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December 10, 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 December 9, 2024 Comments – CLA Engineers, Inc.

Dear Ms. Badalucca:

Loureiro Engineering Associates, Inc. (LEA) has prepared this letter to provide responses to the December 9, 2024 comments from CLA Engineers, Inc., regarding the revised Site Plan Application for the residences at Shantok Village, located at 1758 Route 32 in Montville, CT. This letter is formatted to only provide responses below each of the italicized additional comments for CLA.

Response to CLA Comment letter dated December 9, 2024:

4. *C-2 / Plans: Temporary basin dimensions are indicated. Required storage volume calculations were not included and should be provided.*

   Response: Storage volume calculations have been added to Drawing C-2. A full calculation worksheet is included as Attachment 1 – Sediment Basin Sizing Worksheet.

10. *C-5: The Engineer has indicated that the boundary line will be staked by a land surveyor, which is appropriate. The concern remains about the feasibility of construction in close proximity to the southern boundary line. Steeper slopes may be required to complete the grading.*

    We recommend that the project geotechnical engineer review the constructed slopes and specify additional temporary and permanent slope stabilization measures as needed.

    Response: Note #24 of "Site Notes" on Drawing C-2 has been revised to include slopes in the geotechnical analysis.

11. *C-5: We recommend that the added note #24 include the following: The geotechnical analysis shall include temporary and permanent slope analysis and stabilization requirements for slopes exceeding 3:1. The analysis shall be submitted to the Town for review at least 14 days prior to the start of construction. Changes to the final surface*

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treatment for slope stabilization or retaining walls may require modification of the approved site plan.

Response: Note #24 of "Site Notes" on Drawing C-2 has been revised to include this requirement of analysis and submission to the Town.

18. *C-6: The Engineer has acknowledged that additional subsurface investigation is necessary at the infiltration system locations. We recommend that additional testing be performed and confirmation that the proposed systems are suitable, or modifications proposed prior to the issuance of a zoning permit. Results of the subsurface investigation and system modification (if any) shall be submitted to Town Staff for review. Substantial changes to the subsurface systems may require modification of the approved site plan.*

    Response: This requirement has been added as Note #26 of "Site Notes" on Drawing C-2, in addition to the callouts at the infiltration system locations on Drawing C-6.

22. *C-9: We recommend adding a note that any stockpile areas be surrounded by appropriate erosion & sedimentation control measures.*

    Response: Typical stockpiles surrounded by E&S control measures have been added to all Soil Erosion and Sedimentation Control drawings.

24. *C-12: The detail provided on sheet C-12 does not depict the type of guide rail detailed on DOT sheet HW-910-10. The guide rail proposed should be specified.*

    Response: The metal guide rail will be a metal beam guiderail to match the existing guiderail along Route 32. The CT DOT Standard Sheet number has been revised to match this type of guiderail.

26. *Stormwater Management Report: The Engineer has noted that stormwater runoff along the southern boundary would be considered shallow concentrated flow per TR55, we acknowledge this. The intention of the original comment was to note that the current stormwater runoff from the site is spread (shallow-concentrated/overland) over most of the southern boundary. The project creates two point source discharges that will direct stormwater from a large portion of the site to these two locations, which is substantially different than what currently exists. While the project reduces peak runoff flow rate and volume overall it is now concentrated to the two discharge locations. The Engineer should address if concentrating the previous overland flow to two point source discharges will have any negative impact downstream.*

    Response: To mitigate the potential impacts of a point discharge, Drawing C-6 has been revised to show stilling basins and level spreader outlets for the two discharge points. These level spreaders will provide non-erosive sheet flow over a greater length of the site property. Their positions have been laid out to avoid being directly upstream of any off-

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site structures. The level spreaders have been designed in accordance with the Connecticut Guidelines for Soil Erosion & Sediment Control. Calculations for the level spreaders are included at Attachment 2 – Design of the Level Spreaders for the Point Source Discharges. Stilling basins calculations are included as Attachment 3 – Outlet Protection Calculations. This design has been approved by the Town Engineer.

27. *Stormwater Management Report: We concur with the Engineers response that current stormwater flow is directed to this property. However, as noted in the previous comment, the current stormwater runoff appears to be overland flow distributed along the southern boundary. The new western outlet concentrates the discharge to a single point that appears to be directly upgradient of the building at 100 Fort Hill Drive, based on the available information. The Engineer should address if concentrating discharge to this point will have a negative impact to 100 Fort Hill Drive.*

Response: See above response. Discharges are now directed away from off-site structures and will not be concentrated at a single point.

