CIVIL ENGINEERING ▪ SURVEYING ▪ LANDSCAPE ARCHITECTURE

SITE PLAN APPLICATION

To
City of Portland

For

Portland Retirement Residence
802 Ocean Avenue
Portland, ME 04087

Prepared for

Hawthorne Retirement Group
9310 NE Vancouver Mall Dr., Suite 200
Vancouver, WA 98662-2810

September 2015

75 John Roberts Road – Suite 1A, South Portland, ME 04106-6963 • 207.200.2100 • Fax: 207.856.2206

Site Plan Application

Table of Contents

Section 15. Ability to Serve Letters

- Portland Water District
- City of Portland Public Services – Sewer Division

Section 16. Statement of Solid Waste Generation

Section 17. NFPA 1/Fire Department Standards

Section 18. Assessment of Consistency with Design Standards

Section 19. Manufacturer's Verification on Mechanical Equipment

Section 20. Soils Report

Section 21. Typical Unit Plans/Floor Plans

Section 22. Site Plan/Site Elevations/Color Board

Section 23. Site Construction Plans/Landscaping Plans

Section 24. Lighting Cut Sheets/Lighting Plans

SEBAGO
TECHNICS

September 17, 2015
14432

Barbara Barhydt, Development Review Manager
City of Portland
Planning and Urban Development Department
389 Congress Street
Portland, ME 04101

Re: **<u>Site Plan Submittal – Portland Retirement Residence</u>**
<u>802 Ocean Avenue, Portland, ME, Map 411, Lot 7A and Map 416, Lots A6, A7 & A21</u>

Dear Barbara:

On behalf of our clients, Hawthorn Development Group, LLC and Lenity Architecture, we are pleased to submit the enclosed Level III Site Plan Application for the above referenced project. Hawthorn Development Group, LLC proposes to construct a 150 unit congregate care facility on the property with associated vehicle parking and loading, landscaping, and stormwater management treatment systems.

Independent Senior Housing / Congregate Care Facility Concept
The Congregate Care concept is designed for residents with an average age of 82 who are still ambulatory. The facility does not offer medical or nursing care. This development will be privately funded and operated, and will not receive government subsidies.

Each private suite offers the advantages of independent living while the services included provide support, security, and friendship. The private suites include studio, one, and two bedroom versions. Suites do not contain kitchens, therefore they are not dwelling units, and all resident meals are served in a central dining room.

Services for residents include three prepared meals daily, housekeeping, laundering service, private van transportation, and various social and physical activities. The Management Team lives on the premises and is available to residents 24 hours a day. The residents monthly rent payment covers the cost of their private suite, all meals, services and utilities, no “buy in fee” is required.

Our typical resident is a single woman in her late 70’s or 80’s who lives within 10 miles of the site. Approximately 10% of suites will be rented by couples resulting in a total building population of approximately 165. Fewer than 20% of the residents will be driving their own cars. Because most of our residents prefer not to drive, we provide private van transportation for their use. Van service is included in the monthly rent, available 24/7 and offers residents independence and mobility while providing their families peace of mind.

This type of use does not create the problems typically associated with higher density developments, such as traffic, noise, or increased demand on public services.

Existing Site

The development site is part of an 18.33 tract of land which is located on the west side of Ocean Avenue approximately 0.5 mile north of Washington Avenue. The property has substantial frontage on Ocean Avenue where it also borders individual residential lots that are on Ocean Avenue. The property is bounded on the north by the Ocean Ridge Condominiums, on the west by Alden's Walk Condominiums and forested land and on the south by a single family residential property. The western portion of the property (8.17 acres) is transversed by a 135 foot wide Central Maine Power transmission line easement and is zoned as Residential Open Space (R-OS). The eastern portion of the property (10.16 acres) which is zoned as R-5A Residential Zoning District is the land on which the development is proposed.

The property grades varies from a high point of approximately elevation 170 (location of USGS marker "West Graves") to elevation 145 to 160 along the western boundary and to elevation 100 to 110 along the Ocean Avenue frontage. Slopes vary from 5 to 10% in central portion of the property up to 15 to 25% slopes along Ocean Avenue. The western portion of the property contains wetlands of varying sizes, some of which overflow to a shallow drainage course/wetland that bisects and flows through the eastern portion of the property and southerly along the boundary which the adjacent lots that front on Ocean Avenue. This drainage course eventually turns to the east and discharges from the property via culverts under Ocean Avenue (see stormwater Management Plan).

Extensive geotechnical explorations (see soils report contained within the submission) have been completed for the property; the site is forested with a surficial layer of forest duff and topsoil. The surface is generally overlaid by a thin layer of silty sand and/or silty glacial till overlying shallow bedrock. This bedrock was encountered at the explorations at depths varying from about ½ to 5 feet.

Site Design

Based upon the neighborhood meetings that we have held to date, one aspect of the site layout and design was based upon locating the main structure to minimize the potential for visual impacts from adjacent properties. This was achieved by locating the building in the flatter portion of the site and setting the finished floor elevation such that the highest points of the structure would be roughly about the height of the natural vegetation. The front portion of the natural grade in this area varies around the proposed finished floor elevation of 135. The existing grade in the back portion of the building site will be cut to this elevation and keeps the height of the structure below the tree canopies to the west. This location was also chosen to maximize the separate from the existing surrounding developments and to minimize the amount of material that would need to excavated and potentially blasted on-site.

Careful consideration was also given to the natural resources on-site with placement of the building. By the layout of the site, we have been able to minimize the amount of land necessary for the development with only 4.93 acres of developed area utilized (less than 50% of the R-5A portion of the property). The site design also avoids impacts to any of the wetlands on-site and leaves a large portion of the undeveloped R-5A zone area contiguous with the preserved area within the R-OS zone. The applicant has coordinated with Portland Trails and executed an easement to allow public access through the developed port of the property to existing trails with the R-OS area.

We have also tried to address some of the concerns of our neighbors in the stormwater design for the project. We have maintained the natural drainage course through the development site which drains the western portion of the property and some areas from the adjacent Ocean Ridge Condominiums. Unlike the prior proposed developments, we have avoided using the main section of this drainage course for discharge of the site; we have chosen to use an underground sub surface sand filter for the southern portion of the development. This system will discharge closer to the section of the drainage course that flows to the east to Ocean Avenue. Because of concerns relative to the wet pond that was previously proposed on the northerly portion of the site, we have proposed an under drained soil filter. In lieu of discharges to the natural drainage course through the middle of the site, this filter will discharge via a spreader swale down slope of the access roadway to maintain a current drainage path in the site. This discharge will reduce the amount of flow that was previously was designed to flow in the drainage course upslope and in back of the residences that front of Ocean Avenue.

In addition to the changes reflected above, the project will complete the missing link of sidewalk along Ocean Avenue from just north of Ashley Lane to sidewalk opposite the Ocean Ridge Condominiums, north of the property. The design maintains the section that was used to the south on Ocean Avenue when CSO/roadway improvements were completed several years ago. We have coordinated with the Public Services Division to address minimizing the impact to adjacent properties by moving the walk adjacent to the curb line in one area thus avoiding/minimizing the removal of a large ledge outcropping.

The site will be served by public water supplied by Portland Water District and the City's gravity sewer system located within Ocean Avenue. Based upon the height of the property and the operating pressures within the 12" water main in Ocean Avenue, the project will require a booster pump system to ensure that fire protection flows are met. This system will be placed within an accessory building at the project's entrance along the water meter for the project. We have coordinated with Unitil relative to the extension of the gas main that exists to the south on Ocean Avenue to determine the feasibility to extend the main to serve this project. We have also coordinated with some of the neighbors relative to this extension as many of the existing developments would also like the ability to be served by Unitil.

Our clients are looking forward to the continued working relationship that we have had with the City of Portland and City staff as this project moves through the Planning Board review process.

If you have any questions, relative to this submission, do not hesitate to contact me. Thank you once again for your time relative to our application.

Sincerely,

SEBAGO TECHNICS, INC.

Robert A. McSorley, P.E.
Senior Project Manager

RAM:ram/llg
Enc.

cc: Mark Lowen, Lenity Architecture
Kristi Neznanski, Lenity Architecture
Dan Roach, Lenity Architecture

Section 1. Application Forms

- Site Plan Application
- Site Plan Checklist

Jeff Levine, AICP, Director
Planning & Urban Development Department

Electronic Signature and Fee Payment Confirmation

Notice: Your electronic signature is considered a legal signature per state law.

By digitally signing the attached document(s), you are signifying your understanding this is a legal document and your electronic signature is considered a ***legal signature*** per Maine state law. You are also signifying your intent on paying your fees by the opportunities below.

I, the undersigned, intend and acknowledge that no Site Plan or Historic Preservation Applications can be reviewed until payment of appropriate application fees are ***paid in full*** to the Inspections Office, City of Portland Maine by method noted below:

☐ Within 24-48 hours, once my complete application and corresponding paperwork has been electronically delivered, I intend to **call the Inspections Office** at 207-874-8703 and speak to an administrative representative and provide a credit/debit card over the phone.

☐ Within 24-48 hours, once my application and corresponding paperwork has been electronically delivered, I intend to **call the Inspections Office** at 207-874-8703 and speak to an administrative representative and provide a credit/debit card over the phone.

☒ I intend to deliver a payment method through the U.S. Postal Service mail once my application paperwork has been electronically delivered.

Applicant Signature: ____________________ Date: 9/17/15

I have provided digital copies and sent them on: ____________________ Date: 9/17/15

NOTE: All electronic paperwork must be delivered to buildinginspections@portlandmaine.gov or by physical means i.e. a thumb drive or CD to the Inspections Office, City Hall, 3rd Floor, Room 315.

Level III – Preliminary and Final Site Plans
Development Review Application
Portland, Maine

Planning and Urban Development Department
Planning Division

Portland's Planning and Urban Development Department coordinates the development review process for site plan, subdivision and other applications under the City's Land Use Code. Attached is the application form for a Level III: Preliminary or Final Site Plan. Please note that Portland has delegated review from the State of Maine for reviews under the Site Location of Development Act, Chapter 500 Stormwater Permits, and Traffic Movement Permits

Level III: Site Plan Development includes:

- New structures with a total floor area of 10,000 sf or more except in Industrial Zones.
- New structures with a total floor area of 20,000 sf or more in Industrial Zones.
- New temporary or permanent parking area(s) or paving of existing unpaved parking areas for more than 75 vehicles.
- Building addition(s) with a total floor area of 10,000 sf or more (cumulatively within a 3 year period) except in Industrial Zones.
- Building addition(s) with a total floor area of 20,000 sf or more in Industrial Zones.
- A change in the use of a total floor area of 20,000 sf or more in any existing building (cumulatively within a 3 year period).
- Multiple family development (3 or more dwelling units) or the addition of any additional dwelling unit if subject to subdivision review.
- Any new major or minor auto business in the B-2 or B-5 Zone, or the construction of any new major or minor auto business greater than 10,000 sf of building area in any other permitted zone.
- Correctional prerelease facilities.
- Park improvements: New structures greater than 10,000 sf and/or facilities encompassing 20,000 sf or more (excludes rehabilitation or replacement of existing facilities); new nighttime outdoor lighting of sports, athletic or recreation facilities not previously illuminated.
- Land disturbance of 3 acres or more (includes stripping, grading, grubbing, filling or excavation).

Portland's development review process and requirements are outlined in the Land Use Code (Chapter 14) which is available on our website:

Land Use Code: http://me-portland.civicplus.com/DocumentCenter/Home/View/1080
Design Manual: http://me-portland.civicplus.com/DocumentCenter/View/2355
Technical Manual: http://me-portland.civicplus.com/DocumentCenter/View/2356

Planning Division
Fourth Floor, City Hall
389 Congress Street
(207) 874-8721

Office Hours
Monday thru Friday
8:00 a.m. – 4:30 p.m.

PROJECT NAME: **Portland Retirement Residence**

PROPOSED DEVELOPMENT ADDRESS:

802 Ocean Avenue

PROJECT DESCRIPTION:

Site Plan for 150 Unit Congregate Care Facility

CHART/BLOCK/LOT: **Map 411, Lot 7A, Map 416, Lots A6, A7 & A21**

PRELIMINARY PLAN **N/A** **(date)**
FINAL PLAN **9/17/15** **(date)**

CONTACT INFORMATION:

Applicant – must be owner, Lessee or Buyer	**Applicant Contact Information**
Name: Lenity Architecture LLC c/o Mark Lowen OBO	Work # 503-399-1090
Business Name, if applicable: Hawthorne Development Group, LLC	Home#
Address: 3150 Kettle Court SE	Cell # 503-586-4104 Fax# 503-399-0565
City/State : Salem, OR Zip Code: 97301	e-mail: markl@lenityarchitecture.com
Owner – (if different from Applicant)	**Owner Contact Information**
Name: Graves Hill Land Company, LLC	Work #
Address: 16 Tiffany Lane	Home#
City/State : Saco, ME Zip Code: 04702	Cell # Fax#
	e-mail:
Agent/ Representative	**Agent/Representative Contact information**
Name: Sebago Technics, Inc, c/o Robert A. McSorley, PE	Work # 207-200-2074
Address: 75 John Roberts Road, Suite 1A	Cell # 207-939-1809
City/State : South Portland, ME Zip Code: 04106	e-mail: rmcsorley@sebagotechnics.com
Billing Information	**Billing Information**
Name: Lenity Architecture LLC c/o Mark Lowen	Work # 503-399-1090
Address: 3150 Kettle Court SE	Cell # 503-586-4104 Fax# 503-399-0565
City/State : Salem, OR Zip Code: 97301	e-mail: markl@lenityarchitecture.com

Engineer	Engineer Contact Information	
Name: Sebago Technics, Inc, c/o Robert A. McSorley, PE	Work # 207-200-2074	
Address: 75 John Roberts Road, Suite 1A	Cell # 207-939-1809	Fax# 207-856-2206
City/State : South Portland, ME Zip Code: 04106	e-mail: rmcsorley@sebagotechnics.com	
Surveyor	**Surveyor Contact Information**	
Name: Sebago Technics, Inc, c/o Robert A. McSorley, PE	Work #	
Address: Same as Above	Cell #	Fax#
City/State : Zip Code:	e-mail:	
Architect	**Architect Contact Information**	
Name: Lenity architecture, c/o Mark Lowen	Work # 503-399-1090	
Address: 3150 Kettle Court SE	Cell # 503-586-4104	Fax# 503-399-0565
City/State : Salem,OR Zip Code: 97301	e-mail: markl@lenitygroup.com	
Attorney	**Attorney Contact Information**	
Name: Hopkinson & Abdonndanza, c/o James Hopkinson	Work # 207-772-5845	
Address: 511 Congress Street, Suite 801	Cell #	Fax# 207-874-2330
City/State : Portland, ME Zip Code: 04101	e-mail: jhopkinson@hablaw.com	

APPLICATION FEES:

Check all reviews that apply. (Payment may be made by Cash or Check payable to the City of Portland)

Level III Development **(check applicable reviews)**

___ Less than 50,000 sq. ft. ($500.00)
___ 50,000 - 100,000 sq. ft. ($1,000)
_X_ 100,000 – 200,000 sq. ft. ($2,000)
___ 200,000 – 300,000 sq. ft. ($3,000)
___ over 300,000 sq. ft. ($5,000)
___ Parking lots over 11 spaces ($1,000)
___ After-the-fact Review ($1,000.00 plus applicable application fee)

Plan Amendments **(check applicable reviews)**

___ Planning Staff Review ($250)
___ Planning Board Review ($500)

The City invoices separately for the following:

- Notices ($.75 each)
- Legal Ad (% of total Ad)
- Planning Review ($40.00 hour)
- Legal Review ($75.00 hour)

Third party review is assessed separately. Any outside reviews or analysis requested from the Applicant as part of the development review, are the responsibility of the Applicant and are separate from any application or invoice fees.

Other Reviews **(check applicable reviews)**

___ Traffic Movement ($1,000)
___ Stormwater Quality ($250)
___ Subdivisions ($500 + $25/lot)
# of Lots ____ x $25/lot = _____
___ Site Location ($3,000, except for residential projects which shall be $200/lot)
# of Lots ____ x $200/lot = _____
___ Other______________________
___ Change of Use
___ Flood Plain
___ Shoreland
___ Design Review
___ Housing Replacement
___ Historic Preservation

APPLICATION SUBMISSION:

1. **All site plans and written application materials must be submitted electronically on a CD or thumb drive with each plan submitted as separate files, with individual file which can be found on the Electronic Plan and Document Submittal page of the City's website at http://me-portland.civicplus.com/764/Electronic-Plan-and-Document-Submittal**

2. **In addition, one (1) paper set of the plans (full size), one (1) paper set of plans (11 x 17), paper copy of written materials, and the application fee must be submitted to the Building Inspections Office to start the review process.**

The application must be complete, including but not limited to the contact information, project data, application checklists, wastewater capacity, plan for fire department review, and applicant signature. The submissions shall include one (1) paper packet with folded plans containing the following materials:

1. **One (1) full size site plans** that must be **folded.**
2. One (1) copies of all written materials as follows, unless otherwise noted:
   a. Application form that is completed and signed.
   b. Cover letter stating the nature of the project.
   c. All Written Submittals (Sec. 14-525 2. (c), including evidence of right, title and interest.
3. A stamped standard boundary survey prepared by a registered land surveyor at a scale not less than one inch to 50 feet.
4. Plans and maps based upon the boundary survey and containing the information found in the attached sample plan checklist.
5. One (1) set of plans reduced to 11 x 17.

Refer to the application checklist (attached) for a detailed list of submittal requirements.
Portland's development review process and requirements are outlined in the Land Use Code (Chapter 14), which includes the Subdivision Ordinance (Section 14-491) and the Site Plan Ordinance (Section 14-521). Portland's Land Use Code is on the City's web site: www.portlandmaine.gov Copies of the ordinances may be purchased through the Planning Division.

I hereby certify that I am the Owner of record of the named property, or that the owner of record authorizes the proposed work and that I have been authorized by the owner to make this application as his/her authorized agent. I agree to conform to all applicable laws of this jurisdiction. In addition, if a permit for work described in this application is issued, I certify that the Planning Authority and Code Enforcement's authorized representative shall have the authority to enter all areas covered by this permit at any reasonable hour to enforce the provisions of the codes applicable to this permit.

This application is for a Level III Site Plan review. It is not a permit to begin construction. An approved site plan, a Performance Guarantee, Inspection Fee, Building Permit, and associated fees will be required prior to construction. Other Federal, State or local permits may be required prior to construction, which are the responsibility of the applicant to obtain.

Signature of Applicant:	**Date:**
[signature]	9/17/15

PROJECT DATA

(The following information is required where applicable, in order complete the application)

Total Site Area	**442,875 R-5A, 798,184 Total** sq. ft.
Proposed Total Disturbed Area of the Site	**205,168** sq. ft.
(If the proposed disturbance is greater than one acre, then the applicant shall apply for a Maine Construction General Permit (MCGP) with DEP and a Stormwater Management Permit, Chapter 500, with the City of Portland)	
Impervious Surface Area	
Impervious Area (Total Existing)	**0** sq. ft.
Impervious Area (Total Proposed)	**127,631** sq. ft.
Building Ground Floor Area and Total Floor Area	
Building Footprint (Total Existing)	**0** sq. ft.
Building Footprint (Total Proposed)	**39,869** sq. ft.
Building Floor Area (Total Existing)	**0** sq. ft.
Building Floor Area (Total Proposed)	**134,646** sq. ft.
Zoning	
Existing	**R-5A**
Proposed, if applicable	**R-5A**
Land Use	
Existing	**vacant**
Proposed	**150 suite congregate care facility**
Residential, if applicable	
# of Residential Units (Total Existing)	**0**
# of Residential Units (Total Proposed)	**150**
# of Lots (Total Proposed)	**N/A**
# of Affordable Housing Units (Total Proposed)	**N/A**
Proposed Bedroom Mix	
# of Efficiency Units (Total Proposed)	**57**
# of One-Bedroom Units (Total Proposed)	**78**
# of Two-Bedroom Units (Total Proposed)	**15**
# of Three-Bedroom Units (Total Proposed)	**N/A**
Parking Spaces	
# of Parking Spaces (Total Existing)	**0**
# of Parking Spaces (Total Proposed)	**102 including garages**
# of Handicapped Parking Spaces (Total Proposed)	**5**
Bicycle Parking Spaces	
# of Bicycle Spaces (Total Existing)	**0**
# of Bicycle Spaces (Total Proposed)	**None, Senior Housing**
Estimated Cost Of Project	**$18,000,000.00**

PRELIMINARY PLAN (Optional) - Level III Site Plan			
Applicant Checklist	**Planner Checklist**	**# of Copies**	**GENERAL WRITTEN SUBMISSIONS CHECKLIST**
☐	☐	1	Completed application form
☐	☐	1	Application fees
☐	☐	1	Written description of project
☐	☐	1	Evidence of right, title and interest.
☐	☐	1	Evidence of state and/or Federal approval, if applicable.
☐	☐	1	Written assessment of proposed project's compliance with applicable zoning requirements
☐	☐	1	Summary of existing and/or proposed easements, covenants, public or private rights-of-way, or other burdens on the site
☐	☐	1	Written requests for waivers from site plan and/or technical standards, if applicable.
☐	☐	1	Evidence of financial and technical ability
☐	☐	1	Traffic analysis (may be preliminary, in nature, during the preliminary plan phase).
☐	☐	1	Written summary of significant natural features located on the site.
☐	☐	1	Written summary of project's consistency with related city master plans.
☐	☐	1	Neighborhood Meeting Material (refer to page 13 of this application.)
Applicant Checklist	**Planner Checklist**	**# of Copies**	**SITE PLAN SUBMITTAL CHECKLIST**
☐	☐	1	Boundary Survey meeting the requirements of Section 13 of the City of Portland Technical Manual.
☐	☐	1	**Preliminary Site Plan Including the following: (*information provided may be preliminary in nature during preliminary plan phase):**
☐	☐	Proposed grading and contours;	
☐	☐	Existing structures with distances from property line;	
☐	☐	Proposed site layout and dimensions for all proposed structures (including piers, docks or wharves in Shoreland Zone), paved areas, and pedestrian and vehicle access ways;	
☐	☐	Preliminary design of proposed stormwater management in accordance Section 5 of the Technical Manual (note that Portland has a separate applicability section);	
☐	☐	Preliminary infrastructure improvements;	
☐	☐	Preliminary Landscape Plan in accordance with Section 4 of the Technical Manual;	
☐	☐	Location of significant natural features (including wetlands, ponds, watercourses, floodplains, significant wildlife habitats and fisheries or other important natural features) located on the site as defined in Section 14-526 (b)(1);	
☐	☐	Proposed buffers and preservation measures for significant natural features, as defined in Section 14-526 (b) (1);	
☐	☐	Location , dimensions and ownership of easements, public or private rights of way, both existing and proposed;	
☐	☐	Exterior building elevations.	

FINAL PLAN (Optional) - Level III Site Plan			
Applicant Checklist	**Planner Checklist**	**# of Copies**	**GENERAL WRITTEN SUBMISSIONS CHECKLIST (* If applicant chooses to submit a Preliminary Plan, then the * items were submitted for that phase and only updates are required)**
☒	☐	1	* Completed application form
☒	☐	1	* Application fees
☒	☐	1	* Written description of project
☒	☐	1	* Evidence of right, title and interest.
☐	☐	1	* Evidence of state and/or Federal approval, if applicable. **N/A**
☒	☐	1	* Written assessment of proposed project's specific compliance with applicable zoning requirements
☒	☐	1	* Summary of existing and/or proposed easements, covenants, public or private rights-of-way, or other burdens on the site
☒	☐	1	* Evidence of financial and technical ability
☒	☐	1	Construction management plan
☒	☐	1	A traffic study and other applicable transportation plans in accordance with Section 1 of the technical Manual, where applicable.
☒	☐	1	Written summary of significant natural features located on the site (Section 14-526 (b) (a))
☒	☐	1	Stormwater management plan and stormwater calculations
☐	☐	1	Written summary of project's consistency with related city master plans **N/A**
☒	☐	1	Evidence of utility capacity to serve
☒	☐	1	Written summary of solid waste generation and proposed management of solid waste.
☒	☐	1	A code summary referencing NFPA 1 and all Fire Department technical standards
☒	☐	1	Where applicable, an assessment of the development's consistency with any applicable design standards contined in Section 14-526 and in the City of Portland Design Manual.
☒	☐	1	Manufacturer's verification that HVAC and manufacturing equipment meets applicable state and federal emissions requirements.

Applicant Checklist	Planner Checklist	# of Copies	SITE PLAN SUBMISSIONS CHECKLIST (* If applicant chooses to submit a Preliminary Plan, then the * items were submitted for that phase and only updates are required)
☒	☐	1	Boundary Survey meeting the requirements of Section 13 of the City of Portland Technical Manual.
		1	**Final Site Plans including the following:**
☒	☐	Existing and proposed structures, as applicable, and distance from property line (including location of proposed piers, docks or wharves if in Shoreland Zone);	
☒	☐	Existing and proposed structures on parcels abutting site;	
☒	☐	All streets and intersections adjacent to the site and any proposed geometric modifications to those streets or intersections;	
☒	☐	Location, dimensions and materials of all existing and proposed driveways, vehicle and pedestrian access ways, with corresponding curb lines;	
☒	☐	Engineered construction specifications and cross-sectional drawings for all proposed driveways, paved areas, sidewalks;	
☒	☐	Location and dimensions of all proposed loading areas including turning templates for applicable design delivery vehicles;	
☒	☐	Existing and proposed public transit infrastructure with applicable dimensions and engineering specifications;	
☒	☐	Location of existing and proposed vehicle and bicycle parking spaces with applicable dimensional and engineering information;	
☒	☐	Location of all snow storage areas and/or a snow removal plan;	
☒	☐	A traffic control plan as detailed in Section 1 of the Technical Manual;	
☒	☐	Proposed buffers and preservation measures for significant natural features, where applicable, as defined in Section 14-526(b)(1);	
☒	☐	Location and proposed alteration to any watercourse;	
☒	☐	A delineation of wetlands boundaries prepared by a qualified professional as detailed in Section 8 of the Technical Manual;	
☒	☐	Proposed buffers and preservation measures for wetlands;	
☒	☐	Existing soil conditions and location of test pits and test borings;	
☒	☐	Existing vegetation to be preserved, proposed site landscaping, screening and proposed street trees, as applicable;	
☒	☐	A stormwater management and drainage plan, in accordance with Section 5 of the Technical Manual;	
☒	☐	Grading plan;	
☒	☐	Ground water protection measures;	
☒	☐	Existing and proposed sewer mains and connections;	

- *Continued on next page* -

☒	☐	Location of all existing and proposed fire hydrants and a life safety plan in accordance with Section 3 of the Technical Manual;
☒	☐	Location, sizing, and directional flows of all existing and proposed utilities within the project site and on all abutting streets;
☒	☐	Location and dimensions of off-premises public or publicly accessible infrastructure immediately adjacent to the site;
☒	☐	Location and size of all on site solid waste receptacles, including on site storage containers for recyclable materials for any commercial or industrial property;
☒	☐	Plans showing the location, ground floor area, floor plans and grade elevations for all buildings;
☐	☐	A shadow analysis as described in Section 11 of the Technical Manual, if applicable;
☐	☐	A note on the plan identifying the Historic Preservation designation and a copy of the Application for Certificate of Appropriateness, if applicable, as specified in Section Article IX, the Historic Preservation Ordinance;
☒	☐	Location and dimensions of all existing and proposed HVAC and mechanical equipment and all proposed screening, where applicable;
☒	☐	An exterior lighting plan in accordance with Section 12 of the Technical Manual;
☒	☐	A signage plan showing the location, dimensions, height and setback of all existing and proposed signs;
☒	☐	Location, dimensions and ownership of easements, public or private rights of way, both existing and proposed.

PORTLAND FIRE DEPARTMENT
SITE REVIEW
FIRE DEPARTMENT CHECKLIST

A separate drawing[s] shall be provided as part of the site plan application for the Portland Fire Department's review.

1. Name, address, telephone number of applicant
2. Hawthorn Development 9310 NE Vancouver Mall Drive, Vancouver, WA 98662, 360-213-1550
3. Name address, telephone number of architect
   Lenity Architecture, LLC, 3510 Kette Court SE, Salem OR 97301 503-399-1090
4. Proposed uses of any structures [NFPA and IBC classification]
5. Type V-A
6. Square footage of all structures [total and per story]
   1st flr- 39,869, 2nd flr - 31,552, 3rd flr - 32,911, 4th flr - 30,314 Total - 134,646 sf
7. Elevation of all structures
   4 story, 47' - 7 3/4"
8. Proposed fire protection of all structures
   - ***As of September 16, 2010 all new construction of one and two family homes are required to be sprinkled in compliance with NFPA 13D. This is required by City Code. (NFPA 101 2009 ed.)***

9. Hydrant locations
   Shown on plan, NE corner of the building
10. Water main[s] size and location
    8" main
11. Access to all structures [min. 2 sides]
    Access to three sides
12. A code summary shall be included referencing NFPA 1 and all fire department. Technical standards.
    Building to be sprinklered, details to be reviewed with building plans

Some structures may require Fire flows using annex H of NFPA 1

CITY OF PORTLAND WASTEWATER CAPACITY APPLICATION

Department of Public Services,
55 Portland Street,
Portland, Maine 04101-2991

Date: **Revised 8/12/15**

Mr. Frank J. Brancely,
Senior Engineering Technician,
Phone #: (207) 874-8832,
Fax #: (207) 874-8852,

E-mail:fjb@portlandmaine.gov

1. Please, Submit Utility, Site, and Locus Plans.

Site Address: **802 Ocean Avenue**

Chart Block Lot Number: **Map 411, Lot A7 and Map 416, Lots A6, 17 and A21**

Proposed Use: **Congregate Care Facility**

Previous Use: **Vacant**

Existing Sanitary Flows: **0** GPD

Existing Process Flows: **0** GPD

Description and location of City sewer that is to receive the proposed building sewer lateral.

Sanitary Gravity in Ocean Avenue

Site Category

Site Category	
Commercial (see part 4 below)	☐
Industrial (complete part 5 below)	☐
Governmental	☐
Residential	☒
Other (specify)	☐

(Clearly, indicate the proposed connections, on the submitted plans)

2. Please, Submit Contact Information.

City Planner's Name: **Barbara Barhydt** Phone: **874-8699**

Owner/Developer Name: **Hawthorn Development Group, LLC**

Owner/Developer Address: **9310 NE Vancouver Mall Drive, Suite 200, Vancouver, WA 98662-8210**

Phone: **360-213-1550** Fax: **260-213-1540** E-mail: **robin.goins@hawret.com**

Engineering Consultant Name: **Sebago Technics, Inc. attn: Robert A. McSorley, P.E.**

Engineering Consultant Address: **75 John Roberts Road, Suite 1A, South Portland, ME 04106**

Phone: **200-2074** Fax: **856-2206** E-mail: **rmcsorley@sebagotechnics.com**

(Note: Consultants and Developers should allow +/- 15 days, for capacity status, prior to Planning Board Review)

3. Please, Submit Domestic Wastewater Design Flow Calculations.

Estimated Domestic Wastewater Flow Generated: **10,080** GPD

Peaking Factor/ Peak Times: **10,080 GPD / 16 hors/day / 60 min/hour x 6 = 63 GPM**

Specify the source of design guidelines: (i.e. ☒ "Handbook of Subsurface Wastewater Disposal in Maine," ☐ "Plumbers and Pipe Fitters Calculation Manual," ☐ Portland Water District Records, ☐ Other (specify)

(Note: Please submit calculations showing the derivation of your design flows, either on the following page, in the space provided, or attached, as a separate sheet)

4. Please, Submit External Grease Interceptor Calculations.

Total Drainage Fixture Unit (DFU) Values:	**TBD**
Size of External Grease Interceptor:	**TBD**
Retention Time:	**TBD**
Peaking Factor/ Peak Times:	**TBD**

(Note: In determining your restaurant process water flows, and the size of your external grease interceptor, please use The Uniform Plumbing Code. Note: In determining the retention time, sixty (60) minutes is the minimum retention time. Note: Please submit detailed calculations showing the derivation of your restaurant process water design flows, and please submit detailed calculations showing the derivation of the size of your external grease interceptor, either in the space provided below, or attached, as a separate sheet)

5. Please, Submit Industrial Process Wastewater Flow Calculations

Estimated Industrial Process Wastewater Flows Generated: **0** GPD

Do you currently hold Federal or State discharge permits? Yes ☐ No ☐

Is the process wastewater termed categorical under CFR 40? Yes ☐ No ☐

OSHA Standard Industrial Code (SIC): ____________ *http://www.osha.gov/oshstats/sicser.html*

Peaking Factor/Peak Process Times: ____________

(***Note: On the submitted plans, please show where the building's domestic sanitary sewer laterals, as well as the building's industrial-commercial process wastewater sewer laterals exits the facility. Also, show where these building sewer laterals enter the city's sewer. Finally, show the location of the wet wells, control manholes, or other access points; and, the locations of filters, strainers, or grease traps)***

(Note: Please submit detailed calculations showing the derivation of your design flows, either in the space provided below, or attached, as a separate sheet)

Notes, Comments or Calculation

150 Residential Units (135 single units and 15 duplex units) and 2 Manager Units

135 units x 60 gpd/unit = 8,100 gpd, 15 duplex units x 120 gpd/unit = 1,800 gpd, 2 manager units x 90 gpd = 180 gpd. Total: 10,080 gpd.

Section 2. Location Map

SEBAGO TECHNICS

WWW.SEBAGOTECHNICS.COM

75 John Roberts Rd. - Suite 1A
South Portland, ME 04106
(207) 200-2100

250 Goddard Rd. - Suite B
Lewiston, ME 04240
(207) 783-5656

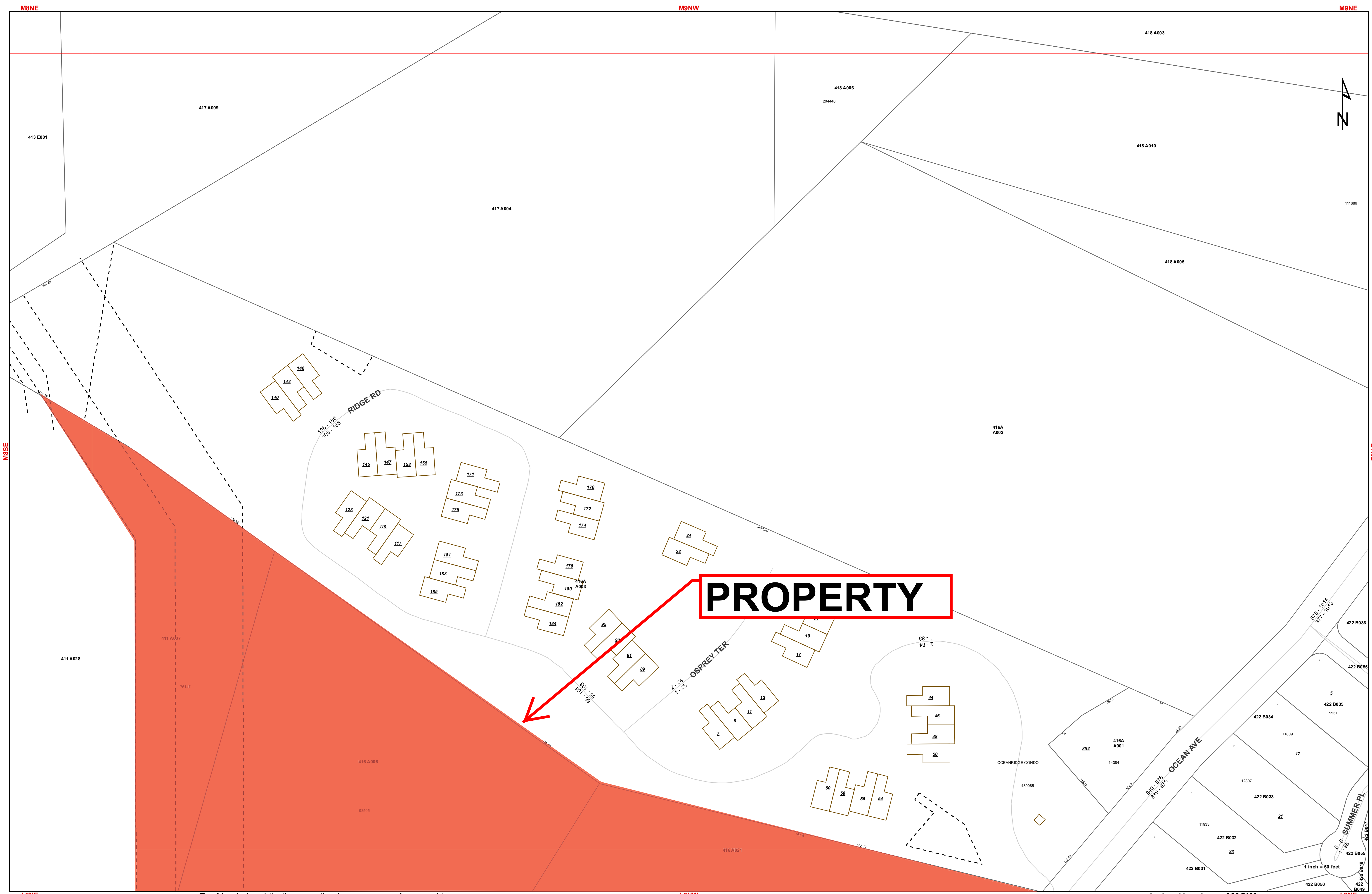
SITE LOCATION MAP
OF PORTLAND RETIREMENT COMMUNITY

SCALE:	1"=2000'
DATE:	11/19/14
SHEET:	1 OF 1

LOCATION: OCEAN AVENUE PORTLAND, ME

FOR: Hawthorn Retirement Group

Section 3. Tax Map



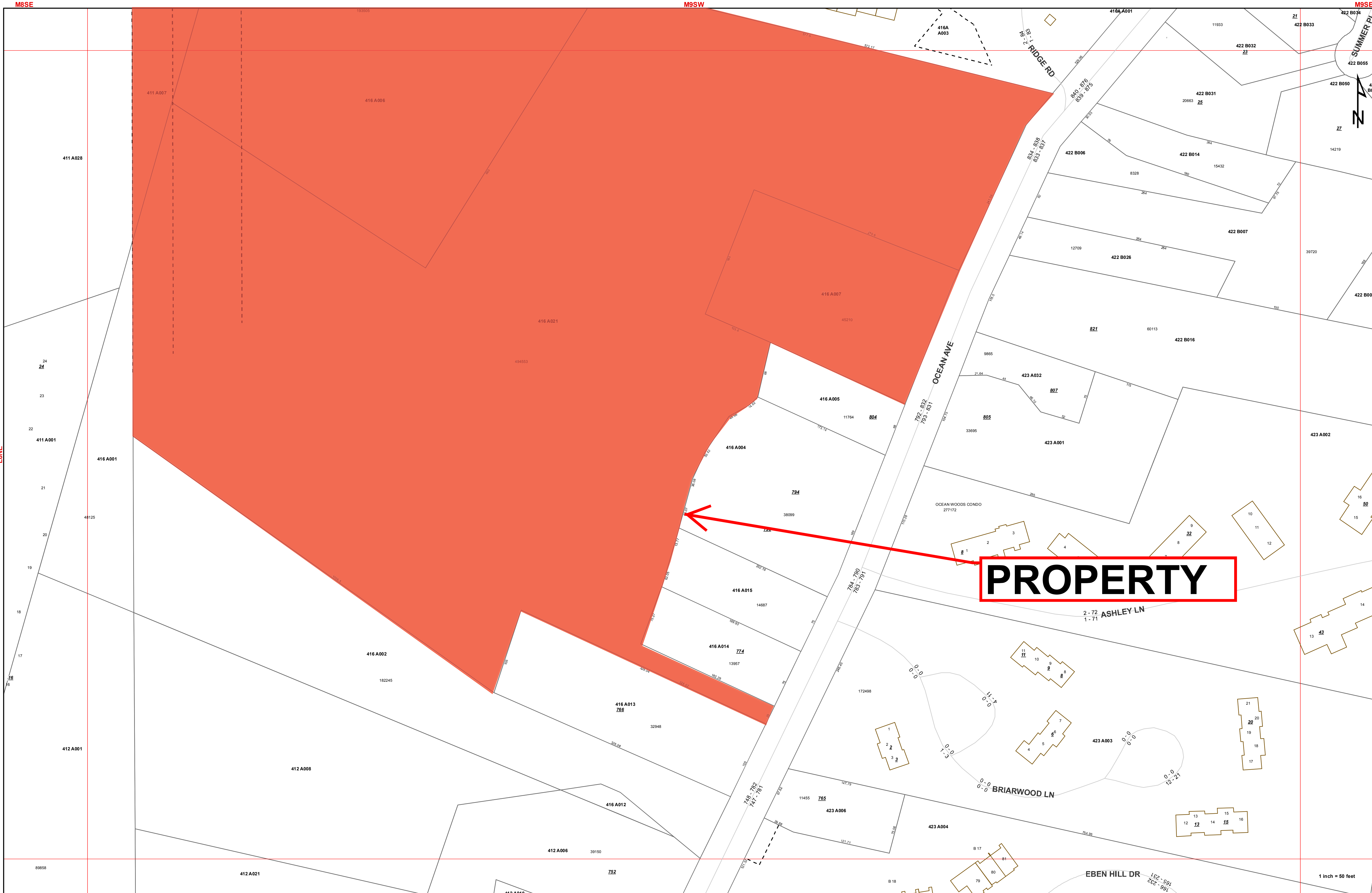
April 1 2012 fy 2013

Tax Map Index; http://www.portlandassessors.com/taxmaps.htm

Index Number - M9SW

M8SE M9SW M9SE

L8NE O7NE



L8SE L9SW L9SE

April 1 2012 fy 2013

Tax Map Index; http://www.portlandassessors.com/taxmaps.htm

Index Number - L9NW

Section 4. Right, Title and Interest (Deed)

HAWTHORN DEVELOPMENT LLC
Real Estate and Acquisition Dept.
Vancouver, WA

OFFER AND CONTRACT TO PURCHASE REAL ESTATE

DATE: October 13, 2014

TO: Graves Hill Land Company LLC, 16 Tiffany Lane, Saco, Maine 04072, Owner of Record of the following described property in Portland, Cumberland County, Maine

THROUGH: Malone Commercial Brokers, 5 Moulton Street, Suite 3, Portland, Maine 04101, Joe Malone, Phone: 207-773-2554, Email: joe@malonecb.com; and Jennifer Small, Phone: 207-233-6782, Email: jennifer@malonecb.com.

Malone Commercial Brokers, 5 Moulton Street, Suite 3, Portland, Maine 04101, Mark Malone, Phone: 207-773-6000, Email: mark@malonecb.com.

The following constitutes a firm offer by HAWTHORN DEVELOPMENT LLC or its assignee ("Purchaser") to purchase property located in Portland, Maine, from GRAVES HILL LAND COMPANY LLC, the owner of record, ("Seller") under the following conditions:

1. PROPERTY DESCRIPTION

Approximately 18.3 acres of land with an address of 802 Ocean Avenue in Portland, Cumberland County, Maine ("the Property") as shown on Exhibit A.

The Property is further identified by Assessor's Parcel ID Number 411A007001.

2. TOTAL CONSIDERATION

[redacted]

3. TERMS OF PAYMENT

[redacted]

[redacted]

4. CONDITIONS OF PURCHASE

Purchaser's obligation to close is subject to Purchaser's satisfaction of the following conditions at its sole discretion: [redacted]

[redacted]

[redacted]

[redacted] [redacted]

[redacted] [redacted]

[redacted] [redacted] [redacted]

[redacted]

[redacted]

[redacted]

[redacted] [redacted]

[redacted]

[redacted]

[redacted] [redacted]REPORT

A. As a courtesy, Purchaser will provide to Seller a written status report ("Status Report") outlining the known outstanding issues that relate to the entitlement process for Purchaser's intended use. [redacted]

[redacted]

[redacted]

[redacted]

6. CLOSING/ POST CLOSING

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

9. REMEDIES

IN THE EVENT OF PURCHASER'S DEFAULT UNDER THIS CONTRACT, AND PROVIDED THAT SELLER HAS FULLY PERFORMED ALL OF ITS OBLIGATIONS HEREUNDER, THE EARNEST MONEY SHALL BE PAID TO SELLER AS FULL LIQUIDATED DAMAGES AND PURCHASER SHALL BE RELEASED FROM ALL LIABILITY OR OBLIGATION HEREUNDER TO SELLER AND NO OTHER REMEDY, INCLUDING THE REMEDY OF SPECIFIC PERFORMANCE, SHALL BE AVAILABLE FOR PURCHASER'S BREACH OF THIS CONTRACT. PURCHASER AND SELLER ACKNOWLEDGE THAT IT WOULD BE DIFFICULT TO ASCERTAIN THE ACTUAL DAMAGES SUFFERED BY SELLER AS A RESULT OF ANY DEFAULT BY PURCHASER AND AGREE THAT SUCH LIQUIDATED DAMAGES ARE AN AGREED UPON REASONABLE ESTIMATE OF THE AMOUNT OF LOSS SELLER WOULD SUFFER AS A RESULT OF PURCHASER'S DEFAULT, AND ARE NOT INTENDED AS A PENALTY.

IF SELLER DEFAULTS AT CLOSING, THEN THE EARNEST MONEY AND ANY OTHER DEPOSITS THERETOFORE MADE BY PURCHASER SHALL BE RETURNED TO PURCHASER IMMEDIATELY AND PURCHASER MAY CLAIM DAMAGES AGAINST SELLER FOR THE AMOUNT NO GREATER THAN $25,000, OR, AT PURCHASER'S OPTION, PURCHASER MAY SEEK THE REMEDY OF SPECIFIC PERFORMANCE.

/s/ Myrle M. Davis
Purchaser

____
Seller

10. TERMINATION

Unless accepted by Seller in writing, this offer shall expire at 5:00 p.m. Pacific time, seven (7) days from the date of this letter.

Seller agrees that after acceptance of the offer contained herein and until the Contract is terminated, it shall not sell, contract to sell, nor enter into a letter of

intent or negotiate for the sale of Property to another party, and that there shall be no material change to the Property through the date of closing.

The parties hereby agree that copies of this document, and signatures, transmitted by telecopier (fax), and electronic mail (email) shall be for all purposes considered as originals. This Contract may be executed in multiple counterparts, each of which shall be deemed to be an original, but all of which, together, shall constitute one and the same instrument.

The ("Effective Date") of this Contract for the purposes of performance of all obligations is the date the escrow agent receipts this Contract after all parties execute this Contract.

If the time for the performance of any obligation or taking any action under this Contract expires on a Saturday, Sunday or legal holiday, the time for performance or taking such action will be extended to the next succeeding day which is not a Saturday, Sunday or legal holiday. Time is of the essence of this agreement.

Sincerely,

HAWTHORN DEVELOPMENT LLC
/s/ Myrle M. Davis
Myrle M. "Mick" Davis
Representative Agent for Purchaser

AGREED AND ACCEPTED:

Seller By:________________________________

Date:______________________

By:________________________________

Date:______________________

By:________________________________

Date:______________________

ESCROW RECEIPT:

Escrow agent acknowledges receipt of the Contract on this date:

______________________________ (Effective Date) and earnest money in the

amount of $______________________________ in the form of ______________________

on _____________________.

Escrow Agent:____________________________

By:______________________________________

Address:________________________________

____

Phone:__________________________________

Fax:____________________________________

Email:__________________________________

9. REMEDIES

IN THE EVENT OF PURCHASER'S DEFAULT UNDER THIS CONTRACT, AND PROVIDED THAT SELLER HAS FULLY PERFORMED ALL OF ITS OBLIGATIONS HEREUNDER, THE EARNEST MONEY SHALL BE PAID TO SELLER AS FULL LIQUIDATED DAMAGES AND PURCHASER SHALL BE RELEASED FROM ALL LIABILITY OR OBLIGATION HEREUNDER TO SELLER AND NO OTHER REMEDY, INCLUDING THE REMEDY OF SPECIFIC PERFORMANCE, SHALL BE AVAILABLE FOR PURCHASER'S BREACH OF THIS CONTRACT. PURCHASER AND SELLER ACKNOWLEDGE THAT IT WOULD BE DIFFICULT TO ASCERTAIN THE ACTUAL DAMAGES SUFFERED BY SELLER AS A RESULT OF ANY DEFAULT BY PURCHASER AND AGREE THAT SUCH LIQUIDATED DAMAGES ARE AN AGREED UPON REASONABLE ESTIMATE OF THE AMOUNT OF LOSS SELLER WOULD SUFFER AS A RESULT OF PURCHASER'S DEFAULT, AND ARE NOT INTENDED AS A PENALTY.

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/s/ Myrle M. Davis Myrle M. Davis

Purchaser Seller

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Sincerely,

HAWTHORN DEVELOPMENT LLC
/s/ Myrle M. Davis Myrle M. Davis
Myrle M. "Mick" Davis
Representative Agent for Purchaser

AGREED AND ACCEPTED:

Seller By:______________________________

Date:______________________

By:______________________________

Date:______________________

By:______________________________

Date:______________________

9. REMEDIES

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/s/ Myrle M. Davis
Purchaser

Seller

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Sincerely,

HAWTHORN DEVELOPMENT LLC
/s/ Myrle M. Davis Myrle M. Davis
Myrle M. "Mick" Davis
Representative Agent for Purchaser

AGREED AND ACCEPTED:

Seller By: ____________________

Date: 10/17/14

By: ____________________

Date: ____________________

By: ____________________

Date: ____________________

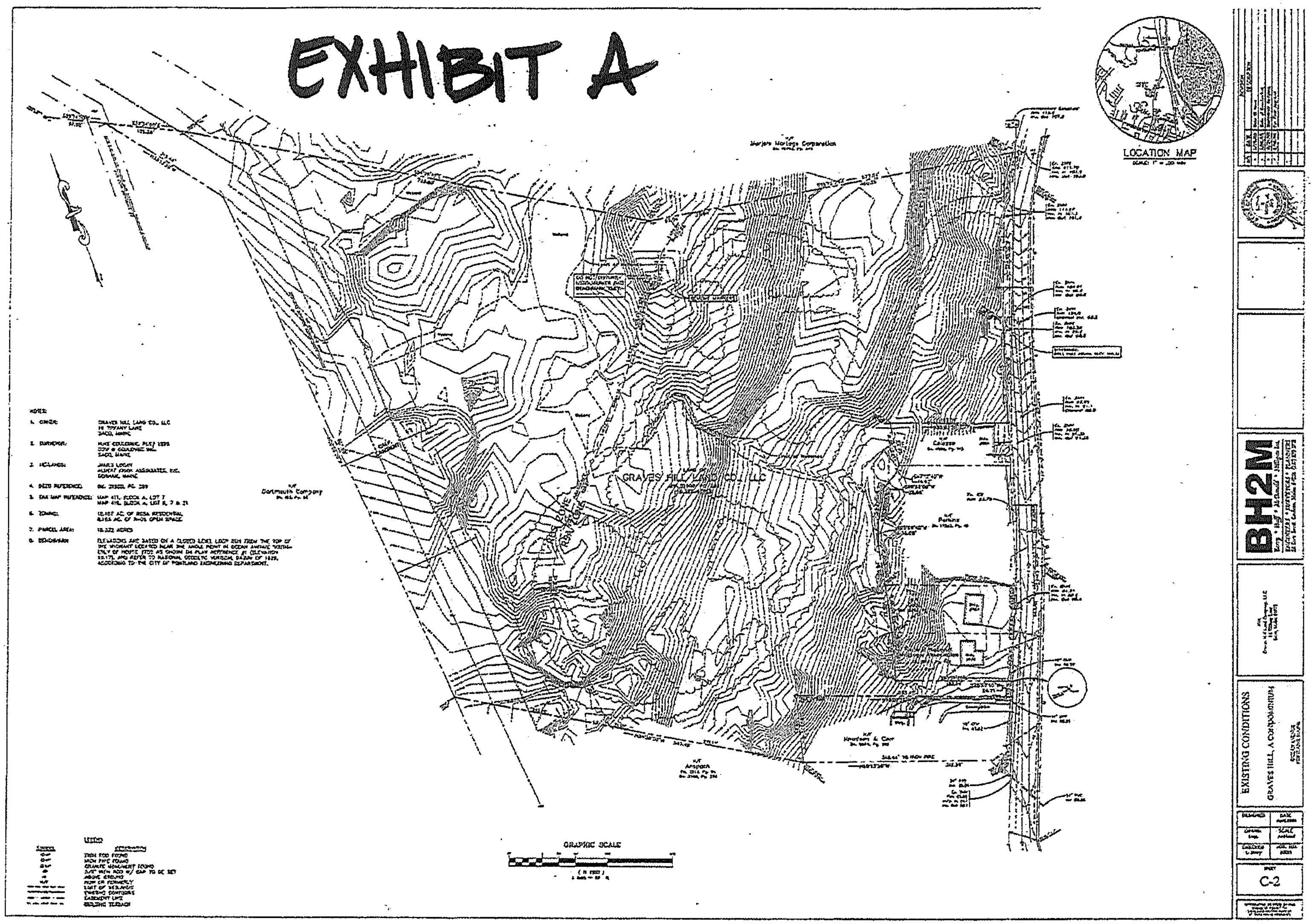
EXISTING CONDITIONS

A full size electronic copy of this Existing Conditions Plan conducted in 2009 is available on request.

Contact broker for a copy and further details that may be available.

Broker:

Mark Malone, CCIM
(207) 773-6000 direct
(207) 358-7912 direct fax
mark@malonecb.com



HAWTHORN DEV.

QUITCLAIM DEED WITH COVENANT

Leo J. Delicata and Jeanne B. Delicata, husband and wife, both of Portland, Cumberland County, Maine, for consideration paid, grant to

Graves Hill Land Company, L.L.C. a Maine Limited Liability Company with a principle place of business in Saco, York County, Maine

whose mailing address is:
16 Tiffany Lane, Saco, Maine 04072

with quitclaim covenants,

A certain lot or parcel of land comprising 18 acres more or less, located on the Northwesterly side of Ocean Avenue in Portland, Maine more particularly bounded and described on a survey plan entitled Plan Showing Boundary Survey and Topographic Survey made for Diane Doyle by Dow & Coulombe, Inc. Land Surveyors & Land Planners dated July 8, 2002 and recorded in the Cumberland County Registry of Deeds in Plan Book 204, Pages 293 and 294.

Meaning and intending to convey a portion of the real property described in a Deed from CRE I Real Estate Corp. to the Grantors herein dated August 14, 1992 and recorded in the Cumberland County Registry of Deeds in Book 10226 Page 236.

Witness our hands and seals this 1st day of July, 2004.

SIGNED, SEALED, AND DELIVERED
in the presence of

James B. Barns

to both

Leo J. Delicata

Jeanne B. Delicata

Leo J. Delicata

Jeanne B. Delicata

State of Maine
Cumberland, ss

July 1 2004

Personally appeared before me the above named Leo J. Delicata and Jeanne B. Delicata and acknowledged the foregoing instrument to be his or her free act and deed.

James B. Barns

Notary Public

SEAL

Received
Recorded Register of Deeds
Jul 02,2004 02:23:37P
Cumberland County
John B OBrien

JAMES B. BARNS
Notary Public, Maine
My Commission Expires October 26, 2008

Section 5. Statement of State and Federal Permits/Agency Letters

- Maine Historic Preservation Commission (MHPC)
- Maine Inland Fisheries and Wildlife (MIFW)
- Maine Natural Areas Program (MNAP)

Statement of State and Federal Permits

The proposed project will create 2.86 acres of non-vegetated surface and therefore is subject to the State of Maine Stormwater Law. As this project is within the City of Portland, this review will be completed by the City under delegated review.

The project will not disturb any jurisdictional waters of the state (wetlands); therefore, project is not subject to State or Federal review of wetland impacts.

Copies of letters from other State of Maine agencies are enclosed.

SEBAGO
TECHNICS

November 19, 2014
14432

RECEIVED
NOV 21 2014 *
1789-14
* More info rec'd
12/22/14.

Earle G. Shettleworth, Jr., State Historic Preservation Officer
Maine Historic Preservation Commission
55 Capitol Street
65 State House Station
Augusta, ME 04039

Re: Site Plan Submittal – Portland Retirement Community
Portland, Maine

Dear Mr. Shettleworth:

On behalf of our client, Hawthorn Development Group, we are currently in the process of filling a site plan application to the City of Portland. Our client proposes a 142 suite retirement facility at 802 Ocean Avenue. The proposed building will be approximately 4 stories or approximately 50' high at roof peak from finished grade. This proposed project will replace one that has been previously approved by the City for another developer for two ten story condominium buildings.

We request that the Maine Historical Preservation Commission review its files for any known historical sites, structures or archeological sites that have been identified with the vicinity of the proposed project. The response obtained from the Commission is required for the site plan approval process with the City and approvals from other jurisdictional agencies.

I have included a copy of the USGS quadrangle and a plan depicting the proposed development on the property. If you have any questions on this project, do not hesitate to contact me.

Sincerely,

SEBAGO TECHNICS, INC.

Robert A. McSorley, P.E.
Senior Project Manager

Based on the information submitted, I have concluded that there will be no historic properties affected by the proposed undertaking, as defined by Section 106 of the National Historic Preservation Act. Consequently, pursuant to 36 CFR 800.4(d)(1), no further Section 106 consultation is required unless additional resources are discovered during project implementation pursuant to 36 CFR 800.13.

Kirk F. Mohney — 1/2/15

Kirk F. Mohney,
Deputy State Historic Preservation Officer
Maine Historic Preservation Commission

Date

RAM/ram:llg
Enc.

cc: Mark Lowen, Lenity Architecture

STATE OF MAINE
DEPARTMENT OF
INLAND FISHERIES & WILDLIFE
284 STATE STREET
41 STATE HOUSE STATION
AUGUSTA ME 04333-0041

PAUL R. LEPAGE
GOVERNOR

CHANDLER E. WOODCOCK
COMMISSIONER

August 25, 2015

Robert McSorley
Sebago Technics
75 John Roberts Road, Suite 1A
South Portland, ME 04016

RE: Information Request - Portland Retirement Community, Portland

Dear Robert:

Per your request received July 27, 2015, we have reviewed current Maine Department of Inland Fisheries and Wildlife (MDIFW) information for known locations of Endangered, Threatened, and Special Concern species; designated Essential and Significant Wildlife Habitats; and fisheries habitat concerns within the vicinity of the *Portland Retirement Community Project* in Portland. For purposes of this review, we are assuming that the proposed development will also include the forested portions of the project search area.

Our Department has not mapped any Essential Habitats or fisheries habitats that would be directly affected by your project.

Endangered, Threatened, and Special Concern Species

<u>Bats</u>

Of the eight species of bats that occur in Maine, four species are listed as Special Concern: red bat (*Lasiurus borealis*), hoary bat (*Lasiurus cinereus*), silver-haired bat (*Lasionycteris noctivagans*), and tri-colored bat (*Perimyotis subflavus*). The three *Myotis* species of bats in Maine will soon be protected under Maine's Endangered Species Act (MESA) and will be afforded special protection against activities that may cause "Take" (kill or cause death), "harassment" (create injury or significantly disrupt normal behavior patterns), and other adverse actions. MDIFW has the legal right, power, and authority to enforce MESA under 12 M.R.S § 12805. The three *Myotis* species include little brown bat (*M. lucifugus,* State Endangered); northern long-eared bat (*M. septentrionalis,* State Endangered); and eastern small-footed bat (*M. leibii,* State Threatened).

While a comprehensive statewide inventory for bats has not been completed, it is likely that several of these species occur within the project area during migration and/or the breeding season. Therefore, we recommend that you contact and will defer to any guidance and recommendations provided by the U.S. Fish and Wildlife Service Maine Field Office (Wende Mahaney, 207-866-3344), as the northern long-eared bat is also listed as a Threatened Species under the Federal Endangered Species Act.

PHONE: (207) 287-5202
FISH AND WILDLIFE ON THE WEB:
www.maine.gov/ifw
EMAIL ADDRESS:
ifw.webmaster@maine.gov

Significant Wildlife Habitat

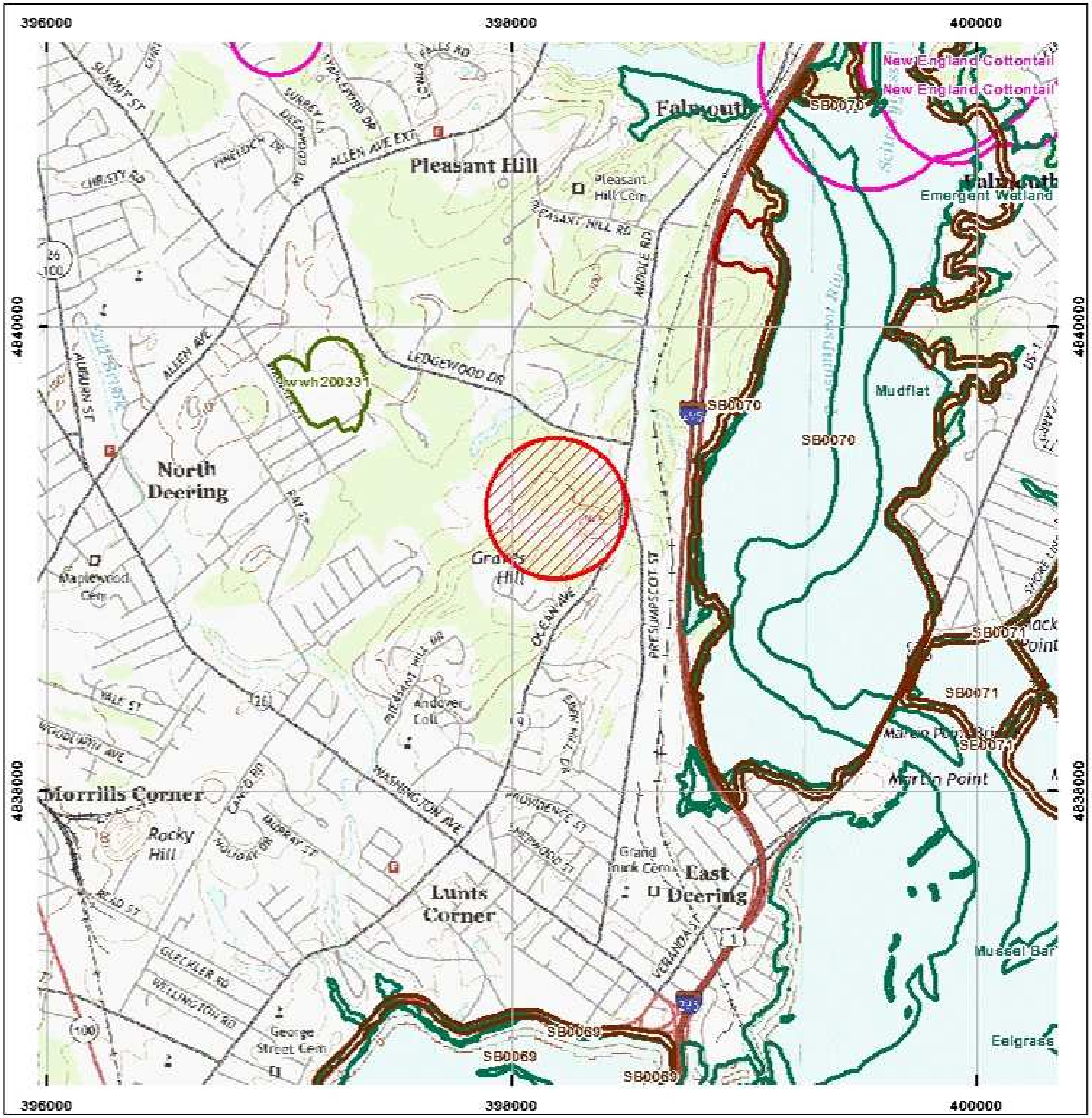
At this time, MDIFW Significant Wildlife Habitat (SWH) maps indicate no known presence of SWHs within the project area, which include Waterfowl and Wading Bird Habitats, Deer Wintering Areas, Seabird Nesting Islands, Shorebird Areas, and Significant Vernal Pools. However, a comprehensive statewide inventory for Significant Vernal Pools has not been completed. Therefore, we recommend that surveys for vernal pools be conducted within the project boundary by qualified wetland scientists prior to final project design to determine whether there are Significant Vernal Pools present in the area. These surveys should extend up to 250 feet beyond the anticipated project footprint because of potential impacts to off-site Significant Vernal Pools, assuming such pools are located on land owned or controlled by the applicant. Once surveys are completed, our Department will need to verify vernal pool data sheets prior to final determination of significance.

This consultation review has been conducted specifically for known MDIFW jurisdictional features and should not be interpreted as a comprehensive review for the presence of other regulated features that may occur in this area. Prior to the start of any future site disturbance we recommend additional consultation with the municipality, and other state resource agencies including the Maine Natural Areas Program and Maine Department of Environmental Protection in order to avoid unintended protected resource disturbance.

Please feel free to contact my office if you have any questions regarding this information, or if I can be of any further assistance.

Best regards,

John Perry
Environmental Review Coordinator



Environmental Review of Fish and Wildlife Observations and Priority Habitats

Project Name: ER Tool Test (Version 1)

Maine Department of Inland Fisheries and Wildlife

Miles

0 0.1250.25 0.5 0.75 1

Projection: UTM, NAD83, Zone 19N

Date: 8/25/2015

- ProjectPoints
- ProjectLines
- ProjectPolys
- ProjectSearchAreas
- Deer Winter Area
- LURC p-fw
- Cooperative DWAs
- Seabird Nesting Islands
- Shorebird Areas
- Inland Waterfowl/Wading Bird
- Shoreland Zoning_iwwh
- Tidal Waterfowl/Wading Bird
- Significant Vernal Pools
- Environmental Review Polygons
- Roseate Tern
- Piping Plover/Least Tern
- Aquatic ETSc (25 mi review)
- Rare Mussels (5 mi review)
- Maine Heritage Fish Waters
- Arctic Charr Habitat
- E. Brook Trout Joint Venture Subwatershed Classification
- Redfin Pickerel/Swamp Darter Habitats (buffer100ft)
- Special Concern-occupied habitats (100ft buffer)
- Wild Lake Trout Habitats

STATE OF MAINE
DEPARTMENT OF AGRICULTURE, CONSERVATION & FORESTRY
93 STATE HOUSE STATION
AUGUSTA, MAINE
04333-0093

PAUL R. LEPAGE
GOVERNOR

WALTER E. WHITCOMB
COMMISSIONER

July 27, 2015

VIA ELECTRONIC MAIL

Robert McSorley
Sebago Technics
75 John Roberts Road, Suite 1A
South Portland, ME 04106

Re: Rare and exemplary botanical features in proximity to: Project 14432, Portland Retirement Community, Portland, Maine

Dear Mr. McSorley:

I have searched the Natural Areas Program's Biological and Conservation Data System files in response to your request received July 27, 2015 for information on the presence of rare or unique botanical features documented from the vicinity of the project site in Portland, Maine. Rare and unique botanical features include the habitat of rare, threatened, or endangered plant species and unique or exemplary natural communities. Our review involves examining maps, manual and computerized records, other sources of information such as scientific articles or published references, and the personal knowledge of staff or cooperating experts.

Our official response covers only botanical features. For authoritative information and official response for zoological features you must make a similar request to the Maine Department of Inland Fisheries and Wildlife, 284 State Street, Augusta, Maine 04333.

According to the information currently in our Biological and Conservation Data System files, there are no rare botanical features documented specifically within the project area. This lack of data may indicate minimal survey efforts rather than confirm the absence of rare botanical features. You may want to have the site inventoried by a qualified field biologist to ensure that no undocumented rare features are inadvertently harmed.

If a field survey of the project area is conducted, please refer to the enclosed supplemental information regarding rare and exemplary botanical features documented to occur in the vicinity of the project site. The list may include information on features that have been known to occur historically in the area as well as recently field-verified information. While historic records have not been documented in several years, they may persist in the area if suitable habitat exists. The enclosed list identifies features with potential to occur in the area, and it should be considered if you choose to conduct field surveys.

This finding is available and appropriate for preparation and review of environmental assessments, but it is not a substitute for on-site surveys. Comprehensive field surveys do not exist for all natural areas in Maine, and in the absence of a specific field investigation, the Maine Natural Areas Program cannot provide a definitive statement on the presence or absence of unusual natural features at this site.

The Natural Areas Program is continuously working to achieve a more comprehensive database of exemplary natural features in Maine. We would appreciate the contribution of any information obtained should you decide to do field work. The Natural Areas Program welcomes coordination with individuals or organizations proposing environmental alteration, or conducting environmental assessments. If, however, data provided by the Natural Areas Program are to be published in any form, the Program should be informed at the outset and credited as the source.

The Natural Areas Program has instituted a fee structure of $75.00 an hour to recover the actual cost of processing your request for information. You will receive an invoice for $150.00 for two hours of our services.

Thank you for using the Natural Areas Program in the environmental review process. Please do not hesitate to contact me if you have further questions about the Natural Areas Program or about rare or unique botanical features on this site.

Sincerely,

Don Cameron
Ecologist
Maine Natural Areas Program
207-287-8041
don.s.cameron@maine.gov

Rare and Exemplary Botanical Features within 4 miles of
Project: #14432, Portland Retirement Community, Portland, Maine

Common Name	State Status	State Rank	Global Rank	Date Last Observed	Occurrence Number	Habitat
Allegheny Vine						
	T	S1	G4	1860-10	9	Rocky summits and outcrops (non-forested, upland),Dry barrens (partly forested, upland)
American Sea-blite						
	T	S2	G5	1932-09-12	5	Tidal wetland (non-forested, wetland)
	T	S2	G5	2011-08-15	17	Tidal wetland (non-forested, wetland)
Beach Plum						
	E	S1	G4	2009-09-16	21	Rocky coastal (non-forested, upland)
Bottlebrush Grass						
	SC	S3	G5	1905-09-13	10	Hardwood to mixed forest (forest, upland)
Broad Beech Fern						
	SC	S2	G5	1872-08	15	Hardwood to mixed forest (forest, upland)
Columbia Water-meal						
	SC	S2	G5	2002-08-04	2	Open water (non-forested, wetland)
Ebony Spleenwort						
	SC	S2	G5	1910-06-06	10	Rocky summits and outcrops (non-forested, upland),Hardwood to mixed forest (forest, upland)
Engelmann's Spikerush						
	PE	SH	G4G5Q	1916-08-31	2	Open wetland, not coastal nor rivershore (non-forested, wetland)
Fern-leaved False Foxglove						
	SC	S3	G5	1902-09-02	13	Dry barrens (partly forested, upland),Hardwood to mixed forest (forest, upland)
Foxtail Bog-clubmoss						
	E	S1	G5	2014-09-24	1	<null>
Great Blue Lobelia						

Rare and Exemplary Botanical Features within 4 miles of
Project: #14432, Portland Retirement Community, Portland, Maine

Common Name	State Status	State Rank	Global Rank	Date Last Observed	Occurrence Number	Habitat
	PE	SX	G5	1905-09	3	Forested wetland,Non-tidal rivershore (non-forested, seasonally wet)
Hollow Joe-pye Weed						
	SC	S2	G5?	2014-06-18	24	Open wetland, not coastal nor rivershore (non-forested, wetland),Old field/roadside (non-forested, wetland or upland)
	SC	S2	G5?	2011-08-04	19	Open wetland, not coastal nor rivershore (non-forested, wetland),Old field/roadside (non-forested, wetland or upland)
Horned Pondweed						
	SC	S2	G5	1913-09-13	9	Tidal wetland (non-forested, wetland)
Marsh Milkwort						
	PE	SH	G5T4	1903-08-18	1	Dry barrens (partly forested, upland),Open wetland, not coastal nor rivershore (non-forested, wetland)
Missouri Rockcress						
	T	S1	G5?Q	1905-06-11	5	Rocky summits and outcrops (non-forested, upland),Hardwood to mixed forest (forest, upland)
Mountain-laurel						
	SC	S2	G5	1985-08-01	13	Conifer forest (forest, upland),Hardwood to mixed forest (forest, upland)
Mountain Honeysuckle						
	E	S2	G5	2014-08-03	14	Dry barrens (partly forested, upland),Hardwood to mixed forest (forest, upland)
	E	S2	G5	2007-07-30	10	Dry barrens (partly forested, upland),Hardwood to mixed forest (forest, upland)
Pale Green Orchis						
	SC	S2	G4T4Q	1907-07-05	27	Non-tidal rivershore (non-forested, seasonally wet),Open wetland, not coastal nor rivershore (non-forested, wetland)
Palmate-leaved Violet						
	PE	SH	G5	1908	1	Hardwood to mixed forest (forest, upland)
Screwstem						

Rare and Exemplary Botanical Features within 4 miles of
Project: #14432, Portland Retirement Community, Portland, Maine

Common Name	State Status	State Rank	Global Rank	Date Last Observed	Occurrence Number	Habitat
	T	S1	G5	2014-09-24	17	Coastal non-tidal wetland (non-forested, wetland)
Slender Knotweed						
	PE	SH	G5	1902-09-07	1	Dry barrens (partly forested, upland)
Smooth Winterberry Holly						
	SC	S3	G5	2010-06-13	32	Forested wetland
Spotted Wintergreen						
	E	S2	G5	1991-09	11	Conifer forest (forest, upland),Hardwood to mixed forest (forest, upland)
Tidal Marsh Estuary Ecosystem						
	<null>	S3	GNR	2011-08-25	8	Tidal wetland (non-forested, wetland)
Upper Floodplain Hardwood Forest						
	<null>	S3	GNR	2010-06-23	20	Forested wetland
Upright Bindweed						
	T	S2	G4G5	2007-06-28	5	Dry barrens (partly forested, upland),Old field/roadside (non-forested, wetland or upland)
Variable Sedge						
	E	S1	G3	1911	8	Dry barrens (partly forested, upland),Hardwood to mixed forest (forest, upland)
	E	S1	G3	1911-06-29	9	Dry barrens (partly forested, upland),Hardwood to mixed forest (forest, upland)
	E	S1	G3	2012-08-09	1	Dry barrens (partly forested, upland),Hardwood to mixed forest (forest, upland)
	E	S1	G3	2006-07-12	6	Dry barrens (partly forested, upland),Hardwood to mixed forest (forest, upland)
	E	S1	G3	2014-09-24	4	Dry barrens (partly forested, upland),Hardwood to mixed forest (forest, upland)
Vasey's Pondweed						
	SC	S2	G4	1901-08-04	7	Open water (non-forested, wetland)

Rare and Exemplary Botanical Features within 4 miles of
Project: #14432, Portland Retirement Community, Portland, Maine

Common Name	State Status	State Rank	Global Rank	Date Last Observed	Occurrence Number	Habitat
Wild Garlic						
	SC	S2	G5	1918-07-16	6	Forested wetland,Hardwood to mixed forest (forest, upland)
Wild Leek						
	SC	S3	G5	1978-06-28	17	Hardwood to mixed forest (forest, upland),Forested wetland
	SC	S3	G5	2003-06-17	42	Hardwood to mixed forest (forest, upland),Forested wetland
	SC	S3	G5	2009-07-12	26	Hardwood to mixed forest (forest, upland),Forested wetland

STATE RARITY RANKS

S1 Critically imperiled in Maine because of extreme rarity (five or fewer occurrences or very few remaining individuals or acres) or because some aspect of its biology makes it especially vulnerable to extirpation from the State of Maine.
S2 Imperiled in Maine because of rarity (6-20 occurrences or few remaining individuals or acres) or because of other factors making it vulnerable to further decline.
S3 Rare in Maine (20-100 occurrences).
S4 Apparently secure in Maine.
S5 Demonstrably secure in Maine.
SU Under consideration for assigning rarity status; more information needed on threats or distribution.
SNR Not yet ranked.
SNA Rank not applicable.
S#? Current occurrence data suggests assigned rank, but lack of survey effort along with amount of potential habitat create uncertainty (e.g. S3?).

Note: **State Rarity Ranks** are determined by the Maine Natural Areas Program for rare plants and rare and exemplary natural communities and ecosystems. The Maine Department of Inland Fisheries and Wildlife determines State Rarity Ranks for animals.

GLOBAL RARITY RANKS

G1 Critically imperiled globally because of extreme rarity (five or fewer occurrences or very few remaining individuals or acres) or because some aspect of its biology makes it especially vulnerable to extinction.
G2 Globally imperiled because of rarity (6-20 occurrences or few remaining individuals or acres) or because of other factors making it vulnerable to further decline.
G3 Globally rare (20-100 occurrences).
G4 Apparently secure globally.
G5 Demonstrably secure globally.
GNR Not yet ranked.

Note: **Global Ranks** are determined by NatureServe.

STATE LEGAL STATUS

Note: State legal status is according to 5 M.R.S.A. § 13076-13079, which mandates the Department of Conservation to produce and biennially update the official list of Maine's **Endangered** and **Threatened** plants. The list is derived by a technical advisory committee of botanists who use data in the Natural Areas Program's database to recommend status changes to the Department of Conservation.

E ENDANGERED; Rare and in danger of being lost from the state in the foreseeable future; or federally listed as Endangered.
T THREATENED; Rare and, with further decline, could become endangered; or federally listed as Threatened.

NON-LEGAL STATUS

SC SPECIAL CONCERN; Rare in Maine, based on available information, but not sufficiently rare to be considered Threatened or Endangered.
PE Potentially Extirpated; Species has not been documented in Maine in past 20 years or loss of last known occurrence has been documented.

ELEMENT OCCURRENCE RANKS - EO RANKS

Element Occurrence ranks are used to describe the quality of a rare plant population or natural community based on three factors:

- **Size**: Size of community or population relative to other known examples in Maine. Community or population's viability, capability to maintain itself.
- **Condition**: For communities, condition includes presence of representative species, maturity of species, and evidence of human-caused disturbance. For plants, factors include species vigor and evidence of human-caused disturbance.
- **Landscape context**: Land uses and/or condition of natural communities surrounding the observed area. Ability of the observed community or population to be protected from effects of adjacent land uses.

These three factors are combined into an overall ranking of the feature of **A**, **B**, **C**, or **D**, where **A** indicates an **excellent** example of the community or population and **D** indicates a **poor** example of the community or population. A rank of **E** indicates that the community or population is **extant** but there is not enough data to assign a quality rank. The Maine Natural Areas Program tracks all occurrences of rare (S1-S3) plants and natural communities as well as A and B ranked common (S4-S5) natural communities.

Note: **Element Occurrence Ranks** are determined by the Maine Natural Areas Program for rare plants and rare and exemplary natural communities and ecosystems. The Maine Department of Inland Fisheries and Wildlife determines Element Occurrence ranks for animals.

Visit our website for more information on rare, threatened, and endangered species!
http://www.maine.gov/dacf/mnap

Section 6. Zoning Assessment

Zoning Assessment

On June 15, 2015, the City of Portland City Council approved a text amendment to Chapter 14, Land Use that included the definition for a living unit and changes to the R-5A Zoning District relative adding congregate care as a permitted use, net residential land area calculation and other dimensional criteria.

On July 20, 2015, the City of Portland City Council approved a rezoning of the subject property to remove an existing contract zone and to zone the property per the underlying R-5A and R-OS zoning Districts. This project will develop the R-5A portion of the property. As stated above, the proposed 150 Unit Congregate Care Facility is an allowed use under the R-5A zoning. The property is not located within a shoreland or flood plain area. It does not appear that the property is subject to any of the requirements of Div. 25, Space and Bulk Regulations and Exceptions. Other zoning requirements are as follows:

Net Residential Calculation		
Total Property Area	442,875	SF
Per Section 14-47 definition of net land area as set forth in Sec. 14-130 Subtract the following from the gross area		
Existing watercourses	0	SF
Wetlands	6,481	SF
Slopes > 25%	32,650	SF
Subtotal deductions	39,131	SF
Net Area	403,744	SF
Min. Area per living unit	1,600	SF/Unit
Net Density Allowed	403,744 SF/1,600 SF/Unit	
	252	Units
Proposed	**150**	**Units**

Dimensional Requirements		
	Required	**Proposed**
Minimum Frontage	50 FT	427.05 FT
Minimum Front Yard	25 FT	114.07 FT
Minimum Rear Yard	25 FT	62.78 FT
Minimum Side Yard	16 FT	25 FT (garage)/51.79 (build)
Maximum Structure Height	55 FT	Approx. 47 FT 8 IN
Maximum Lot Coverage	30%	28.8%
Minimum Lot Width	60 FT	>>60 FT
Minimum Building Setback from external subdivision property lines (building length < 100 feet)	25 FT	25 FT (garage)
Minimum Building Setback from external subdivision property lines (building length > 100 feet)	35 FT	51.79/114.07 FT (build)
Minimum Recreation Open Space	200 SF/Unit	>200 SF/Unit*
Parking (1 space/3 Living Units)	50 spaces	102 spaces

*Lawns, Garden Area, Walking Paths and Site Trails

Section 7. Summary of Existing/Proposed Easements

Existing/Proposed Easements

The proposed property is encumbered by a 135 foot wide easement to Central Maine Power for transmission facilities through the site. This easement only encumbers the R-OS portion of the property and does not affect the development of the R-5A portion of the property.

A proposed easement to Portland Trails from the contract purchaser, Hawthorn Development LLC, is currently being held in escrow and will be recorded once the property ownership is transferred to Hawthorn and a subsidiary corporation of the parent is established. This easement will provide access across the R-5A portion of the property to the existing/proposed trails within the R-OS portion of the property.

It is anticipated that individual easements will need to be worked out with utility providers for service to the facility.

TRAIL EASEMENT

THIS TRAIL EASEMENT is made as of the _____ day of July, 2015, by and between **HAWTHORN DEVELOPMENT LLC**, a Washington limited liability company, with an office in Vancouver, Washington (hereinafter referred to as "Grantor") and **PORTLAND TRAILS**, a Maine non-profit corporation with a place of business in Portland, Maine (hereinafter referred to as "Grantee").

WITNESSETH:

WHEREAS, Grantor is the owner of property on Ocean Avenue, Portland, Maine more specifically described in deed recorded in the Cumberland County Registry of Deeds in Book _____, Page _____ (hereinafter referred to as the "Premises"); and

WHEREAS, Grantor has agreed to grant to Grantee, or other qualified holder, a trail easement over a portion of the Premises as more particularly described herein.

NOW, THEREFORE, in consideration of the foregoing and the mutual covenants herein contained, the parties hereto agree as follows:

1. Grant of Easement. Grantor hereby grants to Grantee a non-exclusive easement for the purpose of constructing, maintaining, repairing, using and replacing an unpaved foot path or walking trail within that portion of the Premises described below, together with improvements delineating such foot path or walking trail, and directional signs, for use by the general public, subject to the conditions and limitations set forth herein.

2. Location. The easement shall be over the portion of Grantor's land (which land is described in Exhibit A) which are depicted in bold lines as "Trail Easement, Typical" on Exhibit B attached hereto. No easement rights exist or are granted hereby over that portion of the trails labelled "For Residents Only" on Exhibit B. The traveled leg of the trail shall traverse the Premises extending from Ocean Avenue to connect with the existing trail system located southerly and westerly of the land described in Exhibit A and as shown on Exhibit B (hereinafter the "Trail"). The design of the Trail and all improvements associated therewith shall be subject to the prior review and approval of Grantor, and its successors, for compliance with this Easement, which approval shall not be unreasonably withheld or delayed. Provided, however, and notwithstanding anything to the contrary contained herein, Grantor reserves the right to relocate all or any portions of the Trail and associated improvements that are located between Ocean Avenue and the R-OS portion of the site, provided that all costs and expenses associated with such relocation shall be borne by Grantor so long as such new location reasonably provides connections with the Trail destinations.

3. Approvals. Grantor shall obtain any necessary federal, State or local permits and approvals required in connection with the construction of the Trail at its sole cost and

expense. Grantee shall cooperate to the extent by executing any application or other forms required for permits.

4. Use. The Trail shall be used solely by the general public for passive recreational uses from dawn to 10:00 p.m., limited to pedestrian and non-motorized bicycle traffic and shall exclude any and all motorized/ wheeled/track recreational vehicles of any kind. Wheelchairs or other similar non-recreational vehicles shall be permitted. Grantor reserves the right to remove nuisance persons and activities.

5. Signs. Grantor shall install and maintain Trail signs through its property, with input from Portland Trails as to content and locations.

6. Duration. This Easement is intended to be perpetual, but shall terminate and be of no further force and effect in the event that it shall pass from Grantee to any third party by grant, operation of law or otherwise without the prior written consent of Grantor, its successors or assigns except to a successor non-profit entity with a similar mission to that of Grantee or an assignment to the City of Portland.

7. Maintenance. Grantee, and its successors, shall have the exclusive right, but not the obligation, to establish, and maintain a paved or unpaved footpath on the Trail. Grantee is further granted the exclusive right to construct, install, and maintain without limitation: a boardwalk, a footbridge, and other low-impact outdoor recreational improvements on the Trail such as steps; railings; paved or unpaved ramps; bollards; rip rap; benches; barriers to discourage use by motorized vehicles (except for motorized wheelchairs or other similar non-recreational vehicles); cairns; and minor erosion control structures. Grantee's construction and maintenance rights may be delegated or assigned to another entity. Notwithstanding the foregoing, Grantor shall be responsible for snow removal over any portion of sidewalks for that portion of the trail that is co-located with sidewalks installed by Grantor as part of its development of the remaining portion of its property. Grantee, and its successors and/or assigns, shall contribute to Grantee a one-time payment of Ten Thousand and 00/100 Dollars $10,000.00 to be used by Grantee to fund Grantee's maintenance responsibilities for the purpose of maintaining the Trail.

8. Enforcement. Grantee is granted the right to inspect the Trail for violations of the terms of this Trail Easement, and to enforce the same by actions at law or in equity. Grantee and Grantor intend that this Trail Easement be construed liberally to carry out its recreational purposes in accordance with the laws of the State of Maine. If a court (or other decision maker chosen by mutual consent of the parties) determines that this Trail Easement has been breached by a party hereto or his/her/its assigns, agents, employees, contractors, invitees, licensees, permittees, tenants, guests, or lessees, the breaching party will reimburse the non-breaching party for any reasonable costs of enforcement, including court costs, reasonable attorney's fees, and any other payments ordered by such court or decision maker. Grantor is not responsible for injury to or change in the Trail originating from outside of the Trail or Grantor's abutting land, or from natural causes, such as, but not limited to, fire, flood, storm, earth movement, natural evolution of plant and animal communities, or from any prudent action taken by Grantor under emergency

conditions to prevent, abate, or mitigate significant injury to the Trail resulting from such causes.

9. Indemnification. Portland Trails agrees to indemnify and hold harmless Grantor, its successors and assigns, from and against any loss, claim, damage, liability, expense or damage (including reasonable attorney fees) resulting from the exercise of rights granted in this Easement Liability under this paragraph shall not apply personally to any director, officer, trustee, member or employee of Portland Trails or to any assets of Portland Trails. Portland Trails agrees to provide primary insurance coverage for public use of the Trail and associated improvements, which insurance shall name Grantor as an additional insured. This indemnification and hold harmless agreement shall survive any termination of this Easement but shall apply solely to loss, claim, damage, liability, expense or damage arising out of acts or omissions occurring prior to the termination of this Easement.

10. Governing Law. This Easement shall be governed by the laws of the State of Maine. This Easement is intended to be a trail easement as defined under 33 M.R.S.A. §1581, et seq., Grantor, by its delivery of this Easement, and Grantee, by its acceptance hereof, acknowledge and agree that this Easement is being granted to Grantee without charge for the purpose of recreational activities by the general public pursuant to and in accordance with 14 M.R.S.A. §159-A and that Grantor shall have the benefit of the terms and provisions hereof.

11. Amendment. No amendment to this Easement shall be effective unless it is in writing and signed by both parties and duly recorded in the Cumberland County Registry of Deeds.

IN WITNESS WHEREOF, the parties hereto have caused this instrument to be executed by their officers, thereunto duly authorized, as of the date first set forth above.

WITNESS

Jennifer Sullivan

Jennifer Sullivan

Hawthorn Development LLC
A Washington limited liability company
By: Hawthorn Management Services Corp.
Its: Manager

By: Barton G. Colson
Its: President

STATE OF WASHINGTON
County of Clark, ss.

July 20th, 2015

Personally appeared before me Barton G. Colson, President of Hawthorn Management Services Corp., a Washington corporation, on behalf of said corporation as Manager of Hawthorn Development LLC, a Washington limited liability company and acknowledged the foregoing instrument to be his free act and deed in his said capacity and the free act and deed of said limited liability company.

NOTARY PUBLIC
STATE OF WASHINGTON
ROBIN R. GOINS
Commission Expires September 26, 2015

Before me,

Robin R. Goins

Print Name: Robin R. Goins
Notary Public for Washington
My commission expires: September 26, 2015

Portland Trails

______________________ [signature]

By: Robert H. Levin
Its: President

STATE OF MAINE
Cumberland, ss.

July 20, 2015

Personally appeared before me Robert H. Levin, President of Portland Trails, and acknowledged the foregoing instrument to be his/her free act and deed in his/her said capacity and the free act and deed of Portland Trails.

Before me,

[signature]

~~Notary Public~~ Attorney at Law ME BAR REG# 764

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A CERTAIN LOT OR PARCEL OF LAND LOCATED ON THE WESTERLY SIDELINE OF OCEAN AVENUE, STATE HIGHWAY 9, IN THE CITY OF PORTLAND, COUNTY OF CUMBERLAND, STATE OF MAINE, SAID LOT OR PARCEL OF LAND BEING MORE PARTICULARLY BOUNDED AND DESCRIBED AS FOLLOWS:

BEGINNING AT AN EXISTING 5/8" REBAR, 8" BELOW GRADE ON THE APPARENT WESTERLY SIDELINE OF OCEAN AVENUE AT LAND NOW OR FORMERLY OF WILLIAM H. CARR, JR. AND LINDA R. CARR, AS DESCRIBED IN A DEED RECORDED AT THE CUMBERLAND COUNTY REGISTRY OF DEEDS (CCRD) IN BOOK 19165, PAGE 114;

THENCE N 65°03'23" W, ALONG LAND OF SAID CARR, A DISTANCE OF 333.97 FEET TO AN EXISTING BLAZED 12" RED OAK TREE;

THENCE S 18°05'41" W, ALONG LAND NOW OR FORMERLY OF CARR, A DISTANCE OF 107.71 FEET TO AN EXISTING 5/8" REBAR, 6" ABOVE GRADE WITH CAP INSCRIBED TITCOMB ASSOCIATES, PLS 2271 AT LAND NOW OR FORMERLY OF JACOB PAUL STAUB AND SONIA MARIA BARANTES AS DESCRIBED IN A DEED RECORDED AT THE CUMBERLAND COUNTY REGISTRY OF DEEDS IN BOOK 29398, PAGE 231;

THENCE N 54°32'36" W ALONG LAND NOW OR FORMERLY OF STAUB AND BARANTES, A DISTANCE OF 547.73 FEET TO AN EXISTING DRILL HOLE IN LEDGE AT LAND NOW OR FORMERLY OF TERENCE B. GOODWIN AND BARBARA R. GOODWIN, TRUSTEES AS DESCRIBED IN A DEED RECORDED AT THE CUMBERLAND COUNTY REGISTRY OF DEEDS IN BOOK 20006, PAGE 118;

THENCE N 00°05'03" W, ALONG LAND NOW OR FORMERLY OF GOODWIN AND LAND NOW OR FORMERLY OF PHEASANT HILL HOMEOWNERS ASSOCIATION AS DESCRIBED IN A DEED RECORDED AT THE CUMBERLAND COUNTY REGISTRY OF DEEDS IN BOOK 31200, PAGE 279, A DISTANCE OF 867.91 FEET TO AN EXISTING 5/8" REBAR, 10" ABOVE GRADE WITH CAP INSCRIBED DOW & COULOMBE, PLS 1293;

THENCE N 33°13'30" W, ALONG LAND NOW OR FORMERLY OF PHEASANT HILL HOMEOWNERS ASSOCIATION, A DISTANCE OF 215.50 FEET TO AN EXISTING DRILL HOLE IN LEDGE AT LAND NOW OR FORMERLY OF BOUMAN REALTY, LLC AS DESCRIBED IN A DEED RECORDED AT THE CUMBERLAND COUNTY REGISTRY OF DEEDS IN BOOK 28510, PAGE 73;

THENCE S 59°35'30" E, ALONG LAND NOW OR FORMERLY OF BOUMAN REALTY, LLC, A DISTANCE OF 126.39 FEET TO AN EXISTING 1" IRON PIPE, 6" ABOVE GRADE, PAINTED RED;

THENCE S 54°24'50" E, ALONG LAND NOW OR FORMERLY OF BOUMAN REALTY, LLC, A DISTANCE OF 728.77 FEET TO AN EXISTING 1.25" IRON PIPE, 14" ABOVE GRADE IN STONES, TIPPED NORTHWESTERLY;

THENCE S 76°12'23" E, ALONG LAND NOW OR FORMERLY OF BOUMAN REALTY, LLC, A DISTANCE OF 571.55 FEET TO A 5/8" REBAR WITH CAP INSCRIBED "STI PLS 2009" TO BE SET ON THE WESTERLY SIDELINE OF OCEAN AVENUE;

THENCE S 39°50'03" W, ALONG THE WESTERLY SIDELINE OF OCEAN AVENUE, A DISTANCE OF 50.78 FEET TO AN EXISTING 5/8" REBAR, 12" ABOVE GRADE, WITH CAP INSCRIBED DOW & COULOMBE, PLS 1293;

THENCE S 24°55'08" W, ALONG THE WESTERLY SIDELINE OF OCEAN AVENUE, A DISTANCE OF 216.07 FEET TO A 5/8" REBAR WITH CAP INSCRIBED "STI PLS 2009" TO BE SET;

THENCE S 21°29'19" W, ALONG THE WESTERLY SIDELINE OF OCEAN AVENUE, A DISTANCE OF 160.65 FEET TO AN EXISTING EXISTING 5/8" REBAR, 12" ABOVE GRADE WITH CAP INSCRIBED DOW & COULOMBE, PLS 1293 AT LAND NOW OR FORMERLY OF SHIRLEY A. CAIAZZO AND TIMOTHY W. CAIAZZO AS DESCRIBED IN A DEED RECORDED AT THE CUMBERLAND COUNTY REGISTRY OF DEEDS IN BOOK 4552, PAGE 113;

THENCE N 65°19'11" W, ALONG LAND NOW OR FORMERLY ALONG LAND NOW OR FORMERLY OF CAIAZZO, A DISTANCE OF 183.15 FEET TO AN EXISTING 1" IRON PIPE, 4" ABOVE GRADE , PAINTED RED;

THENCE S 13°22'39" W, ALONG LAND NOW OR FORMERLY OF CAIAZZO, A DISTANCE OF 69.26 FEET TO A DRILL HOLE TO BE SET IN REMAINS OF A STONE WALL AT LAND NOW OR FORMERLY OF RICHARD M. PERKINS AND MARY H. PERKINS AS DESCRIBED IN A DEED RECORDED AT THE CUMBERLAND COUNTY REGISTRY OF DEEDS IN BOOK 26172, PAGE 343;

THENCE S 47°12'40" W, ALONG LAND NOW OR FORMERLY OF PERKINS AND THE REMAINS OF A STONE WALL, A DISTANCE OF 14.62 FEET TO A DRILL HOLE TO BE SET;

THENCE S 60°52'00" W, ALONG LAND NOW OR FORMERLY PERKINS AND THE REMAINS OF A STONE WALL, A DISTANCE OF 28.66 FEET TO A 5/8" REBAR WITH CAP INSCRIBED "STI PLS 2009" TO BE SET;

THENCE S 33°34'00" W, ALONG LAND NOW OR FORMERLY OF PERKINS, A DISTANCE OF 53.42 FEET TO A 5/8" REBAR WITH CAP INSCRIBED "STI PLS 2009" TO BE SET;

THENCE S 25°09'40" W, ALONG LAND NOW OR FORMERLY OF PERKINS AND THE REMAINS OF A STONE WALL, A DISTANCE OF 36.08 FEET TO A 5/8" REBAR WITH CAP INSCRIBED "STI PLS 2009" TO BE SET;

THENCE S 15°19'00" W, ALONG LAND NOW OR FORMERLY OF PERKINS AND LAND NOW OR FORMERLY OF TAI XUAN HUYNH AND TRUC MI THI NGUYEN AS DESCRIBED IN A DEED RECORDED AT THE CUMBERLAND COUNTY REGISTRY OF DEEDS IN BOOK 28600, PAGE 63, A DISTANCE OF 76.84 FEET TO A 5/8" REBAR WITH CAP INSCRIBED "STI PLS 2009" TO BE SET, FROM WHICH AN EXISTING 5/8" REBAR, 12" ABOVE GRADE BEARS N 16°17'41" E, A DISTANCE OF 13.46 FEET;

THENCE S 16°45'30" W, ALONG LAND OF HUYNH AND NGUYEN AND THE REMAINS OF A STONE WALL, A DISTANCE OF 59.83 FEET TO A 5/8" REBAR WITH CAP INSCRIBED "STI PLS 2009" TO BE SET AT LAND NOW OR FORMERLY OF HEATHER A. LIEBL AS DESCRIBED IN A DEED RECORDED AT THE CUMBERLAND COUNTY REGISTRY OF DEEDS IN BOOK 24446, PAGE 17;

THENCE S 19°42'111" W, ALONG LAND NOW OR FORMERLY OF LIEBL, A DISTANCE OF 77.66 FEET TO AN EXISTING 5/8" REBAR, 18" ABOVE GRADE IN A SEASONAL RUN;

THENCE S 65°03'46" E, ALONG LAND NOW OR FORMERLY OF LIEBL, A DISTANCE OF 181.79 FEET TO A 5/8" REBAR WITH CAP INSCRIBED "STI PLS 2009" TO BE SET ON THE WESTERLY SIDELINE OF OCEAN AVENUE;

THENCE S 25°34'21" W, ALONG THE WESTERLY SIDELINE OF OCEAN AVENUE, A DISTANCE OF 24.82 FEET TO THE POINT OF BEGINNING.

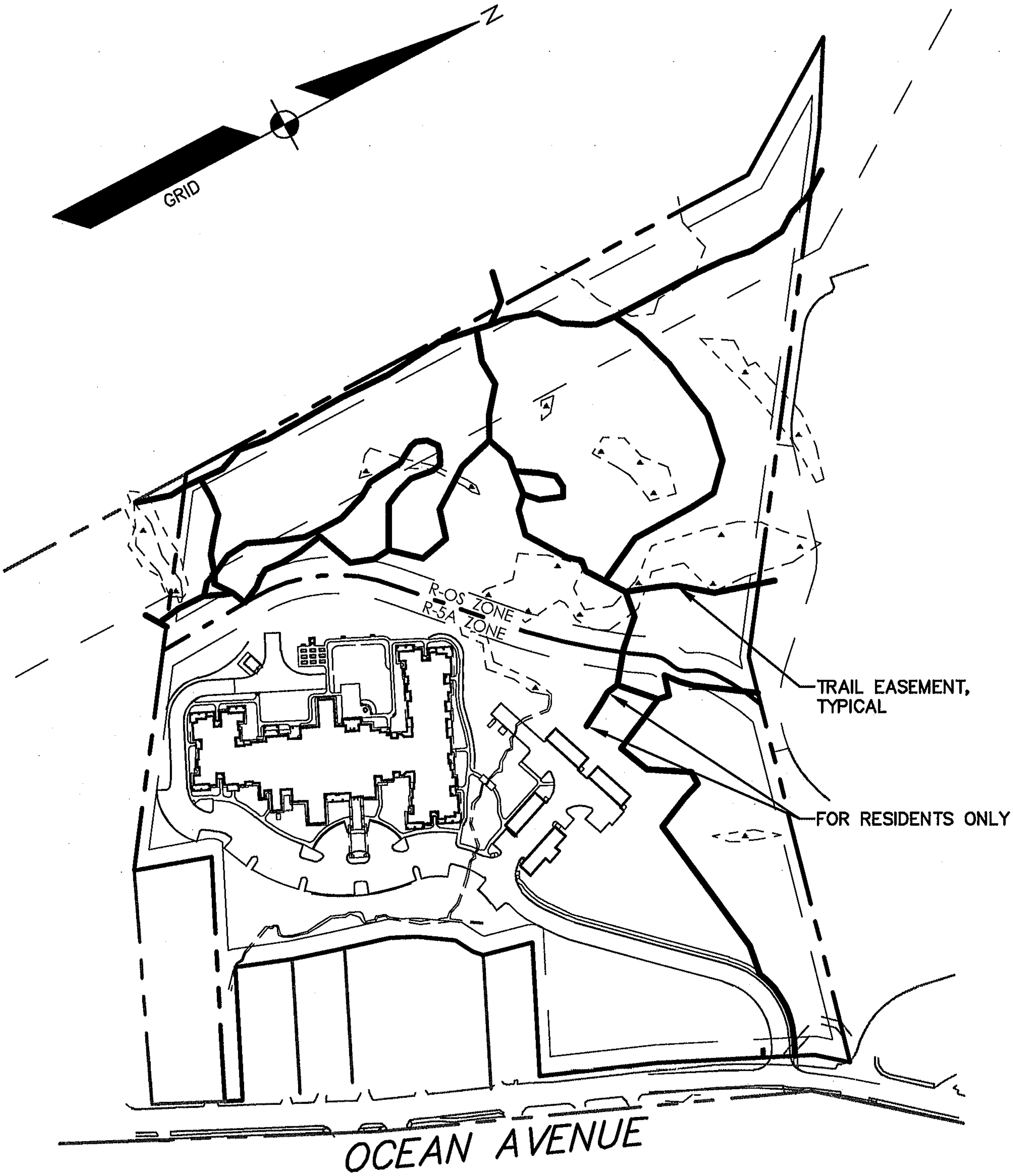
BEARINGS HEREIN ARE BASED ON GRID NORTH, MAINE STATE PLANE COORDINATE SYSTEM, WEST ZONE 1802 – NAD83.

THE HEREIN DESCRIBED LOT OR PARCEL OF LAND CONTAINS APPROXIMATELY 798,387.448 SQUARE FEET OR 18.328 ACRES.

THE HEREIN DESCRIBED LOT OR PARCEL OF LAND IS SUBJECT TO AN EASEMENT AS DEPICTED HEREON GRANTED TO CENTRAL MAINE POWER COMPANY AS DESCRIBED IN A DEED RECORDED AT THE CUMBERLAND COUNTY REGISTRY OF DEEDS IN BOOK 2176, PAGE 301.

THE HEREIN DESCRIBED LOT OR PARCEL OF LAND IS BENEFITED BY AN EASEMENT AS DEPICTED HEREON AND DESCRIBED IN A DEED RECORDED AT THE CUMBERLAND COUNTY REGISTRY OF DEEDS IN BOOK 25281, PAGE 148.

THE HEREIN DESCRIBED LOT OR PARCEL OF LAND MAY BE SUBJECT TO RIGHTS AND PRIVILEGES ASSOCIATED WITH THE USGS CONTROL POINTS LOCATED WITHIN THE BOUNDS OF THE LOCUS PROPERTY.



SEBAGO TECHNICS
WWW.SEBAGOTECHNICS.COM

75 John Roberts Rd.
Suite 1A
South Portland, ME 04106
Tel. 207-200-2100

250 Goddard Rd.
Suite B
Lewiston, ME 04240
Tel. 207-783-5656

EXHIBIT B
OF TRAIL EASEMENT

SCALE:	1" = 200'
DATE:	07/13/15
SHEET:	3 OF 3

LOCATION:
OCEAN AVENUE
PORTLAND, MAINE

FOR:
HAWTHORN DEVELOPMENT LLC
VANCOUVER, WASHINGTON

14432EXB.dwg, TAB: EXHIBIT B

Section 8. Waiver Requests

Waiver Requests

The applicant requests the followings waiver:

1. Section 15-526. Site Plan Standards, 4. Parking, b. Location and Required Number of Bicycle Parking Spaces: Project consists of elderly housing.

Section 9. Evidence of Financial and Technical Ability

Evidence of Financial and Technical Ability

The project is being proposed by Hawthorn Development Group, LLC. Hawthorn and its predecessor, Holiday Retirement Corporation, has developed and managed approximately 375 of these facilities within the United States and abroad. Hawthorn is a family owned business that has a long standing relationship in development of these projects with Lenity Architecture and its predecessor, Curry Brandaw Architects, and Colson and Colson, General Contractors, both of Salem, OR. This group has successfully developed and managed Canco Woods in Portland and Sunbury Village/Winterberry Village in Bangor.

Sebago Technics, Inc. is a local employee owned firm that has partnered with this development group to design, permit and complete numerous projects in New England including Canco Woods and Sunbury Village/Winterberry Village and projects in York, Maine; Derry, New Hampshire; and Beverly and Tewksbury, Massachusetts.

Information relative to Hawthorn Development Group and Sebago Technics, Inc. are enclosed.

HAWTHORN
RETIREMENT GROUP

SENIOR LIVING
In Style

by Hawthorn Retirement Group
Senior Communities & Management Services

www.seniorlivinginstyle.com

Table of Contents

Company Overview

Hawthorn Retirement Group offers management and consulting services to retirement, personal care, assisted living, and memory care communities.

- Currently the company has 31 facilities in operation consisting of 3,447 rentable units with 5 other facilities under construction and 9 new sites in various stages of development in North America and UK.
- Of the 31 existing facilities, 19 are stand alone independent living facilities and 12 are assisted living facilities or facilities with higher care components.
- Geographically Hawthorn Retirement Group's communities cover 13 States in the US, 3 provinces in Canada and 3 locations in UK.
- Of the 28 facilities in its North American portfolio, 10 have been opened for less than a year with an average occupancy of 52% for the portfolio. The "More than 12 Months" portfolio of 18 facilities boasts an average occupancy of 91% with 1/3 of the portfolio 100% occupied and more than 50% of them at or above 95% occupancy.

Company History & Philosophy

Developing senior living options is not only about construction and design, but about bringing people together and establishing a real sense of community, connection, and friendship. In 2000, a group sharing these ideals formalized Hawthorn Retirement Group to pursue the development and operation of senior communities throughout the U.S. and abroad.

The present group of Hawthorn owners and operators are continuing a legacy of quality while providing housing and health support services to seniors around the world. As Hawthorn continues to develop and manage senior communities, its members continue to draw from its roots while building new concepts and designs for the future in senior living.

Hawthorn Retirement Group Mission Statement

At Hawthorn Retirement Group, our caring concern for our residents is the foundation that leads to outstanding resident services. As contributing members of the communities we serve, what is most important is that we love our residents.

Management Services

Accounting Services

Hawthorn Retirement Group offers complete accounting services to the communities managed. Services provided include accounts payable, accounts receivable, payroll, monthly and annual financial statements including balance sheets and income statements. Hawthorn assists with the annual budgeting process with the communities. Additionally, variance reporting is provided to the communities to assist in evaluating financial performance to the communities and owners on a monthly basis.

Food Service

Hawthorn Retirement Group coordinates all dietary services for the communities managed. Including but not limited to menus, daily dietary services, vendor contracts, safety systems and cost control systems. A regional chef is assigned to each community to provide education, oversight and training as necessary.

Human Resources Services

Hawthorn Retirement Group coordinates human resources functions for the communities managed, including all employee benefits, workers' compensation claims, and formal employee complaints. The Hawthorn staff is available to assist with employee recruitment, retention and counseling, as well as, to coordinate and implement the employee orientation and continuing education components of the Hawthorn Operating System.

Health Services

Hawthorn Retirement Group offers extensive health services support to the communities managed. The Hawthorn health services staff is available to advise and assist with education and training of all licensed nurses, medication assistants and resident assistants on staff. Additionally, Health Services will coordinate and implement the effective use of all health services components of the Hawthorn Operating System.

Maintenance Services

Hawthorn Retirement Group coordinates all maintenance services for the communities managed. This includes all issues regarding landscaping, sprinkler systems, pest elimination, snow removal, elevators, HVAC, emergency light systems, smoke detectors, paint, carpet, tile, cabinets, and vehicles.

Management Services

Marketing Services

Hawthorn Retirement Group offers comprehensive marketing services to the communities managed; including advertising, promotional brochures, development, utilization and implementation of marketing plans. Director of Marketing and the Regional Manager for the community are available to coordinate all marketing components of the Hawthorn Management Operating System.

Regional Manager Services

Hawthorn Retirement Group provides a Regional Manager to each community managed. Regional Manager conducts site visits on a routine basis and also is available 24 hours a day, seven days a week for telephone consultation. RM works closely with the Community Manager or Administrator to focus on revenue, expense, marketing, quality assurance, and resident satisfaction issues.

Regulatory Compliance Services

Hawthorn Retirement Group offers extensive assistance and oversight to insure compliance with federal and state rules, regulations, codes, and statutes for communities managed. The Hawthorn Operating System is state specific with respect to policies and procedures required in each state. Facility licensure, both initial or renewal is coordinated by Hawthorn. Also, assistance is provided to communities preparing for annual or other routine inspections by regulatory agencies. Any necessary or required response to these inspections is coordinated by Hawthorn...

Risk Management Services

Hawthorn Retirement Group coordinates all risk management services to communities managed.

Harvest Development LLC

Harvest Development LLC ("Harvest") was formed in 2007 following the sale of Holiday Retirement Corp. to manage their joint venture opportunities with the new Holiday, as well as, to provide a vehicle for other real estate related activities of the principals.

- Harvest is the successor to Colson & Colson Construction Co. (C&C) as the development and holding company for the key principals' various ownership interests. With over 40 years history, C&C has successfully developed and constructed approximately 300 retirement residences throughout North America.
- Harvest is led by Norm Brenden (President) and Pat Kennedy (CEO), two of the former principals of Holiday Retirement/Colson et al group.
- Mr. Brenden served as the Executive Vice President and CFO at various times with the original Holiday and was instrumental in Holiday's portfolio growth to over 330 communities leading up to the sale. He is responsible for all real estate related activities at Harvest Development LLC and Hawthorns Retirement Group including the coordination of construction, development and equity investments.
- Mr. Kennedy has an extensive legal background in structuring business transactions and reorganizations. While being responsible for the original Holiday's International operations, he also served as the interim CEO of Alterra Healthcare Corporation from November 2001 to November 2003. Guiding the company through a financial restructuring. Mr. Kennedy is responsible for the relationship management of the new Holiday Retirement group, overseas development and entity formation activities of Harvest.
- Harvest's mission is to continue to develop and construct new retirement communities, which are owned by separate partnerships or limited liability companies controlled by the principals of the company.
- Colson & Colson General Contractor, Inc., ("GC") the contractor for all new projects developed by Harvest. GC is regularly ranked by Builder Magazine as one of the top 10 multifamily builders in the United States.
- Over their respective careers since the early 1970's, companies led by the key principals have either built or acquired numerous senior housing communities representing more than $6.0 billion in value.

Related Entities

Management Entity

Hawthorn Retirement Group
as Management Company
Management company for all owned retirement residences and 3rd party management contracts

Independent Living Operations
Real Estate Partnerships
&
Limited Liability Companies

Assisted Living Operations
Real Estate Partnerships
&
Limited Liability Companies

Building and Development Entities

Harvest Development LLC
Development Company
Holding Company

Colson & Colson General Contractor, Inc.
General Contractor

The Davis Company
Affiliate
Site Identification & Acquisition

Lenity Group
Affiliate
Zoning & Architectural Design

HAWTHORN RETIREMENT GROUP

Community Location Map

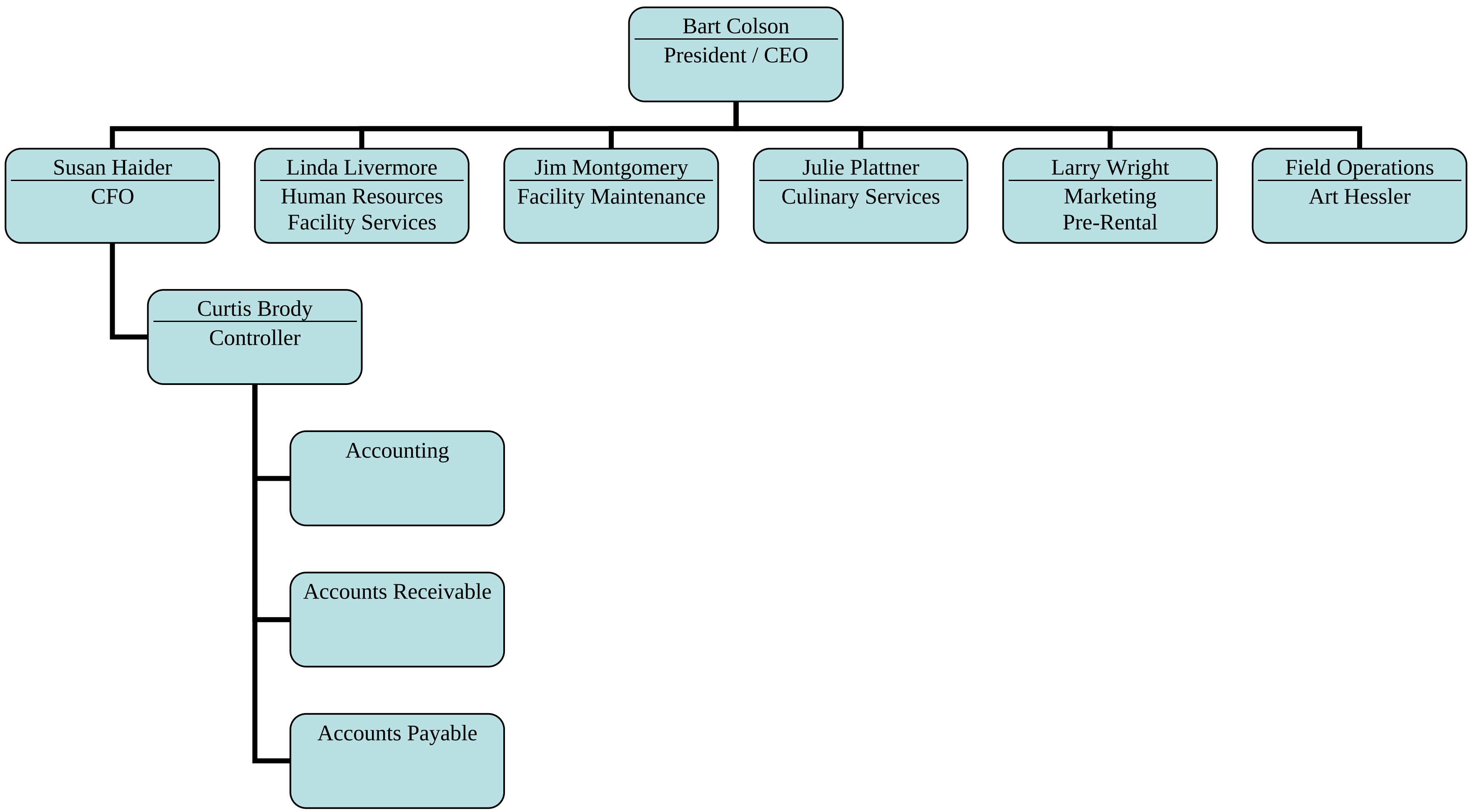
Community Listing

UNITED STATES	
ARIZONA (1)	
Mountain View Gardens	Sierra Vista, AZ
CALIFORNIA (6)	
Deer Park	Novato, CA
Feather Canyon	Paradise, CA
Palms At Bonaventure AL & MC	Ventura, CA
Quail Lodge	Antioch, CA
Scholl Canyon Estates	Glendale, CA
Waterford Terrace	La Mesa, CA
COLORADO (1)	
Summit Glen	Colorado Springs, CO
FLORIDA (2)	
Salishan (Under Construction)	Spring Hill, FL
Steeplechase	Oxford, FL
IDAHO (1)	
Salmon Creek	Boise, ID
MAINE (2)	
Birchwoods At Canco Assisted Living	Portland, ME
Winterberry Heights AL & MC	Bangor, ME
NEW MEXICO (1)	
Paloma Landing	Albuquerque, NM
NORTH CAROLINA (2)	
Oak Park	Salisbury, NC
Carolina Estates	Greensboro, NC
OHIO (3)	
Mulberry Gardens Retirement & Assisted Living	Munroe Falls, OH
Amber Park Assisted Living	Pickerington, OH
Parker Place	Mentor, OH
OREGON (4)	
Edgewood Point Assisted Living	Beaverton, OR
Somerset Assisted Living	Gladstone, OR
Somerset Lodge	Gladstone, OR
Stoneybrook Assisted Living	Corvallis, OR
TEXAS (1)	
Bentley Manor Assisted Living	Dallas, TX
VIRGINIA (1)	
Chesterfield Heights	Midlothian, VA
WASHINGTON (1)	
Charlton Place Assisted Living	Tacoma, WA
26 PROPERTIES in 13 STATES	**UNITED STATES**

CANADA	
QUEBEC (1)	
St. Patrick'S	Quebec City, QC
ONTARIO (2)	
Guelph Lake Commons	Guelph, ON
Rosewood Estates (Under Construction)	Coubourg, ON
SASKATCHEWAN (1)	
Victoria Park Personal Care Community	Regina, SK
4 PROPERTIES IN 3 PROVINCES	**CANADA**

TOTAL NORTH AMERICA PORTFOLIO - 30 PROPERTIES

Organizational Chart



HAWTHORN RETIREMENT GROUP

Facility Number	Facility Name	Units	Phone Number	Street	City, State Zip
	ARIZONA (4)				
544	DESERT SPRINGS	125	(520) 219-8100	30 WEST LAMBERT LANE	ORO VALLEY, AZ 85737
561	ESTRELLA ESTATES *(under construction)*	128	(623) 535-9195	14930 WEST WIGWAM BLVD	GOODYEAR, AZ 85395
525	MOUNTAIN VIEW GARDENS	118	(520) 459-1898	3477 RODEO DRIVE	SIERRA VISTA, AZ 85635
542	PEAKS AT SANTA RITA, THE	196	(520) 777-4800	661 W. CALLE TORRES BLANCAS	GREEN VALLEY, AZ 85614
	CALIFORNIA (5)				
538	CAMDEN SPRINGS	115	(916) 714-6565	8476 SHELDON ROAD	ELK GROVE, CA 95624
522	FEATHER CANYON	126	(530) 877-2207	5900 CANYON VIEW DRIVE	PARADISE, CA 95969
217	PALMS AT BONAVENTURE ASSISTED LIVING & MEMORY CARE	97	(805) 647-0616	111 NORTH WELLS ROAD	VENTURA, CA 93004
556	PALMS AT LA QUINTA, THE *(under construction)*	140	(760) 345-0022	45190 SEELEY DRIVE	LA QUINTA, CA 92253
523	SCHOLL CANYON ESTATES	96	(818) 951-3830	1551 E. CHEVY CHASE DRIVE	GLENDALE, CA 91206
	COLORADO (1)				
528	SUMMIT GLEN	119	(719) 380-1409	4825 OLD FARM DRIVE	COLORADO SPRINGS, CO 80917
	FLORIDA (5)				
548	CARRIAGE HOUSE, THE	130	(352) 330-5987	4680 BELLWETHER LANE	OXFORD, FL 34484
570	CYPRESS SPRINGS *(under construction)*	136	(941) 366-6870	9085 TOWN CENTER PARKWAY	BRADENTON, FL 34202
557	ORCHARD HEIGHTS	124	(352) 242-2235	3650 SOUTH HIGHWAY 27	CLERMONT, FL 34711
536	SALISHAN	118	(352) 263-2300	191 ASTAIRE LANE	SPRING HILL, FL 34609
534	STEEPLECHASE RETIREMENT RESIDENCE	118	(352) 259-0493	12029 COUNTY ROAD 103	OXFORD, FL 34484
	GEORGIA (2)				
559	ASHWOOD MEADOWS *(under construction)*	126	(770) 476-4429	11190 MEDLOCK BRIDGE ROAD	JOHNS CREEK, GA 30097
547	COTTONWOOD ESTATES	118	(678) 242-0334	255 VAUGHAN DRIVE	ALPHARETTA, GA 30009
	IDAHO (1)				
531	SALMON CREEK	118	(208) 938-5529	4890 N CLOVERDALE ROAD	BOISE, ID 83713
	INDIANA (1)				
555	NORTHRIDGE	124	(317) 776-1980	14532 ALLISONVILLE ROAD	FISHERS, IN 46038
	KANSAS (1)				
541	MEADOWLARK ESTATES	124	(785) 842-2400	4430 BAUER FARM DRIVE	LAWRENCE, KS 66049
	MAINE (2)				
214	BIRCHWOODS AT CANCO ASSISTED LIVING	84	(207) 772-1080	86 HOLIDAY DRIVE	PORTLAND, ME 04103
219	WINTERBERRY HEIGHTS ASSISTED LIVING & MEMORY CARE	92	(207) 942-6002	932 OHIO STREET	BANGOR, ME 04401
	MASSACHUSETTS (4)				
540	COLONIAL GARDENS	173	(978) 922-1203	105 CHERRY HILL DRIVE	BEVERLY, MA 01915
564	HEATHERWOOD *(under construction)*	126	(978) 851-2063	1624 MAIN STREET	TEWKSBURY, MA 01876
551	HIGHLANDS, THE	124	(508) 898-3000	129 E MAIN STREET	WESTBOROUGH, MA 01581
567	MAGNOLIA HEIGHTS *(under construction)*	136	(757) 312-0003	485 EAST CENTRAL STREET	FRANKLIN, MA 02038

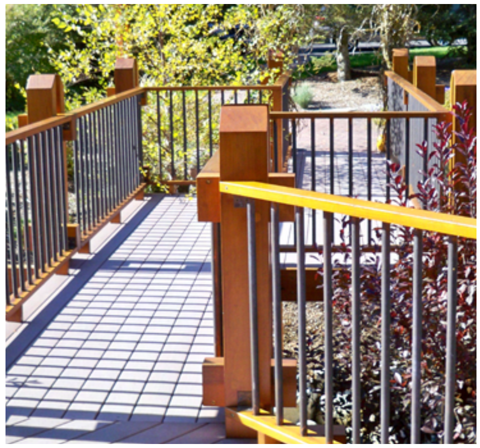
Facility Number	Facility Name	Units	Phone Number	Street	City, State Zip
	NEW MEXICO (2)				
524	PALOMA LANDING	118	(505) 243-1979	8301 PALOMAS AVENUE NE	ALBUQUERQUE, NM 87109
549	RIO GRANDE, THE	131	(505) 994-2800	2331 WESTSIDE BLVD SE	RIO RANCHO, NM 87124
	NORTH CAROLINA (5)				
539	BELLA VISTA	120	(828) 255-8255	55 PINEY MOUNTAIN DRIVE	ASHEVILLE, NC 28805
533	CAROLINA ESTATES	118	(336) 282-6133	4434 OLD BATTLEGROUND ROAD	GREENSBORO, NC 27410
529	OAK PARK RETIREMENT	118	(704) 636-4600	548 WHITE OAKS DRIVE	SALISBURY, NC 28147
537	SOUTHERN PINES	124	(910) 692-3367	205 SE SERVICE ROAD	SOUTHERN PINES, NC 28387
553	WHISPERING PINES	118	(919) 870-0222	7501 LEAD MINE ROAD	RALEIGH, NC 27615
	OHIO (3)				
220	AMBER PARK ASSISTED LIVING	86	(614) 834-3113	401 HILL RD NORTH	PICKERINGTON, OH 43147-0189
210	MULBERRY GARDENS ASSISTED LIVING	86	(330) 634-9919	395 SOUTH MAIN STREET	MUNROE FALLS, OH 44262
530	PARKER PLACE	118	(440) 255-0828	7960 CENTER STREET	MENTOR, OH 44060
	OREGON (5)				
207	EDGEWOOD POINT ASSISTED LIVING & MEMORY CARE	79	(503) 671-9474	7733 SW SCHOLLS FERRY ROAD	BEAVERTON, OR 97008
565	GLENMOORE	125	(503) 698-3555	12154 SE 114TH CT	HAPPY VALLEY, OR 97086
202	SOMERSET ASSISTED LIVING	86	(503) 723-7868	8360 CASON ROAD	GLADSTONE, OR 97027
507	SOMERSET LODGE	122	(503) 657-5659	8330 CASON ROAD	GLADSTONE, OR 97027
201	STONEYBROOK ASSISTED LIVING	85	(541) 758-2026	4650 SW HOLLYHOCK CIRCLE	CORVALLIS, OR 97333
	PENNSYLVANIA (1)				
546	STERLING HEIGHTS	133	(610) 868-4600	3500 FAIRVIEW STREET	BETHLEHEM, PA 18017
	SOUTH CAROLINA (1)				
543	SUMMERVILLE ESTATES	124	(843) 873-3337	704 CENTRAL AVENUE	SUMMERVILLE, SC 29483
	TEXAS (4)				
206	ACADIA ASSISTED LIVING *(formerly Bently Manor)*	88	(972) 247-2266	3344 FOREST LANE	DALLAS, TX 75234
550	LIBERTY HEIGHTS	118	(972) 722-5129	963 WEST YELLOW JACKET LANE	ROCKWALL, TX 75087
560	OAKS, THE *(under construction)*	136	(512) 863-7788	3720 WILLIAMS DRIVE	GEORGETOWN, TX 78628
552	PIONEER RIDGE	126	(972) 547-6800	7210 LINKSIDE POINT DRIVE	MCKINNEY, TX 75071
	VIRGINIA (1)				
532	CHESTERFIELD HEIGHTS	118	(804) 379-2768	901 MADRONA STREET	MIDLOTHIAN, VA 23114
	ONTARIO (4)				
554	CEDARVIEW	124	(519) 602-0282	511 FINKLE STREET	WOODSTOCK, ON N4V 0C4
527	GUELPH LAKE COMMONS	123	(519) 780-5253	520 VICTORIA ROAD NORTH	GUELPH, ON N1E 0E6
545	HERITAGE MEADOWS	128	(519) 620-9999	208 HESPELER ROAD	CAMBRIDGE, ON N1R 0A5
535	ROSEWOOD ESTATES	118	(905) 373-5000	255 DENSMORE ROAD	COBOURG, ON K9A 0E5
	SASKATCHEWAN (1)				
218	VICTORIA PARK PERSONAL CARE COMMUNITY	81	(306) 522-4300	2400 E ARENS ROAD	REGINA, SK S4V 3G6

SEBAGO TECHNICS

CIVIL ENGINEERING • SURVEYING • LANDSCAPE ARCHITECTURE

An Introduction

75 JOHN ROBERTS ROAD, SUITE 1A, SOUTH PORTLAND, MAINE 04106-6963 • SEBAGOTECHNICS.COM



What Sets Us Apart?

Approach
Our approach to project delivery provides a single point of contact, responsive scheduling and cost efficiency.

Reputation
Sebago Technics is recognized as a firm that excels in the permitting of projects through experienced knowledge and excellent reputation.

Ownership
Employee ownership results in improved responsiveness, commitment and accountability throughout the organization.

Quality
Our designs, graphics and plans are subject to rigorous quality standards and review which results in clear, effective documents.

Innovation
Sebago Technics' design professionals employ the latest engineering and technological methods to develop practical, cost-effective solutions.

Results
Sebago Technics' resources and experience combined with our project team approach provide the capacity to meet client needs and deliver results.

Founded in 1981, Sebago Technics, Inc. is a consulting firm of more than fifty design professionals and technical staff providing services throughout New England. From the start, our business plan was simple:"to provide quality, cost-effective civil engineering services that are responsive to a customer's goals, schedule and budget." Our One Company capabilities and resources provide clients with experience and solutions to respond to their planning, permitting and design needs. Guided by integrity, experience and teamwork we understand that we can only succeed when quality, responsive and cost-effective service is provided to our customers.

At a Glance:

Year Established: 1981
(Employee Owned Since 1998)

Licensed & Certified Professionals

- Professional Engineers
- Certified Flood Plain Manager
- Certified Wetland Scientist
- DOT Project Administrators
- LEED Accredited Professionals
- Professional Land Surveyors
- Registered Landscape Architects
- Licensed Soil Scientist
- Subsurface Disposal Systems Designers
- Erosion Control, Sedimentation & Stormwater Inspectors
- Professional Traffic Operations Engineer

Approach & Services

We provide engineering, planning, surveying and environmental services to companies, developers, land owners and the public sector for customers and projects, both large and small. Our experience includes projects in commercial, industrial, retail, residential, recreation, utility and government sectors. We meet our client needs through an efficient and effective delivery system providing clients a single point of contact. Our approach combined with our expertise and services allows us to meet the needs of our customers within One Company.

Nearly every project requires some level of regulatory permitting and public process. Sebago Technics excels in these areas. The nature of our work enables us to remain current on the latest regulations and forge important relationships with regulatory and enforcement personnel in governments and agencies throughout the region. Our project managers and technicians are experienced with the requirements and processes of various federal, regional, state and municipal authorities. We work diligently and proactively in pursuit of permits and approvals striving to balance compliance with our clients' needs and interests.

Clients rely on Sebago Technics to guide their projects through design, permitting and construction processes utilizing either traditional or design-build delivery. Our licensed professionals remain current in the latest engineering practices and are certified in LEED, Erosion, Sedimentation and Stormwater Control & Inspection, Wetlands, Soils, Septic Design, and Traffic Operations. Our One Company range of services and expertise allows us to assist projects from concept through construction.

As a 100% employee owned company our employees set us apart through commitment and integrity. Our team-based approach to services provides each client with the expertise and input of multiple disciplines. Whether an engineer, surveyor, landscape architect or environmental scientist each project benefits from the perspective and skills of varied professionals. The combined experience and knowledge, under one roof, benefits each project and customer for a better result.

General Services

Land Surveying
Site and Civil Engineering
Transportation/Traffic Engineering
Landscape Architecture
Environmental Engineering
Natural Resources and Soils Science
Permitting (Local/State/Federal)
Construction Services
GIS & Mapping

SEBAGO TECHNICS

Civil & Site Engineering

Civil Engineering is a broad based profession that deals with the design, construction and maintenance of the physical and naturally built environment. Civil and Site Engineering projects may include regulatory permitting at all levels of government, technical studies and evaluations, planning and implementation, feasibility assessments, stormwater modeling, infrastructure design, site and subdivision planning/design. Often, the Civil Engineer will take the lead on a project coordinating other disciplines such as environmental, geotechnical, survey and transportation components that comprise a complete project approach.

From the beginning, Sebago Technics, Inc. has focused on offering a broad range of Civil Engineering services to the public and private sector. Our diverse Civil Engineering staff provides customers the experience and expertise to evaluate, design and permit projects covering a broad spectrum. As technology advances and regulatory processes evolve, our Civil Engineering staff has remained flexible and adaptive with a focus on customer service. Our Civil Engineers work together in teams of experienced professionals to assist customers on a variety of projects. Our staff works with customers from inception to completion to plan, design, permit and construct projects. Throughout a project, we strive to be attentive to the customer's goals and seek solutions that are cost-effective and responsive to regulatory requirements.

Fort Meade
Department of Defense, MD

Masterplanning for the 500-Acre, Ft. Meade housing development including civil design for Phase I consisting of 1,000 new homes, 330 acres, and 9 miles of roadway and supporting infrastructure.

Eastern Manufacturing Facility
Brewer, ME

Civil Engineering, permitting and transportation planning for a $19 million site redevelopment for fabricated assembled modular industrial structures for shipment via rail, barge and highway throughout the United States.

Government & Municipal
General Engineering Services

Sebago Technics has a long history of ID/IQ delivery of services to municipalities and government agencies.

U.S.P.S. Distribution Center Expansion
North Reading, MA

Civil Engineering, Regulatory permitting and Traffic Impact Assessment for 140,000 s.f. (design-build) expansion of an existing postal facility.

Exit 3, I-295
South Portland, ME

$6.5 million redesign of existing interchange to expand capacity and eliminate 3 High Crash Locations.

Municipal Streets
Portland, ME

Redesign of 16 arterial and collector streets, including storm sewer separation, totaling more than 4 miles in length as part of the City's CSO program.

Land Surveying

Survey is a fundamental component required by almost every project. We believe maintaining a qualified in-house staff of survey professionals and technicians provides enhanced project coordination and responsive customer service. With one of the largest survey staffs in Maine, we are able to respond promptly to client and project needs. We can produce multiple survey crews on any given day with state of the art technical equipment including, high definition laser scanner, GPS systems, robotic instruments, total stations and technical support. Sebago maintains our own GPS base station allowing us to complete real time kinematic GPS within a supporting network. Data collected in the field is processed electronically by survey technicians and professional land surveyors to produce quality final products whether it is a stand alone survey plan or engineering data to be used in design and construction.

Cutler Naval Communications Facility
Cutler, ME

Boundary and Existing Conditions Survey using aerial mapping for Naval Facility along the coast of Maine.

Brunswick Naval Air Station
Brunswick, ME

Boundary Survey of Base perimeter and supporting Existing Conditions survey for Base projects.

Remote Terminal Survey
Statewide, ME

Boundary survey, existing conditions surveys and topographic surveys on hundreds of Remote Terminal sites. Site design, civil engineering and landscape design were a few of the services performed on the sites. In addition, we performed the site selection, property owner negotiation and represented the utility company before municipal/state agencies.

Maine Medical Center
Multiple Locations, ME

Boundary, Existing Conditions, Construction Layout and As-Built Surveys for multiple campus and single facility locations throughout Maine. Including a recently completed As-built survey of the entire Bramhall Campus consisting of several city blocks within Portland, Maine.

GPS Mapping – Maine Superfund Sites
Statewide, ME

Created maps of all locations identified on the Maine Department of Environmental Protection's Uncontrolled Site Program List. A 2,500 foot radius was mapped to identify all properties within 2,500 feet of the published Superfund Sites for all easements or transfer or real property.

Landscape Architecture

Landscape Architecture was integrated into Sebago Technics' practice in 1988, bringing a creative design focus to the company and complimenting its civil engineering capability. Landscape architects lead the design effort on all projects, working closely with our natural resource scientists and engineers. We listen closely to the needs of our clients, their goals for each project, and strive to accomplish their objectives, accounting for the environmental and regulatory constraints affecting each project.

Having practiced throughout the United States and overseas, observing regional and international design vocabulary, we bring diverse knowledge to each project. Our landscape architects focus on innovative design practices yet remain grounded by a strong technical knowledge that produces cost effective, constructible solutions. A high standard of quality is our trademark.

As LEED Accredited Professionals we are committed to the principles of sustainable design practices. Embracing technology, we believe people understand design in a visual context and continue to reflect our designs with quality graphic communication.

LL Bean Flagship Campus
Freeport, ME

Masterplanning, site design and landscape architecture for three building expansions at the Freeport Campus, including LEED certification and branding of the LL Bean image using native materials and site detailing.

Waterfront City Park
Gardiner, ME

Transformation of a former industrial waterfront into an expansive green, riverfront boardwalk, visitor center and natural amphitheatre along the Kennebec River, including park access gateways and connectivity to adjacent historic downtown area.

Portsmouth Public Library
Portsmouth, NH

Site design and landscape architecture for civic library building and site within Portsmouth's historic waterfront district; this project features extensive brick and granite site paving, native plant materials and was awarded LEED Silver accreditation.

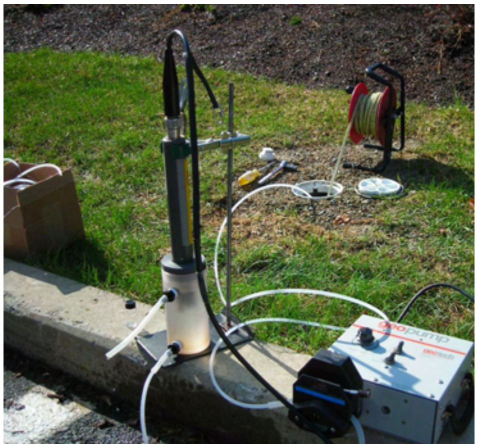
Maine Medical Center
Portland, ME

Masterplanning, site design and landscape architecture for a state of the art birthing center expansion, eight level parking garage, central utility plant, Lifeflight helipad and associated site improvements.

PD Merrill Marine Gateway
Portland, ME

Situated at the eastern terminus of the Veteran's Memorial Bridge, this public park will feature two major pieces of sculpture, and is designed within the context of the marine heritage of Portland's working waterfront.

Environmental Services



At Sebago Technics; our Environmental Engineers and Technical Staff provide its customers with planning, assessments, designing, project management and permit acquisition for a variety of projects. Our experienced team assists with the design of municipal and private water, wastewater, and stormwater conveyance systems. Sebago Technics has completed miles of sewer separation projects, designed sanitary pump stations and solid waste facilities. We also support both businesses and land owners in the completion of Environmental Site Assessments (ESA's) and remediation prior to land transfers or project development.

Sebago Technics offers Phase I & II site assessment services to characterize and quantify site contamination for future site remediation. Sebago Technics has successfully guided numerous properties through the Maine Department of Environmental Protection's Voluntary Response Action Program (VRAP). This process includes timely and cost effective Phase I & II assessments which are typically completed in conjunction with property redevelopment.

With a well respected Environmental Staff, we are known in the industry for high intensity soil surveys, wetland delineations and vernal pool surveys for development prospects. Our licensed Site Evaluators and Engineers work together to design our client's subsurface wastewater disposal systems; and are able to do so for both small and large engineered systems which include local and state permits.

Maine Coast Heritage Trust
Natural Resource Inventories
Islands and Coastal Properties
North Haven to Mount Desert Island

Natural resource field mapping of a variety of natural resources, particularly vegetation habitat communities, on 11 different preserves owned by Maine Coast Heritage Trust, and publishing the data in ArcGIS

City of Portland, ME

Hydrology and FEMA flood plain analysis, mapping and permitting.

Turner Farm Restoration
North Haven, ME

Inventory of natural resources on 260 acres of land. Delineation, classification, and GPS location of the wetlands was performed. Class 'B' High Intensity Soil Survey was prepared to classify all soils on the property. A wetlands map, a soils map, and natural resources report were final deliverables.

Freeport Village Station
Freeport, ME

Sebago Technics conducted Phase II remediation in conjunction with the site's application to the Maine Department of Environmental Protection (MDEP) Voluntary Response Action Program (VRAP). Working closely with the developer and the MDEP, coordinated the most cost-effective and permanent solutions to remediate the site in concert with the construction schedule.

Site Planning

We approach planning much as we do all opportunities; with pragmatism and creativity. Combining site specific information (such as topography, natural resources, and existing development on site), with regulatory criteria, and local ordinance requirements we work to create conceptual and long term master plans that move our client's vision to reality.

Every great land development project needs a solid plan as the foundation. Without this crucial piece of design, sites never realize their true potential and become victim to an ad-hoc style of development, wedging uses together, creating poor internal site circulation and wasted space within the development as well as reduced income potential for land owners.

During the planning process we meet with local, state and federal regulators to ensure the design not only fits the site and the restrictions but to identify potential red flags from a permitting perspective early in the planning process. This is extremely important to both budget and timeline. Understanding the regulatory obstacles at the outset allows for simplified navigation throughout the permitting and development process.

Unum Provident Headquarters
Portland, ME

Masterplanning and landscape architecture for Unum Provident Home Office III, the largest office building in Maine, together with a three level parking structure with 1200 parking spaces and employee amenities including walking pathways constructed with porous paving materials.

LL Bean Order Fulfillment Center
Freeport, ME

Site planning and permitting for 1.2 million square feet of warehousing and distribution space, employee parking and site amenities on a 72 acre campus in Freeport. This facility processes and ships every order from LL Bean to customers worldwide.

Central Maine Medical Center
Lewiston, ME

Site design to accommodate a major expansion and new emergency department at Central Maine Medical Center, including arrival and visitor drop off areas, ambulance service arrival bays, visitor parking and related site features.

Edward T. Gignoux Federal Courthouse
Portland, ME

Streetscape and site planning for the $20 million renovation of this federal facility, located in Portland's civic district. Site materials selected reflect the institutional nature of the courthouse, instilling a character of authority and permanence.

Site Evaluation & Regulatory Permitting



The site alternatives and selection process is often an evolutionary one that begins with defining the project needs and objectives. Over the past 25 plus years Sebago Technics, Inc. has participated in site selection process and permitting for projects ranging in size and complexity. While there are commonalities in the process, no two projects are exactly the same. As a result, we apply our knowledge and depth of experience to develop specific solutions to each and every project.

We have gained a tremendous amount of experience over the years with permitting projects in many regulatory environments. In the development of a design we strive to anticipate the regulatory issues and address them in the design process so that they do not become obstacles later in the process. When considering alternative sites or alternative site designs we are able to quickly summarize the permitting considerations as well as the cost and performance considerations.

When it comes to permitting we have had a great deal of experience with the Maine Department of Environmental Protection (MDEP) and the Army Corps of Engineers (ACOE). We have developed working relationships with the project analysts at the MDEP and the ACOE and as a result have been able to get projects through the permitting process with successful outcomes for our clients.

Maine Crossing
South Portland, ME

Site evaluations and investigation to develop a 13 acre wetland mitigation area responsive to project impacts including permitting through the Maine DEP, USACE and EPA.

Cliff Island and Cushing Barge Landings
City of Portland, ME

Sebago Technics, Inc. assisted the City of Portland with natural resource assessments and permitting for two municipal barge landings. Multiple regulatory permits and coordination were required to include the Harbor Commission, Submerged Lands lease, Maine DEP, USACE, Department of Marine Resources, Inland Fisheries and Wildlife, City of Portland Flood Plain and Shoreland Zoning permits.

International Jetport (GA) Facility
Portland, ME

Planning and Design of a 7 acre General Aviation Facility required preparation of comprehensive permit application for the Maine DEP Site Location of Development Act, Federal Aviation Administration (FAA) and City of South Portland for a new major development project.

Eastern Fine Paper Redevelopment
Brewer, ME

Engineering and permitting for redevelopment of a 39 acre manufacturing site. Permitting was extensive and fast-tracked to include City of Brewer approvals, Maine DEP Site Location of Development Act and Natural Resources Protection Act permits, Submerged Lands lease USACOE permitting, Maine Department of Transportation coordination, Beneficial Use permit for dredging and coordination with multiple agencies (Historic Preservation Office, Dept. of Marine Resources, Inland Fisheries & Wildlife).

SEBAGO TECHNICS

Design/Build Project Delivery

The Design-Build process offers a coordinated team approach to the planning, design and construction of a Project. Sebago Technics, Inc. has successfully participated on a wide variety of Design-Build projects. Our success is a function of an open working relationship committed to customer service, innovation balanced by practicality and the timely delivery of services.

Sebago Technics, Inc. has participated in a wide range of design-build projects throughout Maine and New England. We have partnered with national and local teams for transportation and site development projects focused on government and private/public projects. At the federal level we have successfully completed large scale military housing, infrastructure and facility support projects along with postal services expansions and new facilities. Our broad design-build experience also includes unique private-public partnerships including wind generation and site redevelopment projects. Sebago Technics, Inc. successfully participated in Maine's first large scale Island wind generation project on Vinal Haven Island. We also participated in a fast-tracked private-public partnership of a Brownfield's site in Brewer, Maine. The project included substantial permitting and agency coordination to accommodate a new modular construction facility. Our experienced team of professionals understands the design-build process, importance of strong partnerships and the delivery of quality services focused on the customer.

72 Unit Family Housing, Phase I
Brunswick Naval Air Station, Brunswick, ME

Bachelor Enlisted Quarters (BEQs)
Brunswick Naval Air Station, Brunswick, ME

Brunswick Gardens Sewer Realignment
Brunswick Naval Air Station, Brunswick, ME

50-Unit Navy Lodge, Naval Station
Newport, RI

Naval Exchange Addition, Naval Station
Newport, RI

Naval Submarine Base
New London, Groton, CT

126 Unit Family Housing, Phase II
Brunswick Naval Air Station, Brunswick, ME

U.S.P.S. Flat Sequencing System Expansion
North Reading, MA

U.S. Postal Service Distribution Center
Scarborough, ME

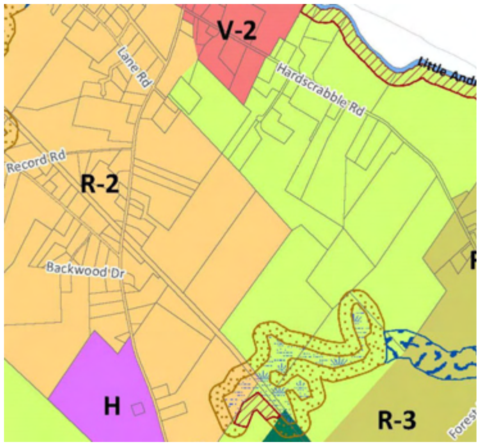
Picerne Military Housing, Fort Meade
Fort Meade, MD

Killock Pond Road
Hollis, ME

Fox Island Wind Power Project
Vinal Haven, ME
(Partnership with Cianbro Corporation)

SEBAGO TECHNICS

GIS and Mapping Services
Municipal



GIS is a set of technologies and software tools that enable maps to be made from geospatial data as well as other data sets, such as tabular information in tables and databases. The data is visualized in the form of a map or other graphical expression of location.

The days of approximate GIS mapping is giving way in many quarters to more accurate and formally constructed maps which can be available for use at various scales, through multiple software platforms, and can be utilized on multiple devices. Additionally, the data is coordinated and registered to one another and other critical data layers to create tightly integrated municipal mapping collections. For instance, zoning and shoreland zoning map layers can be created that will accurately agree with parcel data and orthoimagery collected over many years as part of larger state/regional orthoimagery projects. The data can be available locally for town staff use as well as in hosted, public facing web mapping applications for the staff and public to access. Data which is more reliable and accurate can also be more economical in the long run as it is used to support municipal staff decision making. Activities in planning, code enforcement, assessment, public works, and economic development all can benefit from more reliable and accurate data that agrees well.

Our team can work with all of today's mapping technologies to deliver superior spatial services to public and private clients. Through the use of today's spatial data sources like real time GPS (sub-meter and survey-grade), photogrammetry, orthoimagery, LIDAR, remote sensing, web mapping services (WMS), and mobile mapping we have been able to build and maintain geospatial datasets for local and state government throughout Maine and New England. Our staff is also involved with many state/regional projects such as orthoimagery acquisition and can help town staff navigate through what may be of benefit locally to town specific matters.

Raymond GIS Services
Raymond, ME

Annual maintenance of core GIS data such as tax maps, zoning map, shoreland zoning map, pavement management CIP maps, and various other on call GIS related projects in support of Town staff. Additionally we have assisted in the resolution of town boundary related mapping issues.

Poland Zoning Map Maintenance
Poland, ME

Restructuring an existing municipal zoning map to incorporate a higher degree of spatial accuracy along the water's edge for shoreland zoning and modifying the spatial dataset to represent both overlay zones as well as general zone classes.

South Portland Storm Sewer Inventory Project
South Portland, ME

Capture of centimeter level (survey-grade) GPS elevations for a large municipal storm sewer system and the verification of pipe connections from structure to structure. The data was delivered to the client in an edited version of their own geodatabase to update storm sewer mapping and serve as the basis for a storm water modeling exercise.

Hart Brook Sanitary & Storm Sewer Mapping
Lewiston, ME

Capture of centimeter level (survey-grade) GPS elevations for an impaired municipal watershed and the verification of pipe connections from structure to structure. The data was delivered to the client in a geodatabase designed relate to their existing wastewater geodatabase and serve as the basis for updates to their existing mapping in-house.

Kittery Shorezone Mapping Project
Kittery, ME

Used LIDAR collected at low tide to map the intertidal zone for all of Kittery's coastline to assist town staff in shoreland zoning issues and parcel mapping efforts being conduct in-house. Also created multiple high water lines to assist with changing shoreland zoning needs due to annual tidal variations.

