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December 3, 2008

Northampton Conservation Commission
City Hall
212 Main Street
Northampton, MA 01060

RE: Notice of Intent
North Street Condominiums
Map 25C, Parcels 12 & 17

Dear Members of the Conservation Commission,

We are writing this letter outlining some mitigation options we hope to discuss with you at our hearing on December 11, with the intention of reducing the No-Encroachment Zone for our townhouse project from 35 feet from wetlands to 10 feet. We carefully sited all the townhouses, all parking, and all of the roadway except for 88 square feet, outside the 35-foot buffer. The reduction to 10 feet would apply to grading, yards for the units, detention and bioretention basins, drywells for infiltration, paths and retaining walls. Some of this reduction is within areas that are currently lawn.

The discretionary reduction is written into the City Code (Section 337-10(B)) in order "to encourage infill development, which is considered more sustainable under the principles of smart growth and generally has a smaller environmental footprint than development in outlying areas." Our North Street condominium project is a true infill project, providing an attractive residential option within easy walking distance of schools, jobs, retail establishments, restaurants and entertainment.

The standards given in Section 337-10(B) of the City Code for the reduction of the No-Encroachment Zone from 35 feet to 10 feet are "extraordinary mitigation, replication, restoration or open space preservation measures."

No work is being proposed in any wetland resource area, so replication is not applicable to this project. On-site open space preservation is not feasible due to the small size of the parcel.

Other measures that might be taken on site include:

Restoration: Removal of invasive plant species from the wetland and 100' Buffer Zone

Removal of trash and surface debris from the wetland. This would not include digging out historic fill, which would potentially cause more harm than good to the wetland.

Mitigation: Incorporation of Low Impact Development strategies. This project incorporates many LID strategies. For more specific information, see attachment.

Measures that might be taken off-site include:

Mitigation: Donate money for the construction of a wetland in the cul-de-sac island at the Industrial Park.

Open Space Preservation: Donate money for the purchase of Conservation Land or a Conservation Easement elsewhere in the City.

Donate land elsewhere in the City for conservation purposes.

We look forward to discussing our options for mitigating the impacts of development at our hearing next week.

Sincerely,

Douglas A. Kohl, President
Tofino Associates, Inc.
Northern Avenue Homes, Inc.

In order to mitigate the effects of development on the site, the North Street Condominium project incorporates many Low Impact Development strategies.

The following Low Impact Development Strategies and information is taken directly from the Massachusetts Low Impact Development Toolkit. Notes regarding the incorporation of the strategy into the project are provided in red.

LID Site Design

Reduce Site Coverage: In order to reduce site coverage but not square footage, site development layouts may include buildings clustered together, parking structures (instead of lots), or taller buildings with a smaller footprint relative to floor area.
The project clusters units into blocks of townhouses, 3-stories tall. The units themselves have a modest footprint and 10 out of 25 units have a reduced footprint, thereby reducing lot coverage.

Sensitive site landscaping: Ecological landscaping strategies seek to minimize the amount of lawn area and enhance the property with native, drought-resistant species; as a result, property owners use less water, pesticides, and fertilizers. The maintenance of vegetated buffers along waterways can also enhance the site and help protect water quality.

Back and side yards are minimal. We are willing to do some native plantings between the yards and the wetlands. The limit of work line leaves, at its closest point in the southwest corner of the site, 85 feet of undisturbed vegetation between the grading for the detention basin and the intermittent stream. In other areas, there is over 200 feet of undisturbed vegetation.

Create a Decentralized Stormwater System: The actual location of buildings and the alignment of roadways should be determined in conjunction with the design of the stormwater management system. The goal of this process is to minimize "directly connected impervious area"—those impervious areas that drain directly into a pipe-and-pond stormwater system. Designers should seek to maintain or create small sub-watersheds on the site and "micromanage" the runoff from these sub-watersheds in small decentralized structures, such as swales, bioretention areas, infiltration structures, and filter strips. Paved surfaces should be graded and crowned so that they form multiple "mini-watersheds;" the runoff from each small drainage area should to a different bioretention area, swale, or filter strip. Roof runoff should be sent to rain barrels, cisterns, dry wells, and vegetated areas via level spreaders.

There are 8 sub-watersheds proposed, and a variety of conveyance, treatment, and runoff reduction systems are used in appropriate areas: swales, curb cuts, a bioretention area, catch basins, a proprietary treatment chamber, infiltration trench, infiltration basin, and a detention basin. Dry wells are located adjacent to proposed buildings in order to infiltrate the roof area where possible.

