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March 3, 2020

Ms. Emily Wentworth, Senior Planner/Zoning Administrator
Hingham Zoning Board of Appeals
210 Central Street
Hingham, MA 02043

Subject: **302-304 Whiting Street – Comprehensive Permit**

Dear Ms. Wentworth:

This is to advise that we have reviewed the following documents related to the subject Comprehensive Permit Application:

- Preliminary development plans (8 sheets), revised February 10, 2020, prepared by James Engineering, Inc.
- Drainage Calculations (report), dated December 22, 2019[1], prepared by James Engineering, Inc.
- Transmittal letter from Gary D. James, P.E. dated February 10, 2020

The documents have been prepared to address comments outlined in our January 24, 2020 letter. Below are our original comments in plain text followed by the current status of each in **bold text**.

General

1. There are access and utility easements proposed. The geometry (metes and bounds) of the easements should be shown on the plans. **Addressed – geometry of the easements is shown on the revised plans.**

2. An analysis should be provided to demonstrate that there is adequate access for the Hingham Fire Department's largest apparatus. **The revised plans show that the Hingham Fire Department's ladder truck can negotiate a turn into the proposed driveway without leaving the paved surface.**

3. GIS mapping indicates that the dwelling on the adjacent property at 300 Whiting Street is close to the subject site's eastern property line. This dwelling should be shown on the plans to provide a perspective of how the proposed development may impact the abutter and vice versa. **Addressed – the adjacent dwelling has been added to the revised plans and the proposed dwelling at 302 Whiting Street has been turned to be more parallel to the adjacent dwelling.**

[1] Documents included in the Drainage Calculations were dated more recently, such as HydroCAD calculations dated 2/25/20 and the Operation and Maintenance Plan dated 2/22/20.

4. Proposed grading indicates that the highest portion of the site will be lowered by about two feet. We understand that this is proposed to reduce the slope of the driveway coming up from Whiting Street. However, it appears that much of the remainder of the cut portions of the site could be regraded to reduce the amount of material that would be removed from the site. Proposed grading should be adjusted to provide for a balanced site to the maximum extent practicable. **Grades have been modified slightly. However, there will still be a net export of material. We note that at the public hearing on February 11, 2020, Mr. James explained that the reason for creating a net export is because much of the site has been stripped of topsoil and the intention is to trade exported gravel for topsoil to finish the site.**

5. The size of the proposed dwellings should be clarified. The civil site plans show them to be 24-ft. x 36-ft. whereas the architectural plans show them to be 24-ft. x 28-ft. **Addressed – the revised plans show the size of the proposed dwellings consistent with the architectural plans (24-ft. x 28-ft.).**

6. There appears that there may be some type of curb or berm on the northwest side of the driveway from the cutout for the catch basin extending about 38 feet southwest. We assume this would be to channel stormwater to the catch basin, however, it is not labeled. **Addressed – the proposed Cape Cod berm is labeled on the revised plans.**

7. Sight distance triangles at the driveway intersection with Whiting Street should be shown on the plans. **Addressed – sight distance triangles are shown on the revised plans and indicate adequate sight distance in each direction.**

8. Proposed landscaping should be shown on the plans. **Addressed – a landscaping plan has been added to the revised plan set.**

9. It appears that the plans are orientated so that north is toward the top of the page, however, no north arrows are shown on the plans. **Addressed – north arrows have been added.**

<u>Drainage and Erosion Control</u>

1. Drainage calculations should be provided to document that post-development runoff will not exceed existing conditions. Calculations should include infiltration system sizing. **The submitted drainage calculations indicate that post-development runoff from the site will not exceed existing conditions. We note that the revised plans show a 6-inch overflow pipe from the subsurface infiltration system in the front yard of 304 Whiting Street. Hingham DPW and MassDOT would likely not allow this direct discharge into the Whiting Street layout. We asked Mr. James to forward his HydroCAD model so that we could revise it and model the effects of eliminating the overflow pipe. Without the overflow pipe, the subsurface system is capable of fully infiltrating all runoff from storms up to and including the 25-year event. During the 100-year storm event the system would infiltrate most runoff but during the peak of**

the storm a small amount would bypass the catch basin and flow into Whiting Street, similar to what flows from the gravel driveway under existing conditions. The existing 100-year runoff from the site into Whiting Street is estimated at a rate of 1.2 cubic feet per second (c.f.s.) and a volume of 0.086 acre-feet (a.f.). The proposed 100-year runoff from the site into Whiting Street is estimated at 0.74 c.f.s. and 0.021 a.f., which is a 40% decrease in rate and a 75% decrease in volume. Based on our analysis we recommend that the proposed overflow pipe be eliminated.

