

To: Cumberland Planning Board
From: Carla Nixon, Town Planner
Date: May 14, 2019
Subject: Amendment to Major Site Plan - Friends School - Route 1

I. REQUEST:

The Owner and Applicant is the Friends School of Portland. The Applicant is proposing an amendment to a major site plan that was approved by the Planning Board on 12-17-13.

The amendment is for the construction of a 3,940 sf single story classroom addition, expansion of on-site parking and other minor changes to the approved site plan. The Applicants are also requesting re-approval of the 3,500 sf Community Hall and 28,000 sf Play Area 3 that was part of the 12-17-13 approval.

The 16.08 acre site is located at 11 US Route 1 as shown on Tax Assessor's Map R01, Lot 10 in the Low Density (LDR) Residential district. The use, a private school for grades K-8, is a permitted use in the district.

The Applicant is represented by Norman Chamberlain, P.E., of Walsh Engineers

The project requires Major Site Plan review because it involves the construction of a new structure greater than 3,000 square feet.

II. PROJECT OVERVIEW

Aquifer Protection Area: No.

Zoning: Low Density Residential (LDR); 2 acre minimum lot size required; if served by sewer: 1.5 acres.

Lot Size: 16.08 acres

Frontage: 508.57

Proposed Use: Private School (grades K-8); this is a permitted use in the zone.

Days & Hours of Operation: Typically M-F; 7:00 a.m. to 4:00 p.m. There are occasional evening and weekend events held at the school.

Employees: 14-16 were originally approved; the current application states there will be 30.

Students: 90 were originally approved; the current application states there will be 150.

Flood Map: # 2300450004B; Designation: Zone C (area of minimal flooding)

Financing: Private donations with commercial bridge loan if required.

Utilities: Public water and sewer are in place; adequate capacity has been provided. Underground electric (3 phase), telephone and cable from Route 1.

Signage: There is one sign at the entrance. The sign is lighted.

Natural Features: Wetlands and streams are shown on the plan.

Historical Features: There are stone walls on the site. They will not be disturbed.

Parking: 33 of the 61 spaces originally approved have been built. This amendment asks for an additional 48 spaces. A waiver is being requested.

Solid Waste: A fenced dumpster is located on the site.

Fire Protection: Site is 770' from a hydrant. There will be an alarm system and sprinklers installed. Plans are to be reviewed by the State Fire Marshall's Office.

III. Waivers:

Note: Section 206.7.6 states that the Planning Board may waive any of the submission requirements based upon a written request by the applicant. A waiver may be granted only if the Board finds that the information is not required to determine compliance with the standards and criteria.

Section 10.B – Traffic, Circulation and Parking.

1. The Town Engineer recommends approval of the parking space waiver request as outlined in the comment response letter.
2. The Town Engineer recommends that approval be conditioned on approval by the MEDOT for increase in the site traffic.

Section 10.C – Stormwater Management.

1. The Town Engineer recommends the Planning Board Approval be conditioned on approval of the amended Stormwater Management Permit from the MEDEP.

Section 10.H – Exterior Lighting.

1. The Town Engineer recommends that the Applicant pursue a waiver from the Planning Board for the encroachment of light levels onto the abutting Hawks Ridge property.

IV. Department Head Reviews:

- **Charles Rumsey, Police Chief:** No concerns.
- **Dan Small, Fire Chief:** Recommended Conditions of Approval:
 - 1) The building shall be equipped with a fire alarm system that is monitored by an approved fire alarm company. The system shall have a remote annunciator panel located at the main entrance that can be silenced with the push of one button from this location. The strobe or other visual alarm signaling devices shall remain active when the system is silenced. The alarm system shall identify the exact location of each individual initiation device with plain text at the fire alarm panel.
 - 2) The building shall be equipped with a hinged key box approved by the fire department. The key box shall be electronically connected to the fire alarm system to show a trouble signal whenever the box is in the open position.
 - 3) The building shall meet the requirements of the National Fire Protection Association Life Safety Code. These requirements cannot be determined until a complete set of building drawings are reviewed. For this type of building the requirements typically address, but may not be limited to: building exiting, emergency lighting and fire extinguishers.

- 4) Any fuel storage shall meet the appropriate standard of the National Fire Protection Association. Attention to building and property line set back requirements should be included as part of the site plan review.
- 5) The fire protection sprinkler system shall meet the requirements of the National Fire Protection Association. The fire department connection shall be equipped with a 4” locking coupling that is located at the front of the building in an area that is approved by the fire department. The sprinkler system shall send a water flow signal to the fire alarm panel whenever water is moving throughout the system. The fire department shall receive a copy of the sprinkler system drawings that have been approved and permitted by the State Fire Marshals’ Office.
- 6) Access to the building shall be adequate enough to accommodate fire department vehicles.

V. Cumberland Lands and Conservation Commission: No comments.

VI. Town Planner’s Review Comments:

All of the Town Planner’s comments from the last review have been addressed satisfactorily. Please see response letter in submission packet.

VII. Town Engineer’s Review: Dan Diffin, Sevee and Maher Engineers. May 9, 2019

I have reviewed the comment response from Walsh Engineering for the Amendment to the Friends School Site Plan approval and offer the following remaining comments:

Section 10.B – Traffic, Circulation and Parking.

3. SME recommends approval of the parking space waiver request as outlined in the comment response letter.
4. SME recommends that approval be conditioned on approval by the MEDOT for increase in the site traffic.

Section 10.C – Stormwater Management.

2. SME recommends the Planning Board Approval be conditioned on approval of the amended Stormwater Management Permit from the MEDEP.

Section 10.H – Exterior Lighting.

2. SME recommends that the Applicant pursue a waiver from the Planning Board for the encroachment of light levels onto the abutting Hawks Ridge property.

VIII. Findings of Fact

Sec. 229-10 Approval Standards and Criteria

The following criteria shall be used by the Planning Board in reviewing applications for site plan review and shall serve as minimum requirements for approval of the application. The application shall be approved unless the Planning Board determines that the applicant has failed to meet one or more of these standards. In all instances, the

burden of proof shall be on the applicant who must produce evidence sufficient to warrant a finding that all applicable criteria have been met.

A. Utilization of the Site

The plan for the development, including buildings, lots, and support facilities, must reflect the natural capabilities of the site to support development. Environmentally sensitive areas, including but not limited to, wetlands, steep slopes, floodplains, significant wildlife habitats, fisheries, scenic areas, habitat for rare and endangered plants and animals, unique natural communities and natural areas, and sand and gravel aquifers must be maintained and preserved to the maximum extent. The development must include appropriate measures for protecting these resources, including but not limited to, modification of the proposed design of the site, timing of construction, and limiting the extent of excavation.

The layout of the campus has been designed to minimize impact to environmentally sensitive areas such as wetlands and steep slopes.

The Planning Board finds the standards of this section have been met.

B. Traffic, Circulation and Parking

(1) Traffic Access and Parking: Vehicular access to and from the development must be safe and convenient.

- (a) Any driveway or proposed street must be designed so as to provide the minimum sight distance according to the Maine Department of Transportation standards, to the maximum extent possible.
- (b) Points of access and egress must be located to avoid hazardous conflicts with existing turning movements and traffic flows.
- (c) The grade of any proposed drive or street must be not more than +3% for a minimum of two (2) car lengths, or forty (40) feet, from the intersection.
- (d) The intersection of any access/egress drive or proposed street must function:
 - (a) at a Level of Service D, or better, following development if the project will generate one thousand (1,000) or more vehicle trips per twenty-four (24) hour period; or
 - (b) at a level which will allow safe access into and out of the project if less than one thousand (1,000) trips are generated.
- (e) Where a lot has frontage on two (2) or more streets, the primary access to and egress from the lot must be provided from the street where there is less potential for traffic congestion and for traffic and pedestrians hazards. Access from other streets may be allowed if it is safe and does not promote short cutting through the site.
- (f) Where it is necessary to safeguard against hazards to traffic and pedestrians and/ or to avoid traffic congestion, the applicant shall be responsible for

providing turning lanes, traffic directional islands, and traffic controls within public streets.

- (g) Accessways must be designed and have sufficient capacity to avoid queuing of entering vehicles on any public street.
- (h) The following criteria must be used to limit the number of driveways serving a proposed project:
 - 1. No use which generates less than one hundred (100) vehicle trips per day shall have more than one (1) two-way driveway onto a single roadway. Such driveway must be no greater than thirty (30) feet wide.

No use which generates one hundred (100) or more vehicle trips per day shall have more than two (2) points of entry from and two (2) points of egress to a single roadway. The combined width of all accessways must not exceed sixty (60) feet.

(2) Accessway Location and Spacing

Accessways must meet the following standards:

- a. Private entrance / exits must be located at least fifty (50) feet from the closest unsignalized intersection and one hundred fifty (150) feet from the closest signalized intersection, as measured from the point of tangency for the corner to the point of tangency for the accessway. This requirement may be reduced if the shape of the site does not allow conformance with this standard.
 - b. Private accessways in or out of a development must be separated by a minimum of seventy-five (75) feet where possible.
- ## 3. Internal Vehicular Circulation

The layout of the site must provide for the safe movement of passenger, service, and emergency vehicles through the site.

- a. Projects that will be served by delivery vehicles must provide a clear route for such vehicles with appropriate geometric design to allow turning and backing.
- b. Clear routes of access must be provided and maintained for emergency vehicles to and around buildings and must be posted with appropriate signage (fire lane - no parking).
- c. The layout and design of parking areas must provide for safe and convenient circulation of vehicles throughout the lot.
- d. All roadways must be designed to harmonize with the topographic and natural features of the site insofar as practical by minimizing filling, grading, excavation, or other similar activities which result in unstable soil conditions and soil erosion, by fitting the development to the natural contour of the land and avoiding substantial areas of excessive grade and tree removal, and by retaining existing vegetation during construction. The road network must provide for vehicular, pedestrian, and cyclist safety, all season emergency access, snow storage, and delivery and collection services.

(4) Parking Layout and Design

Off street parking must conform to the following standards:

- a. Parking areas with more than two (2) parking spaces must be arranged so that it is not necessary for vehicles to back into the street.
- b. All parking spaces, access drives, and impervious surfaces must be located at least fifteen (15) feet from any side or rear lot line, except where standards for buffer yards require a greater distance. No parking spaces or asphalt type surface shall be located within fifteen (15) feet of the front property line. Parking lots on adjoining lots may be connected by accessways not exceeding twenty-four (24) feet in width.
- c. Parking stalls and aisle layout must conform to the following standards.

| Parking Angle | Stall Width | Skew Width | Stall Depth | Aisle Width |
|---------------|-------------|------------|-------------|--------------|
| 90° | 9'-0" | | 18'-0" | 24'-0" 2-way |
| 60° | 8'-6" | 10'-6" | 18'-0" | 16'-0" 1-way |
| 45° | 8'-6" | 12'-9" | 17'-6" | 12'-0" 1-way |
| 30° | 8'-6" | 17'-0" | 17'-0" | 12'-0" 1 way |

- d. In lots utilizing diagonal parking, the direction of proper traffic flow must be indicated by signs, pavement markings or other permanent indications and maintained as necessary.
- e. Parking areas must be designed to permit each motor vehicle to proceed to and from the parking space provided for it without requiring the moving of any other motor vehicles.
- f. Provisions must be made to restrict the "overhang" of parked vehicles when it might restrict traffic flow on adjacent through roads, restrict pedestrian or bicycle movement on adjacent walkways, or damage landscape materials.

(5) Building and Parking Placement

(a) The site design should avoid creating a building surrounded by a parking lot. Parking should be to the side and preferably in the back. In rural, uncongested areas buildings should be set well back from the road so as to conform to the rural character of the area. If the parking is in front, a generous, landscaped buffer between the road and parking lot is to be provided. Unused areas should be kept natural, as field, forest, wetland, etc.

(b) Where two or more buildings are proposed, the buildings should be grouped and linked with sidewalks; tree planting should be used to provide shade and break up the scale of the site. Parking areas should be separated from the building by a minimum of five to 10 feet. Plantings should be provided along the building edge, particularly where building facades consist of long or unbroken walls.

(6) Pedestrian Circulation

The site plan must provide for a system of pedestrian ways within the development appropriate to the type and scale of development. This system must connect the major building entrances/ exits with parking areas and with existing sidewalks, if they exist or are planned in the vicinity of the project. The pedestrian network may be located either in the street right-of-way or outside of the right-of-way in open space or recreation

areas. The system must be designed to link the project with residential, recreational, and commercial facilities, schools, bus stops, and existing sidewalks in the neighborhood or, when appropriate, to connect the amenities such as parks or open space on or adjacent to the site.

Bill Bray, PTE of Traffic Solutions, has reviewed the traffic plan and has found that access to and from the site is safe and meets all applicable design standards. Adequate sight distances are shown on the plans.

There is a letter on file from Maine DOT dated 5/8/19 that states the proposed expansion will not require a MaineDOT Traffic Movement Permit because there will not be an increase in peak hour trip generation of more than 99 trip ends.

There is a detailed explanation of the parking situation in a response letter dated April 26, 2019 from Walsh Engineering. To summarize, there will be 44 additional parking spaces provided as part of this amended plan. There was a waiver granted in 2013 that reduced the number of spaces for Phase 1 and Phase 2 to 61 spaces. Total on-site parking will be 110 spaces which includes an overflow grassed area which will be used for special event parking.

The Board finds the standards of this section have been met.

C. Stormwater Management and Erosion Control

- (1) Stormwater Management. Adequate provisions must be made for the collection and disposal of all stormwater that runs off proposed streets, parking areas, roofs, and other surfaces, through a stormwater drainage system and maintenance plan, which must not have adverse impacts on abutting or downstream properties.
 - (a) To the extent possible, the plan must retain stormwater on the site using the natural features of the site.
 - (b) Unless the discharge is directly to the ocean or major river segment, stormwater runoff systems must detain or retain water such that the rate of flow from the site after development does not exceed the predevelopment rate.
 - (c) The applicant must demonstrate that on - and off-site downstream channel or system capacity is sufficient to carry the flow without adverse effects, including but not limited to, flooding and erosion of shoreland areas, or that he / she will be responsible for whatever improvements are needed to provide the required increase in capacity and / or mitigation.
 - (d) All natural drainage ways must be preserved at their natural gradients and must not be filled or converted to a closed system unless approved as part of the site plan review.
 - (e) The design of the stormwater drainage system must provide for the disposal of stormwater without damage to streets, adjacent properties, downstream properties, soils, and vegetation.
 - (f) The design of the storm drainage systems must be fully cognizant of upstream runoff which must pass over or through the site to be developed and provide for this movement.
 - (g) The biological and chemical properties of the receiving waters must not be degraded by the stormwater runoff from the development site. The use of oil and grease traps in manholes, the use of on-site vegetated waterways, and

vegetated buffer strips along waterways and drainage swales, and the reduction in use of deicing salts and fertilizers may be required, especially where the development stormwater discharges into a gravel aquifer area or other water supply source, or a great pond.

The Town Engineer, the Maine Army Corp of Engineers and MEDEP have reviewed and approved the amended stormwater management plan.

The Planning Board finds the standards of this section have been met.

2. Erosion Control

- (a) All building, site, and roadway designs and layouts must harmonize with existing topography and conserve desirable natural surroundings to the fullest extent possible, such that filling, excavation and earth moving activity must be kept to a minimum. Parking lots on sloped sites must be terraced to avoid undue cut and fill, and / or the need for retaining walls. Natural vegetation must be preserved and protected wherever possible.
- (b) Soil erosion and sedimentation of watercourses and water bodies must be minimized by an active program meeting the requirements of the Maine Erosion and Sediment Control Handbook for Construction: Best Management Practices, dated March 1991, and as amended from time to time.

Slope and wetland impacts were limited. Erosion control will be in conformance with the Maine Erosion and Sediment Control manual will be applied during construction. The Town Engineer has reviewed and approved the Erosion and Sedimentation Control Plan.

The Planning Board finds the standards of this section have been met.

D. Water, Sewer and Fire Protection

(1) Water Supply Provisions

The development must be provided with a system of water supply that provides each use with an adequate supply of water. If the project is to be served by a public water supply, the applicant must secure and submit a written statement from the supplier that the proposed water supply system conforms with its design and construction standards, will not result in an undue burden on the source of distribution system, and will be installed in a manner adequate to provide needed domestic and fire protection flows.

The project will continue to use public water. There is an adequate supply of water via the PWD.

The Planning Board finds the standards of this section have been met.

(2) Sewage Disposal Provisions

The development must be provided with a method of disposing of sewage which is in compliance with the State Plumbing Code. If provisions are proposed for on-site waste disposal, all such systems must conform to the Subsurface Wastewater Disposal Rules.

The project will continue to utilize public sewer. The original site plan application in 2013 provided a 2012 ability to serve letter from the PWD for 2,750 gpd for domestic use. Based on actual flow rates the facility average a flowrate of approximately 348 gpd. The Applicant states that assuming a 20% increase in building occupancy with the proposed addition, the facility can be expected to average approximately 418 gpd and peak at 778 gpd which is significantly less than the 2,750 gpd of usage approved by the PWD in 2013. The Ability to serve letter from the Town of Cumberland also allows a flow rate well below the 2,750 gpd originally approved.

The Planning Board finds the standards of this section have been met.

(3) Utilities

The development must be provided with electrical, telephone, and telecommunication service adequate to meet the anticipated use of the project. New utility lines and facilities must be screened from view to the extent feasible. If the service in the street or on adjoining lots is underground, the new service must be placed underground.

The existing electrical and telecommunication service will be connect to the building addition.

The Planning Board finds the standards of this section have been met.

4. Fire Protection

The building has been designed to meet all fire codes and will have sprinklers. Approval by the State Fire Marshall is a condition of approval.

With the proposed condition of approval, the Planning Board finds this standard has been met.

E. Water Protection

(1) Groundwater Protection. The proposed site development and use must not adversely impact either the quality or quantity of groundwater available to abutting properties or to the public water supply systems. Applicants whose projects involve on-site water supply or sewage disposal systems with a capacity of two thousand (2,000) gallons per day or greater must demonstrate that the groundwater at the property line will comply, following development, with the standards for safe drinking water as established by the State of Maine.

The project will connect to public water and sewer. The proposed use is an expansion to an environmentally-conscious K – 8 school. No obnoxious or toxic chemicals will be stored at the site. The property is not located in an Aquifer

Protection Area. This use should have no adverse impact on the quality or quantity of groundwater.

The Planning Board finds the standards of this section have been met.

(2) Water Quality

All aspects of the project must be designed so that:

- a. No person shall locate, store, discharge, or permit the discharge of any treated, untreated, or inadequately treated liquid, gaseous, or solid materials of such nature, quantity, obnoxious, toxicity, or temperature that may run off, seep, percolate, or wash into surface or groundwaters so as to contaminate, pollute, or harm such waters or cause nuisances, such as objectionable shore deposits, floating or submerged debris, oil or scum, color, odor, taste, or unsightliness or be harmful to human, animal, plant, or aquatic life.
- b. All storage facilities for fuel, chemicals, chemical or industrial wastes, and biodegradable raw materials, must meet the standards of the Maine Department of Environmental Protection and the State Fire Marshall's Office.

No substances described above will be stored or discharged in a way that could contaminate surface or groundwater.

The Planning Board finds the standards of this section have been met.

(3) Aquifer Protection (if applicable)

If the site is located within the Town Aquifer Protection Area a positive finding by the board that the proposed plan will not adversely affect the aquifer, is required.

The parcel is not located in the Aquifer Protection Area.

The Planning Board finds the standards of this section have been met.

F. Floodplain Management

If any portion of the site is located within a special flood hazard area as identified by the Federal Emergency Management Agency, all use and development of that portion of the site must be consistent with the Town's Floodplain management provisions.

The property is not located in a flood hazard area.

The Planning Board finds the standards of this section have been met.

G. Historic and Archaeological Resources

If any portion of the site has been identified as containing historic or archaeological resources, the development must include appropriate measures for protecting these

resources, including but not limited to, modification of the proposed design of the site, timing of construction, and limiting the extent of excavation.

A letter from the Maine Historic Preservation Commission is on file from the original site plan approval stating that the site is not in a historically sensitive area.

The Planning Board finds the standards of this section have been met.

H. Exterior Lighting

The proposed development must have adequate exterior lighting to provide for its safe use during nighttime hours, if such use is contemplated. All exterior lighting must be designed and shielded to avoid undue glare, adverse impact on neighboring properties and rights - of way, and the unnecessary lighting of the night sky.

There is a small amount of light trespass onto the adjacent northerly boundary line with Hawks Ridge. This is an existing condition. The Applicant has requested a waiver based on the fact that there are no residences in the area that would be affected by the slight light trespass. The proposed lighting is in conformance with the Ordinances. The Applicant requests a waiver from the lighting standard for the original part of the site plan application.

The Planning Board finds the standards of this section have been met.

I. Buffering and Landscaping

(1) Buffering of Adjacent Uses

The development must provide for the buffering of adjacent uses where there is a transition from one type of use to another use and for the screening of mechanical equipment and service and storage areas. The buffer may be provided by distance, landscaping, fencing, changes in grade, and / or a combination of these or other techniques.

(2) Landscaping:

There are no proposed changes to the landscaping plan due to the minimal change in the amount of pavement.

The applicant has submitted a landscaping plan that utilizes the natural site vegetation and grading for buffering as well as additional plantings around the existing building and entrance circle.

The Planning Board finds the standards of this section have been met.

J. Noise

The development must control noise levels such that it will not create a nuisance for neighboring properties.

The school and parking areas are located away from residential abutters. There will be plantings to provide a visual and noise buffer. The proposed addition to a

private school will not generate any additional noise beyond what was approved as part of the original site plan.

The Planning Board finds the standards of this section have been met.

K. Storage of Materials

- .1 Exposed nonresidential storage areas, exposed machinery, and areas used for the storage or collection of discarded automobiles, auto parts, metals or other articles of salvage or refuse must have sufficient setbacks and screening (such as a stockade fence or a dense evergreen hedge) to provide a visual buffer sufficient to minimize their impact on abutting residential uses and users of public streets.
- .2 All dumpsters or similar large collection receptacles for trash or other wastes must be located on level surfaces which are paved or graveled. Where the dumpster or receptacle is located in a yard which abuts a residential or institutional use or a public street, it must be screened by fencing or landscaping.
- .3 Where a potential safety hazard to children is likely to arise, physical screening sufficient to deter small children from entering the premises must be provided and maintained in good condition.

There will be no outside storage of materials or machinery requiring screening. The existing dumpster will be relocated when the Community Hall is constructed and be installed on a concrete slab and screened with a fence.

The Planning Board finds the standards of this section have been met.

L. Capacity of the Applicant

The applicant must demonstrate that he / she has the financial and technical capacity to carry out the project in accordance with this ordinance and the approved plan.

Technical Capacity: The Applicant has retained the services of a professional engineer, architect, landscape architect, surveyor and soils scientist.

The school has received donations and other funding for the improvements covered in this amendment application, however additional information regarding a bridge loan is requested.

The Planning Board finds the standards of this section have NOT been met.

(M) Design and Performance Standards

(2) Route 1 Design Guidelines (if applicable)

All development in the Office Commercial North and Office Commercial South districts is encouraged to be consistent with the Route 1 Design Guidelines.

Planner's Note: This project is located in the LDR district, but does have frontage on Route 1. The applicant has provided Findings of Fact for the Route 1 Design Guidelines as follows:

1.4.1 – Vehicular Access – Route One Curb Cuts

No new entrances are proposed.

1.6.2 – Parking – Landscaping

Developers are encouraged to separate every ten parking spaces by a landscaped plot to break up long runs of parking.

The Applicant states that in an effort to limit impacts and keep the development in as small a footprint as possible, landscaping is not shown within the limits of the parking areas, however existing vegetation around parking areas will remain untouched wherever possible.

1.6.3 – Parking – Snow Storage

Provisions should be made for snow storage in the design of all parking areas and these areas should be indicated on the site plan.

Snow storage locations have been shown on the site plan.

1.7.2 – Service Area Design

Service areas should be separated from other vehicle movements, parking areas and pedestrian routes. Wood fencing is always preferred as an enclosure.

A fenced dumpster for trash and recycling will be relocated on site.

1.8.1 – Open Space – Internal Walkways

At a minimum, bituminous concrete should be used as the primary material for internal walkways, except that for entrance areas and other special features the use of brick or special paving shall be encouraged.

This has been provided for.

1.8.2 – Open Space – Landscaping

Trees within the 75' buffer between Rt. 1 and the building should be maintained if possible.

Trees within this buffer area will not be affected by this amendment.

1.11.2 – Utilities – Electric, Telephone, Cable

Wired connections to be made underground wherever possible.

Electric and telecommunications will be located underground as show on the plans.

LIMITATION OF APPROVAL:

Construction of the improvements covered by any site plan approval must be substantially commenced within twelve (12) months of the date upon which the approval was granted. If construction has not been substantially commenced and substantially completed within the specified period, the approval shall be null and void. The applicant may request an extension of the approval deadline prior to expiration of the period. Such request must be in writing and must be made to the Planning Board. The Planning Board may grant up to two (2), six (6) month extensions to the periods if the approved plan conforms to the ordinances in effect at the time the extension is granted and any and all federal and state approvals and permits are current.

229-12 STANDARD CONDITION OF APPROVAL:

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 the plans, proposals and supporting documents, except de minimus changes as so determined by the Town Planner which do not affect approval standards, is subject to review and approval of the Planning Board prior to implementation.

VIII. PROPOSED CONDITIONS OF APPROVAL

1. That a preconstruction conference be held prior to the start of construction.
2. That all fees be paid prior to pre-construction conference.
3. That a performance guarantee in an amount acceptable to the Town Manager be provided prior to the preconstruction conference.
4. That all clearing limits are staked and inspected by the Town Engineer prior to the preconstruction conference.
5. That a permit for blasting, if needed, be obtained from the Town.
6. That a Fire Marshal's Permit be obtained prior to submission of building permit application.
7. That the recommendations of the Fire Chief as listed in his review of the project be shown on the final site plan and complied with.

April 26, 2019

Ms. Carla Nixon, Town Planner
Town of Cumberland
290 Tuttle Rd
Cumberland, ME 04021

**RE: Response to Town Comments
Major Site Plan Amendment
Friends School, 11 US Route One
Cumberland, Maine**

Ms. Nixon,

We have reviewed the comments provided in the April 4, 2019 Memo for the Major Site Plan Amendment Application at the subject property. Please find our responses to the comments below in *italics*.

Comments Provided by Town of Cumberland:

V. PROJECT OVERVIEW

Employees: 14-16 were originally approved; the current application states there will be 30.

The current application is for approval of up to 30 staff members.

Students: 90 were originally approved; the current application states there will be 150.

The current application is for the approval of up to 150 students

Utilities: Public water and sewer are in place; a letter dated 3/20/19 was submitted with this amendment application from the Portland Water District stating that there will be no increase in demand, however the number of students and staff are increasing. A letter from the Town Manager stating that there will be additional sewer use units available is required. Underground electric (3 phase), telephone and cable from Route 1.

The original application in 2013 provided a 2012 ability to serve letter from the Portland Water District for 2,750 gpd for domestic use. This was likely based on estimated flows using Table 4C from the Maine Subsurface Wastewater Disposal Rules, which tend to be very conservative. Now that the facility has been operational for many years, real usage flowrates have been obtained from the Portland Water District. Based on this information, the facility averages a flowrate of approximately 348 gpd and peaks at approximately 648 gpd. Assuming a 20% increase in building occupancy with the proposed addition, the facility can be expected to average approximately 418 gpd and peak at 778 gpd. Therefore, the actual flow rates at the facility will be significantly less

than the 2,750 gpd of usage approved by the Portland Water District in 2012.

Similarly, the Town of Cumberland provided an ability to serve letter from the sewer department in 2013 for a capacity of 1,300 gpd from the facility (copy enclosed). The estimated average of 418 gpd based on actual usage data is significantly less than the previously approved sewer capacity.

Per discussion with the Planning Board, a letter is enclosed from a sprinkler designer stating that the existing fire service is adequate to serve the existing and proposed buildings.

Parking: 33 of the 61 spaces originally approved have been built. This amendment asks for an additional 48 spaces. A waiver is being requested.

See the waiver request in the original application submission and response to Town Engineer Section 10B comment below.

Charles Rumsey, Police Chief: No concerns
No response required.

Dan Small, Fire Chief: Recommended Conditions of Approval

1. The building shall be equipped with a fire alarm system that is monitored by an approved fire alarm company. The system shall have a remote annunciator panel located at the main entrance that can be silenced with the push of one button from this location. The strobe or other visual alarm signaling devices shall remain active when the system is silenced. The alarm system shall identify the exact location of each individual initiation device with plain text at the fire alarm panel.
2. The building shall be equipped with a hinged key box approved by the fire department. The key box shall be electronically connected to the fire alarm system to show a trouble signal whenever the box is in the open position.
3. The building shall meet the requirements of the National Fire Protection Association Life Safety Code. These requirements cannot be determined until a complete set of building drawings are reviewed. For this type of building the requirements typically address, but may not be limited to: building exiting, emergency lighting and fire extinguishers.
4. Any fuel storage shall meet the appropriate standard of the National Fire Protection Association. Attention to building and property line set back requirements should be included as part of the site plan review.
5. The fire protection sprinkler system shall meet the requirements of the National Fire Protection Association. The fire department connection shall be equipped with a 4" locking coupling that is located at the front of the building in an area that is approved by the fire department. The sprinkler system shall send a water flow signal to the fire alarm panel whenever water is moving throughout the system. The fire department shall receive a copy of the sprinkler system drawings that have been approved and permitted by the State Fire Marshals' Office.

6. Access to the building shall be adequate enough to accommodate fire department vehicles.

The Applicant agrees to the Conditions of Approval listed above.

Town Planner Comments:

1. Please provide actual square footage increase for the building addition. I see two numbers in the application materials: 3,950 sf and 4,295 sf.

The classroom addition will have a footprint of 4,295 sf based on the architectural plans.

2. Please provide actual number of parking spaces to be added. Again, there is a reference to 50 spaces and another to 48 spaces.

A net increase of 48 spaces will be provided if the alternate parking spaces are installed. If the alternate parking spaces are not installed there will be a net increase of 44 parking spaces.

Per discussion with the Planning Board, note that there are 3 existing spaces where 7 alternate spaces are proposed. Therefore, the proposed alternate spaces will result in a net increase of 4 spaces in this area.

3. Please provide elevation drawings for the three sides of the addition.

Elevations of the classroom addition are enclosed.

4. Please provide a letter from Bill Bray that states an amendment to the DOT Traffic Movement Permit is not required. Also have him explain that there is no need to amend the DOT Entrance Permit.

The enclosed letter from Bill Bray to the Maine DOT has been submitted to the Maine DOT. We expect to have a response from the Maine DOT prior to the Planning Board meeting.

5. Please provide a letter from TD Bank that they have met with the Applicant, understand the costs of the project and are willing to provide financing for the anticipated amount of the bridge loan. This does not need to be a commitment letter.

As discussed at the last Planning Board meeting, the Applicant has provided evidence of financial capacity with funds in their bank account for the construction of the parking lot. The parking lot will be the first part of the project to be constructed because the area will be necessary for construction staging activities

The Applicant is in the process of fundraising for the construction of the classroom addition. TD Bank will provide a bridge loan in the amount necessary to bridge the gap between the construction costs and the cumulative total of school funds and the

fundraising effort. As the loan amount cannot be determined at this time, the Applicant is respectfully requesting that the evidence of financial capacity for the classroom addition can be a condition of approval to be provided prior to issuance of a building permit for the classroom addition when the necessary amount of the loan can be determined.

Similarly, the community hall and the play area 3 field will not be constructed until a future date. The Applicant is respectfully requesting that providing evidence of financial capacity for the community hall and play area 3 be a condition of approval to be provided prior to issuance of the building permit.

6. Please provide more information on the construction plan that will avoid the need to blast.

The design of the building and parking lot is intended to avoid the need to blast ledge. There is a known outcrop near the southwest corner of the proposed classroom addition. The foundation designs for the addition and the outside stairs assume that a portion will need to be pinned to the ledge. The new parking lot is almost all fill and will not require any blasting. Minimal excavation is required for the soil filter. If minimal ledge is encountered it will likely be removed by hammering.

7. Please provide lighting fixture cut sheets.

Cut sheets for the proposed lights are enclosed.

8. Please provide a revised lighting plan that clearly shows the existing and proposed exterior building and site lighting. Also address the slight trespass of light on the northerly boundary line with Hawks Ridge.

The encroachment of lighting onto the Hawks Ridge property is an existing condition from the original construction. Two photometric plans are enclosed. An existing conditions lighting plan shows the existing lighting levels. A proposed lighting plan shows the existing and proposed lighting and shows that the proposed lighting does not impact the lighting offsite onto the Hawks Ridge property. To our knowledge, there have been no complaints from Hawks Ridge in regards to lighting.

If necessary, the Applicant requests a waiver from the lighting standard for the minimal offsite lighting encroachment that has been in existence since the original construction.

9. Please provide letter from MDEP/ACE regarding possible violation of wetland disturbance during Phase 1 construction. I will need to assess whether conditional approval by the Planning Board could be given with this issue outstanding.

A copy of the approved ACOE permit is enclosed. A copy of the after-the-fact Maine DEP Tier I NRPA permit application was previously submitted to the Town.

Town Engineer Review

Sevee & Maher Comments (Daniel Diffin)

Chapter 229: Site Plan Review

Section 10.A. – Utilization of the Site.

1. The parking lot proposed to the south appears to be larger than originally approved in 2013. The additional spaces shown beyond those previously approved appear to result in additional impact within the 75-foot stream setback to the east. Please confirm that this additional impact will not require an amendment to the original NRPA permit.

As discussed with the Maine DEP, a NRPA PBR was submitted to the Maine DEP for the work associated with the expanded parking lot within the 75' setback from the stream. A copy of the PBR notification is included with this submission.

Section 10.B – Traffic, circulation and parking.

1. SME recommends the Applicant provide additional evaluation of the waiver request for the total number of parking spaces. For example, what would the Town Ordinance require for parking and what is the current observed demand during pick-up and drop-off and daily use?

§315-57.A of the ordinance requires 1 parking space per 3 seats of principal assembly area. The proposed community hall has a capacity for 394 people based on 7 square feet per person, which would require 132 parking spaces for the proposed facility. A waiver was granted in 2013 that required the construction of only 61 permanent parking spaces for Phase I and Phase II, which included the community hall. There are currently 36 spaces provided for Phase I. While current parking facilities at dropoff and pickup times are tight, it does currently function for the school. The occupancy of the building will be increased by 20%, but the number of parking spaces available will increase by at least 31% from the previously approved plan (61 spaces to 80 spaces) and 122% from the existing condition (36 spaces to 80 spaces). Therefore, it is our opinion that the proposed cumulative total of 80 to 84 parking spaces will provide adequate parking spaces for the school to operate comfortably during dropoff and pickup times.

In addition to the paved parking spaces, the School currently uses grassed play area 2 for very occasional overflow parking during events. The area has capacity for approximately 30 parking spaces, which brings the total available parking spaces to 110 to 114.

2. Please provide additional spot grades for the existing pavement at the two new ADA parking spaces north of the building. It is unclear if the slope of the existing pavement is below the 2% maximum slope for accessible spaces.

Existing elevation spot grades have been shown on the inset plan of Sheet C2.2. These show that the maximum grade of the handicap spaces and aisles is under the 2% maximum required by the ADA.

3. SME recommends the applicant add a stop bar and a one-way sign where the proposed southern parking lot intersects with the one-way turnaround.

A stop bar and one-way sign have been added to the plan.

4. Please provide a formal determination from the MEDOT or traffic engineer confirming that the increase in students and teachers will not require an amendment to the traffic movement or driveway entrance permits.

The enclosed letter from Bill Bray to the Maine DOT has been submitted to the Maine DOT. We expect to have a response from the Maine DOT prior to the Planning Board meeting.

5. Please clarify how ADA access to the classroom addition will be provided.

An existing elevator in the existing school will provide access to the second floor to access the classroom addition.

Section 10.C – Stormwater management and erosion control.

1. The project is within the Town's Urbanized Area and requires compliance with Chapter 242 Stormwater Management of the Town's Ordinances. SME recommends the applicant revise the Inspection and Maintenance of Stormwater Management Facilities Plan to include the requirement for annual reporting to the Town.

The requirement for annual reporting to the Town has been added.

2. The time of concentration for Subcatchment 11aS and 13aS are below the recommended minimum of 5.0 minutes for modelling completed using HydroCAD. SME recommends the applicant revise the times of concentrations and provide updated peak flows.

The Tc values have been corrected in the model. The changes reduce the volume from the subcatchments and do not affect the peak flow rates at analysis points during the 2, 10, and 25 year storm events or the hydraulic function of the stormwater BMPs.

3. Please revise the Post Development Drainage Plan, D2.0 with the proposed pavement, storm drainage, and grading.

The plan has been revised accordingly.

4. The invert of the 4" underdrain shown on sheet C-2.1 is listed at 72.75. This would place the pipe 6" below the bottom of the soil filter. Please revise the invert to match the detail for Underdrained Soil Filter #3.

The outlet invert has been corrected.

5. The snow storage area at the end of the proposed parking lot appears to block surface drainage from the parking lot and adjacent swale from draining to the filter. SME recommends the applicant consider installing a drainage structure as an outlet in the winter/spring months, or indicating that snow storage is not allowed in the swale area just south of the parking lot.

The elevation difference between the corner of the parking lot and the stormwater filter does not allow for reasonable installation of a structure and pipe outlet. The parking lot pitches to the south and to the east, so if snow blocks runoff to the south it will flow to the east. Boulders will be strategically placed at the southeast corner of the parking lot to prevent snow from being plowed to the southeast corner. This will allow for stormwater flow to the filter in the winter/spring months. In the event of a backup in that location, runoff will flow into the swale on the east side of the parking lot.

6. Please clarify if the existing mound to the south of the new classroom building will be removed. The 85-foot contour crosses several existing contours.

The existing mound will be removed as indicated on Sheet C1.0. The area will be regraded as indicated on Sheet C2.2.

7. SME recommends that Planning Board approval be conditioned on approval of the amended Stormwater Management Permit from the MEDEP.

The stormwater permit is currently under review by the Maine DEP. The Applicant also respectfully requests approval conditional upon receipt of the Maine DEP permits.

Section 10.D – Water, sewer and fire protection.

1. Please clarify if water usage at the site will increase due to the additional students and staff. The project review letter from the PWD states that there will be no increase in water usage as a result of this project. It also discusses a change of use for the water service.

The original application in 2013 provided a 2012 ability to serve letter from the Portland Water District for 2,750 gpd for domestic use. This was likely based on estimated flows using Table 4C from the Maine Subsurface Wastewater Disposal Rules, which tend to be very conservative. Now that the facility has been operational for many years, real usage flowrates have been obtained from the Portland Water District. Based on this information, the facility averages a flowrate of approximately 348 gpd and peaks at approximately 648 gpd. Assuming a 20% increase in building occupancy with the proposed addition, the facility can be expected to average approximately 418 gpd and peak at 778 gpd. Therefore, the actual flow rates at the facility will be significantly less than the 2,750 gpd of usage approved by the Portland Water District in 2012.

2. SME recommends that the applicant provide an ability to serve letter from the Town of Cumberland for the increase in sewer usage.

Similarly, the Town of Cumberland provided an ability to serve letter from the sewer department in 2013 for a capacity of 1,300 gpd from the facility (copy enclosed). The estimated average of 418 gpd based on actual usage data is significantly less than the previously approved sewer capacity.

Section 10.E – Water Protection – SME has reviewed and has no comments.
No response required.

Section 10.F – Floodplain Management – SME has reviewed and has no comments.
No response required.

Section 10.G – Historic and Archaeological Resources – SME has reviewed and has no comments.
No response required.

Section 10.H – Exterior Lighting

1. Please revise the lighting plan to more clearly define where the property boundaries and proposed lights will be placed. SME recommends the Applicant evaluate light placement and fixture type to reduce the light levels beyond the northern property line. It appears that there is a location where light levels will be as high as 0.7-foot candles on the abutting property.

The encroachment of lighting onto the Hawks Ridge property is an existing condition from the original construction. Two photometric plans are enclosed. An existing conditions lighting plan shows the existing lighting levels. A proposed lighting plan shows the existing and proposed lighting and shows that the proposed lighting does not impact the lighting offsite onto the Hawks Ridge property. To our knowledge, there have been no complaints from Hawks Ridge in regards to lighting.

If necessary, the Applicant requests a waiver from the lighting standard for the minimal offsite lighting encroachment that has been in existence since the original construction.

2. Please provide cut sheets for light fixtures for review. Fixtures should be full cut-off.

Cut sheets for the proposed lighting are enclosed. Lights are full-cutoff with the exception of the low intensity landscape lighting along the stairs.

Section 10.I – Buffering and Landscaping – SME has reviewed and has no comments.

No response required.

Section 10.J – Noise – SME has reviewed and has no comments.

No response required.

Section 10.K – Storage of Materials – SME has reviewed and has no comments.

No response required.

Section 10.L – Capacity of the Applicant

1. SME recommends the Applicant provide a letter from TD Bank demonstrating that there is funding available for the project.

As discussed at the last Planning Board meeting, the Applicant has provided evidence of financial capacity with funds in their bank account for the construction of the parking lot. The parking lot will be the first part of the project to be constructed because the area will be necessary for construction staging activities

The Applicant is in the process of fundraising for the construction of the classroom addition. TD Bank will provide a bridge loan in the amount necessary to bridge the gap between the construction costs and the cumulative total of school funds and the fundraising effort. As the loan amount cannot be determined at this time, the Applicant is respectfully requesting that the evidence of financial capacity for the classroom addition can be a condition of approval to be provided prior to issuance of a building permit for the classroom addition when the necessary amount of the loan can be determined.

Similarly, the community hall and the play area 3 field will not be constructed until a future date. The Applicant is respectfully requesting that providing evidence of financial capacity for the community hall and play area 3 be a condition of approval to be provided prior to issuance of the building permit.

Section 10.M – Design and Performance Standards – SME has reviewed and has no comments.

No response required.

Chapter 315: Zoning – SME has reviewed and has no comments

No response required.

We trust we have provided the necessary information to complete your review. Please contact me if you require any additional information.

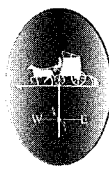
Respectfully,

A handwritten signature in black ink, reading "Silas Canavan". The signature is fluid and cursive, with the first name "Silas" and last name "Canavan" clearly distinguishable.

Silas Canavan, PE
Walsh Engineering Associates, Inc.

Enc. Exhibit 1 – Sewer and Water Capacity Information
 Exhibit 2 – MDOT Correspondence
 Exhibit 3 – Financial Capacity
 Exhibit 4 – Permits
 Exhibit 5 – Lighting
 Exhibit 6 – Stormwater
 Exhibit 7 – Civil Plans
 Exhibit 8 – Architectural Elevations

Exhibit 1
Sewer and Water Capacity Information



Portland Water District

FROM SEBAGO LAKE TO CASCO BAY

November 29, 2012

Blais Civil Engineers
780 Broadway
South Portland, ME 04106

Attn: Jennifer R. Williams, EIT
Re: Friends School; 11 US Route 1, Cumberland
Ability to Serve with PWD Water

Dear Ms. Williams:

The Portland Water District has received your request for an Ability to Serve determination for the noted site submitted on October 31, 2012. Based on the information provided, we can confirm that the District will be able to serve the proposed project as further described in this letter.

Please note that this letter does not constitute approval of this project from the District. Please review this letter for any special conditions specified by the District and to determine the appropriate next steps to take to move your project through the submittal and approval process.

Existing Site Service

According to District records, the project site does not currently have existing water or sewer service.

Water System Characteristics

According to District records, there is a 20-inch diameter ductile iron water main on the east side of US Route 1 and a public fire hydrant located 770-feet from the site.

The current data from the nearest hydrant with flow test information is as follows:

Hydrant Location: US Route 1 2000' N of Johnson Road
Hydrant Number: FAD-HYD00237
Last Tested: 5/17/2011
Static Pressure: 77 psi
Residual Pressure: Not Measured
Flow: 1,373 GPM

Water System Characteristics

There is an 8-inch diameter sewer main on the west side of US Route 1. Please see included sewer record drawings.



Public Fire Protection

You have not indicated whether this project will include the installation of new public hydrants to be accepted into the District water system. The decision to require new hydrants and to determine their locations is solely that of the local fire department. It is your responsibility to contact the Cumberland Fire Department to ensure that this project is adequately served by existing and/or proposed hydrants.

Domestic Water Needs

The ability to serve request noted that the daily flow demand was estimated at 1,670 GPD for Phase I and 1,080 GPD for Phase II of the school development project. The data noted above indicates there should be adequate pressure and volume of water to serve the domestic water needs of your proposed project.

Private Fire Protection Water Needs

It is anticipated that this project will require water service to provide private fire protection to the site. Please note that the District does not guarantee any quantity of water or pressure through a fire protection service. Should private fire protection be required, please share these results with your sprinkler system designer so that they can design the fire protection system to best fit the noted conditions. If the data is out of date or insufficient for their needs, please contact the MEANS Division to request a hydrant flow test and we will work with you to get more complete data.


Conditions of Service

The District can confirm that the existing water and sewer system have the capacity to serve the proposed school on US Route 1 in Cumberland. New water services may be installed from the 20-inch water main in US Route 1 along the properties frontage. Sewer services may be installed from the 8-inch sewer main. Sewer connection permits should be obtained from the Town of Cumberland. Please contact PWD at least 3-5 days in advance of sewer installation to schedule an inspector to witness connections to the sewer main.

As your project progresses, we advise that you submit any preliminary design plans to the MEANS Division for review of the water and sewer service line configuration. We will work with you or your representative to ensure that the design meets our current standards.

If the District can be of further assistance in this matter, please let us know.

Sincerely,
Portland Water District


Glissen Havu, E.I.
Design Engineer



Portland Water District

FROM SEBAGO LAKE TO CASCO BAY

March 20, 2019

Norman Chamberlain
Walsh Engineering Associates, Inc.
1 Karen Drive, Suite 2A
Westbrook, ME 04092

Re: 11 U.S. Route 1, CU
Ability to Serve with PWD Water

Dear Mr. Chamberlain:

The Portland Water District has received your change of use request for the noted site submitted on March 1, 2019. Please see below for existing site conditions and how to proceed with your project. **Please note that this change of use determination is based on information provided. Any changes affecting the site use or water system will require further review and approval by PWD.**

Existing Site Service

The following conditions of service apply:

- Since the water demand at this site is not anticipated to change, the existing service line at this site may be used to provide domestic water to the building. Our records show that the property is currently served with a 2-inch domestic water service with a 1-inch meter and a 6-inch fire service line. Portland Water District does not size fire services so please confirm the existing service is adequate with a licensed fire sprinkler designer.

The MEANS department can be reached by email at MEANS@pwd.org or by phone at (207)774-5961 Ext. 3199.

If the District can be of further assistance in this matter, please let us know.

Sincerely,
Portland Water District

Robert A. Bartels, P.E.
Senior Project Engineer



204454-01

FRIENDS SCHOOL OF PORTL/
11 US ROUTE 1
CUMBERLAND, ME 04110-

CYCLE 3
WS
COEXWS
23

SEWERSUB
SUBFEE
WATER
SEWER

WMEMBR
SMONTH

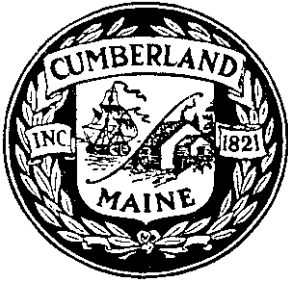
WATER**A23118274****Meter Size:****1.00**

| <u>Read Date</u> | <u>Read Source</u> | <u>Read Reas.</u> | <u>Reading</u> | <u>Usage</u> | <u>Billable Usage</u> | <u>Days between reads</u> |
|------------------|--------------------|-------------------|----------------|--------------|-----------------------|---------------------------|
| 03/06/2019 | R | | 834.00 | 10.00 | 10.00 | 28.00 |
| 02/06/2019 | R | | 824.00 | 14.00 | 14.00 | 29.00 |
| 01/08/2019 | R | | 810.00 | 11.00 | 11.00 | 33.00 |
| 12/06/2018 | R | | 799.00 | 11.00 | 11.00 | 30.00 |
| 11/06/2018 | R | | 788.00 | 14.00 | 14.00 | 28.00 |
| 10/09/2018 | R | | 774.00 | 19.00 | 19.00 | 32.00 |
| 09/07/2018 | R | | 755.00 | 23.00 | 23.00 | 31.00 |
| 08/07/2018 | R | | 732.00 | 8.00 | 8.00 | 29.00 |
| 07/09/2018 | R | | 724.00 | 8.00 | 8.00 | 33.00 |
| 06/06/2018 | R | | 716.00 | 17.00 | 17.00 | 30.00 |
| 05/07/2018 | R | | 699.00 | 12.00 | 12.00 | 32.00 |
| 04/05/2018 | R | | 687.00 | 14.00 | 14.00 | 29.00 |
| 03/07/2018 | R | | 673.00 | 12.00 | 12.00 | 29.00 |
| 02/06/2018 | R | | 661.00 | 13.00 | 13.00 | 28.00 |
| 01/09/2018 | R | | 648.00 | 11.00 | 11.00 | 33.00 |
| 12/07/2017 | R | | 637.00 | 26.00 | 26.00 | 0.00 |

SEWERSUB**B47968256****Meter Size:****0.62**

| <u>Read Date</u> | <u>Read Source</u> | <u>Read Reas.</u> | <u>Reading</u> | <u>Usage</u> | <u>Billable Usage</u> | <u>Days between reads</u> |
|------------------|--------------------|-------------------|----------------|--------------|-----------------------|---------------------------|
| 03/06/2019 | R | | 175.00 | 0.00 | 0.00 | 28.00 |
| 02/06/2019 | R | | 175.00 | 0.00 | 0.00 | 29.00 |
| 01/08/2019 | R | | 175.00 | 0.00 | 0.00 | 33.00 |
| 12/06/2018 | R | | 175.00 | 0.00 | 0.00 | 30.00 |
| 11/06/2018 | R | | 175.00 | 0.00 | 0.00 | 28.00 |
| 10/09/2018 | R | | 175.00 | 4.00 | 4.00 | 32.00 |
| 09/07/2018 | R | | 171.00 | 17.00 | 17.00 | 31.00 |
| 08/07/2018 | R | | 154.00 | 2.00 | 2.00 | 29.00 |
| 07/09/2018 | R | | 152.00 | 2.00 | 2.00 | 33.00 |
| 06/06/2018 | R | | 150.00 | 0.00 | 0.00 | 30.00 |
| 05/07/2018 | R | | 150.00 | 0.00 | 0.00 | 32.00 |
| 04/05/2018 | R | | 150.00 | 0.00 | 0.00 | 29.00 |
| 03/07/2018 | R | | 150.00 | 0.00 | 0.00 | 29.00 |
| 02/06/2018 | R | | 150.00 | 0.00 | 0.00 | 28.00 |
| 01/09/2018 | R | | 150.00 | 0.00 | 0.00 | 33.00 |
| 12/07/2017 | R | | 150.00 | 0.00 | 0.00 | 0.00 |

PrincipalPenaltyTax



TOWN OF CUMBERLAND, MAINE
290 TUTTLE ROAD
CUMBERLAND, MAINE 04021
TEL: 207-829-2205 FAX: 829-2224

November 26, 2013

Carla Nixon, Town Planner
290 Tuttle Road
Cumberland, Maine 04021

Dear Carla:

The Town of Cumberland has agreed to accept, and reserve capacity, for the sewer design flow from the Friends School located at 11 US Route 1.

The estimated average daily flow for the future build out of the school is 1,300 gallons per day or 9 user equivalent. The Town has the ability to handle the requested flow amounts and will reserve this capacity. **Nine sewer user permits must be purchased at a cost of \$500 per unit** (new rate until Dec 2015 - prior rate \$4,000 per unit) prior to the issuance of any building permit.

As you know, Cumberland is a relatively new sewer system (less than 30 years in age) and we have been fortunate to have limited inflow and infiltration in our system. We presently own 30% of the Falmouth Treatment Plant.

Please let me know if you have any additional questions regarding this request.

Sincerely,

William R. Shane, P.E.
Town Manager

cc: Bill Longley
Alyssa Tibbetts
Mike Crosby
Pam Bosarge

Integrated Energy Systems, PLLC

301 Middle Road
Falmouth, ME 04105-1229
207.781.4263
www.iespllc.com

April 22, 2019

Phil Kaplan
Principal, AIA, LEED AP
Kaplan Thompson Architects
102 Exchange Street
Portland, ME 04101

Re: Fire Protection Sprinkler System Capacity

Dear Mr. Kaplan:

The existing 6" sprinkler entrance will be large enough to extend the wet and dry sprinkler system for the classroom addition and the future community hall. The new system demand areas and hazard type will be similar to the existing, so there will be very little increase in flow, if any.

Sincerely,



Richard Grondin, PE, CEM, CBCP
President



Exhibit 2
MDOT Correspondence



Traffic Solutions
William J. Bray, P.E.
17 Mountview Drive
Gorham, ME 04038
(207) 400-6890
trafficsolutions@maine.rr.com

April 23, 2019

Randy Illian, P.E.
Southern Region Traffic Engineer
Maine Department of Transportation
51 Pleasant Hill Road
Scarborough, Maine 04070-0358

RE: Cumberland – Friends School of Portland Expansion Project

Dear Randy:

The Friends School of Portland filed for and received a Traffic Movement Permit on December 13, 2013 for a 125-student private school located on U.S. Route 1 in the Town of Cumberland. The State Permit was approved for a total of 113 trip ends during the morning peak hour and 75 trip ends in the afternoon peak hour. A copy of the signed permit is attached for your reference.

The Friends School is currently proposing a very modest expansion project to their Cumberland school facility that will provide classroom space for an additional 25 students. Consistent with the process previously used and approved by MaineDOT, peak hour trip rates presented in the seventh edition of the Institute of Transportation Engineers **TRIP GENERATION** publication were used to calculate the increase in peak hour trips generated by the proposed expansion project. SECTION 1. E. TRIP GENERATION from the noted Traffic Movement Permit application document (attached for your reference) presents the following peak hour trip rates for a private school project (K-8):

- AM Peak Hour (Street) = 0.90 trips/student
- PM Peak Hour (Generator) = 0.61 trips/student

Based upon these trip rates, the proposed Friends School expansion project will generate an additional 23 trips in the morning peak hour and 15 trips in the PM peak hour of the school. Combined with the existing trip generation of the Friends School, the site will generate a total of 136 trips during the morning peak hour and 90 trips in the afternoon peak hour of the site.

Please find attached a copy of the proposed site plan for the project.

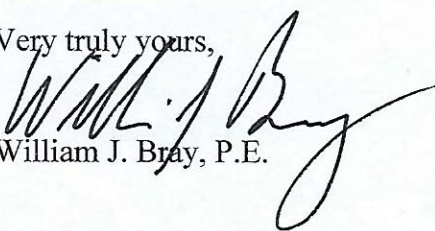
You should be aware that School Speed Zone Flashing Beacons exist directionally on Route 1 in support of the proposed Friends School; and further, a recent lane utilization project completed by MaineDOT provides a designated center turn lane on Route 1 accommodating left-turn entry movements to the school property.

The Friends School requests your review and acknowledgement that the current Traffic Movement Permit for the site remains valid and no additional approvals are required from MaineDOT for the minor expansion project. If

you would be so kind to confirm your acknowledgement through an email to my office that would be most appreciated.

Please call me directly at 400-6890 with questions and/or additional supporting information.

Very truly yours,

A handwritten signature in black ink, appearing to read "William J. Bray". The signature is fluid and cursive, with a large, sweeping "B" at the end.

William J. Bray, P.E.



STATE OF MAINE
DEPARTMENT OF TRANSPORTATION
16 STATE HOUSE STATION
AUGUSTA, MAINE 04333-0016

Applicant:
GOVERNOR

Friends School of Portland
1 Mackworth Island,
Falmouth ME 04105

David Bernhardt
COMMISSIONER

Project Location:

11 US Route 1
Cumberland, Maine

Project:

Friends School of Portland

Identification #:

Reg. 01- 00169-A-N

Permit Category:

100-200 PCEs

Traffic Engineer:

William Bray, P.E.
Traffic Solutions,
235 Bancroft Street, Portland, Maine 04102

Pursuant to the provision of 23 M.R.S.A. § 704-A and Chapter 305 of the Department's Regulations, the Maine Department of Transportation (MaineDOT) has considered the application of the Friends School of Portland, 1 Mackworth Island, Falmouth ME 04105 with supportive data, agency review and other related materials on file.

PROJECT DESCRIPTION

The applicant proposes to construct a 125 student Pre-K through 8th grade private school. The proposed site is located on a 16 +/- acre parcel of property located on 11 US Route 1 in Cumberland, Maine. The project is forecast to generate 113 trip ends on the Weekday AM peak hour of the Street and 75 trip ends on the Weekday PM Peak hour of the Generator.

Findings

Based on a review of the files and related information, MaineDOT approves the Traffic Movement Permit Application for the Friends School of Portland, subject to the following conditions:

MITIGATION

The following mitigation is intended to describe that conceptually shown on the Friends School of Portland Site Plan dated November 8, 2013. If the description contained herein conflict with the plan, these descriptions shall take precedence over the plans. Not all of the mitigation discussed herein may be shown on this or any plan. The following mitigation shall be constructed and implemented to MaineDOT's satisfaction prior to the opening of the facility, unless otherwise approved by MaineDOT.

On-Site Mitigation

A. All Intersections:

All on-site roadway intersections shall have overhead illumination provided, if not existing, to illuminate the intersections per MaineDOT standards at a minimum. Overhead lighting shall have an average of 0.6



PRINTED ON RECYCLED PAPER

to 1.0 foot candles, with the maximum to minimum lighting ratio of not more than 10:1 and an average to minimum light level of not more than 4:1.

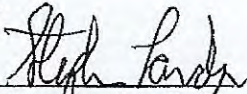
Off-Site Mitigation:

- A. Install WATCH FOR TURNING/ENTERING TRAFFIC on US Route 1 on both approaches to the school entrance.

Overall

- A. Provide all necessary auxiliary signs, striping and pavement markings to implement the improvements described herein according to State of Maine and/or National standards.
- B. All plantings and signs (existing and/or proposed; permanent and/or temporary) shall be placed and maintained such that they do not block available sight distances and do not violate the State's "Installations and Obstructions" law. No signage or plantings shall be allowed within the "clear zone" if they constitute a deadly fixed object as determined by MaineDOT. All signs shall meet MRSA Title 23, Chapter 21, Section 1914: "On-Premise Signs".
- C. If any of the supporting data or representations for which this permit is based changes in any way or is found to be incorrect / inaccurate, the applicant shall request in writing from MaineDOT a decision of what impacts those changes will have on the permit. The applicant will then be required to submit those changes for review and approval and additional mitigation as a result of those changes may be required at the expense of the applicant.