Maximize the travel time for stormwater runoff: Conventional pipe systems increase the speed of stormwater runoff, resulting in bigger peak discharge rates (and therefore bigger ponds) at the end of the pipe. In contrast, LID seeks to increase the time of concentration (the average travel time for rainfall) through a variety of techniques: retain stormwater in small structures close to the source (described above), provide as much overland or sheet flow as possible, use open drainage systems, provide long travel paths, and use vegetation to increase surface roughness.

Where possible roof water is directed into either an adjacent (approx. 10 ft away) infiltration trench or dry well where it is retained and infiltrated before overflowing to either the wetland area or to a larger basin. The dry wells are designed to overflow to the grass yards (reducing time of concentration) toward the wetlands in a situation where the dry well's volume capacity is exceeded.

LID stormwater structures: Bioretention areas and infiltration trenches should be sized to treat the stormwater from frequent, low intensity storms for water quality and infiltrate it into the ground or slowly release it; they should not be expected to completely manage the peak discharge rate or volume from large storms. Volume and rate controls at the downstream end of the site may still be necessary, but much smaller as a result of LID site design, decentralized stormwater management, and long travel paths.

This is true in the stormwater design. The use of a bioretention area and infiltration trenches has reduced the size of the detention basins. Infiltration systems are proposed in all areas where groundwater levels permit infiltration. There are a total of 6 infiltration systems which help absorb runoff to the maximum extent possible rather than relying solely on the detention basin for runoff control (note that in the HydroCAD calculations, infiltration was not included in order to provide a more conservative runoff rate).

Roadways and Parking Areas

Roadway width: Excessively wide streets are the greatest source of impervious cover (and stormwater runoff) in most residential developments. Some local codes require streets up to 40 feet wide in subdivisions with only a dozen houses. These inappropriate standards result from blanket application of high volume/high speed road design criteria, overestimates of on-street parking demand, and the perception that wide streets result in faster emergency response times.

Narrower road sections and alternative road profiles can reduce stormwater runoff and mitigate its impacts, while still allowing safe travel, emergency vehicle access, and adequate parking. For most low-traffic roads, a 24' road width is sufficient to accommodate two way traffic, and even narrower widths should be used in very low traffic conditions (e.g., a six-lot subdivision.) The National Fire Protection Administration Uniform Fire Code (2003) recommends a minimum unobstructed width of just 20 feet, with the recognition that local authorities set lower standards if turnouts or alternate exits are available.

Two-way road widths are reduced to 20 feet, and a one-way loop through the project is used to reduce pavement width to 14 feet in front of units 8-13, and 12 feet at the existing R-O-W heading out of the development.

Roadway Profile: Curbs and gutters concentrate stormwater runoff and increase its velocity, impeding decentralized treatment and infiltration. LID strategies recommend open-section roadways flanked by filter strips and swales instead of curbs and gutters. These LID techniques, built on the model of "country drainage," help to filter roadway runoff, promote infiltration, and reduce runoff velocity, resulting in lower peak discharge rates. If properly designed, open section roadways will be no more prone to flooding than conventional roadway profiles. If curbs are deemed necessary to stabilize the roadway edge, the design can use invisible curbs (same level as the road surface), periodic curb cuts, or perforated curbs to allow stormwater to run off the roadway edge.

This strategy, the "country drainage model," is not suited to the site because of both land constraints and the urban nature of the project. It may be possible that some additional curb cuts can be added in certain locations to allow more water to sheetflow, or to flow through filter strips.

Roadway layout: The location and layout of roadways can also be modified to improve post-development hydrology. Roadways should be placed to avoid crossing steep slopes where significant cut and fill will be required. They should run parallel to contours on gentle slopes and perpendicular to contours on steeper slopes. Design of a roadway network may involve some give and take between reducing total roadway length and road layouts compatible with existing topography. On low-speed streets, clearing and grading should be limited to a small strip of land (5') on either side of the roadway and sidewalk.

The roadways follow the topography of the site. There are no extreme cuts and fills on the site.

Turnarounds and Cul-de-Sacs: Reducing the radius of a cul-de-sac from 40 feet to 30 feet yields a 45% reduction in paved surface (5,000 sq. ft versus 2,800 sq. ft.) A T-shaped hammerhead occupies even less space but still provides sufficient room for turning vehicles and fire trucks (though it may require a 3-point turn.) Depending on the length of the street, designers should consider a one-way loop road with parking on one side.

Turnarounds are minimally sized and make use of adjacent parking spaces instead of adding more pavement for a full hammerhead-type turnaround.

