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December 6, 2024

Town of Montville
310 Norwich-New London Tpke.
Uncasville, CT 06382

Attn: Meredith Badalucca, Assistant Planner

RE: Shantok Village Site Plan Application 24SITE9
1758 Route 32, Montville, Connecticut–
Response to November 20, 2024 Comments – CLA Engineers, Inc.
Response to November 21 and 25, 2024 Comments – Wright-Pierce
Response to November 18, 2024 Comments – Montville Building Official

Dear Ms. Badalucca:

Loureiro Engineering Associates, Inc. (LEA) has prepared this letter to provide responses to the November 20, 2024 comments from CLA Engineers, Inc., the November 21, 2024 comments from Wright-Pierce, and the November 18, 2024 Comments from the Building Official, all regarding the Site Plan Application for the residences at Shantok Village, located at 1758 Route 32 in Montville, CT. This letter is formatted to provide responses below each of the italicized comments for both CLA and Wright-Pierce. Comments received from the Fire Marshal today will be addressed under separate cover or on the record during Tuesday evening's Planning and Zoning meeting.

Response to CLA Comment letter dated November 20, 2024:

1. *C-2 / Plans: There appear to be inconsistencies in the test hole numbering on the plan sheets and corresponding logs on sheet C-2. Some test holes labeled on the plans don't have a corresponding log. Please clarify if the logs provided on sheet C-2 are excavated test pits or boring logs.*

   Response: Test pit locations shown on previous layout drawings depict deep test pit locations recorded by LEA on November 6th and 7th, 2023. Logs shown on Drawing C-2 are boring logs for borings performed by Clarence Welti Associates Inc. in November 2011.

   Test pit labels have been renamed "TP-X" for clarity. Boring locations have been added to Drawing C-4 with "B-X" labels. Test pit logs have been added to Drawing C-5.

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2. *C-2: The Soil Test Data text indicates that no groundwater was observed on the boring completion. Was there evidence of a seasonal high groundwater table observed during test pit excavation?*

   Response: No evidence of groundwater was observed during test pit excavation or borings. The absence of mottling is noted for each test pit in the test pit logs now included on Drawing C-2.

3. *C-2: The Site Notes indicate a separate Zoning Permit is required for onsite material processing. Is onsite rock or material processing proposed throughout construction? It appears to be part of work zone 2, but is located over the site improvements of works zone 1. The use and location should be clarified.*

   Response: Upon full stabilization of work Zone 1, rough grading will commence in Zone 2, where rock excavation is expected, using a portion of Zone 1 as a staging and process area.

4. *C-2: Temporary Sediment Basin "A" is sized based on the Temporary Sediment Trap calculations. This should be sized in accordance with the Basin calculations due to the contributing watershed size.*

   Response: Additional calculations for Sediment Basin A, located in the southeast, are attached and the basin area has been adjusted accordingly. Sediment Trap A, located in the west of the site, is now labeled as such.

5. *C-2: E&S Control Notes: The Work Zone 1 narrative indicates temporary sediment pond 1 and 2, this should be corrected to basins A and B.*

   Response: The work Zone 1 narrative has been corrected to refer to the sediment basin, located in the southeast corner of the site, as Sediment Basin A; and the sediment trap, located in the west end of the site, as Sediment Trap A.

6. *C-2: E&S Control Notes: We recommend adding a note referencing the use of the Earthguard slope stabilization on the 3:1 slopes or steeper as called out on the plans.*

   Response: The use of Earthguard on slopes of 3:1 or greater has been added as Note #6 of "General E&S Requirements" in the Erosion and Sedimentation (E&S) Control Notes. Maintenance notes for Earthguard have also been added to "Maintenance of Erosion Control Devices" on Drawing C-2.

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7. *C-2: E&S Control Notes: We recommend adding a note that temporary E&S measures remain in place until the site has been reviewed and removal allowed by Town Staff.*

   Response: This requirement has been added to Note #8 of "General E&S Requirements" in the Erosion and Sedimentation (E&S) Control Notes.

