

HANCOCK ASSOCIATES

Limited Development of Regional Impact Application
for
Springhill Suites by Marriot
556 Main Street
Falmouth, MA



Prepared By:
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Prepared For:
Falmouth Hospitality, LLC

July 11, 2014

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1. Project Description

Introduction

Falmouth Hospitality, LLC proposes the redevelopment of an existing site at 556 Main Street in Falmouth, MA constructing a 110 room Springhill Suites by Marriot Hotel. The project is located in the Falmouth Business Redevelopment District and has been designed in compliance with Chapter 240-240 of the Falmouth Zoning Bylaw.

Hancock Associates and Vanasse & Associates, Inc. (VAI) has completed this report in support of an Application pursuant to Section 5 of the Cape Cod Commission Chapter A, *Enabling Regulations Governing Review of Developments of Regional Impact* (DRI), for a Limited DRI Review of a proposed extended stay hotel to be located at 556 Main Street (Route 28) in Falmouth, Massachusetts (the "Project"). The purpose of this preliminary report is to provide sufficient information to allow the Cape Cod Commission (the "Commission") to make a finding that the Project meets the requirements for Limited DRI review with respect to the required performance standards relative to those issues as identified in the 2009 *Cape Cod Regional Policy Plan* as amended the Commission believes are either satisfied herein or that are not applicable or in need of further study. The Applicant would endeavor to work with Commission to develop a full Developments of Regional Impact application to the Commission focused on the issues the Commission feels warrant further study .

Existing Conditions

The exiting site is comprised of several parcels acquired by the Fay Family starting in the 1940s (Assessor's 47B03-017A-004, 47B-02-005-001, 47B-03-017-002 and 47B-03-016).The site was bifurcated by Lantern Lane, a 40 foot wide private way created in 1947. The Falmouth Planning Board recently voted favorably to modify the original subdivision plan to eliminate a section of the Lantern Lane Right of Way from Main Street to the northern extent of the Fay property while maintaining an access and utility easement thus making the parcel a single parcel for development. The site is bounded to the south by Main Street, to the west by Pondview Park Commercial Condominiums, to the north by 3 Lantern Lane and 6 Lantern Lane, which are single family residential properties and to the west by lands of the Correia Family Trust, which is a retail center containing a Dunkin Donuts, Anytime Fitness, Hair Essentials and Stone's Barber Shop. The property is also bounded to the east by land of Harriet Dugan where Dugan Real Estate resides.

The 2.03 acre site itself is fully developed consisting of commercial and accessory buildings, compacted gravel parking and material storage areas. A triangular section of the site in the north abutting Lantern Lane and the home at 6 Lantern Lane is vegetated with grass and some trees. Elevations on-site range from elevation 10 at a depression in Lantern Lane to 18 at the northern corner. Four buildings exist on site with a total floor area of 19,000 square feet. The main building is a two story gambrel wood framed building built in the 1940s and features storefront windows on the street level with six dormered windows facing Main Street. The building also features a one story showroom building on lantern Lane and a two story "L" wing off the northwest corner of the main structure. This building has been expanded over the years and connected to a one story masonry block building in the back serving as a warehouse with loading dock doors. Additional accessory building include a 400 square foot one story concrete block garage, a 5,000 square foot, one story concrete block building and a 120 square foot shed. The buildings on site are currently being utilized by several commercial entities including; Fay's Gallery Antique Co-op, Clover Landscaping contractor's yard and Pristine Spring, a self-serve water dispensary that occupies the shed. The buildings are in varied states of disrepair and could be classified as a general blight on the area streetscape. The site is located 1500 to the east of the Falmouth Village Historic District. While not in the district, the

area is considered part of Falmouth Center as evidenced by its inclusion in the Business Redevelopment (BR) Zoning District which runs east to 704 Main Street. The area is therefore considered an Economic Center as the Falmouth Zoning Bylaw the purpose of this article is to promote the revitalization of commercial centers. None of the buildings on site are listed on the Massachusetts Historical Commission's inventory or listed by the Town of Falmouth on their list of significant structures per the Town Clerk's Office.

Vehicular access to the site is currently provided via a 40 foot wide access easement (formerly a section of Lantern Lane) which runs from Main Street to the south and continues Lantern Lane to the north to a residential neighborhood abutting the property. The old section of Lantern Lane is in serious disrepair and experiences flooding during major rain events. The roadway drops from an elevation of 15 at Main Street to a catch basin a low point 200 feet from Main Street at an elevation of 10, then rises to an elevation of 17 near the homes at 3 and 6 Lantern Lane. This catch basin as well as one just to the north appear to be leaching basins with no outlet. Other utilities in the area include a 6" water main in Lantern Lane connected to a 10" main in Main Street, sewer services servicing just the commercial buildings on site and overhead electric which do pass through to the northern section of Lantern Lane. Sewer, drainage, water and overhead electric, cable and telephone utilities exist within Main Street and are available to the project.

Proposed Conditions

The proposal calls for the demolition of all structures on site except the dwelling at 3 Lantern Lane and redevelopment of the parcel constructing a Springhill Suites by Marriot hotel with associated parking, on site amenities and necessary infrastructure improvements.

The hotel will be divided into two buildings with a upper level connectors on the second and third levels and will have 110 guest rooms and a total of 65,000 square foot floor area. The building has been designed in keeping with the Town Falmouth design principles with regard to redevelopment fostering pedestrian-friendly streetscapes by providing sheltered, rear and side yard parking, and allowing shared parking between businesses and uses. The project also takes advantage of the districts relaxed front and side yard setbacks to encourage sidewalk development and pedestrian-friendly buildings offering street side gathering places in front of redeveloped property, rather than front yard parking fields. The Project meets the Cape Cod Commission's Regional Policy Plan's preference for locating new development and redevelopment in existing village centers, economic centers, or concentrated development areas because of the efficiencies of providing infrastructure in more densely developed areas and because it supports the regional development pattern of dense village centers and outlying rural areas. The Commission's design manual supports this pattern in its opening pages, stating: "Locate new development in or immediately adjacent to town, village, and growth centers to reinforce such centers and to preserve surrounding rural areas."

The architectural design has also kept the town and Cape Cod Commission's directives. The design addresses the street and to maintain established setback patterns, consistent with traditional village design. Although a street-oriented entrance is not possible given the need for vehicle access for check-in, a faux entrance is included on Main Street with principal windows on the street elevation to reinforce the building's primary relationship to the street. Windows, second floor decks and multiple articulated roof lines and architectural detailing on all street-facing elevations as well as pedestrian amenities have been included. The form and scale of the buildings should be consistent with their surroundings and should incorporate pedestrian-scaled amenities such as porches and stoops and doors and windows that are consistent with the pedestrian nature of the building.

Associated site improvements will include paved parking, driveway, recreation, and pedestrian areas, landscaped areas, utilities, and a stormwater management system. Vehicular access to the project site will be provided via a driveway located in approximately the same location as the abandoned portion of Lantern Lane. The driveway will provide an entrance and exit onto Main Street as well as a connection to the remaining portion of Lantern Lane. Parking areas will be provided on surface lots under the eastern building, along the driveway, in the northern portion of the site partially under the western building; additional needed parking is provided in a grass-paver, gated parking lot located off-site on a nearby property within 300 feet of the hotel lobby entrance as allowed by Falmouth By-laws.

New sanitary sewer, gas, and domestic and fire protection water services will be provided for each of the proposed buildings. The services will connect to the existing sewer, gas, and water mains in Main Street. The proposed stormwater management system has been designed in accordance with the Standards described in the Massachusetts Stormwater Handbook. It will include subsurface stormwater storage and treatment systems.

2. Limited DRI Review Scoping Checklist

- Checklist
- Narrative on Responses in Shaded Boxes

**LIMITED DRI REVIEW - SCOPING CHECKLIST
REDEVELOPMENT/CHANGE OF USE**

Land Use	Question	Required Info	Yes	No
Compact Growth and Resource Protection	Is the project consistent with the land use categories and their characteristics? (check "Yes" if Town has not adopted a Land Use Vision Map)	RPP Regional Land Use Vision Map which shows project site	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Compact Growth and Resource Protection	Is the development clustered on the site?	Preliminary project plans, Local zoning	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Capital Facilities and Infrastructure	Does the project create new infrastructure?	Preliminary project plans	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Capital Facilities and Infrastructure	Does the project propose to construct a new wireless facility?	Preliminary project plans	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Rural Lands	Is the project site adjacent to rural landscapes or land under active agricultural production?	Staff consultation/Preliminary project plans showing prime agricultural lands	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Rural Lands	Is the land capable of sustained agricultural production as evidenced by recent use, soils, or adjacent land use?	Staff consultation/Preliminary project plans showing prime agricultural lands	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Water Resources	Question	Required Info	Yes	No
Drinking Water Quality and Quantity, Marine Water Embayments and Estuaries, Freshwater Ponds and Lakes	Is the project located in a Wellhead Protection Area, Potential Public Water Supply Area, Marine Water Recharge Area, or Fresh Water Recharge Area?	Site locus map showing watersheds described by Water Resources Classifications Maps I & II	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Public and Private Sewage Treatment Facilities	Is the project's wastewater facility an on-site septic system or private treatment plant?	Preliminary project plans	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Water Quality Improvement Areas, General Aquifer Protection	Is there a net increase in nitrogen load from wastewater, stormwater and turf on-site and does the project's nitrogen load from wastewater, stormwater and turf exceed 5 parts per million?	Nitrogen loading calculations (Technical Bulletin 91-001) comparing existing system design / site development and proposed system design / site development	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Stormwater Management	Does the project substantially improve stormwater management by incorporating Low Impact Design to the greatest extent possible?	Engineered grading, drainage, and erosion control plans that show existing and proposed conditions and stormwater design details	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Stormwater Management	Does the project have a comprehensive engineer-certified Operations and Maintenance Plan (Plan) that 1) demonstrates compliance with the Massachusetts Stormwater Policy & Guidelines 2) provides a schedule for inspection, monitoring and maintenance 3) identifies the parties responsible for Plan implementation and 4) includes an inspection and maintenance log	Copy of project's Stormwater Operation and Maintenance Plan	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Coastal Resources	Question	Required Info	Yes	No
Protecting Maritime Industry, Character and Public Access	Does the project involve a conversion or loss of an existing water-dependent use, any marine infrastructure, or an existing legal public access to the coast?	Preliminary project plans	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Protecting Maritime Industry, Character and Public Access	Does the project limit views of the ocean and/or shoreline from public ways, waterways, access points, and existing development relative to existing conditions?	Preliminary project plans	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Coastal Hazard Mitigation	Does the project involve any expansion or new site disturbance in, or within 100 feet of: land subject to coastal storm flowage, barrier beach, coastal dune, or coastal bank?	Preliminary project plans indicating flood zone boundary, and Resource Area Delineation through local Conservation Commission	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Coastal Hazard Mitigation	Is the project located in land subject to coastal storm flowage, coastal beach, bank, dune or barrier beach?	Resource Area Delineation through local Conservation Commission	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Preserving Coastal Water Quality and Habitat	Does the project involve any alteration of a coastal wetland or its 100 foot buffer zone?	Resource Area Delineation through local Conservation Commission	<input type="checkbox"/>	<input checked="" type="checkbox"/>

***Responses in the shaded boxes may be included in the scope of CCC review.
Consultation with CCC staff recommended.***

**LIMITED DRI REVIEW - SCOPING CHECKLIST
REDEVELOPMENT/CHANGE OF USE**

Wetlands/Wildlife & Plant Habitat		Question	Required Info	Yes	No
Wetlands	Does the project involve any alteration of a wetland that is greater than 500 square feet in size?	Resource Area Delineation through local Conservation Commission	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Wetlands	Does the project involve any alteration of a 100 foot buffer to a wetland that is greater than 500 square feet in size?	Resource Area Delineation through local Conservation Commission	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Wetlands	Does the project involve any alteration of a 350 foot buffer to a vernal pool?	Resource Area Delineation through local Conservation Commission	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Wetlands	Will the project result in any new or additional direct stormwater discharge into a wetland or waterbody that is greater than 500 square feet in size?	Preliminary project plans	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Wildlife & Plant Habitat	Will the project disturb or alter naturally vegetated areas?	Existing conditions plan	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Wildlife & Plant Habitat	Is the project site mapped as Estimated or Priority rare species habitat by the Massachusetts Natural Heritage & Endangered Species Program (NHESP)?	NHESP Atlas	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Open Space Protection & Recreation		Question	Required Info	Yes	No
Open Space Protection & Recreation	Will the project disturb or alter a Significant Natural Resource Area (SNRA)?	SNRA map and preliminary project plans	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Open Space Protection & Recreation	Will the project disturb or alter more than 2 acres of land outside a Significant Natural Resource Area?	SNRA map and preliminary project plans	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Energy		Question	Required Info	Yes	No
Energy	Has the project been designed to meet LEED Certification?	Design information or LEED Certification Checklist	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Energy	Is the project Mixed Use as defined by the Regional Policy Plan?	Project description, RPP definition of Mixed Use	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Energy	Is the project located in an Economic Center? (check "No" if Town has not adopted a Land Use Vision Map)	RPP Regional Land Use Vision Map which shows project site	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Economic Development		Question	Required Info	Yes	No
Low Impact and Compatible Development	Is the project located outside an Economic Center or an Industrial Trade Area? (Check "Yes" if Town has not adopted a Land Use Vision Map)	RPP Regional Land Use Vision Map which shows project site	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Low Impact and Compatible Development	If located in an Industrial Trade Area, will this project accommodate non-industrial uses as defined in the Regional Policy Plan? (Check "Yes" if Town has not adopted a Land Use Vision Map)	Statement from Applicant	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Low Impact and Compatible Development	Is the project located in a resource-based economically productive area?	Existing Conditions Plan, Assessors Data	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Balanced Economy	Does the development involve class III gaming?	Preliminary project plans	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Infrastructure Capacity	Will the project develop new infrastructure as defined in the Regional Policy Plan?	Preliminary project plans	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Affordable Housing		Question	Required Info	Yes	No
Affordable Housing (Residential Projects)	Does the project include 10 or more units/lots in a Town that has an affordable housing bylaw under which this project will be permitted?	Project affordable housing narrative, Local affordable housing bylaw	<input type="checkbox"/>	<input type="checkbox"/>	
Equal Opportunity	Does the project include 10 or more units/lots in a Town that has an affordable housing bylaw under which this project will be permitted?	Project affordable housing narrative, Local affordable housing bylaw	<input type="checkbox"/>	<input type="checkbox"/>	
Community Participation (Commercial Projects)	Does the redevelopment project involve additional commercial development?	Preliminary project plans	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Community Participation (Commercial Projects)	Does the change of use project require more mitigation than the credits received for the existing use?	MPS AH3.1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

N/A - the project is not a residential project.