Civil Engineering

Site Plans
Grading & Drainage Design
Utility Design (Water, Sewer)
Stormwater Management
Permitting (Local, State & Federal)
Quarry/Gravel Pit Studies & Permitting
Technical Review
Construction Inspection

Environmental Engineering

NRPA/NEPA Studies
Site Assessments (ESAs, VRAPs)
Septic Design & Analysis
Floodplain Studies & Permitting

Transportation Engineering

Signal Analysis, Design & Management
Traffic Analysis & Permitting
Intersection, Road & Highway Design
Alternatives Analysis & Route Design

Landscape Architecture

Conceptual & Site Design
Park & Public Space Design
Urban Design
Master and Campus Planning
Waterfront Planning
Planting Design

Land Surveying

Boundary & Topographic Survey
High Definition 3D Laser Scanning
Subdivisions
GPS Survey & Mapping
Construction Layout
As-Built Survey
Deed Research
GIS Mapping

Soil Sciences

Soil Surveys & Testing
Wetland Assessment & Permitting
Turf Impact Testing
Vernal Pool Mapping

SEBAGO TECHNICS
CIVIL ENGINEERING ▪ SURVEYING ▪ LANDSCAPE ARCHITECTURE

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President/CEO

Owens McCullough,PE
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William T. Conway, RLA
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Landscape Architecture

Steven Sawyer, PE
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Transportation

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Regional Manager,
Lewiston

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Daniel L. Riley, PE
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Senior Project Manager

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Environmental Practice
Leader

Kylie S. Mason, RLA
Senior Landscape
Architect

Gary Fullerton,
Director,
Natural Resources

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Vice President, Field
Services

SEBAGO TECHNICS

CIVIL ENGINEERING • SURVEYING • LANDSCAPE ARCHITECTURE

GENERAL SERVICES

Civil Engineering

- Infrastructure and Site Development
- Regulatory Permitting
- Roadway Engineering and Design
- Development Planning & Feasibility Studies
- Airport Engineering

Environmental Engineering

- Regulatory Permitting (Local, State & Federal)
- Site Assessments (ESA Phase I, II & III)
- Wastewater & Groundwater Treatment
- Underground Storage Tank Services
- Effluent & Groundwater Modeling/Monitoring
- Wastewater Minimization Studies
- Landfill Closure Plans
- Water Supply & Treatment System Design

Transportation Engineering

- Corridor Studies
- Traffic Impact/Access Mgmt Analysis
- Traffic Modeling and Simulations
- TSM Evaluations and Design
- TDM Evaluations
- Context Sensitive Highway/Urban Street Design
- Pedestrian & Bike Trail Design
- Traffic Signal System Planning
- Traffic Signal Design & Operations
- Intermodal Facility Planning & Design
- Construction Administration

Land Surveying

- Technical Deed Research
- Boundary Survey/Topographic Survey
- Land Title Surveys
- Hydrographic Surveys
- Mortgage Inspections
- Construction Layout
- As-Built Record Documentation
- Control of Aerial Photography
- Land Data Acquisition/Land Information Systems

Landscape Architecture

- Site Selection Studies
- Conceptual & Site Design
- Skate Park Design
- Recreation Facility Design
- Sidewalk & Streetscape Design
- Planting Design
- Irrigation System Design
- Construction Observation & Administration

Natural Resources

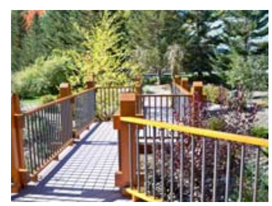
- Medium & High Intensity Soil Surveys
- On-Site Wastewater Disposal
- Systems Design
- HHE-200 Preparation
- Sediment & Erosion Control Plans
- Nutrient Loading & Mitigation Analysis
- Soil Testing
- Wetlands Delineation/Vernal Pools

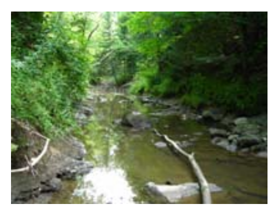
Land Planning

- Zoning Analysis/Ordinance Writing
- Demographic Analysis
- Comprehensive Planning
- Contract Zoning
- Grant Writing
- Planning Board Representation

Artificial Turf Impact Testing

- Municipal Fields
- College Facilities
- Professional Athletic Facilities





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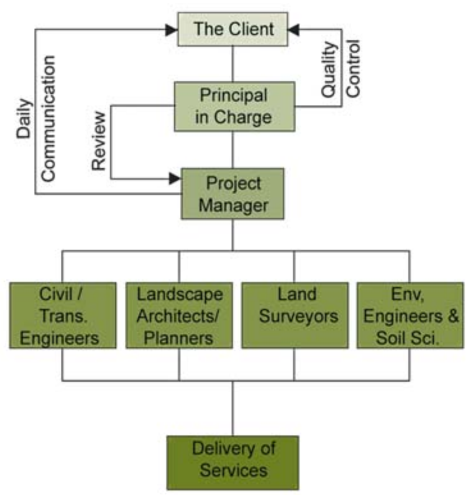
SEBAGO TECHNICS

CIVIL ENGINEERING • SURVEYING • LANDSCAPE ARCHITECTURE

Project Organization

Our diversified professional experience provides each client with the specialized knowledge and abilities required for each project. In accordance with our corporate philosophy, the firm offers integrated professional services in the fields of civil, environmental and transportation engineering, soil science, land surveying, planning and landscape architecture.



Project teams are selected based on our understanding of client objectives, the special technical requirements of the project, and the management skills necessary to coordinate the comprehensive review and approval process. Specific team members are selected for their individual abilities and demonstrated performance on similar projects.

While the firm emphasizes its ability to provide coordinated multi-disciplinary services, each section within the firm practices independently for those clients who may require only certain aspects of our professional service. In some cases, our services may be limited at the outset of a project and more comprehensive as the project progresses. In either case, our multi-disciplinary strength provides a check and balance to each discipline performing services as an independent section of the firm.

A senior member of the firm is assigned responsibility for each client, and fills the position of Principal-in-Charge. A Project Manager is assigned to each project to maintain client communication, and coordinate the diverse technical and administrative aspects of the project. The Project Manager is available daily to meet client needs. With the Principal-in-Charge, the Project Manager selects and assigns technical staff as required by the nature and schedule of the project.

The chart illustrates our corporate structure and details our approach to project organization and management. The professional staff is supported by qualified technicians with the latest in computer technology. Technical software includes AutoCAD, Land Development Desktop and HydroCAD. The ACCI accounting package maintains up to date project costs and detailed reports of time charges and expenses by specific task.

Section 10. Construction Management Plan

Construction Management Plan

The project will be managed throughout construction by Colson & Colson General Contractors, Inc. of Salem, OR. They will relocate one of their full time project manager who will reside in the Portland area during the entire construction period. This project manager will oversee all trades and will be responsible for SWPPP management, interface with neighboring residents, coordinate permitting and inspections with the City and ensure that site access is maintained during construction.

Section 11. Statement of Traffic Generation

Statement of Traffic Generation

The proposed project will have a single access point off from Ocean Avenue. The nature of the project is that it is a low traffic generator both in overall trips and peak hours. In addition, the project will provide transportation services for its residences for shopping, doctor appointments, volunteer activities and other trips from the facility. Furthermore, the peak hour trips do not typically coincide with the peak hour traffic of the abutting roadways as these constitute the times of meals and social activities of the residence.

Depending on how the project is classified, the traffic generation is as follows:

PROPOSED 150 SUITE ASSISTED LIVING LAND USE 254							
BY NUMBER OF BEDS	**BEDS**	**RATE (Trips/Bed)**	**TOTAL**	**ENTER (%)**	**EXIT (%)**	**ENTER#**	**EXIT#**
Weekday	165	2.66	438.9	50.00%	50.00%	219.5	219.5
Weekday Morning Peak Hour of Roadway	165	0.14	23.1	65.00%	35.00%	15.0	8.1
Weekday Afternoon Peak Hour of Roadway	165	0.22	36.3	44.00%	56.00%	16.0	20.3
Saturday	165	2.20	363.0	50.00%	50.00%	181.5	181.5
Saturday Peak Hour	165	0.33	54.5	46.00%	54.00%	25.0	29.4
Reference - ITE Trip Generation Manual, 7th Edition.							

PROPOSED 150 SUITE CONGREGATE CARE FACILITY LAND USE 253							
BY NUMBER OF DWELLING UNITS	**UNITS**	**RATE (Trips/Bed)**	**TOTAL**	**ENTER (%)**	**EXIT (%)**	**ENTER#**	**EXIT#**
Weekday	150	2.02	303.0	50.00%	50.00%	151.5	151.5
Weekday Morning Peak Hour of Roadway	150	0.06	9.0	59.00%	41.00%	5.3	3.7
Weekday Afternoon Peak Hour of Roadway	150	0.02	2.6	55.00%	45.00%	1.4	1.1
Saturday	150	NA	NA	NA	NA	NA	NA
Saturday Peak Hour	150	NA	NA	NA	NA	NA	NA
Reference - ITE Trip Generation Manual, 7th Edition.							

The resulting traffic is not expected to have a significant impact on the surrounding thoroughfares.

Section 12. Summary of Significant Natural Features

Summary of Significant Natural Features

Per the coordination with the Maine Departments of Conservation and inland Fisheries and Wildlife, no specific habitat and natural features were noted.

The entire property consists of approximately 18.33 acres. Of this area, approximately 8.16 acres will remain as zoned, R-OS, and consists of wetland and forested uplands. This land is being preserved by the applicant for public for use of the existing trails that the transverse the parcel. These trails include trials through the Central Maine Power transmission main easement that connect to trails to the north in the Quarry Run Dog Park.

The proposed project will be developed on the remaining 10.17 acres which is within the R-5A Zoning District. The project will “develop” approximately 4.93 acres, impervious and non-forested re-vegetated area, with the remaining 5.46 acres being maintained in a natural state. Within this undeveloped area, the applicant has executed an easement document with Portland Trails that will allow public access from Ocean Avenue to the trails within the R-OS portion of the property.

Along the boundary of the R-5A and R-OS zones and adjacent to the existing and proposed new access trail is a ridge which contains the highest point of Portland along the coast; it is marked by a National Geodetic Survey Marker, designation of West Graves, and is situate at approximately elevation 170 NAVD.

Section 13. Stormwater Management Plan

STORMWATER MANAGEMENT PLAN

For

Portland Retirement Residence
Portland, Maine

Prepared for

Hawthorn Development Group, LLC
9310 NE Vancouver Mall Drive, Suite 200
Vancouver, WA 98662

September 2015

Table of Contents

Contents

14432

STORMWATER MANAGEMENT PLAN

Portland Retirement Residence
802-828 Ocean Avenue
Portland, Maine

Executive Summary

Hawthorne Development Group, LLC is submitted plans to develop within a 10.17 acre portion of 18.32 acres of undeveloped land off Ocean Avenue into a 150-unit retirement residence. The property is shown as Lot A-7 on City of Portland Tax Map 411 and Lots A-6, A-7, and A-21 on City of Portland Tax Map 416.

The development will create approximately 2.86 acres of new non-vegetated surface and 4.93 acres of new developed area as defined by the Maine Department of Environmental Protection (MDEP).

A majority of the site, roughly 90%, is tributary to Casco Bay via unnamed drainage ways. The remaining 10% of the site, located in the southwest portion of the site adjacent to Wildwood Circle appears to be tributary to Fallbrook. As the proposed development is classified by the City of Portland as a Level III development, the site is required to comply with MaineDEP chapter 500 Standards, per Chapter 5 of City of Portland Technical Manual.

The project has been designed to provide treatment for 90.1% of the new non-vegetated area and 85.4% of the new developed area, which exceeds the required treatment level of Table 1 contained in MaineDEP Chapter 500, Section 4.C.(2)(a)(iii) amended date August 12, 2015. Treatment is achieved utilizing an underdrained subsurface sand filter located within the development parking field and a grassed underdrained soil filter. Best Management Practices (BMPs) have been designed and sized in accordance with criteria published in Chapter 500 BMP's Technical Design Manual.

As the project results in an overall reduction in tributary area draining to Fallbrook and has no development within the Fallbrook watershed, the Urban Impaired Stream Standard does not need to be addressed.

14432

STORMWATER MANAGEMENT PLAN

Portland Retirement Residence
802-828 Ocean Avenue
Portland, Maine

I. Introduction

This Stormwater Management Plan has been prepared to address the potential impacts associated with this project due to the proposed modification in stormwater runoff characteristics. The stormwater management controls that are outlined in this plan have been designed to best suit the proposed development and to comply with applicable regulatory requirements.

II. Existing Conditions

The project site is currently undeveloped land with woods land cover comprising of 18.32 acres in Portland.

Land Cover: The site is undeveloped land consisting of wooded land cover. The development site abuts Ocean Ridge to the north, Ocean Avenue and single family residential structures to the east, undeveloped land to the south, and Pheasant Hill Drive development to the west.

Site Topography: The majority of the site (75%) drains in a southeasterly direction towards the existing pipe outlets in Ocean Avenue, with the drainage break located just east of the existing Central Maine Power easement at the rear of the site. The remainder of site drains in a westerly direction away from the proposed development.

Slopes on site range from 5 to 10% in the central portion of the site, within and adjacent to wetland areas, to steeper 15 to 25% slopes along Ocean Avenue and the rear of the site.

Surface Water Features: The majority of the site drains to an existing closed drainage system within Ocean Avenue and a cross culvert across Ocean Avenue. These culverts outlet to an existing drainage way along the northerly side of Eben Hill Road (Ocean's East), continuing to travel in a northeasterly direction, crossing Briarwood, Ocean Woods, Presumpscot Street, on its way to Casco Bay.

Soils: Soil characteristics were obtained from the Soil Conservation Service (SCS) Medium Intensity Soil Survey of Cumberland County. Soils identified on the site (or within close proximity) are identified below in Table 1. These soil boundaries are identified on the attached watershed maps.

Table 1 – Proximity Soil Types and Characteristics			
Soil Type	Symbol	HSG	K Factor
Hollis fine sandy loam	HrB/HrC	D	0.32
Hollis very rock fine sandy loam	HsB/HsE	C	0.32
Scantic Silt Loam	Sn	D	0.49

The K factor is an erodibility index that relates each soil family based on a slight erosion potential of 0.10 to a high erosion potential of 0.64. An index number, greater than 0.32, indicates that a high level of erosion control measures must be taken in order to control erosion of this soil. The Hydrologic Soil Group (HSG) designation is based on a rating of the relative permeability of a soil, with Group "A" being extremely permeable such as coarse sand, to Group "D" having low permeability such as clay.

Historic Flooding: The Federal Emergency Management Agency (FEMA) lists the project site as Zone X, "Areas of 500 year flood based on the published Flood Insurance Rate Map (FEMA Community Panel Number 230051 0007C, dated December 8, 1998).

III. Proposed Development

The Applicant is proposing to a 150 unit retirement residence, consisting of 135 single units and 15 duplex units.

Alterations to Land Cover: Completion of the proposed project will result in the creation of 2.86 acres of non-vegetated area and 4.93 acres of developed area.

IV. Downstream Ponds and Waterbodies

The majority project site is tributary to Casco Bay, which is not listed by the Maine Department of Environmental Protection as impaired or threatened. A small portion of the site, located within the southwest portion of the site, is tributary to Fall Brook which is listed by Maine DEP as an Urban Impaired Stream within Chapter 502.

V. Regulatory Requirements

A. City of Portland, Maine

The proposed development is classified as a Level III development and must comply with Section 5 of the City of Portland's Technical Manual stating that this development "shall be required to submit a Stormwater Management Plan pursuant to the regulations of the MDEP Chapter 500 Stormwater Management Rules, including Basic, General and Flooding Standards. The MDEP Chapter 500 rules describe stormwater management requirements for new development projects.

The following sections describe how this project will address these stormwater management performance standards.

<u>Basic Standards</u>: These standards include various erosion and sedimentation controls, inspection and maintenance procedures, and general housekeeping requirements. These performance standards are addressed in the Erosion and Sedimentation Control Plan on Plan Sheet 6 of 13 and in the Inspection, Maintenance, and Housekeeping Plan attached in Attachment 3. Please refer to these documents for more detailed information.

<u>General Standards</u>: This standard presents minimum treatment thresholds for new non-vegetated areas and new developed areas to be treated by stormwater Best Management Practices (BMPs). General Standard BMPs have been defined by the MDEP and are described thoroughly in their publication "Stormwater Management for Maine: Best Management Practices Manual". Volume III of this manual contains additional information and sizing requirements for the treatment measures proposed for the proposed development.

<u>Urban Impaired Stream Standard</u>: This standard requires a payment of a compensation fee or mitigation of a project's impact by treating, reducing, or eliminating an off-site or on-site pre-development imperious stormwater source.

<u>Flooding Standards:</u> The MDEP requires that projects creating impervious areas greater than three (3) acres, or developed areas greater than twenty (20) acres address various flooding standards. The proposed project will not exceed the MDEP thresholds, but is required to meet the flooding standards for the City of Portland. The development will be designed to "detain, retain or result in the infiltration of stormwater from 24-hour storms of the 2-year, 10-year, and 25-year frequencies such that the peak flows of stormwater from the project site do not exceed the peak flows of stormwater prior to undertaking the project." A detailed stormwater model has been provided to demonstrate compliance with these standards.

VI. Stormwater Management BMPs

In order to meet the applicable regulations, the project will utilize an underdrained subsurface sand filter located within the development parking field and a grassed underdrained soil filter located adjacent to the access roadway. The BMP locations are indicated on the attached plans.

A. Underdrained Subsurface Sand Filter

An underdrained subsurface sand filter must detail a runoff volume equal to 1” times the tributary impervious area and 0.4” times the tributary landscaped areas. The surface area of the system must be at least equal to 5% the impervious area and 2% of the landscaped area. Pre-treatment of the runoff must be provided by Storm-Tech Isolator Row sized based on the runoff from ta 1-year, 24 hour storm event. The runoff volume shall be discharged over a period of time not less than 24 hours and not greater than 48 hours.

The areas treated by this BMP are summarized in the stormwater treatment calculations attached in Attachment 1: *Stormwater Quality Calculations*.

B. Grassed Underdrained Soil Filter

A grassed underdrained soil filter must detail a runoff volume equal to 1” times the tributary impervious area and 0.4” times the tributary landscaped areas. The surface area of the system must be at least equal to 5% the impervious area and 2% of the landscaped area. Pre-treatment of the runoff must be provided by a sediment forebay, adequately sized to retain the anticipated winter sanding load. The runoff volume shall be discharged over a period of time not less than 24 hours and not greater than 48 hours.

The areas treated by this BMP are summarized in the stormwater treatment calculations attached in Attachment 1: *Stormwater Quality Calculations*.

VII. Peak Flow Analysis

This section has been prepared to discuss the proposed modifications to peak flow rates as a result of the development.

A. Modeling Technique

In order to evaluate drainage characteristics in pre and post-development conditions, a quantitative analysis was performed to determine peak rates of runoff for the 2, 10, and 25-year storm events. Runoff calculations were performed following the methodology outlined in the USDA Soil Conservation Service's "Urban Hydrology for Small Watersheds, Technical Release #55" and HydroCAD Stormwater Modeling System Software. A 24-hour, SCS Type III storm distribution for the 2, 10, and 25-year storm frequencies were used for analysis.

The 24-hour rainfall values utilized in the hydrologic model for Southeast Cumberland County are as follows:

Table 2 - Storm Frequency Precipitation (in./24 hr)	
2-year	3.1
10-year	4.6
25-year	5.8

*Appendix H, MDEP Chapter 500, amended date Aug 12, 2015

B. <u>Drainage Characteristics (Pre and Post-Development Watershed Delineation)</u>

Two watershed study points (SP1 and SP2) were established to evaluate the pre-development and post-development peak runoff conditions for compliance with the Flooding Standard.

SP1 is located at the confluence of two outlet pipes which discharge on the east side of Ocean Avenue and just north of Eden Hill Road. Runoff from this study point continues through un-named drainage ways, before crossing Presumpscot Street and I-295, before entering Casco Bay.

SP2 is a representative study point located in the southwest quadrant of the development site, adjacent to the existing utility corridor. This study point is where runoff leaves the site and drains to an adjacent lot, before entering Fallbrook.

C. <u>Pre-Development</u>

SP1: SP1 has a total of twelve (12) drainage areas tributary to it, which includes four (4) drainage areas located on the development site and the remaining being offsite drainage areas, such as the east side of Ocean Avenue, Ocean Ridge development, and residential house lots along Ocean Avenue.

SP2: SP2 has a single drainage area (Subarea 4) tributary to it; this study point is located at the property line where drainage crosses the property line in the southwest portion of the site, adjacent to Wildwood Circle.

Subareas 1, 101, 301, 302, and 303 represent the portions of Ocean Ridge condominium development that is tributary to SP1. These areas remain unchanged from pre-development to post-development condition.

Subareas 100 and 300 represent the east side of Ocean Avenue which enter the closed drainage system within Ocean Avenue prior to discharging to SP1. These areas remain unchanged from pre-development to post-development.

Subarea 3 and Subarea 6 are several house lots along the west side of Ocean Avenue, with the development site located at the rear of these house lots. Subarea 3 enters the closed drainage system within Ocean Avenue. Subarea 6 enters two driveway culverts before reaching the 24" Ocean Avenue cross culvert. Both areas discharge to SP1 and remain unchanged from pre-development to post-development.

Subarea 1 is approximately 3.2 acres in area located at the northeast corner of the development site along Ocean Avenue. This area also includes a portion of Ocean Avenue, a portion of two house lots along Ocean Avenue, and a small portion of the abutting Ocean Ridge development site where runoff from developed portions of the site flows through a stormwater buffer easement prior to entering the subject site. Runoff continues along Ocean Avenue gutter/shoulder before entering the closed drainage system at a catch basin located on the west side of Ocean Avenue, roughly opposite Ashley Lane (Ocean Woods development).

Subarea 2 represents a majority of the site to be developed; it's roughly 11.5 acres in size which includes portions of Ocean Ridge, Ocean Avenue, and two resident house lots. Roughly 10.6 acres of the total area is the development site, which is 60% of the total site area. Runoff from Subarea 2 drains to an existing 15-inch driveway culvert prior to reaching and ultimately flowing across Ocean Avenue at the 24-inch cross culvert.

Subarea 4 is roughly 1.2 acres in area located at the southwest portion of the lot where runoff exits the site at the utility corridor adjunct to Wildwood Circle and is ultimately tributary to Fallbrook.

Subarea 5 represents the southeast portion of the site, a single house lot and a portion of Ocean Avenue. Subarea 5 is roughly 1.8 acres in size and drains to the existing Ocean Avenue cross culvert.

D. Post-Development

Pre-development subarea 1 has been divided into four subareas (11, 12, 15A and 15) in the post-development condition. Subareas 11 and 12 have limited development within the drainage boundaries and respectively represent the south side and north sides of the proposed access. Subarea 15A represents a portion of the access road which will not receive any treatment and will discharge to the wooded area south of the access road. Subarea 15 represents the lower portion of the access which is tributary to the closed drainage system along the site frontage. The total area of these catchments is 4.84 acres, which is greater than the pre-development area of Subarea 1 in the predevelopment, 3.16 acres. The increase in area is a result of the site grading and drainage ditch along the access road.

Pre-development subarea 2 has been divided into 4 subareas in the post-development condition, subarea 20, 21, 22, and 23. Subarea 20 represents the upper and lower portion of the site which will remain undeveloped. A 3-sided box culvert is proposed along the access road so as not to alter the drainage characteristics of existing drainage way which traverses the site. Subarea 21 is the majority of the development footprint and impervious surface which will be collected in the storm drain collection system and outlet to the proposed subsurface sand filter. Subarea 22 represents the upper parking lot and associated access way which will be collected and treated by the grassed underdrain soil filter. Subarea 23 represents the grassed underdrain soil filter.

Subarea 4 in pre-development has been reduced in area by approximately 0.10 acres and is now represented by subarea 40 in the post-development model.

Subarea 50 (subarea 5 in pre-development) has been reduced in area by 0.6 acres but has a minor increase in overall curve number (80 pre vs 82 post).

E. Comparison

The watershed areas and times of concentration of the post-development watersheds vary from the existing conditions based on the proposed site development and grading. Table 3 summarizes the results of the hydrologic analysis of the project under pre-development and post-development conditions.

Table 3 – Stormwater Runoff Summary Table
Pre-Development vs. Post-Development

Study Point	Total Watershed Area (Ac)		Percent Impervious		Peak Rates of Runoff (cfs)					
					2-year		10-year		25-year	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
SP1	23.01	23.10	16.15%	28.68%	17.1	15.9	31.5	31.1	44.2	44.6
SP2	1.21	1.12	0%	0%	1.4	1.3	2.9	2.7	4.1	3.9

As depicted in the above table, post-development peak runoff rates at the two study points will be below pre-development levels for the 2-year and 10 year storm event. The peak runoff rate for the 25-year storm event, at Study Point 1, is anticipated to be 0.40 cfs greater than the pre-development rate, which is a 1% increase. The downstream receiving channel, based on visual filed observations, is adequately sized to accommodate the pre-development peak-runoff rate as well as the anticipated 0.4 cfs increase without overtopping existing channel embankments.

VIII. Water Quality Analysis

To achieve the required water quality treatment, an Underdrained Subsurface Sand Filter is proposed to treat the majority of the development with a grassed underdrained soil filter providing treatment of for the upper parking lot and associated access way. Each treatment measure has been designed and sized in accordance with the current Maine DEP Stormwater Best Management Practices handbook.

The development has been designed to provide water quality treatment through implementation of approved BMP's which provide for an impervious area treatment percentage of 90.1% and a developed area treatment percentage of 85.4%, which exceeds the required treatment levels of 90% and 75%, respectively, in accordance with MaineDEP Chapter 500, Section 4.C.(2)(a)(iii) amended date August 12, 2015.

Water Quality Volumes, BMP sizing volume calculations, and other supporting calculations are attached to this report.

IX. Urban Impaired Stream Standard

As mentioned in Section VII.C of this report, Subarea 4 is tributary to Fallbrook which is listed in Chapter 502 as an Urban Impaired Stream, which requires payment of a compensation fee or mitigation of a project's impact by treating, reducing, or eliminating an off-site or on-site pre-development imperious stormwater source. As a result of the proposed development and project grading, the total drainage area tributary to Fallbrook is reduced by 8% from 1.21 acres to 1.12 acres. No developed area is anticipated within Subarea 4, so no mitigation or compensation fee is proposed.

X. Conclusions

The proposed development has been designed to meet the requirements of the City of Portland's Stormwater Technical Standards. The stormwater management system will treat 90.1% of the created impervious surface and 85.4% of the total developed area. The peak flow rates have been controlled to the greatest extent practical to be at pre-development levels. An anticipated increase of 0.4 cfs at Study Point 1 during the 25-year storm event is expected, but will not cause an unreasonable adverse effect on downstream development. Additionally, erosion and sedimentation controls have been outlined to prevent unreasonable impacts on the site and to the surrounding environment.

Prepared by,

SEBAGO TECHNICS, INC.

Paul D. Ostrowski, P.E.	Robert A. McSorley, P.E.
Project Engineer	Senior Project Manager
PDO/RAM:pdo/jf	Date: 9/17/15
September 9, 2015	

Attachment A

Stormwater Quality Calculations

MDEP GENERAL STANDARD CALCULATIONS
PORTLAND RETIREMENT RESIDENCE
JOB #14432

SUBAREA #	SUBAREA TOTAL AREA	NEW ONSITE IMPERVIOUS AREA	NEW ONSITE LANDSCAPED AREA	NEW DEVELOPED AREA	UNDEVELOPED AREA	TREATMENT METHOD			IMPERVIOUS (AC.)	LANDSCAPED (AC.)
	(AC.)	(AC.)	(AC.)	(AC.)	(AC.)	ID (PRIMARY)	% IMP	% LAND	WP1	WP1
11	1.880	0.053	0.011	0.065	1.815	None				
12	2.607	0.000	0.175	0.175	2.431	None				
15A	0.086	0.059	0.027	0.086	0.000	None				
15	0.273	0.170	0.103	0.273	0.000	None				
20	6.364	0.000	0.118	0.118	6.245	None				
21	3.316	2.113	1.203	3.316	0.000	Sub. Sand Filter (210)	100%	100%	2.113	1.203
22	0.696	0.460	0.237	0.696	0.000	UDF-1 (220)	100%	100%	0.460	0.237
23	0.200	0.000	0.200	0.200	0.000	UDF-1 (220)	100%	100%	0.000	0.200
TOTAL LOTS (AC.)	**15.421**	**2.856**	**2.074**	**4.930**	**10.492**				**2.573**	**1.639**

*TREATED VALUES ONLY INCLUDE AREAS ASSOCIATED WITH THE DEVELOPMENT. OFFSITE AREA NOT INCLUDED IN SITE TREATMENT CALCULATION

TOTAL NEW IMPERVIOUS AREA (SF)	**124,410**	**TOTAL NEW DEVELOPED AREA (SF)**	**214,740**
TOTAL IMPERVIOUS AREA RECEIVING TREATMENT (SF)	**112,084**	**TOTAL DEV. AREA RECEIVING TREATMENT (SF)**	**183,495**
TOTAL IMPERVIOUS AREA NOT RECEIVING TREATMENT (SF)	**12,326**	**TOTAL DEV. AREA NOT RECEIVING TREATMENT (SF)**	**31,245**
% OF IMPERVIOUS AREA RECEIVING TREATMENT	**90.1%**	**% OF DEV. AREA RECEIVING TREATMENT**	**85.4%**

SEBAGO TECHNICS, INC.
75 John Roberts Road Suite 1A
South Portland, Maine 04106
Tel. (207) 200-2100

JOB	14432 - Portland Retirement Community		
SHEET NO.	1	OF	1
CALCULATED BY	PDO	DATE	10/23/2014
FILE NAME		PRNT DATE	9/17/2015

Task: Determine the "Percentage of Developed Area to Land Available for Development" in accordance with MaineDEP Chapter 500 rules, Section 4.C.(2)(a)(iii) Table 1, amended date August 12, 2015

Table 1 presents Stormwater Treatment Based on Percentage of Parcel Developed

Percentage of developed area to land avail for development*	Percentage of total impervious area requiring treatment**	Percentage of total developed area requiring treatment**
>70	95	80
65	92.5	77.5
<60	90	75

*Including all contiguous land area owned by applicant, but not including land with greater than 25% sustained slope or consisting of a protected natural resource.
**Percentage may be pro-rated for values between 60% and 70% in left-hand column.

A	Total Land Area within R5A Zone:	442,875.00	square-feet
B	Wetland Areas within R5A Zone:	6,481.00	square-feet
C	25% Sustained Slopes:	32,650.00	square-feet
	Land Avail for Development (A-B-C)	403,744.00	square-feet
	Total Developed Area	214,740.00	square-feet

Percentage of Developed Land $\frac{214740.000}{403,744.00}$ = **53.19%**

Perecentage of Developed Land to Land Available for Development is less than 60%, therefore requiring 90% treatment of proposed impervious and 75% treatment of developed area

SEBAGO TECHNICS, INC.	JOB	14432 - Portland Retirement Community	
75 John Roberts Road Suite 1A	SHEET NO.	1	OF 1
South Portland, Maine 04106	CALCULATED BY	PDO	DATE 7/9/2015
Tel. (207) 200-2100	FILE NAME	14432.Subsurface Sand Filter BMP.xls	PRNT DATE 9/9/2015

UNDERDRAINED SUBSURFACE SAND FILTER

Task: Calculate water quality volume per MDEP chapter 500 regulations

References
1. Maine DEP Chapter 500, Section 4.B.(2)(b)
   a. "must detain a runoff volume equal to 1.0 inch times the subcatchment's impervious area plus 0.4 inch times the subcatchment's landscaped area"
2. Maine DEP Best Management Practices Stormwater Manual, Section 7.3.2
   a. "detain runoff volume equal to 1.0 inch times the subcatchment's impervious area plus 0.4 inch times the subcatchment's landscaped area"
   b. "surface area of the sand filter bed and chamber system must be at least equal to 5% of the impervious area draining to it and 2% of the landscaped area."
   c. "treatment flow rate for the Stormtech Isolcator Row is the projected one year peak flow rate for the drainage area feeding the Isolator Row"

Flow rates:

SC-310	0.10	cfs/chamber
SC-740	0.20	cfs/chamber
DC-780	0.20	cfs/chamber
MC-3500	0.30	cfs/chamber

<u>Tributary to Underdrained Filter</u> #1

Landscaped Area	52,391.00	SF
Impervious Area	92,058.00	SF

Minimum Surface Area for sand filter and chamber system

Required (2% X Landscaped + 5%" X Impervious)

Total Landscaped Area	52,387.00	SF	Area	1,047.7	SF
Total Impervious Area	92,058.00	SF	Area	4,602.9	SF
Required Minimum Surface Area				5,650.6	SF
Provided Surface Area				6,000.0	SF

Channel Protection Volume (CPV)

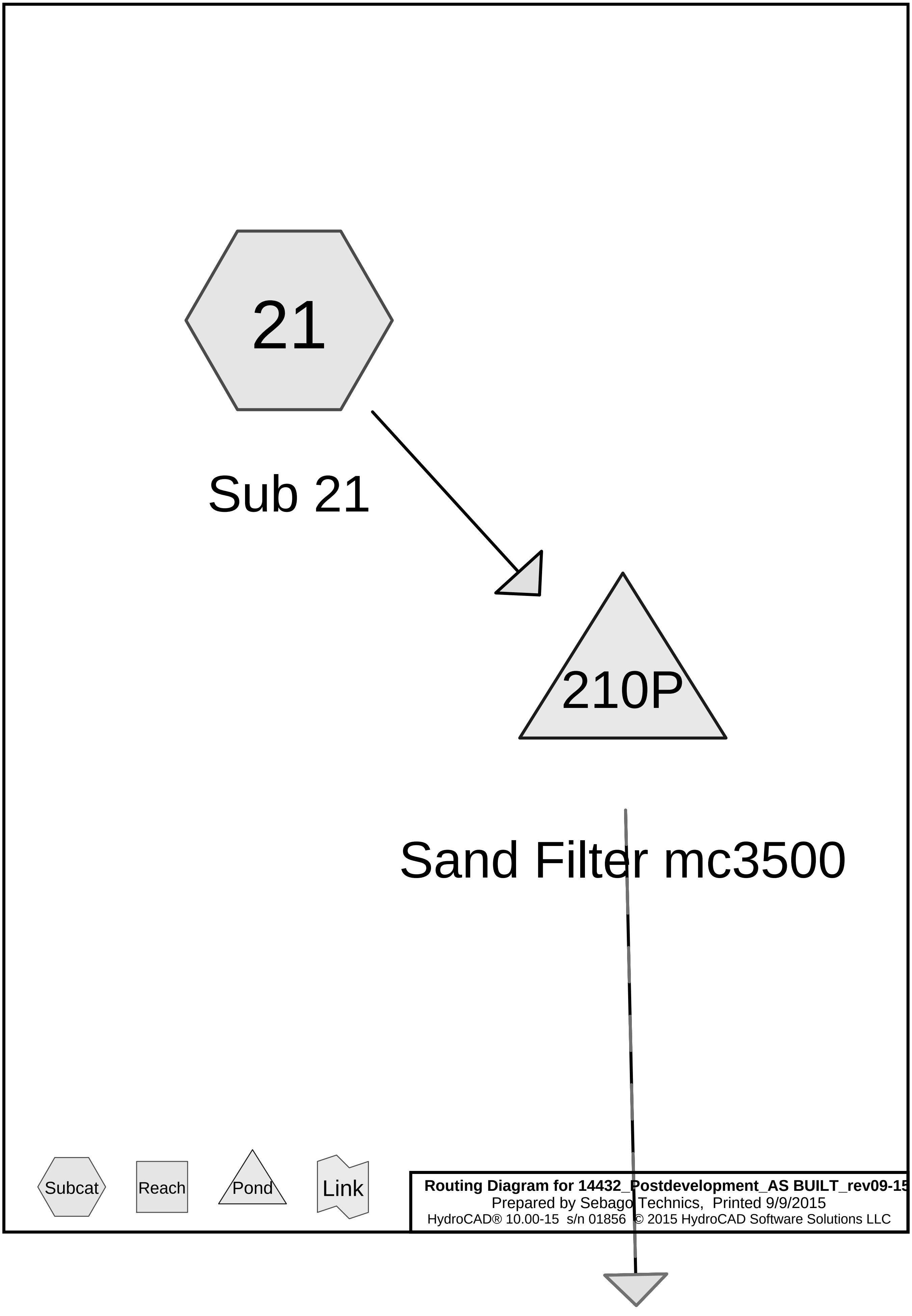
Required (0.4" X Landscaped + 1.0" X Impervious)

Landscaped Area	52,387.00	SF	Volume	1,746.2			
Impervious Area	92,058.00	SF	Volume	7,671.5			
		CPV Required		9,417.7	CF	0.216	AF
		Provided CPV		9685	CF	(Elevation 126.80)	

Sediment Pre-Treatment

Per Reference 2.c above

One year flow rate out put from Hydrocad:		6.80	cfs
Iso Row sizing for:	**MC-3500**	**0.3**	cfs
Total number of Isolator Row Chambers required:		23	Proposing two row, each 15 chambers long, for total of 30 chambers.



Routing Diagram for 14432_Postdevelopment_AS BUILT_rev09-15
Prepared by Sebago Technics, Printed 9/9/2015
HydroCAD® 10.00-15 s/n 01856 © 2015 HydroCAD Software Solutions LLC

Summary for Subcatchment 21: Sub 21

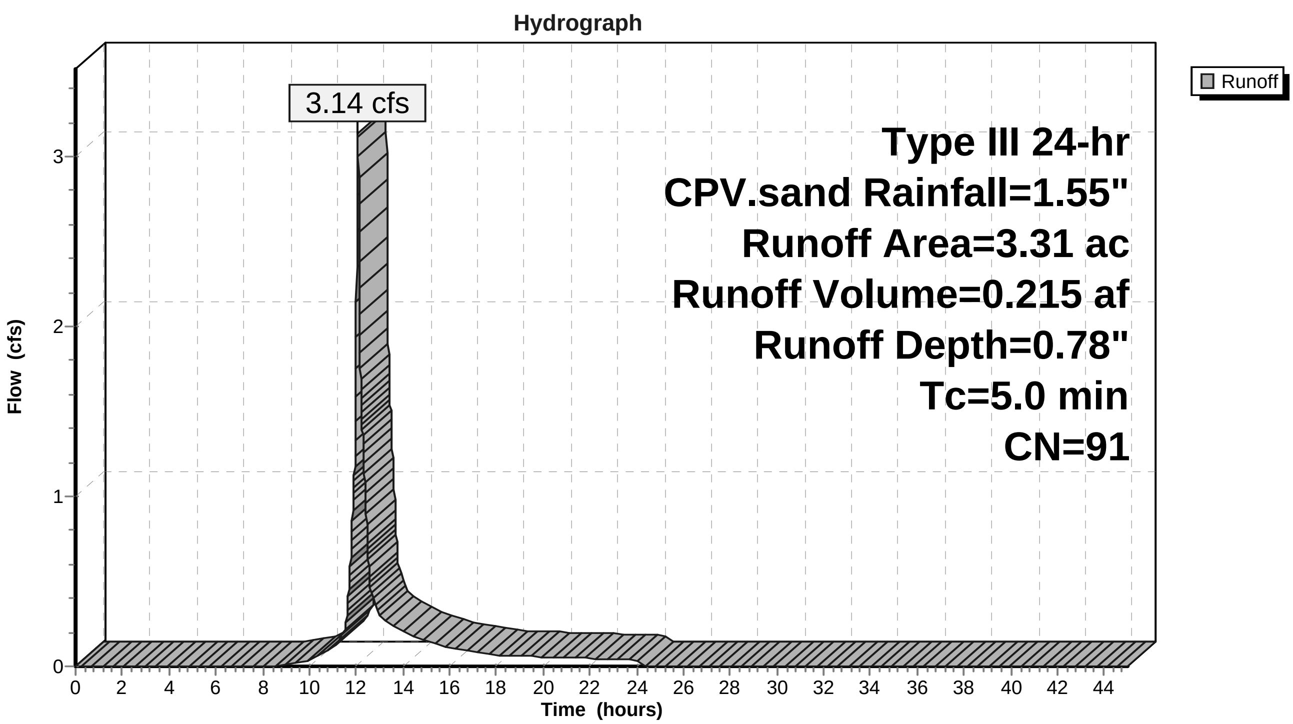
Runoff = 3.14 cfs @ 12.08 hrs, Volume= 0.215 af, Depth= 0.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr CPV.sand Rainfall=1.55"

	Area (ac)	CN	Description
	1.20	80	>75% Grass cover, Good, HSG D
*	2.11	98	Site Development
	3.31	91	Weighted Average
	1.20		36.25% Pervious Area
	2.11		63.75% Impervious Area

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

Subcatchment 21: Sub 21



Summary for Pond 210P: Sand Filter mc3500

Inflow Area = 3.31 ac, 63.75% Impervious, Inflow Depth = 0.78" for CPV.sand event
Inflow = 3.14 cfs @ 12.08 hrs, Volume= 0.215 af
Outflow = 0.12 cfs @ 15.84 hrs, Volume= 0.215 af, Atten= 96%, Lag= 225.8 min
Primary = 0.12 cfs @ 15.84 hrs, Volume= 0.215 af

Routing by Stor-Ind method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Peak Elev= 126.04' @ 15.84 hrs Surf.Area= 6,773 sf Storage= 5,412 cf

Plug-Flow detention time= 486.2 min calculated for 0.215 af (100% of inflow)
Center-of-Mass det. time= 486.3 min (1,318.1 - 831.9)

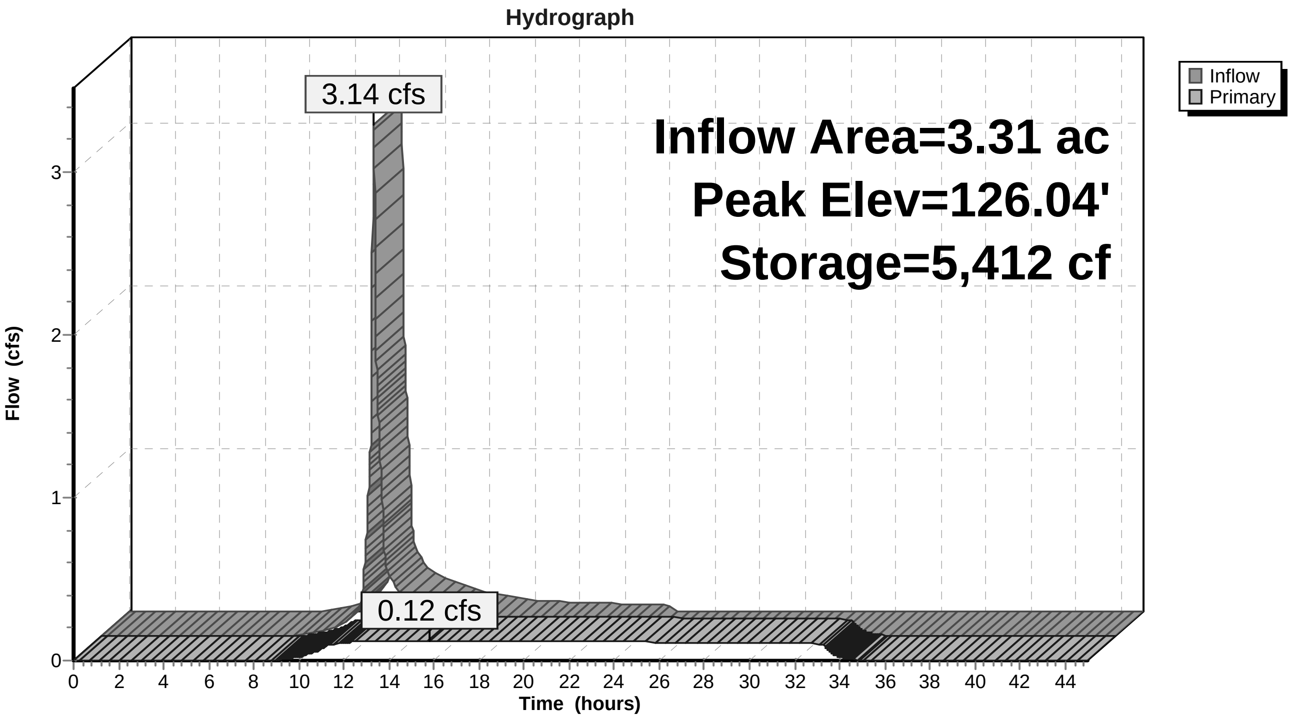
Volume	Invert	Avail.Storage	Storage Description
#1A	124.70'	9,447 cf	**80.08'W x 84.57'L x 5.50'H Field A**
			37,250 cf Overall - 13,632 cf Embedded = 23,618 cf x 40.0% Voids
#2A	125.45'	13,632 cf	**ADS_StormTech MC-3500 d +Cap** x 121 Inside #1
			Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
			Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
			11 Rows of 11 Chambers
			Cap Storage= +14.9 cf x 2 x 11 rows = 327.8 cf
		23,079 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	121.00'	**15.0" Round Culvert** L= 50.0' CPP, square edge headwall, Ke= 0.500
			Inlet / Outlet Invert= 121.00' / 117.00' S= 0.0800 '/' Cc= 0.900
			n= 0.012, Flow Area= 1.23 sf
#2	Device 1	121.00'	**1.0" Vert. Orifice/Grate X 2.00** C= 0.600
#3	Device 1	126.80'	**7.0" Vert. Orifice/Grate X 2.00** C= 0.600
#4	Device 1	129.87'	**6.0' long x 1.50' rise Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)

Primary OutFlow Max=0.12 cfs @ 15.84 hrs HW=126.04' (Free Discharge)
└**1=Culvert** (Passes 0.12 cfs of 12.41 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.12 cfs @ 10.76 fps)
  ├**3=Orifice/Grate** (Controls 0.00 cfs)
  └**4=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Pond 210P: Sand Filter mc3500



Stage-Area-Storage for Pond 210P: Sand Filter mc3500

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
124.70	0	125.76	3,832	126.82	9,793	127.88	15,254
124.72	54	125.78	3,948	126.84	9,902	127.90	15,350
124.74	108	125.80	4,063	126.86	10,011	127.92	15,445
124.76	163	125.82	4,178	126.88	10,119	127.94	15,540
124.78	217	125.84	4,293	126.90	10,227	127.96	15,635
124.80	271	125.86	4,408	126.92	10,335	127.98	15,729
124.82	325	125.88	4,523	126.94	10,443	128.00	15,823
124.84	379	125.90	4,638	126.96	10,550	128.02	15,916
124.86	433	125.92	4,753	126.98	10,658	128.04	16,009
124.88	488	125.94	4,867	127.00	10,765	128.06	16,102
124.90	542	125.96	4,982	127.02	10,872	128.08	16,195
124.92	596	125.98	5,096	127.04	10,979	128.10	16,287
124.94	650	126.00	5,211	127.06	11,085	128.12	16,378
124.96	704	126.02	5,325	127.08	11,192	128.14	16,469
124.98	759	126.04	5,439	127.10	11,298	128.16	16,560
125.00	813	126.06	5,553	127.12	11,404	128.18	16,651
125.02	867	126.08	5,667	127.14	11,510	128.20	16,740
125.04	921	126.10	5,781	127.16	11,615	128.22	16,830
125.06	975	126.12	5,895	127.18	11,721	128.24	16,919
125.08	1,029	126.14	6,008	127.20	11,826	128.26	17,007
125.10	1,084	126.16	6,122	127.22	11,931	128.28	17,096
125.12	1,138	126.18	6,235	127.24	12,036	128.30	17,183
125.14	1,192	126.20	6,349	127.26	12,140	128.32	17,270
125.16	1,246	126.22	6,462	127.28	12,244	128.34	17,357
125.18	1,300	126.24	6,575	127.30	12,349	128.36	17,443
125.20	1,355	126.26	6,688	127.32	12,452	128.38	17,529
125.22	1,409	126.28	6,800	127.34	12,556	128.40	17,614
125.24	1,463	126.30	6,913	127.36	12,659	128.42	17,698
125.26	1,517	126.32	7,025	127.38	12,763	128.44	17,782
125.28	1,571	126.34	7,138	127.40	12,866	128.46	17,866
125.30	1,625	126.36	7,250	127.42	12,968	128.48	17,949
125.32	1,680	126.38	7,362	127.44	13,071	128.50	18,031
125.34	1,734	126.40	7,474	127.46	13,173	128.52	18,113
125.36	1,788	126.42	7,586	127.48	13,275	128.54	18,194
125.38	1,842	126.44	7,698	127.50	13,376	128.56	18,274
125.40	1,896	126.46	7,809	127.52	13,478	128.58	18,354
125.42	1,951	126.48	7,921	127.54	13,579	128.60	18,433
125.44	2,005	126.50	8,032	127.56	13,680	128.62	18,511
125.46	2,090	126.52	8,143	127.58	13,780	128.64	18,588
125.48	2,207	126.54	8,254	127.60	13,881	128.66	18,665
125.50	2,324	126.56	8,365	127.62	13,981	128.68	18,741
125.52	2,440	126.58	8,476	127.64	14,080	128.70	18,816
125.54	2,557	126.60	8,587	127.66	14,180	128.72	18,889
125.56	2,673	126.62	8,697	127.68	14,279	128.74	18,962
125.58	2,789	126.64	8,808	127.70	14,378	128.76	19,034
125.60	2,906	126.66	8,918	127.72	14,477	128.78	19,104
125.62	3,022	126.68	9,028	127.74	14,575	128.80	19,173
125.64	3,138	126.70	9,138	127.76	14,673	128.82	19,241
125.66	3,254	126.72	9,247	127.78	14,770	128.84	19,307
125.68	3,370	126.74	9,357	127.80	14,868	128.86	19,372
125.70	3,485	126.76	9,466	127.82	14,965	128.88	19,436
125.72	3,601	126.78	9,576	127.84	15,061	128.90	19,499
125.74	3,717	126.80	9,685	127.86	15,158	128.92	19,561

Stage-Area-Storage for Pond 210P: Sand Filter mc3500 (continued)

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
128.94	19,622	130.00	22,537	131.06	23,079
128.96	19,682	130.02	22,591	131.08	23,079
128.98	19,742	130.04	22,646	131.10	23,079
129.00	19,802	130.06	22,700	131.12	23,079
129.02	19,861	130.08	22,754	131.14	23,079
129.04	19,920	130.10	22,808	131.16	23,079
129.06	19,978	130.12	22,862	131.18	23,079
129.08	20,035	130.14	22,916	131.20	23,079
129.10	20,092	130.16	22,971	131.22	23,079
129.12	20,149	130.18	23,025	131.24	23,079
129.14	20,205	130.20	**23,079**	131.26	23,079
129.16	20,261	130.22	23,079	131.28	23,079
129.18	20,316	130.24	23,079	131.30	23,079
129.20	20,370	130.26	23,079	131.32	23,079
129.22	20,424	130.28	23,079	131.34	23,079
129.24	20,478	130.30	23,079	131.36	23,079
129.26	20,533	130.32	23,079		
129.28	20,587	130.34	23,079		
129.30	20,641	130.36	23,079		
129.32	20,695	130.38	23,079		
129.34	20,749	130.40	23,079		
129.36	20,803	130.42	23,079		
129.38	20,858	130.44	23,079		
129.40	20,912	130.46	23,079		
129.42	20,966	130.48	23,079		
129.44	21,020	130.50	23,079		
129.46	21,074	130.52	23,079		
129.48	21,128	130.54	23,079		
129.50	21,183	130.56	23,079		
129.52	21,237	130.58	23,079		
129.54	21,291	130.60	23,079		
129.56	21,345	130.62	23,079		
129.58	21,399	130.64	23,079		
129.60	21,454	130.66	23,079		
129.62	21,508	130.68	23,079		
129.64	21,562	130.70	23,079		
129.66	21,616	130.72	23,079		
129.68	21,670	130.74	23,079		
129.70	21,724	130.76	23,079		
129.72	21,779	130.78	23,079		
129.74	21,833	130.80	23,079		
129.76	21,887	130.82	23,079		
129.78	21,941	130.84	23,079		
129.80	21,995	130.86	23,079		
129.82	22,050	130.88	23,079		
129.84	22,104	130.90	23,079		
129.86	22,158	130.92	23,079		
129.88	22,212	130.94	23,079		
129.90	22,266	130.96	23,079		
129.92	22,320	130.98	23,079		
129.94	22,375	131.00	23,079		
129.96	22,429	131.02	23,079		
129.98	22,483	131.04	23,079		

Summary for Subcatchment 21: Sub 21

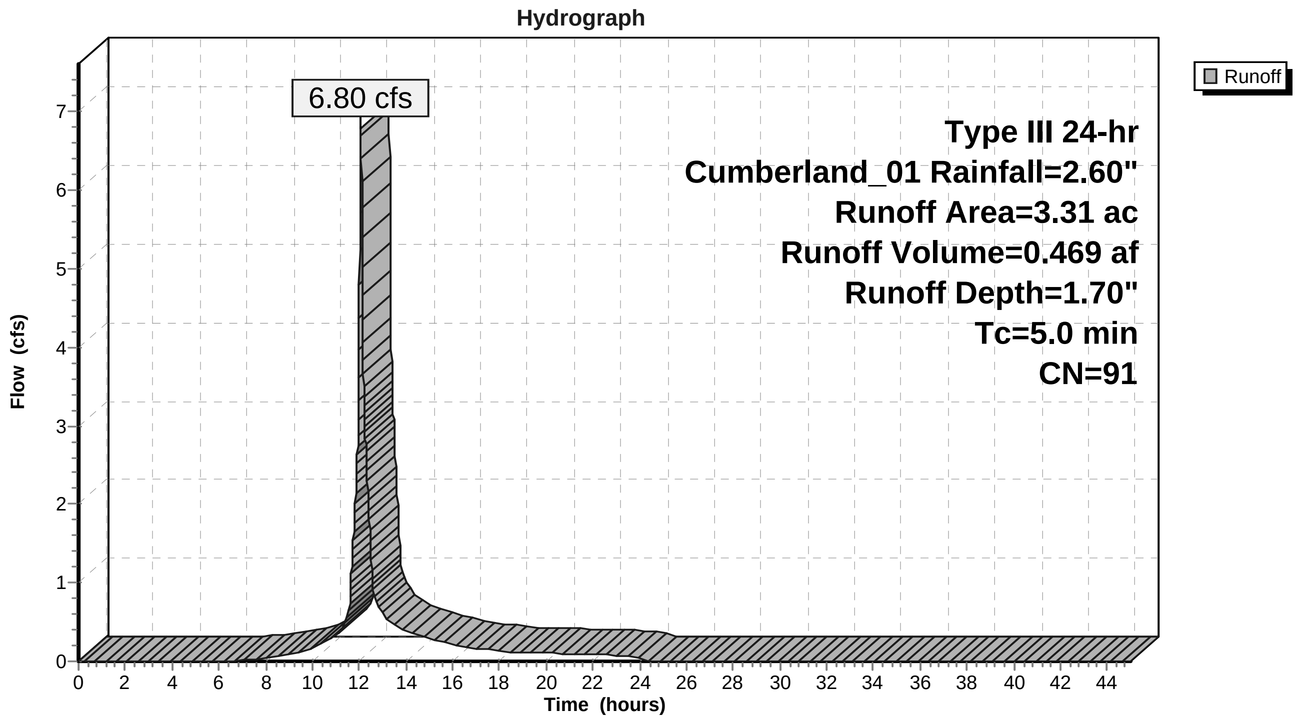
Runoff = 6.80 cfs @ 12.07 hrs, Volume= 0.469 af, Depth= 1.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_01 Rainfall=2.60"

	Area (ac)	CN	Description
	1.20	80	>75% Grass cover, Good, HSG D
*	2.11	98	Site Development
	3.31	91	Weighted Average
	1.20		36.25% Pervious Area
	2.11		63.75% Impervious Area

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

Subcatchment 21: Sub 21



Summary for Pond 210P: Sand Filter mc3500

Inflow Area = 3.31 ac, 63.75% Impervious, Inflow Depth = 1.70" for Cumberland_01 event
Inflow = 6.80 cfs @ 12.07 hrs, Volume= 0.469 af
Outflow = 0.53 cfs @ 13.21 hrs, Volume= 0.457 af, Atten= 92%, Lag= 68.2 min
Primary = 0.53 cfs @ 13.21 hrs, Volume= 0.457 af

Routing by Stor-Ind method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Peak Elev= 127.06' @ 13.21 hrs Surf.Area= 6,773 sf Storage= 11,078 cf

Plug-Flow detention time= 639.1 min calculated for 0.457 af (97% of inflow)
Center-of-Mass det. time= 623.4 min (1,432.9 - 809.5)

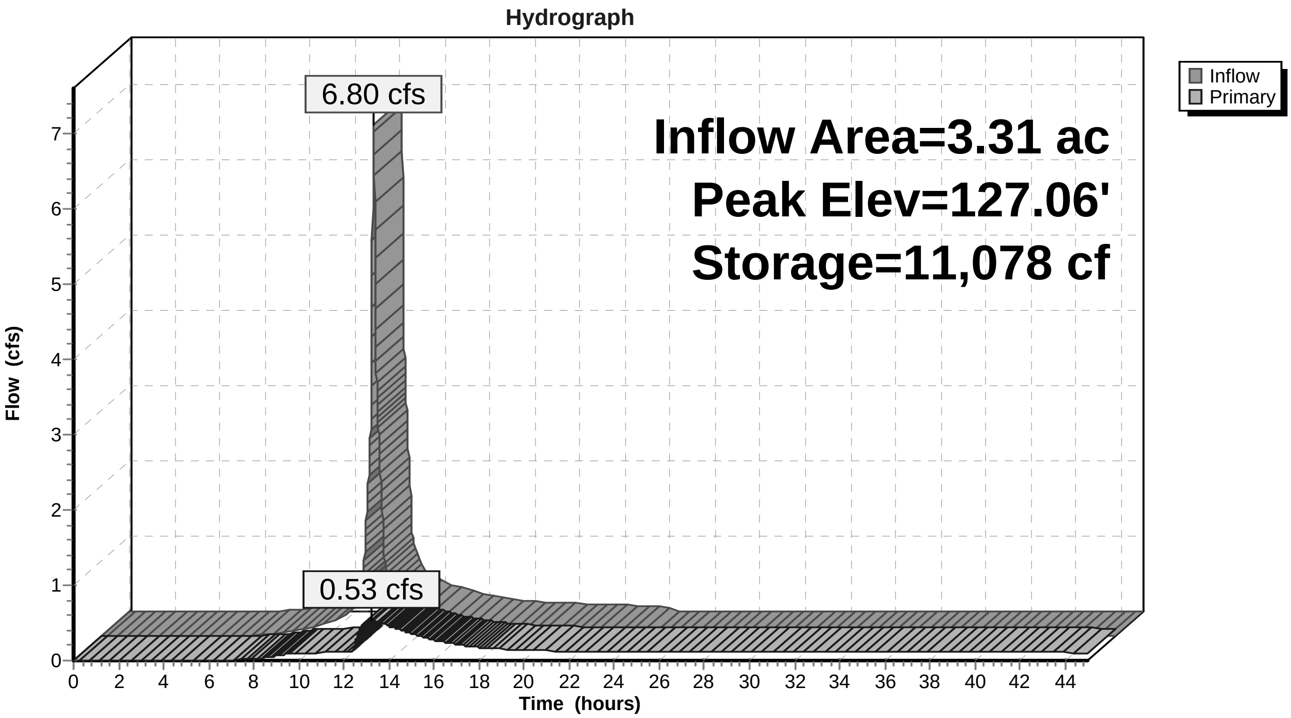
Volume	Invert	Avail.Storage	Storage Description
#1A	124.70'	9,447 cf	**80.08'W x 84.57'L x 5.50'H Field A**
			37,250 cf Overall - 13,632 cf Embedded = 23,618 cf x 40.0% Voids
#2A	125.45'	13,632 cf	**ADS_StormTech MC-3500 d +Cap** x 121 Inside #1
			Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
			Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
			11 Rows of 11 Chambers
			Cap Storage= +14.9 cf x 2 x 11 rows = 327.8 cf
		23,079 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	121.00'	**15.0" Round Culvert** L= 50.0' CPP, square edge headwall, Ke= 0.500
			Inlet / Outlet Invert= 121.00' / 117.00' S= 0.0800 '/' Cc= 0.900
			n= 0.012, Flow Area= 1.23 sf
#2	Device 1	121.00'	**1.0" Vert. Orifice/Grate X 2.00** C= 0.600
#3	Device 1	126.80'	**7.0" Vert. Orifice/Grate X 2.00** C= 0.600
#4	Device 1	129.87'	**6.0' long x 1.50' rise Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)

Primary OutFlow Max=0.52 cfs @ 13.21 hrs HW=127.06' (Free Discharge)
└**1=Culvert** (Passes 0.52 cfs of 13.77 cfs potential flow)
 ├**2=Orifice/Grate** (Orifice Controls 0.13 cfs @ 11.81 fps)
 ├**3=Orifice/Grate** (Orifice Controls 0.40 cfs @ 1.73 fps)
 └**4=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Pond 210P: Sand Filter mc3500



Stage-Area-Storage for Pond 210P: Sand Filter mc3500

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
124.70	0	125.76	3,832	126.82	9,793	127.88	15,254
124.72	54	125.78	3,948	126.84	9,902	127.90	15,350
124.74	108	125.80	4,063	126.86	10,011	127.92	15,445
124.76	163	125.82	4,178	126.88	10,119	127.94	15,540
124.78	217	125.84	4,293	126.90	10,227	127.96	15,635
124.80	271	125.86	4,408	126.92	10,335	127.98	15,729
124.82	325	125.88	4,523	126.94	10,443	128.00	15,823
124.84	379	125.90	4,638	126.96	10,550	128.02	15,916
124.86	433	125.92	4,753	126.98	10,658	128.04	16,009
124.88	488	125.94	4,867	127.00	10,765	128.06	16,102
124.90	542	125.96	4,982	127.02	10,872	128.08	16,195
124.92	596	125.98	5,096	127.04	10,979	128.10	16,287
124.94	650	126.00	5,211	127.06	11,085	128.12	16,378
124.96	704	126.02	5,325	127.08	11,192	128.14	16,469
124.98	759	126.04	5,439	127.10	11,298	128.16	16,560
125.00	813	126.06	5,553	127.12	11,404	128.18	16,651
125.02	867	126.08	5,667	127.14	11,510	128.20	16,740
125.04	921	126.10	5,781	127.16	11,615	128.22	16,830
125.06	975	126.12	5,895	127.18	11,721	128.24	16,919
125.08	1,029	126.14	6,008	127.20	11,826	128.26	17,007
125.10	1,084	126.16	6,122	127.22	11,931	128.28	17,096
125.12	1,138	126.18	6,235	127.24	12,036	128.30	17,183
125.14	1,192	126.20	6,349	127.26	12,140	128.32	17,270
125.16	1,246	126.22	6,462	127.28	12,244	128.34	17,357
125.18	1,300	126.24	6,575	127.30	12,349	128.36	17,443
125.20	1,355	126.26	6,688	127.32	12,452	128.38	17,529
125.22	1,409	126.28	6,800	127.34	12,556	128.40	17,614
125.24	1,463	126.30	6,913	127.36	12,659	128.42	17,698
125.26	1,517	126.32	7,025	127.38	12,763	128.44	17,782
125.28	1,571	126.34	7,138	127.40	12,866	128.46	17,866
125.30	1,625	126.36	7,250	127.42	12,968	128.48	17,949
125.32	1,680	126.38	7,362	127.44	13,071	128.50	18,031
125.34	1,734	126.40	7,474	127.46	13,173	128.52	18,113
125.36	1,788	126.42	7,586	127.48	13,275	128.54	18,194
125.38	1,842	126.44	7,698	127.50	13,376	128.56	18,274
125.40	1,896	126.46	7,809	127.52	13,478	128.58	18,354
125.42	1,951	126.48	7,921	127.54	13,579	128.60	18,433
125.44	2,005	126.50	8,032	127.56	13,680	128.62	18,511
125.46	2,090	126.52	8,143	127.58	13,780	128.64	18,588
125.48	2,207	126.54	8,254	127.60	13,881	128.66	18,665
125.50	2,324	126.56	8,365	127.62	13,981	128.68	18,741
125.52	2,440	126.58	8,476	127.64	14,080	128.70	18,816
125.54	2,557	126.60	8,587	127.66	14,180	128.72	18,889
125.56	2,673	126.62	8,697	127.68	14,279	128.74	18,962
125.58	2,789	126.64	8,808	127.70	14,378	128.76	19,034
125.60	2,906	126.66	8,918	127.72	14,477	128.78	19,104
125.62	3,022	126.68	9,028	127.74	14,575	128.80	19,173
125.64	3,138	126.70	9,138	127.76	14,673	128.82	19,241
125.66	3,254	126.72	9,247	127.78	14,770	128.84	19,307
125.68	3,370	126.74	9,357	127.80	14,868	128.86	19,372
125.70	3,485	126.76	9,466	127.82	14,965	128.88	19,436
125.72	3,601	126.78	9,576	127.84	15,061	128.90	19,499
125.74	3,717	126.80	9,685	127.86	15,158	128.92	19,561

Stage-Area-Storage for Pond 210P: Sand Filter mc3500 (continued)

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
128.94	19,622	130.00	22,537	131.06	23,079
128.96	19,682	130.02	22,591	131.08	23,079
128.98	19,742	130.04	22,646	131.10	23,079
129.00	19,802	130.06	22,700	131.12	23,079
129.02	19,861	130.08	22,754	131.14	23,079
129.04	19,920	130.10	22,808	131.16	23,079
129.06	19,978	130.12	22,862	131.18	23,079
129.08	20,035	130.14	22,916	131.20	23,079
129.10	20,092	130.16	22,971	131.22	23,079
129.12	20,149	130.18	23,025	131.24	23,079
129.14	20,205	130.20	**23,079**	131.26	23,079
129.16	20,261	130.22	23,079	131.28	23,079
129.18	20,316	130.24	23,079	131.30	23,079
129.20	20,370	130.26	23,079	131.32	23,079
129.22	20,424	130.28	23,079	131.34	23,079
129.24	20,478	130.30	23,079	131.36	23,079
129.26	20,533	130.32	23,079		
129.28	20,587	130.34	23,079		
129.30	20,641	130.36	23,079		
129.32	20,695	130.38	23,079		
129.34	20,749	130.40	23,079		
129.36	20,803	130.42	23,079		
129.38	20,858	130.44	23,079		
129.40	20,912	130.46	23,079		
129.42	20,966	130.48	23,079		
129.44	21,020	130.50	23,079		
129.46	21,074	130.52	23,079		
129.48	21,128	130.54	23,079		
129.50	21,183	130.56	23,079		
129.52	21,237	130.58	23,079		
129.54	21,291	130.60	23,079		
129.56	21,345	130.62	23,079		
129.58	21,399	130.64	23,079		
129.60	21,454	130.66	23,079		
129.62	21,508	130.68	23,079		
129.64	21,562	130.70	23,079		
129.66	21,616	130.72	23,079		
129.68	21,670	130.74	23,079		
129.70	21,724	130.76	23,079		
129.72	21,779	130.78	23,079		
129.74	21,833	130.80	23,079		
129.76	21,887	130.82	23,079		
129.78	21,941	130.84	23,079		
129.80	21,995	130.86	23,079		
129.82	22,050	130.88	23,079		
129.84	22,104	130.90	23,079		
129.86	22,158	130.92	23,079		
129.88	22,212	130.94	23,079		
129.90	22,266	130.96	23,079		
129.92	22,320	130.98	23,079		
129.94	22,375	131.00	23,079		
129.96	22,429	131.02	23,079		
129.98	22,483	131.04	23,079		

SEBAGO TECHNICS, INC.
75 John Roberts Road Suite 1A
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Tel. (207) 200-2100

JOB	14432 - Portland Retirement Residence		
SHEET NO.	1	OF	1
CALCULATED BY	PDO	DATE	8/7/2015
FILE NAME		PRNT DATE	9/9/2015

UNDERDRAINED SOIL FILTER

Task: Calculate water quality volume per MDEP chapter 500 regulations

References
1. Maine DEP Chapter 500, Section 4.B.(2)(b)
   a. "must detain a runoff volume equal to 1.0 inch times the subcatchment's impervious area plus 0.4 inch times the subcatchment's landscaped area"
2. Maine DEP Best Management Practices Stormwater Manual, Section 7.1
   a. "surface should represent 5% of impervious area and 2% of landscaped area"

<u>Tributary to Underdrained Filter</u> #1

Landscaped Area	19,020.00	SF
Impervious Area	20,026.00	SF

Minimum Surface Area

Required (2% X Landscaped + 5%" X Impervious)

Total Landscaped Area	19,020.00	SF	Area	380.4	SF
Total Impervious Area	20,026.00	SF	Area	1,001.3	SF
		Required Minimum Surface Area		1,381.7	SF
		Provided Surface Area		2,326.0	SF

Channel Protection Volume (CPV)

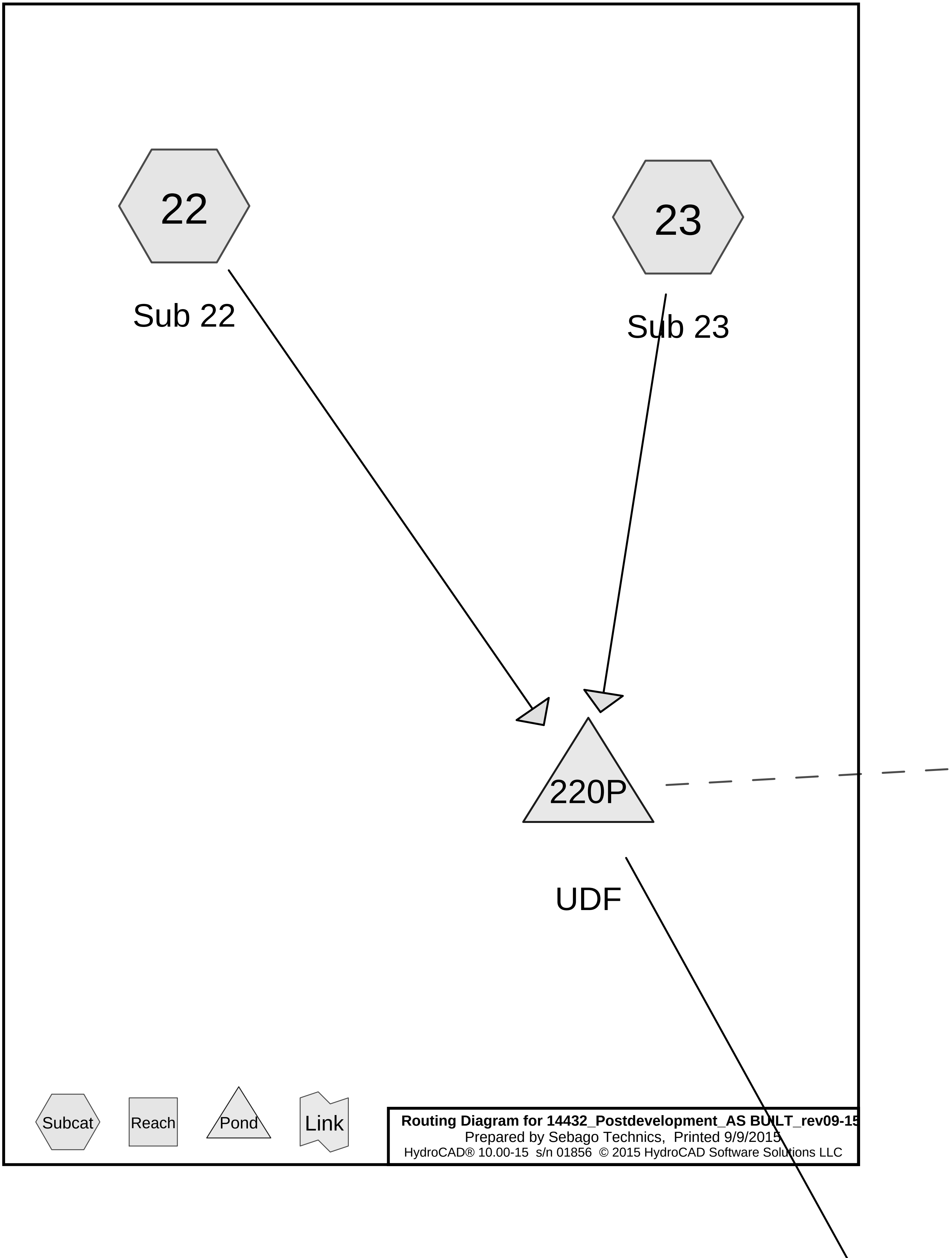
Required (0.4" X Landscaped + 1.0" X Impervious)

Landscaped Area	19,020.00	SF	Volume	634.0			
Impervious Area	20,026.00	SF	Volume	1,668.8			
		CPV Required		2,302.8	CF	0.053	AF
		Provided CPV		2,900.0	CF	(Elevation 125.00 to 126.00)	

Sediment Pre-Treatment

Per Reference 2, Chapter 7.13 "Pretreatment devices shall be provided to minimize discharge of sediment to the soil filter"

Annual Sediment Load:	50 cubic feet per acre per year of sanded area						
Area to be sanded:	20,026.00	SF					
Sediment Volume	23	CF					
Provided	52	CF	6	Inch Deep Forebay	with area of	104	sf



Routing Diagram for 14432_Postdevelopment_AS BUILT_rev09-15
Prepared by Sebago Technics, Printed 9/9/2015
HydroCAD® 10.00-15 s/n 01856 © 2015 HydroCAD Software Solutions LLC

Summary for Subcatchment 22: Sub 22

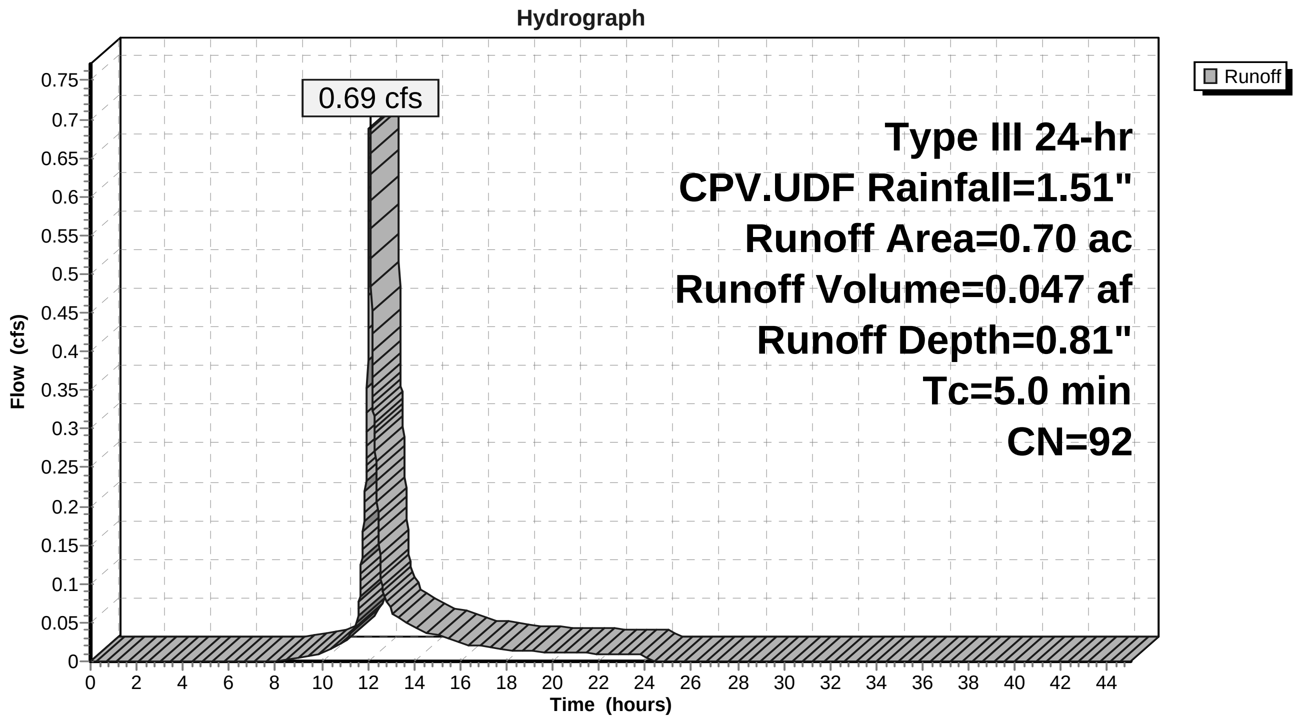
Runoff = 0.69 cfs @ 12.08 hrs, Volume= 0.047 af, Depth= 0.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr CPV.UDF Rainfall=1.51"

	Area (ac)	CN	Description
*	0.45	98	Site Development
	0.25	80	>75% Grass cover, Good, HSG D
	0.70	92	Weighted Average
	0.25		35.71% Pervious Area
	0.45		64.29% Impervious Area

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

Subcatchment 22: Sub 22



Summary for Subcatchment 23: Sub 23

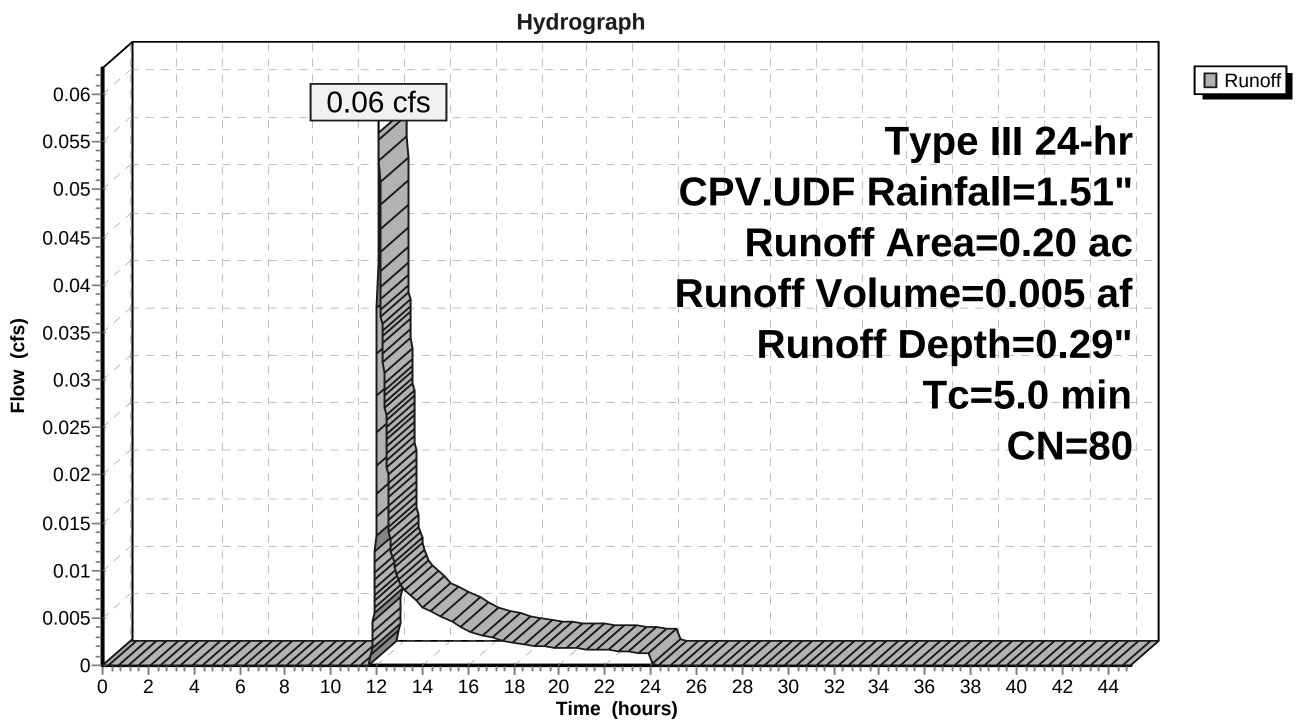
Runoff = 0.06 cfs @ 12.09 hrs, Volume= 0.005 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr CPV.UDF Rainfall=1.51"

Area (ac)	CN	Description
0.20	80	>75% Grass cover, Good, HSG D
0.20		100.00% Pervious Area

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

Subcatchment 23: Sub 23



Summary for Pond 220P: UDF

Inflow Area = 0.90 ac, 50.00% Impervious, Inflow Depth = 0.69" for CPV.UDF event
Inflow = 0.74 cfs @ 12.08 hrs, Volume= 0.052 af
Outflow = 0.03 cfs @ 15.33 hrs, Volume= 0.052 af, Atten= 95%, Lag= 194.9 min
Primary = 0.03 cfs @ 15.33 hrs, Volume= 0.052 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Peak Elev= 125.49' @ 15.33 hrs Surf.Area= 2,643 sf Storage= 1,215 cf

Plug-Flow detention time= 375.9 min calculated for 0.052 af (100% of inflow)
Center-of-Mass det. time= 376.0 min (1,209.2 - 833.2)

Volume	Invert	Avail.Storage	Storage Description
#1	125.00'	10,527 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

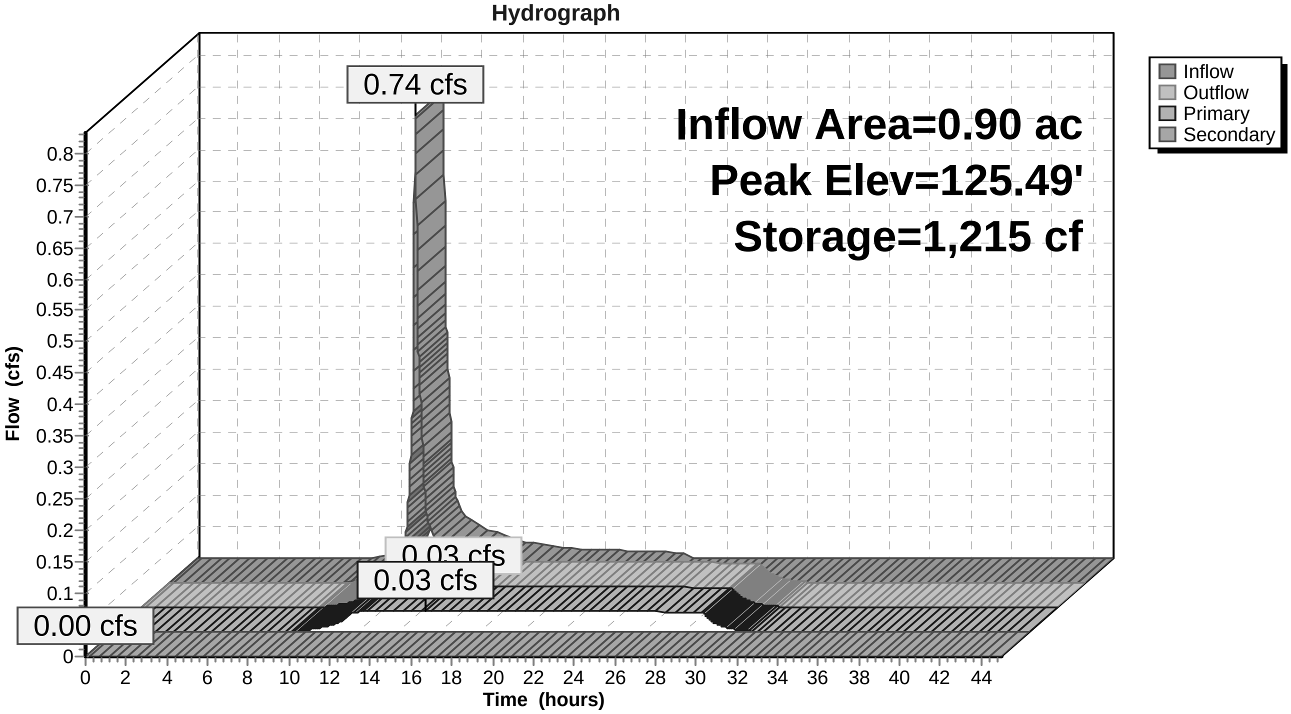
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
125.00	2,326	0	0
126.00	2,974	2,650	2,650
127.00	4,000	3,487	6,137
128.00	4,780	4,390	10,527

Device	Routing	Invert	Outlet Devices
#1	Primary	122.83'	**12.0" Round Culvert** L= 78.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 122.83' / 122.28' S= 0.0071 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	122.83'	**0.9" Vert. Orifice/Grate** C= 0.600
#3	Device 2	125.00'	**2.400 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'
#4	Device 1	126.00'	**4.0" Vert. Orifice/Grate X 4.00** C= 0.600
#5	Device 1	127.00'	**20.0" Vert. Orifice/Grate** C= 0.600
#6	Secondary	127.50'	**10.0' long x 8.0' 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) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Primary OutFlow Max=0.03 cfs @ 15.33 hrs HW=125.49' (Free Discharge)
└─**1=Culvert** (Passes 0.03 cfs of 4.95 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.03 cfs @ 7.80 fps)
  │ └─**3=Exfiltration** (Passes 0.03 cfs of 0.15 cfs potential flow)
  ├─**4=Orifice/Grate** (Controls 0.00 cfs)
  └─**5=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=125.00' (Free Discharge)
└─**6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 220P: UDF



Stage-Area-Storage for Pond 220P: UDF

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
125.00	2,326	0	125.53	2,669	1,324
125.01	2,332	23	125.54	2,676	1,351
125.02	2,339	47	125.55	2,682	1,377
125.03	2,345	70	125.56	2,689	1,404
125.04	2,352	94	125.57	2,695	1,431
125.05	2,358	117	125.58	2,702	1,458
125.06	2,365	141	125.59	2,708	1,485
125.07	2,371	164	125.60	2,715	1,512
125.08	2,378	188	125.61	2,721	1,539
125.09	2,384	212	125.62	2,728	1,567
125.10	2,391	236	125.63	2,734	1,594
125.11	2,397	260	125.64	2,741	1,621
125.12	2,404	284	125.65	2,747	1,649
125.13	2,410	308	125.66	2,754	1,676
125.14	2,417	332	125.67	2,760	1,704
125.15	2,423	356	125.68	2,767	1,731
125.16	2,430	380	125.69	2,773	1,759
125.17	2,436	405	125.70	2,780	1,787
125.18	2,443	429	125.71	2,786	1,815
125.19	2,449	454	125.72	2,793	1,843
125.20	2,456	478	125.73	2,799	1,871
125.21	2,462	503	125.74	2,806	1,899
125.22	2,469	527	125.75	2,812	1,927
125.23	2,475	552	125.76	2,818	1,955
125.24	2,482	577	125.77	2,825	1,983
125.25	2,488	602	125.78	2,831	2,011
125.26	2,494	627	125.79	2,838	2,040
125.27	2,501	652	125.80	2,844	2,068
125.28	2,507	677	125.81	2,851	2,097
125.29	2,514	702	125.82	2,857	2,125
125.30	2,520	727	125.83	2,864	2,154
125.31	2,527	752	125.84	2,870	2,182
125.32	2,533	777	125.85	2,877	2,211
125.33	2,540	803	125.86	2,883	2,240
125.34	2,546	828	125.87	2,890	2,269
125.35	2,553	854	125.88	2,896	2,298
125.36	2,559	879	125.89	2,903	2,327
125.37	2,566	905	125.90	2,909	2,356
125.38	2,572	931	125.91	2,916	2,385
125.39	2,579	956	125.92	2,922	2,414
125.40	2,585	982	125.93	2,929	2,443
125.41	2,592	1,008	125.94	2,935	2,473
125.42	2,598	1,034	125.95	2,942	2,502
125.43	2,605	1,060	125.96	2,948	2,532
125.44	2,611	1,086	125.97	2,955	2,561
125.45	2,618	1,112	125.98	2,961	2,591
125.46	2,624	1,139	125.99	2,968	2,620
125.47	2,631	1,165	126.00	2,974	2,650
125.48	2,637	1,191	126.01	2,984	2,680
125.49	2,644	1,218	126.02	2,995	2,710
125.50	2,650	1,244	126.03	3,005	2,740
125.51	2,656	1,271	126.04	3,015	2,770
125.52	2,663	1,297	126.05	3,025	2,800

Stage-Area-Storage for Pond 220P: UDF (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
126.06	3,036	2,830	126.59	3,579	4,583
126.07	3,046	2,861	126.60	3,590	4,619
126.08	3,056	2,891	126.61	3,600	4,655
126.09	3,066	2,922	126.62	3,610	4,691
126.10	3,077	2,953	126.63	3,620	4,727
126.11	3,087	2,983	126.64	3,631	4,763
126.12	3,097	3,014	126.65	3,641	4,800
126.13	3,107	3,045	126.66	3,651	4,836
126.14	3,118	3,076	126.67	3,661	4,873
126.15	3,128	3,108	126.68	3,672	4,910
126.16	3,138	3,139	126.69	3,682	4,946
126.17	3,148	3,170	126.70	3,692	4,983
126.18	3,159	3,202	126.71	3,702	5,020
126.19	3,169	3,234	126.72	3,713	5,057
126.20	3,179	3,265	126.73	3,723	5,094
126.21	3,189	3,297	126.74	3,733	5,132
126.22	3,200	3,329	126.75	3,744	5,169
126.23	3,210	3,361	126.76	3,754	5,207
126.24	3,220	3,393	126.77	3,764	5,244
126.25	3,231	3,426	126.78	3,774	5,282
126.26	3,241	3,458	126.79	3,785	5,320
126.27	3,251	3,490	126.80	3,795	5,358
126.28	3,261	3,523	126.81	3,805	5,396
126.29	3,272	3,556	126.82	3,815	5,434
126.30	3,282	3,588	126.83	3,826	5,472
126.31	3,292	3,621	126.84	3,836	5,510
126.32	3,302	3,654	126.85	3,846	5,549
126.33	3,313	3,687	126.86	3,856	5,587
126.34	3,323	3,720	126.87	3,867	5,626
126.35	3,333	3,754	126.88	3,877	5,664
126.36	3,343	3,787	126.89	3,887	5,703
126.37	3,354	3,821	126.90	3,897	5,742
126.38	3,364	3,854	126.91	3,908	5,781
126.39	3,374	3,888	126.92	3,918	5,820
126.40	3,384	3,922	126.93	3,928	5,860
126.41	3,395	3,956	126.94	3,938	5,899
126.42	3,405	3,990	126.95	3,949	5,938
126.43	3,415	4,024	126.96	3,959	5,978
126.44	3,425	4,058	126.97	3,969	6,017
126.45	3,436	4,092	126.98	3,979	6,057
126.46	3,446	4,127	126.99	3,990	6,097
126.47	3,456	4,161	127.00	4,000	6,137
126.48	3,466	4,196	127.01	4,008	6,177
126.49	3,477	4,230	127.02	4,016	6,217
126.50	3,487	4,265	127.03	4,023	6,257
126.51	3,497	4,300	127.04	4,031	6,298
126.52	3,508	4,335	127.05	4,039	6,338
126.53	3,518	4,370	127.06	4,047	6,378
126.54	3,528	4,406	127.07	4,055	6,419
126.55	3,538	4,441	127.08	4,062	6,459
126.56	3,549	4,476	127.09	4,070	6,500
126.57	3,559	4,512	127.10	4,078	6,541
126.58	3,569	4,547	127.11	4,086	6,582

Stage-Area-Storage for Pond 220P: UDF (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
127.12	4,094	6,623	127.65	4,507	8,902
127.13	4,101	6,664	127.66	4,515	8,947
127.14	4,109	6,705	127.67	4,523	8,992
127.15	4,117	6,746	127.68	4,530	9,037
127.16	4,125	6,787	127.69	4,538	9,083
127.17	4,133	6,828	127.70	4,546	9,128
127.18	4,140	6,870	127.71	4,554	9,174
127.19	4,148	6,911	127.72	4,562	9,219
127.20	4,156	6,953	127.73	4,569	9,265
127.21	4,164	6,994	127.74	4,577	9,311
127.22	4,172	7,036	127.75	4,585	9,356
127.23	4,179	7,078	127.76	4,593	9,402
127.24	4,187	7,119	127.77	4,601	9,448
127.25	4,195	7,161	127.78	4,608	9,494
127.26	4,203	7,203	127.79	4,616	9,540
127.27	4,211	7,245	127.80	4,624	9,587
127.28	4,218	7,288	127.81	4,632	9,633
127.29	4,226	7,330	127.82	4,640	9,679
127.30	4,234	7,372	127.83	4,647	9,726
127.31	4,242	7,414	127.84	4,655	9,772
127.32	4,250	7,457	127.85	4,663	9,819
127.33	4,257	7,499	127.86	4,671	9,865
127.34	4,265	7,542	127.87	4,679	9,912
127.35	4,273	7,585	127.88	4,686	9,959
127.36	4,281	7,628	127.89	4,694	10,006
127.37	4,289	7,670	127.90	4,702	10,053
127.38	4,296	7,713	127.91	4,710	10,100
127.39	4,304	7,756	127.92	4,718	10,147
127.40	4,312	7,799	127.93	4,725	10,194
127.41	4,320	7,843	127.94	4,733	10,242
127.42	4,328	7,886	127.95	4,741	10,289
127.43	4,335	7,929	127.96	4,749	10,336
127.44	4,343	7,973	127.97	4,757	10,384
127.45	4,351	8,016	127.98	4,764	10,432
127.46	4,359	8,060	127.99	4,772	10,479
127.47	4,367	8,103	128.00	**4,780**	**10,527**
127.48	4,374	8,147	128.01	4,780	10,527
127.49	4,382	8,191	128.02	4,780	10,527
127.50	4,390	8,235	128.03	4,780	10,527
127.51	4,398	8,278	128.04	4,780	10,527
127.52	4,406	8,322	128.05	4,780	10,527
127.53	4,413	8,367	128.06	4,780	10,527
127.54	4,421	8,411	128.07	4,780	10,527
127.55	4,429	8,455	128.08	4,780	10,527
127.56	4,437	8,499	128.09	4,780	10,527
127.57	4,445	8,544	128.10	4,780	10,527
127.58	4,452	8,588	128.11	4,780	10,527
127.59	4,460	8,633	128.12	4,780	10,527
127.60	4,468	8,677	128.13	4,780	10,527
127.61	4,476	8,722	128.14	4,780	10,527
127.62	4,484	8,767	128.15	4,780	10,527
127.63	4,491	8,812	128.16	4,780	10,527
127.64	4,499	8,857	128.17	4,780	10,527

Stage-Area-Storage for Pond 220P: UDF (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
128.18	4,780	10,527
128.19	4,780	10,527
128.20	4,780	10,527
128.21	4,780	10,527
128.22	4,780	10,527
128.23	4,780	10,527
128.24	4,780	10,527
128.25	4,780	10,527
128.26	4,780	10,527
128.27	4,780	10,527
128.28	4,780	10,527
128.29	4,780	10,527
128.30	4,780	10,527
128.31	4,780	10,527
128.32	4,780	10,527
128.33	4,780	10,527
128.34	4,780	10,527
128.35	4,780	10,527
128.36	4,780	10,527
128.37	4,780	10,527
128.38	4,780	10,527
128.39	4,780	10,527
128.40	4,780	10,527
128.41	4,780	10,527
128.42	4,780	10,527
128.43	4,780	10,527
128.44	4,780	10,527
128.45	4,780	10,527
128.46	4,780	10,527
128.47	4,780	10,527
128.48	4,780	10,527
128.49	4,780	10,527
128.50	4,780	10,527
128.51	4,780	10,527
128.52	4,780	10,527
128.53	4,780	10,527
128.54	4,780	10,527
128.55	4,780	10,527
128.56	4,780	10,527
128.57	4,780	10,527
128.58	4,780	10,527
128.59	4,780	10,527
128.60	4,780	10,527
128.61	4,780	10,527
128.62	4,780	10,527
128.63	4,780	10,527
128.64	4,780	10,527
128.65	4,780	10,527
128.66	4,780	10,527
128.67	4,780	10,527

Summary for Subcatchment 22: Sub 22

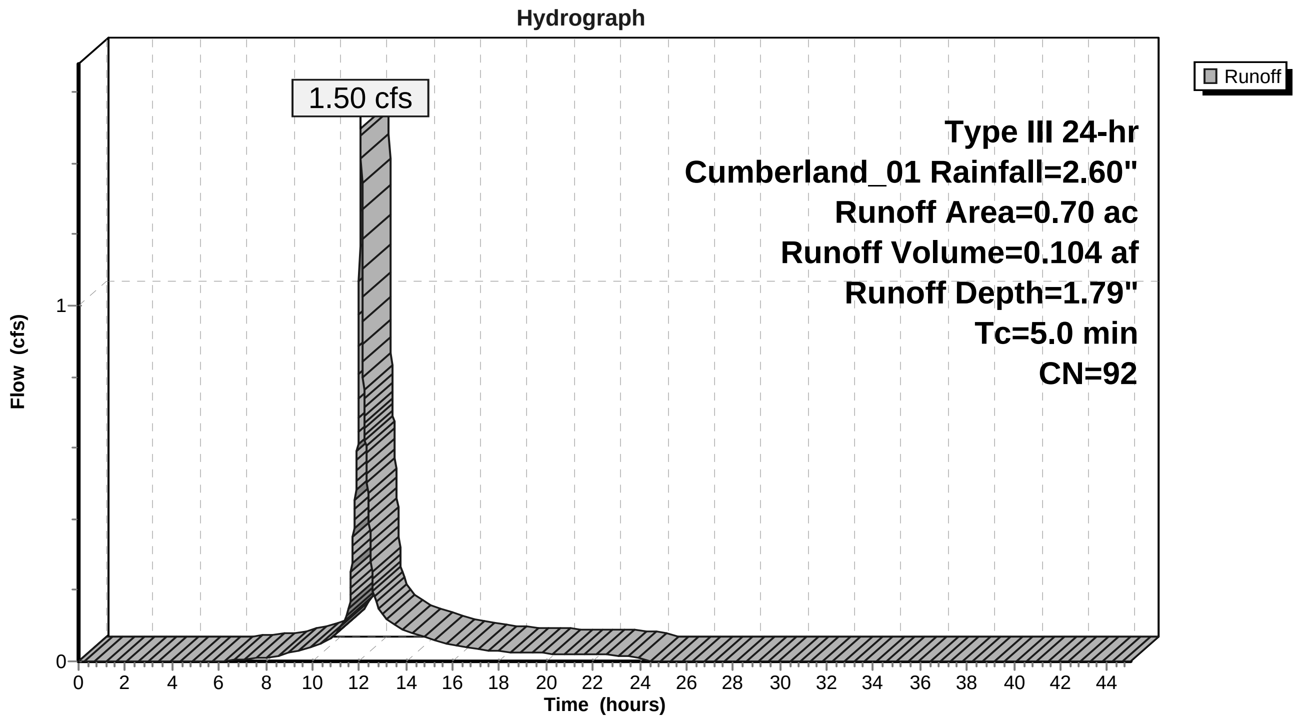
Runoff = 1.50 cfs @ 12.07 hrs, Volume= 0.104 af, Depth= 1.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_01 Rainfall=2.60"

	Area (ac)	CN	Description
*	0.45	98	Site Development
	0.25	80	>75% Grass cover, Good, HSG D
	0.70	92	Weighted Average
	0.25		35.71% Pervious Area
	0.45		64.29% Impervious Area

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

Subcatchment 22: Sub 22



Summary for Subcatchment 23: Sub 23

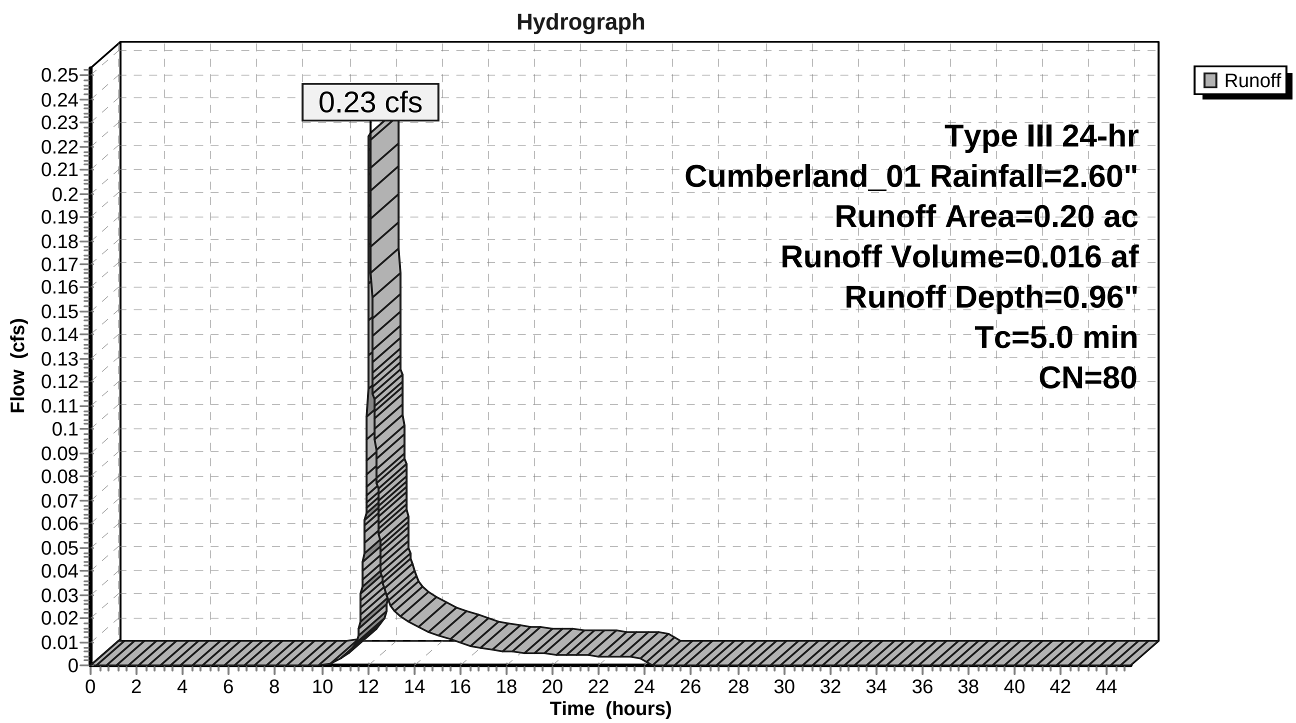
Runoff = 0.23 cfs @ 12.08 hrs, Volume= 0.016 af, Depth= 0.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_01 Rainfall=2.60"

Area (ac)	CN	Description
0.20	80	>75% Grass cover, Good, HSG D
0.20		100.00% Pervious Area

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

Subcatchment 23: Sub 23



Summary for Pond 220P: UDF

Inflow Area = 0.90 ac, 50.00% Impervious, Inflow Depth = 1.60" for Cumberland_01 event
Inflow = 1.73 cfs @ 12.07 hrs, Volume= 0.120 af
Outflow = 0.12 cfs @ 13.69 hrs, Volume= 0.120 af, Atten= 93%, Lag= 97.1 min
Primary = 0.12 cfs @ 13.69 hrs, Volume= 0.120 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Peak Elev= 126.09' @ 13.69 hrs Surf.Area= 3,064 sf Storage= 2,916 cf

Plug-Flow detention time= 641.7 min calculated for 0.120 af (100% of inflow)
Center-of-Mass det. time= 641.1 min (1,452.1 - 811.0)

Volume	Invert	Avail.Storage	Storage Description
#1	125.00'	10,527 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

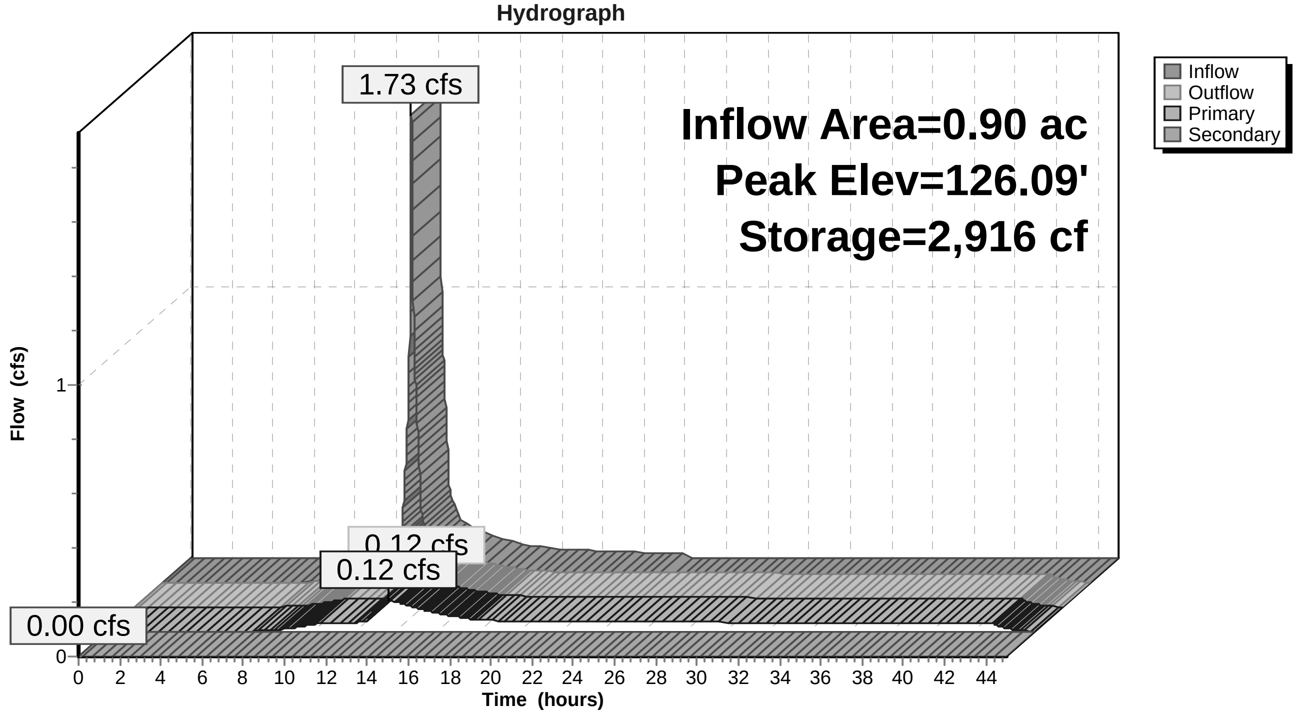
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
125.00	2,326	0	0
126.00	2,974	2,650	2,650
127.00	4,000	3,487	6,137
128.00	4,780	4,390	10,527

Device	Routing	Invert	Outlet Devices
#1	Primary	122.83'	**12.0" Round Culvert** L= 78.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 122.83' / 122.28' S= 0.0071 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	122.83'	**0.9" Vert. Orifice/Grate** C= 0.600
#3	Device 2	125.00'	**2.400 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'
#4	Device 1	126.00'	**4.0" Vert. Orifice/Grate X 4.00** C= 0.600
#5	Device 1	127.00'	**20.0" Vert. Orifice/Grate** C= 0.600
#6	Secondary	127.50'	**10.0' long x 8.0' 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) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Primary OutFlow Max=0.11 cfs @ 13.69 hrs HW=126.09' (Free Discharge)
└─**1=Culvert** (Passes 0.11 cfs of 5.58 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.04 cfs @ 8.64 fps)
  │ └─**3=Exfiltration** (Passes 0.04 cfs of 0.17 cfs potential flow)
  ├─**4=Orifice/Grate** (Orifice Controls 0.07 cfs @ 1.01 fps)
  └─**5=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=125.00' (Free Discharge)
└─**6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 220P: UDF



Stage-Area-Storage for Pond 220P: UDF

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
125.00	2,326	0	125.53	2,669	1,324
125.01	2,332	23	125.54	2,676	1,351
125.02	2,339	47	125.55	2,682	1,377
125.03	2,345	70	125.56	2,689	1,404
125.04	2,352	94	125.57	2,695	1,431
125.05	2,358	117	125.58	2,702	1,458
125.06	2,365	141	125.59	2,708	1,485
125.07	2,371	164	125.60	2,715	1,512
125.08	2,378	188	125.61	2,721	1,539
125.09	2,384	212	125.62	2,728	1,567
125.10	2,391	236	125.63	2,734	1,594
125.11	2,397	260	125.64	2,741	1,621
125.12	2,404	284	125.65	2,747	1,649
125.13	2,410	308	125.66	2,754	1,676
125.14	2,417	332	125.67	2,760	1,704
125.15	2,423	356	125.68	2,767	1,731
125.16	2,430	380	125.69	2,773	1,759
125.17	2,436	405	125.70	2,780	1,787
125.18	2,443	429	125.71	2,786	1,815
125.19	2,449	454	125.72	2,793	1,843
125.20	2,456	478	125.73	2,799	1,871
125.21	2,462	503	125.74	2,806	1,899
125.22	2,469	527	125.75	2,812	1,927
125.23	2,475	552	125.76	2,818	1,955
125.24	2,482	577	125.77	2,825	1,983
125.25	2,488	602	125.78	2,831	2,011
125.26	2,494	627	125.79	2,838	2,040
125.27	2,501	652	125.80	2,844	2,068
125.28	2,507	677	125.81	2,851	2,097
125.29	2,514	702	125.82	2,857	2,125
125.30	2,520	727	125.83	2,864	2,154
125.31	2,527	752	125.84	2,870	2,182
125.32	2,533	777	125.85	2,877	2,211
125.33	2,540	803	125.86	2,883	2,240
125.34	2,546	828	125.87	2,890	2,269
125.35	2,553	854	125.88	2,896	2,298
125.36	2,559	879	125.89	2,903	2,327
125.37	2,566	905	125.90	2,909	2,356
125.38	2,572	931	125.91	2,916	2,385
125.39	2,579	956	125.92	2,922	2,414
125.40	2,585	982	125.93	2,929	2,443
125.41	2,592	1,008	125.94	2,935	2,473
125.42	2,598	1,034	125.95	2,942	2,502
125.43	2,605	1,060	125.96	2,948	2,532
125.44	2,611	1,086	125.97	2,955	2,561
125.45	2,618	1,112	125.98	2,961	2,591
125.46	2,624	1,139	125.99	2,968	2,620
125.47	2,631	1,165	126.00	2,974	2,650
125.48	2,637	1,191	126.01	2,984	2,680
125.49	2,644	1,218	126.02	2,995	2,710
125.50	2,650	1,244	126.03	3,005	2,740
125.51	2,656	1,271	126.04	3,015	2,770
125.52	2,663	1,297	126.05	3,025	2,800

Stage-Area-Storage for Pond 220P: UDF (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
126.06	3,036	2,830	126.59	3,579	4,583
126.07	3,046	2,861	126.60	3,590	4,619
126.08	3,056	2,891	126.61	3,600	4,655
126.09	3,066	2,922	126.62	3,610	4,691
126.10	3,077	2,953	126.63	3,620	4,727
126.11	3,087	2,983	126.64	3,631	4,763
126.12	3,097	3,014	126.65	3,641	4,800
126.13	3,107	3,045	126.66	3,651	4,836
126.14	3,118	3,076	126.67	3,661	4,873
126.15	3,128	3,108	126.68	3,672	4,910
126.16	3,138	3,139	126.69	3,682	4,946
126.17	3,148	3,170	126.70	3,692	4,983
126.18	3,159	3,202	126.71	3,702	5,020
126.19	3,169	3,234	126.72	3,713	5,057
126.20	3,179	3,265	126.73	3,723	5,094
126.21	3,189	3,297	126.74	3,733	5,132
126.22	3,200	3,329	126.75	3,744	5,169
126.23	3,210	3,361	126.76	3,754	5,207
126.24	3,220	3,393	126.77	3,764	5,244
126.25	3,231	3,426	126.78	3,774	5,282
126.26	3,241	3,458	126.79	3,785	5,320
126.27	3,251	3,490	126.80	3,795	5,358
126.28	3,261	3,523	126.81	3,805	5,396
126.29	3,272	3,556	126.82	3,815	5,434
126.30	3,282	3,588	126.83	3,826	5,472
126.31	3,292	3,621	126.84	3,836	5,510
126.32	3,302	3,654	126.85	3,846	5,549
126.33	3,313	3,687	126.86	3,856	5,587
126.34	3,323	3,720	126.87	3,867	5,626
126.35	3,333	3,754	126.88	3,877	5,664
126.36	3,343	3,787	126.89	3,887	5,703
126.37	3,354	3,821	126.90	3,897	5,742
126.38	3,364	3,854	126.91	3,908	5,781
126.39	3,374	3,888	126.92	3,918	5,820
126.40	3,384	3,922	126.93	3,928	5,860
126.41	3,395	3,956	126.94	3,938	5,899
126.42	3,405	3,990	126.95	3,949	5,938
126.43	3,415	4,024	126.96	3,959	5,978
126.44	3,425	4,058	126.97	3,969	6,017
126.45	3,436	4,092	126.98	3,979	6,057
126.46	3,446	4,127	126.99	3,990	6,097
126.47	3,456	4,161	127.00	4,000	6,137
126.48	3,466	4,196	127.01	4,008	6,177
126.49	3,477	4,230	127.02	4,016	6,217
126.50	3,487	4,265	127.03	4,023	6,257
126.51	3,497	4,300	127.04	4,031	6,298
126.52	3,508	4,335	127.05	4,039	6,338
126.53	3,518	4,370	127.06	4,047	6,378
126.54	3,528	4,406	127.07	4,055	6,419
126.55	3,538	4,441	127.08	4,062	6,459
126.56	3,549	4,476	127.09	4,070	6,500
126.57	3,559	4,512	127.10	4,078	6,541
126.58	3,569	4,547	127.11	4,086	6,582

Stage-Area-Storage for Pond 220P: UDF (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
127.12	4,094	6,623	127.65	4,507	8,902
127.13	4,101	6,664	127.66	4,515	8,947
127.14	4,109	6,705	127.67	4,523	8,992
127.15	4,117	6,746	127.68	4,530	9,037
127.16	4,125	6,787	127.69	4,538	9,083
127.17	4,133	6,828	127.70	4,546	9,128
127.18	4,140	6,870	127.71	4,554	9,174
127.19	4,148	6,911	127.72	4,562	9,219
127.20	4,156	6,953	127.73	4,569	9,265
127.21	4,164	6,994	127.74	4,577	9,311
127.22	4,172	7,036	127.75	4,585	9,356
127.23	4,179	7,078	127.76	4,593	9,402
127.24	4,187	7,119	127.77	4,601	9,448
127.25	4,195	7,161	127.78	4,608	9,494
127.26	4,203	7,203	127.79	4,616	9,540
127.27	4,211	7,245	127.80	4,624	9,587
127.28	4,218	7,288	127.81	4,632	9,633
127.29	4,226	7,330	127.82	4,640	9,679
127.30	4,234	7,372	127.83	4,647	9,726
127.31	4,242	7,414	127.84	4,655	9,772
127.32	4,250	7,457	127.85	4,663	9,819
127.33	4,257	7,499	127.86	4,671	9,865
127.34	4,265	7,542	127.87	4,679	9,912
127.35	4,273	7,585	127.88	4,686	9,959
127.36	4,281	7,628	127.89	4,694	10,006
127.37	4,289	7,670	127.90	4,702	10,053
127.38	4,296	7,713	127.91	4,710	10,100
127.39	4,304	7,756	127.92	4,718	10,147
127.40	4,312	7,799	127.93	4,725	10,194
127.41	4,320	7,843	127.94	4,733	10,242
127.42	4,328	7,886	127.95	4,741	10,289
127.43	4,335	7,929	127.96	4,749	10,336
127.44	4,343	7,973	127.97	4,757	10,384
127.45	4,351	8,016	127.98	4,764	10,432
127.46	4,359	8,060	127.99	4,772	10,479
127.47	4,367	8,103	128.00	**4,780**	**10,527**
127.48	4,374	8,147	128.01	4,780	10,527
127.49	4,382	8,191	128.02	4,780	10,527
127.50	4,390	8,235	128.03	4,780	10,527
127.51	4,398	8,278	128.04	4,780	10,527
127.52	4,406	8,322	128.05	4,780	10,527
127.53	4,413	8,367	128.06	4,780	10,527
127.54	4,421	8,411	128.07	4,780	10,527
127.55	4,429	8,455	128.08	4,780	10,527
127.56	4,437	8,499	128.09	4,780	10,527
127.57	4,445	8,544	128.10	4,780	10,527
127.58	4,452	8,588	128.11	4,780	10,527
127.59	4,460	8,633	128.12	4,780	10,527
127.60	4,468	8,677	128.13	4,780	10,527
127.61	4,476	8,722	128.14	4,780	10,527
127.62	4,484	8,767	128.15	4,780	10,527
127.63	4,491	8,812	128.16	4,780	10,527
127.64	4,499	8,857	128.17	4,780	10,527

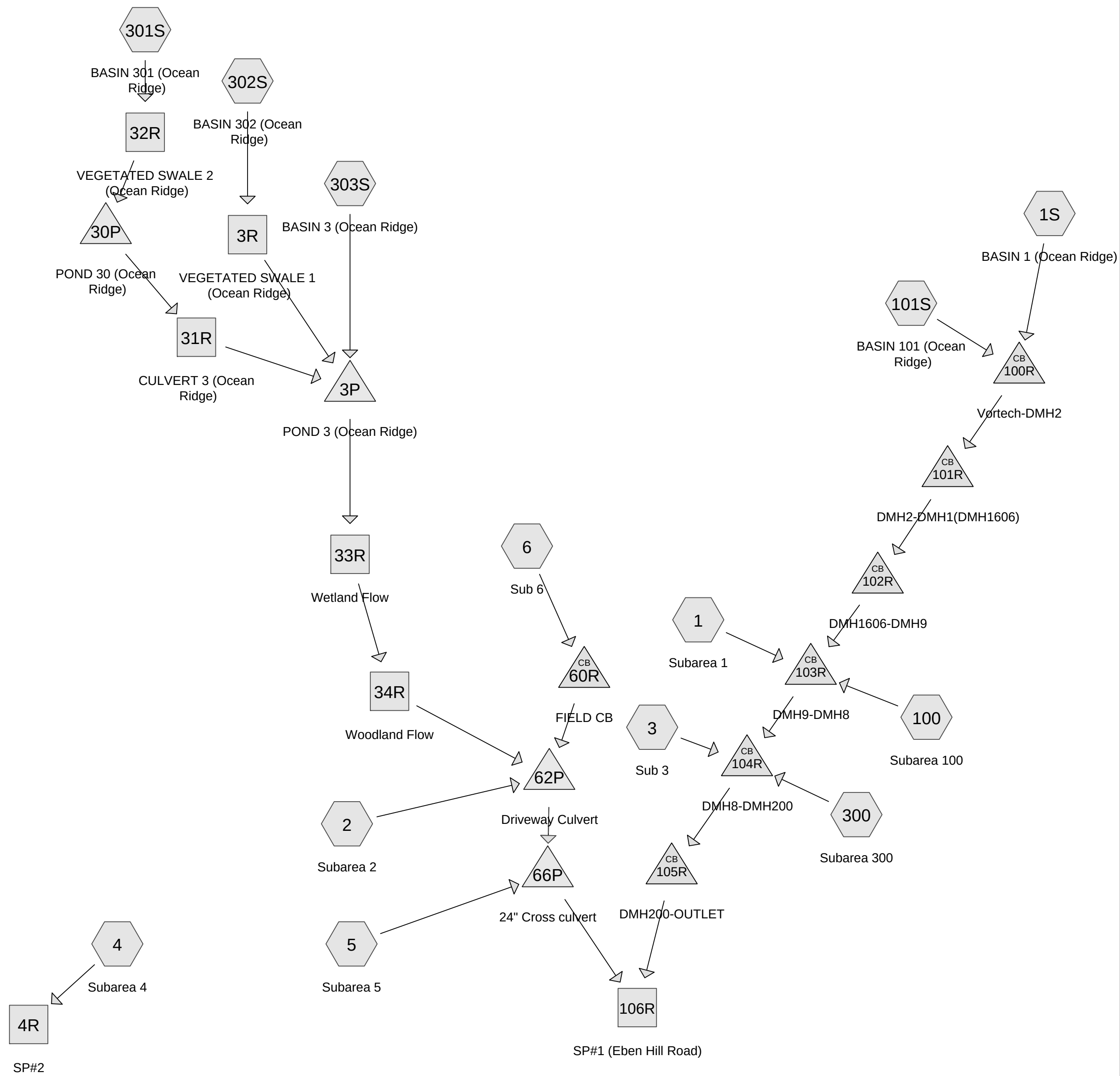
Stage-Area-Storage for Pond 220P: UDF (continued)

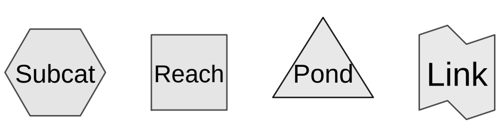
Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
128.18	4,780	10,527
128.19	4,780	10,527
128.20	4,780	10,527
128.21	4,780	10,527
128.22	4,780	10,527
128.23	4,780	10,527
128.24	4,780	10,527
128.25	4,780	10,527
128.26	4,780	10,527
128.27	4,780	10,527
128.28	4,780	10,527
128.29	4,780	10,527
128.30	4,780	10,527
128.31	4,780	10,527
128.32	4,780	10,527
128.33	4,780	10,527
128.34	4,780	10,527
128.35	4,780	10,527
128.36	4,780	10,527
128.37	4,780	10,527
128.38	4,780	10,527
128.39	4,780	10,527
128.40	4,780	10,527
128.41	4,780	10,527
128.42	4,780	10,527
128.43	4,780	10,527
128.44	4,780	10,527
128.45	4,780	10,527
128.46	4,780	10,527
128.47	4,780	10,527
128.48	4,780	10,527
128.49	4,780	10,527
128.50	4,780	10,527
128.51	4,780	10,527
128.52	4,780	10,527
128.53	4,780	10,527
128.54	4,780	10,527
128.55	4,780	10,527
128.56	4,780	10,527
128.57	4,780	10,527
128.58	4,780	10,527
128.59	4,780	10,527
128.60	4,780	10,527
128.61	4,780	10,527
128.62	4,780	10,527
128.63	4,780	10,527
128.64	4,780	10,527
128.65	4,780	10,527
128.66	4,780	10,527
128.67	4,780	10,527

Attachment B

HydroCAD Output- Pre-Development/Post Development TR-2- Model

Predevelopment





Routing Diagram for 14432_Predevelopment_ASBUIILT
Prepared by Sebago Technics, Printed 9/9/2015
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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.630	84	1 acre lots, 20% imp, HSG D (1, 3, 5, 6)
1.000	87	1/4 acre lots, 38% imp, HSG D (1, 2, 6)
0.090	80	>75% Grass cover, Good, HSG D (Ocean Ridge) (1)
0.140	80	>75% Grass cover, Good, HSG D, Ocean Ridge (2)
0.070	98	Building, Ocean Ridge (1, 2)
2.240	98	IMPERVIOUS (1S, 101S, 301S, 302S, 303S)
2.710	80	LAWN D (1S, 101S, 301S, 302S, 303S)
0.040	98	Paved roads Ocean Ave (3)
0.050	98	Road, Ocean Ridge (2)
0.610	98	Roadway (1, 2, 5, 100, 300)
0.510	77	WOODS D (1S, 302S, 303S)
15.100	77	Woods, Good, HSG D (1, 2, 4, 5)
0.030	77	Woods, Good, HSG D, Ocean Ridge (2)
24.220	**81**	**TOTAL AREA**

Time span=0.00-100.00 hrs, dt=0.01 hrs, 10001 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 1: Subarea 1 Runoff Area=3.160 ac 13.23% Impervious Runoff Depth=1.33"
Flow Length=660' Tc=9.5 min CN=80 Runoff=4.29 cfs 0.349 af

Subcatchment 1S: BASIN 1 (Ocean Ridge) Runoff Area=2.600 ac 34.62% Impervious Runoff Depth=1.75"
Flow Length=660' Tc=9.9 min CN=86 Runoff=4.67 cfs 0.379 af

Subcatchment 2: Subarea 2 Runoff Area=11.540 ac 3.32% Impervious Runoff Depth=1.20"
Flow Length=1,435' Tc=32.5 min CN=78 Runoff=8.62 cfs 1.155 af

Subcatchment 3: Sub 3 Runoff Area=0.300 ac 30.67% Impervious Runoff Depth=1.75"
Flow Length=300' Tc=9.4 min CN=86 Runoff=0.55 cfs 0.044 af

Subcatchment 4: Subarea 4 Runoff Area=1.210 ac 0.00% Impervious Runoff Depth=1.14"
Flow Length=250' Tc=9.8 min CN=77 Runoff=1.37 cfs 0.115 af

Subcatchment 5: Subarea 5 Runoff Area=1.820 ac 9.67% Impervious Runoff Depth=1.33"
Flow Length=660' Tc=11.0 min CN=80 Runoff=2.36 cfs 0.201 af

Subcatchment 6: Sub 6 Runoff Area=0.420 ac 23.00% Impervious Runoff Depth=1.60"
Flow Length=235' Tc=4.1 min CN=84 Runoff=0.84 cfs 0.056 af

Subcatchment 100: Subarea 100 Runoff Area=0.220 ac 100.00% Impervious Runoff Depth=2.87"
Flow Length=572' Tc=6.6 min CN=98 Runoff=0.65 cfs 0.053 af

Subcatchment 101S: BASIN 101 (Ocean Ridge) Runoff Area=0.190 ac 57.89% Impervious Runoff Depth=2.08"
Flow Length=155' Tc=6.4 min CN=90 Runoff=0.45 cfs 0.033 af

Subcatchment 300: Subarea 300 Runoff Area=0.090 ac 100.00% Impervious Runoff Depth=2.87"
Flow Length=162' Tc=5.0 min CN=98 Runoff=0.28 cfs 0.022 af

Subcatchment 301S: BASIN 301 (Ocean Ridge) Runoff Area=0.820 ac 45.12% Impervious Runoff Depth=1.91"
Flow Length=190' Tc=9.3 min CN=88 Runoff=1.63 cfs 0.130 af

Subcatchment 302S: BASIN 302 (Ocean Ridge) Runoff Area=1.270 ac 58.27% Impervious Runoff Depth=2.08"
Flow Length=130' Slope=0.0200 '/' Tc=9.1 min CN=90 Runoff=2.76 cfs 0.220 af

Subcatchment 303S: BASIN 3 (Ocean Ridge) Runoff Area=0.580 ac 20.69% Impervious Runoff Depth=1.53"
Flow Length=150' Tc=8.1 min CN=83 Runoff=0.96 cfs 0.074 af

Reach 3R: VEGETATED SWALE 1 (Ocean Ridge) Avg. Flow Depth=0.53' Max Vel=0.62 fps Inflow=2.76 cfs 0.220 af
n=0.150 L=170.0' S=0.0120 '/' Capacity=30.82 cfs Outflow=2.49 cfs 0.220 af

Reach 4R: SP#2 Inflow=1.37 cfs 0.115 af
Outflow=1.37 cfs 0.115 af

Reach 31R: CULVERT 3 (Ocean Ridge) Avg. Flow Depth=0.40' Max Vel=4.38 fps Inflow=1.22 cfs 0.130 af
11.0" Round Pipe n=0.012 L=50.0' S=0.0100 '/' Capacity=3.06 cfs Outflow=1.22 cfs 0.130 af

Reach 32R: VEGETATED SWALE 2 (Ocean Ridge) Avg. Flow Depth=0.39' Max Vel=0.54 fps Inflow=1.63 cfs 0.130 af
n=0.150 L=115.0' S=0.0130 '/' Capacity=32.02 cfs Outflow=1.53 cfs 0.130 af

Reach 33R: Wetland Flow Avg. Flow Depth=0.15' Max Vel=0.61 fps Inflow=1.24 cfs 0.424 af
n=0.035 L=150.0' S=0.0033 '/' Capacity=52.28 cfs Outflow=1.24 cfs 0.424 af

Reach 34R: Woodland Flow Avg. Flow Depth=0.10' Max Vel=2.01 fps Inflow=1.24 cfs 0.424 af
n=0.035 L=1,180.0' S=0.0581 '/' Capacity=108.87 cfs Outflow=1.23 cfs 0.424 af

Reach 106R: SP#1 (Eben Hill Road) Inflow=17.08 cfs 2.714 af
Outflow=17.08 cfs 2.714 af

Pond 3P: POND 3 (Ocean Ridge) Peak Elev=159.97' Storage=6,326 cf Inflow=4.17 cfs 0.424 af
Outflow=1.24 cfs 0.424 af

Pond 30P: POND 30 (Ocean Ridge) Peak Elev=160.52' Storage=815 cf Inflow=1.53 cfs 0.130 af
18.0" Round Culvert n=0.012 L=30.0' S=0.0100 '/' Outflow=1.22 cfs 0.130 af

Pond 60R: FIELD CB Peak Elev=90.47' Inflow=0.84 cfs 0.056 af
12.0" Round Culvert n=0.012 L=110.0' S=0.0091 '/' Outflow=0.84 cfs 0.056 af

Pond 62P: Driveway Culvert Peak Elev=89.59' Storage=986 cf Inflow=9.36 cfs 1.634 af
Primary=7.78 cfs 1.604 af Secondary=1.56 cfs 0.030 af Outflow=9.33 cfs 1.634 af

Pond 66P: 24" Cross culvert Peak Elev=86.27' Storage=82 cf Inflow=10.30 cfs 1.835 af
Primary=10.29 cfs 1.835 af Secondary=0.00 cfs 0.000 af Outflow=10.29 cfs 1.835 af

Pond 100R: Vortech-DMH2 Peak Elev=108.12' Inflow=5.07 cfs 0.412 af
18.0" Round Culvert n=0.012 L=318.0' S=0.0267 '/' Outflow=5.07 cfs 0.412 af

Pond 101R: DMH2-DMH1(DMH1606) Peak Elev=99.50' Inflow=5.07 cfs 0.412 af
18.0" Round Culvert n=0.012 L=177.0' S=0.0391 '/' Outflow=5.07 cfs 0.412 af

Pond 102R: DMH1606-DMH9 Peak Elev=92.42' Inflow=5.07 cfs 0.412 af
18.0" Round Culvert n=0.012 L=110.0' S=0.0185 '/' Outflow=5.07 cfs 0.412 af

Pond 103R: DMH9-DMH8 Peak Elev=91.19' Inflow=9.94 cfs 0.813 af
18.0" Round Culvert n=0.012 L=132.0' S=0.0099 '/' Outflow=9.94 cfs 0.813 af

Pond 104R: DMH8-DMH200 Peak Elev=91.38' Inflow=10.70 cfs 0.879 af
18.0" Round Culvert n=0.012 L=273.0' S=0.0039 '/' Outflow=10.70 cfs 0.879 af

Pond 105R: DMH200-OUTLET Peak Elev=88.86' Inflow=10.70 cfs 0.879 af
18.0" Round Culvert n=0.012 L=60.0' S=0.0400 '/' Outflow=10.70 cfs 0.879 af

Total Runoff Area = 24.220 ac Runoff Volume = 2.829 af Average Runoff Depth = 1.40"
84.66% Pervious = 20.504 ac 15.34% Impervious = 3.716 ac

Summary for Subcatchment 1: Subarea 1

Runoff = 4.29 cfs @ 12.14 hrs, Volume= 0.349 af, Depth= 1.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_02 Rainfall=3.10"

	Area (ac)	CN	Description
	0.290	84	1 acre lots, 20% imp, HSG D
	0.290	87	1/4 acre lots, 38% imp, HSG D
*	0.220	98	Roadway
	2.240	77	Woods, Good, HSG D
*	0.090	80	>75% Grass cover, Good, HSG D (Ocean Ridge)
*	0.030	98	Building, Ocean Ridge
	3.160	80	Weighted Average
	2.742		86.77% Pervious Area
	0.418		13.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	20	0.1500	0.12		**Sheet Flow, Overland Woods** Woods: Light underbrush n= 0.400 P2= 3.00"
1.4	160	0.1500	1.94		**Shallow Concentrated Flow, Overland Woods** Woodland Kv= 5.0 fps
4.9	400	0.0380	1.36		**Shallow Concentrated Flow, Shallow Rd Ditch** Short Grass Pasture Kv= 7.0 fps
0.5	80	0.0200	2.87		**Shallow Concentrated Flow, ROAD GUTTER** Paved Kv= 20.3 fps
9.5	660	Total			

Summary for Subcatchment 1S: BASIN 1 (Ocean Ridge)

Runoff = 4.67 cfs @ 12.14 hrs, Volume= 0.379 af, Depth= 1.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_02 Rainfall=3.10"

	Area (ac)	CN	Description
*	0.900	98	IMPERVIOUS
*	0.380	77	WOODS D
*	1.320	80	LAWN D
	2.600	86	Weighted Average
	1.700		65.38% Pervious Area
	0.900		34.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	50	0.0200	0.10		**Sheet Flow, OVERLAND FLOW** Grass: Dense n= 0.240 P2= 3.00"
0.4	140	0.0430	5.46	65.53	**Trap/Vee/Rect Channel Flow, Segment ID: riprap road ditch** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.060
0.2	90	0.0550	6.18	74.11	**Trap/Vee/Rect Channel Flow, Segment ID: riprap road ditch** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.060
0.8	380	0.0900	7.45	64.10	**Trap/Vee/Rect Channel Flow, Segment ID: riprap road ditch** Bot.W=2.00' D=2.00' Z= 2.0 & 0.3 '/' Top.W=6.60' n= 0.060
9.9	660	Total			

Summary for Subcatchment 2: Subarea 2

Runoff = 8.62 cfs @ 12.46 hrs, Volume= 1.155 af, Depth= 1.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_02 Rainfall=3.10"

	Area (ac)	CN	Description
	0.640	87	1/4 acre lots, 38% imp, HSG D
*	0.050	98	Roadway
	10.590	77	Woods, Good, HSG D
*	0.040	98	Building, Ocean Ridge
*	0.050	98	Road, Ocean Ridge
*	0.030	77	Woods, Good, HSG D, Ocean Ridge
*	0.140	80	>75% Grass cover, Good, HSG D, Ocean Ridge
	11.540	78	Weighted Average
	11.157		96.68% Pervious Area
	0.383		3.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	110	0.0800	0.13		**Sheet Flow, Overland Woods** Woods: Light underbrush n= 0.400 P2= 3.00"
18.8	1,325	0.0550	1.17		**Shallow Concentrated Flow, Overland Woods** Woodland Kv= 5.0 fps
32.5	1,435	Total			

Summary for Subcatchment 3: Sub 3

Runoff = 0.55 cfs @ 12.13 hrs, Volume= 0.044 af, Depth= 1.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_02 Rainfall=3.10"

	Area (ac)	CN	Description
*	0.040	98	Paved roads Ocean Ave
	0.260	84	1 acre lots, 20% imp, HSG D
	0.300	86	Weighted Average
	0.208		69.33% Pervious Area
	0.092		30.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	60	0.1000	0.13		**Sheet Flow, A-B**
					Woods: Light underbrush n= 0.400 P2= 3.00"
1.2	160	0.1000	2.21		**Shallow Concentrated Flow, B-C**
					Short Grass Pasture Kv= 7.0 fps
0.5	80	0.0150	2.49		**Shallow Concentrated Flow, C-D**
					Paved Kv= 20.3 fps
9.4	300	Total			

Summary for Subcatchment 4: Subarea 4

Runoff = 1.37 cfs @ 12.14 hrs, Volume= 0.115 af, Depth= 1.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_02 Rainfall=3.10"

Area (ac)	CN	Description
1.210	77	Woods, Good, HSG D
1.210		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	60	0.1200	0.14		**Sheet Flow, Overland Woods**
					Woods: Light underbrush n= 0.400 P2= 3.00"
2.6	190	0.0600	1.22		**Shallow Concentrated Flow, Overland Woods**
					Woodland Kv= 5.0 fps
9.8	250	Total			

Summary for Subcatchment 5: Subarea 5

Runoff = 2.36 cfs @ 12.16 hrs, Volume= 0.201 af, Depth= 1.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_02 Rainfall=3.10"

	Area (ac)	CN	Description
	0.730	84	1 acre lots, 20% imp, HSG D
*	0.030	98	Roadway
	1.060	77	Woods, Good, HSG D
	1.820	80	Weighted Average
	1.644		90.33% Pervious Area
	0.176		9.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	30	0.1500	0.13		**Sheet Flow, Overland Woods**
					Woods: Light underbrush n= 0.400 P2= 3.00"
7.2	630	0.0850	1.46		**Shallow Concentrated Flow, Overland Woods**
					Woodland Kv= 5.0 fps
11.0	660	Total			

Summary for Subcatchment 6: Sub 6

Runoff = 0.84 cfs @ 12.06 hrs, Volume= 0.056 af, Depth= 1.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_02 Rainfall=3.10"

Area (ac)	CN	Description
0.350	84	1 acre lots, 20% imp, HSG D
0.070	87	1/4 acre lots, 38% imp, HSG D
0.420	84	Weighted Average
0.323		77.00% Pervious Area
0.097		23.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	25	0.1500	0.13		**Sheet Flow, A-B**
					Woods: Light underbrush n= 0.400 P2= 3.00"
0.4	60	0.2300	2.40		**Shallow Concentrated Flow, B-C**
					Woodland Kv= 5.0 fps
0.4	150	0.0400	5.86	41.05	**Trap/Vee/Rect Channel Flow, C-D**
					Bot.W=2.00' D=1.00' Z= 5.0 '/' Top.W=12.00'
					n= 0.035 Earth, dense weeds
4.1	235	Total			

Summary for Subcatchment 100: Subarea 100

Runoff = 0.65 cfs @ 12.09 hrs, Volume= 0.053 af, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_02 Rainfall=3.10"

	Area (ac)	CN	Description
*	0.220	98	Roadway
	0.220		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	12	0.0200	0.87		**Sheet Flow, Road Crown** Smooth surfaces n= 0.011 P2= 3.00"
5.9	480	0.0380	1.36		**Shallow Concentrated Flow, SHALLOW RD DITCH** Short Grass Pasture Kv= 7.0 fps
0.5	80	0.0200	2.87		**Shallow Concentrated Flow, ROAD GUTTER** Paved Kv= 20.3 fps
6.6	572	Total			

Summary for Subcatchment 101S: BASIN 101 (Ocean Ridge)

Runoff = 0.45 cfs @ 12.09 hrs, Volume= 0.033 af, Depth= 2.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_02 Rainfall=3.10"

	Area (ac)	CN	Description
*	0.110	98	IMPERVIOUS
*	0.080	80	LAWN D
	0.190	90	Weighted Average
	0.080		42.11% Pervious Area
	0.110		57.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	30	0.0200	0.09		**Sheet Flow, Segment ID: AB, Lawn** Grass: Dense n= 0.240 P2= 3.00"
0.1	25	0.0200	2.87		**Shallow Concentrated Flow, Segment ID: BC,Driveway** Paved Kv= 20.3 fps
0.7	100	0.1200	2.42		**Shallow Concentrated Flow, Segment ID: grass slope** Short Grass Pasture Kv= 7.0 fps
6.4	155	Total			

Summary for Subcatchment 300: Subarea 300

Runoff = 0.28 cfs @ 12.07 hrs, Volume= 0.022 af, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_02 Rainfall=3.10"

	Area (ac)	CN	Description
*	0.090	98	Roadway
	0.090		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	12	0.0200	0.87		**Sheet Flow, Road Crown** Smooth surfaces n= 0.011 P2= 3.00"
1.1	150	0.0130	2.31		**Shallow Concentrated Flow, Gutter flow** Paved Kv= 20.3 fps
3.7					**Direct Entry,**
5.0	162	Total			

Summary for Subcatchment 301S: BASIN 301 (Ocean Ridge)

Runoff = 1.63 cfs @ 12.13 hrs, Volume= 0.130 af, Depth= 1.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_02 Rainfall=3.10"

	Area (ac)	CN	Description
*	0.370	98	IMPERVIOUS
*	0.450	80	LAWN D
	0.820	88	Weighted Average
	0.450		54.88% Pervious Area
	0.370		45.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	60	0.0300	0.12		**Sheet Flow, Segment ID: AB** Grass: Dense n= 0.240 P2= 3.00"
0.4	50	0.0200	2.12		**Shallow Concentrated Flow, Segment ID: BC** Grassed Waterway Kv= 15.0 fps
0.6	80	0.0200	2.12		**Shallow Concentrated Flow, Segment ID: CD** Grassed Waterway Kv= 15.0 fps
9.3	190	Total			

Summary for Subcatchment 302S: BASIN 302 (Ocean Ridge)

Runoff = 2.76 cfs @ 12.13 hrs, Volume= 0.220 af, Depth= 2.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_02 Rainfall=3.10"

	Area (ac)	CN	Description
*	0.740	98	IMPERVIOUS
*	0.050	77	WOODS D
*	0.480	80	LAWN D
	1.270	90	Weighted Average
	0.530		41.73% Pervious Area
	0.740		58.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	50	0.0200	0.10		**Sheet Flow, Segment ID: AB** Grass: Dense n= 0.240 P2= 3.00"
0.2	30	0.0200	2.87		**Shallow Concentrated Flow, Segment ID: BC** Paved Kv= 20.3 fps
0.4	50	0.0200	2.12		**Shallow Concentrated Flow, Segment ID:** Grassed Waterway Kv= 15.0 fps
9.1	130	Total			

Summary for Subcatchment 303S: BASIN 3 (Ocean Ridge)

Runoff = 0.96 cfs @ 12.12 hrs, Volume= 0.074 af, Depth= 1.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_02 Rainfall=3.10"

	Area (ac)	CN	Description
*	0.120	98	IMPERVIOUS
*	0.080	77	WOODS D
*	0.380	80	LAWN D
	0.580	83	Weighted Average
	0.460		79.31% Pervious Area
	0.120		20.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	30	0.0300	0.07		**Sheet Flow, Segment ID: AB** Woods: Light underbrush n= 0.400 P2= 3.00"
0.9	120	0.0200	2.12		**Shallow Concentrated Flow, Segment ID: BC** Grassed Waterway Kv= 15.0 fps
8.1	150	Total			

Summary for Reach 3R: VEGETATED SWALE 1 (Ocean Ridge)

Inflow Area = 1.270 ac, 58.27% Impervious, Inflow Depth = 2.08" for Cumberland_02 event
Inflow = 2.76 cfs @ 12.13 hrs, Volume= 0.220 af
Outflow = 2.49 cfs @ 12.25 hrs, Volume= 0.220 af, Atten= 10%, Lag= 7.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs / 3
Max. Velocity= 0.62 fps, Min. Travel Time= 4.6 min
Avg. Velocity = 0.17 fps, Avg. Travel Time= 17.1 min

Peak Storage= 685 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.53'
Bank-Full Depth= 2.00' Flow Area= 24.0 sf, Capacity= 30.82 cfs

6.00' x 2.00' deep channel, n= 0.150
Side Slope Z-value= 3.0 '/' Top Width= 18.00'
Length= 170.0' Slope= 0.0120 '/'
Inlet Invert= 0.00', Outlet Invert= -2.04'

‡

Summary for Reach 4R: SP#2

Inflow Area = 1.210 ac, 0.00% Impervious, Inflow Depth = 1.14" for Cumberland_02 event
Inflow = 1.37 cfs @ 12.14 hrs, Volume= 0.115 af
Outflow = 1.37 cfs @ 12.14 hrs, Volume= 0.115 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

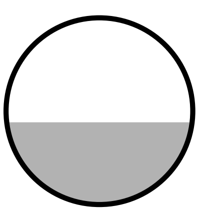
Summary for Reach 31R: CULVERT 3 (Ocean Ridge)

Inflow Area = 0.820 ac, 45.12% Impervious, Inflow Depth = 1.91" for Cumberland_02 event
Inflow = 1.22 cfs @ 12.32 hrs, Volume= 0.130 af
Outflow = 1.22 cfs @ 12.33 hrs, Volume= 0.130 af, Atten= 0%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 4.38 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.03 fps, Avg. Travel Time= 0.8 min

Peak Storage= 14 cf @ 12.32 hrs
Average Depth at Peak Storage= 0.40'
Bank-Full Depth= 0.92' Flow Area= 0.7 sf, Capacity= 3.06 cfs

11.0" Round Pipe
n= 0.012
Length= 50.0' Slope= 0.0100 '/'
Inlet Invert= 0.00', Outlet Invert= -0.50'



Summary for Reach 32R: VEGETATED SWALE 2 (Ocean Ridge)

Inflow Area = 0.820 ac, 45.12% Impervious, Inflow Depth = 1.91" for Cumberland_02 event
Inflow = 1.63 cfs @ 12.13 hrs, Volume= 0.130 af
Outflow = 1.53 cfs @ 12.23 hrs, Volume= 0.130 af, Atten= 6%, Lag= 5.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.54 fps, Min. Travel Time= 3.5 min
Avg. Velocity = 0.15 fps, Avg. Travel Time= 12.7 min

Peak Storage= 325 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.39'
Bank-Full Depth= 2.00' Flow Area= 24.0 sf, Capacity= 32.02 cfs

6.00' x 2.00' deep channel, n= 0.150
Side Slope Z-value= 3.0 '/' Top Width= 18.00'
Length= 115.0' Slope= 0.0130 '/'
Inlet Invert= 0.00', Outlet Invert= -1.49'

‡

Summary for Reach 33R: Wetland Flow

Inflow Area = 2.670 ac, 46.07% Impervious, Inflow Depth = 1.91" for Cumberland_02 event
Inflow = 1.24 cfs @ 12.75 hrs, Volume= 0.424 af
Outflow = 1.24 cfs @ 12.87 hrs, Volume= 0.424 af, Atten= 0%, Lag= 7.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.61 fps, Min. Travel Time= 4.1 min
Avg. Velocity = 0.17 fps, Avg. Travel Time= 14.9 min

Peak Storage= 303 cf @ 12.81 hrs
Average Depth at Peak Storage= 0.15'
Bank-Full Depth= 1.00' Flow Area= 30.0 sf, Capacity= 52.28 cfs

10.00' x 1.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 20.0 '/' Top Width= 50.00'
Length= 150.0' Slope= 0.0033 '/'
Inlet Invert= 158.00', Outlet Invert= 157.50'

‡

Summary for Reach 34R: Woodland Flow

Inflow Area = 2.670 ac, 46.07% Impervious, Inflow Depth = 1.91" for Cumberland_02 event
Inflow = 1.24 cfs @ 12.87 hrs, Volume= 0.424 af
Outflow = 1.23 cfs @ 13.19 hrs, Volume= 0.424 af, Atten= 1%, Lag= 18.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.01 fps, Min. Travel Time= 9.8 min
Avg. Velocity = 0.64 fps, Avg. Travel Time= 30.6 min

Peak Storage= 722 cf @ 13.02 hrs
Average Depth at Peak Storage= 0.10'
Bank-Full Depth= 1.00' Flow Area= 15.0 sf, Capacity= 108.87 cfs

5.00' x 1.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 10.0 '/' Top Width= 25.00'
Length= 1,180.0' Slope= 0.0581 '/'
Inlet Invert= 157.50', Outlet Invert= 89.00'

‡

Summary for Reach 106R: SP#1 (Eben Hill Road)

Inflow Area = 23.010 ac, 16.15% Impervious, Inflow Depth = 1.42" for Cumberland_02 event
Inflow = 17.08 cfs @ 12.15 hrs, Volume= 2.714 af
Outflow = 17.08 cfs @ 12.15 hrs, Volume= 2.714 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Summary for Pond 3P: POND 3 (Ocean Ridge)

Inflow Area = 2.670 ac, 46.07% Impervious, Inflow Depth = 1.91" for Cumberland_02 event
Inflow = 4.17 cfs @ 12.26 hrs, Volume= 0.424 af
Outflow = 1.24 cfs @ 12.75 hrs, Volume= 0.424 af, Atten= 70%, Lag= 29.7 min
Primary = 1.24 cfs @ 12.75 hrs, Volume= 0.424 af