By:



Stephen Landry, P.E.

Assistant State Traffic Engineer

Date:

12/13/13

SECTION 1

E. TRIP GENERATION

Trip generation for the proposed 125 student Pre-K through 8th grade private school was determined based upon trip tables presented in the seventh edition of the Institute of Transportation Engineers “**TRIP GENERATION**” handbook. The ITE publication provides numerous Land-Use categories and the average volume of trips that are generated by each category. The following Land-Use category and trip rates were used in that effort:

Land-Use Code 534 – Private School (K-8)

Street Peak Hour – AM Peak = 0.90 trips/student

Peak Hour Generator – PM Peak Hour = 0.61 trips/student

Accordingly, the proposed private school will generate a total of 113 trips during the AM peak hour and an additional 76 trips in the afternoon peak hour of the site.

LATEST REVISION: 08/08/2012
DATE: JANUARY 27, 2012
DRAWN BY: MS
CHECKED BY: MS
PROJECT NO: 12166

LAYOUT, MATERIALS & UTILITY PLAN
FRIENDS SCHOOL OF PORTLAND
US ROUTE 1, CUMBERLAND, MAINE
PREPARED FOR:
FRIENDS SCHOOL OF PORTLAND
1 MACKWORTH ISLAND
FALMOUTH, MAINE 04105

Blais
civil engineers
780 BROADWAY, 50, PORTLAND, ME 04106 (207) 767-7300
B-212 MAIN ST. CUMBERLAND, ME



| REVISIONS | |
|-----------|----------|
| NO. | DATE |
| 1 | 10/29/13 |
| 2 | 11/29/13 |
| 3 | 12/29/13 |

TOWN/DEP REVIEW
THIS DOCUMENT IS SUBJECT FOR REVIEW
FOR TOWN/DEP REVIEW
IS SUBJECT TO RECORD

| SMALL AND BULK REGULATIONS | |
|---|---|
| EXEMPTION | EXEMPTION |
| 1. EXEMPTION FROM THE REQUIREMENTS OF THE SMALL AND BULK REGULATIONS FOR THE FOLLOWING: | 2. EXEMPTION FROM THE REQUIREMENTS OF THE SMALL AND BULK REGULATIONS FOR THE FOLLOWING: |
| 1. EXEMPTION FROM THE REQUIREMENTS OF THE SMALL AND BULK REGULATIONS FOR THE FOLLOWING: | 2. EXEMPTION FROM THE REQUIREMENTS OF THE SMALL AND BULK REGULATIONS FOR THE FOLLOWING: |

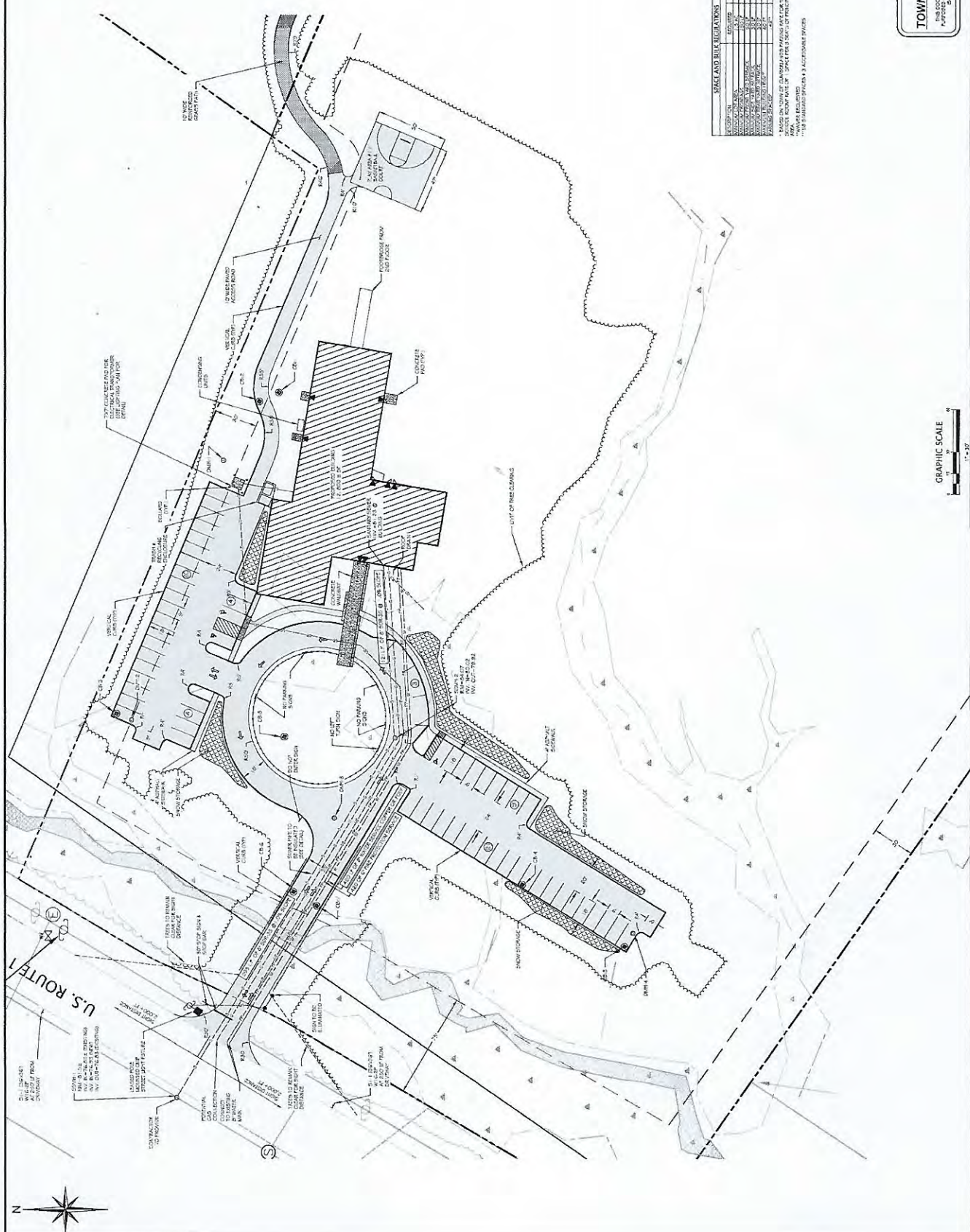


Exhibit 3
Financial Capacity

**Bank**

America's Most Convenient Bank®

7

STATEMENT OF ACCOUNT

FRIENDS SCHOOL OF PORTLAND
11 US ROUTE 1
CUMBERLAND FORESIDE ME 04110-

Page: 1 of 2
Statement Period: Feb 01 2019-Feb 28 2019
Cust Ref #: 2427606255-716-7 ###
Primary Account #: ~~XXXXXXXXXX~~

TD Small Business Money Market Plus

FRIENDS SCHOOL OF PORTLAND

ACCOUNT SUMMARY

| | | | |
|---------------------|------------|--------------------------------|------------|
| Beginning Balance | 894,733.53 | Average Collected Balance | 896,558.96 |
| Electronic Deposits | 34,924.56 | Interest Earned This Period | 1,031.61 |
| Other Credits | 1,031.61 | Interest Paid Year-to-Date | 2,170.03 |
| Electronic Payments | 32,142.31 | Annual Percentage Yield Earned | 1.51% |
| Ending Balance | 898,547.39 | Days in Period | 28 |

DAILY ACCOUNT ACTIVITY**Electronic Deposits**

| POSTING DATE | DESCRIPTION | AMOUNT |
|--------------|---|-------------|
| 02/11 | eTransfer Credit, Online Xfer Transfer from CK | 34,924.56 ✓ |
| Subtotal: | | 34,924.56 |

Other Credits

| POSTING DATE | DESCRIPTION | AMOUNT |
|--------------|---------------|----------|
| 02/28 | INTEREST PAID | 1,031.61 |
| Subtotal: | | 1,031.61 |

Electronic Payments

| POSTING DATE | DESCRIPTION | AMOUNT |
|--------------|--|-------------|
| 02/11 | eTransfer Debit, Online Xfer Transfer to CK | 32,142.31 ✓ |
| Subtotal: | | 32,142.31 |

DAILY BALANCE SUMMARY

| DATE | BALANCE | DATE | BALANCE |
|-------|------------|-------|------------|
| 01/31 | 894,733.53 | 02/28 | 898,547.39 |
| 02/11 | 897,515.78 | | |

As of 3/25/19 403,067.62 of this
balance is dedicated to the New project.
which includes the parking Lot.

Call 1-800-295-7400 for 24-hour Bank-by-Phone services or connect to www.tdbank.com



TD Bank
America's Most Convenient Bank®
One Portland Square
P.O. Box 9540
Portland, ME 04112-9540
T: 207 761 8800
E: 207 761 8850

tdbank.com

April 4, 2019

Jenny Rowe
Head of School
Friends School of Portland
11 US Route 1
Cumberland Foreside, ME 04110

Re: School expansion

Dear Jenny:

Thank you for discussing Friends School's intent to construct a new parking lot and to expand the current school. As we have discussed, TD Bank, N.A. is very interested in meeting the school's financing needs associated with this project. Although this letter does not serve as a commitment to lend, based on our review of the financial information you have provided to us, we are very interested in being involved with this project.

If I can provide you with any additional information at this time, please do not hesitate to call me directly at (207) 756-6804.

Sincerely,

Colin March
Senior Commercial Loan Officer

Exhibit 4
Permits



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
NEW ENGLAND DISTRICT, CORPS OF ENGINEERS
696 VIRGINIA ROAD
CONCORD, MASSACHUSETTS 01742-2751

Regulatory Division
CENAE-RDC

April 9, 2019

Jenny Rowe
c/o Friends of School Portland
11 U.S. Route 1
Cumberland Foreside, Maine 04110

Ms. Rowe:

This letter concerns Department of the Army Permit, number NAE-2012-02497, which authorized you to retain and maintain fill placed in 14,800 SF (0.34 acres) of wetland in conjunction with the construction of an access road stream crossing Norton Brook and site development for a new private school for pre-k thru 8th grade students off 11 U.S. Route One Cumberland, Maine.

In accordance with your recent request, the permit is hereby modified to authorize you to retain and maintain approximately 15,505 s.f. of fill placed in freshwater wetland as shown on the attached revised and annotated plans entitled "OVERALL DEVELOPMENT PLAN C2.0" dated "02/27/19" and "TREE CLEARING & WETLAND IMPACT PLAN" dated "11/26/13". Please note the following additional conditions:

- 1. This permit authorizes impacts to only those areas of wetlands/waterway shown on the attached plans. No other filling, clearing or other disturbance in waters of the United States shall occur without the necessary authorization from the Corps.*
- 2. In the event additional wetland/waterway fill is authorized, the permittee may be required to provide appropriate compensatory mitigation to offset cumulative impacts at the site.*

All other conditions of the original permit remain in full force and effect.

We continually strive to improve our customer service. In order for us to better serve you, we would appreciate your completing our Customer Service Survey located at <http://per2.nwp.usace.army.mil/survey.html>

BY AUTHORITY OF THE SECRETARY OF THE ARMY:

For Lindsey E. Lefebvre
Chief, Permits & Enforcement Branch
Regulatory Division

SKY VIEW DRIVE

US ROUTE

HAWKS RIDGE
CONDOMINIUM ASSOCIATION
MAP U4, LOT 6B
BX 22409 / PG 100

MAP
MADJOY HILL EPM L
MAP US LOT 2C
BK 28676 / PG 128

CYNTHIA A PARRIS
MAP U2, LOT 5E
BX 34324 / PG 80

KERRY E OBERG
MAP U1A LOT 6A
BK 20821/PG 277

JOHN MORAY
MAP U1A, LOT 9
BX 34100 / PG 21

DATE: MAY - AUG 3, 2008
FATH AND POWERED BY
1 + 1 ARE TO BE INSTALLED AS
SHOW ON ATTACHED DRAWING
CIVIL ENGINEER PLANS DATE
DEC. 16, 2013

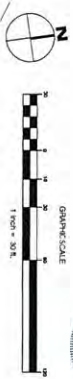
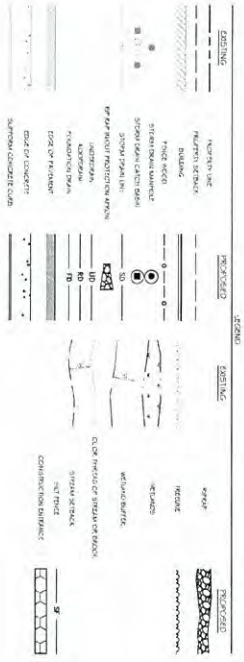
N/F
FRIENDS SCHOOL OF
MAP R1, LOT
BK 30225 / PG

AMANDA PROCTO
MAP U61, LOT 16
BK 11775 / PG 116

| PARKING COUNT | |
|---------------|----|
| EXISTING | 36 |
| REMOVED | 5 |
| PROPOSED | 53 |
| TOTAL | 84 |

N/F:
DONALD B HINKS
MAP U60, LOT 14
BK 15123 / PG 69

MARY LANE HOMEOWNERS
ASSOCIATION
MAP U1, LOT 51
BK 22072 / PG 331



Placement of fill into these wetlands is no longer authorized. Written authorization from the Corps is required prior to placement of fill into these wetlands.

Kaplan
Thompson
Architects

**Classroom &
Community
Hall Addition**

STRUCTURAL
Casco Bay Engineering
424 First Street

LANDSCAPE

43 Wetwood Road
Portland, ME 04103
P: 207-400-2459

**ELECTRICAL
Switchcurrent Engineering
Services**

Yarmouth, ME 04096
P: 207-847-6280

Twiss Engineering Associates, Inc.
1 Karen Drive, Suite 2A

Mechanical & Plumbing

systems, PLLC
301 Middle Road
Falmouth, ME 04105
© 2017-2018

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PROJECT NO. F

DRAWN BY: CARL

— 100 —

DEVELOPMENT PLAN

0.75

**DEPARTMENT OF ENVIRONMENTAL PROTECTION
PERMIT BY RULE NOTIFICATION FORM**

(For use with DEP Regulation, Natural Resources Protection Act- Permit by Rule Standards, Chapter 305)
PLEASE TYPE OR PRINT IN **BLACK INK ONLY**

| APPLICANT INFORMATION (Owner) | | AGENT INFORMATION (If Applying on Behalf of Owner) | |
|--|---|--|---|
| Name: | | Name: | |
| Mailing Address: | | Mailing Address: | |
| Town: | | Town: | |
| State and Zip Code: | | State and Zip Code: | |
| Daytime Phone #: | | Daytime Phone #: | |
| Email Address: | | Email Address: | |
| PROJECT INFORMATION | | | |
| Part of a larger project? (check one): | <input type="checkbox"/> Yes <input type="checkbox"/> No | After the Fact? (check one): | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Project Town: | | Project involves work below mean low water? (check one): | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| Brief Project Description: | | Project Location (Address): | |
| Brief Directions to Site: | | Name of waterbody: | |
| | | Map & Lot Number: | |

PERMIT BY RULE (PBR) SECTIONS (Check at least one): I am filing notice of my intent to carry out work which meets the requirements for Permit By Rule (PBR) under DEP Rules, Chapter 305. **I and my agents, if any, have read and will comply with all of the standards in the Sections checked below.**

- | | | |
|---|---|--|
| <input type="checkbox"/> Sec. (2) Act. Adj. to Protected Natural Res. | <input type="checkbox"/> Sec. (10) Stream Crossing | <input type="checkbox"/> Sec. (17) Transfers/Permit Extension |
| <input type="checkbox"/> Sec. (3) Intake Pipes | <input type="checkbox"/> Sec. (11) State Transportation Facil. | <input type="checkbox"/> Sec. (18) Maintenance Dredging |
| <input type="checkbox"/> Sec. (4) Replacement of Structures | <input type="checkbox"/> Sec. (12) Restoration of Natural Areas | <input type="checkbox"/> Sec. (19) Activities in/on/over significant vernal pool habitat |
| <input type="checkbox"/> Sec. (5) REPEALED | <input type="checkbox"/> Sec. (13) F&W Creation/Enhance/Water Quality Improvement | <input type="checkbox"/> Sec. (20) Activities located in/on/over high or moderate value inland waterfowl & wading bird habitat or shorebird feeding & roosting areas |
| <input type="checkbox"/> Sec. (6) Movement of Rocks or Vegetation | <input type="checkbox"/> Sec. (14) REPEALED | |
| <input type="checkbox"/> Sec. (7) Outfall Pipes | <input type="checkbox"/> Sec. (15) Public Boat Ramps | |
| <input type="checkbox"/> Sec. (8) Shoreline stabilization | <input type="checkbox"/> Sec. (16) Coastal Sand Dune Projects | |
| <input type="checkbox"/> Sec. (9) Utility Crossing | | |

NOTE: Municipal permits may also be required. Contact your local code enforcement office for more information. Federal permits may be required for stream crossings and for projects involving wetland fill. Contact the Army Corps of Engineers at the Maine Project Office for more information.

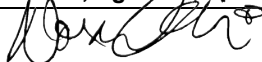
NOTIFICATION FORMS CANNOT BE ACCEPTED WITHOUT THE NECESSARY ATTACHMENTS

- ☐ **Attach** all required submissions for the PBR Section(s) checked above. The required submissions for each PBR Section are outlined in Chapter 305 and may differ depending on the Section you are submitting under.
- ☐ **Attach** a check for the correct fee made payable to: "Treasurer, State of Maine". The current fee for NRPA PBR Notifications can be found at the Department's website: <http://www.maine.gov/dep/feesched.pdf>
- ☐ **Attach** a location map that clearly identifies the site (U.S.G.S. topo map, Maine Atlas & Gazetteer, or similar).
- ☐ **Attach Proof of Legal Name** if applicant is a corporation, LLC, or other legal entity. Provide a copy of Secretary of State's registration information (available at <http://icrs.informe.org/nei-sos-icrs/ICRS?MainPage=x>) Individuals and municipalities are not required to provide any proof of identity.

I authorize staff of the Departments of Environmental Protection, Inland Fisheries & Wildlife, and Marine Resources to access the project site for the purpose of determining compliance with the rules.

I also understand that this PBR becomes effective 14 calendar days after receipt by the Department *unless the Department approves or denies the PBR prior to that date.*

By signing this Notification Form, I represent that the project meets all applicability requirements and standards in the rule and that the applicant has sufficient title, right, or interest in the property where the activity takes place.

| | | | |
|----------------------------------|---|-------|--|
| Signature of Agent or Applicant: |  | Date: | |
|----------------------------------|---|-------|--|

Keep a copy as a record of permit. Send the form with attachments via certified mail or hand deliver to the Maine Dept. of Environmental Protection at the appropriate regional office listed below. The DEP will send a copy to the Town Office as evidence of the DEP's receipt of notification. No further authorization by DEP will be issued after receipt of notice. Permits are valid for two years. **Work carried out in violation of any standard is subject to enforcement action.**

AUGUSTA DEP
17 STATE HOUSE STATION
AUGUSTA, ME 04333-0017
(207)287-7688

PORTLAND DEP
312 CANCO ROAD
PORTLAND, ME 04103
(207)822-6300

BANGOR DEP
106 HOGAN ROAD
BANGOR, ME 04401
(207)941-4570

PRESQUE ISLE DEP
1235 CENTRAL DRIVE
PRESQUE ISLE, ME 04769
(207)764-0477

| | | | | | |
|-----------------|------|------|-----------|-----------|--------------|
| OFFICE USE ONLY | Ck.# | Date | Staff | Staff | After Photos |
| PBR # | FP | | Acc. Date | Def. Date | |

NRPA Permit by Rule Notification
Classroom Addition and Parking Lot Expansion
Friends School of Portland
11 US Route One, Cumberland Foreside, Maine

Narrative:

The Friends School of Portland proposes to construct a classroom building addition and parking lot expansion at its existing campus on Route One in Cumberland. The proposed plan includes a 42 space parking lot, underdrained soil filter and drain outfall that will be located within 75 feet of both Norton Brook and a tributary unnamed stream. The location of the two streams creates a limited area outside of the 75 foot stream setback. However, this is the only practical location for the parking lot on the site, given the number of spaces required for the development.

Stormwater runoff from the parking lot will be directed east, away from Norton Brook, and will enter a shallow swale where it will be directed to Underdrained Soil Filter #3 for treatment. The outlet to the underdrain pipe will be located about 28 feet from Norton Brook. A minimum of 25 feet of undisturbed buffer will remain between the proposed development and the two streams. The location of the outfall within the 75 foot setback is required by grades necessary to discharge flows from the soil filter.

The project is not located in an Essential Habitat as mapped by the Maine Department of Inland Fisheries and Wildlife.

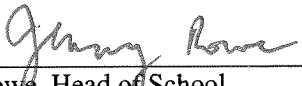
Attachments:

- PBR Form
- Letter of Agent Authorization
- Secretary of State Summary of Good Standing
- Deeds
- Location Plan
- Photographs
- Drawing C2.1 – Grading & Drainage Plan
- Drawing C3.0 – Site Details

To Whom It May Concern,

By this letter, the undersigned authorizes Walsh Engineering Associates, Inc. to act as the agent for the undersigned in the preparation and submission of all Federal, State, and Local City permit applications and relevant documents and correspondence for all necessary permits for the construction on the property at 11 US Route One, Cumberland Foreside, Maine to attend meetings and site visits; to appear before all boards, commissions, and committees, and to provide such other services as are necessary and appropriate in furtherance of the aforementioned project.

Sincerely,



Jenny Rowe, Head of School

1/22/12
Date



MAINE

Department of the Secretary of State
Bureau of Corporations, Elections and Commissions

Corporate Name Search

Information Summary

[Subscriber activity report](#)

This record contains information from the CEC database and is accurate as of: Tue Jan 22 2019 08:55:58. Please print or save for your records.

| Legal Name | Charter Number | Filing Type | Status |
|----------------------------|----------------|-------------------------------|---------------|
| FRIENDS SCHOOL OF PORTLAND | 20050745ND | NONPROFIT CORPORATION (T13-B) | GOOD STANDING |

| Filing Date | Expiration Date | Jurisdiction |
|-------------|-----------------|--------------|
| 06/28/2005 | N/A | MAINE |

Other Names (A=Assumed ; F=Former)

NONE

Clerk/Registered Agent

ROBERT H. LEVIN
2ND FLOOR
94 BECKETT ST.
PORTLAND, ME 04101

[Back to previous screen](#)

[New Search](#)

Click on a link to obtain additional information.

List of Filings

[View list of filings](#)

Obtain additional information:

Certificate of Existence ([more info](#))

[Short Form without amendments \(\\$10.00\)](#) [Long Form with amendments \(\\$10.00\)](#)

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If you encounter problems, visit the [troubleshooting page](#).



If you encounter technical difficulties while using these services, please contact the [Webmaster](#). If you are unable to find the information you need through the resources provided on this web site,

WARRANTY DEED

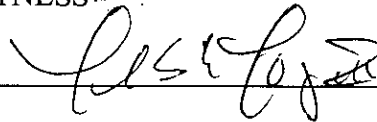
NOW ALL PERSONS BY THESE PRESENTS, that **ANDREW C. SOULE and MARTHA C. SOULE**, as Trustees of the **CRAMAR REALTY TRUST**, under an Declaration of Trust dated July 11, 2002, recorded in the Cumberland County Registry of Deeds in Book 17947, Page 291, of Yarmouth, Maine, do hereby **GRANT** to **FRIENDS SCHOOL OF PORTLAND**, a Maine nonprofit corporation, whose mailing address is One Mackworth Island, Falmouth, ME 04105, with WARRANTY COVENANTS, the following described real estate in Cumberland, Maine:

All that certain lot or parcel of land situated in the Town of Cumberland, County of Cumberland and State of Maine, being situated on the easterly side of U.S. Route One and westerly of, but not adjacent to Route 88, and being more particularly bounded and described on Exhibit A, attached hereto and incorporated herein by reference.


Reference is made to a Resignation of Trustee and Appointment of Successor Co-Trustees dated October 10, 2011, to be recorded herewith.

IN WITNESS WHEREOF, we, the said **ANDREW C. SOULE and MARTHA C. SOULE**, as Trustees of the **CRAMAR REALTY TRUST** have hereunto set our hands and seals on December 27, 2012.

WITNESS



to both



Andrew C. Soule, as Trustee of the CRAMAR REALTY TRUST (and not individually)



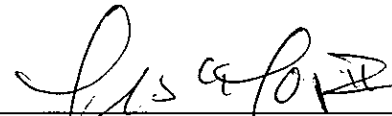
Martha C. Soule, as Trustee of the CRAMAR REALTY TRUST (and not individually)

STATE OF MAINE
COUNTY OF CUMBERLAND, ss.

December 27, 2012

Then personally appeared the above-named **ANDREW C. SOULE and MARTHA C. SOULE**, in their said capacities, and acknowledged the foregoing instrument to be their free act and deed.

Before me,



Notary Public/Attorney-at-Law

Print name: **LESLIE E LOWRY, III**

MAINE REAL ESTATE TAX PAID

EXHIBIT A
DEED FROM CRAMAR REALTY TRUST TO FRIENDS SCHOOL OF PORTLAND

A certain lot or parcel of land situated on the southeasterly side of U.S. Route One in the Town of Cumberland, County of Cumberland, State of Maine; said parcel being bounded and described as follows:

Beginning at a granite monument found on the southeasterly sideline of U.S. Route One on the town line between Cumberland and Falmouth, and the northerly corner of land now or formerly of Amanda Proctor as described in a deed recorded in the Cumberland County Registry of Deeds in Book 11775, Page 119. Thence:

- 1) N 30°39'15" E by said U.S. Route One a distance of Two Hundred Ninety-Eight and 98/100 (298.98) feet to a granite monument found;
- 2) N 25°02'52" E by said U.S. Route One a distance of One Hundred and 50/100 (100.50) feet to a capped iron rod found;
- 3) N 30°45'30" E by said U.S. Route One a distance of One Hundred Nine and 09/100 (109.09) feet to a point and the westerly corner of land now or formerly of BDC, LLC as described in a deed recorded in said Registry in Book 20757, Pages 124 and 128;
- 4) S 67°14'13" E by said land of BDC, LLC a distance of Five Hundred Forty-Seven and 82/100 (547.82) feet to a capped iron pin found;
- 5) N 35°18'28" E by said land of BDC, LLC a distance of Forty and 58/100 (40.58) feet to a granite monument found and the westerly corner of land now or formerly of Martha C. Soule as described in a deed recorded in said Registry in Book 17849, Page 333;
- 6) S 67°05'13" E by said land of Soule a distance of Four Hundred Seventy-Six and 21/100 (476.21) feet to a granite monument found and the westerly corner of land now or formerly of R&N Enterprises, LLC as described in a deed recorded in said Registry in Book 23839, Page 116 and the northerly corner of land now or formerly of Kerry E. Oberg and Gwenne L. Oberg as described in a deed recorded in said Registry in Book 20921, Page 278;
- 7) S 19°48'04" W by said land of Oberg and by land now or formerly of Donald W. Hunt and Sylvia B. Hunt as described in a deed recorded in said Registry in Book 21671, Page 91 a distance of Three Hundred Eleven and 15/100 (311.15) feet to a stone found and the northerly corner of land now or formerly of Stephen Goodrich as described in a deed recorded in said Registry in Book 22072, Page 331;
- 8) S 18°30'53" W by said land of Goodrich a distance of Four Hundred Seventy-Eight and 69/100 (478.69) feet to a point on said Cumberland and Falmouth town line;

9) N 55°08'53" W by said town line and by land now or formerly of Donald B. Hincks as described in a deed recorded in said Registry in Book 15123, Page 89 and by land of said Proctor a distance of One Thousand One Hundred Seventy and 57/100 (1170.57) feet to the point of beginning.

The above premises are conveyed without the benefit of any reserved rights and easements granted (i) by Lawrence Crane to Andrew C. Soule and Martha C. Soule by deed dated December 31, 2001, recorded in the Cumberland County Registry of Deeds in Book 17151, Page 345, (ii) by Lawrence Crane to Grantees by deed dated December 29, 1999, recorded in said Registry in Book 15255, Page 83, (iii) by Lawrence Crane to Grantees by deed dated January 7, 2000, recorded in said Registry in 15272, Page 171, as corrected and re-recorded in Book 15328, Page 209. For reference, see a Release of Easements from the Trustees of Cramar Realty Trust to Martha C. Soule of even date herewith, and to be recorded prior to the within deed.

The within premises are conveyed subject to those grading and drainage rights taken by the State of Maine, Department of Transportation as set forth in a Notice of Layout and Taking dated June 27, 1990, recorded in said Registry of Deeds in Book 9237, Page 247.

The above described parcel contains 700,513 square feet, or 16.08 acres, and being a portion of land now or formerly of Andrew C. Soule and Martha C. Soule, Trustees of the Cramar Realty Trust as described in deeds recorded in the Cumberland County Registry of Deeds in Book 18526, Page 82 and Book 20757, Page 126.

Bearings are referenced to Grid North, Maine State Plane Coordinate System, West Zone.

Reference is herein made to a Plan of Boundary Survey and Existing Conditions made for Friends School of Portland by Titcomb Associates, Inc. dated November 14, 2012 and revised December 20, 2012.

Received
Recorded Register of Deeds
Dec 28, 2012 11:14:29A
Cumberland County
Pamela E. Lovley

WARRANTY DEED

NOW ALL PERSONS BY THESE PRESENTS, that **MARTHA C. SOULE**, of Yarmouth, Maine, does hereby **GRANT** to **FRIENDS SCHOOL OF PORTLAND**, a Maine nonprofit corporation, whose mailing address is One Mackworth Island, Falmouth, ME 04105, with WARRANTY COVENANTS, the following described real estate in Cumberland, Maine:

MAINE REAL ESTATE TAX PAID

All that certain lot or parcel of land situated in the Town of Cumberland, County of Cumberland and State of Maine, being situated on the easterly side of U.S. Route One and westerly of, but not adjacent to Route 88, and being more particularly bounded and described on Exhibit A, attached hereto and incorporated herein by reference.

EXCEPTING and RESERVING from the within conveyed premises any and all appurtenant rights or easements to use any rights of way, easements or appurtenant rights to access the within conveyed lands over and across the grantor's remaining land and over and across Island Pond Road, so-called, and any private right of way or easement extending from said Road, including without limitation the 50' wide easement shown on the "Plan for a Private Way – Cutter Way" prepared by P. Reed recorded in said Registry in Plan Book 204, Page 108, to Route 88, all of which appurtenant rights and easements are expressly reserved by the grantor herein for the sole benefit of grantor's remaining land.

Reference is made to a Release Deed from the Trustees of Cramar Realty Trust to Martha C. Soule and Julia A. Sterling (f/k/a Littlefield) of even date herewith and to be recorded prior to this deed, which Release Deed releases certain rights and easements burdening the within conveyed premises.

The within conveyed premises are a portion of the lands conveyed to the grantor herein by deed from Lawrence Crane dated December 31, 2001, recorded in Book 17151, Page 345, and from Andrew C. Soule by deed dated July 5, 2002, recorded in Book 17849, Page 333.

IN WITNESS WHEREOF, I, the said **MARTHA C. SOULE** have hereunto set my hand and seal on December 27, 2012.

WITNESS



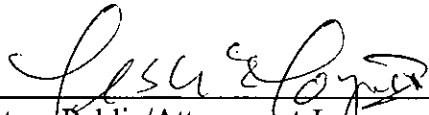
Martha C. Soule

STATE OF MAINE
COUNTY OF CUMBERLAND, ss.

December 27, 2012

Then personally appeared the above-named **MARTHA C. SOULE** and acknowledged the foregoing instrument to be her free act and deed.

Before me,



~~Notary Public~~/Attorney-at-Law
Print name: LESLIE E LOWRY III

EXHIBIT A
DEED FROM MARTHA C. SOULE TO FRIENDS SCHOOL OF PORTLAND

A certain lot or parcel of land located on the easterly side of, but not adjacent to, U.S. Route One in the Town of Cumberland, County of Cumberland, State of Maine, bounded and described as follows:

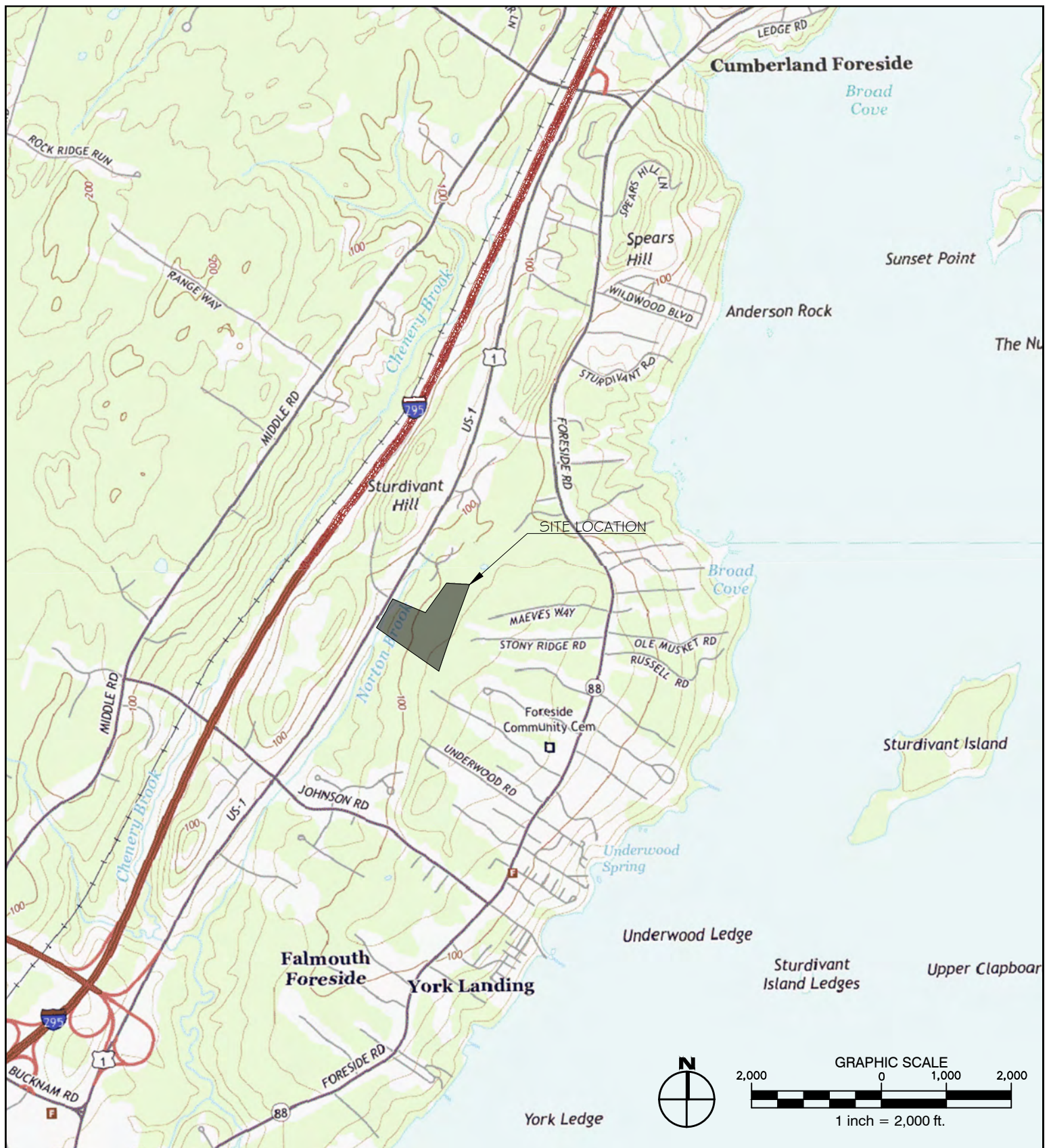
Beginning at an iron pin found at the northwesterly corner of land now or formerly of Munjoy Hill EPM, LLC as described in a deed recorded in the Cumberland County Registry of Deeds in Book 29576, Page 123. Thence:

- (1) S 20°17'03" W by said land of Munjoy Hill EPM, LLC, and by land now or formerly of R&N Enterprises, LLC as described in a deed recorded in said Registry in Book 23839, Page 116, a distance of Six Hundred Twenty-Three and 51/100 (623.51) feet to a 8" x 8" stone with drill hole found at the southwesterly corner of said land of R&N Enterprises, LLC, and the northwesterly corner of land now or formerly of Kerry E. Oberg and Gwenne L. Oberg as described in a deed recorded in said Registry in Book 20921, Page 278, and the northeasterly corner of land now or formerly of Andrew C. Soule and Martha C. Soule, Trustees of the Cramar Realty Trust, as described in a deed recorded in said Registry in Book 18526, Page 82;
- (2) N 67°05'13" W by said land of Cramar Realty Trust a distance of Four Hundred Seventy-Six and 21/100 (476.21) feet to a 8" x 8" stone with drill hole found on the easterly sideline of land now or formerly of BDC, LLC as described in deeds recorded in said Registry in Book 20757, Pages 124 & 128;
- (3) N 35°19'28" E by said land of BDC, LLC a distance of Five Hundred Fifteen and 44/100 (515.44) feet to an iron pin found and the southwesterly corner of land retained by the Grantor herein;
- (4) S 86°36'58" E by said land to be retained by the Grantor herein a distance of Three Hundred Fifty-Seven and 38/100 (357.38) feet to the point of beginning.

The above described parcel contains 226,464 square feet, or 5.20 acres, and being a portion of a parcel of land now or formerly of Martha C. Soule as described in a deed recorded in the Cumberland County Registry of Deeds in Book 17849, Page 333. Bearings are referenced to Grid North, Maine State Plane Coordinate System, NAD 83, West Zone.

Reference is herein made to a Plan of Boundary Survey & Existing Conditions made for Friends School of Portland by Titcomb Associates dated November 14, 2012 and revised December 20, 2012.

Received
Recorded Register of Deeds
Dec 28, 2012 11:15:29A
Cumberland County
Pamela E. Lovley



WALSH
ENGINEERING ASSOCIATES, INC.

One Karen Dr., Suite 2A | Westbrook, Maine 04092
ph: 207.553.9898 | www.walsh-eng.com

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COMMUNITY HALL & CLASSROOM ADDITION

FRIENDS SCHOOL OF PORTLAND
CUMBERLAND, ME 04021

Sheet Title:

**LOCATION
PLAN**

Job No.: 459

Date: 1/30/2019

Scale: 1"=2,000'

Drawn: RJS

Checked: SC



Photo 1: Looking south from Underdrained Soil Filter #3 toward unnamed stream



Photo 2: Looking northeast at Underdrained Soil Filter #3 outfall location



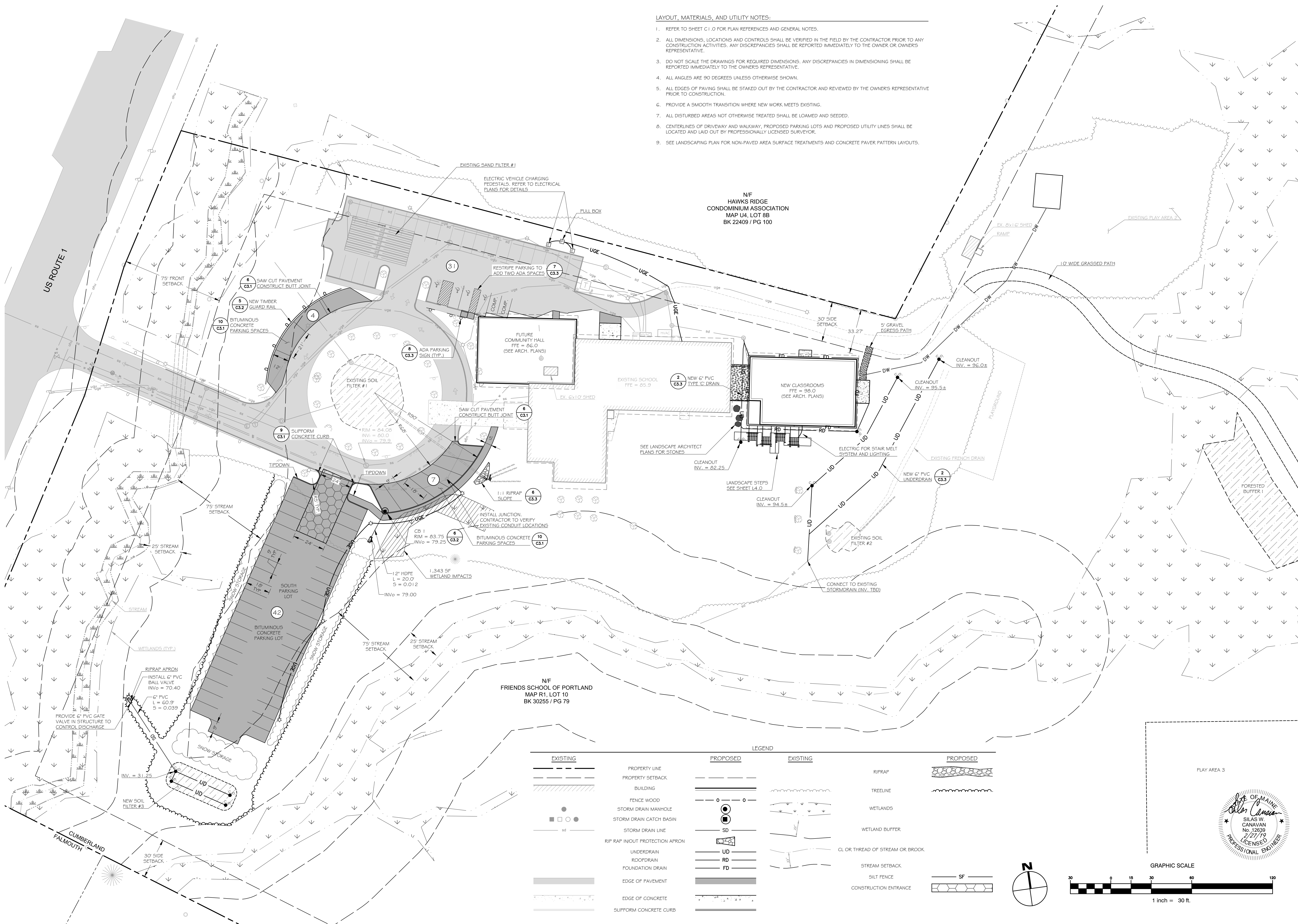
Photo 3: Looking west at Norton Brook from proposed parking lot

Classroom & Community Hall Addition

**Mechanical & Plumbing
Integrated Energy
Systems, PLLC**
301 Middle Road
Falmouth, ME 04105
p: 207-781-4263

| | |
|----------------|------------|
| FOR SFM PERMIT | |
| PROJECT NO: | FSP2 |
| DESIGNED BY: | NGC |
| DRAWN BY: | CAR/JWG |
| PHASE: | PERMITTING |

LAYOUT & UTILITIES PLAN C2.1



EROSION AND SEDIMENTATION CONTROL NOTES:

INTRODUCTION

THE FOLLOWING PLAN FOR CONTROLLING SEDIMENTATION AND EROSION IN THIS PROJECT IS BASED ON CONSERVATION PRACTICES FOUND IN THE MAINE EROSION & SEDIMENT CONTROL BMPs MANUAL, OCTOBER 2016, AND MAINE EROSION AND SEDIMENT CONTROL PRACTICE FIELD GUIDE FOR CONTRACTORS, REVISED 2014. MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION, THE CONTRACTOR WHO IMPLEMENTS THIS PLAN SHALL BE FAMILIAR WITH THESE PUBLICATIONS AND ADHERE TO THEM AND THE PRACTICES PRESENTED HEREIN. REFERENCE IS MADE TO THE GRADING AND DRAINAGE PLANS (C3.0 THROUGH C3.6) WITHIN THE PLAN SET, SHOWING THE LOCATIONS AND TYPES OF PROPOSED MEASURES TO BE IMPLEMENTED.

GENERAL EROSION AND SEDIMENTATION CONTROL PRACTICES

THE FOLLOWING IS A LIST OF GENERAL EROSION CONTROL PRACTICES THAT WILL BE USED TO PREVENT EROSION AND SEDIMENTATION BEFORE, DURING AND AFTER THE CONSTRUCTION OF THIS PROJECT. IN ADDITION, SPECIAL CARE SHALL BE USED AT ALL TIMES TO:

- 1) CORRECT ANY EROSION PROBLEMS IMMEDIATELY
- 2) REGULARLY MONITOR THE IMPLEMENTED PRACTICES, ESPECIALLY AFTER EVERY RAINFALL
- 3) REVEGETATE DISTURBED AREAS AS SOON AS POSSIBLE AFTER CONSTRUCTION
- 4) CONFORM TO ALL REQUIREMENTS/STANDARDS OF THE SITES MAINE DEP EROSION & SEDIMENT CONTROL BMP MANUAL.

SILT FENCE AND/OR EROSION CONTROL MIX SEDIMENT BARRIERS

SILT FENCE AND/OR EROSION CONTROL MIX SEDIMENT BARRIERS WILL BE INSTALLED ALONG THE DOWN GRADIENT SIDE OF THE PROPOSED GROUND DISTURBANCE AREAS PRIOR TO ANY CONSTRUCTION ACTIVITIES WHERE SLOPES EXCEED 8% OR THERE IS FLOWING WATER BOTH SILT FENCE AND EROSION CONTROL MATTING BERMS SHALL BE USED.

CATCH BASIN PROTECTION

CATCH BASIN PROTECTION WILL BE INSTALLED AT THE FIRST DOWNGRADIENT CATCH BASIN IN STREET ADJACENT TO ANY CONSTRUCTION ACTIVITIES AND IN ALL ONSITE CATCH BASINS UNTIL SITE HAS BEEN COMPLETELY STABILIZED.

CONSTRUCTION PHASE

THE FOLLOWING GENERAL PRACTICES WILL BE IMPLEMENTED TO PREVENT EROSION DURING CONSTRUCTION ON THIS PROJECT:

1. ONLY THOSE AREAS UNDER ACTIVE CONSTRUCTION WILL BE CLEARED AND LEFT IN AN UNTREATED OR UNVEGETATED CONDITION. ONCE CONSTRUCTION OF AN AREA IS COMPLETE, FINAL GRADING, LOAMING AND SEEDING SHALL OCCUR IMMEDIATELY (REFER TO "POST CONSTRUCTION REVEGETATION" SECTION). IF DURING FINAL GRADING, LOAMING AND SEEDING CAN NOT OCCUR IMMEDIATELY, IT SHALL BE DONE PRIOR TO ANY STORM EVENT AND WITHIN 15 DAYS OF COMPLETING CONSTRUCTION IN THE AREA. IF FINAL GRADING, LOAMING AND SEEDING CANNOT OCCUR WITHIN 7 DAYS, OR IF THE AREA IS NOT UNDER ACTIVE CONSTRUCTION FOR A PERIOD LONGER THAN 7 DAYS, SEE ITEM NO. 4 BELOW.
2. PRIOR TO THE START OF CONSTRUCTION IN A SPECIFIC AREA, SILT FENCING SHALL BE INSTALLED ON DOWNGRADIENT PORTIONS OF THE SITE AS LOCATED ON THE PLANS TO PROTECT AGAINST ANY CONSTRUCTION RELATED EROSION.
3. TOPSOIL WILL BE STOCKPILED WHEN NECESSARY IN AREAS WHICH HAVE MINIMUM POTENTIAL FOR EROSION AND WILL BE KEPT AS FAR AS POSSIBLE FROM EXISTING DRAINAGE AREAS AND WETLANDS. ALL STOCKPILES EXPECTED TO REMAIN LONGER THAN 7 DAYS SHALL BE:
 - A. TREATED WITH ANCHORED MULCH (WITHIN 5 DAYS OF THE LAST DEPOSIT OF STOCKPILED SOIL).
 - B. SEEDED WITH CONSERVATION MIX AND MULCHED IMMEDIATELY.
 - C. STOCKPILES SHALL BE EITHER PLACED UPHILL OF AN EXISTING SEDIMENT BARRIER ON THE SITE OR ENCIRCLED BY A HAY BALE OR SILT FENCE BARRIER THE FIRST DAY THAT STOCKPILING COMMENCES.
4. ALL DISTURBED AREAS EXPECTED TO REMAIN LONGER THAN 7 DAYS SHALL BE:
 - A. TREATED WITH STRAW AT A RATE OF 70-90 LBS. PER 1,000 SQUARE FEET FROM 4/16 TO 1/01, OR AT A RATE OF 150-200 LBS. PER 1,000 SQUARE FEET FROM 1/01 TO 4/15.
 - B. SEEDED WITH CONSERVATION MIX OF PERENNIAL RYE GRASS (1.0 LBS/1,000 SQ. FT.) AND MULCHED IMMEDIATELY. FROM 1/01 TO 4/15, FOLLOW THE SEEDING RATES AS OUTLINED BELOW IN SUB-SECTION 4.D. OF THE "POST CONSTRUCTION REVEGETATION" SECTION.
 - C. MONITORED EVERY TWO WEEKS UNTIL SEEDING CAN OCCUR AND REMULCHED AS NEEDED TO PROTECT SLOPES.
5. ALL GRADING WILL BE HELD TO A MAXIMUM 3:1 SLOPE WHERE PRACTICAL. GREATER SLOPES MAY BE USED WHERE THE BANKS ARE PROTECTED WITH SOFT ARMOUR MATTING, EROSION CONTROL MATTING, OR RIPRAP. ALL SLOPES WILL BE STABILIZED WITH PERMANENT SEEDING IMMEDIATELY AFTER FINAL GRADING IS COMPLETE. (IT IS UNDERSTOOD THAT IMMEDIATELY MEANS WITHIN 5 DAYS OF THE COMPLETION OF WORK. SEE POST-CONSTRUCTION REVEGETATION FOR SEEDING SPECIFICATION).
6. APPLICATION RATE MUST BE 2 BALES (70-90 LBS.) PER 1,000 SQUARE FEET OR 1.5 TO 2 TONS (90-100 BALES) PER ACRE TO COVER 75 TO 90% OF THE GROUND SURFACE. DRIVE OVER WITH TRACKED CONSTRUCTION EQUIPMENT ON GRADES OF 5% AND LESS.
7. CONSTRUCTION TRAFFIC WILL BE DIRECTED OVER THE EXISTING SITE ENTRANCE. THE ROAD SHALL BE SWEEPED AND VACUUMED DAILY SHOULD SEDIMENT BE TRACKED ONTO IT.
8. ALL AREAS DRAINING TO A STORMWATER FILTER OR BMP SHALL BE STABILIZED PRIOR TO CONSTRUCTION OF FILTER MEDIA TO PREVENT SEDIMENT FROM CLOGGING MEDIA.

DEWATERING

1. ALL DEWATERING DISCHARGE LOCATIONS SHALL BE LOCATED ON RELATIVELY FLAT GROUND AT LEAST 75' FROM STREAMS AND 25' FROM WETLANDS. THE CONTRACTOR SHALL UTILIZE DIRTBAGS, EROSION CONTROL MIX BERMS, OR SIMILAR METHODS FOR FILTRATION OF DEWATERING AND SHALL CONFORM TO THE MAINE EROSION AND SEDIMENT CONTROL BMPs G-1, G-2, AND G-3.

POST CONSTRUCTION REVEGETATION

THE FOLLOWING GENERAL PRACTICES WILL BE IMPLEMENTED TO PREVENT EROSION AS SOON AS AN AREA IS READY TO UNDERGO FINAL GRADING:

1. A MINIMUM OF 6" OF LOAM WILL BE SPREAD OVER DISTURBED AREAS AND GRADED TO A UNIFORM DEPTH AND NATURAL APPEARANCE.
2. LAWN AREAS: "PARK MIX" GRASS SEED BY ALLEN, STERLING & LOTHROP (FALMOUTH, MAINE), OR APPROVED EQUAL.
3. MULCH SHALL BE HAY OR STRAW MULCHES THAT ARE DRY AND FREE FROM UNDESIRABLE SEEDS AND COARSE MATERIALS.
 - A. APPLICATION RATE MUST BE 2 BALES (70-90 LBS.) PER 1,000 SQUARE FEET OR 1.5 TO 2 TONS (90-100 BALES) PER ACRE TO COVER 75 TO 90% OF THE GROUND SURFACE.
 - B. DRIVE OVER WITH TRACKED CONSTRUCTION EQUIPMENT ON GRADES OF 5% AND LESS.
 - C. BLANKET WITH TACKED PHOTODEGRADABLE/BIODEGRADABLE NETTING ON GRADES GREATER THAN 5%.
4. HYDRO-MULCH SHALL CONSIST OF A MIXTURE OF ASPHALT, WOOD FIBRE OR PAPER FIBRE AND WATER, WHICH IS SPRAYED OVER A SEEDED AREA. HYDRO-MULCH SHALL NOT BE USED BETWEEN 1/01 AND 4/15.
5. CONSTRUCTION SHALL BE PLANNED TO ELIMINATE THE NEED FOR SEEDING BETWEEN OCTOBER 1ST AND APRIL 15TH. SHOULD SEEDING BE NECESSARY BETWEEN THESE DATES, THE FOLLOWING PROCEDURE SHALL BE FOLLOWED:
 - A. ONLY UNFROZEN LOAM SHALL BE USED.
 - B. LOAMING, SEEDING AND MULCHING WILL NOT BE DONE OVER SNOW OR ICE COVER. IF SNOW EXISTS, IT MUST BE REMOVED PRIOR TO PLACEMENT OF SEED.
 - C. WHERE PERMANENT SEEDING IS NECESSARY, ANNUAL WINTER RYE (1.2 LBS/1,000 S.F.) SHALL BE SOWN INSTEAD OF THE PREVIOUSLY NOTED SEEDING RATE.
 - D. WHERE TEMPORARY SEEDING IS REQUIRED, ANNUAL WINTER RYE (2.5 LBS/1,000 S.F.) SHALL BE SOWN INSTEAD OF THE PREVIOUSLY NOTED SEEDING RATE.
 - E. FERTILIZING, SEEDING AND MULCHING SHALL BE DONE ON LOAM THE DAY THE LOAM IS SPREAD.
 - F. HAY MULCH SHALL BE SECURED WITH PHOTODEGRADABLE/BIODEGRADABLE NETTING. TRACKING BY MACHINERY ALONE WILL NOT SUFFICE. WINTER MULCHING RATES, SHALL BE DOUBLE AS SPECIFIED ABOVE IN SUBSECTION 3.A OF THE "POST CONSTRUCTION REVEGETATION" SECTION, SHOULD BE APPLIED DURING THIS PERIOD.
 - G. FOLLOWING FINAL SEEDING, THE SITE WILL BE INSPECTED EVERY 30 DAYS UNTIL 90% COVER HAS BEEN ESTABLISHED. RESEEDING WILL BE CARRIED OUT BY THE CONTRACTOR WITHIN 10 DAYS OF NOTIFICATION BY THE DESIGN PROFESSIONAL THAT THE EXISTING CATCH IS INADEQUATE.

MONITORING SCHEDULE

THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING, MONITORING, MAINTAINING, REPAIRING, REPLACING AND REMOVING ALL OF THE EROSION AND SEDIMENTATION CONTROLS OR APPOINTING A QUALIFIED SUBCONTRACTOR TO DO SO. MAINTENANCE MEASURES WILL BE APPLIED AS NEEDED DURING THE ENTIRE CONSTRUCTION CYCLE. IMMEDIATELY FOLLOWING ANY SIGNIFICANT RAINFALL, AND AT LEAST ONCE A WEEK, A VISUAL INSPECTION WILL BE MADE OF ALL EROSION AND SEDIMENTATION CONTROLS AS FOLLOWS:

1. SILT FENCE SHALL BE INSPECTED AND REPAIRED. SEDIMENT TRAPPED BEHIND THESE BARRIERS SHALL BE EXCAVATED WHEN IT REACHES A DEPTH OF 6" AND REDISTRIBUTED TO AREAS UNDERGOING FINAL GRADING.
2. CONSTRUCTION ENTRANCE SHALL BE VISUALLY INSPECTED AND REPAIRED AS NEEDED. ANY AREAS SUBJECT TO RUTTING SHALL BE STABILIZED IMMEDIATELY. IF THE VOIDS OF THE CONSTRUCTION ENTRANCE BECOME FILLED WITH MUD, MORE CRUSHED STONE SHALL BE ADDED AS NEEDED. THE PUBLIC ROADWAY SHALL BE SWEEPED AND VACUUMED SHOULD MUD BE DEPOSITED/TRACKED ONTO THEM.

STANDARDS FOR STABILIZING SITES FOR THE WINTER

THE FOLLOWING STANDARDS AND METHODOLOGIES SHALL BE USED FOR STABILIZING THE SITE DURING THE WINTER CONSTRUCTION PERIOD:

1. STANDARD FOR THE TIMELY STABILIZATION OF DISTURBED SLOPES (ANY AREA HAVING A GRADE GREATER THAN 25%) - THE CONTRACTOR WILL SEED AND MULCH ALL SLOPES TO BE VEGETATED BY SEPTEMBER 15TH. IF THE CONTRACTOR FAILS TO STABILIZE ANY SLOPE TO BE VEGETATED BY SEPTEMBER 15TH, THEN THE CONTRACTOR WILL TAKE ONE OF THE FOLLOWING ACTIONS TO STABILIZE THE SLOPE FOR LATE FALL AND WINTER.
 - A. STABILIZE THE SOIL WITH TEMPORARY VEGETATION AND EROSION CONTROL MATS: BY OCTOBER 1ST THE CONTRACTOR WILL SEED THE DISTURBED SLOPE WITH WINTER RYE AT A RATE OF 3 POUNDS PER 1,000 SQUARE FEET AND THEN INSTALL EROSION CONTROL MATS OR ANCHORED HAY MULCH OVER THE SEEDING AT TWICE THE RATE AS SPECIFIED ABOVE IN SUBSECTION 3.A OF THE "POST CONSTRUCTION REVEGETATION" SECTION. THE CONTRACTOR WILL MONITOR GROWTH OF THE RYE OVER THE NEXT 30 DAYS.
 - B. STABILIZE THE SLOPE WITH WOOD-WASTE COMPOST: THE CONTRACTOR WILL PLACE A SIX-INCH LAYER OF WOOD-WASTE COMPOST ON THE SLOPE BY NOVEMBER 15TH. THE CONTRACTOR WILL NOT USE WOOD-WASTE COMPOST TO STABILIZE SLOPES HAVING GRADES GREATER THAN 50% (2H:1V) OR HAVING GROUNDWATER SEEPS ON THE SLOPE FACE.

- C. STABILIZE THE SLOPE WITH STONE RIPRAP: THE CONTRACTOR WILL PLACE A LAYER OF STONE RIPRAP ON THE SLOPE BY NOVEMBER 15TH. THE DEVELOPMENTS OWNER WILL HIRE A REGISTERED PROFESSIONAL ENGINEER TO DETERMINE THE STONE SIZE NEEDED FOR STABILITY ON THE SLOPE AND TO DESIGN A FILTER LAYER FOR UNDERNEATH THE RIPRAP.