**Responses in the shaded boxes may be included in the scope of CCC review.
Consultation with CCC staff recommended.**

**LIMITED DRI REVIEW - SCOPING CHECKLIST
REDEVELOPMENT/CHANGE OF USE**

Transportation		Question	Required Info	Yes	No
Congestion Management	Will the project generate more than 250 new daily trips?	ITE Trip Generation manual	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Transportation Balance and Efficiency	Will the project generate more than 250 new daily trips?	ITE Trip Generation manual	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Safety	Does the project have direct access on or does the project directly abut a regional roadway?	Cape Cod Metropolitan Planning Organization functional classification	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Safety	Will the project generate more than 25 new peak hour trips at a high crash location?	State / Local crash data	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Heritage Preservation & Community Character		Question	Required Info	Yes	No
Historic Structures / Cultural and Archaeological Resources	Is the building and/or site listed on the National Register of Historic Places or within a National or Local Historic District?	Historic District map	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Historic Structures / Cultural and Archaeological Resources	Is any part of the site known to be archaeologically significant or archaeologically sensitive, including areas within 100 feet of a wetland or waterbody?	Massachusetts Historical Commission consultation, Resource Area Delineation through local Conservation Commission	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Historic Structures / Cultural and Archaeological Resources	Is there a building or structure on the property, which is more than 75 years old or known to be historically significant?	Local Historical Commission / staff consultation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Site and Building Design	Is the redevelopment proposed within a distinctive area, such as a historic district, along a scenic road, cultural landscape, regional road or shoreline?	Staff consultation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Site and Building Design	Outside of distinctive areas, does the project consist of a single mass greater than 50,000 square feet?	Preliminary project plans	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Site and Building Design	Does the project incorporate site design and building design features consistent with the Commission's design manual and design manual addendum guidelines?	Staff consultation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Landscape Design	Is the project subject to habitat restoration requirements resulting from on or off-site disturbance of significant wildlife and plant habitat?	SNRA map, Preliminary project plans	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Landscape Design	Does the landscape design utilize appropriate, non-invasive plantings to reduce water use and maintenance needs, and is it consistent with existing landscape design features?	Preliminary landscape plans	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Exterior Lighting Design	Is the project's exterior lighting design consistent with MPS HPCC2.11 and the Exterior Lighting Technical Bulletin and with the existing exterior lighting design?	Exterior lighting information including fixture cut sheets and foot-candle plans	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Hazardous Materials & Waste		Question	Required Info	Yes	No
Hazardous Materials and Waste Management	Does the project involve a net increase in hazardous materials or hazardous wastes in an existing Wellhead Protection Area or a Potential Public Water Supply Area?	Project inventory, RPP map	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Hazardous Materials and Waste Management	Does the project use, handle, generate, treat or store hazardous waste?	Project inventory	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Solid Waste	Does the project involve a significant amount of land clearing wastes or construction and demolition debris?	Estimate of amounts of land clearing and construction/demo wastes, Plan to address recycling and disposal of wastes	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Solid Waste	Does the project involve greater than 25,000 square feet of new development?	Preliminary project plans	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Local Concerns		Question	Required Info	Yes	No
Town Concerns	Has the Town identified issues or concerns that should be addressed through DRI review?		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Public Concerns	Has the public identified issues or concerns?		<input type="checkbox"/>	<input checked="" type="checkbox"/>	

**Responses in the shaded boxes may be included in the scope of CCC review.
Consultation with CCC staff recommended.**

Narrative on Responses in Shaded and Key Boxes

Land Use

Compact Growth and Resource Management: *Is the development clustered on the site?*

Response: The proposed project will be a hotel divided into two buildings. The two buildings will be connected on the upper levels. The hotel needs to be separated into two buildings due to the location of the site driveway which will be in the space currently occupied by a portion of Lantern Lane which will be abandoned. The driveway will connect to Main Street and to the remaining portion of Lantern Lane. While the project will include two buildings, a traditional cluster development does not apply since this project will be one lot the buildings are interconnected.

Energy

Energy: *Has the project been designed to meet LEED Certification?*

Response: The project intends to be a LEED certified project but has not been analyzed in consideration to the LEED credits. This includes significant improvements to the stormwater management system, use of low impact development site techniques such as drought-tolerant native plants and porous pavement material, energy efficient HVAC and appliances, low-flow plumbing fixtures, and locally-sourced, recycled construction materials.

Energy: *Is the project Mixed Use as defined by the Regional Policy Plan?*

Response: The project is not Mixed Use.

Energy: *Is the project located outside an Economic Center? (Check "No" if Town has not adopted a Land Use Vision Map.)*

Response: The project is located in Falmouth which has not adopted a Land Use Vision Map. The project is located on Main Street in Falmouth and is in the Business Redevelopment district. The purpose of this district is to promote downtown-type economic development and extend Falmouth's downtown area. This area has the characteristics of an Economic Center and the proposed development is in keeping with the goals of the Business Redevelopment district.

Economic Development

Low Impact and Compatible Development: *Is the project located outside an Economic Center or an Industrial Trade Area? (Check "Yes" if Town has not adopted a Land Use Vision Map.)*

Response: The project is located in Falmouth which has not adopted a Land Use Vision Map. The project is located on Main Street in Falmouth and is in the Business Redevelopment district. The purpose of this district is to promote downtown-type economic development and extend Falmouth's downtown area. This area has the characteristics of an Economic Center and the proposed development is in keeping with the goals of the Business Redevelopment district.

Low Impact and Compatible Development: *Is the project located in an Industrial Trade Area? (Check "Yes" if Town has not adopted a Land Use Vision Map.)*

Response: The project is located in Falmouth which has not adopted a Land Use Vision Map. The project is located on Main Street in Falmouth and is in the Business Redevelopment district as described above. This district, as it currently exists and as it is intended to exist in the future is not an Industrial Trade Area.

Affordable Housing

Community Participation (Commercial Projects): *Does the change of use project require more mitigation than the credits received for the existing use?*

Response: See Section 9 of this report for discussion.

Transportation

The following summarizes the guidance provided in the *Limited DRI Review Scoping Checklist* relative to Transportation as this guidance relates to the Project.

Congestion Management

Guidance: Will the Project generate more than 250 new daily trips?

Response: No. The Project is expected to generate 160 new daily vehicle trips on an average weekday and 202 new vehicle trips on a Saturday when compared to the existing uses that occupy the Project site.

Transportation Balance and Efficiency

Guidance: Will the Project generate more than 250 new daily trips?

Response: No. The Project is expected to generate 160 new daily vehicle trips on an average weekday and 202 new vehicle trips on a Saturday when compared to the existing uses that occupy the Project site.

Safety

Guidance: Does the Project have direct access on or does the Project directly abut a regional roadway?

Response: Yes. The Project site has direct access to and directly abuts Main Street (Route 28), a regional roadway under the jurisdiction of the Town of Falmouth.

Safety

Guidance: Will the Project generate more than 25 new peak hour trips at a high crash location?

Response: No. The Project is predicted to generate 13 new vehicle trips during the Saturday midday peak-hour (traffic volume hour with the highest predicted traffic volume increase).

See also Section 10 of this report

Hazardous Materials and Waste

Solid Waste: *Does the project involve greater than 25,000 square feet of new development?*

Response: *Section 12 of this report*

3. Massachusetts Historical Commission Notification Form

950 CMR: OFFICE OF THE SECRETARY OF THE COMMONWEALTH

APPENDIX A

MASSACHUSETTS HISTORICAL COMMISSION
220 MORRISSEY BOULEVARD
BOSTON, MASS. 02125
617-727-8470, FAX: 617-727-5128

PROJECT NOTIFICATION FORM

Project Name: 556 Main Street

Location / Address: 556 Main Street

City / Town: Falmouth

Project Proponent

Name: Falmouth Hospitality, LLC

Address: 2 Lan Drive

City/Town/Zip/Telephone: Westford, MA 01886, 978-692-9450

Agency license or funding for the project (list all licenses, permits, approvals, grants or other entitlements being sought from state and federal agencies).

Agency Name

Falmouth Planning Board
Cape Cod Commission

Type of License or funding (specify)

Site Plan Review
Limited Development of Regional Impact

Project Description (narrative):

Falmouth Hospitality, LLC proposes to construct a hotel at 556 Main Street in Falmouth, MA. The hotel will be divided into two buildings with an upper level connector. Associated site improvements will include paved parking, driveway, recreation, and pedestrian areas, a grass paver parking area, landscaped areas, utilities, and a stormwater management system.

Does the project include demolition? If so, specify nature of demolition and describe the building(s) which are proposed for demolition.

The project will include demolition of all existing buildings on the property. This includes wood and concrete commercial buildings and accessory buildings.

and describe the building(s) which are proposed for rehabilitation.

Does the project include new construction? If so, describe (attach plans and elevations if necessary).

The project site will be redeveloped and will include two new wooden buildings that will be a hotel. They will be connected at the upper levels.

950 CMR: OFFICE OF THE SECRETARY OF THE COMMONWEALTH

APPENDIX A (continued)

To the best of your knowledge, are any historic or archaeological properties known to exist within the project's area of potential impact? If so, specify.

No.

What is the total acreage of the project area?

Woodland _____	acres	Productive Resources:	
Wetland _____	acres	Agriculture _____	acres
Floodplain _____	acres	Forestry _____	acres
Open space _____	acres	Mining/Extraction _____	acres
Developed <u>1.93</u>	acres	Total Project Acreage <u>1.93</u>	acres

What is the acreage of the proposed new construction? 1.93 acres

What is the present land use of the project area?

In the existing conditions, the project area consists of commercial and accessory buildings, a gravel parking area, paved vehicular and pedestrian areas, landscaped and wooded areas, and associated utilities.

Please attach a copy of the section of the USGS quadrangle map which clearly marks the project location.

This Project Notification Form has been submitted to the MHC in compliance with 950 CMR 71.00.

Signature of Person submitting this form: Kathleen Cruz Date: 6/27/2014

Name: Katherine Cruz, Hancock Associates

Address: 185 Centre Street

City/Town/Zip: Danvers, MA 01923

Telephone: 978-777-3050

REGULATORY AUTHORITY

950 CMR 71.00: M.G.L. c. 9, §§ 26-27C as amended by St. 1988, c. 254.

4. Nitrogen Loading Analysis

Hancock Associates has calculated the existing and proposed nitrogen loading at the site and found the proposal will result in a reduction in the loading from 2.67 ppm to 2.5 ppm. Please refer to the calculations in Appendix 2 of this report, performed in accordance with Cape Cod Commission Technical Bulletin 91-001 dated April 1992.

5. Stormwater Management and Landscape Design

In the existing condition stormwater from the majority of the project area drains to a drainage structure located in the central portion of the site. This structure does not appear to have an outlet and ponding has been observed during major storm events. Stormwater runoff from the remaining portions of the site drain over-land to the property lines. Stormwater runoff from a portion of properties to the north and a portion of Lantern Lane drain onto the property. There is a catch basin in that area that is full of debris and therefore not functioning.

In the proposed condition the drainage system will consist of permeable pavement, hydrodynamic separators, and a subsurface stormwater storage system consisting of plastic R-Tanks manufactured by ACF Environmental that will be surrounded by crushed stone. Stormwater runoff from the majority of the driveway area and pedestrian areas surrounding the driveway will drain to a permeable pavement parking area and will be collected in a volume of crushed stone beneath the pavement. Overflow from this volume of stone will drain to the system of R-Tanks. Stormwater runoff from the remaining paved vehicular areas will also drain to the R-Tanks via a system of pipes and structures including hydrodynamic separators. Stormwater runoff from the roof areas will drain directly to the R-Tanks. Overflow from the R-Tank system will drain to the northeast property line. The system is designed to mitigate rates of stormwater runoff to at or below the existing condition rates for all stormwater events up to and including the 100-year storm. Stormwater runoff from all vehicular paved areas will be treated for at least 80% TSS removal. Stormwater runoff from small portions of the site will drain over-land to the drainage system in Main Street or the property lines.

The full DRI will include a full report demonstrating how the project substantially improves stormwater management by incorporating Low Impact Design to the greatest extent possible and presenting a comprehensive engineer-certified Operation and Maintenance Plan demonstrating compliance with the Massachusetts Stormwater Policy and Guidelines, providing for inspection, monitoring and maintenance, identifying parties responsible for Plan implementation and including an inspection and maintenance log.

Similarly, a full landscape design will be included that utilizes appropriate, non-invasive plantings to reduce water use and maintenance needs consistent with existing landscape design features in the downtown Falmouth area.

6. Open Space Provisions

OS1.3 Open Space Requirements: All development, excepting municipal projects serving municipal purposes, that qualifies as a DRI shall provide permanently restricted upland open space in accordance with the proportional calculation described below:

Total Development Area to Total Open Space Provided:

Proportion Required Location of Development

2:1 Development in Growth Incentive Zones/Economic Centers

1:2 Development in Significant Natural Resource Areas

1:1 Development in all other areas

For towns without designated Economic Centers, a DRI shall comply with the open space requirements based on its location relative to SNRA.

Calculation Based on Development Area:

A project's open space requirement is calculated in direct proportion to the project's development area. For the purposes of calculating the open space requirement, the development area for new development and redevelopment is any previously undisturbed upland area (including upland areas that are functioning as habitat) affected by "development" as defined in the Definitions section of this document. Additional guidance can be found in Guidelines for Calculation and Provision of Open Space in DRIs, Technical Bulletin 94-001, as amended.

Response:

The project is a redevelopment project that will realize 42% open space. The project is located in Falmouth which has not adopted a Land Use Vision Map and does not have mapped Growth Incentive Zones or Economic Centers. The project is however located on Main Street in Falmouth and is in the Business Redevelopment Zoning district. The purpose of this district is to promote downtown-type economic development and extend Falmouth's downtown area. This area has the characteristics of an Economic Center and the proposed development is in keeping with the goals of the Business Redevelopment district. Because of this, the proportion of 2:1 open space (33% open space) associated with Growth Incentive Zones and Economic Centers should be considered for the project. Since the project will have 42% open space, which is greater than the required 33%, the requirement is met.

OS1.8 Open Space Requirements and Parking Garages: As an incentive toward minimizing impervious areas, protecting open space, and maintaining or improving community character, projects meeting parking requirements under proposed buildings or as a multi-storied parking garage may reduce their open space requirement by an amount equivalent to the square footage of garaged parking. Open space credit as provided by this MPS may not be obtained for parking spaces provided in excess of the minimum number of spaces required by local zoning.

Response: The project does not provide more parking than is required by Falmouth Zoning. 121 parking spaces are required by Falmouth Zoning (1.1 per guest room). 86 spaces are provided on site with 65 spaces provided under the building (garage), 21 provided open air spaces and 35 spaces provided off-site within a grass-pave, gated parking lot located within 300 feet of the site as allowed by Falmouth Zoning By-law. The

garage spaces total approximately 19,000 SF of the parking areas, representing 20% of the site. The required open space is therefore reduced to 13%. Since the project will have 42% open space the development complies with the provisions of OS 1.8.

7. Energy Use

Information on the project's energy use in accordance with Technical Bulletin 09-002, *DRI Guidelines for Energy Compliance*, as amended.

The Applicant will cause an energy audit to be performed on the existing conditions and will attempt to incorporate recommendations from that audit into the project design in accordance with Minimum Performance Standard E1.1. Furthermore, the project shall be designed to earn Energy Star certification and to comply, where possible, with current ANSI/ASHRAE/IESNA Standard 90.1-2007, Section 5.4 or current prerequisite LEED certified standard. *See* Minimum Performance Standard E.1.2. and E1.3. Minimum Performance Standard E1.5 states that "development and redevelopment involving net new development shall provide a minimum of 10 percent of a building's electrical demand through on-site renewable energy generation." The standard further provides that the Commission "may waive this requirement if... [t]he project is LEED certifiable." The Applicant requests a waiver from E1.5 and states that the proposed project will be LEED certifiable.

8. Economic Impact

Project, employment, and economic impact information in accordance with Technical Bulletin 04-002, *DRI Economic Development Technical Bulletin*, as amended.

The proposed development will create temporary construction jobs as well as year round traveler accommodation jobs. The new, year round jobs will pay wages consistent with traveler accommodation wages for the area. Health benefits will be provided to the full time employees. It is estimated that the hotel will staff anywhere from 30 to 38 employees, including both full time and part time. The new hotel will directly benefit the area and it is expected that the majority of new employment positions will be filled locally as encouraged under ODRP 3.1.3. In addition, the Applicant will encourage the utilization of local contractors, workers and suppliers as recommended by ODRP 3.3.3. As a result, it is not anticipated that the development will have a meaningful impact on the need for affordable housing in the Falmouth Area. However, the Applicant has evaluated the affordable housing mitigation contribution for the project. More information regarding the same can be found in Section 7.

Although the hotel is not proposed within a certified Growth Activity Center or a Growth Incentive Zone, the project will be located on Main Street in Falmouth within a Business Redevelopment zoning district. The purpose of this zoning district is to promote downtown-type economic development and extend Falmouth's downtown area. Accordingly, this area has the characteristics of an Economic Center and will provide the same benefits to Falmouth as encouraged by the Regional Policy Plan MPS 3.2.1. The Applicant also believes the location meets the intent of ODRP 3.2.5 in that the infrastructure on Main Street in Falmouth is suitable for the project in question.

As referenced in the Existing Conditions narrative, there are currently four buildings located on the proposed project site. These buildings are presently utilized for commercial purposes and are all in a state of disrepair. ODRP 3.2.7 encourages redesign and revitalization of existing strip developments in situations where there is adequate infrastructure. This project will meet the intent of this recommendation by razing the existing, non-historic, buildings which have fallen into disrepair and replacing them with a brand new hotel designed to be in keeping with the character and nature of downtown Falmouth. The construction of a new hotel conveniently located in beautiful downtown Falmouth will also encourage increased tourism as recommended by ODRP 3.1.6. This increase in tourism will have a net economic benefit to local Cape Cod business, and in particular, to businesses located in Falmouth.

9. Affordable Housing Requirement

Information on how the project will satisfy the Regional Policy Plan's affordable housing requirements, and, where applicable, Technical Bulletin 09-001, *DRI Guidelines for Mitigation Credit and Reduction of Minimum Performance Standard AH3.2*, as amended and/or Technical Bulletin 10-001, *DRI Guidelines for Calculation of Mitigation for DRIs in "Other" Category for Minimum Performance Standard AH3.1*, as amended.

