Town of Kittery
Planning Board Meeting
February 14, 2019

ITEM 5 Huntington Run - Cluster Subdivision Final Plan Review
Action: Approve or deny preliminary plan. Owner, Landmark Properties, LTD. And Kingsbury and Veronica Bragdon, and applicant, Chinburg Builders, Inc., request consideration of a 20-lot cluster subdivision on 86.6 +/- acres located on Betty Welch Road (Tax Map 66 Lots 2A, 8 & 8A) in the Residential Rural Zone (R-RL) and a portion located in the Shoreland Overlay (SH-250'-OZ) Zone. Agent is Jeff Clifford, P.E., Altus Engineering.

PROJECT TRACKING

REQ'D	ACTION	COMMENTS	STATUS
Yes	Sketch Plan Review / Concept Approval	4/13/2017	APPROVED
No	Site Visit	8/15/2017	HELD
Yes	Preliminary Plan Review Completeness/Acceptance	7/13/2017	ACCEPTED
Yes	Public Hearing	8/24/2017.	HELD
Yes	Preliminary Plan Approval	8/24/2017	APPROVED
Yes	Final Plan Review	2/14/2019	PENDING
Prior to the signing of the approved Plan any **Conditions of Approval related to the Findings of Fact along with waivers and variances (by the BOA) must be placed on the Final Plan and, when applicable, recorded at the York County Registry of Deeds. PLACE THE MAP AND LOT NUMBER IN 1/4" HIGH LETTERS AT LOWER RIGHT BORDER OF ALL PLAN SHEETS.** Per Section 16.4.4.L - Grading/Construction Final Plan Required. - Grading or construction of roads, grading of land or lots, or construction of buildings is prohibited until the original copy of the approved final plan has been duly recorded in the York County registry of deeds, when applicable.			

Background

Planning Board review of the proposed development is required by 16.10.3.1, General Development as a subdivision plan. The applicant is under a purchase and sales agreement with the owners of three abutting vacant parcels that, once combined, will result in an 86.6 acre vacant parcel with frontage along Betty Welch Road. The proposed development is a 20-lot cluster subdivision containing a 60-foot wide right of way, 1200-feet in length.

The proposed development was previously reviewed by the Board in 2014-2015. The Board approved a sketch plan on 11/12/2015 however, prior to submitting a preliminary plan application, the applicant found a discrepancy between the Town's tax map and deed references for Lot 8A. In the process of resolving the issue, the 6-month allowance between sketch plan approval and the submittal of a preliminary plan application expired. The applicant resubmitted a sketch plan, with little variation from the 2015 approved plan, which the Board approved on 4/13/2017 (minutes attached).

The preliminary plan application was scheduled for 7/13/2017, however, that meeting was postponed to 7/27, where a public hearing was scheduled. A site walk was held on 8/15/2017. The preliminary plan application was approved on 8/24/2017 with the following conditions:

Staff Review

1. **Street Standard Modifications**. The applicant is requesting two (2) waivers from the Section 16.8.4.4 and Table 1 for Class III Private Street Standards:

a. *Street Width Design: e.Paved Shoulder*: To maintain the rural character of the area, the applicant proposes to construct 4' wide gravel shoulders each side of the paved 20' travelled way in lieu of the 1' and 8' paved shoulders.
b. *Street Gradients: b. Site Slope (horiz. to vert.)*: To minimize wetland, the applicant proposes to construct 2:1 road side slopes in lieu of 3:1 standard.

2. **Additional waivers being requested.**
   a. Section 16.10.5.2.B.2 Plan Size: Drawing scale: 1"=100' for Existing Conditions and Topographic Plans and Subdivision Plans; 1"=150' for Soils Plan. The smaller scale coincides with the Lot plans, while having a scale that is easily readable.
   b. Section 16.9.3.2 Wetlands Boundaries. Jurisdictional wetlands were not delineated on approximately 22 acres of the northern portion of the parcel since additional developable area was not needed for the density calculation and the area will be protected open space. As agreed to at the August 24, 2017 Planning Board meeting, a Natural Resource Assessment was prepared for the 22 acres by Gove Environmental in lieu of flagging and surveying the wetlands.
3. The following waiver was granted by the Board at the April 13, 2017 Planning Board meeting: Section 16.8.4.13. Sidewalks. No sidewalk is proposed. A walking and biking direction sign shall be provided.
4. **Municipal Impact Analysis**. The applicant has provided a Municipal Impact Analysis which is attached.
5. **Wetlands Alteration**. The applicant proposes to alter 6,438 sf of forested freshwater wetlands at six locations for the construction of the access road. The MDEP permit made a finding that the applicant has avoided and minimized the wetlands impacts to the greatest extent practicable and the proposed project represents the least environmentally damaging alternative that meets the overall purpose of the project. A wetlands alteration permit from the Planning Board may still be necessary for these impacts.
6. **Peer Review -** CMA Engineers reviewed the plans and most of their comments are minor in nature.
7. **Street Naming Application.** A request has been made by the applicant to name the new development road Hamilton Lane. The request is currently being reviewed by the Town departments.

Recommendation / Action

Both Staff and CMA Engineers find the issues to date have been addressed as part of the final plan submission.

Approve the following waivers from Title 16:

1. ***Section 16.10.5.2.B.2 Plan Size. Drawing scale: 1"=100' for Existing Conditions and Topographic Plans and Subdivision Plans; 1"=150' for Soils Plan. The smaller scale coincides with the Lot Plans, while having a scale that is easily readable.***
2. ***Section 16.9.3.2 Wetlands Boundaries. Jurisdictional wetlands were not delineated on approximately 22 acres of the northern portion of the parcel since additional developable area was not needed for the density calculation and the area will be protected open space. As agreed to at the August 24, 2017 Planning Board meeting, a natural Resource Assessment was prepared for the 22 acres by Gove Environmental in lieu of flagging and surveying the wetlands.***
3. ***Section 16.8.4.4 and Table 1 Class III Private Streets Standard. Street Width Design: e. Paved Shoulder: To maintain the rural character of the area and reduce impervious surfaces, the***

applicant proposes to construct 4' wide gravel shoulders each side of the paved 20' travelled way in lieu of the Minor Streets standard of 1' and 8' paved shoulders.

4. ***Section 16.8.4.4 and Table 1 Class III Private Streets Standard. Street Gradients: b. Side Slope (horiz. to vert.). To minimize wetland impact, the applicant proposes to construct 2:1 road side slopes in lieu of 3:1 standard.***

1. ***Approve the final cluster subdivision plan dated January 24, 2019 from owners Landmark Properties & Kingsbury and Veronica Bragdon, and applicant, Chinburg Development, for a 20-lot cluster subdivision located on Betty Welch Road (Tax Map 66 Lots 2A, 8 & 8A) in the Residential Rural and Shoreland Overlay Zones with the condition that additional documents and/or responses to all CMA Engineers' comments be provided prior to presentation of final Mylar.***

Accept and approve a Street naming Application from Chinburg Development, LLC, dated February 6, 2019 to name a new private road off of Betty Welch Road (Map 66, lots 2A, 8, 8A), Hamilton Lane.

CMA ENGINEERS, INC.
CIVIL | ENVIRONMENTAL | STRUCTURAL

35 Bow Street
Portsmouth, New Hampshire
03801-3819

P: 603|431|6196
www.cmaengineers.com

February 7, 2019

Jamie Steffen, Town Planner
Town of Kittery
P.O. Box 808
Kittery, Maine 03904

RE: Town of Kittery, Planning Board Services
Huntington Run Cluster Subdivision
40 Betty Welch Road, Tax Map 66, Lots 2A, 8, & 8A
Review #2
CMA #591.108

Dear Jamie:

CMA Engineers has received the following information for Assignment #108, review of the Huntington Run Cluster Subdivision at 40 Betty Welch Road Road (Tax Map 66, Lots 2A, 8, & 8A). This is our second review; the first was at the time of preliminary plan submittal in August 2017.

1) Huntington Run Subdivision submittal document for Final Approval dated January 29, 2019; 40 Betty Welch Road, Kittery, ME, Tax Map 66, Lots 2A, 8, &8A by Altus Engineering, Inc of Portsmouth, NH.
2) Drawings titled Huntington Run Subdivision, submission for Town Final Approval, 25 sheets, by Altus Engineering, Inc of Portsmouth, NH dated January 24. 2019

We have reviewed the information submitted for conformance with the Kittery Land Use and Development Code (LUDC) and general engineering practices, and offer the comments below.

The proposed project includes a 20-lot clustered residential subdivision of combined parcels between Betty Welch Road and I-95 in Kittery. Access to the property is proposed by a new 1,200-foot roadway from Betty Welch Road. The project is located in the rural residential zone and has significant wetland areas on the site. Some wetland impacts are proposed near the entrance of the access road, and along the route of a sewage force main. As a cluster subdivision, the residential units are clustered on smaller lots in one part of the site, and proposed to be served by individual aerated septic tanks. Effluent from all 20 units is proposed to be pumped through force mains to a remote community leachfield system.

Since the preliminary submittal reviewed in August 2017, the project received preliminary approval by the Kittery Planning Board (August 24, 2017); and has gone through an extensive State permitting process, including:

- MDEP Site Location of Development Permit (issued January 24, 2019)

- MDEP Natural Resources Protection Act permit for wetlands crossings (issued January 24, 2019

- Approval letter from the Maine Department of Health and Human Services, dated March 2, 2018 for the engineered subsurface sewage disposal system.

16.3 Zoning Regulations

16.3.2.1 Residential-Rural (R-RL)
The proposed use (dwellings) is a permitted use, and cluster residential development is specifically included in the permitted uses.

Land area: A common wastewater system is proposed. For a cluster subdivision, the ordinance includes no minimum land area per dwelling unit if a common wastewater system is used. (If no common wastewater system is included, the minimum area is 20,000 sf). For other residential zones in Kittery with sewered lots, the minimum land area per dwelling unit ranges from 30,000 sf (Residential—Suburban), to 20,000 sf (Residential-Urban), to 6,000 sf (Residential Village).

The previous preliminary design included 10,000 feet minimum size. The final design includes a reduction in several lots that are between 8,000 and 9,000 sf, with a minimum of 8,159 sf.

Does the Planning Board accept the 8,159-sf minimum land area proposed by the applicant? (See also discussion in 16.7).

It is noted that in the list of dimensional standards modification for the cluster subdivision provided by the applicant, it appears that the minimum lot area is incorrectly stated as 10,087 sf (this appears to be holdover from the preliminary design). It is now proposed as 8,159 sf. Additionally, the minimum street frontage is presented as 26.61 ft, which is the opening to the rear area for the community septic system. The lot adjacent to that has the minimum lot frontage, which is 34.15 ft.

16.7 General Development Requirements

Article VIII Net Residential Acreage

The Cluster Residential and Cluster Mixed Use Development ordinance (Article XI section 16.8) provides that the number of residential units on a clustered lot can be the same as the number of lots that are allowable with a conventional subdivision, subject to various requirements in that section.

The applicant presents a calculation that reduces the 86.6-acre total lot area to 19.72 acres of potential net residential area. The current submission includes a plan which delineates the reductions in Net Residential Acreage from the total 86.6 acres to 19.72 acres.

For the Residential-Rural zone, the minimum lot size is 40,000 ft.², so theoretically 21 lots could be developed, if a layout could be shown to be feasible. The project proposes 20 units in the clustered subdivision. However, it's not clear that 21 lots (or 20 lots) could be developed with feasible access, permittable wetlands impacts, and the required land use for the community wastewater system and stormwater management systems.

If fewer than 20 lots can be created in a conventional subdivision (with 40,000 sf lots) given the actual site constraints, are 20 lots justified with a cluster subdivision on the same property? The Planning Board may consider requesting that a conventional subdivision be submitted in sketch/layout format to confirm the equivalent number of lots for a clustered subdivision.

16.8 Design and Performance Standards-Built Environment

Article IV. Streets and Pedestrian Ways

The proposed cul-de-sac roadway is proposed to build as a Minor Street classification as a private road. On *Street Design Standards. Table 1* the minor street portion of the roadway does not meet the following standards:

Street Width Design:

c) Sidewalk/Pedestrian way-The Applicant has included the minimum 10' paved width for travel-way, not included the required 5' sidewalk in the roadway design; but has included 4' gravel shoulders on each side of the road. The applicant reports that the Planning Board agreed to waive the sidewalk on April 13, 2017. (That should be confirmed in the record).

d) Paved Shoulder-The standards include paved shoulders in addition to the Travel Pavement. This additional shoulder pavement provides protection to the 10' minimum travel pavement from being chipped/broken/degraded. The proposed road section does not include any paved shoulders. The Applicant should demonstrate that the pavement is protected satisfactorily by either adding a width of paved shoulder (suggest 1-ft minimum; which could be within the 4' gravel shoulder width), or proposing a narrower 9 ft Travel Pavement width, a 1 ft shoulder, and justifying that to the Planning Board.

The changes to roadway standards are performance standards, and as such are being requested as waivers under Article IV of section 16.7.

16.8.4.8.D. The sight distances on Betty Welch Road are indicated as 350' to the north, and 305' to the south. These relate to travel speeds of between 40 and 45 mph and are satisfactory.

Article VI Water Supply

The applicant provided a letter dated July 25, 2017 from the Kittery Water District indicating that the KWD has adequate capacity to serve the subdivision.

The applicant describes a design review process with the KWD for specific details of construction. Documentation of this with a subsequent letter from the KWD is advisable.

Article VII Sewage Disposal

Final design of the community wastewater system has been extensively reviewed by the Maine DEP and Maine DHHS. Both have approved the designs, in terms of design criteria, individual pre-treatment at residences, pumping of effluent to the subsurface disposal units, and the design and operations of the system including the community leachfields. They have concluded that the performance will be favorable with respect to sewage treatment and disposal to the subsurface, and for migration of nitrate. These approvals resolve most of our comments in August 2017 at the preliminary design stage.

The following comments remain to be addressed by the applicant:

- Electric power.
  - Maine DEP requires that each house be equipped with an automatic transfer switch to allow an auxiliary power source to operate the wastewater treatment system in the event of a power outage. What is proposed as the sour(es) of auxiliary power? Will each home have an auxiliary generator? If not, when/if the entire subdivision loses power, how will 20 auxiliary sources of power be provided?

  - We note that the proposed *Declaration of Covenants, Conditions and Restrictions for the Huntington Run Subdivision* includes a provision that essentially requires residents to stop using the plumbing during a power outage, unless they have auxiliary power. This is not a reasonable provision or requirement, in our opinion.

  - With these units, how long can power be out until there are detrimental effects on treatment?
- Sequencing of the dosing of sewage to the two separate pairs of leachfields.
  - It's not clear to us how flow will be distributed evenly between the two leachfield pairs. Please clarify.

- Design of the effluent pumping system.
  - Are the individual effluent pumping units supplied by OxyPro or others, such as E-1?
  - Has there been a design of the hydraulics of the set of pumps and the effluent force main? Can that be supplied?

Article VIII. Surface Drainage

The project obtained a ME DEP Chapter 500 permit (issued January24, 2019). The DEP has completed and extensive review pf many issues, including of stormwater management, and concludes that it meets DEP standards. Our observation is that the overall drainage and stormwater management system are prudently conceived and reflected in the final design.

16.9 Design and Performance Standards-Natural Environment

Article III Conservation of Wetlands Including Vernal Pools

There are two wetlands crossings proposed that require filling of wetlands. Each is greater than 500 sf, and therefor jurisdictional under the Kittery LUDC. The coded requires a Wetlands Alteration Application. The Maine DEP NRPA permit for the wetlands disturbance has been obtained, which addresses many of the issues in the local permit. What is the status of the local Kittery wetlands application? Has it been obtained or has there been an agreement that it is not required in this instance?

Other

The applicant has included a draft of a document: *Declaration of Covenants, Conditions and Restrictions for the Huntington Run Subdivision.* This includes a future *Huntington Run Homeowners' Association By-Laws,* and *Stormwater Management Facility Operation and Maintenance (O&M) Manual.* We have reviewed these from a technical perspective. The planning board may wish to have these reviewed administratively of by Town counsel.

Should you have any questions, please do not hesitate to call.

Very truly yours,

CMA ENGINEERS, INC.

William A. Straub, P.E.
Project Manager

cc: Jeff Clifford, P.E. Altus Engineering

KITTERY PLANNING BOARD
FINDINGS OF FACT - **Unapproved**
for
Huntington Run Subdivision
Major Cluster Subdivision Plan

Note: This approval by the Planning Board constitutes an agreement between the Town and the Developer incorporating the Development plan and supporting documentation, the Findings of Fact, and all waivers and/or conditions approved and required by the Planning Board.

WHEREAS: Owners Landmark Properties, LTD and Kingsbury and Veronica Bragdon, and applicant Chinburg Builders, Inc. requests consideration of a 20-lot cluster subdivision on 86.6 +/- acres located on Betty Welch Road (Tax Map 66 Lots 2A, 8 & 8A) in the Residential-Rural (R-RL) and a portion located in the Shoreland Overlay (SH-250-OZ) Zones. Agent is Jeff Clifford, Altus Engineering.

Hereinafter the "Development".

Pursuant to the Plan Review meetings conducted by the Planning Board as duly noted in the Plan Review Notes dated 02/14/2019;

Sketch Plan Review	Held	4/13/2017
Site Visit	Held	8/15/2017
Preliminary Plan Completeness Review	Held, accepted	7/13/2017
Public Hearing	Held	8/24/2017
Preliminary Plan Approval	Granted (with conditions)	8/24/2017
Final Plan Approval	Granted (with conditions)	2/14/2019

and pursuant to the Project Application and Plan and other documents considered to be a part of the approval by the Planning Board in this finding consist of the following and as noted in the Plan Review Notes dated 02/14/2019 (Hereinafter the "Plan").

1. Final Plan Review Documents, Altus Engineering, Inc. letter dated January 29, 2019
2. Huntington Run Subdivision Plan, Altus Engineering, Inc. dated January 24, 2019
3. Soils Plan, Longview Partners, LLC. dated March 21, 2018
4. Site Details – Plan Sheets – G-1.1, C-1.0 – 8.2, Altus Engineering, Inc., dated January 24, 2019
5. Standard Boundary Survey & Existing Conditions Plan, dated 6/22/17

NOW THEREFORE, based on the entire record before the Planning Board as and pursuant to the applicable standards in the Land Use and Development Code, the Planning Board makes the following factual findings as required by Section **16.10.8.3.D. and as recorded below:**

FINDINGS OF FACT

Action by the Board shall be based upon findings of fact which certify or waive compliance with all the required standards of this title, and which certify that the development satisfies the following requirements:

A. Development Conforms to Local Ordinances.

The proposed development conforms to a duly adopted comprehensive plan as per adopted provisions in the Town Code, zoning ordinance, subdivision regulation or ordinance, development plan or land use plan, if any. In making this determination, the municipal reviewing authority may interpret these ordinances and plans.

Finding: The subdivision is a permitted use in the Residential – Rural R-RL zone and does not require any variances as proposed.

Conclusion: This standard appears to be met.

Vote of __ in favor _ against _ abstaining

B. Freshwater Wetlands Identified.

All freshwater wetlands within the project area have been identified on any maps submitted as part of the application, regardless of the size of these wetlands.

Finding: The wetlands have been delineated by Gove Environmental and depicted on the subdivision plans.

Conclusion: This standard is appears to be met.

Vote of __ in favor __ against __ abstaining

C. River, Stream or Brook Identified.

Any river, stream or brook within or abutting the proposed project area has been identified on any maps submitted as part of the application. For purposes of this section, "river, stream or brook" has the same meaning as in 38 M.R.S. §480-B, Subsection 9.

Finding: A small intermittent stream originating at a culvert under Betty Welch Road and leaving the property near the intersection of the water main and property line has been identified on the site.

Conclusion: This standard appears to be met.

Vote of __ in favor __ against __ abstaining

D. Water Supply Sufficient. *{and}*

The proposed development has sufficient water available for the reasonably foreseeable needs of the development.

E. Municipal Water Supply Available.

The proposed development will not cause an unreasonable burden on an existing water supply, if one is to be used.

Finding: When completed, the proposed project is anticipated to use 5,400 gallon of water per day. The applicant has submitted a letter from the Kittery Water District, dated July 25, 2017, indicating that it will be capable of servicing this project.

Conclusion: This standard appears to be met.

Vote of __ in favor __ against __ abstaining

F. Sewage Disposal Adequate.

The proposed development will provide for adequate sewage waste disposal and will not cause an unreasonable burden on municipal services if they are utilized.

Finding: Wastewater will be disposed of by an engineered system that consists of a septic tank and advanced

treatment system for each lot. MDEP has found that the proposed wastewater disposal system will be built on suitable soil types and that Maine's Drinking Water Standard for nitrates will be met at the project's property lines.

Conclusion: This standard appears to be met.

Vote of __ in favor _ against __ abstaining

G. Municipal Solid Waste Disposal Available.

The proposed development will not cause an unreasonable burden on the municipality's ability to dispose of solid waste, if municipal services are to be used.

Finding: The proposed development will not burden the Town Resource Recovery Facility.

Conclusion: This standard appears to be met.

Vote of __ in favor __ against _ abstaining

H. Water Body Quality and Shoreline Protected.

Whenever situated entirely or partially within two hundred fifty (250) feet of any wetland, the proposed development will not adversely affect the quality of that body of water or unreasonably affect the shoreline of that body of water.

Finding: The proposed development is partially located within the Shoreland Water Body / Wetland Protection Overlay Zone. All proposed development in the regulated zone is outside of the required 100-foot setback and will not adversely affect the water quality of the regulated wetland.

Conclusion: This standard appears to be met.

Vote of __ in favor __ against __ abstaining

I. Groundwater Protected.

The proposed development will not, alone or in conjunction with existing activities, adversely affect the quality or quantity of groundwater.

Finding: MDEP has found that the proposed project will not unreasonably deplete groundwater resources. The Department further found that the proposed project will not have an unreasonable adverse effect on groundwater quality or quantity.

Conclusion: This standard appears to be met.

Vote of __ in favor __ against __ abstaining

J. Flood Areas Identified and Development Conditioned.

All flood-prone areas within the project area have been identified on maps submitted as part of the application based on the Federal Emergency Management Agency's Flood Boundary and Floodway Maps and Flood Insurance Rate Maps, and information presented by the applicant. If the proposed development, or any part of it, is in such an area, the applicant must determine the one hundred (100) year flood elevation and flood hazard boundaries within the project area. The proposed plan must include a condition of plan approval requiring that principal structures in the development will be constructed with their lowest floor, including the basement, at least one foot above the one hundred (100) year flood elevation.

Finding: Flood Insurance Rate Maps (FIRM) and Town maps indicate that the only designated floodplain area on the property is located well away from the area of development.

Conclusion: This standard appears to be met.

Vote of __ in favor __ against __ abstaining

K. Stormwater Managed.

Stormwater Managed. The proposed development will provide for adequate stormwater management

The design was prepared by Altus Engineering, Inc. and reviewed by CMA Engineers, Town peer-review engineer. CMA reported that the applicant has prepared a complete stormwater design and associated analysis and the proposed development meets the requirements of the Title 16.

Finding: MDEP has found that the applicant has made adequate provision to ensure that the proposed project will meet the following: Basic Standards contained in Chapter 500 (4) (B); General Standards contained in Chapter 500 (4) (C), and the Flooding Standard contained in Chapter 500 (4) (F).

Conclusion: This standard appears to be met.

Vote of __ in favor __ against __ abstaining

L. Erosion Controlled.

The proposed development will not cause unreasonable soil erosion or a reduction in the land's capacity to hold water so that a dangerous or unhealthy condition results.

The Contractor shall follow MDEP best management practices for erosion and sediment control (silt fencing, silt sacks, etc.), and CMA Engineers will be notified to observe application during construction.

Finding: The proposed project meets the standard for erosion and sedimentation control in 38 M.R.S Section 420-C provided that sewer grit and sediment are disposed of in compliance with Maine Solid Waste Management rules. The installation of stormwater components will be overseen by CMA Engineers and documented according to State rules. Executed deed restrictions for the designated stormwater buffers will be recorded and marked on the ground.

Conclusion: This standard appears to be met.

Vote of __ in favor __ against __ abstaining

M. Traffic Managed.

The proposed development will:

1. Not cause unreasonable highway or public road congestion or unsafe conditions with respect to the use of the highways or public roads existing or proposed; and

2. Provide adequate traffic circulation, both on-site and off-site.

The proposed development does not require a traffic movement permit as it does not create an additional 100 vehicle trips during peak traffic hours

Finding: With consideration of the waivers granted below, the proposed development conforms to Title 16.8.9 Parking, Loading and Traffic and will provide for adequate traffic circulation. CMA Engineers has indicated that the site distances on Betty Welch Road are acceptable.

Conclusion: This standard appears to be met.

Vote of __ in favor _ against _ abstaining

N. Water and Air Pollution Minimized.

The proposed development will not result in undue water or air pollution. In making this determination, the following must be considered:

1. *Elevation of the land above sea level and its relation to the floodplains;*
2. *Nature of soils and sub-soils and their ability to adequately support waste disposal;*
3. *Slope of the land and its effect on effluents;*
4. *Availability of streams for disposal of effluents;*
5. *Applicable state and local health and water resource rules and regulations; and*
6. *Safe transportation, disposal and storage of hazardous materials.*

1 thru 6 have been addressed previously or are not applicable to the proposed project.

Finding: Addressed under the approval by MDEP of Site Location of Development Permit application.

Conclusion: This standard appears to be met.

Vote of __ in favor _ against _ abstaining

O. Aesthetic, Cultural and Natural Values Protected.

The proposed development will not have an undue adverse effect on the scenic or natural beauty of the area, aesthetics, historic sites, significant wildlife habitat identified by the department of inland fisheries and wildlife or the municipality, or rare and irreplaceable natural areas or any public rights for physical or visual access to the shoreline.

Finding: The applicant has made adequate provision for the protection of wildlife and fisheries. MDEP had found that the proposed development will not have an adverse effect on the scenic character of the area and preservation of unusual natural areas.

Conclusion: This standard appears to be met.

Vote of __ in favor _ against _ abstaining

P. Developer Financially and Technically Capable.

Developer is financially and technically capable to meet the standards of this section.

Finding: The developer has been involved with many large scale construction projects through completion. The developer will provide an inspection escrow in an amount suitable to cover the costs of on-site inspection by the Peer Review Engineer to ensure the proposed development is constructed according to the approved plan.

Conclusion: This standard appears to be met.

Vote of __ in favor _ against _ abstaining

NOW THEREFORE the Kittery Planning Board adopts each of the foregoing Findings of Fact and based on these Findings determines the proposed Development will have no significant detrimental impact, and the Kittery Planning Board hereby grants final approval for the Development at the above referenced property, including any waivers granted or conditions as noted.

Waivers:

1. Section 16.8.4.13. Sidewalks. No sidewalk is proposed. A walking and biking direction sign shall be provided.

2. Section 16.10.5.2.B.2 Plan Size. Drawing scale: 1"=100' for Existing Conditions and Topographic Plans and Subdivision Plans; 1"=150' for Soils Plan. The smaller scale coincides with the Lot Plans, while having a scale that is easily readable.

3. Section 16.9.3.2 Wetlands Boundaries. Jurisdictional wetlands were not delineated on approximately 22 acres of the northern portion of the parcel since additional developable area was not needed for the density calculation and the area will be protected open space. As agreed to at the August 24, 2017 Planning Board meeting, a natural Resource Assessment was prepared for the 22 acres by Gove Environmental in lieu of flagging and surveying the wetlands.

4. Section 16.8.4.4 and Table 1 Class III Private Streets Standard. *Street Width Design: e. Paved Shoulder*: To maintain the rural character of the area and reduce impervious surfaces, the applicant proposes to construct 4' wide gravel shoulders each side of the paved 20' travelled way in lieu of the Minor Streets standard of 1' and 8' paved shoulders.

5. Section 16.8.4.4 and Table 1 Class III Private Streets Standard. *Street Gradients: b. Side Slope (horiz. to vert.)*. To minimize wetland impact, the applicant proposes to construct 2:1 road side slopes in lieu of 3:1 standard.

Conditions of Approval (to be included as notes on the final plan in addition to the existing notes):

1. No changes, erasures, modifications or revisions may be made to any Planning Board approved final plan. (Title 16.10.9.1.2)
2. Applicant/contractor will follow Maine DEP *Best Management Practices* for all work associated with site and building construction to ensure adequate erosion control and slope stabilization.
3. Prior to the commencement of grading and/or construction within a building envelope, as shown on the Plan, the owner and/or developer must stake all corners of the envelope. These markers must remain in place until the Code Enforcement Officer determines construction is completed and there is no danger of damage to areas that are, per Planning Board approval, to remain undisturbed.
4. All Notices to Applicant contained in the Findings of Fact (dated: 02/14/2019).

Conditions of Approval (Not to be included as notes on the final plan):

5. Incorporate any plan revisions on the final plan as recommended by Staff, Planning Board, or Peer Review Engineer, and submit for Staff review prior to presentation of final Mylar.
6. The Home Owners Association (HOA) document must be reviewed and found satisfactory by the Shoreland Resource Officer and the Town Attorney prior to the final Mylar being signed by the Chair.
7. Provide the additional documents and/or responses to all CMA comments prior to presentation of final Mylar.

Notices to Applicant: (not to be included on the final plan)

1. Prior to the release of the signed plans, the applicant must pay all outstanding fees associated with review, including, but not limited to, Town Attorney fees, peer review, newspaper advertisements and abutter notification.
2. State law requires all subdivision and shoreland development plans, and any plans receiving waivers or variances, be recorded at the York County Registry of Deeds within 90 days of the final approval.
3. One (1) Mylar copy and one (1) paper copy of the final plan (recorded plan if applicable) and any and all related state/federal permits or legal documents that may be required, must be submitted to the Town Planning Department. Date of Planning Board approval shall be included on the final plan in the Signature Block.
4. The owner and/or developer, in an amount and form acceptable to the Town Manager, must file with the municipal treasurer an instrument to cover the cost of all infrastructure and right-of-way improvements and site erosion and stormwater stabilization, including inspection fees for same.
5. This approval by the Town Planning Board constitutes an agreement between the Town and the Developer, incorporating the Plan and supporting documentation, the Findings of Fact, and any Conditions of Approval.

The Planning Board authorizes the Planning Board Chair, or Vice Chair, to sign the Final Plan and the Findings of Fact upon confirmation of compliance with any conditions of approval.

Vote of __in favor__ against __ abstaining

APPROVED BY THE KITTERY PLANNING BOARD ON February 14, 2019

_____

Karen Kalmar, Planning Board Vice Chair

Per Title 16.6.2.A - An aggrieved party with legal standing may appeal a final decision of the Planning Board to the York County Superior Court in accordance with Maine Rules of Civil Procedures Section 80B, within forty-five (45) days from the date the decision by the Planning Board was rendered.

ALTUS
ENGINEERING, INC.

Civil
Site Planning
Environmental
Engineering

133 Court Street
Portsmouth, NH
03801-4413

January 29, 2019

Jamie Steffen, Town Planner
Town of Kittery
200 Rogers Road
Kittery, Maine 03904

Re: **Huntington Run Subdivision**
Map 66, Lots 2A, 8, and 8A
40 Betty Welch Road
Kittery, Maine
P-4567

Dear Mr. Steffen:

The Planning Board voted to grant Preliminary Approval for the subject project at their August 24, 2017 meeting. An application was subsequently submitted to the Maine Department of Environmental Protection (MDEP) for a permit under the *Site Location of Development Law* and to the Maine Department Health and Human Services (DHHS) for approval of the proposed wastewater engineered system. With the issuance of the final MDEP approval on January 24, 2019, we respectfully request that the project be considered for Final Approval at the February 14, 2019 Planning Board meeting.

The final plans reflect revisions from the preliminary drawings based on the MDEP and DHHS review processes. The following items were addressed as part of MDEP review: wet pond design, construction oversight notes, and responsibilities of long-term maintenance of stormwater BMPs and wastewater disposal systems.

Enclosed are the following documents (15 copies):

- Updated plan set dated January 24, 2019 – (5 full size and 10 half size sets)
- Project Narrative - Final Plan
- List of revisions subsequent to preliminary approval
- List of Dimensional Standards Modifications
- Attachment A – Response to CMA Engineers' Comments
- Attachment B - Waiver Requests
- Attachment C – Net Residential Acreage Calculation
- Natural Resource Assessment, Huntington Run Subdivision – North 22 Acres
- Kittery Water District letter dated July 25, 2017
- Site Location of Development Permit L-27871-L3-A-N and Natural Resources Protection Act Permit L-2781-TB-B-N

- Engineered subsurface sewage disposal system approval letter from Department of Health and Human Services, dated March 4, 2018
- *Wastewater Mounding and Transmission Analysis*, prepared by Sweet Associates, revised November 20, 2017
- *Groundwater Impact Study*, prepared by Sweet Associates, revised November 20, 2017
- Letter to the Maine Department of Health and Human Services, Division of Environmental Health, prepared by Longview Partners, LLC, dated February 6, 2018.
- *Declaration of Covenants, Conditions and Restrictions Huntington Run Subdivision*
- *Stormwater Management Facility Operation and Maintenance Manual for Huntington Run*
- *Subsurface Wastewater Disposal System Operation and Maintenance Manual – Huntington Run Cluster Subdivision,* revision date 10/12/2018
- OxyPro documents prepared by Aeration Systems:
    - *OxyPro Installation Manual*
    - *OxyPro 1000C-G Owner's Manual*
    - *OxyPro 1000C-G Operation and Maintenance*
    - *Service and Inspection Report* (example)

Please note that a proposed road name application was submitted as part of the Preliminary Plan Review Application.

Please call if you have any questions or require additional information.

Sincerely,

Jeffrey K. Clifford, P.E.
Vice President

RMB/jkc/4567.027.JS.ltr.doc

Enclosures

e-copies (w/encl.): Paul Kerrigan and Matt Assia, Chinburg Development, LLC

PROJECT NARRATIVE - FINAL PLAN

HUNTINGTON RUN SUBDIVISION

Map 66 Lots 2A, 8& 8A

40 Betty Welch Road

Kittery, Maine

January 28, 2019

The applicant proposes a cluster subdivision at 86.6 acres located on the easterly side of Betty Welch Road in Kittery, Maine. The property is approximately 1/4 mile south of the York town line and is comprised of three (3) parcels on Tax Map 66: Lot 2A (62.2 acres), Lot 8 (21.55) 66, and Lot 8A (2.8 acres). The land is abutted by Interstate Highway I-95 to the southeast; vacant parcels to the northeast, southwest and northwest; and several single family homes to the north and west. Lot 2A has over 2,100 feet of frontage along Betty Welch Road. The land is vacant woodlands; timber harvesting occurred several years ago. There are several Kittery Water District water lines passing through the site. The westerly line has been abandoned; the easterly 20-inch and 16-inch pipes in the 50 foot wide easement are active transmission mains. There is also an active watermain in the Betty Welch Road right-of-way.

The proposed clustered subdivision includes 20 single family residential lots. The project has been designed to fit harmoniously into the landscape and maintain the rural woodland character of the surrounding area using concepts and guidelines developed for conservation subdivision design. Through the flexibility provided in the ordinance's cluster provisions, the project team found that carefully locating the house lots respected the land's natural features, and provided a community atmosphere. A 17,400 s.f. village green is proposed in the center of the development creating a neighborhood gathering and play area.

The project provides 76.64 acres of protected common open space, encompassing 88% of the total site. The open space is configured to maximize sensitivity to the natural resources within and near the property by providing significant forested buffers to wetlands which connect to woodland tracts on adjacent properties. The open space provides abundant opportunities for foot trails. Covenants and deeded conservation easements will ensure that the common open space will remain protected from further development. A homeowners association will preside over open space and maintenance of facilities.

The project does not maximize the allowed density. Based on the recently passed amendments to the Kittery Land Use and Development Code (LUDC), the Net Residential Acreage calculation allows for at least 21 lots (additional upland pockets exist at the northerly portion of the property and if mapped would yield additional Net Residential Acreage).

The project will impact approximately 11 acres for the construction of the roadway, lot development and the wastewater disposal beds. The project required a Site Location of Development License (SLDL) from the Maine Department of Environmental Services (MDEP). This rigorous state review process involved a pre-application meeting and detailed analysis of the proposed stormwater management system, soils, subsurface disposal system, wetland impacts, and overall potential impacts to the environment. The project includes "woodland buffer easements" and other stormwater best management practices (BMPs) to address both the stormwater quality and quantity requirements of the state regulations. MDEP approved SLDL permit L-27871-L3-A-N for the project on January 24, 2019.

Much consideration has been given to appropriate wastewater treatment technologies for the project and providing a suitable area for subsurface wastewater disposal. A community system with common wastewater disposal beds and reserve areas are proposed at a topographic knoll on the southerly parcel (Lot 8). Each 10,000+ square foot lot will have its own septic tank and advance treatment system that will pump aerobically treated effluent to the community leach fields via common force mains. The lots will be serviced with municipal water. Electric and communication utilities will be installed underground.

Under a clustered subdivision proposal, the Kittery Land Use and Development Code Zoning Ordinance allows the Planning Board to modify certain design standards. This proposal includes dimensional modifications, most notably in lot size, yard setbacks, and road frontage. The modifications allow for the efficient and desirable cluster lot configurations presented on Plan S1.4, thereby maximizing the function and effectiveness of the common open space. The applicant proposes a 20-foot wide paved traveled way with 4-foot wide gravel shoulders to maintain the rural character of the area and to minimize impervious surfaces.

The proposed private roadway measures less than 1,200 feet to the cul-de-sac radius. The proposed roadway enters onto Betty Welch Road near the southeasterly corner of the property to minimize impacts at a wetlands crossing. This crossing's impact is 3,840 square feet of wetlands. The easterly wetland crossings are necessary for the construction of the common force mains and gravel service road connecting the developed lots to the four (4) wastewater disposal fields. These crossings will impact 2,598 square feet of wetlands. The MDEP issued Natural Resources Protection Act (NRPA) permit L-27871-TB-B-N on January 24, 2019 for the crossings, noting in Finding 17 that "The Department finds that the applicant has avoided and minimized forested, freshwater wetland impacts to the greatest extent practicable, and that the proposed project represents the least environmentally damaging alternative that meets the overall purpose of the project."

Reviews of federal, state and local documents and maps were made of the site. Flood Insurance Rate Maps and Town maps indicate that the only designated floodplain area on the property is located well away from the area of development. The *Beginning with Habitat – High Value Plant and Animal Habitat* showed a potential corridor of New

England Cottontail habitat on the easterly portion of the property near I-95. Gove Environmental Service, Inc. (GES) along with Cory Stearns of MDIFW surveyed the property in January 2016 for cottontail. Tracks and pellets were discovered in the area, but DNA results concluded that the species were Snowshoe Hare. They felt that due to the recent logging activity, the site lacks the understory for the Cottontail to proliferate. GES also performed a vernal pool assessment for the site and several vernal pools were found to exist in areas rutted by logging operations. The GES report (attached) noted that none of the pools contained a sufficient number of egg masses to qualify as a Significant Vernal Pool under state regulation even if considered natural; therefore the pools are not subject to state regulation as vernal pools. A February 4, 2016 letter from MDEP confirmed GES findings. Normandeau Associates, Inc. performed an inventory bat survey; the results of the acoustic surveys (attached) did not indicate the presence of the Northern Long Ear Bat. The northern 22 acres of the property is interspersed with many wetland fingers and will be included in the protected open space. In lieu of flagging and surveying the wetland lines in this densely vegetated area, the applicant agreed to engage Gove Environmental to prepare a report on the area titled, *Natural Resource Assessment – Huntington Run Subdivision – North 22 Acres.*

The project team believes that this development concept has been developed with the utmost sensitivity to the environment and is pleased to present it to the Planning Board for consideration and discussion.

BLACK PAGE

LIST OF REVISIONS SUBSEQUENT TO PRELIMINARY APPROVAL
for
HUNTINGTON RUN SUBDIVISION
BETTY WELCH ROAD, KITTERY, MAINE

Sheet S-1.2 – Subdivision Plan-Sheet 1 of 3

- Updated Dimensional Stds. - Minimum Land Area for Cluster to n/a
- Added Notes, Plan Reference & Approvals to Sheet S-1.2
- Added MDEP SLD & NRPA approval numbers
- Added Monumentation Note
- Added deed reference for 50' utility easement for 12", 16" & 20" watermains
- Added MDEP "Wooded" buffer

Sheet S-1.3 – Subdivision Plan-Sheet 2 of 3

- Moved Notes, Plan Reference & Approvals to Sheet S-1.2
- Added deed reference for 50' utility easement for 12", 16" & 20" watermains
- Added MDEP "Wooded" buffer
- Added list to document approved waivers and dimensional modifications

Sheet S-1.4 – Subdivision Plan- Sheet 3 of 3

- Reconfigured Lots 6 thru 12 to eliminate a flag lot
- Added MDEP "Wooded" buffer

Sheet G-1.0 – Soils Plan

- Stamped plan by Soil Scientist

Sheet C-1.0 – Lot Plan-A

- Revised roadway to 20' wide pavement with 4' shoulders
- Roadway will be private, maintained by HOA
- Revised G.U.S.F. #1
- Added sedimentation barriers

Sheet C-1.1 – Lot Plan-B

- Revised roadway to 20' wide pavement with 4' shoulders
- Roadway will be private, maintained by HOA
- Added watermain details to 50' easement
- Revised G.U.S.F. #1 & #2
- Added sedimentation barriers
- Revised grassed swales widths
- Wet Pond
    - Enlarged and reconfigured pond
    - Added emergency outflow structure
    - Added gravel bench with perforated underdrain
    - Added forebay

HUNTINGTON RUN SUBDIVISION

Sheet C-2.0 – Roadway Plan & Profile-A

- Reduced westerly watermain to 4”
- Added 2” PVC force main to profile
- Added water and sewer services to lots
- Added elevations to 2” force main

Sheet C-2.1 – Roadway Plan & Profile-B

- Added the (3) existing watermains within the 50’ easement; locations to be verified
- Revised tapping sleeve configuration off 20” watermain
- Added 2” PVC force main to profile
- Added water and sewer services to lots
- Added flushing valve
- Added 5’x10’ paved bump out at access way
- Relocated air release manhole from Sta. 15+30 to Sta. 9+12
- Added elevations to 2” force main

Sheet C-3.0 – Stormwater Management Plan-A

- Added “Stormwater Treatment Spreadsheet”
- Added G.U.S.F. construction observation requirement notes
- Revised grassed swales widths
- Label BMPs that require long term maintenance
- Added force main positive drainage note
- Wet Pond
    - Enlargement and reconfigured
    - Added emergency outflow structure
    - Added gravel bench with perforated underdrain
    - Added forebay

Sheet C-3.1 – Stormwater Management Plan-B

- Reconfigured subsurface wastewater disposal fields
- Added Long Term Inspection & Maintenance Schedule
- Added force main positive drainage notes
- Added force main thru cleanout manhole near wetlands impact #2

Sheet C-4.0 - Subsurface Wastewater Disposal Fields

- Reconfigured subsurface wastewater disposal field and reserve area layout
- Revised grading of SSWD fields
- Added MDHHS notes
- Added disposal beds construction monitoring requirement notes
- Added Disposal Field Design Criteria notes

HUNTINGTON RUN SUBDIVISION

Sheet C-5.0 – Erosion Control Notes

- Added Housekeeping Notes

Sheet C-5.1 – Erosion Control Details

- Added Organic Filter Berm detail

Sheet C-6.0 thru 6.2 – Detail Sheet

- Revised Roadway Cross Section details
- Added Storm Drain Inlet Protection detail
- Revised Wet Pond #3 Outlet Structure & Pond Cross Section
- Added Wet Pond Notes
- Revised Det. Basin #1 & #2 Outlet Structure detail
- Added Emergency Overflow Weir detail
- Added Grassed Underdrain Soil Filter detail and notes

Sheet C-7.0 – Water Details

- Removed Water Main Blowoff Valve detail (item provided by K.W.D.)

Sheet C-8.0 thru 8.2 – Sewer Details

- Added Schematic House Lot Wastewater Plan
- Added 1,000 Gallon Septic Tank detail
- Added Oxypro Concrete Module detail
- Added Effluent Pump Chamber detail
- Added 750 Gallon Equalization Tank detail
- Added Low Profile Leaching Chambers detail
- Added Distribution Box detail
- Added Force Main Thru Cleanout Manhole

BLACK PAGE

Town of Kittery, Maine

Planning Office

P.O. Box 808, Kittery, Maine 03904
Phone 439-0452

HUNTINGTON RUN

LIST OF DIMENSIONAL STANDARDS MODIFICATIONS

Proposed Dimensional Modifications per Article XIII, Clustered Residential Development, Section 16.8.11.3

16.3.2.1.D2	Minimum lot area: 10,087 s.f. vs. 40,000 s.f.
16.3.2.1.D2	Street frontage: 26.61' vs. 150' minimum
16.3.2.1.D2	Front yard setback: 20' vs. 40' minimum
16.3.2.1.D2	Side and read yard setback: 10' vs. 20'

HUNTINGTON RUN
Name of Development

Agent: Altus Engineering, Inc.
~~Owner or~~ Agent

Jeffrey K. Clifford, P.E.

BLACK PAGE

Attachment - A

Response to Technical Comments
Huntington Run Cluster Subdivision
Map 66, Lots 2A, 8 and 8A
Kittery, Maine

The following responses are provided to design review comments received from CMA Engineers in their letter dated August 16, 2017. This response supplements the responses provided by the applicant's consultants at the Planning Board's August 24, 2017 Public Hearing.

16.3 Zoning Regulations

16.3.2.1 Residential-Rural (R-RL)
The proposed use (dwellings) is a permitted use, and cluster residential development is specifically included in the permitted uses.

Land area: A common wastewater system is proposed. For a cluster subdivision, there apparently is no minimum land area per dwelling unit if a common wastewater system is used. (If no common wastewater system the minimum is 20,000 sf). The applicant describes that they have chosen 10,000 sf minimum. For other residential zones in Kittery with sewered lots, the minimum land area per dwelling unit ranges from 30,000 sf (Residential—Suburban), to 20,000 sf (Residential-Urban), to 6,000 sf (Residential Village).

Does the Planning Board accept the 10,000 sf minimum land area proposed by the applicant?

> **Response:** As noted by the reviewer, the proposed common wastewater treatment system allows for the lot size to be less than 20,000 sf at a cluster subdivision. The Maine Department Health and Human Services (DHHS) Chapter 241 Subsurface Wastewater Disposal Rules require that the total land area of the proposed 20 lots and the homeowner association's (HOA) common open space be at least 400,000 sf. The project has been approved by the DHHS, as well as the Maine Department of Environmental Services.

16.7 General Development Requirements

Article VIII Net Residential Acreage

The Cluster Residential and Cluster Mixed Use Development ordinance (Article XI section 16.8) provides that the number of residential units on a clustered lot can be the same as the number of lots that are allowable with a conventional subdivision, subject to various requirements in that section. (See separate discussion of cluster residential considerations later in this letter).

The applicant presents a calculation that reduces the 86.55 acre total lot area to 19.72 acres of potential net residential area. It is difficult to verify each of the areas subtracted to yield the 19.72 acres. It would be helpful if a plan (perhaps color-coded) provided that shows each subtracted land area.

For the Residential-Rural zone, the minimum lot size is 40,000 ft.². Assuming physical access can be established to all the net residential area, yields 21 residential units. The project proposes 20 units.

At several locations in the plans and narrative, the applicant represents states that 79.38 acres of the 86.55 total acreage is common open space. We question whether 79.38 acres is accurate. What are the land areas excluded from the total land area, and therefore not included in the 79.38 acre open space? For example, does the 79.38 acres of open space exclude:

- *The drainage and stormwater control ponds and swales?*
- *The 50-foot utility easement for the water main?*
- *Access to the community leach fields?*
- *The community leachfields and appurtenances?*

Clarification of this issue is requested.

Response: Attachment C present a table summarizing the Net Residential Acreage Calculation. The accompanying Net Residential Acreage Plan provides a graphic representation of the land uses and soil types used for calculation. The 50-foot utility easement for the water main is deducted from the Net Residential Acreage, but the easement, along with the stormwater practices, access to community disposal fields, and the community disposal fields and appurtenances located beyond the right-of-way are all part of the 79.38 acre common open space.

16.8 Design and Performance Standards-Built Environment

Article IV. Streets and Pedestrian Ways

There is also a proposed cul-de-sac roadway that the Applicant is proposing to build as a Minor Street classification as a private road. On Street Design Standards. Table 1 the minor street portion of the roadway does not meet the following standards:

Street Width Design:
c) Sidewalk/Pedestrian way-The Applicant has not included the 5' sidewalk in the roadway design.

d) Paved Shoulder-The Applicant has included 1' paved shoulders on each side of the road not 8' on the opposite side.

The applicant proposes these differences as part of the variation from dimensional requirements allowed for a cluster development. The standards for modifications in dimensional requirements in cluster section appear to refer to lot size and configuration. As such, the changes to roadway standards are performance standards, and would require waivers under Article IV of section16.7.

*Does the planning Board accept the dimensional modi*fications presented, or require waivers?

Response: The roadway is proposed as a 60' right-of-way and 20' wide paved surface with 4' wide gravel shoulders on each side of the pavement. A waiver from the sidewalk standard for a Minor Street classification was approved by the Planning Board on April 13, 2017. The applicant agreed to install a sign noted to "walk against traffic, bike ride with traffic". Please refer to Attachment B – Waiver Requests for additional waivers.

This proposed road standard exceeds a number of roadways recently approval by planning board. It provides for an efficient and desirable cluster lot configurations, and will moderate vehicular speeds in the development.

16.8.4.8.D. The sight distances on Betty Welch Road should be indicated.

General: Near the intersection with Betty Welch Rd., Road slopes are steeped (2:1). The applicant should consider guardrail, or other barrier.

Response: The sight distances along Betty Welch Road are shown on Sheet C-1.0. The embankment of the new road and Betty Welch Road is less than 4 feet; therefore guardrail is not warranted per AASTO highway standards. Adding guardrails would require a wider shoulder width, increasing the wetland impact.

Article VI Water Supply

The applicant should provide input from the Kittery water district regarding review of the design, placement of hydrants, and confirmation of ability to serve.

Are there any remaining obligations regarding the public water system that should/must be addressed by a homeowner's association?

Response: A July 25, 2017 letter from the KWD indicated their ability to service the subdivision. The meeting was held with Michael Rogers, KDW Superintendent to review the water main design. The system was modified per KDW comments. An existing hydrant is located at Hamilton Lane entrance and a new hydrant is proposed at Sta. 10+25. There are no homeowners obligations regarding the public water system.

Article VII Sewage Disposal

A separate review is being completed by Michael Giggey, PE of Wright Pierce Engineers, and should be referred to regarding certain aspects of the proposed wastewater disposal system.

It is recognized that the project is being reviewed currently as a "preliminary" submittal. Significant further detail will be prepared and presented on many aspects of the project, including on the proposed wastewater system in the future final review process. The purpose of the issues raised in Mr. Giggey's memo, and this letter, is to frame issues for effective addressing by the applicant's engineering team as part of that final submittal.

We provide the following questions/comments independent of Mr. Giggey's comments:

1. A summary of the design criteria for the wastewater system should be provide as part of the final submittal, including:

- *Wastewater flow estimates.*
- *Summary of design criteria for treatment units at each dwelling.*
- *Sizing of the leachfields, and other design criteria for each unit.*
- *Sequencing of flow distribution among the leachfields.*
- *Any factors of safety or other elements of conservative design.*

Response: A community wastewater disposal system is proposed for the Huntington Run project. Each house lot will have a 1,000 gallon septic tank and a 1,000 gallon capacity OxyPro advance wastewater treatment tank, sufficient to treat up to 500 gallons per day (each dwelling has a design flow of 270 gpd). The 20 on-site systems will pump to four (4) common wastewater disposal fields are proposed at a topographic knoll on the southerly parcel (existing parcel Lot 8). The disposal area includes four (4) reserve areas. Reference is made to the Disposal Field Design Criteria notes on Sheet C-4.0 for additional design information. The disposal fields were analyzed as part of two reports prepared by Sweet Associates, *Wastewater Mound and Transmission Analysis*, and *Groundwater Impact Study*, both revised November 20, 2017. The original reports dated June 9, 2017 were updated to include more conservative parameters for nitrates entering the disposal fields and to reflect changes to the disposal field locations. The system design was approve by the Maine Department of Health and Human Services (DHHS) on March 4, 2018. The Maine DEP also reviewed and approved the wastewater design as part of the *Site Location of Development* permit dated January 24, 2019. Finding 14 of this permit notes that "…Maine's Drinking Water Standard for nitrates will be met at the property line."

2. The applicant should describe in detail the permitting process (with Maine Division of Environmental Health, Maine DEP, and locally) that is anticipated in the final development of the community wastewater disposal system. Please summarize the performance standards that will be part of those regulatory processes, including any performance monitoring that will likely be included, and the operation, maintenance, and reporting requirements of the system. The applications for applicable wastewater permits should be provided to the Town when prepared.

Response: The above response references the Maine DEP and DHHS permits issued for the project. The DHHS approval lists eight (8) conditions including rigorous requirements for oversite and report during construction. Copies of the Operation and Maintenance manuals prepared for the systems are attached. A copy of the DEP application was provided to the Town upon submission to the state. This included a copy of the DHHS application and approval.

3. The system appears to be designed for 6,000 GPD. This represents 300 GPD per residential unit. How many bedrooms per unit, and what controls on future additional occupancy are provided?

Response: The wastewater system is design is based on 3 bedroom homes at 90 GPD, 270 GPD. The total flow from 20 homes is 5,400 GPD. The reference to 6,000 GPD has been deleted. Conservative design is provided by using a large size rating (4.1 sq.ft./ gpd) for the disposal field design versus a medium-large size rating (3.3 sq.ft./gpd) as is allowed for the on-site soils that are predominantly 3C profiles.

4. It has been described that individual homeowners are to be responsible for the operation and maintenance of the individual septic tanks and treatment units; and that a homeowner's association will be responsible for the common elements, including the force mains and community leachfields. In final submittals, descriptions of how this will be reflected in anticipated permits, including operationally and financial assurance will be critical. What local or State regulatory control is anticipated?

Response: The operation and maintenance manuals prepared for the project were provided to and approved by DEP. The homeowners' association (HOA) covenants detail the inspection and record keeping requirements of the HOA. Financial assurance is the responsibility of the HOA. The HOA is required to maintain records of the system operation and inspections for review by state and Town regulators.

5. Electric power. There will be wastewater treatment performance ramifications if the individual treatment systems are without power for appreciable periods of time, in terms of secondary treatment of wastewater, and potential carry-over of biological solids to the leachfield. In the final submittal description should be included of how this is proposed to be managed: commitments for auxiliary power, assuming the risk, or other means.

Response: Pursuant to discussions with Maine DEP staff, each house will be equipped with an automatic transfer switch (ATS) to allow an auxiliary power source to operate the wastewater treatment system in the event of a power outage.

6. On the wastewater disposal cross-sections (C-4.1):

- *What is the surface of the mounded systems? Loam and seed? Other?*

  Response: The surface of the mounded disposal field will be 4" loam and seeded as noted on the cross sections.

- *The Sweet Associates mounding analysis concludes that fill should extend 38' from the center of the leaching chambers. How is that recommendation carried through the design of each mounded field?*

  Response: The downgradient fill extends no less than 49 feet from the center of the leaching chambers as shown on the disposal field grading (see Sheet C-4.0) and the cross-sections (see sheet C-4.1). Note that the downgradient fill extensions is at least 32 feet from the 5 foot shoulder as recommended in the attached *Wastewater Mounding and Transmission Analysis* report prepared by Sweet Associates, revised November 20, 2017.

- *The Sweet Associates mounding analysis assumes a horizontal base for each leach field. The bases for these leach fields are all sloped. Does that change the mounding analysis?*

  Response: The *Wastewater Mounding and Transmission Analysis* report prepared by Sweet Associates, revised November 20, 2017 identifies an average existing grade slope of 6%. The report's author, David Chapman, Maine Certified Geologist #458 provided the following regarding the mounding analysis, "A flat slope under the leachfield simplifies the mathematics of the model, but is also a reasonable assumption because it is conservative. Intuitively, for example, if the mound is assumed to be 1 foot under the high side of the field, it will be lower under the low side because there will be more high-permeability fill at that side under the system to attenuate it. There will be a greater thickness of high-permeability fill under the low side than under the high side because the top of the system is level."

Article VIII. Surface Drainage

The project will require a ME DEP Chapter 500 permit. That application should be provided to the town when prepared.

The overall drainage and stormwater management system appears to be prudently conceived and reflected in the preliminary design. The Stormwater Management Facility O & M Manual is a symbol similarly well-conceived and presented.

Final design should address, similar to the wastewater system, or delineation of the responsible parties for these functions.

16.8.8.2 The Applicant should meet the requirements of post-construction stormwater management. Please clarify.

Response: A full copy of the MDEP Site Location of Development application was previously submitted to the planner and a copy of MDEP permit issued January 24, 2019 is also attached. A copy of *Declaration of Covenants, Conditions and Restrictions for Huntington Run* and the "*Stormwater Management Facility Operation and Maintenance Manual"* are attached. The documents indicate the responsible party of the stormwater facility maintenance.

Article XI. Cluster Residential and Cluster Mixed-Use Development

16.8.11.6.E.2. Open space should be calculated as reserved, common or public as specified in this section.

Response: As shown on the Subdivision Plans, the project proposes an area of 79.64 acres as common open space.

16.8.11.6.E.6. The Applicant should demonstrate how the open space is contiguous and unfragmented.

Response: Per 16.8.11.7 (B)(1), "open space is define as land that cannot be used for future building lots. The common open space wraps around the proposed lots and right-of-way, and is continuous.

16.8.11.6.E.7. Is a portion of the open space in close proximity to other open spaces used for recreation?

Response: There are two (2) privately owned large lots abutting the parcel; a woodland parcel to the southwest (Map 66, Lot 2B) and a partially wooded parcel to the northeast that was harvested several years ago (Map 66, Lot 2). There is no active recreation on these adjacent parcels, but the landowners have reportedly allowed hunting by permission.

16.8.11.6. I.4. No buffering is proposed for the development. This may be appropriate.

Response: The closest lot is over 400 feet from the Betty Welch Road right-of-way. The stormwater management system includes two (2) forested, limited-disturbance stormwater buffers to provide treatment of stormwater.

BLACK PAGE

Attachment -B

Waiver Requests

Huntington Run – Cluster Subdivision

Map 66, Lot 2A, 8 and 8A

The following waiver request was granted at the April 13, 2017 Planning Board meeting:

Ordinance Section	Description
16.8.4.13 Sidewalks	No sidewalk is proposed. A walking and biking direction sign shall be provided

Additional waivers being requested:

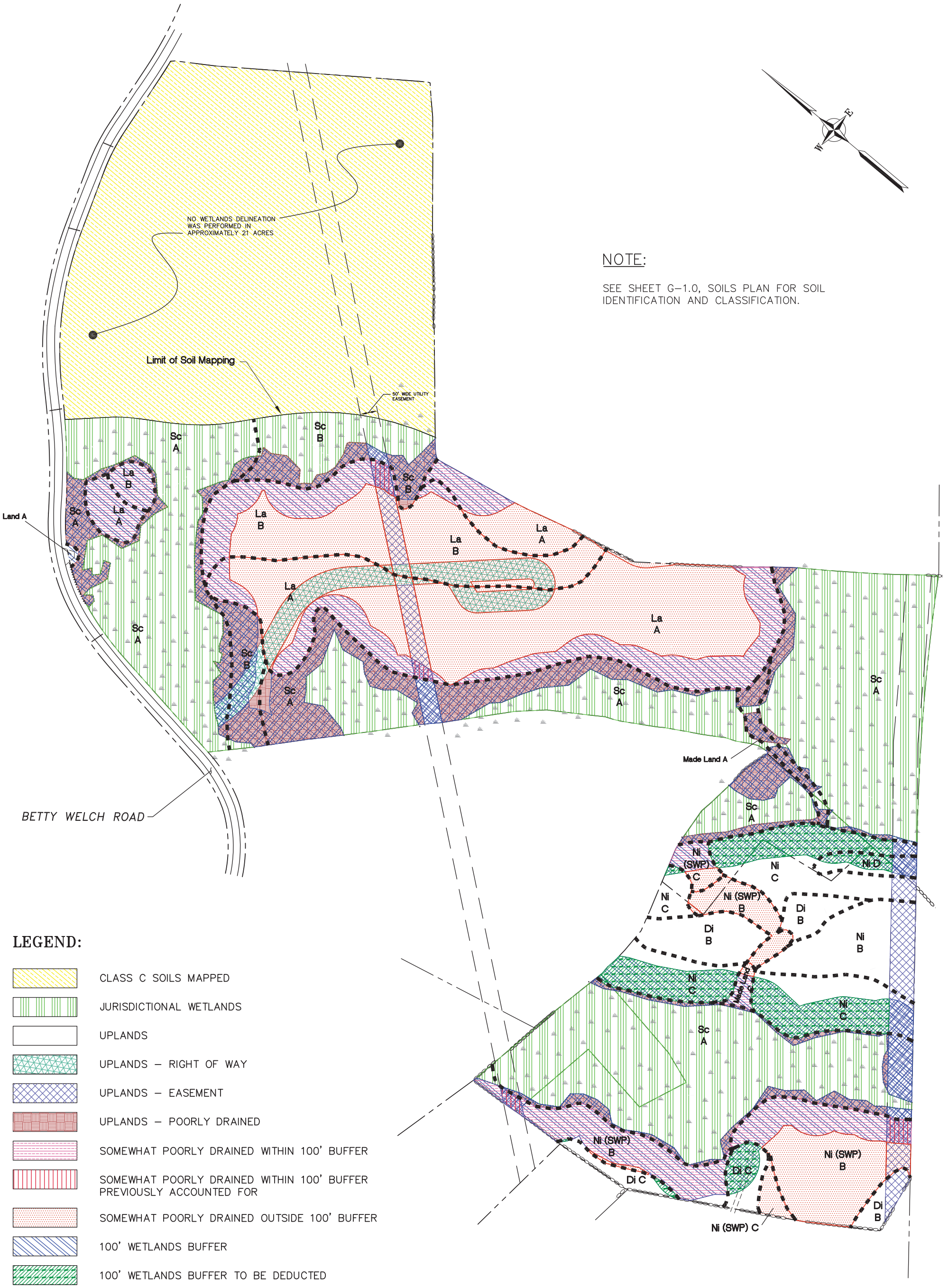
Ordinance Section	Description
16.10.5.2.B.2 Plan Size	Drawing scale: 1"=100' for Existing Conditions and Topographic plans and Subdivision Plans; 1"=150' for Soils Plan; The smaller scale coincides with the Lot Plans, while having a scale that is easily readable.
16.9.3.2 Wetlands Boundaries	Jurisdictional wetlands were not delineated on approximately 22 acres of the northern portion of the parcel since additional developable area was not need for density calculation and the area will be protected open space. As agreed at the August 24, 2017 Planning Board meeting, a Natural Resource Assessment was prepared for the 22 acres by Gove Environmental in lieu of flagging and surveying the wetlands.
16.8.4.4 and Table 1 Class III Private Streets Standards	*Street Width Design: e. Paved Shoulder:* To maintain the rural character of the area and reduce impervious surfaces, the applicant proposes to construct 4' wide gravel shoulders each side of the paved 20' travelled way in lieu of the Minor Streets standard of 1' and 8' paved shoulders.
16.8.4.4 and Table1 Class III Private Streets Standard	*Street Gradients: b. Site Slope (horiz. to vert.)* To minimize wetland impact, the applicant proposes to construct 2:1 road side slopes in lieu of 3:1 standard

BLACK PAGE

Attachment C - Net Residential Acreage Table
Huntington Run Subdivision
Map 66 Lots 2A, 8 8A
Kittery, Maine

Net Residential Acreage Calculation			**Totals** (acres)
Total Lot Area	**86.55**		
Deduct northern area of Class C Soils Survey		-22.43	
Net Area considered for NRA			**64.12**
Deduct Wetlands		-24.30	
Deduct in uplands for ROW, easements, and poorly drained soils		-11.20	
		-35.50	
Subtotal			**28.62**
50% deductions for somewhat pooly drained (SPD) soils and 100' wetland buffer:			
SPD soils - *outside 100' wetland buffer*	14.40		
50% of SPD soils outside 100' buffer		-7.20	
Previous deductions at SPD soils outside 100' buffer		2.30	
Additional deduction required		-4.90	
Subtotal			**23.72**
SPD soils - *within 100' buffer*	8.10		
50% of SPD within 100' wetland buff		-4.05	
Previous deductions at SPD soils within 100' buffer		0.30	
Additional deduction required		-3.80	
Subtotal			**19.92**
100' wetland buffer total area	18.80		
50% of buffer area		-9.40	
Previous deductions in 100' buffer		9.20	
Additional deduction required		-0.20	
Total NRA Area			**19.72**

Net Residential Acreage (NRA)	19.72	Acres
Net Residential Density (NRA*43,560 s.f. / 40,000 sf)	**21.48**	**Lots**



NOTE:

SEE SHEET G–1.0, SOILS PLAN FOR SOIL IDENTIFICATION AND CLASSIFICATION.

LEGEND:

- CLASS C SOILS MAPPED
- JURISDICTIONAL WETLANDS
- UPLANDS
- UPLANDS – RIGHT OF WAY
- UPLANDS – EASEMENT
- UPLANDS – POORLY DRAINED
- SOMEWHAT POORLY DRAINED WITHIN 100' BUFFER
- SOMEWHAT POORLY DRAINED WITHIN 100' BUFFER PREVIOUSLY ACCOUNTED FOR
- SOMEWHAT POORLY DRAINED OUTSIDE 100' BUFFER
- 100' WETLANDS BUFFER
- 100' WETLANDS BUFFER TO BE DEDUCTED

ALTUS ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801
(603) 433–2335 www.ALTUS–ENG.com

NET RESIDENTIAL ACREAGE PLAN

HUNTINGTON RUN SUBDIVISION

MAP 66 LOTS 2A, 8 & 8A

40 BETTY WELCH ROAD
KITTERY, MAINE

GRAPHIC SCALE
120 0 60 120 240 480
(IN FEET)

SCALE: 1"=120" (24"x36")
DATE: JANUARY 23, 2019

Natural Resource Assessment

Huntington Run Subdivision—North 22 Acres

Kittery, Maine

1.0 Introduction

This report details the results of a natural resource assessment of approximately 22 acres of proposed Open Space located on Lot 66-2A within the Huntington Run Subdivision on Betty Welch Road in Kittery, Maine. Figure 1—Locus map depicts the limits of the entire project site and the portion of the property that is the subject of this investigation. There is no work proposed on this portion of the site. The purpose of this report is to provide a natural resources context for this portion of the property which lies beyond the limits of the wetland delineation and other detailed investigations conducted for the subdivision project. This report includes details on the natural communities, potential habitat and observed wildlife, natural resource related management recommendations, and a photo-log.

2.0 Site Description

The property is comprised of undeveloped forested land situated north of the proposed residential lots of the subdivision. The majority if this area was logged at the same time as the remainder of the property. Overall, grades are nearly flat, varying only about 10 feet from the southern part of the evaluation area to the northern end where they are lowest. This type of landscape supports a complex patchwork of marginal forested wetland that is difficult to map even in undisturbed conditions. The recent logging has made mapping wetlands even more difficult. In its current state of regeneration the most prominent features on the property are the limits of the previous logging and a water main corridor which is routinely maintained. A more detailed look also revealed the presence of a low gradient intermit stream channel and associated wetland in the northwest portion of the property. The approximate extent of three main areas features are depicted on the figure and discussed in the following sections.

Disturbed Forested Wetland-Upland Complex

The forest in this area was logged at the same time as the rest of the site exhibits a similar level of disturbance to the area in and directly adjacent to the subdivision project area. The dominant trees include Red Maple (*Acer rubrum*) and Eastern Hemlock (*Tusga Canadensis*) in wetter areas and a mix of Eastern White Pine (*Pinus strobus*), Red Oak (*Quercus rubra*) upland areas. Small amounts Red Spruce *(Picea rubens*) are also present. Currently, however, the forest is in an early state of succession and is dominated

by species such as Glossy Buckthorn (*Rhamnus frangula*), raspberry (*Rubus sp*.), poplar, and Gray Birch (*Betula populifolia*). A very robust herbaceous layer is also present, particularly along the old haul roads and skid trails. This consists of numerous sedges and rushes and forbs that were likely part of a logging area restoration seed mix along with the ubiquitous mix of goldenrod and asters. The late season bloom of the golden rod and asters has also attracted an abundance of pollinating insects that would normally be absent in a forest setting

No formal wetland delineation was conducted on this portion of the property so it is difficult to assess the extent of the wetland in this area. A complex mix of wetland and upland clearly exists within this relatively flat landscape.

There are no water features in this part of the evaluation area aside from a number of skidder ruts created by operation of logging equipment on softer soils. No vernal pool investigation was conducted on this portion of the property but these created features are similar to those that were found to support incidental vernal pool breeding activity within the project area as detailed in the 2015 Vernal Pool Report Submitted to the MDIFW

Undisturbed Forested Wetland-Upland Complex

This area of the property lies east of the water main easement and extend to the eastern property line. It contains the same dominant tree species found to the west, lies at the same landscape position, and has a similar mix of marginal wetland areas and uplands. This area was not, however, subject to recent logging disturbance and therefore likely provides the best representation of the pre-logging condition of the area described in Section 2.1. Notably, with the absence of skidder ruts, no pools of suitable depth for vernal pool breeding were observed in this area. There were no other water features observed in this area.

Forested/Scrub Shrub Wetland & Stream

This area begins along Betty Welch road and extends roughly along the frontage with Betty Welch Road to the northern end of the property. A small intermittent stream meanders through this area, originating at a culvert under Betty Welch Road and leaving the property near the intersection of the water main and the property line. There is a relatively undisturbed forested and scrub shrub wetland associated with this stream with good examples of Red Maple/Sensitive fern swamp and shrub thickets (see photos). As is the case on almost all other areas of the property, invasive Glossy Buckthorn is the dominant shrub though Winterberry (*Illex verticillata*) and Alder (*Alnus rugosa*) are also present. Red Maple is the dominant tree.

Compared to the generally featureless forested area on the rest of the evaluation area this area is rather unique due to the presence of the stream and the fact that it is largely undisturbed by the recent logging activity. Both of these factors increase the habitat

value and water quality fiction supported by the wetland, particularly since the stream appears to drain to the York River by way of Libbey Brook.

3.0 Wildlife and Habitat

The mix of open areas, dense brush, and undisturbed forest created by the logging likely provides better habitat for many species that a single block of uniform forest. The only wildlife directly observed over the course the field visit for this evaluation were deer, songbirds, squirrel and chipmunk. During past field visits coyote and hawk were also observed in the area, no doubt taking advantage of the open hunting grounds.

Rare Threatened and Endangered Species

Two listed species were identified as potently being present on this site during the permitting for the subdivision. New England Cottontail (NEC), which is a state listed endangered species, is known to exist nearby. A winter tracking survey and DNA testing of the pellets was conducted with assistance from MDIFW. The study concluded that the rabbit population on this site consists of snowshoe hare and that NEC is not present on this property. Furthermore, the current state of the property, thorough dense enough to be difficult to walk through, is not currently dense enough to function as optimal habitat for NEC which requires very dense thickets for cover from predators.

An acoustical survey was also conducted for Northern Long Eared Bat which received federal Threatened status in 2015. The survey, conducted by Normandeau Associates in 2016 determined that the species is not present on the property. No other rare, threatened or endangered species were observed or are known to exist I the evaluation area. New England Cottontail and Northern Long Eared Bat do, however present possible conservation management opportunities, these are discussed in the section 4.0.

Vernal Pools

No formal vernal pool survey was conducted in the evaluation area. The presence of equipment rutting similar to that which was found to support vernal pool breeding elsewhere on the site makes it likely that similar opportunistic vernal pool breeding is also currently supported in the evaluation area. As the forest continues to regenerate the long term viability of these areas is, however, uncertain. The evaluation area lacks any conspicuous natural depressions that exhibit clear vernal pool morphology indicative of long term stable habitat. This is supported by observation of the forest to the east of the water line which likely provides a reference for what the area likely looked like pre disturbance. This area also contained no conspicuous pools.

4.0 Recommendation for Management

This section will provide some general recommendations for management of this area of open space with a focus on conservation and passive recreation. Three main categories of

recommendations are discussed in the following sections. It is important to note that these are not mutually exclusive of on another and may yield the most value if pursued together.

Walking Trails

The nature of the property does not necessarily lend itself to an extensive trail network due to limited features of interest and dense early successional growth. A simple loop is recommended with a route that takes advantage of the most interesting features of the property and highlighting wildlife within early successional habitat. The trail could be located mostly through uplands areas, which would probably result in a winding route that would add interest to the trail. Where necessary, only simple crossing techniques would be necessary to cross the marginally wetland areas present on the property. Locating the trail within the stream/wetland complex along the eastern portion of the lot should be avoided but several good upland vantage points are present which would provide good viewing opportunities if the trail was located near this wetland area. The trail should also make use of the exiting maintained water line easement which provides a logical route through the center of the open space and allows viewing of both the undisturbed forest to the east and the regenerating forest to the west. This edge habitat between forest, early successional growth, and cleared the meadow habitat of the water main corridor is good area to encounter wildlife and a viewing blind could be located in this area for that purpose. There are also numerous opportunities for informational kiosks on topics relevant to the property such as the regeneration of forests, early succession habitat, wildlife, or plant identification.

Habitat Management

There are several opportunities for the management of the current or developing habitat on the property. The installation of bat boxes throughout the area would be a simple way to promote habitat for Northern Long eared Bat or other bat species that may use this forest. Bat boxes are simple to construct and install and there are many resources available to assist in such endeavors. Bats also provide enormous benefits to by way of the huge quantity of insect (such as mosquitos) they devour. A more involved habitat management scheme may be envisioned on this property for the New England Cottontail. This state endangered species was not indentured on the property but is known to exist in te region. Historically this species thrived on a landscape with far less forest and a far more cleared fields, or more specifically, fallow fields which quickly became dese this shrub thickets. This habitat is not currently present on the property, but the early succession growth does have the potential to develop into suitable habitat. Management schemes typically involve tree cutting and brush hogging to maintain this long term. There are several nearby placed where this is being done in southern Maine there resources that would assist in developing such a plan if desired.

Leave it Be

Lastly, nothing has to be done with this area at all. The open space in this portion of the property could simply be left alone to develop back into a forest as it likely has in the past. All the internet habitat and water quality benefits would remain intact and change along with the composition of the forest. A forest management plan could be developed to promote long term health of the forest. This would not necessarily preclude trail development or habitat management efforts in the future.

Mostly Undisturbed
Forested and Scrub-Shrub Wetland
Associated with an Intermittent Stream

Disturbed Marginal
Wetland-Upland Complex

Limit of Wetland Mapping for Subdivision

Water Main Corridor

Undisturbed Marginal
Wetland-Upland Complex

Approximate Limits
of Proposed
Subdivision

0 50 100 200 300 400 Feet

Gove Environmental Services, Inc.
8 Continental Drive Bldg 2 Unit 7 Exeter NH 03833 603-778-0611

Date: September 12, 2017

Natural Features

Open Space Evaluation: North 22 ac.
Huntingon Run Subdivision
Betty Welch Road Kittery, ME

Site Photos

Photographs 1&2
Typical conditions of the disturbed areas with late season growth

Photograph 3--Glossy Buckthorn is prevalent on the property

Photograph 4—Typical of the Forested wetland east of the water main

Photograph 5—Panoramic of the disturbed Wetland/Upland complex

Photograph 6—Panoramic of the Wetland/Upland Complex east of the water main

Photograph 7 &8: Red Maple Sensitive Fern swamp along the stream

Photograph 9 &10: Views of the stream near where it exists the property. Numerous wildlife signs were noted in this area

OFFICE OF

KITTERY WATER DISTRICT

17 State Road
Kittery, Maine 03904-1565
TEL: 207-439-1128
FAX: 207-439-8549
Email: kitterywater@comcast.net

Kittery Planning Board
200 Rogers Road
Kittery, ME 03904

July 25, 2017

Re: Proposed Huntington Subdivision, Betty Welch Road, Kittery

Dear Planning Board Members,

Please accept this letter as verification that the Kittery Water District does have the capacity to supply municipal water service and fire protection service for the proposed 20 lot Huntington Subdivision on Betty Welch Road in Kittery.

Sincerely,

Michael S. Rogers
Superintendent

cc: Jeff Clifford, P.E. Altus Engineering, Inc.

STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION
17 STATE HOUSE STATION AUGUSTA, MAINE 04333-0017

DEPARTMENT ORDER

IN THE MATTER OF

CHINBURG DEVELOPMENT, LLC	) SITE LOCATION OF DEVELOPMENT ACT
Kittery, York County	) NATURAL RESOURCES PROTECTION ACT
HUNTINGTON RUN SUBDIVISION	) WATER QUALITY CERTIFICATION
L-27871-L3-A-N (approval)	)
L-27871-TB-B-N (approval)	) FINDINGS OF FACT AND ORDER

Pursuant to the provisions of 38 M.R.S. §§ 481–489-E and §§ 480-A–480-JJ, Section 401 of the Federal Water Pollution Control Act (33 U. S. C. § 1341), and Chapters 310, 372, 373, 375, 376, 500, 501, and 502 of Department rules, the Department of Environmental Protection has considered the application of CHINBURG DEVELOPMENT, LLC with the supportive data, agency review comments, and other related materials on file and FINDS THE FOLLOWING FACTS:

1. PROJECT DESCRIPTION:

A. Summary: The applicant proposes to subdivide an 86.55-acre parcel of land into 20 residential lots ranging in size from approximately 8,159 to 14,325 square feet and two open space lots, 34.49 acres and 39.90 acres, all as shown on a set of plans the first of which is entitled "Huntington Run Subdivision," prepared by Altus Engineering, Inc., and dated March 19, 2018, with a last revision date of October 12, 2018. The proposed project includes approximately 10.9 acres of developed area of which 2.4 acres are impervious area. The project site is located on the west side of Betty Welch Road in the Town of Kittery.