STANDARD FOR THE TIMELY STABILIZATION OF DISTURBED SOILS - BY SEPTEMBER 15TH THE CONTRACTOR WILL SEED AND MULCH ALL DISTURBED SOILS ON THE SITE. IF THE CONTRACTOR FAILS TO STABILIZE THESE SOILS BY THIS DATE, THEN THE CONTRACTOR WILL TAKE ON OF THE FOLLOWING ACTIONS TO STABILIZE THE SOIL FOR LATE FALL AND WINTER.

- A. STABILIZE THE SOIL WITH TEMPORARY VEGETATION: BY OCTOBER 1ST THE CONTRACTOR WILL SEED THE DISTURBED SOIL WITH WINTER RYE AT A SEEDING RATE OF 3 POUNDS PER 1,000 SQUARE FEET, LIGHTLY MULCH THE SEEDS SOIL WITH HAY OR STRAW AT 75 POUNDS PER 1,000 SQUARE FEET, AND ANCHOR THE MULCH WITH PLASTIC NETTING. THE CONTRACTOR WILL 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 THE CONTRACTOR WILL MULCH THE AREA FOR OVER-WINTER PROTECTION AS DESCRIBED IN ITEM III OF THIS STANDARD.
- B. STABILIZE THE SOIL WITH SOD: THE CONTRACTOR WILL STABILIZE THE DISTURBED SOIL WITH PROPERLY INSTALLED SOD BY OCTOBER 1ST. PROPER INSTALLATION INCLUDES THE CONTRACTOR PINNING THE SOD ONTO THE SOIL 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.
- C. STABILIZE THE SOIL WITH MULCH: BY NOVEMBER 15TH THE CONTRACTOR WILL MULCH THE DISTURBED SOIL BY SPREADING HAY OR STRAW AT A RATE OF AT LEAST 150 POUNDS PER 1,000 SQUARE FEET ON THE AREA SO THAT NO SOIL IS VISIBLE THROUGH THE MULCH. IMMEDIATELY AFTER APPLYING THE MULCH, THE CONTRACTOR WILL ANCHOR THE MULCH WITH NETTING OR OTHER METHOD TO PREVENT WIND FROM MOVING THE MULCH OFF THE DISTURBED SOIL.

EROSION CONTROL REMOVAL

AN AREA IS CONSIDERED STABLE IF IT IS PAVED OR IF 80% GROWTH OF PLANTED SEEDS IS ESTABLISHED. ONCE AN AREA IS CONSIDERED STABLE, THE EROSION CONTROL MEASURES CAN BE REMOVED AS FOLLOWS:

1. SILT FENCE: SILT FENCE SHALL BE DISPOSED OF LEGALLY AND PROPERLY OFF-SITE. ALL SEDIMENT TRAPPED BEHIND THESE CONTROLS SHALL BE DISTRIBUTED TO AN AREA UNDERGOING FINAL GRADING OR REMOVED AND RELOCATED OFF-SITE.
2. STABILIZED CONSTRUCTION ENTRANCE: THE STABILIZED CONSTRUCTION ENTRANCE SHALL BE REMOVED ONCE THE COMPACTED ROADWAY BASE IS IN PLACE. STONE AND SEDIMENT FROM THE CONSTRUCTION ENTRANCE SHALL BE REDISTRIBUTED TO AN AREA UNDERGOING GRADING OR REMOVED AND RELOCATED OFFSITE.
3. MISCELLANEOUS: ONCE ALL THE TRAPPED SEDIMENTS HAVE BEEN REMOVED FROM THE TEMPORARY SEDIMENTATION DEVICES THE DISTURBED AREAS MUST BE REGRADED IN AN AESTHETIC MANNER TO CONFORM TO THE SURROUNDING TOPOGRAPHY. ONCE GRADED THESE DISTURBED AREAS MUST BE LOAMED (IF NECESSARY), FERTILIZED, SEEDS AND MULCHED IN ACCORDANCE WITH THE RATES PREVIOUSLY STATED.

THE ABOVE EROSION CONTROLS MUST BE REMOVED WITHIN 30 DAYS OF FINAL STABILIZATION OF THE SITE. CONFORMANCE WITH THIS PLAN AND FOLLOWING THESE PRACTICES WILL RESULT IN A PROJECT THAT COMPLIES WITH THE STATE REGULATIONS AND THE STANDARDS OF THE NATURAL RESOURCES PROTECTION ACT, AND WILL PROTECT WATER QUALITY IN AREAS DOWNSTREAM FROM THE PROJECT.

MAINE CONSTRUCTION GENERAL PERMIT REQUIRED

SUBMISSION OF A MAINE CONSTRUCTION GENERAL PERMIT (MCGP) IS REQUIRED PRIOR TO COMMENCEMENT OF ANY EXCAVATION ACTIVITIES.

INSPECTION AND MAINTENANCE (APPENDIX B)

1. INSPECTION AND MAINTENANCE REQUIREMENTS: INSPECT DISTURBED AND IMPERVIOUS AREAS, EROSION AND STORMWATER CONTROL MEASURES, AREAS USED FOR STORAGE THAT ARE EXPOSED TO PRECIPITATION, AND LOCATIONS WHERE VEHICLES ENTER OR EXIT THE SITE. INSPECT THESE AREAS AT LEAST ONCE A WEEK AS WELL AS BEFORE AND AFTER A STORM EVENT AND PRIOR TO COMPLETION OF PERMANENT STABILIZATION MEASURES. A PERSON WITH KNOWLEDGE OF EROSION AND STORMWATER CONTROL, INCLUDING THE STANDARDS IN THE MCGP AND ANY DEPARTMENTAL COMPANION DOCUMENT TO THE MCGP, MUST CONDUCT THE INSPECTION. THIS PERSON MUST BE IDENTIFIED IN THE INSPECTION LOG. IF BEST MANAGEMENT PRACTICES (BMPs) NEED TO BE MODIFIED OR IF ADDITIONAL BMPs ARE NECESSARY, IMPLEMENTATION MUST BE COMPLETED WITHIN 7 CALENDAR DAYS AND PRIOR TO ANY STORM EVENT (RAINFALL). ALL MEASURES MUST BE MAINTAINED IN EFFECTIVE OPERATING CONDITION UNTIL AREAS AREA PERMANENTLY STABILIZED.
2. INSPECTION LOG (REPORT): A LOG (REPORT) MUST BE KEPT SUMMARIZING THE SCOPE OF THE INSPECTION, NAME(S) AND QUALIFICATIONS OF THE PERSONNEL MAKING THE INSPECTION, THE DATE(S) OF THE INSPECTION, AND MAJOR OBSERVATIONS RELATING TO OPERATION OF EROSION AND SEDIMENTATION CONTROLS AND POLLUTION PREVENTION MEASURES. MAJOR OBSERVATIONS MUST INCLUDE BMPs THAT NEED MAINTENANCE, BMPs THAT FAILED TO OPERATE AS DESIGNED OR PROVED INADEQUATE FOR A PARTICULAR LOCATION, AND LOCATION(S) WHERE ADDITIONAL BMPs ARE NEEDED. FOR EACH BMP REQUIRING MAINTENANCE, BMP NEEDING REPLACEMENT, AND LOCATION NEEDING ADDITIONAL BMPs, NOTE IN THE INSPECTION LOG THE CORRECT ACTION TAKEN AND WHEN IT WAS TAKEN. THE LOG MUST BE MADE ACCESSIBLE TO THE DEPARTMENT STAFF AND A COPY MUST BE PROVIDED UPON REQUEST. THE PERMITTEE SHALL RETAIN A COPY OF THE LOG FOR A PERIOD OF AT LEAST THREE YEARS FROM THE COMPLETION OF THE PERMANENT STABILIZATION.

HOUSEKEEPING (APPENDIX C)

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. FOR OIL SPILLS, CALL 1-800-482-0777 WHICH IS AVAILABLE 24 HOURS A DAY. FOR SPILLS OF TOXIC OR HAZARDOUS MATERIAL, CALL 1-800-452-4664 WHICH IS AVAILABLE 24 HOURS A DAY. FOR MORE INFORMATION, VISIT THE DEPARTMENTS WEBSITE AT: HTTP://WWW.MAINE.GOV/DEPS/SPILLS/EMERGSPILLRESP/

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 CONTAMINANT 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.

NOTE: LACK OF APPROPRIATE POLLUTANT REMOVAL BEST MANAGEMENT PRACTICES (BMPs) MAY RESULT IN VIOLATIONS OF THE GROUNDWATER QUALITY STANDARD ESTABLISHED BY 38 M.R.S.A. §465-G(1).

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 SWEEP 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.

NOTE: DEWATERING A STREAM WITHOUT A PERMIT FROM THE DEPARTMENT MAY VIOLATE STATE WATER QUALITY STANDARDS AND THE NATURAL RESOURCES PROTECTION ACT.

4. DEBRIS AND OTHER MATERIALS: MINIMIZE THE EXPOSURE OF CONSTRUCTION DEBRIS, BUILDINGS AND LANDSCAPING MATERIALS, TRASH, FERTILIZERS, PESTICIDES, DETERGENTS, SANITARY WASTE AND OTHER MATERIALS TO PRECIPITATION AND STORMWATER RUNOFF. THESE MATERIALS MUST BE PREVENTED FROM BECOMING A POLLUTANT SOURCE.

NOTE: TO PREVENT THESE MATERIALS FROM BECOMING A SOURCE OF POLLUTANTS, CONSTRUCTION AND POST-CONSTRUCTION ACTIVITIES RELATED TO A PROJECT MAY BE REQUIRED TO COMPLY WITH APPLICABLE PROVISION OF RULES RELATED TO SOLID, UNIVERSAL, AND HAZARDOUS WASTE, INCLUDING, BUT NOT LIMITED TO, THE MAINE SOLID WASTE AND HAZARDOUS WASTE MANAGEMENT RULES; MAINE HAZARDOUS WASTE MANAGEMENT RULES; MAINE OIL CONVEYANCE AND STORAGE RULES; AND MAINE PESTICIDE REQUIREMENTS.

5. EXCAVATION DEWATERING: EXCAVATION DEWATERING IS THE REMOVAL OF WATER FROM TRENCHES, FOUNDATIONS, COTTER 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 PONDING 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.

NOTE: DEWATERING CONTROLS ARE DISCUSSED IN THE "MAINE EROSION AND SEDIMENT CONTROL BMPs, MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION."

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:

- DISCHARGES FROM FIREFIGHTING ACTIVITY;
- FIRE HYDRANT FLUSHINGS;
- VEHICLE WASHWATER IF DETERGENTS ARE NOT USED AND WASHING IS LIMITED TO THE EXTERIOR OF VEHICLES (ENGINE, UNDERCARRIAGE, AND TRANSMISSION WASHING IS PROHIBITED);
- DUST CONTROL RUNOFF IN ACCORDANCE WITH PERMIT CONDITIONS AND APPENDIX C(3);
- ROUTINE EXTERNAL BUILDING WASHDOWN, NOT INCLUDING SURFACE PAINT REMOVAL, THAT DOES NOT INVOLVE DETERGENTS;
- 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;
- UNCONTAMINATED AIR CONDITIONING OR COMPRESSOR CONDENSATE;
- UNCONTAMINATED GROUNDWATER OR SPRING WATER;
- FOUNDATION OR FOOTER DRAIN-WATER WHERE FLOWS ARE NOT CONTAMINATED;
- UNCONTAMINATED EXCAVATION DEWATERING (SEE REQUIREMENTS IN APPENDIX C(5));
- POTABLE WATER SOURCES INCLUDING WATERLINE FLUSHINGS; AND
- LANDSCAPE IRRIGATION

7. UNAUTHORIZED NON-STORMWATER DISCHARGES: THE DEPARTMENTS APPROVAL UNDER THIS CHAPTER DOES NOT AUTHORIZE A DISCHARGE THAT IS MIXED WITH A SOURCE OF NON-STORMWATER, OTHER THAN THOSE DISCHARGES IN COMPLIANCE WITH APPENDIX C (6). SPECIFICALLY, THE DEPARTMENTS APPROVAL DOES NOT AUTHORIZE DISCHARGES OF THE FOLLOWING:

- WASTEWATER FROM THE WASHOUT OR CLEANOUT OF CONCRETE, STUCCO, PAINT, FORM RELEASE OILS, CURING COMPOUNDS OR OTHER CONSTRUCTION MATERIALS;
- FROZEN GROUT, BEDROCK OR ROOTED FORESTED AREAS.
- FUELS, OILS OR OTHER POLLUTANTS USED IN VEHICLE AND EQUIPMENT OPERATION AND MAINTENANCE;
- SOAPS, SOLVENTS, OR DETERGENTS USED IN VEHICLE AND EQUIPMENT WASHING; AND
- TOXIC OR HAZARDOUS SUBSTANCES FROM A SPILL OR OTHER RELEASE.

8. ADDITIONAL REQUIREMENTS: ADDITIONAL REQUIREMENTS MAY BE APPLIED ON A SITE-SPECIFIC BASIS.

1 EROSION AND SEDIMENTATION CONTROL NOTES

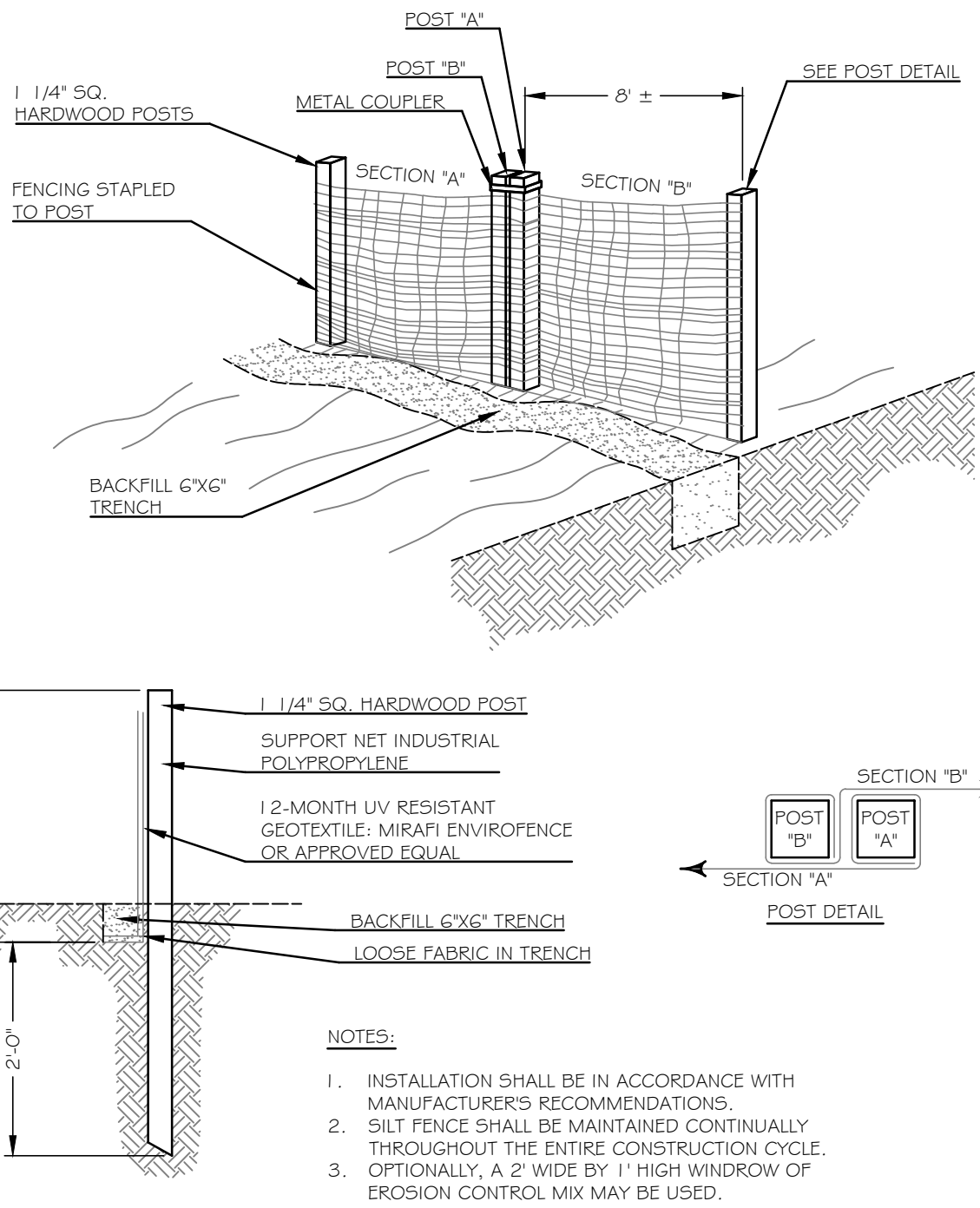
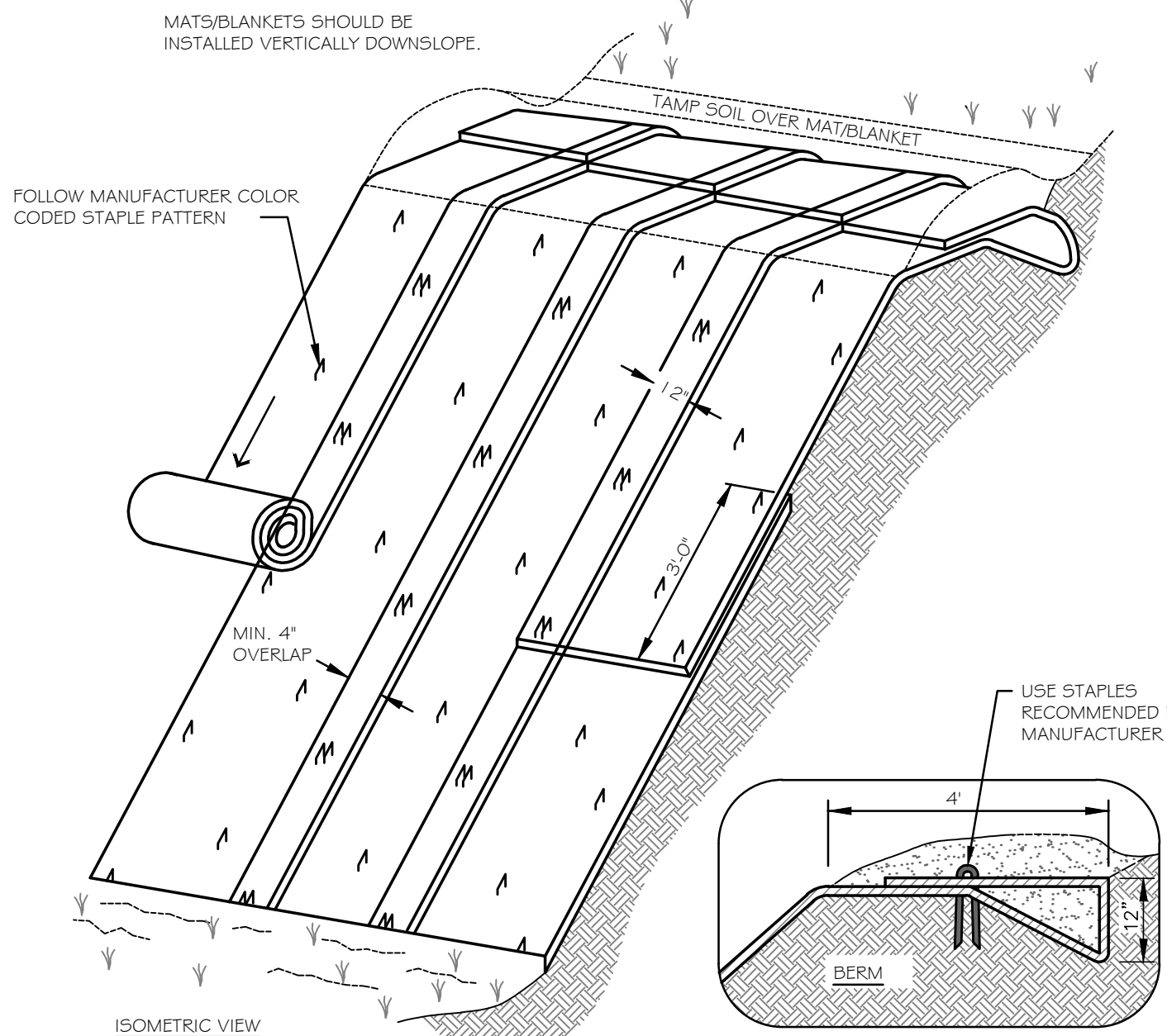
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INSTALLATION INSTRUCTIONS:

1. TURF REINFORCEMENT MAT (TRM) MATERIAL SHALL BE ENKAMAT 7020, OR APPROVED EQUAL.
2. EROSION CONTROL BLANKET (ECB) SHALL BE BIONET 575BN SINGLE NET STRAW BLANKET BY NORTH AMERICAN GREEN OR APPROVED EQUAL.
3. FOR TRM INSTALLATION ONLY:
 - 3.1. APPLY 2" OF LOAM ONTO THE GROUND SURFACE.
 - 3.2. OVER TOP THE 2" OF LOAM, UNROLL MAT IN THE DIRECTION OF WATER FLOW.
4. MAT SHOULD LIE FLAT. DO NOT STRETCH MAT OVER GROUND. STRETCHING MAY CAUSE MAT TO BRIDGE DEPRESSIONS IN THE SURFACE AND ALLOW EROSION UNDERNEATH.
5. BURY TRANSVERSE TERMINAL ENDS OF MAT TO SECURE AND PREVENT EROSIIVE FLOW UNDERNEATH.
6. SECURE MAT SNUGLY INTO ALL TRANSVERSE CHECK SLOTS.
7. BACKFILL AND COMPACT TRENCHES AND CHECK SLOTS AFTER STAKING THE MAT IN BOTTOM OF TRENCH.
8. OVERLAP ROLL ENDS BY THREE (3) FEET (MIN.) WITH UPSLOPE MAT ON TOP TO PREVENT UPLIFT OF MAT END BY WATER FLOW. IF INSTALLING IN THE DIRECTION OF A CONCENTRATED WATER FLOW, START NEW ROLLS IN A TRANSVERSE DITCH.
9. OVERLAP ADJACENT EDGES OF MAT BY THREE (3) INCHES (MIN.) AND STAKE.
10. USE WOOD STAKES OR STAPLES FOR PINNING MAT TO THE GROUND SURFACE, PER MANUFACTURER'S RECOMMENDATIONS.
11. IN ALL TRANSVERSE TERMINAL TRENCHES AND CHECK SLOTS, STAKE EACH MAT AT ITS CENTER AND OVERLAP EDGES BEFORE BACKFILLING AND COMPACTING.
12. STAKE OVERLAPS LONGITUIONALLY AT THREE (3) TO FIVE (5) FOOT INTERVALS.
13. WORK ADDITIONAL LOAM INTO THE MAT AND COVER THE MAT SURFACE WITH 1" OF LOAM, THEN SEED AND MULCH.

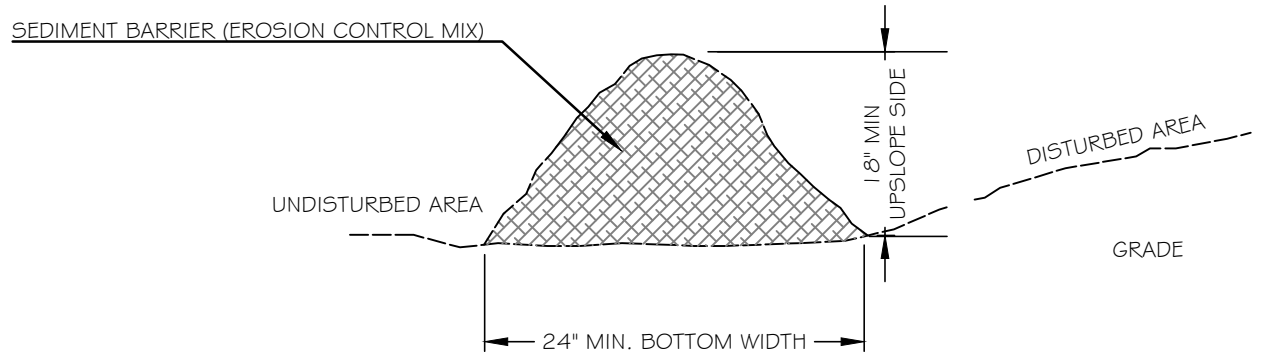
MATS/BLANKETS SHOULD BE INSTALLED VERTICALLY DOWNSLOPE.

FOLLOW MANUFACTURER COLOR CODED STAPLE PATTERN



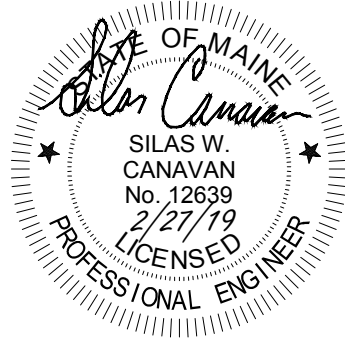
3 PREFABRICATED SILT FENCE

C3.0 NOT TO SCALE



NOTES

1. THE EROSION CONTROL MIX SHALL CONTAIN A WELL GRADED MIXTURE OF PARTICLE SIZES AND MAY CONTAIN ROCKS LESS THAN 4" DIAMETER. EROSION CONTROL MIX MUST BE FREE OF REFUSE, PHYSICAL CONTAMINANTS, AND MATERIAL TOXIC TO PLANT GROWTH.
2. MATERIAL SHALL MEET THE FOLLOWING REQUIREMENTS
 - A. THE ORGANIC CONTENT SHALL BE BETWEEN 80 AND 100% DRY WEIGHT BASIS
 - B. PARTICLE SIZE BY WEIGHT SHALL BE 100% PASSING A 6" SCREEN AND A MAXIMUM OF 85% PASSING A 0.75" SCREEN
 - C. THE ORGANIC PORTION NEEDS TO BE FIBROUS AND ELONGATED
 - D. LARGE PORTIONS OF SILTS, CLAYS, OR FINE SANDS ARE NOT ACCEPTABLE IN THE MIX
 - E. SOLUBLE SALTS CONTENT SHALL BE <.4.0 MM/HOSYCM
 - F. THE PH SHOULD FALL BETWEEN 5.0 AND 8.0
3. PLACE BARRIER ALONG A RELATIVELY FLAT CONTOUR. CUT TALL GRASSES OR WOODY VEGETATION TO AVOID CREATING VOIDS AND BRIDGES WHERE FINES CAN WASH UNDER THE BARRIER THROUGH GRASS BLADES AND BRANCHES.
4. PLACEMENT OF BARRIER SHOULD BE:
 - AT TOE OF THE SLOPE.
 - FROZEN GROUT, BEDROCK OR ROOTED FORESTED AREAS.
 - THE EDGE OF GRAVEL AND AREAS UNDER CONSTRUCTION.
5. BARRIER SHALL NOT BE USED ADJACENT TO WETLANDS
6. REMOVE SEDIMENT DEPOSITS WHEN THEY REACH APPROXIMATELY ONE HALF THE HEIGHT OF THE BARRIER.
7. WHEN BARRIER IS DECOMPOSED, CLOGGED WITH SEDIMENT, ERODED OR INEFFECTIVE, IT MUST BE REPLACED OR REPAIRED. THE BARRIER SHOULD BE RESHAPED AS NECESSARY.



4 SEDIMENT BARRIER (EROSION CONTROL MIX)

C3.0 NOT TO SCALE

Kaplan Thompson Architects

102 Exchange Street
Portland, ME 04101
(207) 842-2888
kaplanthompson.com

PROJECT

Classroom & Community Hall Addition

Friends School of Portland
11 US Route 1
Cumberland, ME 04021



STRUCTURAL

Casco Bay Engineering

424 Fore Street
Portland, ME 04101
p: 207 842-2800

LANDSCAPE

Soren Deniord Design Studio

43 Wellwood Road
Portland, ME 04103
p: 207-400-2450

ELECTRICAL

Swiftcurrent Engineering Services

10 Forest Falls Drive, Unit 8B
Yarmouth, ME 04096
p: 207-847-9280

CIVIL

Walsh Engineering Associates, Inc.

1 Karen Drive, Suite 2A
Westbrook, ME 04092
p: 207-553-9898

Mechanical & Plumbing
Integrated Energy Systems, PLLC

301 Middle Road
Falmouth, ME 04105
p: 207-781-4263

| DATE | 08/20/18 | 10/02/18 | 02/21/19 | 02/22/19 | | | | | | | | | | | | | | | |
|-------------|----------------------------|---------------|---|----------|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| CHANGE NAME | | | | | | | | | | | | | | | | | | | |
| CH ID | | | | | | | | | | | | | | | | | | | |
| DESCRIPTION | PRECING SET FOR SFM PERMIT | FOR CD COORD. | FOR CONSTRUCTION SUBMITTAL FOR PERMITTING | | | | | | | | | | | | | | | | |
| ISSUE NO | A | B | C | D | E | | | | | | | | | | | | | | |

FOR SFM PERMIT

PROJECT NO: FSP2

DESIGNED BY: NGC

DRAWN BY: CAR/JWG

PHASE:

PERMITTING

SITE DETAILS

C3.0

Exhibit 5
Lighting

VIPER S

STRIKE

SMALL VIPER LUMINAIRE

Cat.#

Job

Type

Approvals



BEACON
design · performance · technology

SPECIFICATIONS

Intended Use:

The Beacon Viper luminaire is available with a wide choice of different LED Wattage configurations and optical distributions designed to replace HID lighting up to 400W MH or HPS.

Construction:

- Manufactured with die cast aluminum.
- Coated with a polyester finish that meets ASTM B117 corrosion test requirements and ASTM D522 cracking and loss of adhesion test requirements.
- External hardware is corrosion resistant.
- One piece optical cartridge system consisting of an LED engine, LED lamps, optics, gasket and stainless steel bezel.
- Cartridge is held together with internal brass standoffs soldered to the board so that it can be field replaced as a one piece optical system.
- Two-piece silicone and micro-cellular polyurethane foam gasket ensures a weather-proof seal around each individual LED.

Electrical:

- 100V through 277V, 50 Hz to 60 Hz (UNV), or 347V or 480V input.
- Power factor is $\geq .90$ at full load.
- Dimming drivers are standard, but must contact factory to request wiring leads for purpose of external dimming controls.
- Component-to-component wiring within the luminaire may carry no more than 80% of rated load and is certified by UL for use at 600VAC at 90°C or higher.
- Plug disconnects are certified by UL for use at 600 VAC, 13A or higher. 13A rating applies to primary (AC) side only.
- Fixture electrical compartment shall contain all LED driver components and shall be provided with a push-button terminal block for AC power connections.
- Surge protection - 20kA.
- Optional 7-pin ANSI C136.41-2013 twist-lock photo control receptacle available. Compatible with ANSI C136.41 external wireless control devices.
- Lifeshield™ Circuit - protects luminaire from excessive temperature. The device shall activate at a specific, factory-preset temperature, and progressively reduce power over a finite temperature range. Operation shall be smooth and undetectable to the eye. Thermal circuit is designed to "fail on", allowing the luminaire to revert to full power in the event of an interruption of its power supply, or faulty wiring connection to the drivers. The device shall be able to co-exist with other 0-10V control devices (occupancy sensors, external dimmers, etc.).

Controls/Options:

- Available with an optional passive infrared (PIR) motion sensor capable of detecting motion 360° around the luminaire. When no motion is detected for the specified time, the Motion Response system reduces the wattage to factory preset level, reducing the light level accordingly. When motion is detected by the PIR sensor, the luminaire returns to full wattage and full light output. Please contact Beacon Products if project requirements vary from standard configuration.
- Available with Energeni for optional set dimming, timed dimming with simple delay, or timed dimming based on time of night (see www.beaconproducts.com/products/energeni).
- In addition, Viper can be specified with **SiteSync™** wireless control system for reduction in energy and maintenance costs while optimizing light quality 24/7. For more details, see ordering information or visit: www.hubbellighting.com/sitesync

Installation:

- Mounting options for horizontal arm, vertical arm or traditional arm mounting available. Mounting hardware included.

Finish:

- IFS polyester powder-coat electrostatically applied and thermocured. IFS finish consists of a five stage pretreatment regimen with a polymer primer sealer and top coated with a thermoset super TGIC polyester powder coat finish.
- The finish meets the AAMA 2604 performance specification which includes passing a 3000 hour salt spray test for corrosion resistance and resists cracking or loss of adhesion per ASTM D522 and resists surface impacts of up to 160 inch-pounds.

Certifications/Ratings:

- DesignLights Consortium (DLC) qualified, consult DLC website for more details: <http://www.designlights.org/QPL>
- Certified to UL 1598, UL 8750 and CSA C22.2 No.250.0
- IDA approved
- This product is approved by the Florida Fish and Wildlife Conservation Commission. Separate spec available at: <http://www.beaconproducts.com/products/vipersmall>

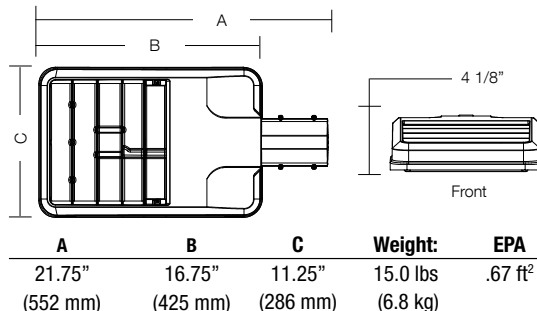
Warranty:

Five year limited warranty for more information visit: www.hubbellighting.com/resources/warranty

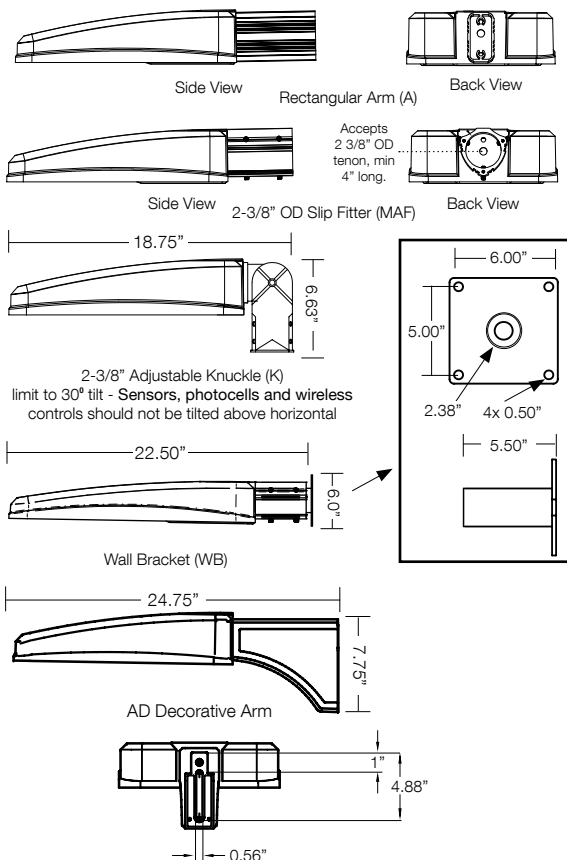
PRODUCT IMAGE(S)



DIMENSIONS



MOUNTING OPTIONS



CERTIFICATIONS/LISTINGS



*3000K and warmer CCTs only



BEACON
design · performance · technology

Beacon Products • 2041 58th Avenue Circle East Bradenton, FL 34203 • Phone: 800-345-4928
Due to our continued efforts to improve our products, product specifications are subject to change without notice.

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HUBBELL
Lighting

ORDERING INFORMATION ORDERING EXAMPLE: VPS/24L-55/4K7/4W/UNV/A/DBT/7PR-TL/GENI-04/BC

| VPS | | | | | | | | |
|-----------|-------------------------|----------------------|-------------------------------------|--------------|---------------------------|---|--|--|
| SERIES | LED ENGINE | CCT/CRI ⁷ | ROTATION | VOLTAGE | COLOR | OPTIONS | | |
| VPS Viper | 24L-55 55W, LED array | 3K7 3000K, 70 CRI | Leave blank for no rotation | UNV 120-277V | BL Black Textured | F Fusing | | |
| | 36L-65 65W, LED array | 4K7 4000K, 70 CRI | L ⁵ Optic rotation left | 120 120V | DB Dark Bronze Textured | BSP Bird Spikes | | |
| | 36L-80 80W, LED array | 5K7 5000K, 70 CRI | R ⁵ Optic rotation right | 208 208V | GYS Light Gray Smooth | BC Backsheldld (available for FR, 2, 3, 4, 4W Optics) | | |
| | 48L-110 110W, LED array | DISTRIBUTION | | 240 240V | PS Platinum Silver Smooth | | | |
| | | FR Type 1/Front Row | | 277 277V | WH White Textured | | | |
| | | 2 Type 2 | | 347 347V | CC Custom Color | | | |
| | | | | 480 480V | | | | |

DISTRIBUTION

- FR** Type 1/Front Row
- 2** Type 2
- 3** Type 3
- 4** Type 4
- 4W** Type 4 Wide
- 5QM** Type 5QM
- 5R** Type 5R (rectangular)
- 5W** Type 5W (round wide)
- TC** Tennis Court

MOUNTING

- A** Rectangular Arm (formerly RA) for square or round pole
- MAF** Mast Arm Fitter (formerly SF2) for 2-3/8" OD horizontal arm
- K** Knuckle (formerly PK2) limit to 45° tilt or 2-3/8" OD horizontal arm or vertical tenon
- WB** Wall Bracket
- AD** Universal Arm for square pole
- AD3** Universal Arm for 2.4"-4.1" round pole
- AD4** Universal Arm for 4.2"-5.3" round pole
- AD5** Universal Arm for 5.5"-5.9" round pole
- AD6** Universal Arm for 6.0"-6.5" round pole

CONTROL OPTIONS

- 7PR** 7-Pin Receptacle only (shorting cap, photo control, or wireless control provided by others)
- 7PR-SC** 7-Pin Receptacle w/Shorting Cap
- 7PR-TL** 7-Pin Receptacle w/Twist Lock photo control
- SCP/_F^{1,2,6}** Programmable Occupancy Sensor w/ daylight control (120-277 volts only)
- GENI-XX³** ENERGENI
- SWP^{1,4}** SiteSync Pre-Commission
- SWPM^{1,2,4}** SiteSync Pre-Comm w/ Sensor

HOUSE SIDE SHIELD ACCESSORIES

- HSS/VP-S/90-FB/XXX** 90° shield front or back
- HSS/VP-S/90-LR/XXX** 90° shield left or right
- HSS/VP-S/270-FB/XXX** 270° shield front or back
- HSS/VP-S/270-LR/XXX** 270° shield left or right
- HSS/VP-S/360/XXX** Full shield

(Replace XXX with notation for desired finish color)
(Refer to page 5 for shield images)

MOUNTING ACCESSORIES

- VPL-AD-RPA3** 2.4"-4.1" Round Pole Adapter for AD arm
- VPL-AD-RPA4** 4.2"-5.3" Round Pole Adapter for AD arm
- VPL-AD-RPA5** 5.5"-5.9" Round Pole Adapter for AD arm
- VPL-AD-RPA6** 6.0"-6.5" Round Pole Adapter for AD arm

¹ Not available with other wireless control or sensor options

² Specify mounting height; 8-8' or less, 40-9' to 40'

³ Specify routine setting code (example GENI-04). See ENERGENI brochure and instructions for setting table and options. Not available with sensor or SiteSync options.

⁴ Specify group and zone at time of order. See www.hubbellighting.com/sitesync for further details. Order at least one SiteSync interface Accessory SWUSB or SWTAB. Each option contains SiteSync License, GUI, and Bridge Node

⁵ Only available with 1A, 2, 3, 4, 4W and 5R distributions

⁶ Order at least one SCP-REMOTE per project location to program and control the occupancy sensor.

⁷ This product is approved by the Florida Fish and Wildlife Conservation Commission. Separate spec available at: http://cdn.beaconproducts.com/content/products/specs/specs_files/Viper_Small_LED_turtle_spec_sheet.pdf

PRECOMMISSIONED SITESYNC ORDERING INFORMATION: When ordering a fixture with the SiteSync lighting control option, additional information will be required to complete the order. The SiteSync Commissioning Form or alternate schedule information must be completed. This form includes Project location, Group information, and Operating schedules. For more detailed information please visit www.hubbell-automation.com/products/sitesync/ or contact Hubbell Lighting tech support at (800) 345-4928.

SiteSync fixtures with Motion control (SWPM) require the mounting height of the fixture for selection of the lens.

Examples: VPS/24L-55/4K7/3/UNV/A/DBT/SWP/ SiteSync only
VPS/24L-55/4K7/3/UNV/A/DBT/SWPM-40F/ SiteSync with Motion Control

Accessories and Services (Ordered Separately)

| Catalog Number | Description |
|-------------------|--|
| SWUSB* | SiteSync interface software loaded on USB flash drive for use with owner supplied PC (Windows based only). Includes SiteSync license, software and USB radio bridge node |
| SWTAB* | Windows tablet and SiteSync interface software. Includes tablet with preloaded software, SiteSync license and USB radio bridge node. |
| SWBRG | SiteSync USB radio bridge node only. Order if a replacement is required or if an extra bridge node is requested. |
| SCP-REMOTE | Remote Control for SCP/_F option. Order at least one per project to program and control |
| SW7PR* | SiteSync 7 Pin on fixture module On/Off/Dim, Daylight Sensor 120-480VAC |

* When ordering SiteSync at least one of these two interface options must be ordered per project.

+ Available as a SiteSync retrofit solution for fixtures with an existing 7pin receptacle.

Hubbell Control Solutions - Accessories (sold separately)

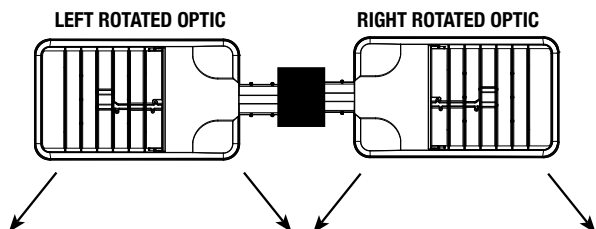
| Catalog Number | Description | HCS System |
|-----------------------|--|------------------------------|
| NXOFM-1R1D-UNV | On-fixture Module (7-pin), On / Off / Dim, Daylight Sensor with HubbNET Radio and Bluetooth® Radio, 120-480VAC | NX Distributed Intelligence™ |
| WIR-RME-L | On-fixture Module (7-pin or 5-pin), On / Off / Dim, Daylight Sensor with wiSCAPE Radio, 110-480VAC | wiSCAPE® Lighting Control |

For additional information related to these accessories please visit www.hubbellcontrolsolutions.com. Options provided for use with integrated sensor, please view specification sheet ordering information table for details.

SiteSync 7-Pin Module



- SiteSync features in a new form
- Available as an accessory for new construction or retrofit applications (with existing 7-Pin receptacle)
- Does not interface with occupancy sensors



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HUBBELL
Lighting

PERFORMANCE DATA

| # LED'S | DRIVE CURRENT (MILLIAMPS) | SYSTEM WATTS | DISTRIBUTION TYPE | 5K (5000K nominal, 70 CRI) | | | | | 4K (4000K nominal, 70 CRI) | | | | | 3K (3000K nominal, 70 CRI) | | | | |
|---------|---------------------------------|-----------------|----------------------|-------------------------------|------------------|---|---|---|-------------------------------|------------------|---|---|---|-------------------------------|------------------|---|---|---|
| | | | | LUMENS | LPW ¹ | B | U | G | LUMENS | LPW ¹ | B | U | G | LUMENS | LPW ¹ | B | U | G |
| 24 | 700 mA | 55W | FR | 6357 | 118 | 1 | 0 | 1 | 6486 | 120 | 1 | 0 | 1 | 5804 | 107 | 1 | 0 | 1 |
| | | | 2 | 6132 | 114 | 1 | 0 | 1 | 6257 | 116 | 1 | 0 | 2 | 5599 | 104 | 1 | 0 | 1 |
| | | | 3 | 6015 | 111 | 1 | 0 | 2 | 6137 | 114 | 1 | 0 | 2 | 5492 | 102 | 1 | 0 | 2 |
| | | | 4 | 5921 | 110 | 1 | 0 | 2 | 6034 | 112 | 1 | 0 | 2 | 5400 | 100 | 1 | 0 | 2 |
| | | | 4W | 5805 | 108 | 1 | 0 | 2 | 5921 | 110 | 1 | 0 | 2 | 5282 | 98 | 1 | 0 | 2 |
| | | | 5QM | 6022 | 112 | 2 | 0 | 1 | 6145 | 114 | 2 | 0 | 1 | 5499 | 102 | 2 | 0 | 1 |
| | | | 5R | 6063 | 112 | 3 | 0 | 3 | 6187 | 115 | 3 | 0 | 3 | 5536 | 103 | 3 | 0 | 3 |
| | | | 5W | 5908 | 109 | 3 | 0 | 1 | 6028 | 112 | 3 | 0 | 1 | 5908 | 102 | 3 | 0 | 1 |
| | | | TC | 6183 | 115 | 1 | 0 | 1 | 6309 | 118 | 1 | 0 | 1 | 5645 | 105 | 1 | 0 | 1 |
| 36 | 560 mA | 65W | FR | 7864 | 121 | 1 | 0 | 1 | 8041 | 124 | 1 | 0 | 1 | 7189 | 111 | 1 | 0 | 1 |
| | | | 2 | 7586 | 117 | 1 | 0 | 2 | 7757 | 119 | 1 | 0 | 2 | 6934 | 107 | 1 | 0 | 2 |
| | | | 3 | 7441 | 114 | 1 | 0 | 2 | 7609 | 117 | 1 | 0 | 2 | 6802 | 105 | 1 | 0 | 2 |
| | | | 4 | 7317 | 110 | 1 | 0 | 2 | 7482 | 112 | 1 | 0 | 2 | 6688 | 100 | 1 | 0 | 2 |
| | | | 4W | 7325 | 113 | 1 | 0 | 2 | 7490 | 115 | 1 | 0 | 2 | 6696 | 103 | 1 | 0 | 2 |
| | | | 5QM | 7450 | 115 | 3 | 0 | 1 | 7618 | 117 | 3 | 0 | 1 | 6810 | 105 | 3 | 0 | 1 |
| | | | 5R | 7501 | 115 | 3 | 0 | 3 | 7670 | 118 | 3 | 0 | 3 | 6857 | 105 | 3 | 0 | 3 |
| | | | 5W | 7309 | 112 | 3 | 0 | 2 | 7473 | 115 | 3 | 0 | 2 | 6681 | 103 | 3 | 0 | 1 |
| | | | TC | 7925 | 115 | 1 | 0 | 1 | 8100 | 118 | 1 | 0 | 1 | 7189 | 111 | 1 | 0 | 1 |
| 36 | 700 mA | 80W | FR | 9535 | 118 | 1 | 0 | 1 | 9730 | 120 | 1 | 0 | 1 | 8706 | 107 | 1 | 0 | 1 |
| | | | 2 | 9197 | 114 | 1 | 0 | 2 | 9385 | 116 | 1 | 0 | 2 | 8398 | 104 | 1 | 0 | 2 |
| | | | 3 | 9022 | 111 | 1 | 0 | 2 | 9206 | 114 | 1 | 0 | 2 | 8238 | 102 | 1 | 0 | 2 |
| | | | 4 | 8871 | 110 | 1 | 0 | 2 | 9052 | 112 | 1 | 0 | 2 | 8100 | 100 | 1 | 0 | 2 |
| | | | 4W | 8707 | 108 | 1 | 0 | 2 | 8881 | 110 | 1 | 0 | 2 | 7923 | 98 | 1 | 0 | 2 |
| | | | 5QM | 9033 | 112 | 3 | 0 | 1 | 9217 | 114 | 3 | 0 | 1 | 8248 | 102 | 3 | 0 | 1 |
| | | | 5R | 9095 | 112 | 3 | 0 | 3 | 9280 | 115 | 3 | 0 | 3 | 8304 | 103 | 3 | 0 | 3 |
| | | | 5W | 8861 | 109 | 3 | 0 | 2 | 9043 | 112 | 3 | 0 | 2 | 8092 | 100 | 3 | 0 | 2 |
| | | | TC | 9275 | 115 | 1 | 0 | 1 | 9464 | 118 | 1 | 0 | 1 | 8468 | 105 | 1 | 0 | 1 |
| 48 | 700 mA | 110W | FR | 12713 | 118 | 1 | 0 | 1 | 12973 | 120 | 2 | 0 | 1 | 11608 | 107 | 1 | 0 | 1 |
| | | | 2 | 12263 | 114 | 2 | 0 | 2 | 12513 | 116 | 2 | 0 | 2 | 11197 | 104 | 2 | 0 | 2 |
| | | | 3 | 12029 | 111 | 2 | 0 | 2 | 11275 | 114 | 2 | 0 | 2 | 10984 | 102 | 1 | 0 | 2 |
| | | | 4 | 11828 | 110 | 1 | 0 | 3 | 12069 | 112 | 1 | 0 | 3 | 10800 | 100 | 1 | 0 | 2 |
| | | | 4W | 11609 | 108 | 1 | 0 | 3 | 11841 | 110 | 1 | 0 | 3 | 10564 | 98 | 1 | 0 | 3 |
| | | | 5QM | 12044 | 112 | 3 | 0 | 2 | 12290 | 114 | 3 | 0 | 2 | 10997 | 102 | 3 | 0 | 1 |
| | | | 5R | 12126 | 112 | 3 | 0 | 3 | 12374 | 115 | 3 | 0 | 3 | 11072 | 103 | 3 | 0 | 3 |
| | | | 5W | 12126 | 109 | 4 | 0 | 2 | 12057 | 112 | 4 | 0 | 2 | 10789 | 100 | 4 | 0 | 2 |
| | | | TC | 12366 | 115 | 1 | 0 | 2 | 12619 | 118 | 1 | 0 | 2 | 11290 | 105 | 1 | 0 | 2 |
| 60 | 700 mA | 136W | FR | 15891 | 117 | 2 | 0 | 2 | 16216 | 120 | 2 | 0 | 2 | 14511 | 107 | 2 | 0 | 1 |
| | | | 2 | 15329 | 113 | 2 | 0 | 2 | 15642 | 116 | 2 | 0 | 2 | 13997 | 103 | 2 | 0 | 2 |
| | | | 3 | 15037 | 111 | 2 | 0 | 3 | 15344 | 113 | 2 | 0 | 3 | 13730 | 101 | 2 | 0 | 3 |
| | | | 4 | 14784 | 109 | 1 | 0 | 3 | 15086 | 111 | 1 | 0 | 3 | 13500 | 100 | 1 | 0 | 3 |
| | | | 4W | 14511 | 108 | 2 | 0 | 4 | 14802 | 110 | 2 | 0 | 4 | 13205 | 98 | 2 | 0 | 3 |
| | | | 5QM | 15055 | 111 | 3 | 0 | 2 | 15362 | 114 | 3 | 0 | 2 | 13747 | 102 | 3 | 0 | 2 |
| | | | 5R | 15158 | 112 | 4 | 0 | 4 | 15469 | 114 | 4 | 0 | 4 | 13841 | 102 | 4 | 0 | 4 |
| | | | 5W | 14781 | 109 | 4 | 0 | 2 | 15083 | 111 | 4 | 0 | 2 | 13495 | 100 | 4 | 0 | 2 |
| | | | TC | 15458 | 115 | 1 | 0 | 2 | 15834 | 118 | 1 | 0 | 2 | 14113 | 105 | 1 | 0 | 2 |

PHOTOMETRICS

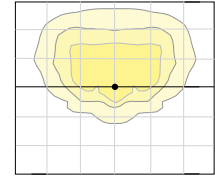
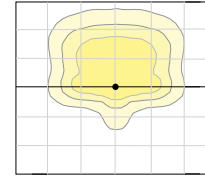
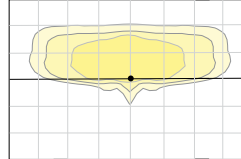
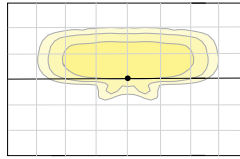
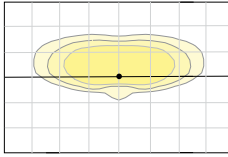
Type FR - Front Row/Auto Optic

Type 2

Type 3

Type 4

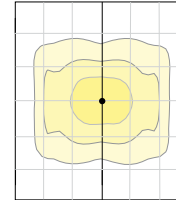
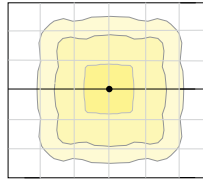
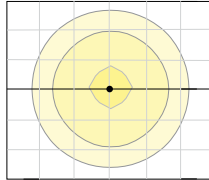
Type 4W



Type 5W

Type 5QM

Type 5R



*Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of the configurations shown. Actual performance may differ as a result of end-use environment and application.

ELECTRICAL DATA

| # OF LEDS | NUMBER OF DRIVERS | DRIVE CURRENT (mA) | INPUT VOLTAGE (V) | SYSTEM POWER (w) | CURRENT (Amps) |
|-----------|-------------------|--------------------|-------------------|------------------|----------------|
| 24 | 2 | 700 mA | 120 | 55 | 0.5 |
| | | | 277 | | 0.2 |
| | | | 347 | | 0.2 |
| | | | 480 | | 0.1 |
| 36 | 1 | 560 mA | 120 | 65 | 0.65 |
| | | | 277 | | 0.28 |
| | | | 347 | | 0.22 |
| | | | 480 | | 0.16 |
| | 1 | 700 mA | 120 | 80 | 0.7 |
| | | | 277 | | 0.3 |
| | | | 347 | | 0.2 |
| | | | 480 | | 0.2 |
| 48 | 1 | 700 mA | 120 | 110 | 0.9 |
| | | | 277 | | 0.4 |
| | | | 347 | | 0.3 |
| | | | 480 | | 0.2 |
| 60 | 1 | 700 mA | 120 | 136 | 1.1 |
| | | | 277 | | 0.5 |
| | | | 347 | | 0.4 |
| | | | 480 | | 0.3 |

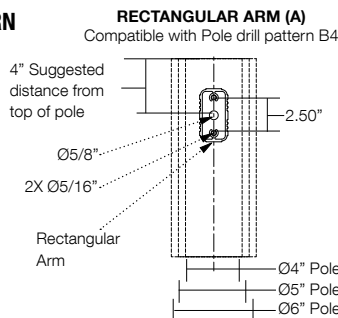
PROJECTED LUMEN MAINTENANCE

| AMBIENT TEMP. | 0 | 25,000 | 50,000 | TM-21-11 60,000 | 100,000 | Calculated L70 (HOURS) |
|---------------|------|--------|--------|-----------------|---------|------------------------|
| 25°C / 77°C | 1.00 | 0.97 | 0.95 | 0.95 | 0.92 | >377,000 |

¹ Projected per IESNA TM-21-11

Data references the extrapolated performance projections for the base model in a 25°C ambient, based on 10,000 hours of LED testing per IESNA LM-80-08.

DRILL PATTERN



EPA

| Config. | EPA | Config. | EPA |
|----------|------|----------|------|
| 1 | .67 | 3 @ 120° | 1.68 |
| 2 @ 90° | 1.06 | 3 @ 90° | 1.73 |
| 2 @ 180° | 1.34 | 4 @ 90° | 2.12 |

TENON TOP POLE BRACKET ACCESSORIES (Order Separately)

(2 3/8" OD tenon)

| Catalog Number | Description |
|----------------|---|
| SETAVP-XX | Square tenon adapter (4 at 90°) for A - Rectangular Arm mounting option only |
| RETAVP-XX | Round tenon adapter (4 at 90°) for A - Rectangular Arm mounting option only |
| TETAVP-XX | Hexagonal tenon adapter (4 at 90°) for A - Rectangular Arm mounting option only |
| SETA2XX | Square tenon adapter (4 at 90°) for AD - Universal Arm mounting option only |
| RETA2XX | Round tenon adapter (4 at 90°) for AD3 - Universal Arm mounting option only |
| TETA2XX | Hexagonal tenon adapter (3 at 120°) for AD - Universal Arm mounting option only |

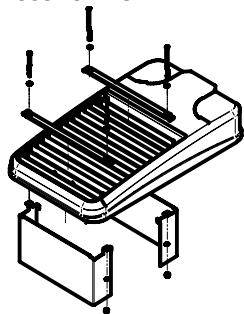


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Due to our continued efforts to improve our products, product specifications are subject to change without notice.