   Additionally, the project will require authorization through the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities (Construction Stormwater GP). As part of the GP, post-construction and final stabilization inspections are required for termination under the GP following construction completion.

8. *C-2: E&S Control Notes: We recommend adding a note that copies of the CTDEEP Construction Stormwater General Permit registration materials and inspection reports shall be provided to Town Staff during construction.*

   Response: Section 4(*h*)(2) of the Construction Stormwater GP requires copies of the permit registration and plans be provided to town staff upon request.

   Note #4 of "General E&S Requirements" in the Erosion and Sedimentation (E&S) Control Notes on Drawing C-2 has been revised to require routine inspection reports be provided to town staff during construction.

9. *C-4/5: Is there adequate room on the final site for snow storage?*

   Response: Multiple locations are designated for snow storage. If a storm is significant to require additional storage, snow will be hauled off-site.

10. *C-5: Grading is shown at or in very close proximity to the property line in several locations. The Applicant should address the feasibility of this construction without disturbing neighboring property. In particular along the southern boundary where E&S measures are shown and necessary.*

    Response: Property limits adjacent to grading will be clearly defined and protected through the following methods:

    - Use of 4' tall silt fence backed by chain link fence offset along downslope southern property limits.
    - Property boundaries will be staked out by a licensed surveyor. This requirement has been added to Note #23 of "Site Notes" on Drawing C-2.

    Additionally, much of the property boundary is already demarcated with a stone wall. This will aid in delineating the limits of grading disturbance.

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11. *C-5: It appears the graded slope east of building 4 heading north toward the ramp is a 2:1 slope or steeper without benching. It also appears that the slope south of building 2 between the entrance drive and south property line is a 2.5:1 slope. Benching should be provided where the slope exceeds 3:1 for 15' vertically, or a detailed analysis should be provided demonstrating the slope stability, as outlined in the E&S Manual.*

    Response: A geotechnical analysis, performed by a licensed professional engineer with experience in geotechnical engineering, will be required for foundations and retaining walls. As part of that analysis, the geotechnical engineer will provide slope stabilization recommendation for during construction and final conditions which will be incorporated into the final solution for construction prior to construction. A note stating such has been added as Note #24 of "Site Notes" on Drawing C-2.

12. *C-5/6 & Stormwater Management Report: Calculations should be provided demonstrating the major vegetated swales have the capacity needed and can accommodate the anticipated velocities within them.*

    Response: Both swales are modelled in HydroCAD to demonstrate their capacity to convey their respective subcatchments. Summaries of how these swales were modelled are now included in Appendix D of the Stormwater Management Report.

    In accordance with the Stormwater Quality Manual, swales with velocities greater than 3 feet per second during the 10-year design storm shall be provided with woven reinforcement matting. Drawing C-8 has been revised to specify the reinforcement matting on the swales. A channel analysis demonstrating the reinforced swales velocity capacity as Attachment 1 to this response to comments package.

13. *C-6: There is a long run of vegetated swale along the north side of the entrance drive. Can stormwater be captured more frequently along this run to help prevent erosion?*

    Response: A scour hole with a catch basin inlet has been added to Drawing C-6 at approximately the midpoint of the swale to capture runoff and prevent erosion.

14. *C-6: Several culverts are proposed with steep slopes. Stormwater velocities should be checked to ensure compliance with the pipe manufacturers' recommendations. The applicant should address if additional support or collars are needed in these trenches to prevent pipe creep.*

    Response: The storm water system is now modeled for major junction catch basins and pipes. Calculations can be found in Appendix D of the Stormwater Management Report. Per ADS (Advanced Drainage Systems) Drainage Handbook specifications, pipes above 12% slope or 12 fps velocity are recommended to be anchored. Callouts for anchoring have been added to Drawing C-6, and a detail has been added to Drawing C-14.