The applicant is also seeking approval under the Natural Resources Protection Act (NRPA) to alter approximately 6,438 square feet of freshwater wetlands at six locations as described in Finding 17.

B. Current Use of Site: The site of the proposed project is currently undeveloped fields and woodland. There are no structures on the property. The project site is further identified as Lot 2A, 8, and 8A on Map 66 of the Town of Kittery's tax maps.

2. FINANCIAL CAPACITY:

The total cost of the project is estimated to be $1,013,150. The applicant submitted a letter from The Provident Bank, dated December 13, 2017, indicating that it intends to provide financing for this project. Prior to the start of construction, the applicant must submit evidence that it has been granted a line of credit or a loan by a financial institution authorized to do business in this State or evidence of any other form of financial

assurance determined by Department Rules, Chapter 373(1), to be adequate to the Bureau of Land Resources (BLR) for review and approval.

Prior to the start of construction, the applicant must submit evidence that it has been granted a line of credit or a loan by a financial institution authorized to do business in this State or evidence of any other form of financial assurance determined by Department Rules, Chapter 373(1), to be adequate to the Bureau of Land Resources (BLR) for review and approval.

3. TECHNICAL ABILITY:

The applicant provided resume information for key persons involved with the project and a list of projects successfully constructed by the applicant. The applicant also retained the services of Altus Engineering, a professional engineering firm, to assist in the design and engineering of the project.

The Department finds that the applicant has demonstrated adequate technical ability to comply with Department standards.

4. NOISE:

The Department finds that no regulated sources of noise have been identified. The applicant proposes to limit construction on the site to the hours between 7:00 A.M. and 7:00 P.M. Construction noise generated during these hours is not regulated pursuant to 38 M.R.S. § 484(3)(A).

The Department finds that the applicant has made adequate provision for the control of excessive environmental noise from the proposed project.

5. SCENIC CHARACTER:

The project site is bounded on all sides by woodland and forested wetland. Single-family residences sporadically line Betty Welch Road. Existing wooded buffers will be maintained between the development and abutting properties. The proposed project consists solely of residential development and open space.

Based on the project's location and design, the Department finds that the proposed project will not have an unreasonable adverse effect on the scenic character of the surrounding area.

6. WILDLIFE AND FISHERIES:

The applicant assessed the project site for the presence of the significant vernal pools, northern long-eared bat, and New England cottontail rabbit.

A vernal pool assessment was conducted in April 2015 and noted seven vernal pools on the property. The assessment determined that these pools were the result of skidder ruts created when the property was logged in 2013. Vernal Pool Assessment Forms were filed with the Maine Department of Inland Fisheries and Wildlife (MDIFW). MDIFW and the Department confirmed that none of the vernal pools on the property met the regulatory definition of significant vernal pool, as set forth in the Department's *Significant Wildlife Habitat* Rules, Chapter 335 § 9.

The application included a bat acoustic survey performed by Normandeau Associates, Inc, and dated June 15, 2016. During four nights of operation at two sites in May 2016, sensors identified three species of bats (big brown bat, eastern red bat, and little brown bat). Because of the lack of identifiable call data from the northern long-eared bat, the survey concluded that this species is not expected to use the forests in and around the project site.

In January 2016, the applicant and a MDIFW wildlife biologist surveyed the property for the presence of New England cottontails. The evidence gathered from this survey indicated that only Snowshoe Hare use this area. In its letter, dated December 2, 2016, MDIFW stated that it found no record of Essential or Significant Wildlife Habitats, or other wildlife habitats of special concern associated within this site, and that based on the information provided by the applicant, impacts to wildlife habitat as a result of the proposed project are expected to be minimal. No fisheries concerns were identified.

The Department finds that the applicant has made adequate provision for the protection of wildlife and fisheries.

7. HISTORIC SITES:

The Maine Historic Preservation Commission reviewed the proposed project and stated that it will have no effect upon any structure or site of historic, architectural, or archaeological significance as defined by the National Historic Preservation Act of 1966.

The Maine Historic Preservation Commission (MHPC) reviewed the proposed project and requested a Phase I archaeological survey to determine whether any prehistoric archaeological sites were present on the project site. In a report dated July 28, 2016, the applicant concluded that, based on the Phase I survey, a Phase II evaluative archaeological investigation of the project site was not warranted. In a letter, dated October 5, 2016, MHPC concurred with the findings of the Phase I survey and stated that the proposed project will have no effect upon any structure or site of historic, architectural, or archaeological significance as defined by the National Historic Preservation Act of 1966.

The Department finds that the proposed development will not have an adverse effect on the preservation of any historic sites either on or near the development site.

8. UNUSUAL NATURAL AREAS:

The Maine Natural Areas Program database does not contain any records documenting the existence of rare or unique botanical features on the project site and, as discussed in Finding 6, MDIFW did not identify any unusual wildlife habitats located on the project site.

The Department finds that the proposed development will not have an adverse effect on the preservation of any historic sites or unusual natural areas either on or near the development site.

9. BUFFER STRIPS:

Two forested, limited-disturbance stormwater buffers are proposed to provide additional treatment of stormwater runoff. The stormwater buffers are located on Open Space lots, as shown on the set of plans referenced in Finding 1. The stormwater buffers will be protected from alteration through the execution of a deed restriction. The applicant proposes to use the deed restriction language contained in Appendix G of Chapter 500 and submitted a draft deed restriction that meets Department requirements.

Prior to the start of construction, the location of the stormwater buffers must be permanently marked on the ground. The deed must contain deed restrictions relative to the stormwater buffers and have attached to it a plot plan for the parcel, drawn to scale, that specifies the location of the buffers on the open space lots. The applicant shall execute and record the required deed restriction within 60 days of the date of this Order. The applicant shall submit a copy of the recorded deed restriction, including the plot plan, to the BLR within 60 days of its recording.

Prior to the start of construction, the location of the stormwater buffers must be permanently marked on the ground.

Provided the stormwater buffers are protected from future disturbance as discussed above, the Department finds that the applicant has made adequate provision for buffer strips.

10. SOILS:

The applicant submitted a Class A soil survey map and report based on the soils found at the project site. This report was prepared by a certified soils scientist and reviewed by staff from the Division of Environmental Assessment (DEA) of the Bureau of Water Quality (BWQ).

The Department finds that, based on this report and DEA's review, the soils on the project site present no limitations to the proposed project that cannot be overcome through standard engineering practices.

11. STORMWATER MANAGEMENT:

The proposed project includes approximately 10.9 acres of developed area of which 2.4 acres are impervious area. It lies within the watershed of Libby Brook. The applicant submitted a stormwater management plan based on the Basic, General, and Flooding Standards contained in Chapter 500 Stormwater Management rules (06-096 C.M.R. ch. 500, effective August 12, 2015). The proposed stormwater management system consists of grassed swales, two vegetated underdrained soil filters, a wet pond, and two forested, limited-disturbance stormwater buffers.

A. Basic Standards:

(1) Erosion and Sedimentation Control: The applicant submitted an Erosion and Sedimentation Control Plan (Section 14 of the application) that is based on the performance standards contained in Appendix A of Chapter 500 and the Best Management Practices outlined in the Maine Erosion and Sediment Control BMPs, which were developed by the Department. This plan and plan sheets containing erosion control details were reviewed by, and revised in response to the comments of, the BLR.

Erosion control details will be included on the final construction plans and the erosion control narrative will be included in the project specifications to be provided to the construction contractor.

(2) Inspection and Maintenance: The applicant submitted a maintenance plan that addresses both short and long-term maintenance requirements. The maintenance plan is based on the standards contained in Appendix B of Chapter 500. This plan was reviewed by, and revised in response to the comments of, BLR. A homeowners' association will be established that will be responsible for the maintenance of all common facilities including the stormwater management system. The Declaration of Covenants and Restrictions for the association was reviewed and found to meet Department requirements. Prior to the formation of the homeowners' association, the applicant will be responsible for all such maintenance.

Storm sewer grit and sediment materials removed from stormwater control structures during maintenance activities must be disposed of in compliance with the Maine Solid Waste Management Rules.

(3) Housekeeping: The proposed project will comply with the performance standards outlined in Appendix C of Chapter 500.

Based on BLR's review of the erosion and sedimentation control plan and the maintenance plan, the Department finds that the proposed project meets the Basic Standards contained in Chapter 500(4)(B).

B. General Standards:

The applicant's stormwater management plan includes general treatment measures that will mitigate for the increased frequency and duration of channel erosive flows due to runoff from smaller storms, provide for effective treatment of pollutants in stormwater, and mitigate potential temperature impacts. This mitigation is being achieved by using Best Management Practices (BMPs) that will control runoff from no less than 95% of the impervious area and no less than 80% of the developed area.

The forested, limited disturbance or meadow stormwater buffers in open space will be protected from alteration through the execution of a deed restriction, as outlined in Finding 9. The applicant proposes to use the deed restriction language contained in Appendix G of Chapter 500 and submitted a draft deed restriction that meets Department standards.

The stormwater management system proposed by the applicant was reviewed by, and revised in response to comments from, BLR. After a final review, BLR commented that the proposed stormwater management system is designed in accordance with the General Standards contained in Chapter 500(4)(C) and recommended that the applicant's design engineer or another qualified engineer oversee the construction of the stormwater management structures to ensure that they are installed in accordance with the details and notes specified on the approved plans. Within 30 days from completion of the entire system, or if the project takes more than one year to complete, at least once per year, the applicant must submit a log of inspection reports detailing the items inspected, photographs taken, and the dates of each inspection to the BLR for review.

Based on the stormwater system's design and BLR's review, the Department finds that the applicant has made adequate provision to ensure that the proposed project will meet the General Standards contained in Chapter 500(4)(C) provided that the applicant retains a professional engineer to inspect and document construction of the stormwater management system as outlined above.

C. Flooding Standard:

The applicant is proposing to utilize a stormwater management system based on estimates of pre- and post-development stormwater runoff flows obtained by using Hydrocad, a stormwater modeling software that utilizes the methodologies outlined in Technical Releases #55 and #20, U.S.D.A., Soil Conservation Service and detains stormwater from 24-hour storms of 2-, 10-, and 25-year frequency. The post-development peak flow from the site will not exceed the pre-development peak flow from the site and the peak flow of the receiving water will not be increased as a result of stormwater runoff from the development site.

BLR commented that the proposed system is designed in accordance with the Flooding Standard contained in Chapter 500(4)(F).

Based on the system's design and BLR's review, the Department finds that the applicant has made adequate provision to ensure that the proposed project will meet the Flooding Standard contained in Chapter 500(4)(F) for peak flow from the project site, and channel limits and runoff areas.

The Department further finds that the proposed project will meet the Chapter 500 standards for: (1) easements and covenants; (2) management of stormwater discharges; (3) discharge to freshwater wetlands; and (4) threatened or endangered species.

12. GROUNDWATER:

The project site is not located over a mapped sand and gravel aquifer. Other than drinking water, the proposed project does not propose any withdrawal from the groundwater. Wastewater will be disposed of via onsite communal wastewater disposal system with common disposal beds as described in Finding 13.

Based on DEA's review of the information discussed in Findings 12 and 13, the Department finds that the proposed project will not unreasonably deplete ground water resources. Therefore, the Department further finds that the proposed project will not have an unreasonable adverse effect on ground water quality or quantity.

13. WATER SUPPLY:

When completed, the proposed project is anticipated to use 5,400 gallons of water per day. Water will be supplied by the Kittery Water District. The applicant submitted a letter from the District, dated July 25, 2017, indicating that it will be capable of servicing this project.

The Department finds that the applicant has made adequate provision for securing and maintaining a sufficient and healthful water supply.

14. WASTEWATER DISPOSAL:

Wastewater will be disposed of by an engineered system that consists of a septic tank and advanced treatment system for each lot. Aerobically treated effluent will be pumped from each lot, via individual force mains, to a common wastewater disposal bed located on the southeasterly portion of the parcel. Each house will be equipped with an automatic transfer switch to allow an auxiliary power source to operate the wastewater treatment system in the event of a power outage. The Declaration of Covenants and Restrictions authorizes the homeowners' association to inspect and assist in maintaining the wastewater treatment system on each lot.

The applicant submitted the soil survey map and report discussed in Finding 9, and an analysis of potential impacts to off-site groundwater quality resulting from on-site wastewater disposal prepared by a certified geologist. In a letter, dated March 4, 2018,

the Department of Health and Human Services, Division of Environmental Health Subsurface Wastewater Unit (DHHS-DEH) granted its approval to this engineered system. This information was reviewed by, and revised in response to comments from, DEA.

Based on the information provided in the application, DEA's comments, and DHHS-DEH's comments, the Department finds that the proposed wastewater disposal system will be built on suitable soil types and that Maine's Drinking Water Standard for nitrates will be met at the project's property lines.

15. SOLID WASTE:

When completed, the proposed project will generate an unspecified amount of municipal solid waste per year from the 20 residential lots. Residents of the subdivision must either take their household trash to the Town of Kittery's Resource Recovery Facility (transfer station) or must make arrangements with a licensed waste hauler that is licensed by the state or exempt from licensing under Chapter 411. All municipal solid wastes are then transported from the transfer station for disposal at ecomaine in Portland, which is currently in substantial compliance with the Maine Solid Waste Management Rules.

The proposed project will generate approximately 3,000 cubic yards of stumps and grubbings. All stumps and grubbings generated will be chipped and ground on site, and used as erosion control mix and landscape mulching in compliance with the Solid Waste Management Regulations of the State of Maine.

The proposed project will generate approximately 2,000 cubic yards of construction debris and demolition debris. All construction and demolition debris generated will be disposed of at the Waste Management facility in Rochester, NH, which is currently in substantial compliance with the Maine Solid Waste Management Rules.

Based on the above information, the Department finds that the applicant has made adequate provision for solid waste disposal.

16. FLOODING:

The proposed project is not located within the 100-year flood plain of any river or stream.

The Department finds that the proposed project is unlikely to cause or increase flooding or cause an unreasonable flood hazard to any structure.

17. WETLAND IMPACTS:

The applicant proposes to directly alter 6,438 square feet of forested freshwater wetlands at six locations for the construction of the access road. The proposed alteration is shown on the set of plans referenced in Finding 1. Given the location of the wetlands on the parcel some amount of wetland impact is unavoidable. The applicant has avoided and

minimized wetland impacts to the greatest extent practicable by designing the access road to cross wetlands at their narrowest point and designing road side slopes at 2H:1V at the wetland crossings. According to the Department's Geographic Information System, there are no mapped Significant Wildlife Habitats associated with the project site.

The Department finds that the applicant has avoided and minimized forested, freshwater wetland impacts to the greatest extent practicable, and that the proposed project represents the least environmentally damaging alternative that meets the overall purpose of the project.

BASED on the above findings of fact, and subject to the conditions listed below, the Department makes the following conclusions pursuant to 38 M.R.S. §§ 480-A–480-JJ and Section 401 of the Federal Water Pollution Control Act:

A. The proposed activity will not unreasonably harm any significant wildlife habitat, freshwater wetland plant habitat, threatened or endangered plant habitat, aquatic habitat, travel corridor, freshwater, estuarine, or marine fisheries or other aquatic life.

B. The proposed activity will not violate any state water quality law including those governing the classifications of the State's waters.

BASED on the above findings of fact, and subject to the conditions listed below, the Department makes the following conclusions pursuant to 38 M.R.S. §§ 481–489-E:

A. The applicant has provided adequate evidence of financial capacity and technical ability to develop the project in a manner consistent with state environmental standards provided that final financial evidence is submitted to the BLR for review and approval, as outlined in Finding 2.

B. The applicant has made adequate provision for fitting the development harmoniously into the existing natural environment and the development will not adversely affect existing uses, scenic character, air quality, water quality or other natural resources in the municipality or in neighboring municipalities.

C. The proposed development will be built on soil types which are suitable to the nature of the undertaking and will not cause unreasonable erosion of soil or sediment nor inhibit the natural transfer of soil.

D. The proposed development meets the standards for storm water management in 38 M.R.S. § 420-D and the standard for erosion and sedimentation control in 38 M.R.S. § 420-C provided that sewer grit and sediment are disposed of properly and that the installation of stormwater components is overseen and documented as described in Finding 11 and provided that executed deed restrictions for the designated stormwater

buffers are recorded and all stormwater buffer are marked on the ground as described in Finding 9.

E. The proposed development will not pose an unreasonable risk that a discharge to a significant groundwater aquifer will occur.

F. The applicant has made adequate provision of utilities, including water supplies, sewerage facilities and solid waste disposal required for the development and the development will not have an unreasonable adverse effect on the existing or proposed utilities in the municipality or area served by those services.

G. The activity will not unreasonably cause or increase the flooding of the alteration area or adjacent properties nor create an unreasonable flood hazard to any structure.

THEREFORE, the Department APPROVES the application of CHINBURG DEVELOPMENT, LLC to construct a 20-lot residential subdivision as described in Finding 1, SUBJECT TO THE FOLLOWING CONDITIONS and all applicable standards and regulations:

1. The Standard Conditions of Approval, a copy attached.

2. In addition to any specific erosion control measures described in this or previous orders, the applicant shall take all necessary actions to ensure that its activities or those of its agents do not result in noticeable erosion of soils or fugitive dust emissions on the site during the construction and operation of the project covered by this approval.

3. Severability. The invalidity or unenforceability of any provision, or part thereof, of this License shall not affect the remainder of the provision or any other provisions. This License shall be construed and enforced in all respects as if such invalid or unenforceable provision or part thereof had been omitted.

4. The applicant shall include in all conveyances of subdivision lots deed restrictions making the conveyance subject to all terms and conditions of this Department permit and any applicable municipal approval. These terms and conditions may be incorporated by specific and prominent reference to the permit in the deed. All conveyances required by this approval to contain restrictions shall include in the restrictions the requirement that any subsequent conveyance shall specifically include the same restrictions.

5. The applicant shall give a copy of this permit, including the standard conditions, and a copy of the approved subdivision plan to each lot buyer at least 14 days prior to the date of closing on the sale or lease of the lot. The applicant also shall maintain a file containing signed and dated statements by lot buyers or lessees acknowledging that they have received and read their copy of this permit and the subdivision plan prior to the closing on their lot. The file shall also contain a copy of the signed and dated deed or lease containing the restrictive covenants required under this approval. The applicant shall make this file available for inspection upon request by the Department.

6. The applicant shall execute and record all required deed restrictions, including the appropriate buffer deed restrictions, within 60 days of the date of this Order unless the deed restriction is to be placed on a subdivision lot. In that situation, the applicant shall execute and record the required deed restriction prior to the start of construction on the lot. The applicant shall submit a copy of the recorded deed restriction, including the plot plan, to the BLR within 60 days of its recording.

7. Prior to starting construction, the applicant shall submit final cost estimates and evidence that it has been granted a line of credit or a loan by a financial institution authorized to do business in this State or evidence of any other form of financial assurance determined by Department Rules, Chapter 373(1), to be adequate to the BLR for review and approval.

8. Prior to the start of construction, the location of forested and meadow stormwater buffers shall be permanently marked on the ground.

9. Prior the start of construction, the applicant shall execute and record the required deed restrictions for the stormwater buffers. The applicant shall submit a copy of the recorded deed restrictions, including the plot plan, to the BLR within 60 days of its recording.

10. The applicant shall retain its design engineer or another qualified engineer to oversee the construction of the stormwater management system according to the details and notes specified on the approved plans. Within 30 days of completion of the entire system or at least once per year, the applicant shall submit a log of inspection reports detailing the items inspected, photographs taken, and dates of each inspection to the BLR for review.

THIS APPROVAL DOES NOT CONSTITUTE OR SUBSTITUTE FOR ANY OTHER REQUIRED STATE, FEDERAL OR LOCAL APPROVALS NOR DOES IT VERIFY COMPLIANCE WITH ANY APPLICABLE SHORELAND ZONING ORDINANCES.

DONE AND DATED IN AUGUSTA, MAINE, THIS 24TH DAY OF JANUARY, 2019.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: _____
For: Melanie Loyzim, Acting Commissioner

PLEASE NOTE THE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES.

RLG/L27871ANBN/ATS#82982, 83977

Department of Environmental Protection

SITE LOCATION OF DEVELOPMENT (SITE)
STANDARD CONDITIONS

A. Approval of Variations from Plans. The granting of this approval is dependent upon and limited to the proposals and plans contained in the application and supporting documents submitted and affirmed to by the applicant. Any variation from these plans, proposals, and supporting documents is subject to review and approval prior to implementation. Further subdivision of proposed lots by the applicant or future owners is specifically prohibited without prior approval of the Board, and the applicant shall include deed restrictions to that effect.

B. Compliance with All Applicable Laws. The applicant shall secure and comply with all applicable federal, state, and local licenses, permits, authorizations, conditions, agreements, and orders prior to or during construction and operation, as appropriate.

C. Compliance with All Terms and Conditions of Approval. The applicant shall submit all reports and information requested by the Board or the Department demonstrating that the applicant has complied or will comply with all preconstruction terms and conditions of this approval. All preconstruction terms and conditions must be met before construction begins.

D. Advertising. Advertising relating to matters included in this application shall refer to this approval only if it notes that the approval has been granted WITH CONDITIONS, and indicates where copies of those conditions may be obtained.

E. Transfer of Development. Unless otherwise provided in this approval, the applicant shall not sell, lease, assign or otherwise transfer the development or any portion thereof without prior written approval of the Board where the purpose or consequence of the transfer is to transfer any of the obligations of the developer as incorporated in this approval. Such approval shall be granted only if the applicant or transferee demonstrates to the Board that the transferee has the technical capacity and financial ability to comply with conditions of this approval and the proposals and plans contained in the application and supporting documents submitted by the applicant.

F. Time frame for approvals. If the construction or operation of the activity is not begun within four years, this approval shall lapse and the applicant shall reapply to the Board for a new approval. The applicant may not begin construction or operation of the development until a new approval is granted. A reapplication for approval may include information submitted in the initial application by reference. This approval, if construction is begun within the four-year time frame, is valid for seven years. If construction is not completed within the seven-year time frame, the applicant must reapply for, and receive, approval prior to continuing construction.

G. Approval Included in Contract Bids. A copy of this approval must be included in or attached to all contract bid specifications for the development.

H. Approval Shown to Contractors. Work done by a contractor pursuant to this approval shall not begin before the contractor has been shown by the developer a copy of this approval.

(2/81)/Revised December 27, 2011

Natural Resources Protection Act (NRPA)
Standard Conditions

THE FOLLOWING STANDARD CONDITIONS SHALL APPLY TO ALL PERMITS GRANTED UNDER THE NATURAL RESOURCES PROTECTION ACT, 38 M.R.S.A. § 480-A ET SEQ., UNLESS OTHERWISE SPECIFICALLY STATED IN THE PERMIT.

A. Approval of Variations From Plans. The granting of this permit is dependent upon and limited to the proposals and plans contained in the application and supporting documents submitted and affirmed to by the applicant. Any variation from these plans, proposals, and supporting documents is subject to review and approval prior to implementation.

B. Compliance With All Applicable Laws. The applicant shall secure and comply with all applicable federal, state, and local licenses, permits, authorizations, conditions, agreements, and orders prior to or during construction and operation, as appropriate.

C. Erosion Control. The applicant shall take all necessary measures to ensure that his activities or those of his agents do not result in measurable erosion of soils on the site during the construction and operation of the project covered by this Approval.

D. Compliance With Conditions. Should the project be found, at any time, not to be in compliance with any of the Conditions of this Approval, or should the applicant construct or operate this development in any way other the specified in the Application or Supporting Documents, as modified by the Conditions of this Approval, then the terms of this Approval shall be considered to have been violated.

E. Time frame for approvals. If construction or operation of the activity is not begun within four years, this permit shall lapse and the applicant shall reapply to the Board for a new permit. The applicant may not begin construction or operation of the activity until a new permit is granted. Reapplications for permits may include information submitted in the initial application by reference. This approval, if construction is begun within the four-year time frame, is valid for seven years. If construction is not completed within the seven-year time frame, the applicant must reapply for, and receive, approval prior to continuing construction.

F. No Construction Equipment Below High Water. No construction equipment used in the undertaking of an approved activity is allowed below the mean high water line unless otherwise specified by this permit.

G. Permit Included In Contract Bids. A copy of this permit must be included in or attached to all contract bid specifications for the approved activity.

H. Permit Shown To Contractor. Work done by a contractor pursuant to this permit shall not begin before the contractor has been shown by the applicant a copy of this permit.

Revised (4/92) DEP LW0428

STORMWATER STANDARD CONDITIONS

STRICT CONFORMANCE WITH THE STANDARD AND SPECIAL CONDITIONS OF THIS APPROVAL IS NECESSARY FOR THE PROJECT TO MEET THE STATUTORY CRITERIA FOR APPROVAL

Standard conditions of approval. Unless otherwise specifically stated in the approval, a department approval is subject to the following standard conditions pursuant to Chapter 500 Stormwater Management Law.

(1) Approval of variations from plans. The granting of this approval is dependent upon and limited to the proposals and plans contained in the application and supporting documents submitted and affirmed to by the permittee. Any variation from these plans, proposals, and supporting documents must be reviewed and approved by the department prior to implementation. Any variation undertaken without approval of the department is in violation of 38 M.R.S. §420-D(8) and is subject to penalties under 38 M.R.S. §349.

(2) Compliance with all terms and conditions of approval. The applicant shall submit all reports and information requested by the department demonstrating that the applicant has complied or will comply with all terms and conditions of this approval. All preconstruction terms and conditions must be met before construction begins.

(3) Advertising. Advertising relating to matters included in this application may not refer to this approval unless it notes that the approval has been granted WITH CONDITIONS, and indicates where copies of those conditions may be obtained.

(4) Transfer of project. Unless otherwise provided in this approval, the applicant may not sell, lease, assign, or otherwise transfer the project or any portion thereof without written approval by the department where the purpose or consequence of the transfer is to transfer any of the obligations of the developer as incorporated in this approval. Such approval may only be granted if the applicant or transferee demonstrates to the department that the transferee agrees to comply with conditions of this approval and the proposals and plans contained in the application and supporting documents submitted by the applicant. Approval of a transfer of the permit must be applied for no later than two weeks after any transfer of property subject to the license.

(5) Time frame for approvals. If the construction or operation of the activity is not begun within four years, this approval shall lapse and the applicant shall reapply to the department for a new approval. The applicant may not begin construction or operation of the project until a new approval is granted. A reapplication for approval may include information submitted in the initial application by reference. This approval, if construction is begun within the four-year time frame, is valid for seven years. If construction is not completed within the seven-year time frame, the applicant must reapply for, and receive, approval prior to continuing construction.

(6) Certification. Contracts must specify that "all work is to comply with the conditions of the Stormwater Permit." Work done by a contractor or subcontractor pursuant to this approval may not begin before the contractor and any subcontractors have been shown a copy of this approval with the conditions by the permittee, and the permittee and each contractor and subcontractor has certified, on a form provided by the department, that the approval and conditions have been received and read, and that the work will be carried out in accordance with the approval and conditions. Completed certification forms must be forwarded to the department.

(7) Maintenance. The components of the stormwater management system must be adequately maintained to ensure that the system operates as designed, and as approved by the Department. If maintenance responsibility is to be transferred from the permittee to another entity, a transfer request must be filed with the Department which includes the name and contact information for the person or entity responsible for this maintenance. The form must be signed by the responsible person or agent of the responsible entity.

(8) Recertification requirement. Within three months of the expiration of each five-year interval from the date of issuance of the permit, the permittee shall certify the following to the department.

(a) All areas of the project site have been inspected for areas of erosion, and appropriate steps have been taken to permanently stabilize these areas.

(b) All aspects of the stormwater control system are operating as approved, have been inspected for damage, wear, and malfunction, and appropriate steps have been taken to repair or replace the system, or portions of the system, as necessary.

(c) The stormwater maintenance plan for the site is being implemented as approved by the Department, and the maintenance log is being maintained.

(d) All proprietary systems have been maintained according to the manufacturer's recommendations. Where required by the Department, the permittee shall execute a 5-year maintenance contract with a qualified professional for the coming 5-year interval. The maintenance contract must include provisions for routine inspections, cleaning and general maintenance.

(e) The Department may waive some or all of these recertification requirements on a case-by-case basis for permittees subject to the Department's Multi-Sector General Permit ("MSGP") and/or Maine Pollutant Discharge Elimination System ("MEPDES") programs where it is demonstrated that these programs are providing stormwater control that is at least as effective as required pursuant to this Chapter.

(9) Transfer of property subject to the license. If any portion of the property subject to the license containing areas of flow or areas that are flooded are transferred to a new property owner, restrictive covenants protecting these areas must be included in any deeds or leases, and recorded at the appropriate county registry of deeds. Also, in all transfers of such areas and areas containing parts of the stormwater management system, deed restrictions must be included making the property transfer subject to all applicable terms and conditions of the permit. These terms and conditions must be incorporated by specific and prominent reference to the permit in the deed. All transfers must include in the restrictions the requirement that any subsequent transfer must specifically include the same restrictions unless their removal or modification is approved by the Department. These restrictions must be written to be enforceable by the Department, and must reference the permit number.

(10) Severability. The invalidity or unenforceability of any provision, or part thereof, of this permit shall not affect the remainder of the provision or any other provisions. This permit shall be construed and enforced in all respects as if such invalid or unenforceable provision or part thereof had been omitted.

DEP INFORMATION SHEET

Appealing a Department Licensing Decision

Dated: November 2018 **Contact: (207) 287-2452**

SUMMARY

There are two methods available to an aggrieved person seeking to appeal a licensing decision made by the Department of Environmental Protection's (DEP) Commissioner: (1) an administrative process before the Board of Environmental Protection (Board); or (2) a judicial process before Maine's Superior Court. An aggrieved person seeking review of a licensing decision over which the Board had original jurisdiction may seek judicial review in Maine's Superior Court.

A judicial appeal of final action by the Commissioner or the Board regarding an application for an expedited wind energy development (35-A M.R.S. § 3451(4)) or a general permit for an offshore wind energy demonstration project (38 M.R.S. § 480-HH(1)) or a general permit for a tidal energy demonstration project (38 M.R.S. § 636-A) must be taken to the Supreme Judicial Court sitting as the Law Court.

This information sheet, in conjunction with a review of the statutory and regulatory provisions referred to herein, can help a person to understand his or her rights and obligations in filing an administrative or judicial appeal.

I. ADMINISTRATIVE APPEALS TO THE BOARD

LEGAL REFERENCES

The laws concerning the DEP's *Organization and Powers*, 38 M.R.S. §§ 341-D(4) & 346; the *Maine Administrative Procedure Act*, 5 M.R.S. § 11001; and the DEP's *Rules Concerning the Processing of Applications and Other Administrative Matters* ("Chapter 2"), 06-096 C.M.R. ch. 2.

DEADLINE TO SUBMIT AN APPEAL TO THE BOARD

The Board must receive a written appeal within 30 days of the date on which the Commissioner's decision was filed with the Board. Appeals filed more than 30 calendar days after the date on which the Commissioner's decision was filed with the Board will be dismissed unless notice of the Commissioner's license decision was required to be given to the person filing an appeal (appellant) and the notice was not given as required.

HOW TO SUBMIT AN APPEAL TO THE BOARD

Signed original appeal documents must be sent to: Chair, Board of Environmental Protection, 17 State House Station, Augusta, ME 04333-0017. An appeal may be submitted by fax or e-mail if it contains a scanned original signature. It is recommended that a faxed or e-mailed appeal be followed by the submittal of mailed original paper documents. The complete appeal, including any attachments, must be received at DEP's offices in Augusta on or before 5:00 PM on the due date; materials received after 5:00 pm are not considered received until the following day. The risk of material not being received in a timely manner is on the sender, regardless of the method used. The appellant must also send a copy of the appeal documents to the Commissioner of the DEP; the applicant (if the appellant is not the applicant in the license proceeding at issue); and if a hearing was held on the application, any intervenor in that hearing process. All of the information listed in the next section of this information sheet must be submitted at the time the appeal is filed.

INFORMATION APPEAL PAPERWORK MUST CONTAIN

Appeal materials must contain the following information at the time the appeal is submitted:

1. *Aggrieved Status*. The appeal must explain how the appellant has standing to maintain an appeal. This requires an explanation of how the appellant may suffer a particularized injury as a result of the Commissioner's decision.
2. *The findings, conclusions, or conditions objected to or believed to be in error.* The appeal must identify the specific findings of fact, conclusions regarding compliance with the law, license conditions, or other aspects of the written license decision or of the license review process that the appellant objects to or believes to be in error.
3. *The basis of the objections or challenge.* For the objections identified in Item #2, the appeal must state why the appellant believes that the license decision is incorrect and should be modified or reversed. If possible, the appeal should cite specific evidence in the record or specific licensing requirements that the appellant believes were not properly considered or fully addressed.
4. *The remedy sought.* This can range from reversal of the Commissioner's decision on the license or permit to changes in specific permit conditions.
5. *All the matters to be contested*. The Board will limit its consideration to those matters specifically raised in the written notice of appeal.
6. *Request for hearing.* If the appellant wishes the Board to hold a public hearing on the appeal, a request for public hearing must be filed as part of the notice of appeal, and must include an offer of proof in accordance with Chapter 2. The Board will hear the arguments in favor of and in opposition to a hearing on the appeal and the presentations on the merits of an appeal at a regularly scheduled meeting. If the Board decides to hold a public hearing on an appeal, that hearing will then be scheduled for a later date.
7. *New or additional evidence to be offered.* If an appellant wants to provide evidence not previously provided to DEP staff during the DEP's review of the application, the request and the proposed evidence must be submitted with the appeal. The Board may allow new or additional evidence, referred to as supplemental evidence, to be considered in an appeal only under very limited circumstances. The proposed evidence must be relevant and material, and (a) the person seeking to add information to the record must show due diligence in bringing the evidence to the DEP's attention at the earliest possible time in the licensing process; or (b) the evidence itself must be newly discovered and therefore unable to have been presented earlier in the process. Specific requirements for supplemental evidence are found in Chapter 2 § 24.

OTHER CONSIDERATIONS IN APPEALING A DECISION TO THE BOARD

1. *Be familiar with all relevant material in the DEP record.* A license application file is public information, subject to any applicable statutory exceptions, and is made easily accessible by the DEP. Upon request, the DEP will make application materials available during normal working hours, provide space to review the file, and provide an opportunity for photocopying materials. There is a charge for copies or copying services.
2. *Be familiar with the regulations and laws under which the application was processed, and the procedural rules governing your appeal.* DEP staff will provide this information on request and answer general questions regarding the appeal process.
3. *The filing of an appeal does not operate as a stay to any decision.* If a license has been granted and it has been appealed, the license normally remains in effect pending the processing of the appeal. Unless a stay of the decision is requested and granted, a license holder may proceed with a project pending the outcome of an appeal, but the license holder runs the risk of the decision being reversed or modified as a result of the appeal.

WHAT TO EXPECT ONCE YOU FILE A TIMELY APPEAL WITH THE BOARD

The Board will formally acknowledge receipt of an appeal, and will provide the name of the DEP project manager assigned to the specific appeal. The notice of appeal, any materials accepted by the Board Chair as supplementary evidence, any materials submitted in response to the appeal, and relevant excerpts from the DEP's application review file will be sent to Board members with a recommended decision from DEP staff. The appellant, the license holder if different from the appellant, and any interested persons are notified in advance of the date set for Board consideration of an appeal or request for public hearing. The appellant and the license holder will have an opportunity to address the Board at the Board meeting. With or without holding a public hearing, the Board may affirm, amend, or reverse a Commissioner decision or remand the matter to the Commissioner for further proceedings. The Board will notify the appellant, the license holder, and interested persons of its decision.

II. JUDICIAL APPEALS

Maine law generally allows aggrieved persons to appeal final Commissioner or Board licensing decisions to Maine's Superior Court (see 38 M.R.S. § 346(1); 06-096 C.M.R. ch. 2; 5 M.R.S. § 11001; and M.R. Civ. P. 80C). A party's appeal must be filed with the Superior Court within 30 days of receipt of notice of the Board's or the Commissioner's decision. For any other person, an appeal must be filed within 40 days of the date the decision was rendered. An appeal to court of a license decision regarding an expedited wind energy development, a general permit for an offshore wind energy demonstration project, or a general permit for a tidal energy demonstration project may only be taken directly to the Maine Supreme Judicial Court. See 38 M.R.S. § 346(4).

Maine's Administrative Procedure Act, DEP statutes governing a particular matter, and the Maine Rules of Civil Procedure must be consulted for the substantive and procedural details applicable to judicial appeals.

ADDITIONAL INFORMATION

If you have questions or need additional information on the appeal process, for administrative appeals contact the Board's Executive Analyst at (207) 287-2452, or for judicial appeals contact the court clerk's office in which your appeal will be filed.

Note: The DEP provides this INFORMATION SHEET for general guidance only; it is not intended for use as a legal reference. Maine law governs an appellant's rights.

Department of Health and Human Services
Maine People Living Safe, Healthy and Productive Lives
Paul R. LePage, Governor Ricker Hamilton, Commissioner

Department of Health and Human Services
Maine Center for Disease Control and Prevention
286 Water Street
11 State House Station
Augusta, Maine 04333-0011
Tel.: (207) 287-8016; Fax: (207) 287-9058
TTY Users: Dial 711 (Maine Relay)

Tel. (207) 287-2070 Drinking Water Program Fax (207) 287-4172

March 4, 2018

Chinburg Development, LLC
Attn.: Paul Kerrigan
3 Penstock Way
Newmarket, NH 03857

Subject: Approval, Engineered System, Huntington Run Subdivision, 40 Betty Welch Road, Kittery

Dear Mr. Kerrigan:

The Division of Environmental Health has completed a review of a design for two engineered subsurface sewage disposal systems to serve Huntington Run Subdivision, which would include 20 single family dwellings. The HHE-200 Forms dated 12/13/2017 were prepared by James Logan, S.E. The systems were designed by Altus Engineering, Inc., with plans signed and stamped by Jefferey K. Clifford. P.E.

Hereafter, the term "design engineer" shall refer collectively to Altus Engineering, Inc., its staff, and its representatives unless otherwise specified; and the term "owner" shall refer collectively to Chinburg Development, LLC, its staff, and its representatives unless otherwise specified.

Design Flow

The design flow for each system is 2,700 gallons per day (gpd), based upon Table 4C of the Maine State Plumbing Code, Subsurface Wastewater Disposal Rules (Rules). The design flows of 2,700 gpd are approved with the notation that the suitability of the design flow is the responsibility of the design engineer.

Treatment Tanks

The design includes one 1,000 gallon septic tank for each proposed single family dwelling, for a total of ten septic tanks for each of the two systems.

The design includes one 1,000 gallon capacity OxyPro wastewater treatment unit for each proposed single family dwelling, for a total of ten units for each of the two systems.

Disposal Areas

The proposed systems include four disposal fields, designated Disposal Field A, B, C, and D by the design engineer. Disposal Field A and Disposal Field C would serve one system. Disposal Field B and Disposal Field D would serve the second system. Reference: Plan C-4.0.

Each disposal field would be comprised of three rows of 22 H-20 load rated concrete chambers, in cluster configuration.

Soils

The soils are shown as 3-B, 3-C, 8-C, and 8-E, and 9-D/E per the Rules on the soil test pit log m prepared by James Logan, S.E.

Well Setback

There are no potable water supply wells reported within 300 feet of the proposal.

Mounding Analysis

The proposed system will not result in groundwater mounding sufficient to intrude into the disposal area, according to the calculations provided by the design engineer.

Site Transmission Analysis

The proposed system design demonstrates that there are sufficient soils down-gradient to prevent the effluent from surfacing within 50 feet of the disposal field, according to the calculations provided by the design engineer.

Interagency Review

The Maine Department of Environmental Protection (MDEP) has reviewed the application and stated that no reason was found to believe the proposal would cause unreasonable adverse impact on resources and uses in the area likely to be affected; the project site is not located on a mapped sand and gravel aquifer; the project site is not located in the watershed of a waterbody most at risk from development, and no wetlands as mapped by the National Wetlands Inventory will be adversely affected. MDEP also commented that mapped wetlands are located 200 feet to the east and 140 feet to the west of the proposed engineered disposal fields, according to project plans. Appropriate erosion control measures should be employed during system construction to minimize any risk to the wetlands.

Findings

The system meets the Rules, unless otherwise noted. Therefore, the design is approved with the following conditions and comments:

1. The owner must retain the design engineer to oversee construction. The constructed system may not be used unless all pertinent requirements of the Rules have been met.

2. Each of the two engineered disposal systems requires a separate permit. The design engineer must provide one copy of a completed page one of an HHE-200 for each of the two systems to the Local Plumbing Inspector (LPI) for permitting purposes.

3. Construction must not commence until the owner has obtained the necessary plumbing permit from LPI.

4. The design engineer must provide sufficient supervision to assure that the system is constructed as designed and in accordance with the code and other regulations. Attention must be given to site preparation, fill selection and placement, installation of pipes, mechanical and electrical systems.

5. The design engineer must provide the owner and this office with a brief report on the construction including any unexpected conditions encountered and any changes made from the approved drawings. The LPI must not issue the Certificate of Approval until the LPI has received the aforementioned report from the design engineer.

6. The design engineer must test all systems prior to acceptance by the owner. The testing must determine whether the components were correctly installed and whether they function as designed. This includes confirmation that flow dividing devices or configurations function as intended.

7. The design engineer, with the concurrence of the LPI must determine when the site conditions are suitable for construction.

8. Construction must cease whenever the design engineer determines that the site conditions, or workmanship, or materials are unacceptable.

9. The owner and design engineer must inform the LPI of the proposed construction schedule and must also inform the LPI of the progress of construction. They must cooperate fully with the LPI in scheduling any inspections and providing any equipment necessary for the inspection.

10. The design engineer must provide the owner with an Operations and Maintenance Manual containing written recommendations for the operation and maintenance of the system including inspection and pumping schedules and record keeping procedures.

11. The owner must operate the system within the requirements of Rules and the limitations of this design.

12. The owner must inform the LPI and the design engineer of any operational problem and/or malfunction.

13. The Local Plumbing Inspector must inspect the engineered disposal system in accordance with Section 10.D.2 of the Rules. In addition, the property owner must retain the design engineer to inspect the construction of the system. The inspection must be sufficient for the design engineer to determine that the system was installed as designed.

14. Erosion control measures must be employed during system construction to minimize risk to adjacent wetlands.

15. This approval is only for the rules administered by this office and it does not consider other federal, state or local regulations. The owner is responsible for compliance with any other pertinent regulations.

16. By accepting this approval and the associated plumbing permit, the owner agrees to comply fully with the conditions of approval and the Subsurface Wastewater Disposal Rules.

Based upon this approval of the design, the LPI may issue the permit required for an engineered system.

Because installation and owner maintenance has a significant effect on the working order of onsite sewage disposal systems, including their components, the Division makes no representation or guarantee as to the efficiency and/or operation of the system.

Should you have any questions, please feel free to contact me at (207) 287-5695, or by fax at (207) 287-4172.

Sincerely,

James A. Jacobsen
Project Manager, Webmaster
Division of Environmental Health
Drinking Water Program
Subsurface Wastewater Unit
e-mail: james.jacobsen@maine.gov

/jaj

xc: File
Jefferey K. Clifford. P.E. via e-mail
Robert Marchi, L.P.I. via e-mail
James Logan, S.E. via e-mail
William Noble, MDEP via e-mail

Sweet Associates
HYDROGEOLOGY | SITE EVALUATIONS

155 Gray Road
Falmouth, Maine 04105
207.797.2110
fax: 207.878.2364
email: sweet@maine.rr.com
www.sweetassociates.com

November 20, 2017

WASTEWATER MOUNDING AND TRANSMISSION ANALYSIS
BETTY WELCH ROAD SUBDIVISION
KITTERY, MAINE

INTRODUCTION:

The purpose of this study is to determine the extent of mounding and wastewater effluent movement beneath proposed engineered subsurface wastewater disposal fields serving the Betty Welch Road Subdivision consisting of 20 three-bedroom homes. The proposed development is located at 4567 Betty Welch Road between Betty Welch Road, Cutts Road and the Maine Turnpike.

The total design flow of the proposed subsurface wastewater disposal fields is 5,400 gallons per day and is disposed in 4 modules (pods), each receiving a maximum of 1,350 gallons per day.

Data used for this project includes a site plan prepared by Altus Engineering of Portsmouth, New Hampshire, a Soil Narrative Report prepared by Longview Partners of Buxton, Maine, along with published regional maps and literature.

SUBSURFACE WASTEWATER DISPOSAL SYSTEM:

The four-proposed subsurface wastewater disposal fields each consist of 66 (three rows of 22) concrete chambers covering an area of 24 by 88 feet.

WASTEWATER MOUNDING AND TRANSMISSION ANALYSIS:

Groundwater mounding is anticipated to occur beneath the proposed disposal fields due to the presence of a low hydraulic conductivity layer (firm soil at 18 to 28 inches below ground surface) beneath the disposal field. The following analysis is a two-step approach used to estimate the height of a groundwater mound beneath a wastewater disposal field on a sloping site and estimate the size of a fill extension (Transmission Analysis) to prevent wastewater breakout. The first step is to use an analytical model (Khan *et al.* 1976) to estimate the geometry of a groundwater mound assuming that the ground surface below the disposal field is level. The second step is to use the analytical modeling results to determine the appropriate down-slope fill extension length.

Step 1 - Analytical Model:

Khan *et al.* (1976) presents an analytical model that can be used to estimate the extent of groundwater mounding on a low hydraulic conductivity layer in the vadose zone below a wastewater disposal field. The conceptual model and a spreadsheet with all calculations are presented in Appendix A. Khan *et al.* (1976) used the following assumptions to simplify the model:

- The conceptual model is for a two-dimensional vertical cross-section with a disposal area (W). The half-width (w) is assumed to be much smaller than the length of the disposal area (if the half-width is not much smaller than the length of the disposal area, then the model will provide a more conservative estimate of mounding).

- The low hydraulic conductivity layer (K_2) and high hydraulic conductivity layer (K_1) interface is the sole cause of mounding (the seasonal high-water table is at or below the interface).

- The soil in each hydraulic conductivity layer is homogeneous and isotropic. $K_1 > K_2$. The K_1/K_2 interface is horizontal.

- The infiltration rate of wastewater (q') is greater than the hydraulic conductivity of the lower layer (K_2). Infiltration is assumed to be constant.

The following equations, based on the conceptual model illustrated in Appendix A, were used to calculate the estimated maximum groundwater mounding and the distance from the center of the disposal field where groundwater mounding becomes negligible (the required extent of fill material downgradient from the disposal field to contain the mounded groundwater).

The height of the mound, H (ft), is calculated by:

$$H = w\left[\frac{K_2}{K_1}\left(\frac{q'}{K_2}-1\right)\left(\frac{q'}{K_2}-\frac{x^2}{w^2}\right)\right]^{1/2}$$

where,

w	=	½ width of the disposal area (ft) - *full width used for this analysis*,
q'	=	uniform recharge rate into the disposal area (ft/day),
K_1	=	hydraulic conductivity of the upper soil layer (ft/day),
K_2	=	hydraulic conductivity of the lower soil layer (ft/day),
x	=	distance from center of disposal field (ft).

The maximum height of the mound, H_{max} (ft), is calculated by setting the distance from the center of the disposal field (x) to zero.

The ground surface below the proposed disposal fields slopes downward toward wetland areas on either side of the ridge where the wastewater disposal areas are located at an average slope of about 6%. Since all wastewater will flow predominately in one direction (down-slope), rather than uniformly around the disposal field in all directions, infiltration of the wastewater will be underneath the disposal field and within the downslope fill. The one-half width of the disposal field (w) is 12 feet.

The Maine Geological Survey's Water Well Database depicts one well nearby, at 49 Betty Welch Road, across the road from the proposed subdivision. This well, installed in 1916 by Clearwater Artesian Well Company, is a 260-foot domestic bedrock well which yields 17 gpm. Overburden thickness at that location is 28 feet.

Hydraulic conductivity of the soil (layer 1 in the model is estimated to be 0.1 ft/day, based on values found in literature and previous constant head permeameter tests in Maine completed by Sweet Associates. Hydraulic conductivity of the bedrock (Layer 2 in the model) is estimated at 0.0035 ft/day. The equivalent hydraulic conductivity is 0.023 ft/day or K2. K1 is the proposed fill around the chambers and it is specified at 40 ft/day.

Based on the values of the abovementioned parameters, the maximum height of the mound above the K_2 layer at the center of the disposal field (H_{max}) is 0.9 feet.

Step 2 - Estimate Length of Down-Slope Fill Extension:

The length of the fill extension required to prevent the possibility of wastewater breakout on nearby side slopes can be determined by rearranging and solving the Khan *et al.* (1976) equations for a distance where the height of the mound is zero (Poeter *et al.*, 2005):

$$L = w * (q'/K_2) ,$$

where,

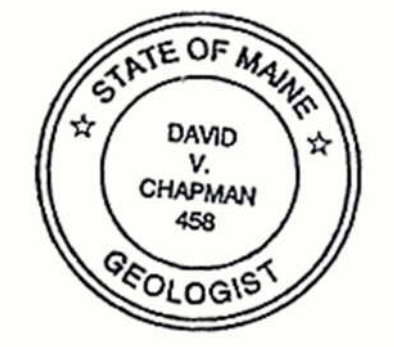
L	=	length of fill extension required from center of disposal field (ft),
w	=	½ width of the disposal area (ft) - *full width used for this analysis*,
q'	=	uniform recharge rate into the disposal area (ft/day),
K_2	=	hydraulic conductivity of the lower soil layer (ft/day).

L is calculated to be 32 feet from the downgradient edge of the disposal field.

CONCLUSIONS:

According to the assumptions and parameters used in this mounding and transmission analysis, the maximum groundwater mound height above the surface of the firm layer at the bottom edge of each disposal field is 0.9 feet. The proposed base of the disposal field should be at least 11 inches above the 12-inch separation distance to the hardpan at a worst case of 15 inches (TP-106) below ground surface. The sand fill used under the disposal field and for the fill extensions should have a hydraulic conductivity of at least 40 feet per day. The fill extension should be at least 32 feet to prevent breakout through the sidewall.

Dave Chapman, LSE
Certified Geologist #458



REFERENCES

Khan, M.Y., *et al.*, 1976, "Shapes of Steady State Perched Groundwater Mounds," *Water Resources Research*, 12(3), 429-436.

Maine Association of Professional Soil Scientists and USDA Soil Conservation Service of Maine, Soil Series of Maine Soil Interpretations.

Maine Subsurface Waste Water Disposal Rules, 144A CMR 241, Department of Human Services, Bureau of Health, Division of Health Engineering.

APPENDIX A

Khan *et al.* (1976) Model Description and Calculations

GREEN Cells for Data Entry | RED Cells for Solutions

Khan Mounding Model (Khan et al, 1976)

K1 (ft/day)	K2 (ft/day)	*1/2 Width of Field* w (ft)	*Flow into Field Footprint* q' (ft/day)	*Distance from Center of Field* x (ft) - Use 0 for Max Mound
40	0.022916667	12	0.08544373	0

	0.000572917
EQUATION	*2.72845368*
TERMS	*3.72845368*
	0.076342855

Mound Height

0.916114259 feet

Length of Fill extension required to prevent the possibility of wastewater breakout on side slopes

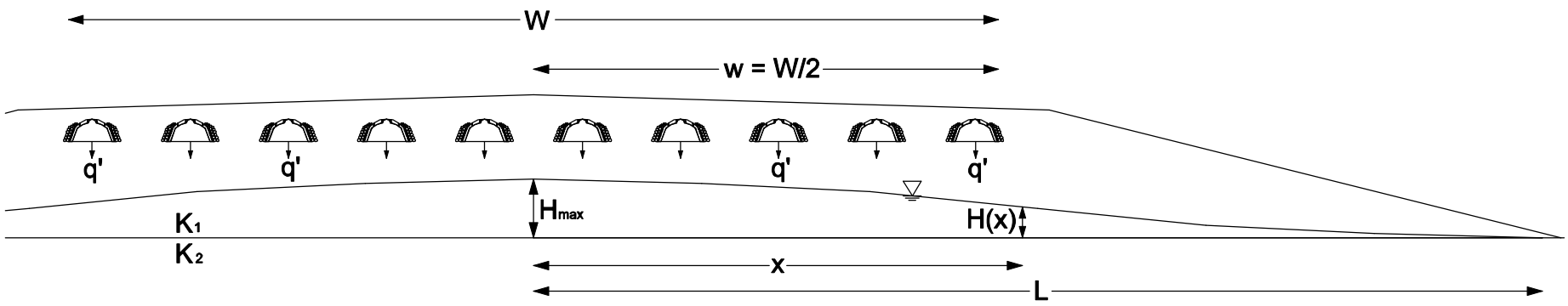
L=	44.74144417	feet from middle of disposal field
	32.74144417	feet from edge of disposal field

Calculate Equivalent Hydraulic Conductivity of Two Layers

Layer 1	Thickness	20	ft
	Hydraulic Conductivity	0.12	ft/day
	Transmissivity	2.4	ft2/day
Layer 2	Thickness	100	ft
	K	0.0035	ft/day
	Transmissivity	0.35	ft2/day
	Equivalent Hydraulic Conductivity	0.022916667	ft/day

Calculate Flow into Field Footprint (q')

Design Flow	1350	gpd
Field Length	88	
Field Width	24	ft
Flow into Field Footprint (q')	0.08544373	ft/day



Not to Scale

Conceptual Model (Khan et al, 1967)

Groundwater Mounding Estimate Over a Low Hydraulic Conductivity Layer in the Vadose Zone

SWEET ASSOCIATES
155 Gray Road
Falmouth, Maine
Phone: (207) 797-2110

Sweet Associates
HYDROGEOLOGY | SITE EVALUATIONS

155 Gray Road
Falmouth, Maine 04105
207.797.2110
fax: 207.878.2364
email: sweet@maine.rr.com
www.sweetassociates.com

November 20, 2017

GROUNDWATER IMPACT STUDY
BETTY WELCH ROAD SUBDIVISION
KITTERY, MAINE

INTRODUCTION:

The purpose of this study is to make an assessment of the hydrogeologic conditions of the abovementioned site and estimate the groundwater quality impact caused by the proposed on-site subsurface wastewater disposal systems for 20 three-bedroom houses.

The proposed development is located at 4567 Betty Welch Road between Betty Welch Road, Cutts Road and the Maine Turnpike at the position indicated on the attached topographic map. Data used for this project includes a site plan prepared by Altus Engineering of Portsmouth, New Hampshire, a Soil Narrative Report prepared by Longview Partners of Buxton, Maine, along with published regional maps and literature.

DISPOSAL FIELDS AND WATER SUPPLY:

A common subsurface wastewater disposal area is proposed for the subdivision. This disposal area consists of four modules (pods) each with 66 (3 rows of 22) concrete chambers and each occupying a footprint of 24 by 88 feet. Each pod will receive up to 1,350 gallons of wastewater per day. Municipal water will be provided to each of the lots.

SURFICIAL GEOLOGY AND TOPOGRAPHY:

The site is located on the *U.S.G.S. York Harbor, Maine 7.5 Minute Series* (Appendix A). Site area topography slopes generally downward from a high area where the four modules are located to lower areas occupied by wetlands to the southwest and northeast.

The *Surficial Geology Map of the York Harbor, Maine Quadrangle* (Appendix A) shows Presumpscot Formation consisting of massive to laminated silty clays overlying rock and till in the site area. The scale of the map appears to be too small to include the upland soil in the subsurface wastewater disposal area which consists of glacial till and lacustrine deposits.

According to the U.S. Department of Agriculture-National Cooperative Soil Service (USDA-NCSS) soil web, the soil under the site consists mostly of Scantic and Buxton silt loam. Under the disposal area, the soil was mapped as Hebron fine sandy loam.

Logs for Test pit SW-1 to 6 and 100 to 114 were reviewed in connection with this report. These logs provided soil information at the larger scale necessary to describe soil conditions at the site. TP101 to 104 and 106 were located in the proposed disposal area. These test pits encountered soil of either till (Dixfield) or lacustrine (Nicholville) origin (see Soil Narrative Report). Bedrock was not encountered in any of the pits.

The Maine Geological Survey's online *Significant Sand and Gravel Aquifer Map (*Appendix A) shows that the site does not fall within a Significant Sand and Gravel Aquifer.

HYDROGEOLOGY:

Precipitation falling on this site enters the open pore spaces on the upper soil horizon, and percolates vertically downward until the water table is encountered. Thereupon, flow is both horizontal and downhill. Two factors of importance in determining the amount of recharge of precipitation into the soil on this site are the groundwater slope or gradient and soil texture. The groundwater seepage velocity is used to calculate the extent of groundwater impact downgradient of the disposal field sites and has been calculated utilizing the following equation:

$$\mathbf{v = Ki/n}$$

where,

v = groundwater seepage velocity (ft/day)
K = hydraulic conductivity (ft/day)
i = hydraulic gradient (ft/ft)
n = effective porosity (dimensionless)

The hydraulic conductivity of the soil in the disposal area is estimated at 1 foot per day using a more conservative figure for lacustrine soil rather than the less conservative figure for glacial till. The average hydraulic gradient downgradient of the disposal areas averaged approximately 6%. A groundwater surface gradient of 3% was used as the slope parameter in the model.

CONTAMINATION POTENTIAL:

It is assumed that the worst potential for contamination is the nitrate-nitrogen (NO_3-N) released from wastewater disposal fields. NO_3-N is known to cause methemoglobinemia in infants and is a suspected cause of stomach cancer. The average NO_3-N concentration value of effluent from OxyPro Advanced Treatment Units entering a disposal field is assumed to be 42 milligrams per liter (mg/L). The Federal and State Drinking Water Limit for NO_3-N in public water supplies is 10 mg/L.

The primary mechanism of NO_3-N concentration reduction is through dilution in groundwater and surface water. Since groundwater is always slowly flowing beneath a disposal field, the NO_3-N intercepting the water table below a disposal field mixes and dilutes in the groundwater and moves in the direction of groundwater flow in the form of a plume. NO_3-N is more concentrated in the center than near the edges of a plume. A source that emanates a constant quantity of potential contaminants into groundwater will eventually reach a "steady state." The plume can then be characterized with regard to size, shape, and distribution of concentration.

The method of analysis used to assess the impact of the septic systems on groundwater is an analytical model used to simulate individual plumes. Analysis of the results of this model is instructive in assessing the possible shape and size of wastewater plumes. The model was developed by Baetsle (1969) to depict the migration of radionuclides in porous media, which is adapted here to represent the subsurface migration of NO_3-N. It is a three-dimensional transport model of plumes generated by continuous, point sources in a uniform groundwater flow field. Variables employed include seepage velocity (hydraulic conductivity multiplied by hydraulic gradient, divided by effective porosity), nitrate mass, time, and

dispersivity. The concentration of NO_3-N is calculated at a downgradient point at a specified time by use of the following equation:

$$C(x,y,z,t) = \left[\frac{CoVo}{8(\pi t)^{1.5}\sqrt{DxDyDz}}\right]\exp\left[-\frac{(x-vt)^2}{4Dxt} - \frac{y^2}{4Dyt} - \frac{z^2}{4Dzt}\right] \quad ;$$

where,

C(x,y,z,t)	=	NO_3-N concentration at specified location and time (mg/L)
x	=	specified distance from source parallel to the direction of groundwater flow (ft)
y	=	specified distance from source perpendicular to the direction of groundwater flow (ft)
z	=	specified vertical distance from source (ft)
Co	=	initial concentration at the source (mg/L)
Vo	=	volume of source (ft^3)
t	=	time elapsed (day)
Dx,Dy,Dz	=	dispersion coefficient along the x,y,z axes (ft^2/day)
v	=	average linear velocity (ft/day).

Assuming that groundwater flow is horizontal, the dispersion coefficient can be calculated as follows:

$D_{x,y,z}$ = $v_{x,y,z}$;

where $_{x,y,z}$ is dispersivity (ft).

The contaminant velocity of a solute subject to sorption/adsorption is calculated as follows:

V_p = v/R_d;

where V_p is the contaminant velocity (ft/day) and R_d is the retardation factor (unitless). The retardation factor for NO_3-N is equal to one, however, so the contaminant velocity is equal to the average linear velocity (V_p = v). Dispersivity is estimated by an equation based on a weighted least-squares statistical analysis of collected longitudinal dispersivity data versus scale (Xu, Eckstein, 1995). Longitudinal dispersivity can be estimated based on the following calculation:

$_x$ = $(0.83)[\log_{10}(L_p)]^{2.414}$;

where $_x$ is longitudinal dispersivity (ft), and L_p is the plume length (ft). The plume length is a function of the elapsed time and is calculated by the following equation:

L_p = $V_p t$.

It has already been established that for NO_3-N, the contaminant velocity (V_p) is equal to the average linear velocity (v). Thus, L_p = vt. The transverse and vertical dispersivities are related to the longitudinal dispersivity, as shown below:

$_y$ = $_x/3$
$_z$ = $_x/20$.

This method is used to calculate a downgradient NO_3-N concentration at a specified elapsed time for a single release of NO_3-N. However, by applying the superposition technique, the estimated concentration of NO_3-N downgradient at a specified time can be calculated for reoccurring daily NO_3-N releases to simulate the NO_3-N plume of a septic system (Chang, *et al*. 1998).

In the main equation, CoVo is represented as a daily mass of nitrate-nitrogen loaded into the subsurface wastewater disposal systems. This is estimated by multiplying the design flow volume of effluent by the assumed NO_3-N concentration in the effluent. The simulations were run based on average annual precipitation during drought conditions (60% of average annual precipitation). The NO_3-N concentration of the wastewater is diluted by the rainfall infiltrating the disposal fields during drought conditions. The rainfall is assumed to have a NO_3-N concentration of 0.5 mg/L. The percent of rainfall infiltrating the soils above the disposal fields is estimated based on the soil type and ground surface slope (Maine Department of Environmental Protection, 1991).

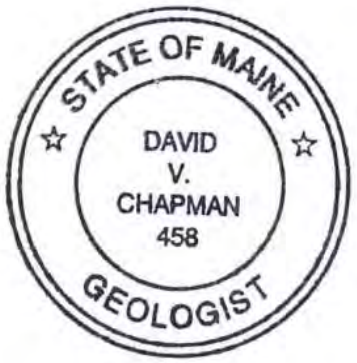
Parameters and results for the disposal field are displayed in Appendix B. The resulting 10 mg/L NO_3-N concentration plume lengths for the four modular disposal fields are shown on the site plan. The downgradient edges of the 10 mg/L plumes are approximately 275 feet from the disposal areas and do not cross the boundaries of the subdivision.

CONCLUSION:

According to the assumptions made for this simulation, the wastewater disposal system will not result in an increase of NO_3-N concentrations above 10 mg/L in groundwater at the subdivision perimeter property line.

David V. Chapman

David Chapman
Maine Certified Geologist #458



REFERENCES

Baetsle, L. H., 1969, *Migration of Radionuclides in Porous Media*, Progress in Nuclear Energy, Series XII, Health Physics, A.M.F. Duhamel (ed.), Pergamon Press, Elmsford, N.Y. pp.707-730.

Chang, Tan-yuch, Winkley, W., Montgomery, J., *Utilizing Baetsle's Equation to Model the Fate and Transport of MTBE in Groundwater*, Proceedings of the Petroleum Hydrocarbons and Organic Chemicals in Ground Water Prevention, Detection, and Remediation Conference, 1998, Houston, TX.

Department of Human Services, *et al.*, Maine Subsurface Waste Water Disposal Rules, 144A CMR 241.

Fetter, C.W., 1994, Applied Hydrogeology, 3rd Edition, Prentice Hall.

Maine Association of Professional Soil Scientists and USDA Soil Conservation Service of Maine, *Soil Series of Maine Soil Interpretations*.

Maine Geological Survey, York Harbor, Maine, Significant Sand and Gravel Aquifers.

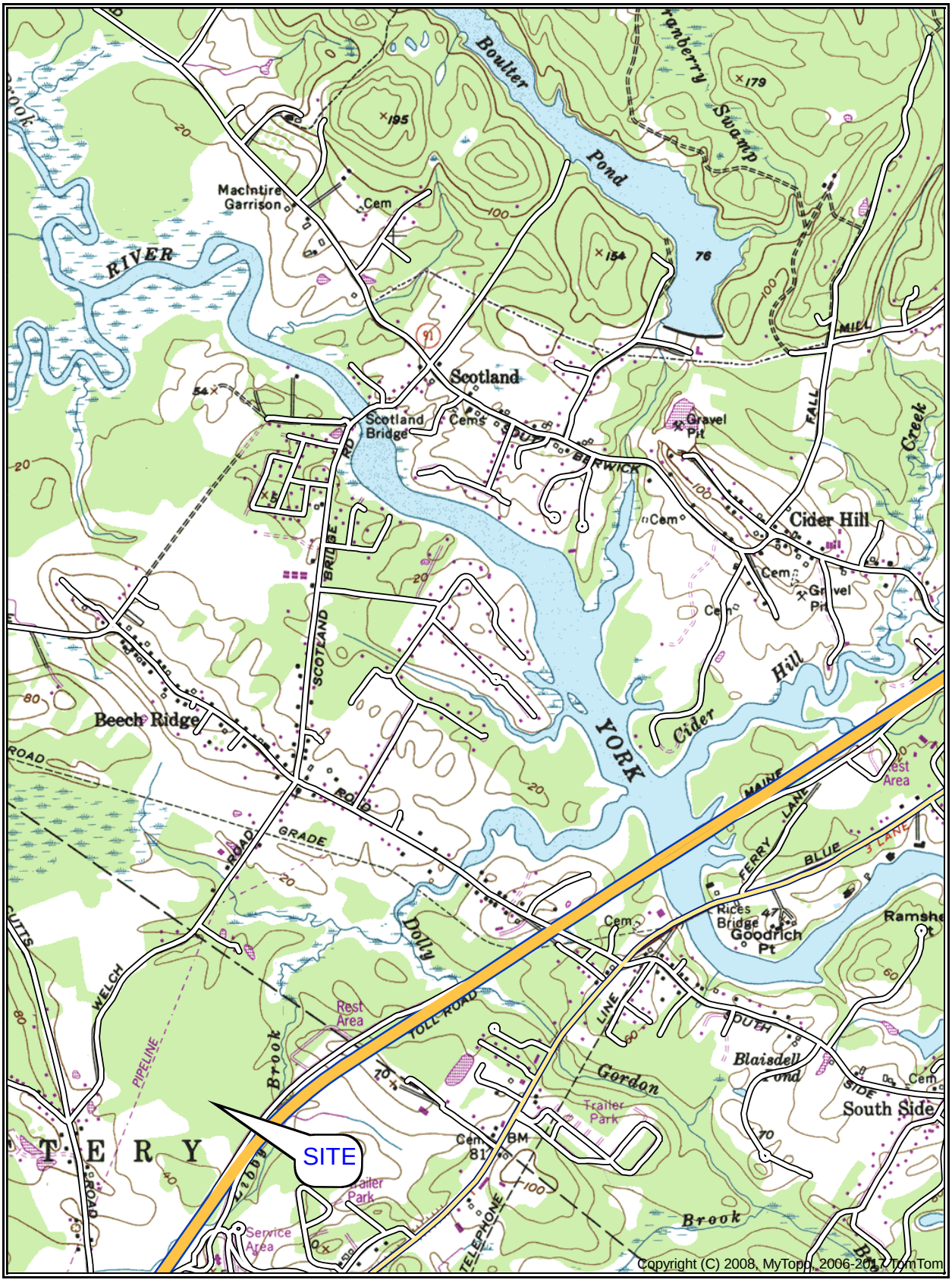
Maine Geological Survey, York Harbor, Maine, Surficial Geology.

U.S.G.S., York Harbor, Maine Quadrangle (Maine) 7.5' Quadrangle 1:24,000, Topographic Map.

Xu, M. and Y. Eckstein, 1995, *Use of Weighted Least-Squares Method in Evaluation of the Relationship Between Dispersivity and Field Scale*: Ground Water, vol.33, No.6, pp.905-908.

APPENDIX A

FIGURES

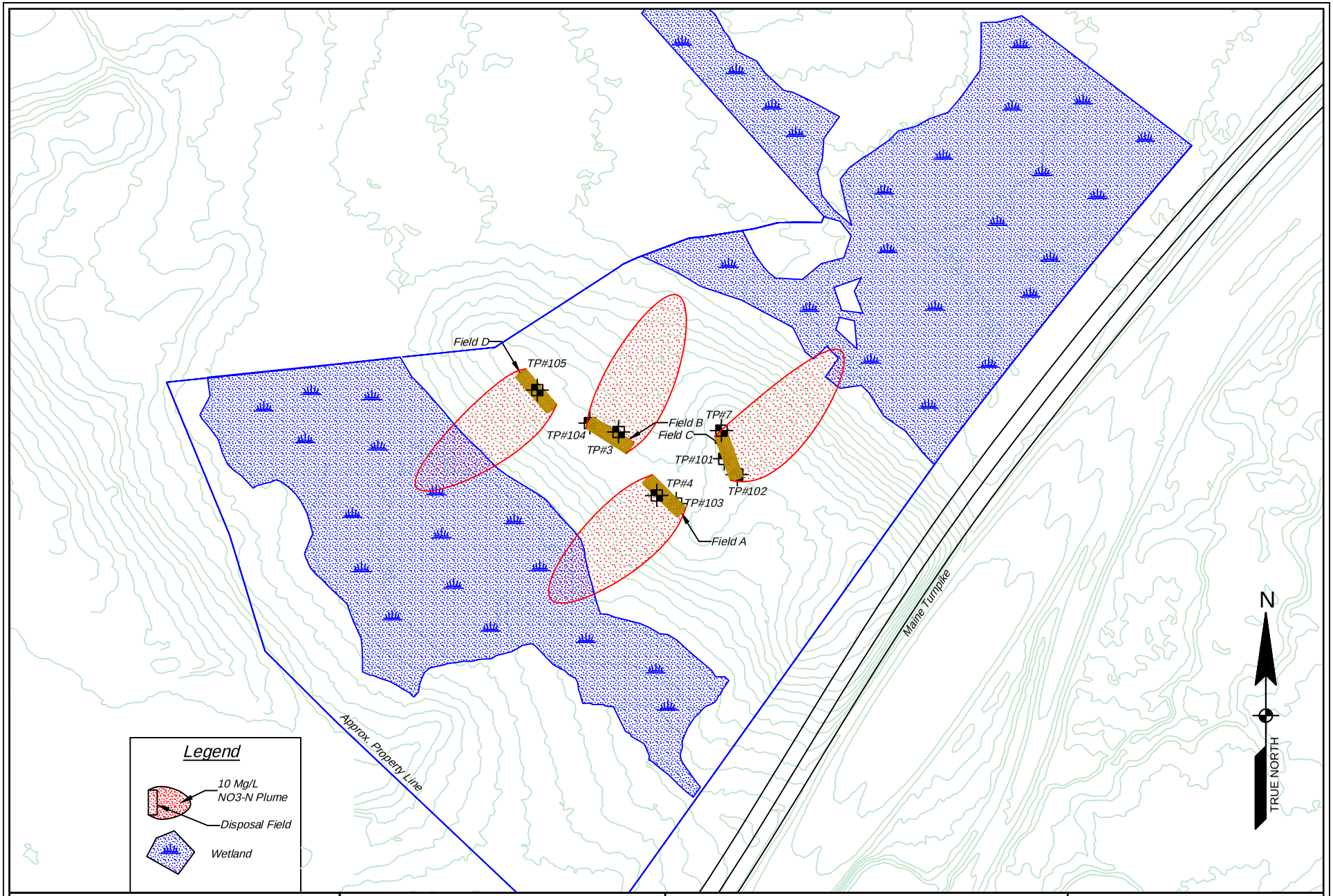


SCALE 1:24000

0 1000 2000 3000 4000 5000 6000

FEET

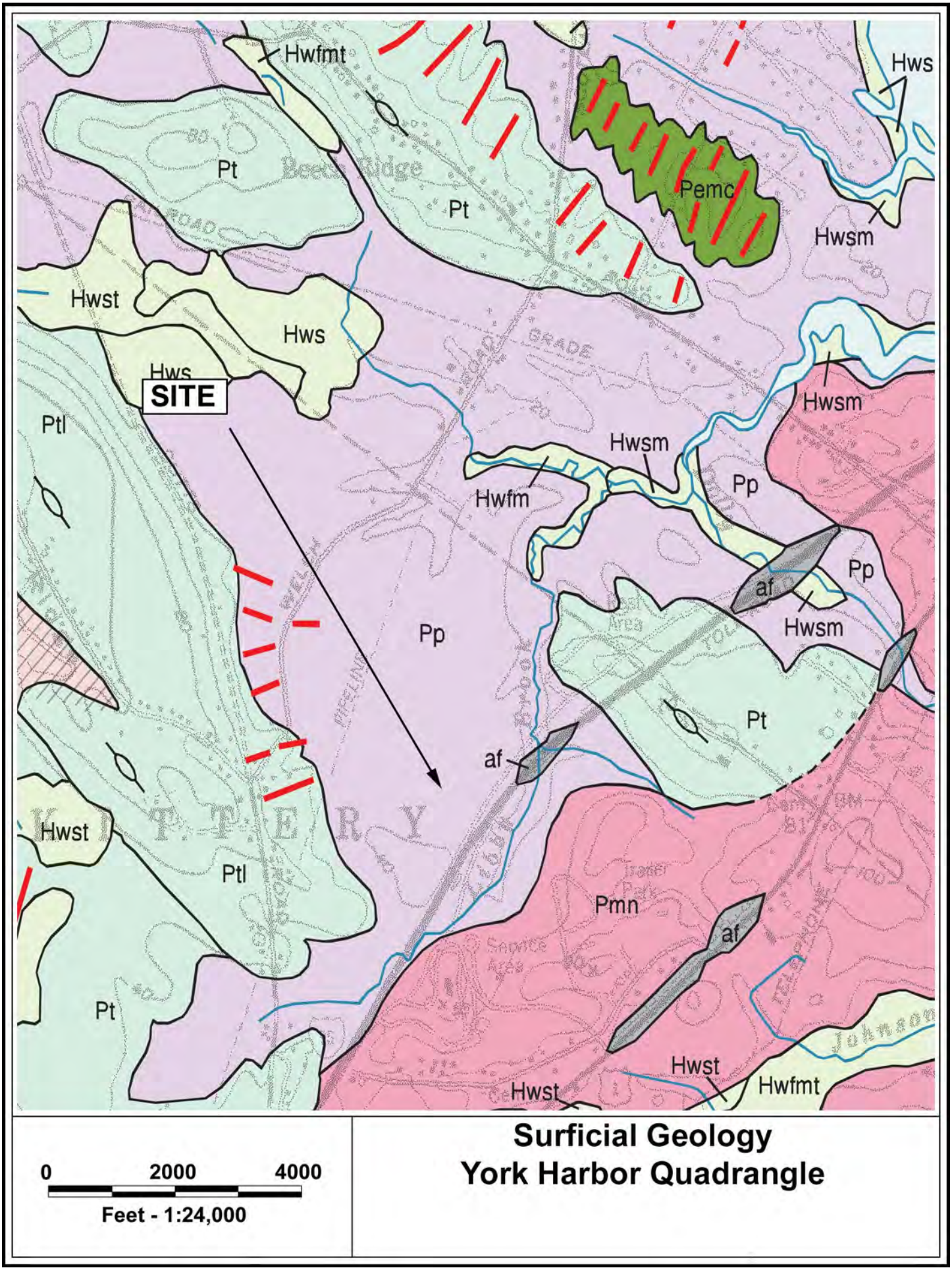
York Harbor 7.5-Minute Quadrangle



Groundwater Impact Study Map

BETTY WELCH ROAD SUBDIVISION
4567 BETTY WELCH ROAD, KITTERY

SWEET ASSOCIATES
155 Gray Road
Falmouth, ME
Phone: (207) 797-2110



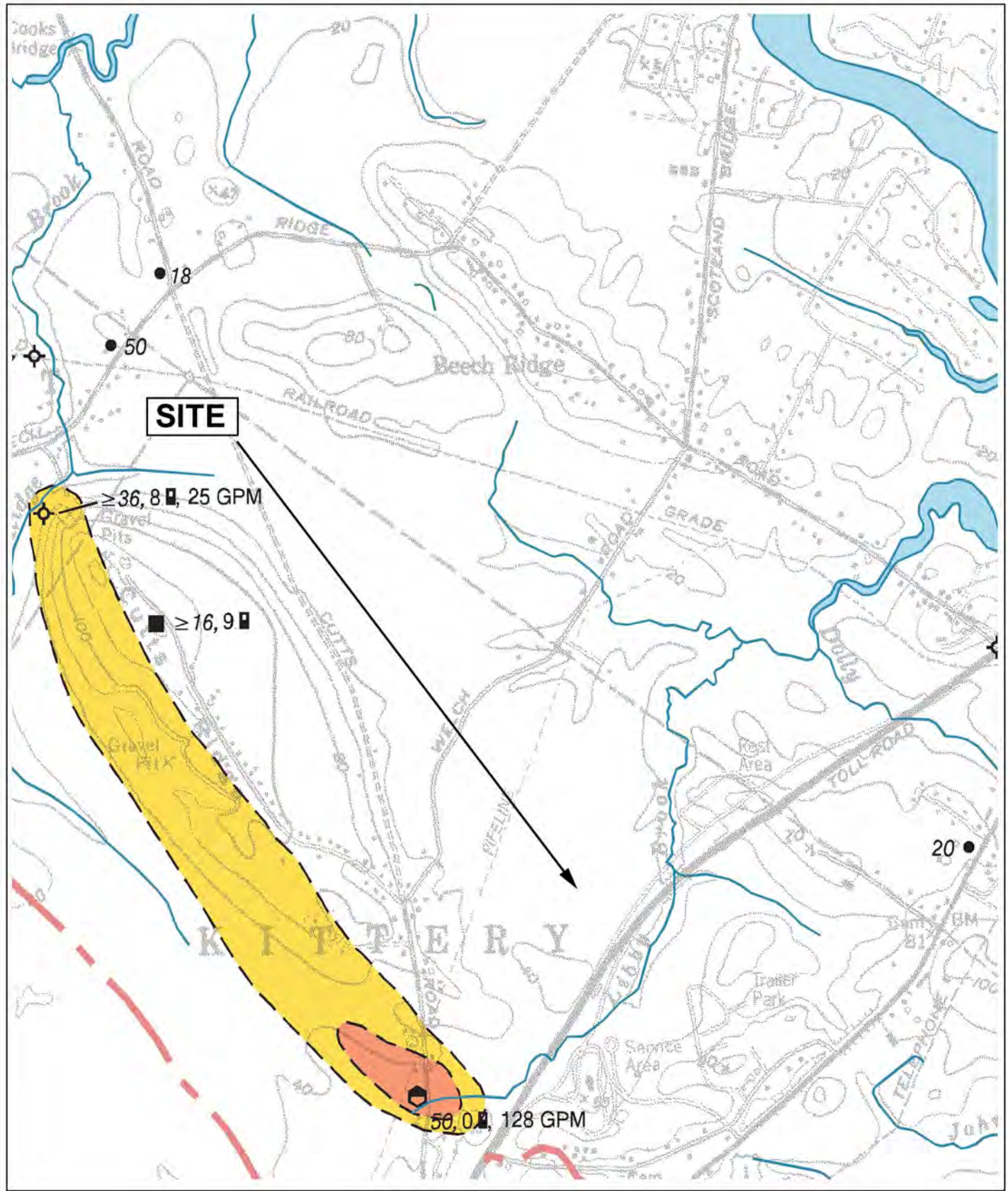
0 2000 4000

Feet - 1:24,000

Surficial Geology
York Harbor Quadrangle

Surficial Geology - York Harbor Quadrangle
Map Unit and Symbol Descriptions

Hws	**Wetland, swamp*** - Peat, muck, silt, and clay. Poorly drained area with variable tree cover; often has standing water.
Hwfm	**Wetland, freshwater marsh*** - Peat, muck, silt, and clay. Poorly drained grassland; often has standing water.
Hwsm	**Wetland, salt marsh** - Peat, muck, silt, and clay. Coastal marsh; subject to tidal flooding.
Pp	**Presumpscot Formation** - Massive to laminated, gray to bluish-gray silt and clay. Weathers to brownish or greenish-gray. Locally may include minor sand and gravel. Occurs as blanket deposit over bedrock and older glacial sediments. Deposited on sea floor during late-glacial marine submergence.
Pemc	**End moraine complex** - Cluster of moraine ridges. Composed of till, sand, and gravel deposited at the margin of the late Wisconsinan glacier.
Pt	**Till** - Loose, poorly sorted, generally nonstratified mixture of sand, pebbles, cobbles, and boulders. Deposited from glacial ice. Forms a blanket over bedrock. Commonly less than 10 ft (3 m) thick.
Ptl	**Lodgement till** - Compact, poorly sorted generally nonstratified mixture of silt, clay, and sand, with pebbles, cobbles, and boulders. Shows prominent fissility near ground surface. Deposited at base of glacial ice sheet.
af	**Artificial fill** - Composed of till, sand and gravel, rock, or various man-made materials.



