

September 1, 2022

To:

Alaa M. Abusalah , Director of Development & Inspectional Services/Town Planner
 Leicester Development and Inspectional Services
 3 Washburn Square
 Leicester, Massachusetts 01524

A&M Project #:

2889-01

Re:

ZBA Special Permit
 651 Main Street
 Map 21/Parcel B5.1

Copy:

Dear Ms. Abusalah

On behalf of our client, MKEP 770, LLC, the Applicant, Allen & Major Associates, Inc. is filing a Special Permit Application with the Board of Appeals to support the construction of a proposed subdivision/site plan off Main Street in Leicester, Massachusetts as portion of the project area lies within the Water Resources Protection Overlay District (Section 7.1.04.2.a). The project includes land depicted on the Assessor's Map #21 as Parcel B5.1 (651 Main Street), owned by 651 Main Street, LLC. The plans submitted intend to depict the land encompassing the subdivision & site plan based on the Existing Conditions Plan created by Allen & Major Associates, Inc. Dated: July 16, 2021.

It is the intent of the applicant is to subdivide the existing parcel into five separate lots, four (4) of which will be fee-simple lots have direct access to Main Street meeting the current zoning requirements (ANR plans to be prepared separately). The fifth and final lot will encompass the remaining land area and will be developed into a private residential development consisting of 2 family duplexes. The Project proposes to construct 46 duplex units consisting of two single-family residential dwellings, each consisting of approximately 2,188 square feet and have building coverage percentages ranging from 9.8% to 19.3% where 33% is allowed. (*SPR Section II, E-1b*). Access/egress to 86-units is serviced by the Project's proposed site driveway which connects to the southerly side of Main Street. An additional 6-units, in the form of three (3) duplexes will directly access Main Street with standard residential driveways.

The project property is approximately 29.78 acres and is located along the southwestern side of Main Street; (*SPR Section II, E-1b*). The majority of the property consists of mainly woodland and brush, with a brook and small wetland pockets near the property's boundary. Electrical utility lines and a tower are located at the southwestern portion of the parcel. As stated above, the existing electrical utility lines will be separated from the development and protected by a 250 foot electric easement.

As part of the proposed development, three interconnected roadways will be constructed to provide access to the individual dwelling units. Although the project will remain private under a home owner association model, the roadways are proposed to be 28-foot wide with a sidewalk to be in harmony with the local subdivision requirements. The primary access will be situated along Main Street approximately 500 feet southeast of Waite Street intersection with a secondary access via an extension of Colonial Drive. Gated emergency access is proposed via an existing residential driveway to #747 Main Street on the westerly end of the property

Along with the construction of the proposed roadway, several other utility improvements will be provided as part of the overall development. The project stormwater management system will be addressed through the construction of a closed drainage system which includes catchbasins and drainage manholes to capture the surface runoff. Through the use of hydrodynamic separator treatment devices, the collected stormwater will then be directed to one of several detention systems for peak rate mitigation and stormwater treatment. A comprehensive review of the drainage system and watersheds has been performed and the Grading & Drainage Plan depicts the anticipated drainage system for the project. A full stormwater analysis has been provided as part of the Site Plan submittal.

Compliance with §7.1.04, 2, a.

Proposed Conditions – Peak Rate of Runoff

The stormwater runoff analysis of the existing and proposed conditions includes an estimate of the peak rate of runoff from various rainfall events. Peak runoff rates were developed using TR55 Urban Hydrology for Small Watersheds, developed by the U.S. Department of Commerce, Engineering Division and the HydroCAD computer program. Further, the analysis has been prepared in accordance with the MassDEP and the town requirements and standard engineering practices. The peak rate of runoff has been estimated for each watershed during the 2, 10, 25, and 100-year storm events.

As the Water Resources Protection Overlay District (WRPOD) bisects the parcel, the analysis points which comprise stormwater flows toward the WRPOD are listed as Study Point #3 and Study Point #4. The stormwater runoff model indicates that the proposed site development reduces the rate of runoff during all storm events at the identified points of analysis. The following tables provide a summary of the estimated peak rate, in Cubic Feet per Second (CFS) and total runoff volume, in cubic-feet (CF) of the points which direct flow toward the WRPOD.