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15. *C-6: Additional detail or information for the "At Grade Stormwater Infiltration" should be provided, including surface treatment or soil section. Has soil testing been done in this area?*

    Response: Soil restoration will be required in the area of the at-grade infiltration basin and elsewhere as needed. Soil restoration guidelines have been added to Drawing C-15. The requirement of soil restoration and the seed mix required has been added to the basin callout on Drawing C-6.

    Soil boring B-31 was recorded nearby the proposed basin location, indicating 5.2' to bedrock. The basin area will be in 3-8' of fill. Soil below the restored topsoil surface will be select fill.

16. *C-6: Will roof drainage be connected to the stormwater drainage system? If so locations, or call-outs should be provided.*

    Response: Roof drainage is proposed to be connected to the stormwater collection system and is tributary to the stormwater management detention / infiltration systems. Stormwater pipes for roof collection are now provided and are generally parallel to the front and rear of each residential building and are indicated on Drawing C-6, Drainage Plan.

17. *C-6: Two of the subsurface systems are labeled infiltration, one is labeled detention. Is there a difference in construction of the systems? If so, additional construction details should be provided for each system.*

    Response: Retain-it infiltration and detention systems use the same size modular units and similar configuration where infiltration units have an open bottom. The difference between the two is the use of an impermeable membrane for detention systems, while infiltration systems are wrapped with geotextile fabric. The membrane prevents water from infiltrating into the surrounding soil.

    Subsurface Infiltration System INF-A and INF-B have been identified as such on Drawing C-6 and a detail "Retain-it Infiltration System Detail, Typical" has been added to Drawing C-15.

    Subsurface Detention System DET-A have been identified as such on Drawing C-6 and a "retain-it Detention System Details, Typical" has been added to Drawing C-15.

18. *C-6: The applicant should address the location of the subsurface infiltration/detention systems relative to seasonal high groundwater and ledge. The lack of existing and proposed contour labels makes it difficult to determine if the systems will be in soil or rock cuts. The bottom of the subsurface infiltration system at the driveway entrance appears to be around 15' below grade, has soil testing been done in that area to that depth?*

Response: Based upon consultation with the town's consultant, CLA Engineers, callouts have been added to Drawing C-6 indicating all subsurface infiltration system locations need to be further investigated with test pits and/or ledge probes to confirm proper separating distances from bedrock and groundwater. Investigations into mitigation measures such as ledge cuts would be completed and presented to the town in writing before construction is initiated. We recommend this be noted as a condition of the approval.

19. *C-8: The location of the mulch socks east of building 4 should be adjusted to avoid installation across the slope and potentially concentrating flow.*

    Response: The location of the mulch socks east of building 4 have been adjusted to avoid installation across the slope.

20. *C-9: How will the site be accessed for this portion of the work? It appears that the construction entrance and Sediment Basin A overlap.*

    Response: The initial location of the construction access will be to the north of the Sediment Basin A as indicated. The construction access that overlaps Sediment Basin A is to be constructed once the sediment basin is removed and this is now indicated in the callout for this construction access.

21. *C-9: Additional E&S measures should be provided at the drainage system outlets and outlets from the temporary sediment traps/basins.*

    Response: Biodegradable straw wattles are now provided at the drainage system outlets and outlets from the temporary sediment trap and basin.

22. *C-9: Where will temporary material stockpiles, staging areas, and trailers be located.*

    Response: There will not be any job trailer during the initial grading in Phase 1 of this project until the upper western land area is graded to facilitate placement. The trailer, if utilized, may require a generator during the initial occupancy until power is advanced to this location.

    The construction access path to the west side of Work Zone 1 will use minimal stockpiling and excavation to provide access since the majority of the access will be built in fills. Stockpiles will be in this western area of Work Zone 1.

23. *C-9: Will the site and building improvements be complete at the end of work zone 1?*

    Response: Upon complete stabilization of the Work Zone 1 area, it will be used as the initial staging area and rock processing area for rough grading of Work Zone 2. Complete stabilization of Work Zone 1 will include permanent stabilization of all vegetated areas

using grass or engineered soil stabilizing emulsion; Other areas will be stabilized with non-erodible surface material such as stone, base course pavement, or concrete.

