R.R. Hiltbrand Engineers & Surveyors, L.L.C.
Consulting Civil Engineers
21 Copper Hill Road
Granby, Connecticut 06035
(860) 986-3617
Email: tdgrimaldi@gmail.com

575 North Main Street
Bristol, Connecticut 06010
(860) 582-4548
Email: rrhilt@aol.com

January 17, 2025

Mr. Larry Burcroff, Chairman
Inland Wetlands Commission
27 Main Street
P.O. Box 0548
Salisbury, CT 06068

Re: Bauer Residence
#95 Preston Lane
Salisbury, CT

Dear Mr. Chairman:

We have reviewed the following information provided to our firm:

1. Engineering drawings entitled, "BAUER RESIDENCE, 95 PRESTON LANE, SALISBURY, CONNECTICUT" as submitted by Patrick R. Hackett, P.E., Scale: As noted on plans, Dated December 12, 2024, to include the following sheets:

    a. Project Info / Cover
    b. Existing Conditions, By Timothy Wyle, Jr., LS - 20 Scale
    c. Septic System Plan- 20 Scale
    d. Site Plan – 20 Scale
    e. Erosion & Sedimentation Control, Sheet 1 of 2
    f. Erosion & Sedimentation Control, Sheet 2 of 2
    g. Pre and Post impervious & Stormwater
    h. Landscape Plan – 20 Scale

2. IWWC Application to include State of CT DEEP reporting form.

3. Project Description dated January 2025.

4. Letter from Veronica R.S. Bauer dated December 12, 2024.

Engineering comments:

DEMO-

1. Update line type shown around the trench area to match the orange construction fence.

2. Indicate existing pipe at southwest corner of the existing dwelling to be removed.

SITE PLAN-

1. SSDS review/approval is required by the TAHD. All revised plans shall be submitted to TAHD for review/approval.

2. Recommend the relocation of the 4" PVC overflow pipe to discharge into the planted area removing the point discharge from close proximity to the lake.

3. Update note to read, "No drain within 25 feet of leaching field and septic tank".

4. Pipe and note to remove 4" PVC pipe shall be moved to the DEMO Plan.

5. What is the proposed make-up of the walkway from the proposed deck to the proposed fire pit? If other than grass, please provide a detail/section.

6. Provide a cross-section detail for the proposed driveway.

7. Label the proposed grading as 4:1 max. slope.

8. Recommend the installation of a small paved apron to prevent surface run-off from entering the driveway and creating erosive conditions.

9. Provide regrading on the easterly side of the proposed garage to direct run-off away from the garage.

10. How will the sewer pipe be protected from settlement below the proposed boulder retaining wall?

E & S-

1. There appears to be an existing swale between the subject property and the Saar property. We recommend the relocation of the haybales closer to the northerly property line and extend the jutte mat to the haybales.

2. Add a note that all areas outside of the jutte mat will be loamed, seeded, and mulched with hay or straw. Note: If hydroseeding is to be utilized, we recommend that the mulch is doubled in the spray mixture.

3. Proposed 4” PVC overflow pipe from trench drain shall discharge upslope of the 18” sediment log.

E & S Notes-

1. Provide a 24-hr emergency contact telephone number for Brian at Riga Construction.

2. The detail shown is for turf reinforced matting not jutte erosion control blankets.

3. Provide a specification for the jutte matting.

Stormwater-

1. Understanding that many design engineers in the industry utilize 0.40 or 40% void space to provide for storage volume within the stone trench, we are concerned with this application due to the close proximity to the lake. The use of 40% void space is only 60% reliable. Attached is a recent article that references a study completed by the Environmental Water Resources Institute of the American Society of Civil Engineers. Based upon this study we recommend the design engineer utilize a void space for storage of 30-35%, which will require an increase to the size of the filter trench. (Please see attached).

2. Provide a Site-specific construction sequence for all site work to be completed on the property.

Conditions of Approval:

1. Revised plans shall be submitted for review/approval.

2. Final approved plans shall have live signature and embossed seal of the Engineer and Surveyor of record. These shall be submitted to the Town of Salisbury Land Use Administrator prior to any construction.

3. **The Design Engineer shall provide an erosion & sedimentation control measures bond estimate for review by the Consulting Town Engineer.**

4. A Pre-Construction Meeting is recommended with the Town staff prior to the start of construction to inspect E & S control measures and to discuss construction sequencing/phasing.

5. During the construction process, the Owner/Developer/Contractor shall add erosion and sedimentation control measures as deemed necessary by the Town of Salisbury staff and/or the Consulting Town Engineer.

6. Daily inspections and required maintenance of all erosion & sedimentation control measures shall be completed by the General and/or the Site Contractor until a permanent vegetated cover is established. Repairs shall be made immediately after inspections.

7. Inspection requirements, by the Consulting Town Engineer, shall be determined by the Commission.

8. **An As-Built Site Improvement and Grading Plan**, which shall include topography/locations of all altered areas within the limit of disturbance, shall be submitted to the Land Use Administrator after all the site work is completed, and prior to requesting a Certificate of Occupancy. Said map shall prepared by a State of Connecticut Registered Land Surveyor.

9. A final site inspection shall be completed by the Land Use Administrator and/or the Consulting Town Engineer prior to the release of the Erosion & Sedimentation Control Bond and/or the issuance of a Certificate of Occupancy.

Sincerely,

Thomas D. Grimaldi
Principal Engineer

Robert R. Hiltbrand
Principal

Examining Stone Void Space Part 1: Is 40% a Reliable Number

September-14-2020

Stormwater detention systems often include a large portion of the storage volume within the voids of the backfill material. Depending on the underground structure design and size, allocated storage within the stone voids can vary between 25-60% of the overall storage for the project. The generally accepted number has been 40% stone void space. However, there have been few national studies to prove the 40% void space is reliable. Engineers need to ask if this number is indeed accurate, and if not, what is the implication on designs?

A recent study[1] with 300+ washed aggregates from 41 facilities within the United States sought to address the 40% assumption. The findings were surprising:

- 40% void space is an average, not a given truth. It is an average communicated based on very few studies. In fact, it's only about 60% reliable.
- The same aggregates were found to have variation throughout various geographies within the same quarry company.
- To obtain a 96% reliability in stone voids, 36% stone void storage should be considered in the design.

Compounding this issue is that stone void space will most often decline over time. One reason for this is that on-site erosion & insufficient sediment controls can lead to sediment buildup and can compromise a design before site stabilization even occurs. If you have ever been to a construction site, you know what I mean. Unfortunately, improper erosion and sediment controls at a construction site are not uncommon, and one month without proper erosion and sediment management during construction can do more damage than years of sediment accumulation from a paved surface, and can present a compounding downstream flooding risk each year with long term accumulation.

It's important to remember that there is no going back when it comes to the occlusion of stone voids; once they are filled, the storage capacity is permanently lost. Therefore, the end goal for engineers should be to minimize the reliance on stone voids for storage, and by doing so, you maintain as much of the storage design as possible,

reducing downstream concerns. How do you do that? We'll address that in our next post.

1 Source: Cashatt, J.C. (2020), Viability of Stone Void Space in Underground Detention/Retention Systems, Proceedings of EWRI 2020, Henderson, NV, American Society of Civil Engineers.