The proposed use falls into the "Other" category (AH 3.1). The Applicant has reviewed Technical Bulletin 10-001 and has calculated the amount of regional impact/affordable housing mitigation for development in the "Other" category. According to data provided by the Commercial Buildings Energy Consumption Survey from the U.S. Department of Energy, the project will generate one employee for every 2,074 square feet.¹ The Applicant currently estimates that the proposed building will be approximately 65,000 square feet. Therefore the expected number of employees will be 31.

In order to determine the percentage of employees that will earn less than the Average Wage, Technical Bulletin 10-001 requires the Applicant to refer to the U.S. Department of Labor's Bureau of Labor Statistics ("BLS"), National Industry-Specific Occupational Employment and Wage Estimates.² According to the BLS website, the National Average Wage for All Occupations as of May 2013 was \$22.33. Technical Bulletin 10-001 then requires the Applicant to determine the percentage of workers in the proposed industry that will earn less than the National Average Wage for All Occupations. This is done by reviewing the data provided by BLS under their National Industry Specific Occupational Employment and Wage Estimates. The proposed use, hotel, qualifies as a Traveler Accommodation (NAICS 721100). According to the estimates provided, Traveler Accommodations account for a total of 1,771,940 jobs nationwide³. Of those, approximately 1,626,310 jobs are estimated to pay below \$22.33 per hour. Accordingly, the total percentage of jobs within the Traveler Accommodation industry below the National Average Wage for All Occupations is expected to be 92%.

Per Technical Bulletin 10-001, the total number of jobs expected in connection with the project that will fall below the National Average Wage for All Occupations is 29.⁴ The Applicant is then directed to utilize that number to calculate the mitigation per square foot multiplier ("PSF"). As of March 2014, for all DRIs located outside of Economic Centers, the PSF for an "Other" category building is $\$5.11 \times (\# \text{ of jobs less than the average wage} / (\text{total square feet} / 1000))$ ⁵. Using that equation, the PSF for this project would be \$2.28. That number is then used to calculate the total proposed mitigation amount.⁶

$\$2.28 \times 65,000 = \$148,200.00$

However, MPS AH 3.2 allows the Commission to consider an alternative mitigation amount should the Applicant be able to provide "information satisfactory to the Commission that the development will result in a higher percentage of employees earning wages greater than the national average wage."⁷ Based on the Applicant's experience in the industry and data from other hotels operated by the Applicant, we expect that we will have approximately four (4) employees earning above the National Average Wage for All Occupations. Again, the Applicant's estimated number of employees is 31. Assuming four of those

¹ <http://www.eia.gov/consumption/commercial/data/2003/pdf/b1-b46.pdf> "Lodging" building type.

² www.bls.gov/oes/current/oesrci.htm

³ http://www.bls.gov/OES/Current/naics4_721100.htm

⁴ $31 \times .92 = 28.52$

⁵ $\$5.11(29/65) = \2.279

⁶ PSF x total square footage = mitigation amount.

⁷ There is no publicly available regional wage data provided in the Nexus Study or otherwise for a "hotel" use. Accordingly, technical bulletin #10-001 refers the Applicant to the Bureau of Labor Statistics, National Industry Specific Occupational Employment and Wage Estimates.

employees will be earning more than Average Wage for the industry, the percentage of employees earning below the Average Wage will be 27 employees or 87% of the total. To calculate the adjustment for mitigation based on our actual data versus the average data from BLS, Technical Bulletin #09-001 calls for the Applicant to calculate the percentage of reduction in below average wage jobs. In this instance, that percentage reduction is 7%.⁸ Accordingly, the PSF mitigation reduction is \$.16.⁹ The adjusted PSF is therefore \$2.12¹⁰. The revised mitigation amount would then be:

$$\mathbf{\$2.12 \times 65,000 = \$137,000.00}$$

In addition, the Applicant's proposal includes the redevelopment of 19,000 s.f. of existing commercial space. Accordingly, the Applicant is requesting credit for that redevelopment space. Therefore, the total square footage for calculating mitigation should be 46,000 s.f. The final affordable housing mitigation amount for this project is therefore:

$$\mathbf{\$2.12 \times 46,000 = \$97,520.00}$$

⁸ $29-27 = 2$; $2/29 = 7\%$.

⁹ $\$2.28 \times .07 = \$.16$.

¹⁰ $\$2.28 - \$.16 = \$2.12$.

10. Transportation

Vanasse & Associates, Inc. (VAI) has completed a preliminary Transportation Impact Assessment (TIA) in support of this Application pursuant to Section 5 of the Cape Cod Commission Chapter A, *Enabling Regulations Governing Review of Developments of Regional Impact* (DRI), for a Limited DRI Review of a proposed extended stay hotel to be located at 556 Main Street (Route 28) in Falmouth, Massachusetts (the “Project”). The purpose of this preliminary TIA is to provide sufficient information to allow the Cape Cod Commission (the “Commission”) to make a finding that the Project meets the requirements for Limited DRI review with respect to Transportation and the goals and performance standards relative to Transportation as identified in the 2009 *Cape Cod Regional Policy Plan* as amended. Assuming a favorable finding by the Commission in this regard, the Applicant would endeavor to work with Commission Transportation Staff with respect to the design of the Project site driveway and other such measures as deemed appropriate to: i) mitigate the projected impact of the Project on the regional roadway network serving the Project locus; and ii) afford safe and convenient access to the Project site for all roadway users.

Project Description

The Project will entail the redevelopment of an existing commercial property located at 556 Main Street (Route 28) in Falmouth, Massachusetts, to accommodate a 108-room extended stay hotel with 119 parking spaces (84 on-site and 35 off-site at 19 Nye Road). The Project site is generally bounded by residential properties to the north; Main Street to the south; and commercial properties to the east and west; and currently contains approximately 16,272 square feet (sf) of commercial/retail space (antique store and ancillary storage space) that will be removed to accommodate the redevelopment of the Project site. Figure 1 depicts the Project site location in relation to the existing roadway network.

Access to the Project site will be provided by way of Lantern Lane, a private way which bisects the Project site and intersects the north side of Main Street approximately 180 feet west of Nye Road. Lantern Lane will be reconstructed to accommodate the Project and will continue to provide access to the residential properties to the north of the Project site. Access to the off-site parking lot will be provided by way of a gated (key card activated) driveway that will intersect the west side of Nye Road approximately 190 feet south of Main Street. Marked crosswalks are provided at the Main Street/Nye Road intersection for hotel guests to cross Main Street between the Project site and the off-site parking lot.

Traffic Characteristics

The anticipated traffic characteristics of the Project were developed using trip-generation statistics published by the Institute of Transportation Engineers (ITE).¹¹ The ITE provides trip-generation information for various types of land uses developed as a result of scientific studies that have been conducted over the past 50 plus years. This information includes trip characteristics for uses similar to those that currently occupy the Project site, as well as for the proposed use. The traffic characteristics of the existing uses (antique store and ancillary storage space) were calculated using ITE Land Use Code (LUC) 826, *Specialty Retail Center*, and assuming 16,272 sf of space,¹² with those of the proposed use (extended stay hotel) calculated using LUC 310, *Hotel*, and following the guidance provided in the Cape Cod Commission Technical Bulletin 96-003.

¹¹*Trip Generation*, 9th Edition; Institute of Transportation Engineers; Washington, DC; 2012.

¹²ITE LUC 820, *Shopping Center*, was also reviewed for use in developing the traffic characteristics of the existing uses and was determined to result in similar or higher trip estimates.

Table 1 summarizes and compares the traffic characteristics of the current and proposed use of the Project site.

Table 1
566 MAIN STREET REDEVELOPMENT PROJECT
EXISTING AND PROPOSED TRAFFIC VOLUME COMPARISON

Time Period/Direction	Vehicle Trips		
	(A) Proposed Extended Stay Hotel (108 Rooms) ^a	(B) Existing Uses ^b	(C = A - B) Difference
<i>Average Weekday Daily:</i>			
Entering	441	361	
<u>Exiting</u>	<u>441</u>	<u>361</u>	
Total	882	722	+160
<i>Weekday Morning Peak-Hour of</i>			
<i>Generator:</i>			
Entering	32	53	
<u>Exiting</u>	<u>28</u>	<u>58</u>	
Total	60	111	-51
<i>Weekday Evening Peak-Hour of</i>			
<i>Generator:</i>			
Entering	38	46	
<u>Exiting</u>	<u>28</u>	<u>36</u>	
Total	66	82	-16
<i>Saturday Daily:</i>			
Entering	443	342	
<u>Exiting</u>	<u>443</u>	<u>342</u>	
Total	886	684	+202
<i>Saturday Midday Peak-Hour:</i>			
Entering	44	33	
<u>Exiting</u>	<u>35</u>	<u>33</u>	
Total	79	66	+13

^aBased on ITE LUC 310, *Hotel*; 108 rooms.

^bBased on ITE LUC 826, *Specialty Retail*; 16,272 sf.

As can be seen in Table 1, the redevelopment of the Project site as an extended stay hotel is expected to result in 160 additional vehicle trips on an average weekday (two-way, 24-hour volume) when compared to the projected traffic characteristics of the existing uses that occupy the Project site, with 51 fewer vehicle trips predicted during the weekday morning peak-hour and 16 fewer vehicle trips predicted during the weekday evening peak-hour. On a Saturday, the redevelopment of the Project site is expected to result in 202 additional vehicle trips, with 13 additional vehicle trips predicted during the Saturday midday peak-hour. The detailed trip-generation calculations that were attached to the May 20, 2014 scoping review letter prepared by Commission Transportation Staff are attached.

11. Exterior Lighting

Information on exterior lighting in accordance with Technical Bulletin 95-001, *DRI Guidance for Exterior Lighting Design*, as amended.

General Exterior Lighting Design Guidance (“GELDG”) standard 2.1 states that light sources should be either high pressure sodium or metal halide. However, the standard suggests that other sources may be considered by the Commission. The Applicant is proposing to utilize LED lighting. LED lighting has been found to be efficient and extremely versatile. LEDs are “directional” light sources that emit light in a specific direction, unlike incandescent and compact fluorescent bulbs which emit light, and heat, in all directions.¹³ Furthermore, LED lights have been demonstrated to be a better alternative than high pressure sodium in many instances for street and security lighting because of their efficiency, effectiveness and long lasting life.¹⁴ The Applicant suggests that LED lighting is a suitable alternative and requests that the Commission allow the use of the same for this project.

The Applicant will ensure that “Pole Mount” or “Wall Pack” luminaires are “Shoe box” type or decorative (with interior directional shields). *See* GELDG standard 2.2. The Applicant is not proposing any flood, area and/or up-lighting and will equip any wall pack luminaires with prismatic lenses. *See* GELDG standard 2.2. Though the Applicant will make all efforts to ensure that all luminaires on site will have a total cutoff of all light at less than 90 degrees from vertical, the Applicant requests a limited waiver for situations where pole or wall mounted fixtures utilize bulbs similar to what would be used in a residential setting and to allow for the use of LED lighting as requested above. *See* GELDG standard 2.3.

The Applicant will select reflectors of IES distribution in an effort to maximize efficiency. *See* GELDG 2.4. No light poles shall be in excess of 20’ (base + pole+head). Light poles for walkway lighting shall not be higher than 12’. Location of wall pack luminaires shall not exceed 20’. Landscape luminaires will not be more than 42’. Safety Accent Luminaires will be mounted not more than 36” from surface. *See* GELDG standard 2.5. In addition, all exterior lights, excepting “Landscape and Safety Accent Luminaires” per the standard, shall have a maximum initial horizontal foot-candle level of 8.0 foot candles. *See* GELDG standard 2.6.

The Applicant will provide the Technical Submittals per Technical Bulletin 95-001.

¹³ See http://www.energystar.gov/index.cfm?c=lighting.pr_what_are

¹⁴ See <http://www.al-e.com/led-vs-sodium-lamps>.
See also http://www1.eere.energy.gov/buildings/ssl/gatewaydemos_results.html.

12. Solid Waste and Hazardous Waste

Information on the types, amounts, methods of generation, use, storage, treatment, and disposal of solid wastes and/or hazardous materials and/or hazardous wastes.

Garbage will be routinely disposed of and temporarily stored in waste receptacles and/or outside dumpsters. Dumpsters shall be emptied weekly or more frequently as needed. Recyclables will be stored in approved containers and will be transferred to a single stream recycling facility as needed. During construction, construction debris will be separated and recycled. No hazardous materials other than ordinary household cleaning products will be stored on site. These cleaning products will be stored in closets, accessible only to employees, and away from guests and invitees. Furthermore, the site will be serviced by municipal sewer and water.

During construction a full construction recycling program will be required of the contractor.

Appendix 1. Required Plans (Full Size Plans Under Separate Cover)



JD LaGrasse & Associates, Inc.
 Architects, Engineers & Land Planners

One Elm Square T 978.470.3675 1420 Celebration Blvd.
 Andover, MA 01810 F 978.470.3670 Celebration, FL 34747
www.lagrassearchitects.com

Springhill Suites by Marriott
 Falmouth, MA

No.	Description	Date

Street Perspective 1		A1
Project number	2404	
Date	9 APRIL 2014	
Drawn by	DJM	
Checked by	JDL	Scale 12" = 1'-0"



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Springhill Suites by Marriott
 Falmouth, MA

No.	Description	Date

Street Perspective		
Project number	2404	A
Date	9 APRIL 2014	
Drawn by	DJM	
Checked by	JDL	
Scale		12" = 1'-0"



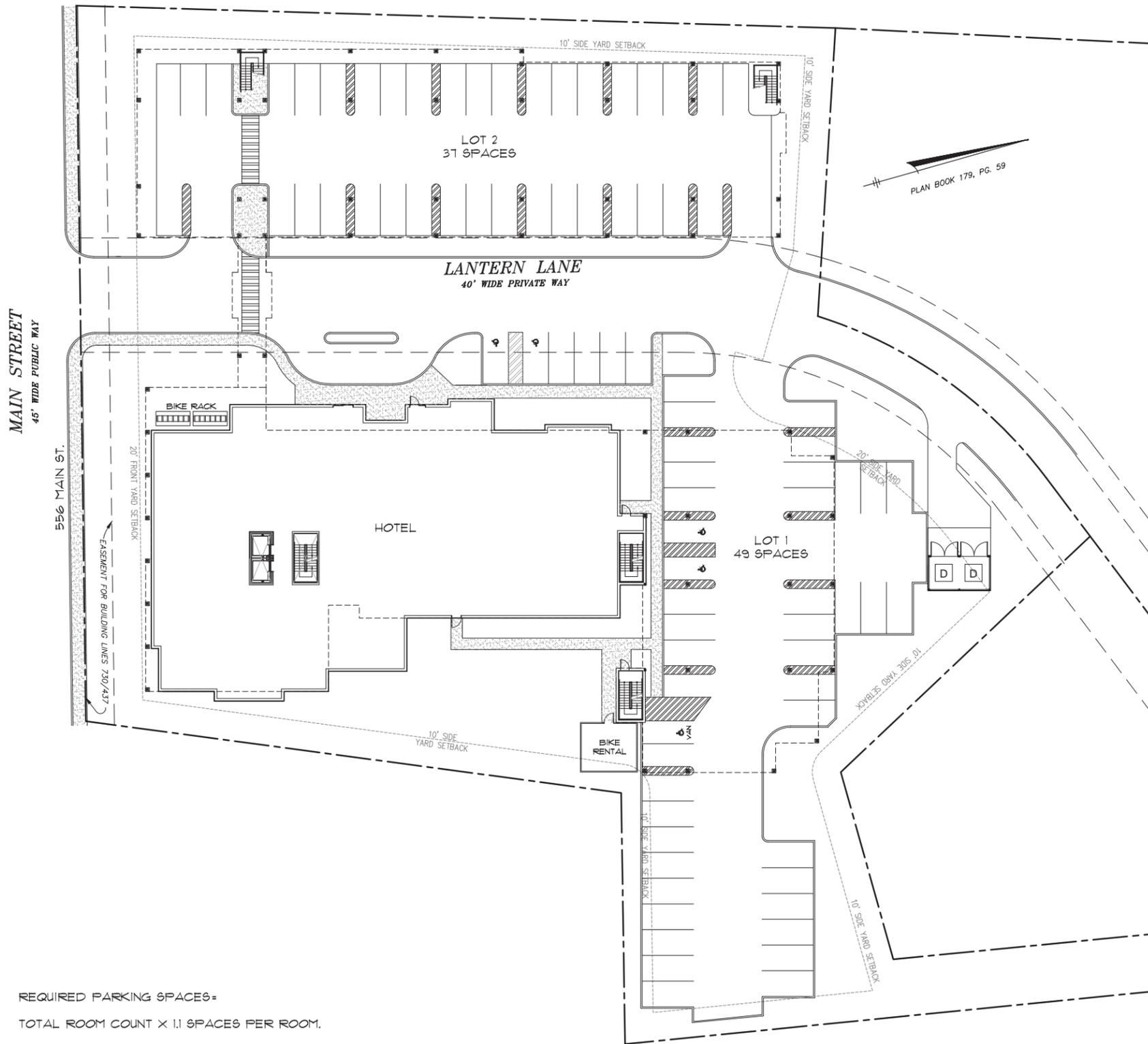
JD LaGrasse & Associates, Inc.
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 Andover, MA 01810 F 978.470.3670 Celebration, FL 34747
www.lagrassearchitects.com

Springhill Suites by Marriott
 Falmouth, MA

No.	Description	Date

Street elevation		A
Project number	2404	
Date	9 APRIL 2014	
Drawn by	DJM	
Checked by	JDL	Scale 1/16" = 1'-0"



REQUIRED PARKING SPACES =
 TOTAL ROOM COUNT X 1.1 SPACES PER ROOM.
 110 ROOMS X 1.1 SPACES PER ROOM = 121 SPACES

PARKING SPACES	
LOT 1	49 SPACES
LOT 2	37 SPACES
LOT 3 (OFF-SITE)	36 SPACES
TOTAL	122 SPACES

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Mark	Date	Revisions

Date: 30 MAY 2014
 Scale: N.T.S.
 Job No.: 2404
 Sheet No.:

MAIN STREET
45' WIDE PUBLIC WAY



Prepared for: Falmouth Hospitality, LLC
Location: 2 Lan Drive Westford, MA 01886

**MIDDLE LEVEL
FLOOR PLAN**

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Mark	Date
Revisions	
Date	30 MAY 2014
Scale	N.T.S.
Job No.	2404
Sheet No.	

