Planning Commission Special Meeting Minutes
Tuesday July 17th, 2018

Present: Peter Lynch
Thomas W. Fitting Jr.
Lawrence Fitzgerald
Kirk Scott
Don Phimister
Michelle Williams, Alternate (*Sat as Regular Member)
Kathryn Johnson

Also Present: Gary Goeschel, Planning Director
Marc Salerno, Ex-Officio
Anne Thurlow, Zoning Liaison

Mr. Scott called the Planning Commission to order at 7:02 p.m. and sat Ms. Williams as a regular member for this evening's meeting.

I. Pledge and Roll Call

Mr. Scott led the Pledge. The Commission Members identified themselves for the audience.

MOTION (1)
Mr. Lynch motioned to move Item #7, A. & B. Zoning Referrals after Item #5.
Mr. Fitzgerald seconded the motion.
Vote: 6-0-0, Motion passed.

II. Commission Vacancy

Mr. Goeschel explained there is currently a vacancy for 1 Regular Member since Brenda Henderson has resigned.

MOTION (2)
Mr. Lynch Scott moved to appoint Ms. Williams as a Regular Member of the Planning Commission upon her resignation as an Alternate Member.
Mr. Lynch seconded the motion.
Vote: 5-0-1, Motion passed.

Ms. Williams abstained from the vote.

III. Reports

A. Communications-

Mr. Goeschel had no communications to report.

B. Zoning Representative

The last Zoning Commission meeting was cancelled.

C. Ex-Officio: Marc Salerno

Mr. Salerno noted the following:

- Celebrate East Lyme is on Saturday and there will be a ribbon cutting at 10 a.m. for the park downtown.
- The Board of Selectmen appointed Michael Quagan as a Planning Commission alternate.
- A Parking Ordinance as well as a Purchasing Policy for Town is being worked on.

Mr. Goeschel said there is now another alternate vacancy.

D. Planning Director: Gary Goeschel

Mr. Goeschel had no report.

E. Sub-Committees

1. Walkability

2. Sustainability and Climate Adaptation

The Subcommittees have not met yet.

F. Chairman

Mr. Scott had nothing to report.

The Commission discussed how a new calendar for attending Zoning meetings needs to be devised given the new members; Mr. Lynch will cover the August 2nd, 2018 meeting.

IV. Approval of Minutes

A. Minutes of June 26th, 2018 Regular Meeting Minutes

There were no corrections.

MOTION (3)
Mr. Phimister moved to approve the Regular Meeting Minutes of June 26th, 2018 as presented.
Mr. Lynch seconded the motion.
Vote: 6-0-0, Motion passed.

V. Zoning Referrals [Connecticut General Statute (CGS) 83a]

A. Application of Cait Meeks for a text amendment to the East Lyme Zoning Regulations. Section 1.19.1, 7.2.5 and 25.5 to allow a Day Spa as a Special Permit in the R-10 Residential District. (Zoning Public Hearing August 2, 2018.)

Mr. Goeschel briefly reviewed his memorandum dated July 17th, 2018, and the application's potential consistency with the POCD. Mr. Goeschel explained it would expand the tax base and allow for economic growth. This would be a special permit scenario from Zoning which would need to be approved by them each year.

Mr. Goeschel said the Zoning Public Hearing for this item is scheduled for August 2nd, 2018, and directed the Commission to the member packet, which contains the language being proposed.

Mr. Lynch asked about parking controls and Mr. Goeschel said it would be one space for each employee and one space for each service station; the parking will be off street and there will be

a buffer between the parking and other properties. The applicant is looking at 14 Lincoln Street for this operation.

Mr. Lynch said he'd like to hear from the neighborhood and he briefly discussed the enforcement a special permit scenario allows. Mr. Salerno said the Public gets to speak at Zoning during the public hearing. He said it's important to remember this application is for all of the R-10 Zone and not a specific locale; each future application would have to request a special permit from Zoning and go before them.

Mr. Scott said the special permit process provides safeguards.

MOTION (4)
Mr. Phimister said based on the findings in Mr. Goeschel's memorandum to the Planning Commission dated July 17th, 2018, I hereby move to find the proposed text amendment consistent with Objectives 2.1 and 2.2, Sections 3.1.1 and 3.2 of the East Lyme 2009 Plan of Conservation and Development, as amended and offered the following comments:

1. **The amendment promotes economic growth and increases the tax base.**

Mr. Fitting seconded the motion.

Mr. Lynch said he disagrees and thinks the neighborhood will be affected negatively by potential traffic and parking difficulty. Mr. Scott said this application is not site specific.

Mr. Goeschel said Zoning has discretion for special uses and you can certainly make them aware you are concerned about traffic and parking issues. He added this is not a super intense use of the zone.

MOTION (5)
Mr. Phimister amended his motion to include the comment the Planning Commission hopes traffic patterns and road use will be considered in their decision.
Mr. Fitting amended his second.
Vote: 5-1-0, Motion passed.

Mr. Lynch voted against the application.

B. Application of Theodore A. Harris, Esq., for a text amendment to the East Lyme Zoning Regulations Definitions and Section 7.2.5 to allow Tourist Cabins in the R-10 Residential District. (Zoning Public Hearing August 2nd, 2018.)

Mr. Goeschel drew attention to his memorandum dated July 17th, 2018 regarding this application. He noted this application has the same potential consistencies with the POCD as the previous application. He said they provided a definition which can be found in the member packet. This is also being proposed as a special use permit as well.

Mr. Scott said his only concern is noise.

Mr. Goeschel pointed out the R-10 Zone on the Town map.

Ms. Williams asked about the water and sewer in the R-10 Zone. She said her only concern would be if the lot was not on sewer.

Mr. Goeschel said he can do some analysis of the R-10 lot sizes where this use would be permitted. He said it will be a small percentage and if the health code is not met, it would not be approved.

Mr. Scott said he is concerned about preserving community character as detailed in Objective 1.1 of the POCD.

Mr. Lynch said this is basically a seasonal rental property.

Mr. Fitzgerald said there is mention of a caretaker who may live on the premises.

MOTION (6)
Mr. Lynch moved to find the proposed text amendment inconsistent with Objective 1.1 with the East Lyme 2009 POCD, as amended due to concerns about water and sewer in the neighborhood and the change in community character that would result.
Mr. Phimister seconded the motion.
Vote: 6-0-0, Motion passed.

VI. Public Hearing

A. Application of James Bernardo, LS, Agent, for Edward J. Watson, Applicant/Owner; Application for a 2-Lot Re-subdivision of approximately 11.11- acres Zoned RU-40 at 31 Walnut Hill Road, East Lyme Assessor's Map # 48.0 Lot #63.

Mr. Goeschel entered Exhibits P, Q, and R into the record and called attention to Town Engineer Victor Benni's memorandum dated July 10th, 2018, and reviewed it with the Commission.

Mr. Lynch asked where the existing house is and Mr. Goeschel replied that it's on Lot 2.

Mr. Goeschel noted we are operating under a 7 day extension.

Mr. Bernardo of noted they received LLHD approval on June 18th and the Inland Wetlands permit on June 11th.

Chairman Scott read the following regarding public hearings into the record:

The purpose of a public hearing is an opportunity for the Commission to gather evidence and testimony, including public comment, regarding the pending application. The Planning Commission encourages all in attendance to offer comments and ask questions. However, a successful public hearing requires some simple rules be followed. These ground rules will ensure that all in attendance are treated in a respectful and courteous manner, and that all who desire to speak will have the opportunity to be heard. As such, the rules are as follows:

1. The applicant or his representative will make a formal presentation to the Commission stating the proposed project. The Commission may, during the presentation, ask questions of the applicant for clarification.

2. After the applicant's presentation is completed, the Chair will ask for members of the public who wish to speak in favor of or in opposition to the application to address their comments to the Commission from the podium.

3. We ask that no one speak unless recognized by the Chair for that purpose. This is necessary to ensure that only one person at a time speaks on any issue, making it easier for everyone to understand as well as for clearer legal transcription. Upon recognition by the Chair, the individual addressing the Commission must identify themselves by clearly stating their and address for the record. If necessary, an individual may be asked to spell their name for the record.

4. Anyone choosing to speak must address their remarks to the Planning Commission and not to other members of the public or the applicant. Any debate between those in favor and those opposed the proposal must be strictly avoided. Oral comments can generally be delivered in 5-minutes. If there is a large number of individuals who wish to speak, the Chair reserves the right, in its sole discretion, to enforce a 5-minute rule in order that all who wish to speak may have an opportunity to do so. Individuals who wish to be heard multiple times may return to the podium but, only after everyone who wants to speak has spoken. To assist us in reducing lengthy public hearings, please be mindful to avoid repetitive comments. If you are in favor, simply tell us and give us your reasons why; and likewise, if you are opposed.

5. As the Planning Commission is here to listen to the public's comments about the subject of the hearing, the Planning Commission is NOT here to express its own views or opinions thereon. The Commission will NOT participate in a debate of the issues. No person has the right to demand an answer to a specific question from a member of the Commission. As noted earlier, questions should seek clarification and information. Questions should not lead to a debate of the issues.

6. All questions are to be directed to the Chair, who may either answer them or refer them to a Commission member, the Town Attorney, Town staff, or the applicant. The answer may be deferred and subject to further review or study and answered at a later date.

7. No member of the public shall engage in any demonstration, booing, handclapping, or otherwise disruptive behavior.

8. The Chair will be responsible for ensuring that these rules are followed. Anyone violating these guidelines will be asked to refrain from doing so, and may, in the sole discretion of the chairperson, be asked to leave the public hearing.

9. The Planning Commission has 35-days from the date the public hearing commences to complete the public hearing. During that time, if the commission requires additional information beyond that which has been or will be submitted, the Commission may ask the applicant for an extension of the public hearing period.

10. Upon the close of the public hearing, the Planning Commission has 65 days from said date to render its decision. If the Commission requires additional time to render its decision, it may ask the applicant for an extension of the time in which to render a decision. The extensions mentioned above are granted by the applicant and can not to exceed a total of 65 days.

Mr. Scott asked if there were any public comments for Mr. Bernardo's application.

Mr. Bialowans Jr. of 61 Walnut Hill Road came forward to speak. He said the wording of 3 Lot verses 2 Lot that he mentioned at a previous meeting still hasn't been clarified for the record. He discussed runoff on the property.

Mr. Bialowans said there is a rumor going around that the Surveyor has been texting and emailing Planning Commission members. He said this is unprofessional and inappropriate given that Joan Bengtson lost her seat on the Planning Commission for the same reason.

Mr. Bialowans said he is speaking up because people are upset with how local government is being run. He said the Town should give George Mitchell some incentive to clean up the front of his buildings and that the Town could look so much better.

Mr. Scott asked the applicant if he could comment on the ground water over the driveway. Mr. Bernardo explained the Soil Scientist delineated the wetlands and the Inland Wetlands Agency asked for a detailed analysis of the wetlands, so he went out again; the Scientist has never conveyed that any wetlands were missed. The driveway was moved due to potential maintenance issues that would accompany having a shared driveway.

Mr. Bernardo said that in terms of emails and Town staff, any that exist, are public record and part of the application on file. He added the Town Engineer and LLHD have approved the modifications made.

Mr. Goeschel said in regards to the Agenda and whether a 2 lot or 3 lot subdivision, the legal notice said 2 lot because there is already an existing lot and 2 new lots would be created, which would result in 3 lots total.

Mr. Bialowans came forward again and said if you go out to his cousin's place which adjoins this property, you will see all the water from the ledge and that there is so much water, he can't mow the grass.

Mr. Goeschel said it makes sense that water from the proposed lot is flowing west from the Lindie property since there is a delineated wetland on the adjacent property; runoff will be accommodated by the drainage design and rain garden. Mr. Bernardo said he actually spoke with that property owner who said this issue has been worse since the Town repaved Walnut Hill Road.

Mr. Goeschel pointed to Mr. Benni's memorandum which says the proposal will not acerbate the existing condition. He said if anything, the drainage mitigation might help it.

MOTION (7)
Mr. Lynch moved to close the Public Hearing.

Mr. Fitzgerald seconded the motion.
Vote: 6-0-0, Motion passed.

Mr. Goeschel clarified that no further information can now be accepted. If the Commission tables this item until the next meeting, they can only review the record.

The Commission opted to table this until the next meeting.

At 8:23 p.m. the Commission took a comfort break.

The Commission reconvened at 8:30 p.m.

B. Application of Robert Fusari, Real Estate Service of Connecticut, Inc, Applicant/ Owner; Application for a 23-Lot Re-subdivision of approximately 97.3+ acres, Zoned RU-40 at Spring Rock Road and Green Valley Lakes Road, East Lyme, Assessor's Map # 14.0 Lot #45, together with a waiver request from Section 6-10-11 of the East Lyme Subdivision Regulations.

Mr. Goeschel read exhibits A-M into the record:
Exhibit A- Application of Real Estate Service of Conn, Inc for a 23 lot re-subdivision of land located on Spring Rock Road and Green Valley Lakes, East Lyme Assessor's Map 14, Lot 45.
Exhibit B- Abutters List of May 1, 2018.
Exhibit C- Planning referral to Wetlands dated May 7, 2018.
Exhibit D- Notice of Public Hearing to Applicant sent dated May 29, 2018.
Exhibit E- Legal Notice Recorded with Town Clerk June 11, 2018.
Exhibit F- Legal Notice Published in the Day June 11, 2018.
Exhibit G- Letter to Director of Planning from Victor Benni, Town Engineer, dated April 13, 2018.
Exhibit H- Review and Comment of Chris Taylor, East Lyme Fire Marshal dated May 11, 2018.
Exhibit I- Referral Response of Lower Conn River Valley COG May 11, 2018.
Exhibit J- Referral Response of COG May 10, 2018.
Exhibit K- Letter to Director of Planning from Victor Benni, Town Engineer, dated June 5, 2018.
Exhibit L- Letter from LLHD recommending Site Suitability June 19, 2018.
Exhibit M- Letters of opposition from neighbors.

Ted Harris of 351 Main Street came forward representing the Applicant, and presented N-T for the record:
Exhibit N- Copy of Site Sign.
Exhibit O- Certificate of Mailings.
Exhibit P- Copy Section 3 Site Plan.
Exhibit Q- Portion 1982 Approval Plan.
Exhibit R- Portion Section 3 of 1995 Reapproval Plan.
Exhibit S- 1984 Judgement from the Superior Court.
Exhibit T- 1986 Letter from Town Attorney.
The entire file is available for review in the East Lyme Planning office.

Mr. Harris asked that the previous Exhibits from the past 25 lot application from last year be included for informational purposes (Exhibit U.)

Mr. Harris briefly reviewed the history of the 1972 subdivision. He explained from an engineering standpoint there is no purpose for including a radius if not installing a road. The

1972 subdivision lapsed because the public improvements were not completed; all three Plans show the same access area- the bottom line it was always intended as the primary and future access.

Mr. Harris turned the presentation over to Joe Wren to go over the specifics of the subdivision.

Joe Wren P.E. of Indigo Design, 40 Elm Street, Old Saybrook came forward and reminded the Commission of the past application including those exhibits, some of which are duplicates of the new exhibits. Mr. Wren said they have to do a conventional subdivision rendering per your R-40 subdivision regulations. He reviewed the site plan in great detail with the Commission:

- Proposing 2 less lots than your regulations allow.
- The property lies to the south and east of Spring Rock Road, and behind three existing lots. The upland of the property is where the majority of the project is. To the south is a privately owned property and I-95.
- The property is 97.3 acres according and the proposed open space is 70.9 acres. This percentage exceeds the required amount in the CDD subdivision regulations as approximately 73% of the land would be open space and within that about 97% of the wetlands area is contained within that open space.
- The Regulations require that only 30% be open space.
- The other .003% of the wetlands area are on lots 3, 4 and 5 on the eastern side, and similar to the prior application all are protected in a 25' wide conservation easement.

Mr. Wren showed the neighborhood Plan to better acquaint the Commission with the location.

Mr. Wren reviewed the proposed road, houses, grading, and clearing limits. This project will divide the property, re-subdividing the older subdivision to create 23 building lots, construction of the road and associated improvements with the road, utilities, grading, 2 detention basins, and paving. Like the past application, this one also has two detention basins and what was once lot 24 with a house is no longer a residential housing lot but will now have a water quality basin. This is a change from last year's plan per the request of the Inland Wetlands Agency

Mr. Wren discussed the micro pool extended detention pond from the Connecticut DEEP Stormwater Quality Manual and how that determined their design, which the Town Engineer has approved; maintenance will be by a homeowners association and they will be provided schedules.

Mr. Wren shared the following:

- The rest of the lots are similar to last year's application and show houses, driveways, and the oblongs are rain gardens for the roof leaders from the houses.
- The road centerline is the top of the ridge. The land slopes to the east and west, that is where the areas of wetlands are.
- The road was designed to go along the approximate center of that ridge with gentle grades to the east and west. The front of the lots and driveways drain toward the street.
- The back half of the roof and yards would drain toward the wetlands areas. That is why some roof water goes to the rain garden, prior to extending to the wetland area.
- The 100-foot regulated area is delineated on the map and the houses were kept out of that line.
- Some of the septic systems are within the 100 ft. review area, but most are outside it.
- There is a two way 24 foot wide road with cape cod curbs and 26 feet of drivable

- surface; the 24 foot width is favored by the Board of Selectmen and acceptable to the Town Engineer.
- LLHD says all the lots are favorable for 4 bedroom septic system; these requirements now cover 5 bedrooms since LLHD has changed their regulations. They found that septic systems were being overdesigned and underutilized.

Mr. Wren gave an in-depth review of the roadway details including the cul-de-sac turn analysis. He explained that traffic will be reviewed at a future meeting.

The Conventional Layout Plan and the Nitrogen Analysis will be known as Exhibit U and W respectively.

Mr. Lynch asked what last year's Traffic Engineer said about the road width. Mr. Wren discussed the previous Engineer who favored a wider road which is in direct conflict with the Town's regulations. He said they were floored by his preference and have obtained a new Traffic Engineer, who will speak at the next meeting.

Mr. Scott asked about the requested waiver and Mr. Harris came forward to review Section 6-10-11 and the so-called road to nowhere waiver. He reviewed the standards of the regulation with the Commission.

Matthew Berger came forward on behalf of Brian Lepkowski of 27 Green Valley Lakes Road. He provided a signed Intervener's Petition (Exhibit X) for the record. He also provided a report by Trinkaus Engineering (Exhibit Y) as well as Steven Trinkaus' resume (Exhibit Z.) Mr. Trinkaus will be speaking at the next meeting.

Mr. Scott called for Public Comment and the Public said they would like to speak at the next meeting due to the late hour. The next meeting will be on July 24th, 2018 at 7:00 p.m.

MOTION (8)
Mr. Lynch moved to continue the Public Hearing until July 24th, 2018.
Mr. Fitting seconded the motion.
Vote: 6-0-0, Motion passed.

X. Adjournment

Motion (9)
Mr. Lynch moved to adjourn the Planning Commission Meeting at 10:13 p.m.
Ms. Williams seconded the motion.
Vote: 6-0-0, Motion passed.

Respectfully Submitted,

Brooke Stevens,
Recording Secretary

Exhibit R

Town of East Lyme

P.O. Drawer 519
Department of Planning & Inland Wetlands
Gary A. Goeschel II, Director of Planning / Inland Wetlands Agent

108 Pennsylvania Ave
Niantic, Connecticut 06357
Phone: (860) 691-4114
Fax: (860) 860-691-0351

MEMORANDUM

To: East Lyme Planning Commission

From: Gary A. Goeschel II, Director of Planning

Date: July 17, 2018

RE: **Application of James Bernardo, LS, Agent, for Edward J. Watson, Applicant/ Owner;** Application for a 3-Lot Re-subdivision of approximately 11.11-acres Zoned RU-40 at 31 Walnut Hill Road, East Lyme, Assessor's Map# 48.0 Lot# 63.

Upon review of the above referenced application, supporting documentation, and proposed subdivision plans, a 5 Sheet Drawing Set (Sheets S-01 thru S-05) entitled "Property of Edward J. Watson, For Property Located at 31 Walnut Hill Road, Town of East Lyme, County of New London, Connecticut, Date: March 28, 2018, Revised to: 7-16-2018, by James Bernardo, LS of James Bernardo Land Surveying, LLC" for a 3-Lot Resubdivision; I offer the following findings:

FINDINGS

Whereas: The Commission commenced a Public Hearing on June 5, 2018 and continued the hearing to June 26, 2018 and again to July 17, 2018, under an extension of time. The Public Hearing for said application was closed at the Commission's July 17, 2018 meeting.

