Stormwater Management

Chapter 90, Site Plan
Article I, In General
Section 90-17, Applicability of state standards.
[Ord. No. 58-1997, § 17.0, 6-17-1997]
The latest standards of the state department of environmental protection as referenced in 38 M.R.S.A §§ 481-490 shall be applied to for all projects which require City approval as major developments and/or developments which substantially affect the environment, as delegated under the review authority provisions of 38 M.R.S.A § 489A.

Section 90-18, Site location review.
[Ord. No. 58-1997, § 18.0, 6-17-1997]
A permit application for site location review shall be required for all projects which require City approval as a major development and/or developments which substantially affect the environment, as delegated under the review authority provisions of M.R.S.A § 489A.

Title 38, Chapter 3, Article 6 § 489A: Site Location of Development.

Municipal Review of development is limited to Structures in excess of 3 acres but less than 7 acres. Nordic Aquafarms has provided an application to Maine Department of Environmental Protection (MEDEP) for Site Location Review which includes M.R.S.A § 420-D, Stormwater Management.

Stormwater Management

Chapter 102. Zoning

Article IX, Performance Standards

Division 2. Environmental Standards

Section 102-1124, Control of stormwater run-off

[Ord. No. 28-1997, § 701.3, 3-4-1997]

Surface water runoff shall be minimized and detained on-site if possible. If it is not possible to detain water on-site, downstream improvements to the channel may be required to prevent flooding. The natural state of watercourses, swales, floodways or rights-of –way shall be maintained as nearly as possible. The stormwater design shall be for a fifty-year storm, that is, the largest storm which would be likely to occur during a fifty-year period.

- 2-year, 10-year, 25-year and 100-year storm events were evaluated for MEDEP review.
- 50-year storm events also evaluated for City of Belfast Review.
- Surface water runoff after development is equal to or less than surface water runoff prior to development for 2-year, 10-year, 25-year, 50-year and 100-year storm events.
- Proposed project meets Sec. 102-1124 requirements.

Stormwater Management

Chapter 98 Technical Standards

Article VI, Water Quality

Section 98-183, Design and construction of drainage systems.

[Ord. No. 39-1998, § 6.1.2, 12-1-1998]

Generally:

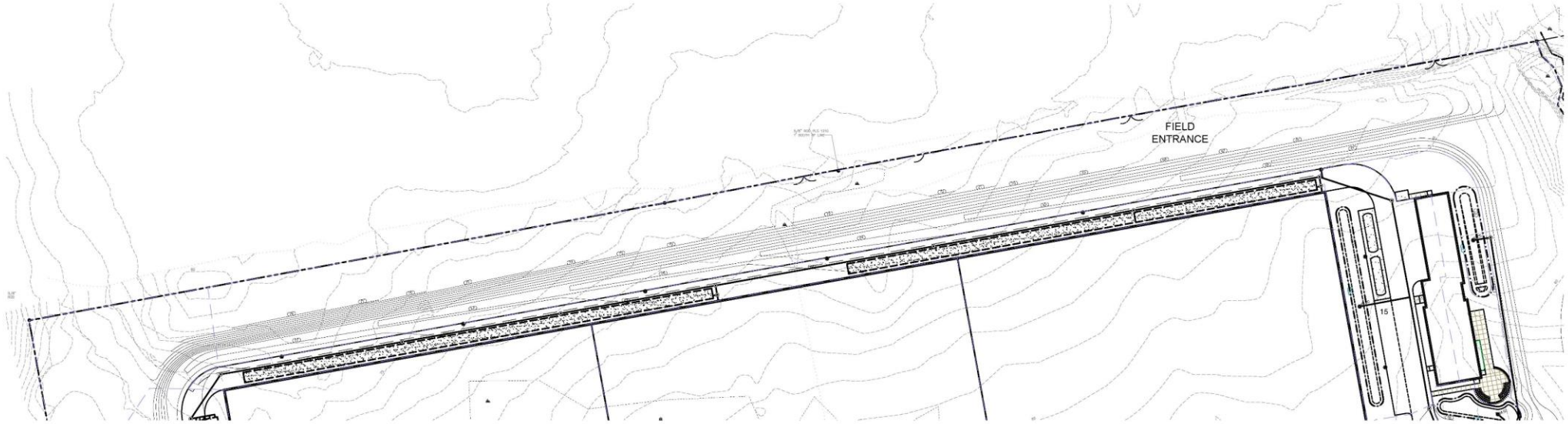
(2) Stormwater management plans shall show means whereby the peak discharge for the developed site shall not exceed the peak discharge for the undeveloped site for the two- and twenty-five-year storms. Emergency spillways shall be provided for storms in excess of the twenty-five-year storm.

Peak discharge for developed site does not exceed peak discharge for the undeveloped site for the 2-Year, 10-Year, 25-Year, 50-Year and 100-Year storm.

(6) Upstream drainage shall be accommodated by an adequately sized drainage system through the proposed development for existing and future potential development in the upstream drainage area or areas tributary to the proposed development.