STUDY POINT #3 (Existing Wetland East)				
	2-Year	10-Year	25-Year	100-Year
Existing Flow (CFS)	3.94	10.91	17.41	32.17
Proposed Flow (CFS)	3.62	10.42	13.62	26.15
Change (CFS)	-0.32	-0.49	-3.79	-6.02
Existing Volume (AF)	0.644	1.482	2.243	3.954
Proposed Volume (AF)	1.114	2.311	3.330	5.532
Change (AF)	0.470	0.829	1.087	1.578

STUDY POINT #4 (Existing Wetland West)				
	2-Year	10-Year	25-Year	100-Year
Existing Flow (CFS)	1.57	3.91	5.98	10.55
Proposed Flow (CFS)	0.75	1.62	2.36	3.93
Change (CFS)	-0.82	-2.29	-3.62	-6.62
Existing Volume (AF)	0.144	0.329	0.495	0.869
Proposed Volume (AF)	0.056	0.012	0.171	0.287
Change (AF)	-0.088	-0.317	-0.324	-0.582

MASSDEP Stormwater Performance Standards

The MA DEP Stormwater Management Policy was developed to improve water quality by implementing performance standards for stormwater management. The intent is to implement the stormwater management standards through the review of Notice of Intent filings by the issuing authority (Conservation Commission or DEP). The following section outlines how the proposed Stormwater Management System meets the standards set forth by the Policy.

BMP's implemented in the design include:

- Deep Sump Catch Basins
- Proprietary Separators (CDS units)
- Detention Systems (Basin)
- Level Spreaders (Gabion Wall)
- Outlet Control Structures

The existing annual recharge for the site has been approximated in the proposed condition. There are proposed dry wells that are designed to meet this requirement. The proposed Recharge Volume is based on the Static Method per the MA DEP Stormwater Management Standards, Volume 3, Chapter 1. As part of the overall design, including areas outside of the WRPOD, drywells have been utilized to provide the required recharge to the site. As noted in the submitted HydroCAD model, each drywell has the capacity of 0.005af (196 cubic feet) of storage. Refer to nodes DW-1 through DW-12 which has consolidated the proposed drywells.

Summary for Pond DW-11: House Drywell

System sized based on standard 1,000g drywell at each dwelling unit.
Storage multiplier added to account for number of dwelling units with subcatchment.
Area multiplier adjusted to the account for the percentage of roof area within subcatchment.

Additionally as noted in the appendix of the previously submitted drainage analysis, there is to be 45 drywells installed which in combination exceed the required recharge.

$$\begin{aligned} \text{Total Site Volume required to be recharged} &= \\ 416,172 \text{ sf} \times 1" / 12 \times 0.25 \text{ in} &= \mathbf{8,794 \text{ cf}} \\ \\ \text{Site volume recharge provided by} &= \text{volume within residential drywells} \\ 45 \text{ Drywells at each grouping of homes} & \qquad \qquad \qquad \text{Volume} = 196 \\ \\ = \mathbf{8,820 \text{ c.f. Total Volume Recharged}} & \qquad \qquad \qquad > \mathbf{8,794 \text{ cf}} \quad (\text{OK}) \end{aligned}$$

Environmental Analysis

As this proposed site plan will be creating ten (10) or more family units, an Environmental Analysis has been provided herein. Many of the items outlined within the Environmental Analysis have been detailed within other plans or within the stormwater report, below is a summary of the specific items of concern.

a.) The same data as on the Site Plans

Refer to plans prepared by A&M dated September 1, 2022 consisting of approximately 31 sheets.

b.) Topography at two foot contour intervals, with graphic drainage analysis; indication of annual high water mark, location of existing structures, including fences and walls, and watershed boundaries.

Topographic information is shown on Sheet V-101 including existing structures, fences, walls and delineated resource areas. The existing and proposed watershed plan were prepared and included within the submitted Stormwater Report, refer to Sheet WS-1 and WS-2.

c.) Vegetation cover analysis, including identification of general cover type (wooded, cropland, brush, wetland, etc.); location of all major tree groupings, plus other outstanding trees or other botanical features; important wildlife habitats; and identification of areas not to be disturbed by construction.

