AGENDA
Regular Meeting
Mansfield Conservation Commission
Wednesday, April 20, 2016
Audrey P. Beck Building
Conference Room B
7:30 p.m.

1. **Call to Order**

2. **Roll Call**

3. **Opportunity for Public Comment**

4. **Minutes**
   - March 16, 2016 Regular Meeting

5. **New Business**
   a. W1561- H. Raphaelson, Dog Lane, 2 lot subdivision
   b. W1562 & PZC #1284-3- Meadowbrook Gardens Multi-Family Development
   c. W1564- Storrs Lodges, 218 Units, Hunting Lodge Road (Parcel I.D. 15.21.3)
   d. W1565- Uniglobe Investment, LLC., Meadowbrook Road, Sidewalk
   e. Membership

   ** All reports for Items W1562 and W1564 are available in the Town Planning Office or on the Town Website at: http://www.mansfieldct.gov/content/1904/1932/14344.aspx **

6. **Continuing Business**
   - Draft Model Conservation Easement
   - Conservation Easement Monitoring
   - Zoning Regulation Updates/Rewrite
   - Town of Coventry/ Mansfield Control of Fanwort in Eagleville Lake
   - UConn Agronomy Farm Irrigation Project
   - Status of UConn's Hazardous Waste Transfer Station
   - Other

7. **Communications**
   - Minutes
     - Open Space: 3/15/16
     - PZC: 4/6/16
     - IWA: 4/6/16
   - Spring 2016 Joshua's Trust News

8. **Other**

9. **Future Agendas**

10. **Adjournment**

Town of Mansfield
CONSERVATION COMMISSION
Meeting of 16 March 2016
Council Chambers, Audrey P. Beck Building
(draft) MINUTES

Members present: Aline Booth (Alt.), Neil Facchinetti, Quentin Kessel, Scott Lehmann, Grant Meitzler, John Silander, Michael Soares. *Members absent*: Joan Buck (Alt.), Robert Dahn. *Others present*: Howard Raphaelson, Jim Wohl, Mark Kohan (W1561); Ed Pelletier (Datum Engineering, W1561 & W1562); Gerald Hardisty, Robert Magi, Edward Paul, Michael Yenke (W1562); Jennifer Kaufman (Wetlands Agent). {The "Others present" list is not complete, since some who attended regarding W1562 did not affix their names to the sign-in sheet.}

1. The meeting was **called to order** at 7:35p by Chair Quentin Kessel. Booth was designated a voting member for this meeting.

2. The **draft minutes** of the 17 February 2016 meeting were approved as written.

3. IWA referrals. {To accommodate visitors, the Commission deferred action on these referrals until all three applications had been presented and public comments regarding them heard. These minutes do not follow temporal order in this respect, but conclude each section with a record of the Commission's action, if any.}

a. W1561 (Raphaelson, Dog La). Ed Pelletier reviewed the application, which proposes to split a 14.85 acre parcel on the east side of Dog Lane into two lots: a roughly rectangular Lot 1 (2.36 ac, 250 ft of continuous frontage) and an irregularly shaped Lot 2, which wraps around Lot 1 (13.49 ac, continuous frontage of 56 ft to the south, and 415 ft to the north, of Lot 1). The 200 ft of continuous frontage required by the Town need not be in front of the house on Lot 2.

{The application was revised, after publication of the Agenda for this meeting, so that it no longer proposes to "subdivide" the 14.85-acre parcel. Instead, Lot 1 qualifies as a "first cut" with no subdivision of Lot 2 proposed at this time. The conservation easement on Lot 2 shown in the original application is absent from the revision.}

The parcel as a whole is mostly (perhaps 70%) wetland. The houses on Lots 1 and 2 (resp.) would be sited fairly close together on a low, forested knoll close to Dog Lane, 108 ft and 63 ft (resp.) from wetlands at their closest points. Their engineered septic systems, which have DPH approval, would be 58 ft and 50 ft (resp.) from wetlands, on a fairly gentle slope above them. A foundation drain for Lot 2 would discharge 8 ft from wetlands.

In a letter circulated by Kaufman, Kathryn Ratcliff (60 Bundy La) indicated that she and other abutters had not received up-to-date plans for the proposed development and expressed concern about the potential for nutrient loading of wetlands from septic leaching or system failure. Jim Wohl (128 Dog La), speaking at the meeting, also said that abutters have not seen the revised plans. He is not opposed to having one house on the knoll, but objected to squeezing two houses into this space; a second house increases the risk of a significant negative impact on wetlands, a risk which should be carefully assessed. Mark Kohan (127 Dog La) reiterated these concerns, noting that the parcel is extremely wet at some times of year.

In response, Mr. Pelletier said that the revised plans differ only slightly from the original proposal and not in respects relevant to the development's potential impact on wetlands. In his judgment, putting Lot 2's house in the proposed location was better for wetlands than locating it on an upland farther east, as that would necessitate a wetlands crossing. To questions from Lehmann, he replied that the alternative of placing just one house on the entire parcel had not been considered, but that an engineered septic system would be required even if just one house

were sited on the knoll. Discharge from a failed septic system could end up in wetlands, but the probability of such a failure is, in his view, quite small. The proposed foundation drains should not threaten wetlands, since the volume of ground-water discharged would be modest and not require treatment.

Kaufman noted that George Logan is preparing a wetlands report, which it is not yet ready. She observed that, while no conservation easement is required, the Commission could recommend such an easement to enhance protection of extensive wetlands on the parcel. Kessel pointed out that Lot 2 abuts Joshua's Trust land and wondered if the parcel's owner, Howard Raphaelson, could be interested in granting a trail easement on Lot 2 providing access to Whetten Woods from Dog Lane; such an easement could permit linking Storrs Center to the Nipmuck Trail via the Torrey Preserve. Mr. Raphaelson appeared willing to consider this.

After some discussion, the Commission agreed (**motion:** Silander, Kessel):

(1) to request that the April 4 hearing be kept open to May 2, so that the Commission could review the wetlands report at its April meeting; but
(2) to comment to the IWA that:

- At this time, the Commission is concerned about the potential for nutrient loading of down-slope wetlands from the engineered septic systems, and suggests moving these systems farther from wetlands or reducing the number of houses from two to one.
- The Commission suggests that the parcel's owner consider conservation easements to enhance wetlands protection and a trail easement across Lot 2 to provide for a future connection to Whetten Woods and Storrs Center from the Nipmuck Trail.

All were in favor, save Soares, who abstained as an interested Dog Lane resident. {Facchinetti, Kessel, Lehmann, & Soares viewed the site on the 16 March IWA/PZC Field Trip.}

b. W1562 & PZC1284-3 (Meadowbrook Gardens Multi-Family Development). This proposal, again introduced by Mr. Pelletier, would construct 36 1- and 2-bedroom residential units on a 4.6-acre site adjacent to the associated Whispering Glen development, now under construction to the east. The parcel is essentially flat from Meadowbrook Lane south to where it drops steeply to Conantville Brook; at its western edge is a more gradual slope to a watercourse on adjacent property. All development would occur on the level portion of the property. Four multi-unit buildings would be arrayed around a central open area, with parking around the outside. Slopes on the south and west would be undisturbed.

The nature of wetlands associated with Conantville Brook to the south and the watercourse to the west was reviewed by soil scientist Ed Paul. The application does not propose a conservation easement for these areas. However, Mr. Pelletier noted that the steep slope and wetlands below it at the south end of the Whispering Glen property are protected by a conservation easement, which could be extended to this new development.

The area is served by water and sewer lines, so the main potential impact on wetlands would be from runoff. Gerald Hardistry reviewed the proposed storm-water management system. Very porous sandy & gravelly soils should permit runoff from impervious surfaces – roofs, parking areas, sidewalks, roads – to be absorbed on site, save in extreme weather events. The system is designed to hold water from a once-in-50-years event. Roofs would drain to catch basins and dry wells in the central open area, parking areas to holding ponds and underground concrete galleries around the perimeter. In extreme events, overflow would be directed into the watercourse to the west via a drainage armored with rip-rap. Responding to a query from Silander about whether other approaches – rain gardens, green roofs, pervious pavement – had been considered, Mr. Haristry said that concerns about the longevity and maintenance

requirements of such systems dictated a more traditional approach.

The Whispering Glen project includes construction of a sidewalk on the south side of Meadowbrook Lane west to Sunny Acres. Soares suggested adding a walkway to give residents of Meadowbrook Gardens access to this sidewalk; Mr. Pelletier said this could be done.

Mr. Pelletier and his associates left the meeting at 8:55p. When the Commission returned to consideration of W1562, Kaufman reported that the density of this project had led the Town to hire a consultant to review the storm-water management system proposed for it. She suggested that the Commission consider the consultant's report at its April meeting. After some discussion, the Commission agreed unanimously (**motion:** Kessel, Silander) to pass along the following suggestions and comments to the IWA & PZC:

- The Commission urges that the conservation easement on the Whispering Glen parcel be extended to include the steep slope and wetlands at the southern end, and the undeveloped strip along the western side, of the Meadowbrook Gardens parcel.
- The Commission suggests additional plantings (a) along Meadowbrook Lane to screen the development and (b) at the rim of the steep slope above Conantville Brook to discourage dumping, driving over the edge, etc.
- The Commission suggests that more creative storm-water management measures (such as rain gardens) be utilized. It would appreciate the opportunity to comment further after it has seen the Town consultant's report on the proposed storm-water management system.
- The Commission is pleased to learn that the sidewalk from Whispering Glen to Sunny Acres will stay on the south side of Meadowbrook Lane. It suggests that the Meadowbrook Gardens project include a walkway to this sidewalk.
- Should regulations be changed to allow more unrelated people to occupy units in this development, additional parking space will be needed.

c. W1563 (Bicentennial Pond, Aquatic Weed Removal & Management). The Parks and Recreation Department proposes to remove aquatic weeds that have been encroaching on the 2.6-acre swimming area at Bicentennial Pond and to treat the Pond with herbicides to control growth of various nuisance plants. Weeds (and silt that has accumulated over the years from their decay) would be mechanically removed from the swimming area by what is essentially a large vacuum cleaner, and pumped into fabric tubes on shore to dewater. Once dry, this material would be hauled away for use as soil enrichment. Mechanical removal would be followed by treating the pond with herbicides to check the growth of a number of nuisance species, including water chestnut, which has recently been found at the inlet to the Pond. Its sharp spines would be a hazard for waders and swimmers, should it spread to the swimming area.

On the 3/16 IWA Field Trip, Facchinetti & Lehmann had been told that the herbicide treatments would be done in the spring, well before Bicentennial Pond was opened for swimming. However, Facchinetti noted that the 11/13/15 proposal from All Habitat Services, Inc. included in the packet mentions follow-up treatments of certain herbicides. For example, treatment with Flumioxazin to control Western Waterweed and Water Starwort is supposed to occur "at the beginning of the season and should be followed by additional applications 5-10 weeks apart." Kaufman agreed that the Town would need to negotiate and monitor the timing of treatments so as to avoid exposing swimmers to active herbicides.

4. Town conservation easements. The Town Attorney has not yet looked into whether a visit by Commission members to a Town-held conservation easement would constitute a "meeting" of the Commission (requiring public notice, opportunity for members of the public to attend, etc.), as a member of the Connecticut Freedom of Information Commission apparently believes. Meanwhile, Kaufman wants to upgrade the Town's "Model Conservation Agreement" (MCA). She distributed a copies of it, along with similar instruments used by Joshua's Trust and East

Haddam, and encouraged Commission members to suggest desirable changes in the Town's MCA.

5. Biking on Town trails. Kaufman distributed copies of a 14 March letter from the Connecticut Forest and Park Association (CFPA), which oversees blue-blazed trails in Connecticut, objecting to (1) permitting mountain biking on the Nipmuck Trail on Town land in Mansfield (e.g., Schoolhouse Brook Park and Fifty Foot) or (2) encouraging bikers to use the Trail as a connector between Town lands where they might be permitted on other trails. Given CFPA's position, proposals to open additional trails on Town land to biking seem ill-advised.

6. Zoning regulations. Booth reported that the Zoning Focus Group has begun meeting to review draft zoning regulations implementing the most recent Plan of Conservation and Development. Kaufman explained that the process of writing and reviewing these regulations will now proceed with the active involvement of the Focus Group.

7. Adjourned at 9:50p. Next meeting: 7:30p, Wednesday, 20 April 2016.

Scott Lehmann, Secretary, 20 March 2016.

Department of Planning and Development

Date: January 27, 2016

To: Mansfield Inland Wetlands Agency

From: Jennifer Kaufman, Inland Wetlands Agent

Subject: Receipt of New Application for Wetlands License
east side of Dog Lane (assessor's parcel id 16.41.23) (IWA File #1561)
H. Raphaelson
Description of work: 2-lot subdivision-Raphaelson Estates

Project Description

The applicants propose to subdivide a 14.75 acre parcel into two single family lots located on the east side of Dog Lane. Except for two foundation drains, all activity will be at least 50 feet from the edge of wetlands.

☐ The project includes work in wetlands.
☒ The project includes work in the 150 foot upland review area.
☒ The project is located in a Public Water Supply Watershed.

Application Fees and Notifications

☒ The applicant has paid the required application fee
☒ The applicant has submitted copies of the notice mailed to neighbors and a list of abutters to be notified. Certified mail receipts must be submitted prior to action on the application.
☒ The applicant has submitted copies of notices provided to the Connecticut DPH and Windham Water Works. Certified mail receipts must be submitted prior to action on the application.
☒ Natural Diversity Database has been checked and state and/or federal listed species or significant natural communities have been identified on the property.

Receipt Motion

_____ MOVES, _____ seconds to receive the application submitted by H. Raphaelson (IWA File #1561) under the Wetlands and Watercourses Regulations of the Town of Mansfield for 2-lot subdivision-Raphaelson Estates on property located on the east side of Dog Lane (assessor's parcel id 16.41.23) as shown on a map dated 1/12/2016 and as described in application submissions, and to refer said application to staff and the Conservation Commission for review and comments.

Town of Mansfield

Department of Planning and Development

Date: March 29, 2016

To: Mansfield Inland Wetlands Agency

From: Jennifer Kaufman, Inland Wetlands Agent

Subject: 128 Dog Lane (File #W1561)
H. Raphaelson
Description of work: Lot Split
Map Date: January 12, 2016, revised through March 16, 2016

Notifications

☒ The applicant has paid the required application fee
☒ The applicant has submitted certified mail receipts for notices mailed to abutters

Project Overview

On February 22, 2016, I requested that the applicants prepare a Wetlands and Assessment and Impact Analysis. This report was submitted to staff on March 28, 2016. Because this report had not been completed for the Conservation Commission Meeting on March 16, 2106, they have requested that the Public Hearing be kept open until May 2, 2016 so that they have the opportunity review and comment on this report at their April meeting.

Since you received the application on February 1, 2016 there have been the following changes and additional submissions:

1. In response to questions from Eastern Highlands Health District (EHHD), the applicants have submitted a revised plan (revised through March 16, 2016). The distance of both the primary and the reserve septic systems to the edge of wetlands has not changed. The proposed plan has been reviewed by EHHD and, based on this review, it is in compliance with the CT Public Health Code and Technical Standards.
2. After doing further research, it was determined that a subdivision is not required for this lot split as it is part of the "free cut" for this parcel. A Building Area Envelope, Development Area Envelope and Conservation Easement are not required for a lot split; and thus have been removed from the plan.
3. According to the DEEP Natural Diversity Database, state and/or federal listed species have been identified on this parcel. CT DEEP has prepared a review of the species and has submitted recommended protection strategies and best management practices to protect the listed species.

4. Civil Engineering Services, LLC, on behalf of the applicant, has submitted a letter addressing the issue of the impact of the proposed septic systems and stormwater discharge.

If the Agency is in agreement with the recommendation to continue the public hearing to May 2, 2016, the following motion is in order:

Recommendation/Suggested Motion

_____ MOVES, _____ seconds to open the public hearing on the lot split application (W1561) submitted by H. Raphaelson at 128 Dog Lane and continue it to May 2, 2016.

APPLICATION FOR PERMIT
MANSFIELD INLAND WETLANDS AGENCY
4 SOUTH EAGLEVILLE ROAD, STORRS, CT 06268
860-429-3015x6204 (DIRECT) TEL: 860-429-3330 OR
FAX: 860-429-6863

FOR OFFICE USE ONLY

File #
W_____
Fee Paid _____
Official Date of Receipt _____

Applicants are referred to the Mansfield Inland Wetlands and Watercourses Regulations for complete requirements, and are obligated to follow them. For assistance, please contact the Inland Wetlands Agent at the telephone numbers above.

Please print or type or use similar format for computer; attach additional pages as necessary.

Part A - Applicant

Name Howard Raphaelson

Mailing Address 119 Timber Drive

Storrs, CT Zip 06268

Phone 860-429-1340 Email howardar@yahoo.com

Title and Brief Description of Project

Raphaelson Estates-Proposed 2 lot subdivision to develop 2 building lots for single family dwellings.

Location of Project Dog Lane, Storrs/Mansfield

Intended Start Date Fall 2016

Part B - Property Owner (if applicant is the owner, just write "same")

Name same as applicant

Mailing Address _____

_____ Zip _____

Phone _____ Email _____

Owner's written consent to the filing of this application, if owner is not the applicant:

Signature _____ date _____

Applicant's interest in the land: (if other than owner) _____

Part C - Project Description (attach extra pages, if necessary)

1) Describe in detail the proposed activity here or on an attached page. (**See guidelines at end of application)**
   Please include a description of all activity or construction or disturbance:

a) ***in*** the wetland/watercourse

b) ***in*** the area ***adjacent*** to (within 150 feet from the edge of) the wetland/watercourse, even if wetland/watercourse is ***off*** your property

Proposed subdivision to develop two building lots for single family dwellings with on-site septic systems and drilled wells.

a.) No activity in wetlands.

b.) Activity at it's nearest point for proposed Lots 1 & 2 as follows:

	Lot 1	Lot 2
House	108'	63'
Well	162'	141'
Septic System	58'	50'
Foundation Drain	38'	8'
Driveway	104'	58'

2) Describe the amount or area of disturbance (in square feet or cubic yards or acres):

a) ***in*** the wetland/watercourse

b) ***in*** the area ***adjacent*** to (within 150 feet from the edge of) the wetland/watercourse, even if wetland/watercourse is **off** your property

a.) No disturbance in wetland soils.

b.) Lot #1- 25,600 sq. ft.
Lot #2- 29,450 sq. ft.

3) Describe the type of materials you are using for the project: _____
sand & gravel fill will be used for driveways and septic system areas

a) include ***type*** of material used as fill or to be excavated sand & gravel

b) include ***volume*** of material to be filled or excavated_____
Lot #1- 100 cu. yds. for driveway Lot #2- 80 cu. yds. for driveway
- 150 cu. yds. for septic system - 130 cu. yds. for septic system

4) Describe measures to be taken to minimize or avoid any adverse impacts on the wetlands and regulated areas (silt fence, staked hay bales or other Erosion and Sedimentation control measures).
see attached plan for E & S notes along with E & S measures for containing any adverse impacts on the wetlands

Part D - Site Description

Describe the general character of the land. (Hilly? Flat? Wooded? Well drained? etc.)
a gently sloping wooded knoll consisting of well drained soils in the area of the proposed improvements

Part E - Alternatives

Have you considered any alternatives to your proposal that would meet your needs and might have less impact on the wetland/watercourse? Please list these alternatives.

We did consider crossing the wetlands to access a large upland area south of the building site located on Lot #2 but felt the proposed plan would have less of an impact on wetlands.

Part F - Map/Site Plan (all applications)

1) Attach to the application a map or site plan showing **existing conditions** and the **proposed project** in relation to wetland/ watercourses. Scale of map or site plan should be 1" = 40'; if this is not possible, please indicate the scale that you are using. A sketch map may be sufficient for small, minor projects. **(See guidelines at end of application)**

2) Applicant's map date and date of last revision January 12, 2016

3) Zone Classification RAR-90

4) Is your property in a flood zone? _____Yes __X__No _____ Don't Know

Part G - Major Applications Requiring Full Review and a Public Hearing

See Section 6 of the Mansfield Regulations for additional requirements.

Part H - Notice to Abutting Property Owners

1) Attach list of abutters, name, and address

2) **Proof of Written Notice to Abutters.** You must notify abutting (neighboring) property owners (any property immediately contiguous with the subject property, including those across the street) by certified mail, return receipt requested, stating that a wetland application is in progress, and that abutters may contact the Mansfield Inland Wetlands Agent for more information. Include a brief description of your project. ***Postal receipts of your notice to abutters must accompany your application.*** To generate an abutters list go to http://www.mainstreetmaps.com/CT/Mansfield/

Part I - Additional Notices, if necessary

Notice to Windham Water Works and CT Department of Public Health is attached. If this application is in the public watershed for the Windham Water Works (WWW), you must notify the WWW and the Department of Public Health of your project within 7 days of sending the application to Mansfield--sending it by certified mail, return receipt requested. Contact the Mansfield Inland Wetlands Agent to find out if you are in this watershed.

Notice to Adjoining Town. If your property is within 500 feet of an adjoining town, you must also send a copy of the application, on the same day you sent one to Mansfield, to the Inland Wetlands Agency of the adjoining town, by certified mail, return receipt requested.

The Statewide Reporting Form shall be part of the application and specified parts must be completed and returned with this application.

Part J - Other Impacts To Adjoining Towns, if applicable

1) Will a significant portion of the traffic to the completed project on the site use streets within the adjoining municipality to enter or exit the site?___Yes_X_No___Don't Know

2) Will sewer or water drainage from the project site flow through and impact the sewage or drainage system within the adjoining municipality?____ Yes _X_No ____ Don't Know

3) Will water run-off from the improved site impact streets or other municipal or private property within the adjoining municipality?____ Yes _X_No ____Don't Know

Part K - Additional Information from the Applicant

Set forth (or attach) any other information which would assist the Agency in evaluating your application. (*Please provide extra copies of any lengthy documents or reports, and* extra copies of maps larger than 8.5" x 11", which are not easily copied.)

Part L - Filing Fee

Application fees shall be in accordance with the current Mansfield Code of Ordinance fee Schedule, pursuant to Section 8-1c of the Connecticut General Statutes. The fee schedule includes provisions for applicant-funded consultant studies and reports. The current fee schedule is available in the Planning and Zoning office.

Note: The Agency may require additional information about the upland review area or about wetlands or watercourses affected by the regulated activity. If the Agency, upon review of your application, finds the activity proposed may involve a "significant activity" as defined in the Regulations, additional information and/or a public hearing may be required.

Certification

I hereby certify that:

☐ I am familiar with the information contained in this form and that such information is true and correct to the best of my knowledge.

☐ I understand the penalties for obtaining a permit through deception or through inaccurate or misleading information.

Howard A Raphaelson _____ 01/26/2016 _____

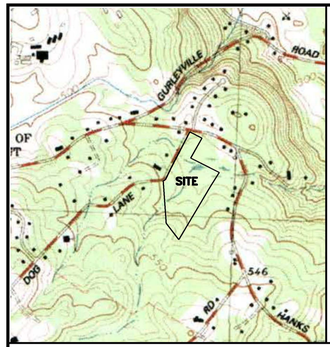
Signature Date

Authorization to Enter Property

The undersigned hereby consent to necessary and proper inspections of the above-mentioned property by members and agents of the Inland Wetlands Agency at reasonable times, both before and after the permit in question has been issued by the Agency.

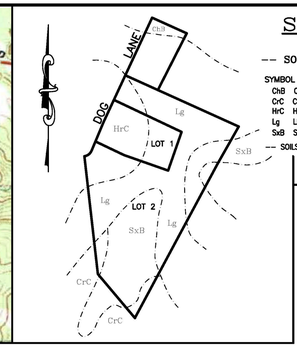
Howard A Raphaelson _____ 01/26/2016 _____

Signature Date



LOCATION MAP

SCALE : 1" = 1000'



SOIL MAP

SCALE : 1" = 400'

-- SOILS LEGEND --

SYMBOL	DESCRIPTION
ChB	CHARLTON STONY FINE SANDY LOAM, 3 TO 8 PERCENT SLOPES
CrC	CHARLTON VERY STONY FINE SANDY LOAM, 3 TO 15 PERCENT SLOPES
HrC	HOLLIS VERY ROCKY FINE SANDY LOAM, 3 TO 15 PERCENT SLOPES
Lg	LEICESTER-RIDGEBURY-WHITMAN VERY STONY COMPLEX
SxB	SUTTON VERY STONY FINE SANDY LOAM, 3 TO 15 PERCENT SLOPES

-- SOILS DATA AS PER : "SOIL SURVEY, TOLLAND COUNTY, CONNECTICUT, UNITED STATES DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE"

TOTAL PARCEL AREA 15.84 ACRES

AREA WITH OVER 15 PERCENT SLOPES – NONE
TOTAL AREA OF WETLANDS – 408,834 SQ.FT.±
PERCENT OF WETLANDS – 59.2%

ZONING TABLE

	REQUIRED	LOT 1	LOT 2
LOT AREA:	90,000 S.F.	102,626 S.F.	587,568 S.F.
LOT FRONTAGE:	200'	250.68'	606.47'
MIN. FRONT SETBACK:	60'	60'	60'
MIN. SIDE SETBACK:	35'	35'	35'
MIN. REAR SETBACK:	50'	575'±	560'±
BUILDABLE AREA:	40,000 S.F.	48,630 S.F.	44,075 S.F.*

*IN AREA OF PROPOSED HOUSE

AERIAL PHOTO

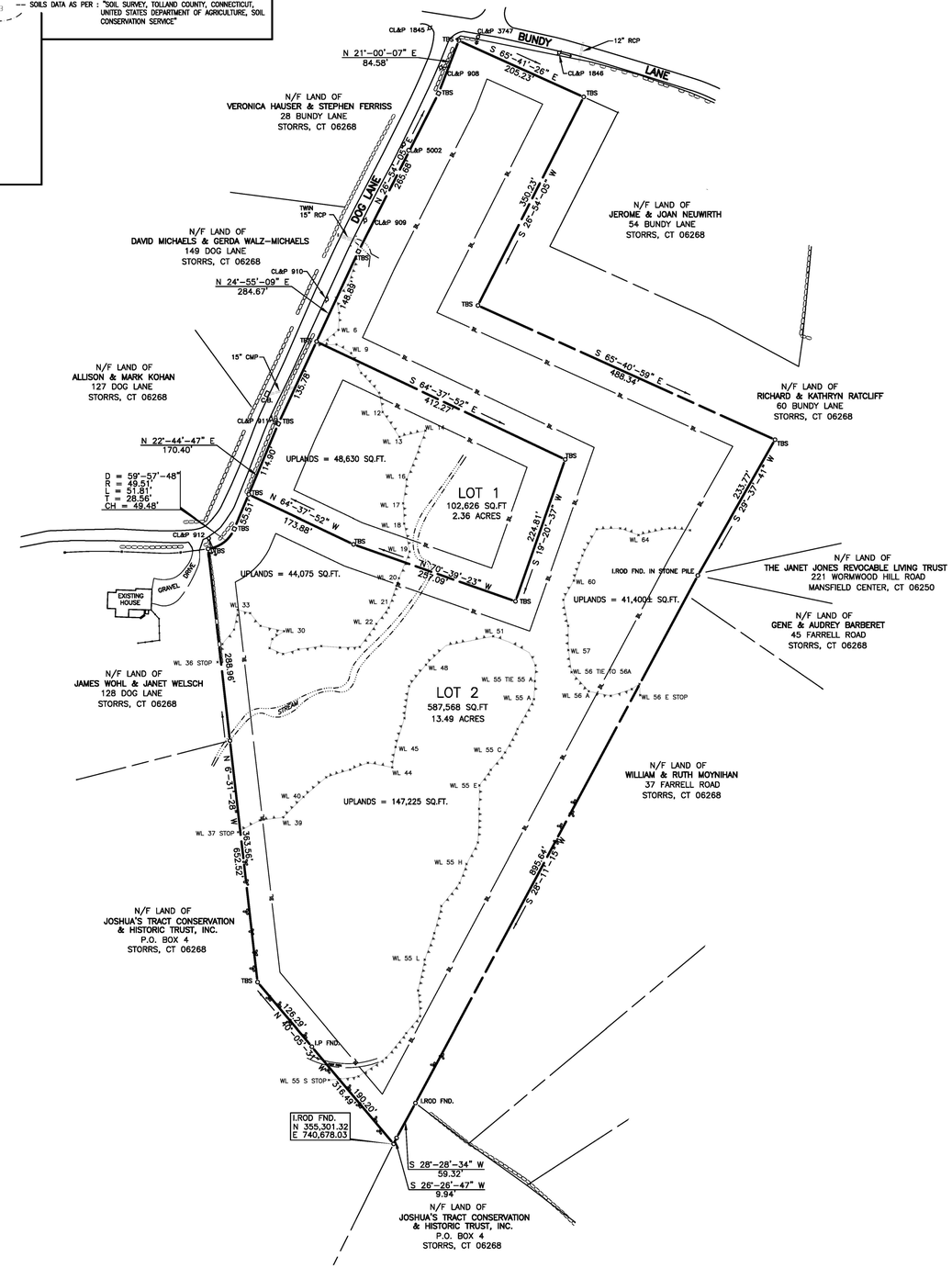
SCALE: 1" = 400'

REFERENCE MADE TO THE FOLLOWING MAPS:

1.) "AS-BUILT PLAN PREPARED FOR WILLIAM ZAVISTOSKI DOG LANE MANSFIELD, CONNECTICUT SCALE: 1" = 20' DATE: JUNE 16, 1998 DRAWN BY: SDK CHECKED BY: SAF SHEET 1 OF 1 FILIP ASSOCIATES 1875 STORRS ROAD, MANSFIELD, CT."

2.) "PLAN PREPARED FOR AUDREY & GENE BARBERET NO. 45 FARRELL ROAD STORRS, CONN. PLOT PLAN SCALE 1" = 20' DRN. R.M. DATE 7-24-84 TRD. D.C.K. FILE NO. 831137 SHEET NO 1 OF 1" PREPARED BY MEEHAN ASSOCIATES.

3.) "BOUNDARY SURVEY PREPARED FOR UCONN FOUNDATION, INC. DOG LANE & BUNDY LANE STORRS, CONNECTICUT SCALE: 1" = 40' DATE: JANUARY 6, 2012 DATUM ENGINEERING & SURVEYING, LLC 132 CONANTVILLE ROAD, MANSFIELD CENTER, CT. 06250 JOB NO. 211064".



BOUNDARY NOTES:

1.) STREETLINE ALONG DOG LANE (LOCAL ROAD PER ARTICLE III SECTION G.3 OF THE ZONING REGULATIONS) WAS ESTABLISHED 25 FEET FROM THE CENTERLINE OF THE EXISTING TRAVELLED WAY PER ARTICLE VIII SECTION 9 (HIGHWAY CLEARANCE SETBACKS) OF THE ZONING REGULATIONS.

2.) THE SUBJECT PROPERTY CONTAINS 15.84 ACRES.

NOTES:

1.) ALL PROPOSED LOTS CONTAIN 40,000 SQUARE FEET OF SUITABLE LAND FOR BUILDING AS DEFINED IN ARTICLE VIII, SECTION B.6 OF THE MANSFIELD ZONING REGULATIONS.

2.) UNDERGROUND UTILITIES

A. ALL WIRED UTILITY LINES SERVING STRUCTURES ON NEW LOTS SHALL BE INSTALLED UNDERGROUND. UTILITY LINES SHALL BE INSTALLED IN A SUITABLE CONDUIT SYSTEM UNLESS THE RESPONSIBLE UTILITY COMPANY DETERMINES THAT DIRECT BURIAL IS MORE APPROPRIATE.

B. UPON APPROVAL BY THE RESPONSIBLE UTILITY COMPANY, PLANS SHALL BE SUBMITTED TO DEPICT THE LOCATION OF ALL UNDERGROUND UTILITY EASEMENT AREAS.

3.) PURSUANT TO SUBDIVISION REGULATION PROVISIONS, (PARTICULARLY SECTIONS 7.4a, 7.5, AND 7.6) AND ZONING REGULATION PROVISIONS (PARTICULARLY ARTICLE VIII, SECTION B.5 AND B.6) THIS ACTION SPECIFICALLY APPROVES PROPOSED LOT AREAS AND THE DEPICTED BUILDING ENVELOPES, INCLUDING SETBACK WAIVERS FOR LOTS 1 & 2. UNLESS THE COMMISSION SPECIFICALLY AUTHORIZES REVISIONS, THE DEPICTED BUILDING ENVELOPES SHALL SERVE AS THE SETBACK LINES FOR ALL FUTURE STRUCTURES AND SITE IMPROVEMENTS, PURSUANT TO ARTICLE VIII OF THE ZONING REGULATIONS. THIS REQUIREMENT SHALL BE NOTED ON THE LAND RECORDS.

4.) PROPERTY LINE TO SERVE AS DEVELOPMENT AREA ENVELOPE LINE (DAE) EXCEPT WHERE DENOTED OTHERWISE ON LOTS.

APPROVED BY THE TOWN OF MANSFIELD INLAND WETLAND AGENCY

CHAIRMAN DATE

--- LEGEND ---

PROPERTY LINE	
ABUTTER'S PROPERTY LINE	
BUILDING SETBACK LINE	BL. BL.
EXISTING ROAD	
LIMIT OF WETLANDS	
CONSERVATION EASEMENT	
STONE WALL	
UTILITY POLE	
VIRGINA RAIL FENCE REMAINS	
IRON ROD TO BE SET	T.B.S.
IRON ROD FOUND	I.ROD FND.
MONUMENT TO BE SET	T.B.S.

THE WETLAND SOILS ON THIS SITE WERE IDENTIFIED IN THE FIELD USING THE CRITERIA REQUIRED BY CONNECTICUT P.A. 72-155 AS AMENDED BY CONN. P.A. 73-571, CONN. P.A. 87-338 AND P.A. 87-533. THE BOUNDARIES OF THESE SOILS AND OF IDENTIFIED WATERCOURSES ARE ACCURATELY REPRESENTED ON THIS PLAN.

JOHN P. IANNI DATE

BOUNDARY PLAN

PREPARED FOR

HOWARD & ALICE RAPHAELSON

DOG LANE
STORRS, CONNECTICUT

OWNER & SUBDIVIDER
HOWARD A. & ALICE K. RAPHAELSON
119 TIMBER DRIVE
STORRS, CONNECTICUT 06268

SCALE: 1" = 100' DATE: JANUARY 12, 2016
REVISED: FEB. 10, 2016 (PER EHHD COMMENTS)
REVISED: MARCH 7, 2016 (ADDITIONAL SOIL TESTING)
REVISED: MARCH 16, 2016

THIS SURVEY AND MAP HAS BEEN PREPARED IN ACCORDANCE WITH SECTIONS 20-300b-1 THRU 20-300b-20 OF THE REGULATIONS OF CONNECTICUT STATE AGENCIES – "MINIMUM STANDARDS FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT" AS ENDORSED BY THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS, INC. IT IS A SUBDIVISION MAP BASED ON A DEPENDENT RESURVEY CONFORMING TO HORIZONTAL ACCURACY CLASS "A-2". THE PROPOSED PROPERTY LINES BETWEEN LOTS BEING AN ORIGINAL SURVEY. THIS SURVEY AND MAP IS INTENDED TO ENABLE DETERMINATION OF COMPLIANCE OR NON-COMPLIANCE WITH APPLICABLE MUNICIPAL OR STATUTORY REQUIREMENTS.

TO THE BEST OF MY KNOWLEDGE AND BELIEF THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON.

EDWARD PELLETIER, L.S. #14203

ANY ORIGINAL OR DUPLICATE OF THIS MAP IS NOT VALID UNLESS IT BEARS THE EMBOSSED SEAL OF THE SURVEYOR WHOSE REGISTRATION NUMBER AND SIGNATURE APPEAR ABOVE. NO OTHER CERTIFICATION OR WARRANTY IS EXPRESSED OR IMPLIED.

SHEET 1 OF 2

DATUM
ENGINEERING & SURVEYING, LLC
132 CONANTVILLE ROAD
MANSFIELD CENTER, CT 06250
TEL (860)456-1357 FAX (860)456-1840

JOB NO.: 214044

CHECKED BY:_____ CORRECTIONS BY:_____

--- HOUSE SITE DEVELOPMENT ---

– THE FOLLOWING PROCEDURES FOR THE DEVELOPMENT OF THESE LOTS ARE RECOMMENDED:

1. THE LIMITS OF DISTURBANCE SHALL BE ESTABLISHED IN THE FIELD FOR THE PROPOSED RESIDENTIAL STRUCTURE. DISTURBANCE LIMITS OF 25–35 FEET BEYOND THE PHYSICAL DIMENSIONS OF THE STRUCTURE AND RELATED APPURTENANCES IS RECOMMENDED.
2. DRIVEWAY SHOULDERS SHOULD BE STABILIZED IMMEDIATELY UPON COMPLETION OF ROUGH GRADING. SHOULDER SEED BED PREPARATION SHOULD BE USED TO ENTRAP ANY SEDIMENT GENERATED FROM EXPOSED SOIL SURFACES. DRIVEWAY ROADBEDS SHALL BE STABILIZED WITH COMPACTED ROAD AGGREGATES AS SOON AS POSSIBLE.
3. TOPSOIL AND EXCAVATED SUBSOIL FROM THE FOUNDATION AREA SHOULD BE STOCKPILED WITHIN THE AREA OF DISTURBANCE IF NOT USED FOR ONSITE REGRADING. EACH STOCKPILE MUST BE ADEQUATELY RINGED WITH SEDIMENT CONTROL MATERIALS(i.e., HAY–BALES AND/OR SILT FENCE).
4. ANY ADDITIONAL STOCKPILING OF LUMBER AND BUILDING MATERIALS SHOULD ALSO BE CONFINED TO THE AREA OF DISTURBANCE. SIMILARLY, VEHICULAR MOVEMENT SHALL BE DIRECTED TO ESTABLISHED PARKING AREAS. DEVELOPMENT OF SEWAGE DISPOSAL LEACHING AREAS SHOULD BE STAGED TO FOLLOW HOUSE SITE PREPARATION. ONLY THE PRIMARY LEACHING SYSTEM NEED BE CLEARED OF EXISTING VEGETATION IN COORDINATION WITH THE APPROVED SEPTIC SYSTEM DESIGN. RESERVE AREA SHALL REMAIN UNDISTURBED IF SITE CONDITIONS PERMIT.
5. ONCE THE PROPOSED STRUCTURE IS ENCLOSED, ALL EFFORTS SHOULD BE MADE TO COMPLETE ON SITE IMPROVEMENTS SUCH AS WELL, FOOTING DRAIN, SEPTIC SYSTEM, DRIVEWAY, ETC.. THEREAFTER, ALL RAW SOIL AREAS SURROUNDING THE HOME SITE SHALL BE FINE GRADED AND MULCHED.

--- GENERAL NOTES ---

EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED PRIOR TO ANY EXCAVATION OR DISTURBANCE OF EXISTING GROUND. EXCAVATIONS WHICH MUST BE DEWATERED WILL BE PUMPED INTO AN EXCAVATED STILLING BASIN SURROUNDED WITH SILT FENCING. DEBRIS AND OTHER WASTE GENERATED FROM EQUIPMENT MAINTENANCE AND CONSTRUCTION WILL NOT BE DISCARDED ON THE SITE. IN THE EVENT OF CONFLICT BETWEEN THESE PLANS AND OTHER REGULATIONS, THE MORE STRINGENT SHALL APPLY.

A. SEED BED PREPARATION: FINE GRADE AND RAKE SOIL SURFACE TO REMOVE STONES LARGER THAN 2" DIAMETER. INSTALL NEEDED EROSION CONTROL DEVICES SUCH AS SURFACE WATER DIVERSIONS. APPLY LIMESTONE AT A MINIMUM RATE OF 2 TONS PER ACRE OR 90 LBS PER 1000 SQUARE FEET.
FERTILIZE WITH 10–10–10 AT A RATE OF 300 LBS. PER ACRE OR 7.5 LBS. PER 1000 SQUARE FEET. WORK LIME AND FERTILIZER INTO SOIL UNIFORMLY TO A DEPTH OF 4" WITH A WISK, SPRINGTOOTH HARROW OR OTHER SUITABLE EQUIPMENT FOLLOWING THE CONTOUR LINES.

B. SEED APPLICATION: APPLY GRASS SEED MIXTURE BY HAND, CYCLONE SEEDER OR HYDROSEEDER. INCREASE SEED MIXTURE BY 10 PERCENT IF HYDROSEEDING. LIGHTLY DRAG OR ROLL THE SEEDED SURFACE TO COVER SEED. SEED SHALL CONSIST OF A MIXTURE OF KENTUCKY BLUEGRASS (0.45 LBS/1000 SQ.FT.), CREEPING RED FESCUE (0.45 LBS./1000 SQ.FT.), AND PERENNIAL RYEGRASS (0.10 LBS./1000 SQ.FT.). SEEDING OF PERMANENT GRASS SEED SHALL BE DONE BETWEEN APRIL 15 THROUGH JUNE 15 AND AUGUST 15 THROUGH SEPTEMBER 15. IN THE EVENT SEEDING CANNOT BE COMPLETED DURING THE ABOVE DATES, A TEMPORARY GRASS SEED CONSISTING OF 1.0 LBS./1000 SQ.FT. OF ANNUAL RYE GRASS SHALL BE APPLIED. MOISTURE CONDITIONS SHALL BE SUPPLEMENTED FOR TEMPORARY SEEDING BETWEEN JUNE 15 AND AUGUST 15.

C. MULCHING: IMMEDIATELY FOLLOWING SEEDING, MULCH THE SEEDED SURFACE, WITH STRAW OR HAY AT A RATE OF 1.5 TO 2 TONS PER ACRE WHERE SLOPES EXCEED 10 PERCENT, SPREAD MULCH BY HAND OR MULCH BLOWER. PUNCH MULCH INTO SOIL SURFACE WITH TRACK MACHINE OR DISH HARROW SET STRAIGHT UP. MULCH MATERIAL SHOULD BE "SET" INTO SOIL SURFACE APPROXIMATELY 2–3 INCHES.

--- PLAN IMPLEMENTATION ---

DURING CONSTRUCTION IT SHALL BE THE RESPONSIBILITY OF HOWARD RAPHAELSON (860–429–1340) TO INSURE THE IMPLEMENTATION OF THIS EROSION & SEDIMENTATION CONTROL PLAN. THIS RESPONSIBILITY INCLUDES INSTALLATION AND MAINTENANCE OF CONTROL MEASURES, INFORMING ALL PARTIES ENGAGED ON THE SITE OF THE REQUIREMENTS AND OBJECTIVES OF THIS PLAN, AND NOTIFYING THE WETLAND AGENT OF ANY TRANSFER OF THIS RESPONSIBILITY AND FOR CONVEYING A COPY OF THE EROSION AND SEDIMENT PLAN IF AND WHEN TITLE OF THE LAND IS TRANSFERRED.

EDWARD PELLETIER, L.S. #14203

TEST HOLE DATA

TEST HOLES OBSERVED BY EHHD
ON NOVEMBER 18, 2015

–TEST HOLE #1 (UNSUITABLE)
0"– 9" TOPSOIL
9"–18" MOTTLED SILT LOAM
18"–61" COMPACT MOTTLED GREY CLAY
ROOTS TO 17"
MOTTLING AT 9"
NO WATER
NO LEDGE

–TEST HOLE #2
0"–10" TOPSOIL
10"–19" BROWN SILT LOAM
19"–71" GREY MOTTLED GLACIAL TILL
ROOTS TO 24"
MOTTLING AT 19"
NO WATER
NO LEDGE

–TEST HOLE #3
0"– 8" TOPSOIL
8"–20" OB FINE SANDY LOAM
20"–64" MOTTLED SANDY LOAM TILL
W/GRAVEL, COBBLES, STONES, BOULDERS
ROOTS TO 25"
MOTTLING AT 20"
NO WATER
NO LEDGE

–TEST HOLE #4
0"– 6" TOPSOIL
6"–24" GRAVELLY OB FINE SANDY LOAM
24"–74" MOTTLED SANDY LOAM TILL
W/GRAVEL, COBBLES, STONES
ROOTS TO 26"
MOTTLING AT 24"
NO WATER
NO LEDGE

–TEST HOLE #5
0"– 4" TOPSOIL
4"–25" GRAVELLY OB FINE SANDY LOAM
25"–77" MOTTLED SANDY LOAM TILL
W/COBBLES, STONES, BOULDERS
ROOTS TO 28"
MOTTLING AT 25"
NO WATER
NO LEDGE

–TEST HOLE #6
0"– 5" TOPSOIL
5"–27" GRAVELLY OB FINE SANDY LOAM
27"–64" MOTTLED SANDY LOAM TILL
W/COBBLES, STONES, BOULDERS
ROOTS TO 29"
MOTTLING AT 27"
NO WATER
NO LEDGE

–TEST HOLE #7
0"– 4" TOPSOIL
4"–26" GRAVELLY OB FINE SANDY LOAM
26"–63" MOTTLED SANDY LOAM TILL
W/COBBLES, STONES
ROOTS TO 25"
MOTTLING AT 26"

TEST HOLES OBSERVED BY EHHD
ON MARCH 1, 2016

–TEST HOLE #100
0"– 6" TOPSOIL
6"–24" ORANGE/BROWN FINE SANDY LOAM
24"–50" GRAY MOTTLED SANDY LOAM TILL
W/GRAVEL, COBBLES, STONES
50"–55" GROUND WATER
ROOTS TO 26"
MOTTLING AT 24"
SEEPAGE AT 25"
NO LEDGE

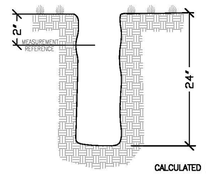
–TEST HOLE #101
0"– 7" TOPSOIL
7"–27" ORANGE/BROWN FINE SANDY LOAM
27"–69" GRAY/BROWN MOTTLED SANDY LOAM TILL
W/GRAVEL, COBBLES, STONES
ROOTS TO 32"
MOTTLING AT 27"
NO WATER
NO LEDGE

–TEST HOLE #102
0"– 5" TOPSOIL
5"–25" ORANGE/BROWN FINE SANDY LOAM
25"–60" GRAY/BROWN MOTTLED SANDY LOAM TILL
W/GRAVEL, COBBLES, STONES
60"–61" GROUND WATER
ROOTS TO 36"
MOTTLING AT 25"
NO SEEPAGE
NO LEDGE

PERCOLATION TEST #1

CONDUCTED BY DATUM ENGINEERING & SURVEYING, LLC. ON NOV. 21, 2015

PRESOAKED AT 3:25 P.M (11–20–15)



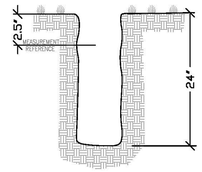
TIME	READING
8:37	8"
8:42	9–1/2"
8:47	10"
8:52	10–1/2"
8:57	11–1/2"
9:02	12"
9:07	12–1/2"
9:12	13"
9:17	13–1/2"
9:22	14"
9:27	14–1/2"
9:32	15"

CALCULATED PERCOLATION RATE: 10 MIN/IN

PERCOLATION TEST #1A

CONDUCTED BY DATUM ENGINEERING & SURVEYING, LLC. ON NOV. 21, 2015

PRESOAKED AT 3:20 P.M (11–20–15)



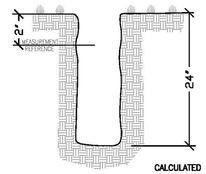
TIME	READING
8:34	7–1/2"
8:39	11"
8:44	13"
8:49	15–1/2"
8:54	16–1/2"
8:59	18"
9:04	19–1/2"
9:09	DRY
9:09	8"
9:14	9–1/2"
9:19	10–1/2"
9:24	12–1/2"
9:29	13–1/2"
9:34	14–1/2"
9:39	16"
9:44	16–1/2"
9:49	17"

CALCULATED PERCOLATION RATE: 10 MIN/IN

PERCOLATION TEST #2

CONDUCTED BY DATUM ENGINEERING & SURVEYING, LLC. ON NOV. 21, 2015

PRESOAKED AT 3:35 P.M (11–20–15)



TIME	READING
8:41	6–1/2"
8:46	9"
8:51	11"
8:56	12"
9:01	13"
9:06	14–1/2"
9:11	15–1/2"
9:16	16–1/2"
9:21	17"
9:26	17–1/2"
9:31	18"

CALCULATED PERCOLATION RATE: 10 MIN/IN

NOTES:

1.) THE DEPICTED SEPTIC SYSTEMS ARE SIZED FOR FOUR BEDROOM DWELLINGS.

2.) SOLAR ACCESS: PROPOSED HOUSES HAVE BEEN DEPICTED TO MAXIMIZE SOLAR HEAT GAIN AND MINIMIZING SOLAR HEAT LOSS AS SPECIFIED IN SECTION 4.6 OF THE TOWN OF MANSFIELD SUBDIVISION REGULATIONS.

2A.) RESIDENTIAL SITE PLAN DESIGNS SHALL INCORPORATE AT LEAST ONE OF THE FOLLOWING PASSIVE SOLAR AND OTHER ALTERNATIVE ENERGY TECHNOLOGIES:

a.) GARAGE POSITIONED ON THE NORTH OR WEST SIDE
b.) KITCHEN ON THE EAST SIDE
c.) PREDOMINATE DAYTIME LIVING SPACE WITH SOUTHERN EXPOSURE
d.) SOUTHERLY FACING BUILDING EAVES EXTENDED SO AS TO REDUCE SUMMER SUNLIT HEAT FROM ENTERING WINDOWS.
e.) GEOTHERMAL OR OTHER ACTIVE ALTERNATIVE ENERGY SOURCE.

3.) IT IS CERTIFIED WITH THE ACKNOWLEDGMENT BELOW, THAT THE DIMENSIONAL LOT REQUIREMENTS OF ARTICLE VIII, SECTION A OF THE TOWN OF MANSFIELD ZONING REGULATIONS HAVE BEEN MET.

4.) ALL PROPOSED LOTS CONTAIN 40,000 SQUARE FEET OF SUITABLE LAND FOR BUILDING AS DEFINED IN ARTICLE VIII, SECTION B.6 OF THE MANSFIELD ZONING REGULATIONS.

5.) ALL STUMP BURIAL HOLES ON INDIVIDUAL LOTS SHALL COMPLY WITH THE STATE OF CONNECTICUT DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION SOLID WASTE REGULATIONS.

6.) UNDERGROUND UTILITIES

6A. ALL WIRED UTILITY LINES SERVING STRUCTURES ON NEW LOTS SHALL BE INSTALLED UNDERGROUND. UTILITY LINES SHALL BE INSTALLED IN A SUITABLE CONDUIT SYSTEM UNLESS THE RESPONSIBLE UTILITY COMPANY DETERMINES THAT DIRECT BURIAL IS MORE APPROPRIATE;

6B. UPON APPROVAL BY THE RESPONSIBLE UTILITY COMPANY, PLANS SHALL BE SUBMITTED TO DEPICT THE LOCATION OF ALL UNDERGROUND UTILITY EASEMENT AREAS;

6C. ALL UNDER PAVEMENT CONDUITS SHALL BE INSTALLED PRIOR TO THE PAVING OF ANY STREETS OR DRIVEWAYS.

7.) UNLESS REVISIONS ARE SPECIFICALLY AUTHORIZED BY THE COMMISSION, THE BUILDING AREA ENVELOPE AS DEPICTED ON THESE FINAL PLANS SHALL SERVE AS THE SETBACK LINES FOR ALL FUTURE STRUCTURES AND SITE IMPROVEMENTS, PURSUANT TO ART. VIII OF THE ZONING REGULATIONS.

8.) PORTIONS OF THE DEPICTED BUILDING ENVELOPES ARE WITHIN AREAS REGULATED BY THE INLAND WETLAND AGENCY. ANY LAND DISTURBANCES WITHIN THESE AREAS THAT ARE NOT INCLUDED ON THE PLANS APPROVED BY THE INLAND WETLAND AGENCY MAY REQUIRE SUBSEQUENT APPROVAL BY THE AGENCY.

9.) ALL LOTS REQUIRE THE REMOVAL OR FILLING OF LESS THAN 500 CUBIC YARDS OF MATERIAL FOR THE CONSTRUCTION OF THE PROPOSED HOUSE AND DRIVEWAY AND LESS THAN 300 CUBIC YARDS FOR THE SEPTIC FILL.

10.) A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF CONNECTICUT SHALL DESIGN ON–SITE SUBSURFACE DISPOSAL SYSTEMS FOR ALL LOTS IN THIS SUBDIVISION.

11.) FOUNDATION DRAIN OUTLETS WITHIN 25 FEET OF PROPOSED SEPTIC SYSTEMS SHALL BE CONSTRUCTED OF SOLID PVC ASTM D 1785/ ASTM D 2665 (OR EQUAL) WITH RUBBER GASKET JOINTS.

12.) NO LOTS MAY BE SOLD UNTIL SUBDIVISION WORK IS COMPLETED AND APPROVED OR FULLY BONDED TO THE SATISFACTION OF THE MANSFIELD PLANNING AND ZONING COMMISSION.

13.) DURING HOUSE CONSTRUCTION EFFORTS SHALL BE MADE TO RETAIN AND PRESERVE EXISTING STONE WALLS. ANY STONE WALLS REMOVED DURING CONSTRUCTION SHALL BE RECONSTRUCTED ALONG BOUNDARY LINES AND/OR ENHANCE ADJACENT SEGMENTS OF EXISTING STONE WALLS.

14.) DRIVEWAY SIGHT LINES MEET OR EXCEED 250 FEET FOR ALL LOTS. NO PROPOSED DRIVEWAY SLOPES EXCEED 15 PERCENT.

15.) ALL SIGNIFICANT TREES PURSUANT TO SECTION 6.5.j.3 OF THE MANSFIELD SUBDIVISION REGULATIONS HAVE BEEN IDENTIFIED BASED ON A FIELD INSPECTION BY A LANDSCAPE ARCHITECT. ALL SIGNIFICANT TREES DEPICTED HEREON, NOT NOTED TO BE REMOVED, SHALL BE PROTECTED DURING ANY NEARBY CONSTRUCTION. PROTECTION SHALL CONSIST OF A 4 FOOT HIGH ORANGE KNITTED POLYETHYLENE BARRIER FENCE WITH POSTS PROVIDING A MINIMUM 10 FOOT RADIUS AROUND THE BASE UNTIL COMPLETION OF CONSTRUCTION ACTIVITIES.

16.) DEVELOPMENT OF INDIVIDUAL HOUSE SITES SHOULD CONSIDER LOW IMPACT DESIGNS PRACTICES FOR STORM WATER MANAGEMENT TO MINIMIZE DISTURBANCE, PRESERVE NATURAL FEATURES, REDUCE IMPERVIOUS COVER, FACILITATE INFILTRATION OPPORTUNITIES AND PRESERVATION OF STONE WALLS.

APPROVED BY THE TOWN OF MANSFIELD INLAND WETLAND AGENCY

CHAIRMAN DATE

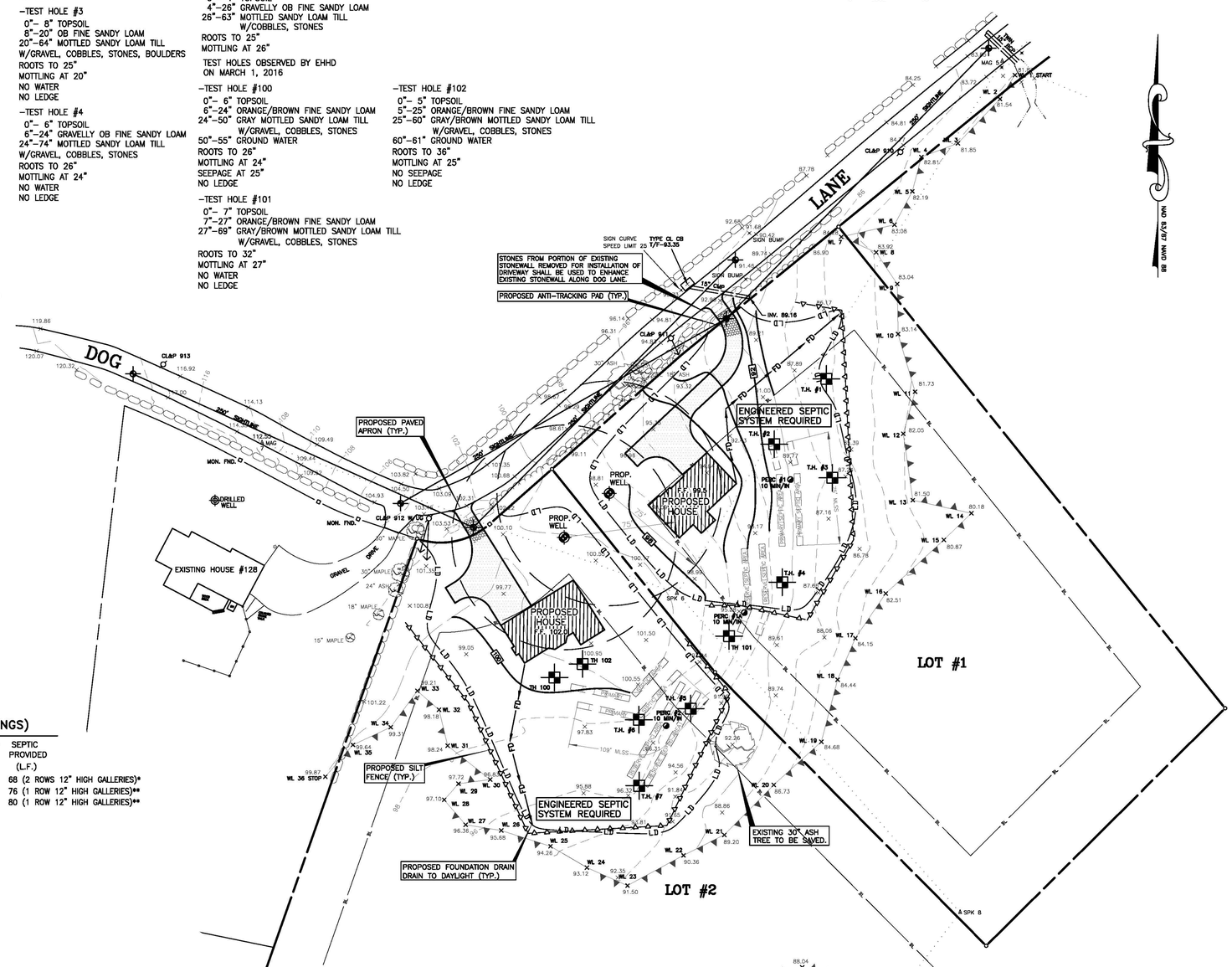
SIZING SUBSURFACE DISPOSAL SYSTEMS (FOR NEW DWELLINGS)

LOT NO.	SLOPE (%)	RESTRICTIVE LAYER (INCHES)	HYDRAULIC FACTOR	FLOW FACTOR	PERCOLATION FACTOR	REQUIRED MLSS (L.F.)	REQUIRED AREA (SQ.FT.)	SEPTIC PROVIDED (L.F.)
1	9.7	21	30	2.0	1.2	72	660	68 (2 ROWS 12" HIGH GALLERIES)*
2	4.0	26	42	2.0	1.2	100.8	660	76 (1 ROW 12" HIGH GALLERIES)**
								80 (1 ROW 12" HIGH GALLERIES)**

*MLSS = 75 L.F.
**MLSS = 105 L.F.

--- LEGEND ---

--- EXISTING ---		--- PROPOSED ---
	PROPERTY LINE	
	STONEWALL	
	TEST HOLE	
	EASEMENT LINE	
493.79	SPOT ELEVATION	
	CONTOUR	550
	WELL	
	LIMIT OF WETLANDS	
	PERCOLATION TEST	
	FOUNDATION DRAIN	FD
	SILT FENCE	
	BUILDING SETBACK LINE	BL
	UNDERGROUND UTILITIES	UTL
	LIMITS OF DISTURBANCE	LD



THE WETLAND SOILS ON THIS SITE WERE IDENTIFIED IN THE FIELD USING THE CRITERIA REQUIRED BY CONNECTICUT P.A. 72–155 AS AMENDED BY CONN. P.A. 73–571, CONN. P.A. 87–338 AND P.A. 87–533. THE BOUNDARIES OF THESE SOILS AND OF IDENTIFIED WATERCOURSES ARE ACCURATELY REPRESENTED ON THIS PLAN.

JOHN P. IANNI DATE

80 40 0 40 120
SCALE : 1" = 40'

THIS SURVEY AND MAP HAS BEEN PREPARED IN ACCORDANCE WITH SECTIONS 20–300b–1 THRU 20–300b–20 OF THE REGULATIONS OF CONNECTICUT STATE AGENCIES – "MINIMUM STANDARDS FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT" AS ENDORSED BY THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS, INC. IT IS A SUBDIVISION MAP BASED ON AN ORIGINAL SURVEY CONFORMING TO HORIZONTAL ACCURACY CLASS A–2 AND TOPOGRAPHIC SURVEY ACCURACY CLASS T–3. THIS SURVEY AND MAP IS INTENDED TO BE USED FOR THE CREATION OF PROPOSED PROPERTY LINES AND TO ENABLE DETERMINATION OF COMPLIANCE OR NON–COMPLIANCE WITH APPLICABLE MUNICIPAL OR STATUTORY REQUIREMENTS.

TO THE BEST OF MY KNOWLEDGE AND BELIEF THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON.

EDWARD PELLETIER, R.L.S. 14203

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SITE DEVELOPMENT PLAN

PREPARED FOR

HOWARD & ALICE RAPHAELSON

DOG LANE
STORRS, CONNECTICUT

OWNER & SUBDIVIDER
HOWARD A. & ALICE K. RAPHAELSON
119 TIMBER DRIVE
STORRS, CONNECTICUT 06268

SCALE: 1" = 40' DATE: JANUARY 12, 2016
REVISED: FEB. 10, 2016 (PER EHHD COMMENTS)
REVISED: FEB. 23, 2016 (SITE GRADING ADDED)
REVISED: MARCH 16, 2016

SHEET 2 OF 2

DATUM
ENGINEERING & SURVEYING, LLC
132 CONANTVILLE ROAD
MANSFIELD CENTER, CT 06250
TEL (860)456–1357 FAX (860)456–1840

JOB NO.: 214044

CHECKED BY:_____ CORRECTIONS BY:_____

● Ecology
● Soil & Wetland Studies
● Water Quality Monitoring ● GPS
● Environmental Planning & Management
● Ecological Restoration & Habitat Mitigation
● Aquatic, Wildlife and Listed Species Surveys
● Application Reviews ● Permitting & Compliance

March 27, 2016

Town of Mansfield
Inland Wetlands Agency
14 Park Place
Mansfield, CT 06226-2217

Re: **WETLANDS ASSESSMENT & IMPACT ANALYSIS: *SUMMARY OF FINDINGS***
Raphaelson Estates, 2-lot Residential Subdivision
Dog Lane, Storrs, CT

REMA Job No.: 16-1903-MNS19

Dear Agency members:

At the request of the applicant, Howard A. Raphaelson, REMA ECOLOGICAL SERVICES, LLC (REMA) has prepared this document to be submitted as part of an application for a two-lot residential subdivision, currently before the Town of Mansfield's Inland Wetlands Agency ("IWA" "the Agency"). The project plans, reviewed by REMA, were prepared by Datum Engineering & Surveying, LLC, and dated 1/12/16, and revised through 3/16/16.

We are providing herein our *Summary of Findings* with an overview of the site's regulated resources and other environmental features, as well as an analysis of the proposal, as it relates to regulated wetlands and watercourses. This document presents the basis for our professional opinion that existing wetland and watercourse functions and values will not be degraded by the proposed activities.

In addition, we discuss the potential for the site's regulated wetlands and watercourses to be utilized as habitat for two "CT-listed" Species of Special Concern, namely the Appalachian brook crayfish (*Cambarus bartonii*), the wood turtle (*Glyptemys insculpta*). According to the

CT DEEP's Natural Diversity Database, the former species has been documented in Robert's Brook, while latter from the Fenton River. Robert's Brook, a perennial stream, is to the northwest of the subject site, in a different watershed than that of the site's intermittent streams[1], while the Fenton River is downgradient and to the north and east of the site.

Site visits, to obtain baseline data that allow for adequate descriptions of the regulated resources, were conducted on February 27th, and March 25th, 2016. During the second site visit we targeted the site's streams, documenting aquatic life, and specifically searching for the "CT-listed" crayfish.

Attached to this report are several figures (Figures 1 through 4) including a recent aerial photograph, as well as several annotated photographs with an emphasis on the site's regulated resources (Photos 1 through 14). Moreover, we also attach two inventory forms, one for the wetlands, and one for the site's eastern intermittent stream, and the CT Soil Survey of the subject site.

INTRODUCTION & OVERVIEW

The applicant proposes to subdivide a roughly 15.85-acre parcel ("the site," "the study area") into two lots, for the purpose of siting two single-family houses, which would be served by on-site wells and septic systems. The plan calls for the proposed houses to be built within the eastern uplands of the overall parcel, with access from Dog Lane. Direct impacts to wetlands and watercourses are not proposed, and proposed lot development activities will average 40-50 feet from the wetland boundaries.

Regulated wetland boundaries were delineated by John P. Ianni, Certified Professional Soil Scientist, and were verified in the field and found to be substantially accurate.

The *Summary of Findings* presented below is based on field investigations, secondary-source maps and documents, and the proposed project plans.

[1] The streams associated with the site show up as "dashed" blue lines in the USGS topographic map of the area (see Figure 1), indicating that they are not considered perennial. However, we believe these stream sto be "semi-perennial," that is, streams which may stop flowing in the summer of some years, but retain moisture within them to support some aquatic species.

2.0 SUMMARY OF FINDINGS

2.1 EXISTING CONDITIONS

- The overall 15.85-acre parcel is located in Storrs, Connecticut, roughly equal distance from Route 195 and the University of Connecticut to the west, and the Fenton River riparian corridor to the east (see Figure 1, attached). The surrounding landscape is comprised of undeveloped land and low to medium density residential landuses.

- The proposed development area is a roughly 2.2-acre wooded upland section of the property, which abuts Dog Lane to the northwest. Soils here are mapped as the well-drained Canton and Charlton (61) soil series complex.

- One contiguous wetland (i.e. Wetland A) is associated with the overall parcel, and extends off-site to the east and to the southwest (see Figure 2, attached). This is red maple dominated forested wetland, with *seasonally flooded*, *seasonally saturated*, and *saturated* hydrologic regimes (see appended definitions). The dominant hydro-geomorphic (HGM) classification of Wetland A, includes *groundwater slope*, and *groundwater depression*.

- Dominant overstory vegetation in Wetland A includes red maple, green ash, and American elm, while the locally dense understory supports spicebush, Japanese barberry (invasive), multiflora rose (invasive), and highbush blueberry. Due to the season of wetland characterization and inventory (early Spring), identifiable species of the herbaceous layer included skunk cabbage, ferns (sensitive, cinnamon, wood ferns), swamp dewberry, scouring rush, sedges, and a few others. Floristic diversity is likely moderately high in the herb stratum. It should be noted that there is a fairly severe infestation of Japanese barberry within Wetland A, particularly within its poorly drained sections on sloping terrain.

- Two intermittent streams are associated with Wetland A, one flows from the west into it via a culvert under Dog Lane (i.e. the northern stream), the other flows down moderate slopes from the south, past the development area (i.e. the eastern stream). Moderate intensity surveys were conducted along the two intermittent streams, in part in an effort to locate a "CT-listed" crayfish (*Cambarus bartonii*) (see also attached USEPA Stream Data Form).

- Wetland A can be characterized as having two sections: a poorly drained section on gentle slopes, associated with the eastern stream, and a very poorly drained section on nearly flat terrain, associated with the stream that forms after the confluence of the two tributaries.

- A formal functions and values assessment of Wetland A has not been conducted. However, it can be said that in general this wetland does offer several *principal* functions including *wildlife potential*, *groundwater discharge*, and *nutrient removal, retention and transformation*. While a significant portion of the wetland is dominated in the understory by invasive species, the very poorly drained section on nearly level terrain, is mostly free of invasives, and would likely be found to have a moderate level of floristic diversity. This fact and the presence of the two streams confer functional value to this wetland. We should also note, that while we did not specifically inventory, being that it was off-site, the far eastern section of Wetland A is flooded and likely provides breeding habitat for forest dwelling amphibians (a few spring peepers were heard chorusing during our March visit).

- A qualitative macro benthos survey of the eastern stream (watershed: +/-85.8 acres, see Figure 4), resulted in a moderately high number of the following taxa: mayflies [Ephemenoptera (E), Ephimerellidae, Baetidae], stoneflies [Plecoptera (P), Perlidae], and caddisflies [Trichoptera (T), Glossosomatidae]. Both the stoneflies and the mayflies were early instars (nymphs). The absence of later instars, particularly of the stoneflies, indicates that this stream is intermittent, not allowing for completion of the 1-2 year cycle to adult emergence. However, the presence of the EPT taxa, and a general paucity of diptera (e.g. midges, black flies, etc.) and other taxa of pollution tolerant macroinvertebrates, indicate good to very good water quality in the stream.

- *Cambarus bartonii*, known at the Appalachian brook crayfish, is one of eight crayfish species identified to date in Connecticut (by CT DEEP and others). It is listed in Connecticut as a Species of Special Concern. As of 2011, this species has been collected in 11 sites statewide, including Eagleville Brook[2], in Mansfield. Additional anecdotal data suggests that this species also exists in many small watercourses of northwestern CT. A moderate intensity search for crayfish species was conducted

[2] A recent email communication with Dawn McKay of CT DEEP's Natural Diversity Database, indicated that this species was also associated with Roberts Brook, located north west of the subject site. This could be an observation made since 2011 or an error in location.

along a roughly 320-stretch of the eastern stream. Roughly 75% of the stream channel was searched, but none where observed. Moreover, remnants of exoskeletons, typically found in crayfish streams, were not encountered. Crayfish breed in early Spring, so they are typically more conspicuous. We surmise that even though crayfish can survive in "semi-perennial" (i.e. higher order intermittent) streams, they prefer perennial streams with a robust and continuous supply of prey (e.g., insect larvae, amphibian eggs, etc.).

- The CT DEEP, via an email communication to the project engineer, in addition to the crayfish species, also indicated that wood turtle, another Species of Special Concern, was known from the vicinity of the site, and specifically the Fenton River riparian corridor. Figure 3 (attached), shows that the subject site is at least 2,000 feet upgradient and to the southwest of the Fenton River. While wood turtles are known to move long distances, usually 1,000 feet or more, in terrestrial, even wooded, habitats in search of foraging opportunities (and sometime nesting), they much prefer more open successional habitats. In addition to a paucity of preferred habitats at the site, and the sheer distance, the terrain is inhospitable for wood turtle travel, including roadways and moderately steep slopes. What comes in play is the ecological principle of energy conservation, especially for a cold-blooded animal. A wood turtle would not expend the energy to travel this far and under unfavorable conditions to utilize the subject site.

2. PROPOSED CONDITIONS

- There are *no* direct impacts to wetlands or watercourses proposed.

- Potential *indirect* impacts would be associated with the potential for erosion and sedimentation during the construction phase, and the potential degradation of water quality during the post-construction phase. Other potential indirect impacts, such as alteration of hydrology, or introduction of invasive species, would not be relevant at this site.

- The erosion and sedimentation controls shown on the plans are more than adequate to ensure protection of the regulated resources during construction. Cuts and fills are minimal, soils are predominately of medium texture, thus only moderately erosible,

the primary areas of earthwork are sufficiently far from the wetlands and watercourses, and slopes are not excessive. Diligent monitoring and maintenance of the controls, however, is of paramount importance.

- In general, the limit of disturbance (LD) shown on the plans allows for an average of about 40 feet of undisturbed upland to the wetlands and even more to the watercourses, on generally gentle slopes. This is a sufficiently wide protective zone both during and after construction.

- It has come to our attention that the Conservation Commission, as well as an adjacent property owner, has voiced concerns regarding the potential for the on-site septic systems to impact the wetlands and watercourses. We note that a slight adjustment to the septic system locations (primary field) is shown on the revised plans (3/16/16). For Lot #1, the closest the primary septic area is to a wetland boundary (following topographic contours) is +/- 66 feet, while for Lot #2, it is 94 feet.

- In the past, failed septic systems have resulted in the release of nutrients to wetland and aquatic systems, often resulting in the degradation of these habitats. This release typically increases rank vegetation that outcompete many other plant species, reducing diversity, and promotes growth of alga on stream substrate, smothering the aquatic habitat. Watershed-wide studies by federal agencies such as USEPA and the USGS had shown that, in general, the water quality of surface waters in watersheds that were sewered, was higher than those that were not (e.g. Heisig 1999)[3]. Today, with the revisions to the "health code" septic systems are much more stringently permitted, and their design is highly engineered and conservative.

- The potentially harmful constituent that is exported by septic systems is nitrate-nitrogen, which while naturally occurring is typically in the 0.3 to 0.6 mg/L range in non-impaired surface waters, based on our multi-year Connecticut experience[4].

- Specifically related to the subject site and septic systems we note the following:

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[3] Heisig, P.M., 1999, Effects of unsewered residential land use on chloride and nitrate concentrations in stream baseflow in the Croton watershed,southeastern New York [abs]: EOS, Transactions, American Geophysical Union 1999 Spring Meeting, v. 80, no. 17, p. S123.

[4] In the early spring these concentrations can be between 1.0 and 1.5 mg/L, or even higher, but quickly subside as soon as vegetation starts taking up this nutrient.

- First, we have not collected a surface water sample to see if there is already elevated nitrate-nitrogen in the eastern stream, which would potentially be the recipient of nitrate-nitrogen from the septic systems. However, based on the type and abundance of emerging vegetation, and the presence of some macro-alga in the stream (e.g. filamentous green), it is likely that nitrate concentrations are low-moderate.

- Second, the assumption here is that shallow groundwater would flow from the septic system areas and be discharged to the eastern stream. While this might be the case during high flow and high groundwater periods, such as during the early Spring (when dilution of nitrate is high diminishing concentrations), during low flows, such as during late spring through early fall, that might not be the case at all, especially considering that the stream does not have much or any baseflow during those times. Technically, it is an intermittent stream.

- Third, the ultimate recipient of any excess nitrate-nitrogen is the larger, nearly level swamp in the northern and northeastern section of the overall property, with very poorly drained soils and dense vegetation. Flow velocities are reduced in the swamp, and water spreads out and interfaces with vegetation and soils. The presence of muck, which is high in organics, promotes denitrification, and nitrate-nitrogen (as well as other nitrogen species) is converted to atmospheric nitrogen. Then, of course, there is plant uptake, which is also quite high here during the growing season. Therefore, the wetland is able to take care of excess nitrogen without any impacts to the downgradient perennial watercourse, namely the Fenton River.

- The only quantitative tool that is available to us is a nitrate-nitrogen dilution analysis for each of the septic systems that are proposed. It is our understanding that the project engineer is conducting such an analysis, and will forward it directly to the Agency. We have not seen the results of this analysis, but we note that even concentrations of 4 to 7 mg/L would not be detrimental to the wetlands or the watercourse, because during the times of higher stream flows when nitrate-nitrogen laden discharge could be experienced here, there would immediately be significant dilution from surface flows generated in the +/-85.8-acre watershed.

- Finally, in our professional opinion, the primary sensitive receptor associated with the site is the Fenton River. But, as discussed above, the forested swamp will significantly attenuate nitrate-nitrogen levels, to nearly baseline, thus protecting this resource. Moreover, while the on-site eastern stream could receive some seasonal increases in nitrogen (during high flow and high dilution periods), based on vegetation and presence of macro-algae it is already a high-nutrient system and, thus, not sensitive. If the on-site stream was a perennial, cold-water habitat, and had a mesotrophic nutrient regime, some concerns would be warranted. But that is not the case at the subject site.

3.0 CONCLUSION

In conclusion, it is REMA's professional opinion that the proposed two-lot residential subdivision, if constructed as designed and shown on the revised plans, will not result in long-term adverse impacts to the site's regulated resources, or the functions and values that they provide. In the short-term (construction phase) it is important that diligence be exercised to minimize the risk for sedimentation into on-site and off-site wetlands and watercourses.

Please contact our office with any questions on the above.

Respectfully submitted,

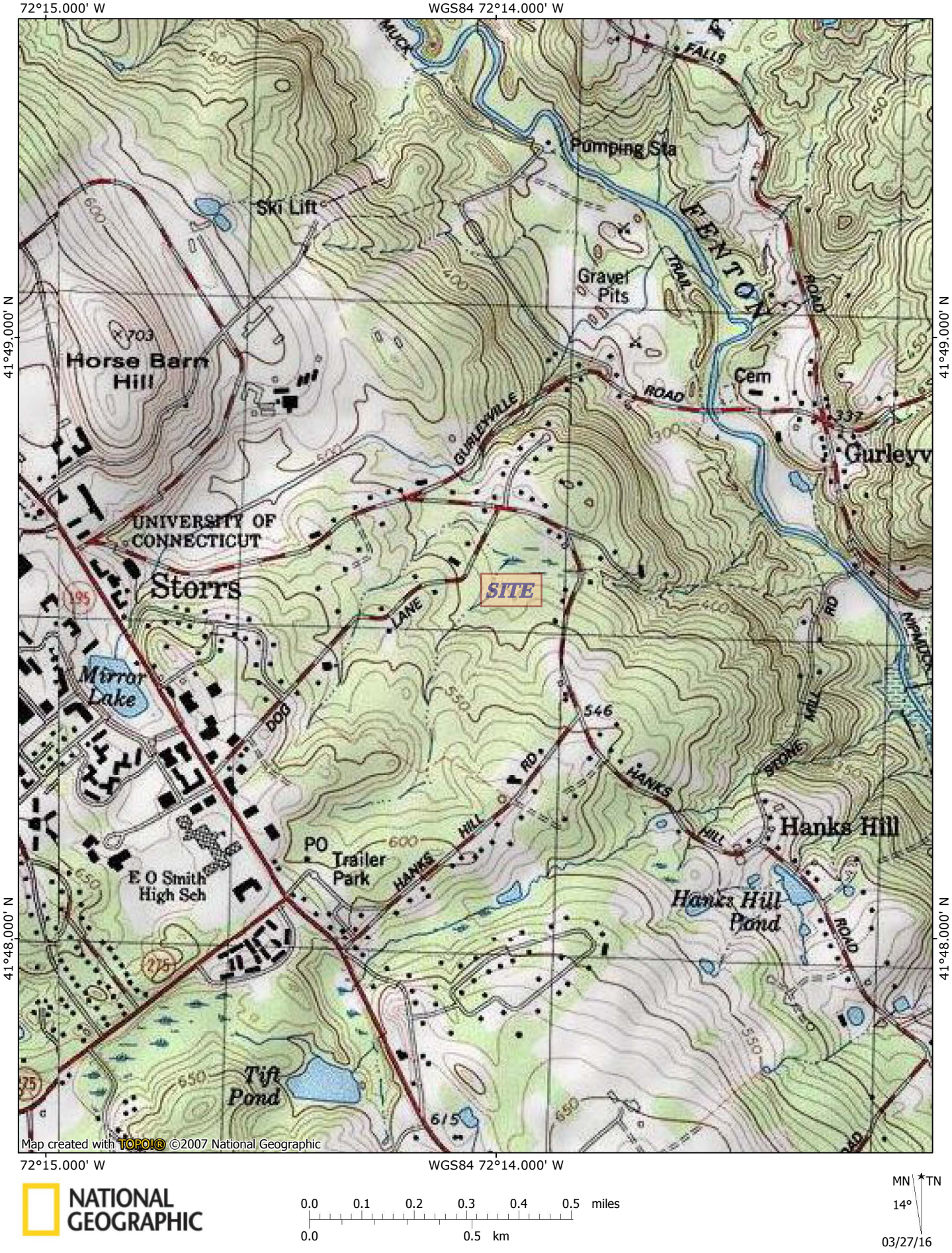
REMA ECOLOGICAL SERVICES, LLC

George T. Logan, MS, PWS, CSE
Professional Wetland Scientist/Registered Soil Scientist
Certified Senior Ecologist/Wildlife Biologist

VIA HAND-DELIVERY

Attachments: Figures 1 through 4, Photos 1 through 14, Wetland Classification & Characterization (Definitions); Wetland Delineation & Characterization Form; USEPA Stream Data Form, Web Soil Survey of Site

Figure 1: Site Locus; Raphaelson Estates, Dog Lane, Storrs, CT



NATIONAL GEOGRAPHIC

0.0 0.1 0.2 0.3 0.4 0.5 miles

0.0 0.5 km

MN TN

14°

03/27/16

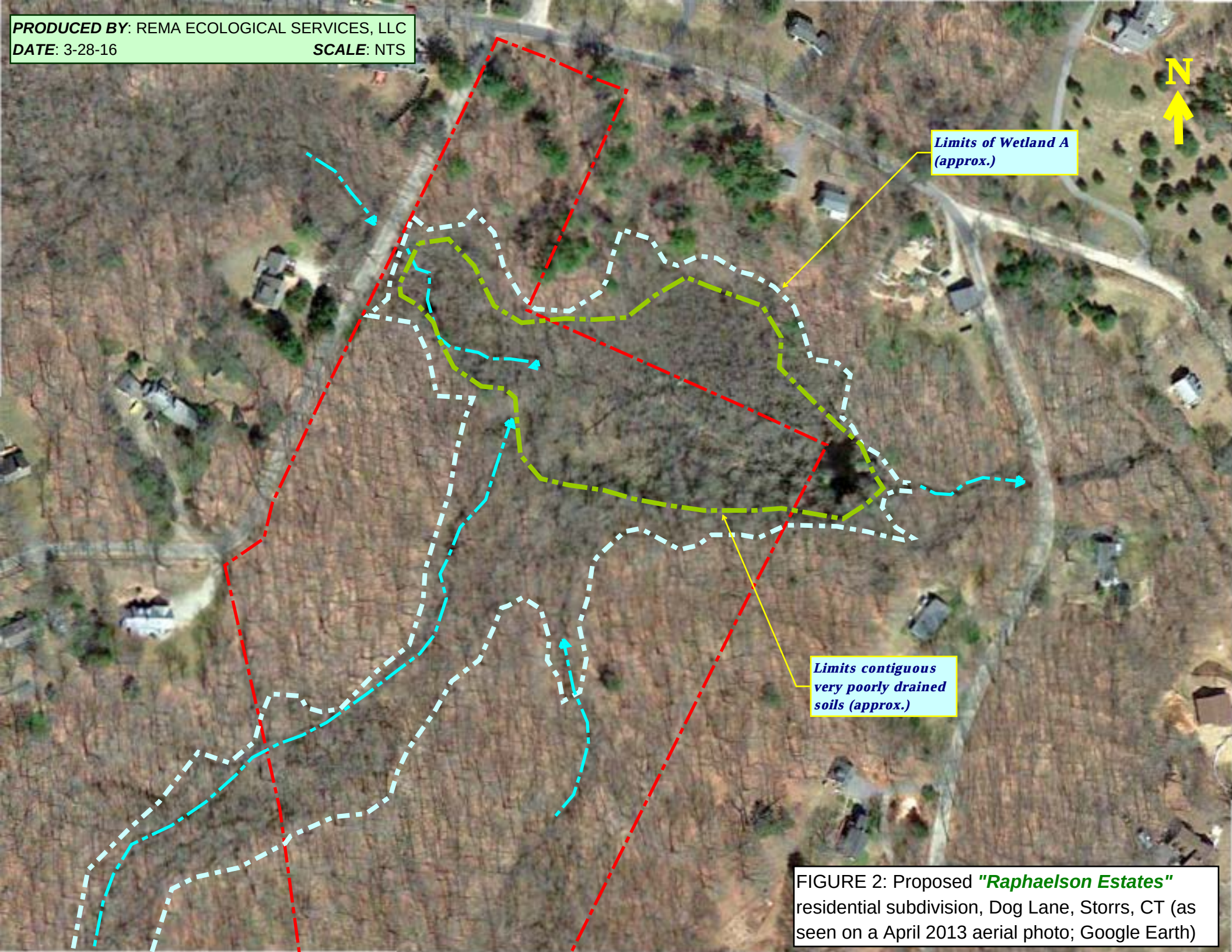


FIGURE 2: Proposed ***"Raphaelson Estates"*** residential subdivision, Dog Lane, Storrs, CT (as seen on a April 2013 aerial photo; Google Earth)

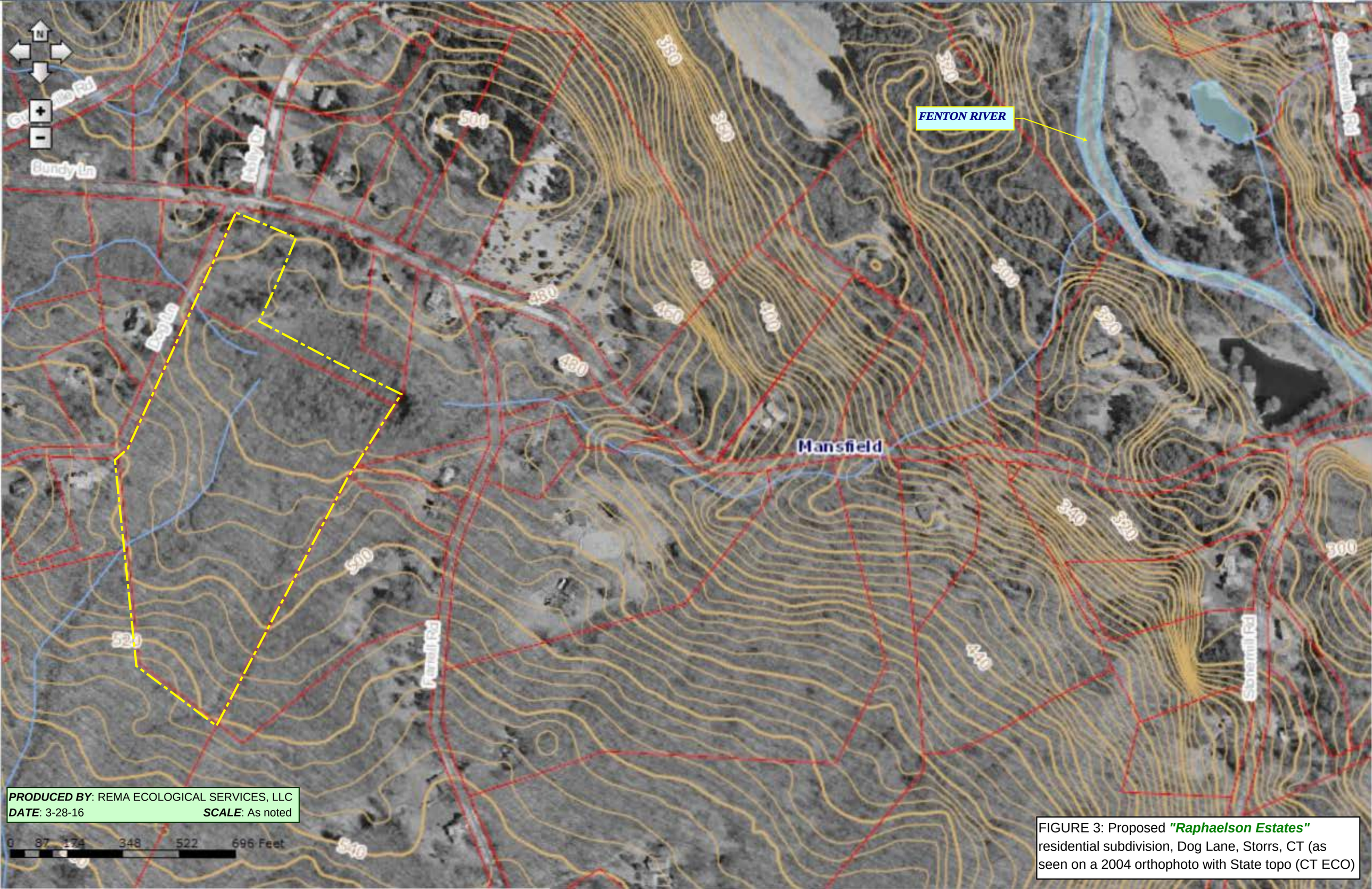


FIGURE 3: Proposed ***"Raphaelson Estates"*** residential subdivision, Dog Lane, Storrs, CT (as seen on a 2004 orthophoto with State topo (CT ECO)

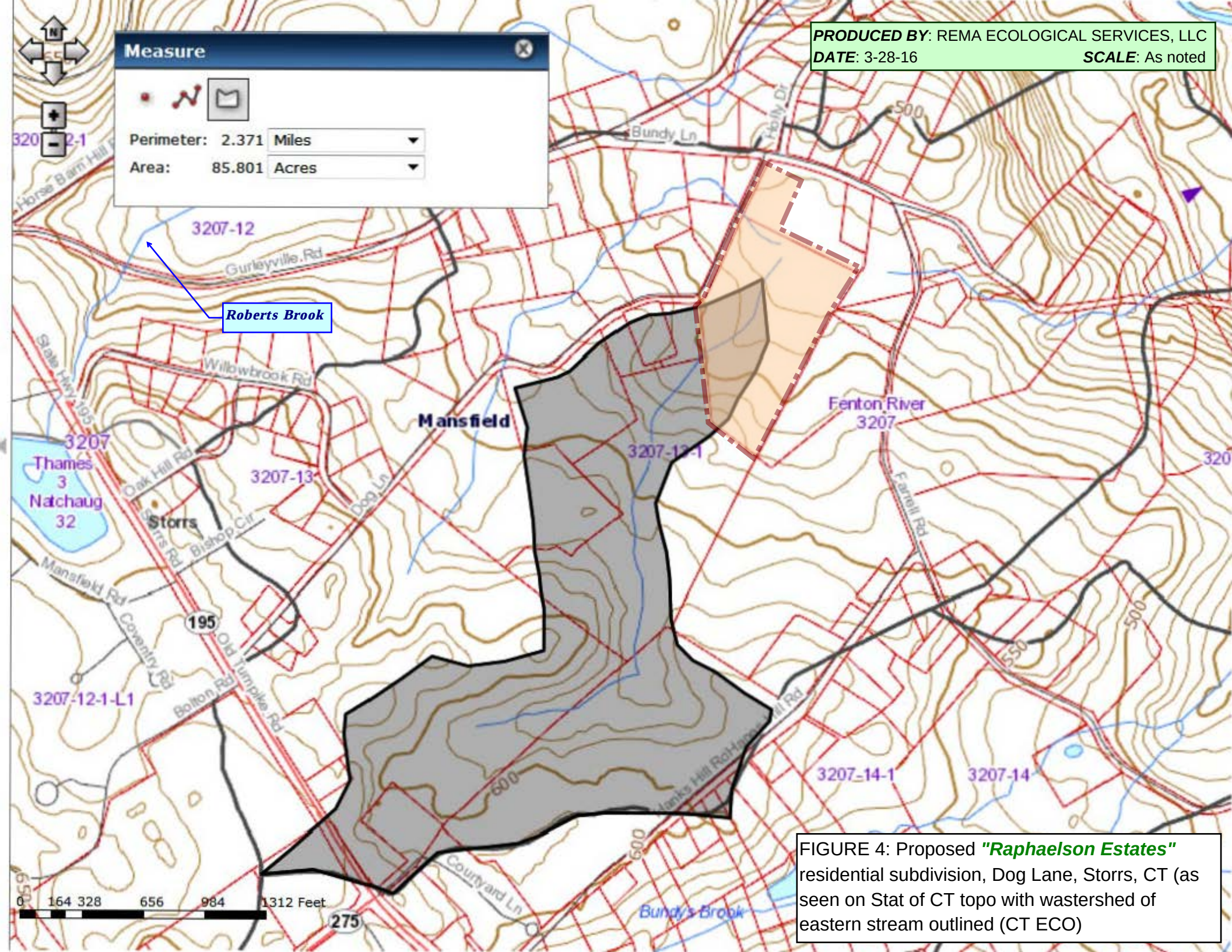


FIGURE 4: Proposed ***"Raphaelson Estates"*** residential subdivision, Dog Lane, Storrs, CT (as seen on Stat of CT topo with wastershed of eastern stream outlined (CT ECO)

Raphaelson Estates, Dog Lane, Storrs, CT
Photos taken February 27th, and March 25th, 2016, by REMA Ecological Services, LLC

Photo 1: Northern intermittent stream, just below culvert at Dog Lane; facing easterly

Photo 2: Same stream as in Photo 1, meandering through forested wetland north of the uplands for the two proposed lots; facing northwesterly

Raphaelson Estates, Dog Lane, Storrs, CT
Photos taken February 27th, and March 25th, 2016, by REMA Ecological Services, LLC

Photo 3: Poorly drained section of forested swamp north of uplands for the two proposed lots; facing southerly

Photo 4: Nearly level, very poorly drained section of forested swamp; receives flows from both of the site's streams; facing northeasterly

Raphaelson Estates, Dog Lane, Storrs, CT
Photos taken February 27th, and March 25th, 2016, by REMA Ecological Services, LLC

Photo 5: Moderate microtopography with bristly-stalked sedge hummocks in somewhat more open, very poorly drained section of northern section of on-site wetland

Photo 6: Poorly drained, Japanese barberry infested forested wetland on a slope, east of uplands for the two proposed residences; facing southeasterly

Raphaelson Estates, Dog Lane, Storrs, CT
Photos taken February 27th, and March 25th, 2016, by REMA Ecological Services, LLC

Photo 7: Eastern stream flowing towards very poorly drained, nearly flat section of on-site forested swamp (February); facing northerly

Photo 8: Same stream as above photo; facing southeasterly

Raphaelson Estates, Dog Lane, Storrs, CT
Photos taken February 27th, and March 25th, 2016, by REMA Ecological Services, LLC

Photo 9: Eastern stream; upstream view; survey was conducted here for "CT-listed" crayfish (*Cambarus bartonii*); no crayfish were observed; facing southerly

Photo 10: At the eastern branch boulders and cobbles are covered with mosses and liverworts, indicating year-round moisture, and good water quality.

Raphaelson Estates, Dog Lane, Storrs, CT
Photos taken February 27th, and March 25th, 2016, by REMA Ecological Services, LLC

Photo 11: Clear waters during higher flows in February 2016 in eastern tributary

Photo 12: View of eastern wetland corridor from uplands where proposed houses would be constructed; not green hue of barberry, and uplands on far side; facing southeasterly

Photo 13: Early instar (nymph) of stonefly; abundant at both of site's streams

Photo 14: Bluebird, one of several avians observed during the site visits (winter resident, migrant)

WETLAND DELINEATION & CHARACTERIZATION FIELD FORM

Project:	Raphaelson Estates, Dog Lane, Storrs, CT	**Wetland ID:**	**A**
Inspection Dates:	2/27/16 & 3/25/16	Wetland Flag Series:	WL-1 to WL-36
Inspector(s):	George T. Logan	NWI Classification Codes:[1]	**PFO1**

Weather/Field Conditions:	Sunny, cold/Overcast, cool	Snow/Frost Depth:	Trace/none
Soil Moisture:	☒ Wet	☒ Moist	☐ Dry
Type of Wetland Delineation:	☒ State	☐ Federal	☐ Other

HGM Classification

☐ Surface Water Slope	☒ Surface Water Depression
☒ Groundwater Slope	☒ Groundwater Depression

NWI Classification

System:

☒ Palustrine	☐ Lacustrine	☐ Riverine	☐ Estuarine

Class:

☒ Forested	☐ Scrub Shrub	☐ Emergent
☐ Aquatic Bed	☐ Unconsolidated Bottom	☐ Unconsolidated Shore

Subclass:

☒ Broad-leaved deciduous	☐ Needle-leaved evergreen	☐ Persistent
☐ Non-persistent	☐ Sand	☐ Mud
☐ Other:_____, _____		

Wetland Hydrology

☒ Seasonally Flooded	☒ Temporarily Flooded	☐ Semi-permanently Flooded
☒ Seasonally Saturated	☒ Saturated	☐ Permanently Flooded

Watercourse Type

☒ Intermittent	☐ Perennial	☐ Tidal

Comments: Two streams with confluence on site, show up as dashed lines on USGS topographic maps, indicating that they are not considered perennial; see separate EPA form

Special Aquatic Habitats

☐ Vernal Pool	☐ Bog	☐ Fen

Comments: None found on site

[1] The wetland unit could include more than one cover type. The dominant cover type is first.

Wetland Delineation & Characterization Field Form *(continued):* ***Project:*** *Raphaelson Estates, Dog Lane*

Wetland ID: **A**

Mapped Soil Series/Units

Soil Series (Map Unit Symbol)	WET	UP	DRAINAGE CLASS	NRCS MAPPED	FIELD CONFIRMED
Ridgebury, Leicester, Whitman (3)	☒	☐	PD, VPD	☒	☒
Sutton (51) fine sandy loam	☐	☒	MWD	☒	☒
Canton and Charlton (61)	☐	☒	WD	☒	☒
	☐	☐		☐	☐
	☐	☐		☐	☐
	☐	☐		☐	☐

ED=excessively drained; SED=somewhat excessively drained; WD=well drained; MWD=moderately well drained; SPD=somewhat poorly drained; PD=poorly drained; VPD=very poorly drained

Observed Plants[2]

TREES:	Green ash	Red maple	American elm
	Swamp white oak	Black gum	White pine
	Tulip tree		
SHRUBS:	American elm (s)	Japanese barberry	Winterberry
	Highbush blueberry	Multiflora rose	Elderberry
	Spicebush	Witherod	
HERBS:	Evergreen woodfern	Sensitive fern	Skunk cabbage
	Tussock sedge	Brstl.-Stalked sedge	Violets
	Soft rush	New York fern	Swamp dewberry
	Sphagnum mosses	Roughstem goldenrod	Sedges
	Penn. bittercress	Jack-in -the-pulpit	False nettle
	False nettle	Scouring rush	Stick tights
	Willow-herbs		
VINES:	Fox grape	Virginia creeper	Poison ivy

Observed Wildlife & Wildlife sign *(within wetland or nearby):*

Bluebird	Phoebe	Tufted titmouse	Blue jay	Spring peeper
W.B nuthatch	Downy woodpecker	Raccoon	Wh. Tailed deer	Two-line salandr.

Notes

This wetland ecological unit is comprised of a lower, nearly level, very poorly drained, more open canopied, forested wetland, where two intermittent streams meet, and a poorly drained hillside wetland, dominated by Japanese barberry in the understory. One tributary is culverted under Dog Lane to the north of the two proposed residential lots, the other flows down the hillside on to the east and south of these lots.

[2] Dominant plant species are underlined. Invasive species are double underlined. (s) = saplings

Watercourse Physical Characterization/Water Quality Field Data Sheet
(Adapted from Appendix 1-1 in U.S. EPA 1999) [1]

Station Descriptor:	RB-DL-1			
Date/Time:	3/25/16; 12:00 pm to 1:15 pm		Stream Origin:	Glacial Till
Investigator(s):	George T. Logan	Weather Conditions:	Overcast, light rain, 40s F	
Stream Name:	Unnamed Tributary to Fenton River		Watershed No.:	3207-13-1
Watershed Size:	~85.8 acres	Perennial? Semi	Stream Type:	Coldwater
Recent Precipitation:	Average		Station Type:	Riffle
Station Description/Location:	A roughly 320-foot stream stretch, starting at stream's entrance to level, very poorly drained wooded swamp, upstream to roughly opposite Wetland Flag #22, on proposed Lot 2			

PHYSICAL CHARACTERIZATION

RIPARIAN ZONE/INSTREAM FEATURES

1. *Predominant Surrounding Land Uses:*				
	■ Forest	☐ Agricultural	☐ Commercial	☐ Industrial
	☐ Field/Pasture	■ Residential	☐ Other:	
2. *Local Watershed Erosion:*				
	☐ None	■ Light	☐ Moderate	☐ Heavy
3. *Local Watershed Non-Point Source Pollution:*				
	☐ No Evidence	■ Some Potential Sources	☐ Obvious Sources	
4. *Estimated Stream Width:*	3-4 ft.			
Estimated Stream Depth:	Riffle 0.4-0.5 ft.	Run ____ ft.	Pool 0.7-0.9 ft.	
5. *High Water Mark:*	1.2 ft.			
6. *Velocity*	☐ Light	■ Moderate	☐ Heavy	Measured: ____ ft./sec
7. *Dam Present*	☐ Yes	■ No	Location:	
8. *Channelized*	☐ Yes	■ No	Extent/Location:	
9. *Canopy Cover:*	☐ Open	■ Partly Shaded	locally only, canopy more open	
	☐ Partly Open	■ Shaded		
10. *Cover Objects:*	■ Abundant	☐ Absent	11. *LWD (density):*	Moderate
	☐ Moderate	☐ Type: boulder, cobble, large woody debris (LWD)		

SEDIMENT/SUBSTRATE

1. *Sediment Odors:*	■ Normal	☐ Petroleum	☐ Anaerobic	
	☐ Sewage	☐ Chemical	☐ None	
			☐ Other:	
2. *Sediment Oils:*	■ Absent	☐ Moderate		
	☐ Slight	☐ Profuse		
3. *Sediment Deposits:*				
	☐ Sludge	☐ Paper Fiber	☐ Relict Shells	
	☐ Sawdust	■ Sand	☐ Other:	
4. *Are the undersides of stones which are not deeply embedded black?*			☐ Yes	■ No

[1] Barbour M.T., J. Gerritsen, B.D. Snyder, and J.B. Stribling. 1999. Rapid Biassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates and Fish, Second Edition. EPA 841-B-99-002. U.S. Environmental Protection Agency; Office Water; Washington, D.C.

SEDIMENT/SUBSTRATE: *Continued*

INORGANIC SUBSTRATE COMPONENTS

Substrate Type	Diameter	% in Sampling Area
Bedrock		none
Boulder	> 10"	8%
Cobble	2.5 - 10"	65-70%
Gravel	0.1 - 2.5"	10-12%
Sand	gritty	5-8%
Silt		2%
Clay	slick	n/a

ORGANIC SUBSTRATE COMPONENTS

Substrate Type	Description	% in Sampling Area
Detritus	Sticks, wood, coarse plant materials (CPOM)	25%
Muck-Mud	Black, very fine organic (FPOM)	5%
Marl	Gray, shell fragments	n/a

Water Quality

1. Temperature :_____ C Conductivity: _____ µS _____ pH Dissolved Oxygen (DO) :_____ mg/L Other:			
2. Water Odors:	■ Normal ☐ Sewage	☐ Petroleum ☐ Chemical	☐ None ☐ Other:
3. Water Surface Oils:	☐ Slick ☐ Sheen	☐ Globs ☐ Flecks	■ None
4. Turbidity:	■ Clear ☐ Slightly Turbid	☐ Turbid ☐ Opaque	☐ Water Color:

Riparian Vegetation *(50-foot buffer)*

■ Trees ■ Herbaceous	■ Shrubs ■ Mosses	☐ Grasses ☐ Other:	*Dominant species present:* red maple, yellow birch, elm J. barberry, highbush blueberry, cinnamon fern

Aquatic Vegetation

■ Rooted emergent ☐ Free floating	☐ Rooted submergent ■ Attached algae	☐ Rooted floating ☐ Other:	*Dominant species present:* Fillamentous green

Notes

Searches conducted for crayfish; none observed (alive or exoskeleton remnants); invertebrates included early instar mayflies and stoneflies, a few case caddisflies, a few Physa snails; conspicuous absence of black fly and midge larvae; several two-lined salamanders observed; minimum embededness of cobbles; high cover of mosses and liverworts on exposed hard surfaces; stream likely does not flow in summer but maintains some water in deeper pools and moisture throughout.

WETLANDS: *The Physical Environment*

WETLAND HYDROGEOMORPHIC CLASSIFICATION

Surface-Water Depression Wetlands: In these wetlands, precipitation and overland flow (surface runoff) collect in a depression where there is little or no groundwater discharge. Water leaves the wetland principally by evaporotranspiration and infiltration (groundwater recharge). The wetland hydrologic system lies above the local or regional groundwater system and is isolated from it by an unsaturated zone; thus, it is said to be "perched." In the glaciated Northeast, surface-water depression wetlands are most likely to form over bedrock or till deposits in topographically elevated areas of landscape; however, they may develop in lowland kettles or ice-block basins that formed in glaciolacustrine or fine-textured glaciofluvial deposits.

Surface-Water Slope Wetlands: These wetlands are located along the edge of stream or lake or on the sloping surface of a floodplain. They may occur on till or stratified drift but are commonly found on alluvium. While precipitation and overland flow also feed these wetlands, the principal source of water is the overflow of the adjacent water body. The sloping surface of the wetland permits water to drain readily back to the lake or river as its stage falls. As was the case with the previous class, the wetland surface usually lies well above the local water table, so groundwater discharge to the wetland is negligible or nonexistent. Groundwater recharge from the wetland is possible, depending on the permeability of underlying surficial deposits.

Groundwater Depression Wetlands: These wetlands occur where a basin intercepts the local groundwater table, so that groundwater discharge as well as precipitation and overland flow feed the wetland. Classic groundwater depression wetlands have no surface drainage leaving the site; however, occasional streamflow out may occur form basin overflow. Groundwater inflow may be continuous or seasonal, depending upon the depth of the basin and the degree of fluctuation of the local water table. During periods when the wetland water level is higher than the local groundwater table (e.g., after major precipitation events in dry season), groundwater recharge may occur. Groundwater may enter the wetland basin from all directions, or it may discharge in one area and recharge in another. In the glaciated Northeast, groundwater depression wetlands are most likely to occur in stratified drift, particularly in coarse-textured glaciofluvial deposits where relatively rapid movement between groundwater and surface water can occur.

Groundwater Slope Wetlands: These wetlands occur where groundwater discharges as springs or seeps at the land surface and drains away as streamflow. Most commonly, these wetlands occur on hillsides over till deposits or at the base of hills where stratified drift and till come into contact. Headwater wetlands are typically groundwater slope wetlands. The local water table slopes toward the wetland surface. Where groundwater flow is continuous, the soil remains saturated. At many sites, however, groundwater inputs cease during late summer or early fall as evaporotranspiration depletes soil moisture in the root zone, in which case the soil is only seasonally saturated. Permanent ponding of water is prevented by the sloping land surface, but water may collect temporarily in isolated depressions. Precipitation and overland flow provide additional water to the wetland on an intermittent basis. Groundwater recharge may occur in the wetland after such events, but amounts are likely to be negligible, especially where wetland soils have formed over dense lodgment till deposits. Where such deposits are present, groundwater slope wetlands may be fed primarily by shallow groundwater systems perched above the regional system.

Reference:

Golet, C.G., A.J.K. Calhoun, W.R. DeRagon, D.J. Lowry, and A.J. Gold. 1993. Ecology of Red Maple Swamps in the Glaciated Northeast: A Community Profile. USFWS. Biological Report No. 12

WETLANDS: *The Physical Environment*

SOIL DRAINAGE CLASSES

Excessively drained: Brightly colored; usually coarse-textured; rapid permeability; very low water-holding capacity; subsoil free of mottles

Somewhat excessively drained: Brightly colored; rather sandy; rapid permeability; low water-holding capacity; subsoil free of mottles

Well drained: Color usually bright yellow, red, or brown; drain excess water readily, but contain sufficient fine material to provide adequate moisture for plant growth; subsoil is free of mottles to a depth of at least 36 inches.