MAIN STREET
45' WIDE PUBLIC WAY



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Mark	Date
Revisions	
Date	30 MAY 2014
Scale	N.T.S.
Job No.	2404
Sheet No.	A3

DIMENSIONAL REQUIREMENTS (EXISTING)

(PER SECTION 240-240. BUSINESS REDEVELOPMENT DISTRICT OF THE TOWN OF FALMOUTH ZONING BYLAW)

	REQUIRED	PROVIDED
LOT AREA	20,000 SQ. FT.	96,036 SQ. FT.
LOT WIDTH	125 FT.	128.63 FT.
MAX. LOT COVERAGE BY STRUCTURES, PAVING AND PARKING	60 %	65 %
MAX. LOT COVERAGE BY STRUCTURES	20 %	16.0 %
MAXIMUM BUILDING HEIGHT	35 FT.	2 STORIES FT.
FRONT YARD	20 FT.	15.1 FT.
SIDE YARD	10 FT.	2.6 FT.
REAR YARD	10 FT.	N/A FT.
FRONTAGE	100 FT.	250.18 FT.

DIMENSIONAL REQUIREMENTS (PROPOSED)

(PER SECTION 240-240. BUSINESS REDEVELOPMENT DISTRICT OF THE TOWN OF FALMOUTH ZONING BYLAW)

	REQUIRED	PROVIDED
LOT AREA	20,000 SQ. FT.	96,036 SQ. FT.
LOT WIDTH	125 FT.	128.63 FT.
MAX. LOT COVERAGE BY STRUCTURES, PAVING AND PARKING	60 %	58 %
MAX. LOT COVERAGE BY STRUCTURES	20 %	17 %
MAXIMUM BUILDING HEIGHT	35 FT.	2.5 STORIES*
FRONT YARD	20 FT.	21 FT.
SIDE YARD	10 FT.	12 FT.
REAR YARD	10 FT.	N/A FT.
FRONTAGE	100 FT.	250.18 FT.
PARKING	121 SPACES (110 HOTEL GUEST UNITS)	86 SPACES ON-SITE 35 SPACES OFF-SITE

*AREA OF UPPER LEVEL OF EAST BUILDING IS 1/2 OF THE AREA OF THE MIDDLE LEVEL OF THE EAST BUILDING.

ZONING

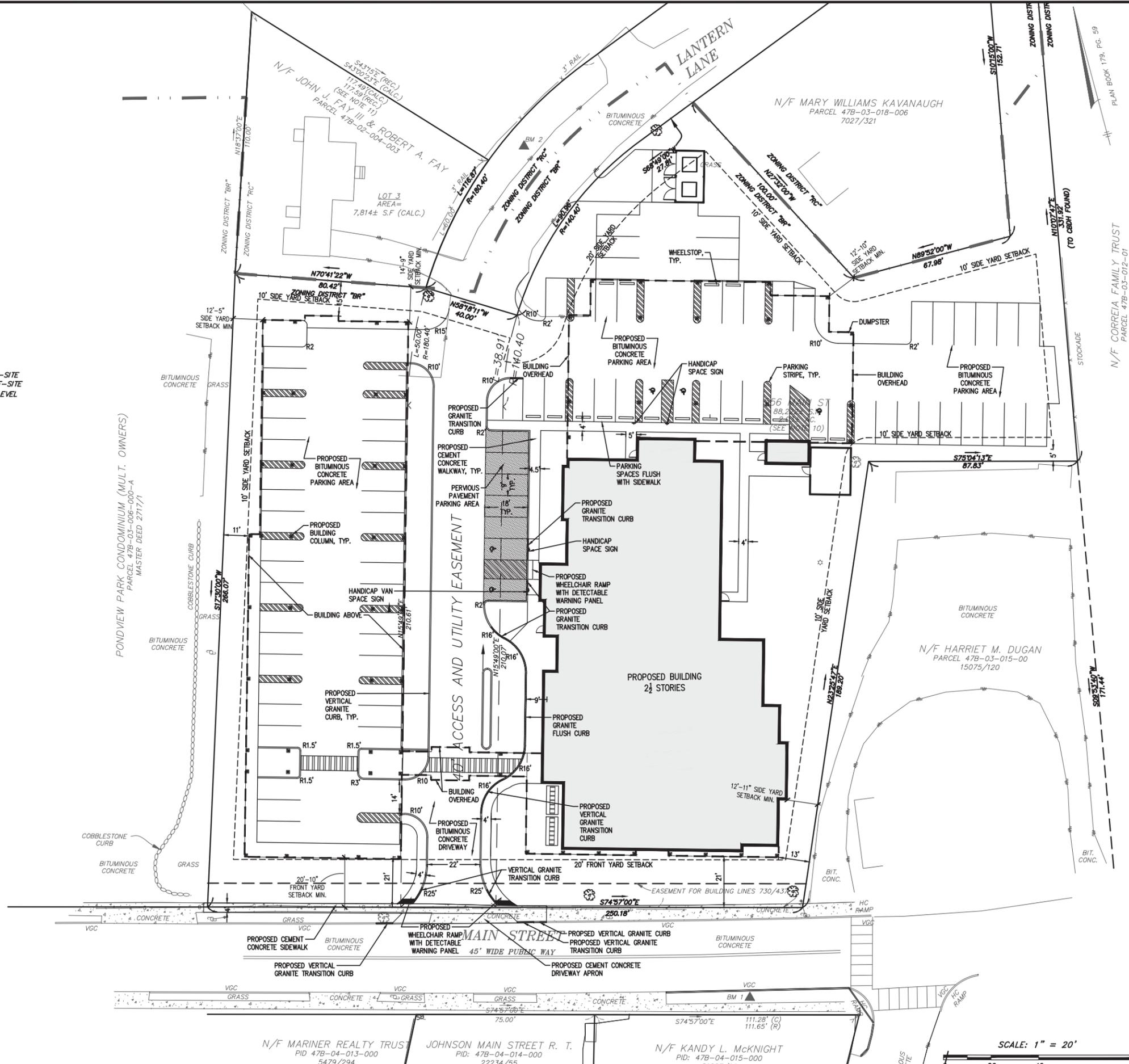
BUSINESS REDEVELOPMENT DISTRICT

ASSESSORS

PARCEL ID: 47B-02-005-001
PARCEL ID: 47B-02-005-001

LAYOUT AND MATERIALS NOTE

1. PROPOSED PARKING STRIPES IN GRASS PAVE PARKING AREA TO BE APPLIED USING WORLD CLASS PREMIUM (ACRYLIC) FIELD PAINT BY BEACON ALTHETICS OR APPROVED EQUAL. PARKING LINES SHAL BE CAREFULLY LAID OUT AND MARKED USING A LINE MARKING MACHINE. INSTALL PER MANUFACTURER'S RECOMMENDATIONS. SUFFICIENT PAINT SHOULD BE APPLIED AND REAPPLIED AS REQUIRED TO ASSURE COMPLETE OPACITY AND UNIFORMITY OF COLOR.



SITE ADDRESS

#556
MAIN STREET
Falmouth,
Massachusetts
02540

PREPARED FOR:

FALMOUTH
HOSPITALITY,
LLC
2 Lan Drive
Westford, Massachusetts 01886

HANCOCK
ASSOCIATES

Civil Engineers

Land Surveyors

Environmental
Consultants

315 Elm Street, Marlborough, MA 01752
Voice (508) 460-1111, Fax (508) 460-1121
www.hancockassociates.com

NO.	BY	APP	DATE	ISSUE/REVISION	DESCRIPTION

DATE: 7/10/14 DRAWN BY: KAC
SCALE: 1"=20' CHECK BY: JP

LAYOUT AND
MATERIALS
PLAN

PLT DATE: Jul 10, 2014 5:22 pm
PATH: F:\DWG 3D Projects\17791\DWG\

DWG: 17791LM.dwg

LAYOUT: LM LDRI

SHEET: 2 OF 3

PROJECT NO.:

C2

17791

SCALE: 1" = 20'

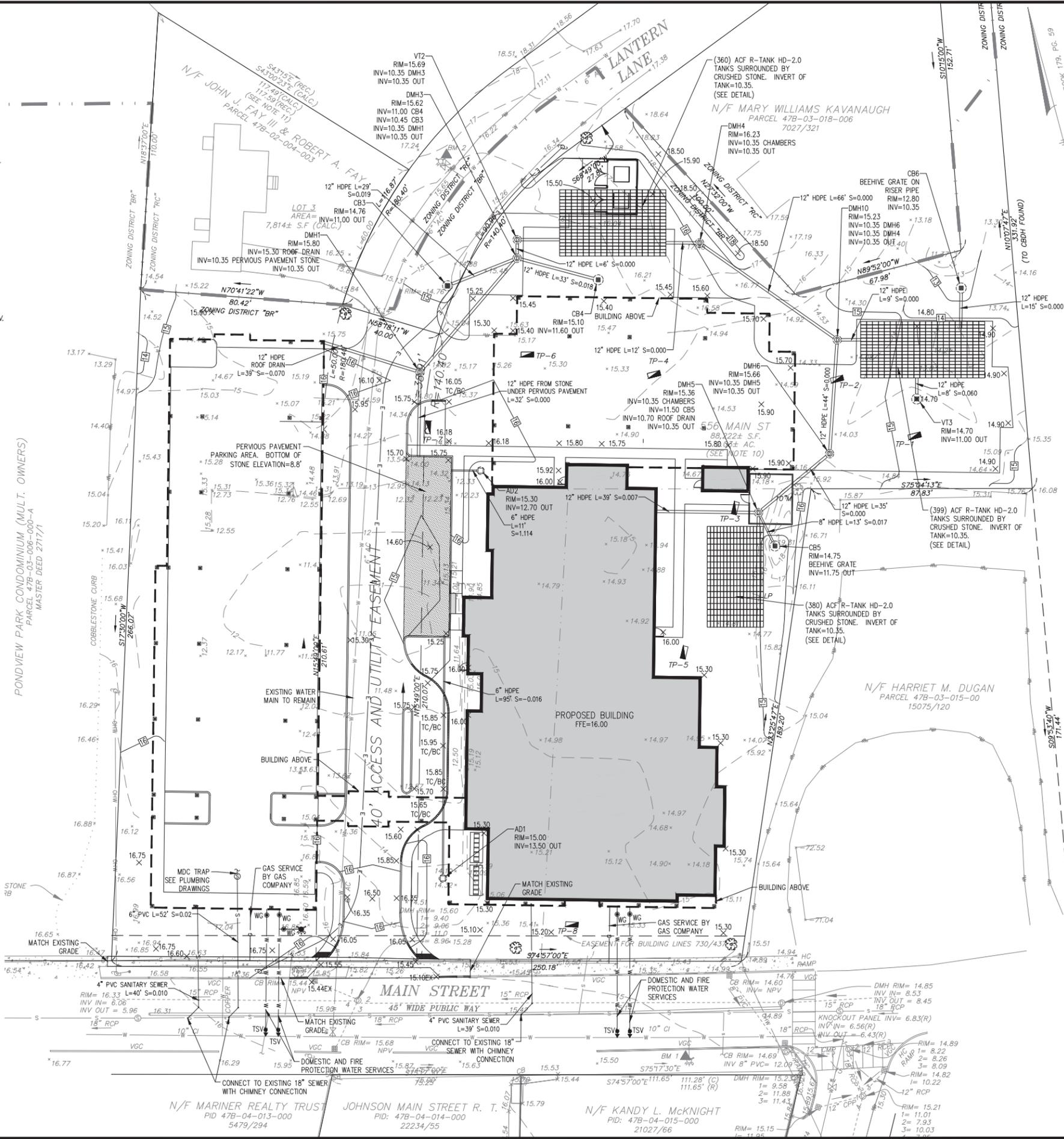
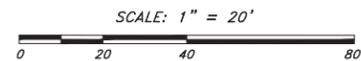


GRADING AND UTILITY PLAN NOTES

- LOCATIONS OF EXISTING UNDERGROUND UTILITIES/OBSTRUCTIONS/SYSTEMS SHOWN HEREON ARE APPROXIMATE ONLY. ALL UTILITIES/OBSTRUCTIONS/SYSTEMS MAY NOT BE SHOWN. CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND PROTECTING ALL UNDERGROUND UTILITIES/OBSTRUCTIONS/SYSTEMS, WHETHER OR NOT SHOWN HEREON.
- UNLESS OTHERWISE SHOWN, ALL NEW UTILITIES SHALL BE UNDERGROUND.
- RIM ELEVATIONS FOR NEW STRUCTURES ARE APPROXIMATE AND ARE PROVIDED TO ASSIST CONTRACTOR WITH MATERIAL TAKEOFFS. FINISH RIM ELEVATIONS SHOULD MATCH PAVEMENT, GRADING OR LANDSCAPING, UNLESS SPECIFICALLY INDICATED OTHERWISE.
- WHERE EXISTING UTILITY LINES/STRUCTURES ARE TO BE CUT/BROKEN DOWN/ ABANDONED, LINES/STRUCTURES SHALL BE PLUGGED/CAPPED/FILLED IN ACCORDANCE WITH OWNER REQUIREMENTS.
- THE CONTRACTOR SHALL ENCASE AND/OR SLEEVE SEWER AND WATER MAINS WHERE THE CROWN OF THE SEWER PIPE IS LESS THAN 18 INCHES BELOW THE INVERT OF THE WATER PIPE AND WHERE THE HORIZONTAL SEPARATION IS LESS THAN 10 FEET, AS REQUIRED BY THE MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION.
- STRUCTURE DETAILS FROM INDEPENDENT VENDORS ARE CONSTANTLY CHANGING. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL VERIFY THAT DETAILS SHOWN MATCH CURRENT DETAILS AND SPECIFICATIONS FROM VENDORS.
- CONTRACTOR SHALL INSTALL ALL PARKING AREAS AND WALKWAYS IN ACCORDANCE WITH APPLICABLE ADA AND MAAB REQUIREMENTS, INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
 - HANDICAPPED SPACES AND STRIPED AREA SLOPES SHALL NOT EXCEED 2% IN ANY DIRECTION.
 - HANDICAPPED RAMPS SHALL NOT EXCEED 8% FOR A MAXIMUM VERTICAL DISTANCE OF 6 INCHES.
 - SIDEWALKS SHALL HAVE A MAXIMUM SLOPE IN THE PATH OF TRAVEL OF 5% AND A MAXIMUM CROSS SLOPE OF 2%. CONTRACTOR SHOULD NOT LAYOUT SLOPES EXCEEDING 4.5% AND 1.5% RESPECTIVELY TO ALLOW FOR CONSTRUCTION TOLERANCES. IF THE CONTRACTOR DETERMINES THAT THE REQUIRED SLOPES CANNOT BE ACHIEVED, THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPORTING THE INFORMATION TO THE ENGINEER FOR RESOLUTION.
- ALL PROPOSED TOP OF VERTICAL CURB ELEVATIONS ARE 6" ABOVE THE BOTTOM OF CURB UNLESS OTHERWISE SHOWN.
- WHERE NEW PAVING MEETS EXISTING PAVING, MEET LINE AND GRADE OF EXISTING WITH NEW PAVING.
- AT LOCATIONS WHERE EXISTING PAVEMENT ABUTS NEW CONSTRUCTION, THE EDGE OF THE EXISTING PAVEMENT SHALL BE SAWCUT TO A CLEAN, SMOOTH EDGE.
- EXCAVATION REQUIRED WITHIN PROXIMITY OF EXISTING UTILITY LINES SHALL BE DONE BY HAND. CONTRACTOR SHALL REPAIR ANY DAMAGE TO EXISTING UTILITY LINES OR STRUCTURES INCURRED DURING CONSTRUCTION OPERATIONS AT NO ADDITIONAL COST TO THE OWNER.
- CONTRACTOR SHALL VERIFY ALL PROPOSED TOP OF CURB ELEVATIONS BEFORE PROCEEDING WITH ANY CONSTRUCTION AND ADVISE THE ENGINEER OF ANY DISCREPANCY WHICH MAY IMPACT DESIGN.
- ALL DISTURBED AREAS NOT COVERED WITH PAVEMENT, STRUCTURES, INDIVIDUAL PLANTINGS, OR MULCH SHALL HAVE LOAM AND SOD, OR LOAM AND SEED AS SHOWN ON THE LANDSCAPE PLANS OR AS DIRECTED BY THE ENGINEER.
- ALL UNDERGROUND STRUCTURES AND UTILITIES SHALL BE CAPABLE OF WITHSTANDING H20 WHEEL LOADS.
- THE CONTRACTOR SHALL FIELD VERIFY THE LOCATION, SIZE, INVERTS AND TYPES OF EXISTING PIPES AT ALL PROPOSED POINTS OF CONNECTION PRIOR TO ORDERING MATERIALS. WHERE AN EXISTING UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, THE LOCATION, ELEVATION AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY AT NO ADDITIONAL COST BY THE CONTRACTOR, AND THE INFORMATION FURNISHED IN WRITING TO THE OWNER'S REPRESENTATIVE FOR THE RESOLUTION OF THE CONFLICT.
- SILT FENCE AND/OR HAYBALES SHOWN HEREON SHALL BE INSTALLED BEFORE EARTH DISTURBANCE OCCURS WITHIN BUFFER ZONE, AND SHALL SERVE AS THE LIMIT OF WORK.
- CONTRACTOR SHALL PROVIDE DUST CONTROL FOR CONSTRUCTION OPERATIONS AS APPROVED BY THE ENGINEER.
- ALL POINTS OF CONSTRUCTION EGRESSOR INGRESS SHALL BE MAINTAINED TO PREVENT TRACKING OR FLOWING OF SEDIMENT ON TO PUBLIC ROADS.