2. We recommend that the proposed catch basin be installed as close to the right-of-way as possible to capture the maximum amount of runoff from the driveway. **The catch basin has not been moved but the drainage calculations indicate that runoff into Whiting Street will be significantly reduced under proposed conditions.**

3. The Roadway Subsurface Stormwater Infiltration System detail on Sheet 3 should specify filter fabric on the top and sides of the crushed stone. This should be the same for the roof drain drywell(s). **Addressed – the detail has been revised to specify filter fabric as recommended and a detail for the roof drain has been added.**

4. There appears to be a subsurface infiltration system (drywell) located in the driveway just north of the proposed dwelling at 302 Whiting Street. However, this is not labeled and there is no proposed piping shown leading to the system. If this is a proposed infiltration system it is too close to the primary soil absorption system (SAS) for 304 Whiting Street. Title 5 requires a minimum setback distance of twenty-five feet. **Addressed – all drainage facilities are in compliance with Title 5 setback requirements.**

5. The Eliminator Catch Basin Oil & Debris detail is shown on Sheet 5. The Precast Concrete Catch Basin detail should either show or specify The Eliminator in the catch basin. **Addressed – The Eliminator hood is not proposed. A Fabco insert is proposed to provide required stormwater treatment.**

6. Proposed erosion controls should be shown and detailed on the plans. **Addressed – a proposed mulch log (filter sock) is shown and detailed on the revised plans.**

7. An operation and maintenance plan (O&M) for the stormwater system (catch basin and subsurface infiltration systems) should be submitted. O&M of the catch basin is particularly important as there is a treatment insert proposed which will require frequent maintenance. **Addressed – the Drainage Calculations include an O&M which outlines specific requirements for the Fabco treatment insert.**

<u>Utilities</u>

1. Proposed electric/telephone/CATV and natural gas utilities should be shown on the plans. **Proposed utilities are shown on the revised plans. However, we note that the**

electric/telephone/CATV utilities are proposed to be overhead from an existing utility pole on the property.

2. The Application materials state that the existing dwelling is served by an onsite well "in front of the house." This well should be shown on the plans. Abandonment and decommissioning of this well will need to comply with Hingham Board of Health regulations. **Addressed – the approximate location of the existing well is shown on the revised plans with a note specifying that it be abandoned in accordance with Hingham Board of Health regulations.**

3. We note that the proposed septic systems are completely located outside of the Zone II. **Informational, no response required.**

4. In accordance with Title 5, two deep holes are required within each primary SAS and each reserve SAS, one percolation hole and one observation hole in each. Of the eight test holes that were excavated on the site in 2003, only TP 4-4 is located within a reserve area (for 304 Whiting Street). A minimum of seven additional deep holes are required by Title 5. **Mr. James has acknowledged this and advised that the additional testing will be performed.**