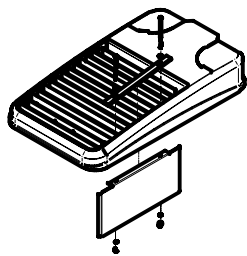
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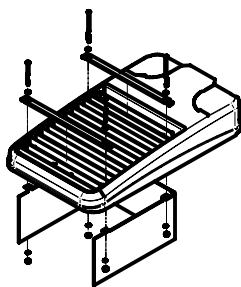
HOUSE SIDE SHIELD FIELD INSTALL ACCESSORIES



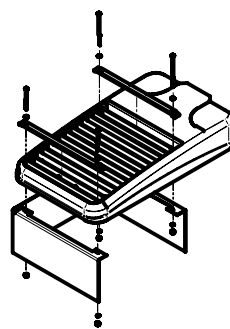
HSS/VP-S/90-FB/XXX
90° shield front or back
(2 shields shown)



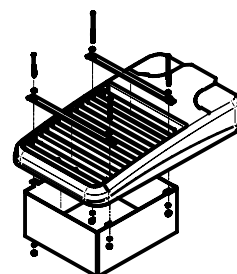
HSS/VP-S/90-LR/XXX
90° shield left or right
(1 shield shown in left orientation)



HSS/VP-S/270-FB/XXX
270° shield front or back
(1 shield shown in back orientation)

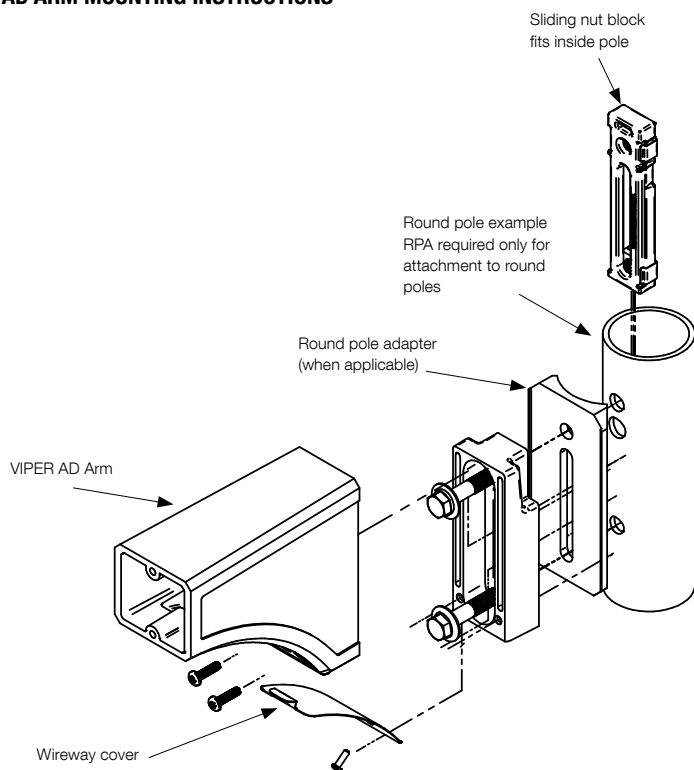


HSS/VP-S/270-LR/XXX
270° shield left or right
(1 shield shown in right orientation)



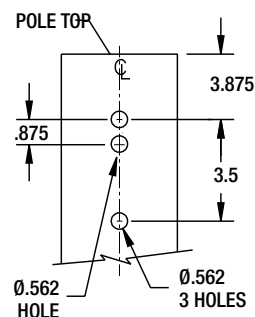
HSS/VP-S/360/XXX
Full shield (1 shield shown)

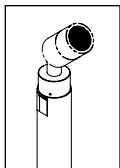
AD ARM MOUNTING INSTRUCTIONS



DECORATIVE ARM (AD)

Compatible with pole drill pattern S2





POWER PIPE™ SYSTEM

Specify Fixture Separately

| | |
|-----------------|--|
| PROJECT: | |
| TYPE: | |
| CATALOG NUMBER: | |
| LAMP(S): | |
| NOTES: | |

CATALOG NUMBER LOGIC

Example B - PP - J - 18 - T-L75E - C - MIT - 120 - SF

Material B
Blank - Aluminum
B - Brass
S - Stainless Steel

Series PP
PP - Power Pipe™ System

Type J
S - Stake
J - Junction Box
A - Adjustable 18" Stem* (requires 18" Power Pipe)
*Not available with Transformer Housing

Power Pipe Length 18
12 - 12" Power Pipe Length
18 - 18" Power Pipe Length

Transformer Housing T-L75E
Blank - Less Transformer
T-L75E - Transformer housing with 75VA Electronic Transformer*
T-Tre20 - Transformer housing with TRe20 Electronic Transformer* (105-300 VAC, 50/60 Hz, Non-Dimming. For use with **BKSSL** fixtures)
*Not available with Adjustable Stem (Type 'A')

Cap Style C
Blank - Less Cap (Adjustable Stem only)
B - Single Hole Cap
C - Solid Cap

Finish MIT

| Aluminum Finish | | | Brass | | Premium Finish | | | | | |
|-------------------|-------|---------|-----------|--|----------------|---------------------------|-----|--------------------------|---|--------------------------|
| Powder Coat Color | Satin | Wrinkle | Machined | MAC | ABP | Antique Brass Powder | CMG | Cascade Mountain Granite | RMG | Rocky Mountain Granite |
| Bronze | BZP | BZW | Polished | POL | AMG | Aleutian Mountain Granite | CRI | Cracked Ice | SDS | Sonoran Desert Sandstone |
| Black | BLP | BLW | Mitique™ | MIT | AQW | Antique White | CRM | Cream | SMG | Sierra Mountain Granite |
| White (Gloss) | WHP | WHW | Stainless | | BCM | Black Chrome | HUG | Hunter Green | TXF | Textured Forest |
| Aluminum | SAP | — | Machined | MAC | BGE | Beige | MDS | Mojave Desert Sandstone | WCP | Weathered Copper |
| Verde | — | VER | Polished | POL | BPP | Brown Patina Powder | NBP | Natural Brass Powder | WIR | Weathered Iron |
| | | | Brushed | BRU <small>Interior use only.</small> | CAP | Clear Anodized Powder | OCP | Old Copper | Also available in RAL Finishes See submittal SUB-1439-00 | |

Input Voltage 120
Blank - Less Transformer or For use with TRe20 Electronic Transformer (105-300 VAC, 50/60 Hz, Non-Dimming)
120 - 120 VAC Input (For use with L75E)
230 - 230 VAC Input (Non-Dimming, For use with L75E)
277 - 277 VAC Input (Non-Dimming, For use with L75E)

Options SF
SF - Stability Flange

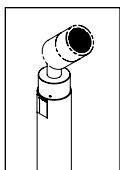
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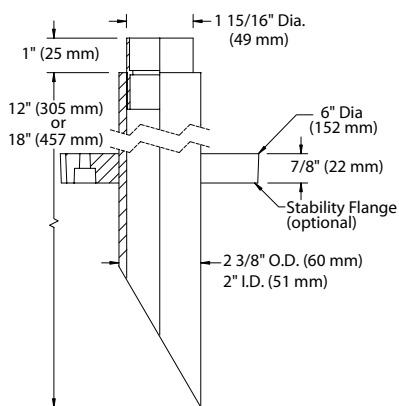
POWER PIPE™ SYSTEM

Specify Fixture Separately

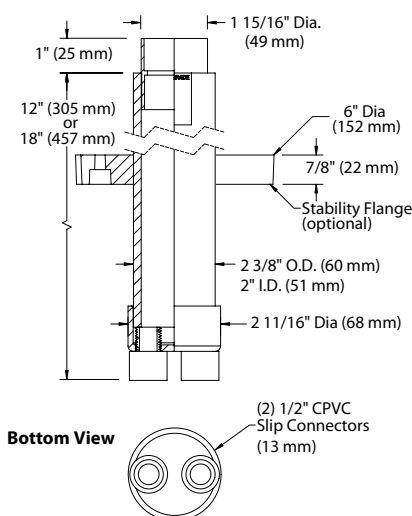
PROJECT:

TYPE:

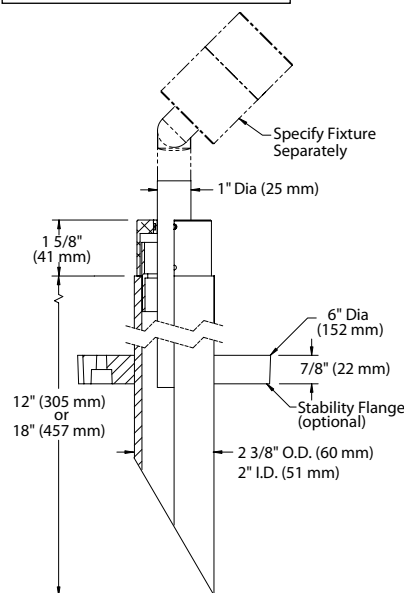
STAKE (S)



JUNCTION (J)

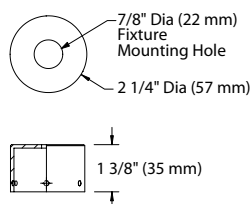


ADJUSTABLE STEM (A)

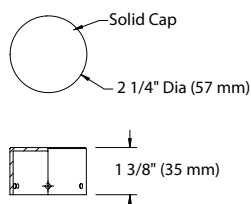


CAP STYLES

'B' Cap (Single Hole)

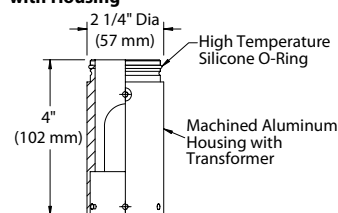


'C' Cap (Solid Cap)



TRANSFORMER

Transformer with Housing



All dimensions indicated on this submittal are nominal.
Contact Technical Sales if you require more stringent specifications.

SPECIFICATIONS

GreenSource Initiative™

Metal and packaging components are made from recycled materials. Manufactured using renewable solar energy, produced on site. Returnable to manufacturer at end of life to ensure cradle-to-cradle handling. Packaging contains no chlorofluorocarbons (CFC's). Use of this product may qualify for GreenSource efficacy and recycling rebate(s). Consult www.bklighting.com/greensource for program requirements.

Installation

Provides a clean, architectural transition from wiring system to fixture. 2" Schedule 80 PVC pipe. For direct burial into soil or concrete. Available in 12" and 18" lengths. Available in three installation types:

Stake (Type S)

60° angled bottom designed for use with conduit or direct burial low voltage cable.

Junction Box (Type J)

Includes [2] 1/2" PVC slip connectors for branch circuit wiring.

Adjustable Stem (Type A18)

18" field adjustable stem accommodates future landscape growth. Unused stem length remains hidden inside housing. Delrin bushing and stainless steel set screws lock mounting height.

Stability Flange

Optional 6" diameter, molded stability flange simplifies installation and projects into substrate to simplify installation and reinforce housing stability.

Cap Style

Machined from copper-free aluminum or machined brass. Choose from Solid ('C'), or Single Hole ('B') cap styles.

Transformer Housing

Fully machined from copper-free aluminum, solid machined brass or stainless steel. Stainless steel hardware. High temperature, silicone 'O' Ring provides watertight seal.

Electronic Transformer

For use with halogen lamps. 120V, 230V, and 277V primary voltage. 120V is fully dimmable (40W minimum load). 50/60Hz. 11.6V secondary voltage. 10 watt minimum load (Halogen) non-dimmed. 75 watt maximum load. >0.93 Power Factor. <20% THD. Operating frequency >10kHz. Soft start circuitry to extend lamp life.

TR20 Electronic Transformer

For use with **BR5531** solid state 12V systems. 105-300VAC primary voltage. 50/60Hz. Non Dimming. 20VA maximum load.

Wiring

Teflon® coated wire, 18AWG, 600V, 250° C rated and certified to UL 1659 standard. Adjustable stem mount additionally includes 24" or 36" 12/2 direct burial low voltage cable.

Hardware

Tamper resistant, stainless steel hardware.

Finish

StarGuard®, our exclusive RoHs compliant, 15 stage chromate-free process cleans and conversion coats aluminum components prior to application of Class 'A' TGIC polyester powder coating.

Warranty

5 year limited warranty.

Listings

UL Listed. Certified to CAN/CSA/ANSI Standards. RoHs compliant. Made in USA.



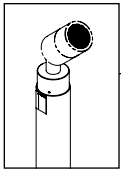
*Teflon is a registered trademark of DuPont Corporation

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POWER PIPE™ SYSTEM

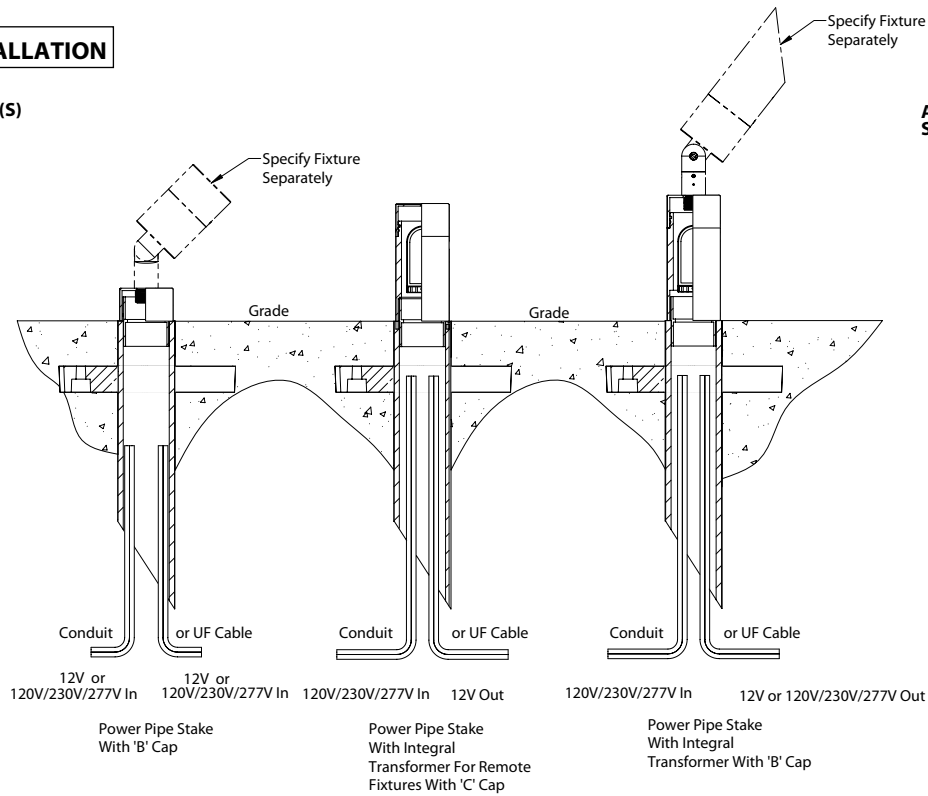
Specify Fixture Separately

PROJECT:

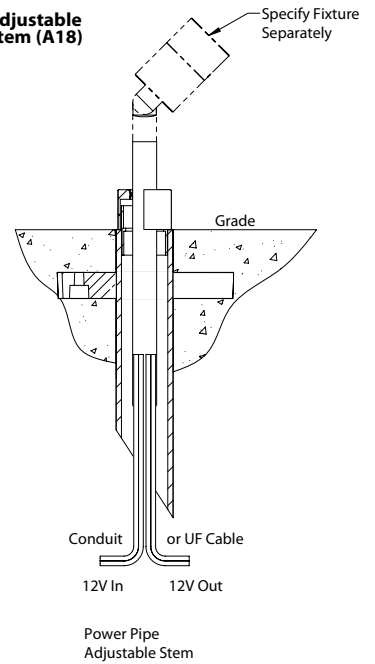
TYPE:

INSTALLATION

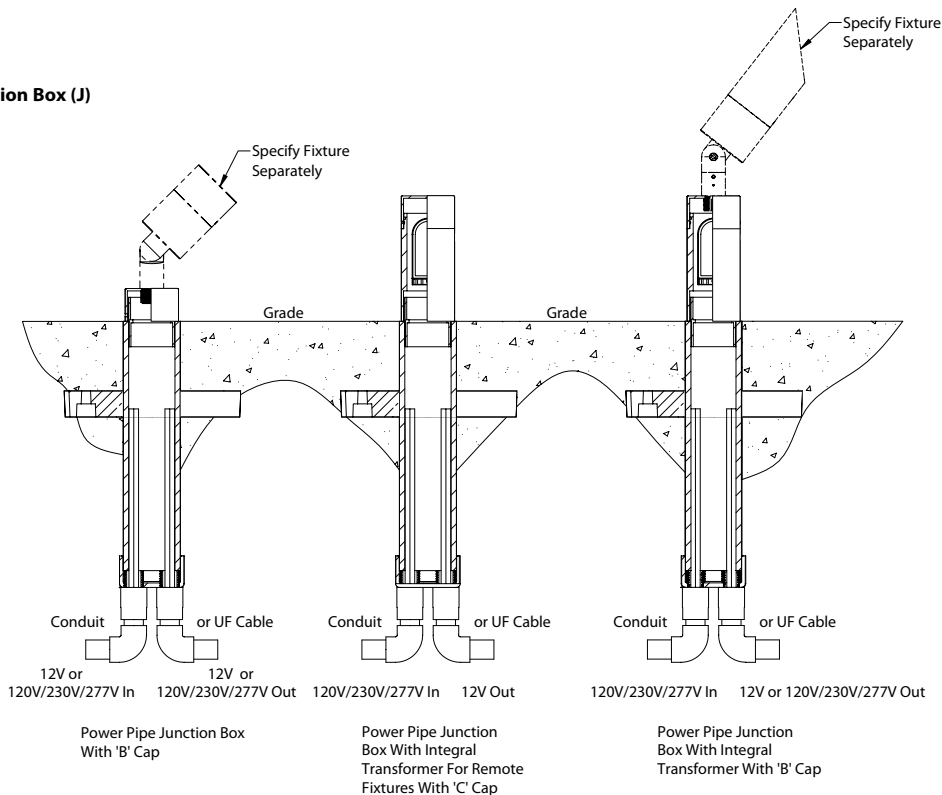
Stake (S)



Adjustable Stem (A18)



Junction Box (J)

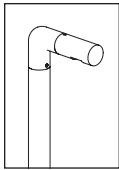


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the power of

LITESTICK® STYLE L

PROJECT:

TYPE:

CATALOG
NUMBER:

SOURCE:

NOTES:

CATALOG NUMBER LOGIC

Example: LT-L - 12 - LED - e70 - VER - PP - TRe20

Series LT-L - Litestick® Pathlight with a 90° Radius

Stem Length 12 - 3", 6", 12", 18", or 24" (Specify in inches)

Source LED - 'e' Technology with Integral Driver
Designed for use with remote 12VAC BKSSL® transformers.

LED Type e70 - 3WLED/2.7K e72 - 3WLED/4K
e71 - 3WLED/3K e73 - 3WLED/Amber

Finish VER - Premium Finish

Aluminum Finishes

| Powder Coat Color | Satin | Wrinkle |
|-------------------|-------|---------|
| Bronze | BZP | BZW |
| Black | BLP | BLW |
| White (Gloss) | WHP | WHW |
| Aluminum | SAP | — |
| Verde | — | VER |

Premium Finish

| | | | | | |
|-----|---------------------------|-----|--------------------------|---|--------------------------|
| ABP | Antique Brass Powder | CMG | Cascade Mountain Granite | RMG | Rocky Mountain Granite |
| AMG | Aleutian Mountain Granite | CRI | Cracked Ice | SDS | Sonoran Desert Sandstone |
| AQW | Antique White | CRM | Cream | SMG | Sierra Mountain Granite |
| BCM | Black Chrome | HUG | Hunter Green | TXF | Textured Forest |
| BGE | Beige | MDS | Mojave Desert Sandstone | WCP | Weathered Copper |
| BPP | Brown Patina Powder | NBP | Natural Brass Powder | WIR | Weathered Iron |
| CAP | Clear Anodized Powder | OCP | Old Copper | Also available in RAL Finishes See submittal SUB-1439-00 | |

Mounting A18 - 18" Power Pipe™ with 18" Adjustable Stem. Allows for variable mounting height
(for use with remote BKSSL® transformer. Must be specified with 18" stem)

PP18B - 18" Power Pipe™ stake with 'B' Cap (for use with remote BKSSL® transformer)

PP-TRe20 - Power Pipe™ "T" option with 18" stake and TRe20 Electronic Transformer**
(105-300 VAC, 50/60 Hz, Non-Dimming)
**For use with up to 24" maximum stem length

Options SF - Stability Flange (for use with Power Pipe™)

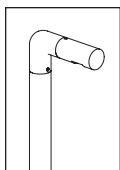
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DRAWING NUMBER
SUB001102

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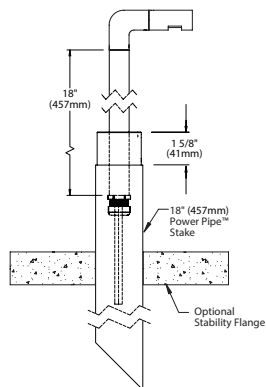
the power of 

LITESTICK® STYLE L

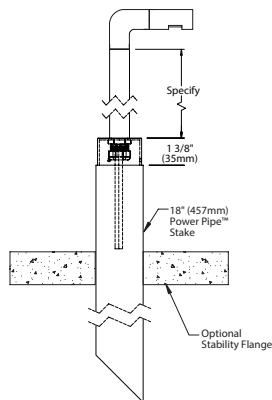
PROJECT:

TYPE:

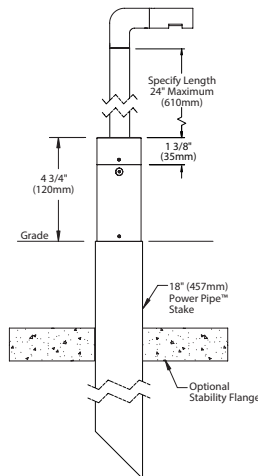
A18 (Mounting Option)



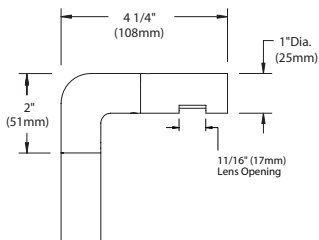
POWER PIPE™ (Mounting Option)



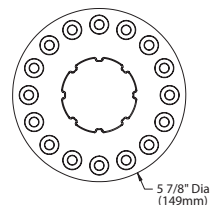
POWER PIPE 'T' (Mounting Option)



DETAIL VIEW

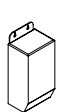


STABILITY FLANGE (optional)



Accessories (Configure separately)

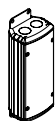
Remote Transformers:



TR Series



Power Pipe™



UPMRM™

All dimensions indicated on this submittal are nominal.
Contact Technical Sales if you require more stringent specifications.

SPECIFICATIONS

GreenSource Initiative™

Metal and packaging components are made from recycled materials. Manufactured using renewable solar energy, produced on site. Returnable to manufacturer at end of life to ensure cradle-to-cradle handling. Packaging contains no chlorofluorocarbons (CFC's). Use of this product may qualify for GreenSource efficacy and recycling rebate(s). Consult www.bklighting.com/greensource for program requirements.

Style

'L' Style provides clean, 90° transition from fixture to stem.

Materials

Furnished in Copper-Free Aluminum (Type 6061-T6).

Body

Fully machined from solid billet. Unibody design provides enclosed, water-proof wiring and integral heat sink for maximum component life. High temperature, silicone 'O' Ring provides water-tight seal. Weather-tight cable connector with 5', 2 wire low voltage cable.

Cap

Fully machined from solid billet with 11/16" lens opening. 360° rotation for precise optic positioning. Tamper resistant, stainless steel set screw.

Stem

Fully machined, 1" dia. with internal threads for maximum visual appeal. Available in configurable lengths to 24" maximum overall.

Lens

Shock resistant, tempered, frosted glass lens is factory adhered to fixture cap and provides hermetically sealed optical compartment.

BKSSL®

Integrated solid state system with 'e' technology is scalable for field upgrade. Modular design with electrical quick disconnects permit field maintenance. High power, forward throw source complies with ANSI C78.377 binning requirements. Exceeds ENERGY STAR® lumen maintenance requirements. LM-80 certified components. Side emitting optical grade lens delivers high efficiency, radial light distribution.

Integral non-dimming driver. Minimum 50,000 hour rated life at 70% of initial lumens (L70). BKSSL® technology provides long life, significant energy reduction and exceptional thermal management.

Installation

Available for installation in three distinct mounting conditions:

Power Pipe™

Provides a clean transition from wiring system to fixture. Schedule 80, 18" PVC housing for direct burial into soil or concrete. Machined 2-1/4" dia. cap for fixture mounting. Stainless steel hardware. Optional 6" diameter, molded stability flange, which simplifies installation and projects into substrate to reinforce housing stability. For use with 12VAC BKSSL® remote transformer.

Power Pipe™ with Adjustable Mount

Features 18" Power Pipe™ and 18" stem which passes through a machined Delrin® bushing within the Power Pipe™ Cap. (3) stainless steel set screws secure fixture position (Not available with integral transformer).

Power Pipe™ with Transformer Housing (Optional)

Additionally features integral transformer housing fully machined from copper-free aluminum. High temperature, silicone 'O' Ring provides water-tight seal. Integral, TRe20 electronic transformer. 105-300VAC primary voltage. 50/60Hz. Non Dimming. 20VA maximum load.

Remote Transformer

For use with 12VAC BKSSL® remote transformer or magnetic transformers only. B-K Lighting cannot guarantee performance with third party manufacturers' transformers.

Wiring

PVC coated, 18AWG, 150V, 60°C rated and certified to UL 1838 standard.

Hardware

Tamper-resistant, stainless steel hardware.

Finish

StarGuard®, our exclusive RoHs compliant, 15 stage chromate-free process cleans and conversion coats aluminum components prior to application of Class 'A' TGIC polyester powder coating. Brass components are available in powder coat or handcrafted metal finish. Stainless steel components are available in handcrafted metal finish. (Brushed finish for interior use only).

Warranty

5 year limited warranty.

Certification and Listing

ITL tested to IESNA LM-79. UL Listed. Certified to CAN/CSA/ANSI Standards. RoHs compliant. Suitable for indoor or outdoor use. Suitable for use in wet locations. IP66 Rated. Made in USA.



*Energy Star is a registered trademark of the United States Environmental Protection Agency.

B-K LIGHTING

40429 Brickyard Drive • Madera, CA 93638 • USA
559.438.5800 • FAX 559.438.5900
www.bklighting.com • info@bklighting.com

RELEASED
05-17-17

DRAWING NUMBER
SUB001102



the power of 

BKSSL
SOLID STATE LIGHTING

LAMP & DRIVER DATA

e70, e71, e72, e73

| DRIVER DATA | Input Volts | InRush Current | Operating Current | Operation Ambient Temperature |
|-------------|------------------|---------------------|-------------------|-------------------------------|
| | 12VAC/DC 50/60Hz | <250mA (non-dimmed) | 500mA | -22°F-194°F (-30°C - 90°C) |

| LM79 DATA | | | | L70 DATA | | OPTICAL DATA | | |
|-----------|---------------|------------|--------------------|--|--|--------------|-----------------|------------------|
| BK No. | CCT (Typ.) | CRI (Typ.) | Input Watts (Typ.) | Minimum Rated Life (hrs.) 70% of initial lumens (L70) | | Beam Type | Angle | Delivered Lumens |
| e70 | 2700K | 80 | 3 | 50,000 | | Radial | 360°h x 270°v | 31 |
| | | | | | | | w/ Glare Shield | 13 |
| e71 | 3000K | 80 | 3 | 50,000 | | Radial | 360°h x 270°v | 32 |
| | | | | | | | w/ Glare Shield | 13 |
| e72 | 4000K | 80 | 3 | 50,000 | | Radial | 360°h x 270°v | 36 |
| | | | | | | | w/ Glare Shield | 15 |
| e73 | Amber (590nm) | ~ | 3 | 50,000 | | Radial | 360°h x 270°v | ~ |

FOR USE WITH

LT Litestick®

B-K LIGHTING

40429 Brickyard Drive • Madera, CA 93636 • USA
559.438.5800 • FAX 559.438.5900
www.bklighting.com • info@bklighting.com

RELEASED
06-01-2018

DRAWING NUMBER
SUB-2582-03

FEATURES & SPECIFICATIONS

INTENDED USE — Architectural deep-cast luminaire provides general illumination for rough service (vandal resistant) applications. Ideal for interior or exterior applications where safety and security are a concern. Designed to complement building architecture and to endure extreme environmental conditions and physical abuse. Amber LEDs available for applications requiring turtle-safe lighting. Certain airborne contaminants can diminish integrity of acrylic. [Click here for Acrylic Environmental Compatibility table for suitable uses.](#)

CONSTRUCTION — *Bezel* - One-piece, die-cast aluminum, low copper alloy (<1% copper). Encloses lens and secures to housing with stainless steel Torx® T-10 set screws (two included) or optional stainless steel tamper-resistant screws (see options).

Housing - One-piece, die-cast aluminum, low copper alloy (<1% copper), with post-painted polyester powder coat finish. Four hole mounting detail for use directly over outlet box, or conduit entry through three 1/2" threaded openings on side or 3/4" threaded opening on rear surface. .012 gauge aluminum sheet metal internal bracket and board plate for thermal conduction and support.

Gasket - Polycarbonate: Perimeter lens gasket is one-piece silicone "O" ring, mechanically held in lens channel. Glass: Perimeter lens gasket is closed-cell silicone. Pad mounting gasket is closed-cell neoprene and seals housing to mounting surface. Gaskets help cushion impact shock.

Finish - Standard finish is textured polyester powder coat in white, black or bronze. Optional architectural colors available (see paint finishes).

OPTICS — *Polycarbonate lens* - Injection-molded lens is .125 inch thick. Designed to enrich the LED color and lumen output. Smooth exterior allows for easy cleaning, and interior pattern diffuses light for even surface illumination.

ELECTRICAL — Utilizes high-efficiency LEDs mounted to 1 metal core circuit board. 3500 Kelvin temperature. Driver: 2 electronic drivers wired in series allows total power to be reduced by half while maintaining even illumination across the board. 70% lumen maintenance at 50,000 hours. 100V through 277V, 50-60Hz operation. 6KV pulse rated. Initial surge protection standard.

INSTALLATION — Unit may be wall mounted.

LISTINGS — CSA Certified to UL and C-UL standards. NOM Certified (see Options). CSA listed for 40°C ambient and wet locations. IP65 rated.

WARRANTY — 5-year limited warranty. Complete warranty terms located at: www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx

For installed Rough Service Product(s), Acuity warrants that, for the lifetime of the product(s), the polycarbonate lens and/or polycarbonate housing will withstand breakage resulting from occasional physical abuse and rough handling (the "Rough Service Warranty"), notwithstanding the vandalism exclusion set forth at www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx

NOTE: Actual performance may differ as a result of end-user environment and application.

All values are design or typical values, measured under laboratory conditions at 25°C.

Specifications subject to change without notice.

| |
|----------------|
| Catalog Number |
| Notes |
| Type |

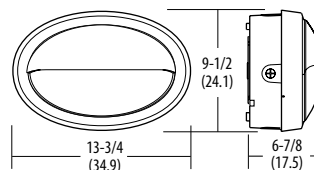

GATEWAY®

Architectural Rough Service Fixture

VG02C



LED
Oval Horizontal Eyelid
Deep Housing
Wall Mounted



All dimensions are inches (centimeters).

ORDERING INFORMATION

For shortest lead times, configure products using **bolded options**.

Example: VG02C 25LED MVOLT DBLB LPI

| Series | Lumen output ¹ /Color temperature ² | Lens | Voltage | Paint finishes ³ | Options | Lamp |
|--------------|---|--|------------------------------|--|---|---|
| VG02C | Lumen output¹ 25LED 25W | Color temperature² (blank) 3500K | (blank) Polycarbonate | 120 277 MVOLT | Standard textured finishes DWHG White DBLB Black DDBT Dark bronze DNAT Natural aluminum DSST Sandstone | Shipped installed in fixture DF Double fuse ^{4,5} SF Single fuse ⁵ DS Dual switching ⁶ MSI8 Wet location motion sensor ^{5,7} PE Photoelectric cell ^{5,8} TRS Tamper-resistant screws ⁹ NOM Meets Mexican standards |
| | | | | | | LPI Lamp included |

Accessories: Order as separate catalog number.

| | |
|------------|---|
| RK1 T10DRV | Torx T10 screwdriver, for use with Gateway set screws. |
| RK1 T20BIT | Hex-base driver bit, Torx TX20, for tamper-resistant screws with center reject pin. |
| RK1 T20DRV | Torx TX20 screwdriver for use with tamper-resistant screws with center reject pin. |

Notes

- Refer to table on back page.
- The CCT value provided is of lamp source and actual CCT will vary upon power levels.
- For additional colors, refer to Architectural Paint brochure.
- Must specify DS option.
- Must specify voltage. Not available with MVOLT.
- Not available with SF or PE options.
- Provided with lens for mounting up to 8'.
- Not available with DS option.
- T-20 screws with center reject pin.

VG02C Rough Service Ceiling/Wall-Mounted Fixture, LED

| System watts | Initial delivered lumens through polycarbonate lens* | Initial delivered lumens through glass lens* | mA | Ambient temperature °C |
|-----------------|---|---|-----|---------------------------|
| | 3500K | 3500K | | |
| 25 | 550 | 210 | 507 | 40 |

* 3500K is LED CCT

PHOTOMETRICS

See www.lithonia.com.

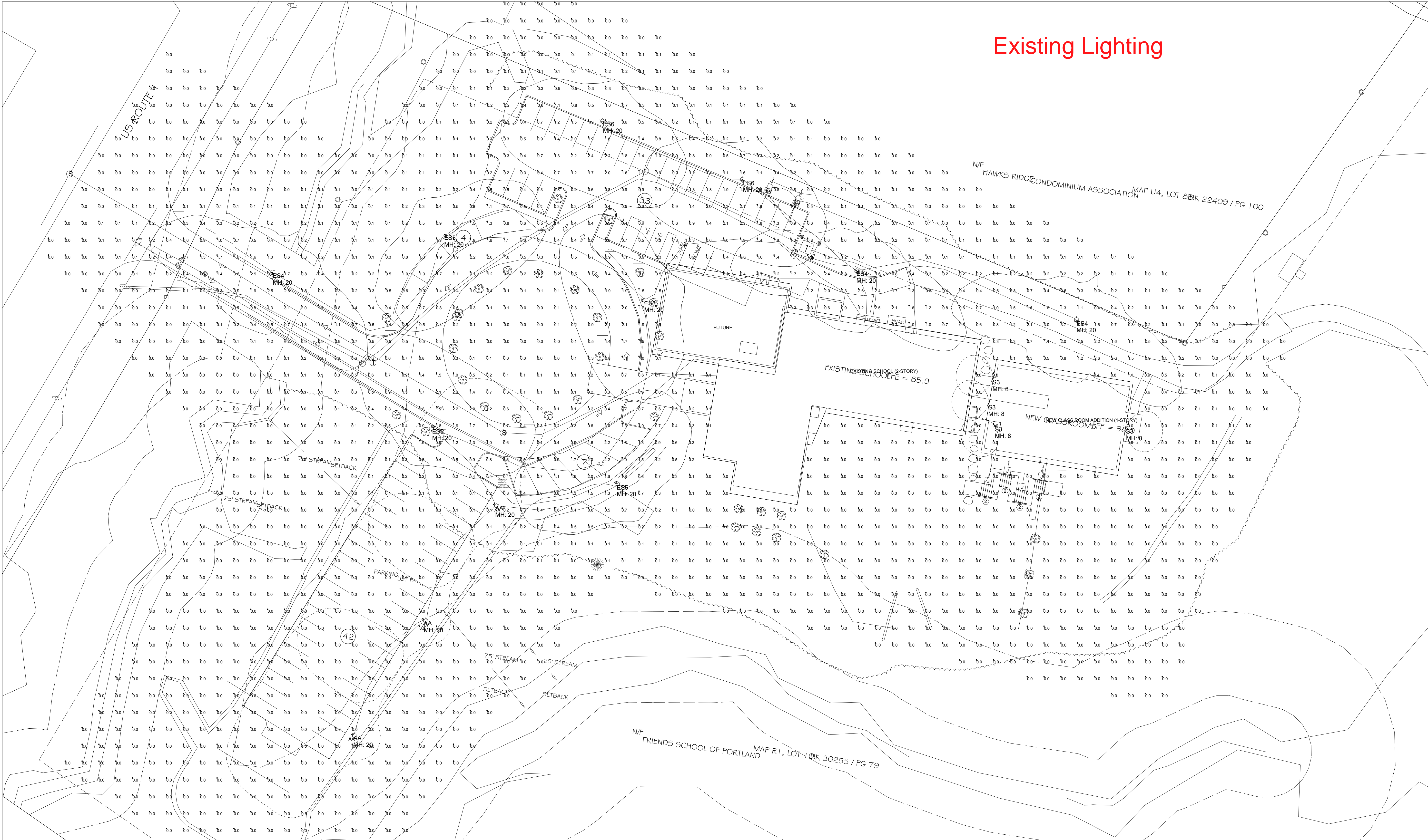
| Calculation Summary | | | | | |
|---------------------|------|-----|-----|---------|---------|
| Label | Avg | Max | Min | Avg/Min | Max/Min |
| SITE | 0.27 | 3.8 | 0.0 | N.A. | N.A. |
| PARKING | 0.04 | 1.0 | 0.0 | N.A. | N.A. |

| Luminaire Schedule (note fixture catalogue numbers are not complete) | | | | | | |
|--|--------|-----|-------------|-------|------------|--------------------|
| Type | Symbol | Qty | Lum. Lumens | LLF | Lum. Watts | Description |
| AA | ☐ | 3 | 8881 | 0.900 | 80.52 | VP-S-36L-80-4K7-4W |
| ES4 | ☐ | 3 | 8415 | 0.900 | 83.8 | VP-S-36NB-80-4K-T2 |
| ES5 | ☐ | 4 | 8331 | 0.800 | 82.8 | VP-S-36NB-80-4K-T3 |
| ES6 | ☐ | 2 | 8331 | 0.800 | 82.8 | VP-S-36NB-80-4K-T3 |
| S3 | ☐ | 4 | 1140 | 0.900 | 13.5 | AOV13-15W 4000K CP |

- NOTES:
- 1) EXACT MOUNTING DETAILS TO BE DETERMINED AT JOBSITE BY OTHERS.
 - 2) CALCULATIONS MAY or MAY NOT SHOW THE EFFECT OF SHADOWING CAUSED BY BUILDINGS AND OBJECTS WITHIN THE CALCULATED SPACE OR IN THE SITE AREA.
 - 3) READINGS SHOWN ARE INITIAL HORIZONTAL FOOTCANDLES ON A FLAT SITE WITHOUT REFLECTIONS OR OBSTRUCTIONS UNLESS OTHERWISE INDICATED.
 - 4) THIS CALCULATION IS BASED ON LIMITED INFORMATION SUPPLIED BY OTHERS TO SWANEY LIGHTING ASSOCIATES AND STANDARD ASSUMPTIONS OF THE SPACE AND/OR SITE.
 - 5) CONFORMANCE TO CODES AND OTHER LOCAL REQUIREMENTS AS DETERMINED BY THE AHJ ARE THE RESPONSIBILITY OF THE OWNER AND/OR THE OWNER'S REPRESENTATIVE.
 - 6) THIS LAYOUT DRAWING MUST BE COORDINATED WITH THE SITE LOCATION FOR CORRECT FIXTURE ORIENTATION.
 - 7) DOCUMENTS PRINTED OR PLOTTED FROM ELECTRONIC FILES MAY APPEAR AT OTHER THAN THE DESIRED OR ASSUMED GRAPHIC SCALES. IT IS THE RESPONSIBILITY OF THE RECIPIENT TO VERIFY THAT THE PRINTED OR PLOTTED-TO-SCALE DRAWING IS PRINTED TO SCALE.

THREE TYPE AA AND FOUR TYPE S3 TURNED OFF

Existing Lighting



PLAN VIEW

GENERATED FOR:
SWIFTCURRENT

SCALE NOT TO SCALE
SITE 4-25-19 AGI

Page 1 of 1


DATE: 4/25/2019

GENERATED BY: SWANEY LIGHTING, SCARBOROUGH ME - 207-883-7100 - swaneylighting.com

PROJECT: FRIENDS SCHOOL

TYPE: LIGHTING LAYOUT

NOTICE: THIS DRAWING IS THE EXCLUSIVE PROPERTY OF SWANEY LIGHTING ASSOCIATES. INFORMATION CONCERNING THE OPERATION OF UNITS INDICATED, THIS DRAWING IS TO BE CONFIDENTIAL. THIS DRAWING IS TO BE USED FOR NO PURPOSE OTHER THAN AS DETAILED AS EXPRESSLY AUTHORIZED BY SWANEY LIGHTING ASSOCIATES. ANY VARIATION IN PERFORMANCE SHOWN IN THIS FILE IS NOT THE RESPONSIBILITY OF THE MANUFACTURER. ITS USE FOR ANY OTHER PURPOSE IS NOT AUTHORIZED BY SWANEY LIGHTING ASSOCIATES.



SWANEY LIGHTING ASSOCIATES, INC.

Exhibit 6
Stormwater

**Classroom Addition and Parking Lot Expansion
Friends School of Portland
Cumberland, Maine
February 27, 2019
REVISED April 24, 2019**

**INSPECTION AND MAINTENANCE OF
STORMWATER MANAGEMENT FACILITIES PLAN**

Stormwater Management Facilities include swales, paved surfaces, manholes and catch basins, drain pipe, riprapped aprons, level spreaders, wooded buffers, underdrained soil filters, a detention pond, a wet pond and a subsurface sand filter. Periodic inspection and maintenance of these site features and devices is necessary to prevent erosion, protect roadways and other paved areas, and remove pollutants from stormwater runoff.

This Plan specifically addresses stormwater features included in the amendment to the Stormwater Permit L-26058-NJ-A-N obtained in January 2014. Refer to the original permit and application for inspection and maintenance of other stormwater features on the site. The Friends School of Portland is responsible for the inspections and maintenance of stormwater facilities associates with this project.

RECERTIFICATION REQUIREMENT:

Annually, the Owner shall certify to the Town of Cumberland by June 1st in accordance with Chapter 242-25.C, and within three months of the expiration of each five-year interval from the date of issuance of the permit, to the Maine Department of Environmental Protection (the Department), the following:

- 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 have been inspected for damage, wear, and malfunction, and appropriate steps have been taken to repair or replace the facilities.
- c) The erosion and stormwater maintenance plan for the site is being implemented as written, or modifications to the plan have been submitted to and approved by the department and the maintenance log is being maintained and kept on file with Town Engineers office.
- d) A copy of the certification along with any required mitigation shall be provided to the Town Engineer.

SWALES, DITCHES, CURBS AND PAVED AREAS:

Swales, ditches, curbs and paved areas are easily inspected during a site walk or even a ride-by. Since visual inspection is easy, their condition should be assessed during and/or after significant rainfall events such as thunder showers and periods of heavy or extended rainfall and during periods of significant snowmelt. Any damage or unusual condition such as sedimentation of a ditch, erosion, damaged curb or dying vegetation should be recorded, dated and initialed by the inspector when observed. Even if there is no damage, the inspector should make record of these inspections at least twice annually.

Appendix D:

Paved areas should be visually inspected monthly during the winter. The inspector should pay particular attention to the build up of sand around catch basin grates and remove accumulations that block the free flow of surface runoff to the catch basins. The date and initials of the inspector should be recorded on the forms provided as well as a notation of any cleanup effort that was made and the approximate volume of sand that was removed.

Open swales and ditches shall be inspected twice per year (in spring and fall) to assure that debris and/or sediments do not reduce the effectiveness of the system. Debris and sediments shall be removed at that time. Any sign of erosion or blockage shall be immediately repaired to assure a vigorous growth of vegetation for the stability of the ditches and slopes proper function. Maintenance shall include, but not be limited to, mowing, trimming and removal of vegetation in the ditches and slopes as required in order to prevent vegetation from blocking or diverting storm flows, replacement of riprap channel lining to prevent scour of the channel invert, removing vegetation and debris from the culverts.

Vegetated ditches should be mowed at least monthly during the growing season. Larger brush or trees must not be allowed to become established in the channel. Any areas where the vegetation fails will be subject to erosion and should be reseeded and mulched immediately.

CATCH BASINS, FIELD INLETS AND DRAIN MANHOLES:

Catch Basins and field inlets are precast concrete structures with sumps and cast iron grates used to collect stormwater and trap heavy sediments. Drain Manholes are similar structures constructed with a channel instead of a sump and a solid cast iron cover instead of a grate. Drain Manholes exist at changes in direction and/or size of storm drain pipe. Catch Basins, field inlets and drain manholes provide access to the closed storm drain system for inspection and maintenance.

Throughout the winter / spring sanding period, inspect catch basins and field inlets monthly and after every significant rainfall event or period of heavy snowmelt. Clean catch basin and field inlet sumps when sediment level is within 12 inches of the outlet pipe invert. At a minimum, remove floating debris and hydrocarbons at the time of the inspection. The removed material must be disposed of in accordance with the Maine Solid Waste Disposal Rules. Confined space entry safety procedures shall be practiced should entry into these structures be required.

Record dates of inspections, observations and maintenance measures implemented (if any) on the forms provided and initial the entry.

DRAIN PIPES:

Drain pipes are road culverts and pipes connecting drain manholes. Inspect drain pipes when inspecting other stormwater maintenance facilities. At least annually make a visual inspection of the pipe. During the daylight you should be able to see light through most pipes as they have been laid to a straight line and grade. In some cases (e.g. pipe runs to a drain manhole, or is blocked) you will need a light to inspect pipes.

Remove any obstructions to flow; remove accumulated sediments and debris at the inlet, at the outlet,

Appendix D:

and within the conduit; and to repair any erosion damage at the pipe inlet and outlet. Sediment should be removed when its level exceeds 20% of the pipe diameter. This may be accomplished by hydraulic flushing or any mechanical means; however, care should be taken to contain the sediment at the pipe outlet, and not flush the sediments into the stormwater filter or wetland areas.

Riprap aprons where stone is displaced should be replaced and chinked to assure stability. With time, additional riprap may be added. Vegetation growing through riprap should be removed on an annual basis.

Record inspections on the forms provided noting condition of pipe and any maintenance procedures implemented.

UNDERDRAINED SOIL FILTERS:

An underdrained soil filter is a landscaped depression with an underdrained soil bed or soil filter that exfiltrates the stormwater. The depression is designed to temporarily store runoff, which will drain through the soil filter into the underdrains; excess runoff will flow into structures or over earthen spillways.

There are three (3) Underdrained Soil Filters on the site. Two (2) were constructed as part of the original development of the school, Soil Filters #1 and #2. Details for the new Soil Filter #3 can be found on Detail 1 Sheet C3.2.

Soil Filter Inspection: The soil filter should be inspected after every major storm in the first few months to ensure proper function. Thereafter, the filter should be inspected at least once every six months to ensure that it is draining within 48 hours; and that, after storms that fill the system to overflow, it drains in no less than 24 hours. If the filter drains too rapidly, (i.e. prior to 24 hours), then the gate valve provided on the discharge pipe should be adjusted such that the filter completely drains within 24 to 72 hours.

Underdrain System: The soil filter outlet consists of a layer of planting loam and sand with a stone and perforated pipe underdrain. Outlet inspections shall include flushing of the underdrain through the cleanouts at the end of the pipes. Trash, sediment, and debris shall be removed from the vicinity of the outlet and must be disposed of in accordance with the Maine Solid Waste Disposal Rules.

Soil Filter Replacement: If the filter fails to drain within 72 hours, the surface of the pond shall be rototilled to promote aeration of the filter media and vegetation shall be re-established. If aeration of the surface soil fails to promote filtration of impounded water within 72 hours, then the filter media shall be replaced as necessary. The stone underdrain shall also be replaced at this time, along with the perforated pipe.

Sediment Removal: Sediment and plant debris should be removed from the pretreatment structure at least annually.

Mowing: Filters with grass cover should be mowed no more than 2 times per growing season to maintain grass heights less than 12 inches.

Appendix D:

Fertilization: Fertilization of the underdrained filter area should be avoided unless absolutely necessary to establish vegetation.

Harvesting and Weeding: Harvesting and pruning of excessive growth will need to be done occasionally. Weeding to control unwanted or invasive plants may also be necessary. Add new mulch as necessary for bioretention cells.

Underdrained soil filters shall not be used for snow storage area. Vehicular equipment used to maintain or rehabilitate underdrained soil filters should work from the basin perimeter and not enter the basin area, as this will compact the soil surface and reduce the design infiltration rate. Record all maintenance on forms provided.

SUBSURFACE SAND FILTER AND DETENTION:

A subsurface sand filter is an underground treatment system comprised of chamber systems, storm drain diversion structures, and distribution piping. Similar to an underdrained soil filter, stormwater exfiltrates through the bottom of the structure through a sand filter, and is collected by an underdrain system.

There is one (1) subsurface sand filter located on site, located under the north parking lot, and was permitted and constructed as part of the original Stormwater Permit. Details and inspection and maintenance procedures for the sand filter can be found in the original design plans.

SEDIMENT DISPOSAL:

Any sediment or debris removed during maintenance of the stormwater system must be disposed of in accordance with the Maine Solid Waste Disposal Rules.

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. For oil spills, call 1-800-482-0777 which is available 24 hours a day. For spills of toxic or hazardous material, call 1-800-452-4664 which is available 24 hours a day. For more information, visit the department's website at: <http://www.maine.gov/dep/spills/emergspillresp/>

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

Appendix D:

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.

Note: Lack of appropriate pollutant removal best management practices (BMPs) may result in violations of the groundwater quality standard established by 38 M.R.S.A. §465-c(1).

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.

Note: Dewatering a stream without a permit from the department may violate state water quality standards and the natural resources protection act.

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.

Note: To prevent these materials from becoming a source of pollutants, construction and post-construction activities related to a project may be required to comply with applicable provision of rules related to solid, universal, and hazardous waste, including, but not limited to, the Maine solid waste and hazardous waste management rules; Maine hazardous waste management rules; Maine oil conveyance and storage rules; and Maine pesticide requirements

5. **Excavation Dewatering:** Excavation dewatering 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.

Note: Dewatering controls are discussed in the "Maine Erosion and Sediment Control BMPs, Maine Department of Environmental Protection."

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:

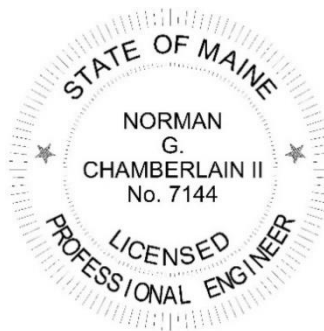
Appendix D:

- Discharges from firefighting activity;
 - Fire hydrant flushings;
 - Vehicle washwater if detergents are not used and washing is limited to the exterior of vehicles (engine, undercarriage, and transmission washing is prohibited);
 - Dust control runoff in accordance with permit conditions and appendix (c)(3);
 - Routine external building washdown, not including surface paint removal, that does not involve detergents;
 - 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;
 - Uncontaminated air conditioning or compressor condensate;
 - Uncontaminated groundwater or spring water;
 - Foundation or footer drain-water where flows are not contaminated;
 - Uncontaminated excavation dewatering (see requirements in appendix c(5));
 - Potable water sources including waterline flushings; and
 - Landscape irrigation
7. Unauthorized Non-Stormwater Discharges: The Department's approval under this chapter does not authorize a discharge that is mixed with a source of non-stormwater, other than those discharges in compliance with appendix c (6). Specifically, the Department's approval does not authorize discharges of the following:
- wastewater from the washout or cleanout of concrete, stucco, paint, form release oils, curing compounds or other construction materials;
 - fuels, oils or other pollutants used in vehicle and equipment operation and maintenance;
 - soaps, solvents, or detergents used in vehicle and equipment washing; and
 - toxic or hazardous substances from a spill or other release.
8. Additional Requirements: Additional requirements may be applied on a site-specific basis.

Submitted by:



Norman G. Chamberlain II, PE
Walsh Engineering Associates, Inc



Appendix D:

[illegible]

Appendix D:

[illegible]

Appendix D:

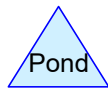
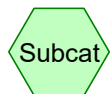
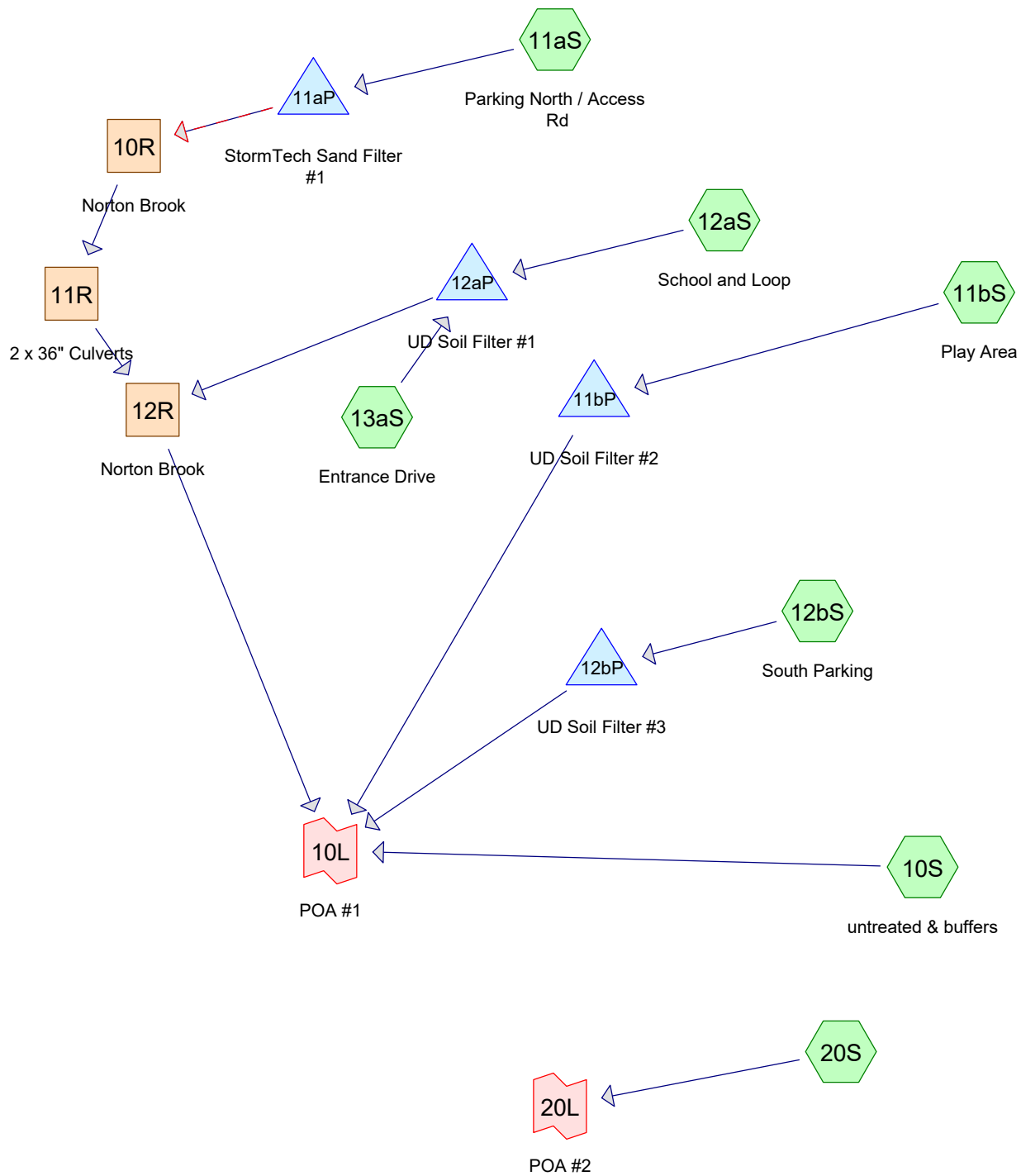
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Appendix D:

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Appendix D:

| STORMWATER MANAGEMENT SYSTEM MAINTENANCE PROGRAM SUMMARY CHECKLIST | | | | | |
|---|--|---|--------------------------|-------------------------------------|----------------------------|
| Item | Commentary | Frequency | | | |
| | | Month | Semi-Annual | Annual | Long-Term |
| All Pond and Filter side slopes | Inspect slopes for sloughing, erosion or undesirable tree growth. Mow slopes to control vegetation, repair any structure flaws identified | X Mow Summer | | X | |
| All Pond and Filter Sediment Removal | Remove sediment when it occupies 15% of volume. | | | | X 5 Years |
| Open Swale, Ditches & Inlet Structures | Inspect for debris accumulation, erosion and excessive vegetation. Mow monthly, remove debris, repair and revegetate any area of erosion | X Mow | | X | |
| Pavement | Review for damage and buildup of debris and sand. | X | X Sweep | | |
| Catchbasin and Drain Manholes | Inspect grates to assure optimum water flows into the structures. Inspect sumps for blockage and sediment accumulation. Clean out sumps . | X Inspect | | X Sediment removal | |
| Pipes | Inspect for sediment build-up in pipe. Flush and remove as required. | | | X | |
| Underdrain Soil Filter | Mow twice per year. Inspect for erosion. | | X | | |



Routing Diagram for 459 - Post Calcs
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459 - Post Calcs

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

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

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

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

Subcatchment 10S: untreated & buffers Runoff Area=910,886 sf 4.41% Impervious Runoff Depth=0.34"
Flow Length=2,520' Tc=67.9 min CN=59 Runoff=1.81 cfs 0.589 af

Subcatchment 11aS: Parking North / Runoff Area=32,975 sf 59.13% Impervious Runoff Depth=1.53"
Flow Length=434' Tc=5.0 min CN=83 Runoff=1.40 cfs 0.096 af

Subcatchment 11bS: Play Area Runoff Area=26,759 sf 0.00% Impervious Runoff Depth=0.37"
Flow Length=191' Tc=26.3 min CN=60 Runoff=0.10 cfs 0.019 af

Subcatchment 12aS: School and Loop Runoff Area=63,782 sf 42.09% Impervious Runoff Depth=1.14"
Flow Length=399' Tc=12.4 min CN=77 Runoff=1.53 cfs 0.139 af

Subcatchment 12bS: South Parking Runoff Area=31,595 sf 45.85% Impervious Runoff Depth=1.14"
Flow Length=290' Tc=22.0 min CN=77 Runoff=0.61 cfs 0.069 af

Subcatchment 13aS: Entrance Drive Runoff Area=4,000 sf 100.00% Impervious Runoff Depth=2.87"
Tc=5.0 min CN=98 Runoff=0.29 cfs 0.022 af

Subcatchment 20S: Runoff Area=630,202 sf 9.00% Impervious Runoff Depth=0.51"
Flow Length=1,530' Tc=56.6 min CN=64 Runoff=2.65 cfs 0.619 af

Reach 10R: Norton Brook Avg. Flow Depth=0.04' Max Vel=0.71 fps Inflow=0.11 cfs 0.076 af
n=0.030 L=120.0' S=0.0167 ' / ' Capacity=94.82 cfs Outflow=0.11 cfs 0.076 af

Reach 11R: 2 x 36" Culverts Avg. Flow Depth=0.06' Max Vel=1.79 fps Inflow=0.11 cfs 0.076 af
36.0" Round Pipe x 2.00 n=0.011 L=75.0' S=0.0133 ' / ' Capacity=182.04 cfs Outflow=0.11 cfs 0.076 af

Reach 12R: Norton Brook Avg. Flow Depth=0.10' Max Vel=1.31 fps Inflow=0.31 cfs 0.145 af
n=0.025 L=370.0' S=0.0121 ' / ' Capacity=488.91 cfs Outflow=0.31 cfs 0.145 af

Pond 11aP: StormTech Sand Filter #1 Peak Elev=79.13' Storage=2,322 cf Inflow=1.40 cfs 0.096 af
Primary=0.05 cfs 0.007 af Secondary=0.06 cfs 0.070 af Outflow=0.11 cfs 0.076 af

Pond 11bP: UD Soil Filter #2 Peak Elev=95.06' Storage=232 cf Inflow=0.10 cfs 0.019 af
Discarded=0.03 cfs 0.015 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.015 af

Pond 12aP: UD Soil Filter #1 Peak Elev=79.79' Storage=4,113 cf Inflow=1.69 cfs 0.161 af
Outflow=0.20 cfs 0.069 af

Pond 12bP: UD Soil Filter #3 Peak Elev=74.53' Storage=1,302 cf Inflow=0.61 cfs 0.069 af
Outflow=0.16 cfs 0.065 af

Link 10L: POA #1 Inflow=2.05 cfs 0.799 af
Primary=2.05 cfs 0.799 af

Link 20L: POA #2 Inflow=2.65 cfs 0.619 af
Primary=2.65 cfs 0.619 af

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Total Runoff Area = 39.031 ac Runoff Volume = 1.553 af Average Runoff Depth = 0.48"
90.49% Pervious = 35.320 ac 9.51% Impervious = 3.712 ac

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Summary for Subcatchment 10S: untreated & buffers