SOIL TEST DATA:

- | | |
|--|---|
| <p>TP-1
 0-61" FILL LAYER
 61-80" Bw LAYER, FINE SANDY LOAM
 80-94" C1 LAYER, LOAMY SAND
 94-135" C2 LAYER, LOAMY SAND
 GROUND EL.=3.7
 ADJUSTED E.S.H.W.T. EL.=7.4</p> | <p>TP-2
 0-5" BITUMINOUS CONCRETE
 5-36" FILL LAYER
 36-76" C1 LAYER, GRAVELLY COARSE SAND
 76-126" C2 LAYER, MEDIUM SAND
 GROUND EL.=3.8
 ADJUSTED E.S.H.W.T. EL.=7.5</p> |
| <p>TP-3
 0-66" FILL LAYER
 66-109" C1 LAYER, LOAMY SAND
 109-138" C2 LAYER, SANDY LOAM
 GROUND EL.=3.1
 ADJUSTED E.S.H.W.T. EL.=6.8</p> | <p>TP-4
 0-11" FILL LAYER
 11-30" Bw LAYER, LOAMY SAND
 30-48" C1 LAYER, SANDY LOAM
 48-137" C2 LAYER, MEDIUM SAND
 GROUND EL.=3.6
 ADJUSTED E.S.H.W.T. EL.=7.3</p> |
| <p>TP-5
 0-141" FILL LAYER
 GROUND EL.=3.0
 NO GROUNDWATER OBSERVED
 ADJUSTED E.S.H.W.T. EL.=6.7</p> | <p>TP-6
 0-64" FILL LAYER
 64-94" C1 LAYER, GRAVELLY COARSE SAND
 94-130" C2 LAYER, MEDIUM SAND
 GROUND EL.=4.4
 ADJUSTED E.S.H.W.T. EL.=8.1</p> |
| <p>TP-7
 0-49" FILL LAYER
 49-89" C1 LAYER, GRAVELLY COARSE SAND
 89-139" C2 LAYER, MEDIUM SAND
 GROUND EL.=2.8
 ADJUSTED E.S.H.W.T. EL.=6.5</p> | <p>TP-8
 0-55" FILL LAYER
 55-64" Ap LAYER, FINE SANDY LOAM
 64-74" Bw LAYER, SANDY LOAM
 74-147" C1 LAYER, SILT LOAM
 GROUND EL.=3.1
 ADJUSTED E.S.H.W.T. EL.=6.8</p> |



SITE ADDRESS

**#556
 MAIN STREET
 Falmouth,
 Massachusetts
 02540**

PREPARED FOR

**FALMOUTH
 HOSPITALITY,
 LLC**

2 Lan Drive
 Westford, Massachusetts 01886

**HANCOCK
 ASSOCIATES**

Civil Engineers
 Land Surveyors
 Environmental
 Consultants

315 Elm Street, Marlborough, MA 01752
 Voice (508) 460-1111, Fax (508) 460-1121
 www.hancockassociates.com

NO.	BY	APP	DATE	ISSUE/REVISION	DESCRIPTION

DATE: 7/10/14 DRAWN BY: KAC
 SCALE: 1"=20' CHECK BY: JP

**GRADING,
 DRAINAGE,
 AND UTILITY
 PLAN**

PLT DATE: Jul 10, 2014 3:09 pm
 PATH: F:\V9 3D Projects\17791\DWG\

DWG: 17791U.dwg
 LAYOUT: U_LDR1
 SHEET: 3 OF 3
 PROJECT NO.: 17791

C3

Appendix 2. Nitrogen Loading Calculations

INTRODUCTION

The purpose of this report is to assess the current levels of Nitrate-Nitrogen (NO₃-N) concentrations at #556 Main Street in Falmouth, MA as well as estimated levels after redevelopment of the property. Falmouth Hospitality, LLC proposes the redevelopment of the site at 556 Main Street in Falmouth, MA by constructing a 108 room Springhill Suites by Marriot Hotel. Associated site improvements will include paved parking, driveway, recreation, and pedestrian areas, a grass paver seasonal parking area, landscaped areas, utilities, and a stormwater management system.

Cape Cod receives the majority of its drinking water from groundwater and NO₃-N is one of its primary contaminants of concern. NO₃-N comes from wastewater, fertilizers, runoff, and other various sources and it can eventually be absorbed into the water system.

"High drinking water nitrate-nitrogen levels have been shown to cause methemoglobinemia (a potentially lethal decreased ability of blood to transport oxygen) in infants and have been correlated with progeny malformations (NRC, 1977; Dorsch, *et al.*, 1984). High NO₃-N concentrations in groundwater have also been correlated with higher concentrations of regulated drinking water contaminants, such as volatile organic compounds (VOCs) (Eckhardt, *et al.*, 1986). However, the link of high nitrate levels to methemoglobinemia is the most well established and extensive research has led to the calculation of a 10 ppm NO₃-N concentration as a "no-observed-adverse-effect level" (NOAEL) for most infants (NRC, 1977; Fan, *et al.*, 1987)." - (Eichner, *et al.*, April 1992)

Therefore, it is very important to monitor these levels to keep people and the environment safe. This report will help to justify that the nitrate-nitrogen levels for this site are within the safe values that have been established by the Cape Cod Commission.

PROCEDURE

To conduct this site analysis of NO₃-N, several different areas of the site needed to be measured since they all contribute different concentration levels. According to the USEPA and MA EOE, the loading values of different areas and the way to calculate the nitrate-nitrogen levels for them are as followed:

Table 1
SUMMARY OF NITROGEN LOADING VALUES

TARGET CONCENTRATION:	5 ppm (milligram/liter) NO ₃ -N		
WASTEWATER			
Residences			
Concentration:	35 ppm NO ₃ -N		
Flow:	Title 5 (310 CMR 15.02)		
Nonresidences			
Concentration:	35 ppm NO ₃ -N		
Flow:	Title 5; Frimpter, <i>et al.</i> (1988): Documented flows satisfactory to CCC WRO staff		
OCCUPANCY:	Range (Actual town rate to 2 people per bedroom)		
LAWNS			
Area:	5,000 ft ²		
Fertilizer:	3 lbs/1,000 ft ² of lawn		
Leaching:	25%		
RECHARGE			
Off of impervious surfaces:	40 inches per year		
Concentrations			
Road runoff:	1.5 ppm NO ₃ -N		
Roof runoff:	0.75 ppm NO ₃ -N		
Natural areas			
Barnstable:	18 inches per year	Mashpee:	19 in/yr
Bourne:	21 in/yr	Orleans:	16 in/yr
Brewster:	17 in/yr	Provincetown:	16 in/yr
Chatham:	16 in/yr	Sandwich:	19 in/yr
Dennis:	18 in/yr	Truro:	16 in/yr
Eastham:	16 in/yr	Wellfleet:	16 in/yr
Falmouth:	21 in/yr	Yarmouth:	18 in/yr
Harwich:	17 in/yr		

Recommended Nitrogen Loading Limits for Coastal Embayments

<u>EMBAYMENT</u>	<u>WATERS CLASSIFIED SB</u>	<u>WATERS CLASSIFIED SA</u>	<u>OUTSTANDING RESOURCE AREAS</u>
Shallow			
• flushing: 4.5 days or less	350 mg/m ³ /Vr	200 mg/m ³ /Vr	100 mg/m ³ /Vr
• flushing: greater than 4.5 days	30 g/m ² /yr	15 g/m ² /yr	5 g/m ² /yr
Deep			
• select rate resulting in lesser annual loading	500 mg/m ³ /Vr or 45 g/m ² /yr	260 mg/m ³ /Vr or 20 g/m ² /yr	130 mg/m ³ /Vr or 10 g/m ² /yr

Note: Vr = Vollenweider flushing term

$$Vr = \frac{r}{1 + \text{sqrt}(r)}$$

r = flushing time (yrs)

Source: USEPA and MA EOE, 1991

Table 1-A

EXAMPLE NONRESIDENTIAL LOADING CALCULATIONS

Office Building:

Lot Size: 5 acres (217,800 ft²)

Impervious Surfaces: Roof Area: 15,000 ft²; Paving Area: 30,000 ft²

Natural Area: 172,800 ft²; Lawn Area: 10,000 ft²

Title V Flow: 75 gallons/day per 1,000 ft²

WASTEWATER

$$15,000 \text{ ft}^2 \left[\frac{75 \text{ gpd}}{1,000 \text{ ft}^2} \right] \left[\frac{3.785 \text{ L}}{\text{gal}} \right] = 4,258.1 \text{ L/d} \left[\frac{35 \text{ mg}}{\text{L}} \right] = 149,034.4 \text{ mg/d}$$

IMPERVIOUS SURFACES

$$15,000 \text{ ft}^2 \left[\frac{40 \text{ in}}{\text{yr}} \right] \left[\frac{\text{ft}}{12 \text{ in}} \right] \left[\frac{28.32 \text{ L}}{\text{ft}^3} \right] \left[\frac{1 \text{ yr}}{365 \text{ d}} \right] = 3,879.5 \text{ L/d} \left[\frac{0.75 \text{ mg}}{\text{L}} \right] = 2,909.6 \text{ mg/d}$$

$$30,000 \text{ ft}^2 \left[\frac{40 \text{ in}}{\text{yr}} \right] \left[\frac{\text{ft}}{12 \text{ in}} \right] \left[\frac{28.32 \text{ L}}{\text{ft}^3} \right] \left[\frac{1 \text{ yr}}{365 \text{ d}} \right] = 7,758.9 \text{ L/d} \left[\frac{1.5 \text{ mg}}{\text{L}} \right] = 11,638.4 \text{ mg/d}$$

LAWN

$$10,000 \text{ ft}^2 \left[\frac{3 \text{ lbs}}{1,000 \text{ ft}^2 \cdot \text{yr}} \right] \left[\frac{1 \text{ yr}}{365 \text{ d}} \right] \left[\frac{454,000 \text{ mg}}{\text{lb}} \right] \left[0.25 \right] = 9,328.8 \text{ mg/d}$$

NATURAL

$$5 \text{ acres} \left[\frac{43,560 \text{ ft}^2}{\text{acre}} \right] = 217,800 \text{ ft}^2; \quad 217,800 \text{ ft}^2 - 45,000 \text{ ft}^2 = 172,800 \text{ ft}^2$$

$$172,800 \text{ ft}^2 \left[\frac{1.5 \text{ ft}}{\text{yr}} \right] \left[\frac{28.32 \text{ L}}{\text{ft}^3} \right] \left[\frac{1 \text{ yr}}{365 \text{ d}} \right] = 20,111.1 \text{ L/d}$$

SUMMARY

$$\frac{149,034.4 + 2,909.6 + 11,638.4 + 9,328.8 \text{ mg}}{4,258.1 + 3,879.5 + 7,758.9 + 20,111.1 \text{ liters}} = \frac{172,911.2 \text{ mg}}{36,007.6 \text{ liters}} = \boxed{4.80 \text{ ppm}}$$

Table 1-B

By referring to Table 1-A and Table 1-B, it is possible to see that the areas of interest for this site are the lawn areas, the impervious areas which include the roof of the building and the pavement, and the natural areas. It is also important to take into consideration the recharge from precipitation because it is the *only* way to dilute NO₃-N loading on an aquifer-wide basis and it provides an important source of dilution for concentrations on smaller scales. (CCC WRO, April 1992) Note that there is no wastewater contributing to the NO₃-N concentrations, so it was not used in the following calculations. The areas were calculated below in Table 2-A.

Existing Site Areas (ft ²)		Percentages	
Total Area	88,222	100.00%	4,935 2 story wood, 1,821 1 story wood, 1867 1 story conc block, 408 1 story garage, 4,981 1 story garage, 110 shed)
Building	14,123	16.01%	
Paved	28,655	32.48%	
Natural	20,641	23.40%	Total Area 19,058
Lawn	24,803	28.11%	

Table 2-A

By using the equation provided in Table 1-B, the existing NO₃-N concentration was then calculated for #556 Main Street, Falmouth, MA.

Existing NO₃-N Concentrations

Roof Areas

$$14,123 \text{ ft}^2 \left[\frac{40 \text{ in}}{\text{yr}} \right] \left[\frac{\text{ft}}{12 \text{ in}} \right] \left[\frac{28.32 \text{ L}}{\text{ft}^3} \right] \left[\frac{1 \text{ yr}}{365 \text{ d}} \right] = 3,652.6 \text{ L} / \text{d}$$

$$3,652.6 \text{ L} / \text{d} \left[\frac{0.75 \text{ mg}}{\text{L}} \right] = 2,739.5 \text{ mg} / \text{d}$$

Impervious Areas

$$28,655 \text{ ft}^2 \left[\frac{40 \text{ in}}{\text{yr}} \right] \left[\frac{\text{ft}}{12 \text{ in}} \right] \left[\frac{28.32 \text{ L}}{\text{ft}^3} \right] \left[\frac{1 \text{ yr}}{365 \text{ d}} \right] = 7,411.0 \text{ L} / \text{d}$$

$$7,411.0 \text{ L} / \text{d} \left[\frac{1.5 \text{ mg}}{\text{L}} \right] = 11,116.6 \text{ mg} / \text{d}$$

Lawn

$$24,803 \text{ ft}^2 \left[\frac{3 \text{ lbs}}{1,000 \text{ ft}^2 * \text{yr}} \right] \left[\frac{\text{yr}}{365 \text{ d}} \right] \left[\frac{454,000 \text{ mg}}{\text{lb}} \right] [0.25] = 23,138.1 \text{ mg} / \text{d}$$

Natural

$$20,641 \text{ ft}^2 \left[\frac{1.75 \text{ ft}}{\text{yr}} \right] \left[\frac{28.32 \text{ L}}{\text{ft}^3} \right] \left[\frac{\text{yr}}{365 \text{ d}} \right] = 2,802.7 \text{ L} / \text{d}$$

Note: 1.75 ft comes from a recharge rate of 21 in/yr in Falmouth, MA

Summary

$$\frac{2,739.5 + 11,116.6 + 23,138.1}{3,652.6 + 7,411.0 + 2,802.7} = \frac{36,994.2mg}{13,866.3L} = \underline{\underline{2.67 \text{ ppm}}}$$

With redevelopment, the areas of interest for the site will change, as shown in Table 3-A. The site will consist only of impervious areas i.e. pavement and sidewalks, roof areas and lawn areas. No areas of natural recharge will remain and have been eliminated from the calculations.