Whereas: The Commission has reviewed the application and received testimony from the applicant, his professionals, representatives, and the public. In addition, Town staff also provided the Commission with comment concerning this application's compliance with local requirements and regulations.

Whereas: The parcel of land constituting the property subject to this application is zoned RU - 40 Rural Residential and the properties abutting the site are zoned RU-40 and the properties to the west, north, and east are zoned RU-40.

Whereas: The proposed Subdivision is found to meet the requirements of the East Lyme Subdivision Regulations and the East Lyme Plan of Conservation and Development (POCD) as demonstrated by the following:

Section 3-4 Plan of Development: As the proposed Subdivision is located within a RU-40 zoning district adjacent to existing residential lots, the proposed subdivision conforms to the comprehensive Plan of Development for the Town of East Lyme (POCD) as adopted by the East Lyme Planning Commission. The proposed subdivision continues following the pattern of development characteristic of the existing residential development.

Section 5-4 Sanitation Report: As indicated in Exhibit "M" correspondence from Kim White, RS, Sanitarian to J. Bernardo dated June 18, 2018, Lots 1-3 are recommended suitable in their current condition.

Section 5-5 Water Supply Report: Again, as indicated in Exhibit M" correspondence from Kim White, RS, Sanitarian to J. Bernardo dated June 18, 2018, Lots 1-3 are recommended suitable in their current condition.

Section 5-2-2(E) and 6-8 Stormwater Management Plan: As indicated in Exhibit "P", Memo from Victor Benni, P.E., Town Engineer, dated July 28, 2017, indicates that the Drainage Calculations confirm that the water quality of the receiving aquifer (Cranberry Meadow Brook) will not be adversely affected and the proposed development will not cause or exacerbate downstream flooding. As such, the proposed design meets the intent of the stormwater regulations..

Section 5-2-2(G) Erosion and Sedimentation Control Plan: The proposed, Grading and Erosion & Sedimentation Plan contains proper provisions to adequately control accelerated erosion and sedimentation and reduce the danger from storm water runoff on the proposed site as evidenced by Exhibit "Q", the proposed subdivision plans, a 5 Sheet Drawing Set (Sheets S-01 thru S-05) entitled "Property of Edward J. Watson, For Property Located at 31 Walnut Hill Road, Town of East Lyme, County of New London, Connecticut, Date: March 28, 2018, Revised to: 7-16-2018, by James Bernardo, LS of James Bernardo Land Surveying, LLC". As such, the Planning Commission may hereby certify that the Soil Erosion and Sediment Control Plan complies with the requirements and objectives of this Subdivision Regulation.

Section 5-6 Pesticide Report: There are no known regular applications of pesticides on the subject site. In addition, as evidenced by Exhibit "E", the pesticide report, indicates pesticides were undetectable in the soil samples tested.

Section 5-8 Archeological Survey: As Evidence by Exhibit "B", letter from Dr. Brian Jones, State Archeologist to J. Bernardo dated February 26, 2018, no documented archeological sites or historic districts are located within the proposed development area or in close proximity to it. In addition, Exhibit "B" indicates "Neither historic maps nor LiDAR indicate the presence of prior historic residential or industrial structures in the area.

Section 6-2 Lot Design Specifications: The proposed subdivision complies with all applicable Zoning Regulations for the purposes of the subdivision of land as evidenced by Exhibit "F" correspondence from William Mulholland, Zoning Official, dated April 3, 2018.

Section 6-7 Open Spaces: As demonstrated by Exhibit "I" and "Q" approximately 2.8-acres are being preserved as open space in the form of a conservation easement. Therefore, the proposed subdivision meets the requirements of Section 7 Open Space and Easements.

Section 6-9 Requirements Regarding Flooding: As demonstrated by Exhibit "P", Memo from Victor Benni, P.E., Town Engineer, dated July 17, 2018, the proposed design meets the intent of the stormwater regulations.

Pursuant to Section 4-5-4 of the Subdivision Regulations the Commission, after the public hearing, if any, shall give approval to the application if it finds that the application, plans and documents conform to the requirement of these Regulations. Such approval shall be conditioned upon presentation of suitable easement and deeds as applicable, as specified in Section 10 of the Regulations, and shall be conditioned upon completion of all required subdivision improvements. In granting approval, the Commission may attach such conditions that it deems necessary to modify the subdivision map, plans, or documents, and

to preserve the purpose and intent of these Regulations. As such, I offer the following language for such a resolution:

RESOLUTION FOR APPROVAL OF THE PROPOSED RESUBDIVISION:

The East Lyme Planning Commission based on the record before it with respect to this application, finds this application to be in conformance with the Subdivision Regulations of the Town of East Lyme as based on the above Findings indicated in the Memorandum from Gary A. Goeschel II, Director of Planning, dated July 17, 2018.

NOW THEREFORE, I hereby Move to APPROVE the application known as Application of James Bernardo, LS, Agent, for Edward J. Watson, Applicant/ Owner; Application for a 3-Lot Re-subdivision of approximately 11.11-acres Zoned RU-40 located at 31 Walnut Hill Road, East Lyme, Assessor's Map# 48.0 Lot# 63 and proposed subdivision plans, a 5 Sheet Drawing Set (Sheets S-01 thru S-05), entitled "Property of Edward J. Watson, For Property Located at 31 Walnut Hill Road, Town of East Lyme, County of New London, Connecticut, Date: March 28, 2018, Revised to: 7-16-2018, by James Bernardo, LS of James Bernardo Land Surveying, LLC" which, is further subject to the following administrative requirements and required modifications to the site plan and/or other materials submitted in support of this application:

1. Pursuant to Section 4-4-10 of the Subdivision Regulations any revisions of the approved construction must be approved by the Town Engineer. Such revisions shall be incorporated on an as-built construction plan.
2. An Erosion & Sedimentation Control bond in the amount $5,000.00 dollars shall be posted with the Town in a form acceptable to the Town of East Lyme and satisfactory to the Director of Planning and the Town Engineer prior to the start of any site work including but not limited to clearing, grubbing, filling and grading.
3. The deeds, drainage, and conservations easements as applicable, shall be submitted to the Director of Planning for approval prior to filing the Mylars on the land record.
4. Adequate or suitable sightlines at the existing and proposed driveway cuts must be demonstrated and physically established to the satisfaction of the Town Engineer prior to the start of any construction.
5. Contact the Planning Director to inspect the installation of erosion and sedimentation controls within 2-days prior to the start of any construction.
6. The above items shall be accomplished prior to the filling of the subdivision on the land records, or other documentation of planning approval and no site work shall commence until all applicable conditions are satisfied.

This approval is specific to the subdivision plan submitted as the application known as Application of James Bernardo, LS, Agent, for Edward J. Watson, Applicant/ Owner; Application for a 3-Lot Re-subdivision of approximately 11.11-acres Zoned RU-40 located at 31 Walnut Hill Road, East Lyme, Assessor's Map# 48.0 Lot# 63 and proposed subdivision plans, a 5 Sheet Drawing Set (Sheets S-01 thru S-05), entitled "Property of Edward J. Watson, For Property Located at 31 Walnut Hill Road, Town of East Lyme, County of New London, Connecticut, Date: March 28, 2018, Revised to: 7-16-2018, by James Bernardo, LS of James Bernardo Land Surveying, LLC". Any changes in the resubdivision plan shall require prior approval from the Commission and/or the Director of Planning. Any change in the development plan layout other than those identified herein shall constitute a new application.

The owner/applicant shall be bound by the provisions of this Application and Approval.

NO. 74718

RAJKO MARIC, ET AL

vs.

TOWN OF EAST LYME

SUPERIOR COURT

NEW LONDON JUDICIAL DISTRICT

NOVEMBER , 1984

MEMORANDUM OF DECISION

Plaintiffs are owners of land in the Green Valley Lakes Section III development (hereinafter Section III) in East Lyme, Connecticut. On June 6, 1982 two bridges over the Four Mile River which provide access to Section III were damaged by severe storms and flooding. Plaintiffs claim that on the basis of the common law doctrines of dedication and acceptance the bridges were public roadways and that the Town of East Lyme (hereinafter "Town") is responsible for bridge repairs. The Town claims that the bridges remained the responsibility of plaintiff Maric, the owner and developer of Section III. The case was submitted based on a stipulation of facts and a view of the premises on November 2, 1984. The Court finds the facts contained in the stipulation, including the following, which bring the issues into focus:

WALLER, SMITH & PALMER, P. C.
COUNSELORS AT LAW
52 EUGENE O'NEILL DRIVE
P. O. BOX 88
NEW LONDON, CONNECTICUT 06320

TELEPHONE (203) 442-0367

January 31, 1986

Planning Commission
Town of East Lyme
East Lyme Town Hall
Niantic, Connecticut 06357

Dear Commission Members:

Re: Rights-of-way for the Roads in Sections II and III, Green Valley Lakes Subdivision

This is in reply to your letter of concerning the above subject.

The direct answer to your question is that no action can be taken to require Mr. Maric to convey the rights-of-way to the Town. You are undoubtedly correct in assuming that either he or some successor in ownership of his property will apply for reapproval of the subdivision, but it may be some time before he does anything.

The judgment recites that all of the roads shown on the subdivision plan are Town roads. As you know, the Town would not ordinarily accept the stubs of roads as Town roads, but would take title to them for future use as Town roads for purposes of making them available to an abutting property owner. In the terms of the judgment, Mr. Maric offered the roads, including the stubs, as shown on the plans to the Town and the Town was deemed to have accepted them. I believe Mr. Maric cannot, at this time, object if any work is done on those stubs to improve them for highway purposes.

Therefore, it is my recommendation that with respect to the extension of roads onto and across those road stubs, you treat them as if owned by the Town and available for improvement.

Very truly yours,

Robert W. Marrion for
Waller, Smith & Palmer, P.C.
ncf

The original subdivision plan for Section III was approved by the East Lyme Planning Commission in March, 1975. (Stipulation, hereinafter "S", 2). All work in connection with the subdivision was not completed within the five year period required by Connecticut General Statutes Section 8-26. (S. 4). In October, 1980, the East Lyme Planning Commission filed notice of the lapse of subdivision approval on the East Lyme Land Records. (S. 4). Maric acquired title by deed of a committee of sale to all land within Section III with the exception of those lots which had been conveyed previously to individuals. (S. 6). Maric filed a new subdivision plan for Section III which was approved by the East Lyme Planning Commission on March 2, 1982. (S. 8). Maric did not file the approved subdivision plan within ninety days of its receipt from the East Lyme Planning Commission as required by Connecticut General Statutes Section 8-25(a). (S. 10). Therefore, the plan became null and void. (S. 9).

The East Lyme tax assessor has not assessed real property taxes on the area of the roads and bridges in Section III and none of the plaintiffs have ever paid taxes on the roads and bridges. (S. 19).

Since 1979, when residences in Section III became occupied, the Town has plowed snow from the bridges and roads and collected garbage. (S. 22). From September, 1981 until September, 1982, the East Lyme Board of Education provided school bus services to residences in Section III. (S. 23). The Town

has provided police protection and patrols in Section III. (S. 24). The Town's dog warden has responded to a complaint in Section III. (S. 25).

The bridges and roads in Section III have been used by plaintiffs and others for passage and repassage to and from Section III. (S. 31).

During the weeks immediately preceding the June, 1982 floods, Maric's attorneys were in the process of preparing a deed for conveyance of the roads and bridges to the Town. (S. 34). The deed had been submitted to the Town attorney for approval as to form and had been returned to Maric's attorney for modification. (S. 34). There are roadways in East Lyme which are regarded by the Town as public highways, which have not been conveyed to the Town by deed. (S. 39).

The issue is whether the evidence supports a finding that the roads and bridges of Section III are Town property. The Court concludes that they became Town property by virtue of common law dedication and acceptance.

I. Dedication

"Dedication is an appropriation of land to some public use, made by the owner of the fee, and accepted for such use by and in behalf of the public." Whippoorwill Crest Co. v. Stratford, 145 Conn. 268, 271 (1958). The two essential elements of dedication are (1) an act by the owner which unequivocally

manifests his intent to dedicate the land involved to public use; and (2) acceptance by the proper public authority or by the genera public. Meshberg v. Bridgeport City Trust Co., 180 Conn. 274 (1980). The determination of whether or not there has been a valid dedication and acceptance is a question of fact. Whippoorwill, 145 Conn. at 270.

In this case, Maric's attorney prepared and submitted a deed to the Town conveying the bridges and roadways of Section III to the Town. (S. 34). Defendant neither claims nor offers evidence to prove that plaintiffs have asserted private control over the bridges and roads of Section III. The proposed deed, the existence of homes along the roads in Section III, open and continuous public use of the roads and bridges, together with the absence of any evidence of private control of the roads and bridges support the conclusion that Maric intended to dedicate the roads and bridges of Section III to public use. A&H Corporation v. Bridgeport, 180 Conn. 435, 440 (1980).

II. Acceptance

Acceptance of property dedicated for public use may be established by actions of the municipality or by actual use of the property by the public. Meshberg v. Bridgeport City Trust Co., 180 Conn. 274 (1980).

Connecticut General Statutes Section 13a-48 provides a formal means of acceptance, stating that "(a)ny municipality whos

duty it is to maintain the highways within its limits may, except as otherwise provided in its charter, at any annual or special meeting held for that purpose, accept as a public highway any proposed highway situated in such municipality." Connecticut General Statutes Section 13a-48 (1983). This statutory provision for acceptance does not preclude a finding of acceptance of property by implication from the acts of a municipality and usage by the public. A&H Corporation, 180 Conn. at 439.

Acceptance by implication has been based on consideration of all the circumstances surrounding the property such as municipal approval of subdivision plan; condition of the roadway (whether it is properly constructed and paved or remains unimproved); services provided by the Town such as snow plowing, refuse removal, police patrols, sewers, storm drains and road maintenance; assessment of taxes; and the convenience and necessity of use by the public. A&H Corporation v. Bridgeport, 180 Conn. 435 (1980); see also, Ventres v. Farmington, 192 Conn. 663 (1984); Katz v. West Hartford, 191 Conn. 594 (1983); Meder v. Milford, 190 Conn. 72 (1983). "Affirmative acts of dominion and control or overt acts recognizing a road as a public highway have been held sufficient to constitute an implied acceptance." Katz, 191 Conn. at 597.

Acceptance has been found not to exist where a developer has failed to improve roadways in a manner acceptable to the Town and seeks to avoid the statutory requirements of Connecticut

General Statutes Section 13a-48, and Section 8-25 pertaining to Town approval of roadway layouts, by claiming common law dedication. Richard C. Thompson v. Town of Portland, 159 Conn. 107 (1970); see also Town of Brookfield v. Greenridge, Inc., 177 Conn. 527 (1979).

In this case, the Town does not claim that the roads and bridges in question were improperly constructed (Exhibit F). Maric's subdivision approval has lapsed due to a technical deficiency in filing. (S. 10). In addition, the facts stipulated support a determination that the Section III roads and bridges have been used as a way of common convenience and necessity for a significant period of time. (S. 31). Town services such as snow plowing (S. 22), garbage removal (S. 22), school bus transportation (September, 1981 to September, 1982) (S. 23), police patrol (S. 24), dog warden (S. 25) have been provided since the homes in Section III began to be occupied in 1979. No taxes have ever been assessed by the Town on the roadways and bridges of Section III. (S. 19).

The actions of the Town and use by the public here are sufficient to establish acceptance by implication of both bridges. Maric's failure to file subdivision approval is not dispositive in and of itself. Meshberg v. Bridgeport City Trust Co., 180 Conn. 274 (1980).

For the foregoing reasons, the Court concludes that the evidence in this case establishes that the roads and bridges of

Section III became property of the Town of East Lyme by virtue of common law dedication and acceptance. The Town is responsible for the repair and restoration thereof. Connecticut General Statutes Section 13a-99. That conclusion makes unnecessary the considerati of other issues raised by the parties.

Accordingly, judgment is rendered in favor of plaintiffs By authority of Connecticut General Statutes Section 13a-102, the Town is ordered to repair, within thirty days, the roads and bridges in question, making them safe for passage. Costs are awarded to plaintiffs.

Schaller, J.

WALLER, SMITH & PALMER, P. C.
COUNSELORS AT LAW
52 EUGENE O'NEILL DRIVE
P. O. BOX 88
NEW LONDON, CONNECTICUT 06320

TELEPHONE (203) 442-0367

January 31, 1986

Planning Commission
Town of East Lyme
East Lyme Town Hall
Niantic, Connecticut 06357

Dear Commission Members:

Re: Rights-of-way for the Roads in Sections II and III, Green Valley Lakes Subdivision

This is in reply to your letter of concerning the above subject.

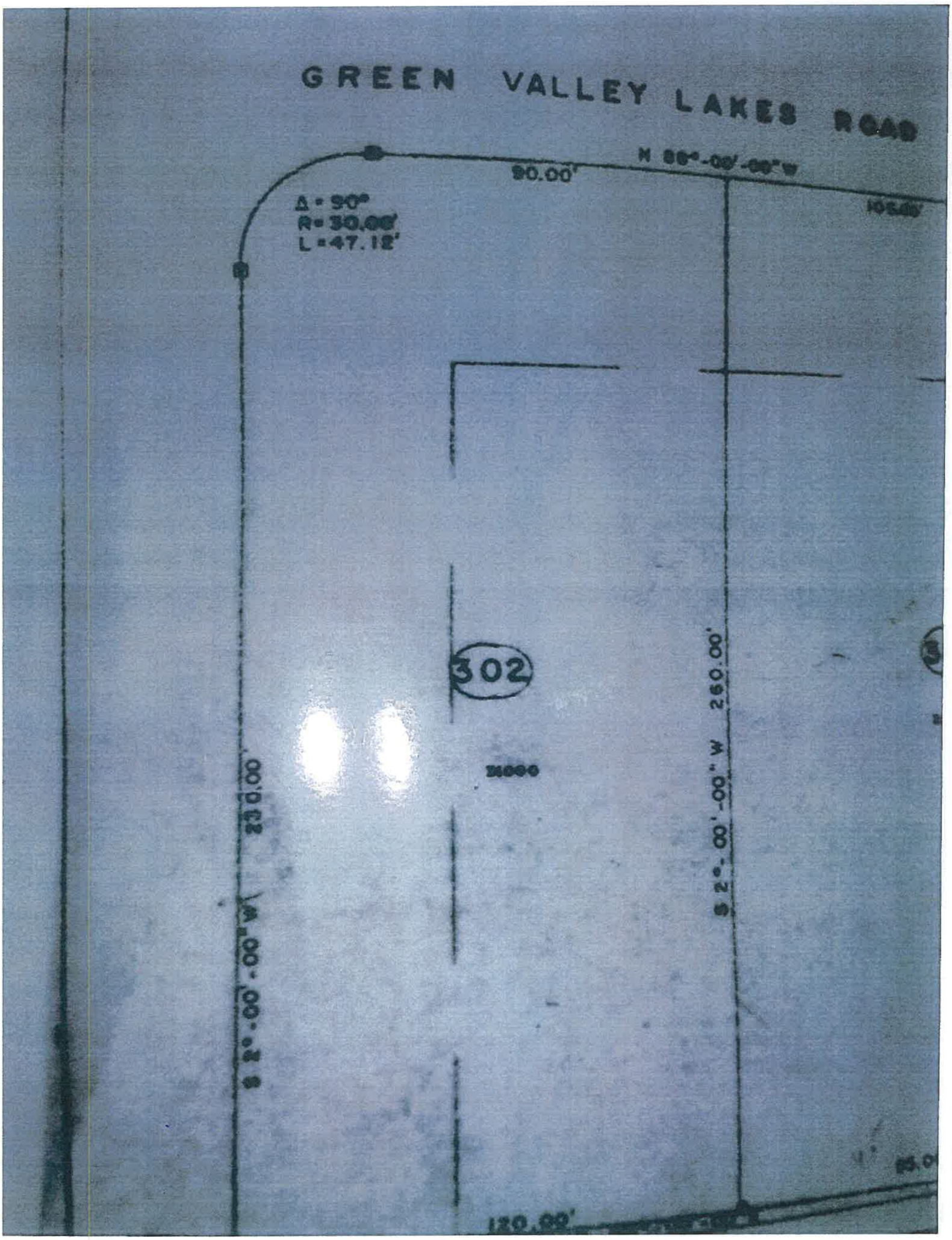
The direct answer to your question is that no action can be taken to require Mr. Maric to convey the rights-of-way to the Town. You are undoubtedly correct in assuming that either he or some successor in ownership of his property will apply for reapproval of the subdivision, but it may be some time before he does anything.

