+00.00

SUBMITTED FOR
 PRELIMINARY PLAN
 REVIEW

| REV | DATE | DESCRIPTION |
|-----|------|-------------|
| | | |
| | | |

STILLWATER PINES SUBDIVISION
 WOODCOCK DRIVE, MAINE 04261
 ROADWAY
 PLAN & PROFILE I
 ALLEN HAMILTON & BEN GROVER
 170 SHAKER ROAD
 GRAY, MAINE 04039

Atlantic Resource Consultants
 541 US Route One
 Freeport, ME 04032
 Tel: 207.869.9050

DRAWN: MPV/CB
 DESIGNED: CEB/MPV
 CHECKED: JAV/CB
 FILE NAME:
 SHEET: C-200

DATE: JANUARY 2021
 SCALE: AS SHOWN
 JOB NO. 20-012

S:\20-012 Woodcock Drive Subdivision\Drawings\20-012 BASE.dwg



NORTH

LOT: 8
30,955 S.F.

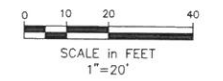
LOT: 13
30,506 S.F.

LOT: 10
46,157 S.F.

LOT: 9
31,610 S.F.

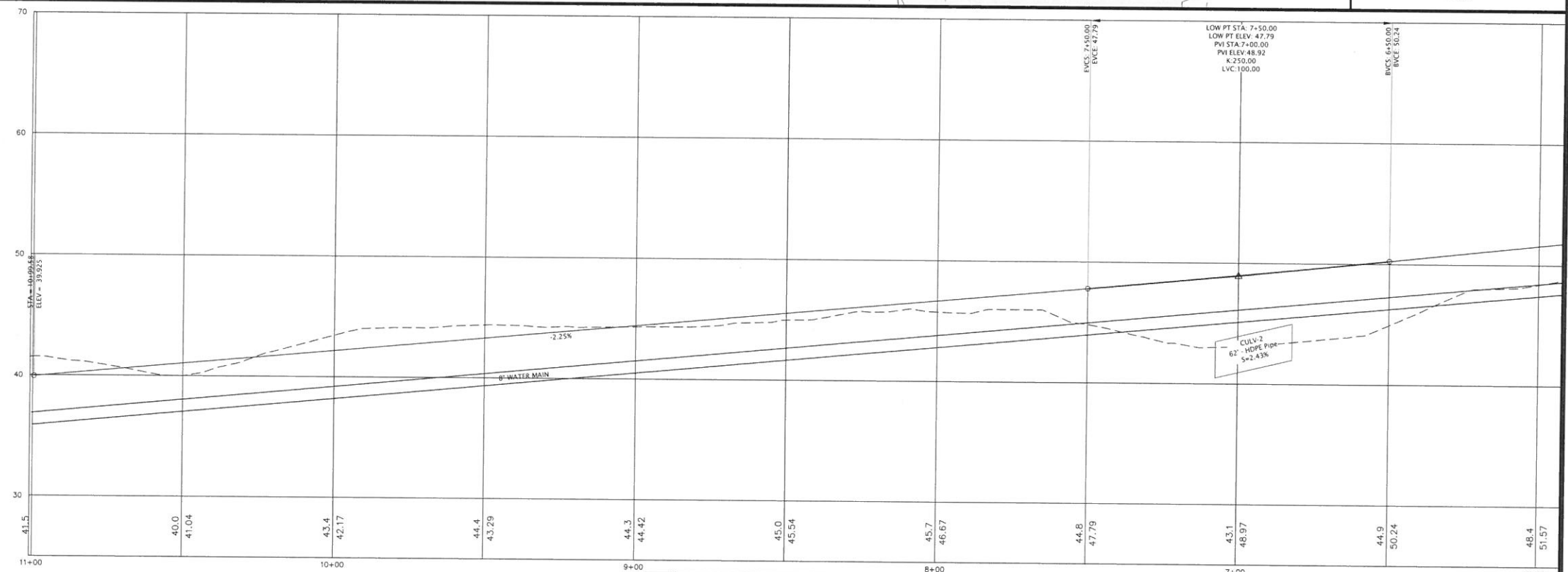
LAND
RETAINED.

STILLWATER PINES PLAN VIEW: STA. 6+00 ~ 11+00.95



LEGEND

| EXISTING | DESCRIPTION | PROPOSED |
|----------|----------------------|----------|
| | BOUNDARY LINE/R.O.W. | |
| | ABUTTER LINE/R.O.W. | |
| | SETBACK | |
| | EASEMENT | |
| | IRON PIPE/ROD | |
| | BUILDING | |
| | WETLAND | |
| | SIGN | |
| | EDGE PAVEMENT | |
| | EDGE CONCRETE | |
| | PAVEMENT PAINT | |
| | GRAVEL ROAD | |
| | CURBLINE | |
| | TREELINE | |
| | CONTOURS | |
| | SPOT GRADE | |
| | STORMWATER FLOW | |
| | STORM DRAIN | |
| | WATER MAIN/SERVICE | |
| | UNDERGROUND UTILITY | |
| | OVERHEAD UTILITY | |
| | UTILITY POLE | |
| | TRANSFORMER | |



SUBMITTED FOR
PRELIMINARY PLAN
REVIEW

SCALE

VERTICAL - 1" = 5'
HORIZONTAL - 1" = 20'

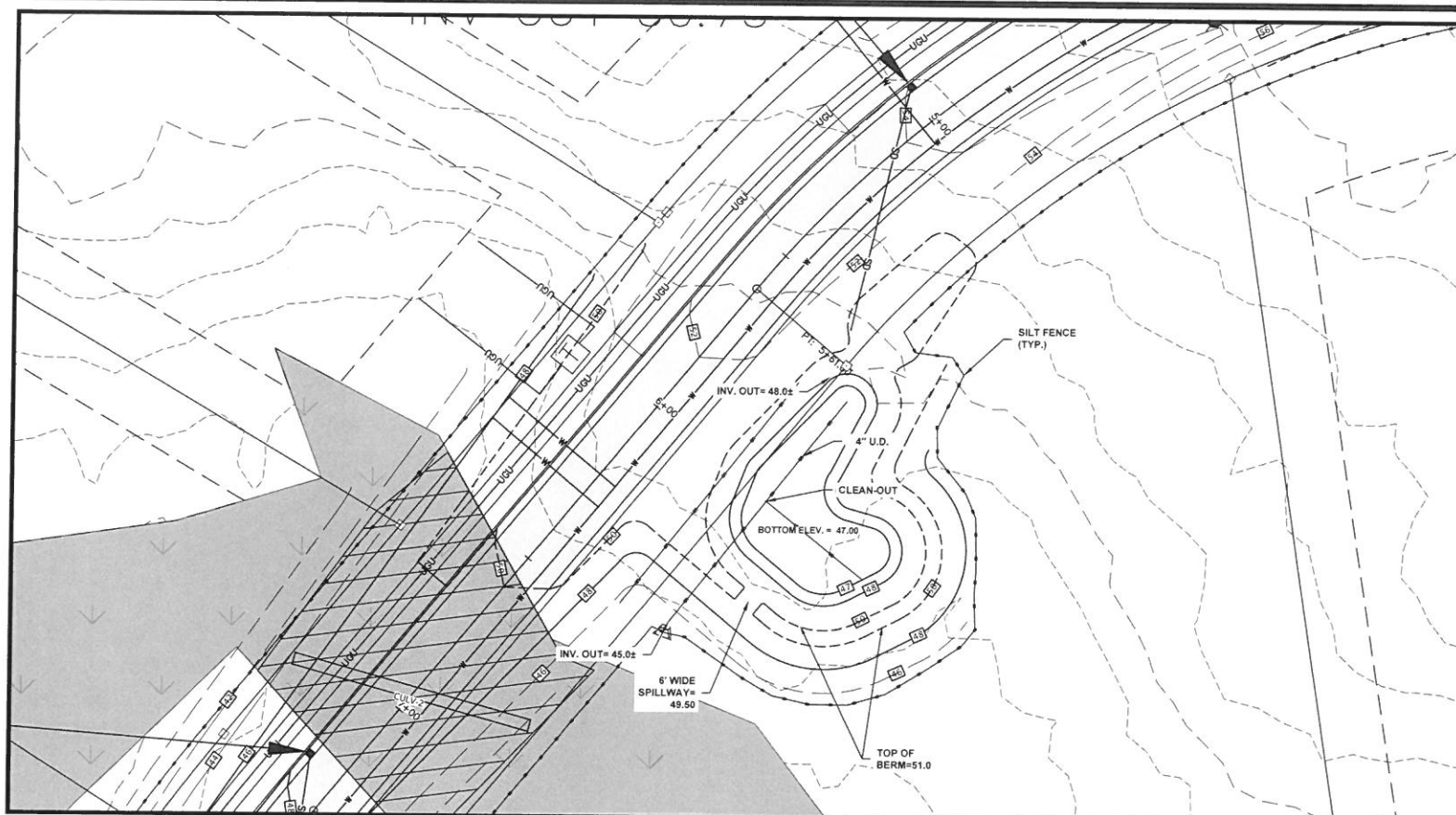
STILLWATER PINES PROFILE VIEW: STA. 6+00 ~ 11+00.95

| REV | DATE | DESCRIPTION | REVISIONS |
|-----|------|-------------|-----------|
| | | | |
| | | | |

STILLWATER PINES SUBDIVISION
WOODCOCK DRIVE, MAINE 04261
ROADWAY
PLAN & PROFILE II
ALLEN HAMILTON & BEN GROVER
170 SHAKER ROAD
GRAY, MAINE 04039

Atlantic Resource Consultants
541 US Route One
Freeport, ME 04032
Tel: 207.869.9050
DRAWN: MPV/CGB DATE: JANUARY 2021
DESIGNED: CEB/MPV SCALE: AS SHOWN
CHECKED: JAV/CGB JOB NO. 20-012
FILE NAME:
SHEET: C-201

S:\20-012 Woodcock Drive Subdivision\Drawings\20-012 BASE.dwg



PLAN VIEW: UNDERDRAINED SOIL FILTER BASIN UDSF-1
SCALE 1" = 20'

BIORETENTION AND UNDERDRAINED FILTER NOTES

1. FILTER SOIL MATERIAL FOR UNDERDRAINED SOIL FILTERS AND BIORETENTION AREAS SHALL COMPRISE A TOPSOIL LAYER AND A LAYER OF LOAMY COARSE SAND AS FOLLOWS:
 - A. TOPSOIL LAYER SHALL BE SIX INCHES DEEP AND SHALL COMPRISE USDA SANDY LOAM TOPSOIL WITH 5-8% HUMIFIED ORGANIC MATTER AND MINIMAL CLAY CONTENT (<5%). ORGANIC MATTER MAY BE ADDED TO PROVIDE SUFFICIENT NUTRIENT CONTENT TO SUPPORT PLANTINGS PROVIDED THAT THE TEXTURE REMAINS AS SPECIFIED.
 - B. THE LOAMY COARSE SAND LAYER SHALL BE 12 INCHES DEEP. THE PREFERRED MATERIAL SHALL HAVE A CLAY CONTENT <2% BUT HAVE BETWEEN 8% AND 15% PASSING THE #200 SIEVE, 15-40% PASSING THE #60, 70-100% PASSING THE #20, AND 85-100% PASSING THE #10.
 - C. FILTER SOIL MATERIAL SHALL BE PLACED IN 12-INCH LIFTS USING LGP EQUIPMENT OR BY HAND. LGP EQUIPMENT SHALL EXERT A GROUND PRESSURE OF LESS THAN 5 PSI, AS STATED IN THE EQUIPMENT SPECIFICATION FROM THE MANUFACTURER. MATERIAL SHALL BE GRADED TO PROVIDE AN EVEN SURFACE, SEEDED AND COVERED WITH EROSION CONTROL BLANKET.
 - D. UNDERDRAIN GRAVELS SHALL MEET THE SPECIFICATION REQUIREMENTS GIVE IN MDOT SPECIFICATION 703.22.
 - E. SOIL FILTER MEDIA SHALL NOT BE INSTALLED UNTIL ALL UPSTREAM CONTRIBUTING AREAS HAVE BEEN FULLY STABILIZED.
2. IMPERMEABLE LINERS FOR BIORETENTION CELLS, AND UNDERDRAINED FILTERS SHALL BE A STRING REINFORCED POLYETHYLENE MEMBRANE WITH A MINIMUM THICKNESS OF 24 MILS - BTL-24 BY BEND TARP AND LINER OR APPROVED EQUAL.