Moderately well drained: Generally any texture, but internal drainage is restricted to some degree; mottles common in the lower part of the subsoil, generally at a depth of 18 to 36 inches; may remain wet and cold later in spring; generally suited for agricultural use.

Somewhat poorly drained: Remain wet for long periods of time due to slow removal of water; generally have a slowly permeable layer within the profile or a high water table; mottles common in the subsoil at a depth of 8 to 18 inches.

Poorly drained: Dark, thick surface horizons commonly; gray colors usually dominate subsoil; water table at or near the surface during a considerable part of the year; mottles frequently found within 8 inches of the soil surface.

Very poorly drained: Generally thick black surface horizons and gray subsoil; saturated by high water table most of the year; usually occur in level or depressed sites and are frequently ponded with water.

Reference:

Wright, W. R., and E. H. Sautter. 1979. Soils of Rhode Island landscapes. R.I. Agric Exp. Station Bull. 429. 42 pp.

WETLANDS: *The Plant Community*

WETLAND CLASSES AND SUBCLASSES IN THE GLACIATED NORTHEAST

WETLAND CLASS	WETLAND SUBCLASS
Open Water	(OW-1) Vegetated (OW-2) Floating-leaved (OW-3) Non-vegetated
Deep Marsh	(DM-1) Dead Woody (DM-2) Shrub (DM-3) Sub-shrub (DM-4) Robust (DM-5) Narrow-leaved (DM-6) Broad-leaved
Shallow Marsh	(SM-1) Robust (SM-2) Narrow-leaved (SM-3) Broad-leaved
Meadow	(M-1) Ungrazed (M-2) Grazed
Shrub Swamp	(SS-1) Sapling (SS-2) Bushy (SS-3) Compact (SS-4) Aquatic
Wooded Swamp	(WS-1) Deciduous (WS-2) Evergreen
Bog	(BG-1A) Compact Shrub (BG-1B) Bushy Shrub (BG-2) Wooded (BG-3) Emergent

Note: Subclass (OW-2) has replaced (SM-4)
Seasonally Flooded Class (SF-1 & SF-2) has been removed

Reference:

Golet, F.C., and J.S. Larson. 1974. Classification of freshwater wetlands in the glaciated Northeast. USFWS Resour. Publ. 116. 56 pp.

WETLANDS: *The Physical Environment*

COMMON WATER REGIMES OF NORTHEASTERN WETLANDS

Seasonally flooded: Surface water is present for extended periods, especially early in the growing season, but is absent by the end of the season in most years. When surface water is absent, the water table is often near the land surface.

Temporarily flooded: Surface water is present for brief periods during the growing season, but the water table usually lies well below the soil surface for most of the season.

Seasonally saturated: The soil is saturated to the surface, especially early in the growing season, but unsaturated conditions prevail by the end of the season in most years. Surface water is absent except for groundwater seepage and overland flow.

Semi-permanently flooded: Surface water persists throughout the growing season in most years. When surface water is absent, the water table is usually at or very near the land surface.

Permanently flooded: Water covers the land surface throughout the year in all years. Vegetation is composed of obligate hydrophytes.

Saturated: The substratum is saturated to the surface for extended periods during the growing season, but surface water is seldom present. This water regime applies to permanently saturated, non-flooded wetlands such as bogs.

References:

Golet, F. C., A. J. K. Calhoun, W. R. DeRagon, D. J. Lowry and A. J. Gold. 1993. Ecology of Red Maple Swamps in the Glaciated Northeast: A Community Profile. U. S. Dep. Int. Fish Wild. Serv. Biol. Rep. 12, 152 pp.

Cowardin, L. M., V. Carter, F. C. Golet, and E. T. LaRoe. 1979. Classification of wetlands and deepwater habitats of the United States. U. S. Fish Wild. Serv. Biol. Serv. Program FWS-OBS 79/31. 103 pp.

Soil Map—State of Connecticut
(Raphaelson Estates, Dog Lane, Storrs, CT)

Map Scale: 1:4,370 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: State of Connecticut
Survey Area Data: Version 14, Sep 22, 2015

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 28, 2011—May 12, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

State of Connecticut (CT600)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
3	Ridgebury, Leicester, and Whitman soils, 0 to 8 percent slopes, extremely stony	15.4	17.5%
46B	Woodbridge fine sandy loam, 0 to 8 percent slopes, very stony	19.6	22.3%
51B	Sutton fine sandy loam, 2 to 8 percent slopes, very stony	0.1	0.2%
60B	Canton and Charlton soils, 3 to 8 percent slopes	7.9	9.0%
61B	Canton and Charlton soils, 3 to 8 percent slopes, very stony	1.3	1.5%
61C	Canton and Charlton soils, 8 to 15 percent slopes, very stony	37.6	42.7%
62D	Canton and Charlton soils, 15 to 35 percent slopes, extremely stony	2.3	2.6%
73C	Charlton-Chatfield complex, 3 to 15 percent slopes, very rocky	3.5	4.0%
73E	Charlton-Chatfield complex, 15 to 45 percent slopes, very rocky	0.2	0.3%
Totals for Area of Interest		**88.0**	**100.0%**

CIVIL ENGINEERING SERVICES, LLC

203 BOSTON HILL ROAD, ANDOVER CT 06232 PH: (860) 742- 0364 FAX: (860) 742-0364

March 30, 2016

Jennifer S. Kaufman
Environmental Planner
Inland Wetlands Agent
Town of Mansfield
4 South Eagleville Road
Mansfield CT 06268

RE: Howard & Alice Raphaelson
Dog Lane, Storrs

Dear Ms. Kaufman;

This letter is intended to address a couple of issues that have been raised concerning the Raphaelson's application for a property split and development of two building lots on the south side of Dog Lane Road in Storrs.

The first issue pertains to a question of how the development of the lots, and particularly on-site septic systems, will affect nitrogen loading. We have run calculations for determination of nitrogen loading and attached a copy of those calculations herewith.

The attached nitrogen loading calculations are based on the requirements for proposed developments on Cape Cod as prescribed in Technical Bulletin 91-001, by the Cape Cod Commission, Water Resources Office, April 1992. They are admittedly (admitted by the Cape Cod Commission) very conservative, and the final numbers generated by the calculations are typically combined and averaged with what the authors refer to as "actual" numbers that are based on a more realistic occupancy rate for bedrooms. Even so, using the numbers dictated under the Cape Cod "Title V" guidelines (and no diluting or averaging), we have a calculated nitrogen loading of 7.26 mg/l (or 7.26 ppm) which is an acceptable level to DPH and DEEP.

We understand that some concern was also expressed about an increase in off-site stormwater discharge due to the proposed development. I have attached a brief, and very conservative address of the impact one could reasonably expect from the proposed development. Contained within a drainage area of some 160 acres, with no impact at all on time of concentration, and with a large and relatively flat wetlands as a receiving body, we can assert that the impact of the proposed development on storm-water drainage to off-site properties will be negligible. SCS hydrographs of "pre" and "post" development conditions showed no change at all in peak storm

run-offs for 2, 5, 10, 25 or 50-year storm events.

I hope this letter and the attached calculations resolve any concerns you or the Commission may have regarding these issues. If you have any further questions, or wish to discuss these aspects of the project, please don't hesitate to call.

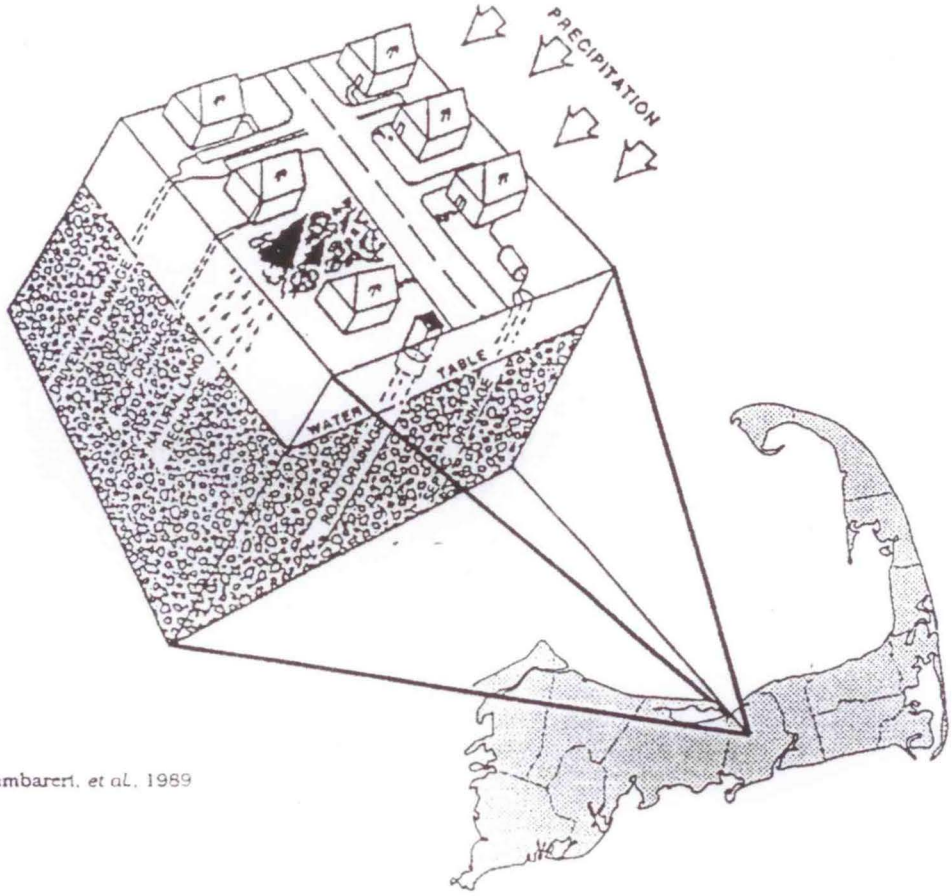
Sincerely,

Gerald E. Hardisty, P.E.

TECHNICAL BULLETIN 91-001 (FINAL)

NITROGEN LOADING

CAPE COD COMMISSION
WATER RESOURCES OFFICE
April, 1992



From Cambarieri, *et al.*, 1989

Cape Cod Commission
3225 Main St.
P.O. Box 226
Barnstable, MA 02630
(508) 362-3828

Civil Engineering Services, LLC
203 Boston Hill Rd
ANDOVER, CT 06232
(860) 742-0364

JOB 214044 - Raphaelson
SHEET NO. 1 OF
CALCULATED BY GH DATE 3/28/16
CHECKED BY DATE
SCALE

Nitrogen Loading Calculations

Note: Calculations are based on Technical Bulletin 91-001 Cape Cod Commission, Water Resources Office, Apr '92

Lot #1 102,330 SF (2.34 AC.)

Wastewater: assume 4 bedrooms @ 110 gdg/bdrm

$$4 \text{ bdrm} \cdot \frac{110 \text{ gpd}}{\text{bdrm}} \cdot \frac{3.785 \text{ L}}{\text{gal}} = \frac{1665.4 \text{ L}}{\text{day}} \cdot \frac{35 \text{ mg}}{\text{L}} =$$

$$58{,}289 \ \frac{\text{mg}}{\text{day}}$$

impervious surfaces:

drive: $2252 \text{ ft}^2 \left(\frac{40''}{\text{yr}}\right)\left(\frac{\text{ft}}{12''}\right)\left(\frac{28.32 \text{ L}}{\text{ft}^3}\right)\left(\frac{\text{yr}}{365 \text{ d}}\right) = 582 \ \frac{\text{L}}{\text{d}} \cdot \left(\frac{1.5 \text{ mg}}{\text{L}}\right) = 873.6 \ \text{mg/day}$

house: $1630 \text{ ft}^2 \ (\ .25863 \ ) = 421 \text{ L/d} \left(\frac{0.75 \text{ mg}}{\text{L}}\right) = 316 \ \frac{\text{mg}}{\text{d}}$

Lawn: 28,137 (assumes to limits of disturbance)
− 3,882
24,255 SF $\left(\frac{3 \text{ lb}}{1000 \text{ ft}^2 \cdot \text{yr}}\right)\left(\frac{\text{yr}}{365 \text{ d}}\right)\left(\frac{454000 \text{ mg}}{\text{lb}}\right)\left(\frac{0.25}{\text{factor}}\right) = 22{,}627 \ \text{mg/d}$

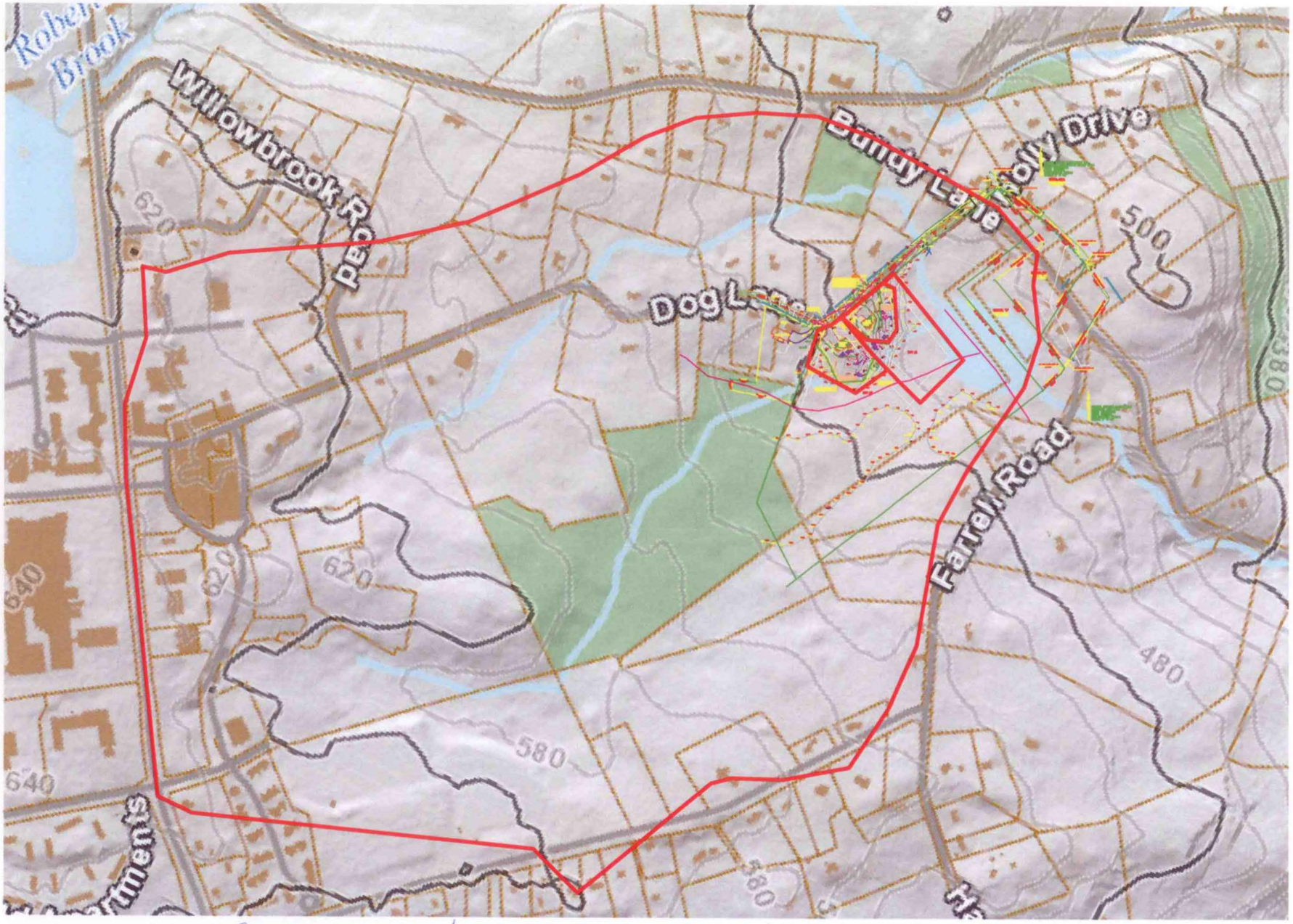
natural area: 102,330 SF − 28,137 SF = 74,193 SF

$$74193 \text{ ft}^2 \left(\frac{1.5 \text{ ft}}{\text{yr}}\right)\left(\frac{28.32 \text{ L}}{\text{ft}^3}\right)\left(\frac{1 \text{ yr}}{365 \text{ d}}\right) = 8{,}635 \text{ L/d}$$

Summary:

TITLE V: $\frac{58{,}289 + 874 + 316 + 22{,}627 \text{ mg}}{1665 + 583 + 421 + 8635 \text{ liters}} = 7.26 \text{ mg/L}$

$= 7.26$ ppm



RAPHAELSON - STORMWATER CONTRIBUTING AREA

Civil Engineering Services, LLC
203 Boston Hill Rd
ANDOVER, CT 06232
(860) 742-0364

JOB 214044 - Raphadson
SHEET NO. 1 OF
CALCULATED BY GH DATE 3/30/16
CHECKED BY DATE
SCALE

Drainage to wetlands/pond:

Total Area: 7,131,583 SF = 163 Ac.

Lot #1 - impervious: 1960 SF Drive
1630 SF House
3590 SF imp.

Lot #2 - impervious: 1806 SF Drive
1940 SF House
3746 SF imp.

Assume we change a total of 7500 SF of woods (CN = 61) to impervious (CN = 98)
* Actually, hydrographs will round up to nearest 0.1 Ac, therefore use 0.2 Acres (8712 SF)

Pre-development:

$$163 \text{ Ac} \cdot 61 = 9943 \text{ CN-A}$$

$$(162.8 \cdot 61) + (0.2)(98) = 9950.4 \text{ CN-A}$$

$$\% \text{ difference} = \frac{9950.4}{9943} \cdot 100\% = 0.07\%$$

Take into account a substantial time of concentration, a receiving area of ponding/wetlands with additional time for attenuation and the resultant hydrographs show zero difference between "pre" and "post" conditions.

Connecticut Department of

ENERGY &
ENVIRONMENTAL
PROTECTION

March 28, 2016

Mr. Edward A. Pelletier
Datum Engineering & Surveying, LLC
132 Conantville Road
Mansfield Center, CT 06250
e.pelletier@datumengr.com

Project: Two Lot Residential Development "Ralphaelson Estates" Located on the East Side of Dog Lane and just South of Bundy Lane in Storrs, Connecticut
NDDB Determination No.: 201603553

Dear Edward,

I have reviewed Natural Diversity Data Base maps and files regarding the area delineated on the map you provided for the proposed two-lot residential development known as "Ralphaelson Estates" located along the east side of Dog Lane and just south of Bundy Lane in Storrs, Connecticut. According to our records we have known extant populations of State Special Concern *Glyptemys insculpta* (wood turtle) and *Cambarus bartonii* (Appalachian brook crayfish) in the vicinity of the project site. I have included recommended protection strategies and best management practices for this state special concern turtle and crayfish.

Wood Turtle: Habitat destruction, degradation or alteration and fragmentation all threaten Wood Turtle populations. Turtles are also particularly vulnerable to any activity that consistently reduces adult survivorship. Disturbances to stream and riparian habitats and activities that change the hydrology of the stream, the physical habitat itself and water quality are all potentially detrimental activities for the Wood Turtle. Although Wood Turtles are found within forested areas, they prefer areas that do not have a fully closed canopy cover. The greatest concern during projects occurring in wood turtle habitat are turtles being run over and crushed by mechanized equipment. Reducing the frequency that motorized vehicles enter Wood Turtle habit**a**t would be beneficial in minimizing direct mortality of adults.

Recommended Protection Strategies for turtles:

Work should occur when these turtles are active (April 1st to September 30th) and I recommend the additional strategies in order to protect these turtles:

- Silt fencing should be installed around the work area prior to construction, please avoid erosion control products that are embedded with plastic netting as these can be fatal to wildlife;

- Where possible, AVOID installing sediment and erosion control materials from late August through September and from March through mid-May. These two time periods are when amphibians and reptiles are most active, moving to and from wetlands to breed;

- After silt fencing is installed and prior to construction, a sweep of the work area should be conducted to look for turtles;

- Workers should be apprised of the possible presence of turtles, and provided a description of the species (http://www.ct.gov/dep/cwp/view.asp?a=2723&q=473472&depNav_GID=1655);

- Any turtles that are discovered should be moved, unharmed, to an area immediately outside of the fenced area, and position in the same direction that it was walking;

- No vehicles or heavy machinery should be parked in any turtle habitat;

- Work conducted during early morning and evening hours should occur with special care not to harm basking or foraging individuals; and

- All silt fencing should be removed after work is completed and soils are stable so that reptile and amphibian movement between uplands and wetlands is not restricted.

- Stockpiles of soil should be cordoned off with silt fencing so turtles do not attempt to try and nest in them.

- Use native plantings if possible. Any plantings should be composed of species native to northeastern United States and appropriate for use in riparian habitat.

Appalachian Brook Crayfish

The Appalachian brook crayfish is a freshwater crustacean and can be found in streams, creeks and spring habitats. They dwell on the bottom and construct burrows called "chimneys" along the water's edge. Most of these burrows are underwater but the top sticks out and resembles a chimney. It is thought that this particular crayfish prefers cool or very cold water. It has a localized distribution in Connecticut and it is known to have been lost from one nearby stream, Eagleville Brook in Mansfield. Localized declines are attributed to general habitat destruction and loss. This species is most active at night because this is when it feed. It is a predator and scavenger relying on decaying organic remains but it may also catch small animals.

Recommended Protection Strategies for the Crayfish

- This project should provide an large buffer around any riparian areas
- Avoid removing trees or other vegetation from riparian areas but especially stream banks; if possible leave a wide buffer to prevent temperature fluctuations to any flowing water that may occur on this property
- Ensure that soil erosion and sedimentation controls are in place to prevent the streams or flowing water to be impacted during storm events while construction is taking place
- Ensure that no additional nutrient loading (fertilizers) or chemicals are used in this area to prevent degradation to the crayfish habitat

If these protection strategies are followed then the proposed activities will lessen the impact on the wood turtle and Appalachian brook crayfish. I have attached a fact sheet on the turtle and an information sheet on the crayfish. This determination is good for one year. Please re-submit an NDDB Request for Review if the scope of work changes or if work has not begun on this project by March 28, 2017.

Natural Diversity Data Base information includes all information regarding critical biological resources available to us at the time of the request. This information is a compilation of data collected over the years by the Department of Energy and Environmental Protection's Natural History Survey and

cooperating units of DEEP, private conservation groups and the scientific community. This information is not necessarily the result of comprehensive or site-specific field investigations. Consultations with the Data Base should not be substitutes for on-site surveys required for environmental assessments. Current research projects and new contributors continue to identify additional populations of species and locations of habitats of concern, as well as, enhance existing data. Such new information is incorporated into the Data Base as it becomes available.

Please contact me if you have further questions at (860) 424-3592, or dawn.mckay@ct.gov . Thank you for consulting the Natural Diversity Data Base. Also be advised that this is a preliminary review and not a final determination. A more detailed review may be conducted as part of any subsequent environmental permit applications submitted to DEEP for the proposed site.

Sincerely,

Dawn M. McKay

Dawn M. McKay
Environmental Analyst 3

WILDLIFE IN CONNECTICUT

STATE SPECIES OF SPECIAL CONCERN

Wood Turtle

Glyptemys insculpta

Background

Wood turtles may be found throughout Connecticut, but they have become increasingly rare due to their complex habitat needs. Wood turtles also have become more scarce in Fairfield County due to the fragmentation of suitable habitat by urban development.

Range

Wood turtles can be found across the northeastern United States into parts of Canada. They range from Nova Scotia through New England, south into northern Virginia, and west through the Great Lakes region into Minnesota.

© PAUL J. FUSCO

Description

The scientific name of the wood turtle, *Glyptemys insculpta*, refers to the deeply sculptured or chiseled pattern found on the carapace (top shell). This part of the shell is dark brown or black and may have an array of faint yellow lines radiating from the center of each chiseled, pyramid-like segment due to tannins and minerals accumulating between ridges. These segments of the carapace, as well as those of the plastron (bottom shell), are called scutes. The carapace also is keeled, with a noticeable ridge running from front to back. The plastron is yellow with large dark blotches in the outer corners of each scute. The black or dark brown head and upper limbs are contrasted by brighter pigments ranging from red and orange to a pale yellow on the throat and limb undersides. Orange hues are most typical for New England's wood turtles. The hind feet are only slightly webbed, and the tail is long and thick at the base. Adults weigh approximately 1.5 to 2.5 pounds and reach a length of 5 to 9 inches.

Habitat and Diet

Wood turtles use aquatic and terrestrial habitats at different times of the year. Their habitats include rivers and large streams, riparian forests (adjacent to rivers), wetlands, hayfields, and other early successional habitats. Terrestrial habitat that is usually within 1,000 feet of a suitable stream or river is most likely used. Preferred stream conditions include moderate flow, sandy or gravelly bottoms, and muddy banks.

Wood turtles are omnivorous and opportunistic. They are not picky eaters and will readily consume slugs, worms, tadpoles, insects, algae, wild fruits, leaves, grass, moss, and carrion.

Life History

From late spring to early fall, wood turtles can be found roaming their aquatic or terrestrial habitats. However, once temperatures drop in autumn, the turtles retreat to rivers and large streams for hibernation. The winter

is spent underwater, often tucked away below undercut riverbanks within exposed tree roots. Dissolved oxygen is extracted from the water, allowing the turtle to remain submerged entirely until the arrival of spring. Once warmer weather sets in, the turtles will become increasingly more active, eventually leaving the water to begin foraging for food and searching for mates. Travel up or down stream is most likely, as turtles seldom stray very far from their riparian habitats.

Females nest in spring to early summer, depositing anywhere from 4 to 12 eggs into a nest dug out of soft soil, typically in sandy deposits along stream banks or other areas of loose soil. The eggs hatch in late summer or fall and the young turtles may either emerge or remain in the nest for winter hibernation. As soon as the young turtles hatch, they are on their own and receive no care from the adults.

Turtle eggs and hatchlings are heavily preyed upon by a wide variety of predators, ranging from raccoons to birds and snakes. High rates of nest predation and hatchling mortality, paired with the lengthy amount of time it takes for wood turtles to reach sexual maturity, present a challenge to maintaining sustainable populations. Wood turtles live upwards of 40 to 60 years, possibly more.

Conservation Concerns

Loss and fragmentation of habitat are the greatest threats to wood turtles. Many remaining populations in Connecticut are low in numbers and isolated from one another by human-dominated landscapes. Turtles forced to venture farther and farther from appropriate habitat to find mates and nesting sites are more likely to be run over by cars, attacked by predators, or collected by people as pets.

Other sources of mortality include entanglements in litter and debris left behind by people, as well as strikes from mowing equipment used to maintain hayfields and other early successional habitats.

The wood turtle is imperiled throughout a large portion of its range and was placed under international trade regulatory protection through the Convention on International Trade in Endangered Species (CITES) in 1992. Wood turtles also have been included on the International Union for Conservation of Nature's (IUCN) Red List as a vulnerable species since 1996. They are listed as a species of special concern in Connecticut and protected by the Connecticut Endangered Species Act.

How You Can Help

- *Conserve riparian habitat. Maintaining a buffer strip of natural vegetation (minimum of 100 feet) along the banks of streams and rivers will protect wood turtle habitat and also help improve the water quality of the stream system. Stream banks that are manicured (cleared of natural shrubby and herbaceous vegetation) or armored by rip rap or stone walls will not be used by wood turtles or most other wildlife species.*
- *Do not litter. Wood turtles and other wildlife may accidentally ingest or become entangled in garbage and die.*
- *Leave turtles in the wild. They should never be kept as pets. Whether collected singly or for the pet trade, turtles that are removed from the wild are no longer able to be a reproducing member of a population. Every turtle removed reduces the ability of the population to maintain itself.*
- *Never release a captive turtle into the wild. It probably would not survive, may not be native to the area, and could introduce diseases to wild populations.*
- *As you drive, watch out for turtles crossing the road. Turtles found crossing roads in June and July are often pregnant females. They should **not** be collected but can be helped on their way. Without creating a traffic hazard or compromising safety, drivers are encouraged to avoid running over turtles that are crossing roads. Also, still keeping safety precautions in mind, you may elect to pick up turtles from the road and move them onto the side in the direction they are headed. Never relocate a turtle to another area that is far from where you found it.*
- *Learn more about turtles and their conservation concerns, and educate others.*
- *If you see a wood turtle, leave it in the wild, take a photograph, record the location where it was seen, and contact the Connecticut Department of Environmental Protection (DEP) Wildlife Division at dep.wildlife@ct.gov, or call 860-424-3011 to report your observation.*

State of Connecticut
Department of Environmental Protection
Bureau of Natural Resources
Wildlife Division
www.ct.gov/dep

4/2011

Appalachian Brook Crayfish

Cambarus bartonii
Friday, August 3, 2012

Crayfish are one of the most common freshwater crustaceans in North America. Although this area is home to more than 30 different species, the Appalachian Brook Crayfish is one of the most widespread. Due to the great amount of intraspecific variation across its range, however, it is thought that *Cambarus bartonii* may actually represent a complex of several different species.

Cambarus bartonii is not particularly distinctive and can be difficult to identify. It is a small- to medium-sized crayfish, with a generally smooth body and smooth claws which curve slightly inwards. One of the characteristic features which separates it from other similar species is the possession of a smaller-than-average rostrum (the triangle-shaped part of the shell between the eyes). These crayfish are typically orange-brown in color, although blue morphs have been found of this species.

The Appalachian Brook Crayfish typically makes its home in the clear, cool water of rivers, lakes, and streams. It prefers more oxygenated water, and as such is often found in somewhat turbulent areas. These crayfish construct burrows under rocks and in the sediment on the bottom of the body of water. These burrows, which are painstakingly excavated by removing small rocks one at a time with the claws, can be surprisingly deep and complex. Burrows have been found to be as deep as 1 m, and may pass through several layers of rock and gravel; they also have long lateral passageways. In the process of digging these burrows, crayfish often create distinctive “chimneys,” which are the openings of their burrows built up

all around with the excavated sediment. These often protrude out of the water or are found on the banks of streams and ponds, and resemble their namesake.

These crayfish mate in spring and early summer. After mating, the female will carry the fertilized eggs attached to her pleopods (the small "legs" on the underside of the tail that are used for swimming). While she is carrying her eggs, the females are referred to as being "in berry," due to the resemblance of the cluster of eggs on her underside to a berry. After the eggs hatch, the young crayfish remain attached to her underside until shortly after their second molt. After separating from their mother and siblings, they young (typically around 5 mm in length) assume a lifestyle similar to their parents'. Namely, they eat anything they can find. Crayfish are predators on small insects, other invertebrates, and small vertebrates such as tadpoles; herbivores on algae and other water plants; and scavengers on recently dead animals.

Crayfish are possessed of an extraordinary sense of smell. It is estimated that 40% of their brain is devoted to the sense of smell, as opposed to less than 1% of a human's. By flicking their antennules (the small, paired sets of miniature antennae between the larger pair) constantly, they are able to detect both chemical cues and motion in their environment that could indicate food, a mate, or a predator. They also have chemical receptors located on their legs, the better to detect their surroundings.

Cambarus bartonii is vulnerable to many predators, humans not the least. This species and its relatives are collected for human consumption, a harvest that can be almost 1,000 tons worldwide. However, many of these crayfish are farmed, and those in our area are not under significant threat from humans. Their natural predators include raccoons, opossums, foxes, birds of prey, and many species of fish. Despite the many dangers, crayfish can live to be four years old in the wild.

This specimen was found in the Station Pond and is a male, judging by its reproductive organs. This species is somewhat sexually dimorphic, with males possessing slightly larger claws.

Hazel Galloway

Sources:

- Ariel Kahrl for help with identification
- http://animaldiversity.ummz.umich.edu/site/accounts/information/Cambarus...
- http://pinicola.ca/crayfishontario/cbartoniiacct.htm
- http://www.fcps.edu/islandcreekes/ecology/crayfish_(cambarus).htm
- http://www.sciencedaily.com/releases/2007/08/070831144229.htm

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College and Graduate School of Arts & Sciences

Maintained by Mountain Lake Biological Station

Mountain Lake Biological Station
434-982-5486
434-297-4907
Contact Us

485 McCormick Road
064 Gilmer Hall
PO Box 400327
Charlottesville, VA 22904-4325

Make a Gift

Department of Planning and Development

Date: March 2, 2016

To: Mansfield Inland Wetlands Agency

From: Jennifer Kaufman, Inland Wetlands Agent

Subject: Receipt of New Application for Wetlands License
91 & 93 Meadowbrook Lane (IWA File #W1562)
Uniglobe Investment
Description of work: construction of 36 dwelling units

Project Description/Recommendation

The applicants propose to develop 36 dwelling units on a 4.6-acre parcel immediately west of the Whispering Glen multi-family complex on Meadowbrook Lane. There is an unnamed brook on the far west side of the parcel that drains to Conantville Brook, approximately 250 feet east of the site. The closest activity to wetlands is the proposed stormwater drainage system, which is located 16 feet from the edge of wetlands.

As the Assistant Town Engineer lives in the immediate vicinity of the proposed Meadowbrook Gardens project, staff recommends that the Agency retain a professional consultant to assist in reviewing the proposed project to ensure that stormwater will be managed in a manner that will not significantly impact wetlands. The consultant would be retained by and report to the Agency. However, as authorized by Chapter 122-12 of the Mansfield Code of Ordinances, all costs associated with the consultant would be the responsibility of the applicant.

Staff posted the attached RFP on the state contracting website and received the attached seven proposals in response. The proposals were reviewed by Linda Painter, Director of Planning and Development, John Carrington, the Director of Public Works and me. Based on the information contained in the proposals, the following three firms were identified as having the best approach and qualifications:

- BSC Group
- Trinkhaus Engineering, LLC
- CME Associates, Inc.

Of these three firms, BSC Group appears to have the lowest cost. As such, staff recommends that the Agency retain BSC Group to assist staff and the Agency with review of the Meadowbrook Gardens project. The Agency has the discretion to select any, or none, of the firms that submitted in response to the proposal.

Department of Planning and Development

☐ The project includes work in wetlands.

☒ The project includes work in the 150 foot upland review area.

☐ The project is located in a Public Water Supply Watershed.

Application Fees and Notifications

☒ The applicant has paid the required application fee

☒ The applicant has submitted copies of the notice mailed to neighbors and a list of abutters to be notified. Certified mail receipts must be submitted prior to action on the application.

Receipt Motion

If the agency agrees with the above recommendation the following motion is in order:

_____ MOVES, _____ seconds to:

1) Receive the application submitted by Uniglobe Investment (IWA File #W1562) under the Wetlands and Watercourses Regulations of the Town of Mansfield for construction of 36 dwelling units on property located at 91 & 93 Meadowbrook Lane as shown on a map dated 1/8/2016 and as described in application submissions, schedule a public hearing on May 2, 2016 and to refer said application to staff and the Conservation Commission for review and comments.
2) Authorize staff to engage the services of BSC Group to review the project to ensure that the stormwater will be managed in a manner that does not significantly impact wetlands. Pursuant to Chapter 122 of the Code of Ordinances, fees incurred for this review shall be the responsibility of the applicant. A deposit in the amount of the estimated cost shall be provided to the Town prior to issuance of a notice to proceed.

APPLICATION FOR PERMIT
MANSFIELD INLAND WETLANDS AGENCY
4 SOUTH EAGLEVILLE ROAD, STORRS, CT 06268
860-429-3015x6204 (DIRECT) TEL: 860-429-3330 OR
FAX: 860-429-6863

FOR OFFICE USE ONLY

File # W 01562
Fee Paid $1,060.00
Official Date of Receipt 2-9-16

Applicants are referred to the Mansfield Inland Wetlands and Watercourses Regulations for complete requirements, and are obligated to follow them. For assistance, please contact the Inland Wetlands Agent at the telephone numbers above.

Please print or type or use similar format for computer; attach additional pages as necessary.

Part A - Applicant

Name Uniglobe Investment, LLC

Mailing Address 73 Meadowbrook Lane

Mansfield Center, CT Zip 06250

Phone Scott Garrett 203-260-5325 Email scott.garrett13@gmail.com

Title and Brief Description of Project

Meadowbrook Gardens

Develop an additional 36 dwelling units associated with the Whispering Glen project.

Location of Project 91 & 93 Meadowbrook Lane

Intended Start Date Spring 2016

Part B - Property Owner (if applicant is the owner, just write "same")

Name same as applicant

Mailing Address

Zip

Phone Email

Owner's written consent to the filing of this application, if owner is not the applicant:

Signature date

Applicant's interest in the land: (if other than owner)

Part C - Project Description (attach extra pages, if necessary)

1) Describe in detail the proposed activity here or on an attached page. **(See guidelines at end of application)**
   Please include a description of all activity or construction or disturbance:

a) ***in*** the wetland/watercourse

b) ***in*** the area ***adjacent*** to (within 150 feet from the edge of) the wetland/watercourse, even if wetland/watercourse is ***off*** your property

a) No proposed activity in wetlands

b) Proposed driveway and parking - 54' at its closest point
Proposed multifamily dwellings - 112' at its closest point
Proposed storm drainage system - 16' at its outlet from retention/ recharge basin
Proposed underground utilities - 67' at its closest point

2) Describe the amount or area of disturbance (in square feet or cubic yards or acres):

a) ***in*** the wetland/watercourse

b) ***in*** the area ***adjacent*** to (within 150 feet from the edge of) the wetland/watercourse, even if wetland/watercourse is **off** your property

a) No activity in wetlands

b) 1.5 acres within 150' of wetland soils

3) Describe the type of materials you are using for the project: Construction of driveway and parking areas will be using gravel from existing site and process gravel for base before paving.

a) include ***type*** of material used as fill or to be excavated gravel/ process gravel

b) include ***volume*** of material to be filled or excavated Site will be graded using on site material (sand & gravel). Excess topsoil will be removed from site - approximately 1700 cu. yds.

4) Describe measures to be taken to minimize or avoid any adverse impacts on the wetlands and regulated areas (silt fence, staked hay bales or other Erosion and Sedimentation control measures).
   See attached plans for detailed erosion and sedimentation measures to be installed and maintained until site is stabilized.

Part D - Site Description

Describe the general character of the land. (Hilly? Flat? Wooded? Well drained? etc.)
See attached report from Connecticut Ecosystems LLC for site characteristics.

Part E - Alternatives

Have you considered any alternatives to your proposal that would meet your needs and might have less impact on the wetland/watercourse? Please list these alternatives.

We moved the proposed buildings northerly to provide a greater distance from the brook southerly of this site. Original layout was 30' closer to the brook. We believe the submitted proposal is less impact on wetland/ watercourse.

Part F - Map/Site Plan (all applications)

1) Attach to the application a map or site plan showing **existing conditions** and the **proposed project** in relation to wetland/ watercourses. Scale of map or site plan should be 1" = 40'; if this is not possible, please indicate the scale that you are using. A sketch map may be sufficient for small, minor projects. **(See guidelines at end of application)**

2) Applicant's map date and date of last revision January 8, 2016
3) Zone Classification DMR (pending zone change application)
4) Is your property in a flood zone? _____Yes __X__No _____ Don't Know

Part G - Major Applications Requiring Full Review and a Public Hearing

See Section 6 of the Mansfield Regulations for additional requirements.

Part H - Notice to Abutting Property Owners

1) Attach list of abutters, name, and address

2) **Proof of Written Notice to Abutters.** You must notify abutting (neighboring) property owners (any property immediately contiguous with the subject property, including those across the street) by certified mail, return receipt requested, stating that a wetland application is in progress, and that abutters may contact the Mansfield Inland Wetlands Agent for more information. Include a brief description of your project. ***Postal receipts of your notice to abutters must accompany your application.*** To generate an abutters list go to http://www.mainstreetmaps.com/CT/Mansfield/

Part I - Additional Notices, if necessary

Notice to Windham Water Works and CT Department of Public Health is attached. If this application is in the public watershed for the Windham Water Works (WWW), you must notify the WWW and the Department of Public Health of your project within 7 days of sending the application to Mansfield--sending it by certified mail, return receipt requested. Contact the Mansfield Inland Wetlands Agent to find out if you are in this watershed.

Notice to Adjoining Town. If your property is within 500 feet of an adjoining town, you must also send a copy of the application, on the same day you sent one to Mansfield, to the Inland Wetlands Agency of the adjoining town, by certified mail, return receipt requested.

The Statewide Reporting Form shall be part of the application and specified parts must be completed and returned with this application.

Part J - Other Impacts To Adjoining Towns, if applicable

1) Will a significant portion of the traffic to the completed project on the site use streets within the adjoining municipality to enter or exit the site?___Yes_X_No___Don't Know

2) Will sewer or water drainage from the project site flow through and impact the sewage or drainage system within the adjoining municipality?_X_ Yes ____No ____ Don't Know

3) Will water run-off from the improved site impact streets or other municipal or private property within the adjoining municipality?____ Yes _X_No ____Don't Know

Part K - Additional Information from the Applicant

Set forth (or attach) any other information which would assist the Agency in evaluating your application. (*Please provide extra copies of any lengthy documents or reports, and extra copies of maps larger than 8.5" x 11", which are not easily copied.)*

Part L - Filing Fee

Application fees shall be in accordance with the current Mansfield Code of Ordinance fee Schedule, pursuant to Section 8-1c of the Connecticut General Statutes. The fee schedule includes provisions for applicant-funded consultant studies and reports. The current fee schedule is available in the Planning and Zoning office.

Note: The Agency may require additional information about the upland review area or about wetlands or watercourses affected by the regulated activity. If the Agency, upon review of your application, finds the activity proposed may involve a "significant activity" as defined in the Regulations, additional information and/or a public hearing may be required.

Certification

I hereby certify that:

- I am familiar with the information contained in this form and that such information is true and correct to the best of my knowledge.
- I understand the penalties for obtaining a permit through deception or through inaccurate or misleading information.

Signature _____ Date 2/9/16

Authorization to Enter Property

The undersigned hereby consent to necessary and proper inspections of the above-mentioned property by members and agents of the Inland Wetlands Agency at reasonable times, both before and after the permit in question has been issued by the Agency.

Signature _____ Date 2/9/16

Connecticut Ecosystems LLC

• Wetland Delineation • Wetland & Aquatic Evaluation • Mitigation
• Natural Resource Inventory • Permit Assistance • Expert Testimony

ON-SITE SOIL INVESTIGATION REPORT

Project Name & Location
91 & 93 Meadowbrook Lane
Mansfield, CT

CE Job No.: 14-27
Field Investigation Date(s): 12/8/2014
Field Investigation Method(s):
☒ Spade & Auger
☐ Backhoe & Test Pits

Report Prepared For:
Development Solutions, LLC
33 East Town Street
Norwich, CT 06360

Field Conditions:
Weather: Sunny 40° F
Recent Precipitation: average
Soil Moisture: average
Snow Depth: ---
Frost Depth: ---

Purpose of Investigation:
☒ Wetland Delineation/Flagging
☐ Sketch Wetland Boundaries on Base Map (No Flagging)
☐ High Intensity Soil Mapping by Soil Scientist
☒ Medium Intensity Soil Mapping from SCS Soil Survey Maps

Wetland Boundary Marker Series: CE 1-1→1-34
Intermittent Watercourse Marker Series: ---

Wetland Notes:
- **Type(s):** Deciduous wooded swamp
- **Hydroperiod(s):** Seasonally saturated
- **Soil Parent Material(s):** Glacial till
- **Drainage Class(es):** Poorly drained
- **Slope:** Gentle

38 Westland Avenue • West Hartford, CT 06107
Phone (860) 561-8598 • Fax (860) 561-0223 • email ecosys@comcast.net

SOIL MAP UNITS

Soil symbols used below and on the accompanying Wetland Sketch Map correspond to those in the National Cooperative Soil Survey.

WETLAND SOIL SERIES

Ridgebury, Leicester and Whitman Complex (3)

This complex consists of poorly drained Ridgebury and Leicester soils, and very poorly drained Whitman soils, described separately below. The complex consists of about 35 percent Ridgebury soils, 30 percent Leicester soils, 20 percent Whitman soils, and 15 percent other soils.

Ridgebury Series

The Ridgebury series consists of deep, poorly and somewhat poorly drained soils formed in a coarse-loamy mantle underlain by firm, compact glacial till on uplands. They are nearly level to moderately steep soils on till plains, low ridges and drumloidal landforms. The soils formed in acid glacial till derived mainly from schist, gneiss or granite.

Typically these soils have a black sandy loam surface layer 6 inches thick. The mottled subsoil from 6 to 16 inches is olive gray sandy loam. The mottled substratum from 16 to 60 inches is a light olive brown and olive, very firm and brittle gravelly sandy loam.

The seasonal high water table is within 0 to 18 inches of the surface from late fall through spring. Surface runoff is slow to medium. Permeability is moderate to moderately rapid in the surface layer and subsoil and slow or very slow in the dense substratum. A perched, fluctuating water table above the dense till saturates the solum to or near the surface for 7 to 9 months of the year.

Leicester Series

The Leicester series consists of deep, poorly drained loamy soils formed in friable glacial till on uplands. They are nearly level to gently sloping soils in drainage ways and low lying positions on till covered uplands. The soils formed in acid glacial till derived mainly from schist, gneiss or granite.

Typically, these soils have a surface layer of black fine sandy loam 6 inches thick. The subsoil from 6 to 23 inches is grayish brown, mottled fine sandy loam. The substratum from 26 to 60 inches or more is dark yellowish brown, mottled, friable, gravelly fine sandy loam.

Leicester soils are poorly drained. The seasonal high water table is within 0 to 18 inches of the surface from late fall through spring. Surface runoff is slow. Permeability is moderate or moderately rapid in the surface layer and subsoil and moderately rapid to rapid in the substratum.

Whitman Series

The Whitman series consists of very poorly drained soils formed in a coarse-loamy mantle underlain by firm, compact glacial till on uplands. They occur in drainageways, at the base of hills and ridges, and in depressions. These soils formed in acid glacial till derived mainly from schist and gneiss. They are characterized by a dense, very firm hardpan at a depth of 22-60 inches.

UPLAND (NON-WETLAND) SOIL SERIES

Canton-Charlton Complex (60)

This complex consists of well drained Canton fine sandy loam and well drained Charlton fine sandy loam, described separately below. The complex consists of about 45 percent Canton, 40 percent Charlton, and 15 percent other soils.

Canton Series

The Canton series consists of deep, well drained soils formed in a coarse-loamy mantle underlain by sandy glacial till on uplands. They are nearly level to very steep soils on till plains and hills. The soils formed in acid glacial till derived mainly from schist, gneiss or granite.

Typically, these soils have a surface layer of very dark grayish brown fine sandy loam 2 inches thick. The subsoil from 2 to 23 inches is yellowish brown fine sandy loam, gravelly fine sandy loam and gravelly sandy loam. The substratum from 23 to 60 inches is pale brown gravelly loamy sand.

The water table is commonly at a depth of more than 6 feet. Surface runoff is medium to rapid. Permeability is moderate or moderately rapid in the surface layer and subsoil and rapid in the substratum.

Charlton Series

The Charlton series consists of gently sloping, well drained soils and range from nonstony to extremely stony. Charlton soils occur on the landscape on broad hilltops, ridge tops, and glacial till plains. They formed in glacial till parent material derived mainly from schist and gneiss. Unlike the Paxton soils, which occur on the same landscape, the Charlton soils are not characterized by a dense hardpan.

Typically, the solum is 8 inches thick, dark brown fine sandy loam. The yellowish brown subsoil is 18 inches thick, and the substratum is grayish brown gravelly fine sandy loam to a depth of 60 inches.

CONNECTICUT ECOSYSTEMS LLC
ON-SITE SOIL INVESTIGATION REPORT (CONTINUED)

Project Name & Location: 91 & 93 Meadowbrook Lane Mansfield, CT
Project #: 14-27

Permeability in Charlton soils is moderate or moderately rapid. The soil has a high available water capacity, and runoff is medium.

Gloucester Series (59)

Gloucester soils are somewhat excessively drained, and developed in very friable, coarse-textured glacial till derived mainly from granite and some gneiss. The sand content is high.

The wetlands were field delineated in accordance with the standards of the National Cooperative Soil Survey and the definition of wetlands as found in the Connecticut General Statutes, Chapter 440, Section 22A-38. The investigation was conducted and reviewed by a Registered Soil Scientist.

Respectfully submitted,

Connecticut Ecosystems LLC

Edward M. Pawlak
Registered Soil Scientist
Certified Professional Wetland Scientist

File c:\soils2014\14-27.doc

Soil Map—State of Connecticut
(91 & 93 Meadowbrook Lane Mansfield, CT)

Map Scale: 1:1,610 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 20 40 80 120

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: State of Connecticut
Survey Area Data: Version 13, Oct 28, 2014

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 28, 2011—May 12, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

State of Connecticut (CT600)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
3	Ridgebury, Leicester, and Whitman soils, 0 to 8 percent slopes, extremely stony	1.7	24.0%
59D	Gloucester gravelly sandy loam, 15 to 35 percent slopes, extremely stony	2.5	36.9%
60B	Canton and Charlton soils, 3 to 8 percent slopes	2.6	37.3%
306	Udorthents-Urban land complex	0.1	1.8%
Totals for Area of Interest		**6.9**	**100.0%**

SCHEDULE OF DIMENSIONAL REQUIREMENTS
ZONE R-20 DMR

	REQUIRED/ALLOWED	PROVIDED
MINIMUM LOT AREA:	5 ACRES	14.89 ACRES
MINIMUM LOT FRONTAGE:	300'	772.57'
MAXIMUM BUILDING HEIGHT:	40'	33'
MAXIMUM BUILDING COVERAGE:	25%	9.9%
*UNIT DENSITY: (5000 SF/UNIT)	86	86

*SEE ART. X.4.A.4.D REQUIRING SPECIAL DIMENSIONAL EXCEPTIONS BY THE COMMISSION

AFFORDABLE HOUSING UNITS (20%) – ART. X SEC. 6.K
TWO BEDROOM UNITS – 1200 SQ.FT. LIVABLE AREA OR LESS

UNITS IN 2-FAMILY DWELLINGS	–	0
MULTI FAMILY DWELLINGS	18	18
ACCESSIBLE HOUSING UNITS	4 MIN.	4

NOTE: THE DEVELOPER WILL COORDINATE WITH THE MANSFIELD HOUSING AUTHORITY AND OTHER STATE AND REGIONAL AGENCIES THAT PROMOTE AFFORDABLE HOUSING OPPORTUNIES TO MARKET THE AFFORDABLE UNITS TO LOW AND MODERATE INCOME FAMILIES.

UNIT DENSITY CALCULATION (ART.X.A.5.B)
TOTAL SITE AREA = 14.89 ACRES (648,302 SQ.FT.)
AREA OF SLOPES > 15% = 1.97 ACRES (85,085 SQ.FT.)
AREA OF WETLANDS = 2.89 ACRES (125,828 SQ.FT.)
641,302 – 85,085 – 125,828 = 430,389 SQ.FT.
430,389 SQ.FT./5000SF/UNIT = 86.07 UNITS

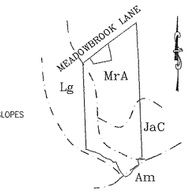
PARKING–MEADOWBROOK GARDENS–(ART X.A.5.B)
PARKING REQUIRED (36 UNITS x 2 SPACES/UNIT) = 72
REGULAR PARKING SPACES PROVIDED – 73
HANDICAP PARKING SPACES PROVIDED – 4
TOTAL PARKING SPACES PROVIDED – 77

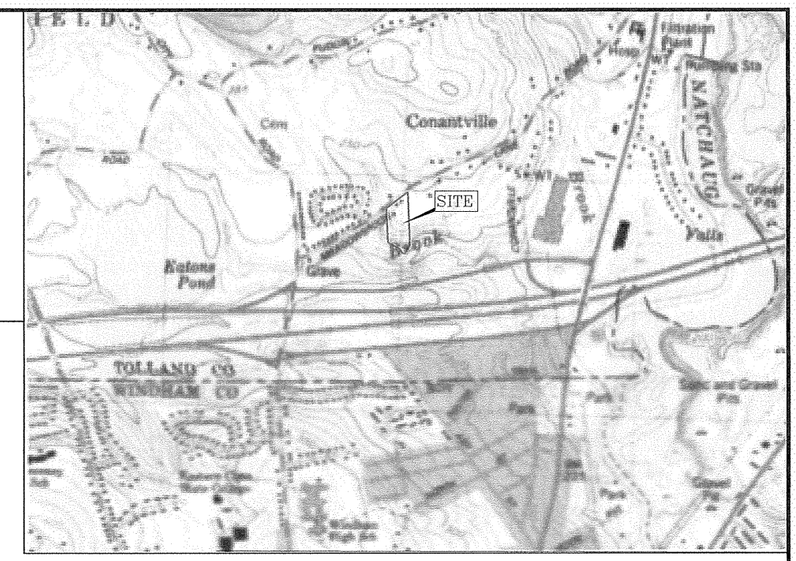
SOIL MAP
SCALE : 1" = 400'

-- SOILS LEGEND --

SYMBOL	DESCRIPTION
Am	ALLUVIAL LAND
JaC	JAFFREY GRAVELLY SANDY LOAM AND LOAMY SAND, 3 TO 15 PERCENT SLOPES
Lg	LEICESTER–RIDGEBURY–WHITMAN VERY STONY COMPLEX
MrA	MERRIMAC FINE SANDY LOAM, 0 TO 3 PERCENT SLOPES

-- SOILS DATA AS PER : "SOIL SURVEY, TOLLAND COUNTY, CONNECTICUT, UNITED STATES DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE"





LOCATION MAP
SCALE : 1" = 1000'

MEADOWBROOK GARDENS

91–93 MEADOWBROOK LANE
MANSFIELD CENTER, CONNECTICUT 06250

OWNER & APPLICANT
UNIGLOBE INVESTMENT, LLC
73 MEADOWBROOK LANE
MANSFIELD CENTER, CT 06250

JANUARY 8, 2016

INDEX TO SHEETS

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SITE LAYOUT & GRADING PLAN	SHEET 5 OF 10
EROSION, SEDIMENTATION & MAINTENANCE PLAN	SHEET 6 OF 10
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DETAIL SHEET	SHEET 8 OF 10
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LANDSCAPE–LIGHTING–SIGN DETAILS	SHEET 10 OF 10

APPROVED BY THE TOWN OF MANSFIELD INLAND WETLAND AGENCY

CHAIRMAN DATE

APPROVED BY THE MANSFIELD PLANNING AND ZONING COMMISSION

CHAIRMAN DATE

APPROVED BY THE DIRECTOR OF HEALTH

DIRECTOR DATE

APPROVED BY THE DIRECTOR OF PUBLIC WORKS

DIRECTOR DATE

DATUM ENGINEERING & SURVEYING, LLC
132 CONANTVILLE ROAD
MANSFIELD CENTER, CONNECTICUT 06250

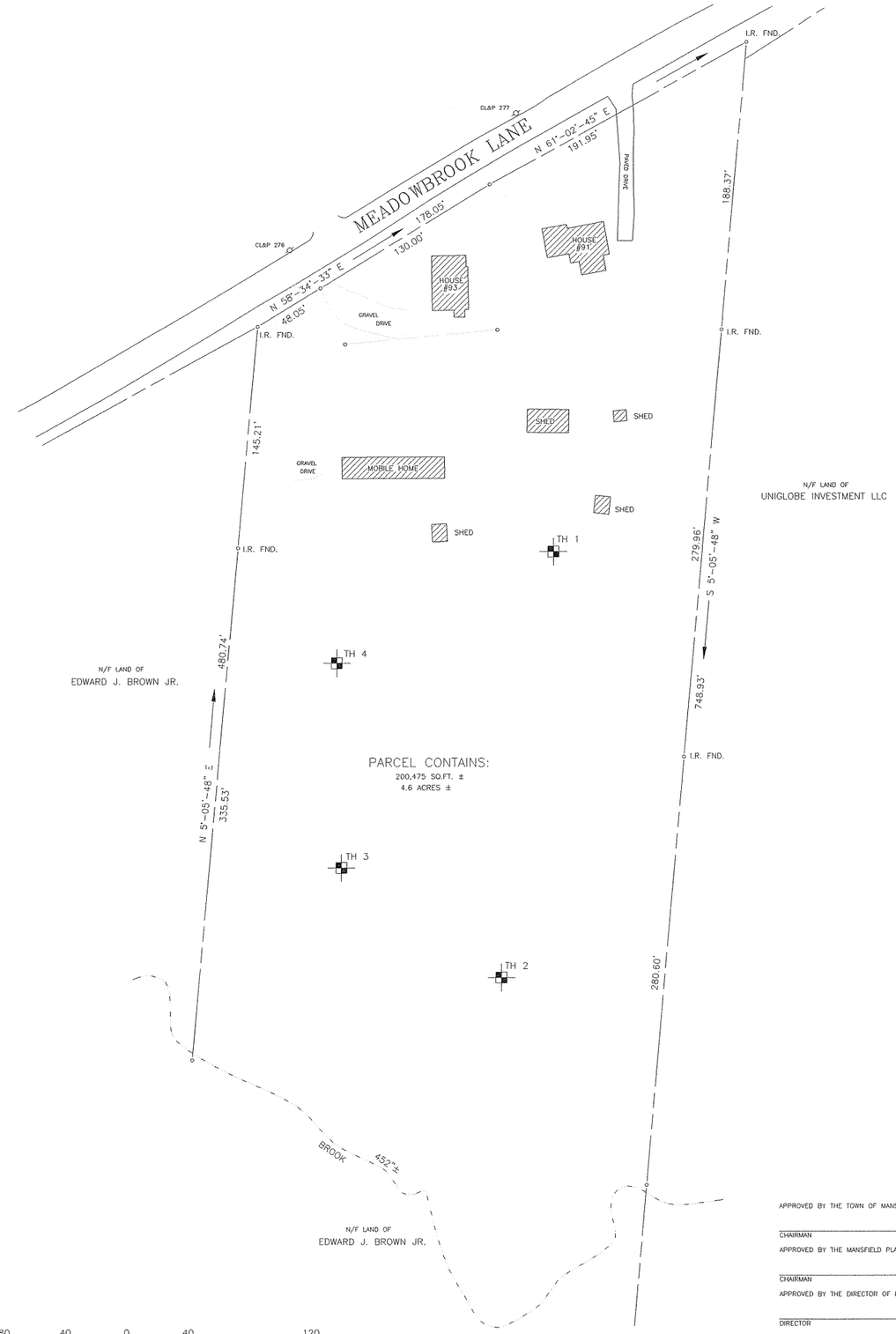
GERALD HARDISTY, P.E.
203 BOSTON HILL ROAD
ANDOVER, CONNECTICUT 06232

JOHN ALEXOPOULOS, ASLA
16 STORRS HEIGHTS ROAD
STORRS, CONNECTICUT 06268

JOB NO. 215049
SHEET 1 OF 10

MAP REFERENCE:

"PROPERTY SURVEY OF 91 & 93 MEADOWBROOK LANE MANSFIELD, CT PREPARED FOR JACK YANG" SHEET NO. 1 OF 1 SCALE 1"=40' JANUARY 8, 2015 PROJECT NO. 14-079 PREPARED BY J DEMPSEY ASSOCIATES PROFESSIONAL LAND SURVEYORS 76 BRAINARD ST. NEW LONDON, CT.



TEST HOLE DATA

OBSERVED BY GERRY HARDISTY, P.E. ON 12/30/15

TEST HOLE 1
- 0- 5" TOPSOIL
- 5-12" BROWN FINE SANDY LOAM
- 12-22" LT. BROWN FINE SAND W/3" BAND AT BOTTOM
- 22-36" YELLOW/BROWN MED SAND
- 36-57" REDDISH COARSE SAND & GRAVEL
- 57-77" YELLOW/BROWN MED/COARSE SAND VERY DISTINCT LAYERS

TEST HOLE 2
- 0-20" DARK BROWN FINE SANDY LOAM
- 20-44" TAN VERY FINE SILTY SAND
- 44-60" LAYERS OF FINE SAND & VERY FINE SAND STRIPPED ORANGE AND GRAY
- 60-84" COARSE AND VERY COARSE SAND & GRAVEL
- NOTE: LAYER OF VERY FINE SAND IN A SLOPE GETTING DEEPER TOWARDS THE EAST, BETTER MATERIAL ON THE WEST END.

TEST HOLE 3
- COARSE SAND AND GRAVEL TOP TO BOTTOM

TEST HOLE 4
- 0-24" TRACE TOPSOIL TO DARK BROWN FINE SANDY LOAM
- 24-46" REDDISH/BROWN FINE SAND TO SILT
- 46-60" VERY COARSE SAND & GRAVEL
- 60-72" CLEAN MED-COARSE SAND

LEGEND

PROPERTY LINE	
ABUTTER PROPERTY LINE	
EDGE PAVEMENT	
EDGE GRAVEL	
IRON ROD FOUND	I.R. FND. o
UTILITY POLE	CL&P 276
TEST HOLE	

80 40 0 40 120

SCALE : 1" = 40'

APPROVED BY THE TOWN OF MANSFIELD INLAND WETLAND AGENCY

CHAIRMAN DATE

APPROVED BY THE MANSFIELD PLANNING AND ZONING COMMISSION

CHAIRMAN DATE

APPROVED BY THE DIRECTOR OF HEALTH

DIRECTOR DATE

APPROVED BY THE DIRECTOR OF PUBLIC WORKS

DIRECTOR DATE

THIS SURVEY AND MAP HAS BEEN PREPARED IN ACCORDANCE WITH SECTIONS 20-300b-1 THRU 20-300b-20 OF THE REGULATIONS OF CONNECTICUT STATE AGENCIES – "MINIMUM STANDARDS FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT" AS ENDORSED BY THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS, INC. IT IS AN IMPROVEMENT LOCATION MAP BASED ON A DEPENDENT RESURVEY CONFORMING TO HORIZONTAL ACCURACY CLASS "A-2". THIS SURVEY AND MAP IS INTENDED TO ENABLE DETERMINATION OF COMPLIANCE OR NON-COMPLIANCE WITH APPLICABLE MUNICIPAL OR STATUTORY REQUIREMENTS.

TO THE BEST OF MY KNOWLEDGE AND BELIEF THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON.

EDWARD PELLETIER, L.S. #14203

ANY ORIGINAL OR DUPLICATE OF THIS MAP IS NOT VALID UNLESS IT BEARS THE EMBOSSED SEAL OF THE SURVEYOR WHOSE REGISTRATION NUMBER AND SIGNATURE APPEAR ABOVE. NO OTHER CERTIFICATION OR WARRANTY IS EXPRESSED OR IMPLIED.

BOUNDARY SURVEY

PREPARED FOR

UNIGLOBE INVESTMENT, LLC.

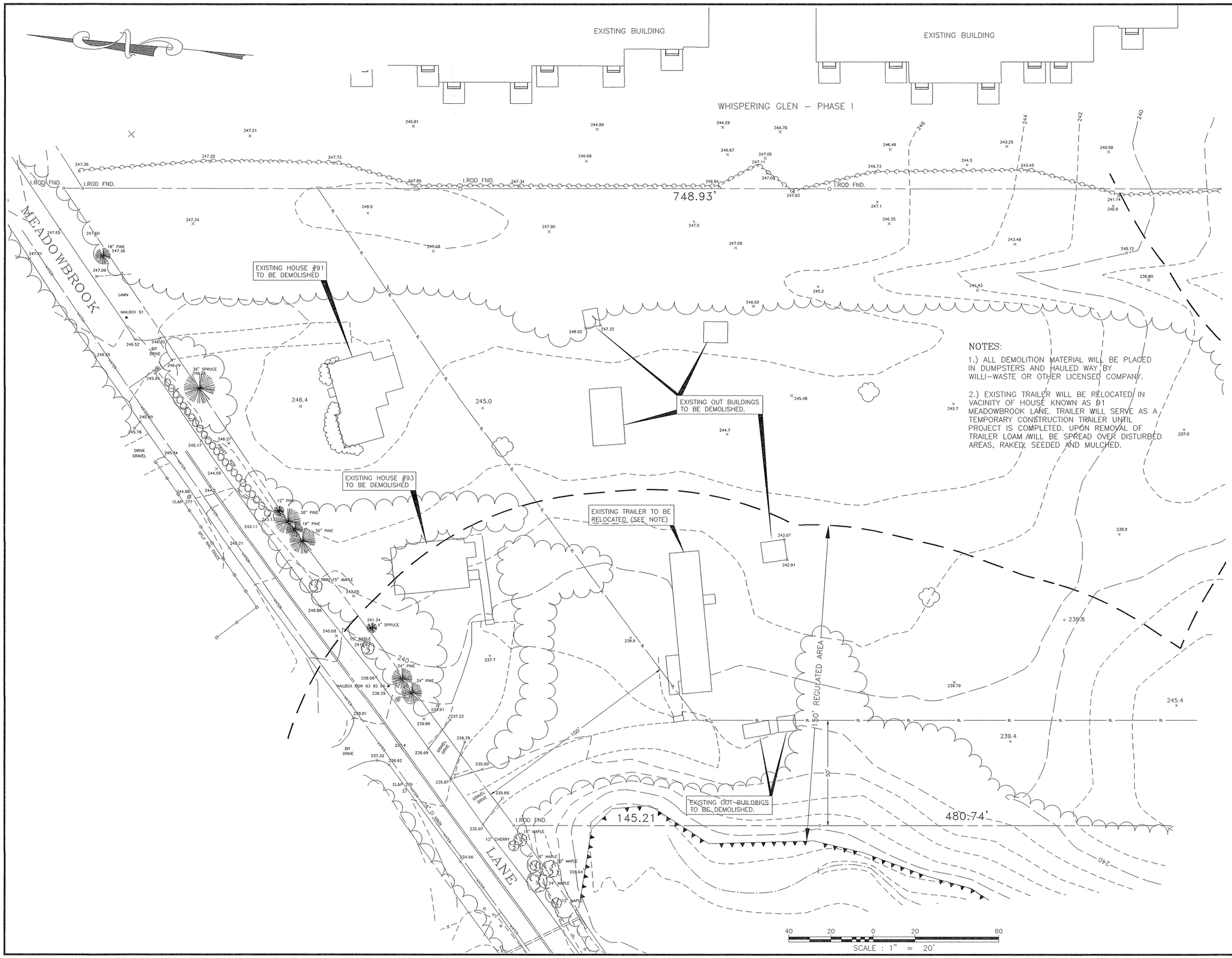
91 & 93 MEADOWBROOK LANE
MANSFIELD, CONNECTICUT

SCALE: 1" = 40' DATE: JANUARY 7, 2016

SHEET 2 OF 10

DATUM
ENGINEERING & SURVEYING, LLC
132 CONANTVILLE ROAD
MANSFIELD CENTER, CT 06250
TEL (860)456-1357 FAX (860)456-1840

CHECKED BY:_____ CORRECTIONS BY:_____



NOTES:

1.) ALL DEMOLITION MATERIAL WILL BE PLACED IN DUMPSTERS AND HAULED WAY BY WILLI-WASTE OR OTHER LICENSED COMPANY.

2.) EXISTING TRAILER WILL BE RELOCATED IN VACINITY OF HOUSE KNOWN AS 91 MEADOWBROOK LANE. TRAILER WILL SERVE AS A TEMPORARY CONSTRUCTION TRAILER UNTIL PROJECT IS COMPLETED. UPON REMOVAL OF TRAILER LOAM WILL BE SPREAD OVER DISTURBED AREAS, RAKED, SEEDED AND MULCHED.

APPROVED BY THE TOWN OF MANSFIELD INLAND WETLAND AGENCY

CHAIRMAN DATE

APPROVED BY THE MANSFIELD PLANNING AND ZONING COMMISSION

CHAIRMAN DATE

APPROVED BY THE DIRECTOR OF HEALTH

DIRECTOR DATE

APPROVED BY THE DIRECTOR OF PUBLIC WORKS

DIRECTOR DATE

DEMOLITION PLAN

PREPARED FOR

UNIGLOBE INVESTMENTS, LLC

91 & 93 MEADOWBROOK LANE
MANSFIELD CENTER, CONNECTICUT

SCALE: 1" = 20' DATE: OCTOBER 12, 2015

SHEET 3 OF 10

DATUM
ENGINEERING & SURVEYING, LLC
132 CONANTVILLE ROAD
MANSFIELD CENTER, CT 06250
TEL (860)456-1357 FAX (860)456-1840

JOB NO. 215049

CHECKED BY:..... CORRECTIONS BY:.....

EXISTING BUILDING

EXISTING BUILDING

WHISPERING GLEN – PHASE I

748.93'

I.ROD FND.

MEADOWBROOK LANE

EXISTING HOUSE #91 TO BE DEMOLISHED

EXISTING HOUSE #93 TO BE DEMOLISHED

EXISTING OUT BUILDINGS TO BE DEMOLISHED.

EXISTING TRAILER TO BE RELOCATED (SEE NOTE)

150' REGULATED AREA

145.21

480.74'

NOTES:

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LEGEND

EXISTING		PROPOSED
	PROPERTY LINE	
	NEW TREE LINE	
	TREE LINE	
	STONEWALL	
WATER	WATER LINE	
	UTILITY POLE	
493.79 ×	SPOT ELEVATION	
	CONTOUR	550
	LIMIT OF WETLANDS	
	STORM DRAINAGE PIPE	
	TREE TO BE REMOVED	12" OAK(R)

SCALE : 1" = 20'

APPROVED BY THE TOWN OF MANSFIELD INLAND WETLAND AGENCY

CHAIRMAN _____ DATE _____

APPROVED BY THE MANSFIELD PLANNING AND ZONING COMMISSION

CHAIRMAN _____ DATE _____

APPROVED BY THE DIRECTOR OF HEALTH

DIRECTOR _____ DATE _____

APPROVED BY THE DIRECTOR OF PUBLIC WORKS

DIRECTOR _____ DATE _____

DEMOLITION PLAN

PREPARED FOR

UNIGLOBE INVESTMENTS, LLC

91 & 93 MEADOWBROOK LANE
MANSFIELD CENTER, CONNECTICUT

SCALE: 1" = 20' DATE: JANUARY 8, 2016

SHEET 4 OF 10

DATUM ENGINEERING & SURVEYING, LLC

132 CONANTVILLE ROAD
MANSFIELD CENTER, CT 06250
TEL (860)456-1357 FAX (860)456-1840

JOB NO. 215049

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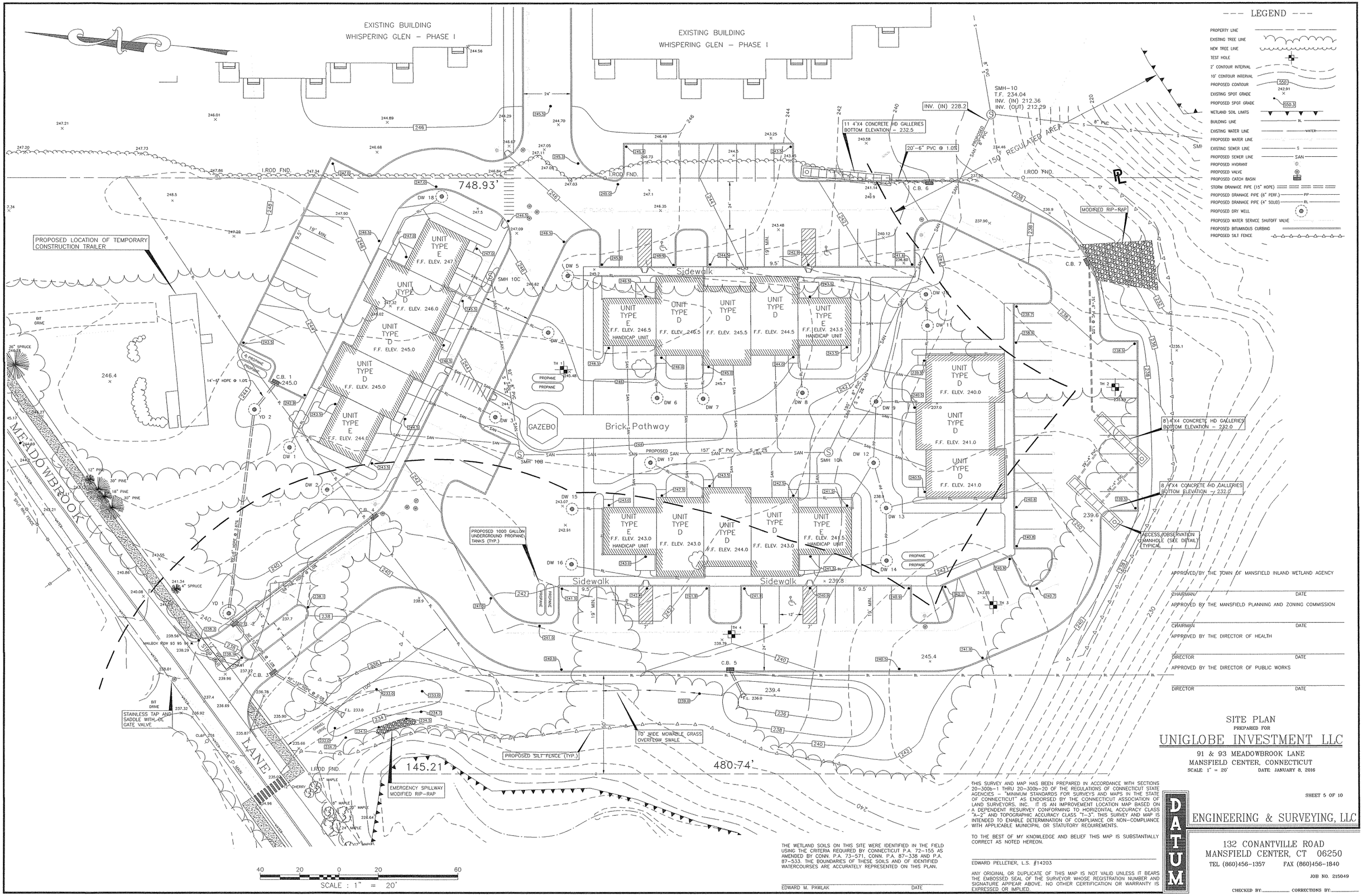

APPROVED BY THE TOWN OF MANSFIELD INLAND WETLAND AGENCY

CHAIRMAN/ DATE

APPROVED BY THE MANSFIELD PLANNING AND ZONING COMMISSION

CHAIRMAN DATE

APPROVED BY THE DIRECTOR OF HEALTH

DIRECTOR DATE

APPROVED BY THE DIRECTOR OF PUBLIC WORKS

DIRECTOR DATE

SITE PLAN

PREPARED FOR

UNIGLOBE INVESTMENT LLC

91 & 93 MEADOWBROOK LANE
MANSFIELD CENTER, CONNECTICUT

SCALE: 1" = 20' DATE: JANUARY 8, 2016

THIS SURVEY AND MAP HAS BEEN PREPARED IN ACCORDANCE WITH SECTIONS 20-300b-1 THRU 20-300b-20 OF THE REGULATIONS OF CONNECTICUT STATE AGENCIES – "MINIMUM STANDARDS FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT" AS ENDORSED BY THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS, INC. IT IS AN IMPROVEMENT LOCATION MAP BASED ON A DEPENDENT RESURVEY CONFORMING TO HORIZONTAL ACCURACY CLASS "A-2" AND TOPOGRAPHIC ACCURACY CLASS "T-3". THIS SURVEY AND MAP IS INTENDED TO ENABLE DETERMINATION OF COMPLIANCE OR NON-COMPLIANCE WITH APPLICABLE MUNICIPAL OR STATUTORY REQUIREMENTS.

TO THE BEST OF MY KNOWLEDGE AND BELIEF THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON.

EDWARD PELLETIER, L.S. #14203

ANY ORIGINAL OR DUPLICATE OF THIS MAP IS NOT VALID UNLESS IT BEARS THE EMBOSSED SEAL OF THE SURVEYOR WHOSE REGISTRATION NUMBER AND SIGNATURE APPEAR ABOVE. NO OTHER CERTIFICATION OR WARRANTY IS EXPRESSED OR IMPLIED.

THE WETLAND SOILS ON THIS SITE WERE IDENTIFIED IN THE FIELD USING THE CRITERIA REQUIRED BY CONNECTICUT P.A. 72-155 AS AMENDED BY CONN. P.A. 73-571, CONN. P.A. 87-338 AND P.A. 87-533. THE BOUNDARIES OF THESE SOILS AND OF IDENTIFIED WATERCOURSES ARE ACCURATELY REPRESENTED ON THIS PLAN.

EDWARD M. PAWLAK DATE

SHEET 5 OF 10

DATUM
ENGINEERING & SURVEYING, LLC
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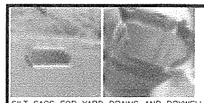
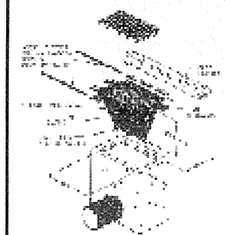
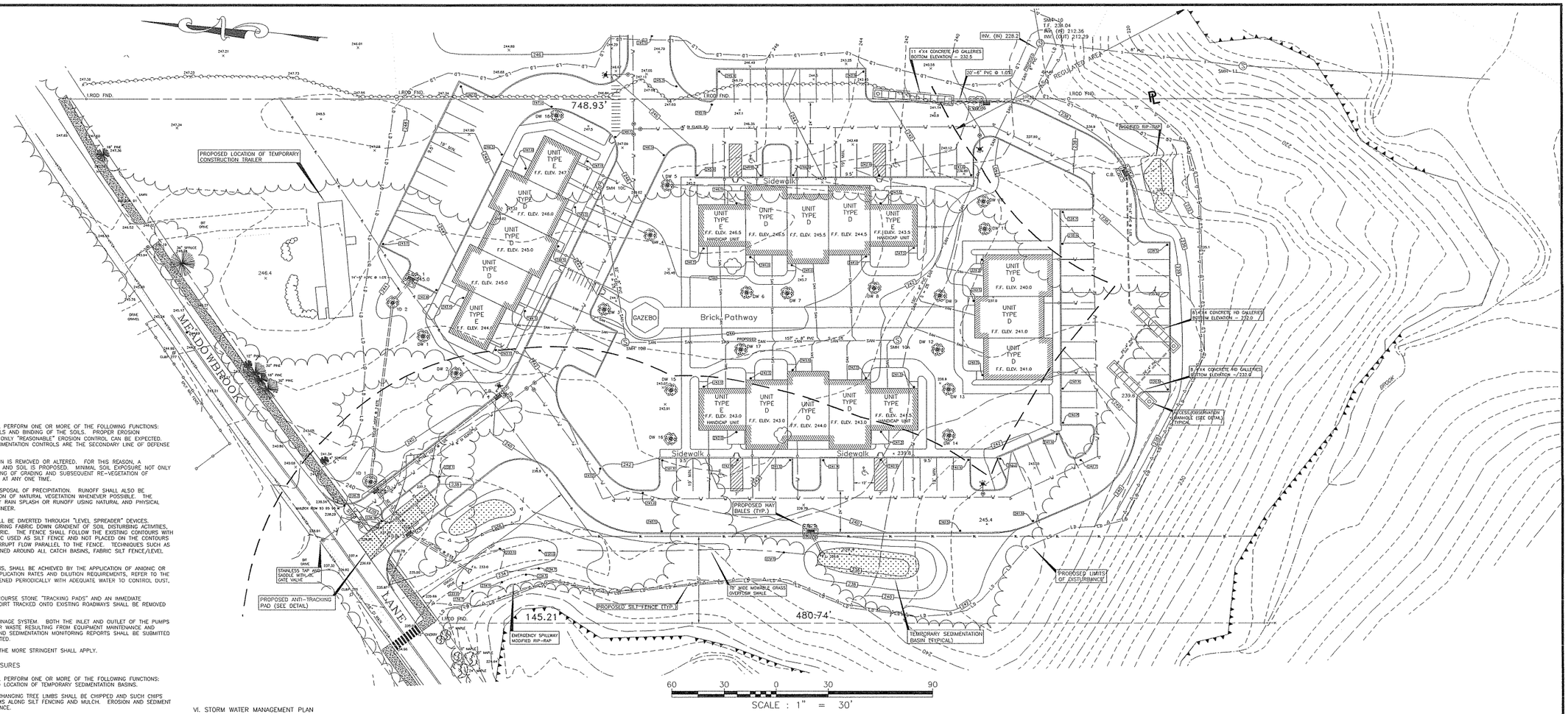


SILT SACS FOR YARD DRAINS AND DRYWELLS
BMP SUPPLIES (WWW.BMPSUPPRES.COM) OR EQUAL



SILT SACS FOR CATCH BASINS
TERRAFIX GEOSYNTHETICS INC.
(WWW.TERRAFIXGEO.COM) OR EQUAL



I. GENERAL EROSION AND SEDIMENTATION CONTROL NOTES

THIS CONSTRUCTION PLAN PROPOSES EROSION CONTROL MEASURES WHICH WILL PERFORM ONE OR MORE OF THE FOLLOWING FUNCTIONS: MINIMIZATION OF SOIL EXPOSURE, CONTROL OF RUNOFF, SHIELDING OF THE SOILS AND BINDING OF THE SOILS. PROPER EROSION MANAGEMENT WILL MINIMIZE THE EROSION, BUT IT MUST BE UNDERSTOOD THAT ONLY "REASONABLE" EROSION CONTROL CAN BE EXPECTED. THUS, EVEN WITH THE BEST PLAN, SOME EROSION MUST BE ANTICIPATED. SEDIMENTATION CONTROLS ARE THE SECONDARY LINE OF DEFENSE ON THE CONSTRUCTION SITE.

WATER GENERATED SEDIMENT IS A SERIOUS PROBLEM WHEN NATURAL VEGETATION IS REMOVED OR ALTERED. FOR THIS REASON, A RECOMMENDATION FOR MINIMAL SITE DISTURBANCE TO THE EXISTING VEGETATION AND SOIL IS PROPOSED. MINIMAL SOIL EXPOSURE NOT ONLY ENTAILS DEMARCATING SITE DISTURBANCE LIMITS, BUT ALSO INVOLVES THE STAGING OF GRADING AND SUBSEQUENT RE-VEGETATION OF DISTURBED AREAS, SO THAT THE LEAST AMOUNT OF SOIL SURFACE IS EXPOSED AT ANY ONE TIME.

RUNOFF SHALL BE CONTROLLED BY THE INTERCEPTION, DIVERSION AND SAFE DISPOSAL OF PRECIPITATION. RUNOFF SHALL ALSO BE CONTROLLED BY THE STAGING OF CONSTRUCTION ACTIVITY AND THE PRESERVATION OF NATURAL VEGETATION WHENEVER POSSIBLE. THE BINDING OF SOIL PARTICLES TO MAKE THEM LESS SUSCEPTIBLE TO REMOVAL BY RAIN SPLASH OR RUNOFF USING NATURAL AND PHYSICAL "BINDERS" (MULCH AND FABRICS) MAY BE REQUIRED AS DIRECTED BY THE ENGINEER.

TO PREVENT SEDIMENT FROM LEAVING THE SITE, TURBID SURFACE RUNOFF SHALL BE DIVERTED THROUGH "LEVEL SPREADER" DEVICES. TEMPORARY LEVEL SPREADER DEVICES SHALL BE CREATED BY PLACING ENGINEERING FABRIC DOWN GRADIENT OF SOIL DISTURBING ACTIVITIES. THUS FLOW WILL BE DISPERSED OVER A WIDE AREA AND FILTERED BY THE FABRIC. THE FENCE SHALL FOLLOW THE EXISTING CONTOURS WITH ENDS OF THE FENCE TURNED UPHILL TO PREVENT END CUTTING. FILTER FABRIC USED AS SILT FENCE AND NOT PLACED ON THE CONTOURS SHOULD HAVE "WINGS" AT INTERVALS OF NO GREATER THAN 100 FEET TO INTERRUPT FLOW PARALLEL TO THE FENCE. TECHNIQUES SUCH AS "WINGED" FABRIC SILT FENCE, CHECK DAMS, HAY BALES INSTALLED AND MAINTAINED AROUND ALL CATCH BASINS, FABRIC SILT FENCE/LEVEL SPREADERS AND SEDIMENTATION PONDS MAY BE USED.

DUST CONTROL, IF DETERMINED TO BE REQUIRED DURING THE DAILY INSPECTIONS, SHALL BE ACHIEVED BY THE APPLICATION OF ANIONIC OR CATIONIC ASPHALT EMULSIONS, LATEX EMULSION, OR RESIN IN WATER. FOR APPLICATION RATES AND DILUTION REQUIREMENTS, REFER TO THE MANUFACTURER'S GUIDELINES. THE EXPOSED SOIL SURFACE SHOULD BE MOISTENED PERIODICALLY WITH ADEQUATE WATER TO CONTROL DUST, BUT WATER SHALL NOT BE USED EXCLUSIVELY.

IN AN EFFORT TO REDUCE THE POTENTIAL FOR TRACKING MUD OFF THE SITE, COURSE STONE "TRACKING PADS" AND AN IMMEDIATE CONSTRUCTION OF A GRAVEL SUB-BASE FOR ROADWAYS ARE RECOMMENDED. DIRT TRACKED ONTO EXISTING ROADWAYS SHALL BE REMOVED BY SHOVEL AND G-BROOM AT THE END OF EACH DAY.

EXCAVATION THAT MUST BE DE-WATERED WILL BE PUMPED INTO AN ACTIVE DRAINAGE SYSTEM. BOTH THE INLET AND OUTLET OF THE PUMPS SHOULD BE FILTERED AND PROTECTED FROM SURGE ACTION. DEBRIS AND OTHER WASTE RESULTING FROM EQUIPMENT MAINTENANCE AND CONSTRUCTION SHALL NOT BE DISCARDED ON SITE. THE BI-WEEKLY EROSION AND SEDIMENTATION MONITORING REPORTS SHALL BE SUBMITTED TO THE ZONING AGENT DURING THE TIME THE ROADWAYS ARE BEING CONSTRUCTED.

IN THE EVENT OF CONFLICT BETWEEN THESE PLANS AND OTHER REGULATIONS, THE MORE STRINGENT SHALL APPLY.

II. CONSTRUCTION SEQUENCE AND DETAILD EROSION CONTROL MEASURES

THIS CONSTRUCTION PLAN PROPOSES EROSION CONTROL MEASURES WHICH WILL PERFORM ONE OR MORE OF THE FOLLOWING FUNCTIONS:
1. A REGISTERED LAND SURVEYOR SHALL FIELD STAKE LIMITS OF CLEARING AND LOCATION OF TEMPORARY SEDIMENTATION BASINS.

2. UPON COMPLETION OF THE FIELD STAKING, ALL VEGETATION, INCLUDING OVERHANGING TREE LIMBS SHALL BE CHIPPED AND SUCH CHIPS SHALL BE STORED IN NON-GRADED AREAS FOR FUTURE USE AS EROSION BERMS ALONG SILT FENCING AND MULCH. EROSION AND SEDIMENT MEASURES SHALL BE INSTALLED AS APPROPRIATE PRIOR TO ANY SITE DISTURBANCE.

3. TEMPORARY STORM WATER RETENTION BASINS SHALL BE CONSTRUCTED AND SITE RUNOFF DIRECTED TOWARD THE BASINS.

4. STUMPING CAN COMMENCE AND BE GROUND INTO CHIPS. CHIPS SHALL BE STOCK PILED IN NON-GRADED AREAS. ANTI-TRACKING PADS SHALL BE INSTALLED PRIOR TO STRIPPING OF THE BALANCE OF THE SITE. THIS ANTI-TRACKING PADDING SHALL BE MAINTAINED AND REPLACED AS NECESSARY.

5. TEMPORARY SEDIMENTATION BASINS SHALL BE CONSTRUCTED AS DEPICTED, AND MAINTAINED UNTIL STORM DRAINAGE STRUCTURES ALONG WITH EROSION AND SEDIMENTATION CONTROLS, HAY BALES, CHECK DAMS, SILT SACKS AND LEVEL SPREADERS HAVE BEEN INSTALLED.

6. ROADWAYS AND PARKING AREAS SHALL BE ROUGH GRADED, DIRECTING STORM WATER RUNOFF TOWARD THE SEDIMENTATION BASINS. EROSION AND SEDIMENTATION CONTROLS SHALL BE INSTALLED AND MAINTAINED UNTIL COMPLETION OF THE PROJECT AND SITE DISTURBANCE IS STABILIZED.

7. INSTALLATION OF THE SEWER SYSTEM FROM THE EXISTING MANHOLE ON PHASE 1 AND THEN THE WATER MAIN FROM MEADOWBROOK LANE TO THE EXISTING CONNECTION PROVIDED FOR IN PHASE 1. INDIVIDUAL WATER SERVICES SHALL BE INSTALLED AS BUILDINGS ARE CONSTRUCTED.

8. UNDERGROUND TELEPHONE, CABLE AND ELECTRIC SHALL BE INSTALLED, FOLLOWED BY THE PLACEMENT OF THE PROCESS GRAVEL BASE, BITUMINOUS PAVEMENT AND BITUMINOUS CONCRETE LIP CURBING. THE SHOULDERS OF ROADWAYS AND PARKING AREAS SHALL BE FINE GRADED, LOAMED AND SEEDED, AS SPECIFIED.

9. PERMANENT STORM WATER RECHARGE BASINS SHALL BE COMPLETED AND STABILIZED IMMEDIATELY, ALONG WITH THE RIP-RAP OVERFLOW AREA SOUTH OF CATCH BASIN 7. ALL SILT SACKS SHALL BE MAINTAINED AND CHECKED AFTER EVERY STORM EVENT UNTIL THE SITE HAS BEEN COMPLETELY STABILIZED.

BEFORE AND AFTER EACH STORM EVENT AND ONCE EVERY DAY, ALL SEDIMENT AND EROSION CONTROLS WILL BE INSPECTED BY THE ENGINEER OR ENVIRONMENTAL SUPERVISOR. ANY CORRECTIVE MEASURES TO MITIGATE ENVIRONMENTAL CONCERNS WILL BE ORDERED AT THAT TIME. THERE WILL BE 150 FEET OF SILT FENCE WITH THE REQUIRED POSTS ON HAND FOR EMERGENCY SITUATIONS.

III. BUILDING SITE DEVELOPMENT

1. THE LIMITS OF DISTURBANCE SHALL BE ESTABLISHED IN THE FIELD FOR EACH PROPOSED BUILDING. THE MAXIMUM DISTURBANCE LIMITS OF 24-30 FEET BEYOND THE PHYSICAL DIMENSIONS OF THE BUILDING AND RELATED APPURTENANCES IS RECOMMENDED.

2. TOPSOIL AND EXCAVATED SUBSOIL FROM THE FOUNDATION AREA SHALL BE STOCKPILED WITH THE AREA OF DISTURBANCE IF NOT USED FOR THE ON SITE RE-GRADING. EACH STOCKPILE SHALL BE ADEQUATELY RINGED ON THE DOWN GRADIENT SIDE WITH SEDIMENT CONTROL MATERIALS MENTIONED PREVIOUSLY.

3. ANY ADDITIONAL STOCKPILING OF LUMBER AND OTHER BUILDING MATERIALS SHALL ALSO BE CONFINED TO THE AREA OF DISTURBANCE. VEHICULAR MOVEMENT SHALL BE DIRECTED TO ESTABLISHED PARKING AREAS.

4. ONCE THE PROPOSED BUILDING IS ENCLOSED, ALL EFFORTS SHALL BE MADE TO COMPLETE ON SITE IMPROVEMENTS, SUCH AS WATER SERVICE, SEWER LATERALS, ROOF LEADER DRAINS, ETC.. THEREAFTER, AREA AROUND THE BUILDING SHALL BE FINE GRADED AND MULCHED.

IV. SEEDING AND PLANTING:

1. SEED BED PREPARATION: FINE GRADE AND RAKE SOIL SURFACE TO REMOVE STONES LARGER THAN 2 INCHES IN DIAMETER FROM LAWN AREAS. APPLY LIMESTONE AT A MINIMUM RATE OF 2 TONS PER ACRE OR 90 LBS. PER 1000 SQUARE FEET. FERTILIZE WITH 10-10-10 AT A RATE OF 300 LBS. PER ACRE OR 7.5 LBS. PER 1000 SQUARE FEET. WORK LIME AND FERTILIZER INTO SOIL UNIFORMLY TO A DEPTH OF 4 INCHES WITH A WHISK, SPRING-TOOTH HARROW OR OTHER SUITABLE EQUIPMENT FOLLOWING THE CONTOUR LINES.

2. SEED APPLICATION: APPLY GRASS SEED MIXTURE BY HAND, CYCLONE SEEDER OR HYDROSEED. INCREASE SEED MIXTURE BY 10% IF HYDROSEEDING. LIGHTLY DRAG OR TOLL THE SEEDED SURFACE TO COVER SEED. SEED SHALL CONSIST OF A MIXTURE OF KENTUCKY BLUEGRASS (0.45LBS/1000 SF), CREEPING RED FESCUE (0.45 LBS/1000 SF), AND PERENNIAL RYE GRASS (0.10 LBS/1000 SF). SEEDING OF PERMANENT GRASS SEED SHALL BE DONE BETWEEN APRIL 15 AND JUNE 15, OR SEPTEMBER 1 THROUGH OCTOBER 15. IN THE EVENT THAT SEEDING CANNOT BE COMPLETED DURING THE ABOVE DATES, A TEMPORARY GRASS SEED CONSISTING OF 1.0 LBS/1000 SF OF ANNUAL RYE GRASS SHALL BE APPLIED. MOISTURE CONDITIONS SHALL BE SUPPLEMENTED FOR TEMPORARY SEEDING BETWEEN JUNE 16 AND AUGUST 31.

3. MULCHING: IMMEDIATELY FOLLOWING SEEDING, MULCH THE SEEDED SURFACE WITH STRAW OR HAY AT A RATE OF 1.5 TO 2 TONS PER ACRE WHERE SLOPES EXCEED 10 PERCENT. SPREAD MULCH BY HAND OR MULCH BLOWER. PUNCH MULCH INTO SOIL SURFACE WITH TRACK MACHINE OR DISH HARROW SET STRAIGHT UP. MULCH MATERIAL SHOULD BE SET INTO SOIL SURFACE APPROXIMATELY EVERY 2-3 INCHES.

V. PLAN IMPLEMENTATION

PRIOR TO THE START OF CONSTRUCTION, THERE SHALL BE A PRE-CONSTRUCTION MEETING WITH THE TOWN ZONING AGENT, THE TOWN WETLANDS AGENT, THE SITE CONTRACTOR AND THE CONTRACTOR'S PROFESSIONAL SOIL EROSION AND SEDIMENT CONTROL SPECIALIST TO DISCUSS THE PLAN, INSPECTION PROCEDURES AND REPORT REQUIREMENTS.

REGULAR INSPECTION OF THE SITE SHALL BE PERFORMED TO ENSURE COMPLIANCE WITH THIS SEDIMENT AND EROSION CONTROL PLAN, AND A SEDIMENT AND EROSION MONITORING REPORT MAY BE REQUIRED BY THE TOWN OF MANSFIELD ZONING AGENT AND INLAND WETLAND AGENT AS DEEMED NECESSARY.
DURING CONSTRUCTION IT SHALL BE THE RESPONSIBILITY OF ROBERT MAGI (TEL. NO. (203) 692-5222) TO ENSURE THE IMPLEMENTATION OF THIS SEDIMENT & EROSION CONTROL PLAN. THIS RESPONSIBILITY INCLUDES INSTALLATION AND MAINTENANCE OF CONTROL MEASURES, INFORMING ALL PARTIES ENGAGED ON THE SITE OF THE OBJECTIVES OF THE PLAN, NOTIFYING THE WETLAND AGENT OR HIS DESIGNATE OF ANY TRANSFER OF THIS RESPONSIBILITY AND FOR CONVEYING A COPY OF THE SEDIMENT & EROSION CONTROL PLAN IF AND WHEN SUCH TRANSFER IS APPROPRIATE. ANY MATERIAL REMOVED FROM SITE AND DEPOSITED IN MANSFIELD MUST BE IN FULL COMPLIANCE WITH APPLICABLE ZONING AND INLAND WETLAND REQUIREMENTS.

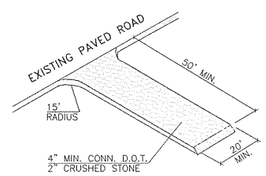
VI. STORM WATER MANAGEMENT PLAN

ONCE CONSTRUCTION IS COMPLETE AND LAWNS AND DISTURBED AREAS FULLY STABILIZED, SOIL EROSION AND SEDIMENT CONTROL MEASURES SUCH AS SILT FENCE AND HAY BALES MAY/SHALL BE REMOVED AT WHICH TIME THIS STORMWATER MANAGEMENT PLAN SHALL BE IMPLEMENTED.

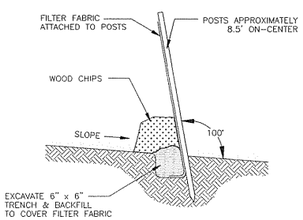
CATCH BASINS AND LAWN DRAINS SHALL BE FITTED WITH "SILT SACS" OR EQUIVALENT GEOSYNTHETIC FILTER FABRICS TO PREVENT SILTATION OR CLOGGING OF CATCH BASIN SUMPS AND DRYWELLS. SUCH FILTERS SHALL BE INSPECTED REGULARLY (SUCH AS AT TIMES OF LAWN MOWING) AND EMPTIED AND OR REPLACED AS NECESSARY. INFILTRATION BASINS SHALL BE MAINTAINED AS LAWNS, MOWED REGULARLY AND KEPT FREE OF TREES, BRUSH OR BRAMBLES.

BOTH FILTER FABRIC SYSTEMS AND INFILTRATION AREAS BEAR CLOSE MONITORING ESPECIALLY IMMEDIATELY AFTER IMPLEMENTATION. MAINTENANCE AND INSPECTION INTERVALS SHOULD BE ADJUSTED AS NECESSARY BASED ON INSPECTION RESULTS, AND A LOG OF INSPECTION DATES AND RESULTS SHOULD BE MAINTAINED.

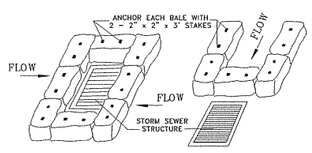
EDWARD PELLETIER, L.S. #14203
ANTICIPATED START DATE: JUNE, 2016 COMPLETION DATE: JANUARY, 2017



ANTI-TRACKING PAD DETAIL
NOT TO SCALE



SILT FENCE DETAIL
NOT TO SCALE



HAY BALE INSTALLATION AT CATCH BASIN
NO SCALE

APPROVED BY THE TOWN OF MANSFIELD INLAND WETLAND AGENCY

CHAIRMAN DATE

APPROVED BY THE MANSFIELD PLANNING AND ZONING COMMISSION

CHAIRMAN DATE

APPROVED BY THE DIRECTOR OF HEALTH

DIRECTOR DATE

APPROVED BY THE DIRECTOR OF PUBLIC WORKS

DIRECTOR DATE

--- LEGEND ---

PROPERTY LINE
EXISTING TREE LINE
2' CONTOUR INTERVAL
10' CONTOUR INTERVAL
PROPOSED CONTOUR 550
EXISTING SPOT GRADE 242.91
PROPOSED SPOT GRADE 550.3
WETLAND SOIL LIMITS
BUILDING LINE
PROPOSED CATCH BASIN
STORM DRAINAGE PIPE (15" HDPE)
PROPOSED DRY WELL
PROPOSED BITUMINOUS CURBING
PROPOSED SILT FENCE
LINMITS OF DISTURBANCE LD

EROSION, SEDIMENTATION & MAINTENANCE PLAN

PREPARED FOR

UNIGLOBE INVESTMENT LLC

91 & 93 MEADOWBROOK LANE
MANSFIELD CENTER, CONNECTICUT

SCALE: 1" = 30' DATE: JANUARY 8, 2016

SHEET 6 OF 10

DATUM ENGINEERING & SURVEYING, LLC
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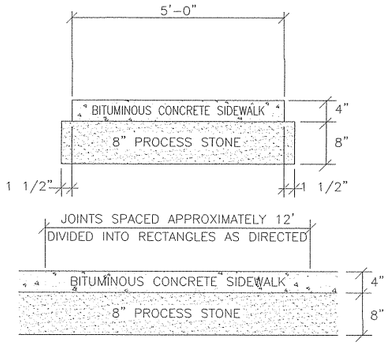
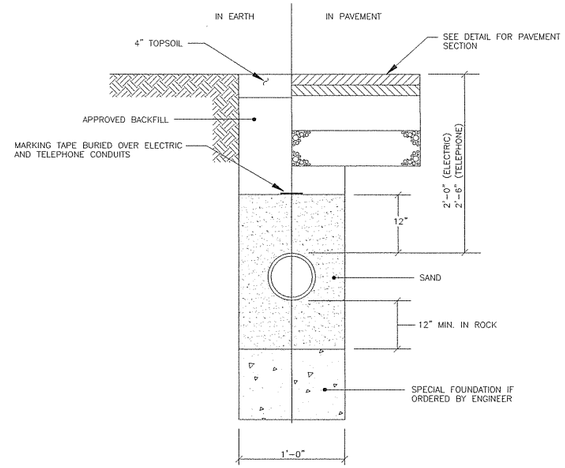


5' BITUMINOUS CONCRETE SIDEWALK

NO SCALE



ELECTRICAL & TELEPHONE PVC CONDUIT TRENCH DETAIL

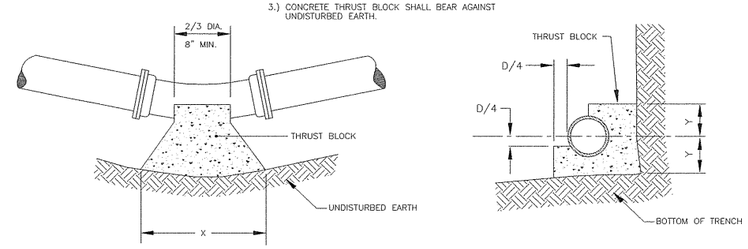
NOT TO SCALE

NOTE:

1.) ALL CONCRETE SHALL BE 3000 PSI AT 28 DAYS

2.) DIMENSIONS SHOWN ARE MINIMUM AND ARE BASED UPON SOIL PRESSURE OF 3000 PSF AND STATIC WATER PRESSURE OF 180 PSI.

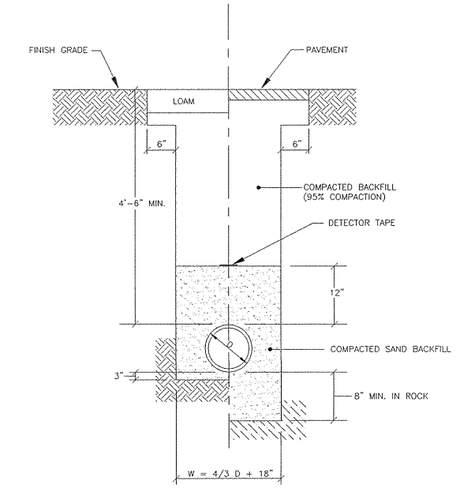
3.) CONCRETE THRUST BLOCK SHALL BEAR AGAINST UNDISTURBED EARTH.



	45° BEND					22 1/2° BEND					11 1/4° BEND				
DIA.	6"	8"	12"	16"	24"	6"	8"	12"	16"	24"	6"	8"	12"	16"	24"
X	12"	18"	24"	36"	42"	12"	16"	18"	24"	42"	12"	12"	14"	18"	42"
Y	12"	12"	12"	16"	28"	12"	12"	12"	14"	28"	12"	12"	12"	14"	28"

THRUST BLOCK DETAIL

NOT TO SCALE



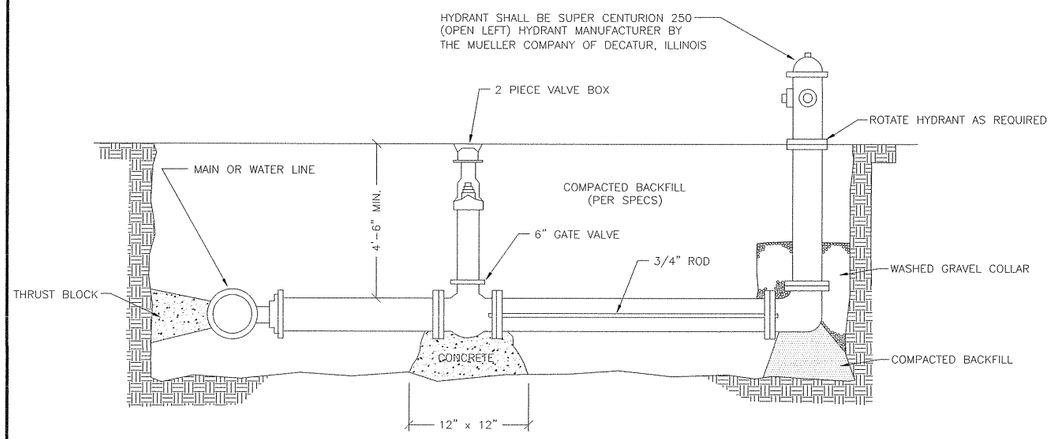
TYPICAL WATER MAIN TRENCH DETAIL

NOT TO SCALE

1. ALL WATER LINE MATERIALS SHALL BE PER WWW SPECS

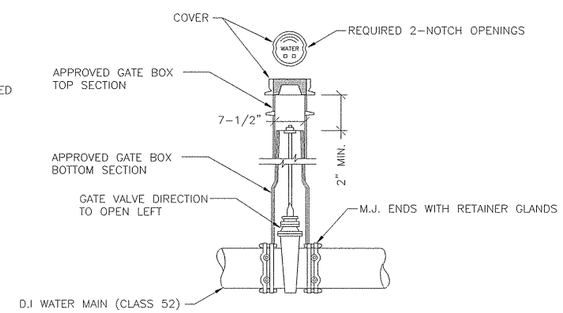
2. WATER MAIN TO MAINTAIN A MINIMUM 10 FEET FROM STORM DRAINAGE RECHARGE STRUCTURES UNLESS APPROVED BY WWW.