Parking Lots: Expansive parking lots that drain to just a few catch basins create large volumes and high velocities that require the use of pipe-and-pond stormwater techniques. The LID approach encourages designers to create multiple smaller parking lots separated by natural vegetation and bioretention areas. On hilly sites, the creation of multiple parking areas at different elevations can reduce the amount of grading necessary and preserve natural hydrology. Other strategies include reducing the total number of parking spaces and reducing the size of some parking spaces.

The project design minimizes the use of parking areas by providing garages and just enough space in the driveway to park a second car. There is minimal guest parking scattered throughout the site.

Bioretention

Bioretention is an important technique that uses soil, plants and microbes to treat stormwater before it is infiltrated or discharged. Bioretention "cells" are shallow depressions filled with sandy soil, topped with a thick layer of mulch, and planted with dense vegetation. Stormwater runoff flows into the cell and slowly percolates through the soil (which acts as a filter) and into the groundwater; some of the water is also taken up by the plants. Bioretention areas are usually designed to allow ponded water 6-8 inches deep, with an overflow outlet to prevent flooding during heavy storms. Where soils are tight or fast drainage is desired, designers may use a perforated underdrain, connected to the storm drain system. In very permeable soils, some bioretention areas can be designed as "off-line" treatment structures (no overflow necessary), but in most situations they will be an "on-line" component of the stormwater management system, connected to downstream treatment structures through an overflow outlet or an overflow drop inlet installed at the ponding depth and routed to the site's stormwater management system. Ideally, overflow outlets should be located as far as possible from runoff inlets to maximize residence time and treatment.

The project incorporates a bioretention area with suitable pretreatment (stone gutter and sod strip) in place of conventional stormwater treatment chambers. The bioretention basin is designed with an overflow outlet into the large detention basin.

Filter Strips

Grass filter strips are low-angle vegetated slopes designed to treat sheet flow runoff from adjacent impervious areas. Filter strips (also known as vegetated filter strips and grassed filters) function by slowing runoff velocities, filtering out sediment and other pollutants, and providing some infiltration into underlying soils. Because they use sheet flow and not channelized flow, filter strips are often more effective than swales at removing suspended solids and trash from runoff. They provide good "pretreatment" of stormwater that will then be routed to another technique such as a bioretention area. They cost significantly less than "hardscaped" stormwater infrastructure and also provide a convenient and effective area for snow storage and treatment.

The current proposed design includes a stone gutter and sod pretreatment system after the curb break located adjacent to the bioretention area, which utilizes a similar theory for runoff pretreatment as the vegetated filter strip.

Infiltration Trenches and Drywells

Infiltration trenches and dry wells are standard stormwater management structures that can play an important role in Low Impact Development site design. Dispersed around the site, these infiltration structures can recharge groundwater and help to maintain or restore the site's natural hydrology. This approach contrasts with conventional stormwater management strategies, which employ infiltration as a secondary strategy that occurs in large basins at the end of a pipe. Dry wells and infiltration trenches store water in the void space between crushed stone or gravel; the water slowly percolates downward into the subsoil. An overflow outlet is needed for runoff from large storms that cannot be fully infiltrated by the trench or dry well. Infiltration trenches do not have the aesthetic or water quality benefits of bioretention areas, but they may be useful techniques where bioretention cells are not feasible.

The project incorporates an infiltration trench behind units 14 and 15, as well as drywells to infiltrate roof runoff from most of the dwelling units, all of which include overflow outlets. The bioretention basin on site is utilized for water quality treatment.

Cisterns and Rain barrels

Cisterns and rain barrels are simple techniques to store rooftop runoff for reuse for landscaping and other nonpotable uses. They are based on the LID approach that treats rooftop runoff as a resource that should be reused or infiltrated. In contrast, conventional stormwater management strategies take rooftop runoff, which is often relatively free of pollutants, and send it into the stormwater treatment system along with runoff from paved areas.

The most common approach to roof runoff storage involves directing each downspout to a 55-gallon rain barrel. A hose is attached to a faucet at the bottom of the barrel and water is distributed by gravity pressure. A more sophisticated and effective technique is to route multiple downspouts to a partially or fully buried cistern with an electric pump for distribution. Where site designs permit, cisterns may be quite large, and shared by multiple households, achieving economies of scale. Stored rain water can be used for lawn irrigation, vegetable and flower gardens, houseplants, car washing, and cleaning windows. When rain barrels or cisterns are full, rooftop runoff should be directed to drywells, stormwater planters, or bioretention areas where it will be infiltrated.

A large underground cistern is not feasible due to groundwater. We are willing to entertain the idea of providing rain barrels to collect roof runoff, but ultimately it will be up to the individual unit owners whether they want to continue the practice over time. It might make more sense to infiltrate as much roof runoff as possible, as the plan does.