Underdrained Soil Filter

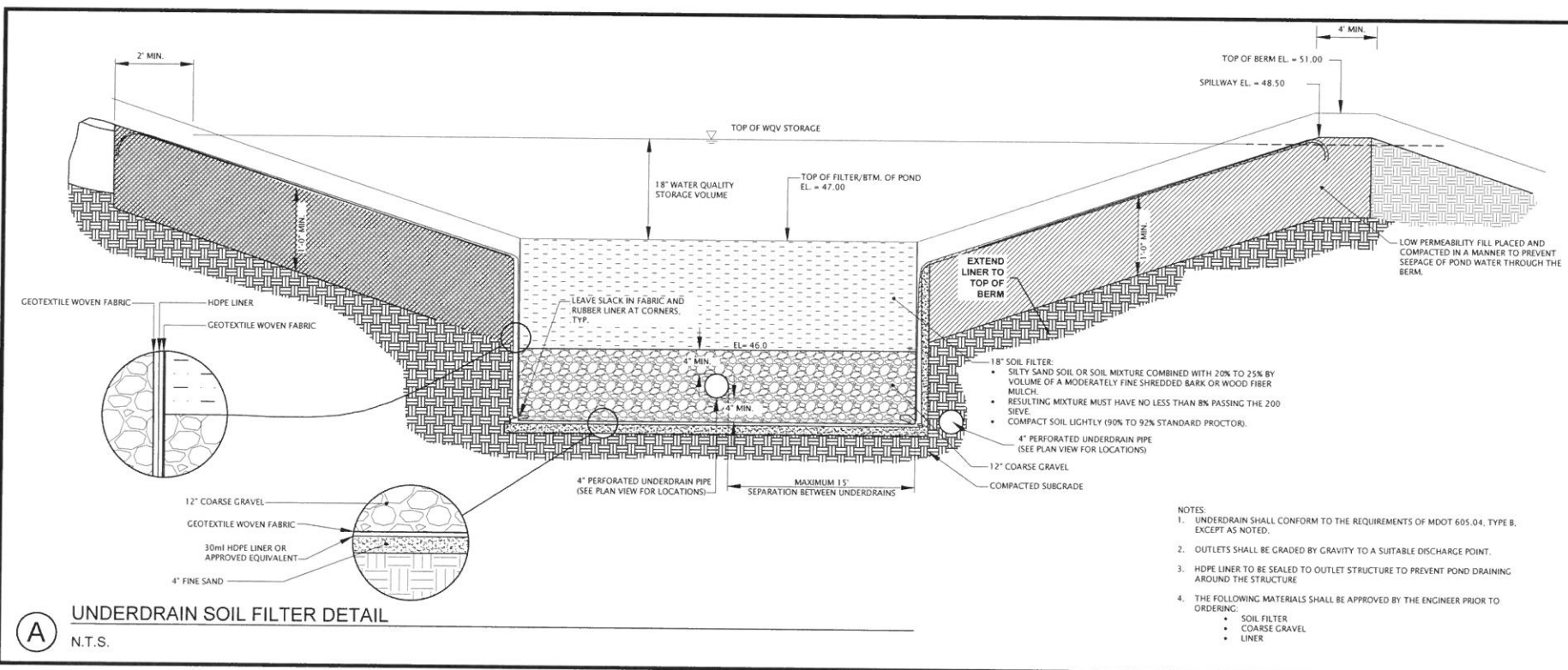
Construction Sequence: The filter media must not be installed until the area that drains to the filter has been permanently stabilized with pavement or other structure, 90% vegetation cover, or other permanent stabilization unless the runoff from the contributing drainage area is diverted around the filter until stabilization is complete.

- Construction Oversight: Inspection by a professional engineer will occur at a minimum:
- o After the preliminary construction of the filter grades and once the underdrain pipes are installed but not backfilled,
 - o After the drainage layer is constructed and prior to the installation of the filter media,
 - o After the filter media has been installed and seeded,
 - o After one year to inspect health of the vegetation and make corrections,
 - o After the system has been brought up to final grade.

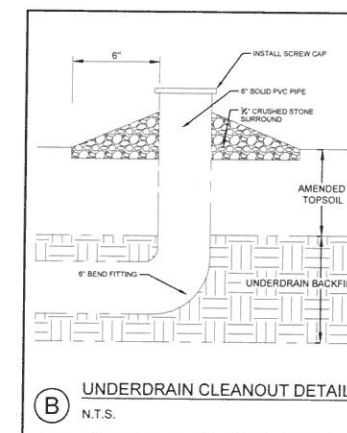
All the material used for the construction of the filter media must be confirmed as suitable by the design engineer. Testing must be done by a certified laboratory to show that they are passing DEP specifications.

- Testing and Submittals: The contractor shall identify the location of the source of each component of the filter media. All results of field and laboratory testing shall be submitted to the project engineer for confirmation. The Contractor shall:
- o Select samples for sampling of each type of material to be blended for the mixed filter media and samples of the underdrain bedding material. Samples must be composite of three different locations (Grabs) from the stockpile or pit face. Sample size required will be determined by the testing laboratory.
 - o Perform a sieve analysis conforming to STM C136 (Standard Testing Method for Sieve Analysis of fine and Coarse Aggregates 1996A) on each type of the sample material. The resulting soil filter media mixture must have 8% to 12% by weight passing the # 2100 sieve, a clay content of less than 2% (determined hydrometer grain size analysis) and have 10% dry weight of organic matter.
 - o Perform a permeability test on the soil filter media mixture conforming to ASTM D2434 with the mixture compacted to 90-92% of maximum dry density based on ASTM D698.

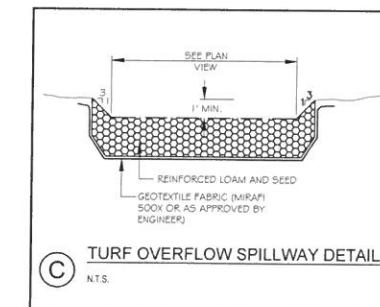
Within 30 days of completion of the underdrained filter basin, the applicant must submit a log of inspection reports detailing the items inspected, photos taken, and the dates of each inspection to the Bureau of Land Resources for review.



A UNDERDRAIN SOIL FILTER DETAIL
N.T.S.



B UNDERDRAIN CLEANOUT DETAIL
N.T.S.



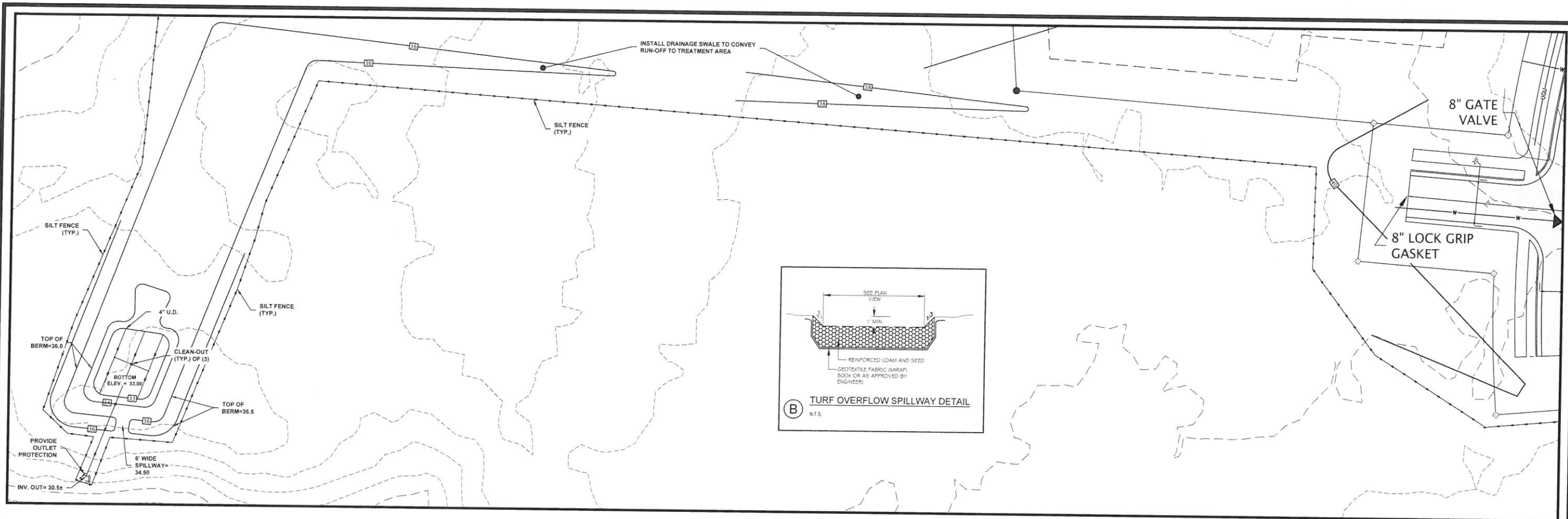
C TURF OVERFLOW SPILLWAY DETAIL
N.T.S.

- NOTES:
1. UNDERDRAIN SHALL CONFORM TO THE REQUIREMENTS OF MDOT 605.04, TYPE B, EXCEPT AS NOTED.
 2. OUTLETS SHALL BE GRADED BY GRAVITY TO A SUITABLE DISCHARGE POINT.
 3. HDPE LINER TO BE SEALED TO OUTLET STRUCTURE TO PREVENT POND DRAINING AROUND THE STRUCTURE.
 4. THE FOLLOWING MATERIALS SHALL BE APPROVED BY THE ENGINEER PRIOR TO ORDERING:
 - SOIL FILTER
 - COARSE GRAVEL
 - LINER

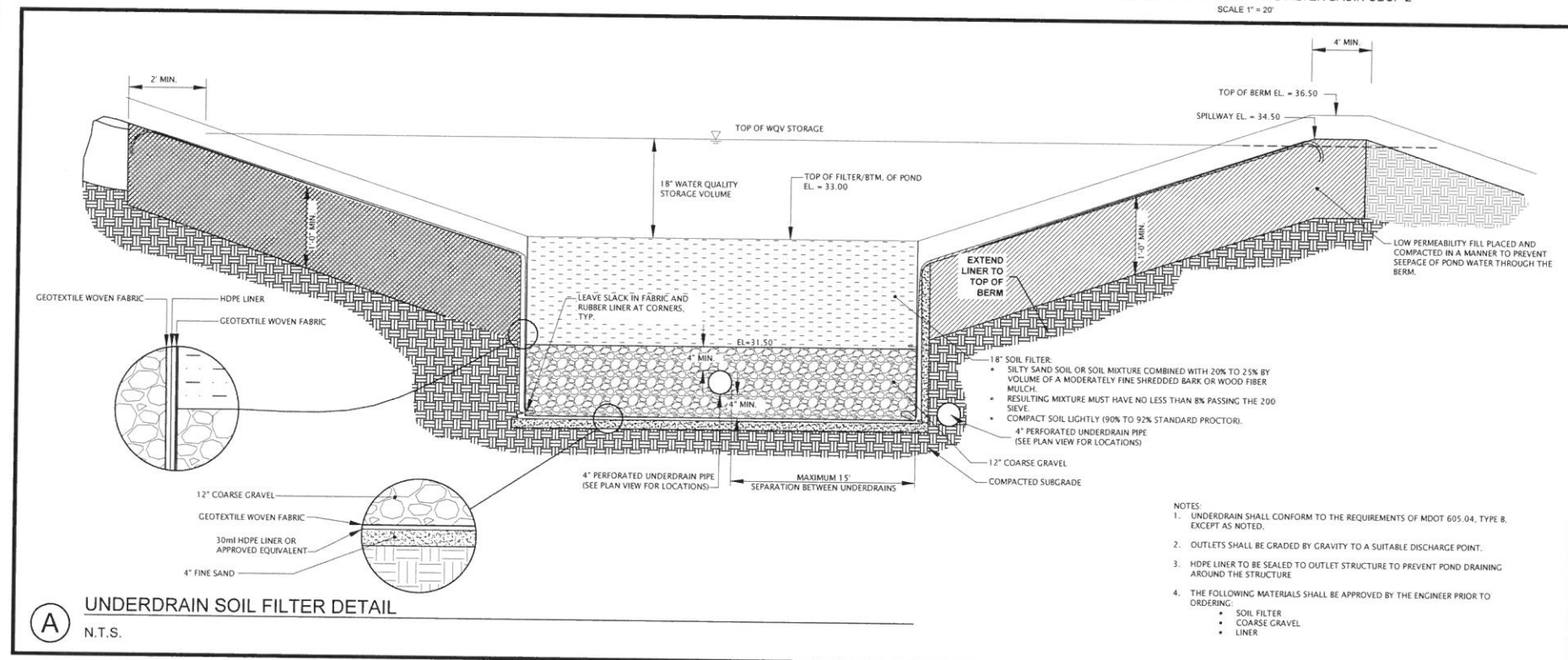
SUBMITTED FOR
PRELIMINARY PLAN
REVIEW

| | | | |
|---|--|--|--------------------|
| STILLWATER PINES SUBDIVISION WOODCOCK DRIVE, MAINE 04261 | | Atlantic Resource Consultants 541 US Route One Freeport, ME 04032 Tel: 207.869.9050 | |
| SITE CIVIL DETAILS III | | DRAWN: MPV/CGB | DATE: JANUARY 2021 |
| ALLEN HAMILTON & BEN GROVER 170 SHAKER ROAD GRAY, MAINE 04039 | | DESIGNED: CEB/MPV | SCALE: AS SHOWN |
| REV. DATE DESCRIPTION REVISIONS | | CHECKED: JAV/CGB | JOB NO. 20-012 |
| | | FILE NAME: | |
| | | SHEET: C-304 | |