3. ALL BUILDING WATER LINE SERVICES TO BE 1" COPPER



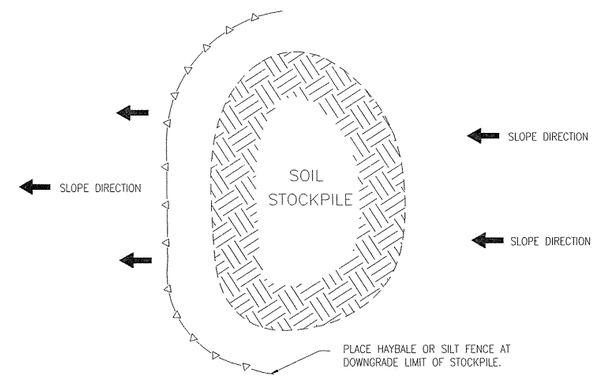
FIRE HYDRANT ASSEMBLY

NO SCALE



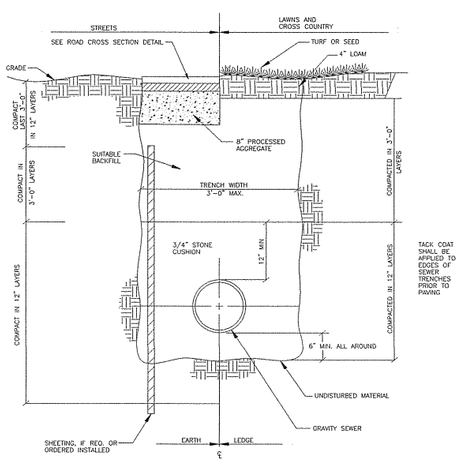
12" OR LESS VERTICAL GATE VALVE AND GATE BOX (OPEN LEFT)

NO SCALE



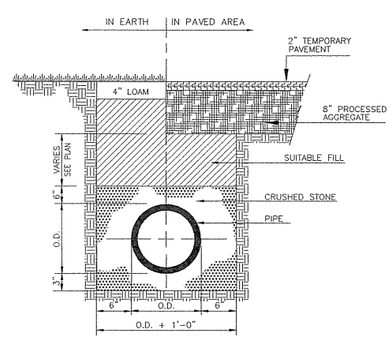
STOCKPILE EROSION PROTECTION DETAIL

NOT TO SCALE



TYPICAL GRAVITY SEWER TRENCH SECTION DETAIL

NOT TO SCALE



STORM SEWER TRENCH SECTION

NO SCALE

APPROVED BY THE TOWN OF MANSFIELD INLAND WETLAND AGENCY

CHAIRMAN DATE

APPROVED BY THE MANSFIELD PLANNING AND ZONING COMMISSION

CHAIRMAN DATE

APPROVED BY THE DIRECTOR OF HEALTH

DIRECTOR DATE

APPROVED BY THE DIRECTOR OF PUBLIC WORKS

DIRECTOR DATE

DETAIL SHEET
PREPARED FOR

UNIGLOBE INVESTMENT LLC

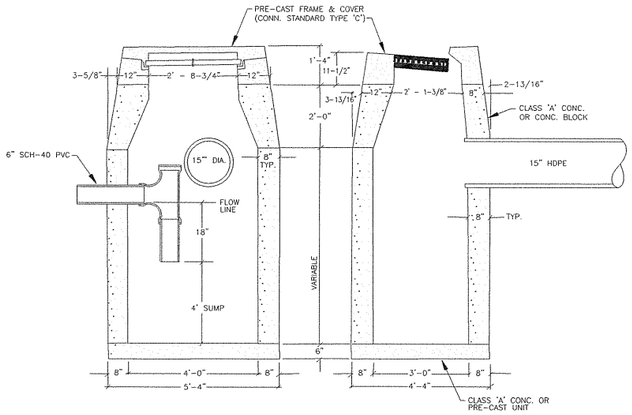
91 & 93 MEADOWBROOK LANE
MANSFIELD CENTER, CONNECTICUT
SCALE: AS NOTED DATE: JANUARY 8, 2016

SHEET 7 OF 10

DATUM
ENGINEERING & SURVEYING, LLC
132 CONANTVILLE ROAD
MANSFIELD CENTER, CT 06250
TEL (860)456-1357 FAX (860)456-1840

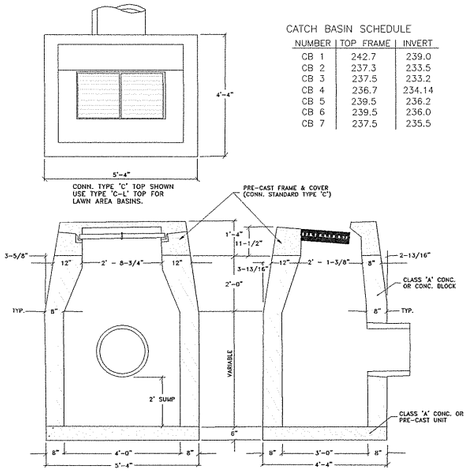
JOB NO. 215049

CHECKED BY:_____ CORRECTIONS BY:_____



CONN. STATE STANDARD CATCH BASIN

NO SCALE

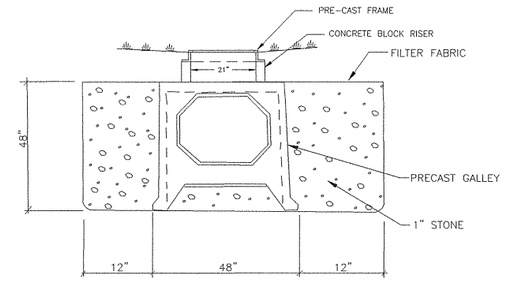


CATCH BASIN SCHEDULE

NUMBER	TOP FRAME	INVERT
CB 1	242.7	239.0
CB 2	237.3	233.5
CB 3	237.5	233.2
CB 4	236.7	234.14
CB 5	239.5	236.2
CB 6	239.5	236.0
CB 7	237.5	235.5

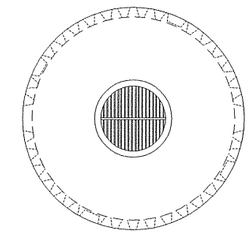
CONN. STATE STANDARD CATCH BASIN

NO SCALE



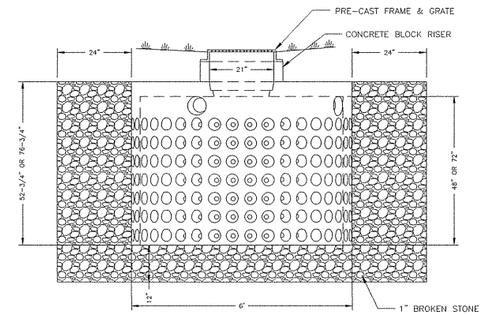
GALLERY CROSS SECTION

NO SCALE



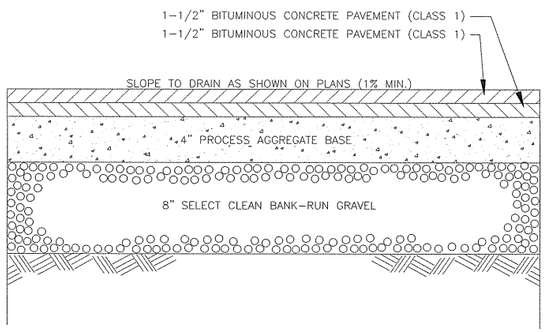
DRY WELL/YARD DRAIN SCHEDULE

NUMBER	SIZE	TOP FRAME	BOTTOM ELEV.	INVERT
DW 1	6'Dx4'H	242.8	237.6	–
DW 2	6'Dx4'H	242.1	236.9	–
DW 3	6'Dx6'H	242.8	235.4	–
DW 4	6'Dx4'H	242.1	236.9	–
DW 5	6'Dx4'H	246.0	240.8	–
DW 6	6'Dx4'H	244.8	239.6	–
DW 7	6'Dx4'H	244.0	238.8	–
DW 8	6'Dx4'H	242.8	237.6	–
DW 9	6'Dx6'H	239.0	230.1	235.64
DW 10	6'Dx6'H	239.0	231.6	237.14
DW 11	6'Dx6'H	239.5	231.6	237.14
DW 12	6'Dx6'H	240.0	231.1	236.64
DW 13	6'Dx6'H	240.0	231.1	236.64
DW 14	6'Dx6'H	240.5	230.1	235.64
DW 15	6'Dx4'H	242.3	237.1	–
DW 16	6'Dx4'H	241.8	236.4	–
DW 17	6'Dx4'H	242.0	236.8	–
DW 18	6'Dx4'H	247.3	242.1	–
YD 1	6'Dx6'H	237.8	230.4	236.20
YD 2	6'Dx6'H	242.5	235.1	238.86



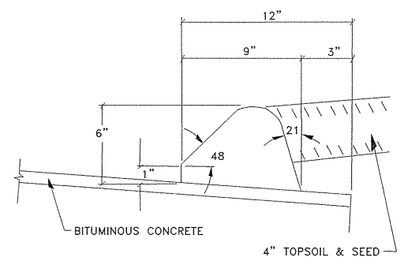
PRECAST DRYWELL/YARD DRAIN

NO SCALE



PAVEMENT DETAIL

NOT TO SCALE



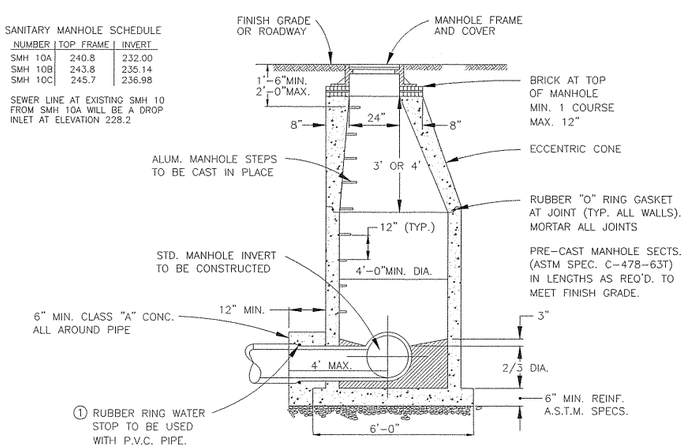
CURB DETAIL

NO SCALE

SANITARY MANHOLE SCHEDULE

NUMBER	TOP FRAME	INVERT
SMH 10A	240.8	232.00
SMH 10B	243.8	235.14
SMH 10C	245.7	236.98

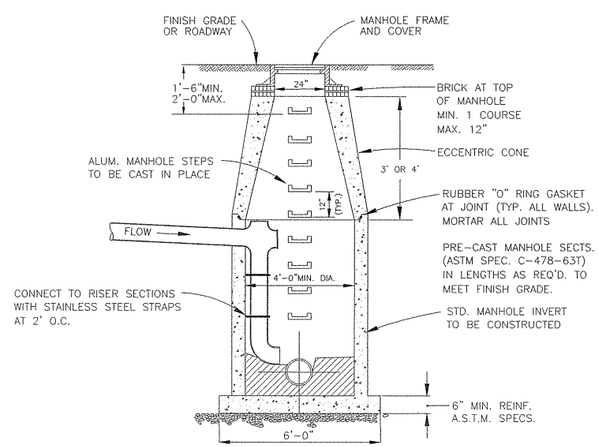
SEWER LINE AT EXISTING SMH 10 FROM SMH 10A WILL BE A DROP INLET AT ELEVATION 228.2



PRECAST MANHOLE DETAIL

NOT TO SCALE

1. MANHOLE SHALL BE WATERTIGHT. IN LIEU OF PARGING, TWO COATS OF BITUMINOUS WATERPROOFING MAY BE BRUSHED ON OR SPRAYED ON. INERTOL, TREMCO OR APPROVED EQUAL MAY BE USED TO OBTAIN DESIRED RESULTS. DO NOT BACKFILL UNTIL LAST COAT IS DRY.



PRECAST DROP MANHOLE DETAIL

NOT TO SCALE

APPROVED BY THE TOWN OF MANSFIELD INLAND WETLAND AGENCY

CHAIRMAN DATE

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CHAIRMAN DATE

APPROVED BY THE DIRECTOR OF HEALTH

DIRECTOR DATE

APPROVED BY THE DIRECTOR OF PUBLIC WORKS

DIRECTOR DATE

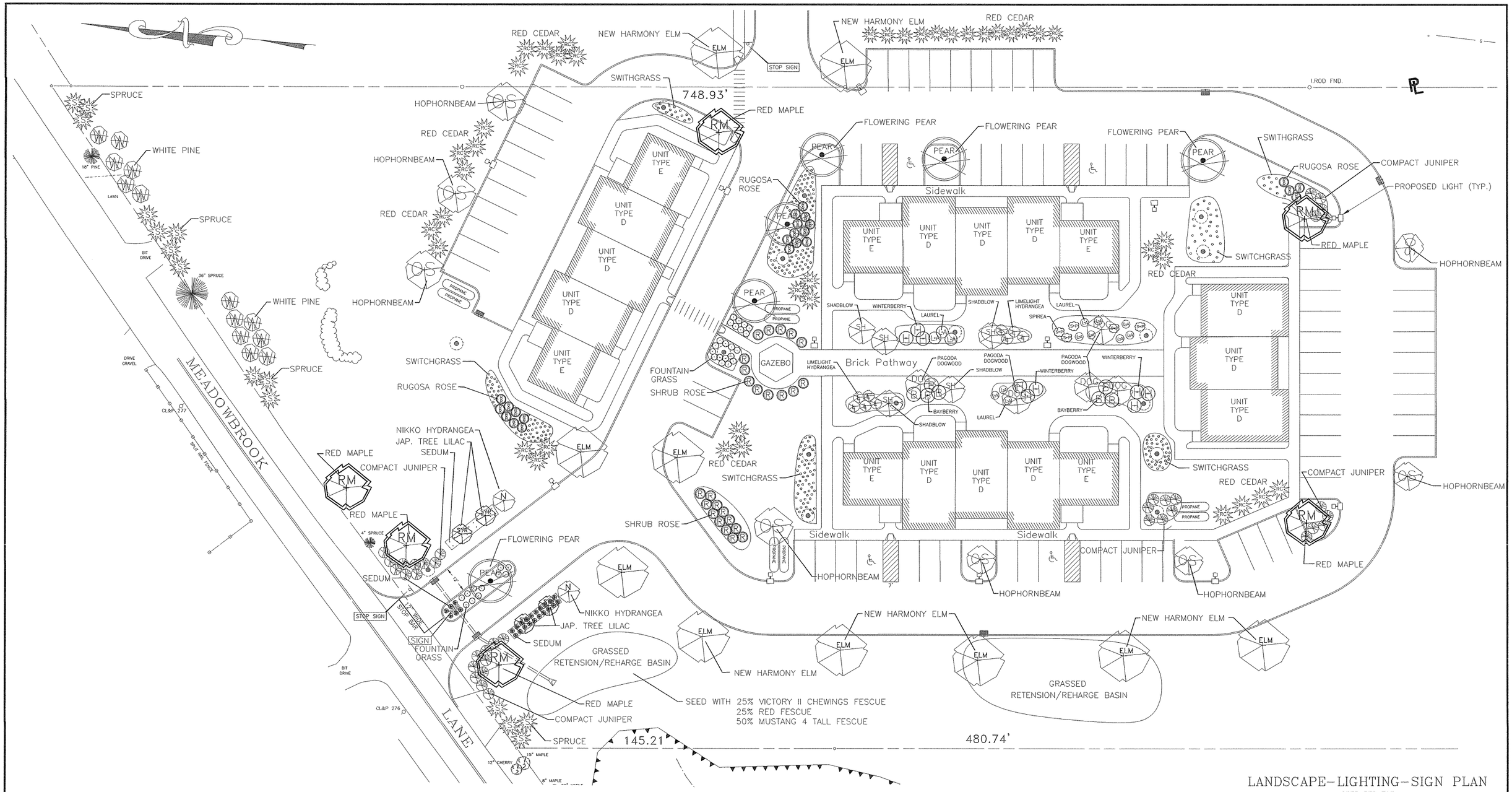
DETAIL SHEET
PREPARED FOR
UNIGLOBE INVESTMENT LLC
91 & 93 MEADOWBROOK LANE
MANSFIELD CENTER, CONNECTICUT
SCALE AS NOTED DATE JANUARY 8, 2016

SHEET 8 OF 10

DATUM
ENGINEERING & SURVEYING, LLC
132 CONANTVILLE ROAD
MANSFIELD CENTER, CT 06250
TEL (860)456-1357 FAX (860)456-1840

JOB NO. 215049

CHECKED BY:_____ CORRECTIONS BY:_____



LANDSCAPE–LIGHTING–SIGN PLAN

PREPARED FOR

ARTISAN DEVELOPMENT, LLC

91 & 93 MEADOWBROOK LANE
MANSFIELD CENTER, CONNECTICUT

SCALE: 1" = 20' DATE: OCTOBER 12, 2015

SHEET 9 OF 10

APPROVED BY THE TOWN OF MANSFIELD INLAND WETLAND AGENCY

CHAIRMAN DATE

APPROVED BY THE MANSFIELD PLANNING AND ZONING COMMISSION

CHAIRMAN DATE

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DIRECTOR DATE

APPROVED BY THE DIRECTOR OF PUBLIC WORKS

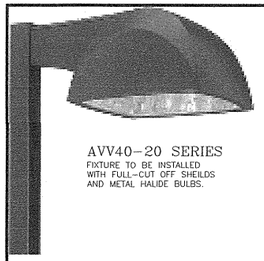
DIRECTOR DATE

LANDSCAPE ARCHITECT
J. ALEXOPOULOS, LAND. ARCH.
CT LIC. NO. 550

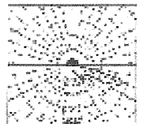
DATUM
ENGINEERING & SURVEYING, LLC
132 CONANTVILLE ROAD
MANSFIELD CENTER, CT 06250
TEL (860)456-1357 FAX (860)456-1840

JOB NO. 215049

CHECKED BY:_____ CORRECTIONS BY:_____



AVV40-20 SERIES
FIXTURE TO BE INSTALLED WITH FULL-CUT OFF SHEILDS AND METAL HALIDE BULBS.



LIGHTING SCIENCES INC. CERTIFIED TEST REPORT NO. LSI 23057 CANDLEPOWER DISTRIBUTION CURVE OF 400W PSMH AERODOME LIGHT.

ISOFOOTCANDLE PLOT OF 400W PSMH AEROODME LIGHT AT 25' MOUNTING HEIGHT (PLAN VIEW)

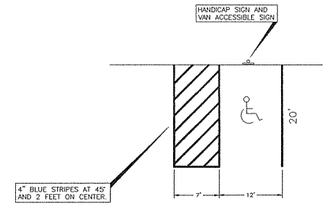
SITE LIGHTING

NOT TO SCALE

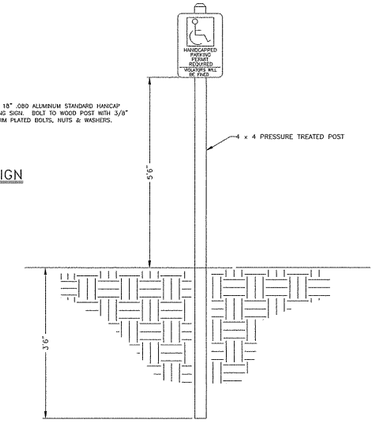
12" x 18" .080 ALUMINUM STANDARD HANICAP PARKING SIGN. BOLT TO WOOD POST WITH 3/8" CADMIUM PLATED BOLTS, NUTS & WASHERS.

ACCESSIBLE PARKING SIGN

NOT TO SCALE

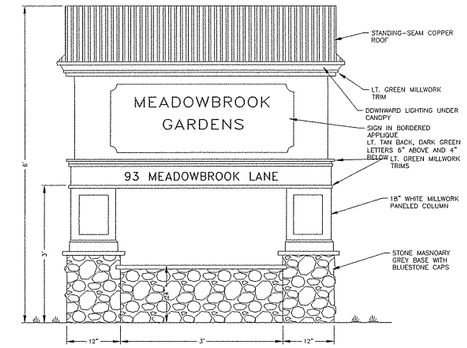


VAN ACCESSIBLE HANDICAP PARKING SPACE DETAIL



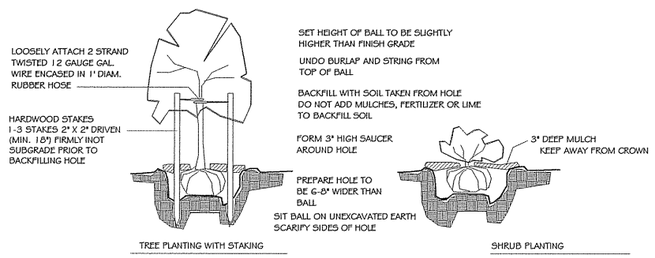
ACCESSIBLE PARKING SIGN

NOT TO SCALE

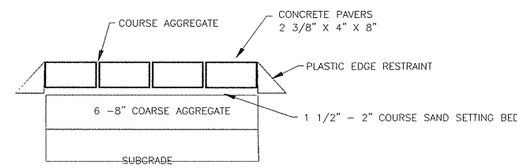


IDENTITY SIGN DETAIL

NO SCALE

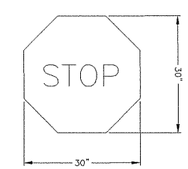


PLANTING DETAILS - NOT TO SCALE



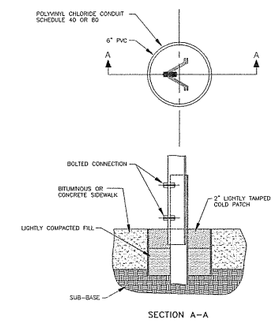
BRICK WALKWAY DETAIL

NOT TO SCALE



STOP SIGN DETAIL

NOT TO SCALE



SIGN POST DETAIL

NO SCALE

PLANTING SCHEDULE

Symbol Code	Name/ Scientific Name	Size	Quantity
RM	ACER RUBRUM 'COLUMNARE'/ COLUMNAR RED MAPLE	2 1/2" - 3" CAL.	6
SH	AMELANCHIER CANADENSIS/ SHADBLOW	6 - 7'	4
DOG	CORNUS ALTERNIFOLIA/ PAGODA DOGWOOD	2 1/2" - 3" CAL.	4
OS	OSTRYA VIRGINICA/ HOPHORNBEAM	2 1/2" - 3" CAL.	6
PEAR	PYRUS CALLERYANA 'CHANTICLEER'/ FLOWERING PEAR	2 1/2" - 3" CAL.	6
SYR	SYRINGA RETICULATA/ JAPANESE TREE LILAC	2 1/2" - 3" CAL.	2
ELM	ULMUS AMERICANA 'NEW HARMONY'/ NEW HARMONY ELM	2 1/2" - 3" CAL.	10
RC	JUNIPERUS VIRGINIANA/ RED CEDAR	6 - 7'	42
SPR	PICEA PUNGENS/ COLORADO SPRUCE	6 - 7'	16
PW	PINUS STROBUS/ WHITE PINE	6 - 7'	13
N	HYDRANGEA MACROPHYLLA 'NIKKO BLUE'/BIGLEAF HYDRANGEA	18 - 21"	2
H	HYDRANGEA PANICULATA 'LIMELIGHT'/LIMELIGHT HYDRANGEA	18 - 21"	9
H	ILEX VERTICILLATA/ WINTERBERRY	18 - 21"	9
J	JUNIPERUS CHIN. PFITZ. COMPACTUM/ COMPACT PFITZER JUNIPER	18 - 21"	37
L+A	KALMIA LATIFOLIA/ LAUREL	18 - 21"	11
B	MYRICA PENNSYLVANICUM/ BAYBERRY	18 - 21"	7
R	ROSA 'KNOCKOUT'/ KNOCKOUT SHRUB ROSE	18 - 21"	25
R	ROSA RUGOSA/ RUGOSA ROSE	18 - 21"	23
S+P	SPIRAEA BUMALDA 'ANTHONY WATERER'/ SPIREA	18 - 21"	4
	PENNISETUM ALOPECUROIDES/ FOUNTAIN GRASS	2 GAL.	32
	SEDUM 'BRILLIANT'/ SEDUM	1 GAL.	26
	PANICUM 'RUBY RIBBONS/ SWITCHGRASS	PLUGS	255

APPROVED BY THE TOWN OF MANSFIELD INLAND WETLAND AGENCY

CHAIRMAN DATE

APPROVED BY THE MANSFIELD PLANNING AND ZONING COMMISSION

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DIRECTOR DATE

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DIRECTOR DATE

LANDSCAPE ARCHITECT

J. ALEXOPOULOS, LAND. ARCH.
CT LIC. NO. 550

LANDSCAPE-LIGHTING-SIGN DETAILS
PREPARED FOR

ARTISAN DEVELOPMENT, LLC

91 & 93 MEADOWBROOK LANE
MANSFIELD CENTER, CONNECTICUT
SCALE: AS NOTED DATE: JANUARY 8, 2016

SHEET 10 OF 10

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132 CONANTVILLE ROAD
MANSFIELD CENTER, CT 06250
TEL (860)456-1357 FAX (860)456-1840

JOB NO. 215049

CHECKED BY:_____ CORRECTIONS BY:_____

DESIGN STATEMENT
DRAINAGE CALCULATIONS
&
HYDRAULIC ANALYSIS

UNIGLOBE INVESTMENTS, LLC

91 & 93 MEADOWBROOK LANE
MANSFIELD CONNECTICUT

Civil Engineering Services, LLC
203 Boston Hill Road
Andover CT 06232

February 5, 2016

UNIGLOBE INVESTMENTS, LLC

91 & 93 MEADOWBROOK LANE
MANSFIELD CONNECTICUT

OVERVIEW & SITE LOCATION

The project proposed entails the development of a modest residential development on a 4.6 acre parcel on the south side of Meadowbrook Lane in Mansfield, Connecticut adjacent the previously approved Whispering Glen development. The proposed development will consist of four new buildings, three of which will contain five units each of housing, one which will contain three units. The units will be a mixture of one-bedroom units and two-bedroom units with a total of 60 bedrooms in the development.

Access to the development will be by way of a 95' long boulevard from Meadowbrook Lane, and an additional access road from the Whispering Glenn development.

The parcel on which this development is proposed is currently in an (R-20) Residential 20 Zone. This application will include a request for a zone change to a Planned Residential Zone.

GEOGRAPHY

The subject site is located on a relatively flat sandy area, with a gentle 4-5% slope from east to west and which also drains to the south through an existing well-defined gulley along the eastern property line. The far west and south side of the site is bound by an un-named brook which empties into the Conantville Brook about 250' east of the subject parcel. The Conantville Brook in turn empties into Sawmill Brook just south of the Eastbrook Mall, and Sawmill Brook continues on to the south and meets the Natchaug River at the north end of Phillip Lauter Park in Willimantic.

According to the Natural Resources Conservation Service Web Soil Survey, the soils on the site are primarily Gloucester gravelly sandy loam on steeps slopes, and Canton and Charleton soils on 3 to 8% slopes, which are typified as well-drained, sandy and gravelly sandy loams, with moderately high to high transmissivity, and greater than 80 inches to restrictive features. These soils belong to Hydrologic Soil Group B.

EXISTING CONDITIONS / PROPOSED CONDITIONS

Most of the property to be affected by the proposed development has been previously cleared and is relatively open sandy ground. There currently exists on the parcel a wood-framed residential building, a mobile home and a number of out buildings. The proposed plan calls for an eighteen–unit development with a total of 60 bedrooms, and paved parking for 77 vehicles. Obviously, the amount of impervious coverage on the site will increase dramatically.

The stormwater management plan that we have designed will mitigate the effects of that change by utilizing the hydrologic qualities of the underlying soils in conjunction with a network of drywells and catch basins to absorb what would typically be a significant increase in stormwater run-off from the site. By breaking up the drainage areas into small enough segments, and routing the stormwater into drywells that provide both storage volume and surface interface area with surrounding soils, we are able to provide a system capable of handling any storm event up to a 50-year storm without allowing any run-off from the developed portion of the site.

In the event that the stormwater system fails to contain a storm event, and there is run-off from the site, that run-off will be routed to one of two stabilized areas: one at the northwest corner of the project near the entrance road, and one at the southeast corner of the project where stormwater run-off from the site currently discharges to the existing stream.

DRAINAGE

As this is a residential development, the Mansfield Public Works Standards require that we design the driveway, roadway and general drainage system to meet requirements for a 10-year storm intensity. We have met those requirements and beyond.

Driveway area drainage consists of seven catch basins only, and five of those catch basins are in sag locations. Peak discharge of run-off from the drainage areas contributing to the catch basins was determined using both Rational and the SCS hydrograph methods of determination. The Rational Method was used initially because the peak discharge from that method is typically a bit more conservative (greater peak) than the SCS Method. The results of the Rational Method calculations were used to examine how much stormwater bypass we could expect from the two catch basins not in a sag configuration, and to determine the maximum expected peak flows to the catch basins in located in sags. In all instances we determined that the basins would perform satisfactorily for 10 and 25-year storm events. Drainage calculations are contained in Appendix A.

In the event that flows were to exceed those anticipated, overflow from the proposed drainage system would run to areas adjacent to established streams or channels and any negative impact would be minimized.

HYDROLOGY

The point of interest in our comparison of present conditions to post-development stormwater conditions is the point on the southeast corner of the property where the un-named brook leaves the site. Since the brook is the receptor for all existing stormwater run-off from the site, and will remain the receptor under improved conditions, it is a logical point at which to measure the impact of the development on the site.

The stormwater management plan for the proposed design utilizes a series of drywells and lawn drains in small defined areas to capture roof run-off and stormwater and introduce it to the ground in small segments rather than gathering it in a large detention or retention area. In fact, we feel the design before the Commission will result in a significant decrease in stormwater run-off from the site and will help recharge the groundwater that eventually feeds the un-named brook.

We used the Hydraflow Hydrographs Extension for AutoCAD program to model existing conditions and proposed storm sewers and to analyze the capacity of the system for the 2-year, 10-year, 25-year, and 50-year storm events. Models were constructed utilizing SCS run-off hydrographs to generate stormwater volumes, and drywells were modeled as small ponds with a specified exfiltration rate.

The following assumptions and parameters were used as input data in our Hydraflow model of existing conditions:

A curve number (CN) of 61 was used for open space, lawns and parks (existing conditions) in hydrologic soil group B; CN of 98 was used for impervious areas (only 0.10 acre under existing conditions); existing time of concentration was calculated to be 29.9 minutes based in large part on an overland flow distance of 150 feet on slopes of 4.7%, and a manning's coefficient of 0.40 (lawn area), and a time in brook of about 8 minutes.

As mentioned above, the proposed stormwater design is based on the theory that we can capture all the stormwater from impervious areas and introduce it to a very permeable subsoil for groundwater recharge. That being the case, the stormwater run-off expected from the site under the proposed conditions would be constrained to run-off from those areas outside of the area "captured" by curbing and the proposed recharge system.

For the proposed conditions model we used a CN of 65 with the assumption that the area that would still be contributing to off-site run-off would generally be on the steeper slopes surrounding the development. We also reduced the time of concentration for proposed conditions to 15 minutes realizing that the run-off from the most remote areas

of the site would be intercepted on site. A comparison of the calculated run-off from the site under existing conditions and proposed conditions follows:

STORM EVENT	EXISTING COND.	DEVELOPED COND.
2-YR	1.3 cfs	1.1 cfs
10-YR	4.5 cfs	3.2 cfs
25-YR	6.2 cfs	4.3 cfs
50-YR	8.0 cfs	5.5 cfs

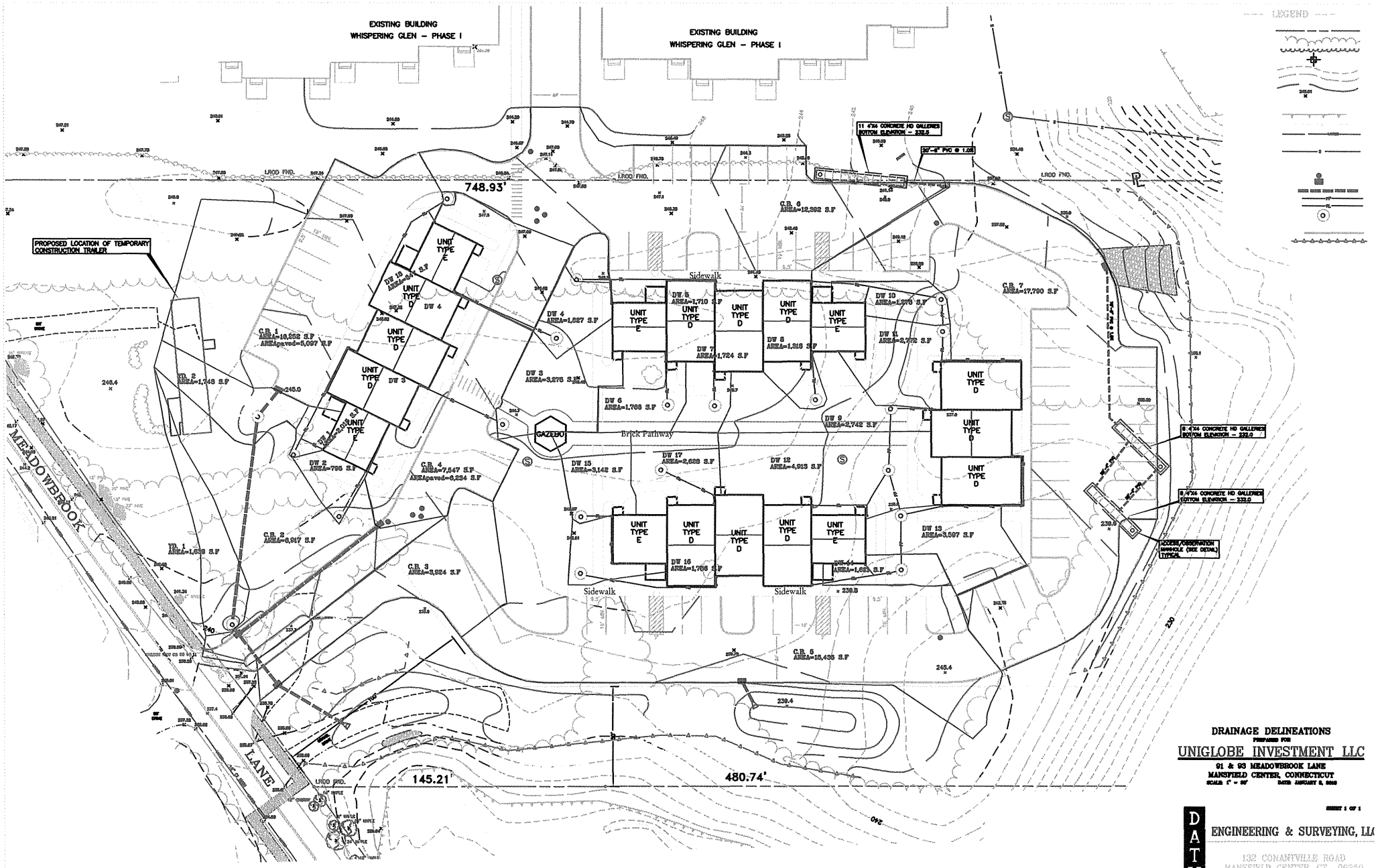
Before starting our hydrographic model of the site, we conducted soil testing on the site. We excavated four large pits on the site, physically examined the soils, and had Materials Testing, Inc. (MTI), take in-situ samples of the material to conduct permeability testing on the material. We found the majority of the material to be med to coarse sand, and sand and gravel, with one exception being in the lower, southern end of test pit #2 where the material was much finer, siltier. The test results from MTI indicated a permeability rate of 10.5 ft./day for the sample taken from the bottom test hole #2 (which we feel was not a particularly representative sample of the site as a whole), and ranged from 68.7 ft./day to 106.2 ft./day in the other three pits, and an overall average of the test results was about 65 ft./day. A copy of the MTI test data is included in Appendix B.

In modeling the proposed run-off capture and disposal plan for the on-site drainage, we modeled a yard drain (with integral 6'x 6' drywell) as a pond with an incremental storage volume and an incremental rate of discharge related to depth of water in the well. Our calculations show that the storage volume of a 6'x6' drywell with 2' of stone around it will provide about 290 cubic feet of storage over the 6 foot depth, and in increments of 48.4 cubic feet per foot elevation. We then calculated the wetted surface area provided at the interface with the stone and, based on an assumed exfiltration rate of 60 feet per day, determined an initial exfiltration rate of about 0.10 cfs for one foot of depth, with an incremental increase of about 0.02 cfs per foot depth. We ran more than 30 hydrographs to determine the appropriate size areas of capture and to ensure some factor of safety.

Because there are so many small drainage areas, and variations in the percentages of impervious surfaces associated with the areas, we have simplified the smaller areas by treating the areas as if they were entirely impermeable surfaces. In doing so, we have found that a 6'x6' drywell (with 2' of stone) will accommodate approximately 3300 sf having a run-off coefficient of CN=98. If we change our permeability factor to 30 ft./day, we can still accommodate a 10-year storm event, but slightly overtops in a 25-year event. Only two drainage areas feeding drywells are greater than 3300 sf, and those areas (DW#12 and DW#13) are connected by a level perforated pipe to two other drywells (DW9 and DW#14) so that the average area for each of the drywells is less than 3300 sf.

Drywell volume calculations and a typical hydrograph for an impervious area of 3300 sf are included in Appendix C.

Appendix A
Drainage Calculations



DRAINAGE DELINEATIONS

PREPARED FOR

UNIGLOBE INVESTMENT LLC

91 & 93 MEADOWBROOK LANE
MANSFIELD CENTER, CONNECTICUT

SCALE: 1" = 50' DATE: JANUARY 8, 2010

SHEET 1 OF 1

DATUM

ENGINEERING & SURVEYING, LLC

132 CONANTVILLE ROAD
MANSFIELD CENTER, CT 06250

JOB NO. 220040

Civil Engineering Services, LLC
203 Boston Hill Rd
ANDOVER, CT 06232
(860) 742-0364

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SHEET NO. 1 OF ~~8~~ 5
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SCALE

CB'S in a SAG -

CB #6 :
(Bypass flows) Area: 12,392 SF = 0.28 AC.
$c = 0.9$

$t_c = 5$ min (minimum)

$Q_{10} = 1.51$ cfs

$Q_{25} = 1.69$

$S = .036$
$S_x = .023$ assume $n = .013$ (smooth asphalt)

$Q_{n_{10}} = .020$

then $T = \sim 5.6'$

~~W = 1.635'~~ ~~1.35~~ (STANDARD)
Use 1.635' width $W/T = \frac{1.35}{5.6} = .24$

from chart Fig. 11-2 · $E_o = Q_w/Q = 0.5$

$$Q_{bypass} = Q_{TOTAL}\left(\frac{(T-W)^2}{T^2}\right) = \left(\frac{(5.6-1.6)^2}{5.6^2}\right)1.51 = 0.77 \text{ cfs}$$

Q into CB #6 = 0.74 cfs

CB #7 : Area: 17,790 SF = 0.41 AC
$CA = .06 \cdot .4$
$+ .35 \cdot .9 = 0.34$

$t_c = 5$ min
$Q_{10} = 2.04$ cfs $+ 0.77 = \underline{2.81 \text{ cfs}}$
$Q_{25} = 2.28$ cfs

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eq. 11-7 : $Q_i = \dfrac{CPd^{1.5}}{C_{FS}}$; $d = \left(\dfrac{Q_i C_{FS}}{CP}\right)^{2/3}$

as a weir :

Q_i = rate of discharge into grate opening (cfs)
P = perimeter of grate (ft)
C = 3.0
d = depth of water above grate (ft)
C_{FS} = factor of safety

eq. 11-8 :

as an orifice : $Q_i = \dfrac{CA(2gd)^{0.5}}{C_{FS}}$; $d = \left(\dfrac{Q_i C_{FS}}{CA}\right)^2 / 2g$

assume $d = 0.5'$; then

Q_i = rate of discharge into grate (cfs)
C = 0.67 orifice coefficient
A = clear opening area of grate
g = 32.2 ft/sec^2
d = depth of water above grate (ft)
C_{FS} = factor of safety

$$Q_i = \frac{(0.67)(3.13)(64.4 \cdot 0.5)^{.5}}{1}$$

$= 11.9$ cfs

for Type C CB w/ Type A grate ;

$P = 5.02'$
$C_{FS} = 1.0$
$A = 3.13$ ft^2

assume ; $d = 0.5'$, then : (as a weir) $Q_i = \dfrac{(3.0)(5.02)(0.5)^{1.5}}{1.0}$

$= 5.32$ cfs

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CB #4

6243 SF = 0.143 AC.

Q_{max} = 5.4 in/hr · 0.143 AC = 0.77 cfs

$\frac{13.6}{43.5}$ = 0.31 · 2 = 0.62'

2'/33.8' = 5.9% slope 3.12% road cross slope

CB cross slope =

flow width = 3.46
- 2.00' intercepted

1.46' wide ⇒ Q = .08 cfs

cross slope in CB top:
2½"/1' 8 3/16" = 2.5"/20.19" = 12.4%

flow width for Q = 0.77 cfs = 1.46'

no bypass

CB 2 in SAG — no bypass

CB 3 in SAG - no bypass

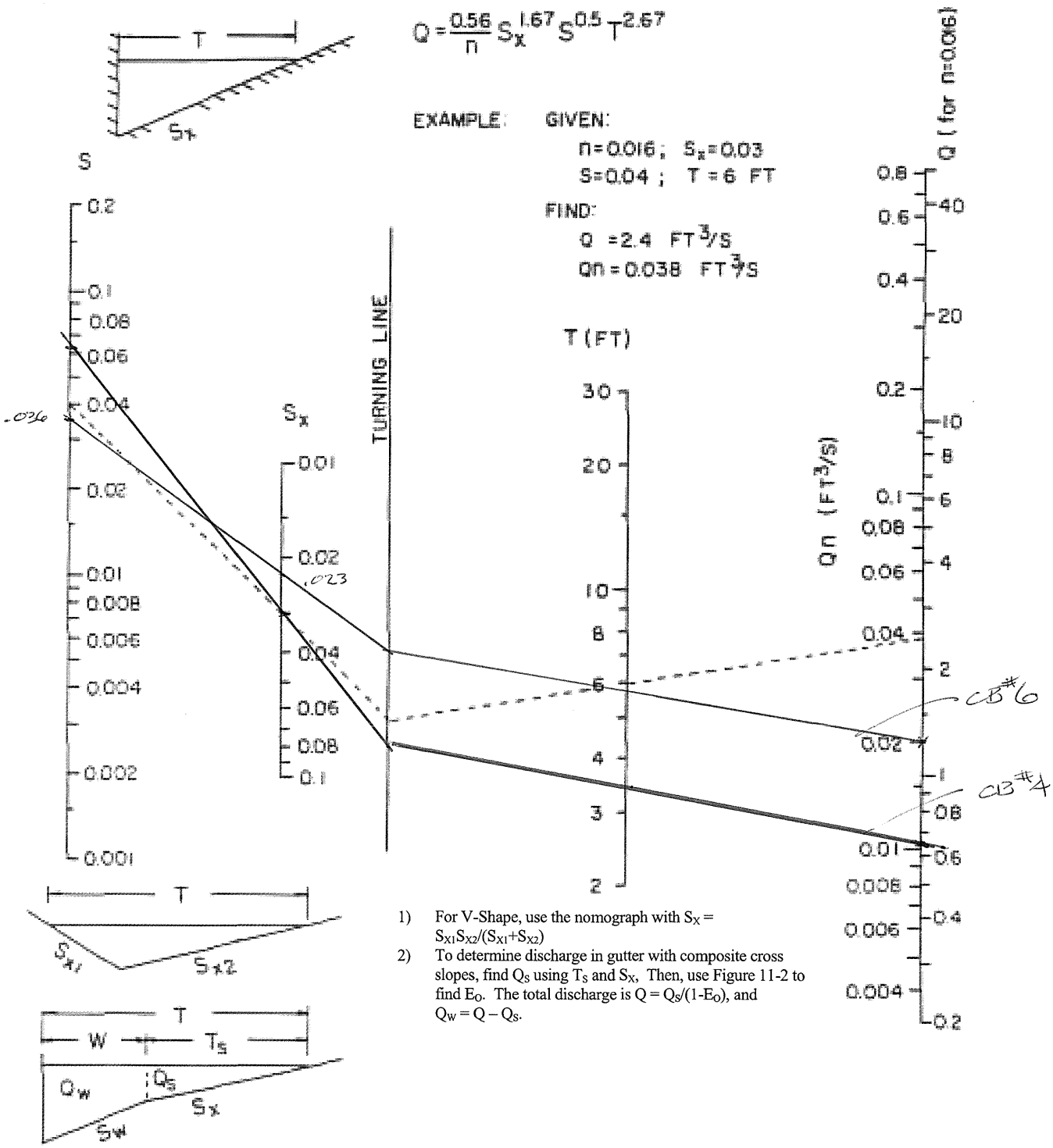
CB flow volume for 25-year storm event

0.143 A = 6243 SF ·

· $\frac{5.75 \text{ inches}}{12''/\text{ft}}$ = 2,991 ft³

~~area req'd to discharge: 2,991 ft³/day ≈ 50 ft²~~
~~60 ft/day~~

peak volume over 2 hrs = 2000 ft³



1) For V-Shape, use the nomograph with $S_X = S_{X1}S_{X2}/(S_{X1}+S_{X2})$
2) To determine discharge in gutter with composite cross slopes, find Q_S using T_S and S_X, Then, use Figure 11-2 to find E_O. The total discharge is $Q = Q_S/(1-E_O)$, and $Q_W = Q - Q_S$.

Figure 11-1.1 Flow In Triangular Gutter Sections – English units
Source: HEC-12

PROJECT 215049 - Artisan-Uniglobe

TOWN Mansfield

ROUTE

DESIGNED BY: CH DATE:

CHECKED BY: DATE:

ROADWAY TYPE PARKING
(See Table 11-2)
ADT

DESIGN SPEED

ALLOWABLE SPEED

GUTTER FLOW ANALYSIS AT LOW POINT LOCATIONS

LOW POINT INLET STATION AND OFFSET	AREA IN ACRES (A)	RUNOFF COEFFICIENT (C)	TIME TO INLET MIN	RAINFALL INTENSITY IN/HR	AC	Q ~~AC~~ BYPASSING PREVIOUS INLET (L)	AC BYPASSING PREVIOUS INLET (R)	TOTAL AC	TOTAL Q TO LOW POINT INLET CFS	CROSS SLOPE OF SHOULDER FT/FT	DEPTH OF FLOW OF GUTTER FT	WIDTH OF FLOW FT	REMARKS
1	2	3	4	5	6	7	8	9	10	11	12	13	
CB#7	0.41	0.83	5	6.0	.34	0.77cfs	N/A		2.81	.021	~.25	~10	
CB#2	.045	0.90			.0405								
	.114	0.40	5	6.0	.0456								
					.086	Ø		.09	0.54	.021	<.25		
CB#3	0.09	0.90	5	6.0	.081	Ø		.08	0.48	.021	<.25		

Sheet 5 of 5

Table 11-5.1 Low Point Analysis Computation Sheet – English units

Appendix B
Soil Sample Test Results

MATERIALS TESTING, INC.

55 LAURA STREET • NEW HAVEN, CONNECTICUT 06512 • (203) 468-5216
42 BOSTON POST ROAD • WILLIMANTIC, CONNECTICUT 06226 • (860) 423-1972

DATE: 01-04-16

REPORT: M-1000

CLIENT: Datum Engineering & Surveying
132 Conantville Road
Mansfield, CT 06250
Attn: Mr. Edward Pelletier, L.S.

PROJECT: Middlebrook Road
Mansfield, CT

SUBJECT: **FIELD PERMEABILITY (CT DEEP Method)**

Sample #	Location	Permeability, Ft/Day
1	Test Hole #1, Elevation- Bottom of hole	106.2
2	Test Hole #1, Elevation- Bottom of hole	10.5
3	Test Hole #3, Elevation- Bottom of hole	68.7
4	Test Hole #4, Elevation- Bottom of hole	75.2

Materials Testing, Inc.
Richard C. Kearns

William J. Soucy

STATE OF CONNECTICUT
M. S. RAVI SHARMA
No. 28322
LICENSED
PROFESSIONAL ENGINEER

7/15/16

File: Orignal
1cc: Client

wlb

Test reports may not be reproduced without the express permission of Materials Testing, Inc. Results only relate to items tested.

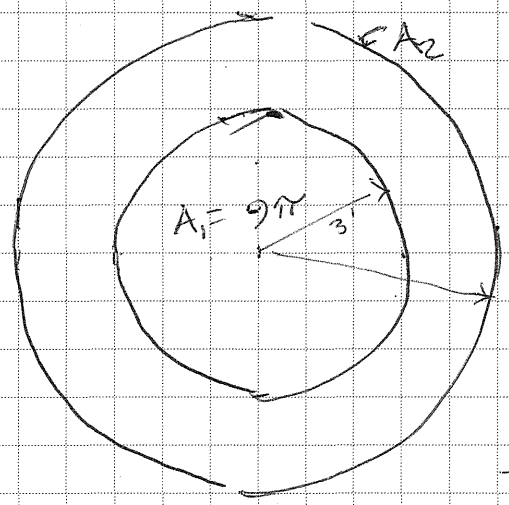
Appendix C
Drywell Volume Calculations
Typical Hydrograph

Civil Engineering Services, LLC
203 Boston Hill Rd
ANDOVER, CT 06232
(860) 742-0364

JOB 215049 - Artisan / Uniglobe
SHEET NO. ____ OF ____
CALCULATED BY SKT DATE ____
CHECKED BY ____ DATE ____
SCALE ____

6 × 6 drywell w/ 2' stone

STORAGE:



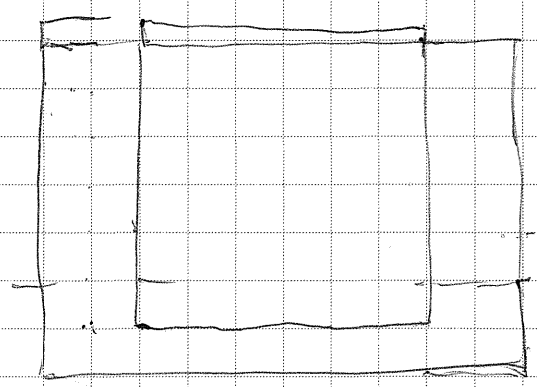
total storage:

$A_1 = 28.27\ ft^2$

$A_2 = 25\pi$

$A_2 - A_1 = 16\pi = 50.27\ ft^2$
use 40% voids = $20.1\ ft^2$

total storage = $48.4\ ft^3/ft$
× 6' = $290.4\ ft^3$



INFILTRATION (@ 60 ft/day)

@ 1' deep; wetted surface =

$25\pi + 2\pi 5' \cdot 1' =$
$78.54 + 62.83 = 141.3\ ft^2$

exfiltration @ 60 ft/day
= .000694 ft/sec
× $141.3\ ft^2$ = 0.10 cfs

@ 2' deep, wetted surface =
$25\pi + 2\pi 5' \cdot 3' =$
$78.54 + 94.25 = 172.8\ ft^2$
exfiltration: 172.8 · .000694 = 0.12 cfs

@ 3' deep, wetted surface =
$78.54 + 125.6 = 204.2\ ft^2$
exfiltration: 204.2 · .00069 = 0.14 cfs

Civil Engineering Services, LLC
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ANDOVER, CT 06232
(860) 742-0364

JOB 215049 - Artisan/Uniglobe
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SCALE _____

INFILTRATION @ 30 ft/day:

@ 1' deep, wetted surface area = 141.3 ft²

$$\times \frac{30\ ft}{day} \cdot \frac{day}{24\ hr} \cdot \frac{hr}{3600\ sec} = .049\ cfs$$

@ 2' deep, wetted surface area = 172.8 ft²

$$\times \frac{30}{24 \cdot 3600} = .060\ cfs$$

(.000347 ft/sec)

@ 3' deep, wet surface = 204.2 ft²

$$\cdot .000347 = .071\ cfs$$

an increase of 0.011 cfs / ft depth

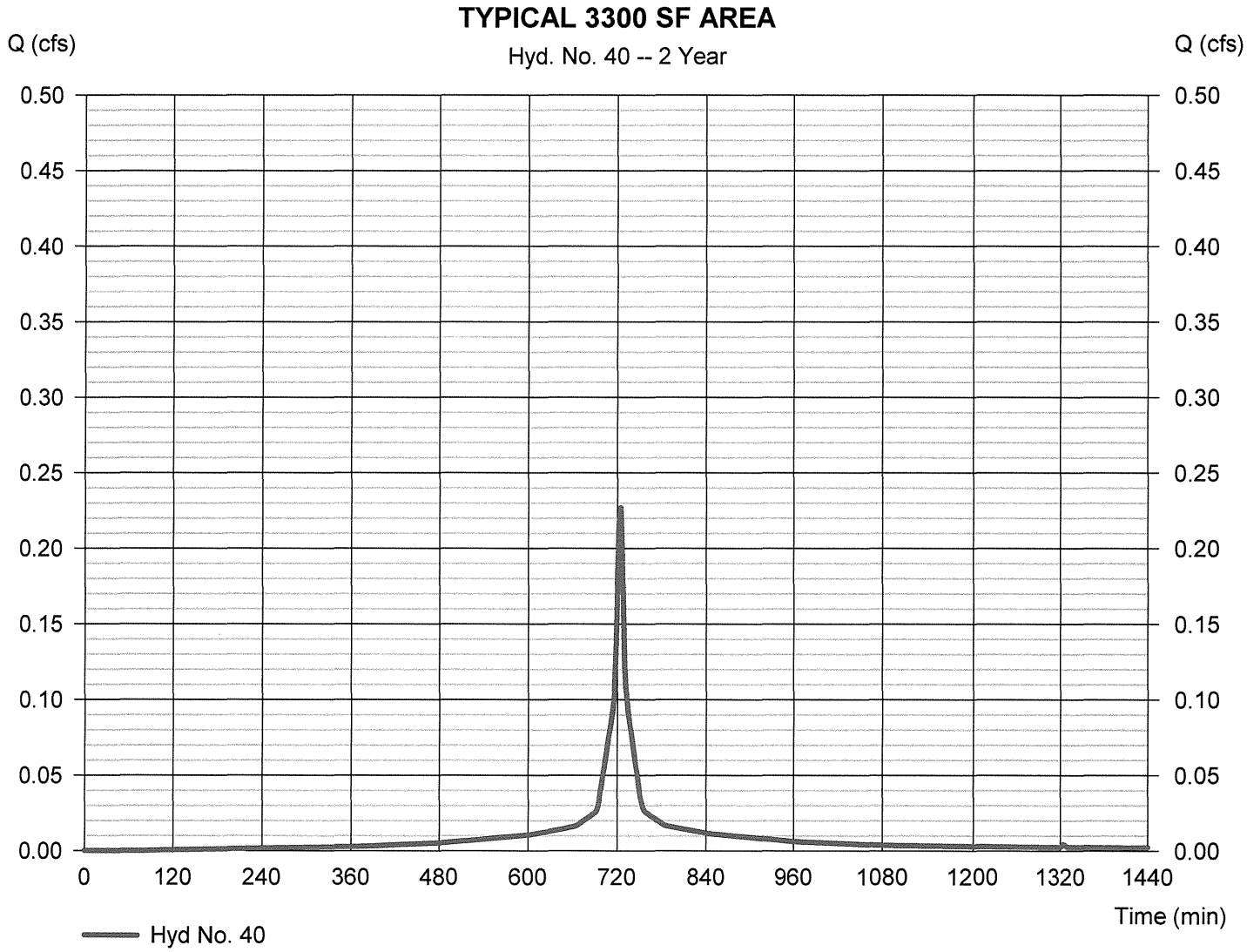
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2011 by Autodesk, Inc. v8 Monday, Feb 8, 2016

Hyd. No. 40

TYPICAL 3300 SF AREA

Hydrograph type	= SCS Runoff	Peak discharge	= 0.227 cfs
Storm frequency	= 2 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 765 cuft
Drainage area	= 0.076 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.20 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

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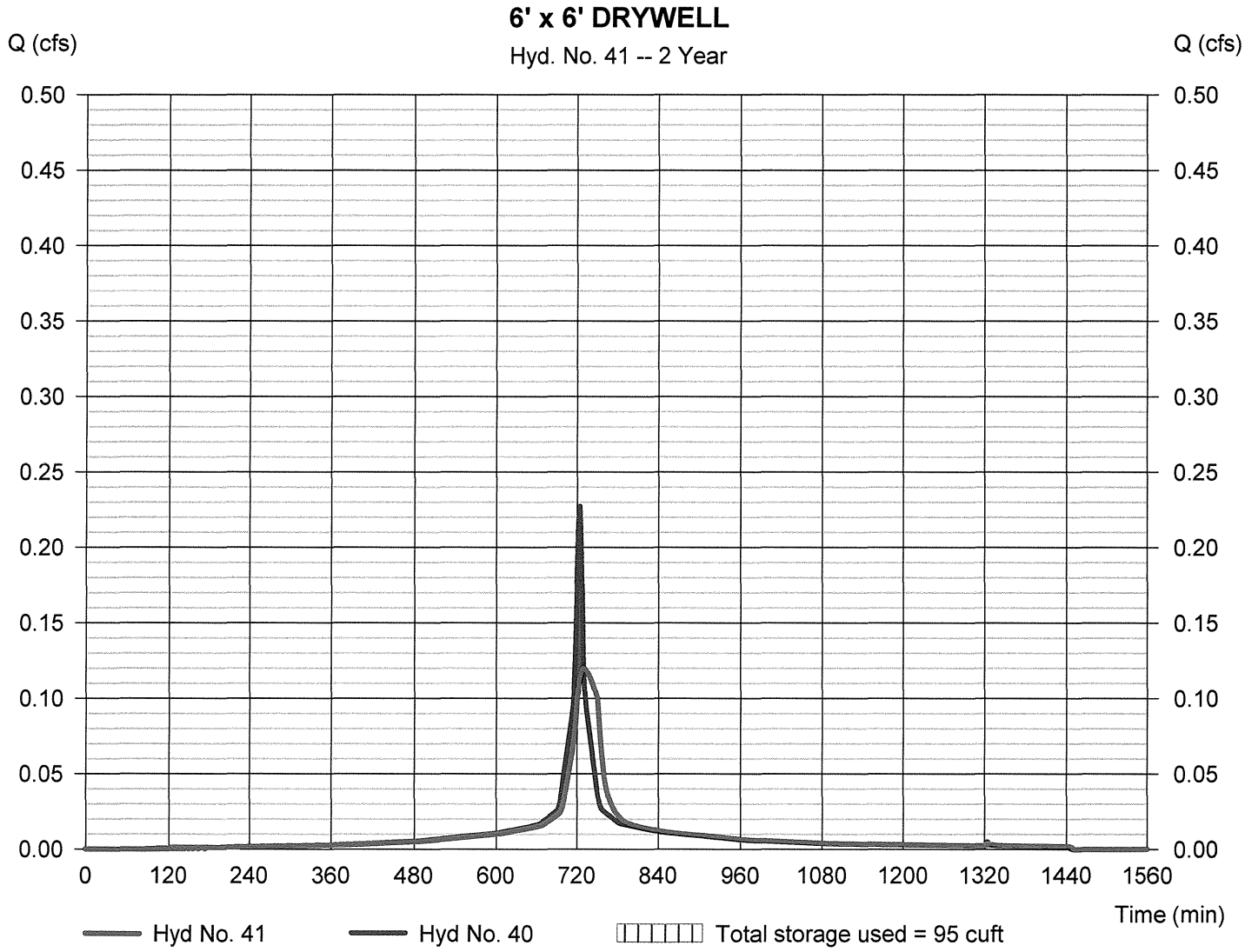
Hyd. No. 41

6' x 6' DRYWELL

Hydrograph type	= Reservoir	Peak discharge	= 0.119 cfs
Storm frequency	= 2 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 765 cuft
Inflow hyd. No.	= 40 - TYPICAL 3300 SF AREA	Max. Elevation	= 237.97 ft
Reservoir name	= 6x6 DRYWELL	Max. Storage	= 95 cuft

Storage Indication method used. Outflow includes exfiltration.



Pond Report

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Pond No. 4 - 6x6 DRYWELL

Pond Data

Pond storage is based on user-defined values.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	236.00	n/a	0	0
1.00	237.00	n/a	48	48
2.00	238.00	n/a	48	97
3.00	239.00	n/a	48	145
4.00	240.00	n/a	48	194
5.00	241.00	n/a	48	242
6.00	242.00	n/a	48	290

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 10.000 (by Wet area)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	236.00	---	---	---	---	---	---	---	---	0.000	---	0.000
1.00	48	237.00	---	---	---	---	---	---	---	---	0.000	0.100	0.100
2.00	97	238.00	---	---	---	---	---	---	---	---	0.000	0.120	0.120
3.00	145	239.00	---	---	---	---	---	---	---	---	0.000	0.140	0.140
4.00	194	240.00	---	---	---	---	---	---	---	---	0.000	0.160	0.160
5.00	242	241.00	---	---	---	---	---	---	---	---	0.000	0.180	0.180
6.00	290	242.00	---	---	---	---	---	---	---	---	0.000	0.200	0.200

Hydrograph Report

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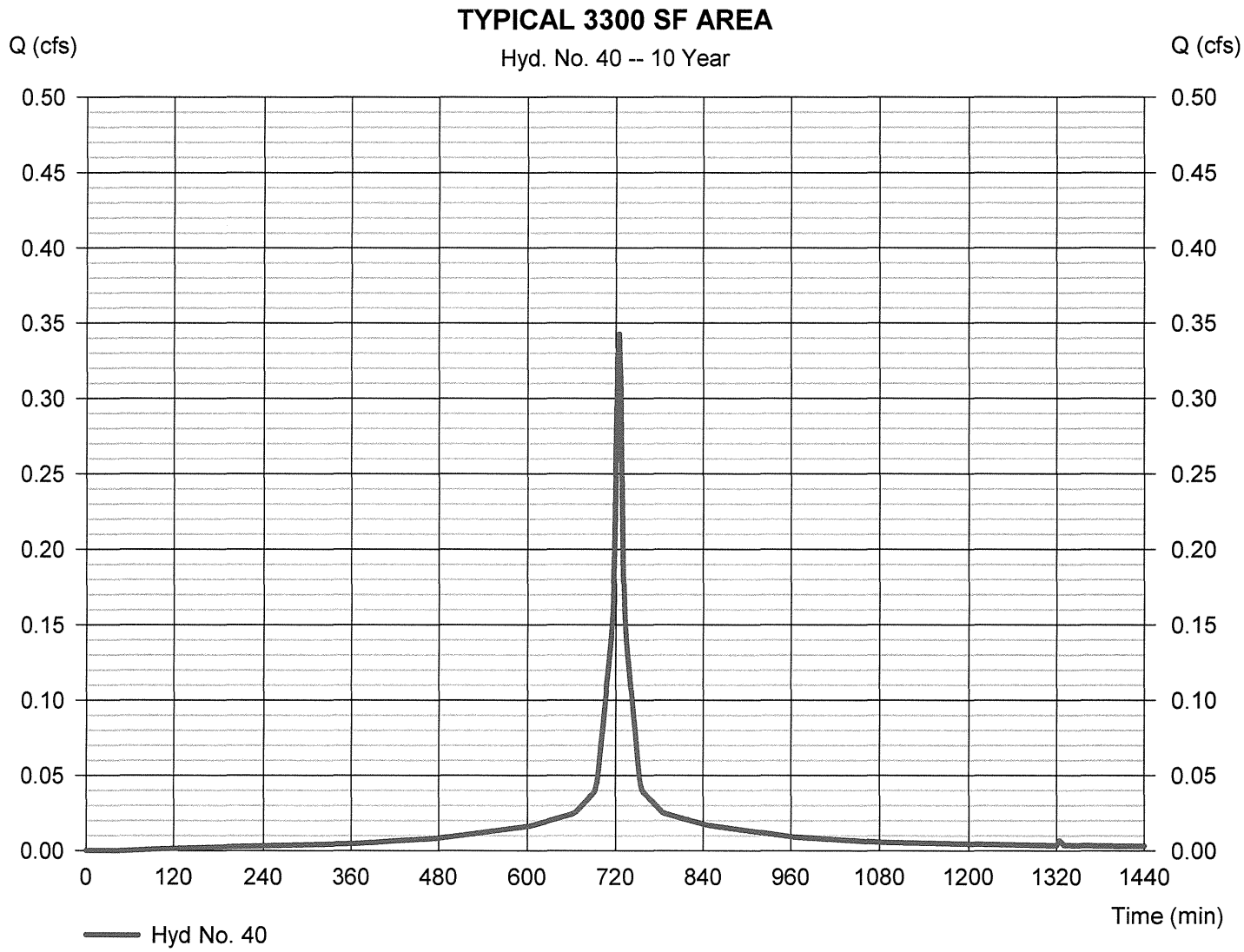
Hyd. No. 40

TYPICAL 3300 SF AREA

Hydrograph type	= SCS Runoff	Peak discharge	= 0.343 cfs
Storm frequency	= 10 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 1,177 cuft
Drainage area	= 0.076 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 4.80 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

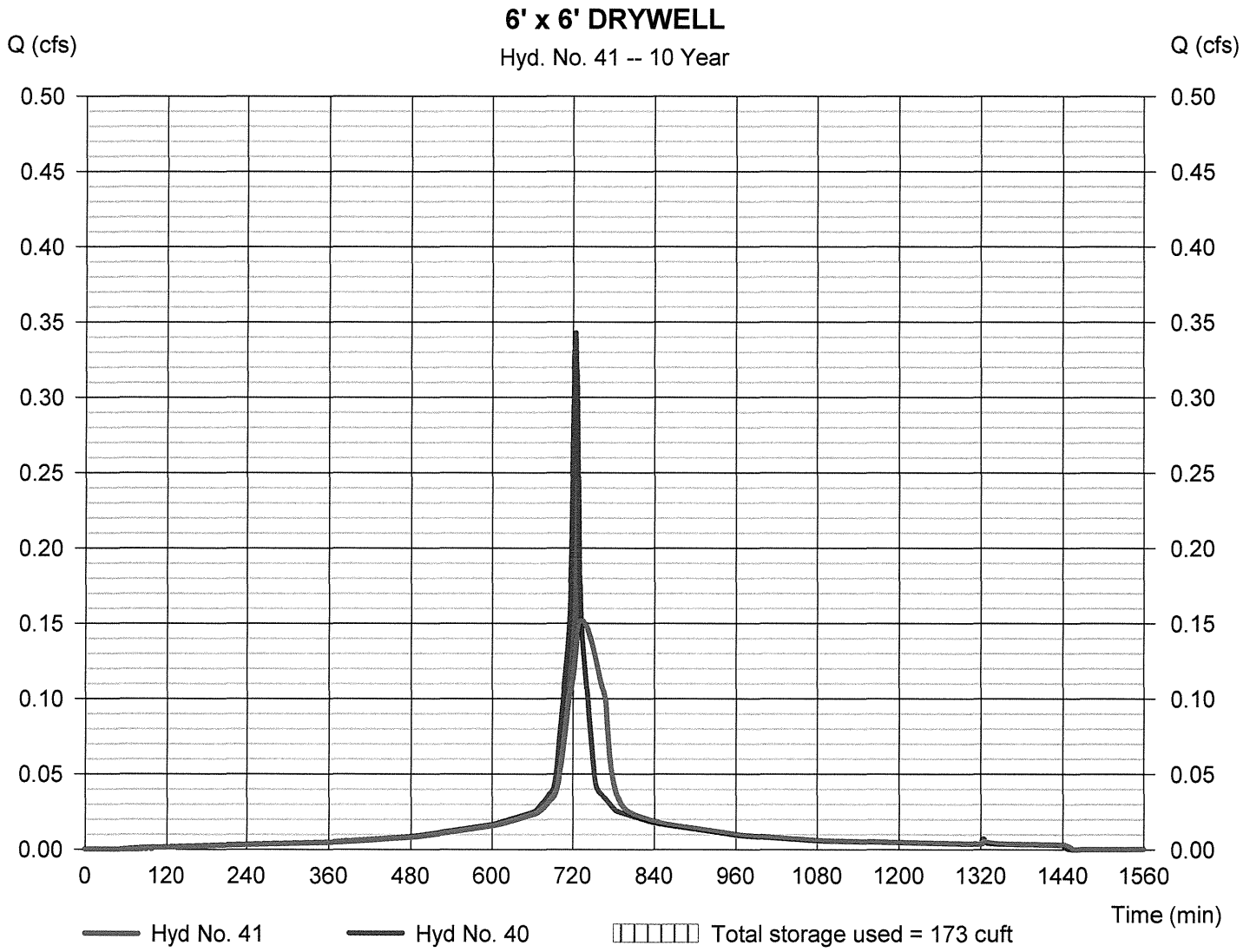
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2011 by Autodesk, Inc. v8 Monday, Feb 8, 2016

Hyd. No. 41

6' x 6' DRYWELL

Hydrograph type	= Reservoir	Peak discharge	= 0.152 cfs
Storm frequency	= 10 yrs	Time to peak	= 732 min
Time interval	= 2 min	Hyd. volume	= 1,176 cuft
Inflow hyd. No.	= 40 - TYPICAL 3300 SF AREA	Max. Elevation	= 239.59 ft
Reservoir name	= 6x6 DRYWELL	Max. Storage	= 173 cuft

Storage Indication method used. Outflow includes exfiltration.



Hydrograph Report

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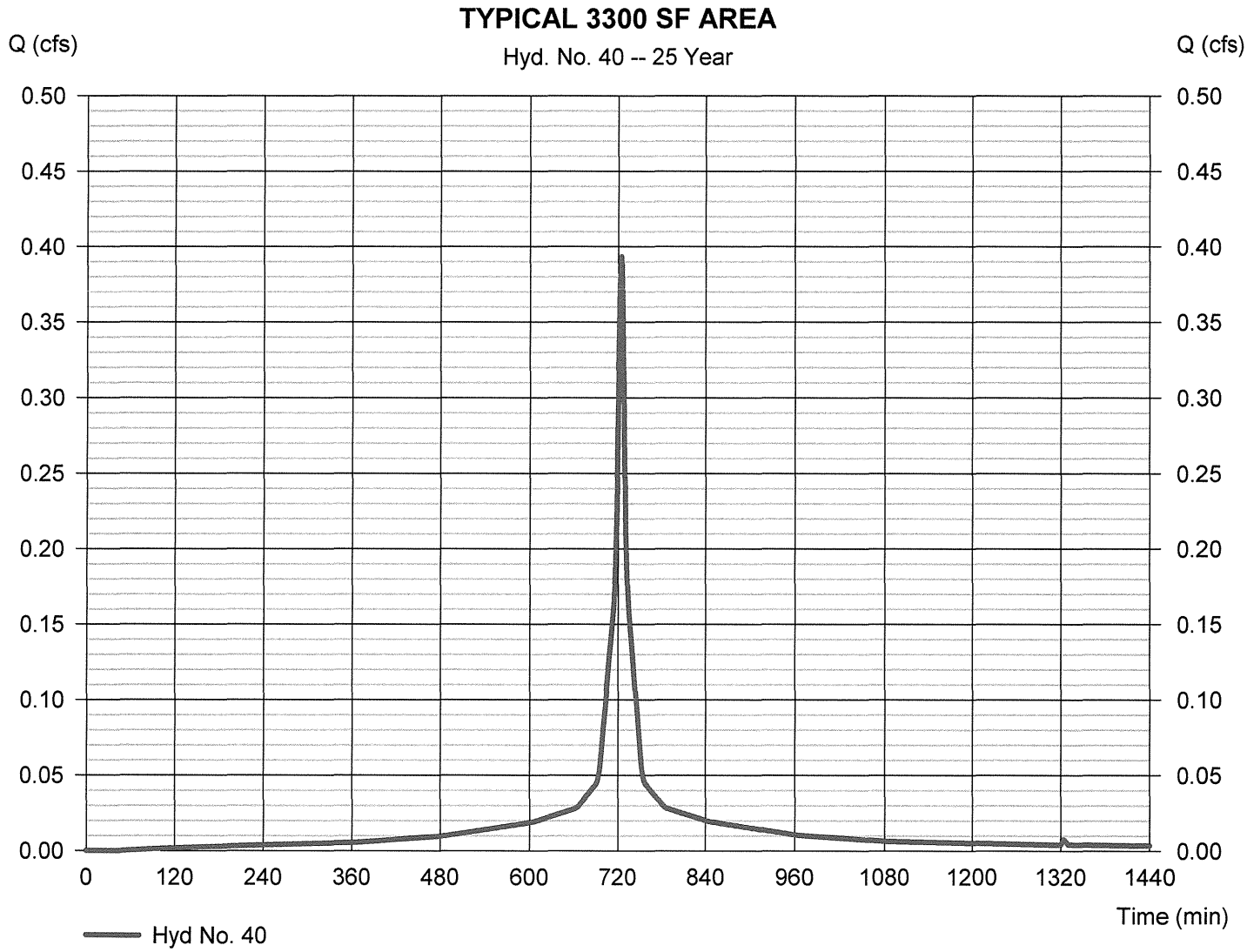
Hyd. No. 40

TYPICAL 3300 SF AREA

Hydrograph type	= SCS Runoff	Peak discharge	= 0.393 cfs
Storm frequency	= 25 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 1,357 cuft
Drainage area	= 0.076 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.50 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

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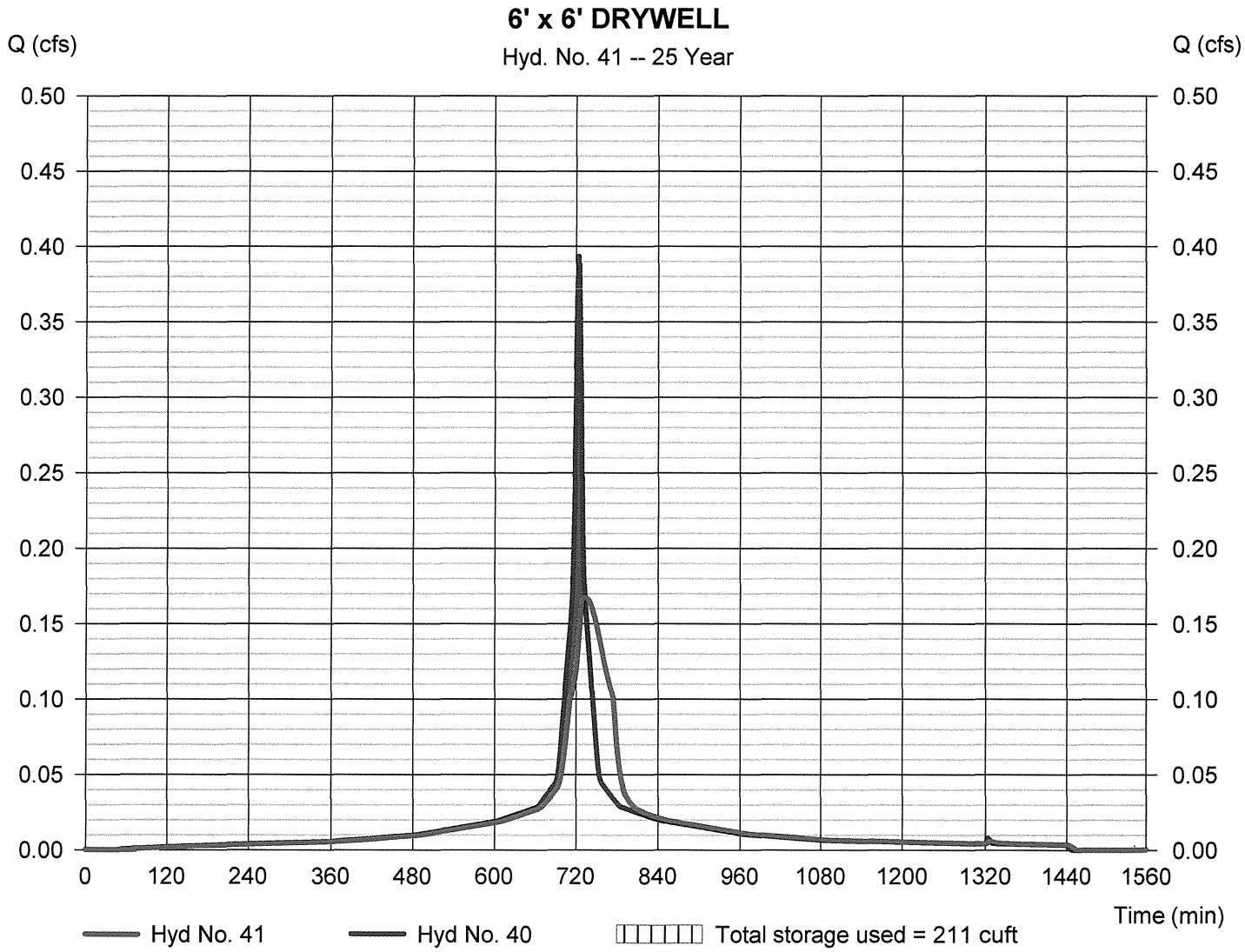
Hyd. No. 41

6' x 6' DRYWELL

Hydrograph type	= Reservoir	Peak discharge	= 0.167 cfs
Storm frequency	= 25 yrs	Time to peak	= 734 min
Time interval	= 2 min	Hyd. volume	= 1,356 cuft
Inflow hyd. No.	= 40 - TYPICAL 3300 SF AREA	Max. Elevation	= 240.36 ft
Reservoir name	= 6x6 DRYWELL	Max. Storage	= 211 cuft

Storage Indication method used. Outflow includes exfiltration.



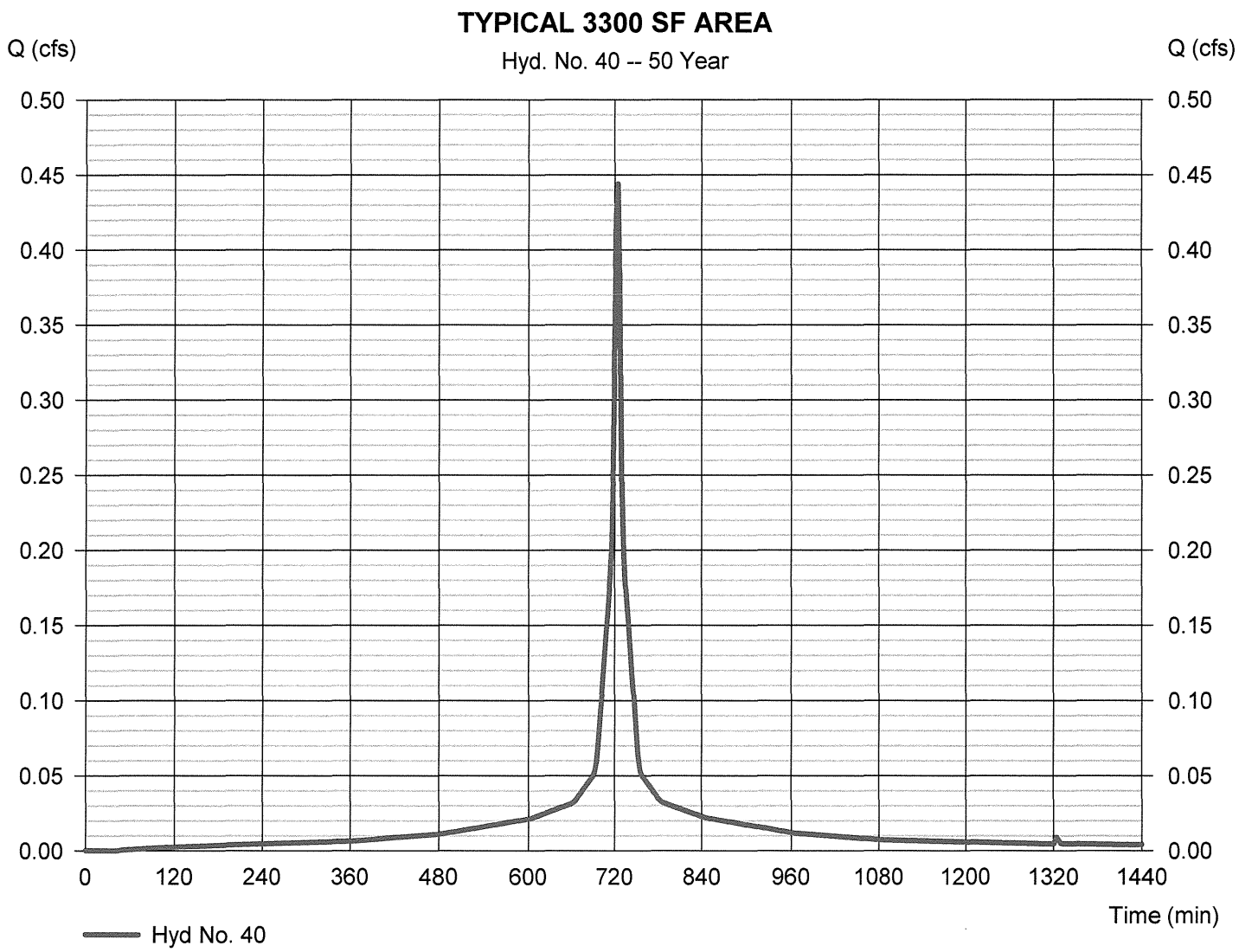
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2011 by Autodesk, Inc. v8 Monday, Feb 8, 2016

Hyd. No. 40

TYPICAL 3300 SF AREA

Hydrograph type	= SCS Runoff	Peak discharge	= 0.444 cfs
Storm frequency	= 50 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 1,537 cuft
Drainage area	= 0.076 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.20 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

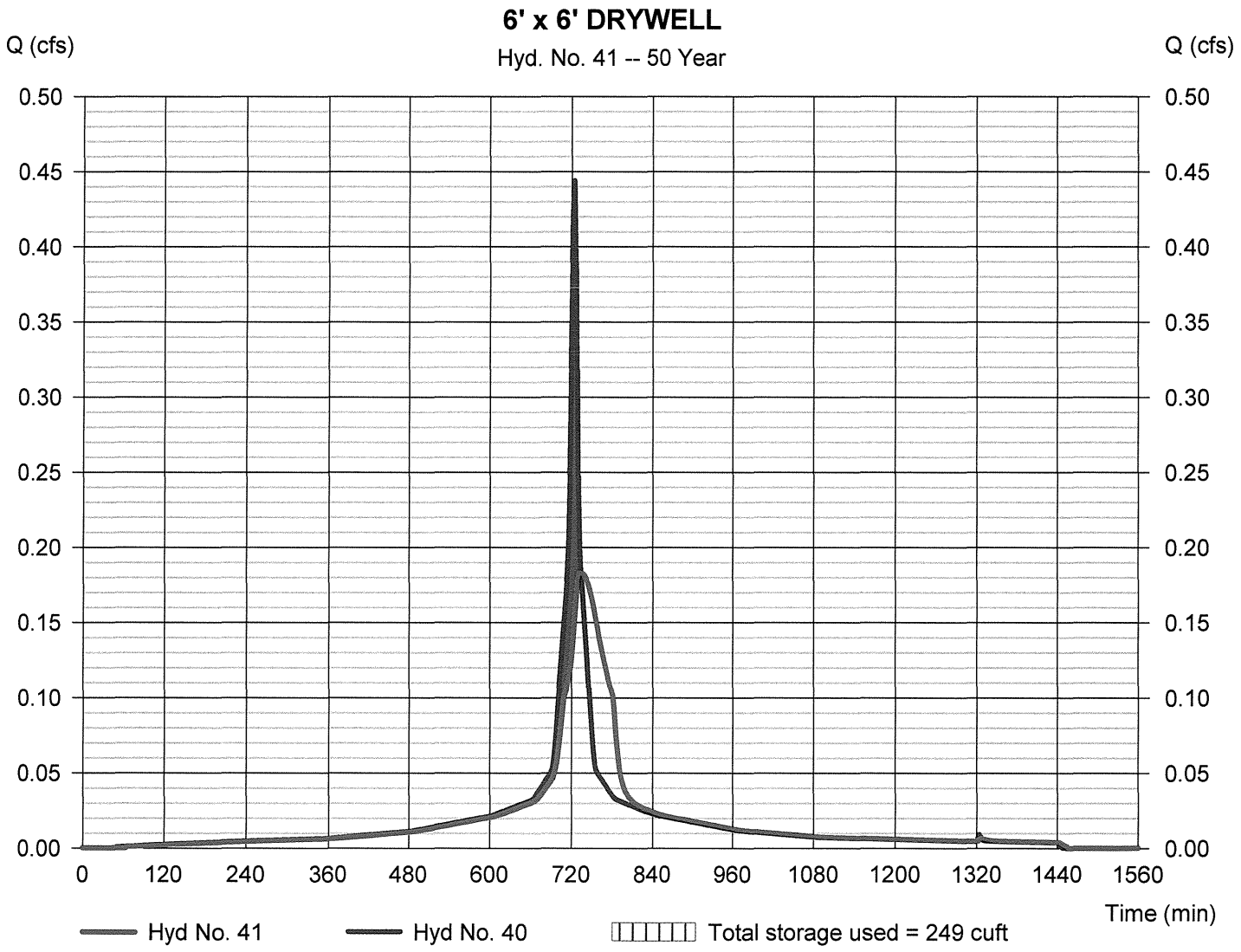
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2011 by Autodesk, Inc. v8 Monday, Feb 8, 2016

Hyd. No. 41

6' x 6' DRYWELL

Hydrograph type	= Reservoir	Peak discharge	= 0.183 cfs
Storm frequency	= 50 yrs	Time to peak	= 734 min
Time interval	= 2 min	Hyd. volume	= 1,537 cuft
Inflow hyd. No.	= 40 - TYPICAL 3300 SF AREA	Max. Elevation	= 241.15 ft
Reservoir name	= 6x6 DRYWELL	Max. Storage	= 249 cuft

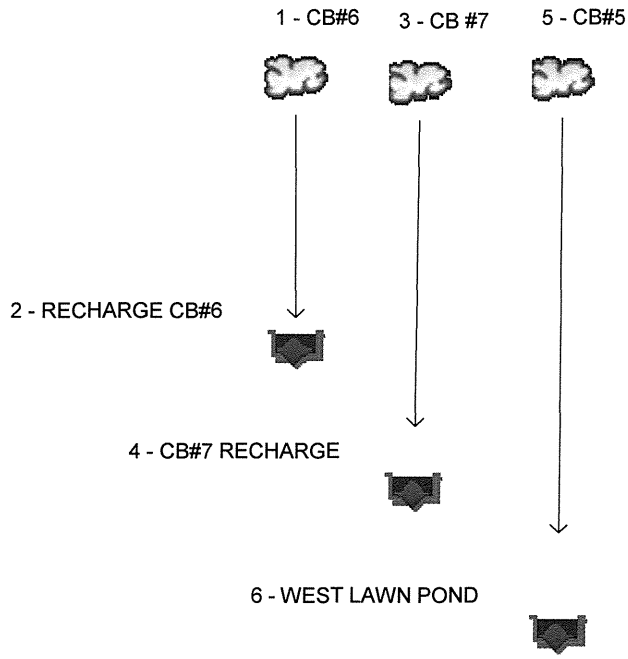
Storage Indication method used. Outflow includes exfiltration.



Appendix D
Hydrographs of
CB#6 Recharge Area
CB#7 Recharge Area
CB#5 Recharge Area

Watershed Model Schematic

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2011 by Autodesk, Inc. v8



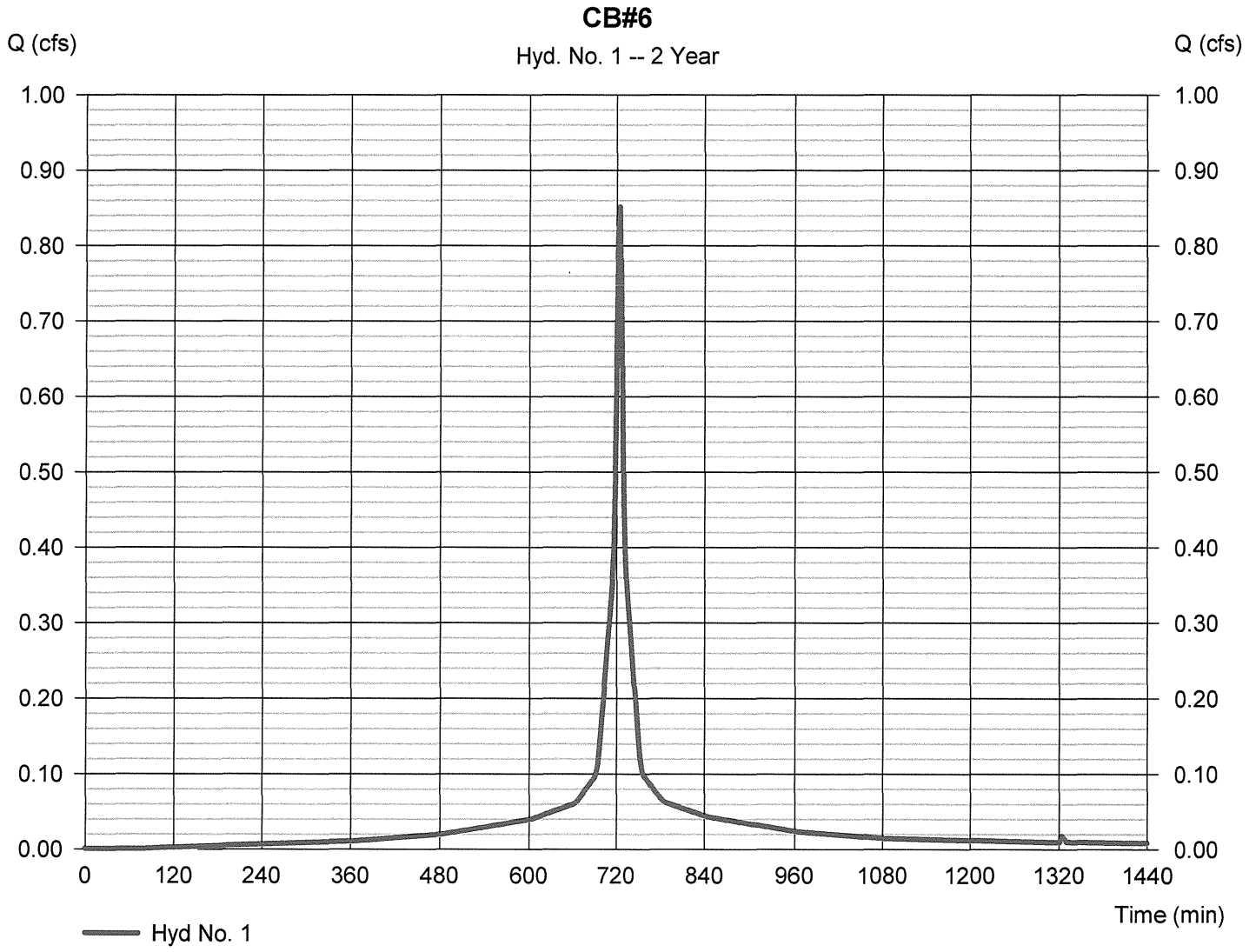
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2011 by Autodesk, Inc. v8 Monday, Feb 8, 2016

Hyd. No. 1

CB#6

Hydrograph type	= SCS Runoff	Peak discharge	= 0.850 cfs
Storm frequency	= 2 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 2,868 cuft
Drainage area	= 0.284 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.20 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

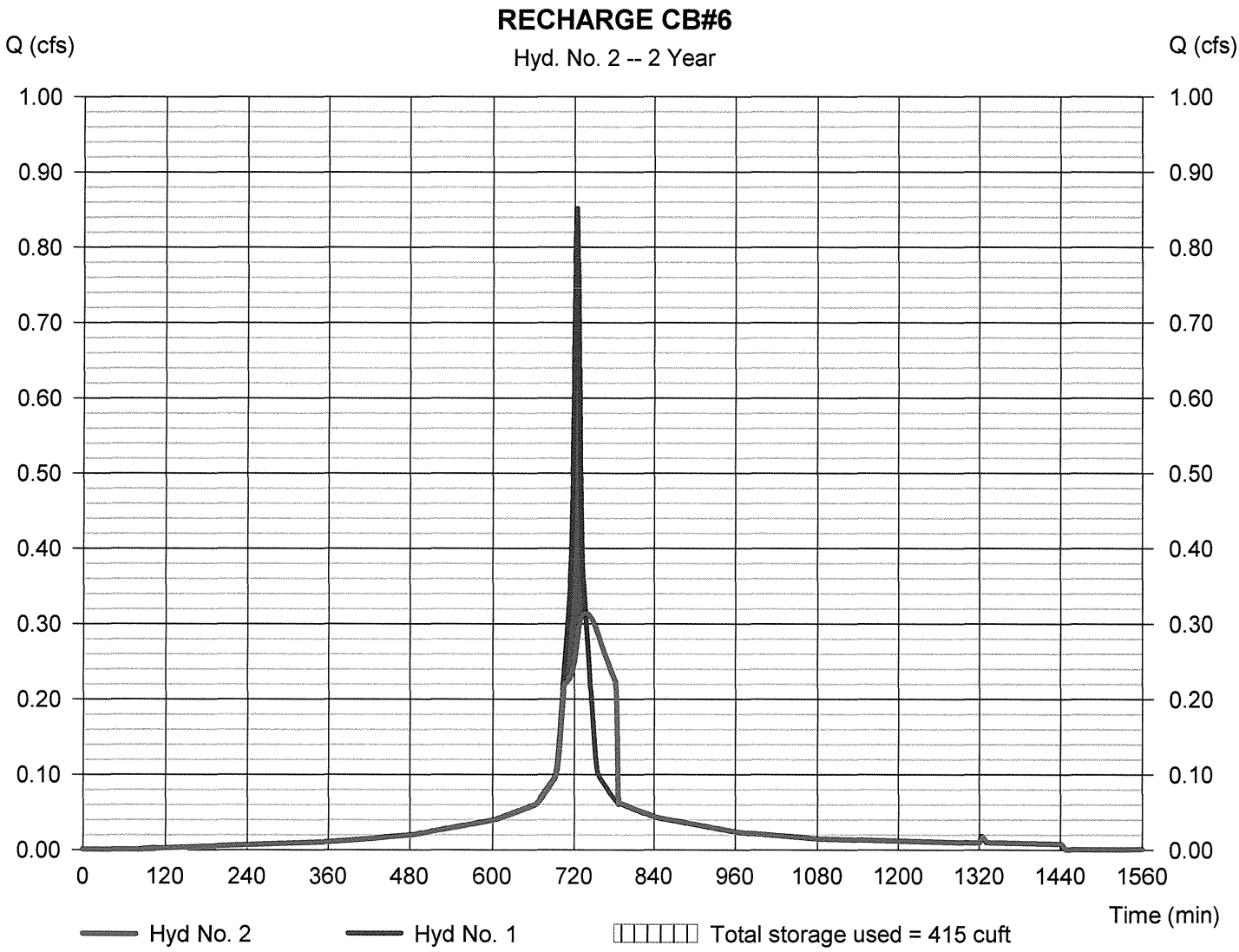
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2011 by Autodesk, Inc. v8 Monday, Feb 8, 2016

Hyd. No. 2

RECHARGE CB#6

Hydrograph type	= Reservoir	Peak discharge	= 0.313 cfs
Storm frequency	= 2 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 2,868 cuft
Inflow hyd. No.	= 1 - CB#6	Max. Elevation	= 233.83 ft
Reservoir name	= CB#6 RECHARGE	Max. Storage	= 415 cuft

Storage Indication method used. Outflow includes exfiltration.



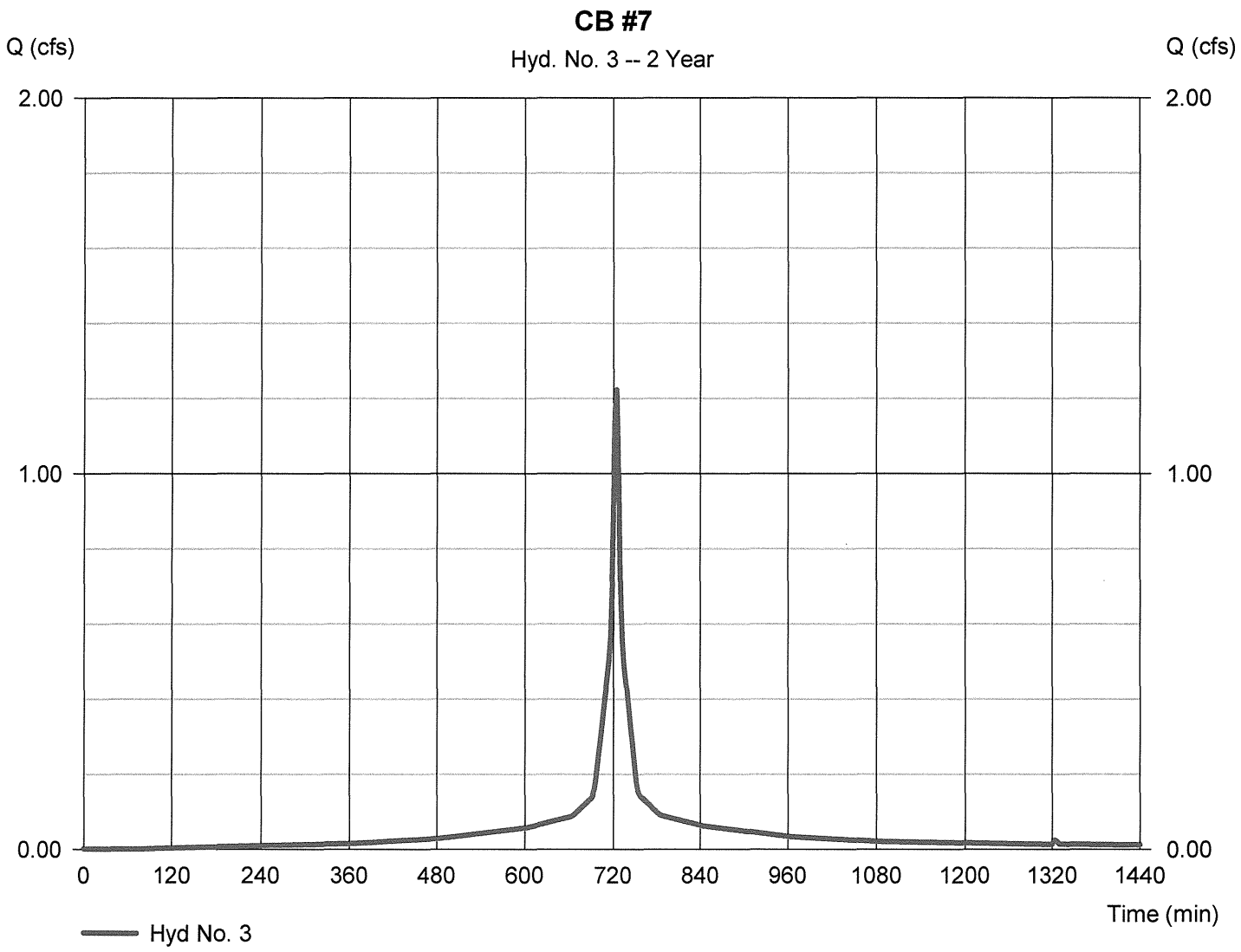
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2011 by Autodesk, Inc. v8 Monday, Feb 8, 2016

Hyd. No. 3

CB #7

Hydrograph type	= SCS Runoff	Peak discharge	= 1.222 cfs
Storm frequency	= 2 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 4,120 cuft
Drainage area	= 0.408 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.20 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

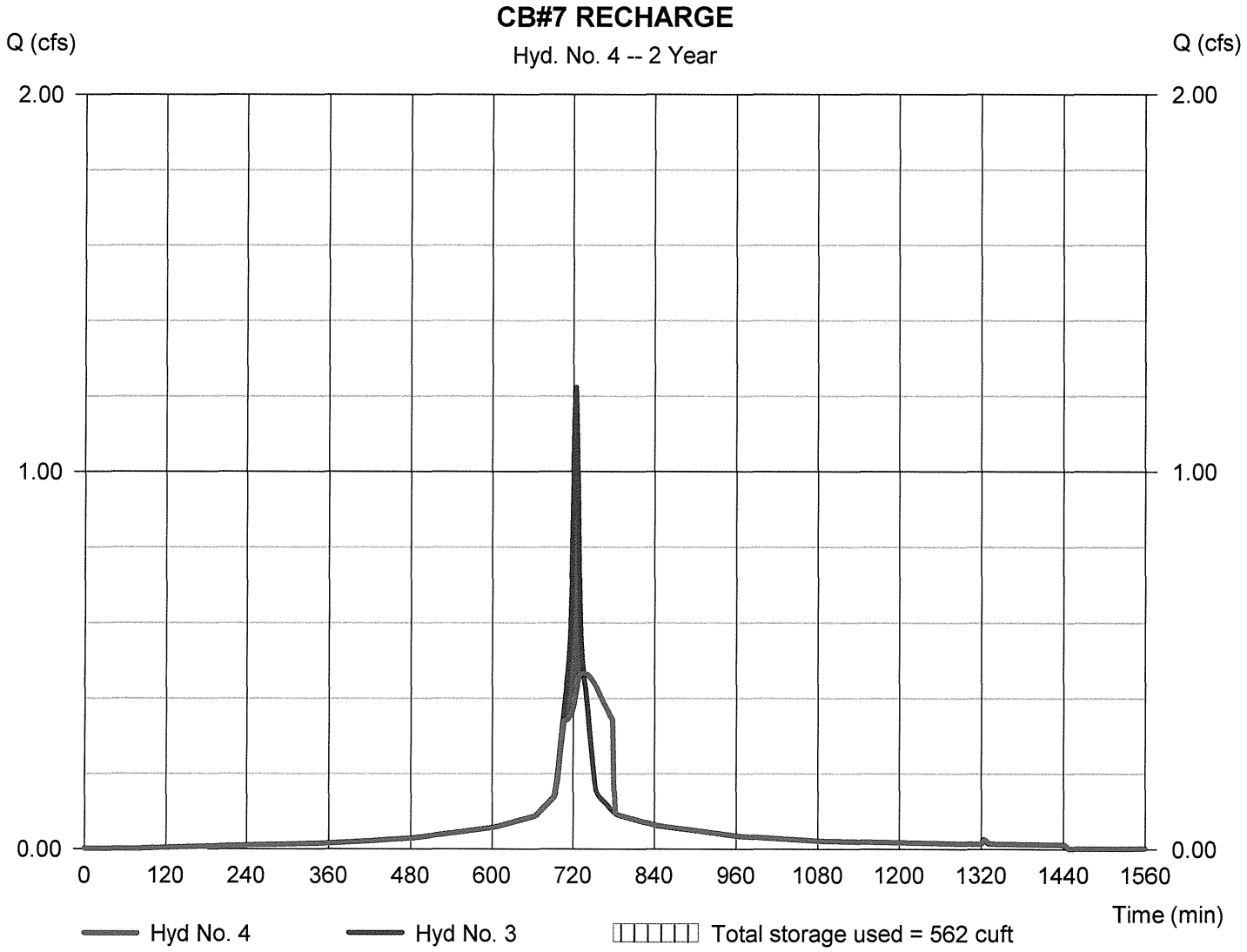
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2011 by Autodesk, Inc. v8 Monday, Feb 8, 2016

Hyd. No. 4

CB#7 RECHARGE

Hydrograph type	= Reservoir	Peak discharge	= 0.463 cfs
Storm frequency	= 2 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 4,120 cuft
Inflow hyd. No.	= 3 - CB #7	Max. Elevation	= 233.17 ft
Reservoir name	= CB#7 RECHARGE	Max. Storage	= 562 cuft

Storage Indication method used. Outflow includes exfiltration.



Hydrograph Report

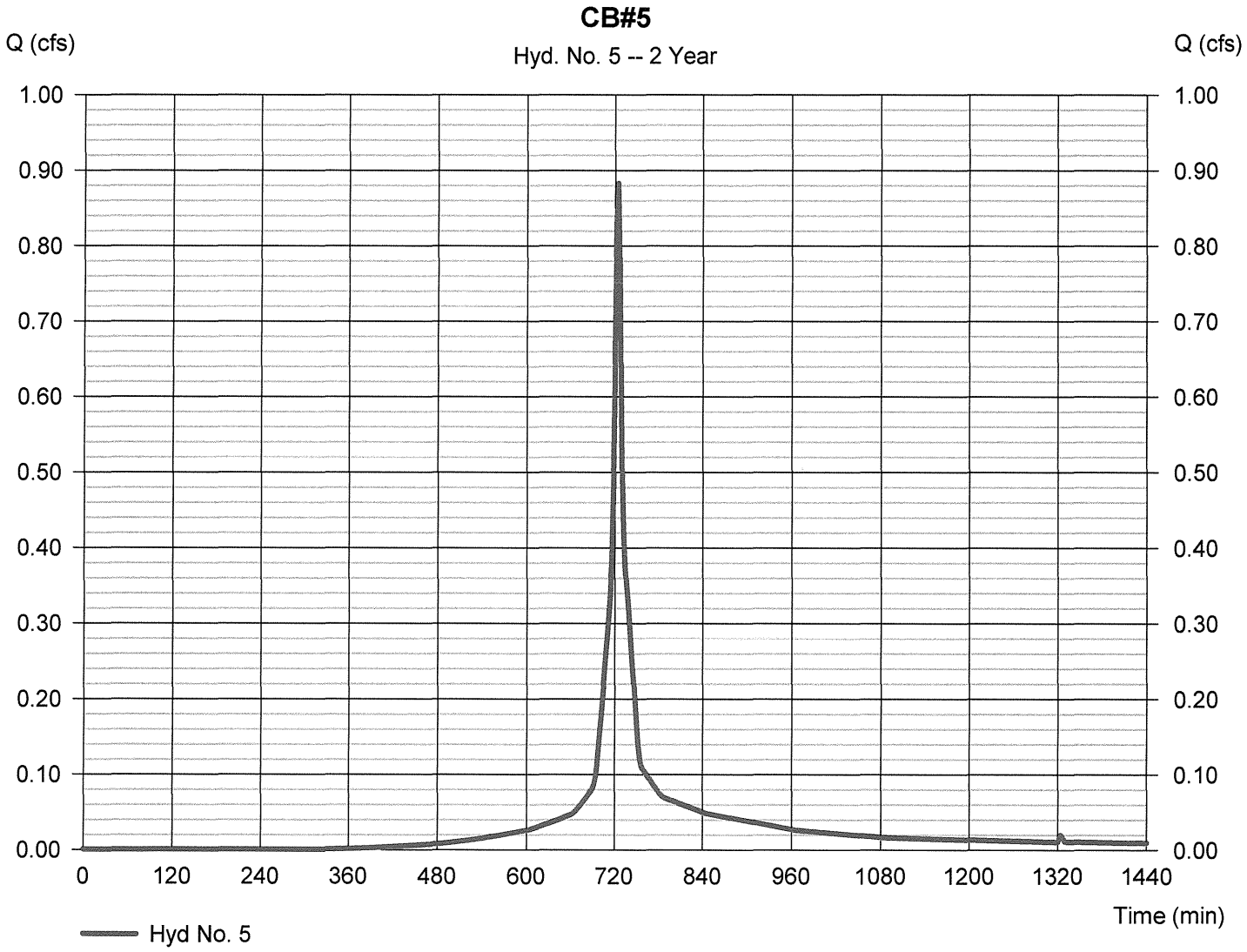
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2011 by Autodesk, Inc. v8 Monday, Feb 8, 2016

Hyd. No. 5

CB#5

Hydrograph type	= SCS Runoff	Peak discharge	= 0.882 cfs
Storm frequency	= 2 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 2,690 cuft
Drainage area	= 0.350 ac	Curve number	= 91*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.20 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.288 x 98) + (0.066 x 61)] / 0.350



Hydrograph Report

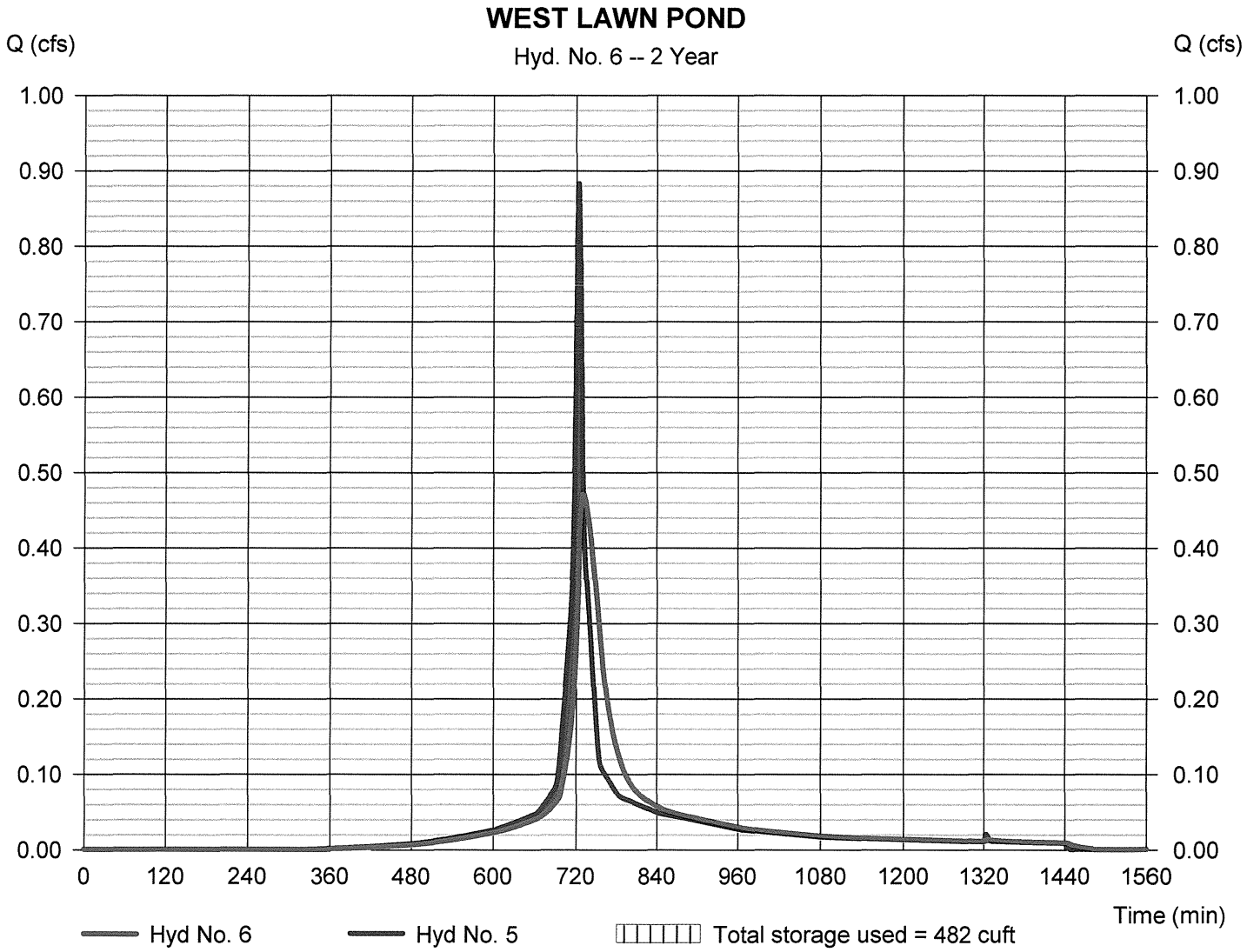
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2011 by Autodesk, Inc. v8 Monday, Feb 8, 2016

Hyd. No. 6

WEST LAWN POND

Hydrograph type	= Reservoir	Peak discharge	= 0.471 cfs
Storm frequency	= 2 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 2,689 cuft
Inflow hyd. No.	= 5 - CB#5	Max. Elevation	= 236.69 ft
Reservoir name	= WEST LAWN	Max. Storage	= 482 cuft

Storage Indication method used. Outflow includes exfiltration.