0 2000 4000

Feet - 1:24,000

Significant Sand and Gravel Aquifer
York Harbor Quadrangle

Significant Sand & Gravel Aquifer Map Unit and Symbol Descriptions

Surficial deposits with good to excellent potential ground-water yield; yields generally greater than 50 gallons per minute to a properly constructed well. Deposits consist primarily of glacial sand and gravel, but can include areas of sandy till and alluvium; yield zones are based on subsurface data where available, and may vary from mapped extent in areas where data are unavailable.

Surficial deposits with moderate to good potential ground-water yield; yields generally greater than 10 gallons per minute to a properly constructed well. Deposits consist primarily of glacial sand and gravel, but can include areas of sandy till and alluvium; yields may exceed 50 gallons per minute in deposits hydraulically connected with surface-water bodies, or in extensive deposits where subsurface data are available.

Areas with moderate to low or no potential ground-water yield (includes areas underlain by till, marine deposits, eolian deposits, alluvium, swamps, thin glacial sand and gravel deposits, or bedrock); yields in surficial deposits generally less than 10 gallons per minute to a properly constructed well.

Drilled overburden well • Drilled bedrock well ⚒ Quarry

■ Dug well ↓ Driven point ⊙ Test pit + Bedrock outcrop

50 Depth to bedrock, in feet below land surface

≥13 Penetration depth of boring; ≥ symbol refers to minimum depth to bedrock based on boring depth or refusal

6 Depth to water level in feet below land surface (observed in well, spring, test boring, pit, or seismic line)

Gravel pit (overburden thickness noted in feet, e.g. 5-12')

4 GPM Yield (flow) of well or spring in gallons per minute (GPM)

Spring, with general direction of flow

Observation well (project well if labeled; nonproject well if unlabeled)

Test boring (project boring if labeled; nonproject boring if unlabeled)

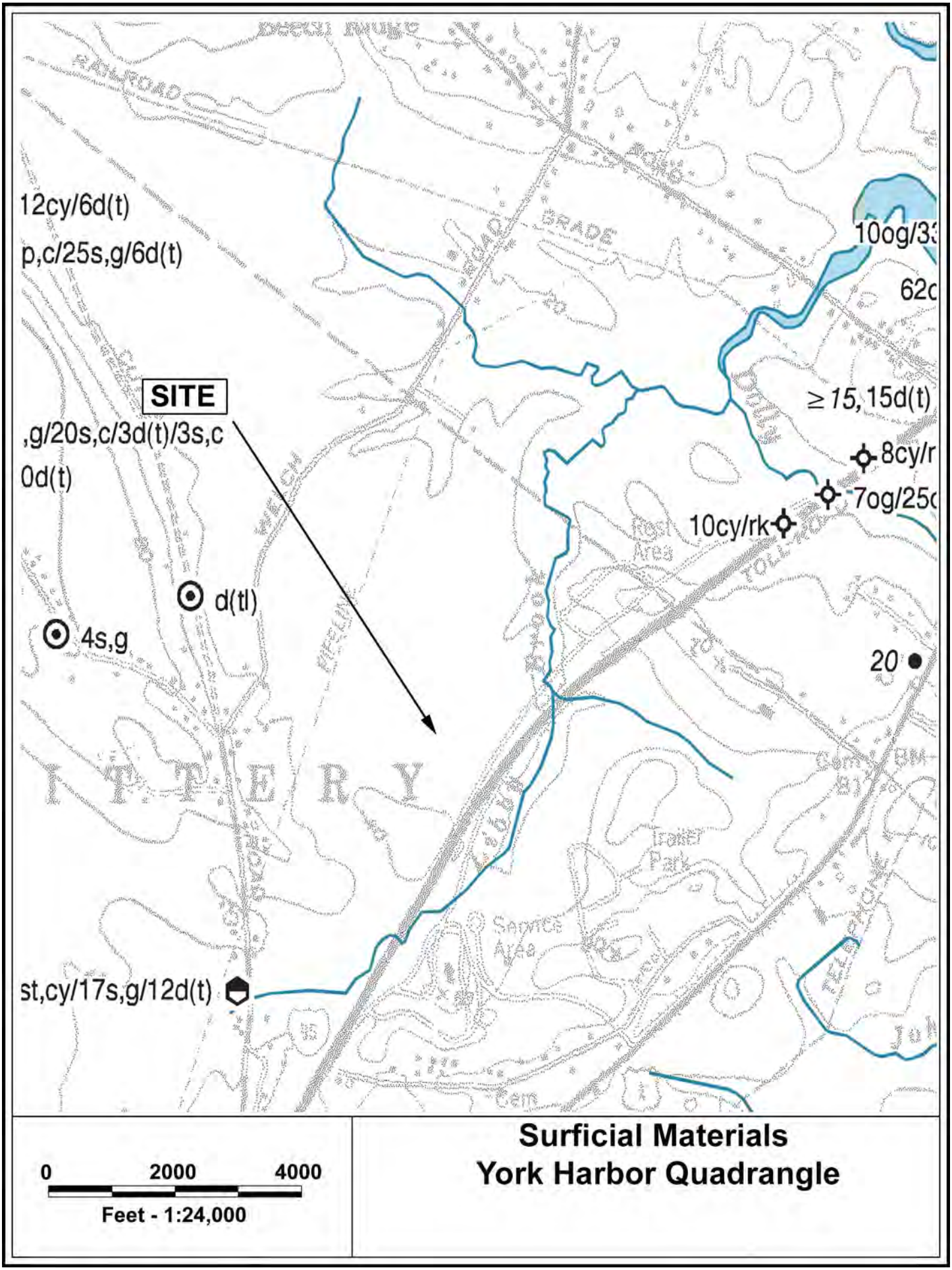
Potential point source of ground-water contamination

Surface-water drainage-basin boundary; surface-water divides generally correspond to ground-water divides. Horizontal direction of ground-water flow generally is away from divides and toward surface-water bodies.

MAP-7 ***131***, 23 Twelve-channel seismic line, with depth to bedrock and depth to water shown at the midpoint of the line, in feet below land surface.

69, 12
MAP-E
72, 12

Single-channel seismic line, with depth to bedrock and depth to water shown at each end of the line, in feet below land surface. Unless otherwise indicated, data shown above the line-identifier box refers to the northern end of the seismic line.


12cy/6d(t)
p,c/25s,g/6d(t)
SITE
,g/20s,c/3d(t)/3s,c
0d(t)
d(tl)
4s,g
st,cy/17s,g/12d(t)
10cy/rk
≥15,15d(t)
8cy/r
7og/25
20
0
2000
4000
Feet - 1:24,000
Surficial Materials
York Harbor Quadrangle

Surficial Material Symbol Descriptions

This map shows the textures of surficial sediments in the quadrangle, independent of interpretations regarding their origin. For example, poorly sorted sediments deposited directly from glacial ice are shown here as "diamicton", although they may be genetically classified as "till".

The symbols listed below indicate materials observed in borrow pits and other surface exposures, as well as subsurface data from varius sources. Where more than one textural class is present, materials are separated by commas and listed in decreasing order of abundance (e.g. s, st, cy). Individual materials may occur in distinct layers, or they may be mixed. Hyphens show the ranges of particle sizes present where their relative abundances are uncertain (e.g. st-c). Slash marks indicate superposition of materials; thicknesses are in feet (e.g. 10s/3cy). "E" indicates a significant stratigraphic sequence of interbedded materials. Some bottow pits and other localities may be designated by numbers that refer to descriptions in the quadrangle text. Not all symbols will necessarily be found on the map.

---

g Undifferentiated gravel, used as a general term. Can be subdivided by size as follows:

b	Boulder gravel	>256 mm (10")
c	Cobble gravel	64-256 mm (2.5-10")
p	Pebble gravel	2-64 mm (0.1-2.5")

---

gs Gravelly sand (this is a special case for sand with lesser amounts of intermixed gravel, i.e. pebbly sand, cobbly sand, or bouldery sand)

sg Sand and gravel (used only to describe slumped face or other site where relative abundances of sand vs. gravel are unknown).

---

s Undifferentiated sand, used as a general term. Can be subdivided by size as follows:

vcs	Very coarse sand	(1-2 mm)
cs	Coarse sand	(0.5-1 mm)
ms	Medium sand	(0.25-0.5 mm)
fs	Fine sand	(0.125-0.25 mm)
vfs	Very fine sand	(0.0625-0.125 mm)

---

st Silt (0.002-0.0625 mm)

---

cy Clay (<0.002 mm)

---

og Organic-rich sediment (can be any organic material, including forest litter, wood, shells, etc.)

pt Peat (reserved for actual fibrous peat)

---

d Undifferentiated diamicton (poorly-sorted sediment in which particle sizes may range from clay to boulders). Used as a general term or subdivided as follows:

dg	Gravelly-matrix diamicton
ds	Sandy-matrix diamicton
dt	Silty-matrix diamicton
dy	Clayey-matrix diamicton

Note: Diamictons of glacial origin may be classified as one of the following varieties of till (shown on the map in parentheses):

t Till, undifferentiated. Usually of late Wisconsinan age (deposited by the last glacial ice sheet).

ta Ablation till. Deposited during retreat of the late Wisconsinan ice sheet. Typically sandy, stony, and not very compact.

tl Lodgement till. Inferred to have been deposited at the base of the late Wisconsinan ice sheet. Usually very compact.

tf Flowtill. Deposited by slumping adjacent to glacial ice.

T Variably weathered till (usually a lodgment facies) of inferred pre-late Wisconsinan age.

---

af Artificial fill (e.g. road fills, building sites, dumps)

bd Scattered boulders; interpreted as till where followed by (t)

rk Bedrock (observed in pit floor, boring, or natural exposure)

rs Rottenstone, disintegrated or weathered bedrock, saprolite,

u Unknown (material unidentified)

R Refusal (in test boring or well)

(f) Fossiliferous (used to indicate fossiliferous units within a sequence).

- Bedrock well
- Drilled overburden well
- Dug well
- Driven point
- Bedrock outcrop
- Quarry
- **20fs,st** Observation well with materials data
- **10gs/rk** Test boring with materials data
- **8s-b** Materials data from shovel hole, hand-auger hole, natural exposure, or excavation (other than borrow pit).
- **56** Depth to bedrock from well (> is used to indicate minimum depth to bedrock), in feet below land surface
- **s-b** Borrow pit, recently active at time of mapping, with materials data.
- **s-p** Borrow pit, evidently abandoned or in long disuse at time of mapping, with materials data.
- **9** Location of site for which a data sheet is on file at the Maine Geological Survey.
- **56** Depth to bedrock from seismic line, in feet below land surface

APPENDIX B

PARAMETERS AND RESULTS

Groundwater Impact Study, Nitrates
Model Input Parameters and Solution
Betty Welch Road Subdivision
Kittery, Maine

Annual rainfall (inches):	44
Hydrologic soil group* (above disposal field):	C
% Slope (above disposal field):	3-5%
% Infiltration* (into disposal field):	21
Assumed rainfall flow into disposal field (gal/day):	33.33
Assumed rainfall flow into disposal field during drought conditions^(gal/day):	20.00
Background NO3-N concentration (mg/L):	2
Assumed effluent NO3-N concentration (mg/L):	42
Assumed effuent flow into disposal field (gal/day):	1350
Assumed NO3-N concentration in rainfall (mg/L):	0.5
Hydraulic conductivity of aquifer (ft/day):	1
Hydraulic gradient of aquifer (ft/ft):	0.030
Effective porosity of aquifer:	0.21
Seepage velocity of aquifer (ft/day):	0.14
Retardation factor	1
Half-Life (0 for no decay)	0
Simulation duration to reach NO3-N concentration equilibrium (days)	4,732
Longitudinal dispersivity at end of simulation duration (ft)	2.95
Lateral dispersivity at end of simulation duration (ft)	0.98
Vertical dispersivity at end of simulation duration (ft)	0.15
Disposal bed length (ft)	88
Disposal bed width (ft)	24
Length of 10 mg/L plume during drought conditions (ft)	**275**

Notes:
* - from The State of Maine Department of Environmental Protection, 1991, The guidelines for expediating the processing of applications under the site location of development act.
^ - drought conditions equals 60% of average annual rainfall
% - percent
gal/day - gallons per day
ft - feet
mg/L - milligrams per liter
NO3-N - Nitrate-Nitrogen

LONGVIEW PARTNERS, LLC
ENVIRONMENTAL PERMITTING SPECIALISTS
6 Second Street Buxton, Maine 04093 207-693-8799

February 6, 2018

Mr. James Jacobsen
Division of Environmental Health
11 State House Station
Augusta, Maine 04333-0011

Re: Proposed engineered subsurface wastewater disposal system, Huntington Run Subdivision, Kittery

Dear Jim,

Please find enclosed the HHE-220 for the above-referenced that we spoke about last August. I thought it might be helpful for me to mention a few of the factors that went into my design of the subsurface wastewater disposal system that is to serve the subdivision.

As you know, maximum daily design flows of 270 gallons per day (gpd) per dwelling results in a 5,400 gpd base flow. The soils on-site are predominantly 3 C profiles and require medium-large size rating for disposal field sizing (3.3 sq. ft./gpd disposal area). I used a large size rating for my design purposes (4.1 sq. ft./gpd which requires that the disposal fields be constructed 8% larger than medium-large sized fields per the *Rules*). Separation distances from soil limiting factors have been also increased by up to 3 times the required amounts (i.e. 36" instead of 12"). By incorporating an Oxy-Pro wastewater treatment unit at each dwelling, system sizing could be reduced by up to 50%; however we have only reduced disposal field area footprint by 24%.

We have been working closely with Jeff Clifford, P.E. and Ron Beal, P.E. of Altus Engineering on this design and any of us are happy to answer any questions that you may have regarding the proposed project.

Feel free to call with any other questions you may have. Otherwise, I look forward to your response.

Sincerely,

James Logan
Longview Partners, LLC
Certified Soil Scientist # 213
Licensed Site Evaluator # 237
USACE Certified Wetland Delineator

cc. Jeffrey Clifford, P.E., Altus Engineering

DECLARATION OF COVENANTS, CONDITIONS AND RESTRICTIONS FOR HUNTINGTON RUN SUBDIVISION

This Declaration of Covenants, Conditions and Restrictions (the "Declaration") is made this ____ day of _____ 2018, by Chinburg Development, LLC, a New Hampshire limited liability company, (the "Declarant") of 3 Penstock Way, Newmarket, NH 03857, being the current owner of real property identified as Lots 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11,12, 13, 14, 15, 16, 17, 18, 19, and 20 and the Common Open Space and the roadway Hamilton Lane, (each a "Lot," collectively, the "Lots," or "Property") as shown on the plan entitled, "Huntington Run Subdivision, Map 66, Lots 2A, 8 and 8A, 40 Betty Welch Road, Kittery, Maine," prepared by Altus Engineering, Inc., dated June 22, 2017, as revised through March 21, 2018 and recorded in the York County Registry of Deeds on _____, 2018 as Plan _____ Book _____ Page _____ (the "Plan"). The Declarant hereby adopts the following covenants, conditions and restrictions applicable to the Property.

This Declaration is made for the purposes of ensuring the most appropriate development of the Lots; to protect Owners of the Lots against the improper use of Lots so as to preserve the values of their property; to reserve, so far as practical, the natural beauty and open space of the subdivision; to guard against the erection of poorly designed or proportioned dwellings and structures built of unsuitable or improper materials and in general, to provide adequately for a predictable quality of improvement within the development and thereby increase the value of investments made in homes within the subdivision. The Declaration is also made for the purpose of maintaining the common open space; maintaining and plowing the roadway in the subdivision; inspecting, maintaining and correcting failures of the common force main, subsurface disposal fields and associated infrastructure, inspecting and filing the inspection reports for the on-lot wastewater system for each lot, pumping the on-lot septic tanks and allocating the costs.

1. **Homeowners' Association.**

1.1 Upon the sale of the last Lot, or sooner if the Declarant so decides, the Declarant shall establish a homeowners' association designated as the Huntington Run Homeowners' Association (the "Association"). The Association shall be governed in accordance with this Declaration and By-Laws attached hereto as **Exhibit A**. Membership in the Association shall be mandatory for all owners of Lots within the subdivision. Until all Lots are sold, or sooner if the Declarant gives voluntary written notice in an acceptable form to the then Owners of record that the Declarant has relinquished its powers hereunder, control of the Association shall be vested with the Declarant subject to this Declaration. Until such time the Association is formed, the

Declarant shall maintain the common area open space, roadway, and such other items deemed necessary for the proper operation of the subdivision, and shall have the right to establish an annual budget for the management of these items, as well as a capital reserve fund and to assess each Lot Owner a portion of the cost. At closing each Lot, the Owner will pay its pro-rata share of its annual fee and contribute toward the capital reserve fund to be held in reserve by the Declarant and turned over to the Association once formed. The Declarant shall not be obligated to make any contribution to either the annual fee or the capital reserve fund.

1.2 After the Association has been formed and the Declarant has relinquished all control to the homeowners, there shall be a meeting of the Association, at which time one Lot Owner shall be elected President, who shall be a member of the Board of Directors. A letter shall be sent to Maine Department of Environmental Protection (MDEP) Stormwater Program, notifying of the creation of an HOA. The members will also elect at least two other members to serve on the Board of Directors. Each Lot shall have one vote regardless of the number of Owners of the Lot. The Board of Directors shall prepare an annual budget and assess one hundred percent (100%) of the cost of maintaining the common open space, roadway and such other items deemed necessary to the proper operation of the Association to each Lot Owner as a common expense assessment. The Board of Directors shall determine the method of payment and may record a lien against any Lot Owner whose assessment is not paid within thirty (30) days of due date for the amount unpaid as well as all costs associated with collection of such expense including reasonable attorney's fees. Failure of the Owner to pay the common expense within thirty (30) days shall result in the Owner being responsible for payment of an interest rate of 1-1/2 percent per month on the unpaid balance until the balance is paid in full. No annual meetings shall be held until such time as Declarant has relinquished control of the Association.

2. **Drainage Easements; Stormwater Requirements; Wastewater Systems.**

2.1 Upon conveyance of the first Lot, stormwater practice(s) and subsurface wastewater disposal field(s) as depicted on the Plan shall automatically be reserved for the benefit of the Declarant or the Association once formed. The Declarant or the Association shall maintain the stormwater practice(s) in accordance with Stormwater Facility Maintenance Requirements in accordance with the Stormwater Management Facility Operation and Maintenance Manual (the "Stormwater O & M Manual") attached hereto as **Schedule A**. The management of these easements shall be further subject to the Bylaws of the Association.

2.2 As required by the Stormwater Facility Maintenance Requirements, the Declarant, or the Association shall have the stormwater facilities inspected by a qualified individual at a minimum of once per year in accordance with the O & M Manual for the specific type of facility. The persons conducting the inspection activities shall complete the appropriate inspection report and file it with the Town, if required. Within three (3) months of each five-year interval from the date of issuance of the permit, a report shall be submitted to MDEP Stormwater Program certifying that the stormwater practices are operating and maintained in accordance to the Stormwater O & M Manual.

2.3 The Association shall maintain any restricted buffer easement in accordance with Maine Department of Environmental Protection ("MDEP") Permit No. _____ and in

accordance with Stormwater Management Law, 38 M.R.S.A. Section 420-D and Chapter 500 of the rules promulgated by the Maine Department of Environmental Protection. *See* restrictions from Appendix G of Chapter 500 attached hereto as **Schedule B** for further information. The Declarant, the Association, the Town of Kittery and MDEP shall have the right to ensure compliance with MDEP Permits. Any costs and expenses incurred by the Declarant, the Town or MDEP to insure compliance can be recovered against the Association.

2.4 Wastewater system disposal fields shall be installed at the locations shown on the complete set of approved subdivision plans filed with the Town of Kittery unless other locations are specifically approved by the MDEP. A force main shall be installed in the private roadway and each lot shall be connected to the force main via an individual line. The Association shall maintain repair and replace the force main and the costs associated with this shall be a common expense. The Association is responsible for inspecting, maintaining and correcting failures of the common force main, subsurface wastewater disposal ("SSWD") fields and associated infrastructure, such as valves, manholes, ect., in accordance with the Subsurface Wastewater Disposal System Operation and Maintenance Manual (the "SSWD O & M Manual") attached hereto as **Schedule C.**

2.5 Each house will have an on-lot wastewater system, consisting of a series of tanks, piping, pumps, blower and control panels and will be provided with an emergency hook-up for a generator in case of a power outage to maintain the functionality of the on-lot wastewater system. In compliance with the SSWD & Manual, the Association shall have the right and obligation to: (i) annually, enter onto each lot and inspect each lot's wastewater system to insure it is operating properly; and (ii) no less frequently than once every two years, pump out the septic tank of each on-lot wastewater system. If an inspection reveals the on-lot wastewater system or parts have malfunctioned or failed, the Lot Owner will remedy all identified issues within thirty (30) days of the notice of the identified issues. If the Lot Owner fails to take the necessary action, the Association, after notice to the Lot Owner, shall have the right to remedy the identified issues and charge the Lot Owner for the cost as a special assessment which can be collected from the Lot Owner in the same manner as a common expense. The Association shall complete the appropriate inspection report and file it with the Association. All costs associated with the inspection of each Lot's on-lot wastewater system and pumping of the septic tank will be a common expense. The Association shall have the authority to assign this responsibility to a qualified third party vendor. Each Lot Owner shall insure access to each Lot's on-lot wastewater system for inspection and pumping by the Association or designated third party vendor.

2.5 **THE ON-LOT WASTEWATER SYSTEMS AND ASSOCIATED PUMPS WILL NOT FUNCTION DURING A POWER OUTAGE, AND IN THE ABSENCE OF A GENERATOR OR ALTERNATIVE POWER SOURCE, PLUMBING AND THE WASTEWATER SYSTEMS SHOULD NOT BE USED DURING A POWER OUTAGE. THE LOT OWNERS SHALL INSURE THEIR TENANTS AND GUESTS COMPLY WITH THIS REQUIREMENT.**

3. **Land Use and Structure Type; Zoning and Land Use Laws.**

3.1 No building or other structure of any kind shall be erected, placed or allowed to stand on any individual building lot, except one detached dwelling house for the use of one family and one garage/barn structure adapted for the storage of not more than four (4) automobiles. There will not be any back lots permitted within the subdivision. No fences will be allowed within the subdivision unless approved by the Declarant or the Association. An "in-law" apartment is permissible if allowed by zoning. No bed and breakfast, food service, kennel, or pet breeder shall be conducted from any dwelling erected on any lot. Business and commercial enterprises shall not be conducted from any dwelling erected on any lot except as permitted by the then existing zoning ordinance and regulations for the Town of Kittery without application for any variance therefrom; and further provided that not more than one (1) additional person be employed and that such use does not require any client/patient/customer contact at the dwelling. No such home business may display external evidence of the business, e.g., signage, nor shall any client/patient/customer/employee be allowed to park on the street.

3.2 No structure, other than the principal dwelling referred to above (other than a moveable trailer or shelter, incidental to construction), shall be used even temporarily as a place of habitation. All house locations and other structures, construction, excavation, sewage disposal and water supply, and stormwater drainage must otherwise be in compliance with Kittery Land Use and Development Code and applicable local, federal and state laws, codes, ordinances and regulations. In addition to the foregoing, each lot shall be and hereby is made subject to all applicable "notes" and other matters as shown on the complete set of approved subdivision plans filed with the Town of Kittery.

4. **Dwelling Size; Approval by Developer**.

4.1 Each dwelling shall have a minimum of 1,000 square feet of finished living area, exclusive of any garage, deck, porch, patio, basement, and attic. No carports shall be erected, placed or allowed to stand on said lots without prior approval of the Declarant. All improvements, including driveways, must be determined to: (i) meet all the terms and conditions of these covenants; (ii) ensure the optimal use of a lot with the least intrusion upon the privacy and views of neighboring lot owners; and (iii) ensure harmony of scale of dwellings with the subdivision.

4.2 Prior to seeking construction approval from Declarant, each Owner shall submit plans, including building plans, specifications and plot plan showing the precise location and setback of all improvements, including driveways. Plans shall also specify the nature, kind, shape, height, orientation, color, composition, and material for all such improvements as well as showing finish grade elevations in relation to existing elevations. All plans must be agreed upon and approved by the Declarant and Owner prior to commencement of construction. Said approval shall not be unreasonably withheld or delayed.

4.3 No dwelling, building, structure, alteration, addition or improvement of any sort, other than interior alterations not affecting the external appearance of the dwelling, building or structure, shall be placed, erected or constructed upon any lot until such plans shall have been approved in writing by the Declarant, which plans, the Declarant shall have the right to approve or disapprove. Notwithstanding the foregoing, Declarant shall have no liability or responsibility

for the enforcement of the within covenants and restrictions nor for the exercise of its discretion in approving or in disapproving any plans submitted as a consequence hereof.

4.4 Once the Declarant no longer owns a lot in the subdivision, no prior approval is required unless the Board of Directors establishes an Architectural Committee as permitted under the Bylaws of the Association to review the plans.

5. **Building and Landscaping Requirements.**

All structures shall have exterior wall surfaces covered with redwood or cedar clapboards or shingles, composition clapboards (HardiPlank or equivalent), brick or stone, vinyl, or a combination of any of the aforesaid, painted or natural sealed and must be maintained in a first-class condition. The use of simulated or artificial brick or stone or aluminum siding or any similar materials shall not be allowed, unless specifically agreed to by Declarant. All dwellings shall be constructed on poured concrete foundations with a maximum of 24 inches of exposure unless approved by Declarant. All foundations shall be treated with waterproofing. Daylight or sump well foundation drain systems shall be used.

6. **Use and Occupancy Restrictions.**

6.1 Further subdivision of the lots is expressly prohibited. Notwithstanding the expressed prohibition for further subdivision of lots, lot line revisions between lots may be allowed.

6.2 Any Owner may lease his lot for a period of not less than twelve (12) months and shall be responsible to ensure compliance with these covenants by his/her tenant, including but limited to paragraph 2.5.

6.3 All Lot Owners shall be subject to and comply with the terms and provisions governing the use, inspection and pumping of their on-lot wastewater system as set forth in paragraph 2.5.

6.4 Certain lots in the subdivision may be subject to easements or restrictions, as shown on the Plan. Acceptance of a deed to any such lot by an Owner shall be subject to such easements or restrictions whether or not referenced in such deed and each Lot Owner agrees not to utilize the Lot in a manner, which will interfere with the reasonable intent of the easement or restriction as referenced on the Plan.

6.5 The following are prohibited:

a. Clotheslines, unless they are in back of the house and not visible from the road or other lot(s);

b. Antennas or satellite dishes with diameters larger than 24 inches unless approved by the Declarant or Association;

c. Additions or outbuildings or appurtenances unless prior approval from Declarant or the Association, if required, has been obtained;

d. Use of pesticides unless by professional application in limited quantity;

e. Fuel tanks or similar storage receptacles that are visible from the road unless prior approval from Declarant or the Association, if required, has been obtained.

f. Tree and vegetation cutting shall be limited to (unless otherwise designated) the building envelope and house yard on each individual lot. All other tree and vegetation cutting shall be subject to the restrictions as shown on the complete set of approved subdivision plans and as set forth in Section 2.3 herein.

g. No open fires shall be permitted, except as allowed by Kittery Town Code.

h. No sign shall be displayed for the public view on any lot except one sign of not more than 6" in height and 24" in length denoting the lot owner's name and address. Temporary real estate agency signs indicating a dwelling for sale shall be permitted. The restriction shall not apply to any sign erected by Declarant at the entrance or within the subdivision.

i No animals, livestock or poultry of any kind shall be raised, bred or kept on any lot, except domestic household pets, which shall be maintained and cared for in accordance with Town Ordinances. All dogs shall be leashed when outside the boundary of an Owner's Lot.

j Household trash disposal will be the responsibility of the individual homeowners.

k No unregistered vehicles, junk cars or trucks or part thereof, shall be permitted on any lot unless garaged. No campers, trailers or boats are to be stored outside of dwelling or garage permanently for more than seven (7) days, unless approved by Declarant or Association in writing.

l No loam, sand or gravel, or other such material, except that resulting from landscaping or from construction permitted under this paragraph, shall be removed from a building lot.

m No hunting or trapping is allowed on any lot or other portion of the subdivision. No noxious, unlawful, or offensive activity shall be carried on in any dwelling nor shall anything be done therein, whether willfully or negligently. No owner shall make or permit any disturbing noises by himself, his family, servants, employees, agents, visitors and permitted occupants and guests, nor do or permit anything by such persons that will interfere with the peaceful possession and rights or other property owned by the Declarant or his successors and assigns.

n Lot grades shall not be changed in such a way as to divert the natural flow of water onto adjoining lots or the subdivision streets or rights-of-way, if any.

o All driveways, dwellings, or other structures built on a lot shall be constructed to provide for proper water runoff and to prevent the formation of any unnatural accumulation or discharge of water and/or ice onto any other lot, except for such approved drainage as may be shown on the complete set of approved subdivision plans.

p No dwelling or structure shall be left with an unfinished exterior. The exterior of every structure on the lot shall be kept in a proper state of repair, appearance and maintenance. Oil tanks or propane tanks for domestic uses must be stored underground, shielded from view in the rear, or in the cellar of the residential dwelling.

q Construction of a dwelling or any other approved structure on a lot, including finished landscaping, shall be completed within twelve (12) months from the commencement of said construction. Commencement shall be on the date on which a building permit is issued for the construction of a dwelling on a lot.

7. **Common Open Space and Other Lot Restrictions.**

7.1 Declarant hereby places certain restrictions, under the terms and conditions herein, over portions of the Property depicted on the Plan as Common Open Space. These restrictions shall run with the Common Open Space and Lots and shall be binding on all parties having any right, title, or interest in and to the Common Open Space and Lots, or any portion thereof, and their heirs, personal representatives, successors, and assigns and shall survive any dissolution of the Association created herein. The Common Open Space will be deeded to the Association within twelve (12) months of substantial completion of all construction, including house lots, roadway and infrastructure in the subdivision or earlier at the option of the Declarant.

7.2 Except as otherwise provided below, Common Open Space shall remain undeveloped in perpetuity. Common Open Space is subject to additional restrictions as set forth below.

7.3. Common Open Space shall be used and designated as shown on the complete set of approved subdivision plans. All structures including the signage and landscaping, shall belong to the Declarant or the Association. All costs associated with the maintenance of the signage and landscaping on Common Open Space, including water and electrical charges, shall be common expense and each lot owner shall pay 1/20th of the cost as provided for in Section 1 of this Declaration.

7.4. Common Open Space is subject to a 50’ wide Utility Easement in favor of the Kittery Water District and to a MDEP Buffer Easement, 100’ MDEP “Wooded” Buffer Easement as shown on the Plan and as further stated in MDEP Permit No. _____ and in **Schedule B** attached. The Common Open Space may be used for well radius protection, underground soil filters, wet pond and such other items as shown on the Plan and which may be later amended and approved by the MDEP and Town of Kittery. The Town of Kittery and MDEP shall have the right, upon advance notice, to cure any default against the Declarant or Association, once formed, to ensure compliance with MDEP Permits. Any costs and expenses incurred by the Town of Kittery or MDEP to insure compliance can be recovered against the Declarant, or Association, once formed. Any activity on or use of the Common Open Space inconsistent with the purpose of the restrictions in this section is prohibited. The Declarant or Association may approve such alterations and changes in use if such alterations and uses do not impede the stormwater control and treatment capability of the Common Open Space or if

adequate and appropriate alternative means of stormwater control and treatment are provided; provided the necessary permits are obtained from the Town of Kittery and MDEP.

7.5 Common Open Space shall include any subsurface wastewater disposal field (SSWD), grassed swales, grassed underground soil filters, the wet pond and the grassed access way to SSWD, all as shown and described on the Plan. Maintenance of Common Open Space in accordance with best management practices shall be the responsibility of the Declarant or Association, with the grassed access way to SSWD being mowed no more than twice per year.

7.6 The restrictions set forth herein shall be binding on any present or future owner of the Common Open Space and Lots.

7.7 Each provision of this Declaration, and any agreement, promise, covenant, and undertaking to comply with each provision of this Declaration, shall be deemed a land use restriction running with the land as a burden and upon the title to the Common Open Space and Lots.

8. **Roadway Maintenance and Plowing**.

Hamilton Lane, the roadway identified on the Plan, shall be and remain a private road. The Declarant or the Association, once the Association is formed, shall maintain, repave and plow the roadway as needed. Each owner of a lot shall share pro rata with other lot owners the cost of maintaining and plowing the roadway. The Declarant, or Association if the Declarant is no longer on the Board of Directors as the case may be, shall assess and bill each lot owner their pro rata contribution. Such assessment shall become a recordable lien against the lot of such member if not paid within thirty (30) days as provided for in Section 1.

9. **Erosion Control.**

9.1 To implement effective and adequate erosion control and protect the beauty of the subdivision, the Declarant or the Association shall have the right to enter upon any property before or after a building or structure has been constructed for the purpose of performing corrective grading or landscaping work necessary to protect adjoining properties or alleviate any unsightly condition or construction or maintaining erosion prevention devices.

9.2 Prior to exercising its right to enter upon the property, Declarant or the Association shall give the Owner the opportunity to take corrective action by giving the Owner written notice indicating what type of corrective action is required and specifying in that notice that immediate corrective action must be taken by such owner. If the Owner fails to take the corrective action specified within fifteen (15) days after having been notified, the Declarant or the Association may exercise its right to enter upon the property in order to take the necessary corrective action.

9.3 The cost of such corrective action or erosion prevention measures shall be paid by the Owner within thirty (30) days after receipt by Owner of an invoice for the cost of such work. Any expense incurred in taking the above action shall be considered a common expense assessed to the Lot Owner for which Declarant or the Association shall be entitled to record a lien upon

the Lot for such common expense as well as all costs associated with collection of such expense including reasonable attorney's fees. Failure of the Owner to pay the expense within thirty (30) days shall result in the Owner being responsible for payment of an interest rate of 1-1/2 percent per month on the unpaid balance until the balance is paid in full.

10. **Reservations and Easements.**

There is hereby excepted and reserved for the benefit of the Declarant, for so long as it owns any portion of the lots, and thereafter to the Association the following:

a. A right of way for all purposes over, across and through the roads, together with the right to install and maintain utilities within or under the traveled portion of said roads.

b. The right to grant easements for utility purposes to enter onto any lot within fifteen (15) feet of the road lot line for the purpose of constructing, reconstructing, installing, replacing, and maintaining an underground or an aboveground utility therein and to extend, connect to, and use in common any previously installed utility by the lot owner providing that promptly after such entry, the surface of the ground shall be restored to substantially the same condition as it was in prior to such entry.

c. A non-exclusive easement is reserved for the Declarant, its successors and assigns, in, upon, over, under, across, and through the subdivision for the purpose of installation, maintenance, repair and replacement of all utility lines and any other equipment and machinery necessary or incidental for the proper function of any utility systems serving the subdivision, which easements may be specifically conveyed to a public utility or municipality supplying the service. The easements created by this section shall include, without limitation, rights of the Declarant or the appropriate utility or service company or governmental agency or authority to install, lay, maintain, repair, relocate and replace gas lines, pipes and conduits, water mains and pipes, sewer and drain lines, drainage ditches and pump stations, telephone wires and equipment, television equipment and facilities (cable or otherwise), electrical wires, conduits, equipment, ducts and vents over, under, through, along and on the lots and common open spaces and roadways. Notwithstanding the foregoing, any such easement shall not be exercised as to materially interfere with the use or occupancy of any residence on a Lot.

d. A non-exclusive easement is reserved for the Declarant, its successors and assigns, in, upon, over, under, across, and through the subdivision for the purpose of installation, maintenance, repair and replacement of all drainage and any other equipment and machinery necessary or incidental for the proper function of any drainage systems serving the Subdivision.

e. A non-exclusive easement is reserved for the Declarant, its successors and assigns, in, upon, over, under, through and across the Development as long as the Declarant, its successors and assigns, shall be engaged in the construction, development and sale of lots and units within the Subdivision and on any contiguous land now or hereafter owned by the Declarant, for the purpose of construction, installation, maintenance and repair of existing and future building and related activities, including extension of and connection with subdivision roads and utility system for such development.

f. A non-exclusive easement is reserved for the Declarant, its successors and assigns, in, upon, over, under through and across each Lot for the purpose of inspecting, and repairing if necessary the on-lot wastewater system on each Lot and pumping out the associated septic tank as required by paragraph 2.5.

g. Any easement reserved for the benefit of the Town or Declarant or Association or as otherwise designated on the Plan shall be deemed automatically granted without the need of any additional documents.

11. **Enforcement**.

Proceedings may be maintained irrespective of the waiver of any prior violation or attempt by the same or other Owners, and the failure to enforce on any one occasion shall in no event be deemed to be a waiver of the right to do so thereafter as to the original breach or as to any breach subsequent thereto. The violation or attempted violations of any covenant or restriction in this Declaration is hereby declared a nuisance, which may be remedied by any appropriated legal proceeding. If any Owner shall attempt to violate, shall violate or shall permit on his lot any violation of any of the covenants, restrictions or reservations described herein, the Declarant or Association once formed or any Lot Owner may commence proceedings at law or in equity to recover damages or other awards for such attempts, violations or permitting of the same, or to enjoin the furtherance or continuation of such attempts or violations, or both.

12. **Severability.**

Invalidation of any covenant by court order or judgment shall not affect any of the other covenants or provisions herein, all of which shall remain in full force and effect.

13. **Notice of Covenant, Conditions and Restrictions.**

A copy of these covenants, conditions and restrictions shall be recorded in the York County Registry of Deeds.

14. **Term.**

These covenants, conditions and restrictions shall run with the land and shall be for the benefit of the premises and shown on the Plan and shall be binding on the lots and purchasers of said Lots for a period of twenty (20) years from the date of this Declaration and shall automatically extend for successive periods of ten (10) years. Failure to specifically refer to and/or incorporate these covenants, conditions and restrictions in deeds to the Lots shall not in any manner affect the validity and effectiveness of these covenants, conditions and restrictions upon any such Lot.

15. **Amendment, Modification or Waiver by Declarant.**

The Declarant may amend the provisions of this Declaration at any time so long as Declarant owns a Lot and such amendments shall be binding on any and all owners purchasing a Lot from the Declarant after such amendments has been duly made and recorded, provided such amendments are not less restrictive then the requirements in Sections 4. After Declarant no longer owns a Lot, these covenants, conditions and restrictions may be amended, at any time, by the then two thirds vote of the Lot Owners. Any amendment must be recorded at the York Country Registry of Deeds. Provided however, no amendment may remove, revoke or modify any right or privilege of the Declarant without the written consent of the Declarant or the assignee of such right or privilege; nor shall any amendment alter Sections 2, 7, 8 or 10 without the written consent of the Town of Kittery or MDEP. Any waiver by the Declarant on any one occasion or for any individual Lot shall not be deemed to constitute a waiver on any future occasion with respect to any Lot.

16. **Title Reference**.

For Declarant's title reference see deeds from Kingsbury P. Bragdon, Veronica M. Bragdon and Angela S. Johnson dated July 19, 2017 and recorded at York Country Registry of Deeds in Book 17520, Page 932 and Landmark Properties, LLC dated January 31, 2018 and recorded at the York County Registry of Deeds at Book 17654, Page 560 and.

IN WITNESS WHEREOF, we have hereunto set our hands and seals the day and year first above written.

DECLARANT
Chinburg Development, LLC

By:_____
Eric J. Chinburg, Manager

STATE OF NEW HAMPSHIRE
ROCKINGHAM, SS

The instrument was acknowledged before me on _____ ___, 2018, by Eric J. Chinburg, Manager of Chinburg Development, LLC for the purposes herein contained.

_____
Notary Public
My Commission Expire

Exhibit A

See attached Bylaws of Huntington Run Homeowners Association

EXHIBIT A

THE HUNTINGTON RUN HOMEOWNERS' ASSOCIATION

BY-LAWS

THESE BY-LAWS dated this __ day of December, 2017 executed by Chinburg Development, LLC, a New Hampshire limited liability company, with a place of business at 3 Penstock Way, Newmarket, County of Rockingham, State of New Hampshire (hereinafter called, together with their successors and assigns referred to as "the Developer") who is the Declarant under a Declaration of even date herewith and to be recorded simultaneously herewith in the York County Registry of Deeds (hereinafter called the "Declaration"). These By-Laws shall apply to the Huntington Run Subdivision as described and created by the Declaration and to all present and future owners, tenants, and occupants of any lots in the development and to all other persons who shall at any time use the development or any portion thereof. The acquisition or rental of any lot or the act of occupancy of any lot will signify that these By-Laws are accepted, ratified and will be complied with. These By-Laws shall run with the land and each lot comprising the development and shall be binding thereon.

ARTICLE I

INTRODUCTORY PROVISIONS

(a) **Definitions.** The terms used herein shall have the same meaning as given to them in the Declaration, except as expressly otherwise provided in the Declaration, or the application of such meaning would be contrary to the clear intent of the statement. The term "rules and regulations" refers to the rules and regulations for the conduct of the occupants of the development, adopted by the Association as hereafter provided.

(b) **Purpose**. Huntington Run Homeowners' Association is a non-profit private mutual benefit corporation pursuant to the State of Maine Title 13-B for the purpose of administering the Common Land of the subdivision in order to preserve property values and amenities in the subdivision and for the preservation, maintenance and improvement of the Common Land, including the Common Open Space, interior roadway, lighting, if any, and easements held by the Association in the subdivision now or in the future.

(c) **Conflicts.** These By-Laws are intended to comply with the requirements of the Declaration. If there is an inadvertent conflict between the provisions of these By-Laws and the Declaration, the provisions of the Declaration shall control.

ARTICLE II

MEMBERS

(a) Class of Members: The Association shall have one class of members. The qualifications and rights shall be as follows:

(1) Every beneficial owner as distinguished from a security owner, of a lot in the subdivision shall become a member of the Huntington Run Homeowners' Association (hereinafter the "Association").

(2) Membership shall include an undertaking to comply with and be bound by the Declaration of Covenants. Conditions and Restrictions, these By-Laws and amendments thereto, and the policies, rules, and regulations at any time adopted by the Association in accordance with these By-Laws. Members shall pay the first year's dues in advance on a pro rata basis based on a calendar year beginning in January of each year.

(3) Membership in this Association shall terminate when a member ceases to be a beneficial owner of a lot in the subdivision.

(b) Voting Rights: Each member in good standing shall be entitled to vote on each matter submitted to a vote of the members; provided, however, that each member shall be the sole beneficial owner of a lot in the subdivision. A member shall have one vote for each lot of which member is a beneficial owner. Where two or more owners own a lot, only one vote for such lot owned shall be allowed, and such joint owners shall designate and register with the Secretary of the Association the name of that owner entitled to cast such single vote.

(1) At membership meetings all votes shall be cast in person, or by proxy registered with the Secretary.

(2) The Board of Directors is authorized to establish regulations providing for voting by mail.

(c) Assignment of Rights: A beneficial owner who is the member of the Association may assign his membership rights to the tenant residing in or on the beneficial owner's lot. Such assignment shall be completed by filing with the Secretary of the Association a written notice of assignment signed by the beneficial owner.

ARTICLE III

MEETINGS OF MEMBERS

(a) Annual Meeting: An annual meeting of the members for the purpose of hearing reports from all officers and standing committees and for electing directors shall be held in Kittery, County of York, State of Maine in September of each year. The time and place shall be fixed by the Directors.

(b) Regular Meetings: In addition to the annual meetings, regular meetings of the members shall be held at such time and place as shall be determined by the Board of Directors.

(c) Special Meetings: A special meeting of the members may be called by the Board of Directors. A special meeting of the members must be called within ten (10) days by the President, or the Board of Directors, if requested by not less than four (4) of the members having voting rights.

(d) Notice of Meetings: Written notice stating the place, day, and hour of any meeting of members shall be delivered either personally or by mail to each member entitled to vote at such meeting, not less than five (5) days before the date of such meeting.

(e) Quorum: The members holding twenty-five (25%) percent of the votes that may be cast at any meeting shall constitute a quorum at any meeting of the members. In the absence of a quorum, a majority of the members present may adjourn the meeting from time to time without further notice.

(f) Proxies: At any meeting of the members, a member entitled to vote may vote by proxy executed in writing by the member. No proxy shall be valid after six months from the date of its execution, unless otherwise provided in the proxy.

(g) Voting by Mail: When Directors or Officers are to be elected by members, or when there is an act requiring the vote of the members, such election or vote on such proposed action may be conducted by mail in such manner as the Board of Directors shall determine.

ARTICLE IV

BOARD OF DIRECTORS

(a) General Powers: The affairs of the Association shall be managed by the Board of Directors, subject to instructions of the members of the Association at a regular meeting, or subject to the approval of the membership as expressed by a vote of the membership.

(b) Number, Tenure, and Qualifications: The number of Directors shall be not less than three (3) but not more than five (5). Each Director shall be a member of the Association, and shall hold office until two (2) annual meetings of the members following Director's original qualification shall have been held, and until his successor shall have been elected and qualified. Exceptions to the provision for the two (2) year tenure shall be in the case of the Director's first taking office following the organizational meeting of the Association. Of the first three (3) Directors, one (1) shall hold office only for a term of one year, one (1) shall hold office until the second subsequent annual meeting, one (1) shall hold office until the third subsequent meeting. The determination of the respective terms shall be by lot. When possible, any increase in the number of Directors shall be in units of two (2) members, and their initial terms shall be one for one (1) year and the other one for two (2) years, with the determination to be by lot.

(c) Regular Meetings: The Board of Directors shall meet regularly at least every six (6) months, at a time and place it shall select.

(d) Special Meetings: A special meeting of the Board of Directors may be called by or at the request of the President or of any three (3) Directors.

(e) Notices: Notice of any special meeting of the Board of Directors shall be given at least five (5) days prior thereto, by written notice delivered personally or sent by mail to each Director. Any director may waive notice of any meeting.

(f) Quorum: A majority of the duly authorized Board of Directors shall constitute a quorum for the transaction of business at any meeting of the Board, but if less than a majority of the Directors are present at said meeting, a majority of the Directors present may adjourn the meeting from time to time, and without further notice.

(g) Manner of Acting: The act of a majority of the Directors present at a meeting at which a quorum is present shall be the act of the Board of Directors, unless the act of a greater number is required by law or by these By-Laws.

(h) Vacancies: Any vacancy occurring in the Board of Directors, and any directorship to be filled by reason of the increase in the number of directors, shall be filled by election of the Board of Directors. A Director elected to fill a vacancy shall be elected for the unexpired term of Director's predecessor in office.

ARTICLE V

OFFICERS

(a) Officers: The officers of the Association shall be a President, a Secretary and a Treasurer.

(b) Qualifications and Method of Election: The officers shall be members of the Association, shall be elected by the Board of Directors, and shall serve for a term of one (1) year. The President and Vice-President shall be members of the Board of Directors.

(c) President: The President shall preside at the meetings of the Association and of the Board of Directors at which President is present, shall exercise general supervision of the affairs and activities of the Association, and shall serve as a member ex officio of all standing committees.

(d) Vice President: The Vice President shall preside at meetings of the Association and the Board of Directors when the President is absent and shall exercise the powers of the President when the President is absent or disabled.

(e) Secretary: The Secretary shall keep the minutes of all of the meetings of the Association and of the Board of Directors, which shall be an accurate and official record of all business transacted. The Secretary shall be custodian of all corporate records.

(f) Treasurer: The Treasurer shall receive all Association funds, keep them in a bank approved by the Board of Directors, and pay out funds only on notice signed by Treasurer and by one (1) other officer. The Treasurer shall be a member ex officio of the Finance Committee.

(g) Vacancy: A vacancy in any office because of death, resignation, removal, disqualification, or otherwise, may be filled by the Board of Directors for the unexpired portion of the term.

ARTICLE VI

POWERS

Powers and Duties. The Association will have all of the powers and duties necessary for the administration of the affairs of the Development. Said powers and duties shall include, but not be limited to, the following:

(a) Operation, care, upkeep and maintenance of the Common Land;

(b) Operation, care and enforcement of any use and restrictions imposed upon the subdivision;

(c) Operation, care, upkeep, maintenance and inspection of the drainage easements, stormwater requirements and septic systems as set forth in the Declaration**.**

(d) The employment, dismissal and replacement of agents and employees to facilitate the operation, care, upkeep and maintenance of the Common Land, including the Common Open Space and the interior roadway, lighting, if any, and the easements held by the Association;

(d) To make or cause to be made additional improvements on and as part of the Common Land;

(e) To acquire, hold, manage, convey and encumber title to real property (including but not limited to development lots conveyed to or acquired by the Association) in the name of and on behalf of the Association;

(f) The assessment and collection of the common expenses from the lot owners, and the enforcement of liens to secure unpaid assessments;

(g) The adoption and amendment of rules and regulations covering the details of the operation and use of the development, the Common Land or any portion thereof;

(h) Opening of bank accounts on behalf of the Association and designating the signatories required therefor;

(i) Obtaining and administering insurance for the subdivision as set forth in the Declaration;

(j) Repairing, restoring or replacing Common Land after damage or destruction by fire or other casualty, or as a result of eminent domain proceedings, as provided in the By-Laws;

(k) Procuring legal and accounting services necessary or proper in the operation of the subdivision or the enforcement of these By-Laws;

(l) The assessment of costs or damages against any lot owner whose actions have proximately caused damages to the Common Land;

(m) Payment of any amount necessary to discharge any lien or encumbrance levied against the entire development or any part thereof which may in the opinion of the Association constitute a lien against the development or against the Common Land, rather than merely against the interests of particular lot owners (where one or more owners are responsible for the existence of such lien, they shall be jointly and severally liable for the cost of discharging it and the costs incurred by the Association by reason of said lien or liens);

(n) Enforcement of the terms of the Declaration.

(o) All other powers granted by the Declaration or these By-Laws, permitted by law or enjoyed by associations of this kind.

(q) The formation, purpose, modification and dissolution of any Committee, such as but not limited to, the Architectural Review Committee, that the Board of Directors deems necessary for the proper administration of the Association. In any matter where the Declaration and/or By-Laws calls for review or action by a committee and said committee has not yet been or is not formed by the Board of Directors, the duties and requirements of the Committee shall be vested in the Board of Directors.

ARTICLE VII

INTERIM MANAGEMENT BY DECLARANT

From and after the date of the recording of these By-Laws, the Declarant shall exercise all powers and responsibilities assigned by these By-Laws and the Declaration to the Association and the Officers until such time as it turns over said powers and responsibilities to the lot owners. Said transfer of said powers and responsibilities shall occur upon the first to occur of: (1) the time of four (4) months after all of the lots in the Development have been conveyed to lot owners; or (2) the date the Declarant gives voluntary written notice in a recordable form to the then lot owners of record that lot owner has relinquished its powers hereunder. No contract binding the Association, or the lot owners as a group, which shall have been entered into during the period of Declarant's control as described in this Article shall be binding after the termination

of the Declarant's control unless ratified or renewed with the consent or affirmative vote of lot owners of a majority of the residential lots in the Development.

ARTICLE VIII

COMMON EXPENSES

(a) **Common Expenses.** The owner of each lot shall be liable for and shall pay as and when assessed an equal share of common expenses in accordance with the terms of the Declaration. Common expenses shall include all charges, costs and expenses of every kind incurred by or on behalf of the Association for and in connection with the administration of the development, including without limitation all charges for taxes (except real property taxes or other such taxes which are or may hereafter be assessed separately on each lot and the common interest appurtenant thereto or the personal property or any other interest of a lot owner), assessments, insurance, liability for loss or damage arising out of or in connection with the Common Land, including Common Open Space, and the interior roadway, lighting, if any, and enforcement of restrictions or any fire, accident or nuisance thereon, the cost of repair, reinstatement, rebuilding and replacement of facilities and improvements in the Common Land and enforcement of use and environmental restrictions, maintenance, trash disposal and similar services, wages, accounting and legal fees, management fees and all other necessary expenses of upkeep, maintenance, improvements, management and operation incurred on or for the Common Land and enforcement of any restrictions. The common expenses may also include such amounts as the Association may deem proper to make up any deficit in the Capital Fund (defined below in paragraph (c)). Common expenses will also include all common expense assessments against all lots, title to which is held by the Association. Common expenses also specifically include all expenses relating to the enforcement of any restriction or easement granted to the Association.

(b) **Capital Improvements.** Whenever in the judgment of the Association the Common Land should be improved by new construction or alteration of existing facilities, any such additions, alterations or new construction may be made by the Association only after obtaining approval of two-thirds of the lot owners, and the Town of Kittery and the Maine Department of Environmental Protection (MDEP), if required. If such approval is so obtained, the cost thereof shall constitute a part of the common expenses.

(c) **Capital Funds.** The Association shall assess as a common expense an amount or amounts on a semi-annual or annual basis for the purpose of establishing and maintaining a general operating reserve and general replacement reserve together known as the Capital Fund, against anticipated future outlays for operations or for maintenance or replacement of facilities within the Common Land or equipment or other property held by the Association in connection with the subdivision. The proportionate interest of each owner in said Capital Fund shall not be withdrawn or assigned separately but shall be deemed to be transferred with each lot even though not mentioned or described expressly in the instrument of transfer.

(d) **Books.** The Association will maintain books of account for common expenses for the Common Land, general operating reserves and replacement reserves, in accordance with

generally recognized accounting practices. The Association will, not less frequently than annually, render or cause to be rendered, a statement to each owner of all receipts and disbursements during the preceding year and the balances of the various accounts. The current copies of the Declaration, Articles of Incorporation, By-Laws and other rules concerning the project, as well as books, records and financial statements shall be available for inspection by lot owners or by holders, insurers and guarantors of first mortgages that are secured by lots in the project. These documents shall be available during normal daytime business hours.

(e) **Enforcement.** The Association shall have a lien on every lot for unpaid assessments of common expenses levied against the lot, which may be applicable to said lot. Each periodic assessment and each special assessment shall be a separate, distinct and personal debt and obligation of the Lot Owner against whom the same are assessed. If a lot owner shall fail to pay this assessment when due, then the Lot Owner shall pay an additional assessment of $50.00 for each such failure, and all delinquent assessments shall bear interest at the rate of eighteen percent (18%) per year from the assessment due date.

ARTICLE IX

GENERAL PROVISIONS

(a) **Abatement of Violations.** The violation of any rule or regulation adopted by the Association, the breach of any By-Law contained herein, or the breach of any provision in the Declaration shall give the Association the right, in addition to any other rights set forth in these By-Laws or in the Declaration, to enjoin, abate or remedy by appropriate legal proceedings, either at law or in equity, the continuance of any such breach, and all costs thereof, including attorney's fees, shall be borne by the defaulting lot owner.

(b) **Waiver.** The failure of the Association to insist in any one or more instances upon strict performance of or compliance with any of the covenants of the owner hereunder, or to exercise any right or option herein contained or to serve any notice, or to institute any action or summary proceeding, shall not be construed as a waiver or a relinquishment for the future, of such covenant or option or right, but such covenant or option or right shall continue and remain in full force and effect.

(c) **Notices.** All notices to lot owners shall be deemed given if hand delivered or sent by Registered or Certified Mail, Return Receipt Requested, to the owner, addressed to the owner's address appearing on the records of the Association. Any notice given or mailed to one co-owner shall be presumed to have been properly given to any other co-owner, regardless of whether a separate notice was given or sent to said other co-owner.

(d) **Amendment.** These By-Laws may be amended in the same fashion as the Declaration, the provisions for which are contained within the Declaration at Paragraph 15.

Executed as of the date and year first above written.

Chinburg Development, LLC.

_____ By:_____

Witness Eric J. Chinburg, Manager

STATE OF NEW HAMPSHIRE
COUNTY OF ROCKINGHAM

The instrument was acknowledged before me on December __, 2017, by Eric J. Chinburg, Manager of Chinburg Development, LLC.

_____

Notary Public / Justice of the Peace
My commission expires:_____

Schedule A

See attached Stormwater Facility Operation and Maintenance Manual (Stormwater O & M Manual)

See separated attachment

Schedule B

Appendix G to Chapter 500 of the Rules of the Maine Department of Environmental Protection

Restrictions on Restricted Buffer Area

1. Restrictions on Restricted Buffer Area. Unless the owner of the Restricted Buffer Area, or any successors or assigns, obtains the prior written approval of the MDEP, the Restricted Buffer Area must remain undeveloped in perpetuity. To maintain the ability of the Restricted Buffer Area to filter and absorb stormwater, and to maintain compliance with the Stormwater Management Law and the permit issued thereunder to the Declarant, the use of the Restricted Buffer Area is hereinafter limited as follows.

a. No soil, loam, peat, sand, gravel, concrete, rock or other mineral substance, refuse, trash, vehicle bodies or parts, rubbish, debris, junk waste, pollutants or other fill material may be placed, stored or dumped on the Restricted Buffer Area, nor may the topography of the area be altered or manipulated in any way;

b. Any removal of trees or other vegetation within the Restricted Buffer Area must be limited to the following:

(i) No purposefully cleared openings may be created and an evenly distributed stand of trees and other vegetation must be maintained. An "evenly distributed stand of trees" is defined as maintaining a minimum rating score of 24 points in any 25 foot by 50 foot square (2500 square feet) area, as determined by the following rating scheme:

Diameter of tree at 4½ feet above ground level	Points
2 - 4 inches	1
4 - 8 inches	2
8 - 12 inches	4
>12 inches	8

Where existing trees and other vegetation result in a rating score less than 24 points, no trees may be cut or sprayed with biocides except for the normal maintenance of dead, windblown or damaged trees and for pruning of tree branches below a height of 12 feet provided two thirds of the tree's canopy is maintained;

(ii) No undergrowth, ground cover vegetation, leaf litter, organic duff layer or mineral soil may be disturbed except that one winding path, that is no wider than six feet and that does not provide a downhill channel for runoff, is allowed through the area;

c. No building or other temporary or permanent structure may be constructed, placed or permitted to remain on the Restricted Buffer Area, except for a sign, utility pole or fence;

d. No trucks, cars, dirt bikes, ATVs, bulldozers, backhoes, or other motorized vehicles or mechanical equipment may be permitted on the Restricted Buffer Area;

e. Any level lip spreader directing flow to the Restricted Buffer Area must be regularly inspected and adequately maintained to preserve the function of the level spreader.

Any activity on or use of the Restricted Buffer Area inconsistent with the purpose of these Restrictions is prohibited. Any future alterations or changes in use of the Restricted Buffer Area must receive prior approval in writing from the MDEP. The MDEP may approve such alterations and changes in use if such alterations and uses do not impede the stormwater control and treatment capability of the Restricted Buffer Area or if adequate and appropriate alternative means of stormwater control and treatment are provided.

2. Enforcement. The MDEP may enforce any of the Restrictions set forth herein.

3. The restrictions set forth herein shall be binding on any present or future owner of the Restricted Buffer Area. If the Restricted Buffer Area is at any time owned by more than one Owner, each Owner shall be bound by the foregoing restrictions to the extent that any of the Restricted Buffer Area is included within such Owner's property.

4. Amendment. Any provision contained herein may be amended or revoked only by the recording of a written instrument or instruments specifying the amendment or the revocation signed by the owner or owners of the Restricted Buffer Area and by the MDEP.

Schedule C

See attached Subsurface Wastewater Disposal System Operations and Maintenance Manual (SSWD O & M Manual)

See separated attachment

Stormwater Management Facility
Operation and Maintenance (O&M) Manual

For:

HUNTINGTON RUN
Hamilton Lane
Kittery, ME

Prepared for:

Chinburg Builders, Inc.
3 Penstock Way
Newmarket, NH 03857

Prepared by:

Altus Engineering, Inc.
133 Court Street
Portsmouth, NH 03801-4413

Compliance with Stormwater Facility Maintenance Requirements

The property owner is the responsible party for ensuring that stormwater facilities installed on their property are properly maintained and that they function as designed. In some cases, this maintenance responsibility may be assigned to others through special agreements. The maintenance responsibility for a stormwater facility may be designated within a maintenance agreement for the property. Property owners shall be aware of their responsibilities regarding stormwater facility maintenance.

Long term inspection, maintenance, and repair are key elements in maintaining a successful stormwater management program on the developed property. Routine inspections will ensure permit compliance; will reduce the potential for deterioration of infrastructure and the high cost to repair/replace, and will reduced the degradation of water quality.

Inspection & Maintenance – Annual Reporting

Requirements for the long term inspection and maintenance of stormwater facilities, as well as reporting requirements are included in this Stormwater Management Facility Operation and Maintenance (O&M) Manual. The attached Long Term Inspection & Maintenance Schedule outlines specific requirements.

Preventative Measures to Reduce Maintenance Costs

The most effective way to maintain the water quality facility is to prevent the pollutants from entering the facility in the first place. Common pollutants include sediment, trash & debris, chemicals, dog wastes, runoff from stored materials, illicit discharges into the storm drainage system and many others. The maintenance program includes measures to address these potential contaminants, and will save money and time in the long run. Key of the maintenance program includes:

- Educate property owners, staff and patrons to be aware of how their actions affect water quality, and how they can help reduce maintenance costs.
- Keep the property, driveway, gutters and parking lots free of trash and debris
- Ensure the proper disposal of hazardous wastes and chemicals.
- Lawn care shall be planned to minimize the use of chemicals and pesticides.
- Be aware of automobiles leaking fluids. Use absorbents such as cat litter to soak up drippings – dispose of properly.
- Sweep paved surfaces of sediment and lawn clippings; dispose of offsite or in upland areas at least 25 feet from wetlands. Mulching mowers are encouraged.
- Re-vegetate disturbed and bare areas to maintain vegetative stabilization.
- Clean out the all components of the storm drainage system, including inlets, storm sewer and outfalls. Dispose of catch basin cleanings offsite.

- Do not store materials outdoors (including landscaping materials) unless properly protected from runoff and erosion.

Safety

Keep safety considerations at the forefront of inspection procedures at all times. Likely hazards should be anticipated and avoided. Never enter a confined space (outlet structure, manhole, etc) without proper training or equipment. A confined space should never be entered without at least one additional person present.

Inspecting Stormwater Management Facilities

The quality of stormwater entering the waters of the state relies heavily on the proper operation and maintenance of permanent best management practices. Stormwater management facilities must be periodically inspected to ensure that they function as designed. The inspection will determine the appropriate maintenance that is required for the facility.

A. Inspection Procedures

All stormwater management facilities are required to be inspected by a qualified individual at a minimum of once per year. Inspections should follow the inspection guidance found in O&M manual for the specific type of facility.

B. Inspection Report

The person(s) conducting the inspection activities shall complete the appropriate inspection report for the specific facility. An inspection and maintenance report, *Stormwater Management Facility Inspection Form*, is provided.

General Information

This section identifies the facility location, person conducting the inspection, the date and time the facility was inspected, and approximate days since the last rainfall. The reason for the inspection is also identified on the form depending on the nature of the inspection. All facilities should be inspected on an annual basis at a minimum. In addition, all facilities should be inspected after a significant precipitation event to ensure the facility is draining appropriately and to identify any damage that occurred as a result of the increased runoff. For the purpose of this Stormwater Management Program, a significant rainfall event is considered an event of three (3) inches in a 24-hour period or 0.5 inches in a one-hour period. It is anticipated that a short, intense event is likely to have a higher potential of erosion for this site than a longer, high volume event.

Inspection Scoring

For each inspection item, a score must be given to identify the urgency of required maintenance. The scoring is as follows:

0 = No deficiencies identified.

1 = Monitor – Although maintenance may not be required at this time, a potential problem exists that will most likely need to be addressed in the future. This can include items like minor erosion, concrete cracks/spalling, or minor sediment accumulation. This item should be revisited at the next inspection.

2 = Routine Maintenance Required – Some inspection items can be addressed through the routine maintenance program (See SOP in appendix A). This can include items like vegetation management or debris/trash removal.

3 = Immediate Repair Necessary – This item needs immediate attention because failure is imminent or has already occurred. This could include items such as structural failure of a feature (outlet works, forebay, etc), significant erosion, or significant sediment accumulation. This score should be given to an item that can significantly affect the function of the facility.

Inspection Summary/Additional Comments

Additional explanations to inspection items, and observations about the facility not covered by the form, are recorded in this section.

C. Verification of Inspection and Form Submittal

The *Stormwater Management Facility Inspection Form* provides a record of inspection of the facility. The verification and the inspection form(s) shall be reviewed and maintained by the property owner or property manager. Any transfer in ownership shall be documented in writing to MDEP.

Maintaining Stormwater Management Facilities

Stormwater management facilities must be properly maintained to ensure that they operate correctly and provide the water quality treatment for which they were designed. Routine maintenance performed on a frequently scheduled basis, can help avoid more costly rehabilitative maintenance that results when facilities are not adequately maintained. Maintenance personnel must be qualified to properly maintain stormwater management facilities. Inadequately trained personnel can cause additional problems resulting in additional maintenance costs.

The following provides a list of recommendations and guidelines for managing the stormwater facilities.

SILT FENCE/ SEDIMENT BARRIER

Straw/hay bale barriers, silt fence and filter barriers shall be inspected immediately after each rainfall and daily during prolonged rainfall events. These structures shall be inspected for signs of erosion or sedimentation regularly. Any required repairs shall be made immediately. If there are signs of undercutting at the center or the edges, or impounding of large volumes of water, sediment barriers shall be replaced with a temporary stone check dam.

Should the fabric of the silt fence or filter barrier decompose or become ineffective prior to the end of its expected usable life and the barrier is still necessary, the fabric shall be replaced promptly.

Sediment deposits must be removed when deposits reach approximately one third (1/3) the height of the barrier. Any sediment deposits remaining in place after the silt fence or filter barrier is no longer required shall be dressed to conform to the existing grade, then prepared, loamed and seeded.

FOREST BUFFER

Buffers are natural, undisturbed strips of natural vegetation or planted strips of close-growing vegetation adjacent to and downslope of develop areas. As stormwater runoff travels over the buffer area, vegetation and the organic duff layer slow runoff, trapping particulate pollutants and allowing time for infiltration. Activities that may result in disturbance of the duff layer are prohibited in a buffer.

VEGETATED SWALE

Timely maintenance is important to keep the vegetation in the swale in good condition. Mowing shall be done frequently enough to keep the vegetation in vigorous condition and to control encroachment of weeds and woody vegetation, however it shall not be mowed too closely to reduce the filtering effect. Fertilize on an "as needed" basis to keep the grass healthy, however, over-fertilization can result in the swale becoming a source of pollution and must be avoided.

The swale should be inspected periodically and after every major storm to determine the condition of the swale. Rills and damaged areas shall be promptly repaired and re-vegetated as necessary to prevent further deterioration.

ROAD DITCH TURNOUT

After construction, ditch turnouts need to be carefully inspected for any signs of channelization and immediately repaired. The structure will fail if water exits from it in channelized flow. It will be necessary to remove sediment from the ditch turnout trench when the structure is no longer functioning properly (i.e. distributing the runoff uniformly across the trench).

LEVEL SPREADERS

The proposed site plan includes a level spreader at locations of concentrated flows. Level spreaders are six feet or more in width and designed as four feet (4') of length per one (1) c.f.s. of flow, with a minimum length of 10 feet. Level spreaders enable run-off directed towards them to be spread evenly into sheet flow prior to discharge into wetlands or treatment by a filter strip, thus allowing for better filter strip efficiency and a lesser potential for erosion.

After construction, level spreaders shall be carefully inspected for any signs of channelization and immediately repaired. The structure will fail if water exits from it in channelized flow. Vegetated level spreaders may require periodic mowing. Spreaders constructed of wood, asphalt, stone or concrete curbing also require periodic inspection to check for damage and repair as needed.

PIPE INLET AND OUTLET PROTECTION

Periodically check all aprons, plunge pools, pipe inlet and outlet protection (riprap) for damage and repair as needed. If any evidence of erosion or scouring is apparent, modify the design as needed to provide long-term protection.

WET PONDS

Wet ponds have a permanent pool of water and have the capacity to temporarily store runoff and release it at controlled rate; provide flood control; and provide water quality treatment. Wet ponds can achieve high rates of removal for a number of urban pollutants, including sediment, trace metals, hydrocarbons, biological oxygen demand, nutrients, and pesticides.

Maintenance

- Inlet and outlet should be check periodically to ensure that flow structures are not blocked by debris.
- Wet ponds shall be inspected annually for erosion, side slope destabilization, embankment settling or other signs of structural failure. Corrective action shall be taken immediately upon identification of the problem.

GRASSED UNDERDRAIN SOIL FILTER

Detention basins are only used for water quantity control and must be used with other water quality BMPs (e.g., "wooded" buffer) to improve water quality. Detention facilities consist of a detention structure that temporarily store excess runoff and gradually releases it over a period of time to the receiving watercourse. It is design to control outflow at a rate no greater than the pre-development peak discharge rate.

Maintenance:
The basin should be inspected semi-annually and following major storm events. Debris and sediment buildup shall be removed from the forebay and basin as needed. Any bare area or erosion rills should be repaired with new filter media, seeded and mulched.

- Maintenance Agreement: A legal entity shall be established with responsibility for inspecting and maintaining any underdrained filter. The legal agreement establishing the entity should list specific maintenance responsibilities (including timetables) and provide for the funding to cover long-term inspection and maintenance.
- Drainage: The filter should drain within 24 to 48 hours following a one-inch storm or greater. If the system drains too fast, an orifice may need to be added on the underdrain outlet or may need to be modified if already present.
- Sediment Removal: Sediment and plant debris shall be removed from the pretreatment structure at least annually.
- Mowing: If mowing is desired, only hand-held string trimmers or push-mowers are allowed on the filter (no tractor) and the grass bed shall be mowed no more than 2 times per growing season to maintain grass heights of no less than 6 inches.
- Fertilization: Fertilization of the underdrained filter area shall be avoided unless absolutely necessary to establish vegetation.
- Harvesting and Weeding: Harvesting and pruning of excessive growth shall be done occasionally. Weeding to control unwanted or invasive plants may also be necessary.
- Grass cover: Maintaining a healthy cover of grass will minimize clogging with fine sediments. If ponding exceeds 48 hours, the top of the filter bed shall be rototilled to reestablish the soil's filtration capacity.
- Soil Filter Replacement: The top several inches of the filter can be replaced with fresh material if water is ponding for more than 72 hours, or the basin can be rototilled, seeded and mulched. Once the filter is mature, adding new material (a 1-inch to 2-inch cover of mature compost) can compensate for subsidence.

CATCH BASIN AND DROP INLET STRUCTURES

Function – The drop inlet structure is used as an overflow structure for ponds/basins.

Maintenance

- Remove sediment from sump
- Inspect inlet and outlet of the drop inlet structure semi-annually and after major storm events to ensure that flow structures are not blocked by debris.

- The drop inlet structure and adjacent area shall be inspected annually for erosion, destabilization of side slopes, embankment settling and other signs of structural failure.

CONTRACTOR'S GENERAL CLEAN UP

Upon completion of the site and permanent stabilization is attained, the contractor shall remove all temporary stormwater structures (i.e., temporary stone check dams, silt fence, temporary diversion swales, etc.). Any sediment deposits remaining in place after the silt fence or filter barrier is no longer required shall be dressed to conform to the existing grade, prepared and seeded. Remove any sediment in catch basins and clean drain pipes that may have accumulated during construction.