24. *The following construction details should be provided:*
    a. New Guide Rail
    b. Headwalls and endwalls
    c. Stacked Retain-it
    d. Vegetated swale
    e. ADA sidewalk ramps (titles are there)
    f. Permanent stone check dams
    g. Steps and handrails
    h. Concrete sidewalk against BCLC
    i. Topsoil section
    j. Seed mixes & application rates

    Response: These details have been added to the detail drawings.

Stormwater Management Report:

25. *The locations, depths, and data for all of the permeability samples should be provided.*

    Response: Permeability results have been added to Appendix B of the Stormwater Management Report. The test pit and depth that each sample was taken at is included.

26. *Current stormwater runoff appears to sheet flow off the site along the entire southern boundary. The proposed development will concentrate flow to two point source discharges. The Applicant should address whether these point source discharges could have a negative impact on property or infrastructure downstream.*

    Response: Based on slope of the existing site, existing runoff travels over 500' prior to crossing into downstream properties. According to TR-55, Urban Hydrology for Small Watersheds, sheet flow becomes shallow concentrated flow after a maximum of 300'. With the slopes that exist on this site, sheet flow is estimated to max out at about 150-feet before transitioning to shallow concentrated flow. It is very likely that downstream areas already receive concentrated flow. The use of scour holes and rip rap aprons will aid in dissipating flow much further downslope than where existing flow paths begin. Additionally, the reduction in stormwater peak and volume discharged from the Site decreases the likelihood of flows having a negative impact to downstream areas.

27. *The Applicant should address the western FES discharge location. Reviewing GIS contours downstream of this location it appears this discharge could be directing water to the structure on the 100 Fort Hill Drive property.*

Response: The western off-site area was chosen as a point of compliance due to topography indicating that existing flows are directed towards this property under existing conditions. As mentioned in the previous comment, the use of flow dissipators and the reduction of peak flows and volumes mitigate the impact of runoff to downstream locations.

28. *Time of concentration travel paths for the existing conditions and for the larger post development watersheds should be shown.*

    Response: Time of concentration travel paths have been added to Drawing DA 1 and DA 2 in the Stormwater Management Report.

29. *The Hydrocad output sheets indicate the calculations were performed for a Type II storm distribution. The NRCS NOAA Type D distribution should be used.*

    Response: Rainfall inputs have been revised to NOAA Type D distributions. Revised HydroCAD outputs can be found in Appendix D of the Stormwater Management Report.

30. *Subcatchment summary sheets and pond report summary sheets should be provided.*

    Response: The HydroCAD report has been revised to include pond and subcatchment summary sheets. Pond and subcatchment summary sheets are only included for the 100-year storm event to reduce the pages of the report. The revised HydroCAD report is included as Appendix D of the Stormwater Management Report.

31. *Analysis for the onsite drainage system should be provided*.

    Response: The HydroCAD model has been revised to include downstream catch basin structures that will receive total flows from respective drainage areas. Some drainage areas were subdivided to more precisely model the routing of the drainage system. Through this process, it was noted that some catch basins would flood during the 100-year storm event. Certain pipes have been enlarged to prevent any flooding during all storm events. The revised HydroCAD report is included as Appendix D of the Stormwater Management Report.

32. *Sizing calculations for outlet protection measures should be provided.*

    Response: Outlet protection calculations are included in Attachment 2 to this response to comments. Note that calculations such as these will be included in the registration package for the Construction Stormwater GP.

33. *Reference is made to hydrodynamic separators. Are there any proposed?*

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Response: The retain-it system's modular unit configuration allows for water quality Primary Treatment Units to be included at the inlets of the systems. These units allow for the capture of oil, trash, and suspended sediment before stormwater is discharged to other units of the system.

Primary Treatment Units are called out on Drawing C-6, and a detail is provided on Drawing C-15.

34. *Water quality for each of the discharges should be addressed.*

Response: Water quality calculations have been revised to show water quality volume and flow for each of the subsurface systems. The infiltration systems provide ample storage and infiltration capacity to retain the water quality volume on-site. The calculations are included as Appendix E of the Stormwater Management Report.