Upstream drainage is being intercepted by a drainage channel along the northern boundary of the property. The channel re-routes stormwater discharge around the site.

Stormwater Management



Stormwater Management

Chapter 98 Technical Standards

Article VI, Water Quality

Section 98-183, Design and construction of drainage systems.

[Ord. No. 39-1998, § 6.1.2, 12-1-1998]

Generally:

(7) Existing upstream and downstream drainage facilities shall be studied to determine the effect of the proposed development's drainage. The developer shall demonstrate to the satisfaction of the City engineer that the storm drainage from the proposed development will not, in any way, overload or damage existing storm drainage systems upstream or downstream form the proposed development.

Existing upstream and downstream drainage facilities were evaluated using HydroCAD for the 2-Year, 10-Year, 25-Year and 50-Year and 100-Year storm events. Peak runoff entering culverts that discharge on the other side of Route 1 do not exceed peak runoff in the undeveloped condition for all of the storm events evaluated.

Stormwater Management

Chapter 98 Technical Standards

Article VI, Water Quality

Section 98-185 – Submission Requirements

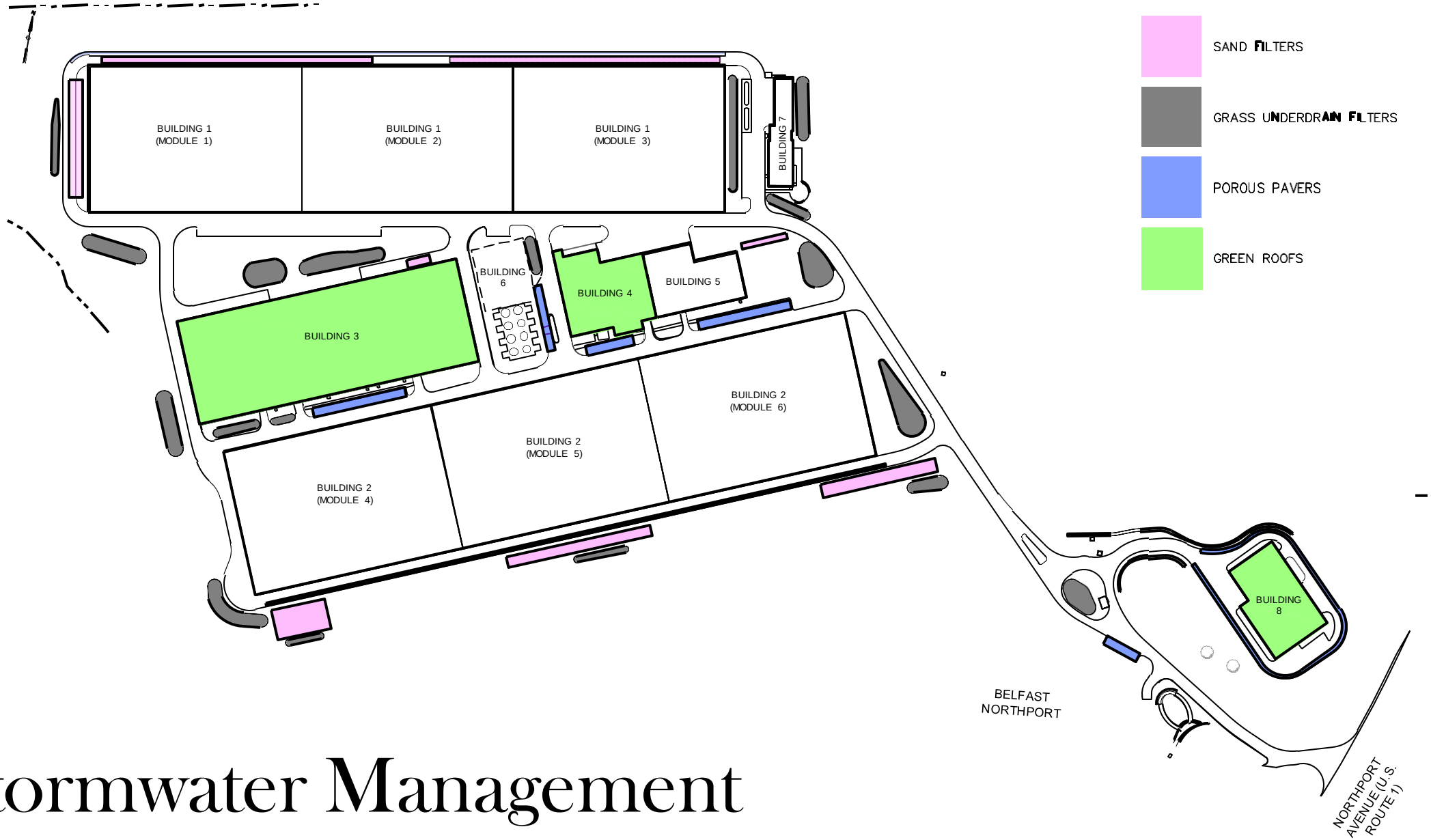
Stormwater Management Reports were submitted to both the Maine Department of Environmental Protection and the City of Belfast and included:

- Maps with pre and post development information as well as High Intensity Soil Survey submitted within the Appendices of the report.
- Narrative which discusses pre and post development land cover and Stormwater handling as well as an analysis of the pre and post development peak runoff rates
- An inspection and maintenance plan which included contracted services for future inspection and maintenance of stormwater structures (by Northeast Stormwater Services.)
- Design calculations for all treatment and conveyance systems, stormwater system design drawings and details.