Long Term Inspection & Maintenance Schedule

	Spring	Fall or Yearly	After Major Storm	Every 2-5 Years
Resource and Treatment Buffers				
Inspect treatment buffers for evidence of erosion, concentrated flow, or encroachment by development	x			
Manage the buffer's vegetation with the requirements in deed restrictions	x			
Repair any sign of erosion within a buffer	x			
Inspect and repair down-slope of all level spreaders and ditch turn-outs	x			
Install more level spreaders or ditch turn-outs if needed for a better distribution of flow	x			
Clean out any accumulation of sediment within spreader bays or turn-out pools	x			
Mow non-wooded buffers no shorter than six inches no more than twice a year	x	x		
Vegetated Areas				
Inspect all slopes and embankments and replant areas of bare soil or with sparse growth	x		x	
Armor rill erosion areas or divert the erosive flows to on-site stable areas	x		x	
Inspect and repair down-slope of all level spreaders and ditch turn-outs for erosion	x		x	
Ditches, Swales & Open Stormwater Channels				
Remove obstructions, sediments or debris from ditches, swales and other open channels	x	x	x	
Repair any erosion of ditch lining	x	x	x	
Mow grass swales	x	x		
Remove vegetated growth and woody vegetation	x	x	x	
Repair any slumping side slopes	x	x	x	
Repair riprap where underlying filter fabric or gravel is showing or if stones have dislodge	x	x	x	
Catch Basins				
Remove sediment and debris from the bottom of the basin and inlet grates	x	x	x	
Remove floating debris and oils (using oil absorptive pads) from the trap	x	x	x	
Culverts				
Remove accumulated sediments and debris at inlet, outlet	x	x	x	
Repair any erosion damage at the culvert's inlet and outlet	x	x	x	
Remove any obstruction to flow	x	x	x	

Roadways and Parking Surfaces				
Clear and remove accumulated winter sand along roadways	x			
Sweep pavement to remove sediment	x			
Grade road shoulders and remove excess sand	x			
Grade gravel roads and gravel shoulders	x			
Clean out sediment within water bars or open –top culverts	x			
Ensure that stormwater is not impeded by false ditches of sediment in the shoulder	x			
Wet Pond/ Detention Basin				
Inspect the embankments for settlement, slope erosion, piping and slumping		x	x	
Mow embankment to control woody vegetation		x	x	
Inspect outlet structure for broken seals, obstructed orifices, and plugged trash rack		x	x	
Remove and dispose of sediments and debris within the control structure		x	x	
Repair any damage to trash racks or debris guards		x	x	
Replace any dislodged stone in riprap spillways		x	x	
Remove and dispose of accumulated sediments within the impoundment and forebay		x	x	
Grassed Underdrain Soil Filter				
Clean the basin of debris, sediment and hydrocarbons	x	x		
Mow basin with push mower or hand-held trimmer				
Provide for the removal and disposal of accumulated sediments and weeds within the basin	x	x		
Renew the basin media if it fails to drain within 72 hours after a one inch rainfall event	x	x		
Till, seed and mulch the basin if vegetation is sparse	x	x		
Repair riprap where underlying filter fabric or gravel is showing or where stones have dislodged	x	x		

STORMWATER MANAGEMENT FACILITY
INSPECTION FORM

(SEE ATTACHED SHEETS C-3.0 & C-3.1 FOR LOCATIONS)

Huntington Run
Hamilton Lane
Kittery, Maine

Date: _____

Inspector _____ Qualifications _____

Current and recent hydrological conditions:

_____
_____
_____

Maintenance and Corrective Actions since last Inspection:

_____
_____
_____

VEGETATED SWALE:

- Is the swale free of debris, litter and/or woody vegetation? _____
- Condition of vegetation in waterway? _____
- Is vegetation being mowed regularly? _____
- Is there evidence of erosion or scour in or near the swale? _____
- Is there evidence of sedimentation in swale? _____
- Comments _____

_____
_____

WET POND:

- Is there bare surface, needing additional mulch? _____
- Is there a buildup of debris and sediment? _____
- Is there evidence of rills? _____
- Comments _____

_____
_____

ROAD DITCH TURNOUT:

- Is there evidence of channelization? _____
- Is there evidence of sedimentation in trench? _____
- Comments _____

_____
_____

LEVEL SPREADERS:

- Is there evidence of channelization? _____
- Is there evidence of excessive sedimentation? _____
- Comments _____

_____

_____

PIPE INLET AND OUTLET PROTECTION:

- Is there evidence of erosion or scour near culvert? _____
- Is there evidence of damage at the aprons? _____
- Is there evidence of damage at the plunge pool? _____
- Is there evidence of damage at the inlet or outlet? _____
- Comments _____

_____

_____

CATCH BASINS / DROP INLET STRUCTURE:

Required Maintenance: Annual Cleaning of Sump:

- Depth of sediment in CB sumps? _____
- Are the CB grates free of leaves and debris? _____
- Is water flowing into or through CB? ___Is the outlet water turbid at drain outfalls? ____
- Is there evidence of damage to structures or at drain outfalls? _____
- Comments _____

_____

_____

GRASS UNDERDRAIN SOIL FILTER:

- Depth of sediment within basin? _____
- Is there evidence of excessive drainage time? _____
- Status of vegetation _____
- Is there evidence of erosion ? _____
- Comments _____

_____

_____

MDEP "WOODED" BUFFERS:

- Is there evidence of cutting or disturbance to vegetation? _____
- Comments _____

_____

_____

Maintenance or Corrective Action Required:

_____

_____

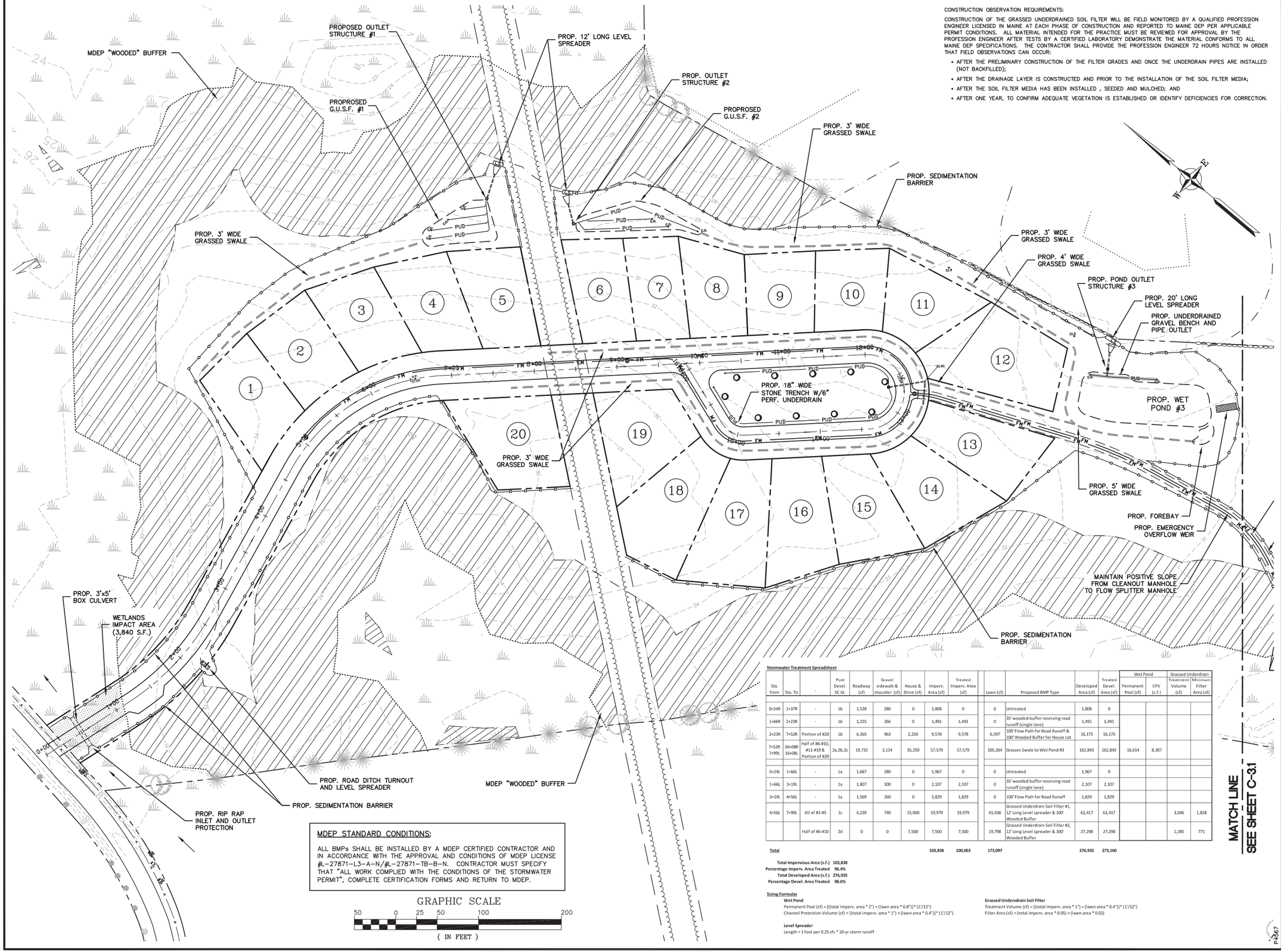
_____

_____

_____

_____

To be performed by: _____ On or before: _____



CONSTRUCTION OBSERVATION REQUIREMENTS:

CONSTRUCTION OF THE GRASSED UNDERDRAINED SOIL FILTER WILL BE FIELD MONITORED BY A QUALIFIED PROFESSION ENGINEER LICENSED IN MAINE AT EACH PHASE OF CONSTRUCTION AND REPORTED TO MAINE DEP PER APPLICABLE PERMIT CONDITIONS. ALL MATERIAL INTENDED FOR THE PRACTICE MUST BE REVIEWED FOR APPROVAL BY THE PROFESSION ENGINEER AFTER TESTS BY A CERTIFIED LABORATORY DEMONSTRATE THE MATERIAL CONFORMS TO ALL MAINE DEP SPECIFICATIONS. THE CONTRACTOR SHALL PROVIDE THE PROFESSION ENGINEER 72 HOURS NOTICE IN ORDER THAT FIELD OBSERVATIONS CAN OCCUR:

- AFTER THE PRELIMINARY CONSTRUCTION OF THE FILTER GRADES AND ONCE THE UNDERDRAIN PIPES ARE INSTALLED (NOT BACKFILLED);
- AFTER THE DRAINAGE LAYER IS CONSTRUCTED AND PRIOR TO THE INSTALLATION OF THE SOIL FILTER MEDIA;
- AFTER THE SOIL FILTER MEDIA HAS BEEN INSTALLED , SEEDED AND MULCHED; AND
- AFTER ONE YEAR, TO CONFIRM ADEQUATE VEGETATION IS ESTABLISHED OR IDENTIFY DEFICIENCIES FOR CORRECTION.

MDEP STANDARD CONDITIONS:

ALL BMPs SHALL BE INSTALLED BY A MDEP CERTIFIED CONTRACTOR AND IN ACCORDANCE WITH THE APPROVAL AND CONDITIONS OF MDEP LICENSE #L-27871-L3-A-N/#L-27871-TB-B-N. CONTRACTOR MUST SPECIFY THAT "ALL WORK COMPLIED WITH THE CONDITIONS OF THE STORMWATER PERMIT", COMPLETE CERTIFICATION FORMS AND RETURN TO MDEP.

Stormwater Treatment Spreadsheet

Sta. from	Sta. To	-	Post Devel. SC Id.	Roadway (sf)	Gravel sidewalk & shoulder (sf)	House & Drive (sf)	Imperv. Area (sf)	Treated Imperv. Area (sf)	Lawn (sf)	Proposed BMP Type	Developed Area (sf)	Treated Devel. Area (sf)	Wet Pond Permanent Pool (cf)	Wet Pond CPV (c.f.)	Grassed Underdrain Treatment Volume (cf)	Grassed Underdrain Minimum Filter Area (sf)
0+24R	1+37R	-	1b	1,528	280	0	1,808	0	0	Untreated	1,808	0				
1+66R	2+23R	-	1b	1,225	266	0	1,491	1,491	0	35' wooded buffer receiving road runoff (single lane)	1,491	1,491				
2+23R	7+52R	Portion of #20	1b	6,365	963	2,250	9,578	9,578	6,597	100' Flow Path for Road Runoff & 100' Wooded Buffer for House Lot	16,175	16,175				
7+52R 7+99L	16+08R 16+08L	Half of #6-#10, #11-#19 & Portion of #20	2a,2b,2c	19,732	3,154	35,250	57,579	57,579	105,264	Grasses Swale to Wet Pond #3	162,843	162,843	16,614	8,307		
0+24L	1+66L	-	1a	1,687	280	0	1,967	0	0	Untreated	1,967	0				
1+66L	3+19L	-	1a	1,807	300	0	2,107	2,107	0	35' wooded buffer receiving road runoff (single lane)	2,107	2,107				
3+19L	4+56L	-	1a	1,569	260	0	1,829	1,829	0	100' Flow Path for Road Runoff	1,829	1,829				
4+56L	7+99L	All of #1-#5	1c	4,239	740	15,000	19,979	19,979	41,438	Grassed Underdrain Soil Filter #1, 12' Long Level spreader & 100' Wooded Buffer	61,417	61,417			3,046	1,828
		Half of #6-#10	2d	0	0	7,500	7,500	7,500	19,798	Grassed Underdrain Soil Filter #2, 12' Long Level spreader & 100' Wooded Buffer	27,298	27,298			1,285	771
Total							**103,838**	**100,063**	**173,097**		**276,935**	**273,160**				

Total Impervious Area (s.f.) 103,838
Percentage Imperv. Area Treated 96.4%
Total Developed Area (s.f.) 276,935
Percentage Devel. Area Treated 98.6%

Sizing Formulas

Wet Pond
Permanent Pool (cf) = [(total imperv. area * 2") + (lawn area * 0.8")]* (1'/12")
Channel Protection Volume (cf) = [(total imperv. area * 1") + (lawn area * 0.4")]* (1'/12")

Level Spreader
Length = 1 foot per 0.25 cfs * 10-yr storm runoff

Grassed Underdrain Soil Filter
Treatment Volume (cf) = [(total imperv. area * 1") + (lawn area * 0.4")]* (1'/12")
Filter Area (sf) = (total imperv. area * 0.05) + (lawn area * 0.02)

ALTUS ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801
(603) 433-2335 www.ALTUS-ENG.com

STATE OF MAINE — JEFFREY K. CLIFFORD No. 5967 LICENSED PROFESSIONAL ENGINEER

THIS DRAWING HAS NOT BEEN RELEASED FOR CONSTRUCTION

ISSUED FOR: FINAL APPROVAL

ISSUE DATE: JANUARY 24, 2019

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	PB SUBMISSION	JKC	6/22/17
1	MDHHS SUBMISSION	JKC	2/21/18
2	MDEP SUBMISSION	JKC	3/19/18
3	TOWN FINAL APPROVAL	JKC	1/24/19

DRAWN BY: RMB
APPROVED BY: JKC
DRAWING FILE: 4567SITE.DWG

SCALE: 1 " = 50'

OWNERS/APPLICANT:

CHINBURG DEVELOPMENT, LLC
3 PENSTOCK WAY
NEWMARKET, NH 03857

PROJECT:

HUNTINGTON RUN SUBDIVISION
MAP 66 LOTS 2A, 8 & 8A
40 BETTY WELCH ROAD
KITTERY, MAINE

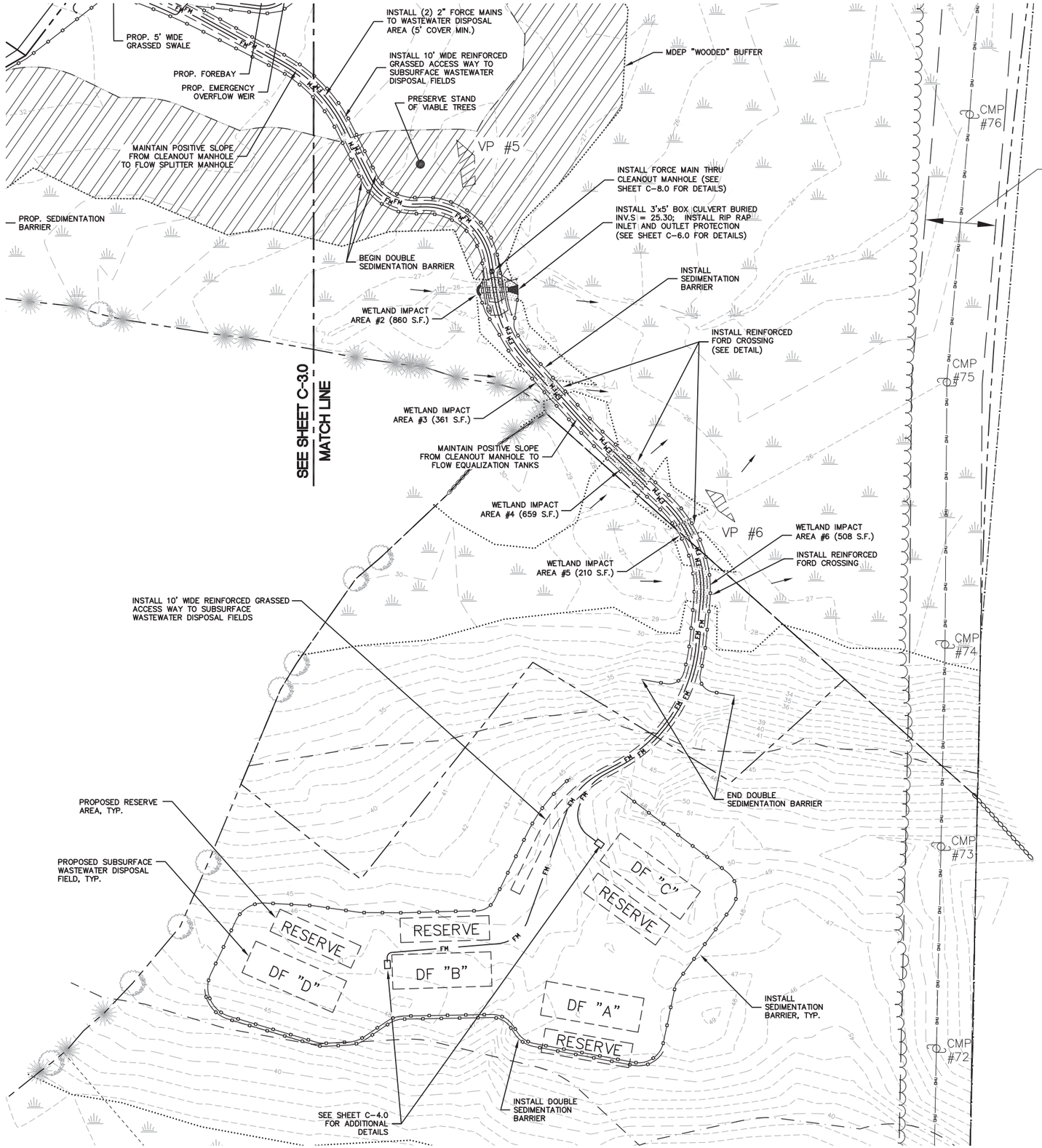
TITLE:

STORMWATER MANAGEMENT PLAN AND FORCE MAIN - A

SHEET NUMBER:

C-3.0

P4567



Long Term Inspection & Maintenance Schedule

	Spring	Fall or Yearly	After Major Storm	Every 2.5 Years
Resource and Treatment Buffers				
Inspect treatment buffers for evidence of erosion, concentrated flow, or encroachment by development	x			
Manage the buffer's vegetation with the requirements in deed restrictions	x			
Repair any sign of erosion within a buffer	x			
Inspect and repair down-slope of all level spreaders and ditch turn-outs	x			
Install more level spreaders or ditch turn-outs if needed for a better distribution of flow	x			
Clean out any accumulation of sediment within spreader bays or turn-out pools	x			
Mow non-wooded buffers no shorter than six inches no more than twice a year	x	x		
Vegetated Areas				
Inspect all slopes and embankments and replant areas of bare soil or with sparse growth	x		x	
Armor rill erosion areas or divert the erosive flows to on-site stable areas	x		x	
Inspect and repair down-slope of all level spreaders and ditch turn-outs for erosion	x		x	
Ditches, Swales & Open Stormwater Channels				
Remove obstructions, sediments or debris from ditches, swales and other open channels	x	x	x	
Repair any erosion of ditch lining	x	x	x	
Mow grass swales	x	x		
Remove vegetated growth and woody vegetation	x	x	x	
Repair any slumping side slopes	x	x	x	
Repair riprap where underlying filter fabric or gravel is showing or if stones have dislodge	x	x	x	
Catch Basins				
Remove sediment and debris from the bottom of the basin and inlet grates	x	x	x	
Remove floating debris and oils (using oil absorptive pads) from the trap	x	x	x	
Culverts				
Remove accumulated sediments and debris at inlet, outlet	x	x	x	
Repair any erosion damage at the culvert's inlet and outlet	x	x	x	
Remove any obstruction to flow	x	x	x	
Roadways and Parking Surfaces				
Clear and remove accumulated winter sand along roadways	x			
Sweep pavement to remove sediment	x			
Grade road shoulders and remove excess sand	x			
Grade gravel roads and gravel shoulders	x			
Clean out sediment within water bars or open –top culverts	x			
Ensure that stormwater is not impeded by false ditches of sediment in the shoulder	x			
Wet Pond/ Detention Basin				
Inspect the embankments for settlement, slope erosion, piping and slumping		x	x	
Mow embankment to control woody vegetation		x	x	
Inspect outlet structure for broken seals, obstructed orifices, and plugged trash rack		x	x	
Remove and dispose of sediments and debris within the control structure		x	x	
Repair any damage to trash racks or debris guards		x	x	
Replace any dislodged stone in riprap spillways		x	x	
Remove and dispose of accumulated sediments within the impoundment and forebay		x	x	
Grassed Underdrain Soil Filter				
Clean the basin of debris, sediment and hydrocarbons	x	x		
Provide for the removal and disposal of accumulated sediments within the basin	x	x		
Renew the basin media if it fails to drain within 72 hours after a one inch rainfall event	x	x		
Till, seed and mulch the basin if vegetation is sparse	x	x		
Mow basin with push mover or hand-held trimmer	x	x		

GRAPHIC SCALE
50 0 25 50 100 200
(IN FEET)

P4567

ALTUS ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801
(603) 433-2335 www.ALTUS-ENG.com

STATE OF MAINE
JEFFREY K. CLIFFORD
No. 5967
LICENSED
PROFESSIONAL ENGINEER

THIS DRAWING HAS NOT BEEN RELEASED FOR CONSTRUCTION

ISSUED FOR:
FINAL APPROVAL

ISSUE DATE:
JANUARY 24, 2019

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	PB SUBMISSION	JKC	6/22/17
1	MDHHS SUBMISSION	JKC	2/21/18
2	MDEP SUBMISSION	JKC	3/19/18
3	TOWN FINAL APPROVAL	JKC	1/24/19

DRAWN BY: RMB
APPROVED BY: JKC
DRAWING FILE: 4567SITE.DWG

SCALE:
1 " = 50'

OWNERS/APPLICANT:
CHINBURG DEVELOPMENT, LLC
3 PENSTOCK WAY
NEWMARKET, NH 03857

PROJECT:
HUNTINGTON RUN SUBDIVISION
MAP 66 LOTS 2A, 8 & 8A
40 BETTY WELCH ROAD
KITTERY, MAINE

TITLE:
STORMWATER MANAGEMENT PLAN AND FORCE MAIN - B

SHEET NUMBER:
C-3.1

Subsurface Wastewater Disposal System

Operations and Maintenance Manual

Huntington Run Cluster Subdivision

Kittery, Maine

Introduction and Purpose

This document has been prepared for the residents, the Homeowner's Association (HOA), and contractors/agents performing inspections and maintenance at Huntington Run clustered subdivision in Kittery, Maine. Each residential lot will utilize on-site wastewater treatment components that treat and pump effluent via a common force main to disposal fields located on land owned by the HOA. This Manual provides an overview of the system, identifies operation and maintenance responsibilities, and lists frequency of inspections and pumping.

Wastewater System Description

The wastewater system for each residence at Huntington Run will include a 1,000 gallon septic tank, a model 1000-C OxyPro advanced treatment unit (ATU), and a pump station that discharges treated effluent to offsite common disposal fields. Wastewater from the house flows into a 1,000 gallon septic tank, where settling and anaerobic digestion occur with the formation of sludge and scum. This material is removed periodically by a pump truck. Clarified wastewater flows from the septic tank into the OxyPro tank for aerobic treatment.

The first (inlet) compartment of the OxyPro tank is the aeration compartment. Air is pumped under pressure to bubble diffusers anchored to the bottom of the tank. Through the process of aeration, an aerobic environment is established in which oxygen-loving microorganisms digest the organic material in the wastewater. These microorganisms form large, visible colonies on a synthetic ribbon media suspended in the water column of the tank. Eventually, these colonies become too large and heavy, and slough off due to the agitation caused by the air bubbles. The sloughed colonies are carried by the wastewater into the next compartment.

The second compartment is designed as an up-flow clarifier where the wastewater is provided a hydraulically calm environment as it flows slowly upward to the outlet. The quiescent environment allows the sloughed colonies and other suspended particles to settle to the bottom of the clarifier. A submersible pump periodically pumps the accumulated sludge from the bottom of the clarifier to the septic tank, where the sludge is ultimately removed when the septic tank is serviced. The cleaned and clarified effluent from the ATU flows out of the clarifier to the pump station. An effluent pump discharges to a force main. The force main from the

pump station connects to a larger common force main in the street which conveys the effluent to the offsite subsurface disposal fields.

A control panel will be installed in each home to power, control and monitor the OxyPro components and the pump station. A blower enclosure, supplying air to the aeration compartment, will be installed below grade, adjacent to the foundation. A second control panel monitors and controls the effluent pump located in the pumping station.

> **WARNING: In the event of a power outage, the wastewater system will not operate unless the home is equipped with a standby generator. Auxiliary power can be obtained by connecting a portable generator to the automatic transfer switch (ATS) installed at each home. If auxiliary power is not available, do not use your plumbing fixtures until power is available.**

Related Documents

Prior to installation the wastewater systems the most current revisions of the following documents will be obtained from the ATU manufacturer:

- OxyPro Installation Manual
- OxyPro Owner's Manual
- OxyPro Operation and Maintenance Manual
- Effluent Pump product sheet

Copies of the Manuals and product sheets will be retained by the HOA. Each homeowner shall retain copies at the residence, preferable near the control panel.

OPERATION AND MAINTENANCE REQUIREMENTS

System Use

- Each dwelling is limited to 3 bedrooms.
- No garbage disposals shall be installed.
- Avoid introduction of foreign materials into the system such as food scraps, bones, feminine napkins or cleaners which can negatively affect system/pump station performance.
- Avoid introducing kitchen grease or fats into the system.
- Chemicals such as septic tank cleaners and/or chlorine (such as from water treatment units) and controlled or hazardous substances shall not be disposed of in this system.
- No chemicals or solvents shall be introduced to the system(s).
- No commercial dishwashers or washing machines shall be connected to the system
- No floor drain, water treatment, dehumidifier, or other discharge (other than sanitary waste) shall be introduced into the system.

- Additives such as yeast or enzymes are discouraged since they have not been proven to extend system life or performance.

Maintenance Schedules

The schedules for pumping and inspections described below shall be used for the Huntington Run development wastewater systems.

Septic Tank Pumping

Septic tank risers and covers shall be installed to ground surface over the outlet and middle covers of the septic tank. The homeowner/residents shall maintain appropriate access to the tank riser covers to allow for inspections, tank maintenance, and pumping.

- The 1,000 gallon septic tank shall be pumped and inspected at least once every two years by a qualified firm engaged by the HOA. The sludge thickness and scum thickness shall be measured in the septic tank prior to pumping. If the sludge depth exceeds 24 inches or the scum thickness exceeds 12 inches, the next scheduled pumping and inspection at the residence shall occur within 12 months.

- The septic tank outlet is equipped with an effluent filter (Zabel or equivalent). The filter shall be removed, cleaned, inspected, and replaced with every pumping. With heavy system use, more frequent cleaning of the effluent filter may be required.

- Inlet and outlet baffles shall be inspected for integrity and obstructions at every pumping.

- A report documenting the pumping, filter cleaning, observations, and measurements shall be provided to the HOA within 14 days of completing the work. The HOA will maintain records of the reports for no less than 10 years.

Advanced Treatment Unit

- Each Oxy-Pro wastewater treatment unit is covered by a 2 year warranty with free inspections during the warranty period. The HOA will engage Aeration Systems, or another qualified firm, for inspections of the OxyPro units and associated equipment. Inspection costs will be paid through assessed HOA fees.

- Conduct inspections and maintenance and testing listed in the referenced OxyPro Manuals

- Inspection reports will be provided to the HOA within 14 days of completing the work. The HOA will maintain records of the reports for no less than 10 years.

Effluent Pump and Pump Station

The effluent pump is located in the pump station and discharges to a common force main. The pump station shall be inspected annually to check for sludge or solids accumulation and general maintenance.

- If sludge accumulation exceeds 2" in pump station, it should be pumped out.

- Check cover and pipe entrances for possible groundwater intrusion. Riser and cover shall be watertight and installed to ground surface.

- The control panel is housed within the dwelling basement (or garage) and equipped with an hour meter as well as audible and visible alarms. Test high water alarms annually. Annually record the run time displayed on the hour meter.

- Conduct periodic maintenance and testing listed in the manufacture's referenced Manuals

Disposal Fields

- At least one riser shall be provided for each bank of chambers and over the distribution box for access to evaluate liquid levels. Maintain appropriate access to the risers.

- Mow the access way to the disposal fields, the top of chamber area, the 5 foot shoulder, and the fill extensions on an annual basis. Maintain grass height below 24 inches to prevent trees from taking root in the disposal area.

- Repair any eroded, damaged or bare soil areas at the access way, chamber area, shoulder, or fill extensions.

Records

Records of all wastewater system inspections and septic tank clean outs shall be maintained by the Homeowner's Association for at least 10 years and will be provided to the Town of Kittery or the Maine Department of Environmental Protection upon request.

Each dwelling will be connected to the public water supply and metered for usage. Home owners will provide water use records to the HOA. The HOA will maintain records of metered water usage for at least 10 years.

OxyPro

Installation Manual

This product has been tested and is listed under NSF/ANSI Standard 40 and is hereby certified as a Class I Aerobic Wastewater Treatment Plant.

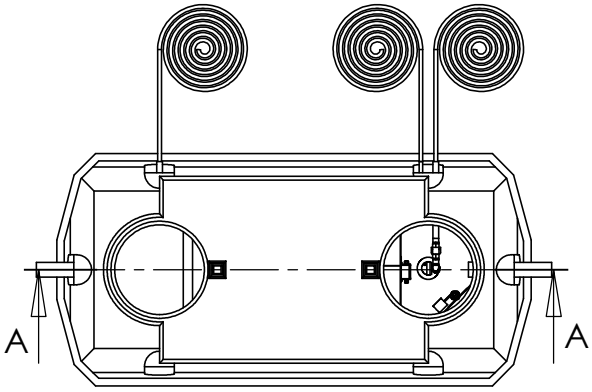
982 Minot Avenue
Auburn, ME 04210
207-797-7351

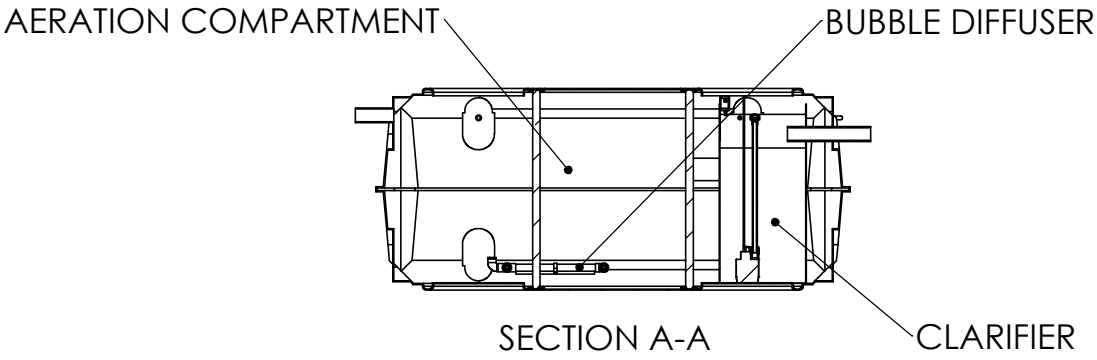
AerationSystems@Gmail.com
www.aerationsystemsllc.com

Revision 1.3
2018

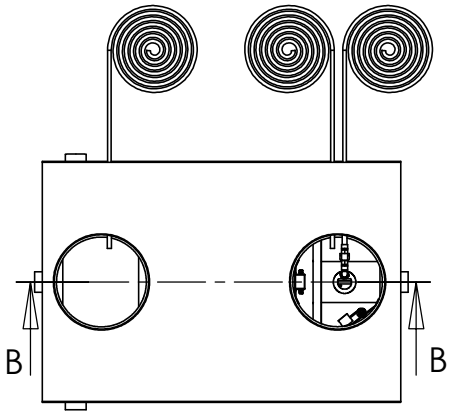
TABLE OF CONTENTS:

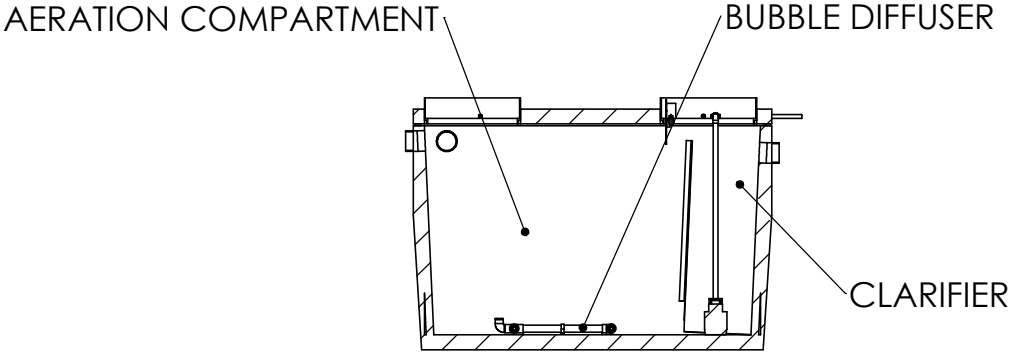
OxyPro 1000C-CONCRETE & HDPE





SECTION A-A





SECTION B-B

COMPONENT LIST:

A. ***Treatment Tank:*** The treatment tank is a 1000-gallon concrete or High-Density Polyethylene (HDPE) tank. This tank is divided into two compartments. The first compartment receives water from the septic tank and mixes it with air to promote the growth of aerobic bacteria on the synthetic ribbon media suspended in the water. The second compartment is a clarifier where any solids or biomass can be settled out and pumped back to the septic tank by the waste pump. Treated water rises to the upper portion of the clarifier where it flows by gravity or is pumped out to the disposal area.

B. ***Blower Housing:*** The blower housing is a below-grade enclosure that houses a linear diaphragm blower. This blower provides air to the treatment tank through the air line (F). The air intake must be protected from damage and high enough off the ground to prevent plugging from snow or excessive ingestion of lawn clippings, etc.

C. ***Control Panel:*** The control panel is in a NEMA 4x indoor outdoor enclosure that operates and monitors the treatment process. The alarm lights indicate a problem with the system. A buzzer sounds in the event of an alarm, and can be silenced by flipping a switch. Power must be provided to the panel along with the tank control cable (D) and the blower control cable (E), which is also wired into the panel.

D. ***Tank Control Cable:*** The tank control cable is 100 feet of 14 AWG 7-conductor direct burial cable. The cable is pre-wired at the tank and should be run back to the control panel for connection. The cable may be cut to length.

E. ***Blower Control Cable:*** The blower control cable is 25 feet of 14 AWG 5-conductor direct burial cable. It is pre-wired at the blower housing and should be run back to the control panel for connection. The cable may be cut to length.

F. ***Air Line:*** The air line is 100 feet of ¾ inch CATV pipe. This flexible pipe is attached at the treatment tank and connects to the blower housing. It can be cut to length and glued to the blower outlet. CATV glues into standard PVC schedule 40 fittings with standard primer and cement.

G. ***Waste Line:*** The waste line is 25 feet of 1-inch CATV pipe. It connects the waste pump outlet to an auxiliary inlet on the septic tank using the waste line adaptor (H). It can be cut to length and glues into standard PVC schedule 40 fittings with standard primer and cement.

H. ***Waste Line Adaptor:*** The waste line adaptor is a 4-inch to 1-inch adaptor that fits into a standard septic tank inlet, and allows the waste line (G) to attach.

I. ***Owner's Manual.***

INTRODUCTION:

Aeration Systems has made every attempt to design the OxyPro system so that it is easy to install and operate. That being said, OxyPro is still a highly advanced wastewater treatment system and must be properly installed to function at optimal performance. We encourage installers to familiarize themselves with all aspects of the OxyPro system in order to provide efficient quality installation. If you have any questions about the OxyPro system, please feel free to contact our technical support specialists. We understand that every site is different and presents its own challenges.

PROCESS DESCRIPTION:

Wastewater from the house flows into a septic tank, where settling and anaerobic digestion occur with the formation of sludge and scum. This material is removed periodically by a pump truck. Clarified wastewater flows from the septic tank into the OxyPro tank.

The first (inlet) compartment of the OxyPro tank is the aeration compartment. Air is pumped under pressure from an efficient, linear-diaphragm pump through flexible-membrane bubble diffusers anchored to the bottom of the tank. This creates a number of curtains of tiny air bubbles, which allow for excellent oxygen transfer efficiency. Through this process of aeration, an aerobic environment is established in which oxygen-loving microorganisms can flourish and digest the organic material in the wastewater. These microorganisms form large, visible colonies on a synthetic ribbon media suspended in the water column. Eventually, these colonies become too large and heavy, and due to the agitation caused by the air bubbles, slough off. The sloughed colonies are carried by the wastewater into the next compartment.

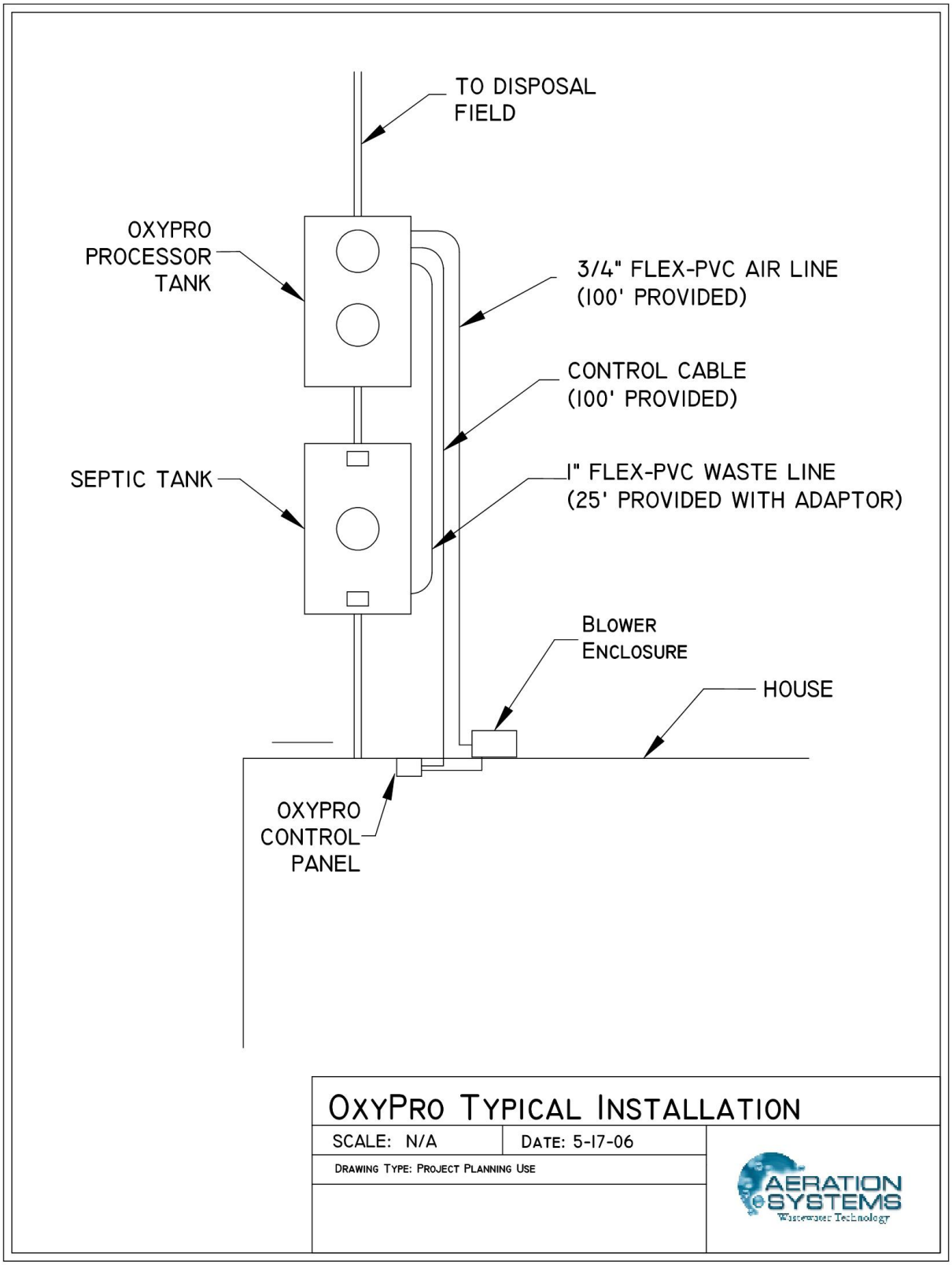
The second compartment is designed as an up-flow clarifier. This means that the wastewater is given a calm environment where it flows slowly upward to the outlet. The quiescent environment allows the sloughed colonies and other suspended particles to settle to the bottom of the clarifier. A submersible pump periodically pumps the accumulated sludge from the bottom of the clarifier to the septic tank, where it is ultimately removed when the septic tank is serviced. The cleaned and clarified effluent from the OxyPro flows or is pumped out of the clarifier to a subsurface disposal area.

OFFLOADING/UNPACKING INSTRUCTIONS:

In the case of a concrete tank, the OxyPro will be delivered on a boom truck. Access must be provided for the boom truck to approach the excavation close enough to set the tank. Care must be taken with cables or slings to prevent damage to air and waste lines as well as the control cable and outlet.

If the OxyPro is an HDPE (plastic) tank, it will also be delivered on a boom truck. However, if access is limited to the site, it can be placed into the excavation by the excavator, using slings and a backhoe or excavator. Approximate weight of the tank is less than 800 lbs.

The control panel enclosure and the blower enclosure will be delivered at the same time. The waste line adaptor and the owner's manual will be packaged with the control panel enclosure, as well as the wiring diagram. If the delivery occurs before there is a place to install these components, they should be stored out of the elements and protected from damage until they can be installed.


TO DISPOSAL FIELD
OXYPRO PROCESSOR TANK
3/4" FLEX-PVC AIR LINE (100' PROVIDED)
CONTROL CABLE (100' PROVIDED)
SEPTIC TANK
1" FLEX-PVC WASTE LINE (25' PROVIDED WITH ADAPTOR)
BLOWER ENCLOSURE
HOUSE
OXYPRO CONTROL PANEL
OXYPRO TYPICAL INSTALLATION
SCALE: N/A
DATE: 5-17-06
DRAWING TYPE: PROJECT PLANNING USE
AERATION SYSTEMS
Wastewater Technology

INSTALLATION REQUIREMENTS:

The installation of an OxyPro is relatively simple, but should be performed by qualified personnel only. Improper installation of the system may cause damage to the OxyPro or the disposal area, or may cause sewage back-up.

The electrical connections will be made by a licensed electrician conversant with local electrical codes.

All plumbing connections should be made by qualified personnel. Each connection should be watertight. All PVC-to-PVC connections should be made with primer and solvent cement. All sewer connections with rubber boots should use appropriate stainless steel boot clamps.

INSTALLATION SEQUENCE:

The hole for the OxyPro Processor tank should be dug so that the entire base is on natural ground. If the base is on old fill or planned fill because of a steep slope, the base must be prepared and compacted to make sure the bearing capacity of the base is equal throughout. If the base is on previously filled ground, precautions must be taken to remove any organics such as peat or wood before compacting the base.

Over-dig the hole for the OxyPro Processor tank 18- to 24-inches on the sides, and 6- to 12-inches on the bottom.

Fill the bottom of the hole with well-compacted sand and gravel mixture up to the base elevation for the tank. The tank must be installed level to insure proper operation.

If a water table higher than the base of the hole is indicated, the tank must be anchored to account for hydrostatic pressure and possible displacement of the tank. Both the septic and the OxyPro Processor tanks must be watertight. Use watertight fittings at the inlet and outlet points of all pipes and cables. All riser connections into the septic and OxyPro Processor tanks must be sealed watertight. The riser covers must be installed above the elevation of the highest seasonal water table.

Install any risers and covers before beginning to backfill. **It is important to keep foreign debris out of the processor tank.** Compact the backfill under the inlet and outlet pipes, as well as under the electrical, air and waste lines. It is preferable for the covers to be at the surface with no overlying fill. The covers must be within 6-inches of finished grade. If notified in advance, Aeration Systems can provide risers, at additional cost.

Plumb the outlet of the septic tank into the inlet on the OxyPro. Plumb the outlet of the OxyPro (4-inch DWV, or 2-inch schedule 40) to the drain field.

Run the provided 1-inch waste line from the treatment tank into a side inlet on the septic tank, using the provided adapter. The CATV pipe can be glued using normal PVC primer and cement.

Hang the control panel inside a storage area in the building. A basement, crawl space, or garage will work fine, as long as ready access is available for maintenance and repair.

Trench the provided control cable from processor tank to the control panel, and make the required electrical connections. The control cable is rated for direct burial but conduit may be required by code and is strongly recommended.

Run the provided ¾-inch airline from the processor tank to the blower enclosure. The blower enclosure is typically located underground just outside of the foundation wall where the control cable enters to the inside. Keep the lid of the blower enclosure just above ground level to avoid water infiltration. Run the provided blower control cable to the control panel and make the necessary electrical connection. Install the provided air vent intake pipe next to the foundation wall, if possible, with a minimum 12-inch separation from the ground to the intake of the pipe.

Bring power from the circuit breaker panel in the house. System power requirements vary by model and are listed in the electrical instructions included in the panel. All breakers should be dedicated to the treatment system, and not have additional appliances, lights, or outlets on the circuit.

The location of all buried covers must be noted on a sketch plan, with measurements to fixed features, such as house corners. This sketch should be stored in the OxyPro control enclosure.

START UP PROCEDURE:

Once installed, the OxyPro system can be turned on. To turn the system on, make sure that the internal breakers in the control panel are in the on position and the PUMP switch is toggled to the AUTO position. On the righthand side of the control panel toggle HWA and COMP to the RUN position.**The control panel will not run the waste return pump until there is enough water in the OxyPro tank to trigger the low water float.** If there is not enough water in the tank, the system may be left on to activate as soon as enough water has entered the OxyPro from the septic tank.

There is no need to pre-fill the OxyPro unless hydraulic displacement is a concern. No special additive or chemicals are needed to start the treatment process.

REPAIR OR REPLACEMENT INSTRUCTIONS:

Before working on any component of the OxyPro system, make sure that the power to the unit has been turned off. Replacement components are available from:

Aeration Systems
982 Minot Avenue
Auburn, ME 04210
Phone Number: (207) 797-7351
Email Address: AerationSystems@Gmail.com

Blower - If the blower is not operational, confirm that the problem does not lie in the control panel. If the blower does need to be replaced, turn the system off, expose the top of the blower enclosure and remove the cover. Disconnect the blower from the rubber hose connection to the enclosure outlet. Cut the electrical connections to the blower and remove the old blower. Replace the blower with a new or rebuilt blower. Connect the new blower to the enclosure outlet, and make the new electrical connections with heat shrink butt connectors. Use a heat gun to seal the connectors against water intrusion. Confirm proper operation of the new blower. Place the enclosure cover back into place, and cover with the dirt removed earlier. Ensure that the air intakes are clear of debris.

Waste Pump - If the waste pump is not operational, turn off power to the system. Open the outlet cover of the OxyPro. Release the Banjo fitting connecting the waste pump to the waste return plumbing. The pump can be removed by grasping the pump riser and simply lifting it out of the clarifier. Remove the impeller cover plate from the pump by removing the screws that hold it in place. Look for obstructions in the impeller and in the discharge line. If an obstruction is found remove it, reassemble the pump and confirm proper operation. If no obstruction is found, test the pump to see if it is operational. If not, the pump will have to be replaced. The junction box is hanging inside the access riser over the clarifier. Remove the cover of the junction box and cut the connections for the waste pump. Remove the old pump and cord. Feed the wire for the new waste pump through the cord grip in the side of the junction box and make the electrical connections using heat-shrink butt connectors. Attach the outlet piping to the new waste pump and ensure proper operation of the new pump. Make sure that all the air is removed from the inlet piping to prevent the pump from getting air bound.

If the waste pump will not draw water through the intake, make sure the pump is not air bound.

Discharge Pump - If the leach field pump is not operational, confirm that the force main to the disposal area is not obstructed. If the pump does not operate, pull up the junction box hanging inside the clarifier hatch of the OxyPro tank and disconnect the wires to the discharge pump. Remove the pump by releasing the Banjo quick disconnect on the outlet. Pull the pump out of the tank and remove the discharge elbow and the base plate with the pump leg. Attach the discharge elbow and the base plate to the new pump and place back into position, ensuring solid connection of the quick disconnect. Feed the wire through the cord grip and make the electrical connections with heat shrink butt connectors. Check to confirm proper operation of the pump.

Control Panel - If the Control Panel is not operational, turn the power off. Repairs or replacement of the Control Panel, voltage transformer, etc will be taken care of by Aeration Systems. There are no user maintainable parts or procedures.

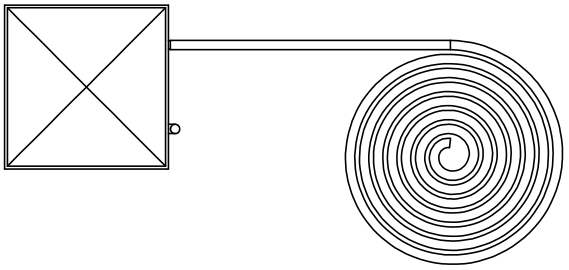
OxyPro 1000

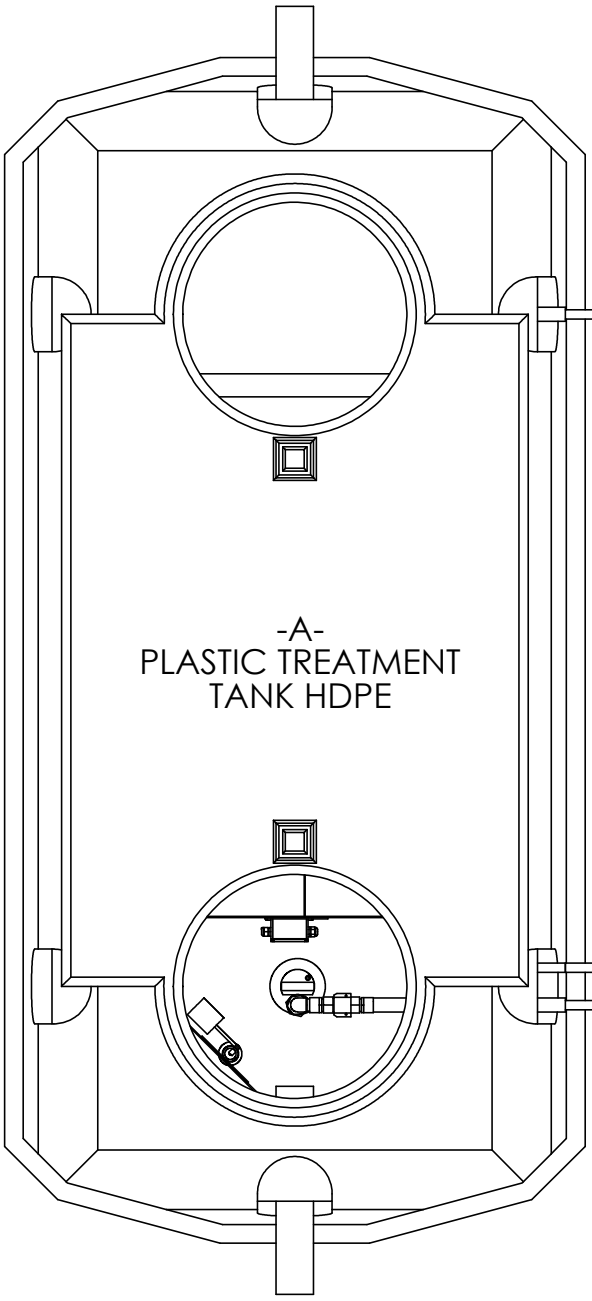
-C-
CONTROL PANEL

-B-
BLOWER HOUSING

-E-
BLOWER CABLE

-H-
WASTE LINE
ADAPTOR

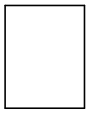




-F-
100' AIR LINE

-A-
PLASTIC TREATMENT
TANK HDPE

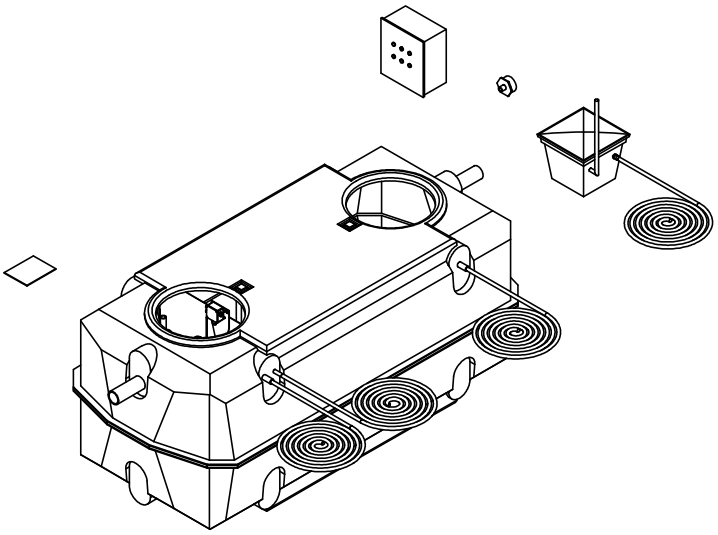
-D-
100' CONTROL CABLE

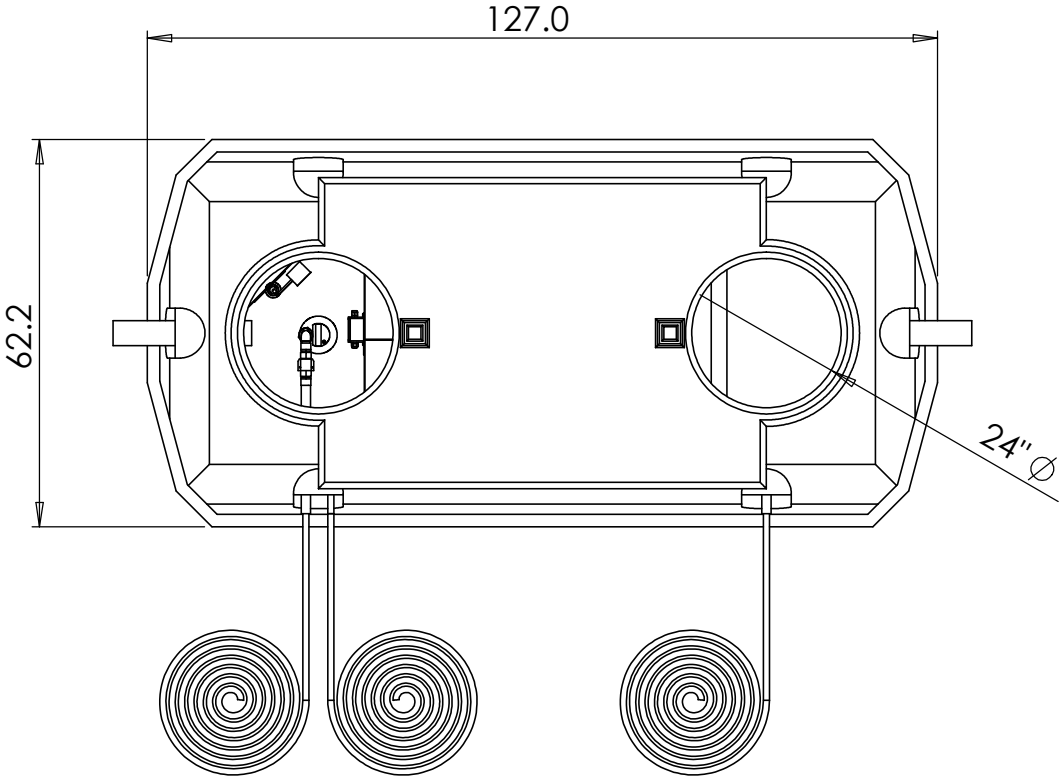


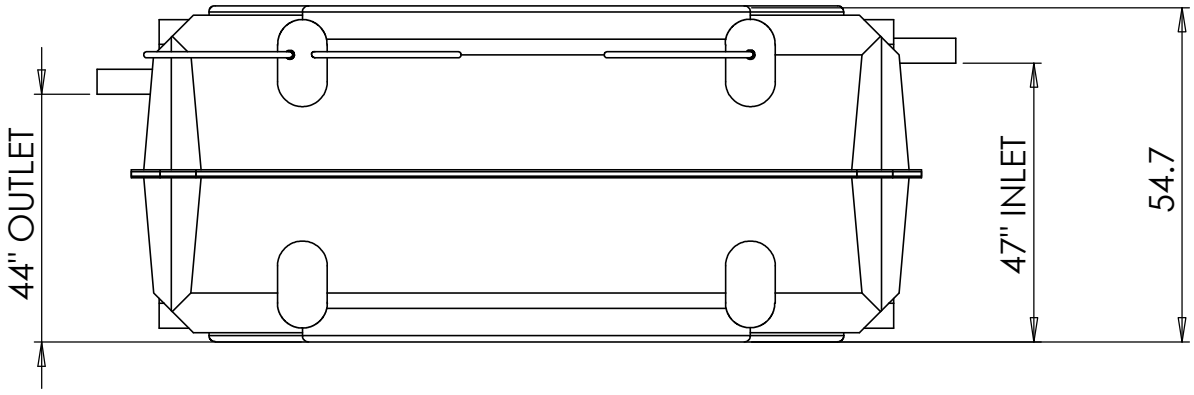
-I-
OWNERS MANUAL

-G-
25' WASTE RETURN LINE

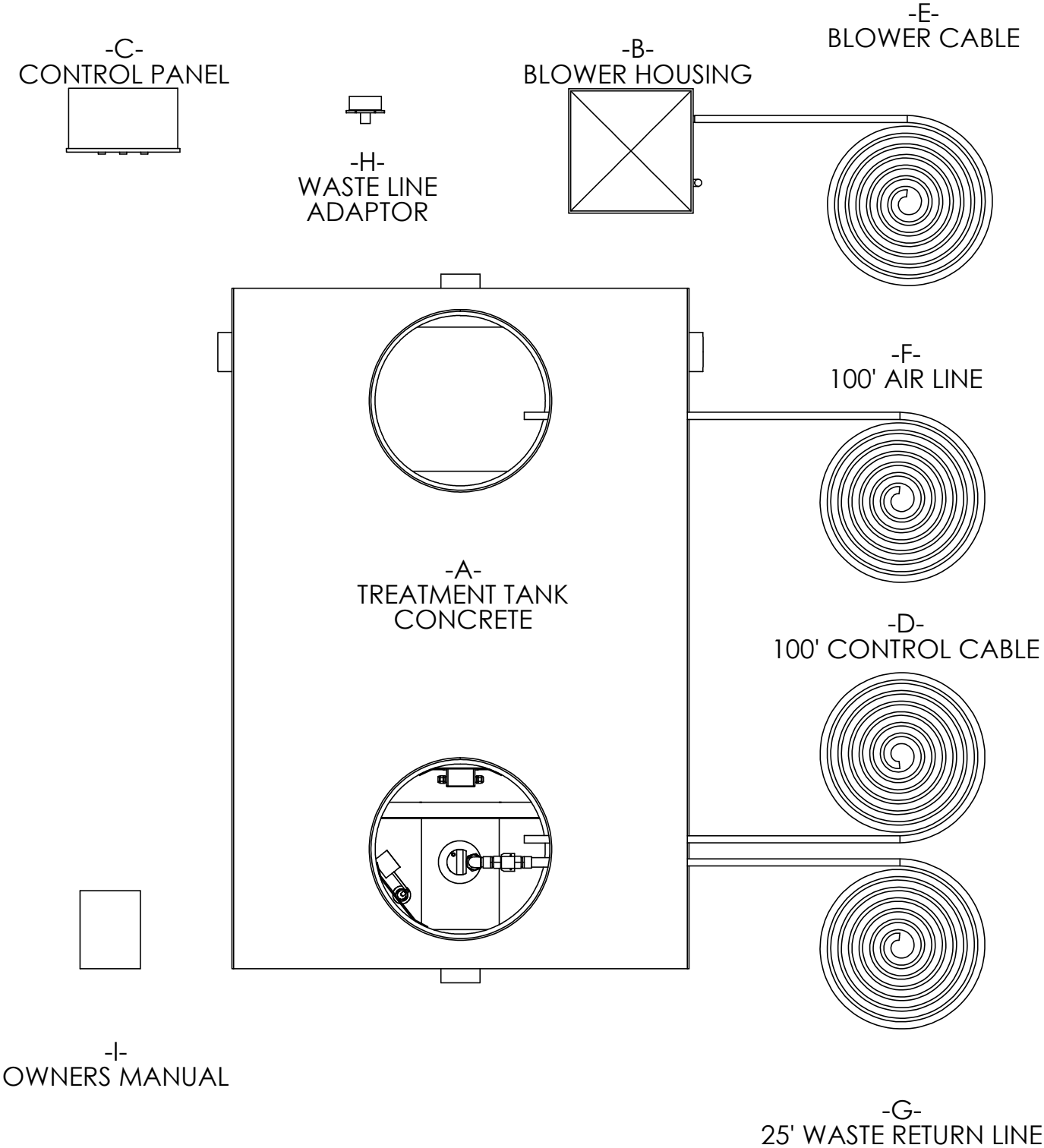
OxyPro 1000P-G



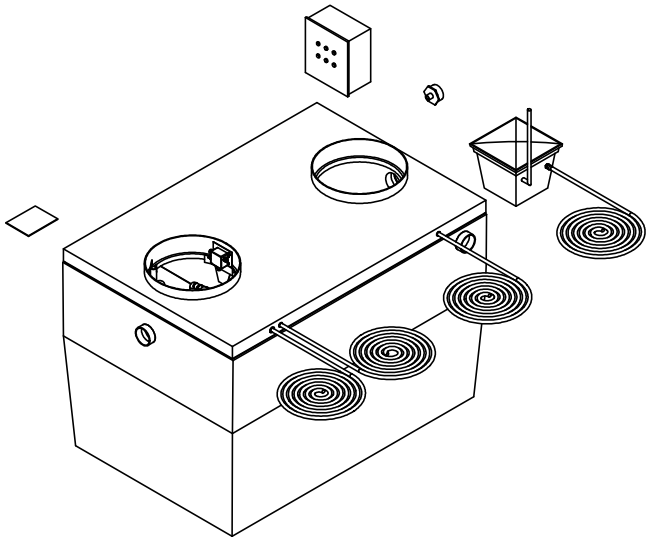


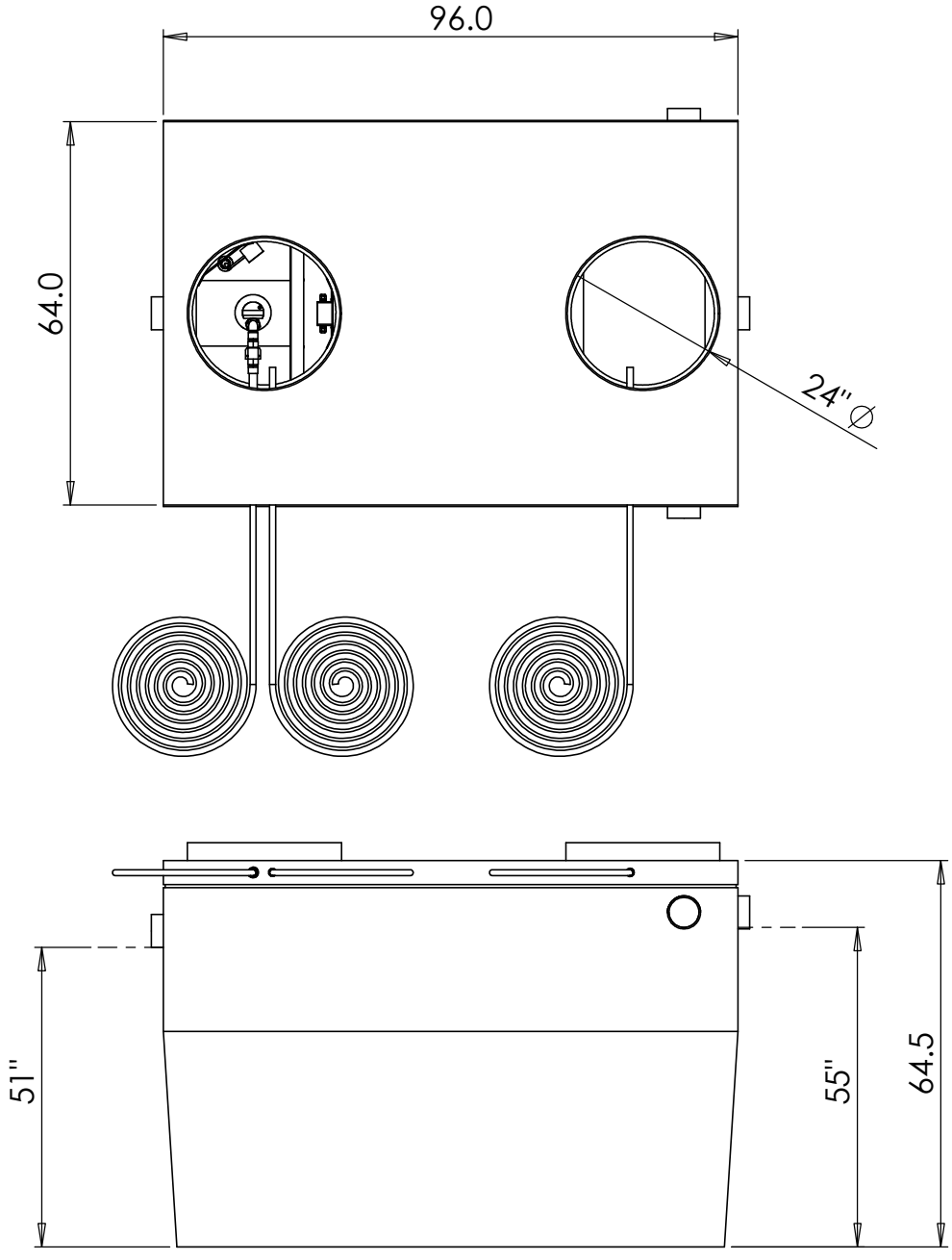


OxyPro 1000C-G

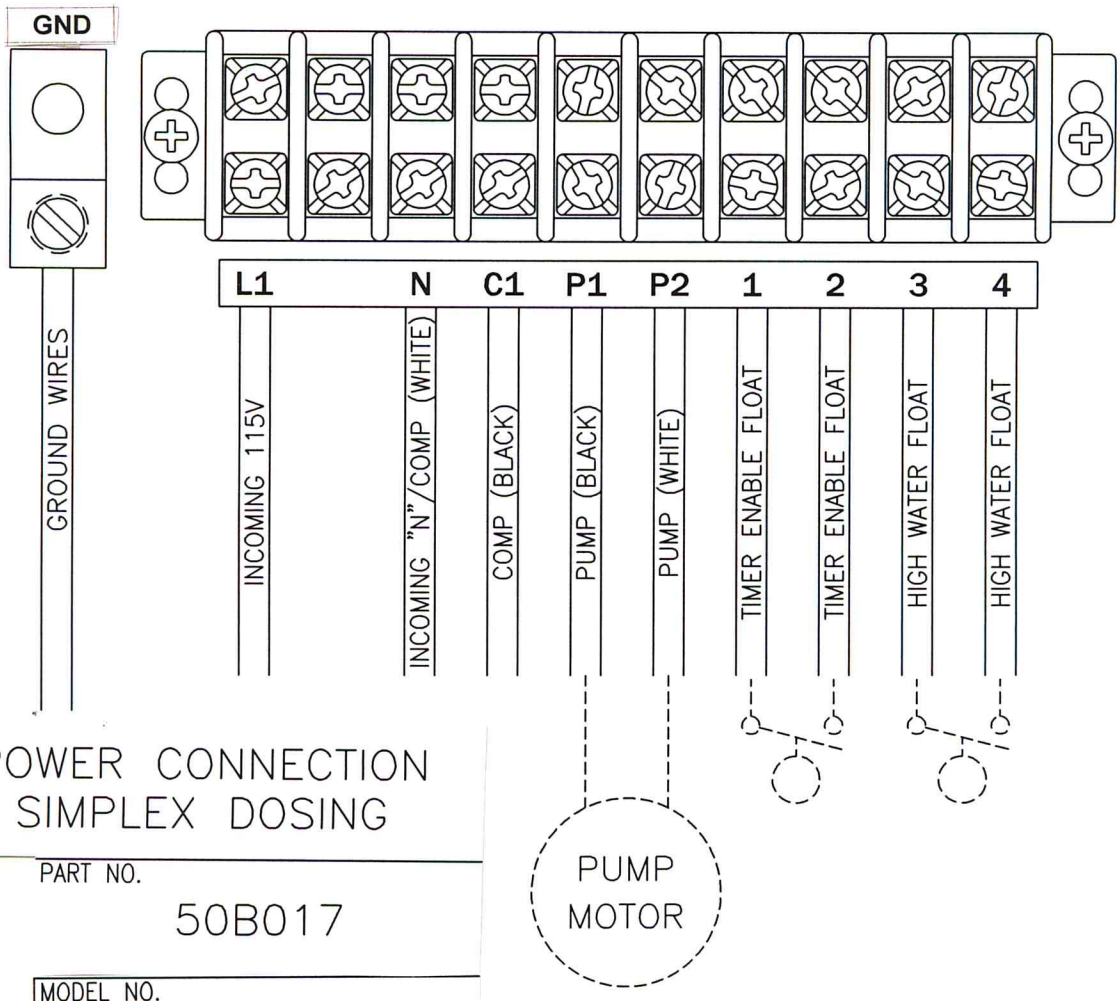


OxyPro 1000C-G





GRAVITY OXYPRO SPI POWER CONNECTION				
Wire From	**Wire Color**		**Terminal Block Label**	**Description**
Line IN 3 Wire	Green or Unshielded	GND	Ground Wires	Line In Ground
	Black	L1	Incoming 115V	Line In Hot
	White	N	Incoming "N" / Comp (White)	Line In Neutral
Tank Cable 7 Wire	Yellow	GND	Ground Wires	Waste Pump Ground
	Black	P1	Pump (Black)	Waste Pump Hot
	Red	P2	Pump (White)	Waste Pump Neutral
	Orange	1	Timer Enable Float	Low Water Float
	Blue	2	Timer Enable Float	Low Water Float
	Brown	3	High Water Float	High Water Float
	Red/Black	4	High Water Float	High Water Float
Blower Cable 5 Wire	Yellow	GND	Ground Wires	Blower Ground
	Black	C1	Comp (Black)	Blower Hot
	Red	N	Incoming "N" / Comp (White)	Blower Neutral
	Blue Male Terminal		Blue Pair Female Terminal	Air Switch
	Orange Male Terminal		Red Female Terminal	Air Switch



POWER CONNECTION SIMPLEX DOSING

PART NO.

50B017

MODEL NO.

120D-1CAL

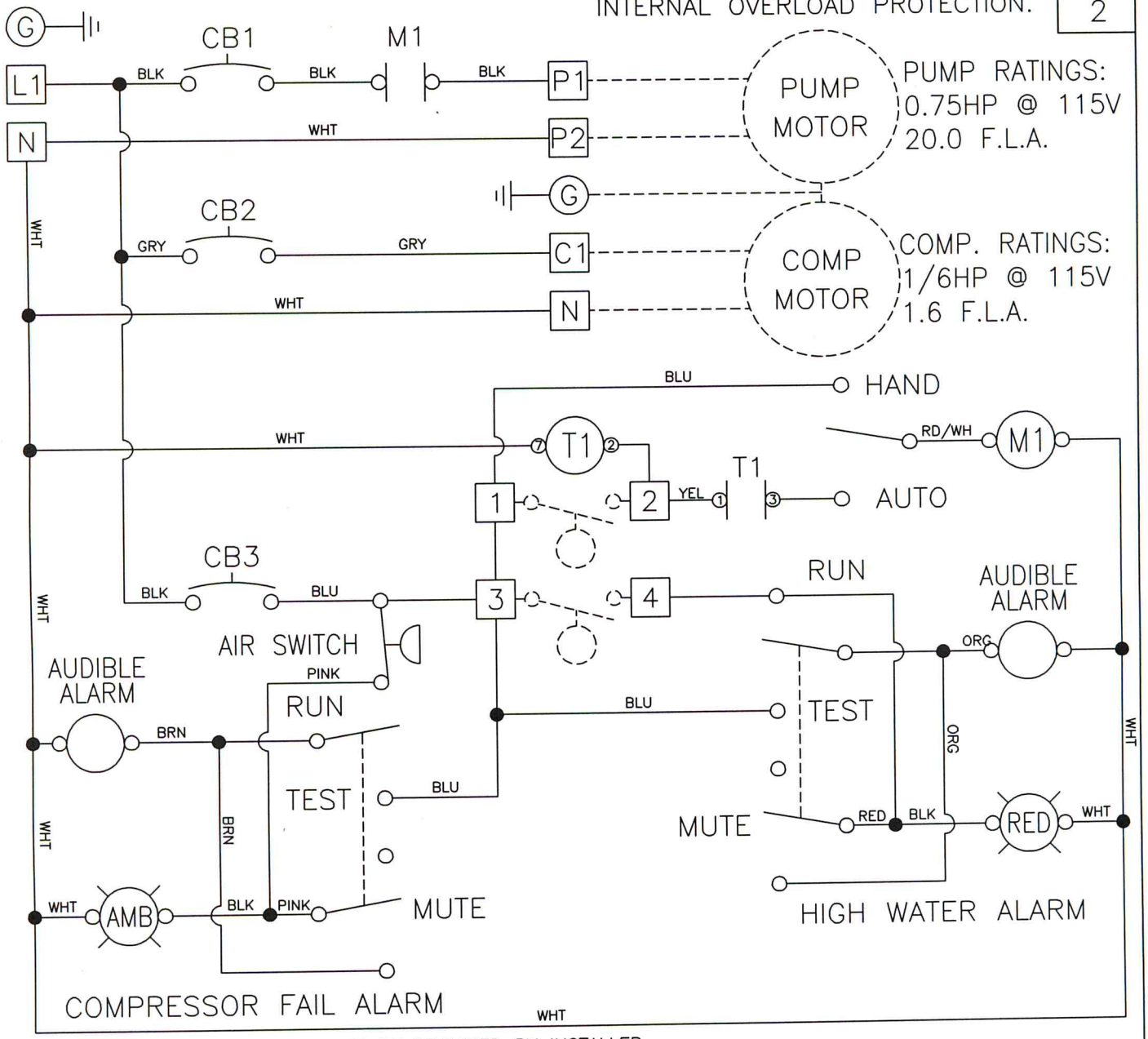
SEPTIC PRODUCTS INC

MODEL NO.
120D-1CAL

PAGE 2

PUMP/COMPRESSER POWER CIRCUIT
115V - 1PH

NOTE: BOTH MOTORS MUST HAVE INTERNAL OVERLOAD PROTECTION.



NOTES: MAIN PANEL DISCONNECT MUST BE PROVIDED BY INSTALLER.
DASHED LINES INDICATE ITEMS NOT CONTAINED IN THE PANEL.
FIELD WIRING MUST BE A MINIMUM OF 60°C COPPER WIRE.
REQUIRED TORQUE FOR TERMINAL BLOCK SCREWS IS 9 in-lbs.

SEPTIC PRODUCTS INC

CHANGES		TOLERANCES	DRAWN BY	DATE
F		DECIMALS .XXX = ±.005 .XX = ±.010 FRACTIONAL X/X = ±.1/64 ANGLES X° = ±1/2°	D. MIDDLETON	03/24/10
E				
D			MATERIAL SPECIFICATION: AS NOTED	
C				
B				
A				

SCHEMATIC, ELECTRICAL
SIMPLEX DOSING (115V)

SCALE:	PART NO.
FULL	50B017

OxyPro

Owners Manual

This product has been tested and is listed under NSF/ANSI Standard 40 and is hereby certified as a Class I Aerobic Wastewater Treatment Plant.

982 Minot Avenue
Auburn, ME 04210
207-797-7351

AerationSystems@Gmail.com
www.aerationsystemsllc.com

Revision 1.3
2018

CONTENTS

INTRODUCTION

Thank you for choosing the OxyPro Advanced Wastewater Treatment System to address your wastewater needs. Aeration Systems has made every attempt to design and build a high quality, efficient, and dependable product. This system was tested and is listed under NSF / ANSI Standard 40.

In this Owners Manual you will find useful information about how your OxyPro treatment unit operates. There is also important information on the need for periodic inspections and maintenance. Please take the time to read over all this material. Do not hesitate to call Aeration Systems with any questions you might have about your OxyPro treatment unit or your septic system in general.

OPERATING CONDITIONS

The OxyPro Advanced Wastewater Treatment System is designed to treat wastewater produced by typical family activities in homes ranging from one to five bedrooms. Other OxyPro models are available to treat flows from restaurants, apartment buildings, community sewers, and other producers of wastewater.

GENERAL PROCESS DESCRIPTION

Septic Tank

Wastewater from the house flows into a septic tank, sized according to State Code. In the septic tank settling occurs with the formation of sludge and scum. Clarified wastewater flows through a filter and into the OxyPro tank.

Aeration Treatment Unit - OxyPro

In the OxyPro tank the wastewater is aerated using a high-efficiency, low-pressure blower and a bubble diffuser. The diffuser allows oxygen transfer and mixing of organic rich wastewater and oxygen. The aeration promotes the growth of aerobic microorganisms which convert and remove biodegradable organic matter. (The organics removed by the aerobic process are the constituents that are measured in the BOD_5 analysis).

To increase contact time the OxyPro treatment unit utilizes a biomedia in the aerobic sections. This plastic media is used to supply a support structure for the establishment of microorganisms and is specifically developed for optimal biological growth. The main advantage is that the microorganisms are attached to the media and do not get flushed out at high input flow rates.

The biomedia also enhances the nitrification process, which requires a larger population of organisms due to the lower metabolic rate of the nitrifying bacteria.
The aerobically treated wastewater, which is now high in nitrates but low in carbon, flows into the second chamber of the system, where clarification and settling of the suspended solids take place. The clean water in the clarification chamber rises to the top and flows or is pumped out to a disposal area.

To promote denitrification and to remove the accumulated biomass, the wastewater is recirculated from the clarifying chamber back to the septic tank. Denitrification is facilitated by this recirculation because the bacteria in the septic tank use the oxygen from the nitrate molecule with nitrogen being released as gas. Removing the accumulated biomass also helps to ensure optimum clarifier performance resulting in an effluent with low suspended solids. The recirculation process also benefits the system in times of low loading such as vacation periods or during the night. When the water is recirculated, it carries nutrients from the septic tank into the OxyPro treatment unit.

The OxyPro treatment unit is controlled by a computer system. The computer runs the pumps and alarm. The computer can also be connected through the telephone to a monitoring facility to eliminate the need for an alarm on-site.

OXYPRO COMPONENTS

The OxyPro system comprises three major components. These are 1) the OxyPro processor tank, 2) the OxyPro blower, 3) the OxyPro control panel.

INTRODUCING SUBSTANCES INTO THE TREATMENT SYSTEM

Your septic tank, OxyPro treatment unit, and disposal field are all designed to treat wastewater of a quantity and quality consistent with typical household activities. Listed on the next page are some substances which should **not** be introduced into the system or which should be used in moderation.

PROHIBITED OR LIMITED DISPOSAL PRACTICES

1) Grease and oil used in cooking should be scraped or poured out of the pan and disposed of in the trash before washing the pan.

2) The garbage disposal should be used only for small amounts of loose vegetables found in the sink. Large portions of vegetable waste should be disposed of in the trash. A septic tank filter is recommended if a garbage disposal is used.

3) If a strainer is used in the kitchen sink, grease on pans is kept to a minimum, and traps are cleaned periodically of hair in the bathrooms, then drain cleaners, which may harm the septic system, can usually be avoided.

4) People with hobbies such as photography or electroplating should not dispose of those chemical wastes in the house drain system.

5) If anyone in the house is using penicillin or other antibiotics, do not dispose of any of the medicine into the septic system as it may kill essential bacteria.