35. *Maintenance for the at grade infiltration should be provided.*

Response: Inspection and maintenance items have been added for the at-grade stormwater infiltration basin in the Stormwater Management System Maintenance Program, included as Appendix F of the Stormwater Management Report.

Response to Wright-Pierce Comment letter dated 11/21 and 11/25/2024:

Water System Comments

1. *The hydraulic grade line for the water service zone is approximately elevation 430 to 450 (NGVD). Based on a preliminary review of the building elevations, it does not appear that adequate water pressure will be provided to the highest building elevation. Therefore, propose a means of boosting the water pressure for the development of that will meet the State's minimum pressure and fire flow requirements.*

Response: A location for a small pre-engineered or custom designed pressure booster station has been added to the plans. The facility will be designed to accommodate domestic flow for the entire facility plus fire protection needs for the highest demand building (Community Building).

2. *Provide a range for the water demand (standard and fire flow conditions) of Shantok Village.*

Response: Based upon the Market Study prepared by Trio Properties LLC, the distribution of the 200 rental units is as noted below:

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Unit Type	Number of Units	Number of Bedrooms
1 BR	94	94
2 BR	92	184
3 BR	14	42
		Total 320

Assuming 1.6 people/bedroom at 75 GPD/person = 38,400 gallons per day domestic

The estimated fire flows prepared by Innovative Services Inc. (Attachment 3) are as follows:

Estimated flow and pressure required for a Residential 4 story building not exceeding 60' at the peak per NFPA 13R is 100 GPM @ 75 PSI

Estimated flow and pressure required for the Community Building is 750 GPM @ 85 PSI

3. *The Water Line Trench detail indicates 3-ft depth. The water pipe depth is to be 4-ft minimum below ground level.*

Response: The detail has been amended to reflect 4-foot minimum below grade.

4. *Note location of water meter(s). Will these be located at each building or one for the whole complex?*

Response: Each unit will be individually metered and the meters shall be located within each building. A typical note has been added to the Drawing C-7

5. *Confirm the proposed fire hydrant locations with the Town of Montville Fire Marshall.*

   Response: The Fire Marshall has reviewed the plans and had no comments. The email from the Deputy Fire Marshall is attached (Attachment 4) to this response to comments.

6. *Plans should label water main pipe size and material throughout the development.*

   Response: The water main has been labeled in the updated plans on Drawing C-7, Utility Plan.

7. *The valves on the service lines should be located close to the water main loop as opposed to buildings to facilitate isolation in the event of a service line break.*

   Response: The valves have been relocated in accordance with this recommendation.

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8. *Maintain required separation distances per Utility Note 4C. Confirm and verify that the proposed water meets the required State of Connecticut Department of Health vertical and horizontal separation distances from the proposed sewer and storm lines.*

   Response: Horizontal separation is provided between storm and sewer lines. The plans have been amended to provide 18" minimum vertical separation at all water crossings.

9. *Backflow preventers must be installed on each service line per Utility Note 4A. Will these be located inside buildings?*

   Response: Backflow preventers will be located in a pit outside of each building. These locations and a typical callout have been added to the Utility Plan.

Sanitary Sewer Comments

1. *Provide a range of anticipated average and peak sanitary sewer flows.*

   Response: Based on the calculations included in number 2 above, we estimate the average daily flow at 38,400 gallons per day. Using a peaking factor of 4 yields a peak flow of 153,600 gallons per day.

2. *Flows discharged to the sewer from this development will flow through a series of isolated pipes further down Route 32 identified in the 2011 wastewater facility plan and I/I study as potentially having capacity limitations during high-flow / storm events. Depending on the estimated peak flows proposed to be discharged from the site, these pipes may need to be reviewed and considered for replacement to provide adequate capacity during peak flow events.*

   Response: Understood.