Stormwater Management

Stormwater Treatment

- 96% treatment of runoff from new impervious surfaces (exceeds the 95% requirement)
- 84% treatment of all developed areas (exceeds the 80% requirement)
- Proposed treatment of stormwater meets MEDEP's Stormwater Management Design Manual and Chapter 500 of Maine Regulations for stormwater.



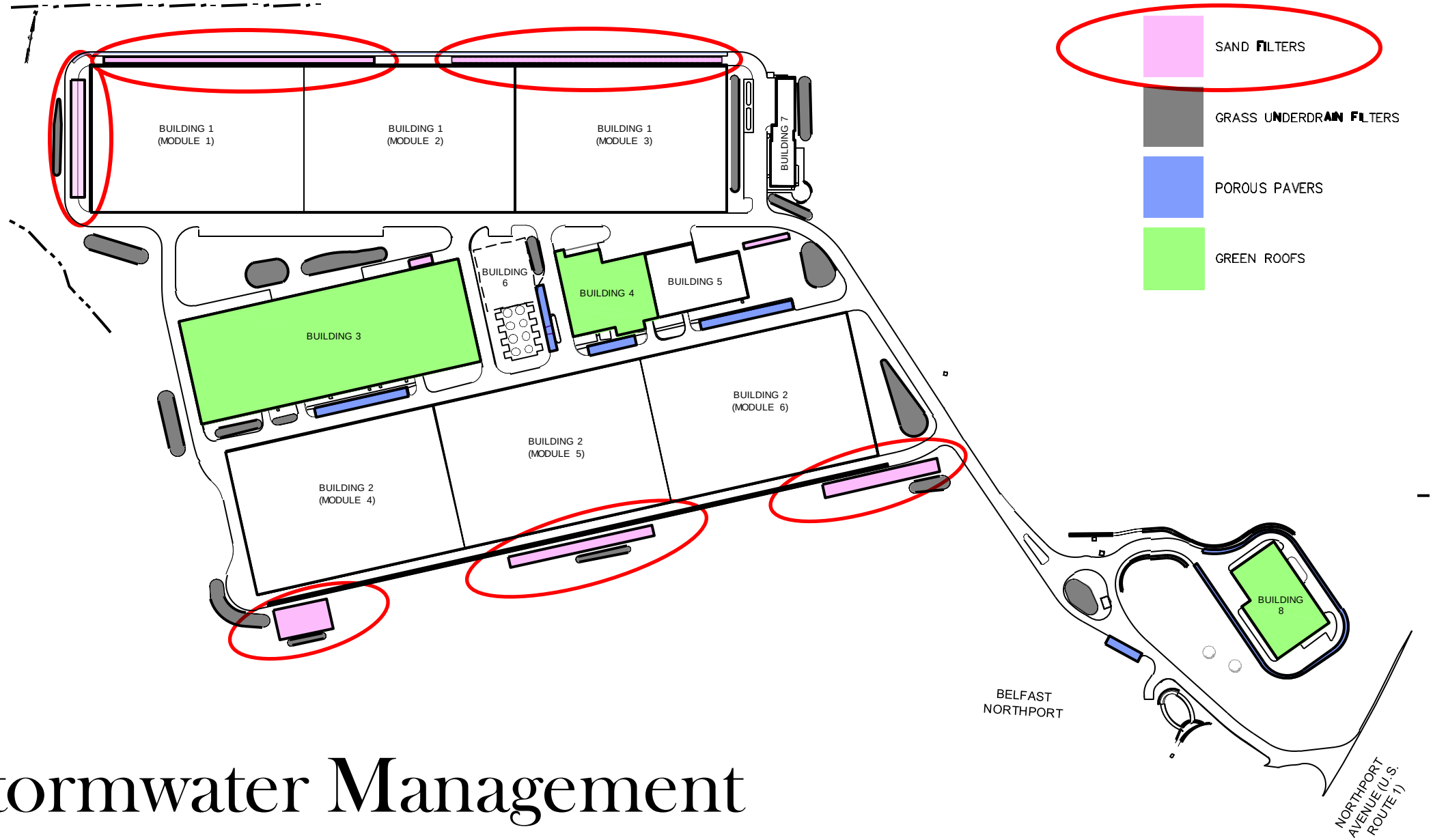
Stormwater Management

NORDIC AQUAFARMS SUSTAINABLE AQUACULTURE

RANSOM Consulting Engineers and Scientists