The judgment recites that all of the roads shown on the subdivision plan are Town roads. As you know, the Town would not ordinarily accept the stubs of roads as Town roads, but would take title to them for future use as Town roads for purposes of making them available to an abutting property owner. In the terms of the judgment, Mr. Maric offered the roads, including the stubs, as shown on the plans to the Town and the Town was deemed to have accepted them. I believe Mr. Maric cannot, at this time, object if any work is done on those stubs to improve them for highway purposes.

Therefore, it is my recommendation that with respect to the extension of roads onto and across those road stubs, you treat them as if owned by the Town and available for improvement.

Very truly yours,

Robert W. Marrion for
Waller, Smith & Palmer, P.C.
ncf


GREEN VALLEY LAKES ROAD
N 88°-00'-00" W
90.00'
Δ = 90°
R = 30.00'
L = 47.12'
302
S 2°-00'-00" W 260.00'
120.00'

SHEET 5	SHEET 4
SHEET 3	SHEET 2

RECEIVED FOR FILING
.18 1975 at 3:40 P.M.
TOWN CLERK'S OFFICE
EAST LYME, CONN.
Tubbs Chendali
Town Clerk

PROPOSED MERESTONE □
PROPOSED IRON PIN ●
AS SURVEY
RU 40 ZONE

...ST LYME PLANNING COMMISSION
...PROVED Lawrence R. Hanson Sect.
12 March 1975

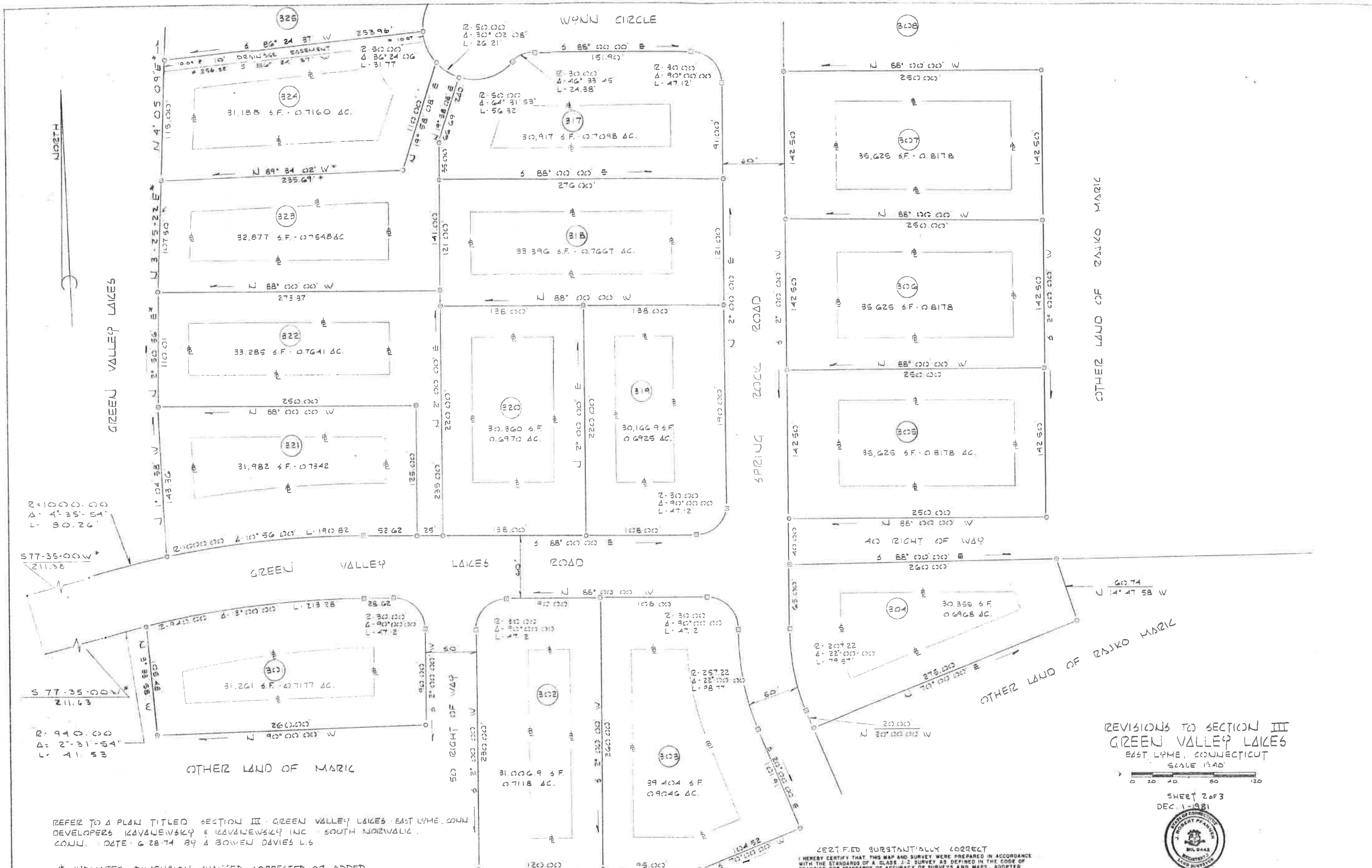
SHEET 2

I HEREBY CERTIFY ... TO BE SUBSTANTIALLY ...

A Bowen Davies

STATE OF CONN... A. BOWEN DAVIES

A. BOWEN DAVIES & CO.
LAND SURVEYOR
96 RIDGEWOOD ROAD
GLASTONBURY, CONN. 06033



REFER TO A PLAN TITLED SECTION III · GREEN VALLEY LAKES · EAST LYME, CONN
DEVELOPERS KAVANEWSKY & KAVANEWSKY INC - SOUTH NORWALK,
CONN. DATE 6-28-74 BY A BOWEN DAVIES L.S.

* INDICATES DIMENSION CHANGED, CORRECTED OR ADDED

□ - MONUMENT SET
⊙ - IRON PIN SET

CERTIFIED SUBSTANTIALLY CORRECT

I HEREBY CERTIFY THAT THIS MAP AND SURVEY WERE PREPARED IN ACCORDANCE WITH THE STANDARDS OF A CLASS A-2 SURVEY AS DEFINED IN THE CODE OF PRACTICE FOR STANDARDS OF ACCURACY OF SURVEYS AND MAPS, ADOPTED DECEMBER 10, 1975 AS AMENDED BY THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS, INC.

J. ROBERT PFANNER PE LS 9442

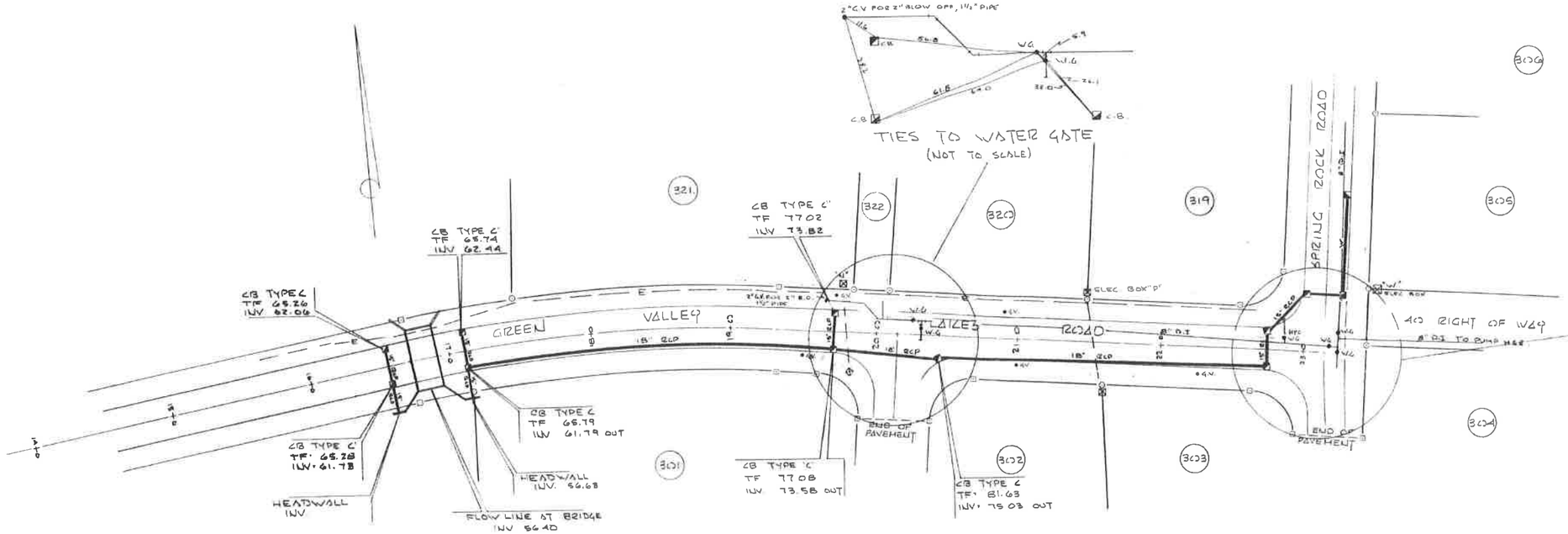
REVISIONS TO SECTION III
GREEN VALLEY LAKES
EAST LYME, CONNECTICUT
SCALE 1"=40'
0 20 40 80 120

SHEET 2 OF 3
DEC. 1 - 1981

STATE OF CONNECTICUT · J. ROBERT PFANNER · NO. 9442 · REGISTERED LAND SURVEYOR

J. ROBERT PFANNER & ASSOCIATES P.C.
SURVEYING & ENGINEERING
2 FERRO COURT EAST LYME, CONNECTICUT

81-63



AS-BUILTS
GREEN VALLEY LAKES ROAD
GREEN VALLEY LAKES
SECTION III
EAST LYME, CONN
SCALE 1"=40 HORZ
1"=4' VERT
SHEET 3 OF 4
1-20-82

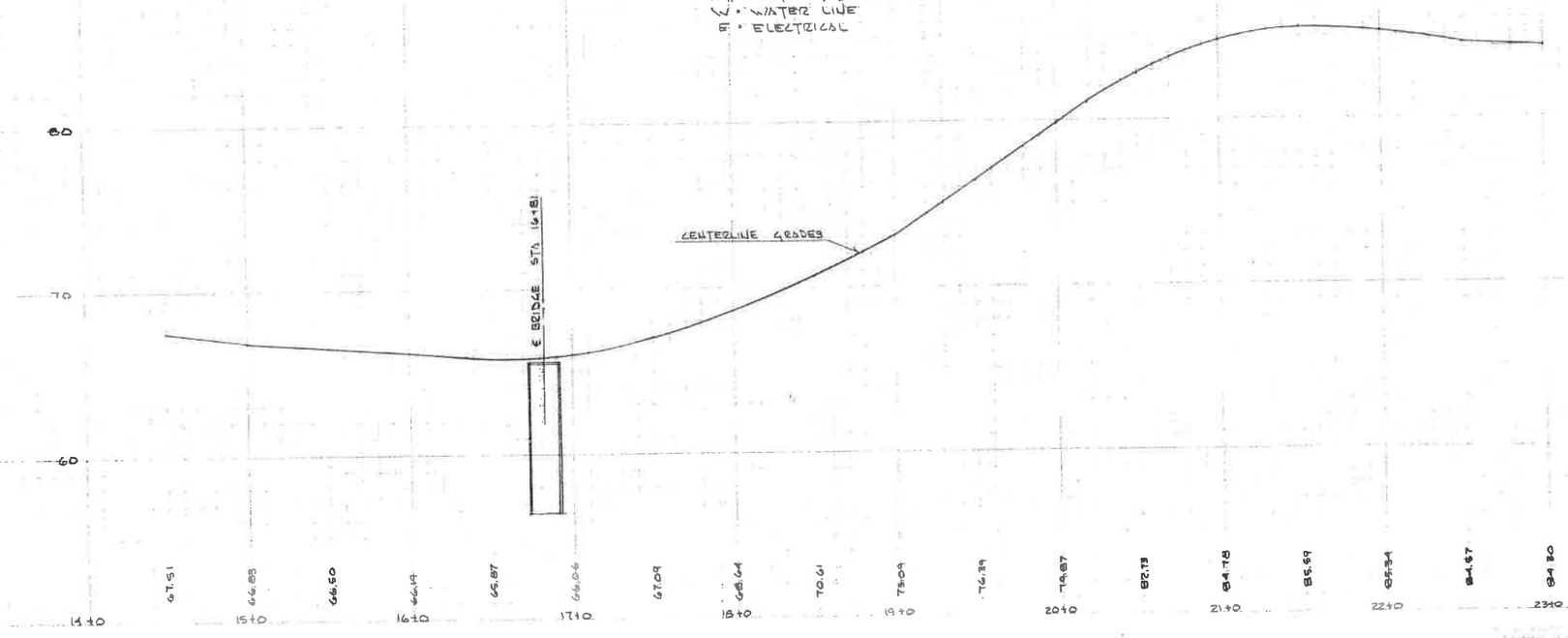
CERTIFIED SUBSTANTIALLY CORRECT

J. Robert Pfanner
J. ROBERT PFANNER PE, LS 9442

J. ROBERT PFANNER & ASSOCIATES P.C.
SURVEYING & ENGINEERING
2 FERRO COURT EAST LYME, CONNECTICUT

ELECTRICAL LAYOUT SHOWN ON THIS MAP AS PER SKETCH BY HELCO.

LEGEND
GV = GATE VALVE
W.G = WATER GATE
W = WATER LINE
E = ELECTRICAL



81-63

EAST LYME PLANNING COMMISSION

APPROVED Alice J. Turner

DATE March 18, 1997

FILING DEADLINE June 17, 1997

YEAR EXPIRATION DATE N/A

NO.	DATE	DESCRIPTION	BY
3	3-19-97	OPEN SPACE "A" IDENTIFIED	JB
2	1-10-97	EASEMENT NOTE ON LOT 319 REVISED	JB
1	12-23-96	LOT 301 REVISED	JB

REVISIONS

Filed In East Lyme Town
Clerk's Office

June 12, 1997 AT 2:20 PM

La Blair ATC
East Lyme Town Clerk

LOT LAYOUT

SECTION 3
GREEN VALLEY LAKES RESUBDIVISION

SPRING ROCK ROAD, OVERBROOK ROAD & GREEN VALLEY LAKES ROAD
EAST LYME, CONNECTICUT

GRAPHIC SCALE

(IN FEET)
1 inch = 40 ft.

NOVEMBER 6, 1996
SHEET 2 OF 10

MA 9

Original Ink Drawing
duced In Accordance With
State Filing Regulations.
bert Pfanner PE, LS #9442

N88°00'00"W

15'

30'

250.00'

321
31,981.29 S.F.
0.7 Ac.

100' MIN. SQ.

125.00'

N02°00'00"E

S02°00'00"W

220.00'

320
30,359.56 S.F.
0.7 Ac.

100' MIN. SQ.

S02°00'00"W

220.00'

30,166.86 S.F.
0.7 Ac.

100' MIN. SQ.

215.98'

190.00'

N02°00'00"E

S P R

Δ = 02°04'00"
R = 1000.00'
T = 18.04'
L = 36.07'
CH = 36.07'
N80°02'00"E

S01°04'58"E

143.36'

Δ=60°00'00"
L=31.42'

Δ=10°56'00" L=190.82' CH=N86°32'00"E 190.53' 52.62' 25.00' 138.00' 108.00'

Δ=13°00'00" CH=N85°30'30"E 226.41'

R=1000.00' L=226.89'

S88°00'00"E

G R E E N V A L L E Y L A K E S R O A D

Δ = 90°00'00"
R = 30.00'
T = 30.00'
L = 47.12'

R=940.00' L=213.28' Δ=13°00'00" CH=N85°30'00"E 212.82'

128.62'

S88°00'00"E

90.00'

105.00'

20'

Δ = 90°00'00"
R = 30.00'
T = 30.00'
L = 47.12'

100' MIN. SQ.

15'

Δ = 90°00'00"
R = 30.00'
T = 30.00'
L = 47.12'

100' MIN. SQ.

230.00'

S02°00'00"W

302
31,006.86 S.F.
0.7 Ac.

260.00'

S02°00'00"W

303
34,906.86 S.F.
0.8 Ac.

230.00'

S02°00'00"W

301
87.9± Ac.

100' MIN. SQ.

LIMIT OF WETLANDS

Exhibit X

APPLICATION OF ROBERT FUSARI, REAL ESTATE SERVICE OF CONNECTICUT: INC., APPLICANT	:	**TOWN OF EAST LYME**
	:	**PLANNING COMMISSION**
	:	
	:	
	:	**JULY 17, 2018**

PETITION FOR INTERVENTION UNDER CONNECTICUT GENERAL STATUTES SECTION 22a-19 (a)

Brian A. Lepkowski (the "Intervenor") of 27 Green Valley Lakes Road, East Lyme, CT 06333, hereby intervenes in the above-captioned matter pursuant to Connecticut General Statutes § 22a-19 and represents that:

1. The Connecticut Environmental Protection Act of 1971 provides in pertinent part at General Statutes § 22a-19(a) (1) that

> In any administrative, ...proceeding, and in any judicial review thereof made available by law, ...any person, ...may intervene as a party on the filing of a verified petition asserting that the proceeding or action has, or is likely to have, the effect of unreasonably polluting, impairing, or destroying the public trust in the air, water or other natural resources of the state.

2. The East Lyme Planning Commission is responsible for regulating the subdivision of land through the use of local subdivision regulations, established and administered by the Planning Commission, reviewing residential and non-residential subdivision applications, performing consistency analysis of proposals with the Plan of Conservation and Development ("POCD"), and providing guidance with regard to existing and future land use policies to insure the East Lyme interests and regulations are met, and must take into consideration the

MATTHEW G. BERGER, ATTORNEY AT LAW, LLC • Juris No.: 411899
164 HEMPSTEAD STREET, NEW LONDON, CONNECTICUT 06320-5638
(860) 444-1649 • Fax (860) 437-0864

following factors, as set forth in the Subdivision Regulations and the Plan of Conservation and Development of the Town of East Lyme:

3. In connection with the application for a permit for a subdivision within East Lyme, the Commission must find

I. Section 4-2 (b) that an adequate drainage report was submitted;
II. Section 4-2-3 (A) 2: that a slope analysis showing 25% slopes has been provided;
III. Section 4-2-3 (A) 7: that drainage basin divides are shown on the plans;
IV. Section 4-2-3 (a) 6: that eneralized types of vegetation are shown on the plans;
V. Section 4-2-3 (A) 9: that landmark trees are shown on the plans;
VI. Section 4-2-8: that an erosion control plan has been prepared for *all* the land disturbance associated with the construction of single family residences, driveway, on-site sewage disposal system and lot grading.
VII. Section 4-13-3 states that an evaluation by the Eastern Connecticut Environmental Review Team be included;
VIII. Section 5-2-2 (E): that a stormwater management plan be provided which addresses all the requirements under this section, specifically subsections "iii", "iv", "v", "vi", "vii", "x", and "xi";
IX. Section 5-2-2 (G): that the controls for This section clearly states the following "any activity which would create a disturbed area of cumulatively more than one-half (1/2) acre in size...." were shown;
X. Section 6-1-2 (C): that "development near prominent hilltops and ridge lines should b sited so that building silhouettes will be below the ridge line as viewed from nearby streets";
XI. Section 6-1-2 (L): that an evaluation of the woodlands has been submitted;
XII. Sections 6-8-2, 6-8-3, 6-8-4, 6-8-5 and 6-8-6 that a stormwater management report and demonstration by adequate calculations that the post-development runoff volumes will be retained and infiltrated on site for the 2-year, 5-year, 10-year, 25-year, 50-year and 100-year rainfall events as required by this section were provided;
XIII. Section 8-3-7 that the maximum length of a dead-end road shall be 1000' and shall serve no more than 15 lots;
XIV. Section 6-10-11 that emergency access needs is in place to provide emergency responders a second access in the event, the subdivision road is blocked, and that the access be of sufficient width.