6) Any product high in chlorine or any other antibacterial agent should be used in small quantities since it may reduce the population of bacteria in the system.

7) The toilet should not be used to dispose of towels, sanitary napkins, newspapers, rags, sticks or any material of this nature.

8) If you are using the septic system in moderation then products that claim to be aids to septic tank function should not be needed.

9) No solvents, paints, or pesticides should be disposed of in the house drain system.

10) Your OxyPro treatment unit and the rest of your septic system are designed to handle a certain amount of wastewater every day. This maximum flow is usually significantly greater than that produced by average households. Continual high volume water use may decrease the treatment efficiency of your OxyPro treatment unit and will stress your disposal field, affecting its longevity.

11) Remove sludge and scum from the septic tank regularly (generally every three to five years) to prevent solid particles from entering the leach field and clogging the pipes and soil.

12) Normal household chemicals (soap, detergent, and drain cleaners) and other kitchen wastes (grease, oil, and ground garbage) should not have a noticeable short term, adverse effect on your septic system if they are used in moderation.

13) Toilet tank tablets that contain antibacterial agents should not be used.

14) Toilet bowl cleaners should not be used more than once a week.

15) Water treatment systems, such as water softeners, should not back-flush into the septic tank.

16) An inspection of your OxyPro treatment unit every year will alert you to any developing problems with the system.

SYSTEM MAINTENANCE AND MONITORING

The OxyPro Advanced Wastewater Treatment System operates automatically. The only maintenance required from the homeowner is that the air intake for the compressor (if required), be kept clear of dirt, leaves, drifting snow, ice, and other debris. The owner is responsible for monitoring the status of the alarm signal located on the control cabinet and ensuring that the septic tank is regularly emptied of solids at an appropriate interval (at least once every three years, depending on use). Septic tank pumping is the owner's responsibility.

INITIAL SERVICE POLICY

The Initial Service Policy will consist of a visual inspection of the system to make sure that the processor is operating properly. The following will be checked.

- Color — The water in the clarifier should be relatively clear or have a slight tannic color.
- Turbidity — The water in the aeration compartment should have a relatively high turbidity with small and large floating bacteria particles. The water in the upper portion of the clarifying compartment should have little to no floating particles.
- Scum overflow — There should be some brown growth on the clarifying surfaces, but there should be no scum overflow.
- Odor — The water will have a slight musty odor, but no rotten egg odor should be present.

Your OxyPro treatment unit is supplied with a two-year service contract which includes at least two service and inspection visits by a certified service technician each year. During service visits, each component of the treatment unit will be checked for proper operation. Effluent quality will also be checked either quantitatively or qualitatively to ensure optimal system performance. Please call to schedule an inspection visit with one of our technicians.

Extended annual service policies are available from Aeration Systems. Your OxyPro treatment unit has been designed and constructed with durability and ease of operation as top priorities. By following the instructions contained in this manual, your treatment unit should provide many years of service with minimal maintenance.

ALARM ACTIVATION

Your OxyPro treatment unit is equipped with audible and visual alarms.

The Amber Lamp will indicate failure of the air blower or a ruptured air line to the OxyPro tank.

The Red Lamp will activate in the event of a high water condition in the OxyPro tank.
If the alarm should sound, contact Aeration Systems.
Do not attempt to access the blower unit or processor tank.

These components are designed to be serviced by authorized personnel.

The audible alarm can be silenced using the "MUTE" switch located on the side of the control panel. Simply toggle the switch to the center location labeled MUTE.

ELECTRICAL POWER OUTAGE

Your OxyPro treatment unit will not operate during power outages. Prolonged outages will cause the aerobic bacteria in the processor tank to die from lack of oxygen. Care should be taken to limit water use in the house during outages to minimize the discharge of untreated wastewater to the disposal field. In pumped systems, excessive water use may also cause wastewater to back up into the processor tank and septic tank.

When electrical power returns, the OxyPro treatment unit should resume normal operation. After a short start-up period, the normal population of aerobic bacteria should be naturally reestablished and the system will again produce clear, odorless effluent.

NO USE FOR AN EXTENDED PERIOD

The OxyPro treatment unit can continue to operate normally during periods of no water use, lasting as long as two weeks. Power to the treatment unit should be left on during short periods when there is no water usage. The treatment unit may be shut off to conserve electricity during periods of extended disuse (greater than 2 weeks).

The unit must be reactivated when wastewater production is resumed. Failure to reactivate the treatment unit may cause damage to your disposal field. A short start-up period will be required after reactivation to reestablish the population of aerobic microorganisms. After this start-up period the treatment system should again produce clear, odorless effluent.

SPECIFICATIONS

OxyPro System Information

Septic tank size: _____ gallons

OxyPro Model #: _____

Disposal Field Type and Size: _____

Effluent Distribution: Gravity □ Pumped □

Number of Bedrooms: _____

Rating: _____ (gallons per day)

Installer: _____

Plumber: _____

Electrician: _____

Site Evaluator: _____

Power Requirements:	Gravity Model 120 Volts AC, 60HZ, 15.0A Pumped Model 120 Volts AC, 60Hz, 20.0A
Processor Tank Volume:	OxyPro 1000 - 1,000 gallons
Waste Pump:	Goulds LSP03
Effluent Pump:	Goulds LSP03 – if present
Air Compressor:	HiBlow Linear Diaphragm HP-80 (or equivalent)
Control Panel:	SPI Part No. 50B017 Model No. 120D-1CAL, 120VAC, 60HZ
Air Pressure Alarm Sensor:	TEC MARK Corp. Model No. TBS345 4116
Float Switches:	CentriPro (Xylem) Narrow Angle, Normally Open P/N A2N13

LIMITED WARRANTY

Aeration Systems warrants the parts in each treatment process/system to be free from defects in material and workmanship for a period of two years from the date of installation treating residential wastewater. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply. Sole obligation under this warranty is as follows:

Aeration Systems will fulfill this warranty by repairing or exchanging any component part, F.O.B. factory, that in Aeration Systems' judgment shows evidence of defects, provided said component part has been paid for and is returned through an authorized dealer, transportation prepaid. The warranty must also specify the nature of the defect to the manufacturer.

The warranty does not cover treatment processes/systems that have been flooded, by external means, or that has been disassembled by unauthorized persons, improperly installed, subjected to external damage or damage due to altered or improper wiring or overload protection.

This warranty applies only to the treatment process/system and does not include any of the residential wiring, plumbing, drainage, or disposal system. Aeration Systems is not responsible for any delay or damages caused by defective components or material, or for loss incurred because of interruption of service, or for any other special or consequential damages or incidental expenses arising from the manufacture, sale, or use of this process/system.

Aeration Systems reserves the right to revise, change, or modify the construction and design of the treatment process/system for residential wastewater or any component part or parts thereof without incurring any obligation to make such changes for modifications in previously sold equipment. Aeration Systems also reserves the right, in making replacements of component parts under this warranty, to furnish a component part which, in its judgment, is equivalent to the company part replaced.

Under no circumstances will Aeration Systems be responsible to the warranty for any other direct or consequential damages, including but not limited to lost profits, lost income, labor charges, delays in production, and/or idle production, which result from defects in material and/or workmanship of the system. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

This warranty is expressly in lieu of any other expressed or implied warranty, excluding any warranty of merchantability or fitness, and of any other obligation on the part of Aeration Systems.

This warranty gives you specific legal rights. You may also have other rights, which vary from state to state.

982 Minot Avenue. • Auburn, Maine 04210
Email: AerationSystems@Gmail.com
Website: www.septicaeration.com

OxyPro™ Initial Two-Year Service Agreement

Starting from the date of installation, maintenance will be provided once every six months at no cost for the first two-years of system operation. This will be a total of four visits throughout the period. Aeration Systems will make a minimum of two attempts to contact the owner to schedule an inspection. If we do not hear from the owner, it will be assumed that the inspection is waived. In order for us to have current contact information, please fill out the attached information card and return it to our office at:

Aeration Systems, 982 Minot Avenue, Auburn, ME 04210 207-797-7351

A service inspection will include cleaning or repair, if necessary, of all OxyPro components to ensure proper mechanical function and a visual and olfactory inspection of the effluent to ensure proper treatment. Lab samples may be taken for analysis as needed.

Response to alarm calls due to failure of the OxyPro or an OxyPro component is also covered under the initial service agreement. This includes site time, parts, and labor to affect repairs as needed.

The following items are not covered:

Electrical, plumbing, pumping out of plant/septic tank, broken risers or covers, lift stations outside the OxyPro plant, or damage to sewer plant by an act of God or others including, but not limited to: fire, flood, lightning, or natural disaster.

All call outs for service which are not for warranty-covered items will result in a service charge plus parts and labor.

At the end of the initial two-year period, our company offers the option to continue your maintenance with a contract.

Contact Information:

(Under no circumstances will we disclose, use, give, sell, or transfer any personal information about our customers.)

Owner's Name(s): _____

Property Address: _____

Town: _____ State: _____ Zip:_____

Mailing Address: _____

Town: _____ State: _____ Zip: _____

Phone Numbers:

Home: _____ Cell: _____ Work: _____

Email Address: _____

Please indicate preferred contact method:

_____

OxyPro

Operation and Maintenance Manual

This product has been tested and is listed under NSF/ANSI Standard 40 and is hereby certified as a Class I Aerobic Wastewater Treatment Plant.

982 Minot Avenue
Auburn, ME 04210
207-797-7351

AerationSystems@Gmail.com
www.aerationsystemsllc.com

Revision 1.3
2018

TABLE OF CONTENTS:

INTRODUCTION:

Aeration Systems has made every attempt to design the OxyPro system so that it is easy to operate and install. That being said, OxyPro is still a highly advanced wastewater treatment system and must be properly maintained to function at optimal performance. We encourage operators to familiarize themselves with all aspects of the OxyPro system in order to provide efficient quality service. If you have any questions about the OxyPro system, please feel free to contact our technical support specialists.

Normal operation of the OxyPro is controlled by a PLC-based control panel. The PLC operates the blower, waste pump and effluent pump (if equipped). It also monitors the air pressure in the air line and water levels in the tank. In the event of a blower, waste pump or an effluent pump failure, the PLC will trigger an appropriate alarm. During an alarm, the PLC will continue to operate the system. In the event that the alarm condition is corrected, the alarm may stay on to indicate a past problem. To reset the alarm once it has been investigated and resolved, reset the control panel by holding the silence button for ten seconds.

Maintenance of the OxyPro system consists of inspection visits every six months, response to alarms, and repair or replacement of inoperative components. The requirements and methods for these responsibilities are laid out in this manual.

MAINTENANCE SCHEDULE:

At a minimum, the OxyPro system ought to be inspected once every six months. Each inspection visit should consist of the following:

Verification of proper operation of the blower.
Verification of proper operation of the waste pump.
Verification of proper operation of the effluent pump (if equipped).
Verification of proper operation of PLC control and alarms.
Clean the air intakes on the blower enclosure.
Clean the filter on the blower.
Determine the level of sludge on the bottom of the clarifier and adjust waste cycle accordingly.
Visual and olfactory inspection of the effluent.
Take samples for laboratory analysis (once per year).

In addition, the septic tank must be pumped at least once every three years. This is the owner's responsibility.

VERIFICATION OF COMPONENT OPERATION:

Control Panel

-Confirm that the supplemental protectors are in the ON position.
-Confirm that the power light is on and that the PLC run LED is lit.

Blower Enclosure

-Check to ensure the air intake is clear of debris.
-Check operation of compressor and clean filter.
-Check the integrity of the air line and sensor fittings in enclosure.

Processor Tank

-Check to ensure aeration is fine and even across tank.
-Confirm Operation of waste pump. Force pump to run at control panel and listen for water returning from septic tank.
-Confirm operation of effluent pump (if equipped). Trigger pump control float manually and observe water level drop.
-Examine effluent with visual and olfactory methods as described below.
-Take samples for laboratory analysis if required. See description below.

VISUAL AND OLFACTORY INSPECTION OF EFFLUENT AND MIXED LIQUOR:

In the inlet (aeration) compartment, the water should be relatively clear, with most of the bacteria growing attached to the synthetic ribbon media. The growth should be brown and should not clump the media into a ball. Large flaps of the growth will slough off the ribbon and be present in the water until they are moved to the clarifier and settled.

Little growth on the media with murky liquor indicates either a system that has recently started or one that is lacking enough food to establish a healthy colony. Heavy growth with clumped media suggests high water use and/or a high organic load in the water.

The effluent in the outlet (clarifier) compartment of the OxyPro ought to be odorless. Generally, the water may have a slight tannic color, and/or a slight musty odor similar to wet hay. The biomass should readily settle to the bottom of the clarifier, where it is removed by the waste pump.

Floating clumps of sludge indicate a need to increase the wasting cycle. Increase the pump runtime or the number of cycles per day to reduce the amount of sludge sitting on the bottom of the clarifier.

Small pinfloc present in the effluent indicate a system that has recently started up or low water temperatures. The pinfloc are not usually a long-term problem, but should be monitored.

LABORATORY SAMPLES AND ANALYSIS:

Effluent quality produced by the system shall fall within the following limits for $CBOD_5$ and TSS:

$CBOD_5$: <30 mg/L
TSS: <30 mg/L

The samples should be taken from the clarifier using a bailer or similar device designed to collect a sample of water from slightly below the surface. Avoid scraping growth from the sides of the tank or other structures.

If the effluent quality limits described above are not reached, then influent samples should be taken to determine if the influent quality is abnormal. The design basis for the influent is the following:

$CBOD_5$ mean: 190 mg/L or 0.793 lb/day

TSS mean: 199 mg/L or 0.830 lb/day

REPAIR OR REPLACEMENT INSTRUCTIONS:

Before working on any component of the OxyPro system, make sure that the power to the unit has been turned off. Replacement components are available from:

Aeration Systems, LLC
155 Gray Rd.
Falmouth, ME 04105.
Phone Number: (207) 797-7351
Email Address: info@aerationsystemsllc.com

Blower - If the blower is not operational, confirm that the problem does not lie in the control panel. If the blower does need to be replaced, turn the system off, expose the top of the blower enclosure and remove the cover. Disconnect the blower from the rubber hose connection to the enclosure outlet. Cut the electrical connections to the blower and remove the old blower. Replace the blower with a new or rebuilt blower. Connect the new blower to the enclosure outlet, and make the new electrical connections with heat shrink butt connectors. Use a heat gun to seal the connectors against water intrusion. Confirm proper operation of the new blower. Place the enclosure cover back into place, and cover with the dirt removed earlier. Ensure that the air intakes are clear of debris.

Waste Pump - If the waste pump is not operational, turn power to the system off. Open the outlet cover of the OxyPro. Cut the discharge pipe for the waste pump and pull the waste pump out for inspection. Remove the impeller cover plate from the pump by removing the screws that hold it in place. Look for obstructions in the impeller and in the discharge line. If an obstruction is found remove it, reassemble the pump and confirm proper operation. If no obstruction is found, test the pump to see if it is operational. If not, the pump will have to be replaced. Remove the intake and outlet pipes from the old waste pump. Take care to prevent them from falling back into the tank. Expose the cover of the junction box on the top of the OxyPro tank and cut the connections for the waste pump. Remove the old pump and cord. Feed the wire for the new waste pump through the cord grip in the bottom of the junction box and make the electrical connections using heat-shrink butt connectors. Attach the inlet and outlet piping to the new waste pump and ensure proper operation of the new pump. Make sure that all the air is removed from the inlet piping to prevent the pump from getting air bound.

If the waste pump will not draw water through the inlet piping, make sure the pump is not air bound. If the intake piping is clogged, connect the inlet pipe to the pump discharge and run the pump to force water backwards through the inlet. This will help to dislodge any obstruction.

Effluent Pump - If the effluent pump is not operational confirm that the force main to the disposal area is not obstructed. If the pump does not operate, expose the junction box on top of the OxyPro tank and disconnect the discharge pump. Open the outlet cover of the tank and remove the pump by releasing the quick disconnect on the outlet. Pull the pump out of the tank and remove the discharge elbow and the base plate with the pump leg. Attach the discharge elbow and the base plate to the new pump and place back into position, ensuring solid connection of the quick disconnect. Feed the wire through the cord grip and make the electrical connections with heat shrink butt connectors. Check to confirm proper operation of the pump.

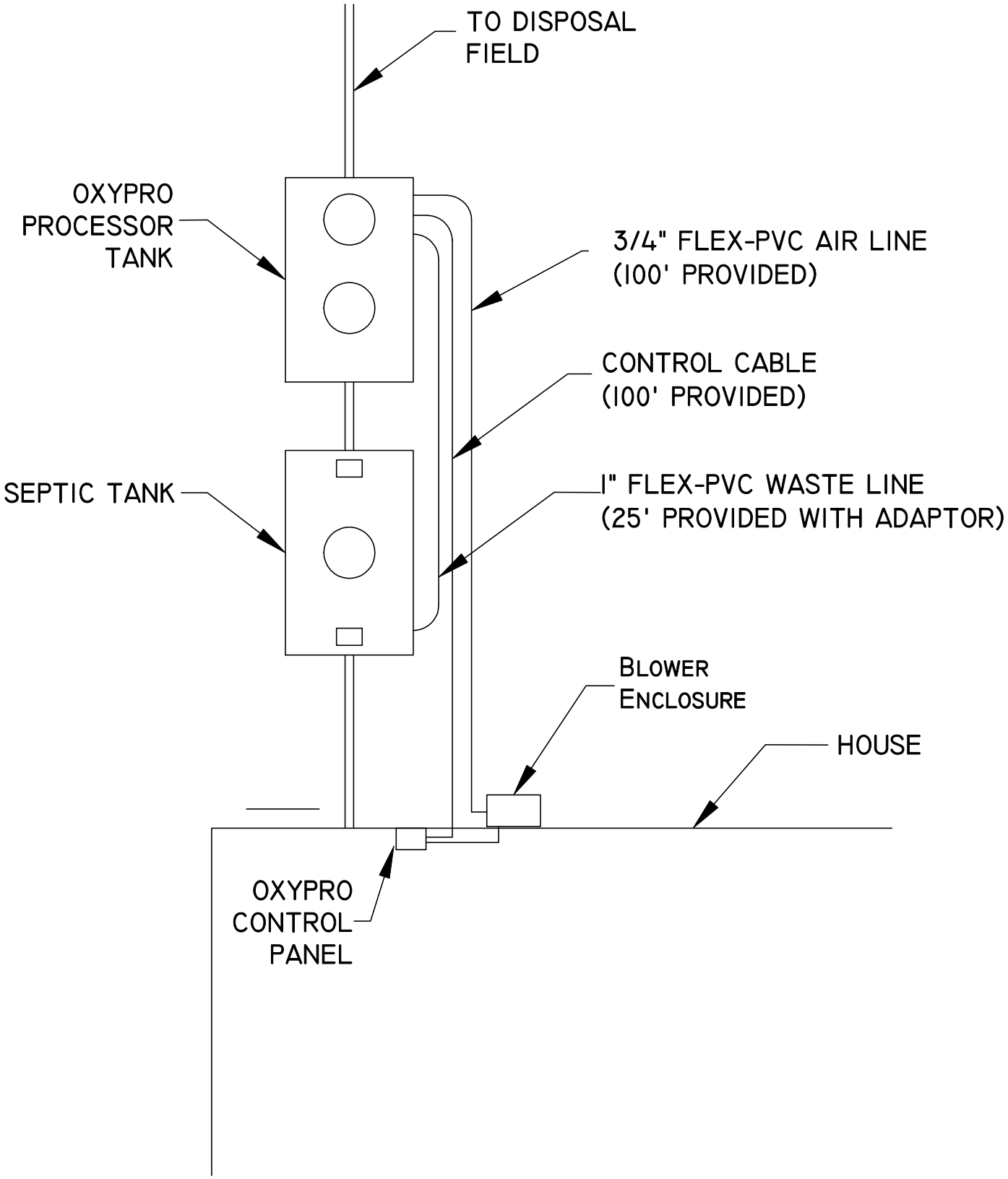
PLC - If the PLC is not operational, turn the power off. Remove the wiring harness by removing the two screws (one on each end) from the PLC. Pull the Din rail clamp on the PLC down to release the PLC from the Din rail. Replace the old PLC with a new one and snap onto the din rail, ensuring positive attachment to the Din rail. Connect the wiring harness to the new PLC and restore power to the system. Place the toggle switch on the PLC in Terminal mode and upload the appropriate program. Place the PLC in Run mode and confirm proper operation of all components

Trouble Shooting Guide

Alarm Conditions	Symptoms	Possible Causes	Solutions
Alarm light (RED) on steady	Blower not running with water in tank - blower failure amber light on	Blower failure	Check electrical connections, check safety disconnect in the blower, replace or rebuild blower if necessary
	Blower running but no aeration in tank - blower failure amber light on		Locate break and repair with PVC cement and fittings
	Blower running, good aeration, normal water level	Corrected high water condition	Inspect OxyPro system, reset panel
Alarm light (RED) on blinking	Water level above normal - amber High Water light should be on	Current high water	Pump tank down, inspect electrical connections, and pump operation, make sure force main is not plugged, replace pump if necessary
Alarm light (RED) on - blinking - Waste Pump alarm ON	Amber Waste Pump Failure light should be on	Dead Waste Pump or pump impellor is jammed with debris	Pull Waste Pump - remove metal plate from foot of pump and check for debris or hair/string caught in impellor.
Alarm sounds without light	Audible alarm sounds without alarm light	Any alarm with a burned out alarm light	Check electrical connections, replace lamp if necessary
No power light	System operating, no power light	Power light burned out or disconnected	Check for power at panel, confirm operation of PLC, replace lamp if necessary
	Power at control panel, PLC dead or only inputs working	PLC failure	Replace PLC if necessary
	No power at control enclosure or supplemental protectors tripped	No power	Reset supplemental protectors, or circuit breaker as required, look for electrical shorts.

Non-alarm Conditions	Symptoms	Possible Causes	Solutions
Too much sludge on bottom of clarifier	Waste pump runs and moves water to septic tank, but sludge builds up over time	Inadequate waste run times	Increase cycle time or frequency to move more sludge
	Waste pump does not run, impellor jammed	Waste pump failure	Repair/replace waste pump as necessary
	Waste pump runs, but does not move water	Clogged suction manifold or line	Clear line by connecting line to discharge on pump and running pump to force water though line backwards
	Waste pump moves water, but no water reaches septic tank	Clogged waste return line	Clear waste return line.
Floating clumps of sludge	Caused by inadequate wasting, see above section on too much sludge on bottom of clarifier		

Non-alarm Conditions	Symptoms	Possible Causes	Solutions
Uneven aeration	Coarse bubbles in one spot in tank	Disconnected diffuser	Pump tank and reconnect diffuer, or replace diffuser with concrete weighted diffuser
	More aeration on one side or end of the tank	Diffusers not level	If aeration is uneven side to side, there isn't much that can be done. If aeration is uneven inlet to outlet, ball valves may be place on each line to equalize the air flow
Clumped media	Thick growth, solid mass of media, odor	High organic loading	Consider an effluent filter on septic tank, educate homeowner on proper disposal practices regarding water use patterns, garbage disposals, etc.
Odor	Temporary condition on start-up after a power failure, last about 4 hours	Power failure	Temporary condition, self correcting
	Gravity inlet to OxyPro - occurrs during periods of high water use (draining a bath tub, multiple loads of laundry, etc.)	High surge volumes	Educate homeowner to spread flows more evenly
	Pumped inlet to OxyPro - Occurs when the pump feeding OxyPro turns on with too large a dose.	Dose volume too high	Reduce the dose volume



OxyPro Typical Installation

SCALE: N/A	DATE: 5-17-06
DRAWING TYPE: PROJECT PLANNING USE	

AERATION SYSTEMS
Wastewater Technology

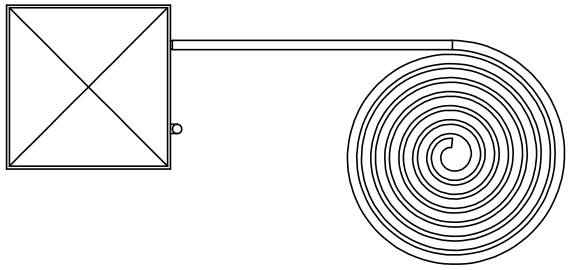
OxyPro 1000

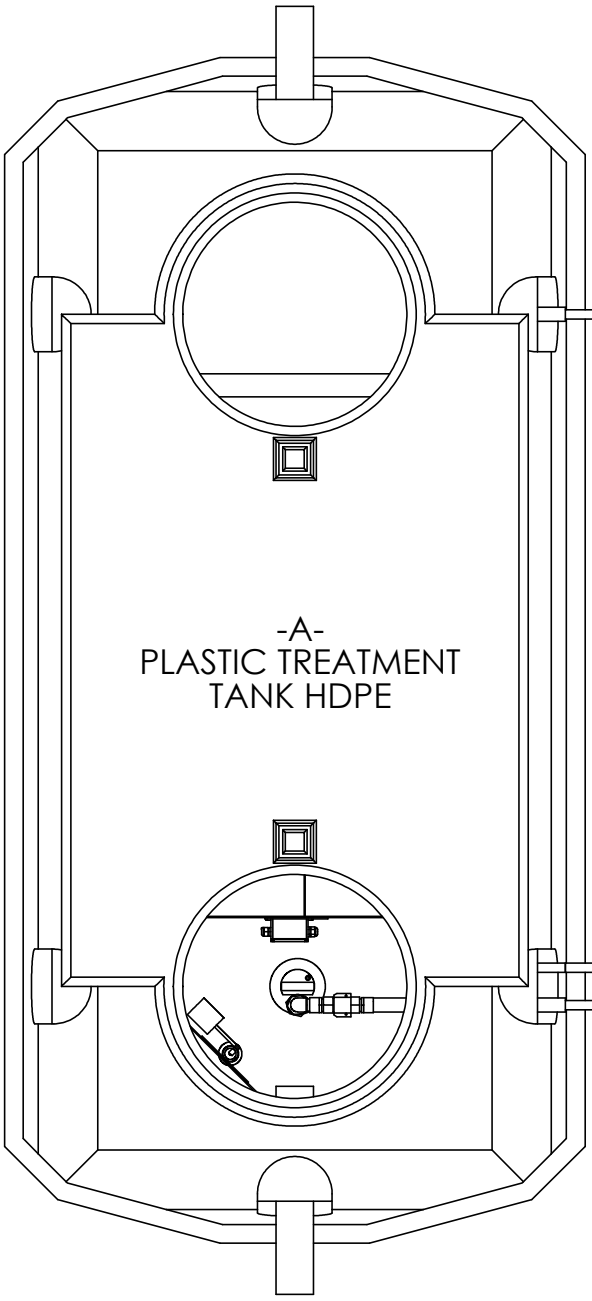
-C-
CONTROL PANEL

-B-
BLOWER HOUSING

-E-
BLOWER CABLE

-H-
WASTE LINE
ADAPTOR

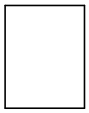




-F-
100' AIR LINE

-A-
PLASTIC TREATMENT
TANK HDPE

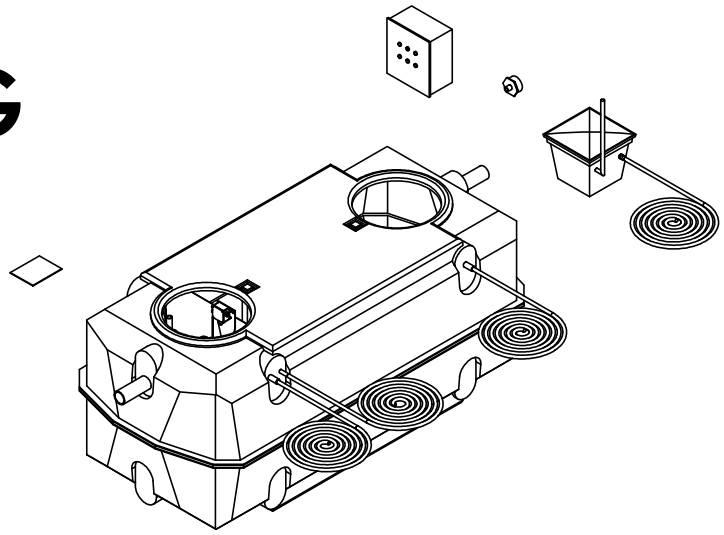
-D-
100' CONTROL CABLE

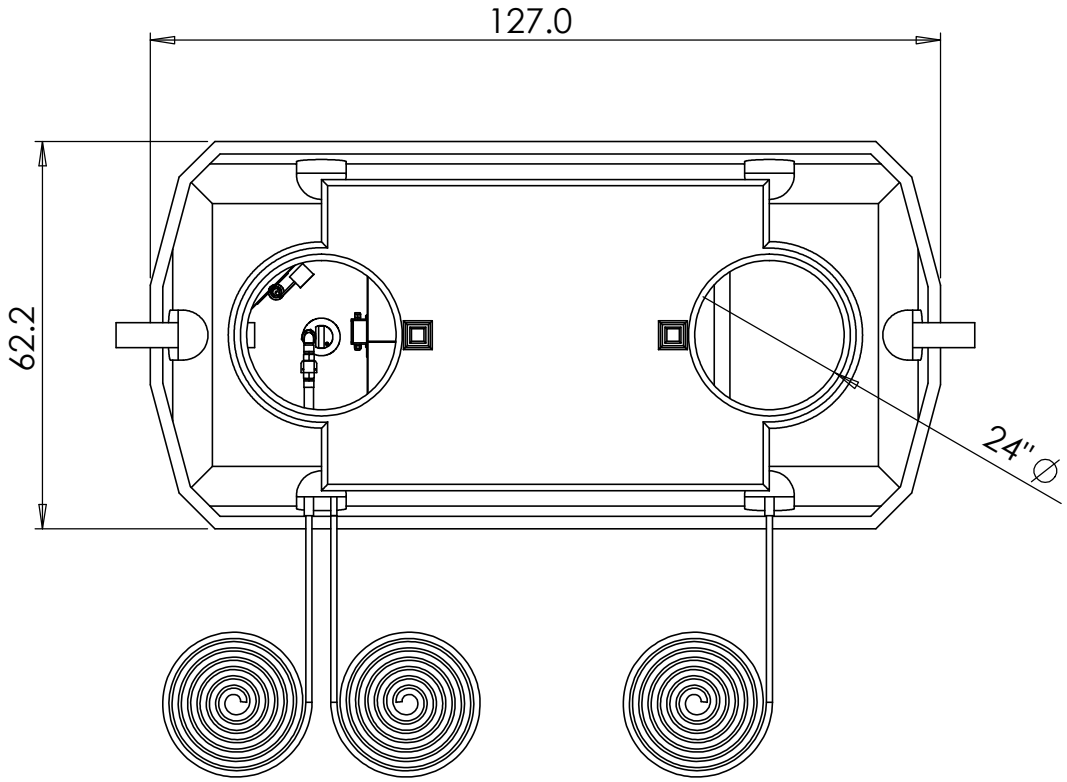


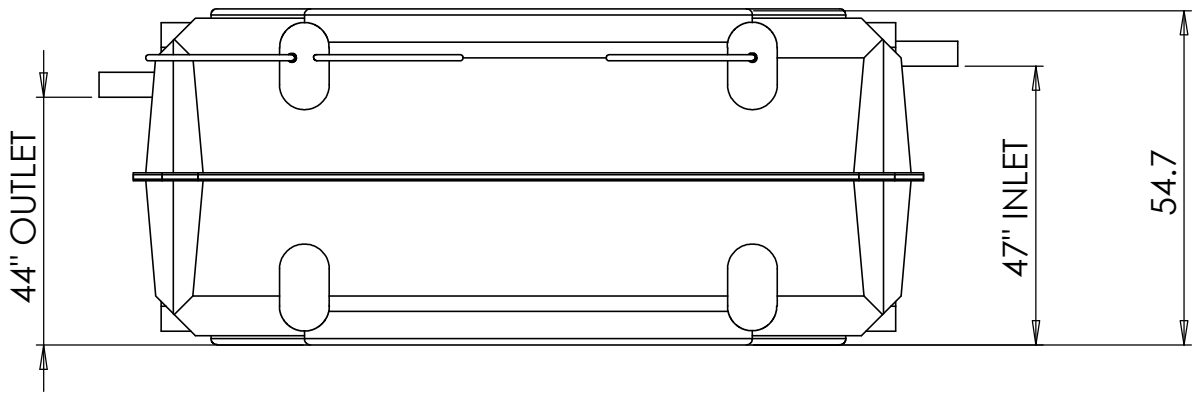
-I-
OWNERS MANUAL

-G-
25' WASTE RETURN LINE

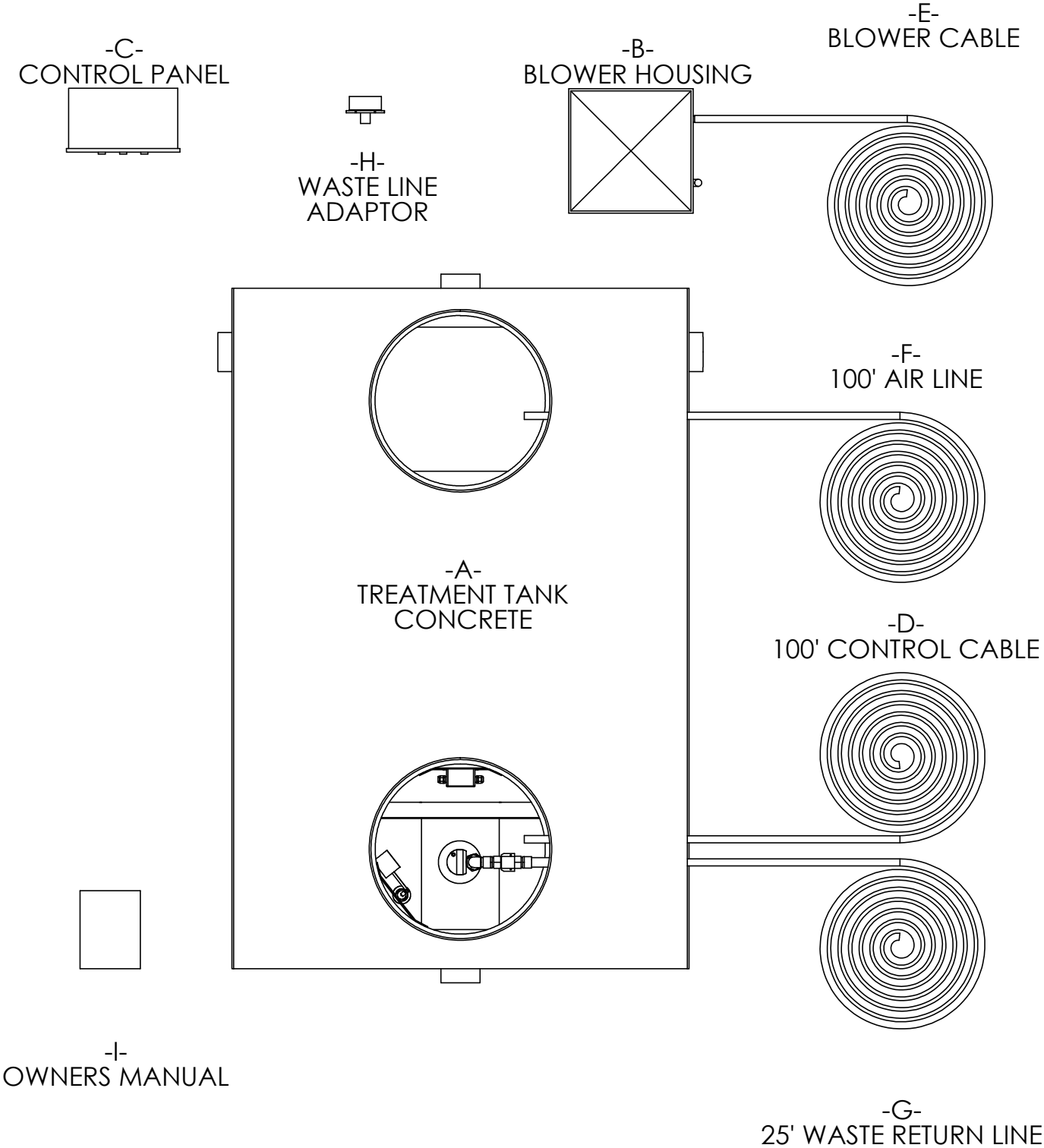
OxyPro 1000 P-G



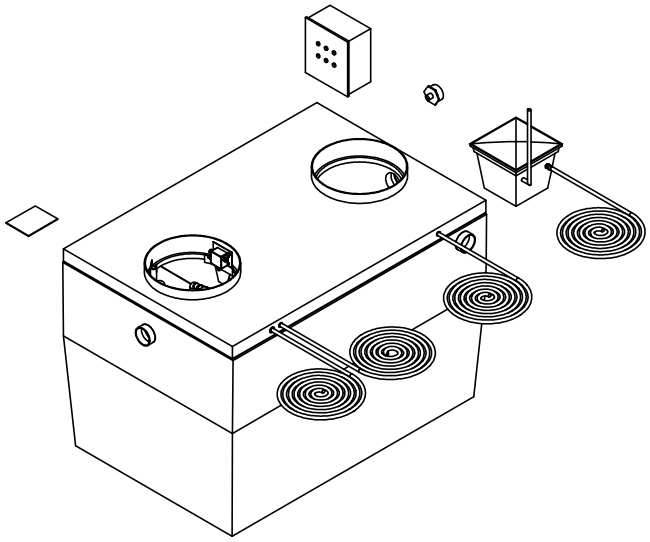


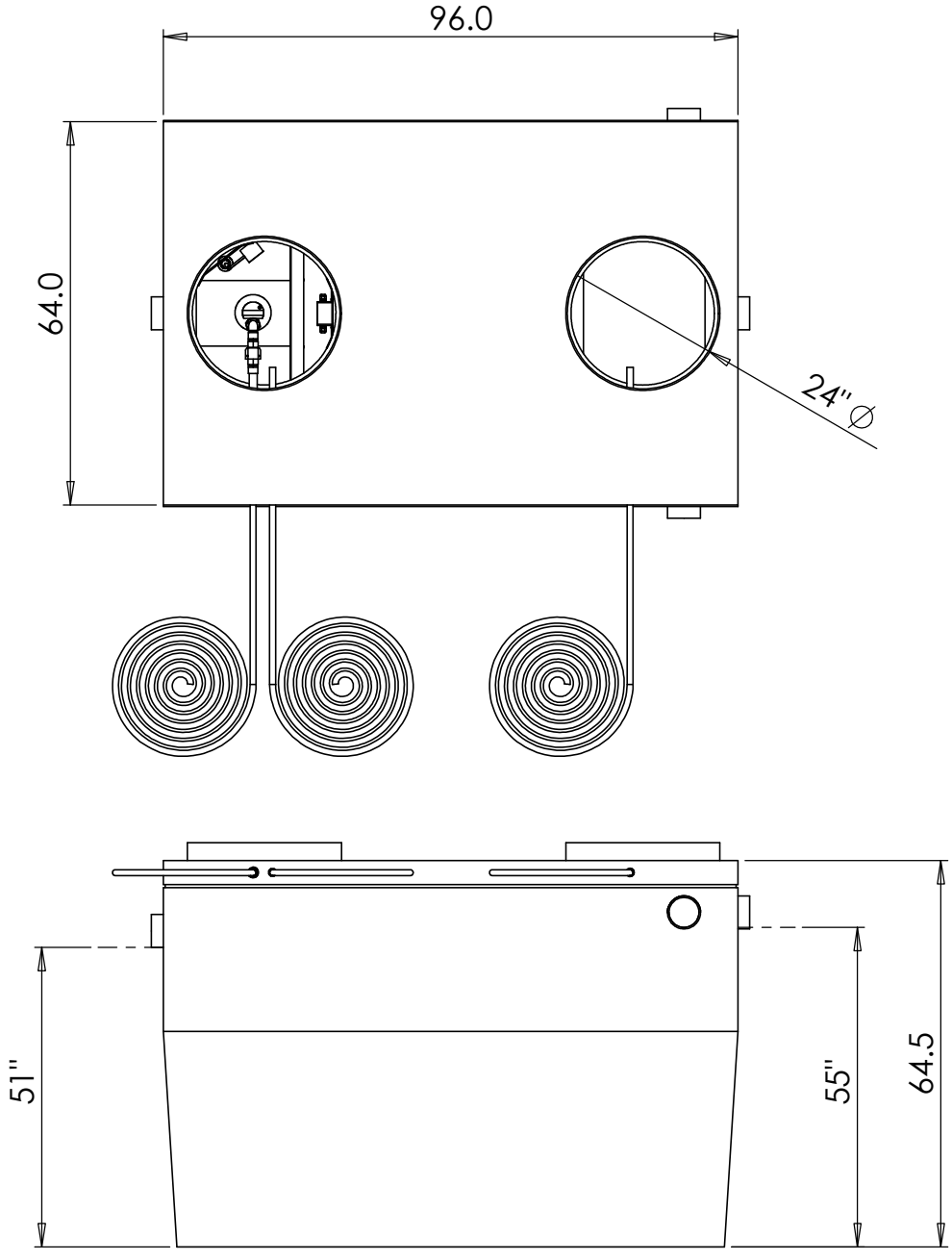


OxyPro 1000 C-G



OxyPro 1000C-G





		OxyPro Gravity - Wiring Instructions for Control Panel		
			GRAVITY OXYPRO	
		Wire Color	**Terminal Block Label**	**Description**
Line IN	**1**	**Black**	**L1**	**Line IN Hot**
	2	**White**	**Neut1**	**Line IN Neutral**
	3	**Green or Unshielded**	**Gnd1**	**Line IN Ground**
Tank Cable	**1**	**Yellow**	**Gnd4**	**Waste Pump Ground**
	2	**Blue**	**F2-2**	**Common Float Feed**
	3	**Orange**	**LW**	**Low Water Float**
	4	**Brown**	**HW**	**High Water Float**
	5	**Black**	**WP**	**Waste Pump Hot**
	6	**Red**	**Neut4**	**Waste Pump Neutral**
	7	**Red/Black (UNUSED)**	**n/a**	
Blower Cable	**1**	**Black**	**BL**	**Blower Hot**
	2	**Red**	**Neut2**	**Blower Neutral**
	3	**Yellow**	**Gnd2**	**Blower Ground**
	4	**Blue**	**F2-1**	**Air Switch Hot**
	5	**Orange**	**AS**	**Air Switch return**

		OxyPro Pumped System - Wiring Instructions		
			PUMPED OXYPRO	
		Wire Color	**Terminal Block Label**	**Description**
Line IN	**1**	**Black**	**L1**	**Line IN Hot**
	2	**White**	**Neut1**	**Line IN Neutral**
	3	**Green or Unshielded**	**Gnd1**	**Line IN Ground**
Tank Cable	**1**	**Yellow**	**Gnd3**	**Waste/effluent pump gnd**
	2	**Blue/Black**	**F2-2**	**Floats - HOT feed**
	3	**Orange/Black**	**LW**	**Low water float on/off**
	4	**Blue**	**EP - Right**	**Effluent pmp float on/off**
	5	**Orange**	**HW**	**High water float on/off**
	6	**Black**	**WP**	**Waste pump HOT**
	7	**Red**	**Neut4**	**Waste pump neutral**
	8	**Yellow/Black**	**EP - Left**	**Effluent pump HOT**
	9	**Red/Black**	**Neut3**	**Effluent pump neutral**
	10	**Brown (UNUSED)**	**n/a**	
Blower Cable	**1**	**Black**	**BL**	**Blower HOT**
	2	**Red**	**Neut2**	**Blower Neutral**
	3	**Yellow**	**Gnd2**	**Blower Gnd**
	4	**Blue**	**F2-1**	**Blower air switch hot**
	5	**Orange**	**AS**	**Blower air switch on/off**

COMPONENT SPECIFICATIONS:

Tank:	1000-Gallon Concrete Tank
Waste Pump:	Goulds LSP0311 1/3 hp pump
Effluent Pump:	Goulds LSP0311 1/3 hp pump
Air Compressor:	HiBlow HP-80 Linear Diaphragm Pump
PLC:	Phoenix Contact Nonoline ILC
Bubble Diffusers:	Environmental Dynamics 00250
Air Line:	¾-inch CATV
Waste Line:	1-inch CATV

Aeration Systems

982 MINOT AV • AUBURN • ME • 04210
AerationSystems@gmail.com
WWW.AerationSystemsLLC.COM

Service and Inspection Report

This report shall be completed, signed and dated after the Inspection. One copy shall be retained by the maintenance company. A second copy will be sent to the system owner. Unless there is a current maintenance contract an Invoice for services rendered will be sent.

Actual Date of Inspection : 00 / 00 / 2018	System Inspection of :
Owners Name and Number	
Address	
Town, State, Zip	
Billing Address if Different	

Mechanical Items	Operational	Inoperative	N / A	Notes
Blower	■			
Air Switch	■			
Waste Pump	■			
Effluent Pump	■			
Float Tree	■			
E-Box	■			
Control Panel	■			
UV Lamp			■	

Comments :

Repairs :

Aeration Systems

982 MINOT AV • AUBURN • ME • 04210
AerationSystems@gmail.com
WWW.AerationSystemsLLC.COM

Treatment Quality	Normal	Abnormal	Notes
Color	■		
Turbidity	■		
Scum	■		
Odor	■		

Comments :

The results if tests are required :

Test	Required	Results
BOD		
TSS		

Inspector's printed name : Mark S Cowperthwaite

Inspector's signature : MSC

ALTUS
ENGINEERING, INC.

Civil
Site Planning
Environmental
Engineering

133 Court Street
Portsmouth, NH
03801-4413

February 7, 2019

Jamie Steffen, Town Planner
Town of Kittery
200 Rogers Road
Kittery, Maine 03904

Re: **Huntington Run – Cluster Subdivision**
Map 66, Lots 2A, 8, and 8A
40 Betty Welch Road
Kittery, Maine
P-4567

Dear Mr. Steffen:

The Final Plan submittal for the subject project was recently submitted following the receipt of the Site Location of Development Permit from the Maine Department of Environmental Protection (MDEP). As a supplement to the submitted documents, the following Municipal Impact Statement is provided for consideration by the Planning Board.

Prior to closing on proposed homes, the applicant will construct the roadway, watermain, sewer force mains, and wastewater disposal fields. The build-out schedule at the 20 house lots is dependent on market conditions.

The Maine Department of Education lists the average cost per pupil in Kittery as $13,831. Maine Demographics and Statistics data indicates that 27% of homes have children, therefore the proposed 20 houses at Huntington Run can be expected to have, on average, 5 homes with school age children. Assuming 2 children in school from these homes, an average of 10 children is calculated equating to a $138,310 cost to the town. This analyses conservatively assumes that all of the children are attending public school, but it can be expected that some children may be home schooled or attend private school. Buses will pick up students at the intersection of Betty Welch Road and the proposed road. Betty Welch Road is currently on the list of bus routes so no additional busing cost is expected. The current tax rate in Kittery is $16.80. With an anticipated average value of $450,000, the 20 homes are expected to generate approximately $151,200 in tax revenue which exceeds the expected school costs by 9%.

There is no roadway cost to the Town since the proposed roadway will be privately owned and maintained by the homeowners association. The roadway will provide appropriate and safe access to the properties for emergency vehicles. The 20 new homes are not expected to require significant costs for fire and police protection. Solid waste will either be transported by residents

to the Kittery Resource and Recovery Facility (KRRF) or residents will hire a private hauler. At an average of 4.3 pounds of trash per person per day, and 2.3 people per household, the 20 homes are expected to generate about 36 tons of trash per year. The property tax generated by the homes will offset the Town's costs for processing solid waste taken to KRRF.

The Town's recreational facilities will not be overburdened by the addition of 20 homes. Use of the Kittery Community Center by the residents will generate additional revenue for the Town. The proposed stormwater management and wastewater facilities will be maintained by the homeowners association. The development will generate revenue for the Sewer Department when septage disposal fees are incurred at the wastewater treatment plant.

This analysis of the costs and revenues associated with the 20 proposed homes demonstrates that there is expected to be a positive cash flow to the Town.

Please call if you have any questions or require additional information.

Sincerely,

ALTUS ENGINEERING, INC.

Jeffrey K. Clifford, P.E.
Vice President

JKC/jkc/4567.028.JS.ltr.doc

e-copies: Paul Kerrigan and Matt Assia, Chinburg Development, LLC

HUNTINGTON RUN SUBDIVISION

MAP 66 LOTS 2A, 8 & 8A

40 BETTY WELCH ROAD

KITTERY, MAINE

Issued:

June 22, 2017	Preliminary Submission
February 21, 2018	MDHHS Submission
March 19, 2018	MDEP Submission
January 24, 2019	Town Final Approval

Owner/Applicant:

CHINBURG DEVELOPMENT, LLC
3 PENSTOCK WAY
NEWMARKET, NH 03857

Soil Scientist/Site Evaluator:

Longview Partners
6 Second Street
Buxton, ME 04093

Civil Engineer:

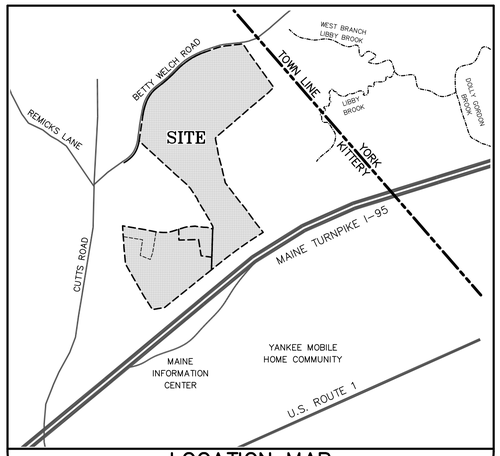
ALTUS ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801
(603) 433-2335 www.ALTUS-ENG.com

Wetland Scientist:

Gove Environmental Services, Inc.
P.O. Box 118
Exeter, NH 03833-0118

Surveyor:

North
EASTERLY
SURVEYING, Inc.
191 STATE ROAD, SUITE #1
KITTERY, MAINE 03904
(207) 439-6333

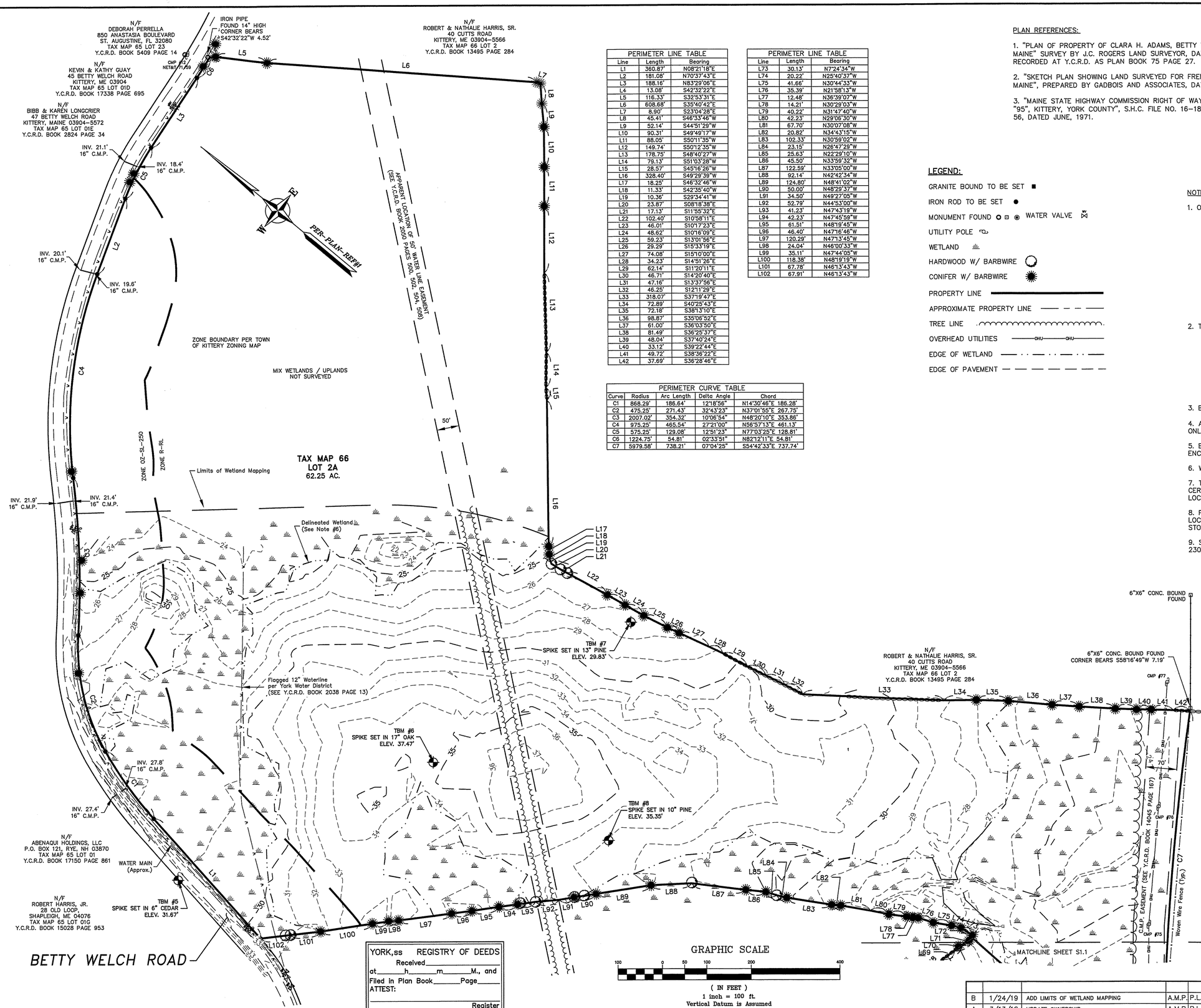


LOCATION MAP
SCALE: 1" = 1000' (+/-)

Sheet Index

Title	***Sheet No.:***	***Rev.***
Standard Boundary Survey and Existing Conditions Plan	S1.0	–
Standard Boundary Survey and Existing Conditions Plan	S1.1	–
Subdivision Plan – Sheet 1 of 3	S1.2	2
Subdivision Plan – Sheet 2 of 3	S1.3	2
Subdivision Plan – Sheet 3 of 3	S1.4	2
Soils Plan	G-1.0	2
Legend & General Notes	G-1.1	2
Lot Plan – A	C-1.0	3
Lot Plan – B	C-1.1	5
Roadway Plan & Profile – A	C-2.0	3
Roadway Plan & Profile – B	C-2.1	3
Stormwater Management Plan and Force Main – A	C-3.0	3
Stormwater Management Plan and Force Main – B	C-3.1	3
Waterwater Disposal Field Layout	C-4.0	3
Waterwater Disposal Field Cross Sections	C-4.1	3
Erosion Control Notes	C-5.0	2
Erosion Control Details	C-5.1	2
Erosion Control Details	C-5.2	2
Detail Sheet	C-6.0	3
Detail Sheet	C-6.1	5
Detail Sheet	C-6.2	3
Water Details	C-7.0	2
Sewer Details	C-8.0	3
Sewer Details	C-8.1	4
Sewer Details	C-8.2	3

P4567



PERIMETER LINE TABLE		
Line	Length	Bearing
L1	360.87'	N08°21'18"E
L2	181.08'	N70°37'43"E
L3	188.16'	N83°29'06"E
L4	13.08'	S42°32'22"E
L5	116.33'	S32°53'31"E
L6	608.68'	S35°40'42"E
L7	8.90'	S23°04'28"E
L8	45.41'	S46°33'46"W
L9	52.14'	S44°51'29"W
L10	90.31'	S49°49'17"W
L11	88.05'	S50°11'35"W
L12	149.74'	S50°12'35"W
L13	178.75'	S48°40'27"W
L14	79.13'	S51°03'28"W
L15	28.57'	S45°16'26"W
L16	328.40'	S49°29'39"W
L17	18.25'	S46°32'46"W
L18	11.33'	S42°35'40"W
L19	10.36'	S29°34'41"W
L20	23.87'	S08°18'38"E
L21	17.13'	S11°55'32"E
L22	102.40'	S10°58'11"E
L23	46.01'	S10°17'23"E
L24	48.62'	S10°16'09"E
L25	59.23'	S13°01'56"E
L26	29.29'	S15°33'19"E
L27	74.08'	S15°10'00"E
L28	34.23'	S14°51'26"E
L29	62.14'	S11°20'11"E
L30	46.71'	S14°20'40"E
L31	47.16'	S13°37'56"E
L32	46.25'	S12°11'29"E
L33	318.07'	S37°19'47"E
L34	72.89'	S40°25'43"E
L35	72.18'	S38°13'10"E
L36	98.87'	S35°06'52"E
L37	61.00'	S36°03'50"E
L38	81.49'	S36°25'37"E
L39	48.04'	S37°40'24"E
L40	33.12'	S39°22'44"E
L41	49.72'	S38°36'22"E
L42	37.69'	S36°28'46"E

PERIMETER LINE TABLE		
Line	Length	Bearing
L73	30.13'	N7°24'34"W
L74	20.22'	N25°40'37"W
L75	41.66'	N30°44'33"W
L76	35.39'	N21°58'13"W
L77	12.48'	N36°39'07"W
L78	14.21'	N30°29'03"W
L79	40.22'	N31°47'40"W
L80	42.23'	N29°06'30"W
L81	67.70'	N30°07'08"W
L82	20.82'	N34°43'15"W
L83	102.33'	N30°59'02"W
L84	23.15'	N26°47'29"W
L85	25.63'	N22°29'10"W
L86	45.50'	N33°59'32"W
L87	122.59'	N33°05'00"W
L88	92.14'	N42°42'34"W
L89	124.80'	N48°41'02"W
L90	50.00'	N48°29'37"W
L91	34.50'	N49°27'05"W
L92	52.79'	N44°53'00"W
L93	41.23'	N47°43'19"W
L94	42.23'	N47°45'59"W
L95	61.51'	N48°19'45"W
L96	46.40'	N47°16'46"W
L97	120.29'	N47°13'45"W
L98	24.04'	N46°00'33"W
L99	35.11'	N47°44'05"W
L100	118.38'	N48°19'19"W
L101	67.78'	N46°13'43"W
L102	67.91'	N46°13'43"W

PERIMETER CURVE TABLE				
Curve	Radius	Arc Length	Delta Angle	Chord
C1	868.29'	186.64'	12°18'56"	N14°30'46"E 186.28'
C2	475.25'	271.43'	32°43'23"	N37°01'55"E 267.75'
C3	2007.02'	354.32'	10°06'54"	N48°20'10"E 353.86'
C4	975.25'	465.54'	27°21'00"	N56°57'13"E 461.13'
C5	575.25'	129.08'	12°51'23"	N77°03'25"E 128.81'
C6	1224.75'	54.81'	02°33'51"	N82°12'11"E 54.81'
C7	5979.58'	738.21'	07°04'25"	S54°42'33"E 737.74'

PLAN REFERENCES:

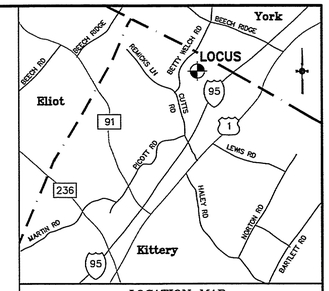
1. "PLAN OF PROPERTY OF CLARA H. ADAMS, BETTY WELCH ROAD, KITTERY, MAINE" SURVEY BY J.C. ROGERS LAND SURVEYOR, DATED JANUARY 1974 AND RECORDED AT Y.C.R.D. AS PLAN BOOK 75 PAGE 27.

2. "SKETCH PLAN SHOWING LAND SURVEYED FOR FREDERICK HART, KITTERY, MAINE", PREPARED BY GADBOIS AND ASSOCIATES, DATED MAY 20, 1987.

3. "MAINE STATE HIGHWAY COMMISSION RIGHT OF WAY MAP, STATE HIGHWAY "95", KITTERY, YORK COUNTY", S.H.C. FILE NO. 16-181, SHEET 35 AND 37 OF 56, DATED JUNE, 1971.

LEGEND:

GRANITE BOUND TO BE SET ■
IRON ROD TO BE SET ●
MONUMENT FOUND ○ ⊡ ◉ WATER VALVE
UTILITY POLE
WETLAND
HARDWOOD W/ BARBWIRE
CONIFER W/ BARBWIRE
PROPERTY LINE
APPROXIMATE PROPERTY LINE
TREE LINE
OVERHEAD UTILITIES OHU OHU
EDGE OF WETLAND
EDGE OF PAVEMENT



LOCATION MAP
(not to scale)

NOTES:

1. OWNERS OF RECORD:
TAX MAP 66 LOT 2A
CHINBURG DEVELOPMENT, LLC
Y.C.R.D. BOOK 17654 PAGE 550
DATED JANUARY 31, 2018

TAX MAP 66 LOT 8
CHINBURG DEVELOPMENT, LLC
Y.C.R.D. BOOK 17654 PAGE 550
DATED JANUARY 31, 2018

TAX MAP 66 LOT 8A
CHINBURG DEVELOPMENT, LLC
Y.C.R.D. BOOK 17520 PAGE 932
DATED JULY 18, 2017

2. TOTAL EXISTING PARCEL AREA:
TAX MAP 66 LOT 2A
62.25 AC.

TAX MAP 66 LOT 8
21.50 AC.

TAX MAP 66 LOT 8A
2.8± AC.

3. BASIS OF BEARING IS PER PLAN REFERENCE #1.

4. APPROXIMATE ABUTTER'S LINES SHOWN HEREON ARE FOR REFERENCE PURPOSES ONLY AND SHALL NOT BE RELIED UPON AS BOUNDARY INFORMATION.

5. EASEMENTS OR OTHER UNWRITTEN RIGHTS MAY EXIST, NOT SHOWN HEREON, THAT ENCUMBER OR BENEFIT THE PROPERTY.

6. WETLANDS SHOWN HEREON WERE DELINEATED BY GOVE ENVIRONMENTAL.

7. THE LOCATION OF TAX MAP 66 LOT 8A COULD NOT BE DETERMINED WITH CERTAINTY FROM THE RECORD DESCRIPTION. THE LOCATION SHOWN IS A POSSIBLE LOCATION BASED ON RECORD DESCRIPTIONS AND PLAN REFERENCE #3.

8. PERIMETER BOUNDARY IS PER PLAN REFERENCES AND PHYSICAL EVIDENCE LOCATED AT THE TIME OF SURVEY. THE PERIMETER BOUNDARY IS BOUNDED BY STONE WALL AND BARB WIRE FENCE OR REMNANTS FOUND THEREOF.

9. SUBJECT PARCELS ARE LOCATED IN ZONE C AS SHOWN ON FEMA FIRM PANEL 230171 0001 C, EFFECTIVE JULY 5, 1984.

CERTIFICATION

This survey conforms to the standards of practice as set forth in Chapter 90 of the Rules of the Board of Licensure for Professional Land Surveyors, April 2001, except that a separate written report has not been prepared.

Adam M. Pray, P.L.S. #2485 — Dated 1/24/19

STATE OF MAINE
ADAM M. PRAY 2485
PROFESSIONAL LAND SURVEYOR

REV.	DATE	STATUS	BY	CHKD	APPD.
B	1/24/19	ADD LIMITS OF WETLAND MAPPING	A.M.P.	P.L.A.	A.M.P.
A	3/13/18	UPDATE OWNERSHIP	A.M.P.	P.L.A.	A.M.P.

STANDARD BOUNDARY SURVEY & EXISTING CONDITIONS PLAN

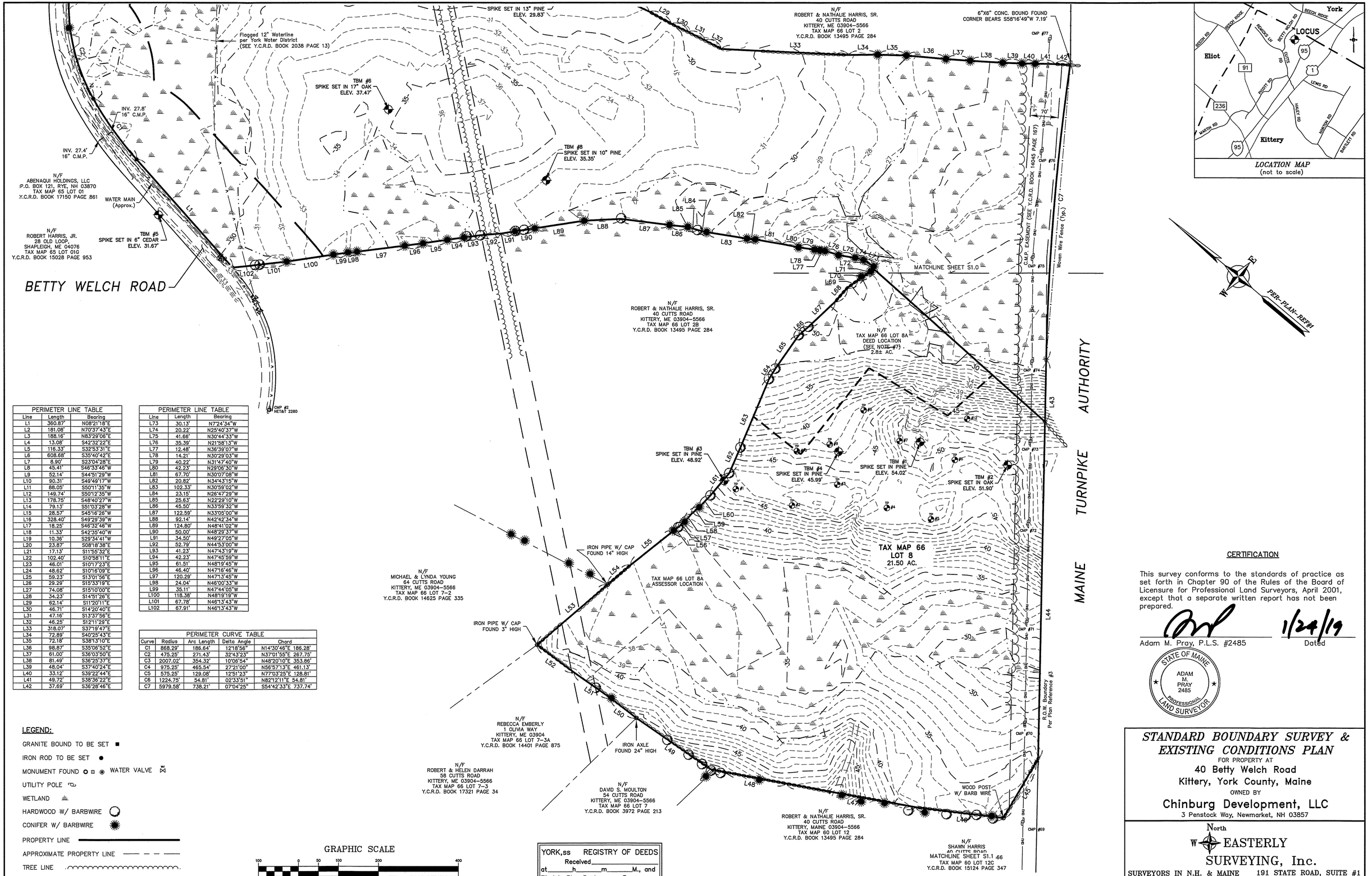
FOR PROPERTY AT
40 Betty Welch Road
Kittery, York County, Maine
OWNED BY
Chinburg Development, LLC
3 Penstock Way, Newmarket, NH 03857

North
EASTERLY
SURVEYING, Inc.
SURVEYORS IN N.H. & MAINE
(207) 439-6333
191 STATE ROAD, SUITE #1
KITTERY, MAINE 03904

SCALE:	PROJECT NO.	DATE:	SHEET:	DRAWN BY:	CHECKED BY:
1" = 100'	13758	6/22/17	S1.0	A.M.P.	P.L.A.

DRAWING No: 13758_Existing_Conditions
FIELD BOOK No: "Kittery #29"

Tax Map 66 Lot 2A, 8 & 8A



LOCATION MAP
(not to scale)

PERIMETER LINE TABLE		
Line	Length	Bearing
L1	360.67'	N08°21'18"E
L2	181.08'	N70°37'43"E
L3	188.16'	N83°29'06"E
L4	13.08'	S42°32'22"E
L5	116.33'	S32°53'31"E
L6	608.68'	S35°40'42"E
L7	8.90'	S23°04'28"E
L8	45.41'	S46°33'46"W
L9	52.14'	S44°51'29"W
L10	90.31'	S49°49'17"W
L11	88.05'	S50°11'35"W
L12	149.74'	S50°12'35"W
L13	178.75'	S48°40'27"W
L14	79.13'	S51°03'28"W
L15	28.57'	S45°16'26"W
L16	328.40'	S49°29'39"W
L17	18.25'	S46°32'46"W
L18	11.33'	S42°35'40"W
L19	10.36'	S29°34'41"W
L20	23.87'	S08°18'38"E
L21	17.13'	S11°55'32"E
L22	102.40'	S10°58'11"E
L23	46.01'	S10°17'23"E
L24	48.62'	S10°16'09"E
L25	59.23'	S13°01'56"E
L26	29.29'	S15°33'19"E
L27	74.08'	S15°10'00"E
L28	34.23'	S14°51'26"E
L29	62.14'	S11°20'11"E
L30	46.71'	S14°20'40"E
L31	47.16'	S13°37'56"E
L32	46.25'	S12°11'29"E
L33	318.07'	S37°19'47"E
L34	72.89'	S40°25'43"E
L35	72.18'	S38°13'10"E
L36	98.87'	S35°06'52"E
L37	61.00'	S36°03'50"E
L38	81.49'	S36°25'37"E
L39	48.04'	S37°40'24"E
L40	33.12'	S39°22'44"E
L41	49.72'	S38°36'22"E
L42	37.69'	S36°28'46"E

PERIMETER LINE TABLE		
Line	Length	Bearing
L73	30.13'	N7°24'34"W
L74	20.22'	N25°40'37"W
L75	41.66'	N30°44'33"W
L76	35.39'	N21°58'13"W
L77	12.48'	N36°39'07"W
L78	14.21'	N30°28'03"W
L79	40.22'	N31°47'40"W
L80	42.23'	N29°06'30"W
L81	67.70'	N30°07'08"W
L82	20.82'	N34°43'15"W
L83	102.33'	N30°59'02"W
L84	23.15'	N26°47'29"W
L85	25.63'	N22°29'10"W
L86	45.50'	N33°59'32"W
L87	122.59'	N33°05'00"W
L88	92.14'	N42°42'34"W
L89	124.80'	N48°41'02"W
L90	50.00'	N48°29'37"W
L91	34.50'	N49°27'05"W
L92	52.79'	N44°53'00"W
L93	41.23'	N47°43'19"W
L94	42.23'	N47°45'59"W
L95	61.51'	N48°19'45"W
L96	46.40'	N47°16'46"W
L97	120.29'	N47°13'45"W
L98	24.04'	N46°00'33"W
L99	35.11'	N47°44'05"W
L100	118.38'	N48°19'19"W
L101	67.78'	N46°13'43"W
L102	67.91'	N46°13'43"W

PERIMETER CURVE TABLE				
Curve	Radius	Arc Length	Delta Angle	Chord
C1	868.29'	186.64'	12°18'56"	N14°30'46"E 186.28'
C2	475.25'	271.43'	32°43'23"	N37°01'55"E 267.75'
C3	2007.02'	354.32'	10°06'54"	N48°20'10"E 353.86'
C4	975.25'	465.54'	27°21'00"	N56°57'13"E 461.13'
C5	575.25'	129.08'	12°51'23"	N77°03'25"E 128.81'
C6	1224.75'	54.81'	02°33'51"	N82°12'11"E 54.81'
C7	5979.58'	738.21'	07°04'25"	S54°42'33"E 737.74'

LEGEND:

- GRANITE BOUND TO BE SET ■
- IRON ROD TO BE SET ●
- MONUMENT FOUND ○ ⊡ ◉ WATER VALVE
- UTILITY POLE
- WETLAND
- HARDWOOD W/ BARBWIRE
- CONIFER W/ BARBWIRE
- PROPERTY LINE
- APPROXIMATE PROPERTY LINE
- TREE LINE
- OVERHEAD UTILITIES —OHU—OHU—
- EDGE OF WETLAND
- EDGE OF PAVEMENT

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.
Vertical Datum is Assumed
Contour Interval = 1'

YORK,ss REGISTRY OF DEEDS
Received_____
at_____h_____m_____M., and
Filed in Plan Book_____Page_____
ATTEST:
_____
Register

CERTIFICATION

This survey conforms to the standards of practice as set forth in Chapter 90 of the Rules of the Board of Licensure for Professional Land Surveyors, April 2001, except that a separate written report has not been prepared.

Adam M. Pray, P.L.S. #2485 — 1/24/19 Dated

STATE OF MAINE
ADAM
M.
PRAY
2485
PROFESSIONAL
LAND SURVEYOR

STANDARD BOUNDARY SURVEY & EXISTING CONDITIONS PLAN
FOR PROPERTY AT
40 Betty Welch Road
Kittery, York County, Maine
OWNED BY
Chinburg Development, LLC
3 Penstock Way, Newmarket, NH 03857

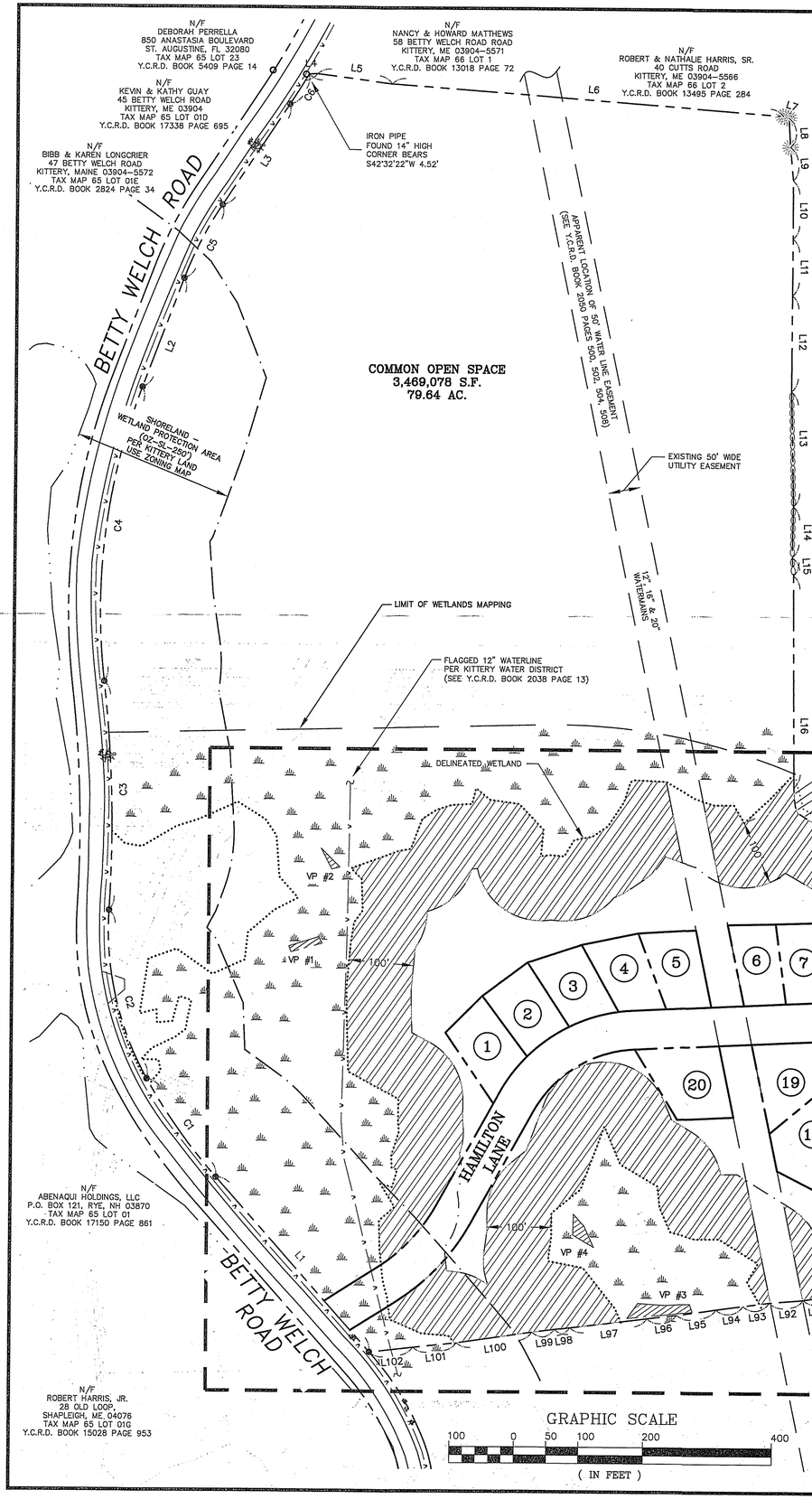
North
W EASTERLY
SURVEYING, Inc.
SURVEYORS IN N.H. & MAINE
(207) 439-6333
191 STATE ROAD, SUITE #1
KITTERY, MAINE 03904

REV.	DATE	STATUS	BY	CHKD	APPD.
B	1/24/19	ADD LIMITS OF WETLAND MAPPING	A.M.P.	P.L.A.	A.M.P.
A	3/13/18	UPDATE OWNERSHIP	A.M.P.	P.L.A.	A.M.P.

SCALE:	PROJECT NO.	DATE:	SHEET:	DRAWN BY:	CHECKED BY:
1" = 100'	13758	6/22/17	S1.0	A.M.P.	P.L.A.

DRAWING No: 13758_Existing_Conditions
FIELD BOOK No: "Kittery #29"

Tax Map 66 Lot 2A, 8 & 8A



ZONING SUMMARY:

ZONE: RESIDENTIAL RURAL (R-RL)

LOT 2A	62.25 AC.
LOT 8	21.50 AC.
LOT 8A	2.80 AC.
TOTAL LOT AREA	86.55 AC.