Routing by Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Peak Elev= 159.97' @ 12.75 hrs Surf.Area= 4,273 sf Storage= 6,326 cf

Plug-Flow detention time= 81.6 min calculated for 0.424 af (100% of inflow)
Center-of-Mass det. time= 81.6 min (921.2 - 839.7)

Volume	Invert	Avail.Storage	Storage Description
#1	158.00'	21,813 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
158.00	2,113	0	0
160.00	4,304	6,417	6,417
162.00	6,739	11,043	17,460
162.60	7,772	4,353	21,813

Device	Routing	Invert	Outlet Devices
#1	Primary	158.00'	**6.0" Vert. Orifice/Grate** C= 0.600
#2	Primary	160.00'	**9.0" Vert. Orifice/Grate** C= 0.600
#3	Primary	161.00'	**4.5" Vert. Orifice/Grate** C= 0.600
#4	Primary	161.50'	**20.0' long Broad-Crested Rectangular Weir X 1.81** Head (feet) 0.50 1.00 1.50 Coef. (English) 1.60 1.80 1.90

Primary OutFlow Max=1.24 cfs @ 12.75 hrs HW=159.97' (Free Discharge)
1=Orifice/Grate (Orifice Controls 1.24 cfs @ 6.32 fps)
2=Orifice/Grate (Controls 0.00 cfs)
3=Orifice/Grate (Controls 0.00 cfs)
4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 30P: POND 30 (Ocean Ridge)

Inflow Area = 0.820 ac, 45.12% Impervious, Inflow Depth = 1.91" for Cumberland_02 event
Inflow = 1.53 cfs @ 12.23 hrs, Volume= 0.130 af
Outflow = 1.22 cfs @ 12.32 hrs, Volume= 0.130 af, Atten= 20%, Lag= 5.7 min
Primary = 1.22 cfs @ 12.32 hrs, Volume= 0.130 af

Routing by Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Peak Elev= 160.52' @ 12.32 hrs Surf.Area= 1,371 sf Storage= 815 cf

Plug-Flow detention time= 33.6 min calculated for 0.130 af (100% of inflow)
Center-of-Mass det. time= 33.5 min (864.4 - 831.0)

Volume	Invert	Avail.Storage	Storage Description
#1	160.00'	3,156 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
160.00	1,150	0	0
162.00	2,006	3,156	3,156

Device	Routing	Invert	Outlet Devices
#1	Primary	160.00'	**18.0" Round Culvert** L= 30.0' Ke= 0.500 Inlet / Outlet Invert= 160.00' / 159.70' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=1.22 cfs @ 12.32 hrs HW=160.52' (Free Discharge)
1=Culvert (Barrel Controls 1.22 cfs @ 3.38 fps)

Summary for Pond 60R: FIELD CB

Inflow Area = 0.420 ac, 23.00% Impervious, Inflow Depth = 1.60" for Cumberland_02 event
Inflow = 0.84 cfs @ 12.06 hrs, Volume= 0.056 af
Outflow = 0.84 cfs @ 12.06 hrs, Volume= 0.056 af, Atten= 0%, Lag= 0.0 min
Primary = 0.84 cfs @ 12.06 hrs, Volume= 0.056 af

Routing by Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Peak Elev= 90.47' @ 12.06 hrs
Flood Elev= 91.81'

Device	Routing	Invert	Outlet Devices
#1	Primary	90.00'	**12.0" Round Culvert** L= 110.0' Square-edged headwall, Ke= 0.500 Inlet / Outlet Invert= 90.00' / 89.00' S= 0.0091 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.84 cfs @ 12.06 hrs HW=90.47' (Free Discharge)
└─**1=Culvert** (Inlet Controls 0.84 cfs @ 2.33 fps)

Summary for Pond 62P: Driveway Culvert

Inflow Area = 14.630 ac, 11.69% Impervious, Inflow Depth = 1.34" for Cumberland_02 event
Inflow = 9.36 cfs @ 12.49 hrs, Volume= 1.634 af
Outflow = 9.33 cfs @ 12.51 hrs, Volume= 1.634 af, Atten= 0%, Lag= 1.4 min
Primary = 7.78 cfs @ 12.51 hrs, Volume= 1.604 af
Secondary = 1.56 cfs @ 12.51 hrs, Volume= 0.030 af

Routing by Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Peak Elev= 89.59' @ 12.51 hrs Surf.Area= 2,134 sf Storage= 986 cf

Plug-Flow detention time= 0.6 min calculated for 1.634 af (100% of inflow)
Center-of-Mass det. time= 0.6 min (895.3 - 894.8)

Volume	Invert	Avail.Storage	Storage Description
#1	88.00'	2,197 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
88.00	47	50.0	0	0	47
89.00	540	284.0	249	249	6,269
90.00	3,860	500.0	1,948	2,197	19,750

Device	Routing	Invert	Outlet Devices
#1	Primary	87.50'	**18.0" Round Culvert** L= 35.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 87.50' / 87.00' S= 0.0143 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Secondary	89.50'	**22.0' long x 13.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.60 2.64 2.70 2.66 2.65 2.66 2.65 2.63

Primary OutFlow Max=7.78 cfs @ 12.51 hrs HW=89.59' (Free Discharge)
└─**1=Culvert** (Inlet Controls 7.78 cfs @ 4.40 fps)

Secondary OutFlow Max=1.55 cfs @ 12.51 hrs HW=89.59' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 1.55 cfs @ 0.78 fps)

Summary for Pond 66P: 24" Cross culvert

Inflow Area = 16.450 ac, 11.46% Impervious, Inflow Depth = 1.34" for Cumberland_02 event
Inflow = 10.30 cfs @ 12.49 hrs, Volume= 1.835 af
Outflow = 10.29 cfs @ 12.49 hrs, Volume= 1.835 af, Atten= 0%, Lag= 0.3 min
Primary = 10.29 cfs @ 12.49 hrs, Volume= 1.835 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs / 4
Peak Elev= 86.27' @ 12.49 hrs Surf.Area= 129 sf Storage= 82 cf

Plug-Flow detention time= 0.3 min calculated for 1.835 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (890.4 - 890.3)

Volume	Invert	Avail.Storage	Storage Description
#1	84.00'	1,817 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
84.00	5	5.0	0	0	5
85.00	25	25.0	14	14	55
86.00	63	40.0	43	56	139
87.00	425	195.0	217	273	3,040
88.00	1,210	305.0	784	1,058	7,424
88.50	1,850	330.0	759	1,817	8,697

Device	Routing	Invert	Outlet Devices
#1	Primary	84.45'	**24.0" Round Culvert** L= 65.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 84.45' / 84.13' S= 0.0049 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf
#2	Secondary	88.50'	**12.0' long x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64

Primary OutFlow Max=10.29 cfs @ 12.49 hrs HW=86.27' (Free Discharge)
└─**1=Culvert** (Barrel Controls 10.29 cfs @ 4.51 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=84.00' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 100R: Vortech-DMH2

Inflow Area = 2.790 ac, 36.20% Impervious, Inflow Depth = 1.77" for Cumberland_02 event
Inflow = 5.07 cfs @ 12.13 hrs, Volume= 0.412 af
Outflow = 5.07 cfs @ 12.13 hrs, Volume= 0.412 af, Atten= 0%, Lag= 0.0 min
Primary = 5.07 cfs @ 12.13 hrs, Volume= 0.412 af

Routing by Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Peak Elev= 108.12' @ 12.13 hrs
Flood Elev= 112.16'

Device	Routing	Invert	Outlet Devices
#1	Primary	107.00'	**18.0" Round Culvert** L= 318.0' Ke= 0.500 Inlet / Outlet Invert= 107.00' / 98.52' S= 0.0267 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=5.06 cfs @ 12.13 hrs HW=108.12' (Free Discharge)
└─**1=Culvert** (Inlet Controls 5.06 cfs @ 3.60 fps)

Summary for Pond 101R: DMH2-DMH1(DMH1606)

Inflow Area = 2.790 ac, 36.20% Impervious, Inflow Depth = 1.77" for Cumberland_02 event
Inflow = 5.07 cfs @ 12.13 hrs, Volume= 0.412 af
Outflow = 5.07 cfs @ 12.13 hrs, Volume= 0.412 af, Atten= 0%, Lag= 0.0 min
Primary = 5.07 cfs @ 12.13 hrs, Volume= 0.412 af

Routing by Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Peak Elev= 99.50' @ 12.13 hrs
Flood Elev= 103.21'

Device	Routing	Invert	Outlet Devices
#1	Primary	98.38'	**18.0" Round Culvert** L= 177.0' Ke= 0.500 Inlet / Outlet Invert= 98.38' / 91.46' S= 0.0391 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=5.06 cfs @ 12.13 hrs HW=99.50' (Free Discharge)
└─**1=Culvert** (Inlet Controls 5.06 cfs @ 3.60 fps)

Summary for Pond 102R: DMH1606-DMH9

Inflow Area = 2.790 ac, 36.20% Impervious, Inflow Depth = 1.77" for Cumberland_02 event
Inflow = 5.07 cfs @ 12.13 hrs, Volume= 0.412 af
Outflow = 5.07 cfs @ 12.13 hrs, Volume= 0.412 af, Atten= 0%, Lag= 0.0 min
Primary = 5.07 cfs @ 12.13 hrs, Volume= 0.412 af

Routing by Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Peak Elev= 92.42' @ 12.13 hrs
Flood Elev= 96.40'

Device	Routing	Invert	Outlet Devices
#1	Primary	91.30'	**18.0" Round Culvert** L= 110.0' RCP, square edge headwall, Ke= 0.500

Inlet / Outlet Invert= 91.30' / 89.27' S= 0.0185 '/' Cc= 0.900
n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf

Primary OutFlow Max=5.06 cfs @ 12.13 hrs HW=92.42' (Free Discharge)
└─**1=Culvert** (Inlet Controls 5.06 cfs @ 3.60 fps)

Summary for Pond 103R: DMH9-DMH8

Inflow Area = 6.170 ac, 26.71% Impervious, Inflow Depth = 1.58" for Cumberland_02 event
Inflow = 9.94 cfs @ 12.13 hrs, Volume= 0.813 af
Outflow = 9.94 cfs @ 12.13 hrs, Volume= 0.813 af, Atten= 0%, Lag= 0.0 min
Primary = 9.94 cfs @ 12.13 hrs, Volume= 0.813 af

Routing by Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Peak Elev= 91.19' @ 12.13 hrs
Flood Elev= 94.51'

Device	Routing	Invert	Outlet Devices
#1	Primary	89.07'	**18.0" Round Culvert** L= 132.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 89.07' / 87.76' S= 0.0099 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf

Primary OutFlow Max=9.93 cfs @ 12.13 hrs HW=91.18' (Free Discharge)
└─**1=Culvert** (Inlet Controls 9.93 cfs @ 5.62 fps)

Summary for Pond 104R: DMH8-DMH200

Inflow Area = 6.560 ac, 27.90% Impervious, Inflow Depth = 1.61" for Cumberland_02 event
Inflow = 10.70 cfs @ 12.13 hrs, Volume= 0.879 af
Outflow = 10.70 cfs @ 12.13 hrs, Volume= 0.879 af, Atten= 0%, Lag= 0.0 min
Primary = 10.70 cfs @ 12.13 hrs, Volume= 0.879 af

Routing by Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Peak Elev= 91.38' @ 12.13 hrs
Flood Elev= 92.36'

Device	Routing	Invert	Outlet Devices
#1	Primary	87.66'	**18.0" Round Culvert** L= 273.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 87.66' / 86.60' S= 0.0039 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf

Primary OutFlow Max=10.70 cfs @ 12.13 hrs HW=91.37' (Free Discharge)
└─**1=Culvert** (Barrel Controls 10.70 cfs @ 6.05 fps)

Summary for Pond 105R: DMH200-OUTLET

Inflow Area = 6.560 ac, 27.90% Impervious, Inflow Depth = 1.61" for Cumberland_02 event
Inflow = 10.70 cfs @ 12.13 hrs, Volume= 0.879 af
Outflow = 10.70 cfs @ 12.13 hrs, Volume= 0.879 af, Atten= 0%, Lag= 0.0 min
Primary = 10.70 cfs @ 12.13 hrs, Volume= 0.879 af

Routing by Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Peak Elev= 88.86' @ 12.13 hrs
Flood Elev= 89.25'

Device	Routing	Invert	Outlet Devices
#1	Primary	86.53'	**18.0" Round Culvert** L= 60.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 86.53' / 84.13' S= 0.0400 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=10.70 cfs @ 12.13 hrs HW=88.86' (Free Discharge)
└─**1=Culvert** (Inlet Controls 10.70 cfs @ 6.05 fps)

Time span=0.00-100.00 hrs, dt=0.01 hrs, 10001 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 1: Subarea 1 Runoff Area=3.160 ac 13.23% Impervious Runoff Depth=2.55"
Flow Length=660' Tc=9.5 min CN=80 Runoff=8.38 cfs 0.671 af

Subcatchment 1S: BASIN 1 (Ocean Ridge) Runoff Area=2.600 ac 34.62% Impervious Runoff Depth=3.10"
Flow Length=660' Tc=9.9 min CN=86 Runoff=8.20 cfs 0.671 af

Subcatchment 2: Subarea 2 Runoff Area=11.540 ac 3.32% Impervious Runoff Depth=2.38"
Flow Length=1,435' Tc=32.5 min CN=78 Runoff=17.52 cfs 2.285 af

Subcatchment 3: Sub 3 Runoff Area=0.300 ac 30.67% Impervious Runoff Depth=3.10"
Flow Length=300' Tc=9.4 min CN=86 Runoff=0.96 cfs 0.077 af

Subcatchment 4: Subarea 4 Runoff Area=1.210 ac 0.00% Impervious Runoff Depth=2.29"
Flow Length=250' Tc=9.8 min CN=77 Runoff=2.85 cfs 0.231 af

Subcatchment 5: Subarea 5 Runoff Area=1.820 ac 9.67% Impervious Runoff Depth=2.55"
Flow Length=660' Tc=11.0 min CN=80 Runoff=4.60 cfs 0.386 af

Subcatchment 6: Sub 6 Runoff Area=0.420 ac 23.00% Impervious Runoff Depth=2.91"
Flow Length=235' Tc=4.1 min CN=84 Runoff=1.53 cfs 0.102 af

Subcatchment 100: Subarea 100 Runoff Area=0.220 ac 100.00% Impervious Runoff Depth=4.36"
Flow Length=572' Tc=6.6 min CN=98 Runoff=0.97 cfs 0.080 af

Subcatchment 101S: BASIN 101 (Ocean Ridge) Runoff Area=0.190 ac 57.89% Impervious Runoff Depth=3.49"
Flow Length=155' Tc=6.4 min CN=90 Runoff=0.74 cfs 0.055 af

Subcatchment 300: Subarea 300 Runoff Area=0.090 ac 100.00% Impervious Runoff Depth=4.36"
Flow Length=162' Tc=5.0 min CN=98 Runoff=0.42 cfs 0.033 af

Subcatchment 301S: BASIN 301 (Ocean Ridge) Runoff Area=0.820 ac 45.12% Impervious Runoff Depth=3.29"
Flow Length=190' Tc=9.3 min CN=88 Runoff=2.78 cfs 0.225 af

Subcatchment 302S: BASIN 302 (Ocean Ridge) Runoff Area=1.270 ac 58.27% Impervious Runoff Depth=3.49"
Flow Length=130' Slope=0.0200 '/' Tc=9.1 min CN=90 Runoff=4.55 cfs 0.370 af

Subcatchment 303S: BASIN 3 (Ocean Ridge) Runoff Area=0.580 ac 20.69% Impervious Runoff Depth=2.81"
Flow Length=150' Tc=8.1 min CN=83 Runoff=1.78 cfs 0.136 af

Reach 3R: VEGETATED SWALE 1 (Ocean Ridge) Avg. Flow Depth=0.71' Max Vel=0.73 fps Inflow=4.55 cfs 0.370 af
n=0.150 L=170.0' S=0.0120 '/' Capacity=30.82 cfs Outflow=4.19 cfs 0.370 af

Reach 4R: SP#2 Inflow=2.85 cfs 0.231 af
Outflow=2.85 cfs 0.231 af

Reach 31R: CULVERT 3 (Ocean Ridge) Avg. Flow Depth=0.58' Max Vel=5.06 fps Inflow=2.22 cfs 0.225 af
11.0" Round Pipe n=0.012 L=50.0' S=0.0100 '/' Capacity=3.06 cfs Outflow=2.22 cfs 0.225 af

Reach 32R: VEGETATED SWALE 2 (Ocean Ridge) Avg. Flow Depth=0.54' Max Vel=0.65 fps Inflow=2.78 cfs 0.225 af
n=0.150 L=115.0' S=0.0130 '/' Capacity=32.02 cfs Outflow=2.64 cfs 0.225 af

Reach 33R: Wetland Flow Avg. Flow Depth=0.24' Max Vel=0.78 fps Inflow=2.79 cfs 0.730 af
n=0.035 L=150.0' S=0.0033 '/' Capacity=52.28 cfs Outflow=2.78 cfs 0.730 af

Reach 34R: Woodland Flow Avg. Flow Depth=0.16' Max Vel=2.60 fps Inflow=2.78 cfs 0.730 af
n=0.035 L=1,180.0' S=0.0581 '/' Capacity=108.87 cfs Outflow=2.72 cfs 0.730 af

Reach 106R: SP#1 (Eben Hill Road) Inflow=31.51 cfs 5.090 af
Outflow=31.51 cfs 5.090 af

Pond 3P: POND 3 (Ocean Ridge) Peak Elev=160.74' Storage=10,521 cf Inflow=7.37 cfs 0.730 af
Outflow=2.79 cfs 0.730 af

Pond 30P: POND 30 (Ocean Ridge) Peak Elev=160.73' Storage=1,151 cf Inflow=2.64 cfs 0.225 af
18.0" Round Culvert n=0.012 L=30.0' S=0.0100 '/' Outflow=2.22 cfs 0.225 af

Pond 60R: FIELD CB Peak Elev=90.66' Inflow=1.53 cfs 0.102 af
12.0" Round Culvert n=0.012 L=110.0' S=0.0091 '/' Outflow=1.53 cfs 0.102 af

Pond 62P: Driveway Culvert Peak Elev=89.82' Storage=1,576 cf Inflow=18.90 cfs 3.117 af
Primary=8.42 cfs 2.615 af Secondary=10.43 cfs 0.502 af Outflow=18.85 cfs 3.117 af

Pond 66P: 24" Cross culvert Peak Elev=88.29' Storage=1,462 cf Inflow=20.77 cfs 3.503 af
Primary=20.13 cfs 3.503 af Secondary=0.00 cfs 0.000 af Outflow=20.13 cfs 3.503 af

Pond 100R: Vortech-DMH2 Peak Elev=108.83' Inflow=8.86 cfs 0.726 af
18.0" Round Culvert n=0.012 L=318.0' S=0.0267 '/' Outflow=8.86 cfs 0.726 af

Pond 101R: DMH2-DMH1(DMH1606) Peak Elev=100.21' Inflow=8.86 cfs 0.726 af
18.0" Round Culvert n=0.012 L=177.0' S=0.0391 '/' Outflow=8.86 cfs 0.726 af

Pond 102R: DMH1606-DMH9 Peak Elev=93.13' Inflow=8.86 cfs 0.726 af
18.0" Round Culvert n=0.012 L=110.0' S=0.0185 '/' Outflow=8.86 cfs 0.726 af

Pond 103R: DMH9-DMH8 Peak Elev=95.06' Inflow=18.11 cfs 1.477 af
18.0" Round Culvert n=0.012 L=132.0' S=0.0099 '/' Outflow=18.11 cfs 1.477 af

Pond 104R: DMH8-DMH200 Peak Elev=98.87' Inflow=19.40 cfs 1.587 af
18.0" Round Culvert n=0.012 L=273.0' S=0.0039 '/' Outflow=19.40 cfs 1.587 af

Pond 105R: DMH200-OUTLET Peak Elev=92.48' Inflow=19.40 cfs 1.587 af
18.0" Round Culvert n=0.012 L=60.0' S=0.0400 '/' Outflow=19.40 cfs 1.587 af

Total Runoff Area = 24.220 ac Runoff Volume = 5.321 af Average Runoff Depth = 2.64"
84.66% Pervious = 20.504 ac 15.34% Impervious = 3.716 ac

Summary for Subcatchment 1: Subarea 1

Runoff = 8.38 cfs @ 12.13 hrs, Volume= 0.671 af, Depth= 2.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_10 Rainfall=4.60"

	Area (ac)	CN	Description
	0.290	84	1 acre lots, 20% imp, HSG D
	0.290	87	1/4 acre lots, 38% imp, HSG D
*	0.220	98	Roadway
	2.240	77	Woods, Good, HSG D
*	0.090	80	>75% Grass cover, Good, HSG D (Ocean Ridge)
*	0.030	98	Building, Ocean Ridge
	3.160	80	Weighted Average
	2.742		86.77% Pervious Area
	0.418		13.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	20	0.1500	0.12		**Sheet Flow, Overland Woods** Woods: Light underbrush n= 0.400 P2= 3.00"
1.4	160	0.1500	1.94		**Shallow Concentrated Flow, Overland Woods** Woodland Kv= 5.0 fps
4.9	400	0.0380	1.36		**Shallow Concentrated Flow, Shallow Rd Ditch** Short Grass Pasture Kv= 7.0 fps
0.5	80	0.0200	2.87		**Shallow Concentrated Flow, ROAD GUTTER** Paved Kv= 20.3 fps
9.5	660	Total			

Summary for Subcatchment 1S: BASIN 1 (Ocean Ridge)

Runoff = 8.20 cfs @ 12.14 hrs, Volume= 0.671 af, Depth= 3.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_10 Rainfall=4.60"

	Area (ac)	CN	Description
*	0.900	98	IMPERVIOUS
*	0.380	77	WOODS D
*	1.320	80	LAWN D
	2.600	86	Weighted Average
	1.700		65.38% Pervious Area
	0.900		34.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	50	0.0200	0.10		**Sheet Flow, OVERLAND FLOW**
					Grass: Dense n= 0.240 P2= 3.00"
0.4	140	0.0430	5.46	65.53	**Trap/Vee/Rect Channel Flow, Segment ID: riprap road ditch**
					Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00'
					n= 0.060
0.2	90	0.0550	6.18	74.11	**Trap/Vee/Rect Channel Flow, Segment ID: riprap road ditch**
					Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00'
					n= 0.060
0.8	380	0.0900	7.45	64.10	**Trap/Vee/Rect Channel Flow, Segment ID: riprap road ditch**
					Bot.W=2.00' D=2.00' Z= 2.0 & 0.3 '/' Top.W=6.60'
					n= 0.060
9.9	660	Total			

Summary for Subcatchment 2: Subarea 2

Runoff = 17.52 cfs @ 12.46 hrs, Volume= 2.285 af, Depth= 2.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_10 Rainfall=4.60"

	Area (ac)	CN	Description
	0.640	87	1/4 acre lots, 38% imp, HSG D
*	0.050	98	Roadway
	10.590	77	Woods, Good, HSG D
*	0.040	98	Building, Ocean Ridge
*	0.050	98	Road, Ocean Ridge
*	0.030	77	Woods, Good, HSG D, Ocean Ridge
*	0.140	80	>75% Grass cover, Good, HSG D, Ocean Ridge
	11.540	78	Weighted Average
	11.157		96.68% Pervious Area
	0.383		3.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	110	0.0800	0.13		**Sheet Flow, Overland Woods**
					Woods: Light underbrush n= 0.400 P2= 3.00"
18.8	1,325	0.0550	1.17		**Shallow Concentrated Flow, Overland Woods**
					Woodland Kv= 5.0 fps
32.5	1,435	Total			

Summary for Subcatchment 3: Sub 3

Runoff = 0.96 cfs @ 12.13 hrs, Volume= 0.077 af, Depth= 3.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_10 Rainfall=4.60"

	Area (ac)	CN	Description
*	0.040	98	Paved roads Ocean Ave
	0.260	84	1 acre lots, 20% imp, HSG D
	0.300	86	Weighted Average
	0.208		69.33% Pervious Area
	0.092		30.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	60	0.1000	0.13		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.00"
1.2	160	0.1000	2.21		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
0.5	80	0.0150	2.49		**Shallow Concentrated Flow, C-D** Paved Kv= 20.3 fps
9.4	300	Total			

Summary for Subcatchment 4: Subarea 4

Runoff = 2.85 cfs @ 12.14 hrs, Volume= 0.231 af, Depth= 2.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_10 Rainfall=4.60"

Area (ac)	CN	Description
1.210	77	Woods, Good, HSG D
1.210		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	60	0.1200	0.14		**Sheet Flow, Overland Woods** Woods: Light underbrush n= 0.400 P2= 3.00"
2.6	190	0.0600	1.22		**Shallow Concentrated Flow, Overland Woods** Woodland Kv= 5.0 fps
9.8	250	Total			

Summary for Subcatchment 5: Subarea 5

Runoff = 4.60 cfs @ 12.15 hrs, Volume= 0.386 af, Depth= 2.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_10 Rainfall=4.60"

	Area (ac)	CN	Description
	0.730	84	1 acre lots, 20% imp, HSG D
*	0.030	98	Roadway
	1.060	77	Woods, Good, HSG D
	1.820	80	Weighted Average
	1.644		90.33% Pervious Area
	0.176		9.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	30	0.1500	0.13		**Sheet Flow, Overland Woods**
					Woods: Light underbrush n= 0.400 P2= 3.00"
7.2	630	0.0850	1.46		**Shallow Concentrated Flow, Overland Woods**
					Woodland Kv= 5.0 fps
11.0	660	Total			

Summary for Subcatchment 6: Sub 6

Runoff = 1.53 cfs @ 12.06 hrs, Volume= 0.102 af, Depth= 2.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_10 Rainfall=4.60"

Area (ac)	CN	Description
0.350	84	1 acre lots, 20% imp, HSG D
0.070	87	1/4 acre lots, 38% imp, HSG D
0.420	84	Weighted Average
0.323		77.00% Pervious Area
0.097		23.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	25	0.1500	0.13		**Sheet Flow, A-B**
					Woods: Light underbrush n= 0.400 P2= 3.00"
0.4	60	0.2300	2.40		**Shallow Concentrated Flow, B-C**
					Woodland Kv= 5.0 fps
0.4	150	0.0400	5.86	41.05	**Trap/Vee/Rect Channel Flow, C-D**
					Bot.W=2.00' D=1.00' Z= 5.0 '/' Top.W=12.00'
					n= 0.035 Earth, dense weeds
4.1	235	Total			

Summary for Subcatchment 100: Subarea 100

Runoff = 0.97 cfs @ 12.09 hrs, Volume= 0.080 af, Depth= 4.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_10 Rainfall=4.60"

	Area (ac)	CN	Description
*	0.220	98	Roadway
	0.220		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	12	0.0200	0.87		**Sheet Flow, Road Crown**
					Smooth surfaces n= 0.011 P2= 3.00"
5.9	480	0.0380	1.36		**Shallow Concentrated Flow, SHALLOW RD DITCH**
					Short Grass Pasture Kv= 7.0 fps
0.5	80	0.0200	2.87		**Shallow Concentrated Flow, ROAD GUTTER**
					Paved Kv= 20.3 fps
6.6	572	Total			

Summary for Subcatchment 101S: BASIN 101 (Ocean Ridge)

Runoff = 0.74 cfs @ 12.09 hrs, Volume= 0.055 af, Depth= 3.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_10 Rainfall=4.60"

	Area (ac)	CN	Description
*	0.110	98	IMPERVIOUS
*	0.080	80	LAWN D
	0.190	90	Weighted Average
	0.080		42.11% Pervious Area
	0.110		57.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	30	0.0200	0.09		**Sheet Flow, Segment ID: AB, Lawn**
					Grass: Dense n= 0.240 P2= 3.00"
0.1	25	0.0200	2.87		**Shallow Concentrated Flow, Segment ID: BC,Driveway**
					Paved Kv= 20.3 fps
0.7	100	0.1200	2.42		**Shallow Concentrated Flow, Segment ID: grass slope**
					Short Grass Pasture Kv= 7.0 fps
6.4	155	Total			

Summary for Subcatchment 300: Subarea 300

Runoff = 0.42 cfs @ 12.07 hrs, Volume= 0.033 af, Depth= 4.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_10 Rainfall=4.60"

	Area (ac)	CN	Description
*	0.090	98	Roadway
	0.090		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	12	0.0200	0.87		**Sheet Flow, Road Crown** Smooth surfaces n= 0.011 P2= 3.00"
1.1	150	0.0130	2.31		**Shallow Concentrated Flow, Gutter flow** Paved Kv= 20.3 fps
3.7					**Direct Entry,**
5.0	162	Total			

Summary for Subcatchment 301S: BASIN 301 (Ocean Ridge)

Runoff = 2.78 cfs @ 12.13 hrs, Volume= 0.225 af, Depth= 3.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_10 Rainfall=4.60"

	Area (ac)	CN	Description
*	0.370	98	IMPERVIOUS
*	0.450	80	LAWN D
	0.820	88	Weighted Average
	0.450		54.88% Pervious Area
	0.370		45.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	60	0.0300	0.12		**Sheet Flow, Segment ID: AB** Grass: Dense n= 0.240 P2= 3.00"
0.4	50	0.0200	2.12		**Shallow Concentrated Flow, Segment ID: BC** Grassed Waterway Kv= 15.0 fps
0.6	80	0.0200	2.12		**Shallow Concentrated Flow, Segment ID: CD** Grassed Waterway Kv= 15.0 fps
9.3	190	Total			

Summary for Subcatchment 302S: BASIN 302 (Ocean Ridge)

Runoff = 4.55 cfs @ 12.12 hrs, Volume= 0.370 af, Depth= 3.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_10 Rainfall=4.60"

	Area (ac)	CN	Description
*	0.740	98	IMPERVIOUS
*	0.050	77	WOODS D
*	0.480	80	LAWN D
	1.270	90	Weighted Average
	0.530		41.73% Pervious Area
	0.740		58.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	50	0.0200	0.10		**Sheet Flow, Segment ID: AB** Grass: Dense n= 0.240 P2= 3.00"
0.2	30	0.0200	2.87		**Shallow Concentrated Flow, Segment ID: BC** Paved Kv= 20.3 fps
0.4	50	0.0200	2.12		**Shallow Concentrated Flow, Segment ID:** Grassed Waterway Kv= 15.0 fps
9.1	130	Total			

Summary for Subcatchment 303S: BASIN 3 (Ocean Ridge)

Runoff = 1.78 cfs @ 12.11 hrs, Volume= 0.136 af, Depth= 2.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_10 Rainfall=4.60"

	Area (ac)	CN	Description
*	0.120	98	IMPERVIOUS
*	0.080	77	WOODS D
*	0.380	80	LAWN D
	0.580	83	Weighted Average
	0.460		79.31% Pervious Area
	0.120		20.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	30	0.0300	0.07		**Sheet Flow, Segment ID: AB** Woods: Light underbrush n= 0.400 P2= 3.00"
0.9	120	0.0200	2.12		**Shallow Concentrated Flow, Segment ID: BC** Grassed Waterway Kv= 15.0 fps
8.1	150	Total			

Summary for Reach 3R: VEGETATED SWALE 1 (Ocean Ridge)

Inflow Area = 1.270 ac, 58.27% Impervious, Inflow Depth = 3.49" for Cumberland_10 event
Inflow = 4.55 cfs @ 12.12 hrs, Volume= 0.370 af
Outflow = 4.19 cfs @ 12.23 hrs, Volume= 0.370 af, Atten= 8%, Lag= 6.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs / 3
Max. Velocity= 0.73 fps, Min. Travel Time= 3.9 min
Avg. Velocity = 0.19 fps, Avg. Travel Time= 14.8 min

Peak Storage= 979 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.71'
Bank-Full Depth= 2.00' Flow Area= 24.0 sf, Capacity= 30.82 cfs

6.00' x 2.00' deep channel, n= 0.150
Side Slope Z-value= 3.0 '/' Top Width= 18.00'
Length= 170.0' Slope= 0.0120 '/'
Inlet Invert= 0.00', Outlet Invert= -2.04'

‡

Summary for Reach 4R: SP#2

Inflow Area = 1.210 ac, 0.00% Impervious, Inflow Depth = 2.29" for Cumberland_10 event
Inflow = 2.85 cfs @ 12.14 hrs, Volume= 0.231 af
Outflow = 2.85 cfs @ 12.14 hrs, Volume= 0.231 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

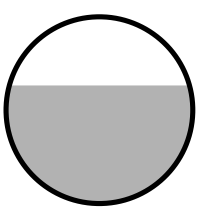
Summary for Reach 31R: CULVERT 3 (Ocean Ridge)

Inflow Area = 0.820 ac, 45.12% Impervious, Inflow Depth = 3.29" for Cumberland_10 event
Inflow = 2.22 cfs @ 12.28 hrs, Volume= 0.225 af
Outflow = 2.22 cfs @ 12.29 hrs, Volume= 0.225 af, Atten= 0%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 5.06 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.16 fps, Avg. Travel Time= 0.7 min

Peak Storage= 22 cf @ 12.29 hrs
Average Depth at Peak Storage= 0.58'
Bank-Full Depth= 0.92' Flow Area= 0.7 sf, Capacity= 3.06 cfs

11.0" Round Pipe
n= 0.012
Length= 50.0' Slope= 0.0100 '/'
Inlet Invert= 0.00', Outlet Invert= -0.50'



Summary for Reach 32R: VEGETATED SWALE 2 (Ocean Ridge)

Inflow Area = 0.820 ac, 45.12% Impervious, Inflow Depth = 3.29" for Cumberland_10 event
Inflow = 2.78 cfs @ 12.13 hrs, Volume= 0.225 af
Outflow = 2.64 cfs @ 12.21 hrs, Volume= 0.225 af, Atten= 5%, Lag= 5.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.65 fps, Min. Travel Time= 3.0 min
Avg. Velocity = 0.17 fps, Avg. Travel Time= 11.0 min

Peak Storage= 470 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.54'
Bank-Full Depth= 2.00' Flow Area= 24.0 sf, Capacity= 32.02 cfs

6.00' x 2.00' deep channel, n= 0.150
Side Slope Z-value= 3.0 '/' Top Width= 18.00'
Length= 115.0' Slope= 0.0130 '/'
Inlet Invert= 0.00', Outlet Invert= -1.49'

‡

Summary for Reach 33R: Wetland Flow

Inflow Area = 2.670 ac, 46.07% Impervious, Inflow Depth = 3.28" for Cumberland_10 event
Inflow = 2.79 cfs @ 12.62 hrs, Volume= 0.730 af
Outflow = 2.78 cfs @ 12.71 hrs, Volume= 0.730 af, Atten= 0%, Lag= 5.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.78 fps, Min. Travel Time= 3.2 min
Avg. Velocity = 0.19 fps, Avg. Travel Time= 13.5 min

Peak Storage= 532 cf @ 12.66 hrs
Average Depth at Peak Storage= 0.24'
Bank-Full Depth= 1.00' Flow Area= 30.0 sf, Capacity= 52.28 cfs

10.00' x 1.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 20.0 '/' Top Width= 50.00'
Length= 150.0' Slope= 0.0033 '/'
Inlet Invert= 158.00', Outlet Invert= 157.50'

‡

Summary for Reach 34R: Woodland Flow

Inflow Area = 2.670 ac, 46.07% Impervious, Inflow Depth = 3.28" for Cumberland_10 event
Inflow = 2.78 cfs @ 12.71 hrs, Volume= 0.730 af
Outflow = 2.72 cfs @ 12.95 hrs, Volume= 0.730 af, Atten= 2%, Lag= 14.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.60 fps, Min. Travel Time= 7.6 min
Avg. Velocity = 0.71 fps, Avg. Travel Time= 27.8 min

Peak Storage= 1,236 cf @ 12.82 hrs
Average Depth at Peak Storage= 0.16'
Bank-Full Depth= 1.00' Flow Area= 15.0 sf, Capacity= 108.87 cfs

5.00' x 1.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 10.0 '/' Top Width= 25.00'
Length= 1,180.0' Slope= 0.0581 '/'
Inlet Invert= 157.50', Outlet Invert= 89.00'

‡

Summary for Reach 106R: SP#1 (Eben Hill Road)

Inflow Area = 23.010 ac, 16.15% Impervious, Inflow Depth = 2.65" for Cumberland_10 event
Inflow = 31.51 cfs @ 12.16 hrs, Volume= 5.090 af
Outflow = 31.51 cfs @ 12.16 hrs, Volume= 5.090 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Summary for Pond 3P: POND 3 (Ocean Ridge)

Inflow Area = 2.670 ac, 46.07% Impervious, Inflow Depth = 3.28" for Cumberland_10 event
Inflow = 7.37 cfs @ 12.24 hrs, Volume= 0.730 af
Outflow = 2.79 cfs @ 12.62 hrs, Volume= 0.730 af, Atten= 62%, Lag= 22.9 min
Primary = 2.79 cfs @ 12.62 hrs, Volume= 0.730 af

Routing by Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Peak Elev= 160.74' @ 12.62 hrs Surf.Area= 5,209 sf Storage= 10,521 cf

Plug-Flow detention time= 75.9 min calculated for 0.730 af (100% of inflow)
Center-of-Mass det. time= 76.0 min (896.4 - 820.4)

Volume	Invert	Avail.Storage	Storage Description
#1	158.00'	21,813 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
158.00	2,113	0	0
160.00	4,304	6,417	6,417
162.00	6,739	11,043	17,460
162.60	7,772	4,353	21,813

Device	Routing	Invert	Outlet Devices
#1	Primary	158.00'	**6.0" Vert. Orifice/Grate** C= 0.600
#2	Primary	160.00'	**9.0" Vert. Orifice/Grate** C= 0.600
#3	Primary	161.00'	**4.5" Vert. Orifice/Grate** C= 0.600
#4	Primary	161.50'	**20.0' long Broad-Crested Rectangular Weir X 1.81** Head (feet) 0.50 1.00 1.50 Coef. (English) 1.60 1.80 1.90

Primary OutFlow Max=2.79 cfs @ 12.62 hrs HW=160.74' (Free Discharge)
1=Orifice/Grate (Orifice Controls 1.49 cfs @ 7.60 fps)
2=Orifice/Grate (Orifice Controls 1.29 cfs @ 2.94 fps)
3=Orifice/Grate (Controls 0.00 cfs)
4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 30P: POND 30 (Ocean Ridge)

Inflow Area = 0.820 ac, 45.12% Impervious, Inflow Depth = 3.29" for Cumberland_10 event
Inflow = 2.64 cfs @ 12.21 hrs, Volume= 0.225 af
Outflow = 2.22 cfs @ 12.28 hrs, Volume= 0.225 af, Atten= 16%, Lag= 4.5 min
Primary = 2.22 cfs @ 12.28 hrs, Volume= 0.225 af

Routing by Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Peak Elev= 160.73' @ 12.28 hrs Surf.Area= 1,462 sf Storage= 1,151 cf

Plug-Flow detention time= 25.9 min calculated for 0.225 af (100% of inflow)
Center-of-Mass det. time= 26.0 min (839.7 - 813.7)

Volume	Invert	Avail.Storage	Storage Description
#1	160.00'	3,156 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
160.00	1,150	0	0
162.00	2,006	3,156	3,156

Device	Routing	Invert	Outlet Devices
#1	Primary	160.00'	**18.0" Round Culvert** L= 30.0' Ke= 0.500 Inlet / Outlet Invert= 160.00' / 159.70' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=2.22 cfs @ 12.28 hrs HW=160.73' (Free Discharge)
1=Culvert (Barrel Controls 2.22 cfs @ 3.82 fps)

Summary for Pond 60R: FIELD CB

Inflow Area = 0.420 ac, 23.00% Impervious, Inflow Depth = 2.91" for Cumberland_10 event
Inflow = 1.53 cfs @ 12.06 hrs, Volume= 0.102 af
Outflow = 1.53 cfs @ 12.06 hrs, Volume= 0.102 af, Atten= 0%, Lag= 0.0 min
Primary = 1.53 cfs @ 12.06 hrs, Volume= 0.102 af

Routing by Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Peak Elev= 90.66' @ 12.06 hrs
Flood Elev= 91.81'

Device	Routing	Invert	Outlet Devices
#1	Primary	90.00'	**12.0" Round Culvert** L= 110.0' Square-edged headwall, Ke= 0.500 Inlet / Outlet Invert= 90.00' / 89.00' S= 0.0091 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=1.52 cfs @ 12.06 hrs HW=90.66' (Free Discharge)
└**1=Culvert** (Inlet Controls 1.52 cfs @ 2.77 fps)

Summary for Pond 62P: Driveway Culvert

Inflow Area = 14.630 ac, 11.69% Impervious, Inflow Depth = 2.56" for Cumberland_10 event
Inflow = 18.90 cfs @ 12.46 hrs, Volume= 3.117 af
Outflow = 18.85 cfs @ 12.48 hrs, Volume= 3.117 af, Atten= 0%, Lag= 1.0 min
Primary = 8.42 cfs @ 12.48 hrs, Volume= 2.615 af
Secondary = 10.43 cfs @ 12.48 hrs, Volume= 0.502 af

Routing by Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Peak Elev= 89.82' @ 12.48 hrs Surf.Area= 3,038 sf Storage= 1,576 cf

Plug-Flow detention time= 0.8 min calculated for 3.116 af (100% of inflow)
Center-of-Mass det. time= 0.8 min (871.1 - 870.3)

Volume	Invert	Avail.Storage	Storage Description
#1	88.00'	2,197 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
88.00	47	50.0	0	0	47
89.00	540	284.0	249	249	6,269
90.00	3,860	500.0	1,948	2,197	19,750

Device	Routing	Invert	Outlet Devices
#1	Primary	87.50'	**18.0" Round Culvert** L= 35.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 87.50' / 87.00' S= 0.0143 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Secondary	89.50'	**22.0' long x 13.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.60 2.64 2.70 2.66 2.65 2.66 2.65 2.63

Primary OutFlow Max=8.42 cfs @ 12.48 hrs HW=89.82' (Free Discharge)
↑**1=Culvert** (Inlet Controls 8.42 cfs @ 4.76 fps)

Secondary OutFlow Max=10.43 cfs @ 12.48 hrs HW=89.82' (Free Discharge)
↑**2=Broad-Crested Rectangular Weir** (Weir Controls 10.43 cfs @ 1.48 fps)

Summary for Pond 66P: 24" Cross culvert

Inflow Area = 16.450 ac, 11.46% Impervious, Inflow Depth = 2.56" for Cumberland_10 event
Inflow = 20.77 cfs @ 12.46 hrs, Volume= 3.503 af
Outflow = 20.13 cfs @ 12.54 hrs, Volume= 3.503 af, Atten= 3%, Lag= 4.7 min
Primary = 20.13 cfs @ 12.54 hrs, Volume= 3.503 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs / 4
Peak Elev= 88.29' @ 12.54 hrs Surf.Area= 1,567 sf Storage= 1,462 cf

Plug-Flow detention time= 0.5 min calculated for 3.503 af (100% of inflow)
Center-of-Mass det. time= 0.3 min (866.9 - 866.5)

Volume	Invert	Avail.Storage	Storage Description
#1	84.00'	1,817 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
84.00	5	5.0	0	0	5
85.00	25	25.0	14	14	55
86.00	63	40.0	43	56	139
87.00	425	195.0	217	273	3,040
88.00	1,210	305.0	784	1,058	7,424
88.50	1,850	330.0	759	1,817	8,697

Device	Routing	Invert	Outlet Devices
#1	Primary	84.45'	**24.0" Round Culvert** L= 65.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 84.45' / 84.13' S= 0.0049 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf
#2	Secondary	88.50'	**12.0' long x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64

Primary OutFlow Max=20.13 cfs @ 12.54 hrs HW=88.29' (Free Discharge)
↑**1=Culvert** (Inlet Controls 20.13 cfs @ 6.41 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=84.00' (Free Discharge)
↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 100R: Vortech-DMH2

Inflow Area = 2.790 ac, 36.20% Impervious, Inflow Depth = 3.12" for Cumberland_10 event
Inflow = 8.86 cfs @ 12.13 hrs, Volume= 0.726 af
Outflow = 8.86 cfs @ 12.13 hrs, Volume= 0.726 af, Atten= 0%, Lag= 0.0 min
Primary = 8.86 cfs @ 12.13 hrs, Volume= 0.726 af

Routing by Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Peak Elev= 108.83' @ 12.13 hrs
Flood Elev= 112.16'

Device	Routing	Invert	Outlet Devices
#1	Primary	107.00'	**18.0" Round Culvert** L= 318.0' Ke= 0.500 Inlet / Outlet Invert= 107.00' / 98.52' S= 0.0267 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=8.85 cfs @ 12.13 hrs HW=108.83' (Free Discharge)
└─**1=Culvert** (Inlet Controls 8.85 cfs @ 5.01 fps)

Summary for Pond 101R: DMH2-DMH1(DMH1606)

Inflow Area = 2.790 ac, 36.20% Impervious, Inflow Depth = 3.12" for Cumberland_10 event
Inflow = 8.86 cfs @ 12.13 hrs, Volume= 0.726 af
Outflow = 8.86 cfs @ 12.13 hrs, Volume= 0.726 af, Atten= 0%, Lag= 0.0 min
Primary = 8.86 cfs @ 12.13 hrs, Volume= 0.726 af

Routing by Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Peak Elev= 100.21' @ 12.13 hrs
Flood Elev= 103.21'

Device	Routing	Invert	Outlet Devices
#1	Primary	98.38'	**18.0" Round Culvert** L= 177.0' Ke= 0.500 Inlet / Outlet Invert= 98.38' / 91.46' S= 0.0391 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=8.85 cfs @ 12.13 hrs HW=100.21' (Free Discharge)
└─**1=Culvert** (Inlet Controls 8.85 cfs @ 5.01 fps)

Summary for Pond 102R: DMH1606-DMH9

Inflow Area = 2.790 ac, 36.20% Impervious, Inflow Depth = 3.12" for Cumberland_10 event
Inflow = 8.86 cfs @ 12.13 hrs, Volume= 0.726 af
Outflow = 8.86 cfs @ 12.13 hrs, Volume= 0.726 af, Atten= 0%, Lag= 0.0 min
Primary = 8.86 cfs @ 12.13 hrs, Volume= 0.726 af

Routing by Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Peak Elev= 93.13' @ 12.13 hrs
Flood Elev= 96.40'

Device	Routing	Invert	Outlet Devices
#1	Primary	91.30'	**18.0" Round Culvert** L= 110.0' RCP, square edge headwall, Ke= 0.500

Inlet / Outlet Invert= 91.30' / 89.27' S= 0.0185 '/' Cc= 0.900
n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf

Primary OutFlow Max=8.85 cfs @ 12.13 hrs HW=93.13' (Free Discharge)
└─**1=Culvert** (Inlet Controls 8.85 cfs @ 5.01 fps)

Summary for Pond 103R: DMH9-DMH8

Inflow Area = 6.170 ac, 26.71% Impervious, Inflow Depth = 2.87" for Cumberland_10 event
Inflow = 18.11 cfs @ 12.13 hrs, Volume= 1.477 af
Outflow = 18.11 cfs @ 12.13 hrs, Volume= 1.477 af, Atten= 0%, Lag= 0.0 min
Primary = 18.11 cfs @ 12.13 hrs, Volume= 1.477 af

Routing by Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Peak Elev= 95.06' @ 12.13 hrs
Flood Elev= 94.51'

Device	Routing	Invert	Outlet Devices
#1	Primary	89.07'	**18.0" Round Culvert** L= 132.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 89.07' / 87.76' S= 0.0099 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf

Primary OutFlow Max=18.11 cfs @ 12.13 hrs HW=95.06' (Free Discharge)
└─**1=Culvert** (Barrel Controls 18.11 cfs @ 10.25 fps)

Summary for Pond 104R: DMH8-DMH200

Inflow Area = 6.560 ac, 27.90% Impervious, Inflow Depth = 2.90" for Cumberland_10 event
Inflow = 19.40 cfs @ 12.13 hrs, Volume= 1.587 af
Outflow = 19.40 cfs @ 12.13 hrs, Volume= 1.587 af, Atten= 0%, Lag= 0.0 min
Primary = 19.40 cfs @ 12.13 hrs, Volume= 1.587 af

Routing by Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Peak Elev= 98.87' @ 12.13 hrs
Flood Elev= 92.36'

Device	Routing	Invert	Outlet Devices
#1	Primary	87.66'	**18.0" Round Culvert** L= 273.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 87.66' / 86.60' S= 0.0039 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf

Primary OutFlow Max=19.39 cfs @ 12.13 hrs HW=98.86' (Free Discharge)
└─**1=Culvert** (Barrel Controls 19.39 cfs @ 10.97 fps)

Summary for Pond 105R: DMH200-OUTLET

Inflow Area = 6.560 ac, 27.90% Impervious, Inflow Depth = 2.90" for Cumberland_10 event
Inflow = 19.40 cfs @ 12.13 hrs, Volume= 1.587 af
Outflow = 19.40 cfs @ 12.13 hrs, Volume= 1.587 af, Atten= 0%, Lag= 0.0 min
Primary = 19.40 cfs @ 12.13 hrs, Volume= 1.587 af

Routing by Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Peak Elev= 92.48' @ 12.13 hrs
Flood Elev= 89.25'

Device	Routing	Invert	Outlet Devices
#1	Primary	86.53'	**18.0" Round Culvert** L= 60.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 86.53' / 84.13' S= 0.0400 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=19.39 cfs @ 12.13 hrs HW=92.47' (Free Discharge)
└─**1=Culvert** (Inlet Controls 19.39 cfs @ 10.97 fps)

Time span=0.00-100.00 hrs, dt=0.01 hrs, 10001 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 1: Subarea 1 Runoff Area=3.160 ac 13.23% Impervious Runoff Depth=3.60"
Flow Length=660' Tc=9.5 min CN=80 Runoff=11.82 cfs 0.948 af

Subcatchment 1S: BASIN 1 (Ocean Ridge) Runoff Area=2.600 ac 34.62% Impervious Runoff Depth=4.22"
Flow Length=660' Tc=9.9 min CN=86 Runoff=11.06 cfs 0.914 af

Subcatchment 2: Subarea 2 Runoff Area=11.540 ac 3.32% Impervious Runoff Depth=3.40"
Flow Length=1,435' Tc=32.5 min CN=78 Runoff=25.13 cfs 3.272 af

Subcatchment 3: Sub 3 Runoff Area=0.300 ac 30.67% Impervious Runoff Depth=4.22"
Flow Length=300' Tc=9.4 min CN=86 Runoff=1.30 cfs 0.105 af

Subcatchment 4: Subarea 4 Runoff Area=1.210 ac 0.00% Impervious Runoff Depth=3.31"
Flow Length=250' Tc=9.8 min CN=77 Runoff=4.12 cfs 0.333 af

Subcatchment 5: Subarea 5 Runoff Area=1.820 ac 9.67% Impervious Runoff Depth=3.60"
Flow Length=660' Tc=11.0 min CN=80 Runoff=6.49 cfs 0.546 af

Subcatchment 6: Sub 6 Runoff Area=0.420 ac 23.00% Impervious Runoff Depth=4.01"
Flow Length=235' Tc=4.1 min CN=84 Runoff=2.09 cfs 0.140 af

Subcatchment 100: Subarea 100 Runoff Area=0.220 ac 100.00% Impervious Runoff Depth=5.56"
Flow Length=572' Tc=6.6 min CN=98 Runoff=1.23 cfs 0.102 af

Subcatchment 101S: BASIN 101 (Ocean Ridge) Runoff Area=0.190 ac 57.89% Impervious Runoff Depth=4.65"
Flow Length=155' Tc=6.4 min CN=90 Runoff=0.98 cfs 0.074 af

Subcatchment 300: Subarea 300 Runoff Area=0.090 ac 100.00% Impervious Runoff Depth=5.56"
Flow Length=162' Tc=5.0 min CN=98 Runoff=0.53 cfs 0.042 af

Subcatchment 301S: BASIN 301 (Ocean Ridge) Runoff Area=0.820 ac 45.12% Impervious Runoff Depth=4.43"
Flow Length=190' Tc=9.3 min CN=88 Runoff=3.69 cfs 0.303 af

Subcatchment 302S: BASIN 302 (Ocean Ridge) Runoff Area=1.270 ac 58.27% Impervious Runoff Depth=4.65"
Flow Length=130' Slope=0.0200 '/' Tc=9.1 min CN=90 Runoff=5.97 cfs 0.492 af

Subcatchment 303S: BASIN 3 (Ocean Ridge) Runoff Area=0.580 ac 20.69% Impervious Runoff Depth=3.91"
Flow Length=150' Tc=8.1 min CN=83 Runoff=2.45 cfs 0.189 af

Reach 3R: VEGETATED SWALE 1 (Ocean Ridge) Avg. Flow Depth=0.83' Max Vel=0.79 fps Inflow=5.97 cfs 0.492 af
n=0.150 L=170.0' S=0.0120 '/' Capacity=30.82 cfs Outflow=5.56 cfs 0.492 af

Reach 4R: SP#2 Inflow=4.12 cfs 0.333 af
Outflow=4.12 cfs 0.333 af

Reach 31R: CULVERT 3 (Ocean Ridge) Avg. Flow Depth=0.75' Max Vel=5.29 fps Inflow=3.04 cfs 0.303 af
11.0" Round Pipe n=0.012 L=50.0' S=0.0100 '/' Capacity=3.06 cfs Outflow=3.04 cfs 0.303 af

Reach 32R: VEGETATED SWALE 2 (Ocean Ridge) Avg. Flow Depth=0.63' Max Vel=0.71 fps Inflow=3.69 cfs 0.303 af
n=0.150 L=115.0' S=0.0130 '/' Capacity=32.02 cfs Outflow=3.54 cfs 0.303 af

Reach 33R: Wetland Flow Avg. Flow Depth=0.29' Max Vel=0.87 fps Inflow=3.95 cfs 0.984 af
n=0.035 L=150.0' S=0.0033 '/' Capacity=52.28 cfs Outflow=3.93 cfs 0.984 af

Reach 34R: Woodland Flow Avg. Flow Depth=0.19' Max Vel=2.90 fps Inflow=3.93 cfs 0.984 af
n=0.035 L=1,180.0' S=0.0581 '/' Capacity=108.87 cfs Outflow=3.87 cfs 0.984 af

Reach 106R: SP#1 (Eben Hill Road) Inflow=44.16 cfs 6.887 af
Outflow=44.16 cfs 6.887 af

Pond 3P: POND 3 (Ocean Ridge) Peak Elev=161.33' Storage=13,782 cf Inflow=9.99 cfs 0.984 af
Outflow=3.95 cfs 0.984 af

Pond 30P: POND 30 (Ocean Ridge) Peak Elev=160.88' Storage=1,387 cf Inflow=3.54 cfs 0.303 af
18.0" Round Culvert n=0.012 L=30.0' S=0.0100 '/' Outflow=3.04 cfs 0.303 af

Pond 60R: FIELD CB Peak Elev=90.81' Inflow=2.09 cfs 0.140 af
12.0" Round Culvert n=0.012 L=110.0' S=0.0091 '/' Outflow=2.09 cfs 0.140 af

Pond 62P: Driveway Culvert Peak Elev=89.96' Storage=2,063 cf Inflow=27.39 cfs 4.397 af
Primary=8.80 cfs 3.332 af Secondary=18.54 cfs 1.065 af Outflow=27.33 cfs 4.397 af

Pond 66P: 24" Cross culvert Peak Elev=88.82' Storage=1,817 cf Inflow=29.90 cfs 4.943 af
Primary=21.93 cfs 4.701 af Secondary=5.72 cfs 0.146 af Outflow=27.65 cfs 4.847 af

Pond 100R: Vortech-DMH2 Peak Elev=109.71' Inflow=11.92 cfs 0.988 af
18.0" Round Culvert n=0.012 L=318.0' S=0.0267 '/' Outflow=11.92 cfs 0.988 af

Pond 101R: DMH2-DMH1(DMH1606) Peak Elev=101.09' Inflow=11.92 cfs 0.988 af
18.0" Round Culvert n=0.012 L=177.0' S=0.0391 '/' Outflow=11.92 cfs 0.988 af

Pond 102R: DMH1606-DMH9 Peak Elev=94.01' Inflow=11.92 cfs 0.988 af
18.0" Round Culvert n=0.012 L=110.0' S=0.0185 '/' Outflow=11.92 cfs 0.988 af

Pond 103R: DMH9-DMH8 Peak Elev=100.19' Inflow=24.85 cfs 2.038 af
18.0" Round Culvert n=0.012 L=132.0' S=0.0099 '/' Outflow=24.85 cfs 2.038 af

Pond 104R: DMH8-DMH200 Peak Elev=108.29' Inflow=26.56 cfs 2.185 af
18.0" Round Culvert n=0.012 L=273.0' S=0.0039 '/' Outflow=26.56 cfs 2.185 af

Pond 105R: DMH200-OUTLET Peak Elev=97.03' Inflow=26.56 cfs 2.185 af
18.0" Round Culvert n=0.012 L=60.0' S=0.0400 '/' Outflow=26.56 cfs 2.185 af

Total Runoff Area = 24.220 ac Runoff Volume = 7.462 af Average Runoff Depth = 3.70"
84.66% Pervious = 20.504 ac 15.34% Impervious = 3.716 ac

Summary for Subcatchment 1: Subarea 1

Runoff = 11.82 cfs @ 12.13 hrs, Volume= 0.948 af, Depth= 3.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_25 Rainfall=5.80"

	Area (ac)	CN	Description
	0.290	84	1 acre lots, 20% imp, HSG D
	0.290	87	1/4 acre lots, 38% imp, HSG D
*	0.220	98	Roadway
	2.240	77	Woods, Good, HSG D
*	0.090	80	>75% Grass cover, Good, HSG D (Ocean Ridge)
*	0.030	98	Building, Ocean Ridge
	3.160	80	Weighted Average
	2.742		86.77% Pervious Area
	0.418		13.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	20	0.1500	0.12		**Sheet Flow, Overland Woods** Woods: Light underbrush n= 0.400 P2= 3.00"
1.4	160	0.1500	1.94		**Shallow Concentrated Flow, Overland Woods** Woodland Kv= 5.0 fps
4.9	400	0.0380	1.36		**Shallow Concentrated Flow, Shallow Rd Ditch** Short Grass Pasture Kv= 7.0 fps
0.5	80	0.0200	2.87		**Shallow Concentrated Flow, ROAD GUTTER** Paved Kv= 20.3 fps
9.5	660	Total			

Summary for Subcatchment 1S: BASIN 1 (Ocean Ridge)

Runoff = 11.06 cfs @ 12.13 hrs, Volume= 0.914 af, Depth= 4.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_25 Rainfall=5.80"

	Area (ac)	CN	Description
*	0.900	98	IMPERVIOUS
*	0.380	77	WOODS D
*	1.320	80	LAWN D
	2.600	86	Weighted Average
	1.700		65.38% Pervious Area
	0.900		34.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	50	0.0200	0.10		**Sheet Flow, OVERLAND FLOW**
					Grass: Dense n= 0.240 P2= 3.00"
0.4	140	0.0430	5.46	65.53	**Trap/Vee/Rect Channel Flow, Segment ID: riprap road ditch**
					Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00'
					n= 0.060
0.2	90	0.0550	6.18	74.11	**Trap/Vee/Rect Channel Flow, Segment ID: riprap road ditch**
					Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00'
					n= 0.060
0.8	380	0.0900	7.45	64.10	**Trap/Vee/Rect Channel Flow, Segment ID: riprap road ditch**
					Bot.W=2.00' D=2.00' Z= 2.0 & 0.3 '/' Top.W=6.60'
					n= 0.060
9.9	660	Total			

Summary for Subcatchment 2: Subarea 2

Runoff = 25.13 cfs @ 12.46 hrs, Volume= 3.272 af, Depth= 3.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_25 Rainfall=5.80"

	Area (ac)	CN	Description
	0.640	87	1/4 acre lots, 38% imp, HSG D
*	0.050	98	Roadway
	10.590	77	Woods, Good, HSG D
*	0.040	98	Building, Ocean Ridge
*	0.050	98	Road, Ocean Ridge
*	0.030	77	Woods, Good, HSG D, Ocean Ridge
*	0.140	80	>75% Grass cover, Good, HSG D, Ocean Ridge
	11.540	78	Weighted Average
	11.157		96.68% Pervious Area
	0.383		3.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	110	0.0800	0.13		**Sheet Flow, Overland Woods**
					Woods: Light underbrush n= 0.400 P2= 3.00"
18.8	1,325	0.0550	1.17		**Shallow Concentrated Flow, Overland Woods**
					Woodland Kv= 5.0 fps
32.5	1,435	Total			

Summary for Subcatchment 3: Sub 3

Runoff = 1.30 cfs @ 12.13 hrs, Volume= 0.105 af, Depth= 4.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_25 Rainfall=5.80"

	Area (ac)	CN	Description
*	0.040	98	Paved roads Ocean Ave
	0.260	84	1 acre lots, 20% imp, HSG D
	0.300	86	Weighted Average
	0.208		69.33% Pervious Area
	0.092		30.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	60	0.1000	0.13		**Sheet Flow, A-B**
					Woods: Light underbrush n= 0.400 P2= 3.00"
1.2	160	0.1000	2.21		**Shallow Concentrated Flow, B-C**
					Short Grass Pasture Kv= 7.0 fps
0.5	80	0.0150	2.49		**Shallow Concentrated Flow, C-D**
					Paved Kv= 20.3 fps
9.4	300	Total			

Summary for Subcatchment 4: Subarea 4

Runoff = 4.12 cfs @ 12.14 hrs, Volume= 0.333 af, Depth= 3.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_25 Rainfall=5.80"

Area (ac)	CN	Description
1.210	77	Woods, Good, HSG D
1.210		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	60	0.1200	0.14		**Sheet Flow, Overland Woods**
					Woods: Light underbrush n= 0.400 P2= 3.00"
2.6	190	0.0600	1.22		**Shallow Concentrated Flow, Overland Woods**
					Woodland Kv= 5.0 fps
9.8	250	Total			

Summary for Subcatchment 5: Subarea 5

Runoff = 6.49 cfs @ 12.15 hrs, Volume= 0.546 af, Depth= 3.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_25 Rainfall=5.80"

	Area (ac)	CN	Description
	0.730	84	1 acre lots, 20% imp, HSG D
*	0.030	98	Roadway
	1.060	77	Woods, Good, HSG D
	1.820	80	Weighted Average
	1.644		90.33% Pervious Area
	0.176		9.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	30	0.1500	0.13		**Sheet Flow, Overland Woods**
					Woods: Light underbrush n= 0.400 P2= 3.00"
7.2	630	0.0850	1.46		**Shallow Concentrated Flow, Overland Woods**
					Woodland Kv= 5.0 fps
11.0	660	Total			

Summary for Subcatchment 6: Sub 6

Runoff = 2.09 cfs @ 12.06 hrs, Volume= 0.140 af, Depth= 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_25 Rainfall=5.80"

Area (ac)	CN	Description
0.350	84	1 acre lots, 20% imp, HSG D
0.070	87	1/4 acre lots, 38% imp, HSG D
0.420	84	Weighted Average
0.323		77.00% Pervious Area
0.097		23.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	25	0.1500	0.13		**Sheet Flow, A-B**
					Woods: Light underbrush n= 0.400 P2= 3.00"
0.4	60	0.2300	2.40		**Shallow Concentrated Flow, B-C**
					Woodland Kv= 5.0 fps
0.4	150	0.0400	5.86	41.05	**Trap/Vee/Rect Channel Flow, C-D**
					Bot.W=2.00' D=1.00' Z= 5.0 '/' Top.W=12.00'
					n= 0.035 Earth, dense weeds
4.1	235	Total			

Summary for Subcatchment 100: Subarea 100

Runoff = 1.23 cfs @ 12.09 hrs, Volume= 0.102 af, Depth= 5.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_25 Rainfall=5.80"

	Area (ac)	CN	Description
*	0.220	98	Roadway
	0.220		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	12	0.0200	0.87		**Sheet Flow, Road Crown**
					Smooth surfaces n= 0.011 P2= 3.00"
5.9	480	0.0380	1.36		**Shallow Concentrated Flow, SHALLOW RD DITCH**
					Short Grass Pasture Kv= 7.0 fps
0.5	80	0.0200	2.87		**Shallow Concentrated Flow, ROAD GUTTER**
					Paved Kv= 20.3 fps
6.6	572	Total			

Summary for Subcatchment 101S: BASIN 101 (Ocean Ridge)

Runoff = 0.98 cfs @ 12.09 hrs, Volume= 0.074 af, Depth= 4.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_25 Rainfall=5.80"

	Area (ac)	CN	Description
*	0.110	98	IMPERVIOUS
*	0.080	80	LAWN D
	0.190	90	Weighted Average
	0.080		42.11% Pervious Area
	0.110		57.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	30	0.0200	0.09		**Sheet Flow, Segment ID: AB, Lawn**
					Grass: Dense n= 0.240 P2= 3.00"
0.1	25	0.0200	2.87		**Shallow Concentrated Flow, Segment ID: BC,Driveway**
					Paved Kv= 20.3 fps
0.7	100	0.1200	2.42		**Shallow Concentrated Flow, Segment ID: grass slope**
					Short Grass Pasture Kv= 7.0 fps
6.4	155	Total			

Summary for Subcatchment 300: Subarea 300

Runoff = 0.53 cfs @ 12.07 hrs, Volume= 0.042 af, Depth= 5.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_25 Rainfall=5.80"

	Area (ac)	CN	Description
*	0.090	98	Roadway
	0.090		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	12	0.0200	0.87		**Sheet Flow, Road Crown** Smooth surfaces n= 0.011 P2= 3.00"
1.1	150	0.0130	2.31		**Shallow Concentrated Flow, Gutter flow** Paved Kv= 20.3 fps
3.7					**Direct Entry,**
5.0	162	Total			

Summary for Subcatchment 301S: BASIN 301 (Ocean Ridge)

Runoff = 3.69 cfs @ 12.13 hrs, Volume= 0.303 af, Depth= 4.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_25 Rainfall=5.80"

	Area (ac)	CN	Description
*	0.370	98	IMPERVIOUS
*	0.450	80	LAWN D
	0.820	88	Weighted Average
	0.450		54.88% Pervious Area
	0.370		45.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	60	0.0300	0.12		**Sheet Flow, Segment ID: AB** Grass: Dense n= 0.240 P2= 3.00"
0.4	50	0.0200	2.12		**Shallow Concentrated Flow, Segment ID: BC** Grassed Waterway Kv= 15.0 fps
0.6	80	0.0200	2.12		**Shallow Concentrated Flow, Segment ID: CD** Grassed Waterway Kv= 15.0 fps
9.3	190	Total			

Summary for Subcatchment 302S: BASIN 302 (Ocean Ridge)

Runoff = 5.97 cfs @ 12.12 hrs, Volume= 0.492 af, Depth= 4.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_25 Rainfall=5.80"

	Area (ac)	CN	Description
*	0.740	98	IMPERVIOUS
*	0.050	77	WOODS D
*	0.480	80	LAWN D
	1.270	90	Weighted Average
	0.530		41.73% Pervious Area
	0.740		58.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	50	0.0200	0.10		**Sheet Flow, Segment ID: AB**
					Grass: Dense n= 0.240 P2= 3.00"
0.2	30	0.0200	2.87		**Shallow Concentrated Flow, Segment ID: BC**
					Paved Kv= 20.3 fps
0.4	50	0.0200	2.12		**Shallow Concentrated Flow, Segment ID:**
					Grassed Waterway Kv= 15.0 fps
9.1	130	Total			

Summary for Subcatchment 303S: BASIN 3 (Ocean Ridge)

Runoff = 2.45 cfs @ 12.11 hrs, Volume= 0.189 af, Depth= 3.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_25 Rainfall=5.80"

	Area (ac)	CN	Description
*	0.120	98	IMPERVIOUS
*	0.080	77	WOODS D
*	0.380	80	LAWN D
	0.580	83	Weighted Average
	0.460		79.31% Pervious Area
	0.120		20.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	30	0.0300	0.07		**Sheet Flow, Segment ID: AB**
					Woods: Light underbrush n= 0.400 P2= 3.00"
0.9	120	0.0200	2.12		**Shallow Concentrated Flow, Segment ID: BC**
					Grassed Waterway Kv= 15.0 fps
8.1	150	Total			

Summary for Reach 3R: VEGETATED SWALE 1 (Ocean Ridge)

Inflow Area = 1.270 ac, 58.27% Impervious, Inflow Depth = 4.65" for Cumberland_25 event
Inflow = 5.97 cfs @ 12.12 hrs, Volume= 0.492 af
Outflow = 5.56 cfs @ 12.22 hrs, Volume= 0.492 af, Atten= 7%, Lag= 5.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs / 3
Max. Velocity= 0.79 fps, Min. Travel Time= 3.6 min
Avg. Velocity = 0.21 fps, Avg. Travel Time= 13.6 min

Peak Storage= 1,192 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.83'
Bank-Full Depth= 2.00' Flow Area= 24.0 sf, Capacity= 30.82 cfs

6.00' x 2.00' deep channel, n= 0.150
Side Slope Z-value= 3.0 '/' Top Width= 18.00'
Length= 170.0' Slope= 0.0120 '/'
Inlet Invert= 0.00', Outlet Invert= -2.04'

‡

Summary for Reach 4R: SP#2

Inflow Area = 1.210 ac, 0.00% Impervious, Inflow Depth = 3.31" for Cumberland_25 event
Inflow = 4.12 cfs @ 12.14 hrs, Volume= 0.333 af
Outflow = 4.12 cfs @ 12.14 hrs, Volume= 0.333 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

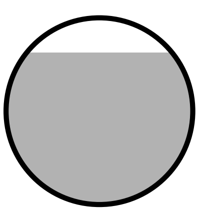
Summary for Reach 31R: CULVERT 3 (Ocean Ridge)

Inflow Area = 0.820 ac, 45.12% Impervious, Inflow Depth = 4.43" for Cumberland_25 event
Inflow = 3.04 cfs @ 12.27 hrs, Volume= 0.303 af
Outflow = 3.04 cfs @ 12.28 hrs, Volume= 0.303 af, Atten= 0%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 5.29 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.24 fps, Avg. Travel Time= 0.7 min

Peak Storage= 29 cf @ 12.27 hrs
Average Depth at Peak Storage= 0.75'
Bank-Full Depth= 0.92' Flow Area= 0.7 sf, Capacity= 3.06 cfs

11.0" Round Pipe
n= 0.012
Length= 50.0' Slope= 0.0100 '/'
Inlet Invert= 0.00', Outlet Invert= -0.50'



Summary for Reach 32R: VEGETATED SWALE 2 (Ocean Ridge)

Inflow Area = 0.820 ac, 45.12% Impervious, Inflow Depth = 4.43" for Cumberland_25 event
Inflow = 3.69 cfs @ 12.13 hrs, Volume= 0.303 af
Outflow = 3.54 cfs @ 12.20 hrs, Volume= 0.303 af, Atten= 4%, Lag= 4.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.71 fps, Min. Travel Time= 2.7 min
Avg. Velocity = 0.19 fps, Avg. Travel Time= 10.1 min

Peak Storage= 574 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.63'
Bank-Full Depth= 2.00' Flow Area= 24.0 sf, Capacity= 32.02 cfs

6.00' x 2.00' deep channel, n= 0.150
Side Slope Z-value= 3.0 '/' Top Width= 18.00'
Length= 115.0' Slope= 0.0130 '/'
Inlet Invert= 0.00', Outlet Invert= -1.49'

‡

Summary for Reach 33R: Wetland Flow

Inflow Area = 2.670 ac, 46.07% Impervious, Inflow Depth = 4.42" for Cumberland_25 event
Inflow = 3.95 cfs @ 12.58 hrs, Volume= 0.984 af
Outflow = 3.93 cfs @ 12.67 hrs, Volume= 0.984 af, Atten= 0%, Lag= 5.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.87 fps, Min. Travel Time= 2.9 min
Avg. Velocity = 0.20 fps, Avg. Travel Time= 12.7 min

Peak Storage= 680 cf @ 12.62 hrs
Average Depth at Peak Storage= 0.29'
Bank-Full Depth= 1.00' Flow Area= 30.0 sf, Capacity= 52.28 cfs

10.00' x 1.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 20.0 '/' Top Width= 50.00'
Length= 150.0' Slope= 0.0033 '/'
Inlet Invert= 158.00', Outlet Invert= 157.50'

‡

Summary for Reach 34R: Woodland Flow

Inflow Area = 2.670 ac, 46.07% Impervious, Inflow Depth = 4.42" for Cumberland_25 event
Inflow = 3.93 cfs @ 12.67 hrs, Volume= 0.984 af
Outflow = 3.87 cfs @ 12.87 hrs, Volume= 0.984 af, Atten= 2%, Lag= 12.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.90 fps, Min. Travel Time= 6.8 min
Avg. Velocity = 0.75 fps, Avg. Travel Time= 26.3 min

Peak Storage= 1,576 cf @ 12.76 hrs
Average Depth at Peak Storage= 0.19'
Bank-Full Depth= 1.00' Flow Area= 15.0 sf, Capacity= 108.87 cfs

5.00' x 1.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 10.0 '/' Top Width= 25.00'
Length= 1,180.0' Slope= 0.0581 '/'
Inlet Invert= 157.50', Outlet Invert= 89.00'

‡

Summary for Reach 106R: SP#1 (Eben Hill Road)

Inflow Area = 23.010 ac, 16.15% Impervious, Inflow Depth = 3.59" for Cumberland_25 event
Inflow = 44.16 cfs @ 12.14 hrs, Volume= 6.887 af
Outflow = 44.16 cfs @ 12.14 hrs, Volume= 6.887 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs

Summary for Pond 3P: POND 3 (Ocean Ridge)

Inflow Area = 2.670 ac, 46.07% Impervious, Inflow Depth = 4.42" for Cumberland_25 event
Inflow = 9.99 cfs @ 12.22 hrs, Volume= 0.984 af
Outflow = 3.95 cfs @ 12.58 hrs, Volume= 0.984 af, Atten= 60%, Lag= 21.4 min
Primary = 3.95 cfs @ 12.58 hrs, Volume= 0.984 af

Routing by Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Peak Elev= 161.33' @ 12.58 hrs Surf.Area= 5,928 sf Storage= 13,782 cf

Plug-Flow detention time= 71.5 min calculated for 0.984 af (100% of inflow)
Center-of-Mass det. time= 71.5 min (881.9 - 810.4)

Volume	Invert	Avail.Storage	Storage Description
#1	158.00'	21,813 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
158.00	2,113	0	0
160.00	4,304	6,417	6,417
162.00	6,739	11,043	17,460
162.60	7,772	4,353	21,813

Device	Routing	Invert	Outlet Devices
#1	Primary	158.00'	**6.0" Vert. Orifice/Grate** C= 0.600
#2	Primary	160.00'	**9.0" Vert. Orifice/Grate** C= 0.600
#3	Primary	161.00'	**4.5" Vert. Orifice/Grate** C= 0.600
#4	Primary	161.50'	**20.0' long Broad-Crested Rectangular Weir X 1.81** Head (feet) 0.50 1.00 1.50 Coef. (English) 1.60 1.80 1.90

Primary OutFlow Max=3.95 cfs @ 12.58 hrs HW=161.33' (Free Discharge)
1=Orifice/Grate (Orifice Controls 1.66 cfs @ 8.46 fps)
2=Orifice/Grate (Orifice Controls 2.08 cfs @ 4.71 fps)
3=Orifice/Grate (Orifice Controls 0.20 cfs @ 1.97 fps)
4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 30P: POND 30 (Ocean Ridge)

Inflow Area = 0.820 ac, 45.12% Impervious, Inflow Depth = 4.43" for Cumberland_25 event
Inflow = 3.54 cfs @ 12.20 hrs, Volume= 0.303 af
Outflow = 3.04 cfs @ 12.27 hrs, Volume= 0.303 af, Atten= 14%, Lag= 4.1 min
Primary = 3.04 cfs @ 12.27 hrs, Volume= 0.303 af

Routing by Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Peak Elev= 160.88' @ 12.27 hrs Surf.Area= 1,526 sf Storage= 1,387 cf

Plug-Flow detention time= 22.7 min calculated for 0.303 af (100% of inflow)
Center-of-Mass det. time= 22.8 min (827.3 - 804.5)

Volume	Invert	Avail.Storage	Storage Description
#1	160.00'	3,156 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
160.00	1,150	0	0
162.00	2,006	3,156	3,156

Device	Routing	Invert	Outlet Devices
#1	Primary	160.00'	**18.0" Round Culvert** L= 30.0' Ke= 0.500 Inlet / Outlet Invert= 160.00' / 159.70' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=3.04 cfs @ 12.27 hrs HW=160.88' (Free Discharge)
1=Culvert (Barrel Controls 3.04 cfs @ 4.07 fps)

Summary for Pond 60R: FIELD CB

Inflow Area = 0.420 ac, 23.00% Impervious, Inflow Depth = 4.01" for Cumberland_25 event
Inflow = 2.09 cfs @ 12.06 hrs, Volume= 0.140 af
Outflow = 2.09 cfs @ 12.06 hrs, Volume= 0.140 af, Atten= 0%, Lag= 0.0 min
Primary = 2.09 cfs @ 12.06 hrs, Volume= 0.140 af

Routing by Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Peak Elev= 90.81' @ 12.06 hrs
Flood Elev= 91.81'

Device	Routing	Invert	Outlet Devices
#1	Primary	90.00'	**12.0" Round Culvert** L= 110.0' Square-edged headwall, Ke= 0.500 Inlet / Outlet Invert= 90.00' / 89.00' S= 0.0091 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=2.09 cfs @ 12.06 hrs HW=90.81' (Free Discharge)
└─**1=Culvert** (Inlet Controls 2.09 cfs @ 3.06 fps)

Summary for Pond 62P: Driveway Culvert

Inflow Area = 14.630 ac, 11.69% Impervious, Inflow Depth = 3.61" for Cumberland_25 event
Inflow = 27.39 cfs @ 12.46 hrs, Volume= 4.397 af
Outflow = 27.33 cfs @ 12.49 hrs, Volume= 4.397 af, Atten= 0%, Lag= 1.5 min
Primary = 8.80 cfs @ 12.49 hrs, Volume= 3.332 af
Secondary = 18.54 cfs @ 12.49 hrs, Volume= 1.065 af

Routing by Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Peak Elev= 89.96' @ 12.49 hrs Surf.Area= 3,691 sf Storage= 2,063 cf

Plug-Flow detention time= 0.9 min calculated for 4.397 af (100% of inflow)
Center-of-Mass det. time= 0.9 min (858.6 - 857.8)

Volume	Invert	Avail.Storage	Storage Description
#1	88.00'	2,197 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
88.00	47	50.0	0	0	47
89.00	540	284.0	249	249	6,269
90.00	3,860	500.0	1,948	2,197	19,750

Device	Routing	Invert	Outlet Devices
#1	Primary	87.50'	**18.0" Round Culvert** L= 35.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 87.50' / 87.00' S= 0.0143 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Secondary	89.50'	**22.0' long x 13.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.60 2.64 2.70 2.66 2.65 2.66 2.65 2.63

Primary OutFlow Max=8.80 cfs @ 12.49 hrs HW=89.96' (Free Discharge)
↑**1=Culvert** (Inlet Controls 8.80 cfs @ 4.98 fps)

Secondary OutFlow Max=18.53 cfs @ 12.49 hrs HW=89.96' (Free Discharge)
↑**2=Broad-Crested Rectangular Weir** (Weir Controls 18.53 cfs @ 1.81 fps)

Summary for Pond 66P: 24" Cross culvert

Inflow Area = 16.450 ac, 11.46% Impervious, Inflow Depth = 3.61" for Cumberland_25 event
Inflow = 29.90 cfs @ 12.46 hrs, Volume= 4.943 af
Outflow = 27.65 cfs @ 12.46 hrs, Volume= 4.847 af, Atten= 8%, Lag= 0.0 min
Primary = 21.93 cfs @ 12.46 hrs, Volume= 4.701 af
Secondary = 5.72 cfs @ 12.46 hrs, Volume= 0.146 af

Routing by Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs / 4
Peak Elev= 88.82' @ 12.46 hrs Surf.Area= 1,850 sf Storage= 1,817 cf

Plug-Flow detention time= 15.5 min calculated for 4.847 af (98% of inflow)
Center-of-Mass det. time= 2.5 min (856.9 - 854.4)

Volume	Invert	Avail.Storage	Storage Description
#1	84.00'	1,817 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
84.00	5	5.0	0	0	5
85.00	25	25.0	14	14	55
86.00	63	40.0	43	56	139
87.00	425	195.0	217	273	3,040
88.00	1,210	305.0	784	1,058	7,424
88.50	1,850	330.0	759	1,817	8,697

Device	Routing	Invert	Outlet Devices
#1	Primary	84.45'	**24.0" Round Culvert** L= 65.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 84.45' / 84.13' S= 0.0049 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf
#2	Secondary	88.50'	**12.0' long x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64

Primary OutFlow Max=21.93 cfs @ 12.46 hrs HW=88.82' (Free Discharge)
↑**1=Culvert** (Inlet Controls 21.93 cfs @ 6.98 fps)

Secondary OutFlow Max=5.71 cfs @ 12.46 hrs HW=88.82' (Free Discharge)
↑**2=Broad-Crested Rectangular Weir** (Weir Controls 5.71 cfs @ 1.48 fps)

Summary for Pond 100R: Vortech-DMH2

Inflow Area = 2.790 ac, 36.20% Impervious, Inflow Depth = 4.25" for Cumberland_25 event
Inflow = 11.92 cfs @ 12.13 hrs, Volume= 0.988 af
Outflow = 11.92 cfs @ 12.13 hrs, Volume= 0.988 af, Atten= 0%, Lag= 0.0 min
Primary = 11.92 cfs @ 12.13 hrs, Volume= 0.988 af

Routing by Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Peak Elev= 109.71' @ 12.13 hrs
Flood Elev= 112.16'

Device	Routing	Invert	Outlet Devices
#1	Primary	107.00'	**18.0" Round Culvert** L= 318.0' Ke= 0.500 Inlet / Outlet Invert= 107.00' / 98.52' S= 0.0267 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=11.92 cfs @ 12.13 hrs HW=109.71' (Free Discharge)
└─**1=Culvert** (Inlet Controls 11.92 cfs @ 6.74 fps)

Summary for Pond 101R: DMH2-DMH1(DMH1606)

Inflow Area = 2.790 ac, 36.20% Impervious, Inflow Depth = 4.25" for Cumberland_25 event
Inflow = 11.92 cfs @ 12.13 hrs, Volume= 0.988 af
Outflow = 11.92 cfs @ 12.13 hrs, Volume= 0.988 af, Atten= 0%, Lag= 0.0 min
Primary = 11.92 cfs @ 12.13 hrs, Volume= 0.988 af

Routing by Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Peak Elev= 101.09' @ 12.13 hrs
Flood Elev= 103.21'

Device	Routing	Invert	Outlet Devices
#1	Primary	98.38'	**18.0" Round Culvert** L= 177.0' Ke= 0.500 Inlet / Outlet Invert= 98.38' / 91.46' S= 0.0391 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=11.92 cfs @ 12.13 hrs HW=101.09' (Free Discharge)
└─**1=Culvert** (Inlet Controls 11.92 cfs @ 6.74 fps)

Summary for Pond 102R: DMH1606-DMH9

Inflow Area = 2.790 ac, 36.20% Impervious, Inflow Depth = 4.25" for Cumberland_25 event
Inflow = 11.92 cfs @ 12.13 hrs, Volume= 0.988 af
Outflow = 11.92 cfs @ 12.13 hrs, Volume= 0.988 af, Atten= 0%, Lag= 0.0 min
Primary = 11.92 cfs @ 12.13 hrs, Volume= 0.988 af

Routing by Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Peak Elev= 94.01' @ 12.13 hrs
Flood Elev= 96.40'

Device	Routing	Invert	Outlet Devices
#1	Primary	91.30'	**18.0" Round Culvert** L= 110.0' RCP, square edge headwall, Ke= 0.500

Inlet / Outlet Invert= 91.30' / 89.27' S= 0.0185 '/' Cc= 0.900
n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf

Primary OutFlow Max=11.92 cfs @ 12.13 hrs HW=94.01' (Free Discharge)
↑**1=Culvert** (Inlet Controls 11.92 cfs @ 6.74 fps)

Summary for Pond 103R: DMH9-DMH8

Inflow Area = 6.170 ac, 26.71% Impervious, Inflow Depth = 3.96" for Cumberland_25 event
Inflow = 24.85 cfs @ 12.13 hrs, Volume= 2.038 af
Outflow = 24.85 cfs @ 12.13 hrs, Volume= 2.038 af, Atten= 0%, Lag= 0.0 min
Primary = 24.85 cfs @ 12.13 hrs, Volume= 2.038 af

Routing by Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Peak Elev= 100.19' @ 12.13 hrs
Flood Elev= 94.51'

Device	Routing	Invert	Outlet Devices
#1	Primary	89.07'	**18.0" Round Culvert** L= 132.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 89.07' / 87.76' S= 0.0099 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf

Primary OutFlow Max=24.85 cfs @ 12.13 hrs HW=100.18' (Free Discharge)
↑**1=Culvert** (Barrel Controls 24.85 cfs @ 14.06 fps)

Summary for Pond 104R: DMH8-DMH200

Inflow Area = 6.560 ac, 27.90% Impervious, Inflow Depth = 4.00" for Cumberland_25 event
Inflow = 26.56 cfs @ 12.13 hrs, Volume= 2.185 af
Outflow = 26.56 cfs @ 12.13 hrs, Volume= 2.185 af, Atten= 0%, Lag= 0.0 min
Primary = 26.56 cfs @ 12.13 hrs, Volume= 2.185 af

Routing by Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Peak Elev= 108.29' @ 12.13 hrs
Flood Elev= 92.36'

Device	Routing	Invert	Outlet Devices
#1	Primary	87.66'	**18.0" Round Culvert** L= 273.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 87.66' / 86.60' S= 0.0039 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf

Primary OutFlow Max=26.54 cfs @ 12.13 hrs HW=108.26' (Free Discharge)
↑**1=Culvert** (Barrel Controls 26.54 cfs @ 15.02 fps)

Summary for Pond 105R: DMH200-OUTLET

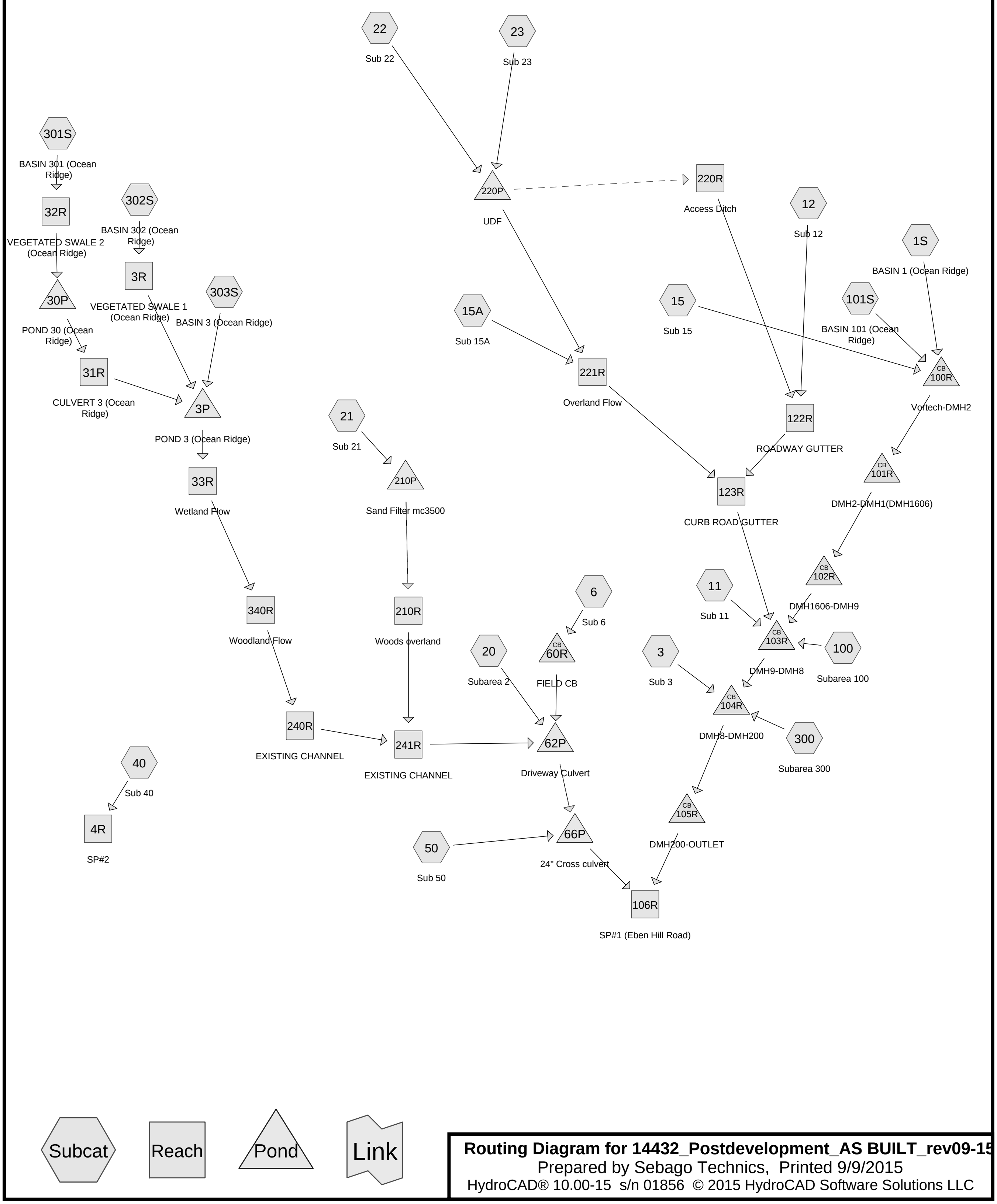
Inflow Area = 6.560 ac, 27.90% Impervious, Inflow Depth = 4.00" for Cumberland_25 event
Inflow = 26.56 cfs @ 12.13 hrs, Volume= 2.185 af
Outflow = 26.56 cfs @ 12.13 hrs, Volume= 2.185 af, Atten= 0%, Lag= 0.0 min
Primary = 26.56 cfs @ 12.13 hrs, Volume= 2.185 af

Routing by Stor-Ind method, Time Span= 0.00-100.00 hrs, dt= 0.01 hrs
Peak Elev= 97.03' @ 12.13 hrs
Flood Elev= 89.25'

Device	Routing	Invert	Outlet Devices
#1	Primary	86.53'	**18.0" Round Culvert** L= 60.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 86.53' / 84.13' S= 0.0400 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=26.54 cfs @ 12.13 hrs HW=97.01' (Free Discharge)
↑**1=Culvert** (Inlet Controls 26.54 cfs @ 15.02 fps)

Postdevelopment



Routing Diagram for 14432_Postdevelopment_AS BUILT_rev09-15
Prepared by Sebago Technics, Printed 9/9/2015
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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.63	84	1 acre lots, 20% imp, HSG D (3, 6, 11, 50)
1.00	87	1/4 acre lots, 38% imp, HSG D (6, 11, 20)
2.18	80	>75% Grass cover, Good, HSG D (11, 12, 15, 15A, 20, 21, 22, 23, 50)
0.23	80	>75% Grass cover, Good, HSG D Ocean Ridge (12)
2.24	98	IMPERVIOUS (1S, 101S, 301S, 302S, 303S)
2.71	80	LAWN D (1S, 101S, 301S, 302S, 303S)
0.04	98	Paved roads OCEAN AVE (12)
0.26	98	Paved roads Ocean Ave (3, 11, 50)
0.05	98	Paved roads Ocean Ridge (12)
0.24	98	Paved roads Site Drive (15, 15A)
0.05	98	Paved roads, Site Drive (11)
0.31	98	Roadway (100, 300)
0.05	98	Roadway, Ocean Ave (20)
0.07	98	Roofs, OCEAN RIDGE (12)
2.56	98	Site Development (21, 22)
0.51	77	WOODS D (1S, 302S, 303S)
10.06	77	Woods, Good, HSG D (11, 12, 20, 40, 50)
0.03	77	Woods, Good, HSG D Ocean Ridge (12)
24.22	**84**	**TOTAL AREA**

Time span=0.00-45.00 hrs, dt=0.01 hrs, 4501 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 1S: BASIN 1 (Ocean Ridge) Runoff Area=2.60 ac 34.62% Impervious Runoff Depth=1.75"
Flow Length=660' Tc=9.9 min CN=86 Runoff=4.67 cfs 0.379 af

Subcatchment 3: Sub 3 Runoff Area=0.30 ac 30.67% Impervious Runoff Depth=1.75"
Flow Length=300' Tc=9.4 min CN=86 Runoff=0.55 cfs 0.044 af

Subcatchment 6: Sub 6 Runoff Area=0.42 ac 23.00% Impervious Runoff Depth=1.60"
Flow Length=235' Tc=5.0 min CN=84 Runoff=0.82 cfs 0.056 af

Subcatchment 11: Sub 11 Runoff Area=1.88 ac 21.71% Impervious Runoff Depth=1.46"
Flow Length=375' Tc=7.3 min CN=82 Runoff=3.06 cfs 0.228 af

Subcatchment 12: Sub 12 Runoff Area=2.61 ac 6.13% Impervious Runoff Depth=1.26"
Flow Length=710' Tc=21.5 min CN=79 Runoff=2.47 cfs 0.275 af

Subcatchment 15: Sub 15 Runoff Area=0.27 ac 66.67% Impervious Runoff Depth=2.26"
Flow Length=342' Tc=5.0 min CN=92 Runoff=0.72 cfs 0.051 af

Subcatchment 15A: Sub 15A Runoff Area=0.09 ac 66.67% Impervious Runoff Depth=2.26"
Flow Length=87' Tc=5.0 min CN=92 Runoff=0.24 cfs 0.017 af

Subcatchment 20: Subarea 2 Runoff Area=6.36 ac 4.61% Impervious Runoff Depth=1.20"
Flow Length=1,435' Tc=32.5 min CN=78 Runoff=4.75 cfs 0.636 af

Subcatchment 21: Sub 21 Runoff Area=3.31 ac 63.75% Impervious Runoff Depth=2.16"
Tc=5.0 min CN=91 Runoff=8.58 cfs 0.597 af

Subcatchment 22: Sub 22 Runoff Area=0.70 ac 64.29% Impervious Runoff Depth=2.26"
Tc=5.0 min CN=92 Runoff=1.88 cfs 0.132 af

Subcatchment 23: Sub 23 Runoff Area=0.20 ac 0.00% Impervious Runoff Depth=1.33"
Tc=5.0 min CN=80 Runoff=0.32 cfs 0.022 af

Subcatchment 40: Sub 40 Runoff Area=1.12 ac 0.00% Impervious Runoff Depth=1.14"
Flow Length=250' Tc=9.1 min CN=77 Runoff=1.30 cfs 0.106 af

Subcatchment 50: Sub 50 Runoff Area=1.19 ac 14.79% Impervious Runoff Depth=1.46"
Flow Length=360' Tc=9.9 min CN=82 Runoff=1.77 cfs 0.145 af

Subcatchment 100: Subarea 100 Runoff Area=0.22 ac 100.00% Impervious Runoff Depth=2.87"
Flow Length=572' Tc=6.6 min CN=98 Runoff=0.65 cfs 0.053 af

Subcatchment 101S: BASIN 101 (Ocean Ridge) Runoff Area=0.19 ac 57.89% Impervious Runoff Depth=2.08"
Flow Length=155' Tc=6.4 min CN=90 Runoff=0.45 cfs 0.033 af

Subcatchment 300: Subarea 300 Runoff Area=0.09 ac 100.00% Impervious Runoff Depth=2.87"
Flow Length=162' Tc=5.0 min CN=98 Runoff=0.28 cfs 0.022 af

Subcatchment 301S: BASIN 301 (Ocean Ridge) Runoff Area=0.82 ac 45.12% Impervious Runoff Depth=1.91"
Flow Length=190' Tc=9.3 min CN=88 Runoff=1.63 cfs 0.130 af

Subcatchment 302S: BASIN 302 (Ocean Ridge) Runoff Area=1.27 ac 58.27% Impervious Runoff Depth=2.08"
Flow Length=130' Slope=0.0200 '/' Tc=9.1 min CN=90 Runoff=2.76 cfs 0.220 af

Subcatchment 303S: BASIN 3 (Ocean Ridge) Runoff Area=0.58 ac 20.69% Impervious Runoff Depth=1.53"
Flow Length=150' Tc=8.1 min CN=83 Runoff=0.96 cfs 0.074 af

Reach 3R: VEGETATED SWALE 1 (Ocean Ridge) Avg. Flow Depth=0.53' Max Vel=0.62 fps Inflow=2.76 cfs 0.220 af
n=0.150 L=170.0' S=0.0120 '/' Capacity=30.82 cfs Outflow=2.49 cfs 0.220 af

Reach 4R: SP#2 Inflow=1.30 cfs 0.106 af
Outflow=1.30 cfs 0.106 af

Reach 31R: CULVERT 3 (Ocean Ridge) Avg. Flow Depth=0.40' Max Vel=4.38 fps Inflow=1.22 cfs 0.130 af
11.0" Round Pipe n=0.012 L=50.0' S=0.0100 '/' Capacity=3.06 cfs Outflow=1.22 cfs 0.130 af

Reach 32R: VEGETATED SWALE 2 (Ocean Ridge) Avg. Flow Depth=0.39' Max Vel=0.54 fps Inflow=1.63 cfs 0.130 af
n=0.150 L=115.0' S=0.0130 '/' Capacity=32.02 cfs Outflow=1.53 cfs 0.130 af

Reach 33R: Wetland Flow Avg. Flow Depth=0.15' Max Vel=0.61 fps Inflow=1.24 cfs 0.423 af
n=0.035 L=150.0' S=0.0033 '/' Capacity=52.28 cfs Outflow=1.24 cfs 0.423 af

Reach 106R: SP#1 (Eben Hill Road) Inflow=15.83 cfs 3.091 af
Outflow=15.83 cfs 3.091 af

Reach 122R: ROADWAY GUTTER Avg. Flow Depth=0.23' Max Vel=3.61 fps Inflow=2.47 cfs 0.275 af
n=0.025 L=290.0' S=0.0379 '/' Capacity=10.97 cfs Outflow=2.46 cfs 0.275 af

Reach 123R: CURB ROAD GUTTER Avg. Flow Depth=0.15' Max Vel=3.20 fps Inflow=2.69 cfs 0.445 af
n=0.013 L=80.0' S=0.0200 '/' Capacity=48.18 cfs Outflow=2.68 cfs 0.445 af

Reach 210R: Woods overland Avg. Flow Depth=0.08' Max Vel=1.49 fps Inflow=1.47 cfs 0.579 af
n=0.035 L=50.0' S=0.0400 '/' Capacity=40.80 cfs Outflow=1.47 cfs 0.578 af

Reach 220R: Access Ditch Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.025 L=310.0' S=0.0500 '/' Capacity=47.31 cfs Outflow=0.00 cfs 0.000 af

Reach 221R: Overland Flow Avg. Flow Depth=0.03' Max Vel=1.19 fps Inflow=0.40 cfs 0.170 af
n=0.040 L=180.0' S=0.1111 '/' Capacity=59.50 cfs Outflow=0.40 cfs 0.170 af

Reach 240R: EXISTING CHANNEL Avg. Flow Depth=0.15' Max Vel=3.28 fps Inflow=1.23 cfs 0.423 af
n=0.025 L=340.0' S=0.0529 '/' Capacity=57.44 cfs Outflow=1.23 cfs 0.423 af

Reach 241R: EXISTING CHANNEL Avg. Flow Depth=0.19' Max Vel=4.57 fps Inflow=2.44 cfs 1.002 af
n=0.025 L=300.0' S=0.0750 '/' Capacity=68.36 cfs Outflow=2.44 cfs 1.001 af

Reach 340R: Woodland Flow Avg. Flow Depth=0.11' Max Vel=1.81 fps Inflow=1.24 cfs 0.423 af
n=0.035 L=700.0' S=0.0421 '/' Capacity=92.76 cfs Outflow=1.23 cfs 0.423 af

Pond 3P: POND 3 (Ocean Ridge) Peak Elev=159.97' Storage=6,326 cf Inflow=4.17 cfs 0.424 af
Outflow=1.24 cfs 0.423 af

Pond 30P: POND 30 (Ocean Ridge) Peak Elev=160.52' Storage=815 cf Inflow=1.53 cfs 0.130 af
18.0" Round Culvert n=0.012 L=30.0' S=0.0100 '/' Outflow=1.22 cfs 0.130 af

Pond 60R: FIELD CB Peak Elev=90.46' Inflow=0.82 cfs 0.056 af
12.0" Round Culvert n=0.012 L=110.0' S=0.0091 '/' Outflow=0.82 cfs 0.056 af

Pond 62P: Driveway Culvert Peak Elev=89.27' Storage=476 cf Inflow=6.96 cfs 1.693 af
Primary=6.80 cfs 1.693 af Secondary=0.00 cfs 0.000 af Outflow=6.80 cfs 1.693 af

Pond 66P: 24" Cross culvert Peak Elev=85.91' Storage=51 cf Inflow=7.30 cfs 1.838 af
Primary=7.30 cfs 1.838 af Secondary=0.00 cfs 0.000 af Outflow=7.30 cfs 1.838 af

Pond 100R: Vortech-DMH2 Peak Elev=108.20' Inflow=5.64 cfs 0.462 af
18.0" Round Culvert n=0.012 L=318.0' S=0.0267 '/' Outflow=5.64 cfs 0.462 af

Pond 101R: DMH2-DMH1(DMH1606) Peak Elev=99.58' Inflow=5.64 cfs 0.462 af
18.0" Round Culvert n=0.012 L=177.0' S=0.0391 '/' Outflow=5.64 cfs 0.462 af

Pond 102R: DMH1606-DMH9 Peak Elev=92.50' Inflow=5.64 cfs 0.462 af
18.0" Round Culvert n=0.012 L=110.0' S=0.0185 '/' Outflow=5.64 cfs 0.462 af

Pond 103R: DMH9-DMH8 Peak Elev=91.36' Inflow=10.55 cfs 1.188 af
18.0" Round Culvert n=0.012 L=132.0' S=0.0099 '/' Outflow=10.55 cfs 1.188 af

Pond 104R: DMH8-DMH200 Peak Elev=91.77' Inflow=11.32 cfs 1.253 af
18.0" Round Culvert n=0.012 L=273.0' S=0.0039 '/' Outflow=11.32 cfs 1.253 af

Pond 105R: DMH200-OUTLET Peak Elev=89.05' Inflow=11.32 cfs 1.253 af
18.0" Round Culvert n=0.012 L=60.0' S=0.0400 '/' Outflow=11.32 cfs 1.253 af

Pond 210P: Sand Filter mc3500 Peak Elev=127.36' Storage=12,652 cf Inflow=8.58 cfs 0.597 af
Outflow=1.47 cfs 0.579 af

Pond 220P: UDF Peak Elev=126.19' Storage=3,249 cf Inflow=2.19 cfs 0.154 af
Primary=0.36 cfs 0.153 af Secondary=0.00 cfs 0.000 af Outflow=0.36 cfs 0.153 af

Total Runoff Area = 24.22 ac Runoff Volume = 3.218 af Average Runoff Depth = 1.59"
72.85% Pervious = 17.64 ac 27.15% Impervious = 6.58 ac

Summary for Subcatchment 1S: BASIN 1 (Ocean Ridge)

Runoff = 4.67 cfs @ 12.14 hrs, Volume= 0.379 af, Depth= 1.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_02 Rainfall=3.10"

	Area (ac)	CN	Description
*	0.90	98	IMPERVIOUS
*	0.38	77	WOODS D
*	1.32	80	LAWN D
	2.60	86	Weighted Average
	1.70		65.38% Pervious Area
	0.90		34.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	50	0.0200	0.10		**Sheet Flow, OVERLAND FLOW** Grass: Dense n= 0.240 P2= 3.00"
0.4	140	0.0430	5.46	65.53	**Trap/Vee/Rect Channel Flow, Segment ID: riprap road ditch** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.060
0.2	90	0.0550	6.18	74.11	**Trap/Vee/Rect Channel Flow, Segment ID: riprap road ditch** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.060
0.8	380	0.0900	7.45	64.10	**Trap/Vee/Rect Channel Flow, Segment ID: riprap road ditch** Bot.W=2.00' D=2.00' Z= 2.0 & 0.3 '/' Top.W=6.60' n= 0.060
9.9	660	Total			

Summary for Subcatchment 3: Sub 3

Runoff = 0.55 cfs @ 12.13 hrs, Volume= 0.044 af, Depth= 1.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_02 Rainfall=3.10"

	Area (ac)	CN	Description
*	0.04	98	Paved roads Ocean Ave
	0.26	84	1 acre lots, 20% imp, HSG D
	0.30	86	Weighted Average
	0.21		69.33% Pervious Area
	0.09		30.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	60	0.1000	0.13		**Sheet Flow, A-B**
					Woods: Light underbrush n= 0.400 P2= 3.00"
1.2	160	0.1000	2.21		**Shallow Concentrated Flow, B-C**
					Short Grass Pasture Kv= 7.0 fps
0.5	80	0.0150	2.49		**Shallow Concentrated Flow, C-D**
					Paved Kv= 20.3 fps
9.4	300	Total			

Summary for Subcatchment 6: Sub 6

Runoff = 0.82 cfs @ 12.08 hrs, Volume= 0.056 af, Depth= 1.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_02 Rainfall=3.10"

Area (ac)	CN	Description
0.35	84	1 acre lots, 20% imp, HSG D
0.07	87	1/4 acre lots, 38% imp, HSG D
0.42	84	Weighted Average
0.32		77.00% Pervious Area
0.10		23.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	25	0.1500	0.13		**Sheet Flow, A-B**
					Woods: Light underbrush n= 0.400 P2= 3.00"
0.4	60	0.2300	2.40		**Shallow Concentrated Flow, B-C**
					Woodland Kv= 5.0 fps
0.4	150	0.0400	5.86	41.05	**Trap/Vee/Rect Channel Flow, C-D**
					Bot.W=2.00' D=1.00' Z= 5.0 '/' Top.W=12.00'
					n= 0.035
4.1	235	Total, Increased to minimum Tc = 5.0 min			

Summary for Subcatchment 11: Sub 11

Runoff = 3.06 cfs @ 12.11 hrs, Volume= 0.228 af, Depth= 1.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_02 Rainfall=3.10"

	Area (ac)	CN	Description
	1.04	77	Woods, Good, HSG D
*	0.19	98	Paved roads Ocean Ave
*	0.05	98	Paved roads, Site Drive
	0.02	80	>75% Grass cover, Good, HSG D
	0.29	84	1 acre lots, 20% imp, HSG D
	0.29	87	1/4 acre lots, 38% imp, HSG D
	1.88	82	Weighted Average
	1.47		78.29% Pervious Area
	0.41		21.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	40	0.1000	0.12		**Sheet Flow, A-B**
					Woods: Light underbrush n= 0.400 P2= 3.00"
0.7	95	0.2000	2.24		**Shallow Concentrated Flow, B-C**
					Woodland Kv= 5.0 fps
1.0	240	0.0400	4.06		**Shallow Concentrated Flow, C-D**
					Paved Kv= 20.3 fps
7.3	375	Total			

Summary for Subcatchment 12: Sub 12

Runoff = 2.47 cfs @ 12.31 hrs, Volume= 0.275 af, Depth= 1.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_02 Rainfall=3.10"

	Area (ac)	CN	Description
	2.01	77	Woods, Good, HSG D
	0.18	80	>75% Grass cover, Good, HSG D
*	0.04	98	Paved roads OCEAN AVE
*	0.07	98	Roofs, OCEAN RIDGE
*	0.05	98	Paved roads Ocean Ridge
*	0.03	77	Woods, Good, HSG D Ocean Ridge
*	0.23	80	>75% Grass cover, Good, HSG D Ocean Ridge
	2.61	79	Weighted Average
	2.45		93.87% Pervious Area
	0.16		6.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.1	110	0.0400	0.10		**Sheet Flow, A-B**
					Woods: Light underbrush n= 0.400 P2= 3.00"
2.8	270	0.1000	1.58		**Shallow Concentrated Flow, B-C**
					Woodland Kv= 5.0 fps
0.6	330	0.0500	9.46	47.31	**Trap/Vee/Rect Channel Flow, C-D**
					Bot.W=2.00' D=1.00' Z= 3.0 '/' Top.W=8.00'
					n= 0.025 Earth, clean & winding
21.5	710	Total			

Summary for Subcatchment 15: Sub 15

Runoff = 0.72 cfs @ 12.07 hrs, Volume= 0.051 af, Depth= 2.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_02 Rainfall=3.10"

	Area (ac)	CN	Description
*	0.18	98	Paved roads Site Drive
	0.09	80	>75% Grass cover, Good, HSG D
	0.27	92	Weighted Average
	0.09		33.33% Pervious Area
	0.18		66.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	12	0.0200	0.87		**Sheet Flow, A-B**
					Smooth surfaces n= 0.011 P2= 3.00"
1.2	330	0.0500	4.54		**Shallow Concentrated Flow, B-C**
					Paved Kv= 20.3 fps
3.6					**Direct Entry, C-D**
5.0	342	Total			

Summary for Subcatchment 15A: Sub 15A

Runoff = 0.24 cfs @ 12.07 hrs, Volume= 0.017 af, Depth= 2.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_02 Rainfall=3.10"

	Area (ac)	CN	Description
*	0.06	98	Paved roads Site Drive
	0.03	80	>75% Grass cover, Good, HSG D
	0.09	92	Weighted Average
	0.03		33.33% Pervious Area
	0.06		66.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	12	0.0200	0.87		**Sheet Flow, A-B**
					Smooth surfaces n= 0.011 P2= 3.00"
0.3	75	0.0500	4.54		**Shallow Concentrated Flow, B-C**
					Paved Kv= 20.3 fps
4.5					**Direct Entry, C-D**
5.0	87	Total			

Summary for Subcatchment 20: Subarea 2

Runoff = 4.75 cfs @ 12.46 hrs, Volume= 0.636 af, Depth= 1.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_02 Rainfall=3.10"

	Area (ac)	CN	Description
	0.64	87	1/4 acre lots, 38% imp, HSG D
	0.12	80	>75% Grass cover, Good, HSG D
*	0.05	98	Roadway, Ocean Ave
	5.55	77	Woods, Good, HSG D
	6.36	78	Weighted Average
	6.07		95.39% Pervious Area
	0.29		4.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	110	0.0800	0.13		**Sheet Flow, Overland Woods**
					Woods: Light underbrush n= 0.400 P2= 3.00"
18.8	1,325	0.0550	1.17		**Shallow Concentrated Flow, Overland Woods**
					Woodland Kv= 5.0 fps
32.5	1,435	Total			

Summary for Subcatchment 21: Sub 21

Runoff = 8.58 cfs @ 12.07 hrs, Volume= 0.597 af, Depth= 2.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_02 Rainfall=3.10"

	Area (ac)	CN	Description
	1.20	80	>75% Grass cover, Good, HSG D
*	2.11	98	Site Development
	3.31	91	Weighted Average
	1.20		36.25% Pervious Area
	2.11		63.75% Impervious Area

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

Summary for Subcatchment 22: Sub 22

Runoff = 1.88 cfs @ 12.07 hrs, Volume= 0.132 af, Depth= 2.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_02 Rainfall=3.10"

	Area (ac)	CN	Description
*	0.45	98	Site Development
	0.25	80	>75% Grass cover, Good, HSG D
	0.70	92	Weighted Average
	0.25		35.71% Pervious Area
	0.45		64.29% Impervious Area

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

Summary for Subcatchment 23: Sub 23

Runoff = 0.32 cfs @ 12.08 hrs, Volume= 0.022 af, Depth= 1.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_02 Rainfall=3.10"

Area (ac)	CN	Description
0.20	80	>75% Grass cover, Good, HSG D
0.20		100.00% Pervious Area

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

Summary for Subcatchment 40: Sub 40

Runoff = 1.30 cfs @ 12.14 hrs, Volume= 0.106 af, Depth= 1.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_02 Rainfall=3.10"

Area (ac)	CN	Description
1.12	77	Woods, Good, HSG D
1.12		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.7	50	0.1000	0.12		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.00"
2.4	200	0.0750	1.37		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
9.1	250	Total			

Summary for Subcatchment 50: Sub 50

Runoff = 1.77 cfs @ 12.14 hrs, Volume= 0.145 af, Depth= 1.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_02 Rainfall=3.10"

	Area (ac)	CN	Description
	0.34	77	Woods, Good, HSG D
	0.09	80	>75% Grass cover, Good, HSG D
*	0.03	98	Paved roads Ocean Ave
	0.73	84	1 acre lots, 20% imp, HSG D
	1.19	82	Weighted Average
	1.01		85.21% Pervious Area
	0.18		14.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	50	0.1200	0.13		**Sheet Flow, A-B**
					Woods: Light underbrush n= 0.400 P2= 3.00"
3.7	310	0.0800	1.41		**Shallow Concentrated Flow, B-C**
					Woodland Kv= 5.0 fps
9.9	360	Total			

Summary for Subcatchment 100: Subarea 100

Runoff = 0.65 cfs @ 12.09 hrs, Volume= 0.053 af, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_02 Rainfall=3.10"

	Area (ac)	CN	Description
*	0.22	98	Roadway
	0.22		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	12	0.0200	0.87		**Sheet Flow, Road Crown**
					Smooth surfaces n= 0.011 P2= 3.00"
5.9	480	0.0380	1.36		**Shallow Concentrated Flow, SHALLOW RD DITCH**
					Short Grass Pasture Kv= 7.0 fps
0.5	80	0.0200	2.87		**Shallow Concentrated Flow, ROAD GUTTER**
					Paved Kv= 20.3 fps
6.6	572	Total			

Summary for Subcatchment 101S: BASIN 101 (Ocean Ridge)

Runoff = 0.45 cfs @ 12.09 hrs, Volume= 0.033 af, Depth= 2.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_02 Rainfall=3.10"

	Area (ac)	CN	Description
*	0.11	98	IMPERVIOUS
*	0.08	80	LAWN D
	0.19	90	Weighted Average
	0.08		42.11% Pervious Area
	0.11		57.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	30	0.0200	0.09		**Sheet Flow, Segment ID: AB, Lawn** Grass: Dense n= 0.240 P2= 3.00"
0.1	25	0.0200	2.87		**Shallow Concentrated Flow, Segment ID: BC,Driveway** Paved Kv= 20.3 fps
0.7	100	0.1200	2.42		**Shallow Concentrated Flow, Segment ID: grass slope** Short Grass Pasture Kv= 7.0 fps
6.4	155	Total			

Summary for Subcatchment 300: Subarea 300

Runoff = 0.28 cfs @ 12.07 hrs, Volume= 0.022 af, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_02 Rainfall=3.10"

	Area (ac)	CN	Description
*	0.09	98	Roadway
	0.09		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	12	0.0200	0.87		**Sheet Flow, Road Crown** Smooth surfaces n= 0.011 P2= 3.00"
1.1	150	0.0130	2.31		**Shallow Concentrated Flow, Gutter flow** Paved Kv= 20.3 fps
3.7					**Direct Entry,**
5.0	162	Total			

Summary for Subcatchment 301S: BASIN 301 (Ocean Ridge)

Runoff = 1.63 cfs @ 12.13 hrs, Volume= 0.130 af, Depth= 1.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_02 Rainfall=3.10"

	Area (ac)	CN	Description
*	0.37	98	IMPERVIOUS
*	0.45	80	LAWN D
	0.82	88	Weighted Average
	0.45		54.88% Pervious Area
	0.37		45.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	60	0.0300	0.12		**Sheet Flow, Segment ID: AB** Grass: Dense n= 0.240 P2= 3.00"
0.4	50	0.0200	2.12		**Shallow Concentrated Flow, Segment ID: BC** Grassed Waterway Kv= 15.0 fps
0.6	80	0.0200	2.12		**Shallow Concentrated Flow, Segment ID: CD** Grassed Waterway Kv= 15.0 fps
9.3	190	Total			

Summary for Subcatchment 302S: BASIN 302 (Ocean Ridge)

Runoff = 2.76 cfs @ 12.13 hrs, Volume= 0.220 af, Depth= 2.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_02 Rainfall=3.10"

	Area (ac)	CN	Description
*	0.74	98	IMPERVIOUS
*	0.05	77	WOODS D
*	0.48	80	LAWN D
	1.27	90	Weighted Average
	0.53		41.73% Pervious Area
	0.74		58.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	50	0.0200	0.10		**Sheet Flow, Segment ID: AB** Grass: Dense n= 0.240 P2= 3.00"
0.2	30	0.0200	2.87		**Shallow Concentrated Flow, Segment ID: BC** Paved Kv= 20.3 fps
0.4	50	0.0200	2.12		**Shallow Concentrated Flow, Segment ID:** Grassed Waterway Kv= 15.0 fps
9.1	130	Total			

Summary for Subcatchment 303S: BASIN 3 (Ocean Ridge)

Runoff = 0.96 cfs @ 12.12 hrs, Volume= 0.074 af, Depth= 1.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_02 Rainfall=3.10"

	Area (ac)	CN	Description
*	0.12	98	IMPERVIOUS
*	0.08	77	WOODS D
*	0.38	80	LAWN D
	0.58	83	Weighted Average
	0.46		79.31% Pervious Area
	0.12		20.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	30	0.0300	0.07		**Sheet Flow, Segment ID: AB** Woods: Light underbrush n= 0.400 P2= 3.00"
0.9	120	0.0200	2.12		**Shallow Concentrated Flow, Segment ID: BC** Grassed Waterway Kv= 15.0 fps
8.1	150	Total			

Summary for Reach 3R: VEGETATED SWALE 1 (Ocean Ridge)

Inflow Area = 1.27 ac, 58.27% Impervious, Inflow Depth = 2.08" for Cumberland_02 event
Inflow = 2.76 cfs @ 12.13 hrs, Volume= 0.220 af
Outflow = 2.49 cfs @ 12.25 hrs, Volume= 0.220 af, Atten= 10%, Lag= 7.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.62 fps, Min. Travel Time= 4.6 min
Avg. Velocity = 0.17 fps, Avg. Travel Time= 17.1 min

Peak Storage= 685 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.53'
Bank-Full Depth= 2.00' Flow Area= 24.0 sf, Capacity= 30.82 cfs

6.00' x 2.00' deep channel, n= 0.150
Side Slope Z-value= 3.0 '/' Top Width= 18.00'
Length= 170.0' Slope= 0.0120 '/'
Inlet Invert= 0.00', Outlet Invert= -2.04'

‡

Summary for Reach 4R: SP#2

Inflow Area = 1.12 ac, 0.00% Impervious, Inflow Depth = 1.14" for Cumberland_02 event
Inflow = 1.30 cfs @ 12.14 hrs, Volume= 0.106 af
Outflow = 1.30 cfs @ 12.14 hrs, Volume= 0.106 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs

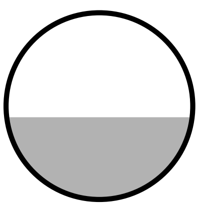
Summary for Reach 31R: CULVERT 3 (Ocean Ridge)

Inflow Area = 0.82 ac, 45.12% Impervious, Inflow Depth = 1.91" for Cumberland_02 event
Inflow = 1.22 cfs @ 12.32 hrs, Volume= 0.130 af
Outflow = 1.22 cfs @ 12.33 hrs, Volume= 0.130 af, Atten= 0%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 4.38 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.06 fps, Avg. Travel Time= 0.8 min

Peak Storage= 14 cf @ 12.32 hrs
Average Depth at Peak Storage= 0.40'
Bank-Full Depth= 0.92' Flow Area= 0.7 sf, Capacity= 3.06 cfs

11.0" Round Pipe
n= 0.012
Length= 50.0' Slope= 0.0100 '/'
Inlet Invert= 0.00', Outlet Invert= -0.50'



Summary for Reach 32R: VEGETATED SWALE 2 (Ocean Ridge)

Inflow Area = 0.82 ac, 45.12% Impervious, Inflow Depth = 1.91" for Cumberland_02 event
Inflow = 1.63 cfs @ 12.13 hrs, Volume= 0.130 af
Outflow = 1.53 cfs @ 12.23 hrs, Volume= 0.130 af, Atten= 6%, Lag= 5.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.54 fps, Min. Travel Time= 3.5 min
Avg. Velocity = 0.15 fps, Avg. Travel Time= 12.7 min

Peak Storage= 325 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.39'
Bank-Full Depth= 2.00' Flow Area= 24.0 sf, Capacity= 32.02 cfs

6.00' x 2.00' deep channel, n= 0.150
Side Slope Z-value= 3.0 '/' Top Width= 18.00'
Length= 115.0' Slope= 0.0130 '/'
Inlet Invert= 0.00', Outlet Invert= -1.49'

‡

Summary for Reach 33R: Wetland Flow

Inflow Area = 2.67 ac, 46.07% Impervious, Inflow Depth > 1.90" for Cumberland_02 event
Inflow = 1.24 cfs @ 12.75 hrs, Volume= 0.423 af
Outflow = 1.24 cfs @ 12.87 hrs, Volume= 0.423 af, Atten= 0%, Lag= 7.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.61 fps, Min. Travel Time= 4.1 min
Avg. Velocity = 0.21 fps, Avg. Travel Time= 12.0 min

Peak Storage= 303 cf @ 12.81 hrs
Average Depth at Peak Storage= 0.15'
Bank-Full Depth= 1.00' Flow Area= 30.0 sf, Capacity= 52.28 cfs

10.00' x 1.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 20.0 '/' Top Width= 50.00'
Length= 150.0' Slope= 0.0033 '/'
Inlet Invert= 158.00', Outlet Invert= 157.50'

‡

Summary for Reach 106R: SP#1 (Eben Hill Road)

Inflow Area = 23.10 ac, 28.47% Impervious, Inflow Depth > 1.61" for Cumberland_02 event
Inflow = 15.83 cfs @ 12.13 hrs, Volume= 3.091 af
Outflow = 15.83 cfs @ 12.13 hrs, Volume= 3.091 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs

Summary for Reach 122R: ROADWAY GUTTER

Inflow Area = 2.61 ac, 6.13% Impervious, Inflow Depth = 1.26" for Cumberland_02 event
Inflow = 2.47 cfs @ 12.31 hrs, Volume= 0.275 af
Outflow = 2.46 cfs @ 12.35 hrs, Volume= 0.275 af, Atten= 0%, Lag= 2.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.61 fps, Min. Travel Time= 1.3 min
Avg. Velocity = 1.30 fps, Avg. Travel Time= 3.7 min

Peak Storage= 198 cf @ 12.33 hrs
Average Depth at Peak Storage= 0.23'
Bank-Full Depth= 0.50' Flow Area= 2.0 sf, Capacity= 10.97 cfs

2.00' x 0.50' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 3.0 5.0 '/' Top Width= 6.00'
Length= 290.0' Slope= 0.0379 '/'
Inlet Invert= 106.50', Outlet Invert= 95.50'

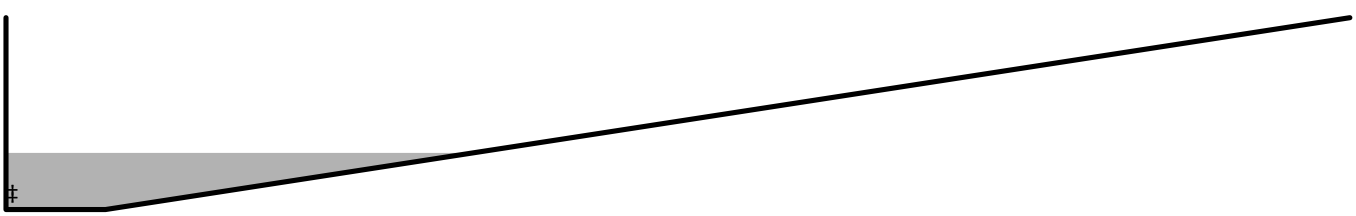
Summary for Reach 123R: CURB ROAD GUTTER

Inflow Area = 3.60 ac, 18.61% Impervious, Inflow Depth > 1.48" for Cumberland_02 event
Inflow = 2.69 cfs @ 12.37 hrs, Volume= 0.445 af
Outflow = 2.68 cfs @ 12.39 hrs, Volume= 0.445 af, Atten= 0%, Lag= 0.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.20 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.13 fps, Avg. Travel Time= 1.2 min

Peak Storage= 67 cf @ 12.38 hrs
Average Depth at Peak Storage= 0.15'
Bank-Full Depth= 0.50' Flow Area= 7.3 sf, Capacity= 48.18 cfs

2.00' x 0.50' deep channel, n= 0.013 Asphalt, smooth
Side Slope Z-value= 0.0 50.0 '/' Top Width= 27.00'
Length= 80.0' Slope= 0.0200 '/'
Inlet Invert= 95.50', Outlet Invert= 93.90'



Summary for Reach 210R: Woods overland

Inflow Area = 3.31 ac, 63.75% Impervious, Inflow Depth > 2.10" for Cumberland_02 event
Inflow = 1.47 cfs @ 12.53 hrs, Volume= 0.579 af
Outflow = 1.47 cfs @ 12.55 hrs, Volume= 0.578 af, Atten= 0%, Lag= 0.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Max. Velocity= 1.49 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 0.64 fps, Avg. Travel Time= 1.3 min

Peak Storage= 49 cf @ 12.54 hrs
Average Depth at Peak Storage= 0.08'
Bank-Full Depth= 0.50' Flow Area= 10.0 sf, Capacity= 40.80 cfs

10.00' x 0.50' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 20.0 '/' Top Width= 30.00'
Length= 50.0' Slope= 0.0400 '/'
Inlet Invert= 112.00', Outlet Invert= 110.00'

‡

Summary for Reach 220R: Access Ditch

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 1.00' Flow Area= 5.0 sf, Capacity= 47.31 cfs

2.00' x 1.00' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 3.0 '/' Top Width= 8.00'
Length= 310.0' Slope= 0.0500 '/'
Inlet Invert= 126.00', Outlet Invert= 110.50'

‡

Summary for Reach 221R: Overland Flow

Inflow Area = 0.99 ac, 51.52% Impervious, Inflow Depth > 2.06" for Cumberland_02 event
Inflow = 0.40 cfs @ 12.51 hrs, Volume= 0.170 af
Outflow = 0.40 cfs @ 12.58 hrs, Volume= 0.170 af, Atten= 1%, Lag= 4.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Max. Velocity= 1.19 fps, Min. Travel Time= 2.5 min
Avg. Velocity = 0.52 fps, Avg. Travel Time= 5.7 min

Peak Storage= 60 cf @ 12.54 hrs
Average Depth at Peak Storage= 0.03'
Bank-Full Depth= 0.50' Flow Area= 10.0 sf, Capacity= 59.50 cfs

10.00' x 0.50' deep channel, n= 0.040 Woods Overland flow
Side Slope Z-value= 20.0 '/' Top Width= 30.00'
Length= 180.0' Slope= 0.1111 '/'
Inlet Invert= 120.00', Outlet Invert= 100.00'

‡

Summary for Reach 240R: EXISTING CHANNEL

Inflow Area = 2.67 ac, 46.07% Impervious, Inflow Depth > 1.90" for Cumberland_02 event
Inflow = 1.23 cfs @ 13.07 hrs, Volume= 0.423 af
Outflow = 1.23 cfs @ 13.12 hrs, Volume= 0.423 af, Atten= 0%, Lag= 3.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.28 fps, Min. Travel Time= 1.7 min
Avg. Velocity = 1.14 fps, Avg. Travel Time= 5.0 min

Peak Storage= 128 cf @ 13.09 hrs
Average Depth at Peak Storage= 0.15'
Bank-Full Depth= 1.00' Flow Area= 6.0 sf, Capacity= 57.44 cfs

2.00' x 1.00' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 4.0 '/' Top Width= 10.00'
Length= 340.0' Slope= 0.0529 '/'
Inlet Invert= 128.00', Outlet Invert= 110.00'

‡

Summary for Reach 241R: EXISTING CHANNEL

Inflow Area = 5.98 ac, 55.85% Impervious, Inflow Depth > 2.01" for Cumberland_02 event
Inflow = 2.44 cfs @ 12.81 hrs, Volume= 1.002 af
Outflow = 2.44 cfs @ 12.84 hrs, Volume= 1.001 af, Atten= 0%, Lag= 1.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.57 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 1.99 fps, Avg. Travel Time= 2.5 min

Peak Storage= 160 cf @ 12.82 hrs
Average Depth at Peak Storage= 0.19'
Bank-Full Depth= 1.00' Flow Area= 6.0 sf, Capacity= 68.36 cfs

2.00' x 1.00' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 4.0 '/' Top Width= 10.00'
Length= 300.0' Slope= 0.0750 '/'
Inlet Invert= 110.00', Outlet Invert= 87.50'

‡

Summary for Reach 340R: Woodland Flow

Inflow Area = 2.67 ac, 46.07% Impervious, Inflow Depth > 1.90" for Cumberland_02 event
Inflow = 1.24 cfs @ 12.87 hrs, Volume= 0.423 af
Outflow = 1.23 cfs @ 13.07 hrs, Volume= 0.423 af, Atten= 0%, Lag= 11.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Max. Velocity= 1.81 fps, Min. Travel Time= 6.5 min
Avg. Velocity = 0.65 fps, Avg. Travel Time= 18.0 min

Peak Storage= 478 cf @ 12.96 hrs
Average Depth at Peak Storage= 0.11'
Bank-Full Depth= 1.00' Flow Area= 15.0 sf, Capacity= 92.76 cfs

5.00' x 1.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 10.0 '/' Top Width= 25.00'
Length= 700.0' Slope= 0.0421 '/'
Inlet Invert= 157.50', Outlet Invert= 128.00'

‡

Summary for Pond 3P: POND 3 (Ocean Ridge)

Inflow Area = 2.67 ac, 46.07% Impervious, Inflow Depth = 1.91" for Cumberland_02 event
Inflow = 4.17 cfs @ 12.26 hrs, Volume= 0.424 af
Outflow = 1.24 cfs @ 12.75 hrs, Volume= 0.423 af, Atten= 70%, Lag= 29.7 min
Primary = 1.24 cfs @ 12.75 hrs, Volume= 0.423 af

Routing by Stor-Ind method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Peak Elev= 159.97' @ 12.75 hrs Surf.Area= 4,273 sf Storage= 6,326 cf

Plug-Flow detention time= 80.6 min calculated for 0.423 af (100% of inflow)
Center-of-Mass det. time= 79.6 min (919.1 - 839.5)

Volume	Invert	Avail.Storage	Storage Description
#1	158.00'	21,813 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
158.00	2,113	0	0
160.00	4,304	6,417	6,417
162.00	6,739	11,043	17,460
162.60	7,772	4,353	21,813

Device	Routing	Invert	Outlet Devices
#1	Primary	158.00'	**6.0" Vert. Orifice/Grate** C= 0.600
#2	Primary	160.00'	**9.0" Vert. Orifice/Grate** C= 0.600
#3	Primary	161.00'	**4.5" Vert. Orifice/Grate** C= 0.600
#4	Primary	161.50'	**20.0' long Broad-Crested Rectangular Weir X 1.81** Head (feet) 0.50 1.00 1.50 Coef. (English) 1.60 1.80 1.90

Primary OutFlow Max=1.24 cfs @ 12.75 hrs HW=159.97' (Free Discharge)
1=Orifice/Grate (Orifice Controls 1.24 cfs @ 6.32 fps)
2=Orifice/Grate (Controls 0.00 cfs)
3=Orifice/Grate (Controls 0.00 cfs)
4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 30P: POND 30 (Ocean Ridge)

Inflow Area = 0.82 ac, 45.12% Impervious, Inflow Depth = 1.91" for Cumberland_02 event
Inflow = 1.53 cfs @ 12.23 hrs, Volume= 0.130 af
Outflow = 1.22 cfs @ 12.32 hrs, Volume= 0.130 af, Atten= 20%, Lag= 5.7 min
Primary = 1.22 cfs @ 12.32 hrs, Volume= 0.130 af

Routing by Stor-Ind method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Peak Elev= 160.52' @ 12.32 hrs Surf.Area= 1,371 sf Storage= 815 cf

Plug-Flow detention time= 33.0 min calculated for 0.130 af (100% of inflow)
Center-of-Mass det. time= 33.1 min (864.0 - 831.0)

Volume	Invert	Avail.Storage	Storage Description
#1	160.00'	3,156 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
160.00	1,150	0	0
162.00	2,006	3,156	3,156

Device	Routing	Invert	Outlet Devices
#1	Primary	160.00'	**18.0" Round Culvert** L= 30.0' Ke= 0.500 Inlet / Outlet Invert= 160.00' / 159.70' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=1.22 cfs @ 12.32 hrs HW=160.52' (Free Discharge)
└─**1=Culvert** (Barrel Controls 1.22 cfs @ 3.38 fps)

Summary for Pond 60R: FIELD CB

Inflow Area = 0.42 ac, 23.00% Impervious, Inflow Depth = 1.60" for Cumberland_02 event
Inflow = 0.82 cfs @ 12.08 hrs, Volume= 0.056 af
Outflow = 0.82 cfs @ 12.08 hrs, Volume= 0.056 af, Atten= 0%, Lag= 0.0 min
Primary = 0.82 cfs @ 12.08 hrs, Volume= 0.056 af

Routing by Stor-Ind method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Peak Elev= 90.46' @ 12.08 hrs
Flood Elev= 91.81'

Device	Routing	Invert	Outlet Devices
#1	Primary	90.00'	**12.0" Round Culvert** L= 110.0' Square-edged headwall, Ke= 0.500 Inlet / Outlet Invert= 90.00' / 89.00' S= 0.0091 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.81 cfs @ 12.08 hrs HW=90.46' (Free Discharge)
└─**1=Culvert** (Inlet Controls 0.81 cfs @ 2.31 fps)

Summary for Pond 62P: Driveway Culvert

Inflow Area = 12.76 ac, 29.23% Impervious, Inflow Depth > 1.59" for Cumberland_02 event
Inflow = 6.96 cfs @ 12.53 hrs, Volume= 1.693 af
Outflow = 6.80 cfs @ 12.59 hrs, Volume= 1.693 af, Atten= 2%, Lag= 4.0 min
Primary = 6.80 cfs @ 12.59 hrs, Volume= 1.693 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Peak Elev= 89.27' @ 12.59 hrs Surf.Area= 1,151 sf Storage= 476 cf

Plug-Flow detention time= 0.3 min calculated for 1.693 af (100% of inflow)
Center-of-Mass det. time= 0.3 min (1,040.4 - 1,040.1)

Volume	Invert	Avail.Storage	Storage Description
#1	88.00'	2,197 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
88.00	47	50.0	0	0	47
89.00	540	284.0	249	249	6,269
90.00	3,860	500.0	1,948	2,197	19,750

Device	Routing	Invert	Outlet Devices
#1	Primary	87.50'	**18.0" Round Culvert** L= 35.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 87.50' / 87.00' S= 0.0143 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Secondary	89.50'	**22.0' long x 13.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.60 2.64 2.70 2.66 2.65 2.66 2.65 2.63

Primary OutFlow Max=6.80 cfs @ 12.59 hrs HW=89.27' (Free Discharge)
└**1=Culvert** (Inlet Controls 6.80 cfs @ 3.85 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=88.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 66P: 24" Cross culvert

Inflow Area = 13.95 ac, 28.00% Impervious, Inflow Depth > 1.58" for Cumberland_02 event
Inflow = 7.30 cfs @ 12.54 hrs, Volume= 1.838 af
Outflow = 7.30 cfs @ 12.54 hrs, Volume= 1.838 af, Atten= 0%, Lag= 0.1 min
Primary = 7.30 cfs @ 12.54 hrs, Volume= 1.838 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs / 6
Peak Elev= 85.91' @ 12.54 hrs Surf.Area= 59 sf Storage= 51 cf

Plug-Flow detention time= 0.3 min calculated for 1.837 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (1,024.9 - 1,024.7)

Volume	Invert	Avail.Storage	Storage Description
#1	84.00'	1,817 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
84.00	5	5.0	0	0	5
85.00	25	25.0	14	14	55
86.00	63	40.0	43	56	139
87.00	425	195.0	217	273	3,040
88.00	1,210	305.0	784	1,058	7,424
88.50	1,850	330.0	759	1,817	8,697

Device	Routing	Invert	Outlet Devices
#1	Primary	84.45'	**24.0" Round Culvert** L= 65.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 84.45' / 84.13' S= 0.0049 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf
#2	Secondary	88.50'	**12.0' long x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64

Primary OutFlow Max=7.30 cfs @ 12.54 hrs HW=85.91' (Free Discharge)
└─**1=Culvert** (Barrel Controls 7.30 cfs @ 4.16 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=84.00' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 100R: Vortech-DMH2

Inflow Area = 3.06 ac, 38.89% Impervious, Inflow Depth = 1.81" for Cumberland_02 event
Inflow = 5.64 cfs @ 12.13 hrs, Volume= 0.462 af
Outflow = 5.64 cfs @ 12.13 hrs, Volume= 0.462 af, Atten= 0%, Lag= 0.0 min
Primary = 5.64 cfs @ 12.13 hrs, Volume= 0.462 af

Routing by Stor-Ind method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Peak Elev= 108.20' @ 12.13 hrs
Flood Elev= 112.16'

Device	Routing	Invert	Outlet Devices
#1	Primary	107.00'	**18.0" Round Culvert** L= 318.0' Ke= 0.500 Inlet / Outlet Invert= 107.00' / 98.52' S= 0.0267 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=5.64 cfs @ 12.13 hrs HW=108.20' (Free Discharge)
└─**1=Culvert** (Inlet Controls 5.64 cfs @ 3.73 fps)

Summary for Pond 101R: DMH2-DMH1(DMH1606)

Inflow Area = 3.06 ac, 38.89% Impervious, Inflow Depth = 1.81" for Cumberland_02 event
Inflow = 5.64 cfs @ 12.13 hrs, Volume= 0.462 af
Outflow = 5.64 cfs @ 12.13 hrs, Volume= 0.462 af, Atten= 0%, Lag= 0.0 min
Primary = 5.64 cfs @ 12.13 hrs, Volume= 0.462 af

Routing by Stor-Ind method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Peak Elev= 99.58' @ 12.13 hrs
Flood Elev= 103.21'

Device	Routing	Invert	Outlet Devices
#1	Primary	98.38'	**18.0" Round Culvert** L= 177.0' Ke= 0.500 Inlet / Outlet Invert= 98.38' / 91.46' S= 0.0391 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=5.64 cfs @ 12.13 hrs HW=99.58' (Free Discharge)
└─**1=Culvert** (Inlet Controls 5.64 cfs @ 3.73 fps)

Summary for Pond 102R: DMH1606-DMH9

Inflow Area = 3.06 ac, 38.89% Impervious, Inflow Depth = 1.81" for Cumberland_02 event
Inflow = 5.64 cfs @ 12.13 hrs, Volume= 0.462 af
Outflow = 5.64 cfs @ 12.13 hrs, Volume= 0.462 af, Atten= 0%, Lag= 0.0 min
Primary = 5.64 cfs @ 12.13 hrs, Volume= 0.462 af

Routing by Stor-Ind method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Peak Elev= 92.50' @ 12.13 hrs
Flood Elev= 96.40'

Device	Routing	Invert	Outlet Devices
#1	Primary	91.30'	**18.0" Round Culvert** L= 110.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 91.30' / 89.27' S= 0.0185 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf

Primary OutFlow Max=5.64 cfs @ 12.13 hrs HW=92.50' (Free Discharge)
└**1=Culvert** (Inlet Controls 5.64 cfs @ 3.73 fps)

Summary for Pond 103R: DMH9-DMH8

Inflow Area = 8.76 ac, 28.40% Impervious, Inflow Depth > 1.63" for Cumberland_02 event
Inflow = 10.55 cfs @ 12.12 hrs, Volume= 1.188 af
Outflow = 10.55 cfs @ 12.12 hrs, Volume= 1.188 af, Atten= 0%, Lag= 0.0 min
Primary = 10.55 cfs @ 12.12 hrs, Volume= 1.188 af

Routing by Stor-Ind method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Peak Elev= 91.36' @ 12.12 hrs
Flood Elev= 94.51'

Device	Routing	Invert	Outlet Devices
#1	Primary	89.07'	**18.0" Round Culvert** L= 132.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 89.07' / 87.76' S= 0.0099 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf

Primary OutFlow Max=10.54 cfs @ 12.12 hrs HW=91.35' (Free Discharge)
└**1=Culvert** (Inlet Controls 10.54 cfs @ 5.96 fps)

Summary for Pond 104R: DMH8-DMH200

Inflow Area = 9.15 ac, 29.18% Impervious, Inflow Depth > 1.64" for Cumberland_02 event
Inflow = 11.32 cfs @ 12.12 hrs, Volume= 1.253 af
Outflow = 11.32 cfs @ 12.12 hrs, Volume= 1.253 af, Atten= 0%, Lag= 0.0 min
Primary = 11.32 cfs @ 12.12 hrs, Volume= 1.253 af

Routing by Stor-Ind method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Peak Elev= 91.77' @ 12.12 hrs
Flood Elev= 92.36'

Device	Routing	Invert	Outlet Devices
#1	Primary	87.66'	**18.0" Round Culvert** L= 273.0' RCP, square edge headwall, Ke= 0.500

Inlet / Outlet Invert= 87.66' / 86.60' S= 0.0039 '/' Cc= 0.900
n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf

Primary OutFlow Max=11.31 cfs @ 12.12 hrs HW=91.76' (Free Discharge)
└**1=Culvert** (Barrel Controls 11.31 cfs @ 6.40 fps)

Summary for Pond 105R: DMH200-OUTLET

Inflow Area = 9.15 ac, 29.18% Impervious, Inflow Depth > 1.64" for Cumberland_02 event
Inflow = 11.32 cfs @ 12.12 hrs, Volume= 1.253 af
Outflow = 11.32 cfs @ 12.12 hrs, Volume= 1.253 af, Atten= 0%, Lag= 0.0 min
Primary = 11.32 cfs @ 12.12 hrs, Volume= 1.253 af

Routing by Stor-Ind method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Peak Elev= 89.05' @ 12.12 hrs
Flood Elev= 89.25'

Device	Routing	Invert	Outlet Devices
#1	Primary	86.53'	**18.0" Round Culvert** L= 60.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 86.53' / 84.13' S= 0.0400 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=11.31 cfs @ 12.12 hrs HW=89.05' (Free Discharge)
└**1=Culvert** (Inlet Controls 11.31 cfs @ 6.40 fps)

Summary for Pond 210P: Sand Filter mc3500

Inflow Area = 3.31 ac, 63.75% Impervious, Inflow Depth = 2.16" for Cumberland_02 event
Inflow = 8.58 cfs @ 12.07 hrs, Volume= 0.597 af
Outflow = 1.47 cfs @ 12.53 hrs, Volume= 0.579 af, Atten= 83%, Lag= 27.5 min
Primary = 1.47 cfs @ 12.53 hrs, Volume= 0.579 af

Routing by Stor-Ind method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Peak Elev= 127.36' @ 12.53 hrs Surf.Area= 6,773 sf Storage= 12,652 cf

Plug-Flow detention time= 519.2 min calculated for 0.579 af (97% of inflow)
Center-of-Mass det. time= 501.0 min (1,303.7 - 802.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	124.70'	9,447 cf	**80.08'W x 84.57'L x 5.50'H Field A** 37,250 cf Overall - 13,632 cf Embedded = 23,618 cf x 40.0% Voids
#2A	125.45'	13,632 cf	**ADS_StormTech MC-3500 d +Cap** x 121 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 11 Rows of 11 Chambers Cap Storage= +14.9 cf x 2 x 11 rows = 327.8 cf
		23,079 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	121.00'	**15.0" Round Culvert** L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 121.00' / 117.00' S= 0.0800 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Device 1	121.00'	**1.0" Vert. Orifice/Grate X 2.00** C= 0.600
#3	Device 1	126.80'	**7.0" Vert. Orifice/Grate X 2.00** C= 0.600
#4	Device 1	129.87'	**6.0' long x 1.50' rise Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)

Primary OutFlow Max=1.47 cfs @ 12.53 hrs HW=127.36' (Free Discharge)
└─**1=Culvert** (Passes 1.47 cfs of 14.15 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.13 cfs @ 12.10 fps)
  ├─**3=Orifice/Grate** (Orifice Controls 1.34 cfs @ 2.54 fps)
  └─**4=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Summary for Pond 220P: UDF

Inflow Area = 0.90 ac, 50.00% Impervious, Inflow Depth = 2.05" for Cumberland_02 event
Inflow = 2.19 cfs @ 12.07 hrs, Volume= 0.154 af
Outflow = 0.36 cfs @ 12.54 hrs, Volume= 0.153 af, Atten= 84%, Lag= 28.2 min
Primary = 0.36 cfs @ 12.54 hrs, Volume= 0.153 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Peak Elev= 126.19' @ 12.54 hrs Surf.Area= 3,174 sf Storage= 3,249 cf

Plug-Flow detention time= 533.0 min calculated for 0.153 af (100% of inflow)
Center-of-Mass det. time= 531.5 min (1,336.0 - 804.5)

Volume	Invert	Avail.Storage	Storage Description
#1	125.00'	10,527 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
125.00	2,326	0	0
126.00	2,974	2,650	2,650
127.00	4,000	3,487	6,137
128.00	4,780	4,390	10,527

Device	Routing	Invert	Outlet Devices
#1	Primary	122.83'	**12.0" Round Culvert** L= 78.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 122.83' / 122.28' S= 0.0071 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	122.83'	**0.9" Vert. Orifice/Grate** C= 0.600
#3	Device 2	125.00'	**2.400 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'
#4	Device 1	126.00'	**4.0" Vert. Orifice/Grate X 4.00** C= 0.600
#5	Device 1	127.00'	**20.0" Vert. Orifice/Grate** C= 0.600
#6	Secondary	127.50'	**10.0' long x 8.0' 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) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Primary OutFlow Max=0.36 cfs @ 12.54 hrs HW=126.19' (Free Discharge)
└─**1=Culvert** (Passes 0.36 cfs of 5.68 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.04 cfs @ 8.78 fps)
  │ └─**3=Exfiltration** (Passes 0.04 cfs of 0.18 cfs potential flow)
  ├─**4=Orifice/Grate** (Orifice Controls 0.32 cfs @ 1.50 fps)
  └─**5=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=125.00' (Free Discharge)
└─**6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Time span=0.00-45.00 hrs, dt=0.01 hrs, 4501 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 1S: BASIN 1 (Ocean Ridge) Runoff Area=2.60 ac 34.62% Impervious Runoff Depth=3.10"
Flow Length=660' Tc=9.9 min CN=86 Runoff=8.20 cfs 0.671 af

Subcatchment 3: Sub 3 Runoff Area=0.30 ac 30.67% Impervious Runoff Depth=3.10"
Flow Length=300' Tc=9.4 min CN=86 Runoff=0.96 cfs 0.077 af

Subcatchment 6: Sub 6 Runoff Area=0.42 ac 23.00% Impervious Runoff Depth=2.91"
Flow Length=235' Tc=5.0 min CN=84 Runoff=1.48 cfs 0.102 af

Subcatchment 11: Sub 11 Runoff Area=1.88 ac 21.71% Impervious Runoff Depth=2.72"
Flow Length=375' Tc=7.3 min CN=82 Runoff=5.73 cfs 0.427 af