MATTHEW G. BERGER, ATTORNEY AT LAW, LLC • Juris No.: 411899
164 HEMPSTEAD STREET, NEW LONDON, CONNECTICUT 06320-5638
(860) 444-1649 • Fax (860) 437-0864

4. The subject application for a proposed road and associated 23-lot re-subdivision involves conduct that has, or is reasonably likely to have, the effect of unreasonably polluting, impairing, or destroying the public trust in the air, water, or other natural resources of the State for the following reasons:

5. The subject application for a proposed road and associated 23-lot re-subdivision involves conduct that has, or is reasonably likely to have, the effect of unreasonably polluting, impairing, or destroying the public trust in the air, water, or other natural resources of the State for the following reasons:

The extent of cutting, regrading and the increases in directly connected impervious areas will eliminate natural infiltration in the upland areas and interfere with the natural recharge and damage the hydrologic cycle and hydrologic systems within the wetlands areas;

The proposed stormwater management system is inadequate to prevent the erosion of the downgradient upland slope toward the wetlands resulting in the discharge of higher pollutant loads to the downgradient wetlands. Eroded material will be deposited into the wetlands and this siltation within a wetland or watercourse is a direct adverse physical impact. Further, the stormwater discharges are likely to create thermal and chemical impacts to receiving wetlands and watercourses, increased thermal loads in receiving wetlands and watercourses will cause die-off of aquatic species who can only survive within a narrow temperature range, and discharges are likely to change subsurface flows of water and

wetlands connected with the site;

The proposed road and associated subdivision is likely to have a substantial environmentally destructive impact on the wetlands. Cutting a corridor will stunt, damage and otherwise adversely effect aquatic species and plants within the wetlands;

At least one feasible and prudent alternative exists to the proposed site development which is consistent with the reasonable requirements of the public health, safety and welfare, and is required to protect the air, water, and other natural resources associated with the subject property including but not limited to relocating the road and/or removing the cul-de-sac and reducing the number of units, as no need has been demonstrated for this intensity or scale of development.

6. The facts, as presented, demonstrate that the Agency can exercise jurisdiction over the environmental issues presented in this petition and that the proposed activity has or is likely reasonably likely to have the effect of unreasonably polluting, impairing or destroying the public trust in the air, water, or other natural resources of the State of Connecticut.

WHEREFORE, the above-named party intervenes in this proceeding pursuant to the Environmental Protection Act of 1971 upon the filing of this verified Petition for Intervention.

THE INTERVENOR

By_____
Matthew G. Berger, His Attorney

MATTHEW G. BERGER, ATTORNEY AT LAW, LLC • Juris No.: 411899
164 HEMPSTEAD STREET, NEW LONDON, CONNECTICUT 06320-5638
(860) 444-1649 • Fax (860) 437-0864

APPLICATION OF ROBERT FUSARI, REAL ESTATE SERVICE OF CONNECTICUT: INC., APPLICANT	:	**TOWN OF EAST LYME**
	:	**PLANNING COMMISSION**
	:	
	:	
	:	**JULY 17, 2018**

VERIFICATION OF PETITION FOR INTERVENTION UNDER CONNECTICUT GENERAL STATUTES SECTION 22a-19 (a)

I, Brian A. Lepkowski, the undersigned, being duly sworn, depose and say that I have read the foregoing Petition for Intervention and the allegations contained therein are true to the best of my knowledge and belief.

Dated at East Lyme, Connecticut, this 17th day of July, 2018.

INTERVENOR

Brian A. Lepkowski

STATE OF CONNECTICUT)
) ss: NEW LONDON
COUNTY OF NEW LONDON)

The foregoing instrument was acknowledged before me this 17th day of July, 2018, by Brian A. Lepkowski, as his free act and deed.

Matthew G. Berger
Commissioner of the Superior Court

MATTHEW G. BERGER, ATTORNEY AT LAW, LLC • Juris No.: 411899
164 HEMPSTEAD STREET, NEW LONDON, CONNECTICUT 06320-5638
(860) 444-1649 • Fax (860) 437-0864

As an intervening party to this proceeding, I request receipt of all notices of action, hearings and decisions and copies of all items to the attention of:

Matthew G. Berger
Matthew G. Berger, Attorney At Law, LLC
164 Hempstead St.
New London, CT 06320-4638
matthew.berger@sbcglobal.net

INTERVENOR

Brian A. Lepkowski

Exhibit Y

LOW IMPACT SUSTAINABLE
LISD
DEVELOPMENT
TRINKAUS ENGINEERING

Trinkaus Engineering, LLC
114 Hunters Ridge Road
Southbury, Connecticut 06488
203-264-4558 (office & fax)
+1-203-525-5153 (mobile)
E-mail: strinkaus@earthlink.net
http://www.trinkausengineering.com

June 24, 2018

Mr. Gary Upton, Chairman
Inland Wetlands Agency
108 Pennsylvania Avenue
P.O. Box 519
Niantic, Connecticut 06357-0519

Ms. Rita Franco-Palazzo, Chairwomen
Planning Commission
108 Pennsylvania Avenue
P.O. Box 519
Niantic, Connecticut 06357-0519

Re: Twin Valley Subdivision
Green Valley Lake Road
East Lyme, Connecticut

Dear Mr. Upton and Members of the Inland Wetlands Agency and Ms. Franco-Palazzo and Members of the Planning Commission,

I have been retained by an adjacent property owner to review the proposed civil engineering work for the above referenced project as well as compliance with the applicable requirements of the East Lyme Inland Wetlands Agency and the East Lyme Planning Commission. There are specific sections for compliance with the requirements of each land use agency.

Inland Wetland and Watercourses Regulations:

1. The applicant has not provided written evidence as required under Section 7.5.a of the Inland Wetland Regulations for all the proposed regulated activities which are associated with this project to show that the proposed regulated activities will not have adverse environmental impacts on the inland wetlands or watercourses found on the subject parcel.
2. A stormwater management report has not been submitted by the applicant and thus the application should be deemed incomplete under Section 7.5.e of the regulations. The stormwater management report is critical to allowing the Agency to evaluate the potential impacts of stormwater discharges on the downgradient wetlands and watercourses.

3. The applicant has not provided a detailed list of all the regulated activities associated with this application. The following is a list of all the regulated activities which must be requested by the applicant, reviewed by the Inland Wetlands Agency:
    a. Construction of approximately 500 lf of gravel emergency access road within 100' upland review area,
    b. Lot #3 – sewage disposal system within 100' upland review area,
    c. Lot #4 – sewage disposal system within 100' upland review area,
    d. Lot #5 – sewage disposal system within 100' upland review area,
    e. Lot #6 – sewage disposal system within 100' upland review area,
    f. Lot #7 – sewage disposal system within 100' upland review area,
    g. Lot #8 – portion of sewage disposal system within 100' upland review area,
    h. Lot #9 – construction of rain garden within 100' upland review area,
    i. Water quality Basin on former lot #10 – grading within 100' upland review area,
    j. Lot #11 – corner of sewage disposal system within 100' upland review area,
    k. Lot #12 – edge of rain garden within 100' upland review area,
    l. Lot #15 – portion of sewage disposal system within 100' upland review area,
    m. Lot #16 – portion of sewage disposal system within 100' upland review area
    n. Lot #17 – portion of sewage disposal system within 100' upland review area,
    o. Lot #23 – sewage disposal system within 100' upland review area,
    p. Water Quality Basin on former lot #24 – grading within 100' upland review area,
    q. Lot #25 – construction of rain garden, sewage disposal system, portion of driveway and underground utilities (proposed) within 100' upland review area,
4. It appears from the submittal that the applicant is only requesting those regulated activities for the construction of the two water quality basins associated with the proposed road. This is not appropriate. For a residential subdivision, all regulated activities associated with the proposed road, stormwater management and proposed building lots must be evaluated and approved or rejected by the Inland Wetlands Agency for the lots to be approved by the Planning Commission. If a lot has a regulated activity, then approval of the regulated activity must be obtained otherwise the lot cannot be considered a building lot. This professional opinion is based upon 38 years of making land use applications here in Connecticut as well as from being a member of the Southbury Inland Wetlands Agency for three years.
5. There has been no discussion by the applicant or submission of written documentation describing the ecological communities (Section 7.6.d) found on the subject property and how the proposed regulated activities will affect these ecological communities. Without this information, the application is incomplete.

Adverse impacts to wetlands and watercourses:

1. It has not been demonstrated by calculations that the increased runoff volumes which will be generated from this development will be reduced as required by the East Lyme regulations.
2. The design of the outlet protection at the outlets of the basins is inadequate to prevent the erosion of the downgradient upland slope toward the wetlands. Eroded material will be deposited into the wetlands and this siltation within a wetland or watercourse is a direct adverse physical impact.

3. There are two proposed stormwater basins, which are supposed to be Micropool Extended Detention Ponds. These ponds are not close to being designed with all the components required by the 2004 CT DEP Storm Water Quality Manual and will result in the discharge of higher pollutant loads to the downgradient wetlands. Specifically, TSS, TP, TN, metals and petroleum hydrocarbons will be discharged to downgradient wetlands and watercourses from the increased impervious areas, new lawn area which will likely be subject to the application of fertilizers and pesticides. Increased phosphorous loads, both soluble and particulate provide food source for increased non-native aquatic vegetation as well as increasing the frequency and duration of algae blooms in open water bodies. Introduction of increased pollutant loads from non-point source runoff particularly metals and hydrocarbons will cause die-offs of benthic organisms which reside in wetlands and watercourses.
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1. The applicant has claimed that it cannot place the road on the east side of the Anderson property (located at #29 Green Valley Lakes Road) for many reasons, but primarily as the road will be in the upland review area. But since, the applicant is proposed an emergency access road in this same location, this argument does not have any validity.
    a. This access strip was created by the original subdivision and is the desired access into this parcel.
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    f. A required landscape buffer, being 40' in width would also be created along the west side of the Lepkowski property.

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1. Section 4-2 (b): No drainage report has been submitted as of this date, so the application is not in compliance with this requirement and therefore is incomplete.
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11. Section 6-1-2 (L): The submitted plans are not in compliance with this section as no evaluation of the woodlands has been submitted.
12. Sections 6-8-2, 6-8-3, 6-8-4, 6-8-5 and 6-8-6 have not been met as the applicant has not submitted the required stormwater management report. Furthermore, the applicant has not demonstrated by adequate calculations that the post-development runoff volumes will be retained and infiltrated on site for the 2-year, 5-year, 10-year, 25-year, 50-year and 100-year rainfall events as required by this section.
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shown in the East Lyme Plan of Conservation and Development, especially regarding safe intersections with such streets." The proposed plan is not in compliance with this section. A future extension of Spring Brook Road to the south on the subject property at the intersection of Green Valley Lakes Road was clearly designed to provide full vehicular access to the subject parcel of land. This would create a "T" intersection, controlled by stop signs and shows that the Planning Commission at the time of the approval of the original subdivision which created these roads was thinking long term regarding access and public safety.

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Civil Engineering Review Comments:

1. **Stormwater management plan.** The Site Drainage Narrative revised to 3/6/18 by the applicant is not a comprehensive stormwater management report which the East Lyme regulations require. There are many incorrect and unsupported statements in the report that render the stated conclusions to be invalid. These issues are stated below in bullet points "a" to "e". A comprehensive stormwater management plan must contain the following information and analyses and the deficiencies in the report are highlighted in bullet points "f" to "g" below.
    a. The Drainage Narrative states that post-development runoff volumes will be reduced for the three analyzed watershed areas. This statement is completely unsupported. No infiltration tests were performed in the field in the proposed stormwater basins.
    b. The pond analyses use an infiltration rate of 3.3"/hr. (source of which is unknown and therefore unverifiable).
    c. The applicant has calculated the Water Quality Volume (WQV) for pre-development and post-development conditions and then has only provided the

difference between the two results. This is not correct, the WQV is only calculated for post-development conditions per the CT DEP 2004 Storm Water Quality Manual is the volume of runoff which must be "captured and treated" by the application of stormwater treatment practice to reduce non-point source pollutant loads. As the applicant is only providing about 50% of the required WQV, it does conform to the DEP 2004 Storm Water Quality Manual.

d. Accurate and proper delineation of pre-development and post-development watershed boundaries for the entire site. The design points are located where runoff leaves the subject property in one of more places.
e. Accurate and proper delineation of the longest hydrologic flow path to determine the Time of Concentration,
f. Accurate determination of the Runoff Curve Number (RCN) for pre- and post-development conditions, soil types shall be based upon soil test results performed in the field and land cover condition shall be based upon recent field inspections of the area during the growing season.
g. The determination of the peak rate and peak volume of runoff for pre-development and post-development conditions for the required design storm frequencies as specified by the municipal regulations.
h. For post-development conditions, delineations of sub-watershed areas on the subject property where runoff is being directed to a given Stormwater Best Management Practice.
i. Same analysis for each sub-watershed area as was previously stated in "a" through "d" above.
j. All stormwater management practices are not designed in compliance with CT DEP 2004 Storm Water Quality Manual or current published standards for Low Impact Development systems.
k. The proposed water quality basin located on the former lot #24 is NOT in compliance with the requirements for a Micropool Extended Detention Pond found in the DEEP Manual.
    i. The forebay is not in compliance as it is not 4-6' in depth, does not have a minimum 2:1 length to width ratio (inlet to outlet). Proposed contours are not labeled on the plan so the stated volume of 1,065 cubic feet cannot be verified.
    ii. It cannot be verified that the permanent pool within the pond will contain a minimum of 20% of the required water quality volume (WQV) and that the extended detention component will contain 80% of the WQV.
    iii. The pond does not provide a 3:1 length to width ratio per the Manual.
    iv. It cannot be verified that the minimum pond volume will be equal to the required WQV.
    v. It does not appear based upon the proposed contours that the bottom of the pond will be below the seasonal high groundwater table to maintain the permanent pool. According to the grading, the bottom of the pond will be set at existing grade.
    vi. The pond as proposed will not have a baseflow as the bottom of the pond is not located below the seasonal high groundwater table.

vii. The micropool (or wet pool) does not meet the requirements of the Manual. It is only 2' in depth, not the 4-6' depth specified in the Manual. The micropool also does not meet the minimum length to width ratio of 3:1 (along the flow path).

l. As proposed, this pond will not reduce the loads of non-point source pollutants (Total Suspended Solids, Total Phosphorous, Total Nitrogen, Metals and Hydrocarbons) prior to the discharge to the downgradient wetlands. To reduce the pollutant loads, all stormwater treatment practices must be designed in accordance with the Manual. If the practices are not designed in accord with the requirements of the Manual, then pollutant loads are not adequately reduced, resulting in the discharge of pollutants to the receiving wetlands on this site.

m. The use of a pre-formed scour hole is not appropriate at the end of the outlet pipe as it does not spread the flow out onto the upland surface. The outlet protection must be designed in accordance with the CT DEEP 2002 Guidelines for Soil Erosion and Sediment Control as the flow are directed onto an upland soil surface. As proposed the discharge from the pond will erode a channel to the downgradient wetland, resulting in the discharge of sediment and pollutants to the wetlands.

n. The proposed water quality basin located on the former lot #10 is NOT in compliance with the requirements for a Micropool Extended Detention Pond found in the DEEP Manual.

i. The forebay is not in compliance as it is not 4-6' in depth, does not have a minimum 2:1 length to width ratio (inlet to outlet). Proposed contours are not labeled on the plan so the stated volume of 2,161 cubic feet cannot be verified.

ii. It cannot be verified that the permanent pool within the pond will contain a minimum of 20% of the required water quality volume (WQV) and that the extended detention component will contain 80% of the WQV.

iii. The pond does not provide a 3:1 length to width ratio per the Manual.

iv. It cannot be verified that the minimum pond volume will be equal to the required WQV.

v. It does not appear based upon the proposed contours that the bottom of the pond will be below the seasonal high groundwater table to maintain the permanent pool. According to the grading, the bottom of the pond will be set at existing grade.

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vii. The micropool (or wet pool) does not meet the requirements of the Manual. It is only 2' in depth, not the 4-6' depth specified in the Manual. The micropool also does not meet the minimum length to width ratio of 3:1 (along the flow path).

viii. As designed the flow entering the pond will not spread out across the entire bottom of the pond, but will "short circuit" the pond, thus making the pond ineffective at the reduction of pollutant loads.

o. As proposed, this pond will not reduce the loads of non-point source pollutants (Total Suspended Solids, Total Phosphorous, Total Nitrogen, Metals and

Hydrocarbons) prior to the discharge to the downgradient wetlands. To reduce the pollutant loads, all stormwater treatment practices must be designed in accordance with the Manual. If the practices are not designed in accord with the requirements of the Manual, then pollutant loads are not adequately reduced, resulting in the discharge of pollutants to the receiving wetlands on this site.

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q. The applicant proposes rain gardens for the roof drains on the proposed lots. There is only a generic detail on the plan set which does not provide any information to evaluate whether the rain gardens will function or not.

r. There are no soil specifications for the rain gardens.

s. There is no construction or maintenance protocols provided for the rain gardens.

t. There are no appropriate infiltration test results for the design of the rain gardens provided. Without appropriate infiltration tests, it cannot be verified that the rain gardens will function at all and as they are an integral part of the stormwater management design for this project.

u. Complete hydrologic modeling of all stormwater practices to demonstrate that they will function as intended to filter runoff (reduce pollutant loads), infiltrate runoff and/or reduce peak rates of runoff.

v. Summary tables of data showing reductions of runoff volume as required by the Town of East Lyme regulations as well as reductions in the peak rate of runoff.

w. A pollutant renovation analysis demonstrating how the stormwater practices will reduce the pollutant loads associated with non-point source runoff.

2. **Erosion and Sedimentation Control Plan.** A proper erosion control plan must contain the following information:

   a. All limits of proposed construction activity on the entire site,
   b. Limits of clearing,
   c. Location of appropriate erosion control measures for all earth disturbing activities,
   d. A construction narrative which follows the form and content provided in the CT DEP 2002 Guidelines for Soil Erosion and Sediment Control.
   e. A detailed Construction Phasing plan for the project.
   f. Design computations and necessary construction information for temporary sediment traps or basins which are proposed.
   g. Detailed inspection and maintenance requirements for all erosion control measures.

3. **Suitability of site to support on-site sewage disposal systems.**

   a. The letter from the Ledge Light Health District discusses that the soils are suitable (thus only meeting the minimum criteria under the Technical Standards of the

Public Health Code) for installation of on-site sewage disposal systems. However, it does NOT discuss compliance with the requirements found in Table 1 of the Technical Standards. This is a critical oversight renders the statement of suitability to be in error as discussed below.

b. As currently proposed the location of the rain gardens in proximity to the proposed primary and reserve sewage disposal systems are NOT compliance with the Current Technical Standards developed by the CT Public Health Department, on-site sewage disposal division.

c. Rain gardens are shown within 50' of proposed primary and/or reserve sewage disposal systems. This is not in violation of Table 1.H of the Technical Standards of the Connecticut Public Health Code which requires a separation of 50' from a leaching system to a rain garden or similar infiltration system. This 50' setback may be reduced under certain conditions: ***"Distance shall be reduced to 25'to a leaching system if the MLSS is not applicable or the storm water system is not up-gradient or down-gradient. Distances may further be reduced to 10'for minor infiltration systems (e.g. rain gardens) with the approval of the local director of health if demonstrated that the leaching system shall not be adversely impacted."*** Specifically, the following information shows the distance between the proposed rain garden to the proposed sewage disposal system. (the relationship of the rain garden to the sewage disposal system is in ( ).

i. Lot #1 – 15' (uphill)
ii. Lot #2 – 25' (uphill)
iii. Lot #3 – 25' (uphill)
iv. Lot #4 – 25' (uphill)
v. Lot #5 – 25' (uphill)
vi. Lot #6 – 32' (uphill)
vii. Lot #7 – 25' (uphill)
viii. Lot #8 – 25' (uphill)
ix. Lot #9 – 50' (uphill)
x. Lot #11 – 25' (uphill)
xi. Lot #12 – not applicable
xii. Lot #13 – 30' (lateral)
xiii. Lot #14 – 25' (lateral)
xiv. Lot #15 – 25' (uphill)
xv. Lot #16 – 16' (uphill)
xvi. Lot #17 – 25' (uphill)
xvii. Lot #18 – 14' (uphill)
xviii. Lot #19 – 42' (uphill)
xix. Lot #20 – 60' (uphill)
xx. Lot #21 – 25' (uphill)
xxi. Lot #22 – 13' (uphill)
xxii. Lot #23 – 10' (uphill)
xxiii. Lot #25 – 50' (lateral)

d. As you can see in the information above is that almost all the proposed rain gardens are located uphill and less than fifty feet away from the proposed sewage

disposal systems which is a clear violation of the requirements found in Table 1.H of the Technical Standards. These separation requirements cannot be waived by the local health department. There are two issues with the location of rain gardens located uphill or downhill of a sewage disposal system. First, Rain gardens, which are infiltration systems and located uphill of a sewage disposal system will increase the groundwater table under the sewage disposal system by the infiltration of rainfall from the building roof. The increased infiltration will affect the functionality of the sewage disposal system to disperse and treat effluent.

e. If the rain garden is located downgradient of the sewage disposal system, and there is less than 50' of separation, partially treated effluent from the sewage disposal system may be discharged into the rain garden. Additionally, the Technical Standards cited above do not permit excavation into the existing grade within 50' downhill of the sewage disposal system. Rain gardens are shallow excavations in to the ground, so they cannot be located less than 50' downhill of the sewage disposal systems.