S 120-012 Woodcock Drive Subdivision Drawings 20-012 DETAILS.dwg



PLAN VIEW: UNDERDRAINED SOIL FILTER BASIN UDSF-2
SCALE 1" = 20'



BIORETENTION AND UNDERDRAINED FILTER NOTES

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Underdrained Soil Filter

Construction Sequence: The filter media must not be installed until the area that drains to the filter has been permanently stabilized with pavement or other structure, 90% vegetation cover, or other permanent stabilization unless the runoff from the contributing drainage area is diverted around the filter until stabilization is complete.

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Within 30 days of completion of the underdrained filter basin, the applicant must submit a log of inspection reports detailing the items inspected, photos taken, and the dates of each inspection to the Bureau of Land Resources for review.

SUBMITTED FOR
PRELIMINARY PLAN
REVIEW

| | | | |
|---|------|--|-----------|
| STILLWATER PINES SUBDIVISION WOODCOCK DRIVE, MAINE 04261 | | Atlantic Resource Consultants 541 US Route One Freeport, ME 04032 Tel: 207.869.9050 | |
| SITE CIVIL DETAILS IV | | DRAWN: MPV/CBB DESIGNED: CBB/MPV CHECKED: JAV/CBB FILE NAME: SHEET: C-305 | |
| ALLEN HAMILTON & BEN GROVER 170 SHAKER ROAD GRAY, MAINE 04039 | | DATE: JANUARY 2021 SCALE: AS SHOWN JOB NO. 20-012 | |
| REV | DATE | DESCRIPTION | REVISIONS |

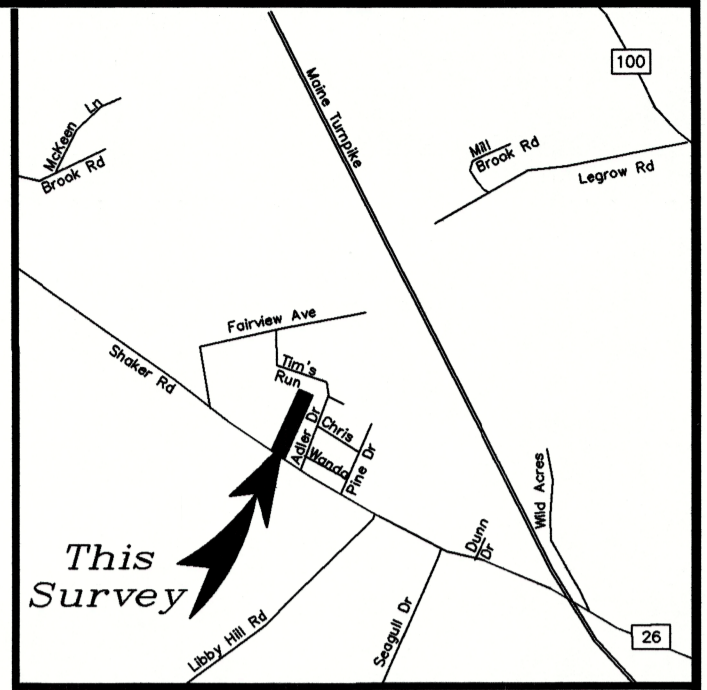
Approved by the Town of Gray Planning Board:

Signed: _____

Date: _____

NET RESIDENTIAL ACERAGE CALCULATIONS

| | |
|---|----------------|
| Original Subdivision Area | 566,129 sq.ft. |
| Wetland Area | 0 sq.ft. |
| Slopes over 25% | 63,995 sq.ft. |
| Poor Soils | 0 sq.ft. |
| Special Flood Hazard Zones | 0 sq.ft. |
| 10% For Roads | 50,213 sq.ft. |
| Net Residential Acreage | 451,921 sq.ft. |
| 451,921 sq.ft./ 80,000 sq.ft. per lot = 5.65 lots allowed | |



VICINITY MAP

PLAN REFERENCES

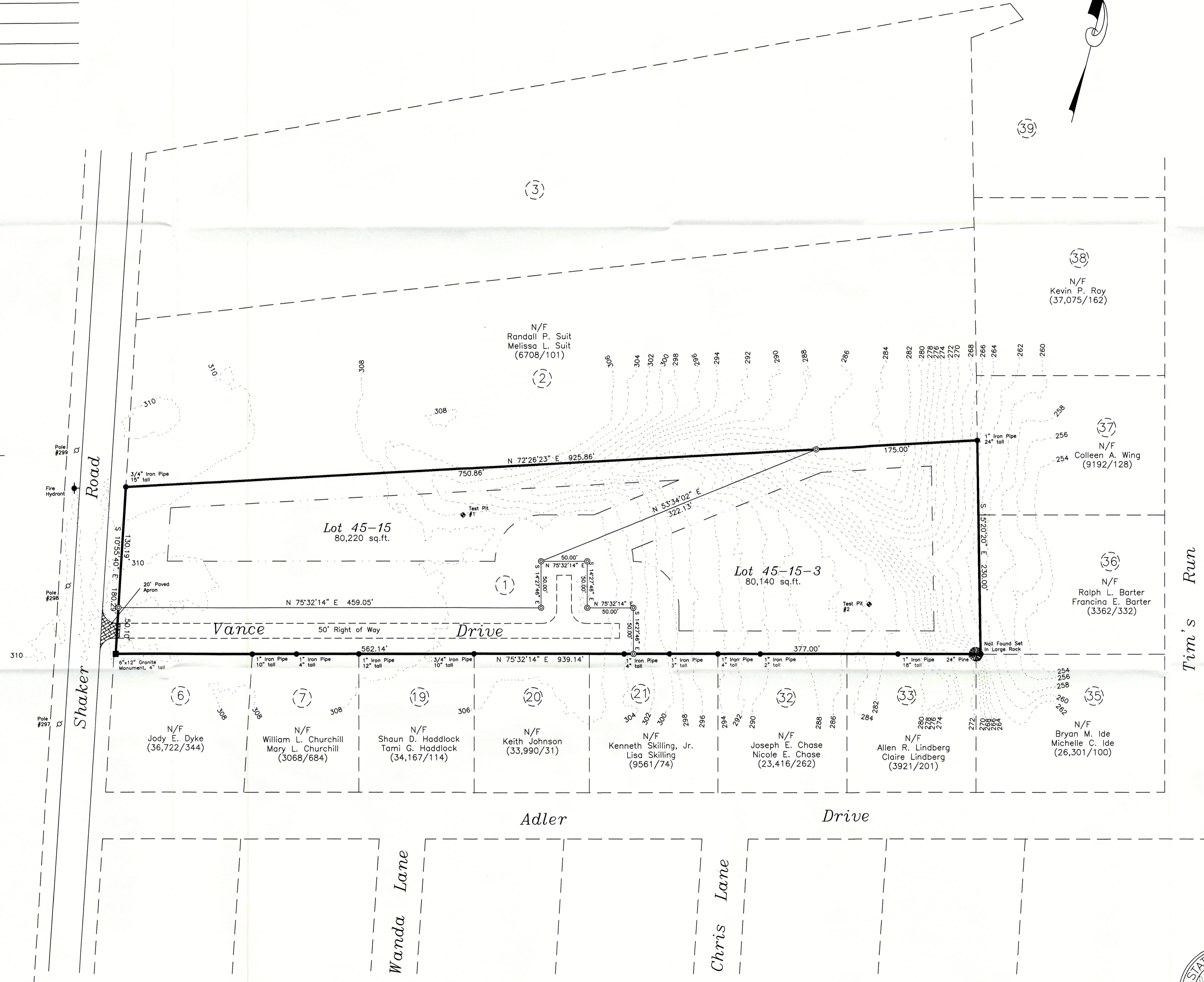
- "Amended Subdivision Plan ~ Lot 3 ~ Earle & Nancy Wilson Subdivision on Shaker Road, Gray, Maine for Owner of Record Cynthia A. Fitzpatrick" dated December 2011 by Wayne T. Wood & Co recorded in Plan Book 212 page 40.
- "Standard Boundary Survey and Division of Property for Scott Liberty, Route 26, Gray, Maine" dated April 1987 by John D. Palmiter.
- "Subdivision Plan For Earle F. and Nancy C. Wilson, Route 26, Gray, Maine" dated July 1984 by John D. Palmiter recorded in Plan Book 144 page 15.
- "Frederick W. Adler Evergreen Grove Lots 36- 47" by H.I. & E.C. Jordan dated 6/22/71 recorded in Plan Book 92 page 6.
- "Plan of Property in Gray, Maine made for Frederick W. Adler Evergreen Grove Lots 21- 34" by H.I. & E.C. Jordan dated 9-26-1967 recorded in Plan Book 75 page 34.
- "Gray, Maine ~ Frederick W. Adler Evergreen Grove Lots 13 -26" dated 12=17=1964 recorded in Plan Book 68 page 30.
- "Gray, Maine Evergreen Grove ~ Frederick W. Adler dated 1-20-1964 added Lots 7-13 May 18, 1964 recorded in Plan Book 37 page 34.

NOTES

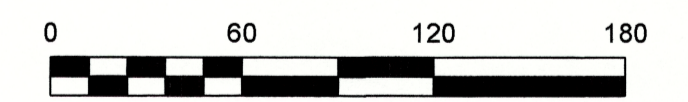
- Owner of record is Ralph Vance Development by deed recorded in the Cumberland County Registry of Deeds in book 37889 page 60.
- This parcel is shown on the Town of Gray Tax Map 20 as Lot 45-15.
- All bearings are referenced to Magnetic North of the year 1984 as per the plan in reference 3 and calculated from angles of an actual on the ground survey.
- This property is in the (RRA) Rural Residential & Agriculture Zone.
- There is no Special Flooding zone as defined by FEMA on this site.
- This plan amends the plan in reference 3 by dividing Lot 1 into 2 lots.
- The soils and wetlands information on this plan is from Mark Cenci Geologic, Inc. There are no wetlands on this site.
- The Elevation contours shown on this plan are for the MEGIS website for LiDAR contours.
- These lots will be served by public water.
- Vance Drive as shown on this plan will be constructed to the Minor Rural Street standards per table 401.13.16-2.
- The sight distance for Vance Drive exceeds 800 feet in both directions.
- There are no areas in or around this amendment that are listed on the National Register of Historic Places or by the Maine Historic Preservation Commission.
- There are no areas in or around this amendment that are listed by the Maine Department of Inland Fisheries & Wildlife as in there Beginnings with Habitat Project.
- This project is expected to generate an additional 19 traffic trips per day.

