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January 11, 2021

Mr. Nazih Elkallassi, Chairman
Wareham Zoning Board of Appeals
Wareham Memorial Town Hall
54 Marion Road
Wareham, Massachusetts 02571

RE: Peer Review – Second Submittal
Comprehensive Permit Application by Pennrose, LLC
4 Littleton Drive
Wareham, Massachusetts

Dear Chairman Elkallassi and Board Members:

Green Seal Environmental, Inc. (GSE) is pleased to provide the Town of Wareham, acting through their Zoning Board of Appeals, the following peer review of application materials submitted by Pennrose, LLC (the Applicant) for a Comprehensive Permit to construct 93 mixed-income housing units on land owned by the Wareham Redevelopment Authority (the "Project").

GSE's review is limited to the Civil/Site aspects of the Applicant's filing and does not represent a review of legal requirements nor does it offer a legal opinion. The documents from the second submittal being reviewed are:

- Plans entitled "Littleton Drive Zoning Board Review Submission, Wareham, MA", dated December 30, 2020, prepared by Horsley Witten Group, Inc. consisting of 10 sheets.
- "Stormwater Analysis and Drainage Report, Littleton Drive Affordable Housing Project, Wareham, Massachusetts" dated December 2020, prepared by Horsley Witten Group, Inc, consisting of 221 pages.
- Flow Test Results for 4 Littleton Drive, Wareham, MA reporting a flow test conducted by the Wareham Fire Department on October 27, 2020.

Based on our review of the submittal documents, we offer the following comments:

General comments

The new plans submitted are labeled "Not for Construction" and are also identified as "For Permitting Only". They show considerably more detail than the conceptual plans previously reviewed and have been brought to the level of permit drawings. The site design shown appears to be well-thought out and supported by the calculations and information that accompany them. Our comments are generally on the completeness and clarity of the information shown; items that will have to be addressed prior to construction.

Comprehensive Permit Rules

The Town Planner, Mr. Kenneth Buckland, has provided Comprehensive Permit Rules of the Wareham Zoning Board of Appeals since the previous review. These regulations, adopted February 8, 2006, include required technical submittals along with administrative requirements.

The required technical submittals and their status are:

Rules Section 3.00 ***Application Requirements***

3.01: The application for a comprehensive permit shall consist of:

(a) a written statement demonstrating consistency with the Town's Affordable Housing Plan.

GSE did not find this statement in the materials submitted.

(b) preliminary site development plans showing the locations and outlines of proposed buildings; the proposed locations, general dimensions and materials for streets, drives, parking areas, walks and paved areas; type and location of proposed sewage disposal and proposed landscaping improvements; trash disposal; open areas within the site including but not limited to school bus shelters and parks or other play areas for children; proposed stormwater management system; proposed property lines and rights of way of any proposed streets; and proposed lighting plans.

The plans submitted generally address this requirement. As noted in the following review, these items were missing from the plans: landscaping improvements (massing shown on architectural plans but no planting schedule), trash disposal, and lighting. Note that no proposed streets are shown; the applicant appears to intend the ways shown to be driveways.

(c) a report on existing site conditions and a summary of conditions in the surrounding areas, showing the location and nature of existing buildings, existing street elevations, traffic patterns and character of open areas, if any, in the neighborhood. This submission may be combined with that required in section 3.01(b), above and shall include, without limitation:

(i) Zoning district boundaries,

The plans should identify the zoning district of the project and include boundaries within the area shown, if any.

(ii) Water Resources Protection Overlay District boundaries,

The plans should identify whether the project is within the Water Resources Protection Overlay District and identify any boundaries within the area shown.

(iii) Existing wetland resource areas, as defined in (a) the Wareham Wetlands Protection Bylaw, including vernal pools, whether certified or not, (b) the Massachusetts Wetlands Protection Act (M.G.L. 131, §40 et seq.),

The plans show wetland flags around Flax Pond. They do not identify Flax Pond as a potential vernal pool.

(iv) Existing and proposed topography at 5 ft. intervals,

Topography is shown at a 1 ft. interval, exceeding this requirement.

(v) Existing structures on adjacent properties within 150 feet of the property line; and

The plans show existing structures, satisfying this requirement.

(vi) Existing significant environmental features such as ledge outcrops, scenic views and large trees.