5. Septic system for the proposed 302 Whiting Street (Sheet 6):

    a. The Septic System Profile shows seasonal high groundwater at El. 140 and that it is based on test hole No. 2. Test hole TP 2-2 was excavated to El. 142.9, which was the lowest of the eight test holes excavated on site. Additional soil testing is required to verify that the required separation from groundwater will be provided. **To be determined pending additional soil testing.**
    b. As noted above, there are no test holes in the primary or reserve area so four test holes are required on this lot. **Additional soil test to be performed.**
    c. A portion of the proposed reserve area is within the 100-foot buffer to the wetlands. The Applicant has asked for a waiver from §IV.5 of the Board of Health Supplemental Rules and Regulations for the Disposal of Sanitary Sewage, which requires a 100-foot setback from wetlands. Title 5 only requires a 50-foot setback. However, it appears that the primary and reserve SAS's could be reconfigured to provide the 100-foot setback. **Addressed – all proposed septic components have been moved outside the 100-foot setback.**
    d. As currently configured, the primary SAS would not meet Title 5 breakout setback requirements. **Addressed – the reconfigured system will meet breakout requirements.**
    e. Note 9 indicates that test hole TP 2-1 had a perc rate of 7 minutes per inch (mpi) and no other perc rates are listed. However, the soil logs indicate that all four test holes had perc rates of less than 2 mpi. (These will need to be revised with the additional test hole data that is required.) **This information will be updated pursuant to the required additional testing.**

f. Note 19 should be revised to list the actual distance to the well on the 300 Whiting Street property (±153-ft.). **Addressed – actual distance to the well is shown on the revised plan to be 141.4-ft.**

6. Septic system for the proposed 304 Whiting Street (Sheet 7):

a. Same comment as for 302 Whiting Street. **To be determined pending additional soil testing.**
b. As noted above, there is only one test hole within the reserve area. Title 5 requires three additional test holes for this lot. **Additional soil test to be performed.**
c. Note 9 indicates that test hole TP 4-4 had a perc rate of less than 2 mpi. However, the test hole log indicates that a perc test was not performed in test hole TP 4-4. (These will need to be revised with the additional test hole data that is required.) **This information will be updated pursuant to the required additional testing.**
d. Note 19 should be revised to list the actual distance to the well on the 300 Whiting Street property (±122-ft.). **Addressed – actual distance to the well is shown on the revised plan to be 124.8-ft.**

In addition to the above, there were concerns raised at the public hearing related to Title 5 requirements as they relate to Nitrogen loading, and the definition of a "facility." Please see the attached excerpts from Title 5 (310 CMR 15) for reference. Nitrogen loading limitation are imposed on a "system" not a "facility" as was suggested at the hearing (see 310 CMR 15.214). A "system" consists of the piping, tanks, distribution systems, soil absorption systems and reserve areas (see definitions 310 CMR 15.002). All proposed components of the septic systems are located outside of the mapped Zone II and the lots are proposed to be served by public water, not on site wells. Therefore, the proposed systems are not within a Nitrogen Sensitive Area and are not subject to Nitrogen loading requirements under Title 5.

Please give us a call should you have any question.

Very truly yours,

AMORY ENGINEERS, P.C.

By:

Patrick G. Brennan, P.E.

PGB
enc.

15.002: continued

Dosing Chamber – A watertight structure placed between a septic tank and either a distribution box or soil absorption system which is equipped with a pump designed to discharge septic tank effluent at a predetermined rate to a soil absorption system.

Dry Well - A pit with open-jointed lining or holes through which storm-water drainage from roofs, basement floors, foundations or other areas seeps into the surrounding soil.

Dune - A coastal dune, as defined in M.G.L. c. 131, § 40 and 310 CMR 10.28(2): *Definition*.

Dwelling - A building which is used, intended, or designed for human habitation, including but not limited, to houses, hotels, motels, apartments, mobile and modular homes and condominiums and cooperatives.

Effective Capacity - The volume of a tank below the design discharge point, liquid level line.

Effluent - Sanitary sewage discharged into the environment, whether or not treated.

Emergency Repair - The repair of a system which is necessary to prevent sewage backup into a building, surface breakout of sewage, or to alleviate an imminent danger to public health, safety or the environment in accordance with 310 CMR 15.353.

Equalization Basin – A watertight tank or basin of sufficient size that has the capacity to store at a minimum the proposed daily design flows for the facility.

Facility - Any real property (including any abutting real property) and any buildings thereon, which is served, is proposed to be served, or could in the future be served, by a system or systems, where:

(a) legal title is held or controlled by the same owner or owners; or

(b) the local Approving Authority or the Department otherwise determines such real property is in single ownership or control pursuant to 310 CMR 15.011 (aggregation).

Failed Subsurface Sewage Disposal System or Failed System - A system which fails to protect public health and safety or the environment as set forth at 310 CMR 15.303 or 15.304.