NET RESIDENTIAL AREA (NRA) CALCULATIONS:	
TOTAL LOT AREA	86.55 AC.
LESS LAND NORTH OF CLASS A SOILS	-22.43 AC.
NET AREA CONSIDERED FOR NRA	64.12 AC.
LESS WETLANDS	-24.3 AC.
LESS ROW, EASEMENT AND POORLY DRAINED SOIL	-11.2 AC.
LESS 50% OF SOMEWHAT POORLY DRAINED SOIL:	
OUTSIDE WETLAND BUFFER	- 4.9 AC.
WITHIN WETLAND BUFFER	- 3.8 AC.
LESS 50% WETLAND BUFFER	- 0.2 AC.
NET RESIDENTIAL AREA	19.72 AC.

ALLOWABLE LOTS PER NET RESIDENTIAL DENSITY	
(19.72 AC * 43,560 SF/AC / 40,000 S.F./LOT)=	21 LOTS
PROPOSED CLUSTER LOTS	20 LOTS

OPEN SPACE CALCULATIONS	REQUIRED	PROVIDED
COMMON OPEN SPACE TOTAL (50% OF TOTAL LOT AREA) (0.50 * 86.55 AC.)	43.28 AC.	79.64 AC.
AT LEAST 30% OF NRA WITH OPEN SPACE (0.30 * 19.72 AC.)	5.92 AC.	12.67 AC.

DIMENSIONAL STANDARDS (R-RL)	STANDARD	CLUSTER	PROVIDED
MINIMUM LOT AREA	40,000 S.F.	N/A	8,159 S.F. MIN.
ROAD FRONTAGE	150 FT.	*	26.61 FT. MIN.
FRONT YARD	40 FT.	*	20 FT. MIN.
SIDE YARD	20 FT.	*	10 FT. MIN.
REAR YARD	20 FT.	*	10 FT. MIN.

* DIMENSIONAL MODIFICATIONS ALLOWED

PERIMETER LINE TABLE		
Line	Length	Bearing
L1	360.87'	N08°21'18"E
L2	181.08'	N70°37'43"E
L3	188.16'	N83°29'06"E
L4	13.08'	S42°32'22"E
L5	116.33'	S32°53'31"E
L6	608.68'	S35°40'42"E
L7	8.90'	S23°04'28"E
L8	45.41'	S46°33'46"W
L9	52.14'	S44°51'29"W
L10	90.31'	S49°49'17"W
L11	88.05'	S50°11'35"W
L12	149.74'	S50°12'35"W
L13	178.75'	S48°40'27"W
L14	79.13'	S51°03'28"W
L15	28.57'	S45°16'26"W
L16	328.40'	S49°29'39"W
L17	18.25'	S46°32'46"W
L18	11.33'	S42°35'40"W
L19	10.36'	S29°34'41"W
L20	23.87'	S08°18'38"E
L21	17.13'	S11°55'32"E
L22	102.40'	S10°58'11"E
L23	46.01'	S10°17'23"E
L24	48.62'	S10°16'09"E
L25	59.23'	S13°01'56"E
L26	29.29'	S15°33'19"E
L27	74.08'	S15°10'00"E
L28	34.23'	S14°51'28"E
L29	62.14'	S11°20'11"E
L30	46.71'	S14°20'40"E
L31	47.16'	S13°37'56"E
L32	46.25'	S12°11'29"E
L33	318.07'	S37°19'47"E
L34	72.89'	S40°25'43"E
L35	72.18'	S38°13'10"E
L36	98.87'	S35°06'52"E
L37	61.00'	S36°03'50"E
L38	81.49'	S36°25'37"E
L39	48.04'	S37°40'24"E
L40	33.12'	S39°22'44"E
L41	49.72'	S38°36'22"E
L42	37.69'	S36°28'46"E

PERIMETER LINE TABLE		
Line	Length	Bearing
L73	30.13'	N7°24'34"W
L74	20.22'	N25°40'37"W
L75	41.66'	N30°44'33"W
L76	35.39'	N21°58'13"W
L77	12.48'	N36°39'07"W
L78	14.21'	N30°29'03"W
L79	40.22'	N31°47'40"W
L80	42.23'	N29°06'30"W
L81	67.70'	N30°07'08"W
L82	20.82'	N34°43'15"W
L83	102.33'	N30°59'02"W
L84	23.15'	N26°47'28"W
L85	25.63'	N22°29'10"W
L86	45.50'	N33°59'32"W
L87	122.59'	N33°05'00"W
L88	92.14'	N42°42'34"W
L89	124.80'	N48°41'02"W
L90	50.00'	N48°29'37"W
L91	34.50'	N49°27'05"W
L92	52.79'	N44°53'00"W
L93	41.23'	N47°43'19"W
L94	42.23'	N47°45'59"W
L95	61.51'	N48°19'45"W
L96	46.40'	N47°16'46"W
L97	120.29'	N47°13'45"W
L98	24.04'	N46°00'33"W
L99	35.11'	N47°44'05"W
L100	118.38'	N48°19'19"W
L101	67.78'	N46°13'43"W
L102	67.91'	N46°13'43"W

PERIMETER CURVE TABLE				
Curve	Radius	Arc Length	Delta Angle	Chord
C1	868.29'	186.64'	12°18'56"	N14°30'46"E 186.28'
C2	475.25'	271.43'	32°43'23"	N37°01'55"E 267.75'
C3	2007.02'	354.32'	10°06'54"	N48°20'10"E 353.86'
C4	975.25'	465.54'	27°21'00"	N56°57'13"E 461.13'
C5	575.25'	129.08'	12°51'23"	N77°03'25"E 128.81'
C6	1224.75'	54.81'	02°33'51"	N82°12'11"E 54.81'
C7	5979.58'	738.21'	07°04'25"	S54°42'33"E 737.74'

NOTES:

1. OWNERS OF RECORD:
   TAX MAP 66 LOT 2A AND LOT 8
   CHINBURG DEVELOPMENT, LLC
   Y.C.R.D. BOOK 17654 PAGE 550
   DATED FEBRUARY 1, 2018
   TAX MAP 66 LOT 8A
   CHINBURG DEVELOPMENT, LLC
   BOOK 17520 PAGE 932
   DATED JULY 21, 2017
2. TOTAL EXISTING PARCEL AREAS:
   TAX MAP 66 LOT 2A 62.25 AC.
   TAX MAP 66 LOT 8 21.50 AC.
   TAX MAP 66 LOT 8A 2.8± AC.
3. BASIS OF BEARING IS PER PLAN REFERENCE #1.
4. APPROXIMATE ABUTTER'S LINES SHOWN HEREON ARE FOR REFERENCE PURPOSES ONLY AND SHALL NOT BE RELIED UPON AS BOUNDARY INFORMATION.
5. EASEMENTS OR OTHER UNWRITTEN RIGHTS MAY EXIST, NOT SHOWN HEREON, THAT ENCUMBER OR BENEFIT THE PROPERTY.
6. WETLANDS SHOWN HEREON WERE DELINEATED BY GOVE ENVIRONMENTAL.
7. THE LOCATION OF TAX MAP 66 LOT 8A COULD NOT BE DETERMINED WITH CERTAINTY FROM THE RECORD DESCRIPTION. THE LOCATION SHOWN IS A POSSIBLE LOCATION BASED ON RECORD DESCRIPTIONS AND PLAN REFERENCE #3. CONSULTATION WITH A TITLE ATTORNEY IS ADVISED.
8. PERIMETER BOUNDARY IS PER PLAN REFERENCES AND PHYSICAL EVIDENCE LOCATED AT THE TIME OF SURVEY. THE PERIMETER BOUNDARY IS BOUNDED BY STONE WALL AND BARB WIRE FENCE OR REMNANTS FOUND THEREOF.
9. SUBJECT PARCELS ARE LOCATED IN ZONE C AS SHOWN ON FEMA FIRM PANEL 230171 0001 C, EFFECTIVE JULY 5, 1984.
10. NET RESIDENTIAL CALCULATIONS PROVIDED BY ALTUS ENGINEERING, INC.

PLAN REFERENCE:

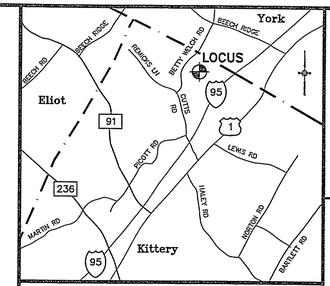
1. "STANDARD BOUNDARY SURVEY & EXISTING CONDITIONS PLAN FOR PROPERTY AT 40 BETTY WELCH ROAD, KITTERY, MAINE", SHEETS S1.0 AND S1.1, BY NORTH EASTERLY SURVEYING, INC., DATED 1/24/2019

APPROVAL:

- KITTERY PLANNING BOARD – PRELIMINARY SITE PLAN APPROVAL, DATED AUGUST 24, 2017
- KITTERY PLANNING BOARD – ROAD NAME APPROVAL, DATED
- KITTERY PLANNING BOARD – FINAL APPROVAL, DATED
  SEE SHEET 2 OF 3 FOR LIST OF APPROVED WAIVERS
  SEE SHEET 2 OF 3 FOR DIMENSIONAL STANDARDS MODIFICATIONS
- MDHHS APPROVAL, ENGINEERED SUBSURFACE DISPOSAL SYSTEM, HUNTINGTON RUN SUBDIVISION, 40 BETTY WELCH ROAD, KITTERY, DATED MARCH 4, 2018
- MDEP APPROVAL, SITE LOCATION DEVELOPMENT LICENSE, #L-27871-L3-A-N AND NRPA LICENSE, #L-27871-TB-B-N, DATED JANUARY 24, 2019

MONUMENTATION:

PRIOR TO CERTIFICATION OF OCCUPANCY OF ANY LOT SHOWN HEREON, MONUMENTS SHOWN AS "TO BE SET" MUST BE SET UNDER THE DIRECTION OF A MAINE LICENSED LAND SURVEYOR.



LOCATION MAP
(not to scale)

ALTUS ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801
(603) 433-2335 www.ALTUS-ENG.com

North EASTERLY SURVEYING, Inc.
SURVEYORS IN N.H. & MAINE
191 STATE ROAD, SUITE #1
KITTERY, MAINE 03904
(207) 439-6333

STATE OF MAINE
ADAM M. PRAY
2485
PROFESSIONAL LAND SURVEYOR

THIS DRAWING HAS NOT BEEN RELEASED FOR CONSTRUCTION

ISSUED FOR: FINAL APPROVAL

ISSUE DATE: JANUARY 24, 2019

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	PB SUBMISSION	JKC	6/22/17
1	MDEP SUBMISSION	JKC	3/19/18
2	TOWN FINAL APPROVAL	JKC	1/24/19

DRAWN BY: RMB
APPROVED BY: JKC
DRAWING FILE: 4567SITE.DWG

SCALE: 1 " = 100'

OWNERS/APPLICANT:

CHINBURG DEVELOPMENT, LLC
3 PENSTOCK WAY
NEWMARKET, NH 03857

PROJECT:

HUNTINGTON RUN SUBDIVISION
MAP 66 LOTS 2A, 8 & 8A
40 BETTY WELCH ROAD
KITTERY, MAINE

TITLE:

HUNTINGTON RUN SUBDIVISION PLAN - SHEET 1 OF 3

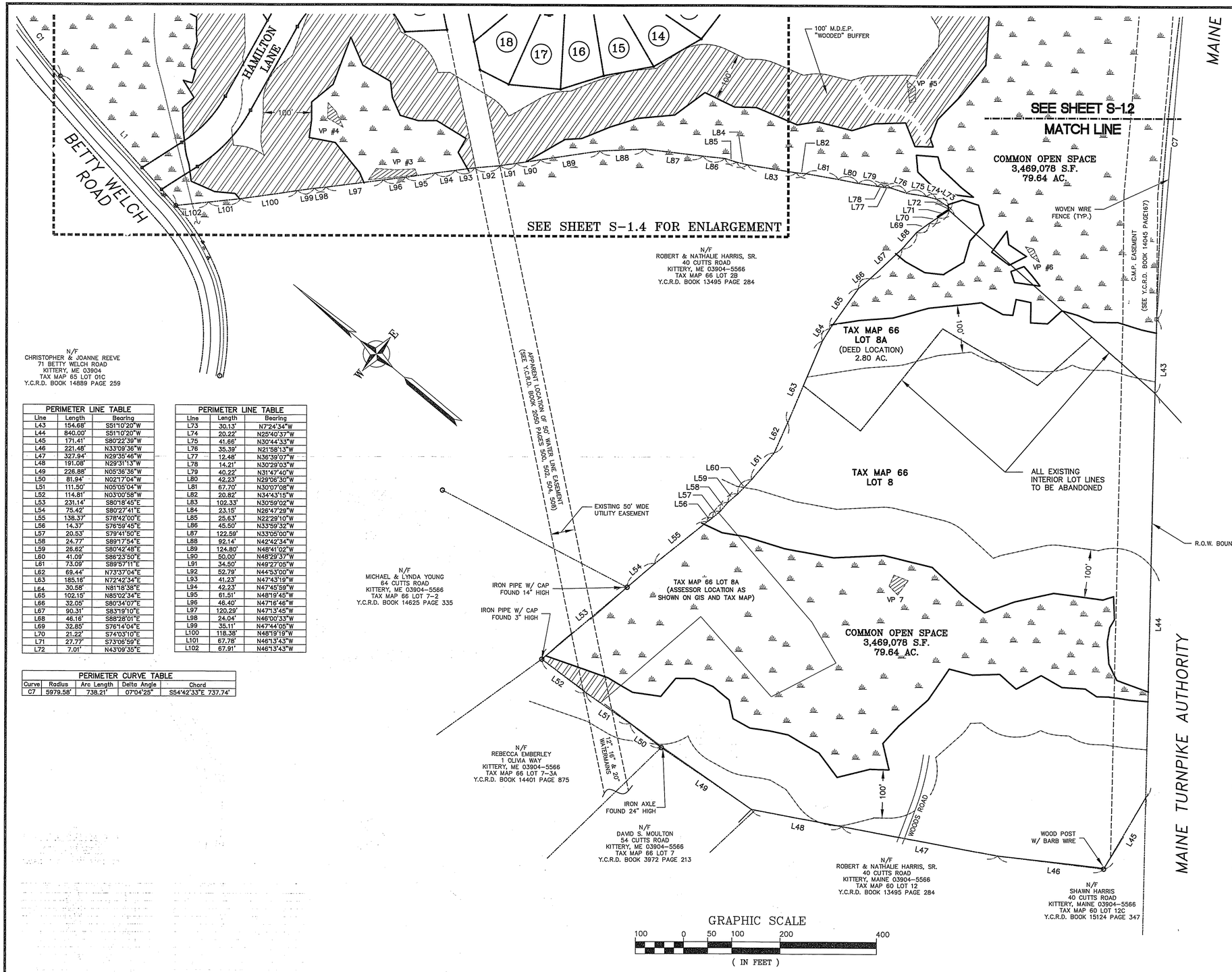
SHEET NUMBER: S-1.2

TOWN OF KITTERY, PLANNING BOARD

CHAIR	DATE
OWNER/APPLICANT	DATE
OWNER/APPLICANT	DATE

YORK ss REGISTRY OF DEEDS
RECIEVED _____ 20____
AT _____ H _____ M ____M., AND
RECORDED IN BOOK _____ PAGE ____
ATTEST:
_____
REGISTER

P4567



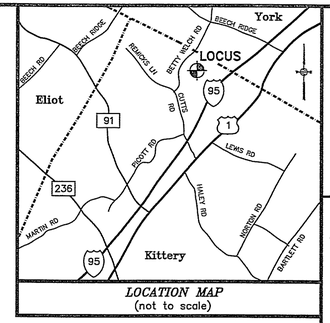
PERIMETER LINE TABLE		
Line	Length	Bearing
L43	154.68'	S51°10'20"W
L44	840.00'	S51°10'20"W
L45	171.41'	S80°22'39"W
L46	221.48'	N33°09'36"W
L47	327.94'	N29°35'46"W
L48	191.08'	N29°31'13"W
L49	226.88'	N05°36'36"W
L50	81.94'	N02°17'04"W
L51	111.50'	N05°05'04"W
L52	114.81'	N03°00'58"W
L53	231.14'	S80°18'45"E
L54	75.42'	S80°27'41"E
L55	138.37'	S78°42'00"E
L56	14.37'	S76°59'45"E
L57	20.53'	S79°41'50"E
L58	24.77'	S89°17'54"E
L59	26.62'	S80°42'48"E
L60	41.09'	S86°23'50"E
L61	73.09'	S89°57'11"E
L62	69.44'	N73°37'04"E
L63	185.16'	N72°42'34"E
L64	30.58'	N81°18'38"E
L65	102.15'	N85°02'34"E
L66	32.05'	S80°34'07"E
L67	90.31'	S83°19'10"E
L68	46.16'	S88°28'01"E
L69	32.85'	S76°14'04"E
L70	21.22'	S74°03'10"E
L71	27.77'	S73°06'59"E
L72	7.01'	N43°09'35"E

PERIMETER LINE TABLE		
Line	Length	Bearing
L73	30.13'	N7°24'34"W
L74	20.22'	N25°40'37"W
L75	41.66'	N30°44'33"W
L76	35.39'	N21°58'13"W
L77	12.48'	N36°39'07"W
L78	14.21'	N30°29'03"W
L79	40.22'	N31°47'40"W
L80	42.23'	N29°06'30"W
L81	67.70'	N30°07'08"W
L82	20.82'	N34°43'15"W
L83	102.33'	N30°59'02"W
L84	23.15'	N26°47'29"W
L85	25.63'	N22°29'10"W
L86	45.50'	N33°59'32"W
L87	122.59'	N33°05'00"W
L88	92.14'	N42°42'34"W
L89	124.80'	N48°41'02"W
L90	50.00'	N48°29'37"W
L91	34.50'	N49°27'05"W
L92	52.79'	N44°53'00"W
L93	41.23'	N47°43'19"W
L94	42.23'	N47°45'59"W
L95	61.51'	N48°19'45"W
L96	46.40'	N47°16'46"W
L97	120.29'	N47°13'45"W
L98	24.04'	N46°00'33"W
L99	35.11'	N47°44'05"W
L100	118.38'	N48°19'19"W
L101	67.78'	N46°13'43"W
L102	67.91'	N46°13'43"W

PERIMETER CURVE TABLE				
Curve	Radius	Arc Length	Delta Angle	Chord
C7	5979.58'	738.21'	07°04'25"	S54°42'33"E 737.74'

APPROVED WAIVERS (GRANTED FEBRUARY _, 2019
•

DIMENSIONAL STANARDS MODIFICATIONS:
•



LOCATION MAP
(not to scale)

TOWN OF KITTERY, PLANNING BOARD

CHAIR	DATE
OWNER/APPLICANT	DATE
OWNER/APPLICANT	DATE

YORK ss REGISTRY OF DEEDS
RECIEVED _____ 20____
AT _____ H _____ M ____M., AND
RECORDED IN BOOK _____ PAGE ____
ATTEST:

_____
REGISTER

LEGEND:

- GRANITE BOUND TO BE SET ⊡
- IRON ROD TO BE SET ●
- MONUMENT FOUND ○ ⊡ ◉
- WETLAND
- VERNAL POOL (NOT SIGNIFICANT M.D.E.P.) VP 7
- HARDWOOD W/ BARBWIRE
- CONIFER W/ BARBWIRE
- PROPERTY LINE
- APPROXIMATE PROPERTY LINE
- EDGE OF WETLAND
- EDGE OF PAVEMENT

ALTUS ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801
(603) 433-2335 www.ALTUS-ENG.com

North EASTERLY SURVEYING, Inc.
SURVEYORS IN N.H. & MAINE
191 STATE ROAD, SUITE #1
KITTERY, MAINE 03904
(207) 439-6333

STATE OF MAINE
ADAM M. PRAY
2485
PROFESSIONAL LAND SURVEYOR

THIS DRAWING HAS NOT BEEN RELEASED FOR CONSTRUCTION

ISSUED FOR:
FINAL APPROVAL

ISSUE DATE:
JANUARY 24, 2019

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	PB SUBMISSION	JKC	6/22/17
1	MDEP SUBMISSION	JKC	3/19/18
2	TOWN FINAL APPROVAL	JKC	1/24/19

DRAWN BY: RMB
APPROVED BY: JKC
DRAWING FILE: 4567SITE.DWG

SCALE:
1 " = 100'

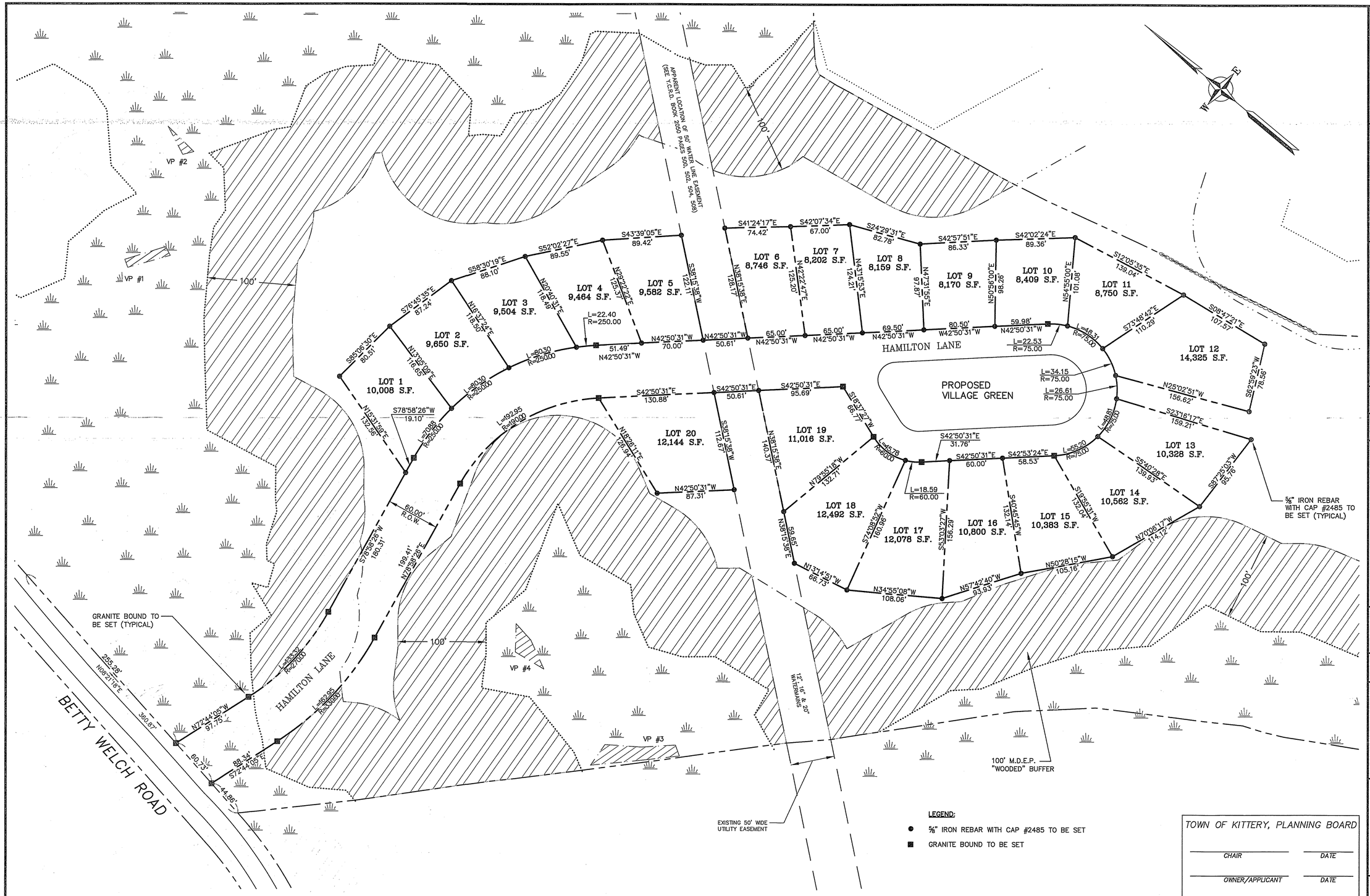
OWNERS/APPLICANT:
CHINBURG DEVELOPMENT, LLC
3 PENSTOCK WAY
NEWMARKET, NH 03857

PROJECT:
HUNTINGTON RUN SUBDIVISION
MAP 66 LOTS 2A, 8 & 8A
40 BETTY WELCH ROAD
KITTERY, MAINE

TITLE:
HUNTINGTON RUN SUBDIVISION PLAN - SHEET 2 OF 3

SHEET NUMBER:
S-1.3

P4567



LEGEND:

- ● 5/8" IRON REBAR WITH CAP #2485 TO BE SET
- ■ GRANITE BOUND TO BE SET

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)

TOWN OF KITTERY, PLANNING BOARD

CHAIR	*DATE*
OWNER/APPLICANT	*DATE*
OWNER/APPLICANT	*DATE*

YORK ss REGISTRY OF DEEDS
RECIEVED _____ 20____
AT _____ H _____ M ____M., AND
RECORDED IN BOOK _____ PAGE ____
ATTEST:

_____
REGISTER

P4567

ALTUS ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801
(603) 433-2335 www.ALTUS-ENG.com

North
WEASTERLY SURVEYING, Inc.
SURVEYORS IN N.H. & MAINE
191 STATE ROAD, SUITE #1
KITTERY, MAINE 03904
(207) 439-6333

STATE OF MAINE
ADAM M. PRAY 2485
PROFESSIONAL LAND SURVEYOR

THIS DRAWING HAS NOT BEEN RELEASED FOR CONSTRUCTION

ISSUED FOR:
FINAL APPROVAL

ISSUE DATE:
JANUARY 24, 2019

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	PB SUBMISSION	JKC	6/22/17
1	MDEP SUBMISSION	JKC	3/19/18
2	TOWN FINAL APPROVAL	JKC	1/24/19

DRAWN BY: RMB
APPROVED BY: JKC
DRAWING FILE: 4567SITE.DWG

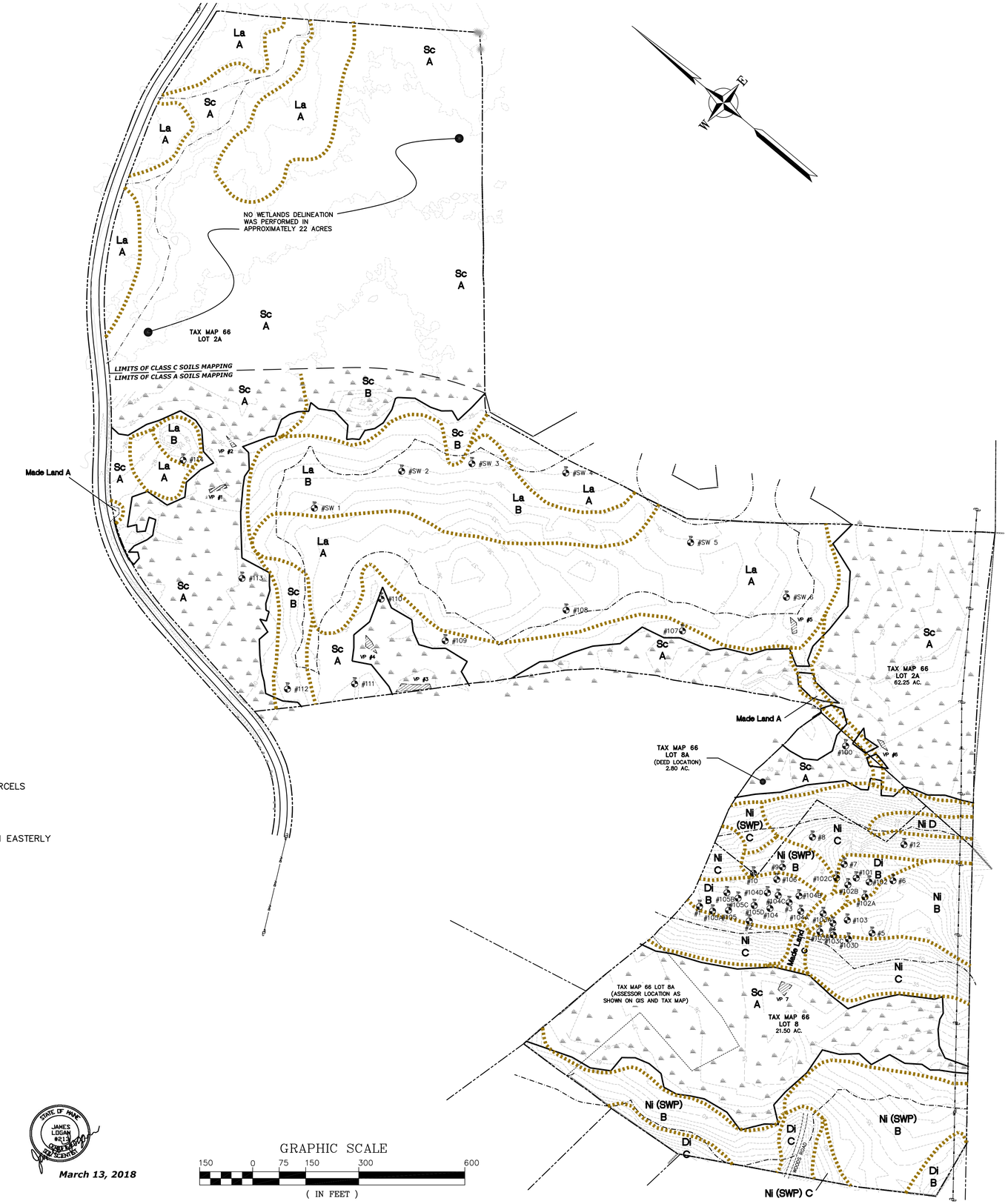
SCALE: 1 " = 50'

OWNERS/APPLICANT:
CHINBURG DEVELOPMENT, LLC
3 PENSTOCK WAY
NEWMARKET, NH 03857

PROJECT:
HUNTINGTON RUN SUBDIVISION
MAP 66 LOTS 2A, 8 & 8A
40 BETTY WELCH ROAD
KITTERY, MAINE

TITLE:
HUNTINGTON RUN SUBDIVISION PLAN - SHEET 3 OF 3

SHEET NUMBER:
S-1.4



NOTES:

1. WETLANDS DELINEATION BY GOVE ENVIRONMENTAL SERVICES, INC., EXETER, NH WITHIN THE SUBJECT PARCELS FEBRUARY 2014 AND RECORD INFORMATION FOR ADJACENT LOTS.
2. HIGH INTENSITY SOILS SURVEY DELINEATED PERFORMED BY LONGVIEW PARTNERS, LLC APRIL 2017.
3. TOPOGRAPHIC DATA BASED ON "STANDARD BOUNDARY SURVEY & EXISTING CONDITION PLAN" BY NORTH EASTERLY SURVEYING, INC., DATED DECEMBER 1, 2016.

SOIL LEGEND:

SOIL I.D.	MAP UNIT NAME	DRAINAGE CLASS	HSG GROUP
Di	DIXFIELD	MODERATELY WELL DRAINED	C
La	LAMOINE	SOMEWHAT POORLY DRAINED	D
Ni	NICHOLVILLE	MODERATELY WELL DRAINED	C
Ni (S.W.P.)	NICHOLVILLE (S.W.P.)	SOMEWHAT POORLY DRAINED	C
Sc	SCANTIC	POORLY DRAINED	D
MAN-MADE			D

LEGEND:

JURISDICTIONAL WETLANDS BOUNDARY

HISS BOUNDARY

VP #4 Vernal Pool (not significant per MDEP)

STATE OF MAINE JAMES LOGAN #215 CERTIFIED SOIL SCIENTIST

March 13, 2018

GRAPHIC SCALE

150 0 75 150 300 600

(IN FEET)

ALTUS ENGINEERING, INC.

133 COURT STREET PORTSMOUTH, NH 03801
(603) 433-2335 www.ALTUS-ENG.com

LONGVIEW PARTNERS, LLC
ENVIRONMENTAL PERMITTING SPECIALISTS

THIS DRAWING HAS NOT BEEN RELEASED FOR CONSTRUCTION

ISSUED FOR: APPROVAL

ISSUE DATE: MARCH 21, 2018

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	PB SUBMISSION	JKC	6/22/17
1	MDHHS SUBMISSION	JKC	2/21/18
2	MDEP SUBMISSION	JKC	3/21/18

DRAWN BY: RMB
APPROVED BY: JKC
DRAWING FILE: 4567SITE.DWG

SCALE: 1 " = 150'

OWNERS/APPLICANT:

CHINBURG DEVELOPMENT, LLC

3 PENSTOCK WAY
NEWMARKET, NH 03857

PROJECT:

HUNTINGTON RUN SUBDIVISION
MAP 66 LOTS 2A, 8 & 8A
40 BETTY WELCH ROAD
KITTERY, MAINE

TITLE:

SOILS PLAN

SHEET NUMBER: G-1.0

P4567

LEGEND:

WETLANDS SYMBOL

WETLANDS BOUNDARY

APPROX. RESOURCE PROTECTION OVERLAY ZONE (OZ-RP)

12 — PROPOSED LOT NUMBER

PROPOSED LOT LINE

PROPOSED BUILDING SETBACK

UGC — PROPOSED UNDERGROUND ELECTRIC, TELEPHONE & CABLE

PW — PROPOSED WATERMAIN

FM — PROPOSED FORCEMAIN

L.S. — PROPOSED LEVEL SPREADER

R.D.T. — PROPOSED ROAD DITCH TURN

WP #1 — PROPOSES WETPOND

VP #4 — VERNAL POOL (NOT SIGNIFICANT PER MDEP)

TP #6 — TEST PIT

SITE NOTES:

1. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL PERMITS OBTAINED FOR THIS PROJECT.
2. HAMILTON LANE IS PROPOSED AS A PUBLIC ROAD.
3. PROPOSED TELEPHONE, ELECTRIC AND CABLE SERVICES AND CONDUITS SHALL BE INSTALLED UNDERGROUND.
4. ALL LOT SHALL BE SERVED BY MUNICIPAL WATER AND AND A COMMUNITY WASTEWATER SYSTEM WITH COMMON DISPOSAL FIELDS AND RESERVE AREAS IN ACCORDANCE TO MAINE SUBSURFACE WASTEWATER DISPOSAL RULES. EACH LOT SHALL HAVE THEIR OWN SEPTIC TANK AND ADVANCED TREATMENT SYSTEM THAT WILL PUMP AEROBICALLY TREATED EFFLUENT TO THE COMMUNITY DISPOSAL FIELDS VIA COMMON FORCE MAINS. RESERVE AREAS ARE SHOWN ON THE PLAN.
5. THE ROAD SHALL HAVE A POSTED SPEED LIMIT OF 20 MPH. THE DEVELOPER SHALL CLEAR EXISTING VEGETATION AND TREES WITHIN SIGHT DISTANCE ENVELOPE.
6. DURING FEBRUARY 2014, WETLANDS WERE DELINEATED BY GOVE ENVIRONMENTAL SERVICES, INC.
7. AS SHOWN ON FIRM FOR THE TOWN OF KITTERY, PANEL NO. 23031C0663G AND NO. 23031C0664G, THE LOTS ARE NOT WITHIN 100-YEAR FLOOD ZONE.
8. "BUFFER EASEMENTS" AS REQUIRED BY MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION, STORMWATER MANAGEMENT LAW, SHALL BE MAINTAINED PER THE PERMIT CONDITIONS AND HOMEOWNER ASSOCIATION DOCUMENTS.
9. ACCUMULATED SNOW WILL BE PLOWED TO AREAS ADJACENT TO PAVEMENT. SNOW WILL NOT BE DUMPED INTO WETLAND AREAS.
10. COMMON OPEN SPACE SHALL NOT BE USED FOR FUTURE BUILDING LOTS. COMMON OPEN SPACE SHALL BE OWNED BY A HOMEOWNER'S ASSOCIATION AND MAINTAINED IN ACCORDANCE WITH THE BYLAWS OF THE ASSOCIATION.
11. BOUNDARY SURVEY PERFORMED BY NORTH EASTERLY SURVEY, INC., KITTERY, MAINE.
12. LOCATION OF NEIGHBORHOOD MAILBOX IS SUBJECT TO APPROVAL OF THE U.S. POSTAL SERVICE.
13. BUFFER AREAS SHALL BE CLEARLY DELINEATED AND PROTECTED DURING CONSTRUCTION. TOWN APPROVED DISKS SHALL BE MOUNTED ON TREES OR BY OTHER SUITABLE MEANS TO PROVIDE LINE OF SIGHT DELINEATION OF BUFFER LIMITS.
14. ROADWAY MONUMENTATION SHALL BE A MINIMUM OF FOUR (4) INCHES SQUARE STONE MONUMENTS AND INSTALLED AS SHOWN ON SUBDIVISION PLAN AND PER TOWN STANDARDS.
15. ELEVATIONS ARE BASED ON ASSUMED DATUM.

PHASING NOTE:

THE PROJECT WILL BE CONSTRUCTED IN ONE PHASE, EXCLUSIVE OF HOUSE CONSTRUCTION AND LOT LANDSCAPING.

CONSTRUCTION NOTES:

1. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL PERMITS OBTAINED FOR THE PROJECT. DO NOT BEGIN CONSTRUCTION UNTIL ALL PERMITS HAVE BEEN OBTAINED.
2. CONTRACTOR SHALL OBTAIN A "DIGSAFE NUMBER" AT LEAST 72 HOURS PRIOR TO COMMENCING CONSTRUCTION. THE LOCATION OF EXISTING UNDERGROUND UTILITIES IS APPROXIMATE AND THE LOCATIONS OR COMPLETENESS ARE NOT GUARANTEED BY THE ENGINEER, SURVEYOR OR OWNER/DEVELOPER. THE ABSENCE OF SUBSURFACE STRUCTURES, UTILITIES, ETC., FROM THESE PLANS, BUT IN EXISTENCE IS NOT INTENDED OR IMPLIED. IT IS THE SITE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL UTILITIES, ANTICIPATE CONFLICTS, REPAIR EXISTING UTILITIES AND RELOCATE EXISTING UTILITIES AT NO ADDITIONAL COST TO THE DEVELOPER/OWNER.
3. ALL CONSTRUCTION SHALL CONFORM TO THE MINIMUM CONSTRUCTION STANDARDS OF THE TOWN OF KITTERY AND THE M.D.O.T. STANDARD SPECIFICATIONS FOR ROAD CONSTRUCTION, LATEST EDITION.
4. ALL PAVEMENT MARKINGS AND SIGNS SHALL CONFORM TO ADA REQUIREMENTS AND THE MINIMUM REQUIREMENTS OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" AND "STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS," LATEST EDITIONS.
5. CLEAN AND COAT VERTICAL FACE OF EXISTING PAVEMENT AT SAWCUT LINE WITH RS-1 IMMEDIATELY PRIOR TO PLACING NEW BITUMINOUS CONCRETE
6. CULVERTS SHALL BE CORRUGATED POLYETHYLENE PIPE (CPE), TYPE ADS N-12 OR HANCOR H1-Q, WITH METAL FLARED END SECTIONS, UNLESS INDICATED OTHERWISE.
7. UPON COMPLETION OF THE ROADWAY CONSTRUCTION, THE DRAINAGE INFRASTRUCTURE SHALL BE CLEANED OF ALL DEBRIS AND SEDIMENT.
8. UPON COMPLETION OF THE SEWER LINES, THE FORCE MAIN AND SEWER SERVICES SHALL BE CLEANED OF ALL DEBRIS AND SEDIMENT, TESTED AND MARKED AT PROPERTY LINE.
9. INSTALL UNDERGROUND TELEPHONE, ELECTRIC AND CABLE SERVICES AND CONDUITS TO THE REQUIREMENTS OF THE RESPECTIVE UTILITY. ALL UNDERGROUND CONDUIT SHALL HAVE NYLON PULL ROPES TO FACILITATE PULLING OF CABLES.
10. GRIND STUMPS AND REUSE GRINDINGS FOR EROSION CONTROL WHERE POSSIBLE. NO STUMPS WILL BE BURIED ON SITE.
11. IF ENCOUNTERED, DISPOSE OF EXCESS ROCK AND BOULDERS BY BLASTING, CRUSHING OR BURYING IN APPROVED UPLAND AREAS, OR OFF-SITE DISPOSAL AREAS.
12. CONTRACTOR TO ESTABLISH AND MAINTAIN TEMPORARY BENCHMARKS (TBMS) AND PERFORM CONSTRUCTION LAYOUT.
13. CONTRACTOR SHALL MAINTAIN AND PROVIDE RECORD DRAWINGS TO THE OWNER/DEVELOPER. CONTRACTOR SHALL PROVIDE TIES FROM PROPERTY BOUNDS TO UTILITY LOCATIONS.
14. STORMWATER AND EROSION CONTROL BEST MANAGEMENT PRACTICES (BMPS) SHALL BE INCORPORATED AND MAINTAINED DURING ALL PHASES OF CONSTRUCTION.
15. ROADWAY CONSTRUCTION AND LOT DEVELOPMENT ARE SUBJECT THE REQUIREMENTS OF THE MAINE CONSTRUCTION GENERAL PERMIT. CONTRACTORS/OWNERS SHALL FILE A "NOTICE OF INTENT" WITH MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION PRIOR TO COMMENCEMENT OF CONSTRUCTION.
16. TEMPORARY EROSION CONTROL MEASURES TO CONTROL EROSION AND PREVENT SEDIMENT CONTAMINATION OF DOWN GRADIENT AREAS SHALL BE INSTALLED PRIOR TO ANY EARTH MOVING ACTIVITIES.
17. ALL AREAS OF THE SITE WHICH ARE DISTURBED SHALL BE LOAMED AND SEEDED WITH A MINIMUM OF 4" DEPTH OF TOPSOIL, UNLESS NOTED OTHERWISE.
18. BLASTING OPERATIONS, IF USED, SHALL MEET THE AIR BLAST STANDARDS OF THE MDEP RULES, CHAPTER 375.10(C)(4)(C), GROUND VIBRATION AT STRUCTURES NOT OWNED OR CONTROLLED BY THE DEVELOPER MUST BE NO GREATER THAN THE FREQUENCY-DEPENDENT LIMITS DEFINED IN FIGURE B-1 OF APPENDIX B, U.S. BUREAU OF MINES RI 8507, AND THAT FLYROCK MAY NOT LEAVE PROPERTY OWNED OR CONTROLLED BY THE DEVELOPER OR ENTER A PROTECTED RESOURCE.
19. THE LOCATION AND CONSTRUCTION OF EACH DRIVEWAY SHALL ENSURE THAT ADEQUATE DRAINAGE IS MAINTAINED. INSTALL 12"ø MIN. CULVERT WHERE NECESSARY.
20. PROTECTION OF SUBGRADE: THE CONTRACTOR SHALL BE REQUIRED TO MAINTAIN STABLE, DEWATERED SUBGRADES FOR FOUNDATIONS, PAVEMENT AREAS, UTILITY TRENCHES, AND OTHER AREAS DURING CONSTRUCTION. SUBGRADE DISTURBANCE MAY BE INFLUENCED BY EXCAVATION METHODS, MOISTURE, PRECIPITATION, GROUNDWATER CONTROL, AND CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL TAKE PRECAUTIONS TO PREVENT SUBGRADE DISTURBANCE. SUCH PRECAUTIONS MAY INCLUDE DIVERTING STORMWATER RUNOFF AWAY FROM CONSTRUCTION AREAS, REDUCING TRAFFIC IN SENSITIVE AREAS, AND MAINTAINING AN EFFECTIVE DEWATERING PROGRAM. SOILS EXHIBITING HEAVING OR INSTABILITY SHALL BE OVER EXCAVATED TO MORE COMPETENT BEARING SOIL AND REPLACED WITH FREE DRAINING STRUCTURAL FILL.
21. IF THE EARTHWORK IS PERFORMED DURING FREEZING WEATHER, EXPOSED SUBGRADES ARE SUSCEPTIBLE TO FROST. NO FILL OR UTILITIES SHALL BE PLACED ON FROZEN GROUND. THIS WILL LIKELY REQUIRE REMOVAL OF FROZEN SOIL CRUST AT THE COMMENCEMENT OF EACH DAY'S OPERATION. THE FINAL SUBGRADE ELEVATION WOULD ALSO REQUIRE AN APPROPRIATE DEGREE OF INSULATION AGAINST FREEZING.
22. EXCAVATED MATERIALS SHALL BE PLACED AS FILL MATERIALS WITHIN UPLAND AREAS ONLY AND SHALL NOT BE PLACED WITHIN THE 100-YEAR FLOOD ZONE OR BUFFER EASEMENTS.
23. CONTRACTOR SHALL REMOVE AND DISPOSE OF EXISTING ON-SITE STRUCTURES, BITUMINOUS CONCRETE, DEBRIS, AND CONSTRUCTION WASTE PRODUCTS WHICH ARE NOT AUTHORIZED TO BE USED AS PART OF CONSTRUCTION.
24. PLACEMENT OF BORROW MATERIALS SHALL BE PERFORMED IN A MANNER THAT PREVENTS LONG TERM DIFFERENTIAL SETTLEMENT. EXCESSIVELY WET MATERIALS SHALL BE STOCKPILED AND ALLOWED TO DRAIN BEFORE PLACEMENT. FROZEN MATERIAL SHALL NOT BE USED FOR CONSTRUCTION. VOIDS BETWEEN STONES AND CLUMPS OF MATERIAL SHALL BE FILLED WITH FINE MATERIALS.
25. WORK HOURS FOR CONSTRUCTION WILL BE AS APPROVED BY TOWN OF KITTERY AND M.D.E.P. STANDARDS WORK HOURS SHALL BE 7AM TO 7PM.

P4567

ALTUS ENGINEERING, INC.

133 COURT STREET PORTSMOUTH, NH 03801
(603) 433-2335 www.ALTUS-ENG.com

STATE OF MAINE
JEFFREY K. CLIFFORD
No. 5967
LICENSED
PROFESSIONAL ENGINEER

THIS DRAWING HAS NOT BEEN RELEASED FOR CONSTRUCTION

ISSUED FOR:
FINAL APPROVAL

ISSUE DATE:
JANUARY 24, 2019

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	PB SUBMISSION	JKC	6/22/17
1	MDEP SUBMISSION	JKC	3/19/18
2	TOWN FINAL APPROVAL	JKC	1/24/19

DRAWN BY: RMB
APPROVED BY: JKC
DRAWING FILE: 4567SITE.DWG

SCALE:
N.T.S.

OWNERS/APPLICANT:

CHINBURG DEVELOPMENT, LLC

3 PENSTOCK WAY
NEWMARKET, NH 03857

PROJECT:

HUNTINGTON RUN
SUBDIVISION
MAP 66 LOTS 2A, 8 & 8A
40 BETTY WELCH ROAD
KITTERY, MAINE

TITLE:

LEGEND AND GENERAL NOTES

SHEET NUMBER:

G-1.1

BETTY WELCH ROAD

INSTALL 'D-3' ROAD NAME SIGN AND 'R1-1' STOP SIGN AT INTERSECTION

SIGHT DISTANCE REFERENCE POINT (15' FROM EXIST. EDGE OF PAVEMENT)

INSTALL DOUBLE SEDIMENTATION BARRIER FROM STA.0+12 TO STA. 2+00

12" Cl. WATERMAIN (INSTALLED 1908, DISCONTINUED)

ZONE R-RL
ZONE OZ-SL-250

100' WETLAND SETBACK

CONSTRUCT 3' WIDE GRASSED SWALE

INSTALL GRASSED UNDERDRAIN SOIL FILTER #1

INSTALL 4' WIDE GRAVEL SHOULDER, TYP.

20' (TYP.)

10' (TYP.)

60' R.O.W.

HAMILTON LANE

0+00 1+00 2+00 3+00 4+00 5+00 6+00 7+00 8+00

H.P. 37.00

INSTALL SEDIMENTATION BARRIER (TYP.)

INSTALL MAILBOXES AND DROP OFF AREA

INSTALL 100' LONG STABILIZED CONSTRUCTION EXIT

INSTALL ROAD DITCH TURNOUT AND LEVEL SPREADER

APPROX. RESOURCE PROTECTION ZONE (OZ-RP)

INSTALL "BIKE WITH VEHICLE TRAFFIC" SIGN

VERNAL POOL (TYP.)

INSTALL UTILITY POLE, 2 TOTAL (LOCATIONS TBD BY UTILITY COMPANY)

EXTEND OVERHEAD ELEC./COMM./TEL. SERVICES

MATCH LINE SEE SHEET C-1.1

12" Cl. WATERMAIN (INSTALLED 1918, DISCONT.)
16" Cl. WATERMAIN (INSTALLED 1962, DISCONT.)
20" DI. WATERMAIN (INSTALLED 1974)

50' EASEMENT

GRAPHIC SCALE
30 0 15 30 60 120
(IN FEET)

P4567

ALTUS ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801
(603) 433-2335 www.ALTUS-ENG.com

STATE OF MAINE
JEFFREY K. CLIFFORD
No. 5967
LICENSED
PROFESSIONAL ENGINEER

THIS DRAWING HAS NOT BEEN RELEASED FOR CONSTRUCTION

ISSUED FOR: FINAL APPROVAL

ISSUE DATE: JANUARY 24, 2019

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	PB SUBMISSION	JKC	6/22/17
1	MDEP SUBMISSION	JKC	3/19/18
2	REVISED ROADWAY WIDTH	JKC	8/23/18
3	TOWN FINAL APPROVAL	JKC	1/24/19

DRAWN BY: RMB
APPROVED BY: JKC
DRAWING FILE: 4567SITE.DWG

SCALE: 1 " = 30'

OWNERS/APPLICANT:

CHINBURG DEVELOPMENT, LLC
3 PENSTOCK WAY
NEWMARKET, NH 03857

PROJECT:

HUNTINGTON RUN SUBDIVISION
MAP 66 LOTS 2A, 8 & 8A
40 BETTY WELCH ROAD
KITTERY, MAINE

TITLE:

LOT PLAN - A

SHEET NUMBER:

C-1.0

50' EASEMENT

INSTALL OUTLET STRUCTURE #1

INSTALL GRASSED UNDERDRAIN SOIL FILTER #1
TOP OF BERM 32.75'
POND BOT.=30.67'

INSTALL OUTLET STRUCTURE #2

INSTALL GRASSED UNDERDRAIN SOIL FILTER #2
TOP OF BERM 32.10'
POND BOT.=30.67'

CONSTRUCT 3' WIDE GRASSED SWALE

INSTALL STORM DRAIN INLET PROTECTION

CONSTRUCT 3' WIDE GRASSED SWALE

INSTALL OUTLET STRUCTURE #3

INSTALL 8'-WIDE BENCH AT ELEV. 29.25' WITH 80' LONG UNDERDRAIN GRAVEL TRENCH WITH 6" PERF. SDR35 PIPE

INSTALL WET POND #3
TOP OF BERM 33.0';
WATER ELEV. 29.25'

HAMILTON LANE

CONSTRUCT 3' WIDE GRASSED SWALE

PROP. VILLAGE GREEN

20' (TYP.)

10' (TYP.)

30'

CONSTRUCT 5' WIDE GRASSED SWALE

INSTALL SEDIMENTATION BARRIER (TYP.)

INSTALL 10' WIDE REINFORCED GRASSED ACCESS WAY TO SUBSURFACE WASTEWATER DISPOSAL FIELDS

CONSTRUCT 4' WIDE GRASSED SWALE

INSTALL FOREBAY

INSTALL EMERGENCY SPILLWAY; ELEV. 31.40

PRESERVE VIABLE TREES WITHIN VILLAGE GREEN; INSTALL TREES ALONG THE EDGE OF LOOP ROAD (10 TREE MIN., 2.5" CALIPER, 12' TALL; TYPE PER KITTERY DESIGN HANDBOOK AND OWNER)

100' WETLAND SETBACK

50' WETLAND SETBACK

50' EASEMENT

20" D.I. WATERMAIN (INSTALLED 1974)
16" CI. WATERMAIN (INSTALLED 1942, DISCONT.)
12" CI. WATERMAIN (INSTALLED 1916, DISCONT.)

SEE SHEET C-1.0 MATCH LINE

GRAPHIC SCALE
30 0 15 30 60 120
(IN FEET)

P4567

ALTUS ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801
(603) 433-2335 www.ALTUS-ENG.com

STATE OF MAINE
JEFFREY K. CLIFFORD
No. 5967
LICENSED
PROFESSIONAL ENGINEER

THIS DRAWING HAS NOT BEEN RELEASED FOR CONSTRUCTION

ISSUED FOR:
FINAL APPROVAL

ISSUE DATE:
JANUARY 24, 2019

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	PB SUBMISSION	JKC	6/22/17
1	MDEP SUBMISSION	JKC	3/19/18
2	MDEP COMMENTS	JKC	7/13/18
3	REVISED ROADWAY WIDTH	JKC	8/29/18
4	MDEP COMMENTS	JKC	9/10/18
5	TOWN FINAL APPROVAL	JKC	1/24/19

DRAWN BY: RMB
APPROVED BY: JKC
DRAWING FILE: 4567SITE.DWG

SCALE: 1 " = 30'

OWNERS/APPLICANT:
CHINBURG DEVELOPMENT, LLC
3 PENSTOCK WAY
NEWMARKET, NH 03857

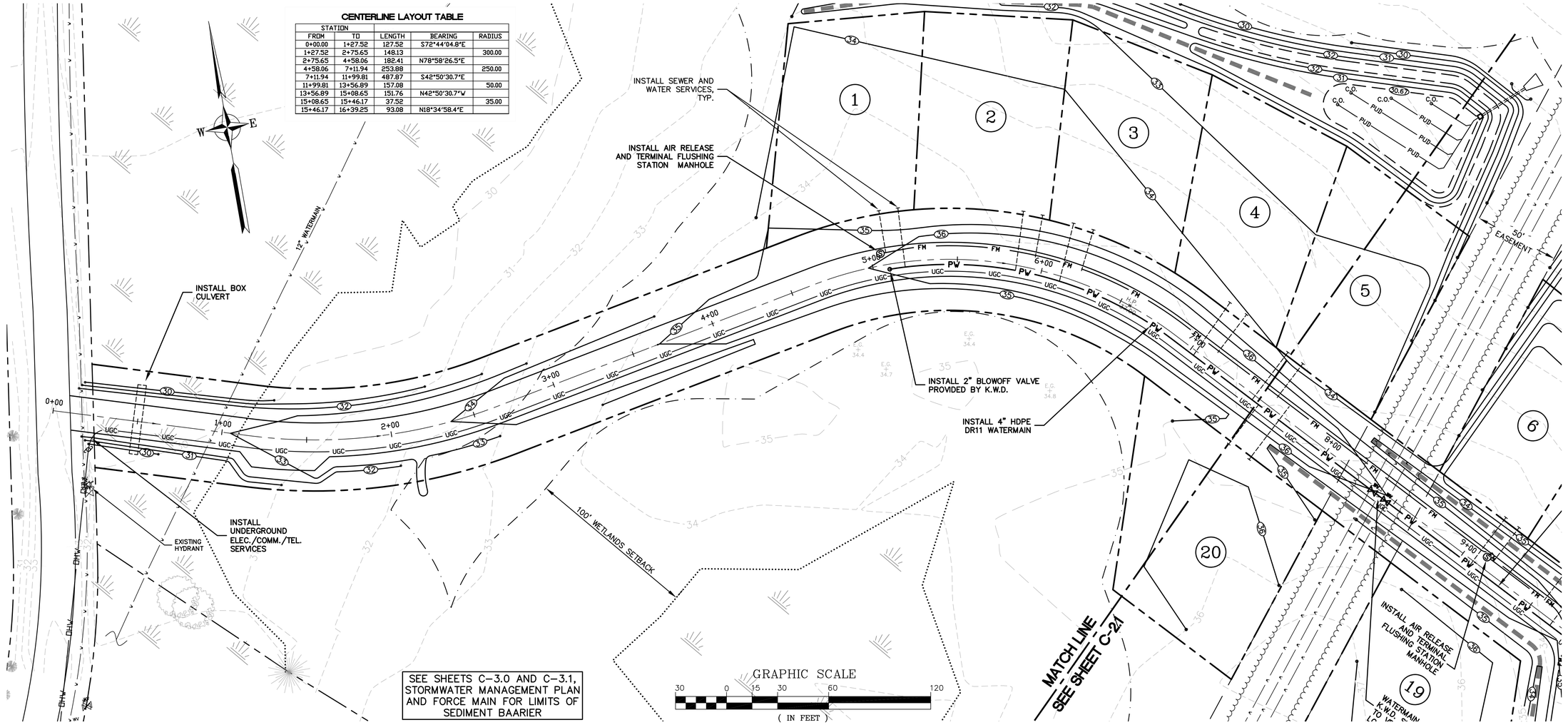
PROJECT:

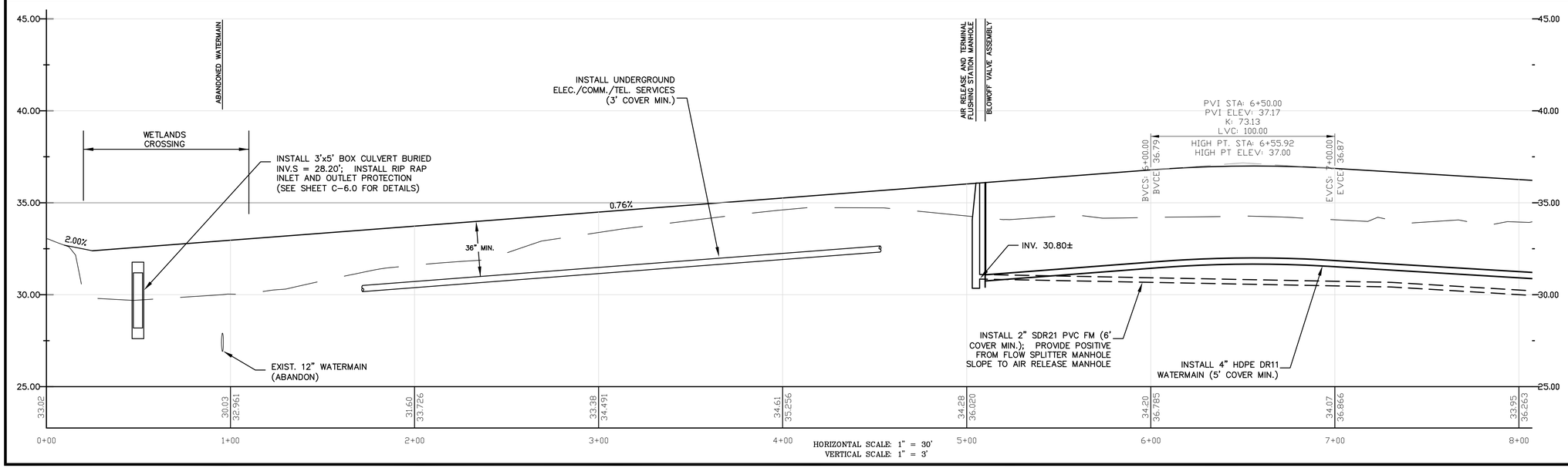
TITLE:
LOT PLAN - B

SHEET NUMBER:
C-1.1

CENTERLINE LAYOUT TABLE

STATION				
FROM	TO	LENGTH	BEARING	RADIUS
0+00.00	1+27.52	127.52	S72°44'04.8"E	
1+27.52	2+75.65	148.13		300.00
2+75.65	4+58.06	182.41	N78°58'26.5"E	
4+58.06	7+11.94	253.88		250.00
7+11.94	11+99.81	487.87	S42°50'30.7"E	
11+99.81	13+56.89	157.08		50.00
13+56.89	15+08.65	151.76	N42°50'30.7"W	
15+08.65	15+46.17	37.52		35.00
15+46.17	16+39.25	93.08	N18°34'58.4"E	





ALTUS ENGINEERING, INC.

133 COURT STREET PORTSMOUTH, NH 03801
(603) 433-2335 www.ALTUS-ENG.com

STATE OF MAINE
JEFFREY K. CLIFFORD
No. 5967
LICENSED
PROFESSIONAL ENGINEER

THIS DRAWING HAS NOT BEEN RELEASED FOR CONSTRUCTION

ISSUED FOR:
FINAL APPROVAL

ISSUE DATE:
JANUARY 24, 2019

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	PB SUBMISSION	JKC	6/22/17
1	MDHHS SUBMISSION	JKC	2/21/18
2	MDEP SUBMISSION	JKC	3/19/18
3	TOWN FINAL APPROVAL	JKC	1/24/19

DRAWN BY: RMB
APPROVED BY: JKC
DRAWING FILE: 4567SITE.DWG

SCALE:
1 " = 30'

OWNERS/APPLICANT:

CHINBURG DEVELOPMENT, LLC

3 PENSTOCK WAY
NEWMARKET, NH 03857

PROJECT:

HUNTINGTON RUN SUBDIVISION
MAP 66 LOTS 2A, 8 & 8A
40 BETTY WELCH ROAD
KITTERY, MAINE

TITLE:

ROADWAY PLAN AND PROFILE - A

SHEET NUMBER:

C-2.0

P4567

CENTERLINE LAYOUT TABLE

STATION		LENGTH	BEARING	RADIUS
FROM	TO			
0+00.00	1+27.52	127.52	S72°44'04.8"E	
1+27.52	2+75.65	148.13		300.00
2+75.65		182.41	N78°58'26.5"E	
4+58.06	7+11.94	253.88		250.00
7+11.94	11+99.81	487.87	S42°50'30.7"E	
11+99.81	13+56.89	157.08		50.00
13+56.89	15+08.65	151.76	N42°50'30.7"W	
15+08.65	15+46.17	37.52		35.00
15+46.17	16+39.25	93.08	N18°34'58.4"E	

INSTALL 8" HDPE DR11 WATERMAIN

INSTALL FLUSHING VALVE, TYP. (2 TOTAL); PROVIDED BY K.W.D.

INSTALL HYDRANT ASSEMBLY

INSTALL UNDERGROUND ELEC./COMM./TEL. SERVICES

INSTALL AIR RELEASE AND TERMINAL FLUSHING STATION MANHOLE

INSTALL 18" WIDE STONE TRENCH W/6" PERF. UNDERDRAIN

INSTALL 2" FORCE MAIN

INSTALL FLOW SPLITTER MANHOLE

PDI #1

OUTLET INV.S 30.50

WATERMAIN CONNECTIONS; K.W.D. SHALL TEST PIT TO VERIFY DEPTHS AND LOCATIONS

INSTALL CULVERT 12" CPE x 24' LONG INV. IN=30.70 INV. OUT=30.50

INSTALL 5'X10' PAVED BUMP OUT

INSTALL SEWER AND WATER SERVICES, TYP.

INSTALL (2) 2" FORCE MAINS TO WASTEWATER DISPOSAL AREA (5' MIN. COVER)

INSTALL 10' WIDE REINFORCED GRASSED ACCESS WAY TO WASTEWATER DISPOSAL AREA

SEE SHEET C-2.0 MATCH LINE

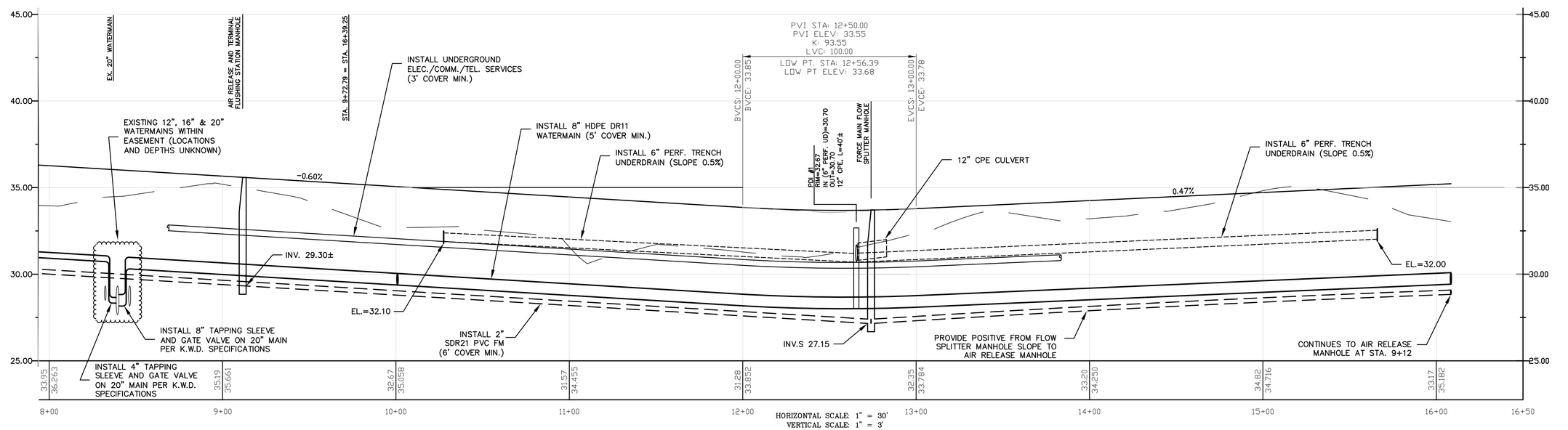
EASEMENT

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)

SEE SHEETS C-3.0 AND C-3.1, STORMWATER MANAGEMENT PLAN AND FORCE MAIN FOR LIMITS OF SEDIMENT BAARIER



HORIZONTAL SCALE: 1" = 30'
VERTICAL SCALE: 1" = 3'

P4567

ALTUS ENGINEERING, INC.

133 COURT STREET PORTSMOUTH, NH 03801
(603) 433-2335 www.ALTUS-ENG.com

STATE OF MAINE
JEFFREY K. CLIFFORD
No. 5967
LICENSED
PROFESSIONAL ENGINEER

THIS DRAWING HAS NOT BEEN RELEASED FOR CONSTRUCTION

ISSUED FOR:
FINAL APPROVAL

ISSUE DATE:
JANUARY 24, 2019

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	PB SUBMISSION	JKC	6/22/17
1	MDHHS SUBMISSION	JKC	2/21/18
2	MDEP SUBMISSION	JKC	3/19/18
3	TOWN FINAL APPROVAL	JKC	1/24/19

DRAWN BY: RMB
APPROVED BY: JKC
DRAWING FILE: 4567SITE.DWG

SCALE:
1 " = 30'

OWNERS/APPLICANT:

CHINBURG DEVELOPMENT, LLC

3 PENSTOCK WAY
NEWMARKET, NH 03857

PROJECT:

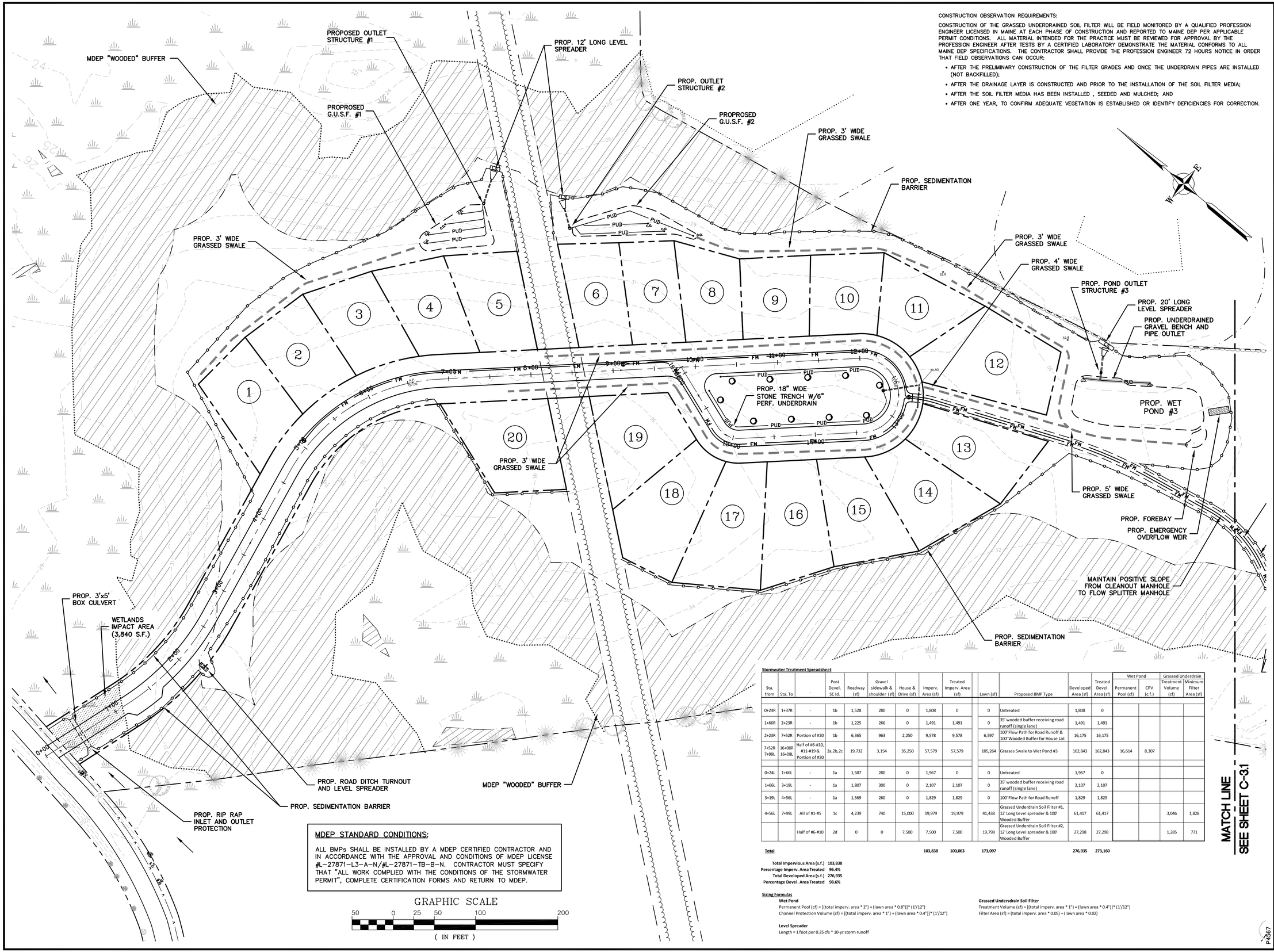
HUNTINGTON RUN SUBDIVISION
MAP 66 LOTS 2A, 8 & 8A
40 BETTY WELCH ROAD
KITTERY, MAINE

TITLE:

ROADWAY PLAN AND PROFILE - B

SHEET NUMBER:

C-2.1



CONSTRUCTION OBSERVATION REQUIREMENTS:

CONSTRUCTION OF THE GRASSED UNDERDRAINED SOIL FILTER WILL BE FIELD MONITORED BY A QUALIFIED PROFESSION ENGINEER LICENSED IN MAINE AT EACH PHASE OF CONSTRUCTION AND REPORTED TO MAINE DEP PER APPLICABLE PERMIT CONDITIONS. ALL MATERIAL INTENDED FOR THE PRACTICE MUST BE REVIEWED FOR APPROVAL BY THE PROFESSION ENGINEER AFTER TESTS BY A CERTIFIED LABORATORY DEMONSTRATE THE MATERIAL CONFORMS TO ALL MAINE DEP SPECIFICATIONS. THE CONTRACTOR SHALL PROVIDE THE PROFESSION ENGINEER 72 HOURS NOTICE IN ORDER THAT FIELD OBSERVATIONS CAN OCCUR:

- AFTER THE PRELIMINARY CONSTRUCTION OF THE FILTER GRADES AND ONCE THE UNDERDRAIN PIPES ARE INSTALLED (NOT BACKFILLED);
- AFTER THE DRAINAGE LAYER IS CONSTRUCTED AND PRIOR TO THE INSTALLATION OF THE SOIL FILTER MEDIA;
- AFTER THE SOIL FILTER MEDIA HAS BEEN INSTALLED , SEEDED AND MULCHED; AND
- AFTER ONE YEAR, TO CONFIRM ADEQUATE VEGETATION IS ESTABLISHED OR IDENTIFY DEFICIENCIES FOR CORRECTION.

Stormwater Treatment Spreadsheet

Sta. from	Sta. To	-	Post Devel. SC Id.	Roadway (sf)	Gravel sidewalk & shoulder (sf)	House & Drive (sf)	Imperv. Area (sf)	Treated Imperv. Area (sf)	Lawn (sf)	Proposed BMP Type	Developed Area (sf)	Treated Devel. Area (sf)	Wet Pond Permanent Pool (cf)	Wet Pond CPV (c.f.)	Grassed Underdrain Treatment Volume (cf)	Grassed Underdrain Minimum Filter Area (sf)
0+24R	1+37R	-	1b	1,528	280	0	1,808	0	0	Untreated	1,808	0				
1+66R	2+23R	-	1b	1,225	266	0	1,491	1,491	0	35' wooded buffer receiving road runoff (single lane)	1,491	1,491				
2+23R	7+52R	Portion of #20	1b	6,365	963	2,250	9,578	9,578	6,597	100' Flow Path for Road Runoff & 100' Wooded Buffer for House Lot	16,175	16,175				
7+52R 7+99L	16+08R 16+08L	Half of #6-#10, #11-#19 & Portion of #20	2a,2b,2c	19,732	3,154	35,250	57,579	57,579	105,264	Grasses Swale to Wet Pond #3	162,843	162,843	16,614	8,307		
0+24L	1+66L	-	1a	1,687	280	0	1,967	0	0	Untreated	1,967	0				
1+66L	3+19L	-	1a	1,807	300	0	2,107	2,107	0	35' wooded buffer receiving road runoff (single lane)	2,107	2,107				
3+19L	4+56L	-	1a	1,569	260	0	1,829	1,829	0	100' Flow Path for Road Runoff	1,829	1,829				
4+56L	7+99L	All of #1-#5	1c	4,239	740	15,000	19,979	19,979	41,438	Grassed Underdrain Soil Filter #1, 12' Long Level spreader & 100' Wooded Buffer	61,417	61,417			3,046	1,828
		Half of #6-#10	2d	0	0	7,500	7,500	7,500	19,798	Grassed Underdrain Soil Filter #2, 12' Long Level spreader & 100' Wooded Buffer	27,298	27,298			1,285	771
Total							**103,838**	**100,063**	**173,097**		**276,935**	**273,160**				

Total Impervious Area (s.f.) 103,838
Percentage Imperv. Area Treated 96.4%
Total Developed Area (s.f.) 276,935
Percentage Devel. Area Treated 98.6%

Sizing Formulas

Wet Pond
Permanent Pool (cf) = [(total imperv. area * 2") + (lawn area * 0.8")]* (1'/12")
Channel Protection Volume (cf) = [(total imperv. area * 1") + (lawn area * 0.4")]* (1'/12")

Level Spreader
Length = 1 foot per 0.25 cfs * 10-yr storm runoff

Grassed Underdrain Soil Filter
Treatment Volume (cf) = [(total imperv. area * 1") + (lawn area * 0.4")]* (1'/12")
Filter Area (sf) = (total imperv. area * 0.05) + (lawn area * 0.02)

MDEP STANDARD CONDITIONS:

ALL BMPs SHALL BE INSTALLED BY A MDEP CERTIFIED CONTRACTOR AND IN ACCORDANCE WITH THE APPROVAL AND CONDITIONS OF MDEP LICENSE #L-27871-L3-A-N/#L-27871-TB-B-N. CONTRACTOR MUST SPECIFY THAT "ALL WORK COMPLIED WITH THE CONDITIONS OF THE STORMWATER PERMIT", COMPLETE CERTIFICATION FORMS AND RETURN TO MDEP.

