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TECHNICAL MEMORANDUM

TO: Mr. Bob Gambale, Chair Ipswich Zoning Board of Appeals

FROM: Bree D. Sullivan, P.E.

DATE: May 9, 2019

RE: Essex Pastures - Site Plan Revisions
Essex Road, Ipswich, MA

This memorandum has been prepared to provide a summary of the plan revisions and additional project design components since the last submittal. The plan set changes are in response to review comments and design review meeting with the peer review architect, Cliff Boehmer, of Davis Square Architects as well as comments from the board.

Site Design and Layout

1. The driveway passing the first (easterly) set of buildings has been straightened to allow a complete street tree planting strip between driveway and sidewalk.

2. The driveway passing the northerly building has been pulled away from the building 5 to 6 feet. This results in a buffer of approximately 20 feet from the curb to the face of the building.

3. The parking in front of the northerly multifamily buildings has been "flipped" so that cars will now park toward the green space with the driveway edge closest to the building in order to minimize vehicle headlight glare into the buildings.

4. Since residents living in the northerly buildings will be walking to the sidewalk from the parking spaces across the drive, the sidewalk now abuts the curb to create an improved pedestrian connection.

5. We examined the possibility of raising the pavement at the crosswalks, but it was felt that doing so would create problems with snow plowing and related maintenance, and raised crosswalks could redirect stormwater which would not be consistent with the proposed stormwater management facilities. Instead,

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crosswalks will be painted and otherwise completed in accordance with the standards set forth in the most recent edition of the Federal Highway Administration's Manual on Uniform Traffic Control Devices (MUTCD), and shall be in place prior to project occupancy.

6. As requested by the Board, the Applicant has added and depicted the pedestrian connection network (i.e., walkways, crosswalks) throughout the site and to Essex Road.

7. Parking space calculation information has been revised for Lot R (proposed residential project) and added for Lot H (remaining existing commercial lot).

8. As requested by the Board, the proposed "tot lot" has been moved to the greenspace which provides a more central location that is more readily accessible to all of the buildings.

9. In addition to the path that has been added through the central greenspace, the site plans have been revised to incorporate a comprehensive pedestrian network linking the residential buildings to the centralized common area as well as providing safe pedestrian access to Essex Road which connects to the existing Town sidewalk network.

10. Retaining walls have been added to the parking area on the rear lot line. With an average wall height of approximately 36 inches, the retaining wall along with proposed fencing and landscaping will provide a barrier that will block on-site vehicular headlights from the abutting properties.

11. Fire truck swept-path turning movement plans have been included. The state code minimum corner radius to accommodate fire apparatus is 25-feet. largest emergency vehicle apparatus operated by the Town of Ipswich is the Ipswich ladder truck. The turning movements of this vehicle dictate that a minimum corner radius of 30-feet is more appropriate for easier turns. As a result, all of the corner radii are have been designed to be a 30-foot minimum.

<u>Landscape Design, Lighting and Open Space</u>

12. Central Open Space/Common Area – programming of open space

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- The central open space/common area includes a total of 54,500 s.f., or approximately 1.3 acres of open area.
- Of the 1.3 acres, only 7,800 s.f. will be set aside and restricted as a bioretention area as depicted on the plans.
- The open space has now been designed with pedestrian connections to make this area the focal point for recreational and other outdoor opportunities for the residents.
- The limits of the open space area have also been carefully designed with landscape and hardscape elements to define the areas programmed.
- While these programmed areas have not been finally designed, the open space area will be programmed in a manner similar to other comparable residential communities and may include one or more of a combination of the following: a gazebo with surrounding patio and street furniture to encourage community gathering; pedestrian walkways which link pedestrians through and to the area from surrounding residences; pedestrian-scale lighting along walkways to encourage subtle lighting along landscaped pathways. The area can possibly be programmed for other activities as well such as a bocci court, volleyball court or other uses.

13. Site Lighting -- program for lighting

- Site lighting has been designed to be pedestrian scale, and is located along pedestrian walkways, parking areas, and entrance areas.
- Building lighting will include wall-pak lighting which will be downcast with coverage in areas such as along entranceways.
- Similarly, the site lighting will be “dark sky” compliant and will be downcast to ensure that lighting is focused in certain key areas of the site such as intersections between pedestrian paths and the roadways, as well as in parking areas.
- An updated photometric plan is attached and which demonstrates there is no light spillover onto abutting properties.

14. Landscaping and Screening

- The Applicant’s landscape architect has updated the Landscape Plan.
- As a part of this updated plan, the landscaping has been enhanced to define walkway areas. Benches and other street furniture may be added to encourage outdoor use and neighborhood gatherings.