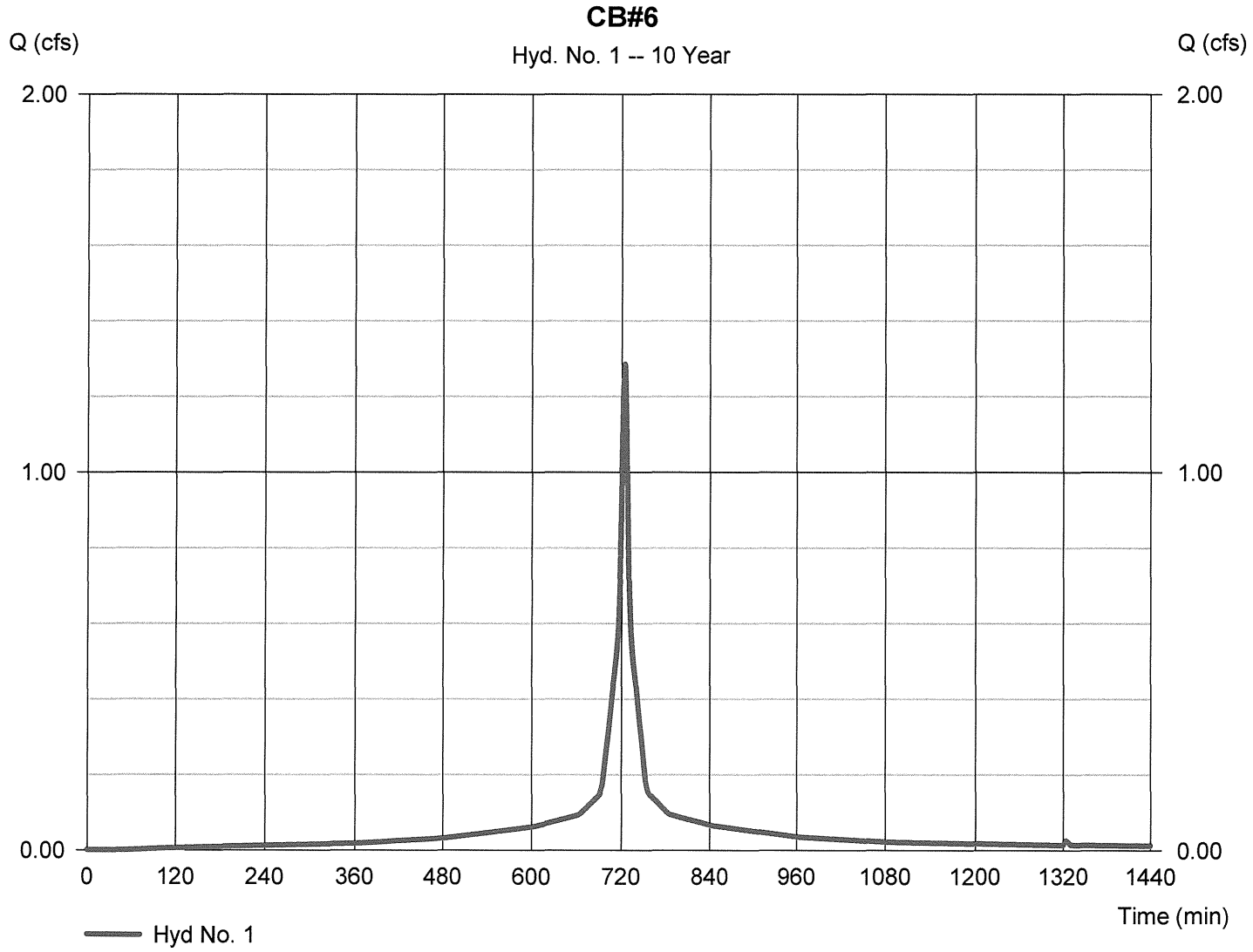
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2011 by Autodesk, Inc. v8 Monday, Feb 8, 2016

Hyd. No. 1

CB#6

Hydrograph type	= SCS Runoff	Peak discharge	= 1.285 cfs
Storm frequency	= 10 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 4,411 cuft
Drainage area	= 0.284 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 4.80 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

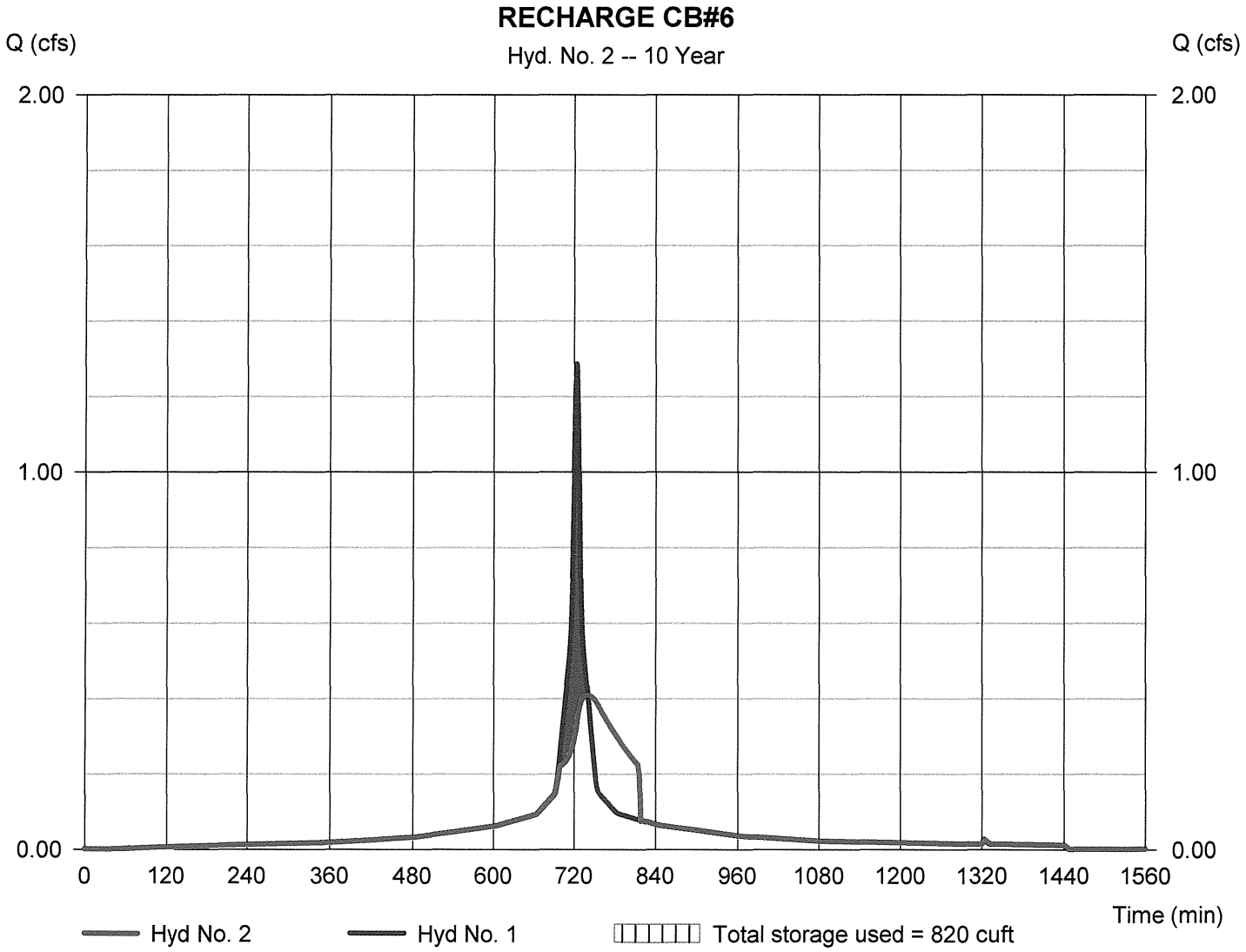
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2011 by Autodesk, Inc. v8 Monday, Feb 8, 2016

Hyd. No. 2

RECHARGE CB#6

Hydrograph type	= Reservoir	Peak discharge	= 0.406 cfs
Storm frequency	= 10 yrs	Time to peak	= 740 min
Time interval	= 2 min	Hyd. volume	= 4,410 cuft
Inflow hyd. No.	= 1 - CB#6	Max. Elevation	= 235.13 ft
Reservoir name	= CB#6 RECHARGE	Max. Storage	= 820 cuft

Storage Indication method used. Outflow includes exfiltration.



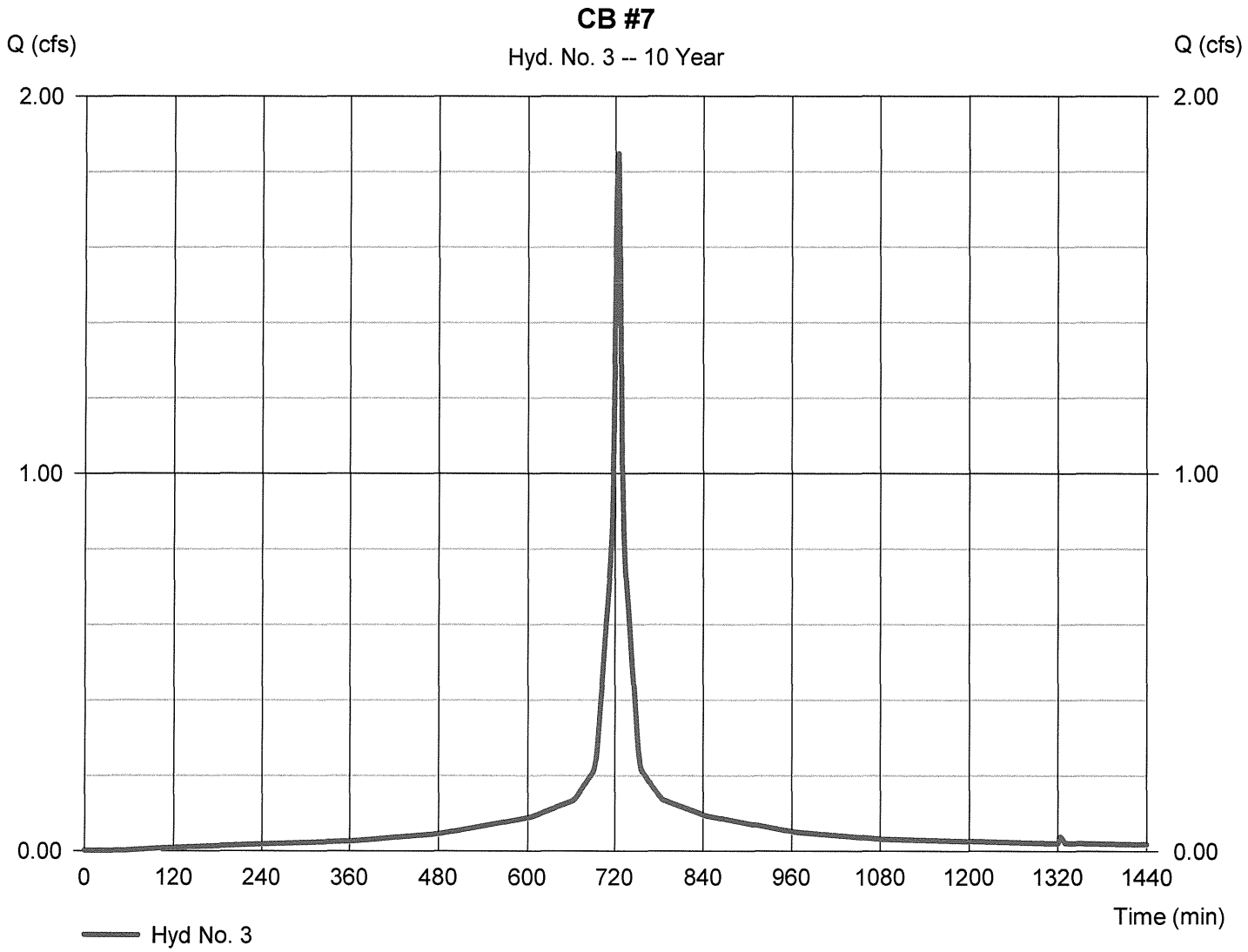
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2011 by Autodesk, Inc. v8 Monday, Feb 8, 2016

Hyd. No. 3

CB #7

Hydrograph type	= SCS Runoff	Peak discharge	= 1.846 cfs
Storm frequency	= 10 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 6,336 cuft
Drainage area	= 0.408 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 4.80 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

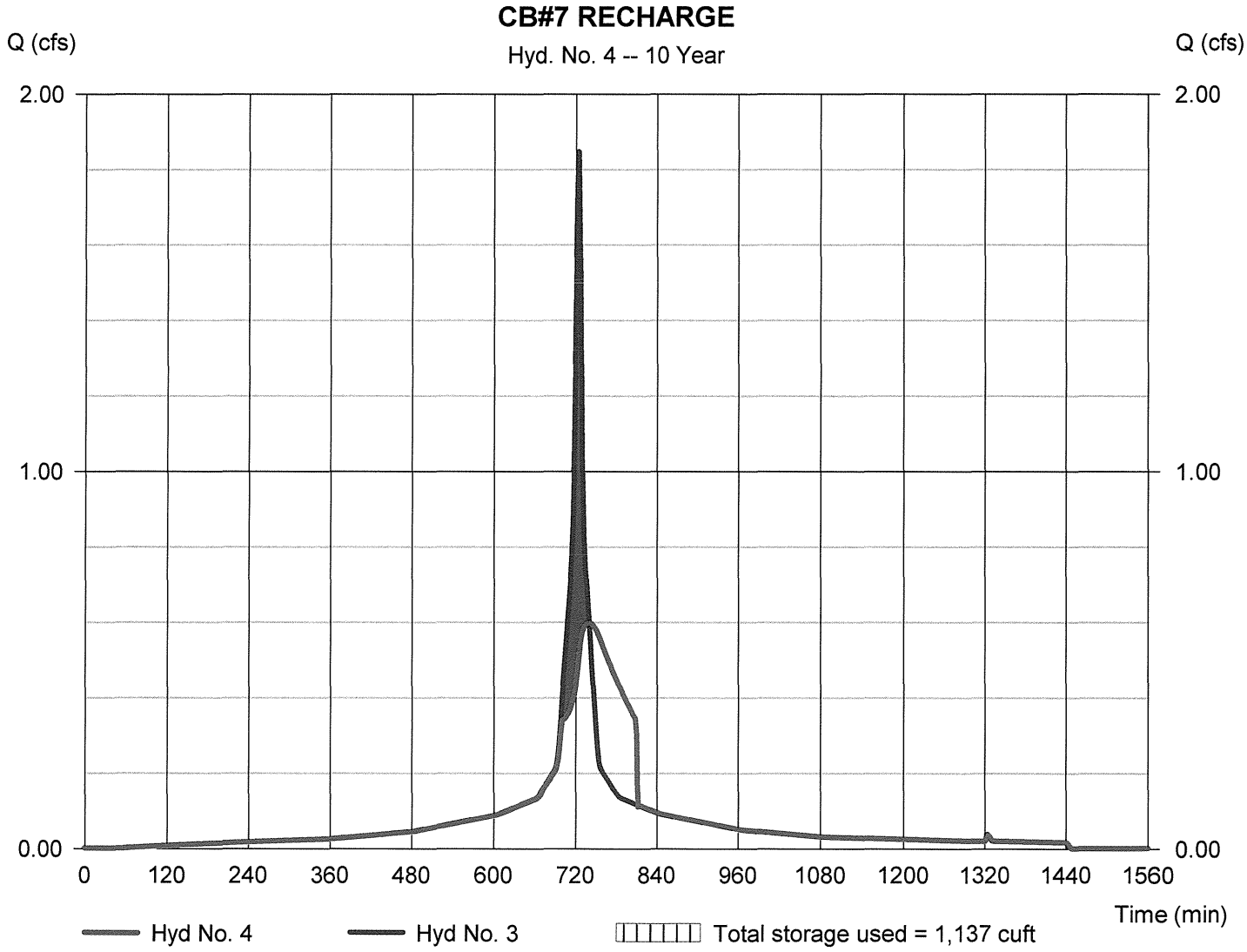
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2011 by Autodesk, Inc. v8 Monday, Feb 8, 2016

Hyd. No. 4

CB#7 RECHARGE

Hydrograph type	= Reservoir	Peak discharge	= 0.596 cfs
Storm frequency	= 10 yrs	Time to peak	= 740 min
Time interval	= 2 min	Hyd. volume	= 6,336 cuft
Inflow hyd. No.	= 3 - CB #7	Max. Elevation	= 234.37 ft
Reservoir name	= CB#7 RECHARGE	Max. Storage	= 1,137 cuft

Storage Indication method used. Outflow includes exfiltration.



Hydrograph Report

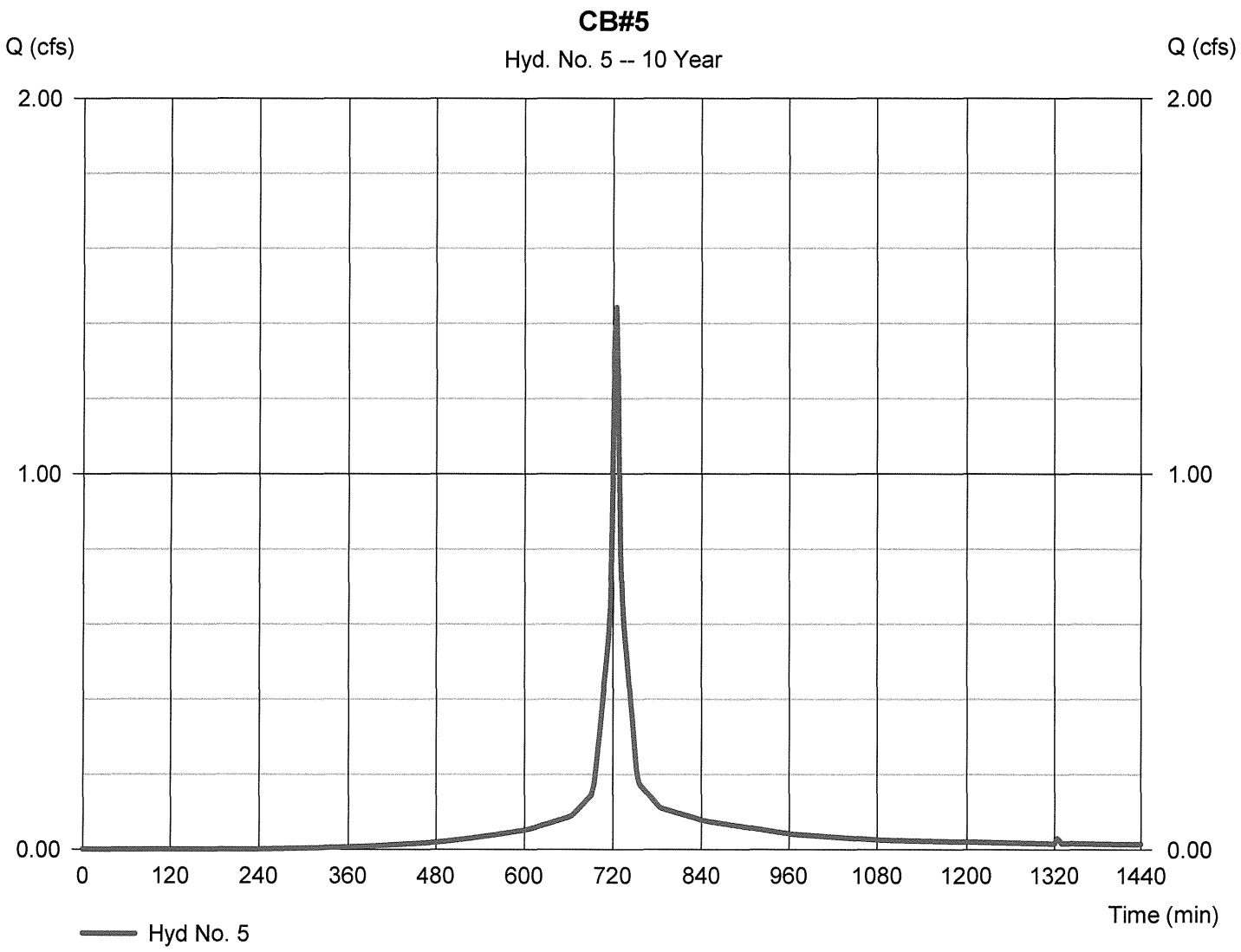
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2011 by Autodesk, Inc. v8 Monday, Feb 8, 2016

Hyd. No. 5

CB#5

Hydrograph type	= SCS Runoff	Peak discharge	= 1.442 cfs
Storm frequency	= 10 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 4,512 cuft
Drainage area	= 0.350 ac	Curve number	= 91*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 4.80 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.288 x 98) + (0.066 x 61)] / 0.350



Hydrograph Report

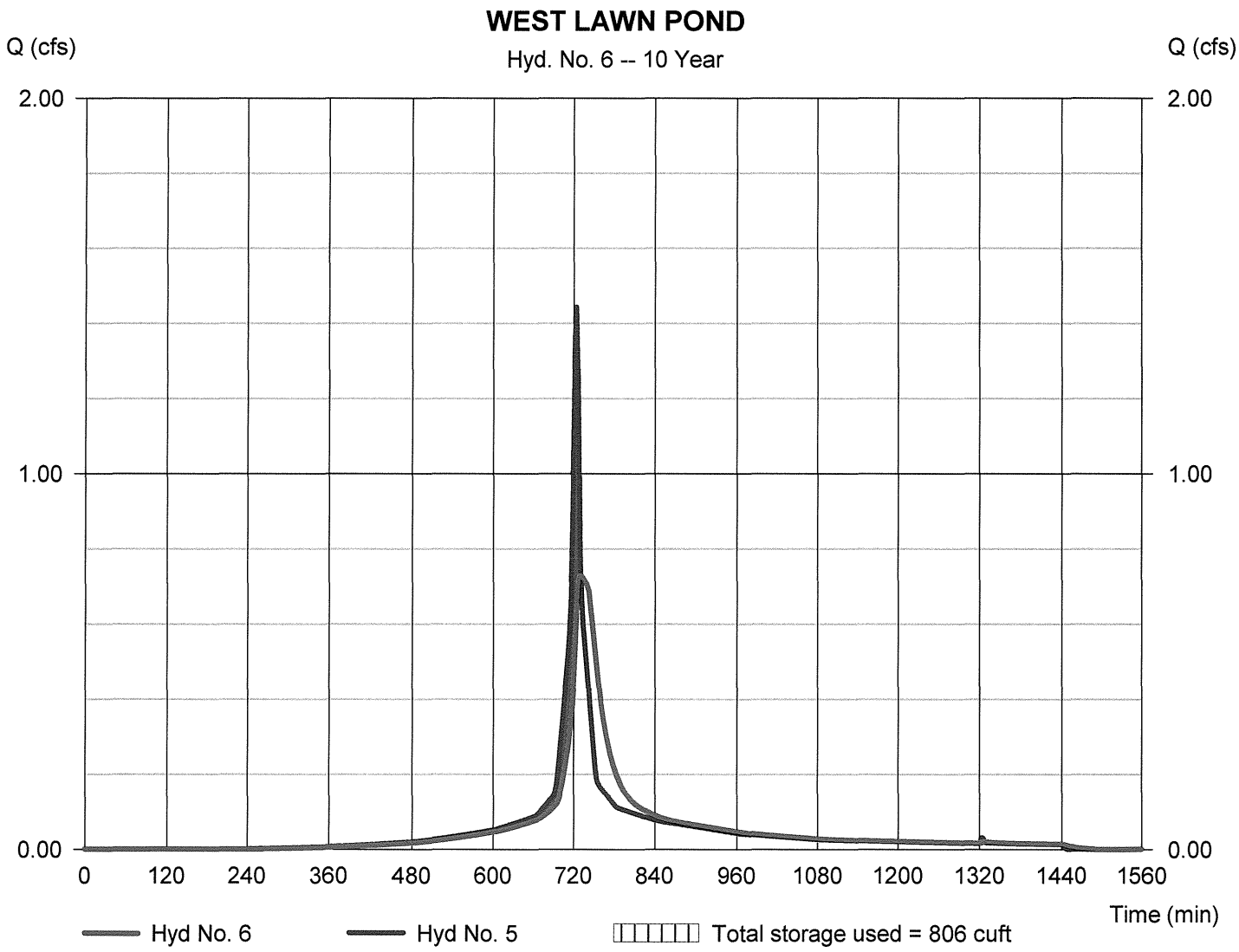
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2011 by Autodesk, Inc. v8 Monday, Feb 8, 2016

Hyd. No. 6

WEST LAWN POND

Hydrograph type	= Reservoir	Peak discharge	= 0.726 cfs
Storm frequency	= 10 yrs	Time to peak	= 732 min
Time interval	= 2 min	Hyd. volume	= 4,511 cuft
Inflow hyd. No.	= 5 - CB#5	Max. Elevation	= 237.08 ft
Reservoir name	= WEST LAWN	Max. Storage	= 806 cuft

Storage Indication method used. Outflow includes exfiltration.



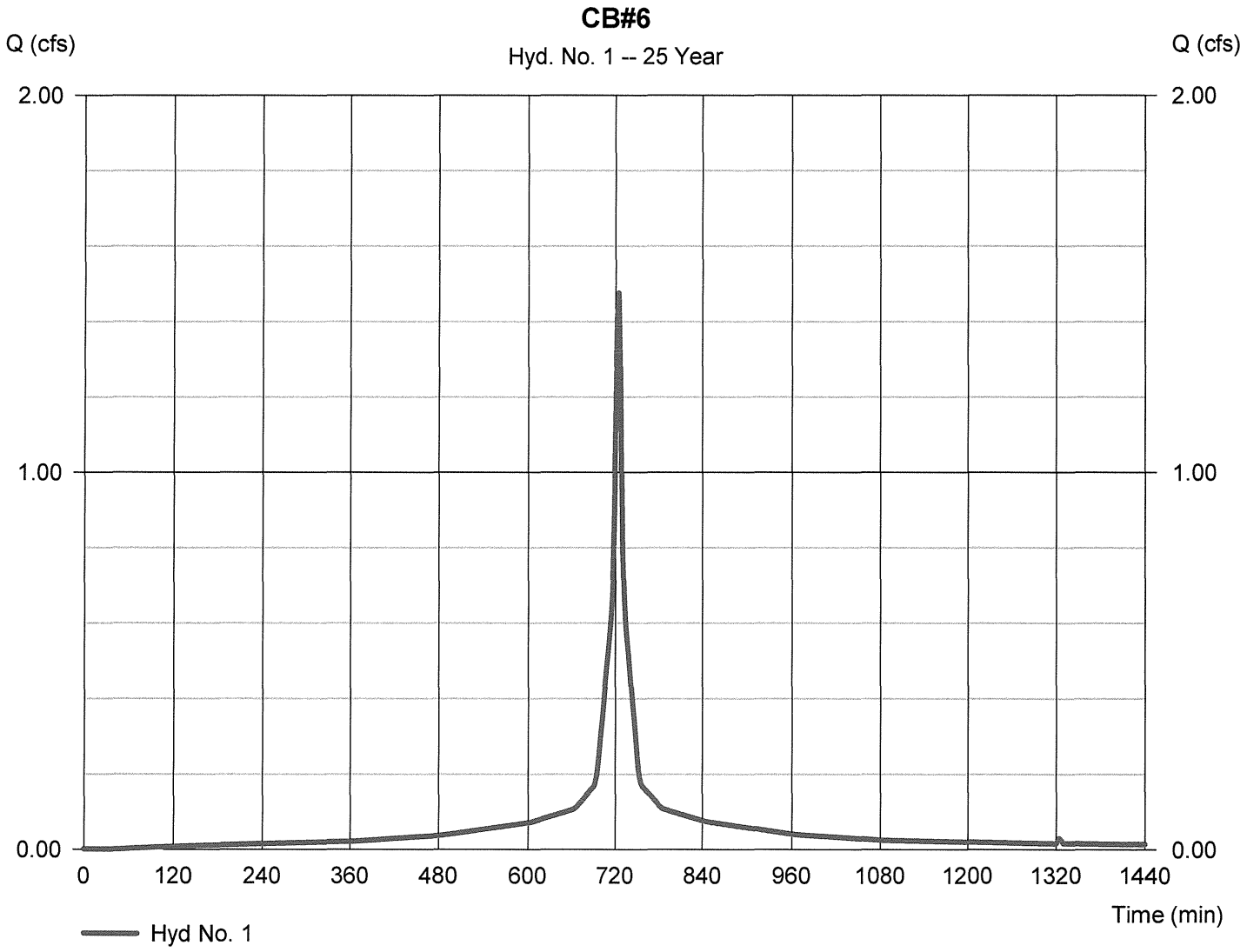
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2011 by Autodesk, Inc. v8 Monday, Feb 8, 2016

Hyd. No. 1

CB#6

Hydrograph type	= SCS Runoff	Peak discharge	= 1.474 cfs
Storm frequency	= 25 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 5,086 cuft
Drainage area	= 0.284 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.50 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

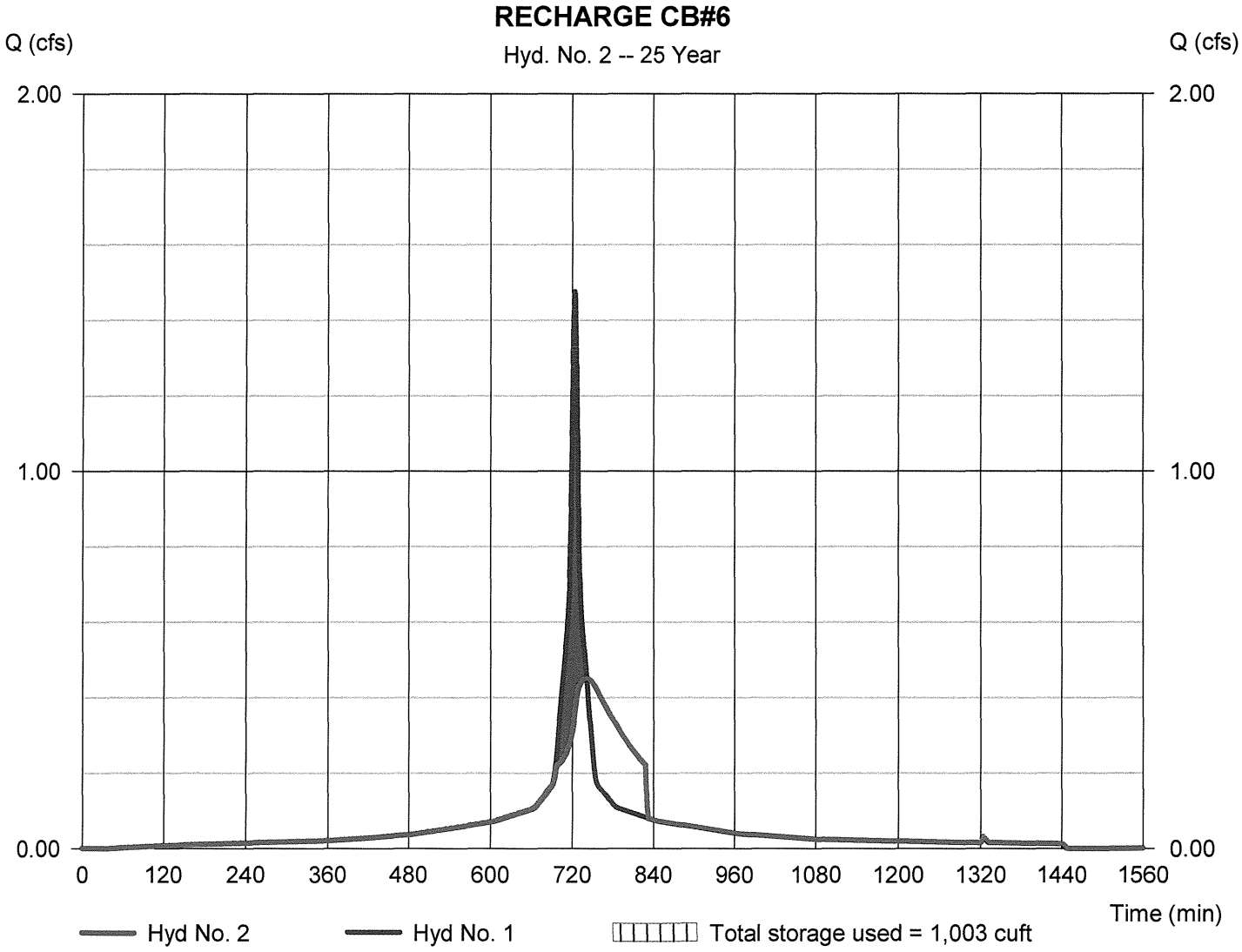
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2011 by Autodesk, Inc. v8 Monday, Feb 8, 2016

Hyd. No. 2

RECHARGE CB#6

Hydrograph type	= Reservoir	Peak discharge	= 0.449 cfs
Storm frequency	= 25 yrs	Time to peak	= 740 min
Time interval	= 2 min	Hyd. volume	= 5,086 cuft
Inflow hyd. No.	= 1 - CB#6	Max. Elevation	= 235.72 ft
Reservoir name	= CB#6 RECHARGE	Max. Storage	= 1,003 cuft

Storage Indication method used. Outflow includes exfiltration.



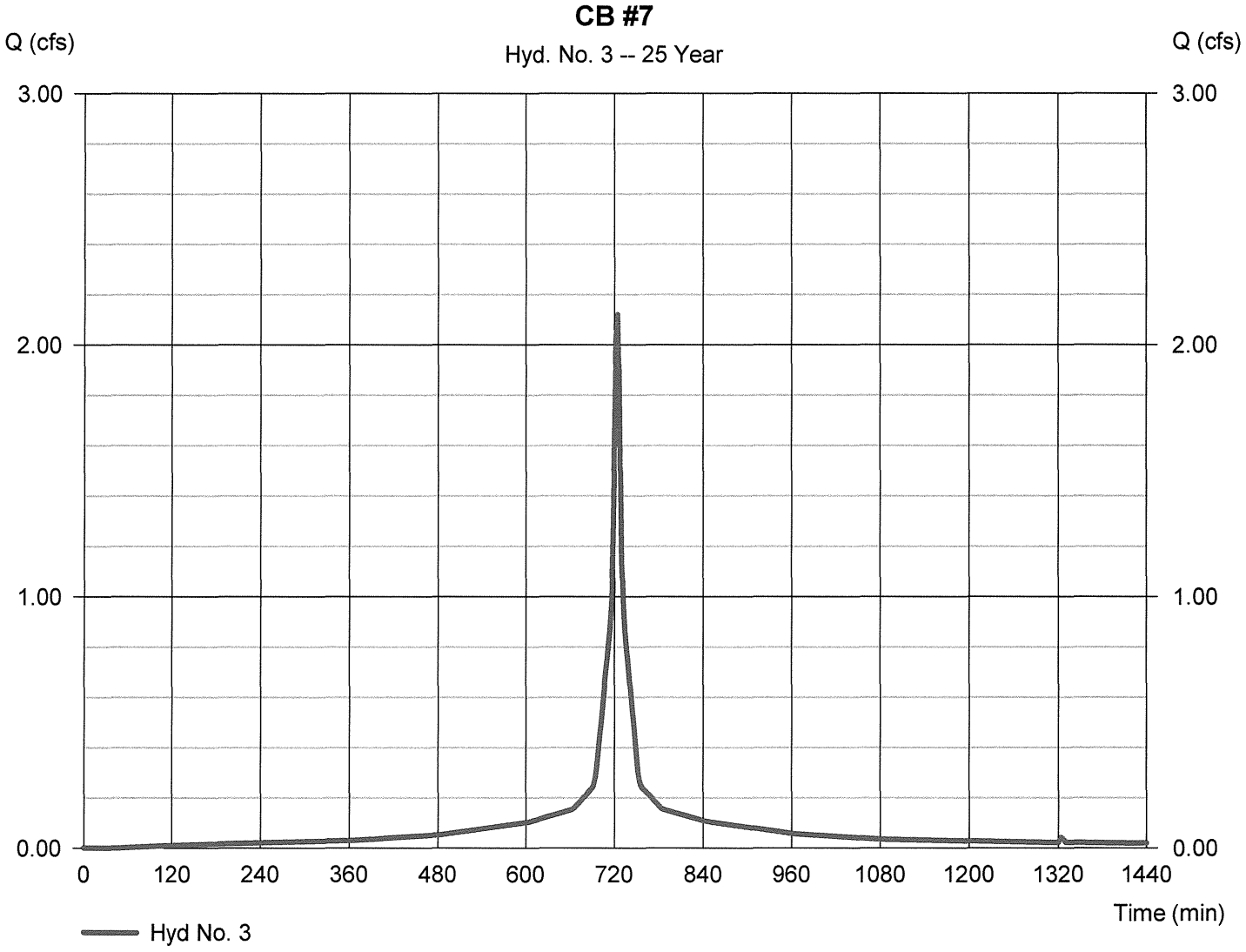
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2011 by Autodesk, Inc. v8 Monday, Feb 8, 2016

Hyd. No. 3

CB #7

Hydrograph type	= SCS Runoff	Peak discharge	= 2.118 cfs
Storm frequency	= 25 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 7,307 cuft
Drainage area	= 0.408 ac	Curve number	= 98
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.50 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

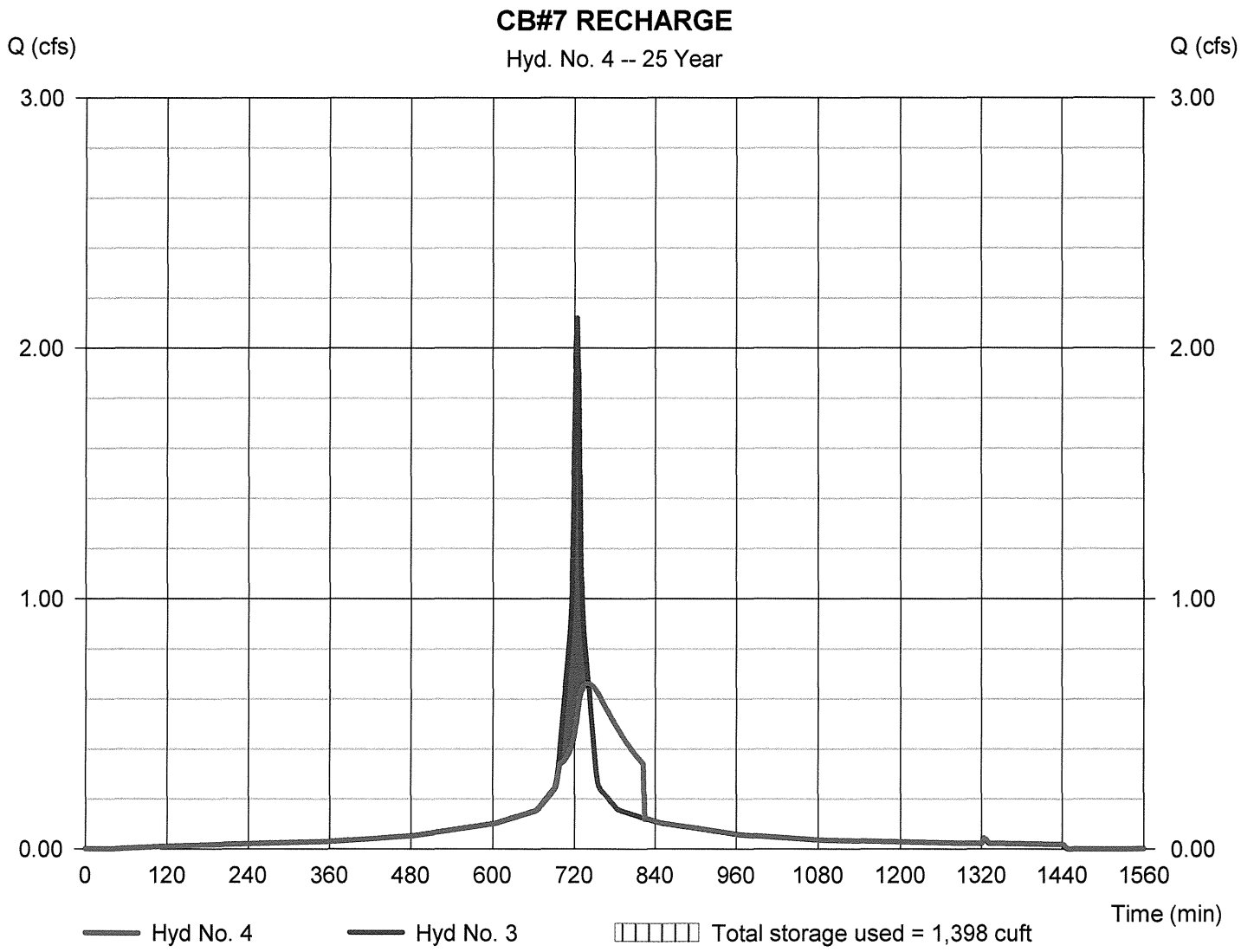
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2011 by Autodesk, Inc. v8 Monday, Feb 8, 2016

Hyd. No. 4

CB#7 RECHARGE

Hydrograph type	= Reservoir	Peak discharge	= 0.657 cfs
Storm frequency	= 25 yrs	Time to peak	= 740 min
Time interval	= 2 min	Hyd. volume	= 7,307 cuft
Inflow hyd. No.	= 3 - CB #7	Max. Elevation	= 234.92 ft
Reservoir name	= CB#7 RECHARGE	Max. Storage	= 1,398 cuft

Storage Indication method used. Outflow includes exfiltration.



Hydrograph Report

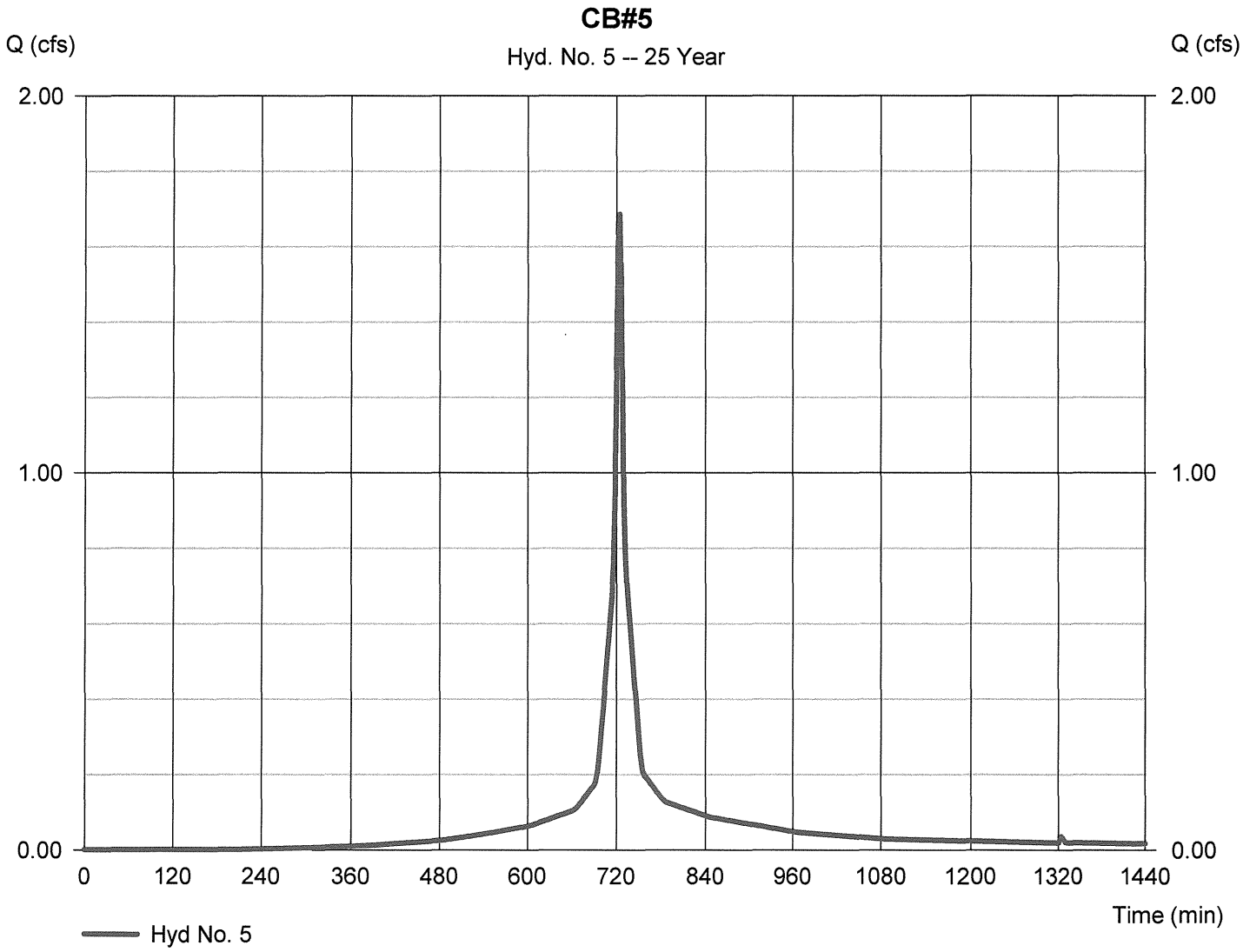
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2011 by Autodesk, Inc. v8 Monday, Feb 8, 2016

Hyd. No. 5

CB#5

Hydrograph type	= SCS Runoff	Peak discharge	= 1.685 cfs
Storm frequency	= 25 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 5,323 cuft
Drainage area	= 0.350 ac	Curve number	= 91*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.50 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.288 x 98) + (0.066 x 61)] / 0.350



Hydrograph Report

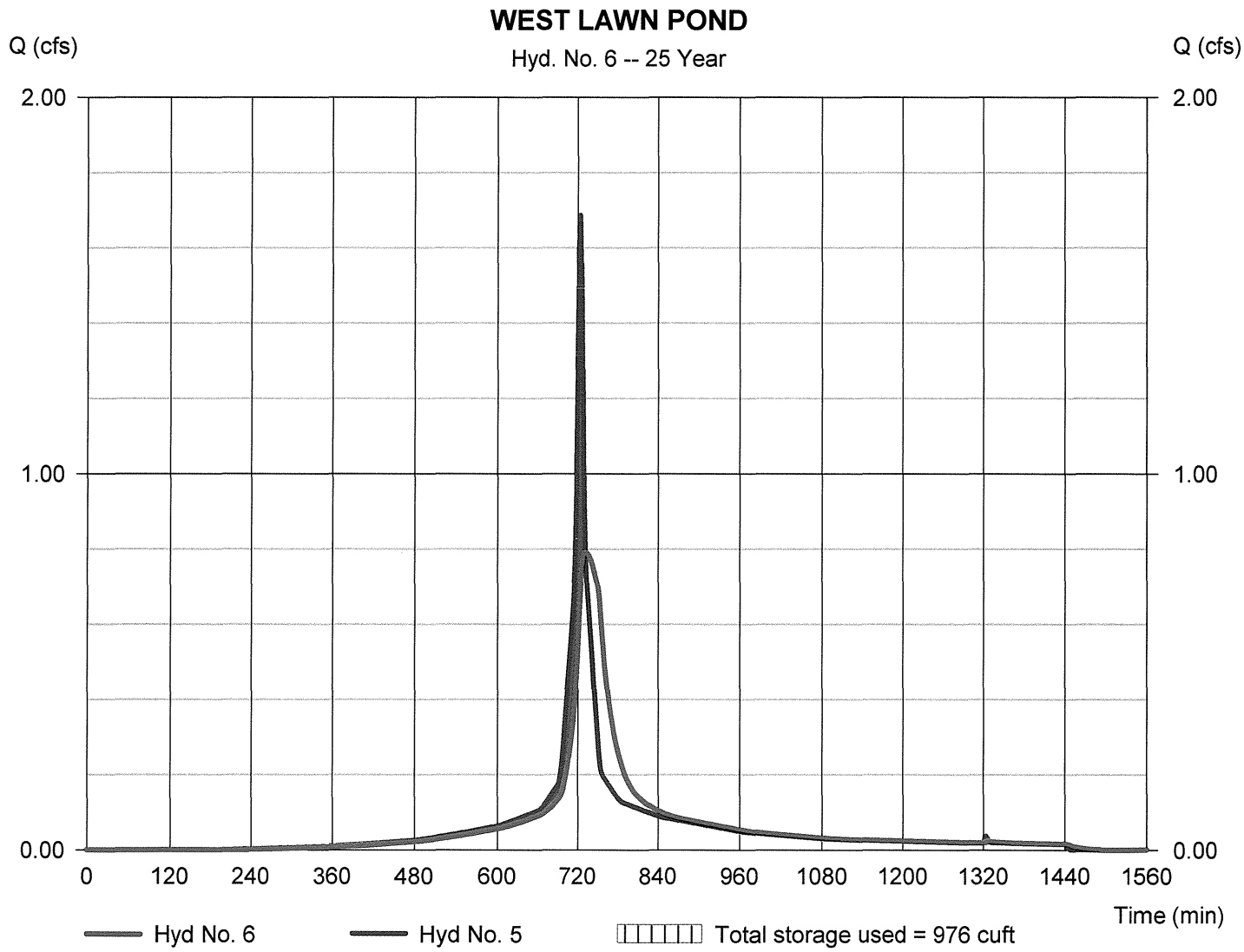
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2011 by Autodesk, Inc. v8 Monday, Feb 8, 2016

Hyd. No. 6

WEST LAWN POND

Hydrograph type	= Reservoir	Peak discharge	= 0.790 cfs
Storm frequency	= 25 yrs	Time to peak	= 732 min
Time interval	= 2 min	Hyd. volume	= 5,322 cuft
Inflow hyd. No.	= 5 - CB#5	Max. Elevation	= 237.20 ft
Reservoir name	= WEST LAWN	Max. Storage	= 976 cuft

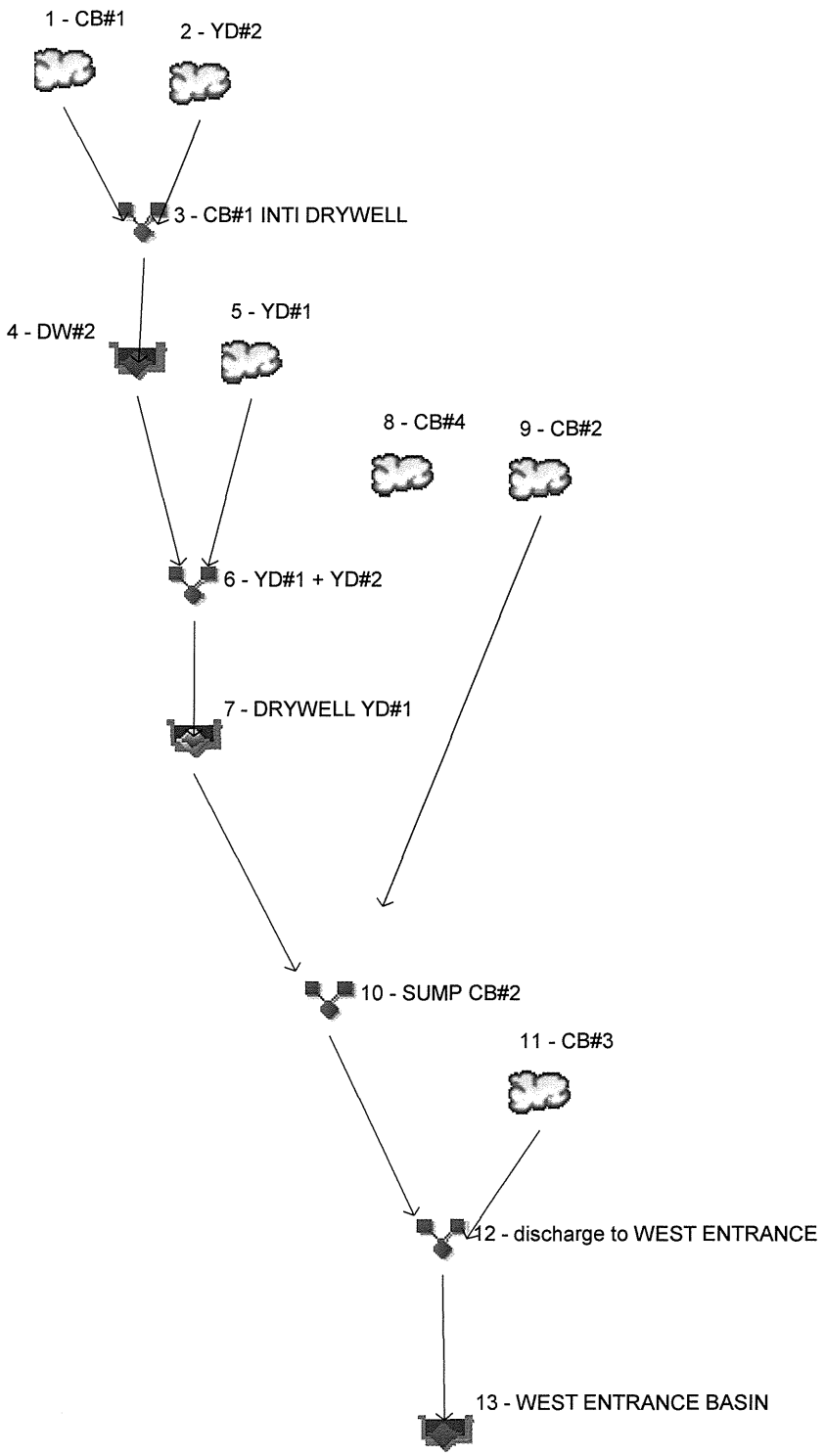
Storage Indication method used. Outflow includes exfiltration.



Appendix E
Hydrograph of North End Storm System

Watershed Model Schematic

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2011 by Autodesk, Inc. v8



Project: UNIGLOBE_NORTH.gpw	Tuesday, Feb 9, 2016

Hydrograph Return Period Recap

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2011 by Autodesk, Inc. v8

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)								Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	SCS Runoff	------	-------	0.345	-------	0.557	0.689	0.846	1.006	-------	CB#1
2	SCS Runoff	------	-------	0.013	-------	0.035	0.051	0.072	0.094	-------	YD#2
3	Combine	1, 2	-------	0.357	-------	0.591	0.740	0.918	1.099	-------	CB#1 INTI DRYWELL
4	Reservoir	3	-------	0.154	-------	0.536	0.732	0.932	1.105	-------	DW#2
5	SCS Runoff	------	-------	0.012	-------	0.033	0.048	0.068	0.089	-------	YD#1
6	Combine	4, 5	-------	0.162	-------	0.564	0.780	0.992	1.194	-------	YD#1 + YD#2
7	Reservoir(i)	6	-------	0.127	-------	0.193	0.319	0.450	0.521	-------	DRYWELL YD#1
8	SCS Runoff	------	-------	0.428	-------	0.599	0.700	0.818	0.936	-------	CB#4
9	SCS Runoff	------	-------	0.146	-------	0.271	0.353	0.453	0.557	-------	CB#2
10	Combine	7, 9	-------	0.205	-------	0.357	0.471	0.706	0.948	-------	SUMP CB#2
11	SCS Runoff	------	-------	0.270	-------	0.356	0.407	0.467	0.527	-------	CB#3
12	Combine	10, 11	-------	0.473	-------	0.713	0.858	1.063	1.415	-------	discharge to WEST ENTRANCE
13	Reservoir	12	-------	0.331	-------	0.458	0.541	0.677	0.802	-------	WEST ENTRANCE BASIN

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2011 by Autodesk, Inc. v8

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	0.345	2	724	1,046	------	------	------	CB#1
2	SCS Runoff	0.013	2	726	60	------	------	------	YD#2
3	Combine	0.357	2	724	1,107	1, 2	------	------	CB#1 INTI DRYWELL
4	Reservoir	0.154	2	738	1,106	3	239.68	177	DW#2
5	SCS Runoff	0.012	2	726	57	------	------	------	YD#1
6	Combine	0.162	2	736	1,164	4, 5	------	------	YD#1 + YD#2
7	Reservoir(i)	0.127	2	770	1,163	6	238.44	186	DRYWELL YD#1
8	SCS Runoff	0.428	2	724	1,306	------	------	------	CB#4
9	SCS Runoff	0.146	2	724	478	------	------	------	CB#2
10	Combine	0.205	2	726	1,641	7, 9	------	------	SUMP CB#2
11	SCS Runoff	0.270	2	724	909	------	------	------	CB#3
12	Combine	0.473	2	724	2,550	10, 11	------	------	discharge to WEST ENTRANCE
13	Reservoir	0.331	2	730	2,549	12	233.38	181	WEST ENTRANCE BASIN

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2011 by Autodesk, Inc. v8

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	0.557	2	724	1,665	------	------	------	CB#1
2	SCS Runoff	0.035	2	724	125	------	------	------	YD#2
3	Combine	0.591	2	724	1,790	1, 2	------	------	CB#1 INTI DRYWELL
4	Reservoir	0.536	2	728	1,789	3	241.45	256	DW#2
5	SCS Runoff	0.033	2	724	118	------	------	------	YD#1
6	Combine	0.564	2	728	1,908	4, 5	------	------	YD#1 + YD#2
7	Reservoir(i)	0.193	2	750	1,906	6	241.13	351	DRYWELL YD#1
8	SCS Runoff	0.599	2	724	1,857	------	------	------	CB#4
9	SCS Runoff	0.271	2	724	835	------	------	------	CB#2
10	Combine	0.357	2	724	2,740	7, 9	------	------	SUMP CB#2
11	SCS Runoff	0.356	2	724	1,214	------	------	------	CB#3
12	Combine	0.713	2	724	3,955	10, 11	------	------	discharge to WEST ENTRANCE
13	Reservoir	0.458	2	730	3,954	12	233.56	284	WEST ENTRANCE BASIN

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2011 by Autodesk, Inc. v8

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	0.689	2	724	2,059	------	------	------	CB#1
2	SCS Runoff	0.051	2	724	170	------	------	------	YD#2
3	Combine	0.740	2	724	2,229	1, 2	------	------	CB#1 INTI DRYWELL
4	Reservoir	0.732	2	724	2,229	3	241.45	261	DW#2
5	SCS Runoff	0.048	2	724	162	------	------	------	YD#1
6	Combine	0.780	2	724	2,390	4, 5	------	------	YD#1 + YD#2
7	Reservoir(i)	0.319	2	740	2,400	6	241.57	433	DRYWELL YD#1
8	SCS Runoff	0.700	2	724	2,192	------	------	------	CB#4
9	SCS Runoff	0.353	2	724	1,071	------	------	------	CB#2
10	Combine	0.471	2	736	3,470	7, 9	------	------	SUMP CB#2
11	SCS Runoff	0.407	2	724	1,398	------	------	------	CB#3
12	Combine	0.858	2	724	4,868	10, 11	------	------	discharge to WEST ENTRANCE
13	Reservoir	0.541	2	744	4,868	12	233.76	434	WEST ENTRANCE BASIN

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2011 by Autodesk, Inc. v8

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	0.846	2	724	2,533	------	------	------	CB#1
2	SCS Runoff	0.072	2	724	229	------	------	------	YD#2
3	Combine	0.918	2	724	2,762	1, 2	------	------	CB#1 INTI DRYWELL
4	Reservoir	0.932	2	722	2,761	3	241.64	266	DW#2
5	SCS Runoff	0.068	2	724	217	------	------	------	YD#1
6	Combine	0.992	2	722	2,979	4, 5	------	------	YD#1 + YD#2
7	Reservoir(i)	0.450	2	736	2,989	6	241.97	541	DRYWELL YD#1
8	SCS Runoff	0.818	2	724	2,585	------	------	------	CB#4
9	SCS Runoff	0.453	2	724	1,362	------	------	------	CB#2
10	Combine	0.706	2	728	4,351	7, 9	------	------	SUMP CB#2
11	SCS Runoff	0.467	2	724	1,612	------	------	------	CB#3
12	Combine	1.063	2	726	5,963	10, 11	------	------	discharge to WEST ENTRANCE
13	Reservoir	0.677	2	744	5,962	12	234.04	664	WEST ENTRANCE BASIN

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2011 by Autodesk, Inc. v8

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	1.006	2	724	3,020	------	------	------	CB#1
2	SCS Runoff	0.094	2	724	291	------	------	------	YD#2
3	Combine	1.099	2	724	3,312	1, 2	------	------	CB#1 INTI DRYWELL
4	Reservoir	1.105	2	724	3,311	3	241.64	270	DW#2
5	SCS Runoff	0.089	2	724	277	------	------	------	YD#1
6	Combine	1.194	2	724	3,588	4, 5	------	------	YD#1 + YD#2
7	Reservoir(i)	0.521	2	736	3,585	6	241.83	677	DRYWELL YD#1
8	SCS Runoff	0.936	2	724	2,981	------	------	------	CB#4
9	SCS Runoff	0.557	2	724	1,667	------	------	------	CB#2
10	Combine	0.948	2	726	5,252	7, 9	------	------	SUMP CB#2
11	SCS Runoff	0.527	2	724	1,826	------	------	------	CB#3
12	Combine	1.415	2	726	7,078	10, 11	------	------	discharge to WEST ENTRANCE
13	Reservoir	0.802	2	744	7,077	12	234.17	832	WEST ENTRANCE BASIN

Connecticut Ecosystems LLC

• Wetland Delineation • Wetland & Aquatic Evaluation • Mitigation
• Natural Resource Inventory • Permit Assistance • Expert Testimony

ON-SITE SOIL INVESTIGATION REPORT

Project Name & Location
91 & 93 Meadowbrook Lane
Mansfield, CT

CE Job No.: 14-27
Field Investigation Date(s): 12/8/2014
Field Investigation Method(s):
☒ Spade & Auger
☐ Backhoe & Test Pits

Report Prepared For:
Development Solutions, LLC
33 East Town Street
Norwich, CT 06360

Field Conditions:
Weather: Sunny 40° F
Recent Precipitation: average
Soil Moisture: average
Snow Depth: ---
Frost Depth: ---

Purpose of Investigation:
☒ Wetland Delineation/Flagging
☐ Sketch Wetland Boundaries on Base Map (No Flagging)
☐ High Intensity Soil Mapping by Soil Scientist
☒ Medium Intensity Soil Mapping from SCS Soil Survey Maps

Wetland Boundary Marker Series: CE 1-1→1-34
Intermittent Watercourse Marker Series: ---

Wetland Notes:
- **Type(s)**: Deciduous wooded swamp
- **Hydroperiod(s)**: Seasonally saturated
- **Soil Parent Material(s)**: Glacial till
- **Drainage Class(es)**: Poorly drained
- **Slope**: Gentle

38 Westland Avenue • West Hartford, CT 06107
Phone (860) 561-8598 • Fax (860) 561-0223 • email ecosys@comcast.net

CONNECTICUT ECOSYSTEMS LLC
ON-SITE SOIL INVESTIGATION REPORT (CONTINUED)

Project Name & Location: 91 & 93 Meadowbrook Lane Mansfield, CT
Project #: 14-27

SOIL MAP UNITS

Soil symbols used below and on the accompanying Wetland Sketch Map correspond to those in the National Cooperative Soil Survey.

WETLAND SOIL SERIES

Ridgebury, Leicester and Whitman Complex (3)

This complex consists of poorly drained Ridgebury and Leicester soils, and very poorly drained Whitman soils, described separately below. The complex consists of about 35 percent Ridgebury soils, 30 percent Leicester soils, 20 percent Whitman soils, and 15 percent other soils.

Ridgebury Series

The Ridgebury series consists of deep, poorly and somewhat poorly drained soils formed in a coarse-loamy mantle underlain by firm, compact glacial till on uplands. They are nearly level to moderately steep soils on till plains, low ridges and drumloidal landforms. The soils formed in acid glacial till derived mainly from schist, gneiss or granite.

Typically these soils have a black sandy loam surface layer 6 inches thick. The mottled subsoil from 6 to 16 inches is olive gray sandy loam. The mottled substratum from 16 to 60 inches is a light olive brown and olive, very firm and brittle gravelly sandy loam.

The seasonal high water table is within 0 to 18 inches of the surface from late fall through spring. Surface runoff is slow to medium. Permeability is moderate to moderately rapid in the surface layer and subsoil and slow or very slow in the dense substratum. A perched, fluctuating water table above the dense till saturates the solum to or near the surface for 7 to 9 months of the year.

Leicester Series

The Leicester series consists of deep, poorly drained loamy soils formed in friable glacial till on uplands. They are nearly level to gently sloping soils in drainage ways and low lying positions on till covered uplands. The soils formed in acid glacial till derived mainly from schist, gneiss or granite.

Typically, these soils have a surface layer of black fine sandy loam 6 inches thick. The subsoil from 6 to 23 inches is grayish brown, mottled fine sandy loam. The substratum from 26 to 60 inches or more is dark yellowish brown, mottled, friable, gravelly fine sandy loam.

Leicester soils are poorly drained. The seasonal high water table is within 0 to 18 inches of the surface from late fall through spring. Surface runoff is slow. Permeability is moderate or moderately rapid in the surface layer and subsoil and moderately rapid to rapid in the substratum.

Whitman Series

The Whitman series consists of very poorly drained soils formed in a coarse-loamy mantle underlain by firm, compact glacial till on uplands. They occur in drainageways, at the base of hills and ridges, and in depressions. These soils formed in acid glacial till derived mainly from schist and gneiss. They are characterized by a dense, very firm hardpan at a depth of 22-60 inches.

UPLAND (NON-WETLAND) SOIL SERIES

Canton-Charlton Complex (60)

This complex consists of well drained Canton fine sandy loam and well drained Charlton fine sandy loam, described separately below. The complex consists of about 45 percent Canton, 40 percent Charlton, and 15 percent other soils.

Canton Series

The Canton series consists of deep, well drained soils formed in a coarse-loamy mantle underlain by sandy glacial till on uplands. They are nearly level to very steep soils on till plains and hills. The soils formed in acid glacial till derived mainly from schist, gneiss or granite.

Typically, these soils have a surface layer of very dark grayish brown fine sandy loam 2 inches thick. The subsoil from 2 to 23 inches is yellowish brown fine sandy loam, gravelly fine sandy loam and gravelly sandy loam. The substratum from 23 to 60 inches is pale brown gravelly loamy sand.

The water table is commonly at a depth of more than 6 feet. Surface runoff is medium to rapid. Permeability is moderate or moderately rapid in the surface layer and subsoil and rapid in the substratum.

Charlton Series

The Charlton series consists of gently sloping, well drained soils and range from nonstony to extremely stony. Charlton soils occur on the landscape on broad hilltops, ridge tops, and glacial till plains. They formed in glacial till parent material derived mainly from schist and gneiss. Unlike the Paxton soils, which occur on the same landscape, the Charlton soils are not characterized by a dense hardpan.

Typically, the solum is 8 inches thick, dark brown fine sandy loam. The yellowish brown subsoil is 18 inches thick, and the substratum is grayish brown gravelly fine sandy loam to a depth of 60 inches.

CONNECTICUT ECOSYSTEMS LLC
ON-SITE SOIL INVESTIGATION REPORT (CONTINUED)

Project Name & Location: 91 & 93 Meadowbrook Lane Mansfield, CT
Project #: 14-27

Permeability in Charlton soils is moderate or moderately rapid. The soil has a high available water capacity, and runoff is medium.

Gloucester Series (59)

Gloucester soils are somewhat excessively drained, and developed in very friable, coarse-textured glacial till derived mainly from granite and some gneiss. The sand content is high.

The wetlands were field delineated in accordance with the standards of the National Cooperative Soil Survey and the definition of wetlands as found in the Connecticut General Statutes, Chapter 440, Section 22A-38. The investigation was conducted and reviewed by a Registered Soil Scientist.

Respectfully submitted,

Connecticut Ecosystems LLC

Edward M. Pawlak
Registered Soil Scientist
Certified Professional Wetland Scientist

File c:\soils2014\14-27.doc

Soil Map—State of Connecticut
(91 & 93 Meadowbrook Lane Mansfield, CT)

Map Scale: 1:1,610 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 20 40 80 120

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: State of Connecticut
Survey Area Data: Version 13, Oct 28, 2014

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 28, 2011—May 12, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

State of Connecticut (CT600)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
3	Ridgebury, Leicester, and Whitman soils, 0 to 8 percent slopes, extremely stony	1.7	24.0%
59D	Gloucester gravelly sandy loam, 15 to 35 percent slopes, extremely stony	2.5	36.9%
60B	Canton and Charlton soils, 3 to 8 percent slopes	2.6	37.3%
306	Udorthents-Urban land complex	0.1	1.8%
Totals for Area of Interest		**6.9**	**100.0%**

BSC GROUP
Transportation ▪ Energy ▪ Land Development

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www.bscgroup.com

March 31, 2016

Town of Mansfield Inland Wetland Agency
Town of Mansfield Planning & Zoning Commission
Attention: Ms. Linda Painter
Director of Planning and Development – Town of Mansfield
Audrey P. Beck Municipal Building
4 South Eagleville Road
Mansfield, CT 06268

RE: Peer Review
Meadowbrook Gardens
Special Permit Application and Inland Wetlands License

Dear Planning & Zoning Commission and Inland Wetland Agency Members and Ms. Painter:

BSC has completed its review of the applications for a Special Permit and Inland Wetlands license for the proposed 36 unit apartment complex known as Meadowbrook Gardens located at 91-93 Meadowbrook Lane in Mansfield, Connecticut. This letter report summarizes our findings and presents comments and questions that we have formed as a result of the review. This review encompasses the Project's compliance with the Town of Mansfield Zoning Regulations, Town of Mansfield Inland Wetlands & Watercourses Regulations, Town of Mansfield Engineering Standards and Specifications, 2004 Connecticut Stormwater Quality Manual and the 2002 Connecticut Guidelines for Soil Erosion & Sediment Control, and general engineering and best development practices.

Project Summary and Information Reviewed

The proposed project includes an expansion of the existing 50-unit development apartment complex, currently under construction at 73 Meadowbrook Lane, by an additional 36-units. The development will include four (4) buildings with associated bituminous parking and drive areas, as well as associated sidewalks, landscaping, and utilities. The main access to the site is off Meadowbrook Lane, with a secondary connection to the adjacent development. The site is approximately 4.6 acres and is a combination of wooded and grass areas with several small structures. The portion of the site to be developed, which is located on the northern half of the site, is relatively flat and generally slopes from east to west. The southern half of the site, as well as the portion along the western border, slopes down to an existing unnamed brook, which also helps define the limits of on-site wetlands. Portions of the slope exhibit a gradient of 40% and a change in vertical elevation of up to 28 feet.

This reports was generated based on our review of the following:

- The plan set "Meadowbrook Gardens, 91-93 Meadowbrook Lane, Mansfield Center, CT 06250," Uniglobe Investments, LLC, 73 Meadowbrook Lane, Mansfield Center, CT 06250, January 8, 2016.

Engineers
Environmental Scientists
Custom Software Developers
Landscape Architects
Planners
Surveyors

- "Design Statement Drainage Calculations & Hydraulic Analysis, Uniglobe Investments, LLC," by Civil Engineering Services, LLC, 203 Boston Hill Road, Andover, CT 06232, February 5, 2016.
- "Traffic Impact Report, Meadowbrook Gardens, Meadowbrook Lane, Mansfield, CT, Draft 3" by F.A. Hesketh & Associates, Inc., August 14, 2015.
- "On-Site Investigation Report, 91 & 93 Meadowbrook Lane, Mansfield, CT," by Connecticut Ecosystems, LLC, August 11, 2015.
- Meadowbrook Gardens "Special Permit Application", dated 2-9-16.

Additionally, we made several site visits to observe field conditions, and had conversations with Bob Magi (Uniglobe) and Gerald Hardisty, PE (Civil Engineering Services).

Stormwater Review

The site generally consists of sand, gravel and loam which, as defined by the National Resources Conservation Service (NRCS), are "well drained." The applicant had soil samples tested for permeability by Connecticut-certified materials testing laboratory and the results verified the soils depicted by NRCS and observed by us on the site. The stormwater design intent was to take advantage of the existing soils and maximize percolation by utilizing a combination of dry wells (18), underground leaching galleys (27 4'x4'x4' units) and two (2) shallow above-ground detention basins. The design intent was to infiltrate all stormwater generated within the development footprint for storms up to the 25-year storm, and thereby reduce the peak flow as required by the Town of Mansfield Zoning Regulations.

Our stormwater review comments are as follows:

1. We concur with the Applicant's hydrologic design assumptions and computations, as well as the resulting intent to infiltrate stormwater utilizing the previously mentioned drainage facilities. We concur that the site peak flows will be reduced for storms up to the 50-Year storm, which satisfies the Town zoning requirements.

2. Based upon the specific site characteristics, the 2004 CT DEEP Stormwater Quality Manual requires a Water Quality Volume (WQV) storage of approximately 6,800 cubic feet. The applicant, through the use of dry wells, leaching galleys, and above-ground detention, has provided a water quality volume of approximately 11,100 cubic feet, which exceeds the required WQV.

3. Based upon the specific site characteristics, the 2004 CT DEEP Stormwater Quality Manual requires a Groundwater Recharge Volume (GRV) storage of approximately 1,670 cubic feet. The applicant, through the use of dry wells, leaching galleys, and above-ground detention, has provided a water quality volume of approximately 11,100 cubic feet, which exceeds the GRV.

4. The horizontal roof leaders that connect the roof drainage to the dry wells are designed to be four (4) inch diameter. We recommend the diameter be increased from four (4) inches to eight (8) inches.

5. The pipe connections between the two (2) sets of leaching galleys located on the southern end of the development are designed to be four (4) inches. We recommend

the diameter be increased to 12 inches.

6. A large percentage of drainage piping between dry wells and connected to catch basins are designed to be a diameter of six (6) inches. We recommend piping between dry wells and any piping connected to a catch basin and/or leaching basin be a minimum of 12 inch diameter.

7. Catch Basin – 4 is designed to have a TF = 236.7. Based upon the design contours at CB-4, the proposed grade is approximately 240. We recommend this be reviewed and the top of frame grade revised as appropriate.

8. We recommend that a detail, or at the least some more spot grading, be provided for the outlet of the detention basin located on the west side of the paved area.

9. We recommend that a detail of the emergency spillway at the small basin located west of the main entrance drive be provided.

10. Catch Basin – 7 has been designed to be at the low point of the paved area and it has been designed with a modified rip rap overflow to prevent erosion of the hill during large storm events, during which the leaching galleys/existing soil do not have the volume/percolation to prevent runoff from leaving the site. By our computations, the large storm events (50-year and up) will overflow and, during those events, the entire paved drive to the "238" contour will be ponded. We recommend, as a safety measure in lieu of the rip rap overflow down the entirety of the slope, that CB-7 be designed with a 12" outlet pipe at elevation 236. The outlet pipe would extend approximately 30' to the bottom of the slope and be fitted with a concrete flared end and rip rap outlet control. We recommend this be designed per the 2000 ConnDOT Drainage Manual standards and a detail be provided.

Erosion & Sedimentation Control Review

11. Based on the fifth paragraph of the General Erosion and Sedimentation Control Notes, dust control seems to be left up to the contractor. We recommend that the notes be revised to indicated it is the contractor's responsibility to provide dust control as necessary, and as required by the Town, to prevent fugitive emissions from leaving the site.

12. Based on the sixth paragraph of the General Erosion and Sedimentation Control Notes, an anti-tracking pad seems to be recommended but not required. Although there is an anti-tracking pad detail, we recommend revising the notes to indicate that an anti-tracking pad is required.

13. Although the plan calls for the use of temporary sediment traps, we do not see a detail of one. We recommend placing a temporary sediment trap detail, as shown on page 5-11-25 of the 2002 Connecticut Guidelines for Erosion & Sediment Control, on the plans.

14. We recommend a detail for a concrete washout area be provided on the plans, to ensure chemicals associated with concrete do not get washed towards the resource areas as concrete trucks and other equipment, are washed on-site after use. We also

recommend a note be added to the general notes requiring the contractor to utilize the concrete washout area detail during any operations that involve washing concrete off concrete trucks or other equipment.

15. Erosion and sedimentation controls should be extended along the southwest edge of the construction envelope, so that a continuous line of erosion and sedimentation controls extends along the undeveloped perimeter of the construction envelope.

16. We recommend that as an extra layer of protection for the resource area, along the southern and western borders of the developed area, a double row of silt fence or a hay bale-reinforced row of silt fence be used in lieu of the single row of silt fence that is currently shown.

Sanitary Review

In accordance with the Connecticut Department of Public Health Code On-Site Sewage Disposal Regulations, and Technical Standards for Subsurface Sewage Disposal Systems, Section IV, Design Flows, the peak design flow for a residential building is 150 gallons per day per bedroom. Assuming two (2) bedrooms per unit, the peak design flow is 300 gallons per day (gpd). Based on 18 units, the total peak flow for the development is 5,400 gallons per day.

17. Sanitary laterals are shown on the Site Plan; however, their material, diameter, inverts, and slopes are not shown. In accordance with Section V.A.1 – Utilities, of the Town of Mansfield Department of Public Works Engineering Standards and Specifications, we recommend the plans be revised to show the following:

    - Diameter (minimum 4”).
    - Inverts and slopes, to ensure the laterals do not conflict with storm drain pipes.
    - Material (recommend PVC to match the same material as the sanitary collector pipes, which are designed to be PVC.)

18. We recommend that reference on the plans be made to require the construction of all sanitary facilities to be constructed to the Mansfield Department of Public Works Engineering Standards and Specifications, specifically:

    - Sanitary Drop Manhole.
    - Sanitary Manhole Invert.
    - Sanitary Service Connection to Sanitary Main.
    - Typical Trench Section.

19. Based on a conversation on March 28, 2016 with David Garand, Windham Water Pollution Control Authority (WPCA), he has received a set of plans and performed a review. He indicated that the WPCA facility has the capacity to accept the proposed design flow. He indicated that the WPCA had several minor comments that were sent back to the applicant but that he has not received any revised plans yet.

Wetlands Review

On Thursday, March 24th, BSC conducted a site visit to evaluate proposed potential impacts to regulated wetland/watercourse resources and the associated 150' Upland Review Area (URA). BSC reviewed the project site in accordance with Connecticut Public Act No 155 of 1972 and associated amendments, Connecticut General Statutes Sections 22a-36 to 22a-45 inclusive, and with Bylaws for the Mansfield Inland Wetlands Agency and associated "Inland Wetlands & Watercourses Regulations". BSC reviewed project documents listed above, and the Natural Resources Conservation Service soils mapping (Web Soil Survey) for the project site. It should be noted that BSC was not requested to review the placement of wetland boundary flagging on the site, but has been requested to evaluate the proposed project for potential impacts to wetland resource areas. In this regard, BSC provides the following comments.

20. Although not specifically requested to review wetland flag locations, BSC did walk the flagged wetland boundary, and concurs that flagging is generally correctly located. The flagged wetland borders the stream that flows along the western edge and through the southern portion of the property. Land slopes steeply upwards from the wetland and stream, with forested upland occurring on the slopes. Most of the level land at the top of the slope is mowed grass and yard associated with existing houses and buildings on the property.

21. No direct impacts to wetlands or stream are proposed. Maintenance of naturally vegetated areas that buffer these resources, particularly where slopes are steep, will help protect wetland resources from impacts. Greater protection of regulated wetland/watercourse resources would be achieved if proposed development were removed from forested areas within the 150' URA Portions of the URA are already altered and maintained as mowed grass/yard. These altered URA areas provide fewer of the buffering services that the undisturbed URA provides, and thus are more suited to development. BSC recommends that the Applicant evaluate opportunities to move development out of the forested portion of the 150' URA.

22. On the western side of the property, near Meadowbrook Lane, a stormwater basin is proposed within approximately 15 feet of the wetland boundary. BSC recommends that this feature be moved as far as possible from the wetland boundary.

23. On the southwest side of the development, another stormwater basin is located within approximately 45 feet of the wetland boundary. BSC recommends that the Applicant consider moving this feature as far as possible from the wetland boundary.

24. In the southeast portion of the development footprint, forested land is proposed to be cut within the URA, and a paved drive and parking area are proposed in this area. BSC recommends that the Applicant consider reducing or moving the footprint for the paved area so that impacts to the naturally vegetated URA area are reduced.

25. Maintaining erosion and sedimentation controls during the construction phase will be essential for protecting the stream, wetlands and associated naturally vegetated URA,

given the steep grade on the slopes above the regulated wetland/waterway resources. BSC recommends at least weekly construction phase environmental inspections to ensure that erosion and sedimentation controls are maintained, and an inspection of erosion and sedimentation controls prior to the start of construction.

Traffic Impact Study

In general, we concur with the design approach and methodology of the applicant's traffic impact study. We concur that the report demonstrates that the existing roadway infrastructure has sufficient capacity to accommodate the proposed site generated traffic and should not require off-site mitigation with the exceptions and requested clarifications as outlined below.

26. Traffic Counts - The traffic turning movement counts were collected in late June and early July of 2015. Eastern Connecticut State University is located approximately one mile from the project site and the University of Connecticut is located approximately six miles from the project site. Both of these universities significantly affect the traffic volumes in the area which would not have been reflected in the traffic data that was collected since the academic year had ended. We would recommend that the traffic information at a minimum be seasonally adjusted to account for this condition or new data be collected and analyzed.

27. The report does not include any discussion or analysis of the intersection of Meadowbrook Lane and Mansfield City Road. All traffic heading to or from the west and south of the project site will travel through this intersection and therefore we recommend it should be studied.

28. Sight Distance - We concur that the proposed site driveway location appears to have sufficient sight distance to allow ingress and egress to the site. Please confirm that any proposed driveway landscaping or signing does not block the required sight lines. No sight distance triangle diagrams were provided.

29. Turning Movements - The report states that an SU-30 design vehicle was used to determine the layout of the proposed site driveway which is in concurrence with the ConnDOT Highway Design Manual for a minor commercial drive. However, no turning movement graphics we provided for review. Additionally, we would recommend that the Town of Mansfield emergency personnel be given the opportunity to comment regarding emergency vehicles access into as well as circulation throughout the entire proposed site.

30. Trip Generation – It is discussed that the two Meadowbrook Garden developments will have separate access points onto Meadowbrook Lane as well as the proposed internal connection. We would suggest that the two developments be analyzed separately as there will not likely be many trips that cross the developments to utilize another driveway. The trip distribution showing 134% instead of 100% is not standard. As noted in the report, this could account for some variation in the distribution and given the small volumes would not likely have a large impact on the analysis.

31. The site location referenced as Figure 1 was not provided. Please provide.

32. Description of the Area – the 3rd paragraph states "Conantville Road originates at an un-signalized intersection with S.R. 632 (North Frontage Road)." This intersection appears to be signalized. Please clarify.

33. Table 2 indicates that the traffic data is for EB only but the data provided in the appendix appears to indicate it is for both directions. Please clarify.

34. Capacity Analysis and Traffic Impact

    a. The LOS for the intersection of Route 195 and Conantville Road will be reduced to LOS D in the future condition. Although there is a decrease in the LOS, as noted in the report the increase in the delay is minor.

    b. Intersection Analysis does not include discussion or analysis of the intersection of Meadowbrook Lane and Mansfield City Road.

35. Crosswalk – a proposed midblock crosswalk is shown on the submitted plans but lack proposed signing. Please provide appropriate signing and pavement markings that meet Town, ConnDOT, and MUTCD standards.

Please do not hesitate to contact our office with any inquiries you may have.

Very truly yours,
BSC Group-Connecticut, Inc.

Will Walter, PE, LEED AP
Manager of Civil Engineering

Department of Planning and Development

Date: March 29, 2016

To: Mansfield Inland Wetlands Agency

From: Jennifer Kaufman, Inland Wetlands Agent

Subject: Receipt of New Application for Wetlands License
Hunting Lodge Road (Assessor's Parcel ID 15.21.3) (IWA File #1564)
Storrs Lodges LLC
Description of work: construction of a 218-unit apartment complex

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Project Description

The applicants propose to construct a 218 unit apartment complex known as the Lodges at Storrs, on a 45.9-acre parcel on the west side of Hunting Lodge Road, north of North Eagleville Road (Parcel ID 15.21.3). On February 1, 2016, the Mansfield Inland Wetlands Agency approved a wetland map amendment (File # W1549) for this parcel based on field delineation of the wetlands by a Registered Soil Scientist, pursuant to section 15.0 of the Mansfield Inland Wetlands and Watercourses Regulations (the Regulations).

The property is currently entirely forested. Of the 45.9-acre parcel, 6.7 acres are wetlands. The site also includes 1,439 linear feet of an unnamed tributary to Eagleville Brook. The eastern portion of the property drains to the Eagleville Brook. The western portion of the property drains to Cedar Swamp Brook. There is also a vernal pool located on the western edge of the property. The proposed development would result in the loss of 4,402 square feet (0.1 acres) of wetlands related to the construction of the main driveway crossing. The applicants propose in-kind mitigation in the form of both wetland restoration and creation. Construction will occur on approximately 9.4 acres within the Upland Review area.

The proposed activity may have a significant impact on wetlands. Therefore, a public hearing is warranted pursuant to section 9.0 of the Regulations. Further, because of the magnitude of the project, staff recommends that the Agency engage the services of an independent consultant. Section 8.6 of Mansfield's Inland Wetlands and Watercourses Regulations and the Fee Schedule established in Article V, Chapter 122, Section 122-12 of the Mansfield Code of Ordinances authorizes the Agency to hire independent consultants at the expense of an applicant when the Agency deems it necessary to do so.

In anticipation of this, staff prepared and distributed a Request for Proposal (RFP) in the following manner:

- Posted RFP on the State Contracting Portal and the Town Website
- Emailed RFP to firms that submitted a proposal for the Meadowbrook Gardens Project (File #W1562)
- Emailed RFP to Pietras Environmental, the firm that completed the review of the Wetland Map Amendment for the subject property.

Department of Planning and Development

After being informed by Pietras Environmental that they would not be submitting a proposal, staff forwarded the RFP to GEI Consultants and Michael Klein of Environmental Planning Services based on the recommendation of Tom Pietras. In full disclosure, the marketing manager for GEI Consultants is the spouse of a Town Public Works employee.

Proposals were received from BSC Group, GEI Consultants, and Environmental Planning Services, LLC/Nathan Jacobson Associates, Inc. and reviewed by Derek Dilaj, Assistant Town Engineer, Linda Painter, Director of Planning and Development, and Jennifer Kaufman, Inland Wetland Agent using criteria laid out in the RFP. The following are the scores identified for each firm based on the criteria identified in the RFP. The maximum score that could be obtained for each criteria was 10 points.

Criteria	**BSC**	**GEI**	**Environmental Planning Services/Nathan Jacobson Associates**
Completeness of Application	7	10	7
Background and Experience of the Consultant in Providing the Services (Examples of Similar Work Provided)	6	9	9
Effectiveness of Proposed Delivery System to Ensure Quality of Service and Timely Completion of Service	9	9	8
Background, Education, Qualification of Key Personnel	7	8	9
Professional Certifications	5	7	7
Familiarity with the Town	10	1	3
References	8	10	10
Budget	5	10	1
Total	**57**	**64**	**54**

Based on these criteria and reference checks, GEI Consultants ranked the highest. As such, staff recommends that the Agency retain GEI Consultants to assist staff and the Agency with review of the Storrs Lodges project. Copies of all three proposals are attached to this memo for your review. The Agency has the final decision on which firm, if any, to retain for this project.

☒ The project includes work in wetlands.

☒ The project includes work in the 150 foot upland review area.

☐ The project is located in a Public Water Supply Watershed.

Application Fees and Notifications

☒ The applicant has paid the required application fee

☒ The applicant has submitted copies of the notice mailed to neighbors and a list of abutters to be notified. Certified mail receipts must be submitted prior to action on the application.

☒ The applicant has submitted copies of notices provided to the Connecticut DPH and Windham Water Works. Certified mail receipts must be submitted prior to action on the application.

☒ Natural Diversity Database has been checked and state and/or federal listed species or significant natural communities have been identified on the property.

If the Agency agrees with the above recommendation, the following motion is in order.

Receipt Motion

_____ MOVES, _____ seconds to:

1) Receive the application submitted by Storrs Lodges LLC (IWA File #1564) under the Inland Wetlands and Watercourses Regulations of the Town of Mansfield for the construction of a 218-unit apartment complex on property owned by the applicants and located at Hunting Lodge Road (Assessor's Parcel ID 15.21.3) as shown on plans dated 3/18/2016 and as described in application submissions, schedule a public hearing on June 6, 2016, and to refer said application to the Conservation Commission for review and comment.
2) Authorize staff to engage the services of GEI Consultants to provide independent review of the application. Pursuant to section 8.6 of Mansfield's Inland Wetlands and Watercourses Regulations, fees incurred for this review will be the responsibility of the applicants; a deposit in the amount of the estimated cost shall be provided prior to issuance of a notice to proceed.

APPLICATION FOR PERMIT
MANSFIELD INLAND WETLANDS AGENCY
4 SOUTH EAGLEVILLE ROAD, STORRS, CT 06268
860-429-3015x6204 (DIRECT) TEL: 860-429-3330 OR
FAX: 860-429-6863

FOR OFFICE USE ONLY

File # W 1564
Fee Paid $1000
Official Date of Receipt 3-18-16

Applicants are referred to the Mansfield Inland Wetlands and Watercourses Regulations for complete requirements, and are obligated to follow them. For assistance, please contact the Inland Wetlands Agent at the telephone numbers above.

Please print or type or use similar format for computer; attach additional pages as necessary.

Part A - Applicant

Name STORRS LODGES, LLC

Mailing Address 30 DORSET CROSSING SUITE 600

SIMSBURY, CT Zip 06070

Phone 860-217-1700 Email tony@thekeystonecompanies.com

Title and Brief Description of Project

CONSTRUCTION OF 218 UNIT STUDENT APARTMENT COMPLEX UNDER THE DMR ZONE

Location of Project HUNTING LODGE ROAD PARCEL ID 15.21.3

Intended Start Date FALL 2016

Part B - Property Owner (if applicant is the owner, just write "same")

Name PONDE PLACE, LLC

Mailing Address SAME AS APPLICANT

Zip

Phone Email

Owner's written consent to the filing of this application, if owner is not the applicant:

Signature date

Applicant's interest in the land: (if other than owner) OPTIONEE

Part C - Project Description (attach extra pages, if necessary)

1) Describe in detail the proposed activity here or on an attached page. (**See guidelines at end of application)**
   Please include a description of all activity or construction or disturbance:

a) ***in*** the wetland/watercourse
b) ***in*** the area ***adjacent*** to (within 150 feet from the edge of) the wetland/watercourse, even if wetland/watercourse is ***off*** your property

SEE ATTACHED SHEET

2) Describe the amount or area of disturbance (in square feet or cubic yards or acres):

a) ***in*** the wetland/watercourse
b) ***in*** the area ***adjacent*** to (within 150 feet from the edge of) the wetland/watercourse, even if wetland/watercourse is **off** your property

WETLAND / WATERCOURSE = 4,402 S.F.
150' URU = 9.4 AC. ±

3) Describe the type of materials you are using for the project: CONVENTIONAL MATERIALS USED FOR RESIDENTIAL CONSTRUCTION. FILL WILL BE IMPORTED CLEAN SANDS & GRAVEL

a) include ***type*** of material used as fill or to be excavated SANDS & GRAVEL (LOAMY)
b) include ***volume*** of material to be filled or excavated
25,000 C.Y. ±

4) Describe measures to be taken to minimize or avoid any adverse impacts on the wetlands and regulated areas (silt fence, staked hay bales or other Erosion and Sedimentation control measures).

A FULL EROSION & SEDIMENTATION PLAN IS INCLUDED IN THE APPLICATION PLAN SET THAT INCLUDES ALL REQUIRED CONTROL MEASURES

Part D - Site Description

Describe the general character of the land. (Hilly? Flat? Wooded? Well drained? etc.)

THE SITE IS GENERALLY WOODED WITH GENTLE TO MODERATE SLOPES. OUTSIDE THE WETLAND AREAS THE SOILS ARE A MIXTURE OF WELL DRAINED TYPE B SOILS, SUCH AS WOODBRIDGE, CANTON & PAXTON

Part E - Alternatives

Have you considered any alternatives to your proposal that would meet your needs and might have less impact on the wetland/watercourse? Please list these alternatives.

SEE ATTACHED SHEET

Part F - Map/Site Plan (all applications) SEE PLANS DATED 3/18/16

1) Attach to the application a map or site plan showing **existing conditions** and the **proposed project** in relation to wetland/ watercourses. Scale of map or site plan should be 1" = 40'; if this is not possible, please indicate the scale that you are using. A sketch map may be sufficient for small, minor projects. **(See guidelines at end of application)**

2) Applicant's map date and date of last revision 3/18/16
3) Zone Classification RAR 90 WITH ZONE CHANGE TO DMR
4) Is your property in a flood zone? _____Yes __X__No _____ Don't Know

Part G - Major Applications Requiring Full Review and a Public Hearing

See Section 6 of the Mansfield Regulations for additional requirements.

Part H - Notice to Abutting Property Owners

1) Attach list of abutters, name, and address

2) **Proof of Written Notice to Abutters.** You must notify abutting (neighboring) property owners (any property immediately contiguous with the subject property, including those across the street) by certified mail, return receipt requested, stating that a wetland application is in progress, and that abutters may contact the Mansfield Inland Wetlands Agent for more information. Include a brief description of your project. ***Postal receipts of your notice to abutters must accompany your application.*** To generate an abutters list go to http://www.mainstreetmaps.com/CT/Mansfield/

Part I - Additional Notices, if necessary

Notice to Windham Water Works and CT Department of Public Health is attached. If this application is in the public watershed for the Windham Water Works (WWW), you must notify the WWW and the Department of Public Health of your project within 7 days of sending the application to Mansfield--sending it by certified mail, return receipt requested. Contact the Mansfield Inland Wetlands Agent to find out if you are in this watershed.

Notice to Adjoining Town. If your property is within 500 feet of an adjoining town, you must also send a copy of the application, on the same day you sent one to Mansfield, to the Inland Wetlands Agency of the adjoining town, by certified mail, return receipt requested.

The Statewide Reporting Form shall be part of the application and specified parts must be completed and returned with this application.

Part J - Other Impacts To Adjoining Towns, if applicable

1) Will a significant portion of the traffic to the completed project on the site use streets within the adjoining municipality to enter or exit the site?___Yes_X_No___Don't Know

2) Will sewer or water drainage from the project site flow through and impact the sewage or drainage system within the adjoining municipality?____ Yes _X_No ____ Don't Know

3) Will water run-off from the improved site impact streets or other municipal or private property within the adjoining municipality?____ Yes _X_No ____Don't Know

Part K - Additional Information from the Applicant

Set forth (or attach) any other information which would assist the Agency in evaluating your application. (*Please provide extra copies of any lengthy documents or reports, and extra copies of maps larger than 8.5" x 11", which are not easily copied.)*

Part L - Filing Fee

Application fees shall be in accordance with the current Mansfield Code of Ordinance fee Schedule, pursuant to Section 8-1c of the Connecticut General Statutes. The fee schedule includes provisions for applicant-funded consultant studies and reports. The current fee schedule is available in the Planning and Zoning office.

Note: The Agency may require additional information about the upland review area or about wetlands or watercourses affected by the regulated activity. If the Agency, upon review of your application, finds the activity proposed may involve a "significant activity" as defined in the Regulations, additional information and/or a public hearing may be required.

Certification

I hereby certify that:

- I am familiar with the information contained in this form and that such information is true and correct to the best of my knowledge.
- I understand the penalties for obtaining a permit through deception or through inaccurate or misleading information.

Anthony Gorzy _____ March 18, 2016 _____

Signature Date

Authorization to Enter Property

The undersigned hereby consent to necessary and proper inspections of the above-mentioned property by members and agents of the Inland Wetlands Agency at reasonable times, both before and after the permit in question has been issued by the Agency.

Anthony Gorzy _____ March 18, 2016 _____

Signature Date

Part C—Project Description:

1) The project includes the construction of 47 two-story residential buildings with 218 dwelling units providing housing a total of 692 UCONN students along with a Community Center Building and outdoor recreational areas. . There will be two 24 foot wide access driveways proposed. The main access drive to the development will be from Hunting Lodge Road. The second access drive from Northwood Road will be for limited emergency access and campus bus circulation. On-site parking will be constructed for 619 vehicles.

   Site work will be completed using conventional construction equipment and techniques. Little or no blasting or rock excavation is anticipated to construct the project based on soil characteristics on the property. Construction will take place over an 18-24 month period. The proposed storm drainage system incorporates Best Management Practices (BMP) and LID design techniques as described in the CTDEP stormwater regulations. The drainage system for the project discharges to the on-site wetland and watercourses. The project will be served by public water and sanitary sewer. A comprehensive Soil and Erosion Plan has been developed for the project and will be implemented throughout the duration of the construction of the development until all areas are fully stabilized. The project will submit a registration for the CTDEEP General Permit associated with site construction activities prior to the start of any construction.

   Every effort has been made to maintain a substantial buffer from the wetland and watercourse resources identified on the site. The proposed wetland crossing for the main driveway out to Hunting Lodge Road will be accomplished using a precast concrete arch bridge so there are minimal impacts to the wetlands at this location. There are no other direct impacts to wetlands on the property.

   a. The site contains approximately 6.7 acres (291,172 s,f,) of flagged wetlands. The only direct impact is the loss of 4,402 s.f. of wetlands related to the construction of the main driveway crossing. There are 1,439 l.f. of watercourses on the property. There will be no direct impact to watercourses.

   b. There are approximately 24.1 acres of 150 foot Upland Review Area on the property. The project includes building construction and site improvements within approximately 9.4 acres of the Upland Review Area

Part E –Alternatives

   a. Given the topographical features of the property and practical access limitations to existing public roadways, any development on this property would include access roads and public utility connections following basically the layout included in the proposed project. There are no other alternate road locations on the property. The property is currently zoned for residential use development under the RAR-90 zone. It the property were developed as a

single family development, it would require carving up the site into 2-acre lots with a minimum 200 feet of frontage along a public road. Developing the site in this manner would mean portions of wetlands and watercourses would fall within these lots subjecting them to the long-term impacts resulting from the use of the land in a conventional residential environment. The monitoring and enforcement of potential activities and impacts on these resources becomes difficult when they occur on individually owned residential properties.

b. Development of this property under a master planned development concept as proposed allows development to occur in selected upland areas and essentially sets aside the wetland and watercourse resources with appropriate buffers from the development in undisturbed portions of the property.

c. The one wetland crossing required to gain proper and safe roadway access to Hunting Lodge Road occurs at a location that has been used for such access for many years. The existing remains of this crossing need to be upgraded to current design standards providing for a minimum 24-foot wide paved roadway. Crossing the wetlands using conventional culverts was evaluated as a possible more cost effective alternate to the proposed precast arch bridge crossing. Due to the sensitive nature of the crossing location, a conventional culvert and fill installation was deemed to not be the most prudent alternative.

d. The applicant believes that the proposed project which restricts direct impacts to wetland and watercourse resources to a small area at the crossing for the main driveway to Hunting Lodge Road as the most prudent and feasible development alternative for the property.