GRAPHIC SCALE
50 0 25 50 100 200
(IN FEET)

ALTUS ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801
(603) 433-2335 www.ALTUS-ENG.com

STATE OF MAINE
JEFFREY K. CLIFFORD
No. 5967
LICENSED
PROFESSIONAL ENGINEER

THIS DRAWING HAS NOT BEEN RELEASED FOR CONSTRUCTION

ISSUED FOR:
FINAL APPROVAL

ISSUE DATE:
JANUARY 24, 2019

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	PB SUBMISSION	JKC	6/22/17
1	MDHHS SUBMISSION	JKC	2/21/18
2	MDEP SUBMISSION	JKC	3/19/18
3	TOWN FINAL APPROVAL	JKC	1/24/19

DRAWN BY: RMB
APPROVED BY: JKC
DRAWING FILE: 4567SITE.DWG

SCALE:
1 " = 50'

OWNERS/APPLICANT:

CHINBURG DEVELOPMENT, LLC
3 PENSTOCK WAY
NEWMARKET, NH 03857

PROJECT:

HUNTINGTON RUN SUBDIVISION
MAP 66 LOTS 2A, 8 & 8A
40 BETTY WELCH ROAD
KITTERY, MAINE

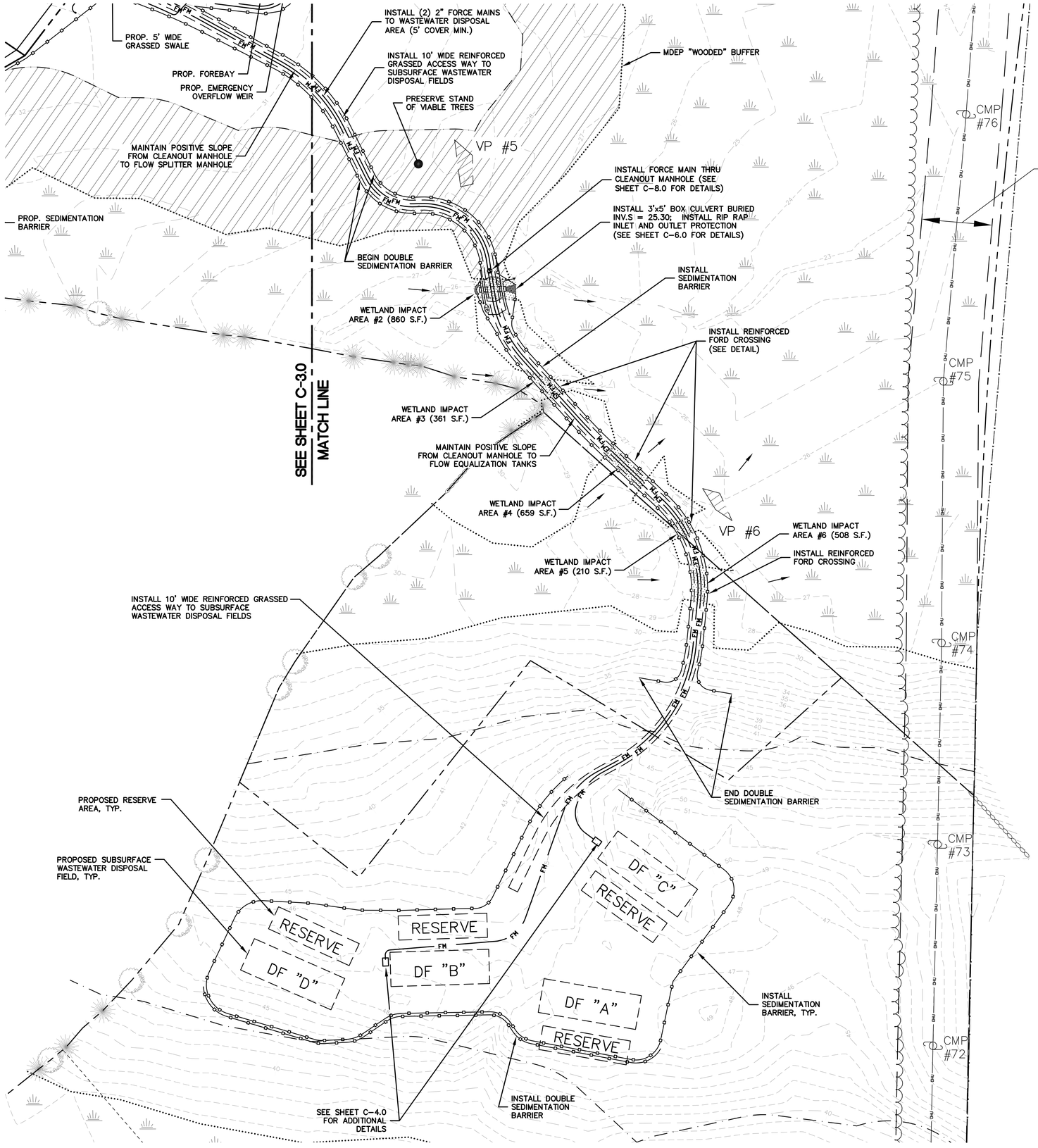
TITLE:

STORMWATER MANAGEMENT PLAN AND FORCE MAIN - A

SHEET NUMBER:

C-3.0

P4567



Long Term Inspection & Maintenance Schedule

	Spring	Fall or Yearly	After Major Storm	Every 2-5 Years
Resource and Treatment Buffers				
Inspect treatment buffers for evidence of erosion, concentrated flow, or encroachment by development	x			
Manage the buffer's vegetation with the requirements in deed restrictions	x			
Repair any sign of erosion within a buffer	x			
Inspect and repair down-slope of all level spreaders and ditch turn-outs	x			
Install more level spreaders or ditch turn-outs if needed for a better distribution of flow	x			
Clean out any accumulation of sediment within spreader bays or turn-out pools	x			
Mow non-wooded buffers no shorter than six inches no more than twice a year	x	x		
Vegetated Areas				
Inspect all slopes and embankments and replant areas of bare soil or with sparse growth	x		x	
Armor rill erosion areas or divert the erosive flows to on-site stable areas	x		x	
Inspect and repair down-slope of all level spreaders and ditch turn-outs for erosion	x		x	
Ditches, Swales & Open Stormwater Channels				
Remove obstructions, sediments or debris from ditches, swales and other open channels	x	x	x	
Repair any erosion of ditch lining	x	x	x	
Mow grass swales	x	x		
Remove vegetated growth and woody vegetation	x	x	x	
Repair any slumping side slopes	x	x	x	
Repair riprap where underlying filter fabric or gravel is showing or if stones have dislodge	x	x	x	
Catch Basins				
Remove sediment and debris from the bottom of the basin and inlet grates	x	x	x	
Remove floating debris and oils (using oil absorptive pads) from the trap	x	x	x	
Culverts				
Remove accumulated sediments and debris at inlet, outlet	x	x	x	
Repair any erosion damage at the culvert's inlet and outlet	x	x	x	
Remove any obstruction to flow	x	x	x	
Roadways and Parking Surfaces				
Clear and remove accumulated winter sand along roadways	x			
Sweep pavement to remove sediment	x			
Grade road shoulders and remove excess sand	x			
Grade gravel roads and gravel shoulders	x			
Clean out sediment within water bars or open –top culverts	x			
Ensure that stormwater is not impeded by false ditches of sediment in the shoulder	x			
Wet Pond/ Detention Basin				
Inspect the embankments for settlement, slope erosion, piping and slumping		x	x	
Mow embankment to control woody vegetation		x	x	
Inspect outlet structure for broken seals, obstructed orifices, and plugged trash rack		x	x	
Remove and dispose of sediments and debris within the control structure		x	x	
Repair any damage to trash racks or debris guards		x	x	
Replace any dislodged stone in riprap spillways		x	x	
Remove and dispose of accumulated sediments within the impoundment and forebay		x	x	
Grassed Underdrain Soil Filter				
Clean the basin of debris, sediment and hydrocarbons	x	x		
Provide for the removal and disposal of accumulated sediments within the basin	x	x		
Renew the basin media if it fails to drain within 72 hours after a one inch rainfall event	x	x		
Till, seed and mulch the basin if vegetation is sparse	x	x		
Mow basin with push mover or hand-held trimmer	x	x		

ALTUS ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801
(603) 433-2335 www.ALTUS-ENG.com

STATE OF MAINE
JEFFREY K. CLIFFORD
No. 5967
LICENSED
PROFESSIONAL ENGINEER

THIS DRAWING HAS NOT BEEN RELEASED FOR CONSTRUCTION

ISSUED FOR:
FINAL APPROVAL

ISSUE DATE:
JANUARY 24, 2019

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	PB SUBMISSION	JKC	6/22/17
1	MDHHS SUBMISSION	JKC	2/21/18
2	MDEP SUBMISSION	JKC	3/19/18
3	TOWN FINAL APPROVAL	JKC	1/24/19

DRAWN BY: RMB
APPROVED BY: JKC
DRAWING FILE: 4567SITE.DWG

SCALE: 1 " = 50'

OWNERS/APPLICANT:
CHINBURG DEVELOPMENT, LLC
3 PENSTOCK WAY
NEWMARKET, NH 03857

PROJECT:
HUNTINGTON RUN SUBDIVISION
MAP 66 LOTS 2A, 8 & 8A
40 BETTY WELCH ROAD
KITTERY, MAINE

TITLE:
STORMWATER MANAGEMENT PLAN AND FORCE MAIN - B

SHEET NUMBER:
C-3.1

P4567

MDHHS NOTES:

1. EACH OF THE TWO ENGINEERED DISPOSAL SYSTEMS REQUIRES A SEPARATE PERMIT. A COPY OF A COMPLETED PAGE ONE OF AN HHE–200 SHALL BE PROVIDED FOR EACH SYSTEM TO THE LOCAL PLUMBING INSPECTOR PRIOR TO CONSTRUCTION.
2. SEE MDHHS APPROVAL LETTER, ENGINEERED SYSTEMS, HUNTINGTON RUN SUBDIVISION, 40 BETTY WELCH ROAD, KITTERY, DATED MARCH 4, 2018 FOR ADDITIONAL CONDITIONS OF APPROVAL.

DISPOSAL BED CONSTRUCTION MONITORING REQUIREMENTS:

CONSTRUCTION OF THE DISPOSAL FIELDS WILL BE FIELD MONITORED BY A QUALIFIED PROFESSIONAL (LICENSED SITE EVALUATOR OR PROFESSION ENGINEER LICENSED IN MAINE) AT EACH PHASE OF CONSTRUCTION AND REPORTED TO MAINE DEP PER APPLICABLE PERMIT CONDITIONS. ALL MATERIAL INTENDED FOR THE DISPOSAL FIELDS MUST BE REVIEWED FOR APPROVAL BY THE QUALIFIED PROFESSION AFTER TESTS BY A CERTIFIED LABORATORY DEMONSTRATE THE MATERIAL CONFORMS TO ALL MAINE DEP SPECIFICATIONS. THE CONTRACTOR SHALL PROVIDE THE QUALIFIED PROFESSIONAL 72 HOURS NOTICE IN ORDER THAT FIELD OBSERVATIONS CAN OCCUR AT EACH DISPOSAL FIELD:

- SUBGRADE INSPECTION
- TOE EXTENSION FILL INSTALLATION
- CHAMBER AND D–BOX INSTALLATION,
- AFTER BACKFILL HAS BEEN INSTALLED , SEEDED AND MULCHED; AND
- FORCE MAIN PRESSURE TESTS
- AFTER ONE YEAR, TO CONFIRM ADEQUATE VEGETATION IS ESTABLISHED OR IDENTIFY DEFICIENCIES FOR CORRECTION.

DISPOSAL FIELD DESIGN CRITERIA:

DESIGN FLOW = 20 UNITS X 3 BEDROOMS X 90 GALLON PER DAY = 5,400 GPD
10 UNITS TO D–BOX #1 AND DISPOSAL FIELDS A & C (1,350 GPD PER FIELD; 2,700 GPD TOTAL)
10 UNITS TO D–BOX #2 AND DISPOSAL FIELDS B & D (1,350 GOD PER FIELD; 2,700 GPD TOTAL)

SOILS ARE PREDOMINATELY 3C PROFILES WHICH REQUIRE MEDIUM–LARGE SIZE RATING (3.3 SQ.FT/GPD DISPOSAL AREA); A LARGE SIZE RATING WAS CONSERVATIVELY UTILIZED FOR DESIGN (4.1 SQ.FT/GPD).

USE OF ADVANCED TREATMENT UNITS (ATU) AT EACH RESIDENCE ALLOWS FOR A 50% REDUCTION IN THE DISPOSAL FIELD FOOTPRINT.

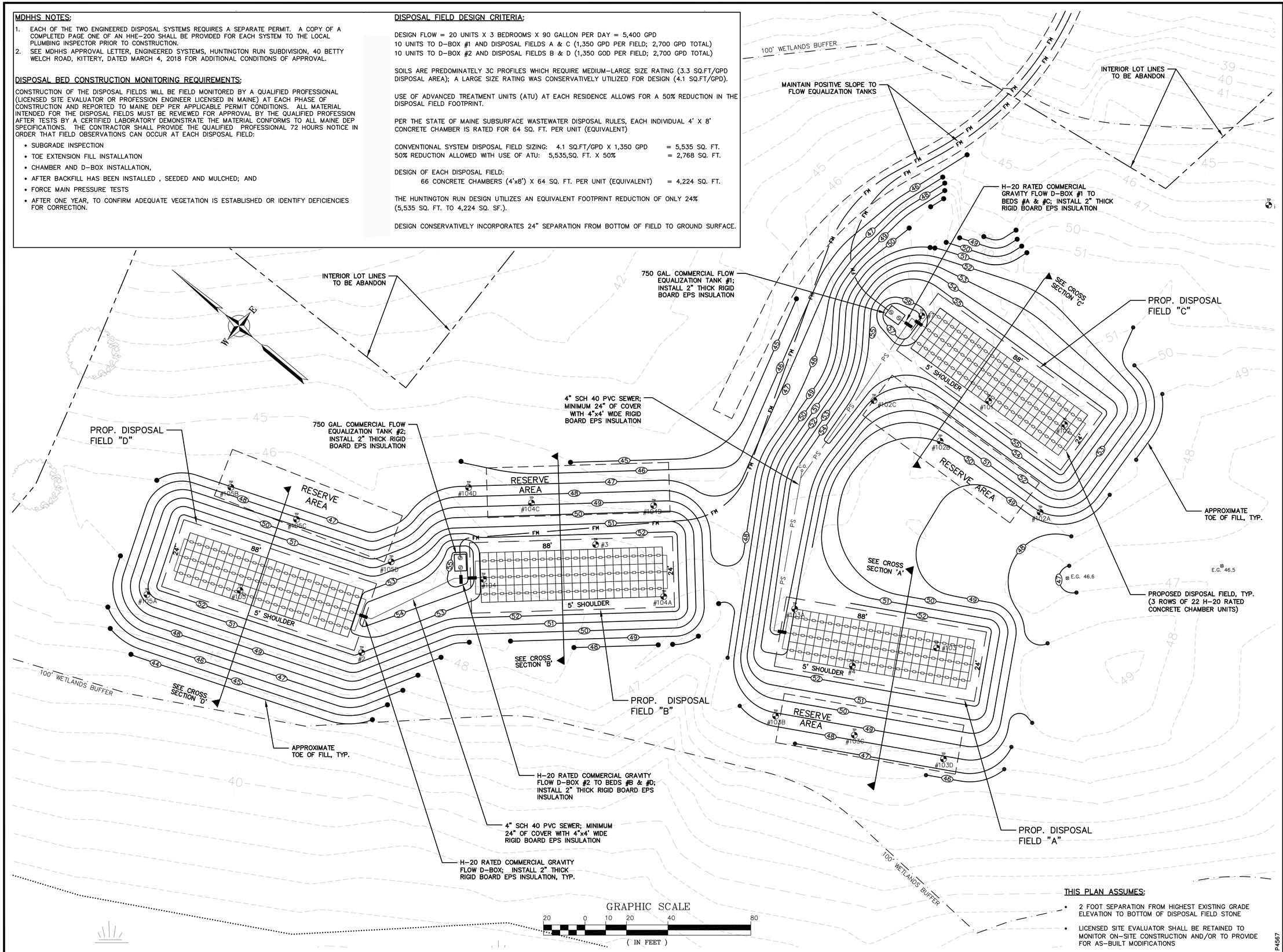
PER THE STATE OF MAINE SUBSURFACE WASTEWATER DISPOSAL RULES, EACH INDIVIDUAL 4' X 8' CONCRETE CHAMBER IS RATED FOR 64 SQ. FT. PER UNIT (EQUIVALENT)

CONVENTIONAL SYSTEM DISPOSAL FIELD SIZING: 4.1 SQ.FT/GPD X 1,350 GPD = 5,535 SQ. FT.
50% REDUCTION ALLOWED WITH USE OF ATU: 5,535,SQ. FT. X 50% = 2,768 SQ. FT.

DESIGN OF EACH DISPOSAL FIELD:
66 CONCRETE CHAMBERS (4'x8') X 64 SQ. FT. PER UNIT (EQUIVALENT) = 4,224 SQ. FT.

THE HUNTINGTON RUN DESIGN UTILIZES AN EQUIVALENT FOOTPRINT REDUCTION OF ONLY 24% (5,535 SQ. FT. TO 4,224 SQ. SF.).

DESIGN CONSERVATIVELY INCORPORATES 24" SEPARATION FROM BOTTOM OF FIELD TO GROUND SURFACE.



THIS PLAN ASSUMES:

- 2 FOOT SEPARATION FROM HIGHEST EXISTING GRADE ELEVATION TO BOTTOM OF DISPOSAL FIELD STONE
- LICENSED SITE EVALUATOR SHALL BE RETAINED TO MONITOR ON–SITE CONSTRUCTION AND/OR TO PROVIDE FOR AS–BUILT MODIFICATIONS

P4567

ALTUS ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801
(603) 433–2335 www.ALTUS–ENG.com

STATE OF MAINE
JEFFREY K. CLIFFORD
No. 5957
LICENSED
PROFESSIONAL ENGINEER

LONGVIEW PARTNERS, LLC
ENVIRONMENTAL PERMITTING SPECIALISTS

THIS DRAWING HAS NOT BEEN RELEASED FOR CONSTRUCTION

ISSUED FOR: FINAL APPROVAL

ISSUE DATE: JANUARY 24, 2019

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	PB SUBMISSION	JKC	6/22/17
1	MDHHS SUBMISSION	JKC	2/21/18
2	MDEP SUBMISSION	JKC	3/19/18
3	TOWN FINAL APPROVAL	JKC	1/24/19

DRAWN BY: RMB
APPROVED BY: JKC
DRAWING FILE: 4567SITE.DWG

SCALE: 1 " = 20'

OWNERS/APPLICANT:

CHINBURG DEVELOPMENT, LLC
3 PENSTOCK WAY
NEWMARKET, NH 03857

PROJECT:

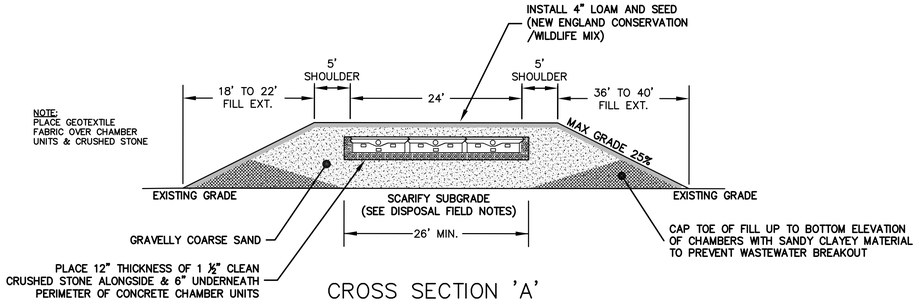
HUNTINGTON RUN SUBDIVISION
MAP 66 LOTS 2A, 8 & 8A
40 BETTY WELCH ROAD
KITTERY, MAINE

TITLE:

SUBSURFACE WASTEWATER DISPOSAL FIELDS

SHEET NUMBER:

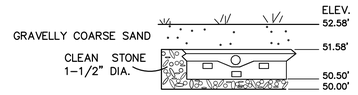
C–4.0



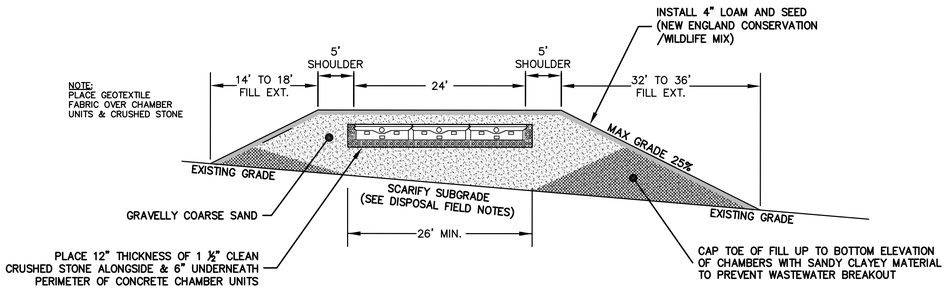
CROSS SECTION 'A'

SCALE: HORIZONTAL: 1" = 10'

VERTICAL: 1" = 5'



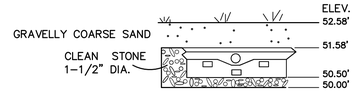
CONCRETE CHAMBER 'A' DETAIL
(no scale)



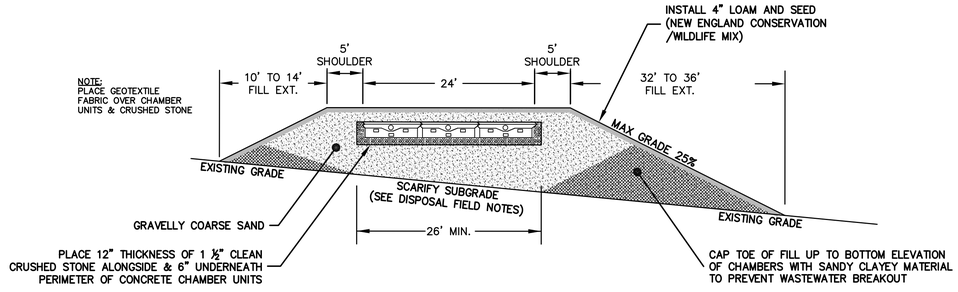
CROSS SECTION 'B'

SCALE: HORIZONTAL: 1" = 10'

VERTICAL: 1" = 5'



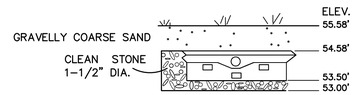
CONCRETE CHAMBER 'B' DETAIL
(no scale)



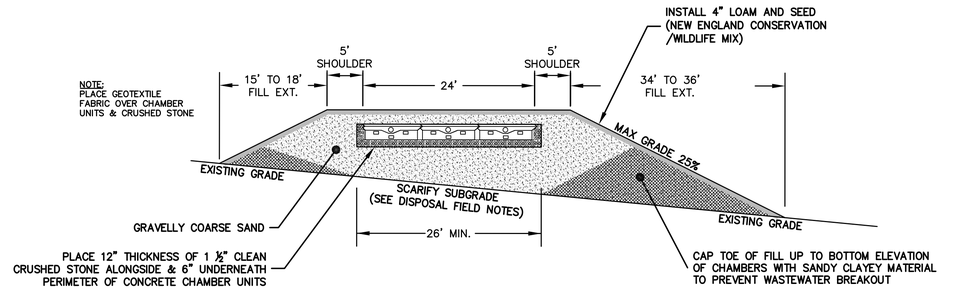
CROSS SECTION 'C'

SCALE: HORIZONTAL: 1" = 10'

VERTICAL: 1" = 5'



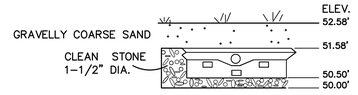
CONCRETE CHAMBER 'C' DETAIL
(no scale)



CROSS SECTION 'D'

SCALE: HORIZONTAL: 1" = 10'

VERTICAL: 1" = 5'



CONCRETE CHAMBER 'D' DETAIL
(no scale)

DISPOSAL FIELD NOTES:

1. THIS PLAN IS PRELIMINARY AND IS SUBJECT TO REVISION PER M.D.E.P. REVIEW
2. LICENSED SITE EVALUATOR SHALL BE RETAINED TO MONITOR ON-SITE CONSTRUCTION AND/OR TO PROVIDE FOR AS-BUILT MODIFICATIONS

P4567

ALTUS ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801
(603) 433-2335 www.ALTUS-ENG.com

STATE OF MAINE
JEFFREY K. CLIFFORD
No. 5967
LICENSED
PROFESSIONAL ENGINEER

LONGVIEW PARTNERS, LLC
ENVIRONMENTAL PERMITTING SPECIALISTS

THIS DRAWING HAS NOT BEEN RELEASED FOR CONSTRUCTION

ISSUED FOR:
FINAL APPROVAL

ISSUE DATE:
JANUARY 24, 2019

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	PB SUBMISSION	JKC	6/22/17
1	MDHHS SUBMISSION	JKC	2/21/18
2	MDEP SUBMISSION	JKC	3/19/18
3	TOWN FINAL APPROVAL	JKC	1/24/19

DRAWN BY: RMB
APPROVED BY: JKC
DRAWING FILE: 4567SITE.DWG

SCALE: AS SHOWN

OWNERS/APPLICANT:

CHINBURG DEVELOPMENT, LLC
3 PENSTOCK WAY
NEWMARKET, NH 03857

PROJECT:

HUNTINGTON RUN SUBDIVISION
MAP 66 LOTS 2A, 8 & 8A
40 BETTY WELCH ROAD
KITTERY, MAINE

TITLE:

WASTEWATER DISPOSAL CROSS SECTIONS

SHEET NUMBER:

C-4.1

PROJECT NAME AND LOCATION

Huntington Run Subdivision
Betty Welch Road
Kittery, Maine

LATITUDE: 043° 08' 08.7" N
LONGITUDE: 070° 43' 08.1" W

DESCRIPTION

The project consists of a new 20–lot single family subdivision and one (1) common open space lot. The project will be completed in a single phase.

DISTURBED AREA

The total area to be disturbed is approximately 10.9 acres (including lot development and wastewater disposal fields).

SEQUENCE OF MAJOR ACTIVITIES

1. Contractor shall prepare an Erosion and Sediment Control Plan (E.S.C.). Prior to construction, the Contractor and Owner shall each file a Notice of Intent (N.O.I.) to the Maine Department of Environmental Protection (MDEP).
2. Install temporary erosion control measures, including silt fences and stabilized construction entrances.
3. Upon completion of items 1 through 2, clear and grub wooded areas, strip and stockpile loam. Stockpiles shall be temporarily stabilized with hay bales mulch and surrounded by a hay bale or silt fence barrier until material is removed and final grading is complete.
4. Construct ditches and stabilize prior to directing flow to them.
5. Construct drainage structures, swales & road base materials.
6. Ditches and swales with grades over 5% shall have sides and bottom reinforced with excelsior matting.
7. Grade and shape lots to finish elevations.
8. Stabilize disturbed areas.
9. When all construction activity is complete and site is stabilized, remove all hay bales, storm check dams, silt fences and sediment that has been trapped by these devices.
10. File a Notice of Termination (N.O.T.) with MDEP.

NAME OF RECEIVING WATER

Unnamed wetlands complex to York River.

TEMPORARY EROSION AND SEDIMENT CONTROLS AND STABILIZATION PRACTICES

All work shall be in accordance with state and local permits. Work shall conform to the practices described in the "Maine Erosion and Sediment Control BMPs, 2003" published by the Maine Department of Environmental Protection.

As indicated in the sequence of Major Activities, the hay bales and silt fences shall be installed prior to commencing any clearing or grading of the site. Structural controls shall be installed concurrently with the applicable activity. Once construction activity ceases permanently in an area, silt fences and hay bale barriers and any earth/dikes will be removed once permanent measures are established.

During construction, runoff will be diverted around the site with stabilized channels where possible channels where possible. Sheet runoff from the site will be filtered through hay bale barriers, stone check dams, and silt fences. All storm drain inlets shall be provided with hay bale filters or stone check dams. Stone rip rap shall be provided at the outlets of drain pipes and culverts where shown.

Temporary and permanent vegetation and mulching is an integral component of the erosion and sedimentation control plan. All areas shall be inspected and maintained until desires vegetative cover is established. These control measures are essential to erosion prevention and also reduce costly rework of graded and shaped areas.

Temporary vegetation shall be maintained in these areas until permanent seeding is applied. Additionally, erosion sedimentation measures shall be maintained until permanent vegetation is established.

INSTALLATION, MAINTENANCE AND INSPECTION PROCEDURES FOR TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES

A. GENERAL

These are the general inspection and maintenance practices that will be used to implement the plan.

1. The smallest practical portion of the site will be denuded at one time. All disturbed areas must be stabilized be temporary measures within 5 days of initial disturbance and stabilized by permanent measures immediately after final grading.
2. All control measures will be inspected at least once each week and following any storm event of 0.50 inches or greater. A maintenance inspection report will be made after each inspection and made available to the Town officials.
3. The Contractor's site superintendent will be responsible for inspections, maintenance and repair activities, and filling out the inspection and maintenance report.
4. Built up sediment will be removed from silt fence, stone check dams, or hay bale barriers when it has reached one third the height of the fence, check dam, or bale, or when "bulges" occur.
5. All diversion dikes will be inspected and any breaches promptly repaired.
6. Temporary seeding and planting will be inspected for bare spots, washouts, and unhealthy growth.
7. All measures will be maintained in good working order; if a repair is necessary, it will be initiated within 24 hours and completed within 72 hours.

B. MULCHING

Considerations

* In sensitive areas (within 100 ft of streams, wetlands and in lake watersheds) temporary mulch shall be applied within 7 days of exposing soil or prior to any storm event.
* Areas, which have been temporarily or permanently seeded, shall be mulched immediately following seeding.
* Areas which cannot be seeded within the growing season shall be mulched for over–winter protection and the area should be seeded at the beginning of the growing season.
* Mulch anchoring should be used on slopes greater than 5% in late fall (past September 15), and over–winter (September 15 – April 15).

Type of Mulch

Hay or Straw Mulches

Organic mulches, including hay and straw, shall be air–dried, free of undesirable seeds and coarse materials. Application rate shall be 2 bales (70–90 pounds) per 1000 SQ FT or 1.5 to 2 tons (90–100 bales) per acre to cover 75 to 90 % of the ground surface. Hay mulch subject to wind blowing shall be anchored via: netting; peg and twine or tracking.

Erosion Control Mix

Erosion control mix shall consist primarily of organic material and shall include any of the following: shredded bark, stump grindings, composted bark or other acceptable products based on a similar raw source. Wood or bark chips, ground construction debris or reprocessed wood products shall not be acceptable as the organic component of the mix.

It can be used as a stand–alone reinforcement:

* On slopes 2 horizontal to 1 vertical or less.
* On frozen ground or forested areas.
* At the edge of gravel parking areas and areas under construction.

Other reinforcement BMPs (i.e. riprap) should be used:

* On slopes with groundwater seepage;
* At low points with concentrated flows and in gullies;
* At the bottom of steep perimeter slopes exceeding 100 feet in length;
* Below culvert outlet aprons; and
* Around catch basins and closed storm systems.

Composition

Erosion control mix shall contain a well–graded mixture of particle sizes and may contain rocks less than 4" in diameter. Erosion control mix must be free of refuse, physical contaminants, and material toxic to plant growth. The mix composition shall meet the following standards:

* The organic matter content shall be between 80 and 100%, dry weight basis.
* Particle size by weight shall be 100 % passing a 6" screen and a minimum of 70 %, maximum of 85%, passing a 0.75" screen.
* The organic portion needs to be fibrous and elongated.
* Large portions of silts, clays or fine sands are not acceptable in the mix.

Installation

* Erosion control mix shall not be used on slopes steeper than 2:1.
* On slopes of 3:1 or less; 2 inches plus an additional 1/2 inch per 20 feet of slope up to 100 feet.
* On slopes between 3:1 and 2:1, 4 inch plus an additional 1/2 inch per 20 feet of slope up to 100 feet.

The thickness of the mulch at the bottom of the slope needs to be:

	< 3:1 slope	slopes between 3:1 and 2:1
< 20' of slope	2.0"	4.0'
< 60' of slope	3.0"	5.0'
< 100' of slope	4.0"	6.0'

* It shall be placed evenly and must provide 100 % soil coverage, with the soil totally invisible.

Any required repairs shall be made immediately, with additional erosion control mix placed on top of the mulch to reach the recommended thickness. When the mix is decomposed, clogged with sediment, eroded or ineffective, it shall be replaced or repaired. Erosion control mix mulch shall be left in place. If the mulch needs to be removed spread it out into the landscape.

Maintenance

All mulches must be inspected periodically, in particular after rainstorms, to check for rill erosion. If less than 90% of the soil surface is covered by mulch, additional mulch shall be immediately applied. Nets shall be inspected after rain events for dislocation or failure. If washouts or breakage occur, re–install the nets as necessary after repairing damage to the slope. Inspections shall take place until grasses are firmly established (95% soil surface covered with grass). Where mulch is used in conjunction with ornamental plantings, inspect periodically throughout the year to determine if mulch is maintaining coverage of the soil surface. Repair as needed.

C. TEMPORARY VEGETATION

Considerations

* Proper seedbed preparation and the use of quality seed are important in this practice just as in permanent seeding. Failure to carefully follow sound agronomic recommendations will often result in an inadequate stand of vegetation that provides little or no erosion control.
* Nutrients and pesticides used to establish and maintain a vegetation cover shall be managed to protect the surface and ground water quality.
* Temporary seeding shall be used extensively in sensitive areas (ponds and lake watersheds, steep slopes, streambanks, etc.).
* Late fall seeding may fail and cause water quality deterioration in spring runoff events, thus other measures such as mulching shall be implemented.

Specifications

Seedbed Preparation

Apply limestone and fertilizer according to soil test recommendations. If soil testing is not feasible on small or variable sites, or where timing is critical, fertilizer may be applied at the rate of 600 pounds per acre or 13.8 pounds per 1,000 square feet of 10–10–10 (N–P2OS–K20) or equivalent. Apply limestone (equivalent to 50 percent calcium plus magnesium oxide) at a rate of 3 tons per acre (138 lb. per 1,000 square feet).

Seeding

* Select seed from recommendations in enclosed table.
* Where the soil has been compacted by construction operations, loosen soil to a depth of 2 inches before applying fertilizer, lime and seed.
* Apply seed uniformly by hand, cyclone seeder, drill, cultipacker type seeder or hydroseeder (slurry including seed and fertilizer). Hydroseeding that includes mulch may be left on soil surface. Seeding rates must be increased 10% when hydroseeding.

Mulching

Apply mulch over seeded area according to the MULCHING BMP.

Maintenance

Temporary seeding shall be periodically inspected. At a minimum, 95% of the soil surface should be covered by vegetation. If any evidence of erosion or sedimentation is apparent, repairs shall be made and other temporary measures used in the interim (mulch, filter barriers, check dams, etc.).

Temporary Seeding Rates and Dates

Seed	Lb./Ac	Seeding Depth	Recommended Seeding Dates	Remarks
Winter Rye	112 (2.0 bu)	1–1.5 in	8/15–10/1	Good for fall seeding. Select a hardy species, such as Aroostook Rye.
Oats	80 (2.5 bu)	1–1.5 in	4/1–7/1 8/15–9/15	Best for spring seeding. Early fall seeding will die when winter weather moved in, but mulch will provide protection.
Annual Ryegrass	40	.25 in	4/1–7/1	Grows quickly but is of short duration. Use where appearance is important. With mulch, seeding may be done throughout growing season.
Sudangrass	40 (1.0 bu)	.5–1 in	5/15–8/15	Good growth during hot summer periods.
Perennial	40 (2.0 bu)	.25 in	8/15–9/15	Good cover, longer lasting than Annual Ryegrass. Mulching will allow seeding throughout growing season.
Temporary mulch with or without dormant seeding			10/1–4/1	Refer to TEMPORARY MULCHING BMP and/or PERMANENT VEGETATION BMP.

D. FILTERS

Silt Fences

a. Synthetic filter fabric shall be a pervious sheet of propylene, nylon, polyester or ethylene yarn and shall be certified by the manufacturer or supplier as conforming to the following requirements:

Physical Property	Test	Requirements
Filtering Efficiency	VTM–51	75% minimum
Tensile Strength at 20% Maximum Elongation **	VTM–52	Extra Strength – 50 ib/lin in (min.) Standard Strength – 30 ib/lin in (min.)
Flow Rate	VTM–51	0.3 gal/sf/min

** Requirements reduced by 50% after 6 months on installations.

Synthetic filter fabric shall contain ultraviolet ray inhibitors and stabilizers to provide a minimum of six (6) months of expected usable construction life at a temperature range of 0 degrees F to 120° F.

b. Posts shall be spaced a maximum of ten (10) feet apart at the barrier location or as recommended by the manufacturer and driven securely into the ground (minimum of 16 inches).
c. A trench shall be excavated approximately six (6) inches wide and six (8) inches deep along the line of posts and upslope from the barrier.
d. When standard strength filter fabric is used, a wire mesh support fence shall be fastened securely to the upslope side of the posts using heavy duty wire staples at least one (1) inch long, tie wires or hog rings. The wire shall extend no more than 36 inches above the original ground surfaces.
e. The "standard strength" filter fabric shall be stapled or wired to the fence, and eight (8) inches of the fabric shall be extended into the trench. The fabric shall not extend more than 36 inches above the original ground surface. Filter fabric shall not be stapled to existing trees.
f. When extra strength filter fabric and closer post spacing are used, the wire mesh support fence may be eliminated. In such a case, the filter fabric is stapled or wired directly to the posts with all other provisions of item (g) applying.
g. The trench shall be backfilled and the soil compacted over the filter fabric.
h. Silt fences shall be removed when they have served their useful purpose but not before the upslope areas has been permanently stabilized.

Straw/Hay Bales

* Bales shall be placed in a single row, lengthwise on the contour, with ends of adjacent bales tightly abutting one another.
* All bales shall be either wire–bound or string–tied. Bales shall be installed so that bindings are oriented around the sides, parallel to the ground surface to prevent deterioration of the bindings.
* The barrier shall be entrenched and backfilled. A trench shall be excavated the width of a bale and the length of the proposed barrier to a minimum depth of 4 inches.
* After the bales are staked and chinked, the excavated soil shall be backfilled against the barrier. Backfill soil shall conform to the ground level on the downhill side and shall be build up to 4 inches against the uphill side of the barrier.
* At least two stakes or rebars driven through the bale shall securely anchor each bale. The first stake in each bale shall be driven toward the previously laid bale to force the bales together. Stakes or re–bars shall be driven deep enough into the ground to securely anchor the bales.
* The gaps between bales shall be chinked (filled by wedging) with hay to prevent water from escaping between the bales.

Installation

* Sediment barriers shall be installed prior to any soil disturbance of the contributing drainage uplope of them.
* The barrier must be placed along a relatively level contour.

Maintenance

* Hay bale barriers, silt fences and filter berms shall be inspected immediately after each rainfall and at least daily during prolonged rainfall. They shall be repaired immediately if there are any signs of erosion or sedimentation below them. If there are signs of undercutting at the center or the edges of the barrier, or impounding of large volumes of water behind them, sediment barriers shall be replaced with a temporary check dam.
* Should the fabric on a silt fence or filter barrier decompose or become ineffective prior to the end of the expected usable life and the barrier still is necessary, the fabric shall be replaced promptly.
* Sediment deposits should be removed when deposits reach approximately one third (1/3) the height of the barrier.
* Filter berms should be reshaped as needed.
* Any sediment deposits remaining in place after the silt fence or filter barrier is no longer required shall be dressed or removed to conform to the existing grade, prepared and seeded.
* Additional stone may have to be added to the construction stabilized entrance, rock barriers, stone lined swales, etc., periodically to maintain propoer function of the erosion control structure.

E. PERMANENT SEEDING

* Seeding shall be performed in accordance with USDA, Soil Conservation Service guidelines.
* Bedding – stones larger than 1 1/8", trash, roots, and other debris that will interfere with seeding and future maintenance of the area shall be removed. Where feasible, the soil should be tilled to a depth of 4" to prepare a seedbed and mix fertilizer into the soil.
* Fertilizer – lime and fertilizer should be applied evenly over the area prior to or at the time of seeding and incorporated into the soil. Kinds and amounts of lime and fertilizer shall be based on an evaluation of soil tests. When a soil test is not available, the following minimum amounts should be applied:
  Limestone @ 3 tons per acre 10–20–20 and fertilizer (N–P205–K201) @ 800 lbs. per acre
* Seed Mixture:

  Rate:

Type	LBS. per Acre	LBS per 1,000 sf	Use
Kentucky Bluegrass	20	0.46	Lawn Areas / Loam Areas (non–slope work)
Creeping Red Fescue	20	0.46	
Perennial Ryegrass	5	0.11	
Total	45	1.03	
Tall Fescue	20	0.46	Drainage Swales All Slope Work (3 : 1 or steeper)
Creeping Red Fescue	20	0.46	
Redtop	2	0.05	
Total	42	0.97	

* Sodding – sodding is done where it is desirable to rapidly establish cover on a disturbed area. Sodding an area may be substituted for permanent seeding procedures anywhere on site. Bed preparation, fertilizing, and placement of sod shall be performed according to the Maine Erosion and Sediment Control BMPs. Sodding is recommended for steep sloped areas, areas immediately adjacent to sensitive water coursed, easily erodible soils (fine sand/silt) etc.

F. OVER WINTER STABILIZATION

a. If a construction site is not stabilized with pavement, a road gravel base, 75 % mature vegetation cover or riprap by November 15 then the site shall be protected with over–winter stabilization. An area considered open is any area not stabilized with pavement; vegetation, mulching, erosion control mix, erosion control mats, riprap or gravel base on a road. The winter construction period is from November 1 through April 15.
b. Winter excavation and earthwork shall be completed such that no more than 1 acre of the site is without stabilization at any one time. Limit the exposed area to those areas in which work is to occur during the following 15 days and that can be mulched in one day prior to any snow event.
c. During winter construction, a double row of sediment barriers (i.e. silt fence backed with hay bales or erosion control mix) shall be placed between any natural resource and the disturbed area.
d. During frozen conditions, sediment barriers shall consist of erosion control mix berms or any other recognized sediment barriers.
e. Hay and straw mulch shall be applied at a rate of 150 lb. per 1,000 square feet or 3 tons/acre (twice the normal accepted rate of 75–1bs./1,000 s.f. or 1.5 tons/acre) and shall be properly anchored. Erosion control mix shall be applied with a minimum 4 inch thickness. Mulch shall not be spread on top of snow.
f. Between the dates of November 1 and April 15, all mulch shall be anchored by either mulch netting, asphalt emulsion chemical, tracking or wood cellulose fiber. After November 1st, mulch and anchoring of all exposed soil shall occur at the end of each final grading workday.
g. Stockpiles of soil or subsoil will be mulched for over winter protection with hay or straw at twice the normal rate or with a four–inch layer of erosion control mix.
h. Seeding – Between the dates of October 15 and April 1st, loam or seed will not be required. If the date is after November 1st, and if the exposed area has been loomed, final graded with a uniform surface, then the area may be dormant seeded at a rate of 3 times higher than specified for permanent seed and then mulched. If dormant seeding is used for the site, all disturbed areas shall receive 4' of loam and seed at an application rate of 5lbs/1000 s.f. All areas seeded during the winter will be inspected in the spring for adequate catch. All areas insufficiently vegetated (less than 75 % catch) shall be revegetated by replacing loam, seed and mulch. If dormant seeding is not used for the site, all disturbed areas shall be revegetated in the spring.
i. All stone–lined ditches and channels shall be constructed and stabilized by November 15. All grass–lined ditches and channels shall be constructed and stabilized by September 1. If a ditch or channel is not grass–lined by September 1, then one of the following actions must be taken to stabilize the ditch for late fall and winter.
   Install a sod lining in the ditch: A ditch must be lined with properly installed sod by October 1.
   Install a stone lining in the ditch: A ditch must be lined with stone riprap by November 15.
j. All stone–covered slopes must be constructed and stabilized by November 15. And all slopes to be vegetated must be seeded and mulched by September 1. If a slope to be vegetated is not stabilized by September 1, then one of the following actions must be taken to stabilize the slope for late fall and winter.
   Stabilize the soil with temporary vegetation and erosion control mats: By October 1 the disturbed slope shall be seeded with winter rye at a seeding rate of 3 pounds per 1000 square feet and then install erosion control mats or anchored mulch over the seeding. If the rye fails to grow at least three inches or fails to cover at least 75% of the slope by November 1, then the contractor shall cover the slope with a layer of erosion control mix or with stone riprap as described in the following standards.
   Stabilize the soil with sod: The disturbed slope shall be stabilized with properly installed sod by October 1. Proper installation includes pinning the sod onto the slope with wire pins, rolling the sod to guarantee contact between the sod and underlying soil, and watering the sod to promote root growth into the disturbed soil. The contractor will not use late–season sod installation to stabilize slopes having a grade greater than 33% (3H:1V) or having groundwater seeps on the slope face.
   Stabilize the soil with erosion control mix: Erosion control mix shall be properly installed by November 15. The contractor shall not use erosion control mix to stabilize slopes having grades greater than 50% (2H:1V) or having groundwater seeps on the slope face.
   Stabilize the soil with stone riprap: Place a layer of stone riprap on the slope by November 15.
k. By September 15, all disturbed soils on areas having a slope less than 15% shall be seeded and mulched. If the disturbed areas are not stabilized by this date, then one of the following actions shall be taken to stabilize the soil for late fall and winter.
   Stabilize the soil with temporary vegetation: By October 1, seed the disturbed soil with winter rye at a seeding rate of 3 pounds per 1000 square feet, lightly mulch the seeded soil with hay or straw at 75 pounds per 1000 square feet, and anchor the mulch with plastic netting. Monitor growth of the rye over the next 30 days. If the rye fails to grow at least three inches or fails to cover at least 75% of the disturbed soil before November 1, then mulch the area for over–winter protection as described below.
   Stabilize the soil with sod: Stabilize the disturbed soil with properly installed sod by October 1. Proper installation includes pinning the sod onto the soil with wire pins, rolling by the sod to guarantee contact between the sod and underlying soil, and watering the sod to promote root growth into the disturbed soil.
   Stabilize the soil with mulch: By November 15, mulch the disturbed soil by spreading hay or straw at a rate of at least 150 pounds per 1000 square feet on the area so that no soil is visible through the mulch. Immediately after applying the mulch, anchor the mulch with plastic netting to prevent wind from moving the mulch off the disturbed soil.

Maintenance

Maintenance measures shall be applied as needed during the entire construction season. After each rainfall, snow storm or period of thawing and runoff, the site contractor shall perform a visual inspection of all installed erosion control measures and perform repairs as needed to insure their continuous function. Following the temporary and/or final seeding and mulching, the contractor shall, in the spring, inspect and repair any damages and/or bare spots. An established vegetative cover means a minimum of 85 to 90 % of areas vegetated with vigorous growth.

Stabilization Schedule before Winter

September 15	All disturbed areas shall be seeded and mulched. All slopes shall be stabilized, seeded and mulched. All grass–lined ditches and channels shall be stabilized with mulch or an erosion control blanket.
October 1	If the slope is stabilized with an erosion control blanket and seeded. All disturbed areas to be protected with an annual grass shall be seeded at a seeding rate of 3 pounds per 1000 square feet and mulched.
November 15	All stone–lined ditches and channels shall be constructed and stabilized. Slopes that are covered with riprap shall be constructed by that date.
December 1	All disturbed areas where the growth of vegetation fails to be at least three inches tall or at least 75% of the disturbed soil is covered by vegetation, shall be protected for over–winter.

HOUSEKEEPING

1. Spill prevention. Controls must be used to prevent pollutants from construction and waste materials stored on site to enter stormwater, which includes storage practices to minimize exposure of the materials to stormwater. The site contractor or operator must develop, and implement as necessary, appropriate spill prevention, containment, and response planning measures.

   NOTE: Any spill or release of toxic or hazardous substances must be reported to the Department.

2. Groundwater protection. During construction, liquid petroleum products and other hazardous materials with the potential to contaminate groundwater may not be stored or handled in areas of the site draining to an infiltration area. An "infiltration area" is any area of the site that by design or as a result of soils, topography and other relevant factors accumulates runoff that infiltrates into the soil. Dikes, berms, sumps, and other forms of secondary containment that prevent discharge to groundwater may be used to isolate portions of the site for the purposes of storage and handling of these materials. Any project proposing infiltration of stormwater must provide adequate pre–treatment of stormwater prior to discharge of stormwater to the infiltration area, or provide for treatment within the infiltration area, in order to prevent the accumulation of fines, reduction in infiltration rate, and consequent flooding and destabilization.
3. Fugitive sediment and dust. Actions must be taken to ensure that activities do not result in noticeable erosion of soils or fugitive dust emissions during or after construction. Oil may not be used for dust control, but other water additives may be considered as needed. A stabilized construction entrance (SCE) should be included to minimize tracking of mud and sediment. If off–site tracking occurs, public roads should be swept immediately and no less than once a week and prior to significant storm events. Operations during dry months, that experience fugitive dust problems, should wet down unpaved access roads once a week or more frequently as needed with a water additive to suppress fugitive sediment and dust.
4. Debris and other materials. Minimize the exposure of construction debris, building and landscaping materials, trash, fertilizers, pesticides, herbicides, detergents, sanitary waste and other materials to precipitation and stormwater runoff. These materials must be prevented from becoming a pollutant source.
5. Excavation de–watering. Excavation de–watering is the removal of water from trenches, foundations, coffer dams, ponds, and other areas within the construction area that retain water after excavation. In most cases the collected water is heavily silted and hinders correct and safe construction practices. The collected water removed from the ponded area, either through gravity or pumping, must be spread through natural wooded buffers or removed to areas that are specifically designed to collect the maximum amount of sediment possible, like a cofferdam sedimentation basin. Avoid allowing the water to flow over disturbed areas of the site. Equivalent measures may be taken if approved by the Department.
6. Authorized Non–stormwater discharges. Identify and prevent contamination by non–stormwater discharges. Where allowed non–stormwater discharges exist, they must be identified and steps should be taken to ensure the implementation of appropriate pollution prevention measures for the non–stormwater component(s) of the discharge. Authorized non–stormwater discharges are:

   (a) Discharges from firefighting activity;

   (b) Fire hydrant flushings;

   (c) Vehicle washwater if detergents are not used and washing is limited to the exterior of vehicles (engine, undercarriage and transmission washing is prohibited);

   (d) Dust control runoff in accordance with permit conditions and Appendix (C)(3);

   (e) Routine external building washdown, not including surface paint removal, that does not involve detergents;

   (f) Pavement washwater (where spills/leaks of toxic or hazardous materials have not occurred, unless all spilled material had been removed) if detergents are not used;

   (g) Uncontaminated air conditioning or compressor condensate;

   (h) Uncontaminated groundwater or spring water;

   (i) Foundation or footer drain–water where flows are not contaminated;

   (j) Uncontaminated excavation dewatering;

   (k) Potable water sources including waterline flushings; and

   (l) Landscape irrigation.

7. Unauthorized non–stormwater discharges. MDEP's approval does not authorize a discharge that is mixed with a source of nonstormwater, other than those discharges in compliance with item in section 6. Specifically, MDEP's approval does not authorize discharges of the following:

   (a) Wastewater from the washout or cleanout of concrete, stucco, paint, form release oils, curing compounds or other construction materials;

   (b) Fuels, oils or other pollutants used in vehicle and equipment operation and maintenance;

   (c) Soaps, solvents, or detergents used in vehicle and equipment washing; and

   (d) Toxic or hazardous substances from a spill or other release.

ALTUS ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801
(603) 433–2335 www.ALTUS–ENG.com

STATE OF MAINE
JEFFREY K. CLIFFORD
No. 5957
LICENSED
PROFESSIONAL ENGINEER

THIS DRAWING HAS NOT BEEN RELEASED FOR CONSTRUCTION

ISSUED FOR: FINAL APPROVAL

ISSUE DATE: JANUARY 24, 2019

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	PB SUBMISSION	JKC	6/22/17
1	MDEP SUBMISSION	JKC	3/19/18
2	TOWN FINAL APPROVAL	JKC	1/24/19

DRAWN BY: RMB
APPROVED BY: JKC
DRAWING FILE: 4567SITE.DWG

SCALE: N.T.S.

OWNER/APPLICANT:

CHINBURG DEVELOPMENT, LLC
3 PENSTOCK WAY
NEWMARKET, NH 03857

PROJECT:

HUNTINGTON RUN SUBDIVISION
MAP 66 LOTS 2A, 8 & 8A
40 BETTY WELCH ROAD
KITTERY, MAINE

TITLE:

EROSION CONTROL NOTES

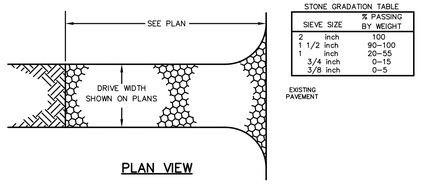
SHEET NUMBER:

C–5.0

P4567

TEMPORARY EROSION CONTROL BMP's

(USE TO CONTROL SEDIMENT AND EROSION AT TEMPORARY CONSTRUCTION LAYDOWN AND STOCKPILE AREAS, OR AS NEEDED TO COMPLY WITH MAINE CONSTRUCTION GENERAL PERMIT)



STONE GRADATION TABLE

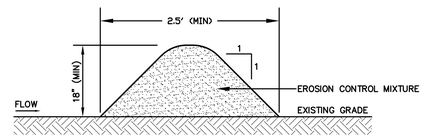
SIEVE SIZE	% PASSING BY WEIGHT
2 inch	100
1 1/2 inch	90–100
1 inch	20–55
3/4 inch	0–15
3/8 inch	0–5

CONSTRUCTION SPECIFICATIONS

1. STONE SIZE – SEE GRADATION TABLE
2. LENGTH – DETAILED ON PLANS (75 FOOT MINIMUM).
3. THICKNESS – SIX (6) INCHES (MINIMUM).
4. WIDTH – FULL DRIVE WIDTH
5. FILTER FABRIC – MIRAFI 600X OR APPROVED EQUAL.
6. SURFACE WATER CONTROL – ALL SURFACE WATER THAT IS FLOWING TO OR DIVERTED TOWARD THE CONSTRUCTION EXIST SHALL BE PIPED BENEATH THE EXIST. IF PIPING IS IMPRACTICAL, A BERM WITH 5:1 SLOPES THAT CAN BE CROSSED BY VEHICLES MAY BE SUBSTITUTED FOR THE PIPE.
7. MAINTENANCE – THE EXIST SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS–OF–WAY. THIS WILL REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE OR ADDITIONAL LENGTH AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS–OF–WAY MUST BE REMOVED IMMEDIATELY.
8. WHEELS SHALL BE CLEANED TO REMOVE MUD PRIOR TO ENTRANCE ONTO PUBLIC RIGHTS–OF–WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.

STABILIZED CONSTRUCTION EXIT

NOT TO SCALE



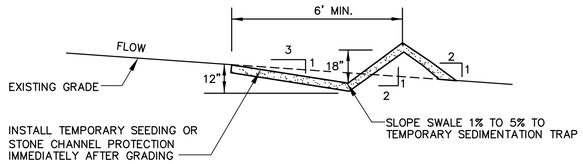
NOTES

1. ORGANIC FILTER BERMS MAY BE UTILIZED IN LIEU OF SILT FENCE OR OTHER SEDIMENT BARRIERS.
2. THE EROSION CONTROL MIXTURE USED IN FILTER BERMS SHALL BE A WELL–GRADED MIX OF PARTICLE SIZES THAT MAY CONTAIN ROCKS LESS THAN 4" IN DIAMETER, STUMP GRINDINGS, SHREDDED OR COMPOSTED BARK, AND/OR ACCEPTABLE MANUFACTURED PRODUCTS AND SHALL BE FREE OF REFUSE, PHYSICAL CONTAMINANTS AND MATERIAL TOXIC TO PLANT GROWTH. EROSION CONTROL MIXTURE SHALL MEET THE FOLLOWING STANDARDS:
   a) THE ORGANIC CONTENT SHALL BE 80–100% OF DRY WEIGHT.
   b) PARTICLE SIZE BY WEIGHT SHALL BE 100% PASSING A 6" SCREEN, AND 70–85% PASSING A 0.75" SCREEN.
   c) THE ORGANIC PORTION SHALL BE FIBROUS AND ELONGATED.
   d) LARGE PORTIONS OF SILTS, CLAYS, OR FINE SANDS SHALL NOT BE INCLUDED IN THE MIXTURE.
   e) SOLUBLE SALTS CONTENT SHALL BE >4.0mmhos/cm.
   f) THE pH SHALL BE BETWEEN 5.0 AND 8.0.
3. ORGANIC FILTER BERMS SHALL BE INSTALLED ALONG A RELATIVELY LEVEL CONTOUR. IT MAY BE NECESSARY TO CUT TALL GRASSES OR WOODY VEGETATION TO AVOID CREATING VOIDS AND BRIDGES THAT WOULD ENABLE FINES TO WASH UNDER THE BERM.
4. ON SLOPES LESS THAN 5%, OR AT THE BOTTOM OF SLOPES NO STEEPER THAN 3:1 AND UP TO 20' LONG, THE BERM SHALL BE A MINIMUM OF 12" HIGH (AS MEASURED ON THE UPHILL SIDE) AND A MINIMUM OF 36" WIDE. ON LONGER AND/OR STEEPER SLOPES, THE BERM SHALL BE TALLER AND WIDER TO ACCOMMODATE THE POTENTIAL FOR ADDITIONAL RUNOFF (MAXIMUM HEIGHT SHALL NOT EXCEED 2').
5. FROZEN GROUND, OUTCROPS OF BEDROCK, AND VERY ROOTED FORESTED AREAS PRESENT THE MOST PRACTICAL AND EFFECTIVE LOCATIONS FOR ORGANIC FILTER BERMS. OTHER BMP'S SHOULD BE USED AT LOW POINTS OF CONCENTRATED RUNOFF, BELOW CULVERT OUTLET APRONS, AROUND CATCH BASINS, AND AT THE BOTTOM OF STEEP PERIMETER SLOPES THAT HAVE A LARGE CONTRIBUTING AREA.
6. SEDIMENT SHALL BE REMOVED FROM BEHIND THE FILTER BERMS WHEN IT HAS ACCUMULATED TO ONE HALF THE ORIGINAL HEIGHT OF THE BERM.
7. ORGANIC FILTER BERMS MAY BE LEFT IN PLACE ONCE THE SITE IS STABILIZED PROVIDED ANY SEDIMENT DEPOSITS TRAPPED BY THEM ARE REMOVED AND DISPOSED OF PROPERLY.

ORGANIC FILTER BERM

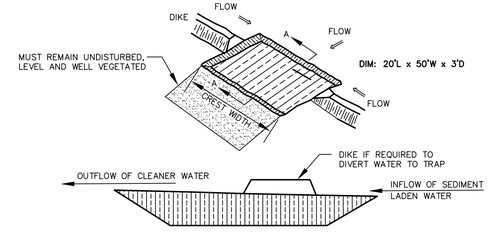
NOT TO SCALE

SWALE SHALL BE FREE OF IRREGULARITIES WHICH MAY CAUSE PONDING. COMPACT FILLS AS NECESSARY TO STABILIZE MATERIAL.



TEMPORARY DIVERSION SWALE

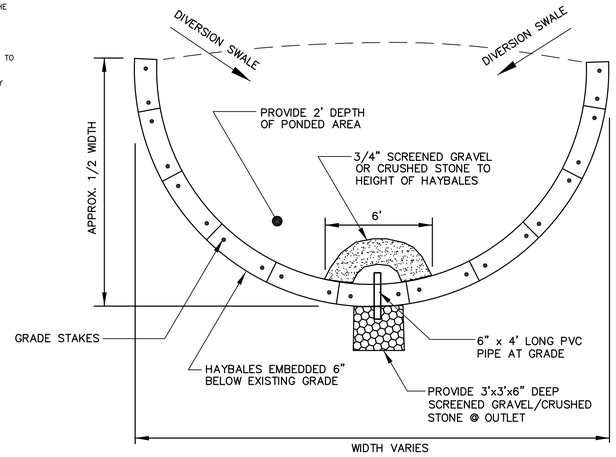
NOT TO SCALE



NOTE:
SEDIMENT SHALL BE REMOVED AND TRAP RESTORED TO ITS ORIGINAL DIMENSION WHEN SEDIMENT HAS ACCUMULATED TO 1/2 THE DESIGN DEPTH OF THE TRAP. REMOVED SEDIMENT SHALL BE DEPOSITED IN A SUITABLE AREA AND IN SUCH A MANNER THAT IT WILL NOT ERODE.

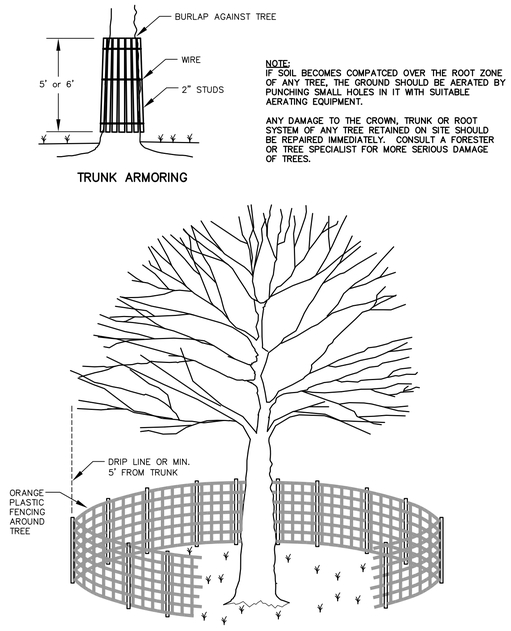
EXCAVATED GRASS OUTLET SEDIMENT TRAP

NOT TO SCALE



TYPICAL TEMPORARY SEDIMENT BASIN (TSB)

NOT TO SCALE



NOTE:
IF SOIL BECOMES COMPATCED OVER THE ROOT ZONE OF ANY TREE, THE GROUND SHOULD BE AERATED BY PUNCHING SMALL HOLES IN IT WITH SUITABLE AERATING EQUIPMENT.

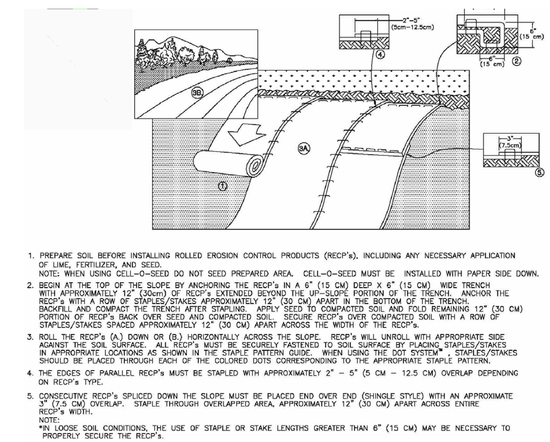
ANY DAMAGE TO THE CROWN, TRUNK OR ROOT SYSTEM OF ANY TREE RETAINED ON SITE SHOULD BE REPAIRED IMMEDIATELY. CONSULT A FORESTER OR TREE SPECIALIST FOR MORE SERIOUS DAMAGE OF TREES.

TREE PROTECTION

NOT TO SCALE

DOUBLE SILT BARRIER DETAIL

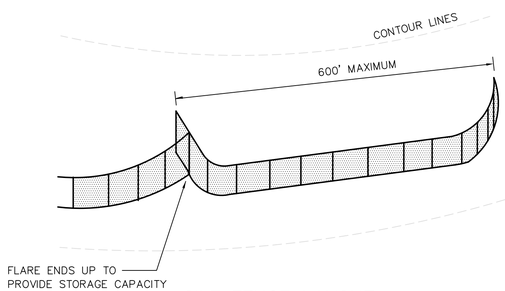
NOT TO SCALE



1. PREPARE SOIL BEFORE INSTALLING ROLLED EROSION CONTROL PRODUCTS (RECP's), INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED.
   NOTE: WHEN USING CELL–O–SEED DO NOT SEED PREPARED AREA. CELL–O–SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE RECP's IN A 6" (15 CM) DEEP X 6" (15 CM) WIDE TRENCH WITH APPROXIMATELY 12" (30cm) OF RECP's EXTENDED BEYOND THE UP–SLOPE PORTION OF THE TRENCH. ANCHOR THE RECP's WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" (30 CM) APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" (30 CM) PORTION OF RECP's BACK OVER SEED AND COMPACTED SOIL. SECURE RECP's OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" (30 CM) APART ACROSS THE WIDTH OF THE RECP's.
3. ROLL THE RECP's (A) DOWN OR (B) HORIZONTALLY ACROSS THE SLOPE. RECP's WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL RECP's MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING THE DOT SYSTEM™, STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
4. THE EDGES OF PARALLEL RECP's MUST BE STAPLED WITH APPROXIMATELY 2" – 5" (5 CM – 12.5 CM) OVERLAP DEPENDING ON RECP's TYPE.
5. CONSECUTIVE RECP's SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" (7.5 CM) OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" (30 CM) APART ACROSS ENTIRE RECP's WIDTH.
   NOTE:
   *IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" (15 CM) MAY BE NECESSARY TO PROPERLY SECURE THE RECP's.

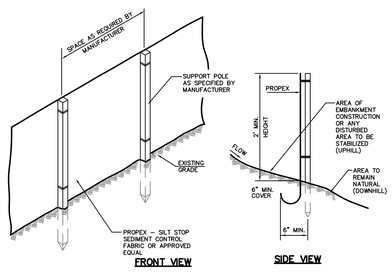
EROSION CONTROL BLANKET

NOT TO SCALE



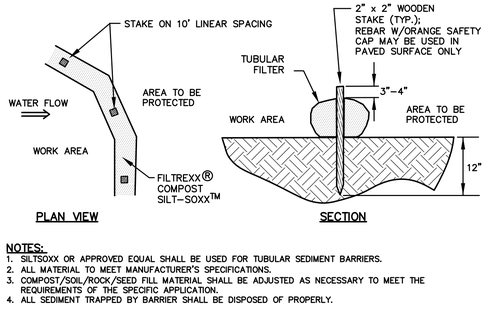
SILT FENCE LAYOUT

NOT TO SCALE



SILT FENCE DETAIL

NOT TO SCALE



NOTES:
1. SILTSOXX OR APPROVED EQUAL SHALL BE USED FOR TUBULAR SEDIMENT BARRIERS.
2. ALL MATERIAL TO MEET MANUFACTURER'S SPECIFICATIONS.
3. COMPOST/SOIL/ROCK/SEED FILL MATERIAL SHALL BE ADJUSTED AS NECESSARY TO MEET THE REQUIREMENTS OF THE SPECIFIC APPLICATION.
4. ALL SEDIMENT TRAPPED BY BARRIER SHALL BE DISPOSED OF PROPERLY.

TUBULAR SEDIMENT BARRIER DETAIL

NOT TO SCALE

P4567

ALTUS ENGINEERING, INC.

133 COURT STREET PORTSMOUTH, NH 03801
(603) 433–2335 www.ALTUS–ENG.com

STATE OF MAINE
JEFFREY K. CLIFFORD
No. 5957
LICENSED PROFESSIONAL ENGINEER

THIS DRAWING HAS NOT BEEN RELEASED FOR CONSTRUCTION

ISSUED FOR:
FINAL APPROVAL

ISSUE DATE:
JANUARY 24, 2019

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	PB SUBMISSION	JKC	6/22/17
1	MDEP SUBMISSION	JKC	3/19/18
2	TOWN FINAL APPROVAL	JKC	1/24/19

DRAWN BY: RMB
APPROVED BY: JKC
DRAWING FILE: 4567SITE.DWG

SCALE: N.T.S.

OWNER/APPLICANT:

CHINBURG DEVELOPMENT, LLC
3 PENSTOCK WAY
NEWMARKET, NH 03857

PROJECT:

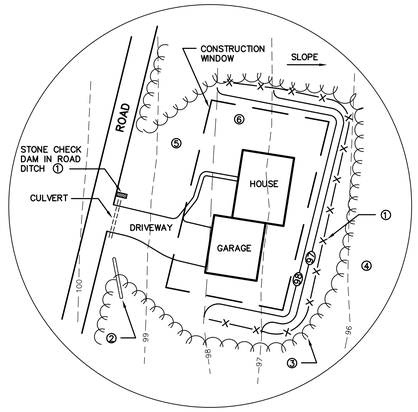
HUNTINGTON RUN SUBDIVISION
MAP 66 LOTS 2A, 8 & 8A
40 BETTY WELCH ROAD
KITTERY, MAINE

TITLE:

EROSION CONTROL DETAILS

SHEET NUMBER:

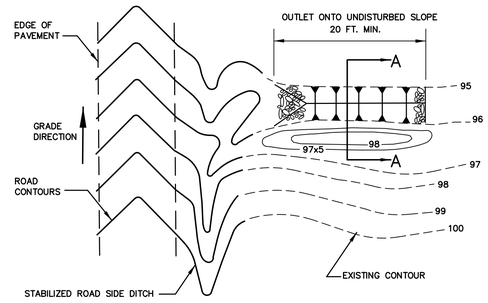
C–5.1



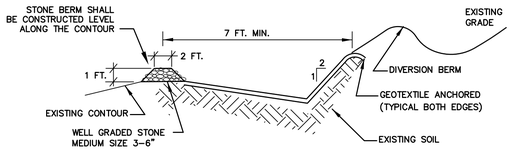
INSTALLATION
1. INSTALL SEDIMENT BARRIERS ON THE SITE BEFORE DISTURBING SOILS. SEE THE "SEDIMENT BARRIER" MEASURE FOR DETAILS ON INSTALLATION AND MAINTENANCE.
2. CONSTRUCT A DIVERSION DITCH TO KEEP UPSLOPE RUNOFF OUT OF WORK AREA.
3. MARK CLEARING LIMITS ON THE SITE TO KEEP EQUIPMENT OUT OF AREAS WITH STEEP SLOPES, CHANNELIZED FLOW, OR ADJACENT SURFACE WATERS AND WETLANDS.
4. PRESERVE BUFFERS BETWEEN THE WORK AREA AND ANY DOWNSTREAM SURFACE WATERS AND WETLANDS. SEE THE "BUFFERS" MEASURE FOR BUFFER PRESERVATION.
5. USE TEMPORARY MULCH AND RYE-SEED TO PROTECT DISTURBED SOILS OUTSIDE THE ACTIVE CONSTRUCTION AREA. SEE THE "MULCHING" MEASURE AND "VEGETATION" MEASURE FOR DETAILS AND SPECIFICATIONS FOR THESE CONTROLS.
6. PERMANENTLY SEED AREAS NOT TO BE PAVED WITHIN SEVEN DAYS OF COMPLETING FINAL GRADING. SEE "VEGETATION" MEASURE FOR INFORMATION ON PROPER SEEDING.

MAINTENANCE
EVERY MONTH THE FIRST YEAR AFTER CONSTRUCTION AND YEARLY THEREAFTER, INSPECT FOR AREAS SHOWING EROSION OR POOR VEGETATION GROWTH. FIX THESE PROBLEMS AS SOON AS POSSIBLE. EACH SPRING REMOVE ANY ACCUMULATION OF DEBRIS OR WINTER SAND THAT WOULD IMPEDE RUNOFF FROM ENTERING A BUFFER OR DITCH.

HOUSE LOT BMP
NOT TO SCALE



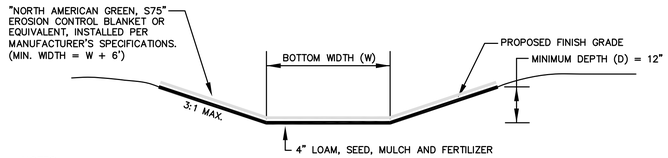
PLAN VIEW



SECTION A-A

ROAD DITCH TURNOUTS SHALL BE CONSTRUCTED PER STORMWATER MANAGEMENT FOR MAINE, "VOLUME III BMPS TECHNICAL DESIGN MANUAL, CHAPTER 5.2.4, DITCH TURN OUT BUFFER", JANUARY 2006 SPECIFICATIONS.

ROAD DITCH TURNOUT
NOT TO SCALE



NOTES:
1. THE FOUNDATION AREA OF THE WATERWAY SHALL BE CLEARED AND GRUBBED OF ALL TREES, BRUSH, STUMPS, AND OTHER OBJECTIONABLE MATERIAL. MATERIALS REMOVED SHALL BE DISPOSED OF SO THEY WILL NOT INTERFERE WITH THE CONSTRUCTION OR PROPER FUNCTIONING OF THE WATERWAY.
2. THE WATERWAY SHALL BE EXCAVATED OR SHAPED TO LINE, GRADE AND CROSS SECTION AS REQUIRED TO MEET THE DESIGN CRITERIA. THE WATERWAY SHALL BE FREE OF IRREGULARITIES WHICH WILL IMPEDE NORMAL FLOW.
3. EARTH FILLS REQUIRED TO MEET SUBGRADE REQUIREMENTS BECAUSE OF OVER EXCAVATION OR TOPOGRAPHY SHALL BE COMPACTED TO THE SAME DENSITY AS THE SURROUNDING SOIL TO PREVENT UNEQUAL SETTLEMENT THAT COULD CAUSE DAMAGE TO THE COMPLETED WATERWAY. EARTH REMOVED AND NOT NEEDED IN CONSTRUCTION SHALL BE SPREAD OR DISPOSED OF SO IT WILL NOT INTERFERE WITH THE FUNCTIONING OF THE WATERWAY.
4. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER AS TO MINIMIZE EROSION AND AIR AND WATER POLLUTION. ALL APPROPRIATE STATE AND LOCAL LAWS AND REGULATIONS SHALL BE COMPLIED WITH FOR INSTALLATION.
5. VEGETATION SHALL BE ESTABLISHED IN THE SWALE OR AN EROSION CONTROL MATTING INSTALLED PRIOR TO ALLOWING STORMWATER RUNOFF TO FLOW THROUGH THE SWALE.
6. MAINTENANCE OF THE VEGETATION IN THE GRASSED WATERWAY IS EXTREMELY IMPORTANT IN ORDER TO PREVENT RILLING, EROSION, AND FAILURE OF THE WATERWAY. MOWING SHALL BE DONE FREQUENTLY ENOUGH TO CONTROL ENCROACHMENT OF WEEDS AND WOODY VEGETATION AND TO KEEP THE GRASSES IN A VIGOROUS CONDITION. THE VEGETATION SHALL NOT BE MOWED TOO CLOSELY SO AS TO REDUCE THE EROSION RESISTANCE IN THE WATERWAY.
7. THE WATERWAY SHOULD BE INSPECTED PERIODICALLY AND AFTER ANY STORM GREATER THAN 0.5" OF RAINFALL IN 24 HOURS TO DETERMINE THE CONDITION OF THE WATERWAY. RILLS AND DAMAGED AREAS SHOULD BE PROMPTLY REPAIRED AND REVEGETATED AS NECESSARY TO PREVENT FURTHER DETERIORATION.
8. APPLY LIME AND FERTILIZER AS NEEDED TO MAINTAIN VIGOROUS GROWTH.

GRASSED SWALE
NOT TO SCALE

CONSTRUCTION OVERSIGHT

The applicant will retain the services of a professional engineer to inspect the construction and stabilization of all stormwater management structures. If necessary, the inspecting engineer will interpret the pond's construction plan for the contractor. Once all stormwater management structures are constructed and stabilized, the inspecting engineer will notify the department in writing within 30 days to state that the pond has been completed. Accompanying the engineer's notification must be a log of the engineer's inspections giving the date of each inspection, the time of each inspection, and the items inspected on each visit, and include any testing data or sieve analysis data of every mineral soil and soil media specified in the plans and used on site.

UNDERDRAINED FILTER BASIN

Construction Sequence: The soil filter media and vegetation 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 completed.

Compaction of Soil Filter: Filter soil media and underdrain bedding material must be compacted to between 90% and 92% standard proctor. The bed should be installed in at least 2 lifts of 9 inches to prevent pockets of loose media.

Construction Oversight: Inspection by a professional engineer will occur at a minimum:
- After the preliminary construction of the filter grades and once the underdrain pipes are installed but not backfilled,
- After the drainage layer is constructed and prior to the installation of the filter media,
- After the filter media has been installed and seeded. Bio-retention cells must be stabilized per the provided planting scheme and density for the canopy coverage of 30 and 50%.
- After one year to inspect health of the vegetation and make corrections, and
- All the material used for the construction of the filter basin 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:
- 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 a composite of three different locations (grabs) from the stockpile or pit face. Sample size required will be determined by the testing laboratory.
- Perform a sieve analysis conforming to STM C136 (Standard Test Method for Sieve Analysis of fine and Course Aggregates 1996A) on each type of the sample material. The resulting soil filter media mixture must have 8% to 12% by weight passing the #200 sieve, a clay content of less than 2% (determined hydrometer grain size analysis) and have 10% dry weight of organic matter.
- 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.

LOT GRADING AND DRIVEWAY LOCATION

Inspections a professional engineer will consist of a visit to the site prior to construction to consult with the earthwork contractor and a post construction meeting to confirm grading on lots and for all driveways to ensure runoff is directed according to plans and to oversee the re-stabilization of the lot into a vegetated cover.

BUFFERS - GENERAL

General forest use means that the land must be maintained with a forest cover and undisturbed soil, duff layer ground cover vegetation, and understory vegetation. Timber may be harvested on a selective basis provided that no more than 40% of the volume is harvested within any 10 year period.

ROAD DITCH TURNOUT

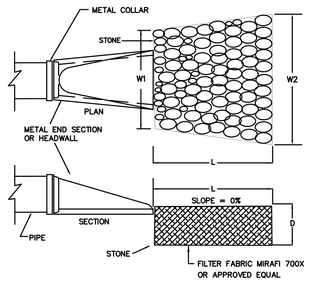
Inspections by a professional engineer shall consist of weekly visits to the site to inspect each turnout construction, turnout's stone berm material and placement, from initial ground disturbance to final stabilization of the level spreader.

DEWATERING

A dewatering plan is needed to address excavation de-watering following heavy rainfall events or where the excavation may intercept the groundwater table during construction. The collected water needs treatment and a discharge point that will not cause downgradient erosion and offsite sedimentation or within a resource. Please follow the details of such a plan.

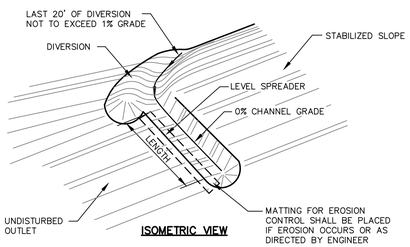
BASIC STANDARDS - EROSION CONTROL MEASURES

Minimum erosion control measures will need to be implemented and the applicant will be responsible to maintain all components of the erosion control plan until the site is fully stabilized. However, based on site and weather conditions during construction, additional erosion control measures may need to be implemented. All areas of instability and erosion must be repaired immediately during construction and need to be maintained until the site is fully stabilized or vegetation is established. A construction log must be maintained for the erosion and sedimentation control inspections and maintenance

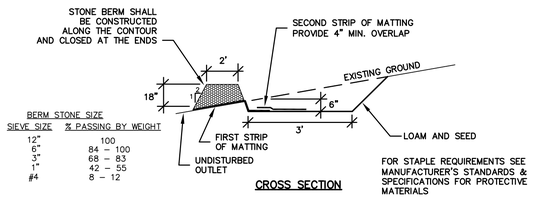


NOTES:
1. STONE SIZE AND MAT DIMENSIONS DETAILED ON GRADING, DRAINAGE & EROSION CONTROL PLAN
2. FIELD STONE, QUARRY STONE, OR ROCK FRAGMENTS SHALL BE SOUND, OF APPROVED QUALITY, AND FREE FROM STRUCTURAL DEFECTS. THE STONES SHALL BE ANGULAR AND APPROXIMATELY RECTANGULAR IN SHAPE. FLAT OR ROUND ROCKS ARE NOT ACCEPTABLE.
3. A WELL GRADED MIXTURE OF ROCK SIZES SHALL BE USED FOR STONE. FIFTY PERCENT BY WEIGHT OF THE STONE MIXTURE SHALL BE SMALLER THAN THE MEDIAN SIZE STONE (d50). THE LARGEST STONE SIZE IN THE MIXTURE SHALL BE 1.5 TIMES THE d50 SIZE.