LEGEND

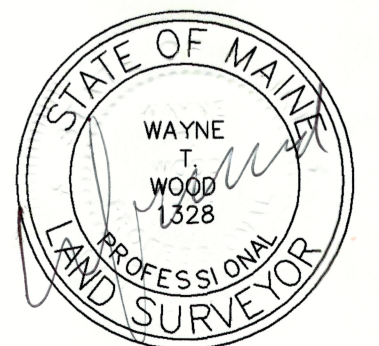
- Iron Pipe or Pin Found
- Granite Monument Found
- ⊙ 5/8" Capped Rebar (#1328) set
- ⊕ Utility Pole
- ◆ Soils Test Pit
- N/F Now or Formerly of (6708/101)
- ⑥ CCRD Deed Reference
- ⑥ Original Lot Number
- Building Setback Line
- ⋯ Elevation Contour Line
- ◆ Fire Hydrant



Tim's Run



State of Maine, Cumberland ss.
Registry of Deeds
Received _____ 21 _____
at _____ and recorded in
Plan Book _____ Page _____
Attest: _____
Register

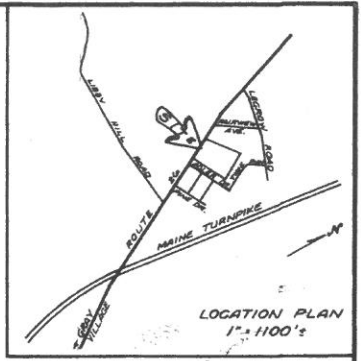


Amended Lot 1
Earle & Nancy Wilson Subdivision
on
Shaker Road
Gray, Maine
For Record Owner
Ralph Vance Development
590 Roosevelt Trail ~ Windham, ME 04092

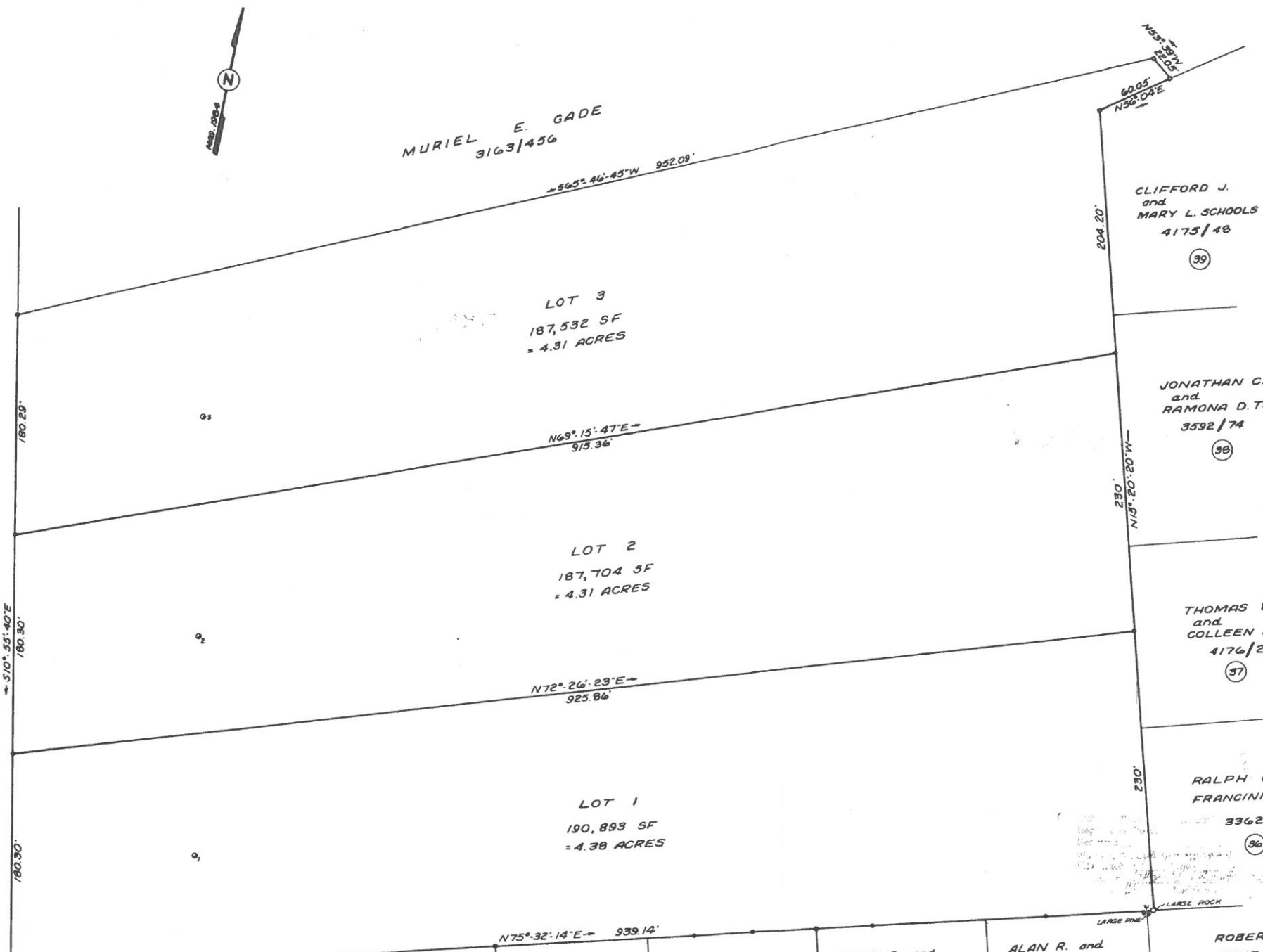
WAYNE T. WOOD & CO.
Gray, Maine 04039
Drawn By: WTW/KW
Scale: 1"=60'
Checked By: WTW
Field Crew: JW/BR

30 Wood Drive
(207)657-3330
Date: March 2021
Job No. 221035

144/15



NORWAY
ROUTE 26
GRAY VILLAGE



RICHARD T. and SHIRLEY M. WALLS
4383/261

WILLIAM L. and MARY L. CHURCHILL
3068/684

HARRY and GLORIA KERR
3008/208

RONALD S. and PATRICIA B. HARWOOD
4276/268

CHARLES H. WHISTON
6173/51

FRANK G. and GLENNIS M. SKILLINGS
3107/748

ALAN R. and CLAIRE R. LINDBERG
3921/201

ROBERT and ANNE M. DROUIN
6355/227

CUMB. CO. REG. OF DEEDS
PLAN BOOK 67 - PAGE 34

EVERGREEN GROVE

CUMB. CO. REG. OF DEEDS - PLAN BOOK 68 - PAGE 30
75 - 34

State of Maine, Cumberland ss.
Registry of Deeds
Received August 23, 1984
at 3:00 P.M. and recorded in
Plan Book 68, Page 30
Attest *John D. Palmiter*

- LEGEND
- IRON PIPE FOUND
- STONE MARKER FOUND
- GRANITE MONUMENT SET
- IRON PIPE SET
- SOIL TEST PIT
- E.T.W. EDGE OF TRAVELLED WAY

RECORD OWNERS:
EARLE F. AND NANCY C. WILSON
P.O. BOX 297
GRAY PARK - GRAY, MAINE

DEED REFERENCE:
BOOK 3324 - PAGE 83
CUMBERLAND COUNTY REGISTRY
OF DEEDS.

ZONING:
MD - MIXED DENSITY
PUBLIC WATER SUPPLY
PRIVATE SEWAGE DISPOSAL SYSTEMS
TOTAL AREA - LOTS 1-3 (366,129 SF - 8.300 AC)

APPROVED BY TOWN OF GRAY
PLANNING BOARD

Janet Wilbur
James Wilbur
Wayne Pollock

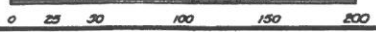


John D. Palmiter

DATE August 9, 1984

SUBDIVISION PLAN
FOR EARLE F. AND
NANCY C. WILSON
ROUTE 26
GRAY, MAINE

JULY 1984 SCALE: 1"=30'
SURVEYED BY:
JOHN D. PALMITER
R.L.S.#1057



144/15

March 11, 2021

TO: Gray Town Council
Nate Rudy, Town Manager

FROM: Doug Webster, Community Development

RE: Proposed Zoning Changes for proposed Solar Array
100 +/- acre parcel located at end of Hillcrest Drive

Introduction

In accordance with policy direction provided by the Town Council at the 2-2-21 meeting and input from OAC, I have prepared this memo detailing the proposed changes to the Town's Zoning Ordinance (Chapter 402).

I have divided the proposed changes into two categories: (1) Changes to Chapter 402 that are not in 402.8.10, and, (2) Changes to Section 402.8.10 (Commercial Solar Energy System Overlay District).

Under each category, I have numbered the proposed changes to enable referencing for discussion purposes.

Proposed Changes to Zoning Ordinance (Chapter 402) not in 402.8.10:

1. Changes to definitions (402.2.2) related to Ground-Mounted Solar Energy Systems:

- a. Add new Def of "**Commercial Solar Energy Production Site**" (CSEPS): A component of a Commercial Solar Energy System that includes the maximum cumulative area of the solar array footprint, typically fenced for security purposes, which commonly includes any of the following: ground-mounted solar arrays, transformers, inverters, and buildings housing equipment functionally necessary for the solar energy system.
- b. Add new Def of Small CSEPS's: **CSEPS's less than .5 of an Acre**
- c. Change current Def of Medium from 2,000-16,999 SF to **CSEPS's .5-20 Acres**
- d. Current Def of Large from 17K SF+ to **CSEPS's 20-40 acres**

2. Additional parcel added to existing Commercial Solar Energy Systems Overlay District:

- a. Amend the Town's existing Zoning Map (402.3.1) to show the entirety of the 100-acre parcel at end of Hillcrest Drive (Tax Map 36, lot 33-1) in the Commercial Solar Energy System Overlay District (CSESOD).

3. Amend Footnote "D" in Table 402.5.4.A addressing impervious cover measurement: Add to end of existing language "provided that the maximum size of any individual solar array panel is thirty (30) square feet when measured horizontally".
4. Amend Footnote "F" in Table 402.5.4.B by adding the following language to the end of the existing footnote: "provided that the maximum size of any individual solar array panel is thirty (30) square feet when measured horizontally".
5. Amend both Footnotes "G" in Table 402.5.4.B by adding the following underlined language: Lot coverage in RRA can be increased to 30% for any portion of a parcel lots in the Commercial Solar Energy Overlay District and only for Commercial medium and large-scale ground-mounted solar energy system installations provided that the maximum size of any individual solar array panel is thirty (30) square feet when measured horizontally. Planning Board approval subject to the requirements of Section 402.8.4.L for recharge protection is required.
6. Re-word Footnote "H" in Table 402.5.4.B addressing setbacks in RRA as follows (underlined portions proposed to be added): Setbacks for ground-mounted solar panels and arrays less than 15 feet in height on parcels within five-hundred (500) feet of a publicly owned road shall be a minimum of twenty-five (25) feet from any lot line. Setbacks for Commercial Solar Energy Production sites on parcels at least five-hundred (500) feet from a publicly owned road shall be a minimum of fifty (50) feet or one-hundred (100) feet from any property line as established in Section 402.8.10 of this Ordinance.

Proposed Changes to standards to existing Section of CSESOD (402.8.10):

1. New "B": **Required Information & Submittals:** In addition to submittals required in Articles 9 and 10 of this Ordinance, the applicant shall submit the following information to the Planning Board as part of the application. The Planning Board shall have the authority to determine if one (1) or more of the following are not applicable.
 - a. A description of the owner of the system, the operator if different, and detail of qualifications and technical ability of the owner or operator to construct, maintain, and operate the facility.
 - b. If the operator is leasing the site, a copy of the lease agreement (minus financial compensation) and any and all related easements clearly outlining the relationship of the respective parties, inclusive of the rights and responsibilities of the operator, landowner, and any other responsible party with regard to the large-scale solar energy system and the term or duration of the agreement. Further, the operator shall identify any and all agreements or obligations of the landowner to the operator regarding any premises that are not specifically subject to the lease agreement, but which the operator has certain rights to use as part of the operation of the solar energy system.

- c. A description of the anticipated quantity of energy to be produced and to whom it will be sold.
- d. A copy of the agreement and schematic details of the connection arrangement with the transmission system that clearly indicates who is responsible for various requirements and how such will be operated and maintained.
- e. A basic description of the number, size, and configuration of panels to be installed, including make, model, and associated major system components.
- f. A construction plan and timeline that identifies all known contractors, site control, when the project construction will commence and the anticipated date that the system will be on-line.
- g. An operations and maintenance plan for the projected operating life of the system.
- h. An emergency management plan that identifies potential hazards and the response to such hazards. The applicant shall submit a copy of the emergency management plan to Gray Fire Rescue and include any of their comments.
- i. Evidence of financial capacity to construct, operate, and decommission the proposed facility including the abandonment guarantee as required in this Ordinance.
- j. Identification of methods that the operator shall use to manage on-site vegetation.
- k. Identification of how the applicant shall address required buffering as required in this Ordinance.
- l. Submission of a decommissioning plan that addresses applicable standards.
- m. Evidence that the owner or operator has applied for any and all non-municipal permits that may be required for the installation of the proposed system; for example, a stormwater management permit from the Maine Department of Environmental Protection (MeDEP).