The vast majority of the site consists of wooded cover with some areas of grass and brush. There are also several areas of delineated resource areas adjacent to Colonial Drive and Henshaw Street. Additionally, the southwest section of the property is bisected by an existing electrical transmission line easement. The areas can be seen on Sheet V-101. As part of the stormwater analysis for the project both the existing and proposed surface covers were calculated. A summary of these areas are listed below and additional information can be found in the stormwater report in Section 4 and Section 5.

Existing

Area (acres)	Description (subcatchment-numbers)
1.734	>75% Grass cover, Good
2.164	Brush, Good
0.071	Paved parking
25.418	Woods, Good

Proposed (SPR Section II, E-1a)

Area (acres)	Description (subcatchment-numbers)
11.816	>75% Grass cover, Good
2.057	Brush, Good
6.799	Paved parking
4.622	Roofs
3.724	Woods, Good

The proposed 98 dwelling units are encompassed within the proposed subcatchments area including driveways and roadways. Based upon the HydroCAD analysis included in the Drainage Report, the total project site will be approximately 30.48% impervious cover. Refer to Drainage Report for additional information. A separate calculation specific to the area directly within the Watershed Overlay District has been provided herein.

d.) Soil types, based on United State Department of Agriculture (USDA) soils study; approximate ground water level, location and results of soil percolation or other sub surface tests.

As the project is proposed to be on municipal sewer, soil percolation tests were not performed on the site. Published soil information from USDA and NRSC were utilized to approximate a design infiltration rate for the proposed roof drainage infiltration system.

e.) Visual analysis, including analysis of scenic vistas, and locations of visual prominence.

Although the project is situated on an elevated portion of the site, there are no significant scenic vistas that will be created nor impacted as part of the project.

f.) Location of surface water bodies, wetlands, aquifer or recharge areas for existing or potential drinking water supplies.

The vast majority of the site consists of wooded cover with some areas of grass and brush. There are also several areas of delineated resource areas adjacent to Colonial Drive and Henshaw Street. Additional, the southwest section of the property is bisected by an existing electrical transmission line easement. The areas can be seen on Sheet V-101.

The following narrative will set to document the following, with reference to the above maps as germane.

a) Impact upon surface water quality and level.

As part of the proposed project, impacts to surface water quality will be enhanced through the implementation of a new stormwater collection system. The stormwater collection system is a series of inlets located at low points within the limits of the paved area. All of the proposed on-site catch basins incorporate a deep sump and hooded outlet. The catch basins are connected by a closed gravity pipe network that pass through proprietary separators prior to entering the pipe detention systems or gabion walls.

The proposed stormwater management system has been designed to remove 80% of the average annual post-construction load for each treatment train. The TSS removal calculations can be seen within the appendix of the stormwater report. Structural Pretreatment BMPs consisting of Deep sump catch basins, also known as oil and grease or hooded catch basins, are underground retention systems designed to remove trash, debris, and coarse sediment from stormwater runoff, and serve as temporary spill containment devices for floatables such as oils and greases. Further treatment is provided via a proprietary separator this is a flow-through structure with a settling or separation unit to remove sediments and other pollutants. They typically use the power of swirling or flowing water to separate floatables and coarser sediments, are typically designed and manufactured by private businesses, and come in different sizes to accommodate different design storms and flow conditions.

As a further management system, a Long-Term Operation & Maintenance (O&M) Plan has been developed for the proposed stormwater management system and is included within the stormwater report. The purpose of the O&M is to identify potential sources of pollution that may affect the quality of stormwater discharges, and to describe the implementation of practices to reduce the pollutants in stormwater discharges.

b.) Impact upon ground water quality and level.

As indicated above, the proposed project, impacts to surface water quality will be enhanced through the implementation of a new stormwater collection system which will provide for pretreatment. The existing annual recharge for the site has been approximated in the proposed condition. Groundwater recharge will be provided through the use of proposed dry wells that are designed to meet this requirement. The proposed Recharge Volume is based on the Static Method per the MA DEP Stormwater Management Standards, Volume 3, Chapter 1. See the appendix located at section 6 of this report for stormwater recharge calculations.

c.) Effects on important wildlife habitats, outstanding botanical features, scenic or historic sites or buildings.