RIP RAP OUTLET PROTECTION
NOT TO SCALE



ISOMETRIC VIEW



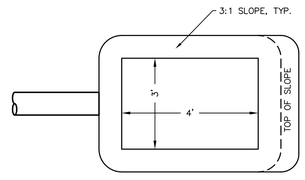
BERM STONE SIZE

SIEVE SIZE	% PASSING BY WEIGHT
12"	100
6"	84 - 100
3"	68 - 83
1"	42 - 55
#4	8 - 12

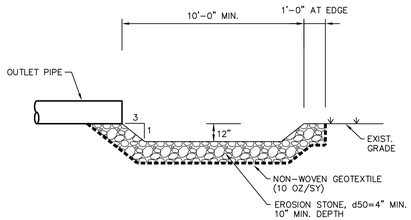
CROSS SECTION

LEVEL SPREADERS SHALL BE CONSTRUCTED PER STORMWATER MANAGEMENT FOR MAINE, "VOLUME III BMPS TECHNICAL DESIGN MANUAL, CHAPTER 5.2.2, BUFFER WITH STONE BERMED LEVEL LIP SPREADER", JANUARY 2006 SPECIFICATIONS.

LEVEL SPREADER
NOT TO SCALE



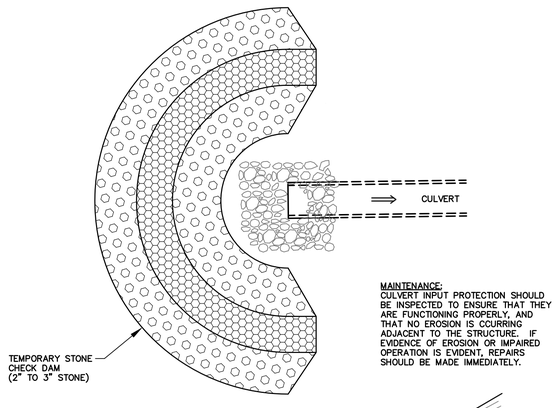
PLAN VIEW



SECTION

1. CONSTRUCT PLUNGE POOL TO THE WIDTHS AND LENGTHS SHOWN ON THE PLAN.
2. THE SUBGRADE FOR THE GEOTEXTILE FABRIC AND RIPRAP SHALL BE PREPARED TO LINES AND GRADES SHOWN ON THE PLANS.
3. EROSION STONE USED FOR THE PLUNGE POOL SHALL MEET THE FOLLOWING GRADATION.
4. GEOTEXTILE FABRICS SHALL BE PROTECTED FROM PUNCTURE OR TEARING DURING THE PLACEMENT OF THE EROSION STONE. DAMAGED AREAS IN THE FABRIC SHALL BE REPAIRED BY PLACING A PIECE OF FABRIC OVER THE DAMAGED AREA OR BY COMPLETE REPLACEMENT OF THE FABRIC. ALL OVERLAPS REQUIRED FOR REPAIRS OR JOINING TWO PIECES OF FABRIC SHALL BE A MINIMUM OF 18 INCHES.
5. THE EROSION STONE MAY BE PLACED BY EQUIPMENT AND SHALL BE CONSTRUCTED TO THE FULL LAYER THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO PREVENT SEGREGATION OF THE STONE SIZES.

PLUNGE POOL DETAIL
NOT TO SCALE



PIPE INLET PROTECTION
NOT TO SCALE

ALTUS ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801
(603) 433-2335 www.ALTUS-ENG.com

STATE OF MAINE
JEFFREY K. CLIFFORD
No. 5957
LICENSED PROFESSIONAL ENGINEER

THIS DRAWING HAS NOT BEEN RELEASED FOR CONSTRUCTION

ISSUED FOR:
FINAL APPROVAL

ISSUE DATE:
JANUARY 24, 2019

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	PB SUBMISSION	JKC	6/22/17
1	MDEP SUBMISSION	JKC	3/19/18
2	TOWN FINAL APPROVAL	JKC	1/24/19

DRAWN BY: RMB
APPROVED BY: JKC
DRAWING FILE: 4567SITE.DWG

SCALE: N.T.S.

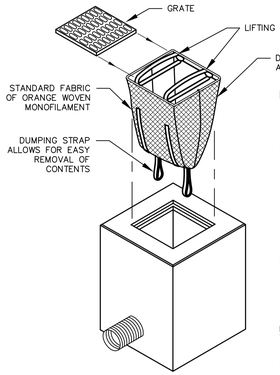
OWNER/APPLICANT:
CHINBURG DEVELOPMENT, LLC
3 PENSTOCK WAY
NEWMARKET, NH 03857

PROJECT:
HUNTINGTON RUN SUBDIVISION
MAP 66 LOTS 2A, 8 & 8A
40 BETTY WELCH ROAD
KITTERY, MAINE

TITLE:
EROSION CONTROL DETAILS

SHEET NUMBER:
C-5.2

P4567



INSTALLATION AND MAINTENANCE:

INSTALLATION: REMOVE THE GRATE FROM CATCH BASIN. IF USING OPTIONAL OIL ABSORBENTS; PLACE ABSORBENT PILLOW IN UNIT. STAND GRATE ON END. MOVE THE TOP LIFTING STRAPS OUT OF THE WAY AND PLACE THE GRATE INTO CATCH BASIN INSERT SO THE GRATE IS BELOW THE TOP STRAPS AND ABOVE THE LOWER STRAPS. HOLDING THE LIFTING DEVICES, INSERT THE GRATE INTO THE INLET.

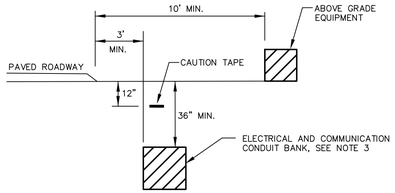
MAINTENANCE: REMOVE ALL ACCUMULATED SEDIMENT AND DEBRIS FROM VICINITY OF THE UNIT AFTER EACH STORM EVENT. AFTER EACH STORM EVENT AND AT REGULAR INTERVALS, LOOK INTO THE CATCH BASIN INSERT. IF THE CONTAINMENT AREA IS MORE THAN 1/3 FULL OF SEDIMENT, THE UNIT MUST BE EMPTIED. TO EMPTY THE UNIT, LIFT THE UNIT OUT OF THE INLET USING THE LIFTING STRAPS AND REMOVE THE GRATE. IF USING OPTIONAL ABSORBENTS; REPLACE ABSORBENT WHEN NEAR SATURATION.

UNACCEPTABLE INLET PROTECTION METHOD:

A SIMPLE SHEET OF GEOTEXTILE UNDER THE GRATE IS NOT ACCEPTABLE.

STORM DRAIN INLET PROTECTION

NOT TO SCALE

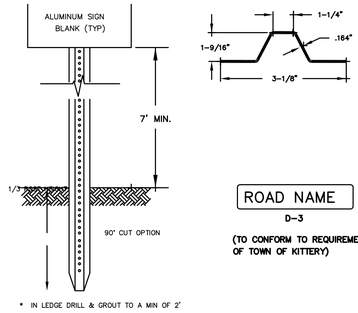


NOTES:

1) ELECTRICAL AND COMMUNICATION CONDUIT SIZE, MATERIALS AND SPACING SHALL BE IN ACCORDANCE WITH THE APPLICABLE UTILITY COMPANY STANDARDS.
2) CONDUIT SHALL CROSS PAVED AREAS AT 90°.
3) BACKFILL NOTES:
   A) SELECTED SAND BACKFILL SHALL CONSIST OF A FINE GRANULAR MATERIAL OF WHICH 100% SHALL PASS THROUGH A 1/4" SIEVE.
   B) EXCEPTION: NATURALLY OCCURRING SMOOTH ROUND PEBBLES NO GREATER THAN 3/8" IN DIAMETER ARE PERMITTED AS LONG AS THEIR TOTAL VOLUME PER CUBIC FOOT OF SAND DOES NOT EXCEED 1%.
   C) THE SAND SHALL BE COMPLETELY FREE OF FROZEN LUMPS, ROCKS, STONES, DEBRIS AND RUBBISH.

UNDERGROUND CONDUIT BANK DETAIL

NOT TO SCALE



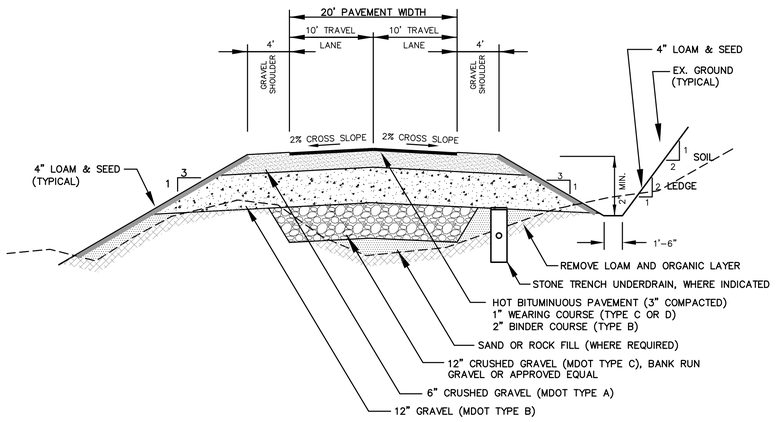
NOTE:
ALL SIGNS TO BE INSTALLED AS INDICATED IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION.

SIGN LEGEND
NOT TO SCALE

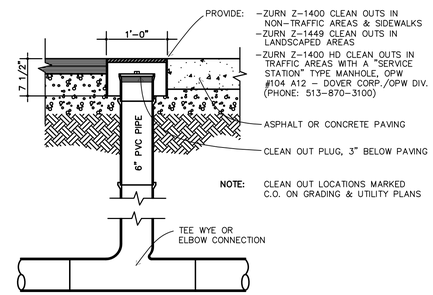
LENGTH: AS REQUIRED
WEIGHT PER LINEAR FOOT: 2.50 LBS (MIN.)
HOLES: 3/8" DIAMETER, 1" C-C FULL LENGTH
STEEL: SHALL CONFORM TO ASTM A-499 (GRADE 60) OR ASTM A-576 (GRADE 1070 - 1080)
FINISH: SHALL BE PAINTED WITH TWO COATS OF AN APPROVED MEDIUM GREEN BAKED ON OR AIR DRIED, PAINT OF WEATHER RESISTANT QUALITY. ALL FABRICATION SHALL BE COMPLETE BEFORE PAINTING.

SIGN POST DETAIL

NOT TO SCALE

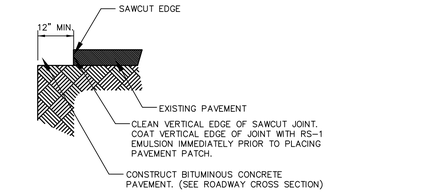


TYPICAL ROADWAY CROSS SECTION
STA. 1+10 TO STA. 16+39



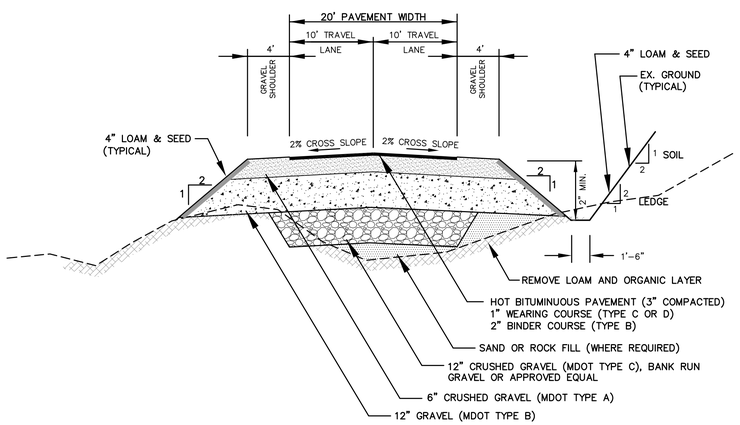
CLEANOUT DETAIL

NOT TO SCALE



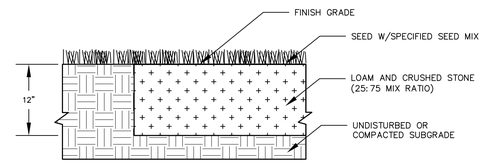
TYPICAL PAVEMENT SAWCUT DETAIL

NOT TO SCALE



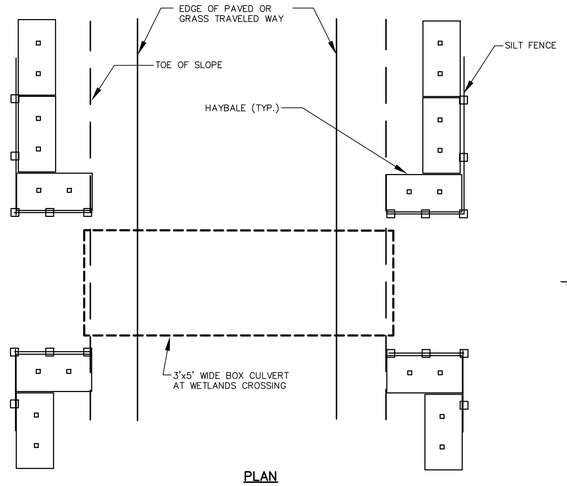
TYPICAL ROADWAY CROSS SECTION (WETLANDS CROSSING)
STA. 0+10 TO STA. 1+10

NOT TO SCALE

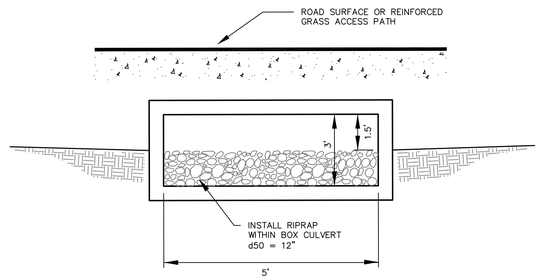


REINFORCED TURF

NOT TO SCALE



PLAN



CULVERT DETAIL AT WETLANDS X-ING

NOT TO SCALE

ALTUS ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801
(603) 433-2335 www.ALTUS-ENG.com

STATE OF MAINE
JEFFREY K. CLIFFORD
No. 5957
LICENSED PROFESSIONAL ENGINEER

THIS DRAWING HAS NOT BEEN RELEASED FOR CONSTRUCTION

ISSUED FOR:
FINAL APPROVAL

ISSUE DATE:
JANUARY 24, 2019

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	PB SUBMISSION	JKC	6/22/17
1	MDEP SUBMISSION	JKC	3/19/18
2	REVISED ROADWAY X-SEC	JKC	8/23/18
3	TOWN FINAL APPROVAL	JKC	1/24/19

DRAWN BY: RMB
APPROVED BY: JKC
DRAWING FILE: 4567SITE.DWG

SCALE: N.T.S.

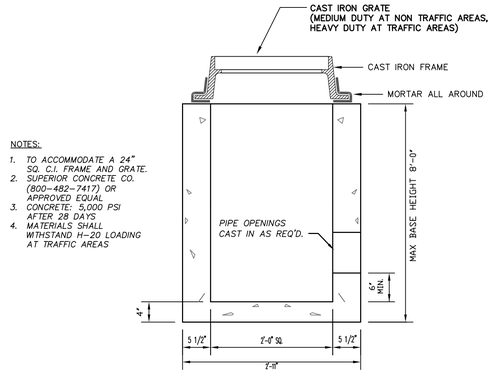
OWNER/APPLICANT:
CHINBURG DEVELOPMENT, LLC
3 PENSTOCK WAY
NEWMARKET, NH 03857

PROJECT:
HUNTINGTON RUN SUBDIVISION
MAP 66 LOTS 2A, 8 & 8A
40 BETTY WELCH ROAD
KITTERY, MAINE

TITLE:
DETAIL SHEET

SHEET NUMBER:
C-6.0

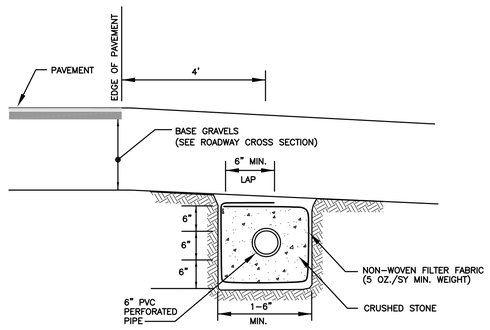
P4567



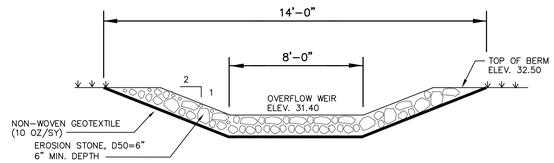
NOTES:

1. TO ACCOMMODATE A 24" SQ. C.I. FRAME AND GRATE.
2. SUPERIOR CONCRETE CO. (800-482-7417) OR APPROVED EQUAL
3. CONCRETE: 5,000 PSI AFTER 28 DAYS
4. MATERIALS SHALL WITHSTAND H-20 LOADING AT TRAFFIC AREAS

DROP INLET
NOT TO SCALE

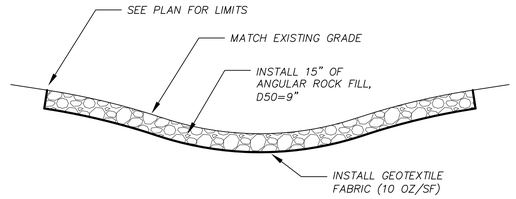


STONE TRENCH UNDERDRAIN SECTION
NOT TO SCALE

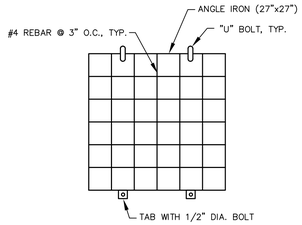


1. CONSTRUCT OVERFLOW WEIR TO THE LENGTH SHOWN ON THE PLAN.
2. THE SUBGRADE FOR THE GEOTEXTILE FABRIC AND RIPRAP SHALL BE PREPARED TO LINES AND GRADES SHOWN ON THE PLANS.
3. GEOTEXTILE FABRICS SHALL BE PROTECTED FROM PUNCTURE OR TEARING DURING THE PLACEMENT OF THE EROSION STONE. DAMAGED AREAS IN THE FABRIC SHALL BE REPAIRED BY PLACING A PIECE OF FABRIC OVER THE DAMAGED AREA OR BY COMPLETE REPLACEMENT OF THE FABRIC. ALL OVERLAPS REQUIRED FOR REPAIRS OR JOINING TWO PIECES OF FABRIC SHALL BE A MINIMUM OF 18 INCHES.
4. THE EROSION STONE MAY BE PLACED BY EQUIPMENT AND SHALL BE CONSTRUCTED TO THE FULL LAYER THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO PREVENT SEGREGATION OF THE STONE SIZES.

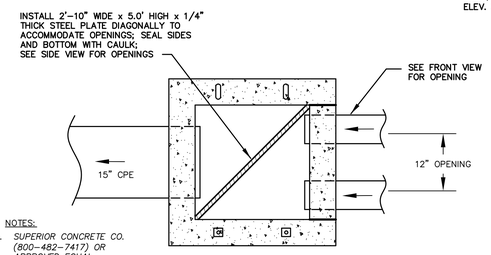
EMERGENCY OVERFLOW WEIR
NOT TO SCALE



ROCK FORD WETLANDS CROSSING
NOT TO SCALE



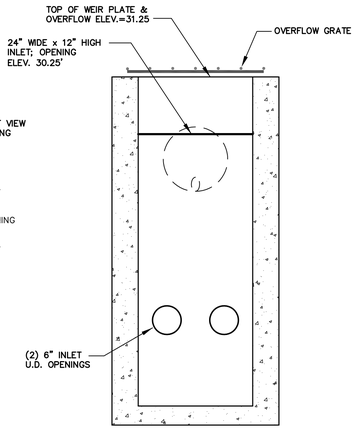
OUTLET STRUCTURE OVERFLOW GRATE
NOT TO SCALE



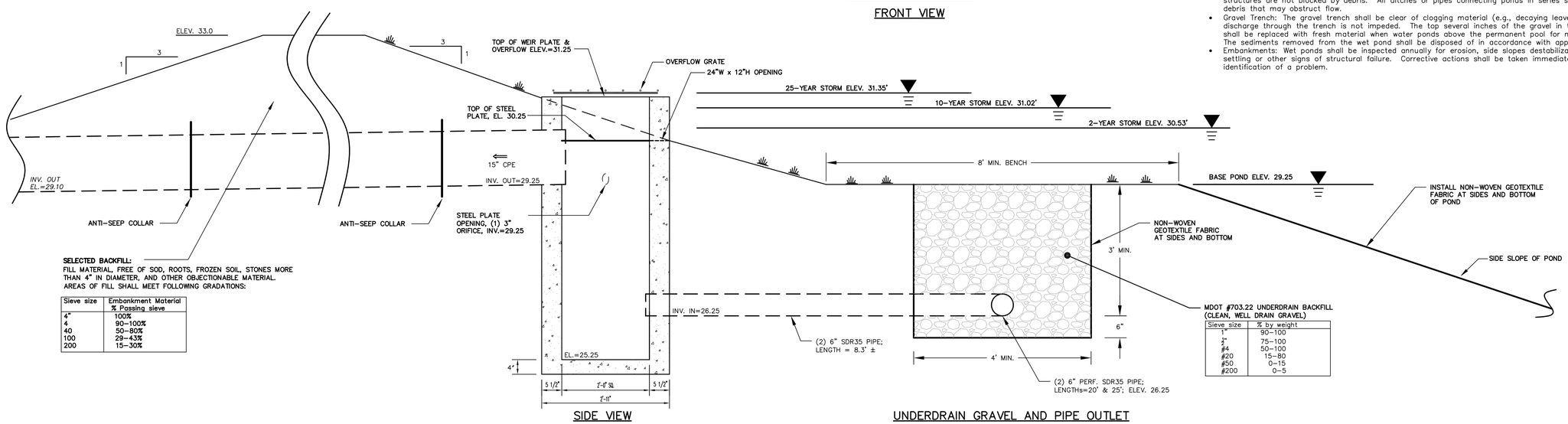
NOTES:

1. SUPERIOR CONCRETE CO. (800-482-7417) OR APPROVED EQUAL
2. CONCRETE: 5,000 PSI AFTER 28 DAYS
3. MATERIALS SHALL WITHSTAND H-20 LOADING AT TRAFFIC AREAS

TOP VIEW



FRONT VIEW



SELECTED BACKFILL:
FILL MATERIAL, FREE OF SOD, ROOTS, FROZEN SOIL, STONES MORE THAN 4" IN DIAMETER, AND OTHER OBJECTIONABLE MATERIAL. AREAS OF FILL SHALL MEET FOLLOWING GRADATIONS:

Sieve size	Embankment Material % Passing sieve
4"	100%
4	90-100%
40	50-80%
100	29-43%
200	15-30%

SIDE VIEW

UNDERDRAIN GRAVEL AND PIPE OUTLET

MDOT #703.22 UNDERDRAIN BACKFILL (CLEAN, WELL DRAIN GRAVEL)	
Sieve size	% by weight
1"	90-100
3/4"	75-100
#4	50-100
#20	15-80
#50	0-15
#200	0-5

WET POND #3 OUTLET STRUCTURE & POND CROSS SECTION
NOT TO SCALE

WET POND NOTES

The applicant will retain the services of a qualified professional to inspect the construction and stabilization of all stormwater management structures. If necessary, the qualified professional shall interpret the pond's construction plan for the contractor. Once all stormwater management structures are constructed and stabilized, the qualified professional will notify the department in writing within 30 days to state that the pond has been completed. Accompanying the notification must be a log of the inspections giving the date of each inspection, the time of each inspection, and the items inspected on each visit, and include any testing data or sieve analysis data of every mineral soil and soil media specified in the plans and used on site.

Construction Sequence: The wet pond shall 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 completed.

Construction Oversight: Construction of wet ponds shall be started no later than September 1 or before June. If side slopes and banks cannot be revegetated or stabilized before winter, basin construction shall be delayed to the following growing season. Seeding must occur by September 15 or other stabilization measures must be implemented before winter. Do not discharge stormwater to the basin until the basin is fully stabilized, or provide a sediment barrier at the outlet.

- A qualified professional shall witness and inspect the construction of the wet pond.
- The disposal of construction sediments shall be located such that water draining from the material could not flow directly to pond.

Vegetation: Appropriate species shall be carefully selected for different sections of the pond. appropriate plants shall be chosen to stabilize the sides and bottom of the pond, as well as the safety bench. Prior to filling the ponds, side slopes and banks must be stabilized with grass or conservation mix seeding to prevent erosion. Creation of a marsh environment at the pond inlet will help to trap sediment. If the inlet has a sump, aquatic plants can be planted upstream of the sump to help retain sediments in the sump. Fertilizer shall not be used in or around the pond except when necessary to establish new vegetation. Allowing for natural invasion along the safety bench or planting native species may encourage healthier growth than planting species not already found on site. Six inches of loam, composted wood waste or fine erosion control mix shall be added to amend dry mineral soils. A qualified professional shall be consulted when planning the revegetation of a basin.

Maintenance: The wet pond shall be inspected after every major storm to ensure proper functioning. thereafter, the basin shall be inspected at least once every six months. inspections shall include verification that the pond is slowly emptying through the gravel filter for a short time (12-24 hours) after a storm.

- Maintenance agreement: A legal agreement lists specific maintenance responsibilities, establish the responsible party, and provide for the funding to cover long-term inspection and maintenance. (See Declaration of Covenants, Conditions and Restrictions for Huntington Run Subdivision)
- Inlets and Outlets: The inlet and outlet of the pond shall be checked periodically to ensure that flow structures are not blocked by debris. All ditches or pipes connecting ponds in series shall be checked for debris that may obstruct flow.
- Gravel Trench: The gravel trench shall be clear of clogging material (e.g., decaying leaves) so that discharge through the trench is not impeded. The top several inches of the gravel in the outlet trench shall be replaced with fresh material when water ponds above the permanent pool for more than 72 hours. The sediments removed from the wet pond shall be disposed of in accordance with application regulations.
- Embankments: Wet ponds shall be inspected annually for erosion, side slopes destabilization, embankment settling or other signs of structural failure. Corrective actions shall be taken immediately upon identification of a problem.

ALTUS ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801
(603) 433-2335 www.ALTUS-ENG.com

STATE OF MAINE
JEFFREY K. CLIFFORD
No. 5957
LICENSED
PROFESSIONAL ENGINEER

THIS DRAWING HAS NOT BEEN RELEASED FOR CONSTRUCTION

ISSUED FOR:
FINAL APPROVAL

ISSUE DATE:
JANUARY 24, 2019

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	PB SUBMISSION	JKC	6/22/17
1	MDEP SUBMISSION	JKC	3/19/18
2	MDEP COMMENTS	JKC	7/13/18
3	MDEP COMMENTS	JKC	8/29/18
4	MDEP COMMENTS	JKC	9/10/18
5	TOWN FINAL APPROVAL	JKC	1/24/19

DRAWN BY: RMB
APPROVED BY: JKC
DRAWING FILE: 4567SITE.DWG

SCALE: N.T.S.

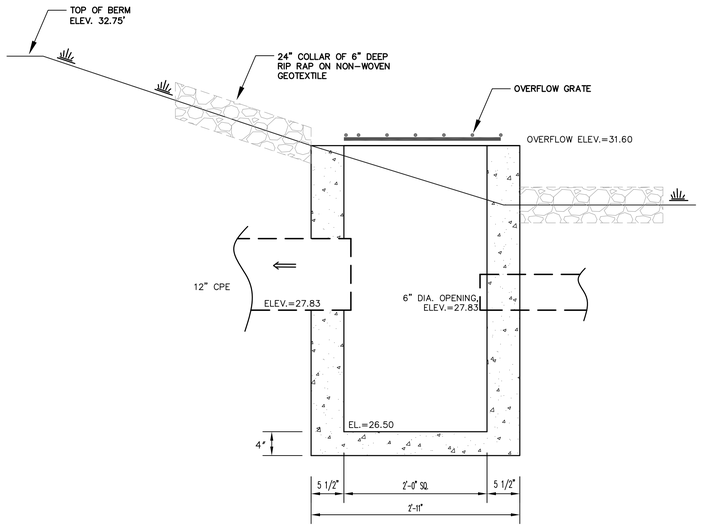
OWNER/APPLICANT:
CHINBURG DEVELOPMENT, LLC
3 PENSTOCK WAY
NEWMARKET, NH 03857

PROJECT:
HUNTINGTON RUN SUBDIVISION
MAP 66 LOTS 2A, 8 & 8A
40 BETTY WELCH ROAD
KITTERY, MAINE

TITLE:
DETAIL SHEET

SHEET NUMBER:
C-6.1

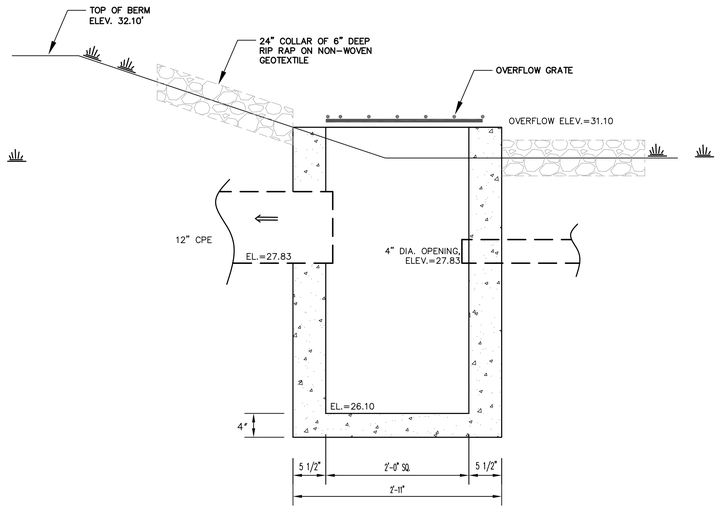
P4567



SIDE VIEW

DET. BASIN OUTLET STRUCTURE #1

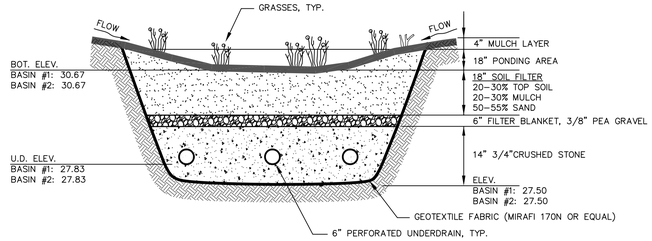
NOT TO SCALE



SIDE VIEW

DET. BASIN OUTLET STRUCTURE #2

NOT TO SCALE



SOIL FILTER MEDIA

FILTER MEDIA	MIXUTRE BY VOLUME	SPECIFICATION
SAND	50-55%	MEDOT SPECICATION #703.01 FINE AGGREGATE FOR CONCRETE
TOPSOIL	20-30%	LOAMY SAND TOPSOIL WITH MINIMAL CLAY CONTENT AND BETWEEN 15 TO 25% FINES PASSING THE #200 SIEVE
MULCH	20-30%	MODERATELY FINE, SHREDDED BARK OR WOOD FIBER MULCH WITH LESS THAN 5% PASSING #200 SIEVE

MEDOT #703.01 AGGREGATE

SIEVE SIZE	% BY WEIGHT
3/8"	100
#4	95-100
#8	80-100
#16	50-85
#30	25-60
#60	10-30
#100	2-10
#200	0-5

SEEDING (CONSERVATION MIX)

Creeping red fescue	20 lb/acre
Tall fescue	20 lb/acre
Bird's foot treefoil	8 lb/acre
Annual Rye	20 lb/acre
Total	68 lb/acre

Straw mulch or erosion control blanket after seeding

GRASSED UNDERDRAIN SOIL FILTER (GUSF) NOTES

The applicant will retain the services of a qualified professional to inspect the construction and stabilization of all stormwater management structures. If necessary, the qualified professional shall interpret the pond's construction plan for the contractor. Once all stormwater management structures are constructed and stabilized, the qualified professional will notify the department in writing within 30 days to state that the pond has been completed. Accompanying the notification must be a log of the inspections giving the date of each inspection, the time of each inspection, and the items inspected on each visit, and include any testing data or sieve analysis data of every mineral soil and soil media specified in the plans and used on site.

Construction Sequence: Erosion and sedimentation from unstable construction areas is the most common reason for filter failure. The soil filter media shall not be installed until the area that drains to it has been permanently stabilized or unless the runoff is diverted around the filter.

- Basin Excavation: The basin area may be excavated for underdrain installation and can be used as a sediment trap during construction. After excavation of the basin, the outlet structure and piping system may be installed if protected with a sediment barrier.
- Sacrificial Mulch cover: If the basin will be used as a sediment trap, the sides of the embankments must be stabilized and maintained to prevent erosion. The basin will need to be restored for its planned purpose after construction. Before final stabilization of the drainage area to the basin, a 2–inch to 3–inch layer of sandy loam (with less than 2% clay content) shall be spread on the surface of the soil filter media as a sacrificial protection layer. The sacrificial layer will need to be removed at the end of construction, and the soil filter media will need to be seeded and mulched.
- Compaction of Soil Filter: Filter soil media and underdrain bedding material shall be applied to reach a bulk density of between 90% and 92% standard proctor. The soil filter media shall be installed in at least two lifts of 9 inches to prevent pockets of loose media.
- Remedial Loam Cover: If vegetation is not established within the first year, the basin may be rototilled, reseeded and protected with a well–anchored erosion control blanket. Or, a 2–inch to 3–inch layer of fine sandy loam may be applied before seeding and mulching.

Construction Oversight: Inspection of the filter basin shall be provided for each phase of construction by a qualified professional with required reporting to the DEP. All material intended for the filter basin must be approved by the qualified professional after tests by a certified laboratory show that the material conforms to all DEP specifications. At a minimum, inspections will occur:

- o After the preliminary construction of the filter grades and once the underdrain pipes are installed (not backfilled);
- o After the drainage layer is constructed and prior to the installation of the soil filter media;
- o After the soil filter media has been installed, seeded and mulched.

Testing and Submittals: The source of each component of the soil filter media needs to be identified prior to construction. All results of field and laboratory testing must be submitted to the DEP for approval.

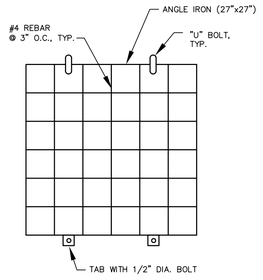
- Media Source: Samples of each type of material shall be blended for the mixed filter media and underdrain bedding material. Samples must be a composite of three different locations (grabs) from the stockpile or pit face. Sample size requirements will be determined by the testing laboratory.
- Sieve Analysis: A sieve analysis conforming to ASTM C136 shall be performed on each type of the sample material.
- Permeability Testing: Testing the permeability of the soil filter media mixture is recommended with the mixture at a measured bulk dry density of 90–92% based on ASTM D698.

Maintenance: The basin shall be inspected semi–annually and following major storm events. debris and sediment buildup shall be removed from the forebay and basin as needed. any bare area or erosion rills shall be repaired with new filter media, seeded and mulched.

- Maintenance Agreement: A legal entity shall be established with responsibility for inspecting and maintaining any underdrained filter. The legal agreement establishing the entity lists the specific maintenance responsibilities (including timetables) and provide for the funding to cover long–term inspection and maintenance. (See Declaration of Covenants, Conditions and Restrictions for Huntington Run Subdivision)
- Inlets and Outlets: The inlets and outlets of the pond shall be checked to ensure that flow structures are not blocked by debris.
- Drainage: The filter shall drain within 24 to 48 hours following a one–inch storm or greater. If the system drains too fast, an orifice may need to be added on the underdrain outlet or may need to be modified if already present.
- Sediment Removal: Sediment and plant debris shall be removed from the pretreatment structure at least annually.
- Mowing: If mowing is desired, only hand–held string trimmers or push–mowers are allowed on the filter (no tractor) and the grass bed shall be mowed no more than 2 times per growing season to maintain grass heights of no less than 6 inches.
- Fertilization: Fertilization of the underdrained filter area shall be avoided unless absolutely necessary to establish vegetation.
- Harvesting and Weeding: Harvesting and pruning of excessive growth shall be done occasionally. weeding to control unwanted or invasive plants may also be necessary.
- Grass Cover: Maintaining a healthy cover of grass will minimize clogging with fine sediments. If ponding exceeds 48 hours, the top of the filter bed shall be rototilled to reestablish the soil's filtration capacity.
- Soil Filter Replacement: The top several inches of the filter shall be replaced with fresh material if water is ponding for more than 72 hours, or the basin can be rototilled, seeded and mulched. Once the filter is mature, adding new material (a 1–inch to 2–inch cover of mature compost) can compensate for subsidence.

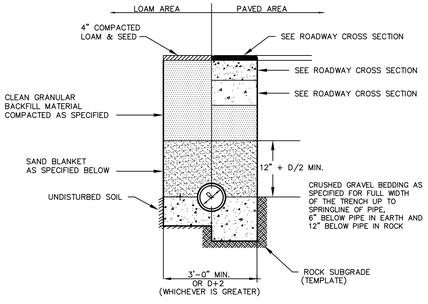
GRASSED UNDERDRAINED SOIL FILTER

NOT TO SCALE



OUTLET STRUCTURE OVERFLOW GRATE

NOT TO SCALE



SAND BLANKET		CRUSHED GRAVEL BEDDING	
SIEVE SIZE	% FINER BY WEIGHT	SIEVE SIZE	% PASSING BY WEIGHT
1/2"	90 – 100	3"	100
200	0 – 15	2"	95 – 100
		1"	55 – 85
		# 4	27 – 52
		# 200	0 – 12

MDOT TYPE A, CRUSHED GRAVEL

*(IN SAND PORTION) FRACTION PASSING THE #4 SIEVE.

BACKFILL MATERIAL BELOW PAVED OR CONCRETE AREAS, BEDDING MATERIAL, AND SAND BLANKET SHALL BE COMPACTED TO NOT LESS THAN 95% OF AASHTO T 99, METHOD C. SUITABLE BACKFILL MATERIAL BELOW LOAM AREAS SHALL BE COMPACTED TO NOT LESS THAN 90% OF AASHTO T 99, METHOD C.

TRENCH SECTION

NOT TO SCALE

ALTUS ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801
(603) 433-2335 www.ALTUS-ENG.com

STATE OF MAINE
JEFFREY K. CLIFFORD
No. 5957
LICENSED
PROFESSIONAL ENGINEER

THIS DRAWING HAS NOT BEEN RELEASED FOR CONSTRUCTION

ISSUED FOR: *FINAL APPROVAL*

ISSUE DATE: *JANUARY 24, 2019*

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	PB SUBMISSION	JKC	6/22/17
1	MDEP SUBMISSION	JKC	3/19/18
2	MDEP COMMENTS	JKC	7/13/18
3	TOWN FINAL APPROVAL	JKC	1/24/19

DRAWN BY: RMB
APPROVED BY: JKC
DRAWING FILE: 4567SITE.DWG

SCALE: N.T.S.

OWNERS/APPLICANT:

CHINBURG DEVELOPMENT, LLC

3 PENSTOCK WAY
NEWMARKET, NH 03857

PROJECT:

HUNTINGTON RUN SUBDIVISION
MAP 66 LOTS 2A, 8 & 8A
40 BETTY WELCH ROAD
KITTERY, MAINE

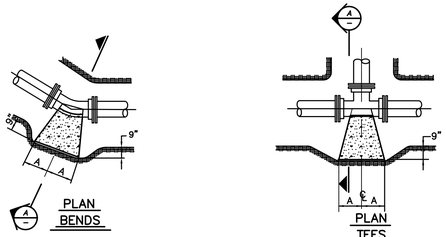
TITLE:

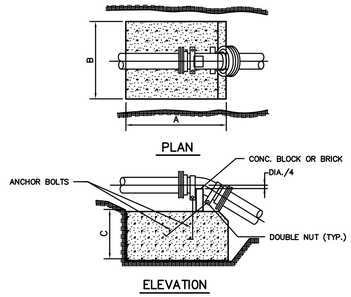
DETAIL SHEET

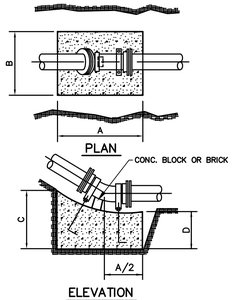
SHEET NUMBER:

C-6.2

P4567







TYPE	SIZE	90° BENDS		45° BENDS		22-1/2°& 11-1/4°BENDS		TEES		PLUGS	
		A	B	A	B	A	B	A	B	C	D
2000 P.S.F. SOIL	6" *	18"	11"	10"	11"	6"	9"	11"	13"	10"	24"
	8"	25"	14"	14"	14"	9"	11"	15"	17"	12"	32"
	10"	27"	20"	16"	19"	10"	15"	18"	22"	14"	40"
	12"	33"	23"	18"	23"	12"	18"	21"	26"	16"	47"
	14"	39"	26"	22"	26"	13"	22"	24"	30"	18"	54"
	16"	43"	30"	24"	30"	14"	26"	28"	33"	20"	61"
	20"	50"	39"	27"	39"	17"	32"	33"	42"	24"	74"
	24"	60"	45"	33"	45"	20"	38"	40"	49"	28"	88"

*6" OR LESS

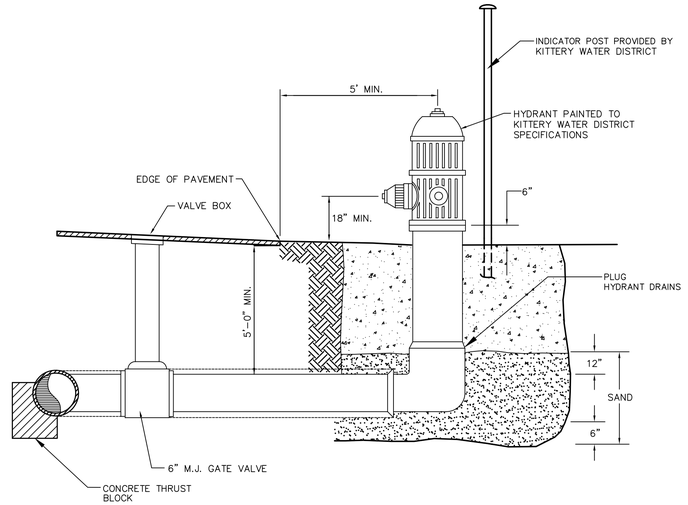
NOTE
BASED ON 150 P.S.I. STATIC PRESSURE PLUS A.W.W.A. WATER HAMMER.
ALL BEARING SURFACES TO BE CARRIED TO UNDISTURBED GROUND.

VERTICAL BENDS

TYPE	SIZE	TYPE A			TYPE B				STRAPS	ANCH. BOLT SIZE (DIA.)	L_1
		A	B	C	A	B	C	D			
2000 P.S.F. SOIL	6"*	38"	32"	27"	27"	27"	27"	16"	(1) 1/4"x 1 1/8"	5/8"	1'-0"
	8"	44"	38"	27"	30"	30"	30"	18"	" "	"	"
	10"	50"	44"	34"	37"	37"	33"	18"	(2) 1/4"x 1 1/4"	5/8"	1'-0"
	12"	57"	51"	40"	41"	41"	40"	21"	" "	"	"
	14"	57"	51"	67"	47"	47"	47"	24"	(2) 3/8"x 1 1/2"	3/4"	1'-0"
	16"	64"	57"	67"	54"	54"	49"	24"	" "	"	"
	20"	78"	63"	80"	64"	64"	64"	30"	(2) 1/2"x 1 3/4"	7/8"	2'-0"
	24"	93"	75"	83"	78"	78"	78"	36"	(2) 1/2"x 2 1/2"	1"	2'-0"

*6" OR LESS

NOTE
BASED ON 150 P.S.I. STATIC PRESSURE PLUS A.W.W.A. WATER HAMMER.
ALL BEARING SURFACES TO BE CARRIED TO UNDISTURBED GROUND.
ALL STRAPS, BOLTS AND ANCHORS SHALL BE MADE OF GALVANIZED STEEL AND SHALL CONFORM TO ASTM 123 AND 153

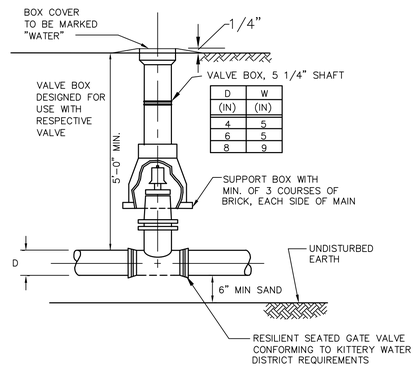


FIRE HYDRANT

NOT TO SCALE

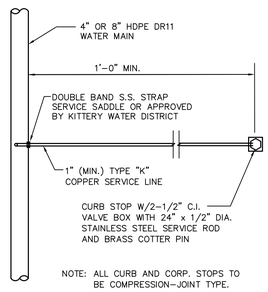
WATER MAIN NOTES:

1. OPERATION OF HYDRANTS AND VALVES SHALL BE AS DETERMINED BY KITTERY WATER DISTRICT AND KITTERY FIRE DEPARTMENT.
2. ALL WORK SHALL CONFORM TO KITTERY WATER DISTRICT "WATER MAIN MATERIAL AND INSTALLATION SPECIFICATIONS, MARCH 2009". CONTRACTOR SHALL OBTAIN A COPY OF SAID SPECIFICATIONS AND MEET WITH THE KITTERY WATER DISTRICT PRIOR TO PURCHASING MATERIALS OR COMMENCING CONSTRUCTION.
3. MECHANICAL JOINT FITTINGS ARE TO BE CLASS 350 AND HAVE ROMAC "GRIP RING" RETAINER GLANDS WITH CORTEN LOW ALLOY STEEL NUTS AND BOLTS OR MEGALUG RETAINER GLANDS.



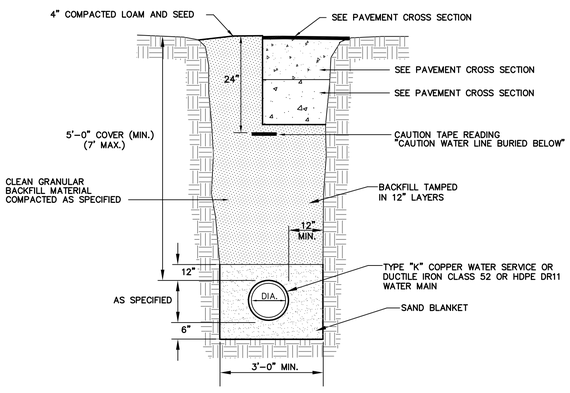
WATER VALVE DETAIL

NOT TO SCALE



TYPICAL SERVICE CONNECTION

NOT TO SCALE



WATER MAIN AND SERVICE TRENCH DETAIL

NOT TO SCALE

ALTUS ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801
(603) 433-2335 www.ALTUS-ENG.com

STATE OF MAINE
JEFFREY K. CLIFFORD
No. 5957
LICENSED PROFESSIONAL ENGINEER

THIS DRAWING HAS NOT BEEN RELEASED FOR CONSTRUCTION

ISSUED FOR: *FINAL APPROVAL*

ISSUE DATE: *JANUARY 24, 2019*

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	PB SUBMISSION	JKC	6/22/17
1	MDEP SUBMISSION	JKC	3/19/18
2	TOWN FINAL APPROVAL	JKC	1/24/19

DRAWN BY: RMB
APPROVED BY: JKC
DRAWING FILE: 4567SITE.DWG

SCALE: N.T.S.

OWNERS/APPLICANT:

CHINBURG DEVELOPMENT, LLC
3 PENSTOCK WAY
NEWMARKET, NH 03857

PROJECT:

HUNTINGTON RUN SUBDIVISION
MAP 66 LOTS 2A, 8 & 8A
40 BETTY WELCH ROAD
KITTERY, MAINE

TITLE:

WATER DETAILS

SHEET NUMBER:

C-7.0

P4567

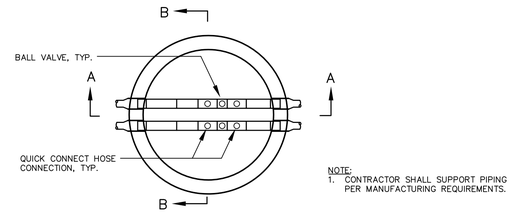
STANDARD TRENCH NOTES:

1. ORDERED EXCAVATION OF UNSUITABLE MATERIAL BELOW GRADE: BACKFILL AS STATED IN THE TECHNICAL SPECIFICATIONS OR AS SHOWN OF THE DRAWING.
2. BEDDING: SCREENED GRAVEL AND/OR CRUSHED STONE FREE FROM CLAY, LOAM, ORGANIC MATTER AND MEETING ASTM C33, STONE SIZE NO. 67.
   100% PASSING 1 INCH SCREEN
   90 – 100% PASSING 3/4 INCH SCREEN
   20 – 55% PASSING 3/8 INCH SCREEN
   0–10% PASSING #4 SIEVE
   0–5% PASSING #8 SIEVE
   WHERE ORDERED BY THE ENGINEER TO STABILIZE THE BASE, SCREENED GRAVEL OR CRUSHED STONE 1–1/2 INCH TO 1/2 INCH SHALL BE USED.
3. SAND BLANKET: CLEAN SAND FREE FROM ORGANIC MATTER, SO GRADED THAT 90 – 100% PASSES 1/2 INCH SIEVE AND NOT MORE THAN 15% WILL PASS A #200 SIEVE.
4. SUITABLE MATERIAL: IN ROADS, ROAD SHOULDERS, WALKWAYS AND TRAVELED WAYS, SUITABLE MATERIAL FOR TRENCH BACKFILL SHALL BE THE NATURAL MATERIAL EXCAVATED DURING THE COURSE OF CONSTRUCTION, BUT SHALL EXCLUDE DEBRIS; PIECES OF PAVEMENT; ORGANIC MATTER; TOP SOIL; ALL WET OR SOFT MUCK, PEAT, OR CLAY; ALL EXCAVATED LEDGE MATERIAL; ALL ROCKS OVER 6 INCHES IN LARGEST DIMENSION; AND ANY MATERIAL WHICH, AS DETERMINED BY THE ENGINEER, WILL NOT PROVIDE SUFFICIENT SUPPORT OR MAINTAIN THE COMPLETED CONSTRUCTION IN A STABLE CONDITION.

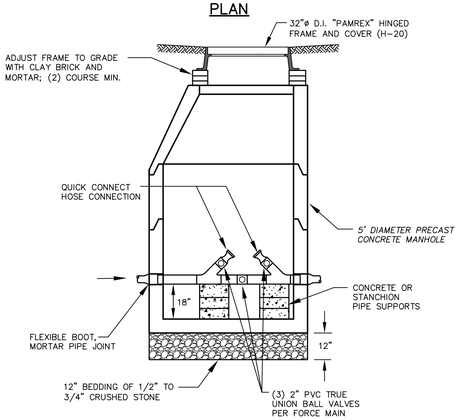
   IN CROSS COUNTRY CONSTRUCTION, SUITABLE MATERIAL SHALL BE AS DESCRIBED ABOVE, EXCEPT THAT THE ENGINEER MAY PERMIT THE USE OF TOP SOIL, LOAM, MUCK, OR PEAT, IF SATISFIED THAT THE COMPLETED CONSTRUCTION WILL BE ENTIRELY STABLE AND PROVIDED THAT EASY ACCESS TO THE SEWER, FOR MAINTENANCE AND POSSIBLE RECONSTRUCTION, WILL BE PRESERVED.
5. WOOD SHEETING, IF REQUIRED: WHERE SHEETING IS PLACED ALONGSIDE THE PIPE AND EXTENDS BELOW MID–DIAMETER, IT SHALL BE CUT OFF AND LEFT IN PLACE TO AN ELEVATION 1 FOOT ABOVE THE TOP OF PIPE. WHERE SHEETING IS ORDERED BY THE ENGINEER TO BE LEFT IN PLACE, IT SHALL BE CUT OFF AT LEAST 3 FEET BELOW FINISHED GRADE, BUT NOT LESS THAT 1 FOOT ABOVE THE TOP OF THE PIPE.
6. FOR CROSS COUNTRY CONSTRUCTION, BACKFILL OR FILL SHALL BE MOUNDED TO A HEIGHT OF 6 INCHES ABOVE THE ORIGINAL GROUND SURFACE EXCEPT AT WETLAND CROSSINGS.
7. CONCRETE FOR ENCASEMENT SHALL CONSIST OF CLASS A (3000#) CONCRETE AS FOLLOWS:
   CEMENT: 6.0 BAGS PER CUBIC YARD
   WATER: 5.75 GALLONS PER BAG CEMENT
   MAXIMUM SIZE OF AGGREGATE: 1 INCH
8. CONCRETE FULL ENCASEMENT: IF FULL ENCASEMENT IS UTILIZED, DEPTH OF CONCRETE BELOW PIPE SHALL BE 1/4 I.D. (4" MINIMUM). BLOCK SUPPORT SHALL BE SOLID CONCRETE BLOCKS.

SEWER NOTES:

1. ALL SEWER AND MANHOLE MATERIALS, INSTALLATION, AND TESTING ARE TO BE IN ACCORDANCE WITH STATE AND LOCAL REQUIREMENTS.
2. VERTICAL ALIGNMENT OF THE GRAVITY SEWER LINES ARE TO BE SET WITH A LASER LEVEL DURING INSTALLATION.
3. THE CAPPED ENDS FOR ALL BUILDING SERVICE CONNECTIONS, OR WYES, ARE TO BE MARKED BY 4' MIN. HIGH 2"X4" STAKES. MEASUREMENTS LOCATING THESE CONNECTIONS SHALL BE SUBMITTED TO THE KITTERY SEWER DEPARTMENT.
4. PLACE 2" EPS RIGID INSULATION BOARD OVER ALL SEWER LINES IF LESS THAN 4' FROM FINISH GRADE TO TOP OF PIPE. THE STYROFOAM SHALL EXTEND 2' EACH SIDE OF PIPE CENTERLINE. ALLOW 6" OF BEDDING MATERIAL BETWEEN THE PIPE AND THE INSULATION BOARD.
5. ALL LOCAL, STATE OR FEDERAL PERMITS AS NECESSARY WILL BE OBTAINED PRIOR TO CONSTRUCTION.
6. SEWER LINES AND MANHOLES SHALL BE A MINIMUM OF TEN FEET FROM ALL WATER MAINS.
7. AT WATER AND SEWER LINE CROSSINGS, THE WATER LINE SHALL BE AT LEAST 18 INCHES ABOVE OR BELOW THE SEWER LINE, WITH SAID SEPARATION TO BE FILLED WITH FREE EARTH. ADDITIONALLY, THE SEWER PIPE MATERIAL AT EACH CROSSING SHALL BE DUCTILE IRON OR "BLUE BRUTE" OR EQUIVALENT WATER GRADE PIPE. ONE FULL LENGTH OF THIS PIPE SHALL BE LOCATED SO THAT BOTH JOINTS WILL BE AS FAR FROM THE WATER LINE CROSSING AS POSSIBLE. WATERTIGHT COUPLINGS SHALL BE INSTALLED AT EACH PIPE END.
8. THE CONTRACTOR SHALL CONTACT THE KITTERY WATER DISTRICT WHEN WATER MAINS OR SERVICE LINES ARE ENCOUNTERED. WHEN THE 18" VERTICAL SEPARATION CANNOT BE ACHIEVED, THE CONTRACTOR SHALL MEET ALL ADDITIONAL KITTERY WATER DISTRICT CONSTRUCTION REQUIREMENTS.
9. DEWATERING MAY BE NECESSARY. ALL WATER REMOVED FROM THE EXCAVATIONS SHALL BE DISPOSED OF IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL REQUIREMENTS AND AS APPROVED BY THE OWNER'S AUTHORIZED FIELD REPRESENTATIVE.
10. A TRENCH BOX MAY BE REQUIRED DURING CONSTRUCTION.
11. THE CONTRACTOR AND HIS SUBCONTRACTORS WILL AT ALL TIMES COMPLY TO ALL RULES, REGULATIONS AND LAWS WHICH APPLY TO HIS WORK CONCERNING THE HEALTH AND SAFETY OF ALL PERSONS.
12. THE LOCATION OF ALL MANHOLES SHALL BE LAID OUT BY A STATE OF MAINE REGISTERED LAND SURVEYOR PRIOR TO THE START OF CONSTRUCTION.

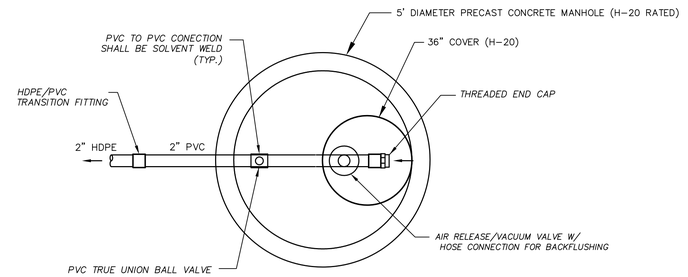


PLAN



FORCEMAIN THRU CLEANOUT MANHOLE

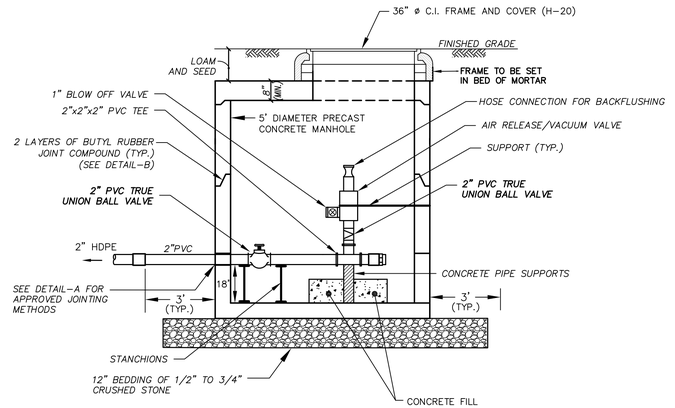
NOT TO SCALE



NOTES:
1. ALL FITTINGS AND CONNECTIONS SHALL MEET MANUFACTURER'S SPECIFICATION.
2. SEE SEWER MANHOLE DETAIL FOR ADDITIONAL INFORMATION.

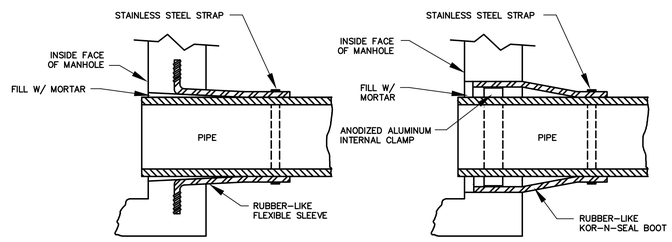
PLAN

NOT TO SCALE



FORCE MAIN AIR RELEASE AND TERMINAL FLUSHING STATION MANHOLE DETAIL

NOT TO SCALE

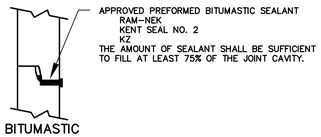


LOCK–JOINT FLEXIBLE MANHOLE SLEEVE
(OR EQUAL)

KOR–N–SEAL JOINT SLEEVE
(OR EQUAL)

NOTE: ALL GASKETS, SEALANTS, MORTAR, ETC. SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS WRITTEN INSTRUCTIONS.

DETAIL–A



BITUMASTIC

NOTE: ALL GASKETS, SEALANTS, MORTAR, ETC. SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS WRITTEN INSTRUCTIONS.

DETAIL–B
(APPROVED MANHOLE SECTION JOINTING METHODS)

SEWER MANHOLE DETAILS

NOT TO SCALE

P4567

ALTUS ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801
(603) 433–2335 www.ALTUS–ENG.com

STATE OF MAINE
JEFFREY K. CLIFFORD
No. 5957
LICENSED PROFESSIONAL ENGINEER

THIS DRAWING HAS NOT BEEN RELEASED FOR CONSTRUCTION

ISSUED FOR:
FINAL APPROVAL

ISSUE DATE:
JANUARY 24, 2019

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	PB SUBMISSION	JKC	6/22/17
1	MDHHS SUBMISSION	JKC	2/21/18
2	MDEP SUBMISSION	JKC	3/19/18
3	TOWN FINAL APPROVAL	JKC	1/24/19

DRAWN BY: RMB
APPROVED BY: JKC
DRAWING FILE: 4567SITE.DWG

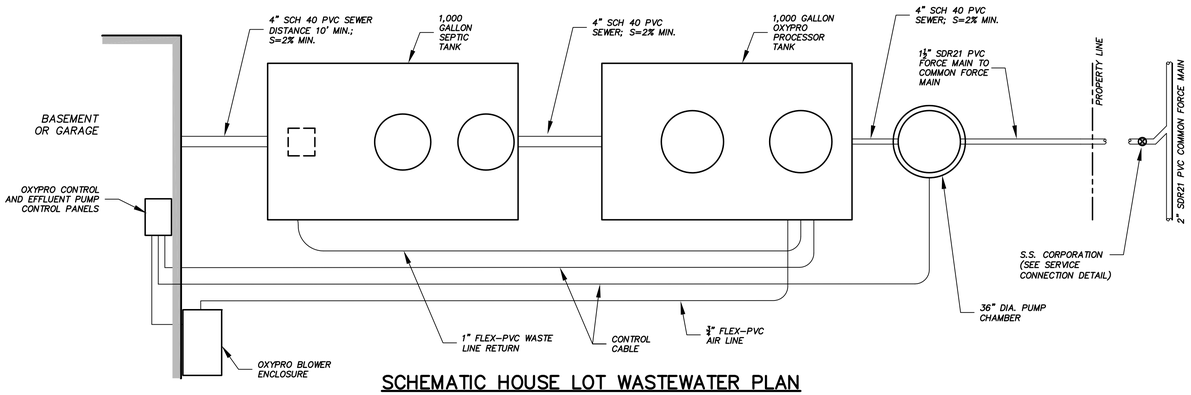
SCALE: N.T.S.

OWNER/APPLICANT:
CHINBURG DEVELOPMENT, LLC
3 PENSTOCK WAY
NEWMARKET, NH 03857

PROJECT:
HUNTINGTON RUN SUBDIVISION
MAP 66 LOTS 2A, 8 & 8A
40 BETTY WELCH ROAD
KITTERY, MAINE

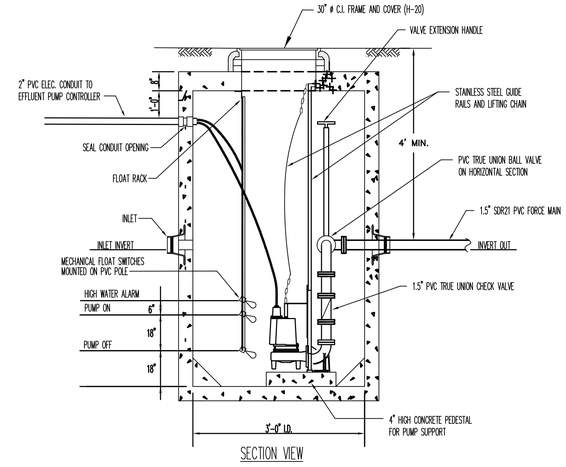
TITLE:
SEWER DETAILS

SHEET NUMBER:
C–8.0



SCHEMATIC HOUSE LOT WASTEWATER PLAN

NOT TO SCALE



SECTION VIEW

EFFLUENT PUMP CHAMBER NOTES

PUMP CHAMBER BASIN:
FURNISH AND INSTALL PUMP CHAMBER AS SHOWN ON THE PLANS. STATION SHALL INCLUDE BUT NOT BE LIMITED TO A CONCRETE PUMP CHAMBER, CONTROLLER, JUNCTION BOX, ACCESS COVER, DISCHARGE PIPING, FITTINGS, VALVES, WIRING, ELECTRIC SERVICE AND LEVEL CONTROLS. PUMP CHAMBER SHALL BE A 3 FOOT DIAMETER CONCRETE MANHOLE WITH MEDIUM DUTY DUCTILE IRON CASTING OR APPROVED EQUAL.

PUMP:
THE EFFLUENT PUMP SHALL BE OF THE SUBMERSIBLE TYPE CAPABLE OF PASSING 2" SOLIDS. IT SHALL HAVE A CAPACITY OF 20 GPM AGAINST A TDH OF 60 FEET, INCLUDING STATIC LIFT AND PIPE FRICTION. MOTOR TO BE 6/10 HORSEPOWER (HP), 3450 RPM, 208-230 VOLT, 60 HERTZ. THE PUMP AND MOTOR SHALL BE BUILT BY THE PUMP MANUFACTURER, AND HAVE THE CAPACITY OF RUNNING DRY EXTENDED PERIODS WITHOUT DAMAGE TO MOTOR AND/OR SEAL. THE MOTOR SHALL BE OIL FILLED AND HERMETICALLY SEALED. PUMP SHALL BE LIBERTY PUMP, MODEL FL-62M-5 OR APPROVED EQUAL.

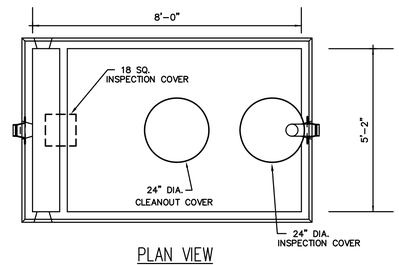
PIPING:
THE DISCHARGE PIPES SHALL BE AS SHOWN. ALL FITTINGS SHALL BE CEMENTED OR THREADED. THE WORKING PRESSURE OF THE CHECK VALVES SHALL BE 150 PSI.

LEVEL CONTROL:
THREE (3) LIQUID LEVEL CONTROL SENSORS SHALL BE PROVIDED TO CONTROL OPERATION OF THE PUMP AND HIGH WATER ALARM. THE LEVEL CONTROL SENSORS SHALL BE MOUNTED AS SHOWN. THE CONTROLS SHALL BE SET TO PROVIDE 80 GALLON DOSE. APPROXIMATE RUN TIME IS 4.0 MINUTES.

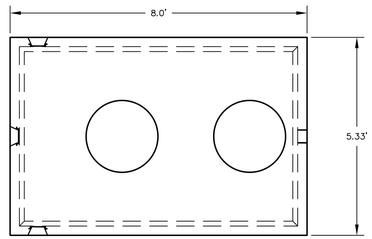
CONTROLLER:
PROVIDE AN ALARM LIGHT AND AUDIBLE ALARM; PROVIDE SILENCE BUTTON, WHICH SHALL NOT DISENGAGE THE ALARM LIGHT; PROVIDE AN HOUR METER TO MONITOR PUMP RUN TIME.

EFFLUENT PUMP CHAMBER DETAIL

NOT TO SCALE



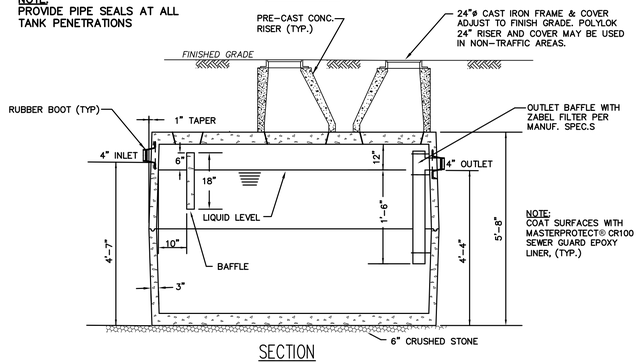
PLAN VIEW



PLAN VIEW

NOTE:
PROVIDE PIPE SEALS AT ALL TANK PENETRATIONS

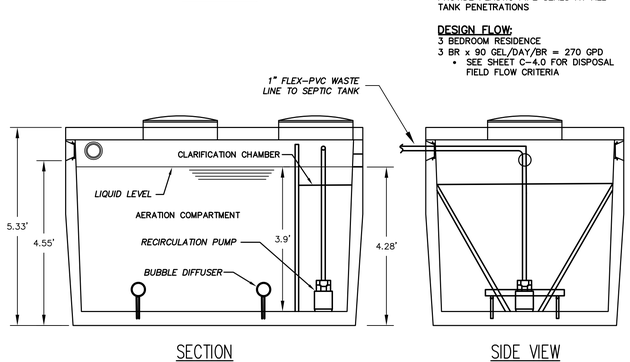
DESIGN FLOW:
3 BEDROOM RESIDENCE
3 BR x 90 GEL/DAY/BR = 270 GPD
- SEE SHEET C-4.0 FOR DISPOSAL FIELD FLOW CRITERIA



SECTION

1000 GALLON SEPTIC TANK

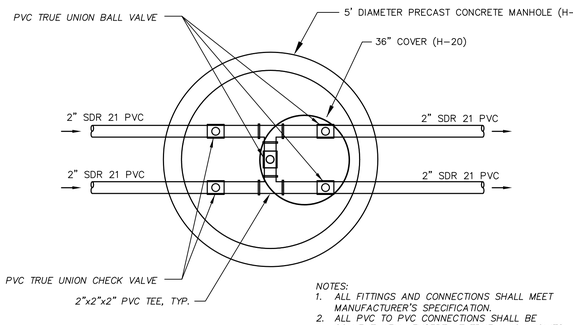
NOT TO SCALE



SECTION SIDE VIEW

OXYPRO CONCRETE MODULE

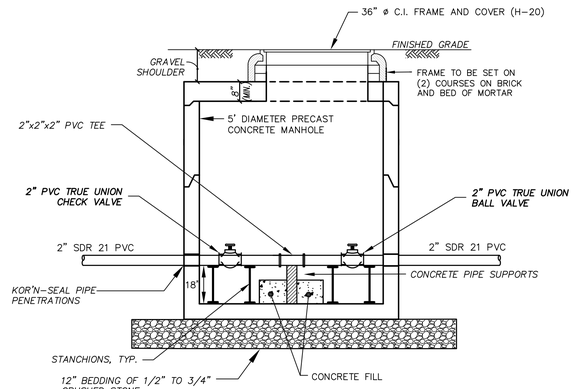
NOT TO SCALE



NOTES:
1. ALL FITTINGS AND CONNECTIONS SHALL MEET MANUFACTURER'S SPECIFICATION.
2. ALL PVC TO PVC CONNECTIONS SHALL BE SOLVENT WELL, EXCEPT AT TRUE UNION JOINTS.
3. SEE SEWER MANHOLE DETAIL FOR ADDITIONAL INFORMATION.

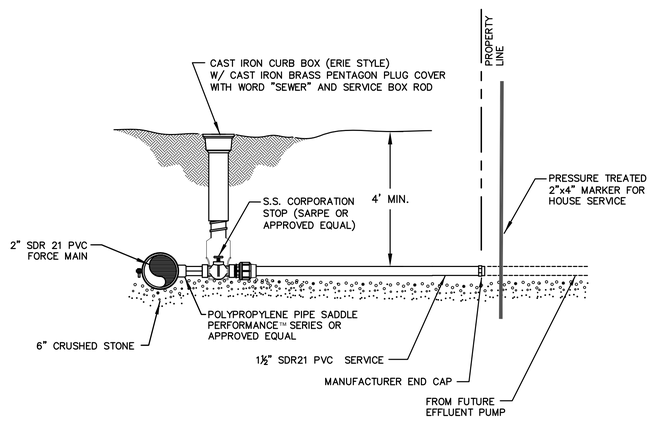
PLAN

NOT TO SCALE



FLOW SPLITTER MANHOLE DETAIL

NOT TO SCALE



SERVICE CONNECTION – LOWER PRESSURE SEWER

NOT TO SCALE

ALTUS ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801
(603) 433-2335 www.ALTUS-ENG.com

STATE OF MAINE — JEFFREY K. CLIFFORD — No. 5957 — LICENSED PROFESSIONAL ENGINEER

THIS DRAWING HAS NOT BEEN RELEASED FOR CONSTRUCTION

ISSUED FOR: FINAL APPROVAL

ISSUE DATE: JANUARY 24, 2019

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	PB SUBMISSION	JKC	6/22/17
1	MDHHS SUBMISSION	JKC	2/21/18
2	MDEP SUBMISSION	JKC	3/19/18
3	MDEP COMMENTS	JKC	10/12/18
4	TOWN FINAL APPROVAL	JKC	1/24/19

DRAWN BY: RMB
APPROVED BY: JKC
DRAWING FILE: 4567SITE.DWG

SCALE: N.T.S.

OWNER/APPLICANT:

CHINBURG DEVELOPMENT, LLC

3 PENSTOCK WAY
NEWMARKET, NH 03857

PROJECT:

HUNTINGTON RUN SUBDIVISION
MAP 66 LOTS 2A, 8 & 8A
40 BETTY WELCH ROAD
KITTERY, MAINE

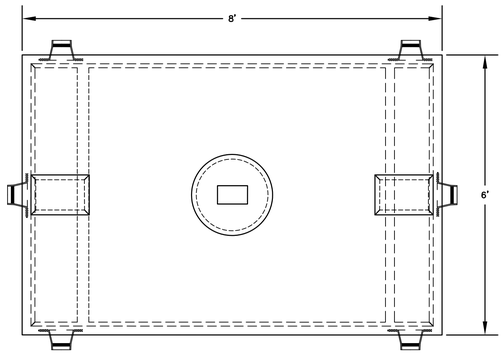
TITLE:

SEWER DETAILS

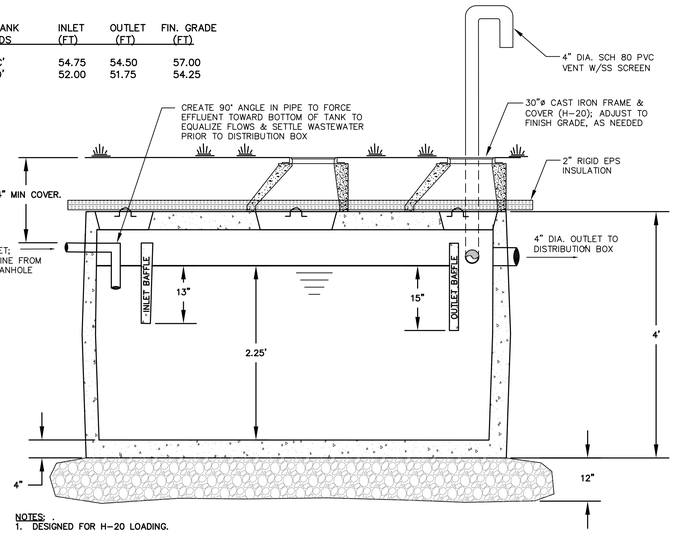
SHEET NUMBER:

C-8.1

P4567



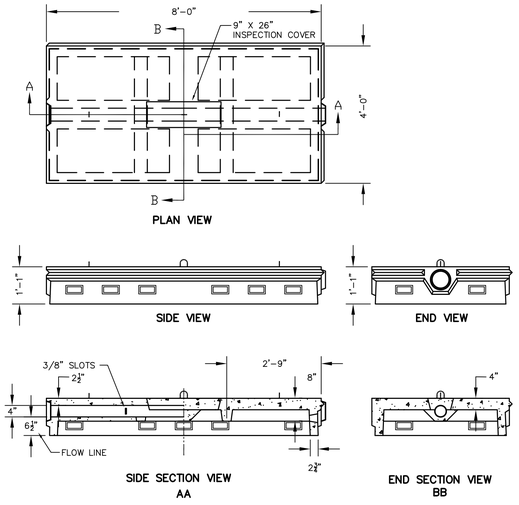
SEPTIC TANK FOR FIELDS	INLET (FT)	OUTLET (FT)	FIN. GRADE (FT)
'A' & 'C'	54.75	54.50	57.00
'B' & 'D'	52.00	51.75	54.25



NOTES:
1. DESIGNED FOR H-20 LOADING.

750 GALLON EQUALIZATION TANK DETAIL

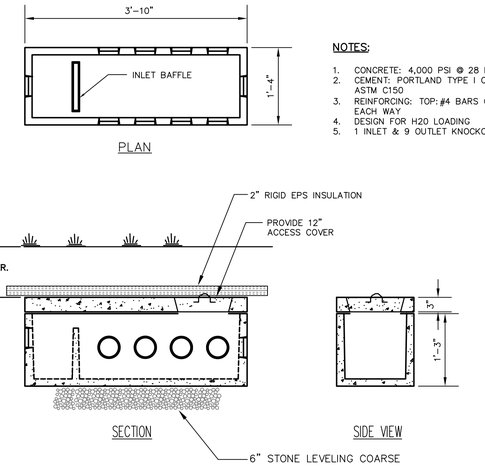
NOT TO SCALE



NOTES:
1. CONCRETE: 4,000 PSI MINIMUM AFTER 28 DAYS.
2. REINFORCED STEEL CONFORMS TO LATEST ASTM SPEC.
3. DESIGNED FOR H-20 LOADING.

LOW PROFILE LEACHING CHAMBERS

NOT TO SCALE



DISTRIBUTION BOX DETAIL

NOT TO SCALE

ALTUS ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801
(603) 433-2335 www.ALTUS-ENG.com

STATE OF MAINE
JEFFREY K. CLIFFORD
No. 5957
LICENSED PROFESSIONAL ENGINEER

THIS DRAWING HAS NOT BEEN RELEASED FOR CONSTRUCTION

ISSUED FOR:
FINAL APPROVAL

ISSUE DATE:
JANUARY 24, 2019

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	PB SUBMISSION	JKC	6/22/17
1	MDHHS SUBMISSION	JKC	2/21/18
2	MDEP SUBMISSION	JKC	3/19/18
3	TOWN FINAL APPROVAL	JKC	1/24/19

DRAWN BY: RMB
APPROVED BY: JKC
DRAWING FILE: 4567SITE.DWG

SCALE: N.T.S.

OWNER/APPLICANT:
CHINBURG DEVELOPMENT, LLC
3 PENSTOCK WAY
NEWMARKET, NH 03857

PROJECT:
HUNTINGTON RUN SUBDIVISION
MAP 66 LOTS 2A, 8 & 8A
40 BETTY WELCH ROAD
KITTERY, MAINE

TITLE:
SEWER DETAILS

SHEET NUMBER:
C-8.2

P4567