The plans do not identify any ledge outcrops or scenic views. Large trees are identified. However, no large trees are identified for preservation.

(d) preliminary, scaled, architectural drawings; for each building the drawings shall be signed by a registered architect, and shall include typical floor plans, typical elevations, and sections, and shall identify construction type and exterior finish. The architectural plans shall also describe base interior amenities;

Architectural plans generally meeting this requirement were part of the original submittal. They are not stamped by a registered architect.

[Note that a page appears to be missing from the Rules, with the remainder of item (d) and all of item (e) missing.]

(f) if a subdivision of land is involved, a preliminary subdivision plan, conforming to the Rules and Regulations of the Wareham Planning Board as most recently adopted;

No subdivision is proposed on the plans submitted.

(g) a preliminary utilities plan showing the proposed location and types of utilities, sewage, drainage and water facilities, including hydrants. Drainage plans shall be accompanied with preliminary drainage calculations and shall describe how the project conforms to best management practices and the DEP's Stormwater Management guidelines;

These items were submitted and appear to meet this requirement.

Section 3.02 Additional Materials includes a number of items that the Zoning Board, at its option, could require the developer to submit. These items are a traffic analysis, and economic analysis, a comparison to a project built in compliance with the zoning bylaws, an environmental analysis, verification of fire flows, and a detailed representative unit specification. A traffic

analysis and fire flow data were submitted for review as described later in this report.

Plans:

Sheet C-1: The Cover Sheet shows locus and vicinity maps and includes a Sheet List and General Notes. GSE has the following comments:

- GSE recommends that the Sheet List include a column listing the latest revision for each sheet, so that the Town can keep track of which plan set is most current.
- GSE understands that a Landscaping Plan has been prepared separately from the civil drawings. GSE recommends that any landscaping sheets, and any other drawings related to site construction, be listed on the Sheet List and incorporated into future submittals so that site-related design information is more easily coordinated.
- The General Notes are not numbered consecutively and either missing notes should be added or the numbering made consecutive.

***Sheet EX-1*:** The Existing Conditions sheet shows property lines, structures, topography, test pits, and utilities present on the site and on adjacent areas at a scale of 1" =50'.

- The Existing Conditions sheet shows the surrounding roadways, including Swifts Beach Avenue and Brown Street. GSE recommends that Brown Street be labeled, and that all streets include information on the right of way width, pavement width, jurisdiction, signage, striping, sidewalks, crosswalks, and any one-way restrictions.
- The metes and bounds of the project property boundaries and monumentation are missing and should be shown. Other plan sheets should reflect this information.
- Contour labels and representative spot elevations are missing and should be shown.
- The graphical wetland boundary line does not connect all wetland flags and should do so, and the wetland offsets shown should be adjusted if needed. Other plan sheets should reflect the adjustment.
- Rims and inverts of the existing catch basins in Littleton Street to remain should be shown.
- Four sheds, and a portion of an attached garage (n/f Rohrbach) appear to encroach on the site. How these encroachments will be addressed should be resolved and addressed on the plan.
- One abutter to the north of the site is not labeled and this information should be added.

Sheet C-3: The General Notes sheet includes detailed construction notes to assist the contractor in constructing the project.

- GSE observes that the notes are "generic" and appear to be intended to cover typical site construction. The notes for Stormwater Facility Operation and Maintenance include maintenance requirements for stormwater elements that are not proposed on this project, and does not include appropriate maintenance for the subsurface infiltration systems proposed. To avoid confusion, these notes should be amended to reflect the structures proposed, or a note citing the O&M plan in the stormwater report can be substituted.

- The plan views contain line-types and symbols which aren't labeled or shown on a legend. GSE suggests that a legend be added to this sheet containing all of the items on the remaining sheets.

***Sheet C-4*:** The Site Plan sheet shows the overall site development with the layout and materials identified, including the buildings, parking, driveways, paths, and some stormwater features at a scale of 1" =40 feet. This sheet also shows erosion control measures.

- GSE recommends that all plan view sheets be at a consistent scale. For sheets C-4, C-5, and C-6, a larger sheet size would be required to show Swift River Road at a scale of 1" =40 feet.

- Metes and bounds and abutter labels are missing and should be added.