Runoff = 1.81 cfs @ 13.20 hrs, Volume= 0.589 af, Depth= 0.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.10"

| | Area (sf) | CN | Description |
|---|-----------|----|--|
| * | 334,580 | 65 | 2 acre lots, 12% imp, HSG B (off-site) |
| * | 6,570 | 77 | Woods, Good, HSG D (wetland on-site) |
| * | 569,736 | 55 | Woods, Good, HSG B |
| | 910,886 | 59 | Weighted Average |
| | 870,736 | | 95.59% Pervious Area |
| | 40,150 | | 4.41% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|---|
| 26.8 | 100 | 0.0500 | 0.06 | | Sheet Flow, A to B |
| | | | | | Woods: Dense underbrush n= 0.800 P2= 3.00" |
| 3.6 | 200 | 0.0350 | 0.94 | | Shallow Concentrated Flow, B to C |
| | | | | | Woodland Kv= 5.0 fps |
| 2.4 | 220 | 0.0950 | 1.54 | | Shallow Concentrated Flow, C to D |
| | | | | | Woodland Kv= 5.0 fps |
| 28.0 | 750 | 0.0080 | 0.45 | | Shallow Concentrated Flow, D to E |
| | | | | | Woodland Kv= 5.0 fps |
| 3.4 | 175 | 0.0300 | 0.87 | | Shallow Concentrated Flow, E to F |
| | | | | | Woodland Kv= 5.0 fps |
| 0.1 | 30 | 0.0100 | 4.82 | 3.05 | Pipe Channel, F to G |
| | | | | | 12.0" Round w/ 3.0" inside fill Area= 0.6 sf Perim= 3.0' r= 0.21' |
| | | | | | n= 0.011 Concrete pipe, straight & clean |
| 2.9 | 195 | 0.0487 | 1.10 | | Shallow Concentrated Flow, G to H |
| | | | | | Woodland Kv= 5.0 fps |
| 0.7 | 850 | 0.0350 | 20.99 | 671.80 | Parabolic Channel, H to I |
| | | | | | W=12.00' D=4.00' Area=32.0 sf Perim=14.9' |
| | | | | | n= 0.022 Earth, clean & straight |
| 67.9 | 2,520 | Total | | | |

Summary for Subcatchment 11aS: Parking North / Access Rd

Runoff = 1.40 cfs @ 12.08 hrs, Volume= 0.096 af, Depth= 1.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.10"

| | Area (sf) | CN | Description |
|---|-----------|----|-------------------------------|
| * | 19,499 | 98 | Impervious |
| | 13,476 | 61 | >75% Grass cover, Good, HSG B |
| | 32,975 | 83 | Weighted Average |
| | 13,476 | | 40.87% Pervious Area |
| | 19,499 | | 59.13% Impervious Area |

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| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|-------------|------------------|------------------|----------------------|-------------------|---|
| 1.2 | 9 | 0.2730 | 0.13 | | Sheet Flow, A to B Grass: Bermuda n= 0.410 P2= 3.00" |
| 0.8 | 49 | 0.0200 | 0.99 | | Shallow Concentrated Flow, B to C Short Grass Pasture Kv= 7.0 fps |
| 0.2 | 181 | 0.7600 | 17.70 | | Shallow Concentrated Flow, C to D Paved Kv= 20.3 fps |
| 1.0 | 195 | 0.0100 | 3.27 | 1.28 | Pipe Channel, D to E 12.0" Round w/ 6.0" inside fill Area= 0.4 sf Perim= 2.6' r= 0.15' n= 0.013 Corrugated PE, smooth interior |
| 1.8 | | | | | Direct Entry, |
| 5.0 | 434 | Total | | | |

Summary for Subcatchment 11bS: Play Area

Runoff = 0.10 cfs @ 12.54 hrs, Volume= 0.019 af, Depth= 0.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.10"

| Area (sf) | CN | Description |
|-----------|----|-------------------------------|
| 20,393 | 61 | >75% Grass cover, Good, HSG B |
| 6,366 | 55 | Woods, Good, HSG B |
| 26,759 | 60 | Weighted Average |
| 26,759 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|-------------|------------------|------------------|----------------------|-------------------|---|
| 20.0 | | | | | Direct Entry, Open Field |
| 2.8 | 30 | 0.3300 | 0.18 | | Sheet Flow, A to B Grass: Bermuda n= 0.410 P2= 3.00" |
| 3.5 | 161 | 0.0120 | 0.77 | | Shallow Concentrated Flow, B to C Short Grass Pasture Kv= 7.0 fps |
| 26.3 | 191 | Total | | | |

Summary for Subcatchment 12aS: School and Loop

Runoff = 1.53 cfs @ 12.18 hrs, Volume= 0.139 af, Depth= 1.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.10"

| Area (sf) | CN | Description |
|-----------|----|-------------------------------|
| * 26,848 | 98 | Impervious |
| 36,934 | 61 | >75% Grass cover, Good, HSG B |
| 63,782 | 77 | Weighted Average |
| 36,934 | | 57.91% Pervious Area |
| 26,848 | | 42.09% Impervious Area |

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| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|-------------|------------------|------------------|----------------------|-------------------|---|
| 7.9 | 55 | 0.0800 | 0.12 | | Sheet Flow, A to B Woods: Light underbrush n= 0.400 P2= 3.00" |
| 0.6 | 71 | 0.0850 | 2.04 | | Shallow Concentrated Flow, B to C Short Grass Pasture Kv= 7.0 fps |
| 0.2 | 38 | 0.2630 | 3.59 | | Shallow Concentrated Flow, C to D Short Grass Pasture Kv= 7.0 fps |
| 3.4 | 160 | 0.0125 | 0.78 | | Shallow Concentrated Flow, D to E Short Grass Pasture Kv= 7.0 fps |
| 0.3 | 75 | 0.0100 | 4.25 | 1.67 | Pipe Channel, E to F 12.0" Round w/ 6.0" inside fill Area= 0.4 sf Perim= 2.6' r= 0.15' n= 0.010 PVC, smooth interior |
| 12.4 | 399 | Total | | | |

Summary for Subcatchment 12bS: South Parking

Runoff = 0.61 cfs @ 12.32 hrs, Volume= 0.069 af, Depth= 1.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.10"

| Area (sf) | CN | Description |
|-----------|----|-------------------------------|
| * 14,485 | 98 | Impervious |
| 10,568 | 61 | >75% Grass cover, Good, HSG B |
| 6,542 | 55 | Woods, Good, HSG B |
| 31,595 | 77 | Weighted Average |
| 17,110 | | 54.15% Pervious Area |
| 14,485 | | 45.85% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|-------------|------------------|------------------|----------------------|-------------------|--|
| 20.7 | 130 | 0.0400 | 0.10 | | Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.00" |
| 1.3 | 160 | 0.0220 | 2.00 | 0.16 | Trap/Vee/Rect Channel Flow, Bot.W=0.00' D=0.20' Z= 2.0 '/' Top.W=0.80' n= 0.022 Earth, clean & straight |
| 22.0 | 290 | Total | | | |

Summary for Subcatchment 13aS: Entrance Drive

Runoff = 0.29 cfs @ 12.07 hrs, Volume= 0.022 af, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.10"

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| | Area (sf) | CN | Description |
|---|-----------|----|-------------------------|
| * | 4,000 | 98 | Impervious |
| | 4,000 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|-------------|------------------|------------------|----------------------|-------------------|------------------------------|
| 5.0 | | | | | Direct Entry, Minimum |

Summary for Subcatchment 20S:

Runoff = 2.65 cfs @ 12.90 hrs, Volume= 0.619 af, Depth= 0.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.10"

| | Area (sf) | CN | Description |
|---|-----------|----|--|
| * | 425,200 | 65 | 2 acre lots, 12% imp, HSG B (off-site) |
| * | 47,244 | 82 | 2 acre lots, 12% imp, HSG D (off-site) |
| * | 9,606 | 77 | Woods, Good, HSG D (wetland on-site) |
| * | 140,402 | 55 | Woods, Good, HSG B (on-site) |
| | 7,750 | 61 | >75% Grass cover, Good, HSG B |
| | 630,202 | 64 | Weighted Average |
| | 573,509 | | 91.00% Pervious Area |
| | 56,693 | | 9.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|-------------|------------------|------------------|----------------------|-------------------|---|
| 32.3 | 80 | 0.0200 | 0.04 | | Sheet Flow, A to B Woods: Dense underbrush n= 0.800 P2= 3.00" |
| 0.7 | 90 | 0.1800 | 2.12 | | Shallow Concentrated Flow, B to C Woodland Kv= 5.0 fps |
| 23.6 | 1,360 | 0.0370 | 0.96 | | Shallow Concentrated Flow, C to D Woodland Kv= 5.0 fps |
| 56.6 | 1,530 | Total | | | |

Summary for Reach 10R: Norton BrookInflow Area = 0.757 ac, 59.13% Impervious, Inflow Depth = 1.21" for 2-Year event
Inflow = 0.11 cfs @ 13.41 hrs, Volume= 0.076 af
Outflow = 0.11 cfs @ 13.49 hrs, Volume= 0.076 af, Atten= 0%, Lag= 5.0 minRouting by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.71 fps, Min. Travel Time= 2.8 min
Avg. Velocity= 0.57 fps, Avg. Travel Time= 3.5 minPeak Storage= 19 cf @ 13.44 hrs
Average Depth at Peak Storage= 0.04'
Bank-Full Depth= 2.00' Flow Area= 12.7 sf, Capacity= 94.82 cfs

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Custom cross-section, Length= 120.0' Slope= 0.0167 '/'

Constant n= 0.030 Stream, clean & straight

Inlet Invert= 69.00', Outlet Invert= 67.00'



| Offset (feet) | Elevation (feet) | Chan.Depth (feet) |
|------------------|---------------------|----------------------|
| -4.20 | 70.00 | 0.00 |
| -3.00 | 69.00 | 1.00 |
| -2.00 | 68.00 | 2.00 |
| 2.40 | 68.00 | 2.00 |
| 3.30 | 69.00 | 1.00 |
| 4.20 | 70.00 | 0.00 |

| Depth (feet) | End Area (sq-ft) | Perim. (feet) | Storage (cubic-feet) | Discharge (cfs) |
|-----------------|---------------------|------------------|-------------------------|--------------------|
| 0.00 | 0.0 | 4.4 | 0 | 0.00 |
| 1.00 | 5.4 | 7.2 | 642 | 28.17 |
| 2.00 | 12.7 | 10.1 | 1,524 | 94.82 |

Summary for Reach 11R: 2 x 36" Culverts

Inflow Area = 0.757 ac, 59.13% Impervious, Inflow Depth = 1.21" for 2-Year event
Inflow = 0.11 cfs @ 13.49 hrs, Volume= 0.076 af
Outflow = 0.11 cfs @ 13.51 hrs, Volume= 0.076 af, Atten= 0%, Lag= 1.3 min

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

Max. Velocity= 1.79 fps, Min. Travel Time= 0.7 min

Avg. Velocity= 1.54 fps, Avg. Travel Time= 0.8 min

Peak Storage= 5 cf @ 13.50 hrs

Average Depth at Peak Storage= 0.06'

Bank-Full Depth= 3.00' Flow Area= 14.1 sf, Capacity= 182.04 cfs

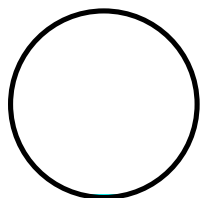
A factor of 2.00 has been applied to the storage and discharge capacity

36.0" Round Pipe

n= 0.011 Concrete pipe, straight & clean

Length= 75.0' Slope= 0.0133 '/'

Inlet Invert= 67.00', Outlet Invert= 66.00'



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Summary for Reach 12R: Norton Brook

Inflow Area = 2.313 ac, 49.97% Impervious, Inflow Depth = 0.75" for 2-Year event
Inflow = 0.31 cfs @ 13.52 hrs, Volume= 0.145 af
Outflow = 0.31 cfs @ 13.67 hrs, Volume= 0.145 af, Atten= 1%, Lag= 9.0 min

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

Max. Velocity= 1.31 fps, Min. Travel Time= 4.7 min

Avg. Velocity= 0.92 fps, Avg. Travel Time= 6.7 min

Peak Storage= 88 cf @ 13.59 hrs

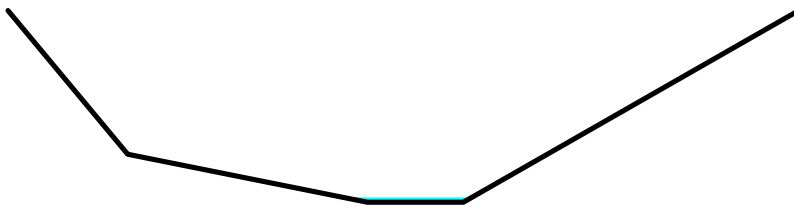
Average Depth at Peak Storage= 0.10'

Bank-Full Depth= 4.00' Flow Area= 43.3 sf, Capacity= 488.91 cfs

Custom cross-section, Length= 370.0' Slope= 0.0121 '/'

Constant n= 0.025 Earth, clean & winding

Inlet Invert= 66.00', Outlet Invert= 61.51'



| Offset (feet) | Elevation (feet) | Chan.Depth (feet) |
|------------------|---------------------|----------------------|
| -8.50 | 70.00 | 0.00 |
| -6.00 | 67.00 | 3.00 |
| -1.00 | 66.00 | 4.00 |
| 1.00 | 66.00 | 4.00 |
| 8.00 | 70.00 | 0.00 |

| Depth (feet) | End Area (sq-ft) | Perim. (feet) | Storage (cubic-feet) | Discharge (cfs) |
|-----------------|---------------------|------------------|-------------------------|--------------------|
| 0.00 | 0.0 | 2.0 | 0 | 0.00 |
| 1.00 | 5.4 | 9.1 | 1,989 | 24.75 |
| 4.00 | 43.3 | 19.1 | 16,003 | 488.91 |

Summary for Pond 11aP: StormTech Sand Filter #1

Inflow Area = 0.757 ac, 59.13% Impervious, Inflow Depth = 1.53" for 2-Year event
Inflow = 1.40 cfs @ 12.08 hrs, Volume= 0.096 af
Outflow = 0.11 cfs @ 13.41 hrs, Volume= 0.076 af, Atten= 92%, Lag= 79.9 min
Primary = 0.05 cfs @ 13.41 hrs, Volume= 0.007 af
Secondary = 0.06 cfs @ 13.41 hrs, Volume= 0.070 af

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

Peak Elev= 79.13' @ 13.41 hrs Surf.Area= 2,772 sf Storage= 2,322 cf

Flood Elev= 82.00' Surf.Area= 2,772 sf Storage= 2,516 cf

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Plug-Flow detention time= 364.7 min calculated for 0.076 af (79% of inflow)

Center-of-Mass det. time= 284.1 min (1,117.7 - 833.5)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|--------|---------------|--|
| #1 | 75.68' | 900 cf | Custom Stage Data (Prismatic) Listed below (Recalc) 2,250 cf Overall x 40.0% Voids |
| #2A | 77.18' | 901 cf | 28.17'W x 45.16'L x 2.33'H Field A 2,968 cf Overall - 715 cf Embedded = 2,253 cf x 40.0% Voids |
| #3A | 77.68' | 715 cf | ADS_StormTech SC-310 x 48 Inside #2 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap Row Length Adjustment= +0.44' x 2.07 sf x 8 rows |
| | | 2,516 cf | Total Available Storage |

Storage Group A created with Chamber Wizard

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---------------------|----------------------|---------------------------|---------------------------|
| 75.68 | 1,500 | 0 | 0 |
| 77.18 | 1,500 | 2,250 | 2,250 |

| Device | Routing | Invert | Outlet Devices |
|--------|-----------|--------|--|
| #1 | Primary | 79.01' | 12.0" Round 12" Outfall to Level Spreader L= 40.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 79.01' / 74.58' S= 0.1108 ' / Cc= 0.900 n= 0.013, Flow Area= 0.79 sf |
| #2 | Secondary | 75.68' | 2.000 in/hr Underdrain over Surface area above 75.68' Conductivity to Groundwater Elevation = -2.00' Excluded Surface area = 1,500 sf |

Primary OutFlow Max=0.05 cfs @ 13.41 hrs HW=79.13' (Free Discharge)↑**1=12" Outfall to Level Spreader** (Inlet Controls 0.05 cfs @ 0.94 fps)**Secondary OutFlow** Max=0.06 cfs @ 13.41 hrs HW=79.13' (Free Discharge)↑**2=Underdrain** (Controls 0.06 cfs)**Summary for Pond 11bP: UD Soil Filter #2**

| | | | |
|---------------|------------|-------------------|---|
| Inflow Area = | 0.614 ac, | 0.00% Impervious, | Inflow Depth = 0.37" for 2-Year event |
| Inflow = | 0.10 cfs @ | 12.54 hrs, | Volume= 0.019 af |
| Outflow = | 0.03 cfs @ | 13.96 hrs, | Volume= 0.015 af, Atten= 69%, Lag= 85.1 min |
| Discarded = | 0.03 cfs @ | 13.96 hrs, | Volume= 0.015 af |
| Primary = | 0.00 cfs @ | 0.00 hrs, | Volume= 0.000 af |

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

Peak Elev= 95.06' @ 13.96 hrs Surf.Area= 1,304 sf Storage= 232 cf

Plug-Flow detention time= 161.1 min calculated for 0.015 af (77% of inflow)

Center-of-Mass det. time= 66.5 min (1,010.3 - 943.7)

459 - Post Calcs

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

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| Volume | Invert | Avail.Storage | Storage Description |
|--------|--------|---------------|--|
| #1 | 93.50' | 195 cf | Media Storage (Prismatic) Listed below (Recalc) 975 cf Overall x 20.0% Voids |
| #2 | 95.00' | 1,498 cf | Ponding Storage (Prismatic) Listed below (Recalc) |
| | | 1,693 cf | Total Available Storage |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---------------------|----------------------|---------------------------|---------------------------|
| 93.50 | 650 | 0 | 0 |
| 95.00 | 650 | 975 | 975 |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---------------------|----------------------|---------------------------|---------------------------|
| 95.00 | 650 | 0 | 0 |
| 96.50 | 760 | 1,058 | 1,058 |
| 97.00 | 1,000 | 440 | 1,498 |

| Device | Routing | Invert | Outlet Devices |
|--------|-----------|--------|--|
| #1 | Discarded | 93.50' | 2.000 in/hr Underdrain over Surface area above 93.50' Conductivity to Groundwater Elevation = -2.00' Excluded Surface area = 650 sf |
| #2 | Primary | 96.50' | 8.0' long x 4.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32 |

Discarded OutFlow Max=0.03 cfs @ 13.96 hrs HW=95.06' (Free Discharge)

↑1=Underdrain (Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=93.50' (Free Discharge)

↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 12aP: UD Soil Filter #1

Inflow Area = 1.556 ac, 45.51% Impervious, Inflow Depth = 1.24" for 2-Year event
 Inflow = 1.69 cfs @ 12.17 hrs, Volume= 0.161 af
 Outflow = 0.20 cfs @ 13.52 hrs, Volume= 0.069 af, Atten= 88%, Lag= 81.0 min
 Primary = 0.20 cfs @ 13.52 hrs, Volume= 0.069 af

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 79.79' @ 13.52 hrs Surf.Area= 2,970 sf Storage= 4,113 cf

Plug-Flow detention time= 306.9 min calculated for 0.069 af (43% of inflow)
 Center-of-Mass det. time= 173.0 min (1,019.0 - 846.0)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|--------|---------------|--|
| #1 | 78.25' | 15,379 cf | Ponding (Prismatic) Listed below (Recalc) |

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| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---------------------|----------------------|---------------------------|---------------------------|
| 78.25 | 2,385 | 0 | 0 |
| 79.75 | 2,958 | 4,007 | 4,007 |
| 83.00 | 4,040 | 11,372 | 15,379 |

| Device | Routing | Invert | Outlet Devices |
|--------|----------|--------|---|
| #1 | Primary | 75.65' | 12.0" Round 12" Outfall to Level Spreader L= 90.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 75.65' / 74.75' S= 0.0100 ' S= 0.0100 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |
| #2 | Device 1 | 79.75' | 24.0" x 24.0" Horiz. CB 8 C= 0.600 Limited to weir flow at low heads |

Primary OutFlow Max=0.18 cfs @ 13.52 hrs HW=79.79' (Free Discharge)

1=12" Outfall to Level Spreader (Passes 0.18 cfs of 5.69 cfs potential flow)

2=CB 8 (Weir Controls 0.18 cfs @ 0.62 fps)

Summary for Pond 12bP: UD Soil Filter #3

Inflow Area = 0.725 ac, 45.85% Impervious, Inflow Depth = 1.14" for 2-Year event
 Inflow = 0.61 cfs @ 12.32 hrs, Volume= 0.069 af
 Outflow = 0.16 cfs @ 12.99 hrs, Volume= 0.065 af, Atten= 74%, Lag= 40.0 min
 Primary = 0.16 cfs @ 12.99 hrs, Volume= 0.065 af

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 74.53' @ 12.99 hrs Surf.Area= 1,568 sf Storage= 1,302 cf

Plug-Flow detention time= 415.3 min calculated for 0.065 af (94% of inflow)
 Center-of-Mass det. time= 385.3 min (1,254.3 - 869.0)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|--------|---------------|--|
| #1 | 73.50' | 2,118 cf | Custom Stage Data (Pyramidal) Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) | Wet.Area (sq-ft) |
|---------------------|----------------------|---------------------------|---------------------------|---------------------|
| 73.50 | 1,024 | 0 | 0 | 1,024 |
| 74.00 | 1,233 | 563 | 563 | 1,244 |
| 75.00 | 1,900 | 1,555 | 2,118 | 1,929 |

| Device | Routing | Invert | Outlet Devices |
|--------|----------|--------|---|
| #1 | Primary | 70.75' | 2.0" Vert. Orifice/Grate C= 0.600 |
| #2 | Device 1 | 73.50' | 0.750 in/hr Exfiltration over Surface area |
| #3 | Primary | 74.50' | 9.0' long (Profile 7) Broad-Crested Rectangular Weir Head (feet) 0.49 0.98 1.48 Coef. (English) 2.99 3.41 3.62 |

Primary OutFlow Max=0.16 cfs @ 12.99 hrs HW=74.53' (Free Discharge)

1=Orifice/Grate (Passes 0.03 cfs of 0.20 cfs potential flow)

2=Exfiltration (Exfiltration Controls 0.03 cfs)

3=Broad-Crested Rectangular Weir (Weir Controls 0.13 cfs @ 0.50 fps)

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Summary for Link 10L: POA #1

Inflow Area = 24.564 ac, 9.81% Impervious, Inflow Depth > 0.39" for 2-Year event
Inflow = 2.05 cfs @ 13.41 hrs, Volume= 0.799 af
Primary = 2.05 cfs @ 13.41 hrs, Volume= 0.799 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Summary for Link 20L: POA #2

Inflow Area = 14.467 ac, 9.00% Impervious, Inflow Depth = 0.51" for 2-Year event
Inflow = 2.65 cfs @ 12.90 hrs, Volume= 0.619 af
Primary = 2.65 cfs @ 12.90 hrs, Volume= 0.619 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

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

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

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

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

Subcatchment 10S: untreated & buffers Runoff Area=910,886 sf 4.41% Impervious Runoff Depth=1.01"
Flow Length=2,520' Tc=67.9 min CN=59 Runoff=7.62 cfs 1.768 af

Subcatchment 11aS: Parking North / Runoff Area=32,975 sf 59.13% Impervious Runoff Depth=2.81"
Flow Length=434' Tc=5.0 min CN=83 Runoff=2.58 cfs 0.178 af

Subcatchment 11bS: Play Area Runoff Area=26,759 sf 0.00% Impervious Runoff Depth=1.07"
Flow Length=191' Tc=26.3 min CN=60 Runoff=0.40 cfs 0.055 af

Subcatchment 12aS: School and Loop Runoff Area=63,782 sf 42.09% Impervious Runoff Depth=2.29"
Flow Length=399' Tc=12.4 min CN=77 Runoff=3.19 cfs 0.280 af

Subcatchment 12bS: South Parking Runoff Area=31,595 sf 45.85% Impervious Runoff Depth=2.29"
Flow Length=290' Tc=22.0 min CN=77 Runoff=1.26 cfs 0.139 af

Subcatchment 13aS: Entrance Drive Runoff Area=4,000 sf 100.00% Impervious Runoff Depth=4.36"
Tc=5.0 min CN=98 Runoff=0.43 cfs 0.033 af

Subcatchment 20S: Runoff Area=630,202 sf 9.00% Impervious Runoff Depth=1.33"
Flow Length=1,530' Tc=56.6 min CN=64 Runoff=8.39 cfs 1.600 af

Reach 10R: Norton Brook Avg. Flow Depth=0.22' Max Vel=2.18 fps Inflow=3.36 cfs 0.158 af
n=0.030 L=120.0' S=0.0167 '/' Capacity=94.82 cfs Outflow=2.16 cfs 0.158 af

Reach 11R: 2 x 36" Culverts Avg. Flow Depth=0.23' Max Vel=4.35 fps Inflow=2.16 cfs 0.158 af
36.0" Round Pipe x 2.00 n=0.011 L=75.0' S=0.0133 '/' Capacity=182.04 cfs Outflow=2.14 cfs 0.158 af

Reach 12R: Norton Brook Avg. Flow Depth=0.39' Max Vel=2.74 fps Inflow=3.63 cfs 0.379 af
n=0.025 L=370.0' S=0.0121 '/' Capacity=488.91 cfs Outflow=3.54 cfs 0.379 af

Pond 11aP: StormTech Sand Filter #1 Peak Elev=80.72' Storage=2,516 cf Inflow=2.58 cfs 0.178 af
Primary=3.30 cfs 0.075 af Secondary=0.06 cfs 0.082 af Outflow=3.36 cfs 0.158 af

Pond 11bP: UD Soil Filter #2 Peak Elev=96.50' Storage=1,256 cf Inflow=0.40 cfs 0.055 af
Discarded=0.04 cfs 0.050 af Primary=0.01 cfs 0.000 af Outflow=0.04 cfs 0.051 af

Pond 12aP: UD Soil Filter #1 Peak Elev=79.96' Storage=4,633 cf Inflow=3.43 cfs 0.313 af
Outflow=2.50 cfs 0.221 af

Pond 12bP: UD Soil Filter #3 Peak Elev=74.62' Storage=1,450 cf Inflow=1.26 cfs 0.139 af
Outflow=1.16 cfs 0.132 af

Link 10L: POA #1 Inflow=8.78 cfs 2.279 af
Primary=8.78 cfs 2.279 af

Link 20L: POA #2 Inflow=8.39 cfs 1.600 af
Primary=8.39 cfs 1.600 af

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Total Runoff Area = 39.031 ac Runoff Volume = 4.052 af Average Runoff Depth = 1.25"
90.49% Pervious = 35.320 ac 9.51% Impervious = 3.712 ac

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Summary for Subcatchment 10S: untreated & buffers

Runoff = 7.62 cfs @ 13.05 hrs, Volume= 1.768 af, Depth= 1.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.60"

| Area (sf) | CN | Description |
|-----------|----|--|
| * 334,580 | 65 | 2 acre lots, 12% imp, HSG B (off-site) |
| * 6,570 | 77 | Woods, Good, HSG D (wetland on-site) |
| * 569,736 | 55 | Woods, Good, HSG B |
| 910,886 | 59 | Weighted Average |
| 870,736 | | 95.59% Pervious Area |
| 40,150 | | 4.41% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|---|
| 26.8 | 100 | 0.0500 | 0.06 | | Sheet Flow, A to B |
| | | | | | Woods: Dense underbrush n= 0.800 P2= 3.00" |
| 3.6 | 200 | 0.0350 | 0.94 | | Shallow Concentrated Flow, B to C |
| | | | | | Woodland Kv= 5.0 fps |
| 2.4 | 220 | 0.0950 | 1.54 | | Shallow Concentrated Flow, C to D |
| | | | | | Woodland Kv= 5.0 fps |
| 28.0 | 750 | 0.0080 | 0.45 | | Shallow Concentrated Flow, D to E |
| | | | | | Woodland Kv= 5.0 fps |
| 3.4 | 175 | 0.0300 | 0.87 | | Shallow Concentrated Flow, E to F |
| | | | | | Woodland Kv= 5.0 fps |
| 0.1 | 30 | 0.0100 | 4.82 | 3.05 | Pipe Channel, F to G |
| | | | | | 12.0" Round w/ 3.0" inside fill Area= 0.6 sf Perim= 3.0' r= 0.21' |
| | | | | | n= 0.011 Concrete pipe, straight & clean |
| 2.9 | 195 | 0.0487 | 1.10 | | Shallow Concentrated Flow, G to H |
| | | | | | Woodland Kv= 5.0 fps |
| 0.7 | 850 | 0.0350 | 20.99 | 671.80 | Parabolic Channel, H to I |
| | | | | | W=12.00' D=4.00' Area=32.0 sf Perim=14.9' |
| | | | | | n= 0.022 Earth, clean & straight |
| 67.9 | 2,520 | Total | | | |

Summary for Subcatchment 11aS: Parking North / Access Rd

Runoff = 2.58 cfs @ 12.07 hrs, Volume= 0.178 af, Depth= 2.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.60"

| Area (sf) | CN | Description |
|-----------|----|-------------------------------|
| * 19,499 | 98 | Impervious |
| 13,476 | 61 | >75% Grass cover, Good, HSG B |
| 32,975 | 83 | Weighted Average |
| 13,476 | | 40.87% Pervious Area |
| 19,499 | | 59.13% Impervious Area |

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

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| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|-------------|------------------|------------------|----------------------|-------------------|---|
| 1.2 | 9 | 0.2730 | 0.13 | | Sheet Flow, A to B Grass: Bermuda n= 0.410 P2= 3.00" |
| 0.8 | 49 | 0.0200 | 0.99 | | Shallow Concentrated Flow, B to C Short Grass Pasture Kv= 7.0 fps |
| 0.2 | 181 | 0.7600 | 17.70 | | Shallow Concentrated Flow, C to D Paved Kv= 20.3 fps |
| 1.0 | 195 | 0.0100 | 3.27 | 1.28 | Pipe Channel, D to E 12.0" Round w/ 6.0" inside fill Area= 0.4 sf Perim= 2.6' r= 0.15' n= 0.013 Corrugated PE, smooth interior |
| 1.8 | | | | | Direct Entry, |
| 5.0 | 434 | Total | | | |

Summary for Subcatchment 11bS: Play Area

Runoff = 0.40 cfs @ 12.42 hrs, Volume= 0.055 af, Depth= 1.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.60"

| Area (sf) | CN | Description |
|-----------|----|-------------------------------|
| 20,393 | 61 | >75% Grass cover, Good, HSG B |
| 6,366 | 55 | Woods, Good, HSG B |
| 26,759 | 60 | Weighted Average |
| 26,759 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|-------------|------------------|------------------|----------------------|-------------------|---|
| 20.0 | | | | | Direct Entry, Open Field |
| 2.8 | 30 | 0.3300 | 0.18 | | Sheet Flow, A to B Grass: Bermuda n= 0.410 P2= 3.00" |
| 3.5 | 161 | 0.0120 | 0.77 | | Shallow Concentrated Flow, B to C Short Grass Pasture Kv= 7.0 fps |
| 26.3 | 191 | Total | | | |

Summary for Subcatchment 12aS: School and Loop

Runoff = 3.19 cfs @ 12.17 hrs, Volume= 0.280 af, Depth= 2.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.60"

| Area (sf) | CN | Description |
|-----------|--------|----------------------------------|
| * | 26,848 | 98 Impervious |
| | 36,934 | 61 >75% Grass cover, Good, HSG B |
| | 63,782 | 77 Weighted Average |
| | 36,934 | 57.91% Pervious Area |
| | 26,848 | 42.09% Impervious Area |

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

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| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|-------------|------------------|------------------|----------------------|-------------------|---|
| 7.9 | 55 | 0.0800 | 0.12 | | Sheet Flow, A to B Woods: Light underbrush n= 0.400 P2= 3.00" |
| 0.6 | 71 | 0.0850 | 2.04 | | Shallow Concentrated Flow, B to C Short Grass Pasture Kv= 7.0 fps |
| 0.2 | 38 | 0.2630 | 3.59 | | Shallow Concentrated Flow, C to D Short Grass Pasture Kv= 7.0 fps |
| 3.4 | 160 | 0.0125 | 0.78 | | Shallow Concentrated Flow, D to E Short Grass Pasture Kv= 7.0 fps |
| 0.3 | 75 | 0.0100 | 4.25 | 1.67 | Pipe Channel, E to F 12.0" Round w/ 6.0" inside fill Area= 0.4 sf Perim= 2.6' r= 0.15' n= 0.010 PVC, smooth interior |
| 12.4 | 399 | Total | | | |

Summary for Subcatchment 12bS: South Parking

Runoff = 1.26 cfs @ 12.30 hrs, Volume= 0.139 af, Depth= 2.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.60"

| Area (sf) | CN | Description |
|-----------|----|-------------------------------|
| * 14,485 | 98 | Impervious |
| 10,568 | 61 | >75% Grass cover, Good, HSG B |
| 6,542 | 55 | Woods, Good, HSG B |
| 31,595 | 77 | Weighted Average |
| 17,110 | | 54.15% Pervious Area |
| 14,485 | | 45.85% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|-------------|------------------|------------------|----------------------|-------------------|--|
| 20.7 | 130 | 0.0400 | 0.10 | | Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.00" |
| 1.3 | 160 | 0.0220 | 2.00 | 0.16 | Trap/Vee/Rect Channel Flow, Bot.W=0.00' D=0.20' Z= 2.0 '/' Top.W=0.80' n= 0.022 Earth, clean & straight |
| 22.0 | 290 | Total | | | |

Summary for Subcatchment 13aS: Entrance Drive

Runoff = 0.43 cfs @ 12.07 hrs, Volume= 0.033 af, Depth= 4.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.60"

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

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| | Area (sf) | CN | Description |
|---|-----------|----|-------------------------|
| * | 4,000 | 98 | Impervious |
| | 4,000 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|-------------|------------------|------------------|----------------------|-------------------|------------------------------|
| 5.0 | | | | | Direct Entry, Minimum |

Summary for Subcatchment 20S:

Runoff = 8.39 cfs @ 12.83 hrs, Volume= 1.600 af, Depth= 1.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.60"

| | Area (sf) | CN | Description |
|---|-----------|----|--|
| * | 425,200 | 65 | 2 acre lots, 12% imp, HSG B (off-site) |
| * | 47,244 | 82 | 2 acre lots, 12% imp, HSG D (off-site) |
| * | 9,606 | 77 | Woods, Good, HSG D (wetland on-site) |
| * | 140,402 | 55 | Woods, Good, HSG B (on-site) |
| | 7,750 | 61 | >75% Grass cover, Good, HSG B |
| | 630,202 | 64 | Weighted Average |
| | 573,509 | | 91.00% Pervious Area |
| | 56,693 | | 9.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|-------------|------------------|------------------|----------------------|-------------------|---|
| 32.3 | 80 | 0.0200 | 0.04 | | Sheet Flow, A to B Woods: Dense underbrush n= 0.800 P2= 3.00" |
| 0.7 | 90 | 0.1800 | 2.12 | | Shallow Concentrated Flow, B to C Woodland Kv= 5.0 fps |
| 23.6 | 1,360 | 0.0370 | 0.96 | | Shallow Concentrated Flow, C to D Woodland Kv= 5.0 fps |
| 56.6 | 1,530 | Total | | | |

Summary for Reach 10R: Norton BrookInflow Area = 0.757 ac, 59.13% Impervious, Inflow Depth = 2.50" for 10-Year event
Inflow = 3.36 cfs @ 12.10 hrs, Volume= 0.158 af
Outflow = 2.16 cfs @ 12.14 hrs, Volume= 0.158 af, Atten= 36%, Lag= 2.4 minRouting by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.18 fps, Min. Travel Time= 0.9 min
Avg. Velocity= 0.64 fps, Avg. Travel Time= 3.1 minPeak Storage= 120 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.22'
Bank-Full Depth= 2.00' Flow Area= 12.7 sf, Capacity= 94.82 cfs

459 - Post Calcs

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

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Custom cross-section, Length= 120.0' Slope= 0.0167 '/'

Constant n= 0.030 Stream, clean & straight

Inlet Invert= 69.00', Outlet Invert= 67.00'



| Offset (feet) | Elevation (feet) | Chan.Depth (feet) |
|------------------|---------------------|----------------------|
| -4.20 | 70.00 | 0.00 |
| -3.00 | 69.00 | 1.00 |
| -2.00 | 68.00 | 2.00 |
| 2.40 | 68.00 | 2.00 |
| 3.30 | 69.00 | 1.00 |
| 4.20 | 70.00 | 0.00 |

| Depth (feet) | End Area (sq-ft) | Perim. (feet) | Storage (cubic-feet) | Discharge (cfs) |
|-----------------|---------------------|------------------|-------------------------|--------------------|
| 0.00 | 0.0 | 4.4 | 0 | 0.00 |
| 1.00 | 5.4 | 7.2 | 642 | 28.17 |
| 2.00 | 12.7 | 10.1 | 1,524 | 94.82 |

Summary for Reach 11R: 2 x 36" Culverts

Inflow Area = 0.757 ac, 59.13% Impervious, Inflow Depth = 2.50" for 10-Year event
Inflow = 2.16 cfs @ 12.14 hrs, Volume= 0.158 af
Outflow = 2.14 cfs @ 12.15 hrs, Volume= 0.158 af, Atten= 1%, Lag= 0.6 min

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

Max. Velocity= 4.35 fps, Min. Travel Time= 0.3 min

Avg. Velocity= 1.67 fps, Avg. Travel Time= 0.7 min

Peak Storage= 37 cf @ 12.14 hrs

Average Depth at Peak Storage= 0.23'

Bank-Full Depth= 3.00' Flow Area= 14.1 sf, Capacity= 182.04 cfs

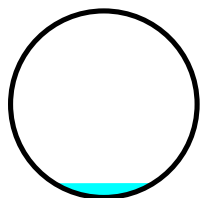
A factor of 2.00 has been applied to the storage and discharge capacity

36.0" Round Pipe

n= 0.011 Concrete pipe, straight & clean

Length= 75.0' Slope= 0.0133 '/'

Inlet Invert= 67.00', Outlet Invert= 66.00'



459 - Post Calcs

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

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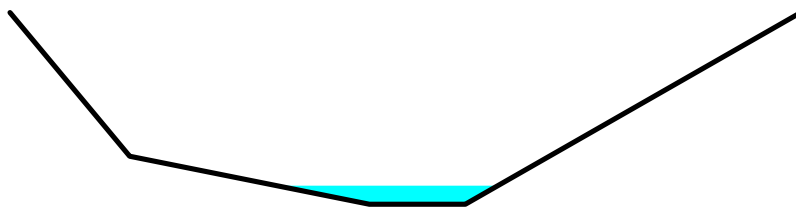
Summary for Reach 12R: Norton Brook

Inflow Area = 2.313 ac, 49.97% Impervious, Inflow Depth = 1.96" for 10-Year event
Inflow = 3.63 cfs @ 12.28 hrs, Volume= 0.379 af
Outflow = 3.54 cfs @ 12.36 hrs, Volume= 0.379 af, Atten= 3%, Lag= 4.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.74 fps, Min. Travel Time= 2.2 min
Avg. Velocity= 1.07 fps, Avg. Travel Time= 5.8 min

Peak Storage= 478 cf @ 12.32 hrs
Average Depth at Peak Storage= 0.39'
Bank-Full Depth= 4.00' Flow Area= 43.3 sf, Capacity= 488.91 cfs

Custom cross-section, Length= 370.0' Slope= 0.0121 '/'
Constant n= 0.025 Earth, clean & winding
Inlet Invert= 66.00', Outlet Invert= 61.51'



| Offset (feet) | Elevation (feet) | Chan.Depth (feet) |
|------------------|---------------------|----------------------|
| -8.50 | 70.00 | 0.00 |
| -6.00 | 67.00 | 3.00 |
| -1.00 | 66.00 | 4.00 |
| 1.00 | 66.00 | 4.00 |
| 8.00 | 70.00 | 0.00 |

| Depth (feet) | End Area (sq-ft) | Perim. (feet) | Storage (cubic-feet) | Discharge (cfs) |
|-----------------|---------------------|------------------|-------------------------|--------------------|
| 0.00 | 0.0 | 2.0 | 0 | 0.00 |
| 1.00 | 5.4 | 9.1 | 1,989 | 24.75 |
| 4.00 | 43.3 | 19.1 | 16,003 | 488.91 |

Summary for Pond 11aP: StormTech Sand Filter #1

Inflow Area = 0.757 ac, 59.13% Impervious, Inflow Depth = 2.81" for 10-Year event
Inflow = 2.58 cfs @ 12.07 hrs, Volume= 0.178 af
Outflow = 3.36 cfs @ 12.10 hrs, Volume= 0.158 af, Atten= 0%, Lag= 1.6 min
Primary = 3.30 cfs @ 12.10 hrs, Volume= 0.075 af
Secondary = 0.06 cfs @ 12.10 hrs, Volume= 0.082 af

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 80.72' @ 12.10 hrs Surf.Area= 2,772 sf Storage= 2,516 cf
Flood Elev= 82.00' Surf.Area= 2,772 sf Storage= 2,516 cf

459 - Post Calcs

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Plug-Flow detention time= 233.6 min calculated for 0.158 af (89% of inflow)

Center-of-Mass det. time= 180.6 min (996.5 - 815.9)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|--------|---------------|--|
| #1 | 75.68' | 900 cf | Custom Stage Data (Prismatic) Listed below (Recalc) 2,250 cf Overall x 40.0% Voids |
| #2A | 77.18' | 901 cf | 28.17'W x 45.16'L x 2.33'H Field A 2,968 cf Overall - 715 cf Embedded = 2,253 cf x 40.0% Voids |
| #3A | 77.68' | 715 cf | ADS_StormTech SC-310 x 48 Inside #2 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap Row Length Adjustment= +0.44' x 2.07 sf x 8 rows |
| | | 2,516 cf | Total Available Storage |

Storage Group A created with Chamber Wizard

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---------------------|----------------------|---------------------------|---------------------------|
| 75.68 | 1,500 | 0 | 0 |
| 77.18 | 1,500 | 2,250 | 2,250 |

| Device | Routing | Invert | Outlet Devices |
|--------|-----------|--------|--|
| #1 | Primary | 79.01' | 12.0" Round 12" Outfall to Level Spreader L= 40.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 79.01' / 74.58' S= 0.1108 ' / Cc= 0.900 n= 0.013, Flow Area= 0.79 sf |
| #2 | Secondary | 75.68' | 2.000 in/hr Underdrain over Surface area above 75.68' Conductivity to Groundwater Elevation = -2.00' Excluded Surface area = 1,500 sf |

Primary OutFlow Max=3.18 cfs @ 12.10 hrs HW=80.64' (Free Discharge)↑**1=12" Outfall to Level Spreader** (Inlet Controls 3.18 cfs @ 4.05 fps)**Secondary OutFlow** Max=0.06 cfs @ 12.10 hrs HW=80.67' (Free Discharge)↑**2=Underdrain** (Controls 0.06 cfs)**Summary for Pond 11bP: UD Soil Filter #2**

| | | | |
|---------------|------------|-------------------|--|
| Inflow Area = | 0.614 ac, | 0.00% Impervious, | Inflow Depth = 1.07" for 10-Year event |
| Inflow = | 0.40 cfs @ | 12.42 hrs, | Volume= 0.055 af |
| Outflow = | 0.04 cfs @ | 15.96 hrs, | Volume= 0.051 af, Atten= 89%, Lag= 212.6 min |
| Discarded = | 0.04 cfs @ | 15.96 hrs, | Volume= 0.050 af |
| Primary = | 0.01 cfs @ | 15.96 hrs, | Volume= 0.000 af |

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

Peak Elev= 96.50' @ 15.96 hrs Surf.Area= 1,412 sf Storage= 1,256 cf

Plug-Flow detention time= 401.3 min calculated for 0.051 af (92% of inflow)

Center-of-Mass det. time= 361.5 min (1,262.2 - 900.8)

459 - Post Calcs

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

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| Volume | Invert | Avail.Storage | Storage Description |
|--------|--------|---------------|--|
| #1 | 93.50' | 195 cf | Media Storage (Prismatic) Listed below (Recalc) 975 cf Overall x 20.0% Voids |
| #2 | 95.00' | 1,498 cf | Ponding Storage (Prismatic) Listed below (Recalc) |
| | | 1,693 cf | Total Available Storage |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---------------------|----------------------|---------------------------|---------------------------|
| 93.50 | 650 | 0 | 0 |
| 95.00 | 650 | 975 | 975 |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---------------------|----------------------|---------------------------|---------------------------|
| 95.00 | 650 | 0 | 0 |
| 96.50 | 760 | 1,058 | 1,058 |
| 97.00 | 1,000 | 440 | 1,498 |

| Device | Routing | Invert | Outlet Devices |
|--------|-----------|--------|--|
| #1 | Discarded | 93.50' | 2.000 in/hr Underdrain over Surface area above 93.50' Conductivity to Groundwater Elevation = -2.00' Excluded Surface area = 650 sf |
| #2 | Primary | 96.50' | 8.0' long x 4.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32 |

Discarded OutFlow Max=0.04 cfs @ 15.96 hrs HW=96.50' (Free Discharge)

↑1=Underdrain (Controls 0.04 cfs)

Primary OutFlow Max=0.00 cfs @ 15.96 hrs HW=96.50' (Free Discharge)

↑2=Broad-Crested Rectangular Weir (Weir Controls 0.00 cfs @ 0.15 fps)

Summary for Pond 12aP: UD Soil Filter #1

Inflow Area = 1.556 ac, 45.51% Impervious, Inflow Depth = 2.41" for 10-Year event
 Inflow = 3.43 cfs @ 12.17 hrs, Volume= 0.313 af
 Outflow = 2.50 cfs @ 12.30 hrs, Volume= 0.221 af, Atten= 27%, Lag= 8.2 min
 Primary = 2.50 cfs @ 12.30 hrs, Volume= 0.221 af

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 79.96' @ 12.30 hrs Surf.Area= 3,028 sf Storage= 4,633 cf

Plug-Flow detention time= 163.8 min calculated for 0.221 af (71% of inflow)
 Center-of-Mass det. time= 66.4 min (896.2 - 829.8)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|--------|---------------|--|
| #1 | 78.25' | 15,379 cf | Ponding (Prismatic) Listed below (Recalc) |

459 - Post Calcs

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| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---------------------|----------------------|---------------------------|---------------------------|
| 78.25 | 2,385 | 0 | 0 |
| 79.75 | 2,958 | 4,007 | 4,007 |
| 83.00 | 4,040 | 11,372 | 15,379 |

| Device | Routing | Invert | Outlet Devices |
|--------|----------|--------|---|
| #1 | Primary | 75.65' | 12.0" Round 12" Outfall to Level Spreader L= 90.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 75.65' / 74.75' S= 0.0100 ' S= 0.0100 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |
| #2 | Device 1 | 79.75' | 24.0" x 24.0" Horiz. CB 8 C= 0.600 Limited to weir flow at low heads |

Primary OutFlow Max=2.50 cfs @ 12.30 hrs HW=79.96' (Free Discharge)

1=12" Outfall to Level Spreader (Passes 2.50 cfs of 5.83 cfs potential flow)

2=CB 8 (Weir Controls 2.50 cfs @ 1.50 fps)

Summary for Pond 12bP: UD Soil Filter #3

Inflow Area = 0.725 ac, 45.85% Impervious, Inflow Depth = 2.29" for 10-Year event
 Inflow = 1.26 cfs @ 12.30 hrs, Volume= 0.139 af
 Outflow = 1.16 cfs @ 12.40 hrs, Volume= 0.132 af, Atten= 8%, Lag= 5.9 min
 Primary = 1.16 cfs @ 12.40 hrs, Volume= 0.132 af

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 74.62' @ 12.40 hrs Surf.Area= 1,630 sf Storage= 1,450 cf

Plug-Flow detention time= 216.7 min calculated for 0.132 af (95% of inflow)
 Center-of-Mass det. time= 190.8 min (1,039.3 - 848.5)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|--------|---------------|--|
| #1 | 73.50' | 2,118 cf | Custom Stage Data (Pyramidal) Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) | Wet.Area (sq-ft) |
|---------------------|----------------------|---------------------------|---------------------------|---------------------|
| 73.50 | 1,024 | 0 | 0 | 1,024 |
| 74.00 | 1,233 | 563 | 563 | 1,244 |
| 75.00 | 1,900 | 1,555 | 2,118 | 1,929 |

| Device | Routing | Invert | Outlet Devices |
|--------|----------|--------|---|
| #1 | Primary | 70.75' | 2.0" Vert. Orifice/Grate C= 0.600 |
| #2 | Device 1 | 73.50' | 0.750 in/hr Exfiltration over Surface area |
| #3 | Primary | 74.50' | 9.0' long (Profile 7) Broad-Crested Rectangular Weir Head (feet) 0.49 0.98 1.48 Coef. (English) 2.99 3.41 3.62 |

Primary OutFlow Max=1.16 cfs @ 12.40 hrs HW=74.62' (Free Discharge)

1=Orifice/Grate (Passes 0.03 cfs of 0.20 cfs potential flow)

2=Exfiltration (Exfiltration Controls 0.03 cfs)

3=Broad-Crested Rectangular Weir (Weir Controls 1.13 cfs @ 1.04 fps)

459 - Post Calcs

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Summary for Link 10L: POA #1

Inflow Area = 24.564 ac, 9.81% Impervious, Inflow Depth > 1.11" for 10-Year event
Inflow = 8.78 cfs @ 12.98 hrs, Volume= 2.279 af
Primary = 8.78 cfs @ 12.98 hrs, Volume= 2.279 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Summary for Link 20L: POA #2

Inflow Area = 14.467 ac, 9.00% Impervious, Inflow Depth = 1.33" for 10-Year event
Inflow = 8.39 cfs @ 12.83 hrs, Volume= 1.600 af
Primary = 8.39 cfs @ 12.83 hrs, Volume= 1.600 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

459 - Post Calcs*Type III 24-hr 25-Year Rainfall=5.80"*

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

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

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

Subcatchment 10S: untreated & buffers Runoff Area=910,886 sf 4.41% Impervious Runoff Depth=1.71"
Flow Length=2,520' Tc=67.9 min CN=59 Runoff=14.02 cfs 2.984 af

Subcatchment 11aS: Parking North / Runoff Area=32,975 sf 59.13% Impervious Runoff Depth=3.91"
Flow Length=434' Tc=5.0 min CN=83 Runoff=3.56 cfs 0.246 af

Subcatchment 11bS: Play Area Runoff Area=26,759 sf 0.00% Impervious Runoff Depth=1.79"
Flow Length=191' Tc=26.3 min CN=60 Runoff=0.72 cfs 0.092 af

Subcatchment 12aS: School and Loop Runoff Area=63,782 sf 42.09% Impervious Runoff Depth=3.31"
Flow Length=399' Tc=12.4 min CN=77 Runoff=4.61 cfs 0.403 af

Subcatchment 12bS: South Parking Runoff Area=31,595 sf 45.85% Impervious Runoff Depth=3.31"
Flow Length=290' Tc=22.0 min CN=77 Runoff=1.82 cfs 0.200 af

Subcatchment 13aS: Entrance Drive Runoff Area=4,000 sf 100.00% Impervious Runoff Depth=5.56"
Tc=5.0 min CN=98 Runoff=0.54 cfs 0.043 af

Subcatchment 20S: Runoff Area=630,202 sf 9.00% Impervious Runoff Depth=2.12"
Flow Length=1,530' Tc=56.6 min CN=64 Runoff=14.08 cfs 2.558 af

Reach 10R: Norton Brook Avg. Flow Depth=0.29' Max Vel=2.61 fps Inflow=3.93 cfs 0.226 af
n=0.030 L=120.0' S=0.0167 '/' Capacity=94.82 cfs Outflow=3.53 cfs 0.226 af

Reach 11R: 2 x 36" Culverts Avg. Flow Depth=0.29' Max Vel=5.05 fps Inflow=3.53 cfs 0.226 af
36.0" Round Pipe x 2.00 n=0.011 L=75.0' S=0.0133 '/' Capacity=182.04 cfs Outflow=3.52 cfs 0.226 af

Reach 12R: Norton Brook Avg. Flow Depth=0.55' Max Vel=3.29 fps Inflow=7.06 cfs 0.580 af
n=0.025 L=370.0' S=0.0121 '/' Capacity=488.91 cfs Outflow=6.91 cfs 0.580 af

Pond 11aP: StormTech Sand Filter #1 Peak Elev=81.19' Storage=2,516 cf Inflow=3.56 cfs 0.246 af
Primary=3.87 cfs 0.135 af Secondary=0.06 cfs 0.092 af Outflow=3.93 cfs 0.226 af

Pond 11bP: UD Soil Filter #2 Peak Elev=96.58' Storage=1,312 cf Inflow=0.72 cfs 0.092 af
Discarded=0.04 cfs 0.056 af Primary=0.41 cfs 0.031 af Outflow=0.45 cfs 0.087 af

Pond 12aP: UD Soil Filter #1 Peak Elev=80.07' Storage=4,959 cf Inflow=4.93 cfs 0.446 af
Outflow=4.66 cfs 0.354 af

Pond 12bP: UD Soil Filter #3 Peak Elev=74.66' Storage=1,519 cf Inflow=1.82 cfs 0.200 af
Outflow=1.80 cfs 0.193 af

Link 10L: POA #1 Inflow=16.00 cfs 3.788 af
Primary=16.00 cfs 3.788 af

Link 20L: POA #2 Inflow=14.08 cfs 2.558 af
Primary=14.08 cfs 2.558 af

459 - Post Calcs

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

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Total Runoff Area = 39.031 ac Runoff Volume = 6.526 af Average Runoff Depth = 2.01"
90.49% Pervious = 35.320 ac 9.51% Impervious = 3.712 ac

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

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Summary for Subcatchment 10S: untreated & buffers

Runoff = 14.02 cfs @ 12.98 hrs, Volume= 2.984 af, Depth= 1.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.80"

| Area (sf) | CN | Description |
|-----------|----|--|
| * 334,580 | 65 | 2 acre lots, 12% imp, HSG B (off-site) |
| * 6,570 | 77 | Woods, Good, HSG D (wetland on-site) |
| * 569,736 | 55 | Woods, Good, HSG B |
| 910,886 | 59 | Weighted Average |
| 870,736 | | 95.59% Pervious Area |
| 40,150 | | 4.41% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|----------|---------------|---------------|-------------------|----------------|---|
| 26.8 | 100 | 0.0500 | 0.06 | | Sheet Flow, A to B |
| | | | | | Woods: Dense underbrush n= 0.800 P2= 3.00" |
| 3.6 | 200 | 0.0350 | 0.94 | | Shallow Concentrated Flow, B to C |
| | | | | | Woodland Kv= 5.0 fps |
| 2.4 | 220 | 0.0950 | 1.54 | | Shallow Concentrated Flow, C to D |
| | | | | | Woodland Kv= 5.0 fps |
| 28.0 | 750 | 0.0080 | 0.45 | | Shallow Concentrated Flow, D to E |
| | | | | | Woodland Kv= 5.0 fps |
| 3.4 | 175 | 0.0300 | 0.87 | | Shallow Concentrated Flow, E to F |
| | | | | | Woodland Kv= 5.0 fps |
| 0.1 | 30 | 0.0100 | 4.82 | 3.05 | Pipe Channel, F to G |
| | | | | | 12.0" Round w/ 3.0" inside fill Area= 0.6 sf Perim= 3.0' r= 0.21' |
| | | | | | n= 0.011 Concrete pipe, straight & clean |
| 2.9 | 195 | 0.0487 | 1.10 | | Shallow Concentrated Flow, G to H |
| | | | | | Woodland Kv= 5.0 fps |
| 0.7 | 850 | 0.0350 | 20.99 | 671.80 | Parabolic Channel, H to I |
| | | | | | W=12.00' D=4.00' Area=32.0 sf Perim=14.9' |
| | | | | | n= 0.022 Earth, clean & straight |
| 67.9 | 2,520 | Total | | | |

Summary for Subcatchment 11aS: Parking North / Access Rd

Runoff = 3.56 cfs @ 12.07 hrs, Volume= 0.246 af, Depth= 3.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.80"

| Area (sf) | CN | Description |
|-----------|----|-------------------------------|
| * 19,499 | 98 | Impervious |
| 13,476 | 61 | >75% Grass cover, Good, HSG B |
| 32,975 | 83 | Weighted Average |
| 13,476 | | 40.87% Pervious Area |
| 19,499 | | 59.13% Impervious Area |

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

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| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|-------------|------------------|------------------|----------------------|-------------------|---|
| 1.2 | 9 | 0.2730 | 0.13 | | Sheet Flow, A to B Grass: Bermuda n= 0.410 P2= 3.00" |
| 0.8 | 49 | 0.0200 | 0.99 | | Shallow Concentrated Flow, B to C Short Grass Pasture Kv= 7.0 fps |
| 0.2 | 181 | 0.7600 | 17.70 | | Shallow Concentrated Flow, C to D Paved Kv= 20.3 fps |
| 1.0 | 195 | 0.0100 | 3.27 | 1.28 | Pipe Channel, D to E 12.0" Round w/ 6.0" inside fill Area= 0.4 sf Perim= 2.6' r= 0.15' n= 0.013 Corrugated PE, smooth interior |
| 1.8 | | | | | Direct Entry, |
| 5.0 | 434 | Total | | | |

Summary for Subcatchment 11bS: Play Area

Runoff = 0.72 cfs @ 12.41 hrs, Volume= 0.092 af, Depth= 1.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.80"

| Area (sf) | CN | Description |
|-----------|----|-------------------------------|
| 20,393 | 61 | >75% Grass cover, Good, HSG B |
| 6,366 | 55 | Woods, Good, HSG B |
| 26,759 | 60 | Weighted Average |
| 26,759 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|-------------|------------------|------------------|----------------------|-------------------|---|
| 20.0 | | | | | Direct Entry, Open Field |
| 2.8 | 30 | 0.3300 | 0.18 | | Sheet Flow, A to B Grass: Bermuda n= 0.410 P2= 3.00" |
| 3.5 | 161 | 0.0120 | 0.77 | | Shallow Concentrated Flow, B to C Short Grass Pasture Kv= 7.0 fps |
| 26.3 | 191 | Total | | | |

Summary for Subcatchment 12aS: School and Loop

Runoff = 4.61 cfs @ 12.17 hrs, Volume= 0.403 af, Depth= 3.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.80"

| Area (sf) | CN | Description |
|-----------|--------|----------------------------------|
| * | 26,848 | 98 Impervious |
| | 36,934 | 61 >75% Grass cover, Good, HSG B |
| | 63,782 | 77 Weighted Average |
| | 36,934 | 57.91% Pervious Area |
| | 26,848 | 42.09% Impervious Area |