The property contains several areas subject to the Wetland Protection Act, all of which being outside direct impacts associated with the proposed roadway construction. These areas have been delineated by Gove Environmental Services, Inc. and are depicted on the Proposed Subdivision Plan. Some of the proposed drainage detention/infiltration basins are proposed to be located within the buffer zone and a filing with the Conservation Commission will be required. This will be made concurrent with the Definitive Subdivision review process.

Upon review of the Commonwealth's published data, there were no Areas of Critical Environmental Concern (ACEC); Outstanding Resource Waters (ORWs) nor areas of Priority and Protected Habitat for rare and endangered species located within the project limits. See Exhibit 3.4 within the submitted stormwater report.

At the time of writing this letter a Notice of Intent has been obtain from the Leicester Conservation Commission (DEP 197-0677) dated November 10, 2021

d.) Capability of soils and vegetative cover to support proposed development without erosion, silting or other instability.

Existing Soil Conditions: The on-site soils were identified using the USDA Natural Resources Conservation Services (NRCS) Soil Survey for Worcester County. The site contains a range of soil types including: Ridgebury, Whitman, Paxton, Woodbridge, Charlton, Canton, and Udorthents. The majority of the site is made up of Paxton fine sandy loam. A copy of the NRCS Custom Soil Resource Report is included in the appendix of the stormwater report.

A plan to control construction-related impacts, including erosion, sedimentation and other pollutant sources during construction has been developed. A detailed Erosion and Sedimentation Control Plan is included in the Permit Drawings. Refer to Sheet C-100 for location of proposed erosion control measure and Section 2 of the Stormwater Report for additional information. The proponent will prepare and submit a Stormwater Pollution Prevention Plan (SWPPP) prior to commencement of construction activities that will result in the disturbance of one acre of land or more.

The proposed stormwater management system for the site will control the Peak Rate of Runoff through the use of deep sump catch basins, pipe detention systems, a detention basin, outlet control structures, and gabion walls (level spreaders). These systems have been designed in accordance with the MA DEP Stormwater Management Policy to recharge groundwater and reduce rate of runoff from the parcel.

e.) Relationship to Massachusetts General Laws, Chapter 131, Sections 40, (Wetlands Protection Act) and Town Wetland Bylaw.

The property contains several areas subject to the Wetland Protection Act, all of which being outside direct impacts associated with the proposed roadway construction. These areas have been delineated by Gove Environmental Services, Inc. and are depicted on the Proposed Subdivision Plan. Some of the proposed drainage detention/infiltration basins are proposed to be located within the buffer zone and a filing with the Conservation Commission will be required. This will be made concurrent with the Definitive Subdivision review process.

f.) The report shall estimate the proposed traffic flow in relation to the roadways giving access to the subdivision.

Traffic

TEC, Inc. (TEC) has been retained by MKEP 770, LLC (the "Applicant") to prepare a Traffic Impact Assessment (TIA) associated with the proposed Skyview Estates (the "Project"). Traffic generated by the proposed residential development was determined based on the "Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition". The trip generation rates were based on Land Use Code 270, defined as a Residential Planned Unit Development. The estimated vehicle trips generated are shown in the following table:

The estimated vehicle trips are shown in the following tables:

Weekday	Total	Incoming	Outgoing
Daily	742	273	273
AM Peak	49	15	34
PM Peak	59	34	25

TEC has evaluated the traffic operations for the study area under existing and future conditions consistent with the Transportation Impact Assessment (TIA) Guidelines issued by the Massachusetts Department of Transportation (MassDOT) and the standards of the Traffic Engineering and Transportation Planning professions for the preparation of such reports. The future year examines traffic operations under a 7-year planning horizon (2028) for traffic-volume projections, which includes an evaluation of the build conditions (with site traffic added). A copy of the report has been included in this submission. Additionally, as part of the permitting process, a driveway access permit has been initiated through the Massachusetts Department of Transportation as Main Street, aka Route 9 as is currently under review.

g.) The report shall estimate the effect of the project on public services, such as water, sewer, schools, police, fire and highway department.

Water & Sewer

Both water and sewer will be provided through municipal services. In a letter obtained from Cherry Valley Sewer District, the project is available for hook-up to the public sewer system. The project proposes sewer manholes to be placed within the newly aligned roadways at various locations to collect sewage and direct it to the existing municipal sewer system along Main Street. In a letter obtained from Leicester Water Supply District, there is adequate water supply for the proposed development. Domestic water for the property is intended to be sourced from the existing municipal water main within Main Street.