THE LODGES AT STORRS
Hunting Lodge Road
Mansfield, Connecticut

Inland Wetlands & Watercourses Application

March 18, 2016
Revised 3/24/2016

DEVELOPMENT TEAM

Developer/Applicant	Storrs Lodges, LLC
Land Owner	Ponde Place, LLC
Civil and Traffic Engineer	F. A. Hesketh & Associates, Inc.
Land Surveyor	F. A. Hesketh & Associates, Inc.
Environmental Consultant	REMA Ecological Services, LLC
Landscape Architect	F. A. Hesketh & Associates, Inc.
Soil Scientist	REMA Ecological Services, LLC
Legal Counsel	Thomas Fahey, Esquire

LIST OF DRAWINGS

	Title Sheet
MA-1	Master Plan
IW-1	Inland Wetlands Plan
LA-1 thru LA-4	Layout Plan
GR-1 thru GR-4	Grading Plan
ER-1 thru ER-4	Soil Erosion & Sedimentation Control Plan
UT-1 thru UT-4	Drainage and Utility Plan
UT-5 and UT-6	Overall Utility Plan
SDD-1 and SDD-2	Site Driveway Detail
SD-1 thru SD-7	Details
NT-1	Notes
PS-1	Property Survey
A-200	Building A and B Elevations
A-100	Building A and B Lower Level Plan

David S. Ziaks P.E. #13336

F. A. Hesketh & Associates, Inc.
6 Creamery Brook, East Granby, CT 06026
Civil & Traffic Engineers · Surveyors · Planners · Landscape Architects

Phone (860) 653-8000
Fax (860) 844-8600
e-mail mail@fahesketh.com

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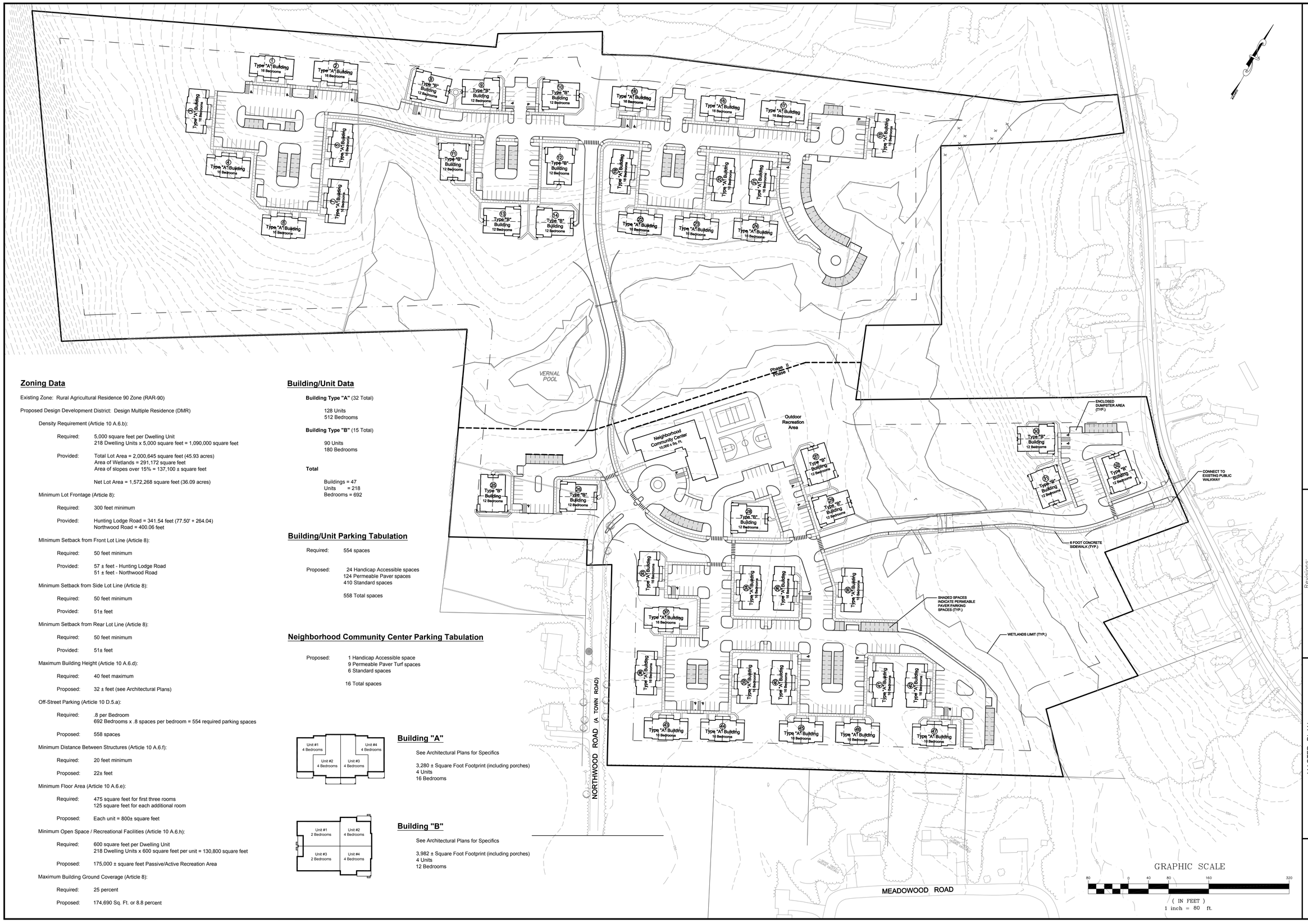
THE LODGES AT STORRS



Zoning Data

Existing Zone: Rural Agricultural Residence 90 Zone (RAR-90)

Proposed Design Development District: Design Multiple Residence (DMR)

Density Requirement (Article 10 A.6.b):

Required: 5,000 square feet per Dwelling Unit
218 Dwelling Units x 5,000 square feet = 1,090,000 square feet

Provided: Total Lot Area = 2,000,645 square feet (45.93 acres)
Area of Wetlands = 291,172 square feet
Area of slopes over 15% = 137,100 ± square feet

Net Lot Area = 1,572,268 square feet (36.09 acres)

Minimum Lot Frontage (Article 8):

Required: 300 feet minimum

Provided: Hunting Lodge Road = 341.54 feet (77.50' + 264.04)
Northwood Road = 400.06 feet

MInimum Setback from Front Lot Line (Article 8):

Required: 50 feet minimum

Provided: 57 ± feet - Hunting Lodge Road
51 ± feet - Northwood Road

Minimum Setback from Side Lot Line (Article 8):

Required: 50 feet minimum

Provided: 51± feet

Minimum Setback from Rear Lot Line (Article 8):

Required: 50 feet minimum

Provided: 51± feet

Maximum Building Height (Article 10 A.6.d):

Required: 40 feet maximum

Proposed: 32 ± feet (see Architectural Plans)

Off-Street Parking (Article 10 D.5.a):

Required: .8 per Bedroom
692 Bedrooms x .8 spaces per bedroom = 554 required parking spaces

Proposed: 558 spaces

Minimum Distance Between Structures (Article 10 A.6.f):

Required: 20 feet minimum

Proposed: 22± feet

Minimum Floor Area (Article 10 A.6.e):

Required: 475 square feet for first three rooms
125 square feet for each additional room

Proposed: Each unit = 800± square feet

Minimum Open Space / Recreational Facilities (Article 10 A.6.h):

Required: 600 square feet per Dwelling Unit
218 Dwelling Units x 600 square feet per unit = 130,800 square feet

Proposed: 175,000 ± square feet Passive/Active Recreation Area

Maximum Building Ground Coverage (Article 8):

Required: 25 percent

Proposed: 174,690 Sq. Ft. or 8.8 percent

Building/Unit Data

Building Type "A" (32 Total)

128 Units
512 Bedrooms

Building Type "B" (15 Total)

90 Units
180 Bedrooms

Total

Buildings = 47
Units = 218
Bedrooms = 692

Building/Unit Parking Tabulation

Required: 554 spaces

Proposed: 24 Handicap Accessible spaces
124 Permeable Paver spaces
410 Standard spaces

558 Total spaces

Neighborhood Community Center Parking Tabulation

Proposed: 1 Handicap Accessible space
9 Permeable Paver Turf spaces
6 Standard spaces

16 Total spaces

Building "A"

See Architectural Plans for Specifics

3,280 ± Square Foot Footprint (including porches)
4 Units
16 Bedrooms

Building "B"

See Architectural Plans for Specifics

3,982 ± Square Foot Footprint (including porches)
4 Units
12 Bedrooms

F.A. Hesketh & Associates, Inc.
6 Creamery Brook, East Granby, CT 06026
Civil & Traffic Engineers · Surveyors · Planners · Landscape Architects
Phone (860) 653-8000
Fax (860) 844-8600
e-mail mail@fahesketh.com

No.	Date	Description

Revisions:

MASTER PLAN
PREPARED FOR
STORRS LODGES, LLC
HUNTING LODGE ROAD
MANSFIELD, CONNECTICUT

Date: 03-18-2016	Drawn by: KLL	Job no: 04161	
Scale: 1" = 80'	Checked by: DSZ	Sheet no: 1 OF 1	

MA-1

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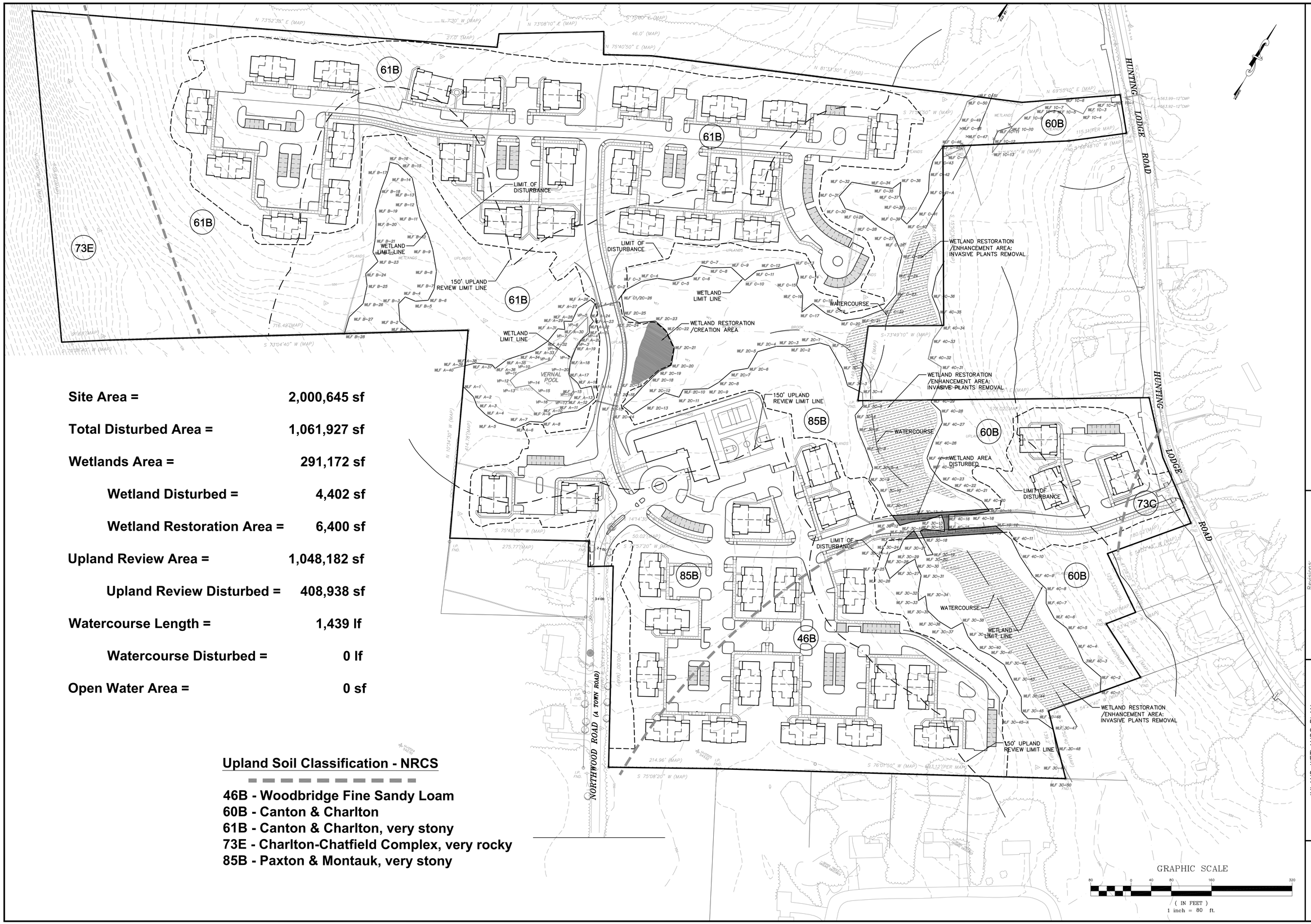

Site Area =	**2,000,645 sf**
Total Disturbed Area =	**1,061,927 sf**
Wetlands Area =	**291,172 sf**
Wetland Disturbed =	**4,402 sf**
Wetland Restoration Area =	**6,400 sf**
Upland Review Area =	**1,048,182 sf**
Upland Review Disturbed =	**408,938 sf**
Watercourse Length =	**1,439 lf**
Watercourse Disturbed =	**0 lf**
Open Water Area =	**0 sf**

Upland Soil Classification - NRCS

46B - Woodbridge Fine Sandy Loam
60B - Canton & Charlton
61B - Canton & Charlton, very stony
73E - Charlton-Chatfield Complex, very rocky
85B - Paxton & Montauk, very stony

THE LODGES AT STORRS

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No.	Date	Revisions: Description

INLAND WETLANDS PLAN
PREPARED FOR
STORRS LODGES, LLC
HUNTING LODGE ROAD
MANSFIELD, CONNECTICUT

Date: 03-18-16	Drawn by: CAD	Job no: 04161	
Scale: 1" = 80'	Checked by: DSZ	Sheet no: 1 OF 1	

IW-1

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e-mail mail@fahesketh.com

No.	Date	Description

Revisions:

LAYOUT PLAN
PREPARED FOR
STORRS LODGES, LLC
HUNTING LODGE ROAD
MANSFIELD, CONNECTICUT

Date: 03-18-2016	Drawn by: KLL	Job no: 04161	
Scale: 1" = 40'	Checked by: DSZ	Sheet no: 1 OF 4	

LA-1

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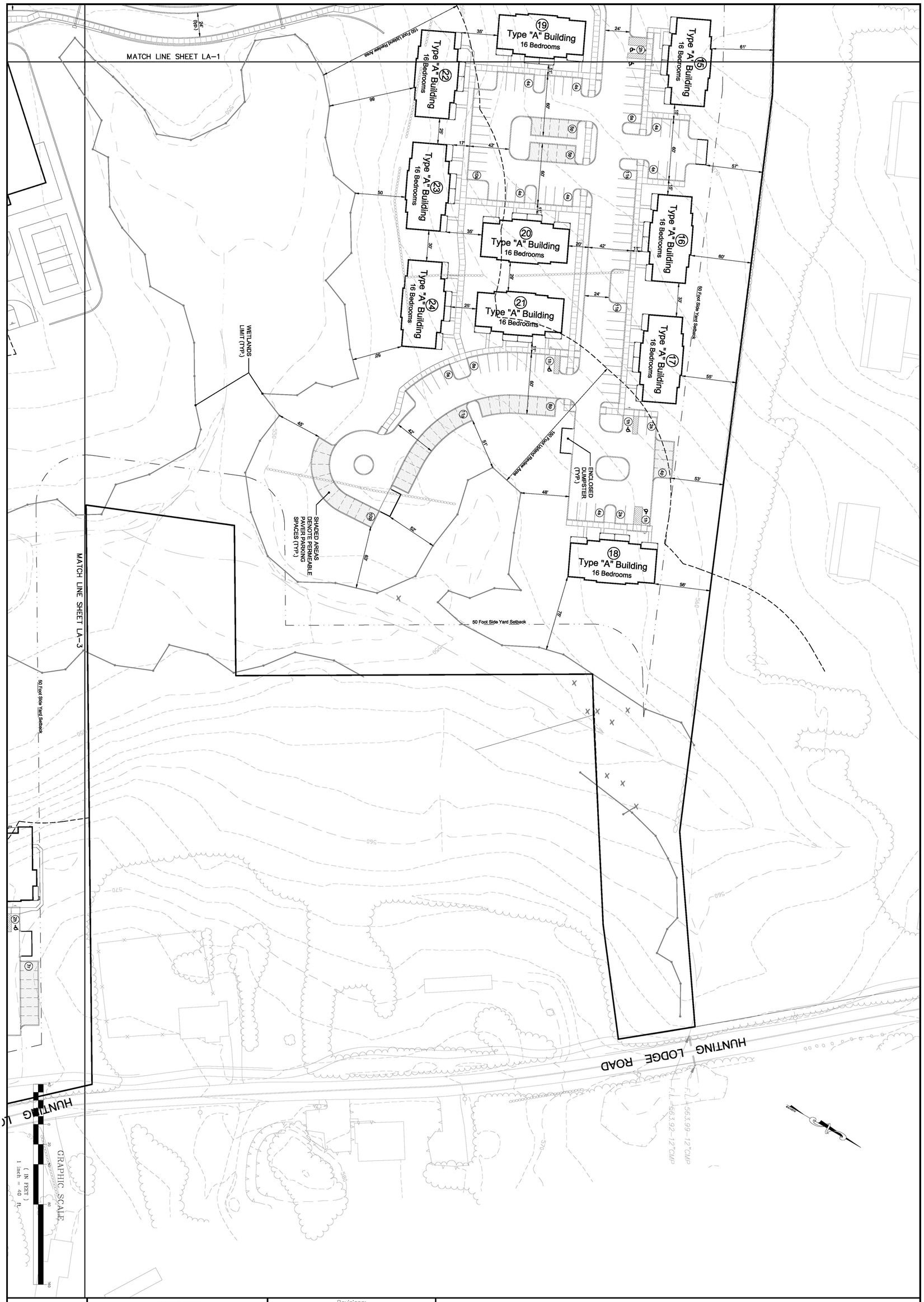

LA-2

LAYOUT PLAN
PREPARED FOR
STORRS LODGES, LLC
HUNTING LODGE ROAD
MANSFIELD, CONNECTICUT

Date: 03-18-2016	Drawn by: KLL	Job no: 04161
Scale: 1" = 40'	Checked by: DSZ	Sheet no: 2 OF 4

Revisions:

No.	Date	Description

THE LODGES AT STORRS

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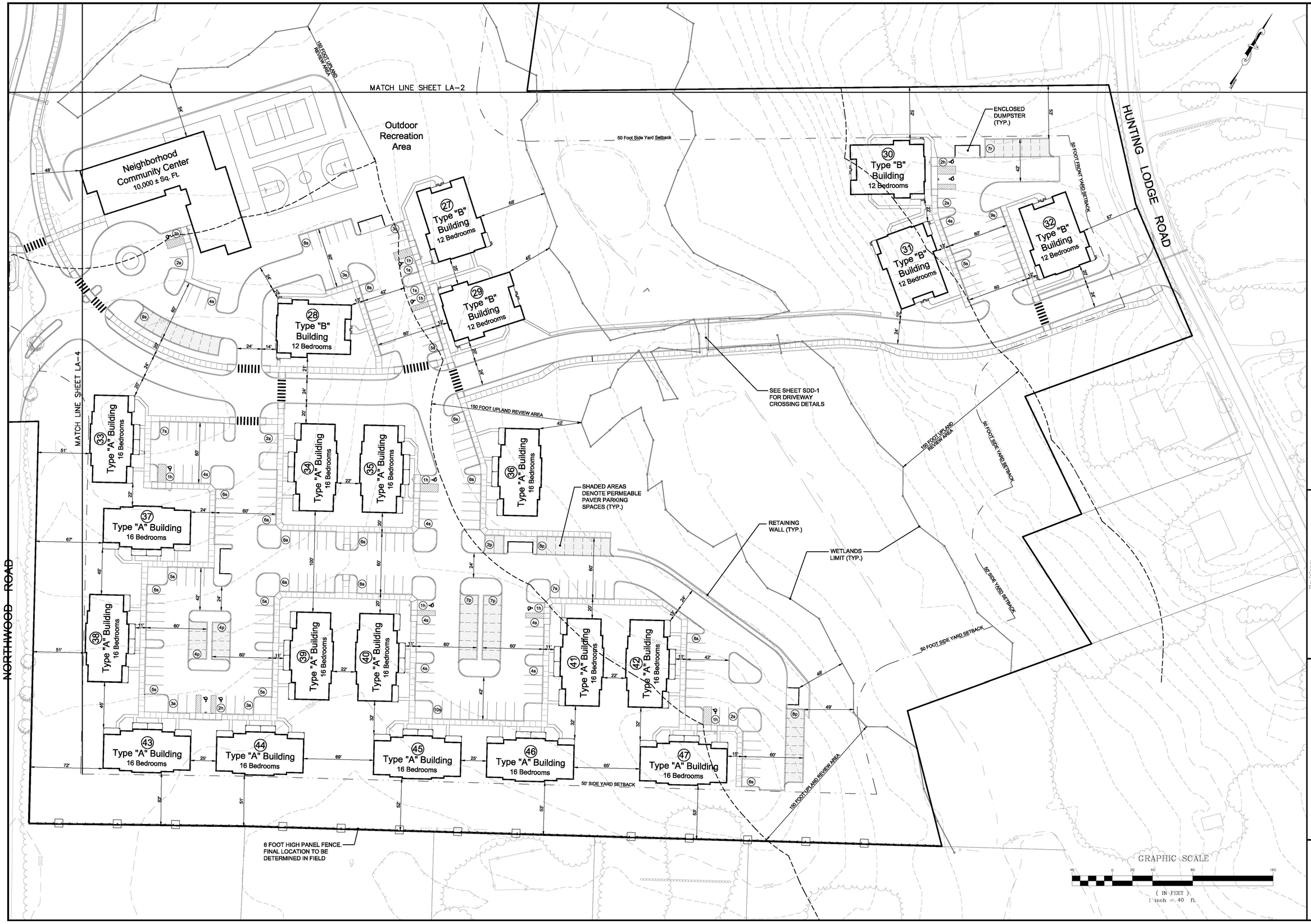

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e-mail mail@heskethc.com

No.	Date	Description

Revisions:

LAYOUT PLAN
PREPARED FOR
STORRS LODGES, LLC
HUNTING LODGE ROAD
MANSFIELD, CONNECTICUT

Date: 03-18-2016	Drawn by: KLL	Job no: 04161	
Scale: 1" = 40'	Checked by: DSZ	Sheet no: 3 OF 4	

LA-3

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LA-4

LAYOUT PLAN

PREPARED FOR

STORRS LODGES, LLC

HUNTING LODGE ROAD

MANSFIELD, CONNECTICUT

Date: *03-18-2016*	Drawn by: *KLL*	Job no: *04161*
Scale: *1" = 40'*	Checked by: *DSZ*	Sheet no: *4 OF 4*

Revisions:

No.	Date	Description

THE LODGES AT STORRS

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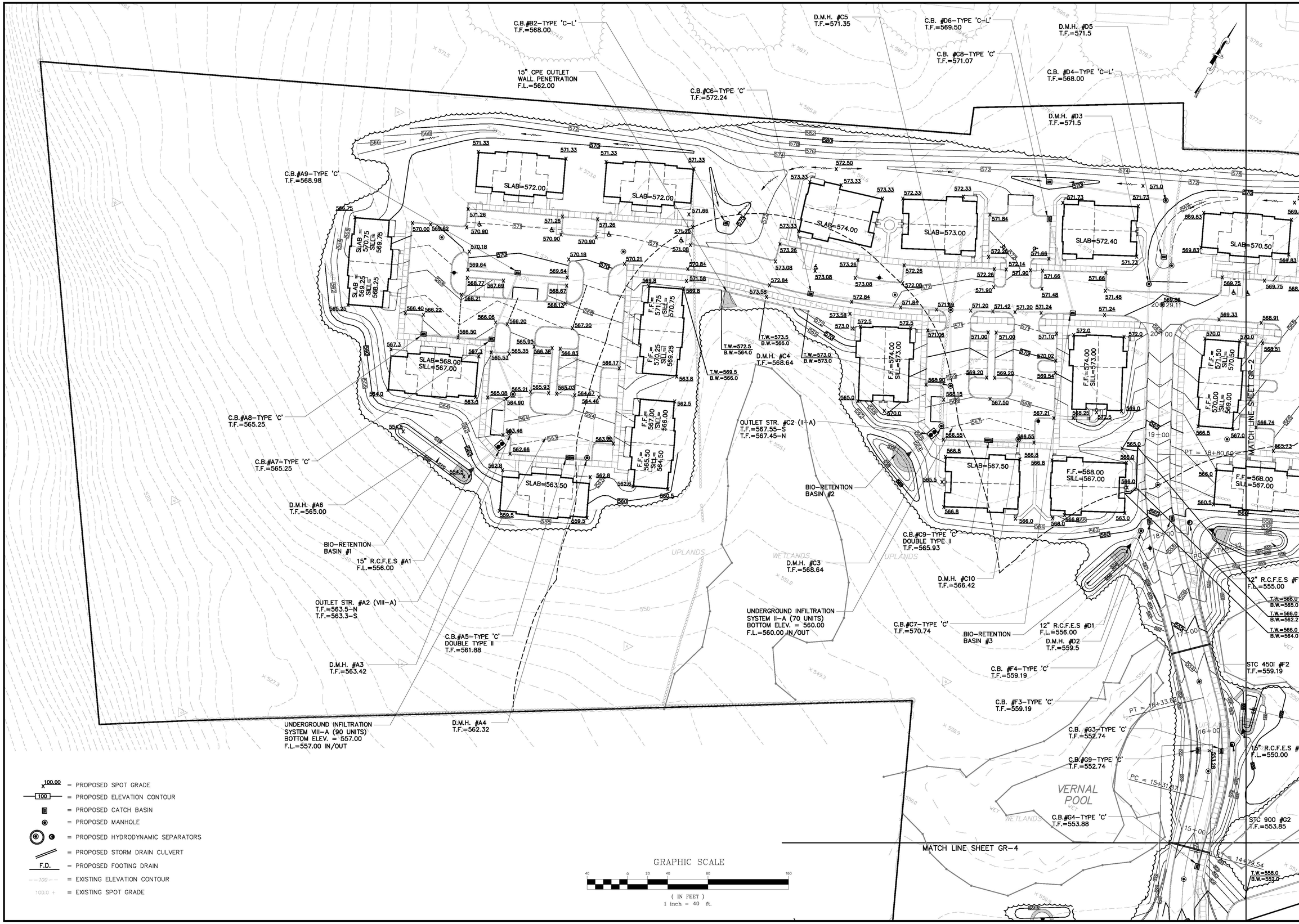

= PROPOSED SPOT GRADE
= PROPOSED ELEVATION CONTOUR
= PROPOSED CATCH BASIN
= PROPOSED MANHOLE
= PROPOSED HYDRODYNAMIC SEPARATORS
= PROPOSED STORM DRAIN CULVERT
F.D. = PROPOSED FOOTING DRAIN
= EXISTING ELEVATION CONTOUR
= EXISTING SPOT GRADE

THE LODGES AT STORRS

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Phone (860) 653-8000
Fax (860) 844-8600
e-mail mail@fahesketh.com

Revisions:

No.	Date	Description
1	03-24-16	General

GRADING PLAN

prepared for

STORRS LODGES, LLC

HUNTING LODGE ROAD
MANSFIELD, CONNECTICUT

Date: 03-18-2016	Drawn by: RJK	Job no: 04161	
Scale: 1" = 40'	Checked by: DSZ	Sheet no: 1 OF 4	

GR-1

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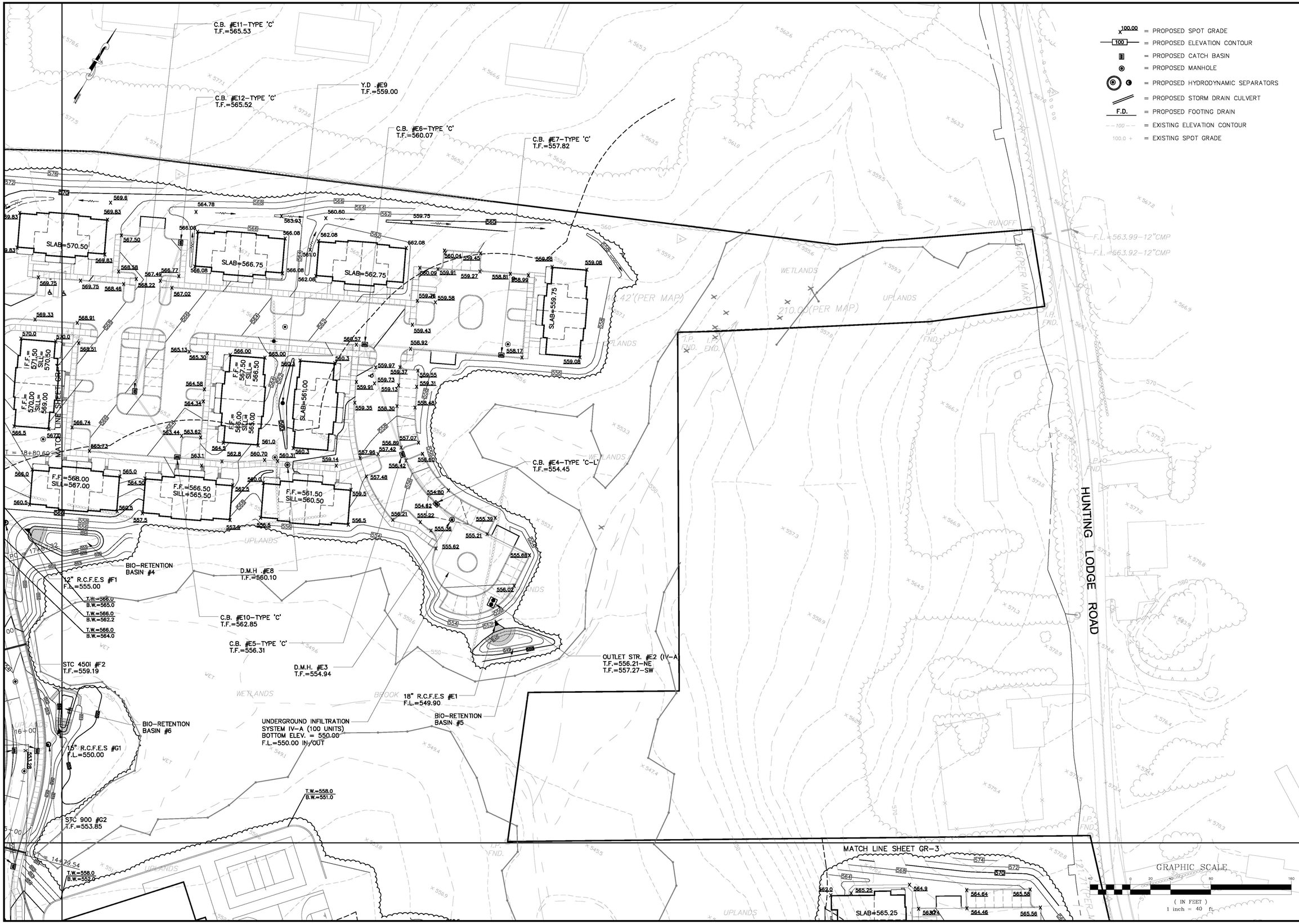

THE LODGES AT STORRS

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Fax (860) 844-8600
e-mail mail@hesketh.com

Revisions:

No.	Date	Description
1	03-24-16	General

GRADING PLAN
PREPARED FOR
STORRS LODGES, LLC
HUNTING LODGE ROAD
MANSFIELD, CONNECTICUT

Date: 03-18-2016	Drawn by: RJK	Job no: 04161	
Scale: 1" = 40'	Checked by: DSZ	Sheet no: 2 OF 4	

GR-2

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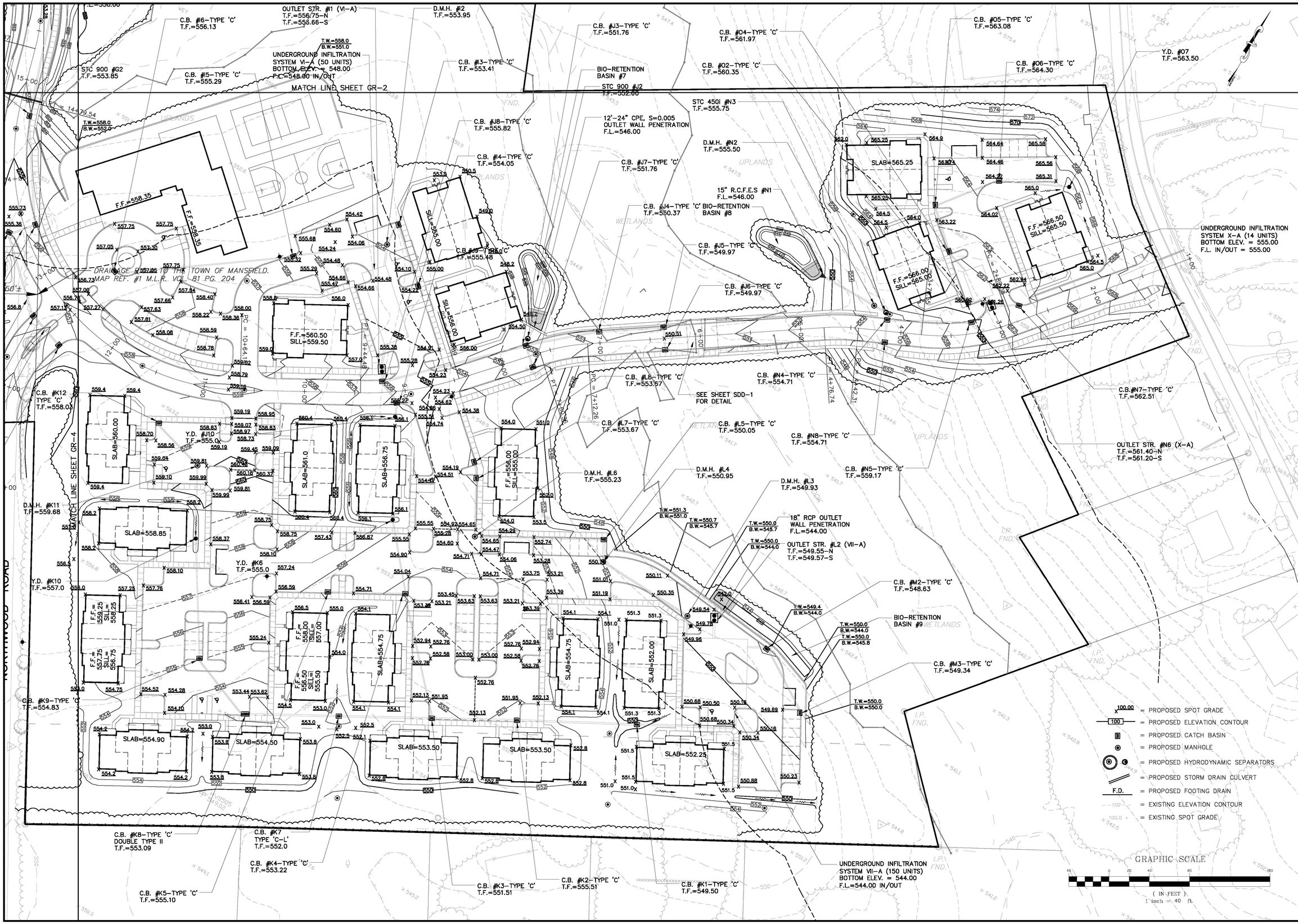

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No.	Date	Revisions: Description
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GRADING PLAN

PREPARED FOR

STORRS LODGES, LLC

HUNTING LODGE ROAD

MANSFIELD, CONNECTICUT

Date: 03-18-2016	Drawn by: RJK	Job no: 04161	
Scale: 1" = 40'	Checked by: DSZ	Sheet no: 3 OF 4	

GR-3

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100.00 = PROPOSED SPOT GRADE

100 = PROPOSED ELEVATION CONTOUR

= PROPOSED CATCH BASIN

= PROPOSED MANHOLE

= PROPOSED HYDRODYNAMIC SEPARATORS

= PROPOSED STORM DRAIN CULVERT

F.D. = PROPOSED FOOTING DRAIN

100 = EXISTING ELEVATION CONTOUR

100.0 + = EXISTING SPOT GRADE

GRADING NOTES

1. SET/RAISE FRAMES OF ALL MANHOLES, CATCH BASINS, GAS AND WATER GATES, HAND HOLES, METER BOXES, AND ALL OTHER UTILITY APPURTENANCES TO MATCH PROPOSED FINISH GRADE.
2. SAW CUT EXISTING PAVEMENT ALONG LIMITS OF WORK. BLEND ALL NEW WORK TO MATCH EXISTING.
3. GRADE ALL AREAS TO PRECLUDE PONDING.
4. GRADE TRANSITIONS TO ROADWAYS TO MAINTAIN GUTTER FLOW AND PRECLUDE PONDING.

DRAINAGE SYSTEM NOTES:

1. RCP = REINFORCED CONCRETE PIPE CONFORMING TO CT DOT FORM 816, M.08.01–6, CLASS IV, UNLESS DESIGNATED ON DRAWINGS AS CLASS IV BY (C5).
2. F.E.S. = FLARED–END–SECTION OR REINFORCED CONCRETE CULVERT END CONFORMING TO CT DOT FORM 816, M.08.01–22.
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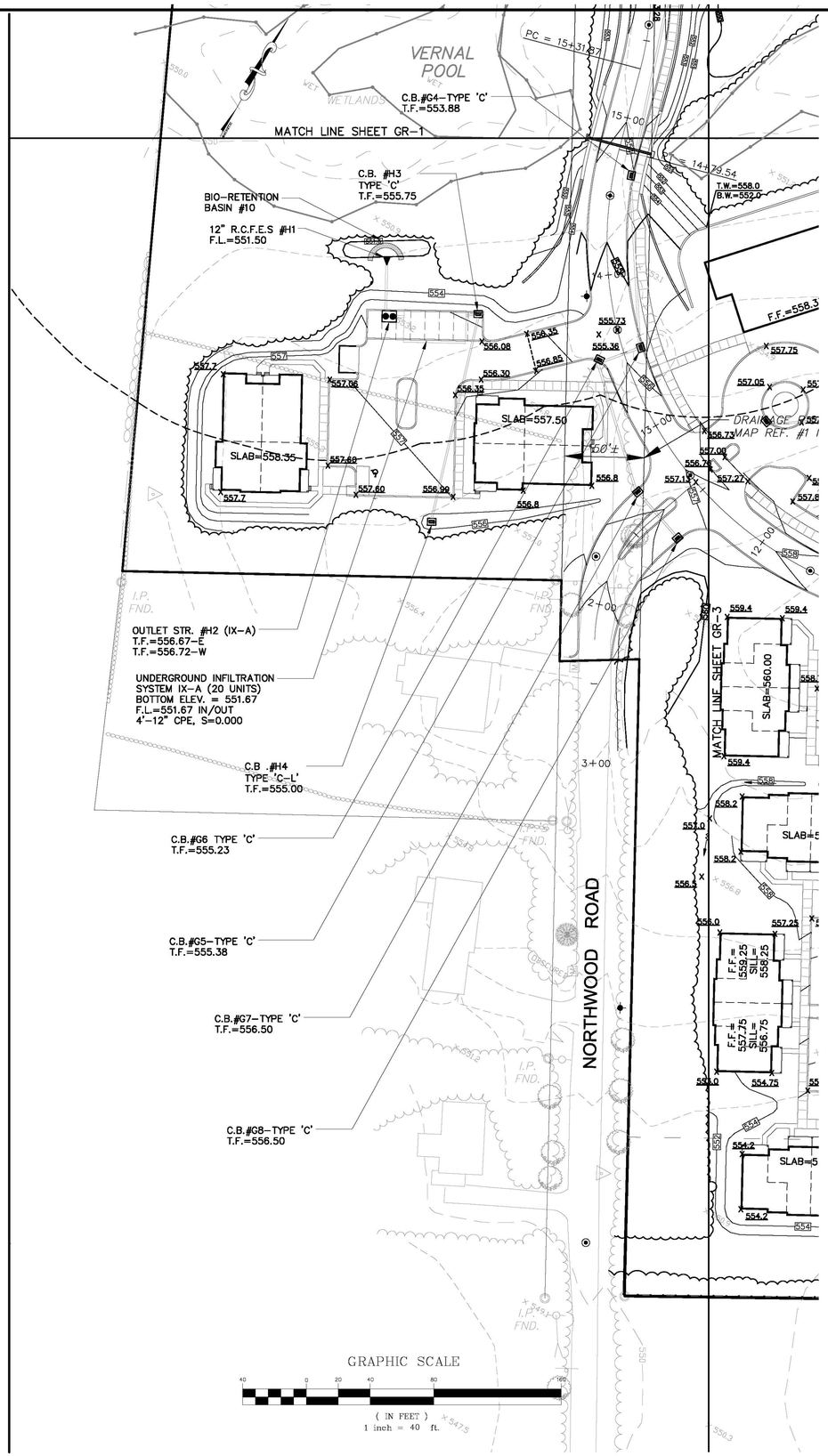
4. CATCH BASINS, MANHOLES, AND OTHER DRAINAGE STRUCTURES SHALL CONFORM TO CT DOT 816, M.08.02 SPECIFICATIONS.
5. STC UNITS: PRECAST CONCRETE SEPARATOR STRUCTURES (CAPACITY AS SHOWN) AS MANUFACTURED BY RINKER MATERIALS CORPORATION (TEL. 800–909–7763)
6. FLOW LINE AND INVERT ELEVATIONS OF ALL STORM DRAIN ROOF LEADERS MUST BE COORDINATED WITH FINAL ARCHITECTURAL DRAWINGS. NOTIFY DESIGN ENGINEER OF CONFLICTS PRIOR TO START OF CONSTRUCTION.
7. UNDERGROUND UTILITIES DEPICTED ON THIS DRAWING ARE A COMPILATION OF FIELD SURVEY DATA, RECORD DESIGN PLANS, AND READILY AVAILABLE INFORMATION. NOT ALL UTILITIES MAY BE SHOWN, AND THOSE SHOWN MAY NOT BE ACCURATE. THE CONTRACTOR SHALL VERIFY ALL UTILITY LOCATIONS PRIOR TO START OF CONSTRUCTION OF UTILITIES. CONDUCT TEST PITS AT ALL UTILITY CROSSINGS AND POINT OF CONNECTIONS WITH EXISTING UTILITIES. NOTIFY DESIGN ENGINEER OF POTENTIAL CONFLICTS WITH PROPOSED ALIGNMENT AND GRADE.
8. CONTACT "CALL BEFORE YOU DIG" AT CALLING 1–800–922–4455 TO MARK THE LOCATION OF ALL UNDERGROUND UTILITIES AT LEAST 72 HOURS PRIOR TO START OF CONSTRUCTION.
9. ALL MATERIALS AND INSTALLATION PER EAST HARTFORD STANDARD SPECIFICATIONS, CT DOT FORM 816, OR CUSTODIAL UTILITY COMPANY SPECIFICATION, AS APPROPRIATE.
10. CONNECT ALL ROOF LEADERS AND FOOTING DRAINS INTO EXISTING OR NEW STORM DRAINAGE STRUCTURES AS SHOWN.
11. FOLLOW CT DOT PROCEDURES FOR DEMOLITION OF EXISTING PIPING INTO STRUCTURES AND FOR CONNECTION OF NEW PIPING INTO EXISTING STORM DRAIN STRUCTURES.
12. DEMOLISH EXISTING ON–SITE DRAINAGE SYSTEM BY REMOVING OLD PIPE AND STRUCTURES AND BACKFILLING AND COMPACTING TRENCHES IN CONTROLLED LAYERS WITH GRANULAR FILL. PRIOR TO DEMOLITION, VERIFY CONNECTIONS OF OFF–SITE PIPING AND NOTIFY DESIGN ENGINEER. FOLLOW ALL LOCAL, STATE, AND FEDERAL REQUIREMENTS FOR DEMOLITION ACTIVITIES.



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Revisions:

No.	Date	Description
1	03–24–16	General

GRADING PLAN
PREPARED FOR
STORRS LODGES, LLC
HUNTING LODGE ROAD
MANSFIELD, CONNECTICUT

Date: 03–18–2016 | Drawn by: RJK | Job no: 04161
Scale: 1" = 40' | Checked by: DSZ | Sheet no: 4 OF 4

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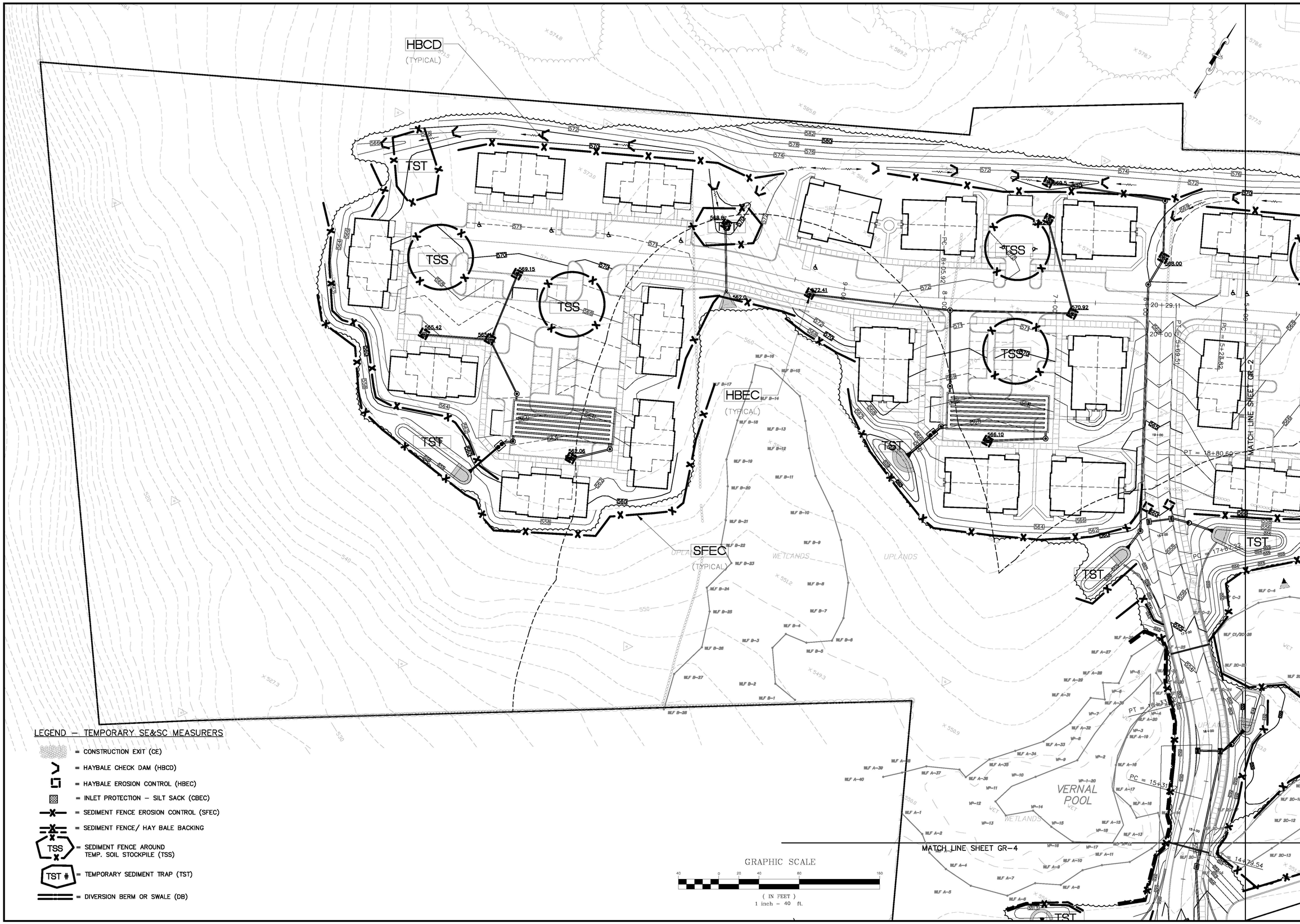

LEGEND – TEMPORARY SE&SC MEASURERS

- = CONSTRUCTION EXIT (CE)
- = HAYBALE CHECK DAM (HBCD)
- = HAYBALE EROSION CONTROL (HBEC)
- = INLET PROTECTION – SILT SACK (CBEC)
- = SEDIMENT FENCE EROSION CONTROL (SFEC)
- = SEDIMENT FENCE/ HAY BALE BACKING
- TSS = SEDIMENT FENCE AROUND TEMP. SOIL STOCKPILE (TSS)
- TST # = TEMPORARY SEDIMENT TRAP (TST)
- = DIVERSION BERM OR SWALE (DB)

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No.	Date	Description

Revisions:

SOIL EROSION & SEDIMENTATION CONTROL PLAN

PREPARED FOR

STORRS LODGES, LLC

HUNTING LODGE ROAD
MANSFIELD, CONNECTICUT

Date: 03-18-2016 | Drawn by: RJK | Job no: 04161
Scale: 1" = 40' | Checked by: DSZ | Sheet no: 1 OF 4

ER-1

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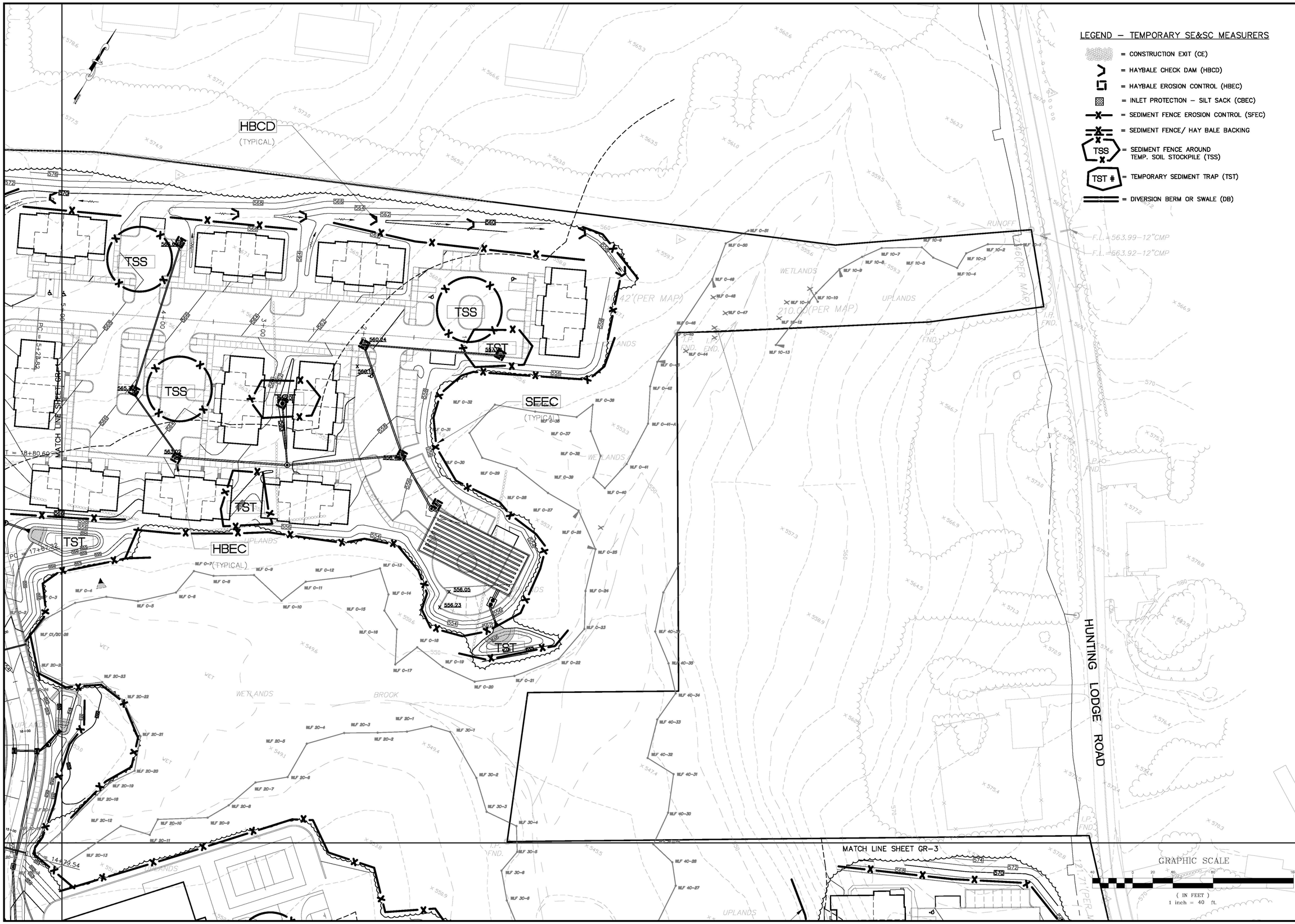

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Revisions:

No.	Date	Description

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PREPARED FOR

STORRS LODGES, LLC

HUNTING LODGE ROAD

MANSFIELD, CONNECTICUT

Date: 03-18-2016	Drawn by: RJK	Job no: 04161	
Scale: 1" = 40'	Checked by: DSZ	Sheet no: 2 OF 4	

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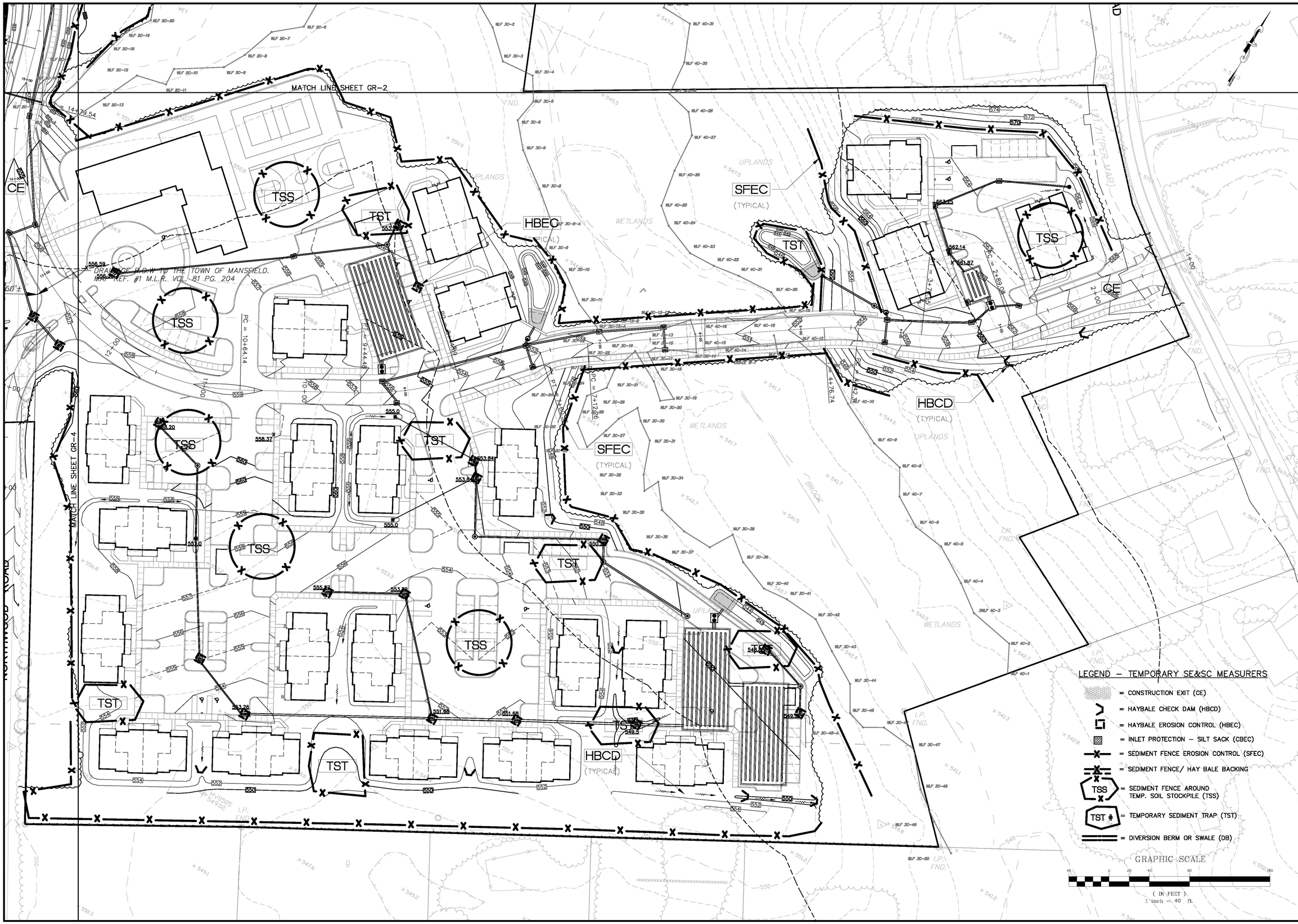

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No.	Date	Description

Revisions:

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PREPARED FOR

STORRS LODGES, LLC

HUNTING LODGE ROAD
MANSFIELD, CONNECTICUT

Date: 03-18-2016	Drawn by: RJK	Job no: 04161	
Scale: 1" = 40'	Checked by: DSZ	Sheet no: 3 OF 4	

ER-3

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100.00 = PROPOSED SPOT GRADE

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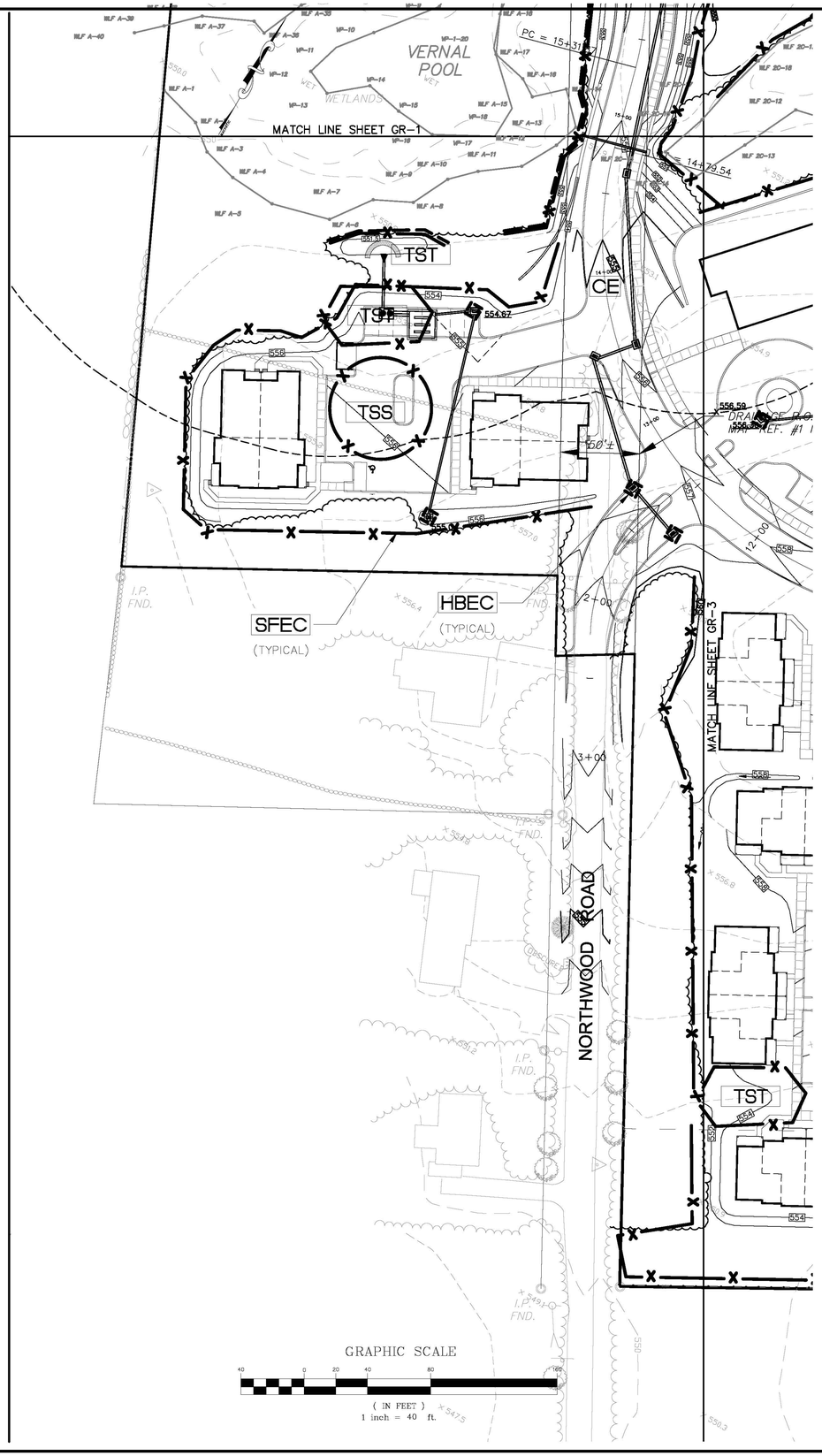

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SOIL EROSION & SEDIMENTATION CONTROL PLAN

PREPARED FOR

STORRS LODGES, CT

HUNTING LODGE ROAD

MANSFIELD, CONNECTICUT

Date: 03-18-2016 | Drawn by: RJK | Job no: 04161

Scale: 1" = 40' | Checked by: DSZ | Sheet no: 4 OF 4

ER-4

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100.00 = PROPOSED SPOT GRADE
100 = PROPOSED ELEVATION CONTOUR
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F.D. = PROPOSED FOOTING DRAIN
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No.	Date	Description
1	03-24-16	General

Revisions:

DRAINAGE AND UTILITY PLAN

STORRS LODGES, LLC

HUNTING LODGE ROAD
MANSFIELD, CONNECTICUT

PREPARED FOR

Date: 03-18-2016	Drawn by: RJK	Job no: 04161	Sheet no: 1 OF 4
Scale: 1" = 40'	Checked by: DSZ		

UT–1

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= PROPOSED SPOT GRADE
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DRAINAGE AND UTILITY PLAN
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HUNTING LODGE ROAD
MANSFIELD, CONNECTICUT

Date: 03-18-2016 | Drawn by: RJK | Job no: 04161
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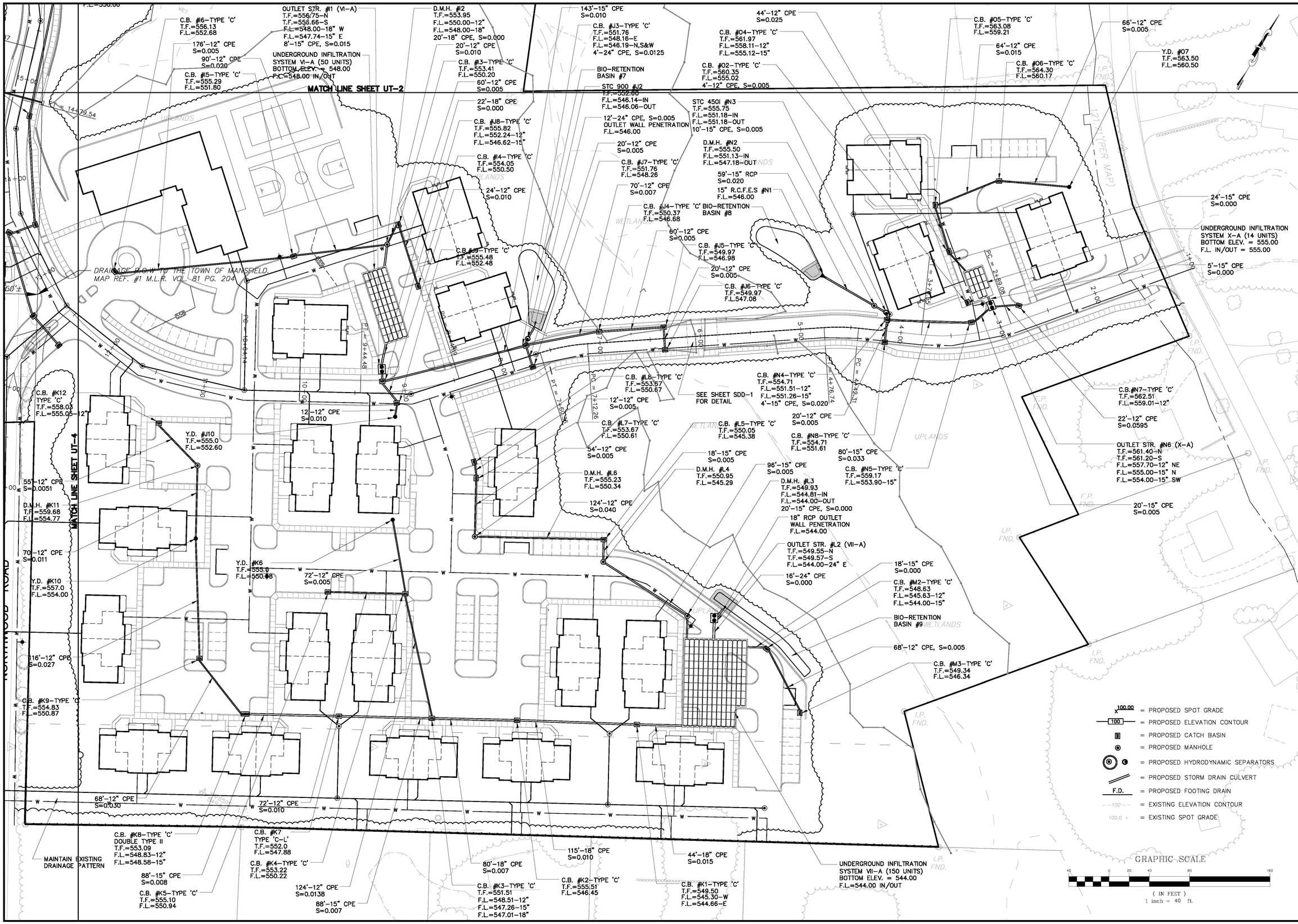

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No.	Date	Description
1	03-24-16	General

Revisions:

DRAINAGE AND UTILITY PLAN
PREPARED FOR
STORRS LODGES, LLC
HUNTING LODGE ROAD
MANSFIELD, CONNECTICUT

Date: 03-18-2016 | Drawn by: RJK | Job no: 04161
Scale: 1" = 40' | Checked by: DSZ | Sheet no: 3 OF 4

UT-3

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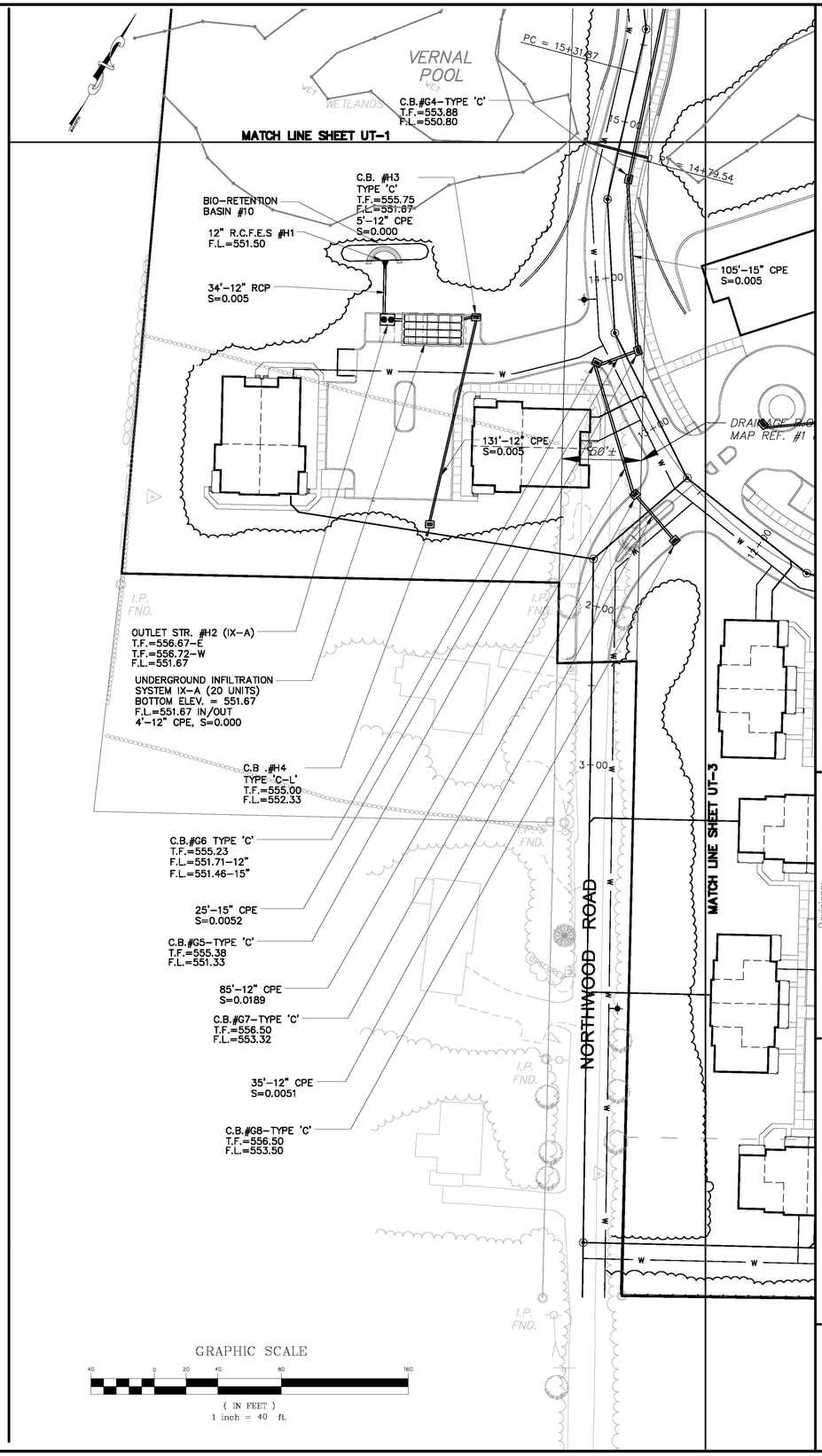

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Revisions:

No.	Date	Description
1	03-24-16	General

DRAINAGE AND UTILITY PLAN

PROPOSED PLAN

STORRS LODGES, LLC

HUNTING LODGE ROAD

MANSFIELD, CONNECTICUT

Date: 03-18-2016 | Drawn by: RJK | Job no: 04161

Scale: 1" = 40' | Checked by: DSZ | Sheet no: 4 OF 4

UT-4

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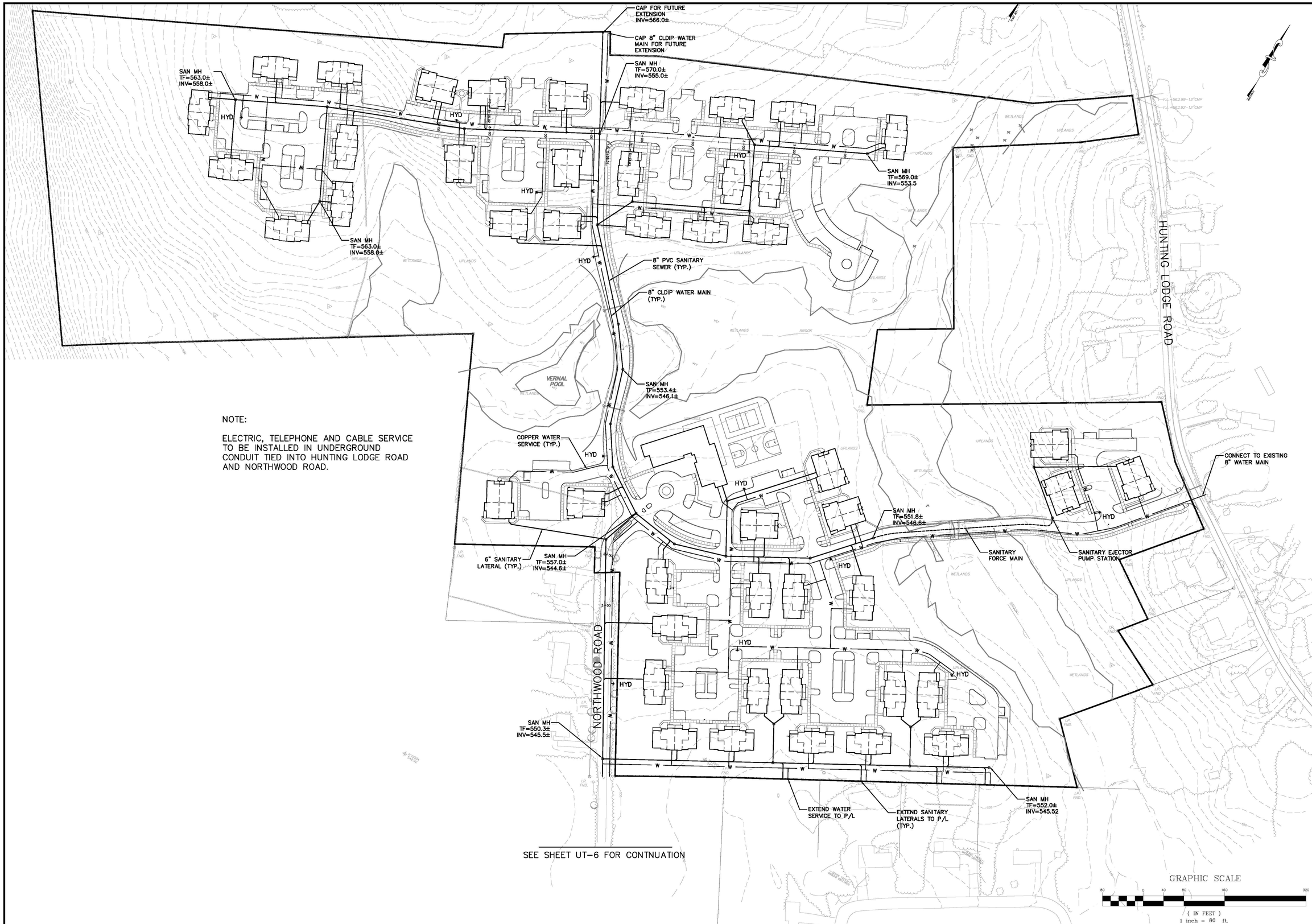
NOTE:

ELECTRIC, TELEPHONE AND CABLE SERVICE TO BE INSTALLED IN UNDERGROUND CONDUIT TIED INTO HUNTING LODGE ROAD AND NORTHWOOD ROAD.



SEE SHEET UT-6 FOR CONTNUATION

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Revisions:

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OVERALL UTILITY PLAN
PROPOSED FOR
STORRS LODGES, LLC
HUNTING LODGE ROAD
MANSFIELD, CONNECTICUT

Date: 03-18-16	Drawn by: CAD	Job no: 04161
Scale: 1" = 80'	Checked by: DSZ	Sheet no: 1 OF 2

UT-5

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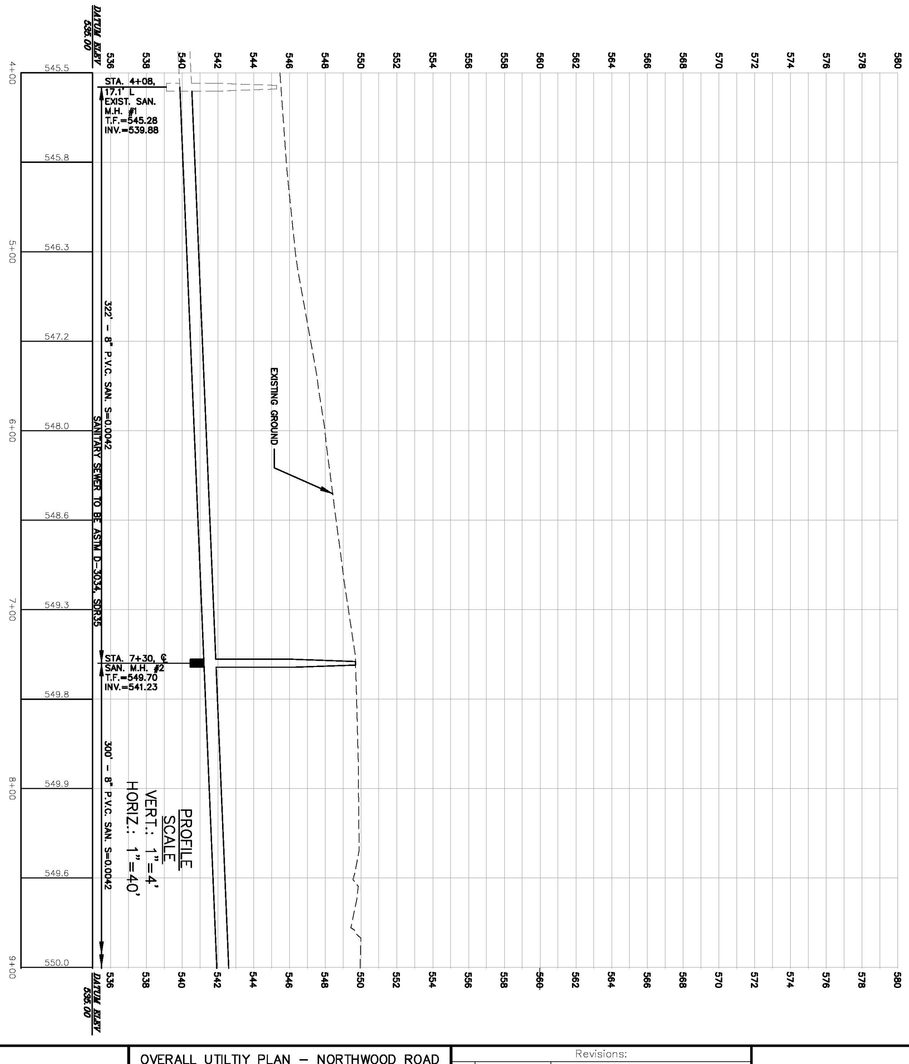

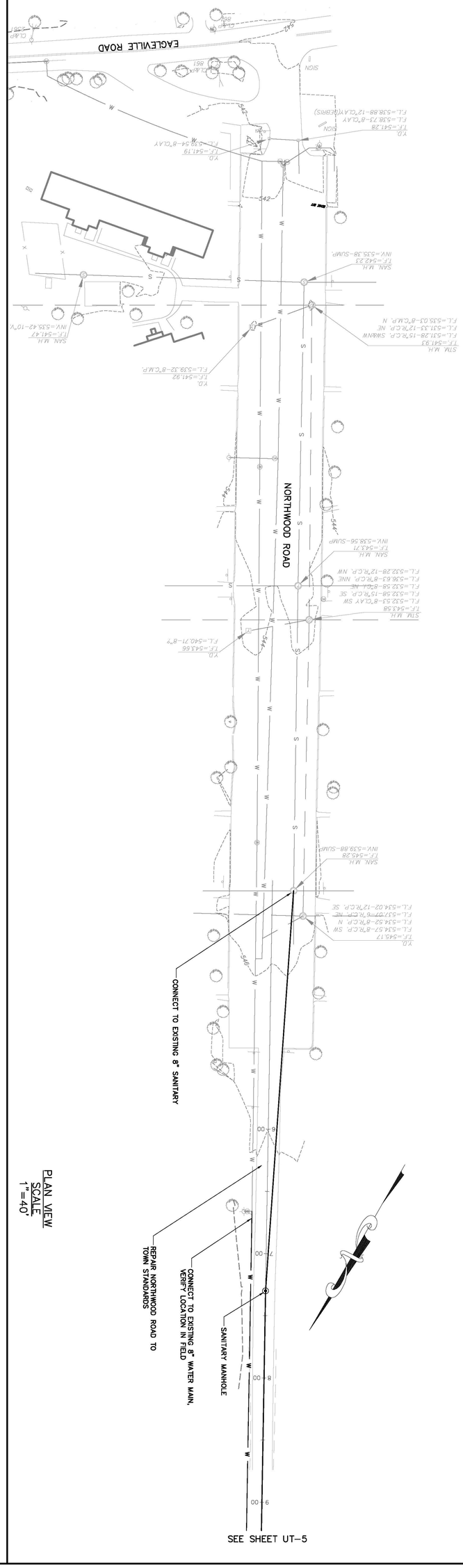

PLAN VIEW
SCALE
1"=40'

UT-6

OVERALL UTILTIY PLAN – NORTHWOOD ROAD

PREPARED FOR

STORRS LODGES, CT

HUNTING LODGE ROAD

MANSFIELD, CONNECTICUT

Date: *03-18-16*	Drawn by: *CAD*	Job no: *04161*
Scale: *A NOTED*	Checked by: *DSZ*	Sheet no: *2 OF 2*

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e-mail mail@fahesketh.com

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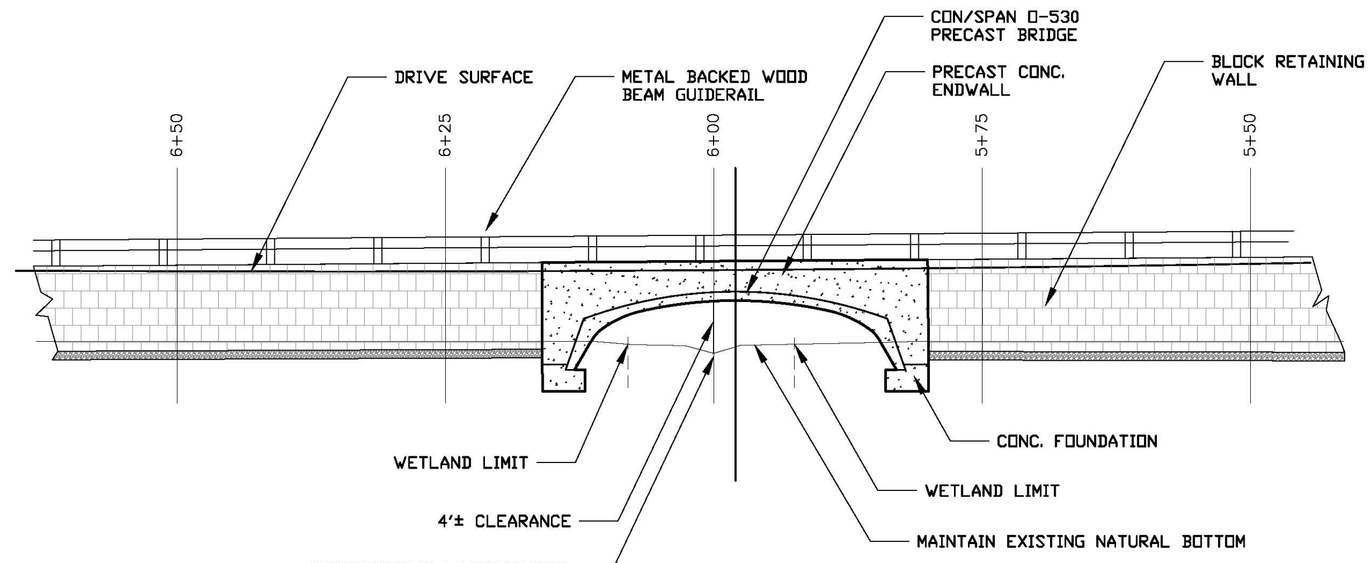
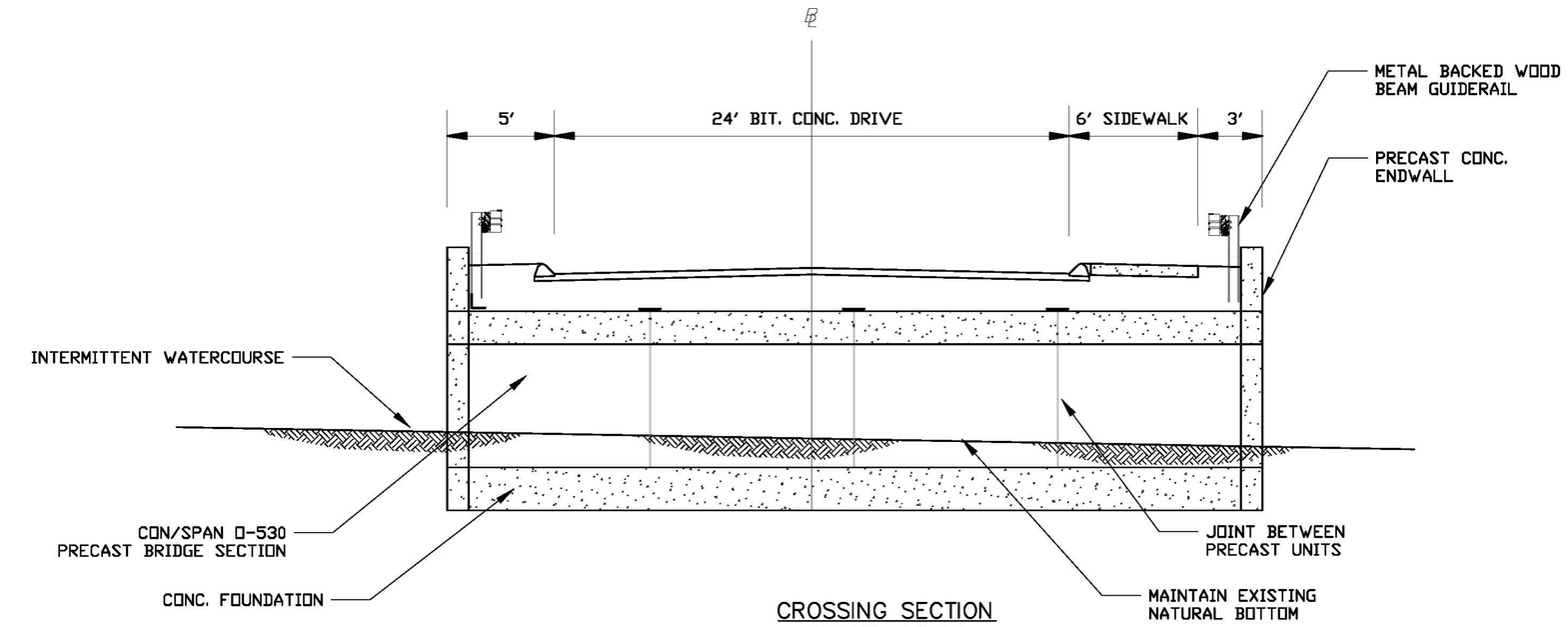
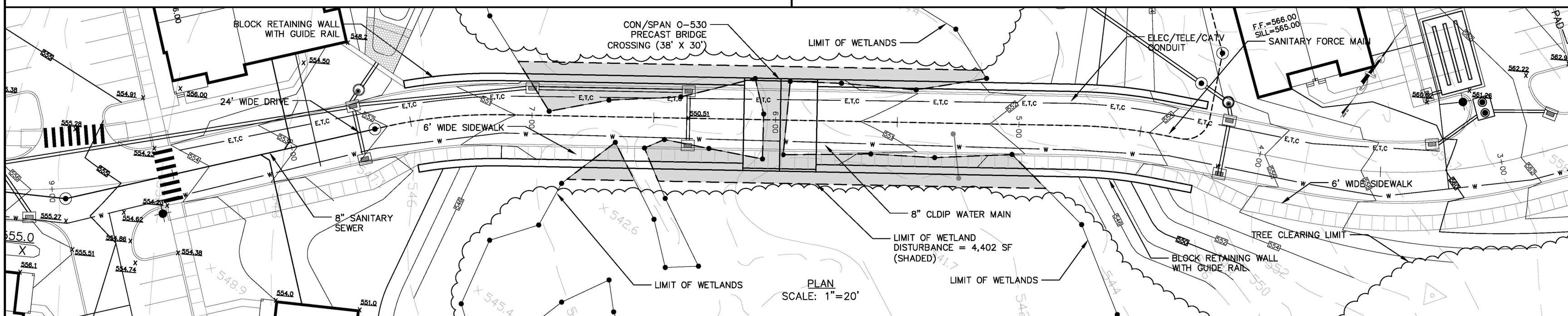


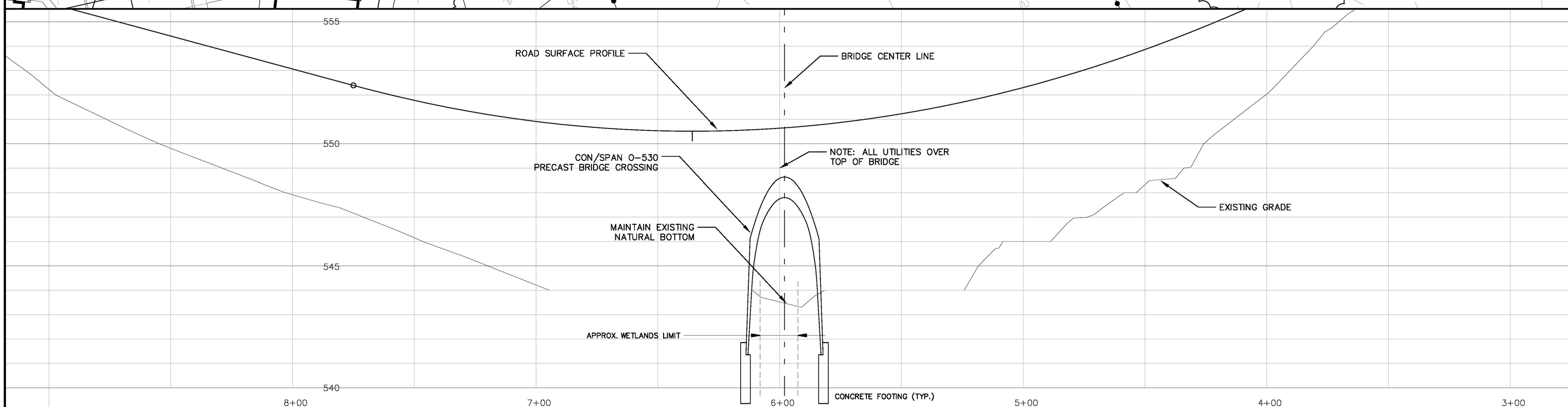
CROSSING ELEVATION
SCALE: 1"=10'



CROSSING SECTION
SCALE: 1"=5'



PLAN
SCALE: 1"=20'



PROFILE
VERT.: 1"=2'
HORIZ.: 1"=20'

THE LODGES AT STORRS

F. A. Hesketh & Associates, Inc.
6 Creamery Brook, East Granby, CT 06026
Civil & Traffic Engineers · Surveyors · Planners · Landscape Architects
Phone (860) 653-8000
Fax (860) 844-8600
e-mail mail@fahesketh.com

No.	Date	Description

Revisions:

SITE DRIVEWAY DETAIL
PREPARED FOR
STORRS LODGES, LLC
HUNTING LODGE ROAD
MANSFIELD, CONNECTICUT

Date: 03-18-2016 | Drawn by: RJK | Job no: 04161
Scale: AS SHOWN | Checked by: DSZ | Sheet no: 1 OF 2

SDD-1

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WETLAND RESTORATION NOTE:
PLANT SHRUBS AND TREES IN
A MOSAIC WITH WET MEADOW

LIMIT OF WETLANDS
STONE CHECK DAM
WETLAND RESTORATION (SEE NOTE)
VEGETATED SWALE
LEVEL SPREADER
TREE CLEARING LIMIT
GUIDANCE FENCE (TYP.)
LIMIT OF WETLANDS
STONE CHECK DAM
RIP RAP OUTLET PROTECTION/FOREBAY
6' WIDE BIT. CONC. SIDEWALK
BIORETENTION BASIN
BLOCK RETAINING WALL
BLOCK RETAINING WALL
RIP RAP OUTLET PROTECTION/FOREBAY
ELEC/TELE/CATV CONDUIT
6' WIDE BIT. CONC. SIDEWALK
DRIVE B
24' WIDE BIT. CONC. DRIVE WITH BIT. CONC. CURB
8" SANITARY SEWER
8" CLDIP WATER MAIN
BLOCK RETAINING WALL
WILDLIFE TUNNEL #1
WILDLIFE TUNNEL #2
GUIDANCE FENCE (TYP.)
BLOCK RETAINING WALL
LIMIT OF WETLANDS
TREE CLEARING LIMIT
LIMIT OF WETLANDS
100' MIN.
100'
VERNAL POOL
WET
WETLANDS
UPLANDS
566.10
554.67
556.59
551.5
GRAPHIC SCALE
(IN FEET)
1 inch = 20 ft.

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e-mail mail@fahesketh.com

Revisions:

No.	Date	Description
1	03-24-2016	General

SITE DRIVEWAY DETAIL – STA. 14+00–18+00

PREPARED FOR
STORRS LODGES, LLC
HUNTING LODGE ROAD
MANSFIELD, CONNECTICUT

Date: 03-18-2016 | Drawn by: RJK | Job no: 04161
Scale: AS SHOWN | Checked by: DSZ | Sheet no: 2 OF 2

SDD-2

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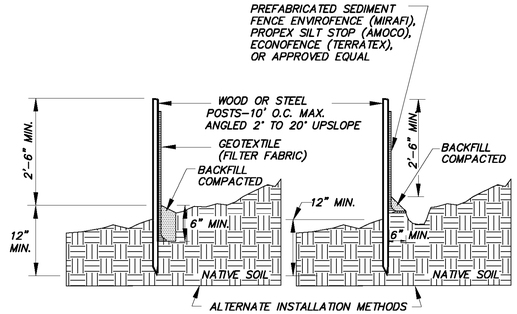
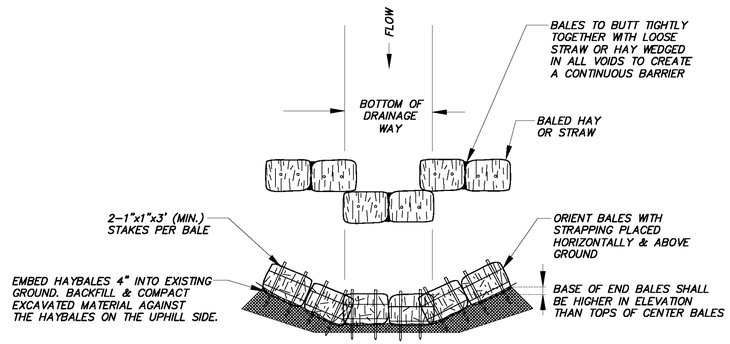


NOTE:
1. WOOD POSTS SHALL BE HARDWOOD 1 1/2" x 1 1/2" x 48" MIN. STEEL POST SHALL BE A MINIMUM OF 0.5 POUNDS PER LINEAR FOOT X 48".
2. JOINTS, WHEN REQUIRED, SHALL BE SPLICED & SECURELY SEALED TOGETHER, AT POST LOCATIONS ONLY, WITH A MINIMUM 6" OVERLAP.

SEDIMENT FENCE EROSION CONTROL (SFEC)

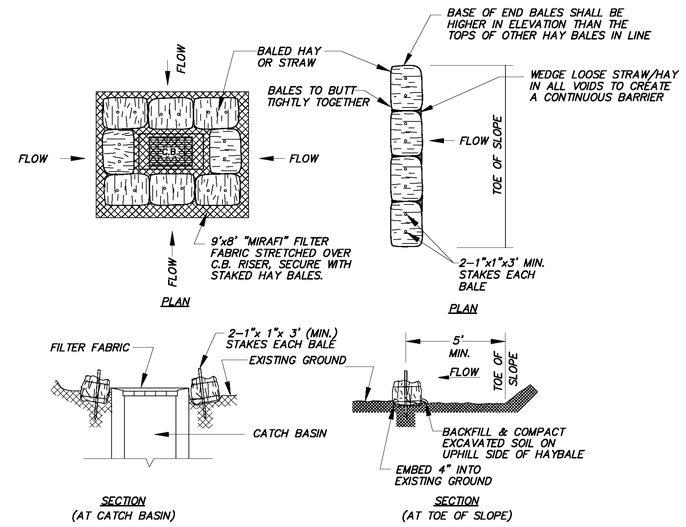
N.T.S.



PLAN

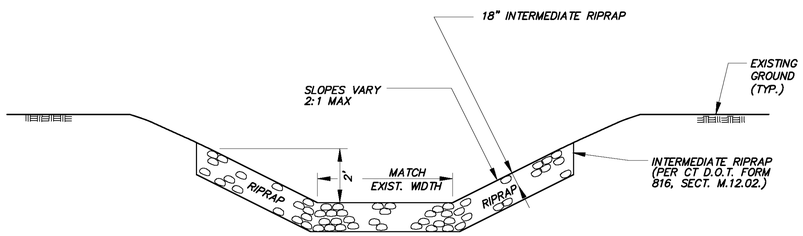
HAYBALE CHECK DAM (HBCD)

N.T.S.



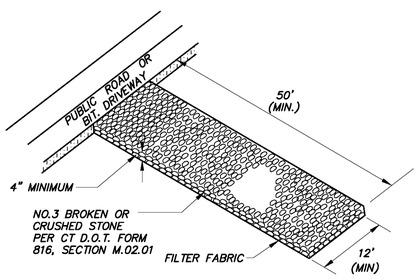
HAYBALE EROSION CONTROL (HBEC)

N.T.S.



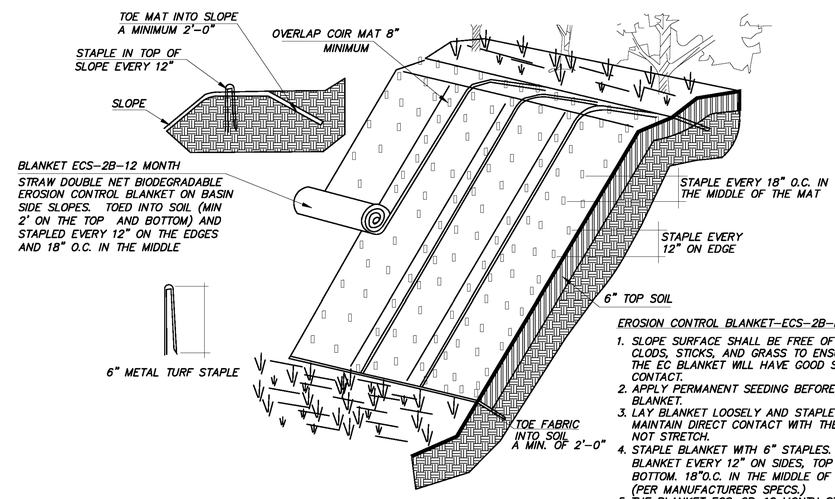
RIPRAP SWALE (RRSW)

N.T.S.



CONSTRUCTION EXIT (CE)

N.T.S.



EROSION CONTROL BLANKET–ECS–2B–NOTES

1. SLOPE SURFACE SHALL BE FREE OF ROCKS, CLODS, STICKS, AND GRASS TO ENSURE THAT THE EC BLANKET WILL HAVE GOOD SOIL CONTACT.
2. APPLY PERMANENT SEEDING BEFORE PLACING BLANKET.
3. LAY BLANKET LOOSELY AND STAPLE TO MAINTAIN DIRECT CONTACT WITH THE SOIL. DO NOT STRETCH.
4. STAPLE BLANKET WITH 6" STAPLES. STAPLE BLANKET EVERY 12" ON SIDES, TOP AND BOTTOM. 18"O.C. IN THE MIDDLE OF THE MAT. (PER MANUFACTURERS SPECS.)
5. THE BLANKET ECS–2B–12 MONTH STRAW DOUBLE NET BIODEGRADABLE EROSION CONTROL BLANKETS TO BE INSTALLED IN SECTIONS RUNNING FROM THE TOP TO THE BOTTOM OF THE SLOPE, ALONG THE ENTIRE AREAS AS SHOWN ON THE PLAN (PER MANUFACTURERS SPECIFICATIONS.)

NOTES:

1. USE ANTI–WASH/GEOJUTE PRODUCT OR APPROVED EQUAL
2. FOR USE ON SLOPES 2:1 OR GREATER

EROSION CONTROL BLANKET

N.T.S.

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MANSFIELD, CONNECTICUT

Date: 03–18–2016	Drawn by: CAD	Job no: 04161	Sheet no: 1 OF 6
Scale: AS NOTED	Checked by: DSZ		

SD–1

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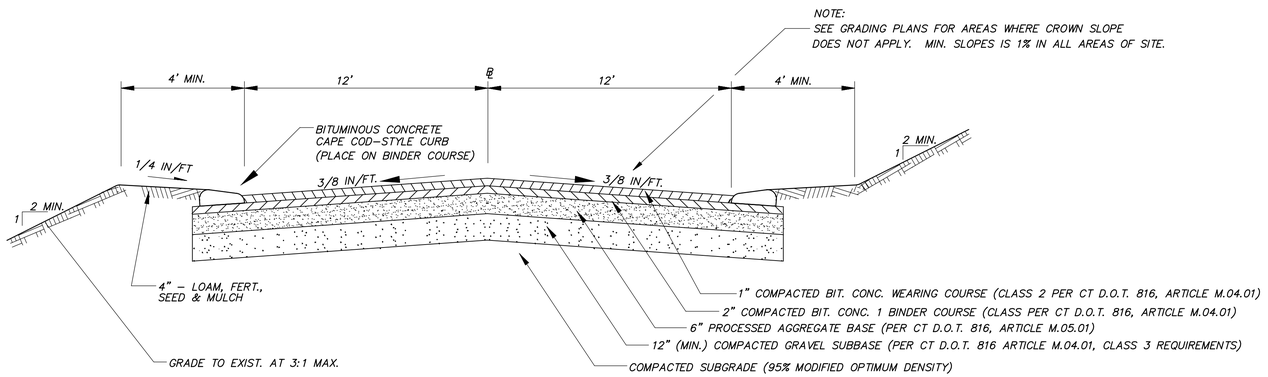
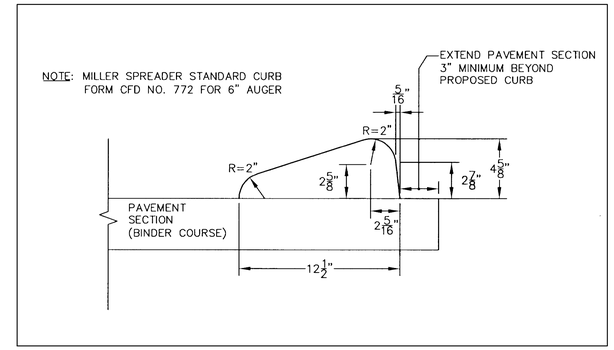


TYPICAL DRIVEWAY SECTION

N.T.S.

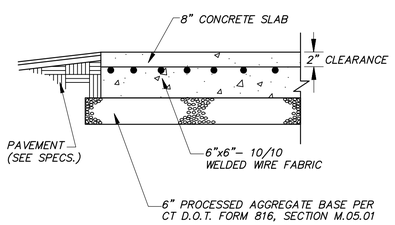
NOTE: INSTALL UNDERDRAIN WHERE INDICATED ON PLAN/PROFILE SHEETS.



CAPE COD-STYLE CURB SECTION

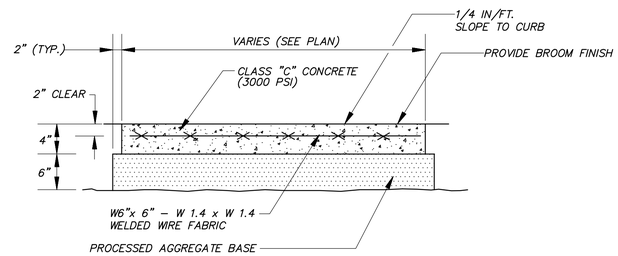
N.T.S.

NOTE: SLOPE PAD TO PROPERLY DRAIN AND
TO PRECLUDE PONDING (SEE GRADING PLAN)



DUMPSTER PAD DETAIL

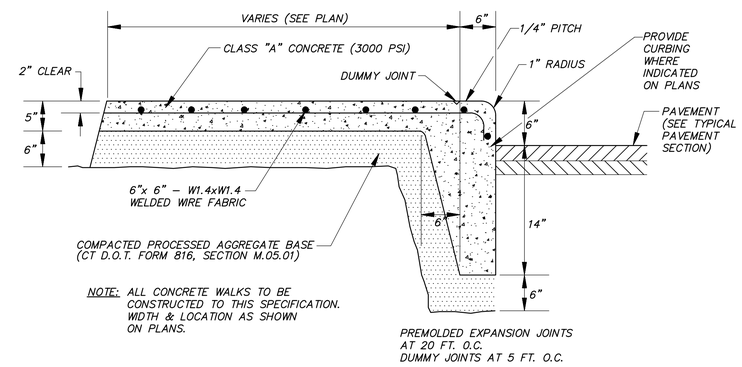
N.T.S.



EXPANSION JOINTS AT 20 FT. O.C.
DUMMY JOINTS AT 5 FT. O.C.
UNLESS OTHERWISE SPECIFIED

CONCRETE SIDEWALK DETAIL

N.T.S.

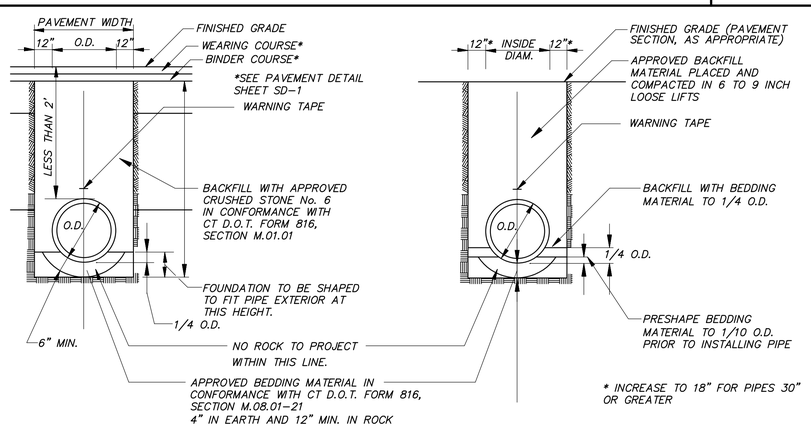


NOTE: ALL CONCRETE WALKS TO BE
CONSTRUCTED TO THIS SPECIFICATION.
WIDTH & LOCATION AS SHOWN
ON PLANS.

PREMOLDED EXPANSION JOINTS
AT 20 FT. O.C.
DUMMY JOINTS AT 5 FT. O.C.

CONCRETE SIDEWALK & CURB DETAIL

N.T.S.

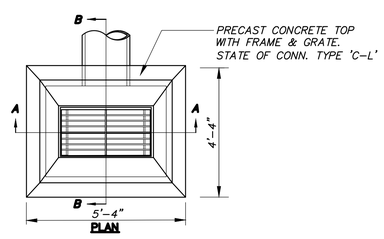


SHALLOW PIPE WITH LESS THAN 2' OF COVER

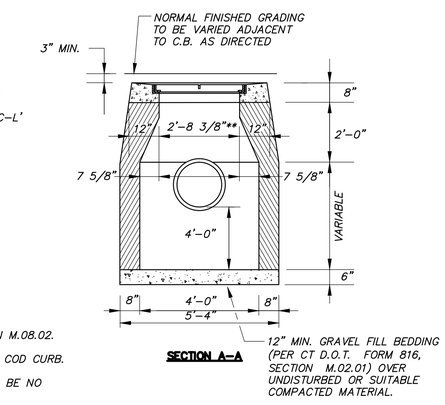
PIPE WITH MORE THAN 2' OF COVER

STORM SEWER TRENCH DETAIL

N.T.S.

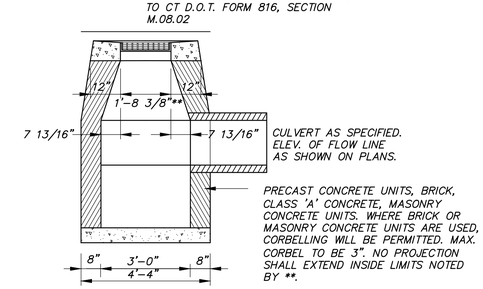


NOTE:
1. ALL MATERIALS SHALL CONFORM TO CT D.O.T. FORM 816, SECTION M.08.02.
2. PRECAST CONCRETE TOP TO MATCH PROPOSED BITUMINOUS CAPE COD CURB.
3. GRATES AND FRAME SHALL BE GALVANIZED STEEL. THERE SHALL BE NO CURB OPENING.
4. INSTALL SNOUT HOOD TRAP AT OUTLET FROM EACH CATCH BASIN.



SECTION A–A

NOTE: ALL MATERIALS SHALL CONFORM
TO CT D.O.T. FORM 816, SECTION
M.08.02



SECTION B–B

TYPE 'C–L' CATCH BASIN

N.T.S.

THE LODGES AT STORRS

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No.	Date	Revisions: Description

DETAILS
PREPARED FOR
STORRS LODGES, LLC
HUNTING LODGE ROAD
MANSFIELD, CONNECTICUT

Date: 03-18-2016	Drawn by: CAD	Job no: 04161	
Scale: AS NOTED	Checked by: DSZ	Sheet no: 2 OF 6	

SD-2

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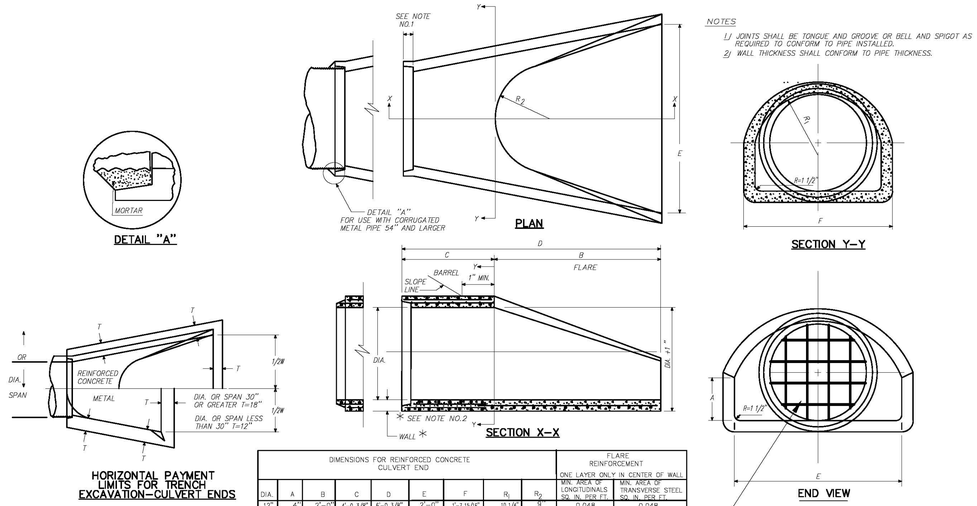


NOTES

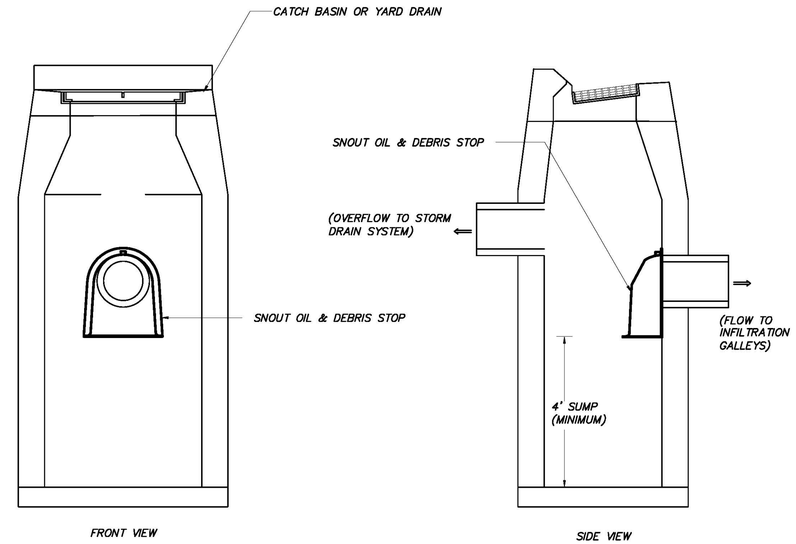
1/ JOINTS SHALL BE TONGUE AND GROOVE OR BELL AND SPIGOT AS REQUIRED TO CONFORM TO PIPE INSTALLED.
2/ WALL THICKNESS SHALL CONFORM TO PIPE THICKNESS.