- Existing trees are shown and conflict with proposed drives and buildings. GSE suggests that they be removed from this plan and any trees to remain be addressed on a landscaping plan.

- Representative setbacks to buildings from the property line are shown. There is an unlabeled structure near Nicholas Drive which should be labeled, and have its setback shown. A minimum setback between structures should also be shown, as it is relevant to the fire code.

- One parking space to the north of the community garden appears to have insufficient width. The group of spaces between building 7 and 8 is incorrectly numbered. In several instances parking space that abut a disabled parking space egress are not labeled as disabled parking, the applicant should consider designating these as disabled parking as they are close to the Senior Building and Community Building.

- Wheelchair ramps should be shown where disabled spaces are provided, and where sidewalks cross driveways.

- The "Y" shaped sidewalk connecting the Senior Building and Community building should have crosswalks where it crosses traveled ways.

- GSE suggests that a parking table be added to this sheet, identifying the parking space counts following the description in the Traffic Impact Study, and calling out the final number of disabled spaces. GSE counts 134 total parking spaces shown, along with 9

disabled spaces including one van accessible space. The disabled and van space counts meet the requirements of the Americans with Disabilities Act and the Massachusetts Architectural Access Board requirements.

- GSE suggests that a table that summarizes the characteristics of the site layout, such as total area, open space, building area and summary, and related data be added to this sheet.

Sheet C-5: The Grading and Drainage plan shows proposed contours, spot elevations, and both surface and subsurface drainage facilities at a scale of 1" =40'.

- GSE notes that the stormwater design has been developed considerably since that shown on the Concept Plan and includes more areas for stormwater treatment. Runoff is conveyed to stormwater practices via "paved inlet flumes" from paved areas rather than catchbasins, a practice typical of sites with shallow groundwater tables. The design also includes elements of low impact design as suggested by Mr. Charles L. Rowley, PE, PLS in an email comment submitted on 12/8/2020.

- The stormwater structures are shown, with rims and inverts on manhole structures but no pipe types, lengths, or slopes are shown. These should be added to the plan.

- In cases where there are more than 2 pipes at a structure, the respective inverts should be identified (i.e., "N", "E", "S").

- Each structure is labeled by type and number. GSE suggests that this labeling and the HydroCAD nodes be made consistent, and that a structure table with relevant data be considered for the plan to minimize text obscuring underlying graphics. The infiltration basin on the west side of the site should be labeled.

- GSE notes several scrivener's errors. At STR:210, the invert in is labeled "out", and the invert out appears to have an incorrect elevation, making the outlet pipe slope backward. At STR:220, on pipe out appears to be incorrectly labeled as 18". At STR:330, the invert in is labeled "out". The designer should check and if necessary, correct these errors.

- Test pits with groundwater information are shown on this sheet. The test pits are not directly under each infiltration practice. Test pits under each practice should be performed and the number for each should follow the guidance in the Stormwater Management Handbook.

- Roof drainage features are not shown. The stormwater report indicates that some of the buildings will discharge roof runoff to STR:410, and no roof drain leaders to that structure are shown. These should be added to the plan. GSE recommends that the plans include a construction detail for the roof drains that discharge to grade that demonstrates how stormwater will be directed away from each building.

Sheet C-6: The Utility Plan shows existing and proposed utilities at a scale of 1" =40'.

- The Utility Plan shows a proposed sewer system for the project that incorporates a pump station to ensure that the distribution pipes will have adequate cover, addressing the comment in the GSE 1/4/2021 letter. The plan shows the components of the gravity distribution system as sewer manholes connected by PVC pipes, with rims, inverts, pipe sizes, and slopes shown. The type of PVC pipe should be identified.
- Sewer connections to the proposed buildings are shown but not labeled as to pipe type, or slope. This information should be added and a cleanout for each connection should be shown.
- The proposed sewer forcemain is shown as "size TBD". The type of pipe and size should be determined and shown on the plan.
- A note indicating "relocate section of existing PVC sewer force main" indicates where the existing sewer force main that crosses the site must be adjusted to permit the construction of the Senior Building. The plan should identify the specifics of the replacement pipe and indicate the size and type of the existing forcemain (if known), how the connection will be made, testing requirements, and how continuous sewer service will be provided to the user.
- Proposed water main and services shown should reflect the requirements of the Wareham Water District.
- The water main appears to be placed exactly 10 feet from the sewer main, placing it within 10 feet of some sewer manholes. The plan should address this by increasing the distance where needed.
- The hydrants are not placed at regular intervals, varying from approximately 330 feet to 560 feet. The applicant should consult with the Fire Department for appropriate placement and adjust as needed.
- No site lighting appears to be shown on any of the drawings. GSE recommends that it be shown on the utility sheet along with the required handholes and conduit connections to the electrical infrastructure already shown.
- The subsurface utilities shown, excepting drainage and sewer, follow the driveway alignments but are not consistently within either the driveway or shoulder, crossing curbing and sidewalk in multiple locations. GSE suggests that the designer consider placing some or all of these utilities where possible within the shoulder, parallel to the roadway, to facilitate maintenance.
- GSE suggests that a separate demolition plan be included in the plan set to specifically identify which existing utilities will be removed and which will remain.