Police, Fire & Highway Department

Based on email correspondence received from Fire Chief Dupuis and Police Chief Antanavica, they have both met on site to review the proposed project and do not have any concerns at this time. Street lighting is being proposed which will help deter suspicious activities from taking place within the development. The project proposes a new municipal water service, including strategic placement of fire hydrants throughout the development to lessen the burden on any potential firefighting activities that may occur.

Schools

All of the 86 dwelling units, will have a layout which places the living quarters all on the first floor including 2 bedrooms and 1 office area (that could be a bedroom). Based on the new alignment of the project, the spacing of the proposed homes and interior configuration of the homes, this is more conducive to young professionals or older couples without children, so it is presumed that these units would not have an impact on the school system.

It is anticipated that approximately 15% of the units will be marketed or sold with an option to expand the unit layout to include a total of 4 bedrooms which is more desirable for potential families with children. Based upon this presumption and the local average of 2.0 children per dwelling unit, it is anticipated that the project could produce 26 school age children. Based on discussion with school superintendents office about the impact on the schools for 86 homes. Here is what she said and the reports from the state.

1. K-4 would put a strain on the system, the school is at capacity.
2. Middle School - They can handle the new homes.
3. High School - They can handle the new homes.

Special Permit Criteria Evaluation

1. *Such use will not nullify or substantially derogate from the intent and purpose of this Bylaw;*
The proposed use (duplex) will not alter the general character of the surrounding area nor impair the intent or purpose of said bylaw because the proposed use conforms to the existing residential dwellings in the area. Although there are proposed to be 92 dwelling units of slightly varying size and configuration, the same general characteristics will be consistent, including separated building entrances and buffered driveways to aid in the appearance of each being a separate unit.
2. *Such use will not constitute a nuisance; and*
As the proposed project is for a residential development in accordance with Town standards, it will not constitute a nuisance to the surrounding area. Through the development of comprehensive stormwater management system, the site will control post development stormwater flows to below predevelopment conditions. Additionally, an extensive erosion control plan has been prepared, included a construction phase protections to prevent erosion concerns to abutting properties.
3. *Such use will not adversely affect the neighborhood in which the lot is situated.*
The proposed residential development which includes forty six (46) duplexes will not adversely affect the surrounding neighborhoods as the layout has been designed to provide a consolidated entrance to the project along Main Street (Route 9). The proposed duplex home, although connected, are designed to provide a sense of separation through the placement of interior spaces as well as landscape buffers.
4. *Such use complies with the Standards for Site Plan Approval in the Leicester Zoning Bylaw.*
The proposed use (duplex) will not alter the general character of the surrounding area nor impair the intent or purpose of said bylaw because the proposed use conforms to the existing residential dwellings in the area.

5. *Provision shall be made for convenient and safe vehicular and pedestrian circulation within the site and in relation to adjacent streets and property. The service level of adjacent streets shall not be significantly reduced due to added traffic volume or type of traffic in accordance with the most recent edition of the Massachusetts Highway Department Highway Capacity Manual;*
The proposed residential development will be interconnected with paved roadways meeting the width of required by the subdivision regulations, including the installation of paved sidewalks. The added traffic volume is not anticipated to negatively impact the existing network. Please refer to Traffic Impact Analysis prepared by TEC, Inc.
6. *The proposed use shall not overload the capacity of water and sewer systems, storm water drainage, solid waste disposal facilities, and other public facilities;*
Both water and sewer will be provided through municipal services. In a letter obtained from Cherry Valley Sewer District, the project is available for hook-up to the public sewer system. The project proposes sewer manholes to be placed within the newly aligned roadways at various locations to collect sewage and direct it to the existing municipal sewer system along Main Street. In a letter obtained from Leicester Water Supply District, there is adequate water supply for the proposed development. Domestic water for the property is intended to be sourced from the existing municipal water main within Main Street.
7. *The design of the project shall provide for adequate methods of disposal of sewage, refuse, or other wastes generated by the proposed use;*
The subject is serviced by municipal sewer and a new collection system has been designed to service the individual building units. As the project will remain private under a home owner association model, trash collection will be handled by a private trash hauler. The project proposes the installation of several dumpster enclosures throughout the project and which will be screened from view.
8. *The project shall comply with all applicable environmental laws and regulations;*
The project will comply with applicable environmental laws and regulations through the implementation of comprehensive stormwater management system and permitting through the local conservation commission.
9. *The proposed project shall be consistent with Leicester's Master Plan; and,*
As the proposed project is for a residential development in accordance with Town standards and is consistent with Leicester's Master Plan..