NOTE: Re-lettering of current Ordinance standards is necessary from current 402.8.10.B to end of Section 402.8.10.

2. Existing 402.8.10.C.1, after "height", insert the following: "for parcels located adjacent to or entirely within five-hundred (500) feet of a publicly owned road(s)".

3. New 402.8.10.C.2: Minimum setbacks for any large scale Commercial Solar Energy Production Site with ground-mounted solar panels and arrays less than fifteen (15) feet in height on parcels located in an RRA District that are at least five-hundred (500) feet from a publicly owned road shall be determined by the following standards:

- a. The minimum setback for any Commercial Solar Energy Production Site shall be one-hundred (100) feet from any of the following based upon conditions existing when the application is filed and deemed sufficiently complete by Town Staff to be placed on a Planning Board agenda for review:
 - 1. Any parcel in a Village Center (VC) or Village Center Proper (VCP) Zoning District

2. Any abutting parcel utilized primarily for residential purposes that is less than double the minimum lot area required for the respective Zoning District
 3. Any abutting parcel that contains a structure utilized primarily for residential purposes located less than fifty (50) feet from the property line of the parcel proposed for the ground-mounted solar panels and/or arrays.
- b. Provided that none of the conditions specified in 402.8.10.C.2.a exist, the Planning Board shall have the authority to require the setback for the ground-mounted solar energy system project site to a minimum of fifty (50) feet after reviewing the following elements:
1. Any input received from abutting property owners after being duly-notified as part of the Town's review
 2. Location of any structure(s) on abutting parcels in relationship the project site
 3. Ability to meet and maintain Visual Impact standards specified in (new) Section 402.8.10.H (currently 402.8.10.F.7).
4. Add to the beginning of current 402.8.10.D.1: "Provided that the maximum size of any individual solar array panel is thirty (30) square feet when measured horizontally".
 5. Add to end of current 402.8.10.E.1: "provided that the maximum size of any individual solar array panel is thirty (30) square feet when measured horizontally".
 6. Retitle current 402.8.10.F: to "General Standards for Medium & Large-scale...."
 7. Add to 402.8.10.F new "General Standards for Medium & Large Scale Ground-Mounted Solar Energy Systems" an additional standard as follows: **Energy Storage:** Battery storage of electricity generated from the Commercial Solar Energy Production Site of any type is specifically prohibited including but not limited to lead-acid and lithium ion.
 8. Add to 402.8.10.F new "General Standards for Medium & Large Scale Ground-Mounted Solar Energy Systems" an additional standard as follows: **Copies of Permits Required:** If the owner, operator, or applicant has approvals from non-municipal entities such as MeDEP upon applying to the Planning Board (PB), these shall be submitted as part of the PB application. If such permit(s) are not approved upon PB submittal, the owner or operator shall provide full copies of all permits to the Code Enforcement Officer prior to the issuance of permits to construct any portion of the Solar Energy System.
 9. Create new 402.8.10.G: "Utility Connection Standards". Utilize existing language as G.1.
 10. New Section/language 402.8.10.G.2: **Utility Connections for Existing Residential Areas:** Any Commercial Solar Energy Production Site and/or connection to the main utility grid that is located adjacent to, or in the immediate proximity to, an existing

residentially utilized area as determined by the Planning Board, shall be required to place all utility lines underground unless the utility company owning/operating the main transmission lines requires the lines to be above ground on utility poles. The Planning Board shall have the authority to require the applicant to provide documentation from duly qualified parties regarding the utility companies requirements.

11. New Section/language 402.8.10.3: **Utility Connections for areas not residentially utilized:** The Planning Board shall have the authority to make the determination of if the Commercial Solar Energy Production Site and connection to the main power grid is in, or in the immediate proximity of, an existing residentially utilized area. If the Planning Board makes the determination that it is not, the determination of underground or above ground utility lines shall be as established in this Section.

The Planning Board is encouraged to make a distinction between the necessary switching required by the utility company owning/operating the transmission lines and the utility lines originating from the Commercial Solar Energy Production Site to point of connection to the main power "grid". The Planning Board (or designee) shall notify neighboring property owners and request their input.

The applicant shall be responsible for providing information relevant to the criteria listed below. The Planning Board shall review and consider the following elements in making the determination of underground or above ground utilities:

- a. Any input from neighboring property owners after being duly notified as part of the Town's review
- b. Estimated visual implications to neighboring property owners based on renderings provided by the applicant and/or field conditions observed as part of a sitewalk by the Planning Board (if one is held)
- c. Location and number of existing utility poles (if any)
- d. Overall purpose, intent, and use of the Zoning District in which the utility connection is located i.e. is the District predominantly residential
- e. Number of residences that the utility lines will need to be adjacent to
- f. Number and location of any new and/or upgraded utility poles that are necessary
- g. Input from the utility company owning/operating the main transmission lines
- h. Documented existing physical site conditions that substantially complicate placing utilities underground such as bedrock

12. Re-number current 402.8.10.F.6 to (new) 402.8.10.F.5

13. Add new Section 402.8.10.H Visual Impact: Current language (402.8.10.F.7) is new 402.8.10.H.1.

14. New 402.8.10.H.2: For any Medium or Large Scale Commercial Solar Energy Production Site (CSEPS) in a Rural Residential & Agricultural Zoning District, the Planning Board shall have the authority to require sufficient vegetative buffering

and/or screening, as determined by the Board, to minimize the adverse visual impacts of solar array from any existing residential property. The objective is to provide adequate year-round buffering of the CSEPS, on the property where the CSEPS is proposed, for any abutting parcel utilized primarily for residential purposes when the application is submitted to the Town and deemed complete.

15. New 402.8.10.H.3: The Applicant and Planning Board shall follow the steps below to minimize the adverse impacts of the project site from all abutting properties utilized primary for residential purposes:

- a. In addition to all required Planning Board submittals, the applicant shall submit a scaled legible plan, with supporting documentation as appropriate, showing the following:
 - i. The entire parcel proposed for the Commercial Solar Energy Production Site (CSEPS), property boundaries, and parcels within two-hundred and fifty (250) feet
 - ii. The proposed location of the CSEPS, proposed buildings, vehicular access(es), and any structure fifteen (15) feet or more in height including utility poles
 - iii. All parcels shown on the submitted plan shall be identified with the Tax Map/lot, owners last name, and lot size in acres.
 - iv. All existing structures located on the parcel proposed for the CSEPS and within one hundred (100) feet of the parcel proposed accurate to ten (10) feet
 - v. For all portions of the perimeter of the CSEPS proposed property that abut a residentially utilized property, the approximate location of existing trees at least fifteen (15) feet high and other significant woody vegetation on the CSEPS parcel that is proposed to remain when the project is completed to provide a vegetative buffer
 - vi. Locations and associated details (size, type, spacing, etc.) of native evergreen trees proposed to be planted on the CSEPS parcel to provide reasonable year-round vegetative buffering for residentially utilized properties within five (5) years of completing the CSEPS
 - vii. Any replanting plan shall be completed by a duly qualified professional, such as registered Landscape Architect, and shall include descriptions and/or renderings of anticipated buffering at appropriate time intervals to enable the Planning Board and abutting property owners to understand the anticipated timeframe for the growth to be an effective buffer
- b. The Planning Board shall review the plan submitted by the applicant and any input from neighboring property owners to determine if the proposed vegetative screening is, or will be in five (5) years, sufficient for residential properties abutting the CSEPS parcel. The Board may wish to consider a site walk to view field conditions.
- c. The Planning Board shall have the authority to require the applicant to provide photographs of existing conditions, renderings of vegetative screening, or

documentation from similar completed projects. If the Planning Board determines that the existing vegetative screening, together with any proposed replanting, is not sufficient, it shall have the authority to require the applicant to revise the plan as deemed appropriate by the Board.

- d. The Board shall have the ability to hire a qualified consultant, at applicants' expense, per 402.10.9 (Technical Review Fees). The Board shall consider and have the authority to require a performance bond for any necessary replanting per 402.10.17 in accordance with professionally accepted practices such as 80% survival rate for a 5-year period.

16. Re-number current 402.8.10.F.8 to (new) 402.8.10.F.6 and continue this re-numbering to end of current "F" and/or adjust numbering/lettering as necessary.

17. Adjust current Section 402.8.10.F.2 (mis-labeled) addressing performance guarantee for abandonment as follows: F.2: Performance Guarantee for Abandonment Requirements:

- a. The owner and/or operator of the Commercial Solar Energy System shall be responsible for establishing and maintaining the performance guarantee for abandonment in accordance with standards established in this Ordinance throughout the lifetime of the system until all components of the Commercial Solar Energy System have been properly removed. Any proposed replacements, changes, or adjustments to the performance guarantee must be approved by the Code Enforcement Officer with input from the Town Planner as necessary. Owners/operators are reminded of Section 402.8.10.XX.XX (currently 402.8.10.F.15) above that requires Staff Review Committee approval for a change of ownership and/or operator(s).
- b. As an integral part of the submittal to the Planning Board, the owner/operator of the proposed Commercial Solar Energy System shall provide an estimate of all costs that the Town would incur to employ the services of duly qualified contractor(s) to remove all components of Commercial Solar Energy System and all associated abandoned structures from the respective parcel(s). The cost estimate must include sufficient detail for the Planning Board to ensure the accuracy of the submitted figures and address all necessary aspects of the abandonment. The Board may request input from the Town Engineer and other duly qualified professionals at the applicant's expense for making this determination.
- c. The amount of the performance guarantee shall be at least one hundred and fifty (150) percent, as determined by the Planning Board, of the estimated cost for demolition and complete removal of the system. The form of the performance guarantee shall be approved by the Planning Board, with input from the Town's legal counsel as necessary at the applicant's expense, and duly established with

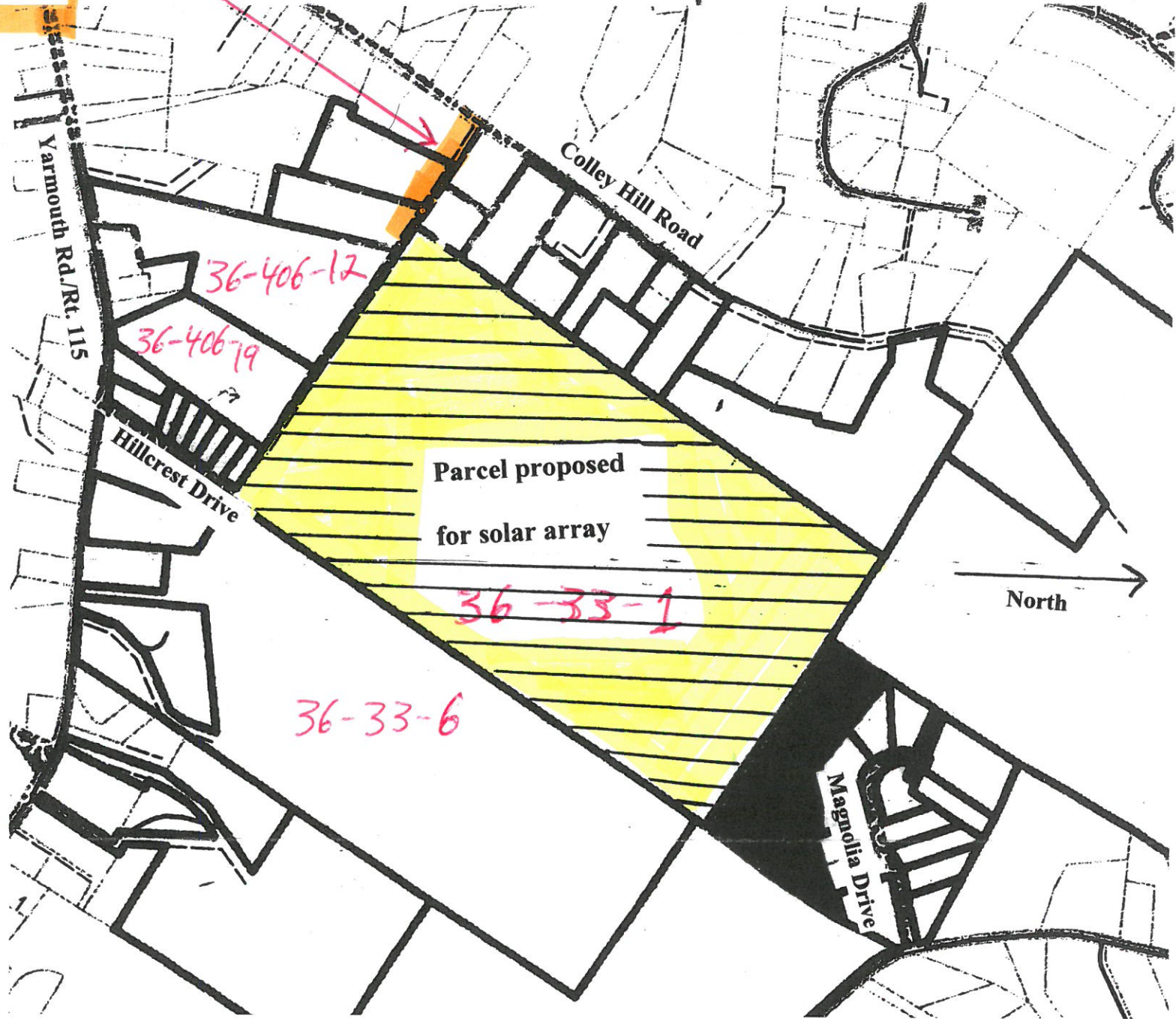
the Town prior to the Code Enforcement Officer issuing any permits for the Commercial Solar Energy System.