3. *Confirm adequate separation distance according to CT Public Health Code at the intersection with the storm drain and water main.*

   Response: Horizontal separation is provided between storm, water, and sewer lines. The plans have been amended to provide 18" minimum vertical separation at all water crossings.

4. *Investigate alternative sewer connection point. It appears there is a sewer manhole approximately 70 to 80-feet to the south, on the west side of the road. Confirm this location and pipe size, and the existence of connection stubs. (See attached utility drawing and profile for reference.)*

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Response: We reviewed the plan and profile prepared by Moffit and Duffy, Inc. titled Route 32, Station 76+85 to 77+00, dated 7/1/85 (which should be titled 76+85 to 84+60). There are no stubs indicated on the plans. We are much more comfortable making the new connection as designed with a doghouse manhole with a new table invert.

5. *MH 9, although a drop manhole is shown to be approximately 31' deep (rim to invert) in an area behind a building that will be inaccessible for future maintenance. Please consider alternatives that would allow for improved maintenance access.*

   Response: Maintenance can be provided by vehicles accessing between buildings 3 & 4, and then running hoses and other equipment to personnel standing on the slope. To alleviate the need for machinery access to the manhole, the depth of the manhole has been reduced to 15'.

6. *There are significant drop piping connections within multiple manholes on the plan. Provide a detail for this type of manhole connection. Larger diameter manholes may be required for manholes containing drop pipes to allow for maintenance access.*

   Response: A Typical drop manhole detail has been added to the detail sheet and called out on the plans. The sanitary sewer slopes on pipes approaching such structures have been revised.

7. *The sewer piping leaving the building locations and heading downhill towards the sewer main connections will have significant slopes. Designer to confirm that adequate measures have been provided for high velocity protection in accordance with TR-16 Guides for the Design of Wastewater Treatment Works.*

   Response: Steep pipe slopes have been reduced to ensure velocities below 12 fps.

8. *Design should consider inclusion of impervious dam materials in the sewer bedding for steep pipe segments to avoid groundwater collection and downstream groundwater issues.*

   Response: An anti-seep collar has been added to the steep pipe section to mitigate groundwater streaming. A detail has been provided on Drawing C-16.

9. *Provide adequate sewer pipe cover or other protection for shallow pipes. There are instances of sewer piping having less than preferred minimum covers (such as the inlet to MH 19 with a frame elevation of 319.43, but an 8" pipe invert of 316.5, leaving approximately 2' of cover over the pipe). Typically, a minimum cover of 3.5' to 4' is maintained over sewer pipes where possible.*

   Response: Pipe inverts have been adjusted at MH 19 to provide 3.5' minimum cover.

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Response to Town of Montville Building Official email dated 11/18/24:

1. *A building permit is required for any retaining wall over 36" in height.*

   Response: So noted.

2. *Where retaining walls greater than 30" in height over the lower grade have a walking surface adjacent, a pedestrian guard rail meeting the requirements of the 2022 CT State Building Code is required.*

   Response: Guards will be provided along all retaining walls greater than 30-inches in height regardless of the proximity of pedestrian walks, consisting of a secure chain link fence with dark colored vinyl slats, a top and bottom rail.

3. *Outdoor lighting fixtures shall be compliant with the CT State Building Code and be "full cut off" fixtures.*

   Response: All outdoor lighting fixtures are indeed dark sky compliant and full cut-off in accordance with the Connecticut State Building Code.

4. *Plumbing permit is required for site storm water piping and systems.*

   Response: This requirement has been added to the Utility Notes.

5. *Accessible site elements (parking spaces, signage, ramps, walkways, etc.) may be regulated by the CT State Building Code, and where regulated by the CT State Building Code shall be included as a scope of work with the associated building permits for the structures the site the elements will serve.*

   Response: So noted

6. *Subject to further review of the number of Type A and Type B units that will be proposed at time of building permit application, the site appears to be compliant with the ratio and location of accessible parking spaces.*

   Response: So noted.

7. *Symbols and signage are controlled by State Statute and referenced in the CT State Building Code. It is typical for these details to be updated at the time of Building Permit application.*

   Response: So noted.