Site Plan Review Criteria (Section 5.2.05 of the Zoning By-law)

- A. *The use complies with all the provisions of the Leicester Zoning By-Law; (SPR Section II, E-1a)*
The proposed use (duplex) will not alter the general character of the surrounding area nor impair the intent or purpose of said bylaw because the proposed use conforms to the existing residential dwellings in the area. As the proposed use is residential in nature, there will be no employees nor hours of operation.
- B. *General description of the size of proposed structures, lot size, and building coverage %. In the Watershed Overlay District, include total impervious area*
The proposed use (duplex) will not alter the general character of the surrounding area nor impair the intent or purpose of said bylaw because the proposed use conforms to the existing residential dwellings in the area. Although there are proposed to be 92 dwelling units of slightly varying size and configuration, the same general characteristics will be consistent, including separated building entrances and buffered driveways to aid in the appearance of each being a separate unit.

- C. *The use will not materially endanger or constitute a hazard to the public health;*
As the proposed project is for a residential development in accordance with Town standards, it will not constitute a nuisance or hazard to the surrounding area or public health.
- D. *The use will not create undue traffic congestion or unduly impair pedestrian safety;*
The project Traffic engineer, TEC has evaluated the traffic operations for the study area under existing and future conditions consistent with the Transportation Impact Assessment (TIA) Guidelines issued by the Massachusetts Department of Transportation (MassDOT) and the standards of the Traffic Engineering and Transportation Planning professions for the preparation of such reports. The future year examines traffic operations under a 7-year planning horizon (2028) for traffic-volume projections, which includes an evaluation of the build conditions (with site traffic added).
- E. *Sufficient off-street parking exists or will be provided to serve the use (SPR Section II, E-1d)*
The proposed homes have been developed with a two stall garage and a driveway which could feasibly accommodate up to two additional vehicles for a total of four per units. There are no existing parking spaces within the parcel limits.
- F. *The use can be adequately served by water, sewer, and other necessary utilities, or if these are unavailable, that they will be brought to the site at the owner's expense; or, the Planning Board is satisfied that the proposed alternatives will comply with all applicable regulations; (SPR Section II, E-1e)*
Both water and sewer will be provided through municipal services. In a letter obtained from Cherry Valley Sewer District, the project is available for hook-up to the public sewer system. The project proposes sewer manholes to be placed within the newly aligned roadways at various locations to collect sewage and direct it to the existing municipal sewer system along Main Street. In a letter obtained from Leicester Water Supply District, there is adequate water supply for the proposed development. Domestic water for the property is intended to be sourced from the existing municipal water main within Main Street.
- G. *The use will not result in a substantial increase of volume or rate of surface water runoff to neighboring properties and streets, nor will result in pollution or degradation to surface water or ground water;*
A plan to control construction-related impacts, including erosion, sedimentation and other pollutant sources during construction has been developed. A detailed Erosion and Sedimentation Control Plan is included in the Permit Drawings. Refer to Sheet C-100 for location of proposed erosion control measure and Section 2 of the Stormwater Report for additional information. The proponent will prepare and submit a Stormwater Pollution Prevention Plan (SWPPP) prior to commencement of construction activities that will result in the disturbance of one acre of land or more.
The proposed stormwater management system for the site will control the Peak Rate of Runoff through the use of deep sump catch basins, pipe detention systems, a detention basin, outlet control structures, and gabion walls (level spreaders). These systems have been designed in accordance with the MA DEP Stormwater Management Policy to recharge groundwater and reduce rate of runoff from the parcel.
- H. *The use will not result in any undue disturbance to adjoining property owners or the Town caused by excessive or unreasonable noise, smoke, vapors, fumes, dust, glare, etc.*
The proposed residential development which includes of mixed single-family residential housing will not cause excessive or unreasonable noise, smoke, vapors, fumes, dust, glare, etc.