DIMENSIONS FOR REINFORCED CONCRETE CULVERT END										FLARE REINFORCEMENT ONE LAYER ONLY IN CENTER OF WALL	
DIA.	A	B	C	D	E	F	R_1	R_2		MIN. AREA OF LONGITUDINALS SQ. IN. PER FT.	MIN. AREA OF TRANSVERSE STEEL SQ. IN. PER FT.
12"	4"	2'-0"	4'-0 3/8"	6'-0 3/8"	2'-0"	1'-7 15/16"	13 1/4"	9"		0.048	0.048
15"	6"	2'-3"	3'-10"	6'-1"	2'-6"	2'-0 3/16"	1'-0 1/2"	11"		0.054	0.054
18"	9"	2'-3"	3'-10"	6'-1"	3'-0"	2'-5"	1'-3 1/2"	1'-0"		0.060	0.060
21"	9"	2'-1 1"	3'-2"	6'-1"	3'-6"	2'-7 1/2"	1'-4"	1'-1"		0.066	0.066
24"	9 1/2"	2'-7 1/2"	2'-6"	6'-1 1/2"	4'-0"	2'-9 3/16"	1'-4 13/16"	1'-2"		0.072	0.072
30"	1'-0"	4'-0"	1'-7 3/4"	6'-1 3/4"	5'-0"	3'-1"	1'-6 1/2"	1'-3"		0.084	0.084
36"	1'-3"	5'-3"	2'-10 3/4"	6'-1 3/4"	6'-0"	3'-11 3/16"	2'-0 5/16"	1'-8"		0.096	0.096
42"	1'-9"	5'-3"	2'-11"	8'-2"	6'-6"	4'-5 7/16"	2'-3 1/2"	1'-10"		0.108	0.108
48"	2'-0"	6'-0"	2'-2"	8'-2"	7'-0"	4'-8 1/2"	2'-4 1/2"	1'-10"		0.120	0.120

INSTALL BAR GRATE ON PIPES 36" DIA. OR GREATER (3/8" BARS WELDED AT 6"O.C. EACH WAY)

METAL & REINFORCED CONCRETE CULVERT END

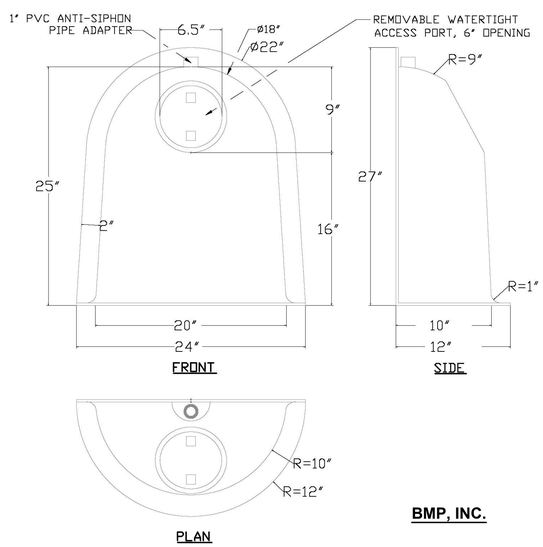
N.T.S.



NOTES:
1. CAST NOTCHED SECTIONS IN CORBEL RISER TO FACILITATE INSTALLATION OF THE TRAP HOOD AGAINST A CONTINUOUS VERTICAL WALL WITHIN THE INTERIOR OF CATCHBASIN OR MANHOLE, AS REQUIRED.
2. WHERE NOTCHING IS REQUIRED IN CORBELS, CONTRACTOR TO SUBMIT DETAILED SHOP DRAWINGS OF CATCHBASINS OR MANHOLE PRIOR TO CASTING
3. CATCHBASINS/MANHOLES TO HAVE 4' MINIMUM SUMPS.
4. CATCHBASINS INSTALLATION SHOWN. WHERE SHOWN ON PLANS, INSTALL IN MANHOLE STRUCTURES.

SNOUT HOOD TRAP FOR CATCH BASIN (TYPICAL)

N.T.S.



BMP, INC.

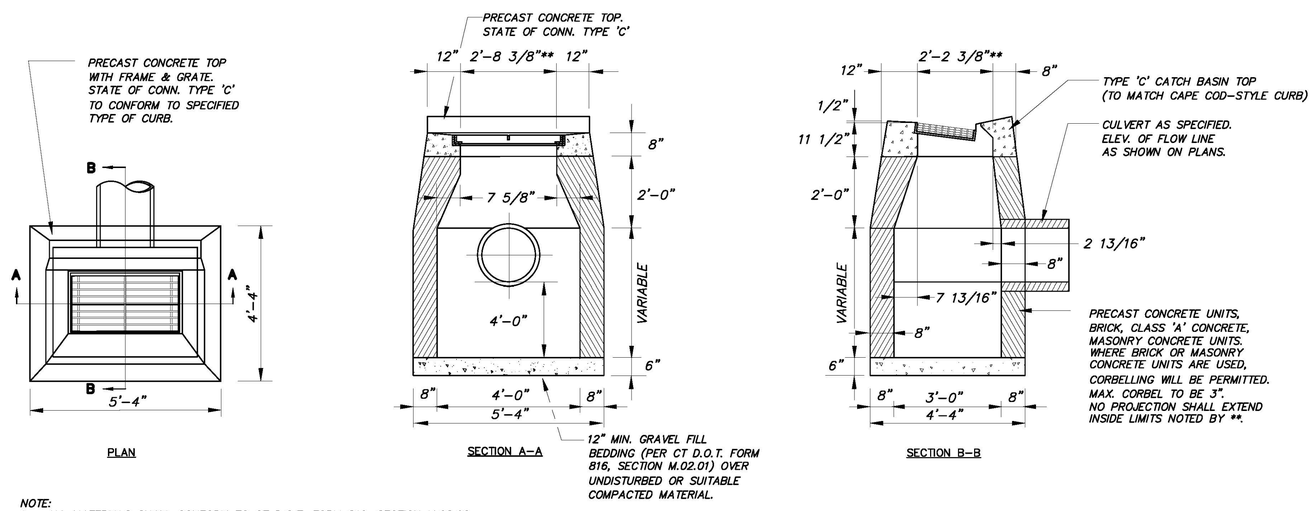
18F SNOUT OIL & DEBRIS STOP (SEE NOTE 10)

NOTE:
1. THE 18F MODEL SHOWN IS FOR ILLUSTRATIVE PURPOSES ONLY. CONTRACTOR SHALL SELECT APPROPRIATE MODEL FOR OUTLET PIPING SPECIFIED.

NOTES:
1. ALL HOODS AND TRAPS FOR CATCH BASINS AND WATER QUALITY STRUCTURES SHALL BE AS MANUFACTURED BY: BEST MANAGEMENT PRODUCTS, INC. 53 MT. ARCHER RD. LYME, CT 06371 (860) 434-0277, (860) 434-3195 FAX TOLL FREE: (800) 504-8008 OR (888) 354-7585 WEB SITE: www.bmpinc.com OR PRE-APPROVED EQUAL
2. ALL HOODS SHALL BE CONSTRUCTED OF A GLASS REINFORCED RESIN COMPOSITE WITH ISO GEL COAT EXTERIOR FINISH WITH A MINIMUM 0.125" LAMINATE THICKNESS.
3. ALL HOODS SHALL BE EQUIPPED WITH A WATERTIGHT ACCESS PORT, A MOUNTING FLANGE, AND AN ANTI-SIPHON VENT AS DRAWN. (SEE CONFIGURATION DETAIL)
4. THE SIZE AND POSITION OF THE HOOD SHALL BE DETERMINED BY OUTLET PIPE SIZE AS PER MANUFACTURER'S RECOMMENDATION.
5. THE BOTTOM OF THE HOOD SHALL EXTEND DOWNWARD A DISTANCE EQUAL TO 1/2 THE OUTLET PIPE DIAMETER WITH A MINIMUM DISTANCE OF 6" FOR PIPES <12" I.D.
6. THE ANTI-SIPHON VENT SHALL EXTEND ABOVE HOOD BY MINIMUM OF 3" AND A MAXIMUM OF 24" ACCORDING TO STRUCTURE CONFIGURATION.
7. THE SURFACE OF THE STRUCTURE WHERE THE HOOD IS MOUNTED SHALL BE FINISHED SMOOTH AND FREE OF LOOSE MATERIAL.
8. THE HOOD SHALL BE SECURELY ATTACHED TO STRUCTURE WALL WITH 3/8" STAINLESS STEEL BOLTS AND OIL-RESISTANT GASKET AS SUPPLIED BY MANUFACTURER. (SEE INSTALLATION DETAIL).
9. INSTALLATION INSTRUCTIONS SHALL BE FURNISHED WITH MANUFACTURER SUPPLIED INSTALLATION KIT. INSTALLATION KIT SHALL INCLUDE:
   A. INSTALLATION INSTRUCTIONS
   B. PVC ANTI-SIPHON VENT PIPE AND ADAPTER
   C. OIL-RESISTANT CRUSHED CELL FOAM GASKET WITH PSA BACKING
   D. 3/8" STAINLESS STEEL BOLTS
   E. ANCHOR SHIELDS
10. FOR MANHOLE APPLICATIONS, UTILIZE ROUND STYLE HOODS DESINGED FOR CIRCULAR STRUCTURES.

TRAP HOOD DETAIL

N.T.S.



NOTE:
1. ALL MATERIALS SHALL CONFORM TO CT D.O.T. FORM 816, SECTION M.08.02.
2. PRECAST CONCRETE TOP TO MATCH PROPOSED BITUMINOUS CAPE COD CURB.
3. GRATES AND FRAME SHALL BE GALVANIZED STEEL. THERE SHALL BE NO CURB OPENING.
4. INSTALL SNOUT HOOD TRAP AT OUTLET FROM EACH CATCH BASIN.

TYPE 'C' CATCH BASIN

N.T.S.

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No.	Date	Description

Revisions:

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MANSFIELD, CONNECTICUT

Date: 03-18-2016	Drawn by: CAD	Job no: 04161	Sheet no: 3 OF 6
Scale: AS NOTED	Checked by: DSZ		

SD-3

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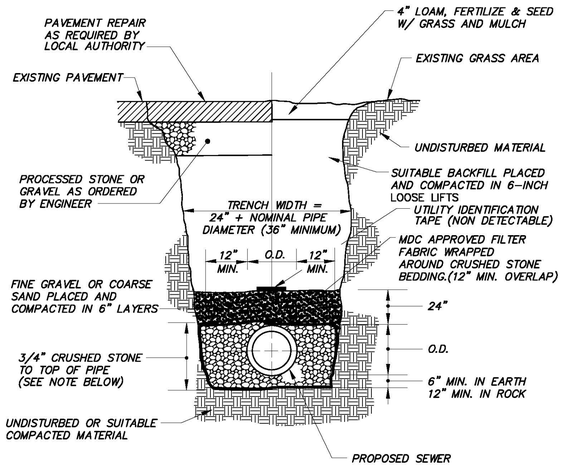
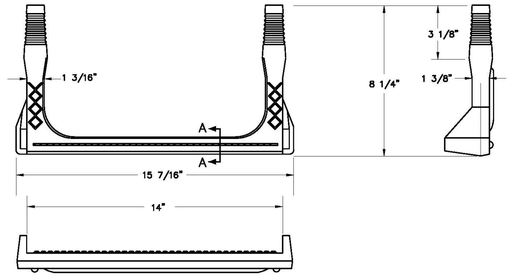
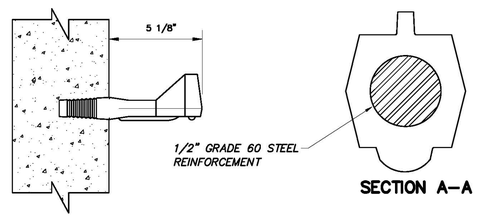


SANITARY SEWER TRENCH DETAIL

N.T.S.



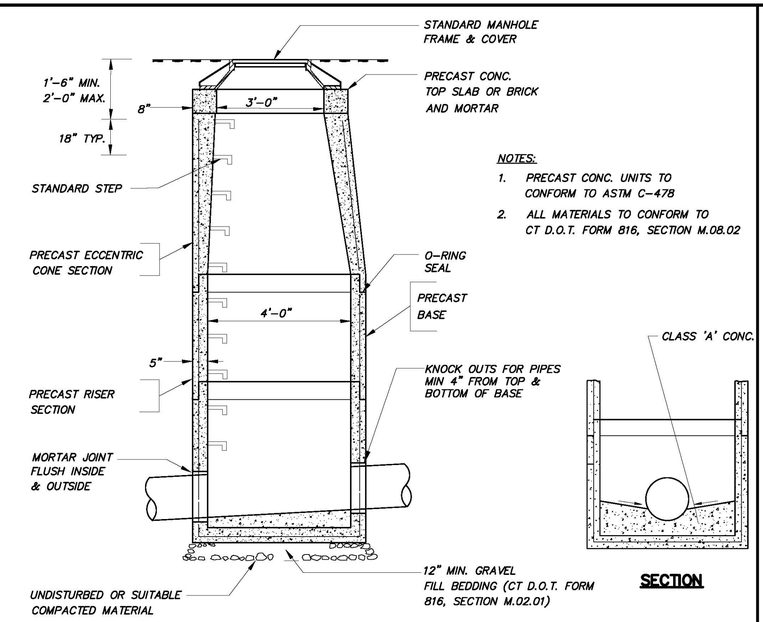
Copolymer Polypropylene Plastic



SECTION A–A

PLASTIC MANHOLE STEP

N.T.S.



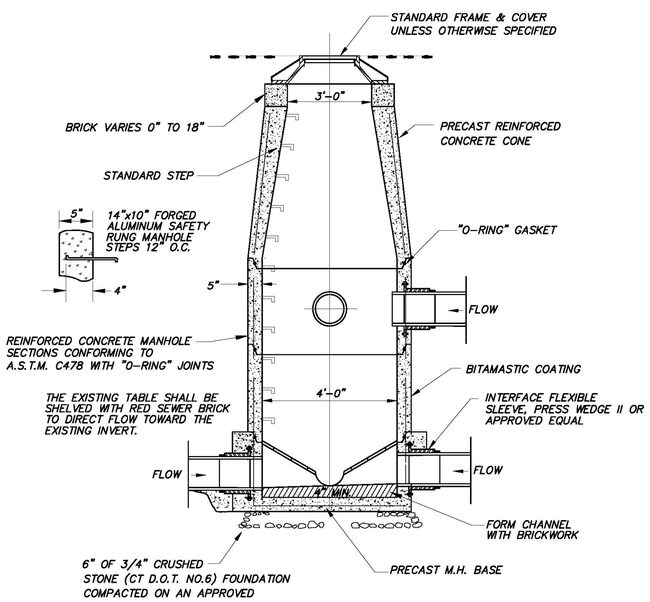
NOTES:

1. PRECAST CONC. UNITS TO CONFORM TO ASTM C-478
2. ALL MATERIALS TO CONFORM TO CT D.O.T. FORM 816, SECTION M.08.02

SECTION

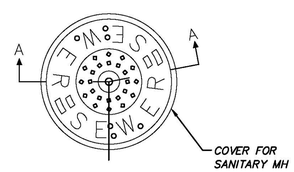
STORM SEWER MANHOLE

N.T.S.

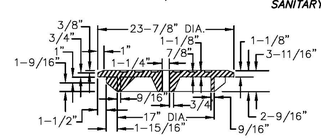


SANITARY SEWER MANHOLE

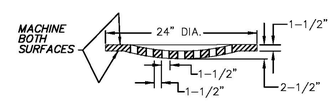
N.T.S.



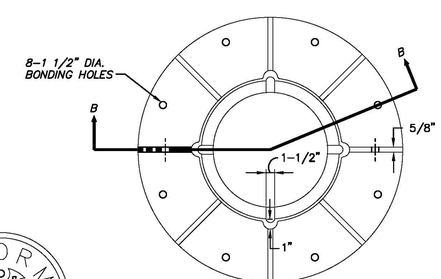
NOTE:
THE LOWER SURFACE OF THE COVER AND THE CORRESPONDING UPPER SURFACE OF THE FRAME SHALL BE MACHINE FINISHED TO PROVIDE A SMOOTH FLAT CONTACT OR FIT WITHOUT ANY TENDENCY FOR THE COVER OR GRATE TO ROCK OR RATTLE.

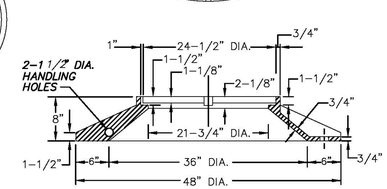


SECTION A–A



SECTION C–C

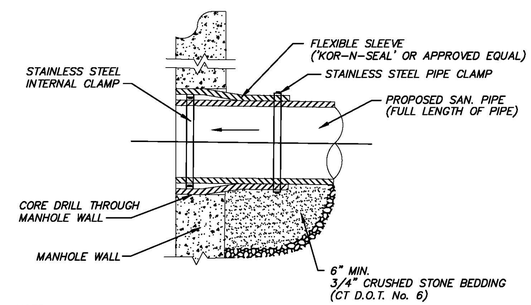




SECTION B–B

STANDARD FRAME AND COVER

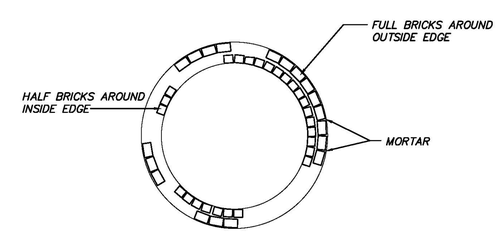
N.T.S.



NOTE:
ALL STRAPS AND BOLTS TO BE STAINLESS STEEL

TYPICAL MANHOLE SLEEVE DETAIL

N.T.S.



PLAN VIEW

BRICK LEVELING COURSE FOR MANHOLE

N.T.S.

THE LODGES AT STORRS

F. A. Hesketh & Associates, Inc.
6 Creamery Brook, East Granby, CT 06026
Civil & Traffic Engineers · Surveyors · Planners · Landscape Architects
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Fax (860) 844-8600
e-mail mail@hesketh.com

No.	Date	Description

Revisions:

DETAILS
PREPARED FOR
STORRS LODGES, LLC
HUNTING LODGE ROAD
MANSFIELD, CONNECTICUT

Date: 03-18-2016	Drawn by: CAD	Job no: 04161	
Scale: AS NOTED	Checked by: DSZ	Sheet no: 4 OF 6	

SD-4

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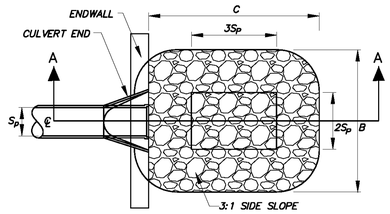
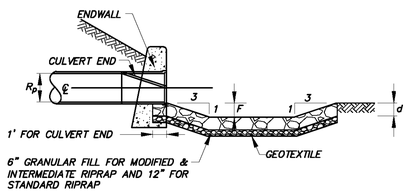


PLAN VIEW



SECTION A–A

LEGEND

S_p { MAX. INSIDE PIPE SPAN (NON CIRCULAR SECTIONS) / INSIDE PIPE DIAMETER (CIRCULAR SECTION)

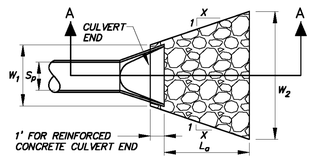
R_p { MAX. INSIDE PIPE RISE (NON CIRCULAR SECTIONS) / INSIDE PIPE DIAMETER (CIRCULAR SECTION)

d { 12" FOR MODIFIED RIPRAP / 18" FOR INTERMEDIATE RIPRAP / 36" FOR STANDARD RIPRAP

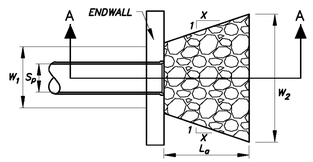
TYPE 1 F=0.5Rp
TYPE 2 F=Rp
C=3Sp+6F
B=2Sp+6F

PREFORMED SCOUR HOLE TYPE 1 AND TYPE 2

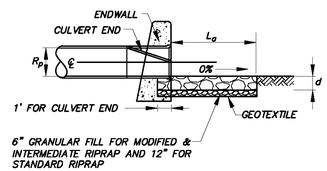
N.T.S.



CULVERT END PLAN VIEW



END WALL PLAN VIEW



SECTION A–A
CULVERT END AND END WALL

LEGEND

S_p { MAX. INSIDE PIPE SPAN (NON CIRCULAR SECTIONS) / INSIDE PIPE DIAMETER (CIRCULAR SECTION)

R_p { MAX. INSIDE PIPE RISE (NON CIRCULAR SECTIONS) / INSIDE PIPE DIAMETER (CIRCULAR SECTION)

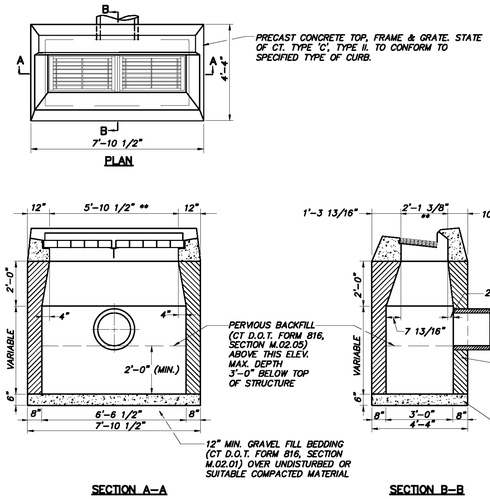
L_a { LENGTH OF RIPRAP APRON MEASURED FROM THE END OF CULVERT END SECTION OR FACE OF ENDWALL

d { 12" FOR MODIFIED RIPRAP / 18" FOR INTERMEDIATE RIPRAP / 36" FOR STANDARD RIPRAP

	X	W_1	W_2
TYPE A RIPRAP APRON	3	3Sp	3Sp+0.7 La
TYPE B RIPRAP APRON	5	3Sp	3Sp+0.4 La

TYPE A & B RIPRAP APRON

N.T.S.

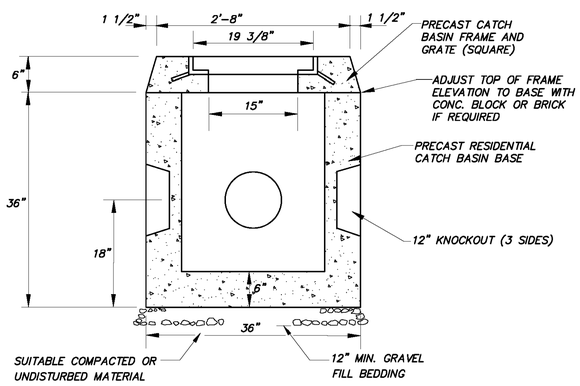


NOTES:

1. ALL MATERIALS SHALL CONFORM TO CT D.O.T. FORM 816, SECTION M.08.02
2. WHERE PRECAST CONCRETE UNIT IS USED FOR SUMP, TOP OF THE UNIT SHALL BE AT LEAST 6" BELOW THE BOTTOM OF THE PIPE OUTLETTING FROM THE CATCH BASIN.

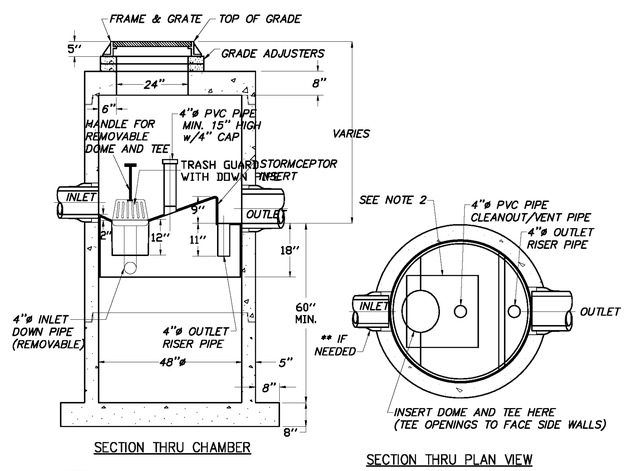
TYPE 'C' CATCH BASIN DOUBLE GRATE – TYPE II

N.T.S.



TYPE 'R' CATCH BASIN

N.T.S.



SECTION THRU CHAMBER

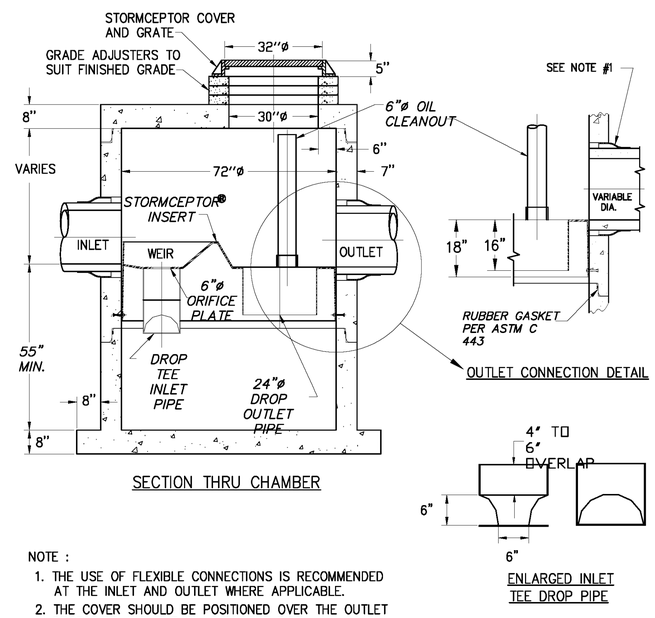
SECTION THRU PLAN VIEW

NOTE :

1. THE USE OF FLEXIBLE CONNECTIONS IS RECOMMENDED AT THE OUTLET WHERE APPLICABLE.
2. THE COVER SHOULD BE POSITIONED OVER THE 4"ø CLEANOUT/VENT PIPE AND THE 4"ø INLET DOWN PIPE.
3. THE STORMCEPTOR SYSTEM IS PROTECTED BY ONE OR MORE OFF THE FOLLOWING U.S. PATENTS: #4985148, #5498331, #5725760, #5753115, #5849181.
4. CONTRACTOR TO PROVIDE CRANE TO SET UNIT (HEAVIEST SECTION WEIGHS 5000 LB)

STORMCEPTOR STC 450i

N.T.S.



SECTION THRU CHAMBER

ENLARGED INLET TEE DROP PIPE

NOTE :

1. THE USE OF FLEXIBLE CONNECTIONS IS RECOMMENDED AT THE INLET AND OUTLET WHERE APPLICABLE.
2. THE COVER SHOULD BE POSITIONED OVER THE OUTLET DROP PIPE AND THE OIL CLEANOUT PIPE.
3. THE STORMCEPTOR SYSTEM IS PROTECTED BY ONE OR MORE OF THE FOLLOWING U.S. PATENTS: #4985148, #5498331, #5725760, #5753115, #5849181.

STORMCEPTOR STC 900

N.T.S.

THE LODGES AT STORRS

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Revisions:

No.	Date	Description
1	03-24-2016	General

DETAILS
PREPARED FOR
STORRS LODGES, LLC
HUNTING LODGE ROAD
MANSFIELD, CONNECTICUT

Date: 03-18-2016	Drawn by: CAD	Job no: 04161	
Scale: AS NOTED	Checked by: DSZ	Sheet no: 5 OF 7	

SD-5

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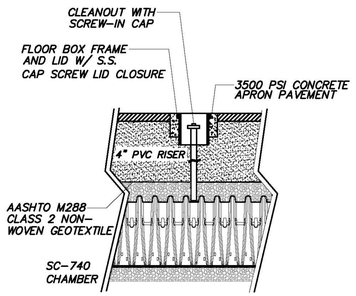
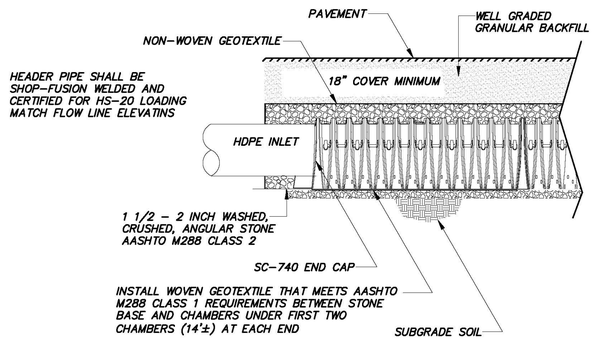
BOTTOM OF STONE – "N"



*REFER TO STORMTECH'S DESIGN MANUAL

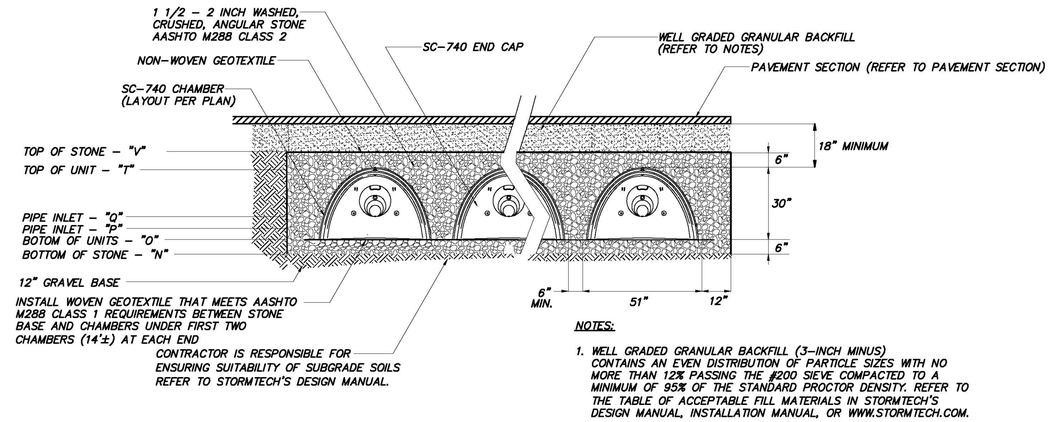
STORMTECH SC-740 CHAMBER SYSTEM INSPECTION PORT DETAIL

N.T.S.



STORMTECH SC-740 CHAMBER SYSTEM TYPICAL PROFILE – INLET ROW

N.T.S.



NOTES:

1. WELL GRADED GRANULAR BACKFILL (3-INCH MINUS) CONTAINS AN EVEN DISTRIBUTION OF PARTICLE SIZES WITH NO MORE THAN 12% PASSING THE #200 SIEVE COMPACTED TO A MINIMUM OF 95% OF THE STANDARD PROCTOR DENSITY. REFER TO THE TABLE OF ACCEPTABLE FILL MATERIALS IN STORMTECH'S DESIGN MANUAL, INSTALLATION MANUAL, OR WWW.STORMTECH.COM.

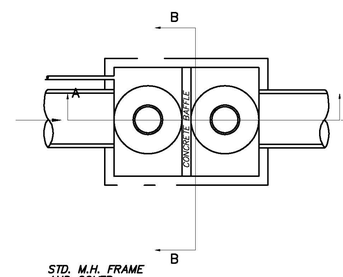
STORMTECH SC-740 CHAMBER SYSTEM TYPICAL CROSS SECTION

N.T.S.

	#	IIA	IVA	VIA	VIIA	VIIIA	IXA	XA
TOP OF STONE ("T"+6")	"V"	563.00	553.00	551.00	547.00	560.00	554.67	558.00
TOP OF UNIT ("O"+30")	"T"	562.50	552.50	550.50	546.50	559.50	554.17	557.50
PIPE INLET	"Q"	18"	18"	18"	18",15"	18"	12"	15"
		560.00	550.00	548.00	544.00	557.00	551.67	555.00
PIPE OUTLET	"P"	24"	18"	18"	24"	18"	12"	15"
		560.00	550.00	548.00	544.00	557.00	551.67	555.00
BOTTOM OF UNITS	"O"	560.00	550.00	548.00	544.00	557.00	551.67	555.00
BOTTOM OF STONE ("O"–6")	"N"	559.50	549.50	547.50	543.50	556.50	551.17	554.50

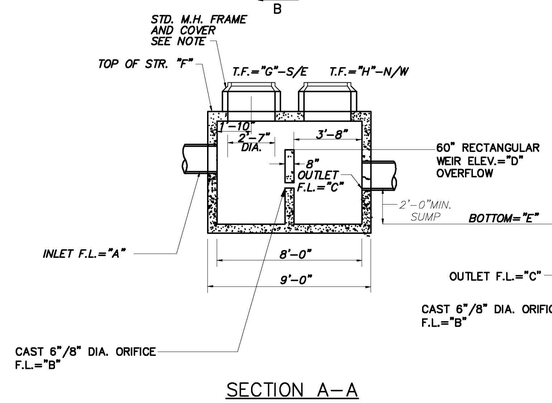
	#	IIA	IVA	VIA	VIIA	VIIIA	IXA	XA
INLET	"A"	24"	18"	18"	24"	18"	12"	15"
		560.00	550.00	548.00	544.00	557.00	551.67	555.00
ORIFICE (="O") *	"B"	560.00	550.00	548.00	544.00	557.00	551.67	555.00
OUTLET	"C"	18"	18"	15"	18"	15"	12"	15"
		559.90	550.00	547.74	544.00	556.35	551.67	554.00
WEIR ("B"+36")	"D"	563.00	553.00	551.00	547.81	560.00	554.67	558.00
BOTTOM ("C"–24")	"E"	557.90	548.00	545.74	542.00	554.35	549.67	552.00
TOP OF STR.	"F"	564.90	555.00	552.74	548.50	561.35	556.17	559.50
T.F. SOUTH OR EAST	"G"	567.55	556.27	556.66	549.57	563.30	556.67	561.20
T.F. NORTH OR WEST	"H"	567.45	556.21	556.75	549.55	563.50	556.70	561.40

* ALL ORIFICES ARE 6" EXCEPT FOR VIIIA = 8"

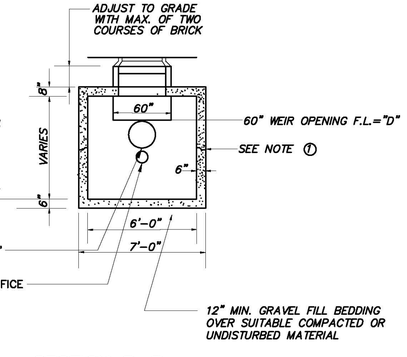


NOTES:

1. CONSTRUCTION JOINT – SEALED WITH 1" DIA. BUTYL RUBBER OR EQUIVALENT.
2. DESIGN LOADING – STANDARD UNITS: AASHTO H10-44. OPTIONAL UNITS: AASHTO HS20-44. STEEL REINFORCEMENT – ASTM A615, GRADE 60, 1" MIN. COVER. CONCRETE MINIMUM STRENGTH– 5,000 P.S.I. @ 28 DAYS. MAXIMUM HEIGHT OF EACH ADDITIONAL PIECE 4'-0".
3. MAXIMUM INSIDE HEIGHT FOR 2 PIECE CHAMBER 8'-0". ROOF AND SIDE WALL OPENINGS AS SPECIFIED.
4. ADJUST M.H. FRAME TO SUIT REQUIRED FIELD HEIGHT.



SECTION A–A



SECTION B–B

UNDERGROUND STORAGE OUTLET STRUCTURE # IIA, IVA, VIA, VIIA, VIIIA, IXA, & XA.

N.T.S.

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No.	Date	Description
1	03-24-2016	General

Revisions:

DETAILS
PREPARED FOR
STORRS LODGES, LLC
HUNTING LODGE ROAD
MANSFIELD, CONNECTICUT

Date: 03-18-2016 | Drawn by: CAD | Job no: 04161
Scale: AS NOTED | Checked by: DSZ | Sheet no: 6 OF 7

SD-6

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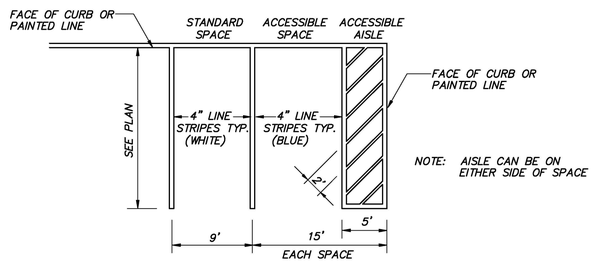
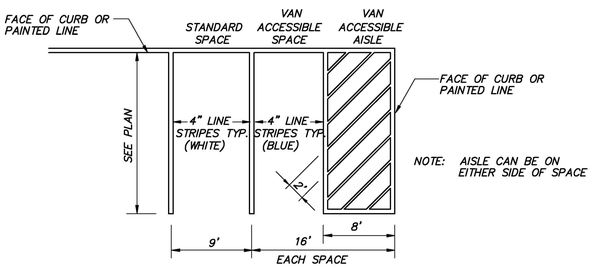


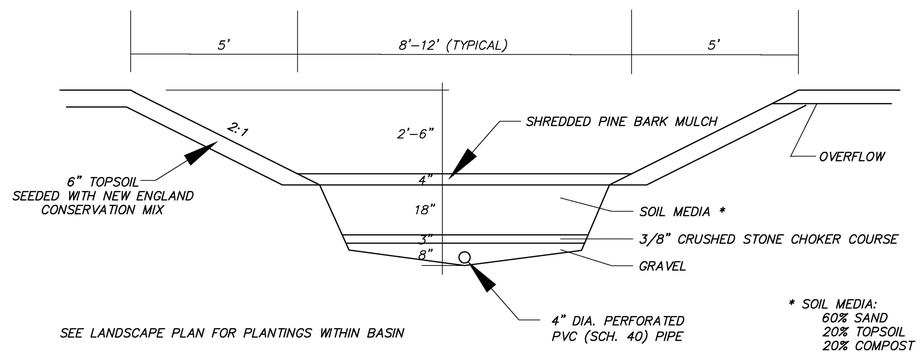
ACCESSIBLE PARKING SPACE LAYOUT

N.T.S.



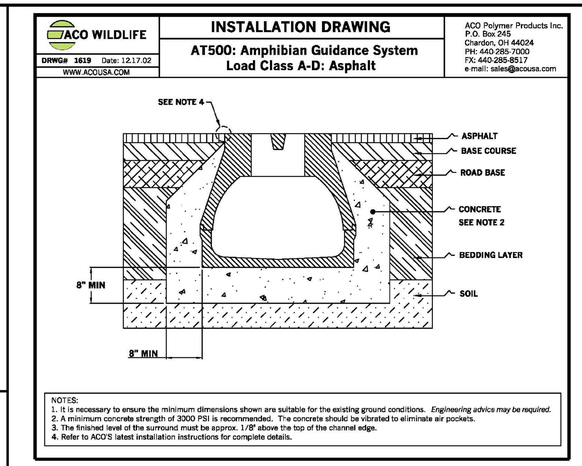
ACCESSIBLE VAN PARKING SPACE LAYOUT

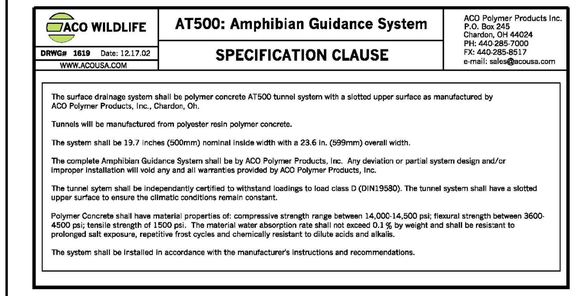
N.T.S.



BIO–RETENTION BASIN

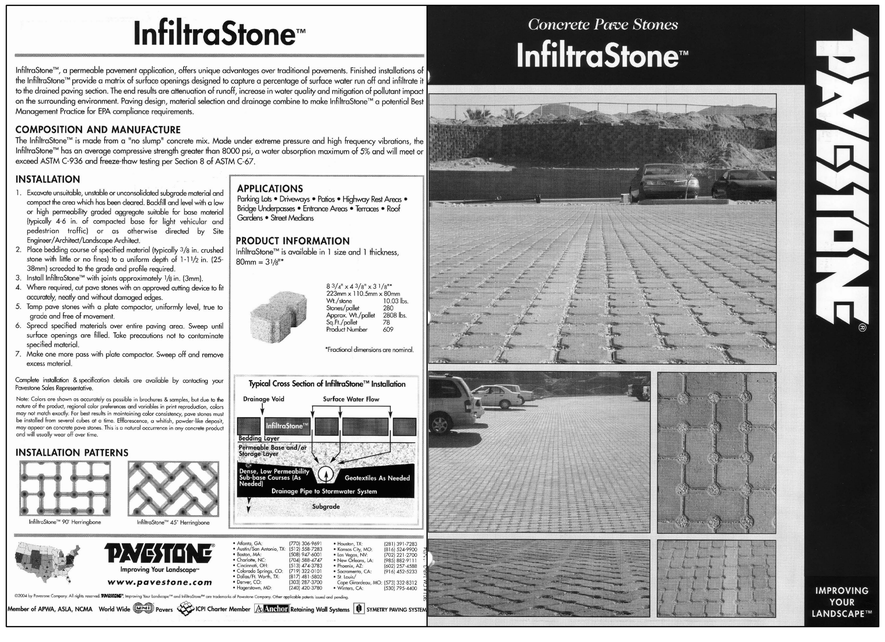
1"=2'





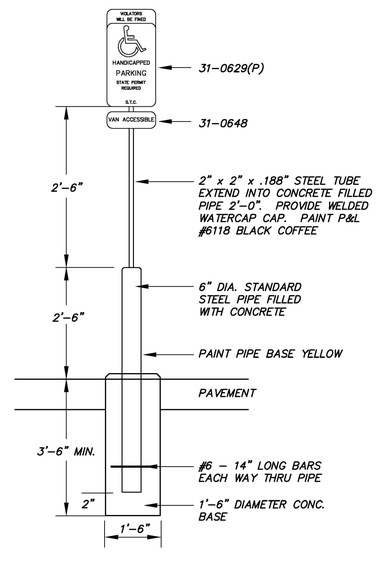
WILDLIFE TUNNEL INSTALLATION

N.T.S.



'PAVESTONE' PERVIOUS PAVEMENT SYSTEM

N.T.S.

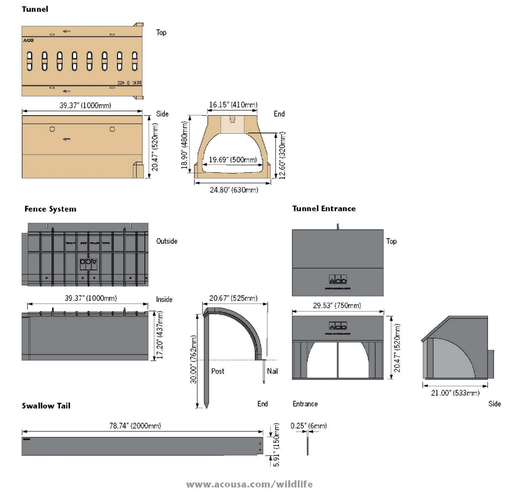


ACCESSIBLE SPACE SIGN POST/BASE

N.T.S.

ACO WILDLIFE

Description	Part No.	Length in. (mm)	Width in. (mm)	Height in. (mm)	Wgt lbs
Tunnel					
KT500 Tunnel	**11120**	39.37 (1000)	24.80 (630)	20.47 (520)	566.5
Fence System					
Fence	**99705**	39.37 (1000)	20.67 (525)	17.20 (437)	17.6
Post	**99708**	30.00 (762)	1.57 (70)	-	2.5
Nail (bag of 20)	**99710**	7.00 (178)	0.25 (6) dia	-	1.5
Tunnel Entrance					
AT500 tunnel entrance	**99712**	29.53 (750)	21.47 (545)	20.47 (520)	46.0
Swallow tail (optional)	**99707**	78.74 (2000)	0.25 (6)	5.91 (150)	8.4



WILDLIFE TUNNEL AND GUIDANCE FENCE

N.T.S.

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Revisions:

No.	Date	Description
1	03–24–2016	General

DETAILS
PREPARED FOR
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MANSFIELD, CONNECTICUT

Date: *03–18–2016* | Drawn by: *CAD* | Job no: *04161*
Scale: *AS NOTED* | Checked by: *DSZ* | Sheet no: *7 OF 7*

SD–7

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PROJECT DESCRIPTION:

The project site, The Lodges at Storrs, consists of a 45.93 acre parcel of undeveloped land located on the west side of Hunting Lodge Road, just south of the existing Carriage House Apartments. The applicant is proposing to construct a 692-bed student apartment complex consisting of 47 two story buildings and a 10,000 s.f. community building. The application includes on-site parking for approximately 558 vehicles. Best Management Practices (BMP's) are being employed on the drainage system. The crossing of the flagged wetlands from the main driveway out to Hunting Lodge Road is being accomplished using a pre-cast concrete arch bridge which minimizes the disturbance to the wetlands on the property.

CONSTRUCTION SEQUENCE:

In general, the overall project will follow the sequence below:

1. Contact "call before you dig" at 1-800-922-4455 at least 48 hours prior to the start of construction to have existing utilities marked.
2. A pre-construction meeting and authorization to proceed will be required prior to start of any construction, including demolition, removal of trees or stripping of land. Procedures for such pre-construction meeting and authorization to proceed shall be in accordance with Town and State requirements. The contractor is responsible for arranging this meeting with Town and State officials.
3. Install temporary traffic controls, construction fencing, as required, or as necessary to protect the public.
4. Install temporary soil erosion and sedimentation control measures as shown on the plan or as required to meet specific site conditions, including items listed below, prior to the start of any clearing, demolition or excavation.
5. Install sediment fence, hay bale check dams, and construction exits.
6. Stake clearing limits and flag trees to remain. No site clearing to begin until stakeout approved by the Town and Engineer.
7. Construct temporary sedimentation collection basins as directed by the Engineer.
8. Schedule and coordinate relocation of utilities, including water mains and other utilities indicated on the plans.
9. On Northwood Road and Hunting Lodge Road saw cut pavement and demolish pavement, curbing and landscaping required for installation of new utility services.
10. On Northwood Road install new water main and hydrants.
11. On Northwood Road install new sanitary sewer.
12. Complete site clearing and grubbing and begin rough grading.
13. Install borrow fill and grade pad sites for start of buildings and site improvements. Begin building foundations.
14. Begin installation of underground utilities.
15. Begin installation of the pre-cast concrete arch bridge crossing.
16. Install storm drainage structures and culverts, underground infiltration devices, and outlet structures. Install hay bales around drainage structures as they are completed.
17. Complete grading to subgrade.
18. Compact subgrade.
19. Place and regrade pavement base utilizing existing processed pavement material, as allowed, and additional gravel subbase and processed aggregate base as required.
20. Install pavement binder course and curbing.
21. Install concrete sidewalk, bike path, and other site amenities.
22. Install pavement wearing course.
23. Place topsoil and landscape materials.
24. Install pavement markings and signs.
25. Remove erosion controls after disturbed areas are landscaped and mulched or new lawn areas are stabilized, and as approved by the Town.
26. Remove sediment from storm drainage system and riprap aprons as required.
27. The approximate date for start of construction is the Fall of 2016 and the estimated completion date is the Summer of 2018.

EROSION CONTROL DEVICES:

Refer to the "Connecticut Guidelines For Soil Erosion And Sediment Control – 2002" (see Erosion and Sediment Control Note 3) when constructing erosion control devices shown on this plan.

HBEC – HAYBALE EROSION CHECKS shall be staked a minimum of five (5) feet from the base of disturbed slopes exceeding eight (8) feet in height, or at locations shown on the plans. Place haybales before starting a fill slope and after digging a cut slope. Heel haybales 4" into the soil. Stake haybales around the perimeter of all catch basins. Remove all sediment when deposits reach 1/2 bale height. Haybales must be replaced periodically.

SFEC – SEDIMENT FENCE EROSION CHECK: a synthetic textile barrier designed to filter sediment from surface water runoff. Placement shall be similar to HBEC and installation requires anchoring the fence bottom to prevent bypass. All sediment shall be removed if deposits reach one (1) foot in depth. Additional support (such as snow fence or wire fence) on the downhill face may be required to strengthen sediment fence in high flow locations.

CE – CONSTRUCTION EXIT: a broken stone pad providing a hard surface points where vehicles will leave the site. The construction exits reduce tracking of sediment into adjacent pavement. Excess sediment should be periodically removed from the stone surface.

RRPP – RIP RAP PLUNGE POOL: a riprap lined apron installed at a zero percent grade to absorb the initial impact of stormwater discharge from the storm drainage system and further reduce flow velocities to prevent erosion downstream. RROP is designed per the "Connecticut Department of Transportation, Drainage Manual – 2000"

RRSW – RIP RAP SWALE: a swale with rip rap lining installed to to absorb the energy of flowing stormwater and reduce flow velocities to prevent erosion of the channel.

FES – FLARED END SECTION: a precast concrete culvert or formed polyethylene end structure designed to spread runoff to greater width of flow.

EROSION AND SEDIMENT CONTROL NOTES

1. Disturbance of soil surfaces is regulated by State Law. All work shall comply with an approved "Erosion and Sediment Control Plan" to prevent or minimize soil erosion.
2. The installation and maintenance of erosion control devices is the responsibility of the land owner, developer, and the excavation contractor. Town officials shall be notified in writing of the name, address and telephone number of the individual responsible for this work (including any changes) at the required pre-construction conference.
3. The contractor shall use the "Connecticut Guidelines for Soil Erosion and Sediment Control" (2002), as amended as a guide in constructing the erosion and sediment controls indicated on these plans. The guidelines may be obtained from the Connecticut Department of Environmental Protection store, 79 Elm Street, Hartford, CT 06106-5127.
4. The contractor shall schedule operations to limit disturbance to the smallest practical area for the shortest possible time. Overall site disturbance shall be confined to those limits delineated on the plans.
5. The contractor is responsible for the timely installation, inspection, repair or replacement of erosion control devices to insure proper operation.
6. The contractor shall notify the design engineer of unsatisfactory erosion conditions not controlled by the erosion and sediment control plan and shall install additional measures as required.
7. All disturbed areas not covered by buildings, pavement, mulch or ground cover plantings shall be planted with grass.
8. Once 1/3 height occurs, accumulated sediment removed from erosion control devices is to be spread and stabilized in level, erosion resistant locations as general fill.
9. Special attention shall be given to the construction sequence outlined on the erosion and sediment control plan.
10. The contractor shall be responsible for cleaning any construction debris or sediment from existing roads as ordered by the Town and/or State, if any debris or sediment from construction activities enter onto these roadways.
11. Limit work within wetland areas to the least disturbance necessary for construction. Restore disturbed areas as closely as possible to their original natural state.
12. Additional dust control measures as specified in D.O.T. 816 Section 9.39, Section 9.42 and Section 9.43 shall be furnished by the contractor as site conditions warrant or as directed by Town or State officials.
13. The contractor is responsible for cleaning and removal of sediment and/or debris from the storm drainage system throughout the duration of the project (i.e. sumps, plunge pools, level spreaders, etc.)
14. Additional rolls of silt fence and haybales shall be maintained on site by the contractor for use during emergency conditions.
15. Due to the area of proposed disturbance, this project will require a stormwater permit from the Connecticut Department of Environmental Protection. A copy of this permit, and the required Stormwater Pollution Prevention Plan, shall be submitted to the town prior to the start of any construction.
16. The contractor is responsible for developing a final construction phasing plan submitted to the Engineer for approval prior to the start of site and/or off-site construction activities.

GENERAL NOTES:

1. Existing topography developed from aerial photogrammetrics and limited filed survey completed by F. A. Hesketh and Associates, Inc.
2. Bearings and coordinates depicted hereon refer to 1927 North American Datum (NAD 27).
3. Elevations depicted hereon are based on NGVD 29.
4. All work on this project shall be completed in conformance with the requirements of the various federal, State, and local permits issued for this project, including the Town of Mansfield Inland Wetland and Watercourses Commission permit and the Town of Mansfield Planning and Zoning Commission Site Plan and Special Permit approvals. The contractor is responsible for complying with the relevant conditons of approval/permits.
5. A pre-construction meeting and authorization to proceed will be required prior to start of any construction, including demolition, removal of trees or stripping of land. Procedures for such pre-construction meeting and authorization to proceed shall be in accordance with Town and State requirements. The contractor is responsible for arranging this meeting with Town and State officials.
6. Prior to any excavation the contractor shall verify all underground utilities by calling 1-800-922-4455 at least 48 hours in advance.
7. All work and materials to conform to Town of Mansfield standard specifications, D.O.T. Form 816 (as amended), custodial utility company specifications, the details shown on these plans, or the project specifications, as applicable.
8. Erosion and sedimentation control measures shall be installed and maintained in accordance with the plan, specifications, and the erosion and sedimentation control notes.
9. Drainage shall be maintained throughout the project so as not to cause flooding of roadways or damage to private property.
10. Connect all roof leaders into new storm sewer system.
11. Trees shall be flagged and approved, prior to removal.
12. Trees and vegetation identified to be saved shall be protected from construction equipment by suitable means approved by Town staff.
13. Removal of trees or other vegetation, or re-grading substantially different from that shown on the approved site plan, will not be permitted without prior authorization by the Town or State, as applicable.
14. No stumps are to be buried on site.
15. All debris shall be removed from the site by the contractor.
16. All exterior lighting shall not be directed onto abutting properties or roadways.
17. Handicapped accessible parking spaces shall be marked and signed in accordance with current state and town requirements.
18. Fire Lanes shall be marked and signed as required by the Fire Marshall. The contractor shall coordinate this work with the Fire Marshall prior to installation.

GENERAL GRADING NOTES:

1. Set frames of all manholes, catch basins, gas and water gates, hand holes, meter boxes, and all other utility appurtenances to match proposed finish grade.
2. On Northwood Road and Hunting Lodge Road, saw cut existing pavement along limits of work. construct pavement match detail to Town of Mansfield standards. Blend all new work to match existing.
3. Fine grade all areas to preclude ponding.
4. Grade transitions to roadways to maintain gutter flow, where present, and to preclude ponding.

SCHEDULE AND DESCRIPTION OF RESPONSIBILITY FOR MAINTENANCE OF THE ON-SITE STORM WATER SYSTEM:

1. Maintenance of the on-site storm water system is the responsibility of the property owner. This includes all biofilters, catch basins, stormceptor units, Stormtech infiltrators, system piping, manholes, roof leaders and system outfall and riprap.
2. The following schedule of maintenance shall be followed:

   a. In general, good housekeeping practices shall be incorporated into the routine site and facility maintenance plan to minimize deposition of sediment, litter and contaminants into the storm drainage system.

   b. Paved parking and loading areas and walks shall be swept of debris, sand, and litter at least twice annually, in particular, late spring after winter sanding operations, and in late fall after leaf litter cleanup.

   c. Biofilters, catch basins and stormceptor units shall be inspected annually, following spring site cleanup. Accumulated sediment and debris shall be removed and disposed of to approved off-site locations.

   d. Rip rap and crushed stone erosion control shall be inspected annually. Excess sediments shall be removed and repairs made when erosion is noted.
3. Maintenance records documenting system inspection and cleaning operations shall be maintained by the property owner and shall be made available for inspection by the Town as requested.

GENERAL UTILITY NOTES:

1. PVC drain pipe=sch. 40 PVC pipe, sewer pipe = SDR 35 PVC pipe w/ push-on gasketed joints.
2. CPE = corrugated polyethylene pipe conforming to CT DOT 816, M.08.01-25, type S.
3. The location of all utilities shown is approximate and are based on available as-built information from utility company records, the property owner, and limited survey data. All existing utilities may not be shown. The contractor is responsible for determining the exact location of all utilities on the site prior to the start of any construction activity and notifying the design site engineer of any adjustments to the plans which are necessary. Test pits will be required at all proposed utility crossings in order to determine underground utility locations and to identify potential conflicts with vertical and horizontal alignments shown on the plans. Test pits shall be completed by the contractor at his expense.
4. Contact "call before you dig" at 1-800-922-4455 to mark the location of all underground utilities at least 72 hours prior to start of construction.
5. Remove/abandon all existing utilities required for construction of site improvements whether or not shown on these plans. All work shall be in accordance with custodial utility company requirements.
6. Flow line and invert elevations of all storm and sanitary sewers must be coordinated with final architectural drawings. Notify design engineer of conflicts prior to start of construction.
7. All materials and installation per Town of Mansfield, CT DOT Form 816, or custodial utility company specification, as appropriate.
8. All new site utilities are to be installed underground unless indicated otherwise.
9. All utilities to be installed in accordance with utility company applicable requirements. Final location of utility connections is subject to revision by individual utility companies prior to the installation. The contractor is responsible for coordinating the work with the applicable utility companies.
10. Catch basins, manholes, and other drainage structures shall conform to CT DOT Form 816 Section M.08.02
11. Water service installation and existing water service termination is to be coordinated with CT Water Co. and UCONN facilities staff prior to the start of work by the contractor.
12. All work and materials for water main and service shall conform to UCONN specifications and requirements.
13. All water main and service piping shall be ANSI/AWWA C151/A21.51 C.L.D.I.P. Class 52, unless otherwise specified. All water service shall have a minimum cover of 4 1/2 feet.
14. All fittings and valves shall be mechanical joint and shall be restrained using joint retainer glands, and concrete thrust blocks, unless otherwise specified. All valves shall open left.
15. Fire hydrant locations shall be approved by the Mansfield Fire Marshall prior to installation. Coordination with the Fire Marshall is the responsibility of the contractor.
16. All work related to gas, electric, telephone and communication service shall be in accordance with the custodial utility company standards and specifications
17. All work and materials for sanitary sewer shall conform to UCONN specifications and requirements.

THE LODGES AT STORRS

FAH F. A. Hesketh & Associates, Inc.
6 Creamery Brook, East Granby, CT 06026
Civil & Traffic Engineers • Surveyors • Planners • Landscape Architects
Phone (860) 653-8000
Fax (860) 844-8600
e-mail mail@fahesketh.com

Revisions:		
No.	Date	Description

NOTES
PREPARED FOR
STORRS LODGES, LLC
HUNTING LODGE ROAD
MANSFIELD, CONNECTICUT

Date: 03-18-2016	Drawn by: CAD	Job no: 04161
Scale: N.T.S.	Checked by: DSZ	Sheet no: 1 OF 1

NT-1

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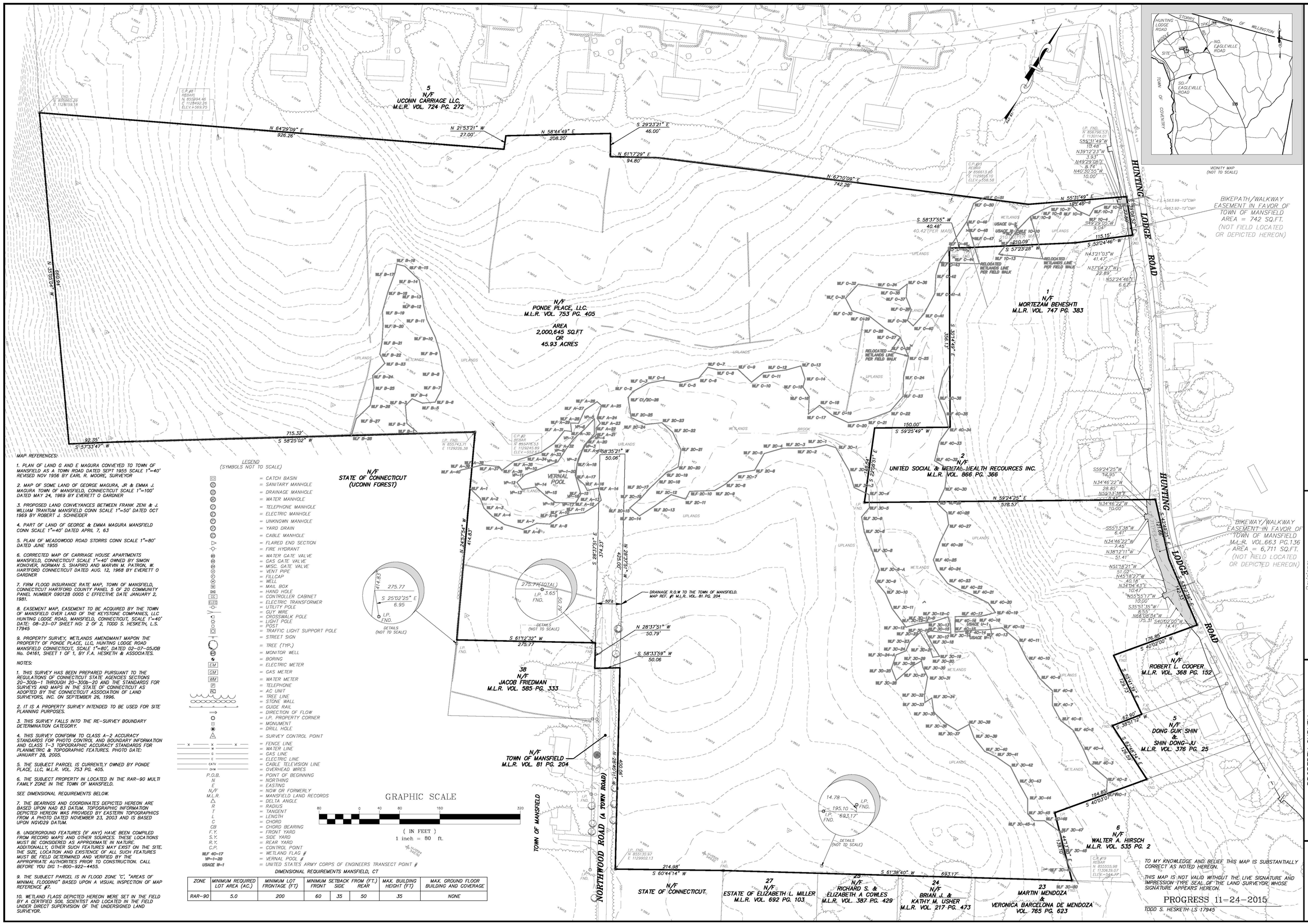

MAP REFERENCES:

1. PLAN OF LAND G AND E MAGURA CONVEYED TO TOWN OF MANSFIELD AS A TOWN ROAD DATED SEPT 1955 SCALE 1"=40' REVISED NOV 1956 BY EARL R. MOORE, SURVEYOR

2. MAP OF SOME LAND OF GEORGE MAGURA, JR & EMMA J. MAGURA TOWN OF MANSFIELD, CONNECTICUT SCALE 1"=100' DATED MAY 24, 1969 BY EVERETT O GARDNER

3. PROPOSED LAND CONVEYANCES BETWEEN FRANK ZENI & J. WILLIAM TRANTUM MANSFIELD CONN SCALE 1"=50' DATED OCT 1969 BY ROBERT J. SCHNEIDER

4. PART OF LAND OF GEORGE & EMMA MAGURA MANSFIELD CONN SCALE 1"=40' DATED APRIL 7, 63

5. PLAN OF MEADOWOOD ROAD STORRS CONN SCALE 1"=80' DATED JUNE 1955

6. CORRECTED MAP OF CARRIAGE HOUSE APARTMENTS MANSFIELD, CONNECTICUT SCALE 1"=40' OWNED BY SIMON KONOVER, NORMAN S. SHAPIRO AND MARVIN M. PATRON, W. HARTFORD CONNECTICUT DATED AUG. 12, 1968 BY EVERETT O GARDNER

7. FIRM FLOOD INSURANCE RATE MAP, TOWN OF MANSFIELD, CONNECTICUT HARTFORD COUNTY PANEL 5 OF 20 COMMUNITY PANEL NUMBER 090128 0005 C EFFECTIVE DATE JANUARY 2, 1981.

8. EASEMENT MAP, EASEMENT TO BE ACQUIRED BY THE TOWN OF MANSFIELD OVER LAND OF THE KEYSTONE COMPANIES, LLC HUNTING LODGE ROAD, MANSFIELD, CONNECTICUT, SCALE 1"=40' DATE: 08-23-07 SHEET NO: 2 OF 2, TODD S. HESKETH, L.S. 17945

9. PROPERTY SURVEY, WETLANDS AMENDMANT MAPON THE PROPERTY OF PONDE PLACE, LLC, HUNTING LODGE ROAD MANSFIELD CONNECTICUT, SCALE 1"=80', DATED 02-07-05JOB No. 04161, SHEET 1 OF 1, BY F.A. HESKETH & ASSOCIATES.

NOTES:

1. THIS SURVEY HAS BEEN PREPARED PURSUANT TO THE REGULATIONS OF CONNECTICUT STATE AGENCIES SECTIONS 20-300b-1 THROUGH 20-300b-20 AND THE STANDARDS FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT AS ADOPTED BY THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS, INC. ON SEPTEMBER 26, 1996.

2. IT IS A PROPERTY SURVEY INTENDED TO BE USED FOR SITE PLANNING PURPOSES.

3. THIS SURVEY FALLS INTO THE RE-SURVEY BOUNDARY DETERMINATION CATEGORY.

4. THIS SURVEY CONFORM TO CLASS A-2 ACCURACY STANDARDS FOR PHOTO CONTROL AND BOUNDARY INFORMATION AND CLASS T-3 TOPOGRAPHIC ACCURACY STANDARDS FOR PLANIMETRIC & TOPOGRAPHIC FEATURES. PHOTO DATE: JANUARY 28, 2005.

5. THE SUBJECT PARCEL IS CURRENTLY OWNED BY PONDE PLACE, LLC, M.L.R. VOL. 753 PG. 405.

6. THE SUBJECT PROPERTY IN LOCATED IN THE RAR-90 MULTI FAMILY ZONE IN THE TOWN OF MANSFIELD.

SEE DIMENSIONAL REQUIREMENTS BELOW.

7. THE BEARINGS AND COORDINATES DEPICTED HEREON ARE BASED UPON NAD 83 DATUM. TOPOGRAPHIC INFORMATION DEPICTED HEREON WAS PROVIDED BY EASTERN TOPOGRAPHICS FROM A PHOTO DATED NOVEMBER 23, 2003 AND IS BASED UPON NGVD29 DATUM.

8. UNDERGROUND FEATURES (IF ANY) HAVE BEEN COMPILED FROM RECORD MAPS AND OTHER SOURCES. THESE LOCATIONS MUST BE CONSIDERED AS APPROXIMATE IN NATURE. ADDITIONALLY, OTHER SUCH FEATURES MAY EXIST ON THE SITE. THE SIZE, LOCATION AND EXISTENCE OF ALL SUCH FEATURES MUST BE FIELD DETERMINED AND VERIFIED BY THE APPROPRIATE AUTHORITIES PRIOR TO CONSTRUCTION. CALL BEFORE YOU DIG 1-800-922-4455.

9. THE SUBJECT PARCEL IS IN FLOOD ZONE 'C', "AREAS OF MINIMAL FLOODING" BASED UPON A VISUAL INSPECTION OF MAP REFERENCE #7.

10. WETLAND FLAGS DEPICTED HEREON WERE SET IN THE FIELD BY A CERTIFIED SOIL SCIENTIST AND LOCATED IN THE FIELD UNDER DIRECT SUPERVISION OF THE UNDERSIGNED LAND SURVEYOR.

LEGEND
(SYMBOLS NOT TO SCALE)

- = CATCH BASIN
- = SANITARY MANHOLE
- = DRAINAGE MANHOLE
- = WATER MANHOLE
- = TELEPHONE MANHOLE
- = ELECTRIC MANHOLE
- = UNKNOWN MANHOLE
- = YARD DRAIN
- = CABLE MANHOLE
- = FLARED END SECTION
- = FIRE HYDRANT
- = WATER GATE VALVE
- = GAS GATE VALVE
- = MISC. GATE VALVE
- = VENT PIPE
- = FILL CAP
- = WELL
- = MAIL BOX
- = HAND HOLE
- = CONTROLLER CABINET
- = ELECTRIC TRANSFORMER
- = UTILITY POLE
- = GUY WIRE
- = CROSSWALK POLE
- = LIGHT POLE
- = POST
- = TRAFFIC LIGHT SUPPORT POLE
- = STREET SIGN
- = TREE (TYP.)
- = MONITOR WELL
- = BORING
- = ELECTRIC METER
- = GAS METER
- = WATER METER
- = TELEPHONE
- = AC UNIT
- = TREE LINE
- = STONE WALL
- = GUIDE RAIL
- = DIRECTION OF FLOW
- = I.P. PROPERTY CORNER
- = MONUMENT
- = DRILL HOLE
- = SURVEY CONTROL POINT
- = FENCE LINE
- = WATER LINE
- = GAS LINE
- = ELECTRIC LINE
- = CABLE TELEVISION LINE
- = OVERHEAD WIRES
- = POINT OF BEGINNING
- = NORTHING
- = EASTING
- = NOW OR FORMERLY
- = MANSFIELD LAND RECORDS
- = DELTA ANGLE
- = RADIUS
- = TANGENT
- = LENGTH
- = CHORD
- = CHORD BEARING
- = FRONT YARD
- = SIDE YARD
- = REAR YARD
- = CONTROL POINT
- = WETLAND FLAG #
- = VERNAL POOL #
- = UNITED STATES ARMY CORPS OF ENGINEERS TRANSECT POINT #

P.O.B.
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C.P.
WLF 40-17
VP-1-20
USACE W-1

DIMENSIONAL REQUIREMENTS MANSFIELD, CT

ZONE	MINIMUM REQUIRED LOT AREA (AC.)	MINIMUM LOT FRONTAGE (FT)	MINIMUM SETBACK FROM (FT.) FRONT	SIDE	REAR	MAX. BUILDING HEIGHT (FT)	MAX. GROUND FLOOR BUILDING AND COVERAGE
RAR-90	5.0	200	60	35	50	35	NONE

TO MY KNOWLEDGE AND BELIEF THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON.

THIS MAP IS NOT VALID WITHOUT THE LIVE SIGNATURE AND IMPRESSION TYPE SEAL OF THE LAND SURVEYOR, WHOSE SIGNATURE APPEARS HEREON.

PROGRESS 11-24-2015

TODD S. HESKETH LS 17945

F. A. Hesketh & Associates, Inc.
6 Creamery Brook, East Granby, CT 06026
Civil & Traffic Engineers · Surveyors · Planners · Landscape Architects
Phone (860) 653-8000
Fax (860) 844-8600
e-mail mail@fahesketh.com

No.	Date	Description
1	06-27-07	MISC
2	10-27-15	WETLANDS / TITLE UPDATED
3	03-18-16	SUBMITTAL / TITLE

Revisions:

PROPERTY SURVEY
PREPARED FOR
STORRS LODGES, LLC.
HUNTING LODGE ROAD
MANSFIELD, CONNECTICUT

Date: 02-07-05	Drawn by: RM	Job no: 04161	Sheet no: 1 OF 1
Scale: 1" = 80'	Checked by: TSH		

PS-1

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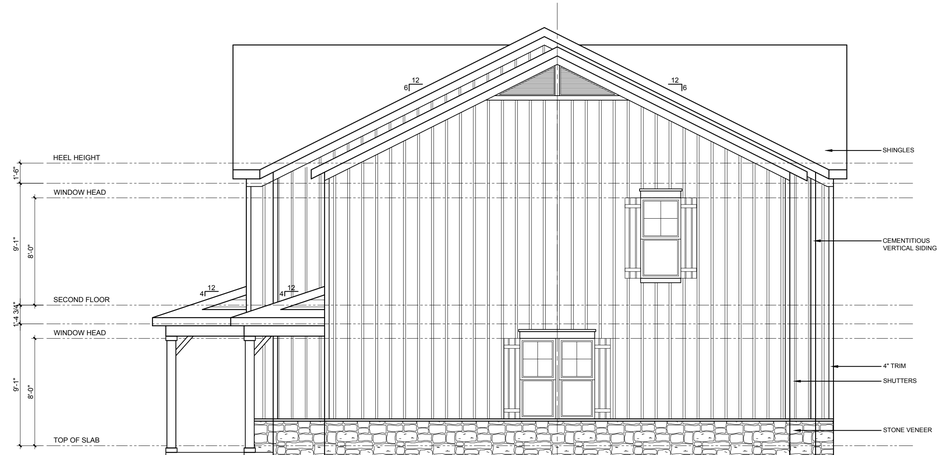
FRONT ELEVATION | SCALE: 3/16"=1'-0" | 1

REAR ELEVATION @ HIGH VIS. | SCALE: 3/16"=1'-0" | 2



SIDE ELEVATION @ HIGH VIS. | SCALE: 3/16"=1'-0" | 3

ktgy ARCHITECTURE+PLANNING

CLIENT:

EdR

COLLEGIATE HOUSING

CONSULTANT:

Consultant Name

Address 1
Address 2
P: ###.###.####
Website

SEAL

STORRS LODGE BUILDING A

CLIENT: EdR

REV	DATE	PRELIMINARY DESCRIPTION

DESIGN DELIVERABLE: _

ISSUE DATE:

PROJECT NUMBER: **20140673.00**

DRAWN BY: --

CHECKED BY: --

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SHEET TITLE:

FRONT AND REAR ELEVATIONS

SHEET NUMBER:

A-200

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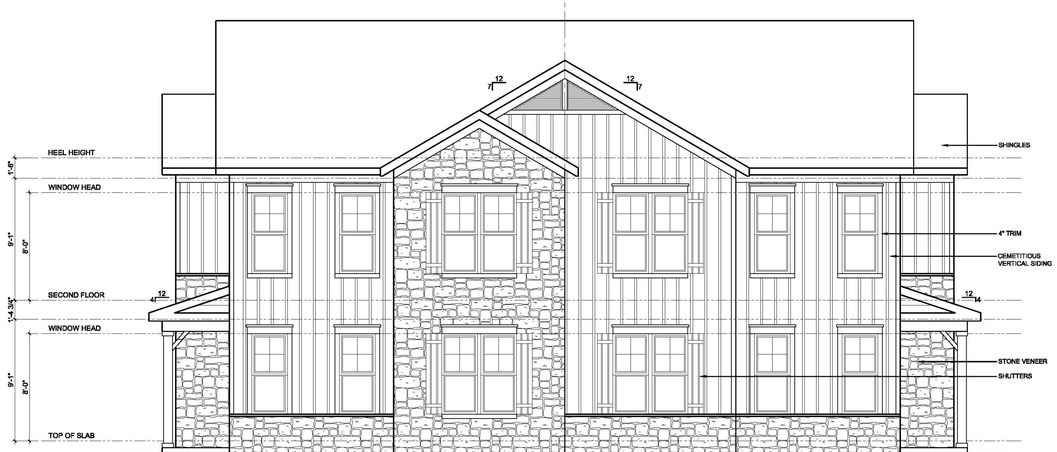
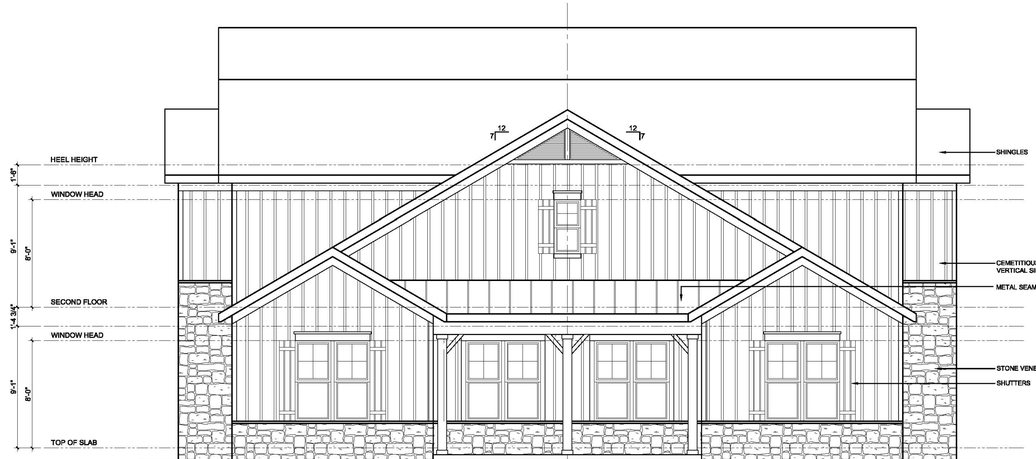
ELEVATION 3 | SCALE: 3/16"=1'-0" | 3



ELEVATION 2 | SCALE: 3/16"=1'-0" | 2



ELEVATION 1 | SCALE: 3/16"=1'-0" | 1

ktgy
ARCHITECTURE+PLANNING

CLIENT:

EdR
COLLEGIATE HOUSING

CONSULTANT:

Consultant Name
Address 1
Address 2
P: ###.###.####
Website

SEAL

STORRS LODGE BUILDING B

CLIENT: EdR

REV	DATE	DESCRIPTION
1	02/26/2016	PRELIMINARY

DESIGN DELIVERABLE: _

ISSUE DATE:

PROJECT NUMBER: 20140673.00

DRAWN BY: --

CHECKED BY: --

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SHEET TITLE:
ELEVATIONS

SHEET NUMBER:
A-200

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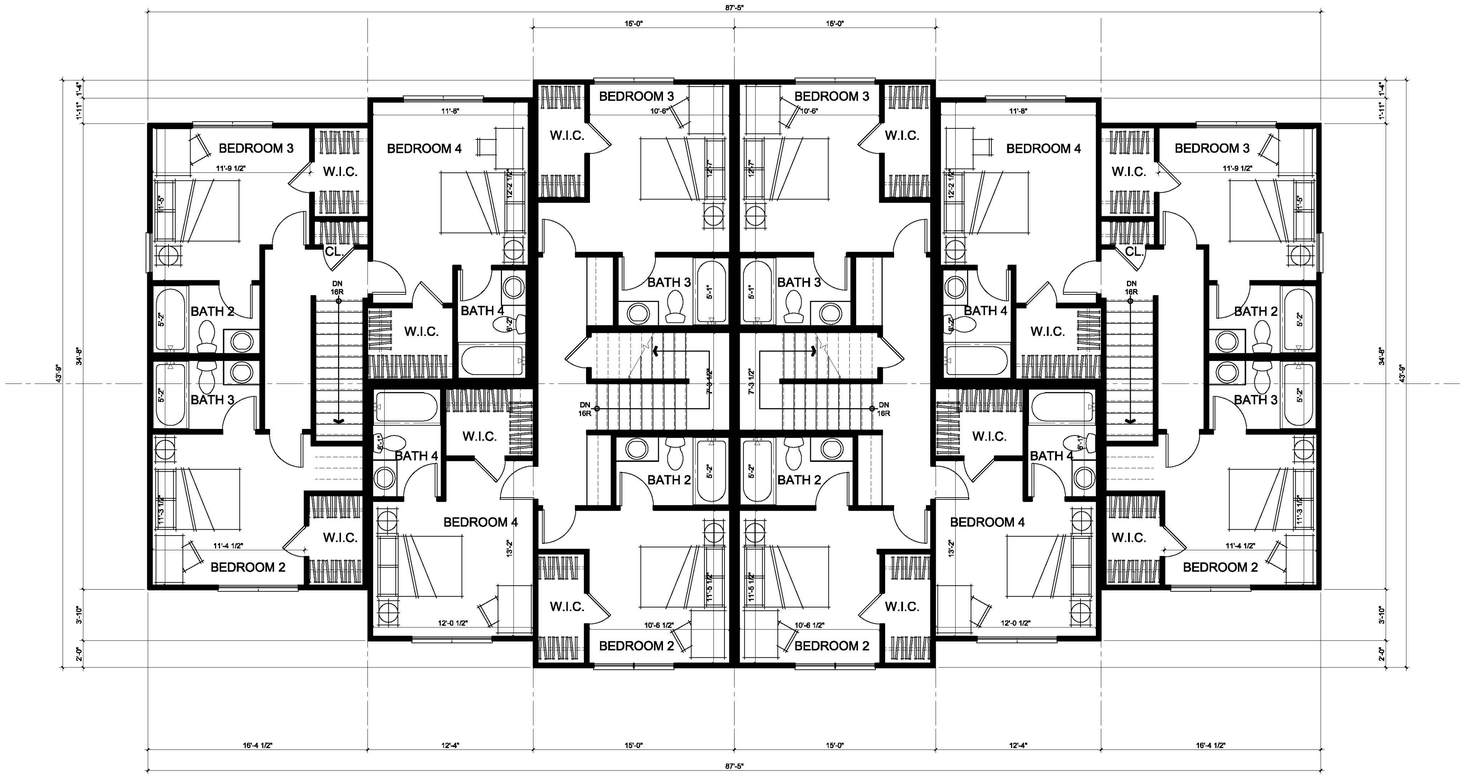
LOWER LEVEL PLAN | SCALE: 1/4"=1'-0" | 1



UPPER LEVEL PLAN | SCALE: 1/4"=1'-0" | 2

ktgy ARCHITECTURE+PLANNING

CLIENT:

EdR

COLLEGIATE HOUSING

CONSULTANT:

Consultant Name

Address 1
Address 2
P: ###.###.####
Website

SEAL

STORRS LODGE BUILDING A

_

CLIENT: EdR

REV	DATE	PRELIMINARY DESCRIPTION

DESIGN DELIVERABLE: _

ISSUE DATE:

PROJECT NUMBER: 20140673.00

DRAWN BY: --

CHECKED BY: --

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SHEET TITLE:

LOWER LEVEL PLAN

SHEET NUMBER:

A-100

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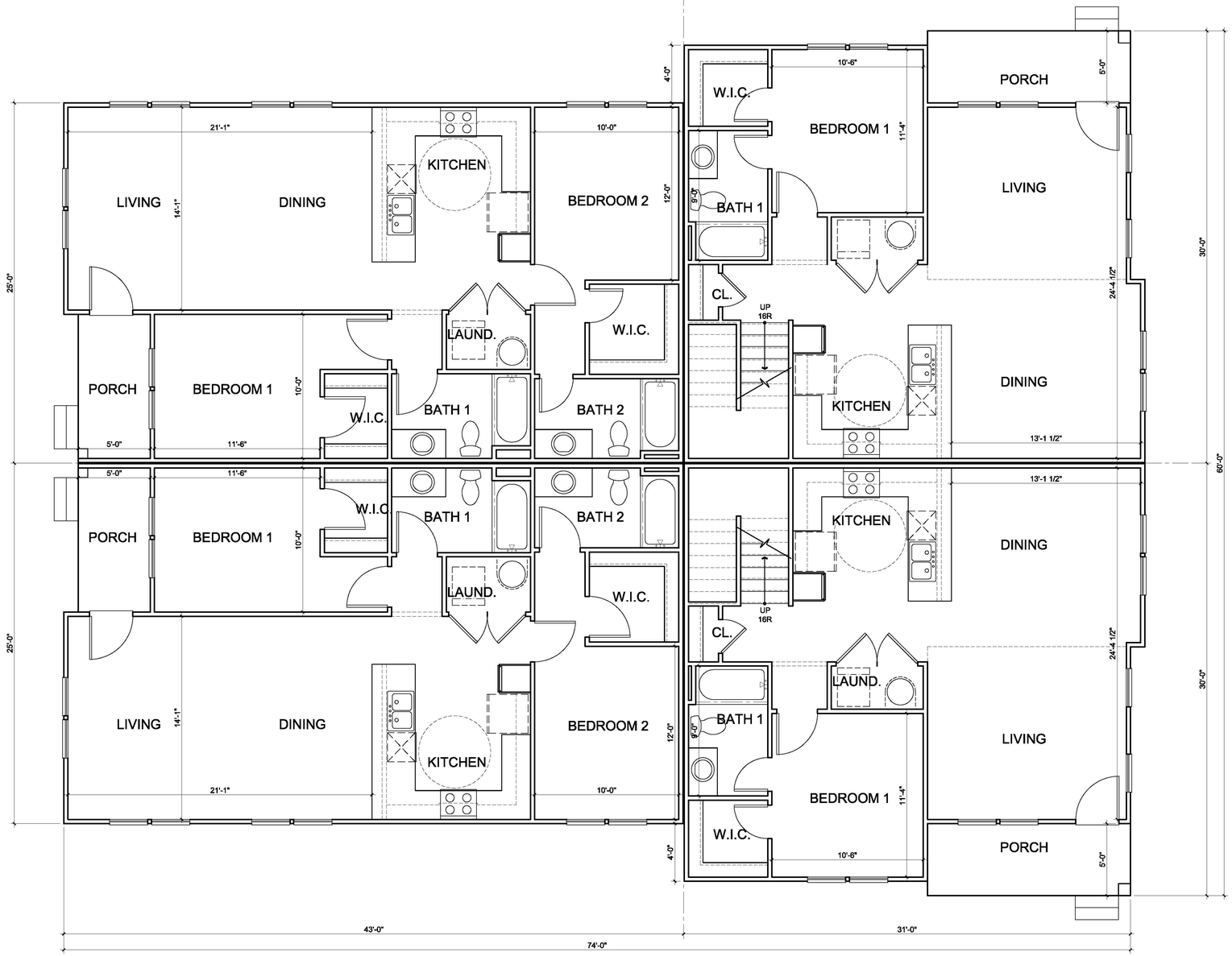

LOWER LEVEL PLAN | SCALE: 1/4"=1'-0" | 1

ktgy ARCHITECTURE+PLANNING

CLIENT:

EdR
COLLEGIATE HOUSING

CONSULTANT:

Consultant Name
Address 1
Address 2
P: ###.###.####
Website

SEAL

STORRS LODGE BUILDING B

CLIENT: EdR

REV	DATE	DESCRIPTION
1	02/26/2016	PRELIMINARY

DESIGN DELIVERABLE: --

ISSUE DATE:

PROJECT NUMBER: 20140673.00

DRAWN BY: --

CHECKED BY: --

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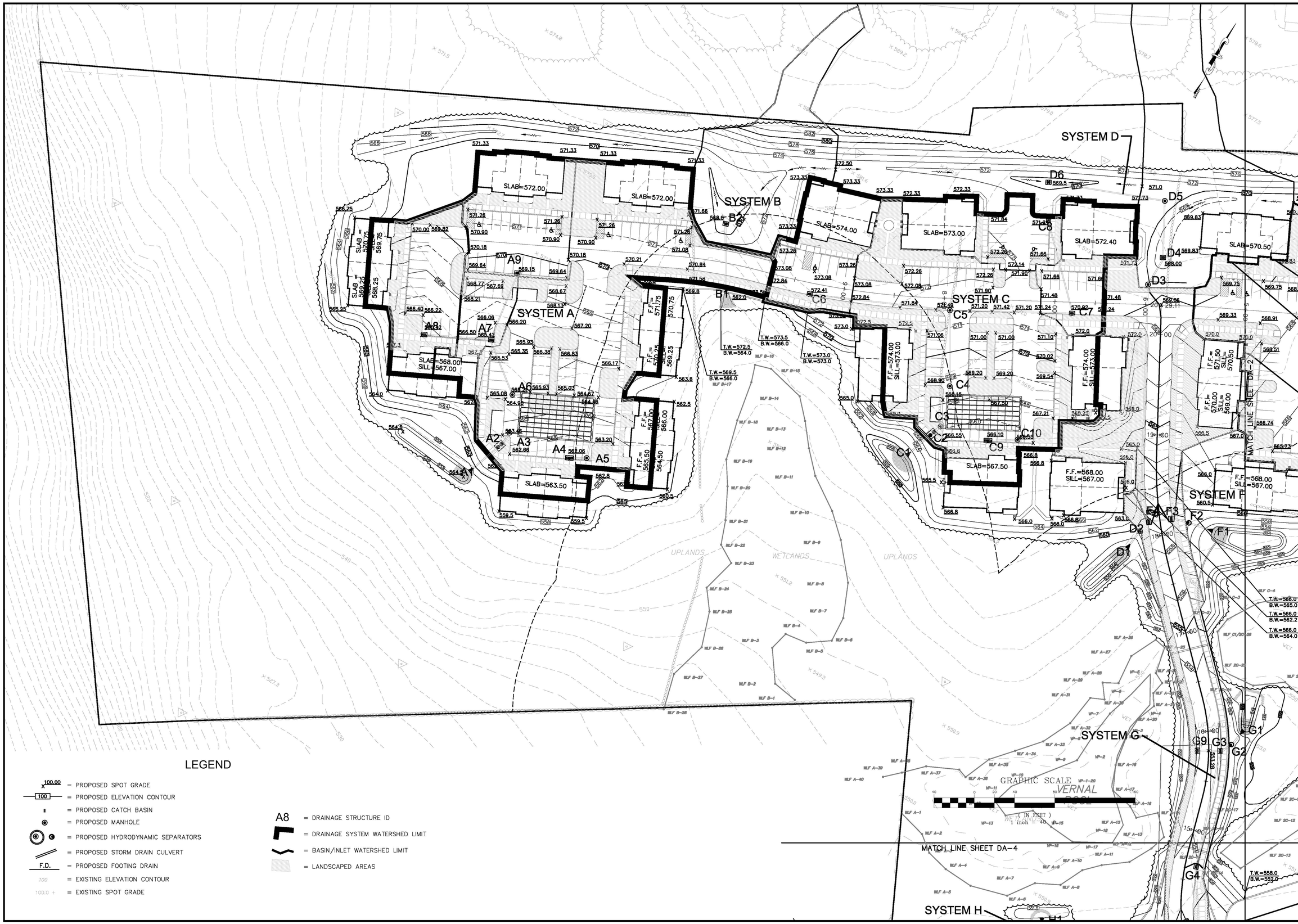
SHEET TITLE:

LOWER LEVEL PLAN

SHEET NUMBER:

A-100

T:\Single Family\EdR\20140673_Storrs Lodge\00_Building B\Design\Building B Plans.dwg 2/26/2016 4:48:27 PM



LEGEND

100.00	= PROPOSED SPOT GRADE
100	= PROPOSED ELEVATION CONTOUR
	= PROPOSED CATCH BASIN
	= PROPOSED MANHOLE
	= PROPOSED HYDRODYNAMIC SEPARATORS
	= PROPOSED STORM DRAIN CULVERT
F.D.	= PROPOSED FOOTING DRAIN
100	= EXISTING ELEVATION CONTOUR
100.0 +	= EXISTING SPOT GRADE
A8	= DRAINAGE STRUCTURE ID
	= DRAINAGE SYSTEM WATERSHED LIMIT
	= BASIN/INLET WATERSHED LIMIT
	= LANDSCAPED AREAS

F. A. Hesketh & Associates, Inc.
6 Creamery Brook, East Granby, CT 06026
Civil & Traffic Engineers · Surveyors · Planners · Landscape Architects
Phone (860) 653-8000
Fax (860) 844-8600
e-mail mail@heskethc.com

No.	Date	Description

Revisions:

DRAINAGE AREA MAP

PREPARED FOR

STORRS LODGES, LLC

HUNTING LODGE ROAD

MANSFIELD, CONNECTICUT

Date: 03-24-2016	Drawn by: RJK	Job no: 04161	
Scale: 1" = 40'	Checked by: DSZ	Sheet no: 1 OF 4	

DA-1

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No.	Date	Description

Revisions:

DRAINAGE AREA MAP
PREPARED FOR
STORRS LODGES, LLC
HUNTING LODGE ROAD
MANSFIELD, CONNECTICUT

Date: 03-24-2016 | Drawn by: RJK | Job no: 04161
Scale: 1" = 40' | Checked by: DSZ | Sheet no: 2 OF 4

DA-2

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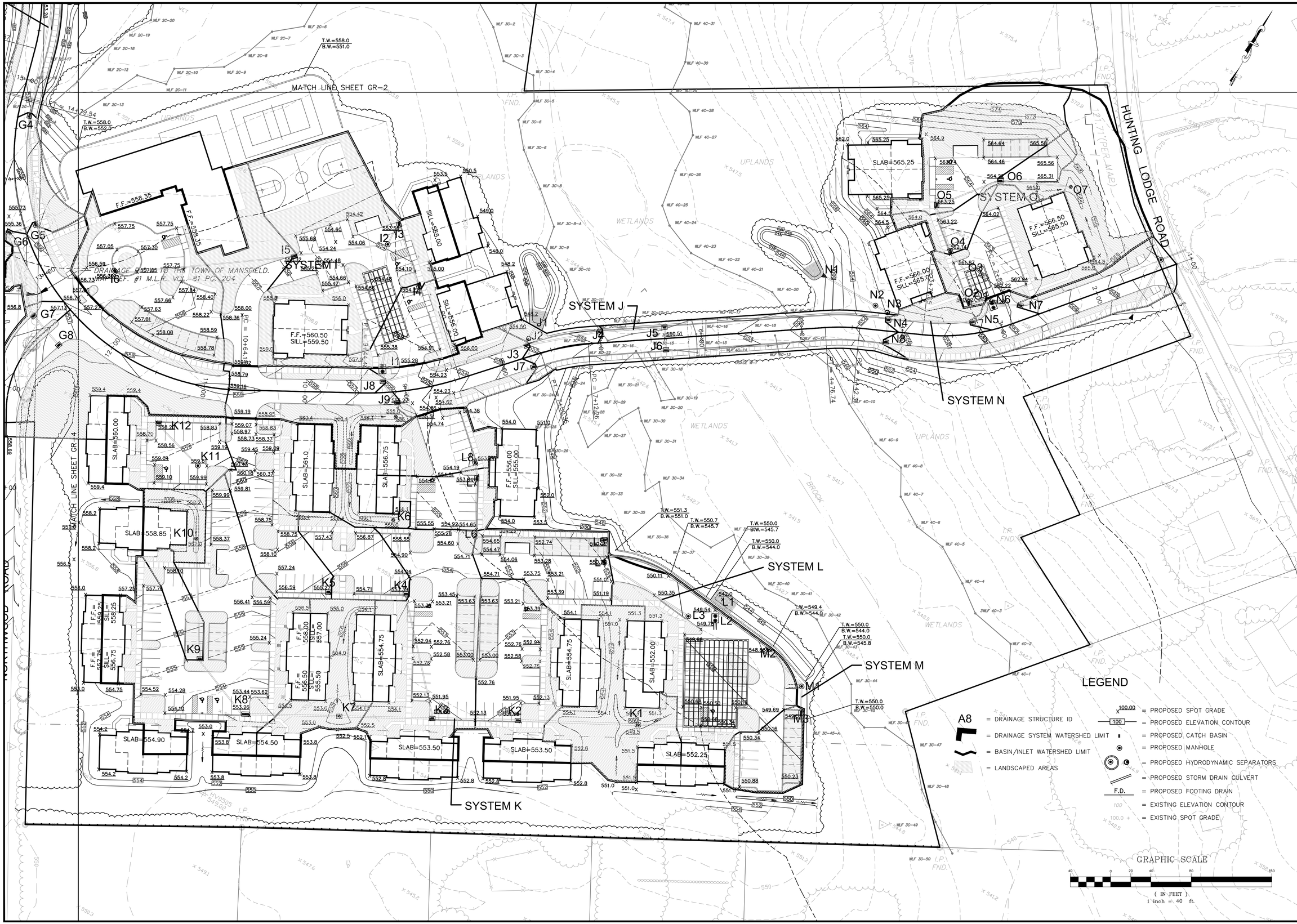

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No.	Date	Description

Revisions:

DRAINAGE AREA MAP

PREPARED FOR

STORRS LODGES, LLC

HUNTING LODGE ROAD

MANSFIELD, CONNECTICUT

Date: 03-24-2016	Drawn by: RJK	Job no: 04161	
Scale: 1" = 40'	Checked by: DSZ	Sheet no: 3 OF 4	

DA-3

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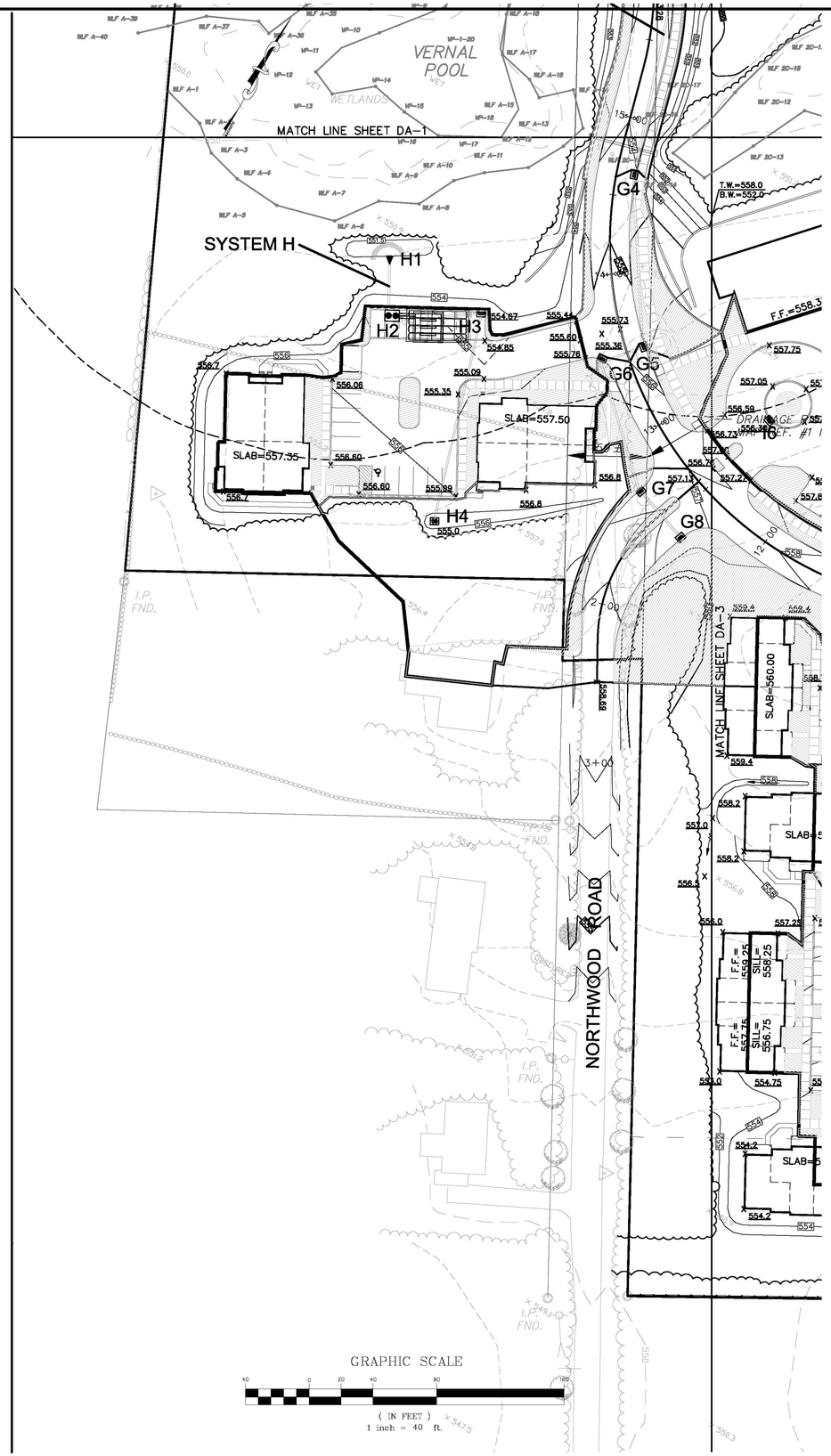
LEGEND

- 100.00 = PROPOSED SPOT GRADE
- 100 = PROPOSED ELEVATION CONTOUR
- = PROPOSED CATCH BASIN
- = PROPOSED MANHOLE
- = PROPOSED HYDRODYNAMIC SEPARATORS
- = PROPOSED STORM DRAIN CULVERT
- F.D. = PROPOSED FOOTING DRAIN
- 100 = EXISTING ELEVATION CONTOUR
- 100.0 + = EXISTING SPOT GRADE
- A8 = DRAINAGE STRUCTURE ID
- = DRAINAGE SYSTEM WATERSHED LIMIT
- = BASIN/INLET WATERSHED LIMIT
- = LANDSCAPED AREAS



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No.	Date	Revisions: Description

DRAINAGE AREA MAP
PREPARED FOR
STORRS LODGES, CT
HUNTING LODGE ROAD
MANSFIELD, CONNECTICUT

Date: 03-24-2016	Drawn by: RJK	Job no: 04161	
Scale: 1" = 40'	Checked by: DSZ	Sheet no: 4 OF 4	

DA-4

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ENGINEERING DESIGN
AND
DRAINAGE REPORT

THE LODGES AT STORRS
MANSFIELD, CT

Prepared for:

Storrs Lodges, CT
Mansfield, CT
Applicant

Prepared by:

F. A. Hesketh
& Associates, Inc.

6 Creamery Brook
East Granby, CT 06026

860-653-8000

March 18, 2016

FAHA Project #04161

STATE OF CONNECTICUT
DAVID S. ZIAKS
13336
LICENSED
PROFESSIONAL ENGINEER

ENGINEERING DESIGN
AND
DRAINAGE REPORT

Prepared For

STORRS LODGES, LLC
MANSFIELD, CT

March 18, 2016

A. INTRODUCTION

The project site consists of a 45.93-acre parcel of land located on the west side of Hunting Lodge Road, as shown on the attached Property Survey, Sheet PS-1. The developer is proposing to develop the property under the zoning requirements for a DMR-Design Multiple Residence. The property is currently zoned RAR-90.

An application will be been made to the Town of Mansfield for an Inland Wetlands Permit, Zone Change and Special Use-Site Plan approvals for a proposed multi-family development to consist of 218 residential rental units for UCONN students. Under the current proposed Development Plan, the property will be developed with a mix of 47 two-story apartment buildings and a community center building with outdoor recreation area, as shown on the attached Master Plan, Sheet MA-1.

B. WATER SUPPLY

The project will be serviced by extension of the existing UCONN/CT Water public water supply system located in Northwood Road and Hunting Lodge Road through conventional service connections to the property. Fire hydrants will be provided throughout the development at the locations specified by the Mansfield Fire Marshal and water company personnel. All work and materials will conform to utility company standard water service specifications.

C. SANITARY SEWAGE DISPOSAL

The project will be serviced by extension of the existing UCONN sanitary sewer system located in Northwood Road through conventional service connections to the property. The applicant is currently reviewing with UCONN utility personnel the scope of public improvements required to the existing sanitary pumping station located to the south near Eagleville Road in order to properly accommodate the additional wastewater generated by the project. Wastewater generated from the Northwood Road residential area is pumped up Eagleville Road via a force main towards the UCONN campus to the

university's wastewater treatment plant for disposal. All work and materials will conform to UCONN sanitary sewer design specifications.

D. ELECTRIC, TELEPHONE and OTHER UTILITY SERVICES

The site will be serviced by underground connections to the public electrical and communication utility companies using standard service extensions to the existing systems located in Northwood Road and Hunting Lodge Road. All work and materials will conform to the applicable utility company specifications. The applicant is also in discussions with the gas company on the feasibility of providing gas service to the site.

E. ON-SITE STORM DRAINAGE DESIGN

The storm sewer collection system proposed for the project is comprised for the most part of a conventional catch basin and pipe system connected to underground infiltration systems and bio-retention treatment basins and swales at each of the outlets. The system design is based on a 10-year design storm using the Rational Method. All materials and equipment will follow Town of Mansfield and ConnDOT design specifications for small drainage collection systems.

The design goals for the on-site storm sewer system are as follows:

- Provide a system that has the hydraulic capacity for the 10-year design storm
- Create multiple discharge points around the Project Site to replicate existing runoff patterns to receiving wetlands and watercourses and the on-site vernal pool
- Create a Treatment Train that will provide a minimum of 80% TSS removal
- Provide for the necessary Water Quality Volume (WQV) and Groundwater Recharge Volume (GRV)
- Implement BMP and LID design techniques
- Provide outlet protection to minimize erosion issues and provide final treatment of runoff before discharge downstream

The overall Stormwater Management Plan for the project includes the implementation of Best Management Practices (BMP's) with Low Impact Design (LID) techniques to produce a Treatment Train to treat runoff consistent with the guidelines recommended by CTDEEP, as follows:

- Implementation of a comprehensive routine site cleaning and maintenance program
- Use of permeable paver units in selected overflow parking space areas
- Pre-cast catch basins with 4-foot precast sumps and hooded outlets
- Use of a combination of underground infiltration systems, bio-retention basins and in-line hydrodynamic separator structures prior to outlet discharge for primary treatment, along with the use of permeable pavers, flared end sections, and level spreaders for secondary treatment to meet the design goals of 80% TSS removals, Water Quality Volume (WQV) and Groundwater Recharge Volume (GRV)
- Discharge of roof leaders to multiple splash blocks around the buildings and connection to the underground infiltrator systems to the extent possible to promote infiltration

F. MACRO WATERSHED ANALYSIS

In accordance with Town Engineering Requirements, a comprehensive drainage and watershed analysis was completed. The computer printout for the macro analysis for the proposed Stormwater Management Plan is included in Appendix A. The hydrologic analysis and stormwater routing for the project site was completed using the software package Hydraflow by Intelisove utilizing the 2 thru 100-year storm events.

The purpose of the macro study was to determine the effect of stormwater runoff generated by the development on downstream watersheds and the need to incorporate detention and/or retention facilities in the various on-site sub-watersheds. The roughly 98-acre± Study Area falls partially within the watershed for Eagleville Brook and partially within the watershed for Cedar Swamp Brook. Eagleville Brook has a total watershed of approximately 2.4 sq. miles and Cedar Swamp Brook has a much larger watershed. Both brooks are tributary to the Willimantic River.

The limits of the Study Area under existing and proposed conditions are shown on the attached Watershed Maps (WS-1 and WS-2), Scale 1"=100'. In addition to the Project Site, the Study Area includes portions of neighboring parcels that discharge runoff to the site including a small watercourse tributary to Eagleville Brook that enters the northeasterly portion of the site and flows through the property to the south where is continues to an existing 24" drainage culvert under Eagleville Road to Eagleville Brook.

Eagleville Brook is listed as an impaired watercourse by CTDEEP. Both Eagleville Brook and Cedar Swamp Brook are rated as B/A or B/AA water quality, meaning that

the natural water quality is or may be threatened. Concerns with Eagleville Brook from both water quality and hydrological perspectives are well documented in several published studies, some of which remain ongoing. In addition, neighbors to the south of the project site down to Eagleville Road have expressed concerns with the effects of possible increases in flow caused by the development that could further exacerbate existing localized drainage issues they currently experience on their properties.

In order to assess the potential impacts to the downstream watersheds, the Study Area was divided into several subwatershed areas for both existing and proposed conditions. Each subwatershed area was analyzed separately and then combined to determine peak design flow at Design Points "X", "Y' and "Z". Under Existing Conditions, the Study Area (see Sheet WS-1) was broken up into nine (9) sub-watershed areas (A thru I) comprised of the Project Site (except for the westerly most portion of the property outside the development area), the portion of Carriage House Apartments to the north and residential properties to the east of Hunting Lodge Road that drain to the Project Site, and portions of the residential properties south of the Project Site down to Eagleville Road.

Under Proposed Conditions, the Study Area (see Sheet WS-2) is broken up similar to the Existing Conditions model. The Project Site is further broken up into 24 sub-watersheds that follow the drainage patterns created by the grading and drainage system layout in the proposed development.