Please feel free to contact my office if you have any questions concerning the information found in this report. My CV is attached for the record.

Respectfully Submitted,
Trinkaus Engineering, LLC

Steven D. Trinkaus, PE

LOW IMPACT~SUSTAINABLE
LID DEVELOPMENT
TRINKAUS ENGINEERING

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June 24, 2018

Mr. Gary Upton, Chairman
Inland Wetlands Agency
108 Pennsylvania Avenue
P.O. Box 519
Niantic, Connecticut 06357-0519

Ms. Rita Franco-Palazzo, Chairwomen
Planning Commission
108 Pennsylvania Avenue
P.O. Box 519
Niantic, Connecticut 06357-0519

Re: Twin Valley Subdivision
Green Valley Lake Road
East Lyme, Connecticut

Dear Mr. Upton and Members of the Inland Wetlands Agency and Ms. Franco-Palazzo and Members of the Planning Commission,

I have been retained by an adjacent property owner to review the proposed civil engineering work for the above referenced project as well as compliance with the applicable requirements of the East Lyme Inland Wetlands Agency and the East Lyme Planning Commission. There are specific sections for compliance with the requirements of each land use agency.

Inland Wetland and Watercourses Regulations:

1. The applicant has not provided written evidence as required under Section 7.5.a of the Inland Wetland Regulations for all the proposed regulated activities which are associated with this project to show that the proposed regulated activities will not have adverse environmental impacts on the inland wetlands or watercourses found on the subject parcel.
2. A stormwater management report has not been submitted by the applicant and thus the application should be deemed incomplete under Section 7.5.e of the regulations. The stormwater management report is critical to allowing the Agency to evaluate the potential impacts of stormwater discharges on the downgradient wetlands and watercourses.

3. The applicant has not provided a detailed list of all the regulated activities associated with this application. The following is a list of all the regulated activities which must be requested by the applicant, reviewed by the Inland Wetlands Agency:
    a. Construction of approximately 500 lf of gravel emergency access road within 100' upland review area,
    b. Lot #3 – sewage disposal system within 100' upland review area,
    c. Lot #4 – sewage disposal system within 100' upland review area,
    d. Lot #5 – sewage disposal system within 100' upland review area,
    e. Lot #6 – sewage disposal system within 100' upland review area,
    f. Lot #7 – sewage disposal system within 100' upland review area,
    g. Lot #8 – portion of sewage disposal system within 100' upland review area,
    h. Lot #9 – construction of rain garden within 100' upland review area,
    i. Water quality Basin on former lot #10 – grading within 100' upland review area,
    j. Lot #11 – corner of sewage disposal system within 100' upland review area,
    k. Lot #12 – edge of rain garden within 100' upland review area,
    l. Lot #15 – portion of sewage disposal system within 100' upland review area,
    m. Lot #16 – portion of sewage disposal system within 100' upland review area
    n. Lot #17 – portion of sewage disposal system within 100' upland review area,
    o. Lot #23 – sewage disposal system within 100' upland review area,
    p. Water Quality Basin on former lot #24 – grading within 100' upland review area,
    q. Lot #25 – construction of rain garden, sewage disposal system, portion of driveway and underground utilities (proposed) within 100' upland review area,
4. It appears from the submittal that the applicant is only requesting those regulated activities for the construction of the two water quality basins associated with the proposed road. This is not appropriate. For a residential subdivision, all regulated activities associated with the proposed road, stormwater management and proposed building lots must be evaluated and approved or rejected by the Inland Wetlands Agency for the lots to be approved by the Planning Commission. If a lot has a regulated activity, then approval of the regulated activity must be obtained otherwise the lot cannot be considered a building lot. This professional opinion is based upon 38 years of making land use applications here in Connecticut as well as from being a member of the Southbury Inland Wetlands Agency for three years.
5. There has been no discussion by the applicant or submission of written documentation describing the ecological communities (Section 7.6.d) found on the subject property and how the proposed regulated activities will affect these ecological communities. Without this information, the application is incomplete.

Adverse impacts to wetlands and watercourses:

1. It has not been demonstrated by calculations that the increased runoff volumes which will be generated from this development will be reduced as required by the East Lyme regulations.
2. The design of the outlet protection at the outlets of the basins is inadequate to prevent the erosion of the downgradient upland slope toward the wetlands. Eroded material will be deposited into the wetlands and this siltation within a wetland or watercourse is a direct adverse physical impact.

3. There are two proposed stormwater basins, which are supposed to be Micropool Extended Detention Ponds. These ponds are not close to being designed with all the components required by the 2004 CT DEP Storm Water Quality Manual and will result in the discharge of higher pollutant loads to the downgradient wetlands. Specifically, TSS, TP, TN, metals and petroleum hydrocarbons will be discharged to downgradient wetlands and watercourses from the increased impervious areas, new lawn area which will likely be subject to the application of fertilizers and pesticides. Increased phosphorous loads, both soluble and particulate provide food source for increased non-native aquatic vegetation as well as increasing the frequency and duration of algae blooms in open water bodies. Introduction of increased pollutant loads from non-point source runoff particularly metals and hydrocarbons will cause die-offs of benthic organisms which reside in wetlands and watercourses.
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shown in the East Lyme Plan of Conservation and Development, especially regarding safe intersections with such streets." The proposed plan is not in compliance with this section. A future extension of Spring Brook Road to the south on the subject property at the intersection of Green Valley Lakes Road was clearly designed to provide full vehicular access to the subject parcel of land. This would create a "T" intersection, controlled by stop signs and shows that the Planning Commission at the time of the approval of the original subdivision which created these roads was thinking long term regarding access and public safety.

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15. The applicant is requesting a waiver for the emergency access roadway and cites Section 6-10-11 in their request, which as noted above only applies to Private Streets and Roadways. This section does not concern emergency access and is only applicable to building a portion of a roadway which does not provide a benefit to a proposed Conservation Development. That is not the case for this application. The proposed emergency access needs to be in place to provide emergency responders a second access in the event, the subdivision road is blocked. The applicant claims in their waiver request that "the elimination of a fifty (50) foot roadway in close proximity is consistent with the Plan of Conservation and Development." This statement is highly misleading. While the right of way for the emergency access is 50' in width, the width of the emergency access itself is only 12' wide and is also located on very mild slope which require a minimal amount of grading to construct. A waiver of the emergency access should not be granted as it has a negative impact on public safety of the future residents of the development.

Civil Engineering Review Comments:

1. **Stormwater management plan.** The Site Drainage Narrative revised to 3/6/18 by the applicant is not a comprehensive stormwater management report which the East Lyme regulations require. There are many incorrect and unsupported statements in the report that render the stated conclusions to be invalid. These issues are stated below in bullet points "a" to "e". A comprehensive stormwater management plan must contain the following information and analyses and the deficiencies in the report are highlighted in bullet points "f" to "g" below.
    a. The Drainage Narrative states that post-development runoff volumes will be reduced for the three analyzed watershed areas. This statement is completely unsupported. No infiltration tests were performed in the field in the proposed stormwater basins.
    b. The pond analyses use an infiltration rate of 3.3"/hr. (source of which is unknown and therefore unverifiable).
    c. The applicant has calculated the Water Quality Volume (WQV) for pre-development and post-development conditions and then has only provided the

difference between the two results. This is not correct, the WQV is only calculated for post-development conditions per the CT DEP 2004 Storm Water Quality Manual is the volume of runoff which must be "captured and treated" by the application of stormwater treatment practice to reduce non-point source pollutant loads. As the applicant is only providing about 50% of the required WQV, it does conform to the DEP 2004 Storm Water Quality Manual.

d. Accurate and proper delineation of pre-development and post-development watershed boundaries for the entire site. The design points are located where runoff leaves the subject property in one of more places.
e. Accurate and proper delineation of the longest hydrologic flow path to determine the Time of Concentration,
f. Accurate determination of the Runoff Curve Number (RCN) for pre- and post-development conditions, soil types shall be based upon soil test results performed in the field and land cover condition shall be based upon recent field inspections of the area during the growing season.
g. The determination of the peak rate and peak volume of runoff for pre-development and post-development conditions for the required design storm frequencies as specified by the municipal regulations.
h. For post-development conditions, delineations of sub-watershed areas on the subject property where runoff is being directed to a given Stormwater Best Management Practice.
i. Same analysis for each sub-watershed area as was previously stated in "a" through "d" above.
j. All stormwater management practices are not designed in compliance with CT DEP 2004 Storm Water Quality Manual or current published standards for Low Impact Development systems.
k. The proposed water quality basin located on the former lot #24 is NOT in compliance with the requirements for a Micropool Extended Detention Pond found in the DEEP Manual.
    i. The forebay is not in compliance as it is not 4-6' in depth, does not have a minimum 2:1 length to width ratio (inlet to outlet). Proposed contours are not labeled on the plan so the stated volume of 1,065 cubic feet cannot be verified.
    ii. It cannot be verified that the permanent pool within the pond will contain a minimum of 20% of the required water quality volume (WQV) and that the extended detention component will contain 80% of the WQV.
    iii. The pond does not provide a 3:1 length to width ratio per the Manual.
    iv. It cannot be verified that the minimum pond volume will be equal to the required WQV.
    v. It does not appear based upon the proposed contours that the bottom of the pond will be below the seasonal high groundwater table to maintain the permanent pool. According to the grading, the bottom of the pond will be set at existing grade.
    vi. The pond as proposed will not have a baseflow as the bottom of the pond is not located below the seasonal high groundwater table.

vii. The micropool (or wet pool) does not meet the requirements of the Manual. It is only 2' in depth, not the 4-6' depth specified in the Manual. The micropool also does not meet the minimum length to width ratio of 3:1 (along the flow path).

l. As proposed, this pond will not reduce the loads of non-point source pollutants (Total Suspended Solids, Total Phosphorous, Total Nitrogen, Metals and Hydrocarbons) prior to the discharge to the downgradient wetlands. To reduce the pollutant loads, all stormwater treatment practices must be designed in accordance with the Manual. If the practices are not designed in accord with the requirements of the Manual, then pollutant loads are not adequately reduced, resulting in the discharge of pollutants to the receiving wetlands on this site.

m. The use of a pre-formed scour hole is not appropriate at the end of the outlet pipe as it does not spread the flow out onto the upland surface. The outlet protection must be designed in accordance with the CT DEEP 2002 Guidelines for Soil Erosion and Sediment Control as the flow are directed onto an upland soil surface. As proposed the discharge from the pond will erode a channel to the downgradient wetland, resulting in the discharge of sediment and pollutants to the wetlands.

n. The proposed water quality basin located on the former lot #10 is NOT in compliance with the requirements for a Micropool Extended Detention Pond found in the DEEP Manual.

i. The forebay is not in compliance as it is not 4-6' in depth, does not have a minimum 2:1 length to width ratio (inlet to outlet). Proposed contours are not labeled on the plan so the stated volume of 2,161 cubic feet cannot be verified.

ii. It cannot be verified that the permanent pool within the pond will contain a minimum of 20% of the required water quality volume (WQV) and that the extended detention component will contain 80% of the WQV.

iii. The pond does not provide a 3:1 length to width ratio per the Manual.

iv. It cannot be verified that the minimum pond volume will be equal to the required WQV.

v. It does not appear based upon the proposed contours that the bottom of the pond will be below the seasonal high groundwater table to maintain the permanent pool. According to the grading, the bottom of the pond will be set at existing grade.

vi. The pond as proposed will not have a baseflow as the bottom of the pond is not located below the seasonal high groundwater table.

vii. The micropool (or wet pool) does not meet the requirements of the Manual. It is only 2' in depth, not the 4-6' depth specified in the Manual. The micropool also does not meet the minimum length to width ratio of 3:1 (along the flow path).

viii. As designed the flow entering the pond will not spread out across the entire bottom of the pond, but will "short circuit" the pond, thus making the pond ineffective at the reduction of pollutant loads.

o. As proposed, this pond will not reduce the loads of non-point source pollutants (Total Suspended Solids, Total Phosphorous, Total Nitrogen, Metals and

Hydrocarbons) prior to the discharge to the downgradient wetlands. To reduce the pollutant loads, all stormwater treatment practices must be designed in accordance with the Manual. If the practices are not designed in accord with the requirements of the Manual, then pollutant loads are not adequately reduced, resulting in the discharge of pollutants to the receiving wetlands on this site.

p. The use of a pre-formed scour hole is not appropriate at the end of the outlet pipe as it does not spread the flow out onto the upland surface. The outlet protection must be designed in accordance with the CT DEEP 2002 Guidelines for Soil Erosion and Sediment Control as the flow are directed onto an upland soil surface. As proposed the discharge from the pond will erode a channel to the downgradient wetland, resulting in the discharge of sediment and pollutants to the wetlands.

q. The applicant proposes rain gardens for the roof drains on the proposed lots. There is only a generic detail on the plan set which does not provide any information to evaluate whether the rain gardens will function or not.

r. There are no soil specifications for the rain gardens.

s. There is no construction or maintenance protocols provided for the rain gardens.

t. There are no appropriate infiltration test results for the design of the rain gardens provided. Without appropriate infiltration tests, it cannot be verified that the rain gardens will function at all and as they are an integral part of the stormwater management design for this project.

u. Complete hydrologic modeling of all stormwater practices to demonstrate that they will function as intended to filter runoff (reduce pollutant loads), infiltrate runoff and/or reduce peak rates of runoff.

v. Summary tables of data showing reductions of runoff volume as required by the Town of East Lyme regulations as well as reductions in the peak rate of runoff.

w. A pollutant renovation analysis demonstrating how the stormwater practices will reduce the pollutant loads associated with non-point source runoff.

2. **Erosion and Sedimentation Control Plan.** A proper erosion control plan must contain the following information:

   a. All limits of proposed construction activity on the entire site,
   b. Limits of clearing,
   c. Location of appropriate erosion control measures for all earth disturbing activities,
   d. A construction narrative which follows the form and content provided in the CT DEP 2002 Guidelines for Soil Erosion and Sediment Control.
   e. A detailed Construction Phasing plan for the project.
   f. Design computations and necessary construction information for temporary sediment traps or basins which are proposed.
   g. Detailed inspection and maintenance requirements for all erosion control measures.

3. **Suitability of site to support on-site sewage disposal systems.**

   a. The letter from the Ledge Light Health District discusses that the soils are suitable (thus only meeting the minimum criteria under the Technical Standards of the

Public Health Code) for installation of on-site sewage disposal systems. However, it does NOT discuss compliance with the requirements found in Table 1 of the Technical Standards. This is a critical oversight renders the statement of suitability to be in error as discussed below.

b. As currently proposed the location of the rain gardens in proximity to the proposed primary and reserve sewage disposal systems are NOT compliance with the Current Technical Standards developed by the CT Public Health Department, on-site sewage disposal division.

c. Rain gardens are shown within 50' of proposed primary and/or reserve sewage disposal systems. This is not in violation of Table 1.H of the Technical Standards of the Connecticut Public Health Code which requires a separation of 50' from a leaching system to a rain garden or similar infiltration system. This 50' setback may be reduced under certain conditions: ***"Distance shall be reduced to 25'to a leaching system if the MLSS is not applicable or the storm water system is not up-gradient or down-gradient. Distances may further be reduced to 10'for minor infiltration systems (e.g. rain gardens) with the approval of the local director of health if demonstrated that the leaching system shall not be adversely impacted."*** Specifically, the following information shows the distance between the proposed rain garden to the proposed sewage disposal system. (the relationship of the rain garden to the sewage disposal system is in ( ).

i. Lot #1 – 15' (uphill)
ii. Lot #2 – 25' (uphill)
iii. Lot #3 – 25' (uphill)
iv. Lot #4 – 25' (uphill)
v. Lot #5 – 25' (uphill)
vi. Lot #6 – 32' (uphill)
vii. Lot #7 – 25' (uphill)
viii. Lot #8 – 25' (uphill)
ix. Lot #9 – 50' (uphill)
x. Lot #11 – 25' (uphill)
xi. Lot #12 – not applicable
xii. Lot #13 – 30' (lateral)
xiii. Lot #14 – 25' (lateral)
xiv. Lot #15 – 25' (uphill)
xv. Lot #16 – 16' (uphill)
xvi. Lot #17 – 25' (uphill)
xvii. Lot #18 – 14' (uphill)
xviii. Lot #19 – 42' (uphill)
xix. Lot #20 – 60' (uphill)
xx. Lot #21 – 25' (uphill)
xxi. Lot #22 – 13' (uphill)
xxii. Lot #23 – 10' (uphill)
xxiii. Lot #25 – 50' (lateral)

d. As you can see in the information above is that almost all the proposed rain gardens are located uphill and less than fifty feet away from the proposed sewage

disposal systems which is a clear violation of the requirements found in Table 1.H of the Technical Standards. These separation requirements cannot be waived by the local health department. There are two issues with the location of rain gardens located uphill or downhill of a sewage disposal system. First, Rain gardens, which are infiltration systems and located uphill of a sewage disposal system will increase the groundwater table under the sewage disposal system by the infiltration of rainfall from the building roof. The increased infiltration will affect the functionality of the sewage disposal system to disperse and treat effluent.

e. If the rain garden is located downgradient of the sewage disposal system, and there is less than 50' of separation, partially treated effluent from the sewage disposal system may be discharged into the rain garden. Additionally, the Technical Standards cited above do not permit excavation into the existing grade within 50' downhill of the sewage disposal system. Rain gardens are shallow excavations in to the ground, so they cannot be located less than 50' downhill of the sewage disposal systems.

Please feel free to contact my office if you have any questions concerning the information found in this report. My CV is attached for the record.

Respectfully Submitted,
Trinkaus Engineering, LLC

Steven D. Trinkaus, PE

Exhibit 2

Steven D. Trinkaus, PE
Trinkaus Engineering, LLC
114 Hunters Ridge Road Southbury, Connecticut 06488
Phone/fax: +1-203-264-4558
Website: http://www.trinkausengineering.com
Email: strinkaus@earthlink.net

Qualifications	B.S. / Forest Management/1980 University of New Hampshire
Licenses/Certifications	Licensed Professional Engineer- Connecticut (1988) Licensed Professional Engineer – Maryland (2017)
Professional Societies	American Society of Civil Engineers National Society of Professional Engineers Connecticut Society of Professional Engineers Soil and Water Conservation Society of America International Erosion Control Association American Society of Agricultural and Biological Engineers
Professional Awards	Steve was named an Industry Icon by Storm Water Solutions in July 2015 http://editiondigital.net/publication/?i=263831&p=16 for his work in the Low Impact Development field.

International Experience

South Korea – June 2018, July 2017, June 2016, April 2015, October 2014, April 2014, October 2013 and June 2013

- Steve was invited by Dr. Jongsoo Choi of Land and Housing Institute in Daejeon, South Korea to review and provide input to a report written by Dr. Choi for the implementation of LID in the Sejong New city currently under development in South Korea. Sejong New city is compromised of 28 square miles and will preserve over 50% of the land as open space. The LID report will serve as a template in South Korea for the development of other cities.
- Steve was invited by Dr. Leeyoung Kim of Kongju University to make a presentation at the Seoul International Symposium for water cycle held on July 27, 2017 at Seoul City Hall. Steve's presentation was entitled "Sustainable Urban Water Cycle Management, Low Impact Development Strategies for Urban Retrofits". Steve also made a presentation to Master and PhD Engineering students at Kongju University on designing LID treatment systems. He also visit the research office of Land & Housing Institute in Daejeon to inspect recent LID retrofits consisting of Bioretention systems, Bioswales and Permeable Paver systems.
- Steve was invited by Dr. Shin to visit the Korean GI/LID research center in July of 2017. The purpose of the visit was to inspect the LID research systems which had been in place

for a year to observe how well they were functioning and also to observe the current research on infiltration of LID systems and evaportranspiration of green roof systems.