459 - Post Calcs

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

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| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|-------------|------------------|------------------|----------------------|-------------------|---|
| 7.9 | 55 | 0.0800 | 0.12 | | Sheet Flow, A to B Woods: Light underbrush n= 0.400 P2= 3.00" |
| 0.6 | 71 | 0.0850 | 2.04 | | Shallow Concentrated Flow, B to C Short Grass Pasture Kv= 7.0 fps |
| 0.2 | 38 | 0.2630 | 3.59 | | Shallow Concentrated Flow, C to D Short Grass Pasture Kv= 7.0 fps |
| 3.4 | 160 | 0.0125 | 0.78 | | Shallow Concentrated Flow, D to E Short Grass Pasture Kv= 7.0 fps |
| 0.3 | 75 | 0.0100 | 4.25 | 1.67 | Pipe Channel, E to F 12.0" Round w/ 6.0" inside fill Area= 0.4 sf Perim= 2.6' r= 0.15' n= 0.010 PVC, smooth interior |
| 12.4 | 399 | Total | | | |

Summary for Subcatchment 12bS: South Parking

Runoff = 1.82 cfs @ 12.30 hrs, Volume= 0.200 af, Depth= 3.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.80"

| Area (sf) | CN | Description |
|-----------|----|-------------------------------|
| * 14,485 | 98 | Impervious |
| 10,568 | 61 | >75% Grass cover, Good, HSG B |
| 6,542 | 55 | Woods, Good, HSG B |
| 31,595 | 77 | Weighted Average |
| 17,110 | | 54.15% Pervious Area |
| 14,485 | | 45.85% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|-------------|------------------|------------------|----------------------|-------------------|--|
| 20.7 | 130 | 0.0400 | 0.10 | | Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.00" |
| 1.3 | 160 | 0.0220 | 2.00 | 0.16 | Trap/Vee/Rect Channel Flow, Bot.W=0.00' D=0.20' Z= 2.0 '/' Top.W=0.80' n= 0.022 Earth, clean & straight |
| 22.0 | 290 | Total | | | |

Summary for Subcatchment 13aS: Entrance Drive

Runoff = 0.54 cfs @ 12.07 hrs, Volume= 0.043 af, Depth= 5.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.80"

459 - Post Calcs

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

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| | Area (sf) | CN | Description |
|---|-----------|----|-------------------------|
| * | 4,000 | 98 | Impervious |
| | 4,000 | | 100.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|-------------|------------------|------------------|----------------------|-------------------|------------------------------|
| 5.0 | | | | | Direct Entry, Minimum |

Summary for Subcatchment 20S:

Runoff = 14.08 cfs @ 12.82 hrs, Volume= 2.558 af, Depth= 2.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.80"

| | Area (sf) | CN | Description |
|---|-----------|----|--|
| * | 425,200 | 65 | 2 acre lots, 12% imp, HSG B (off-site) |
| * | 47,244 | 82 | 2 acre lots, 12% imp, HSG D (off-site) |
| * | 9,606 | 77 | Woods, Good, HSG D (wetland on-site) |
| * | 140,402 | 55 | Woods, Good, HSG B (on-site) |
| | 7,750 | 61 | >75% Grass cover, Good, HSG B |
| | 630,202 | 64 | Weighted Average |
| | 573,509 | | 91.00% Pervious Area |
| | 56,693 | | 9.00% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|-------------|------------------|------------------|----------------------|-------------------|---|
| 32.3 | 80 | 0.0200 | 0.04 | | Sheet Flow, A to B Woods: Dense underbrush n= 0.800 P2= 3.00" |
| 0.7 | 90 | 0.1800 | 2.12 | | Shallow Concentrated Flow, B to C Woodland Kv= 5.0 fps |
| 23.6 | 1,360 | 0.0370 | 0.96 | | Shallow Concentrated Flow, C to D Woodland Kv= 5.0 fps |
| 56.6 | 1,530 | Total | | | |

Summary for Reach 10R: Norton BrookInflow Area = 0.757 ac, 59.13% Impervious, Inflow Depth = 3.59" for 25-Year event
Inflow = 3.93 cfs @ 12.07 hrs, Volume= 0.226 af
Outflow = 3.53 cfs @ 12.09 hrs, Volume= 0.226 af, Atten= 10%, Lag= 1.4 minRouting by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.61 fps, Min. Travel Time= 0.8 min
Avg. Velocity= 0.67 fps, Avg. Travel Time= 3.0 minPeak Storage= 163 cf @ 12.08 hrs
Average Depth at Peak Storage= 0.29'
Bank-Full Depth= 2.00' Flow Area= 12.7 sf, Capacity= 94.82 cfs

459 - Post Calcs

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

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Custom cross-section, Length= 120.0' Slope= 0.0167 '/'

Constant n= 0.030 Stream, clean & straight

Inlet Invert= 69.00', Outlet Invert= 67.00'



| Offset (feet) | Elevation (feet) | Chan.Depth (feet) |
|------------------|---------------------|----------------------|
| -4.20 | 70.00 | 0.00 |
| -3.00 | 69.00 | 1.00 |
| -2.00 | 68.00 | 2.00 |
| 2.40 | 68.00 | 2.00 |
| 3.30 | 69.00 | 1.00 |
| 4.20 | 70.00 | 0.00 |

| Depth (feet) | End Area (sq-ft) | Perim. (feet) | Storage (cubic-feet) | Discharge (cfs) |
|-----------------|---------------------|------------------|-------------------------|--------------------|
| 0.00 | 0.0 | 4.4 | 0 | 0.00 |
| 1.00 | 5.4 | 7.2 | 642 | 28.17 |
| 2.00 | 12.7 | 10.1 | 1,524 | 94.82 |

Summary for Reach 11R: 2 x 36" Culverts

Inflow Area = 0.757 ac, 59.13% Impervious, Inflow Depth = 3.59" for 25-Year event

Inflow = 3.53 cfs @ 12.09 hrs, Volume= 0.226 af

Outflow = 3.52 cfs @ 12.10 hrs, Volume= 0.226 af, Atten= 0%, Lag= 0.4 min

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

Max. Velocity= 5.05 fps, Min. Travel Time= 0.2 min

Avg. Velocity= 1.73 fps, Avg. Travel Time= 0.7 min

Peak Storage= 52 cf @ 12.10 hrs

Average Depth at Peak Storage= 0.29'

Bank-Full Depth= 3.00' Flow Area= 14.1 sf, Capacity= 182.04 cfs

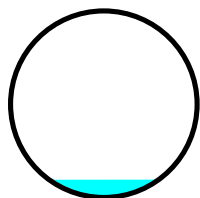
A factor of 2.00 has been applied to the storage and discharge capacity

36.0" Round Pipe

n= 0.011 Concrete pipe, straight & clean

Length= 75.0' Slope= 0.0133 '/'

Inlet Invert= 67.00', Outlet Invert= 66.00'



459 - Post Calcs

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

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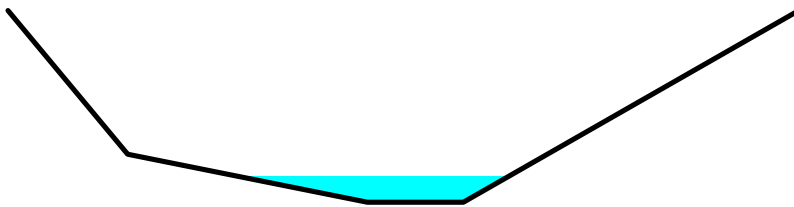
Summary for Reach 12R: Norton Brook

Inflow Area = 2.313 ac, 49.97% Impervious, Inflow Depth = 3.01" for 25-Year event
Inflow = 7.06 cfs @ 12.15 hrs, Volume= 0.580 af
Outflow = 6.91 cfs @ 12.22 hrs, Volume= 0.580 af, Atten= 2%, Lag= 3.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.29 fps, Min. Travel Time= 1.9 min
Avg. Velocity= 1.11 fps, Avg. Travel Time= 5.5 min

Peak Storage= 776 cf @ 12.19 hrs
Average Depth at Peak Storage= 0.55'
Bank-Full Depth= 4.00' Flow Area= 43.3 sf, Capacity= 488.91 cfs

Custom cross-section, Length= 370.0' Slope= 0.0121 '/'
Constant n= 0.025 Earth, clean & winding
Inlet Invert= 66.00', Outlet Invert= 61.51'



| Offset (feet) | Elevation (feet) | Chan.Depth (feet) |
|------------------|---------------------|----------------------|
| -8.50 | 70.00 | 0.00 |
| -6.00 | 67.00 | 3.00 |
| -1.00 | 66.00 | 4.00 |
| 1.00 | 66.00 | 4.00 |
| 8.00 | 70.00 | 0.00 |

| Depth (feet) | End Area (sq-ft) | Perim. (feet) | Storage (cubic-feet) | Discharge (cfs) |
|-----------------|---------------------|------------------|-------------------------|--------------------|
| 0.00 | 0.0 | 2.0 | 0 | 0.00 |
| 1.00 | 5.4 | 9.1 | 1,989 | 24.75 |
| 4.00 | 43.3 | 19.1 | 16,003 | 488.91 |

Summary for Pond 11aP: StormTech Sand Filter #1

Inflow Area = 0.757 ac, 59.13% Impervious, Inflow Depth = 3.91" for 25-Year event
Inflow = 3.56 cfs @ 12.07 hrs, Volume= 0.246 af
Outflow = 3.93 cfs @ 12.07 hrs, Volume= 0.226 af, Atten= 0%, Lag= 0.0 min
Primary = 3.87 cfs @ 12.07 hrs, Volume= 0.135 af
Secondary = 0.06 cfs @ 12.07 hrs, Volume= 0.092 af

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 81.19' @ 12.07 hrs Surf.Area= 2,772 sf Storage= 2,516 cf
Flood Elev= 82.00' Surf.Area= 2,772 sf Storage= 2,516 cf

459 - Post Calcs

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Plug-Flow detention time= 186.3 min calculated for 0.226 af (92% of inflow)

Center-of-Mass det. time= 144.9 min (951.5 - 806.6)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|--------|---------------|--|
| #1 | 75.68' | 900 cf | Custom Stage Data (Prismatic) Listed below (Recalc) 2,250 cf Overall x 40.0% Voids |
| #2A | 77.18' | 901 cf | 28.17'W x 45.16'L x 2.33'H Field A 2,968 cf Overall - 715 cf Embedded = 2,253 cf x 40.0% Voids |
| #3A | 77.68' | 715 cf | ADS_StormTech SC-310 x 48 Inside #2 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap Row Length Adjustment= +0.44' x 2.07 sf x 8 rows |
| | | 2,516 cf | Total Available Storage |

Storage Group A created with Chamber Wizard

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---------------------|----------------------|---------------------------|---------------------------|
| 75.68 | 1,500 | 0 | 0 |
| 77.18 | 1,500 | 2,250 | 2,250 |

| Device | Routing | Invert | Outlet Devices |
|--------|-----------|--------|--|
| #1 | Primary | 79.01' | 12.0" Round 12" Outfall to Level Spreader L= 40.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 79.01' / 74.58' S= 0.1108 ' / Cc= 0.900 n= 0.013, Flow Area= 0.79 sf |
| #2 | Secondary | 75.68' | 2.000 in/hr Underdrain over Surface area above 75.68' Conductivity to Groundwater Elevation = -2.00' Excluded Surface area = 1,500 sf |

Primary OutFlow Max=3.86 cfs @ 12.07 hrs HW=81.18' (Free Discharge)

↑1=12" Outfall to Level Spreader (Inlet Controls 3.86 cfs @ 4.91 fps)

Secondary OutFlow Max=0.06 cfs @ 12.07 hrs HW=81.18' (Free Discharge)

↑2=Underdrain (Controls 0.06 cfs)

Summary for Pond 11bP: UD Soil Filter #2

| | |
|---------------|--|
| Inflow Area = | 0.614 ac, 0.00% Impervious, Inflow Depth = 1.79" for 25-Year event |
| Inflow = | 0.72 cfs @ 12.41 hrs, Volume= 0.092 af |
| Outflow = | 0.45 cfs @ 12.73 hrs, Volume= 0.087 af, Atten= 38%, Lag= 19.4 min |
| Discarded = | 0.04 cfs @ 12.73 hrs, Volume= 0.056 af |
| Primary = | 0.41 cfs @ 12.73 hrs, Volume= 0.031 af |

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

Peak Elev= 96.58' @ 12.73 hrs Surf.Area= 1,447 sf Storage= 1,312 cf

Plug-Flow detention time= 281.5 min calculated for 0.087 af (95% of inflow)

Center-of-Mass det. time= 256.1 min (1,140.0 - 883.8)

459 - Post Calcs

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

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| Volume | Invert | Avail.Storage | Storage Description |
|--------|--------|---------------|--|
| #1 | 93.50' | 195 cf | Media Storage (Prismatic) Listed below (Recalc) 975 cf Overall x 20.0% Voids |
| #2 | 95.00' | 1,498 cf | Ponding Storage (Prismatic) Listed below (Recalc) |
| | | 1,693 cf | Total Available Storage |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---------------------|----------------------|---------------------------|---------------------------|
| 93.50 | 650 | 0 | 0 |
| 95.00 | 650 | 975 | 975 |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---------------------|----------------------|---------------------------|---------------------------|
| 95.00 | 650 | 0 | 0 |
| 96.50 | 760 | 1,058 | 1,058 |
| 97.00 | 1,000 | 440 | 1,498 |

| Device | Routing | Invert | Outlet Devices |
|--------|-----------|--------|--|
| #1 | Discarded | 93.50' | 2.000 in/hr Underdrain over Surface area above 93.50' Conductivity to Groundwater Elevation = -2.00' Excluded Surface area = 650 sf |
| #2 | Primary | 96.50' | 8.0' long x 4.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32 |

Discarded OutFlow Max=0.04 cfs @ 12.73 hrs HW=96.58' (Free Discharge)

↑1=Underdrain (Controls 0.04 cfs)

Primary OutFlow Max=0.40 cfs @ 12.73 hrs HW=96.58' (Free Discharge)

↑2=Broad-Crested Rectangular Weir (Weir Controls 0.40 cfs @ 0.66 fps)

Summary for Pond 12aP: UD Soil Filter #1

Inflow Area = 1.556 ac, 45.51% Impervious, Inflow Depth = 3.44" for 25-Year event
 Inflow = 4.93 cfs @ 12.16 hrs, Volume= 0.446 af
 Outflow = 4.66 cfs @ 12.21 hrs, Volume= 0.354 af, Atten= 5%, Lag= 2.7 min
 Primary = 4.66 cfs @ 12.21 hrs, Volume= 0.354 af

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs / 3

Peak Elev= 80.07' @ 12.21 hrs Surf.Area= 3,063 sf Storage= 4,959 cf

Plug-Flow detention time= 127.2 min calculated for 0.354 af (79% of inflow)

Center-of-Mass det. time= 47.9 min (868.9 - 821.0)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|--------|---------------|--|
| #1 | 78.25' | 15,379 cf | Ponding (Prismatic) Listed below (Recalc) |

459 - Post Calcs

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

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| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---------------------|----------------------|---------------------------|---------------------------|
| 78.25 | 2,385 | 0 | 0 |
| 79.75 | 2,958 | 4,007 | 4,007 |
| 83.00 | 4,040 | 11,372 | 15,379 |

| Device | Routing | Invert | Outlet Devices |
|--------|----------|--------|---|
| #1 | Primary | 75.65' | 12.0" Round 12" Outfall to Level Spreader L= 90.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 75.65' / 74.75' S= 0.0100 ' S= 0.0100 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |
| #2 | Device 1 | 79.75' | 24.0" x 24.0" Horiz. CB 8 C= 0.600 Limited to weir flow at low heads |

Primary OutFlow Max=4.65 cfs @ 12.21 hrs HW=80.07' (Free Discharge)

1=12" Outfall to Level Spreader (Passes 4.65 cfs of 5.91 cfs potential flow)

2=CB 8 (Weir Controls 4.65 cfs @ 1.84 fps)

Summary for Pond 12bP: UD Soil Filter #3

Inflow Area = 0.725 ac, 45.85% Impervious, Inflow Depth = 3.31" for 25-Year event
 Inflow = 1.82 cfs @ 12.30 hrs, Volume= 0.200 af
 Outflow = 1.80 cfs @ 12.34 hrs, Volume= 0.193 af, Atten= 1%, Lag= 2.1 min
 Primary = 1.80 cfs @ 12.34 hrs, Volume= 0.193 af

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
 Peak Elev= 74.66' @ 12.34 hrs Surf.Area= 1,659 sf Storage= 1,519 cf

Plug-Flow detention time= 153.5 min calculated for 0.193 af (97% of inflow)
 Center-of-Mass det. time= 134.1 min (972.0 - 837.9)

| Volume | Invert | Avail.Storage | Storage Description |
|--------|--------|---------------|--|
| #1 | 73.50' | 2,118 cf | Custom Stage Data (Pyramidal) Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) | Wet.Area (sq-ft) |
|---------------------|----------------------|---------------------------|---------------------------|---------------------|
| 73.50 | 1,024 | 0 | 0 | 1,024 |
| 74.00 | 1,233 | 563 | 563 | 1,244 |
| 75.00 | 1,900 | 1,555 | 2,118 | 1,929 |

| Device | Routing | Invert | Outlet Devices |
|--------|----------|--------|---|
| #1 | Primary | 70.75' | 2.0" Vert. Orifice/Grate C= 0.600 |
| #2 | Device 1 | 73.50' | 0.750 in/hr Exfiltration over Surface area |
| #3 | Primary | 74.50' | 9.0' long (Profile 7) Broad-Crested Rectangular Weir Head (feet) 0.49 0.98 1.48 Coef. (English) 2.99 3.41 3.62 |

Primary OutFlow Max=1.80 cfs @ 12.34 hrs HW=74.66' (Free Discharge)

1=Orifice/Grate (Passes 0.03 cfs of 0.21 cfs potential flow)

2=Exfiltration (Exfiltration Controls 0.03 cfs)

3=Broad-Crested Rectangular Weir (Weir Controls 1.77 cfs @ 1.21 fps)

459 - Post Calcs

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

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Summary for Link 10L: POA #1

Inflow Area = 24.564 ac, 9.81% Impervious, Inflow Depth > 1.85" for 25-Year event
Inflow = 16.00 cfs @ 12.90 hrs, Volume= 3.788 af
Primary = 16.00 cfs @ 12.90 hrs, Volume= 3.788 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Summary for Link 20L: POA #2

Inflow Area = 14.467 ac, 9.00% Impervious, Inflow Depth = 2.12" for 25-Year event
Inflow = 14.08 cfs @ 12.82 hrs, Volume= 2.558 af
Primary = 14.08 cfs @ 12.82 hrs, Volume= 2.558 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Exhibit 7
Civil Plans

Classroom & Community Hall Addition



FRIENDS SCHOOL OF PORTLAND
inquiry, reflection, & action

CIVIL
Walsh Engineering
Associates, Inc.
1 Karen Drive, Suite 2A
Westbrook, ME 04092
p: 207-553-9898

**Mechanical & Plumbing
Integrated Energy
Systems, PLLC**
301 Middle Road
Falmouth, ME 04105
p: 207-781-4263

[illegible]

| | |
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| PHASE: | PERMITTING |
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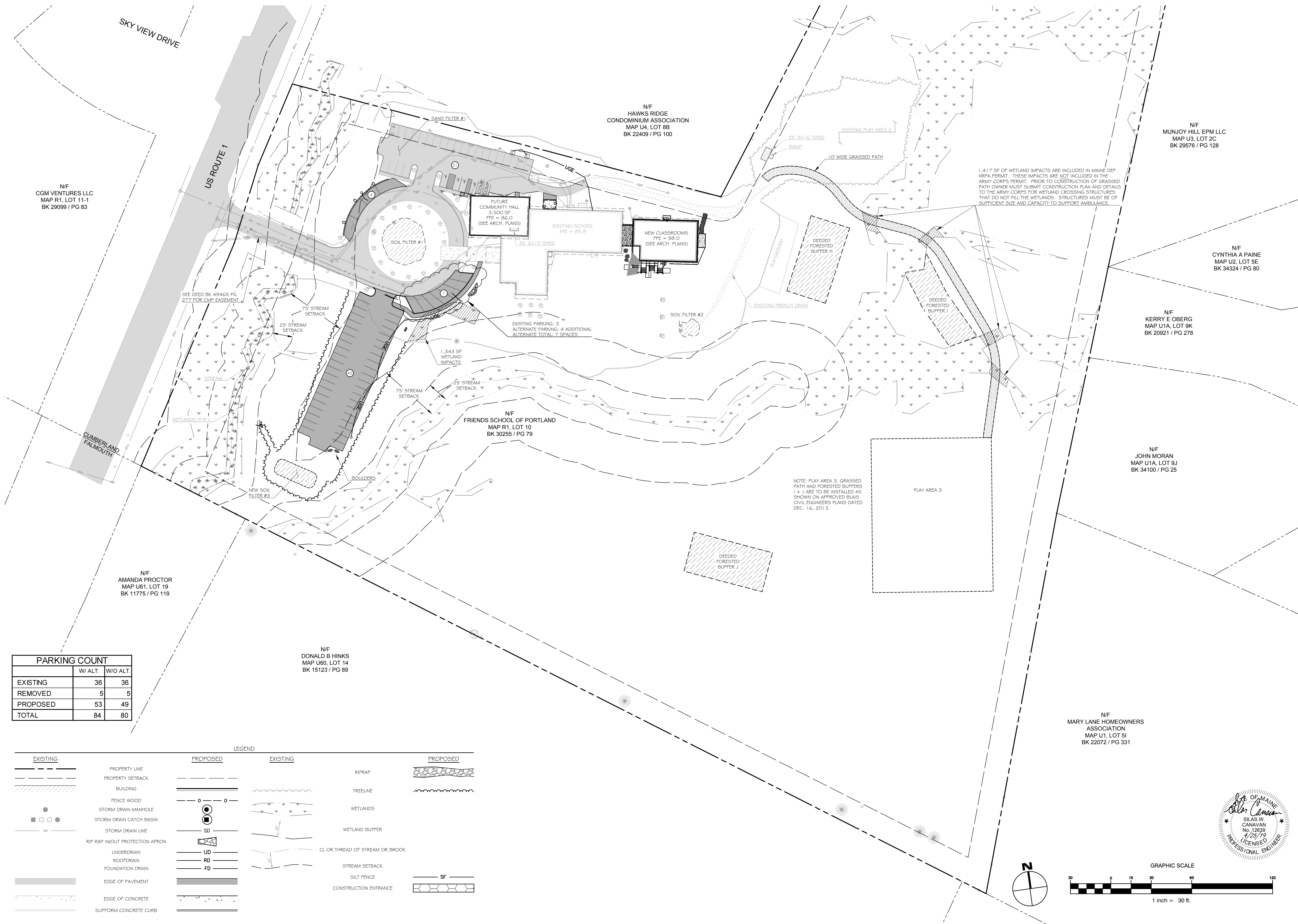
OVERALL

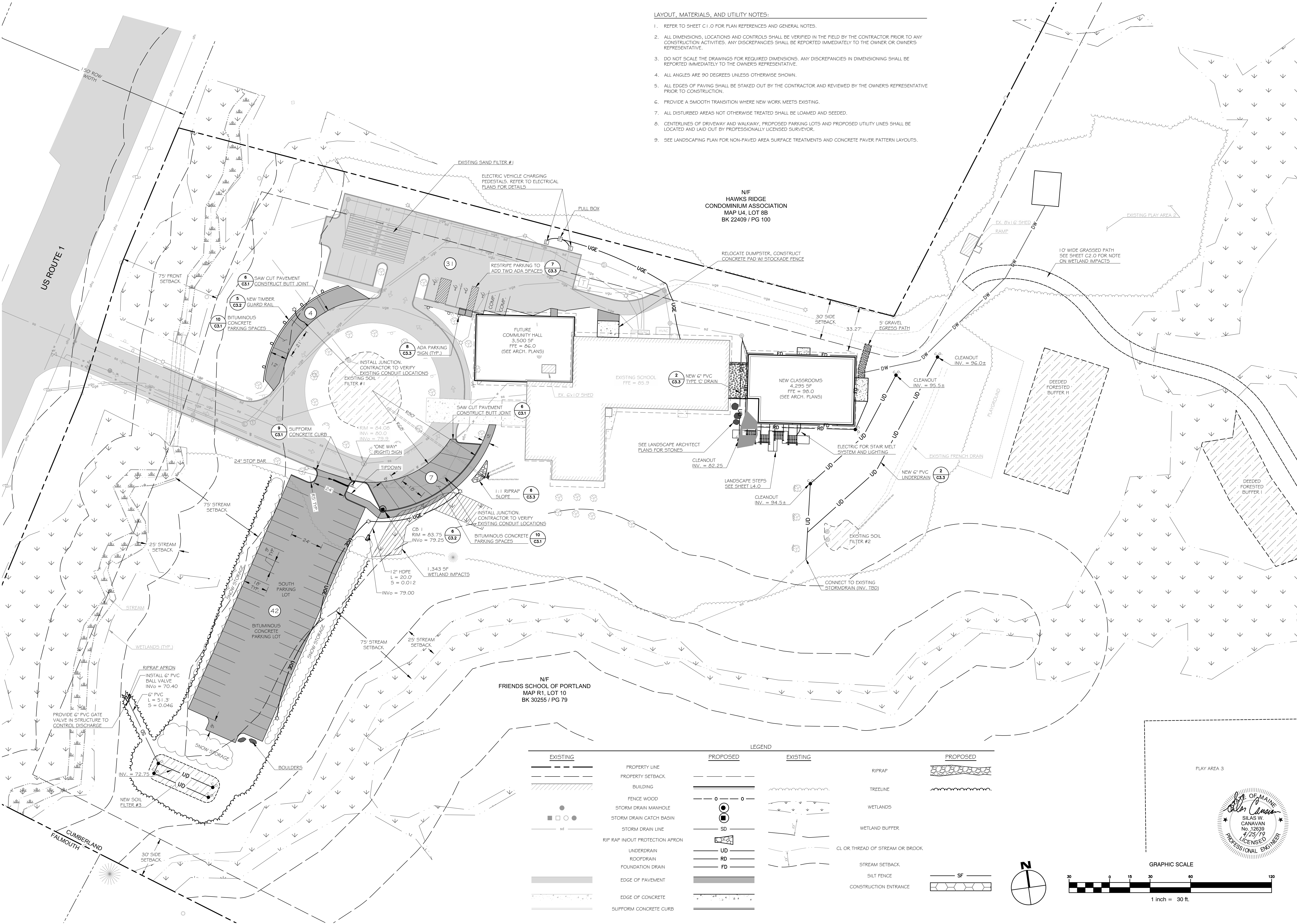
OVERALL DEVELOPMENT

DEVELOPMENT PLAN

C3.0

C2.0





LAYOUT, MATERIALS, AND UTILITY NOTES:

1. REFER TO SHEET C1.0 FOR PLAN REFERENCES AND GENERAL NOTES.
2. ALL DIMENSIONS, LOCATIONS AND CONTROLS SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO ANY CONSTRUCTION ACTIVITIES. ANY DISCREPANCIES SHALL BE REPORTED IMMEDIATELY TO THE OWNER OR OWNER'S REPRESENTATIVE.
3. DO NOT SCALE THE DRAWINGS FOR REQUIRED DIMENSIONS. ANY DISCREPANCIES IN DIMENSIONING SHALL BE REPORTED IMMEDIATELY TO THE OWNER'S REPRESENTATIVE.
4. ALL ANGLES ARE 90 DEGREES UNLESS OTHERWISE SHOWN.
5. ALL EDGES OF PAVING SHALL BE STAKED OUT BY THE CONTRACTOR AND REVIEWED BY THE OWNER'S REPRESENTATIVE PRIOR TO CONSTRUCTION.
6. PROVIDE A SMOOTH TRANSITION WHERE NEW WORK MEETS EXISTING.
7. ALL DISTURBED AREAS NOT OTHERWISE TREATED SHALL BE LOAMED AND SEEDED.
8. CENTERLINES OF DRIVEWAY AND WALKWAY, PROPOSED PARKING LOTS AND PROPOSED UTILITY LINES SHALL BE LOCATED AND LAID OUT BY PROFESSIONALLY LICENSED SURVEYOR.
9. SEE LANDSCAPING PLAN FOR NON-PAVED AREA SURFACE TREATMENTS AND CONCRETE PAVEMENT PATTERNS.

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PROJECT

Classroom & Community Hall Addition

Friends School of Portland
11 US Route 1
Cumberland, ME 04021



STRUCTURAL

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424 Fore Street
Portland, ME 04101
p: 207-842-2800

LANDSCAPE

Soren Deniro Design Studio
43 Wellwood Road
Portland, ME 04103
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ELECTRICAL

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CIVIL

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Westbrook, ME 04092
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Mechanical & Plumbing
Integrated Energy Systems, PLLC

301 Middle Road
Fairmount, ME 04105
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| DATE | CHANGE NAME | CHD | ISSUE NO | DESCRIPTION |
|----------|-------------|-----|----------|-----------------------------|
| 08/20/18 | | | A | PRICING SET |
| 10/02/18 | | | B | FOR SPK PERMIT |
| 02/21/18 | | | C | FOR CD COORD. |
| 02/22/19 | | | D | FOR CONSTRUCTION |
| 02/27/19 | | | E | FOR CONSTRUCTION PERMITTING |
| 03/25/19 | | | F | SUBMITTED FOR PERMITTING |
| 04/25/19 | | | G | REVISED PER TOWN COMMENTS |

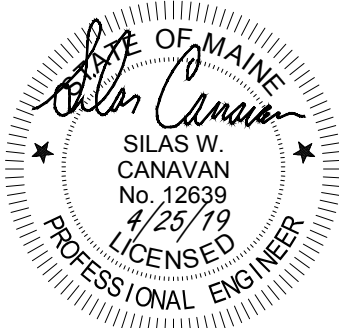
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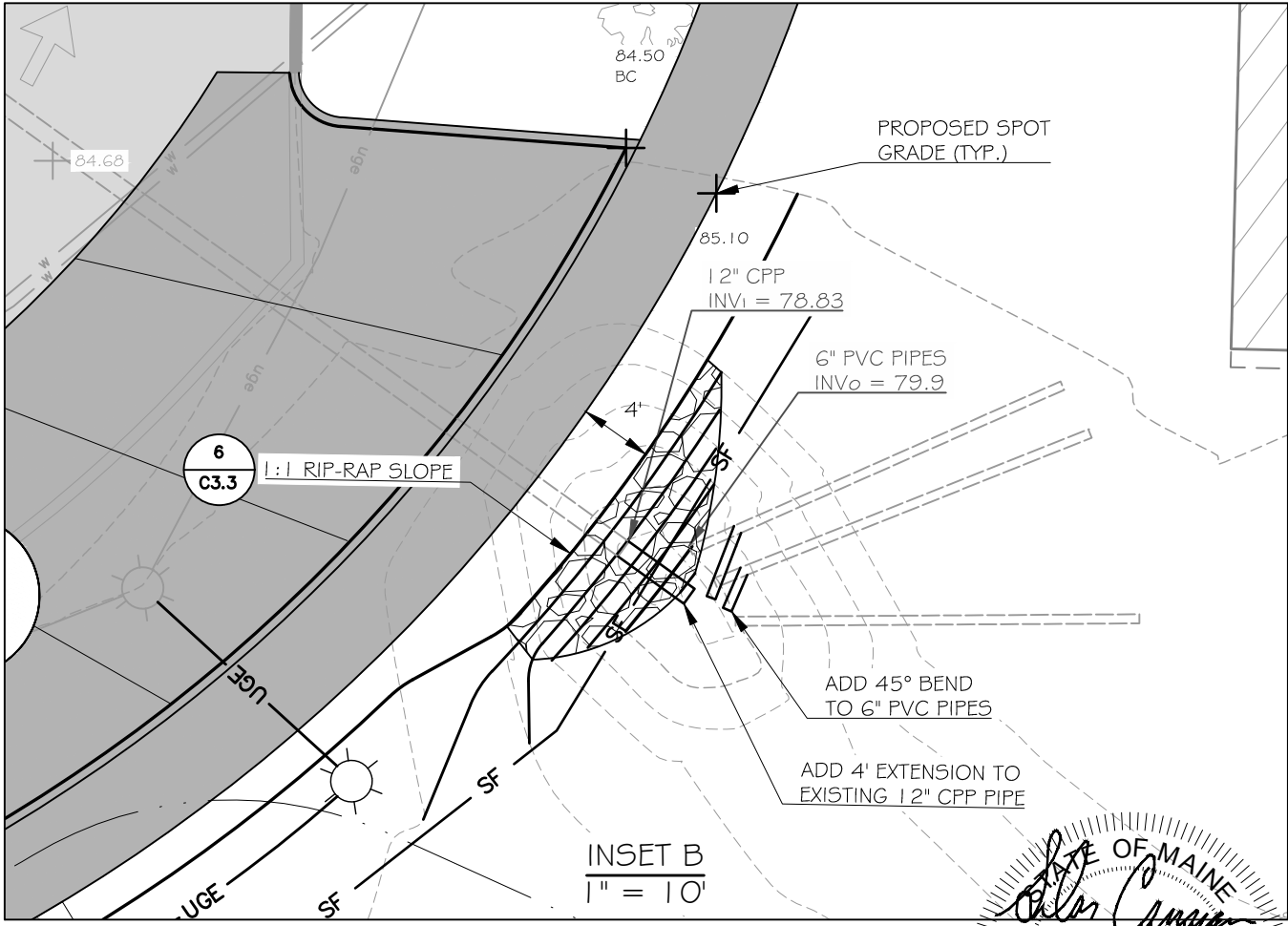
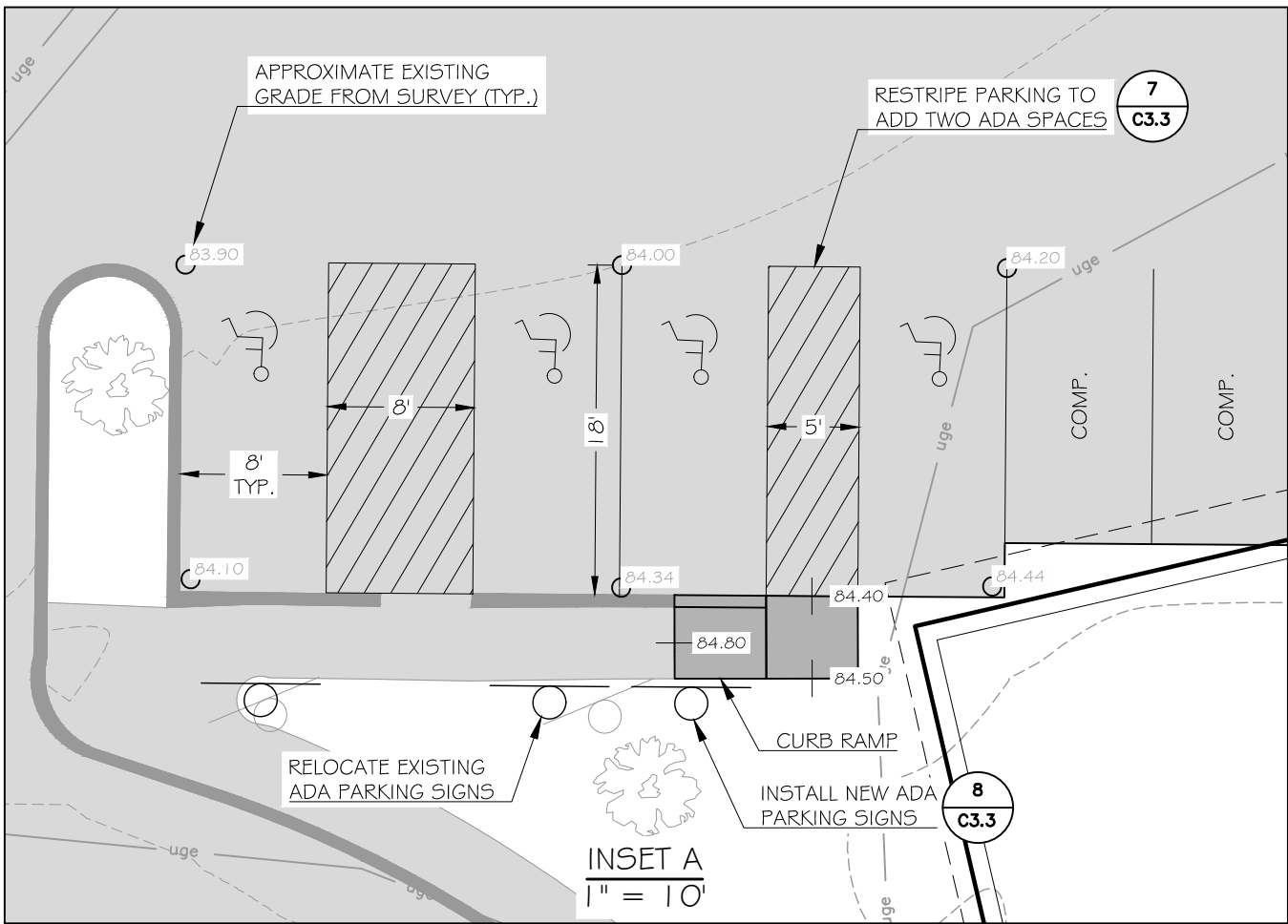
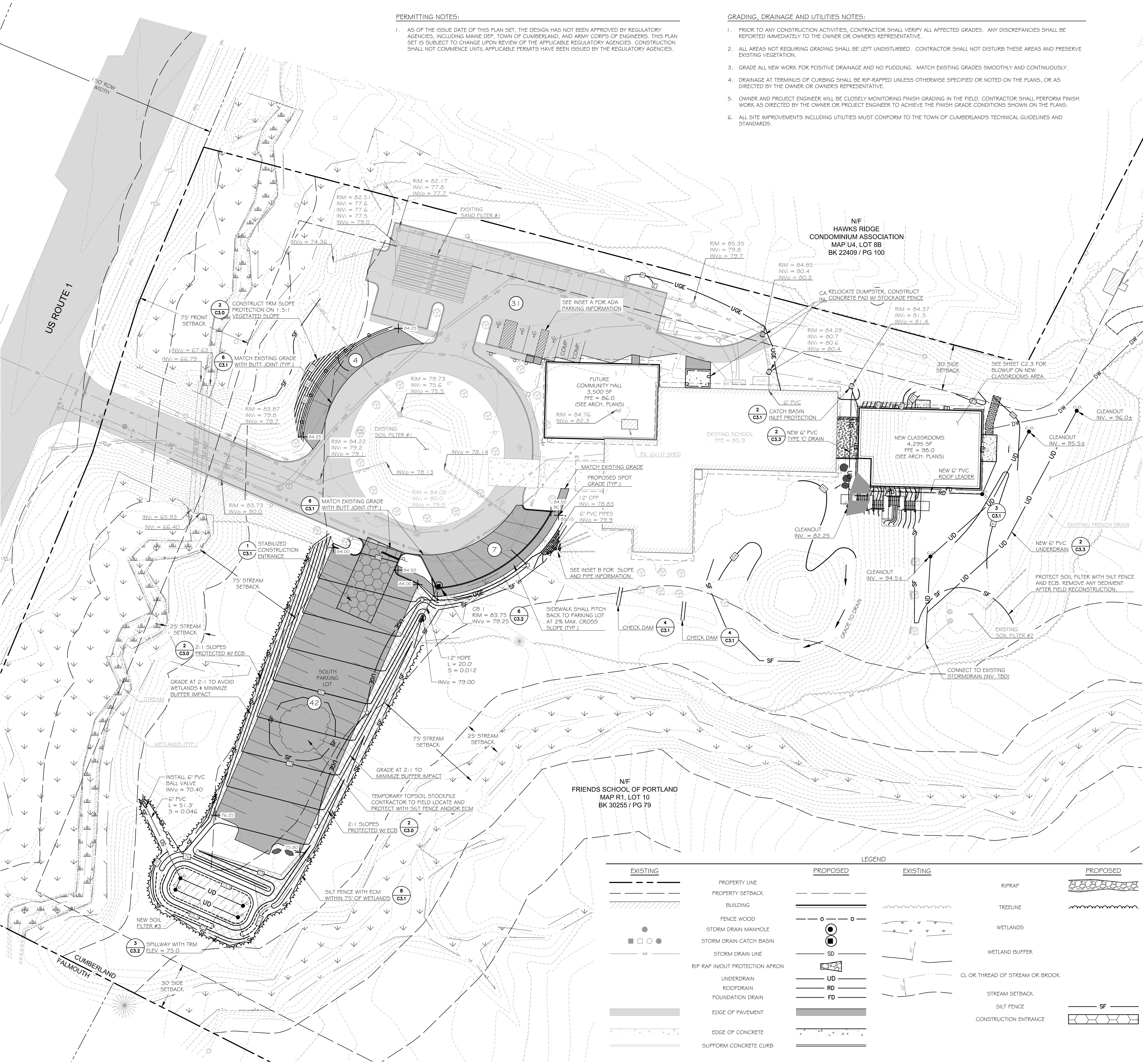
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PHASE: PERMITTING



LAYOUT & UTILITIES PLAN
C2.1



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| 02/27/19 | | | E | FOR PERMITTING | |
| 03/25/19 | | | F | SUBMITTED FOR PERMITTING | |
| 04/26/19 | | | G | REVISED PER TOWN COMMENTS | |

PROJECT NO: FSP2

DESIGNED BY: NGC

DRAWN BY: CAR/JWG

PHASE: PERMITTING

GRADING & DRAINAGE PLAN
C2.2

EROSION AND SEDIMENTATION CONTROL NOTES:

INTRODUCTION

THE FOLLOWING PLAN FOR CONTROLLING SEDIMENTATION AND EROSION IN THIS PROJECT IS BASED ON CONSERVATION PRACTICES FOUND IN THE MAINE EROSION & SEDIMENT CONTROL BMPs MANUAL, OCTOBER 2016, AND MAINE EROSION AND SEDIMENT CONTROL PRACTICE FIELD GUIDE FOR CONTRACTORS, REVISED 2014. MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION, THE CONTRACTOR WHO IMPLEMENTS THIS PLAN SHALL BE FAMILIAR WITH THESE PUBLICATIONS AND ADHERE TO THEM AND THE PRACTICES PRESENTED HEREIN. REFERENCE IS MADE TO THE GRADING AND DRAINAGE PLANS (C3.0 THROUGH C3.6) WITHIN THE PLAN SET, SHOWING THE LOCATIONS AND TYPES OF PROPOSED MEASURES TO BE IMPLEMENTED.

GENERAL EROSION AND SEDIMENTATION CONTROL PRACTICES

THE FOLLOWING IS A LIST OF GENERAL EROSION CONTROL PRACTICES THAT WILL BE USED TO PREVENT EROSION AND SEDIMENTATION BEFORE, DURING AND AFTER THE CONSTRUCTION OF THIS PROJECT. IN ADDITION, SPECIAL CARE SHALL BE USED AT ALL TIMES TO:

- 1) CORRECT ANY EROSION PROBLEMS IMMEDIATELY
- 2) REGULARLY MONITOR THE IMPLEMENTED PRACTICES, ESPECIALLY AFTER EVERY RAINFALL
- 3) REVEGETATE DISTURBED AREAS AS SOON AS POSSIBLE AFTER CONSTRUCTION
- 4) CONFORM TO ALL REQUIREMENTS/STANDARDS OF THE SITES MAINE DEP EROSION & SEDIMENT CONTROL BMP MANUAL.

SILT FENCE AND/OR EROSION CONTROL MIX SEDIMENT BARRIERS

SILT FENCE AND/OR EROSION CONTROL MIX SEDIMENT BARRIERS WILL BE INSTALLED ALONG THE DOWN GRADIENT SIDE OF THE PROPOSED GROUND DISTURBANCE AREAS PRIOR TO ANY CONSTRUCTION ACTIVITIES WHERE SLOPES EXCEED 8% OR THERE IS FLOWING WATER BOTH SILT FENCE AND EROSION CONTROL MATTING BERMS SHALL BE USED.

CATCH BASIN PROTECTION

CATCH BASIN PROTECTION WILL BE INSTALLED AT THE FIRST DOWNGRADIENT CATCH BASIN IN STREET ADJACENT TO ANY CONSTRUCTION ACTIVITIES AND IN ALL ONSITE CATCH BASINS UNTIL SITE HAS BEEN COMPLETELY STABILIZED.

CONSTRUCTION PHASE

THE FOLLOWING GENERAL PRACTICES WILL BE IMPLEMENTED TO PREVENT EROSION DURING CONSTRUCTION ON THIS PROJECT:

1. ONLY THOSE AREAS UNDER ACTIVE CONSTRUCTION WILL BE CLEARED AND LEFT IN AN UNTREATED OR UNVEGETATED CONDITION. ONCE CONSTRUCTION OF AN AREA IS COMPLETE, FINAL GRADING, LOAMING AND SEEDING SHALL OCCUR IMMEDIATELY (REFER TO "POST CONSTRUCTION REVEGETATION" SECTION). IF DURING FINAL GRADING, LOAMING AND SEEDING CAN NOT OCCUR IMMEDIATELY, IT SHALL BE DONE PRIOR TO ANY STORM EVENT AND WITHIN 15 DAYS OF COMPLETING CONSTRUCTION IN THE AREA. IF FINAL GRADING, LOAMING AND SEEDING CANNOT OCCUR WITHIN 7 DAYS, OR IF THE AREA IS NOT UNDER ACTIVE CONSTRUCTION FOR A PERIOD LONGER THAN 7 DAYS, SEE ITEM NO. 4 BELOW.
2. PRIOR TO THE START OF CONSTRUCTION IN A SPECIFIC AREA, SILT FENCING SHALL BE INSTALLED ON DOWNGRADIENT PORTIONS OF THE SITE AS LOCATED ON THE PLANS TO PROTECT AGAINST ANY CONSTRUCTION RELATED EROSION.
3. TOPSOIL WILL BE STOCKPILED WHEN NECESSARY IN AREAS WHICH HAVE MINIMUM POTENTIAL FOR EROSION AND WILL BE KEPT AS FAR AS POSSIBLE FROM EXISTING DRAINAGE AREAS AND WETLANDS. ALL STOCKPILES EXPECTED TO REMAIN LONGER THAN 7 DAYS SHALL BE:
 - A. TREATED WITH ANCHORED MULCH (WITHIN 5 DAYS OF THE LAST DEPOSIT OF STOCKPILED SOIL).
 - B. SEEDED WITH CONSERVATION MIX AND MULCHED IMMEDIATELY.
 - C. STOCKPILES SHALL BE EITHER PLACED UPHILL OF AN EXISTING SEDIMENT BARRIER ON THE SITE OR ENCIRCLED BY A HAY BALE OR SILT FENCE BARRIER THE FIRST DAY THAT STOCKPILING COMMENCES.
4. ALL DISTURBED AREAS EXPECTED TO REMAIN LONGER THAN 7 DAYS SHALL BE:
 - A. TREATED WITH STRAW AT A RATE OF 70-90 LBS. PER 1,000 SQUARE FEET FROM 4/16 TO 1/4", OR AT A RATE OF 150-200 LBS. PER 1,000 SQUARE FEET FROM 1/4" TO 4/15.
 - B. SEEDED WITH CONSERVATION MIX OF PERENNIAL RYE GRASS (1.0 LBS/1,000 SQ.FT.) AND MULCHED IMMEDIATELY. FROM 1/4" TO 4/15, FOLLOW THE SEEDING RATES AS OUTLINED BELOW IN SUB-SECTION 4.D. OF THE "POST CONSTRUCTION REVEGETATION" SECTION.
 - C. MONITORED EVERY TWO WEEKS UNTIL SEEDING CAN OCCUR AND REMULCHED AS NEEDED TO PROTECT SLOPES.
5. ALL GRADING WILL BE HELD TO A MAXIMUM 3:1 SLOPE WHERE PRACTICAL. GREATER SLOPES MAY BE USED WHERE THE BANKS ARE PROTECTED WITH SOFT ARMOUR MATTING, EROSION CONTROL MATTING, OR RIPRAP. ALL SLOPES WILL BE STABILIZED WITH PERMANENT SEEDING IMMEDIATELY AFTER FINAL GRADING IS COMPLETE. (IT IS UNDERSTOOD THAT IMMEDIATELY MEANS WITHIN 5 DAYS OF THE COMPLETION OF WORK. SEE POST-CONSTRUCTION REVEGETATION FOR SEEDING SPECIFICATION).
6. APPLICATION RATE MUST BE 2 BALES (70-90 LBS.) PER 1,000 SQUARE FEET OR 1.5 TO 2 TONS (90-100 BALES) PER ACRE TO COVER 75 TO 90% OF THE GROUND SURFACE. DRIVE OVER WITH TRACKED CONSTRUCTION EQUIPMENT ON GRADES OF 5% AND LESS.
7. CONSTRUCTION TRAFFIC WILL BE DIRECTED OVER THE EXISTING SITE ENTRANCE. THE ROAD SHALL BE SWEEPED AND VACUUMED DAILY SHOULD SEDIMENT BE TRACKED ONTO IT.
8. ALL AREAS DRAINING TO A STORMWATER FILTER OR BMP SHALL BE STABILIZED PRIOR TO CONSTRUCTION OF FILTER MEDIA TO PREVENT SEDIMENT FROM CLOGGING MEDIA.

1 EROSION AND SEDIMENTATION CONTROL NOTES

C3.0 NOT TO SCALE

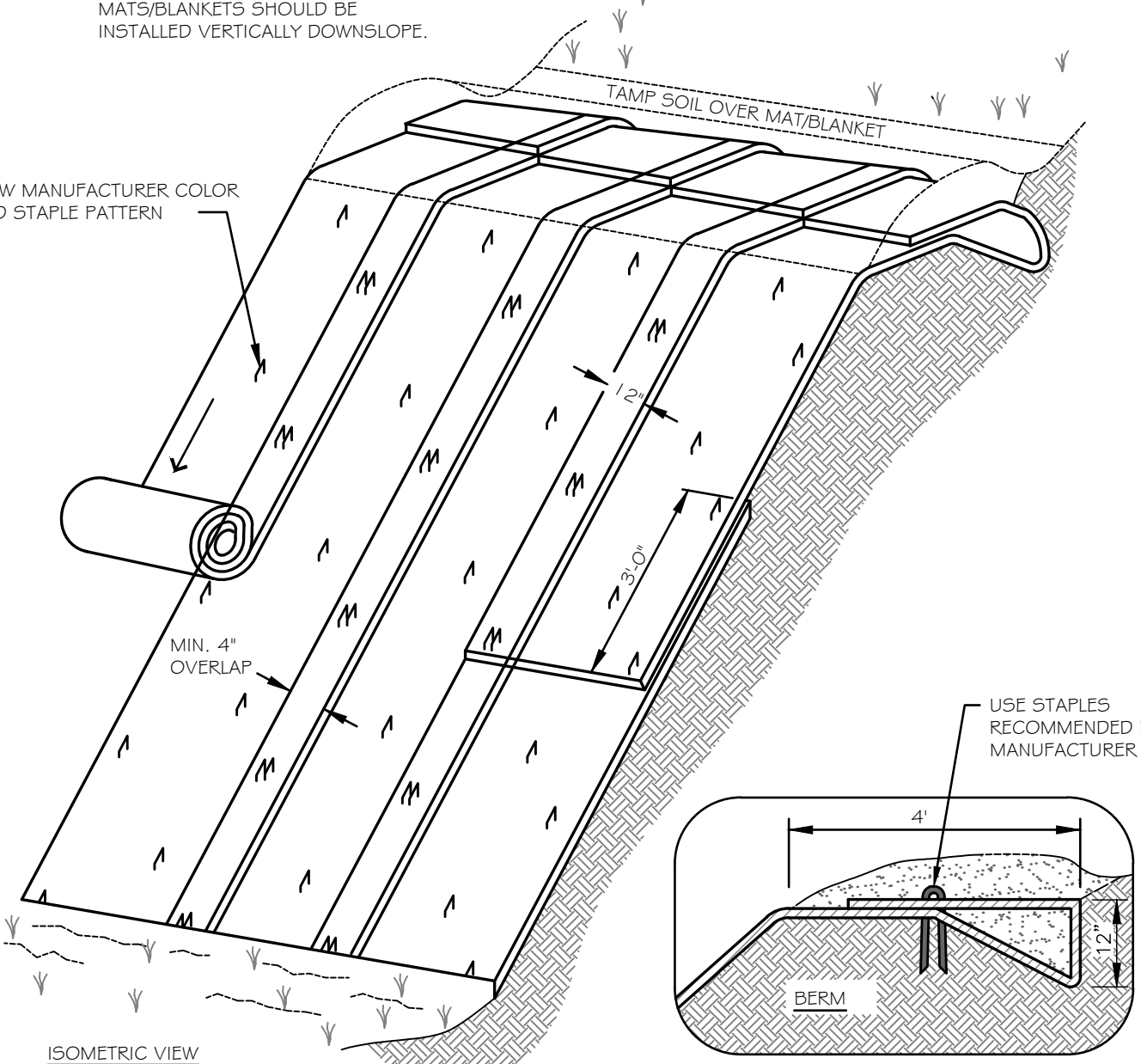
INSTALLATION INSTRUCTIONS:

1. TURF REINFORCEMENT MAT (TRM) MATERIAL SHALL BE ENKAMAT 7020, OR APPROVED EQUAL.
2. EROSION CONTROL BLANKET (ECB) SHALL BE BIONET 575BN SINGLE NET STRAW BLANKET BY NORTH AMERICAN GREEN OR APPROVED EQUAL.
3. FOR TRM INSTALLATION ONLY:
 - 3.1. APPLY 2" OF LOAM ONTO THE GROUND SURFACE.
 - 3.2. OVER TOP THE 2" OF LOAM, UNROLL MAT IN THE DIRECTION OF WATER FLOW.
4. MAT SHOULD LIE FLAT. DO NOT STRETCH MAT OVER GROUND. STRETCHING MAY CAUSE MAT TO BRIDGE DEPRESSIONS IN THE SURFACE AND ALLOW EROSION UNDERNEATH.
5. BURY TRANSVERSE TERMINAL ENDS OF MAT TO SECURE AND PREVENT EROSION FLOW UNDERNEATH.
6. SECURE MAT SNUGLY INTO ALL TRANSVERSE CHECK SLOTS.
7. BACKFILL AND COMPACT TRENCHES AND CHECK SLOTS AFTER STAKING THE MAT IN BOTTOM OF TRENCH.
8. OVERLAP ROLL ENDS BY THREE (3) FEET (MIN.) WITH UPSLOPE MAT ON TOP TO PREVENT UPLIFT OF MAT END BY WATER FLOW. IF INSTALLING IN THE DIRECTION OF A CONCENTRATED WATER FLOW, START NEW ROLLS IN A TRANSVERSE DITCH.
9. OVERLAP ADJACENT EDGES OF MAT BY THREE (3) INCHES (MIN.) AND STAKE.
10. USE WOOD STAKES OR STAPLES FOR PINNING MAT TO THE GROUND SURFACE, PER MANUFACTURER'S RECOMMENDATIONS.
11. IN ALL TRANSVERSE TERMINAL TRENCHES AND CHECK SLOTS, STAKE EACH MAT AT ITS CENTER AND OVERLAP EDGES BEFORE BACKFILLING AND COMPACTING.
12. STAKE OVERLAPS LONGITUUDINALLY AT THREE (3) TO FIVE (5) FOOT INTERVALS.
13. WORK ADDITIONAL LOAM INTO THE MAT AND COVER THE MAT SURFACE WITH 1" OF LOAM, THEN SEED AND MULCH.

MATS/BLANKETS SHOULD BE INSTALLED VERTICALLY DOWNSLOPE.

FOLLOW MANUFACTURER COLOR CODED STAPLE PATTERN

MIN. 4" OVERLAP



2 STRAW MATTING (ECB) AND TRM EROSION CONTROL

C3.0 NOT TO SCALE

DEWATERING

1. ALL DEWATERING DISCHARGE LOCATIONS SHALL BE LOCATED ON RELATIVELY FLAT GROUND AT LEAST 75' FROM STREAMS AND 25' FROM WETLANDS. THE CONTRACTOR SHALL UTILIZE DIRTBAGS, EROSION CONTROL MIX BERMS, OR SIMILAR METHODS FOR FILTRATION OF DEWATERING AND SHALL CONFORM TO THE MAINE EROSION AND SEDIMENT CONTROL BMPs G-1, G-2, AND G-3.

POST CONSTRUCTION REVEGETATION

THE FOLLOWING GENERAL PRACTICES WILL BE IMPLEMENTED TO PREVENT EROSION AS SOON AS AN AREA IS READY TO UNDERGO FINAL GRADING:

1. A MINIMUM OF 6" OF LOAM WILL BE SPREAD OVER DISTURBED AREAS AND GRADED TO A UNIFORM DEPTH AND NATURAL APPEARANCE.
2. LAWN AREAS: "PARK MIX" GRASS SEED BY ALLEN, STERLING & LOTHROP (FALMOUTH, MAINE), OR APPROVED EQUAL.
3. MULCH SHALL BE HAY OR STRAW MULCHES THAT ARE DRY AND FREE FROM UNDESIRABLE SEEDS AND COARSE MATERIALS.
 - A. APPLICATION RATE MUST BE 2 BALES (70-90 LBS.) PER 1,000 SQUARE FEET OR 1.5 TO 2 TONS (90-100 BALES) PER ACRE TO COVER 75 TO 90% OF THE GROUND SURFACE.
 - B. DRIVE OVER WITH TRACKED CONSTRUCTION EQUIPMENT ON GRADES OF 5% AND LESS.
 - C. BLANKET WITH TACKED PHOTODEGRADABLE/BIODEGRADABLE NETTING ON GRADES GREATER THAN 5%.
4. HYDRO-MULCH SHALL CONSIST OF A MIXTURE OF ASPHALT, WOOD FIBRE OR PAPER FIBRE AND WATER, WHICH IS SPRAYED OVER A SEEDED AREA. HYDRO-MULCH SHALL NOT BE USED BETWEEN 1/4" AND 4/15.
5. CONSTRUCTION SHALL BE PLANNED TO ELIMINATE THE NEED FOR SEEDING BETWEEN OCTOBER 1ST AND APRIL 15TH. SHOULD SEEDING BE NECESSARY BETWEEN THESE DATES, THE FOLLOWING PROCEDURE SHALL BE FOLLOWED:
 - A. ONLY UNFROZEN LOAM SHALL BE USED.
 - B. LOAMING, SEEDING AND MULCHING WILL NOT BE DONE OVER SNOW OR ICE COVER. IF SNOW EXISTS, IT MUST BE REMOVED PRIOR TO PLACEMENT OF SEED.
 - C. WHERE PERMANENT SEEDING IS NECESSARY, ANNUAL WINTER RYE (1.2 LBS/1,000 S.F.) SHALL BE SOWN INSTEAD OF THE PREVIOUSLY NOTED SEEDING RATE.
 - D. WHERE TEMPORARY SEEDING IS REQUIRED, ANNUAL WINTER RYE (2.5 LBS/1,000 S.F.) SHALL BE SOWN INSTEAD OF THE PREVIOUSLY NOTED SEEDING RATE.
 - E. FERTILIZING, SEEDING AND MULCHING SHALL BE DONE ON LOAM THE DAY THE LOAM IS SPREAD.
 - F. HAY MULCH SHALL BE SECURED WITH PHOTODEGRADABLE/BIODEGRADABLE NETTING. TRACKING BY MACHINERY ALONE WILL NOT SUFFICE. WINTER MULCHING RATES, SHALL BE DOUBLE AS SPECIFIED ABOVE IN SUBSECTION 3.A OF THE "POST CONSTRUCTION REVEGETATION" SECTION, SHOULD BE APPLIED DURING THIS PERIOD.
 - G. FOLLOWING FINAL SEEDING, THE SITE WILL BE INSPECTED EVERY 30 DAYS UNTIL 90% COVER HAS BEEN ESTABLISHED. RESEEDING WILL BE CARRIED OUT BY THE CONTRACTOR WITHIN 10 DAYS OF NOTIFICATION BY THE DESIGN PROFESSIONAL THAT THE EXISTING CATCH IS INADEQUATE.