Design Point "X" is located at the southerly side of the existing culverts under Eagleville Road. Design Point "Y" is located at the westerly portion of the site and indicates runoff to the Cedar Swamp Watershed. Design Point "Z" is located along the southerly property line of the Project Site at the point where the watercourse intersects the property line.

No credit was taken in the macro model calculations for infiltration or other LID design techniques that are included in the proposed site drainage system design. To be conservative, the drainage model treats all pavement types as impervious. The actual peak rates of runoff generated for all storm events will therefore be actually less than projected in the macro model results.

The goals of the Stormwater Management Plan are as follows:

- Implement treatment systems to meet CTDEEP Water Quality standards

- Match or reduce peak flow rates for all design storm events to the Eagleville Brook Watershed analyzed at Design Points "X" and "Z"
- Minimize any increase in peak flow rates for all design storm events to the Cedar Swamp Watershed to a negligible amount

Results and Conclusion

Initial modeling efforts indicated that substantial detention/retention capacity was needed for the drainage systems discharging to both watersheds in order to meet the goals of the design. Starting with Design Point "Y" the results of the macro hydraulic computer modeling indicate that the peak flow rates from the Project Site for the 2 thru 100-year storm events will be essentially maintained to the Cedar Swamp Brook Watershed. If you factor in the positive effects of the proposed infiltration system, natural storage of the downstream wetland corridor and the large heavily wooded upland along the entire westerly side of the site, peak flow rates, particularly for the more frequent storm events, will be considerably reduced under Proposed Conditions.

At the downstream Design Point "X" at Eagleville Road, there is very little change to peak flow rates and essentially no change to inlet elevations at the town owned culverts under the road. Therefore, there will be no measurable impact to the downstream Eagleville Brook watershed or the existing town drainage system.

At Design Point "Z", the model indicates there will be a measurable reduction in peak flow rates leaving the property for all storm events. Again, when you factor in effects of the infiltration system and other LID techniques incorporated into the analysis, there will a considerable reduction in peak flow leaving the site at the southerly property line under Proposed Conditions.

In conclusion, the model results indicate that all goals of the Stormwater Management Plan have been accomplished with the proposed design.

Water Quality Volume (WQV), Groundwater Recharge Volume (GRV), Treatment Train Analysis

The calculations provide a summary of the Water Quality Volume (WQV) calculations completed and indicates that more than sufficient capacity is provided through the combination of volumes in the infiltration systems and bio-retention basins.

With regards to Groundwater Recharge Volume (GRV), the underlying soil conditions in the development areas on the property fall generally as Group B soils meaning that they are conducive to groundwater infiltration techniques. The calculations provide a summary of the GRV calculations completed and indicate that more than sufficient capacity is provided through the combination of volumes in the infiltration systems.

Treatment Train Efficiency Calculations for the portion of the new drainage system discharging to the basins are attached. The TSS removal rate was determined to exceed the CTDEEP minimum requirement of 80%.

G. DRIVEWAY DESIGN AND WETLAND CROSSINGS

In order to minimize impervious coverage, proposed driveway widths are limited to 24 feet. On the main driveway from Hunting Lodge Road, the applicant is proposing to use a pre-cast concrete arch bridge with block retaining walls on both sides to minimize the footprint of the embankment and span the wetland corridor, as illustrated on Sheet SDD-1. The proposed site driveway is located over what appears to be the remains of a gravel driveway that once served the property. There is a natural breech in the existing filled embankment that allows the watercourse to pass through. This does create some ponding upstream of the crossing that the project wetlands consultant has recommended not be altered. The proposed crossing design eliminates any disturbance to the existing watercourse and minimizes the need to fill the adjoining wetland areas.

H. SOIL EROSION CONTROL PLAN

A soil and erosion control plan has been prepared in accordance with town and ConnDEP requirements. Prior to the start of site construction, the limits of clearing will be carefully staked out in the field and reviewed with town staff. Silt fencing will be installed around the entire perimeter of the site. Once the site clearing has been completed, rough grading of the site and installation of site improvements can commence.

The project contract specifications will require the contractor to prepare sub-phasing plans as the work progresses incorporating interim erosion control measures at every step. These plans will be submitted to the project engineer and construction manager for review and concurrence throughout the duration of site construction.

I. FEMA FLOOD ANALYSIS

According to the current FEMA FIRM for Eagleville Brook, no portion of the property falls within the Zone A (100-year BFE storm) limits.

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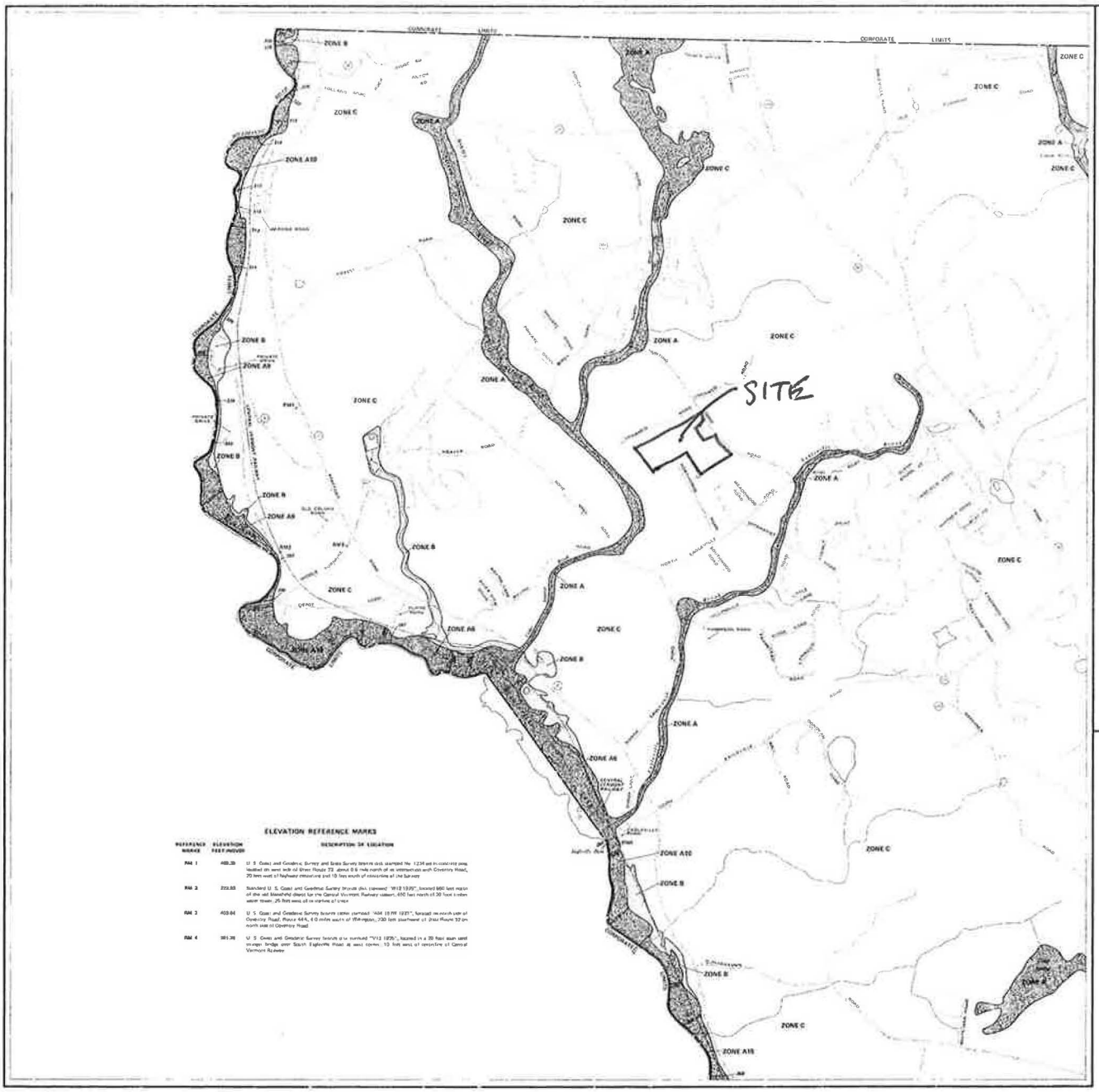


ELEVATION REFERENCE MARKS

REFERENCE MARKS	ELEVATION FEET (NGVD)	DESCRIPTION OF LOCATION
RM 1	488.39	U. S. Coast and Geodetic Survey and State Survey bench disk stamped No. 1234 set in concrete peg, located on west side of Main Route 32, about 0.6 mile north of an intersection with Coventry Road, 20 feet west of highway centerline and 10 feet south of centerline of the Survey
RM 2	222.93	Standard U. S. Coast and Geodetic Survey bronze disk (stamped "W12 1939"), located 660 feet north of the old township depot for the Central Vermont Railway station, 650 feet north of 30 foot trolley water tower, 25 feet west of centerline of track
RM 3	403.04	U. S. Coast and Geodetic Survey bronze tablet (stamped "AM 15 M 1931"), located on north side of Coventry Road, Route 44A, 4.0 miles south of Willington, 730 feet southwest of State Route 32 on north side of Coventry Road
RM 4	381.28	U. S. Coast and Geodetic Survey bronze disk stamped "V12 1935", located in a 30 foot steel and concrete bridge over South Eagleville Road at west corner, 10 feet west of centerline of Central Vermont Railway

KEY TO MAP

ZONE A

ZONE B

ZONE C

*EXPLANATION OF ZONE DESIGNATIONS

ZONE	EXPLANATION
A	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
A0	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
AH	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; ponding areas; average depths of inundation are shown, but no flood hazard factors are determined.
A1-A30	Areas of 100-year flood; base flood elevations and flood hazard factors determined.
A99	Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors not determined.
A	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
V	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined.
V1-V30	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.

NOTES TO USER

Refer to the FLOOD INSURANCE RATE MAP EFFECTIVE date shown on this map to determine when actuarial rates apply to structures in the zones where elevations or depths have been established.

To determine if flood insurance is available in the community, contact your insurance agent or call the National Flood Insurance Program, at (800) 638-6620, or (800) 424-8872.

INITIAL IDENTIFICATION
JANUARY 9, 1979

FLOOD HAZARD BOUNDARY MAP REVISIONS
OCTOBER 29, 1979
JUNE 26, 1980

FLOOD INSURANCE RATE MAP EFFECTIVE
JANUARY 2, 1981

FLOOD INSURANCE RATE MAP REVISIONS

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

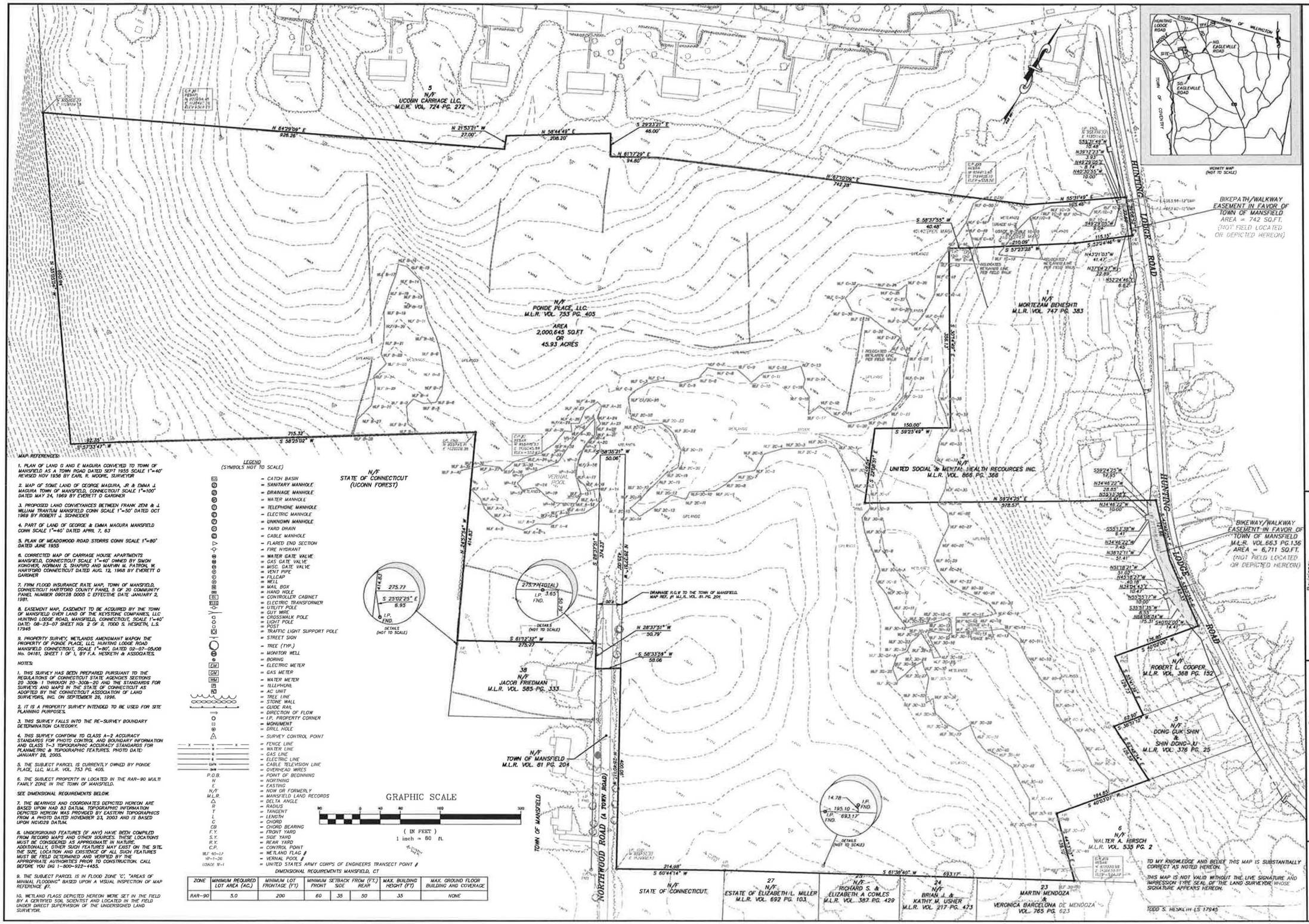
TOWN OF
MANSFIELD,
CONNECTICUT
TOLLAND COUNTY

PANEL 5 OF 20

COMMUNITY-PANEL NUMBER
090128 0005 C

EFFECTIVE DATE:
JANUARY 2, 1981

federal emergency management agency
federal insurance administration



MAP REFERENCES:

1. PLAN OF LAND G AND E MAGURA CONVEYED TO TOWN OF MANSFIELD AS A TOWN ROAD DATED SEPT 1955 SCALE 1"=40' REVISED NOV 1956 BY EARL R. MOORE, SURVEYOR
2. MAP OF SOME LAND OF GEORGE MAGURA, JR & EMMA J. MAGURA TOWN OF MANSFIELD, CONNECTICUT SCALE 1"=100' DATED MAY 24, 1969 BY EVERETT O GARDNER
3. PROPOSED LAND CONVEYANCES BETWEEN FRANK ZEMI & J. WILLIAM TRANTUM MANSFIELD CONN SCALE 1"=50' DATED OCT 1969 BY ROBERT J. SCHNEIDER
4. PART OF LAND OF GEORGE & EMMA MAGURA MANSFIELD CONN SCALE 1"=40' DATED APRIL 7, 63
5. PLAN OF MEADOWOOD ROAD STORRS CONN SCALE 1"=80' DATED JUNE 1955
6. CORRECTED MAP OF CARRIAGE HOUSE APARTMENTS MANSFIELD, CONNECTICUT SCALE 1"=40' OWNED BY SIMON KONOVER, NORMAN S. SHAPIRO AND MARVIN M. PATRON, W. HARTFORD CONNECTICUT DATED AUG. 12, 1968 BY EVERETT O GARDNER
7. FIRM FLOOD INSURANCE RATE MAP, TOWN OF MANSFIELD, CONNECTICUT HARTFORD COUNTY PANEL 5 OF 20 COMMUNITY PANEL NUMBER 090128 0005 C EFFECTIVE DATE JANUARY 2, 1981.
8. EASEMENT MAP, EASEMENT TO BE ACQUIRED BY THE TOWN OF MANSFIELD OVER LAND OF THE KEYSTONE COMPANIES, LLC HUNTING LODGE ROAD, MANSFIELD, CONNECTICUT, SCALE 1"=40' DATE: 08-23-07 SHEET NO: 2 OF 2, TODD S. HESKETH, L.S. 17945
9. PROPERTY SURVEY, WETLANDS AMENDMANT MAPON THE PROPERTY OF PONDE PLACE, LLC, HUNTING LODGE ROAD MANSFIELD CONNECTICUT, SCALE 1"=80', DATED 02-07-05,NO8 No. 04161, SHEET 1 OF 1, BY F.A. HESKETH & ASSOCIATES.

NOTES:

1. THIS SURVEY HAS BEEN PREPARED PURSUANT TO THE REGULATIONS OF CONNECTICUT STATE AGENCIES SECTIONS 20-300b 1 THROUGH 20-300b-20 AND THE STANDARDS FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT AS ADOPTED BY THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS, INC. ON SEPTEMBER 26, 1998.
2. IT IS A PROPERTY SURVEY INTENDED TO BE USED FOR SITE PLANNING PURPOSES.
3. THIS SURVEY FALLS INTO THE RE-SURVEY BOUNDARY DETERMINATION CATEGORY.
4. THIS SURVEY CONFORM TO CLASS A-2 ACCURACY STANDARDS FOR PHOTO CONTROL AND BOUNDARY INFORMATION AND CLASS T-3 TOPOGRAPHIC ACCURACY STANDARDS FOR PLANIMETRIC & TOPOGRAPHIC FEATURES. PHOTO DATE: JANUARY 28, 2005.
5. THE SUBJECT PARCEL IS CURRENTLY OWNED BY PONDE PLACE, LLC, M.L.R. VOL. 753 PG. 405.
6. THE SUBJECT PROPERTY IN LOCATED IN THE RAR-90 MULTI FAMILY ZONE IN THE TOWN OF MANSFIELD.

SEE DIMENSIONAL REQUIREMENTS BELOW.

7. THE BEARINGS AND COORDINATES DEPICTED HEREON ARE BASED UPON NAD 83 DATUM. TOPOGRAPHIC INFORMATION DEPICTED HEREON WAS PROVIDED BY EASTERN TOPOGRAPHICS FROM A PHOTO DATED NOVEMBER 23, 2003 AND IS BASED UPON NGVD29 DATUM.
8. UNDERGROUND FEATURES (IF ANY) HAVE BEEN COMPILED FROM RECORD MAPS AND OTHER SOURCES. THESE LOCATIONS MUST BE CONSIDERED AS APPROXIMATE IN NATURE. ADDITIONALLY, OTHER SUCH FEATURES MAY EXIST ON THE SITE. THE SIZE, LOCATION AND EXISTENCE OF ALL SUCH FEATURES MUST BE FIELD DETERMINED AND VERIFIED BY THE APPROPRIATE AUTHORITIES PRIOR TO CONSTRUCTION. CALL BEFORE YOU DIG 1-800-922-4455.
9. THE SUBJECT PARCEL IS IN FLOOD ZONE "C", "AREAS OF MINIMAL FLOODING" BASED UPON A VISUAL INSPECTION OF MAP REFERENCE #7.
10. WETLAND FLAGS DEPICTED HEREON WERE SET IN THE FIELD BY A CERTIFIED SOIL SCIENTIST AND LOCATED IN THE FIELD UNDER DIRECT SUPERVISION OF THE UNDERSIGNED LAND SURVEYOR.

LEGEND
(SYMBOLS NOT TO SCALE)

- CATCH BASIN
- SANITARY MANHOLE
- DRAINAGE MANHOLE
- WATER MANHOLE
- TELEPHONE MANHOLE
- ELECTRIC MANHOLE
- UNKNOWN MANHOLE
- YARD DRAIN
- CABLE MANHOLE
- FLARED END SECTION
- FIRE HYDRANT
- WATER GATE VALVE
- GAS GATE VALVE
- MISC. GATE VALVE
- VENT PIPE
- FILLCAP
- WELL
- MAIL BOX
- HAND HOLE
- CONTROLLER CABINET
- ELECTRIC TRANSFORMER
- UTILITY POLE
- GUY WIRE
- CROSSWALK POLE
- LIGHT POLE
- POST
- TRAFFIC LIGHT SUPPORT POLE
- STREET SIGN
- TREE (TYP.)
- MONITOR WELL
- BORING
- ELECTRIC METER
- GAS METER
- WATER METER
- TELEPHONE
- AC UNIT
- TREE LINE
- STONE WALL
- GUIDE RAIL
- DIRECTION OF FLOW
- I.P. PROPERTY CORNER
- MONUMENT
- DRILL HOLE
- SURVEY CONTROL POINT
- FENCE LINE
- WATER LINE
- GAS LINE
- ELECTRIC LINE
- CABLE TELEVISION LINE
- OVERHEAD WIRES
- POINT OF BEGINNING
- NORTHING
- EASTING
- NOW OR FORMERLY
- MANSFIELD LAND RECORDS
- DELTA ANGLE
- RADIUS
- TANGENT
- LENGTH
- CHORD
- CHORD BEARING
- FRONT YARD
- SIDE YARD
- REAR YARD
- CONTROL POINT
- WETLAND FLAG #
- VERNAL POOL #
- UNITED STATES ARMY CORPS OF ENGINEERS TRANSECT POINT #

P.O.B.
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M.L.R.
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C
CB
F.Y.
S.Y.
R.Y.
C.P.
WLF 40-12
WP-1-20
USACE W-1

DIMENSIONAL REQUIREMENTS MANSFIELD, CT

ZONE	MINIMUM REQUIRED LOT AREA (AC.)	MINIMUM LOT FRONTAGE (FT)	MINIMUM SETBACK FROM (FT.) FRONT	SIDE	REAR	MAX. BUILDING HEIGHT (FT)	MAX. GROUND FLOOR BUILDING AND COVERAGE
RAR-90	5.0	200	60	35	50	35	NONE

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Fax (860) 844-8600
e-mail: mail@fahesketh.com

Revisions:

No.	Date	Description
1	06-27-07	MISC
2	10-27-15	WETLANDS / TITLE UPDATED
3	03-18-16	SUBMITTAL / TITLE

PROPERTY SURVEY
PREPARED FOR
STORRS LODGES, LLC.
HUNTING LODGE ROAD
MANSFIELD, CONNECTICUT

Date: 02-07-05	Drawn by: RM	Job no: 04161
Scale: 1" = 80'	Checked by: TSH	Sheet no: 1 OF 1

PS-1

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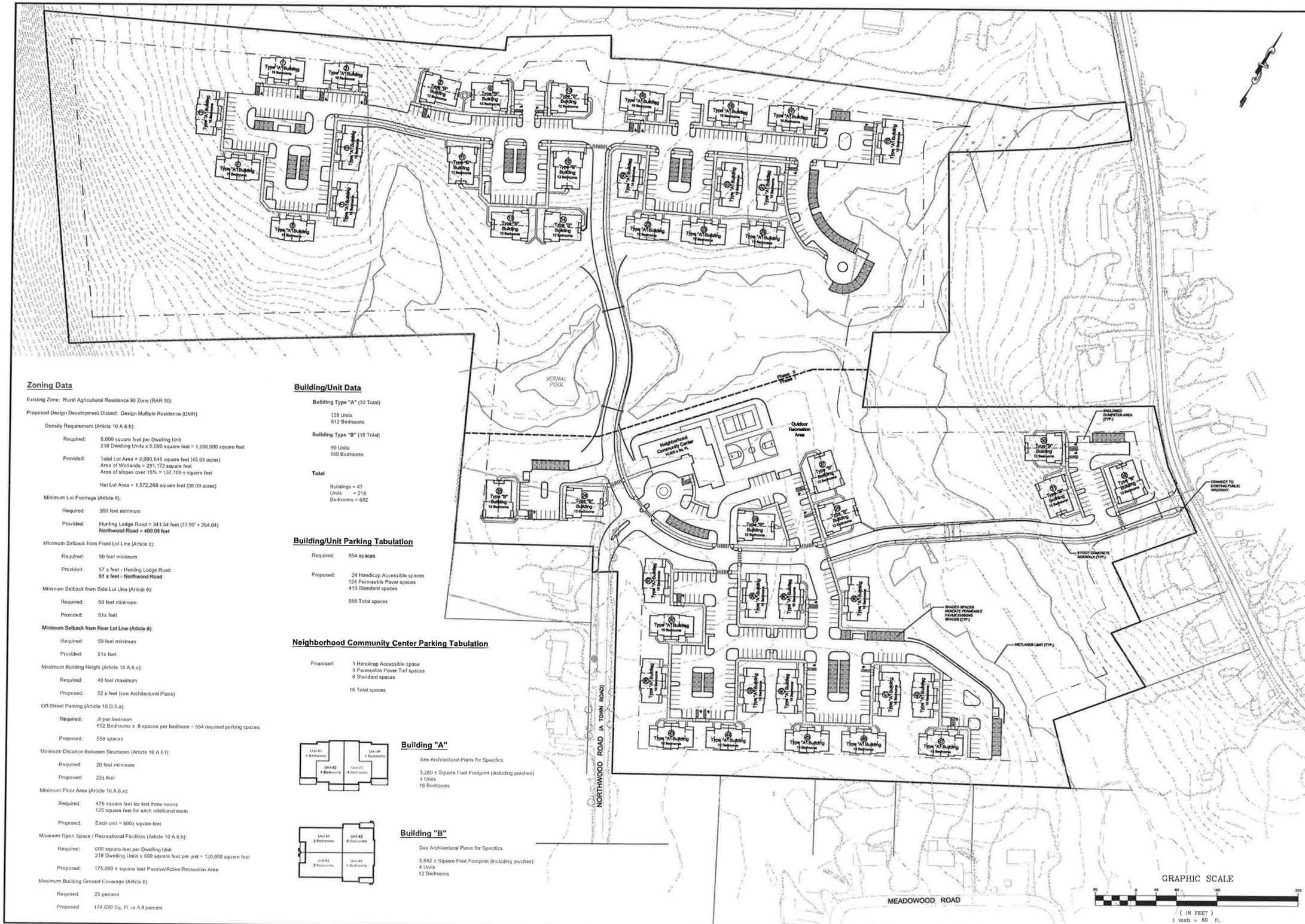

Zoning Data

Existing Zone: Rural Agricultural Residence 90 Zone (RAR 90)

Proposed Design Development District: Design Multiple Residence (DMR)

Density Requirement (Article 10 A.6.b):

Required: 5,000 square feet per Dwelling Unit
218 Dwelling Units x 5,000 square feet = 1,090,000 square feet

Provided: Total Lot Area = 2,000,645 square feet (45.93 acres)
Area of Wetlands = 291,172 square feet
Area of slopes over 15% = 137,100 ± square feet

Net Lot Area = 1,572,268 square feet (36.09 acres)

Minimum Lot Frontage (Article 8):

Required: 300 feet minimum

Provided: Hunting Lodge Road = 341.54 feet (77.50' + 264.04)
Northwood Road = 400.05 feet

Minimum Setback from Front Lot Line (Article 8):

Required: 50 feet minimum

Provided: 57 ± feet - Hunting Lodge Road
51 ± feet - Northwood Road

Minimum Setback from Side Lot Line (Article 8):

Required: 50 feet minimum

Provided: 51± feet

Minimum Setback from Rear Lot Line (Article 8):

Required: 50 feet minimum

Provided: 51± feet

Maximum Building Height (Article 10 A.6.d):

Required: 40 feet maximum

Proposed: 32 ± feet (see Architectural Plans)

Off-Street Parking (Article 10 D.5.a):

Required: .8 per Bedroom
692 Bedrooms x .8 spaces per bedroom = 554 required parking spaces

Proposed: 558 spaces

Minimum Distance Between Structures (Article 10 A.6.f):

Required: 20 feet minimum

Proposed: 22± feet

Minimum Floor Area (Article 10 A.6.e):

Required: 475 square feet for first three rooms
125 square feet for each additional room

Proposed: Each unit = 800± square feet

Minimum Open Space / Recreational Facilities (Article 10 A.6.h):

Required: 600 square feet per Dwelling Unit
218 Dwelling Units x 600 square feet per unit = 130,800 square feet

Proposed: 175,000 ± square feet Passive/Active Recreation Area

Maximum Building Ground Coverage (Article 8)

Required: 25 percent

Proposed 174,690 Sq. Ft. or 8.8 percent

Building/Unit Data

Building Type "A" (32 Total)

128 Units
512 Bedrooms

Building Type "B" (15 Total)

90 Units
180 Bedrooms

Total

Buildings = 47
Units = 218
Bedrooms = 692

Building/Unit Parking Tabulation

Required: 554 spaces

Proposed: 24 Handicap Accessible spaces
124 Permeable Paver spaces
410 Standard spaces

558 Total spaces

Neighborhood Community Center Parking Tabulation

Proposed: 1 Handicap Accessible space
9 Permeable Paver Turf spaces
6 Standard spaces

16 Total spaces

Building "A"

See Architectural Plans for Specifics

3,280 ± Square Foot Footprint (including porches)
4 Units
16 Bedrooms

Building "B"

See Architectural Plans for Specifics

3,982 ± Square Foot Footprint (including porches)
4 Units
12 Bedrooms

THE LODGES AT STORRS

F.A. Hesketh & Associates, Inc.
8 Creamery Brook, East Granby, CT 06026
Civil & Traffic Engineers · Surveyors · Planners · Landscape Architects
Phone (860) 653-8000
Fax (860) 844-8000
e-mail: info@fahesketh.com

Revisions:

No.	Date	Description

MASTER PLAN
PREPARED FOR
STORRS LODGES, LLC
HUNTING LODGE ROAD
MANSFIELD, CONNECTICUT

Date: 03-18-2016	Drawn by: KLL	Job no: 04161	
Scale: 1" = 80'	Checked by: DSZ	Sheet no: 1 OF 1	

MA-1

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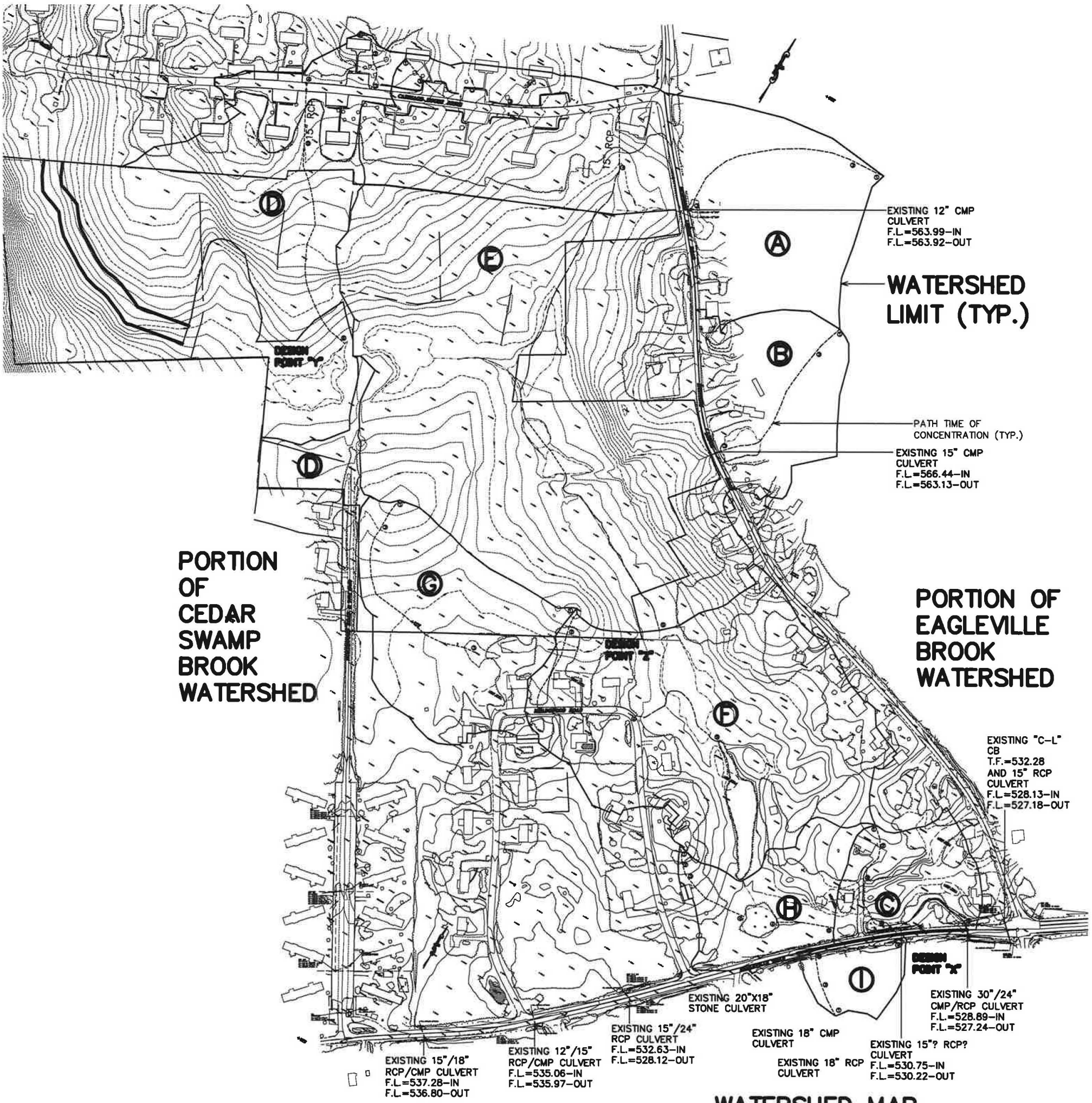
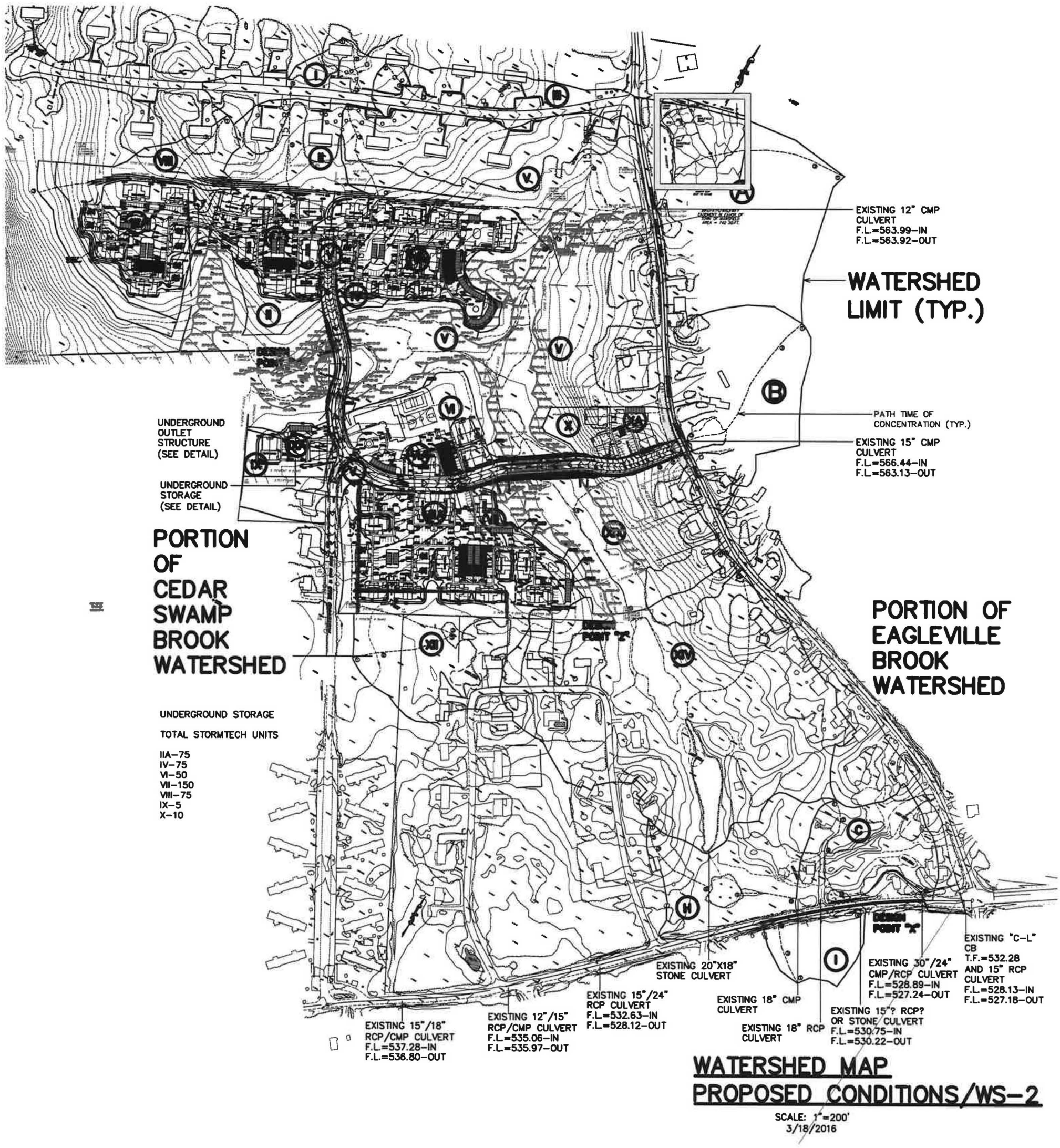


WATERSHED MAP
EXISTING CONDITIONS/WS-1

SCALE: 1"=100'
Revised: 3/18/16



WATERSHED MAP
PROPOSED CONDITIONS/WS-2

SCALE: 1"=200'
3/18/2016

PEAK FLOW SUMMARY-TABLE 1

EXISTING AND PROPOSED CONDITIONS

STORRS LODGES, CT

PLANS DATED 3/18/2016

STORM EVENT	EXISTING CONDITIONS							PROPOSED CONDITIONS						
	DESIGN POINT "X"			DESIGN POINT "Y"	DESIGN POINT "Z"			DESIGN POINT "X"			DESIGN POINT "Y"	DESIGN POINT "Z"		
	IN	OUT	ELEV	IN	IN	OUT	ELEV	IN	OUT	ELEV	IN	IN	OUT	ELEV
2(1)	3.6(2)	3.3	529.64(3)	9	22.7	8.7	541.9	3.6	3.2	529.64	10	11.8	6.8	541.69
10	5.2	4.6	529.83	12.9	33.6	16.3	542.1	5.2	4.6	529.83	13.9	18.8	12	542.04
25	6.1	5.4	529.92	15.2	39.6	20.4	542.15	6.1	5.4	529.92	16	23	15.6	542.08
50	6.8	6	529.99	16.9	44.2	23.6	542.2	6.8	6	529.99	17.6	26.8	18.1	542.12
100	7.4	6.6	530.05	18.5	48.8	28	542.23	7.4	6.6	530.05	19.8	30.5	20.6	542.16

(1) Return period (Years)
(2) Flow (CFS)
(3) Elevation (FT)

Design Point "X"- Eagleville Brook Watershed (North Eagleville Road)
Design Point "Y"- Cedar Swamp Brook Watershed (Northwood Road)
Design Point "Z"- Access Road (From Hunting Lodge Road)

● Ecology
● Soil & Wetland Studies
● Water Quality Monitoring ● GPS
● Environmental Planning & Management
● Ecological Restoration & Habitat Mitigation
● Aquatic, Wildlife and Listed Species Surveys
● Application Reviews ● Permitting & Compliance

March 18, 2016

Town of Mansfield
Inland Wetlands Commission
14 Park Place
Mansfield, CT 06226-2217

Re: **WETLANDS ASSESSMENT & IMPACT ANALYSIS: *SUMMARY OF FINDINGS***
Storrs Lodges, Connecticut
Hunting Lodge Road, Mansfield, CT

REMA Job No.: 15-1860-MNS18

Dear Commissioners:

REMA ECOLOGICAL SERVICES, LLC (REMA) has prepared this document to be submitted as part of an application for a student housing project, currently before the Town of Mansfield's Inland Wetlands Commission ("IWC" "the Commission"). The project plans, were prepared by F. A. Hesketh & Associates, Inc., and are dated 3/18/16. This housing project, catering to UConn students, is proposed in western Mansfield, about half a mile northeast of the campus center at Storrs.

We are providing herein our *Summary of Findings* with an overview of the site's regulated resources and other environmental features, as well as an analysis of the proposal, as it relates to regulated wetlands and watercourses. This document presents the basis for our professional opinion that existing wetland and watercourse functions and values will not be degraded by the proposed activities, taking into consideration some of the benefits from the proposed mitigation.

INTRODUCTION & OVERVIEW

The applicant proposes to construct this residential housing project on a 45.9-acre property ("the site"), with roughly 6.7-acres of wetlands, and 1,439 linear feet of intermittent watercourse. The plan calls for 47 buildings, 218 units, and 692 bedrooms. The number of parking spaces would 558, close to the minimum allowed by Town zoning. Stormwater management includes pervious pavement, below-ground infiltrator galleys, and discharges to infiltration swales or water quality basins.

It should be noted that a very different application for high density student housing had previously been submitted for the subject site in 2008/2009 (i.e. Ponde Place Residential Apartment Community). This report encompasses some of the baseline ecological work in the Environmental Review Team (ERT) report (April 2009), and in the Wetlands Report, dated 7/5/07, prepared by wetland scientist and vernal pool specialist Edward Pawlak, Principal of CT Ecosystems, LLC.

Approximately 4,402 square feet (0.1 acres) of *direct* impacts to wetlands will be associated with the entry road and an emergency access road from Hunting Lodge Road. The former would cross the primary stream corridor, Wetland C, while the latter will pass between Wetlands A and C1. The wetland crossing from Hunting Lodge Road is unavoidable. Moreover, roughly 9.38 acres of encroachment to the 150-foot wide upland review area (URA) is proposed.

Regulated wetland boundaries were delineated by George T. Logan, Certified Soil Scientist, wildlife ecologist, and Professional Wetland Scientist (PWS). In 2015, the wetland boundaries were accepted by the IWC, via a Town wetlands map amendment application. Mr. Logan and other REMA natural resource professionals visited the site on 12 different occasions in the fall of 2015, and winter of 2015/2016, to obtain baseline wetland and upland data. REMA coordinated closely with Hesketh & Associates, Inc. (FHA), as the site plan was developed. The extremely tight timeline for submission did not allow for a full review of the storm water management system, before submission of the application, but REMA will complete our review in the near future, and make any final recommendations.

Attached to this report, Figures A1, and 1 through 5 show the topography, road network, soil series, and vegetation cover types in the site vicinity. They include both recent and historic aerial photos taken in different seasons, and show vegetation cover types and wetland

distribution on the site. Moreover, the attached, annotated photo-record provides information on wetland soils, plants, hydrologic regime, and microtopography, and the size-class distribution of different sections of forest.

Additional supplementary documents will follow, to be submitted under separate cover, including, wetland/watercourse functions and values forms, water quality testing by a CT-certified laboratory (nutrient parameters), and additional soils data.

The *Summary of Findings* presented below is based on field investigations, secondary-source maps and documents, and the proposed project plans.

2.0 SUMMARY OF FINDINGS

2.1 EXISTING CONDITIONS

Site Location and Landscape Setting

- The 45.93-acre parcel is located in Mansfield, Connecticut, about half a mile southwest of the University of Connecticut campus center. It is only 0.75 miles south of Route 44, the main east-west through-road. It is bounded to the north by student housing along Carriage House Drive and to the east by Hunting Lodge Road. Additional student housing and single-family house residential developments, associated with Northwood Road, are to the south of the site. To the west is a rural landscape with undeveloped forested land, and then large, open fields.

Topography

- The site is mostly level to gently sloping. Only the western hill has moderate slopes. The highest elevation is roughly 572.7, on the western hilltop, upgradient of the western headwaters seepage Wetland (WB), the only high-gradient stream at the site. The eastern intermittent watercourse is a moderate to low gradient (Wetlands C3 to C4) stream. Microtopography is most pronounced in WA, the west central wetland with an embedded vernal pool habitat, with classic shrub islands and vegetated tree bases, surrounded by inundation, on a seasonal basis. Moderate to slight microtopography is found throughout the WC wetlands.

Cover Types

- The property is currently entirely forested. A 1970 CTDEEP aerial photo (Figure 5, attached) shows only one unvegetated fill area at the terminus of Northwood Road. Although the entire site is seen to be wooded in archived aerial photographs dating back to 1934, with the noted above exception, it is likely that selective logging has taken place in the 20th century. Even so, portions of two of the eastern wetlands, WC2 and WC3, have a "woodland" cover type (20% to 60% cover), because a very poorly drained hydrologic regime has limited tree growth.

Geology

- Bedrock is in the Hebron formation, with biotite and calc-silicate gneiss. Plan Sheet IW-1 shows the distribution of soil series, per the USDA-NRCS soil survey (also see the attached *On-Site Soil Investigation & Wetland Delineation Report*). Soils derived from this bedrock are coarse loamy, free-draining, and moderately fertile. Surficial materials are characterized as thin till and include both ablation and lodgement till, the latter with a hard pan. Charlton- Chatfield complex (85) includes deep coarse loamy soils (Charlton) and shallow, coarse-loamy upland soils over bedrock (Chatfield series). This mapping unit is limited to the far western portion of the site. Associated wetland soils are the Leicester, Ridgebury, Whitman (3) fine sandy loams, a soil series complex.

  Deep, coarse loamy upland soils without a compact hardpan in the Charlton and Canton series (Mapping Unit 73) are on the east side between the Wetland C3 and C4 corridor and Hunting Lodge Road. In the central portion of the site are deep, upland till soils with a densic horizon (hardpan) in the Paxton and Montauk series, and in the Woodbridge (46) series.

Wetlands Summary

- Wetlands total 6.7 acres (see Figure A1, attached). The eastern on-site stream segment is an unnamed tributary of Eagleville Brook, to the south, and is roughly 1,439 linear feet long on-site. The eastern wetland units (WC1 to WC4) are all part of this stream system. Two intermittent, seasonal headwaters wetlands, labeled WA and WB drain toward Cedar Swamp Brook, which is offsite to the west, flowing

southerly, shown in Photos 39 to 41. Both Cedar Swamp Brook and Eagleville Brook are tributaries of Willimantic River. The watershed divide is an old farm road built on fill, the extension of the northern terminus of Northwood Road, bisecting a seasonally flooded red maple swamp.

<u>Cedar Swamp Brook Watershed</u>

- Wetland A (WA), contains an embedded vernal pool habitat, with moderately high productivity for wood frog, as documented by Ed Pawlak, for the prior application. A total of 53 wood frog egg masses were counted on April 20th, 2007 and water depth was 8 inches, but only a few spotted salamander egg masses; the pool likely dries out too soon for successful metamorphosis of salamanders, in most years. Large woody debris is common, but density of shrubs within the vernal pool is low; one small, young patch of buttonbush was observed. Red maple is dominant, including one three-foot dimeter tree; healthy slippery elms were also noted. Herbs are sparse in ponded areas: royal fern patches and cinnamon fern on pool margins. Herbs and mosses are concentrated on tree bases: small wood ferns, sedges, Virginia creeper, small patches of sphagnum mosses and unidentified seedlings on tree bases.

- The 150-foot URA of Wetland A, which includes the 100-foot vernal pool envelope, is entirely forested, except for the dirt roadbed of the unpaved extension of Northwood Road. To the south and southeast of the pool, the moist, mixed hardwood forest has a dense understory dominated by Japanese barberry. The infestation that began along the unpaved roadway south of Northwood Drive, in the filled area, visible in the 1970 aerial photo (Figure 5). Japanese barberry is present, but has not yet become dominant in the URA to the north of the pool, which also has moist, nearly level soils, suitable for wood frog hibernation, an herb stratum dominated by hay-scented fern, and a diverse tree stratum including hickory and beech. The shrub stratum north of the pool is low in density, though one clump of wild currant was observed. This genus includes several rare species in Connecticut, but is only possible to reliably identify in early spring, when in bloom.

- Wetland B (WB) is a moderate to high gradient headwaters wetland, 80 to 120 feet wide. Saturation was observed in mid fall in the central channel, and higher flow volumes occur in times of seasonal high water. Water quality is expected to be excellent, as the small watershed is entirely forested. Bristly dewberry, Christmas

fern, and spinulose wood fern are dominant herbs. Agrimony was also observed. Spicebush and red maple are the dominant woody species, and shagbark hickory and beech are present as well. Some dieback of spicebush was noted. Clumps of barberry average about five to eight feet across, and thirty feet apart within the wetland. Barberry is also present in the URA. The most important portion of its upland review area is the upgradient hillside, its water source.

Eagleville Brook Watershed

- The eastern wetland system has a watershed of 112 acres per the 2009 ERT. Much of the eastern URA of this wetland is off-site, owned by others. An old woods road on a historic fill causeway crosses this broad wetland at the location selected for the entry road. This old road impounded the south-flowing stream, creating an area of flooding (likely temporary to seasonal). WC3, the portion to the north of the causeway, averages only about eighty feet wide, and very poorly drained soils are limited to narrow zones adjacent to the stream. WC 4, which begins south of the entry road, is much wider, up to 240 feet wide. Both tributary wetlands flow into the steam from the west, from on-site sub-watersheds (i.e., WC1 and WC2).

- Adjacent wetlands throughout the system are red maple swamp, but tree maturity and density, is variable depending on hydrologic regime. Tree and shrub density is low in the partially impounded, saturated portion of Wetland WC3, though trees rooted on the old causeway overhang the very poorly drained areas. Sizable very poorly drained areas also occur in the western terrace of WC4 and the small northwestern seepage wetland, WC2. These two areas also have a low percent cover of tree canopy, dead over-turned trees, and soils high in organic matter.

- The extensive western stream terrace of WC4 has an interesting assemblage of herbs of saturated, but well–oxygenated and mineral rich conditions. In addition to skunk cabbage and Jack-in-the-pulpit, which tolerate a wide range of nutrient regimes, species of mesotrophic to oligotrophic wetland communities were also observed: abundant golden ragwort, swamp saxifrage, Carrion-flower, skullcaps, swamp violet, and occasional turtlehead, the host plant of the declining and uncommon Baltimore checkerspot butterfly. Native Pennsylvania bittercress grows within the steam channel. A swath of Cinnamon fern is dominant along the wetland boundary in

poorly drained to somewhat poorly drained soil. An old stone "culvert" was also noted.

- In WC2 small evergreen sedges and skunk cabbage are dominants, and sphagnum and other mosses are more abundant. A network of moss-covered fallen logs creates small-scale microtopography. Shrub diversity was moderately high, including healthy arrowwood viburnum.

- WC1 is a much larger wetland than WC2, with substantial disturbance at its western end, due to fill placement and proliferation of Asiatic bittersweet and Japanese barberry. Red maples include immature pole size trees and multi-trunk sprout trees. At the eastern end, adjacent to the outlet stream, one white oak, a wolf tree, is over three feet in diameter. Highbush blueberry is also a dominant shrub, though barberry is locally the most abundant, within the wetland and in adjacent to filled areas. Footing is firmer than in the terrace of WC4, indicating that the dominant soil drainage type is poorly drained rather than very poorly drained.

- The distance between Hunting Lodge Road and the east side of this semi-perennial stream corridor (i.e. Wetland C3 and C4) averages about two hundred feet. The forest slopes down moderately steeply from four residential back yards. Sugar maple and ashes are both dominant trees. The forest community in the URA to the west of WC4 and south of WC1 has undisturbed moderately well-drained Woodbridge soils and includes a substantial evergreen component. A mix of age classes includes mature trees and understory species characteristic of mixed white pine-hardwood forest: low blueberries, sheep laurel, and starflower. To the west of WC3 at the northern end of the site the URA consists of moist mixed hardwood forest, largely with a sparse, low diversity understory (still largely free of barberry), and a short gentle slope down to the wetland boundary. Soils are pervious, in the well-drained Canton-Charlton mapping unit (62).

- The 2009 ERT reported moderately impaired water quality downgradient of the site. Water quality testing has not been completed by REMA, but field observations indicate that the diversity and productivity of aquatic life is limited, by seasonal low flow and non-point source pollution. One stream salamander was observed in WC3 and some hydropsychid net spinner caddisflies, but no stone flies, mayflies or hellgrammites. However, plants indicative of clean water do occur on the stream

terrace of WC4. REMA will likely provide a more robust macro-benthos bioassessment in the near future, when water samples are collected from the site's stream.

2.2 PROPOSED CONDITIONS

Overview

- The proposal would entail the development and construction of multi-unit residential buildings, associated parking areas and driveways, recreational and community amenities, and other infrastructure improvements, including stormwater conveyance, storage, and renovation. These residential units would be served by public sewer and water. The primary access would be from Hunting Lodge Road, to the east, while emergency only access would be from the south, through an extension of Northwood Road. Forty-seven (47) buildings would be concentrated at four distinct site locations (i.e. westerly, north-central, southeastern, and eastern). Two building types (i.e. Type "A" and Type "B") will contain 218 units, and 692 bedrooms. These units will be rented to students at the University of Connecticut.

- Many buildings (i.e. 24) of the proposed residential community would lie outside the 150-foot upland review area (URA) to the site's regulated wetlands, and only 10 would be located completely within the URA. Portions of the access and internal circulation driveways, the neighborhood community center, outdoor athletic fields, and the nine (9) stormwater management facilities (e.g. water quality basins, swales, and level-spreaders), would encroach into the URAs of the on-site wetlands. Of the 24 acres of URA on the subject site, the encroachment within it would be 9.38 acres, or 39% of the total.

- A total of 4,402 square feet (0.10 acres) of *direct* wetland impacts are proposed, in order to provide access to the developable portions of the site from Hunting Lodge Road. The proposed location is that of an old woods road, which would represent a roughly 4,675 square foot reduction of wetland impacts for a roadway crossing at this location, without this pre-existing wetland impact. Overall, this wetland impact is of *low intensity* and does not unduly alter or compromise the functions and values provided by Wetlands C3 and C4. We should note that the existing "breach" of the old road crossing, which allows passage of the intermittent watercourse, will be

maintained by using a precast bridge with a 30-foot wide span and a 4-foot vertical clearance. This will not only allow for passage of wildlife, but also ensure that the hydrology of Wetland C3, upgradient of the crossing, will not be altered.

- Potential *indirect* wetland impacts would be associated with both long-term (post-construction) and short-term (during construction) impacts, particularly erosion and sedimentation during the construction phase, and nutrients in stormwater discharge, and proximity to the wetlands, in the post-construction phase.

- Adequate sedimentation and erosion controls are found in the submitted plans, but extra care should be taken due to the sloping terrain and sensitivity of some of the regulated resources to sediment. Because sediment continues to be a phosphorus source for many years following construction, it will important to rigorously comply with CT DEEP's 2002 *Connecticut Erosion & Sedimentation Control Guidelines* specifying temporary stabilization for all areas not being actively graded. Fortunately, the somewhat more sensitive vernal pool-type habitat associated with Wetland A (see Figure A1, attached), is hydrologically isolated from the site's primary wetland corridor (Wetland C1 – C4), and proposed development is at least 100 feet away. It is recommended that in addition to the silt fence and or staked haybales, Silt-Sox tube barriers be placed immediately downgradient of all perimeter controls bordering wetlands, in several critical areas, such as upgradient and to the north of Wetland A (the vernal pool wetland), and upgradient and to the north of Wetland B, the western hillside seepage wetland.
- Because most of the on-site and the off-site wetlands are in large part fed by groundwater seepage, stormwater generated on impervious surfaces at the site will be infiltrated, and level spreaders will disperse discharge from several water quality basins or water quality swales.

- REMA has not, as of yet, had the opportunity to review calculations that show that the various stormwater treatment systems are sized to detain and treat the Water Quality Volume (WQV), as specified in CT DEEP's 2004 Stormwater Quality Manual ("the Manual"). Following this submission, we will provide a more detailed analysis of the stormwater management system, from a stormwater quality renovation perspective.

- The relatively low intensity of landscaping maintenance practices, that are associated with a development proposal of this type, with relatively small lawn areas, greatly minimize the potential for adverse impacts from excess fertilizer runoff and long-lasting pesticides and herbicides that could pass though the storm water basins. In contrast, an upscale, single-family residential land use would present a substantially greater risk to the regulated resources.

- The configuration of the building clusters is such that parking lots and roadways have to a large extent been placed *within* building clusters, such that the buildings themselves will shield wildlife in adjacent forested wetlands and uplands from idling vehicles, parking lot lighting, reducing indirect disturbance from added ambient noise, nighttime illumination, and human disturbance.

- Regarding proposed wetland buffers and the proximity of the buildings to the wetlands, we note that for the most part the development has maintained a minimum 40-foot undisturbed wetland buffer to all wetlands, and a 100-foot undisturbed wetland buffer to Wetland A, and its embedded vernal pool habitat. This was a recommendation made by REMA at the start of the development feasibility analysis for the site. In fact, a greater than 40-foot wetland buffer is being proposed in many areas, such as around Wetland B, the hillside seepage wetland.

- Amphibian migration and movement between Wetland A and the site's eastern uplands and wetlands, will be maintained through the use of two state-of-the-art wildlife tunnels proposed between Wetland A and Wetland C1, under the western access and circulation roadway. These are similar to the design selected for the newly constructed entrance roadway to the UConn Tech Park.

- In-kind mitigation (i.e. wetland restoration and creation) to off-set the direct impacts to wetlands, is proposed adjacent and to west of Wetland C1 (see submitted plans). This is an area of past wetland disturbance, as seen in Figure 5 (attached). Approximately 6,400 square feet of productive wetland shall be restored at this location, through removal of the old fill, placement of suitable, organically-enriched topsoil, and planting and seeding with appropriate native species (trees, shrubs, and herbs), similar to those present within the site's wetlands. REMA will be submitting a detailed Wetland Mitigation Implementation Plan in the near future.

- Additional wetland mitigation (i.e. wetland restoration/enhancement), in the form of invasive plant removal, is being proposed for several large sections of Wetlands C3 and C4, which locally have dense infestations of Japanese barberry (*Berberis thunbergii*). In total a minimum of 77,000 square feet (1.76 acres) of Wetland C3 and C4 (and possibly other wetland areas also) will be targeted for invasive shrub eradication and control (i.e. Japanese barberry, multiflora rose, firebush). REMA will develop a detailed Invasives Plant Species Management Plan, which will include a multi-year monitoring plan, based on our experience, and the latest guidance from the CT DEEP and the Nature Conservancy.

3.0 CONCLUSION

In conclusion, it is REMA's professional opinion that the proposal, if constructed as designed and shown on the plans, will not result in long-term adverse impacts to the site's regulated resources, or the functions and values that they provide. In the short-term (construction phase) it is important that diligence be exercised to minimize the risk for sedimentation into on-site and off-site wetlands and watercourses.

Please feel free to contact our office with any questions on the above.

Respectfully submitted,

REMA ECOLOGICAL SERVICES, LLC

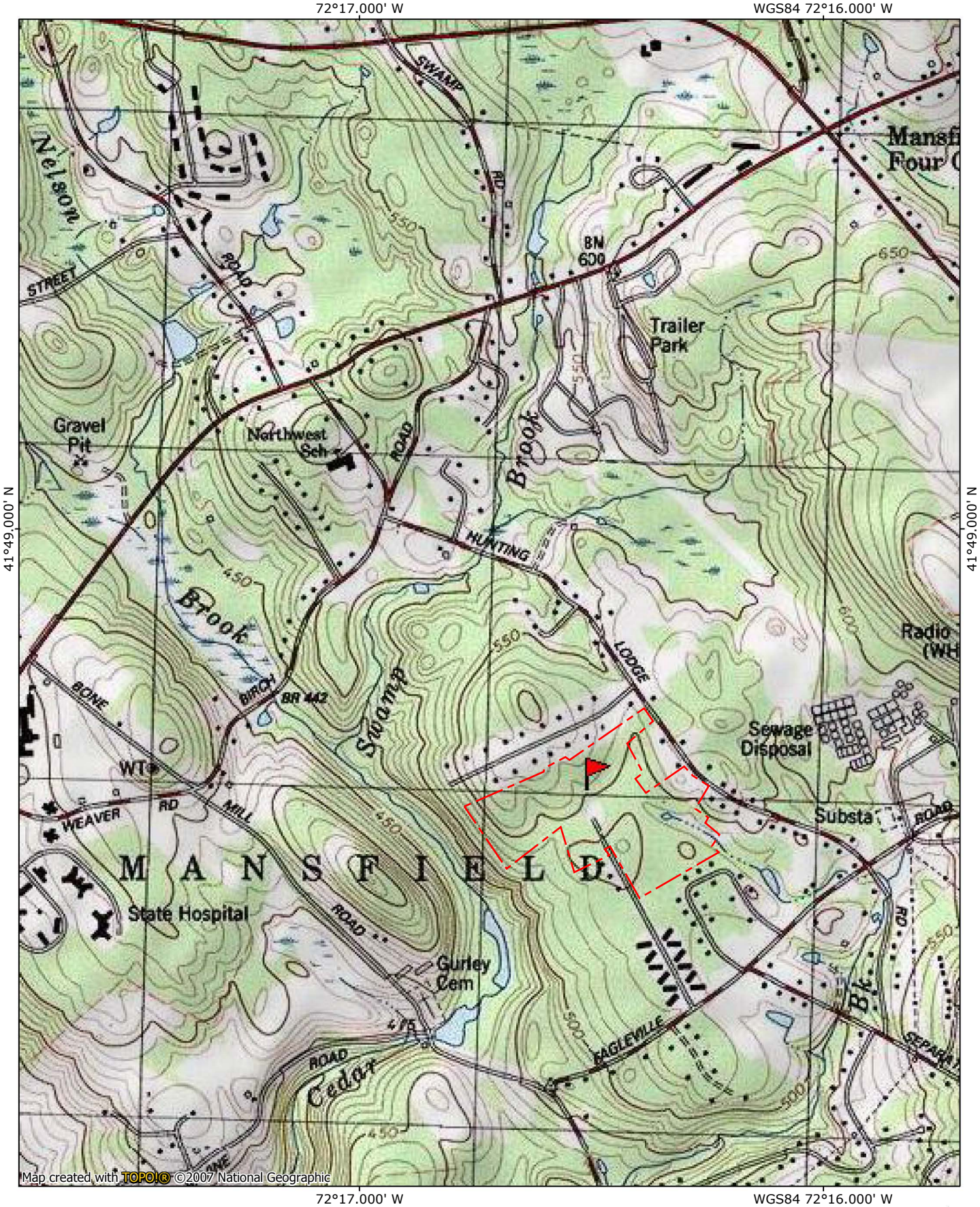
Sigrun N. Gadwa, MS, PWS
Professional Wetland Scientist
Registered Soil Scientist

George T. Logan, MS, PWS, CE
Professional Wetland Scientist
Registered Soil Scientist, Certified Senior Ecologist

VIA HAND-DELIVERY

Attachments: Figures 1 through 5, and A1, Photos 1 through 56, On-Site Soil Investigation & Wetland Delineation Report

Figure 1: Site Locus; Storrs Lodges, Hunting Lodge Road, Mansfield, CT



NATIONAL GEOGRAPHIC

0.0 0.1 0.2 0.3 0.4 0.5 miles

0.0 0.5 km

MN TN

14°

11/27/15

PRODUCED BY: REMA ECOLOGICAL SERVICES, LLC
DATE: 3-17-16 ***SCALE***: NTS

FIGURE 2: Proposed ***"Storrs Lodges"*** residential community, Mansfield, CT (as seen on a 5-6-15 aerial photo; Google Earth)

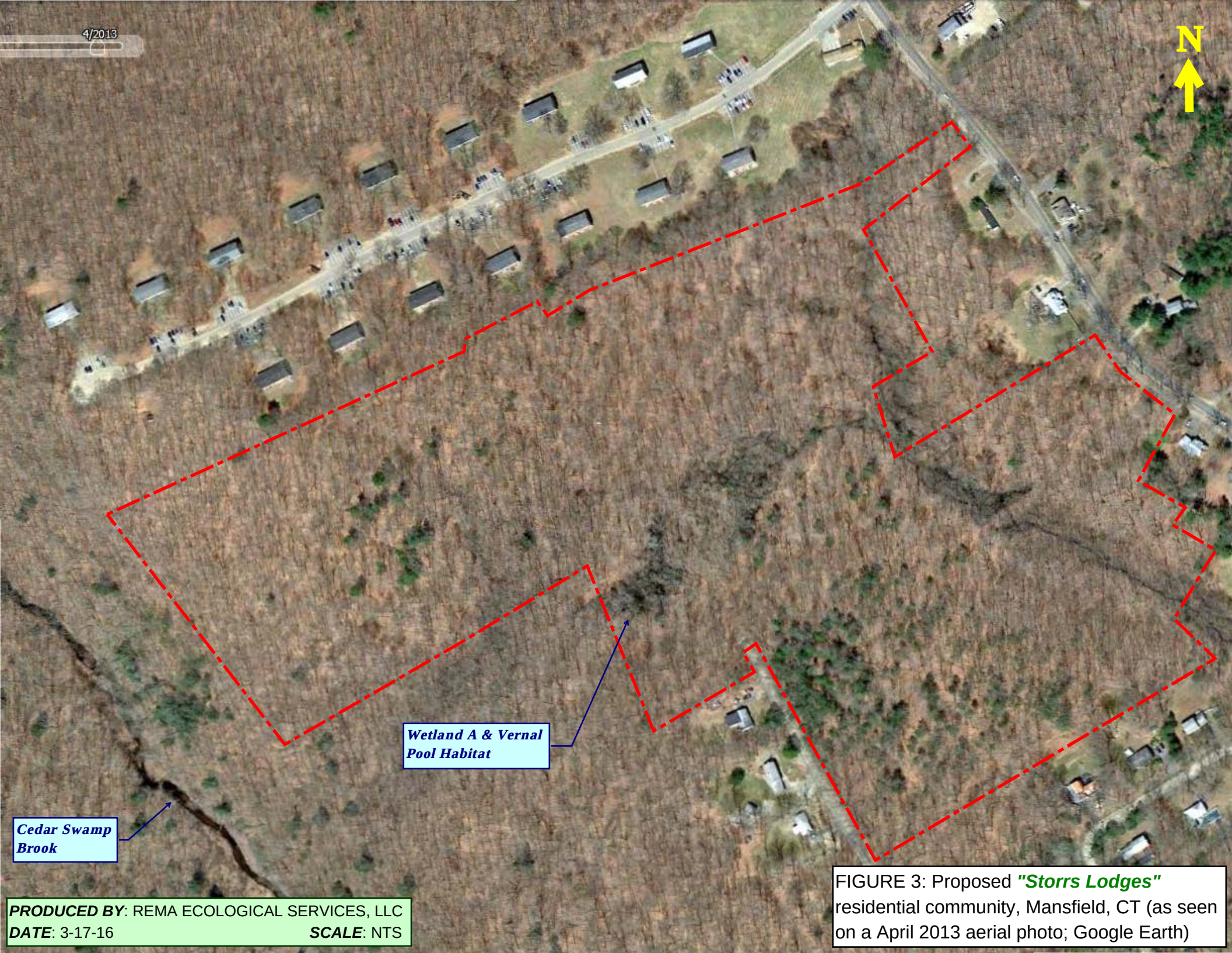


FIGURE 3: Proposed ***"Storrs Lodges"*** residential community, Mansfield, CT (as seen on a April 2013 aerial photo; Google Earth)

PRODUCED BY: REMA ECOLOGICAL SERVICES, LLC
DATE: 3-17-16 ***SCALE***: NTS

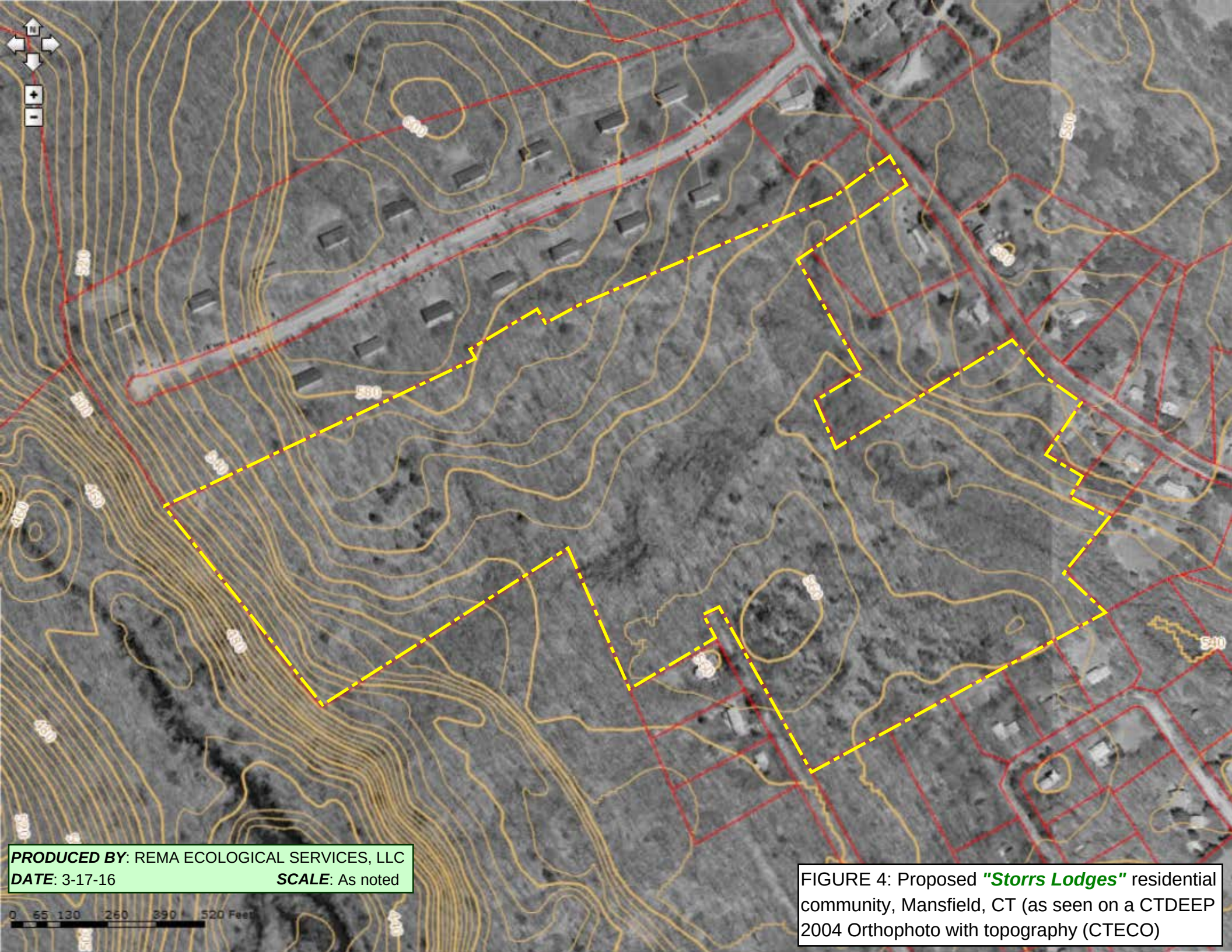
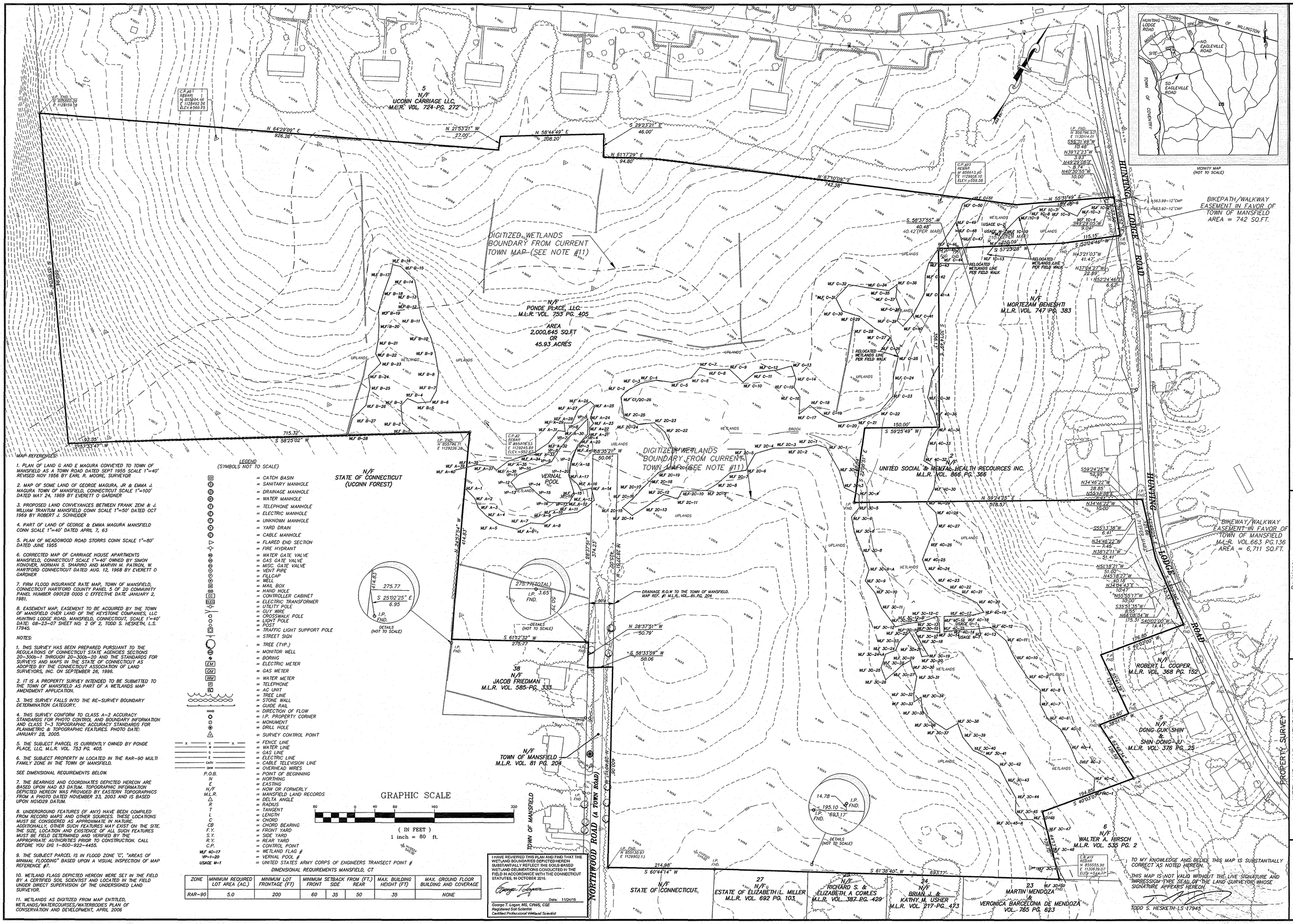


FIGURE 4: Proposed ***"Storrs Lodges"*** residential community, Mansfield, CT (as seen on a CTDEEP 2004 Orthophoto with topography (CTECO)

FIGURE 5: Proposed ***"Storrs Lodges"*** residential community, Mansfield, CT (as seen on an March 1970 aerial photo; CT

PRODUCED BY: REMA ECOLOGICAL SERVICES, LLC
DATE: 3-17-16 ***SCALE***: NTS



MAP REFERENCES:

1. PLAN OF LAND G AND E MAGURA CONVEYED TO TOWN OF MANSFIELD AS A TOWN ROAD DATED SEPT 1955 SCALE 1"=40' REVISED NOV 1956 BY EARL R. MOORE, SURVEYOR
2. MAP OF SOME LAND OF GEORGE MAGURA, JR & EMMA J. MAGURA TOWN OF MANSFIELD, CONNECTICUT SCALE 1"=100' DATED MAY 24, 1969 BY EVERETT O GARDNER
3. PROPOSED LAND CONVEYANCES BETWEEN FRANK ZENI & J. WILJIAM TRANTUM MANSFIELD CONN SCALE 1"=50' DATED OCT 1969 BY ROBERT J. SCHNEIDER
4. PART OF LAND OF GEORGE & EMMA MAGURA MANSFIELD CONN SCALE 1"=40' DATED APRIL 7, 63
5. PLAN OF MEADOWOOD ROAD STORRS CONN SCALE 1"=80' DATED JUNE 1955
6. CORRECTED MAP OF CARRIAGE HOUSE APARTMENTS MANSFIELD, CONNECTICUT SCALE 1"=40' OWNED BY SIMON KONOVER, NORMAN S. SHAPIRO AND MARVIN M. PATRON, W. HARTFORD CONNECTICUT DATED AUG. 12, 1968 BY EVERETT O GARDNER
7. FIRM FLOOD INSURANCE RATE MAP, TOWN OF MANSFIELD, CONNECTICUT HARTFORD COUNTY PANEL 5 OF 20 COMMUNITY PANEL NUMBER 090128 0005 C EFFECTIVE DATE JANUARY 2, 1981.
8. EASEMENT MAP, EASEMENT TO BE ACQUIRED BY THE TOWN OF MANSFIELD OVER LAND OF THE KEYSTONE COMPANIES, LLC HUNTING LODGE ROAD, MANSFIELD, CONNECTICUT, SCALE 1"=40' DATE: 08-23-07 SHEET NO: 2 OF 2, TODD S. HESKETH, L.S. 17945.

NOTES:

1. THIS SURVEY HAS BEEN PREPARED PURSUANT TO THE REGULATIONS OF CONNECTICUT STATE AGENCIES SECTIONS 20-300b-1 THROUGH 20-300b-20 AND THE STANDARDS FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT AS ADOPTED BY THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS, INC. ON SEPTEMBER 26, 1996.
2. IT IS A PROPERTY SURVEY INTENDED TO BE SUBMITTED TO THE TOWN OF MANSFIELD AS PART OF A WETLANDS MAP AMENDMENT APPLICATION.
3. THIS SURVEY FALLS INTO THE RE-SURVEY BOUNDARY DETERMINATION CATEGORY.
4. THIS SURVEY CONFORM TO CLASS A-2 ACCURACY STANDARDS FOR PHOTO CONTROL AND BOUNDARY INFORMATION AND CLASS T-3 TOPOGRAPHIC ACCURACY STANDARDS FOR PLANIMETRIC & TOPOGRAPHIC FEATURES. PHOTO DATE: JANUARY 28, 2005.
5. THE SUBJECT PARCEL IS CURRENTLY OWNED BY PONDE PLACE, LLC, M.L.R. VOL. 753 PG. 405.
6. THE SUBJECT PROPERTY IN LOCATED IN THE RAR-90 MULTI FAMILY ZONE IN THE TOWN OF MANSFIELD.

SEE DIMENSIONAL REQUIREMENTS BELOW.

7. THE BEARINGS AND COORDINATES DEPICTED HEREON ARE BASED UPON NAD 83 DATUM. TOPOGRAPHIC INFORMATION DEPICTED HEREON WAS PROVIDED BY EASTERN TOPOGRAPHICS FROM A PHOTO DATED NOVEMBER 23, 2003 AND IS BASED UPON NGVD29 DATUM.
8. UNDERGROUND FEATURES (IF ANY) HAVE BEEN COMPILED FROM RECORD MAPS AND OTHER SOURCES. THESE LOCATIONS MUST BE CONSIDERED AS APPROXIMATE IN NATURE. ADDITIONALLY, OTHER SUCH FEATURES MAY EXIST ON THE SITE. THE SIZE, LOCATION AND EXISTENCE OF ALL SUCH FEATURES MUST BE FIELD DETERMINED AND VERIFIED BY THE APPROPRIATE AUTHORITIES PRIOR TO CONSTRUCTION. CALL BEFORE YOU DIG 1-800-922-4455.
9. THE SUBJECT PARCEL IS IN FLOOD ZONE "C", "AREAS OF MINIMAL FLOODING" BASED UPON A VISUAL INSPECTION OF MAP REFERENCE #7.
10. WETLAND FLAGS DEPICTED HEREON WERE SET IN THE FIELD BY A CERTIFIED SOIL SCIENTIST AND LOCATED IN THE FIELD UNDER DIRECT SUPERVISION OF THE UNDERSIGNED LAND SURVEYOR.
11. WETLANDS AS DIGITIZED FROM MAP ENTITLED, WETLANDS/WATERCOURSES/WATERBODIES PLAN OF CONSERVATION AND DEVELOPMENT, APRIL 2006

LEGEND
(SYMBOLS NOT TO SCALE)

- = CATCH BASIN
- = SANITARY MANHOLE
- = DRAINAGE MANHOLE
- = WATER MANHOLE
- = TELEPHONE MANHOLE
- = ELECTRIC MANHOLE
- = UNKNOWN MANHOLE
- = YARD DRAIN
- = CABLE MANHOLE
- = FLARED END SECTION
- = FIRE HYDRANT
- = WATER GATE VALVE
- = GAS GATE VALVE
- = MISC. GATE VALVE
- = VENT PIPE
- = FILLCAP
- = WELL
- = MAIL BOX
- = HAND HOLE
- = CONTROLLER CABINET
- = ELECTRIC TRANSFORMER
- = UTILITY POLE
- = GUY WIRE
- = CROSSWALK POLE
- = LIGHT POLE
- = POST
- = TRAFFIC LIGHT SUPPORT POLE
- = STREET SIGN
- = TREE (TYP.)
- = MONITOR WELL
- = BORING
- = ELECTRIC METER
- = GAS METER
- = WATER METER
- = TELEPHONE
- = AC UNIT
- = TREE LINE
- = STONE WALL
- = GUIDE RAIL
- = DIRECTION OF FLOW
- = I.P. PROPERTY CORNER
- = MONUMENT
- = DRILL HOLE
- = SURVEY CONTROL POINT
- = FENCE LINE
- = WATER LINE
- = GAS LINE
- = ELECTRIC LINE
- = CABLE TELEVISION LINE
- = OVERHEAD WIRES
- P.O.B. = POINT OF BEGINNING
- N = NORTHING
- E = EASTING
- N/F = NOW OR FORMERLY
- M.L.R. = MANSFIELD LAND RECORDS
- Δ = DELTA ANGLE
- R = RADIUS
- T = TANGENT
- L = LENGTH
- C = CHORD
- CB = CHORD BEARING
- F.Y. = FRONT YARD
- S.Y. = SIDE YARD
- R.Y. = REAR YARD
- C.P. = CONTROL POINT
- WLF A0-17 = WETLAND FLAG #
- VP-1-20 = VERNAL POOL #
- USACE W-1 = UNITED STATES ARMY CORPS OF ENGINEERS TRANSECT POINT #

DIMENSIONAL REQUIREMENTS MANSFIELD, CT

ZONE	MINIMUM REQUIRED LOT AREA (AC.)	MINIMUM LOT FRONTAGE (FT)	MINIMUM SETBACK FROM (FT.) FRONT	SIDE	REAR	MAX. BUILDING HEIGHT (FT)	MAX. GROUND FLOOR BUILDING AND COVERAGE
RAR-90	5.0	200	60	35	50	35	NONE

I HAVE REVIEWED THIS PLAN AND FIND THAT THE WETLAND BOUNDARIES DEPICTED HEREON SUBSTANTIALLY REFLECT THE SOILS-BASED WETLAND DELINEATIONS CONDUCTED IN THE FIELD IN ACCORDANCE WITH THE CONNECTICUT STATUTES. IN OCTOBER 2015.

Date: 11/24/15

George T. Logan, MS, CPWS, CSE
Registered Soil Scientist
Certified Professional Wetland Scientist

TODD S. HESKETH-LS 17945

TO MY KNOWLEDGE AND BELIEF THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON.

THIS MAP IS NOT VALID WITHOUT THE LIVE SIGNATURE AND IMPRESSION TYPE SEAL OF THE LAND SURVEYOR WHOSE SIGNATURE APPEARS HEREON.

F. A. Hesketh & Associates, Inc.
6 Creamery Brook, East Granby, CT 06026
Civil & Traffic Engineers · Surveyors · Planners · Landscape Architects
Phone (860) 653-8000
Fax (860) 844-8600
e-mail mail@fahesketh.com

Revisions:

No.	Date	Description
1	06-27-07	MISC
2	10-27-15	WETLANDS / TITLE UPDATED
3	11-30-2015	WETLANDS MAP AMENDMENT/TITLE
4	01-08-16	REVISED WETLAND LINE PER FIELD WALK

WETLAND MAP AMENDMENT
ON PROPERTY OF
PONDE PLACE, LLC.
HUNTING LODGE ROAD
MANSFIELD, CONNECTICUT

Date: 02-07-05 | Drawn by: RM | Job no: 04161
Scale: 1" = 80' | Checked by: TSH | Sheet no: 1 OF 1

PS-1

© \2004\04161\Survey\WETLAND AMENDMENT 3.dwg, WMA, Jan. 12, 2016 - 11:19:59 AM

"*Storrs Lodges*," a Proposed Residential Community, Hunting Lodge Road, Mansfield, CT
Photos taken in the Fall of 2015 and Winter of 2016, by REMA Ecological Services, LLC

Photo 1: Wetland A (with embedded vernal pool habitat); early Fall 2015; facing westerly

Photo 2: Wetland A; a forested swamp; western section; facing westerly

Photo 3: Wetland A; seasonally saturated section; early Fall 2015; facing westerly

Photo 4: Wetland A; no inundation in mid-Fall 2015; blue/green flagging denotes edge of vernal pool habitat; pink/blue is the wetland boundary; facing northerly

Photo 5: Wetland A; northeastern section; December 2015; facing northerly

Photo 6: Wetland A; northeastern section; January 2016; facing southwesterly

Photo 7: Wetland A; east-central section; February 2016; seasonally flooded pool near capacity; facing southerly

Photo 8: Wetland B; northcentral section; September 2015; facing southerly

Photo 9: Wetland B; seasonally saturated northern section; October 2015; facing southerly

Photo 10: Wetland B; southern section; September 2015; wall in background is at the property boundary; facing southwesterly

Photo 11: Wetland C1; seasonally saturated to seasonally flooded wooded swamp; central section; September 2015; floristic diversity is moderately high; facing easterly

Photo 12: Wetland C1; west-central section; October 2015; section filled in the late 1960s at far edge of wetland (background); facing southwesterly

Photo 13: Wetland C1; seasonally saturated southern section grades to moist uplands in background; central section; September 2015; facing southerly

Photo 14: Wetland C1 experiences seasonal groundwater seepage; Sphagnum mosses and sedge species are locally common

Photo 15: Wetland C1; view of westernmost section from on top of old fill (area of proposed wetland restoration); September 2015; facing southwesterly

Photo 16: Outlet intermittent stream from Wetland C1 connects to intermittent stream of site's main, north-south oriented wetland corridor; facing westerly

Photo 17: Large white oak (a "wolf tree") just south of the outlet stream for Wetland C1; facing southwesterly

Photo 18: Wetland C2; a seasonally saturated forested wetland seep, discharging easterly to Wetland C3; facing easterly

Photo 19: Wetland C3; site's main riparian corridor; a seasonally flooded, seasonally saturated, and saturated forested swamp; facing southwesterly

Photo 20: Wetland C2; a significant proportion of wetland is very poorly drained, seasonally flooded, and devoid of shrubs and trees; facing southerly

Photo 21: Wetland C3; central section; October 2015; note invasive Japanese barberry (common throughout); facing northerly

Photo 22: Wetland C3; upper portion; showing intermittent stream; facing northerly

Photo 23: Wetland C3; uppermost section; December 2015; sandy deposits originate at discharge from Hunting Lodge Road; facing northerly

Photo 24: Wetland C3 extends off-site to the north; September 2015; note last flag (C-51) at northern property border; facing northeasterly

Photo 25: Wetland C3; stream flows through the central nearly flat mucky section (very poorly drained); facing southeasterly

Photo 26: A few sections of stream within Wetland C3 have small riffles; two-lined salamanders were noted here.

Photo 27: Wetland C3; along southeastern edge, a seasonally saturated poorly drained zone; note cinnamon fern "zone;"facing southerly

Photo 28: Seasonally saturated, poorly drained "transitional" wetland grades into uplands with similar vegetation; facing southerly

Photo 29: One of two off-site, piped discharges to Wetland C3; facing northerly

Photo 30: Stormwater discharge to Wetland C3 from Hunting Lodge Road; located at the far northeastern corner of the site; facing northerly

Photo 31: Soils in the central sections of Wetlands C3 and C4 are very poorly drained, as seen in this soil core with mucky topsoil and nearly glayed sandy subsoil

Photo 32: Wetland C4; typical view of central section; Wetland C4 has more trees than Wetland C3; facing southerly

Photo 33: Wetland boundary of WC4, indicated by flag; note the wide poorly drained zone above the very poorly drained portion of wetland with stream; facing northeasterly

Photo 34: Upper section of Wetland C4; old farm road crossing, separating WC3 and WC4 is the far background; facing northerly

Photo 35: Southernmost section of Wetland C4; facing northeasterly

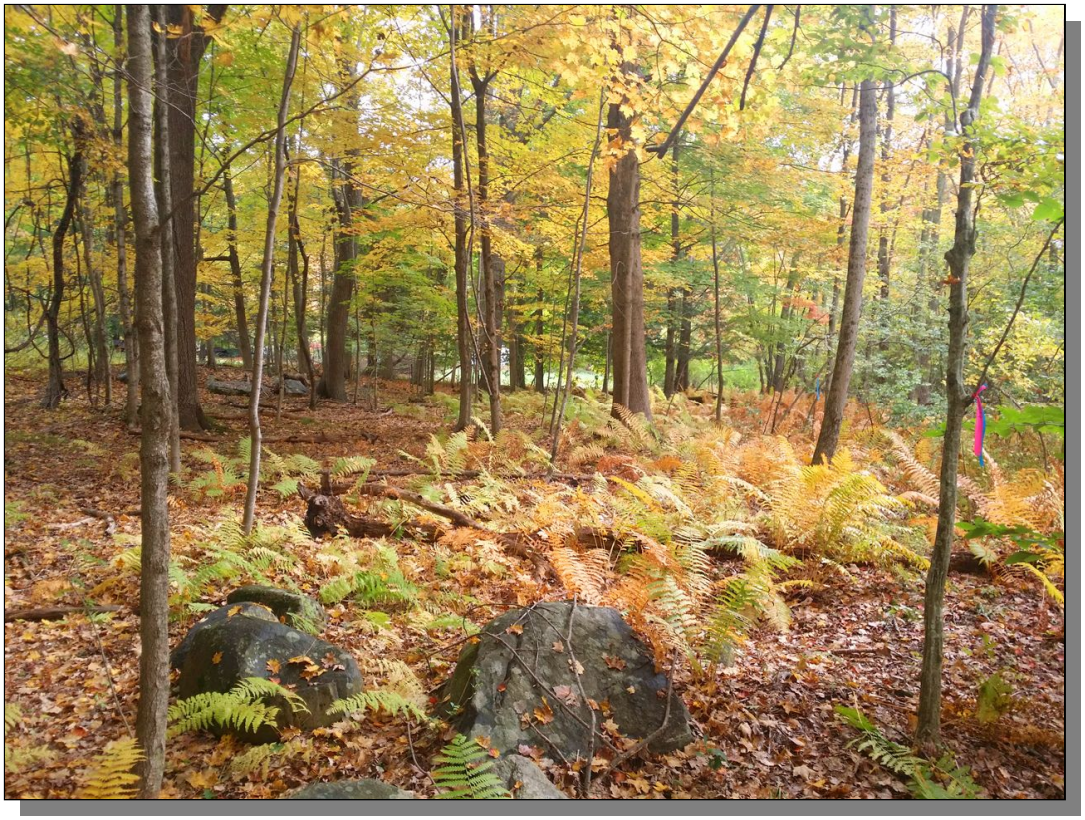


Photo 36: Eastern edge of Wetland C4 near property boundary; note "cinnamon fern zone" which can be found on both sides of the wetland boundary; facing southeasterly

Photo 37: Wetland C4 outlet stream near southern property boundary; facing southeasterly (downstream)

Photo 38: Wetland C4 intermittent stream near southern site boundary; facing westerly (upstream)

Photo 39: Cedar Swamp Brook just westerly of subject site; facing northwesterly (upstream)

Photo 40: Cedar Swam Brook flows within a steep sided "ravine"; facing southeasterly (downstream)

Photo 41: Cedar Swamp Brook; qualitative macro-benthos survey at this riffle, revealed the stream to be moderately impaired; facing northwesterly (upstream)

Photo 42: Stormflow from the western section of the subject site, including Wetland A and B flows down the steep slope above Cedar Swamp Brook; facing northeasterly

Photo 43: This is the uphill section of the broad swale that drains a portion of the subject site towards Cedar Swamp Brook; facing southwesterly

Photo 44: Off-site wetland, with heavy Japanese barberry infestation, downgradient of the western section of the site that drains to Cedar Swamp Brook; facing easterly

Photo 45: The old farm road wetland crossing (left side of photo); note pink/blue wetland boundary markers; facing northerly

Photo 46: Old farm road crossing will be the location of the main roadway into the site from Hunting Lodge Road; WC3 to right, and WC4 to left of photo; facing southwesterly

Photo 47: Breach in old farm roadbed will be maintained in order not to alter the hydrology of Wetland C3, upstream; facing northwesterly

Photo 48: Old wetland fill area, adjacent to Wetland C1, will be removed and wetland conditions restored and planted; facing northerly

Photo 49: Large boulders were placed at edge of old fill and Wetland C1; facing northerly

Photo 50: Old wetland fill area, adjacent to Wetland C1, is replete with invasives; trees include "pioneer" species such as aspens; facing northerly

Photo 51: Uplands east of Wetland C3; facing easterly

Photo 52: Maturing deciduous forest in the north-central section of subject site; facing northwesterly

Photo 53: Upland woods within the westernmost development area at the site; facing southerly

Photo 54: Woods (upland) at the far western area of the subject site just beyond the development envelope; note well casing; facing southwesterly

Photo 55: Upland woods within the southeastern section of the site, designated for development; facing easterly

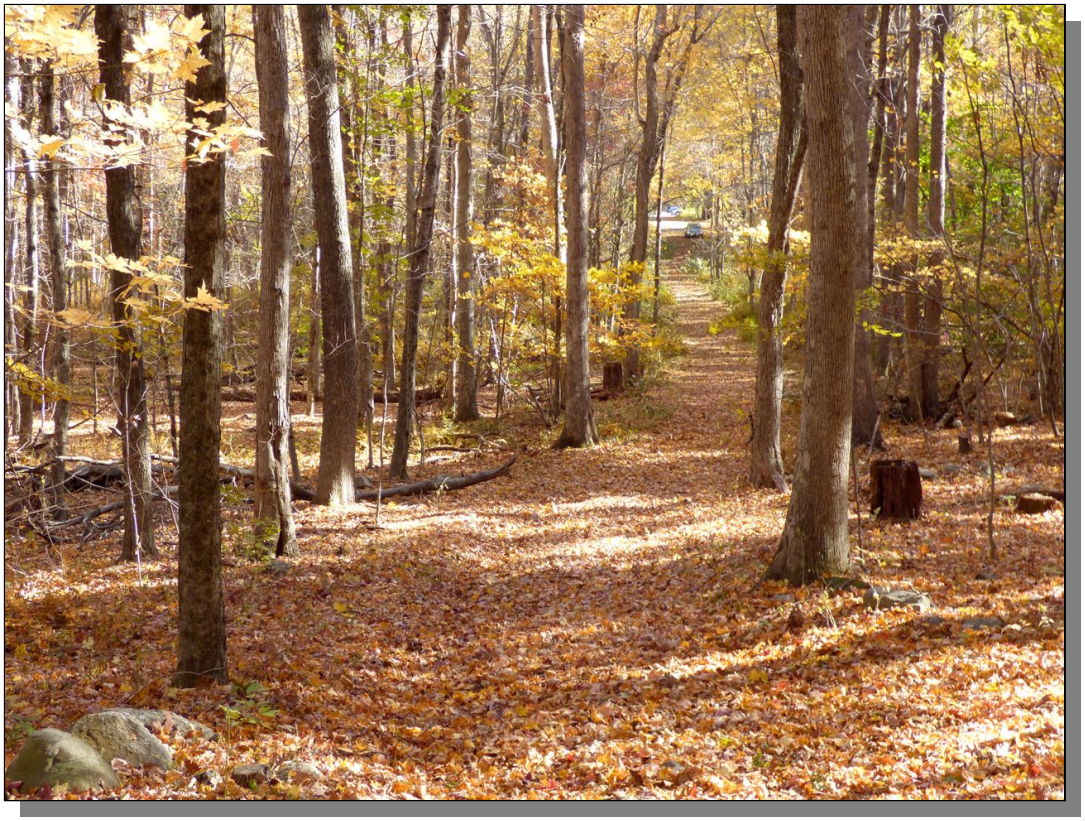


Photo 56: Existing woods road (extending north of Northwood Road) n the southwesterly section of the site; facing southeasterly

REMA ECOLOGICAL SERVICES, LLC
164 East Center Street, Suite 8
Manchester, CT 06040
860.649.REMA (7362)

REPORT DATE: November 25, 2015

ON-SITE SOIL INVESTIGATION & WETLAND DELINEATION REPORT

PROJECT NAME & SITE LOCATION:
+/- 45.93 acres
Hunting Lodge Road
Mansfield, CT

REMA Job No.: 15-1860-MNS18
Field Investigation Date(s): 10/1, 10/9, 10/10/2015
Field Investigation Method(s):
- ☒ Spade and Auger
- ☐ Backhoe Test Pits
- ☐ Other:

REPORT PREPARED FOR:
EdR
999 South Shady Grove Road
Suite 600
Memphis, TN 38120

Field Conditions:
Weather: Mostly sunny to cloudy, 50s to 70s
Soil Moisture: low-moderate
Snow Depth: none
Frost Depth: none

Purpose of Investigation:
- ☒ Wetland Delineation/Flagging in Field
- ☐ Wetland Mapping on Sketch Plan or Topographic Plan
- ☐ High Intensity Soil Mapping by Soil Scientist
- ☒ Medium Intensity Soil Mapping from *The Soil Survey of Connecticut* Maps (USDA-NRCS)
- ☐ Other:

Base Map Source: CT Soil Survey web (USDA-NRCS) Figure A (attached)

Wetland Boundary Marker Series: RES-A-1 to RES-A-40 (open line), RES-B-1 to RES-B-28 (open line), RES-C-1 to RES-C-51 tied to RES-2C-1 to RES-2C-28 tied to RES-3C-1 to 3C-50, RES-1C-1 to RES-1C-13, and RES-4C-1 to RES-4C-36 (all open lines)

General Site Description/Comments: The "study area" or "site" is a roughly 49.93-acre, residentially-zoned parcel, westerly of Hunting Lodge Road, and northerly, easterly, and westerly of the northern terminus of Northwood Road, in Mansfield, CT. The site is predominately wooded and undisturbed, except for historic disturbances associated with filling just northerly of the terminus of Northwood Road, and with a crossing over the site's eastern wetland corridor and stream to connect Hunting Lodge Road with Northwood Road. The soils within the study area are both disturbed and undisturbed in nature, and are derived from glacial till (i.e. unstratified sand, silt & rock), both with and without a hardpan, and with rocky/sandy fill in the areas noted. The disturbed upland soils are identified as the Udorthents (306) soil mapping unit. The undisturbed upland soils are the well drained Paxton and Montauk (85), Canton and Charlton (60), and Charlton and Chatfield (73) soil series complexes, and the moderately well drained Woodbridge (46) soil series, while the undisturbed wetland soils belong to the poorly and very poorly drained Ridgebury, Leicester, and Whitman (3) soil series complex. The site's regulated wetland areas include a seasonally saturated to seasonally flooded eastern forested corridor associated with an intermittent stream, tributary to Eagleville Brook, and western forested wetlands, including a hillside seep and vernal pool habitat, that drain westerly to Cedar Swamp Brook. All of the forested wetlands are red-maple dominated swamps, with typical understory species (e.g. spicebush, highbush blueberry). However, the eastern forested wetland understory is dominated by Japanese barberry, and invasive shrub.

ON-SITE SOIL INVESTIGATION & WETLAND DELINEATION REPORT *(CONTINUED)*

PROJECT NAME & SITE LOCATION: +/- 45.93 acres
Hunting Lodge Road, Mansfield, CT

SOIL MAP UNITS

Upland Soils

Montauk loam (85). This series consists of very deep, well drained soils formed in till derived primarily from granitic materials. These soils are on upland till plains and moraines. Slope ranges from 0 to 35 percent. Saturated hydraulic conductivity is moderately high or high in the solum and low to moderately high in the substratum. Mean annual temperature is about 49 degrees F, and mean annual precipitation is about 45 inches. Thickness of the solum and depth to the firm till substratum typically ranges from 20 to 38 inches but the range currently includes 18 to 38. Rock fragments range from 3 to 35 percent in the solum and 5 to 50 percent in the C horizon. The soil ranges from extremely acid to moderately acid throughout.

Paxton fine sandy loam (85). This series consists of deep, well drained soils formed in a coarse-loamy mantle underlain by firm, compact glacial till on uplands. They are nearly level to very steep soils on till plains, low ridges and drumloidal landforms. The soils formed in acid glacial till derived mainly from schist, gneiss or granite. In tilled areas, these soils have a dark brown fine sandy loam surface layer 8 inches thick. The subsoil from 8 to 26 inches is dark yellowish brown and olive brown fine sandy loam. The substratum from 26 to 60 inches is olive, very firm and brittle gravelly fine sandy loam.

Udorthents (306). This soil mapping unit consists of well drained to moderately well drained soils that have been altered by cutting, filling, or grading. The areas either have had two feet or more of the upper part of the original soil removed or have more than two feet of fill material on top of the original soil. Udorthents or Made Land soils can be found on any soil parent material but are typically fluvial on glacial till plains and outwash plains and stream terraces.

Woodbridge fine sandy loam (46). This series consists of deep, moderately well drained soils formed in a coarse-loamy mantle underlain by firm, compact glacial till on uplands. They are nearly level to moderately steep soils on till plains, low ridges and drumloidal landforms. The soils formed in acid glacial till derived mainly from schist, gneiss or granite. In tilled areas, these soils typically have a very dark grayish brown fine sandy loam surface layer 7 inches thick. The subsoil from 7 to 30 inches is dark yellowish brown and light olive brown fine sandy loam, mottled below 18 inches. The substratum from 30 to 60 inches is light olive brown, very firm and brittle gravelly fine sandy loam.

Charlton very stony fine sandy loam (73). This series consists of very deep, well drained coarse-loamy soils formed in friable, glacial till on uplands. They are nearly level to very steep soils on till plains and hills. The soils formed in acid glacial till derived mainly from schist, gneiss or granite. In tilled areas, these soils have a surface layer of dark brown fine sandy loam 8 inches thick. The subsoil from 8 to 26 inches is yellowish brown fine sandy loam and sandy loam. The substratum from 26 to 60 inches or more is grayish brown gravelly fine sandy loam.

Chatfield loam (73). This series consists of moderately deep, well drained, and somewhat excessively drained soils formed in till. They are nearly level to very steep soils on glaciated plains, hills, and ridges. Slope ranges from 0 to 70 percent. Crystalline bedrock is at depths of 20 to 40 inches. Permeability is moderate or moderately rapid. In tilled areas, these soils have a surface layer that is very dark to dark grayish brown loam up to 8 inches thick. The subsoil from 8 to 26 inches is brown, flaggy silt loam.

Canton stony fine sandy loam (61). This series consists of deep, well drained soils formed in a coarse-loamy mantle underlain by sandy glacial till on uplands. They are nearly level to very steep soils on till plains and hills. The soils formed in acid glacial till derived mainly from schist, gneiss or granite. Typically, these soils have a surface layer of very dark grayish brown fine sandy loam 2 inches thick. The subsoil from 2 to 23 inches is yellowish brown fine sandy loam, gravelly fine sandy loam and gravelly sandy loam. The substratum from 23 to 60 inches is pale brown gravelly loamy sand.

ON-SITE SOIL INVESTIGATION & WETLAND DELINEATION REPORT *(CONTINUED)*

PROJECT NAME & SITE LOCATION: +/- 45.93 acres
Hunting Lodge Road, Mansfield, CT

SOIL MAP UNITS

Wetland Soils

Ridgebury fine sandy loam (3). This soil series consists of deep, poorly and somewhat poorly drained soils formed in a coarse-loamy mantle underlain by firm, compact glacial till on uplands. They are nearly level to moderately steep soils on till plains, low ridges and drumloidal landforms. The soils formed in acid glacial till derived mainly from schist, gneiss or granite. Typically these soils have a black sandy loam surface layer 6 inches thick. The mottled subsoil from 6 to 16 inches is olive gray sandy loam. The mottled substratum from 16 to 60 inches is a light olive brown and olive, very firm and brittle gravelly sandy loam.

Leicester fine sandy loam (3). This series, which is some Connecticut counties is found only in complex with the Ridgebury and Whitman series, consists of deep, poorly drained loamy soils formed in friable glacial till on uplands. They are nearly level to gently sloping soils in drainage ways and low lying positions on till covered uplands. The soils formed in acid glacial till derived mainly from schist, gneiss or granite. Typically, these soils have a surface layer of black fine sandy loam 6 inches thick. The subsoil from 6 to 23 inches is grayish brown, mottled fine sandy loam. The substratum from 26 to 60 inches or more is dark yellowish brown, mottled, friable, gravelly fine sandy loam.

Whitman fine sandy loam (3). This series, which is some Connecticut counties is only mapped in complex with the Ridgebury and Leicester series, consists of deep, very poorly drained soils formed in a coarse-loamy mantle underlain by firm, compact glacial till on uplands. They are nearly level and gently sloping soils on till plains, low ridges and drumloidal landforms. The soils formed in acid glacial till derived mainly from schist, gneiss or granite. Typically these soils have a black fine sandy loam surface layer 8 inches thick. The mottled subsoil from 8 to 15 inches is gray sandy loam. The mottled substratum from 15 to 60 inches is firm, olive gray to gray dense glacial till.

Any accompanying soil logs and soil maps, and the on-site soil investigation narrative are in accordance with the taxonomic classification of the National Cooperative Soil Survey of the USDA Natural Resource Conservation Service, and with the Connecticut Soil Legend (DEP Bulletin No.5, 1983), as amended by USDA-NRCS. Jurisdictional wetland boundaries were delineated pursuant to the Connecticut General Statutes (CGS Sections 22a-36 to 22a-45), as amended. The site investigation was conducted and/or reviewed by the undersigned Registered Soil Scientist(s) [registered with the Society of Soil Scientists of Southern New England (SSSSNE) in accordance with the standards of the Federal Office of Personnel Management].