Stormwater Management

- Sand Filters
- Grass Underdrain Filters
- Green Roofs
- Pervious Pavers

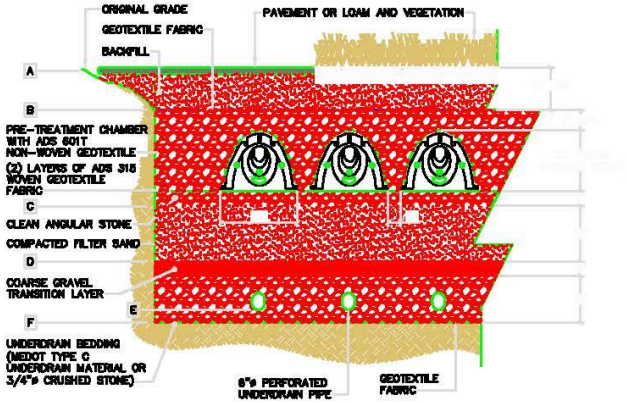


Stormwater Management

NORDIC AQUAFARMS SUSTAINABLE AQUACULTURE

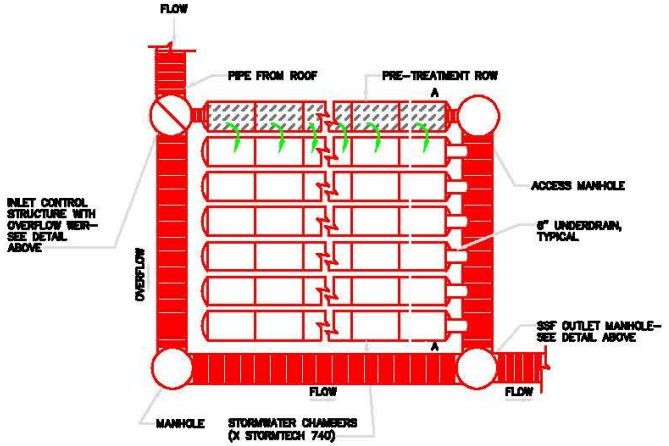
RANSOM Consulting Engineers and Scientists

Stormwater Management



SUBSURFACE SAND FILTER - SECTION A-A

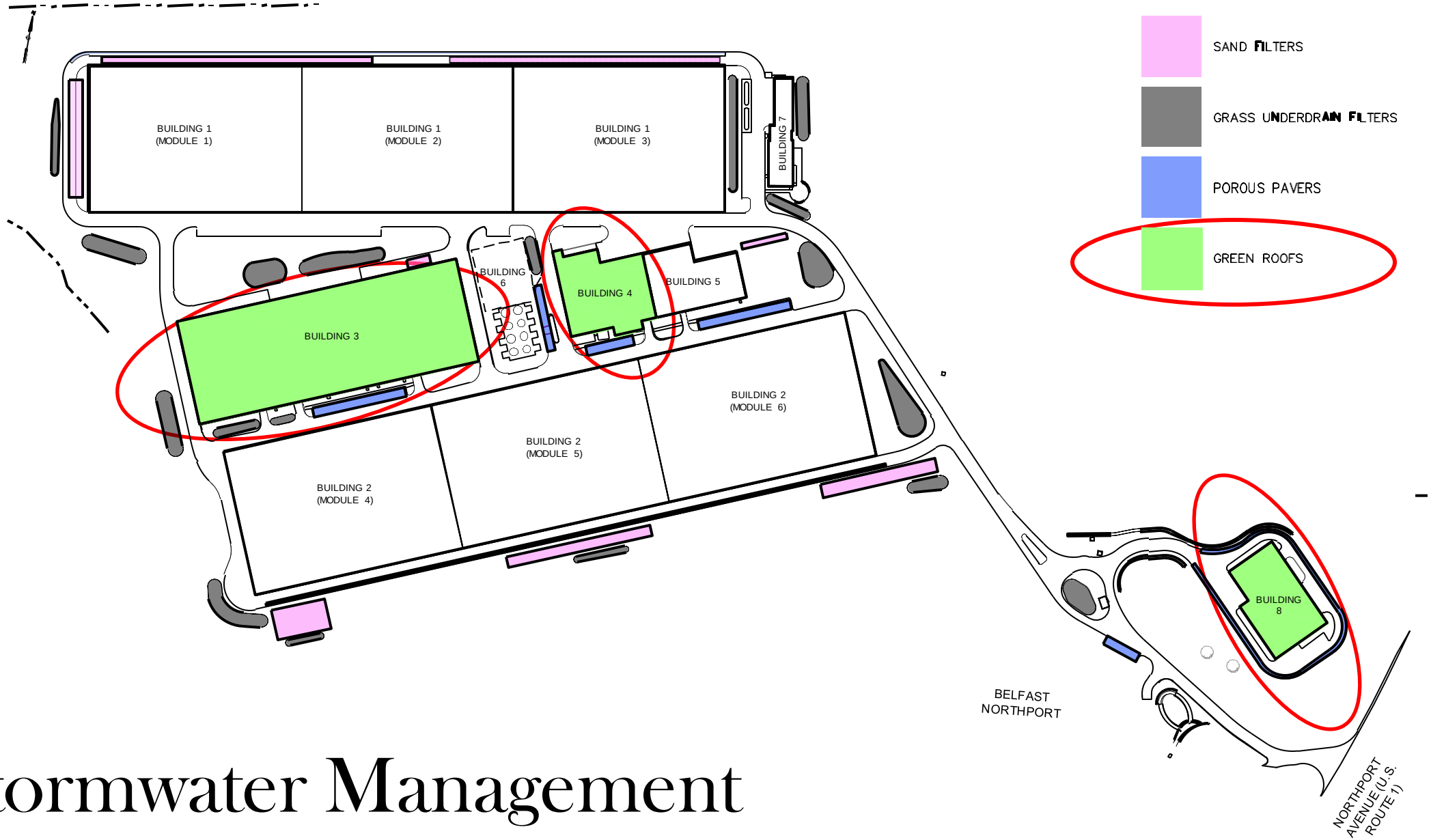
SCALE: N.T.S. SOURCE: MDEP LAST UPDATED: 03/2018