Subcatchment 12: Sub 12 Runoff Area=2.61 ac 6.13% Impervious Runoff Depth=2.46"
Flow Length=710' Tc=21.5 min CN=79 Runoff=4.93 cfs 0.535 af

Subcatchment 15: Sub 15 Runoff Area=0.27 ac 66.67% Impervious Runoff Depth=3.70"
Flow Length=342' Tc=5.0 min CN=92 Runoff=1.16 cfs 0.083 af

Subcatchment 15A: Sub 15A Runoff Area=0.09 ac 66.67% Impervious Runoff Depth=3.70"
Flow Length=87' Tc=5.0 min CN=92 Runoff=0.39 cfs 0.028 af

Subcatchment 20: Subarea 2 Runoff Area=6.36 ac 4.61% Impervious Runoff Depth=2.38"
Flow Length=1,435' Tc=32.5 min CN=78 Runoff=9.65 cfs 1.259 af

Subcatchment 21: Sub 21 Runoff Area=3.31 ac 63.75% Impervious Runoff Depth=3.59"
Tc=5.0 min CN=91 Runoff=13.91 cfs 0.992 af

Subcatchment 22: Sub 22 Runoff Area=0.70 ac 64.29% Impervious Runoff Depth=3.70"
Tc=5.0 min CN=92 Runoff=3.00 cfs 0.216 af

Subcatchment 23: Sub 23 Runoff Area=0.20 ac 0.00% Impervious Runoff Depth=2.55"
Tc=5.0 min CN=80 Runoff=0.62 cfs 0.042 af

Subcatchment 40: Sub 40 Runoff Area=1.12 ac 0.00% Impervious Runoff Depth=2.29"
Flow Length=250' Tc=9.1 min CN=77 Runoff=2.70 cfs 0.214 af

Subcatchment 50: Sub 50 Runoff Area=1.19 ac 14.79% Impervious Runoff Depth=2.72"
Flow Length=360' Tc=9.9 min CN=82 Runoff=3.33 cfs 0.270 af

Subcatchment 100: Subarea 100 Runoff Area=0.22 ac 100.00% Impervious Runoff Depth=4.36"
Flow Length=572' Tc=6.6 min CN=98 Runoff=0.97 cfs 0.080 af

Subcatchment 101S: BASIN 101 (Ocean Ridge) Runoff Area=0.19 ac 57.89% Impervious Runoff Depth=3.49"
Flow Length=155' Tc=6.4 min CN=90 Runoff=0.74 cfs 0.055 af

Subcatchment 300: Subarea 300 Runoff Area=0.09 ac 100.00% Impervious Runoff Depth=4.36"
Flow Length=162' Tc=5.0 min CN=98 Runoff=0.42 cfs 0.033 af

Subcatchment 301S: BASIN 301 (Ocean Ridge) Runoff Area=0.82 ac 45.12% Impervious Runoff Depth=3.29"
Flow Length=190' Tc=9.3 min CN=88 Runoff=2.78 cfs 0.225 af

Subcatchment 302S: BASIN 302 (Ocean Ridge) Runoff Area=1.27 ac 58.27% Impervious Runoff Depth=3.49"
Flow Length=130' Slope=0.0200 '/' Tc=9.1 min CN=90 Runoff=4.55 cfs 0.370 af

Subcatchment 303S: BASIN 3 (Ocean Ridge) Runoff Area=0.58 ac 20.69% Impervious Runoff Depth=2.81"
Flow Length=150' Tc=8.1 min CN=83 Runoff=1.78 cfs 0.136 af

Reach 3R: VEGETATED SWALE 1 (Ocean Ridge) Avg. Flow Depth=0.71' Max Vel=0.73 fps Inflow=4.55 cfs 0.370 af
n=0.150 L=170.0' S=0.0120 '/' Capacity=30.82 cfs Outflow=4.19 cfs 0.370 af

Reach 4R: SP#2 Inflow=2.70 cfs 0.214 af
Outflow=2.70 cfs 0.214 af

Reach 31R: CULVERT 3 (Ocean Ridge) Avg. Flow Depth=0.58' Max Vel=5.06 fps Inflow=2.22 cfs 0.225 af
11.0" Round Pipe n=0.012 L=50.0' S=0.0100 '/' Capacity=3.06 cfs Outflow=2.22 cfs 0.225 af

Reach 32R: VEGETATED SWALE 2 (Ocean Ridge) Avg. Flow Depth=0.54' Max Vel=0.65 fps Inflow=2.78 cfs 0.225 af
n=0.150 L=115.0' S=0.0130 '/' Capacity=32.02 cfs Outflow=2.64 cfs 0.225 af

Reach 33R: Wetland Flow Avg. Flow Depth=0.24' Max Vel=0.78 fps Inflow=2.79 cfs 0.730 af
n=0.035 L=150.0' S=0.0033 '/' Capacity=52.28 cfs Outflow=2.78 cfs 0.730 af

Reach 106R: SP#1 (Eben Hill Road) Inflow=31.13 cfs 5.570 af
Outflow=31.13 cfs 5.570 af

Reach 122R: ROADWAY GUTTER Avg. Flow Depth=0.33' Max Vel=4.40 fps Inflow=4.93 cfs 0.535 af
n=0.025 L=290.0' S=0.0379 '/' Capacity=10.97 cfs Outflow=4.91 cfs 0.535 af

Reach 123R: CURB ROAD GUTTER Avg. Flow Depth=0.21' Max Vel=3.96 fps Inflow=6.20 cfs 0.819 af
n=0.013 L=80.0' S=0.0200 '/' Capacity=48.18 cfs Outflow=6.19 cfs 0.819 af

Reach 210R: Woods overland Avg. Flow Depth=0.14' Max Vel=1.99 fps Inflow=3.53 cfs 0.965 af
n=0.035 L=50.0' S=0.0400 '/' Capacity=40.80 cfs Outflow=3.53 cfs 0.965 af

Reach 220R: Access Ditch Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.025 L=310.0' S=0.0500 '/' Capacity=47.31 cfs Outflow=0.00 cfs 0.000 af

Reach 221R: Overland Flow Avg. Flow Depth=0.06' Max Vel=1.82 fps Inflow=1.28 cfs 0.284 af
n=0.040 L=180.0' S=0.1111 '/' Capacity=59.50 cfs Outflow=1.28 cfs 0.284 af

Reach 240R: EXISTING CHANNEL Avg. Flow Depth=0.23' Max Vel=4.20 fps Inflow=2.75 cfs 0.730 af
n=0.025 L=340.0' S=0.0529 '/' Capacity=57.44 cfs Outflow=2.75 cfs 0.730 af

Reach 241R: EXISTING CHANNEL Avg. Flow Depth=0.30' Max Vel=5.88 fps Inflow=5.75 cfs 1.695 af
n=0.025 L=300.0' S=0.0750 '/' Capacity=68.36 cfs Outflow=5.75 cfs 1.694 af

Reach 340R: Woodland Flow Avg. Flow Depth=0.17' Max Vel=2.33 fps Inflow=2.78 cfs 0.730 af
n=0.035 L=700.0' S=0.0421 '/' Capacity=92.76 cfs Outflow=2.75 cfs 0.730 af

Pond 3P: POND 3 (Ocean Ridge) Peak Elev=160.74' Storage=10,521 cf Inflow=7.37 cfs 0.730 af
Outflow=2.79 cfs 0.730 af

Pond 30P: POND 30 (Ocean Ridge) Peak Elev=160.73' Storage=1,151 cf Inflow=2.64 cfs 0.225 af
18.0" Round Culvert n=0.012 L=30.0' S=0.0100 '/' Outflow=2.22 cfs 0.225 af

Pond 60R: FIELD CB Peak Elev=90.65' Inflow=1.48 cfs 0.102 af
12.0" Round Culvert n=0.012 L=110.0' S=0.0091 '/' Outflow=1.48 cfs 0.102 af

Pond 62P: Driveway Culvert Peak Elev=89.73' Storage=1,325 cf Inflow=14.61 cfs 3.055 af
Primary=8.18 cfs 2.731 af Secondary=6.40 cfs 0.324 af Outflow=14.58 cfs 3.055 af

Pond 66P: 24" Cross culvert Peak Elev=87.19' Storage=365 cf Inflow=15.81 cfs 3.325 af
Primary=15.75 cfs 3.325 af Secondary=0.00 cfs 0.000 af Outflow=15.75 cfs 3.325 af

Pond 100R: Vortech-DMH2 Peak Elev=109.07' Inflow=9.78 cfs 0.809 af
18.0" Round Culvert n=0.012 L=318.0' S=0.0267 '/' Outflow=9.78 cfs 0.809 af

Pond 101R: DMH2-DMH1(DMH1606) Peak Elev=100.45' Inflow=9.78 cfs 0.809 af
18.0" Round Culvert n=0.012 L=177.0' S=0.0391 '/' Outflow=9.78 cfs 0.809 af

Pond 102R: DMH1606-DMH9 Peak Elev=93.37' Inflow=9.78 cfs 0.809 af
18.0" Round Culvert n=0.012 L=110.0' S=0.0185 '/' Outflow=9.78 cfs 0.809 af

Pond 103R: DMH9-DMH8 Peak Elev=96.14' Inflow=19.72 cfs 2.135 af
18.0" Round Culvert n=0.012 L=132.0' S=0.0099 '/' Outflow=19.72 cfs 2.135 af

Pond 104R: DMH8-DMH200 Peak Elev=100.74' Inflow=21.02 cfs 2.245 af
18.0" Round Culvert n=0.012 L=273.0' S=0.0039 '/' Outflow=21.02 cfs 2.245 af

Pond 105R: DMH200-OUTLET Peak Elev=93.38' Inflow=21.02 cfs 2.245 af
18.0" Round Culvert n=0.012 L=60.0' S=0.0400 '/' Outflow=21.02 cfs 2.245 af

Pond 210P: Sand Filter mc3500 Peak Elev=128.82' Storage=19,250 cf Inflow=13.91 cfs 0.992 af
Outflow=3.53 cfs 0.965 af

Pond 220P: UDF Peak Elev=126.60' Storage=4,625 cf Inflow=3.62 cfs 0.258 af
Primary=1.15 cfs 0.256 af Secondary=0.00 cfs 0.000 af Outflow=1.15 cfs 0.256 af

Total Runoff Area = 24.22 ac Runoff Volume = 5.814 af Average Runoff Depth = 2.88"
72.85% Pervious = 17.64 ac 27.15% Impervious = 6.58 ac

Summary for Subcatchment 1S: BASIN 1 (Ocean Ridge)

Runoff = 8.20 cfs @ 12.14 hrs, Volume= 0.671 af, Depth= 3.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_10 Rainfall=4.60"

	Area (ac)	CN	Description
*	0.90	98	IMPERVIOUS
*	0.38	77	WOODS D
*	1.32	80	LAWN D
	2.60	86	Weighted Average
	1.70		65.38% Pervious Area
	0.90		34.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	50	0.0200	0.10		**Sheet Flow, OVERLAND FLOW** Grass: Dense n= 0.240 P2= 3.00"
0.4	140	0.0430	5.46	65.53	**Trap/Vee/Rect Channel Flow, Segment ID: riprap road ditch** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.060
0.2	90	0.0550	6.18	74.11	**Trap/Vee/Rect Channel Flow, Segment ID: riprap road ditch** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.060
0.8	380	0.0900	7.45	64.10	**Trap/Vee/Rect Channel Flow, Segment ID: riprap road ditch** Bot.W=2.00' D=2.00' Z= 2.0 & 0.3 '/' Top.W=6.60' n= 0.060
9.9	660	Total			

Summary for Subcatchment 3: Sub 3

Runoff = 0.96 cfs @ 12.13 hrs, Volume= 0.077 af, Depth= 3.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_10 Rainfall=4.60"

	Area (ac)	CN	Description
*	0.04	98	Paved roads Ocean Ave
	0.26	84	1 acre lots, 20% imp, HSG D
	0.30	86	Weighted Average
	0.21		69.33% Pervious Area
	0.09		30.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	60	0.1000	0.13		**Sheet Flow, A-B**
					Woods: Light underbrush n= 0.400 P2= 3.00"
1.2	160	0.1000	2.21		**Shallow Concentrated Flow, B-C**
					Short Grass Pasture Kv= 7.0 fps
0.5	80	0.0150	2.49		**Shallow Concentrated Flow, C-D**
					Paved Kv= 20.3 fps
9.4	300	Total			

Summary for Subcatchment 6: Sub 6

Runoff = 1.48 cfs @ 12.07 hrs, Volume= 0.102 af, Depth= 2.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_10 Rainfall=4.60"

Area (ac)	CN	Description
0.35	84	1 acre lots, 20% imp, HSG D
0.07	87	1/4 acre lots, 38% imp, HSG D
0.42	84	Weighted Average
0.32		77.00% Pervious Area
0.10		23.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	25	0.1500	0.13		**Sheet Flow, A-B**
					Woods: Light underbrush n= 0.400 P2= 3.00"
0.4	60	0.2300	2.40		**Shallow Concentrated Flow, B-C**
					Woodland Kv= 5.0 fps
0.4	150	0.0400	5.86	41.05	**Trap/Vee/Rect Channel Flow, C-D**
					Bot.W=2.00' D=1.00' Z= 5.0 '/' Top.W=12.00'
					n= 0.035
4.1	235	Total, Increased to minimum Tc = 5.0 min			

Summary for Subcatchment 11: Sub 11

Runoff = 5.73 cfs @ 12.11 hrs, Volume= 0.427 af, Depth= 2.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_10 Rainfall=4.60"

	Area (ac)	CN	Description
	1.04	77	Woods, Good, HSG D
*	0.19	98	Paved roads Ocean Ave
*	0.05	98	Paved roads, Site Drive
	0.02	80	>75% Grass cover, Good, HSG D
	0.29	84	1 acre lots, 20% imp, HSG D
	0.29	87	1/4 acre lots, 38% imp, HSG D
	1.88	82	Weighted Average
	1.47		78.29% Pervious Area
	0.41		21.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	40	0.1000	0.12		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.00"
0.7	95	0.2000	2.24		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
1.0	240	0.0400	4.06		**Shallow Concentrated Flow, C-D** Paved Kv= 20.3 fps
7.3	375	Total			

Summary for Subcatchment 12: Sub 12

Runoff = 4.93 cfs @ 12.30 hrs, Volume= 0.535 af, Depth= 2.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_10 Rainfall=4.60"

	Area (ac)	CN	Description
	2.01	77	Woods, Good, HSG D
	0.18	80	>75% Grass cover, Good, HSG D
*	0.04	98	Paved roads OCEAN AVE
*	0.07	98	Roofs, OCEAN RIDGE
*	0.05	98	Paved roads Ocean Ridge
*	0.03	77	Woods, Good, HSG D Ocean Ridge
*	0.23	80	>75% Grass cover, Good, HSG D Ocean Ridge
	2.61	79	Weighted Average
	2.45		93.87% Pervious Area
	0.16		6.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.1	110	0.0400	0.10		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.00"
2.8	270	0.1000	1.58		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
0.6	330	0.0500	9.46	47.31	**Trap/Vee/Rect Channel Flow, C-D** Bot.W=2.00' D=1.00' Z= 3.0 '/' Top.W=8.00' n= 0.025 Earth, clean & winding
21.5	710	Total			

Summary for Subcatchment 15: Sub 15

Runoff = 1.16 cfs @ 12.07 hrs, Volume= 0.083 af, Depth= 3.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_10 Rainfall=4.60"

	Area (ac)	CN	Description
*	0.18	98	Paved roads Site Drive
	0.09	80	>75% Grass cover, Good, HSG D
	0.27	92	Weighted Average
	0.09		33.33% Pervious Area
	0.18		66.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	12	0.0200	0.87		**Sheet Flow, A-B**
					Smooth surfaces n= 0.011 P2= 3.00"
1.2	330	0.0500	4.54		**Shallow Concentrated Flow, B-C**
					Paved Kv= 20.3 fps
3.6					**Direct Entry, C-D**
5.0	342	Total			

Summary for Subcatchment 15A: Sub 15A

Runoff = 0.39 cfs @ 12.07 hrs, Volume= 0.028 af, Depth= 3.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_10 Rainfall=4.60"

	Area (ac)	CN	Description
*	0.06	98	Paved roads Site Drive
	0.03	80	>75% Grass cover, Good, HSG D
	0.09	92	Weighted Average
	0.03		33.33% Pervious Area
	0.06		66.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	12	0.0200	0.87		**Sheet Flow, A-B**
					Smooth surfaces n= 0.011 P2= 3.00"
0.3	75	0.0500	4.54		**Shallow Concentrated Flow, B-C**
					Paved Kv= 20.3 fps
4.5					**Direct Entry, C-D**
5.0	87	Total			

Summary for Subcatchment 20: Subarea 2

Runoff = 9.65 cfs @ 12.46 hrs, Volume= 1.259 af, Depth= 2.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_10 Rainfall=4.60"

	Area (ac)	CN	Description
	0.64	87	1/4 acre lots, 38% imp, HSG D
	0.12	80	>75% Grass cover, Good, HSG D
*	0.05	98	Roadway, Ocean Ave
	5.55	77	Woods, Good, HSG D
	6.36	78	Weighted Average
	6.07		95.39% Pervious Area
	0.29		4.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	110	0.0800	0.13		**Sheet Flow, Overland Woods**
					Woods: Light underbrush n= 0.400 P2= 3.00"
18.8	1,325	0.0550	1.17		**Shallow Concentrated Flow, Overland Woods**
					Woodland Kv= 5.0 fps
32.5	1,435	Total			

Summary for Subcatchment 21: Sub 21

Runoff = 13.91 cfs @ 12.07 hrs, Volume= 0.992 af, Depth= 3.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_10 Rainfall=4.60"

	Area (ac)	CN	Description
	1.20	80	>75% Grass cover, Good, HSG D
*	2.11	98	Site Development
	3.31	91	Weighted Average
	1.20		36.25% Pervious Area
	2.11		63.75% Impervious Area

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

Summary for Subcatchment 22: Sub 22

Runoff = 3.00 cfs @ 12.07 hrs, Volume= 0.216 af, Depth= 3.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_10 Rainfall=4.60"

	Area (ac)	CN	Description
*	0.45	98	Site Development
	0.25	80	>75% Grass cover, Good, HSG D
	0.70	92	Weighted Average
	0.25		35.71% Pervious Area
	0.45		64.29% Impervious Area

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

Summary for Subcatchment 23: Sub 23

Runoff = 0.62 cfs @ 12.07 hrs, Volume= 0.042 af, Depth= 2.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_10 Rainfall=4.60"

Area (ac)	CN	Description
0.20	80	>75% Grass cover, Good, HSG D
0.20		100.00% Pervious Area

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

Summary for Subcatchment 40: Sub 40

Runoff = 2.70 cfs @ 12.13 hrs, Volume= 0.214 af, Depth= 2.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_10 Rainfall=4.60"

Area (ac)	CN	Description
1.12	77	Woods, Good, HSG D
1.12		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.7	50	0.1000	0.12		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.00"
2.4	200	0.0750	1.37		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
9.1	250	Total			

Summary for Subcatchment 50: Sub 50

Runoff = 3.33 cfs @ 12.14 hrs, Volume= 0.270 af, Depth= 2.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_10 Rainfall=4.60"

	Area (ac)	CN	Description
	0.34	77	Woods, Good, HSG D
	0.09	80	>75% Grass cover, Good, HSG D
*	0.03	98	Paved roads Ocean Ave
	0.73	84	1 acre lots, 20% imp, HSG D
	1.19	82	Weighted Average
	1.01		85.21% Pervious Area
	0.18		14.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	50	0.1200	0.13		**Sheet Flow, A-B**
					Woods: Light underbrush n= 0.400 P2= 3.00"
3.7	310	0.0800	1.41		**Shallow Concentrated Flow, B-C**
					Woodland Kv= 5.0 fps
9.9	360	Total			

Summary for Subcatchment 100: Subarea 100

Runoff = 0.97 cfs @ 12.09 hrs, Volume= 0.080 af, Depth= 4.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_10 Rainfall=4.60"

	Area (ac)	CN	Description
*	0.22	98	Roadway
	0.22		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	12	0.0200	0.87		**Sheet Flow, Road Crown**
					Smooth surfaces n= 0.011 P2= 3.00"
5.9	480	0.0380	1.36		**Shallow Concentrated Flow, SHALLOW RD DITCH**
					Short Grass Pasture Kv= 7.0 fps
0.5	80	0.0200	2.87		**Shallow Concentrated Flow, ROAD GUTTER**
					Paved Kv= 20.3 fps
6.6	572	Total			

Summary for Subcatchment 101S: BASIN 101 (Ocean Ridge)

Runoff = 0.74 cfs @ 12.09 hrs, Volume= 0.055 af, Depth= 3.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_10 Rainfall=4.60"

	Area (ac)	CN	Description
*	0.11	98	IMPERVIOUS
*	0.08	80	LAWN D
	0.19	90	Weighted Average
	0.08		42.11% Pervious Area
	0.11		57.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	30	0.0200	0.09		**Sheet Flow, Segment ID: AB, Lawn** Grass: Dense n= 0.240 P2= 3.00"
0.1	25	0.0200	2.87		**Shallow Concentrated Flow, Segment ID: BC,Driveway** Paved Kv= 20.3 fps
0.7	100	0.1200	2.42		**Shallow Concentrated Flow, Segment ID: grass slope** Short Grass Pasture Kv= 7.0 fps
6.4	155	Total			

Summary for Subcatchment 300: Subarea 300

Runoff = 0.42 cfs @ 12.07 hrs, Volume= 0.033 af, Depth= 4.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_10 Rainfall=4.60"

	Area (ac)	CN	Description
*	0.09	98	Roadway
	0.09		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	12	0.0200	0.87		**Sheet Flow, Road Crown** Smooth surfaces n= 0.011 P2= 3.00"
1.1	150	0.0130	2.31		**Shallow Concentrated Flow, Gutter flow** Paved Kv= 20.3 fps
3.7					**Direct Entry,**
5.0	162	Total			

Summary for Subcatchment 301S: BASIN 301 (Ocean Ridge)

Runoff = 2.78 cfs @ 12.13 hrs, Volume= 0.225 af, Depth= 3.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_10 Rainfall=4.60"

	Area (ac)	CN	Description
*	0.37	98	IMPERVIOUS
*	0.45	80	LAWN D
	0.82	88	Weighted Average
	0.45		54.88% Pervious Area
	0.37		45.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	60	0.0300	0.12		**Sheet Flow, Segment ID: AB** Grass: Dense n= 0.240 P2= 3.00"
0.4	50	0.0200	2.12		**Shallow Concentrated Flow, Segment ID: BC** Grassed Waterway Kv= 15.0 fps
0.6	80	0.0200	2.12		**Shallow Concentrated Flow, Segment ID: CD** Grassed Waterway Kv= 15.0 fps
9.3	190	Total			

Summary for Subcatchment 302S: BASIN 302 (Ocean Ridge)

Runoff = 4.55 cfs @ 12.12 hrs, Volume= 0.370 af, Depth= 3.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_10 Rainfall=4.60"

	Area (ac)	CN	Description
*	0.74	98	IMPERVIOUS
*	0.05	77	WOODS D
*	0.48	80	LAWN D
	1.27	90	Weighted Average
	0.53		41.73% Pervious Area
	0.74		58.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	50	0.0200	0.10		**Sheet Flow, Segment ID: AB** Grass: Dense n= 0.240 P2= 3.00"
0.2	30	0.0200	2.87		**Shallow Concentrated Flow, Segment ID: BC** Paved Kv= 20.3 fps
0.4	50	0.0200	2.12		**Shallow Concentrated Flow, Segment ID:** Grassed Waterway Kv= 15.0 fps
9.1	130	Total			

Summary for Subcatchment 303S: BASIN 3 (Ocean Ridge)

Runoff = 1.78 cfs @ 12.11 hrs, Volume= 0.136 af, Depth= 2.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_10 Rainfall=4.60"

	Area (ac)	CN	Description
*	0.12	98	IMPERVIOUS
*	0.08	77	WOODS D
*	0.38	80	LAWN D
	0.58	83	Weighted Average
	0.46		79.31% Pervious Area
	0.12		20.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	30	0.0300	0.07		**Sheet Flow, Segment ID: AB** Woods: Light underbrush n= 0.400 P2= 3.00"
0.9	120	0.0200	2.12		**Shallow Concentrated Flow, Segment ID: BC** Grassed Waterway Kv= 15.0 fps
8.1	150	Total			

Summary for Reach 3R: VEGETATED SWALE 1 (Ocean Ridge)

Inflow Area = 1.27 ac, 58.27% Impervious, Inflow Depth = 3.49" for Cumberland_10 event
Inflow = 4.55 cfs @ 12.12 hrs, Volume= 0.370 af
Outflow = 4.19 cfs @ 12.23 hrs, Volume= 0.370 af, Atten= 8%, Lag= 6.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.73 fps, Min. Travel Time= 3.9 min
Avg. Velocity = 0.19 fps, Avg. Travel Time= 14.8 min

Peak Storage= 980 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.71'
Bank-Full Depth= 2.00' Flow Area= 24.0 sf, Capacity= 30.82 cfs

6.00' x 2.00' deep channel, n= 0.150
Side Slope Z-value= 3.0 '/' Top Width= 18.00'
Length= 170.0' Slope= 0.0120 '/'
Inlet Invert= 0.00', Outlet Invert= -2.04'

‡

Summary for Reach 4R: SP#2

Inflow Area = 1.12 ac, 0.00% Impervious, Inflow Depth = 2.29" for Cumberland_10 event
Inflow = 2.70 cfs @ 12.13 hrs, Volume= 0.214 af
Outflow = 2.70 cfs @ 12.13 hrs, Volume= 0.214 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs

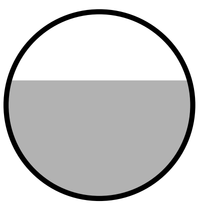
Summary for Reach 31R: CULVERT 3 (Ocean Ridge)

Inflow Area = 0.82 ac, 45.12% Impervious, Inflow Depth = 3.29" for Cumberland_10 event
Inflow = 2.22 cfs @ 12.28 hrs, Volume= 0.225 af
Outflow = 2.22 cfs @ 12.29 hrs, Volume= 0.225 af, Atten= 0%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 5.06 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.20 fps, Avg. Travel Time= 0.7 min

Peak Storage= 22 cf @ 12.29 hrs
Average Depth at Peak Storage= 0.58'
Bank-Full Depth= 0.92' Flow Area= 0.7 sf, Capacity= 3.06 cfs

11.0" Round Pipe
n= 0.012
Length= 50.0' Slope= 0.0100 '/'
Inlet Invert= 0.00', Outlet Invert= -0.50'



Summary for Reach 32R: VEGETATED SWALE 2 (Ocean Ridge)

Inflow Area = 0.82 ac, 45.12% Impervious, Inflow Depth = 3.29" for Cumberland_10 event
Inflow = 2.78 cfs @ 12.13 hrs, Volume= 0.225 af
Outflow = 2.64 cfs @ 12.21 hrs, Volume= 0.225 af, Atten= 5%, Lag= 5.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.65 fps, Min. Travel Time= 3.0 min
Avg. Velocity = 0.17 fps, Avg. Travel Time= 11.0 min

Peak Storage= 470 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.54'
Bank-Full Depth= 2.00' Flow Area= 24.0 sf, Capacity= 32.02 cfs

6.00' x 2.00' deep channel, n= 0.150
Side Slope Z-value= 3.0 '/' Top Width= 18.00'
Length= 115.0' Slope= 0.0130 '/'
Inlet Invert= 0.00', Outlet Invert= -1.49'

‡

Summary for Reach 33R: Wetland Flow

Inflow Area = 2.67 ac, 46.07% Impervious, Inflow Depth > 3.28" for Cumberland_10 event
Inflow = 2.79 cfs @ 12.62 hrs, Volume= 0.730 af
Outflow = 2.78 cfs @ 12.71 hrs, Volume= 0.730 af, Atten= 0%, Lag= 5.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.78 fps, Min. Travel Time= 3.2 min
Avg. Velocity = 0.24 fps, Avg. Travel Time= 10.5 min

Peak Storage= 532 cf @ 12.66 hrs
Average Depth at Peak Storage= 0.24'
Bank-Full Depth= 1.00' Flow Area= 30.0 sf, Capacity= 52.28 cfs

10.00' x 1.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 20.0 '/' Top Width= 50.00'
Length= 150.0' Slope= 0.0033 '/'
Inlet Invert= 158.00', Outlet Invert= 157.50'

‡

Summary for Reach 106R: SP#1 (Eben Hill Road)

Inflow Area = 23.10 ac, 28.47% Impervious, Inflow Depth > 2.89" for Cumberland_10 event
Inflow = 31.13 cfs @ 12.14 hrs, Volume= 5.570 af
Outflow = 31.13 cfs @ 12.14 hrs, Volume= 5.570 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs

Summary for Reach 122R: ROADWAY GUTTER

Inflow Area = 2.61 ac, 6.13% Impervious, Inflow Depth = 2.46" for Cumberland_10 event
Inflow = 4.93 cfs @ 12.30 hrs, Volume= 0.535 af
Outflow = 4.91 cfs @ 12.33 hrs, Volume= 0.535 af, Atten= 0%, Lag= 1.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.40 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 1.55 fps, Avg. Travel Time= 3.1 min

Peak Storage= 324 cf @ 12.31 hrs
Average Depth at Peak Storage= 0.33'
Bank-Full Depth= 0.50' Flow Area= 2.0 sf, Capacity= 10.97 cfs

2.00' x 0.50' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 3.0 5.0 '/' Top Width= 6.00'
Length= 290.0' Slope= 0.0379 '/'
Inlet Invert= 106.50', Outlet Invert= 95.50'

‡

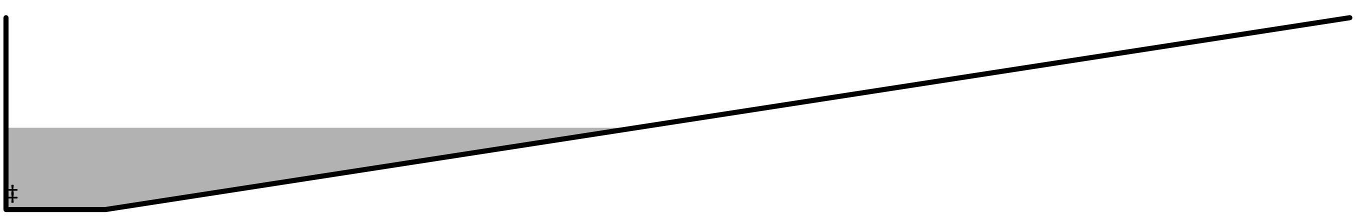
Summary for Reach 123R: CURB ROAD GUTTER

Inflow Area = 3.60 ac, 18.61% Impervious, Inflow Depth > 2.73" for Cumberland_10 event
Inflow = 6.20 cfs @ 12.33 hrs, Volume= 0.819 af
Outflow = 6.19 cfs @ 12.34 hrs, Volume= 0.819 af, Atten= 0%, Lag= 0.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.96 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.25 fps, Avg. Travel Time= 1.1 min

Peak Storage= 125 cf @ 12.33 hrs
Average Depth at Peak Storage= 0.21'
Bank-Full Depth= 0.50' Flow Area= 7.3 sf, Capacity= 48.18 cfs

2.00' x 0.50' deep channel, n= 0.013 Asphalt, smooth
Side Slope Z-value= 0.0 50.0 '/' Top Width= 27.00'
Length= 80.0' Slope= 0.0200 '/'
Inlet Invert= 95.50', Outlet Invert= 93.90'



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Summary for Reach 210R: Woods overland

Inflow Area = 3.31 ac, 63.75% Impervious, Inflow Depth > 3.50" for Cumberland_10 event
Inflow = 3.53 cfs @ 12.43 hrs, Volume= 0.965 af
Outflow = 3.53 cfs @ 12.44 hrs, Volume= 0.965 af, Atten= 0%, Lag= 0.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Max. Velocity= 1.99 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 0.70 fps, Avg. Travel Time= 1.2 min

Peak Storage= 89 cf @ 12.44 hrs
Average Depth at Peak Storage= 0.14'
Bank-Full Depth= 0.50' Flow Area= 10.0 sf, Capacity= 40.80 cfs

10.00' x 0.50' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 20.0 '/' Top Width= 30.00'
Length= 50.0' Slope= 0.0400 '/'
Inlet Invert= 112.00', Outlet Invert= 110.00'

‡

Summary for Reach 220R: Access Ditch

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 1.00' Flow Area= 5.0 sf, Capacity= 47.31 cfs

2.00' x 1.00' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 3.0 '/' Top Width= 8.00'
Length= 310.0' Slope= 0.0500 '/'
Inlet Invert= 126.00', Outlet Invert= 110.50'

‡

Summary for Reach 221R: Overland Flow

Inflow Area = 0.99 ac, 51.52% Impervious, Inflow Depth > 3.44" for Cumberland_10 event
Inflow = 1.28 cfs @ 12.28 hrs, Volume= 0.284 af
Outflow = 1.28 cfs @ 12.33 hrs, Volume= 0.284 af, Atten= 0%, Lag= 2.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Max. Velocity= 1.82 fps, Min. Travel Time= 1.6 min
Avg. Velocity = 0.57 fps, Avg. Travel Time= 5.2 min

Peak Storage= 127 cf @ 12.30 hrs
Average Depth at Peak Storage= 0.06'
Bank-Full Depth= 0.50' Flow Area= 10.0 sf, Capacity= 59.50 cfs

10.00' x 0.50' deep channel, n= 0.040 Woods Overland flow
Side Slope Z-value= 20.0 '/' Top Width= 30.00'
Length= 180.0' Slope= 0.1111 '/'
Inlet Invert= 120.00', Outlet Invert= 100.00'

‡

Summary for Reach 240R: EXISTING CHANNEL

Inflow Area = 2.67 ac, 46.07% Impervious, Inflow Depth > 3.28" for Cumberland_10 event
Inflow = 2.75 cfs @ 12.87 hrs, Volume= 0.730 af
Outflow = 2.75 cfs @ 12.91 hrs, Volume= 0.730 af, Atten= 0%, Lag= 2.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.20 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 1.30 fps, Avg. Travel Time= 4.4 min

Peak Storage= 223 cf @ 12.88 hrs
Average Depth at Peak Storage= 0.23'
Bank-Full Depth= 1.00' Flow Area= 6.0 sf, Capacity= 57.44 cfs

2.00' x 1.00' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 4.0 '/' Top Width= 10.00'
Length= 340.0' Slope= 0.0529 '/'
Inlet Invert= 128.00', Outlet Invert= 110.00'

‡

Summary for Reach 241R: EXISTING CHANNEL

Inflow Area = 5.98 ac, 55.85% Impervious, Inflow Depth > 3.40" for Cumberland_10 event
Inflow = 5.75 cfs @ 12.80 hrs, Volume= 1.695 af
Outflow = 5.75 cfs @ 12.83 hrs, Volume= 1.694 af, Atten= 0%, Lag= 1.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.88 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 2.19 fps, Avg. Travel Time= 2.3 min

Peak Storage= 293 cf @ 12.81 hrs
Average Depth at Peak Storage= 0.30'
Bank-Full Depth= 1.00' Flow Area= 6.0 sf, Capacity= 68.36 cfs

2.00' x 1.00' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 4.0 '/' Top Width= 10.00'
Length= 300.0' Slope= 0.0750 '/'
Inlet Invert= 110.00', Outlet Invert= 87.50'

‡

Summary for Reach 340R: Woodland Flow

Inflow Area = 2.67 ac, 46.07% Impervious, Inflow Depth > 3.28" for Cumberland_10 event
Inflow = 2.78 cfs @ 12.71 hrs, Volume= 0.730 af
Outflow = 2.75 cfs @ 12.87 hrs, Volume= 0.730 af, Atten= 1%, Lag= 9.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.33 fps, Min. Travel Time= 5.0 min
Avg. Velocity = 0.73 fps, Avg. Travel Time= 15.9 min

Peak Storage= 826 cf @ 12.78 hrs
Average Depth at Peak Storage= 0.17'
Bank-Full Depth= 1.00' Flow Area= 15.0 sf, Capacity= 92.76 cfs

5.00' x 1.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 10.0 '/' Top Width= 25.00'
Length= 700.0' Slope= 0.0421 '/'
Inlet Invert= 157.50', Outlet Invert= 128.00'

‡

Summary for Pond 3P: POND 3 (Ocean Ridge)

Inflow Area = 2.67 ac, 46.07% Impervious, Inflow Depth = 3.28" for Cumberland_10 event
Inflow = 7.37 cfs @ 12.24 hrs, Volume= 0.730 af
Outflow = 2.79 cfs @ 12.62 hrs, Volume= 0.730 af, Atten= 62%, Lag= 22.9 min
Primary = 2.79 cfs @ 12.62 hrs, Volume= 0.730 af

Routing by Stor-Ind method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Peak Elev= 160.74' @ 12.62 hrs Surf.Area= 5,209 sf Storage= 10,521 cf

Plug-Flow detention time= 75.3 min calculated for 0.730 af (100% of inflow)
Center-of-Mass det. time= 74.8 min (895.1 - 820.3)

Volume	Invert	Avail.Storage	Storage Description
#1	158.00'	21,813 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
158.00	2,113	0	0
160.00	4,304	6,417	6,417
162.00	6,739	11,043	17,460
162.60	7,772	4,353	21,813

Device	Routing	Invert	Outlet Devices
#1	Primary	158.00'	**6.0" Vert. Orifice/Grate** C= 0.600
#2	Primary	160.00'	**9.0" Vert. Orifice/Grate** C= 0.600
#3	Primary	161.00'	**4.5" Vert. Orifice/Grate** C= 0.600
#4	Primary	161.50'	**20.0' long Broad-Crested Rectangular Weir X 1.81** Head (feet) 0.50 1.00 1.50 Coef. (English) 1.60 1.80 1.90

Primary OutFlow Max=2.79 cfs @ 12.62 hrs HW=160.74' (Free Discharge)
1=Orifice/Grate (Orifice Controls 1.49 cfs @ 7.60 fps)
2=Orifice/Grate (Orifice Controls 1.29 cfs @ 2.94 fps)
3=Orifice/Grate (Controls 0.00 cfs)
4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 30P: POND 30 (Ocean Ridge)

Inflow Area = 0.82 ac, 45.12% Impervious, Inflow Depth = 3.29" for Cumberland_10 event
Inflow = 2.64 cfs @ 12.21 hrs, Volume= 0.225 af
Outflow = 2.22 cfs @ 12.28 hrs, Volume= 0.225 af, Atten= 16%, Lag= 4.5 min
Primary = 2.22 cfs @ 12.28 hrs, Volume= 0.225 af

Routing by Stor-Ind method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Peak Elev= 160.73' @ 12.28 hrs Surf.Area= 1,462 sf Storage= 1,151 cf

Plug-Flow detention time= 25.7 min calculated for 0.225 af (100% of inflow)
Center-of-Mass det. time= 25.8 min (839.5 - 813.7)

Volume	Invert	Avail.Storage	Storage Description
#1	160.00'	3,156 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
160.00	1,150	0	0
162.00	2,006	3,156	3,156

Device	Routing	Invert	Outlet Devices
#1	Primary	160.00'	**18.0" Round Culvert** L= 30.0' Ke= 0.500 Inlet / Outlet Invert= 160.00' / 159.70' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=2.22 cfs @ 12.28 hrs HW=160.73' (Free Discharge)
└─**1=Culvert** (Barrel Controls 2.22 cfs @ 3.82 fps)

Summary for Pond 60R: FIELD CB

Inflow Area = 0.42 ac, 23.00% Impervious, Inflow Depth = 2.91" for Cumberland_10 event
Inflow = 1.48 cfs @ 12.07 hrs, Volume= 0.102 af
Outflow = 1.48 cfs @ 12.07 hrs, Volume= 0.102 af, Atten= 0%, Lag= 0.0 min
Primary = 1.48 cfs @ 12.07 hrs, Volume= 0.102 af

Routing by Stor-Ind method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Peak Elev= 90.65' @ 12.07 hrs
Flood Elev= 91.81'

Device	Routing	Invert	Outlet Devices
#1	Primary	90.00'	**12.0" Round Culvert** L= 110.0' Square-edged headwall, Ke= 0.500 Inlet / Outlet Invert= 90.00' / 89.00' S= 0.0091 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=1.47 cfs @ 12.07 hrs HW=90.65' (Free Discharge)
└─**1=Culvert** (Inlet Controls 1.47 cfs @ 2.74 fps)

Summary for Pond 62P: Driveway Culvert

Inflow Area = 12.76 ac, 29.23% Impervious, Inflow Depth > 2.87" for Cumberland_10 event
Inflow = 14.61 cfs @ 12.46 hrs, Volume= 3.055 af
Outflow = 14.58 cfs @ 12.48 hrs, Volume= 3.055 af, Atten= 0%, Lag= 1.3 min
Primary = 8.18 cfs @ 12.48 hrs, Volume= 2.731 af
Secondary = 6.40 cfs @ 12.48 hrs, Volume= 0.324 af

Routing by Stor-Ind method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Peak Elev= 89.73' @ 12.48 hrs Surf.Area= 2,672 sf Storage= 1,325 cf

Plug-Flow detention time= 0.8 min calculated for 3.055 af (100% of inflow)
Center-of-Mass det. time= 0.8 min (952.3 - 951.5)

Volume	Invert	Avail.Storage	Storage Description
#1	88.00'	2,197 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
88.00	47	50.0	0	0	47
89.00	540	284.0	249	249	6,269
90.00	3,860	500.0	1,948	2,197	19,750

Device	Routing	Invert	Outlet Devices
#1	Primary	87.50'	**18.0" Round Culvert** L= 35.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 87.50' / 87.00' S= 0.0143 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Secondary	89.50'	**22.0' long x 13.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.60 2.64 2.70 2.66 2.65 2.66 2.65 2.63

Primary OutFlow Max=8.18 cfs @ 12.48 hrs HW=89.73' (Free Discharge)
└**1=Culvert** (Inlet Controls 8.18 cfs @ 4.63 fps)

Secondary OutFlow Max=6.40 cfs @ 12.48 hrs HW=89.73' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 6.40 cfs @ 1.25 fps)

Summary for Pond 66P: 24" Cross culvert

Inflow Area = 13.95 ac, 28.00% Impervious, Inflow Depth > 2.86" for Cumberland_10 event
Inflow = 15.81 cfs @ 12.46 hrs, Volume= 3.325 af
Outflow = 15.75 cfs @ 12.49 hrs, Volume= 3.325 af, Atten= 0%, Lag= 1.6 min
Primary = 15.75 cfs @ 12.49 hrs, Volume= 3.325 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs / 6
Peak Elev= 87.19' @ 12.49 hrs Surf.Area= 544 sf Storage= 365 cf

Plug-Flow detention time= 0.2 min calculated for 3.324 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (942.0 - 941.8)

Volume	Invert	Avail.Storage	Storage Description
#1	84.00'	1,817 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
84.00	5	5.0	0	0	5
85.00	25	25.0	14	14	55
86.00	63	40.0	43	56	139
87.00	425	195.0	217	273	3,040
88.00	1,210	305.0	784	1,058	7,424
88.50	1,850	330.0	759	1,817	8,697

Device	Routing	Invert	Outlet Devices
#1	Primary	84.45'	**24.0" Round Culvert** L= 65.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 84.45' / 84.13' S= 0.0049 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf
#2	Secondary	88.50'	**12.0' long x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64

Primary OutFlow Max=15.75 cfs @ 12.49 hrs HW=87.19' (Free Discharge)
↑**1=Culvert** (Inlet Controls 15.75 cfs @ 5.01 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=84.00' (Free Discharge)
↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 100R: Vortech-DMH2

Inflow Area = 3.06 ac, 38.89% Impervious, Inflow Depth = 3.17" for Cumberland_10 event
Inflow = 9.78 cfs @ 12.13 hrs, Volume= 0.809 af
Outflow = 9.78 cfs @ 12.13 hrs, Volume= 0.809 af, Atten= 0%, Lag= 0.0 min
Primary = 9.78 cfs @ 12.13 hrs, Volume= 0.809 af

Routing by Stor-Ind method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Peak Elev= 109.07' @ 12.13 hrs
Flood Elev= 112.16'

Device	Routing	Invert	Outlet Devices
#1	Primary	107.00'	**18.0" Round Culvert** L= 318.0' Ke= 0.500 Inlet / Outlet Invert= 107.00' / 98.52' S= 0.0267 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=9.76 cfs @ 12.13 hrs HW=109.07' (Free Discharge)
↑**1=Culvert** (Inlet Controls 9.76 cfs @ 5.52 fps)

Summary for Pond 101R: DMH2-DMH1(DMH1606)

Inflow Area = 3.06 ac, 38.89% Impervious, Inflow Depth = 3.17" for Cumberland_10 event
Inflow = 9.78 cfs @ 12.13 hrs, Volume= 0.809 af
Outflow = 9.78 cfs @ 12.13 hrs, Volume= 0.809 af, Atten= 0%, Lag= 0.0 min
Primary = 9.78 cfs @ 12.13 hrs, Volume= 0.809 af

Routing by Stor-Ind method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Peak Elev= 100.45' @ 12.13 hrs
Flood Elev= 103.21'

Device	Routing	Invert	Outlet Devices
#1	Primary	98.38'	**18.0" Round Culvert** L= 177.0' Ke= 0.500 Inlet / Outlet Invert= 98.38' / 91.46' S= 0.0391 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=9.76 cfs @ 12.13 hrs HW=100.45' (Free Discharge)
↑**1=Culvert** (Inlet Controls 9.76 cfs @ 5.53 fps)

Summary for Pond 102R: DMH1606-DMH9

Inflow Area = 3.06 ac, 38.89% Impervious, Inflow Depth = 3.17" for Cumberland_10 event
Inflow = 9.78 cfs @ 12.13 hrs, Volume= 0.809 af
Outflow = 9.78 cfs @ 12.13 hrs, Volume= 0.809 af, Atten= 0%, Lag= 0.0 min
Primary = 9.78 cfs @ 12.13 hrs, Volume= 0.809 af

Routing by Stor-Ind method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Peak Elev= 93.37' @ 12.13 hrs
Flood Elev= 96.40'

Device	Routing	Invert	Outlet Devices
#1	Primary	91.30'	**18.0" Round Culvert** L= 110.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 91.30' / 89.27' S= 0.0185 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf

Primary OutFlow Max=9.76 cfs @ 12.13 hrs HW=93.37' (Free Discharge)
└─**1=Culvert** (Inlet Controls 9.76 cfs @ 5.53 fps)

Summary for Pond 103R: DMH9-DMH8

Inflow Area = 8.76 ac, 28.40% Impervious, Inflow Depth > 2.92" for Cumberland_10 event
Inflow = 19.72 cfs @ 12.13 hrs, Volume= 2.135 af
Outflow = 19.72 cfs @ 12.13 hrs, Volume= 2.135 af, Atten= 0%, Lag= 0.0 min
Primary = 19.72 cfs @ 12.13 hrs, Volume= 2.135 af

Routing by Stor-Ind method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Peak Elev= 96.14' @ 12.13 hrs
Flood Elev= 94.51'

Device	Routing	Invert	Outlet Devices
#1	Primary	89.07'	**18.0" Round Culvert** L= 132.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 89.07' / 87.76' S= 0.0099 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf

Primary OutFlow Max=19.71 cfs @ 12.13 hrs HW=96.13' (Free Discharge)
└─**1=Culvert** (Barrel Controls 19.71 cfs @ 11.15 fps)

Summary for Pond 104R: DMH8-DMH200

Inflow Area = 9.15 ac, 29.18% Impervious, Inflow Depth > 2.94" for Cumberland_10 event
Inflow = 21.02 cfs @ 12.13 hrs, Volume= 2.245 af
Outflow = 21.02 cfs @ 12.13 hrs, Volume= 2.245 af, Atten= 0%, Lag= 0.0 min
Primary = 21.02 cfs @ 12.13 hrs, Volume= 2.245 af

Routing by Stor-Ind method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Peak Elev= 100.74' @ 12.13 hrs
Flood Elev= 92.36'

Device	Routing	Invert	Outlet Devices
#1	Primary	87.66'	**18.0" Round Culvert** L= 273.0' RCP, square edge headwall, Ke= 0.500

Inlet / Outlet Invert= 87.66' / 86.60' S= 0.0039 '/' Cc= 0.900
n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf

Primary OutFlow Max=21.00 cfs @ 12.13 hrs HW=100.71' (Free Discharge)
↑**1=Culvert** (Barrel Controls 21.00 cfs @ 11.88 fps)

Summary for Pond 105R: DMH200-OUTLET

Inflow Area = 9.15 ac, 29.18% Impervious, Inflow Depth > 2.94" for Cumberland_10 event
Inflow = 21.02 cfs @ 12.13 hrs, Volume= 2.245 af
Outflow = 21.02 cfs @ 12.13 hrs, Volume= 2.245 af, Atten= 0%, Lag= 0.0 min
Primary = 21.02 cfs @ 12.13 hrs, Volume= 2.245 af

Routing by Stor-Ind method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Peak Elev= 93.38' @ 12.13 hrs
Flood Elev= 89.25'

Device	Routing	Invert	Outlet Devices
#1	Primary	86.53'	**18.0" Round Culvert** L= 60.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 86.53' / 84.13' S= 0.0400 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=21.00 cfs @ 12.13 hrs HW=93.37' (Free Discharge)
↑**1=Culvert** (Inlet Controls 21.00 cfs @ 11.88 fps)

Summary for Pond 210P: Sand Filter mc3500

Inflow Area = 3.31 ac, 63.75% Impervious, Inflow Depth = 3.59" for Cumberland_10 event
Inflow = 13.91 cfs @ 12.07 hrs, Volume= 0.992 af
Outflow = 3.53 cfs @ 12.43 hrs, Volume= 0.965 af, Atten= 75%, Lag= 21.7 min
Primary = 3.53 cfs @ 12.43 hrs, Volume= 0.965 af

Routing by Stor-Ind method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Peak Elev= 128.82' @ 12.43 hrs Surf.Area= 6,773 sf Storage= 19,250 cf

Plug-Flow detention time= 339.0 min calculated for 0.965 af (97% of inflow)
Center-of-Mass det. time= 322.9 min (1,111.6 - 788.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	124.70'	9,447 cf	**80.08'W x 84.57'L x 5.50'H Field A** 37,250 cf Overall - 13,632 cf Embedded = 23,618 cf x 40.0% Voids
#2A	125.45'	13,632 cf	**ADS_StormTech MC-3500 d +Cap** x 121 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 11 Rows of 11 Chambers Cap Storage= +14.9 cf x 2 x 11 rows = 327.8 cf
		23,079 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	121.00'	**15.0" Round Culvert** L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 121.00' / 117.00' S= 0.0800 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Device 1	121.00'	**1.0" Vert. Orifice/Grate X 2.00** C= 0.600
#3	Device 1	126.80'	**7.0" Vert. Orifice/Grate X 2.00** C= 0.600
#4	Device 1	129.87'	**6.0' long x 1.50' rise Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)

Primary OutFlow Max=3.53 cfs @ 12.43 hrs HW=128.82' (Free Discharge)
└─**1=Culvert** (Passes 3.53 cfs of 15.85 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.15 cfs @ 13.43 fps)
  ├─**3=Orifice/Grate** (Orifice Controls 3.39 cfs @ 6.33 fps)
  └─**4=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Summary for Pond 220P: UDF

Inflow Area = 0.90 ac, 50.00% Impervious, Inflow Depth = 3.44" for Cumberland_10 event
Inflow = 3.62 cfs @ 12.07 hrs, Volume= 0.258 af
Outflow = 1.15 cfs @ 12.37 hrs, Volume= 0.256 af, Atten= 68%, Lag= 17.6 min
Primary = 1.15 cfs @ 12.37 hrs, Volume= 0.256 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Peak Elev= 126.60' @ 12.37 hrs Surf.Area= 3,591 sf Storage= 4,625 cf

Plug-Flow detention time= 348.8 min calculated for 0.256 af (99% of inflow)
Center-of-Mass det. time= 344.4 min (1,135.5 - 791.0)

Volume	Invert	Avail.Storage	Storage Description
#1	125.00'	10,527 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
125.00	2,326	0	0
126.00	2,974	2,650	2,650
127.00	4,000	3,487	6,137
128.00	4,780	4,390	10,527

Device	Routing	Invert	Outlet Devices
#1	Primary	122.83'	**12.0" Round Culvert** L= 78.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 122.83' / 122.28' S= 0.0071 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	122.83'	**0.9" Vert. Orifice/Grate** C= 0.600
#3	Device 2	125.00'	**2.400 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'
#4	Device 1	126.00'	**4.0" Vert. Orifice/Grate X 4.00** C= 0.600
#5	Device 1	127.00'	**20.0" Vert. Orifice/Grate** C= 0.600
#6	Secondary	127.50'	**10.0' long x 8.0' 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) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Primary OutFlow Max=1.15 cfs @ 12.37 hrs HW=126.60' (Free Discharge)
└─**1=Culvert** (Passes 1.15 cfs of 6.07 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.04 cfs @ 9.30 fps)
  │ └─**3=Exfiltration** (Passes 0.04 cfs of 0.20 cfs potential flow)
  ├─**4=Orifice/Grate** (Orifice Controls 1.11 cfs @ 3.18 fps)
  └─**5=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=125.00' (Free Discharge)
└─**6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Time span=0.00-45.00 hrs, dt=0.01 hrs, 4501 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 1S: BASIN 1 (Ocean Ridge) Runoff Area=2.60 ac 34.62% Impervious Runoff Depth=4.22"
Flow Length=660' Tc=9.9 min CN=86 Runoff=11.06 cfs 0.914 af

Subcatchment 3: Sub 3 Runoff Area=0.30 ac 30.67% Impervious Runoff Depth=4.22"
Flow Length=300' Tc=9.4 min CN=86 Runoff=1.30 cfs 0.105 af

Subcatchment 6: Sub 6 Runoff Area=0.42 ac 23.00% Impervious Runoff Depth=4.01"
Flow Length=235' Tc=5.0 min CN=84 Runoff=2.02 cfs 0.140 af

Subcatchment 11: Sub 11 Runoff Area=1.88 ac 21.71% Impervious Runoff Depth=3.80"
Flow Length=375' Tc=7.3 min CN=82 Runoff=7.96 cfs 0.596 af

Subcatchment 12: Sub 12 Runoff Area=2.61 ac 6.13% Impervious Runoff Depth=3.50"
Flow Length=710' Tc=21.5 min CN=79 Runoff=7.01 cfs 0.762 af

Subcatchment 15: Sub 15 Runoff Area=0.27 ac 66.67% Impervious Runoff Depth=4.87"
Flow Length=342' Tc=5.0 min CN=92 Runoff=1.50 cfs 0.110 af

Subcatchment 15A: Sub 15A Runoff Area=0.09 ac 66.67% Impervious Runoff Depth=4.87"
Flow Length=87' Tc=5.0 min CN=92 Runoff=0.50 cfs 0.037 af

Subcatchment 20: Subarea 2 Runoff Area=6.36 ac 4.61% Impervious Runoff Depth=3.40"
Flow Length=1,435' Tc=32.5 min CN=78 Runoff=13.85 cfs 1.804 af

Subcatchment 21: Sub 21 Runoff Area=3.31 ac 63.75% Impervious Runoff Depth=4.76"
Tc=5.0 min CN=91 Runoff=18.15 cfs 1.313 af

Subcatchment 22: Sub 22 Runoff Area=0.70 ac 64.29% Impervious Runoff Depth=4.87"
Tc=5.0 min CN=92 Runoff=3.89 cfs 0.284 af

Subcatchment 23: Sub 23 Runoff Area=0.20 ac 0.00% Impervious Runoff Depth=3.60"
Tc=5.0 min CN=80 Runoff=0.87 cfs 0.060 af

Subcatchment 40: Sub 40 Runoff Area=1.12 ac 0.00% Impervious Runoff Depth=3.31"
Flow Length=250' Tc=9.1 min CN=77 Runoff=3.90 cfs 0.308 af

Subcatchment 50: Sub 50 Runoff Area=1.19 ac 14.79% Impervious Runoff Depth=3.80"
Flow Length=360' Tc=9.9 min CN=82 Runoff=4.62 cfs 0.377 af

Subcatchment 100: Subarea 100 Runoff Area=0.22 ac 100.00% Impervious Runoff Depth=5.56"
Flow Length=572' Tc=6.6 min CN=98 Runoff=1.23 cfs 0.102 af

Subcatchment 101S: BASIN 101 (Ocean Ridge) Runoff Area=0.19 ac 57.89% Impervious Runoff Depth=4.65"
Flow Length=155' Tc=6.4 min CN=90 Runoff=0.98 cfs 0.074 af

Subcatchment 300: Subarea 300 Runoff Area=0.09 ac 100.00% Impervious Runoff Depth=5.56"
Flow Length=162' Tc=5.0 min CN=98 Runoff=0.53 cfs 0.042 af

Subcatchment 301S: BASIN 301 (Ocean Ridge) Runoff Area=0.82 ac 45.12% Impervious Runoff Depth=4.43"
Flow Length=190' Tc=9.3 min CN=88 Runoff=3.69 cfs 0.303 af

Subcatchment 302S: BASIN 302 (Ocean Ridge) Runoff Area=1.27 ac 58.27% Impervious Runoff Depth=4.65"
Flow Length=130' Slope=0.0200 '/' Tc=9.1 min CN=90 Runoff=5.97 cfs 0.492 af

Subcatchment 303S: BASIN 3 (Ocean Ridge) Runoff Area=0.58 ac 20.69% Impervious Runoff Depth=3.91"
Flow Length=150' Tc=8.1 min CN=83 Runoff=2.45 cfs 0.189 af

Reach 3R: VEGETATED SWALE 1 (Ocean Ridge) Avg. Flow Depth=0.83' Max Vel=0.79 fps Inflow=5.97 cfs 0.492 af
n=0.150 L=170.0' S=0.0120 '/' Capacity=30.82 cfs Outflow=5.56 cfs 0.492 af

Reach 4R: SP#2 Inflow=3.90 cfs 0.308 af
Outflow=3.90 cfs 0.308 af

Reach 31R: CULVERT 3 (Ocean Ridge) Avg. Flow Depth=0.75' Max Vel=5.29 fps Inflow=3.04 cfs 0.303 af
11.0" Round Pipe n=0.012 L=50.0' S=0.0100 '/' Capacity=3.06 cfs Outflow=3.04 cfs 0.303 af

Reach 32R: VEGETATED SWALE 2 (Ocean Ridge) Avg. Flow Depth=0.63' Max Vel=0.71 fps Inflow=3.69 cfs 0.303 af
n=0.150 L=115.0' S=0.0130 '/' Capacity=32.02 cfs Outflow=3.54 cfs 0.303 af

Reach 33R: Wetland Flow Avg. Flow Depth=0.29' Max Vel=0.87 fps Inflow=3.95 cfs 0.984 af
n=0.035 L=150.0' S=0.0033 '/' Capacity=52.28 cfs Outflow=3.93 cfs 0.984 af

Reach 106R: SP#1 (Eben Hill Road) Inflow=44.57 cfs 7.626 af
Outflow=44.57 cfs 7.626 af

Reach 122R: ROADWAY GUTTER Avg. Flow Depth=0.40' Max Vel=4.86 fps Inflow=7.01 cfs 0.762 af
n=0.025 L=290.0' S=0.0379 '/' Capacity=10.97 cfs Outflow=6.99 cfs 0.762 af

Reach 123R: CURB ROAD GUTTER Avg. Flow Depth=0.25' Max Vel=4.32 fps Inflow=8.71 cfs 1.139 af
n=0.013 L=80.0' S=0.0200 '/' Capacity=48.18 cfs Outflow=8.71 cfs 1.139 af

Reach 210R: Woods overland Avg. Flow Depth=0.22' Max Vel=2.57 fps Inflow=8.03 cfs 1.284 af
n=0.035 L=50.0' S=0.0400 '/' Capacity=40.80 cfs Outflow=8.02 cfs 1.284 af

Reach 220R: Access Ditch Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.025 L=310.0' S=0.0500 '/' Capacity=47.31 cfs Outflow=0.00 cfs 0.000 af

Reach 221R: Overland Flow Avg. Flow Depth=0.08' Max Vel=2.04 fps Inflow=1.77 cfs 0.378 af
n=0.040 L=180.0' S=0.1111 '/' Capacity=59.50 cfs Outflow=1.77 cfs 0.378 af

Reach 240R: EXISTING CHANNEL Avg. Flow Depth=0.27' Max Vel=4.65 fps Inflow=3.91 cfs 0.983 af
n=0.025 L=340.0' S=0.0529 '/' Capacity=57.44 cfs Outflow=3.90 cfs 0.983 af

Reach 241R: EXISTING CHANNEL Avg. Flow Depth=0.38' Max Vel=6.65 fps Inflow=8.98 cfs 2.268 af
n=0.025 L=300.0' S=0.0750 '/' Capacity=68.36 cfs Outflow=8.95 cfs 2.267 af

Reach 340R: Woodland Flow Avg. Flow Depth=0.21' Max Vel=2.60 fps Inflow=3.93 cfs 0.984 af
n=0.035 L=700.0' S=0.0421 '/' Capacity=92.76 cfs Outflow=3.91 cfs 0.983 af

Pond 3P: POND 3 (Ocean Ridge) Peak Elev=161.33' Storage=13,782 cf Inflow=9.99 cfs 0.984 af
Outflow=3.95 cfs 0.984 af

Pond 30P: POND 30 (Ocean Ridge) Peak Elev=160.88' Storage=1,387 cf Inflow=3.54 cfs 0.303 af
18.0" Round Culvert n=0.012 L=30.0' S=0.0100 '/' Outflow=3.04 cfs 0.303 af

Pond 60R: FIELD CB Peak Elev=90.79' Inflow=2.02 cfs 0.140 af
12.0" Round Culvert n=0.012 L=110.0' S=0.0091 '/' Outflow=2.02 cfs 0.140 af

Pond 62P: Driveway Culvert Peak Elev=89.88' Storage=1,753 cf Inflow=21.95 cfs 4.211 af
Primary=8.56 cfs 3.382 af Secondary=13.35 cfs 0.829 af Outflow=21.92 cfs 4.211 af

Pond 66P: 24" Cross culvert Peak Elev=88.68' Storage=1,817 cf Inflow=24.07 cfs 4.588 af
Primary=21.46 cfs 4.544 af Secondary=2.33 cfs 0.037 af Outflow=23.78 cfs 4.581 af

Pond 100R: Vortech-DMH2 Peak Elev=110.12' Inflow=13.11 cfs 1.098 af
18.0" Round Culvert n=0.012 L=318.0' S=0.0267 '/' Outflow=13.11 cfs 1.098 af

Pond 101R: DMH2-DMH1(DMH1606) Peak Elev=101.50' Inflow=13.11 cfs 1.098 af
18.0" Round Culvert n=0.012 L=177.0' S=0.0391 '/' Outflow=13.11 cfs 1.098 af

Pond 102R: DMH1606-DMH9 Peak Elev=94.42' Inflow=13.11 cfs 1.098 af
18.0" Round Culvert n=0.012 L=110.0' S=0.0185 '/' Outflow=13.11 cfs 1.098 af

Pond 103R: DMH9-DMH8 Peak Elev=102.54' Inflow=27.40 cfs 2.935 af
18.0" Round Culvert n=0.012 L=132.0' S=0.0099 '/' Outflow=27.40 cfs 2.935 af

Pond 104R: DMH8-DMH200 Peak Elev=112.37' Inflow=29.13 cfs 3.082 af
18.0" Round Culvert n=0.012 L=273.0' S=0.0039 '/' Outflow=29.13 cfs 3.082 af

Pond 105R: DMH200-OUTLET Peak Elev=99.00' Inflow=29.13 cfs 3.082 af
18.0" Round Culvert n=0.012 L=60.0' S=0.0400 '/' Outflow=29.13 cfs 3.082 af

Pond 210P: Sand Filter mc3500 Peak Elev=130.18' Storage=23,017 cf Inflow=18.15 cfs 1.313 af
Outflow=8.03 cfs 1.284 af

Pond 220P: UDF Peak Elev=126.96' Storage=5,960 cf Inflow=4.77 cfs 0.344 af
Primary=1.54 cfs 0.342 af Secondary=0.00 cfs 0.000 af Outflow=1.54 cfs 0.342 af

Total Runoff Area = 24.22 ac Runoff Volume = 8.012 af Average Runoff Depth = 3.97"
72.85% Pervious = 17.64 ac 27.15% Impervious = 6.58 ac

Summary for Subcatchment 1S: BASIN 1 (Ocean Ridge)

Runoff = 11.06 cfs @ 12.13 hrs, Volume= 0.914 af, Depth= 4.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_25 Rainfall=5.80"

	Area (ac)	CN	Description
*	0.90	98	IMPERVIOUS
*	0.38	77	WOODS D
*	1.32	80	LAWN D
	2.60	86	Weighted Average
	1.70		65.38% Pervious Area
	0.90		34.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	50	0.0200	0.10		**Sheet Flow, OVERLAND FLOW** Grass: Dense n= 0.240 P2= 3.00"
0.4	140	0.0430	5.46	65.53	**Trap/Vee/Rect Channel Flow, Segment ID: riprap road ditch** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.060
0.2	90	0.0550	6.18	74.11	**Trap/Vee/Rect Channel Flow, Segment ID: riprap road ditch** Bot.W=2.00' D=2.00' Z= 2.0 '/' Top.W=10.00' n= 0.060
0.8	380	0.0900	7.45	64.10	**Trap/Vee/Rect Channel Flow, Segment ID: riprap road ditch** Bot.W=2.00' D=2.00' Z= 2.0 & 0.3 '/' Top.W=6.60' n= 0.060
9.9	660	Total			

Summary for Subcatchment 3: Sub 3

Runoff = 1.30 cfs @ 12.13 hrs, Volume= 0.105 af, Depth= 4.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_25 Rainfall=5.80"

	Area (ac)	CN	Description
*	0.04	98	Paved roads Ocean Ave
	0.26	84	1 acre lots, 20% imp, HSG D
	0.30	86	Weighted Average
	0.21		69.33% Pervious Area
	0.09		30.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	60	0.1000	0.13		**Sheet Flow, A-B**
					Woods: Light underbrush n= 0.400 P2= 3.00"
1.2	160	0.1000	2.21		**Shallow Concentrated Flow, B-C**
					Short Grass Pasture Kv= 7.0 fps
0.5	80	0.0150	2.49		**Shallow Concentrated Flow, C-D**
					Paved Kv= 20.3 fps
9.4	300	Total			

Summary for Subcatchment 6: Sub 6

Runoff = 2.02 cfs @ 12.07 hrs, Volume= 0.140 af, Depth= 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_25 Rainfall=5.80"

Area (ac)	CN	Description
0.35	84	1 acre lots, 20% imp, HSG D
0.07	87	1/4 acre lots, 38% imp, HSG D
0.42	84	Weighted Average
0.32		77.00% Pervious Area
0.10		23.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	25	0.1500	0.13		**Sheet Flow, A-B**
					Woods: Light underbrush n= 0.400 P2= 3.00"
0.4	60	0.2300	2.40		**Shallow Concentrated Flow, B-C**
					Woodland Kv= 5.0 fps
0.4	150	0.0400	5.86	41.05	**Trap/Vee/Rect Channel Flow, C-D**
					Bot.W=2.00' D=1.00' Z= 5.0 '/' Top.W=12.00'
					n= 0.035
4.1	235	Total, Increased to minimum Tc = 5.0 min			

Summary for Subcatchment 11: Sub 11

Runoff = 7.96 cfs @ 12.10 hrs, Volume= 0.596 af, Depth= 3.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_25 Rainfall=5.80"

	Area (ac)	CN	Description
	1.04	77	Woods, Good, HSG D
*	0.19	98	Paved roads Ocean Ave
*	0.05	98	Paved roads, Site Drive
	0.02	80	>75% Grass cover, Good, HSG D
	0.29	84	1 acre lots, 20% imp, HSG D
	0.29	87	1/4 acre lots, 38% imp, HSG D
	1.88	82	Weighted Average
	1.47		78.29% Pervious Area
	0.41		21.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	40	0.1000	0.12		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.00"
0.7	95	0.2000	2.24		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
1.0	240	0.0400	4.06		**Shallow Concentrated Flow, C-D** Paved Kv= 20.3 fps
7.3	375	Total			

Summary for Subcatchment 12: Sub 12

Runoff = 7.01 cfs @ 12.30 hrs, Volume= 0.762 af, Depth= 3.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_25 Rainfall=5.80"

	Area (ac)	CN	Description
	2.01	77	Woods, Good, HSG D
	0.18	80	>75% Grass cover, Good, HSG D
*	0.04	98	Paved roads OCEAN AVE
*	0.07	98	Roofs, OCEAN RIDGE
*	0.05	98	Paved roads Ocean Ridge
*	0.03	77	Woods, Good, HSG D Ocean Ridge
*	0.23	80	>75% Grass cover, Good, HSG D Ocean Ridge
	2.61	79	Weighted Average
	2.45		93.87% Pervious Area
	0.16		6.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.1	110	0.0400	0.10		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.00"
2.8	270	0.1000	1.58		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
0.6	330	0.0500	9.46	47.31	**Trap/Vee/Rect Channel Flow, C-D** Bot.W=2.00' D=1.00' Z= 3.0 '/' Top.W=8.00' n= 0.025 Earth, clean & winding
21.5	710	Total			

Summary for Subcatchment 15: Sub 15

Runoff = 1.50 cfs @ 12.07 hrs, Volume= 0.110 af, Depth= 4.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_25 Rainfall=5.80"

	Area (ac)	CN	Description
*	0.18	98	Paved roads Site Drive
	0.09	80	>75% Grass cover, Good, HSG D
	0.27	92	Weighted Average
	0.09		33.33% Pervious Area
	0.18		66.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	12	0.0200	0.87		**Sheet Flow, A-B**
					Smooth surfaces n= 0.011 P2= 3.00"
1.2	330	0.0500	4.54		**Shallow Concentrated Flow, B-C**
					Paved Kv= 20.3 fps
3.6					**Direct Entry, C-D**
5.0	342	Total			

Summary for Subcatchment 15A: Sub 15A

Runoff = 0.50 cfs @ 12.07 hrs, Volume= 0.037 af, Depth= 4.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_25 Rainfall=5.80"

	Area (ac)	CN	Description
*	0.06	98	Paved roads Site Drive
	0.03	80	>75% Grass cover, Good, HSG D
	0.09	92	Weighted Average
	0.03		33.33% Pervious Area
	0.06		66.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	12	0.0200	0.87		**Sheet Flow, A-B**
					Smooth surfaces n= 0.011 P2= 3.00"
0.3	75	0.0500	4.54		**Shallow Concentrated Flow, B-C**
					Paved Kv= 20.3 fps
4.5					**Direct Entry, C-D**
5.0	87	Total			

Summary for Subcatchment 20: Subarea 2

Runoff = 13.85 cfs @ 12.46 hrs, Volume= 1.804 af, Depth= 3.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_25 Rainfall=5.80"

	Area (ac)	CN	Description
	0.64	87	1/4 acre lots, 38% imp, HSG D
	0.12	80	>75% Grass cover, Good, HSG D
*	0.05	98	Roadway, Ocean Ave
	5.55	77	Woods, Good, HSG D
	6.36	78	Weighted Average
	6.07		95.39% Pervious Area
	0.29		4.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	110	0.0800	0.13		**Sheet Flow, Overland Woods**
					Woods: Light underbrush n= 0.400 P2= 3.00"
18.8	1,325	0.0550	1.17		**Shallow Concentrated Flow, Overland Woods**
					Woodland Kv= 5.0 fps
32.5	1,435	Total			

Summary for Subcatchment 21: Sub 21

Runoff = 18.15 cfs @ 12.07 hrs, Volume= 1.313 af, Depth= 4.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_25 Rainfall=5.80"

	Area (ac)	CN	Description
	1.20	80	>75% Grass cover, Good, HSG D
*	2.11	98	Site Development
	3.31	91	Weighted Average
	1.20		36.25% Pervious Area
	2.11		63.75% Impervious Area

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

Summary for Subcatchment 22: Sub 22

Runoff = 3.89 cfs @ 12.07 hrs, Volume= 0.284 af, Depth= 4.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_25 Rainfall=5.80"

	Area (ac)	CN	Description
*	0.45	98	Site Development
	0.25	80	>75% Grass cover, Good, HSG D
	0.70	92	Weighted Average
	0.25		35.71% Pervious Area
	0.45		64.29% Impervious Area

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

Summary for Subcatchment 23: Sub 23

Runoff = 0.87 cfs @ 12.07 hrs, Volume= 0.060 af, Depth= 3.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_25 Rainfall=5.80"

Area (ac)	CN	Description
0.20	80	>75% Grass cover, Good, HSG D
0.20		100.00% Pervious Area

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

Summary for Subcatchment 40: Sub 40

Runoff = 3.90 cfs @ 12.13 hrs, Volume= 0.308 af, Depth= 3.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_25 Rainfall=5.80"

Area (ac)	CN	Description
1.12	77	Woods, Good, HSG D
1.12		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.7	50	0.1000	0.12		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.00"
2.4	200	0.0750	1.37		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
9.1	250	Total			

Summary for Subcatchment 50: Sub 50

Runoff = 4.62 cfs @ 12.14 hrs, Volume= 0.377 af, Depth= 3.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_25 Rainfall=5.80"

	Area (ac)	CN	Description
	0.34	77	Woods, Good, HSG D
	0.09	80	>75% Grass cover, Good, HSG D
*	0.03	98	Paved roads Ocean Ave
	0.73	84	1 acre lots, 20% imp, HSG D
	1.19	82	Weighted Average
	1.01		85.21% Pervious Area
	0.18		14.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	50	0.1200	0.13		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.00"
3.7	310	0.0800	1.41		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
9.9	360	Total			

Summary for Subcatchment 100: Subarea 100

Runoff = 1.23 cfs @ 12.09 hrs, Volume= 0.102 af, Depth= 5.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_25 Rainfall=5.80"

	Area (ac)	CN	Description
*	0.22	98	Roadway
	0.22		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	12	0.0200	0.87		**Sheet Flow, Road Crown** Smooth surfaces n= 0.011 P2= 3.00"
5.9	480	0.0380	1.36		**Shallow Concentrated Flow, SHALLOW RD DITCH** Short Grass Pasture Kv= 7.0 fps
0.5	80	0.0200	2.87		**Shallow Concentrated Flow, ROAD GUTTER** Paved Kv= 20.3 fps
6.6	572	Total			

Summary for Subcatchment 101S: BASIN 101 (Ocean Ridge)

Runoff = 0.98 cfs @ 12.09 hrs, Volume= 0.074 af, Depth= 4.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_25 Rainfall=5.80"

	Area (ac)	CN	Description
*	0.11	98	IMPERVIOUS
*	0.08	80	LAWN D
	0.19	90	Weighted Average
	0.08		42.11% Pervious Area
	0.11		57.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	30	0.0200	0.09		**Sheet Flow, Segment ID: AB, Lawn** Grass: Dense n= 0.240 P2= 3.00"
0.1	25	0.0200	2.87		**Shallow Concentrated Flow, Segment ID: BC,Driveway** Paved Kv= 20.3 fps
0.7	100	0.1200	2.42		**Shallow Concentrated Flow, Segment ID: grass slope** Short Grass Pasture Kv= 7.0 fps
6.4	155	Total			

Summary for Subcatchment 300: Subarea 300

Runoff = 0.53 cfs @ 12.07 hrs, Volume= 0.042 af, Depth= 5.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_25 Rainfall=5.80"

	Area (ac)	CN	Description
*	0.09	98	Roadway
	0.09		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	12	0.0200	0.87		**Sheet Flow, Road Crown** Smooth surfaces n= 0.011 P2= 3.00"
1.1	150	0.0130	2.31		**Shallow Concentrated Flow, Gutter flow** Paved Kv= 20.3 fps
3.7					**Direct Entry,**
5.0	162	Total			

Summary for Subcatchment 301S: BASIN 301 (Ocean Ridge)

Runoff = 3.69 cfs @ 12.13 hrs, Volume= 0.303 af, Depth= 4.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_25 Rainfall=5.80"

	Area (ac)	CN	Description
*	0.37	98	IMPERVIOUS
*	0.45	80	LAWN D
	0.82	88	Weighted Average
	0.45		54.88% Pervious Area
	0.37		45.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3	60	0.0300	0.12		**Sheet Flow, Segment ID: AB** Grass: Dense n= 0.240 P2= 3.00"
0.4	50	0.0200	2.12		**Shallow Concentrated Flow, Segment ID: BC** Grassed Waterway Kv= 15.0 fps
0.6	80	0.0200	2.12		**Shallow Concentrated Flow, Segment ID: CD** Grassed Waterway Kv= 15.0 fps
9.3	190	Total			

Summary for Subcatchment 302S: BASIN 302 (Ocean Ridge)

Runoff = 5.97 cfs @ 12.12 hrs, Volume= 0.492 af, Depth= 4.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_25 Rainfall=5.80"

	Area (ac)	CN	Description
*	0.74	98	IMPERVIOUS
*	0.05	77	WOODS D
*	0.48	80	LAWN D
	1.27	90	Weighted Average
	0.53		41.73% Pervious Area
	0.74		58.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	50	0.0200	0.10		**Sheet Flow, Segment ID: AB** Grass: Dense n= 0.240 P2= 3.00"
0.2	30	0.0200	2.87		**Shallow Concentrated Flow, Segment ID: BC** Paved Kv= 20.3 fps
0.4	50	0.0200	2.12		**Shallow Concentrated Flow, Segment ID:** Grassed Waterway Kv= 15.0 fps
9.1	130	Total			

Summary for Subcatchment 303S: BASIN 3 (Ocean Ridge)

Runoff = 2.45 cfs @ 12.11 hrs, Volume= 0.189 af, Depth= 3.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Type III 24-hr Cumberland_25 Rainfall=5.80"

	Area (ac)	CN	Description
*	0.12	98	IMPERVIOUS
*	0.08	77	WOODS D
*	0.38	80	LAWN D
	0.58	83	Weighted Average
	0.46		79.31% Pervious Area
	0.12		20.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	30	0.0300	0.07		**Sheet Flow, Segment ID: AB**
					Woods: Light underbrush n= 0.400 P2= 3.00"
0.9	120	0.0200	2.12		**Shallow Concentrated Flow, Segment ID: BC**
					Grassed Waterway Kv= 15.0 fps
8.1	150	Total			

Summary for Reach 3R: VEGETATED SWALE 1 (Ocean Ridge)

Inflow Area = 1.27 ac, 58.27% Impervious, Inflow Depth = 4.65" for Cumberland_25 event
Inflow = 5.97 cfs @ 12.12 hrs, Volume= 0.492 af
Outflow = 5.56 cfs @ 12.22 hrs, Volume= 0.492 af, Atten= 7%, Lag= 5.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.79 fps, Min. Travel Time= 3.6 min
Avg. Velocity = 0.21 fps, Avg. Travel Time= 13.6 min

Peak Storage= 1,192 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.83'
Bank-Full Depth= 2.00' Flow Area= 24.0 sf, Capacity= 30.82 cfs

6.00' x 2.00' deep channel, n= 0.150
Side Slope Z-value= 3.0 '/' Top Width= 18.00'
Length= 170.0' Slope= 0.0120 '/'
Inlet Invert= 0.00', Outlet Invert= -2.04'

‡

Summary for Reach 4R: SP#2

Inflow Area = 1.12 ac, 0.00% Impervious, Inflow Depth = 3.31" for Cumberland_25 event
Inflow = 3.90 cfs @ 12.13 hrs, Volume= 0.308 af
Outflow = 3.90 cfs @ 12.13 hrs, Volume= 0.308 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs

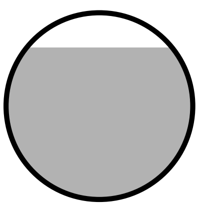
Summary for Reach 31R: CULVERT 3 (Ocean Ridge)

Inflow Area = 0.82 ac, 45.12% Impervious, Inflow Depth = 4.43" for Cumberland_25 event
Inflow = 3.04 cfs @ 12.27 hrs, Volume= 0.303 af
Outflow = 3.04 cfs @ 12.28 hrs, Volume= 0.303 af, Atten= 0%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 5.29 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.29 fps, Avg. Travel Time= 0.6 min

Peak Storage= 29 cf @ 12.27 hrs
Average Depth at Peak Storage= 0.75'
Bank-Full Depth= 0.92' Flow Area= 0.7 sf, Capacity= 3.06 cfs

11.0" Round Pipe
n= 0.012
Length= 50.0' Slope= 0.0100 '/'
Inlet Invert= 0.00', Outlet Invert= -0.50'



Summary for Reach 32R: VEGETATED SWALE 2 (Ocean Ridge)

Inflow Area = 0.82 ac, 45.12% Impervious, Inflow Depth = 4.43" for Cumberland_25 event
Inflow = 3.69 cfs @ 12.13 hrs, Volume= 0.303 af
Outflow = 3.54 cfs @ 12.20 hrs, Volume= 0.303 af, Atten= 4%, Lag= 4.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.71 fps, Min. Travel Time= 2.7 min
Avg. Velocity = 0.19 fps, Avg. Travel Time= 10.1 min

Peak Storage= 574 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.63'
Bank-Full Depth= 2.00' Flow Area= 24.0 sf, Capacity= 32.02 cfs

6.00' x 2.00' deep channel, n= 0.150
Side Slope Z-value= 3.0 '/' Top Width= 18.00'
Length= 115.0' Slope= 0.0130 '/'
Inlet Invert= 0.00', Outlet Invert= -1.49'

‡

Summary for Reach 33R: Wetland Flow

Inflow Area = 2.67 ac, 46.07% Impervious, Inflow Depth > 4.42" for Cumberland_25 event
Inflow = 3.95 cfs @ 12.58 hrs, Volume= 0.984 af
Outflow = 3.93 cfs @ 12.67 hrs, Volume= 0.984 af, Atten= 0%, Lag= 5.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.87 fps, Min. Travel Time= 2.9 min
Avg. Velocity = 0.26 fps, Avg. Travel Time= 9.8 min

Peak Storage= 680 cf @ 12.62 hrs
Average Depth at Peak Storage= 0.29'
Bank-Full Depth= 1.00' Flow Area= 30.0 sf, Capacity= 52.28 cfs

10.00' x 1.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 20.0 '/' Top Width= 50.00'
Length= 150.0' Slope= 0.0033 '/'
Inlet Invert= 158.00', Outlet Invert= 157.50'

‡

Summary for Reach 106R: SP#1 (Eben Hill Road)

Inflow Area = 23.10 ac, 28.47% Impervious, Inflow Depth > 3.96" for Cumberland_25 event
Inflow = 44.57 cfs @ 12.14 hrs, Volume= 7.626 af
Outflow = 44.57 cfs @ 12.14 hrs, Volume= 7.626 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs

Summary for Reach 122R: ROADWAY GUTTER

Inflow Area = 2.61 ac, 6.13% Impervious, Inflow Depth = 3.50" for Cumberland_25 event
Inflow = 7.01 cfs @ 12.30 hrs, Volume= 0.762 af
Outflow = 6.99 cfs @ 12.32 hrs, Volume= 0.762 af, Atten= 0%, Lag= 1.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.86 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 1.70 fps, Avg. Travel Time= 2.8 min

Peak Storage= 418 cf @ 12.31 hrs
Average Depth at Peak Storage= 0.40'
Bank-Full Depth= 0.50' Flow Area= 2.0 sf, Capacity= 10.97 cfs

2.00' x 0.50' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 3.0 5.0 '/' Top Width= 6.00'
Length= 290.0' Slope= 0.0379 '/'
Inlet Invert= 106.50', Outlet Invert= 95.50'

‡

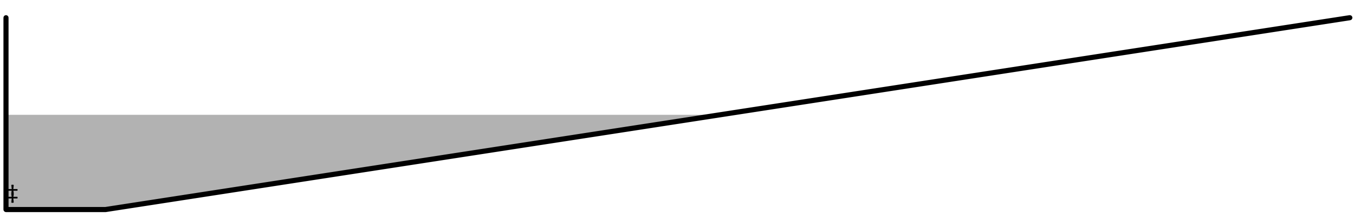
Summary for Reach 123R: CURB ROAD GUTTER

Inflow Area = 3.60 ac, 18.61% Impervious, Inflow Depth > 3.80" for Cumberland_25 event
Inflow = 8.71 cfs @ 12.32 hrs, Volume= 1.139 af
Outflow = 8.71 cfs @ 12.33 hrs, Volume= 1.139 af, Atten= 0%, Lag= 0.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.32 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.32 fps, Avg. Travel Time= 1.0 min

Peak Storage= 161 cf @ 12.33 hrs
Average Depth at Peak Storage= 0.25'
Bank-Full Depth= 0.50' Flow Area= 7.3 sf, Capacity= 48.18 cfs

2.00' x 0.50' deep channel, n= 0.013 Asphalt, smooth
Side Slope Z-value= 0.0 50.0 '/' Top Width= 27.00'
Length= 80.0' Slope= 0.0200 '/'
Inlet Invert= 95.50', Outlet Invert= 93.90'



‡

Summary for Reach 210R: Woods overland

Inflow Area = 3.31 ac, 63.75% Impervious, Inflow Depth > 4.66" for Cumberland_25 event
Inflow = 8.03 cfs @ 12.23 hrs, Volume= 1.284 af
Outflow = 8.02 cfs @ 12.24 hrs, Volume= 1.284 af, Atten= 0%, Lag= 0.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.57 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 0.73 fps, Avg. Travel Time= 1.1 min

Peak Storage= 156 cf @ 12.24 hrs
Average Depth at Peak Storage= 0.22'
Bank-Full Depth= 0.50' Flow Area= 10.0 sf, Capacity= 40.80 cfs

10.00' x 0.50' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 20.0 '/' Top Width= 30.00'
Length= 50.0' Slope= 0.0400 '/'
Inlet Invert= 112.00', Outlet Invert= 110.00'

‡

Summary for Reach 220R: Access Ditch

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 1.00' Flow Area= 5.0 sf, Capacity= 47.31 cfs

2.00' x 1.00' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 3.0 '/' Top Width= 8.00'
Length= 310.0' Slope= 0.0500 '/'
Inlet Invert= 126.00', Outlet Invert= 110.50'

‡

Summary for Reach 221R: Overland Flow

Inflow Area = 0.99 ac, 51.52% Impervious, Inflow Depth > 4.58" for Cumberland_25 event
Inflow = 1.77 cfs @ 12.12 hrs, Volume= 0.378 af
Outflow = 1.77 cfs @ 12.17 hrs, Volume= 0.378 af, Atten= 1%, Lag= 2.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.04 fps, Min. Travel Time= 1.5 min
Avg. Velocity = 0.60 fps, Avg. Travel Time= 5.0 min

Peak Storage= 156 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.08'
Bank-Full Depth= 0.50' Flow Area= 10.0 sf, Capacity= 59.50 cfs

10.00' x 0.50' deep channel, n= 0.040 Woods Overland flow
Side Slope Z-value= 20.0 '/' Top Width= 30.00'
Length= 180.0' Slope= 0.1111 '/'
Inlet Invert= 120.00', Outlet Invert= 100.00'

‡

Summary for Reach 240R: EXISTING CHANNEL

Inflow Area = 2.67 ac, 46.07% Impervious, Inflow Depth > 4.42" for Cumberland_25 event
Inflow = 3.91 cfs @ 12.80 hrs, Volume= 0.983 af
Outflow = 3.90 cfs @ 12.84 hrs, Volume= 0.983 af, Atten= 0%, Lag= 2.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.65 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 1.40 fps, Avg. Travel Time= 4.1 min

Peak Storage= 286 cf @ 12.81 hrs
Average Depth at Peak Storage= 0.27'
Bank-Full Depth= 1.00' Flow Area= 6.0 sf, Capacity= 57.44 cfs

2.00' x 1.00' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 4.0 '/' Top Width= 10.00'
Length= 340.0' Slope= 0.0529 '/'
Inlet Invert= 128.00', Outlet Invert= 110.00'

‡

Summary for Reach 241R: EXISTING CHANNEL

Inflow Area = 5.98 ac, 55.85% Impervious, Inflow Depth > 4.55" for Cumberland_25 event
Inflow = 8.98 cfs @ 12.25 hrs, Volume= 2.268 af
Outflow = 8.95 cfs @ 12.27 hrs, Volume= 2.267 af, Atten= 0%, Lag= 1.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Max. Velocity= 6.65 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 2.31 fps, Avg. Travel Time= 2.2 min

Peak Storage= 404 cf @ 12.26 hrs
Average Depth at Peak Storage= 0.38'
Bank-Full Depth= 1.00' Flow Area= 6.0 sf, Capacity= 68.36 cfs

2.00' x 1.00' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 4.0 '/' Top Width= 10.00'
Length= 300.0' Slope= 0.0750 '/'
Inlet Invert= 110.00', Outlet Invert= 87.50'

‡

Summary for Reach 340R: Woodland Flow

Inflow Area = 2.67 ac, 46.07% Impervious, Inflow Depth > 4.42" for Cumberland_25 event
Inflow = 3.93 cfs @ 12.67 hrs, Volume= 0.984 af
Outflow = 3.91 cfs @ 12.80 hrs, Volume= 0.983 af, Atten= 1%, Lag= 8.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.60 fps, Min. Travel Time= 4.5 min
Avg. Velocity = 0.79 fps, Avg. Travel Time= 14.8 min

Peak Storage= 1,053 cf @ 12.72 hrs
Average Depth at Peak Storage= 0.21'
Bank-Full Depth= 1.00' Flow Area= 15.0 sf, Capacity= 92.76 cfs

5.00' x 1.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 10.0 '/' Top Width= 25.00'
Length= 700.0' Slope= 0.0421 '/'
Inlet Invert= 157.50', Outlet Invert= 128.00'

‡

Summary for Pond 3P: POND 3 (Ocean Ridge)

Inflow Area = 2.67 ac, 46.07% Impervious, Inflow Depth = 4.42" for Cumberland_25 event
Inflow = 9.99 cfs @ 12.22 hrs, Volume= 0.984 af
Outflow = 3.95 cfs @ 12.58 hrs, Volume= 0.984 af, Atten= 61%, Lag= 21.4 min
Primary = 3.95 cfs @ 12.58 hrs, Volume= 0.984 af

Routing by Stor-Ind method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Peak Elev= 161.33' @ 12.58 hrs Surf.Area= 5,928 sf Storage= 13,782 cf

Plug-Flow detention time= 71.1 min calculated for 0.984 af (100% of inflow)
Center-of-Mass det. time= 70.6 min (880.9 - 810.4)

Volume	Invert	Avail.Storage	Storage Description
#1	158.00'	21,813 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
158.00	2,113	0	0
160.00	4,304	6,417	6,417
162.00	6,739	11,043	17,460
162.60	7,772	4,353	21,813

Device	Routing	Invert	Outlet Devices
#1	Primary	158.00'	**6.0" Vert. Orifice/Grate** C= 0.600
#2	Primary	160.00'	**9.0" Vert. Orifice/Grate** C= 0.600
#3	Primary	161.00'	**4.5" Vert. Orifice/Grate** C= 0.600
#4	Primary	161.50'	**20.0' long Broad-Crested Rectangular Weir X 1.81** Head (feet) 0.50 1.00 1.50 Coef. (English) 1.60 1.80 1.90

Primary OutFlow Max=3.95 cfs @ 12.58 hrs HW=161.33' (Free Discharge)
1=Orifice/Grate (Orifice Controls 1.66 cfs @ 8.46 fps)
2=Orifice/Grate (Orifice Controls 2.08 cfs @ 4.71 fps)
3=Orifice/Grate (Orifice Controls 0.20 cfs @ 1.97 fps)
4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 30P: POND 30 (Ocean Ridge)

Inflow Area = 0.82 ac, 45.12% Impervious, Inflow Depth = 4.43" for Cumberland_25 event
Inflow = 3.54 cfs @ 12.20 hrs, Volume= 0.303 af
Outflow = 3.04 cfs @ 12.27 hrs, Volume= 0.303 af, Atten= 14%, Lag= 4.1 min
Primary = 3.04 cfs @ 12.27 hrs, Volume= 0.303 af

Routing by Stor-Ind method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Peak Elev= 160.88' @ 12.27 hrs Surf.Area= 1,526 sf Storage= 1,387 cf

Plug-Flow detention time= 22.7 min calculated for 0.303 af (100% of inflow)
Center-of-Mass det. time= 22.6 min (827.1 - 804.5)

Volume	Invert	Avail.Storage	Storage Description
#1	160.00'	3,156 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
160.00	1,150	0	0
162.00	2,006	3,156	3,156

Device	Routing	Invert	Outlet Devices
#1	Primary	160.00'	**18.0" Round Culvert** L= 30.0' Ke= 0.500 Inlet / Outlet Invert= 160.00' / 159.70' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=3.04 cfs @ 12.27 hrs HW=160.88' (Free Discharge)
↑**1=Culvert** (Barrel Controls 3.04 cfs @ 4.07 fps)

Summary for Pond 60R: FIELD CB

Inflow Area = 0.42 ac, 23.00% Impervious, Inflow Depth = 4.01" for Cumberland_25 event
Inflow = 2.02 cfs @ 12.07 hrs, Volume= 0.140 af
Outflow = 2.02 cfs @ 12.07 hrs, Volume= 0.140 af, Atten= 0%, Lag= 0.0 min
Primary = 2.02 cfs @ 12.07 hrs, Volume= 0.140 af

Routing by Stor-Ind method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Peak Elev= 90.79' @ 12.07 hrs
Flood Elev= 91.81'

Device	Routing	Invert	Outlet Devices
#1	Primary	90.00'	**12.0" Round Culvert** L= 110.0' Square-edged headwall, Ke= 0.500 Inlet / Outlet Invert= 90.00' / 89.00' S= 0.0091 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=2.02 cfs @ 12.07 hrs HW=90.79' (Free Discharge)
↑**1=Culvert** (Inlet Controls 2.02 cfs @ 3.03 fps)

Summary for Pond 62P: Driveway Culvert

Inflow Area = 12.76 ac, 29.23% Impervious, Inflow Depth > 3.96" for Cumberland_25 event
Inflow = 21.95 cfs @ 12.39 hrs, Volume= 4.211 af
Outflow = 21.92 cfs @ 12.40 hrs, Volume= 4.211 af, Atten= 0%, Lag= 0.8 min
Primary = 8.56 cfs @ 12.40 hrs, Volume= 3.382 af
Secondary = 13.35 cfs @ 12.40 hrs, Volume= 0.829 af

Routing by Stor-Ind method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Peak Elev= 89.88' @ 12.40 hrs Surf.Area= 3,283 sf Storage= 1,753 cf

Plug-Flow detention time= 0.8 min calculated for 4.210 af (100% of inflow)
Center-of-Mass det. time= 0.8 min (918.3 - 917.5)

Volume	Invert	Avail.Storage	Storage Description
#1	88.00'	2,197 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
88.00	47	50.0	0	0	47
89.00	540	284.0	249	249	6,269
90.00	3,860	500.0	1,948	2,197	19,750

Device	Routing	Invert	Outlet Devices
#1	Primary	87.50'	**18.0" Round Culvert** L= 35.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 87.50' / 87.00' S= 0.0143 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Secondary	89.50'	**22.0' long x 13.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.60 2.64 2.70 2.66 2.65 2.66 2.65 2.63

Primary OutFlow Max=8.56 cfs @ 12.40 hrs HW=89.88' (Free Discharge)
└─**1=Culvert** (Inlet Controls 8.56 cfs @ 4.85 fps)

Secondary OutFlow Max=13.35 cfs @ 12.40 hrs HW=89.88' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 13.35 cfs @ 1.62 fps)

Summary for Pond 66P: 24" Cross culvert

Inflow Area = 13.95 ac, 28.00% Impervious, Inflow Depth > 3.95" for Cumberland_25 event
Inflow = 24.07 cfs @ 12.36 hrs, Volume= 4.588 af
Outflow = 23.78 cfs @ 12.36 hrs, Volume= 4.581 af, Atten= 1%, Lag= 0.0 min
Primary = 21.46 cfs @ 12.36 hrs, Volume= 4.544 af
Secondary = 2.33 cfs @ 12.36 hrs, Volume= 0.037 af

Routing by Stor-Ind method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs / 6
Peak Elev= 88.68' @ 12.36 hrs Surf.Area= 1,850 sf Storage= 1,817 cf

Plug-Flow detention time= 3.3 min calculated for 4.581 af (100% of inflow)
Center-of-Mass det. time= 0.7 min (910.4 - 909.7)

Volume	Invert	Avail.Storage	Storage Description
#1	84.00'	1,817 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
84.00	5	5.0	0	0	5
85.00	25	25.0	14	14	55
86.00	63	40.0	43	56	139
87.00	425	195.0	217	273	3,040
88.00	1,210	305.0	784	1,058	7,424
88.50	1,850	330.0	759	1,817	8,697

Device	Routing	Invert	Outlet Devices
#1	Primary	84.45'	**24.0" Round Culvert** L= 65.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 84.45' / 84.13' S= 0.0049 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf
#2	Secondary	88.50'	**12.0' long x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64

Primary OutFlow Max=21.46 cfs @ 12.36 hrs HW=88.68' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 21.46 cfs @ 6.83 fps)

Secondary OutFlow Max=2.32 cfs @ 12.36 hrs HW=88.68' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 2.32 cfs @ 1.09 fps)

Summary for Pond 100R: Vortech-DMH2

Inflow Area = 3.06 ac, 38.89% Impervious, Inflow Depth = 4.30" for Cumberland_25 event
Inflow = 13.11 cfs @ 12.12 hrs, Volume= 1.098 af
Outflow = 13.11 cfs @ 12.12 hrs, Volume= 1.098 af, Atten= 0%, Lag= 0.0 min
Primary = 13.11 cfs @ 12.12 hrs, Volume= 1.098 af

Routing by Stor-Ind method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Peak Elev= 110.12' @ 12.12 hrs
Flood Elev= 112.16'

Device	Routing	Invert	Outlet Devices
#1	Primary	107.00'	**18.0" Round Culvert** L= 318.0' Ke= 0.500 Inlet / Outlet Invert= 107.00' / 98.52' S= 0.0267 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=13.10 cfs @ 12.12 hrs HW=110.12' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 13.10 cfs @ 7.41 fps)

Summary for Pond 101R: DMH2-DMH1(DMH1606)

Inflow Area = 3.06 ac, 38.89% Impervious, Inflow Depth = 4.30" for Cumberland_25 event
Inflow = 13.11 cfs @ 12.12 hrs, Volume= 1.098 af
Outflow = 13.11 cfs @ 12.12 hrs, Volume= 1.098 af, Atten= 0%, Lag= 0.0 min
Primary = 13.11 cfs @ 12.12 hrs, Volume= 1.098 af

Routing by Stor-Ind method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Peak Elev= 101.50' @ 12.12 hrs
Flood Elev= 103.21'

Device	Routing	Invert	Outlet Devices
#1	Primary	98.38'	**18.0" Round Culvert** L= 177.0' Ke= 0.500 Inlet / Outlet Invert= 98.38' / 91.46' S= 0.0391 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=13.10 cfs @ 12.12 hrs HW=101.50' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 13.10 cfs @ 7.41 fps)

Summary for Pond 102R: DMH1606-DMH9

Inflow Area = 3.06 ac, 38.89% Impervious, Inflow Depth = 4.30" for Cumberland_25 event
Inflow = 13.11 cfs @ 12.12 hrs, Volume= 1.098 af
Outflow = 13.11 cfs @ 12.12 hrs, Volume= 1.098 af, Atten= 0%, Lag= 0.0 min
Primary = 13.11 cfs @ 12.12 hrs, Volume= 1.098 af

Routing by Stor-Ind method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Peak Elev= 94.42' @ 12.12 hrs
Flood Elev= 96.40'

Device	Routing	Invert	Outlet Devices
#1	Primary	91.30'	**18.0" Round Culvert** L= 110.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 91.30' / 89.27' S= 0.0185 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf

Primary OutFlow Max=13.10 cfs @ 12.12 hrs HW=94.42' (Free Discharge)
↑**1=Culvert** (Inlet Controls 13.10 cfs @ 7.41 fps)

Summary for Pond 103R: DMH9-DMH8

Inflow Area = 8.76 ac, 28.40% Impervious, Inflow Depth > 4.02" for Cumberland_25 event
Inflow = 27.40 cfs @ 12.12 hrs, Volume= 2.935 af
Outflow = 27.40 cfs @ 12.12 hrs, Volume= 2.935 af, Atten= 0%, Lag= 0.0 min
Primary = 27.40 cfs @ 12.12 hrs, Volume= 2.935 af

Routing by Stor-Ind method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Peak Elev= 102.54' @ 12.12 hrs
Flood Elev= 94.51'

Device	Routing	Invert	Outlet Devices
#1	Primary	89.07'	**18.0" Round Culvert** L= 132.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 89.07' / 87.76' S= 0.0099 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf

Primary OutFlow Max=27.38 cfs @ 12.12 hrs HW=102.52' (Free Discharge)
↑**1=Culvert** (Barrel Controls 27.38 cfs @ 15.49 fps)

Summary for Pond 104R: DMH8-DMH200

Inflow Area = 9.15 ac, 29.18% Impervious, Inflow Depth > 4.04" for Cumberland_25 event
Inflow = 29.13 cfs @ 12.12 hrs, Volume= 3.082 af
Outflow = 29.13 cfs @ 12.12 hrs, Volume= 3.082 af, Atten= 0%, Lag= 0.0 min
Primary = 29.13 cfs @ 12.12 hrs, Volume= 3.082 af

Routing by Stor-Ind method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Peak Elev= 112.37' @ 12.12 hrs
Flood Elev= 92.36'

Device	Routing	Invert	Outlet Devices
#1	Primary	87.66'	**18.0" Round Culvert** L= 273.0' RCP, square edge headwall, Ke= 0.500

Inlet / Outlet Invert= 87.66' / 86.60' S= 0.0039 '/' Cc= 0.900
n= 0.012 Concrete pipe, finished, Flow Area= 1.77 sf

Primary OutFlow Max=29.11 cfs @ 12.12 hrs HW=112.34' (Free Discharge)
└─**1=Culvert** (Barrel Controls 29.11 cfs @ 16.47 fps)

Summary for Pond 105R: DMH200-OUTLET

Inflow Area = 9.15 ac, 29.18% Impervious, Inflow Depth > 4.04" for Cumberland_25 event
Inflow = 29.13 cfs @ 12.12 hrs, Volume= 3.082 af
Outflow = 29.13 cfs @ 12.12 hrs, Volume= 3.082 af, Atten= 0%, Lag= 0.0 min
Primary = 29.13 cfs @ 12.12 hrs, Volume= 3.082 af

Routing by Stor-Ind method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Peak Elev= 99.00' @ 12.12 hrs
Flood Elev= 89.25'

Device	Routing	Invert	Outlet Devices
#1	Primary	86.53'	**18.0" Round Culvert** L= 60.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 86.53' / 84.13' S= 0.0400 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=29.11 cfs @ 12.12 hrs HW=98.98' (Free Discharge)
└─**1=Culvert** (Inlet Controls 29.11 cfs @ 16.47 fps)

Summary for Pond 210P: Sand Filter mc3500

Inflow Area = 3.31 ac, 63.75% Impervious, Inflow Depth = 4.76" for Cumberland_25 event
Inflow = 18.15 cfs @ 12.07 hrs, Volume= 1.313 af
Outflow = 8.03 cfs @ 12.23 hrs, Volume= 1.284 af, Atten= 56%, Lag= 9.8 min
Primary = 8.03 cfs @ 12.23 hrs, Volume= 1.284 af

Routing by Stor-Ind method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Peak Elev= 130.18' @ 12.23 hrs Surf.Area= 6,773 sf Storage= 23,017 cf

Plug-Flow detention time= 270.8 min calculated for 1.284 af (98% of inflow)
Center-of-Mass det. time= 257.4 min (1,038.6 - 781.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	124.70'	9,447 cf	**80.08'W x 84.57'L x 5.50'H Field A** 37,250 cf Overall - 13,632 cf Embedded = 23,618 cf x 40.0% Voids
#2A	125.45'	13,632 cf	**ADS_StormTech MC-3500 d +Cap** x 121 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 11 Rows of 11 Chambers Cap Storage= +14.9 cf x 2 x 11 rows = 327.8 cf
		23,079 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	121.00'	**15.0" Round Culvert** L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 121.00' / 117.00' S= 0.0800 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Device 1	121.00'	**1.0" Vert. Orifice/Grate X 2.00** C= 0.600
#3	Device 1	126.80'	**7.0" Vert. Orifice/Grate X 2.00** C= 0.600
#4	Device 1	129.87'	**6.0' long x 1.50' rise Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)

Primary OutFlow Max=8.02 cfs @ 12.23 hrs HW=130.18' (Free Discharge)
└─**1=Culvert** (Passes 8.02 cfs of 17.28 cfs potential flow)
 ├─**2=Orifice/Grate** (Orifice Controls 0.16 cfs @ 14.55 fps)
 ├─**3=Orifice/Grate** (Orifice Controls 4.52 cfs @ 8.46 fps)
 └─**4=Sharp-Crested Vee/Trap Weir** (Weir Controls 3.34 cfs @ 1.81 fps)

Summary for Pond 220P: UDF

Inflow Area = 0.90 ac, 50.00% Impervious, Inflow Depth = 4.59" for Cumberland_25 event
Inflow = 4.77 cfs @ 12.07 hrs, Volume= 0.344 af
Outflow = 1.54 cfs @ 12.36 hrs, Volume= 0.342 af, Atten= 68%, Lag= 17.1 min
Primary = 1.54 cfs @ 12.36 hrs, Volume= 0.342 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-45.00 hrs, dt= 0.01 hrs
Peak Elev= 126.96' @ 12.36 hrs Surf.Area= 3,954 sf Storage= 5,960 cf

Plug-Flow detention time= 277.3 min calculated for 0.342 af (99% of inflow)
Center-of-Mass det. time= 272.4 min (1,056.2 - 783.7)

Volume	Invert	Avail.Storage	Storage Description
#1	125.00'	10,527 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
125.00	2,326	0	0
126.00	2,974	2,650	2,650
127.00	4,000	3,487	6,137
128.00	4,780	4,390	10,527

Device	Routing	Invert	Outlet Devices
#1	Primary	122.83'	**12.0" Round Culvert** L= 78.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 122.83' / 122.28' S= 0.0071 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	122.83'	**0.9" Vert. Orifice/Grate** C= 0.600
#3	Device 2	125.00'	**2.400 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'
#4	Device 1	126.00'	**4.0" Vert. Orifice/Grate X 4.00** C= 0.600
#5	Device 1	127.00'	**20.0" Vert. Orifice/Grate** C= 0.600
#6	Secondary	127.50'	**10.0' long x 8.0' 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) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Primary OutFlow Max=1.54 cfs @ 12.36 hrs HW=126.96' (Free Discharge)
└─**1=Culvert** (Passes 1.54 cfs of 6.38 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.04 cfs @ 9.74 fps)
  │ └─**3=Exfiltration** (Passes 0.04 cfs of 0.22 cfs potential flow)
  ├─**4=Orifice/Grate** (Orifice Controls 1.49 cfs @ 4.28 fps)
  └─**5=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=125.00' (Free Discharge)
└─**6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Attachment C

Inspection, Maintenance and Housekeeping Plan

INSPECTION, MAINTENANCE, AND HOUSEKEEPING PLAN

Portland Retirement Residence
Portland, ME

Introduction

Upon completion of the proposed development, Hawthorne Development Group, LLC (or a subsidiary of) will be the responsible party for maintaining the stormwater management system. Until such time as the condominium association is established, such as during construction, the developer (Hawthorne Development Group, LLC) shall be responsible for maintaining the stormwater management system. The responsible party shall schedule maintenance of all stormwater management structures, the establishment of any contract services required to implement the program, and the keeping of records and maintenance logbook.

Records of all inspections and maintenance work accomplished must be kept on file and retained for a minimum 5-year time span. The maintenance logbook will be made available to the Maine Department of Environmental Protection (MDEP) and the City of Portland upon request. At a minimum, the appropriate and relevant activities for each of the stormwater management systems will be performed on the prescribed schedule.

The following plan outlines the anticipated inspection, maintenance, and housekeeping procedures for the erosion and sedimentation controls as well as stormwater management devices for the project site. Also, this plan outlines several housekeeping requirements that shall be followed during and after construction. These procedures should be followed in order to ensure the intended function of the designed measures and to prevent unreasonable adverse impacts to the surrounding environment.

The procedures outlined in the Inspection, Maintenance, and Housekeeping Plan is provided as an overview of the anticipated practices to be used on this site. In some instances, additional measures may be required due to unexpected conditions. For additional details on any of the erosion and sedimentation control measures or stormwater management devices to be utilized on this project, refer to the most recently revised edition of the “Maine Erosion and Sedimentation Control BMP” manual and/or the “Stormwater Management for Maine: Best Management Practices” manual as published by the MDEP.

During Construction

1. **Inspection:** During the construction process, it is the Contractor’s responsibility to comply with

the inspection and maintenance procedures outlined in this section. These responsibilities include inspecting disturbed and impervious areas, erosion control measures, materials storage areas that are exposed to precipitation, and locations where vehicles enter or exit the site. These areas shall be inspected at least once a week as well as before and after a storm event, and prior to completing permanent stabilization measures. A person with knowledge of erosion and stormwater control, including the standards and conditions in any applicable permits, shall conduct the inspections.

2. **Maintenance:** All measures shall be maintained in an effective operating condition until areas are permanently stabilized. If Best Management Practices (BMPs) need to be maintained or modified, additional BMPs are necessary, or other corrective action is needed, implementation must be completed within seven (7) calendar days and prior to any storm event (rainfall).

3. **Documentation:** A log summarizing the inspections and any corrective action taken must be maintained on-site. The log must include the name(s) and qualifications of the person making the inspections, the date(s) of the inspections, and major observations about the operation and maintenance of erosion and sedimentation controls, material storage areas, and vehicle access points to the site. Major observations must include BMPs that need maintenance, BMPs that failed to operate as designed or proved inadequate for a particular location, and locations where additional BMPs are needed. For each BMP requiring maintenance, BMP needing replacement, and location needing additional BMPs, note in the log the corrective action taken and when it was taken.

   The log must be made accessible to the appropriate regulatory agency upon request. The permittee shall retain a copy of the log for a period of at least three (3) years from the completion of permanent stabilization.

4. **Specific Inspection and Maintenance Tasks:** The following is a list of erosion control and stormwater management measures and the specific inspection and maintenance tasks to be performed during construction.

   A. <u>Sediment Barriers:</u>

   - Hay bale barriers, silt fences, and filter berms shall be inspected immediately after each rainfall and at least daily during prolonged rainfall.
   - If the fabric on silt fence or filter barrier should decompose or become ineffective prior to the end of the expected usable life and the barrier is still necessary, it shall be replaced.
   - Sediment deposits should be removed after each storm event. They must be removed before deposits reach approximately one-half the height of the barrier.
   - Filter berms shall be reshaped as needed.
   - Any sediment deposits remaining in place after the silt fence or filter barrier is no longer

required should be dressed to conform to the existing grade, prepared, and seeded.

B. Riprap Materials:

- Once a riprap installation has been completed, it should require very little maintenance. It shall, however, be inspected periodically to determine if high flows have caused scour beneath the riprap or dislodged any of the stone.

C. Erosion Control Blankets:

- Inspect these reinforced areas semi-annually and after significant rainfall events for slumping, sliding, seepage, and scour. Pay close attention to unreinforced areas adjacent to the erosion control blankets, which may experience accelerated erosion.
- Review all applicable inspection and maintenance procedures recommended by the specific blanket manufacturer. These tasks shall be included in addition to this plan.

D. Temporary Storm Drain Inlet Protection:

- The inlet protection structure shall be inspected before each rain event and repaired as necessary.
- Sediment shall be removed and the storm drain sediment barrier restored to its original dimensions when the sediment has accumulated to half of the design depth of the trap.
- Structures shall be removed upon permanent stabilization of the tributary area.
- Upon removal of the structure, all accumulated sediments downstream of the structure shall be cleaned from the storm drain system.

E. Stabilized Construction Entrances/Exits:

- The exit shall be maintained in a condition that will prevent tracking of sediment onto public rights-of-way.
- When the control pad becomes ineffective, the stone shall be removed along with the collected soil material. The entrance should then be reconstructed.
- Areas that have received mud-tracking or sediment deposits shall be swept or washed. Washing shall be done on an area stabilized with aggregate, which drains into an approved sediment-trapping device (not into storm drains, ditches, or waterways).

F. Temporary Seed and Mulch:

- Mulched areas should be inspected after rain events to check for rill erosion.
- If less than 90% of the soil surface is covered by mulch, additional mulch shall be applied in bare areas.

- In applications where seeding and mulch have been applied in conjunction with erosion control blankets, the blankets must be inspected after rain events for dislocation or undercutting.
- Mulch shall continue to be reapplied until 95% of the soil surface has established temporary vegetative cover.

G. Stabilized Drainage Swales:

- Sediment accumulation in the swale shall be removed once the cross section of the swale is reduced by 25%.
- The swales shall be inspected after rainfall events. Any evidence of sloughing of the side slopes or channel erosion shall be repaired and corrective action should be taken to prevent reoccurrence of the problem.
- In addition to the stabilized lining of the channel (i.e. erosion control blankets), stone check dams may be needed to further reduce channel velocity.

5. **Housekeeping:** The following general performance standards apply to the proposed project.

A. Spill Prevention: Controls must be used to prevent pollutants from being discharged from materials on-site, including storage practices to minimize exposure of the materials to stormwater, and appropriate spill prevention, containment, and response planning and implementation.

B. 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.

C. Fugitive Sediment and Dust: Actions must be taken to insure 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.

D. Debris and Other Materials: Litter, construction debris, and chemicals exposed to stormwater must be prevented from becoming a pollutant source.

E. Trench or Foundation Dewatering: Trench dewatering is the removal of water from trenches, foundations, cofferdams, 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 must be removed from the ponded area, either through gravity or pumping, and 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.

<u>After Construction</u>

1. **Inspection:** After construction, the owner or operator shall hire a qualified post-construction stormwater inspector to at least annually, inspect the BMPs, in accordance with all municipal and state inspection, cleaning and maintenance requirements of the approved post-construction stormwater management plan.

2. **Maintenance, and repair:** If a BMP requires maintenance, repair or replacement to function as intended by the approved post-construction stormwater management plan, the owner or operator shall take corrective actions to address the deficiency or deficiencies as soon as possible after the deficiency is discovered and shall provide a record of the deficiency and corrective actions to the Department of Public Services (DPS). The following is a list of permanent erosion control and stormwater management measures and the inspection, maintenance, and housekeeping tasks to be performed after construction.

   A. <u>Vegetated Areas:</u>
      - Inspect vegetated areas, particularly slopes and embankments, early in the growing season or after heavy rains to identify active or potential erosion problems.
      - Replant bare areas or areas with sparse growth. Where rill erosion is evident, armor the area with an appropriate lining or divert the erosive flows to on-site areas able to withstand the concentrated flows.

   B. <u>Ditches, Swales and Other Open Channels:</u>
      - Inspect ditches, swales, and other open stormwater channels in the spring, in the late fall, and after heavy rains to remove any obstructions to the flow. Remove accumulated sediments and debris, remove woody vegetative growth that could obstruct flow and repair any erosion of the ditch lining.
      - Vegetated ditches must be mowed at least annually or otherwise maintained to control the growth of woody vegetation and maintain flow capacity.
      - Any woody vegetation growing through riprap linings must also be removed. Repair any slumping side slopes as soon as practicable.
      - Replace riprap in areas where any underlying filter fabric or underlying gravel is showing through the stone or where stones have dislodged.

   C. <u>Level Lip Spreaders/Ditch Turnouts:</u>
      - The level lip spreader pool shall be inspected after significant rainfall events for sediment accumulation and debris that may reduce its capacity. Sediment and debris buildup shall be removed once the volume of the pool has been reduced by 25%.

- The level lip must be constructed so that runoff flows slowly over the lip to a sheet flow condition through the receiving area. Repair or reconstruction of the level lip is required when the flow from the spreader becomes channelized.
- Do not store snow removed from the street/parking lot within the area of the level spreader.

D. <u>Winter Sanding:</u>
- Clear accumulations of winter sand in parking lots and along roadways at least once a year, preferably in the spring.
- Accumulations on pavement may be removed by pavement sweeping.
- Accumulations of sand along road shoulders may be removed by grading excess sand to the pavement edge and removing it manually or by a front-end loader or other acceptable method.

E. <u>Underdrained Grass Filter</u>
- The inlet and outlet of the BMP shall be checked periodically to ensure that flow structures are not blocked by debris. Inspections should be conducted monthly during wet weather conditions from March to November.
- Debris and sediment buildup shall be removed from the forebay and basin upon reaching a 6-inch accumulation within the forebay and 2 inches within the basin, but not less than annually.
- Mowing of grass may be conducted semiannually to a height of no less than 6-inches, with hand held trimmers or push mowers
- Grass filters shall be inspected annually for erosion, destabilization of sideslopes, embankment settling and other signs of structural failure. Corrective action should be taken immediately upon identification of problems.
- Rototill top of filter bed when ponding exceeds 48 hours
- Replace top several inches of filter material when ponding exceeds 72 hours

F. Underdrained Subsurface Sand Filter
- Inspect the site monthly for the first few months after construction. Then inspections can occur on an annual basis, preferably after rain events when clogging will be obvious.
- Make any repairs necessary to ensure the measure is operating properly.
- Regular maintenance is necessary to remove surface sediment, trash, debris, and leaf litter.
- Outlets and chambers need to be cleaned/repaired when drawdown times in the filter exceed 36 hours.
- In certain cases, layers of sand may need to be replaced every 3 to 5 years.

G. Stormtech Chambers/Isolator Row:
   - Stormtech Chambers shall be inspected and maintained according to manufacturer's recommendations.
   - Recommended maintenance includes, but not limited to, visual inspection of accumulated sediment within isolator row and jet-vac flushing when required.

H. Catch Basins:
   - Inspect and, if required, clean-out catch basins at least once a year, preferably in early spring.
   - Clean out must include the removal and legal disposal of accumulated sediments and debris at the bottom of the basin, at any inlet grates, at any inflow channels to the basin, and at any pipes between basins.

I. Culverts:
   - Inspect culverts in the spring, in the late fall, and after heavy rains to remove any obstructions to flow.
   - Remove accumulated sediments and debris at the inlet, at the outlet, and within the conduit.
   - Inspect and repair any erosion damage at the culvert's inlet and outlet.
   - Inspect embankment for erosion, settling, and structural failure.

3. **Annual Report:** The owner or operator or a qualified post-construction stormwater inspector hired by that person, shall, on or by June 30 of each year, provide a completed and signed certification that the person has inspected the BMPs and that they are adequately maintained and functioning as intended by the approved post-construction stormwater management plan, or that they require maintenance or repair, including the record of the deficiency and corrective actions taken.

4. **Duration of Maintenance:** Perform maintenance as described and required for any associated permits unless and until the system is formally accepted by a municipality or quasi-municipal district, or is placed under the jurisdiction of a legally created association that will be responsible for the maintenance of the system. If a municipality or quasi-municipal district chooses to accept a stormwater management system, or a component of a stormwater system, it must provide a letter to the MDEP stating that it assumes responsibility for the system. The letter must specify the components of the system for which the municipality or district will assume responsibility, and that the municipality or district agrees to maintain those components of the system in compliance with MDEP standards. Upon such assumption of responsibility, and approval by the MDEP, the municipality, quasi-municipal district, or association becomes a co-permittee for this purpose only and must comply with all terms and conditions of the permit.

Attachments

Attachment 1 – Sample Stormwater Inspection and Maintenance Form

Sample Stormwater Inspection and Maintenance Form

Portland Retirement Residence; Portland, ME
Attachment 1

This log is intended to accompany the stormwater Inspection, Maintenance and Housekeeping Plan for the Portland Retirement Residence. The following items shall be checked, cleaned and maintained on a regular basis as specified in the Maintenance Plan and as described in the table below. This log shall be kept on file for a minimum of five (5) years and shall be available for review. Qualified personnel familiar with drainage systems and soils shall perform all inspections. Attached is a copy of the construction and post-construction maintenance logs.

Item	Maintenance Required & Frequency	Date Completed	Maintenance Personnel	Comments
Ditches and Swales	Inspect after major rainfall event producing greater than 3” of rain in 2 hours.			
	Repair erosion or damage immediately.			
Catch Basins and Culverts	Remove accumulated sediment and debris			
	Sump depth			
Vegetated Areas	Inspect Slopes			
	Replant Bare Areas			
	Check after Major Storms			
Winter Sanding	Clean annually (Spring)			
	Remove sand and sediment from roadway shoulders			
Level Lip Spreaders	Inspect after significant rainfall			
	Remove sediment if pool volume reduced by 25%			
	Repair the riprap if flow become s channelized			
Subsurface Sand Filter	Inspect system thru inspection ports following major storm event			
	Remove sediment/debris from inlet structure annually			
Underdrained Grass Filter	Inspect inlets/outlets to ensure no blockage from debris			
	Inspect sideslopes annually for erosion, destabilization, and embankment settling.			

Item	Maintenance Required & Frequency	Date Completed	Maintenance Personnel	Comments
Stormtech	Follow manufacturer's recommendations			

PLS OR PE

PROGRESS PRINT

PLS OR PE

NOT FOR CONSTRUCTION

DESIGNED	CHECKED
PDO	RAM

REV:	BY:	DATE:	STATUS:
A	RAM	9-17-15	PLAN SUBMISSION TO CITY OF PORTLAND

THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION FROM SEBAGO TECHNICS, INC. ANY ALTERATIONS, AUTHORIZED OR OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO SEBAGO TECHNICS. INC.

SEBAGO TECHNICS
WWW.SEBAGOTECHNICS.COM
75 John Roberts Rd.
Suite 1A
South Portland, ME 04106
Tel. 207-200-2100

250 Goddard Rd.
Suite B
Lewiston, ME 04240
Tel. 207-783-5656

PRE DEVELOPMENT WATERSHED PLAN

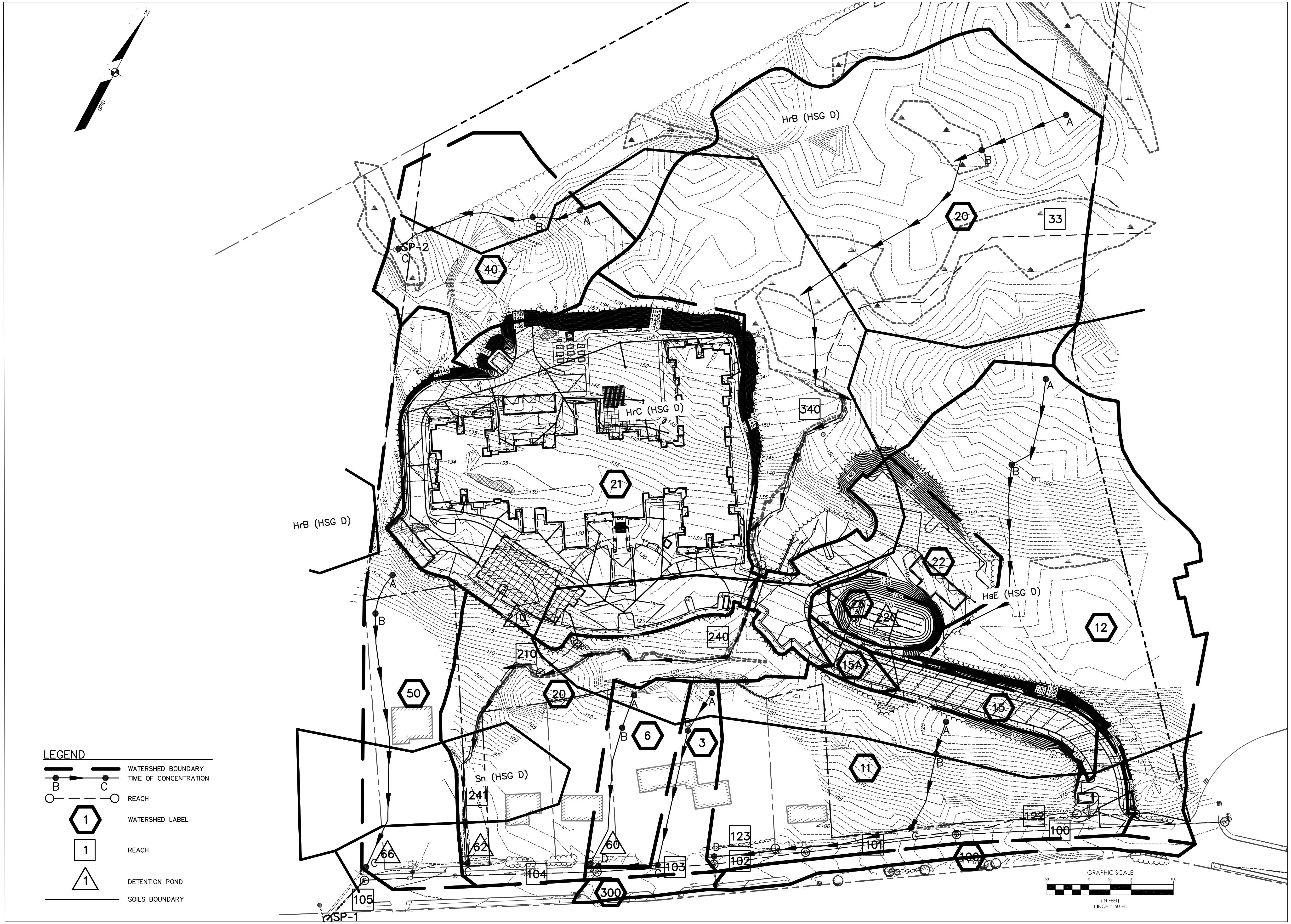
OF:
PORTLAND RETIREMENT RESIDENCE
802 OCEAN AVENUE
PORTLAND, ME

FOR:
HAWTHORN RETIREMENT GROUP
9310 NE VANCOUVER MALL DR., STE200
VANCOUVER, WA 98662-8210

PROJECT NO.	SCALE
14432	1" = 50'

SHEET 1 OF 2

14432SWP.dwg, TAB:PRE



PLS OR PE

PROGRESS PRINT

PLS OR PE

NOT FOR CONSTRUCTION

DESIGNED	CHECKED
PDO	RAM

REV:	BY:	DATE:	STATUS:
A	RAM	9-17-15	PLAN SUBMISSION TO CITY OF PORTLAND

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250 Goddard Rd. Suite B Lewiston, ME 04240 Tel. 207-783-5656

POST DEVELOPMENT WATERSHED PLAN

OF:
PORTLAND RETIREMENT RESIDENCE
802 OCEAN AVENUE
PORTLAND, ME

FOR:
HAWTHORN RETIREMENT GROUP
9310 NE VANCOUVER MALL DR., STE200
VANCOUVER, WA 98662-8210

PROJECT NO.	SCALE
14432	1" = 50'

SHEET 2 OF 2

14432SWP.dwg, TAB:POST

Section 14. Statement of Project's Consistency with City Master Plans

Statement of Project's Consistency with City Master Plans

There are no City of Portland Master Plans for the subject area. Nevertheless, the Portland Retirement Residence is in harmony with the Portland's Comprehensive Plan. Our proposed development addresses the planning goals of the Portland Comprehensive Plan (November 2002, updated 2005) as follows:

Goal "A" – Encourage Orderly Growth

This Development will contribute to the inventory of Senior Housing in the Greater Portland Area. The growing senior demographic both nationally and in Portland and the surrounding area is increasing demand for this and other senior housing options. The proposed site design carefully considers the most efficient layout, emphasizing minimal impact to environmentally sensitive areas.

Goal "B" – Accommodate Anticipated Growth

Senior Housing, as stated in Goal "A", is a critical segment of future housing inventory options for Portland. Our proposed Congregate Care Facility allows for lower impact on traffic, utilities, schools, and other public infrastructures compared with other possible uses for this site.

Goal 'C" – Promote Economic Development

Short Term: The development and construction budget for the proposed Portland Retirement Residence is approximately $18,000,000. A large amount of these funds will be spent locally- hiring local trades and consultants as well as purchasing building materials and services.

Long Term: Upon completion, the Portland Retirement Residence will provide:
18 - Full time employees
17 - Part time employees

Estimated local contributions annually:
Wages, taxes and benefits costs of approximately $675,000
Expenditures for energy and utility cost of approximately $175,000
Local contracts for services and supplies estimated at $36,000.
Properly Tax contribution $280,000

Goal "D" –Encourage Decent Housing

The Portland Retirement Residence will meet the "wide variety of new housing" recommendation as called out in Goal "D". It also addresses the policy objective of "insuring a diverse mix of housing types that offers a continuum of options" and the goal to Identify vacant and redevelopment land opportunities throughout the city to facilitate the construction of new housing".

More specifically, this site will address a portion of item viii: "Housing with a range of services and medical support for the elderly and special needs population, including assisted living, congregate care, group homes and nursing homes".

Goal "E" – Protect Water Resources

The design of the onsite stormwater facilities will serve to protect water resource areas from increased or negative impact. Sanitary Sewer outflow volumes are much less that other possible development on this site, creating less overall impact that other allowed uses.

Goal "F" – Protect Critical Natural Resources

The site design protects the onsite natural resources, by:

A) Setting aside over 8 acres under a ROS, Residential Open Space zoning designation
B) Minimizing the building footprint and hard surfaces to avoid wetlands and other sensitive areas
C) Site design allows for approximately 84% of the site to stand as landscaped and open spaces, providing ample opportunity and protection for flourishing wetlands, wildlife and natural resources.

Goal "G" – Protect Marine Resources

The location of this site does not create any direct impact on local marine resources. The onsite stormwater facilities will include pretreatment features to stormwater discharge lessening any downstream impact on Casco Bay.

Goal "H" – Safeguard Agricultural and Forrest Resources

The ROS zoning designation as well as the substantial amount of open and landscape areas of the overall site contributes to further safeguarding the forest resources on the site.

Goal "I" – Protect Historic and Archeological Resources

As a part of the early development process we have contacted the Maine Historical Commission and confirmed that this site does not have any historical or archeological significance. Note: Near the north central portion of the site a USGS Reference Disk and two additional reference markers are located. These are identified as the "West Graves" USGS marker. The site design will leave this area untouched but accessible.

Goal "J" – Promote Outdoor Recreation

The ROS zoned portion of the site (8.16 acres) establishes over 45% of the Portland Retirement Residence site as undisturbed open space for future recreational opportunities.

Compatibility with the Portland Comprehensive- Summary:

Our Congregate Care Facility will be an important part of future housing in the Greater Portland area. The Portland Retirement Residence uses careful site placement to complement the surrounding community and to co-exist with the natural environment. Additionally, it meets housing needs for local seniors and contributes to the local economy.

Statement of Solid Waste Generation

Upon completion of construction, the project will have a trash compactor and recycling program including waste oils and greases from meal preparations.

A. Estimated Quantities of Solid Waste

The proposed 150-suite facility is expected to generate average quantities of waste as follows:

Construction Phase: The site is primarily wooded and construction of the proposed development will require clearing that will generate stumps and grubbings. Stumps and grubbings will be ground on site and the grindings will be incorporated into erosion control mix if possible. Any material not deemed to be inert by the Solid Waste Management Regulations will be source separated and disposed at a local construction material recycling facility.

Type	Estimated Quantity
Stumps/Grubbings (assume 4.93 ac @ 400 CY/ac.)	1,972 CY
Construction debris (assume 20 CY/wk for 16 months1 year)	1,400 CY

Municipal Solid Waste:

Type	Estimated Quantity
Normal residential waste (assume 2 ½ CY/month/unit)	375 CY/month

B. Off-Site Disposal of Construction/Demolition Debris

Any material not suitable for on-site disposal will be source separated and transferred by a licensed non-hazardous waste transporter to a local construction material recycling facility.

Local waste management providers include:
- *Casella Waste Systems*, 87 Pleasant Hill Road, Scarborough
- *Troiano Waste*, 10 Filmike Way, South Portland

Local disposal sites include:
- Riverside Recycling Facility, Portland
- Community Recycling Center (CPRC Group), Scarborough

C. On-Site Disposal of Wood Waste/Land Clearing Debris

Stumps and grubbings will be chipped or ground on site. The grindings will be used for erosion control mulch whenever possible.

D. **Special or Hazardous Waste**

Oils used in cooking are separated and stored for recycling by a commercial recycling company. Furthermore, kitchen waste lines will be treated through the use of an on-site grease trap.

No Hazardous Waste will used or generated by this facility.

Section 15. Ability to Serve Letters

- Portland Water District
- City of Portland Public Services – Sewer Division

Portland Water District
FROM SEBAGO LAKE TO CASCO BAY

December 9, 2014

Sebago Technics
75 John Roberts Road – Suite 1A
South Portland, ME 04106-6963

RECEIVED
DEC 11 2014
SEBAGO TECHNICS

Attn: Robert A. McSorley, P.E.
Re: Casco Heights; Ocean Avenue, Portland
Ability to Serve with PWD Water

Dear Mr. McSorley:

The Portland Water District has received your request for an Ability to Serve Determination for the noted site submitted on November 20, 2014. 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. Review and approval of final plans will be required. 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 service.

Water System Characteristics

According to District records, there is a 12-inch diameter cast iron water main on the west side of Ocean Avenue and a public fire hydrant located 305-feet from the site.

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

Hydrant Location:	Ocean Avenue 1000' northeast of Ashley Lane
Hydrant Number:	POD-HYD01222
Last Tested:	9/30/2003
Static Pressure:	68 psi
Residual Pressure:	64
Flow:	1,221 GPM

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. It is your responsibility to contact the Portland Fire Department to ensure that this project is adequately served by existing and/or proposed hydrants.

225 Douglass Street P.O. Box 3553 Portland, Maine 04104-3553
Phone: 207.774.5961 Fax: 207.761.8307 Web: www.pwd.org

Domestic Water Needs

The ability to serve request indicated that the anticipated water usage for the 142 unit condominium subdivision is 9,540 gallons per day. 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

You have indicated 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. 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 insufficient for their needs, please contact the MEANS group to request a hydrant flow test and we will work with you to get more complete data.

Conditions of Service

We have reviewed the Overall Site Plan dated March 24, 2014 for the Casco Heights project. Since each of the 142 units is located within a single parcel, the District would prefer not to own and maintain water mains, hydrants and a water pump station serving a private development. We suggest a water service configuration consisting of either separate fire and domestic services or a single combined fire and domestic service with a fire line meter. Either of these scenarios would only have one meter and one District account. The condo/homeowner association may choose to install private meters for each unit in order to split the bill proportionately.

As your project progresses, we advise that you submit any design plans to the MEANS group for review of the water service line configuration. We will work with you 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

Gordon Johnson, P.E..
Engineering Services Manager

Michael J. Bobinsky
Director of Public Services

25 November 2014

Robert A. McSorley, P.E.,
Sebago Technics Inc.,
95 John Roberts Road, Suite 1A,
South Portland, Maine 04106

RE: The Capacity to Handle Wastewater Flows, from a Proposed One Hundred and Forty Two Retirement Residences at a Congregate Care Facility

Dear Mr. McSorley:

The existing eight inch diameter, reinforced concrete, sewer pipe, located in Ocean Avenue, has adequate capacity to **transport,** while The Portland Water District sewage treatment facility, located off Marginal Way, has adequate capacity to **treat,** the total net increase in anticipated wastewater flows of **9,540 GPD**, from this proposed project.

Anticipated Wastewater Flows from the Proposed Commercial Units:	
128 One Bedroom Suites x 60 GPD	= 7,680 GPD
14 Two Bedroom Suites x 120 GPD	= 1,680 GPD
2 Full-time Manager Units x 90 GPD	= 180 GPD
Total Net Increase in Proposed Wastewater Flows for this Project	= **9,540 GPD**

In order to offset any increase in sanitary flows, the City combined sewer overflow (C.S.O.) abatement consent agreement (with the U.S.E.P.A., and with the Maine D.E.P.) requires C.S.O. abatement, as well as storm water mitigation, from all projects. If the City can be of further assistance, please call 874-8832.

Sincerely,
CITY OF PORTLAND
David M-Pineo
David Margolis-Pineo
Deputy City Engineer

DMP
CC: Jeffrey Levine, Director, Department of Planning, and Urban Development, City of Portland
Barbara Barhydt, Development Review Services Mgr., Dep't. of Planning, and Urban Development, City of Portland
Jean Fraser, Planner, Department of Planning, and Urban Development, City of Portland
Frank Brancely, Senior Wastewater Technician, City of Portland
Michael Farmer, P.E., Project Engineer, City of Portland
Bradley A. Roland, P.E., Environmental Projects Engineer, City of Portland
Benjamin N. Pearson, E.I., Industrial Pretreatment Coordinator, City of Portland
John Emerson, Wastewater Coordinator, City of Portland
Rhonda Zazzara, Field Inspection Coordinator, City of Portland
Jane Ward, Administrative Assistant, City of Portland

Section 16. Statement of Solid Waste Generation

Statement of Solid Waste Generation

Upon completion of construction, the project will have a trash compactor and recycling program including waste oils and greases from meal preparations.

A. Estimated Quantities of Solid Waste

The proposed 150-suite facility is expected to generate average quantities of waste as follows:

Construction Phase: The site is primarily wooded and construction of the proposed development will require clearing that will generate stumps and grubbings. Stumps and grubbings will be ground on site and the grindings will be incorporated into erosion control mix if possible. Any material not deemed to be inert by the Solid Waste Management Regulations will be source separated and disposed at a local construction material recycling facility.

Type	Estimated Quantity
Stumps/Grubbings (assume 4.93 ac @ 400 CY/ac.)	1,972 CY
Construction debris (assume 20 CY/wk for 16 months1 year)	1,400 CY

Municipal Solid Waste:

Type	Estimated Quantity
Normal residential waste (assume 2 ½ CY/month/unit)	375 CY/month

B. Off-Site Disposal of Construction/Demolition Debris

Any material not suitable for on-site disposal will be source separated and transferred by a licensed non-hazardous waste transporter to a local construction material recycling facility.

Local waste management providers include:

- *Casella Waste Systems*, 87 Pleasant Hill Road, Scarborough
- *Troiano Waste*, 10 Filmike Way, South Portland

Local disposal sites include:

- Riverside Recycling Facility, Portland
- Community Recycling Center (CPRC Group), Scarborough

C. On-Site Disposal of Wood Waste/Land Clearing Debris

Stumps and grubbings will be chipped or ground on site. The grindings will be used for erosion control mulch whenever possible.

D. **Special or Hazardous Waste**

Oils used in cooking are separated and stored for recycling by a commercial recycling company. Furthermore, kitchen waste lines will be treated through the use of an on-site grease trap.

No Hazardous Waste will used or generated by this facility.

Section 17. NFPA 1/Fire Department Standards

NFPA 1/Fire Department Standards

The proposed building will be sprinkled in accordance with NFPA guidelines. Furthermore, the site has been designed to meet the requirements of NFPA 1, Chapter 18 more specifically:

Section 18.2 Fire Department Access

The site provides a minimum of 20’ wide of clear paved accessed access to entire developed portion of the property with most of the accesses being 24’ wide including the main access road. T-turnarounds have been provided at the parking area access off the main access road and the delivery area/dumpster area to the rear of the building. With radii of 30’ and 35’, these locations provide ample room for maneuvers of the City’s fire fighting apparatus.

The porte-cochere at the entrance to the building will provide clear vertical clearance in excess of 13’ 6”.

Section 18.3 Water Supplies

The project will connect to the existing 12” water main on Ocean Avenue and extend an 8” main to the building for fire protection and domestic flows. Because of the height differential of the site and the exiting capacity of the 12” water main, a booster pump system will be constructed at the project’s to provide the necessary flows/pressures during the higher flows necessary for fire protection.

Section 18.4 Fire Flow Requirements for Buildings

The proposed booster pump system will provide 1,900 gpm at adequate pressure which equates to the required fire flow for a sprinkled, IBC Type V-A building construction and the peak domestic flow for the project.

Section 18.5 Fire Hydrants

A fire hydrant is provided off the northeast corner of building along the front access road. A fire department connection will be provided within 50’ of the fire hydrant as shown on the proposed Utility Plan.

Section 18. Assessment of Consistency with Design Standards

Assessment of Consistency with Design Standards

The following is an assessment of the conformance with the design standards of Section 14-526:

(a) Transportation Standards

1. Impact on Surrounding Street Systems

   The segment of Ocean Avenue to which the project accesses is currently not operating at over capacity. Based upon the generation of traffic from the proposed project and the peak traffic generated off the time of the roadway peaks, the project is not expected to have a significant impact on the adjacent streets and public ways.

2. Access and Circulation

   The project provides adequate access and internal circulation. The location of the driveway has been chosen to minimize the slope of the access road, 3.5% at the connection and approximately 5.0% up to the building/parking areas of the site. The site access is located approximately at the crest of Ocean Avenue on the outside of a slight curve in the roadway to the east. The design speed of Ocean Avenue in this location is 35 mph. Sight distance from this access location to the south is well over the 305 feet listed for this speed in the Maine Department of Transportation Entrance Rules. Sight distance to the north extends down to the entrance to Summer Place which is approximately 600’ from the proposed entrance.

   The traffic from this project is not expected to have an impact on adjacent driveways or street connections as the peak trips would be at a different time from these other access locations.

3. Public Transit Access

   The project is not located on a local or minor arterial roadway as shown n the City’s Federal Street Classification Map. Nevertheless, the project will provide bus shuttle serviced for its residents to shopping, doctor appointments, volunteer activities, etc.

4. Parking

   The project provides more than adequate parking as shown in the zoning Assessment Section. Because of the elderly nature of the project’s resends, the applicant is requesting a waiver for required bicycle parking.

(b) Environmental Quality Standards

1. Preservation of Significant Natural Features

   No specific habitats or natural features were noted in our coordination with the Departments of Conservation and Inland Fisheries. Nonetheless, there is substantial portion of the property (8.16 acres) that is being maintained in the R-OS zoning in its current nature state.

2. Landscaping and Landscape Preservation

   Of the 10.17 acres of the development property, only 4.93 acres will be impacted with the creation 2.86 acres of impervious area. The remaining property will remain in its current nature state. This preservation includes significant buffers including understory vegetation from neighboring properties.

   The project proposes a substantial site landscaping plan to enhance the developed portion of the site and to blend the development with the natural surroundings. This includes interior islands within the parking areas, street trees along the entrance roadway and numerous canopy and evergreen trees throughout the developed portion of the property.

3. Water Quality, Stormwater Management and Erosion Control

   The project is designed to meet the current Chapter 500 Standards of Maine Stormwater Law as recently updated by the Maine Department of Environmental Protection. Please refer to the Stormwater Section of this submission.

(c) Public Infrastructure and Community Safety Standards

1. Consistency with City Master Plans

   There are no known master plans for this area. Project is consistent with the Comprehensive Plan, see section on Statement of Project's Consistency with City Master Plans.

2. Public Safety and Fire Prevention

   The site is proposed with limited access and for areas to be observable form the central building of the site. The site proposes accesses that meet the requirements for emergency vehicles including access way width, minimum height clearance and adequate maneuvering. The project will connect to the existing 12" water main on Ocean Avenue, provide a booster pump system to provide adequate fire flow, and hydrant and fire development connections for fire protection systems.

3. Availability and Adequate Capacity of Public Utilities

The project will connect to the existing public water and sanitary systems. Adequate public utilities exist for the project, please see enclosed letters from the Portland Water District and the City's Public Services Department relative to sewer. The applicant has also coordinated with Central Maine Power, Unitil and telcomm/cable providers.

(d) Site Design Standards

1. Massing, Ventilation and Wind Impact

   The proposed building is sufficiently setback from property lines and adjacent neighboring buildings such that the building will have minimum adverse effects on these adjacent facilities. The project uses individual heating/cooling systems for the suites that do not produce emissions. Other mechanical equipment will be located away from property lines and meet the applicable state and federal emission standards.

2. Shadows

   The proposed building is such that the highest elevations will; be at approximately the same elevations as the nature canopies on the site at the proposed location of the building . Based upon the nature of the sun position in Maine, it is expected that the greatest impacts from shadows would be to the west, north and east of the building. In each of the these directions, because of the proposed height being at about the height of the natural canopies and the placement of the building, the building will not cast significant shadows onto to neighboring properties.

3. Snow and Ice Loading

   Snow storage areas are shown of the proposed site plan. As the project will retain the services of a commercial landscaping maintenance company, it is anticipated that snow management will be provided by the same company. If snow amount exceeds the ability of the site to retain it, the maintenance company will be engaged to remove excess snow from the property.

4. View corridors

   Based upon the proposed height of the building and the amount of natural vegetation that exists, the project will not affect any existing view corridors.

5. Historic Resources

   Coordination with the Maine State Historical Preservation Office did not note any adjacent or on-site historical resources will be impacted by the development.

6. Exterior Lighting

All site lighting will be energy efficient LED fixtures. All general lighting for the site areas will be cut off type fixtures. All up-lighting of architectural features and landscaping will comply with Section 12 of the Technical Manual.

7. Noise and Vibration

   The individual nature of the heating/cooling elements for the suite are chosen based upon the minimum noise/sounds from vibration that they produce. Because of the individual units of the suites, the mechanical facilities for the common areas are smaller than for a similar sized building and are isolated away from the adjacent property lines.

8. Signage and Wayfinding

   The project will provide identification sign along the Ocean Avenue frontage at the project's entrance. Signage will meet the requirements of the City's code relative to size, scale, proportions, design, materials, placements and lighting.

9. Zoning Related Design Standards

   There are no other known zoning related design standards that affect the property.

Section 19. Manufacturer’s Verification on Mechanical Equipment

Manufacturer's Verification on Mechanical Equipment

The applicant proposes to utilize energy efficient products throughout the building design. The individual suites have independent heating/cooling units that produce no emissions. Other mechanical equipment for common areas and the site emergency generator are smaller systems relative to the size of the building, located in isolated areas and will meet the applicable emission standards. Document has been requested from the manufacturer(s) and will be provided under separate cover to the City.

Section 20. Soils Report

REPORT

January 16, 2015
14-1188 S

Geotechnical Engineering Services

Proposed Retirement Residence
802 Ocean Avenue
Portland, Maine

PREPARED FOR:
Hawthorn Development, LLC
c/o Lenity Architecture
Attention: Mark Lowen
3150 Kettle Court SE
Salem, Oregon 97301

PREPARED BY:
S. W. Cole Engineering, Inc.
286 Portland Road
Gray, Maine 04039
207-657-2866

S.W.COLE ENGINEERING, INC.

- Geotechnical Engineering
- Construction Materials Testing
- GeoEnvironmental Services
- Ecological Services

www.swcole.com

TABLE OF CONTENTS

14-1188 S

January 16, 2015

Hawthorn Development, LLC
c/o Lenity Architecture
Attention: Mark Lowen
3150 Kettle Court SE
Salem, Oregon 97301

Subject: Geotechnical Engineering Services
Proposed Retirement Residence
802 Ocean Avenue
Portland, Maine

Dear Mark:

In accordance with our Revised Proposal dated November 11, 2014, we have performed subsurface explorations for the subject project in Portland, Maine. This report presents our findings and geotechnical recommendations and its contents are subject to the limitations set forth in Attachment A.