Proposed Site Areas (ft²)	Percentages	
Total Area	88,222	100.00%
Building	37,447	42.44%
Paved	21,928	24.86%
Lawn	28,847	32.70%

Table 3-A

Proposed NO₃-N Concentrations

Roof Areas

$$37,447 \text{ ft}^2 \left[\frac{40 \text{ in}}{\text{yr}} \right] \left[\frac{\text{ft}}{12 \text{ in}} \right] \left[\frac{28.32 \text{ L}}{\text{ft}^3} \right] \left[\frac{1 \text{ yr}}{365 \text{ d}} \right] = 9,684.9 \text{ L} / \text{d}$$

$$9,684.9 \text{ L} / \text{d} \left[\frac{0.75 \text{ mg}}{\text{L}} \right] = 7,263.6 \text{ mg} / \text{d}$$

Impervious Areas

$$21,928 \text{ ft}^2 \left[\frac{40 \text{ in}}{\text{yr}} \right] \left[\frac{\text{ft}}{12 \text{ in}} \right] \left[\frac{28.32 \text{ L}}{\text{ft}^3} \right] \left[\frac{1 \text{ yr}}{365 \text{ d}} \right] = 5,671.2 \text{ L} / \text{d}$$

$$5,671.2 \text{ L} / \text{d} \left[\frac{1.5 \text{ mg}}{\text{L}} \right] = 4,253.4 \text{ mg} / \text{d}$$

Lawn

$$29,181 \text{ ft}^2 \left[\frac{3 \text{ lbs}}{1,000 \text{ ft}^2 * \text{ yr}} \right] \left[\frac{\text{ yr}}{365 \text{ d}} \right] \left[\frac{454,000 \text{ mg}}{\text{ lb}} \right] [0.25] = 26,910.7 \text{ mg} / \text{d}$$

Summary

$$\frac{7,263.6 + 4,253.4 + 26,910.7}{9,684.9 + 5,671.2} = \frac{38,427.7 \text{ mg}}{15,356.1 \text{ L}} = \underline{\underline{2.50 \text{ ppm}}}$$

Conclusion

It has been shown that the existing concentration of nitrate-nitrogen at #556 Main Street, Falmouth, MA is 2.67 ppm. After redevelopment of the site, this figure will drop to 2.50 ppm due to increased aquifer recharge on site. This value is well below the target concentration of 5 ppm listed in Table 1-A so therefore it is acceptable. A value of 2.50 ppm of NO₃-N is considered safe and shall not cause harm to either people or the environment.

References

- Dorsch, M.M., R.K.R. Scragg, A.J. McMichael, and P.A. Baghurst. 1984. "Congenital Malformations and Maternal Drinking Water Supply in Reval, South Australia." *Journal of Epidemiology*. 119, 4: 473-485.
- Eckhardt, D.A., W.J. Flipse, Jr., and E.T. Oaksford. 1986. *Relation Between Land Use and Ground Water Quality in the Upper Glacial Aquifer in Nassau and Suffolk Counties, Long Island, New York*. United States Geological Survey Resources Investigations Report 86-4142, Washington, DC.
- Fan, A.M., C.C. Willhite, and S.A. Book. 1987. "Evaluation of the Nitrate Drinking Water Standard with Reference to Infant Methemoglobinemia and Potential Reproductive Toxicity." *Regulatory Toxicology and Pharmacology*. 7: 135-148
- National Research Council. 1977. *Drinking Water and Health*. National Academy of Sciences, Washington, DC.
- Eichner, E.M. and T.C. Cambareri. April 1992. *Nitrogen Loading*. Cape Cod Commission. Water Resources Office Technical Bulletin 91-001 (FINAL), Barnstable, MA.

Appendix 3. Traffic Site Location Map and CCC Scoping Memo

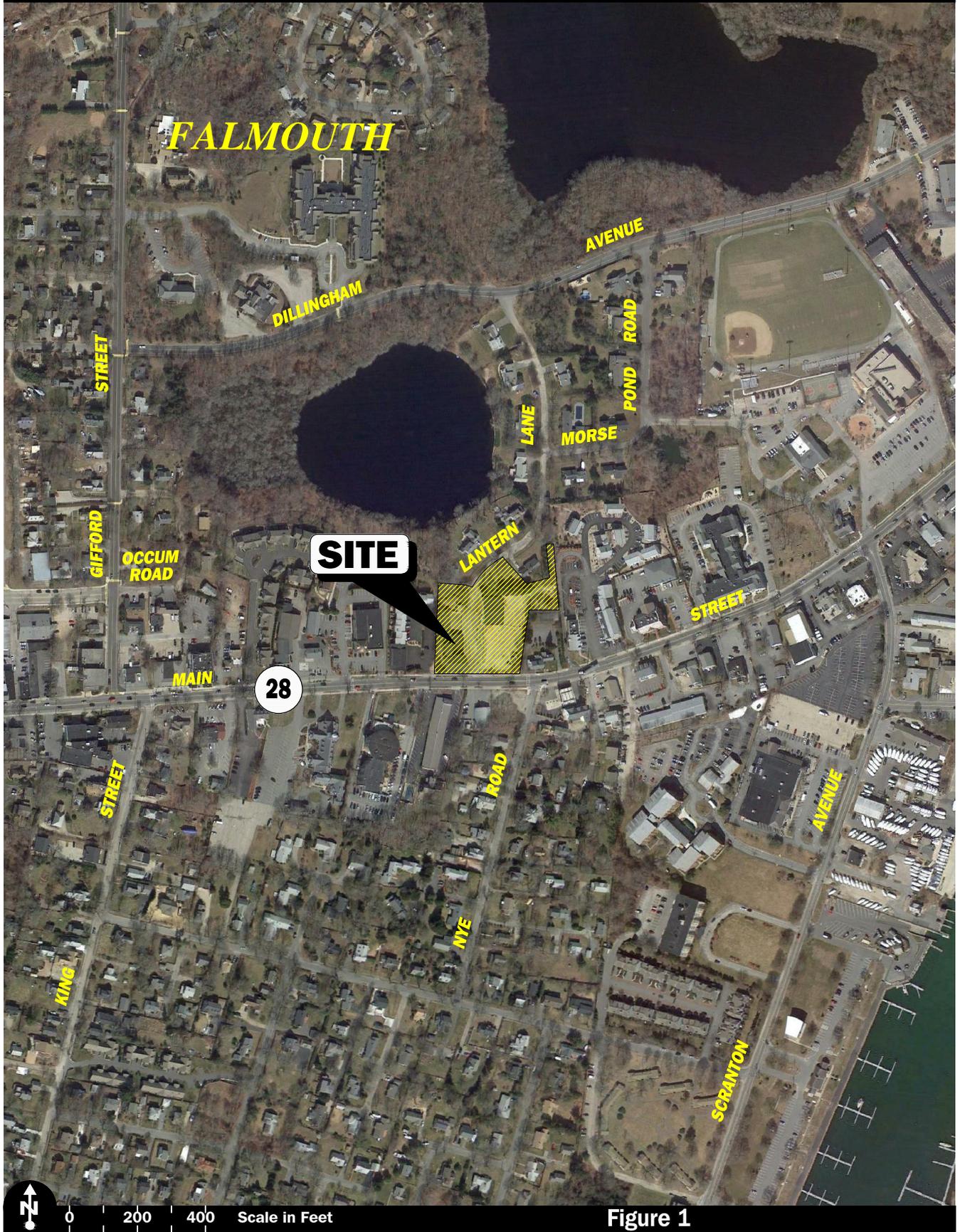


Figure 1

Site Location Map



3225 MAIN STREET • P.O. BOX 226
BARNSTABLE, MASSACHUSETTS 02630



CAPE COD
COMMISSION

(508) 362-3828 • Fax (508) 362-3136 • www.capecodcommission.org

May 20, 2014

Jeffrey S. Dirk, P.E., PTOE, FITE
Principal
Vanasse & Associates, Inc.
10 New England Business Center Drive
Suite 314
Andover, MA 01810-1066

Re: Traffic Impact Assessment – Proposed Scope of Work – Proposed Extended Stay
Hotel – 566 Main Street (Route 28), Falmouth

Dear Mr. Dirk,

Thank you for submitting the letter dated April 30, 2014 regarding traffic study requirements for the proposed extended stay hotel to be located at 556 Main Street (Route 28) in Falmouth. Cape Cod Commission Transportation staff has reviewed the document and offer the following comments.

PROJECT DESCRIPTION

As outlined in the letter, the Applicant is proposing to redevelop the existing commercial property at 556 Main Street (Route 28) in Falmouth that currently contains 16,272 square feet (sf) of commercial/retail space. The Applicant is proposing to construct a 108-room extended stay hotel.

TRIP GENERATION

Commission Transportation staff has reviewed the trip generation calculations as outlined in the letter. The letter states that the trip generation estimates are based on trip generation data in *Institute of Transportation Engineers' (ITE) Trip Generation*, 9th Edition, for Land Use Code (LUC) 826, Specialty Retail, for the existing use, and LUC 310, Hotel, for the proposed use. Commission Transportation staff agrees with the characterization of the existing and proposed uses, but suggests that some of the calculations do not follow guidance provided in the Cape Cod Commission Technical 96-003. Specifically, the "Peak Hour of Generator" should be used for the Weekday AM and



Extended Stay Hotel – Falmouth
May 20, 2014

PM Peak Hour analysis as opposed to the Peak of Hour of Adjacent Street Traffic. Additionally, the regression equation should only be used “when statistically appropriate and used according to the methods outlined” in the *ITE Trip Generation Manual*.

Commission Transportation staff suggests that the expected increase in traffic from the project during different time periods is as presented in Table 1. Trip generation calculations are attached and Commission Transportation staff is available for any questions.

Table 1: Estimated Project Trip Generation

Time Period	Trip Generation (trips)		
	Proposed Use Hotel (108 rooms) ¹	Existing Use ²	Net New Trips ³
Weekday Daily Trips	882	721	+161
Weekday AM Peak Hour	60	111	-51
Weekday PM Peak Hour	66	82	-16
Saturday Daily	885	684	+201
Saturday Midday Peak Hour	79	66	+13

Note:

¹ Based on ITE LUC 310, Hotel, 108 rooms

² Based on ITE LUC 826, Specialty Retail, 16,272 sf

³ Trip from proposed use minus credit for trips from existing use

Based on these estimates, the project would add 161 new Weekday Daily trips and 13 new trips during the project’s Peak Hour (Saturday Midday Peak Hour). Based on the fact that the project is anticipated to generate less the 250 daily and 25 peak hour trips, the Applicant could consider pursuing Limited Development of Regional Impact (DRI) Review. In addition to the trip generation related questions, the Limited DRI Review scoping checklists asks whether the project is on or abuts a regional roadway. If the Applicant considers Limited DRI Review, discussions with Commission staff about site drive design may be able to address potential impacts on this regional roadway without the need for full DRI review.

If the Applicant pays careful attention to site drive design and provided analysis of safety and other safety characteristics of the driveway, Commission Transportation staff may

Commission Transportation staff notes that while staff suggests that the existing use credits shown in Table 1 are appropriately calculated and applied, it is at the Cape Cod Commission’s discretion, per Minimum Performance Standard TR0.2, whether or not to allow such credits.

Extended Stay Hotel – Falmouth
May 20, 2014

STUDY AREA

Based on the current estimates of project trip generation, Commission Transportation staff suggests that the proposed study area, as presented in the letter and shown below, is appropriate for the traffic impact assessment for the proposed development.

1. Main Street, east and west of the project site (roadway links)
2. Main Street at Lantern Lane/Proposed Site Drive (intersection)
3. Main Street at Nye Road (intersection)

TRIP DISTRIBUTION

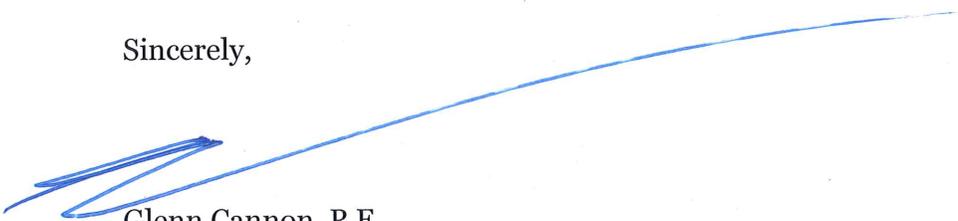
To be provided following further analysis by the Applicant.

OTHER STUDY PARAMETERS

Commission Transportation staff suggests that the study time periods, analysis conditions, background traffic growth rate, background develop project, and roadway improvement projects, as presented in the letter, are appropriate for the traffic impact assessment for the proposed development.

Please feel free to contact me with any questions regarding these comments or anything else.

Sincerely,



Glenn Cannon, P.E.
CCC Director of Technical Services

Cc: Steven Tupper, CCC Technical Services Planner
Jonathan Idman, CCC Chief Regulatory Officer

Attachments (1)

Trip Generation Calculation Sheet
Institute of Transportation Engineers (ITE)
Land Use Code (LUC) 826 - Specialty Retail

Average Vehicle Trip Ends per: 1000 Sq. Feet Gross Leasable Area
 Independent Variable (X): 16.272

Average Weekday Daily

Available Data

Number of Studies:	4
Directional Distribution:	50 % Entering 50 % Exiting
Average Rate:	44.32
Standard Deviation:	15.52
R ²	0.69
Regression Equation:	T = 42.78(X) + 37.66

Regression Equation Check

Regression Equation?	Yes
Indep. Var. within Data Range?	Yes
20 points or R ² ≥ 0.75	No
Equation within data cluster?	Yes
Std. Dev. > 110% of Ave. Rate?	No
Use Regression Equation?	No

Estimate Based on Regression Equation

T = 42.78(X) + 37.66
 T = 42.78(16.272) + 37.66
 T = 733.78
 T = 734 vehicle trips with 50% (367) entering and 50% (367) exiting.

Estimate Based on Weighted Average Rate

T = 44.32 (X)
 T = 44.32 (16.272)
 T = 721.18
 T = 721 vehicle trips with 50% (361) entering and 50% (360) exiting.

Weekday AM Peak Hour of Generator

Available Data

Number of Studies:	4
Directional Distribution:	48 % Entering 52 % Exiting
Average Rate:	6.84
Standard Deviation:	3.55
R ²	0.9
Regression Equation:	T = 4.91(X)+115.59

Regression Equation Check

Regression Equation?	Yes
Indep. Var. within Data Range?	Yes
20 points or R ² ≥ 0.75	Yes
Equation within data cluster?	Yes
Std. Dev. > 110% of Ave. Rate?	No
Use Regression Equation?	No

Estimate Based on Regression Equation

T = 4.91(X)+115.59
 T = 4.91(16.272)+115.59
 T = 195.49
 T = 195 vehicle trips with 48% (94) entering and 52% (101) exiting.

Estimate Based on Weighted Average Rate

T = 6.84 (X)
 T = 6.84 (16.272)
 T = 111.3
 T = 111 vehicle trips with 48% (53) entering and 52% (58) exiting.

Weekday PM Peak Hour of Generator

Available Data

Number of Studies:	3
Directional Distribution:	56 % Entering 44 % Exiting
Average Rate:	5.02
Standard Deviation:	2.31
R ²	-
Regression Equation:	Not Given

Regression Equation Check

Regression Equation?	No
Indep. Var. within Data Range?	-
20 points or R ² ≥ 0.75	-
Equation within data cluster?	-
Std. Dev. > 110% of Ave. Rate?	-
Use Regression Equation?	No

Estimate Based on Regression Equation

-
 -
 -
 -

Estimate Based on Weighted Average Rate

T = 5.02 (X)
 T = 5.02 (16.272)
 T = 81.69
 T = 82 vehicle trips with 56% (46) entering and 44% (36) exiting.

Trip Generation Calculation Sheet
Institute of Transportation Engineers (ITE)
Land Use Code (LUC) 826 - Specialty Retail

Average Vehicle Trip Ends per: 1000 Sq. Feet Gross Leasable Area
 Independent Variable (X): 16.272

Saturday Daily

Available Data

Number of Studies:	3
Directional Distribution:	50 % Entering 50 % Exiting
Average Rate:	42.04
Standard Deviation:	13.97
R ²	-
Regression Equation:	Not Given

Regression Equation Check

Regression Equation?	No
Indep. Var. within Data Range?	-
20 points or R ² ≥ 0.75	-
Equation within data cluster?	-
Std. Dev. > 110% of Ave. Rate?	-
Use Regression Equation?	No

Estimate Based on Regression Equation

-
-
-
-

Estimate Based on Weighted Average Rate

T = 42.04 (X)
T = 42.04 (16.272)
T = 684.07
T = 684 vehicle trips with 50% (342) entering and 50% (342) exiting.