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8. *We have not conducted a thorough review of the plans for determination of compliance with the CT State Building Code, and as is typical, will not until a formal set of signed and sealed documents are submitted along with a building permit application. It is also typical for certain accessible features to be revised during the building permit process.*

   Response: Understood.

We hope that this resubmission meets your standards for approval and if there is a need for additional information, or if you have any further questions or concerns, please contact me at 860-410-2906.

Sincerely,

LOUREIRO ENGINEERING ASSOCIATES, INC.

George F. Andrews, P.E.
Principal Engineer, Civil Engineering

Attachments

Attachment 1 - Channel Analysis
Attachment 2 – Outlet Protection Calculations
Attachment 3- The Villages Fire Flow Estimates
Attachment 4 - Comment from Town of Montville Deputy Fire Marshall

North American Green
5401 St. Wendel-Cynthiana Rd.
Poseyville, Indiana 47633
Tel. 800.772.2040
>Fax 812.867.0247
www.nagreen.com
ECMDS v7.0

CHANNEL ANALYSIS

> > > Swale 2

Name	Swale 2
Discharge	2.41
Channel Slope	0.09
Channel Bottom Width	0
Left Side Slope	3
Right Side Slope	3
Low Flow Liner	
Retardence Class	D 2-6 in
Vegetation Type	Mix (Sod and Bunch)
Vegetation Density	Good 65-79%
Soil Type	Loam (MH)

C125BN

Phase	Reach	Discharge	Velocity	Normal Depth	Mannings N	Permissible Shear Stress	Calculated Shear Stress	Safety Factor	Remarks	Staple Pattern
C125BN Unvegetated	Straight	2.41 cfs	5.36 ft/s	0.39 ft	0.027	2.8 lbs/ft2	2.17 lbs/ft2	1.29	STABLE	D
Underlying Substrate	Straight	2.41 cfs	5.36 ft/s	0.39 ft	0.027	2.25 lbs/ft2	1.03 lbs/ft2	2.18	STABLE	D

Unreinforced Vegetation

Phase	Reach	Discharge	Velocity	Normal Depth	Mannings N	Permissible Shear Stress	Calculated Shear Stress	Safety Factor	Remarks	Staple Pattern
Unreinforced Vegetation	Straight	2.41 cfs	4.89 ft/s	0.41 ft	0.03	4 lbs/ft2	2.28 lbs/ft2	1.76	STABLE	--
Underlying Substrate	Straight	2.41 cfs	4.89 ft/s	0.41 ft	0.03	1.15 lbs/ft2	1.08 lbs/ft2	1.07	STABLE	--

North American Green
5401 St. Wendel-Cynthiana Rd.
Poseyville, Indiana 47633
Tel. 800.772.2040
>Fax 812.867.0247
www.nagreen.com
ECMDS v7.0

CHANNEL ANALYSIS

> > > Along Road

Name	Along Road
Discharge	2.16
Channel Slope	0.06
Channel Bottom Width	0
Left Side Slope	2
Right Side Slope	6
Low Flow Liner	
Retardence Class	D 2-6 in
Vegetation Type	Mix (Sod and Bunch)
Vegetation Density	Good 65-79%
Soil Type	Loam (MH)

C125BN

Phase	Reach	Discharge	Velocity	Normal Depth	Mannings N	Permissible Shear Stress	Calculated Shear Stress	Safety Factor	Remarks	Staple Pattern
C125BN Unvegetated	Straight	2.16 cfs	3.98 ft/s	0.37 ft	0.029	2.8 lbs/ft2	1.38 lbs/ft2	2.03	STABLE	D
Underlying Substrate	Straight	2.16 cfs	3.98 ft/s	0.37 ft	0.029	2.25 lbs/ft2	0.66 lbs/ft2	3.4	STABLE	D