1.0 INTRODUCTION

1.1 Scope and Purpose

The purpose of our services was to obtain subsurface information at the site in order to develop geotechnical recommendations relative to foundations, earthwork and pavement associated with the proposed construction. Our scope of services included review of existing subsurface information, drilling test boring and auger probe explorations, a geotechnical analysis of the subsurface findings and preparation of this report.

1.2 Proposed Construction

Based on the site plan dated October 28, 2014 and the RFP dated October 29, 014, we understand development plans call for construction of a new retirement residence with associated paved access drive and parking areas on an undeveloped parcel located at

802 Ocean Avenue in Portland, Maine. We understand the residence will be four-story with 142 suites and will consist of wood-framed construction.

The building will have a finish floor elevation of 145 feet (project datum) requiring cuts in the west side of the footprint and fills in the east side of the footprint approaching 10 to 12 feet. Additionally, cuts and fills approaching about 15 feet will be required to achieve proposed site grades in paved parking and access drive areas. Two detached garages are proposed south and southeast of the main building.

Proposed and existing site features are shown on the "Exploration Location Plan" attached as Sheet 1.

2.0 EXPLORATION AND TESTING

2.1 Explorations

We performed thirteen explorations for the subject project as well as a review of explorations performed at the site for a previous development proposal. The approximate exploration locations are shown on the "Exploration Location Plan" attached as Sheet 1. Logs of the recent explorations are attached as Sheets 2 through 14. A key to the notes and symbols used on the log is attached as Sheet 15. Logs of the previous explorations are attached as Appendix A.

2.1.1 Recent Explorations

Five test borings (B-101 through B-105) and eight auger probes (P-201 through P-208) were made at the site on November 22, 2014, by Northern Test Boring, Inc of Gorham, Maine working under subcontract to S. W. Cole Engineering, Inc. (S.W.COLE). Bedrock was encountered at the ground surface at B-103 and P-208. The exploration locations were selected and established in the field using a Trimble GPS by S.W.COLE.

2.1.2 Previous Explorations

Seventeen test borings (B-1 through B-17) and eight auger probes (P-1 through P-8) were made at the site in 2004 for a previous development proposal.

2.2 Testing

The explorations were made using cased wash-boring, rock coring, solid stem auger, and air hammer drilling techniques. The soils were sampled at the test borings using a split spoon sampler and Standard Penetration Test (SPT) methods. SPT blow counts are shown on the logs. Soil and bedrock samples obtained from the explorations were returned to our laboratory for visual classification.

3.0 SITE AND SUBSURFACE CONDITIONS

3.1 Surficial Conditions

The site is located at 802 Ocean Avenue in Portland, Maine. The site consists of an undeveloped wood parcel located on the west side of Ocean Avenue. Bedrock outcrops are present across the site. The site generally slopes down to the east with existing topography varying from about elevation 160 to 125 feet within the footprint of proposed construction and elevation 140 to 115 feet along the proposed access drive. Some shallow drainage channels and lower laying areas of ponded water are present at the site, with flow generally draining to the east and southeast. A wetland is present in the northwestern limits of the site, which appears to feed shallow drainage channels. Existing site features and topography are shown on Sheet 1.

3.2 Subsurface Conditions

Underlying a surficial layer of forest duff and topsoil, the explorations generally encountered a thin layer of silty sand and/or silty glacial till overlying shallow bedrock. Bedrock was encountered at the explorations at depths varying from about ½ to 5 feet. The drilling equipment penetrated into an upper zone of weathered bedrock at some exploration locations. Based on rock coring performed as part of the 2004 exploration program, the bedrock is classified as migmatite and biotite-muscovite schist of varying quality. Refer to the attached logs for more detailed subsurface information.

3.3 Groundwater Conditions

The overburden soils encountered at the explorations were generally moist to saturated. Groundwater monitoring wells were installed in several borings made for the 2004 exploration program. Details of these monitoring wells are shown on the borings logs attached in Appendix A. Groundwater measurements obtained at the wells in January, 2005 are as follows:

Boring	Water Depth From Existing Ground Surface (ft)
B-2	4.1 Below
B-4	1.7 Above (Possible Artesian Condition)
B-8	0.5 Above (Possible Artesian Condition)
B-12	0.1 Above (Possible Artesian Condition)
B-16	3.0 Below
B-17 (Shallow)	2.7 Below
B-17 (Deep)	1.1 Above (Possible Artesian Condition)

An attempt was made to locate the monitoring wells at the site during the recent exploration program; however the wells had either been destroyed or were frozen, hindering measurement. Groundwater likely becomes perched on top of the shallow bedrock at the site. It should be anticipated that seasonal groundwater levels will fluctuate, especially during periods of snowmelt and precipitation.

3.4 Seismic and Frost Considerations

The 100-year Air Freezing Index for the Portland, Maine area is about 1,410-Fahrenheit degree-days, which corresponds to a frost penetration depth on the order of 4.5 feet. Based on the findings at the explorations, we interpret the site soils and bedrock to correspond to Seismic Site Class C in accordance with 2009 IBC/ASCE-7.

4.0 EVALUATION AND RECOMMENDATIONS

4.1 General Findings

Based on the subsurface findings, the proposed construction appears feasible from a geotechnical standpoint. Specifically, conventional spread footings and on-grade floor slabs appear suitable for the proposed buildings. The principle geotechnical considerations are as follows:

- Shallow bedrock is present across the site. The bedrock will require blasting to achieve proposed site grades. Blasting and subsequent preparation of blasted bedrock subgrades must be performed in a controlled manner to provide adequate support of the proposed buildings and pavements. Subgrades should be observed by the geotechnical engineer and may need to be overexcavated and replaced as deemed necessary. Blasted bedrock subgrades must be thoroughly choked with Crushed Stone or blasted bedrock fines.

- Possible artesian groundwater conditions were observed in the monitoring wells. Groundwater seepage in anticipated from cut slopes. A continuous Crushed Stone Drainage blanket with perimeter underdrains is recommended below the entire building.

- Blasted bedrock may be processed on-site to reuse for compacted fills as well as pavement gravels and foundation backfill. The contractor should be prepared to break down larger rock particles as needed to meet the requirements of Rock Borrow, Structural Fill, Pavement Gravel and Crushed Stone. Some imported materials will be needed for construction.

- A sub-slab radon venting system must be installed beneath building. The radon system should be designed by a qualified indoor air quality consultant.

4.2 Site and Subgrade Preparation

We recommend that site preparation begin with the construction of an erosion control system to protect adjacent drainage ways and areas outside the construction limits. As much vegetation as possible should remain outside the construction areas to lessen the potential for erosion.

Following stripping and grubbing of the site, blasting will be required to achieve proposed grades. Blasting and subsequent preparation of blasted bedrock subgrades must be performed in a controlled manner to provide adequate support of the proposed buildings and pavement. Care must be taken to control overblasting below buildings and paved areas. We recommend vertical overblasting be limited to 1-foot below footings and 2-feet below slabs and paved areas.

S.W.COLE should observe blasted bedrock subgrades prior to placing any new fill or concrete. Depending how the rock fractures, some overblasted rock may be able to remain in place; however, the contractor should be prepared to overexcavate and remove loose and overblasted bedrock as deemed necessary by the geotechnical engineer's field observations. We recommend the contract documents contain unit rate provisions for removal and replacement of overblasted bedrock. Blast rock fines or Crushed Stone should be thoroughly worked into the bedrock surface to choke any voids or fractures in the bedrock.

4.3 Excavation and Dewatering

Excavation work will generally encounter topsoil, a relatively thin layer of silty sand and silty glacial till and shallow bedrock. Final cuts to subgrade elevation in soil, if encountered, should be performed with a smooth-edged bucket to help minimize soil disturbance.

The bedrock encountered at the site is hard and sound and will require blasting for excavation. Blasting can adversely affect adjacent structures, water-wells, septic systems, up-gradient wetlands, and buried utilities. We recommend that blasting be performed by a licensed and qualified contractor and that a blasting plan be prepared sufficiently in advance of blasting activities to coordinate efforts with abutting properties and to serve notice to the general public. Pre-blast surveys of structures, wells, septic systems, pipelines, and protected natural resources within 500 feet of the blast area should be completed prior to blasting.

Groundwater seepage is anticipated in excavations. Sumping and pumping dewatering techniques should be adequate to control groundwater in shallower excavations. The layer of Crushed Stone recommended below foundations will provide a media from which to dewater. Controlling the water levels to below planned excavation depths will help stabilize subgrades during construction.

Excavations must be properly shored and/or sloped to prevent sloughing and caving of the sidewalls during construction. Temporary excavations should be sloped or shored in accordance with OSHA regulations.

4.4 Foundations

We recommend the proposed buildings be supported on spread footing foundations bearing on at least 12-inches of Crushed Stone overlying properly prepared subgrades. Building subgrades are anticipated to consist of blasted bedrock in the western portion of the footprint, transitioning to compacted Rock Borrow fill in the east.

For spread footings bearing on properly prepared subgrades, we recommend the following geotechnical parameters for design consideration:

Geotechnical Parameters for Spread Footings and Foundation Walls	
Design Frost Depth	4.5 feet
Net Allowable Bearing Pressure	4.0 ksf or less
Base Friction Factor	0.4
At-Rest Lateral Earth Pressure Coeff.	0.5
Total Unit Weight of Backfill	130 pcf
Internal Friction Angle of Backfill	30 degrees
Seismic Soil Site Class	C (2009 IBC/ASCE 7)

For the anticipated foundation bearing conditions, we anticipate less than 1-inch of post-construction settlement with differential settlement approaching ½-inch.

4.5 Foundation Drainage

We recommend a perimeter foundation underdrain system be installed beneath the building. The underdrain pipe should consist of 4-inch diameter, perforated SDR-35 foundation drain pipe enveloped within the exterior side of the Crushed Stone provided below the footings. Non-woven geotextile, such as Mirafi 140N or equivalent, should be provided around the exterior side of the Crushed Stone layer prior to placing foundation backfill soils. The underdrain pipe must be connected to a positive gravity outlet protected from freezing, clogging and backflow. The Crushed Stone layer provided below the building footings and floor slabs should be continuous and hydraulically connected to the underdrains. General underdrain details are shown on Sheet 16.

4.6 Slab-On-Grade Floors and Soil-Gas Venting

We recommend on-grade concrete floors be supported on a minimum of 12 inches of compacted Crushed Stone overlying properly prepared subgrades. On-grade floor slabs founded on properly prepared subgrades may be designed considering a modulus of subgrade reaction of 100 pci. The structural engineer or concrete consultant must design steel reinforcing and joint spacing appropriate to slab thickness and function.

The presence of shallow bedrock beneath the proposed building increases the risk of radon intrusion in the building. Consequently, building design must include a sub-slab radon venting system and positive building pressurization. The venting system should be designed by a qualified indoor air quality consultant.

We recommend a sub-slab vapor retarder overlying at least 1-inch of rigid insulation overlying the 12 inch thick Crushed Stone venting and drainage layer below on-grade floor slabs. The vapor retarder must have a permeance that is less than the floor cover or surface treatment that is applied to the slab. The vapor retarder must have sufficient durability to withstand puncture from construction activity. The vapor retarder material shall be placed according to the manufacturer's recommended method, including the taping and lapping of all joints and wall connections. The architect and/or flooring consultant should select the vapor retarder products compatible with flooring and adhesive materials.

The floor slab should be appropriately cured using moisture retention methods after casting. Typical floor slab curing methods should be used for at least 7 days. The architect or flooring consultant should assign curing methods consistent with current applicable American Concrete Institute (ACI) procedures with consideration of curing method compatibility to proposed surface treatments, flooring and adhesive materials.

4.7 Entrance Slabs and Sidewalks

Entrance slabs and sidewalks adjacent to buildings must be designed to reduce the effects of differential frost action between adjacent pavement, doorways, and entrances. We recommend that clean, non-frost susceptible Structural Fill be provided to a depth of 4.5 feet (or until sound bedrock is encountered) below the top of entrance slabs. This thickness of Structural Fill should extend the full width of the entrance slabs and outward at least 4.5 feet, thereafter transitioning up to the bottom of the adjacent sidewalk or pavement subbase gravel at a 3H:1V or flatter slope. General frost transition zone details for entrance slabs are illustrated on Sheet 16.

4.8 Backfill and Compaction

Based on the subsurface findings, the existing site soils are unsuitable for reuse as fill within building areas, but may be reused in paved areas during dry, non-freezing weather conditions. We recommend the following fill and backfill materials.

Granular Borrow: Imported compacted fill to raise site grades in paved areas should be sand, silty sand or sand and gravel meeting the requirements of MDOT Standard Specification 703.19 “Granular Borrow”.

Rock Borrow: Blasted bedrock fill to raise site grades in building and paved areas should be processed to meet the requirements of MDOT Standard Specification 703.21 “Rock Borrow” with a maximum particle size of 3 feet in greatest dimension. The maximum particle size of Rock Borrow should be limited to 4-inches in the top 5 feet below the building.

Structural Fill: Fill to raise site grades in the top 5 feet below the building, over wet subgrades, backfill for foundations and retaining walls, and backfill below exterior slabs and patios should be non-frost susceptible sand and gravel meeting the gradation requirements for Structural Fill as given below.

Structural Fill	
Sieve Size	**Percent Finer by Weight**
4 inch	100
3 inch	90 to 100
¼ inch	25 to 90
#40	0 to 30
#200	0 to 5

Structural Fill is recommended for use as:

- Fill to raise site grades over wet subgrades
- Backfill for foundations
- Fill and backfill below exterior patios and slabs to at least 4.5 feet below finish grade, or until sound bedrock is encountered

Crushed Stone: Crushed Stone, used below building footings and floor slabs should meet the gradation requirements of MDOT Standard Specifications 703.22 “Underdrain Backfill Type C”. A nominally sized 3/4-inch crushed stone will meet this requirement.

Reuse of Existing Soils and Bedrock: The existing site overburden soils are moisture and frost susceptible and are unsuitable for reuse in the building area, but may be reused to raise grades in landscape and paved areas during dry and non-freezing conditions.

Blasted bedrock may be reused to raise site grades provided it is processed to meet the requirements of Rock Borrow. Additionally, blasted bedrock may be processed on-site and blended with sand to create Structural Fill and pavement gravels.

Placement and Compaction: Fill should be placed in horizontal lifts and compacted such that the desired density is achieved throughout the lift thickness with 3 to 5 passes of the compaction equipment. Loose soil lift thicknesses for grading, fill and backfill activities should not exceed 12 inches. We recommend that soil fill and backfill in building and paved areas be compacted to at least 95 percent of its maximum dry density as determined by ASTM D-1557.

Rock Borrow should be placed in lifts not exceeding 3 feet and compacted and choked with Crushed Stone or blast fines such that voids are filled within the Rock Borrow mass prior to placing the next lift. Rock borrow lifts should be compacted with at least 3 passes each way of a vibratory roller having a static weight of at least 12-tons.

4.9 Weather Considerations

Considering the site is principally shallow rock, blasting and site grading with Rock Borrow may occur in variable weather conditions. Site grading with soil fills should ideally be performed in drier, non-freezing weather. The contractor should anticipate the need for water to temper fills in order to facilitate compaction during dry weather. If construction takes place during cold weather, subgrades, foundations and floor slabs must be protected during freezing conditions. Concrete and fill must not be placed on frozen soil; and once placed, the concrete and soil beneath the structure must be protected from freezing.

4.10 Paved Areas

We anticipate paved areas will be subjected primarily to passenger vehicle and light delivery truck traffic with occasional heavy delivery truck traffic. Considering the site soils, and proposed usage, we offer the following pavement section for consideration. Materials are based on Maine Department of Transportation 2014 Standard Specifications.

Asphalt Pavement Section	
Material	**Thickness (Inches)**
9.5 mm Hot Mix Asphalt (50 Gyration Design)	1 ¼
19.0 mm Hot Mix Asphalt (50 Gyration Design)	2 ¼
MDOT 703.06 Type A, Crushed Aggregate Base	3
MDOT 703.06 Type D, Crushed Aggregate Subbase	15

The base and subbase materials should be compacted to at least 95 percent of their maximum dry density as determined by ASTM D-1557. Hot mix asphalt pavement should be compacted to 92 to 97 percent of its theoretical maximum density as determined by ASTM D-2041. A tack coat should be used between successive lifts of bituminous pavement.

It should be understood that frost penetration can be on the order of 4.5 feet in this area. In the absence of full depth excavation of frost susceptible soils below paved areas and subsequent replacement with non-frost susceptible compacted fill, frost penetration into the subgrade will occur and some heaving and distress of pavement must be anticipated.

4.11 Fill Slopes and MSE Walls

Fill slopes should be constructed of properly compacted Rock Borrow or Granular Borrow overlying bedrock. The slopes should be constructed as oversized level benches to facilitate proper compaction which are then excavated to grade. Vegetation should be established on the slopes as soon as practicable. Temporary erosion control mesh or other means may be needed to stabilize the slopes during construction.

We understand mechanically stabilized earth walls (MSE Walls) may be needed for site grading. We recommend the following geotechnical parameters for design of MSE Walls:

Geotechnical Parameters for MSE Walls		
Wall Zone	**Unit Weight (pcf)**	**Friction Angle**
Reinforced Soil	130	32
Retained Soil	135	30
Foundation Soil	125	28

S.W.COLE should be retained to review MSE Wall designs and perform a global stability analysis of MSE Walls, as well as cut and fill slopes.

4.12 Design Review and Construction Testing

S.W.COLE should be retained to review the final design and specifications to determine that our earthwork, foundation and pavement recommendations have been properly interpreted and implemented.

A construction materials testing and special inspection program should also be implemented during construction to observe compliance with the design concepts, plans, and specifications. S.W.COLE is available to provide pre-blast surveys, subgrade observations for foundations as well as testing and special inspection services for soils, concrete, asphalt, steel, and spray-applied fireproofing construction materials.

5.0 CLOSURE

It has been a pleasure to be of assistance to you with this phase of your project. We look forward to working with you during the construction phase of the project.

Sincerely,

S. W. Cole Engineering, Inc.

Evan M. Walker, P.E.
Geotechnical Engineer

Timothy J. Boyce, P.E.
Senior Geotechnical Engineer

STATE OF MAINE
TIMOTHY J.
BOYCE
No. 9263
LICENSED
PROFESSIONAL ENGINEER

EMW:tjb-mas

Attachment A
Limitations

This report has been prepared for the exclusive use Hawthorn Development, LLC and Lenity Architecture for specific application to the proposed Retirement Residence at 802 Ocean Avenue in Portland, Maine. S. W. Cole Engineering, Inc. has endeavored to conduct the work in accordance with generally accepted soil and foundation engineering practices. No warranty, expressed or implied, is made.

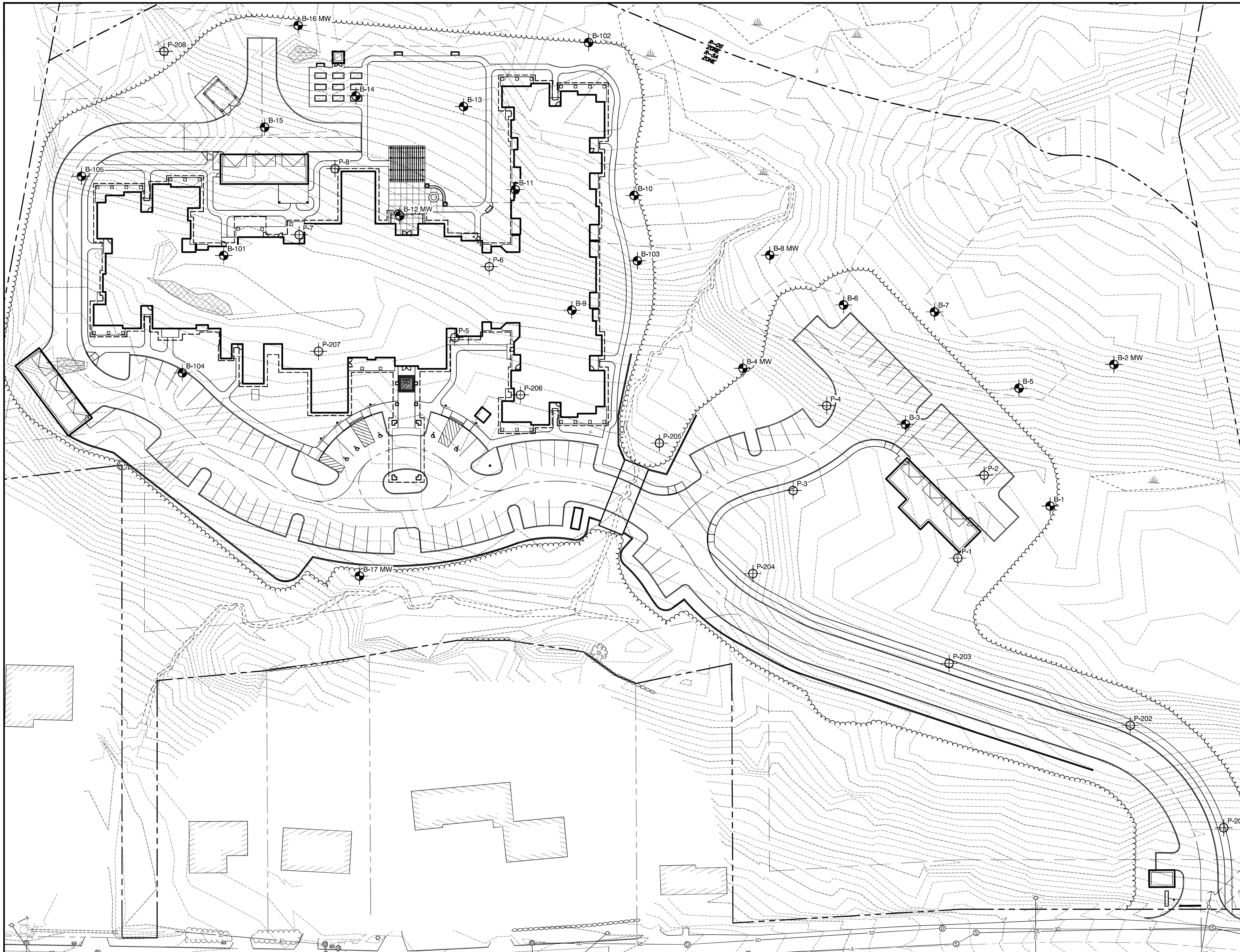
The soil profiles described in the report are intended to convey general trends in subsurface conditions. The boundaries between strata are approximate and are based upon interpretation of exploration data and samples.

The analyses performed during this investigation and recommendations presented in this report are based in part upon the data obtained from subsurface explorations made at the site. Variations in subsurface conditions may occur between explorations and may not become evident until construction. If variations in subsurface conditions become evident after submission of this report, it will be necessary to evaluate their nature and to review the recommendations of this report.

Observations have been made during exploration work to assess site groundwater levels. Fluctuations in water levels will occur due to variations in rainfall, temperature, and other factors.

S. W. Cole Engineering, Inc.'s scope of work has not included the investigation, detection, or prevention of any Biological Pollutants at the project site or in any existing or proposed structure at the site. The term "Biological Pollutants" includes, but is not limited to, molds, fungi, spores, bacteria, and viruses, and the byproducts of any such biological organisms.

Recommendations contained in this report are based substantially upon information provided by others regarding the proposed project. In the event that any changes are made in the design, nature, or location of the proposed project, S. W. Cole Engineering, Inc. should review such changes as they relate to analyses associated with this report. Recommendations contained in this report shall not be considered valid unless the changes are reviewed by S. W. Cole Engineering, Inc.



LEGEND:

APPROXIMATE BORING LOCATION

APPROXIMATE PROBE LOCATION

NOTES:

1. EXPLORATION LOCATION PLAN WAS PREPARED FROM A SCALE PLAN OF THE SITE PREPARED BY SEBAGO TECHNICS, RECEIVED VIA E-MAIL SEPTEMBER 16, 2015 IN AUTOCAD DWG FILE FORMAT.

2. BORINGS B-101 THROUGH B-105 AND PROBES P-201 THROUGH P-207 WERE LOCATED IN THE FIELD BY SURVEY BY SEBAGO TECHNICS AND PROVIDED ON THE ABOVE REFERENCED PLAN. PROBE P-208 WAS LOCATED IN THE FIELD BY GPS SURVEY BY S. W. COLE ENGINEERING, INC. USING A MAPPING GRADE TRIMBLE GPS RECEIVER AND EXISTING SITE FEATURES TO ESTABLISH CONTROL.

3. BORINGS B-1 THROUGH B-16 AND PROBES P-1 THROUGH P-8 WERE PERFORMED BY S. W. COLE ENGINEERING, INC. IN DECEMBER 2004 AND LOCATED ON A 1"=50' SCALE PLAN OF THE SITE ENTITLED "PRE-DEVELOPMENT DRAINAGE PLAN," PREPARED BY BH2M, INC., DATED DECEMBER 2004.

4. THIS PLAN SHOULD BE USED IN CONJUNCTION WITH THE ASSOCIATED S. W. COLE ENGINEERING, INC. GEOTECHNICAL REPORT.

5. THE PURPOSE OF THIS PLAN IS ONLY TO DEPICT THE LOCATION OF THE EXPLORATIONS IN RELATION TO THE EXISTING CONDITIONS AND PROPOSED CONSTRUCTION AND IS NOT TO BE USED FOR CONSTRUCTION.

0 30 60 Feet

NO.	DATE	DESCRIPTION	BY
1	09/17/2015	REVISED BASE PLAN, REVISE LOCATIONS OF B-101 - B-105 AND P-201 - P-207 PER SURVEY DATA	CEM
0	12/05/2014	REPORT SUBMISSION	CEM

S.W.COLE ENGINEERING, INC.

HAWTHORN DEVELOPMENT, LLC

EXPLORATION LOCATION PLAN

PROPOSED RETIREMENT RESIDENCE
802 OCEAN AVENUE
PORTLAND, MAINE

Job No.:	14-1188	Scale:	1" = 40'
Date :	12/05/2014	Sheet:	1

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: **B-101**
SHEET: 1 OF 1
PROJECT NO.: 14-1188
DATE START: 11/22/2014
DATE FINISH: 11/22/2014
ELEVATION:
SWC REP.: E. WALKER

PROJECT: PROPOSED RETIREMENT RESIDENCE
CLIENT : HAWTHORNE DEVELOPMENT, LLC
LOCATION: 802 OCEAN AVENUE, PORTLAND, MAINE
DRILLING FIRM: NORTHERN TEST BORING, INC. DRILLER: MIKE NADEAU

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	SSA	4" O.D.		
SAMPLER:	SS	1 3/8"	140 LBS.	30"
CORE BARREL:				

WATER LEVEL INFORMATION
ALL SOILS MOIST

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
	1D	8"	4"	0.6'	1	50-2"			0.6'	FOREST DUFF
									0.9'	WEATHERED BEDROCK - ADVANCE BY AUGER
										REFUSAL @ 0.9'
										BEDROCK

SAMPLES:
D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

REMARKS:

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

2

BORING NO.: **B-101**

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.:	**B-102**
SHEET:	1 OF 1
PROJECT NO.:	14-1188
DATE START:	11/22/2014
DATE FINISH:	11/22/2014
ELEVATION:	
SWC REP.:	E. WALKER

PROJECT: PROPOSED RETIREMENT RESIDENCE
CLIENT : HAWTHORNE DEVELOPMENT, LLC
LOCATION: 802 OCEAN AVENUE, PORTLAND, MAINE
DRILLING FIRM: NORTHERN TEST BORING, INC. DRILLER: MIKE NADEAU

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	SSA	4" O.D.		
SAMPLER:	SS	1 3/8"	140 LBS.	30"
CORE BARREL:				

WATER LEVEL INFORMATION

CASING BLOWS PER FOOT	SAMPLE NO.	SAMPLE PEN.	SAMPLE REC.	SAMPLE DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
									0.4'	FOREST DUFF
	1D	14"	14"	1.2'	1	2	50-2"		1.0'	DARK BROWN SILTY SAND WITH ORGANICS
									1.2'	WEATHERED BEDROCK - ADVANCE BY AUGER
										REFUSAL @ 1.2'
										BEDROCK

SAMPLES:
D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

REMARKS:

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

3

BORING NO.: **B-102**

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: **B-103**
SHEET: 1 OF 1
PROJECT NO.: 14-1188
DATE START: 11/22/2014
DATE FINISH: 11/22/2014
ELEVATION:
SWC REP.: E. WALKER

PROJECT: PROPOSED RETIREMENT RESIDENCE
CLIENT : HAWTHORNE DEVELOPMENT, LLC
LOCATION: 802 OCEAN AVENUE, PORTLAND, MAINE
DRILLING FIRM: NORTHERN TEST BORING, INC. DRILLER: MIKE NADEAU

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:				
SAMPLER:				
CORE BARREL:				

WATER LEVEL INFORMATION

CASING BLOWS PER FOOT	SAMPLE NO.	SAMPLE PEN.	SAMPLE REC.	SAMPLE DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
										BEDROCK AT GROUND SURFACE

SAMPLES:
D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
- [ ] DRILLER - VISUALLY
- [x] SOIL TECH. - VISUALLY
- [ ] LABORATORY TEST

REMARKS:

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

4

BORING NO.: **B-103**

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: **B-104**
SHEET: 1 OF 1
PROJECT NO.: 14-1188
DATE START: 11/22/2014
DATE FINISH: 11/22/2014
ELEVATION:
SWC REP.: E. WALKER

PROJECT: PROPOSED RETIREMENT RESIDENCE
CLIENT : HAWTHORNE DEVELOPMENT, LLC
LOCATION: 802 OCEAN AVENUE, PORTLAND, MAINE
DRILLING FIRM: NORTHERN TEST BORING, INC. DRILLER: MIKE NADEAU

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	SSA	4" O.D.		
SAMPLER:	SS	1 3/8"	140 LBS.	30"
CORE BARREL:				

WATER LEVEL INFORMATION
ALL SOILS MOIST

CASING BLOWS PER FOOT	SAMPLE NO.	SAMPLE PEN.	SAMPLE REC.	SAMPLE DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
	1D	8"	8"	1.6'	13	50-2"			0.2'	FOREST DUFF / DARK BROWN SILTY SAND WITH ORGANICS
									1.1'	WEATHERED BEDROCK - ADVANCE BY AUGER
										REFUSAL @ 1.1' BEDROCK

SAMPLES:
D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

REMARKS:

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

5

BORING NO.: **B-104**

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.:	**B-105**
SHEET:	1 OF 1
PROJECT NO.:	14-1188
DATE START:	11/22/2014
DATE FINISH:	11/22/2014
ELEVATION:	
SWC REP.:	E. WALKER

PROJECT:	PROPOSED RETIREMENT RESIDENCE
CLIENT :	HAWTHORNE DEVELOPMENT, LLC
LOCATION:	802 OCEAN AVENUE, PORTLAND, MAINE
DRILLING FIRM:	NORTHERN TEST BORING, INC. DRILLER: MIKE NADEAU

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	SSA	4" O.D.		
SAMPLER:	SS	1 3/8"	140 LBS.	30"
CORE BARREL:				

WATER LEVEL INFORMATION

ALL SOILS MOIST

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
	1D	10"	8"	0.8'	2	50-4"			0.4'	FOREST DUFF
									0.8'	DARK BROWN SILTY SAND WITH ORGANICS
									1.8'	WEATHERED BEDROCK - ADVANCE BY AUGER
										REFUSAL @ 1.8'
										BEDROCK

SAMPLES:

D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:

- [ ] DRILLER - VISUALLY
- [x] SOIL TECH. - VISUALLY
- [ ] LABORATORY TEST

REMARKS:

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

6

BORING NO.: **B-105**

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.:	**P-201**
SHEET:	1 OF 1
PROJECT NO.:	14-1188
DATE START:	11/22/2014
DATE FINISH:	11/22/2014
ELEVATION:	
SWC REP.:	E. WALKER

PROJECT: PROPOSED RETIREMENT RESIDENCE
CLIENT : HAWTHORNE DEVELOPMENT, LLC
LOCATION: 802 OCEAN AVENUE, PORTLAND, MAINE
DRILLING FIRM: NORTHERN TEST BORING, INC. DRILLER: MIKE NADEAU

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	SSA	4" O.D.		
SAMPLER:				
CORE BARREL:				

WATER LEVEL INFORMATION

CASING BLOWS PER FOOT	SAMPLE NO.	SAMPLE PEN.	SAMPLE REC.	SAMPLE DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
										FOREST DUFF
									1.2'	DARK BROWN SILTY SAND WITH ORGANICS
										REFUSAL @ 1.2'
										BEDROCK
										NOTE: NO SAMPLING - AUGER PROBE

SAMPLES:
D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

REMARKS:

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

7

BORING NO.: **P-201**

BORING LOG

S.W.COLE ENGINEERING, INC.

BORING NO.:	**P-202**		
SHEET:	1 OF 1		
PROJECT NO.:	14-1188		
PROJECT:	PROPOSED RETIREMENT RESIDENCE	DATE START:	11/22/2014
CLIENT :	HAWTHORNE DEVELOPMENT, LLC	DATE FINISH:	11/22/2014
LOCATION:	802 OCEAN AVENUE, PORTLAND, MAINE	ELEVATION:	
DRILLING FIRM:	NORTHERN TEST BORING, INC. DRILLER: MIKE NADEAU	SWC REP.:	E. WALKER

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	SSA	4" O.D.		
SAMPLER:				
CORE BARREL:				

WATER LEVEL INFORMATION

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
										FOREST DUFF
										ORANGE-BROWN SILTY SAND
									2.6'	
									3.1'	WEATHERED BEDROCK
										REFUSAL @ 3.1'
										BEDROCK
										NOTE: NO SAMPLING - AUGER PROBE

SAMPLES:

D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:

- [ ] DRILLER - VISUALLY
- [X] SOIL TECH. - VISUALLY
- [ ] LABORATORY TEST

REMARKS:

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

8

BORING NO.: **P-202**

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.:	**P-203**
SHEET:	1 OF 1
PROJECT NO.:	14-1188
DATE START:	11/22/2014
DATE FINISH:	11/22/2014
ELEVATION:	
SWC REP.:	E. WALKER

PROJECT: PROPOSED RETIREMENT RESIDENCE
CLIENT : HAWTHORNE DEVELOPMENT, LLC
LOCATION: 802 OCEAN AVENUE, PORTLAND, MAINE
DRILLING FIRM: NORTHERN TEST BORING, INC. DRILLER: MIKE NADEAU

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	SSA	4" O.D.		
SAMPLER:				
CORE BARREL:				

WATER LEVEL INFORMATION

CASING BLOWS PER FOOT	SAMPLE NO.	SAMPLE PEN.	SAMPLE REC.	SAMPLE DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
										FOREST DUFF
									2.0'	ORANGE-BROWN SILTY SAND
										REFUSAL @ 2.0'
										BEDROCK
										NOTE: NO SAMPLING - AUGER PROBE

SAMPLES:
D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

REMARKS:

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

9

BORING NO.: **P-203**

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.:	**P-204**
SHEET:	1 OF 1
PROJECT NO.:	14-1188
DATE START:	11/22/2014
DATE FINISH:	11/22/2014
ELEVATION:	
SWC REP.:	E. WALKER

PROJECT: PROPOSED RETIREMENT RESIDENCE
CLIENT : HAWTHORNE DEVELOPMENT, LLC
LOCATION: 802 OCEAN AVENUE, PORTLAND, MAINE
DRILLING FIRM: NORTHERN TEST BORING, INC. DRILLER: MIKE NADEAU

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	SSA	4" O.D.		
SAMPLER:				
CORE BARREL:				

WATER LEVEL INFORMATION

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
										FOREST DUFF
									1.9'	DARK BROWN SILTY SAND WITH ORGANICS
										REFUSAL @ 1.9'
										BEDROCK
										NOTE: NO SAMPLING - AUGER PROBE

SAMPLES:
D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

REMARKS:

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

10

BORING NO.: **P-204**

BORING LOG

S.W.COLE ENGINEERING, INC.

BORING NO.:	**P-205**
SHEET:	1 OF 1
PROJECT NO.:	14-1188
DATE START:	11/22/2014
DATE FINISH:	11/22/2014
ELEVATION:	
SWC REP.:	E. WALKER

PROJECT: PROPOSED RETIREMENT RESIDENCE

CLIENT : HAWTHORNE DEVELOPMENT, LLC

LOCATION: 802 OCEAN AVENUE, PORTLAND, MAINE

DRILLING FIRM: NORTHERN TEST BORING, INC. DRILLER: MIKE NADEAU

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	SSA	4" O.D.		
SAMPLER:				
CORE BARREL:				

WATER LEVEL INFORMATION

CASING BLOWS PER FOOT	SAMPLE				SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA
	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24		
										FOREST DUFF DARK BROWN SILTY SAND WITH ORGANICS
									2.6'	
										REFUSAL @ 2.6' BEDROCK

SAMPLES:

D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:

	DRILLER - VISUALLY
X	SOIL TECH. - VISUALLY
	LABORATORY TEST

REMARKS:

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

11

BORING NO.: **P-205**

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: **P-206**
SHEET: 1 OF 1
PROJECT NO.: 14-1188
DATE START: 11/22/2014
DATE FINISH: 11/22/2014
ELEVATION:
SWC REP.: E. WALKER

PROJECT: PROPOSED RETIREMENT RESIDENCE
CLIENT : HAWTHORNE DEVELOPMENT, LLC
LOCATION: 802 OCEAN AVENUE, PORTLAND, MAINE
DRILLING FIRM: NORTHERN TEST BORING, INC. DRILLER: MIKE NADEAU

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	SSA	4" O.D.		
SAMPLER:				
CORE BARREL:				

WATER LEVEL INFORMATION

CASING BLOWS PER FOOT	SAMPLE NO.	SAMPLE PEN.	SAMPLE REC.	SAMPLE DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
										FOREST DUFF
										DARK BROWN TO BROWN SILTY SAND
									3.4'	
										REFUSAL @ 3.4'
										BEDROCK
										NOTE: NO SAMPLING - AUGER PROBE

SAMPLES:
D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

REMARKS:

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

12

BORING NO.: **P-206**

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.:	P-207
SHEET:	1 OF 1
PROJECT NO.:	14-1188
DATE START:	11/22/2014
DATE FINISH:	11/22/2014
ELEVATION:	
SWC REP.:	E. WALKER

PROJECT: PROPOSED RETIREMENT RESIDENCE
CLIENT : HAWTHORNE DEVELOPMENT, LLC
LOCATION: 802 OCEAN AVENUE, PORTLAND, MAINE
DRILLING FIRM: NORTHERN TEST BORING, INC. DRILLER: MIKE NADEAU

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	SSA	4" O.D.		
SAMPLER:				
CORE BARREL:				

WATER LEVEL INFORMATION

CASING BLOWS PER FOOT	SAMPLE NO.	SAMPLE PEN.	SAMPLE REC.	SAMPLE DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
										FOREST DUFF
									1.9'	BROWN SILTY SAND, TRACE GRAVEL
										REFUSAL @ 1.9'
										BEDROCK
										NOTE: NO SAMPLING - AUGER PROBE

SAMPLES:
D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

REMARKS:

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

13

BORING NO.: P-207

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: **P-208**
SHEET: 1 OF 1
PROJECT NO.: 14-1188
DATE START: 11/22/2014
DATE FINISH: 11/22/2014
ELEVATION:
SWC REP.: E. WALKER

PROJECT: PROPOSED RETIREMENT RESIDENCE
CLIENT : HAWTHORNE DEVELOPMENT, LLC
LOCATION: 802 OCEAN AVENUE, PORTLAND, MAINE
DRILLING FIRM: NORTHERN TEST BORING, INC. DRILLER: MIKE NADEAU

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	SSA	4" O.D.		
SAMPLER:				
CORE BARREL:				

WATER LEVEL INFORMATION

CASING BLOWS PER FOOT	SAMPLE NO.	SAMPLE PEN.	SAMPLE REC.	SAMPLE DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
										BEDROCK AT GROUND SURFACE

SAMPLES:
D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

REMARKS:

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

14

BORING NO.: **P-208**

KEY TO THE NOTES & SYMBOLS
Test Boring and Test Pit Explorations

All stratification lines represent the approximate boundary between soil types and the transition may be gradual.

Key to Symbols Used:

w	-	water content, percent (dry weight basis)
q_u	-	unconfined compressive strength, kips/sq. ft. - laboratory test
S_v	-	field vane shear strength, kips/sq. ft.
L_v	-	lab vane shear strength, kips/sq. ft.
q_p	-	unconfined compressive strength, kips/sq. ft. – pocket penetrometer test
O	-	organic content, percent (dry weight basis)
W_L	-	liquid limit - Atterberg test
W_P	-	plastic limit - Atterberg test
WOH	-	advance by weight of hammer
WOM	-	advance by weight of man
WOR	-	advance by weight of rods
HYD	-	advance by force of hydraulic piston on drill
RQD	-	Rock Quality Designator - an index of the quality of a rock mass.
γ_T	-	total soil weight
γ_B	-	buoyant soil weight

Description of Proportions:

Trace:	0 to 5%
Some:	5 to 12%
"Y"	12 to 35%
And	35+%

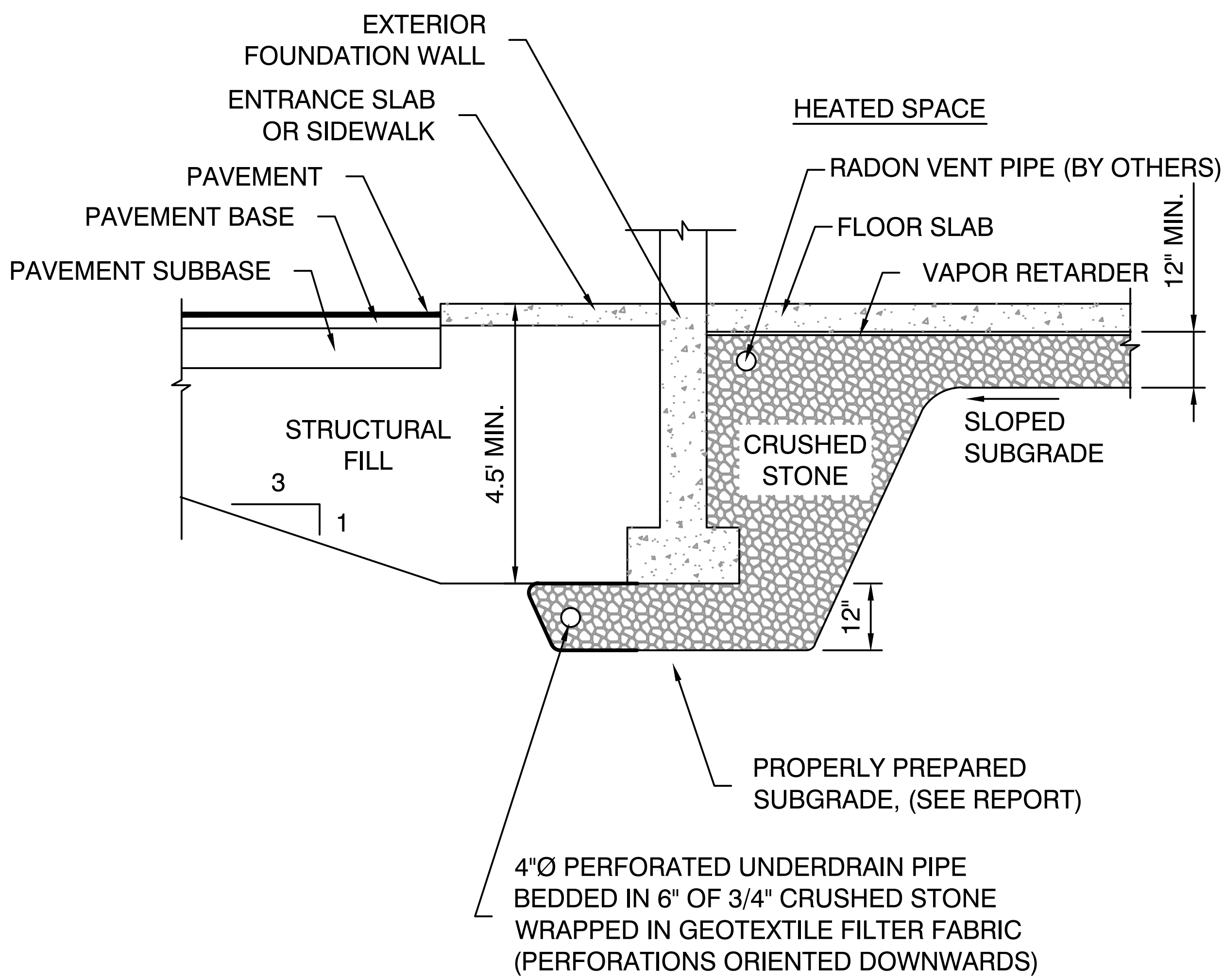
Description of Stratified Soils

Parting:	0 to 1/16" thickness
Seam:	1/16" to ½" thickness
Layer:	½" to 12" thickness
Varved:	Alternating seams or layers
Occasional:	one or less per foot of thickness
Frequent:	more than one per foot of thickness

REFUSAL: **Test Boring Explorations** - Refusal depth indicates that depth at which, in the drill foreman's opinion, sufficient resistance to the advance of the casing, auger, probe rod or sampler was encountered to render further advance impossible or impracticable by the procedures and equipment being used.

REFUSAL: **Test Pit Explorations** - Refusal depth indicates that depth at which sufficient resistance to the advance of the backhoe bucket was encountered to render further advance impossible or impracticable by the procedures and equipment being used.

Although refusal may indicate the encountering of the bedrock surface, it may indicate the striking of large cobbles, boulders, very dense or cemented soil, or other buried natural or man-made objects or it may indicate the encountering of a harder zone after penetrating a considerable depth through a weathered or disintegrated zone of the bedrock.



NOTE:

1. UNDERDRAIN INSTALLATION AND MATERIAL GRADATION RECOMMENDATIONS ARE CONTAINED WITHIN THIS REPORT.

2. DETAIL IS PROVIDED FOR ILLUSTRATIVE PURPOSES ONLY, NOT FOR CONSTRUCTION.

S.W.COLE
ENGINEERING, INC.

HAWTHORN DEVELOPMENT, LLC

UNDERDRAIN DETAIL

PROPOSED RETIREMENT RESIDENCE
802 OCEAN AVENUE
PORTLAND, MAINE

Job No.:	14-1188	Scale:	Not to Scale
Date :	12/05/2014	Sheet:	16

R:\2014\14-1188\CAD\Drawings\14-1188 Sheet 16 UD.dwg, 12/5/2014 2:25:55 PM, 1:1, CEM, S.W. Cole Engineering, Inc.

APPENDIX A

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.:	B-1
SHEET:	1 OF 1
PROJECT NO.:	04-1228
DATE START:	12/9/2004
DATE FINISH:	12/9/2004
ELEVATION:	140.8
SWC REP.:	PFK

PROJECT / CLIENT:

LOCATION: OCEAN AVENUE, PORTLAND, MAINE

DRILLING CO. : GREAT WORKS TEST BORING INC. DRILLER: JEFF LEE

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4"	300 lb	18"
SAMPLER:				
CORE BARREL:	NQ2	2"		

WATER LEVEL INFORMATION

OVERBURDEN SOILS SATURATED

CASING BLOWS PER FOOT	SAMPLE NO.	SAMPLE PEN.	SAMPLE REC.	SAMPLE DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
										FOREST DUFF / TOPSOIL OVERLYING BROWN SILTY SAND WITH ORGANICS AND COBBLES GLACIAL TILL
									5.0'	
										BEDROCK INTERBEDDED WHITE TO LIGHT GRAY MIGMATITE AND BIOTITE-MUSCOVITE SCHIST
	1R	60"	53"	10.0'						RQD = 37%
	2R	60"	59"	15.0'					15.0'	RQD = 60%
										BOTTOM OF EXPLORATION AT 15.0'

SAMPLES:

D = SPLIT SPOON

C = 3" SHELBY TUBE

U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:

	DRILLER - VISUALLY
X	SOIL TECH. - VISUALLY
	LABORATORY TEST

REMARKS:

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

2

BORING NO.: B-1

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.:	**B-2 / MW**
SHEET:	1 OF 1
PROJECT NO.:	04-1228
DATE START:	12/9/2004
DATE FINISH:	12/9/2004
ELEVATION:	158.7
SWC REP.:	PFK

PROJECT / CLIENT:

LOCATION: OCEAN AVENUE, PORTLAND, MAINE

DRILLING CO. : GREAT WORKS TEST BORING INC. DRILLER: DONNY BOLSTRIDGE

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4"	300 lb	18"
SAMPLER:				
CORE BARREL:	NQ2	2"		

WATER LEVEL INFORMATION
1" PIEZOMETER INSTALLED

CASING BLOWS PER FOOT	SAMPLE NO.	SAMPLE PEN.	SAMPLE REC.	SAMPLE DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
									1.0'	FOREST DUFF / TOPSOIL
										BEDROCK
										[ADVANCED BORING BY AIR HAMMER TO 21.5']
									21.5'	
										INTERBEDDED WHITE TO LIGHT GRAY MIGMATITE AND BIOTITE-MUSCOVITE SCHIST
	1R	60"	58"	26.5'						RQD = 77 %
	2R	58"	58"	31.3'					31.3'	RQD = 63 %
										BOTTOM OF EXPLORATION AT 31.3'
										PIEZOMETER DETAILS: SCREEN 26.3' - 31.3'; FILTER SAND 21' - 31.3'; BENTONITE 19' - 21'; SAND TO SURFACE

SAMPLES:
D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

REMARKS:

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

3

BORING NO.: **B-2 / MW**

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.:	B-3
SHEET:	1 OF 1
PROJECT NO.:	04-1228
DATE START:	12/9/2004
DATE FINISH:	12/9/2004
ELEVATION:	144.4
SWC REP.:	PFK

PROJECT / CLIENT:
LOCATION: OCEAN AVENUE, PORTLAND, MAINE
DRILLING CO. : GREAT WORKS TEST BORING INC. DRILLER: JEFF LEE

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4"	300 lb	18"
SAMPLER:				
CORE BARREL:	NQ2	2"		

WATER LEVEL INFORMATION
OVERBURDEN SOILS SATURATED

CASING BLOWS PER FOOT	SAMPLE NO.	SAMPLE PEN.	SAMPLE REC.	SAMPLE DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
										FOREST DUFF / TOPSOIL
										OVERLYING BROWN SILTY SAND WITH ORGANICS AND COBBLES
									2.5'	GLACIAL TILL
										PROBABLE WEATHERED BEDROCK
									4.5'	
										BEDROCK
									7.0'	[ADVANCED BORING BY ROLLER CONE TO 7.0']
										INTERBEDDED WHITE TO LIGHT GRAY
										MIGMATITE AND BIOTITE-MUSCOVITE SCHIST
	1R	60"	60"	12.0'						RQD = 62 %
	2R	60"	59"	17.0'					17.0'	RQD = 72 %
										BOTTOM OF EXPLORATION AT 17.0'

SAMPLES:
D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

REMARKS:
STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

4

BORING NO.: B-3

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.:	B-4 / MW
SHEET:	1 OF 1
PROJECT NO.:	04-1228
DATE START:	12/9/2004
DATE FINISH:	12/10/2004
ELEVATION:	137
SWC REP.:	PFK / KBG

PROJECT / CLIENT:
LOCATION: OCEAN AVENUE, PORTLAND, MAINE
DRILLING CO. : GREAT WORKS TEST BORING INC. DRILLER: JEFF LEE

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4"	300 lb	18"
SAMPLER:	SS	1 3/8"		
CORE BARREL:	NQ2	2"		

WATER LEVEL INFORMATION
1" PIEZOMETER INSTALLED

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
									1.0'	FOREST DUFF / TOPSOIL
	1D	24"	12"	2.0'	WOH/12"		2	3		RUST BROWN SILTY SAND WITH COBBLES - GLACIAL TILL
									3.0'	~LOOSE~
	2D	3"	3"	5.2'	50/3"					PROBABLE WEATHERED BEDROCK
										[ADVANCED BORING BY ROLLER CONE TO 12.0']
	3D	3"	3"	10.2'	50/3"					
									12.0'	BEDROCK
										INTERBEDDED WHITE TO LIGHT GRAY MIGMATITE AND BIOTITE-MUSCOVITE SCHIST
	1R	60"	59"	17.0'						RQD = 40 %
	2R	63"	58"	22.3'					22.3'	RQD = 83 %
										BOTTOM OF EXPLORATION AT 22.3'

PIEZOMETER DETAILS:
SCREEN 17.5' - 22.5'
FILTER SAND 15' - 22.5'
BENTONITE 13' - 15'
SAND TO SURFACE

SAMPLES:
D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

REMARKS:
STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

5

BORING NO.: B-4 / MW

BORING LOG

S.W.COLE ENGINEERING, INC.

BORING NO.: **B-5**
SHEET: 1 OF 1
PROJECT NO.: 04-1228
DATE START: 12/10/2004
DATE FINISH: 12/10/2004
ELEVATION: 153.2
SWC REP.: KBG

PROJECT / CLIENT:
LOCATION: OCEAN AVENUE, PORTLAND, MAINE
DRILLING CO. : GREAT WORKS TEST BORING INC. DRILLER: DONNY BOLSTRIDGE

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4"	300 lb	18"
SAMPLER:				
CORE BARREL:	NQ2	2"		

WATER LEVEL INFORMATION
OVERBURDEN SOILS SATURATED

CASING BLOWS PER FOOT	SAMPLE NO.	SAMPLE PEN.	SAMPLE REC.	SAMPLE DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
										TOPSOIL OVERLYING BROWN SILTY SAND AND GRAVEL - GLACIAL TILL
									4.0'	
									5.0'	PROBABLE WEATHERED BEDROCK
										BEDROCK
										[BORING ADVANCED BY AIR HAMMER TO 15']
									15.0'	
										INTERBEDDED WHITE TO LIGHT GRAY MIGMATITE AND BIOTITE-MUSCOVITE SCHIST
	1R	60"	53"	20.0'						RQD = 83 %
	2R	60"	58"	25.0'					25.0'	RQD = 63 %
										BOTTOM OF EXPLORATION AT 25.0'

SAMPLES:
D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

REMARKS:
STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

6

BORING NO.: **B-5**

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.:	**B-6**
SHEET:	1 OF 1
PROJECT NO.:	04-1228
DATE START:	12/13/2004
DATE FINISH:	12/13/2004
ELEVATION:	153 +/-
SWC REP.:	KBG

PROJECT / CLIENT:

LOCATION: OCEAN AVENUE, PORTLAND, MAINE

DRILLING CO. : GREAT WORKS TEST BORING INC. DRILLER: DONNY BOLSTRIDGE

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4"	300 lb	18"
SAMPLER:				
CORE BARREL:	NQ2	2"		

WATER LEVEL INFORMATION
NO FREE WATER OBSERVED

CASING BLOWS PER FOOT	SAMPLE NO.	SAMPLE PEN.	SAMPLE REC.	SAMPLE DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
									0.5'	FOREST DUFF / TOPSOIL
										BEDROCK
										[ADVANCED BORING BY AIR HAMMER TO 15.0']
									15.0'	
										INTERBEDDED WHITE TO LIGHT GRAY MIGMATITE AND BIOTITE-MUSCOVITE SCHIST
	1R	60"	56"	20.0'						RQD = 47 %
	2R	60"	58"	25.0'					25.0'	RQD = 83 %
										BOTTOM OF EXPLORATION AT 25.0'

SAMPLES:
D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:

	DRILLER - VISUALLY
X	SOIL TECH. - VISUALLY
	LABORATORY TEST

REMARKS:

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

7

BORING NO.: **B-6**

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.:	B-7
SHEET:	1 OF 1
PROJECT NO.:	04-1228
DATE START:	12/10/2004
DATE FINISH:	12/10/2004
ELEVATION:	156.7
SWC REP.:	KBG

PROJECT / CLIENT:
LOCATION: OCEAN AVENUE, PORTLAND, MAINE
DRILLING CO. : GREAT WORKS TEST BORING INC. DRILLER: DONNY BOLSTRIDGE

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4"	300 lb	18"
SAMPLER:				
CORE BARREL:	NQ2	2"		

WATER LEVEL INFORMATION
NO FREE WATER OBSERVED

CASING BLOWS PER FOOT	SAMPLE NO.	SAMPLE PEN.	SAMPLE REC.	SAMPLE DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
										PROBABLE WEATHERED BEDROCK
										[ADVANCED BORING BY AIR HAMMER TO 20']
									10.0'	
										BEDROCK
									20.0'	
										INTERBEDDED WHITE TO LIGHT GRAY MIGMATITE AND BIOTITE-MUSCOVITE SCHIST
	1R	60"	59"	25.0'						RQD = 87 %
	2R	60"	52"	30.0'					30.0'	RQD = 78 %
										BOTTOM OF EXPLORATION AT 30.0'

SAMPLES:
D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

REMARKS:

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

8

BORING NO.: B-7

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: **B-8 / MW**
SHEET: 1 OF 1
PROJECT NO.: 04-1228
DATE START: 12/13/2004
DATE FINISH: 12/13/2004
ELEVATION: 140.8
SWC REP.: KBG

PROJECT / CLIENT:
LOCATION: OCEAN AVENUE, PORTLAND, MAINE
DRILLING CO. : GREAT WORKS TEST BORING INC. DRILLER: DONNY BOLSTRIDGE

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4"	300 lb	18"
SAMPLER:				
CORE BARREL:	NQ2	2"		

WATER LEVEL INFORMATION
1" PIEZOMETER INSTALLED

CASING BLOWS PER FOOT	SAMPLE NO.	SAMPLE PEN.	SAMPLE REC.	SAMPLE DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
										FOREST DUFF / TOPSOIL
									2.0'	OVERLYING BROWN SILTY SAND WITH ORGANICS
										BEDROCK
										[ADVANCED BORING BY AIR HAMMER TO 15.0']
									15.0'	
										INTERBEDDED WHITE TO LIGHT GRAY
										MIGMATITE AND BIOTITE-MUSCOVITE SCHIST
	1R	60"	59"	20.0'						RQD = 78 %
	2R	60"	58"	25.0'					25.0'	RQD = 82 %
										BOTTOM OF EXPLORATION AT 25.0'
										PIEZOMETER DETAILS: SCREEN 20' - 25'
										FILTER SAND 16' - 25'
										BENTONITE 14' - 16'
										SAND TO SURFACE

SAMPLES:
D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

REMARKS:

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

9

BORING NO.: **B-8 / MW**

BORING LOG

S.W.COLE ENGINEERING, INC.

BORING NO.:	B-9
SHEET:	1 OF 1
PROJECT NO.:	04-1228
DATE START:	12/10/2004
DATE FINISH:	12/10/2004
ELEVATION:	136.6
SWC REP.:	KBG

PROJECT / CLIENT:
LOCATION: OCEAN AVENUE, PORTLAND, MAINE
DRILLING CO. : GREAT WORKS TEST BORING INC. DRILLER: JEFF LEE

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4"	300 lb	18"
SAMPLER:	SS	1 3/8"		
CORE BARREL:	NQ2	2"		

WATER LEVEL INFORMATION
OVERBURDEN SATURATED
ARTESIAN WATER FLOW AFTER 1R OBTAINED

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
									1.0'	FOREST DUFF / TOPSOIL
	1D	24"	15"	2.0'	2	3	2	2		BROWN TO ORANGE SILTY SAND WITH ORGANICS
										OCCASIONAL COBBLES - GLACIAL TILL
									4.0'	~LOOSE~
	2D	0"	0"	5.0'	50/0"					PROBABLE WEATHERED BEDROCK
									6.0'	[ADVANCED BORING BY ROLLER CONE TO 6']
										BEDROCK
										INTERBEDDED WHITE TO LIGHT GRAY
										MIGMATITE AND BIOTITE-MUSCOVITE SCHIST
	1R	60"	59"	11.0'						RQD = 63 %
	2R	60"	59"	16.0'					16.0'	RQD = 98 %
										BOTTOM OF EXPLORATION AT 16.0'

SAMPLES:
D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:

	DRILLER - VISUALLY
X	SOIL TECH. - VISUALLY
	LABORATORY TEST

REMARKS:

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

10

BORING NO.: B-9

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.:	**B-10**
SHEET:	1 OF 1
PROJECT NO.:	04-1228
DATE START:	12/13/2004
DATE FINISH:	12/14/2004
ELEVATION:	151.2
SWC REP.:	KBG

PROJECT / CLIENT:

LOCATION: OCEAN AVENUE, PORTLAND, MAINE

DRILLING CO. : GREAT WORKS TEST BORING INC. DRILLER: DONNY BOLSTRIDGE

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4"	300 lb	18"
SAMPLER:				
CORE BARREL:	NQ2	2"		

WATER LEVEL INFORMATION

NO FREE WATER OBSERVED

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
										FOREST DUFF / TOPSOIL
									2.0'	OVERLYING BROWN SILTY SAND WITH ORGANICS
										BEDROCK
										[ADVANCED BORING BY AIR HAMMER TO 20.0']
									20.0'	
										INTERBEDDED WHITE TO LIGHT GRAY TO LIGHT GREEN MIGMATITE AND BIOTITE-MUSCOVITE-CHLORITE SCHIST
	1R	60"	58"	25.0'						RQD = 68 %
										INTERBEDDED WHITE TO LIGHT GRAY MIGMATITE AND BIOTITE-MUSCOVITE SCHIST
	2R	60"	60"	30.0'					30.0'	RQD = 92 %
										BOTTOM OF EXPLORATION AT 30.0'

SAMPLES:

D = SPLIT SPOON

C = 3" SHELBY TUBE

U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:

	DRILLER - VISUALLY
X	SOIL TECH. - VISUALLY
	LABORATORY TEST

REMARKS:

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

11

BORING NO.: **B-10**

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.:	**B-11**
SHEET:	1 OF 1
PROJECT NO.:	04-1228
DATE START:	12/14/2004
DATE FINISH:	12/14/2004
ELEVATION:	149.9
SWC REP.:	KBG

PROJECT / CLIENT:
LOCATION: OCEAN AVENUE, PORTLAND, MAINE
DRILLING CO. : GREAT WORKS TEST BORING INC. DRILLER: JEFF LEE

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4"	300 lb	18"
SAMPLER:				
CORE BARREL:	NQ2	2"		

WATER LEVEL INFORMATION
NO FREE WATER OBSERVED

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
										FOREST DUFF / TOPSOIL
									1.5'	OVERLYING BROWN SILTY SAND WITH ORGANICS
										PROBABLE WEATHERED BEDROCK
									4.0'	
										BEDROCK
										[ADVANCED BORING BY ROLLER CONE TO 9.0']
									9.0'	
										WHITE TO LIGHT GRAY MIGMATITE WITH GRAY BIOTITE-MUSCOVITE SCHIST LAYERS
	1R	60"	56"	14.0'						RQD = 68 %
										INTERBEDDED WHITE TO GRAY MIGMATITE AND BIOTITE-MUSCOVITE SCHIST
	2R	60"	58"	19.0'						RQD = 73 %
	3R	60"	59"	24.0'					24.0'	RQD = 65 %
										BOTTOM OF EXPLORATION AT 24.0'

SAMPLES:
D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

REMARKS:

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

12

BORING NO.: **B-11**

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.:	B-12 / MW
SHEET:	1 OF 1
PROJECT NO.:	04-1228
DATE START:	12/10/2004
DATE FINISH:	12/10/2004
ELEVATION:	138.4
SWC REP.:	KBG

PROJECT / CLIENT:
LOCATION: OCEAN AVENUE, PORTLAND, MAINE
DRILLING CO. : GREAT WORKS TEST BORING INC. DRILLER: JEFF LEE

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4"	300 lb	18"
SAMPLER:	SS	1 3/8"		
CORE BARREL:	NQ2	2"		

WATER LEVEL INFORMATION
1" PIEZOMETER INSTALLED

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
									1.0'	FOREST DUFF / TOPSOIL
	1D	24"	8"	2.0'	1	1	2	2	2.0'	BROWN SILTY SAND WITH ORGANICS
										BEDROCK
									6.0'	[ADVANCED BORING BY ROLLER CONE TO 6']
										BEDROCK
										GRAY BIOTITE-MUSCOVITE
	1R	60"	60"	11.0'						RQD = 30 %
										INTERBEDDED WHITE TO GRAY MIGMATITE AND BIOTITE-MUSCOVITE SCHIST
	2R	60"	59"	16.0'					16.0'	RQD = 73 %
										BOTTOM OF EXPLORATION AT 16.0'
										PIEZOMETER DETAILS: SCREEN 11' - 16'; FILTER SAND 10' - 16'; BENTONITE 8' - 10'; SAND TO SURFACE

SAMPLES:
D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

REMARKS:

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

13

BORING NO.: B-12 / MW

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.:	B-13
SHEET:	1 OF 1
PROJECT NO.:	04-1228
DATE START:	12/14/2004
DATE FINISH:	12/15/2004
ELEVATION:	152.9
SWC REP.:	KBG

PROJECT / CLIENT:
LOCATION: OCEAN AVENUE, PORTLAND, MAINE
DRILLING CO. : GREAT WORKS TEST BORING INC. DRILLER: DONNY BOLSTRIDGE

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4"	300 lb	18"
SAMPLER:				
CORE BARREL:	NQ2	2"		

WATER LEVEL INFORMATION
NO FREE WATER OBSERVED

CASING BLOWS PER FOOT	SAMPLE NO.	SAMPLE PEN.	SAMPLE REC.	SAMPLE DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
										BEDROCK
									3.0'	[ADVANCED BORING BY AIR HAMMER TO 3.0']
										WHITE TO LIGHT GRAY MIGMATITE AND GRAY BIOTITE-MUSCOVITE SCHIST
	1R	60"	60"	8.0'						RQD = 52 %
										WHITE TO LIGHT GRAY MIGMATITE
	2R	60"	60"	13.0'						RQD = 89 %
	3R	60"	56"	18.0'						RQD = 82 %
	4R	60"	54"	23.0'						RQD = 72 %
	5R	60"	60"	28.0'					28.0'	RQD = 82 %
										BOTTOM OF EXPLORATION AT 28.0'

SAMPLES:
D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

REMARKS:

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

14

BORING NO.: B-13

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: **B-14**
SHEET: 1 OF 1
PROJECT NO.: 04-1228
DATE START: 12/13/2004
DATE FINISH: 12/13/2004
ELEVATION: 147.8
SWC REP.: KBG

PROJECT / CLIENT:
LOCATION: OCEAN AVENUE, PORTLAND, MAINE
DRILLING CO. : GREAT WORKS TEST BORING INC. DRILLER: JEFF LEE

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4"	300 lb	18"
SAMPLER:				
CORE BARREL:	NQ2	2"		

WATER LEVEL INFORMATION
SOIL OVERBURDEN SATURATED

CASING BLOWS PER FOOT	SAMPLE NO.	SAMPLE PEN.	SAMPLE REC.	SAMPLE DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
									2.0'	FOREST DUFF / TOPSOIL OVERLYING BROWN SILTY SAND
										BEDROCK
									9.0'	[ADVANCED BORING BY ROLLER CONE TO 9']
										GRAY BIOTITE-MUSCOVITE SCHIST WITH WHITE TO LIGHT GRAY MIGMATITE LAYERS
	1R	60"	60"	14.0'						RQD = 45 %
										WHITE TO LIGHT GRAY MIGMATITE WITH GRAY BIOTITE-MUSCOVITE SCHIST LAYERS
	2R	60"	60"	19.0'						RQD = 80 %
	3R	60"	60"	24.0'					24.0'	RQD = 75 %
										BOTTOM OF EXPLORATION AT 24.0'

SAMPLES:
D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

REMARKS:

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

15

BORING NO.: **B-14**

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: **B-15**
SHEET: 1 OF 1
PROJECT NO.: 04-1228
DATE START: 12/13/2004
DATE FINISH: 12/13/2004
ELEVATION: 142.3
SWC REP.: KBG

PROJECT / CLIENT:
LOCATION: OCEAN AVENUE, PORTLAND, MAINE
DRILLING CO. : GREAT WORKS TEST BORING INC. DRILLER: JEFF LEE

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4"	300 lb	18"
SAMPLER:	SS	1 3/8"		
CORE BARREL:	NQ2	2"		

WATER LEVEL INFORMATION
OVERBURDEN SOILS SATURATED

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
										FOREST DUFF / TOPSOIL
	1D	24"	3"	2.0'	1	1	1	5	1.5'	~LOOSE~
									3.0'	BROWN SILTY SAND TRACE GRAVEL
										BROWN SILTY SAND SOME GRAVEL
	2D	5"	5"	5.3'	50/5"				4.8'	WITH OCCASIONAL COBBLES
									6.0'	PROBABLE WEATHERED BEDROCK
										BEDROCK
									11.0'	[ADVANCED BORING BY ROLLER CONE TO 11.0']
										BROWN SULFIDIC SCHIST AND GRAY BIOTITE-MUSCOVITE SCHIST
	1R	60"	58"	16.0'						RQD = 23 %
										GRAY BIOTITE-MUSCOVITE SCHIST AND WHITE TO LIGHT GRAY MIGMATITE
	2R	60"	60"	21.0'					21.0'	RQD = 93 %
										BOTTOM OF EXPLORATION AT 21.0'

SAMPLES:
D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

REMARKS:

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

16

BORING NO.: **B-15**

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.:	**B-16 / MW**
SHEET:	1 OF 1
PROJECT NO.:	04-1228
DATE START:	12/15/2004
DATE FINISH:	12/15/2004
ELEVATION:	155.2
SWC REP.:	KBG

PROJECT / CLIENT:

LOCATION: OCEAN AVENUE, PORTLAND, MAINE

DRILLING CO. : GREAT WORKS TEST BORING INC. DRILLER: JEFF LEE

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4"	300 lb	18"
SAMPLER:				
CORE BARREL:	NQ2	2"		

WATER LEVEL INFORMATION
1" PIEZOMETER INSTALLED

CASING BLOWS PER FOOT	SAMPLE NO.	SAMPLE PEN.	SAMPLE REC.	SAMPLE DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
										FOREST DUFF / TOPSOIL
										OVERLYING BROWN SILTY SAND WITH ORGANICS
									3.0'	
									3.5'	PROBABLE WEATHERED BEDROCK
										BEDROCK
										[ADVANCED BORING BY AIR HAMMER TO 18.0']
									18.0'	
										WHITE TO LIGHT GRAY MIGMATITE WITH
										GRAY BIOTITE-MUSCOVITE SCHIST LAYERS
	1R	60"	58"	23.0'						RQD = 78 %
	2R	60"	59"	28.0'					28.0'	RQD = 65 %
										BOTTOM OF EXPLORATION AT 28.0'
										PIEZOMETER DETAILS: SCREEN 23' - 28'
										FILTER SAND 22' - 28"
										BENTONITE 20' - 22'
										SAND TO SURFACE

SAMPLES:
D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

REMARKS:

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: **B-16 / MW**

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.:	**B-17 / MW**
SHEET:	1 OF 1
PROJECT NO.:	04-1228
DATE START:	12/14/2004
DATE FINISH:	12/14/2004
ELEVATION:	114.5
SWC REP.:	KBG

PROJECT / CLIENT:

LOCATION: OCEAN AVENUE, PORTLAND, MAINE

DRILLING CO. : GREAT WORKS TEST BORING INC. DRILLER: JEFF LEE

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4"	300 lb	18"
SAMPLER:	SS	1 3/8"		
CORE BARREL:	NQ2	2"		

WATER LEVEL INFORMATION

NESTED 1" PIEZOMETERS INSTALLED

CASING BLOWS PER FOOT	SAMPLE NO.	SAMPLE PEN.	SAMPLE REC.	SAMPLE DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
										FOREST DUFF / TOPSOIL
									2.0'	OVERLYING BROWN SILTY SAND WITH ORGANICS
										BEDROCK
										[ADVANCED BORING BY ROLLER CONE TO 10.0']
									10.0'	
										INTERBEDDED GRAY GRANITIC GNEISS AND SCHIST
	1R	60"	60"	15.0'						RQD = 45 %
	2R	60"	57"	20.0'					20.0'	RQD = 65 %
										BOTTOM OF EXPLORATION AT 20.0'
										PIEZOMETER DETAILS: SCREEN 15' - 20' FILTER SAND 14' - 20' BENTONITE 11' - 14' SCREEN 5' - 10' FILTER SAND 4' - 11' BENTONITE TO SURFACE

SAMPLES:

D = SPLIT SPOON
C = 3" SHELBY TUBE
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:

	DRILLER - VISUALLY
X	SOIL TECH. - VISUALLY
	LABORATORY TEST

REMARKS: PROPOSED POND

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

18

BORING NO.: **B-17 / MW**

S.W.COLE ENGINEERING, INC.

ROCK CORE LOG

PROJECT:

CLIENT:

BORING NO.: B-1

PROJECT NO.: 04-1228

LOGGED BY: MTT **DATE:** 1/10/2005 **SHEET NO.:** 1 OF 1

CHECKED BY: GWB **DATE:** 1/13/2005 **CORE SIZE:** NQ2

DEPTH BELOW SURFACE (FT)	CORE RUN	CORE INTERVAL (IN)	CORE RECOVERY (IN)	RQD (%)	ROCK QUALITY	GRAPHIC LOG	ROCK DESCRIPTION AND IDENTIFICATION
5.0' – 10.0'	R1	60"	53"	22"/60" 37%	POOR		INTERBEDDED WHITE TO LIGHT GRAY MIGMATITE AND BIOTITE-MUSCOVITE SCHIST, HARD, MODERATELY WEATHERED, FRACTURES @ 15 TO 40 DEGREES FROM HORIZONTAL. HIGHLY FRACTURED ZONE ZONE OF CORE LOSS
10.0' – 15.0'	R2	60"	59"	36"/60" 60%	FAIR		INTERBEDDED WHITE TO LIGHT GRAY MIGMATITE AND BIOTITE-MUSCOVITE SCHIST, HARD, MODERATELY WEATHERED, FRACTURES @ 15 TO 40 DEGREES FROM HORIZONTAL. HIGHLY FRACTURED ZONE ZONE OF CORE LOSS
15.0'							BOTTOM OF EXPLORATION @ 15.0'

S.W.COLE ENGINEERING, INC.

ROCK CORE LOG

PROJECT:

CLIENT:

BORING NO.: B-2

PROJECT NO.: 04-1228

LOGGED BY: MTT | DATE: 1/10/2005 | SHEET NO.: 1 OF 1

CHECKED BY: GWB | DATE: 1/13/2005 | CORE SIZE: NQ2

DEPTH BELOW SURFACE (FT)	CORE RUN	CORE INTERVAL (FT)	CORE RECOVERY (FT)	RQD (%)	ROCK QUALITY	GRAPHIC LOG	ROCK DESCRIPTION AND IDENTIFICATION
21.5' – 26.5'	R1	60"	58"	46"/60" 77%	GOOD		INTERBEDDED WHITE TO LIGHT GRAY MIGMATITE AND BIOTITE-MUSCOVITE SCHIST, HARD, SLIGHTLY WEATHERED, FRACTURES @ 10 TO 40 DEGREES FROM HORIZONTAL ZONE OF CORE LOSS
26.5' – 31.3'	R2	58"	58"	37"/58" 63%	FAIR		INTERBEDDED WHITE TO LIGHT GRAY MIGMATITE AND BIOTITE-MUSCOVITE SCHIST, HARD, SLIGHTLY WEATHERED, FRACTURES @ 10 TO 40 DEGREES FROM HORIZONTAL
							BOTTOM OF EXPLORATION @ 31.3'

S.W.COLE ENGINEERING, INC.

ROCK CORE LOG

PROJECT:
CLIENT:

BORING NO.: B-3
PROJECT NO.: 04-1228

LOGGED BY: MTT   DATE: 1/10/2005   SHEET NO.: 1 OF 1
CHECKED BY: GWB   DATE: 1/13/2005   CORE SIZE: NQ2

DEPTH BELOW SURFACE (FT)	CORE RUN	CORE INTERVAL (IN)	CORE RECOVERY (IN)	RQD (%)	ROCK QUALITY	GRAPHIC LOG	ROCK DESCRIPTION AND IDENTIFICATION
7.0' – 12.0'	R1	60"	60"	37"/60" 62%	FAIR		INTERBEDDED WHITE TO LIGHT GRAY MIGMATITE AND BIOTITE-MUSCOVITE SCHIST, HARD, MODERATELY WEATHERED, FRACTURES @ 25 TO 50 DEGREES FROM HORIZONTAL.
12.0' – 17.0'	R2	60"	59"	46"/60" 72%	FAIR		INTERBEDDED WHITE TO LIGHT GRAY MIGMATITE AND BIOTITE-MUSCOVITE SCHIST, HARD, MODERATELY WEATHERED, FRACTURES @ 25 TO 50 DEGREES FROM HORIZONTAL. ZONE OF CORE LOSS
17.0'							BOTTOM OF EXPLORATION @ 17.0'

ROCK CORE LOG

S.W.COLE ENGINEERING, INC.

PROJECT:		BORING NO.:	B-4
CLIENT:		PROJECT NO.:	04-1228
LOGGED BY:	MTT	DATE:	1/10/2005
SHEET NO.:	1 OF 1		
CHECKED BY:	GWB	DATE:	1/13/2005
CORE SIZE:	NQ2		

DEPTH BELOW SURFACE (FT)	CORE RUN	CORE INTERVAL (IN)	CORE RECOVERY (IN)	RQD (%)	ROCK QUALITY	GRAPHIC LOG	ROCK DESCRIPTION AND IDENTIFICATION
12.0' – 17.0'	R1	60"	59"	24"/60" 40%	POOR		HIGHLY FRACTURED ZONE INTERBEDDED WHITE TO LIGHT GRAY MIGMATITE AND BIOTITE-MUSCOVITE SCHIST, HARD, VERY WEATHERED TO MODERATELY WEATHERED, FRACTURES @ 20 TO 60 DEGREES FROM HORIZONTAL ZONE OF CORE LOSS
17.0' – 22.3'	R2	63"	58"	52"/63" 83%	GOOD		INTERBEDDED WHITE TO LIGHT GRAY MIGMATITE AND BIOTITE-MUSCOVITE SCHIST, HARD SLIGHTLY WEATHERED, FRACTURES @ 20 TO 60 DEGREES FROM HORIZONTAL ZONE OF CORE LOSS
							BOTTOM OF EXPLORATION @ 22.3'

ROCK CORE LOG

S.W.COLE ENGINEERING, INC.

PROJECT:		BORING NO.:	B-5
CLIENT:		PROJECT NO.:	04-1228
LOGGED BY:	MTT	DATE:	1/10/2005
SHEET NO.:	1 OF 1		
CHECKED BY:	GWB	DATE:	1/13/2005
CORE SIZE:	NQ2		

DEPTH BELOW SURFACE (FT)	CORE RUN	CORE INTERVAL (IN)	CORE RECOVERY (IN)	RQD (%)	ROCK QUALITY	GRAPHIC LOG	ROCK DESCRIPTION AND IDENTIFICATION
15.0' – 20.0'	R1	60"	53"	50"/60" 83%	GOOD		INTERBEDDED WHITE TO LIGHT GRAY MIGMATITE AND BIOTITE-MUSCOVITE SCHIST, HARD, SLIGHTLY WEATHERED, FRACTURES @ 20 TO 40 DEGREES FROM HORIZONTAL ZONE OF CORE LOSS
20.0' – 25.0'	R2	60"	58"	38"/60" 63%	FAIR		INTERBEDDED WHITE TO LIGHT GRAY MIGMATITE AND BIOTITE-MUSCOVITE SCHIST, HARD, SLIGHTLY WEATHERED, FRACTURES @ 20 TO 40 DEGREES FROM HORIZONTAL ZONE OF CORE LOSS
25.0'							BOTTOM OF EXPLORATION @ 25.0'

ROCK CORE LOG

S.W.COLE ENGINEERING, INC.

PROJECT:
CLIENT:

BORING NO.: B-6
PROJECT NO.: 04-1228

LOGGED BY: MTT DATE: 1/10/2005 SHEET NO.: 1 OF 1
CHECKED BY: GWB DATE: 1/13/2005 CORE SIZE: NQ2

DEPTH BELOW SURFACE (FT)	CORE RUN	CORE INTERVAL (IN)	CORE RECOVERY (IN)	RQD (%)	ROCK QUALITY	GRAPHIC LOG	ROCK DESCRIPTION AND IDENTIFICATION
15.0' – 20.0'	R1	60"	56"	28"/60" 47%	POOR		INTERBEDDED WHITE TO LIGHT GRAY MIGMATITE AND BIOTITE-MUSCOVITE SCHIST, HARD, MODERATELY WEATHERED, FRACTURES @ 10 TO 35 DEGREES FROM HORIZONTAL HIGHLY FRACTURED ZONE ZONE OF CORE LOSS
20.0' – 25.0'	R2	60"	58"	50"/60" 83%	GOOD		INTERBEDDED WHITE TO LIGHT GRAY MIGMATITE AND BIOTITE-MUSCOVITE SCHIST, HARD, SLIGHTLY WEATHERED, FRACTURES @ 10 TO 35 DEGREES FROM HORIZONTAL HIGHLY FRACTURED ZONE ZONE OF CORE LOSS
25.0'							BOTTOM OF EXPLORATION @ 25.0'

S.W.COLE ENGINEERING, INC.

ROCK CORE LOG

PROJECT:

CLIENT:

BORING NO.: B-7

PROJECT NO.: 04-1228

LOGGED BY: MTT

DATE: 1/10/2005

SHEET NO.: 1 OF 1

CHECKED BY: GWB

DATE: 1/13/2005

CORE SIZE: NQ2

DEPTH BELOW SURFACE (FT)	CORE RUN	CORE INTERVAL (IN)	CORE RECOVERY (IN)	RQD (%)	ROCK QUALITY	GRAPHIC LOG	ROCK DESCRIPTION AND IDENTIFICATION
20.0' – 25.0'	R1	60"	59"	52"/60" 87%	GOOD		INTERBEDDED WHITE TO LIGHT GRAY MIGMATITE AND BIOTITE-MUSCOVITE SCHIST, HARD, SLIGHTLY WEATHERED, FRACTURES @ 10 TO 35 DEGREES FROM HORIZONTAL ZONE OF CORE LOSS
25.0' – 30.0'	R2	60"	52"	47"/60" 78%	GOOD		INTERBEDDED WHITE TO LIGHT GRAY MIGMATITE AND BIOTITE-MUSCOVITE SCHIST, HARD, SLIGHTLY WEATHERED, FRACTURES @ 10 TO 35 DEGREES FROM HORIZONTAL ZONE OF CORE LOSS
30.0'							BOTTOM OF EXPLORATION @ 30.0'

ROCK CORE LOG

S.W.COLE ENGINEERING, INC.

PROJECT: ______ BORING NO.: B-8

CLIENT: ______ PROJECT NO.: 04-1228

LOGGED BY: GWB DATE: 12/21/2004 SHEET NO.: 1 OF 1

CHECKED BY: GWB DATE: 1/13/2005 CORE SIZE: NQ2

DEPTH BELOW SURFACE (FT)	CORE RUN	CORE INTERVAL (IN)	CORE RECOVERY (IN)	RQD (%)	ROCK QUALITY	GRAPHIC LOG	ROCK DESCRIPTION AND IDENTIFICATION
15.0' – 20.0'	R1	60"	59"	47"/60" 78%	GOOD		INTERBEDDED WHITE TO LIGHT GRAY MIGMATITE AND BIOTITE-MUSCOVITE SCHIST, HARD, MODERATELY WEATHERED BECOMING SLIGHTLY WEATHERED, FRACTURES @ 0 TO 55 DEGREES FROM HORIZONTAL. ZONE OF CORE LOSS
20.0' – 25.0'	R2	60"	58"	49"/60" 82%	GOOD		INTERBEDDED WHITE TO LIGHT GRAY MIGMATITE AND BIOTITE-MUSCOVITE SCHIST, HARD, SLIGHTLY WEATHERED, FRACTURES @ 10 TO 35 DEGREES FROM HORIZONTAL. ZONE OF CORE LOSS
25.0'							BOTTOM OF EXPLORATION @ 25.0'

S.W.COLE ENGINEERING, INC.

ROCK CORE LOG

PROJECT:
CLIENT:

BORING NO.: B-9
PROJECT NO.: 04-1228

LOGGED BY: MTT DATE: 1/10/2005 SHEET NO.: 1 OF 1
CHECKED BY: GWB DATE: 1/13/2005 CORE SIZE: NQ2

DEPTH BELOW SURFACE (FT)	CORE RUN	CORE INTERVAL (IN)	CORE RECOVERY (IN)	RQD (%)	ROCK QUALITY	GRAPHIC LOG	ROCK DESCRIPTION AND IDENTIFICATION
6.0' – 11.0'	R1	60"	59"	38"/60" 63%	FAIR		HIGHLY FRACTURED ZONE INTERBEDDED WHITE TO LIGHT GRAY MIGMATITE AND BIOTITE-MUSCOVITE SCHIST, HARD, MODERATELY TO MODERATELY WEATHERED, FRACTURES @ 15 TO 35 DEGREES FROM HORIZONTAL ZONE OF CORE LOSS
11.0' – 16.0'	R2	60"	59"	59"/60" 98%	EXCELLENT		INTERBEDDED WHITE TO LIGHT GRAY MIGMATITE AND BIOTITE-MUSCOVITE SCHIST, HARD, MODERATELY TO MODERATELY WEATHERED, FRACTURES @ 15 TO 35 DEGREES FROM HORIZONTAL ZONE OF CORE LOSS
16.0'							BOTTOM OF EXPLORATION @ 16.0'

S.W.COLE ENGINEERING, INC.

ROCK CORE LOG

PROJECT:

CLIENT:

BORING NO.: B-10

PROJECT NO.: 04-1228

LOGGED BY: GWB

DATE: 12/21/2004

SHEET NO.: 1 OF 1

CHECKED BY: GWB

DATE: 1/13/2005

CORE SIZE: NQ2

DEPTH BELOW SURFACE (FT)	CORE RUN	CORE INTERVAL (IN)	CORE RECOVERY (IN)	RQD (%)	ROCK QUALITY	GRAPHIC LOG	ROCK DESCRIPTION AND IDENTIFICATION
20.0' – 25.0'	R1	60"	58"	41"/60" 68%	FAIR		INTERBEDDED WHITE TO LIGHT GRAY TO LIGHT GREEN MIGMATITE AND BIOTITE-MUSCOVITE-CHLORITE SCHIST, HARD, SLIGHTLY WEATHERED, FRACTURES @ 10 TO 25 DEGREES FROM HORIZONTAL ZONE OF CORE LOSS
25.0' – 30.0'	R2	60"	60"	55"/60" 92%	EXCELLENT		INTERBEDDED WHITE TO LIGHT GRAY MIGMATITE AND BIOTITE-MUSCOVITE SCHIST, HARD, SLIGHTLY WEATHERED, FRACTURES @ 5 TO 25 DEGREES FROM HORIZONTAL
30.0'							BOTTOM OF EXPLORATION @ 30.0'

S.W.COLE ENGINEERING, INC.

ROCK CORE LOG

PROJECT:

CLIENT:

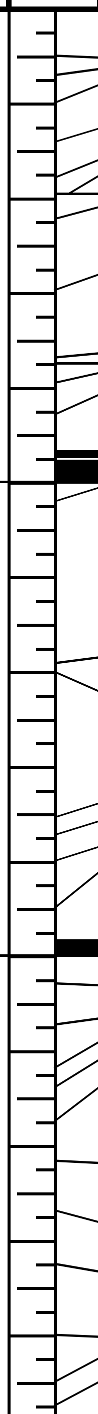
BORING NO.: B-11

PROJECT NO.: 04-1228

LOGGED BY: GWB **DATE:** 12/20/2004 **SHEET NO.:** 1 OF 1

CHECKED BY: GWB **DATE:** 1/13/2005 **CORE SIZE:** NQ2

DEPTH BELOW SURFACE (FT)	CORE RUN	CORE INTERVAL (IN)	CORE RECOVERY (IN)	RQD (%)	ROCK QUALITY	GRAPHIC LOG	ROCK DESCRIPTION AND IDENTIFICATION
9.0' – 14.0'	R1	60"	56"	41"/60" 68%	FAIR		WHITE TO LIGHT GRAY MIGMATITE WITH GRAY BIOTITE-MUSCOVITE SCHIST LAYERS, VERY HARD (MIGMATITE) TO MODERATELY HARD (SCHIST), SLIGHTLY WEATHERED, FRACTURES @ 10 TO 45 DEGREES FROM HORIZONTAL ZONE OF CORE LOSS
14.0' – 19.0'	R2	60"	58"	44"/60" 73%	FAIR		INTERBEDDED WHITE TO GRAY MIGMATITE AND BIOTITE-MUSCOVITE SCHIST, HARD, SLIGHTLY WEATHERED, FRACTURES @ 20 TO 45 DEGREES FROM HORIZONTAL ZONE OF CORE LOSS
19.0' – 24.0'	R3	60"	59"	39"/60" 65%	FAIR		INTERBEDDED WHITE TO GRAY MIGMATITE AND BIOTITE-MUSCOVITE SCHIST, HARD, SLIGHLTY WEATHERED, FRACTURES @ 0 TO 35 DEGREES FROM HORIZONTAL ZONE OF CORE LOSS BOTTOM OF EXPLORATION @ 24.0'



S.W.COLE ENGINEERING, INC.

ROCK CORE LOG

PROJECT:		BORING NO.:	B-12
CLIENT:		PROJECT NO.:	04-1228
LOGGED BY:	GWB	DATE: 12/21/2004	SHEET NO.: 1 OF 1
CHECKED BY:	GWB	DATE: 1/13/2005	CORE SIZE: NQ2

DEPTH BELOW SURFACE (FT)	CORE RUN	CORE INTERVAL (IN)	CORE RECOVERY (IN)	RQD (%)	ROCK QUALITY	GRAPHIC LOG	ROCK DESCRIPTION AND IDENTIFICATION
6.0' – 11.0'	R1	60"	60"	18"/60" 30%	POOR		GRAY BIOTITE-MUSCOVITE, MODERATELY HARD, MODERATELY WEATHERED, HIGHLY FRACTURED, FRACTURES @ 5 TO 40 DEGREES FROM HORIZONTAL
11.0' – 16.0'	R2	60"	59"	44"/60" 73%	FAIR		INTERBEDDED WHITE TO GRAY MIGMATITE AND BIOTITE-MUSCOVITE SCHIST, HARD, SLIGHTLY WEATHERED, FRACTURES @ 0 TO 35 DEGREES FROM HORIZONTAL ZONE OF CORE LOSS
16.0'							BOTTOM OF EXPLORATION @ 16.0'

S.W.COLE ENGINEERING, INC.

ROCK CORE LOG

PROJECT:

CLIENT:

BORING NO.: B-13

PROJECT NO.: 04-1228

LOGGED BY: GWB   DATE: 12/20/2004

SHEET NO.: 1 OF 2

CHECKED BY: GWB   DATE: 1/13/2005

CORE SIZE: NQ2

DEPTH BELOW SURFACE (FT)	CORE RUN	CORE INTERVAL (IN)	CORE RECOVERY (IN)	RQD (%)	ROCK QUALITY	GRAPHIC LOG	ROCK DESCRIPTION AND IDENTIFICATION
3.0' – 8.0'	R1	60"	60"	31"/60" 52%	FAIR		WHITE TO LIGHT GRAY MIGMATITE AND GRAY BIOTITE- MUSCOVITE SCHIST, VERY HARD TO MODERATELY HARD, MODERATELY TO SLIGHTLY WEATHERED, FRACTURES @ 10 TO 35 DEGREES FROM HORIZONTAL
8.0' – 13.0'	R2	60"	60"	53"/60" 89%	GOOD		WHITE TO LIGHT GRAY MIGMATITE, VERY HARD, SLIGHTLY WEATHERED, FRACTURES @ 5 TO 25 DEGREES FROM HORIZONTAL
13.0' – 18.0'	R3	60"	56"	49"/60" 82%	GOOD		WHITE TO LIGHT GRAY MIGMATITE, VERY HARD, SLIGHTLY WEATHERED, FRACTURES @ 5 TO 20 DEGREES FROM HORIZONTAL ZONE OF CORE LOSS

ROCK CORE LOG

S.W.COLE ENGINEERING, INC.

PROJECT:		BORING NO.:	B-13
CLIENT:		PROJECT NO.:	04-1228
LOGGED BY:	GWB	DATE:	12/20/2004
SHEET NO.:	2 OF 2		
CHECKED BY:	GWB	DATE:	1/13/2005
CORE SIZE:	NQ2		

DEPTH BELOW SURFACE (FT)	CORE RUN	CORE INTERVAL (IN)	CORE RECOVERY (IN)	RQD (%)	ROCK QUALITY	GRAPHIC LOG	ROCK DESCRIPTION AND IDENTIFICATION
18.0' – 23.0'	R4	60"	54"	43"/60" 72%	FAIR		WHITE TO LIGHT GRAY MIGMATITE, VERY HARD, SLIGHTLY WEATHERED, FRACTURES @ 0 TO 25 DEGREES FROM HORIZONTAL ZONE OF CORE LOSS
23.0' – 28.0'	R5	60"	60"	49"/60" 82%	GOOD		WHITE TO LIGHT GRAY MIGMATITE, VERY HARD, SLIGHTLY WEATHERED, FRACTURES @ 0 TO 40 DEGREES FROM HORIZONTAL
28.0'							BOTTOM OF EXPLORATION @ 28.0'

S.W.COLE ENGINEERING, INC.

ROCK CORE LOG

PROJECT: ______

CLIENT: ______

BORING NO.: B-14

PROJECT NO.: 04-1228

LOGGED BY: GWB

DATE: 12/20/2004

SHEET NO.: 1 OF 1

CHECKED BY: GWB

DATE: 1/13/2005

CORE SIZE: NQ2

DEPTH BELOW SURFACE (FT)	CORE RUN	CORE INTERVAL (IN)	CORE RECOVERY (IN)	RQD (%)	ROCK QUALITY	GRAPHIC LOG	ROCK DESCRIPTION AND IDENTIFICATION
9.0' – 14.0'	R1	60"	60"	27"/60" 45%	POOR		GRAY BIOTITE-MUSCOVITE SCHIST WITH WHITE TO LIGHT GRAY MIGMATITE LAYERS, VERY HARD (MIGMATITE) TO MODERATELY HARD (SCHIST), MODERATELY TO SLIGHTLY WEATHERED, FRACTURES @ 0 TO 80 DEGREES FROM HORIZONTAL.
14.0' – 19.0'	R2	60"	60"	48"/60" 80%	GOOD		WHITE TO LIGHT GRAY MIGMATITE WITH GRAY BIOTITE-MUSCOVITE SCHIST LAYERS, VERY HARD (MIGMATITE) TO MODERATELY HARD (SCHIST), SLIGHTLY WEATHERED, FRCATURES @ 0 TO 40 DEGREES FROM HORIZONTAL.
19.0' – 24.0'	R3	60"	60"	45"/60" 75%	GOOD		WHITE TO LIGHT GRAY MIGMATITE WITH GRAY BIOTITE-MUSCOVITE SCHIST LAYERS, VERY HARD (MIGMATITE) TO MODERATELY HARD (SCHIST), SLIGHTLY WEATHERED, FRCATURES @ 10 TO 45 DEGREES FROM HORIZONTAL. BOTTOM OF EXPLORATION @ 24.0'

S.W.COLE ENGINEERING, INC.

ROCK CORE LOG

PROJECT:

CLIENT:

BORING NO.: B-15

PROJECT NO.: 04-1228

LOGGED BY: GWB

DATE: 12/21/2004

SHEET NO.: 1 OF 1

CHECKED BY: GWB

DATE: 1/13/2005

CORE SIZE: NQ2

DEPTH BELOW SURFACE (FT)	CORE RUN	CORE INTERVAL (IN)	CORE RECOVERY (IN)	RQD (%)	ROCK QUALITY	GRAPHIC LOG	ROCK DESCRIPTION AND IDENTIFICATION
11.0' – 16.0'	R1	60"	58"	14"/60" 23%	VERY POOR		BROWN SULFIDIC SCHIST (11.0' TO 12.8') AND GRAY BIOTITE-MUSCOVITE SCHIST (12.8' TO 16.0'), SOFT BECOMING MODERATELY HARD, MODERATELY WEATHERED, HIGHLY FRACTURED, FRACTURES @ 0 TO 50 DEGREES FROM HORIZONTAL. HIGHLY FRACTURED ZONE ZONE OF CORE LOSS
16.0' – 21.0'	R2	60"	60"	56"/60" 93%	EXCELLENT		GRAY BIOTITE-MUSCOVITE SCHIST (16.0' TO 17.3') AND WHITE TO LIGHT GRAY MIGMATITE (17.3' TO 21.0'), MODERATELY HARD BECOMING VERY HARD, SLIGHTLY WEATHERED, FRACTURES @ 5 TO 15 DEGREES FROM HORIZONTAL.
21.0'							BOTTOM OF EXPLORATION @ 21.0'

ROCK CORE LOG

S.W.COLE ENGINEERING, INC.

PROJECT:
CLIENT:
BORING NO.: B-16
PROJECT NO.: 04-1228
LOGGED BY: GWB
DATE: 12/20/2004
SHEET NO.: 1 OF 1
CHECKED BY: GWB
DATE: 1/13/2005
CORE SIZE: NQ2

DEPTH BELOW SURFACE (FT)	CORE RUN	CORE INTERVAL (IN)	CORE RECOVERY (IN)	RQD (%)	ROCK QUALITY	GRAPHIC LOG	ROCK DESCRIPTION AND IDENTIFICATION
18.0' – 23.0'	R1	60"	58"	47"/60" 78%	GOOD		WHITE TO LIGHT GRAY MIGMATITE WITH GRAY BIOTITE-MUSCOVITE SCHIST LAYERS, VERY HARD (MIGMATITE) TO MODERATELY HARD (SCHIST), SLIGHTLY WEATHERED, FRACTURES @ 5 TO 25 DEGREES FROM HORIZONTAL ZONE OF CORE LOSS
23.0' – 28.0'	R2	60"	59"	39"/60" 65%	FAIR		WHITE TO LIGHT GRAY MIGMATITE WITH GRAY BIOTITE-MUSCOVITE SCHIST LAYERS, VERY HARD (MIGMATITE) TO MODERATELY HARD (SCHIST), SLIGHTLY WEATHERED, FRACTURES @ 0 TO 35 DEGREES FROM HORIZONTAL ZONE OF CORE LOSS
28.0'							BOTTOM OF EXPLORATION @ 28.0'

ROCK CORE LOG

S.W.COLE ENGINEERING, INC.

PROJECT:
CLIENT:

BORING NO.: B-17
PROJECT NO.: 04-1228

LOGGED BY: GWB DATE: 12/21/2004 SHEET NO.: 1 OF 1

CHECKED BY: GWB DATE: 1/13/2005 CORE SIZE: NQ2

DEPTH BELOW SURFACE (FT)	CORE RUN	CORE INTERVAL (IN)	CORE RECOVERY (IN)	RQD (%)	ROCK QUALITY	GRAPHIC LOG	ROCK DESCRIPTION AND IDENTIFICATION
10.0' – 15.0'	R1	60"	60"	27"/60" 45%	POOR		INTERBEDDED GRAY GRANITIC GNEISS AND SCHIST, HARD, SLIGHTLY WEATHERED, FRACTURES @ 5 TO 40 DEGREES FROM HORIZONTAL
15.0' – 20.0'	R2	60"	57"	39"/60" 65%	FAIR		INTERBEDDED GRAY GRANITIC GNEISS AND SCHIST, HARD, SLIGHTLY WEATHERED, FRACTURES @ 5 TO 35 DEGREES FROM HORIZONTAL. HIGHLY FRACTURED ZONE ZONE OF CORE LOSS
20.0'							BOTTOM OF EXPLORATION @ 20.0'

S. W. COLE ENGINEERING, INC.

AUGER PROBE LOG

PROJECT/CLIENT:
CLIENT:
LOCATION: OCEAN AVENUE, PORTLAND, MAINE
DRILLING FIRM: GREAT WORKS TEST BORING, INC.

PROJECT NUMBER 04-1228
AUGER PROBE SIZE O.D. SOLID STEM

BORING NO. P-1		BORING NO. P-2	
GROUND ELEV. 141 +/-		GROUND ELEV. 142 +/-	
DATE 12/15/2004		DATE 12/15/2004	
DEPTH (FT)	**STRATUM DESCRIPTION**	**DEPTH (FT)**	**STRATUM DESCRIPTION**
	FOREST DUFF / TOPSOIL OVERLYING BROWN SILTY SAND WITH ORGANICS AND COBBLES		FOREST DUFF / TOPSOIL OVERLYING BROWN SILTY SAND WITH ORGANICS AND COBBLES
2.4'	REFUSAL AT 2.4' (PROBABLE BEDROCK)	4.0'	PROBABLE WEATHERED BEDROCK
		9.0'	REFUSAL AT 9.0' (PROBABLE BEDROCK)

SOIL CLASSIFIED BY:

	DRILLER - VISUALLY
X	SOIL TECHNICIAN - VISUALLY
	LABORATORY TESTS

S. W. COLE ENGINEERING, INC.

AUGER PROBE LOG

PROJECT/CLIENT:
CLIENT:
LOCATION: OCEAN AVENUE, PORTLAND, MAINE
DRILLING FIRM: GREAT WORKS TEST BORING, INC.

PROJECT NUMBER 04-1228
AUGER PROBE SIZE O.D. SOLID STEM

BORING NO. **P-3**
GROUND ELEV. 134 +/-
DATE 12/15/2004

DEPTH (FT)	STRATUM DESCRIPTION
3.0'	FOREST DUFF / TOPSOIL OVERLYING BROWN SILTY SAND WITH ORGANICS AND COBBLES
	REFUSAL AT 3.0' (PROBABLE BEDROCK)

BORING NO. **P-4**
GROUND ELEV. 142 +/-
DATE 12/15/2004

DEPTH (FT)	STRATUM DESCRIPTION
3.0'	FOREST DUFF / TOPSOIL OVERLYING BROWN SILTY SAND WITH ORGANICS AND COBBLES
5.0'	PROBABLE WEATHERED BEDROCK
	REFUSAL AT 5.0' (PROBABLE BEDROCK)

SOIL CLASSIFIED BY:

	DRILLER - VISUALLY
X	SOIL TECHNICIAN - VISUALLY
	LABORATORY TESTS

S. W. COLE ENGINEERING, INC.

AUGER PROBE LOG

PROJECT/CLIENT:
CLIENT:
LOCATION: OCEAN AVENUE, PORTLAND, MAINE
DRILLING FIRM: GREAT WORKS TEST BORING, INC.

PROJECT NUMBER 04-1228
AUGER PROBE SIZE O.D. SOLID STEM

BORING NO. **P-5**
GROUND ELEV. 132 +/-
DATE 12/15/2004

DEPTH (FT)	STRATUM DESCRIPTION
2.7'	FOREST DUFF / TOPSOIL OVERLYING BROWN SILTY SAND WITH ORGANICS AND COBBLES
	REFUSAL AT 2.7' (PROBABLE BEDROCK)

BORING NO. **P-6**
GROUND ELEV. 139 +/-
DATE 12/15/2004

DEPTH (FT)	STRATUM DESCRIPTION
1.5'	FOREST DUFF / TOPSOIL OVERLYING BROWN SILTY SAND WITH ORGANICS AND COBBLES
2.0'	PROBABLE WEATHERED BEDROCK
	REFUSAL AT 2.0' (PROBABLE BEDROCK)

SOIL CLASSIFIED BY:

	DRILLER - VISUALLY
X	SOIL TECHNICIAN - VISUALLY
	LABORATORY TESTS

S. W. COLE ENGINEERING, INC.
AUGER PROBE LOG

PROJECT/CLIENT:
CLIENT:
LOCATION: OCEAN AVENUE, PORTLAND, MAINE
DRILLING FIRM: GREAT WORKS TEST BORING, INC.

PROJECT NUMBER 04-1228
AUGER PROBE SIZE O.D. SOLID STEM

BORING NO.	P-7
GROUND ELEV.	135 +/-
DATE	12/15/2004

DEPTH (FT)	STRATUM DESCRIPTION
	FOREST DUFF / TOPSOIL OVERLYING BROWN SILTY SAND WITH ORGANICS AND COBBLES
5.2'	
	REFUSAL AT 5.2' (PROBABLE BEDROCK)

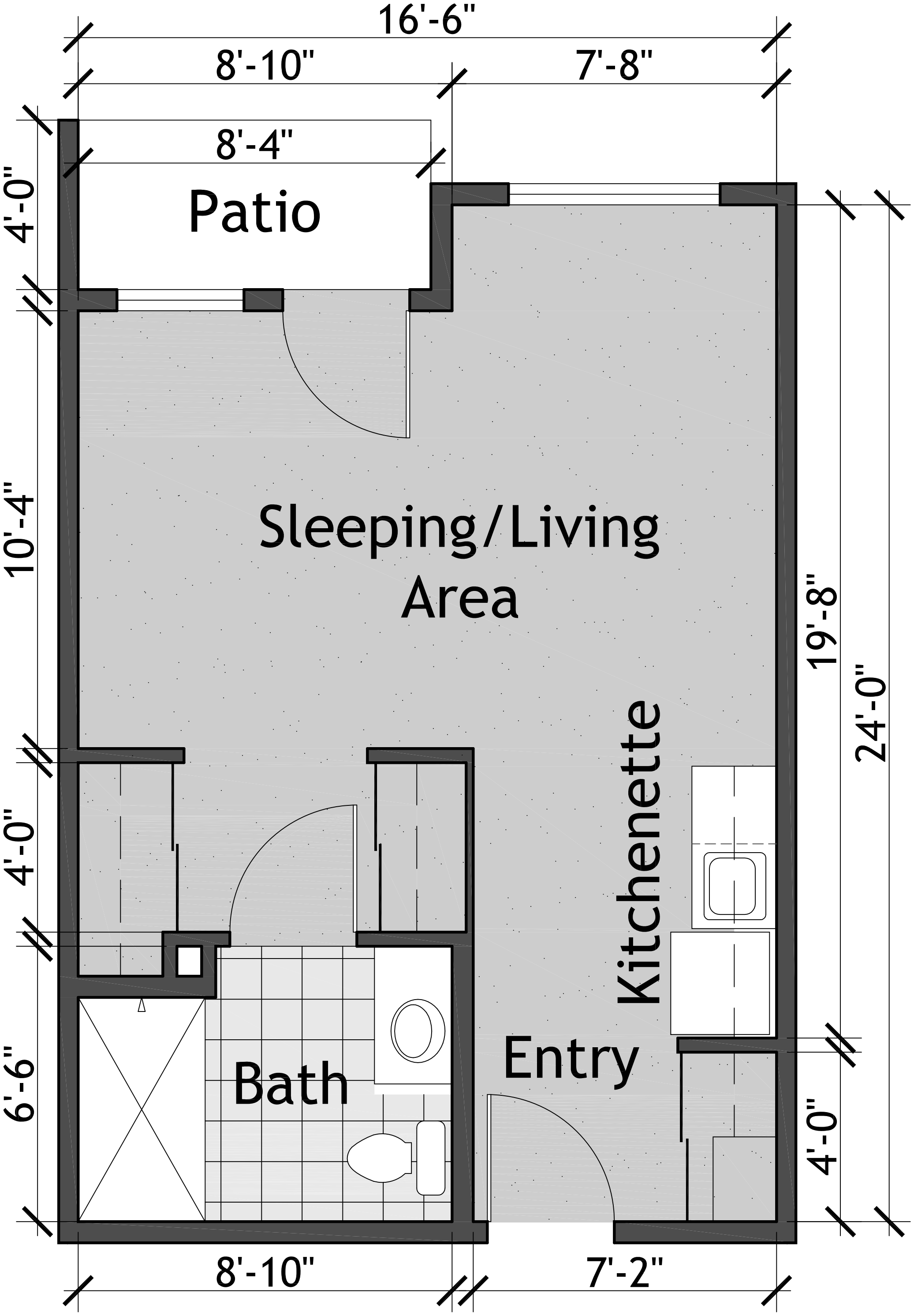
BORING NO.	P-8
GROUND ELEV.	142 +/-
DATE	12/15/2004

DEPTH (FT)	STRATUM DESCRIPTION
1.5'	FOREST DUFF / TOPSOIL OVERLYING BROWN SILTY SAND WITH ORGANICS AND COBBLES
	REFUSAL AT 1.5' (PROBABLE BEDROCK)

SOIL CLASSIFIED BY:

	DRILLER - VISUALLY
X	SOIL TECHNICIAN - VISUALLY
	LABORATORY TESTS

Section 21. Typical Unit Plans/Floor Plans

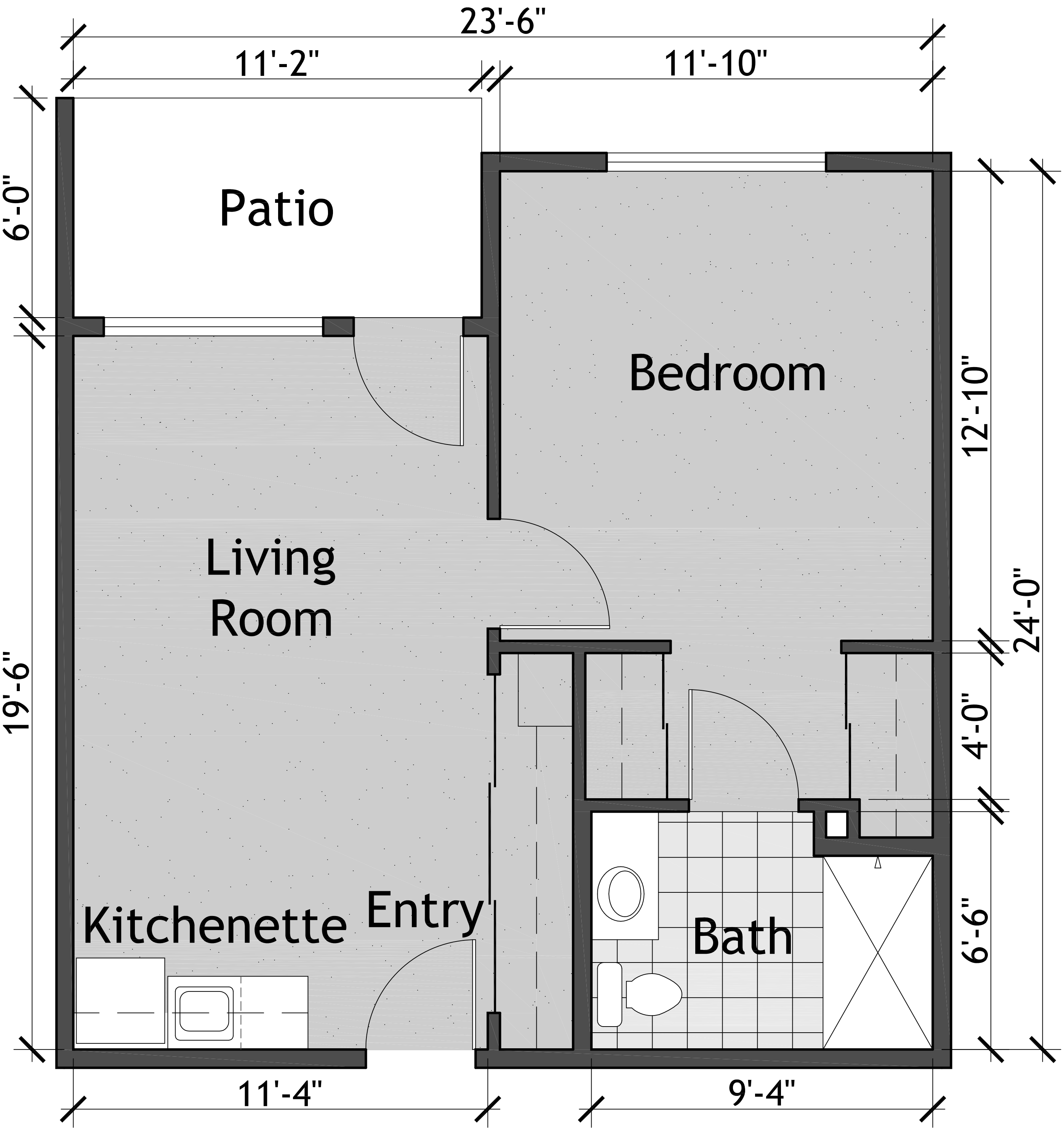


TYPICAL SUITE A

SCALE: 1/4" = 1'-0"

Portland Retirement Residence

Portland, ME

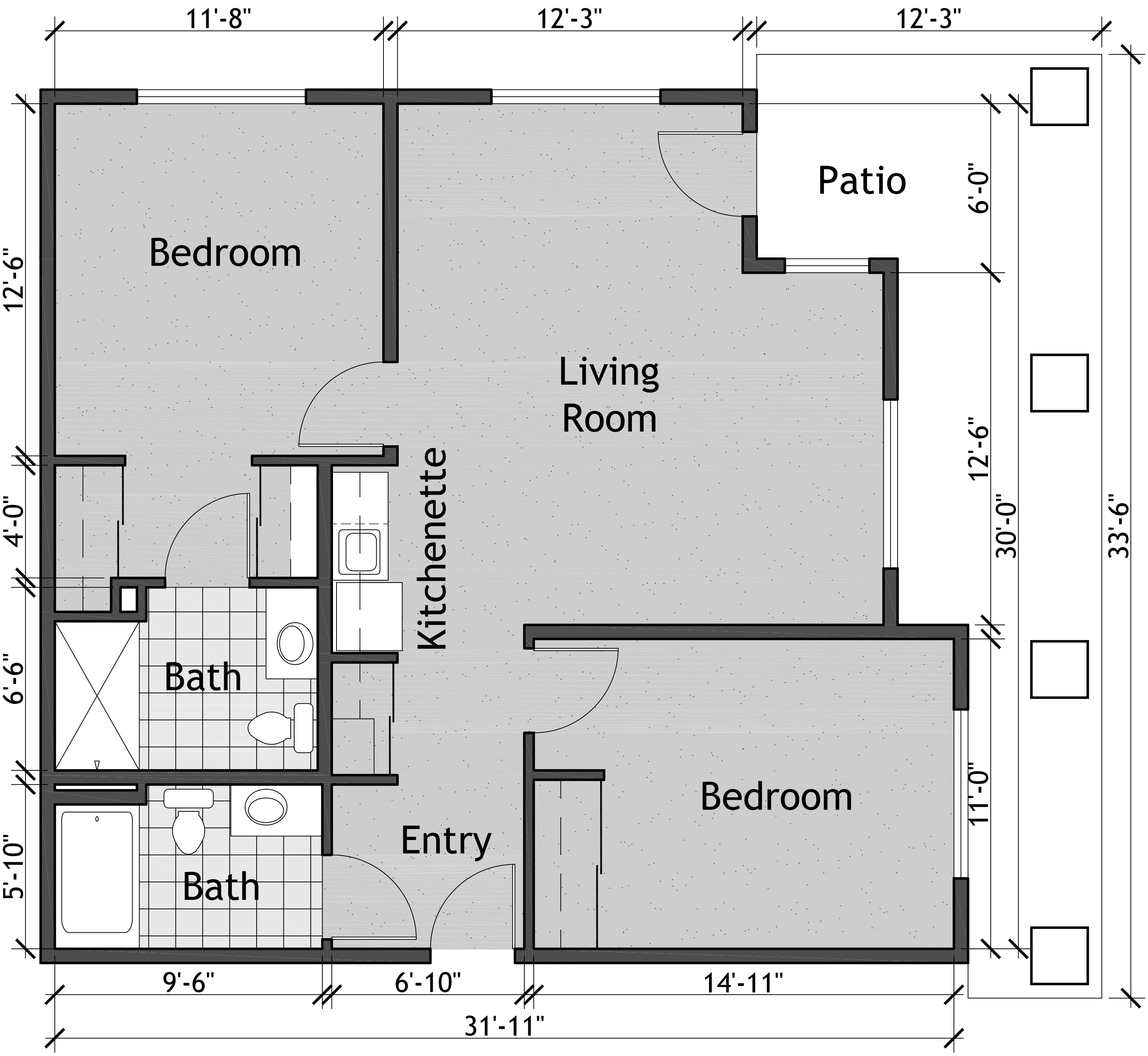


TYPICAL SUITE B

SCALE: 1/4" = 1'-0"

Portland Retirement Residence

Portland, ME

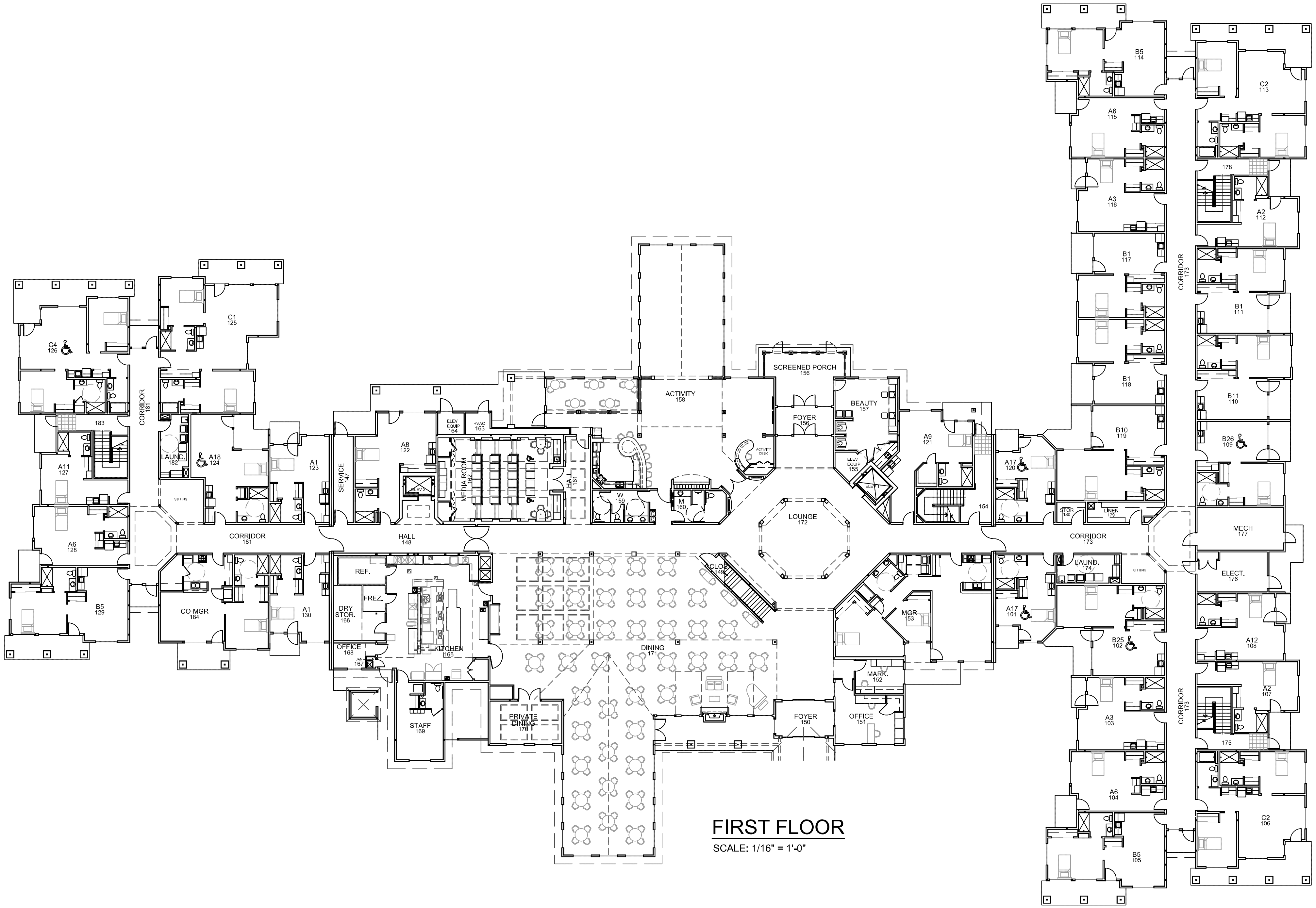


TYPICAL SUITE C

SCALE: 3/16" = 1'-0"

Portland Retirement Residence

Portland, ME

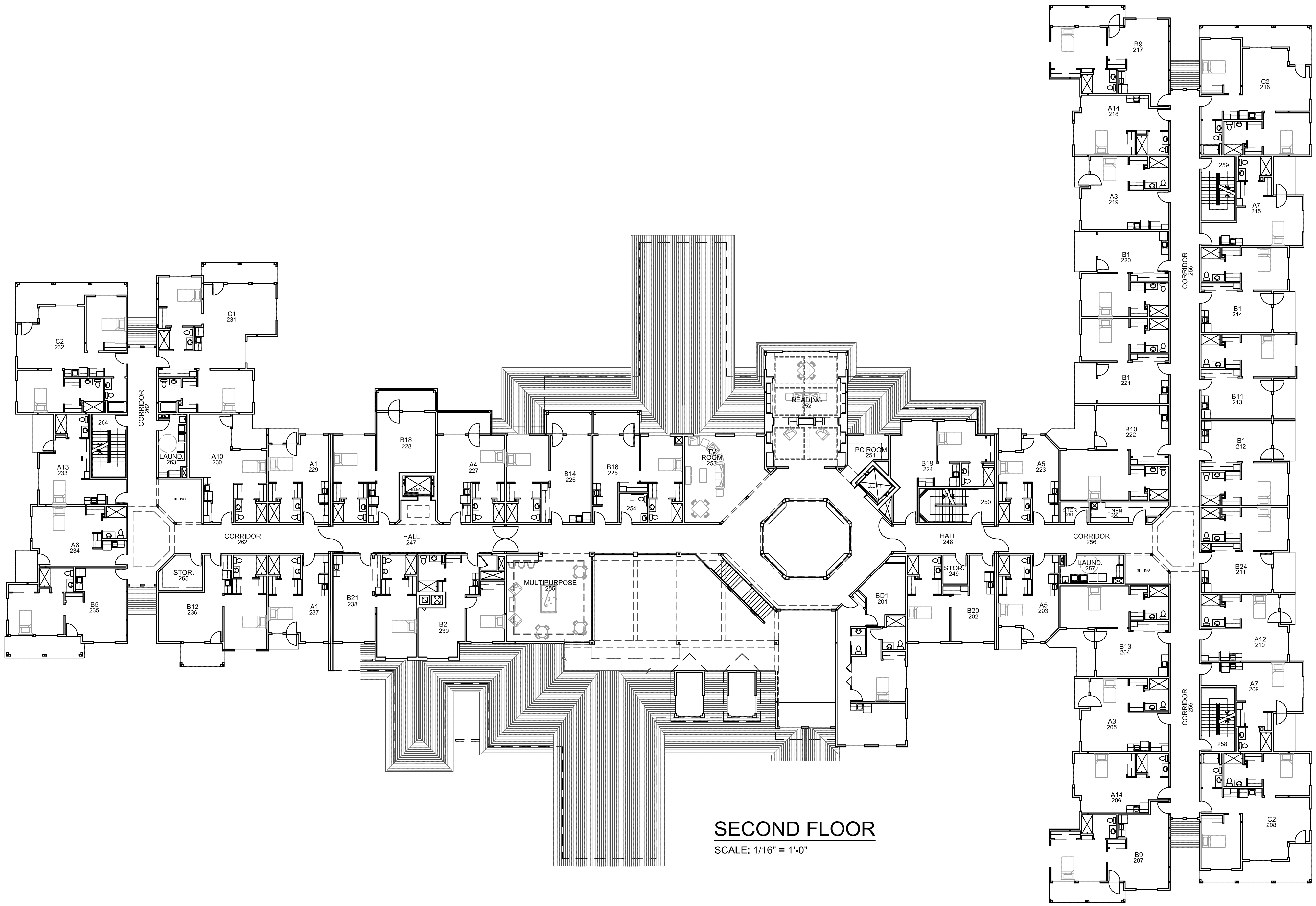


lenity architecture
3150 Kettle Court SE, Salem, Oregon 97301
P 503 399 1090 F 503 399 0565 W lenityarchitecture.com

Portland Retirement Residence

Portland, ME

HAWTHORN RETIREMENT GROUP
9310 NE Vancouver Mall Dr., Suite 200
Vancouver, WA 98662-8210
(360) 213-1550 Fax (360) 213-1540



SECOND FLOOR
SCALE: 1/16" = 1'-0"

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3150 Kettle Court SE, Salem, Oregon 97301
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Portland, ME

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9310 NE Vancouver Mall Dr., Suite 200
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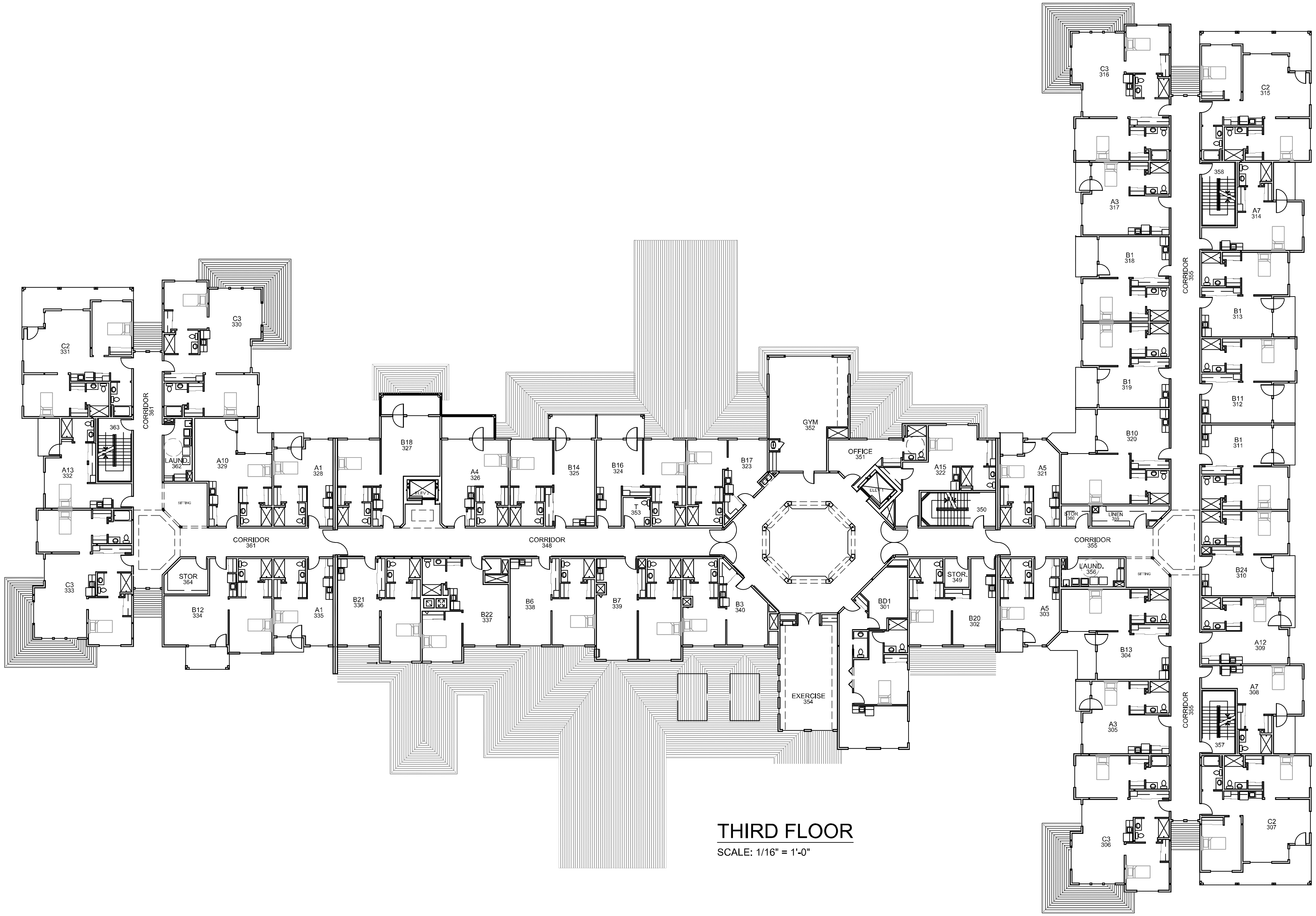
(360) 213-1550 Fax (360) 213-1540



THIRD FLOOR

SCALE: 1/16" = 1'-0"

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Portland, ME

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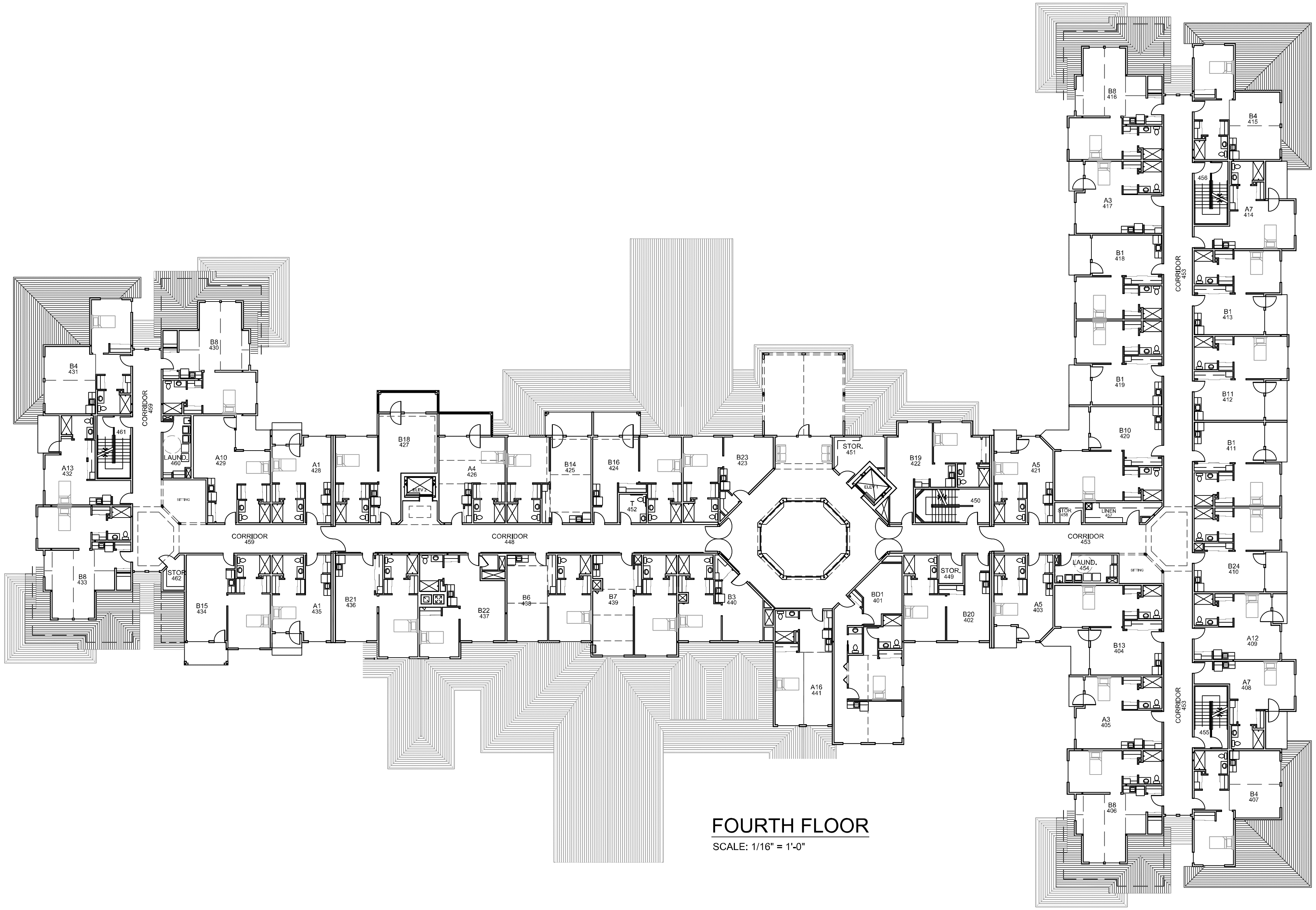

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3150 Kettle Court SE, Salem, Oregon 97301
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Portland Retirement Residence

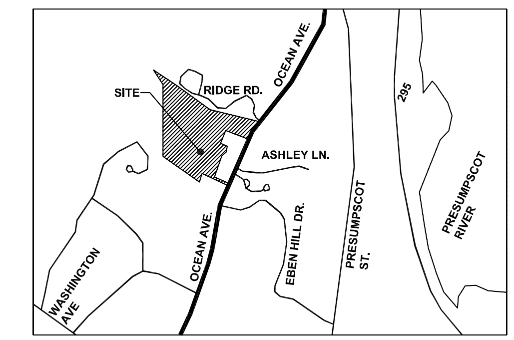
Portland, ME

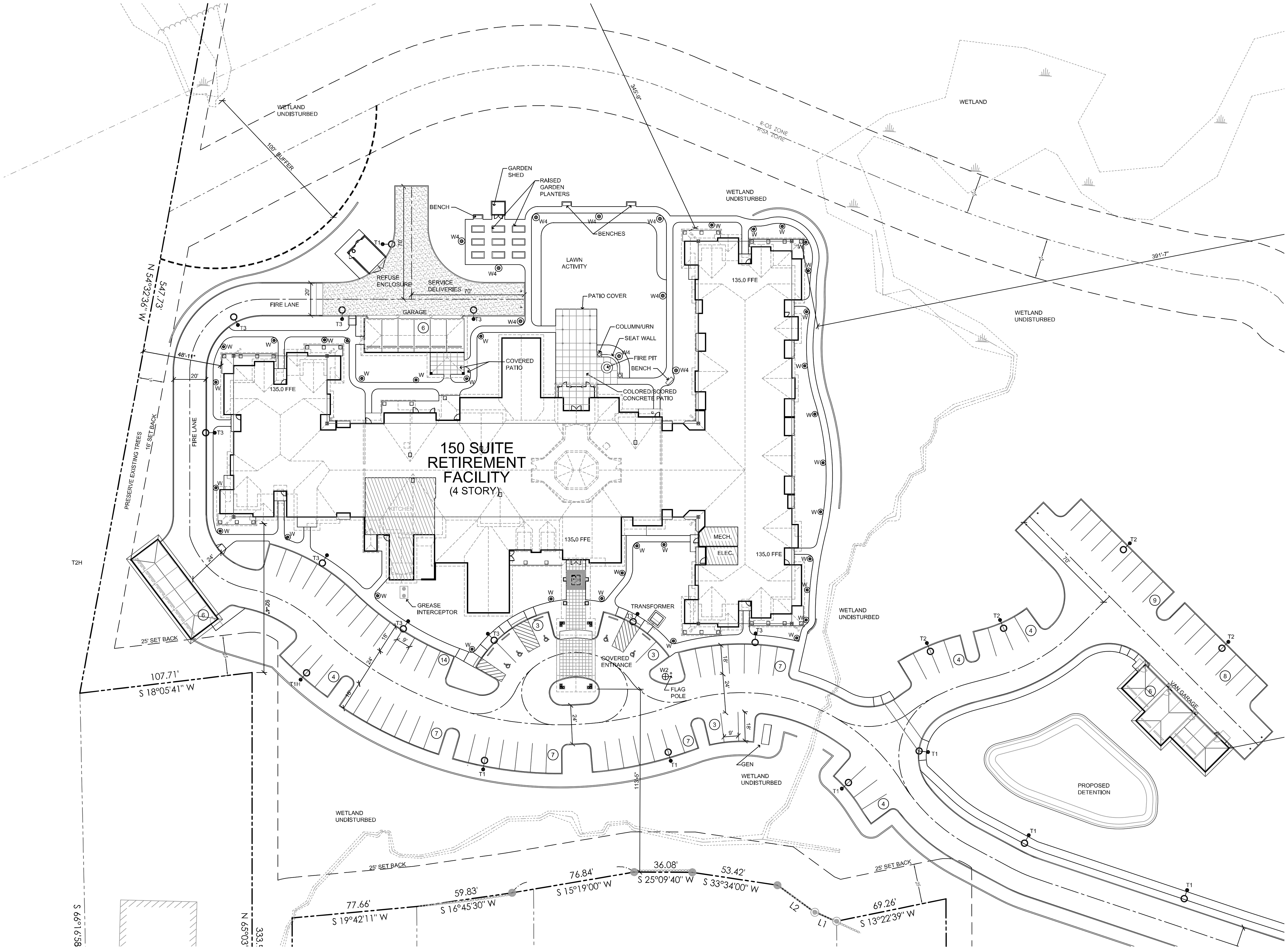
HAWTHORN RETIREMENT GROUP
9310 NE Vancouver Mall Dr., Suite 200
Vancouver, WA 98662-8210
(360) 213-1550 Fax (360) 213-1540

Section 22. Site Plan/Site Elevations/Color Board

Portland Vicinity Map

SCALE: N.T.S.





PROJECT STATISTICS:

PROJECT AREA:

TOTAL AREA 18.33 ACRES NET 798,363 SQ. FT.

TOTAL BUILDING COVERAGE:

AREA CALCULATIONS:

RETIREMENT BUILDING:	39,869 SQ. FT.	5.0%
GARAGES:		
ACCESSORY BUILDINGS:	128 SQ. FT.	0.1%

PERVIOUS / IMPERVIOUS AREA

IMPERVIOUS AREA: 15.9% PERVIOUS AREA: 84.1%

PARKING:

RETIREMENT PROJECT:
82 OPEN SPACES
18 COVERED SPACES
5 ACCESSIBLE SPACES
102 TOTAL SPACES

SITE PLAN

DATE: 28 Aug. 2015

SCALE: 1" = 30'-0"

0 15 30 60 90

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Portland Retirement Residence

Portland, Maine

HAWTHORN RETIREMENT GROUP
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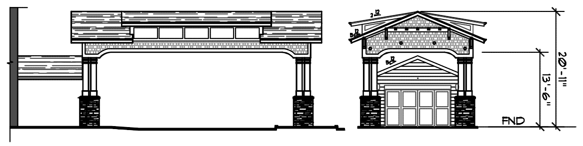
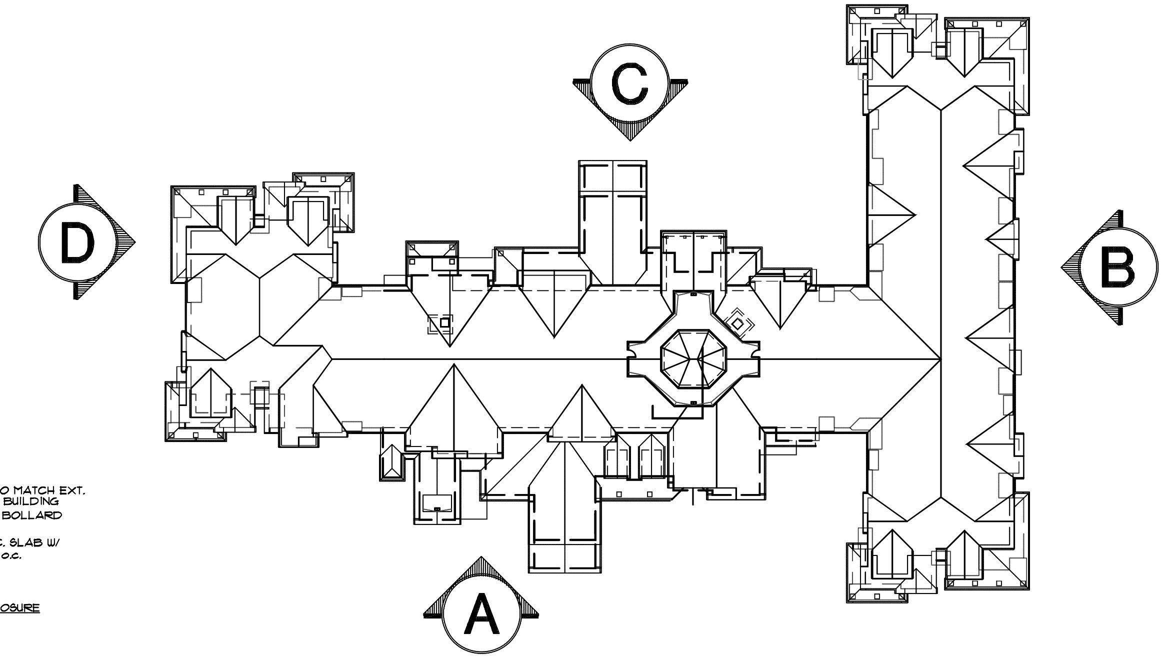
Vancouver, WA 98662-8210
(360) 213-1550 Fax (360) 213-1540

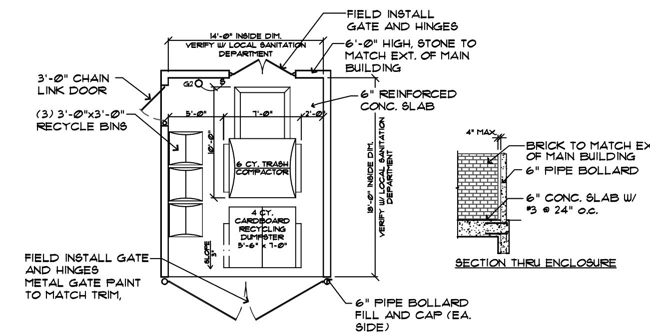


2 ENTRY CANOPY

3 VAN GARAGE



B WING B ELEVATION

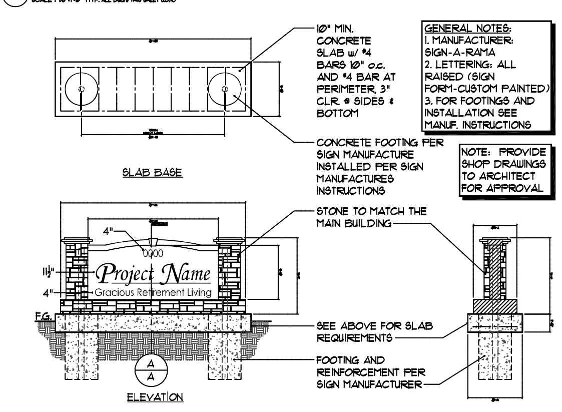


1 REFUSE ENCLOSURE

C REAR ELEVATION

D WING B ELEVATION

A FRONT ELEVATION



PROJECT SIGN

Exterior Elevations

DATE: 06-01-15

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Portland Retirement Residence

Portland, Maine

HAWTHORN RETIREMENT GROUP
9310 NE Vancouver Mall Dr., Suite 200
Vancouver, WA 98662-8210
(360) 213-1550 Fax (360) 213-1540

EXTERIOR MATERIALS:

Roof- GAF Timberline: Weathered Wood

Trim- James Hardie: Arctic White

Siding 1- James Hardie: Khaki Brown

Siding 2- James Hardie: Sandstone Beige

Shingles- James Hardie: Autumn Tan

Awnings- MS Metal: Antique Bronze

Stone- Coronado French Country Villa: Verona

AUTUMN TAN

SANDSTONE BEIGE

KHAKI BROWN

VERONA

WEATHERED WOOD

ANTIQUE BRONZE

Portland Retirement Residence

Portland, ME

lenity architecture
3150 Kettle Court SE, Salem, Oregon 97301
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HAWTHORN RETIREMENT GROUP
9310 NE Vancouver Mall Dr., Suite 200
Vancouver, WA 98662-8210
(360) 213-1550 Fax (360) 213-1540

Section 23. Site Construction Plans/Landscaping Plans

PORTLAND RETIREMENT RESIDENCE

802 OCEAN AVENUE
PORTLAND, ME

APPLICANT:

HAWTHORN RETIREMENT GROUP
9310 NE Vancouver Mall Dr., Suite 200
Vancouver, WA 98662-8210
(360) 213-1550 Fax (360) 213-1540

ENGINEER/SURVEYOR:

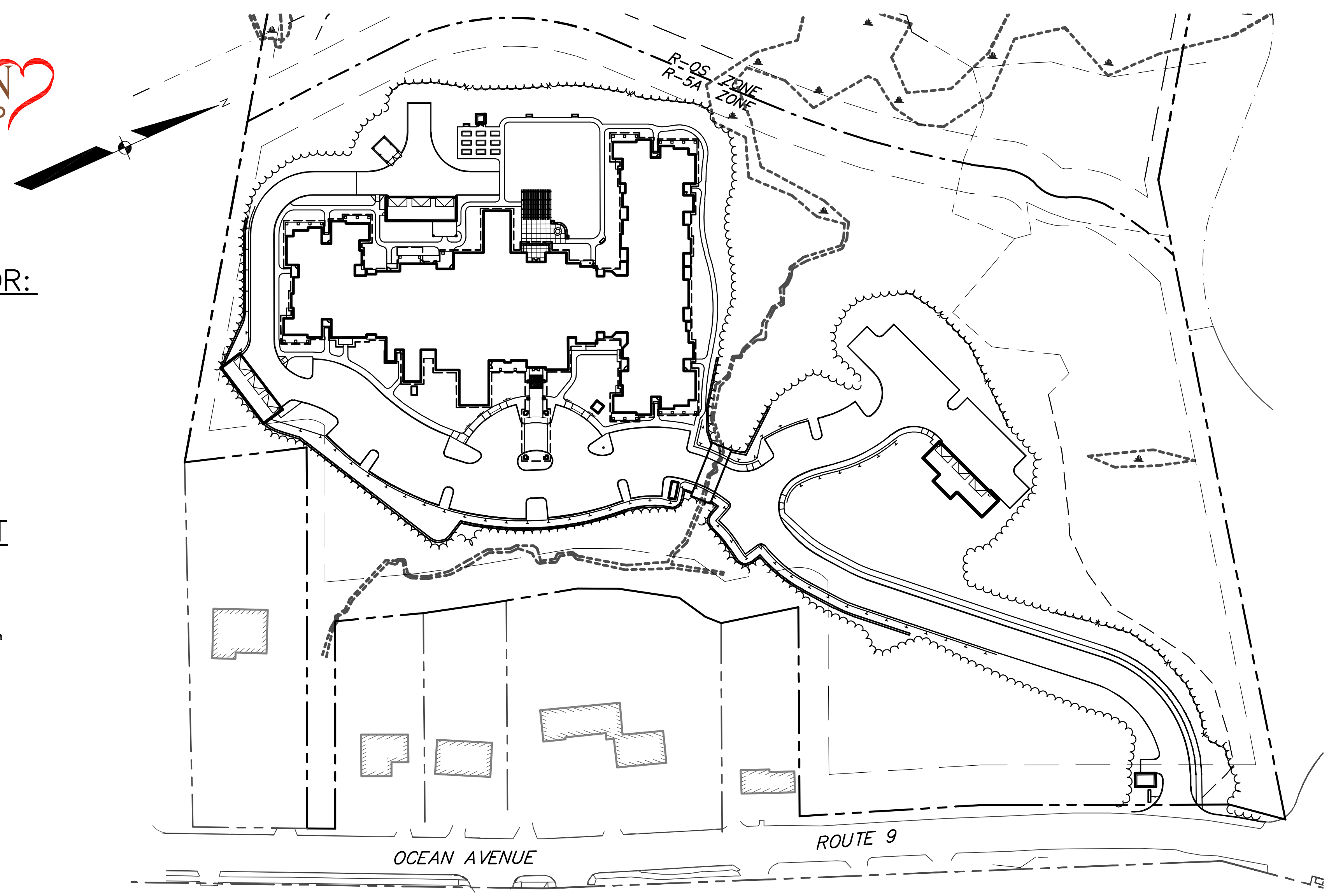
SEBAGO TECHNICS
WWW.SEBAGOTECHNICS.COM

75 John Roberts Rd.
Suite 1A
South Portland, ME 04106
Tel. 207-200-2100

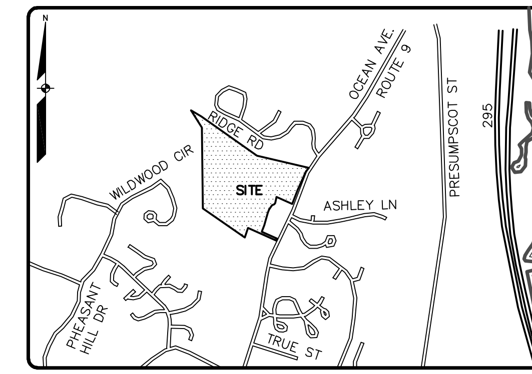
250 Goddard Rd.
Suite B
Lewiston, ME 04240
Tel. 207-783-5656

ARCHITECT/AGENT

lenity architecture
3150 Kettle Court SE, Salem, Oregon 97301
P 503 399 1090 F 503 399 0565 W lenityarchitecture.com



SCALE: 1" = 60'



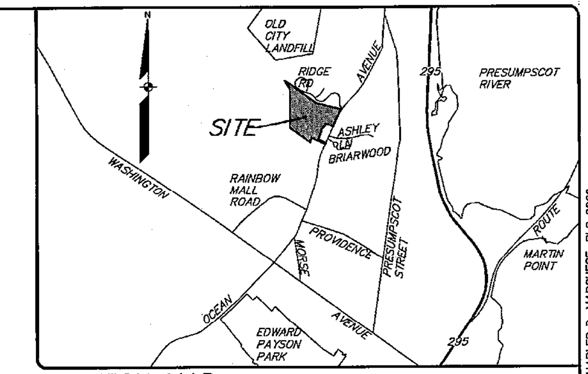
LOCATION MAP

NTS

SHEET INDEX

REVISED THROUGH 09-17-15

14432C.dwg, TAB:C



LOCATION MAP N.T.S.