Saturday Midday Peak Hour

Available Data

Number of Studies:	3
Directional Distribution:	50 % Entering 50 % Exiting
Average Rate:	4.06
Standard Deviation:	-
R ²	-
Regression Equation:	Not Given

Regression Equation Check

Regression Equation?	No
Indep. Var. within Data Range?	-
20 points or R ² ≥ 0.75	-
Equation within data cluster?	-
Std. Dev. > 110% of Ave. Rate?	-
Use Regression Equation?	No

Estimate Based on Regression Equation

-
-
-
-

Estimate Based on Weighted Average Rate

T = 4.06 (X)
T = 4.06 (16.272)
T = 66.06
T = 66 vehicle trips with 50% (33) entering and 50% (33) exiting.

Note: Assumes same Directional Distribution as Saturday Daily, Average Rate based on Daily Rate factored to Peak Hour using Saturday Midday Peak Hour rate/Saturday Daily Rate (4.82/49.97) for ITE LUC 820

Trip Generation Calculation Sheet
Institute of Transportation Engineers (ITE)
Land Use Code (LUC) 310 - Hotel

Average Vehicle Trip Ends per: Rooms
 Independent Variable (X): 108

Average Weekday Daily

Available Data

Number of Studies:	10
Directional Distribution:	50 % Entering 50 % Exiting
Average Rate:	8.17
Standard Deviation:	3.38
R ²	0.98
Regression Equation:	T = 8.95(X)-373.16

Regression Equation Check

Regression Equation?	Yes
Indep. Var. within Data Range?	Yes
20 points or R ² ≥ 0.75	Yes
Equation within data cluster?	Yes
Std. Dev. > 110% of Ave. Rate?	No
Use Regression Equation?	No

Estimate Based on Regression Equation

T = 8.95(X)-373.16
T = 8.95(108)-373.16
T = 593.44
T = 593 vehicle trips with 50% (297) entering and 50% (296) exiting.

Estimate Based on Weighted Average Rate

T = 8.17 (X)
T = 8.17 (108)
T = 882.36
T = 882 vehicle trips with 50% (441) entering and 50% (441) exiting.

Weekday AM Peak Hour of Generator

Available Data

Number of Studies:	34
Directional Distribution:	54 % Entering 46 % Exiting
Average Rate:	0.52
Standard Deviation:	0.75
R ²	0.56
Regression Equation:	Ln(T) = 0.85*Ln(X)+0.12

Regression Equation Check

Regression Equation?	Yes
Indep. Var. within Data Range?	Yes
20 points or R ² ≥ 0.75	Yes
Equation within data cluster?	Yes
Std. Dev. > 110% of Ave. Rate?	Yes
Use Regression Equation?	Yes

Estimate Based on Regression Equation

Ln(T) = 0.85*Ln(X)+0.12
Ln(T) = 0.85*Ln(108)+0.12
T = 60.33
T = 60 vehicle trips with 54% (32) entering and 46% (28) exiting.

Estimate Based on Weighted Average Rate

T = 0.52 (X)
T = 0.52 (108)
T = 56.16
T = 56 vehicle trips with 54% (30) entering and 46% (26) exiting.

Weekday PM Peak Hour of Generator

Available Data

Number of Studies:	35
Directional Distribution:	58 % Entering 42 % Exiting
Average Rate:	0.61
Standard Deviation:	0.81
R ²	-
Regression Equation:	Not Given

Regression Equation Check

Regression Equation?	No
Indep. Var. within Data Range?	-
20 points or R ² ≥ 0.75	-
Equation within data cluster?	-
Std. Dev. > 110% of Ave. Rate?	-
Use Regression Equation?	No

Estimate Based on Regression Equation

-
-
-
-

Estimate Based on Weighted Average Rate

T = 0.61 (X)
T = 0.61 (108)
T = 65.88
T = 66 vehicle trips with 58% (38) entering and 42% (28) exiting.

Trip Generation Calculation Sheet
Institute of Transportation Engineers (ITE)
Land Use Code (LUC) 310 - Hotel

Average Vehicle Trip Ends per: Rooms
 Independent Variable (X): 108

Saturday Daily

Available Data

Number of Studies:	8
Directional Distribution:	50 % Entering 50 % Exiting
Average Rate:	8.19
Standard Deviation:	3.13
R ²	0.93
Regression Equation:	T = 9.62(X)-294.56

Regression Equation Check

Regression Equation?	Yes
Indep. Var. within Data Range?	Yes
20 points or R ² ≥ 0.75	Yes
Equation within data cluster?	Yes
Std. Dev. > 110% of Ave. Rate?	No
Use Regression Equation?	No

Estimate Based on Regression Equation

T = 9.62(X)-294.56
 T = 9.62(108)-294.56
 T = 744.4
 T = 744 vehicle trips with 50% (372) entering and 50% (372) exiting.

Estimate Based on Weighted Average Rate

T = 8.19 (X)
 T = 8.19 (108)
 T = 884.52
 T = 885 vehicle trips with 50% (443) entering and 50% (442) exiting.

Saturday Midday Peak Hour

Available Data

Number of Studies:	9
Directional Distribution:	56 % Entering 44 % Exiting
Average Rate:	0.72
Standard Deviation:	0.87
R ²	0.8
Regression Equation:	T = 0.69(X)+4.32

Regression Equation Check

Regression Equation?	Yes
Indep. Var. within Data Range?	Yes
20 points or R ² ≥ 0.75	Yes
Equation within data cluster?	Yes
Std. Dev. > 110% of Ave. Rate?	Yes
Use Regression Equation?	Yes

Estimate Based on Regression Equation

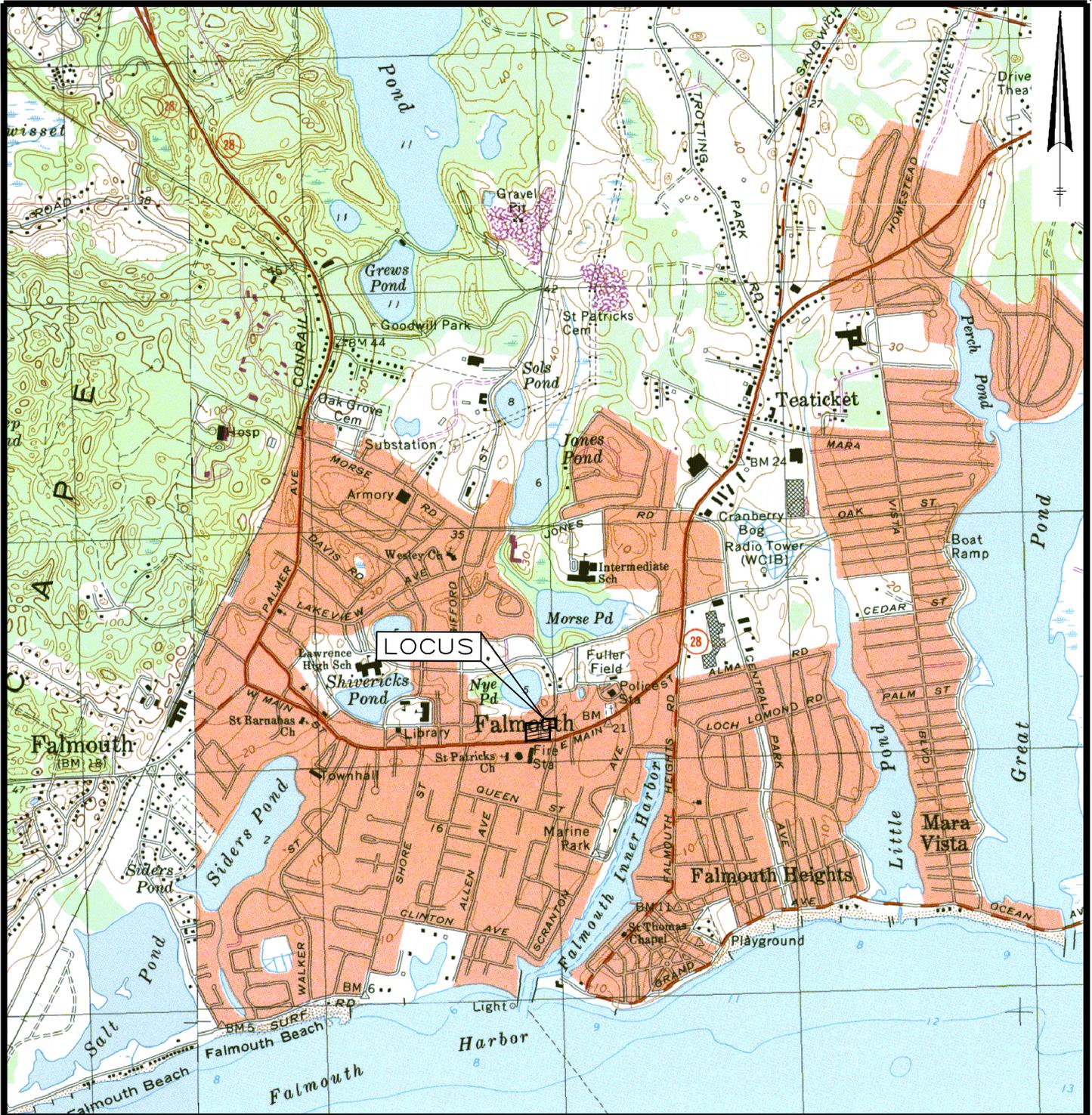
T = 0.69(X)+4.32
 T = 0.69(108)+4.32
 T = 78.84
 T = 79 vehicle trips with 56% (44) entering and 44% (35) exiting.

Estimate Based on Weighted Average Rate

T = 0.72 (X)
 T = 0.72 (108)
 T = 77.76
 T = 78 vehicle trips with 56% (44) entering and 44% (34) exiting.

Appendix 4: Required Figures

- USGS Locus Map
- Water Resource Classification Maps 1 and 2
- FEMA Flood Plain Map
- NHESP Map
- SNRA Map
- Historic District Map
- MHC Inventory List



LOCUS MAP

556 MAIN STREET
FALMOUTH, MA

HANCOCK ASSOCIATES

185 CENTRE STREET, DANVERS, MA. 01923
VOICE (978) 777-3050, FAX (978) 774-7816

DATE: 04/25/14

SCALE: 1"=2,000'

DESIGN: KAC

DRAWN: KAC

LAYOUT: LOCUS

Land Use

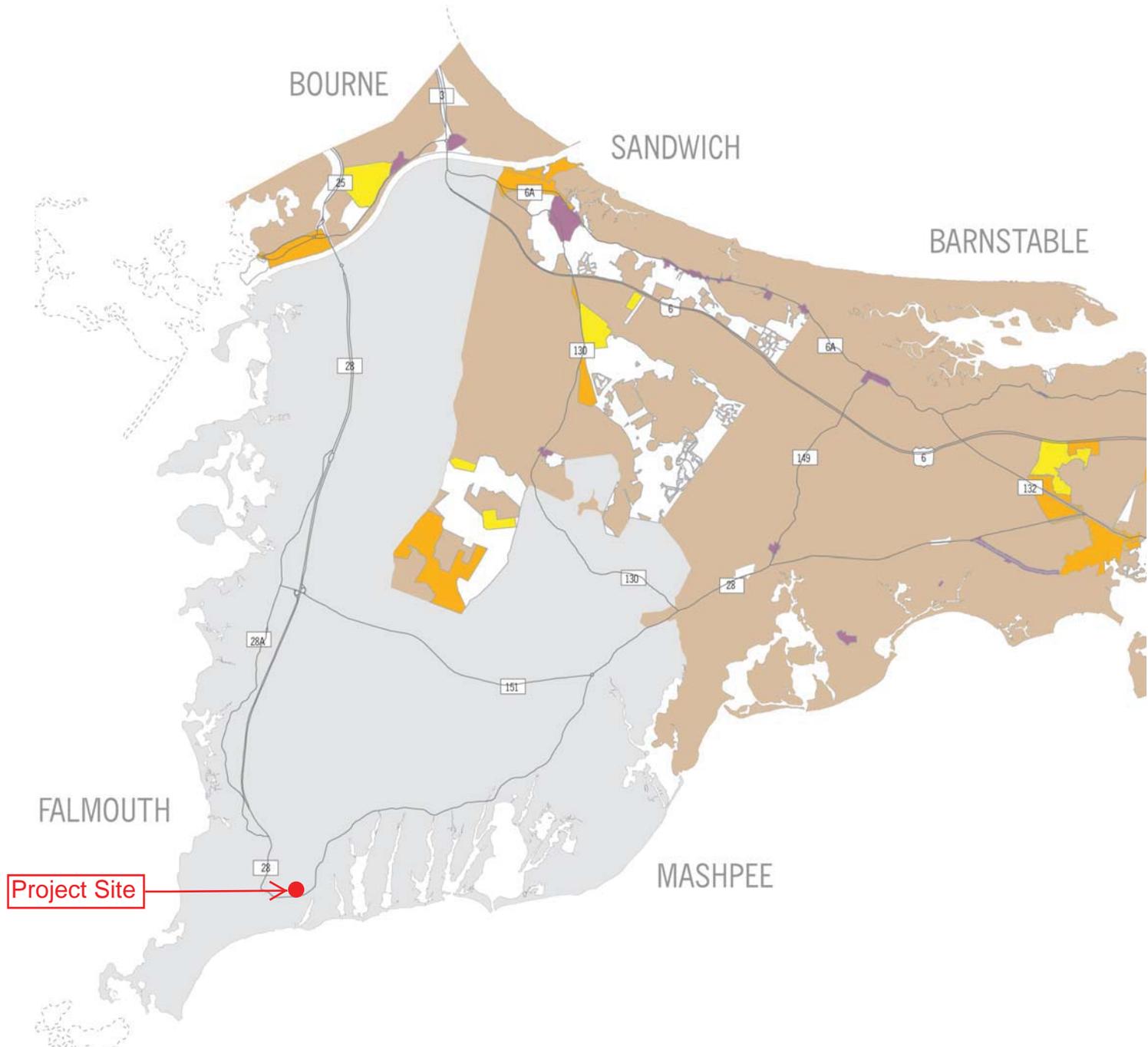
Map LU1a

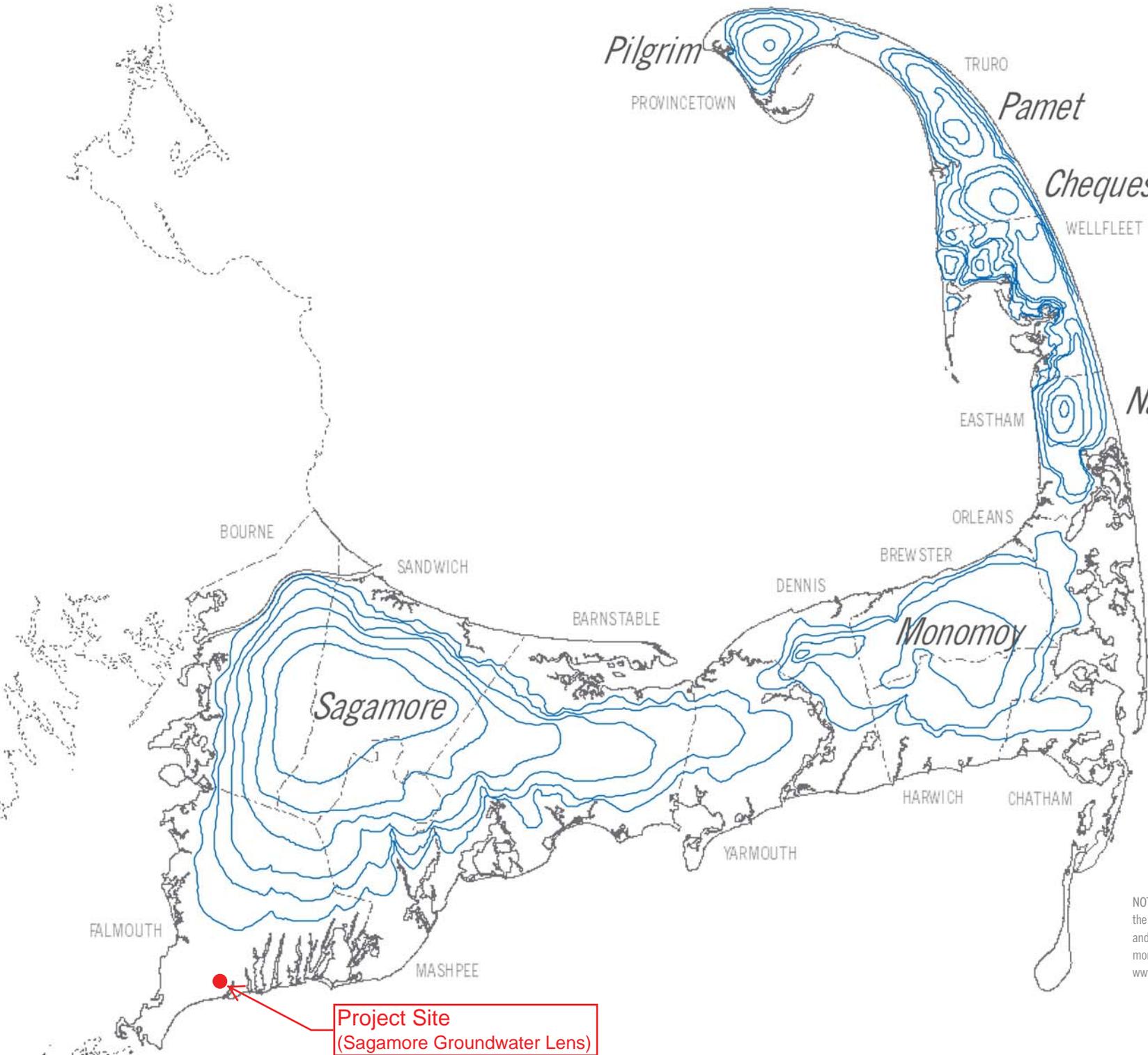
Upper and Mid Cape: Regional Land Use Vision Map

As of March 4, 2011

The Regional Land Use Vision Map for the Upper and Mid Cape shows target areas for growth. (Some towns have not yet completed the regional land use vision mapping process.) Focusing growth in identified areas and minimizing it in others will help protect Cape Cod's natural resources and traditional character.