Sheets C-7 through C-10: These sheets include construction, stormwater, and utility details and are not to scale.

On Sheet C-8, the dimension specifying the maximum ponding depth is missing from the bioretention detail and should be added. A section referenced does not appear to be included, and some apparent elevation references (A, B, etc.) do not have a corresponding schedule providing the elevations. The sediment forebay and sediment forebay check dam details include a number of dimensions that are not defined. A schedule of these dimensions is not provided. The paved flume shown on the sediment forebay detail does not appear to match the paved drainage flume detail.

Sheet C-9 includes generic details of the subsurface infiltration system provided by the manufacturer. Some elevation references (A, B, etc) in the Stormtech System Detail do not have a corresponding schedule providing the elevations. GSE recommends that a schedule be provided showing the elevations for each installation, and that the Estimated Seasonal High Groundwater (ESHGW), vertical separation distance to ESHGW, mounded groundwater, and cover over each system be included in the schedule. Any variation between installations (for example, inlet pipe sizes) should also be included.

GSE notes that the underground infiltration system specified requires specialized equipment for sediment removal ("Jetvac" is specified in the manufacturers literature) .

Sheet C-10 includes details of the proposed utilities. The detail of the sewage lift station shows a wet-well installation with dual grinder pumps and a separate vault for valves. There is a reference calling for elevations of lift station components. These elevations should be provided, along with pump specifications and calculations.

All aspects of the sewer system proposed must meet the requirements of the Wareham Sewer Department.

All aspects of the water distribution system proposed must meet the requirements of the Wareham Water Department, and the hydrants and fire service connections must also meet the requirements of the Wareham Fire District. Fire alarm boxes may also be required by the Fire District.

Stormwater Analysis and Drainage Report

Accompanying the plans submitted is a Stormwater Analysis and Drainage Report that is intended to document compliance with the Massachusetts Stormwater Management Policy and includes a narrative and detailed calculations supporting the design of the proposed stormwater management system. Compliance with the Policy is required since the project is subject to the Wetlands Protection Act. The calculations were prepared using HydroCAD software which is in widespread use for this purpose. The report addresses each of the ten stormwater management standards included in the Policy and specifically addresses the requirements for documenting compliance.

The report addresses the comment made by both Charles L. Rowley, PE, PLS and GSE that soil test pits be performed to determine the depth of groundwater. Six (6) test pits were performed, with ESHGW determined using mottling by a Massachusetts Soil Evaluator. Groundwater depths based on ESHGW ranged from 48 to 64 inches below grade in four test pits; two of the test pits reported no mottling.

The report notes that perforated pipes were installed in two test pits "to allow for future observation of groundwater prior to development of final construction drawings." GSE concurs with this approach and suggests that these observations be coordinated with the additional test pits for each infiltration practice as noted previously.