GENERAL NOTES:

1. THE RECORD OWNER OF THE PARCEL IS GRAVES HILL LAND COMPANY, LLC BY DEED DATED JULY 1, 2004 AND RECORDED AT THE CUMBERLAND COUNTY REGISTRY OF DEEDS IN BOOK 21500, PAGE 269.
2. THE PROPERTY IS SHOWN AS LOTS A006, A007 AND A021 ON TAX MAP 416 AND LOT A007 ON TAX MAP 411 OF THE CITY OF PORTLAND TAX MAPS AND IS LOCATED IN THE BOTH THE R-5A RESIDENTIAL ZONE AND R-OS RECREATION AND OPEN SPACE ZONING DISTRICTS.
3. SPACE AND BULK CRITERIA FOR THE R5A AND ROS DISTRICTS ARE AS FOLLOWS:

	R5A	ROS
LOCUS AREA WITHIN ZONING DISTRICT:	10.171 ACRES	8.157 ACRES
MINIMUM LOT SIZE:	1,600 S.F. PER DWELLING UNIT	N/A
MINIMUM FRONTAGE:	50 FEET	N/A
MAXIMUM LOT COVERAGE:	30%	25%
MINIMUM LOT WIDTH:	60 FEET	N/A
MINIMUM RECREATION OPEN SPACE:	200 S.F. PER DWELLING UNIT	N/A
MINIMUM FRONT YARD:	35 FEET	25 FEET
MINIMUM SIDE YARD:	16 FEET	12 FEET
MINIMUM REAR YARD:	25 FEET	25 FEET
MAXIMUM BUILDING HEIGHT:	55 FEET	N/A

* SEE BUILDING LENGTH GREATER THAN 100'.

4. TOTAL AREA OF PARCEL IS APPROXIMATELY 798,387.448 SQUARE FEET OR 18.328 ACRES.
5. BOUNDARY AND TOPOGRAPHIC INFORMATION SHOWN HEREON IS BASED UPON FIELD WORK PERFORMED BY SEBAGO TECHNICS, INC. IN DECEMBER 2014 AND JANUARY 2015.
6. PLAN REFERENCES:

   A. "PLAN SHOWING A BOUNDARY SURVEY AND TOPOGRAPHIC SURVEY MADE FOR DIANE DOYLE, (MAILING ADDRESS: 16 TIFFANY LANE, SACO, ME 04072) PARCEL LOCATED AT OCEAN AVENUE, PORTLAND, MAINE" DATED JULY 8, 2002 AND REVISED THROUGH FEBRUARY 11, 2005 BY DOW & COULOMBE, INC, SHEETS 1 & 2 OF 2. THIS PLAN IS RECORDED AT THE CUMBERLAND COUNTY REGISTRY OF DEEDS IN PLAN BOOK 204, PAGE 293 & PAGE 294.

   B. "ASBUILT SURVEY PLAN OF OCEAN RIDGE CONDOMINIUMS, 852 OCEAN AVENUE, PORTLAND, MAINE FOR RECORD OWNER OCEAN RIDGE REALTY, LLC, 91 OLD OCEAN HOUSE ROAD, CAPE ELIZABETH, MAINE 04107" DATED NOVEMBER 29, 2005 BY SEBAGO TECHNICS, INC., PROJECT NO. 84180.

   C. "BOUNDARY SURVEY & LOT DIVISION 752 OCEAN AVENUE, PORTLAND, MAINE MADE FOR DONALD ANSPACH, 752 OCEAN AVENUE, PORTLAND, MAINE" DATED MAY 25, 2004 AND REVISED THROUGH JUNE 18, 2008 BY TITCOMB ASSOCIATES, JOB NO. 87114.1.

   D. "STANDARD BOUNDARY SURVEY PLAN OF PROPERTY OCEAN AVENUE, PORTLAND, MAINE MADE FOR THE FINCH GROUP, 160 FEDERAL STREET, BOSTON, MA." DATED JULY 30, 1992 BY TITCOMB ASSOCIATES, JOB NO. 87114M.

   E. "OCEAN AVENUE STORM DRAIN AND SANITARY SEWER EXTENSION OF OCEAN RIDGE CONDOMINIUMS, 852 OCEAN AVENUE, PORTLAND, MAINE FOR OCEAN RIDGE REALTY, LLC, 91 OCEAN HOUSE ROAD, CAPE ELIZABETH, MAINE 04107" DATED APRIL 3, 2001 AND REVISED THROUGH DECEMBER 3, 2002 BY SEBAGO TECHNICS, INC., PROJECT NO. 84180, SHEETS 15 & 16 OF 18 SHEETS.

   F. "OCEAN AVENUE RECONSTRUCTION PHASE 3 AND PHASE 4, PLAN AND PROFILE STA. 122+00 TO STA. 127+50" DATED AUGUST 31, 2007 BY CITY OF PORTLAND, MAINE DEPARTMENT OF PUBLIC WORKS ENGINEERING SECTION, PROJECT NO. C04517, SHEETS 6 & 7 OF 23 SHEETS

   G. "AMENDED SUBDIVISION PLAN OF OCEAN RIDGE CONDOMINIUMS, 852 OCEAN AVENUE, PORTLAND, MAINE FOR RECORD OWNER OCEAN RIDGE REALTY, LLC, 91 OLD OCEAN HOUSE ROAD, CAPE ELIZABETH, MAINE 04107" DATED MARCH 6, 2001 AND REVISED THROUGH MARCH 13, 2003 BY SEBAGO TECHNICS, INC. THIS PLAN IS RECORDED AT THE CUMBERLAND COUNTY REGISTRY OF DEEDS IN PLAN BOOK 203, PAGE 264 AND SUPERCEDES A PLAN RECORDED IN PLAN BOOK 202, PAGE 725.

7. PLAN ORIENTATION IS GRID NORTH, MAINE STATE PLANE COORDINATE SYSTEM, WEST ZONE 1802-NAD83, ELEVATIONS DEPICTED HEREON WERE OBSERVED IN NAVD88, BASED ON DUAL FREQUENCY GPS OBSERVATIONS. ELEVATIONS HAVE BEEN CONVERTED TO NGVD29 UTILIZING THE U.S.ARMY CORPS OF ENGINEERS CORPSCON 6.0.1 SOFTWARE. THE CONVERSION IN THIS VICINITY IS 0.70 FEET HIGHER THAN NAVD88. ELEVATIONS ARE TIED TO THE CITY OF PORTLAND, MAINE VERTICAL DATUM.
8. UTILITY INFORMATION DEPICTED HEREON IS COMPILED USING PHYSICAL EVIDENCE LOCATED IN THE FIELD. UTILITIES DEPICTED HEREON MAY NOT NECESSARILY REPRESENT ALL EXISTING UTILITIES. CONTRACTORS AND/OR DESIGNERS NEED TO CONTACT DIG-SAFE SYSTEMS, INC. (1-888-DIG-SAFE) AND FIELD VERIFY EXISTING UTILITIES PRIOR TO CONSTRUCTION AND/OR EXCAVATION.
9. THE LOCUS PROPERTY AS DEPICTED HEREON DOES NOT FALL WITHIN A SPECIAL FLOOD HAZARD AREA AS DELINEATED ON THE FLOOD INSURANCE RATE MAP FOR THE CITY OF PORTLAND, MAINE, CUMBERLAND COUNTY, COMMUNITY-PANEL NUMBER 230051 0007 C, HAVING AN EFFECTIVE DATE OF DECEMBER 8, 1998. THE LOCUS FALLS WITHIN AN AREA IDENTIFIED AS AN UNSHADED ZONE X, AREAS DETERMINED TO BE OUTSIDE THE 500-YEAR FLOODPLAIN.
10. A WETLAND DELINEATION WAS PERFORMED ON THIS PROJECT SITE IN NOVEMBER 2001 AND REVIEWED IN APRIL 2014 BY GARY M. FULLERTON, CERTIFIED SOIL SCIENTIST OF SEBAGO TECHNICS, INC. THIS DELINEATION CONFORMS TO THE STANDARDS AND METHODS OUTLINED IN THE 1987 WETLANDS DELINEATION MANUAL AND REGIONAL SUPPLEMENT AUTHORED AND PUBLISHED BY THE U.S. ARMY CORPS OF ENGINEERS. WETLAND FLAGS WITHIN THE PROPOSED DEVELOPMENT AREAS WERE LOCATED BY GROUND SURVEY. WETLAND FLAGS OUTSIDE OF THE PROPOSED DEVELOPMENT AREA WERE LOCATED USING GLOBAL POSITIONING SYSTEMS (GPS) TECHNOLOGY. ALL GPS LOCATED POINTS HAVE A VARYING DEGREE OF ACCURACY AND MAY NOT REPRESENT THE ACTUAL FIELD LOCATION.
11. WITH REFERENCE TO ITEM 18 OF THE ALTA TABLE A, THE AREA ADJOINING THE NORTHERLY AND WESTERLY SIDELINES OF LAND OF CAIAZZO IS CLUTTERED WITH CONSTRUCTION AND RESIDENTIAL DEBRIS, TWO OLD VEHICLES AND ASSORTED HOUSEHOLD LITTER.

    THE AREA IN THE VICINITY OF THE USGS CONTROL DISKS IS ALSO BEING USED AS A DUMP SITE FOR LAWN DEBRIS BY THE ADJOINING CONDOMINIUM PROJECT.
12. EXISTING FOOTPATHS/TRAILS ARE AS DEPICTED HEREON, THEY ARE TYPICALLY ±2 FEET WIDE.

PROPERTY LINE TABLE

LINE	DIRECTION	DISTANCE
L1	S 47°12'40" W	14.62'
L2	S 60°52'00" W	28.66'

GRAPHIC SCALE
0 10 20 50 100
(IN FEET)
1 INCH = 50 FT.

SURVEYOR'S STATEMENT

THIS SURVEY WAS PERFORMED UNDER MY DIRECT SUPERVISION AND TO THE BEST OF MY KNOWLEDGE AND BELIEF, IT WAS DONE IN ACCORDANCE WITH CHAPTER 90, PART 1 (PROFESSIONAL STANDARDS OF PRACTICE) AND PART 2 (TECHNICAL STANDARDS OF PRACTICE) OF THE MAINE BOARD OF LICENSURE FOR PROFESSIONAL LAND SURVEYORS.

CHARLES D. MARCHESE, MAINE PLS 2009
SEPTEMBER 18, 2015

SURVEYOR'S CERTIFICATION

TO HAWTHORN DEVELOPMENT, LLC OR ITS ASSIGNEE AND FIDELITY NATIONAL TITLE INSURANCE COMPANY:
FILE NO. 14030089 (REV. 1-12-15)

THIS IS TO CERTIFY THAT THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE 2011 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/ACSM LAND TITLE SURVEYS, JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS, AND INCLUDE ITEMS 1,2,3,4,5,6a,6b,8,11a,11b,13,14,16,17,18,19,20a AND 21 OF TABLE A THEREOF. THE FIELD WORK WAS COMPLETED ON JANUARY 7, 2015.

DATE: SEPTEMBER 18, 2015

CHARLES D. MARCHESE, MAINE PLS 2009
SEBAGO TECHNICS, INC.

CHARLES D. MARCHESE, PLS 2009

STATE OF MAINE · CHARLES D. MARCHESE · No. 2009 · PROFESSIONAL LAND SURVEYOR

DESIGNED	CHECKED
-	CDM

REV:	BY:	DATE:	STATUS:
F	RAM	9-18-15	PLAN SUBMISSION TO CITY OF PORTLAND
E	CDM	5-04-15	ADDED FOOTPATHS/TRAILS & CORRESPONDING NOTE 12
D	CDM	2-26-15	REVISED UTILITIES IN OCEAN AVENUE
C	CDM	1-23-15	REVISED BORINGS/PROBES
B	CDM	1-23-15	PLAN REVISED TO REFLECT TITLE COMMITMENT 14030089 REVISED 1-12-15
A	CDM	1-07-15	ISSUED TO CLIENT FOR REVIEW

THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION FROM SEBAGO TECHNICS, INC. ANY ALTERATIONS, AUTHORIZED OR OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO SEBAGO TECHNICS, INC.

SEBAGO TECHNICS
WWW.SEBAGOTECHNICS.COM
75 John Roberts Rd. Suite 1A South Portland, ME 04106 Tel. 207-200-2100
250 Goddard Rd. Suite B Lewiston, ME 04240 Tel. 207-783-5656

ALTA-ACSM LAND TITLE SURVEY

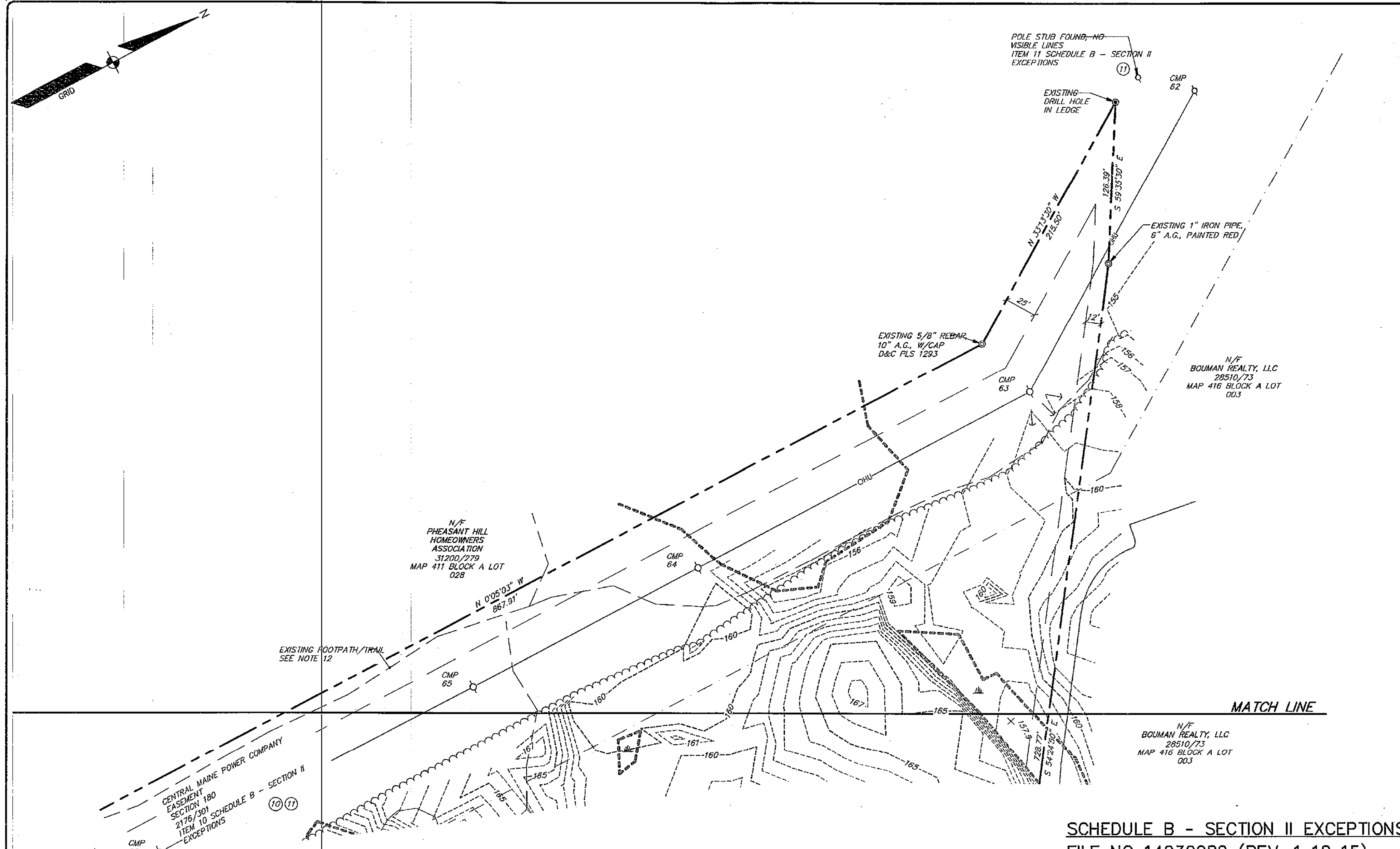
OF LAND OWNED BY:
GRAVES HILL LAND COMPANY, LLC
802-838 OCEAN AVENUE
PORTLAND, MAINE 04103
PREPARED FOR:
HAWTHORN DEVELOPMENT, LLC
9310 NE VANCOUVER MALL DRIVE, SUITE 200
VANCOUVER, WASHINGTON 98662-8210

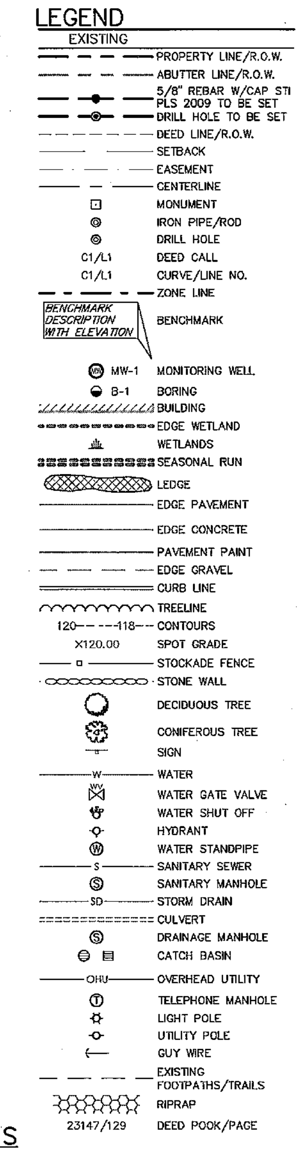
RECORD OWNER: SEE NOTE 1.

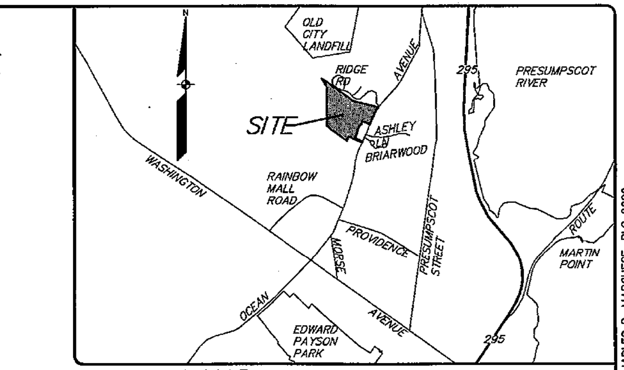
PROJECT NO.	SCALE
14432	1" = 50'

SHEET 2 OF 14

14432EC.dwg, TAB:14432LTS1







LOCATION MAP N.T.S.

LEGAL DESCRIPTION

A CERTAIN LOT OR PARCEL OF LAND LOCATED ON THE WESTERLY SIDELINE OF OCEAN AVENUE, STATE HIGHWAY 9, IN THE CITY OF PORTLAND, COUNTY OF CUMBERLAND, STATE OF MAINE, SAID LOT OR PARCEL OF LAND BEING MORE PARTICULARLY BOUNDED AND DESCRIBED AS FOLLOWS:

BEGINNING AT AN EXISTING 5/8" REBAR, 8" BELOW GRADE ON THE APPARENT WESTERLY SIDELINE OF OCEAN AVENUE AT LAND NOW OR FORMERLY OF WILLIAM H. CARR, JR. AND LINDA R. CARR, AS DESCRIBED IN A DEED RECORDED AT THE CUMBERLAND COUNTY REGISTRY OF DEEDS (CCRD) IN BOOK 19165, PAGE 114;

THENCE N 65°03'23" W, ALONG LAND OF SAID CARR, A DISTANCE OF 333.97 FEET TO AN EXISTING BLAZED 12" RED OAK TREE;

THENCE S 18°05'41" W, ALONG LAND NOW OR FORMERLY OF CARR, A DISTANCE OF 107.71 FEET TO AN EXISTING 5/8" REBAR, 6" ABOVE GRADE WITH CAP INSCRIBED TITCOMB ASSOCIATES, PLS 2271 AT LAND NOW OR FORMERLY OF JACOB PAUL STAUB AND SONIA MARIA BARANTES AS DESCRIBED IN A DEED RECORDED AT THE CUMBERLAND COUNTY REGISTRY OF DEEDS IN BOOK 29398, PAGE 231;

THENCE N 54°32'36" W ALONG LAND NOW OR FORMERLY OF STAUB AND BARANTES, A DISTANCE OF 547.73 FEET TO AN EXISTING DRILL HOLE IN LEDGE AT LAND NOW OR FORMERLY OF TERENCE B. GOODWIN AND BARBARA R. GOODWIN, TRUSTEES AS DESCRIBED IN A DEED RECORDED AT THE CUMBERLAND COUNTY REGISTRY OF DEEDS IN BOOK 20005, PAGE 118;

THENCE N 00°05'03" W, ALONG LAND NOW OR FORMERLY OF GOODWIN AND LAND NOW OR FORMERLY OF PHEASANT HILL HOMEOWNERS ASSOCIATION AS DESCRIBED IN A DEED RECORDED AT THE CUMBERLAND COUNTY REGISTRY OF DEEDS IN BOOK 31200, PAGE 279, A DISTANCE OF 867.91 FEET TO AN EXISTING 5/8" REBAR, 10" ABOVE GRADE WITH CAP INSCRIBED DOW & COULOMBE, PLS 1293;

THENCE N 33°13'30" W, ALONG LAND NOW OR FORMERLY OF PHEASANT HILL HOMEOWNERS ASSOCIATION, A DISTANCE OF 215.50 FEET TO AN EXISTING DRILL HOLE IN LEDGE AT LAND NOW OR FORMERLY OF BOUMAN REALTY, LLC AS DESCRIBED IN A DEED RECORDED AT THE CUMBERLAND COUNTY REGISTRY OF DEEDS IN BOOK 28510, PAGE 73;

THENCE S 59°35'30" E, ALONG LAND NOW OR FORMERLY OF BOUMAN REALTY, LLC, A DISTANCE OF 126.39 FEET TO AN EXISTING 1" IRON PIPE, 6" ABOVE GRADE, PAINTED RED;

THENCE S 54°24'50" E, ALONG LAND NOW OR FORMERLY OF BOUMAN REALTY, LLC, A DISTANCE OF 728.77 FEET TO AN EXISTING 1.25" IRON PIPE, 14" ABOVE GRADE IN STONES, TIPPED NORTHWESTERLY;

THENCE S 76°12'23" E, ALONG LAND NOW OR FORMERLY OF BOUMAN REALTY, LLC, A DISTANCE OF 571.55 FEET TO A 5/8" REBAR WITH CAP INSCRIBED "STI PLS 2009" TO BE SET ON THE WESTERLY SIDELINE OF OCEAN AVENUE;

THENCE S 39°50'03" W, ALONG THE WESTERLY SIDELINE OF OCEAN AVENUE, A DISTANCE OF 50.78 FEET TO AN EXISTING 5/8" REBAR, 12" ABOVE GRADE, WITH CAP INSCRIBED DOW & COULOMBE, PLS 1293;

THENCE S 24°55'08" W, ALONG THE WESTERLY SIDELINE OF OCEAN AVENUE, A DISTANCE OF 216.07 FEET TO A 5/8" REBAR WITH CAP INSCRIBED "STI PLS 2009" TO BE SET;

THENCE S 21°29'19" W, ALONG THE WESTERLY SIDELINE OF OCEAN AVENUE, A DISTANCE OF 160.65 FEET TO AN EXISTING EXISTING 5/8" REBAR, 12" ABOVE GRADE WITH CAP INSCRIBED DOW & COULOMBE, PLS 1293 AT LAND NOW OR FORMERLY OF SHIRLEY A. CAIAZZO AND TIMOTHY W. CAIAZZO AS DESCRIBED IN A DEED RECORDED AT THE CUMBERLAND COUNTY REGISTRY OF DEEDS IN BOOK 4552, PAGE 113;

THENCE N 65°19'11" W, ALONG LAND NOW OR FORMERLY ALONG LAND NOW OR FORMERLY OF CAIAZZO, A DISTANCE OF 183.15 FEET TO AN EXISTING 1" IRON PIPE, 4" ABOVE GRADE , PAINTED RED;

THENCE S 13°22'39" W, ALONG LAND NOW OR FORMERLY OF CAIAZZO, A DISTANCE OF 69.26 FEET TO A DRILL HOLE TO BE SET IN REMAINS OF A STONE WALL AT LAND NOW OR FORMERLY OF RICHARD M. PERKINS AND MARY H. PERKINS AS DESCRIBED IN A DEED RECORDED AT THE CUMBERLAND COUNTY REGISTRY OF DEEDS IN BOOK 26172, PAGE 343;

THENCE S 47°12'40" W, ALONG LAND NOW OR FORMERLY OF PERKINS AND THE REMAINS OF A STONE WALL, A DISTANCE OF 14.62 FEET TO A DRILL HOLE TO BE SET;

THENCE S 60°52'00" W, ALONG LAND NOW OR FORMERLY PERKINS AND THE REMAINS OF A STONE WALL, A DISTANCE OF 28.66 FEET TO A 5/8" REBAR WITH CAP INSCRIBED "STI PLS 2009" TO BE SET;

LEGAL DESCRIPTION CONTINUED

THENCE S 33°34'00" W, ALONG LAND NOW OR FORMERLY OF PERKINS, A DISTANCE OF 53.42 FEET TO A 5/8" REBAR WITH CAP INSCRIBED "STI PLS 2009" TO BE SET;

THENCE S 25°09'40" W, ALONG LAND NOW OR FORMERLY OF PERKINS AND THE REMAINS OF A STONE WALL, A DISTANCE OF 36.08 FEET TO A 5/8" REBAR WITH CAP INSCRIBED "STI PLS 2009" TO BE SET;

THENCE S 15°19'00" W, ALONG LAND NOW OR FORMERLY OF PERKINS AND LAND NOW OR FORMERLY OF TAI XUAN HUYNH AND TRUC MI THI NGUYEN AS DESCRIBED IN A DEED RECORDED AT THE CUMBERLAND COUNTY REGISTRY OF DEEDS IN BOOK 28600, PAGE 63, A DISTANCE OF 76.84 FEET TO A 5/8" REBAR WITH CAP INSCRIBED "STI PLS 2009" TO BE SET, FROM WHICH AN EXISTING 5/8" REBAR, 12" ABOVE GRADE BEARS N 16°17'41" E, A DISTANCE OF 13.46 FEET;

THENCE S 16°45'30" W, ALONG LAND OF HUYNH AND NGUYEN AND THE REMAINS OF A STONE WALL, A DISTANCE OF 59.83 FEET TO A 5/8" REBAR WITH CAP INSCRIBED "STI PLS 2009" TO BE SET AT LAND NOW OR FORMERLY OF HEATHER A. LIEBL AS DESCRIBED IN A DEED RECORDED AT THE CUMBERLAND COUNTY REGISTRY OF DEEDS IN BOOK 24446, PAGE 17;

THENCE S 19°42'111" W, ALONG LAND NOW OR FORMERLY OF LIEBL, A DISTANCE OF 77.66 FEET TO AN EXISTING 5/8" REBAR, 18" ABOVE GRADE IN A SEASONAL RUN;

THENCE S 65°03'46" E, ALONG LAND NOW OR FORMERLY OF LIEBL, A DISTANCE OF 181.79 FEET TO A 5/8" REBAR WITH CAP INSCRIBED "STI PLS 2009" TO BE SET ON THE WESTERLY SIDELINE OF OCEAN AVENUE;

THENCE S 25°34'21" W, ALONG THE WESTERLY SIDELINE OF OCEAN AVENUE, A DISTANCE OF 24.82 FEET TO THE POINT OF BEGINNING.

BEARINGS HEREIN ARE BASED ON GRID NORTH, MAINE STATE PLANE COORDINATE SYSTEM, WEST ZONE 1802 - NAD83.

THE HEREIN DESCRIBED LOT OR PARCEL OF LAND CONTAINS APPROXIMATELY 798,387.448 SQUARE FEET OR 18.328 ACRES.

THE HEREIN DESCRIBED LOT OR PARCEL OF LAND IS SUBJECT TO AN EASEMENT AS DEPICTED HEREON GRANTED TO CENTRAL MAINE POWER COMPANY AS DESCRIBED IN A DEED RECORDED AT THE CUMBERLAND COUNTY REGISTRY OF DEEDS IN BOOK 2176, PAGE 301.

THE HEREIN DESCRIBED LOT OR PARCEL OF LAND IS BENEFITED BY AN EASEMENT AS DEPICTED HEREON AND DESCRIBED IN A DEED RECORDED AT THE CUMBERLAND COUNTY REGISTRY OF DEEDS IN BOOK 25281, PAGE 148.

THE HEREIN DESCRIBED LOT OR PARCEL OF LAND MAY BE SUBJECT TO RIGHTS AND PRIVILEGES ASSOCIATED WITH THE USGS CONTROL POINTS LOCATED WITHIN THE BOUNDS OF THE LOCUS PROPERTY.

GRAPHIC SCALE
(IN FEET)
1 INCH = 50 FT.

SCHEDULE B - SECTION II EXCEPTIONS
FILE NO 14030089 (REV. 1-12-15)

ITEMS 1 THROUGH ITEM 7 INCLUSIVE

THESE ARE NOT SURVEY ISSUES AND ARE NOT ADDRESSED BY SEBAGO TECHNICS, INC.

ITEM 8

IF THE LAND IS A CONDOMINIUM UNIT: ...

THE LAND IS NOT A CONDOMINIUM UNIT. HOWEVER, THE LOCUS HAS RIGHTS OVER A PORTION OF THE OCEAN RIDGE CONDOMINIUM PROPERTY, SEE ITEM 13 AND 25281/148.

ITEM 9

TITLE TO RIGHTS OF THE PUBLIC AND OTHERS ENTITLED THERETO IN AND TO ANY PORTION OF THE INSURED PREMISES LOCATED WITHIN THE BOUNDS OF ADJACENT STREETS, ROADS AND WAYS.

THE STREET LINE OF OCEAN AVENUE IS AS DEPICTED HEREON. RIDGE ROAD IS AS DEPICTED ON PLAN REFERENCE 6G HEREON.

ANY RIGHTS THE UNITED STATES GOVERNMENT MAY HAVE IN THE USGS DISK AND ASSOCIATED REFERENCE MARKS AND ACCESS THERETO IS UNKNOWN. NO DATA FURNISHED OR SHOWN ON PREVIOUS SURVEYS.

ITEM 10

RIGHTS AND EASEMENTS GRANTED FROM FREDERICK T. KNOWLES, GEORGE WILSON, ADAM W. WILSON AND ALICE HANNAH PALMER TO CENTRAL MAINE POWER COMPANY BY DEED DATED MARCH 29, 1954 AND RECORDED IN BOOK 2176, PAGE 301.

THIS EASEMENT IS LOCATED AS DEPICTED HEREON AND RUNS ALONG THE WESTERLY BOUNDARY.

ITEM 11

STATE OF FACTS SHOWN ON PLAN OF SURVEY ENTITLED "PLAN SHOWING BOUNDARY SURVEY AND TOPOGRAPHIC SURVEY MADE FOR DIANE DOYLE, RECORD OWNER ...". SEE PLAN REFERENCE 6A HEREON.

SEBAGO TECHNICS, INC. HAS EXAMINED THIS PLAN AND HAS RETRACED THE BOUNDARY, TOPOGRAPHIC AND CULTURAL FEATURES AS DEPICTED HEREON. i) THE UTILITY EASEMENT ALONG NORTHERN PORTION OF THE LAND BOOK 2176, PAGE 301 IS DEPICTED HEREON; ii)NEW ENGLAND TELEPHONE AND TELEGRAPH COMPANY EASEMENT IS NOT LOCATED ON THE LOCUS PROPERTY; iii) OCEAN AVENUE IS AS DEPICTED HEREON AND iv) UTILITY LINES AND APPURTENANCES ARE DEPICTED HEREON ALONG THE LENGTH OF OCEAN AVENUE.

ITEM 12

TERMS AND CONDITIONS OF CONDITIONAL ZONE AGREEMENT GRAVES HILL LAND COMPANY, LLC ...

THESE TWO DOCUMENTS AFFECT THE ENTIRE PROPERTY AND RUN WITH THE LAND.

ITEM 13

TERMS AND CONDITIONS OF EASEMENT AGREEMENT FROM OCEAN RIDGE REALTY, LLC TO GRAVES HILL LAND COMPANY, LLC DATED JULY 10, 2007 AND RECORDED IN BOOK 25281, PAGE 148. THE AREA IS IDENTIFIED HEREON WITH HATCHING ALONG LAND OF BOUMAN REALTY, LLC.

ITEM 14

STATE OF FACTS SHOWN ON PLAN OF SURVEY ENTITLED "ALTA/ACSM LAND TITLE SURVEY OF LAND OWNED BY GRAVES HILL LAND COMPANY, LLC, PREPARED FOR HAWTHORN DEVELOPMENT, LLC" BY SEBAGO TECHNICS, INC, DATED JANUARY 7, 2015, INCLUDING: i) UTILITY EASEMENT ALONG NORTHWESTERLY PORTION OF THE LAND, BOOK 2176, PAGE 301; ii) OCEAN AVENUE; iii) UTILITY POLE AND LINE OFF OCEAN AVENUE; iv) ENCROACHMENT OF NORTHEASTERLY CORNER OF THE LAND INTO THE PAVED ACCESS OF RIDGE ROAD; v) SIDELINE SETBACKS; vi) CONTRACT ZONE LINES; vii) EASEMENT AREA ALONG NORTHERLY PORTION OF THE LAND, BOOK 25281, PAGE 148; viii) NOTE #8 THAT NOT ALL UTILITIES MAY BE DEPICTED ON THE PLAN; ix) NOTE #11 THAT ABUTTERS CAIAZZO AND ADJOINING CONDOMINIUM PROJECT MAY BE USING THE LAND AS A DUMP SITE; AND x) TRAILS RUNNING GENERALLY FROM THE WESTERLY SIDE OF THE PROPERTY THROUGH THE CENTRAL MAINE POWER COMPANY EASEMENT INTO THE ADJOINING CONDOMINIUM PROJECT WERE FIELD LOCATED AS SHOWN HEREON. NO RECORD EVIDENCE WAS FOUND ESTABLISHING RIGHTS IN OR TO THESE TRAILS.

GENERAL NOTES:

1. THE RECORD OWNER OF THE PARCEL IS GRAVES HILL LAND COMPANY, LLC BY DEED DATED JULY 1, 2004 AND RECORDED AT THE CUMBERLAND COUNTY REGISTRY OF DEEDS IN BOOK 21500, PAGE 269.
2. THE PROPERTY IS SHOWN AS LOTS A006, A007 AND A021 ON TAX MAP 416 AND LOT A007 ON TAX MAP 411 OF THE CITY OF PORTLAND TAX MAPS AND IS LOCATED IN THE BOTH THE R-5A RESIDENTIAL ZONE AND R-OS RECREATION AND OPEN SPACE ZONING DISTRICTS.
3. SPACE AND BULK CRITERIA FOR THE R5A AND ROS DISTRICTS ARE AS FOLLOWS:

	R5A	ROS
LOCUS AREA WITHIN ZONING DISTRICT:	10.171 ACRES	8.157 ACRES
MINIMUM LOT SIZE:	1,600 S.F. PER DWELLING UNIT	N/A
MINIMUM FRONTAGE:	50 FEET	N/A
MAXIMUM LOT COVERAGE:	30%	25%
MINIMUM LOT WIDTH:	60 FEET	N/A
MINIMUM RECREATION OPEN SPACE:	200 S.F. PER DWELLING UNIT	N/A
MINIMUM FRONT YARD:	35 FEET	25 FEET
MINIMUM SIDE YARD:	16 FEET	12 FEET
MINIMUM REAR YARD:	25 FEET	25 FEET
MAXIMUM BUILDING HEIGHT:	55 FEET	N/A

* SEE BUILDING LENGTH GREATER THAN 100'.

4. TOTAL AREA OF PARCEL IS APPROXIMATELY 798,387.448 SQUARE FEET OR 18.328 ACRES.
5. BOUNDARY AND TOPOGRAPHIC INFORMATION SHOWN HEREON IS BASED UPON FIELD WORK PERFORMED BY SEBAGO TECHNICS, INC. IN DECEMBER 2014 AND JANUARY 2015.
6. PLAN REFERENCES:

A. "PLAN SHOWING A BOUNDARY SURVEY AND TOPOGRAPHIC SURVEY MADE FOR DIANE DOYLE, (MAILING ADDRESS: 16 TIFFANY LANE, SACO, ME 04072) PARCEL LOCATED AT OCEAN AVENUE, PORTLAND, MAINE" DATED JULY 8, 2002 AND REVISED THROUGH FEBRUARY 11, 2005 BY DOW & COULOMBE, INC, SHEETS 1 & 2 OF 2. THIS PLAN IS RECORDED AT THE CUMBERLAND COUNTY REGISTRY OF DEEDS IN PLAN BOOK 204, PAGE 293 & PAGE 294.

B. "ASBUILT SURVEY PLAN OF OCEAN RIDGE CONDOMINIUMS, 852 OCEAN AVENUE, PORTLAND, MAINE FOR RECORD OWNER OCEAN RIDGE REALTY, LLC, 91 OLD OCEAN HOUSE ROAD, CAPE ELIZABETH, MAINE 04107" DATED NOVEMBER 29, 2005 BY SEBAGO TECHNICS, INC., PROJECT NO. 84180.

C. "BOUNDARY SURVEY & LOT DIVISION 752 OCEAN AVENUE, PORTLAND, MAINE MADE FOR DONALD ANSPACH, 752 OCEAN AVENUE, PORTLAND, MAINE" DATED MAY 25, 2004 AND REVISED THROUGH JUNE 18, 2008 BY TITCOMB ASSOCIATES, JOB NO. 87114.1.

D. "STANDARD BOUNDARY SURVEY PLAN OF PROPERTY OCEAN AVENUE, PORTLAND, MAINE MADE FOR THE FINCH GROUP, 160 FEDERAL STREET, BOSTON, MA." DATED JULY 30, 1992 BY TITCOMB ASSOCIATES, JOB NO. 87114M.

E. "OCEAN AVENUE STORM DRAIN AND SANITARY SEWER EXTENSION OF OCEAN RIDGE CONDOMINIUMS, 852 OCEAN AVENUE, PORTLAND, MAINE FOR OCEAN RIDGE REALTY, LLC, 91 OCEAN HOUSE ROAD, CAPE ELIZABETH, MAINE 04107" DATED APRIL 3, 2001 AND REVISED THROUGH DECEMBER 3, 2002 BY SEBAGO TECHNICS, INC., PROJECT NO. 84180, SHEETS 15 & 16 OF 18 SHEETS.

F. "OCEAN AVENUE RECONSTRUCTION PHASE 3 AND PHASE 4, PLAN AND PROFILE STA. 122+00 TO STA. 127+50" DATED AUGUST 31, 2007 BY CITY OF PORTLAND, MAINE DEPARTMENT OF PUBLIC WORKS ENGINEERING SECTION, PROJECT NO. C04517, SHEETS 6 & 7 OF 23 SHEETS

G. "AMENDED SUBDIVISION PLAN OF OCEAN RIDGE CONDOMINIUMS, 852 OCEAN AVENUE, PORTLAND, MAINE FOR RECORD OWNER OCEAN RIDGE REALTY, LLC, 91 OLD OCEAN HOUSE ROAD, CAPE ELIZABETH, MAINE 04107" DATED MARCH 6, 2001 AND REVISED THROUGH MARCH 13, 2003 BY SEBAGO TECHNICS, INC. THIS PLAN IS RECORDED AT THE CUMBERLAND COUNTY REGISTRY OF DEEDS IN PLAN BOOK 203, PAGE 264 AND SUPERCEDES A PLAN RECORDED IN PLAN BOOK 202, PAGE 725.

7. PLAN ORIENTATION IS GRID NORTH, MAINE STATE PLANE COORDINATE SYSTEM, WEST ZONE 1802-NAD83, ELEVATIONS DEPICTED HEREON WERE OBSERVED IN NAVD88, BASED ON DUAL FREQUENCY GPS OBSERVATIONS. ELEVATIONS HAVE BEEN CONVERTED TO NGVD29 UTILIZING THE U.S.ARMY CORPS OF ENGINEERS CORPSCON 6.0.1 SOFTWARE. THE CONVERSION IN THIS VICINITY IS 0.70 FEET HIGHER THAN NAVD88. ELEVATIONS ARE TIED TO THE CITY OF PORTLAND, MAINE VERTICAL DATUM.
8. UTILITY INFORMATION DEPICTED HEREON IS COMPILED USING PHYSICAL EVIDENCE LOCATED IN THE FIELD. UTILITIES DEPICTED HEREON MAY NOT NECESSARILY REPRESENT ALL EXISTING UTILITIES. CONTRACTORS AND/OR DESIGNERS NEED TO CONTACT DIG-SAFE SYSTEMS, INC. (1-888-DIG-SAFE) AND FIELD VERIFY EXISTING UTILITIES PRIOR TO CONSTRUCTION AND/OR EXCAVATION.
9. THE LOCUS PROPERTY AS DEPICTED HEREON DOES NOT FALL WITHIN A SPECIAL FLOOD HAZARD AREA AS DELINEATED ON THE FLOOD INSURANCE RATE MAP FOR THE CITY OF PORTLAND, MAINE, CUMBERLAND COUNTY, COMMUNITY-PANEL NUMBER 230051 0007 C, HAVING AN EFFECTIVE DATE OF DECEMBER 8, 1998. THE LOCUS FALLS WITHIN AN AREA IDENTIFIED AS AN UNSHADED ZONE X, AREAS DETERMINED TO BE OUTSIDE THE 500-YEAR FLOODPLAIN.
10. A WETLAND DELINEATION WAS PERFORMED ON THIS PROJECT SITE IN NOVEMBER 2001 AND REVIEWED IN APRIL 2014 BY GARY M. FULLERTON, CERTIFIED SOIL SCIENTIST OF SEBAGO TECHNICS, INC. THIS DELINEATION CONFORMS TO THE STANDARDS AND METHODS OUTLINED IN THE 1987 WETLANDS DELINEATION MANUAL AND REGIONAL SUPPLEMENT AUTHORED AND PUBLISHED BY THE U.S. ARMY CORPS OF ENGINEERS. WETLAND FLAGS WITHIN THE PROPOSED DEVELOPMENT AREAS WERE LOCATED BY GROUND SURVEY. WETLAND FLAGS OUTSIDE OF THE PROPOSED DEVELOPMENT AREA WERE LOCATED USING GLOBAL POSITIONING SYSTEMS (GPS) TECHNOLOGY. ALL GPS LOCATED POINTS HAVE A VARYING DEGREE OF ACCURACY AND MAY NOT REPRESENT THE ACTUAL FIELD LOCATION.
11. WITH REFERENCE TO ITEM 18 OF THE ALTA TABLE A, THE AREA ADJOINING THE NORTHERLY AND WESTERLY SIDELINES OF LAND OF CAIAZZO IS CLUTTERED WITH CONSTRUCTION AND RESIDENTIAL DEBRIS, TWO OLD VEHICLES AND ASSORTED HOUSEHOLD LITTER.

THE AREA IN THE VICINITY OF THE USGS CONTROL DISKS IS ALSO BEING USED AS A DUMP SITE FOR LAWN DEBRIS BY THE ADJOINING CONDOMINIUM PROJECT.

12. EXISTING FOOTPATHS/TRAILS ARE AS DEPICTED HEREON, THEY ARE TYPICALLY ±2 FEET WIDE.

SURVEYOR'S STATEMENT

THIS SURVEY WAS PERFORMED UNDER MY DIRECT SUPERVISION AND TO THE BEST OF MY KNOWLEDGE AND BELIEF, IT WAS DONE IN ACCORDANCE WITH CHAPTER 90, PART 1 (PROFESSIONAL STANDARDS OF PRACTICE) AND PART 2 (TECHNICAL STANDARDS OF PRACTICE) OF THE MAINE BOARD OF LICENSURE FOR PROFESSIONAL LAND SURVEYORS.

CHARLES D. MARCHESE, MAINE PLS 2009
SEPTEMBER 18, 2015

SURVEYOR'S CERTIFICATION

TO HAWTHORN DEVELOPMENT, LLC OR ITS ASSIGNEE AND FIDELITY NATIONAL TITLE INSURANCE COMPANY:
FILE NO. 14030089 (REV. 1-12-15)

THIS IS TO CERTIFY THAT THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE 2011 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/ACSM LAND TITLE SURVEYS, JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS, AND INCLUDE ITEMS 1,2,3,4,5,6a,6b,8,11a,11b,13,14,16,17,18,19,20a AND 21 OF TABLE A THEREOF. THE FIELD WORK WAS COMPLETED ON JANUARY 7, 2015.

DATE: SEPTEMBER 18, 2015

CHARLES D. MARCHESE, MAINE PLS 2009
SEBAGO TECHNICS, INC.

CHARLES D. MARCHESE, PLS 2009

STATE OF MAINE CHARLES D. MARCHESE No. 2009 PROFESSIONAL LAND SURVEYOR

DESIGNED	CHECKED
-	CDM

REV	BY	DATE	STATUS
F	RAM	9-18-15	PLAN SUBMISSION TO CITY OF PORTLAND
E	CDM	5-04-15	ADDED FOOTPATHS/TRAILS & CORRESPONDING NOTE 12
D	CDM	2-26-15	REVISED UTILITIES IN OCEAN AVENUE
C	CDM	2-18-15	REVISED BORINGS/PROBES
B	CDM	1-23-15	PLAN REVISED TO REFLECT TITLE COMMITMENT 14030089 REVISED 1-12-15
A	CDM	1-07-15	ISSUED TO CLIENT FOR REVIEW

THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION FROM SEBAGO TECHNICS, INC. ANY ALTERATIONS, AUTHORIZED OR OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO SEBAGO TECHNICS, INC.

SEBAGO TECHNICS
WWW.SEBAGOTECHNICS.COM
75 John Roberts Rd. Suite 1A South Portland, ME 04106 Tel. 207-200-2100
250 Goddard Rd. Suite B Lewiston, ME 04240 Tel. 207-783-5656

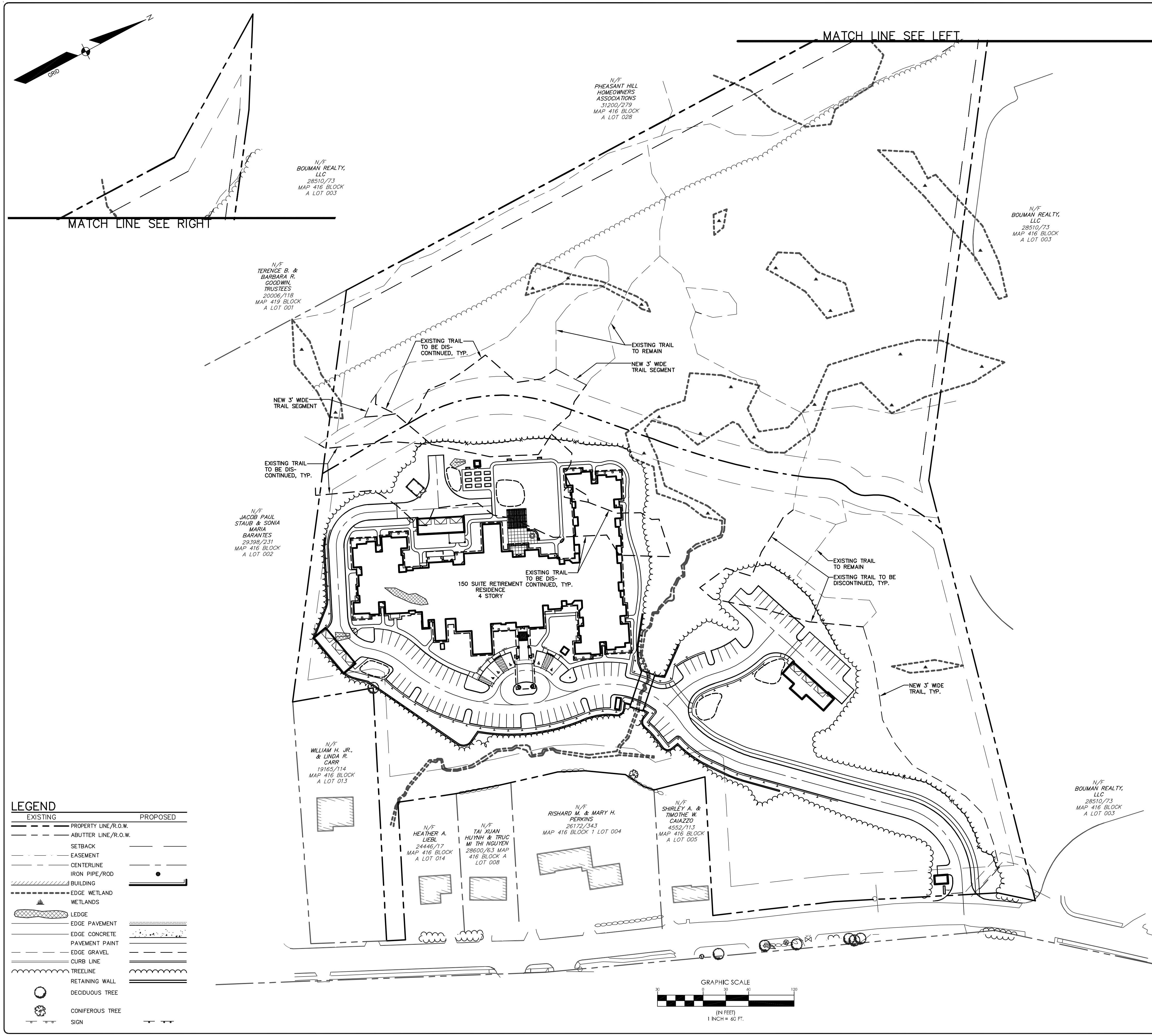
ALTA-ACSM LAND TITLE SURVEY
OF LAND OWNED BY:
GRAVES HILL LAND COMPANY, LLC
802-838 OCEAN AVENUE
PORTLAND, MAINE 04103
PREPARED FOR:
HAWTHORN DEVELOPMENT, LLC
9310 NE VANCOUVER MALL DRIVE, SUITE 200
VANCOUVER, WASHINGTON 98662-8210

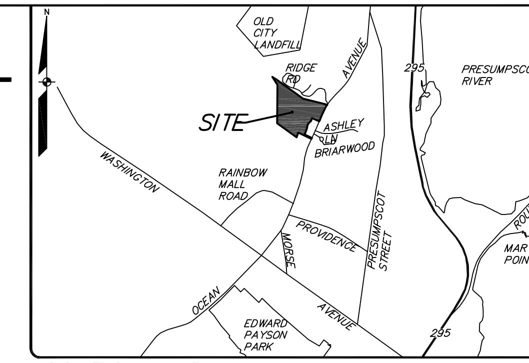
RECORD OWNER: SEE NOTE 1.

PROJECT NO.	SCALE
14432	1" = 50'

SHEET 3 OF 14

14432C.dwg, TAB:14432LTS2





LOCATION MAP

N.T.S.

GENERAL NOTES:

1. THE RECORD OWNER OF THE PARCEL IS GRAVES HILL LAND COMPANY, LLC BY DEED DATED JULY 1, 2004 AND RECORDED AT THE CUMBERLAND COUNTY REGISTRY OF DEEDS IN BOOK 21500, PAGE 269.
2. THE PROPERTY IS SHOWN AS LOTS A006, A007 AND A021 ON TAX MAP 416 AND LOT A007 ON TAX MAP 411 OF THE CITY OF PORTLAND TAX MAPS AND IS LOCATED IN THE BOTH THE R-5A RESIDENTIAL ZONE AND R-OS RECREATION AND OPEN SPACE ZONING DISTRICTS.
3. SPACE AND BULK CRITERIA FOR THE R5A AND ROS DISTRICTS ARE AS FOLLOWS:

	R5A	ROS
LOCUS AREA WITHIN ZONING DISTRICT:	10.171 ACRES	8.157 ACRES
MINIMUM LOT SIZE:	1,600 S.F. PER DWELLING UNIT	N/A
MINIMUM FRONTAGE:	50 FEET	N/A
MAXIMUM LOT COVERAGE:	30%	25%
MINIMUM LOT WIDTH:	60 FEET	N/A
MINIMUM RECREATION OPEN SPACE:	200 S.F. PER DWELLING UNIT	N/A
MINIMUM FRONT YARD:	35 FEET	25 FEET
MINIMUM SIDE YARD:	16 FEET	12 FEET
MINIMUM REAR YARD:	25 FEET	25 FEET
MAXIMUM BUILDING HEIGHT:	55 FEET	N/A

* SEE BUILDING LENGTH GREATER THAN 100'.

4. TOTAL AREA OF PARCEL IS APPROXIMATELY 798,387.448 SQUARE FEET OR 18.328 ACRES.
5. BOUNDARY AND TOPOGRAPHIC INFORMATION SHOWN HEREON IS BASED UPON FIELD WORK PERFORMED BY SEBAGO TECHNICS, INC. IN DECEMBER 2014 AND JANUARY 2015.
6. PLAN REFERENCES:

A. "PLAN SHOWING A BOUNDARY SURVEY AND TOPOGRAPHIC SURVEY MADE FOR DIANE DOYLE, (MAILING ADDRESS: 16 TIFFANY LANE, SACO, ME 04072) PARCEL LOCATED AT OCEAN AVENUE, PORTLAND, MAINE" DATED JULY 8, 2002 AND REVISED THROUGH FEBRUARY 11, 2005 BY DOW & COULOMBE, INC, SHEETS 1 & 2 OF 2. THIS PLAN IS RECORDED AT THE CUMBERLAND COUNTY REGISTRY OF DEEDS IN PLAN BOOK 204, PAGE 293 & PAGE 294.

B. "ASBUILT SURVEY PLAN OF OCEAN RIDGE CONDOMINIUMS, 852 OCEAN AVENUE, PORTLAND, MAINE FOR RECORD OWNER OCEAN RIDGE REALTY, LLC, 91 OLD OCEAN HOUSE ROAD, CAPE ELIZABETH, MAINE 04107" DATED NOVEMBER 29, 2005 BY SEBAGO TECHNICS, INC., PROJECT NO. 84180.

C. "BOUNDARY SURVEY & LOT DIVISION 752 OCEAN AVENUE, PORTLAND, MAINE MADE FOR DONALD ANSPACH, 752 OCEAN AVENUE, PORTLAND, MAINE" DATED MAY 25, 2004 AND REVISED THROUGH JUNE 18, 2008 BY TITCOMB ASSOCIATES, JOB NO. 87114.1.

D. "STANDARD BOUNDARY SURVEY PLAN OF PROPERTY OCEAN AVENUE, PORTLAND, MAINE MADE FOR THE FINCH GROUP, 160 FEDERAL STREET, BOSTON, MA." DATED JULY 30, 1992 BY TITCOMB ASSOCIATES, JOB NO. 87114M.

E. "OCEAN AVENUE STORM DRAIN AND SANITARY SEWER EXTENSION OF OCEAN RIDGE CONDOMINIUMS, 852 OCEAN AVENUE, PORTLAND, MAINE FOR OCEAN RIDGE REALTY, LLC, 91 OCEAN HOUSE ROAD, CAPE ELIZABETH, MAINE 04107" DATED APRIL 3, 2001 AND REVISED THROUGH DECEMBER 3, 2002 BY SEBAGO TECHNICS, INC., PROJECT NO. 84180, SHEETS 15 & 16 OF 18 SHEETS.

F. "OCEAN AVENUE RECONSTRUCTION PHASE 3 AND PHASE 4, PLAN AND PROFILE STA. 122+00 TO STA. 127+50" DATED AUGUST 31, 2007 BY CITY OF PORTLAND, MAINE DEPARTMENT OF PUBLIC WORKS ENGINEERING SECTION, PROJECT NO. C04517, SHEETS 6 & 7 OF 23 SHEETS

G. "AMENDED SUBDIVISION PLAN OF OCEAN RIDGE CONDOMINIUMS, 852 OCEAN AVENUE, PORTLAND, MAINE FOR RECORD OWNER OCEAN RIDGE REALTY, LLC, 91 OLD OCEAN HOUSE ROAD, CAPE ELIZABETH, MAINE 04107" DATED MARCH 6, 2001 AND REVISED THROUGH MARCH 13, 2003 BY SEBAGO TECHNICS, INC. THIS PLAN IS RECORDED AT THE CUMBERLAND COUNTY REGISTRY OF DEEDS IN PLAN BOOK 203, PAGE 264 AND SUPERCEDES A PLAN RECORDED IN PLAN BOOK 202, PAGE 725.

7. PLAN ORIENTATION IS GRID NORTH, MAINE STATE PLANE COORDINATE SYSTEM, WEST ZONE 1802-NAD83, ELEVATIONS DEPICTED HEREON WERE OBSERVED IN NAVD88, BASED ON DUAL FREQUENCY GPS OBSERVATIONS. ELEVATIONS HAVE BEEN CONVERTED TO NGVD29 UTILIZING THE U.S.ARMY CORPS OF ENGINEERS CORPSCON 6.0.1 SOFTWARE. THE CONVERSION IN THIS VICINITY IS 0.70 FEET HIGHER THAN NAVD88. ELEVATIONS ARE TIED TO THE CITY OF PORTLAND, MAINE VERTICAL DATUM.
8. UTILITY INFORMATION DEPICTED HEREON IS COMPILED USING PHYSICAL EVIDENCE LOCATED IN THE FIELD. UTILITIES DEPICTED HEREON MAY NOT NECESSARILY REPRESENT ALL EXISTING UTILITIES. CONTRACTORS AND/OR DESIGNERS NEED TO CONTACT DIG-SAFE SYSTEMS, INC. (1-888-DIG-SAFE) AND FIELD VERIFY EXISTING UTILITIES PRIOR TO CONSTRUCTION AND/OR EXCAVATION.
9. THE LOCUS PROPERTY AS DEPICTED HEREON DOES NOT FALL WITHIN A SPECIAL FLOOD HAZARD AREA AS DELINEATED ON THE FLOOD INSURANCE RATE MAP FOR THE CITY OF PORTLAND, MAINE, CUMBERLAND COUNTY, COMMUNITY-PANEL NUMBER 230051 0007 C, HAVING AN EFFECTIVE DATE OF DECEMBER 8, 1998. THE LOCUS FALLS WITHIN AN AREA IDENTIFIED AS AN UNSHADED ZONE X, AREAS DETERMINED TO BE OUTSIDE THE 500-YEAR FLOODPLAIN.
10. A WETLAND DELINEATION WAS PERFORMED ON THIS PROJECT SITE IN NOVEMBER 2001 AND REVIEWED IN APRIL 2014 BY GARY M. FULLERTON, CERTIFIED SOIL SCIENTIST OF SEBAGO TECHNICS, INC. THIS DELINEATION CONFORMS TO THE STANDARDS AND METHODS OUTLINED IN THE 1987 WETLANDS DELINEATION MANUAL AND REGIONAL SUPPLEMENT AUTHORED AND PUBLISHED BY THE U.S. ARMY CORPS OF ENGINEERS. WETLAND FLAGS WITHIN THE PROPOSED DEVELOPMENT AREAS WERE LOCATED BY GROUND SURVEY. WETLAND FLAGS OUTSIDE OF THE PROPOSED DEVELOPMENT AREA WERE LOCATED USING GLOBAL POSITIONING SYSTEMS (GPS) TECHNOLOGY. ALL GPS LOCATED POINTS HAVE A VARYING DEGREE OF ACCURACY AND MAY NOT REPRESENT THE ACTUAL FIELD LOCATION.
11. WITH REFERENCE TO ITEM 18 OF THE ALTA TABLE A, THE AREA ADJOINING THE NORTHERLY AND WESTERLY SIDELINES OF LAND OF CAIAZZO IS CLUTTERED WITH CONSTRUCTION AND RESIDENTIAL DEBRIS, TWO OLD VEHICLES AND ASSORTED HOUSEHOLD LITTER.

THE AREA IN THE VICINITY OF THE USGS CONTROL DISKS IS ALSO BEING USED AS A DUMP SITE FOR LAWN DEBRIS BY THE ADJOINING CONDOMINIUM PROJECT.

12. EXISTING FOOTPATHS/TRAILS ARE AS DEPICTED HEREON, THEY ARE TYPICALLY ±2 FEET WIDE.

DESIGNED	CHECKED
PDO	RAM

REV:	BY:	DATE:	STATUS:
A	RAM	9-18-15	PLAN SUBMISSION TO CITY OF PORTLAND

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250 Goddard Rd. Suite B Lewiston, ME 04240 Tel. 207-783-5656

OVERALL SITE PLAN

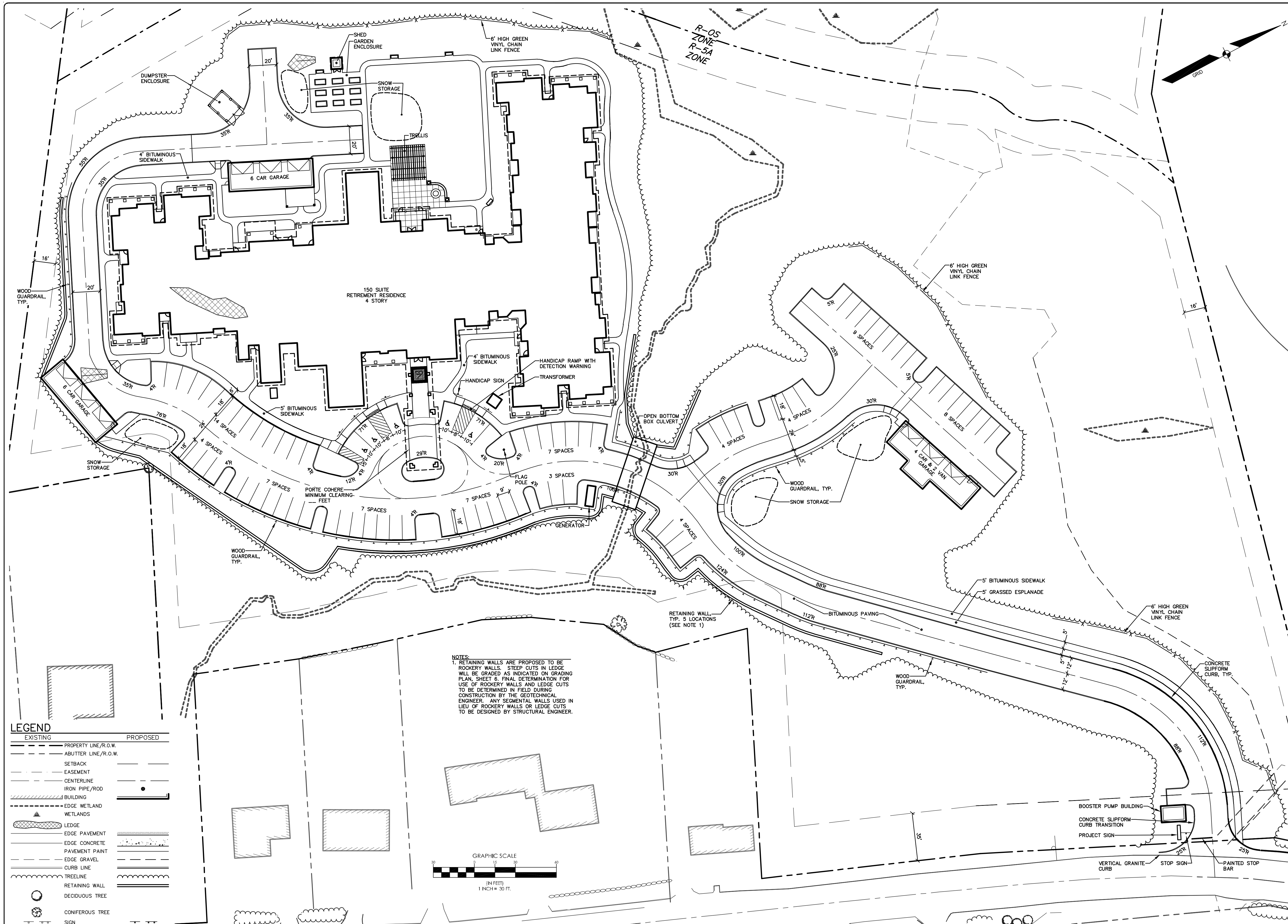
OF: PORTLAND RETIREMENT RESIDENCE
802 OCEAN AVENUE
PORTLAND, ME

FOR: HAWTHORN DEVELOPMENT GROUP, LLC
9310 NE VANCOUVER MALL DR., STE200
VANCOUVER, WA 98662-8210

PROJECT NO.	SCALE
14432	1" = 60'

SHEET 4 OF 14

14432S.dwg, TAB:S



9-18-15

DESIGNED	CHECKED
PDO	RAM

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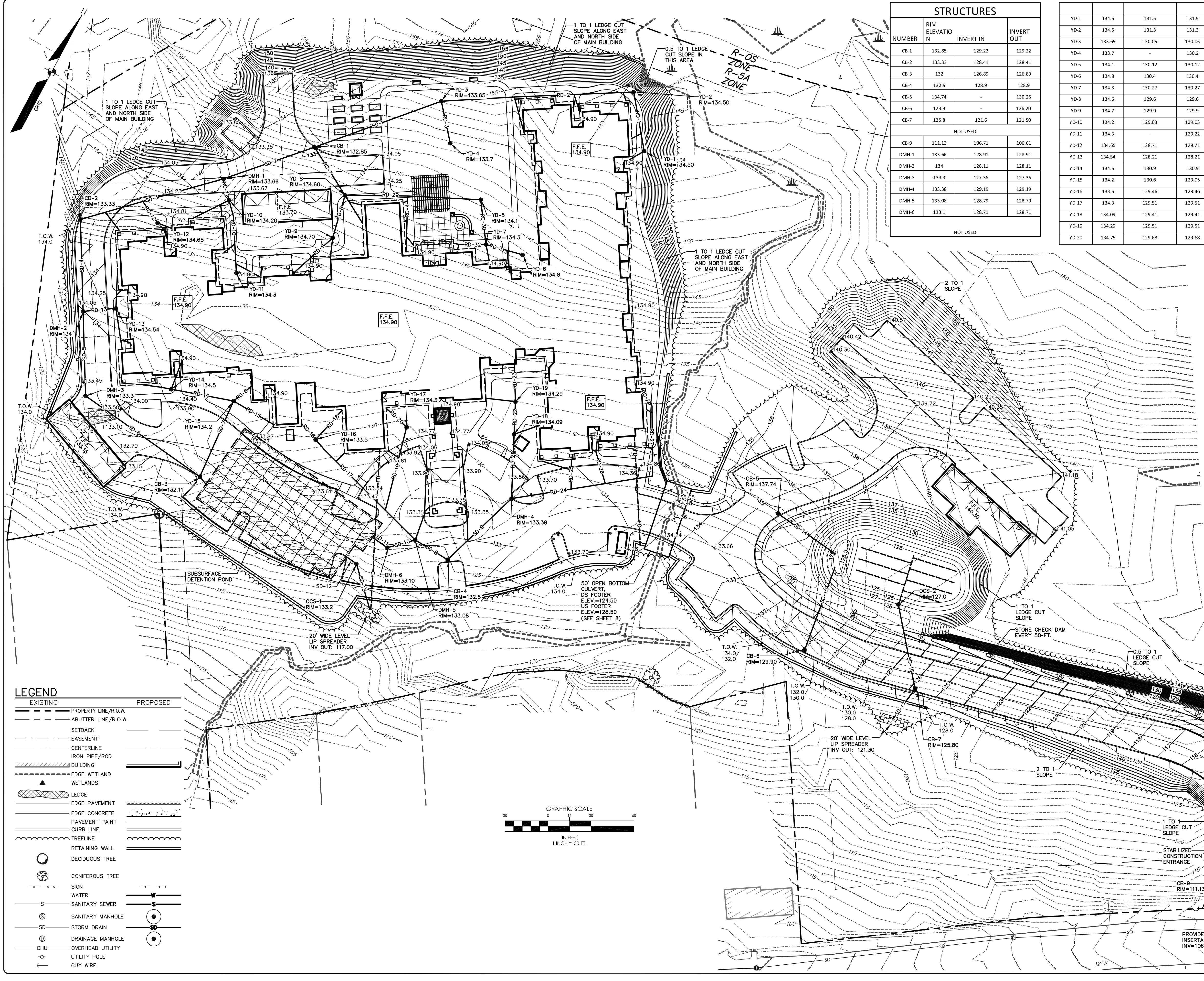
SITE PLAN
OF:
PORTLAND RETIREMENT RESIDENCE
802 OCEAN AVENUE
PORTLAND, ME
FOR:
HAWTHORN DEVELOPMENT GROUP, LLC
9310 NE VANCOUVER MALL DR., STE200
VANCOUVER, WA 98662-8210

PROJECT NO.	SCALE
14432	1" = 30'

SHEET 5 OF 14

14432S.dwg, TAB:S1



STRUCTURES

NUMBER	RIM ELEVATION	INVERT IN	INVERT OUT
CB-1	132.85	129.22	129.22
CB-2	133.33	128.41	128.41
CB-3	132	126.89	126.89
CB-4	132.5	128.9	128.9
CB-5	134.74	-	130.25
CB-6	129.9	-	126.20
CB-7	125.8	121.6	121.50
NOT USED			
CB-9	111.13	106.71	106.61
DMH-1	133.66	128.91	128.91
DMH-2	134	128.11	128.11
DMH-3	133.3	127.36	127.36
DMH-4	133.38	129.19	129.19
DMH-5	133.08	128.79	128.79
DMH-6	133.1	128.71	128.71
NOT USED			

YD-1	134.5	131.5	131.5
YD-2	134.5	131.3	131.3
YD-3	133.65	130.05	130.05
YD-4	133.7	-	130.2
YD-5	134.1	130.12	130.12
YD-6	134.8	130.4	130.4
YD-7	134.3	130.27	130.27
YD-8	134.6	129.6	129.6
YD-9	134.7	129.9	129.9
YD-10	134.2	129.03	129.03
YD-11	134.3	-	129.22
YD-12	134.65	128.71	128.71
YD-13	134.54	128.21	128.21
YD-14	134.5	130.9	130.9
YD-15	134.2	130.6	129.05
YD-16	133.5	129.46	129.46
YD-17	134.3	129.51	129.51
YD-18	134.09	129.41	129.41
YD-19	134.29	129.51	129.51
YD-20	134.75	129.68	129.68

STORM DRAINS

STORM DRAIN DESIGNATION	SIZE	LENGTH	SLOPE
RD-1	12	40	0.005
RD-2	12	132	0.009
RD-3	12	30	0.005
RD-4	12	37	0.005
RD-5	12	27	0.01
RD-6	12	13	0.005
RD-7	12	38	0.01
RD-8	12	30	0.01
RD-9	12	38	0.005
RD-10	12	38	0.005
RD-11	12	23	0.005
RD-12	12	16	0.005
RD-13	12	20	0.005
RD-14	12	65	0.005
RD-15	12	30	0.005
RD-16	12	23	0.005
RD-17	12	86	0.005
RD-18	12	28	0.005
RD-19	12	58	0.005
RD-20	12	19	0.005
RD-21	12	43	0.005
RD-22	12	21	0.005
RD-23	12	22	0.005
RD-24	12	98	0.005
RD-25	12	19	0.005
RD-26	12	21	0.005
RD-27	12	47	0.005
RD-28	12	13	0.005
RD-29	12	119	0.005
RD-30	12	30	0.005
RD-31	12	25	0.005
RD-32	12	17	0.005
RD-33	12	37	0.005
RD-34	12	13	0.005
SD-1	12	92	0.009
SD-2	12	63	0.005
SD-3	12	100	0.005
SD-4	12	60	0.005
SD-5	12	55	0.005
SD-6	12	94	0.005
SD-7	12	18	0.043
SD-8	12	22	0.005
SD-9	12	62	0.005
SD-10	15	16	0.005
SD-11	12	18	0.005
SD-12	12	8	0.01
SD-13	12	30	0.13
SD-14	12	50	0.085
SD-15	12	65	0.01
SD-16	12	56	0.022
SD-17	12	21	0.01
NOT USED			
NOT USED			
NOT USED			
NOT USED			
NOT USED			
SD-23	12	21	0.01

9-18-15

DESIGNED	CHECKED
PDO	RAM

REV:	BY:	DATE:	STATUS:
A	RAM	9-18-15	PLAN SUBMISSION TO CITY OF PORTLAND

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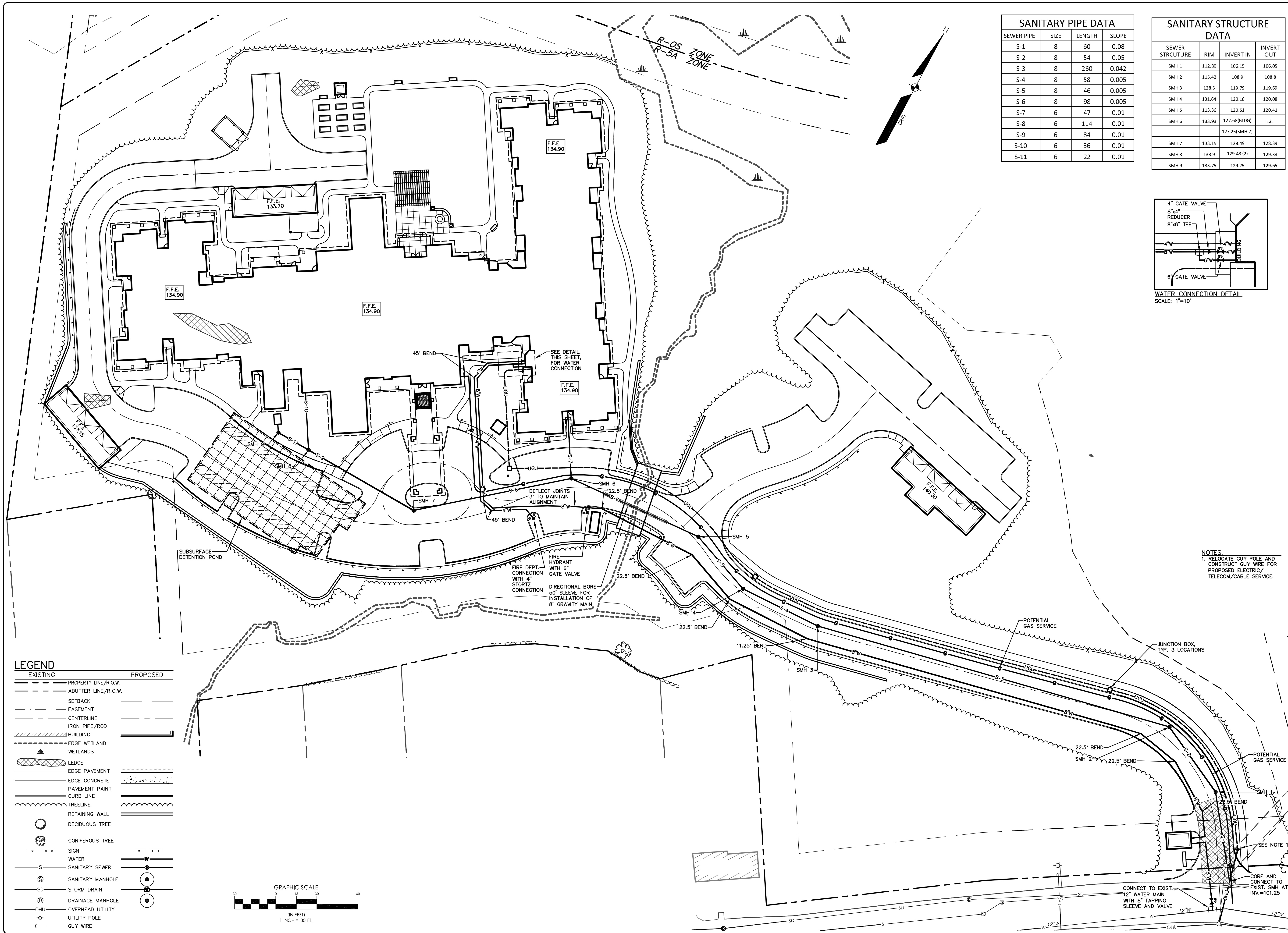
GRADING AND DRAINAGE PLAN

OF: PORTLAND RETIREMENT RESIDENCE
802 OCEAN AVENUE
PORTLAND, ME

FOR: HAWTHORN DEVELOPMENT GROUP, LLC
9310 NE VANCOUVER MALL DR., STE200
VANCOUVER, WA 98662-8210

PROJECT NO.	SCALE
14432	1" = 30'

14432GU.dwg, TAB:G



SANITARY PIPE DATA			
SEWER PIPE	SIZE	LENGTH	SLOPE
S-1	8	60	0.08
S-2	8	54	0.05
S-3	8	260	0.042
S-4	8	58	0.005
S-5	8	46	0.005
S-6	8	98	0.005
S-7	6	47	0.01
S-8	6	114	0.01
S-9	6	84	0.01
S-10	6	36	0.01
S-11	6	22	0.01

SANITARY STRUCTURE DATA			
SEWER STRCUTURE	RIM	INVERT IN	INVERT OUT
SMH 1	112.89	106.15	106.05
SMH 2	115.42	108.9	108.8
SMH 3	128.5	119.79	119.69
SMH 4	131.64	120.18	120.08
SMH 5	113.36	120.51	120.41
SMH 6	133.93	127.68(BLDG)	121
		127.25(SMH 7)	
SMH 7	133.15	128.49	128.39
SMH 8	133.9	129.43 (2)	129.33
SMH 9	133.75	129.75	129.65

DESIGNED	CHECKED
PDO	RAM

REV:	BY:	DATE:	STATUS:
A	RAM	9-18-15	PLAN SUBMISSION TO CITY OF PORTLAND

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UTILITY PLAN

OF:
PORTLAND RETIREMENT RESIDENCE
802 OCEAN AVENUE
PORTLAND, ME

FOR:
HAWTHORN DEVELOPMENT GROUP, LLC
9310 NE VANCOUVER MALL DR., STE200
VANCOUVER, WA 98662-8210

PROJECT NO.	SCALE
14432	1" = 30'

14432GU.dwg, TAB:U

9-18-15

GENERAL STRUCTURAL NOTES

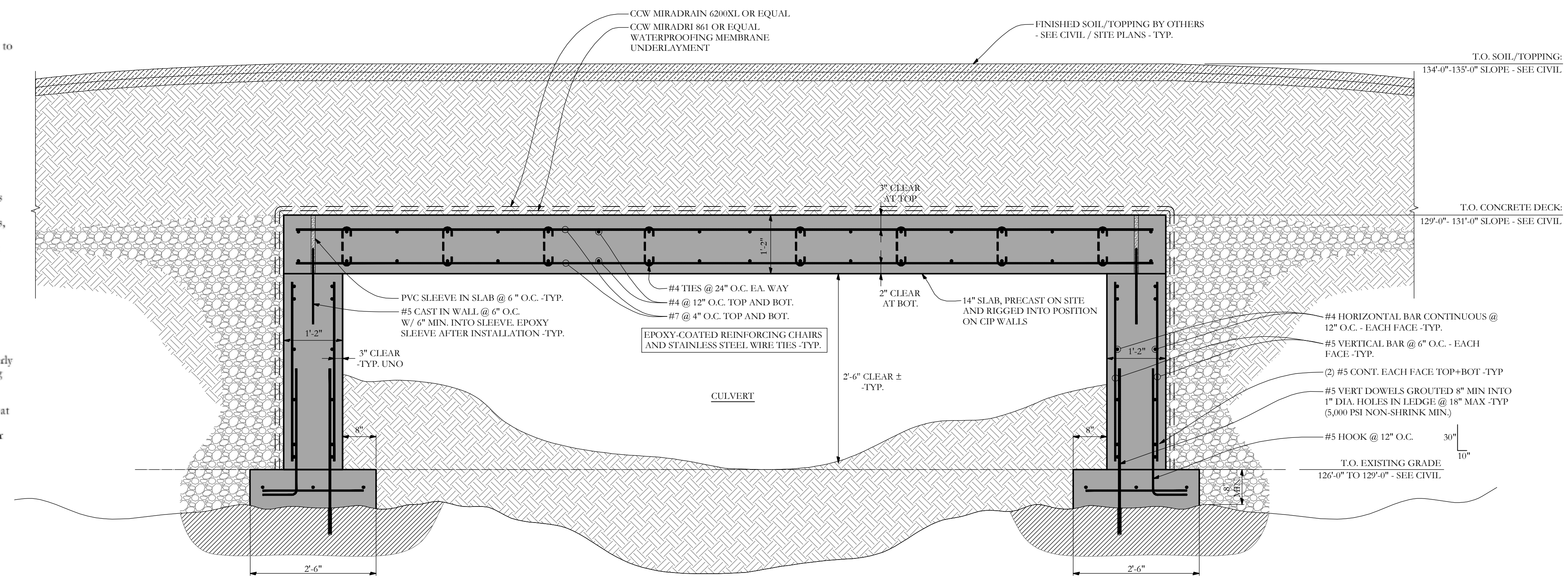
SI Job # 15-0169
Portland Retirement Residence
Box Culvert Design
Portland, ME

DESIGN LIVE LOADS: MUEBC, ACI 318 and AASHTO/HY-25
* Vehicle/Traffic TA400 (56,438 #/ Axle)

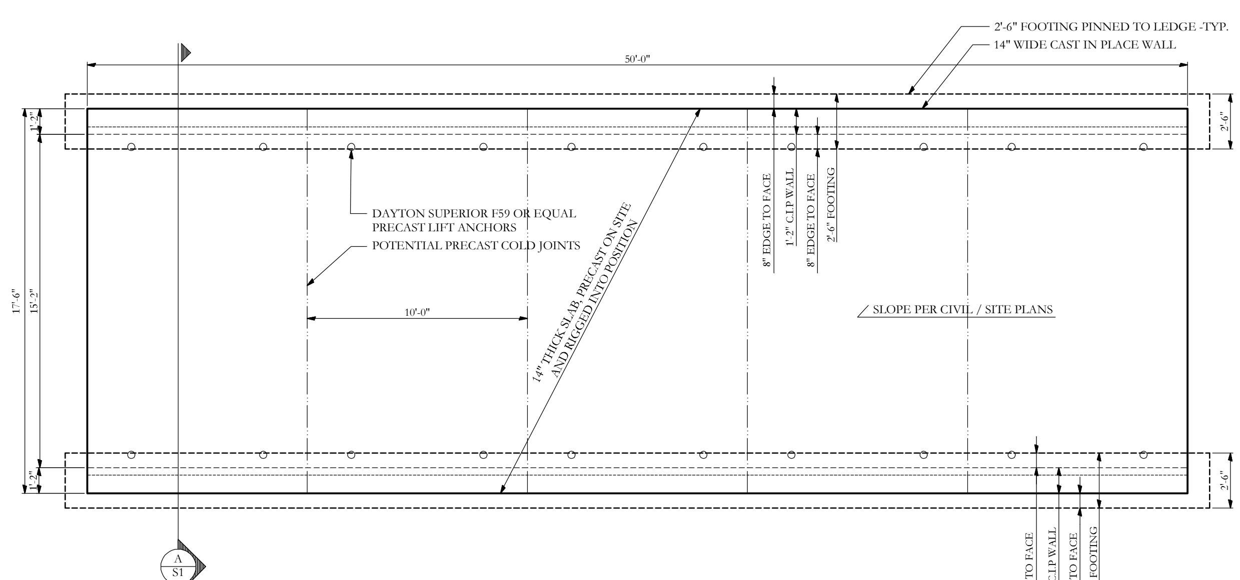
FOUNDATION:
* Based on geotechinical report No. 14-1188 S by S.W. Cole, dated January 16, 2015. See report for earthwork requirements. Soils engineer shall verify soil conditions and types during excavation and prior to concrete placement.
* Footings shall bear on ledge, or otherwise be placed on undisturbed natural soil or compacted fill tested and approved by soils engineer where ledge bearing is not possible.
* Maximum design soil pressure: 4,000 psf on crushed stone on firm virgin soil.

CONCRETE AND REINFORCEMENT:
* Concrete shall conform to applicable provisions of ACI-301 and 318.
  Minimum 28 day compressive strength (F'c)
  Footings, slab, and walls: 5,000 psi w/ 6% air entrainment, max w/c ratio = .42
* Cement Type: I/II
* Deformed reinforcement: ASTM A615 grade 60, except bars specified to be field-bent, stirrups, and ties which shall be grade 40.
* Reinforcement shall be fabricated and placed per ACI Manual of Standard Practice (ACI-315). At splices, lap bars 50 diameters unless noted otherwise.
* Concrete cover over reinforcing: 1 1/2" for concrete placed against forms; 3" for concrete placed against earth. See also drawings.
* Keep reinforcement clean and free of dirt, oil, and scale. Oil forms prior to placing reinforcement.
* All reinforcing steel to be epoxy coated
* All reinforcing steel **crossing cold joints** shall be stainless steel [when required by DOT].
* Repair damaged epoxy coated bars with approved repair coating.
* Grout: 2500 psi at 28 days. Vibrate to consolidate.

STRUCTURAL ERECTION AND BRACING REQUIREMENTS
* The structural drawings illustrate the completed structure with all elements in their final positions, properly supported and braced. The contractor, in the proper sequence, shall provide proper shoring and bracing as may be required to achieve the final completed structure.
* These plans have been engineered for construction at one specific building site. Builder assumes ALL responsibility for use of these plans at Any Other building site. Plans shall not be used for construction at any other building site without specific review by the engineer.
* Observations of foundation reinforcing as required by the owner, lender, insurer, building department or any other party will be accomplished by the engineer at the owner's expense. At least 24 hours advance notice is requested.



SECTION A/S1 3/4"=1'-0



CULVERT PLAN

NOTES:

SCALE 1/4"=1'-0"

1. MAINTAIN 4'-6" MIN. FROST DEPTH TYP. IF NOT BEARING ON LEDGE

FOR PERMIT

AARON C. JONES No. 10958 STATE OF MAINE LICENSED PROFESSIONAL ENGINEER

8/25/15

Structural Integrity Consulting Engineers, Inc.
77 Oak Street
Portland, ME, 04101
p. 207-774-4614
f. 866-793-7835
www.structuralintegrity.com

BUILD WITH CONFIDENCE

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SI# 15-0169

DESIGNED	CHECKED
CDM	CLB

REV:	BY:	DATE:	STATUS:
E	CDM	05-04-2015	ADDED FOOTPATHS/TRAILS & CORRESPONDING NOTE 12
D	CDM	02-26-2015	REVISED UTILITIES IN OCEAN AVENUE
C	CDM	01-23-2015	REVISED BORINGS/PROBES
B	CDM	01-23-2015	PLAN REVISED TO REFLECT TITLE COMMITMENT 14030089 REVISED 1-12-15
A	CDM	01-07-2015	ISSUED TO CLIENT FOR REVIEW

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250 Goddard Rd., Suite B Lewiston, ME 04240 Tel. 207-783-5656

BOX CULVERT PLAN AND SECTION

ON LAND OWNED BY:
GRAVES HILL LAND COMPANY, LLC
802-838 OCEAN AVENUE
PORTLAND, MAINE 04103

PREPARED FOR:
HAWTHORN DEVELOPMENT, LLC
9310 NE VANCOUVER MALL DRIVE, SUITE 200
VANCOUVER, WASHINGTON 98662-8210

PROJECT NO.	SCALE
14432	1" = 50'

SHEET 8 OF 14

15-0169.dwg, TAB: S1

EROSION CONTROL MEASURES:

PRE-CONSTRUCTION PHASE

PRIOR TO THE BEGINNING OF ANY CONSTRUCTION, SEDIMENT BARRIERS (SILT FENCE) WILL BE STAKED/INSTALLED ACROSS THE SLOPE(S), ON THE CONTOUR AT OR JUST BELOW THE LIMITS OF CLEARING OR GRUBBING, AND/OR JUST ABOVE ANY ADJACENT PROPERTY LINE OR WATERCOURSE TO PROTECT AGAINST CONSTRUCTION RELATED EROSION. THE PLACEMENT OF SEDIMENT BARRIERS SHALL BE COMPLETED IN ACCORDANCE WITH GUIDELINES ESTABLISHED IN BEST MANAGEMENT PRACTICES AND IN ACCORDANCE WITH THIS EROSION CONTROL PLAN AND DETAILS IN THIS PLAN SET. THIS NETWORK IS TO BE MAINTAINED BY THE CONTRACTOR UNTIL ALL EXPOSED SLOPES HAVE AT LEAST 85%-90% VIGOROUS PERENNIAL VEGETATIVE COVER TO PREVENT EROSION. TEMPORARY EROSION CONTROL MEASURES SHALL BE REMOVED WITHIN 30 DAYS AFTER PERMANENT STABILIZATION IS ATTAINED.

PRIOR TO ANY CLEARING OR GRUBBING, A CONSTRUCTION ENTRANCE/EXIT SHALL BE CONSTRUCTED AT THE INTERSECTION OF THE PROPOSED ENTRANCES AND EXISTING ROADWAY TO AVOID TRACKING OF MUD, DUST AND DEBRIS FROM THE SITE.

PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL PREPARE A DETAILED SCHEDULE AND MARKED UP PLAN INDICATING AREAS AND COMPONENTS OF THE WORK AND KEY DATES SHOWING DATE OF DISTURBANCE AND COMPLETION OF THE WORK. THE CONTRACTOR SHALL SCHEDULE A PRE-CONSTRUCTION MEETING WITH THE MUNICIPAL STAFF. THREE COPIES OF THE SCHEDULE AND MARKED UP PLAN SHALL BE PROVIDED TO THE MUNICIPALITY THREE DAYS PRIOR TO THE SCHEDULED PRE-CONSTRUCTION MEETING. SPECIAL ATTENTION SHALL BE GIVEN TO THE 14 DAY LIMIT OF DISTURBANCE IN THE SCHEDULE ADDRESSING TEMPORARY AND PERMANENT VEGETATION MEASURES.

CONSTRUCTION AND POST-CONSTRUCTION PHASE

AREAS UNDERGOING ACTUAL CONSTRUCTION SHALL ONLY EXPOSE THAT AMOUNT OF MINERAL SOIL NECESSARY FOR PROGRESSIVE AND EFFICIENT CONSTRUCTION . AN AREA CONSIDERED OPEN IS ANY AREA NOT STABILIZED WITH PAVEMENT, VEGETATION, MULCHING, EROSION CONTROL MATS, RIPRAP OR GRAVEL BASE ON A ROAD . OPEN AREAS SHALL BE ANCHORED WITH TEMPORARY EROSION CONTROL AS SHOWN ON THE DESIGN PLANS AND AS DESCRIBED WITHIN THIS EROSION CONTROL PLAN WITHIN 14-DAYS OF DISTURBANCE. AREAS LOCATED WITHIN 100' OF STREAMS SHALL BE ANCHORED WITH TEMPORARY EROSION CONTROL WITHIN SEVEN (7) DAYS. REFER TO WINTER EROSION CONTROL NOTES FOR THE TREATMENT OF OPEN AREAS AFTER OCTOBER 1ST OF THE CONSTRUCTION YEAR.

THE CONTRACTOR MUST INSTALL ANY ADDED MEASURES WHICH MAY BE NECESSARY TO CONTROL EROSION/SEDIMENTATION FROM THE SITE DEPENDENT UPON THE ACTUAL SITE AND WEATHER CONDITIONS. CONTINUATION OF EARTHWORK OPERATIONS ON ADDITIONAL AREAS SHALL NOT BEGIN UNTIL THE EXPOSED SOIL SURFACE ON THE AREA BEING WORKED HAS BEEN STABILIZED, IN ORDER TO MINIMIZE AREAS WITHOUT EROSION CONTROL PROTECTION.

EROSION CONTROL APPLICATIONS & MEASURES

THE PLACEMENT OF EROSION CONTROL MEASURES SHALL BE COMPLETED IN ACCORDANCE WITH GUIDELINES ESTABLISHED IN BEST MANAGEMENT PRACTICES AND IN ACCORDANCE WITH THE EROSION CONTROL PLAN AND DETAILS IN THE PLAN SET.

1. TEMPORARY MULCHING:

ALL DISTURBED AREAS SHALL BE MULCHED WITH MATERIALS SPECIFIED BELOW PRIOR TO ANY STORM EVENT. ALL DISTURBED AREAS NOT FINAL GRADED WITHIN 14 DAYS SHALL BE MULCHED. ALSO, AREAS, WHICH HAVE BEEN TEMPORARILY OR PERMANENTLY SEEDED, SHALL BE MULCHED IMMEDIATELY FOLLOWING SEEDING. EROSION CONTROL BLANKETS ARE RECOMMENDED TO BE USED AT THE BASE OF GRASSED WATERWAYS AND ON SLOPES GREATER THAN 15%. MULCH ANCHORING SHOULD BE USED ON SLOPES GREATER THAN 5% AFTER SEPTEMBER 15TH OF THE CONSTRUCTION YEAR (SEE WINTER EROSION CONTROL NOTES).
TYPES OF MULCH:
HAY OR STRAW: SHALL BE APPLIED AT A RATE OF 75 LBS/1,000 S.F. (1.5 TONS PER ACRE).
EROSION CONTROL MIX: SHALL BE PLACED EVENLY AND MUST PROVIDE 100% SOIL COVERAGE. EROSION CONTROL MIX SHALL BE APPLIED SUCH THAT THE THICKNESS ON SLOPES 3:1 OR LESS IS 2 INCHES PLUS 1/2 INCH PER 20 FEET OF SLOPE UP TO 100 FEET. THE THICKNESS ON SLOPES BETWEEN 3:1 AND 2:1 SHALL BE 4 INCHES PLUS 1/2 INCH PER 20 FEET OF SLOPE UP TO 100 FEET. THIS SHALL NOT BE USED ON SLOPES GREATER THAN 2:1.
EROSION CONTROL BLANKET: SHALL BE INSTALLED SUCH THAT CONTINUOUS CONTACT BETWEEN THE MAT AND THE SOIL IS OBTAINED. INSTALL BLANKETS AND STAPLE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

2. SOIL STOCKPILES:

STOCKPILES OF SOIL OR SUBSOIL SHALL BE MULCHED WITH HAY OR STRAW AT A RATE OF 75 LBS/1,000 S.F. (1.5 TONS PER ACRE) OR WITH A FOUR-INCH LAYER OF WOOD WASTE EROSION CONTROL MIX. THIS WILL BE DONE WITHIN 24 HOURS OF STOCKING AND RE-ESTABLISHED PRIOR TO ANY RAINFALL. ANY SOIL STOCKPILE WILL NOT BE PLACED (EVEN COVERED WITH HAY OR STRAW) WITHIN 100 FEET FROM ANY NATURAL RESOURCES.

3. NATURAL RESOURCES PROTECTION:

ANY AREAS WITHIN 100 FEET FROM ANY NATURAL RESOURCES, IF NOT STABILIZED WITH A MINIMUM OF 75% MATURE VEGETATION CATCH, SHALL BE MULCHED USING TEMPORARY MULCHING (AS DESCRIBED IN PART 1. OF THIS SECTION) WITHIN 7 DAYS OF EXPOSURE OR PRIOR TO ANY STORM EVENT. SEDIMENT BARRIERS (AS DESCRIBED IN PART 4. OF THIS SECTION) SHALL BE PLACED BETWEEN ANY NATURAL RESOURCE AND THE DISTURBED AREA.
PROJECTS CROSSING THE NATURAL RESOURCE SHALL BE PROTECTED A MINIMUM DISTANCE OF 100 FEET ON EITHER SIDE FROM THE RESOURCE.

4. SEDIMENT BARRIERS:

PRIOR TO THE BEGINNING OF ANY CONSTRUCTION, SEDIMENT BARRIERS SHALL BE STAKED ACROSS THE SLOPE(S), ON THE CONTOUR AT OR JUST BELOW THE LIMITS OF CLEARING OR GRUBBING, AND/OR JUST ABOVE ANY ADJACENT PROPERTY LINE OR WATERCOURSE TO PROTECT AGAINST CONSTRUCTION RELATED EROSION. SEDIMENT BARRIERS SHALL BE MAINTAINED BY THE CONTRACTOR UNTIL ALL EXPOSED SLOPES HAVE AT LEAST 85%-90% VIGOROUS PERENNIAL VEGETATIVE COVER TO PREVENT EROSION.

SILT FENCE: SHALL BE INSTALLED PER THE DETAIL ON THE PLANS. THE EFFECTIVE HEIGHT OF THE FENCE SHALL NOT EXCEED 36 INCHES. IT IS RECOMMENDED THAT SILT FENCE BE REMOVED BY CUTTING THE FENCE MATERIALS AT GROUND LEVEL SO AS TO AVOID ADDITIONAL SOIL DISTURBANCE.

HAY BALES: SHALL BE INSTALLED PER THE DETAIL ON THE PLANS. BALES SHALL BE WIRE-BOUND OR STRING-TIED AND THESE BINDINGS MUST REMAIN PARALLEL WITH THE GROUND SURFACE DURING INSTALLATION TO PREVENT DETERIORATION OF THE BINDINGS. BALES SHALL BE INSTALLED WITHIN A MINIMUM 4 INCH DEEP TRENCH LINE WITH ENDS OF ADJACENT BALES TIGHTLY ABUTTING ONE ANOTHER.

EROSION CONTROL MIX: SHALL BE INSTALLED PER THE DETAIL ON THE PLANS. THE MIX SHALL CONSIST PRIMARILY OF ORGANIC MATERIAL AND CONTAIN A WELL-GRADED MIXTURE OF PARTICLE SIZES AND MAY CONTAIN ROCKS LESS THAN 4 INCHES IN DIAMETER. THE MIX COMPOSITION SHALL MEET THE STANDARDS DESCRIBED WITHIN THE MDEP BEST MANAGEMENT PRACTICES. NO TRENCHING IS REQUIRED FOR INSTALLATION OF THIS BARRIER.

CONTINUOUS CONTAINED BERM: SHALL BE INSTALLED PER THE DETAIL ON THE PLANS. THIS SEDIMENT BARRIER IS EROSION CONTROL MIX PLACED WITHIN A SYNTHETIC TUBULAR NETTING AND PERFORMS AS A STURDY SEDIMENT BARRIER THAT WORKS WELL ON HARD GROUND SUCH AS FROZEN CONDITIONS, TRAVELED AREAS OR PAVEMENT. NO TRENCHING IS REQUIRED FOR INSTALLATION OF THIS BARRIER.

5. TEMPORARY CHECK DAMS:

SHALL BE INSTALLED PER THE DETAIL ON THE PLANS. CHECK DAMS ARE TO BE PLACED WITHIN DITCHES/ SWALES AS SPECIFIED ON THE DESIGN PLANS IMMEDIATELY AFTER FINAL GRADING. CHECK DAMS SHALL BE 2 FEET HIGH. TEMPORARY CHECK DAMS MAY BE REMOVED ONLY AFTER THE ROADWAYS ARE PAVED AND THE VEGETATED SWALE ARE ESTABLISHED WITH AT LEAST 85%-90% OF VIGOROUS PERENNIAL GROWTH. THE AREA BENEATH THE CHECK DAM MUST BE SEEDED AND MULCHED IMMEDIATELY AFTER REMOVAL OF THE CHECK DAM.

STONE CHECK DAMS: SHOULD BE CONSTRUCTED OF 2 TO 3 INCH STONE AND PLACED SUCH THAT COMPLETE COVERAGE OF THE SWALE IS OBTAINED AND THAT THE CENTER OF THE DAM IS 6 INCHES LOWER THAT THE OUTER EDGES.

HAY BALE CHECK DAMS: WE DO NOT RECOMMEND THE USE OF HAY BALES AS CHECK DAMS.

MANUFACTURED CHECK DAMS: MANUFACTURED CHECK DAMS, AS SPECIFIED IN THE DETAIL ON THE PLANS, MAY BE USED IF AUTHORIZED BY THE PROPER LOCAL, STATE OR FEDERAL REGULATING AGENCIES. THESE UNITS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURE'S RECOMMENDATIONS.

6. STORMDRAIN INLET PROTECTION:

INLET PROTECTION SHALL BE PLACED AROUND A STORMDRAIN DROP INLETOR CURB INLET PRIOR TO PERMANENT STABILIZATION OF THE IMMEDIATE AND UPSTREAM DISTURBED AREAS. THEY SHALL BE CONSTRUCTED IN A MANNER THAT WILL FACILITATE CLEAN-OUT AND DISPOSAL OF TRAPPED SEDIMENTS AND MINIMIZE INTERFERENCE WITH CONSTRUCTION ACTIVITIES. ANY RESULTANT PONDING OF WATER FROM THE PROTECTION METHOD MUST NOT CAUSE EXCESSIVE INCONVENIENCE OR DAMAGE TO ADJACENT AREAS OR STRUCTURES.

HAY BALE DROP INLET PROTECTION: WE DO NOT RECOMMEND THE USE OF HAY BALES AS INLET PROTECTION.

CONCRETE BLOCK AND STONE INLET SEDIMENT FILTER (DROP OR CURB INLET): SHALL BE INSTALLED PER THE DETAIL ON THE PLANS. THE HEIGHT OF THE CONCRETE BLOCK BARRIER CAN VARY BUT MUST BE BETWEEN 12 AND 24 INCHES TALL. A MINIMUM OF 1 INCH CRUSHED STONE SHALL BE USED.

MANUFACTURED SEDIMENT BARRIERS AND FILTER (DROP OR CURB INLET): MANUFACTURED FILTERS, AS SPECIFIED IN THE DETAIL ON THE PLANS, MAY BE USED IF INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

7. STABILIZED CONSTRUCTION ENTRANCE/EXIT:

PRIOR TO CLEARING AND/OR GRUBBING THE SITE A STABILIZED CONSTRUCTION ENTRANCE/EXIT SHALL BE CONSTRUCTED WHEREVER TRAFFIC WILL EXIT THE CONSTRUCTION SITE ONTO A PAVED ROADWAY IN ORDER TO MINIMIZE THE TRACKING OF SEDIMENT AND DEBRIS FROM THE CONSTRUCTION SITE ONTO PUBLIC ROADWAYS. THE ENTRANCES AND ADJACENT ROADWAY AREAS SHALL BE PERIODICALLY SWEPT OR WASHED TO FURTHER MINIMIZE THE TRACKING OF MUD, DUST OR DEBRIS FROM THE CONSTRUCTION AREA. STABILIZED CONSTRUCTION EXITS SHALL BE CONSTRUCTED IN AREAS SPECIFIED ON THE PLANS AND AS DETAILED ON THE PLANS.

8. DUST CONTROL:

DUST CONTROL DURING CONSTRUCTION SHALL BE ACHIEVED BY THE USE OF A WATERING TRUCK TO PERIODICALLY SPRINKLE THE EXPOSED ROADWAY AREAS AS NECESSARY TO REDUCE DUST DURING THE DRY MONTHS. APPLYING OTHER DUST CONTROL PRODUCTS SUCH AS CALCIUM CHLORIDE OR OTHER MANUFACTURED PRODUCTS ARE ALLOWED IF AUTHORIZED BY THE PROPER LOCAL, STATE AND/OR FEDERAL REGULATING AGENCIES. HOWEVER, IT IS THE CONTRACTOR'S ULTIMATE RESPONSIBILITY TO MITIGATE DUST AND SOIL LOSS FROM THE SITE.

9. TEMPORARY VEGETATION:

TEMPORARY VEGETATION SHALL BE APPLIED TO DISTURBED AREAS THAT WILL NOT RECEIVE FINAL GRADING FOR PERIODS UP TO 12 MONTHS. THIS PROCEDURE SHOULD BE USED EXTENSIVELY IN AREAS ADJACENT TO NATURAL RESOURCES. SEEDBED PREPARATION AND APPLICATION OF SEED SHALL BE CONDUCTED AS INDICATED IN THE PERMANENT VEGETATION SECTION OF THIS NARRATIVE. SPECIFIC SEEDS (FAST GROWING AND SHORT LIVING) SHALL BE SELECTED FROM THE MAINE EROSION AND SEDIMENT CONTROL BMP MANUAL DATED 3/2003 OR LATER. ALTERNATIVE EROSION CONTROL MEASURES SHOULD BE USED IF SEEDING CAN NOT BE DONE BEFORE SEPTEMBER 15TH OF THE CONSTRUCTION YEAR.

10. PERMANENT VEGETATION:

REVEGETATION MEASURES SHALL COMMENCE IMMEDIATELY UPON COMPLETION OF FINAL GRADING OF AREAS TO BE LOAMED AND SEEDED. THE APPLICATION OF SEED SHALL BE CONDUCTED BETWEEN APRIL 1ST AND OCTOBER 1ST OF THE CONSTRUCTION YEAR, PLEASE REFER TO THE WINTER EROSION CONTROL NOTES FOR MORE DETAIL. REVEGETATION MEASURES SHALL CONSIST OF THE FOLLOWING:

SEEDBED PREPARATION:

A. FOUR (4) INCHES OF LOAM SHALL BE SPREAD OVER DISTURBED AREAS AND SMOOTHED TO A UNIFORM SURFACE. LOAM SHALL BE FREE OF SUBSOIL, CLAY LUMPS, STONES AND OTHER OBJECTS OVER 2 INCHES OR LARGER IN ANY DIMENSION, AND WITHOUT WEEDS, ROOTS OR OTHER OBJECTIONABLE MATERIAL.

B. SOILS TESTS SHALL BE TAKEN AT THE TIME OF SOIL STRIPPING TO DETERMINE FERTILIZATION REQUIREMENTS. SOILS TESTS SHALL BE TAKEN PROMPTLY AS TO NOT INTERFERE WITH THE 14-DAY LIMIT ON SOIL EXPOSURE. BASED UPON TEST RESULTS, SOIL AMENDMENTS SHALL BE INCORPORATED INTO THE SOIL PRIOR TO FINAL SEEDING. IN LIEU OF SOIL TESTS, SOIL AMENDMENTS MAY BE APPLIED AS FOLLOWS:

ITEM	APPLICATION RATE
10-20-20 FERTILIZER (N-P205-K20 OR EQUAL)	18.4 LBS./1,000 S.F.
GROUND LIMESTONE (50% CALCIUM & MAGNESIUM OXIDE)	138 LBS./1,000 S.F.

C. WORK LIME AND FERTILIZER INTO THE SOIL AS NEARLY AS PRACTICAL TO A DEPTH OF 4 INCHES WITH PROPER EQUIPMENT. ROLL THE AREA TO FIRM THE SEEDBED EXCEPT ON CLAY OR SILTY SOILS OR COARSE SAND.

APPLICATION OF SEED:

A. SEEDING: SHALL BE CONDUCTED BETWEEN APRIL 1ST AND OCTOBER 1ST OF THE CONSTRUCTION YEAR. GENERALLY A SEED MIXTURE MAY BE APPLIED AS FOLLOWS:

MDOT SEEDING METHOD NO.1- PARK MIXTURE
MDOT SEEDING METHOD NO.3- ROADSIDE MIXTURE NO.3

NOTE: A SPECIFIC SEED MIXTURE SHOULD BE CHOSEN TO MATCH THE SOILS CONDITION OF THE SITE. VARIOUS AGENCIES CAN RECOMMEND SEED MIXTURES. MDEP RECOMMENDED SEED MIXTURES ARE IN THE EROSION AND SEDIMENT CONTROL BMP MANUAL DATED 3/2003 OR LATER.

B. HYDROSEEDING: SHALL BE CONDUCTED ON PREPARED AREAS WITH SLOPES LESS THAN 2:1. LIME AND FERTILIZER MAY BE APPLIED SIMULTANEOUSLY WITH THE SEED. RECOMMENDED SEEDING RATES MUST BE INCREASED BY 10% WHEN HYDROSEEDING.

C. MULCHING: SHALL COMMENCE IMMEDIATELY AFTER SEED IS APPLIED. REFER TO THE TEMPORARY MULCHING SECTION OF THIS NARRATIVE FOR DETAILS.

SODDING:

FOLLOWING SEEDBED PREPARATION, SOD CAN BE APPLIED IN LIEU OF SEEDING IN AREAS WHERE IMMEDIATE VEGETATION IS MOST BENEFICIAL SUCH AS DITCHES, AROUND STORMWATER DROP INLETS AND AREAS OF AESTHETIC VALUE. SOD SHOULD BE LAID AT RIGHT ANGLES TO THE DIRECTION OF FLOW, STARTING AT THE LOWEST ELEVATION. SOD SHOULD BE ROLLED OR TAMPED DOWN TO EVEN OUT THE JOINTS ONCE LAID DOWN. WHERE FLOW IS PREVALENT THE SOD MUST BE PROPERLY ANCHORED DOWN. IRRIGATE THE SOD IMMEDIATELY AFTER INSTALLATION. IN MOST CASES, SOD CAN BE ESTABLISHED BETWEEN APRIL 1ST AND NOVEMBER 15TH OF THE CONSTRUCTION YEAR, HOWEVER, REFER TO THE WINTER EROSION CONTROL NOTES FOR ANY ACTIVITIES AFTER OCTOBER 1ST.

TRENCH DEWATERING AND TEMPORARY STREAM DIVERSION:

WATER FROM CONSTRUCTION TRENCH DEWATERING OR TEMPORARY STREAM DIVERSION WILL PASS FIRST THROUGH A FILTER BAG OR SECONDARY CONTAINMENT STRUCTURE (E.G. HAY BALE LINED POOL) PRIOR TO DISCHARGE. THE DISCHARGE SITE SHALL BE SELECTED TO AVOID FLOODING AND SEDIMENT DISCHARGES TO A PROTECTED RESOURCE. IN NO CASE SHALL THE FILTER BAG OR CONTAINMENT STRUCTURE BE LOCATED WITHIN 100 FEET OF A PROTECTED NATURAL RESOURCE.

STANDARDS FOR TIMELY STABILIZATION:

STANDARD FOR THE TIMELY STABILIZATION OF DISTURBED SLOPES -- THE CONTRACTOR WILL CONSTRUCT AND STABILIZE STONE-COVERED SLOPES BY NOVEMBER 15. THE CONTRACTOR WILL SEED AND MULCH ALL SLOPES TO BE VEGETATED BY SEPTEMBER 15. THE MDEP WILL CONSIDER ANY AREA HAVING A GRADE GREATER THAN 15% (10H:1V) TO BE A SLOPE. IF THE CONTRACTOR FAILS TO STABILIZE ANY SLOPE TO BE VEGETATED BY SEPTEMBER 15, 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 1 THE CONTRACTOR WILL SEED THE DISTURBED SLOPE WITH WINTER RYE AT A SEEDING RATE OF 3 POUNDS PER 1,000 SQUARE FEET AND APPLY EROSION CONTROL MATS OVER THE MULCHED SLOPE. THE CONTRACTOR WILL MONITOR GROWTH OF THE RYE OVER THE NEXT 30 DAYS. IF THE RYE FAILS TO GROW AT LEAST THREE INCHES OR COVER AT LEAST 75% OF THE DISTURBED SLOPE BY NOVEMBER 1, THEN THE APPLICANT WILL COVER THE SLOPE WITH A LAYER OF WOOD WASTE COMPOST AS DESCRIBED IN ITEM 2(C.) OF THIS STANDARD OR WITH STONE RIPRAP AS DESCRIBED IN ITEM 2(D.) OF THIS STANDARD.
B. STABILIZE THE SLOPE WITH SOD -- THE CONTRACTOR WILL STABILIZE THE DISTURBED SLOPE WITH PROPERLY INSTALLED SOD BY OCTOBER 1. PROPER INSTALLATION INCLUDES THE APPLICANT PINNING THE SOD ONTO THE SLOPE WITH WIRE PINS, ROLLING THE SOD TO GUARANTEE CONTACT BETWEEN THE SOD AND UNDERLYING SOIL, AND WATERING THE SOD TO PROMOTE ROOT GROWTH INTO THE DISTURBED SOIL. THE APPLICANT WILL NOT USE LATE-SEASON SOD INSTALLATION TO STABILIZE SLOPES HAVING A GRADE GREATER THAN 33% (3H:1V).
C. STABILIZE THE SLOPE WITH WOOD WASTE COMPOST -- THE CONTRACTOR WILL PLACE A SIX-INCH LAYER OF WOOD WASTE COMPOST ON THE SLOPE BY NOVEMBER 15. PRIOR TO PLACING THE WOOD WASTE COMPOST, THE APPLICANT WILL REMOVE ANY SNOW ACCUMULATION ON THE DISTURBED SLOPE. THE APPLICANT WILL NOT USE WOOD WASTE COMPOST TO STABILIZE SLOPES HAVING GRADES GREATER THAN 50% (2H:1V) OR HAVING GROUNDWATER SEEPS ON THE SLOPE FACE.
D. STABILIZE THE SLOPE WITH STONE RIPRAP -- THE CONTRACTOR WILL PLACE A LAYER OF STONE RIPRAP ON THE SLOPE BY NOVEMBER 15. THE APPLICANT WILL HIRE A REGISTERED PROFESSIONAL ENGINEER TO DETERMINE THE STONE SIZE NEEDED FOR STABILITY AND TO DESIGN A FILTER LAYER FOR UNDERNEATH THE RIPRAP.

STANDARD FOR THE TIMELY STABILIZATION OF DISTURBED SOILS -- BY SEPTEMBER 15 THE CONTRACTOR WILL SEED AND MULCH ALL DISTURBED SOILS ON AREAS HAVING A SLOPE LESS THAN 15%. 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 1 THE CONTRACTOR WILL SEED THE DISTURBED SOIL WITH WINTER RYE AT A SEEDING RATE OF 3 POUNDS PER 1000 SQUARE FEET, LIGHTLY MULCH THE SEEDED SOIL WITH HAY OR STRAW AT 75 POUNDS PER 1000 SQUARE FEET, AND ANCHOR THE MULCH WITH PLASTIC NETTING. THE APPLICANT WILL MONITOR GROWTH OF THE RYE OVER THE NEXT 30 DAYS. IF THE RYE FAILS TO GROW AT LEAST THREE INCHES OR COVER AT LEAST 75% OF THE DISTURBED SOIL BEFORE NOVEMBER 15, THEN THE APPLICANT WILL MULCH THE AREA FOR OVER-WINTER PROTECTION AS DESCRIBED IN ITEM 3(C.) OF THIS STANDARD.
B. STABILIZE THE SOIL WITH SOD -- THE APPLICANT WILL STABILIZE THE DISTURBED SOIL WITH PROPERLY INSTALLED SOD BY OCTOBER 1. PROPER INSTALLATION INCLUDES THE APPLICANT 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 15 THE APPLICANT WILL MULCH THE DISTURBED SOIL BY SPREADING HAY OR STRAW AT A RATE OF AT LEAST 150 POUNDS PER 1000 SQUARE FEET ON THE AREA SO THAT NO SOIL IS VISIBLE THROUGH THE MULCH. PRIOR TO APPLYING THE MULCH, THE APPLICANT WILL REMOVE ANY SNOW ACCUMULATION ON THE DISTURBED AREA. IMMEDIATELY AFTER APPLYING THE MULCH, THE APPLICANT WILL ANCHOR THE MULCH WITH PLASTIC NETTING TO PREVENT WIND FROM MOVING THE MULCH OFF THE DISTURBED SOIL.

CONSTRUCTION SCHEDULE

SITE IMPROVEMENTS WILL MOST LIKELY BEGIN IN SPRING/SUMMER 2016 DEPENDING UPON FINAL PROJECT APPROVAL. THE FOLLOWING SCHEDULE IS ANTICIPATED FOR THE CONSTRUCTION OF THE SITE IMPROVEMENTS.

SCHEDULE

1. ESTIMATED CONSTRUCTION TIME:	16 MONTHS
*2. EROSION CONTROL MEASURES PLACED.	WEEK 1 - WEEK 15
3. SITE CLEARING AND GRUBBING.	WEEK 2 - WEEK 8
4. BUILDING CONSTRUCTION	WEEK 8 - WEEK 72
5. CONSTRUCTION OF PARKING SUBBASE FOR ACCESS.	WEEK 4 - WEEK 12
6. STORMWATER MANAGEMENT AREA CONSTRUCTION.	WEEK 6 - WEEK 12
7. UTILITY IMPROVEMENTS	WEEK 8 - WEEK 12
8. PARKING BASE AND BINDER PAVEMENT	WEEK 12 - WEEK 14
9. STABILIZE FOR WINTER	OCTOBER 31 OF CONSTRUCTION YEAR
10. LANDSCAPING AND SEEDING	WEEK 66 - 67
11. CONSTRUCTION OF FINISH PAVEMENT	WEEK 68
12. FINAL SEEDING ON PREPARED AREAS. (DURING GROWING SEASON.)	WEEK 64 - WEEK 68
13. BIWEEKLY MONITORING OF VEGETATIVE GROWTH.	WEEK 41 - WEEK 72
** 14. RE-SEEDING OF AREAS, IF NEEDED.	WEEK 52 - WEEK 72
** 15. REMOVAL OF EROSION CONTROL DEVICES.	UPON FINAL PROJECT COMPLETION AND STABILIZATION

** DATES ARE SUBJECT TO CHANGE AT THE DISCRETION OF THE ENGINEER, DEPENDING ON CONSTRUCTION PROGRESS.

INSPECTIONS/MONITORING:

1. MAINTENANCE MEASURES SHALL BE APPLIED AS NEEDED DURING THE ENTIRE CONSTRUCTION CYCLE. AFTER EACH RAINFALL, SNOW STORM OR PERIOD OF THAWING AND RUNOFF, OR AT LEAST EVERY SEVEN (7) DAYS, THE CONTRACTOR SHALL PERFORM A VISUAL INSPECTION OF ALL INSTALLED EROSION CONTROL MEASURES. THE CONTRACTOR SHALL PERFORM REPAIRS AS NEEDED TO ALLOW CONTINUED PROPER FUNCTIONING OF THE EROSION CONTROL MEASURE. THE CONTRACTOR SHALL PROVIDE THE NECESSARY REGULATING AGENCIES WITH WRITTEN DOCUMENTATION DESCRIBING DATES OF INSPECTIONS AND NECESSARY FOLLOW-UP WORK TO MAINTAIN EROSION CONTROL MEASURES MEETING THE REQUIREMENTS OF THIS PLAN.

2. FOLLOWING THE TEMPORARY AND/OR FINAL SEEDINGS, THE CONTRACTOR SHALL INSPECT THE WORK AREA SEMIMONTHLY UNTIL THE SEEDINGS HAVE BEEN ESTABLISHED. ESTABLISHED MEANS A MINIMUM OF 85%-90% OF AREAS VEGETATED WITH VIGOROUS GROWTH. RESEEDING SHALL BE CARRIED OUT BY THE CONTRACTOR WITH FOLLOW-UP INSPECTIONS IN THE EVENT OF ANY FAILURES UNTIL VEGETATION IS ADEQUATELY ESTABLISHED.

HOUSEKEEPING:

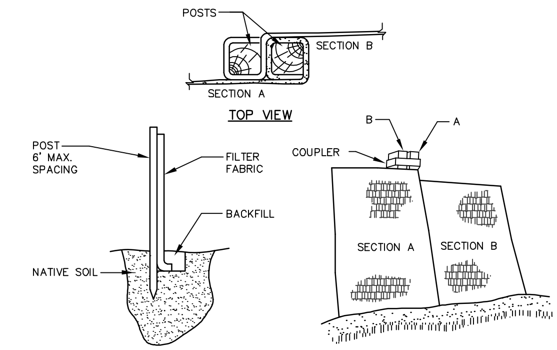
A. SPILL PREVENTION: CONTROLS MUST BE USED TO PREVENT POLLUTANTS FROM BEING DISCHARGED FROM MATERIALS ON-SITE, INCLUDING STORAGE PRACTICES TO MINIMIZE EXPOSURE OF THE MATERIALS TO STORMWATER, AND APPROPRIATE SPILL PREVENTION, CONTAINMENT, AND RESPONSE PLANNING AND IMPLEMENTATION.

B. 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.

C. FUGITIVE SEDIMENT AND DUST: ACTIONS MUST BE TAKEN TO INSURE 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.

D. DEBRIS AND OTHER MATERIALS: LITTER, CONSTRUCTION DEBRIS, AND CHEMICALS EXPOSED TO STORMWATER MUST BE PREVENTED FROM BECOMING A POLLUTANT SOURCE.

E. TRENCH DEWATERING: TRENCH DEWATERING IS THE REMOVAL OF WATER FROM TRENCHES, FOUNDATIONS, COFFERDAMS, 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 MUST BE REMOVED FROM THE PONDED AREA, EITHER THROUGH GRAVITY OR PUMPING, AND 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.



INSTALLATION:

1. EXCAVATE A 6"x 6" TRENCH ALONG THE LINE OF PLACEMENT FOR THE FILTER BARRIER.
2. UNROLL A SECTION AT A TIME AND POSITION THE POSTS AGAINST THE BACK (DOWNSTREAM) WALL OF THE TRENCH.
3. DRIVE POSTS INTO THE GROUND UNTIL APPROXIMATELY 2" OF FABRIC IS LYING ON THE TRENCH BOTTOM.
4. LAY THE TOE-IN FLAP OF FABRIC ONTO THE UNDISTURBED BOTTOM OF THE TRENCH, BACKFILL THE TRENCH AND TAMP THE SOIL. TOE-IN CAN ALSO BE ACCOMPLISHED BY LAYING THE FABRIC FLAP ON UNDISTURBED GROUND AND PILING AND TAMPING FILL AT THE BASE, BUT MUST BE ACCOMPANIED BY AN INTERCEPTION DITCH.
5. JOIN SECTION AS SHOWN ABOVE.
6. BARRIER SHALL BE MIRAFI SILT FENCE OR EQUAL.

FILTER BARRIER
NOT TO SCALE

WINTER EROSION CONTROL MEASURES:

THE WINTER CONSTRUCTION PERIOD IS FROM OCTOBER 1 THROUGH APRIL 15. IF THE CONSTRUCTION SITE IS NOT STABILIZED WITH PAVEMENT, A ROAD GRAVEL BASE, 75% MATURE VEGETATION COVER OR RIPRAP BY NOVEMBER 15 THEN THE SITE NEEDS TO BE PROTECTED WITH OVER-WINTER STABILIZATION. AN AREA CONSIDERED OPEN IS ANY AREA NOT STABILIZED WITH PAVEMENT, VEGETATION, MULCHING, EROSION CONTROL MATS, RIPRAP OR GRAVEL BASE ON A ROAD.
WINTER EXCAVATION AND EARTHWORK SHALL BE COMPLETED SUCH THAT NO MORE THAN 1 ACRE OF THE SITE IS WITHOUT STABILIZATION AT ANY ONE TIME. LIMIT THE EXPOSED AREA TO THOSE AREAS IN WHICH WORK IS EXPECTED TO BE UNDER TAKEN DURING THE PROCEEDING 15 DAYS AND THAT CAN BE MULCHED IN ONE DAY PRIOR TO ANY SNOW EVENT.
ALL AREAS SHALL BE CONSIDERED TO BE DENUDED UNTIL THE SUBBASE GRAVEL IS INSTALLED IN ROADWAY AREAS OR THE AREAS OF FUTURE LOAM AND SEED HAVE BEEN LOAMED, SEEDED AND MULCHED. HAY AND STRAW MULCH RATE SHALL BE A MINIMUM OF 150 LBS./1,000 S.F. (3 TONS/ACRE) AND SHALL BE PROPERLY ANCHORED.
THE CONTRACTOR MUST INSTALL ANY ADDED MEASURES WHICH MAY BE NECESSARY TO CONTROL EROSION/SEDIMENTATION FROM THE SITE DEPENDENT UPON THE ACTUAL SITE AND WEATHER CONDITIONS.
CONTINUATION OF EARTHWORK OPERATIONS ON ADDITIONAL AREAS SHALL NOT BEGIN UNTIL THE EXPOSED SOIL SURFACE ON THE AREA BEING WORKED HAS BEEN STABILIZED, IN ORDER TO MINIMIZE AREAS WITHOUT EROSION CONTROL PROTECTION.

1. SOIL STOCKPILES

STOCKPILES OF SOIL OR SUBSOIL WILL BE MULCHED FOR OVER WINTER PROTECTION WITH HAY OR STRAW AT TWICE THE NORMAL RATE OR AT 150 LBS/1,000 S.F. (3 TONS PER ACRE) OR WITH A FOUR-INCH LAYER OF WOOD WASTE EROSION CONTROL MIX. THIS WILL BE DONE WITHIN 24 HOURS OF STOCKING AND RE-ESTABLISHED PRIOR TO ANY RAINFALL OR SNOWFALL.
ANY SOIL STOCKPILE WILL NOT BE PLACED (EVEN COVERED WITH HAY OR STRAW) WITHIN 100 FEET FROM ANY NATURAL RESOURCES.

2. NATURAL RESOURCES PROTECTION

ANY AREAS WITHIN 100 FEET FROM ANY NATURAL RESOURCES, IF NOT STABILIZED WITH A MINIMUM OF 75% MATURE VEGETATION CATCH, SHALL BE MULCHED BY DECEMBER 1 AND ANCHORED WITH PLASTIC NETTING OR PROTECTED WITH EROSION CONTROL MATS.
DURING WINTER CONSTRUCTION, A DOUBLE LINE OF SEDIMENT BARRIERS (I.E. SILT FENCE BACKED WITH HAY BALES OR EROSION CONTROL MIX) WILL BE PLACED BETWEEN ANY NATURAL RESOURCE AND THE DISTURBED AREA.
PROJECTS CROSSING THE NATURAL RESOURCE SHALL BE PROTECTED A MINIMUM DISTANCE OF 100 FEET ON EITHER SIDE FROM THE RESOURCE. EXISTING PROJECTS NOT STABILIZED BY DECEMBER 1 SHALL BE PROTECTED WITH THE SECOND LINE OF SEDIMENT BARRIER TO ENSURE FUNCTIONALITY DURING THE SPRING THAW AND RAINS.

3. SEDIMENT BARRIERS

DURING FROZEN CONDITIONS, SEDIMENT BARRIERS SHALL CONSIST OF WOOD WASTE FILTER BERMS AS FROZEN SOIL PREVENTS THE PROPER INSTALLATION OF HAY BALES AND SEDIMENT SILT FENCES.

4. MULCHING

ALL AREA SHALL BE CONSIDERED TO BE DENUDED UNTIL AREAS OF FUTURE LOAM AND SEED HAVE BEEN LOAMED, SEEDED AND MULCHED. HAY AND STRAW MULCH SHALL BE APPLIED AT A RATE OF 150 LB. PER 1.000 SQUARE FEET OR 3 TONS/ACRE (TWICE THE NORMAL ACCEPTED RATE OF 75-LBS./1,000 S.F. OR 1.5 TONS/ACRE) AND SHALL BE PROPERLY ANCHORED.
MULCH SHALL NOT BE SPREAD ON TOP OF SNOW. THE SNOW WILL BE REMOVED DOWN TO A ONE-INCH DEPTH OR LESS PRIOR TO APPLICATION.
AFTER EACH DAY OF FINAL GRADING, THE AREA WILL BE PROPERLY STABILIZED WITH ANCHORED HAY OR STRAW OR EROSION CONTROL MATTING.
AN AREA SHALL BE CONSIDERED TO HAVE BEEN STABILIZED WHEN EXPOSED SURFACES HAVE BEEN EITHER MULCHED WITH STRAW OR HAY AT A RATE OF 150 LB. PER 1.000 SQUARE FEET (3TONS/ACRE) AND ADEQUATELY ANCHORED THAT GROUND SURFACE IS NOT VISIBLE THOUGH THE MULCH.

BETWEEN THE DATES OF SEPTEMBER 1 AND APRIL 15, ALL MULCH SHALL BE ANCHORED BY EITHER PEG LINE, MULCH NETTING, ASPHALT EMULSION CHEMICAL, TRACK OR WOOD CELLULOSE FIBER. WHEN GROUND SURFACE IS NOT VISIBLE THOUGH THE MULCH THEN COVER IS SUFFICIENT.
AFTER NOVEMBER 1ST, MULCH AND ANCHORING OF ALL BARE SOIL SHALL OCCUR AT THE END OF EACH FINAL GRADING WORK DAY.

5. MULCHING ON SLOPES AND DITCHES

SLOPES SHALL NOT BE LEFT EXPOSED FOR ANY EXTENDED TIME OF WORK SUSPENSION UNLESS FULLY MULCHED AND ANCHORED WITH PEG AND NETTING OR WITH EROSION CONTROL BLANKETS.
MULCHING SHALL BE APPLIED AT A RATE OF 230 LBS/1,000 S.F. ON ALL SLOPES GREATER THAN 8%.
MULCH NETTING SHALL BE USED TO ANCHOR MULCH IN ALL DRAINAGE WAYS WITH A SLOPE GREATER THAN 3% FOR SLOPES EXPOSED TO DIRECT WINDS AND FOR ALL OTHER SLOPES GREATER THAN 8%.
EROSION CONTROL BLANKETS SHALL BE USED IN LIEU OF MULCH IN ALL DRAINAGE WAYS WITH SLOPES 8%.
EROSION CONTROL MIX CAN BE USED TO SUBSTITUTE EROSION CONTROL BLANKETS ON ALL SLOPES EXCEPT DITCHES.

6. SEEDING

BETWEEN THE DATES OF OCTOBER 15 AND APRIL 1ST, LOAM OR SEED WILL NOT BE REQUIRED. DURING PERIODS OF ABOVE FREEZING TEMPERATURES FINISHED AREAS SHALL BE FINE GRADED AND EITHER PROTECTED WITH MULCH OR TEMPORARILY SEEDED AND MULCHED UNTIL SUCH TIME AS THE FINAL TREATMENT CAN BE APPLIED. IF THE DATE IS AFTER NOVEMBER 1ST AND IF THE EXPOSED AREA HAS BEEN LOOMED, FINAL GRADED WITH A UNIFORM SURFACE, THEN THE AREA MAY BE DORMANT SEEDED AT A RATE OF 3 TIMES HIGHER THAN SPECIFIED FOR PERMANENT SEED AND THEN MULCHED.
DORMANT SEEDING MAY BE SELECTED TO BE PLACED PRIOR TO THE PLACEMENT OF MULCH AND FABRIC NETTING ANCHORED WITH STAPLES.
IF DORMANT SEEDING IS USED FOR THE SITE, ALL DISTURBED AREAS SHALL RECEIVE 4' OF LOAM AND SEED AT AN APPLICATION RATE OF 5LBS/1000 S.F. ALL AREAS SEEDED DURING THE WINTER WILL BE INSPECTED IN THE SPRING FOR ADEQUATE CATCH. ALL AREAS SUFFICIENTLY VEGETATED (LESS THAN 75% CATCH) SHALL BE REVEGETATED BY REPLACING LOAM, SEED AND MULCH. IF DORMANT SEEDING IS NOT USED FOR THE SITE, ALL DISTURBED AREAS SHALL BE REVEGETATED IN THE SPRING.

7. TRENCH DEWATERING AND TEMPORARY STREAM DIVERSION

WATER FROM CONSTRUCTION TRENCH DEWATERING OR TEMPORARY STREAM DIVERSION WILL PASS FIRST THROUGH A FILTER BAG OR SECONDARY CONTAINMENT STRUCTURE (E.G. HAY BALE LINED POOL) PRIOR TO DISCHARGE. THE DISCHARGE SITE SHALL BE SELECTED TO AVOID FLOODING, ICING, AND SEDIMENT DISCHARGES TO A PROTECTED RESOURCE. IN NO CASE SHALL THE FILTER BAG OR CONTAINMENT STRUCTURE BE LOCATED WITHIN 100 FEET OF A PROTECTED NATURAL RESOURCE.

8. INSPECTION AND MONITORING

MAINTENANCE MEASURES SHALL BE APPLIED AS NEEDED DURING THE ENTIRE CONSTRUCTION SEASON. AFTER EACH RAINFALL, SNOW STORM OR PERIOD OF THAWING AND RUNOFF, THE SITE CONTRACTOR SHALL PERFORM A VISUAL INSPECTION OF ALL INSTALLED EROSION CONTROL MEASURES AND PERFORM REPAIRS AS NEEDED TO INSURE THEIR CONTINUOUS FUNCTION.
FOLLOWING THE TEMPORARY AND OR FINAL SEEDING AND MULCHING, THE CONTRACTOR SHALL IN THE SPRING INSPECT AND REPAIR ANY DAMAGES AND/ OR UNESTABLISHED SPOTS. ESTABLISHED VEGETATIVE COVER MEANS A MINIMUM OF 85 TO 90% OF AREAS VEGETATED WITH VIGOROUS GROWTH.

STANDARDS FOR TIMELY STABILIZATION OF CONSTRUCTION SITES DURING WINTER

1. STANDARD FOR THE TIMELY STABILIZATION OF DITCHES AND CHANNELS -- THE APPLICANT WILL CONSTRUCT AND STABILIZE ALL STONE-LINED DITCHES AND CHANNELS ON THE SITE BY NOVEMBER 15. THE APPLICANT WILL CONSTRUCT AND STABILIZE ALL GRASS-LINED DITCHES AND CHANNELS ON THE SITE BY SEPTEMBER 15. IF THE APPLICANT FAILS TO STABILIZE A DITCH OR CHANNEL TO BE GRASS-LINED BY SEPTEMBER 15, THEN THE APPLICANT WILL TAKE ONE OF THE FOLLOWING ACTIONS TO STABILIZE THE DITCH FOR LATE FALL AND WINTER.

INSTALL A SOD LINING IN THE DITCH -- THE APPLICANT WILL LINE THE DITCH WITH PROPERLY INSTALLED SOD BY OCTOBER 1. PROPER INSTALLATION INCLUDES THE APPLICANT PINNING THE SOD ONTO THE SOIL WITH WIRE PINS, ROLLING THE SOD TO GUARANTEE CONTACT BETWEEN THE SOD AND UNDERLYING SOIL, WATERING THE SOD TO PROMOTE ROOT GROWTH INTO THE DISTURBED SOIL, AND ANCHORING THE SOD WITH JUTE OR PLASTIC MESH TO PREVENT THE SOD STRIPS FROM SLOUGHING DURING FLOW CONDITIONS.
INSTALL A STONE LINING IN THE DITCH --THE APPLICANT WILL LINE THE DITCH WITH STONE RIPRAP BY NOVEMBER 15. THE APPLICANT WILL HIRE A REGISTERED PROFESSIONAL ENGINEER TO DETERMINE THE STONE SIZE AND LINING THICKNESS NEEDED TO WITHSTAND THE ANTICIPATED FLOW VELOCITIES AND FLOW DEPTHS WITHIN THE DITCH. IF NECESSARY, THE APPLICANT WILL REGRADE THE DITCH PRIOR TO PLACING THE STONE LINING SO TO PREVENT THE STONE LINING FROM REDUCING THE DITCH'S CROSS-SECTIONAL AREA.

2. STANDARD FOR THE TIMELY STABILIZATION OF DISTURBED SLOPES -- THE APPLICANT WILL CONSTRUCT AND STABILIZE STONE-COVERED SLOPES BY NOVEMBER 15. THE APPLICANT WILL SEED AND MULCH ALL SLOPES TO BE VEGETATED BY SEPTEMBER 15. THE DEPARTMENT WILL CONSIDER ANY AREA HAVING A GRADE GREATER THAN 15% (10H:1V) TO BE A SLOPE. IF THE APPLICANT FAILS TO STABILIZE ANY SLOPE TO BE VEGETATED BY SEPTEMBER 15, THEN THE APPLICANT WILL TAKE ONE OF THE FOLLOWING ACTIONS TO STABILIZE THE SLOPE FOR LATE FALL AND WINTER.
STABILIZE THE SOIL WITH TEMPORARY VEGETATION AND EROSION CONTROL MATS -- BY OCTOBER 1 THE APPLICANT WILL SEED THE DISTURBED SLOPE WITH WINTER RYE AT A SEEDING RATE OF 3 POUNDS PER 1000 SQUARE FEET AND APPLY EROSION CONTROL MATS OVER THE MULCHED SLOPE. THE APPLICANT WILL MONITOR GROWTH OF THE RYE OVER THE NEXT 30 DAYS. IF THE RYE FAILS TO GROW AT LEAST THREE INCHES OR COVER AT LEAST 75% OF THE DISTURBED SLOPE BY NOVEMBER 1, THEN THE APPLICANT WILL COVER THE SLOPE WITH A LAYER OF WOOD WASTE COMPOST AS DESCRIBED IN ITEM III OF THIS CONDITION OR WITH STONE RIPRAP AS DESCRIBED IN ITEM IV OF THIS CONDITION.
STABILIZE THE SLOPE WITH SOD -- THE APPLICANT WILL STABILIZE THE DISTURBED SLOPE WITH PROPERLY INSTALLED SOD BY OCTOBER 1. PROPER INSTALLATION INCLUDES THE APPLICANT PINNING THE SOD ONTO THE SLOPE WITH WIRE PINS, ROLLING THE SOD TO GUARANTEE CONTACT BETWEEN THE SOD AND UNDERLYING SOIL, AND WATERING THE SOD TO PROMOTE ROOT GROWTH INTO THE DISTURBED SOIL. THE APPLICANT WILL NOT USE LATE-SEASON SOD INSTALLATION TO STABILIZE SLOPES HAVING A GRADE GREATER THAN 33% (3H:1V).
STABILIZE THE SLOPE WITH WOOD WASTE COMPOST -- THE APPLICANT WILL PLACE A SIX-INCH LAYER OF WOOD WASTE COMPOST ON THE SLOPE BY NOVEMBER 15. PRIOR TO PLACING THE WOOD WASTE COMPOST, THE APPLICANT WILL REMOVE ANY SNOW ACCUMULATION ON THE DISTURBED SLOPE. THE APPLICANT WILL NOT USE WOOD WASTE COMPOST TO STABILIZE SLOPES HAVING GRADES GREATER THAN 50% (2H:1V) OR HAVING GROUNDWATER SEEPS ON THE SLOPE FACE.
STABILIZE THE SLOPE WITH STONE RIPRAP -- THE APPLICANT WILL PLACE A LAYER OF STONE RIPRAP ON THE SLOPE BY NOVEMBER 15. THE APPLICANT WILL HIRE A REGISTERED PROFESSIONAL ENGINEER TO DETERMINE THE STONE SIZE NEEDED FOR STABILITY AND TO DESIGN A FILTER LAYER FOR UNDERNEATH THE RIPRAP.

3. STANDARD FOR THE TIMELY STABILIZATION OF DISTURBED SOILS -- BY SEPTEMBER 15 THE APPLICANT WILL SEED AND MULCH ALL DISTURBED SOILS ON AREAS HAVING A SLOPE LESS THAN 15%. IF THE APPLICANT FAILS TO STABILIZE THESE SOILS BY THIS DATE, THEN THE APPLICANT WILL TAKE ONE OF THE FOLLOWING ACTIONS TO STABILIZE THE SOIL FOR LATE FALL AND WINTER.
STABILIZE THE SOIL WITH TEMPORARY VEGETATION -- BY OCTOBER 1 THE APPLICANT WILL SEED THE DISTURBED SOIL WITH WINTER RYE AT A SEEDING RATE OF 3 POUNDS PER 1000 SQUARE FEET, LIGHTLY MULCH THE SEEDED SOIL WITH HAY OR STRAW AT 75 POUNDS PER 1000 SQUARE FEET, AND ANCHOR THE MULCH WITH PLASTIC NETTING. THE APPLICANT WILL MONITOR GROWTH OF THE RYE OVER THE NEXT 30 DAYS. IF THE RYE FAILS GROW AT LEAST THREE INCHES OR COVER AT LEAST 75% OF THE DISTURBED SOIL BEFORE NOVEMBER 15, THEN THE APPLICANT WILL MULCH THE AREA FOR OVER-WINTER PROTECTION AS DESCRIBED IN ITEM III OF THIS STANDARD.
STABILIZE THE SOIL WITH SOD -- THE APPLICANT WILL STABILIZE THE DISTURBED SOIL WITH PROPERLY INSTALLED SOD BY OCTOBER 1. PROPER INSTALLATION INCLUDES THE APPLICANT 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.
STABILIZE THE SOIL WITH MULCH -- BY NOVEMBER 15 THE APPLICANT WILL MULCH THE DISTURBED SOIL BY SPREADING HAY OR STRAW AT A RATE OF AT LEAST 150 POUNDS PER 1000 SQUARE FEET ON THE AREA SO THAT NO SOIL IS VISIBLE THROUGH THE MULCH. PRIOR TO APPLYING THE MULCH, THE APPLICANT WILL REMOVE ANY SNOW ACCUMULATION ON THE DISTURBED AREA. IMMEDIATELY AFTER APPLYING THE MULCH, THE APPLICANT WILL ANCHOR THE MULCH WITH PLASTIC NETTING TO PREVENT WIND FROM MOVING THE MULCH OFF THE DISTURBED SOIL.

9-18-15

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PDO	RAM

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A	RAM	9-18-15	PLAN SUBMISSION TO CITY OF PORTLAND

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DETAILS
OF:
PORTLAND RETIREMENT RESIDENCE
802 OCEAN AVENUE
PORTLAND, ME
FOR:
HAWTHORN DEVELOPMENT GROUP, LLC
9310 NE VANCOUVER MALL DR., STE200
VANCOUVER, WA 98662-8210

PROJECT NO.	SCALE
14432	NTS

SHEET 9 OF 14

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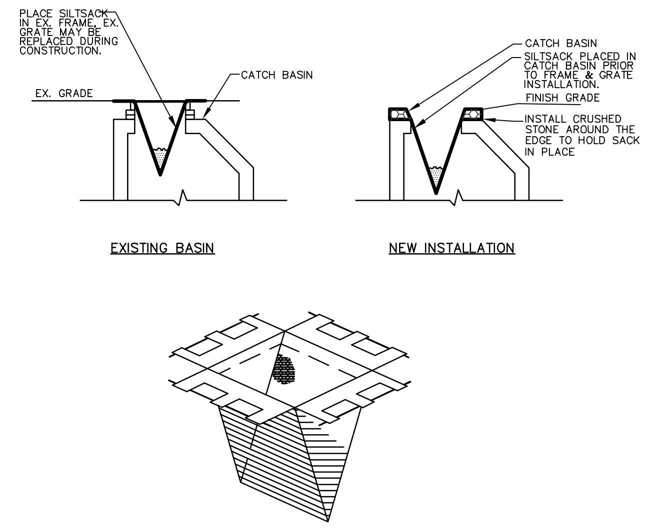
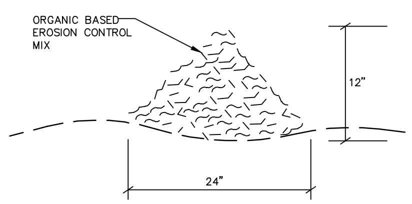


NOTES:
PRIOR TO FINAL GRADING AND PAVING OPERATIONS BEGIN A CATCH BASIN INSERT (SUCH AS A SILT SACK OR A DANDY BAG II) MUST BE INSTALLED IN EACH BASIN PER MANUFACTURES INSTRUCTIONS. HAY BALES SHOULD BE REMOVED ONCE INSERTS ARE INSTALLED.

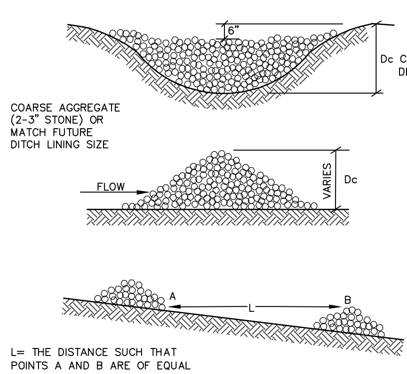
1 CATCH BASIN PROTECTION DETAIL (FOR PAVED AREAS)
NOT TO SCALE



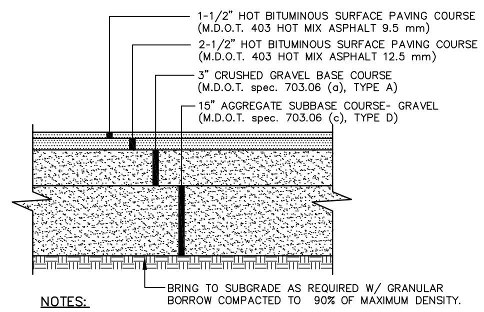
COMPOSITION
EROSION CONTROL MIX SHALL BE MANUFACTURED ON OR OFF THE PROJECT SITE SUCH THAT ITS COMPOSITION IS IN ACCORDANCE WITH THE MDEP MAINE EROSION AND SEDIMENT CONTROL BMP MANUAL, LAST REVISED 3/2003 OR LATER. IT MUST CONSIST PRIMARILY OF ORGANIC MATERIAL, SEPARATED AT THE POINT OF GENERATION, AND MAY INCLUDE: SHREDDED BARK, STUMP GRINDINGS, COMPOSTED BARK, OR ACCEPTABLE MANUFACTURED PRODUCTS. WOOD AND BARK CHIPS, GROUND CONSTRUCTION DEBRIS OR REPROCESSED WOOD PRODUCTS WILL NOT BE ACCEPTABLE AS THE ORGANIC COMPONENT OF THE MIX.

INSTALLATION:
1. THE BARRIER MUST BE PLACED ACROSS THE SLOPE, ALONG THE CONTOUR.
2. EXISTING GROUND SHALL BE PREPARED SUCH THAT THE BARRIER MAY LIE NEARLY FLAT ALONG THE GROUND TO AVOID THE CREATION OF VOIDS AND BRIDGES IN ORDER TO MINIMIZE THE POTENTIAL OF WASH OUTS UNDER THE BARRIER.
3. THE BARRIER SHALL BE A MINIMUM OF 1 FOOT HIGH (AS MEASURED ON THE UPHILL SIDE) AND 2 FEET WIDE FOR SLOPES LESS THAN 5% IN GRADE AND SHALL BE WIDER TO ACCOMMODATE THE ADDITIONAL RUNOFF.
4. EROSION CONTROL MIX CAN BE INSTALLED WHERE SILT FENCE IS ILLUSTRATED ON THE DESIGN PLANS IN AREAS EXCEPT IN, BUT NOT LIMITED TO, THE FOLLOWING AREAS: WETLAND AREAS, AT POINTS OF CONCENTRATED FLOW, BELOW CULVERT OUTLET APRONS, AROUND CATCH BASINS AND CLOSED STORM SYSTEMS AND AT THE BOTTOM OF STEEP SLOPES THAT ARE MORE THAN 50 FEET FROM TOP TO BOTTOM.