- d. If the Commercial Solar Energy System is required to establish and maintain a financial surety for abandonment by another governmental entity, such as the Maine Department of Environmental Protection, the applicant is encouraged to ensure that the posting of the financial performance guarantee for abandonment complies with Town standards to streamline the administrative process. The applicant shall submit information about any such performance guarantee as part of the Planning Board's review and the Board shall determine if Town standards are met with input from duly qualified professionals as necessary at applicant's expense.
- e. If the Planning Board determines that the financial surety for abandonment required by another governmental entity meets Town standards, the performance guarantee for abandonment requirement shall be deemed acceptable provided that the Planning Board also determines that sufficient written documentation is submitted ensuring that the Town will be kept apprised of any changes to the surety for the lifetime of the Commercial Solar Energy System.
- f. If the Planning Board determines that the financial surety for abandonment required by another governmental entity does not meet Town standards, the applicant shall have two options. The first is to make the necessary adjustments to the financial surety for the Planning Board to determine that Town standards are met. The second option for the applicant is to request to be on the agenda for the next available meeting of the Gray Town Council.
- g. The Gray Town Council shall have the authority to determine if the financial surety is sufficient in the event that the applicant for the Commercial Solar Energy System chooses to approach the Council per above. Prior to being placed on a Council agenda, the applicant shall provide written documentation, with attachments as necessary, that specifically lists all deviations from Town requirements for the performance guarantee for abandonment. The applicant shall also provide information regarding the reasoning for not meeting Town requirements.
- h. In the event that the applicant decides to approach the Gray Town Council, and Planning Board has deemed the application complete and that all applicable standards are met except the Town Council resolution of the performance guarantee for the abandonment, the Planning Board shall have the authority to consider a conditional approval of the application. Any such approval shall include a specific condition that the Code Enforcement Officer shall not issue permits for the Commercial Solar Energy System until the Town Council has determined that the performance guarantee for abandonment is acceptable.

- i. Once the owner and/or operator has properly removed all components of Commercial Solar Energy System and associated abandoned structures, the owner and/or operator shall notify the Town Planner in writing and request an inspection by the Code Enforcement Officer (CEO). The CEO shall have the authority to employ the services of the Town's Engineer or other qualified professionals, at the owner/operators expense, to verify that the abandonment complies with all applicable standards. If the CEO, in consultation with the Town Planner, determines that such removal is satisfactory, the CEO shall notify the Town Planner or designee in writing to release the abandonment performance guarantee.

-Map for Proposed Solar Array-

Pennell Lane



(4)

TC-31



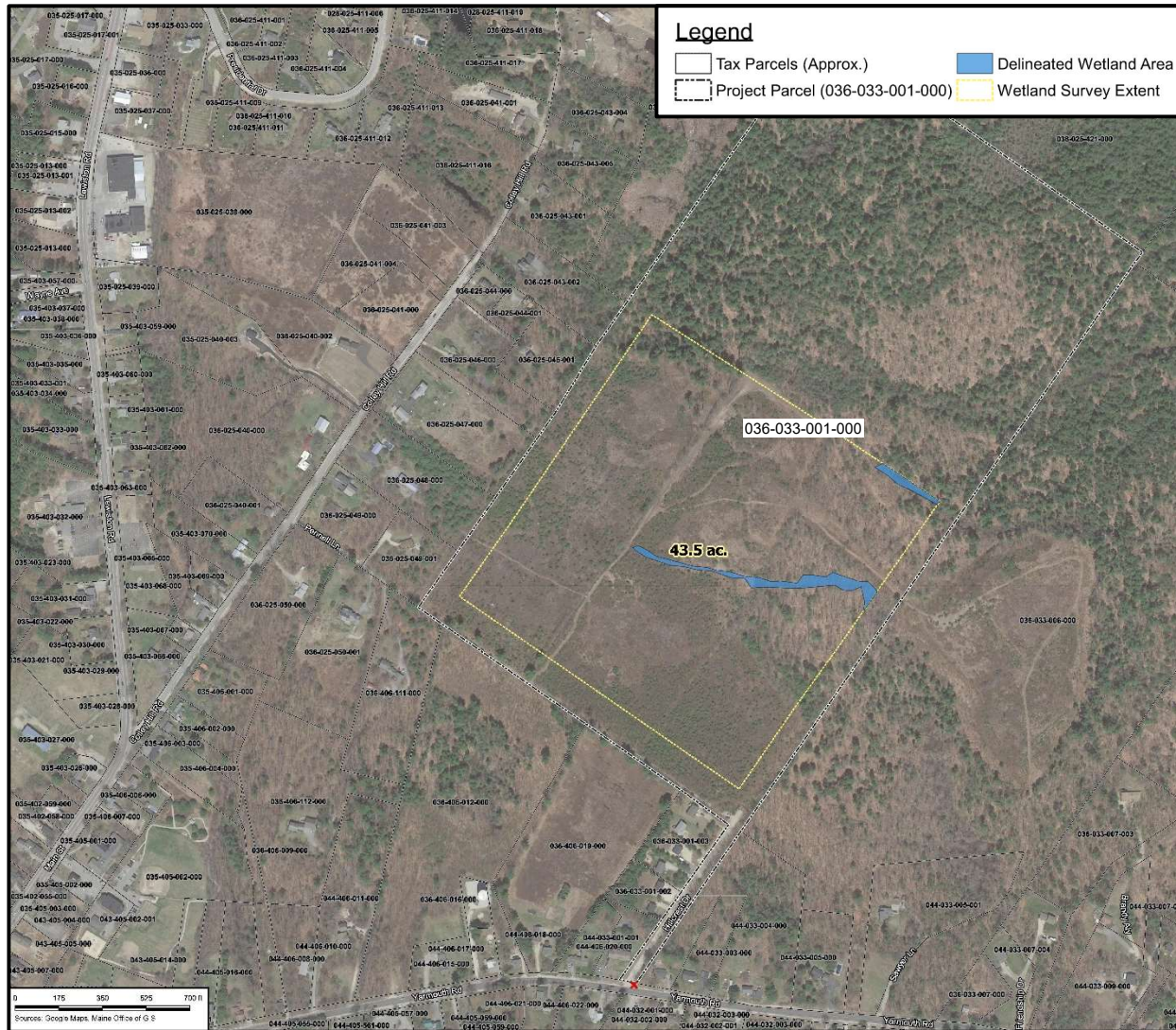
Gray Yarmouth Road Solar LLC

December 15, 2020



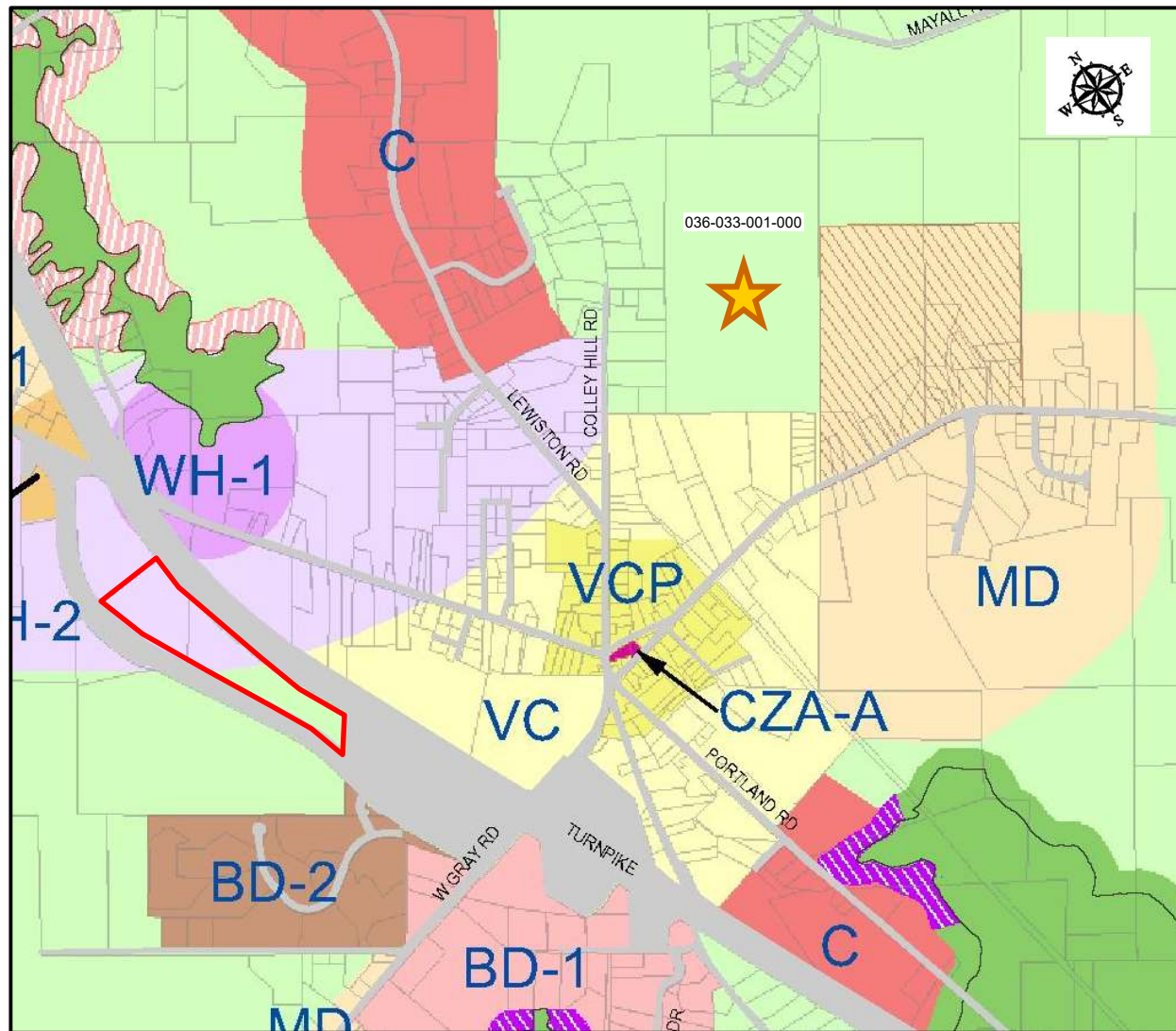
Confidential and Proprietary – For Intended Recipients Only

Proposed Solar Project Location



- ❖ Located at 51 Yarmouth Road off of Hillcrest Drive
- ❖ Landowners are Sawyer & Dunn families
- ❖ 103-acre vacant lot, former blueberry field
- ❖ Professional wetlands and natural resources survey conducted in October 2020 on 43.5 acres
- ❖ Access and CMP interconnection off of Hillcrest Drive