PRETREATMENT ROW - PLAN VIEW

NORDIC AQUAFARMS

RANSOM Consulting



Stormwater Management

NORDIC AQUAFARMS
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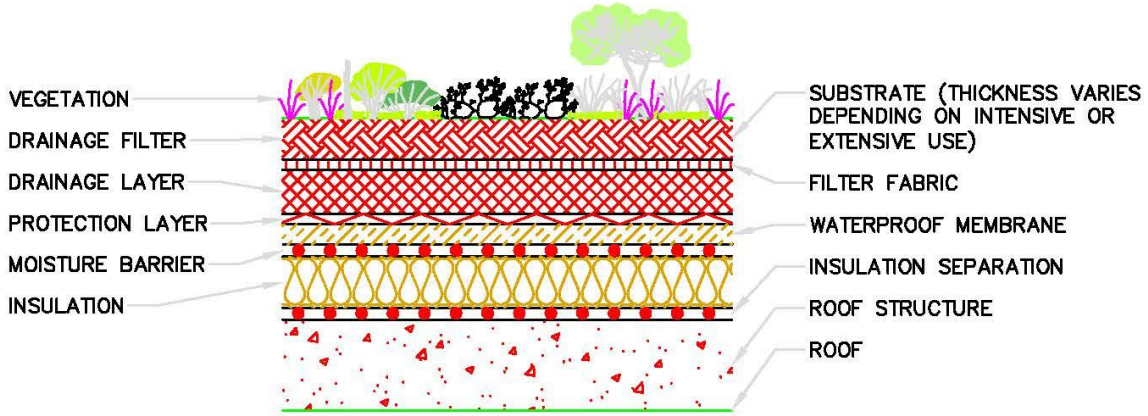


GROWING MEDIUM: THE VEGETATION SUPPORT COURSE SHOULD ACCOMMODATE A DENSE ROOT STOCK AND HAVE ALL THE PHYSICAL, CHEMICAL, AND BIOLOGICAL PROPERTIES NEEDED FOR PLANT GROWTH. AVAILABLE MATERIALS INCLUDE:

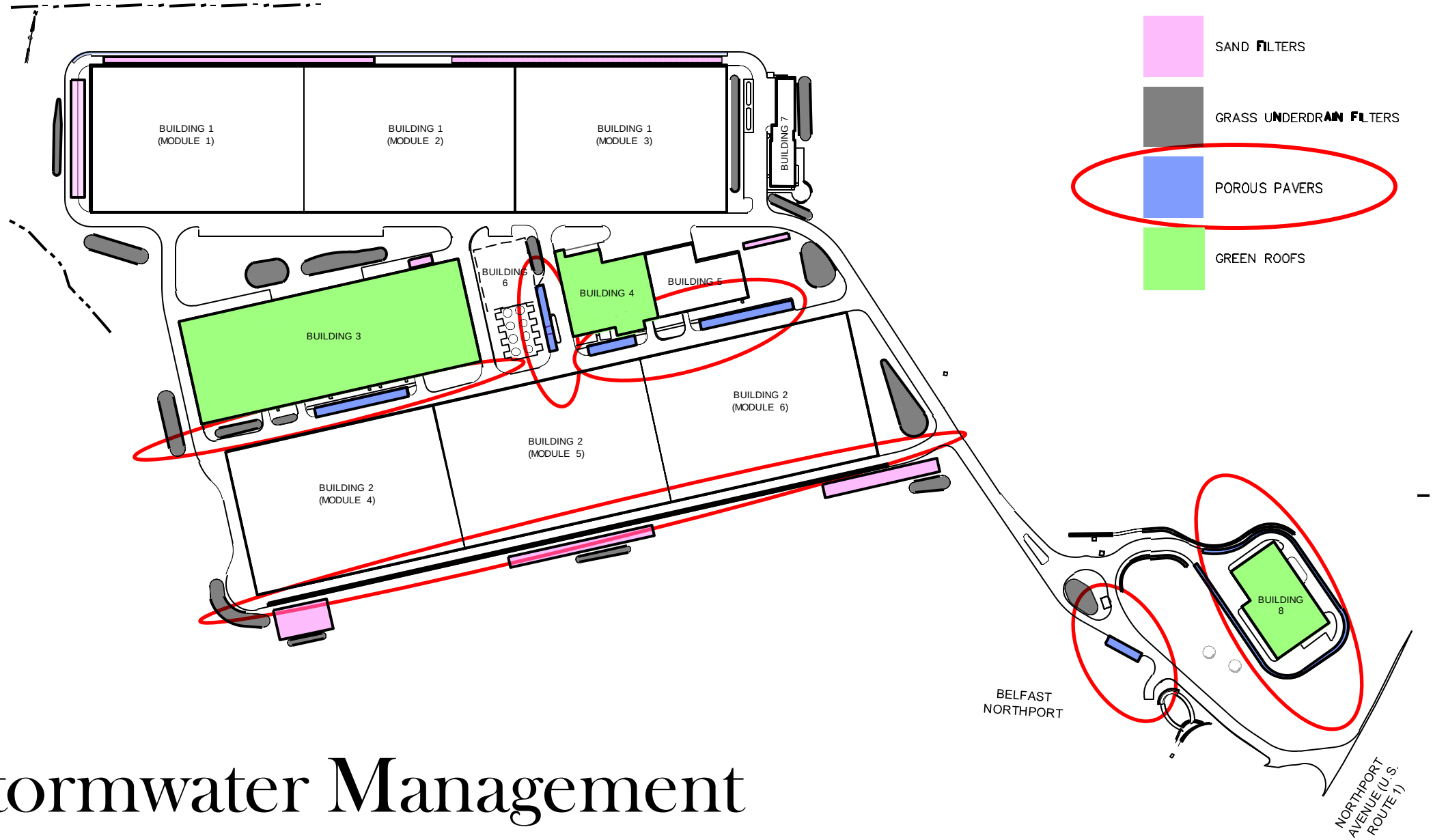
- SOIL MIXTURES – IMPROVED TOP AND UNDERLYING SOIL.
- AGGREGATE MIXTURES – MINERAL AGGREGATE MIXTURES WITH HIGH OR LOW ORGANIC CONTENT OR WITH AN OPEN–PORE GRANULAR STRUCTURE WITH NO ORGANIC CONTENT.
- SUBSTRATE BOARDS – BOARDS MADE FROM MODIFIED FOAM MATERIALS OR MINERAL FIBERS.
- VEGETATION MATTING – MATTING WITH MINERAL/ORGANIC AGGREGATE MIXTURES. THE ORGANIC CONTENT OF THE VEGETATION SUPPORT COURSE SHOULD BE AS SHOWN ON TABLE 7.6.1.

TABLE 7.6.1 – GROWING MEDIUM

TYPE OF GREENING	SUBSTRATE DENSITY	ORGANIC CONTENT
INTENSIVE GREENING	<0.8 >0.8	<12% BY MASS <6% BY MASS
EXTENSIVE GREENING		
MULTIPLE–COURSE CONSTRUCTION	<0.8 >0.8	<8% BY MASS <6% BY MASS
SINGLE–COURSE CONSTRUCTION	N/A	<4% BY MASS