At this time, Allen & Major Associates, Inc. is requesting to be placed on the agenda for the next available meeting of the Zoning Board of Appeals to discuss this Residential Site Plan. Representatives of this office and the owner/applicant will attend to present the plan and address any concerns raised by the Board at that time. We thank you in advance for your anticipated cooperation regarding this project and look forward to meeting to discuss the plans.

Very Truly Yours,

ALLEN & MAJOR ASSOCIATES, INC.



Michael Malynowski, PE
Senior Project Manager



Project No.	<u>2889-01</u>	Sheet	<u>1 of 1</u>
Project Description	<u>Skyview Estates</u>		
	<u>Leicester, MA</u>		
Calculated By	<u>JG</u>	Date	<u>04/29/22</u>
Checked By	<u>MAM</u>		

RECHARGE CALCULATION FOR AREA WITHin WATERSHED OVERLAY PROTECTION DISTRICT ONLY

Standard # 3: Groundwater Recharge

Proposed recharge system: Dry Well

In accordance with MADEP – Volume 2, Technical Guide for Compliance with Massachusetts Stormwater Management Standards, dated January 2008

A soils require a Volume to recharge of	0.60 inches
B soils require a Volume to recharge of	0.35 inches
C soils require a Volume to recharge of	0.25 inches
D soils require a Volume to recharge of	0.10 inches

Impervious area within: A-soils =	0	sf	Weighted Groundwater Recharge Depth	=	0.25 in
Impervious area within: B-soils =	566	sf			
Impervious area within: C-soils =	171,496	sf			
Impervious area within: D-soils =	0	sf			

Total Site Volume required to be recharged =

$$172,062 \text{ sf} \times 1" / 12 \times 0.25 \text{ in} = \mathbf{3,589 \text{ cf}}$$

Site volume recharge provided by = volume within residential drywells

$$\text{House Drywell} = 196 \text{ cf}$$

Unit #28	Drywell #26	=	196	cf
Unit #28	Drywell #27	=	196	cf
Unit #32	Drywell #28	=	196	cf
Unit #32	Drywell #29	=	196	cf
Unit #33	Drywell #30	=	196	cf
Unit #33	Drywell #31	=	196	cf
Unit #33	Drywell #32	=	196	cf
Unit #34	Drywell #33	=	196	cf
Unit #34	Drywell #34	=	196	cf
Unit #35	Drywell #35	=	196	cf
Unit #35	Drywell #36	=	196	cf
Unit #36	Drywell #37	=	196	cf
Unit #36	Drywell #38	=	196	cf
Unit #37	Drywell #39	=	196	cf
Unit #37	Drywell #40	=	196	cf
Unit #38	Drywell #41	=	196	cf
Unit #39	Drywell #42	=	196	cf
Unit #39	Drywell #43	=	196	cf
Unit #39	Drywell #44	=	196	cf
Unit #39	Drywell #45	=	196	cf
	<i>Total</i>	=	3920	cf

$$= \mathbf{3,920} \text{ c.f. Total Volume Recharged} > \mathbf{3,589 \text{ cf}} \text{ (OK)}$$

2889-01 - Proposed HydroCAD-WRPOD_rev1

Prepared by Allen & Major Associates, Inc
HydroCAD® 10.20-2d s/n 02881 © 2021 HydroCAD Software Solutions LLC

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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-year	Type III 24-hr		Default	24.00	1	3.23	2

Summary for Subcatchment WRPOD: Subcat WRPOD

Runoff = 24.03 cfs @ 12.01 hrs, Volume= 1.506 af, Depth= 1.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.23"

Area (sf)	CN	Description
76,243	98	Paved parking, HSG C
555	98	Paved parking, HSG B
1,130	61	>75% Grass cover, Good, HSG B
275,580	74	>75% Grass cover, Good, HSG C
62,470	70	Woods, Good, HSG C
78,003	65	Brush, Good, HSG C
85,144	98	Roofs, HSG C
579,126	79	Weighted Average
417,183		72.04% Pervious Area
161,942		27.96% Impervious Area