Family Mobile Home Park - A facility upon which two or more mobile homes are located on a continual or seasonal non-recreational basis, regardless of whether a charge is made therefor.

Fill - The clean, uncontaminated, nonindigenous soil placed beneath, above, and/or around a soil absorption system, as specified in 310 CMR 15.201 through 15.293.

Foundation Drain – A drain around a foundation, usually located at the footing, and consisting of perforated pipe surrounded by crushed stone and filter fabric.

Geotextile Fabric – A porous material suitable to prevent fines from migrating down through the soil absorption system while still letting air circulate.

Grease Trap - A watertight structure located on a building sewer before a septic tank in which grease and oils are separated from other solid and liquid constituents of sewage and accumulated in accordance with 310 CMR 15.230.

Greywater - Any putrescible wastewater discharged from domestic activities including but not limited to washing machines, sinks, showers, bath tubs, dishwashers, or other source except toilets, urinals and any drains equipped with garbage grinders.

Groundwater - Water found in cracks, fissures and pore spaces in the saturated zone below the ground surface, including but not limited to perched groundwater.

15.002: continued

Modular Home - A prefabricated building designed and constructed to be used as a dwelling and to be transported in two or more sections to a site where the sections are permanently connected and installed on a permanent foundation.

Mottling Due to Wetness (Redoximorphic Features) - A color pattern in soil consisting of blotches or spots of contrasting high or low chroma colors which may be an indication of the upper extent of soil saturation by groundwater.

Multiple Compartment Tank - A septic tank containing more than one settling compartment in series.

Munsell System - The system of classifying soil color consisting of an alpha-numeric designation for hue, value and chroma together with a descriptive color name accepted by the USDA/Natural Resources Conservation Service (NRCS) used as a standard procedure in soil classification.

Naturally Occurring Pervious Material - Naturally occurring soil exhibiting a percolation rate of 60 minutes or less per inch which was deposited on a site by natural causes and not by human action.

New Construction - The construction of a new building for which an occupancy permit is required or an increase in the actual or design flow to any system or an increase in the actual or design flow to any nonconforming system or an increase in the design flow to any system above the existing approved capacity. New construction shall not include replacement or repair of a building in existence as of March 31, 1995 that has been totally or partially destroyed or demolished, provided there is no increase in design flow, no increase in design flow above the existing approved capacity to any system, no increase in the number of dwellings or dwelling units or no increase in the number of bedrooms in any dwelling or dwelling unit.

Nitrogen Sensitive Area - An area of land and/or natural resource area so designated by the Department in accordance with 310 CMR 15.215.

Nonconforming System - Any system which is not in full compliance with the standards and requirements of 310 CMR 15.000 and for which a variance or local upgrade approval has not been obtained. Nonconforming systems include, but are not limited to, cesspools, privies, failed systems, and systems with a design flow above 10,000 gpd.

Observed Ground-Water Elevation - That elevation below the ground surface at which water is observed weeping, flowing from the walls of, or standing in a deep observation hole.

On-site System or Disposal System or On-site Subsurface Sewage Disposal System or System - A system or series of systems for the treatment and disposal of sanitary sewage below the ground surface on a facility.

(a) The standard components of a system are: a building sewer; a septic tank to retain solids and scum; a distribution system; a soil absorption system containing effluent distribution lines to distribute and treat septic tank effluent prior to discharge to appropriate subsurface soils; and a reserve area.

(b) These terms also include tight tanks, shared systems and alternative systems. Unless the text of 310 CMR 15.000 indicates otherwise, these terms also include nonconforming systems.

Open Drain - Any uncovered ditch or culvert used for the conveyance of surface water runoff or groundwater. A culvert that carries a water course or intermittent stream is not a surface drain.

Operate - To use or occupy a facility served by an on-site system or to own a facility where such use or occupation exists.

Operator - A person who alone or together with other persons has charge or control of any system.

15.002: continued

Surface Water Supply - Any lake, pond, reservoir, or impoundment designated as a public water supply in 314 CMR 4.00: *Massachusetts Surface Water Quality Standards*.