2 EROSION CONTROL MIX BERM
NOT TO SCALE

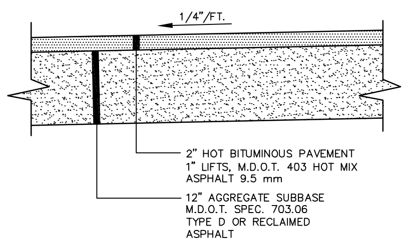


3 STONE CHECK DAM
NOT TO SCALE

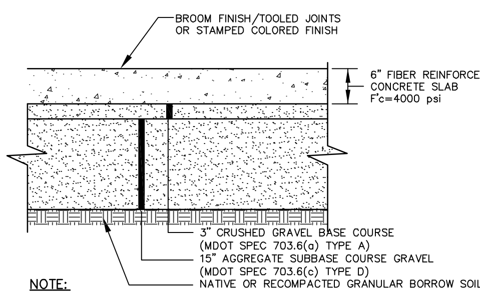


NOTES:
1. COMPACT GRAVEL SUBBASE, BASE COURSE TO 92% OF MAXIMUM DENSITY USING HEAVY ROLLER COMPACTION.
2. CONTRACTOR SHALL SET GRADE STAKES MARKING SUBBASE AND FINISH GRADE ELEVATIONS FOR CONSTRUCTION REFERENCE.

4 TYP. PAVED PARKING LOT SECTION
NOT TO SCALE

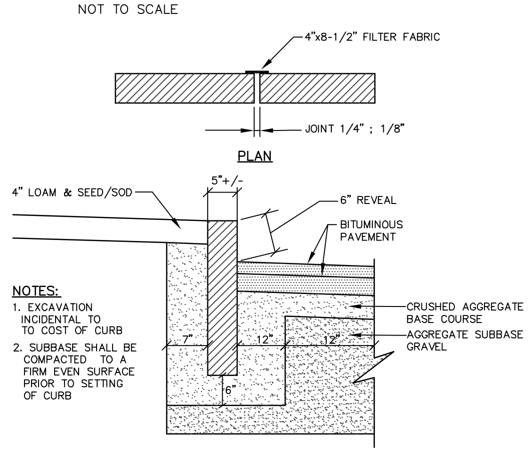


5 BITUMINOUS SIDEWALK
NOT TO SCALE



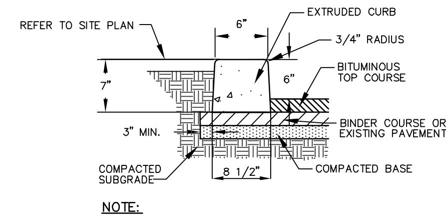
NOTE:
1. PROVIDE CONTRACTION CONTROL JOINTS EVERY 6' IN EACH DIRECTION

6 CONCRETE SLAB FOR SOLIDWASTE ENCLOSURE, TRANSFORMER, AND GENERATOR PAD
NOT TO SCALE



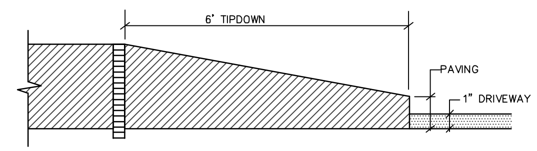
NOTES:
1. EXCAVATION INCIDENTAL TO TO COST OF CURB
2. SUBBASE SHALL BE COMPACTED TO A FIRM EVEN SURFACE PRIOR TO SETTING OF CURB

7 VERTICAL GRANITE CURB
NOT TO SCALE

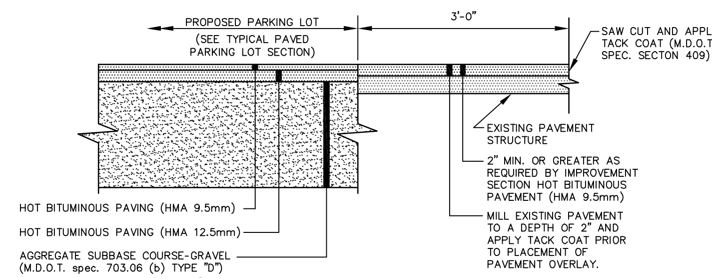


NOTE:
USE SLOPED MOLD WHEREVER CURB ABUTS LANDSCAPE AREAS.

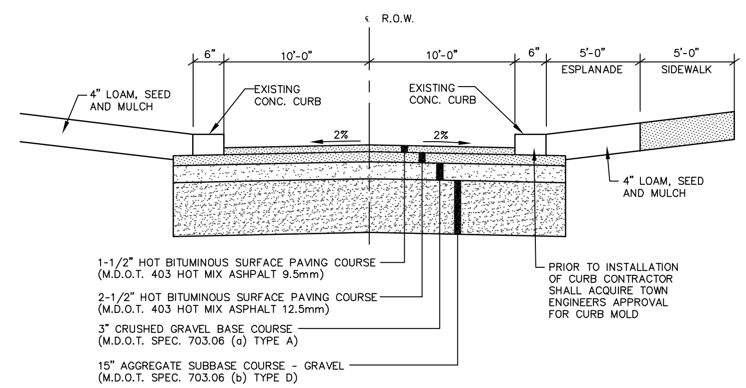
8 SLIPFORM CONCRETE CURB
NOT TO SCALE



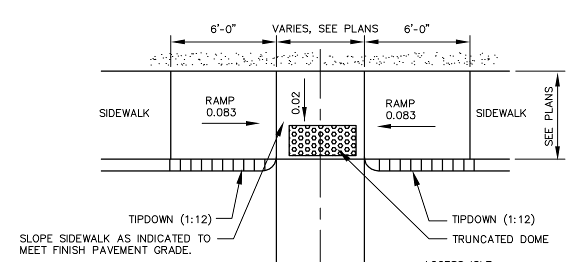
9 TYPICAL TIPDOWN CURB INSTALLATION
NOT TO SCALE



10 TYPICAL PAVEMENT JOINT
NOT TO SCALE

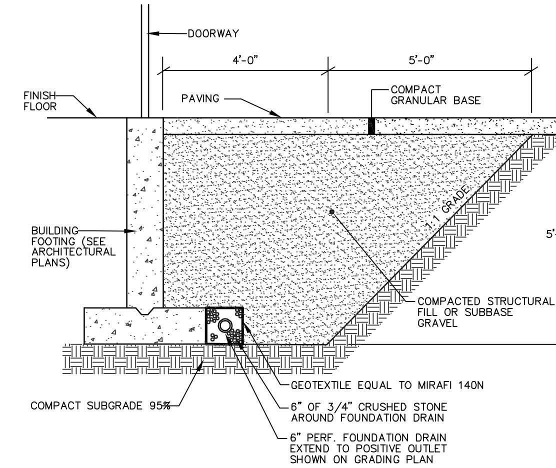


11 TYPICAL DRIVEWAY SECTION
NOT TO SCALE

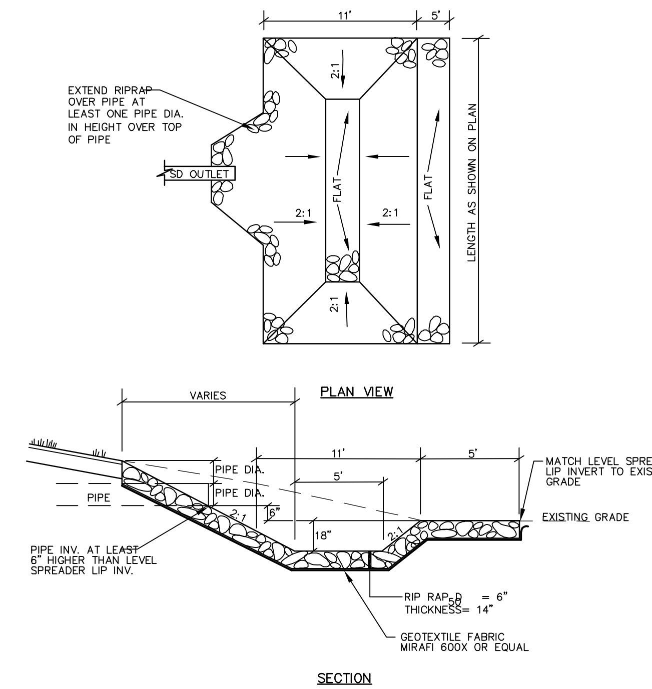


NOTE:
ALL OTHER RAMPS SHALL HAVE MAX. SLOPE OF 0.083 '/' FOR LENGTH OF 6'-0".

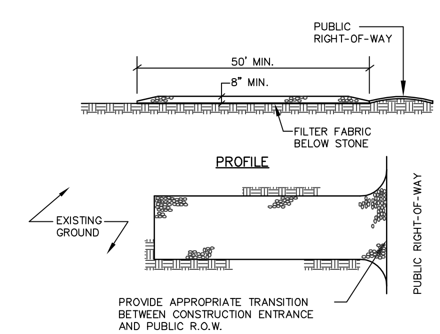
12 TYPICAL SIDEWALK/HANDICAP RAMP
NOT TO SCALE



13 5' GRANULAR BASE @ DOOR THRESHOLD
NOT TO SCALE



14 RIPRAP LEVEL SPREADER OUTLET
NOT TO SCALE



NOTES:
1. STONE SIZE- AASHTO DESIGNATION M43, SIZE NO. 2 (2 1/2" TO 1 1/2"). USE CRUSHED STONE.
2. LENGTH- AS SHOWN ON PLANS, MIN. 50 FEET.
3. THICKNESS- NOT LESS THAN EIGHT (8) INCHES.
4. WIDTH- NOT LESS THAN FULL WIDTH OF ALL POINT OF INGRESS OR EGRESS.
5. MAINTENANCE- THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHT-OF-WAY MUST BE REMOVED IMMEDIATELY.

15 STABILIZED CONSTRUCTION ENTRANCE
NOT TO SCALE

9-18-15

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PROJECT NO.	SCALE
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SHEET 10 OF 14

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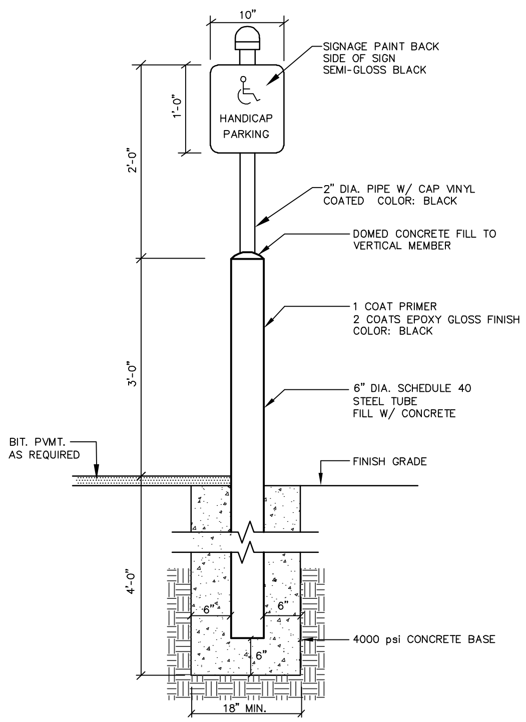
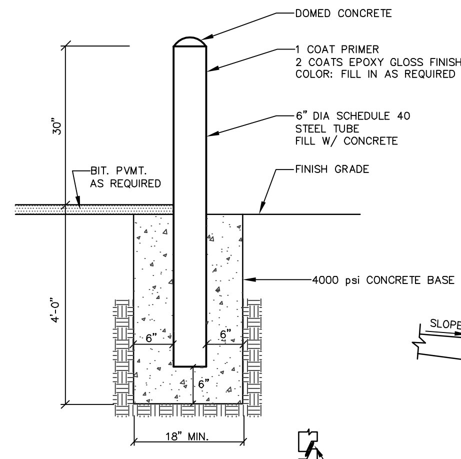
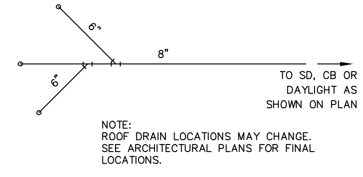


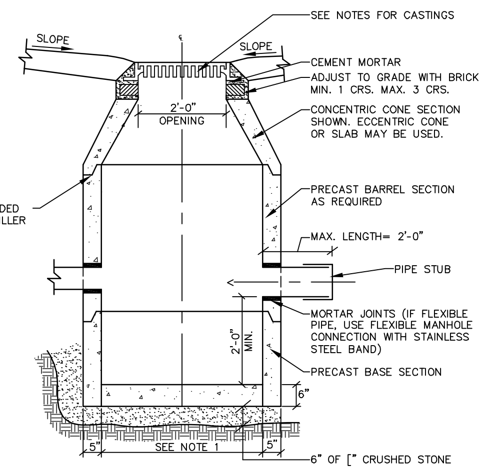
1 HANDICAP SIGNS IN METAL BOLLARD
NOT TO SCALE



4 METAL BOLLARD
NOT TO SCALE

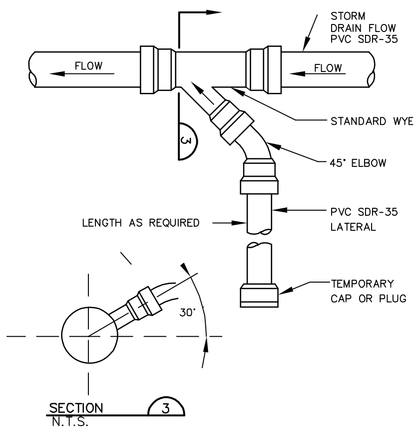


5 TYPICAL ROOF DRAIN
NOT TO SCALE

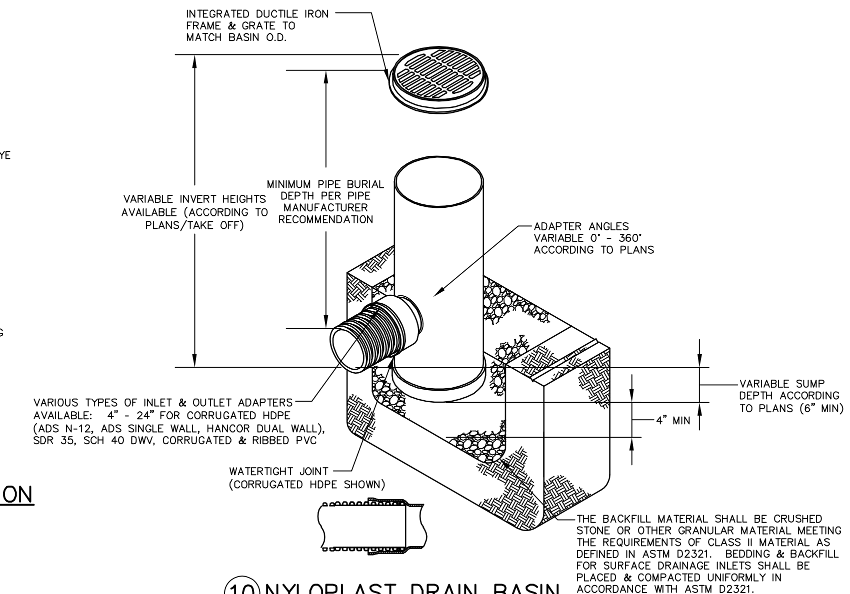


NOTES:
1. 4'-0" I.D. TYPICAL. SOME STRUCTURES MAY REQUIRE LARGER I.D. PROVIDE SHOP DRAWINGS.
2. DRAINAGE STRUCTURES TO BE DESIGNED FOR H-20 LOADING.
3. PIPE SIZES AND INVERTS AS NOTED ON PLANS.
4. CATCH BASIN FRAME AND GRATE TO BE EAST JORDAN FOUNDRY 5250 OR APPROVED EQUAL.
5. DRAINAGE MANHOLE FRAME AND COVER TO BE EAST JORDAN FOUNDRY 1122, TYPE A, OR APPROVED EQUAL. COVER SHALL BE MARKED "DRAIN".

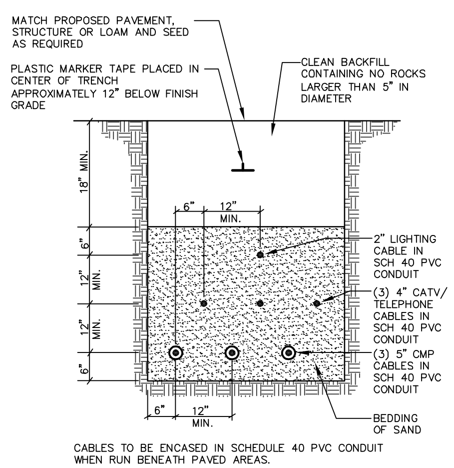
6 TYPICAL CONCRETE DRAINAGE STRUCTURE
NOT TO SCALE



8 ROOF DRAIN SERVICE CONNECTION
NOT TO SCALE

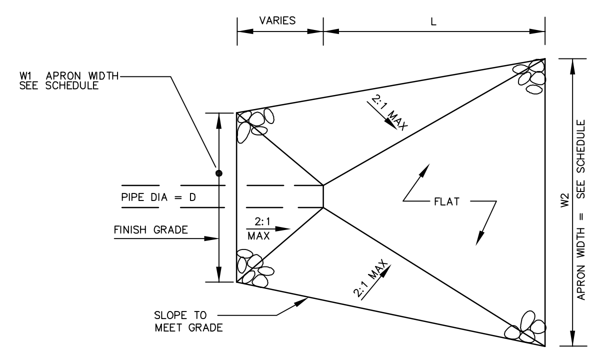


10 NYLOPLAST DRAIN BASIN
NOT TO SCALE

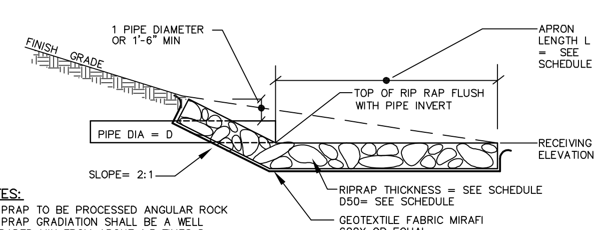


CABLES TO BE ENCASED IN SCHEDULE 40 PVC CONDUIT WHEN RUN BENEATH PAVED AREAS.

2 TYPICAL UNDERGROUND CABLE INSTALLATION
NOT TO SCALE



PLAN VIEW



NOTES:
1. RIPRAP TO BE PROCESSED ANGULAR ROCK
2. RIPRAP GRADIATION SHALL BE A WELL GRADED MIX FROM ABOUT 1.5 TIMES D SIZE TO 25 PERCENT OF THE D SIZE
3. THE RIPRAP STONES SHALL BE CAREFULLY PLACED FROM THE TOE OF THE SLOPE UPWARD
4. STONES SHALL BE LOWERED TO THE SLOPE AND NOT BE ALLOWED TO DROP MORE THAN 12" ONTO THE GEOTEXTILE
5. THE FINISHED SURFACE SHALL BE A RELATIVELY SMOOTH, UNIFORMLY SLOPED SURFACE

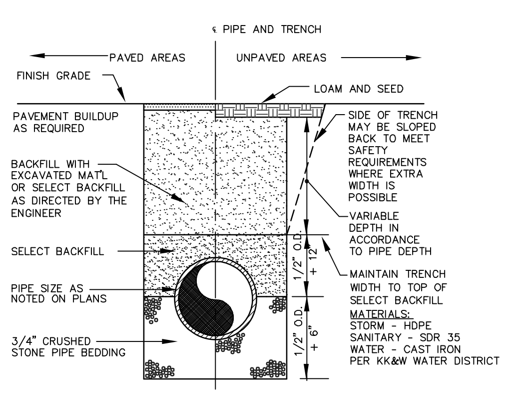
SIZING NOTES:
1. VALUES CALCULATED USING AN HDPE CULVERT AT A SLOPE OF 1% FLOWING FULL.
2. APRON LENGTHS AND RIPRAP D50 SIZES DETERMINED FROM THE OUTLET PROTECTION SIZING CHART IN THE MARCH 2003 MAINE EROSION AND SEDIMENT CONTROL BMP MANUAL.
3. APRON WIDTHS W1 & W2 WERE BASED ON THE STANDARDS SET FORTH IN THE MARCH 2003 MAINE EROSION AND SEDIMENT CONTROL BMP MANUAL SECTION E-3-2.
4. THESE DIMENSIONS ARE MINIMUM VALUES FOR EACH PIPE. IF NECESSARY, THESE DIMENSIONS CAN BE INCREASED AND ARE LABELED BY THE ENGINEER ON THE PLANS.

SECTION VIEW

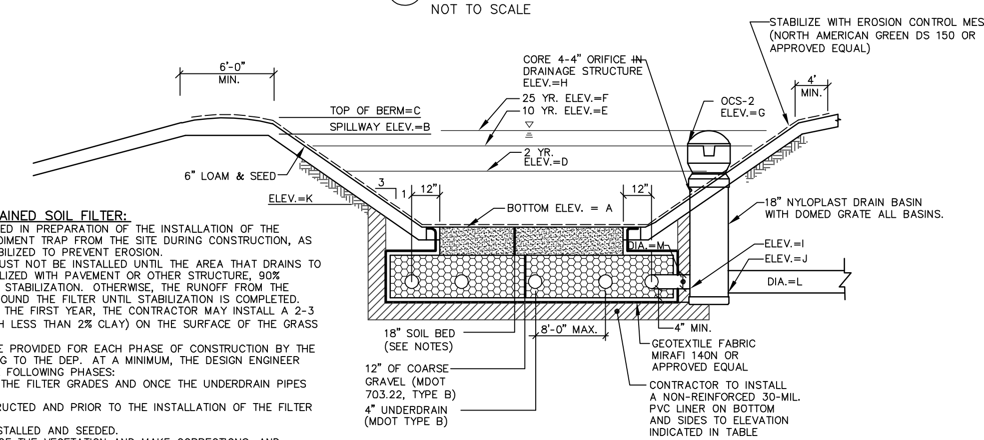
TYPICAL RIPRAP APRON SCHEDULE

CULVERT DIAMETER - D (IN.)	APRON LENGTH - L (FT.)	WIDTH -W1 (FT)	WIDTH -W2 (FT)	RIPRAP D50 (IN.)	RIPRAP THICKNESS (IN.)
12	8	3	9	6	14
15	10	4	12	6	14
18	13	5	15	7	16
24	18	6	20	8	18
36	29	9	32	11	25
42	33	11	37	12	27
48	39	12	43	16	36

7 RIPRAP APRON
NOT TO SCALE



3 TYPICAL TRENCH SECTION
NOT TO SCALE



CONSTRUCTION NOTES FOR UNDERDRAINED SOIL FILTER:
1. THE AREA OF THE BASIN MAY BE EXCAVATED IN PREPARATION OF THE INSTALLATION OF THE UNDERDRAIN AND CAN BE USED FOR A SEDIMENT TRAP FROM THE SITE DURING CONSTRUCTION, AS LONG AS THE BASIN IS MULCHED AND STABILIZED TO PREVENT EROSION.
2. THE SOIL FILTER MEDIA AND VEGETATION MUST NOT BE INSTALLED UNTIL THE AREA THAT DRAINS TO THE FILTER HAS BEEN PERMANENTLY STABILIZED WITH PAVEMENT OR OTHER STRUCTURE, 90% VEGETATION COVER, OR OTHER PERMANENT STABILIZATION. OTHERWISE, THE RUNOFF FROM THE CONTRIBUTING AREA MUST BE DIVERTED AROUND THE FILTER UNTIL STABILIZATION IS COMPLETED.
3. IF VEGETATION IS NOT ESTABLISHED WITHIN THE FIRST YEAR, THE CONTRACTOR MAY INSTALL A 2-3 INCH LAYER OF SANDY LOAM TOPSOIL (WITH LESS THAN 2% CLAY) ON THE SURFACE OF THE GRASS FILTER AND RESEED/MULCH.
4. INSPECTION OF THE FILTER BASIN SHALL BE PROVIDED FOR EACH PHASE OF CONSTRUCTION BY THE DESIGN ENGINEER WITH REQUIRED REPORTING TO THE DEP. AT A MINIMUM, THE DESIGN ENGINEER SHALL INSPECT THE CONSTRUCTION AT THE FOLLOWING PHASES:
   A. AFTER PRELIMINARY CONSTRUCTION OF THE FILTER GRADES AND ONCE THE UNDERDRAIN PIPES ARE INSTALLED BUT NOT BACKFILLED.
   B. AFTER THE DRAINAGE LAYER IS CONSTRUCTED AND PRIOR TO THE INSTALLATION OF THE FILTER MEDIA.
   C. AFTER THE FILTER MEDIA HAS BEEN INSTALLED AND SEEDED.
   D. AFTER ONE YEAR TO INSPECT HEALTH OF THE VEGETATION AND MAKE CORRECTIONS, AND
   E. ALL MATERIAL USED FOR THE CONSTRUCTION OF THE FILTER BASIN SHALL BE APPROVED BY THE DESIGN ENGINEER AFTER TESTS BY A CERTIFIED LABORATORY SHOW THAT THEY ARE PASSING DEP SPECIFICATIONS.
5. THE CONTRACTOR SHALL IDENTIFY THE LOCATION OF THE SOURCE OF EACH COMPONENT OF THE FILTER MEDIA. ALL RESULTS OF THE FIELD AND LABORATORY TESTING SHALL BE SUBMITTED TO THE DESIGN ENGINEER FOR CONFIRMATION. THE CONTRACTOR SHALL
   A. SUBMIT SAMPLES OF EACH TYPE OF MATERIAL TO BE BLENDED FOR THE MIXED FILTER MEDIA AND SAMPLES OF THE UNDERDRAIN BEDDING MATERIAL. SAMPLES MUST BE A COMPOSITE OF THREE GRABS FROM THE STOCKPILE OR PIT FACE. SAMPLE SIZE REQUIRED WILL BE DETERMINED BY THE TESTING LABORATORY.
   B. PERFORM A SIEVE ANALYSIS CONFORMING TO ASTM C136 (STANDARD TEST METHOD FOR SIEVE ANALYSIS OF FINE AND COARSE AGGREGATES, 1996A) ON EACH TYPE OF THE SAMPLE MATERIAL. THE RESULTING SOIL FILTER MEDIA MIXTURE MUST HAVE 8% TO 12% BY WEIGHT PASSING THE #200 SIEVE, A CLAY CONTENT OF LESS THAN 2% (DETERMINED BY HYDROMETER GRAIN SIZE ANALYSIS) AND HAVE 10% DRY WEIGHT OF ORGANIC MATTER.
   C. PERFORM A PERMEABILITY TEST ON THE SOIL FILTER MEDIA CONFORMING TO ASTM D2434 WITH THE MIXTURE COMPACTED TO 90-92% OF MAXIMUM DRY DENSITY BASED ON ASTM D698.

UNDERDRAINED FILTER NOTES:
1. THE SOIL BED SHALL CONSIST OF A SILTY SAND SOIL OR SOIL MIXTURE COMBINED WITH 20% TO 25% BY VOLUME OF A MODERATELY FINE SHREDDED BARK OR WOOD FIBER MULCH. THE RESULTING MIXTURE MUST HAVE NO LESS THAN 8% PASSING THE 200 SIEVE AND SHALL HAVE A CLAY CONTENT OF LESS THAN 2%. THE SAND USED IN THE MIXTURE SHALL MEET THE FOLLOWING SPECIFICATIONS:
   SIEVE 3/8" - 100 PERCENT PASSING
   SIEVE #4 - 95-100 PERCENT PASSING
   SIEVE #8 - 80-100 PERCENT PASSING
   SIEVE #16 - 50-85 PERCENT PASSING
   SIEVE #30 - 25-60 PERCENT PASSING
   SIEVE #60 - 10-30 PERCENT PASSING
   SIEVE #100 - 2-10 PERCENT PASSING
   SIEVE #200 - 0-5 PERCENT PASSING
2. COMPACTION OF THE SOIL BED MATERIAL SHALL BE AVOIDED. IF COMPACTION OCCURS, ROTOTILL AGAIN PRIOR TO SEEDING OR SODDING.

EMBANKMENT CONSTRUCTION NOTES:
1. CONSTRUCTION OF COMMON BORROW MATERIAL MEETING M.D.O.T. SPECIFICATIONS
2. PLACE BORROW MATERIAL IN 12" LIFTS COMPACTED TO 95% OF MAXIMUM
3. INSTALL RIPRAP AND EROSION CONTROL MESH WHERE SPECIFIED ON PLANS
4. LOAM, SEED, AND STABILIZE IN ACCORDANCE WITH SEDIMENTATION AND EROSION CONTROL PLAN.

POND DIMENSIONS

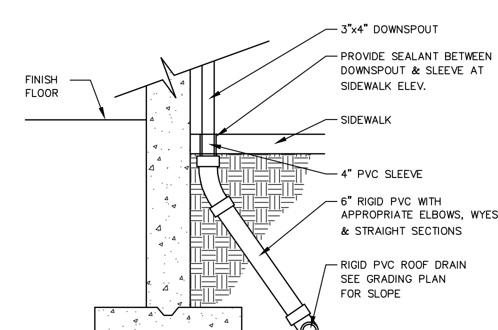
UNDERDRAIN GRASS FILTER	ELEVATION IN FEET											DIA (IN)	
	A	B	C	D	E	F	G	H	I	J	K	L	M
USF-1	125.00	127.5	128.0	126.28	126.74	126.96	127.0	126.00	122.83	122.83	126.0	12	4

SOIL BORING SUMMARY TABLE

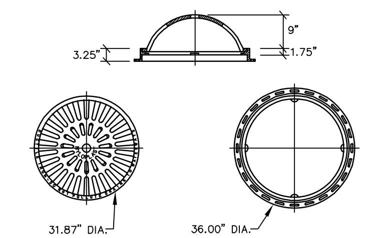
BORING NO.	EXIST. GRADE (FT.)	EXIST. SHWT DEPTH (IN.)	EXIST. SHWT ELEV. (FT.)	PROPOSED BMP STRUCTURE	UNDERDRAIN INVERT ELEV. (FT.)
1	VARIES	VARIES	VARIES	UNDERDRAINED FILTER POND-USF-1	122.83

ENTIRE SITE IS OVERLAID BY LEDGE. SOIL REPORTS INDICATE THAT GROUNDWATER MAY BE WITHIN A COUPLE FEET OF SURFACE BASED UPON ARTESIAN CONDITIONS.

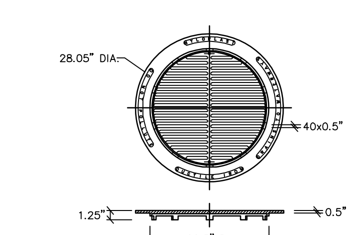
11 UNDERDRAINED SOIL FILTER BASIN
NOT TO SCALE



9 ROOF DRAIN CONNECTOR
NOT TO SCALE



12 NYLOPLAST DOME GRATE
NYLOPLAST #3099CGD NOT TO SCALE
USE AT ALL UNDERDRAINED PONDS



13 NYLOPLAST DROP IN GRATE
NYLOPLAST #2401DI NOT TO SCALE
USE AT ALL FIELD INLETS

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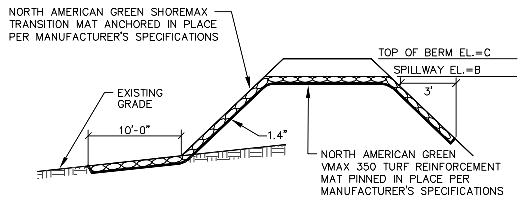
802 OCEAN AVENUE
PORTLAND, ME
FOR:
HAWTHORN DEVELOPMENT GROUP, LLC
9310 NE VANCOUVER MALL DR., STE200
VANCOUVER, WA 98662-8210

PROJECT NO.	SCALE
14432	NTS

SHEET 11 OF 14

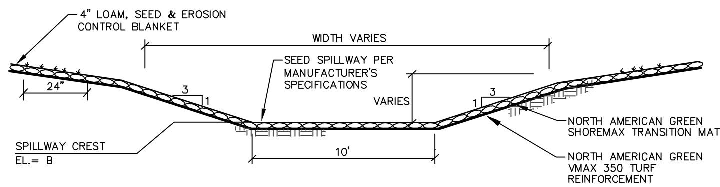
14432D.dwg, TAB:D3



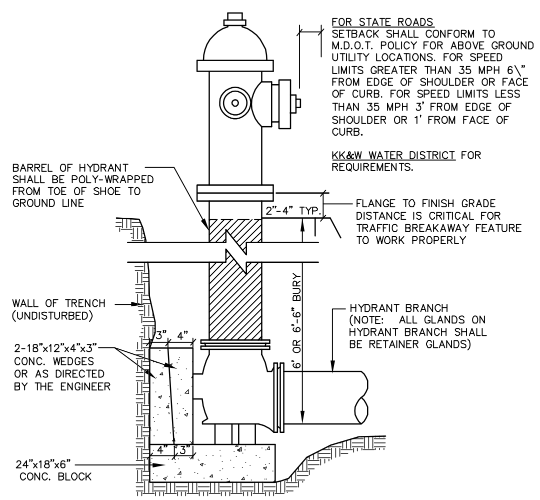
EMBANKMENT CONSTRUCTION

1. CONSTRUCTION OF COMMON BORROW MATERIAL MEETING M.D.O.T. SPECIFICATION.
2. PLACE BORROW MATERIAL IN 12" LIFTS. COMPACTED TO 95% OF MAXIMUM DRY DENSITY.
3. EROSION CONTROL MESH WHERE SPECIFIED ON PLANS
4. LOAM, SEED, AND STABILIZE IN ACCORDANCE WITH SEDIMENTATION AND EROSION CONTROL PLAN.

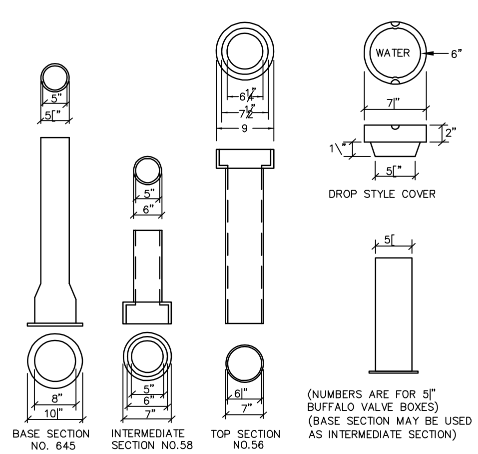
(1) SPILLWAY SECTION
NOT TO SCALE



(2) EMERGENCY SPILLWAY CROSS-SECTION
NOT TO SCALE

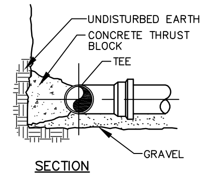


(3) TYPICAL HYDRANT INSTALLATION
NOT TO SCALE



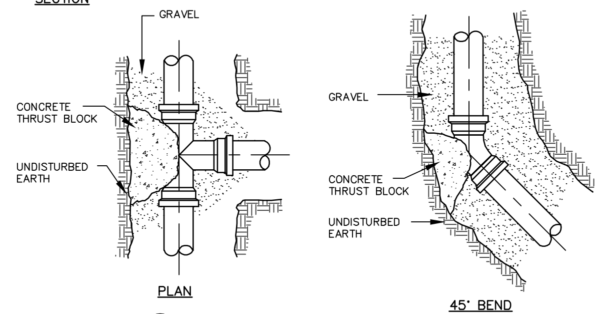
MATERIALS TO CONFORM WITH KK&W WATER DISTRICT

(4) VALVE BOX & COVER
NOT TO SCALE

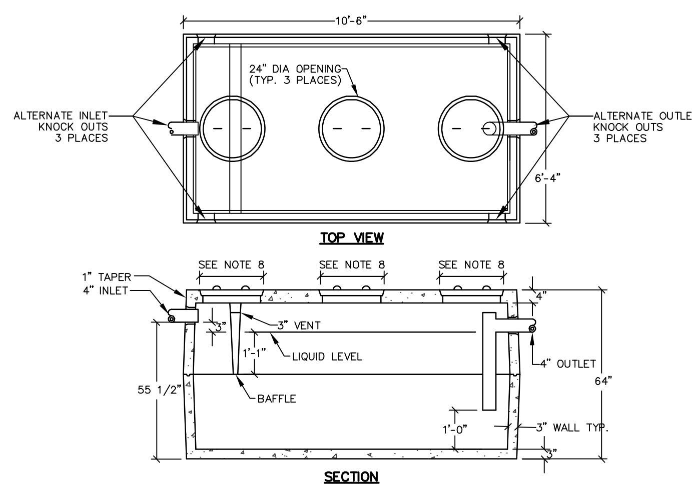


CONCRETE THRUST BLOCK SIZE REQUIREMENTS

FITTINGS		SQ. FT. OF BEARING ON UNDISTURBED SOIL		
		90° BENDS	45° BENDS	TEES AND PLUGS
PIPE SIZE	6"	4.0	2.0	3.0
	8"	8.0	4.0	6.0
	12"	15	10	10



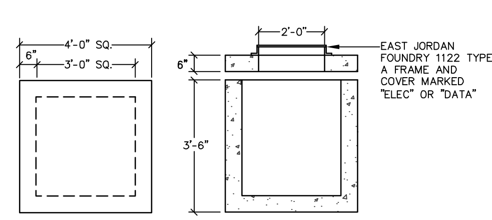
(5) WATER TEE & BEND DETAIL
NOT TO SCALE



NOTES:

1. STRUCTURE SHALL BE 1,500 GALLON GREASE TRAP AS MANUFACTURED BY PRECAST CONCRETE PRODUCTS OF MAINE, INC. (ITEM #A-904) OR APPROVED EQUAL.
2. CONCRETE 4000 PSI AT 28 DAYS.
3. INLET BAFFLE IS PRECAST AS ONE UNIT WITH THE TOP SECTION OF THE SEPTIC TANK.
4. TANKS REINFORCED WITH 6X6X10 G.A.WIRE.
5. KEYED JOINTS SEALED WITH ASPHALT SEALANT.
6. HEAVY DUTY SEPTIC TANK TOPS REINFORCED WITH 1/2" REBAR ON 6" CENTERS EACH WAY.
7. GREASE FILTER AVAILABLE.
8. PROVIDE PRECAST SECTIONS AND EAST JORDAN FOUNDRY 1122 TYPE A FRAME AND COVER MARKED "SEWER"

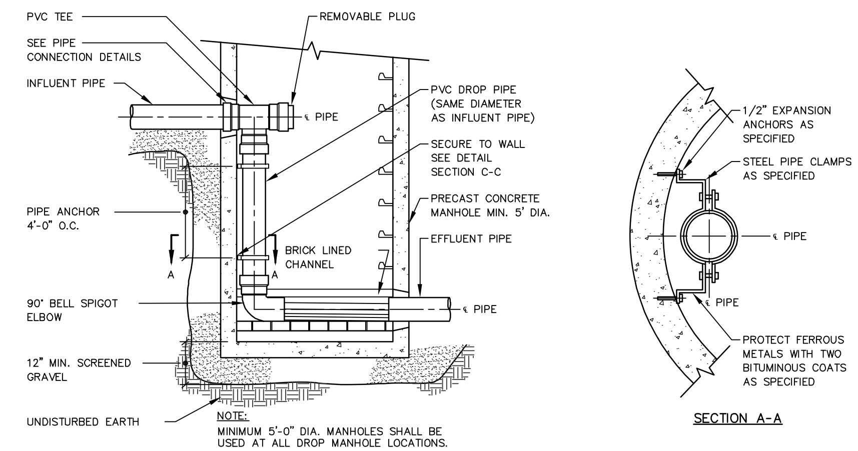
(6) 1,500 GALLON GREASE TRAP
NOT TO SCALE



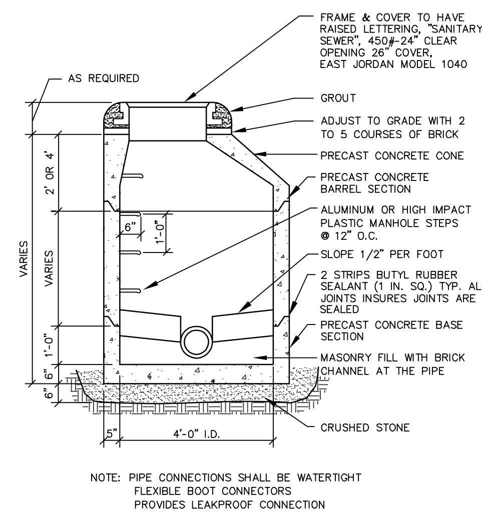
NOTES:

1. STRUCTURE SHALL BE 3' SQ UTILITY BOX WITH 6" WALLS AS MANUFACTURED BY PRECAST CONCRETE PRODUCTS OF MAINE, INC. (ITEM #B-14) OR APPROVED EQUAL.
2. CONCRETE 4000 PSI AT 28 DAYS.
3. STRUCTURE TO BE H-20 LOADED.
4. OPENINGS AS NEEDED.

(7) UTILITY PULL BOX
NOT TO SCALE

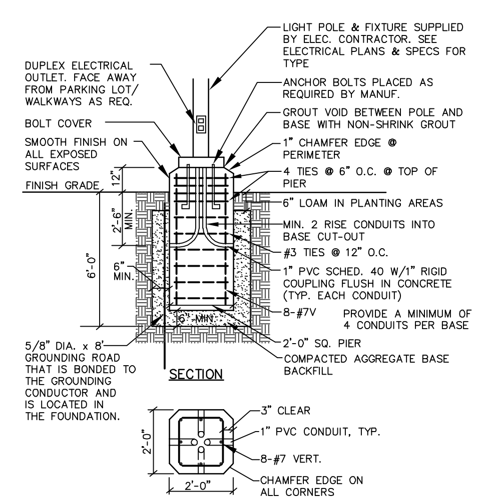


(8) PVC DROP CONNECTION (INTERNAL)
NOT TO SCALE



NOTE: PIPE CONNECTIONS SHALL BE WATERTIGHT FLEXIBLE BOOT CONNECTORS PROVIDES LEAKPROOF CONNECTION

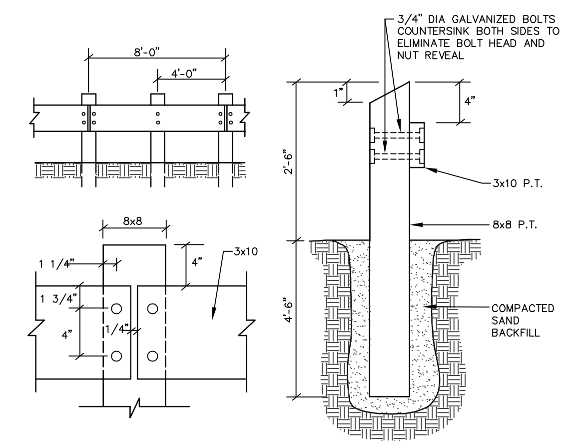
(9) PRECAST MANHOLE
NOT TO SCALE



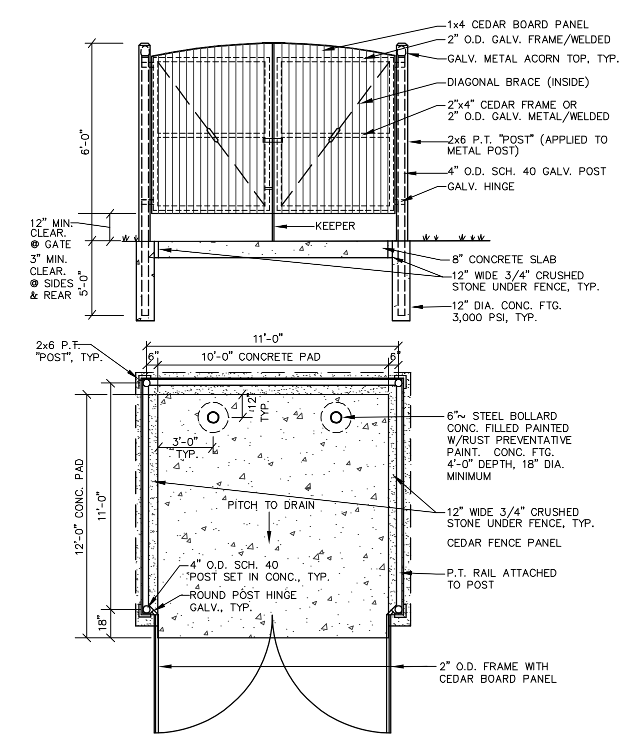
NOTES:

1. CONCRETE f'c=4000 psi.
2. REINF. STEEL GRADE 60 NEW BARS.
3. CONCRETE 3/4" AGG., 6 +/- 1% ENTRAINED AIR.
4. PROVIDE 2 COATS BITUMINOUS DAMPROOFING FOR ALL CONCRETE BELOW GRADE.
5. INSTALL BASE 3'-0" ABOVE FINISH GRADE IN LOCATIONS WHERE POLES ARE IN PARKING LOT PAVEMENT.
6. BID ALT.- CONTRACTOR MAY SUBSTITUTE PRECAST CONCRETE LIGHT POLE BASE EQUAL TO ABOVE SPEC.

(10) LIGHT POLE BASE
NOT TO SCALE



(11) PRESSURE TREATED WOOD GUARDRAIL
NOT TO SCALE



(12) TYPICAL DUMPSTER ENCLOSURE
NOT TO SCALE

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PROJECT NO.	SCALE
14432	NTS

SHEET 12 OF 14

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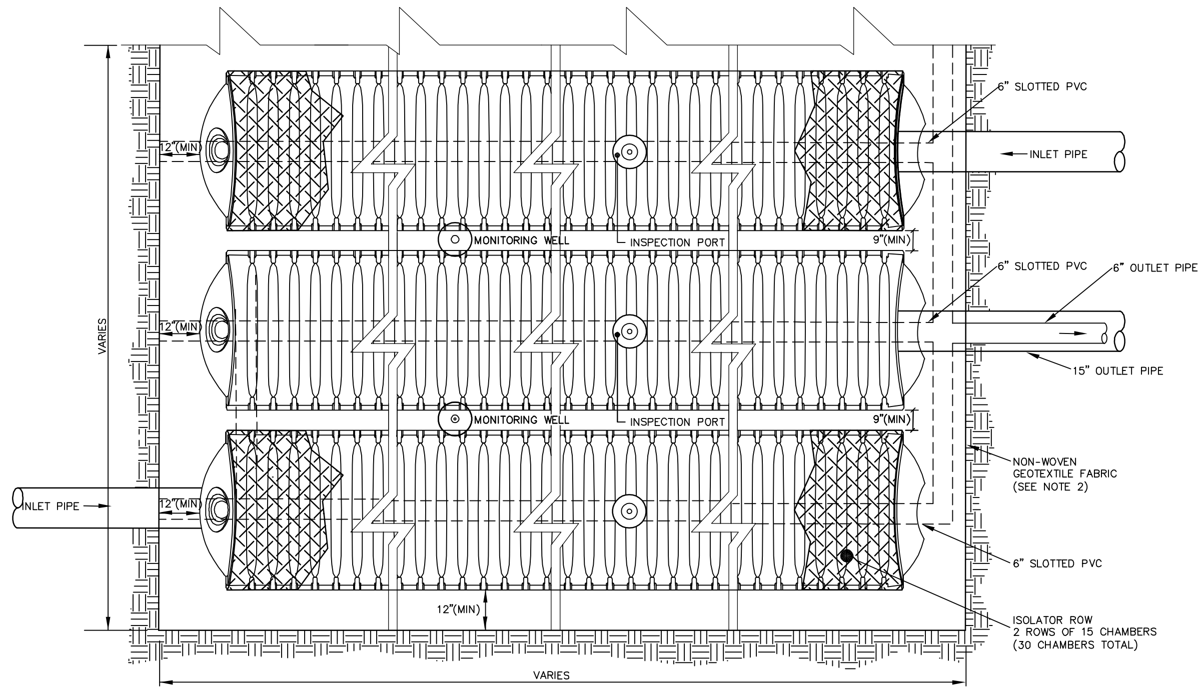


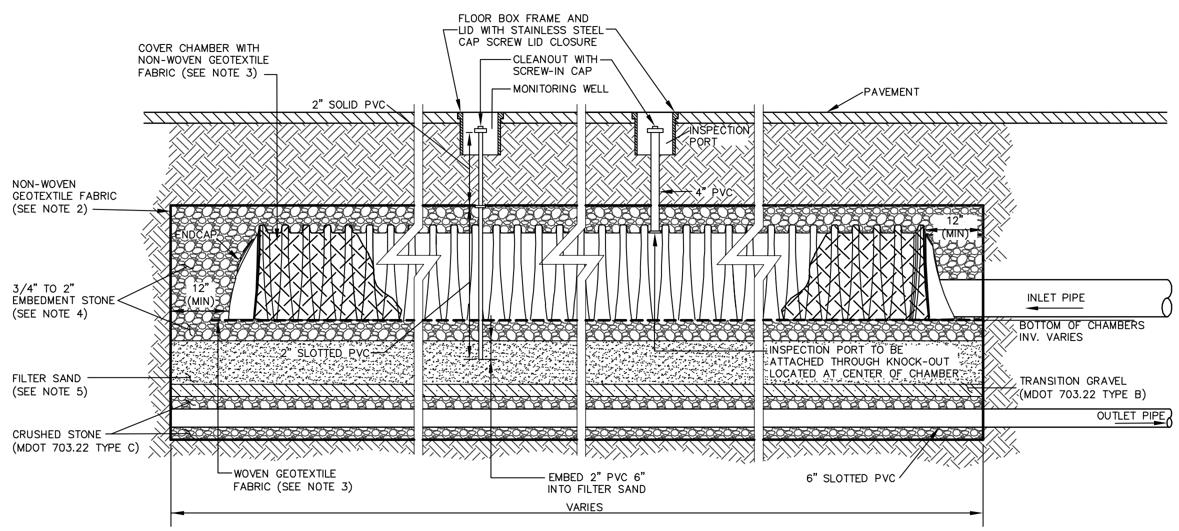
UNDERDRAINED SAND FILTER PLAN VIEW

SUBSURFACE UNDERDRAINED SAND FILTER NOTES:

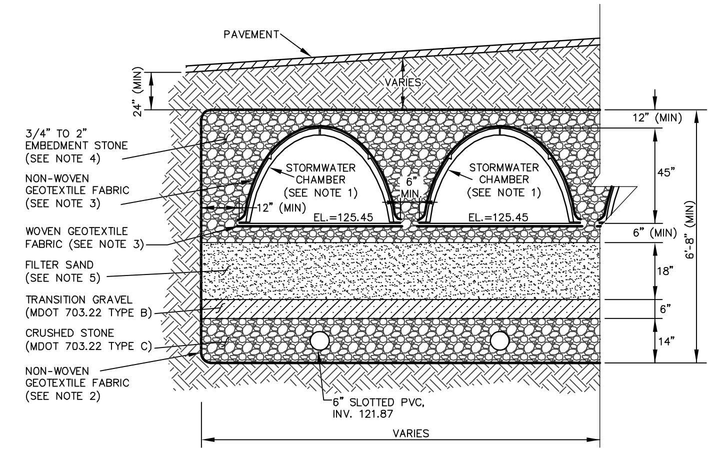
1. THE STORMWATER CHAMBER SHALL BE A STORMTECH MC-3500 OR EQUIVALENT SUBSURFACE STORAGE CHAMBER APPROVED BY THE ENGINEER.
2. THE ENTIRE SUBSURFACE SYSTEM, INCLUDING THE CRUSHED STONE STORAGE VOLUME, THE FILTER MEDIA, AND UNDERDRAIN MATERIALS, SHALL BE WRAPPED IN A NON-WOVEN GEOTEXTILE FABRIC (MIRAFI 160N OR EQUIVALENT).
3. A STRIP OF WOVEN GEOTEXTILE THAT MEETS AASHTO M288 CLASS ONE REQUIREMENTS (MIRAFI FW404 OR EQUIVALENT) MUST BE PLACED BETWEEN THE BOTTOM OF THE CHAMBER AND ITS STONE FOUNDATION. THIS FABRIC TRAPS SEDIMENTS AND PROTECTS THE UNDERLYING CRUSHED STONE. A SECOND STRIP OF NON-WOVEN AASHTO M288 CLASS 2 GEOTEXTILE (MIRAFI 160N OR EQUIVALENT) SHALL BE DRAPED OVER THE ENTIRE LENGTH OF THE CHAMBERS. THIS FABRIC WILL ALSO TRAP SEDIMENTS AND PROVIDE SEPARATION BETWEEN THE CHAMBERS AND SURROUNDING STONE.
4. THE EMBEDMENT STONE SURROUNDING THE CHAMBERS SHALL BE A WASHED, ANGULAR STONE WITH THE MAJORITY OF PARTICLES BETWEEN 3/4 INCH AND 2 INCH. THE BOTTOM 6 INCH LAYER OF STONE THAT ACTS AS THE FOUNDATION BELOW THE CHAMBERS SHALL BE COMPACTED TO ACHIEVE A 95% STANDARD PROCTOR DENSITY.
5. THE SAND FILTER MATERIAL SHALL BE A UNIFORM MIX, FREE OF STONES LARGER THAN 2 INCHES, STUMPS, ROOTS, OR OTHER SIMILAR OBJECTS. THE MATERIAL SHALL MEET THE SPECIFICATIONS FOR MDOT AGGREGATE SAND (MDOT #703.01). HOWEVER, THIS AGGREGATE SAND SHALL BE MIXED WITH LOAM TO CHIVE A MATERIAL WITH BETWEEN 8% AND 10% PASSING THE #200 SIEVE. THE LOAM USED IN THIS MIXTURE SHALL HAVE A MINIMAL CLAY CONTENT. THIS 18 INCH LAYER OF SAND FILTRATION MEDIA SHALL BE PLACED TO ACHIEVE A LEVEL OF COMPACTION BETWEEN 92% AND 95% STANDARD PROCTOR DENSITY.

CONSTRUCTION OVERSIGHT NOTES FOR SUBSURFACE SAND FILER:

1. INSPECTIONS BY A PROFESSIONAL ENGINEER SHALL CONSIST OF WEEKLY VISITS TO THE SITE TO INSPECT THE CONSTRUCTION AND STABILIZATION OF THE PROPOSED SUBSURFACE CHAMBERS AND ITS FILTER COURSE MATERIAL TO BE BUILT ON THE SITE. INSPECTIONS SHALL CONSIST OF AN APPROPRIATE NUMBER OF VISITS TO THE SITE TO INSPECT THE INSTALLATION OF THE SUBGRADE, FILTER BED MATERIAL PLACEMENT, INSTALLATION OF STONE, ISOLATOR ROW AND CHAMBER, SURROUNDING STONE, FABRIC LAYMENT AND STORMWATER OVERFLOW BYPASS CONSTRUCTION FROM INITIAL GROUND DISTURBANCE TO FINAL PAVER PLACEMENT.



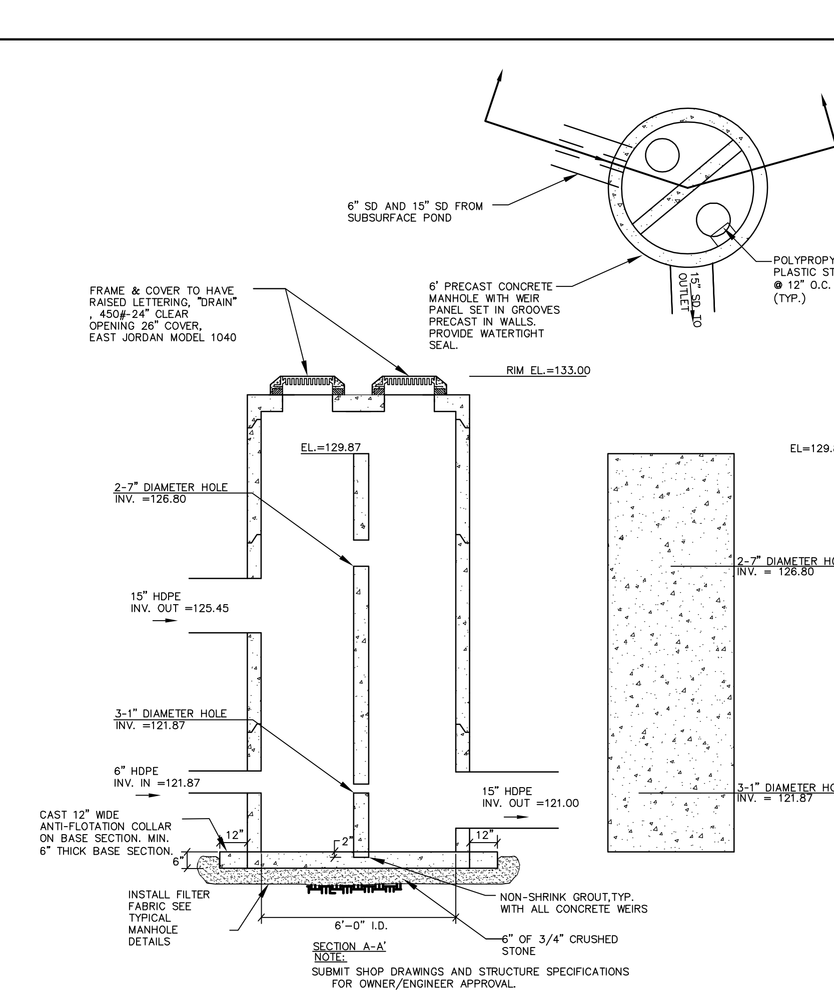
UNDERDRAINED SAND FILTER ELEVATION VIEW



UNDERDRAINED SAND FILTER SECTION

① SUBSURFACE UNDERDRAINED SAND FILTER

NOT TO SCALE



② OUTLET CONTROL STRUCTURE (OCS-1)

NOT TO SCALE

HOUSEKEEPING:

A. SPILL PREVENTION: CONTROLS MUST BE USED TO PREVENT POLLUTANTS FROM BEING DISCHARGED FROM MATERIALS ON-SITE, INCLUDING STORAGE PRACTICES TO MINIMIZE EXPOSURE OF THE MATERIALS TO STORMWATER, AND APPROPRIATE SPILL PREVENTION, CONTAINMENT, AND RESPONSE PLANNING AND IMPLEMENTATION.

B. 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.

C. FUGITIVE SEDIMENT AND DUST: ACTIONS MUST BE TAKEN TO INSURE 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.

D. DEBRIS AND OTHER MATERIALS: LITTER, CONSTRUCTION DEBRIS, AND CHEMICALS EXPOSED TO STORMWATER MUST BE PREVENTED FROM BECOMING A POLLUTANT SOURCE.

E. TRENCH DEWATERING: TRENCH DEWATERING IS THE REMOVAL OF WATER FROM TRENCHES, FOUNDATIONS, COFFERDAMS, 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 MUST BE REMOVED FROM THE PONDED AREA, EITHER THROUGH GRAVITY OR PUMPING, AND 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.

9-18-15

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PROJECT NO.	SCALE
14432	NTS

SHEET 13 OF 14

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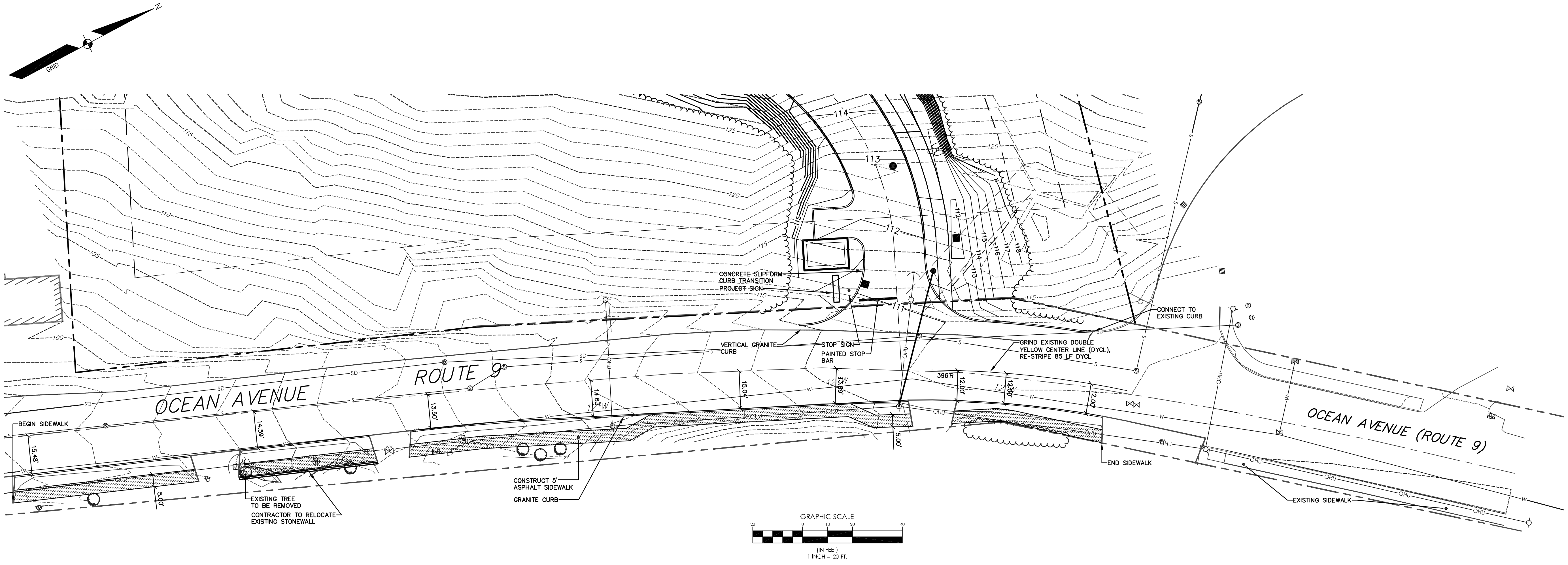
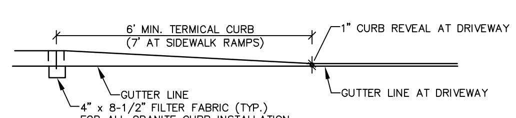
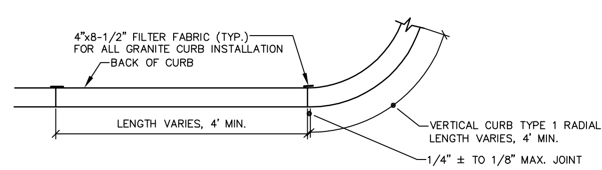
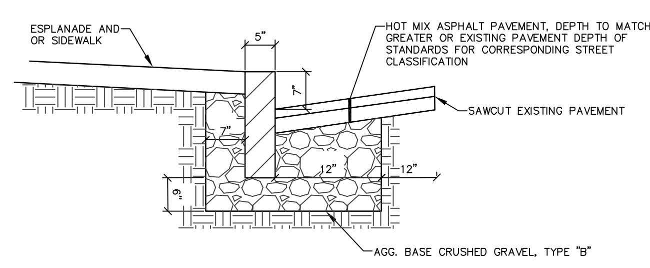




TERMINAL CURB PROFILE



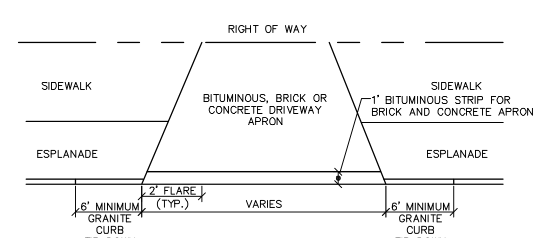
VERTICAL GRANITE CURB PLAN VIEW



VERTICAL GRANITE CURB CROSS SECTION

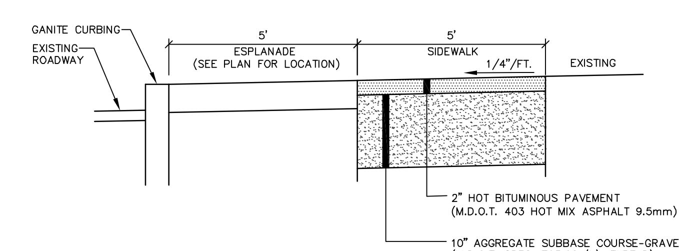
VERTICAL GRANITE CURB INSTALLATION IN EXISTING STREETS

NOT TO SCALE



DRIVEWAY APRON LAYOUT

NOT TO SCALE



BITUMINOUS SIDEWALK

NOT TO SCALE

LEGEND

EXISTING		PROPOSED
	PROPERTY LINE/R.O.W.	
	ABUTTER LINE/R.O.W.	
	SETBACK	
	CENTERLINE	
	IRON PIPE/ROD	
	BUILDING	
	EDGE PAVEMENT	
	CURB LINE	
	RETAINING WALL	
	DECIDUOUS TREE	
	SIGN	
W	WATER	
	WATER GATE VALVE	
	WATER SHUT OFF	
	HYDRANT	
	WATER MANHOLE	
S	SANITARY SEWER	
	SANITARY MANHOLE	
SD	STORM DRAIN	
	DRAINAGE MANHOLE	
	CATCH BASIN	
OHU	OVERHEAD UTILITY	
	UTILITY POLE	

9-18-15

DESIGNED	CHECKED
PDO	RAM

REV:	BY:	DATE:	STATUS:
A	RAM	9-18-15	PLAN SUBMISSION TO CITY OF PORTLAND

THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION FROM SEBAGO TECHNICS, INC. ANY ALTERATIONS, AUTHORIZED OR OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO SEBAGO TECHNICS, INC.

SEBAGO TECHNICS
WWW.SEBAGOTECHNICS.COM
75 John Roberts Rd. Suite 1A South Portland, ME 04106 Tel. 207-200-2100
250 Goddard Rd. Suite B Lewiston, ME 04240 Tel. 207-783-5656

OCEAN AVENUE SIDEWALK PLAN
OF:
PORTLAND RETIREMENT RESIDENCE
802 OCEAN AVENUE
PORTLAND, ME
FOR:
HAWTHORN DEVELOPMENT GROUP, LLC
9310 NE VANCOUVER MALL DR., STE200
VANCOUVER, WA 98662-8210

PROJECT NO.	SCALE
14432	1" = 20'

SHEET 14 OF 14

14432OCEAN SIDEWALK.dwg, TAB: OCEAN AVE SIDEWALK

PLS OR PE

PROGRESS PRINT

PLS OR PE

NOT FOR CONSTRUCTION

DESIGNED	CHECKED
PDO	RAM

REV:	BY:	DATE:	STATUS:
A	RAM	9-17-15	PLAN SUBMISSION TO CITY OF PORTLAND

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Tel. 207-200-2100

250 Goddard Rd.
Suite B
Lewiston, ME 04240
Tel. 207-783-5656

PRE DEVELOPMENT WATERSHED PLAN

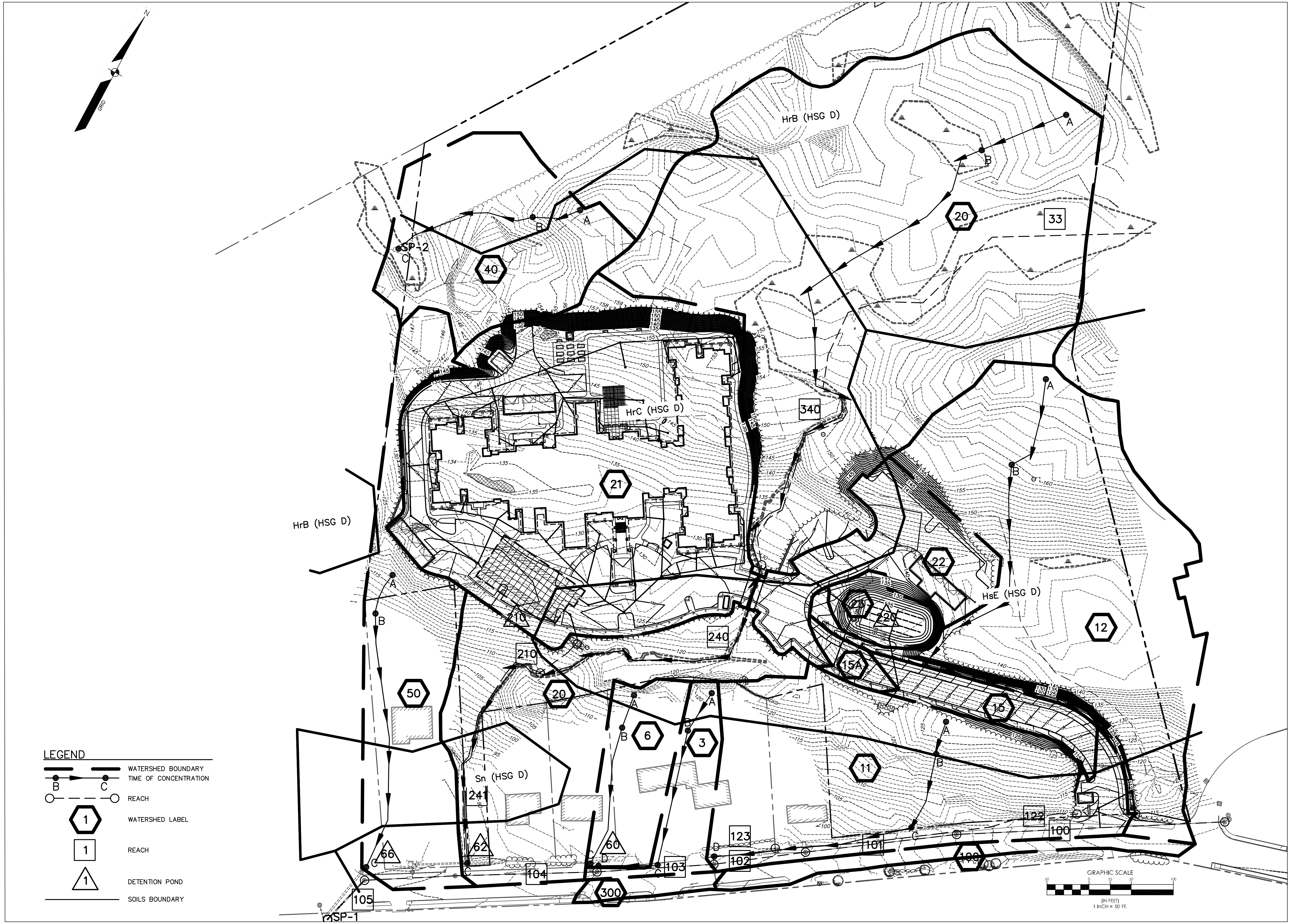
OF:
PORTLAND RETIREMENT RESIDENCE
802 OCEAN AVENUE
PORTLAND, ME

FOR:
HAWTHORN RETIREMENT GROUP
9310 NE VANCOUVER MALL DR., STE200
VANCOUVER, WA 98662-8210

PROJECT NO.	SCALE
14432	1" = 50'

SHEET 1 OF 2

14432SWP.dwg, TAB:PRE



PLS OR PE

PROGRESS PRINT

PLS OR PE

NOT FOR CONSTRUCTION

DESIGNED	CHECKED
PDO	RAM

REV:	BY:	DATE:	STATUS:
A	RAM	9-17-15	PLAN SUBMISSION TO CITY OF PORTLAND

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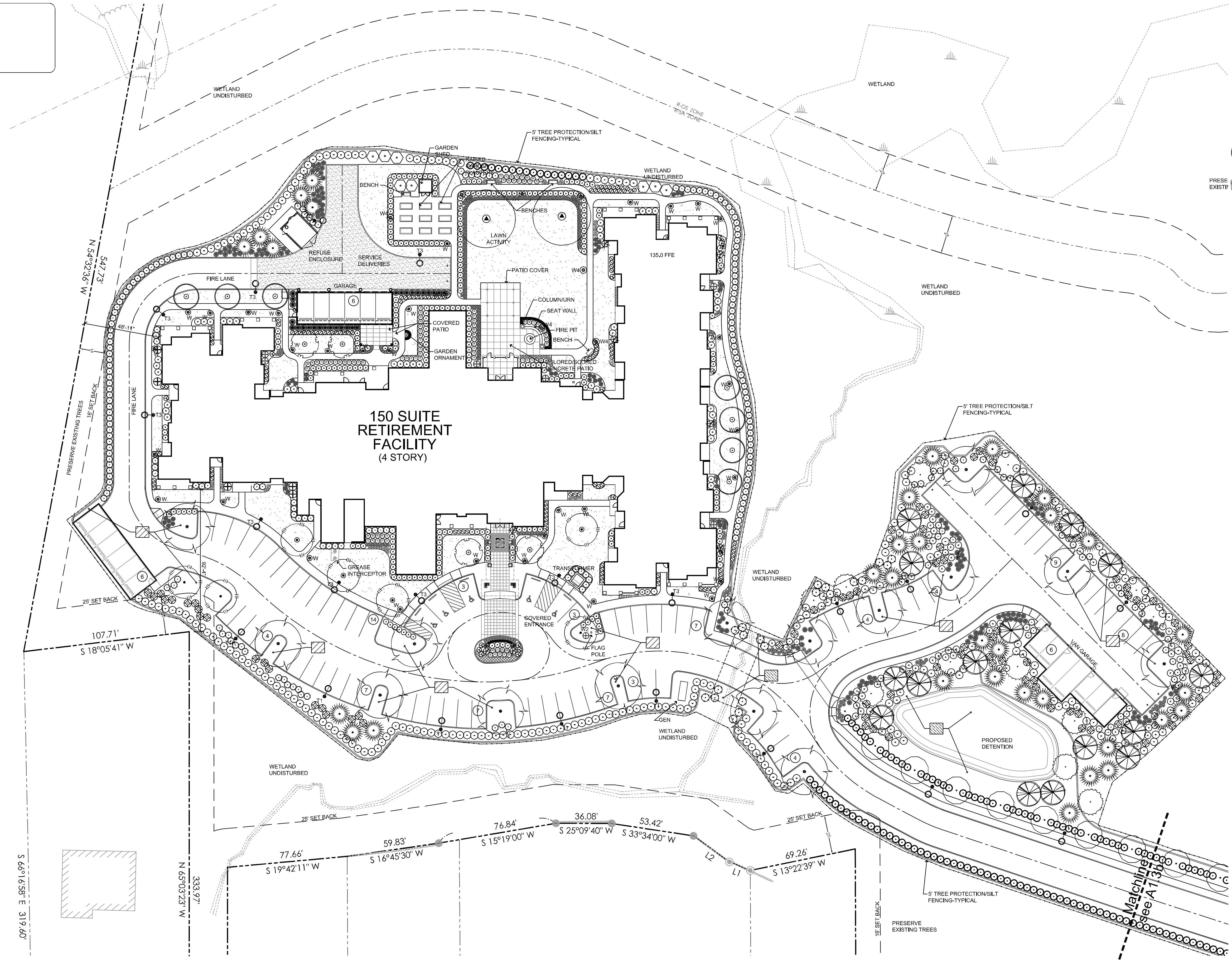
75 John Roberts Rd. Suite 1A South Portland, ME 04106 Tel. 207-200-2100
250 Goddard Rd. Suite B Lewiston, ME 04240 Tel. 207-783-5656

POST DEVELOPMENT WATERSHED PLAN
OF: PORTLAND RETIREMENT RESIDENCE
802 OCEAN AVENUE
PORTLAND, ME
FOR: HAWTHORN RETIREMENT GROUP
9310 NE VANCOUVER MALL DR., STE200
VANCOUVER, WA 98662-8210

PROJECT NO.	SCALE
14432	1" = 50'

SHEET 2 OF 2

14432SWP.dwg, TAB:POST



Planting Legend

Symbol	Botanical Name / Common Name	Quantity	Size / Comments
	Trees: (some symbols reduced in scale in Legend)		
	Acer saccharum 'Green Mountain' Sugar Maple (native)	2	2.50" caliper B&B Standard
	Amelanchier canadensis Shadblow Serviceberry (native)	12	1.75" caliper B&B Standard
	Fraxinus pennsylvanica 'Patmore' Patmore Green Ash (native)	15	2.50" caliper B&B Standard
	Ginkgo biloba 'Princeton Sentry' Princeton Sentry Maidenhair Tree	16	2.50" caliper B&B Standard
	Juniperus virginiana Eastern Red Cedar (native)	33	5-6 ft. B&B Low-branched
	Malus 'Spring Snow' Flowering Crabapple	7	1.75" caliper B&B Standard
	Picea glauca White Spruce (native)	16	6-7 ft. B&B Low-branched
	Prunus sargentii 'Columnaris' Columnar Sargent Flowering Cherry	7	1.75" caliper B&B Standard
	Syringa reticulata 'Ivory Silk' Japanese Tree Lilac	4	1.75" caliper B&B Standard
	Thuja occidentalis 'Emerald' American Arborvitae (native)	27	5-6 ft. B&B Full to ground-matching
	Shrubs/Vines:		
	Abies balsamea 'Nana' Dwarf Balsam Fir (native)	15	3 gal. container 18" min. height
	Aronia arbutifolia 'Brilliantissima' Red Chokeberry (native)	79	5 gal. container 24" min. height
	Buxus koreana x sempervirens 'Green Mountain' Green Mountain Boxwood	46	18-21" B&B
	Clethra alnifolia 'Hummingbird' Summersweet (native)	119	3 gal. container 18" min. height
	Cornus sericea baileyi Redtwig Dogwood (native)	19	3 gal. container 24" min. height
	Gaultheria procumbens Wintergreen (native)	43	3 gal. container 12" min. height
	Hydrangea arborescens 'Annabelle' Annabelle Hydrangea	6	5 gal. container 24" min height
	Ilex glabra 'Compacta' Compact Inkberry (native)	277	3 gal. container 24" min. height
	Ilex verticillata 'Red Sprite' Winterberry (native)	105	3 gal. container 24" min. height
	Juniperus chinensis 'Old Gold' Old Gold Juniper	239	5 gal. container 24" min. height
	Myrica pennsylvanica Northern Bayberry (native)	239	5 gal. container 24" min. height
	Picea glauca albertiana 'Conica' Dwarf White Spruce (native)	8	36" B&B Full & Symmetrical
	Rosa 'Radrazz' Red Knock-out Rose	95	3 gal. container 18" min. height
	Syringa patula 'Miss Kim' Miss Kim Lilac	5	5 gal. container 24" min. height
	Vaccinium corymbosum Highbush Blueberry (native)	8	5 gal. container 24" min. height
	Weigela 'Wine and Roses' Hybrid Weigela	199	5 gal. container 24" min. height
	Grasses / Perennials:		
	Asclepias tuberosa Butterfly Weed (native)	35	1 gal. container
	Coreopsis verticillata 'Zagreb' Coreopsis	117	1 gal. container
	Hemerocallis flava Lemon Daylily	36	1 gal. container
	Heuchera 'Plum Pudding' Alum Root	78	1 gal. container
	Panicum virgatum Switch Grass (native)	130	1 gal. container
	Pennisetum alopecuroides 'Hameln' Hameln Fountain Grass	119	1 gal. container
	Ground Covers:		
	Arctostaphylos uva-ursi 'Massachusetts' Bearberry (native)		Liners @ 36" o.c. triangularly spaced
	Native Wetland/Buffer Seed Mix Pierson Nurseries Inc. or equal		Hydroseed all disturbed areas
	Annual Flowers by season Spring-Summer-Fall rotations		4" Pots@ 8" o.c. triangularly spaced
	Lawn Areas- Kentucky Bluegrass/ Fescue mix		Sod or Seed areas to be determined

Notes-

1. An automated permanent irrigation system shall be installed using SMART Technology, providing 100% coverage to all landscaped areas.
2. Provide 5 ft. high Tree Protection fencing around driplines of all trees or tree groups to be preserved prior to commencement of construction. Tree Protection fencing shall remain in place throughout entire construction activity period.
3. All shrub/ground cover beds to receive a 3" layer of organic mulch.

PLANTING PLAN

DATE: 5 August 2015 rev. 8-12-15
SCALE: 1" = 30'

0 15 30 60 90

LICENSED LANDSCAPE ARCHITECT
BRIAN D. LIND
No. 4193
STATE OF MAINE

lenity architecture
3150 Kettle Court SE, Salem, Oregon 97301
p 503 399 1090 f 503 399 0565 w lenityarchitecture.com

COLSON AND COLSON
GENERAL CONTRACTOR, INC.
2260 McGILCHRIST STREET SE, SUITE 200
SALEM, OREGON, 97302
PHONE (503) 586-7401

PORTLAND
RETIREMENT RESIDENCE
802 OCEAN AVE. PORTLAND, MAINE 04103

PLANTING PLAN

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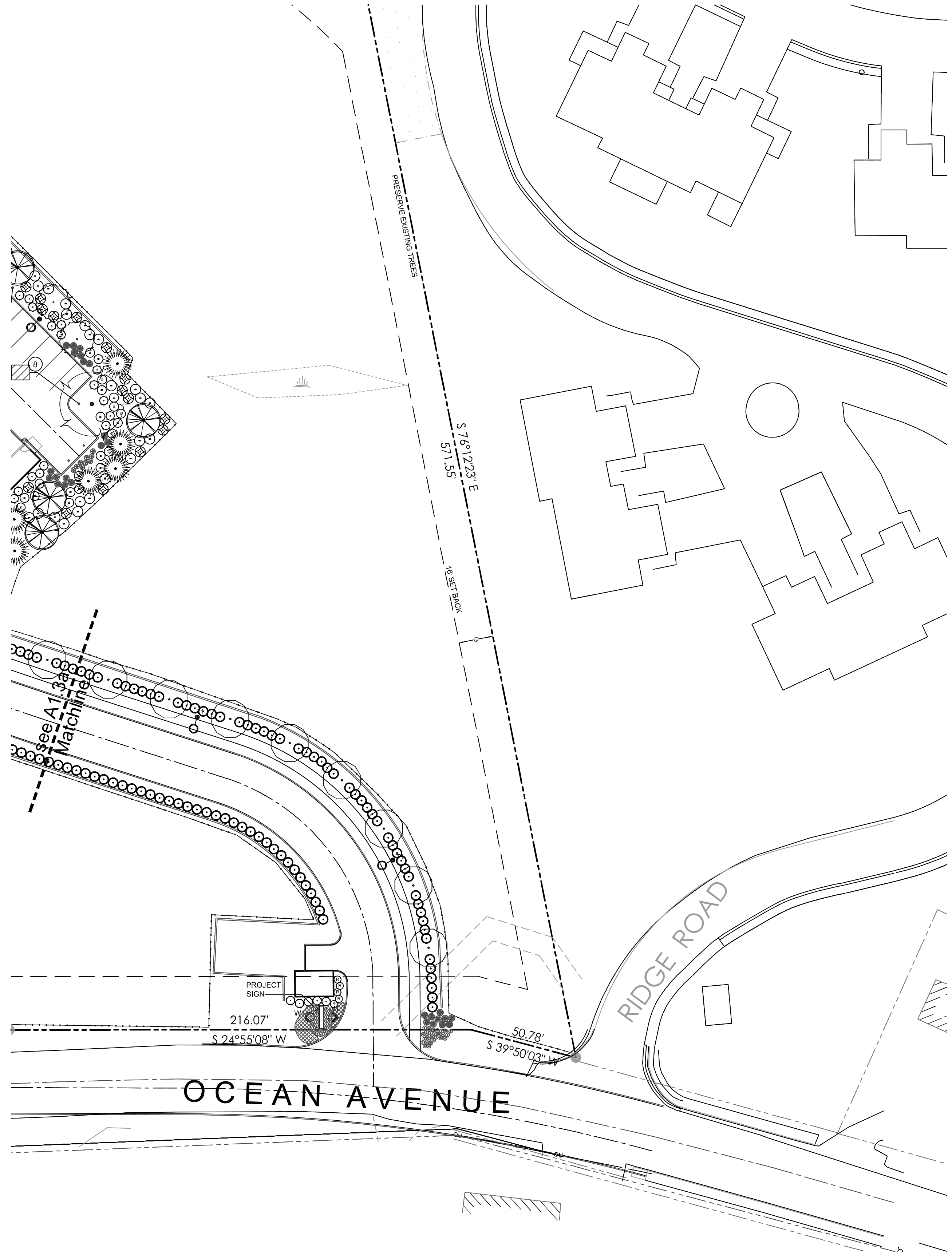
DATE
8/28/2015

REVISED DATE

SHEET
A1.3a



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PLANTING PLAN

DATE: 5 August 2015 rev. 8-12-15
SCALE: 1" = 30'

0 15 30 60 90

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No. 4193
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PHONE (503) 586-7401

PORTLAND
RETIREMENT RESIDENCE
802 OCEAN AVE. PORTLAND, MAINE 04103

PLANTING PLAN

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DATE
8/28/2015

REVISED DATE

SHEET
A1.3b

Section 24. Lighting Cut Sheets/Lighting Plan

Portland Retirement Residence

Portland, ME

Exterior Lighting

Cut Sheets

9/11/2015

lenity architecture

LITHONIA LIGHTING®

Catalog Number	
Notes	Type

FEATURES & SPECIFICATIONS

Intended Use

For use in indoor or outdoor wet locations, such as patios and pathways.

Construction

Aluminum, white die-cast frame-in.

Louvered, slotted, and opal faceplates available.

Die-cast powder coat painted faceplates are available in white or black.

Faceplates are shipped separately.

Electrical system

9DTT – encased-and-potted, high power factor (HPF) electromagnetic ballast standard (120V only).

13DTTE – high power factor (HPF), -20°F to 158°F, instant start electronic ballast standard (120V or 277V).

Maximum of 4 No. 12 AWG through branch circuit connectors suitable for 75°C or higher permitted in box.

One electrical conduit fitting and one plug provided.

Electrical fittings are suitable for wet locations in wood construction, masonry and poured concrete applications.

Listing

Wet location listed.

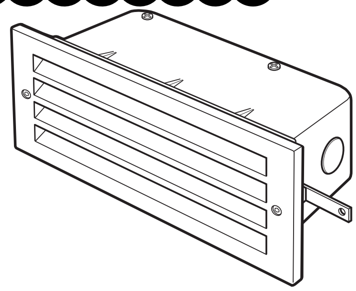
UL listed to U.S. and Canadian safety standards.

INSTALLED AT PATIO IN SEAT WALL.

TYPE D

Compact Fluorescent Lighting

WSL1F



WET LOCATION STEPLIGHT

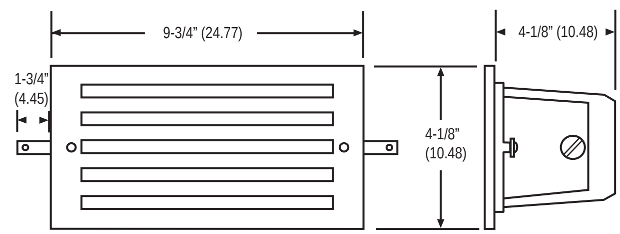
Non-IC

Specifications

Cutout: 9-1/4" x 3-5/8"

Suitable depth for concrete 4.25"

Mounting nipples make cutout 10.25" clearance.



All dimensions are inches (centimeters).

ORDERING INFORMATION

Example: **WSL1F 9DTT FPLBL 120 FPLBL**

Choose the boldface catalog nomenclature that best suits your needs and write it on the appropriate line.

WSL1F

Series	Wattage/Lamp	Faceplate	Voltage
WSL1F	**9DTT**[1]	**FPL** White Louvered	**120**
	13DTTE[2]	**FPLBL** Black Louvered	**277**
		FPS White Slotted	
		FPSBL Black Slotted	
		FPO White Opal	
		FPOBL Black Opal	

NOTES:

1 120V only.

2 Electronic ballast standard.

WSL1F Wet Location Steplight, Compact Fluorescent

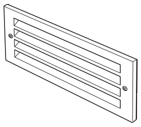
TYPE D

Faceplates

Louvered Faceplate

FPL White

FPLBL Black



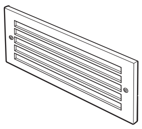
9DTT
13DTT 4-PIN

Non-IC

Slotted

FPS White

FPSBL Black



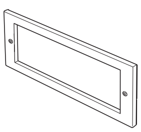
9DTT
13DTT 4-PIN

Non-IC

Opal

FPO White

FPOBL Black



9DTT
13DTT 4-PIN

Non-IC

LITHONIA LIGHTING®
An Acuity Brands Company

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Lithonia Lighting
Recessed Downlighting
One Lithonia Way, Conyers, GA 30012
Phone: 800-315-4935 Fax: 770-918-1209
www.lithonia.com

e-conolight®

TYPE F1

SMALL LED FLOODLIGHT 7 WATT LED (E-GL3L SERIES)

Applications – Security, building facades, displays, signs, and other residential uses.
Typical Mounting Height: 8 to 15 feet

ARCHITECTURAL FEATURES AND LANDSCAPE ELEMENTS.

4"H x **4"**W x **4-5/8"**D

Catalog #	Description	Input Voltage	Delivered Lumen Output	CCT	CRI	Lifetime	Weight	Comparable To:
E-GL3L01N2K (black) **E-GL3L01N2W (white)**	7W LED, Neutral white	120V-277V	600 Lumens	4100K	80	50,000 Hours	0.8 lbs	50W Halogen

Features

- 50,000 hours of maintenance-free operation
- Non-dimmable
- 7W LED
- 600 lumens, comparable to 50W halogen
- Neutral white (4100K) color temperature at 80 CRI
- Low-copper, die-cast aluminum housing and lens frame
- Polyester powder-coat finish (textured black or smooth white)
- Tempered glass lens, thermal shock and impact resistant
- 1/2-inch NPS aluminum die-cast swivel fitter attaches to standard J-box
- Universal voltage (120V through 277V)
- Minimum starting temperature: -22° F
- UL Listed for wet locations
- 1-year warranty

Accessories

None Available

e-conolight®

PREMIUM LED DIRECTIONAL SPOT LIGHT
38-WATT LED
(E-GL1S SERIES)

TYPE F2

Applications – For accenting architecture or lighting landscape areas
Typical Mounting Height: 8 to 15 feet

ARCHITECTURAL FEATURES AND LANDSCAPE ELEMENTS.

CREE LEDs

8-1/2"H x **6-1/4"**W x **7-3/4"**D (Height dimension includes fitter)

Catalog #	Description	Input Voltage	Delivered Lumen Output	Beam Angle/ Photometric Distribution	CCT	CRI	Lifetime (L_{70} at 15˚C)	Weight	Comparable To:
E-GL1S03C2W (white) **E-GL1S03C2K (black)**	38W LED Cool white	120V-277V	2000 Lumens	20˚ Spot	5700K	73	50,000 Hours	5 lbs	70W PSMH
E-GL1S03N2W (white) **E-GL1S03N2K (black)**	38W LED Neutral white	120V-277V	2000 Lumens	20˚ Spot	4100K	74	50,000 Hours	5 lbs	70W PSMH

Features

- 50,000 hours of maintenance-free operation to L_{70} at 15°C
- Non-dimmable
- Low copper, die-cast aluminum housing and lens frame
- Textured black or smooth white polyester powder-coat finish
- Tempered glass lens, thermal shock and impact resistant
- 1/2" NPS adjustable fitter included
- Universal voltage (120V through 277V)
- RoHS compliant
- Suitable for ground mounting, uplighting & downlighting
- Precise optical reflector
- Heat dissipating fins
- Minimum starting temperature: -40° F
- UL Listed for wet locations
- Cree® LEDs inside
- 3-year warranty

Accessories

None Available

e-conolight®

PREMIUM LED DIRECTIONAL FLOODLIGHT 38-WATT LED (E-GL1F SERIES)

Applications – For accenting architecture or lighting landscape areas
Typical Mounting Height: 8 to 15 feet

TYPE F3

ARCHITECTURAL FEATURES AND LANDSCAPE ELEMENTS.

CREE LEDs

8-1/2"H x **6-1/4"**W x **7-3/4"**D (Height dimension includes fitter)

Catalog #	Description	Input Voltage	Delivered Lumen Output	Beam Angle/ Photometric Distribution	CCT	CRI	Lifetime (L_{70} at 15˚C)	Weight	Comparable To:
E-GL1F03C2W (white) **E-GL1F03C2K (black)**	38W LED Cool white	120V-277V	2000 Lumens	40˚ Flood	5700K	73	50,000 Hours	5 lbs	70W PSMH
E-GL1F03N2W (white) **E-GL1F03N2K (black)**	38W LED Neutral white	120V-277V	2000 Lumens	40˚ Flood	4100K	74	50,000 Hours	5 lbs	70W PSMH

Features

- 50,000 hours of maintenance-free operation to L_{70} at 15°C
- Non-dimmable
- Low copper, die-cast aluminum housing and lens frame
- Textured black or smooth white polyester powder-coat finish
- Tempered glass lens, thermal shock and impact resistant
- 1/2" NPS adjustable fitter included
- Universal voltage (120V through 277V)
- RoHS compliant
- Suitable for ground mounting, uplighting & downlighting
- Precise optical reflector
- Heat dissipating fins
- Minimum starting temperature: -40° F
- UL Listed for wet locations
- Cree® LEDs inside
- 3-year warranty

Accessories

None Available

TYPE G

PREMIUM LED WALL PACK - SMALL
36-WATT LED
(E-WP6L SERIES)

Applications: Security, pathway and perimeter lighting; ideal for entryways and other applications where control of spill light is important.
Typical Mounting Height: 8 to 15 feet **Typical Spacing:** 1 to 2 times the mounting height

INSTALLED ON AT BUILDING AT EXITS AND GARAGES.

9.5"**D** x 8.75"**W** x 4.5"**H**
Weight: 7.0 lbs.

Catalog #	Description	Input Voltage	Initial Delivered Lumens	CCT	CRI	50K Hours Projected Lumen Maintenance Factor at 25°C [1]	Comparable To:
E-WP6L03CZ	36W LED Cool white	120V-277V	3350	5000K	70	50,000 Hours	100W PSMH
E-WP6L03NZ	36W LED Neutral white	120V-277V	3350	4000K	70	50,000 Hours	100W PSMH

[1] Calculated L_{70} based on 6,048 hours of LM-80 testing: >36,000 hours

Performance
- Estimated 50,000 hours of maintenance-free operation to L_{70}
- Minimum starting temperature: -40°F
- 5-year limited warranty

Construction & Materials
- Low copper, die-cast aluminum housing and lens frame
- Dark bronze polyester powder-coat finish
- Fixed cutoff glare shield to reduce light pollution
- Tempered glass lens, thermal shock and impact resistant
- Patented lens design delivers true IES Type III distribution
- Mounts over recessed junction box or with conduit
- Die-cast detachable back box for easy mounting
- Heat dissipating fins
- Conduit entries on all sides of the fixture
- Two knockouts provided on back for conduit or J-box mounting
- Cree® LEDs inside

Electrical
- Non-dimmable
- 75°C minimum supply wire required
- Universal voltage (120V through 277V)

Regulatory
- UL Listed for wet locations
- RoHS compliant

Accessories

CAT.# E-ACP1 (120 volts)
CAT.# E-ACP2 (208/240/277 volts)

Photocell is field installed.
For use with adjustable slip fitter only.

Due to continuous product improvement, information in this document is subject to change. All published photometric testing performed to IESNA LM-79-08 standards by a NVLAP certified laboratory. Fixture photometry was completed on a single representative fixture. Actual production units may vary up to ±10% of initial delivered lumens. Lumen maintenance values at 25°C (77°F) are calculated per TM-21 based on LM-80 data and in-situ fixture testing.

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TYPE G1

LED DECORATIVE WALL SCONE - UP OR DOWN
16-WATT LED
(E-S12 SERIES)

Applications: Ideal for illumination along steps, walkways and entry ways
Typical Mounting Height: 8 to 15 feet **Typical Spacing:** 1 to 2 times the mounting height

INSTALLED ON BUILDING

6.1875"**L** x 4.875"**W** x 5.1875"**H**
Weight: 3.2 lbs.

Catalog #	Description	Input Voltage	Initial Delivered Lumens	CCT	CRI	50K Hours Projected Lumen Maintenance Factor at 25°C [1]
E-S12L013U(*)	16W LED Warm White	120-277V	950	3000K	80	100,000+ Hours
E-S12L014U(*)	16W LED Neutral White	120-277V	95	4000K	80	100,000+ Hours

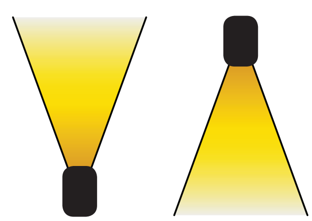
(*) Specify finish color. K=Black, W=White
[1] Calculated L_{70} based on 6,048 hours of LM-80 testing: >36,000 hours

Performance
- Estimated 100,000+ hours of maintenance-free operation to L_{70}
- 3-year limited warranty

Construction & Materials
- Use as an uplight or downlight
- Die-cast aluminum mounting box with extruded aluminum housing-mounting box measures 5" square (5-3/8" square with gasket)
- Supplied with back mounting plate to mount over a 4" square or 4" octagonal junction box
- 25-degree beam spread
- Silicon gasket provides a water tight seal
- Polyester powder-coat black or white finish
- Tempered glass lens, thermal shock and impact resistant
- Cree® LEDs inside

Electrical
- Dimmable with most 0-10V dimmers
- Universal voltage (120V through 277V)

Regulatory
- ETL Listed for wet locations



E-S12 Series fixture mounted at 12 feet with 0° tilt.

TYPE G2

LED WALL MOUNT
14- & 22-WATT LED
(E-WW1L SERIES)

Applications: Security, entryways, stairways, storage and perimeter areas, as well as residential exteriors.
Typical Mounting Height: 8 to 12 feet **Typical Spacing:** 12 feet

INSTALLED AT TRASH ENCLOSURE

CREE LEDs

9"**D** x 5.75"**W** x 4"**H**
Weight: 2.0 lbs.

Catalog #	Description	Input Voltage	Initial Delivered Lumens	CCT	CRI	50K Hours Projected Lumen Maintenance Factor at 25°C[1]	Comparable To
E-WW1L11N(*)P	14W Neutral White	120V	1017	4000K	70+	91%	100W Incandescent
E-WW1L21N(*)P	22W Neutral White	120V	1228	4000K	70+	86%	120W Incandescent

(*) Specify finish color. M=Medium Bronze, W=White

[1] Calculated L_{70} based on 6,048 hours of LM-80 testing: >36,000 hours

Performance
- Estimated 172,000 **(22W)** 118,000 **(14W)** hours of maintenance-free operation to L_{70} at 25°C
- Minimum starting temperature: -40°C (-40°F)
- 5-year limited warranty

Construction & Materials
- Polycarbonate housing in bronze or white with heavy-duty aluminum mounting plate
- 1/2" NPT tapped back and bottom for conduit entrances
- UV-stabilized polycarbonate prismatic refractor
- Cree® LEDs inside

Electrical
- Non-dimmable
- 120V operation with built-in photocell

Regulatory
- UL Listed for wet locations

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TYPE G3

LED DECORATIVE WALL SCONE - UP AND DOWN
30-WATT LED
(E-S22 SERIES)

Applications: Ideal for illumination along steps, walkways and entry ways
Typical Mounting Height: 8 to 15 feet **Typical Spacing:** 1 to 2 times the mounting height

INSTALLED ON BUILDING

6.1875"**L** x 4.875"**W** x 7.1875"**H**
Weight: 4.2 lbs.

Catalog #	Description	Input Voltage	Initial Delivered Lumens	CCT	CRI	50K Hours Projected Lumen Maintenance Factor at 25°C [1]
E-S22L033U(*)	30W (total) LED Warm White	120-277V	1850 (total)	3000K	80	100,000+ Hours
E-S22L034U(*)	30W (total) LED Neutral White	120-277V	1850 (total)	4000K	80	100,000+ Hours

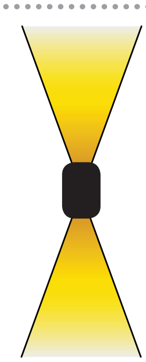
(*) Specify finish color. K=Black, W=White
[1] Calculated L_{70} based on 6,048 hours of LM-80 testing: >36,000 hours

Performance
- Estimated 100,000+ hours of maintenance-free operation to L_{70}
- 3-year limited warranty

Construction & Materials
- Up and down fixture creates gorgeous hourglass lighting effect
- Die-cast aluminum mounting box with extruded aluminum housing-mounting box measures 5" square (5-3/8" square with gasket)
- Supplied with back mounting plate to mount over a 4" square or 4" octagonal junction box
- 25-degree beam spread
- Silicon gasket provides a water tight seal
- Polyester powder-coat black or white finish
- Tempered glass lens, thermal shock and impact resistant
- Cree® LEDs inside

Electrical
- Dimmable with most 0-10V dimmers
- Universal voltage (120V through 277V)

Regulatory
- ETL Listed for wet locations



E-S22 Series fixture mounted at 12 feet with 0° tilt.

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TYPE G4

LED GOOSENECK 15-WATT LED (E-DG1L SERIES)

Applications: Business storefronts, restaurants, and building perimeters that need an architectural touch of style
Typical Mounting Height: 8 to 15 feet

Straight Shroud

31.5"**L** x 15.3"**W** x 18.8"**H**
Weight: 5.0 lbs.

Angled Shroud

35"**L** x 15.3"**W** x 25.8"**H**
Weight: 5.0 lbs.

INSTALLED ON BUILDING AT ENTRY CANOPY.

Catalog #	Description	Input Voltage	Initial Delivered Lumens	CCT	CRI	50K Hours Projected Lumen Maintenance Factor at 25°C [1]	Comparable To:
E-DG1L13UAK	15W LED Warm White Angled Shroud	120V-277V	1100	3000K	≥70	88%	90W Incandescent
E-DG1L13USK	15W LED Warm White Straight Shroud	120V-277V	1260	3000K	≥70	88%	90W Incandescent

[1] Calculated L_{70} based on 6,048 hours of LM-80 testing: >36,000 hours

Performance
- Estimated 150,000+ hours of maintenance-free operation to L_{70}
- -30°C (-22°F) minimum starting temp
- 5-year limited warranty

Construction & Materials
- Die-cast aluminum mounting box and housing
- Supplied with back mounting plate to mount over a 4" square or octagonal j-box
- Black polyester powder-coat finish for extra corrosion protection and long-lasting color
- Tempered glass lens, thermal, shock and impact resistant
- Cree® LEDs inside

Electrical
- Non-dimmable
- Universal voltage (120V through 277V)

Regulatory
- ETL Listed for wet locations

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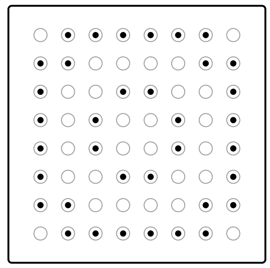
TYPE M

RECESSED LED CANOPY LIGHT - WIDE DISTRIBUTION
42-WATT LED
(E-RC2L04CW)

Applications: Security, entryway and perimeter lighting. Also recommended for walkways and exterior canopies
Typical Mounting Height: 8 to 15 feet **Typical Spacing:** 1 to 2 times the mounting height

INSTALLED ON UNDERSIDE OF ENTRY CANOPY

16"**D** x 16"**W** x 3.75"**H**
Weight: 6.2 lbs.



LED PATTERN

This fixture is listed on the DesignLights Consortium® Qualified Products List.

Catalog #	Description	Input Voltage	Initial Delivered Lumens	CCT	CRI	50K Hours Projected Lumen Maintenance Factor at 25°C [1]	Comparable To:
E-RC2L04CW	42W LED Cool White	120V-277V	4100	5000K	75	50,000 Hours	100W PSMH

[1] Calculated L_{70} based on 6,048 hours of LM-80 testing: >36,000 hours

Performance
- 50,000 hours of maintenance-free operation to L_{70}
- Minimum starting temperature: -22° F
- 5-year limited warranty

Construction & Materials
- Rugged and durable aluminum housing
- UV-stabilized acrylic lens with molded precision optics
- Two 1/2" conduit entries on top for through wiring
- Hanging cable supports fixture while wiring connections are made
- Secures to mounting surface with four screws (provided by others)
- Cree® LEDs inside

Electrical
- 0-10 Dimmer (See below for recommended dimmers)
- Universal voltage (120V through 277V)

Regulatory
- ETL Listed for wet locations
- Non-IC rated
- RoHS compliant

Recommended Dimmers
- **Lutron CTCL-153PDH-WH**
- **Lutron TGCL-153PH-WH**
- **Lutron MA-600MR-WH**
- **Leviton R50-IPL06-10M**

NOTE: The presence of a dimmer on this chart is not a guarantee or warranty of the compatibility of the fixture in any particular installation.
The absence of a dimmer from this chart does not necessarily imply incompatibility.

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HALO

TYPE N

Catalog #	
Project	
Comments	
Prepared by	

Type
Date

INSTALLED ON UNDERSIDE OF BUILDING AT EXITS

DESCRIPTION

The Halo Surface LED Downlight (SLD) incorporates WaveStream™ technology to create an ultra-low profile surface mounting luminaire with the performance and look of a traditional downlight. SLD6 is designed for installation in many 3-1/2" and 4" square, octagon or round junction boxes. And may also retrofit in 5" and 6" IC and Non-IC recessed housings.* Suitable for residential or commercial installations. Ideal for closets, storage areas, attics and basements. Compliant with NFPA® 70, NEC® Section 410.16 (A)(3) and 410.16 (C)(5).

SLD 1200 Series

SLD6128xxWH

80CRI

2700K, 3000K, 3500K, and 4000K

SLD6129xxWH

90CRI

2700K, 3000K, 3500K, and 4000K

6" Surface LED Downlight

High Lumen 1200 Series

Suitable for ceiling or wall electrical junction boxes

Suitable for 5" & 6" recessed housing retrofit (IC, Non-IC & AIR-TITE™)

SPECIFICATION FEATURES

CONSTRUCTION

- Die cast aluminum trim ring, and die formed aluminum frame

OPTICS

- WaveStream™ technology provides uniform luminance from a low profile flat lens
- AccuAim™ optics provide directional control for the "cone-of-light" beam distribution of a traditional downlight.
- Precision molded lens features high transmission polymer with UV stabilized protecting film

DESIGNER TRIMS

Accessories (sold separately)

SLD designer trims are accessory rings that attach to the SLD for a permanent finish.* Refer to SLD accessories specification sheet for details.

- White (Paintable)
- Satin Nickel
- Tuscan Bronze

*SLD accessory trims attach with permanent adhesion and are not interchangeable after installation.

ELECTRICAL JUNCTION BOX MOUNTING

- SLD may be used in compatible electrical junction boxes in direct contact with insulation including spray foam insulation
- Suitable for installation in many 3-1/2" and 4" square, octagon, and round electrical junction boxes

  Note: Driver consumes 3 cubic inches of junction box
- Surface mounting in a fire-rated ceiling using an appropriate electrical box offers a cost-effective alternative to fire-rated recessed housings

  Note: Fire-rating is per the rating of the ceiling and applicable junction box, not the SLD.
- Installer must ensure compatibility of fit, wiring and proper mounting in the electrical junction box. This includes all applicable national and local electrical and building codes.
- Proprietary Slot-N-Lock quick installation system for junction box installation
- T-bracket with Slot-N-Lock mounting tabs included

RECESSED HOUSING MOUNTING

- May be installed in IC recessed housings in direct contact with insulation

* **Note:** Not for use in recessed housings in direct contact with spray foam insulation. Refer to NEMA LSD 57-2013

Torsion Spring 5" & 6"

- Optional precision formed torsion spring bracket kit is included
- The torsion springs adjust on the frame to fit 5" or 6" compatible housings

Friction Blade 5" & 6"

- Optional precision formed friction blades included
- For retrofit in 5" and 6" housings without torsion spring mounting tabs
- Friction blade design allows the SLD to be installed in any position within the housing aperture (360 degrees)

LED

- Linear LED arrays are integrated in trim perimeter
- Color Temperature: 2700K, 3000K, 3500K, 4000K
- CRI options: 80 and 90
  - 90 CRI can be used for California Title 24 compliance/ certified to Title 20
  - 80 CRI can be used to comply with California Title 24 Non-Residential Lighting Controls as a LED luminaire.

WARRANTY

Cooper Lighting provides a five year limited warranty on the SLD LED

LED CHROMATICITY

- A tight chromaticity specification ensures LED color uniformity, sustainable Color Rendering Index (CRI) and Correlated Color Temperature (CCT) over the useful life of the LED
- LED chromaticity of 3 SDCM exceeds ENERGY STAR® color standards per ANSI.
- 90 CRI model features high color performance with R9 greater than 50
- Every Halo LED is quality tested, measured, and serialized in a permanent record to register lumens, wattage, CRI and CCT.
- Halo LED serialized testing and measurement ensures color and lumen consistency on a per-unit basis, and validates long-term product consistency over time

ELECTRICAL CONNECTIONS

Junction Box

- Compatible with 3-1/2" x 2" and 4" x 1-1/2" deep round, square and octagon boxes (2-1/8" deep boxes recommended)
- Supply Wire Adapter with LED quick connector included

Recessed Housings

- LED connector is compatible with Halo 5" H550 Series and 6" H750 Series LED Housings
- LED Connector meets California Title-24 high-efficacy luminaire standard as a non-screw base
- The included E26 Edison screw-base adapter provides capability for retrofit
- LED connector is a non-screwbase luminaire disconnect for tool-less installation

ENERGY DATA

	80 CRI	90 CRI
Lumens (4000K models)	1215	1000
Input Voltage	120V	120V
Frequency	50/60 Hz	50/60 Hz
Input Current	0.12 A	0.12 A
Input Power	14.8 W	14.8 W
Efficiency (4000K models)	82 lm/W	68 lm/W
THD	≤ 20%	
Power Factor	≥ 0.90	
T Ambient	-30 - +40°C	
Sound Rating	Class A	

80 CRI nominal CCT 2700K 3000K 3500K 4000K

ENERGY STAR | Can be used for IECC International Energy Conservation Code High Efficacy Compliance | Can be used to comply with T24 California Non-Residential Lighting Controls requirements | Can be used for WSEC Washington State Energy Code High Efficacy Compliance | RoHS Compliant | airtite | Showerlight

Refer to ENERGY STAR® Certified Products List.
Can be used to comply with California Title 24 Non-Residential Lighting Controls requirements as a LED Luminaire.

90 CRI nominal CCT 2700K 3000K 3500K 4000K

ENERGY STAR | Can be used for IECC International Energy Conservation Code High Efficacy Compliance | T24 Can be used to comply with California Title 24 High Efficacy requirements | T20 Certified to California Title 20 Appliance Database | Can be used for WSEC Washington State Energy Code High Efficacy Compliance | RoHS Compliant | airtite | Showerlight

Refer to ENERGY STAR® Certified Products List.
Can be used to comply with California Title 24 High Efficacy requirements.
Certified to California Title 20 Appliance Efficiency Database.

NOMENCLATURE

SLD 612 8 30 WH

612 = 6" SLD 1200 Series
8 = >80 CRI
30 = 3000K
WH = Matte White

EATON
Powering Business Worldwide

HALO

TYPE N

SLD6128xxWH
SLD6129xxWH

LED DRIVER
- Driver is a 120V input, high efficiency, dimmable electronic power supply providing DC power to the LED arrays
- Driver features high power factor, low THD, and has integral thermal protection in the event of over temperature or internal failure
- Driver is replaceable if it should be required

DIMMING
- Designed for continuous dimming capability to nominally 5% with many 120V Leading Edge (LE) and Trailing Edge (TE) phase control dimmers. Dimming to 5% is best assured using dimmers with low end trim adjustment. Consult dimmer manufacturer for compatibility and conditions of use. (Note some dimmers require a neutral in the wallbox.)

COMPLIANCE
- cULus Listed ceiling and wall
- cULus Damp Location listed ceiling and wall
- cULus Wet Location Listed, ceiling only (shower rated)
- Suitable for use in closets, compliant with NFPA® 70, NEC® Section 410.16 (A)(3) and 410.16 (C)(5)
- SLD may be used in compatible electrical junction boxes in direct contact with insulation including spray foam insulation
- May be installed in IC recessed housings in direct contact with insulation (Not for use in recessed housings in direct contact with spray foam insulation. Refer to NEMA LSD 57-2013)
- UL Classified when used in retrofit with listed housings (See Housing Compatibility)
- EMI/RFI: meets FCC 47CFR Part 15 Class B limits, and is suitable for use in residential and commercial installations
- Airtight certified per ASTM E283 (not exceeding 2.0 CFM under 57 Pascals pressure difference)
- 90 CRI: Can be used to comply with California Title 24 High Efficacy requirements. Certified to California Title 20 Appliance Efficiency Database.
- 80 CRI: Can be used to comply with California Title 24 Non-Residential Lighting Controls requirements as a LED luminaire.
- Can be used for International Energy Conservation Code (IECC) and Washington State Energy Code high efficiency luminaire compliance
- ENERGY STAR® certified luminaire - consult ENERGY STAR® Certified Product List
- Contains no mercury or lead and RoHS compliant.
- Photometric testing in accordance with IES LM-79
- Lumen maintenance projections in accordance with IES LM-80 and TM-21

SLD 1200 Series

SLD6128xxWH
80CRI
2700K, 3000K, 3500K, and 4000K

SLD6129xxWH
90CRI
2700K, 3000K, 3500K, and 4000K

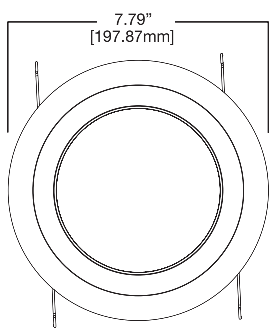
6" Surface LED Downlight

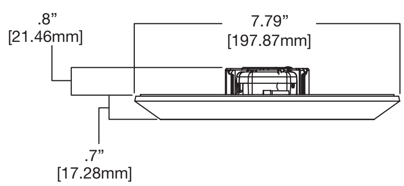
High Lumen 1200 Series

Suitable for ceiling or wall electrical junction boxes

Suitable for 5" & 6" recessed housing retrofit (IC, Non-IC & AIR-TITE™)

DIMENSIONS





ORDERING INFORMATION

SAMPLE NUMBER: SLD612927WH SLD6TRMSN
Junction Box Installation: Order junction box separately, as supplied by others, to complete installation.
Recessed Installation: Order Halo recessed housing separately to complete installation.

Models	Color Rendering Index	Color Temperature (CCT)	Finish	Accessories
SLD612= 6" Surface LED Downlight, 120V 1200 Series	**8**=80 CRI **9**=90 CRI	**27**=2700K **30**=3000K **35**=3500K **40**=4000K	**WH**=White	Designer Trims Fit over the SLD for a designer finish **SLD6TRMSN**=6" SLD Satin Nickel **SLD6TRMTBZ**=6" SLD Tuscan Bronze **SLD6TRMWH**=6" SLD White (paintable) *SLD accessory trims attach with permanent adhesion and are not interchangable after installation J-Box Spacer Extension Ring Add 15/16" depth when SLD driver cannot fit into installed junction box **SLD6EXT**=6" Surface LED J-Box Extender, 9.5" O.D. RAD Adapters When junction box is mounted flat on a ceiling or beam surface (not recessed in ceiling) **SLD6RAD**=6" SLD Round Surface J-Box Adapter, 7.92" O.D. (for 4-inch round or octagon junction boxes.) **SLD6SADPLT**=6" SLD Square Surface J-Box Adapter Plate (For 4-inch square junction boxes, use with SLD6RAD.) Spare Parts **SLD6ACCKIT**=6" Accessory Parts Replacement Kit (Screwbase adapter, torsion springs, friction blades) **SLD6BRKT**=6" Junction Box Bracket & Screws Refer to SLD Accessories specification sheet for further information.

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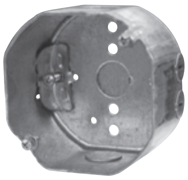
Powering Business Worldwide

HOUSING COMPATIBILITY

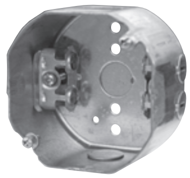
The SLD6 is UL Listed in Halo and All-Pro recessed housings, and is UL Classified for use with **any** 5 or 6 inch diameter recessed housing constructed of steel or aluminum with an internal volume that exceeds 107.9 in³ in addition to those noted below.
Note: Some other's housings require installation with included friction clips.

Compatible Halo LED Housings with LED luminaire connector (high-efficacy compliant)		
HALO LED	Recessed Can Size	Catalog Number
	5"	H550ICAT, H550RICAT
	6"	H750ICAT, H750RICAT, H750T, H750TCP, H2750ICAT
Halo LED Retrofit Enclosures		
HALO	6"	ML7BXRFK, ML7E26RFK
Compatible Halo Incandescent E26 Screwbase Housings		
HALO	5"	H5ICAT, H5RICAT, H5T, H5RT, H5TM, H25ICAT
	6"	H7ICAT, H7RICAT, H7ICT, H7RICT, H7ICATNB, H7ICTNB, H7T, H7RT, H7TNB, H7TCP, H7UICT, H7UICAT, H27ICAT, H27RICAT, H27ICT, H27RICT, H27T, H27RT
Compatible All-Pro Incandescent E26 Screwbase Housings		
ALL-PRO	5"	EI500AT, EI500RAT, ET500, ET500R
	6"	EI700AT, EI700RAT, EI700, EI700R, EI700ATNB, EI700NB, EI700U, EI700UAT, ET700, ET700R, EI2700AT, EI2700, EI2700R, ET2700, ET2700R

COMPATIBLE WITH EATON'S CROUSE-HINDS JUNCTION BOXES



TP316
for non-metallic cable
4" x 4" x 2-1/8"
(102mm x 102mm x 54mm)

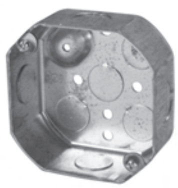


TP317
for metal clad cable
4" x 4" x 2-1/8"
(102mm x 102mm x 54mm)

- **TP316 -** for non-metallic cable
- **TP317 -** for metal clad cable
- UL Listed
- Suitable for two-hour fire-rated ANSI/UL 263 when properly installed in a fire-rated ceiling or wall
- Refer to www.crouse-hinds.com

COMPATIBLE WITH MANY OTHER JUNCTION BOXES*

4" octagon light fixture/fan steel box
4" x 4" x 2-1/8"
(102mm x 102mm x 54mm)



4" octagon steel box
4" x 4" x 1-1/2"
(102mm x 102mm x 38mm)

4" square deep steel box
4" x 4" x 2-1/8"
(102mm x 102mm x 54mm)

4" square standard steel box
4" x 4" x 1-1/2"
(102mm x 102mm x 38mm)

4" round new work non-metallic light fixture/ fan box
4" diameter x 2-3/16"
(102mm x 56mm)

3-1/2" round new work non-metallic ceiling box
3-1/2" diameter x 2-3/4"
(89mm x 70mm)

3-1/2" round old work non-metallic box
4-1/4" O.D. flange, 3-1/2" I.D. x 2-5/8"
(108mm O.D., 89mm I.D. x 67mm)

4" round surface mount box
4" diameter x 1-1/2"
(102mm x 38mm)
Requires SLD6RAD adapter

4" round new work non-metallic box with hanger bar assembly
4" diameter x 2-3/16" (102mm x 56mm)

Surface mounting in a fire-rated ceiling using an appropriate electrical box offers a cost-effective alternative to fire-rated recessed housings.
Note: Fire-rating is per the rating of the ceiling and applicable junction box, not the SLD.

*This is a representative list of compatible junction boxes only. Information contained in this literature about other manufacturers' products is from published information made available by the manufacturer and is deemed to be reliable, but has not been verified. Eaton makes no specific recommendation on product selection and there are no warranties of performance or compatibility implied. Installer must determine that site conditions are suitable to allow proper installation of the SLD mounting bracket in the box.

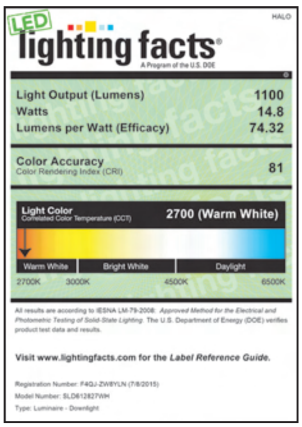
PRODUCT DATA

Cat No.	CRI	CCT	Lumens	Power (W)	LPW
SLD612827WH	80	2700	1100	14.8	74
SLD612830WH	80	3000	1150	14.8	78
SLD612835WH	80	3500	1200	14.8	81
SLD612840WH	80	4000	1215	14.8	82
SLD612927WH	92	2700	880	14.8	59
SLD612930WH	92	3000	925	14.8	63
SLD612935WH	92	3500	965	14.8	65
SLD612940WH	92	4000	1000	14.8	68

Performance values are presented as typical for the model(s) indicated. Field results may vary.

LIGHTING FACTS®

SLD612827WH - 80 CRI



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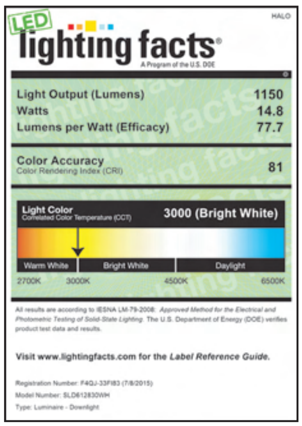

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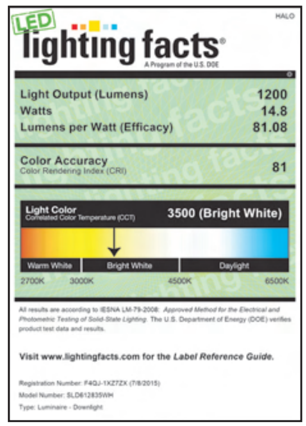

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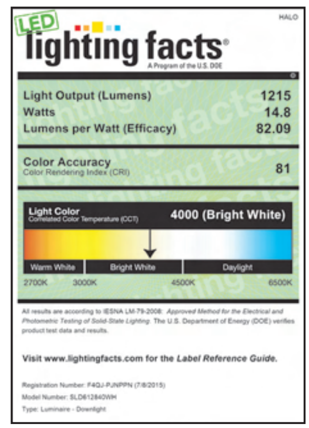
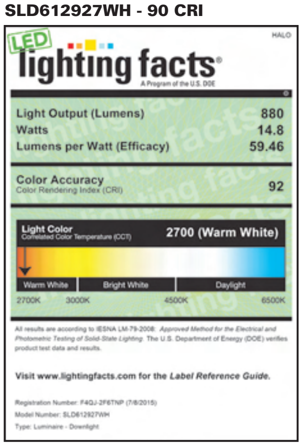


SLD612927WH - 90 CRI



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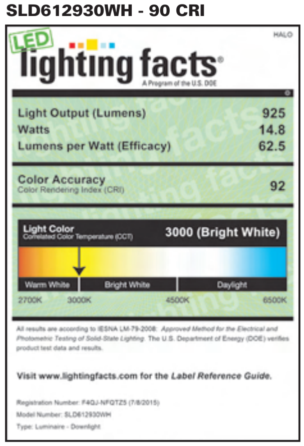

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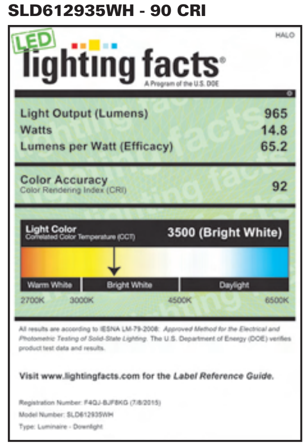
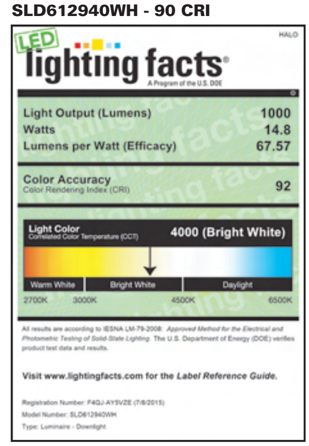


SLD612940WH - 90 CRI



Eaton
1121 Highway 74 South
Peachtree City, GA 30269
P: 770-486-4800
www.eaton.com/lighting

Specifications and dimensions subject to change without notice.

TYPE Q1

INSTALLED AT SUITE DECKS. NOT SHOWN ON PLANS.

D-Series Size 0
LED Area Luminaire

Catalog Number

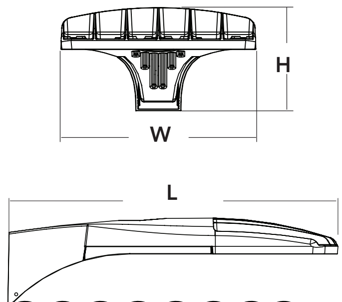
Notes

Type TYPE T1/T1H

Hit the Tab key or m

Specifications

EPA:	0.8 ft² (.07 m²)
Length:	26" (66.0 cm)
Width:	13" (33.0 cm)
Height:	7" (17.8 cm)
Weight (max):	16 lbs (7.25 kg)



MAIN PARKING LOT LIGHTING

Introduction

The modern styling of the D-Series is striking yet unobtrusive - making a bold, progressive statement even as it blends seamlessly with its environment.

The D-Series distills the benefits of the latest in LED technology into a high performance, high efficacy, long-life luminaire. The outstanding photometric performance results in sites with excellent uniformity, greater pole spacing and lower power density. It is ideal for replacing up to 400W metal halide with typical energy savings of 65% and expected service life of over 100,000 hours.

Ordering Information

XAMPLE: DSX0 LED 40C 1000 40K T3M MVOLT SPA DDBXD

DSX0 LED

Series	LEDs	Drive current	Color temperature	Distribution	Voltage	Mounting
DSX0 LED	**Forward optics** 20C 20 LEDs (one engine) 40C 40 LEDs (two engines) **Rotated optics**[1] 30C 30 LEDs (one engine)	530 530 mA 700 700 mA 1000 1000 mA (1 A) [2]	30K 3000 K 80 CRI min.) 40K 4000 K (70 CRI min.) 50K 5000 K (70 CRI) AMBPC Amber phosphor converted [3]	T1S Type I short T2S Type II short T2M Type II medium T3S Type III short T3M Type III medium T4M Type IV medium TFTM Forward throw medium T5VS Type V very short T5S Type V short T5M Type V medium T5W Type V wide	MVOLT [4] 120 [4] 208 [4] 240 [4] 277 [4] 347 [5] 480 [5]	**Shipped included** SPA Square pole mounting RPA Round pole mounting WBA Wall bracket SPUMBA Square pole universal mounting adaptor [6] RPUMBA Round pole universal mounting adaptor [6] **Shipped separately** [7] KMA8 DDBXD U Mast arm mounting bracket adaptor (specify finish)

TYPE T1H ONLY

Control options		Other options	Finish *(required)*
Shipped installed PER NEMA twist-lock receptacle only (no controls) [8] PER5 Five-wire receptacle only (no controls) [8,9] PER7 Seven-wire receptacle only (no controls) [8,9] DMG 0-10V dimming driver (no controls) [10] DCR Dimmable and controllable via ROAM® (no controls) [11] PIR Motion sensor, 8-15' mounting height [12] PIRH Motion sensor, 15-30' mounting height [12]	BL30 Bi-level switched dimming, 30% [13,14] BL50 Bi-level switched dimming, 50% [13,14] PNMTDD3 Part night, dim till dawn [15] PNMT5D3 Part night, dim 5 hrs [15] PNMT6D3 Part night, dim 6 hrs [15] PNMT7D3 Part night, dim 7 hrs [15]	**Shipped installed** HS House-side shield [16] SF Single fuse (120, 277, 347V) [17] DF Double fuse (208, 240, 480V) [17] L90 Left rotated optics [1] R90 Right rotated optics [1] DDL Diffused drop lens [16]	DDBXD Dark bronze DBLXD Black DNAXD Natural aluminum DWHXD White DDBTXD Textured dark bronze DBLBXD Textured black DNATXD Textured natural aluminum DWHGXD Textured white

Accessories

Ordered and shipped separately.

Controls & Shields

DLL127F 1.5 JU	Photocell - SSL twist-lock (120-277V) [18]
DLL347F 1.5 CUL JU	Photocell - SSL twist-lock (347V) [18]
DLL480F 1.5 CUL JU	Photocell - SSL twist-lock (480V) [18]
SC U	Shorting cap [18]
DSX0HS 20C U	House-side shield for 20 LED unit [16]
DSX0HS 30C U	House-side shield for 30 LED unit [16]
DSX0HS 40C U	House-side shield for 40 LED unit [16]
DSX0DDL U	Diffused drop lens (polycarbonate) [16]
PUMBA DDBXD U*	Square and round pole universal mounting bracket adaptor (specify finish)
KMA8 DDBXD U	Mast arm mounting bracket adaptor (specify finish) [7]

For more control options, visit DTL and ROAM online.

NOTES
1. 30 LEDs (30C option) and rotated options (L90 or R90) only available together.
2. 1000mA not available with AMBPC.
3. AMBPC only available with 530mA or 700mA.
4. MVOLT driver operates on any line voltage from 120-277V (50/60 Hz). Specify 120V, 208V, 240V or 277V options only when ordering with fusing (SF, DF options).
5. Not available with single board, 530mA product (20C 530 or 30C 530). Not available with BL30, BL50 or PNMT options.
6. Available as a separate combination accessory: PUMBA (finish) U; 1.5 G vibration load rating per ANCI C136.31.
7. Must be ordered as a separate accessory; see Accessories information. For use with 2-3/8" mast arm (not included).
8. Photocell ordered and shipped as a separate line item from Acuity Brands Controls. See accessories.
9. If ROAM® node required, it must be ordered and shipped as a separate line item from Acuity Brands Controls. Not available with DCR.
10. DMG option for 347V or 480V requires 1000mA.
11. Specifies a ROAM® enabled luminaire with 0-10V dimming capability; PER option required. Additional hardware and services required for ROAM® deployment; must be purchased separately. Call 1-800-442-6745 or email: sales@roamservices.net. N/A with PIR, PIRH, PER5, PER7, BL30, BL50 or PNMT options.
12. PIR specifies the SensorSwitch SBGR-10-ODP control; PIRH specifies the SensorSwitch SBGR-6-ODP control; see Motion Sensor Guide for details. Dimming driver standard. Not available with PER5 or PER7.
13. Requires an additional switched circuit.
14. Dimming driver standard. MVOLT only. Not available with 347V, 480V, DCR, PER5, PER7 or PNMT options.
15. Dimming driver standard. MVOLT only. Not available with 347V, 480V, DCR, PER5, PER7, BL30 or BL50.
16. Also available as a separate accessory; see Accessories information.
17. Single fuse (SF) requires 120V, 277V or 347V. Double fuse (DF) requires 208V, 240V or 480V.
18. Requires luminaire to be specified with PER option. Ordered and shipped as a separate line item from Acuity Brands Controls.

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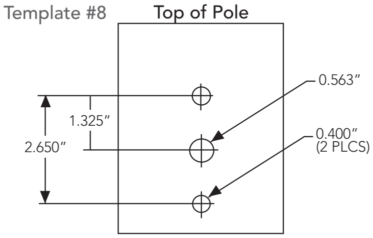
Drilling



DSX0 shares a unique drilling pattern with the AERIS™ family. Specify this drilling pattern when specifying poles, per the table below.

DM19AS	Single unit	**DM29AS**	2 at 90° *
DM28AS	2 at 180°	**DM39AS**	3 at 90° *
DM49AS	4 at 90° *	**DM32AS**	3 at 120° **

Example: SSA 20 4C **DM19AS** DDBXD

Visit Lithonia Lighting's POLES CENTRAL to see our wide selection of poles, accessories and educational tools.

*Round pole top must be 3.25" O.D. minimum.

**For round pole mounting (RPA) only.

Tenon Mounting Slipfitter **

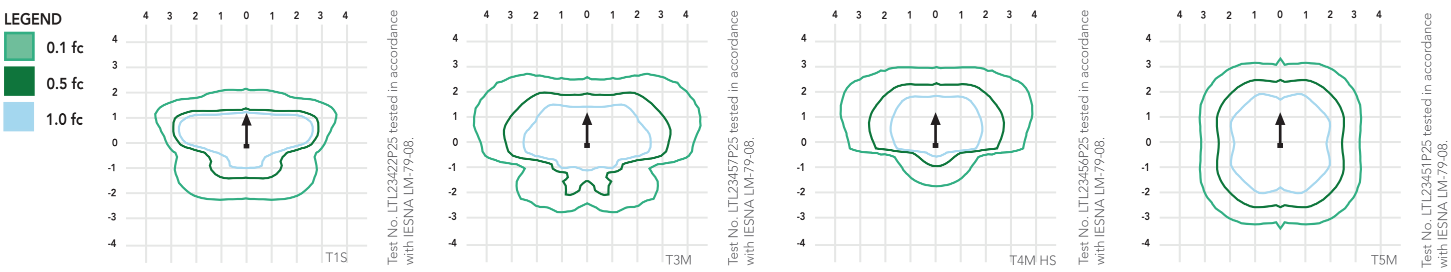
Tenon O.D.	Single Unit	2 at 180°	2 at 90°	3 at 120°	3 at 90°	4 at 90°
2-3/8"	AST20-190	AST20-280	AST20-290	AST20-320	AST20-390	AST20-490
2-7/8"	AST25-190	AST25-280	AST25-290	AST25-320	AST25-390	AST25-490
4"	AST35-190	AST35-280	AST35-290	AST35-320	AST35-390	AST35-490

TYPE T1/T1H

Photometric Diagrams

To see complete photometric reports or download .ies files for this product, visit Lithonia Lighting's D-Series Area homepage.

Isofootcandle plots for the DSX0 LED 40C 1000 40K. Distances are in units of mounting height (20').



Performance Data

Lumen Ambient Temperature (LAT) Multipliers

Use these factors to determine relative lumen output for average ambient temperatures from 0-40°C (32-104°F).

Ambient		Lumen Multiplier
0°C	32°F	1.02
10°C	50°F	1.01
20°C	68°F	1.00
25°C	**77°F**	**1.00**
30°C	86°F	1.00
40°C	104°F	0.99

Electrical Load

Number of LEDs	Drive Current (mA)	System Watts	Current (A) 120	208	240	277	347	480
20C	530	35	0.34	0.22	0.21	0.20	--	--
	700	45	0.47	0.28	0.24	0.22	0.18	0.14
	1000	72	0.76	0.45	0.39	0.36	0.36	0.26
30C	530	52	0.51	0.31	0.28	0.25	--	--
	700	70	0.72	0.43	0.37	0.34	0.25	0.19
	1000	104	1.11	0.64	0.56	0.49	0.47	0.34
40C	530	68	0.71	0.41	0.36	0.33	0.25	0.19
	700	91	0.94	0.55	0.48	0.42	0.33	0.24
	1000	138	1.45	0.84	0.73	0.64	0.69	0.50

Projected LED Lumen Maintenance

Data references the extrapolated performance projections for the platforms noted in a **25°C ambient**, based on 10,000 hours of LED testing (tested per IESNA LM-80-08 and projected per IESNA TM-21-11).

To calculate LLF, use the lumen maintenance factor that corresponds to the desired number of operating hours below. For other lumen maintenance values, contact factory.

Operating Hours	0	25,000	50,000	100,000
Lumen Maintenance Factor	DSX0 LED 20C 1000			
	1	0.97	0.94	0.90
	DSX0 LED 40C 1000			
	1	0.94	0.90	0.84
	DSX0 LED 40C 700			
	1	0.99	0.98	0.96

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TYPE T1/T1H

Lumen Output

Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of the configurations shown, within the tolerances allowed by Lighting Facts. Contact factory for performance data on any configurations not shown here.

Forward Optics

LEDs	Drive Current (mA)	System Watts	Dist. Type	30K (3000 K, 70 CRI)					40K (4000 K, 70 CRI)					50K (5000 K, 70 CRI)					AMBPC (Amber Phosphor Converted)				
				Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW
20C (20 LEDs)	530 mA	35 W	T1S	3,174	1	0	1	91	3,971	1	0	1	113	4,001	1	0	1	114	2,541	1	0	1	73
			T2S	3,234	1	0	1	92	4,045	1	0	1	116	4,075	1	0	1	116	2,589	1	0	1	74
			T2M	3,171	1	0	1	91	3,967	1	0	1	113	3,997	1	0	1	114	2,539	1	0	1	73
			T3S	3,195	1	0	1	91	3,997	1	0	1	114	4,027	1	0	1	115	2,558	1	0	1	73
			T3M	3,226	1	0	1	92	4,036	1	0	1	115	4,066	1	0	1	116	2,583	1	0	1	74
			T4M	3,210	1	0	1	92	4,015	1	0	1	115	4,045	1	0	1	116	2,570	1	0	1	73
			TFTM	3,173	1	0	1	91	3,969	1	0	2	113	3,999	1	0	2	114	2,540	1	0	1	73
			T5VS	3,310	2	0	0	95	4,140	2	0	0	118	4,172	2	0	0	119	2,650	1	0	0	76
			T5S	3,360	2	0	2	96	4,203	2	0	0	120	4,235	2	0	0	121	2,690	1	0	0	77
			T5M	3,320	2	0	1	95	4,153	3	0	1	119	4,184	3	0	1	120	2,658	2	0	0	76
			T5W	3,327	3	0	1	95	4,161	3	0	1	119	4,193	3	0	1	120	2,663	2	0	1	76
	700 mA	45 W	T1S	3,927	1	0	1	87	4,913	1	0	1	109	4,950	1	0	1	110	3,144	1	0	1	70
			T2S	4,000	1	0	1	89	5,004	1	0	1	111	5,042	1	0	1	112	3,203	1	0	1	71
			T2M	3,924	1	0	1	87	4,908	1	0	1	109	4,945	1	0	1	110	3,141	1	0	1	70
			T3S	3,953	1	0	1	88	4,945	1	0	1	110	4,982	1	0	1	111	3,165	1	0	1	70
			T3M	3,991	1	0	1	89	4,994	1	0	2	111	5,031	1	0	2	112	3,196	1	0	1	71
			T4M	3,971	1	0	1	88	4,967	1	0	2	110	5,005	1	0	2	111	3,179	1	0	1	71
			TFTM	3,925	1	0	2	87	4,910	1	0	2	109	4,947	1	0	2	110	3,143	1	0	1	70
			T5VS	4,095	2	0	0	91	5,122	2	0	0	114	5,161	2	0	0	115	3,278	2	0	0	73
			T5S	4,157	2	0	0	92	5,200	2	0	0	116	5,239	2	0	0	116	3,328	2	0	0	74
			T5M	4,107	3	0	1	91	5,138	3	0	1	114	5,177	3	0	1	115	3,288	2	0	1	73
			T5W	4,116	3	0	1	91	5,148	3	0	1	114	5,187	3	0	1	115	3,295	2	0	1	73
	1000 mA	72 W	T1S	5,387	1	0	1	75	6,739	2	0	2	94	6,790	2	0	2	94					
			T2S	5,488	1	0	1	76	6,865	2	0	2	95	6,917	2	0	2	96					
			T2M	5,382	1	0	2	75	6,733	2	0	2	94	6,784	2	0	2	94					
			T3S	5,423	1	0	1	75	6,784	2	0	2	94	6,835	2	0	2	95					
			T3M	5,475	1	0	2	76	6,850	2	0	2	95	6,901	2	0	2	96					
			T4M	5,447	1	0	2	76	6,814	2	0	2	95	6,866	2	0	2	95					
			TFTM	5,385	1	0	2	75	6,736	1	0	2	94	6,787	1	0	2	94					
			T5VS	5,617	2	0	0	78	7,027	3	0	0	98	7,080	3	0	0	98					
			T5S	5,702	2	0	0	79	7,133	2	0	0	99	7,187	2	0	0	100					
			T5M	5,634	3	0	1	78	7,048	3	0	1	98	7,101	3	0	1	99					
			T5W	5,646	3	0	1	78	7,063	3	0	2	98	7,116	3	0	2	99					
40C (40 LEDs)	530 mA	68 W	T1S	6,093	2	0	2	90	7,622	2	0	2	112	7,679	2	0	2	113	4,878	1	0	1	72
			T2S	6,207	2	0	2	91	7,764	2	0	2	114	7,823	2	0	2	115	4,969	1	0	1	73
			T2M	6,087	2	0	2	90	7,615	2	0	2	112	7,672	2	0	2	113	4,874	1	0	1	72
			T3S	6,133	1	0	2	90	7,672	2	0	2	113	7,730	2	0	2	114	4,910	1	0	1	72
			T3M	6,193	2	0	2	91	7,747	2	0	2	114	7,805	2	0	2	115	4,958	1	0	2	73
			T4M	6,161	1	0	2	91	7,707	2	0	2	113	7,765	2	0	2	114	4,932	1	0	2	73
			TFTM	6,090	1	0	2	90	7,618	2	0	2	112	7,676	2	0	2	113	4,876	1	0	2	72
			T5VS	6,353	2	0	0	93	7,947	3	0	0	117	8,007	3	0	0	118	5,086	2	0	0	75
			T5S	6,449	2	0	0	95	8,068	3	0	1	119	8,128	3	0	1	120	5,163	2	0	0	76
			T5M	6,372	3	0	1	94	7,971	3	0	2	117	8,031	3	0	2	118	5,102	3	0	1	75
			T5W	6,385	3	0	2	94	7,988	3	0	2	117	8,048	3	0	2	118	5,112	3	0	1	75
	700 mA	91 W	T1S	7,752	2	0	2	85	9,697	2	0	2	107	9,770	2	0	2	107	6,206	2	0	2	68
			T2S	7,897	2	0	2	87	9,878	2	0	2	109	9,953	2	0	2	109	6,322	2	0	2	69
			T2M	7,745	2	0	2	85	9,688	2	0	2	106	9,761	2	0	2	107	6,201	2	0	2	68
			T3S	7,803	2	0	2	86	9,761	2	0	2	107	9,834	2	0	2	108	6,247	1	0	2	69
			T3M	7,879	2	0	2	87	9,856	2	0	2	108	9,930	2	0	2	109	6,308	2	0	2	69
			T4M	7,838	2	0	2	86	9,805	2	0	2	108	9,879	2	0	2	109	6,275	1	0	2	69
			TFTM	7,748	2	0	2	85	9,693	2	0	3	107	9,765	2	0	3	107	6,203	1	0	2	68
			T5VS	8,083	3	0	0	89	10,111	3	0	1	111	10,187	3	0	1	112	6,569	2	0	0	72
			T5S	8,205	3	0	1	90	10,264	3	0	1	113	10,341	3	0	1	114	6,569	2	0	0	72
			T5M	8,107	3	0	2	89	10,142	3	0	2	111	10,218	3	0	2	112	6,491	3	0	1	71
			T5W	8,124	3	0	2	89	10,163	4	0	2	112	10,239	4	0	2	113	6,504	3	0	2	71
	1000 mA	138 W	T1S	10,435	2	0	2	76	13,054	3	0	3	95	13,152	3	0	3	95					
			T2S	10,630	2	0	2	77	13,297	3	0	3	96	13,398	3	0	3	97					
			T2M	10,426	2	0	2	76	13,042	3	0	3	95	13,140	3	0	3	95					
			T3S	10,503	2	0	2	76	13,139	2	0	2	95	13,238	2	0	2	96					
			T3M	10,606	2	0	2	77	13,267	3	0	3	96	13,367	3	0	3	97					
			T4M	10,551	2	0	2	76	13,199	3	0	3	96	13,298	3	0	3	96					
			TFTM	10,430	2	0	3	76	13,047	2	0	3	95	13,146	2	0	3	95					
			T5VS	10,881	3	0	1	79	13,611	3	0	1	99	13,714	4	0	1	99					
			T5S	11,045	3	0	1	80	13,817	3	0	1	100	13,921	3	0	1	101					
			T5M	10,914	4	0	2	79	13,652	4	0	2	99	13,755	4	0	2	100					
			T5W	10,936	4	0	2	79	13,680	4	0	2	99	13,783	4	0	2	100					

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TYPE T1/T1H

L90 and R90 Rotated Optics

LEDs	Drive Current (mA)	System Watts	Dist. Type	30K (3000 K, 70 CRI)					40K (4000 K, 70 CRI)					50K (5000 K, 70 CRI)					AMBPC (Amber Phosphor Converted)				
				Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW
30C (30 LEDs)	530 mA	52 W	T1S	4,797	2	0	2	92	6,001	2	0	2	115	6,046	2	0	2	116	3,841	2	0	2	74
			T2S	4,887	2	0	2	94	6,113	2	0	2	118	6,159	3	0	3	118	3,912	2	0	2	75
			T2M	4,793	2	0	2	92	5,996	3	0	3	115	6,041	3	0	3	116	3,837	2	0	2	74
			T3S	4,829	2	0	2	93	6,041	3	0	3	116	6,086	3	0	3	117	3,866	2	0	2	74
			T3M	4,876	3	0	3	94	6,099	3	0	3	117	6,145	3	0	3	118	3,904	2	0	2	75
			T4M	4,851	3	0	3	93	6,068	3	0	3	117	6,114	3	0	3	118	3,884	2	0	2	75
			TFTM	4,795	3	0	3	92	5,998	3	0	3	115	6,043	3	0	3	116	3,839	2	0	2	74
			T5VS	5,002	2	0	0	96	6,258	2	0	0	120	6,305	2	0	0	121	4,005	2	0	0	77
			T5S	5,078	2	0	0	98	6,352	2	0	0	122	6,400	2	0	0	123	4,065	2	0	0	78
			T5M	5,017	3	0	1	96	6,276	3	0	1	121	6,324	3	0	1	122	4,017	2	0	1	77
			T5W	5,028	3	0	1	97	6,289	3	0	2	121	6,337	3	0	2	122	4,025	3	0	1	77
	700 mA	70 W	T1S	5,975	2	0	2	85	7,474	3	0	3	107	7,530	3	0	3	108	4,783	2	0	2	68
			T2S	6,086	2	0	2	87	7,614	3	0	3	109	7,671	3	0	3	110	4,873	2	0	2	70
			T2M	5,969	3	0	3	85	7,467	3	0	3	107	7,524	3	0	3	107	4,779	2	0	2	68
			T3S	6,014	3	0	3	86	7,523	3	0	3	107	7,580	3	0	3	108	4,815	2	0	2	69
			T3M	6,072	3	0	3	87	7,596	3	0	3	109	7,654	3	0	3	109	4,862	3	0	3	69
			T4M	6,041	3	0	3	86	7,557	3	0	3	108	7,614	3	0	3	109	4,837	3	0	3	69
			TFTM	5,972	3	0	3	85	7,471	3	0	3	107	7,527	3	0	3	108	4,781	3	0	3	68
			T5VS	6,230	2	0	0	89	7,793	3	0	0	111	7,852	3	0	0	112	4,988	2	0	0	71
			T5S	6,324	2	0	0	90	7,911	3	0	1	113	7,971	3	0	1	114	5,063	2	0	0	72
			T5M	6,249	3	0	1	89	7,817	3	0	2	112	7,876	3	0	2	113	5,003	3	0	1	71
			T5W	6,262	3	0	2	89	7,833	3	0	2	112	7,892	3	0	2	113	5,013	3	0	1	72
	1000 mA	104 W	T1S	7,956	3	0	3	76	9,952	3	0	3	96	10,027	3	0	3	96					
			T2S	8,104	3	0	3	78	10,138	3	0	3	97	10,214	3	0	3	98					
			T2M	7,949	3	0	3	76	9,943	3	0	3	96	10,018	3	0	3	96					
			T3S	8,008	3	0	3	77	10,018	3	0	3	96	10,093	3	0	3	97					
			T3M	8,086	3	0	3	78	10,115	4	0	4	97	10,191	4	0	4	98					
			T4M	8,044	3	0	3	77	10,063	3	0	3	97	10,139	3	0	3	97					
			TFTM	7,952	3	0	3	76	9,948	3	0	3	96	10,022	4	0	4	96					
			T5VS	8,296	3	0	0	80	10,377	3	0	1	100	10,455	3	0	1	101					
			T5S	8,421	3	0	1	81	10,534	3	0	1	101	10,613	3	0	1	102					
			T5M	8,321	3	0	2	80	10,409	4	0	2	100	10,487	4	0	2	101					
			T5W	8,338	4	0	2	80	10,430	4	0	2	100	10,509	4	0	2	101					

FEATURES & SPECIFICATIONS

INTENDED USE

The sleek design of the D-Series Size 0 reflects the embedded high performance LED technology. It is ideal for many commercial and municipal applications, such as parking lots, plazas, campuses, and streetscapes.

