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January 10, 2017

Ms. Julie Mercier, AICP, LEED AP
Community Development Director
Town of Reading
16 Lowell Street
Reading, MA 01867

Subject: **Engineering Peer Review Services for
Traffic and Parking at the Proposed
“Reading Village” at 2 Prescott Street
and 35-39 Lincoln Street**

Dear Ms. Mercier:

On behalf of the Town of Reading, Green International Affiliates, Inc. (Green) is submitting this letter report of the findings from our engineering peer review of the proposed parking layout and three alternatives for a loading layout at the proposed “Reading Village” at 2 Prescott Street and 35-39 Lincoln Street. The scope of this review includes a review of the proposed site plans as they relate to parking layouts and loading zone locations at the proposed site, and provides recommendations regarding the feasibility of the proposed parking and loading configuration, as well as recommendations for the efficient management of the parking spaces.

This review included an examination of the following documents submitted in support of the proposed project:

- Plan titled “Proposed Parking Layout – Proposed Site Plan – 2 Prescott St. & 35-39 Lincoln St., Reading, Massachusetts”, prepared by DeCelle-Burke & Associates, Inc., dated September 12, 2016 and containing 1 sheet (Sheet 5 of 8). This plan is considered to be “Loading Option 1”.
- Plan titled “Proposed Parking Layout – Proposed Site Plan – 2 Prescott St. & 35-39 Lincoln St., Reading, Massachusetts”, prepared by DeCelle-Burke & Associates, Inc., revised December 6, 2016 and containing 1 sheet (Sheet 5 of 8). This plan is considered to be “Loading Option 2”.
- Plan titled “Proposed Parking Layout – Proposed Site Plan – 2 Prescott St. & 35-39 Lincoln St., Reading, Massachusetts”, prepared by DeCelle-Burke & Associates, Inc., revised December 6, 2016 and containing 1 sheet (Sheet 5 of 8). This plan is considered to be “Loading Option 3”. This plan also depicts the current parking layout that we reviewed from an operations and management perspective.
- Plan titled “Proposed Parking Layout – Proposed Site Plan – 2 Prescott St. & 35-39 Lincoln St., Reading, Massachusetts”, prepared by DeCelle-Burke & Associates, Inc., revised December 6, 2016 and containing 1 sheet (Sheet 5 of 8) with vehicle turning movements. This plan was submitted by the Applicant in support of the proposed Parking Layout, with vehicle turning movements shown maneuvering within the parking layout. This plan is considered to be “Turning Maneuvers”.

Parking Layout

The latest parking plan shows 49 perpendicular [9-foot by 18-foot] parking spaces, seven parallel [9-foot by 22-foot] parking spaces, four accessible spaces [8-foot by 18-foot plus shared spaces], and 25 compact perpendicular [8-foot-6-inch by 16-foot] for a total of 85 off-street parking spaces. The proposed 85 parking spaces provides a ratio of 1.25 parking spaces to residential units (68) proposed at the site. It is noted that under "Loading Option 3", an additional perpendicular parking space is provided near the Lincoln Street driveway.

The width of the two-way aisles adjacent to the perpendicular parking spaces is 24 feet, which is consistent with general industry practice. The aisle width in the one-way section of the parking lot varies between 18-21.2 feet, with the narrowest point (18 feet), between a compact space and a parallel parking space.

Green offers the following comments and recommendations regarding the currently proposed parking layout:

1. Of the total number of parking spaces, 29.5 percent would be compact parking spaces. This is generally consistent with typical industry practices, and is less than the maximum percentage allowed to be allocated to compact spaces in the zoning bylaws of several other Massachusetts municipalities^{1,2}.
2. A concern with compact parking spaces is that drivers with large vehicles attempt to squeeze into the compact spaces, or if driving a large enough vehicle, park across multiple spaces³. Another concern is that residents or guests may drive around the site to look for preferably large parking spaces, impacting site circulation. Assigned parking would eliminate the problem of residents circulating the lot to find the most desirable (i.e. non-compact) spaces. Assigned parking would also eliminate the possibility of residents with large vehicles parking across multiple compact spaces. To similarly reduce the problem of vehicles excessively circulating within the site, visitor parking would be restricted to the larger parking spaces so that non-residents with large vehicles will not park across multiple compact spaces.
3. The possibility of providing dual-use parking spaces (that is, parking spaces that during the nighttime are allocated to site residents but which may be used by visitors during the daytime hours) is most feasible if individual parking spaces are *not* assigned to residential units. If individual parking spaces were assigned to residents, in the event that a resident returns home or stays home during the daytime hours in which visitor parking is allowed, the capacity of visitors' vehicles would be less than what was planned for. Alternatively, residents with assigned and dual-use spaces returning home early on a weekday could find "their" spot taken by a visitor. Allowing dual-use parking would thus create a scenario in which it is preferred not to have assigned parking. However, as noted above, assigned parking for residents would improve the functional feasibility of providing compact parking spaces. Green recommends not allowing dual-use parking spaces, and assigning individual spaces to residents, with a group of visitor-only parking spaces.
4. Assuming that each residential unit is assigned one parking space, the total number of visitor parking spaces is 17 spaces. Four of these spaces are accessible spaces, leaving 13 parking spaces available

¹ City of Woburn Zoning Bylaws, Section 8.2, 1985 amended 2016.

² City of Marlborough Zoning Bylaws, Section 650-48 C, 2002.

³ Urban Land Institute, National Parking Association. *The Dimensions of Parking*. Fifth Ed. Washington, D.C. 2010.

for general visitors. Green recommends allotting these 13 visitor parking spaces near either of the driveways to visitors, so as to reduce the number of circulating vehicles.

5. On-street parking is currently allowed during daytime hours on many of the roadways surrounding the project site, including Lincoln Street and Prescott Street. If the on-site visitor parking is fully occupied, the on-street parking in the area surrounding the site will be used as overflow visitor parking. Green recommends that on-street parking should be restricted for a minimum distance of 20-feet on either side of the project site driveways in order to provide and maintain the required lines of sight for the driveways to operate in a safe manner.
6. The aisle width for the westernmost perpendicular spaces along the one-way aisle is 22 feet, which is one foot less than the 23 feet minimum aisle width recommended by the Urban Land Institute for perpendicular parking spaces. However, at the east side of the aisle is four feet of striped pavement, so the maneuvering space exists. Green recommends restriping the aisle to be 24 feet wide for consistency with the circulating aisles for perpendicular parking and the driveway width at Prescott Street.
7. The Do Not Enter Sign on the western aisle should not be located within the circulating aisle and should be moved to the striped area adjacent to the column.

Parking Turning Maneuvers

The “Turning Maneuvers” plan shows turning movements of a small vehicle accessing the compact spaces proposed south of the building. The compact vehicles depicted in the “Turning Maneuvers” plan have the following dimensions are 15 feet long and six feet wide. The compact vehicles are shown being able to negotiate the aisle between the compact spaces.

The regular-sized vehicle for which a parallel parking maneuver is tested corresponds in size to that of the standard Passenger Car as defined by the American Association of State Highway and Transportation Officials (AASHTO) in A Policy on Geometric Design of Highways and Streets, 6th Ed., and is 19 feet long and seven feet wide.

8. The “Turning Maneuvers” plan does not depict a vehicle maneuvering out of the westernmost compact space without encroaching upon the parallel parking spaces south of it, where the aisle width is the minimum 18 feet. Green has conducted turning movements (using the same compact vehicle) and has found that parking maneuvers **are** feasible at the westernmost compact parking spaces.
9. Green notes a slight discrepancy between the southwestern parallel parking striping parking layout plan and the “Turning Maneuvers” plan. In the southwest corner of the parking lot, the parking layout plan shows raised curb adjacent to the westernmost parallel parking space. In the “Turning Maneuvers” plan, this corner is shown as painted instead of raised and curbed off, thereby allowing a vehicle to maneuver into the westernmost parallel parking space should the two nearest parking spaces be occupied. The project applicant has confirmed that this area is needed for parking maneuvers and will not be curbed. Green notes that even with the area striped for parking maneuvers, it will be awkward for a parked vehicle to exit the westernmost parallel parking space, though it is feasible.