- Steve was an invited attendee to the official opening of the Korean GI & LID Research Center recently constructed at the Yangsam Campus of Pusan National University. Steve was a consultant on the design of the research center for Dr. Hyunsuk Shin of Pusan National University.
- Steve was an invited presenter at the World Water Forum by Dr. Hyunsuk Shin of Pusan National University. He presented case studies of GI/LID applications in the United States.
- Steve was invited by Dr. Yong Deok Cho of Kwater to participate in the Water Business Forum at the World Water Forum. Steve presented an overview of his business and expertise in Low Impact Development.
- Steve was invited by Dr. Hong-Ro Lee of Kunsan National University and made a presentation entitled "Understanding Low Impact Development in the Urban-Rural Interface" for the **Ariul Brainstorming Working Group** on April 16, 2015 in Gunsan, South Korea. He also toured portions of the proposed land reclamation area to assess how Low Impact Development strategies could be incorporated to address water quality issues from the proposed agricultural, residential, commercial and industrial land uses for this area.
- Steve was a Contributing Author as well as an Advisory Reviewer for a report prepared by Land & Housing Institute (LHI) entitled " Pyeongtaek Godeok New City Low Impact Development techniques (LID), A study on the introduction of measures (I) " dated: January 2015. This report by LHI also cited the Town of Tolland LID Design Manual as a foreign LID Manual to be used as a reference document.
- Steve was an invited presenter at the International Water Forum 2014 held in conjunction with the Nakong River International Water Week in Gyeongju, South Korea sponsored by DaeGyeong Water Foundation & the International Hydrologic Environmental Society. His presentation focused on urban stormwater and the benefits of LID in these areas.
- Steve was an invited presenter at the IWA Water Reuse & Energy Conference 2014 held in Daegu, South Korea. His presentation was on the regulatory barriers to implementation of LID and how to overcome these barriers. He also participated in a panel discussion with other presenters.
- He also made a presentation at The 1st GI & LID Technical Education Workshop held at Pusan National University on October 22nd on an overview of LID and the application of LID concepts. He was invited by Dr. Kyung Hak Hyun of Land & Housing Institute (LHI) to make two presentations of LID case studies at Sangyung University and at a seminar hosted at LHI along with Kwater.
- Steve met with Jong-Pyo Park, Director and Kyoung-Do Lee, CEO of HECOREA, a water resource consulting firm to discuss LID in dense urban areas. Steve signed a MOU with HECOREA to provide consulting services on LID monitoring approaches and maintenance protocols for the Go-Deok International Planning District near Pyeongtaek, South Korea.
- Steve was invited by Dr. Kyung Hak Hyun of Land & Housing Institute to present at the 2nd Low Impact Development Forum in Daejeon, South Korea on October 31, 2013. He also inspected the site of Asan-tangjeong which is an expansion of residential housing for the city of Asan. This expansion will incorporate LID stormwater strategies.

- Steve was invited to make a presentation of the implementation of LID on commercial sites by Dr. Reeho Kim of the Korea Institute of Construction Technology in Seoul.
- Steve met with Dr. Sangjin Lee of Korean Water and Dr. Woo Young Heo, CEO of LID Solution Co, Ltd to review the initial concept plans for the Eco-Delta City project. Eco-Delta City is a new city located near the Gimhae International Airport of 13 square kilometers and will incorporate LID concepts throughout the new city.
- Steve signed a MOU with Dr. Shin of Pusan National University to provide consulting services for the Smart GI/LID Research Facility at Pusan National University. Steve was asked by Dr. Shin to review the design plans for the GI/LID research facility to be constructed at Pusan National University with a focus on the exterior LID research facilities. He provided a written comprehensive review for consideration by PNU.
- Steve was invited by Dr. Hyunsuk Shin of Pusan National University in South Korea to present a workshop on Low Impact Development on June 24, 2013. The presentation was made to research professors, graduate engineering students and practicing engineers at K-water headquarters in Daejeon, South Korea. He also met with representatives of other agencies tasked with the development of a new city, called Eco-Delta City which will implement LID practices from the ground up and comprises approximately 3,500 acres.

Beijing/Zhenjiang, China – August 2017
Steve was invited to make a presentation entitled "Urban LID in China and South Korea" at the 2017 Second China Sponge City International Exchange Conference held in Beijing on August 16-1, 2017. He also made a presentation for Dr. Nian She, Director of Smart Sponge City Planning and Construction Research Institute in Zhenjiang, China on modeling approaches for LID treatment systems as well as inspecting some recent LID retrofits currently under construction in Zhenjiang.
Steve also made a presentation at Reschand entitled "LID Case Studies from US" at the request of Yuming Su of Reschand.

Nanjing, China – September 2016
Steve was invited to present at the 2016 First China Sponge City International Exchange Conference held in Nanjing, China. The presentation focused on several case studies of LID systems in the US.

Zhenjiang, China – June 2015
Was retained by Dr. Nian She to design Urban LID retrofits for a 2.5 hectare (6.5 acres) dense residential area in the city of Zhenjiang. The LID retrofits had to fully treat runoff from the existing impervious areas (building roofs, driveways and parking areas) for 65 mm (2.6") of rainfall in 24 hours. The LID systems also had to attenuate the peak rate of runoff for a rainfall event of 150 mm (5.9") rainfall event. A combination of Bioretention systems, and permeable pavers with a filter course and reservoir layer were used to meet these stormwater requirements.

Zhenjiang, China – May 2015
Steve was invited by Professor Nian She of Shenzhen University to make a presentation entitled "Using LID to Attenuate Large Rainfall Events and Reduce Flood Potential" at the 2015 First Sino US Sponge City LID Technology Practice Conference held on May 4-5, 2015 in Zhenjiang,

China organized by Zhenjiang Water Supply and Drainage Management Office. (http://www.c-water.com.cn/2015lid/en/index_e.html). In addition to the presentation, field inspections were made of several new LID installations in the city consisting of Bioswales, permeable pavement systems and rainwater harvesting.

Guangzhou, China – December 2012

- Steve was an invited attendee at the 15th Annual Guangzhou Convention of Chinese Scholars in Science and Technology in Guangzhou, China on December 17 – 21, 2012 to present a project narrative on how Low Impact Development and sustainable development can be applied to address water quality issues in urban and rural areas of China to implement sustainability concepts and conservation of resources. He attended with Dr. Jim Su, PE of Golder Associates of Mt. Laurel, New Jersey. While at the convention he met with representatives from Sichuan University, Chang'an University, Guangdong University of Technology, Shenzhen University and the South China Institute of Environmental Sciences, MEP to discuss LID being incorporated into their engineering programs.
- Steve also met Dr. Hongbin Cheng of New China Times Technology which is located in Stellenbosch, South Africa. Steve has signed a three year partnership agreement with New China Times Technology to introduce LID concepts to the west cape area of South Africa.

Taiwan – December 2011

- Steve was invited by Hung Kwai Chen, Director of the Water Resources Planning Institute, Water Resource Agency, Ministry of Economic Affairs of Taiwan and Dr. Yong Lai of the US Bureau of Reclamation to present a 12-hour presentation on Low Impact Development on December 8th and 9th, 2011 in Taichung, Taiwan. The presentation focused on applying LID strategies in both urban and rural environments to address runoff volumes and water quality issues.
- Steve is an invited consultant to a project team headed up by Xiaoyan Zhou, PhD of the Institute for Taiwan Water Environment Research (TIIWE) along with The National Taiwan Ocean University, Hohai Engineering Professor Liao Chaoxuan, Ting Engineering Consultants Co., Ltd and University of Colorado professor Guo Chunyuan to develop a LID demonstration project in New Taipei City along with LID policy strategies to further the use of LID in New Taipei City, Taiwan.

Low Impact Development

- Review of existing municipal land use regulations to identify barriers to the implementation of Low Impact Development
- Preparation of regulatory language changes to facilitate the adoption of Low Impact Development
- Preparation of design manuals for the implementation of Low Impact Development strategies and processes with an approach that simplifies the design process
- Application of environmental site design strategies to focus development concepts on land most suitable for development while enhancing the protection of environmentally sensitive areas

- Design of Low Impact Development treatment systems, such as Bioretention areas, wet/dry swales, vegetated level spreaders, vegetated filter strips, subsurface gravel wetlands, constructed wetlands and/or pond systems, infiltration basins & trenches

- Hydrologic analyses of current and post-development conditions to assess impacts of proposed development on storm water flows

- Design of storm water control systems including detention and water quality basins and appropriate planting plans

- Perform hydrologic modeling of stormwater management systems to demonstrate compliance with regulatory benchmarks

- Prepare Pollutant loadings analyses to evaluate the effectiveness of stormwater treatment designs in reducing pollutant loads

Wastewater Management:

- Soil testing to determine suitability of land to support on-site sewage disposal systems for residential and commercial projects and assistance with identifying optimal location for both small and large scale system

- Perform necessary calculations to model and design large scale subsurface sewage disposal systems under CT DEEP criteria and State Department of Public Health

- Design of on-site sewage disposal systems in accordance with state and local health codes

- Perform construction oversight of both small and large scale subsurface sewage disposal systems and provide certifications of compliance

Site Engineering:

- Development feasibility studies

- Layout concepts to maximize development, while preserving environmentally sensitive areas

- Design of horizontal and vertical road geometry

- Preparation of grading, drainage and erosion and sedimentation control plans

- Use AutoCAD Land Development, Civil3D, HydroCAD and Pondpack software packages

- Layout and design of sanitary sewers

- Bid estimates

- Construction oversight

- Third party technical reviews
- Expert testimony

Professional Committees

- Chairman and primary author of EWRI/ASCE LID Model Ordinance Task Committee (goal is to create a National LID Guidance document to further the adoption of LID)
- Chairman of EWRI/ASCE LID Task Committee on Filter Strips and Bioswales (goal is to review & evaluate literature and design specifications for filter strips and Bioswales and create uniform design standards for different geographical regions)
- Member of EWRI/ASCE LID National Guidelines Task Committee
- Connecticut Representative to the Board of Directors of the Northeast Chapter of the International Erosion Control Association

Published Articles

- **"Large-scale LID Design for urban expansion in South Korea"** with co-author, Dr. Kyung Hak Hyun of South Korean Land and Housing Institute – Volume 3/Issue 4, August/September 2015 – Worldwater Stormwater Management by the Water Environmental Federation.
- **"Research team leads LID deployment in South Korea"** – Volume 2/Issue 1, Spring 2014 – Worldwater Stormwater Management by the Water Environmental Federation.
- **"Low Impact Development, Sustainable Stormwater Management"** – English article converted to Chinese and published in the Chinese Edition of Global Water Magazine, July 2013.
- **"A Case Study: Southbury Medical Facility and Low Impact Development"** - January/February 2014 issue of Land and Water.
- **"A True Pioneer of Low Impact Development – Member Spotlight"** – January/February 2014 Issue of Erosion Control – Official Journal of the International Erosion Control Association.
- **"Low Impact Development: Changing the Paradigm"** published in the March 2012 edition of PE, The Magazine for Professional Engineers by the National Society of Professional Engineers. Article was also republished in the Spring 2012 addition of EWRI Currents (with permission of NSPE).
- **"Stormwater Retrofit of Existing Detention Basins"** published in the March/April 2012 Land and Water, The Magazine of Natural Resource Management and Restoration with co-author Sean Hayden of the Northwest Conservation District.
- **"Out in the Open; Creating a Stormwater Park in the Heart of a Community"** published in the April 2013 issue of WaterWorld by Pennwell Corporation.
- **"Creating a Stormwater Park in the City Meadow of Norfolk, Connecticut"** published in the July/August 2013 edition of Land and Water

Volunteer Organizations

- President (elected 11/2013) and Connecticut Representative to the Board of Directors for the Northeast Chapter of IECA, (Chairman of 2012 Annual Conference to be held in Fishkill, NY)
- Chairman, Water Pollution Control Authority for the Town of Southbury
- Alternate member of Inland Wetlands Commission Town of Southbury (served three years)
- Northwest Conservation District Board of Directors (served 18 months)

Software Development

Developed a proprietary software application called Assessment of Pollutant Loads and Evaluation of Treatment Systems (**A.P.L.E.T.S.**). This application calculates the pollutant loads for current and future land use conditions for the seven most common pollutants in non-point source runoff (TSS, TP, TN, Zn, Cu, TPH, & DIN) for a total of twenty two different types of land uses. The application then allows the evaluation of the effectiveness of thirty four Conventional and Low Impact Development treatment systems in removing these pollutants. Up to four treatment systems can be used in a row as a treatment train to achieve water quality goals.

Future Presentations

- Steve will be making two presentations at UKC2018 entitled "A Study on Introduction Plan of Low Impact Development Techniques for widespread Application in South Korea" and "The Korean GI/LID Research Center – Pusan National University" sponsored by the Korean American Scientists and Engineers Association on August 2 – 4, 2018 in New York, NY.

- Steve will be making a presentation entitled "If LID is so easy to implement, how come we keep getting in wrong" at the **2018 International Low Impact Development** conference being held in Nashville, TN on August 12 – 15, 2018. The conference is sponsored by ASCE and EWRI. (https://www.lidconference.org/)

- Steve along with Jim Su, PhD, PE, D.WRE; Ruth Ayn Hocker, PE, D.WRE; and Jianpeng Zhou, PhD, PE, BCEE, F.EWRI were chosen by EWRI to present training in Low Impact Development in two-day workshops to be held in Beijing, Shanghai and Shenzhen, China in November of 2018.

Invited Speaker Presentations:

- Steve made two presentations at the **2018 TRIECA Conference** held on March 21 & 22, 2018 at the Pearson Convention Center in Brampton, Ontario. The presentations are entitled "Addressing Stormwater in China with Low Impact Development" and "Implement Low Impact Development in South Korea." This conference is sponsored by the Toronto and Region Conservation Authority and the Canadian Chapter of the International Erosion Control Association.

- Steve made the following presentations at **St. Andrews University in Scotland** on October 19th for the Sustainable Development program. The first presentation is entitled "Improving the environment with Low Impact Sustainable Development Strategies". The second presentation is entitled "Addressing Water Quality and Runoff Issues in a changing weather world".

- Steve was invited by Dr. Jae Ryu of the University of Idaho Water Center to make a presentation entitled "Designing Low Impact Development treatment systems for **Urban & Agricultural Environments" at the Annual US-Korea Conference on Science, Technology, and Entrepreneurship** being held in Atlanta, Georgia on July 29 to August 1, 2015. (http://www.ukc.ksea.org/UKC2015/)

- Steve was invited by the Lake George Waterkeeper to make a presentation entitled "Applying LID Concepts in the Real World" at the 5th Annual Low Impact Development Conference being held in Lake George, NY on May 7, 2015. (http://fundforlakegeorge.org/2015LID)

- Steve was invited by Dr. Hyunsuk Shin and made a presentation entitled "Real Adaptation and Implementation of GI and LID Technology in USA" at the **World Water Forum** (http://eng.worldwaterforum7.org/main/) being held in Daegu, South Korea on April 14, 2015.

- Steve prepared a presentation for a workshop to civil and environmental engineering students at **Pusan National University** (http://www.pusan.ac.kr/uPNU_homepage/kr/default.asp) in Busan, South Korea on April 17, 2015 entitled "Designing LID System, What do you need to know and why".

- Steve was invited by Dr. Hong-Ro Lee of Kunsan National University and made a presentation entitled "Understanding Low Impact Development in the Urban-Rural Interface" for the **Ariul Brainstorming Working Group** on April 16, 2015 in Gunsan, South Korea. It will focus on how Low Impact Development concepts can be applied to made land areas filled in off the west coast of South Korea to address water quality issues.

- Steve was an invited speaker at the **2014 Low Impact Development Conference** sponsored by the Lake George Waterkeeper and the Fund for Lake George in Lake George, NY on May 1, 2014 for land use professionals and regulatory agencies. He will be presenting case studies focusing on the application of LID concepts for commercial and residential projects.

- Steve was invited by Justin Kenney, Green Infrastructure Coordinator of the Vermont Department of Environmental Conservation Watershed Management Division to present an eight hour workshop entitled "From Bioretention to Permeable Pavement: An In-depth Introduction to Low Impact Development and Green Stormwater Infrastructure" in Montpelier, Vermont on December 5, 2013. The presentation was hosted by the **Vermont Green Infrastructure Initiative** with support from the following Vermont Agencies and Divisions; **Building and General Services, Ecosystem Restoration Program and Agency of Transportation.**

- Steve was invited to attend and present on the Application of LID Concepts for the Urban Environment and LID Case Studies at the 2nd Low Impact Development, Stormwater Management Forum hosted by the **Land & Housing Institute, Korean Land & Housing Corporation** to be held in South Korea in on October 31, 2013. He also made presentations at the **Korean Institute of Construction Technology** and **Pusan National University** on various aspects of LID during this time.

- Steve was an invited speaker at the **2013 Low Impact Development Conference** sponsored by the Lake George Waterkeeper and the The Fund for Lake George in Lake George, NY on May 2, 2013 for land use professionals and regulatory agencies. Over 80 design professionals and regulatory people were in attendance. He made a presentation entitled "Barriers to the implementation of LID".

- Steve was an invited presenter at a closed-meeting of the **National Association of Home Builders (NAHB) and the Water Environment Federation (WEF)** on October 10, 2012 focusing on progressive stormwater management. The presentation focused on the application of LID strategies on actual development projects and discussed the hydrologic performance and cost effectiveness of LID design.

- Steve was the invited presenter for a 1-hour long webinar presented by **Stormwater Solutions and Stormwater USA** on Low Impact Development and the Basics of Bioretention held on September 18, 2012. Over 760 individuals watched the webinar.

- Steve was an invited speaker at and **EPA/WEF Stormwater Technical Meeting** on July 18, 2012 in Baltimore, MD to discuss the application of Low Impact Development strategies for actual projects with a focus on cost effectiveness when compared to conventional stormwater management as well as field performance of the LID designs. The purpose of this meeting was to assist EPA in the development of a National Stormwater Rule.

- Site Design using Low Impact Development Strategies and What are the impacts of Impervious Cover on Water Quality and Quantity were presented at a workshop entitled "Challenges and Solutions using Low Impact Development", sponsored by the **Lake George Waterkeeper** in Lake George, NY on May 5, 2011 for land use professionals and regulatory agencies. 90 design professionals and regulators in attendance.

- Steve was an invited speaker at the **2012 Low Impact Development Seminar** sponsored by the Lake George Waterkeeper in Lake George, NY on April 25, 2012 for land use professionals and regulatory agencies. 100 design professionals and regulatory people were in attendance. He made a presentation entitled "The Hydrologic Benefits of Vegetation in Site Design".

Conference Presentations:

- Steve made the following presentations at the **2018 IECA Annual Conference** being held in Long Beach, CA in February of 2018. The presentations are entitled "How Low Impact Development strategies can mitigate high intensity rainfall events" and Designing Low Impact Sustainable Development treatment systems for Agricultural Environments".

- Steve was invited by the Dylan Drudul, President of the Mid-Atlantic Chapter of IECA to present the keynote address at a one day event called "Sediment Control Innovations Roadshow on July 14th in Columbia, Maryland. The keynote is entitled **"A Worldwide Perspective on Municipal Stormwater Issues".**

- Steve made a presentation entitled **"Designing LID Systems: What do you need to know and why"** at the 27th Annual Nonpoint Source Pollution Conference being held in Hartford, CT on April 20-21, 2016 as sponsored by the New England Interstate Water Pollution Control Commission.

- Steve will be presenting four one-hour long webinars through Halfmoon Seminars on Low Impact Development. The first entitled **"Introduction to Low Impact Development"** will be on May 10, 2016 at 12 pm. The second entitled **"Bioretention System Design"** will be offered on May 10, 2016 at 1:30 pm. The third entitled **"Applying LID Concepts to Residential Development"** will be offered on May 12, 2016 at 12 pm. The fourth entitled **"LID Case Studies"** will be offered on May 12, 2016 at 1:30 pm.

- Steve will be making a presentation entitled **"Designing LID Systems: What do you need to know and why"** at the UKC2016 conference, sponsored by KSEA (Korean-American Scientists and Engineers Association) at the Hyatt Regency DFW in Dallas, Texas, August 10 – 13, 2016.

- Steve made five presentations at the **2016 Environmental Connection** conference by IECA (www.ieca.org) being held in San Antonio, Texas on February 16 – 19,,2016. The presentations were entitled "Designing LID Systems: What do you need to know and why", "Construction Site Stormwater: The Ignored Problem", "Solving Construction Stormwater Problems in the Field", "Developing Effective LID Municipal Regulations", and "LID Demonstration Projects in Connecticut, a study of Contrasts".

- Steve made two presentations at the **EPA Region Stormwater Conference 2015** (http://epa.gov/region6/water/npdes/sw/ms4/2015conference/index.html) being held in Hot Springs, AR on October 18-23, 2015. The presentations are entitled "Designing LID systems: What do you need to know and why" and "Designing LID treatment systems for Urban and Agricultural Environments."

- Steve made a presentation entitled "Applying LID strategies to residential and commercial developments to address water quality and runoff volumes" at the KSEA Northwest Regional Conference 2015 held at the Idaho Water Center in Boise, Idaho on October 11, 2015.