CONSTRUCTION

Single-piece die-cast aluminum housing has integral heat sink fins to optimize thermal management through conductive and convective cooling. Modular design allows for ease of maintenance and future light engine upgrades. The LED driver is mounted in direct contact with the casting to promote low operating temperature and long life. Housing is completely sealed against moisture and environmental contaminants (IP65). Low EPA (0.8 ft^2) for optimized pole wind loading.

FINISH

Exterior parts are protected by a zinc-infused Super Durable TGIC thermoset powder coat finish that provides superior resistance to corrosion and weathering. A tightly controlled multi-stage process ensures a minimum 3 mils thickness for a finish that can withstand extreme climate changes without cracking or peeling. Available in both textured and non-textured finishes.

OPTICS

Precision-molded proprietary acrylic lenses are engineered for superior area lighting distribution, uniformity, and pole spacing. Light engines are available in standard 4000 K (70 minimum CRI) or optional 3000 K (80 minimum CRI) or 5000 K (70 CRI) configurations. The D-Series Size 0 has zero uplight and qualifies as a Nighttime Friendly™ product, meaning it is consistent with the LEED® and Green Globes™ criteria for eliminating wasteful uplight.

ELECTRICAL

Light engine(s) configurations consist of high-efficacy LEDs mounted to metal-core circuit boards to maximize heat dissipation and promote long life (up to L96/100,000 hours at 25°C). Class 1 electronic drivers are designed to have a power factor >90%, THD <20%, and an expected life of 100,000 hours with <1% failure rate. Easily serviceable 10kV or 6kV surge protection device meets a minimum Category C Low operation (per ANSI/IEEE C62.41.2).

INSTALLATION

Included mounting block and integral arm facilitate quick and easy installation. Stainless steel bolts fasten the mounting block securely to poles and walls, enabling the D-Series Size 0 to withstand up to a 3.0 G vibration load rating per ANSI C136.31. The D-Series Size 0 utilizes the AERIS™ series pole drilling pattern. Optional terminal block, tool-less entry, and NEMA photocontrol receptacle are also available.

LISTINGS

UL Listed for wet locations. Light engines are IP66 rated; luminaire is IP65 rated. Rated for -40°C minimum ambient. U.S. Patent No. D672,492 S. International patent pending.

DesignLights Consortium® (DLC) qualified product. Not all versions of this product may be DLC qualified. Please check the DLC Qualified Products List at www.designlights.org to confirm which versions are qualified.

WARRANTY

Five-year limited warranty. Full warranty terms located 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.

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D-Series Size 0

LED Area Luminaire

NIGHTTIME FRIENDLY

Catalog Number

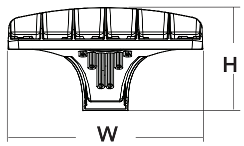
Notes

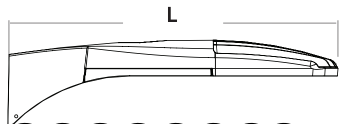
Type TYPE T2/T2H

Hit the Tab key or m

Specifications

EPA:	0.8 ft² (.07 m²)
Length:	26" (66.0 cm)
Width:	13" (33.0 cm)
Height:	7" (17.8 cm)
Weight (max):	16 lbs (7.25 kg)





MAIN PARKING LOT LIGHTING

Introduction

The modern styling of the D-Series is striking yet unobtrusive - making a bold, progressive statement even as it blends seamlessly with its environment.

The D-Series distills the benefits of the latest in LED technology into a high performance, high efficacy, long-life luminaire. The outstanding photometric performance results in sites with excellent uniformity, greater pole spacing and lower power density. It is ideal for replacing up to 400W metal halide with typical energy savings of 65% and expected service life of over 100,000 hours.

Ordering Information

XAMPLE: DSX0 LED 40C 1000 40K T3M MVOLT SPA DDBXD

DSX0 LED

Series	LEDs	Drive current	Color temperature	Distribution	Voltage	Mounting
DSX0 LED	**Forward optics** 20C 20 LEDs (one engine) 40C 40 LEDs (two engines) **Rotated optics**[1] 30C 30 LEDs (one engine)	530 530 mA 700 700 mA 1000 1000 mA (1 A)[2]	30K 3000 K 80 CRI min.) 40K 4000 K (70 CRI min.) 50K 5000 K (70 CRI) AMBPC Amber phosphor converted[3]	T1S Type I short T2S Type II short T2M Type II medium T3S Type III short T3M Type III medium T4M Type IV medium TFTM Forward throw medium T5VS Type V very short T5S Type V short T5M Type V medium T5W Type V wide	MVOLT[4] 120[4] 208[4] 240[4] 277[4] 347[5] 480[5]	**Shipped included** SPA Square pole mounting RPA Round pole mounting WBA Wall bracket SPUMBA Square pole universal mounting adaptor[6] RPUMBA Round pole universal mounting adaptor[6] **Shipped separately**[7] KMA8 DDBXD U Mast arm mounting bracket adaptor (specify finish)

Control options		Other options	Finish (required)
Shipped installed PER NEMA twist-lock receptacle only (no controls)[8] PER5 Five-wire receptacle only (no controls)[8,9] PER7 Seven-wire receptacle only (no controls)[8,9] DMG 0-10V dimming driver (no controls)[10] DCR Dimmable and controllable via ROAM® (no controls)[11] PIR Motion sensor, 8-15' mounting height[12] PIRH Motion sensor, 15-30' mounting height[12]	BL30 Bi-level switched dimming, 30%[13,14] BL50 Bi-level switched dimming, 50%[13,14] PNMTDD3 Part night, dim till dawn[15] PNMT5D3 Part night, dim 5 hrs[15] PNMT6D3 Part night, dim 6 hrs[15] PNMT7D3 Part night, dim 7 hrs[15]	**Shipped installed** HS House-side shield[16] SF Single fuse (120, 277, 347V)[17] DF Double fuse (208, 240, 480V)[17] L90 Left rotated optics[1] R90 Right rotated optics[1] DDL Diffused drop lens[16]	DDBXD Dark bronze DBLXD Black DNAXD Natural aluminum DWHXD White DDBTXD Textured dark bronze DBLBXD Textured black DNATXD Textured natural aluminum DWHGXD Textured white

TYPE T2H ONLY

Accessories

Ordered and shipped separately.

Controls & Shields

DLL127F 1.5 JU	Photocell - SSL twist-lock (120-277V)[18]
DLL347F 1.5 CUL JU	Photocell - SSL twist-lock (347V)[18]
DLL480F 1.5 CUL JU	Photocell - SSL twist-lock (480V)[18]
SC U	Shorting cap[18]
DSX0HS 20C U	House-side shield for 20 LED unit[16]
DSX0HS 30C U	House-side shield for 30 LED unit[16]
DSX0HS 40C U	House-side shield for 40 LED unit[16]
DSX0DDL U	Diffused drop lens (polycarbonate)[16]
PUMBA DDBXD U*	Square and round pole universal mounting bracket adaptor (specify finish)
KMA8 DDBXD U	Mast arm mounting bracket adaptor (specify finish)[7]

For more control options, visit DTL and ROAM online.

NOTES

1. 30 LEDs (30C option) and rotated options (L90 or R90) only available together.
2. 1000mA not available with AMBPC.
3. AMBPC only available with 530mA or 700mA.
4. MVOLT driver operates on any line voltage from 120-277V (50/60 Hz). Specify 120V, 208V, 240V or 277V options only when ordering with fusing (SF, DF options).
5. Not available with single board, 530mA product (20C 530 or 30C 530). Not available with BL30, BL50 or PNMT options.
6. Available as a separate combination accessory: PUMBA (finish) U; 1.5 G vibration load rating per ANCI C136.31.
7. Must be ordered as a separate accessory; see Accessories information. For use with 2-3/8" mast arm (not included).
8. Photocell ordered and shipped as a separate line item from Acuity Brands Controls. See accessories.
9. If ROAM® node required, it must be ordered and shipped as a separate line item from Acuity Brands Controls. Not available with DCR.
10. DMG option for 347V or 480V requires 1000mA.
11. Specifies a ROAM® enabled luminaire with 0-10V dimming capability; PER option required. Additional hardware and services required for ROAM® deployment; must be purchased separately. Call 1-800-442-6745 or email: sales@roamservices.net. N/A with PIR, PIRH, PER5, PER7, BL30, BL50 or PNMT options.
12. PIR specifies the SensorSwitch SBGR-10-ODP control; PIRH specifies the SensorSwitch SBGR-6-ODP control; see Motion Sensor Guide for details. Dimming driver standard. Not available with PER5 or PER7.
13. Requires an additional switched circuit.
14. Dimming driver standard. MVOLT only. Not available with 347V, 480V, DCR, PER5, PER7 or PNMT options.
15. Dimming driver standard. MVOLT only. Not available with 347V, 480V, DCR, PER5, PER7, BL30 or BL50.
16. Also available as a separate accessory; see Accessories information.
17. Single fuse (SF) requires 120V, 277V or 347V. Double fuse (DF) requires 208V, 240V or 480V.
18. Requires luminaire to be specified with PER option. Ordered and shipped as a separate line item from Acuity Brands Controls.

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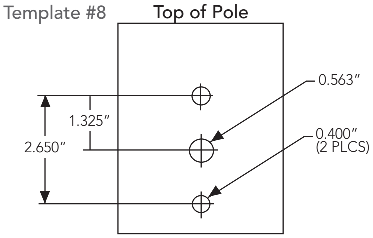
Drilling



DSX0 shares a unique drilling pattern with the AERIS™ family. Specify this drilling pattern when specifying poles, per the table below.

DM19AS	Single unit	**DM29AS**	2 at 90° *
DM28AS	2 at 180°	**DM39AS**	3 at 90° *
DM49AS	4 at 90° *	**DM32AS**	3 at 120° **

Example: SSA 20 4C **DM19AS** DDBXD

Visit Lithonia Lighting's POLES CENTRAL to see our wide selection of poles, accessories and educational tools.

*Round pole top must be 3.25" O.D. minimum.

**For round pole mounting (RPA) only.

Tenon Mounting Slipfitter **

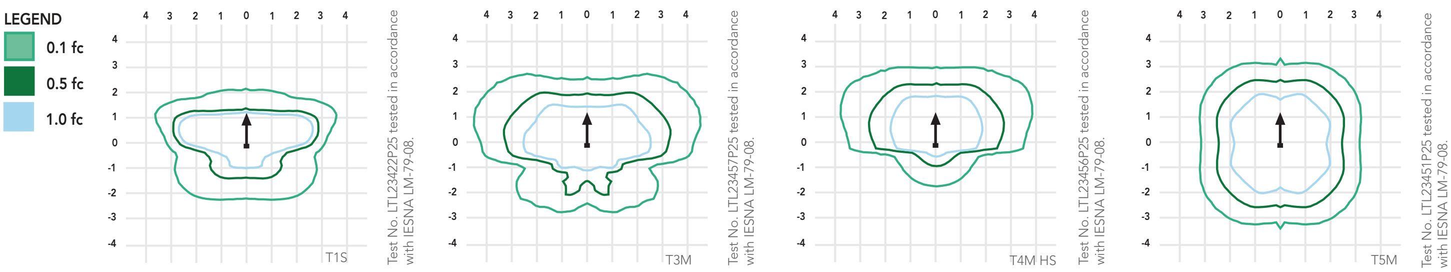
Tenon O.D.	Single Unit	2 at 180°	2 at 90°	3 at 120°	3 at 90°	4 at 90°
2-3/8"	AST20-190	AST20-280	AST20-290	AST20-320	AST20-390	AST20-490
2-7/8"	AST25-190	AST25-280	AST25-290	AST25-320	AST25-390	AST25-490
4"	AST35-190	AST35-280	AST35-290	AST35-320	AST35-390	AST35-490

TYPE T2/T2H

Photometric Diagrams

To see complete photometric reports or download .ies files for this product, visit Lithonia Lighting's D-Series Area homepage.

Isofootcandle plots for the DSX0 LED 40C 1000 40K. Distances are in units of mounting height (20').



Performance Data

Lumen Ambient Temperature (LAT) Multipliers

Use these factors to determine relative lumen output for average ambient temperatures from 0-40°C (32-104°F).

Ambient		Lumen Multiplier
0°C	32°F	1.02
10°C	50°F	1.01
20°C	68°F	1.00
25°C	**77°F**	**1.00**
30°C	86°F	1.00
40°C	104°F	0.99

Electrical Load

Number of LEDs	Drive Current (mA)	System Watts	Current (A) 120	208	240	277	347	480
20C	530	35	0.34	0.22	0.21	0.20	--	--
	700	45	0.47	0.28	0.24	0.22	0.18	0.14
	1000	72	0.76	0.45	0.39	0.36	0.36	0.26
30C	530	52	0.51	0.31	0.28	0.25	--	--
	700	70	0.72	0.43	0.37	0.34	0.25	0.19
	1000	104	1.11	0.64	0.56	0.49	0.47	0.34
40C	530	68	0.71	0.41	0.36	0.33	0.25	0.19
	700	91	0.94	0.55	0.48	0.42	0.33	0.24
	1000	138	1.45	0.84	0.73	0.64	0.69	0.50

Projected LED Lumen Maintenance

Data references the extrapolated performance projections for the platforms noted in a **25°C ambient**, based on 10,000 hours of LED testing (tested per IESNA LM-80-08 and projected per IESNA TM-21-11).

To calculate LLF, use the lumen maintenance factor that corresponds to the desired number of operating hours below. For other lumen maintenance values, contact factory.

Operating Hours	0	25,000	50,000	100,000
Lumen Maintenance Factor	DSX0 LED 20C 1000			
	1	0.97	0.94	0.90
	DSX0 LED 40C 1000			
	1	0.94	0.90	0.84
	DSX0 LED 40C 700			
	1	0.99	0.98	0.96

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Performance Data

TYPE T2/T2H

Lumen Output

Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of the configurations shown, within the tolerances allowed by Lighting Facts. Contact factory for performance data on any configurations not shown here.

Forward Optics

LEDs	Drive Current (mA)	System Watts	Dist. Type	30K (3000 K, 70 CRI)					40K (4000 K, 70 CRI)					50K (5000 K, 70 CRI)					AMBPC (Amber Phosphor Converted)				
				Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW
20C (20 LEDs)	530 mA	35 W	T1S	3,174	1	0	1	91	3,971	1	0	1	113	4,001	1	0	1	114	2,541	1	0	1	73
			T2S	3,234	1	0	1	92	4,045	1	0	1	116	4,075	1	0	1	116	2,589	1	0	1	74
			T2M	3,171	1	0	1	91	3,967	1	0	1	113	3,997	1	0	1	114	2,539	1	0	1	73
			T3S	3,195	1	0	1	91	3,997	1	0	1	114	4,027	1	0	1	115	2,558	1	0	1	73
			T3M	3,226	1	0	1	92	4,036	1	0	1	115	4,066	1	0	1	116	2,583	1	0	1	74
			T4M	3,210	1	0	1	92	4,015	1	0	1	115	4,045	1	0	1	116	2,570	1	0	1	73
			TFTM	3,173	1	0	1	91	3,969	1	0	2	113	3,999	1	0	2	114	2,540	1	0	1	73
			T5VS	3,310	2	0	0	95	4,140	2	0	0	118	4,172	2	0	0	119	2,650	1	0	0	76
			T5S	3,360	2	0	2	96	4,203	2	0	0	120	4,235	2	0	0	121	2,690	1	0	0	77
			T5M	3,320	2	0	1	95	4,153	3	0	1	119	4,184	3	0	1	120	2,658	2	0	0	76
			T5W	3,327	3	0	1	95	4,161	3	0	1	119	4,193	3	0	1	120	2,663	2	0	1	76
	700 mA	45 W	T1S	3,927	1	0	1	87	4,913	1	0	1	109	4,950	1	0	1	110	3,144	1	0	1	70
			T2S	4,000	1	0	1	89	5,004	1	0	1	111	5,042	1	0	1	112	3,203	1	0	1	71
			T2M	3,924	1	0	1	87	4,908	1	0	1	109	4,945	1	0	1	110	3,141	1	0	1	70
			T3S	3,953	1	0	1	88	4,945	1	0	1	110	4,982	1	0	1	111	3,165	1	0	1	70
			T3M	3,991	1	0	1	89	4,994	1	0	2	111	5,031	1	0	2	112	3,196	1	0	1	71
			T4M	3,971	1	0	1	88	4,967	1	0	2	110	5,005	1	0	2	111	3,179	1	0	1	71
			TFTM	3,925	1	0	2	87	4,910	1	0	2	109	4,947	1	0	2	110	3,143	1	0	1	70
			T5VS	4,095	2	0	0	91	5,122	2	0	0	114	5,161	2	0	0	115	3,278	2	0	0	73
			T5S	4,157	2	0	0	92	5,200	2	0	0	116	5,239	2	0	0	116	3,328	2	0	0	74
			T5M	4,107	3	0	1	91	5,138	3	0	1	114	5,177	3	0	1	115	3,288	2	0	1	73
			T5W	4,116	3	0	1	91	5,148	3	0	1	114	5,187	3	0	1	115	3,295	2	0	1	73
	1000 mA	72 W	T1S	5,387	1	0	1	75	6,739	2	0	2	94	6,790	2	0	2	94					
			T2S	5,488	1	0	1	76	6,865	2	0	2	95	6,917	2	0	2	96					
			T2M	5,382	1	0	2	75	6,733	2	0	2	94	6,784	2	0	2	94					
			T3S	5,423	1	0	1	75	6,784	2	0	2	94	6,835	2	0	2	95					
			T3M	5,475	1	0	2	76	6,850	2	0	2	95	6,901	2	0	2	96					
			T4M	5,447	1	0	2	76	6,814	2	0	2	95	6,866	2	0	2	95					
			TFTM	5,385	1	0	2	75	6,736	1	0	2	94	6,787	1	0	2	94					
			T5VS	5,617	2	0	0	78	7,027	3	0	0	98	7,080	3	0	0	98					
			T5S	5,702	2	0	0	79	7,133	2	0	0	99	7,187	2	0	0	100					
			T5M	5,634	3	0	1	78	7,048	3	0	1	98	7,101	3	0	1	99					
			T5W	5,646	3	0	1	78	7,063	3	0	2	98	7,116	3	0	2	99					
40C (40 LEDs)	530 mA	68 W	T1S	6,093	2	0	2	90	7,622	2	0	2	112	7,679	2	0	2	113	4,878	1	0	1	72
			T2S	6,207	2	0	2	91	7,764	2	0	2	114	7,823	2	0	2	115	4,969	1	0	1	73
			T2M	6,087	2	0	2	90	7,615	2	0	2	112	7,672	2	0	2	113	4,874	1	0	1	72
			T3S	6,133	1	0	2	90	7,672	2	0	2	113	7,730	2	0	2	114	4,910	1	0	1	72
			T3M	6,193	2	0	2	91	7,747	2	0	2	114	7,805	2	0	2	115	4,958	1	0	2	73
			T4M	6,161	1	0	2	91	7,707	2	0	2	113	7,765	2	0	2	114	4,932	1	0	2	73
			TFTM	6,090	1	0	2	90	7,618	2	0	2	112	7,676	2	0	2	113	4,876	1	0	2	72
			T5VS	6,353	2	0	0	93	7,947	3	0	0	117	8,007	3	0	0	118	5,086	2	0	0	75
			T5S	6,449	2	0	0	95	8,068	3	0	1	119	8,128	3	0	1	120	5,163	2	0	0	76
			T5M	6,372	3	0	1	94	7,971	3	0	2	117	8,031	3	0	2	118	5,102	3	0	1	75
			T5W	6,385	3	0	2	94	7,988	3	0	2	117	8,048	3	0	2	118	5,112	3	0	1	75
	700 mA	91 W	T1S	7,752	2	0	2	85	9,697	2	0	2	107	9,770	2	0	2	107	6,206	2	0	2	68
			T2S	7,897	2	0	2	87	9,878	2	0	2	109	9,953	2	0	2	109	6,322	2	0	2	69
			T2M	7,745	2	0	2	85	9,688	2	0	2	106	9,761	2	0	2	107	6,201	2	0	2	68
			T3S	7,803	2	0	2	86	9,761	2	0	2	107	9,834	2	0	2	108	6,247	1	0	2	69
			T3M	7,879	2	0	2	87	9,856	2	0	2	108	9,930	2	0	2	109	6,308	2	0	2	69
			T4M	7,838	2	0	2	86	9,805	2	0	2	108	9,879	2	0	2	109	6,275	1	0	2	69
			TFTM	7,748	2	0	2	85	9,693	2	0	3	107	9,765	2	0	3	107	6,203	1	0	2	68
			T5VS	8,083	3	0	0	89	10,111	3	0	1	111	10,187	3	0	1	112	6,569	2	0	0	72
			T5S	8,205	3	0	1	90	10,264	3	0	1	113	10,341	3	0	1	114	6,569	2	0	0	72
			T5M	8,107	3	0	2	89	10,142	3	0	2	111	10,218	3	0	2	112	6,491	3	0	1	71
			T5W	8,124	3	0	2	89	10,163	4	0	2	112	10,239	4	0	2	113	6,504	3	0	2	71
	1000 mA	138 W	T1S	10,435	2	0	2	76	13,054	3	0	3	95	13,152	3	0	3	95					
			T2S	10,630	2	0	2	77	13,297	3	0	3	96	13,398	3	0	3	97					
			T2M	10,426	2	0	2	76	13,042	3	0	3	95	13,140	3	0	3	95					
			T3S	10,503	2	0	2	76	13,139	2	0	2	95	13,238	2	0	2	96					
			T3M	10,606	2	0	2	77	13,267	3	0	3	96	13,367	3	0	3	97					
			T4M	10,551	2	0	2	76	13,199	3	0	3	96	13,298	3	0	3	96					
			TFTM	10,430	2	0	3	76	13,047	2	0	3	95	13,146	2	0	3	95					
			T5VS	10,881	3	0	1	79	13,611	3	0	1	99	13,714	4	0	1	99					
			T5S	11,045	3	0	1	80	13,817	3	0	1	100	13,921	3	0	1	101					
			T5M	10,914	4	0	2	79	13,652	4	0	2	99	13,755	4	0	2	100					
			T5W	10,936	4	0	2	79	13,680	4	0	2	99	13,783	4	0	2	100					

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TYPE T2/T2H

L90 and R90 Rotated Optics

LEDs	Drive Current (mA)	System Watts	Dist. Type	30K (3000 K, 70 CRI)					40K (4000 K, 70 CRI)					50K (5000 K, 70 CRI)					AMBPC (Amber Phosphor Converted)				
				Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW
30C (30 LEDs)	530 mA	52 W	T1S	4,797	2	0	2	92	6,001	2	0	2	115	6,046	2	0	2	116	3,841	2	0	2	74
			T2S	4,887	2	0	2	94	6,113	2	0	2	118	6,159	3	0	3	118	3,912	2	0	2	75
			T2M	4,793	2	0	2	92	5,996	3	0	3	115	6,041	3	0	3	116	3,837	2	0	2	74
			T3S	4,829	2	0	2	93	6,041	3	0	3	116	6,086	3	0	3	117	3,866	2	0	2	74
			T3M	4,876	3	0	3	94	6,099	3	0	3	117	6,145	3	0	3	118	3,904	2	0	2	75
			T4M	4,851	3	0	3	93	6,068	3	0	3	117	6,114	3	0	3	118	3,884	2	0	2	75
			TFTM	4,795	3	0	3	92	5,998	3	0	3	115	6,043	3	0	3	116	3,839	2	0	2	74
			T5VS	5,002	2	0	0	96	6,258	2	0	0	120	6,305	2	0	0	121	4,005	2	0	0	77
			T5S	5,078	2	0	0	98	6,352	2	0	0	122	6,400	2	0	0	123	4,065	2	0	0	78
			T5M	5,017	3	0	1	96	6,276	3	0	1	121	6,324	3	0	1	122	4,017	2	0	1	77
			T5W	5,028	3	0	1	97	6,289	3	0	2	121	6,337	3	0	2	122	4,025	3	0	1	77
	700 mA	70 W	T1S	5,975	2	0	2	85	7,474	3	0	3	107	7,530	3	0	3	108	4,783	2	0	2	68
			T2S	6,086	2	0	2	87	7,614	3	0	3	109	7,671	3	0	3	110	4,873	2	0	2	70
			T2M	5,969	3	0	3	85	7,467	3	0	3	107	7,524	3	0	3	107	4,779	2	0	2	68
			T3S	6,014	3	0	3	86	7,523	3	0	3	107	7,580	3	0	3	108	4,815	2	0	2	69
			T3M	6,072	3	0	3	87	7,596	3	0	3	109	7,654	3	0	3	109	4,862	3	0	3	69
			T4M	6,041	3	0	3	86	7,557	3	0	3	108	7,614	3	0	3	109	4,837	3	0	3	69
			TFTM	5,972	3	0	3	85	7,471	3	0	3	107	7,527	3	0	3	108	4,781	3	0	3	68
			T5VS	6,230	2	0	0	89	7,793	3	0	0	111	7,852	3	0	0	112	4,988	2	0	0	71
			T5S	6,324	2	0	0	90	7,911	3	0	1	113	7,971	3	0	1	114	5,063	2	0	0	72
			T5M	6,249	3	0	1	89	7,817	3	0	2	112	7,876	3	0	2	113	5,003	3	0	1	71
			T5W	6,262	3	0	2	89	7,833	3	0	2	112	7,892	3	0	2	113	5,013	3	0	1	72
	1000 mA	104 W	T1S	7,956	3	0	3	76	9,952	3	0	3	96	10,027	3	0	3	96					
			T2S	8,104	3	0	3	78	10,138	3	0	3	97	10,214	3	0	3	98					
			T2M	7,949	3	0	3	76	9,943	3	0	3	96	10,018	3	0	3	96					
			T3S	8,008	3	0	3	77	10,018	3	0	3	96	10,093	3	0	3	97					
			T3M	8,086	3	0	3	78	10,115	4	0	4	97	10,191	4	0	4	98					
			T4M	8,044	3	0	3	77	10,063	3	0	3	97	10,139	3	0	3	97					
			TFTM	7,952	3	0	3	76	9,948	3	0	3	96	10,022	4	0	4	96					
			T5VS	8,296	3	0	0	80	10,377	3	0	1	100	10,455	3	0	1	101					
			T5S	8,421	3	0	1	81	10,534	3	0	1	101	10,613	3	0	1	102					
			T5M	8,321	3	0	2	80	10,409	4	0	2	100	10,487	4	0	2	101					
			T5W	8,338	4	0	2	80	10,430	4	0	2	100	10,509	4	0	2	101					

FEATURES & SPECIFICATIONS

INTENDED USE
The sleek design of the D-Series Size 0 reflects the embedded high performance LED technology. It is ideal for many commercial and municipal applications, such as parking lots, plazas, campuses, and streetscapes.

CONSTRUCTION
Single-piece die-cast aluminum housing has integral heat sink fins to optimize thermal management through conductive and convective cooling. Modular design allows for ease of maintenance and future light engine upgrades. The LED driver is mounted in direct contact with the casting to promote low operating temperature and long life. Housing is completely sealed against moisture and environmental contaminants (IP65). Low EPA (0.8 ft²) for optimized pole wind loading.

FINISH
Exterior parts are protected by a zinc-infused Super Durable TGIC thermoset powder coat finish that provides superior resistance to corrosion and weathering. A tightly controlled multi-stage process ensures a minimum 3 mils thickness for a finish that can withstand extreme climate changes without cracking or peeling. Available in both textured and non-textured finishes.

OPTICS
Precision-molded proprietary acrylic lenses are engineered for superior area lighting distribution, uniformity, and pole spacing. Light engines are available in standard 4000 K (70 minimum CRI) or optional 3000 K (80 minimum CRI) or 5000 K (70 CRI) configurations. The D-Series Size 0 has zero uplight and qualifies as a Nighttime Friendly™ product, meaning it is consistent with the LEED® and Green Globes™ criteria for eliminating wasteful uplight.

ELECTRICAL
Light engine(s) configurations consist of high-efficacy LEDs mounted to metal-core circuit boards to maximize heat dissipation and promote long life (up to L96/100,000 hours at 25°C). Class 1 electronic drivers are designed to have a power factor >90%, THD <20%, and an expected life of 100,000 hours with <1% failure rate. Easily serviceable 10kV or 6kV surge protection device meets a minimum Category C Low operation (per ANSI/IEEE C62.41.2).

INSTALLATION
Included mounting block and integral arm facilitate quick and easy installation. Stainless steel bolts fasten the mounting block securely to poles and walls, enabling the D-Series Size 0 to withstand up to a 3.0 G vibration load rating per ANSI C136.31. The D-Series Size 0 utilizes the AERIS™ series pole drilling pattern. Optional terminal block, tool-less entry, and NEMA photocontrol receptacle are also available.

LISTINGS
UL Listed for wet locations. Light engines are IP66 rated; luminaire is IP65 rated. Rated for -40°C minimum ambient. U.S. Patent No. D672,492 S. International patent pending.

DesignLights Consortium® (DLC) qualified product. Not all versions of this product may be DLC qualified. Please check the DLC Qualified Products List at www.designlights.org to confirm which versions are qualified.

WARRANTY
Five-year limited warranty. Full warranty terms located 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.

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D-Series Size 0

LED Area Luminaire

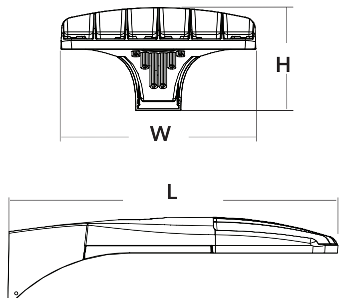
NIGHTTIME FRIENDLY

Catalog Number	
Notes	
Type	TYPE T3

Hit the Tab key or m

Specifications

EPA:	0.8 ft² (.07 m²)
Length:	26" (66.0 cm)
Width:	13" (33.0 cm)
Height:	7" (17.8 cm)
Weight (max):	16 lbs (7.25 kg)



Introduction

The modern styling of the D-Series is striking yet unobtrusive - making a bold, progressive statement even as it blends seamlessly with its environment.

The D-Series distills the benefits of the latest in LED technology into a high performance, high efficacy, long-life luminaire. The outstanding photometric performance results in sites with excellent uniformity, greater pole spacing and lower power density. It is ideal for replacing up to 400W metal halide with typical energy savings of 65% and expected service life of over 100,000 hours.

MAIN PARKING LOT LIGHTING

Ordering Information

XAMPLE: DSX0 LED 40C 1000 40K T3M MVOLT SPA DDBXD

DSX0 LED

Series	LEDs	Drive current	Color temperature	Distribution	Voltage	Mounting
DSX0 LED	**Forward optics** 20C 20 LEDs (one engine) 40C 40 LEDs (two engines) **Rotated optics**[1] 30C 30 LEDs (one engine)	530 530 mA 700 700 mA 1000 1000 mA (1 A)[2]	30K 3000 K 80 CRI min.) 40K 4000 K (70 CRI min.) 50K 5000 K (70 CRI) AMBPC Amber phosphor converted[3]	T1S Type I short T2S Type II short T2M Type II medium T3S Type III short T3M Type III medium T4M Type IV medium TFTM Forward throw medium T5VS Type V very short T5S Type V short T5M Type V medium T5W Type V wide	MVOLT[4] 120[4] 208[4] 240[4] 277[4] 347[5] 480[5]	**Shipped included** SPA Square pole mounting RPA Round pole mounting WBA Wall bracket SPUMBA Square pole universal mounting adaptor[6] RPUMBA Round pole universal mounting adaptor[6] **Shipped separately**[7] KMA8 DDBXD U Mast arm mounting bracket adaptor (specify finish)

Control options		Other options	Finish *(required)*
Shipped installed PER NEMA twist-lock receptacle only (no controls)[8] PER5 Five-wire receptacle only (no controls)[8,9] PER7 Seven-wire receptacle only (no controls)[8,9] DMG 0-10V dimming driver (no controls)[10] DCR Dimmable and controllable via ROAM® (no controls)[11] PIR Motion sensor, 8-15' mounting height[12] PIRH Motion sensor, 15-30' mounting height[12]	BL30 Bi-level switched dimming, 30%[13,14] BL50 Bi-level switched dimming, 50%[13,14] PNMTDD3 Part night, dim till dawn[15] PNMT5D3 Part night, dim 5 hrs[15] PNMT6D3 Part night, dim 6 hrs[15] PNMT7D3 Part night, dim 7 hrs[15]	**Shipped installed** HS House-side shield[16] SF Single fuse (120, 277, 347V)[17] DF Double fuse (208, 240, 480V)[17] L90 Left rotated optics[1] R90 Right rotated optics[1] DDL Diffused drop lens[16]	DDBXD Dark bronze DBLXD Black DNAXD Natural aluminum DWHXD White DDBTXD Textured dark bronze DBLBXD Textured black DNATXD Textured natural aluminum DWHGXD Textured white

Accessories

Ordered and shipped separately.

Controls & Shields

DLL127F 1.5 JU	Photocell - SSL twist-lock (120-277V)[18]
DLL347F 1.5 CUL JU	Photocell - SSL twist-lock (347V)[18]
DLL480F 1.5 CUL JU	Photocell - SSL twist-lock (480V)[18]
SC U	Shorting cap[18]
DSX0HS 20C U	House-side shield for 20 LED unit[16]
DSX0HS 30C U	House-side shield for 30 LED unit[16]
DSX0HS 40C U	House-side shield for 40 LED unit[16]
DSX0DDL U	Diffused drop lens (polycarbonate)[16]
PUMBA DDBXD U*	Square and round pole universal mounting bracket adaptor (specify finish)
KMA8 DDBXD U	Mast arm mounting bracket adaptor (specify finish)[7]

For more control options, visit DTL and ROAM online.

NOTES

1. 30 LEDs (30C option) and rotated options (L90 or R90) only available together.
2. 1000mA not available with AMBPC.
3. AMBPC only available with 530mA or 700mA.
4. MVOLT driver operates on any line voltage from 120-277V (50/60 Hz). Specify 120V, 208V, 240V or 277V options only when ordering with fusing (SF, DF options).
5. Not available with single board, 530mA product (20C 530 or 30C 530). Not available with BL30, BL50 or PNMT options.
6. Available as a separate combination accessory: PUMBA (finish) U; 1.5 G vibration load rating per ANCI C136.31.
7. Must be ordered as a separate accessory; see Accessories information. For use with 2-3/8" mast arm (not included).
8. Photocell ordered and shipped as a separate line item from Acuity Brands Controls. See accessories.
9. If ROAM® node required, it must be ordered and shipped as a separate line item from Acuity Brands Controls. Not available with DCR.
10. DMG option for 347V or 480V requires 1000mA.
11. Specifies a ROAM® enabled luminaire with 0-10V dimming capability; PER option required. Additional hardware and services required for ROAM® deployment; must be purchased separately. Call 1-800-442-6745 or email: sales@roamservices.net. N/A with PIR, PIRH, PER5, PER7, BL30, BL50 or PNMT options.
12. PIR specifies the SensorSwitch SBGR-10-ODP control; PIRH specifies the SensorSwitch SBGR-6-ODP control; see Motion Sensor Guide for details. Dimming driver standard. Not available with PER5 or PER7.
13. Requires an additional switched circuit.
14. Dimming driver standard. MVOLT only. Not available with 347V, 480V, DCR, PER5, PER7 or PNMT options.
15. Dimming driver standard. MVOLT only. Not available with 347V, 480V, DCR, PER5, PER7, BL30 or BL50.
16. Also available as a separate accessory; see Accessories information.
17. Single fuse (SF) requires 120V, 277V or 347V. Double fuse (DF) requires 208V, 240V or 480V.
18. Requires luminaire to be specified with PER option. Ordered and shipped as a separate line item from Acuity Brands Controls.

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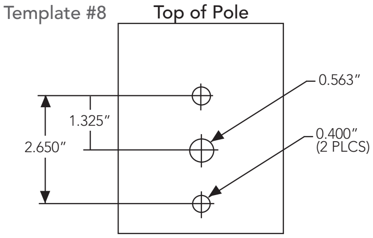
Drilling



DSX0 shares a unique drilling pattern with the AERIS™ family. Specify this drilling pattern when specifying poles, per the table below.

DM19AS	Single unit	**DM29AS**	2 at 90° *
DM28AS	2 at 180°	**DM39AS**	3 at 90° *
DM49AS	4 at 90° *	**DM32AS**	3 at 120° **

Example: SSA 20 4C **DM19AS** DDBXD

Visit Lithonia Lighting's POLES CENTRAL to see our wide selection of poles, accessories and educational tools.

*Round pole top must be 3.25" O.D. minimum.

**For round pole mounting (RPA) only.

Tenon Mounting Slipfitter **

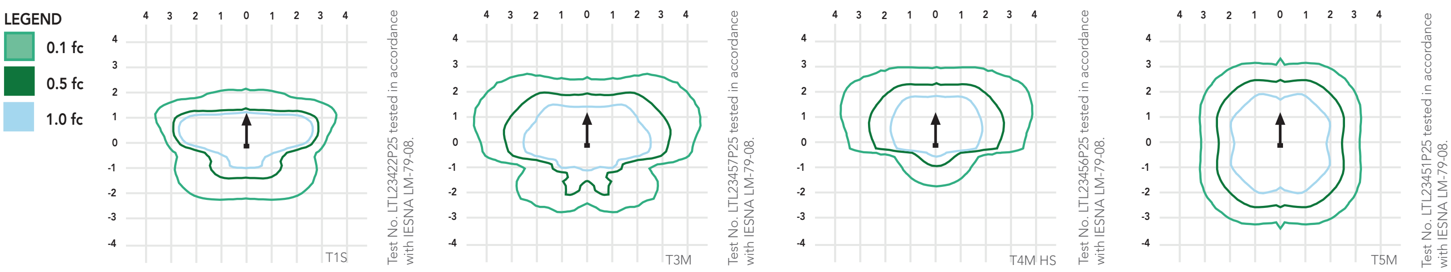
Tenon O.D.	Single Unit	2 at 180°	2 at 90°	3 at 120°	3 at 90°	4 at 90°
2-3/8"	AST20-190	AST20-280	AST20-290	AST20-320	AST20-390	AST20-490
2-7/8"	AST25-190	AST25-280	AST25-290	AST25-320	AST25-390	AST25-490
4"	AST35-190	AST35-280	AST35-290	AST35-320	AST35-390	AST35-490

TYPE T3

Photometric Diagrams

To see complete photometric reports or download .ies files for this product, visit Lithonia Lighting's D-Series Area homepage.

Isofootcandle plots for the DSX0 LED 40C 1000 40K. Distances are in units of mounting height (20').



Performance Data

Lumen Ambient Temperature (LAT) Multipliers

Use these factors to determine relative lumen output for average ambient temperatures from 0-40°C (32-104°F).

Ambient		Lumen Multiplier
0°C	32°F	1.02
10°C	50°F	1.01
20°C	68°F	1.00
25°C	**77°F**	**1.00**
30°C	86°F	1.00
40°C	104°F	0.99

Electrical Load

Number of LEDs	Drive Current (mA)	System Watts	Current (A)					
			120	208	240	277	347	480
20C	530	35	0.34	0.22	0.21	0.20	--	--
	700	45	0.47	0.28	0.24	0.22	0.18	0.14
	1000	72	0.76	0.45	0.39	0.36	0.36	0.26
30C	530	52	0.51	0.31	0.28	0.25	--	--
	700	70	0.72	0.43	0.37	0.34	0.25	0.19
	1000	104	1.11	0.64	0.56	0.49	0.47	0.34
40C	530	68	0.71	0.41	0.36	0.33	0.25	0.19
	700	91	0.94	0.55	0.48	0.42	0.33	0.24
	1000	138	1.45	0.84	0.73	0.64	0.69	0.50

Projected LED Lumen Maintenance

Data references the extrapolated performance projections for the platforms noted in a **25°C ambient**, based on 10,000 hours of LED testing (tested per IESNA LM-80-08 and projected per IESNA TM-21-11).

To calculate LLF, use the lumen maintenance factor that corresponds to the desired number of operating hours below. For other lumen maintenance values, contact factory.

Operating Hours	0	25,000	50,000	100,000
Lumen Maintenance Factor	DSX0 LED 20C 1000			
	1	0.97	0.94	0.90
	DSX0 LED 40C 1000			
	1	0.94	0.90	0.84
	DSX0 LED 40C 700			
	1	0.99	0.98	0.96

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TYPE T3

Performance Data

Lumen Output

Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of the configurations shown, within the tolerances allowed by Lighting Facts. Contact factory for performance data on any configurations not shown here.

Forward Optics

LEDs	Drive Current (mA)	System Watts	Dist. Type	30K (3000 K, 70 CRI)					40K (4000 K, 70 CRI)					50K (5000 K, 70 CRI)					AMBPC (Amber Phosphor Converted)				
				Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW
20C (20 LEDs)	530 mA	35 W	T1S	3,174	1	0	1	91	3,971	1	0	1	113	4,001	1	0	1	114	2,541	1	0	1	73
			T2S	3,234	1	0	1	92	4,045	1	0	1	116	4,075	1	0	1	116	2,589	1	0	1	74
			T2M	3,171	1	0	1	91	3,967	1	0	1	113	3,997	1	0	1	114	2,539	1	0	1	73
			T3S	3,195	1	0	1	91	3,997	1	0	1	114	4,027	1	0	1	115	2,558	1	0	1	73
			T3M	3,226	1	0	1	92	4,036	1	0	1	115	4,066	1	0	1	116	2,583	1	0	1	74
			T4M	3,210	1	0	1	92	4,015	1	0	1	115	4,045	1	0	1	116	2,570	1	0	1	73
			TFTM	3,173	1	0	1	91	3,969	1	0	2	113	3,999	1	0	2	114	2,540	1	0	1	73
			T5VS	3,310	2	0	0	95	4,140	2	0	0	118	4,172	2	0	0	119	2,650	1	0	0	76
			T5S	3,360	2	0	2	96	4,203	2	0	0	120	4,235	2	0	0	121	2,690	1	0	0	77
			T5M	3,320	2	0	1	95	4,153	3	0	1	119	4,184	3	0	1	120	2,658	2	0	0	76
			T5W	3,327	3	0	1	95	4,161	3	0	1	119	4,193	3	0	1	120	2,663	2	0	1	76
	700 mA	45 W	T1S	3,927	1	0	1	87	4,913	1	0	1	109	4,950	1	0	1	110	3,144	1	0	1	70
			T2S	4,000	1	0	1	89	5,004	1	0	1	111	5,042	1	0	1	112	3,203	1	0	1	71
			T2M	3,924	1	0	1	87	4,908	1	0	1	109	4,945	1	0	1	110	3,141	1	0	1	70
			T3S	3,953	1	0	1	88	4,945	1	0	1	110	4,982	1	0	1	111	3,165	1	0	1	70
			T3M	3,991	1	0	1	89	4,994	1	0	2	111	5,031	1	0	2	112	3,196	1	0	1	71
			T4M	3,971	1	0	1	88	4,967	1	0	2	110	5,005	1	0	2	111	3,179	1	0	1	71
			TFTM	3,925	1	0	2	87	4,910	1	0	2	109	4,947	1	0	2	110	3,143	1	0	1	70
			T5VS	4,095	2	0	0	91	5,122	2	0	0	114	5,161	2	0	0	115	3,278	2	0	0	73
			T5S	4,157	2	0	0	92	5,200	2	0	0	116	5,239	2	0	0	116	3,328	2	0	0	74
			T5M	4,107	3	0	1	91	5,138	3	0	1	114	5,177	3	0	1	115	3,288	2	0	1	73
			T5W	4,116	3	0	1	91	5,148	3	0	1	114	5,187	3	0	1	115	3,295	2	0	1	73
	1000 mA	72 W	T1S	5,387	1	0	1	75	6,739	2	0	2	94	6,790	2	0	2	94					
			T2S	5,488	1	0	1	76	6,865	2	0	2	95	6,917	2	0	2	96					
			T2M	5,382	1	0	2	75	6,733	2	0	2	94	6,784	2	0	2	94					
			T3S	5,423	1	0	1	75	6,784	2	0	2	94	6,835	2	0	2	95					
			T3M	5,475	1	0	2	76	6,850	2	0	2	95	6,901	2	0	2	96					
			T4M	5,447	1	0	2	76	6,814	2	0	2	95	6,866	2	0	2	95					
			TFTM	5,385	1	0	2	75	6,736	1	0	2	94	6,787	1	0	2	94					
			T5VS	5,617	2	0	0	78	7,027	3	0	0	98	7,080	3	0	0	98					
			T5S	5,702	2	0	0	79	7,133	2	0	0	99	7,187	2	0	0	100					
			T5M	5,634	3	0	1	78	7,048	3	0	1	98	7,101	3	0	1	99					
			T5W	5,646	3	0	1	78	7,063	3	0	2	98	7,116	3	0	2	99					
40C (40 LEDs)	530 mA	68 W	T1S	6,093	2	0	2	90	7,622	2	0	2	112	7,679	2	0	2	113	4,878	1	0	1	72
			T2S	6,207	2	0	2	91	7,764	2	0	2	114	7,823	2	0	2	115	4,969	1	0	1	73
			T2M	6,087	2	0	2	90	7,615	2	0	2	112	7,672	2	0	2	113	4,874	1	0	1	72
			T3S	6,133	1	0	2	90	7,672	2	0	2	113	7,730	2	0	2	114	4,910	1	0	1	72
			T3M	6,193	2	0	2	91	7,747	2	0	2	114	7,805	2	0	2	115	4,958	1	0	2	73
			T4M	6,161	1	0	2	91	7,707	2	0	2	113	7,765	2	0	2	114	4,932	1	0	2	73
			TFTM	6,090	1	0	2	90	7,618	2	0	2	112	7,676	2	0	2	113	4,876	1	0	2	72
			T5VS	6,353	2	0	0	93	7,947	3	0	0	117	8,007	3	0	0	118	5,086	2	0	0	75
			T5S	6,449	2	0	0	95	8,068	3	0	1	119	8,128	3	0	1	120	5,163	2	0	0	76
			T5M	6,372	3	0	1	94	7,971	3	0	2	117	8,031	3	0	2	118	5,102	3	0	1	75
			T5W	6,385	3	0	2	94	7,988	3	0	2	117	8,048	3	0	2	118	5,112	3	0	1	75
	700 mA	91 W	T1S	7,752	2	0	2	85	9,697	2	0	2	107	9,770	2	0	2	107	6,206	2	0	2	68
			T2S	7,897	2	0	2	87	9,878	2	0	2	109	9,953	2	0	2	109	6,322	2	0	2	69
			T2M	7,745	2	0	2	85	9,688	2	0	2	106	9,761	2	0	2	107	6,201	2	0	2	68
			T3S	7,803	2	0	2	86	9,761	2	0	2	107	9,834	2	0	2	108	6,247	1	0	2	69
			T3M	7,879	2	0	2	87	9,856	2	0	2	108	9,930	2	0	2	109	6,308	2	0	2	69
			T4M	7,838	2	0	2	86	9,805	2	0	2	108	9,879	2	0	2	109	6,275	1	0	2	69
			TFTM	7,748	2	0	2	85	9,693	2	0	3	107	9,765	2	0	3	107	6,203	1	0	2	68
			T5VS	8,083	3	0	0	89	10,111	3	0	1	111	10,187	3	0	1	112	6,569	2	0	0	72
			T5S	8,205	3	0	1	90	10,264	3	0	1	113	10,341	3	0	1	114	6,569	2	0	0	72
			T5M	8,107	3	0	2	89	10,142	3	0	2	111	10,218	3	0	2	112	6,491	3	0	1	71
			T5W	8,124	3	0	2	89	10,163	4	0	2	112	10,239	4	0	2	113	6,504	3	0	2	71
	1000 mA	138 W	T1S	10,435	2	0	2	76	13,054	3	0	3	95	13,152	3	0	3	95					
			T2S	10,630	2	0	2	77	13,297	3	0	3	96	13,398	3	0	3	97					
			T2M	10,426	2	0	2	76	13,042	3	0	3	95	13,140	3	0	3	95					
			T3S	10,503	2	0	2	76	13,139	2	0	2	95	13,238	2	0	2	96					
			T3M	10,606	2	0	2	77	13,267	3	0	3	96	13,367	3	0	3	97					
			T4M	10,551	2	0	2	76	13,199	3	0	3	96	13,298	3	0	3	96					
			TFTM	10,430	2	0	3	76	13,047	2	0	3	95	13,146	2	0	3	95					
			T5VS	10,881	3	0	1	79	13,611	3	0	1	99	13,714	4	0	1	99					
			T5S	11,045	3	0	1	80	13,817	3	0	1	100	13,921	3	0	1	101					
			T5M	10,914	4	0	2	79	13,652	4	0	2	99	13,755	4	0	2	100					
			T5W	10,936	4	0	2	79	13,680	4	0	2	99	13,783	4	0	2	100					

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Performance Data

TYPE T3

L90 and R90 Rotated Optics

LEDs	Drive Current (mA)	System Watts	Dist. Type	30K (3000 K, 70 CRI)					40K (4000 K, 70 CRI)					50K (5000 K, 70 CRI)					AMBPC (Amber Phosphor Converted)				
				Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW
30C (30 LEDs)	530 mA	52 W	T1S	4,797	2	0	2	92	6,001	2	0	2	115	6,046	2	0	2	116	3,841	2	0	2	74
			T2S	4,887	2	0	2	94	6,113	2	0	2	118	6,159	3	0	3	118	3,912	2	0	2	75
			T2M	4,793	2	0	2	92	5,996	3	0	3	115	6,041	3	0	3	116	3,837	2	0	2	74
			T3S	4,829	2	0	2	93	6,041	3	0	3	116	6,086	3	0	3	117	3,866	2	0	2	74
			T3M	4,876	3	0	3	94	6,099	3	0	3	117	6,145	3	0	3	118	3,904	2	0	2	75
			T4M	4,851	3	0	3	93	6,068	3	0	3	117	6,114	3	0	3	118	3,884	2	0	2	75
			TFTM	4,795	3	0	3	92	5,998	3	0	3	115	6,043	3	0	3	116	3,839	2	0	2	74
			T5VS	5,002	2	0	0	96	6,258	2	0	0	120	6,305	2	0	0	121	4,005	2	0	0	77
			T5S	5,078	2	0	0	98	6,352	2	0	0	122	6,400	2	0	0	123	4,065	2	0	0	78
			T5M	5,017	3	0	1	96	6,276	3	0	1	121	6,324	3	0	1	122	4,017	2	0	1	77
			T5W	5,028	3	0	1	97	6,289	3	0	2	121	6,337	3	0	2	122	4,025	3	0	1	77
	700 mA	70 W	T1S	5,975	2	0	2	85	7,474	3	0	3	107	7,530	3	0	3	108	4,783	2	0	2	68
			T2S	6,086	2	0	2	87	7,614	3	0	3	109	7,671	3	0	3	110	4,873	2	0	2	70
			T2M	5,969	3	0	3	85	7,467	3	0	3	107	7,524	3	0	3	107	4,779	2	0	2	68
			T3S	6,014	3	0	3	86	7,523	3	0	3	107	7,580	3	0	3	108	4,815	2	0	2	69
			T3M	6,072	3	0	3	87	7,596	3	0	3	109	7,654	3	0	3	109	4,862	3	0	3	69
			T4M	6,041	3	0	3	86	7,557	3	0	3	108	7,614	3	0	3	109	4,837	3	0	3	69
			TFTM	5,972	3	0	3	85	7,471	3	0	3	107	7,527	3	0	3	108	4,781	3	0	3	68
			T5VS	6,230	2	0	0	89	7,793	3	0	0	111	7,852	3	0	0	112	4,988	2	0	0	71
			T5S	6,324	2	0	0	90	7,911	3	0	1	113	7,971	3	0	1	114	5,063	2	0	0	72
			T5M	6,249	3	0	1	89	7,817	3	0	2	112	7,876	3	0	2	113	5,003	3	0	1	71
			T5W	6,262	3	0	2	89	7,833	3	0	2	112	7,892	3	0	2	113	5,013	3	0	1	72
	1000 mA	104 W	T1S	7,956	3	0	3	76	9,952	3	0	3	96	10,027	3	0	3	96					
			T2S	8,104	3	0	3	78	10,138	3	0	3	97	10,214	3	0	3	98					
			T2M	7,949	3	0	3	76	9,943	3	0	3	96	10,018	3	0	3	96					
			T3S	8,008	3	0	3	77	10,018	3	0	3	96	10,093	3	0	3	97					
			T3M	8,086	3	0	3	78	10,115	4	0	4	97	10,191	4	0	4	98					
			T4M	8,044	3	0	3	77	10,063	3	0	3	97	10,139	3	0	3	97					
			TFTM	7,952	3	0	3	76	9,948	3	0	3	96	10,022	4	0	4	96					
			T5VS	8,296	3	0	0	80	10,377	3	0	1	100	10,455	3	0	1	101					
			T5S	8,421	3	0	1	81	10,534	3	0	1	101	10,613	3	0	1	102					
			T5M	8,321	3	0	2	80	10,409	4	0	2	100	10,487	4	0	2	101					
			T5W	8,338	4	0	2	80	10,430	4	0	2	100	10,509	4	0	2	101					

FEATURES & SPECIFICATIONS

INTENDED USE
The sleek design of the D-Series Size 0 reflects the embedded high performance LED technology. It is ideal for many commercial and municipal applications, such as parking lots, plazas, campuses, and streetscapes.

CONSTRUCTION
Single-piece die-cast aluminum housing has integral heat sink fins to optimize thermal management through conductive and convective cooling. Modular design allows for ease of maintenance and future light engine upgrades. The LED driver is mounted in direct contact with the casting to promote low operating temperature and long life. Housing is completely sealed against moisture and environmental contaminants (IP65). Low EPA (0.8 ft^2) for optimized pole wind loading.

FINISH
Exterior parts are protected by a zinc-infused Super Durable TGIC thermoset powder coat finish that provides superior resistance to corrosion and weathering. A tightly controlled multi-stage process ensures a minimum 3 mils thickness for a finish that can withstand extreme climate changes without cracking or peeling. Available in both textured and non-textured finishes.

OPTICS
Precision-molded proprietary acrylic lenses are engineered for superior area lighting distribution, uniformity, and pole spacing. Light engines are available in standard 4000 K (70 minimum CRI) or optional 3000 K (80 minimum CRI) or 5000 K (70 CRI) configurations. The D-Series Size 0 has zero uplight and qualifies as a Nighttime Friendly™ product, meaning it is consistent with the LEED® and Green Globes™ criteria for eliminating wasteful uplight.

ELECTRICAL
Light engine(s) configurations consist of high-efficacy LEDs mounted to metal-core circuit boards to maximize heat dissipation and promote long life (up to L96/100,000 hours at 25°C). Class 1 electronic drivers are designed to have a power factor >90%, THD <20%, and an expected life of 100,000 hours with <1% failure rate. Easily serviceable 10kV or 6kV surge protection device meets a minimum Category C Low operation (per ANSI/IEEE C62.41.2).

INSTALLATION
Included mounting block and integral arm facilitate quick and easy installation. Stainless steel bolts fasten the mounting block securely to poles and walls, enabling the D-Series Size 0 to withstand up to a 3.0 G vibration load rating per ANSI C136.31. The D-Series Size 0 utilizes the AERIS™ series pole drilling pattern. Optional terminal block, tool-less entry, and NEMA photocontrol receptacle are also available.

LISTINGS
UL Listed for wet locations. Light engines are IP66 rated; luminaire is IP65 rated. Rated for -40°C minimum ambient. U.S. Patent No. D672,492 S. International patent pending.

DesignLights Consortium® (DLC) qualified product. Not all versions of this product may be DLC qualified. Please check the DLC Qualified Products List at www.designlights.org to confirm which versions are qualified.

WARRANTY
Five-year limited warranty. Full warranty terms located 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.

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LITHONIA LIGHTING

Catalog Number	
Notes	

TYPE T POLE

FEATURES & SPECIFICATIONS

CONSTRUCTION

Weldable-grade, hot-rolled, commercial-quality carbon steel tubing with a minimum yield of 55,000 psi (11-gauge), 50,000 psi (7-gauge). Uniform wall thickness of .125" or .188". Shafts are one-piece with a longitudinal electric resistance weld. Uniformly square in cross-section with flat sides, small corner radii and excellent torsion. Available shaft widths are 4", 5" and 6".

Anchor base is fabricated from hot-rolled carbon steel plate that meets or exceeds a minimum yield strength of 36,000 psi. The anchor base is provided with slotted holes. Base cover is finished to match pole.

A handhole having nominal dimensions of 3" x 5" for all shafts. Included is a cover with attachment screws.

Top cap provided with all drill-mount poles.

Fasteners are high-strength galvanized zinc-plated or stainless steel.

FINISH — Dark bronze (DDB) polyester powder standard. Other architectural colors available.

GROUNDING — A nut holder located immediately inside the handhole rim is provided with a 1/2" – 13 UNC ground bolt and nut.

ANCHOR BOLTS — Top protion of anchor bolt is galvanized per ASTM A-153. Made of steel rod having a minimum yield strength of 55,000 psi.

Anchor Base Poles

SSS

SQUARE STRAIGHT STEEL

T1/T2 - 18'
T3 - 12'

ORDERING INFORMATION

Example: **SSS 20 5C DM19 DDB**

Choose the boldface catalog nomenclature that best suits your needs and write it in the appropriate blank.

SSS

Shaft type	Nominal shaft length	Nominal shaft base size/ wall thickness	Mounting[1]	Options
SSS	**10 – 39 feet** (See back page.)	(See back page.)		

Mounting[1]

Tenon Mounting

- **PT** Open top
- **T20** 2-3/8" O.D. (2" NPS)
- **T25** 2-7/8" O.D. (2-1/2" NPS)
- **T30**[2] 3-1/2" O.D. (3" NPS)
- **T35**[2] 4" O.D. (3-1/2" NPS)

Drill Mounting[3]

- **DM19** 1 at 90°
- **DM28** 2 at 180°
- **DM28PL** 2 at 180° with one side plugged
- **DM29** 2 at 90°
- **DM39** 3 at 90°
- **DM49** 4 at 90°

Aeris Drill Mounting[3]

- **DM19AS** 1 at 90°
- **DM28AS** 2 at 180°
- **DM29AS** 2 at 90°
- **DM39AS** 3 at 90°
- **DM49AS** 4 at 90°

Options

Shipped Installed

- **L/AB** Less Anchor Bolts
- **VD** Vibration Damper
- **TP** Tamper Proof
- **Hxx**[4,5] Horizontal Arm Bracket (1 fixture)
- **FDLxx**[4] Festoon Outlet less electrical
- **FGLxx**[4] Festoon GFI Outlet less electrical
- **12CPxx**[4] 1/2" Coupling
- **34CPxx**[4] 3/4" Coupling
- **1CPxx**[4] 1" Coupling
- **12NPxx**[4] 1/2" Threaded Nipple
- **34NPxx**[4] 3/4" Threaded Nipple
- **1NPxx**[4] 1" Threaded Nipple
- **HHxx**[4,6] Extra Handhole

Architectural Colors (powder finish)[7]

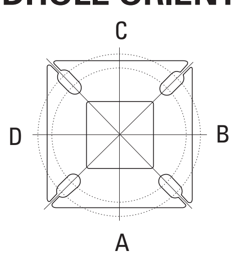
Standard Colors

- **DDB** Dark bronze
- **DWH** White
- **DBL** Black

Classic Colors

- **DMB** Medium bronze
- **DNA** Natural aluminum
- **DSS** Sandstone
- **DGC** Charcoal gray
- **DTG** Tennis green
- **DBR** Bright red
- **DSB** Steel blue
- **GALV** Galvanized finish

HANDHOLE ORIENTATION



NOTES:

1. When ordering tenon mounting and drill mounting for the same pole, follow this example: DM28/T20. The combination requires an extra handhole.
2. 3-1/2" and 4" tenons available on 5" and 6" shafts only.
3. The drilling template to be used for a particular luminaire depends on the luminaire that is used. Refer to the Technical Data Section of the Outdoor Binder for Drilling Templates.
4. Specify location and orientation when ordering option.
   For 1st "x": Specify the height in feet above base of pole. *Example: 5ft = 5 and 20ft = 20*
   For 2nd "x": Specify orientation from handhole (A,B,C,D)
   Refer to the Handhole Orientation diagram on this page.
5. Horizontal arm is 18" x 2-3/8" O.D. tenon standard.
6. Combination of tenon-top and drill mount requires extra handhole.
7. Additional colors available; see Architectural Colors brochure, form no. 794.3.

IMPORTANT INSTALLATION NOTES:

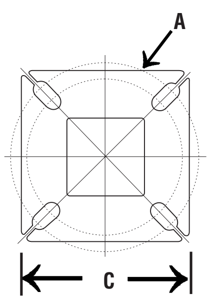
- **Do not** erect poles without having fixtures installed.
- Factory-supplied templates must be used when setting anchor bolts. Lithonia will not accept claim for incorrect anchorage placement due to failure to use factory template.
- If poles are stored outside, all protective wrapping must be removed immediately to prevent finish damage.
- Lithonia is not responsible for the foundation design.
- Installation requires grout to be packed under base to ensure full contact with foundation.

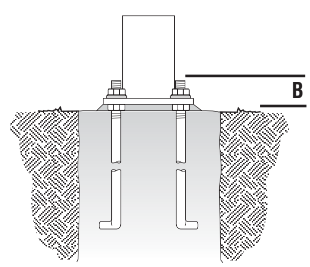
TYPE T POLE

T1/T2 - 18'
T3 - 12'

TECHNICAL INFORMATION

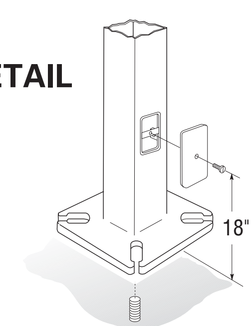
					EPA (ft^2) with 1.3 gust								
Catalog Number	Nominal shaft length (feet)	Pole Shaft Size(in x in x ft)	Wall Thickness (inches)	Gauge	80 mph	Max. weight	90 mph	Max. weight	100 mph	Max. weight	Bolt Circle (inches)	Bolt Size (in. x in. x in.)	Approximate ship weight (pounds)
SSS 10 4C	10	4.0 x 10.0	0.125	11	30.6	765	23.8	595	18.9	473	8--9	3/4 x 18 x 3	75
SSS 12 4C	12	4.0 x 12.0	0.125	11	24.4	610	18.8	470	14.8	370	8--9	3/4 x 18 x 3	90
SSS 14 4C	14	4.0 x 14.0	0.125	11	19.9	498	15.1	378	11.7	293	8--9	3/4 x 18 x 3	100
SSS 16 4C	16	4.0 x 16.0	0.125	11	15.9	398	11.8	295	8.9	223	8--9	3/4 x 18 x 3	115
SSS 18 4C	18	4.0 x 18.0	0.125	11	12.6	315	9.2	230	6.7	168	8--9	3/4 x 18 x 3	125
SSS 20 4C	20	4.0 x 20.0	0.125	11	9.6	240	6.7	167	4.5	150	8--9	3/4 x 18 x 3	140
SSS 20 4G	20	4.0 x 20.0	0.188	7	16.5	415	12.25	310	9.3	240	8--9	3/4 x 30 x 3	198
SSS 20 5C	20	5.0 x 20.0	0.125	11	17.7	443	12.7	343	9.4	235	10--12	1 x 36 x 4	185
SSS 20 5G	20	5.0 x 20.0	0.188	7	28.1	703	21.4	535	16.2	405	10--12	1 x 36 x 4	265
SSS 25 4C	25	4.0 x 25.0	0.125	11	4.8	150	2.6	100	1.0	50	8--9	3/4 x 18 x 3	170
SSS 25 4G	25	4.0 x 25.0	0.188	7	10.8	270	7.7	188	5.4	135	8--9	3/4 x 30 x 3	245
SSS 25 5C	25	5.0 x 25.0	0.125	11	9.8	245	6.3	157	3.7	150	10--12	1 x 36 x 4	225
SSS 25 5G	25	5.0 x 25.0	0.188	7	18.0	350	12.6	350	9.0	250	10--12	1 x 36 x 4	320
SSS 30 4G	30	4.0 x 30.0	0.188	7	6.4	160	4.0	100	2.3	58	8--9	3/4 x 30 x 3	295
SSS 30 5C	30	5.0 x 30.0	0.125	11	4.7	150	2.0	50	--	--	10--12	1 x 36 x 4	265
SSS 30 5G	30	5.0 x 30.0	0.188	7	10.7	267	6.7	167	3.9	100	10--12	1 x 36 x 4	380
SSS 30 6G	30	6.0 x 30.0	0.188	7	15.7	392	10.2	257	6.4	160	11--13	1 x 36 x 4	520
SSS 35 5G	35	5.0 x 35.0	0.188	7	5.9	150	2.5	100	--	--	10--12	1 x 36 x 4	440
SSS 35 6G	35	6.0 x 35.0	0.188	7	9.5	237	5.0	150	1.8	50	11--13	1 x 36 x 4	540
SSS 39 6G	39	6.0 x 39.0	0.188	7	5.1	128	1.3	33	--	--	11--13	1 x 36 x 4	605





Shaft Base Size	Bolt Circle **A**	Bolt Projection **B**	Base Square **C**	Anchor Bolt Description	Warehouse Anchor Bolt Description	Template Number
4"C	8-1/2"	2-3/4"–4"	8"	ABSSS-4C	AB18-0	PJ50004
4"G	8-1/2"	2-3/4"–4"	8"	ABSSS-4G	AB30-0	PJ50004
5"	10"–12"	3-3/8"–4"	11"	ABSSS-5	AB36-0	PJ50010
6"	11"–13"	3-3/8"–4"	12-1/2"	ABSSS-6	AB36-0	PJ50011

BASE DETAIL



IMPORTANT:

- These specifications are intended for general purposes only. Lithonia reserves the right to change material or design, without prior notice, in a continuing effort to upgrade its products.

LITHONIA LIGHTING

An Acuity Brands Company

Lithonia Lighting
Acuity Lighting Group, Inc.
Outdoor Lighting
One Lithonia Way, Conyers, GA 30012
Phone: 770-922-9000 Fax: 770-918-1209
In Canada: 1100 50th Ave., Lachine, Quebec H8T 2V3
www.lithonia.com

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VISTA PROFESSIONAL OUTDOOR LIGHTING

SIDEWALK BOLLARD

Type: TYPE W

Model:

Project:

SPECIFICATION SHEET

MODEL: 1447 - *120V Series:* **Bollards & Beacons**

FIXTURE SPECIFICATIONS:

HOUSING:
Die-cast, copper-free aluminum.

POST:
3" diameter, heavy-gauge, extruded aluminum (1/8" wall thickness).

FINISH:
Polyester powder-coat finish available in Black, Verde, Architectural Brick, Architectural Bronze, Light Bronze, Dark Bronze, Granite, Pewter, Terra-cotta, Rust, Hunter Green, Mocha, Weathered Bronze, Weathered Iron, and White.

SOCKET/LAMP HOLDER:
Compact fluorescent thermoplastic socket.

BALLAST:
High-power factor magnetic ballast rated for ±32°F starting, 120-volt standard.

LENS:
Clear, frosted or prismatic threaded and gasketed, tempered glass vapor globe.

LAMP TYPE:
PL- Compact Fluorescent. 22W Maximum. Ballast is integrated into fixture. Please specify ballast type from the fixture ordering information chart. Lamp not included with fixture, order separately.

MOUNTING:
Direct-burial post. (Post extended 12" for in-ground or concrete mounting.)

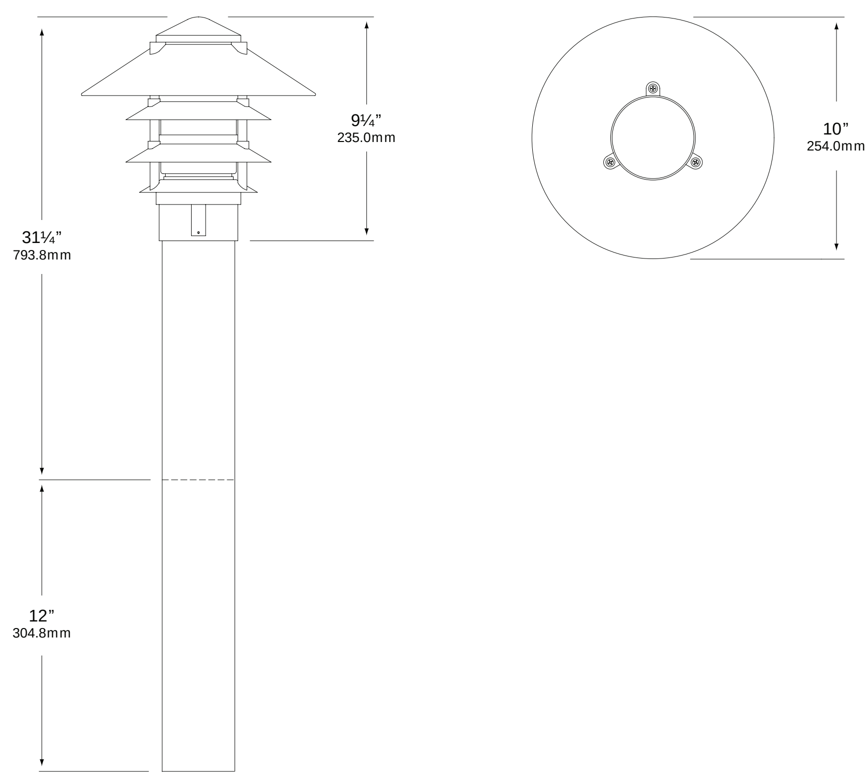
FASTENERS:
All fasteners are stainless steel.

WIRING:
Prewired with 200°C-rated wire along with a grounded lead.

CERTIFICATION:
UL Listed to U.S. and Canadian safety standards for line voltage landscape luminaires (UL 1598). The maximum wattages allowed by Underwriters Laboratories (UL) for the U.S. and Canadian markets may vary. Maximum wattages specified are Underwriters Laboratories U.S. standard. Please contact Vista for any questions about the maximum wattages allowed by UL Canadian standards.

All Vista luminaires are **MADE IN THE U.S.A.**

DIMENSIONS:



C UL US LISTED

Vista Professional Outdoor Lighting reserves the right to modify the design and/or construction of the fixture shown without further notification.

1625 Surveyor Avenue • Simi Valley, CA 93063 • (805) 527-0987 • (800) 766-VISTA (8478)
FAX: (888) 670-VISTA (8478) • email@vistapro.com • www.vistapro.com

VISTA PROFESSIONAL OUTDOOR LIGHTING

TYPE W

SPECIFICATION SHEET

MODEL: 1447 - *120V Series:* Bollards & Beacons

FIXTURE ORDERING INFORMATION

TO ORDER FIXTURE: Select appropriate choice from each column as in the following example

EXAMPLE: 1447-B-CR-13-120

MODEL	FINISH	LENS	INTEGRATED FLUORESCENT BALLAST	
			WATTAGE	VOLTAGE
1447	**B** - Black **G** - Verde **BR** - Architectural Brick **Z** - Architectural Bronze **LZ** - Light Bronze **DZ** - Dark Bronze **GT** - Granite **P** - Pewter **TC** - Terra-cotta **R** - Rust **HG** - Hunter Green **M** - Mocha **WB** - Weathered Bronze **WI** - Weathered Iron **W** - White	**CR** – Clear lens **FR** – Frosted lens **PR** – Prismatic lens	5 7 9 13* 22*	120 208 240 277 **MT** - Multi-tap

Lamp not included with fixture, order separately. For available lamps, see Lamp Guide, Vista catalog.
* - Ballast available in 120 or 277 volts only.

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FAX: (888) 670-VISTA (8478) • email@vistapro.com • www.vistapro.com

TYPE W1

LED COMPACT FLOODLIGHT 30-WATT LED (E-CF3L SERIES)

Applications: Building facades, displays, uplighting and signs. Also effective as security lighting, for storage areas and commercial sites.
Typical Mounting Height: 8 to 15 feet

SIGN LIGHTING

4.75"**D** x 7.75"**W** x 6"**H**
Weight: 3.0 lbs.

Catalog #	Description	Input Voltage	Initial Delivered Lumens	CCT	CRI	50K Hours Projected Lumen Maintenance Factor at 25°C [1]	Comparable To:
E-CF3L03C2(*)	30W LED Cool White	120V-277V	3000	5000K	70	76,000 Hours	100W PSMH
E-CF3L03N2(*)	30W LED Neutral White	120V-277V	3000	4000K	70	76,000 Hours	100W PSMH

(*) Specify finish color. Z=Dark Bronze, W=White

[1] Calculated L_{70} based on 6,048 hours of LM-80 testing: >36,000 hours

Performance
- Estimated 76,000 hours of maintenance-free operation to L_{70}
- Minimum starting temperature: -40°F
- 5-year limited warranty

Electrical
- Non-dimmable
- Universal voltage (120V through 277V)

Construction & Materials
- Durable die-cast aluminum housing
- Polyester powder coat white or dark-bronze finish for extra corrosion protection
- 1/2-inch NPS die-cast swivel fitter included
- Tempered glass lens, thermal shock and impact resistant
- Cree® LEDs inside

Regulatory
- UL listed for wet locations

TYPE W2

PREMIUM LED FLOODLIGHT - SMALL
72-WATT LED
(E-HL5F/S SERIES)

Applications: Building facades, displays, uplighting and signs. Also effective as security lighting, for storage areas and commercial sites.
Typical Mounting Height: 8 to 20 feet

6"**D** x 10.75"**W** x 12.25"**H**
Weight: 8.4 lbs.
(Dimensions include fitter)

FLAG LIGHT

CHOOSE FROM TWO HIGH-QUALITY OPTICS

40° Flood
Perfect for general illumination applications like parking lots and signs.

20° Spot
Use when you need a precise, focused beam of light like accenting architecture.

Catalog #	Description	Input Voltage	Initial Delivered Lumens	Beam Angle/ Photometric Distribution	CCT	CRI	50K Hours Projected Lumen Maintenance Factor at 25°C [1]	Comparable To:
E-HL5F06C2Z	72W LED Cool white	120V-277V	6150	40° Flood	5000K	70	50,000 Hours	150W PSMH
E-HL5F06N2Z	72W LED Neutral white	120V-277V	6150	40° Flood	4000K	70	50,000 Hours	150W PSMH
E-HL5S06C2Z	72W LED Cool white	120V-277V	6150	20° Spot	5000K	70	50,000 Hours	150W PSMH
E-HL5S06N2Z	72W LED Neutral white	120V-277V	6150	20° Spot	4000K	70	50,000 Hours	150W PSMH

[1] Calculated L_{70} based on 6,048 hours of LM-80 testing: >36,000 hours

Line Current Data

Voltage	Operating Amperes
120V	0.61
277V	0.28

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Due to continuous product improvement, information in this document is subject to change. All published photometric testing performed to IESNA LM-79-08 standards by a NVLAP certified laboratory. Fixture photometry was completed on a single representative fixture. Actual production units may vary up to ±10% of initial delivered lumens. Lumen maintenance values at 25°C (77°F) are calculated per TM-21 based on LM-80 data and in-situ fixture testing.

1501 96th Street, Sturtevant, WI 53177 | Phone (888)243-9445 | Fax (262)504-5409 | www.e-conolight.com

TYPE W2

PREMIUM LED FLOODLIGHT - SMALL
72-WATT LED
(E-HL5F/S SERIES)

Performance

- Estimated 50,000 hours of maintenance-free operation to L_{70}
- Minimum starting temperature: -40°F
- 5-year limited warranty

Construction & Materials

- Die-cast aluminum housing and lens frame
- Dark Bronze polyester powder-coat finish
- Tempered glass lens, thermal shock and impact resistant
- Precise optical reflector
- Heat dissipating fins
- Suitable for ground mounting, uplighting & downlighting
- 1/2" NPS adjustable fitter included
- Cree® LEDs inside

Electrical

- Non-dimmable
- Universal voltage (120V through 277V)

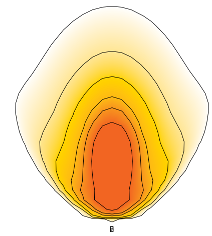
Regulatory

- UL listed for wet locations

Flood

E-HL5F06N2Z fixture mounted at 15 feet with 60° tilt.

Spot



E-HL5S06C2Z fixture mounted at 15 feet with 60° tilt.

Due to continuous product improvement, information in this document is subject to change. All published photometric testing performed to IESNA LM-79-08 standards by a NVLAP certified laboratory. Fixture photometry was completed on a single representative fixture. Actual production units may vary up to ±10% of initial delivered lumens. Lumen maintenance values at 25°C (77°F) are calculated per TM-21 based on LM-80 data and in-situ fixture testing.

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TRZP Series

Catalog No.

TYPE W4

Job Name:

Features & Specifications

Material
Reflector hat is made from heavy gauge spun aluminum. Yolk is heavy die cast aluminum. Lens jar is clear tempered glass.

Finish
Thermoset TGIC polyester powder coat paint. Underside of reflector hat is white other surfaces are customer selected color.

Ballast
Electronic (CF) - 120v, normal power factor (NPF), optional 120-277 volt, high power factor(HPF)
Electronic (MH) - 120-277 volt, high power factor
Min. starting temp -30 C / -20F

Magnetic (MH) - 120v, normal power factor (NPF),

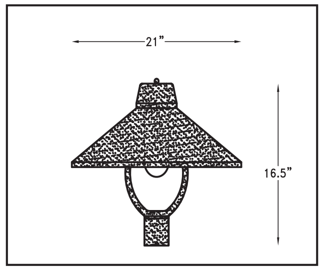
Mounting
Mounts to a standard 3' round pole. Intended for mounting 8-12 feet above grade with either mounting plate or direct burial.

Warranty
Two year product warranty, exclusive of lamps.

Features
- Contemporary architectural grade outdoor fixture
- UL wet location listed
- Easy re-lamping
- Available with battery backup
- Dark Sky

PATIO LIGHTING AND WALKWAY

TRZP-21
Height - 16 1/2"
Width - 21"
Depth - 21"



Example: TRZP-21-U-1T42-3-B1

Model	Voltage	Lamping	Kelvin	Finish	Diffuser	Options
TRZP-21	**A** 120V, NPF *(Elec)* **1** 120v *(Mag)* **Optional Voltage** See price list for Pricing **U** 120-277v *(Elec)*	**1Q26** (1) Q-26w Elec ~~**1T32** (1) T-32w Elec~~ **1T42** (1) T-42w Elec **M050** 50w MH Mag	**2** 2700K **3** 3500K **4** 4100K **T** Clear	**B1** Satin Black **Optional Finishes** See color chart for Pricing		**Pole Options** See price sheet

28435 Industry Drive., Valencia, CA 91355
West Coast Sales: 800-325-4448 ● fax 800-323-2346
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www.lightwayind.com ● sales@lightwayind.com

MADE IN USA

Lightway
distinctive fluorescent lighting

POLE Options

Catalog No.	TYPE W4
Job Name:	

Specifications

Pole
Round, steel, seamless, Wall thickness - 14-gauge (.065")
Nominal dimensions:
O.D. - 3.04"
I.D. - 2.88"
Available in 8', 10', 12' and custom lengths

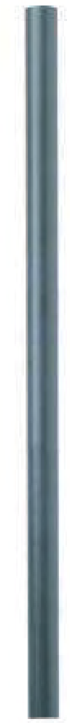
Flange Bases
1/4" steel plate with slots for anchor bolts
Round - 9" diameter (3 anchor bolt attachment)
Square - 9" square (4 anchor bolt attachment)

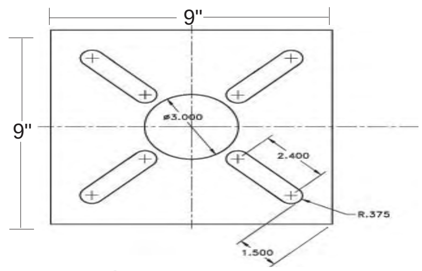
Decorative Covers
Steel decorative covers attach to flange
base (round or square)

Anchor Bolt Set
Consists of hex nut, washer and anchor
bolt (3/8" diameter X 9 1/2" long with 1 1/4" thread)

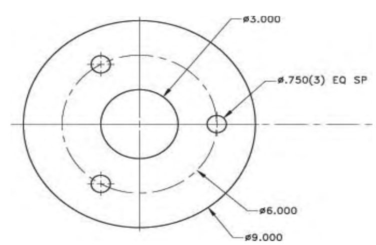
Hand Hole
For flange base attachment only, hand
hole is 12" above base with gasket and cover

Installation (consult local building code)
Direct burial - typically 2-feet set in concrete
Flange base - mounts to concrete footing
Templates - consult factory

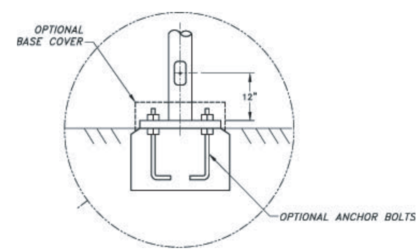




Square Base



Round Base



Typical Flange Installation

Pole Sizes	Discription	Direct Buried	Anchor Bolts	Base Cover	Finish	Options
-81	10 foot pole round, 3 inch OD, steel	Yes		N/A	B1 Satin Black	-88 Base Cover
-82	12 foot pole round, 3 inch OD, steel	Yes		N/A		-89 Set of 3 anchor bolts
-86	8 foot pole round, 3 inch OD, steel with 9" round base		3	RD		-90 Set of 4 anchor bolts
-91	10 foot pole round, 3 inch OD, steel with 9" round base		3			-99 Custom length, diameter or configuration
-93	12 foot pole round, 3 inch OD, steel with 9" round base		3		Optional Finishes See color chart Consult Factory for Pricing	
-87	8 foot pole round, 3 inch OD, steel with 9" square base		4	SQ		*Consult factory for pricing*
-92	10 foot pole round, 3 inch OD, steel with 9" square base		4			
-94	12 foot pole round, 3 inch OD, steel with 9" square base		4			

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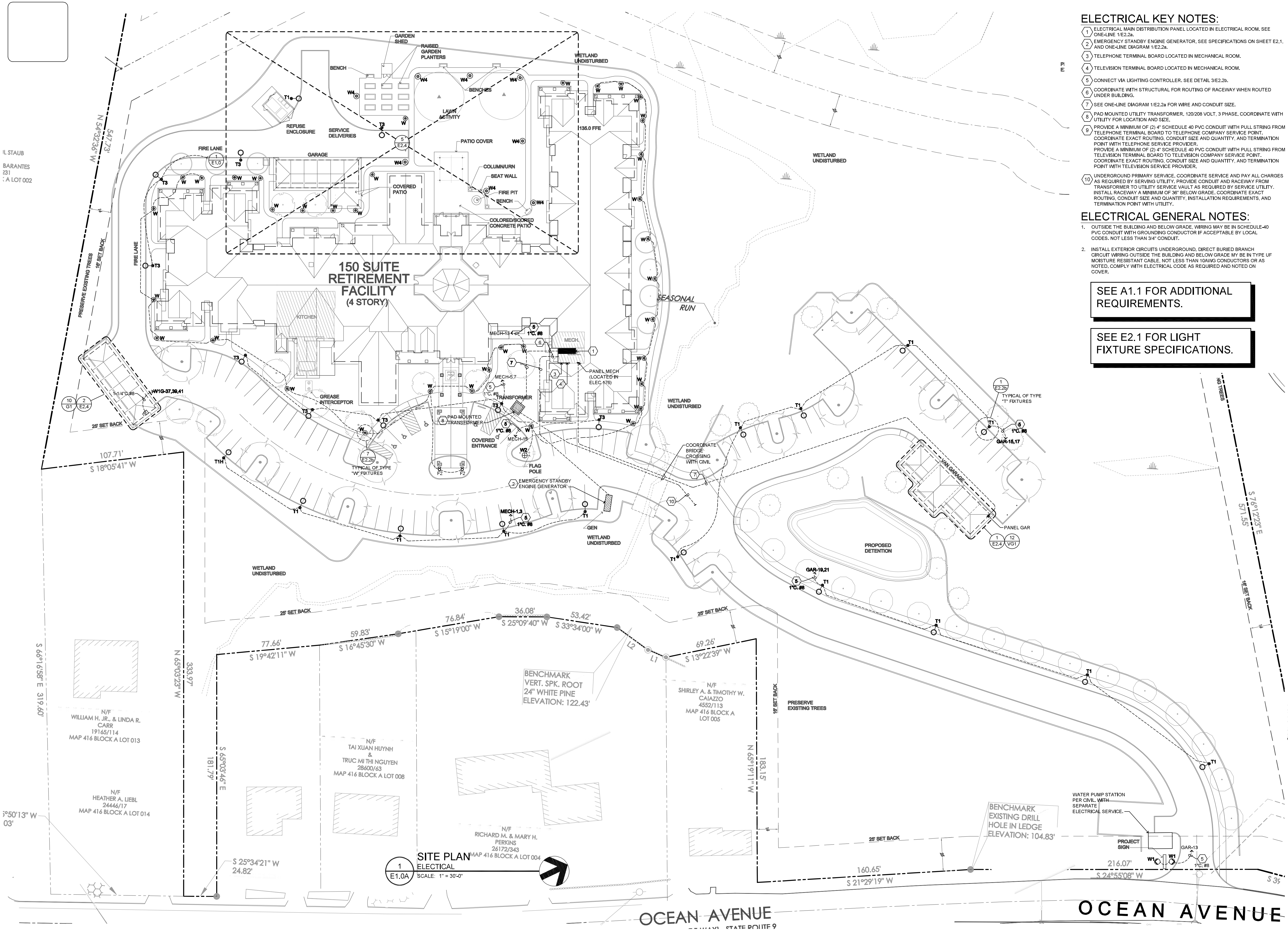
distinctive fluorescent lighting



SITE PLAN
ELECTICAL
SCALE: 1" = 30'-0"

ELECTRICAL KEY NOTES:

1. ELECTRICAL MAIN DISTRIBUTION PANEL LOCATED IN ELECTRICAL ROOM. SEE ONE-LINE 1/E2.2a.
2. EMERGENCY STANDBY ENGINE GENERATOR. SEE SPECIFICATIONS ON SHEET E2.1, AND ONE-LINE DIAGRAM 1/E2.2a.
3. TELEPHONE TERMINAL BOARD LOCATED IN MECHANICAL ROOM.
4. TELEVISION TERMINAL BOARD LOCATED IN MECHANICAL ROOM.
5. CONNECT VIA LIGHTING CONTROLLER. SEE DETAIL 3/E2.2b.
6. COORDINATE WITH STRUCTURAL FOR ROUTING OF RACEWAY WHEN ROUTED UNDER BUILDING.
7. SEE ONE-LINE DIAGRAM 1/E2.2a FOR WIRE AND CONDUIT SIZE.
8. PAD MOUNTED UTILITY TRANSFORMER. 120/208 VOLT, 3 PHASE. COORDINATE WITH UTILITY FOR LOCATION AND SIZE.
9. PROVIDE A MINIMUM OF (2) 4" SCHEDULE 40 PVC CONDUIT WITH PULL STRING FROM TELEPHONE TERMINAL BOARD TO TELEPHONE COMPANY SERVICE POINT. COORDINATE EXACT ROUTING, CONDUIT SIZE AND QUANTITY, AND TERMINATION POINT WITH TELEPHONE SERVICE PROVIDER.
   PROVIDE A MINIMUM OF (2) 4" SCHEDULE 40 PVC CONDUIT WITH PULL STRING FROM TELEVISION TERMINAL BOARD TO TELEVISION COMPANY SERVICE POINT. COORDINATE EXACT ROUTING, CONDUIT SIZE AND QUANTITY, AND TERMINATION POINT WITH TELEVISION SERVICE PROVIDER.
10. UNDERGROUND PRIMARY SERVICE. COORDINATE SERVICE AND PAY ALL CHARGES AS REQUIRED BY SERVING UTILITY. PROVIDE CONDUIT AND RACEWAY FROM TRANSFORMER TO UTILITY SERVICE VAULT AS REQUIRED BY SERVICE UTILITY. INSTALL RACEWAY A MINIMUM OF 36" BELOW GRADE. COORDINATE EXACT ROUTING, CONDUIT SIZE AND QUANTITY, INSTALLATION REQUIREMENTS, AND TERMINATION POINT WITH UTILITY.

ELECTRICAL GENERAL NOTES:

1. OUTSIDE THE BUILDING AND BELOW GRADE, WIRING MAY BE IN SCHEDULE-40 PVC CONDUIT WITH GROUNDING CONDUCTOR IF ACCEPTABLE BY LOCAL CODES. NOT LESS THAN 3/4" CONDUIT.
2. INSTALL EXTERIOR CIRCUITS UNDERGROUND. DIRECT BURIED BRANCH CIRCUIT WIRING OUTSIDE THE BUILDING AND BELOW GRADE MY BE IN TYPE UF MOISTURE RESISTANT CABLE, NOT LESS THAN 10AWG CONDUCTORS OR AS NOTED. COMPLY WITH ELECTRICAL CODE AS REQUIRED AND NOTED ON COVER.

SEE A1.1 FOR ADDITIONAL REQUIREMENTS.

SEE E2.1 FOR LIGHT FIXTURE SPECIFICATIONS.

lenity architecture
3150 Kettle Court SE, Salem, Oregon 97301
P 503 399 1090 F 503 399 0565 W lenityarchitecture.com

COLSON AND COLSON
GENERAL CONTRACTOR, INC.
2260 McGILCHRIST STREET SE, SUITE 200
SALEM, OREGON, 97302
PHONE (503) 586-7401

PORTLAND
RETIREMENT RESIDENCE
802 OCEAN AVE, PORTLAND, MAINE 04103

ELECTRICAL SITE PLAN

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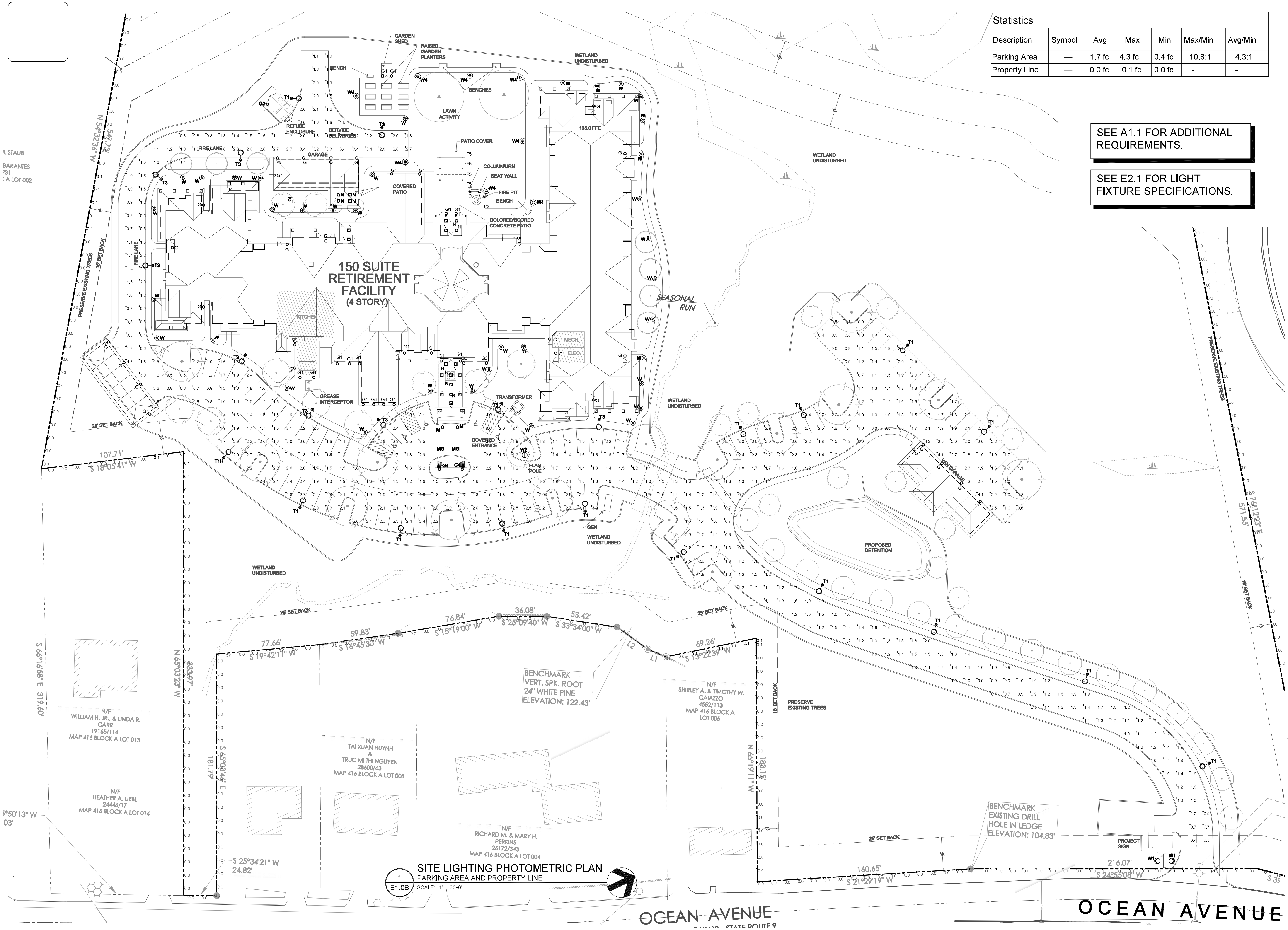
DATE
8/28/2015

REVISED DATE

SHEET
E1.0A



Statistics

Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
Parking Area	+	1.7 fc	4.3 fc	0.4 fc	10.8:1	4.3:1
Property Line	+	0.0 fc	0.1 fc	0.0 fc	-	-

SEE A1.1 FOR ADDITIONAL REQUIREMENTS.

SEE E2.1 FOR LIGHT FIXTURE SPECIFICATIONS.

1 E1.0B SITE LIGHTING PHOTOMETRIC PLAN
PARKING AREA AND PROPERTY LINE
SCALE: 1" = 30'-0"

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COLSON AND COLSON GENERAL CONTRACTOR, INC.
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SALEM, OREGON, 97302
PHONE (503) 586-7401

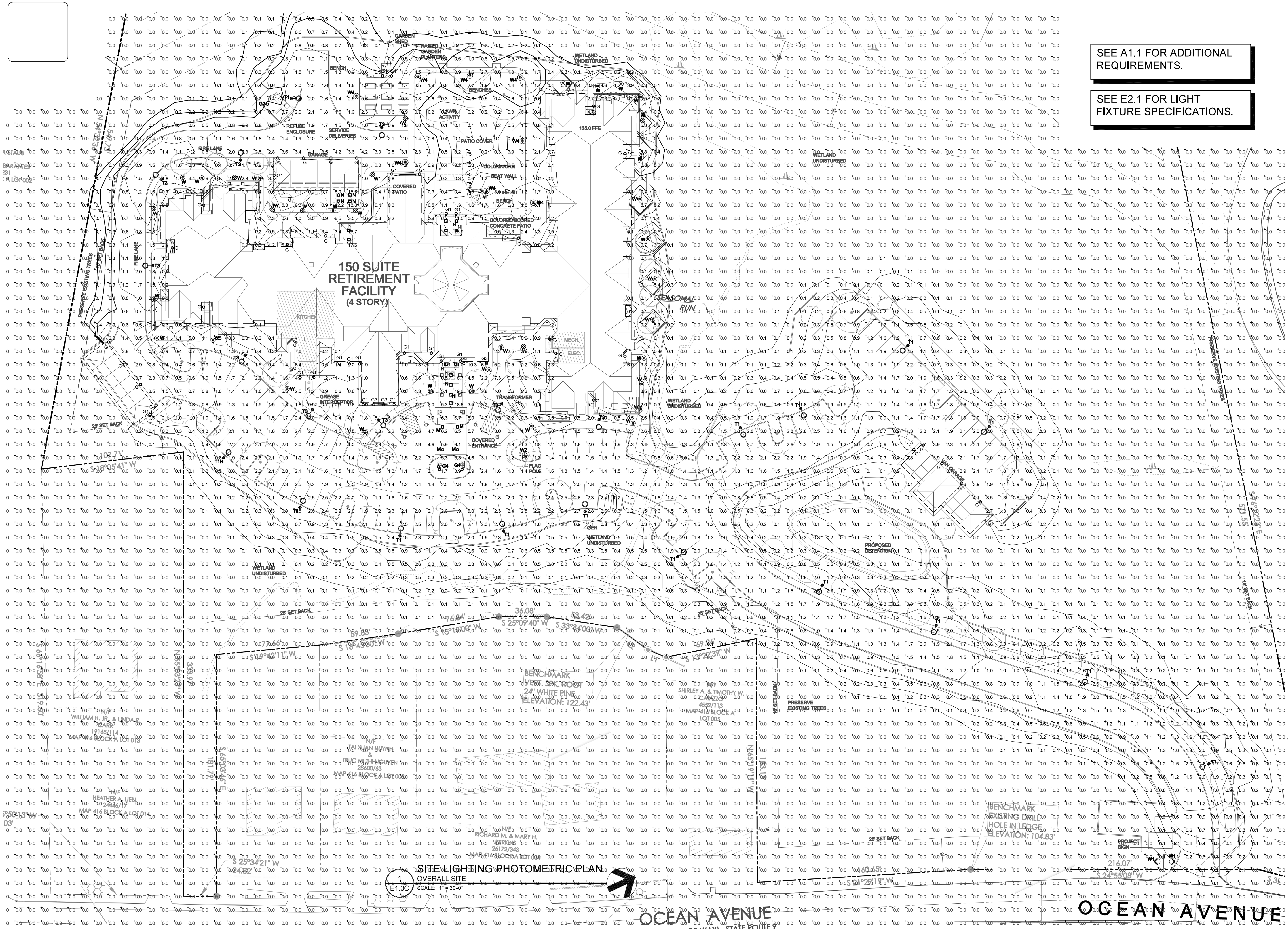
PORTLAND RETIREMENT RESIDENCE
802 OCEAN AVE, PORTLAND, MAINE 04103

SITE LIGHTING PHOTOMETRIC PLAN PARKING/PL

DATE 8/28/2015

REVISED DATE

SHEET E1.0B



SEE A1.1 FOR ADDITIONAL REQUIREMENTS.

SEE E2.1 FOR LIGHT FIXTURE SPECIFICATIONS.

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PHONE (503) 586-7401

PORTLAND
RETIREMENT RESIDENCE
802 OCEAN AVE, PORTLAND, MAINE 04103

SITE LIGHTING PHOTOMETRIC PLAN OVERALL SITE

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DATE
8/28/2015

REVISED DATE

SHEET
E1.0C

SHORT CIRCUIT, COMPONENT PROTECTION, FLASH HAZARD ANALYSIS, AND SELECTIVE COORDINATION STUDY

PART 1 GENERAL

1.1 SUMMARY

A. Provide a short-circuit, component protection, flash hazard analysis, and selective coordination study for the emergency electrical distribution system from all power sources (normal and emergency) down to the branch circuit overcurrent protective device and equipment per NEC 700.27.

1.2 PURPOSE

A. The study shall calculate the available short-circuit current at each point in the emergency electrical distribution system. The overcurrent protective devices shall have an interrupting rating equal to or greater than the available short-circuit current at the point of application.

B. The study shall examine proper protection of emergency electrical system components and utilization equipment such that the equipment has a sufficient short-circuit current rating. If a specific type of overcurrent protective device is required for proper protection of equipment, it shall be noted in the report and reflected in the design of the system.

C. The study shall include a flash hazard analysis for electrical distribution equipment where required per codes and standards. The analysis shall determine the flash protection boundary, incident energy, and required level of personal protective equipment (PPE) for workers at the electrical distribution equipment. The flash protection boundary and incident energy shall be determined based upon a working distance of 18 inches. The electrical distribution equipment shall be field marked with this information in accordance with codes and standards.

D. The emergency overcurrent protective devices shall be analyzed for selective coordination. This analysis shall identify any potential selective coordination problems up the available short-circuit current. Any areas where the overcurrent protective devices are not selectively coordinated shall be explicitly noted and recommendations shall be made to achieve selective coordination if desired.

1.3 REFERENCES

A. The study shall be completed in accordance with the latest edition of IEEE Standard 242 - Recommended Practice for Protection and Coordination of Industrial and Commercial Power Systems.

B. The flash hazard analysis shall be completed in accordance with latest editions of NFPA 70E - Standard for Electrical Safety Requirements for Employee Workplaces and IEEE Standard 1584 - Guide for Performing Arc-Flash Hazard Calculations.

1.4 QUALIFICATIONS

A. The company and individual(s) performing the study shall have a minimum 5 years documented experience in power system analysis and completed projects of similar size and scope. The individual(s) performing the study shall be a registered Professional Engineer in the state of the project location.

B. The company performing study shall have the capability and experience to provide assistance during system start up.

1.5 SCHEDULING

A. The selection of the company and individual performing the study shall be submitted and approved by the design engineer prior to the start of the study.

B. The study shall be completed and submitted prior to the equipment submittals. The study will be reviewed during the equipment submittal and review process. Any changes to the study or equipment will be noted in the returned submittals.

C. Final approval of both the study and equipment submittals shall be given prior to the release of equipment for manufacturing.

1.6 SUBMITTALS

A. The results of the study shall be summarized in report form. Submit 10 copies for review and approval by the design engineer.

B. The results of the study shall include the following:

1. Descriptions, purpose, basis, and scope of study.
2. Fault current calculations including definition of terms and guide for interpretation of computer printout.
3. Tabulations of protective device and equipment ratings versus calculated short-circuit duties, and commentary regarding same.
4. Flash hazard analysis report for electrical distribution equipment.
5. Time versus current curves or fuse selectivity ratio analysis, with tabulations of overcurrent protective device settings, and selective coordination analysis and commentary regarding same.

C. If power company review and approval is required, the results of the study shall be submitted to the power company for review and approval. Approved copies from the power company shall be forwarded to the design engineer.

1.7 SUBMITTALS - CLOSEOUT

A. Submit ten copies of the final approved study to the electrical design engineer.

PART 2 PRODUCTS

2.1 REQUIREMENTS

A. The short circuit and flash hazard analysis study shall be completed with the aid of a computer software program where possible.

B. The available short-circuit current, corresponding required interrupting or short-circuit current ratings of components, and flash hazard analysis data, shall be calculated based upon the 3-phase bolted short-circuit current and phase to ground/neutral short-circuit current at each of the following (if applicable):

1. Utility Service Point.
2. Medium voltage switchgear.
3. Medium voltage motor controllers.
4. Medium/Low-Voltage Unit Substations.
5. Low-voltage switchgear or switchboards.
6. Distribution panelboards.
7. Branch circuit panelboards.
8. Motor control centers.
9. Busway and Busplugs.
10. Other significant equipment or utilization equipment.

C. The study shall include the following:

1. Calculation methods and assumptions.
2. One-line diagram (with available short-circuit current and flash hazard data identified).
3. Calculations shall identify:
   a. Available short-circuit currents from all power sources (kVA)
   b. Motor fault contribution
   c. Component impedance data
   d. X to R ratio
   e. Symmetrical and asymmetrical fault current characteristics
   f. Flash hazard analysis data
4. Tabulation of all calculation quantities and results
5. Detailed description of each protective device identifying its type, function, manufacturer, interrupting rating, ampere rating, selected settings, and time-current characteristics.
6. System component characteristic curves or short-circuit current ratings identified and/or plotted up to the maximum symmetrical fault current to which the component is exposed. Include the following where applicable:
   a. Medium voltage equipment characteristics
   b. Low voltage equipment characteristics
   c. ICEA conductor damage characteristics
   d. Transformer characteristics
   e. Motor and motor circuit equipment characteristics
   f. Generator and transfer switch (manual or automatic) characteristics
   g. Other system equipment characteristics.
7. Time-current curves prepared graphically on full size, log-log forms with title, one-line diagram, and specific system components analyzed.
8. Conclusions regarding interrupting rating for overcurrent protective devices, flash hazard analysis, protection of components, selective coordination, and recommendations and requirements on the same.

PART 3 EXECUTION

3.1 INSTALLATION/START-UP

A. The contractor shall install equipment and protective devices in accordance with the approved short-circuit and selective coordination study.

B. The contractor shall field mark equipment with flash hazard analysis data as required in accordance with codes and standards.

C. The company performing the study shall provide assistance to the installing contractor during start up of electrical system and equipment as needed.

SECTION 16010 - GENERAL CONDITIONS

The electrical subcontractor is bound by the general and supplementary conditions, and Division I.

Document Priorities-

In the case of discrepancies, the construction documents take precedence as follows:

1. Change orders
2. Addendum
3. Specifications
4. Large scale drawings
5. Small scale drawings
6. Submittal and equipment reviews
7. Substitution requests.

Specifications take precedence over substitution requests and submittal reviews.
Where discrepancies/duplications occur, the more stringent requirements shall be provided.

Products under this contract shall meet minimum specification requirements in detail without exception unless specifically noted and approved as provided in these specifications. Equipment submitted for review must clearly state on cover sheet any differences from specified product. Equipment substitution or submittal review does not relieve contractor from meeting all requirements of specified item.

Scope of Electrical Work-

Materials and workmanship shall be furnished and installed for complete, tested, and operating electrical systems as shown on the drawings and specified herein.

Electrical work is to include the electrical service. Complete to the point of connection with the serving utility. Any changes of or work required by the serving utility, are part of this work and shall be fully included in the bid price.

Work is also to include main distribution panel, feeder system and branch circuit panels. Complete branch circuit wiring. Light fixtures, wall switches, receptacles and similar items, exterior lighting and wiring, and wiring and connection to mechanical equipment, all fire alarm, intercom/emergency call system, phone system, unit phone wires, and kitchen equipment as required. Coordinate services with all trades. Coordinate locations of wiring conduit and other runs with other trades in confined areas such as in the corridor ceilings.

Quality Assurance-

Work is to comply to the governing electrical codes as required and noted on the cover sheet, and shall comply with all applicable local codes, rules, and ordinances. All regulations, requirements and charges of the local utility company shall be complied with and paid. Materials used are to be listed by locally accepted listing agencies. Provide work per industry standards of acceptance and industry practice.

Coordination-

Check all equipment locations and connections on the site for coordination with other divisions equipment, connections, structure, and the like. Location of electrical equipment shall not impeed reasonable placement of furnishings including artwork. Locate readily accissble and readily used equipment such as switches near ends of walls where shown as to not impeed practicle use of walls for furnishings and artwork.

Testing-

Test all parts of system at completion of installation. Instruct owners personnel in all aspects of operation.

Warranty-

Contractor to provide full warranty on materials and workmanship for a period of one year after final completion of project.

Trenching and Backfill-

Follow trenching and back fill requirements of local codes and ordinances, and pipe trenching detail on drawings.

PROTECTION OF PENETRATIONS AT FIRE RATED CONSTRUCTION

Protect penetrations of fire rated or draft stop construction. Typical for penetrations including conduit, fixtures, outlets, pipes, panel boxes, etc. Protection to be consistent with type of materials:

1. Metal materials extending minimum 18 each side of surface -- draft seal with one of the following:

   a. Listed silicone foam
   b. Other listed product as approved

2. Other materials including plastic conduits and cables: UL listed fire barrier penetration sealing system. Install according to manufacturers instructions. Listing and approvals:

   -ASTM E-119 fire test of building construction and materials.
   -UL 1479 firestops, tests of through penetrations.
   -ASTM E-814 fire tests of through penetration fire stops.
   -ICBO, BOCA, SBBC, NBC (Nat. Research Bd. REPORT NRB-243).
   -As required by Arch.

Electrical Devices in Common Wall-

Electrical boxes shown in common walls serving adjacent rooms are to be offset from each other a minimum of 24" horizontally. Do not mount boxes back to back in any location.

SECTION 16026-Submittals

Provide 5 (five) copies of shop drawings and catalog cuts of materials and equipment listed to architect prior to ordering of equipment. Alternate equipment will be considered for use only with proper Pre-Bid submittal, CSI substitution request form and procedures as given in the general and supplementary conditions.
Submittal schedule for product evaluation indicated below. Each item requiring a submittal is given the following code:

L Manufacturer's Label
C Manufacturer's Catalog data (cuts)
E Technical and Engineering data
S Shop drawings
SA Samples
CR Certifications/Qualifications

16100 - Wiring Systems - L

16010 - Firestopping (For Arch. review) - C, E

16140 - Wiring Devices - C, S

16170 - Disconnects - C, S

16195 - Identification - L

16400 - Panels - C, E, ,S

16500 - Lighting - C, E, S

16520 - Timing Switches - C, E, S

16590 - Heaters - C, E, S

16600 - Emergency Generator System - C, E, S, CR
(Regardless of Supplier, Contractor shall submit generator/ATS information)

16700 - Low Voltage - C, E, S, CR

SECTION 16100 - Wiring Systems

Interior Raceway System: Power conductors shall be in EMT or MC cable throughout common areas of the facility, as detailed in NEC Article 518, including corridors, assembly areas, meeting areas and common gathering areas. Provide EMT in unfinished spaces where raceway is not concealed such as in mechanical and electrical rooms as required by the NEC and local codes. All raceway in finished areas shall be concealed. Where conductors are exposed above a suspended ceiling, provide in a listed metal raceway. NMSC may be used in residential suites meeting the requirements of NEC 334.10 and as permitted by local codes. Fire alarm conductors shall be installed in accordance with NEC Article 760. Provide RMC for interior concrete encased raceway or where EMT is subject to damage.

Aluminum conductors may be used in services and feeders 60A and larger. All branch circuit conductors shall be copper conductor. Sizes indicated on drawing are based upon copper ampacities.

Provide conductors with type THHN insulation in dry locations only. Provide conductors with type THWN, THW and XHHW in dry damp or wet locations.

Conductors smaller than #12 AWG for branch circuits not permitted.

Conductors shall not be less then 12AWG. All other circuits shall be sized as noted or as required by equipment served.

Liquid tight flexible metallic conduit shall be used in short (2 foot nominal) lengths for all equipment which: Vibrates, May need to be moved for servicing, or is exposed to weather.

Outside the building and below grade, wiring may be in schedule-40 PVC conduit with grounding conductor if acceptable by local codes.

Install exterior circuits underground. Direct buried branch circuit wiring outside the building and below grade my be in type UF moisture resistant cable, not less than 10AWG conductors or as noted. Comply with electrical code as required and noted on cover.

Clean and clear-out raceway prior to installation of any conductor/pull string. Provide pull string in empty raceways. Provide listed pulling lubricant/compound for installing conductors in raceway systems.

SECTION 16140 - Wiring Devices

Duplex receptacles: 2 blade grounding type, nylon face.
15 Amp, NEMA 5-15R, Leviton Decora 5325, (Residential Grade) in suites.
20 Amp, NEMA 5-20R, Leviton Decora 16352, (Spec. Grade) in Common areas.
G.F.C.I. Receptacles: 2 blade grounding type, nylon face, 20A NEMA 5-20R.

Tamper resistant receptacles required in all locations in the manager and co-manager suites listed under NEC section 210.52.

Switches: Back & side wired 120 / 277v AC Leviton Decora AC quiet rocker switches 20-amp Spec. Grade in public areas, and 15-amp Residential Grade in suites.

Dimming Switch: 1500w, 120v, 60hz. Leviton 81500 Series. With slide to off function.
Other wiring devices not listed here or elsewhere on drawings to be Specification Grade in common areas, Residential Grade in suites, contractor selected, subject to approval.

Automatic wall switches: Dual technology, conformance with Energy Code. Coverage verified by manufacturer SensorSwitch WSD-PDT-W.

Ceiling Mounted Occupancy Sensor: Dual Technology, conformance with energy code, coverage verified by manufacturer. Complete system by sensor manufacturer. Sensor Switch CMR-PDT.

Devices (receptacles, switches, time switches) and cover plates shall be white, unless on emergency power, provide red receptacles and cover plate.
302 Stainless steel cover plates required in commercial kitchen.
Outdoor receptacles and receptacles indicated with "WP" weather proof shall utilize non-metallic in-use type protective weatherproof covers.

SECTION 16170 - Disconnects

Motor and circuit disconnects shall be UL listed. Constructed of not less than NEMA 1 where installed indoor dry locations. Enclosures for outdoor, or wet locations shall be not less than NEMA 3R. NEMA rating as required where installed. Rated at voltage connected not less than 240 Volts. Heavy duty, quick make, quick break. Number of poles, fusing, and ampacity as noted and required by Code. Solid ground, Solid neutral with Al/Cu compression or set-screw lugs. ON/OFF positions shall be clearly marked and lockable in OFF position. Provide interlock with defeater for authorized personnel. Interlock to prevent disconnect from being opened when "ON" or turned ON with cover open.

Provide disconnect per Code on all machines, HVAC equipment, water heaters including but not limited to: FSD's, AC units, Condenser units, commercial dishwasher, EF's, etc.

SECTION 16195 - Identification

Identify components with neatly printed labeled routed phenolic plastic signs, including any pertinent information for the owner. Panel directories to be typewritten on factory issued card, showing circuit number and description of use of each circuit. Permanently attach to inside of panel door.

The disconnecting means for each service, feeder or branch circuit originating on a switchboard or panelboard shall be legibly and durably marked to indicate its purpose unless such pupose is clearly evident, per NEC 100.22.

SECTION 16400 - Panels

Main panel to be Square D, or equal by Cutler-Hammer, Siemens (ITE), General Electric, or approved. Panel shall be sized, arrangement, and capacity as shown. Verify available fault current with utility. Contractor is responsible for size of equipment within footprint shown. Verify physical equipment size.

Provide branch circuit panel board, with equal or greater series AIC rating shown on E2.2a not rated less than 10,000 AIC, with bolt-on circuit breakers with the same AIC rating as the panel board. Square D type NQOD or equal by Cutler-Hammer, General Electric, Siemens or Westinghouse. Load centers are not permitted.

Panel shall be lockable and include "door-in-door" type construction.

See one-line for additional locking requirements.

Determine available fault current from serving electric utility at point of service. Calculate fault current at each panel-board throughout distribution system. Provide equipment with equal or greater series equipment AIC rating. Provide Flash label on switchboards and panelboard, control panels, meter sockets, and motor control centers, per NEC 110.16. Labels from panel equipment manufacturer, Seaton, or approved. Submit fault current from utility in writing clearly shown from utility (such as letter on utility letter-head). Fault currents shown are for reference only based on general conditions.

SECTION 16450 - Grounding

Grounding Electrodes to be installed per the NEC 250.50, 250.52 and 250.53 using any of the types listed as required (A)(1) thru (A)(7). Per the installation requirements in 250.53 if metal underground piping (i.e. copper water piping service) is used as the grounding electrode a supplemental electrode is required (see 250.53 (D)(2)) supplementing with an additional electrode specified in 250.52 (A)(2) thru (A)(7).

SECTION 16500 - Lighting

See Lighting Fixture Schedule and notes.

Circuit emergency and exit fixtures (E labeled) to emergency panel. Emergency lights and exit lights are to be switched per plans using Bodine GTD20A, NIN3E 24 or approved UL924 listed emergency lighting relay.

Emergency corridor lighting to be on continuously, unswitched.

Non emergency corridor lighting to be controlled by automatic lighting controller, located in the mechanical room.

Switch common area lighting where indicated with a maximum of 1440 watts per circuit.

SECTION 16520 - Time Switches

Corridor lights: 24 hour type, PCI LiteKeeper Series. Mount in mechanical room.

Exterior lights: 7-day astrological time control. PCI LiteKeeper Series. Provide photo sensor. Mount in mechanical room.

Include 12 keypad programming and LCD interface.

SECTION 16590 - Baseboard Heaters

Baseboard heaters shall be, size and voltage as shown, 250 watt per foot nominal densities, Q-MARK 2500 Series. Heater and thermostat shall be white in color. Control with wall mount line voltage remote thermostat, type TA1AW. Heater and thermostat shall be white in color. Heaters shown and connected by Electrical, but sized during design by Mechanical Engineer.

Wall Heaters-

Wall heaters shall be size and voltage as shown with integral thermostat, recessed type. Q-MARK AWH 4000 series. Heater shall be white in color.

Unit Heaters-

Unit heaters shall be size and voltage as shown. Q-MARK Type MUH. Control with wall-mount line voltage thermostat Type MT-1. Heater shall be white in color.

SECTION 16600 - EMERGENCY GENERATOR SYSTEM

Emergency Generator

Emergency generator shall be 120/208 volt, 3 Phase, 4 wire WYE Unit, 125 KW nominal output, natural gas fired standby engine/generator unit shall be complete with transfer switch, low oil, high temp, over speed, voltage controls and gauges, starting batteries, continuous charging hardware, output circuit protection, water jacket heater and weatherproof enclosure. Provide remote annunciator with back-up battery located in office. Unit shall be complete with all accessories as recommended by the manufacturer, and shall be furnished complete with manufacturers start-up service. All equipment and installation shall conform to article 445 on the NEC and NFPA 110. Generator shall be seismic certified.

Cummins, furnished by owner, installed, connected and tested by electrical contractor.

Natural gas consumption: 1,668 cu. ft./hr. (1000 BTU/cu. ft.)

Mount on concrete pad in location indicated on site plan. Circuit to transfer switch in mechanical room as shown by riser diagram. Coordinate with mechanical for separate natural gas supply from gas meter. Do not connect after (down stream) automatic shut-off valve. Provide sign at all main gas valves to indicate emergency generator operates from natural gas supply. Refer to details on drawing. Integral generator breakers shall be coordinated with distribution equipment. Breakers shall be by same manufacturer as the panels/switchboard to assure selective coordination. Provide breaker, include form C auxiliary contact.

Automatic Transfer Switches-

Amps as shown, 120/208 volt 3 pole plus solid neutral. Equipped with manual test button, engine starting contact mechanically held, automatic return to normal. Provide separate control conductors in separate 1" C from generator to ATS. Provide two pair, stranded shielded twisted pair cable 24 AWG, Belden 9729. Transfer switches shall be manufactured by, and the responsibility of, the generator manufacturer.

ATS shall include form C auxiliary contacts mounted on mechanically operated switch blade shaft of ATS.

Boxes and enclosures in the emergency system to be painted red and labeled with phenolic plastic sign saying Emergency so as to clearly identify components of system. Provide placard required by NEC 700-8(a).

SECTION 16700 - Low Voltage Installation

Low voltage equipment installation shall maintain fire ratings of wall. Equipment to be mounted on 2x4x2 listed boxes. The use of Mud Rings only, is not acceptable. Check with local codes on running low voltage wire directly into units smoke detectors (120 volt power). Run low voltage separate from 120v and at least 24" from service cables in corridors. Do not mount boxes back to back.

EMERGENCY POWER SYSTEM

Light fixtures with the "E" designation shall be wired to emergency panel. In the event of a power failure, the emergency generator will start and the automatic transfer shall provide emergency power to the emergency distribution system, and the emergency lights, including exit signs.

16500 - LIGHT FIXTURE SCHEDULE NOTES

ALL FLUORESCENT LAMPS TO HAVE A COLOR RATING OF 4100K (NO EXCEPTIONS).

NOTES:
1. SOME FIXTURES MAY NOT BE USED: VERIFY WITH PLANS
2. 'E' DESIGNATION: FIXTURES INDICATED WITH AN "E" SHALL BE WIRED SEPARATELY ON EMERGENCY CIRCUITS.
3. MAINTAIN 6" MINIMUM CLEARANCE BETWEEN INSULATION AND RECESSED FIXTURES - SEE LIGHTING FIXTURE PROTECTION DETAIL ON DETAIL SHEET. TYPICAL OF ALL RECESSED FIXTURES.
4. ALL EXIT LIGHTS TO BE WIRED TO EMERGENCY PANEL.
5. NOT USED
6. FIXTURE IS SUBJECT TO ARCHITECTURAL APPROVAL. SUBMIT FIXTURE PRIOR TO ORDERING.
7. PROVIDE IN-FIXTURE DISCONNECT ON ALL FLUORESCENT FIXTURES WITH DOUBLE ENDED LAMPS.

SUBMITTALS:
-PRIOR TO ORDERING LIGHTING FIXTURES AND ACCESSORIES LISTED ABOVE, PROVIDE SUBMITTAL OF PRODUCT DATA TO ARCHITECT FOR APPROVAL.
-ALL FLUORESCENT FIXTURES TO HAVE ELECTRONIC BALLAST(S). LESS THEN 10% THD. INSTANT START. COLD WEATHER TYPE WHERE REQUIRED.
-NO PCBS IN ANY BALLASTS.

NOTE: SUBSTITIONS SHALL INCLUDE PRE-BID CSI SUBSTITUTION REQUEST FORM. ALL FIXTURE USED ARE TO BE SUBMITTED FOR APPROVAL. NO SUBSTITUTIONS ON FIXTURES C4, L1, Q2, & S OR PRIOR TO BID.

16500 - LIGHT FIXTURE SCHEDULE

DESIG.	DESCRIPTION	MANUFACTURER	LAMPS
A	2'x4' 2 TUBE FLUORESCENT TROFFER (SUSPENDED)	LITHONIA 2GT8-2-32-A12-120-GEB10IS	(2) F028T8
A2	2'x4' 3 TUBE FLUORESCENT TROFFER (SUSPENDED)	LITHONIA 2GT8-3-32-A12-120-GEB10IS	(3) F028T8
C	1'x4' 2 TUBE FLUORESCENT SURFACE MOUNT	LITHONIA M-2-32-A12-MVOLT-GEB10IS	(2) F028T8
C3	15-1/2"x53-1/8" 2 TUBE FLUORESCENT SURFACE MOUNT (SURFACE MOUNTED) W/ SOLID WOOD FRAME	LITHONIA 11430-WH-32-120-GEB10IS	(2) F028T8
C4	20-7/8"x53-1/8" 4 TUBE FLUORESCENT SURFACE MOUNT (SURFACE MOUNTED) W/ SOLID WOOD FRAME	LITHONIA 114-32-WH-32-120-GEB10IS	(4) F028T8
C5	2'x4' 3 TUBE FLUORESCENT SURFACE MOUNT (SURFACE MOUNTED)	LITHONIA 2M-3-32-A12-MVOLT-1/3-GEB10IS	(3) F028T8
D	STEP LIGHT - FLUORESCENT RECESSED WALL MOUNT. PROVIDE WHITE FACEPLATE INDOORS AND BLACK FACEPLATE OUTDOORS.	LITHONIA WSLIF 13DTTE FPL 120 (FPSBL)	(1) 13w DTT
D1	LED UNDER CABINET LINEAR DISPLAY LIGHT. 13-1/2" LONG. HARDWIRE INSTALLATION. WARM WHITE LED. PROVIDE REQUIRED TRANSFORMER, ACCESSORIES, WIREWAYS, CONNECTORS, AND MOUNTING TRACK FOR COMPLETE INSTALL.	AMERICAN LIGHTING LCL-12-3000K WITH (LED-DR60-24) DRIVER	LED
D2	STEP LIGHT - INCANDESCENT RECESSED WALL MOUNT	HYDREL 4453-A-40I-120-LLV-BL	(1) 40W T10
F1	7 WATT, LED LANDSCAPE LIGHT. BLACK FINISH. UL LISTED WET LOCATION. 120 VOLT. 600 LUMEN OUTPUT. 4100K COLOR TEMP.	E-CONOLIGHT E-GL3L01N2K	LED 7 WATT 600 LUMENS
F2	38 WATT, LED LANDSCAPE LIGHT. BLACK FINISH. UL LISTED WET LOCATION. SPOT DISTRIBUTION. 120 VOLT. 2000 LUMEN OUTPUT. 4100K COLOR TEMP.	E-CONOLIGHT E-GL1S03N2K	LED 38 WATT 2000 LUMENS
F3	38 WATT, LED LANDSCAPE LIGHT. BLACK FINISH. UL LISTED WET LOCATION. FLOOD DISTRIBUTION. 120 VOLT. 2000 LUMEN OUTPUT. 4100K COLOR TEMP.	E-CONOLIGHT E-GL1F03N2K	LED 38 WATT 2000 LUMENS
G	WALL MOUNT LED DOWNLIGHT. FULL CUTOFF. 9.5"DX8.75"WX4.5"H. DARK BRONZE FINISH. 3,350 LUMENS, 4.000 KELVIN COLOR TEMPERATURE. 120 VOLT.	E-CONOLIGHT E-WP6L03NZ	LED 36 WATTS 3,300 LUMENS
G1	WALL MOUNT LED DOWNLIGHT. FULL CUTOFF. 6-3/16"LX4-7/8"WX5-3/16"H. BLACK FINISH. 950 LUMENS, 4.000 KELVIN COLOR TEMPERATURE. 120 VOLT.	E-CONOLIGHT E-S12L014UK	LED 16 WATTS 950 LUMENS
G2	WALL MOUNT LED DOWNLIGHT. FULL CUTOFF. 9.5"DX5.75"WX4"H. DARK BRONZE FINISH. 1,200 LUMENS, 4.000 KELVIN COLOR TEMPERATURE. 120 VOLT.	E-CONOLIGHT E-WW1LZ1NZP	LED 20 WATTS 1,200 LUMENS
G3	WALL MOUNT LED UP/DOWN LIGHT. 6-3/16"LX4-7/8"WX7-3/16"H. BLACK FINISH. 1850 LUMENS, 4.000 KELVIN COLOR TEMPERATURE. 120 VOLT.	E-CONOLIGHT E-S22L034UK	LED 30 WATTS 1,850 LUMENS
G4	WALL MOUNT LED GOOSENECK WITH STARLIGHT SHROUD. 31-1/2"LX15-1/4"WX25-3/4"H. BLACK FINISH. 1260 LUMENS, 4.000 KELVIN COLOR TEMPERATURE. 120 VOLT.	E-CONOLIGHT E-DG1L13USK	LED 15 WATTS 1,260 LUMENS
G5	PARKING LOT WALL MOUNT DOWNLIGHT CUT-0FF WITH FORWARD THROW REFLECTOR.	LITHONIA WST-150M-FT-120-SCWA-DDBT	(1) 150W MH
HL	SUITE BATH - HEAT LAMP AND LIGHT (RECESSED MOUNT). SEE DETAIL 6/E2.2b FOR FIXTURE INSTALLED IN RATED CEILING.	BROAN MODEL 163	(1) 14 WATT BR30 CFL, 4100^K W/MED. BASE (1) 250 WATT BR40 INFRARED HEAT LAMP
J	2-1/8"x48" 1 TUBE FLUORESCENT STRIP	LITHONIA Z-1-32-MVOLT-GEB10IS	(1) F028T8
J1	4-3/8"x48" 2 TUBE FLUORESCENT STRIP CHANNEL	LITHONIA C-2-32-MVOLT-GEB10IS	(2) F028T8
J3	4"x24-3/8"X1-3/8" 1 TUBE FLUORESCENT UNDER CABINET LIGHT WITH SWITCH.	LITHONIA UCB-17-120-SWR	(1) 17W T8
J4	4"x48-3/8"x1-3/8" 1 LAMP FLUORESCENT UNDER CABINET LIGHT WITH SWITCH.	LITHONIA UCB-120-SWR	(1) F028T8
K	CHANDELIER OWNER SUPPLIED, PROVIDE J-BOX, WIRE, SWITCHING AND INSTALLATION.		300 WATTS MAX.
K1	CHANDELIER 23"W, 24"H. BRUSHED NICKEL FINISH. ETCHED OPAL GLASS.	PROGRESS P4082-09	USE (3) 23 WATT 4100^K CFL. W/MED. BASE ITEM #4T223 T.C.P., INC.
K2	INCANDESCENT BOWL PENDANT FIXTURE. BRUSHED NICKEL FINISH.	PROGRESS P3608-81	USE (3) 13 WATT 4100^K CFL. W/MED. BASE ITEM #4T213 T.C.P., INC.
K3	INCANDESCENT CHANDELIER. 36" DIA, 14" HIGH BOWL, 31" OVERALL HEIGHT. OLDE BRONZE FINISH WITH SATIN ETCHED LENS. PROVIDE SWIVEL CANOPY WHERE INSTALLED AT VAULTED CEILING.	KICHLER 3279OZW	USE (5) 23 WATT 4100^K CFL. W/MED. BASE ITEM #4T223 T.C.P., INC.
K4	INCANDESCENT SEMI-FLUSH 24" DIA, 12" HIGH BOWL. OLDE BRONZE FINISH WITH SATIN ETCHED LENS. PROVIDE SWIVEL CANOPY WHERE INSTALLED AT VAULTED CEILING.	KICHLER 3606OZW	USE (3) 23 WATT 4100^K CFL. W/MED. BASE ITEM #4T223 T.C.P., INC.
L1	6-1/4" WIDTH 50-5/8" LENGTH 2-1/4" DEPTH FLUORESCENT SLIM LINE WRAP WITH WHITE ACRYLIC DIFFUSER. 120v NPF ELECTRONIC BALLAST.	PROGRESS P7189-30STR (PROVIDE INSTANT START BALLAST)	(2) F028T8
M	SQUARE 12" HID RECESSED CANOPY LIGHT.	RUUD LIGHTING MRC0615-1	(1) 150w MH
N	8" RECESSED HID DOWNLIGHT WITH REGRESSED FRESNEL LENS	GOTHAM LGH-50M-8RW-FFL-120	(1) 50w MH
N1	8" RECESSED HID DOWNLIGHT WITH REGRESSED FRESNEL LENS WITH QUARTZ RESTRIKE SYSTEM	GOTHAM LGH-50M-8RW-FFL-120-QRS	(1) 50w MH (1) 75W QUARTZ RESTRIKE
O	18"~ INCANDESCENT PENDENT FIXTURE, CHAIN HUNG.	PROGRESS P5095-09	USE (1) 13 WATT 4100^K CFL. W/MED. BASE ITEM #4T213 T.C.P., INC.
O1	6-1/2"~ INCANDESCENT PENDANT FIXTURE.	PROGRESS P5108-09 MED. BASE LAMPHOLDER - MAX. 100 WATTS	USE (1) 13 WATT 4100^K CFL. W/MED. BASE ITEM #4T213 T.C.P., INC.
O2	4-3/4"~ FLUORESCENT PENDANT FIXTURE. BRONZE FINISH WITH TOPAZ TORTOISE ART GLASS.	PROGRESS P5150-20EBWB	(1) 13 WATT CFL.
P	VAPOR TIGHT	(FURNISHED W/ COOLER)	
Q	19" DIAMETER SEMI-FLUSH DIRECT CEILING MOUNTED FIXTURE. BRUSHED NICKEL FINISH WITH INVERTED SATIN WHITE GLASS BOWL.	PROGRESS P3569-09 MED. BASE LAMPHOLDER - MAX. 300 WATTS	USE (3) 23 WATT 4100^K CFL. W/MED. BASE ITEM #4T223 T.C.P., INC.
Q1	DECK/PATIO-10" CEILING-MOUNTED WHITE GLASS & FINISH, UL LISTED WET LOCATION. FROSTED RIBBED GLASS.	VOLUME LIGHTING V8870-6 MED. BASE LAMPHOLDER - MAX. 100 WATTS	USE (1) 13 WATT 4100^K CFL. W/MED. BASE ITEM #4T213 T.C.P., INC.
Q2	SUITE AREAS - 14"~ CEILING MOUNTED, BRUSHED NICKEL HOUSING, WITH ETCHED RIBBED GLASS.	PROGRESS P3689-09 MED. BASE LAMPHOLDER - MAX. 120 WATTS	USE (2) 13 WATT 4100^K CFL. W/MED. BASE ITEM #4T213 T.C.P., INC.
Q3	19"~ SEMI-FLUSH DIRECT CEILING MOUNTED FIXTURE. ANTIQUE BRONZE FINISH WITH INVERTED SATIN WHITE GLASS BOWL.	PROGRESS P3484-09 MED. BASE LAMPHOLDER - MAX. 300 WATTS	USE (3) 23 WATT 4100^K CFL. W/MED. BASE ITEM #4T223 T.C.P., INC.
S	SUITE BATH - WALL-MOUNT THREE-LIGHT FIXTURE, BRUSHED NICKEL FINISH.	PROGRESS P3303-09 MED. BASE LAMPHOLDER - MAX. 100 WATTS	USE (3) 13 WATT 4100^K CFL. W/MED. BASE ITEM #4T213 T.C.P., INC.
S1	FLUORESCENT WALL SCONCE. 16"H x 8"W x 4"D. BRUSHED NICKEL FINISH. ETCHED OPAL GLASS. ELECTRONIC BALLAST.	MINKA LAVERY 347-84-PL	(2) 13w G24 LAMPS
S2	FLUORESCENT WALL SCONCEONE-LIGHT ADA WALL SCONCE WITH LIGHT SATIN AMBER GLASS AND ANTIQUE BRONZE FINISH.	PROGRESS P7081-20	(1) 13W DIMMABLE GU-24 LAMP
T1	PARKING LOT - LED SHOEBOX WITH TYPE III MEDIUM DISTRIBUTION WITH 18' POLE (SEE SITE PLAN FOR LOCATION) (SEE DETAIL #1/E2.2). WITH POLE MOUNTED RECEPTACLE. DARK BRONZE FINISH. 9,800 LUMENS, 4,000 KELVIN COLOR TEMPERATURE. 120 VOLT.	LITHONIA DSX0 LED 40C-700-40K-T3M-MVOLT-SPA-DDBXD POLE: SSS-18-4C-DM19-FGL5A	LED 91 WATTS 9,800 LUMENS
T1H	SAME AS T1 EXCEPT WITH HOUSE SIDE SHIELD.	LITHONIA DSX0 LED 40C-700-40K-T3M-MVOLT-SPA-HS-DDBXD POLE: SSS-18-4C-DM19-FGL5A	LED 91 WATTS 9,800 LUMENS
T2	SAME AS T1 EXCEPT WITH TYPE 4 MEDIUM DISTRIBUTION.	LITHONIA DSX0 LED 40C-700-40K-T4M-MVOLT-SPA-DDBXD POLE: SSS-18-4C-DM19-FGL5A	LED 91 WATTS 9,800 LUMENS
T2H	SAME AS T2 EXCEPT WITH HOUSE SIDE SHIELD.	LITHONIA DSX0 LED 40C-700-40K-T4M-MVOLT-SPA-HS-DDBXD POLE: SSS-18-4C-DM19-FGL5A	LED 91 WATTS 9,800 LUMENS
T3	PARKING LOT - LED SHOEBOX WITH TYPE III MEDIUM DISTRIBUTION WITH 12' POLE (SEE SITE PLAN FOR LOCATION) (SEE DETAIL #1/E2.2). WITH POLE MOUNTED RECEPTACLE. DARK BRONZE FINISH. 7,700 LUMENS, 4,000 KELVIN COLOR TEMPERATURE. WITH HOUSE SIDE SHIELD. 120 VOLT.	LITHONIA DSX0 LED 40C-530-40K-T3M-MVOLT-SPA-HS-DDBXD POLE: SSS-12-4C-DM19-FGL5A	LED 68 WATTS 7,700 LUMENS
U	6" INCANDESCENT WALLWASH DOWNLIGHT. WITH NARROW FLANGE WHITE TRIM AND OPEN CLEAR DIFFUSE REFLECTOR.	LITHONIA 6VI-6W9A-TRW MED. BASE LAMPHOLDER - MAX. 100 WATTS	USE (1) 23 WATT 4100^K CFL. W/MED. BASE ITEM #4T223 T.C.P., INC.
U1	6" FLUORESCENT DOWNLIGHT. WITH NARROW FLANGE WHITE TRIM AND OPEN CLEAR DIFFUSE REFLECTOR. ELECTRONIC BALLAST.	LITHONIA 6VF-26-42TRT-609A-MVOLT-TRW	(1) 32W TRT
U2	8" COMPACT FLUORESCENT DOWNLIGHT FOR FLAT AND SLOPED CEILING. OPEN CLEAR DIFFUSE REFLECTOR.	LITHONIA 8HF-2/32TRT-F803A-120-TRW (PROVIDE "SCA8" TRIM IN SLOPED CEILING AREAS)	(2) 32W TRT
U3	6" INCANDESCENT DOWNLIGHT. WITH NARROW FLANGE WHITE TRIM AND OPEN CLEAR DIFFUSE REFLECTOR.	LITHONIA 6VI-609A-TRW MED. BASE LAMPHOLDER - MAX. 100 WATTS	USE (1) 23 WATT PAR38 CFL, 4100^K W/MED. BASE ITEM #1P3823 T.C.P., INC.
U4	8" COMPACT FLUORESCENT DOWNLIGHT FOR SLOPED CEILINGS. OPEN CLEAR DIFFUSE REFLECTOR. 120 VOLT. WITH 20° SLOPED CEILING ADAPTER.	LITHONIA 8HF-2/26-42TRT-F803A-MVOLT-SCA8-20D	(2) 42W TRT
U5	8" RECESSED LENSED METAL HALIDE DOWNLIGHT. ALUMINUM ANODIZED CLEAR DIFFUSE REFLECTOR WITH CLEAR GLASS LENS. WHITE TRIM RING. STEEL MOUNTING FRAME WITH MECHANICAL TRIM RETENTION CLIPS. WITH QUARTZ RESTRIKE SYSTEM. 120 VOLT.	LITHONIA LP8HN-100M-802A-CGL-120/277-QRS	(1) 100W MH (1) 100W QUARTZ RESTRIKE
U6	3" INCANDESCENT DOWNLIGHT. SHALLOW CEILING, 120V LINE VOLTAGE. WITH OPEN NARROW FLANGE OIL-RUBBED BRONZE REFLECTOR/TRIM.	LITHONIA L3 TRIM: 3010RB	(1) 50W PAR20 LAMP
U7	SAME AS "U6" EXCEPT PROVIDE CLEAR DIFFUSE REFLECTOR/TRIM.	LITHONIA L3 TRIM: 301A	(1) 50 WATT R20 LAMP
U8	SAME AS "U3" EXCEPT PROVIDE PEWTER REFLECTOR/TRIM.	LITHONIA 6VI-609PR	USE (1) 23 WATT PAR38 CFL, 4100^K W/MED.
U9	SAME AS "U" EXCEPT PROVIDE PEWTER REFLECTOR/TRIM.	LITHONIA 6VI-6W9PR	USE (1) 23 WATT 4100^K CFL. W/MED. BASE
U10	SAME AS "U3" EXCEPT PROVIDE WET LOCATION REFLECTOR/TRIM WITH WHITE SPLAY FRESNEL LENS.	LITHONIA 6VI-6LR4 MED. BASE LAMPHOLDER - MAX. 100 WATTS	USE (1) 23 WATT 4100^K CFL. W/MED. BASE ITEM #4T223 T.C.P., INC.
V	4' ENCLOSED FLUORESCENT LENSED AND GASKETED FIXTURE. UL LISTED WET LOCATION.	LITHONIA DMW-2-32-120-GEB10IS	(2) F028T8
W	WALKWAY - LANDSCAPE LIGHT, SATIN BLACK POLYESTER POWDER COATED FINISH OVER DIE CAST ALUMINUM, CLEAR GLASS DIFFUSER (SEE SITE PLAN FOR LOCATION) (SEE DETAIL #7/E2.2)	VISTA 1447-B-CR-13-120	13W PL
W1	LED SIGN LIGHT WITH VISOR. 4.75"D X 7.75"W X 6"H. DARK BRONZE FINISH. 3,000 LUMENS, 4,000 KELVIN COLOR TEMPERATURE. 120 VOLT. (SEE SITE PLAN FOR LOCATION)	E-CONOLIGHT E-CF3L03N2Z	LED 30 WATTS 3,000 LUMENS
W2	LED FLAG LIGHT. 20° SPOT. 6"D X 10.75"W X 12.25"H. DARK BRONZE FINISH. 6,150 LUMENS, 4,000 KELVIN COLOR TEMPERATURE. 120 VOLT. (SEE SITE PLAN FOR LOCATION)	E-CONOLIGHT E-HL5S06N2Z	LED 72 WATTS 6,150 LUMENS
W3	HID BUILDING LIGHT. NARROW PARABOLIC FLOODLIGHT WITH FULL VISOR. (SEE SITE PLAN FOR LOCATION)	LITHONIA TFM-50M-RG-TB-FV-DMB	(1) 50W MH
W4	POLE MOUNTED FLUORESCENT FIXTURE MOUNTED ON 8' POLE. ALUMINUM HOUSING BLACK POWDER COAT FINISH. (SEE SITE PLAN FOR LOCATION) (SEE DETAIL #10/E2.2)	LIGHTWAY TRZP-21-A-1T42-4-B1	(1) 42W
X	EXIT - CEILING MOUNTED - EXIT SIGN 3/4" LETTERS WITH DIRECTION ARROWS AS INDICATED. LETTER COLOR PER LOCAL CODE.	LITHONIA LQM S W 3 R 120/277	LED
AoR	AREA OF RESCUE ASSISTANCE SIGN WITH ACCESS PICTOGRAM AND INTEGRAL BATTERY BACK-UP.	LITHONIA LQM-P-W-2-R-120-EL N-SW04	LED
Y1	6-1/2" HIGH 5" DIAMETER TUBE CEILING MOUNTED DOWNLIGHT CUT-OFF - BRONZE ALUMINUM FINISH.	PROGRESS P5774-20	(1) 23 WATT R40 CFL, 4100^K W/MED. BASE
Z	WALL MOUNTED INDIRECT H1D (WHITE FINISH)	RUUD LACU410D	(1) 100W MH
CF-1	52" WHITE CEILING FAN AND WITH LIGHT, 3 SPEED REVERSIBLE, WITH WHITE BLADES WITH BOX LISTED FOR CEILING FAN. MOUNT 9' A.F.F.	PROGRESS FAN: P2501-30W LIGHT: P2612-30	USE (3) 9 WATT 4100^K CFL. W/CANDELABRA BASE
CF-2	52" WHITE CEILING FAN AND WITHOUT LIGHT, 3 SPEED REVERSIBLE, WITH WHITE BLADES WITH BOX LISTED FOR CEILING FAN. MOUNT 9' A.F.F.	PROGRESS FAN: P2501-30W	N/A
CF-3	52" WHITE CEILING FAN AND WITHOUT LIGHT, 3 SPEED REVERSIBLE, WITH WHITE ABS BLADES WITH BOX LISTED FOR CEILING FAN. MOUNT 9' A.F.F. RATED FOR OUTDOORS. UL LISTED WET.	PROGRESS FAN: P2502-30W	N/A

ELECTRICAL MOUNTING HEIGHTS

ITEM:	HEIGHT A.F.F. TO CENTER LINE:
THERMOSTATS	48"
DOOR HOLDERS	75" TO CENTER
EMERGENCY CALL	40"
SPEAKERS & PULL STATIONS	42"
WALL LIGHTS IN CORRIDORS	80" TO CENTER LINE
EXTERIOR WALL LIGHTS	96" TO CENTER LINE (U.N.O.)
OUTLETS (COMMON AREAS)	17"
OUTLETS (SUITE AREAS)	24"
LIGHT SWITCH	44"
COUNTER OUTLETS	44" TO BOTTOM
STAIR LIGHTS	2" TO BOTTOM, ABOVE TREAD
ELECTRICAL PANEL	80" TO TOP OF PANEL
BATHROOM WALL VANITY LIGHT	6'-11" TO CENTER (SEE NOTE #1)

NOTES:
1. CENTER OVER CABINET BASE PROVIDE BACKING IF REQUIRED.
2. INFORMATION SHOWN FOR REFERENCE. CONFORM TO ARCH, ADA, AND CODE REQUIREMENTS.

ELECTRICAL LEGEND

SYMBOL	DESCRIPTION
	RECESSED FLUORESCENT LIGHT FIXTURE
	SURFACE MOUNT FLUORESCENT LIGHT FIXTURE
	OPEN CHANNEL FLUORECENT, TYPE INDICATED
	WALL MOUNT FIXTURE, TYPE INDICATED
	SURFACE MOUNT OR CHAIN HUNG FIXTURE, TYPE INDICATED
	RECESSED FIXTURE, TYPE INDICATED
AoR	AREA OF RESCUE SIGN - SEE LIGHTING SCHEDULE
	EXIT LIGHT, DIRECTIONAL ARROWS AS INDICATED. WIRE ALL EXIT LIGHTS TO NEAREST EM. LIGHT CIRCUIT.
$ $_D $_{SC}	S.P.S.T. SWITCH, DIMMER SWITCH, FAN SPEED CONTROL SWITCH
$_3 $_P $_K	3-WAY SWITCH, PILOT LIGHT SWITCH, KEYED SWITCH
$_{OC}	AUTOMATIC WALL SWITCH
	DUPLEX RECEPTACLE, SPLIT WIRED WITH 1/2 SWITCHED, ABOVE COUNTER
	DOUBLE DUPLEX (TWO) DUPLEX RECEPTACLE
	FLOOR BOX RECEPTACLE
	208V, 1P RECEPTACLE - 20A EXCEPT WHEN NOTED
	THROUGH WALL PTAC UNIT. SEE MECHANICAL.
	DISCONNECT SWITCH
F	FUSED DISCONNECT SWITCH
T	TRANSFORMER
PNL W1A	ELECTRICAL PANEL OR ENCLOSURE, DESIGNATION NOTED
	ELECTRICAL MOTOR LOAD
—C—	CONTROL CABLE
	SPECIAL RECEPTACLE
TV	TELEVISION SIGNAL CONNECTION
	TELEPHONE CONNECTION
$_{EP}	EMERGENCY PULL SWITCH
T	THERMOSTAT
TS	TIMESWITCH
T	TRANSFORMER
M	CEILING MOUNTED OCCUPANCY SENSOR
J	JUNCTION BOX
E	"E" INDICATES WIRING TO EMERGENCY POWER. SEE SCHEDULE ON E2.1.
WP	WEATHER PROOF
GFI	GROUND FAULT CURRENT INTERRUPTING RECEPTACLE
CVO	CONVENIENCE OUTLET

ELECTRICAL HEAT SCHEDULE

2.0	2 KILOWATT RECESSED WALL HEATER WITH INTEGRAL THERMOSTAT. 208 VOLT.
1.5	1.5 KILOWATT RECESSED WALL HEATER WITH INTEGRAL THERMOSTAT. 120 VOLT.
1.2	1250 WATT BASEBOARD HEATER CONTROLLED BY WALL THERMOSTAT. 120 VOLT.
1B	1 KILOWATT RECESSED WALL HEATER WITH INTEGRAL THERMOSTAT. 120 VOLT.
1.0	1 KILOWATT BASEBOARD HEATER CONTROLLED BY WALL THERMOSTAT. 120 VOLT.
0.7	750 WATT BASEBOARD HEATER CONTROLLED BY WALL THERMOSTAT. 120 VOLT.
0.7B	750 WATT LIQUID FILLED ELEC. HYDRONIC BASEBOARD HEATER CONTROLLED BY WALL THERMOSTAT. BERKO HBB750. 120 VOLT.
0.5	500 WATT RECESSED WALL HEATER WITH INTEGRAL THERMOSTAT. 120 VOLT.
0.5B	500 WATT BASEBOARD HEATER CONTROLLED BY WALL THERMOSTAT. 120 VOLT.

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ELECTRICAL SPECIFICATIONS AND SCHEDULE

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REVISED DATE

SHEET E2.1