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- The landscaping to the rear (easterly) and northeasterly boundaries of the site have been modified to provide a retaining wall on top of which are a dense set of plantings designed to provide enhanced buffering for 28 and 31 Heartbreak Road.
- A white vinyl fence of 6 feet in height has also been added in select locations to the rear (easterly) and northeasterly boundaries of the site to add an additional measure of screening to buffer adjacent properties from headlight glare.
- Retaining walls, plantings and fence areas not only serve to provide a solid screening between abutting properties, but also serve to mitigate any potential noise or activity at the proposed residential community.
- An updated plant list, as well as height and caliper of landscaping amenities have been provided.

Estimated Water Supply Demand (Domestic and Fire)

Calculations were performed to determine anticipated water demand. Data provided in the Water Demand and Supply Evaluation Report by AECOM dated February 2019 and water use data provided by the Ipswich Utilities Department was used to develop the numbers.

Essex Pastures Units:

Flows for residential units are based on 44 gallons per day per capita (gpcd) which is the 2018 average flow for residential properties in Ipswich. Flow estimates for other uses are obtained using 310 CMR 15.203.

Residential	172 Units	
	258 Bedrooms	
	387 People (1.5 people/bdrm)	17,028 gpd
Clubhouse	2,424 SF	182 gpd
Retail	8,000 SF	400 gpd
Food Service	3,000 SF (includes 28 seats)	980 gpd
	Total Average Day Demand (ADD)	18,590 gpd

For comparison purposes only, average water use over a three year period at 108/112 County Road (Powderhouse Village – 48 units/98 bedrooms/147 people) was 47 gpcd. Because Essex Pastures will include high-efficiency toilets (HET – 1.28 gpf), low-flow

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fixtures and unit sub-metering, this ADD is readily attainable. Landscape plantings are low-water tolerant. Supplemental water will be provided by a proposed on-site irrigation well.

Fire Protection

Calculations were performed to determine water main sizing based on providing adequate fire protection flows with sufficient residual pressure in the on-site system.

Existing hydrant flow test results

Location	30 Essex Road
Elevation	54
Static pressure	62 psi
Calculated Flow	623 gpm @ 20 psi

Based on these results, the existing water main has likely reached the end of its service life. As a result, the proposed project will include replacing the water main on Essex Road from the County Road intersection to south property line of the proposed residential development site (approximately 2,000 feet) with a new 8-inch diameter water main.

The following data was used for on-site water main calculations:

Sprinkler Flow (from fire protection engineer)		300 gpm
Hydrant Flow 2 hydrants @ 250 gpm/hydrant		500 gpm
	Total	800 gpm
	Say	1,000 gpm

Pipe Material	AWWA C-900 PVC
Pipe Diameter	6 inch
Allowable Headloss for fire flow	10 ft/100 feet
Pipe Length	800 feet
Calculated headloss	5.43 feet/100 feet
Total headloss	43.4 feet
	19 psi
Pipe Velocity (DR-18 diam = 6.08 inches)	11 ft/s

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Estimated Sewer Flow Demand

Sewer flow demand and infrastructure requirements have been calculated using the anticipated flows based on Water demand estimates and 310 CMR 15.203 flow rates. The existing sanitary collection system serving the site currently flows via gravity to an on-site duplex pump station. The effluent is pumped to an existing on-site manhole that is adjacent to Essex Road. Effluent flows via gravity from the manhole to the municipal sewer system. The existing pump station was placed into service in the summer of 2002.

Design Flow from Essex Pastures 172 residential units 3,000 SF Food svc. 8,000 SF Retial	18,590 gpd
Existing design flow from Medical offices (6 doctors @ 250 gpd/doctor)	1,500 gpd
Existing Design Flow from Retail/Office (2,000 SF @ 75 gal/1,000 SF)	150 gpd
Existing Residential (8 bedrooms x 110 gal/bedroom)	880 gpd
Total Flow	21,120 gpd
Peak Flow	116,160 gpd (259 gpm) (using TR-16 peak factor=5.5)
Existing single pump capacity	325 gpm @ 33 feet TDH

Calculations show that anticipated sewer peak flow is less than the capacity of one of the two existing pumps. As a result, the project will include upgrades to the existing pump station including the installation of a standby backup electric generator, new controls building and revised float level elevation settings to accommodate the anticipated increase in flow to the system. With the proposed upgrades, the pump station will meet the applicable requirements of the NEIWPCC TR-16 for wastewater

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pumping stations. As such, the existing pump station (as modified) will be adequate to handle the proposed flows.

Because the pumping rate will remain unchanged, under the proposed peak design daily flow conditions, there will be no increase in the flow rate of effluent to the municipal system.