- Steve made a presentation entitled "Solving Construction Stormwater Problems in the Field" at **WEFTEC 2015** (http://www.weftec.org) in Chicago, IL on September 29, 2015.

- Steve made three presentations entitled: "Korean GI/LID Research Facility", Applying LID concepts to High Density Residential Developments, and Municipal LID Regulations" at the 2015 Environmental Connection IECA Annual Conference being held in Portland, Oregon on February 16 – 18, 2015. He also presented a half day workshop entitled: "Designing LID Projects". He moderated an Expert Panel on Low Impact Development with Seth Brown, (Water Environment Federation), Bob Adair (Construction Ecoservices, Inc.) and Roger Sutherland (AMEC)

- Steve made two presentations at International Low Impact Development Conference 2015 in Houston, Texas which is sponsored by ASCE-EWRI. The presentations are entitled "Korean GI/LID Research Facility", and "LID Demonstration Projects in Connecticut: The Good and the Bad".

- Steve made presentations entitled "Overview of Low Impact Development" and "The Application of Low Impact Development Strategies for Land Development Projects" along with Dr. Jae Ryu of the University of Idaho and Dr. Hyun-Suk Shin of Pusan National University at the annual meeting of the **American Water Works Association** in Tyson Corners, VA on November 6, 2014.

- Steve made two presentations entitled "Construction Site Stormwater: The Ignored Problem" and "Applying LID Concepts to High Density Residential Development" at the **2014 Annual Conference and Trade Show of the Northeast Chapter of IECA** held at Lake Morey, Vermont on November 4 – 5, 2014.

- Steve made the following presentations entitled: "A Case Study – Southbury Medical Facility and Applying LID concepts on undeveloped land and in the urban environment" at Municipal Wet Weather Stormwater Conference, hosted by the **Southeast Chapter of IECA** in Charlotte, NC on August 18th and 19th, 2014.

- Steve made the following presentations: "The Incorporation of LID on Affordable Housing Projects, A Case Study – Southbury Medical Facility and LID' and Municipal LID Regulations" at the **16th Annual EPA Region 6 Stormwater Conference** sponsored by the South Central Chapter of IECA in Fort Worth, TX on July 27th through August 1st, 2014.

- Steve made oral presentations at the **2014 Environmental Connection** sponsored by the International Erosion Control Association in Nashville, Tennessee on February 25 – 18, 2014. The presentations were entitled "A Case Study – Southbury Medical Facility and LID", "The Implementation of the Highland Estates Detention Basin Retrofit water quality impairment in Northfield Lake", and "Creating Effective Municipal LID Regulations".

- Steve co-presented an all day workshop on Low Impact Development with Jamie Houle of the University of New Hampshire Stormwater Center at the **2013 International Erosion Control Association Northeast Chapter Conference and Trade Exposition** on November 19 – 21, 2013 in Warwick, RI.

- Steve made three oral presentations at the **2013 International Low Impact Development Symposium** held at the Saint Paul RiverCentre in Saint Paul, Minnesota on August 18 – 21, 2013. The presentations were entitled "A Case Study – Southbury Medical Facility and LID", "LID regulations in Connecticut: The Long and Tortured Road", and "Creating a Stormwater Park in the City Meadow of Norfolk, Connecticut."

- Steve presented two papers at the **2013 EWRI World Environmental and Water Resources Congress** held in Cincinnati, Ohio on May 19- 23, 2013. The papers are entitled: "Municipal LID Regulations - What is important to include to be successful?" and "Creating a Stormwater Park in the City Meadow of Norfolk, Connecticut". http://content.asce.org/conferences/ewri2013/index.html

- Steve made a presentation at the **Soil and Water Conservation Society Winter Conference** held in Berlin, Connecticut on February 15, 2013. The presentation focused on erosion and sedimentation control issues with Low Impact Development treatment systems.

- Steve presented two papers at the **2013 Environmental Connection** held in San Diego, CA on February 10 – 13, 2013. The papers are entitled "LID Demonstration Project for Seaside Village in Bridgeport, Connecticut" and "Creating a Stormwater Park in the City Meadow of Norfolk, Connecticut". He also presented a full day LID workshop entitled "Next Generation Low Impact Development and Meet Today's Needs" and a half day workshop on Low Impact Development covering Environmental Site Design, Water Quality Issues, Pollutant Loading Analyses, Designing different types of LID treatment systems and actual case studies.

- Steve made three presentations at the **2012 Annual Conference of the Northeast Chapter of IECA** in Fishkill, NY on November 7, 8, & 9, 2012. The presentations are entitled: "LID Demonstration Projects in Connecticut, A Study of Contrasts, Environmental Site Design and LID Hydrologic Issues, and Siting and Designing LID Treatment Systems with Case Studies"

- Steve made two oral presentations entitled "Applying Environmental Site Design Strategies to Design a Residential Subdivision" and "The incorporation of LID on Affordable Housing Projects" at the **2012 Ohio Stormwater Conference** in Toledo, Ohio sponsored by the Ohio Stormwater Association on June 7th and 8th, 2012.

- Presented two papers at the **ASABE Watershed Technology Conference** in Bari, Italy, May 28 – 30, 2012. The papers were entitled "LID Demonstration Project for Seaside Village in Bridgeport, Connecticut" and "The creation of a Stormwater Park in the City Meadow of Norfolk, Connecticut".

- Steve made one oral presentation entitled "LID Demonstration Project for Seaside Village in Bridgeport, Connecticut" and presented one poster entitled "The Incorporation of LID on Affordable Housing Projects" at the **2012 World Environmental & Water Resources Congress** in Albuquerque, New Mexico sponsored by EWRI/ASCE on May 20 - 24, 2012.

- "Stormwater Retrofit of Highwood Estates Detention basins to address Water Quality Issues and How the application of Environmental Site Design Strategies can provide a resource for carbon sequestering" were presented at the **2011 International Erosion Control Associated Northeast**

Chapter Annual Conference on December 1 – 3, 2011 at the Crowne Plaza Hotel in Natick, Massachusetts.

- Stormwater Retrofit of Highwood Estates Detention Basins to enhance Water Quality Benefits; A Low Impact Development (LID) Model Ordinance and Guidance Document and The Farmington River Enhancement Grants: A tale of three towns and the path to Low Impact Development were presented at the **Philadelphia Low Impact Development Symposium "Greening the Urban Environment"** in Philadelphia, PA (September 2011) sponsored by EWRI, Villanova University, North Carolina University and the University of Maryland.

- Stormwater Retrofit of Highwood Estates Detention Basins to enhance Water Quality Benefits; The Farmington River Enhancement Grants: A tale of two towns and the path to Low Impact Development and A Low Impact Development (LID) Model Ordinance and Guidance Document was presented at the **EWRI/ASCE 2011 World Environmental & Water Resources Congress** in Palm Springs, CA (May 2011).

- Stormwater Retrofit of Highwood Estates Detention Basins to enhance Water Quality Benefits was presented at the "Annual Nonpoint Source Pollution Conference", sponsored by the **New England Interstate Pollution Control Commission** in Saratoga Springs, NY, on May 17-18, 2011.

- Stormwater Pollutant Load Modeling presented at the **Northeast Chapter of IECA Annual Conference** at the University of New Hampshire Stormwater Center in Durham, NH (December 2010).

- How the application of Environmental Site Design Strategies and Low Impact Development Storm Water Treatment Systems can mimic the Natural Hydrologic Conditions in a watershed and provide a resource for carbon sequestering and The Importance of Assessing Pollutant Loads from Land Development Project and the Design of Effective Storm Water Treatment Systems at the **EWRI/ASCE Watershed Management Conference** in Madison, WI (August 2010).

- The Tolland Low Impact Development Design Manual: The Changing Paradigm for Land Development, The application of Environmental Site Design Processes to design a residential subdivision and A Low Impact Development (LID) Model Ordinance and Guidance Document at the **ERWI/ASCE 2010 World Environmental and Water Resources Congress** in Providence, RI (May 2010).

- The application of Form-Based Zoning and Low Impact Development for the Revitalization of the Town Center of Simsbury, Connecticut and The Integration of Low Impact Development to enhance the application of Smart Code Zoning to create a Gateway District to the Historic Town Center of Tolland, Connecticut at the **EWRI/ASCE 2010 International Low Impact Development Conference** in San Francisco, CA (April 2010).

- The application of Environmental Site Design Processes to design a residential subdivision and Assessing Pollutant Loads and Evaluation of Treatment Systems to achieve Water Quality Goals for Land Development Projects at the **EWRI/ASCE 2009 World Environmental & Water Resources Congress** in Kansas City, Missouri (May 2009).

- Ahead of the Curve – Tolland, CT adopts Low Impact Development Regulations and Preparing a Pollutant Loading Analysis for Land Development Projects at the **Urban Water Management**

Conference in Overland Park, KS sponsored by National Association of Clean Water Agencies (NACWA) and the City of Independence Water Pollution Control Department (March 2009).

- Ahead of the Curve – Tolland, Connecticut adopts Low Impact Development Regulations and Trade Winds Farm – Winchester, Connecticut – How to create a LID subdivision along with the preparation of a poster on Preparing a Pollutant Loading Analysis for Land Development Projects at **EWRI/ASCE 2008 International Low Impact Development Conference** in Seattle, WA (November, 2008).

- Trade Winds Farm – Winchester, Connecticut – How to create a LID subdivision and Preparing a Pollutant Loading Analysis for Land Development Projects at the **IECA Northeast Chapter's Annual Conference & Trade Exposition** in Portland, ME (October, 2008).

- The Preparation of a Valid Pollutant Loading Analysis at the **National StormCon 2008 Conference** in Orlando, FL (August, 2008).

- Panelist with Linda Farmer, AICP for Profiles of Partnerships for Addressing NPS Pollution at **NEIWPCC Annual Non-point Source Pollution Conference** in Groton, CT (May, 2008).

Workshop Presentations:

- Steve presented a webinar entitled "Construction Stormwater Regulation Strategies: Best Practices to Assure NPDES Compliance" on Thursday, November 12, 2015 at 2:00 pm to 3:00 pm eastern time. The webinar is sponsored by Business and Legal Resources (www.blr.com).

- Steven presented a full day workshop entitled "Stormwater Management 2015" in Columbia, Maryland on August 13, 2015 which focused on applying the State of Maryland Stormwater Manual. The workshop was sponsored by Halfmoon Seminars, LLC and 113 people attended the workshop.

- Steve presented a full day workshop on "Stormwater Regulations in Connecticut", sponsored by Halfmoon Seminars, LLC in North Haven, Connecticut on June 25, 2014. More than 30 engineers and landscape architects attended the workshop.

- Steve was the facilitator in a live chat as part of the Stormwater Solutions Virtual Trade Show on April 2, 2014. The topic of the live chat will be LID with a focusing on Bioretention systems.

- Steve made a presentation entitled "What is Low Impact Development and how do you apply it to residential projects" for the Connecticut Chapter of the American Institute of Architects in New Haven, Connecticut on April 22, 2014.

- Steve made a presentation entitled "Wastewater to Stormwater; Designing a subsurface flow gravel wetlands" at the annual meeting of the Connecticut Association of Wetland Scientists on March 20, 2014 in Southbury, Connecticut.

- Steve made a presentation entitled " Low Impact Development and the Connecticut General Stormwater Permit" at the annual meeting of the Southern New England Chapter of the Soil and Water Conservation Society on March 14, 2014 at Eastern Connecticut State University.

- He co-taught an ASCE Short Course entitled, "Introduction to Low Impact Development" with Mike Clar at the 2013 Low Impact Development Symposium held in St. Paul, Minnesota on August 18, 2013.

- Steve presented a workshop on Low Impact Development to the Town of Naugatuck Inland Wetlands Commission on June 5, 2013 to demonstrate how the implementation of LID can reduce stormwater impacts in the urban area of the community.

- Steve presented a webinar entitled "The Basics of Low Impact Development on Wednesday, April 17, 2013. More information is available at http://www.ieca.org/education/webinar/livewebinars.asp

- Steve presented a webinar entitled "Changing the Regulatory Framework to Adopt LID Strategies" on Thursday, March 7, 2013 and on Thursday, August 8, 2013 from 11:30 am to 1:00 pm through **ASCE and EWRI.** Link for more information: http://www.asce.org/Continuing-Education/Brochures/Webinars/ChangingRegulatoryFrameworkLIDStrategies/#Purpose

- Steve presented a three hour workshop on Low Impact Development on June 5, 2012 at the Oxford town hall for municipal land use staff and officials at the request of the **Oxford Inland Wetlands and Watercourses Commission**. Approximately 20 individuals attended the workshop.

- Steve presented an eight hour short courses on Low Impact Development at the **EWRI/ASCE 2011 World Environmental & Water Resources Congress** in Palm Springs, CA (May 2011). The following topics will be covered: Understanding and Implementing Principles of Low Impact Development, Applying LID Strategies to a Site, Low Impact Development Hydrologic Considerations, The Regulatory Framework and LID, LID Integrated Management Practices, Erosion and Sedimentation Controls for the Implementation of LID Practices and Case Studies (Applying LID and Regulations). 12 attendees took the course, including professors from Mississippi State University, Oklahoma State University, Adelaide University (Australia) and Pusan National University (South Korea).

- Understanding and Implementing Principles of Low Impact Development, Applying Low Impact Development to a Site, Low Impact Development Hydrologic Considerations, Low Impact Development Integrated Management Practices, Erosion and Sediment Control for the Implementation of Low Impact Development Practices, and Case Studies of LID (Residential and Commercial) at workshops on Low Impact Development sponsored by **HalfMoon, LLC** (https://www.halfmoonseminars.com) in Albany, NY, Ronkonkoma, NY, North Haven, CT, Manchester, NH, Nanuet, NY, Cleveland, OH, Natick, MA, Portland, ME Fort Washington, PA, Springfield, MA, Wilmington, DE, White River Junction, VT, Somerset, NJ, and White Plains, NY for continuing education credit for design professionals. A total of 322 land use professionals have attended these workshops.

- Pollutant Loads and the Design of Effective Stormwater Treatment Systems was presented at the Virtual H2O conference on February 22, 2011 as presented by **PennWell Publishing**. 25 professionals in attendance.

- LID Stormwater Treatment Systems: Siting, Design and Installation for Maximum Environmental Benefit. What are the aesthetic, financial and maintenance implications? presented at a seminar for the **AIA Connecticut, Committee on the Environment** in New Haven, CT (December 2010). 70 architects in attendance.

- Low Impact Development and the Environmental Site Design process to create sustainable sites at a seminar for the **AIA Connecticut, Committee on the Environment** in New Haven, CT (September 2010). 40 architects in attendance.

- Workshop entitled Using Environmental Site Design Strategies and LID stormwater systems for commercial development at the **Connecticut Conference on Natural Resources** at the University of Connecticut (March 2010). 10 design professionals and regulatory staff in attendance.

- Implementing Low Impact Development in Your Community for the **Connecticut Technology Transfer Center** in Glastonbury, CT (November, 2009). 40+ professionals in attendance.

- What towns can do to encourage LID at the "Low Impact Development Forum" presented by the **Housatonic Valley Association** in Shelton, CT. (October 2009). 12 professionals in attendance.

- Town of Tolland, CT; Low Impact Development Regulations and Design Manual at the **Community Builders Institute** for the workshop entitled: "Swift, Certain & Smart: Best Practices in Land Use" (May 2009). 30+ professionals in attendance.

- Low Impact Development, Environmental Site Design and Water Quality issues and strategies to local municipalities (**Greenwich, and Old Lyme**) to provide an educational opportunity about the many benefits of Low Impact Development in 2009. 30+ design professionals, regulatory commissioners and staff in attendance for each presentation.

- Low Impact Development, Environmental Site Design and Water Quality issues and strategies to local municipalities (**Bolton, Farmington, and Guilford** to date) on a pro bono basis to provide an educational opportunity about the many benefits of Low Impact Development in 2009. 25+ design professionals, regulatory staff and commission members in attendance for each presentation.

- Workshop entitled Using Environmental Site Design Strategies to create a residential subdivision at the **Connecticut Conference on Natural Resources** at the University of Connecticut (March 2009). 20 design professionals and regulatory staff in attendance.

- The Need for Pollutant Loading Analyses for Land Development Projects to storm water engineers at **CT DEP** (March 2009). 6 DEP staff in attendance.

- A review of existing land use regulations and storm water management issues for the Middle Quarter Districts in Woodbury, CT and how the implementation of Environmental Site Design and Low Impact Development strategies can improve water quality of storm water runoff for the Woodbury land use agencies (August 2008). 15 regulatory commission members in attendance.

- Low Impact Development at meeting of the **Connecticut Association of Zoning Enforcement Officers** (October 2007). 30+ professionals in attendance.

- Low Impact Development and adoption of LID regulations by municipalities at workshops of the **Land Use Leadership Alliance (LULA)** (2007, 2010 and 2011). 20+ professionals in attendance at each presentation.

- Stormwater management and Low Impact Development at workshop sponsored by the **Northwest Conservation District** held for land use officials (March 2006). 20+ professionals in attendance.

Conferences Attended

- Bioretention Summit: Ask the Researcher – Annapolis, MD by the University of Maryland (Dr. Alan Davis), North Carolina State University (Dr. Bill Hunt) and Villanova University Stormwater Partnership (Dr. Rob Traver) – (July 2010).

- Workshop at the University of New Hampshire Stormwater Center on permeable pavements. This full-day training included field visits to a variety of on-the ground porous pavement installations throughout the region. Participants learned key design principles necessary to successfully design, evaluate, specify, and install porous pavement for stormwater management. (December 2009).

- Two workshops at the University of New Hampshire Stormwater Center in Durham, NH to observe conventional and Low Impact Development storm water treatment systems in operation. The Stormwater Center is independently verifying the effectiveness of the various treatment systems to remove pollutants from runoff and reduce impacts associated with storm flows. (March 2006 and May 2007).

- 2ND National Low Impact Development Conference – North Carolina State University held in Wilmington, NC, (March 2007).

- Designing Bio/Infiltration Best Management Practices for Stormwater Quality Improvement – University of Wisconsin (Madison, WI) (November 2005).

- Stormwater Design Institute – Center for Watershed Protection (White Plains, NY), (December 2004).

- Engineering and Planning Approaches/Tools for Conservation Design – University of Wisconsin (Madison, WI) (December 2003).

- Law for Design Professionals in Connecticut – Lorman Education Services in Trumbull, CT (September 2002).

- On-site Wastewater Facility Design – University of Massachusetts in Amherst, MA (May 2002).

- The Northeast Onsite Wastewater Short Course & Equipment Exhibition – New England Interstate Water Pollution Control Commission in Newport, RI (March 2002).

- Designing On-site Wetland Treatment Systems, University of Wisconsin, (Madison, WI) (October 1999).

- Cost Effective Drainage System Design – University of Wisconsin (Atlanta, GA) (November 1997).

- Treatment Wetlands, University of Wisconsin, (Madison, WI). "Creating and Using Wetlands for Wastewater Disposal and Water Quality Improvement" (April 1996).

- Alternative On-site Wastewater Treatment Systems, New England Intrastate Pollution Control Commission's On-Site Wastewater Task Force in Westford, MA (November 1994).

- Stormwater Quality, University of Wisconsin, (Portland, ME). "Designing Stormwater Quality Management Practices" (June 1994).

LOW IMPACT SUSTAINABLE
LID
DEVELOPMENT
TRINKAUS ENGINEERING

LOW IMPACT SUSTAINABLE DEVELOPMENT PROJECTS

LID Regulations and Design Manuals

- **Town of Tolland. CT** – Prepared amendments to Town of Tolland Zoning, Subdivision, Inland Wetland regulations and Road Design Manual to incorporate Low Impact Development standards. Wrote "Design Manual – Low Impact Development – Storm Water Treatment Systems – Performance Requirements – Road Design & Storm Water Management" prepared for the Town of Tolland; October 2007. The Town of Tolland was awarded the Implementation Award by the CT-APA for the LID regulations and design manual in December 2008.

- **Town of Plainville, CT** – Planimetrics was the lead consultant on this project. This office performed the technical regulatory audit to identify barriers to the implementation of LID. These barriers were removed from the regulations to provide for the implementation of LID. A LID design manual was written by Steve Trinkaus to address specific development/stormwater issues for the Town of Plainville. The regulatory changes and LID manual were adopted by the Planning and Zoning Commission in September 2010. This work was funded by the Farmington River Enhancement Grants from CT DEP.