System - *see* on-site system.

System Inspector - A person approved by the Department pursuant to 310 CMR 15.340 as capable of appropriately assessing the condition of systems in accordance with 310 CMR 15.000.

Temporary - A single time period or an accumulation of time periods not exceeding 180 total days in any 365-day period.

Tight Tank - A water tight vessel having an inlet to receive raw sewage but no outlet and which is designed and used to collect and store sewage until it is removed for disposal.

Title 5 of the State Environmental Code, 310 CMR 15.000 - The Department's regulation for the siting, construction, inspection, upgrade and expansion of on-site sewage treatment and disposal systems and for the transport and disposal of septage.

Training Contact Hours (TCH) – The hours of training a person has had prior to the renewal of either a soil evaluator or system inspector approval. Each seminar, workshop, training course, or college course will have a specific training hour value as rated by the Department or an agent authorized by the Department.

Treatment Works - Any and all devices, processes, and properties, real or personal, used in the collection, pumping, transmission, storage, treatment, disposal, recycling, reclamation or reuse of waterborne pollutants, including septage receiving facilities but not including any works receiving a hazardous waste from off the site of the works for the purpose of treatment, storage or disposal. Treatment works must be permitted by the Department pursuant to the authority of M.G.L. c. 21, §§ 27 through 52 and regulations thereunder.

Tributary to Surface Water Supply - Any body of running water, including a river, stream, brook or creek, which moves in a definite channel in the ground due to a hydraulic gradient, and which is designated as a tributary to a public water supply in 314 CMR 4.00: *Massachusetts Surface Water Quality Standards*, provided that such water supply is a surface water supply as defined in 310 CMR 15.000. The exact location and extent of tributaries to surface water supplies shall be determined by reference to the most current U.S.G.S. and/or GIS maps and in consultation with the Department's Division of Watershed Management and the Drinking Water Program.

Underground Injection Control Program or UIC Program – The Underground Injection Control Program under Part C of the federal Safe Drinking Water Act, 42 U.S.C. §§ 300f *et seq*., which is implemented and enforced by the Department in Massachusetts pursuant to its UIC regulations at 310 CMR 27.00: *Underground Injection Control Regulations*.

Unsuitable Material – All impervious material, all organic sediments, and all material found in the following horizons: O (organic), A (topsoil), and E (mineral). All bedrock, including saprolite or weathered bedrock, schist, and ledge. (*see*, also, the definition of impervious material).

Upgrade - The modification of one or more components of an on-site system or the design and construction of a new on-site system which is intended to bring a nonconforming system into conformance with 310 CMR 15.000. An emergency repair is not an upgrade.

USDA/NRCS - The United States Department of Agriculture, Natural Resources Conservation Service.

USGS - The United States Geological Survey, within the United States Department of the Interior.

15.213: continued

(b) there is no increase in design flow from such building or buildings;
(c) no connection to a public sewer or shared system is available;
(d) the owner or applicant cannot site the system elsewhere;
(e) the septic tank or humus/composting toilet is sited outside of the velocity zone or regulatory floodway, either horizontally or vertically;
(f) the system achieves separation from high groundwater elevation as required by 310 CMR 15.212; and
(g) any portion of the soil absorption system that is within the velocity zone or regulatory floodway is a leaching bed or trench system or any other system constructed in accordance with the Wetlands Protection Act and 310 CMR 10.00: *Wetlands Protection*.

15.214: Nitrogen Loading Limitations

(1) No system serving new construction in Nitrogen Sensitive Areas designated in 310 CMR 15.215 shall be designed to receive or shall receive more than 440 gallons of design flow per day per acre except as set forth at 310 CMR 15.216 (aggregate flows) or 15.217 (enhanced nitrogen removal).

(2) No system serving new construction in areas where the use of both on-site systems and drinking water supply wells is proposed to serve the facility shall be designed to receive or shall receive more than 440 gallons of design flow per day per acre from residential uses except as set forth at 310 CMR 15.216 (aggregate flows) or 15.217 (enhanced nitrogen removal).