VEGETATED ROOF CROSS-SECTION

SCALE: N.T.S. SOURCE: MDEP LAST UPDATED: 05/2016



Stormwater Management

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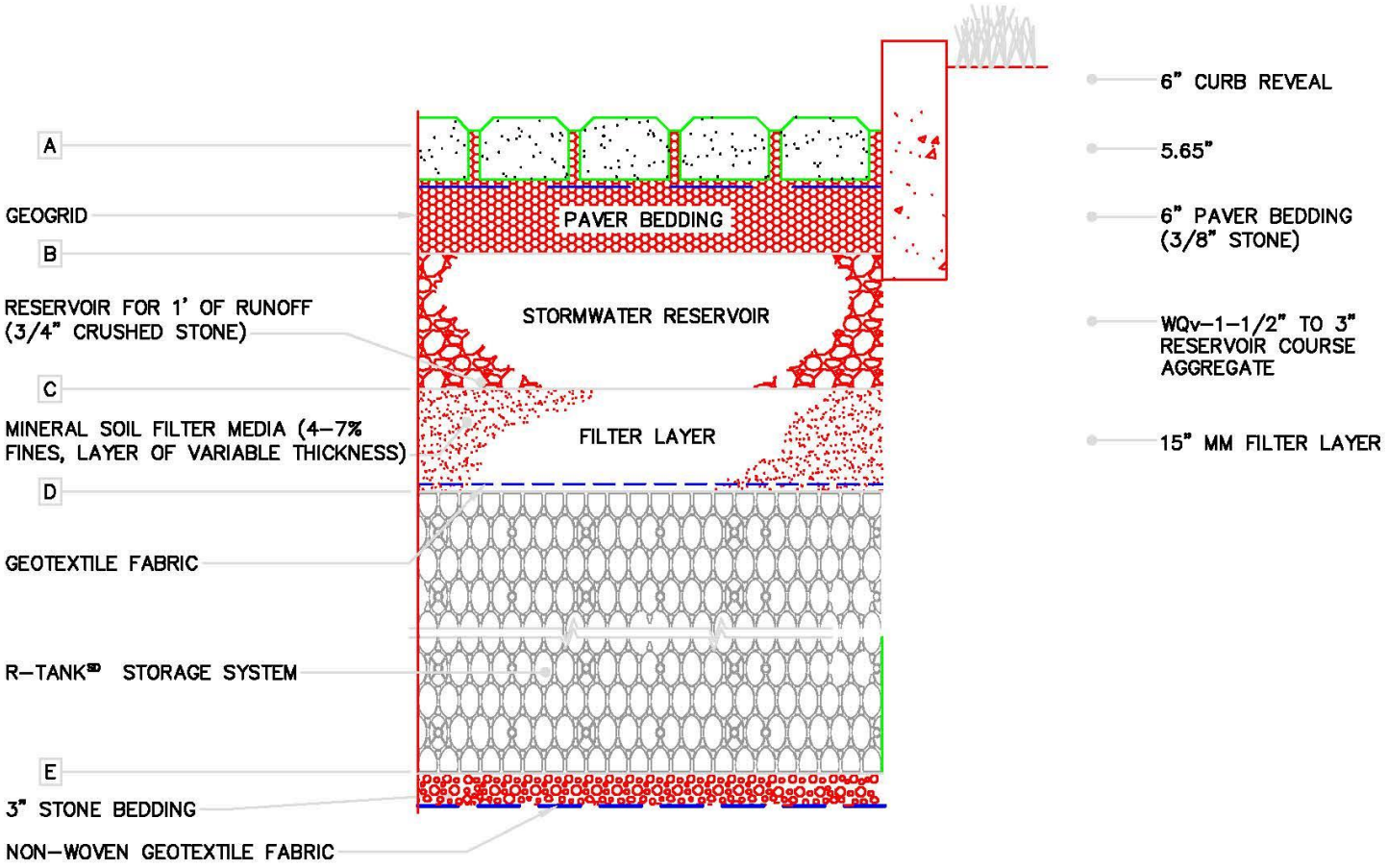