-  Economic Center
-  Industrial/Service Trade Area
-  Village
-  Resource Protection Area
-  Areas Yet to Complete Mapping
-  Other





Groundwater Lenses

This map illustrates the six groundwater lenses (Sagamore, Monomoy, Nauset, Chequesset, Pamet, and Pilgrim) that comprise Cape Cod’s sole source aquifer. The underground topography influences groundwater flow direction and speed. The water table contour lines indicate the height of groundwater above sea level.

 Water Table Contour

NOTE: All maps in the Regional Planning section of the Cape Cod Regional Policy Plan are for illustration and planning purposes only. They may be viewed in more detail online: www.capecodcommission.org/regionalplans/RPP/

Project Site
(Sagamore Groundwater Lens)

Water Resources

Map WR2

Drinking Water Resources

As of June 18, 2010

The Drinking Water Resources map illustrates the location of Cape Cod's existing Wellhead Protection Areas and Potential Public Water Supply Areas. These areas provide the majority of Cape Cod's drinking water. Monitoring and reducing groundwater pollution levels is critical to ensuring their future use.

- Public Water Supply Wellhead Protection Area (Zone II)
- Potential Public Water Supply Area
- Public Supply Well
- Small Volume Well
- Mass. Military Reservation

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Project Site



APPROXIMATE SCALE



NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

TOWN OF FALMOUTH,
MASSACHUSETTS
BARNSTABLE COUNTY

PANEL 11 OF 13
(SEE MAP INDEX FOR PANELS NOT PRINTED)

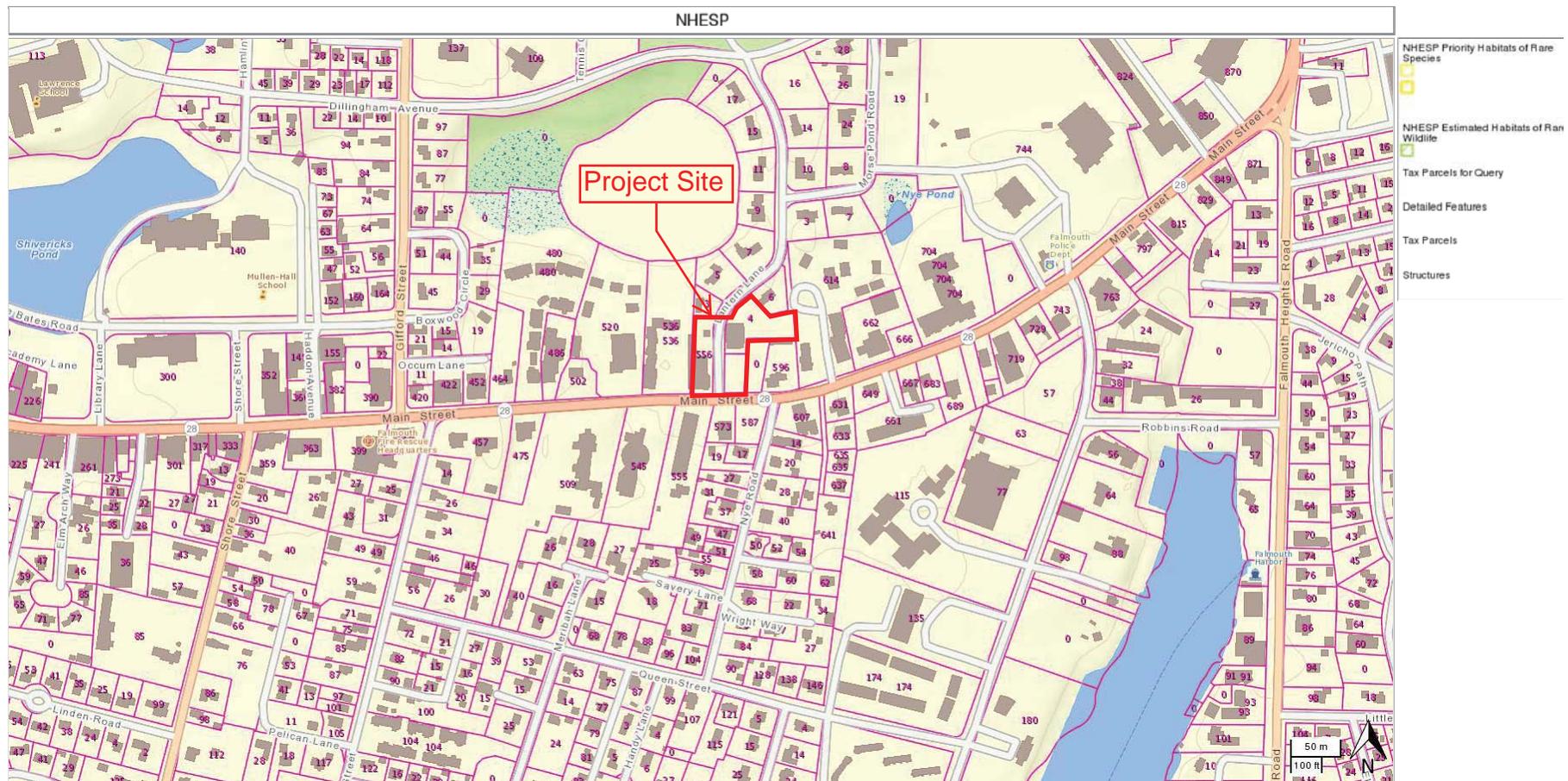
COMMUNITY-PANEL NUMBER
255211 0011 F

MAP REVISED:
MAY 15, 1986



Federal Emergency Management Agency

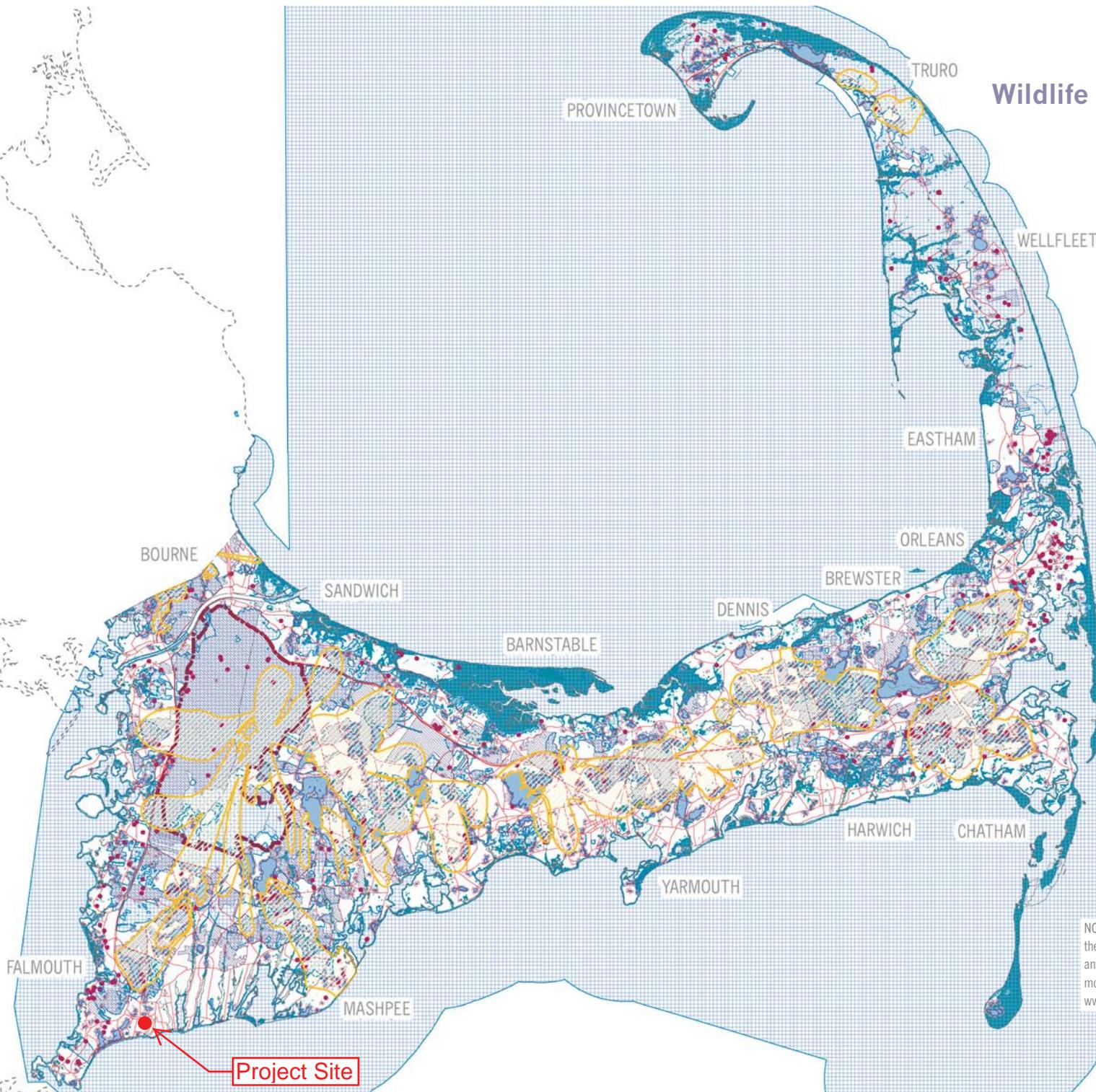
This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov



Wildlife and Plant Habitat Map SNRA

Significant Natural Resource Areas
As of June 18, 2010

-  Current DEP Zone II (March 30, 2010)
-  Major Roads
-  350-foot Buffer of Certified Vernal Pool
-  Water Body
-  300-foot Buffer from Pond Shore
-  Massachusetts Military Reservation
-  Potential Public Water Supply Area (PLAAP)
-  Priority Habitats (NHESP 2008)
-  DEP Wetland Area



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www.capecodcommission.org/regionalplans/RPP/

Heritage Preservation and Community Character

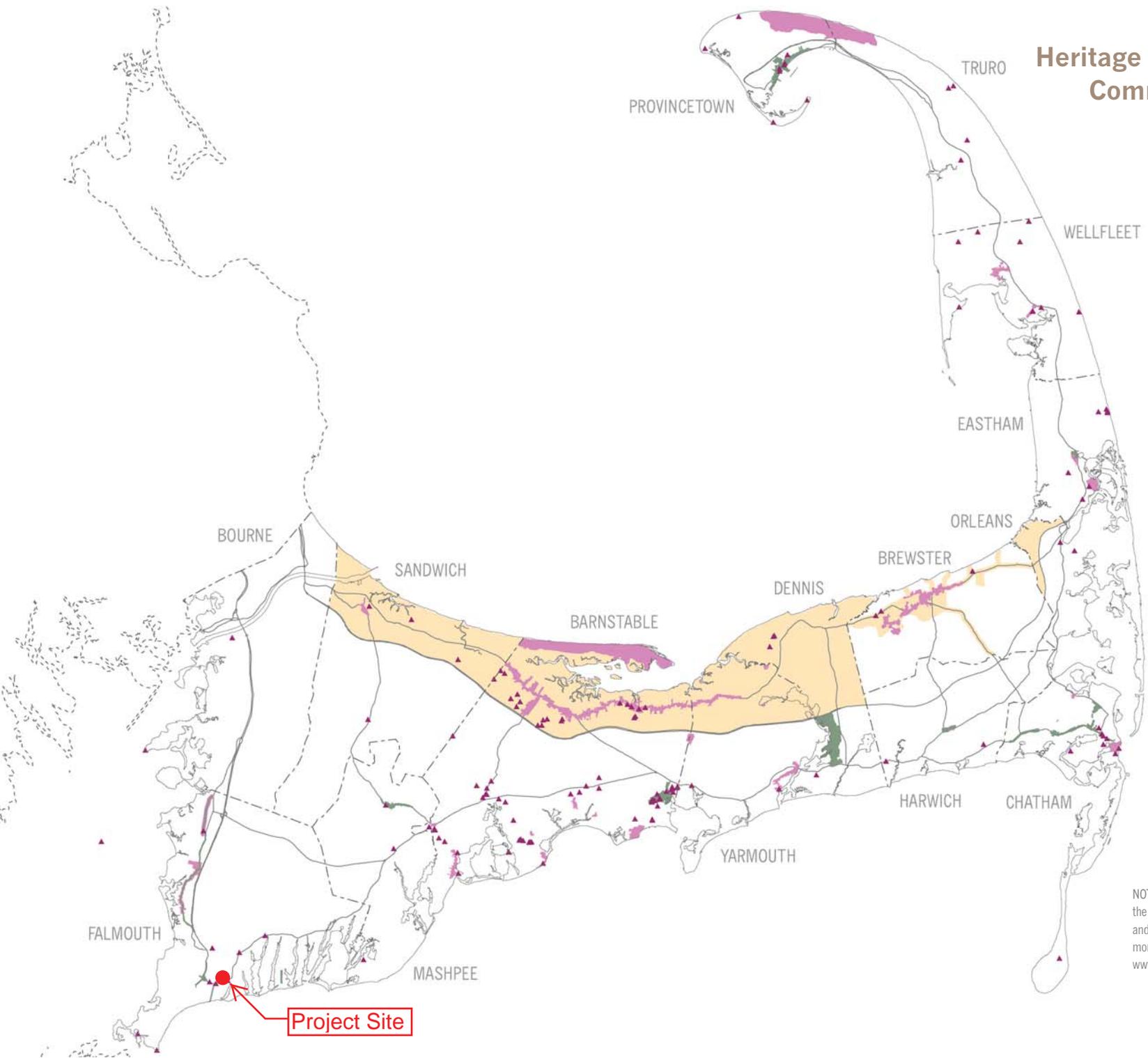
Map HPCC1

Historic Resources

Significant historic buildings in areas under high development pressures are in danger of being demolished. This map shows the Cape Cod properties that receive some protection through historic district review at the town or county level. Note: If a Local Historic District is also a National Register Historic District, the Local Historic District alone is visible on this map.

-  National Register Historic Properties
-  Local Historic District
-  National Register Historic Districts
-  Old King's Highway Regional Historic District

NOTE: All maps in the Regional Planning section of the Cape Cod Regional Policy Plan are for illustration and planning purposes only. They may be viewed in more detail online: www.capecodcommission.org/regionalplans/RPP/



Project Site

Massachusetts Cultural Resource Information

MACRIS

[MHC Home](#) | [MACRIS Home](#)

Results

[Get Results in Report Format](#)

PDF Spreadsheet

Below are the results of your search, using the following search criteria:

Town(s): Falmouth

Street No: 556

Street Name: main

Resource Type(s): Area, Building, Burial Ground, Object, Structure

For more information about this page and how to use it, [click here](#)

No Results Found.

[New Search](#)

[New Search – Same Town\(s\)](#)

[Previous](#)

[MHC Home](#) | [MACRIS Home](#)