(3) It shall be the duty of the owner of the system or proposed system to ascertain whether or not the facility to be constructed will be in a nitrogen sensitive area. The Department will prepare and make available at locations generally accessible to the public maps portraying designated nitrogen sensitive areas within the Commonwealth.

15.215: Designation of Nitrogen Sensitive Areas

The following areas have been determined by the Department to be particularly sensitive to the discharge of pollutants from on-site sewage disposal systems and are therefore designated nitrogen sensitive. The necessity of providing increased treatment of pollutants and reduction in nutrients discharged from on-site sewage disposal systems, including nitrogen, nitrogen as nitrate, phosphorous and pathogens in these areas warrants the imposition of the loading restrictions set forth in 310 CMR 15.214.

(1) Interim Wellhead Protection Areas and Department approved Zone IIs of public water supplies;

(2) Nitrogen sensitive embayments or other areas which are designated as nitrogen sensitive for purposes of 310 CMR 15.000 shall be mapped based on scientific evaluations of the affected water body and adopted through parallel public processes pursuant to both 310 CMR 15.000 and 314 CMR 4.00: *Massachusetts Surface Water Quality Standards*.

15.216: Aggregate Determinations of Flows and Nitrogen Loadings

(1) The 440 gallons per day per acre nitrogen loading limitation imposed by 310 CMR 15.214 may be calculated in the aggregate by using nitrogen credit land in accordance with an approved Facility Aggregation Plan or Community Aggregation Plan. Applicants proposing systems to be located within a community or region covered by a Community Aggregation Plan approved by the Department shall calculate aggregate determinations of flows and nitrogen loadings in accordance with the Plan and the Department's *Guidelines for Title 5 Aggregation of Flows and Nitrogen Loading*. All other applicants seeking aggregate determination of flows and nitrogen loading shall prepare a Facility Aggregation Plan in accordance with 310 CMR 15.216 and the Department's *Guidelines for Title 5 Aggregation of Flows and Nitrogen Loading*.

15.216: continued

(2) To qualify as Nitrogen Credit Land, the land must:

(a) be within the same Nitrogen Sensitive Area as the facility if the facility is in a Nitrogen Sensitive Area;

(b) be within the same subdivision in an area where the use of both on-site systems and drinking water wells are proposed to serve the facility;

(c) not have any manmade sources of nitrogen, including, but not limited to, wastewater discharges and nitrogen based fertilizer located thereon;

(d) not be used for raising, breeding or keeping of animals;

(e) be pervious;

(f) be outside of Zone As, Velocity Zones and Regulatory Floodways;

(g) not be covered by any surface water body including, but not limited to, a river, stream, lake, pond, or ocean;

(h) not be currently designated as nitrogen credit land; and

(i) meet the criteria set forth in the Department's *Guidelines for Title 5 Aggregation of Flows and Nitrogen Loading*.

(3) Land located within a Zone I of a public water supply well may be used as nitrogen credit land unless the well is determined to be at risk in accordance with the Department's "Guidelines for Title 5 Aggregation of Flows and Nitrogen Loading" or the proposed design flow is 2,000 gallons per day or greater.

(4) Community Aggregation Plans.

(a) A city or town may seek Department approval for aggregate determination of flows and nitrogen loading across a region wide area such as, but not limited to, a Zone II of a public water supply well. Department approval of a Community Aggregation Plan may authorize the local Approving Authority to approve site specific facility aggregation plans in accordance with the approved Community Aggregation Plan.

(b) The Department may approve a Community Aggregation Plan provided that the following conditions are met:

1. the local Approving Authority has approved the Plan;
2. the Plan contains a mechanism to protect surface and ground water supplies within the community or region from pollutant and nitrogen loading and a proposed mechanism for implementing the Plan;
3. the Plan meets the criteria in the Department's "Guidelines for Title 5 Aggregation of Flows and Nitrogen Loading;"
4. for areas that include a Zone II, the Plan includes a nitrate loading analysis and nitrate management plan as specified in 310 CMR 22.21(2)(d); and
5. any other conditions that the Department deems appropriate.