Loading Zone Location

Three options for truck loading zones are offered by the project applicant, the locations of and impacts to surrounding space of which Green reviewed. Green offers comments and recommendations concerning the functionality and safety each of the three alternatives:

Loading Option 1

Option 1 depicts a 12-foot by 30-foot loading zone in front of the proposed building, immediately behind the sidewalk and the curb ramps on the southern corner of the intersection of Lincoln Street at Prescott Street.

10. The loading zone is smaller than the minimum 12-foot by 35-foot space required by the Town zoning bylaws. Given the proximity of this loading zone to one of the proposed building entrances, it is possible that the entrance could be fully or partially blocked while a vehicle is using the loading area.
11. It is not clear how a truck would safely access the loading area at this location. To access this loading area, a truck would either need to drive over the Prescott Street sidewalk and curb ramps, or drive over the Lincoln Street sidewalk, or both. This could create unexpected conflicts with pedestrians. Heaving vehicles driving over the sidewalk repeatedly could also damage the sidewalk (if a typical sidewalk pavement structure is provided) and may result in additional maintenance costs to the Town. Depending on the truck maneuverability into and out of this loading area, it is also possible that proposed landscaped areas could be impacted.

Loading Option 2

The loading zone in the "Option 2" plan is shown as a 17-foot by 30-foot area on the side of the proposed building, adjacent to the Lincoln Street site driveway. The proposed curb cut for this driveway would be widened to accommodate the loading zone.

12. The "Option 2" loading zone creates a large curb cut on Lincoln Street. Green recommends providing a raised island between the 24 ft wide driveway opening and the proposed loading zone (behind the sidewalk) to provide better definition to the driveway and loading areas. Additionally, a raised island would provide an area for the proposed STOP sign.

13. To clearly define the loading zone area, a MUTCD standard R7-6 "NO PARKING LOADING ZONE" sign is recommended to be installed (pictured to the right).



R7-6

14. The loading zone is shorter by five feet than the minimum 12-foot by 35-foot space required by the Town zoning bylaws. Although the defined loading area extends to the property limits, three feet separate the front of the loading zone and the back of sidewalk. Presumably, the Town standard loading zone size of 12 feet by 35 feet includes some space to allow loading objects into and out of a vehicle. As long as a parked vehicle in the loading zone does not impede the sidewalk, it is expected that there would be sufficient space for loading objects into and an out of a vehicle at this location.

Loading Option 3

Under Option 3, the six 9'x22' parallel parking spaces are proposed to be dual-use, to provide three 9'x44' loading spaces. This loading area is proposed to be south of the building.

15. One potential issue that could arise from this scenario is that trucks would need to drive under the building to access the loading zone. The podium height clearance underneath the proposed building is proposed to be to be 7 feet 6 inches at its lowest point, and 8 feet 2 inches in general. Trucks may

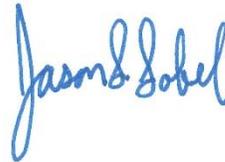
experience difficulty in accessing the loading area and the types of trucks that can access this area would be restricted by the height limits. Trucks accessing the loading zone in Option 3 would also have to drive further into the site and hence potentially have a greater impact on site residents. As discussed earlier, dual-use parking spaces are not as feasible with individually assigned parking spaces for residents (as recommended to improve the functional feasibility of the proposed compact parking spaces).

16. The loading zone as depicted in the "Option 3" plan is narrower by three feet than the minimum 12-foot by 35-foot space required by the Town zoning bylaws. As a result, larger vehicles may extend into the 18 ft wide aisle, and potentially restrict movements into and out of the westernmost compact parking space.

Based on our comments above, the proposed Loading Option 2 is recommended as it provides the most feasible and functional loading zone, with the fewest conflicts.

Should you have any questions regarding this Peer Review please do not hesitate to contact me.

Sincerely,
Green International Affiliates, Inc.



Jason S. Sobel, P.E., PTOE
Project Manager