Unreinforced Vegetation

Phase	Reach	Discharge	Velocity	Normal Depth	Mannings N	Permissible Shear Stress	Calculated Shear Stress	Safety Factor	Remarks	Staple Pattern
Unreinforced Vegetation	Straight	2.16 cfs	3.39 ft/s	0.4 ft	0.036	4 lbs/ft2	1.49 lbs/ft2	2.68	STABLE	--
Underlying Substrate	Straight	2.16 cfs	3.39 ft/s	0.4 ft	0.036	1.6 lbs/ft2	0.72 lbs/ft2	2.22	STABLE	--

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Project:	Shantok Village		
Comm #			
Sheet No.:	1 of		1
Calculated By:	APH	Date:	12/6/2024
Checked By:	GFA	Date:	12/6/2024

CALCULATION FOR DIMENSION
OUTLET PROTECTION -

Pipe	West Scour	East Scour	SE Apron
Dia (in)	12	12	24
L (ft)	106.5	45	57
Slope (ft/ft)	0.0051	0.275	0.0061
Mannings n	0.012	0.012	0.012
Max Q (flow, cfs)	4.35	2.34	16.05
Max v (Velocty ft/sec)	2.76	20.24	19.14
Outlet Protection Type	Scourhole	Scourhole	Type A riprap
Length of Apron			14

Calculations for pipes flowing at full capacity, these are the maximum flow and velocities that can be achieved.

Use CT DOT Drainage Manual Section 11.13 to size outlet protection. Table 11-12.1 requires use of pre-formed scour hole

Scour Hole Dimensions:
C (ft)= 3Sp + 6F
B (ft)= 2Sp + 6F
F = 0.5Rp (Type 1) or Rp (Type 2)

Use Type 2
Sp= Inside span of pipe
Rp= Inside pipe rise
Sp=Rp for circular pipes
F=Depth of scour hole

Type 2 scour hole selected

	West	East
C (Basin Length in ft)	9	9
B (Basin width in ft)	14	11

d_{50}=median stone size required

Type 2 $d_{50}=(0.0082R_p^2/TW)\ (Q/R_p^{2.5})^{1.333}$	0.03	0.01
Rip Rap Size	Modified	Standard

Innovative Services, Inc.
10 Lamont Lane
Tolland, CT 06084
P: 860-870-3888 **F: 860-870-3881**
CT License # F11507 **MA License # SC006132**
HIC.0582799
A CT SBE Certified Company

7-30-24

Four Seasons Construction
24 main Street, Suite D
Centerbrook CT 06409

Re: The Villages
Uncasville, CT
Fire Protection

Attn: Corey Grossman

My estimated flow and pressure required for a Residential 4 story building not exceeding 60' at the peak per NFPA 13R is 100 GPM @ 75 PSI

Estimate for club house is 750 GPM @ 85 PSI

These are just estimates as layout of underground site mains and available water pressure and volume may change these results.

Any questions please call me @860-306-8222 or email garycusson@snet.net

All past due invoices are subject to 1 ½ percent interest per month, 18 percent per year. In addition, the owner shall be responsible to the contractor for all costs incurred by the contractor for collection of all unpaid balances, including all attorneys' fees.

Thank you,

Gary W. Cusson
President
Innovative Services, Inc.

George F. Andrews

From: Megan Egbert <megbert@montville-ct.org>
Sent: Tuesday, December 3, 2024 3:38 PM
To: George F. Andrews; cgrossman@fsc-homes.com
Cc: Meredith Badalucca
Subject: FW: 24SITE9 - Shantok Village

Good Afternoon,

Please see below from the Fire Marshal's office.

Thank you,
Megan

From: John Meigel <jmeigel@montville-ct.org>
Sent: Tuesday, December 3, 2024 3:35 PM
To: Megan Egbert <megbert@montville-ct.org>
Subject: 24SITE9 - Shantok Village

At this time the fire marshals office has no further comments on the site plan at this time

John Meigel
Deputy Fire Marshal
Town of Montville
Fire Services & Emergency Management
310 Norwich- New London Tpke
Uncasville, CT 06382

Phone: (860) 848-6781
Fax: (860) 848-4063
Office# 860-848-6729
Email : JMeigel@montville-ct.org