



CHRISTIANSEN & SERGI, INC.
PROFESSIONAL ENGINEERS AND LAND SURVEYORS

160 SUMMER STREET. HAVERHILL. MA 01830

City of Newburyport Planning Board
Site Plan Review

Review Date: June 26, 2017
Plan Title: 18 Boyd Drive
Applicant: Evergreen Commons, LLC
Applicant's Engineer: Design Consultants, Inc.
Plan Date: May 22, 2017

The submitted plan set was reviewed for compliance with the City of Newburyport Rules and Regulations Governing the Subdivision of Land Review. The applicant has submitted the following plans and documents for Christiansen & Sergi, Inc. (CSI) to review:

1. Plans entitled Open Space Residential Definitive Subdivision (18 Boyd Drive); Sheets 1 – 35, dated 5/22/2017
2. Application for Definitive Subdivision Approval, dated 5/22/2017.
3. Project Narrative and Stormwater Analysis, dated 5/22/2017.
4. Traffic Impact and Access Study, last revised 9/15/16

A compliance checklist comparing the plan's content to the City of Newburyport Rules and Regulations for the Subdivision of Land is attached. While there are many areas in which the plan is non-compliant the Board should consider which of those required items are necessary to be added to the plan and which are not needed

We have listed below those non-compliant issues we consider to be of most Importance as well as engineering design issues that need to be addressed so that the project will be built and function as intended.

1. The Board should determine the classification of the proposed streets. Under the definitions set forth in the regulations, we feel all proposed roads other than the cul-de-sac could be considered collector streets as they provide access from multiple streets and can be used as a through road.
2. As designed, most of the drainage structures proposed a 2' rim to invert offset. This offset is not constructible and should be revised. Also, for minimal offsets, flat top structures should be specified rather than conic.

3. The rules and regulations specify concrete pipe for drainage pipe, HDPE was proposed.
4. The minimum cover over the drainage pipes should be revised. One foot of cover is the minimum allowed, however for structures within the roadway, this would mean the pipes are within the roadway gravel. Additional cover should be provided.
5. Catch basins should be added on the loop road around STA 4+50. There is currently 550' of road from the high point to the nearest catch basins.
6. The minimum road grade is 1%. The roads within the subdivision are proposed at 1%. An issue arises when you have vertical curves with 1% slopes on either end of the vertical curve. Throughout the vertical curve the resulting slope is less than 1%. This causes an issue with the proposed street drainage. There are difficulties accurately paving at less than 1% and can lead to ponding in the roadway and leading to water not being caught by the drainage system. The proposed grades should be revised to allow more grade throughout the vertical curves to ensure proper drainage.
7. Spot grades or swales should be provided along the rear of lots 28-30 and 36-38 to provide adequate drainage as these areas currently appear to be low spots and may cause ponding if not properly designed.
8. The expanded Isolated Wetland and ILSF area are stated to be excavated to elevation 49 (the Estimate Seasonal High Groundwater Level), however the calculations for the drawdown time state it drains in 45 hours. During high groundwater seasons, the area will not drain as designed due to groundwater at or very near to the surface. According to the Stormwater Handbook, a 2 foot offset must be held when infiltration stormwater. According to the number provided in the stormwater analysis, the drawdown time should be 60 hours not the 45 proposed. Groundwater mounding analysis should be performed to ensure that if this area is capable of infiltration the standing water that the groundwater mound will not break through the bottom elevation of the area causing even slower drawdown times. No storage volumes or calculation were provided with this ILSF area and should be submitted for review. The elevations listed in the narrative section of the report indicated that the ILSF area will hold more than 4' of water which is a safety concern and should be addressed.
9. The Bio-retention areas should not be used to meet both the water quality volume and recharge requirements. In order to treat the stormwater, the bio-retention area will accumulate sediment cause recharge to be limited or not possible. These areas should be redesigned to ensure proper functioning.

10. All catch basins and manholes should be modeled in HydroCAD and the entire system should be run as a dynamic model to ensure backwater does not cause catch basins to over-top and cause more ponding on already flat streets.
11. Actual Time of Concentration numbers should be calculated to accurately model the drainage system. The minimum Tc as specified in TR-55 is not intended for computer modeling.
12. TSS removal worksheets should be provided proving the efficiency of the system. 44% pretreatment should also be shown.
13. The calculations show the total depth of the Constructed Stormwater Wetland to be greater than 4' in depth. This should be reviewed as it is a safety issue.
14. The water mains should be shown on the road profiles. It appears that there are a few conflicts between the water and sewer mains and should be reviewed for constructability.
15. Cross-country drainage and sewer profiles should be provided for these system that run outside of the roadways to ensure proper cover and function.

Substantial revisions should be made to the plans and the hydrologic analysis before a thorough review can be completed. Construction details must be revised to reflect the designs illustrated in the plan and profile view, the water line must be shown because of the potential interferences of shallow sewers and the water pipes, the drainage pipes need to be lowered, sewer pipes must be lowered, house service water and sewer locations must be shown and the hydrologic analysis must be rerun reflecting a dynamic analysis with the proper drainage structures and piping.

The Applicant should submit revised plans and a written response to these comments at their earliest convenience. The Applicant may request a digital copy of this review to expedite their response. Should the Applicant have any questions or comments regarding this review, the Applicant should correspond through the Planning Board, or may contact Christiansen & Sergi, Inc. at the discretion of the City of Newburyport Planning Board.

Regards,

Christiansen & Sergi, Inc.