- **Town of Harwinton, CT** – In conjunction with Planimetrics of Avon, CT, the existing land use regulations were evaluated for barriers to the implementation of Low Impact Development (LID). The project team suggested changes to the land use regulations to encourage the application of LID in the community. Steve Trinkaus defined design processes and strategies to encourage the implementation of LID in the town. This work was funded by the Farmington River Enhancement Grants from CT DEP.

- **Town of East Granby, CT** – Planimetrics was the lead consultant on this project. This office performed the technical regulatory audit to identify barriers to the implementation of LID. These barriers were removed from the regulations to provide for the implementation of LID. Steve Trinkaus prepared a LID Design Manual and LID Educational document for the town working with Gary Haynes, the town planner. This work was funded by the Farmington River Enhancement Grants from CT DEP.

LID Projects

- **Garden Homes Management** – Westport, Connecticut – 48 unit residential apartment building being developed under 8-30g (affordable housing) on 1 acre site directly tributary to West Branch of the Saugatuck River. All construction activities are located outside regulatory setbacks to tidal wetland and 100-year flood boundary. Stormwater management system was designed to fully infiltrate the

runoff for all storm events up to and including the 100-year event and reduce pollutant loads to existing levels as wooded parcel.

- **Jelliff Mill, LLC** – New Canaan, Connecticut: Redesigned the site layout to create ten single family residential units on a site overlooking the restored historic Jelliff Mill dam on the Noroton River. The site design uses two sections of permeable pavement and a Bioretention system to infiltrate the runoff from the proposed impervious areas on the site. Due to the presence of sand and gravel soils, all runoff from the impervious areas will be infiltrated up to and including the 25-yr storm event (5.7" of rain/24 hrs). Fully constructed and occupied.

- **SRG Family, LLC** – Southbury, Connecticut: Design final site grading for 38,000+ sq.ft. Medical services building and approximately 225 parking spaces in order to maintain overland flow patterns. Designed multiple LID treatment systems consisting of bioswales with weirs, Bioretention systems and Permeable Pavement (asphalt) to handle runoff from all impervious area on the project site. The LID treatment systems are capable of fully infiltrating the runoff from a 50-yr storm event will virtually eliminating the discharge of any pollutants to the adjacent wetland area. Currently pending before Inland Wetlands Commission for modification of original approval.

- **Farmington River Watershed Association** – Winchester, Connecticut: Designed stormwater retrofit for existing 1 acre paved parking area at the science building of the Northwest Community College to treat runoff prior to discharge into the Still River. Retrofit consists of forebay and Bioswale to treat runoff from parking area and building roof. Currently at Bid stage.

- **Garden Homes Management** – Southport, Connecticut: Designed site to support 96 unit apartment building and 115 parking spaces. Site contains both freshwater and tidal wetlands. Stormwater management design required to provide Groundwater Recharge Volume & Water Quality Volume in addition to reducing the post-development peak rate of runoff from the 10-yr rainfall event to the pre-development peak rate of runoff from the 2-yr rainfall event. The stormwater management design includes grassed swales, Bioretention systems and underground concrete galleries to meet all of these stormwater requirements. Due to favorable soils on the site, the site will likely be a zero discharge site. Currently under legal review.

- **Garden Homes Management** – Milford, Connecticut: Designed site to support 257 unit apartment building with 295 parking spaces. Stormwater management design required to provide Groundwater Recharge Volume & Water Quality Volume in addition to reducing the post-development peak rate of runoff from the 25-yr rainfall event to the pre-development peak rate of runoff from the 25-yr rainfall event. The design utilizes a Bioretention system, two underground galleries systems as well as a small detention basin to meet all of the stormwater requirements. Currently under legal review.

- **Garden Homes Management** – Milford, Connecticut: Designed site to support 21,888 sq.ft. building (three stories) containing 36 studio apartments and 45 parking spaces. Permeable pavement and Bioretention will be used on the site to treat runoff for water quality improvements along with reducing runoff volume from the 1-yr to 100-yr storm event. Construction complete and project ready for occupancy.

- **Quickcomm, Inc.** – Newtown, CT: Design a parking facility for approximately 140 vehicles to serve an existing corporate use. Runoff from the entire parking facility will be directed to one of seven Bioretention systems. Water quality of the runoff will be improved by the filtration through a specialized soil media and will then infiltrate into the underlying soils. Due the presence of sand and gravel soils, the Bioretention systems will fully infiltrate all runoff up to and including a fifty-year

design storm (6.5" of rain/24 hours). Land use approvals obtained in the fall of 2012 and work completed in the fall of 2013.

- **Garden Homes Management** – Fairfield, Connecticut: Designed site to support 32,592 sq.ft. building (three stories) containing 54 studio apartments and 68 parking spaces. Permeable pavement will be used for majority of parking facility. Roof drains will also be directed to permeable pavement system for water quality improvement. Reservoir layer was sized to fully contain 1.7" of runoff from contributing impervious area. By using a raised underdrain an anaerobic condition will be maintained in the bottom of the reservoir, thus providing denitrification of Total Nitrogen prior to discharge to tidal section of Rooster River. Construction complete and project ready for occupancy.

- **Garden Homes Management** – Oxford, Connecticut: Design site plan for 126 units of manufactured housing on 41+ acres. Stormwater management is achieved by the use of linear Bioretention systems (Bioswales) along both sides of all interior roads. After treatment in Bioswales, all runoff is directed to standard detention basins to provide peak rate attenuation from the 2-year to 100-year rainfall event. Approved by Inland Wetlands Agency, Denied by Planning and Zoning Commission. Currently under legal appeal in court.

- **Compton Family Trust** – New Hartford, Connecticut: Design two wet swales systems to convey and filter runoff from road which is currently discharged into West Hill Lake via a paved swale. West Hill Lake has very good water quality and the owner desires this work on this property to become a template for other homeowners on West Hill Lake to prevent adverse impacts of stormwater on the water quality of the lake. Received all necessary land use approvals. Construction to commence in the summer of 2012.

- **Highwood Estates** – Thomaston, Connecticut: Design retrofits for two existing failing detention basins serving existing 50 lot residential subdivision. Retrofits were designed using LID techniques to improve water quality reaching Northfield Brook, an impaired waterway. The larger basin was converted to an Extended Detention Shallow Wetlands to significantly reduce pollutant loads. Due to a limited area, only a forebay and deep pool could be designed for the smaller basin, thus providing measurable improvements in water quality.

- **Farmington River Watershed Association** – Winchester, Connecticut: Design stormwater retrofits consisting of a Bioretention system at the Town of Winchester Wastewater Treatment Plant and a Bioswale at the Town of Winchester Public Drinking Supply facility. These projects are being funded as LID demonstration projects to increase public awareness of LID. The systems were installed in June 2012 and were featured in articles in the Republican American and Register Citizen newspapers.

- **Harwinton Sports Complex** – Harwinton, Connecticut: Redesign stormwater management system for indoor sports facility to use vegetated swales and Bioretention systems. Redesign site grading to eliminate all structural drainage in parking facility. Client saved over $ 40,000 on infrastructure costs by the use of LID treatment systems.

- **Holland Joint Venture, LLC** – Bridgewater, Connecticut: Prepared site plan for 28,000 sq.ft. industrial/light assembly use and 140 parking spaces on 10.94 acres. Utilize Environmental Site Design strategies to preserve large portions of site in natural condition, minimize impacts due to site disturbance, and minimize impacts to wetland/watercourse system by access driveway. Designed five Bioretention systems for storm water management and pollutant removal from all impervious areas.

- **Goodhouse Flooring, LLC** – Newtown, Connecticut: Design site to accommodate 8,800 commercial building and associated driveway and parking areas on 1.0 acre site. Designed eight Bioretention systems to handle runoff from all impervious surfaces. Analyze and demonstrate that State of Connecticut water quality goals will be achieved for the site design.

- **Trade Winds Farm** – Winchester, Connecticut: 24 lot Open space subdivision on 104+ acres of land. Performed all civil engineering design work for project. Notable feature of project is the preservation of 64+ acres of the site as dedicated Open Space. Many LID strategies such as Environmental Site Design, site fingerprinting, volumetric reduction and water quality improvements were incorporated into site design. Storm water treatment systems utilized vegetated basins, vegetated swales with gravel filter berms, emergent marsh, Bioretention systems, linear vegetated level spreader, and meadow filter strips.

- **Northern View Estates** – Sherman, Connecticut: Five lot subdivision with private road. Design has no direct wetland impacts and only minor intrusions into defined 100' upland review area. Low Impact Development systems, such as vegetated swales and Bioretention were used to treat post-development runoff while maintaining existing drainage patterns to the maximum extent possible.

- **Mill River** – New Milford, Connecticut: Designed 14 lot open space subdivision on 68 acre site. Performed all civil engineering services for project. .LID treatment systems such as a permanent pond/emergent marsh system, linear biofiltration swale, and rain gardens were designed for the site.

- **Byron Avenue Cluster Development** – Ridgefield, Connecticut: Seven lot cluster subdivision on 4 acres. The Stormwater management system consisted of a road with no curbs, grassed swales and constructed wetland with detention to reduce pollutant loads and increases in the peak rate of runoff.

- **The Estates on the Ridge** – Ridgefield, Connecticut: 32 lot open space subdivision on 152+ acres. Over 80 acres of the site will be preserved as Open Space as part of this project. Stormwater will be treated by the use of rain gardens for roof drains, infiltration trenches for footing drains, emergent marsh systems and vegetated swales for conveyance and treatment of road runoff. Designed over 1 mile of proposed road for project. Designed bottomless culverts over several wetlands crossing to minimize direct impact on wetland areas.

- **G & F Rentals, LLC** – Oxford, Connecticut: By utilizing LID stormwater concepts such as grass filter strips, Bioretention in parking islands, Bioretention for roof drains, and infiltration trenches, a total of 54,000 sq.ft. of commercial office space along with 140+ parking spaces was placed on 10 acre site. The project also restored previously degraded inland wetlands on the site.

- **Dauti Construction – Edona Commons** – Newtown, Connecticut: Designed 23 unit affordable housing plan to minimize impacts on delineated wetland areas. Designed three construction wetland systems for the treatment of storm water runoff for water quality renovation.

- **American Dimensions, LLC** – New Milford, Connecticut: Redesigned the storm water treatment systems for a 7 lot residential subdivision. Rain gardens were designed to handle the runoff from all roof areas and proposed driveways. Each rain garden provided the required Water Quality Volume and Groundwater Recharge Volume as specified in the 2004 Storm Water Quality Manual. A Subsurface Gravel Wetland was designed to treat the full Water Quality Volume for runoff from adjacent roads network which drained through the subject property.

- **Molitero Residence** – New Fairfield, CT: Designed five Bioretention systems to mitigate both volumetric increases of runoff and address water quality issues for large building addition to single family residence on Candlewood Lake. Also designed landscape filter strip above lake edge to filter runoff from up gradient lawn area. Bioretention systems fully infiltrated 5" of rain in 24 hours from Hurricane Irene in August of 2011. Project was featured in newsletter of Candlewood Lake Authority to demonstrate the effectiveness of LID treatment systems in a lake environment.

- **Multiple single family residences** – Design Bioretention systems to mitigate volumetric increases of runoff due to increases of impervious cover on the lot for large building additions and new construction including the reduction of volumetric increases up to the 25-yr event (5.7" of rain in 24 hours).

Residential Subdivisions

- **Stone Ridge Estates**, 59 lot residential open space subdivision, Ridgefield, Connecticut (Town of Ridgefield)
- **Oak Knoll**, 14 lot open space subdivision, Ridgefield, Connecticut (Mike Forbes)
- **Ward Acres Farm**, 12 lot open space subdivision, Ridgefield, Connecticut (Sturges Brothers, Inc.)
- **Horblitz Subdivision**, 13 lot open space subdivision, Ridgefield, Connecticut (John Sturges)
- **McKeon Subdivision**, 14 lot conventional subdivision, Ridgefield, Connecticut (McKeon Family Trust)
- **High Ridge Estates**, 5 lot subdivision in historic district, Ridgefield, Connecticut (Scandia Construction)
- **Millstone Court**, 7 lot conventional subdivision, Ridgefield, Connecticut (Sturges Brothers, Inc.)
- **Cricklewood Subdivision** – 12 lot conventional subdivision, Redding, Connecticut (Jay Aaron)
- **Spruce Meadows Subdivision** – 12 lot conventional subdivision, Wilton, Connecticut (Piburo Builders)
- **Noroneke Estates** – 12 lot open space subdivision, Ridgefield, Connecticut (John Sturges)
- **Lynch Brook Lane** – 7 lot open space subdivision, Ridgefield, Connecticut (Sturges Brothers, Inc.)
- **Ledgebrook Subdivision** – 27 lot conventional subdivision, Southbury, Connecticut (Conte Family Trust, LLC)
- **Seven Oaks** – 19 lot open space subdivision, Ridgefield, Connecticut (Basha Szymanska)
- **Applewoods** – 29 lot conventional subdivision, Bethel, Connecticut (Gene & Joe Nazzaro)

Third Party Engineering Reviews

- **Groton Open Space Association** – Wal-Mart Super center, Mystic Woods Age Restricted Development, and changes to stormwater standards in the Town of Groton regulations – Groton, Connecticut. Focus of review was on stormwater management plans to address water quality and runoff volumes per the CT DEP 2004 Storm Water Quality Manual as well as the adequacy of the erosion and sedimentation control plan for the proposed development.
- **Town of Tolland Planning & Zoning Commission** – Star Hill Athletic Complex with focus on water quality impacts on existing impaired waterway. Focus was on suggesting changes to stormwater management system to comply with recently adopted Low Impact Development requirements in the Town of Tolland.
- **Town of Newtown Inland Wetlands Commission** – Sherman Woods – 38 lot residential Subdivision with focus on stormwater management and water quality. Review stormwater management plan for compliance with CT DEP 2004 Storm Water Quality Manual to address water quality issues being directed to high quality wetland systems. Also review erosion & sedimentation

control plan for adequacy and compliance with CT DEP 2002 Guidelines for Soil Erosion & Sediment Control.

- **Town of Winchester Inland Wetlands Commission** – 30,000 sq.ft. Commercial building with grading and stormwater management within 100-yr flood plain. Plan reviewed focused on impacts to floodway and 100-year flood plain as a result of the placement of significant fill within the flood plain.
- **Town of Southbury Inland Wetlands Commission** – 35,000 sq.ft. Medical office building proposed in close proximity to inland wetlands & watercourses. Review focus on the adequacy of the stormwater management plan to address water quality and runoff volumes prior to discharge into on-site wetland areas.
- **Friends of Litchfield** – Stop & Shop proposal on existing retail site proposing an increase of impervious area of 1 acre directly draining into an aquifer protection area. Focus of review was on adequacy of stormwater management system to address water quality of runoff and prevent further off-site adverse impacts.
- **The Regency at Ridgefield** – Proposal for contractor's yard on steep slope immediately uphill of existing pond and wetlands. Project proposed removal of over 45,000 cubic yards of earth and rock to facilitate construction of building. Focus of review was on adequacy of erosion control and stormwater management plan to prevent discharges of pollutants to receiving pond.
- **Friends of Oswegatchie Hills Nature Preserve, Inc. and Save the River, Save the Hills, Inc.** – Review of preliminary site plan for 840 unit of affordable housing on a 230+ acre site directly adjacent to the Niantic River submitted for a zone change to the Planning and Zoning Commission. Focus of review was on stormwater management and impacts to down gradient wetlands, including the Niantic River.
- **Town of Brookfield Inland Wetlands Commission** – The Enclave at Brookfield, an affordable housing project with 187 units on 9.8 acres proposing filling of wetland, locating stormwater basin within inland wetland area and a significant increase of impervious. Review focused on adequacy of stormwater management system to address water quality, runoff volume and peak rate changes due to development in accordance with CT DEP 2004 Storm Water Quality Manual and local land use requirements; review of erosion & sedimentation control plan for compliance with CT DEP 2002 Guidelines for Soil Erosion & Sediment Control and local land use requirements.
- **Town of Brookfield Inland Wetlands Commission and Zoning Commission** – The Renaissance, an affordable housing project with 156 units of 5+ acres adjacent to the Still River replacing existing development on the site. Review focused on adequacy of stormwater management system to address water quality, runoff volume and peak rate changes due to development in accordance with CT DEP 2004 Storm Water Quality Manual and local land use requirements; review of erosion & sedimentation control plan for compliance with CT DEP 2002 Guidelines for Soil Erosion & Sediment Control and local land use requirements. Additionally reviewed issues of development in the floodway and 100-year flood plain of the Still River.
- **Branford Citizens for Responsible Development** – Review of development plans for Costco Store and other commercial development on 45 acres in Branford, CT. Review focuses on stormwater management issues, particularly increased runoff volumes and pollutant loads to be generated by development and whether the proposed stormwater management proposal would adequately address the impacts of these two issues. Both the 2004 CT DEP Storm Water Quality Manual and the Branford Inland Wetland Regulations were used to determine if the plans were in compliance with the applicable standards. The erosion control plan was evaluated for compliance with the CT DEP 2002 Guidelines for Soil Erosion & Sediment Control.

Commercial Site Plans

- **Cannondale Corporation Headquarters** - Bethel, Connecticut

- **Village Bank Headquarters** – Danbury, Connecticut
- **Newtown Hardware** - Newtown, Connecticut
- **Amicus Healthcare Living Centers** – Rocky Hill, Connecticut
- **Nathan Hale Office Building** – Fairfield, Connecticut
- **Ridgefield Recreation Center** – Ridgefield, Connecticut
- **Silver Spring Country Clubhouse & Pool house renovations** - Ridgefield, Connecticut
- **Tiger Hollow Athletic Complex at Ridgefield High School** - Ridgefield, Connecticut

On-site sewage disposal systems

- **Candle Hill Mobile Home Park** – Design Subsurface Sewage Disposal Systems for individual mobile home units. New Milford, Connecticut.
- **Hemlock Hills Camp Resort** – Expansion of campground, design of gravity sanitary sewer and design of subsurface sewage disposal system to handle 4,800 gpd. Litchfield, Connecticut.
- **Old Field Condominiums** – long term inspection & reporting on the condition of multiple subsurface sewage disposal systems serving 40 unit condominium complex with design flows in excess of 15,000 gpd. Southbury, Connecticut.
- **Thorncrest Farm** – Design of on-site sewage disposal system to handle wastewater from milking operation. Goshen, Connecticut.
- **Silver Spring Country Club** – Design of multiple subsurface sewage disposal systems for private country club with average daily flow of 7,000 gpd during peak usage season.
- **Richter Park Golf Course** – Design subsurface sewage disposal system to replace existing failed system for golf club house and year round restaurant with average daily flow of just under 5,000 gpd.
- **Redding Country Club** - Performed soil testing to design a repair to an existing wastewater management system that was experiencing periodic effluent discharges during high use on very marginal soil conditions. Utilized oversized grease tanks for kitchen waste and septic tanks to increase the clarity of the effluent which was discharged by force main to the subsurface sewage disposal system increase the long term functionality of the system. Discharge rate 4,900 gpd.

General Civil Engineering Projects

- **Montgomery Residence**, 10,000 sq.ft. residence with 2.5 acre pond, Redding, Connecticut.
- **Neils Different,** Design 1 acre pond, Ridgefield, Connecticut.
- **Anthony DeLuca**, Design 2 acre pond, Redding, Connecticut.
- **Barrett Cram**, Design 0.5 acre pond, Redding, Connecticut.
- **Jay & Eileen Walker Residence**, 27,000 sq.ft. residence, Ridgefield, Connecticut.

Athletic Facilities

- **Kingdome – East Fishkill, NY,** Prepare comprehensive site plan for the construction of an air-supported structure covering 7.96 acres of land area. Project also includes the design of 303 parking spaces, two full size artificial turf baseball fields and three 54-80 artificial turf baseball fields. Designed all site grading and stormwater management facilities to address water quality volume, channel protection volume as well as peak rate attenuation for the 1-yr, 2-yr, 10-yr, 25-yr, 50-yr and 100-yr rainfall events.
- **Tiger Hollow – Ridgefield High School – Phase I**, Design and site artificial turf competition field and track complex. Design access road to provide access to new building containing locker rooms, concessions, media room, and equipment storage areas. Design all utility connections and obtain local permits.

- **Tiger Hollow – Ridgefield High School – Phase II**, Prepare Conceptual Development plan for reconfiguration of existing athletic fields adjacent to the Tiger Hollow stadium.
- **Joel Barlow High School – Redding, CT**, Provide preliminary Master Plan on pro bono basis for reconfiguration and improvement of existing athletic fields at Joel Barlow in response to Falcon Pride stadium proposal. Plan was provided to Region 9 Board of Education for general discussion purposes.