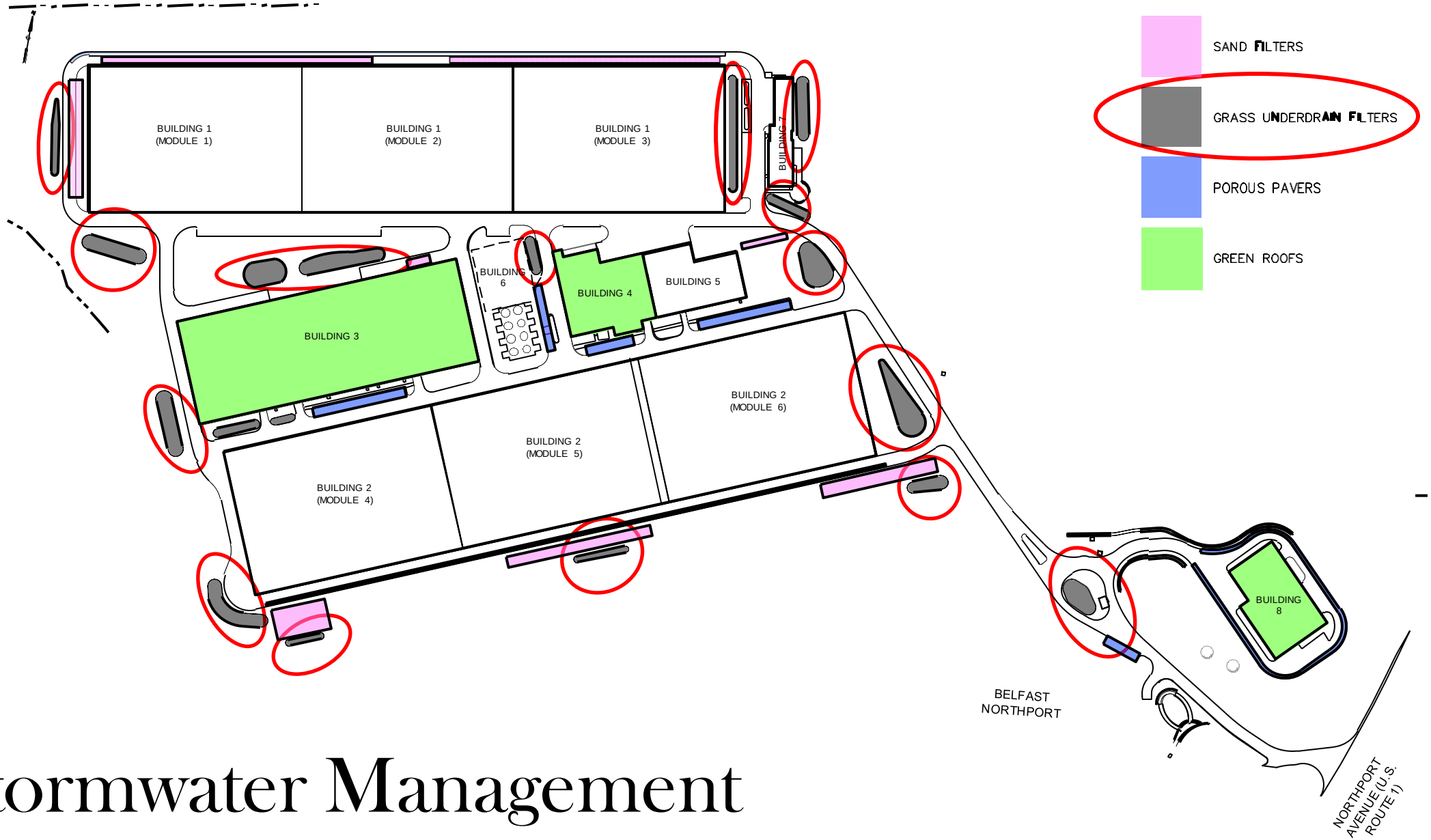

Stormwater Management

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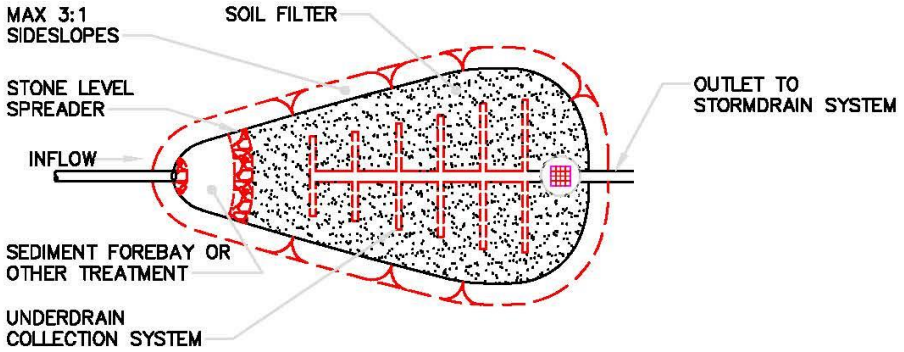

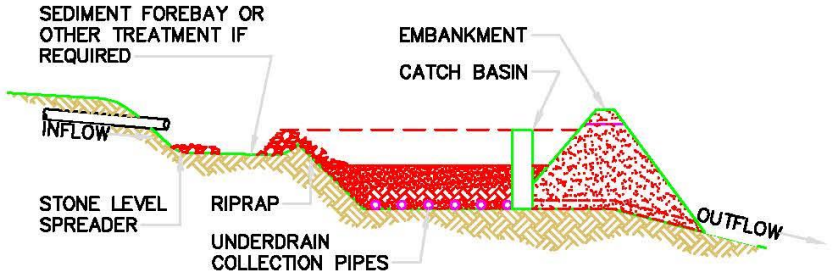

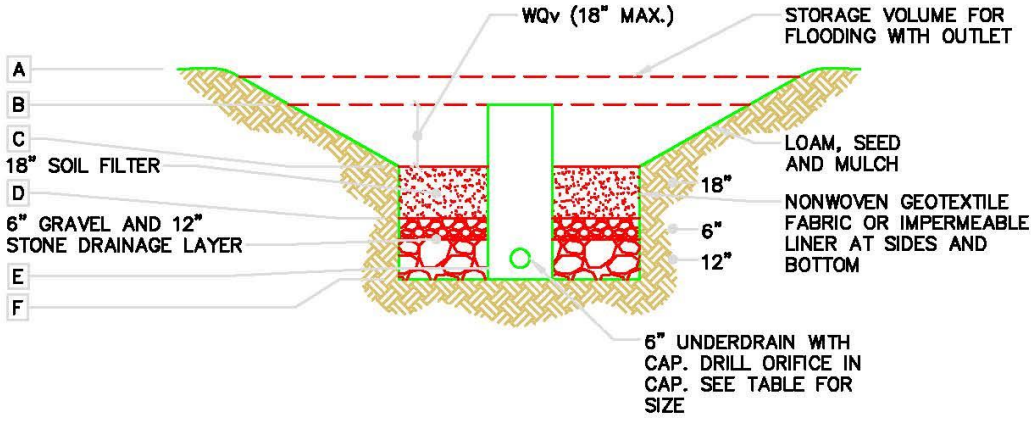

Stormwater Management

Chapter 90, Site Plan
Article I, In General
Section 90-42, Criteria for Review by Planning Board

(16) Stormwater. The proposed development will provide adequate stormwater management.

Nordic Aquafarms has submitted a Stormwater Management Report to the Maine Department of Environmental Protection for their review and has provided a contract for future inspection and maintenance services of Stormwater Systems.