Zoning Map



Town of Gray Maine Zoning Map

April, 2016

Legend

- Mobile Home Park Overlay
- MaineDEP Restrictions & Standards
- Approximate Wetland Edge
- Tax Parcels (2015)
- Shoreland Zoning Districts**
- Resource Protection
- Limited Commercial
- Limited Residential
- Stream Protection
- Zoning Districts**
- Business Development-1
- Business Development-2
- Business Transitional-1
- Business Transitional-2
- Commercial
- Contract Zone "A"
- Contract Zone "B"
- Village Center
- Village Center Proper
- Wellhead Protection-1
- Wellhead Protection-2
- Medium Density
- Rural Residential and Agricultural
- Lake
- Water

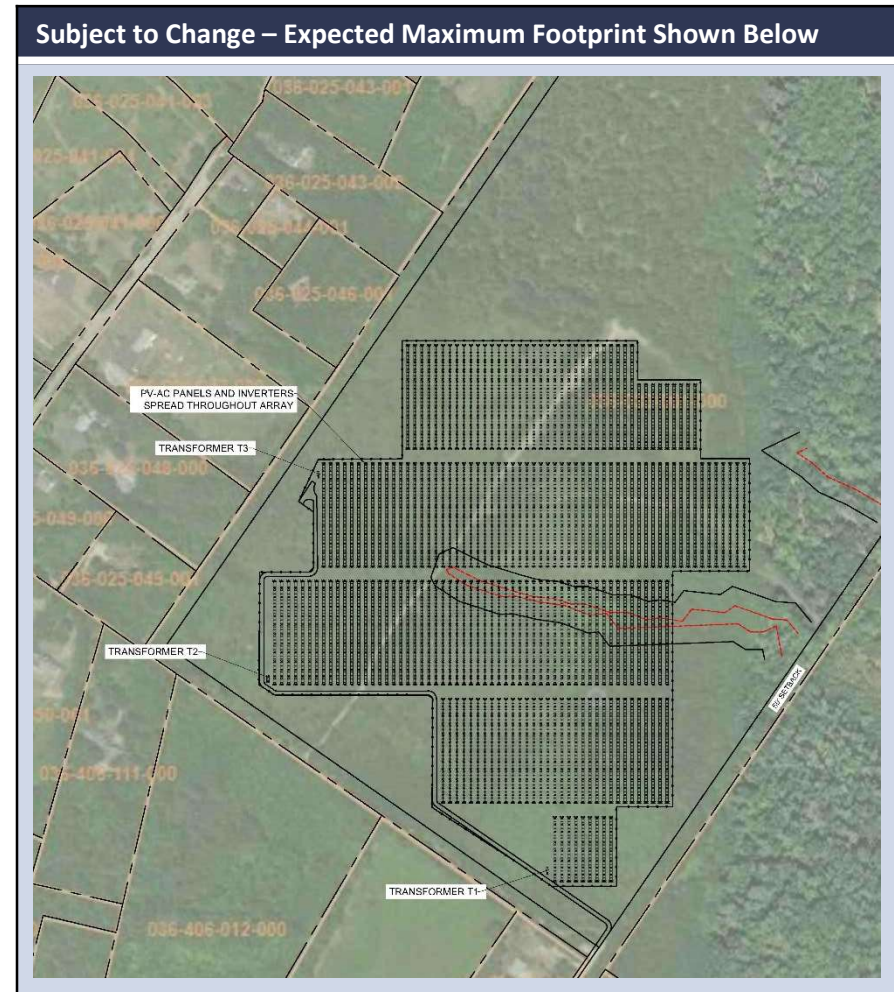
= Proposed Commercial Solar Energy Overlay District Map



Preliminary Engineering Layout

| Project Details | |
|------------------------------|-----------------------|
| Project Size (MWAC) | 4.9 |
| Estimated Acres of Footprint | ~30 acres |
| Site Control | Lease |
| Project Type | Photovoltaic |
| Racking | Single-Axis Tracker |
| Interconnection | CMP – Gray Substation |
| State Permitting | DEP – SLODA* & NRPA |
| Expected Construction Start | Q3 2021 |
| Project Life | ~35-40 Years |

*Project decommissioning costs will be bonded with Maine DEP via Site Law (SLODA) permit





About Dynamic Energy

Summary

Dynamic Energy, a Chester County, PA-based company, is one of the leading developers and turnkey installers of community solar projects in Pennsylvania, Massachusetts, New York, and Illinois. Since 2019, Dynamic has built and commissioned nearly 60 MW of community solar farms. This is in addition to the 150 MW of large, ground mount solar projects Dynamic has developed in central Pennsylvania in the past two years. Having the experience to build these projects across the country, Dynamic is excited to bring distributed solar generation to Maine!

Recent Highlights

New York



Dynamic developed, constructed, and owns one of the largest community solar farms in NY State. Dynamic has also developed and built over 20 MW of other ground mount projects in the state.

Massachusetts



Dynamic developed and built one of the largest portfolios of community solar projects in the Massachusetts market, totaling over 40 MW.

Illinois



Dynamic developed and built 8.5 MW of community solar projects in 2020. These were among the first community solar installations in the state.

Similar Projects Completed in Region

| PROJECT NAME | LOCATION | SIZE (MW) |
|--|---------------------|-----------|
| East Brookfield Adams Road Solar | East Brookfield, MA | 7.0 |
| Winchendon Ash Street Solar | Winchendon, MA | 7.0 |
| Winchendon Lincoln Avenue Solar 2 | Winchendon, MA | 6.8 |
| West Brookfield Boston Post Road Solar | West Brookfield, MA | 6.5 |
| Williamsburg East Street Solar | Williamsburg, MA | 6.0 |
| Knaggs Community Solar Farm | Altamont, NY | 5.5 |
| SunStream Hudson | Greenport, NY | 5.4 |
| Hobart & William Smith Colleges | Geneva, NY | 5.1 |
| Winchendon Lincoln Avenue Solar 1 | Winchendon, MA | 4.4 |
| Ware Palmer Road Solar | Ware, MA | 4.3 |
| Norstar Community Solar Farm | Lee, NY | 2.7 |
| Pamal Broadcasting | Glenmont, NY | 2.7 |
| WGL Energy | Greenwich, NY | 2.6 |
| Brookfield Wire Company | Brookfield, MA | 2.0 |
| Bartlett's Farm | Nantucket, MA | 2.0 |
| East Brookfield Main Street Solar | East Brookfield, MA | 1.4 |
| TOMZ Corporation | Berlin, CT | 1.1 |
| The Beistle Company | Shippensburg, PA | 1.0 |
| John F. Martin & Sons, Inc. | Stevens, PA | 0.8 |



Dynamic's Financial Partners

Dynamic Energy works with several major financial institutions in the solar industry such as: Wunder Capital, Key Bank, AES Distributed Energy, Amp, WGL Energy, and others.





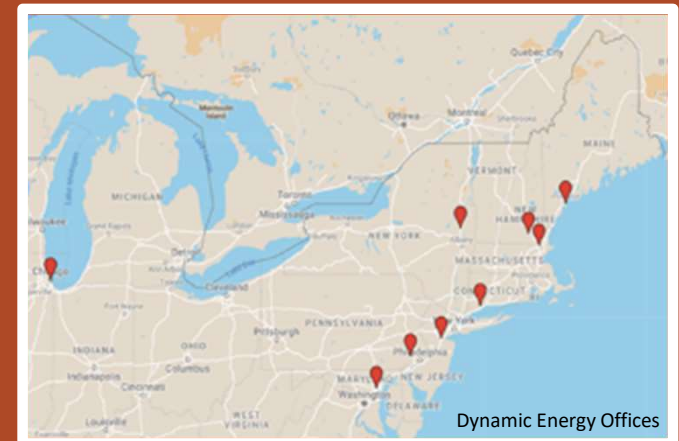
CONTACT

John Motta, Vice President
(202) 403-9562
jmotta@dynamicenergy.com

Ben Gregory, Project Manager
(781) 801-2476
bgregory@dynamicenergy.com

Headquarters:
1550 Liberty Ridge Drive, Suite 310
Wayne, PA 19087

DYNAMICENERGY.COM



April 7, 2021

TO: Gray Planning Board

FROM: Doug Webster, Community Development

RE: Proposed Zoning Changes for proposed Solar Array
100 +/- acre parcel located at end of Hillcrest Drive

Introduction

In accordance with direction provided by the Town Council at their meetings on 2-2-21, 3-16-21, 4-6-21, and input from OAC, I have prepared this memo detailing the proposed changes to the Town's Zoning Ordinance (Chapter 402).

I have divided the proposed changes into two categories: (1) Changes to Chapter 402 that *are not* in 402.8.10, and, (2) Changes to Section 402.8.10 (Commercial Solar Energy System Overlay District).

Under each category, I have numbered the proposed changes to enable referencing for discussion purposes.

Proposed Changes to Zoning Ordinance (Chapter 402) not in 402.8.10:

1. Changes to definitions (402.2.2) related to Ground-Mounted Solar Energy Systems:
 - a. Add new Def of "**Commercial Solar Energy Production Site**" (CSEPS): A component of a Commercial Solar Energy System that includes the maximum cumulative area of the solar array footprint, typically fenced for security purposes, which commonly includes any of the following: ground-mounted solar arrays, transformers, inverters, and buildings housing equipment functionally necessary for the solar energy system.
 - b. Add new Def of Small CSEPS's: **CSEPS's less than .5 of an Acre**
 - c. Change current Def of Medium from 2,000-16,999 SF to **CSEPS's .5-20 Acres**
 - d. Current Def of Large from 17K SF+ to **CSEPS's 20-40 acres**
2. Additional parcel added to existing Commercial Solar Energy Systems Overlay District:
 - a. Amend the Town's existing Zoning Map (402.3.1) to show the entirety of the 100-acre parcel at end of Hillcrest Drive (Tax Map 36, lot 33-1) in the Commercial Solar Energy System Overlay District (CSESOD).
3. Amend Footnote "D" in Table 402.5.4.A addressing impervious cover measurement:
Add to end of existing language "provided that the maximum size of any individual solar array panel is thirty (30) square feet when measured horizontally".

4. Amend Footnote "F" in Table 402.5.4.B by adding the following language to the end of the existing footnote: "provided that the maximum size of any individual solar array panel is thirty (30) square feet when measured horizontally".
5. Amend both Footnotes "G" in Table 402.5.4.B by adding the following underlined language: Lot coverage in RRA can be increased to 30% for any portion of a parcel lots in the Commercial Solar Energy Overlay District and only for Commercial medium and large-scale ground-mounted solar energy system installations provided that the maximum size of any individual solar array panel is thirty (30) square feet when measured horizontally. Planning Board approval subject to the requirements of Section 402.8.4.L for recharge protection is required.
6. Re-word Footnote "H" in Table 402.5.4.B addressing setbacks in RRA as follows (underlined portions proposed to be added): Setbacks for ground-mounted solar panels and arrays less than 15 feet in height on parcels within five-hundred (500) feet of a publicly owned road shall be a minimum of twenty-five (25) feet from any lot line. Setbacks for Commercial Solar Energy Production Sites on parcels at least five-hundred (500) feet from a publicly owned road shall be a minimum of fifty (50) feet or one-hundred (100) feet from any property line as established in Section 402.8.10 of this Ordinance.

Proposed Changes to standards to existing Section of CSESOD (402.8.10):

1. New "B": **Required Information & Submittals:** In addition to submittals required in Articles 9 and 10 of this Ordinance, the applicant shall submit the following information to the Planning Board as part of the application. The Planning Board shall have the authority to determine if one (1) or more of the following are not applicable.
 - a. A description of the owner of the system, the operator if different, and detail of qualifications and technical ability of the owner or operator to construct, maintain, and operate the facility.
 - b. If the operator is leasing the site, a copy of the lease agreement (minus financial compensation) and any and all related easements clearly outlining the relationship of the respective parties, inclusive of the rights and responsibilities of the operator, landowner, and any other responsible party with regard to the large-scale solar energy system and the term or duration of the agreement. Further, the operator shall identify any and all agreements or obligations of the landowner to the operator regarding any premises that are not specifically subject to the lease agreement, but which the operator has certain rights to use as part of the operation of the solar energy system.
 - c. A description of the anticipated quantity of energy to be produced and to whom it will be sold.