29. *Stormwater Management Report: Curve "A" was used for existing conditions, please address.*

Response: The storm type was corrected to Curve "D" for the existing HydroCAD report. Note that this had no effects on peak flow values.

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 - Sediment Basin Sizing Worksheet
Attachment 2 - Design of the Level Spreaders for the Point Source Discharges
Attachment 3 – Outlet Protection Calculations

Connecticut Guidelines for Soil Erosion & Sediment Control

Publication Date: September 30, 2023, Effective Date: March 30, 2024

portal.ct.gov/-/media/deep/water/water_quality_management/guidance/sescg_cleanfinal.pdf

Sediment Storage Volume

$$V = \frac{(DA)(A)(DR)(TE)(\frac{2000lbs}{ton})}{(\gamma)(43{,}560\ sq\frac{ft}{acre})}$$

Total drainage area:	DA =	8	Acres
		0.01	Square Miles
Average annual erosion:	A =	50	Tons/acre/year
Delivery Ratio:	DR =	0.5	
Trap Efficiency:	TE =	0.8	
Estimated Sediment Density:	γ =	80	lbs/cf
Volume of sediment trapped:	V =	**0.1**	**Acre-Ft/Yr**
		161.33	**CY**
		4,356.00	**CF**

Basin Shape and Depth

Average Depth:	D =	4.75	ft (Min 4 ft)

$$W = 10\sqrt{Q_5}$$

5-Year Storm Peak Discharge:	Q_5 =	5.59	cfs
Minimum Width:	W_5 =	23.65	ft
Min Effective Flow Length	L_5 =	47.3	ft

When the downstream area is highly sensitive to sediment impacts, the minimum width shall be:

$$W = 10\sqrt{Q_{25}}$$

25-Year Storm Peak Discharge:	Q_{25} =	25	cfs
Minimum Width:	W_{25} =	50	ft
Min Effective Flow Length	L_{25} =	100	ft

Sediment Basin Length	L=	80	ft
Sediment Basin Width	W=	80	ft
Sediment Basin Depth	D=	4	ft
	Vol=	25,600	CF
		0.59	Acre-Ft

Design of the Level Spreaders for the Point Source Discharges

West Off-Site (POC1) – The Connecticut Guidelines for Soil Erosion and Sediment Control, September 30, 2023 recommends sizing for the 10-year recurrence interval storm event. In an effort to mitigate potential erosion of the lip surface of the level spreaders, we have designed to the 25-year storm event.

Discharge allowed – 0.25 CFS/FT of spreader.

25-year storm event = 3.42 CFS

Spreader length = 13.68-feet in length by design, however, the objective is to spread the flow over as wide an area as possible, so use 50-feet.

Depth is 6" minimum, use 12" to enhance infiltration

Orient the level spreader parallel to the pipe discharge

Use 6" of crushed CT DOT #3 stone (2.5" minus) for lip creation at a level elevation across the entire spreader with an apron extending down slope 3-feet, with geotextile under and galvanized mesh thereover.

Rte 32 Culvert (POC2) –

25-year storm event = 3.42 CFS

Spreader length = 24.88-feet in length by design, however, the objective is to spread the flow over as wide an area as possible, so use 53-feet.

Depth is 6" minimum, use 12" to enhance infiltration

Orient the level spreader parallel to the pipe discharge

Use 6" of crushed CT DOT #3 stone (2.5" minus) for lip creation at a level elevation across the entire spreader with an apron extending down slope 3-feet, with geotextile under and galvanized mesh thereover.

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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 Stilling	East Scour	SE Stilling
Dia (in)	15	12	24
L (ft)	14.57	45	28
Slope (ft/ft)	0.017	0.275	0.0071
Mannings n	0.012	0.012	0.012
Max Q (flow, cfs)	4.35	2.34	17.39
Max v (Velocty ft/sec)	7.43	20.24	6.57
Outlet Protection Type	Scourhole	Scourhole	Scourhole
Length of Apron			

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	SE
C (Basin Length in ft)	11.25	9	18
B (Basin width in ft)	14.5	11	13

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