MONITORING SCHEDULE

THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING, MONITORING, MAINTAINING, REPAIRING, REPLACING AND REMOVING ALL OF THE EROSION AND SEDIMENTATION CONTROLS OR APPOINTING A QUALIFIED SUBCONTRACTOR TO DO SO. MAINTENANCE MEASURES WILL BE APPLIED AS NEEDED DURING THE ENTIRE CONSTRUCTION CYCLE. IMMEDIATELY FOLLOWING ANY SIGNIFICANT RAINFALL, AND AT LEAST ONCE A WEEK, A VISUAL INSPECTION WILL BE MADE OF ALL EROSION AND SEDIMENTATION CONTROLS AS FOLLOWS:

1. SILT FENCE SHALL BE INSPECTED AND REPAIRED. SEDIMENT TRAPPED BEHIND THESE BARRIERS SHALL BE EXCAVATED WHEN IT REACHES A DEPTH OF 6" AND REDISTRIBUTED TO AREAS UNDERGOING FINAL GRADING.
2. CONSTRUCTION ENTRANCE SHALL BE VISUALLY INSPECTED AND REPAIRED AS NEEDED. ANY AREAS SUBJECT TO RUTTING SHALL BE STABILIZED IMMEDIATELY. IF THE VOIDS OF THE CONSTRUCTION ENTRANCE BECOME FILLED WITH MUD, MORE CRUSHED STONE SHALL BE ADDED AS NEEDED. THE PUBLIC ROADWAY SHALL BE SWEEPED AND VACUUMED SHOULD MUD BE DEPOSITED/TRACKED ONTO THEM.

STANDARDS FOR STABILIZING SITES FOR THE WINTER

THE FOLLOWING STANDARDS AND METHODOLOGIES SHALL BE USED FOR STABILIZING THE SITE DURING THE WINTER CONSTRUCTION PERIOD:

1. STANDARD FOR THE TIMELY STABILIZATION OF DISTURBED SLOPES (ANY AREA HAVING A GRADE GREATER THAN 25%) - THE CONTRACTOR WILL SEED AND MULCH ALL SLOPES TO BE VEGETATED BY SEPTEMBER 15TH. IF THE CONTRACTOR FAILS TO STABILIZE ANY SLOPE TO BE VEGETATED BY SEPTEMBER 15TH, THEN THE CONTRACTOR WILL TAKE ONE OF THE FOLLOWING ACTIONS TO STABILIZE THE SLOPE FOR LATE FALL AND WINTER.
 - A. STABILIZE THE SOIL WITH TEMPORARY VEGETATION AND EROSION CONTROL MATS: BY OCTOBER 1ST THE CONTRACTOR WILL SEED THE DISTURBED SLOPE WITH WINTER RYE AT A RATE OF 3 POUNDS PER 1,000 SQUARE FEET AND THEN INSTALL EROSION CONTROL MATS OR ANCHORED HAY MULCH OVER THE SEEDING AT TWICE THE RATE AS SPECIFIED ABOVE IN SUBSECTION 3.A OF THE "POST CONSTRUCTION REVEGETATION" SECTION. THE CONTRACTOR WILL MONITOR GROWTH OF THE RYE OVER THE NEXT 30 DAYS.
 - B. STABILIZE THE SLOPE WITH WOOD-WASTE COMPOST: THE CONTRACTOR WILL PLACE A SIX-INCH LAYER OF WOOD-WASTE COMPOST ON THE SLOPE BY NOVEMBER 15TH. THE CONTRACTOR WILL NOT USE WOOD-WASTE COMPOST TO STABILIZE SLOPES HAVING GRADES GREATER THAN 50% (2H:1V) OR HAVING GROUNDWATER SEEPS ON THE SLOPE FACE.

- C. STABILIZE THE SLOPE WITH STONE RIPRAP: THE CONTRACTOR WILL PLACE A LAYER OF STONE RIPRAP ON THE SLOPE BY NOVEMBER 15TH. THE DEVELOPER'S OWNER WILL HIRE A REGISTERED PROFESSIONAL ENGINEER TO DETERMINE THE STONE SIZE NEEDED FOR STABILITY ON THE SLOPE AND TO DESIGN A FILTER LAYER FOR UNDERNEATH THE RIPRAP.

STANDARD FOR THE TIMELY STABILIZATION OF DISTURBED SOILS - BY SEPTEMBER 15TH THE CONTRACTOR WILL SEED AND MULCH ALL DISTURBED SOILS ON THE SITE. IF THE CONTRACTOR FAILS TO STABILIZE THESE SOILS BY THIS DATE, THEN THE CONTRACTOR WILL TAKE ONE OF THE FOLLOWING ACTIONS TO STABILIZE THE SOIL FOR LATE FALL AND WINTER.

- A. STABILIZE THE SOIL WITH TEMPORARY VEGETATION: BY OCTOBER 1ST THE CONTRACTOR WILL SEED THE DISTURBED SOIL WITH WINTER RYE AT A SEEDING RATE OF 3 POUNDS PER 1,000 SQUARE FEET, LIGHTLY MULCH THE SEEDS WITH HAY OR STRAW AT 75 POUNDS PER 1,000 SQUARE FEET, AND ANCHOR THE MULCH WITH PLASTIC NETTING. THE CONTRACTOR WILL 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 THE CONTRACTOR WILL MULCH THE AREA FOR OVER-WINTER PROTECTION AS DESCRIBED IN ITEM III OF THIS STANDARD.
- B. STABILIZE THE SOIL WITH SOD: THE CONTRACTOR WILL STABILIZE THE DISTURBED SOIL WITH PROPERLY INSTALLED SOD BY OCTOBER 1ST. PROPER INSTALLATION INCLUDES THE CONTRACTOR PINNING THE SOD ONTO THE SOIL 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.
- C. STABILIZE THE SOIL WITH MULCH: BY NOVEMBER 15TH THE CONTRACTOR WILL MULCH THE DISTURBED SOIL BY SPREADING HAY OR STRAW AT A RATE OF AT LEAST 150 POUNDS PER 1,000 SQUARE FEET ON THE AREA SO THAT NO SOIL IS VISIBLE THROUGH THE MULCH. IMMEDIATELY AFTER APPLYING THE MULCH, THE CONTRACTOR WILL ANCHOR THE MULCH WITH NETTING OR OTHER METHOD TO PREVENT WIND FROM MOVING THE MULCH OFF THE DISTURBED SOIL.

EROSION CONTROL REMOVAL

AN AREA IS CONSIDERED STABLE IF IT IS PAVED OR IF 80% GROWTH OF PLANTED SEEDS IS ESTABLISHED. ONCE AN AREA IS CONSIDERED STABLE, THE EROSION CONTROL MEASURES CAN BE REMOVED AS FOLLOWS:

1. SILT FENCE: SILT FENCE SHALL BE DISPOSED OF LEGALLY AND PROPERLY OFF-SITE. ALL SEDIMENT TRAPPED BEHIND THESE CONTROLS SHALL BE DISTRIBUTED TO AN AREA UNDERGOING FINAL GRADING OR REMOVED AND RELOCATED OFF-SITE.
2. STABILIZED CONSTRUCTION ENTRANCE: THE STABILIZED CONSTRUCTION ENTRANCE SHALL BE REMOVED ONCE THE COMPACTED ROADWAY BASE IS IN PLACE. STONE AND SEDIMENT FROM THE CONSTRUCTION ENTRANCE SHALL BE REDISTRIBUTED TO AN AREA UNDERGOING GRADING OR REMOVED AND RELOCATED OFFSITE.
3. MISCELLANEOUS: ONCE ALL THE TRAPPED SEDIMENTS HAVE BEEN REMOVED FROM THE TEMPORARY SEDIMENTATION DEVICES THE DISTURBED AREAS MUST BE REGRADED IN AN AESTHETIC MANNER TO CONFORM TO THE SURROUNDING TOPOGRAPHY. ONCE GRADED THESE DISTURBED AREAS MUST BE LOAMED (IF NECESSARY), FERTILIZED, SEEDS AND MULCHED IN ACCORDANCE WITH THE RATES PREVIOUSLY STATED.

THE ABOVE EROSION CONTROLS MUST BE REMOVED WITHIN 30 DAYS OF FINAL STABILIZATION OF THE SITE. CONFORMANCE WITH THIS PLAN AND FOLLOWING THESE PRACTICES WILL RESULT IN A PROJECT THAT COMPLIES WITH THE STATE REGULATIONS AND THE STANDARDS OF THE NATURAL RESOURCES PROTECTION ACT, AND WILL PROTECT WATER QUALITY IN AREAS DOWNSTREAM FROM THE PROJECT.

MAINE CONSTRUCTION GENERAL PERMIT REQUIRED

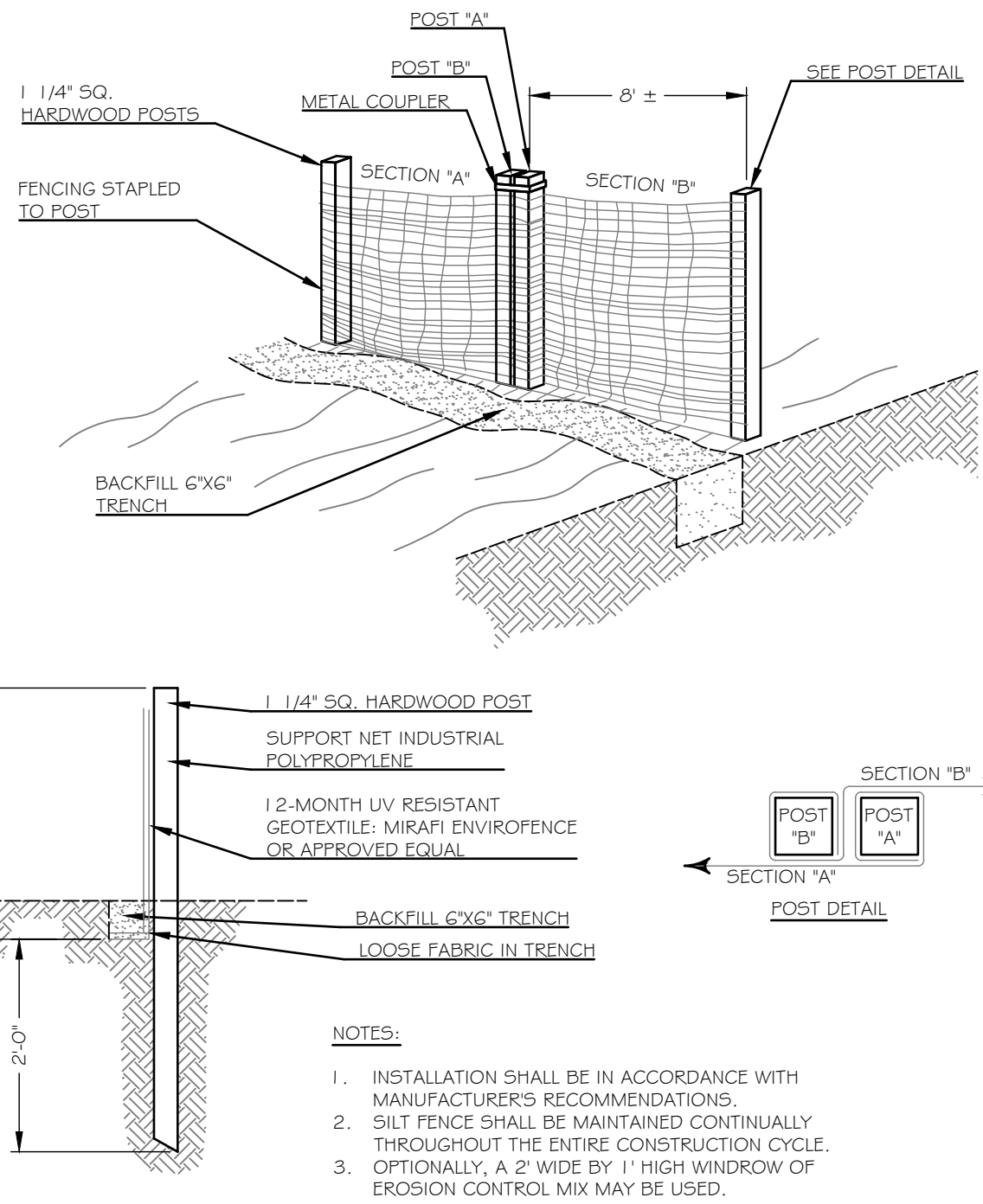
SUBMISSION OF A MAINE CONSTRUCTION GENERAL PERMIT (MCGP) IS REQUIRED PRIOR TO COMMENCEMENT OF ANY EXCAVATION ACTIVITIES.

INSPECTION AND MAINTENANCE (APPENDIX B)

1. INSPECTION AND MAINTENANCE REQUIREMENTS: INSPECT DISTURBED AND IMPERVIOUS AREAS, EROSION AND STORMWATER CONTROL MEASURES, AREAS USED FOR STORAGE THAT ARE EXPOSED TO PRECIPITATION, AND LOCATIONS WHERE VEHICLES ENTER OR EXIT THE SITE. INSPECT THESE AREAS AT LEAST ONCE A WEEK AS WELL AS BEFORE AND AFTER A STORM EVENT AND PRIOR TO COMPLETION OF PERMANENT STABILIZATION MEASURES. A PERSON WITH KNOWLEDGE OF EROSION AND STORMWATER CONTROL, INCLUDING THE STANDARDS IN THE MCGP AND ANY DEPARTMENTAL COMPANION DOCUMENT TO THE MCGP, MUST CONDUCT THE INSPECTION. THIS PERSON MUST BE IDENTIFIED IN THE INSPECTION LOG. IF BEST MANAGEMENT PRACTICES (BMPs) NEED TO BE MODIFIED OR IF ADDITIONAL BMPs ARE NECESSARY, IMPLEMENTATION MUST BE COMPLETED WITHIN 7 CALENDAR DAYS AND PRIOR TO ANY STORM EVENT (RAINFALL). ALL MEASURES MUST BE MAINTAINED IN EFFECTIVE OPERATING CONDITION UNTIL AREAS AREA PERMANENTLY STABILIZED.
2. INSPECTION LOG (REPORT): A LOG (REPORT) MUST BE KEPT SUMMARIZING THE SCOPE OF THE INSPECTION, NAME(S) AND QUALIFICATIONS OF THE PERSONNEL MAKING THE INSPECTION, THE DATE(S) OF THE INSPECTION, AND MAJOR OBSERVATIONS RELATING TO OPERATION OF EROSION AND SEDIMENTATION CONTROLS AND POLLUTION PREVENTION MEASURES. MAJOR OBSERVATIONS MUST INCLUDE BMPs THAT NEED MAINTENANCE, BMPs THAT FAILED TO OPERATE AS DESIGNED OR PROVED INADEQUATE FOR A PARTICULAR LOCATION, AND LOCATION(S) WHERE ADDITIONAL BMPs ARE NEEDED. FOR EACH BMP REQUIRING MAINTENANCE, BMP NEEDING REPLACEMENT, AND LOCATION NEEDING ADDITIONAL BMPs, NOTE IN THE INSPECTION LOG THE CORRECT ACTION TAKEN AND WHEN IT WAS TAKEN. THE LOG MUST BE MADE ACCESSIBLE TO THE DEPARTMENT STAFF AND A COPY MUST BE PROVIDED UPON REQUEST. THE PERMITTEE SHALL RETAIN A COPY OF THE LOG FOR A PERIOD OF AT LEAST THREE YEARS FROM THE COMPLETION OF THE PERMANENT STABILIZATION.

HOUSEKEEPING (APPENDIX C)

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.



3 PREFABRICATED SILT FENCE

C3.0 NOT TO SCALE

NOTE: ANY SPILL OR RELEASE OF TOXIC OR HAZARDOUS SUBSTANCES MUST BE REPORTED TO THE DEPARTMENT. FOR OIL SPILLS, CALL 1-800-482-0777 WHICH IS AVAILABLE 24 HOURS A DAY. FOR SPILLS OF TOXIC OR HAZARDOUS MATERIAL, CALL 1-800-452-4664 WHICH IS AVAILABLE 24 HOURS A DAY. FOR MORE INFORMATION, VISIT THE DEPARTMENT'S WEBSITE AT: HTTP://WWW.MAINE.GOV/DEP/SPILLS/EMERGENCYSPILLS.PDF

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 CONTAMINANT 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.

NOTE: LACK OF APPROPRIATE POLLUTANT REMOVAL BEST MANAGEMENT PRACTICES (BMPs) MAY RESULT IN VIOLATIONS OF THE GROUNDWATER QUALITY STANDARD ESTABLISHED BY 38 M.R.S.A. §465-G(1).

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 SWEEP 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.

NOTE: DEWATERING A STREAM WITHOUT A PERMIT FROM THE DEPARTMENT MAY VIOLATE STATE WATER QUALITY STANDARDS AND THE NATURAL RESOURCES PROTECTION ACT.

4. DEBRIS AND OTHER MATERIALS: MINIMIZE THE EXPOSURE OF CONSTRUCTION DEBRIS, BUILDINGS AND LANDSCAPING MATERIALS, TRASH, FERTILIZERS, PESTICIDES, DETERGENTS, SANITARY WASTE AND OTHER MATERIALS TO PRECIPITATION AND STORMWATER RUNOFF. THESE MATERIALS MUST BE PREVENTED FROM BECOMING A POLLUTANT SOURCE.

NOTE: TO PREVENT THESE MATERIALS FROM BECOMING A SOURCE OF POLLUTANTS, CONSTRUCTION AND POST-CONSTRUCTION ACTIVITIES RELATED TO A PROJECT MAY BE REQUIRED TO COMPLY WITH APPLICABLE PROVISION OF RULES RELATED TO SOLID, UNIVERSAL, AND HAZARDOUS WASTE, INCLUDING, BUT NOT LIMITED TO, THE MAINE SOLID WASTE AND HAZARDOUS WASTE MANAGEMENT RULES, MAINE HAZARDOUS WASTE MANAGEMENT RULES, MAINE OIL CONVEYANCE AND STORAGE RULES, AND MAINE PESTICIDE REQUIREMENTS.

5. EXCAVATION DEWATERING: EXCAVATION DEWATERING IS THE REMOVAL OF WATER FROM TRENCHES, FOUNDATIONS, COTTER 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 COTTERDAM SEDIMENTATION BASIN. AVOID ALLOWING THE WATER TO FLOW OVER DISTURBED AREAS OF THE SITE. EQUIVALENT MEASURES MAY BE TAKEN IF APPROVED BY THE DEPARTMENT.

NOTE: DEWATERING CONTROLS ARE DISCUSSED IN THE "MAINE EROSION AND SEDIMENT CONTROL BMPs, MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION."

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:

- DISCHARGES FROM FIREFIGHTING ACTIVITY;
- FIRE HYDRANT FLUSHINGS;
- VEHICLE WASHWATER IF DETERGENTS ARE NOT USED AND WASHING IS LIMITED TO THE EXTERIOR OF VEHICLES (ENGINE, UNDERCARRIAGE, AND TRANSMISSION WASHING IS PROHIBITED);
- DUST CONTROL RUNOFF IN ACCORDANCE WITH PERMIT CONDITIONS AND APPENDIX C(3);
- ROUTINE EXTERNAL BUILDING WASHDOWN, NOT INCLUDING SURFACE PAINT REMOVAL, THAT DOES NOT INVOLVE DETERGENTS;
- 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;
- UNCONTAMINATED AIR CONDITIONING OR COMPRESSOR CONDENSATE;
- UNCONTAMINATED GROUNDWATER OR SPRING WATER;
- FOUNDATION OR FOOTER DRAIN-WATER WHERE FLOWS ARE NOT CONTAMINATED;
- UNCONTAMINATED EXCAVATION DEWATERING (SEE REQUIREMENTS IN APPENDIX C(5));
- POTABLE WATER SOURCES INCLUDING WATERLINE FLUSHINGS; AND
- LANDSCAPE IRRIGATION

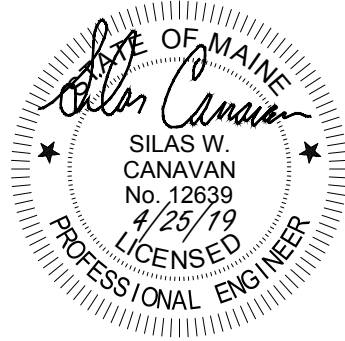
7. UNAUTHORIZED NON-STORMWATER DISCHARGES: THE DEPARTMENT'S APPROVAL UNDER THIS CHAPTER DOES NOT AUTHORIZE A DISCHARGE THAT IS MIXED WITH A SOURCE OF NON-STORMWATER, OTHER THAN THOSE DISCHARGES IN COMPLIANCE WITH APPENDIX C (6). SPECIFICALLY, THE DEPARTMENT'S APPROVAL DOES NOT AUTHORIZE DISCHARGES OF THE FOLLOWING:

- WASTEWATER FROM THE WASHOUT OR CLEANOUT OF CONCRETE, STUCCO, PAINT, FORM RELEASE OILS, CURING COMPOUNDS OR OTHER CONSTRUCTION MATERIALS;
- FUELS, OILS OR OTHER POLLUTANTS USED IN VEHICLE AND EQUIPMENT OPERATION AND MAINTENANCE;
- SOAPS, SOLVENTS, OR DETERGENTS USED IN VEHICLE AND EQUIPMENT WASHING; AND
- TOXIC OR HAZARDOUS SUBSTANCES FROM A SPILL OR OTHER RELEASE.

8. ADDITIONAL REQUIREMENTS: ADDITIONAL REQUIREMENTS MAY BE APPLIED ON A SITE-SPECIFIC BASIS.

NOTES

1. THE EROSION CONTROL MIX SHALL CONTAIN A WELL GRADED MIXTURE OF PARTICLE SIZES AND MAY CONTAIN ROCKS LESS THAN 4" DIAMETER. EROSION CONTROL MIX MUST BE FREE OF REFUSE, PHYSICAL CONTAMINANTS, AND MATERIAL TOXIC TO PLANT GROWTH.
2. MATERIAL SHALL MEET THE FOLLOWING REQUIREMENTS
 - A. THE ORGANIC CONTENT SHALL BE BETWEEN 80 AND 100% DRY WEIGHT BASIS
 - B. PARTICLE SIZE BY WEIGHT SHALL BE 100% PASSING A #6 SCREEN AND A MAXIMUM OF 85% PASSING A 0.75" SCREEN
 - C. THE ORGANIC PORTION NEEDS TO BE FIBROUS AND ELONGATED
 - D. LARGE PORTIONS OF SILTS, CLAYS, OR FINE SANDS ARE NOT ACCEPTABLE IN THE MIX
 - E. SOLUBLE SALTS CONTENT SHALL BE <4.0 MMHG/CM
 - F. THE PH SHOULD FALL BETWEEN 5.0 AND 8.0
3. PLACE BARRIER ALONG A RELATIVELY FLAT CONTOUR. CUT TALL GRASSES OR WOODY VEGETATION TO AVOID CREATING VOIDS AND BRIDGES WHERE FINES CAN WASH UNDER THE BARRIER THROUGH GRASS BLADES AND BRANCHES.
4. PLACEMENT OF BARRIER SHOULD BE:
 - AT TOE OF THE SLOPE.
 - FROZEN GROUND, BEDROCK OR ROOTED FORESTED AREAS.
 - THE EDGE OF GRAVEL AND AREAS UNDER CONSTRUCTION.
5. BARRIER SHALL NOT BE USED ADJACENT TO WETLANDS
6. REMOVE SEDIMENT DEPOSITS WHEN THEY REACH APPROXIMATELY ONE HALF THE HEIGHT OF THE BARRIER.
7. WHEN BARRIER IS DECOMPOSED, CLOGGED WITH SEDIMENT, ERODED OR INEFFECTIVE, IT MUST BE REPLACED OR REPAIRED. THE BARRIER SHOULD BE RESHAPED AS NECESSARY.



4 SEDIMENT BARRIER (EROSION CONTROL MIX)

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PROJECT

Classroom & Community Hall Addition

Friends School of Portland
11 US Route 1
Cumberland, ME 04021



STRUCTURAL

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Soren Deniord Design Studio

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Mechanical & Plumbing

Integrated Energy

Systems, PLLC

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p: 207-781-4263

| DATE | 09/22/18 | 10/02/18 | 02/11/18 | 02/22/18 | 02/27/18 | 03/25/18 | 04/25/18 | | | | | | | | | | | | |
|-------------|----------------------------------|---------------|---|----------------------|---------------------------|----------|----------|--|--|--|--|--|--|--|--|--|--|--|--|
| CHANGE NAME | | | | | | | | | | | | | | | | | | | |
| CH ID | | | | | | | | | | | | | | | | | | | |
| DESCRIPTION | A | B | C | D | E | F | G | | | | | | | | | | | | |
| ISSUE NO | A | B | C | D | E | F | G | | | | | | | | | | | | |
| DESCRIPTION | PRECIPITATION SET FOR SPM PERMIT | FOR CD COORD. | FOR CONSTRUCTION SUBMITTAL FOR PERMITTING | SUBMITTED FOR REVIEW | REVISED PER TOWN COMMENTS | | | | | | | | | | | | | | |

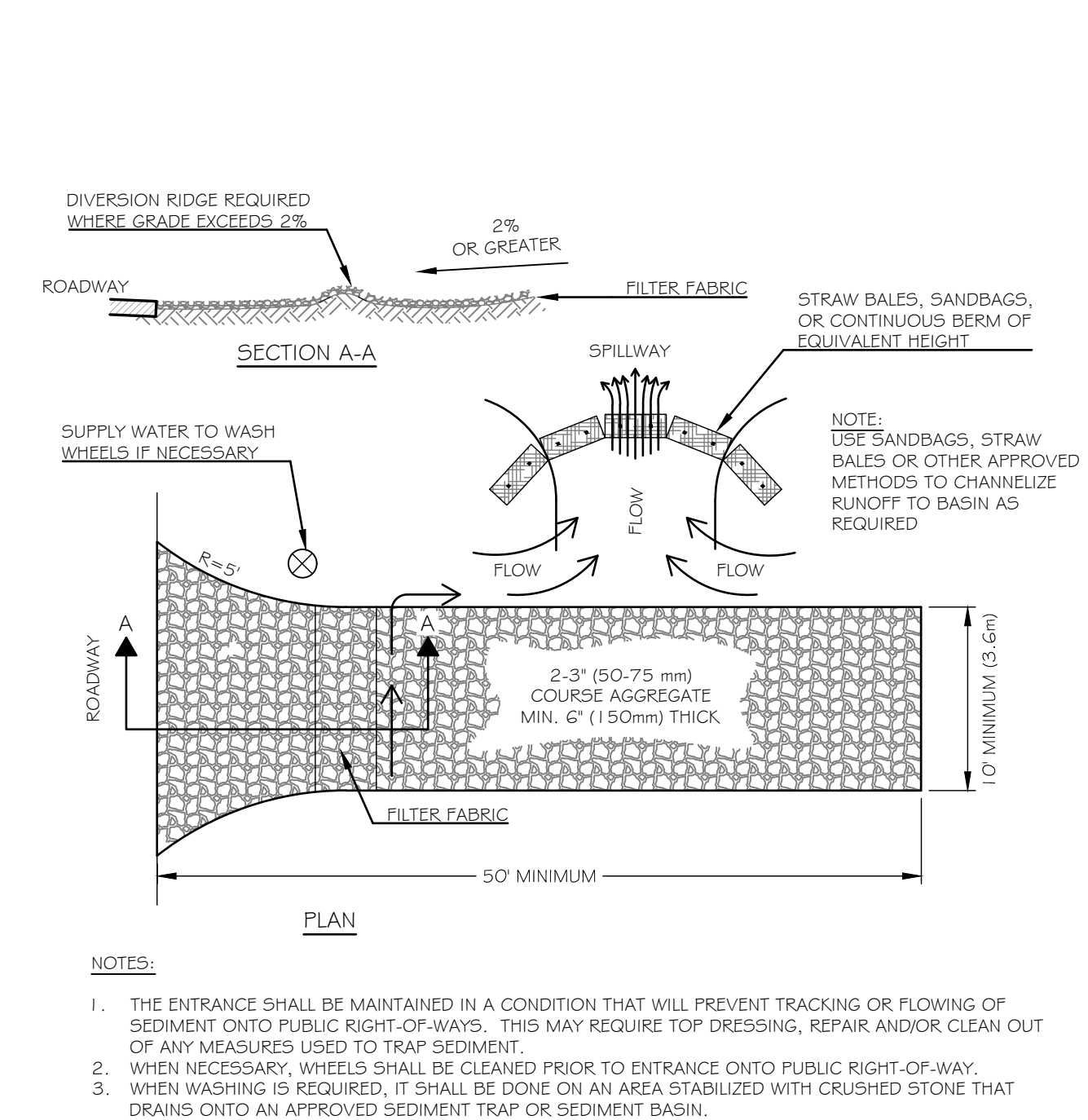
FOR TOWN PERMIT

PROJECT NO: FSP2

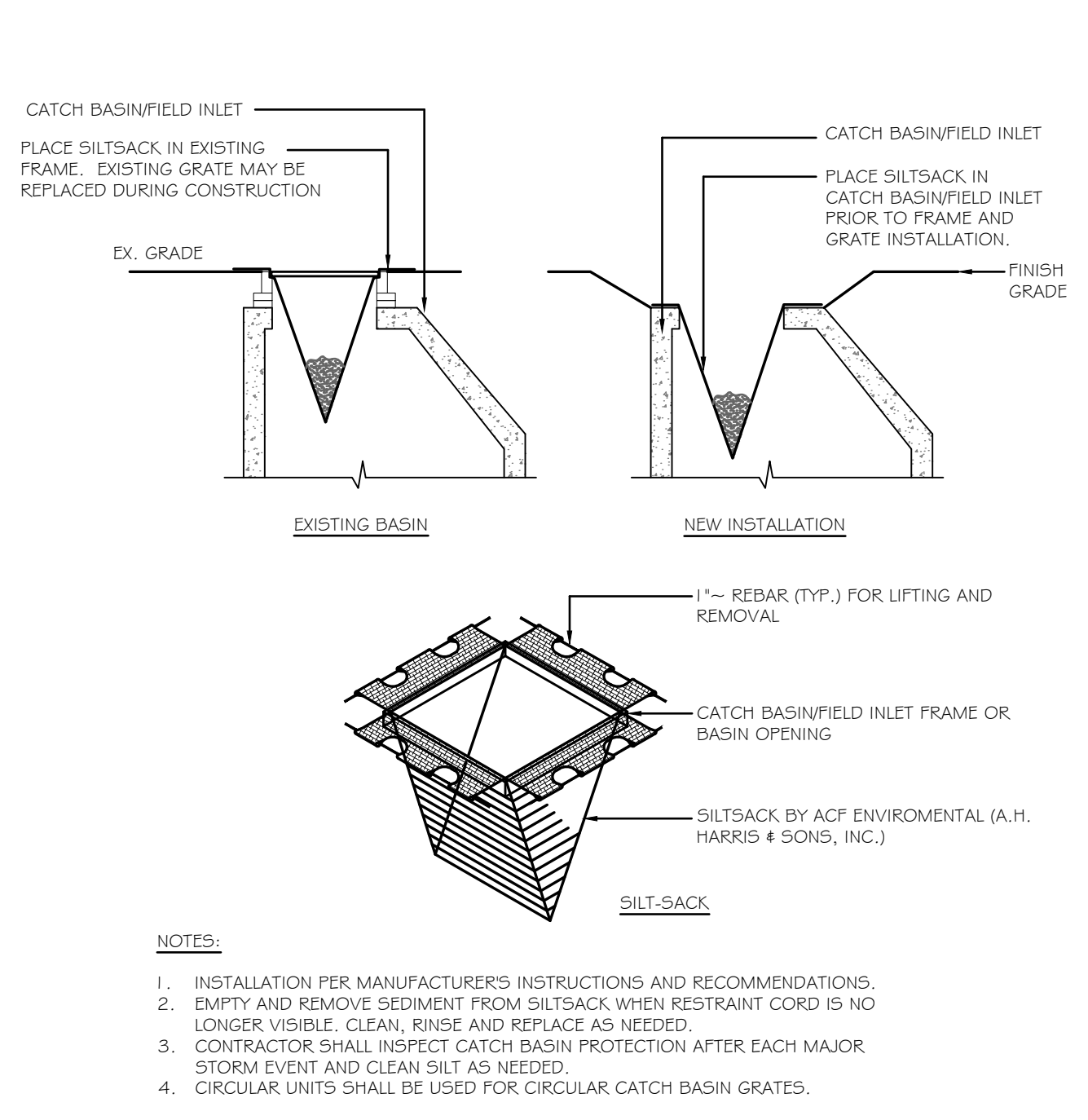
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DRAWN BY: CAR/JWG

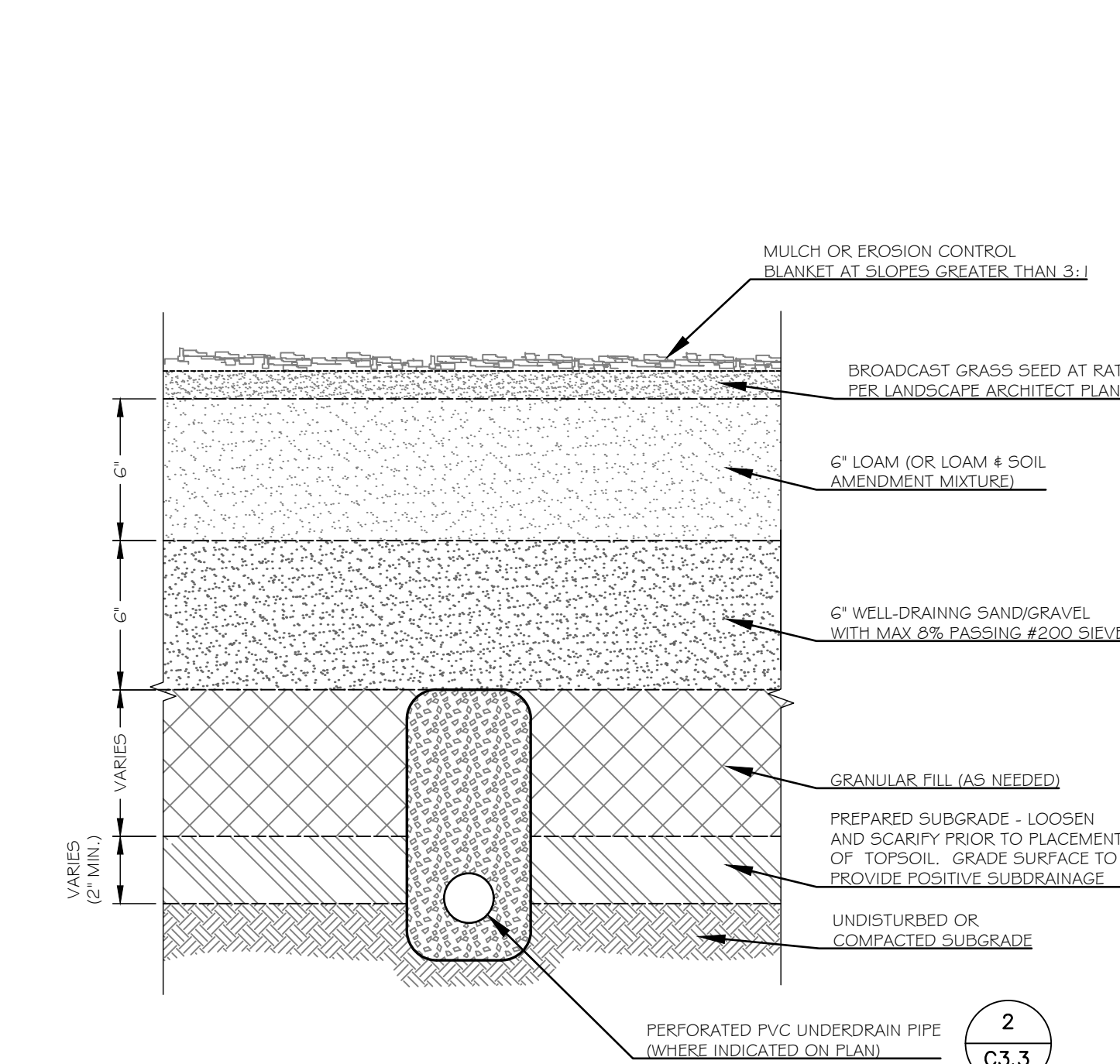
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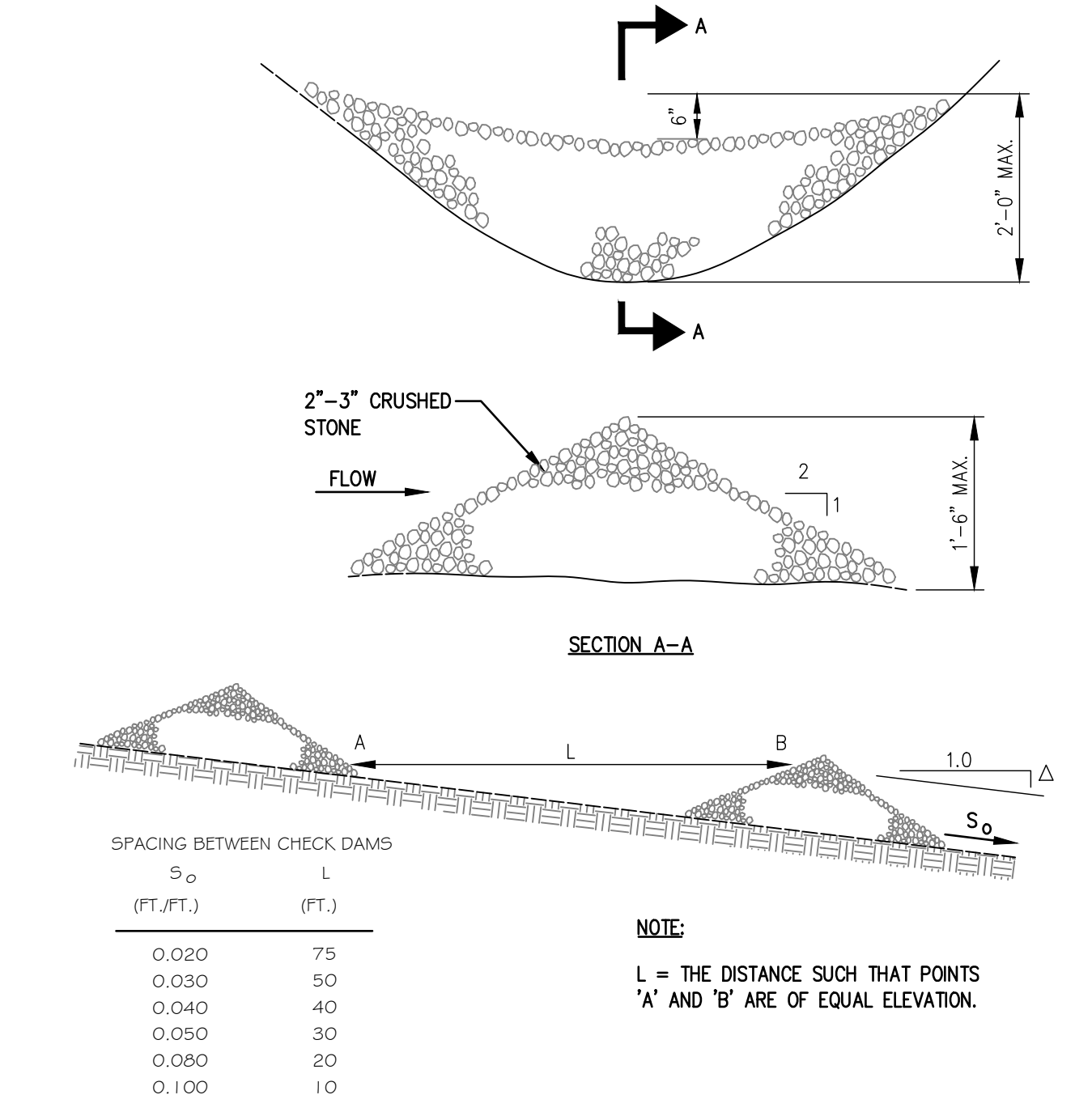
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STABILIZED CONSTRUCTION ENTRANCE
NOT TO SCALE



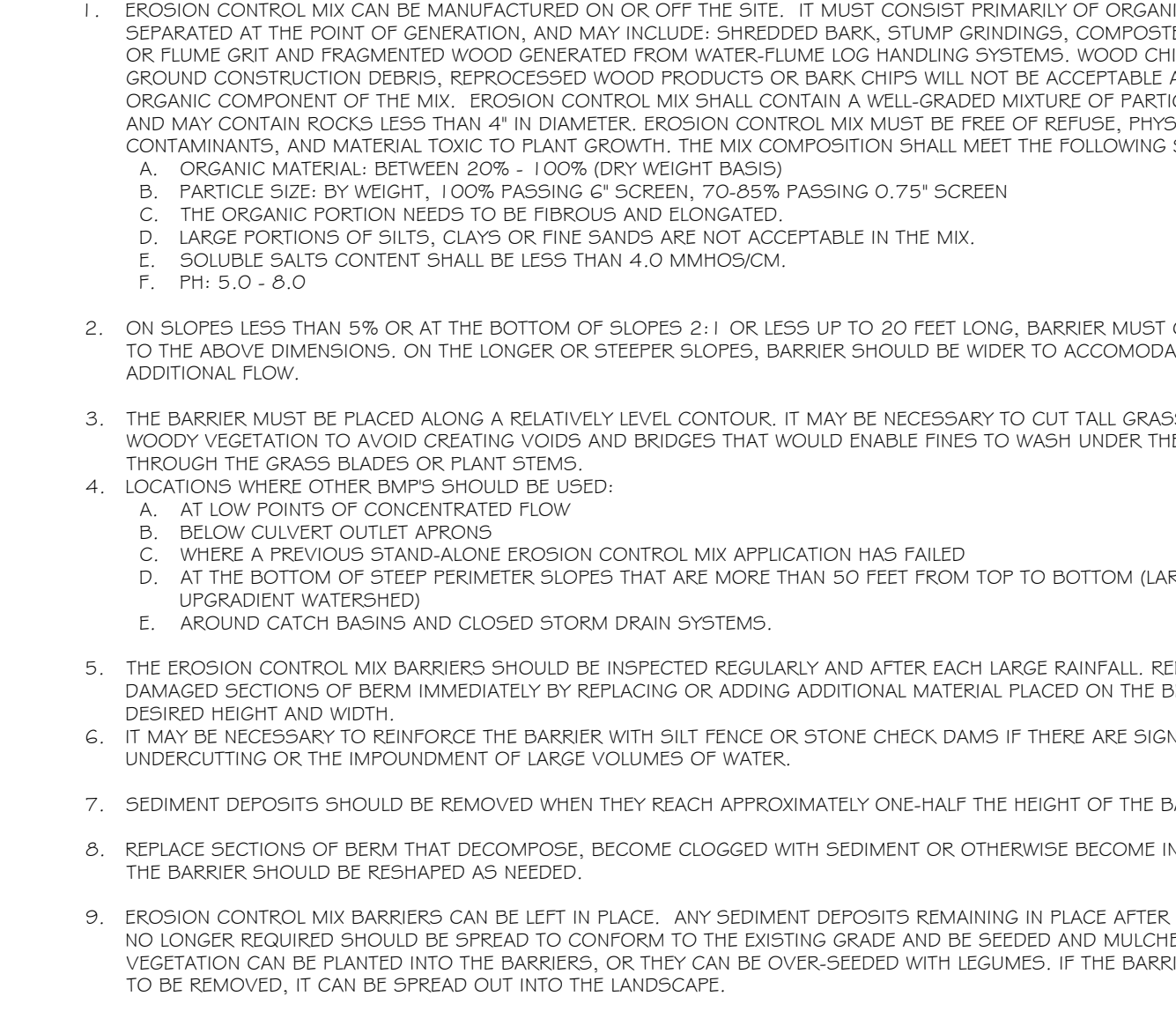
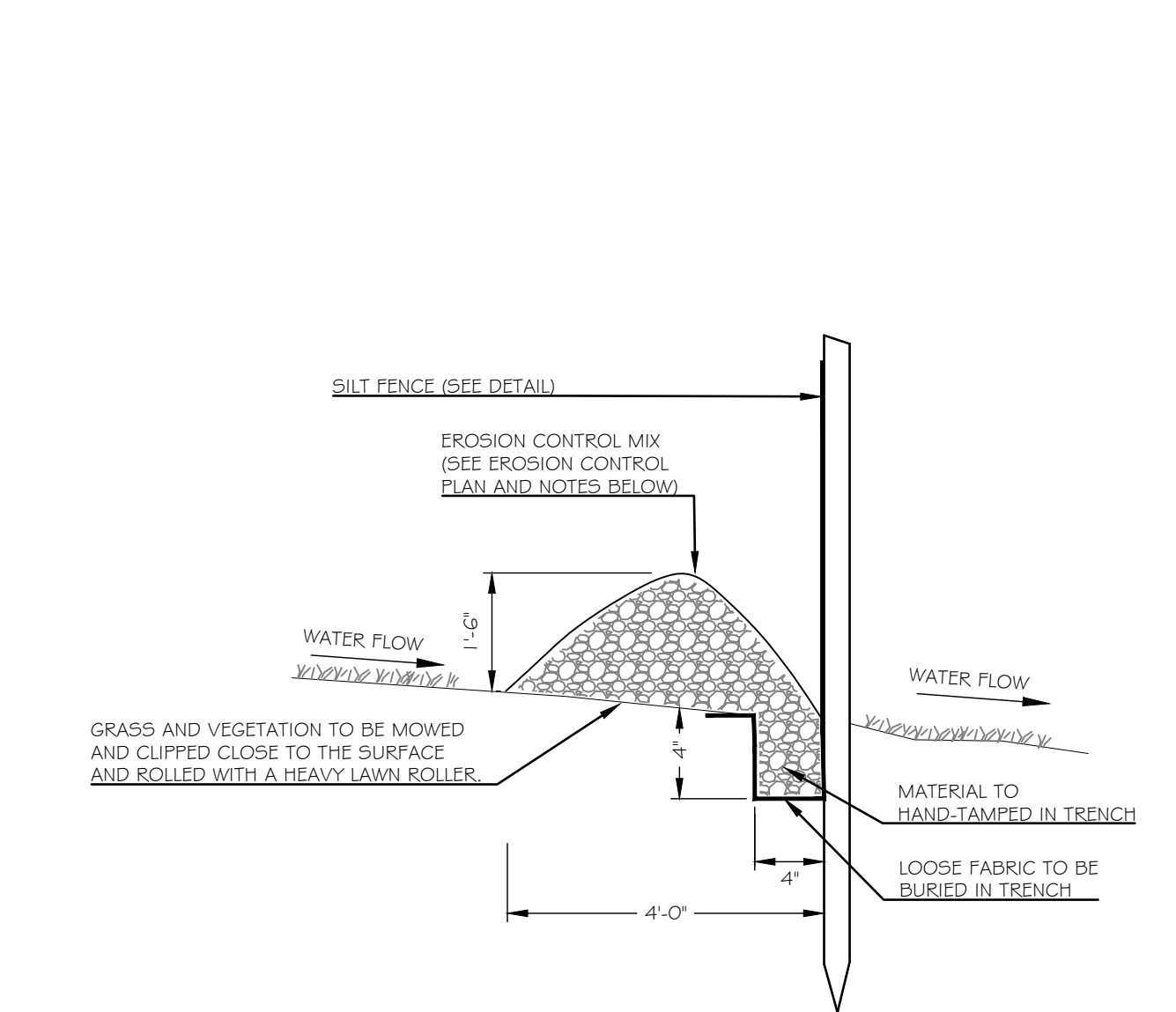
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CATCH BASIN PROTECTION DETAIL
NOT TO SCALE



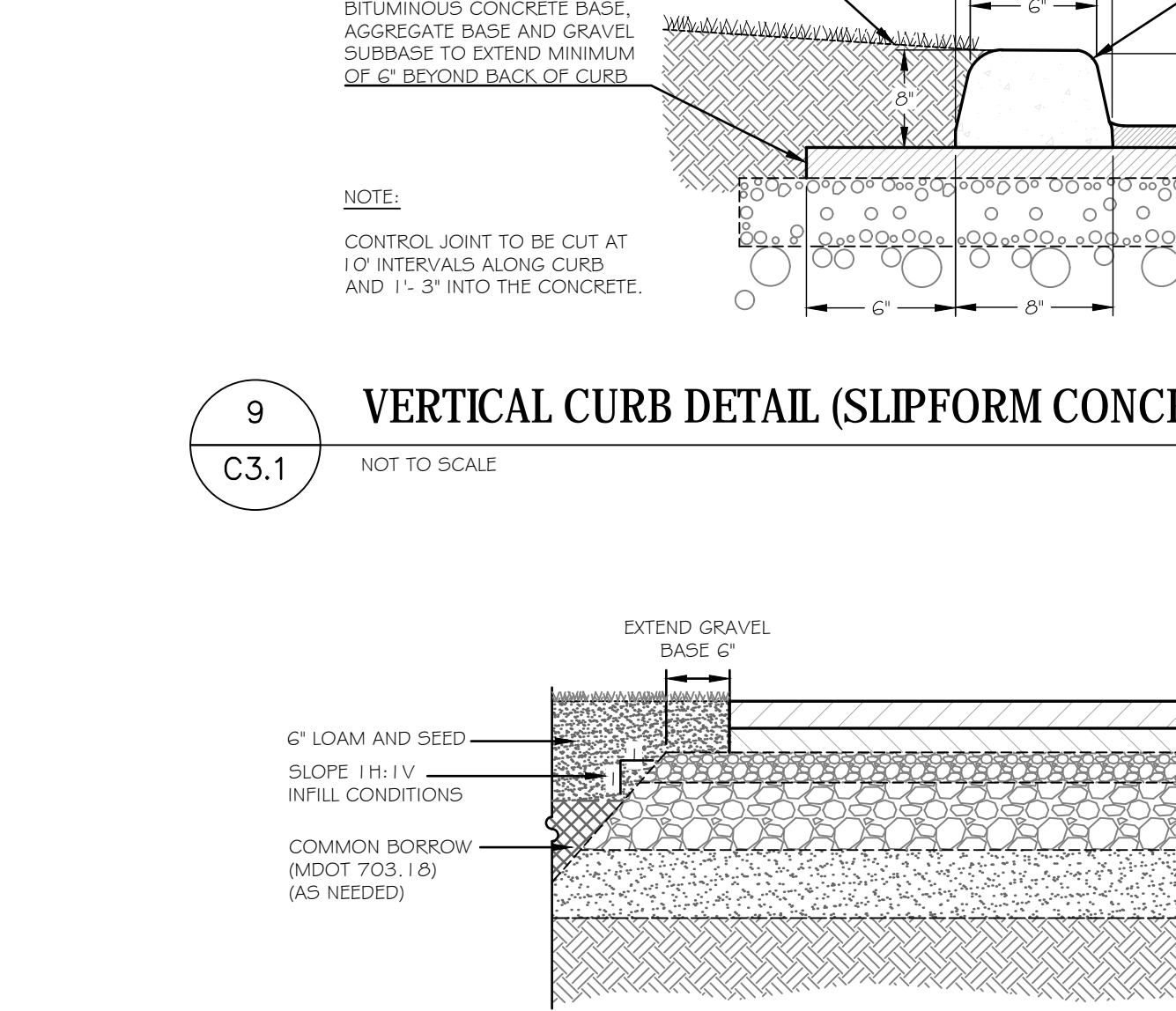
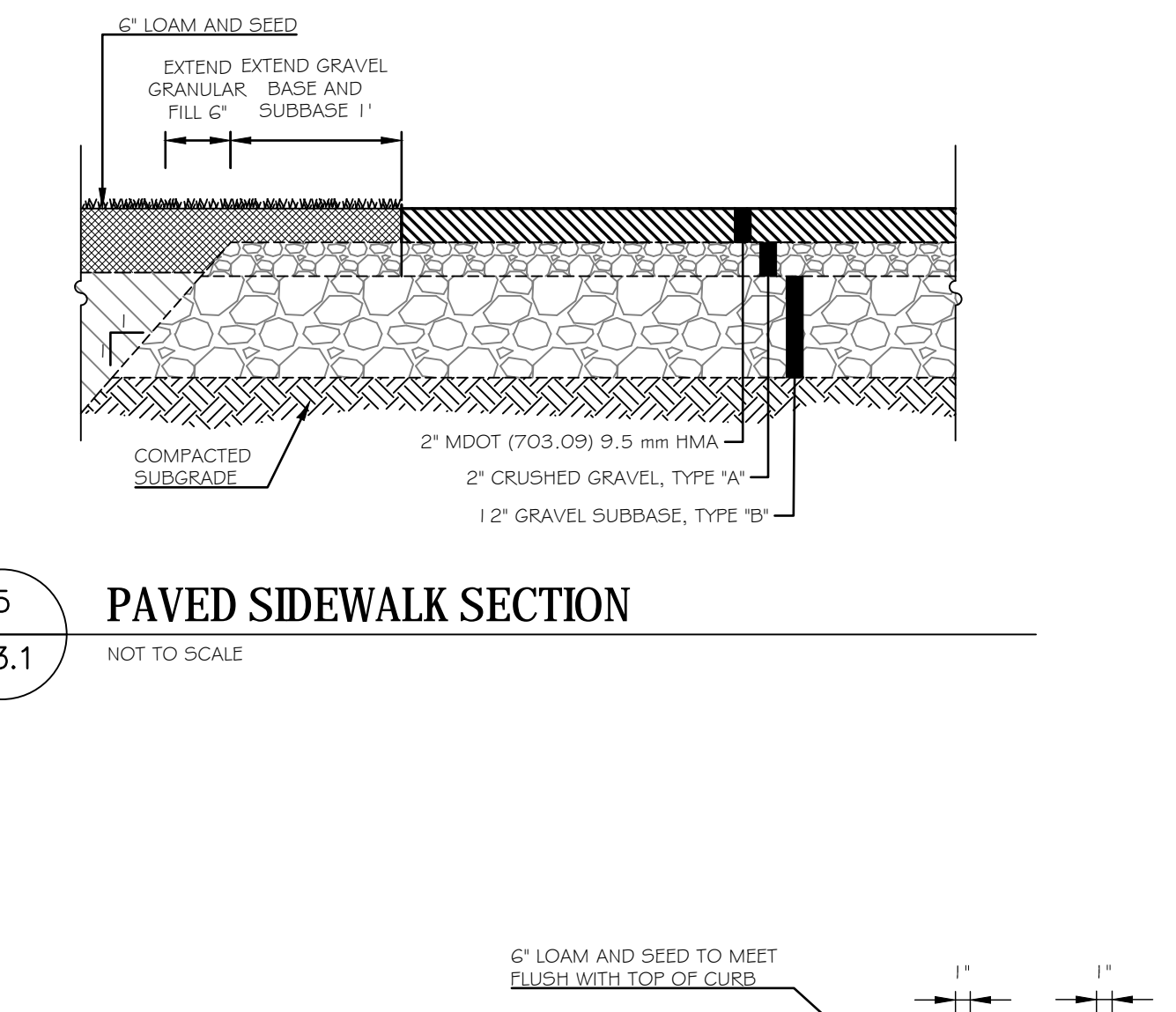
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C3.1
LOAM AND SEED DETAIL
NOT TO SCALE



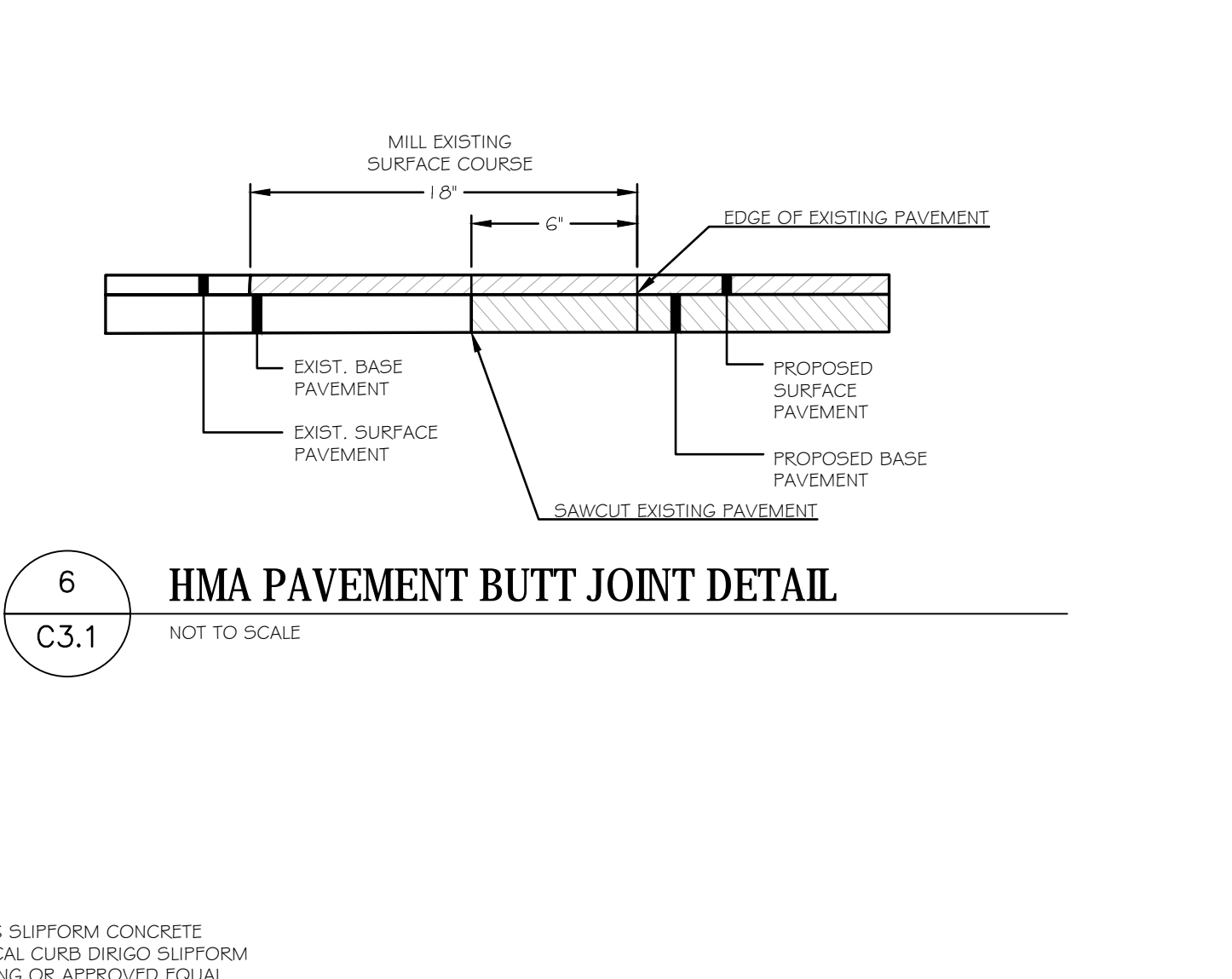
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C3.1
TEMP. STONE CHECK DAM DETAIL
NOT TO SCALE



8
C3.1
EROSION CONTROL MIX SEDIMENT BARRIER
NOT TO SCALE



10
C3.1
BITUMINOUS CONCRETE PAVEMENT SECTION
NOT TO SCALE



11
C3.1
'DIRTBAG' DETAIL
NOT TO SCALE

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| DATE | 09/20/18 | 10/02/18 | 02/11/18 | 02/22/19 | 02/27/19 | 03/25/19 | 04/25/19 | | | |
|-------------|---------------|-------------------|-------------------|---------------------|------------------------------|-----------------------------|-------------|--|--|--|
| CHANGE NAME | | | | | | | | | | |
| CH ID | | | | | | | | | | |
| ISSUE NO | | | | | | | | | | |
| DESCRIPTION | A. PRELIM SET | B. FOR SP. PERMIT | C. FOR CO. COORD. | D. FOR CONSTRUCTION | E. SUBMITTING FOR PERMITTING | F. SUBMITTED FOR PERMITTING | G. COMMENTS | | | |

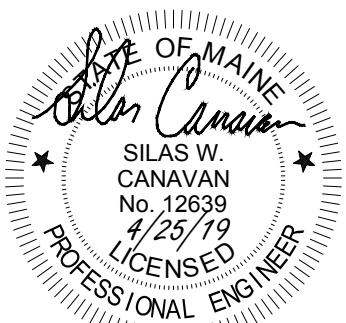
FOR TOWN PERMIT

PROJECT NO: FSP2

DESIGNED BY: NGC

DRAWN BY: CAR/JWG

PHASE: PERMITTING

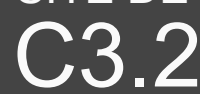


SITE DETAILS
C3.1

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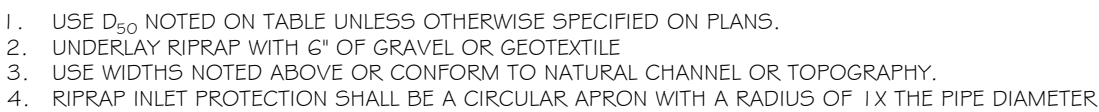
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- SUBMIT SAMPLES OF EACH TYPE OF MATERIAL TO BE BLENDED FOR THE MIXED FILTER MEDIA AND SAMPLES OF THE UNDERDRIN BEDDING MATERIAL. SAMPLES MUST BE A COMPOSITE OF THREE DIFFERENT LOCATIONS (GRABS) FROM THE STOCKPILE OR PIT FACE. SAMPLE SIZE REQUIRED WILL BE DETERMINED BY THE TESTING LABORATORY.
- PERFORM A SIEVE ANALYSIS CONFORMING TO ASTM D 36 (STANDARD TEST METHOD FOR SIEVE ANALYSIS OF FINE AND COARSE AGGREGATES) ON EACH TYPE OF MATERIAL.
- 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.