GSE has reviewed the HydroCAD calculations and is in general agreement with the assumptions and values used in modeling runoff and the proposed stormwater structures. The calculations provided indicate that runoff to offsite will decrease significantly. GSE does note the following:

- As suggested previously, the labels for the structures on the plan should match those used in the calculations for clarity.
- The Existing Conditions watershed DA1 is labeled a pond when it should be labeled as a subcatchment.
- The hydrology calculations utilize the National Oceanic and Atmospheric Administration's (NOAA) Atlas 14 rainfall values, which are reported to be considered for adoption in upcoming revisions to the Stormwater Management Policy. GSE has verified that but notes that they are not in effect at the time of this application. GSE also notes that the value for the 24-hour 100-year return storm in the NOAA Atlas, 7.6 inches, is one inch less than the 8.6 inches in the Northeast Regional Climate Center's (NRCC) atlas, which is often used in southeastern Massachusetts communities. Since analysis of the 100-year return storm is performed to determine the potential for off-site flooding impacts, GSE recommends that the calculations be revised to incorporate the higher NRCC values. Regardless, since runoff to offsite is being decreased significantly, and the distance to the ocean(the nearest receptor) is small, offsite flooding is not of great concern in this instance.

GSE understands that revisions to the site plan may change the amount of proposed impervious area. GSE understands that the project is being reviewed concurrently by the Wareham Conservation Commission, who will also be reviewing the stormwater calculations. GSE recommends that the stormwater review be coordinated with the Wareham Conservation Commission to maintain consistency.

Fire Flow

Flow test results conducted by the Wareham Fire Department on 10/27/2020 were provided for review. No locations or elevations of the hydrants used were provided. For the purposes of preliminary evaluation, a ground elevation of the hydrants of 15 feet is assumed, consistent with elevations along Swift's River Road. Based on the site and architectural plans, the highest

elevation requiring protection is the ceiling of the Senior Building's 3rd floor, at an elevation of 55 feet. Using these values and the American Water Works Association (AWWA) Manual of Water Supply Practices M17 methodology yields a flow rate of 1,385 gallons per minute (gpm).

The architectural plans indicate that the Senior Building's total floor area is 38,481 square feet and is construction Type 5A under International Fire Code (IFC) standards. Table B105.2(2) from IFC indicates that the Senior Building would require a fire flow rate of 3,500 gpm.

Based on these preliminary results, fire flow for the Senior Building may require a booster pump or other measures to ensure fire protection meeting code requirements. GSE recommends that the applicant obtain the necessary information, provide final calculations, and determine the methods needed for fire protection based on the flow test results.

Traffic Impact Assessment/Pedestrian Movement

We have reviewed the Traffic Impact Assessment prepared by Vanesse & Associates, Inc. (VAI) included in the recent submittal, and note that it is the same as that reviewed in our letter of 1/4/2020. GSE and has no further comments on this assessment.

Additional Comments/recommendations

The following comments and recommendations from GSE's 1/4/2020 letter are still outstanding and have not been addressed:

- The sidewalk on Swift's Beach Road is on the northern side. The walk is separated from traffic lane by a vertical granite curb. We would recommend 12" wide thermoplastic crosswalk striping on Swift's Beach Road with appropriate "Crosswalk Ahead" signage in both directions. This will allow pedestrian to cross from the Project site to the existing sidewalk network.
- We would recommend installation of a stop sign and stop line at the Littleton Drive/Swift's Beach Road intersection.
- The Applicant may wish to evaluate installation of solar panels on southward facing roofs as a means of offsetting the carbon footprint of the Project.
- A mailbox kiosk on the traffic island in front of the Community Building is recommended to prevent parking in travel lanes.
- The plans should show adequate areas for trash dumpsters and/or recycling collection areas. Dumpsters should be placed on a concrete pad and screened from view. Dumpsters should not be placed in wetland buffer zones.
- Section 824.6 of Zoning By-law requires outdoor recreation areas for multi-family dwellings in a MR-30 zone. Calculating the required square footage of recreation area using the proposed number of non-age restricted 2- and 3-bedroom units equates to 18,500 square feet. Site plans in Appendix 2 show a playground area but it is unclear if this proposal has adequate recreational area or if a waiver is requested.

- The plan depicts a walking trail in the open space behind the buildings. We recommend this trail be within previously cleared roadway areas where possible to minimize overall project impact specifically behind Buildings 5 through 9 and again near Flax Pond.

Additional documents the Board may wish the Applicant to file include:

- List of Requested Waivers from Local By-laws
- Certificate of Good Standing from the Secretary of State's office (SOS)
- Landscape & Lighting Plans

Please do not hesitate to contact the undersigned at 508-888-6034 or 508-813-9037 if you have any questions or require additional information.

Sincerely,

GREEN SEAL ENVIRONMENTAL, INC.

Stuart Clark, P.E.
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