(5) Facility Aggregation Plans. The Approving Authority may approve a Facility Aggregation Plan provided that the following conditions are met:

(a) The proposed facility meets the criteria in the Department's *Guidelines for Title 5 Aggregation of Flows and Nitrogen Loading*,

(b) the design flow of 440 gallons per day per acre equivalency across the facility and other land areas for which nitrogen credit is sought, but not necessarily on every individual acre, will be met through recorded land use restrictions that restrict nitrogen loading on facility land and nitrogen credit land. These land use restrictions must be substantially identical to those contained in the Department's *Guidelines for Title 5 Aggregation of Flows and Nitrogen Loading*, run in perpetuity, be approved by the respective land owners, run to the benefit of the municipality acting by and through the Local Approving Authority and, in the case of nitrogen credit land, also run to the benefit of the facility land. The applicant shall record or register such restrictions and easements in the appropriate Registry of Deeds or Land Registration Office within 30 days of approval of the plan; and

(c) any other conditions that the Approving Authority deems appropriate.

15.217: Systems with Enhanced Nitrogen Removal

(1) The nitrogen loading limitations established in 310 CMR 15.214 shall not apply to discharge of an effluent meeting the federal Safe Drinking Water Act nitrate standard of 10 ppm through either an approved alternative system or a treatment works with a groundwater discharge permit issued pursuant to 314 CMR 5.00: *Ground Water Discharge Permit Program*.

(2) An increase in calculated allowable nutrient loading per acre may be allowed with the use of a technology approved for enhanced nutrient removal pursuant to either the piloting, provisional or general use certification provisions in 310 CMR 15.281 through 15.288 as illustrated by the following example:

Recirculating Sand Filter	550 gpd/acre

In the event that the Department determines that a system approved for enhanced nutrient removal using a technology approved by the Department on a piloting or provisional basis pursuant to 310 CMR 15.285 and 15.286 respectively is not performing in accordance with the approval, the Department or the Local Approving Authority may require the system owner to instead use an enhanced nutrient removal technology that has been certified for general use by the Department. The increased design flow allowed reflects the nutrient removal performance of the approved technology compared to a standard system otherwise described in 310 CMR 15.100 through 15.255. A system receiving a design flow credit for enhanced nutrient removal pursuant to 310 CMR 15.217 must still comply with the requirements of 310 CMR 15.100 through 15.293 with respect to system siting and design; the credit does not affect any other siting or design requirement.

15.220: Preparation of Plans and Specifications

The plans and specifications for every on-site system shall be prepared as follows:

(1) Every system shall be designed by a Massachusetts Registered Professional Engineer or a Massachusetts Registered Sanitarian provided that a Registered Sanitarian shall not design a system to discharge more than 2,000 gallons per day pursuant to 310 CMR 15.203. Any other agent of the owner may prepare plans for the repair of one or more components, excluding the soil absorption system, of a system designed to discharge not more than 2,000 gallons per day pursuant to 310 CMR 15.203 provided the plans are reviewed and stamped by a Massachusetts Registered Sanitarian or Massachusetts Registered Professional Engineer and approved by the Approving Authority.

(2) Every plan submitted for approval must be dated and bear the stamp and signature of the designer. At least one copy submitted shall bear the original stamp and signature of the designer.

(3) Every plan for a new system or plan for the upgrade or expansion of an existing system which requires a variance to a property line setback distance, must also reference a plan which bears the stamp and signature of a Massachusetts Licensed Land Surveyor in accordance with M.G.L. c. 112, § 81D;

(4) Every plan for a system shall be of suitable scale (one inch = 40 feet or fewer for plot plans and one inch = 20 feet or fewer for details of system components) and shall include depiction of:

(a) the legal boundaries of the facility to be served;

(b) the holder and location of any easements appurtenant to or which could impact the system;

(c) the location of all dwelling(s) and building(s) existing and proposed on the facility and identification of those to be served by the system;

(d) the location of existing or proposed impervious areas, including driveways and parking areas;

(e) location and dimensions of the system (including reserve area);

(f) system design calculations, including design daily sewage flow, septic tank capacity (required and provided); soil absorption system capacity (required and provided); and whether system is designed for garbage grinder;

(g) North arrow and existing and proposed contours;