- d. A copy of the agreement and schematic details of the connection arrangement with the transmission system that clearly indicates who is responsible for various requirements and how such will be operated and maintained.
- e. A basic description of the number, size, and configuration of panels to be installed, including make, model, and associated major system components.
- f. A construction plan and timeline that identifies all known contractors, site control, when the project construction will commence and the anticipated date that the system will be on-line.
- g. An operations and maintenance plan for the projected operating life of the system.
- h. An emergency management plan that identifies all potential hazards and the response to such hazards. The applicant shall submit a copy of the emergency management plan to Gray Public Safety Department and include any of their comments.
- i. Evidence of financial capacity to construct, operate, and decommission the proposed facility including the abandonment guarantee as required in this Ordinance.
- j. Identification of methods that the operator shall use to manage on-site vegetation.
- k. Identification of how the applicant shall address required buffering as required in this Ordinance.
- l. Submission of a decommissioning plan that addresses applicable standards.
- m. Evidence that the owner or operator has applied for any and all non-municipal permits that may be required for the installation of the proposed system; for example, a stormwater management permit from the Maine Department of Environmental Protection (MeDEP).

NOTE: Re-lettering of current Ordinance standards is necessary from current 402.8.10.B to end of Section 402.8.10.

2. Existing 402.8.10.C.1, after "height", insert the following: "for parcels located adjacent to or entirely within five-hundred (500) feet of a publicly owned road(s)".

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- a. The minimum setback for any Commercial Solar Energy Production Site shall be one-hundred (100) feet from any and all of the following based upon conditions existing when the application is filed and deemed sufficiently complete by Town Staff to be placed on a Planning Board agenda for review:
 - 1. Any parcel in a Village Center (VC) or Village Center Proper (VCP) Zoning District
 - 2. Any abutting parcel utilized primarily for residential purposes that is less than double the minimum lot area required for the respective Zoning District

3. Any abutting parcel that contains a structure utilized primarily for residential purposes located less than fifty (50) feet from the property line of the parcel proposed for the ground-mounted solar panels and/or arrays.
- b. Provided that none of the conditions specified in 402.8.10.C.2.a exist, the Planning Board shall have the authority to require the setback for the ground-mounted solar energy system project site to a minimum of fifty (50) feet after reviewing the following elements:
1. Any input received from abutting property owners after being duly-notified as part of the Town's review
 2. Location of any structure(s) on abutting parcels in relationship the project site
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 7. Add to 402.8.10.F new "General Standards for Medium & Large Scale Ground-Mounted Solar Energy Systems" an additional standard as follows: **Energy Storage:** Battery storage of electricity generated from the Commercial Solar Energy Production Site of any type is specifically prohibited including but not limited to lead-acid and lithium ion.
 8. Add to 402.8.10.F new "General Standards for Medium & Large Scale Ground-Mounted Solar Energy Systems" an additional standard as follows: **Copies of Permits Required:** If the owner, operator, or applicant has approvals from non-municipal entities such as MeDEP upon applying to the Planning Board (PB), these shall be submitted as part of the PB application. If such permit(s) are not approved upon PB submittal, the owner or operator shall provide full copies of all permits to the Code Enforcement Officer prior to the issuance of permits to construct any portion of the Solar Energy System.
 9. Create new 402.8.10.G: "Utility Connection Standards". Utilize existing language as G.1.
 10. New Section/language 402.8.10.G.2: **Utility Connections for Existing Residential Areas:** Any Commercial Solar Energy Production Site and/or connection to the main utility grid that is located adjacent to, or in the immediate proximity to, an existing residentially utilized area as determined by the Planning Board, shall be required to place all utility lines underground unless the utility company owning/operating the

main transmission lines requires the lines to be above ground on utility poles. The Planning Board shall have the authority to require the applicant to provide documentation from duly qualified parties regarding the utility companies requirements.

11. New Section/language 402.8.10.3: Utility Connections for areas not residentially utilized: The Planning Board shall have the authority to determine if the Commercial Solar Energy Production Site and connection to the main power grid is in, or in the immediate proximity of, an existing residentially utilized area. If the Planning Board makes the determination that it is not, the determination of underground or above ground utility lines shall be as established in this Section.

The Planning Board is encouraged to make a distinction between the necessary switching required by the utility company owning/operating the transmission lines and the utility lines originating from the Commercial Solar Energy Production Site to point of connection to the main power "grid". The Planning Board (or designee) shall notify neighboring property owners and request their input.

The applicant shall be responsible for providing information relevant to the criteria listed below. The Planning Board shall review and consider the following elements in making the determination of underground or above ground utilities:

- a. Any input from neighboring property owners after being duly notified as part of the Town's review
- b. Estimated visual implications to neighboring property owners based on renderings provided by the applicant and/or field conditions observed as part of a sitewalk by the Planning Board (if one is held)
- c. Location and number of existing utility poles (if any)
- d. Overall purpose, intent, and use of the Zoning District in which the utility connection is located i.e. is the District predominantly residential
- e. Number of residences that the utility lines will need to be adjacent to
- f. Number and location of any new and/or upgraded utility poles that are necessary
- g. Input from the utility company owning/operating the main transmission lines
- h. Documented existing physical site conditions that substantially complicate placing utilities underground such as bedrock

12. Re-number current 402.8.10.F.6 to (new) 402.8.10.F.5

13. Add new Section 402.8.10.H Visual Impact: Current language (402.8.10.F.7) is new 402.8.10.H.1.

14. New 402.8.10.H.2: For any Medium or Large Scale Commercial Solar Energy Production Site (CSEPS) in a Rural Residential & Agricultural Zoning District, the Planning Board shall have the authority to require sufficient vegetative buffering and/or screening, as determined by the Board, to minimize the adverse visual impacts of solar array from any existing residential property. The objective is to provide

adequate year-round buffering of the CSEPS, for the lifetime of the CSEPS on the property where the CSEPS is proposed, for any abutting parcel utilized primarily for residential purposes when the application is submitted to the Town and deemed complete.

15. New 402.8.10.H.3: The Applicant and Planning Board shall follow the steps below to minimize the adverse impacts of the project site from all abutting properties utilized primary for residential purposes:

- a. In addition to all required Planning Board submittals, the applicant shall submit a scaled legible plan, with supporting documentation as appropriate, showing the following:
 - i. The entire parcel proposed for the Commercial Solar Energy Production Site (CSEPS), property boundaries, and parcels within two-hundred and fifty (250) feet
 - ii. The proposed location of the CSEPS, proposed buildings, vehicular access(es), and any structure fifteen (15) feet or more in height including utility poles
 - iii. All parcels shown on the submitted plan shall be identified with the Tax Map/lot, owners last name, and lot size in acres.
 - iv. All existing structures located on the parcel proposed for the CSEPS and within one hundred (100) feet of the parcel proposed accurate to ten (10) feet
 - v. For all portions of the perimeter of the CSEPS proposed property that abut a residentially utilized property, the approximate location of existing trees at least fifteen (15) feet high and other significant woody vegetation on the CSEPS parcel that is proposed to remain when the project is completed to provide a vegetative buffer
 - vi. Locations and associated details (size, type, spacing, etc.) of native evergreen trees proposed to be planted on the CSEPS parcel to provide reasonable year-round vegetative buffering for residentially utilized properties within five (5) years of completing the construction of the CSEPS and continuing to adequately screen the facility for the lifetime of the CSEPS.
 - vii. Any replanting plan shall be completed by a duly qualified professional, such as registered Landscape Architect, and shall include descriptions and/or renderings of anticipated buffering at appropriate time intervals to enable the Planning Board and abutting property owners to understand the anticipated timeframe for the growth to be an effective buffer
- b. The Planning Board shall review the plan submitted by the applicant and any input from neighboring property owners to determine if the proposed vegetative screening is, or will be in five (5) years, sufficient for residential properties abutting the CSEPS parcel. The Planning Board may wish to consider a site walk to view field conditions.
- c. The Planning Board shall have the authority to require the applicant to provide photographs of existing conditions, renderings of vegetative screening, or

documentation from similar completed projects. If the Planning Board determines that the existing vegetative screening, together with any proposed replanting, is not sufficient, it shall have the authority to require the applicant to revise the plan as deemed appropriate by the Planning Board.

- d. The Planning Board shall have the ability to hire a qualified consultant, at applicants' expense, per 402.10.9 (Technical Review Fees). The Planning Board shall consider and have the authority to require a performance bond for any necessary replanting per 402.10.17 in accordance with professionally accepted practices such as 80% survival rate for a 5-year period.

16. Re-number current 402.8.10.F.8 to (new) 402.8.10.F.6 and continue this re-numbering to end of current "F" and/or adjust numbering/lettering as necessary.

17. Adjust current Section 402.8.10.F.2 (mis-labeled) addressing performance guarantee for abandonment as follows: F.2: Performance Guarantee for Abandonment Requirements:

- a. The owner and/or operator of the Commercial Solar Energy System shall be responsible for establishing and maintaining the performance guarantee for abandonment in accordance with standards established in this Ordinance throughout the lifetime of the system until all components of the Commercial Solar Energy System have been properly removed. Any proposed replacements, changes, or adjustments to the performance guarantee must be approved by the Code Enforcement Officer with input from the Town Planner as necessary. Owners/operators are reminded of Section 402.8.10.XX.XX (currently 402.8.10.F.15) above that requires Staff Review Committee approval for a change of ownership and/or operator(s).
- b. As an integral part of the submittal to the Planning Board, the owner/operator of the proposed Commercial Solar Energy System shall provide an estimate of all costs that the Town would incur to employ the services of duly qualified contractor(s) to remove all components of Commercial Solar Energy System and all associated abandoned structures from the respective parcel(s). The cost estimate must include sufficient detail for the Planning Board to ensure the accuracy of the submitted figures and address all necessary aspects of the abandonment. The Planning Board may request input from the Town Engineer and other duly qualified professionals at the applicant's expense for making this determination.
- c. The amount of the performance guarantee shall be at least one hundred and fifty (150) percent, as determined by the Planning Board, of the estimated cost for demolition and complete removal of the system. The form of the performance guarantee shall be approved by the Planning Board, with input from the Town's legal counsel as necessary at the applicant's expense, and duly established with

the Town prior to the Code Enforcement Officer issuing any permits for the Commercial Solar Energy System.

- d. If the Commercial Solar Energy System is required to establish and maintain a financial surety for abandonment by another governmental entity, such as the Maine Department of Environmental Protection, the applicant is encouraged to ensure that the posting of the financial performance guarantee for abandonment complies with Town standards to streamline the administrative process. The applicant shall submit information about any such performance guarantee as part of the Planning Board's review and the Planning Board shall determine if Town standards are met with input from duly qualified professionals as necessary at applicant's expense.
- e. If the Planning Board determines that the financial surety for abandonment required by another governmental entity meets Town standards, the performance guarantee for abandonment requirement shall be deemed acceptable provided that the Planning Board also determines that sufficient written documentation is submitted ensuring that the Town will be kept apprised of any changes to the surety for the lifetime of the Commercial Solar Energy System.
- f. If the Planning Board determines that the financial surety for abandonment required by another governmental entity does not meet Town standards, the applicant shall have two options. The first is to make the necessary adjustments to the financial surety for the Planning Board to determine that Town standards are met. The second option for the applicant is to request to be on the agenda for the next available meeting of the Gray Town Council.
- g. The Gray Town Council shall have the authority to determine if the financial surety is sufficient in the event that the applicant for the Commercial Solar Energy System chooses to approach the Council per above. Prior to being placed on a Council agenda, the applicant shall provide written documentation, with attachments as necessary, that specifically lists all deviations from Town requirements for the performance guarantee for abandonment. The applicant shall also provide information regarding the reasoning for not meeting Town requirements.
- h. In the event that the applicant decides to approach the Gray Town Council, and Planning Board has deemed the application complete and that all applicable standards are met except the Town Council resolution of the performance guarantee for the abandonment, the Planning Board shall have the authority to consider a conditional approval of the application. Any such approval shall include a specific condition that the Code Enforcement Officer shall not issue permits for the Commercial Solar Energy System until the Town Council has determined that the performance guarantee for abandonment is acceptable.

- i. Once the owner and/or operator has properly removed all components of Commercial Solar Energy System and associated abandoned structures, the owner and/or operator shall notify the Town Planner in writing and request an inspection by the Code Enforcement Officer (CEO). The CEO shall have the authority to employ the services of the Town's Engineer or other qualified professionals, at the owner/operators expense, to verify that the abandonment complies with all applicable standards. If the CEO, in consultation with the Town Planner, determines that such removal is satisfactory, the CEO shall notify the Town Planner or designee in writing to release the abandonment performance guarantee.