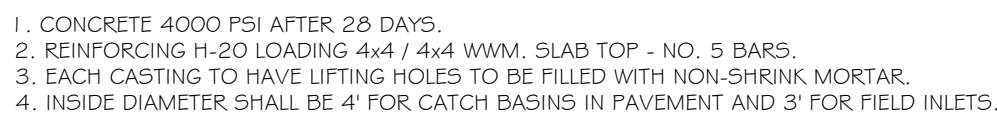
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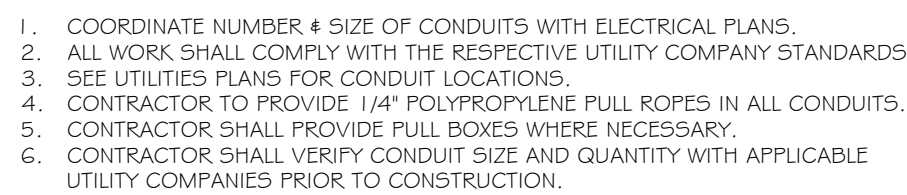
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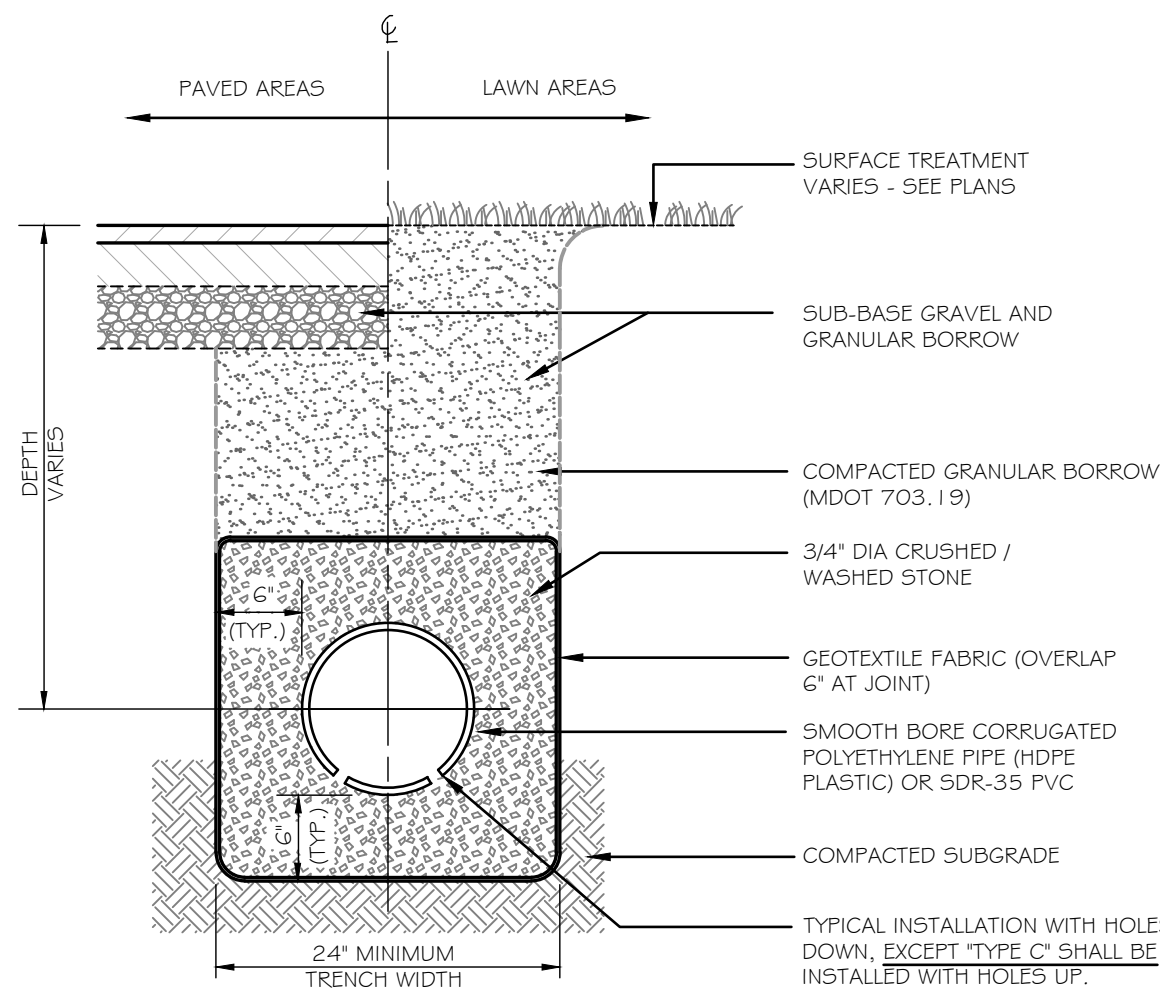
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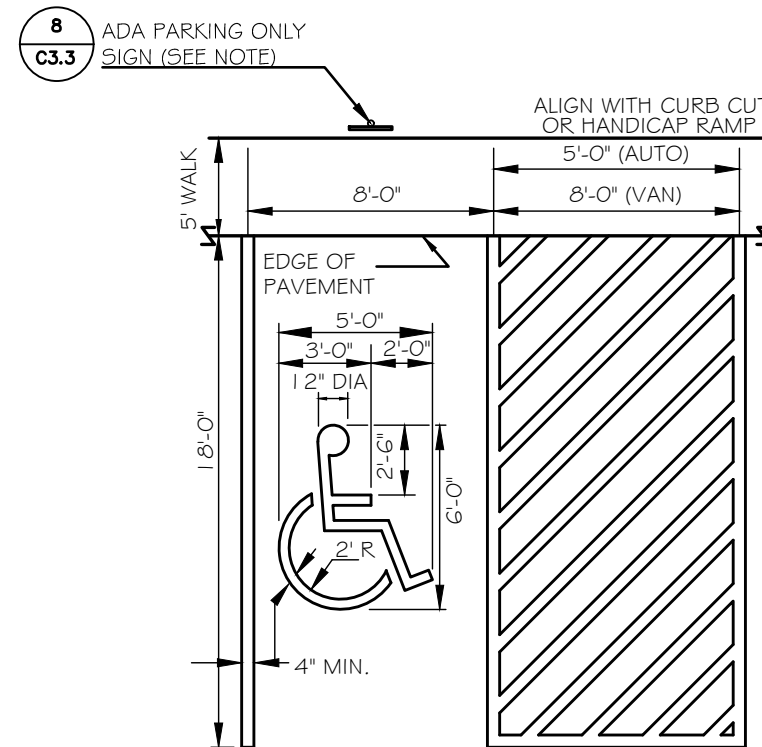
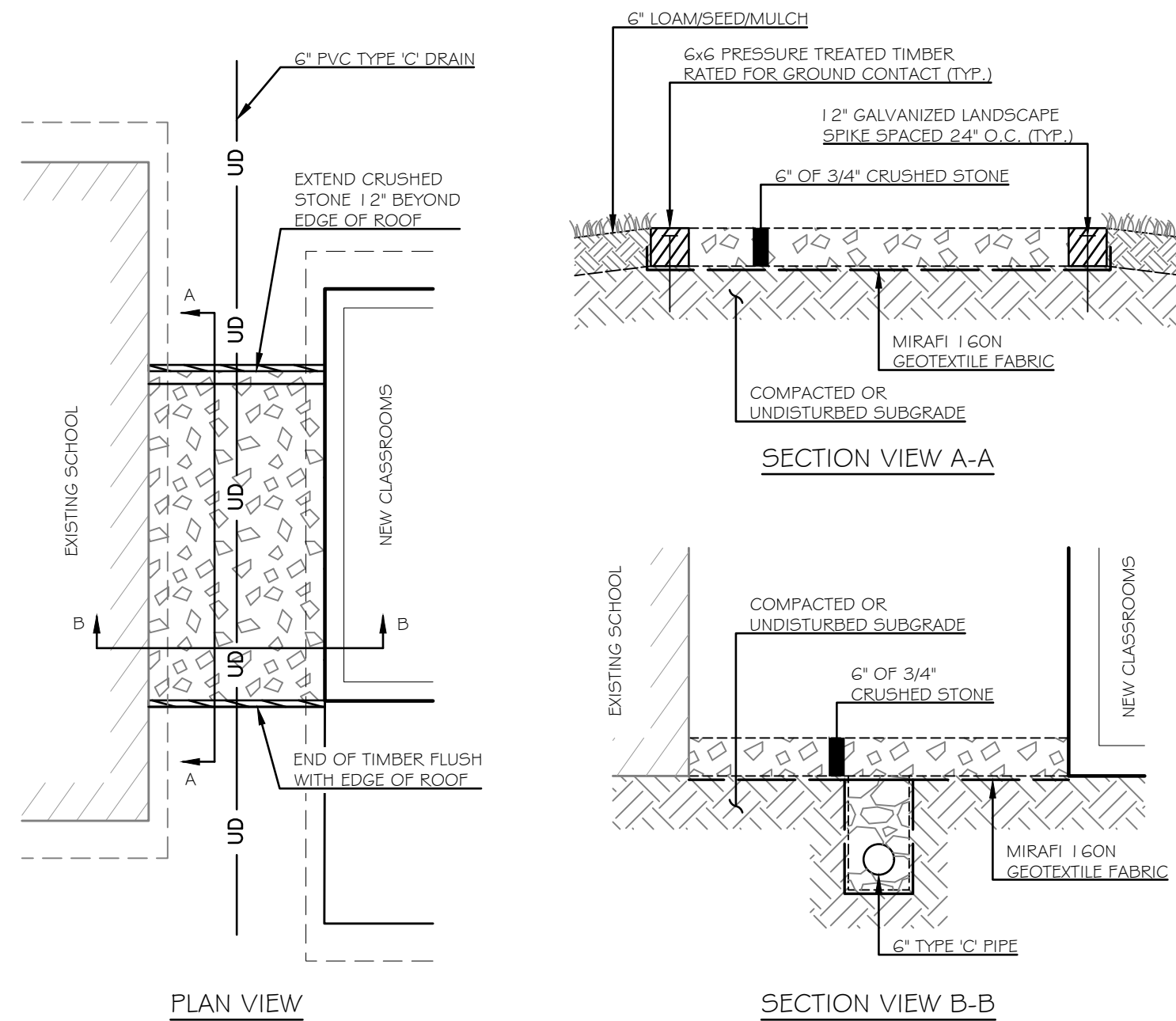
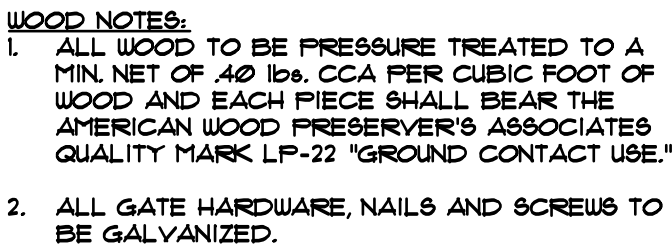
NOT TO SCALE



NOT TO SCALE



1. BACKFILL MATERIAL WITHIN TRENCH BEYOND UNDERDRAIN LATERAL LIMITS SHALL, AS A MINIMUM, CONFORM TO THE REQUIREMENTS OF GRANULAR BORROW.
2. UNDERDRAIN SHALL CONFORM TO THE REQUIREMENTS OF MDOT 605.04, TYPE "B", EXCEPT AS NOTED.
3. OUTLETS SHALL BE CONNECTED TO THE STORM DRAIN SYSTEM AS SHOWN ON THE PLANS, OR GRADED BY GRAVITY TO A SUITABLE DISCHARGE POINT. FREE DRAINING OUTLET TO BE METAL AS REQUIRED BY MDOT 605.05.



1. ALL ACCESSIBLE PARKING SPACE SIGNS SHALL BE MUTCD R7-8. 'VAN ACCESSIBLE' PLAQUES (MUTCD R7-8P) SHALL BE PROVIDED FOR ALL SPACES WITH AN 8' WIDE (OR WIDER) AISLE
2. PAINT ALL PAVEMENT STRIPES AND LINES 4 INCHES WIDE (TYP.)
3. ALL ACCESSIBLE PARKING SPACES SHALL MEET MOST RECENT ADA STANDARDS FOR ACCESSIBLE DESIGN
4. VERIFY THAT ALL PARKING SPACES AND ACCESS AISLES DO NOT EXCEED 2% GRADE IN ANY DIRECTION

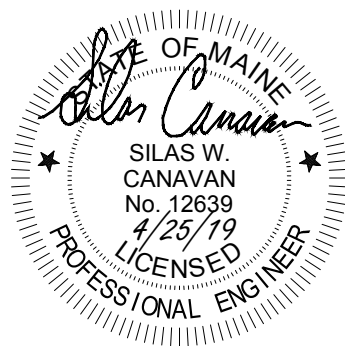


12"x18"
(MUTCD R7-8)

**VAN
ACCESSIBLE**

18"X 9"
(MUTCD R7-8P)

1. PROVIDE SHOP DRAWINGS OF ALL SIGNS TO THE OWNER PRIOR TO PURCHASING.
2. OWNER TO APPROVE ALL SIGN LOCATIONS IN THE FIELD PRIOR TO INSTALLATION.



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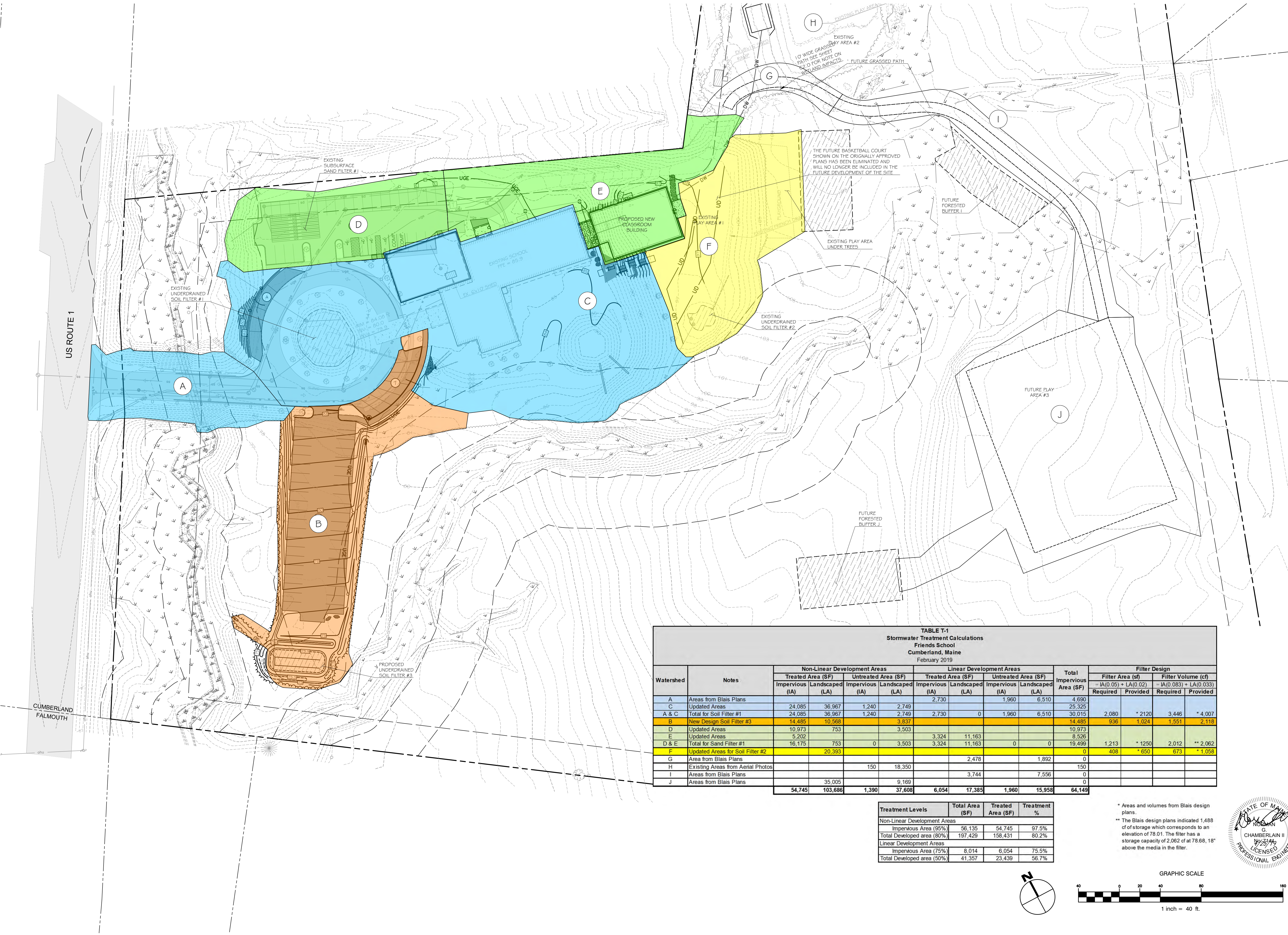
PROJECT NO: FSP:

DESIGNED BY: NGO

PHASE: PERMITTING

SITE DETAILS

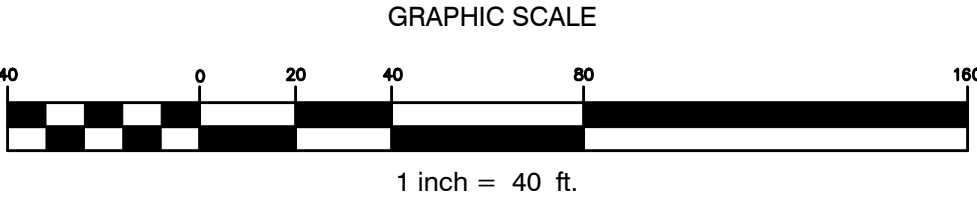
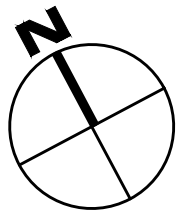
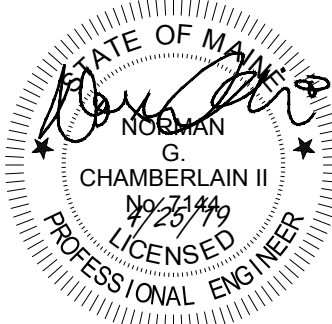
C3.3



| TABLE T-1 Stormwater Treatment Calculations Friends School Cumberland, Maine February 2019 | | | | | | | | | | | | | | |
|--|-----------------------------------|------------------------------|--------------------|---------------------|--------------------|--------------------------|--------------------|---------------------|--------------------|----------------------------------|-----------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| Watershed | Notes | Non-Linear Development Areas | | | | Linear Development Areas | | | | Total Impervious Area (SF) | Filter Design | | | |
| | | Treated Area (SF) | | Untreated Area (SF) | | Treated Area (SF) | | Untreated Area (SF) | | | Filter Area (sf) | | Filter Volume (cf) | |
| | | Impervious (IA) | Landscaped (LA) | Impervious (IA) | Landscaped (LA) | Impervious (IA) | Landscaped (LA) | Impervious (IA) | Landscaped (LA) | | = IA(0.05) + LA(0.02) Required | = IA(0.083) + LA(0.033) Provided | = IA(0.083) + LA(0.033) Required | = IA(0.083) + LA(0.033) Provided |
| A | Areas from Blais Plans | | | | | 2,730 | | 1,960 | 6,510 | 4,690 | | | | |
| C | Updated Areas | 24,085 | 36,967 | 1,240 | 2,749 | | | | | 25,325 | | | | |
| A & C | Total for Soil Filter #1 | 24,085 | 36,967 | 1,240 | 2,749 | 2,730 | 0 | 1,960 | 6,510 | 30,015 | 2,080 | * 2120 | 3,446 | * 4,007 |
| B | New Design Soil Filter #3 | 14,485 | 10,568 | | 3,837 | | | | | 14,485 | 936 | 1,024 | 1,551 | 2,118 |
| D | Updated Areas | 10,973 | 753 | | 3,503 | | | | | 10,973 | | | | |
| E | Updated Areas | 5,202 | | | | 3,324 | 11,163 | | | 8,526 | | | | |
| D & E | Total for Sand Filter #1 | 16,175 | 753 | 0 | 3,503 | 3,324 | 11,163 | 0 | 0 | 19,499 | 1,213 | * 1250 | 2,012 | ** 2,062 |
| F | Updated Areas for Soil Filter #2 | | 20,393 | | | | | | | 0 | 408 | * 650 | 673 | * 1,058 |
| G | Area from Blais Plans | | | | | | 2,478 | | 1,892 | 0 | | | | |
| H | Existing Areas from Aerial Photos | | | 150 | 18,350 | | | | | 150 | | | | |
| I | Areas from Blais Plans | | | | | | 3,744 | | 7,556 | 0 | | | | |
| J | Areas from Blais Plans | | 35,005 | | 9,169 | | | | | 0 | | | | |
| | | 54,745 | 103,686 | 1,390 | 37,608 | 6,054 | 17,385 | 1,960 | 15,958 | 64,149 | | | | |

| Treatment Levels | Total Area (SF) | Treated Area (SF) | Treatment % |
|------------------------------|-----------------|-------------------|-------------|
| Non-Linear Development Areas | | | |
| Impervious Area (95%) | 56,135 | 54,745 | 97.5% |
| Total Developed Area (80%) | 197,429 | 158,431 | 80.2% |
| Linear Development Areas | | | |
| Impervious Area (75%) | 8,014 | 6,054 | 75.5% |
| Total Developed Area (50%) | 41,357 | 23,439 | 56.7% |

* Areas and volumes from Blais design plans.
** The Blais design plans indicated 1,488 cf of storage which corresponds to an elevation of 78.01. The filter has a storage capacity of 2,062 cf at 78.68, 18" above the media in the filter.



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Portland, ME 04103
p: 207-400-2450

ELECTRICAL

Swiftcurrent Engineering
Services
10 Forest Falls Drive, Unit 8B
Yarmouth, ME 04096
p: 207-847-9280

CIVIL

Walsh Engineering
Associates, Inc.
1 Karen Drive, Suite 2A
Westbrook, ME 04092
p: 207-553-9898

Mechanical & Plumbing
Integrated Energy
Systems, PLLC

301 Middle Road
Falmouth, ME 04105
p: 207-781-4263

| DATE | 08/20/18 | 10/02/18 | 02/21/18 | 02/22/19 | 02/27/19 | 03/25/19 | 04/25/19 | | | | |
|----------------------|------------|---------------|---------------|------------------|------------------|--------------------------|------------------|--|--|--|--|
| CHANGE NAME | | | | | | | | | | | |
| CH ID | | | | | | | | | | | |
| ISSUE NO DESCRIPTION | A | B | C | D | E | F | G | | | | |
| | PRELIM SET | FOR SP/PERMIT | FOR CD COORD. | FOR CONSTRUCTION | FOR CONSTRUCTION | SUBMITTED FOR PERMITTING | REVISOR COMMENTS | | | | |

FOR TOWN PERMIT

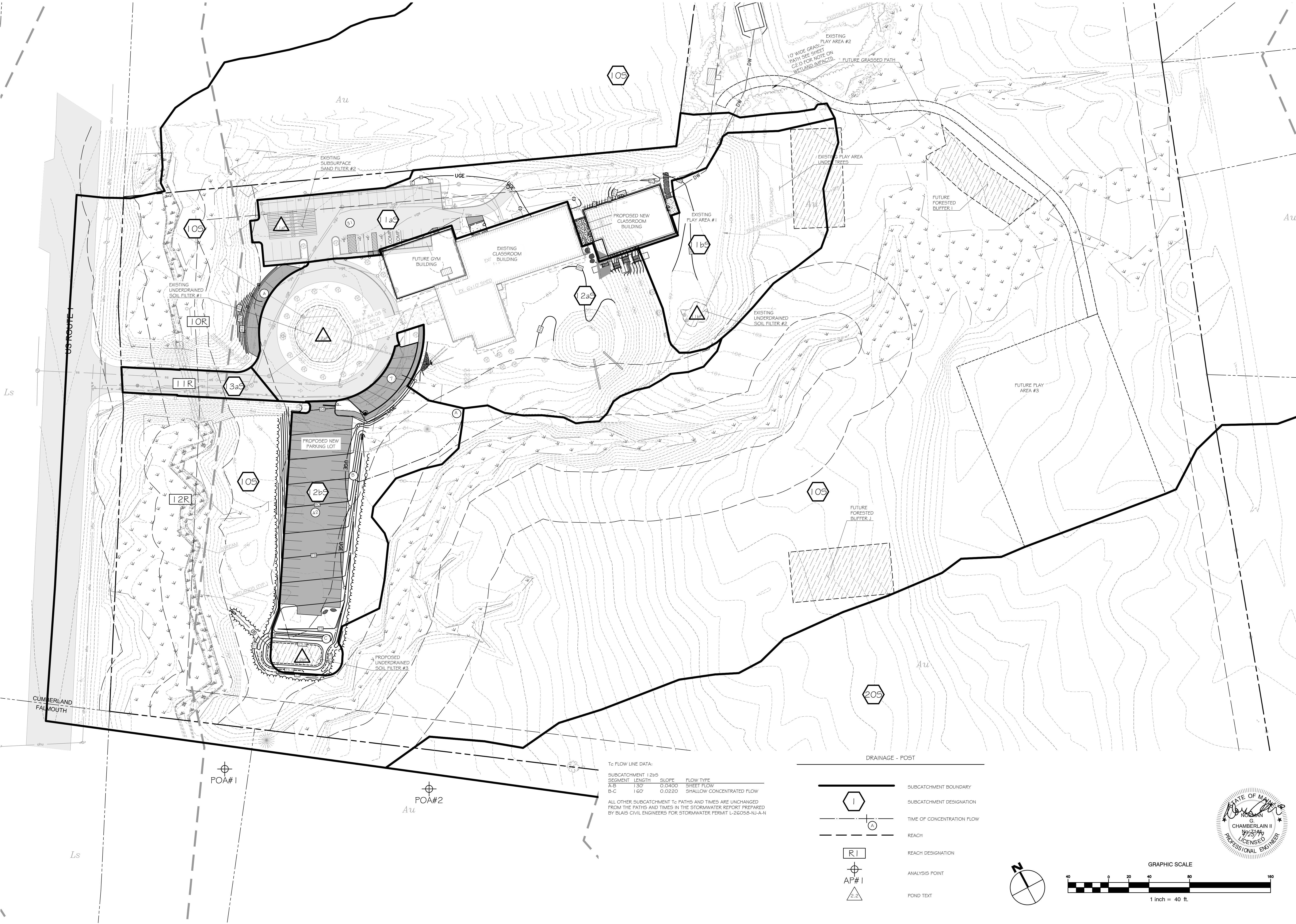
PROJECT NO: FSP2

DESIGNED BY: NGC

DRAWN BY: CAR/JWG

PHASE: PERMITTING

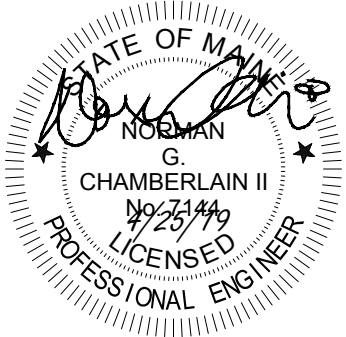
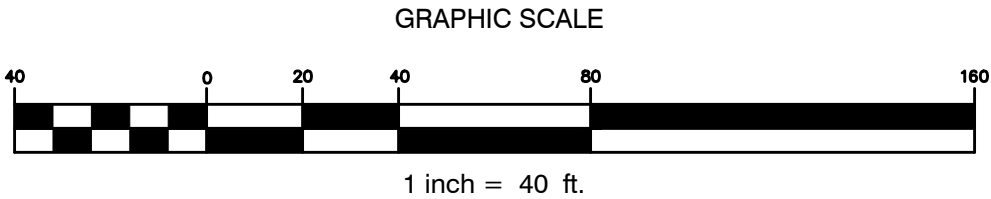
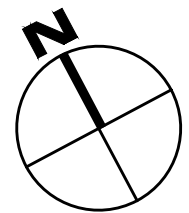
STORMWATER
TREATMENT
ANALYSIS PLAN
D1.0



Tc FLOW LINE DATA:
SUBCATCHMENT 12b5
SEGMENT LENGTH SLOPE FLOW TYPE
A-B 130' 0.0400 SHEET FLOW
B-C 160' 0.0220 SHALLOW CONCENTRATED FLOW

ALL OTHER SUBCATCHMENT Tc PATHS AND TIMES ARE UNCHANGED FROM THE PATHS AND TIMES IN THE STORMWATER REPORT PREPARED BY BLAIS CIVIL ENGINEERS FOR STORMWATER PERMIT L-26058-NJ-A-N

- DRAINAGE - POST
- SUBCATCHMENT BOUNDARY
 - SUBCATCHMENT DESIGNATION
 - TIME OF CONCENTRATION FLOW
 - REACH
 - REACH DESIGNATION
 - ANALYSIS POINT
 - POND TEXT



Kaplan Thompson Architects
102 Exchange Street
Portland, ME 04101
(207) 842-2888
kaplanthompson.com

PROJECT
Classroom & Community Hall Addition

Friends School of Portland
11 US Route 1
Cumberland, ME 04021



STRUCTURAL
Casco Bay Engineering
424 Fore Street
Portland, ME 04101
p: 207-842-2800

LANDSCAPE
Soren Deniro Design Studio
43 Wellwood Road
Portland, ME 04103
p: 207-400-2450

ELECTRICAL
Swiftcurrent Engineering Services
10 Forest Falls Drive, Unit 8B
Yarmouth, ME 04096
p: 207-847-9280

CIVIL
Walsh Engineering Associates, Inc.
1 Karen Drive, Suite 2A
Westbrook, ME 04092
p: 207-553-9898

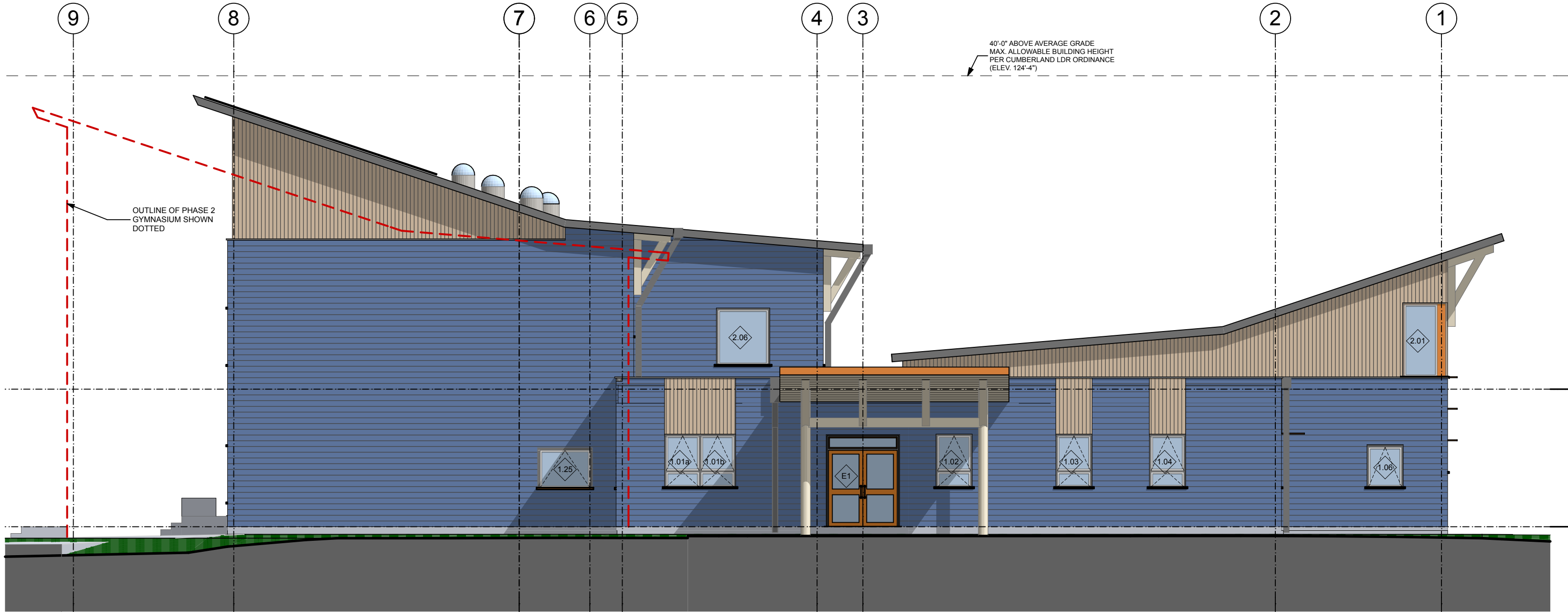
Mechanical & Plumbing
Integrated Energy Systems, PLLC
301 Middle Road
Falmouth, ME 04105
p: 207-781-4263

| ISSUE NO | DESCRIPTION | CH ID | CHANGE NAME | DATE |
|----------|--------------------------|-------|-------------|----------|
| A | PRICING SET | | | 09/20/18 |
| B | FOR SPV PERMIT | | | 10/02/18 |
| C | FOR CD COORD. | | | 02/21/18 |
| D | FOR CONSTRUCTION | | | 02/22/19 |
| E | FOR CONSTRUCTION | | | 02/27/19 |
| F | SUBMITTED FOR PERMITTING | | | 03/25/19 |
| G | SUBMITTED FOR PERMITTING | | | 04/25/19 |
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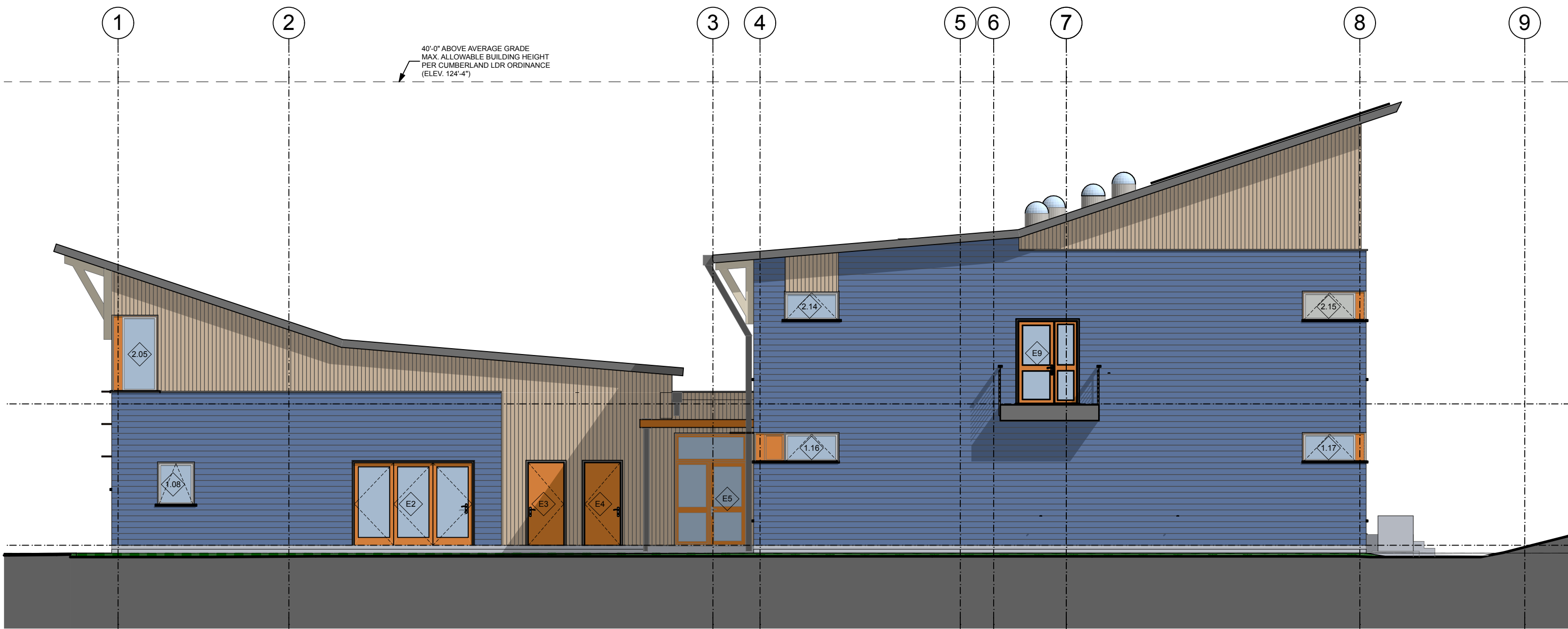
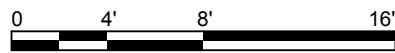
| | |
|-----------------|------------|
| FOR TOWN PERMIT | |
| PROJECT NO: | FSP2 |
| DESIGNED BY: | NGC |
| DRAWN BY: | CAR/JWG |
| PHASE: | PERMITTING |

POST-DEVELOPMENT
DRAINAGE
ANALYSIS PLAN
D2.0

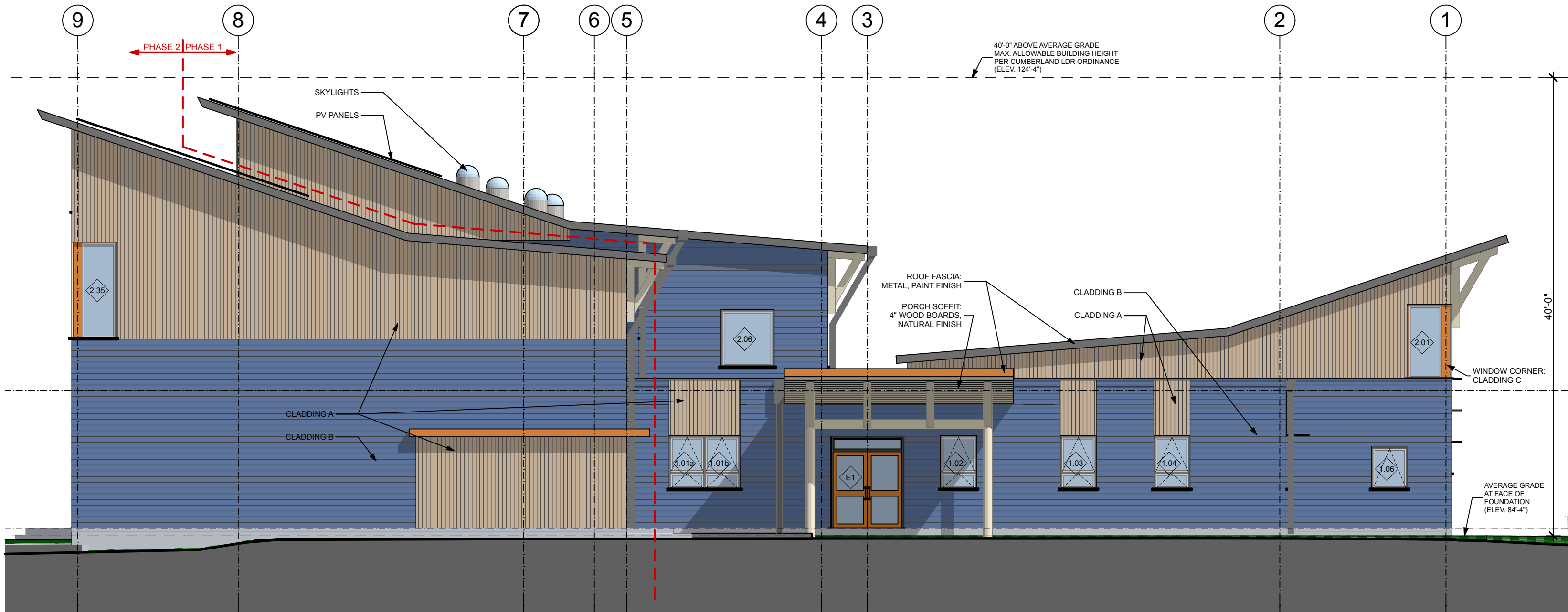
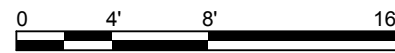
Exhibit 8
Architectural Elevations



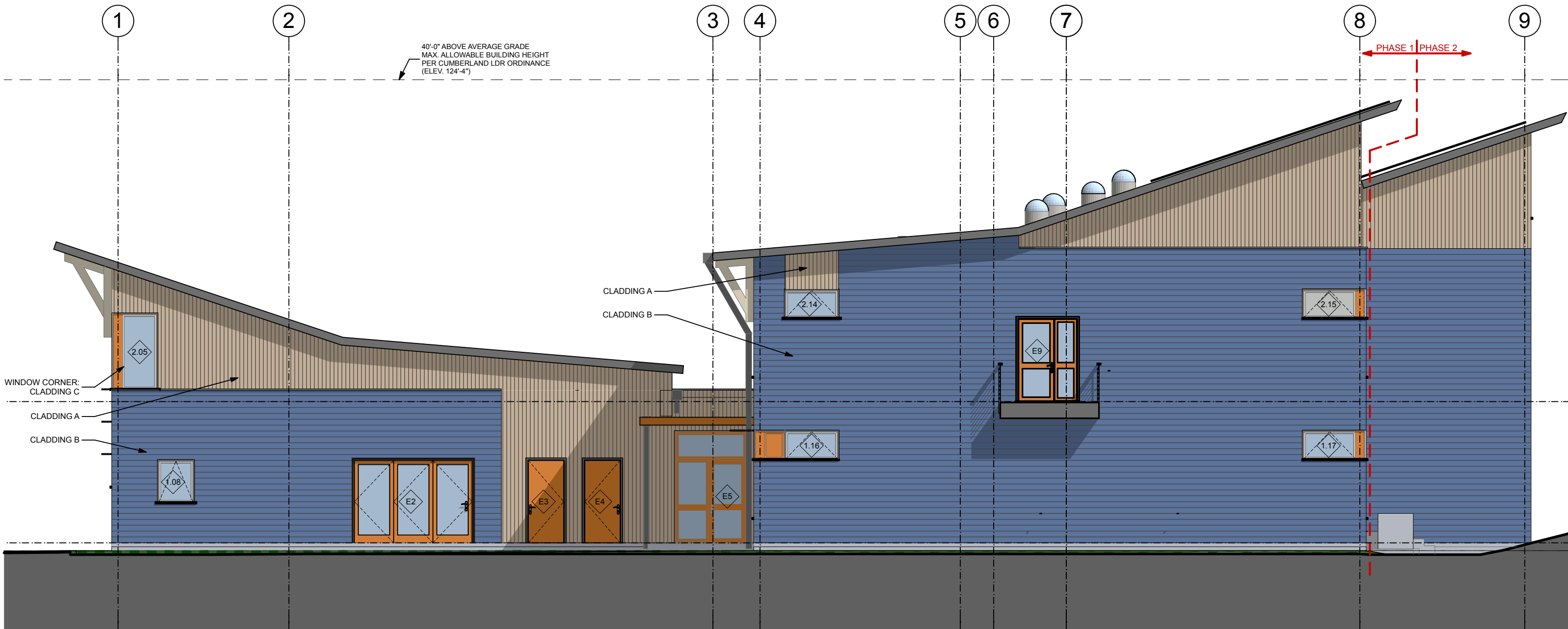
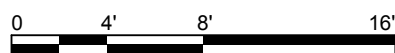
1 WEST ELEVATION - PHASE 1 (MAIN ENTRY)
SCALE: 1/8" = 1'-0"



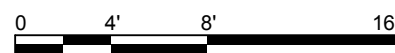
2 EAST ELEVATION - PHASE 1
SCALE: 1/8" = 1'-0"



3 WEST ELEVATION - PHASE 1 & 2 (MAIN ENTRY WITH GYM)
SCALE: 1/8" = 1'-0"



4 EAST ELEVATION - PHASE 1 & 2 (WITH GYM)
SCALE: 1/8" = 1'-0"



CLADDING NOTES:
CLADDING A: WOOD BOARD (4" VERT.) NATURAL FINISH
CLADDING B: F/C BOARD (6" HORIZ.) PAINT FINISH
CLADDING C: F/C PANEL PAINT FINISH



Classroom Addition

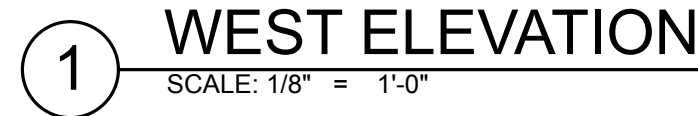







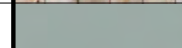












Mechanical & Plumbing
**Integrated Energy
Systems, PLLC**
301 Middle Road
Falmouth, ME 04105
p: 207-781-4263

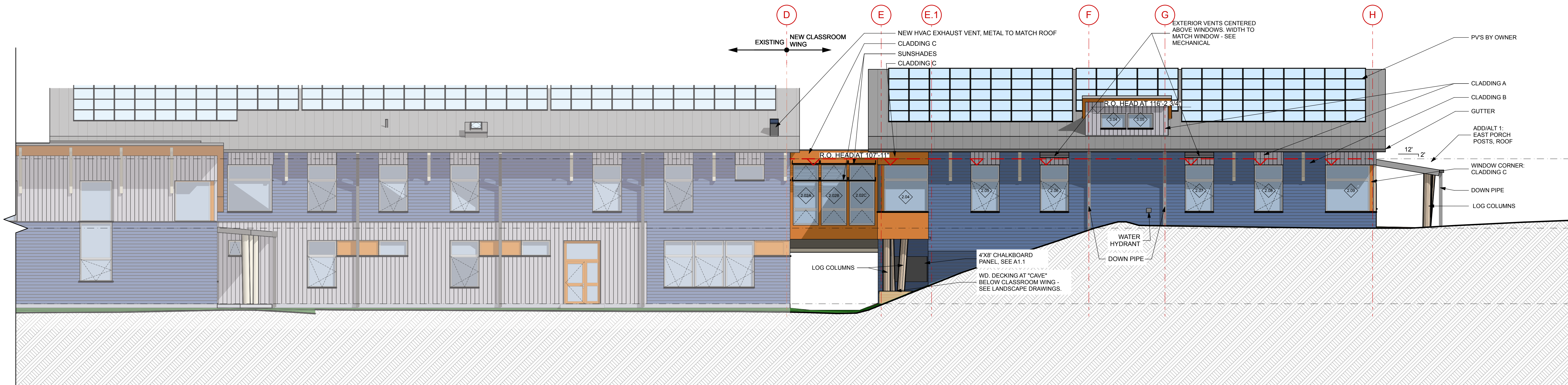
| ISSUE NO. | DESCRIPTION | CHID | CHANGE NAME | DATE |
|-----------|------------------|------|-------------|---------|
| A | PRICING SET | | | 9/20/18 |
| B | FOR SHW PERMIT | | | 10/2/18 |
| C | FOR CD COORD. | | | 10/2/18 |
| D | FOR CONSTRUCTION | | | 2/22/19 |
| | | | | |
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PHASE FOR CONSTRUCTION

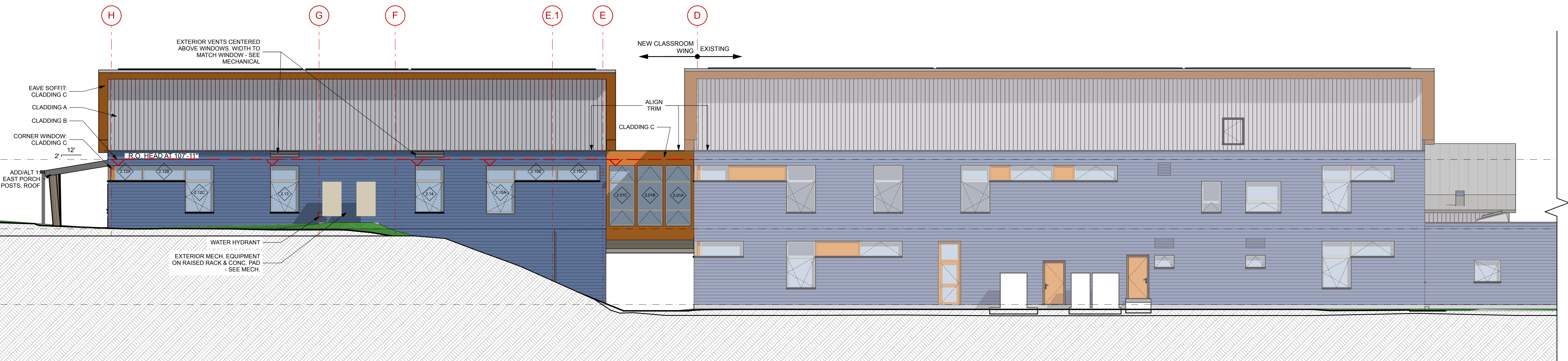
A-2.1








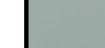












| EXTERIOR MATERIALS AND COLORS | | | | |
|---------------------------------|---|--|---|---|
| LOCATION | MATERIAL | SPECIFIED PRODUCT & COLOR (PER SUBMITTAL REVIEW) | | NOM. COLOR |
| ROOF | STEEL RAISED SEAM | ENGLERT | "SLATE GRAY" |  |
| ROOF EDGE - TYPICAL | STEEL BREAK METAL | ENGLERT | "SLATE GRAY" |  |
| EAVE SOFFIT - TYPICAL | FIBER CEMENT | PAINT | MATCH BEN. MOORE "FALL HARVEST" 2168-10 |  |
| ROOF EDGE - PORCHES | CELLULAR PVC | PAINT | MATCH BEN. MOORE "FALL HARVEST" 2168-10 |  |
| EAVE SOFFIT - PORCHES | PINE BOARDS - LUMBER SUPPLIED BY FSP | | NATURAL FINISH |  |
| CLADDING "A" | STEEL VERTICAL RIB - PAC-CLAD "M36" | PAC-CLAD | "CITYSCAPE" |  |
| CLADDING "B" | STEEL HORIZ. RIB - ATAS "BELVEDERE" BWS91 | ATAS | "REGAL BLUE" |  |
| CLADDING "C" - PANELS & CORNERS | FIBER CEMENT | PAINT | MATCH BEN. MOORE "FALL HARVEST" 2168-10 |  |
| EXTERIOR DOORS | SCHUCO ALUMINUM | RAL | "SIGNAL ORANGE" 2010 |  |
| WINDOWS - FRAME/SASH | INTUS uPVC | uPVC | WHITE |  |
| WINDOWS - JAMB/HEAD TRIM | STEEL BREAK METAL | | "CITYSCAPE" / "REGAL BLUE" / "FALL HARVEST" |  |
| WINDOWS - SILL | STEEL BREAK METAL | KYNAR | MATCH BEN. MOORE "FALL HARVEST" 2168-10 |  |
| EXTERIOR WALL LOUVERS | ALUMINUM | AWV | "IBM BLUE" |  |
| FLASHING - FOUNDATION | STEEL BREAK METAL | | "CITYSCAPE" / "REGAL BLUE" |  |
| FOUNDATION WALL APRON | PLASTIC COMPOSITE BOARD | AZEK FASCIA | "RIVERROCK" |  |
| SUNSHADES | GALV. STEEL | PAINT FINISH TO MATCH ROOF EDGE | |  |
| GUTTER | GALV. STEEL | PAINT FINISH TO MATCH ROOF EDGE | |  |
| DOWN PIPES | BREAK METAL | PAINT FINISH TO MATCH ROOF EDGE | |  |



1 SOUTH ELEVATION - CLASSROOM WING
SCALE: 1/8" = 1'-0"



2 NORTH ELEVATION - CLASSROOM WING
SCALE: 1/8" = 1'-0"

| EXTERIOR MATERIALS AND COLORS | | | | |
|---------------------------------|---|--|---|---|
| LOCATION | MATERIAL | SPECIFIED PRODUCT & COLOR (PER SUBMITTAL REVIEW) | | NOM. COLOR |
| ROOF | STEEL RAISED SEAM | ENGLERT | "SLATE GRAY" |  |
| ROOF EDGE - TYPICAL | STEEL BREAK METAL | ENGLERT | "SLATE GRAY" |  |
| EAVE SOFFIT - TYPICAL | FIBER CEMENT | PAINT | MATCH BEN. MOORE "FALL HARVEST" 2168-10 |  |
| ROOF EDGE - PORCHES | CELLULAR PVC | PAINT | MATCH BEN. MOORE "FALL HARVEST" 2168-10 |  |
| EAVE SOFFIT - PORCHES | PINE BOARDS - LUMBER SUPPLIED BY FSP | | NATURAL FINISH |  |
| CLADDING "A" | STEEL VERTICAL RIB - PAC-CLAD "M36" | PAC-CLAD | "CITYSCAPE" |  |
| CLADDING "B" | STEEL HORIZ. RIB - ATAS "BELVEDERE" BWS91 | ATAS | "REGAL BLUE" |  |
| CLADDING "C" - PANELS & CORNERS | FIBER CEMENT | PAINT | MATCH BEN. MOORE "FALL HARVEST" 2168-10 |  |
| EXTERIOR DOORS | SCHUCO ALUMINUM | RAL | "SIGNAL ORANGE" 2010 |  |
| WINDOWS - FRAME/SASH | INTUS uPVC | uPVC | WHITE |  |
| WINDOWS - JAMB/HEAD TRIM | STEEL BREAK METAL | | "CITYSCAPE" / "REGAL BLUE" / "FALL HARVEST" |  |
| WINDOWS - SILL | STEEL BREAK METAL | KYNAR | MATCH BEN. MOORE "FALL HARVEST" 2168-10 |  |
| EXTERIOR WALL LOUVERS | ALUMINUM | AWV | "IBM BLUE" |  |
| FLASHING - FOUNDATION | STEEL BREAK METAL | | "CITYSCAPE" / "REGAL BLUE" |  |
| FOUNDATION WALL APRON | PLASTIC COMPOSITE BOARD | AZEK FASCIA | "RIVERROCK" |  |
| SUNSHADES | GALV. STEEL | PAINT FINISH TO MATCH ROOF EDGE | |  |
| GUTTER | GALV. STEEL | PAINT FINISH TO MATCH ROOF EDGE | |  |
| DOWN PIPES | BREAK METAL | PAINT FINISH TO MATCH ROOF EDGE | |  |

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| D | FOR CONSTRUCTION | | | 2/22/19 |



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

Janet T. Mills
GOVERNOR

Bruce A. Van Note
COMMISSIONER

May 8, 2019

William J. Bray, P.E.
Traffic Solutions
17 Mountview Drive
Gorham, ME 04038

RE: Cumberland – Friends School of Portland Expansion Project

Dear William:

Based on the information provided on April 23, 2019, the MaineDOT concurs that the proposed expansion of the Friends School of Portland in Cumberland will not require a MaineDOT Traffic Movement Permit (TMP). Since the project is not anticipated to result in an increase in peak hour trip generation of more than 99 trip ends over the existing trips, the project does not require a TMP.

It should be noted that any future projects on the Friends School of Portland site will need to include the anticipated increase in peak hour trip generation of this expansion in addition to the anticipated increase in peak hour trip generation of the future development. If the combined anticipated increase in peak hour trips of this project and any future project exceed 99 trip ends, a TMP will be required.

If you have any questions or wish to discuss this in more detail, please do not hesitate to contact me.

Sincerely,

Randy Illian, PE
Region 1 Traffic Engineer

Cc: Steve Landry, State Traffic Engineer
file