Respectfully submitted,

REMA ECOLOGICAL SERVICES, LLC

George T. Logan, MS, PWS, CSE
Registered Soil Scientist, Professional Wetland Scientist
Field Investigator/Senior Reviewer

FIGURE A: Ponde Place, LLC property, Hunting Lodge Road, Mansfield, CT; showing soil types on a 2004 orthophoto (CT ECO)

Soil Map—State of Connecticut
(Proposed Storrs Lodges, Hunting Lodge Road, Mansfield, CT)

Map Scale: 1:8,550 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 100 200 400 600

Feet: 0 400 800 1600 2400

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: State of Connecticut
Survey Area Data: Version 14, Sep 22, 2015

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 28, 2011—May 12, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

State of Connecticut (CT600)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
3	Ridgebury, Leicester, and Whitman soils, 0 to 8 percent slopes, extremely stony	46.6	14.4%
29A	Agawam fine sandy loam, 0 to 3 percent slopes	2.2	0.7%
46B	Woodbridge fine sandy loam, 0 to 8 percent slopes, very stony	62.2	19.2%
51B	Sutton fine sandy loam, 2 to 8 percent slopes, very stony	17.9	5.5%
60B	Canton and Charlton soils, 3 to 8 percent slopes	18.0	5.6%
60C	Canton and Charlton soils, 8 to 15 percent slopes	4.1	1.3%
61B	Canton and Charlton soils, 3 to 8 percent slopes, very stony	58.0	17.9%
61C	Canton and Charlton soils, 8 to 15 percent slopes, very stony	25.2	7.8%
62C	Canton and Charlton soils, 3 to 15 percent slopes, extremely stony	7.3	2.2%
62D	Canton and Charlton soils, 15 to 35 percent slopes, extremely stony	28.2	8.7%
73C	Charlton-Chatfield complex, 3 to 15 percent slopes, very rocky	24.0	7.4%
73E	Charlton-Chatfield complex, 15 to 45 percent slopes, very rocky	10.5	3.2%
84B	Paxton and Montauk fine sandy loams, 3 to 8 percent slopes	5.3	1.7%
84C	Paxton and Montauk fine sandy loams, 8 to 15 percent slopes	0.9	0.3%
85B	Paxton and Montauk fine sandy loams, 3 to 8 percent slopes, very stony	9.2	2.9%
85C	Paxton and Montauk fine sandy loams, 8 to 15 percent slopes, very stony	0.1	0.0%
302	Dumps	2.1	0.7%
W	Water	1.8	0.5%
Totals for Area of Interest		**323.5**	**100.0%**

● Ecology
● Soil & Wetland Studies
● Water Quality Monitoring ● GPS
● Environmental Planning & Management
● Ecological Restoration & Habitat Mitigation
● Aquatic, Wildlife and Listed Species Surveys
● Application Reviews ● Permitting & Compliance

April 4, 2016

Town of Mansfield
Inland Wetlands Agency
14 Park Place
Mansfield, CT 06226-2217

Re: **WETLANDS ASSESSMENT-SUPPLEMENTAL: *WATER QUALITY INVESTIGATION***
Lodges at Storrs, Hunting Lodge Road, Mansfield, CT

REMA Job No.: 15-1860-MNS18

Dear Agency Members:

REMA ECOLOGICAL SERVICES, LLC (REMA), is providing herein the results to date of an investigation of water quality in the southern portion of the eastern semi-perennial[i] watercourse (WC4), and the southern seasonally flooded wetland (WA), the only area in which breeding activity of vernal pool species was observed in 2016. Sampling station locations are shown in Figure A (attached), and were also flagged in the field.

Samples were collected in polypropylene bottles in mid-afternoon of March 24th, 2016, and delivered to Phoenix Laboratories, of Manchester, in late afternoon; preservation was as specified by the laboratory, e.g. H_2SO_4. Additional parameters will be tested later in the season using hand-held meters, at the time of the final search for additional evidence of amphibian breeding, e.g. spotted salamanders and late-arriving wood frogs (see separate letter/report on vernal pool investigation).

Results indicated moderately good water quality in the eastern stream. At 211 µS/com, specific conductivity was relatively low for a semi-perennial stream. Nutrient parameters were close to the draft USEPA criteria for non-impaired watercourses, based on a large data set of pristine watercourses. Nitrate-nitrogen level in the sample form the stream was 0.45 mg/l, exceeding the criterion (0.31 mg/l). Total Kjeldahl nitrogen (TKN) concentration was

0.35 mg/l, well below the drafter criterion of 1.26 mg/l. Total phosphorus was again close to double the USEPA criteria, but well below the majority of streams in the urbanizing Connecticut landscape. Initial exploratory rock turning, revealed a few moderately pollution intolerant taxa: water penny beetles and stream salamanders.

Results for the vernal pool must be considered in the context of the season, and site topography. Conductivity was relatively low (98.1 mg/l) and nutrient parameters were somewhat elevated (160 µg/l TP and 2.48 mg/l TN). However, the nutrient loading from partially treated septic leachate or infiltrated fertilizer is unlikely, considering the 200-foot width of the naturally vegetated buffer and the fact that the nearest residential lots drain predominantly southerly. Elevated nutrient levels would be expected for any pool in early spring, as the winter's decomposition of leaf litter always releases nutrients, in both dissolved and fine particulate form. In early spring little nutrient attenuation has taken place, via plant uptake, denitrification, and filter-feeding invertebrates. The initial pH reading (pending the more accurate in-situ reading) was substantially lower than that for the stream, as expected for a still pool without throughflow.

Respectfully submitted,

REMA ECOLOGICAL SERVICES, LLC

Sigrun N. Gadwa, MS, PWS
Professional Wetland Scientist
Registered Soil Scientist

George T. Logan, MS, PWS, CE
Professional Wetland Scientist
Registered Soil Scientist, Certified Senior Ecologist

VIA E-MAIL & HAND-DELIVERY

Attachments: Figure A; Table 1: Water Quality Summary Table; Laboratory Analytical Results

[i] A semi-perennial watercourse does not flow year round, but the substrate retains sufficient saturation, at least locally, for a variety of aquatic organisms, to remain hydrated until flow resumes. These include most case caddisflies and lungless stream salamanders.

Table 1. Surface water analytical results in Vernal Pool (Wetland A), and an un-named Intermittent Stream (Wetland C4) at Proposed Lodges at Storrs, Hunting Lodge Road, Mansfield, CT, on 3-24-16.

Sampling Station	*Unnamed Stream*	*Vernal Pool*	*CT Standards*
Sampling Date:	3/24/2016	3/24/2016	
Conductivity (µS/cm)	211.0	98.1	NE
pH [3]	7.06	6.01	as naturally occurs[1]
Total Phosphorus as P (µg/l)	40.00	160.00	only of natural origin[1], 23.75[2]
Ortho Phosphorus as P (µg/l)	<0.01	0.01	NE
Nitrate-N (mg/l)	0.45	1.39	0.31[2] (includes Nitrite-N)
Nitrite-N (mg/l)	<0.01	<0.01	NE
Total Keldahl Nitrogen (mg/l)	0.35	2.48	5[1]; 1.26[2]

NOTES:

N/A = Not applicable

NE = No standard established

mg/L = milligrams per Liter; µg/L = micrograms per Liter

[1] The State of Connecticut Water Quality Standards for Class A Waters.

[2] USEPA Nutrient Criteria (draft) for EcoRegion 1V, Level 11 Ecoregion 59 (coastal New England).

Note that Brook (Wetland C4) was sampled downgradient of the old causeway crossing. The vernal pool (Wetland A) was sampled in east-central portion. Sampling stations are shown on Figure A, attache

[3] If tested in the laboratory, pH should be tested within a few hours of sample collection. Readings for this parameter could be too high, because testing took place ~ 19 hours hours after sampling.

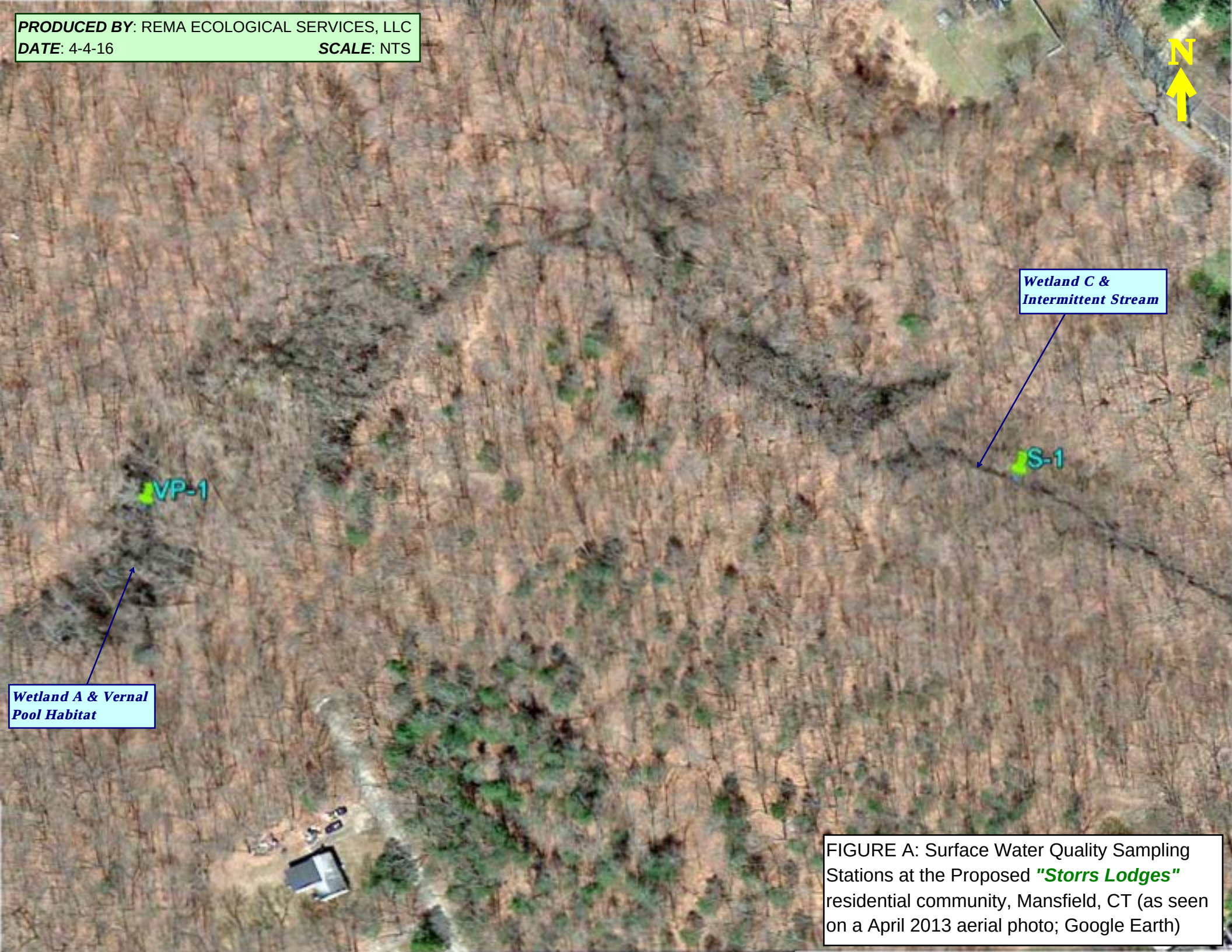


FIGURE A: Surface Water Quality Sampling Stations at the Proposed ***"Storrs Lodges"*** residential community, Mansfield, CT (as seen on a April 2013 aerial photo; Google Earth)

PHOENIX
Environmental Laboratories, Inc.

Wednesday, March 30, 2016

Attn:
Rema Ecological Services
164 East Center Street
Suite 8
Manchester CT 06040

Project ID: LODGES AT STORRS
Sample ID#s: BK88942 - BK88943

This laboratory is in compliance with the NELAC requirements of procedures used except where indicated.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

If you have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext. 200.

Sincerely yours,

Phyllis Shiller
Laboratory Director

NELAC - #NY11301
CT Lab Registration #PH-0618
MA Lab Registration #MA-CT-007
ME Lab Registration #CT-007
NH Lab Registration #213693-A,B
NJ Lab Registration #CT-003
NY Lab Registration #11301
PA Lab Registration #68-03530
RI Lab Registration #63
VT Lab Registration #VT11301

587 East Middle Turnpike, P.O. Box 370, Manchester, CT 06040
Telephone (860) 645-1102 Fax (860) 645-0823

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

March 30, 2016

FOR: Attn:
Rema Ecological Services
164 East Center Street
Suite 8
Manchester CT 06040

Sample Information		Custody Information		Date	Time
Matrix:	SURFACE WATER	Collected by:		03/24/16	15:21
Location Code:	REMA	Received by:	SW	03/24/16	16:44
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:					

Laboratory Data

SDG ID: GBK88942
Phoenix ID: BK88942

Project ID: LODGES AT STORRS
Client ID: VP-1

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Conductivity	98	5.00	umhos/cm	1	03/25/16	RR/EG	SM2510B-97
Ammonia as Nitrogen	0.30	0.10	mg/L	2	03/29/16	WHM	E350.1
Nitrite-N	< 0.01	0.01	mg/L	1	03/24/16 20:42	CAL	E353.2
Nitrate-N	1.39	0.02	mg/L	1	03/24/16 20:42	CAL	E353.2
Ortho-Phosphate-P	0.04	0.01	mg/L	1	03/25/16 18:37	CAL	SM4500PF-99
pH	6.01	0.10	pH Units	1	03/25/16 07:03	RR/EG	SM4500-H B-00
Nitrogen Tot Kjeldahl	2.48	0.20	mg/L	2	03/29/16	WHM	E351.1
Total Nitrogen	3.87	0.10	mg/L	1	03/29/16	WHM	SM4500NH3/E300.0
Phosphorus, as P	0.16	0.02	mg/L	2	03/25/16	JR	SM4500PE-99

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

Ortho-Phosphate was not field filtered within 15 minutes of collection.

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.
This report must not be reproduced except in full as defined by the attached chain of custody.

Phyllis Shiller, Laboratory Director
March 30, 2016
Reviewed and Released by: Deb Lawrie, Project Manager

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

March 30, 2016

FOR: Attn:
Rema Ecological Services
164 East Center Street
Suite 8
Manchester CT 06040

Sample Information		Custody Information		Date	Time
Matrix:	SURFACE WATER	Collected by:		03/24/16	16:07
Location Code:	REMA	Received by:	SW	03/24/16	16:44
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:					

Laboratory Data

SDG ID: GBK88942
Phoenix ID: BK88943

Project ID: LODGES AT STORRS
Client ID: STREAM-1

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Conductivity	211	5.00	umhos/cm	1	03/25/16	RR/EG	SM2510B-97
Ammonia as Nitrogen	< 0.05	0.05	mg/L	1	03/29/16	WHM	E350.1
Nitrite-N	< 0.01	0.01	mg/L	1	03/24/16 20:43	CAL	E353.2
Nitrate-N	0.45	0.02	mg/L	1	03/24/16 20:43	CAL	E353.2
Ortho-Phosphate-P	< 0.01	0.01	mg/L	1	03/25/16 18:38	CAL	SM4500PF-99
pH	7.06	0.10	pH Units	1	03/25/16 07:06	RR/EG	SM4500-H B-00
Nitrogen Tot Kjeldahl	0.35	0.10	mg/L	1	03/29/16	WHM	E351.1
Total Nitrogen	0.80	0.10	mg/L	1	03/29/16	WHM	SM4500NH3/E300.0
Phosphorus, as P	0.04	0.01	mg/L	1	03/25/16	JR	SM4500PE-99

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

Ortho-Phosphate was not field filtered within 15 minutes of collection.

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.
This report must not be reproduced except in full as defined by the attached chain of custody.

Phyllis Shiller, Laboratory Director
March 30, 2016
Reviewed and Released by: Deb Lawrie, Project Manager

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

QA/QC Report

March 30, 2016

QA/QC Data

SDG I.D.: GBK88942

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 339352 (mg/L), QC Sample No: BK87168 (BK88942, BK88943)													
Nitrate-N	BRL	0.02	<0.02	<0.02	NC	102			95.8			85 - 115	20
Nitrite-N	BRL	0.01	0.01	0.02	NC	106			96.4			85 - 115	20
QA/QC Batch 339406 (mg/L), QC Sample No: BK87874 (BK88942, BK88943)													
Phosphorus, as P	BRL	0.01	0.05	0.03	NC	107			96.0			85 - 115	20
QA/QC Batch 339731 (mg/L), QC Sample No: BK88719 (BK88942, BK88943)													
Ammonia as Nitrogen	BRL	0.05	<0.05	<0.05	NC	101			100				
Nitrogen Tot Kjeldahl	BRL	0.10	0.37	0.33	NC	90.3			102				
QA/QC Batch 339432 (umhos/cm), QC Sample No: BK88845 (BK88942, BK88943)													
Conductivity	BRL	5.00	1820	1820	0	106						85 - 115	20
QA/QC Batch 339420 (pH), QC Sample No: BK88845 (BK88942, BK88943)													
pH			7.81	7.79	0.30	99.6						85 - 115	20
QA/QC Batch 339518 (mg/L), QC Sample No: BK88856 (BK88942, BK88943)													
Ortho-Phosphate as Phosphorus	BRL	0.01	0.25	0.25	0	106			104			85 - 115	20

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

RPD - Relative Percent Difference
LCS - Laboratory Control Sample
LCSD - Laboratory Control Sample Duplicate
MS - Matrix Spike
MS Dup - Matrix Spike Duplicate
NC - No Criteria
Intf - Interference

Phyllis Shiller, Laboratory Director
March 30, 2016

Sample Criteria Exceedences Report

GBK88942 - REMA

Criteria: None

State: CT

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL Criteria	Analysis Units

*** No Data to Display ***

Phoenix Laboratories does not assume responsibility for the data contained in this report. It is provided as an additional tool to identify requested criteria exceedences. All efforts are made to ensure the accuracy of the data (obtained from appropriate agencies). A lack of exceedence information does not necessarily suggest conformance to the criteria. It is ultimately the site professional's responsibility to determine appropriate compliance.

Coolant: IPK [X] ICE [ ] No [ ]

Temp 4 °C Pg of

CHAIN OF CUSTODY RECORD

PHOENIX Environmental Laboratories, Inc.

587 East Middle Turnpike, P.O. Box 370, Manchester, CT 06040
Email: info@phoenixlabs.com Fax (860) 645-0823
Client Services (860) 645-8726

Data Delivery:
[ ] Fax #:
[X] Email: REMAE@AOL.COM

Customer: REMA ECOLOGICAL SERVICES, LLC
Address: 164 E. CENTER ST
MANCHESTER, CT 06040
ATTN: GEORGE LOGAN

Project: LODGES AT STORRS
Report to: REMA —
Invoice to: REMA —
Phone #: 860-649-7362
Fax #:

Project P.O:

This section MUST be completed with Bottle Quantities.

Client Sample - Information - Identification

Sampler's Signature _____ Date: _____

Matrix Code:
DW=Drinking Water **GW**=Ground Water **SW**=Surface Water **WW**=Waste Water
RW=Raw Water **SE**=Sediment **SL**=Sludge **S**=Soil **SD**=Solid **W**=Wipe
OIL=Oil **B**=Bulk **L**=Liquid

Analysis Request

PHOENIX USE ONLY SAMPLE #	Customer Sample Identification	Sample Matrix	Date Sampled	Time Sampled	TKN or TOTAL N	NO2-NO3	TP	Ammonia	ORTHO-P	pH	Conductivity	Soil VOA Vials [ ] methanol	GL Soil container ( ) oz	40 ml VOA Vial [ ] As is [ ] HCl	GL Amber 1000ml [ ] As is [ ] H2SO4	PL As is [ ] 250ml [ ] 500ml [ ] 1000ml	PL H2SO4 [ ] 250ml [ ] 500ml	PL HNO3 250ml	PL NaOH 250ml	Bacteria (as is)	Bacteria (w/thio)
88942	VP-1	SW	3/24/16	3:21p	X	X	X	X	X	X	X					1	1	1			
88943	STREAM-1	SW	"	4:07p	X	X	X	X	X	X	X					1	1	1			

Relinquished by:	Accepted by:	Date:	Time:
[signature]	[signature]	3/24/16	16:44

RI
[ ] Direct Exposure (Residential)
[ ] GW
[ ] Other

CT
[ ] RCP Cert
[ ] GW Protection
[ ] SW Protection
[ ] GA Mobility
[ ] GB Mobility
[ ] Residential DEC
[ ] I/C DEC
[ ] Other

MA
[ ] MCP Certification
[ ] GW-1
[ ] GW-2
[ ] GW-3
[ ] S-1
[ ] S-2
[ ] S-3
[ ] MWRA eSMART
[ ] Other

Data Format
[ ] Excel
[ ] PDF
[ ] GIS/Key
[ ] EQuIS
[ ] Other

Data Package
[ ] Tier II Checklist
[ ] Full Data Package*
[ ] Phoenix Std Report
[ ] Other

Comments, Special Requirements or Regulations:
RCVD CHECK # 1087
FOR $ 47.86 (TP)

Turnaround:
[ ] 1 Day*
[ ] 2 Days*
[ ] 3 Days*
[X] Standard
[ ] Other
* SURCHARGE APPLIES

State where samples were collected: _____

* SURCHARGE APPLIES

● Ecology
● Soil & Wetland Studies
● Water Quality Monitoring ● GPS
● Environmental Planning & Management
● Ecological Restoration & Habitat Mitigation
● Aquatic, Wildlife and Listed Species Surveys
● Application Reviews ● Permitting & Compliance

March 30, 2016

Town of Mansfield
Inland Wetlands Agency
14 Park Place
Mansfield, CT 06226-2217

Re: **WETLANDS ASSESSMENT-SUPPLEMENTAL: VERNAL POOL INVESTIGATION**
Storrs Lodges, Connecticut, Hunting Lodge Road, Mansfield, CT

REMA Job No.: 15-1860-MNS18

Dear Agency Members:

REMA ECOLOGICAL SERVICES, LLC (REMA) is providing herein the results of a breeding season, vernal pool investigation conducted at Wetland A, at the above-referenced site on March 24th, 2016. Attached to this report please find a Vernal Pool Characterization Form (Draft-USACE), and several annotated photographs taken on the day of the survey.

In total, sixty-seven (67) wood frog egg masses were observed, most of which (i.e. 62) were found together in one "raft" or grouping, and in about 12 inches of water.

Respectfully submitted,

REMA ECOLOGICAL SERVICES, LLC

Sigrun N. Gadwa, MS, PWS
Professional Wetland Scientist
Registered Soil Scientist

George T. Logan, MS, PWS, CE
Professional Wetland Scientist
Registered Soil Scientist, Certified Senior Ecologist

VIA E-MAIL & HAND-DELIVERY

Attachments: Vernal Pool Characterization Form; Photos 1 to 5

US Army Corps of Engineers - New England District
DRAFT Vernal Pool Characterization Form

Project File # 15-1860-MNS18 Project Name Lodges at Storrs, a proposed Residential/Student Community Pool ID WA-VP
Observer George T. Logan, MS, PWS, CSE Phone or E-mail rema8@aol.com
Landowner/Applicant Ponde Place, LLC/Storrs Lodges, LLC Phone or E-mail
Address Hunting Lodge Road City Mansfield State CT Zip
Location of vernal pool: City/State Mansfield, CT
Survey date(s) 3-24-16
Longitude/Latitude (in decimal degrees) 41.8086 -72.2755

A. VERNAL POOL CHARACTERISTICS (fill in all information known):

1. Landscape setting (check all that apply):

- [ ] Upland depression (4 pts; if this is also in a floodplain, use 2 pts)
- [x] Pool part of wildlife corridor (4 pts)
- [ ] Pool part of a pool complex (within 1000 feet of one or more other vernal pools) (NA)
- [x] Pool within larger wetland system (4 pts; if this is also in a floodplain, use 2 pts)
- [ ] Other:_____(variable pts)

2. Vernal pool condition:

Describe any recent modifications to the pool and associated landscape: Pool within forested swamp was created when fill for a road (later abandoned) was placed in wetland between 1965 and 1970, hydrologically isolating its western most lobe, allowing water to pond.

3. Parent material:

- [ ] Glacial fluvial ("outwash")
- [ ] Loose till
- [ ] Peat
- [x] Dense till
- [ ] Alluvium
- [ ] Coastal marine sediments

4. Aquatic resource type that best applies to this pool (choose dominant):

- [x] Forested wetland (4 pts)
- [ ] Herbaceous wetland (4 pts)
- [ ] Floodplain (overflow/oxbow) (3 pts)
- [ ] Shrub wetland (4 pts)
- [ ] Open water (2 pts)
- [ ] Other:_____(variable points)
- [ ] Peatland (acidic fen or bog) (4 pts)
- [ ] Intermittent stream reach (2 pts)

5. Pool canopy cover (%): ~85

6. Predominant substrate:

- [x] Mineral soil
- [ ] Organic matter (peat/muck) Depth _____ Sampling location (e.g., deepest zone, edge, etc.)_____

7. Pool size:

a. Approximate dimensions of pool (at maximum capacity; include units): Length _____ Width _____
Area: 9,280

b. Maximum depth at deepest point at time of survey (include units): 15 inches

8. Hydrology:

a. Estimated hydroperiod (unless actual, observed hydroperiod value(s) is(are) known, use the presence of these example indicator species to best predict the expected hydroperiod of the pool):

- [x] Dries between early March and early July (e.g., *Thelypteris palustris, Carex stricta, Impatiens capensis, Ilex verticillata*) (6 pts)
- [ ] Dries between early July and early September (e.g., *Sagittaria latifolia, Scirpus cyperinus, Dulichium arund., Cephalanthus occ.*) (8 pts)
- [ ] Dries between early September and early November (e.g., *Eleocharis palustris, Glyceria cana., Utricularia* spp., *Decodon vert.*) (8 pts)
- [ ] Dries between early November and late December, or intermittently exposed (e.g., *Nuphar* spp., *Potamogeton* spp.) (2 pts)

b. Inlet/outlet (pick one):

- [x] No inlet/outlet (8 pts)
- [ ] Permanent inlet or outlet (channel with well-defined banks and permanent flow) (2 pts)
- [ ] Temporary inlet/outlet (6 pts)

9. Water quality:

- [ ] Clear
- [ ] High turbidity
- [ ] High algae content
- [x] Tannic

26 **TOTAL for Pool Characteristics (out of 28 max.)**

B. VERNAL POOL ENVELOPE (100 ft) AND CRITICAL HABITAT AREA (100-750 ft) CHARACTERISTICS (fill in all information known):

1. Landuse type and approximate percentage within the 100-ft vernal pool envelope:

[x] Forested 99.0 % (16 pts) [ ] Open (e.g., meadow, agriculture, golf course) ____ % (4 pts)

[ ] Shrub ____ % (10 pts) [x] Developed 1.0 % (0 pts)

2. **Landuse type and approximate percentage within the 100 - 750-ft vernal pool critical terrestrial habitat:**

[x] Forested 93.8 % (16 pts) [ ] Open (e.g., agriculture, golf course) ____ % (4 pts)

[ ] Shrub ____ % (10 pts) [x] Developed 6.2 % (0 pts)

[ ] Are there one or more barriers to vernal pool fauna movement within the envelope and/or critical terrestrial habitat? If so, check here and see directions for explanation of how to incorporate this information.

Based on: [ ] Field estimate [ ] GIS [ ] Aerial photo estimate

31 **TOTAL for Pool Envelope and Critical Terrestrial Habitat Area (out of 32 max.)**

C. SPECIES PRESENT IN VERNAL POOL

INDICATOR SPECIES	DATE	EGG MASSES (#)	TADPOLES/LARVAE
Wood Frog (*Lithobates sylvaticus*)	3/24/16	67	
Spotted Salamander (*Ambystoma maculatum*)			
Blue-spotted Salamander (*Ambystoma laterale*)			
Jefferson's Salamander (*Ambystoma jeffersonianum*)			
Marbled Salamander (*Ambystoma opacum*)			
Fairy Shrimp (*Eubranchipus* spp.)		**PRESENT/ABSENT**	**ABUNDANCE:**
OTHER SPECIES	**DATE**	**PRESENCE/ABSENCE**	**FEW/COMMON/MANY**
Facultative Species (e.g., Spring Peeper (*Pseudacris crucifer*), Gray Tree Frog (*Hyla versicolor*), Caddisflies (Limnephilidae, Phryganeidae), American Toad (*Anaxyrus americanus*), Eastern Spadefoot Toad (*Scaphiopus holbrookii*), Fowler's Toad (*Anaxyrus fowleri*), Fingernail Clams (Sphaeriidae, Pisidiidae))(list):	3/24/16	Spring Peeper	FEW
Rare Species (list):			
Predator Species (e.g., Bullfrog/Green frog tadpoles, Fish) (list):			
Other species (e.g., Ducks, Turtles, etc.)(list):			

Presence of Indicator Species [x] Yes [ ] No

SUMMARY:

26 **TOTAL for Pool Characteristics** 31 **TOTAL for Pool Envelope and Critical Terrestrial Habitat Area**

Other comments (append photographs, additional notes, sketch of pool and surrounding landscape):

On April 20, 2007, 53 wood frog, and four spotted salamander egg masses were observed in the pool by Edward M. Pawlak, MS, PWS

"*Storrs Lodges*," a Proposed Residential Community, Hunting Lodge Road, Mansfield, CT
Photos taken March 24th, 2016, by REMA Ecological Services, LLC

Photo 1: Wetland A (with embedded vernal pool habitat); facing northerly

Photo 2: Wetland A; vernal pool, near location of wood frog egg mass raft; facing southerly

Photo 3: Wetland A (with embedded vernal pool habitat); shallow non-productive portion; facing westerly

Photo 4: Wood frog egg mass

Photo 5: Wood frog egg mass raft

● Ecology
● Soil & Wetland Studies
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April 14, 2016

Town of Mansfield
Inland Wetlands Agency
14 Park Place
Mansfield, CT 06226-2217

Re: **WETLANDS ASSESSMENT-SUPPLEMENTAL: VERNAL POOL INVESTIGATION**
Lodges at Storrs, Hunting Lodge Road, Mansfield, CT

REMA Job No.: 15-1860-MNS18

Dear Agency Members:

REMA ECOLOGICAL SERVICES, LLC (REMA) is providing herein the revised results of a breeding season, vernal pool investigation conducted at Wetland A, at the above-referenced site on April 13th, 2016. Attached to this report please find a revised Vernal Pool Characterization Form (Draft-USACE), and several annotated photographs.

Do date, a total of seventy-eight (78) wood frog, and five (5) spotted salamander egg masses have been observed. The pool maximum depth of inundation had gone up by 2-3 inches between the two site visits to seventeen inches (17). The wood frog egg masses observed in March had all hatched.

Respectfully submitted,

REMA ECOLOGICAL SERVICES, LLC

Sigrun N. Gadwa, MS, PWS
Professional Wetland Scientist
Registered Soil Scientist

George T. Logan, MS, PWS, CE
Professional Wetland Scientist
Registered Soil Scientist, Certified Senior Ecologist

VIA E-MAIL

Attachments: Vernal Pool Characterization Form (revised); Photos 1 to 4

US Army Corps of Engineers - New England District
DRAFT Vernal Pool Characterization Form

Project File # 15-1860-MNS18 Project Name Lodges at Storrs, a proposed Residential/Student Community Pool ID WA-VP
Observer George T. Logan, MS, PWS, CSE Phone or E-mail rema8@aol.com
Landowner/Applicant Ponde Place, LLC/Storrs Lodges, LLC Phone or E-mail
Address Hunting Lodge Road City Mansfield State CT Zip
Location of vernal pool: City/State Mansfield, CT
Survey date(s) 3-24-16, 4-13-16
Longitude/Latitude (in decimal degrees) 41.8086 -72.2755

A. VERNAL POOL CHARACTERISTICS (fill in all information known):

1. Landscape setting (check all that apply):

- [ ] Upland depression (4 pts; if this is also in a floodplain, use 2 pts)
- [x] Pool part of wildlife corridor (4 pts)
- [ ] Pool part of a pool complex (within 1000 feet of one or more other vernal pools) (NA)
- [x] Pool within larger wetland system (4 pts; if this is also in a floodplain, use 2 pts)
- [ ] Other:_____(variable pts)

2. Vernal pool condition:

Describe any recent modifications to the pool and associated landscape: Pool within forested swamp was created when fill for a road (later abandoned) was placed in wetland between 1965 and 1970, hydrologically isolating its western most lobe, allowing water to pond.

3. Parent material:

- [ ] Glacial fluvial ("outwash")
- [ ] Loose till
- [ ] Peat
- [x] Dense till
- [ ] Alluvium
- [ ] Coastal marine sediments

4. Aquatic resource type that best applies to this pool (choose dominant):

- [x] Forested wetland (4 pts)
- [ ] Herbaceous wetland (4 pts)
- [ ] Floodplain (overflow/oxbow) (3 pts)
- [ ] Shrub wetland (4 pts)
- [ ] Open water (2 pts)
- [ ] Other:_____(variable points)
- [ ] Peatland (acidic fen or bog) (4 pts)
- [ ] Intermittent stream reach (2 pts)

5. Pool canopy cover (%): ~85

6. Predominant substrate:

- [x] Mineral soil
- [ ] Organic matter (peat/muck) Depth _____ Sampling location (e.g., deepest zone, edge, etc.)_____

7. Pool size:

a. Approximate dimensions of pool (at maximum capacity; include units): Length _____ Width _____
Area: 9,280

b. Maximum depth at deepest point at time of survey (include units): 17 inches

8. Hydrology:

a. Estimated hydroperiod (unless actual, observed hydroperiod value(s) is(are) known, use the presence of these example indicator species to best predict the expected hydroperiod of the pool):

- [x] Dries between early March and early July (e.g., *Thelypteris palustris, Carex stricta, Impatiens capensis, Ilex verticillata*) (6 pts)
- [ ] Dries between early July and early September (e.g., *Sagittaria latifolia, Scirpus cyperinus, Dulichium arund., Cephalanthus occ.*) (8 pts)
- [ ] Dries between early September and early November (e.g., *Eleocharis palustris, Glyceria cana., Utricularia* spp., *Decodon vert.*) (8 pts)
- [ ] Dries between early November and late December, or intermittently exposed (e.g., *Nuphar* spp., *Potamogeton* spp.) (2 pts)

b. Inlet/outlet (pick one):

- [x] No inlet/outlet (8 pts)
- [ ] Permanent inlet or outlet (channel with well-defined banks and permanent flow) (2 pts)
- [ ] Temporary inlet/outlet (6 pts)

9. Water quality:

- [ ] Clear
- [ ] High turbidity
- [ ] High algae content
- [x] Tannic

26 **TOTAL for Pool Characteristics (out of 28 max.)**

Pool ID WA-VP

B. VERNAL POOL ENVELOPE (100 ft) AND CRITICAL HABITAT AREA (100-750 ft) CHARACTERISTICS (fill in all information known):

1. Landuse type and approximate percentage within the 100-ft vernal pool envelope:

[x] Forested 99.0 % (16 pts) [ ] Open (e.g., meadow, agriculture, golf course) ____ % (4 pts)

[ ] Shrub ____ % (10 pts) [x] Developed 1.0 % (0 pts)

2. Landuse type and approximate percentage within the 100 - 750-ft vernal pool critical terrestrial habitat:

[x] Forested 93.8 % (16 pts) [ ] Open (e.g., agriculture, golf course) ____ % (4 pts)

[ ] Shrub ____ % (10 pts) [x] Developed 6.2 % (0 pts)

[ ] Are there one or more barriers to vernal pool fauna movement within the envelope and/or critical terrestrial habitat? If so, check here and see directions for explanation of how to incorporate this information.

Based on: [ ] Field estimate [ ] GIS [ ] Aerial photo estimate

31 **TOTAL for Pool Envelope and Critical Terrestrial Habitat Area (out of 32 max.)**

C. SPECIES PRESENT IN VERNAL POOL

INDICATOR SPECIES	DATE	EGG MASSES (#)	TADPOLES/LARVAE
Wood Frog (*Lithobates sylvaticus*)	by 4/13/16	78	
Spotted Salamander (*Ambystoma maculatum*)	4/13/16	5	
Blue-spotted Salamander (*Ambystoma laterale*)			
Jefferson's Salamander (*Ambystoma jeffersonianum*)			
Marbled Salamander (*Ambystoma opacum*)			
Fairy Shrimp (*Eubranchipus* spp.)		**PRESENT/ABSENT**	**ABUNDANCE:**
OTHER SPECIES	**DATE**	**PRESENCE/ABSENCE**	**FEW/COMMON/MANY**
Facultative Species (e.g., Spring Peeper (*Pseudacris crucifer*), Gray Tree Frog (*Hyla versicolor*), Caddisflies (Limnephilidae, Phryganeidae), American Toad (*Anaxyrus americanus*), Eastern Spadefoot Toad (*Scaphiopus holbrookii*), Fowler's Toad (*Anaxyrus fowleri*), Fingernail Clams (Sphaeriidae, Pisidiidae))(list):	3/24/16	Spring Peeper	FEW
Rare Species (list):			
Predator Species (e.g., Bullfrog/Green frog tadpoles, Fish) (list):			
Other species (e.g., Ducks, Turtles, etc.)(list):			

Presence of Indicator Species [x] Yes [ ] No

SUMMARY:

26 **TOTAL for Pool Characteristics** 31 **TOTAL for Pool Envelope and Critical Terrestrial Habitat Area**

Other comments (append photographs, additional notes, sketch of pool and surrounding landscape):

On April 20, 2007, 53 wood frog, and four spotted salamander egg masses were observed in the pool by Edward M. Pawlak, MS, PWS

"*Lodges at Storrs*," a Proposed Residential Community, Hunting Lodge Road, Mansfield, CT
Photos taken April 13th, 2016, by REMA Ecological Services, LLC

Photo 1: Wetland A (with embedded vernal pool habitat); facing northerly

Photo 2: Wetland A; vernal pool; facing southerly

Photo 3: Wetland A; one of five spotted salamander egg masses deposited since our March vernal pool survey

Photo 4: Wetland A; one of an additional 11 wood frog egg masses deposited since our March vernal pool survey

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April 6, 2016

Town of Mansfield
Inland Wetlands Agency
14 Park Place
Mansfield, CT 06226-2217

Re: **WETLANDS ASSESSMENT-SUPPLEMENTAL: *REVIEW OF STORMWATER SYSTEM***
Lodges at Storrs, Hunting Lodge Road, Mansfield, CT

REMA Job No.: 15-1860-MNS18

Dear Agency Members:

REMA ECOLOGICAL SERVICES, LLC (REMA), is providing herein a summary of our findings and recommendations of a detailed review of the proposed stormwater management system for the above-referenced student housing proposal. Our main objectives were to ensure protection of water quality and protection of the hydrologic regimes of the receiving waters, namely the regulated wetlands and watercourses associated with the site.

1.0 Water Quality Protection

During the planning process for the development proposal, REMA worked closely with the applicant, site planners, and civil engineers, identifying potential issues and exploring various planning and engineering solutions. The primary objective was to maintain existing water quality of surface waters, specifically that of the eastern intermittent watercourse (Wetland C), and of the site's documented vernal pool habitat (Wetland A).

As explained in the Engineering Design and Drainage Report ("the Drainage Report"), prepared by F. A. Hesketh & Associates, Inc. (dated 3/18/16, revised 3/24/16), primary

objectives of the stormwater management system included compliance with CT DEEP's Stormwater Quality Manual (2004) ("the Manual"). Specifically, two primary design and sizing objectives were taken into account, the Groundwater Recharge Volume (GRV), and the Water Quality Volume (WQV). For a review of the storm drainage designs implemented at the site, please refer to Section E, of the aforementioned Drainage Report.

The GRV ensures that groundwater regimes are maintained to continue providing seasonal shallow groundwater flow to the site's wetlands and streams, thus also indirectly contributing positively to water quality. The WQV is defined as the volume of stormwater generated and conveyed as runoff, during the water quality precipitation event, or a 1-inch storm. This is based on a national study[1] that found that approximately 90% of runoff, on an annual basis, is generated during storm events of 1-inch or less. The same national study also found that the great majority of runoff constituents, which could contribute to water quality degradation, are also generated during such storms. The national study, determined that a reduction of total suspended solids (TSS)[2] by at least 80%, on an annual basis, should be the goal for any new development, because studies showed that the concomitant reduction of other runoff constituents, such as nutrients and heavy metals, were also high at this level of TSS reduction[3].

The proposed stormwater management system (SMS) partitions the runoff generated on impervious surfaces into several catchment areas and provides treatment trains which include a significant infiltration component, using below ground, low-profile infiltration units. In accordance with the Manual, above-ground primary treatment is also utilized at each of the catchment areas. This is accomplished via water quality basins, which are in essence bioretention basins (a.k.a. rain gardens; see below).

The WQV is met in all of the catchment areas treating runoff from the site's impervious surfaces,[4] except in one case. This is the system that treats the southern portion of the internal circulation roadway that links the northern and southern sections of the residential community. The primary reason for this is the location of the selected wetland restoration site, which interfered with the ability of increasing the size of Bioretention Area #6. This is a

[1] USEPA Nationwide Urban Runoff Program
[2] TSS are those particles that are 100 microns in size or less (i.e very fine sand and finer).
[3] Percentages of Pollutants adhering to TSS (various citations): Total Phosphorus: 60%; Total Nitrogen: 50%; Iron: 85%; Lead: 55%.
[4] The design also includes many pervious parking surfaces, distributed across the site; these are considered Low-Impact Development (LID) practices.

design recommended by REMA, and several mitigating factors were considered. First, we desired that as much of the previously filled wetland is restored as possible, providing substantive mitigation to off-set the direct impacts to wetlands associated with the main access roadway. Second, the discharge point at this location is to the upper reaches of Wetland C1, an area of dense vegetation, and moderate microtopography, and without a distinct stream channel. This allows for discharge dispersal and a long flow path before the outlet channel of this wetland area, and conveyance to the eastern intermittent watercourse of Wetland C3/C4. Even so, the design includes a hydrodynamic separator (Stormceptor), which alone can provide very good water quality renovation, and thus, the 80% TSS removal would be met. We note that two additional hydrodynamic separators are being provided in conjunction with below-ground infiltration and above-ground bioretention, to provide exceptional treatment for the site's main roadway. This recognizes the fact that roadways generate more runoff constituents than parking lots.

Bioretention areas, also known from their smaller and simpler siblings, rain gardens, are known for providing exceptional stormwater quality renovation. In fact, bioretention areas such as those proposed have consistently been found to be highly effective through real world testing at University of New Hampshire's Stormwater Center[5]. These best management practices (BMPs) provide physical, chemical, and biological renovation of runoff, by combining dense vegetation and a specialized media that filters runoff, which is either infiltrated to the ground or discharges to upland areas for further polishing before reaching the downgradient wetlands.

The plans call for the bottom of the bioretention basins to be covered with shredded bark mulch. Upon further research, REMA recommends instead that they be seeded to grasses and forbs using the attached specialized seed mix by Ernst Conservation Seeds (i.e. ERNMX-180). This will result in a dense vegetative cover which will further enhance this BMP's runoff renovation effectiveness. We recommend that annual mowing be conducted at these basins during the first half of June, in a given year. Skipping a year would also be as effective to discourage woody vegetation, promote rigorous growth, and provide habitat and aesthetic functions and values.

[5] Only Bioretention Basin #6, does not use the same design as in other locations, which include an underdrain.

Based on our review, it is our professional opinion that the proposed stormwater management system will effectively treat runoff and be protective of the regulated resources' water quality, post-development.

2.0 Maintenance of Wetland Hydrology

By providing many stormwater discharge points, and exceptional infiltration throughout the site, the design has succeeded in maintaining the groundwater regime at the site, which is important for wetland hydrology. Moreover, during the planning process we identified two wetland areas that were potentially more susceptible to changes in hydrology. These were the vernal pool habitat embedded in Wetland A, and the western hillside seepage wetland (i.e. Wetland B).

For Wetland A and B, the design engineer was able to convey portions of the existing contributing watersheds directly to the wetland resources, bypassing impervious surfaces. Since a portion of the off-site watershed that is conveyed to Wetland A is presently developed, a bioretention basin (i.e. No. 3), is employed to ensure treatment. In addition, this bioretention area allows discharge more than 100 feet from the edge of the vernal pool, allowing further infiltration and polishing.

Based on review, it is our professional opinion that the hydrologic regimes of the site's regulated wetlands and watercourses will be maintained post-development.

Respectfully submitted,

REMA ECOLOGICAL SERVICES, LLC

Sigrun N. Gadwa, MS, PWS
Professional Wetland Scientist
Registered Soil Scientist

George T. Logan, MS, PWS, CE
Professional Wetland Scientist
Registered Soil Scientist, Certified Senior Ecologist

VIA E-MAIL & HAND-DELIVERY

Attachments: ERNMX-180 (Rain Garden Seed Mix)

Rain Garden Mix

ERNMX #	ERNMX-180
Cost Per Pound	$38.34
Seeding Rate	20 lb per acre with a cover crop of grain rye at 30 lb per acre
Mix Type	Upland & Meadow Sites
Species List (click for details)	38% River Oats, PA/VA Ecotype blend (Chasmanthium latifolium (Uniola latifolia), PA/VA Ecotype blend) 20% Virginia Wildrye, PA Ecotype (Elymus virginicus, PA Ecotype) 10% Fox Sedge, PA Ecotype (Carex vulpinoidea, PA Ecotype) 4% Purple Coneflower (Echinacea purpurea) 3% Tall White Beardtongue, PA Ecotype (Penstemon digitalis, PA Ecotype) 3% Blackeyed Susan, Coastal Plain NC Ecotype (Rudbeckia hirta, Coastal Plain NC Ecotype) 3% Lanceleaf Coreopsis, Coastal Plain NC Ecotype (Coreopsis lanceolata, Coastal Plain NC Ecotype) 2% Ohio Spiderwort, PA Ecotype (Tradescantia ohiensis, PA Ecotype) 2% Oxeye Sunflower, PA Ecotype (Heliopsis helianthoides, PA Ecotype) 2% Autumn Bentgrass, PA Ecotype (Agrostis perennans, PA Ecotype) 2% Partridge Pea, PA Ecotype (Chamaecrista fasciculata (Cassia f.), PA Ecotype) 2% Marsh (Dense) Blazing Star (Spiked Gayfeather), PA Ecotype (Liatris spicata, PA Ecotype) 1.5% Smooth Blue Aster, NY Ecotype (Aster laevis (Symphyotrichum laeve), NY Ecotype) 1% Wild Senna, VA & WV Ecotype (Senna hebecarpa (Cassia h.), VA & WV Ecotype) 1% New England Aster, PA Ecotype (Aster novae-angliae (Symphyotrichum n.), PA Ecotype) 1% Swamp Milkweed, PA Ecotype (Asclepias incarnata, PA Ecotype) 1% Path Rush, PA Ecotype (Juncus tenuis, PA Ecotype) 1% Soft Rush (Juncus effusus) 0.8% Wild Bergamot, Fort Indiantown Gap-PA Ecotype (Monarda fistulosa, Fort Indiantown Gap-PA Ecotype) 0.5% Mistflower, VA Ecotype (Eupatorium coelestinum (Conoclinium c.), VA Ecotype) 0.5% Blue False Indigo, Southern WV Ecotype (Baptisia australis, Southern WV Ecotype) 0.5% Early Goldenrod, VA Ecotype (Solidago juncea, VA Ecotype) 0.2% Slender Mountainmint (Pycnanthemum tenuifolium) Total: 100%

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April 4, 2016

Town of Mansfield
Inland Wetlands Agency
14 Park Place
Mansfield, CT 06226-2217

Re: **WETLANDS ASSESSMENT-SUPPLEMENTAL: *WETLAND MITIGATION***
Lodges at Storrs, Hunting Lodge Road, Mansfield, CT

REMA Job No.: 15-1860-MNS18

Dear Agency Members:

REMA ECOLOGICAL SERVICES, LLC (REMA), is providing herein detailed implementation notes and planting materials tables for the proposed wetland mitigation at the above-referenced site. This includes the +/- 6,400 square foot wetland creation/restoration, adjacent to Wetland C1, as well as the eradication of invasive shrub species, particulary Japanese barberry, within Wetland C (see submitted plans).

Respectfully submitted,

REMA ECOLOGICAL SERVICES, LLC

Sigrun N. Gadwa, MS, PWS
Professional Wetland Scientist
Registered Soil Scientist

George T. Logan, MS, PWS, CE
Professional Wetland Scientist
Registered Soil Scientist, Certified Senior Ecologist

VIA E-MAIL & HAND-DELIVERY

Attachments: Wetland Mitigation Implementation Notes, Tables 1, 2, and 3

WETLAND MITIGATION IMPLEMENTATION NOTES

THE LODGES AT STORRS, HUNTING LODGE ROAD, MANSFIELD, CT

HABITAT RESTORATION, CREATION & ENHANCEMENT

JAPANESE BARBERRY REMOVAL: *COMBINATION METHOD*

1. PHASE 1: WINTER 2016/2017. CONDUCT THE MECHANICAL REMOVAL PORTION OF THE JAPANESE BARBERRY REMOVAL. CUT ALL THE BARBERRY PLANTS (AND A FEW WIDELY SCATTERED OTHER INVASIVES) DURING THE DORMANT-LEAF-OFF SEASON WHEN MOST NATIVE VEGETATION IS DORMANT. USE A HAND-HELD WEED-WHACKER (WITH BLADE) OR BRUSH SAW, NOT A BRUSH HOG, AS TERRAIN IS IRREGULAR WITH MUCH MOSS.

2. HAUL THE INVASIVE BRUSH OUT OF THE FOREST TO AN OPEN CENTRAL LOCATION USING TARPS (I.E. NO MACHINERY TO BE USED IN INTERIOR OF FORESTED WETLAND).

3. PHASE 2: SPRING 2017. APPLY DIRECTED FLAME TO NEW SPROUTS AS SOON AS POSSIBLE AFTER NEW SPROUTS FULLY EMERGE, IN EARLY SPRING ON A DAMP DAY WITH HIGH HUMIDITY. USE A 300 TO 400 BTU MODEL FOR THIS LARGE JOB. NOTE: APPLICATOR MUST BE TRAINED AND CERTIFIED BY CT DEEP OR OTHER APPROPRIATE AGENCY SPECIFICALLY IN THIS METHOD.

4. AIM PROPANE TORCH WAND OUTLET AT BASE OF PLANT, HOLDING TIP OF WAND 8 TO 12 INCHES AWAY FROM TARGET AREA. APPLY FROM TWO SIDES IF POSSIBLE. TWO 10 SECOND BLASTS (ONE FROM EACH SIDE) SHOULD BE SUFFICIENT, DEPENDING ON SIZE OF CLUMP. HEAT STEMS UNTIL THEY BEGIN TO GLOW.

5. TAKE CARE NOT TO TRAMPLE OR APPLY HEAT TO THE MANY INTERSPERSED NEARBY NATIVE WILDFLOWERS AND WOODY SEEDLINGS.

6. APPLICATOR SHALL WEAR NATURAL FIBER CLOTHING (WOOL OR COTTON), HEAVY GLOVES, AND EAR AND EYE PROTECTION. FIRE-FIGHTING EQUIPMENT SHALL BE READILY AVAILABLE NEARBY.

7. TAMP DOWN ALL DISTURBED SOIL AND SPREAD ABOUT ONE INCH OF SHREDDED LEAF LITTER (FROM MUNICIPAL STOCKPILE) TO REDUCE REGERMINATION OF INVASIVE SEEDS IN SEEDBANK. TAKE CARE NOT TO BURY NATIVE WOODY SEEDLINGS OR WILDFLOWERS, MOSS, OR FERNS.

8. PHASE 3: IN LATE SUMMER OF 2017 SYSTEMATICALLY, INSPECT THE TREATED AREAS FOR (ONLY LOW NUMBERS EXPECTED) FOR SURVIVING SPROUTS AND SEEDLINGS. DEPENDING ON THE NUMBER OF SURVIVING SPROUTS LABORERS SHALL BE HIRED TO DIG THEM OUT WITH SHARP-SHOOTER OR WEED WENCH, OR A CERTIFIED PESTICIDE APPLICATOR TO APPLY

FOLIAR HERBICIDE TO THE SMALL RESPROUTS. USE TRICLOPYR HERBICIDE (8%) (BRUSH-B-GON OR ANOTHER BRAND WITH THE SAME ACTIVE INGREDIENT).

9. FOR FIVE (5) YEARS, IN LATE SPRING OR EARLY SUMMER, FOLOWING THE INITIAL REMOVAL, SYSTEMATICALLY, INSPECT THE TREATED AREA FOR SEEDLINGS OF BARBERRY AND OTHER INVASIVE SPECIES (ONLY LOW NUMBERS EXPECTED). NUMBERS OF BARBERRY SEEDLINGS WILL DECLINE QUICKLY AS THE SEED BANK IS EXHAUSED. SEEDLINGS SHOULD BE MECHANICALLY REMOVED BY HAND.

INVASIVES REMOVAL FROM EDGE HABITAT

10. IN JUNE OR LATE SUMMER OF THE YEAR FOLLOWING CONSTRUCTION (OF A PARTICULAR PHASE) USE THE "SNIP AND PAINT" METHOD TO TREAT WOODY INVASIVES ON THE NEW WOODS EDGES.

11. USE A NARROW WINDOW SASH BRUSH OR A WICK-TYPE APPLICATOR, PAINT CUT SURFACE AND ONE-TWO INCHES OF BARK BELOW CUT WITHIN TEN MINUTES OF CUTTING. WORK IN PAIRS, ONE PERSON CUTTING, THE OTHER PAINTING. DO NOT USE THE FOLIAR SPRAY METHOD. USE TRICLOPYR HERBICIDE (8%) (BRUSH-B-GON OR ANOTHER BRAND WITH THE SAME ACTIVE INGREDIENT).

12. BAG OR PILE UP WHAT IS PULLED AND CUT INTO A HEAP FOR REMOVAL. SPREAD PULLED AND CUT MATERAIL IN THE SUN, ON A TARP OR PAVEMENT. DO THIS PRIOR TO BURNING (WITH A PERMIT) OR TRUCKING TO LANDFILL.

WETLAND CREATION & RESTORATION

1.0 INTRODUCTION

WETLAND CREATION AND RESTORATION, BY EXCAVATION AND PLANTINGS, WILL TAKE PLACE IN THE SELECTED AREA, JUST EAST OF THE PROPOSED ROADWAY CONNECTING PHASES I AND II OF THE RESIDENTIAL COMMUNITY, ADJACENT TO "WETLAND C1." THIS IS AN AREA OF PREVIOUSLY FILLED WETLANDS, CURRENTLY IN LIGHT WOODS, WITH A SEVERE INFESTATION OF INVASIVE SHRUBS (E.G. JAPANESE BARBERRY, MULTIFLORA ROSE). WETLANDS WILL BE RESTORED IN THIS LOCATION THROUGH THE REMOVAL OF ROUGHLY 2 - 3 FEET OF ROCKY FILL.

FOR THE CREATION & RESTORATION AREA, A MOSAIC OF ***WET MEADOW, SHALLOW MARSH***, AND ***SCRUB-SHRUB*** (ABOUT 25% TOTAL WOODY COVER OF SHRUBS AND SAPLINGS) IS THE SHORT TERM TARGET COVER TYPE. THE GOAL IS TO CREATE WETLAND HABITAT, WITH HIGHER FUNCTIONS AND VALUES TO THAT OF THE EXISTING WETLANDS TO BE DISTURBED AT THE MAIN ACCESS ROAD CROSSING, MOST OF WHICH ARE ALREADY DISTURBED TO SOME EXTENT (OLD WOODS ROAD CROSSING), TO MITIGATE FOR THE ROUGHLY 4,402 SQUARE FEET OF PERMANENT WETLAND DISTURBANCE, FOR ACCESS TO SITE.

THESE WETLAND FUNCTIONS AND VALUES INCLUDE WILDLIFE AND INSECT SUPPORT, AESTHETICS, PRODUCTION EXPORT VIA THE FOOD CHAIN, ESPECIALLY NECTAR, INVERTEBRATES, AND SMALL MAMMALS. WETLAND CREATION WILL ALSO HELP ENHANCE POPULATION SIZES OF INVERTEBRATES AND WILDLIFE THAT USE THE ADJACENT WETLANDS. WETLAND CREATION WILL ALSO MITIGATE FOR DIMINISHED WETLAND FUNCTION WHERE PROPOSED ACTIVITES WILL BE RELATIVELY CLOSE TO WETLANDS, SOMEWHAT DIMINISHING FUNCTIONALITY.

MITIGATION WILL ALSO INCLUDE THE PLANTING OF A DENSE WOODY ***BUFFER*** TO THE NEWLY RESTORED WETLAND (EASTERLY) OF THE INTERNAL CIRCULATION ROADWAY, PROVIDING APPROPRIATE SCREENING. THIS ALSO INCLUDES REMOVAL OF INVASIVE SPECIES AND PLANTING/SEEDING OF SHRUBS AND HERBS.

IMPORTANT: ***ALL WORK, INCLUDING MARKING CLEARING LIMITS, GRADING, AND PLANTING SHALL BE SUPERVISED BY AN ECOLOGIST (OR WETLAND SCIENTIST). A PRE-IMPLEMENTATION MEETING SHALL TAKE PLACE AT LEAST ONE MONTH PRIOR TO PLAN IMPLEMENTATION BETWEEN, AT A MINIMUM, THE LANDSCAPER AND THE ECOLOGIST. TOWN STAFF WILL BE INVITED TO PARTICIPATE AS WELL.***

2.0 SITE PREPARATION

1. IN THE SELECTED MITIGATION AREA (I.E., CREATION AND RESTORATION) ALL OF THE WOODY VEGETATION WILL BE REMOVED, INCLUDING INVASIVE SPECIES, USING APPROPRIATE CT DEEP RECOMMENDED METHODS, SUCH AS MULTIFLORA ROSE AND JAPANESE BARBERRRY. IN ADDITION THE ECOLOGICST WILL FLAG ANY ADDITIONAL INVASIVES TO BE REMOVED IN UPLANDS AND WETLANDS IN CLOSE PROXIMITY TO THE WETLAND MITIGATION AREA.

2. THE CREATION AREA WILL BE +/- **6,400** SQUARE FEET (SF). THE BUFFER ENHANCEMENT AREA WILL BE +/- **1,180** SF. LIMITS OF THESE AREAS WILL BE ADJUCTED IN THE FIELD, AS NECESSARY, BY THE WETLANDS PROFESSIONAL.

3. MULTIFLORA ROSE, JAPANESE BARBERRY, AND OTHER INVASIVES WILL BE BRUSH-HOGGED AND CUTTINGS WILL BE TRUCKED OUT AND APPROPRIATELY DISPOSED OF OFF-SITE.

4. INSTALL *PERIMETER EROSION CONTROLS* AROUND THE MITIGATION AREA AS SHOWN ON PLANS: CORRECTLY TRENCHED AND STAKED SILT FENCE PER THE *2002 CONNECTICUT EROSION & SEDIMENTATION CONTROL GUIDELINES* (2002 GUIDELINES).

5. GRADING, INCLUDING EXCAVATION, WILL TAKE PLACE UNDER THE DIRECTION OF THE ECOLOGIST OR WETLANDS PROFESSIONAL. THE TARGETED WETLAND HYDROLOGIC

REGIMES ARE *"SEASONALLY SATURATED"* TO *"SEASONALLY FLOODED"* AND MAY BE, ADJUSTED AT THE DISCRETION OF THE WETLANDS PROFESSIONAL. OVER-EXCAVATE TO A DEPTH OF 10 TO 20 INCHES, TO ALLOW FOR BACK-FILLING OF 6 INCHES MINIMUM OF SALVAGED FOREST TOPSOIL, FREE OF WETLAND INVASIVES. THE EXCAVATED, INVASIVES-INFESTED TOPSOIL FROM THE WETLAND CREATION AREA WILL BE MOVED TO THE DEVELOPMENT PORTION OF THE SITE FOR SCREENING AND REUSE IN LAWN AREAS, OR BE TRUCKED OFF-SITE.

6. THE MITIGATION AREA WILL BE GRADED AS A BROAD TERRACE WITH UNIFORM DEPTH TO WATER TABLE. ONE "SUMP" WILL BE ABOUT TEN INCHES DEEPER (A TOTAL AREA OF ABOUT 1,600 SQUARE FEET TO BE IN PART PLANTED AS A SHALLOW MARSH). ADDITIONAL, IRREGULAR SHALLOWER DEPRESSIONS WILL BE TWO TO FOUR INCHES DEEP. SURFICIAL MICROTOPOGRAPHY (THE SUMP AND SMALLER DEPRESSIONS) WILL ALLOW LIMITED TEMPORARY TO SEMI-PERMANENT PONDING, WITH LATERAL CAPILLARY ACTION INTO HIGHER ELEVATION AREAS. THE SEASONALLY FLOODED AREA MAY, OVER TIME, ATTRACT ADDITIONAL AMPHIBIANS (E.G. WOOD FROG, SPRING PEEPER, EASTERN TOAD, PICKEREL FROG, GREEN FROG, ETC.).

7. COLLECT THREE TO FOUR CUBIC YARDS OF WOODY DEBRIS (FALLEN STICKS AND LOGS WITH MOSS AND FUNGUS) FROM NATURAL FOREST AREAS (WITH LOW INVASIVE COVER) AFTER THE LIMITS OF THIS AREA HAVE BEEN FLAGGED BY AN ECOLOGIST. WHEELBARROW TO THE MITIGATION SITE AND STOCKPILE.

8. SALVAGED TOPSOIL FROM UPLAND AREAS, MOSTLY FREE FROM INVASIVES (SOUTHERN FORESTED AREA), WILL BE SPREAD PROMPTLY IN CREATION AREA (ALREADY EXCAVATED AND GRADED) TO MINIMIZE MORTALITY OF PROPAGULES DURING STORAGE. PLANTING BED PREPARATION COULD TAKE PLACE IN LATE SUMMER TO EARLY FALL, SO THAT PLANTING OF SHRUBS AND TREES CAN TAKE PLACE IN EARLY FALL, IF POSSIBLE (HERBACEOUS PLANTS WOULD BE PLANTED THE FOLLOWING SPRING; THIS ALLOWS FOR SEVERAL MONTHS OF OBSERVATION AND OVERWINTERING). THIS WILL REINTRODUCE PROPAGULES OF INVERTEBRATES MICROBES, MOSSES, FUNGI, AND VASCUALAR AND PLANTS. *A MINIMUM OF 6 INCHES* OF TOPSOIL SHALL BE USED TO REALIZE FINAL GRADES *MINIMUM 6 PERCENT ORGANIC MATTER (DRY WEIGHT)* IS REQUIRED IN PLANTING MEDIUM. DARK UPPER TOPSOIL ON-SITE MEETS THESE SPECIFICATIONS.

9. IF SUFFICIENT QUANTITY AND QAULITY OF TOPSOIL IS NOT AVAILABLE ON-SITE, IT WILL BE SUPPLEMENTED WITH OFF-SITE TOPSOIL, FREE OF INVASIVES, AND/OR WITH 2-YEAR OLD MULCH MIXED WITH ON-SITE SUBSOIL.

3.0 PLANTINGS - WETLAND MITIGATION AREAS

10. WORK SHALL BE INITIATED *IN SPRING* BETWEEN APRIL 15TH AND MAY 30TH *OR IN EARLY FALL* BETWEEN SEPTEMBER 1ST AND OCTOBER 15TH. ONLY SEEDING MAY BE DONE IN LATE FALL OR EARLY WINTER. BARE ROOT PLANTS SHOULD BE PLANTED IN LATE SPRING AND NO LATER THAN AUGUST 1ST (WATERING COULD BE REQUIRED OF PLANTED IN JULY).

11. *ORDER PLANTS AHEAD OF TIME* (AT LEAST ONE MONTH) TO IMPROVE LIKELIHOOD OF AVAILABILITY. PLANT LIST INCLUDES SOME NURSERY CONTACTS, BUT OTHERS MAY BE USED. NURSERIES SHOULD BE IN SOUTHERN NEW ENGLAND OR THE MID-ATLANTIC STATES. OBTAIN APPROVAL FROM WETLANDS PROFESSIONAL FOR ANY PLANT SUBSTITUTIONS DUE TO LACK OF AVAILABILITY.

3.1 PLANTINGS INSTALLATION

1. STORAGE: KEEP PLANTS IN THE SHADE AND INSTALL WITHIN THREE DAYS OF DELIVERY. KEEP WATERED.

2. A QUALIFIED WETLAND PROFESSIONAL OR ECOLOGIST SHALL SPECIFY PLANTING LOCATIONS AND DIRECT THE INSTALLATION, EITHER BY STAKING PLANTING LOCATIONS WITH A WIRE FLAG OR BAMBOO STAKE LABELED WITH THE SPECIES NAME OR CODE. POTTED STOCK MAY ALSO BE DIRECTLY PLACED AT PLANTING LOCATION.

3. PLANT IN SAME-SPECIES CLUSTERS, FOUR TO SIX FEET APART, FOR SHRUBS, TEN FEET APART FOR SMALL TREES.

4. WOODY PLANTINGS: DIG HOLES *BY HAND* TO *MINIMIZE COMPACTION* OF SOIL (MECHANICAL AUGERS ARE DISCOURAGED). WATER HOLES BEFORE PLANTING, UNLESS SOIL IS ALREADY VERY MOIST. ADD *SLOW RELEASE FERTILIZER* (MILORGANITE OR EQUIVALENT) TO PLANTING HOLE AND AROUND PLANTING. PLACE PLANTS INTO HOLES AND REPLACE SOIL, SO THAT THERE IS FULL COVERAGE OF ROOTS, WITH NO AIR SPACES AND LEVEL SOIL AROUND THE PLANT. HOLES SHALL BE OVERSIZED (2X THE POT DIAMETER) AND BACKFILLED WITH HIGH QUALITY TOPSOIL (NOT SUBSOIL REMOVED FROM BOTTOM PART OF HOLE).

5. SPREAD A THREE-INCH THICK LAYER OF WELL-ROTTED HARDWOOD MULCH THROUGHOUT THE CLUSTER. LEAVE A GAP OF THREE INCHES AROUND EACH TRUNK. FORM SHALLOW *SAUCERS* AROUND ALL MULCHED TREE AND SHRUB PLANTINGS, TWO INCHES HIGH, 36" ACROSS FOR NURSERY STOCK. WATER RIGHT AFTER PLANTING. FOR PLUGS IN THE WET MEADOW, WATERING SEVERAL TIMES A WEEK IS ESSENTIAL, IN DRY WEATHER. FOR IRRIGATION, SET UP A PUMP DRAWING ON LOCAL WATER, IF AVAILABLE.

6. PERENNIAL PLUGS: PLANT *AFTER* SHRUB INSTALLATION (IF IN THE SPRING SEASON), IN MID TO LATE AFTERNOON, OR UNDER SHADY CONDITIONS. *WATER* IMMEDIATELY AFTER PLANTING. SPACE PLUGS 12 TO 18 INCHES APART, PER PLAN.

7. FOR PLANTINGS IN SHALLOW WATER (E.G. WETLAND SUMP), MAKE SURE PLANTS ARE WELL SECURED IN THE BOTTOM. USE BIODEGRADABLE MESH AND STONE WEIGHTS TO SECURE, IF NECESSARY.

8. SPECIES TO BE PLANTED ARE SHOWN IN ***TABLES 1 AND 2***.

3.2 SEEDING

9. IN WET AND MOIST MEADOW AND BETWEEN SHRUB CLUSTERS IN MITIGATION AREA, SEED PER ***TABLE 3***. SEED IN LOCATIONS SPECIFIED IN SEEDING TABLE, AT SPECIFIED RATE. USE SPRAY PAINT TO DELINEATE LOCATIONS OF SEED PATCHES, AND/OR SOW SEED AS DIRECTED BY WETLAND ECOLOGIST.

10. USE THE DARK, HIGH QUALITY TOPSOIL ALREADY ON THE SITE, SALVAGED AND STOCKPILED PRIOR TO INSTALLATION. USE SIX INCHES OF TOPSOIL.

11. FOR SPRING SEEDING, LIGHTLY RAKE IN SEED (LESS THAN ½ INCH DEEP), ROLL, AND LIGHTLY MULCH TO HOLD MOISTURE FOR GERMINATION. FOR MID TO LATE FALL SEEDING, SEED MAY SIMPLY BE SOWN. SNOW AND FROST WILL INCORPORATE INTO THE SOIL.

12. IF SOIL IS SATURATED, BROADCAST SOIL ON SURFACE WITHOUT RAKING.

13. SPREAD A THIN LAYER OF *HAY MULCH* OVER ALL SEEDED AREAS WITHOUT STANDING WATER, ALLOWING SOME LIGHT PENETRATION. (LEAF MULCH IS TO GO UNDER AND AROUND WOODY PLANTINGS.)

3.3 FOLLOW-UP & MAINTENANCE

1. COARSE WOODY DEBRIS. AFTER INSTALLATION OF PLANTINGS, SPREAD THE STOCKPILED LARGE LOGS AND MEDIUM-SIZED BRANCHES IN VARIOUS STAGES OF DECAY IN MITIGATION AREA, INCLUDING INUNDATED AREAS. WOODY DEBRIS WILL HAVE BEEN STOCKPILED, TAKEN FROM SITE'S UPLAND FORESTED AREAS OR OTHER ON-SITE SOURCES, AND SHALL COVER AT LEAST 1% OF SURFACE AREA. WOODY DEBRIS PROVIDES SHELTER FOR WILDLIFE, SUBSTRATES FOR MOSSES AND FOREST FUNGI, AND ASSOCIATED INVERTEBRATES ARE A FOOD SOURCE FOR WILDLIFE.

2. PERIMETER SEDIMENT CONTROLS. MAINTAIN PER THE 2002 CT E&S GUIDELINES, CHECK AFTER EACH RAIN GREATER THAN ONE INCH DURING INITIAL ESTABLISHMENT. REMOVE

SILT FENCE AS SOON AS GROUND IS VEGETATED (>70% COVER) TO PREVENT IMPEDING ANIMAL MOVEMENT TO AND FROM ADJACENT AND NEARBY SEASONALLY FLOODED WETLANDS. SEDIMENT COLLECTED BY THESE DEVICES WILL BE REMOVED AND PLACED UPLAND IN A MANNER THAT PREVENTS ITS EROSION AND TRANSPORT TO A WATERWAY OR WETLAND.

3. IRRIGATION: WATER ALL SEEDED AREAS, PLANTINGS AND/OR TRANSPLANTS AT LEAST WEEKLY DURING DROUGHTY PERIODS. MORE FREQUENT WATERING WILL INCREASE PLANTINGS SUCCESS. FOR PLUGS AND BARE ROOT STOCK, MORE FREQUENT WATERING WILL BE NEEDED.

4. PROTECTION FROM DEER BROWSING: THE WETLANDS PROFESSIONAL MAY EMPLOY TECHNIQUES TO REDUCE DEER BROWSE THAT CAN BE HARMFULL TO NEWLY PLANTED SHRUBS AND TREES, INCLUDING NATURAL DETERENTS (E.G. GARLIC EXTRACT, MILORGANITE FERTILIZER, DOG URINE, ETC.). APPLICATION OF SUCH TECHNIQUES MAY TAKE PLACE SEVERAL TIMES UNTIL PLANTINGS ARE WELL ESTABLISHED.

4.0 PLANTINGS - BUFFER AT WETLAND CREATION-RESTORATION AREA

1. IN THE BUFFER TO THE WETLAND CREATION/RESTORATION AREA (+/- 1,180 SF):
   a. REMOVE ANY MAN-MADE DEBRIS
   b. REMOVE INVASIVE SHRUBS USING APPROPRIATE CT DEEP RECOMMENDED METHOD (E.G. "CUT & PAINT" METHOD USING HERBICIDE).
   c. PLANT SHRUBS AND TREES PER TABLE 1.

5.0 MONITORING

1. INSPECTIONS BY A QUALIFIED WETLAND PROFESSIONAL OR ECOLOGIST SHALL TAKE PLACE IN THE EARLY FALL (AND/OR SPRING) AFTER INSTALLATION, AND IN THE THREE (3) NEXT GROWING SEASONS.

2. DURING INSPECTIONS, CHECK MITIGATION AREA FOR SEEDLINGS OF *INVASIVE SPECIES* AND MECHANICALLY REMOVE. INSPECTIONS SHALL BE DONE BY THE WETLANDS PROFESSIONAL, BUT PERSONNEL TRAINED BY THE PROFESSIONAL IN IDENTIFICATION OF INVASIVE SEEDLINGS MAY ASSIST WITH REMOVAL.

3. *COMPETING PLANTS:* IF THE WETLANDS PROFESSIONAL DETERMINES THAT EXCESSIVE NUMBERS OF SEEDLINGS OF A PARTICULAR NATIVE SPECIES HAVE GERMINATED ON SITE (E.G. CATTAIL), REMOVE THEM BY HOEING OR HAND PULLING. COLONIZATION BY A VARIETY OF NON-PLANTED NATIVE SPECIES IS EXPECTED AND IS DESIRABLE.

4. ANNUAL MONITORING REPORTS SHALL BE SUBMITTED TO THE INLAND WETLANDS COMMISSION OF THE TOWN OF MANSFIELD WITHIN TWO MONTHS OF MONITORING (BUT NO LATER THAN DECEMBER 15TH OF THE YEAR BEING MONITORED), AND SHALL PROVIDE A SHORT *NARRATIVE* INCLUDING INFORMATION ON SURVIVAL AND PERFORMANCE OF PLANTINGS, EXTENT TO WHICH TARGET HYDROLOGY IS ACHIEVED, DEVELOPING WETLAND SOIL CHARACTERISTICS, COLONIZATION BY INVASIVE PLANTS & CONTROL MEASURES, COLONIZATION BY DESIRABLE NATIVE SPECIES, AND OBSERVED USAGE BY FAUNA (E.G., AVIANS, HERPTILES, MAMMALS, INVERTEBRATES).

5. AN 80% SURVIVAL RATE OF PLANTED MATERIALS IS TARGETED, AS WELL AS 90% VEGETATIVE COVERAGE BY THE SECOND GROWING SEASON (EXCLUDING SEASONALLY INUNDATED DEPRESSION).

6. *REMEDIAL MEASURES* SUCH AS REPLACEMENT PLANTINGS, HYDROLOGIC ADJUSTMENTS, AND DEER PROTECTION, MAY BE RECOMMENDED DURING THE FOUR YEARS OF MONITORING, AND IMPLEMENTED PER THE DIRECTION OF THE WETLANDS PROFESSIONAL, AFTER CONSULTATION WITH TOWN ENVIRONMENTAL STAFF.

PLANTING MATERIALS FOR WETLAND CREATION

Table 1: SHRUBS AND TREES

Zone A: Inundated, seasonally to semi-permanently flooded (Shallow Marsh)
Zone B: Saturated within 6", may be flooded at times (Wet Meadow)
Zone C: Transitional wetland / moist upland, occasionally saturated

LOW - MEDIUM SHRUBS										
Scientific Name	**Common Name**	**Shade/salt. tolerant**	**Code**	**Zone**	**Ht.**	**Wet Meadow**	**Wet Meadow / Moist Meadow**	**Shallow Marsh**	**Wetland Buffer**	**Total Numbers per Species**
Cornus amomum	Silky dogwood	No/No	**CA**	**A, B**	**36"**		4			*4*
Aronia arbutifolia	Red chokeberry	No/No	**AA**	**B**	**36"**		4			*4*
Cephalanthus occidentalis	Buttonbush	No/No	**CO**	**A**	**36"**			10		*10*
Clethra alnifolia	Sweet pepperbush	Yes/Yes	**CL**	**B, C**	**36"**	6	4		7	*17*
Cornus racemosa	Gray dogwood	Yes/no	**CR**	**B, C**	**36"**		5		20	*25*
Sambucus americana	Common elderberry	No/No	**SA**	**A, B**	**36"**	5		3		*8*
Spirea latifolia	Meadowsweet	No/Yes	**SL**	**A, B**	**36"**	22				*22*
						33	**17**	**13**	**27**	**90**
TALL SHRUBS										
Scientific Name	**Common Name**	**Shade Tolerant**	**Code**	**Zone**	**Ht.**					
Ilex verticillata	Winterberry	Yes	**IV**	**B**	**48"**	5			4	*9*
Vaccinium corymbosum	Highbush blueberry	Yes	**VC**	**B, C**	**48"**	5	4		4	*13*
Viburnum lentago	Nannyberry	No/No	**VL**	**B, C**	**48"**		5		3	*8*
Total:						**5**	**9**		**7**	**30**

Table 1: SHRUBS AND TREES *(CONTINUED)*

TREES **Scientific Name**	**Common Name**	**Shade Tolerant**	**Code**	**Zone**	**Size**	**Wet Meadow**	**Wet Meadow / Moist Meadow**	**Shallow Marsh**	**Wetland Buffer**	**Total Numbers per Species**
Amelanchier canadensis	Shadblow	Yes	**AC**	**C**	**48"**		3		4	*7*
Nyssa sylvatica	Black gum	Yes	**NS**	**B, C**	**1" cl**	4	1			*5*
Acer rubrum	Red maple	Yes	**PS**	**B, C**	**1" cl**	3	3			*6*
Betula alleghaniensis	Yellow birch	Yes	**BA**	**B**	**1" cl**	5				*5*
Betula papyrifera	Paper birch	No	**BP**	**C**	**1" cl**				4	*4*
Carpinus caroliniana	Ironwood	Yes	**CC**	**B, C**	**48"**		5			*5*
Pinus strobus	White pine	Yes/No	**WP**	**B, C**	**1" cl**		2		2	*4*
Quercus palustris	Pin Oak	Yes	**QP**	**B, C**	**1" cl**		4			*4*
Total:						**12**	**18**	**0**	**10**	**40**

Small Tree species: 4 foot minimum height
Large Tree species: 1.0" diameter minimum caliper or 6 foot minimum height

Planting Form: Potted or balled not bare-root.

Table 2: Shallow Marsh and Wet Meadow Plants for Wetland Mitigation Area

Zone A: Seasonally to semi-permanently flooded (Marsh/Wet Meadow)
Zone B: Saturated within 6", may be flooded at times (Wet Meadow)

Scientific Name	ID	Common name	Planting Form	Spacing	Zone	Total Numbers Per Species: Marsh / Wet Meadow	Wet Meadow	Total Number per Species
Asclepias incarnata	AI	Swamp milkweed	*plug*	2' OC	**A, B**	10	40	*50*
Caltha palustris	CP	Marsh marigold	*plug*	3' OC	**A**	50		*50*
Carex vulpinoidea	CV	Fox sedge	*plug*	2' OC	**B**		50	*50*
Carex stricta	CS	Tussock sedge	*plug*	4' OC	**A, B**	25	25	*50*
Eutrochium maculatum	EM	Spotted Joe-pye-weed	*plug*	3' OC	**B**		50	*50*
Juncus canadensis	JC	Canada rush	*plug*	3' OC	**A, B**	25	25	*50*
Iris versicolor	IV	Blue flag iris	*plug*	2' OC	**A, B**	25	25	*50*
Osmunda cinnamomea	OC	Cinnamon fern	*6" pot*	3' OC	**B**		25	*25*
Pontederia cordata	PC	Pickerelweed	*6" pot*	3' OC	**A**	15		*15*
Mimulus ringens	MR	Monkey flower	*plug*	3' OC	**B, C**	10	40	*50*
Scirpus atrovirens	SA	Green bulrush	*plug*	3' OC	**A**	50		*50*
*Schoenoplectus validus**	SV	Softstem bulrush	*plug*	3' OC	**A**	50		*50*
Symplotrichum novae-angliae	SN	New England aster	*plug*	2' OC	**B**		50	*50*
Vernonia noveboracensis	VN	New York Ironweed	*plug*	3' OC	**B**		50	*50*
Sagittaria latifolia	SL	Northern arrowhead	*6" pot*	2' OC	**A**	15		*15*
					Totals:	**275**	**380**	**655**

Notes:

* If larger size emergent plants are purchased numbers can be reduced by 50%; survival will be greater. Planting form could include potted plants; Plugs are available only in flats of fifty (NEWP).

Sources: ***Most species available from multiple sources***

New England Wetland Plants, Inc. (NEWP), 820 West Street, Amherst, Mass. 01002; phone: 413-548-8000

Aqua Scapes of CT LLC, 505 William St, Portland, CT 06480; phone: 860-342-7331

Table 3: Seed Mixes for Wetland Mitigation Area and Wetland Buffer Area

Zone B: Saturated within 6", may be flooded at times (Wet Meadow)
Zone C: Transitional wetland/ moist upland, occasionally saturated

NEWP Seed Mixes (New England Wetland Plants)	Comments	Zone	Total Pounds Per Seed Mix: Wet Meadow	Wet Meadow / Moist Meadow	Wetland Buffer	Totals
NE Wetmix ***1 lb/2500 sf***	*Excludes shallow marsh sump center (seed around edges)*	**A, B**	2	1		3.00
NE Roadside Matrix Upland Seed Mix ***1 lb/1250 sf***	*For graded slope wetland buffer*	**C**			1	1.00
NE Conservation Wildlife Mix ***1 lb/1750 sf***	*Upper portion of wetland mitigation area and wetland buffer*	**B, C**		1	1	2.00
		Totals:	**2**	**2**	**2**	**6**

Notes:

1. Mix 1:1 with filler (coarse sand or kitty litter) to help correctly divide seed packages and for even spreading.
2. Mixes contain seeds with a range of hydrologic tolerances, so different species will thrive in different areas.
3. Plants will set seed and spread further, increasing in density, becoming concnetrated in most suitable areas.
4. Mulch (do not seed) areas under and around plug & shrub clusters, to exclude weeds and hold moisture. (Coverage specified assumes area occupied by mulched woody plantings has been subtracted.)
5. A late fall seeding will require 20% more seed, because some seed wil be lost to wash off and herbivory, but germination rates will actually be higher, due to the cold winter stratification of the seed.

Sources:

New England Wetland Plants, 820 West Street, Amherst, Massachusetts 01002; phone: 413-548-8000

● Ecology
● Soil & Wetland Studies
● Water Quality Monitoring ● GPS
● Environmental Planning & Management
● Ecological Restoration & Habitat Mitigation
● Aquatic, Wildlife and Listed Species Surveys
● Application Reviews ● Permitting & Compliance

April 4, 2016

Town of Mansfield
Inland Wetlands Agency
14 Park Place
Mansfield, CT 06226-2217

Re: **WETLANDS ASSESSMENT-SUPPLEMENTAL: *FUNCTIONS & VALUES ASSESSMENT***
Lodges at Storrs
Hunting Lodge Road, Mansfield, CT

REMA Job No.: 15-1860-MNS18

Dear Agency Members:

REMA ECOLOGICAL SERVICES, LLC (REMA), is providing herein the results of functions and values assessment using the US Army Corps of Engineers (USACE), Highway Methodology (Descriptive Method). This is the methodology commonly utilized in Connecticut, and the only one authorized by the USACE.

Three wetland ecological units at the above-referenced site, Wetland A (with embedded vernal pool habitat), Wetland B (western hillside seepage wetland), and Wetland C (associated with eastern intermittent stream), were assessed, using baseline data collected in the field October 2015 through April 2016. On-line mapping resources, including Town of Mansfield GIS and CTECO (Connecticut Environmental Conditions Online), provided watershed-level information.

Attached to this report please find the assessment summary page, a detailed rationales matrix for fourteen functions and values, with a column for each wetland assessment unit, and Figure A1, showing their locations on the subject site. Please refer to the March 18th, 2016

REMA Wetlands Assessment report for detailed descriptions and annotated photos of wetland habitats and vegetation.

Respectfully submitted,

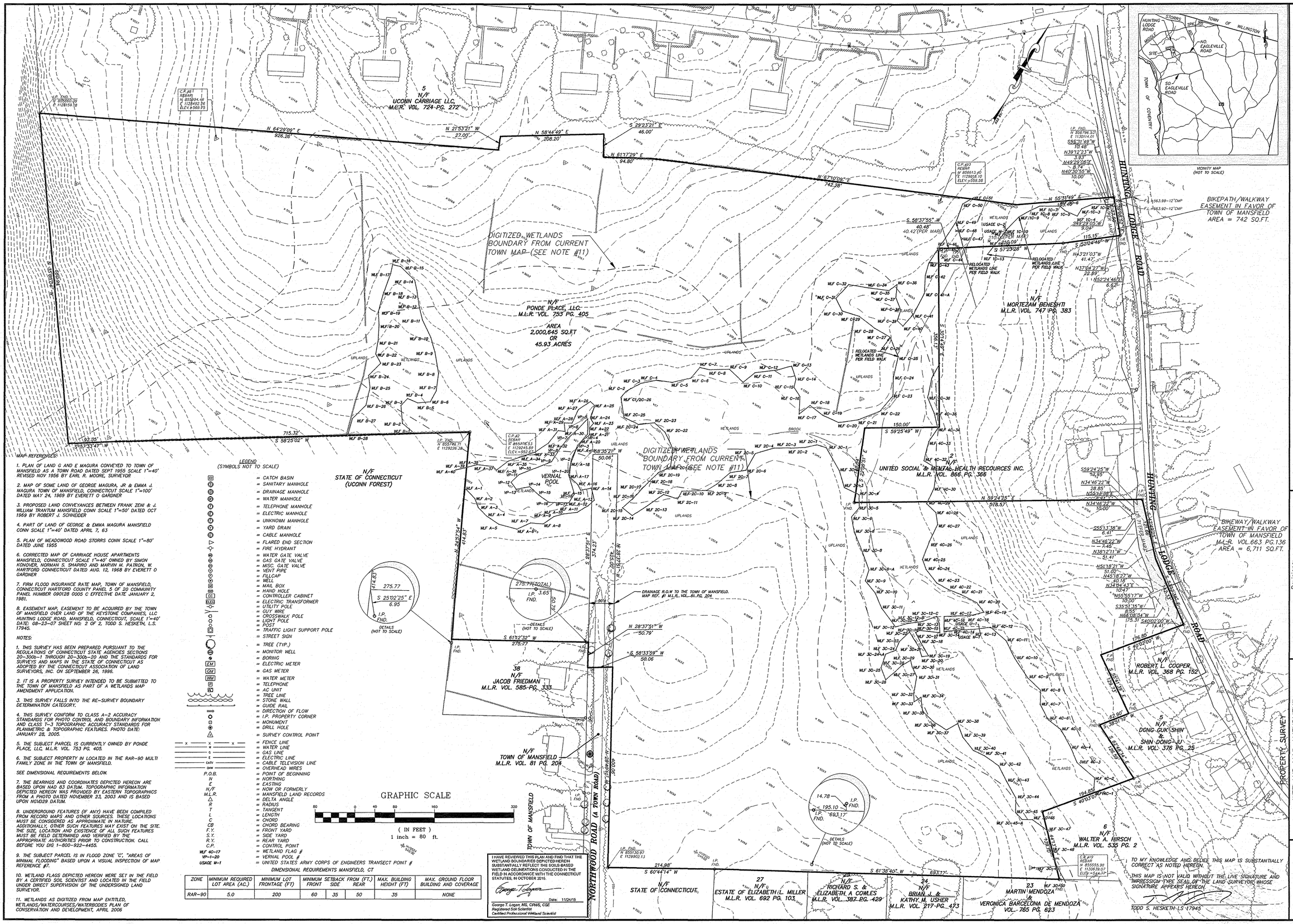
REMA ECOLOGICAL SERVICES, LLC

Sigrun N. Gadwa, MS, PWS
Professional Wetland Scientist
Registered Soil Scientist

George T. Logan, MS, PWS, CE
Professional Wetland Scientist
Registered Soil Scientist, Certified Senior Ecologist

VIA E-MAIL & HAND-DELIVERY

Attachments: Functions and Values Assessment Summary Form, Rationales Matrix, and location map (Figure A1)



MAP REFERENCES:

1. PLAN OF LAND G AND E MAGURA CONVEYED TO TOWN OF MANSFIELD AS A TOWN ROAD DATED SEPT 1955 SCALE 1"=40' REVISED NOV 1956 BY EARL R. MOORE, SURVEYOR
2. MAP OF SOME LAND OF GEORGE MAGURA, JR & EMMA J. MAGURA TOWN OF MANSFIELD, CONNECTICUT SCALE 1"=100' DATED MAY 24, 1969 BY EVERETT O GARDNER
3. PROPOSED LAND CONVEYANCES BETWEEN FRANK ZENI & J. WILJIAM TRANTUM MANSFIELD CONN SCALE 1"=50' DATED OCT 1969 BY ROBERT J. SCHNEIDER
4. PART OF LAND OF GEORGE & EMMA MAGURA MANSFIELD CONN SCALE 1"=40' DATED APRIL 7, 63
5. PLAN OF MEADOWOOD ROAD STORRS CONN SCALE 1"=80' DATED JUNE 1955
6. CORRECTED MAP OF CARRIAGE HOUSE APARTMENTS MANSFIELD, CONNECTICUT SCALE 1"=40' OWNED BY SIMON KONOVER, NORMAN S. SHAPIRO AND MARVIN M. PATRON, W. HARTFORD CONNECTICUT DATED AUG. 12, 1968 BY EVERETT O GARDNER
7. FIRM FLOOD INSURANCE RATE MAP, TOWN OF MANSFIELD, CONNECTICUT HARTFORD COUNTY PANEL 5 OF 20 COMMUNITY PANEL NUMBER 090128 0005 C EFFECTIVE DATE JANUARY 2, 1981.
8. EASEMENT MAP, EASEMENT TO BE ACQUIRED BY THE TOWN OF MANSFIELD OVER LAND OF THE KEYSTONE COMPANIES, LLC HUNTING LODGE ROAD, MANSFIELD, CONNECTICUT, SCALE 1"=40' DATE: 08-23-07 SHEET NO: 2 OF 2, TODD S. HESKETH, L.S. 17945.

NOTES:

1. THIS SURVEY HAS BEEN PREPARED PURSUANT TO THE REGULATIONS OF CONNECTICUT STATE AGENCIES SECTIONS 20-300b-1 THROUGH 20-300b-20 AND THE STANDARDS FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT AS ADOPTED BY THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS, INC. ON SEPTEMBER 26, 1996.
2. IT IS A PROPERTY SURVEY INTENDED TO BE SUBMITTED TO THE TOWN OF MANSFIELD AS PART OF A WETLANDS MAP AMENDMENT APPLICATION.
3. THIS SURVEY FALLS INTO THE RE-SURVEY BOUNDARY DETERMINATION CATEGORY.
4. THIS SURVEY CONFORM TO CLASS A-2 ACCURACY STANDARDS FOR PHOTO CONTROL AND BOUNDARY INFORMATION AND CLASS T-3 TOPOGRAPHIC ACCURACY STANDARDS FOR PLANIMETRIC & TOPOGRAPHIC FEATURES. PHOTO DATE: JANUARY 28, 2005.
5. THE SUBJECT PARCEL IS CURRENTLY OWNED BY PONDE PLACE, LLC, M.L.R. VOL. 753 PG. 405.
6. THE SUBJECT PROPERTY IN LOCATED IN THE RAR-90 MULTI FAMILY ZONE IN THE TOWN OF MANSFIELD.

SEE DIMENSIONAL REQUIREMENTS BELOW.

7. THE BEARINGS AND COORDINATES DEPICTED HEREON ARE BASED UPON NAD 83 DATUM. TOPOGRAPHIC INFORMATION DEPICTED HEREON WAS PROVIDED BY EASTERN TOPOGRAPHICS FROM A PHOTO DATED NOVEMBER 23, 2003 AND IS BASED UPON NGVD29 DATUM.
8. UNDERGROUND FEATURES (IF ANY) HAVE BEEN COMPILED FROM RECORD MAPS AND OTHER SOURCES. THESE LOCATIONS MUST BE CONSIDERED AS APPROXIMATE IN NATURE. ADDITIONALLY, OTHER SUCH FEATURES MAY EXIST ON THE SITE. THE SIZE, LOCATION AND EXISTENCE OF ALL SUCH FEATURES MUST BE FIELD DETERMINED AND VERIFIED BY THE APPROPRIATE AUTHORITIES PRIOR TO CONSTRUCTION. CALL BEFORE YOU DIG 1-800-922-4455.
9. THE SUBJECT PARCEL IS IN FLOOD ZONE "C", "AREAS OF MINIMAL FLOODING" BASED UPON A VISUAL INSPECTION OF MAP REFERENCE #7.
10. WETLAND FLAGS DEPICTED HEREON WERE SET IN THE FIELD BY A CERTIFIED SOIL SCIENTIST AND LOCATED IN THE FIELD UNDER DIRECT SUPERVISION OF THE UNDERSIGNED LAND SURVEYOR.
11. WETLANDS AS DIGITIZED FROM MAP ENTITLED, WETLANDS/WATERCOURSES/WATERBODIES PLAN OF CONSERVATION AND DEVELOPMENT, APRIL 2006

LEGEND
(SYMBOLS NOT TO SCALE)

- = CATCH BASIN
- = SANITARY MANHOLE
- = DRAINAGE MANHOLE
- = WATER MANHOLE
- = TELEPHONE MANHOLE
- = ELECTRIC MANHOLE
- = UNKNOWN MANHOLE
- = YARD DRAIN
- = CABLE MANHOLE
- = FLARED END SECTION
- = FIRE HYDRANT
- = WATER GATE VALVE
- = GAS GATE VALVE
- = MISC. GATE VALVE
- = VENT PIPE
- = FILLCAP
- = WELL
- = MAIL BOX
- = HAND HOLE
- = CONTROLLER CABINET
- = ELECTRIC TRANSFORMER
- = UTILITY POLE
- = GUY WIRE
- = CROSSWALK POLE
- = LIGHT POLE
- = POST
- = TRAFFIC LIGHT SUPPORT POLE
- = STREET SIGN
- = TREE (TYP.)
- = MONITOR WELL
- = BORING
- = ELECTRIC METER
- = GAS METER
- = WATER METER
- = TELEPHONE
- = AC UNIT
- = TREE LINE
- = STONE WALL
- = GUIDE RAIL
- = DIRECTION OF FLOW
- = I.P. PROPERTY CORNER
- = MONUMENT
- = DRILL HOLE
- = SURVEY CONTROL POINT
- = FENCE LINE
- = WATER LINE
- = GAS LINE
- = ELECTRIC LINE
- = CABLE TELEVISION LINE
- = OVERHEAD WIRES
- P.O.B. = POINT OF BEGINNING
- N = NORTHING
- E = EASTING
- N/F = NOW OR FORMERLY
- M.L.R. = MANSFIELD LAND RECORDS
- Δ = DELTA ANGLE
- R = RADIUS
- T = TANGENT
- L = LENGTH
- C = CHORD
- CB = CHORD BEARING
- F.Y. = FRONT YARD
- S.Y. = SIDE YARD
- R.Y. = REAR YARD
- C.P. = CONTROL POINT
- WLF A0-17 = WETLAND FLAG #
- VP-1-20 = VERNAL POOL #
- USACE W-1 = UNITED STATES ARMY CORPS OF ENGINEERS TRANSECT POINT #

DIMENSIONAL REQUIREMENTS MANSFIELD, CT

ZONE	MINIMUM REQUIRED LOT AREA (AC.)	MINIMUM LOT FRONTAGE (FT)	MINIMUM SETBACK FROM (FT.) FRONT	SIDE	REAR	MAX. BUILDING HEIGHT (FT)	MAX. GROUND FLOOR BUILDING AND COVERAGE
RAR-90	5.0	200	60	35	50	35	NONE

I HAVE REVIEWED THIS PLAN AND FIND THAT THE WETLAND BOUNDARIES DEPICTED HEREON SUBSTANTIALLY REFLECT THE SOILS-BASED WETLAND DELINEATIONS CONDUCTED IN THE FIELD IN ACCORDANCE WITH THE CONNECTICUT STATUTES. IN OCTOBER 2015.

Date: 11/24/15

George T. Logan, MS, CPWS, CSE
Registered Soil Scientist
Certified Professional Wetland Scientist

TODD S. HESKETH-LS 17945

TO MY KNOWLEDGE AND BELIEF THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON.

THIS MAP IS NOT VALID WITHOUT THE LIVE SIGNATURE AND IMPRESSION TYPE SEAL OF THE LAND SURVEYOR WHOSE SIGNATURE APPEARS HEREON.

F. A. Hesketh & Associates, Inc.
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Revisions:

No.	Date	Description
1	06-27-07	MISC
2	10-27-15	WETLANDS / TITLE UPDATED
3	11-30-2015	WETLANDS MAP AMENDMENT/TITLE
4	01-08-16	REVISED WETLAND LINE PER FIELD WALK

WETLAND MAP AMENDMENT
ON PROPERTY OF
PONDE PLACE, LLC.
HUNTING LODGE ROAD
MANSFIELD, CONNECTICUT

Date: 02-07-05 | Drawn by: RM | Job no: 04161
Scale: 1" = 80' | Checked by: TSH | Sheet no: 1 OF 1

PS-1

© \2004\04161\Survey\WETLAND AMENDMENT 3.dwg, WMA, Jan. 12, 2016 - 11:19:59 AM

The Highway Methodology Workbook:
Wetland Functions and Values, a Descriptive Approach

(US Army Corps of Engineers New England Division 1995)

Project: ***Lodges at Storrs, Mansfield, Connecticut: Proposed Student Residence Community***

Summary of Wetland Characteristics *(from summary form)*

Wetland A:	Seasonally flooded wooded swamp with overflow towards Cedar Swamp Brook
Wetland B:	Hillside wetland draining to Cedar Swamp Brook
Wetland C:	Riparian corridor of intermittent Eagleville Brook tributary

Total Area of wetland: *A: 0.73 acres* *B: 0.75 acres* *C: 5.22 acres*

Part of a wildlife Corridor ? A: *Yes* B: *Yes* C: *Yes* Habitat Island? A: *No* B: *No* C: *No*

Adjacent Land use: A: *Forest, single family residential;* *B: Forest, C: Forest, single family residential*

Distance to nearest roadway/other development: *A: 200'* *B: 500'* C: 160'

Dominant Wetland Systems: *A: PFO1* *B: PFO1* *C: R3UB1, PFO1*

Contiguous undeveloped buffer zone: *A: Yes* *B: Yes* *C: Yes*

Is the wetland a separate hydraulic system? A: *No* *B: No* *C: No*

If not, where does wetland lie in drainage basin? *A: upper* *B: upper* *C: upper*

How many tributaries contribute to the wetland? *A: 0* *B: 1* *C: 2*

Wildlife and Vegetation Diversity and abundance: (*See report)*

Summary of Assessment Results *(rationales in following pages)*

		Wetland A	Wetland B	Wetland C
1	GROUNDWATER RECHARGE/DISCHARGE	Y	P	P
2	FLOODFLOW ALTERATION (Storage & Desynchronization)	Y	Y	P
3	FISH AND SHELLFISH HABITAT	N	N	N
4	SEDIMENT/TOXICANT/PATHOGEN RETENTION	N	N	Y
5	NUTRIENT REMOVAL/RETENTION/TRANSFORMATION	Y	Y	P
6	PRODUCTION EXPORT (Nutrient)	P	Y	P
7	SEDIMENT/SHORELINE STABILIZATION	N	Y	Y
8	WILDLIFE HABITAT	P	Y	P
9	RECREATION	P	Y	P
10	EDUCATIONAL/SCIENTIFIC VALUE	Y	Y	Y
11	UNIQUENESS/HERITAGE	N	N	N
12	VISUAL QUALITY/AESTHETICS	P	Y	P
13	ENDANGERED SPECIES HABITAT	N	N	N
14	FISH AND SHELLFISH HABITAT (Supporting marine resources)	N	N	N
		Present? (Y/N)	Principal? (P)	

The Highway Methodology Workbook:
Wetland Functions and Values, a Descriptive Approach

Numbers correspond to numbers on ACOE Functional Values summary form.

GROUNDWATER RECHARGE/DISCHARGE

Wetland A	Wetland B	Wetland C	CONSIDERATIONS/QUALIFIERS	
Y	Y	Y	1. Public or private wells occur downstream of the wetland.	*No public wellfields*
Y	Y	Y	2. Potential exists for public or private wells downstream of the wetland.	
N	N	N	3. Wetland is underlain by stratified drift.	
N	N	N	4. Gravel or sandy soils present in/or adjacent to the wetland.	
N	N	N	5. Fragipan does not occur in the wetland.	
Y	Y	Y	6. Fragipan, impervious soils, or bedrock, does occur in the wetland.	
Y	Y	Y	7. Wetland is associated with a perennial or intermittent watercourse.	
Y	Y	Y	8. Signs of groundwater recharge are present or piezometer data demonstrates recharge.	
Y	N	N	9. Wetland is associated with a watercourse, but lacks a defined outlet or contains a constricted outlet.	
Y	Y	N	10. Wetland contains only an outlet.	
Y	Y	Y	11. Groundwater quality of stratified drift aquifer within or downstream of wetland meets drinking water standards.	*No stratified drft aquifer within wetland or close enough for assessment.*
Y	Y	Y	12. Quality of water associated with the wetland is high.	
N	Y	Y	13. Signs of groundwater discharge are present (e.g. springs).	
			14. Water temperature suggests it is a discharge site.	*Temperatures not measured*
Y	Y	Y	15. Wetland shows signs of variable water levels.	
N	N	N	16. Gravel or sandy soils present in or adjacent to wetland.	
			17. Piezometer data demonstrates discharge.	*No peizometer data*
			18. Other	

Y	**P**	**P**	Present? (Y/N) Principal? (P)

The Highway Methodology Workbook:
Wetland Functions and Values, a Descriptive Approach
(Continued)

FLOODFLOW ALTERATION (Storage & Desynchronization)

Wetland A	Wetland B	Wetland C	CONSIDERATIONS/QUALIFIERS	
Y	N	Y	1. Area of this wetland is large relative to its watershed.	*Broad terraces in WC*
Y	Y	Y	2. Wetland occurs in the upper portions of its watershed.	
Y	Y	N	3. Effective flood storage is small or non-existent upslope of or above the wetland.	
N	N	N	4. Wetland watershed contains a high degree of impervious surfaces.	
Y	Y	Y	5. Wetland contains hydric soils that are able to absorb and detain water.	
Y	N	Y	6. Wetland exists in a relatively flat area that has flood storage potential.	
Y	Y	Y	7. Wetland has an intermittent outlet, ponded water, or signs are present of variable water level.	
Y	N	Y	8. During flood events, this wetland can retain higher volumes of water than under normal or average	*WA: deep ponding*
Y	Y	Y	9. Wetland receives and retains overland or sheet flow runoff from surrounding uplands.	*WB: at base of hill*
N	N	Y	10. In the event of a large storm, this wetland may receive and detain excessive flood water from a nearby watercourse.	
Y	Y	Y	11. Valuable properties, structures or resources are located in or near the floodplain downstream from the wetland.	
N	N	N	12. The watershed has a history of economic loss due to flooding.	*Flooding history not known for downstream rivers*
N	Y	Y	13. This wetland is associated with one or more watercourses.	
N	N	Y	14. This wetland watercourse is sinuous or diffuse.	
Y	Y	Y	15. This wetland outlet is constricted.	*WC3: Small pipe through old farm crossing & small field stone culvert, S. end*
Y	Y	Y	16. Channel flow velocity is affected by this wetland.	
Y	Y	Y	17. Land uses downstream are protected by this wetland.	*Among many others.*
Y	N	Y	18.This wetland contains a high density of vegetation.	*Dense invasives in lower part of WB*
			19.Other	
Y	**Y**	**Y**	Present? (Y/N) Principal? (P)	

The Highway Methodology Workbook:
Wetland Functions and Values, a Descriptive Approach
(Continued)

FISH AND SHELLFISH HABITAT

Wetland A	Wetland B	Wetland C	CONSIDERATIONS/QUALIFIERS	
Y	Y	Y	1. Forest land dominant in the watershed above this wetland.	
Y	Y	Y	2. Abundance of cover objects present.	
			STOP HERE IF THIS WETLAND IS NOT ASSOCIATED WITH A PERENNIAL WATERCOURSE	
			3. Size of this wetland is able to support large fish/shellfish populations.	
			4. Wetland is part of a larger, contiguous watercourse.	*WC3 & WC4 associated with small intermittent watercourse*
			5. Wetland has sufficient size and depth in open water areas so as not to freeze solid and retains some open water during winter.	
			6. Stream width (bank to bank) is more than 50 feet.	
			7. Quality of the watercourse associated with this wetland is able to support healthy fish/shellfish populations.	
			8. Streamside vegetation provides shade for the watercourse.	
			9. Spawning areas are present (submerged vegetation or gravel beds).	
			10. Food is available to fish/shellfish populations within this wetland.	
			11. Barrier(s) to anadromous fish (such as dams, including beaver dams, waterfalls, road crossing, etc.) are absent from the stream reach associated with this wetland.	
			12. Evidence of fish is present.	*No fish observed*
			13. Wetland is stocked with fish.	
			14. The watercourse is persistent.	*Localized saturation year round, but channel is only 18-24" wide*
			15. Man-made streams are absent.	
			16. Water velocities are not too excessive for fish usage.	
			17. Defined stream channel is present.	
			18. Other	*Watershed is only 51.33 acres as stream exits site, low numbers of small fish m* ay visit.
N	N	N	Present? (Y/N) Principal? (P)	

The Highway Methodology Workbook:
Wetland Functions and Values, a Descriptive Approach
(Continued)

SEDIMENT/TOXICANT/PATHOGEN RETENTION

Wetland A	Wetland B	Wetland C	CONSIDERATIONS/QUALIFIERS	
N	N	Y	1. Potential sources of excess sediment are in the watershed above the wetland.	
N	N	Y	2. Potential or known sources of toxicants are in the watershed above the wetland.	
Y	N	Y	3. Opportunity for sediment trapping by slow moving water or deepwater habitat is present in this wetland.	
Y	Y	Y	4. Mineral, fine grained, or organic soils are present.	
Y	N	Y	5. Long duration water retention time is present in this wetland.	*WC: Water retained in soil, not ponded very long*
Y	Y	Y	6. Public or private water sources occur downstream.	*just private water sources*
Y	Y	Y	7. The wetland edge is broad and intermittently aerobic.	
Y	Y	Y	8. The wetland is known to have existed for more than 50 years.	
Y	Y	N	9. Drainage ditches have not been constructed in the wetland.	*WC: Excavation associated with causeway*
			STOP HERE IF WETLAND IS NOT ASSOCIATED WITH A WATERCOURSE.	
	Y	Y	10. Wetland is associated with an intermittent or perennial stream, or a lake.	
	N	Y	11. Channelized flows have visible velocity decreases in the wetland.	*Velocity decreases at base of WB*
	Y	Y	12. Effective floodwater storage in wetland is occurring. Areas of impounded open water are present.	
	N	Y	13. No indicators of erosive forces are present. No high water velocities are present.	
	Y	Y	14. Diffuse water flows are present in the wetland.	
	N	Y	15. Wetland has a high degree of water and vegetation interspersion.	
	N	Y	16. Dense vegetation provides opportunity for sediment trapping and/or signs of sediment accumulation is present by dense vegetation.	*WB: woody stems of dense J. barberry not effective at trapping sed.*
			17. Other	*WA: Only during large events when stream overtops defined channel, do wetlands trap sediment carried by the stream. Otherwise sediment trapping limited to overland flow.*
N	**N**	**Y**	Present? (Y/N) Principal? (P)	*Opportunity is lacking for WB. Potential is present, buit low.*

The Highway Methodology Workbook:
Wetland Functions and Values, a Descriptive Approach
(Continued)

NUTRIENT REMOVAL/RETENTION/TRANSFORMATION

Wetland A	Wetland B	Wetland C	CONSIDERATIONS/QUALIFIERS	
Y	N	Y	1. Wetland is large relative to the size of its watershed.	
Y	N	N	2. Deep water or open water habitat exists.	Present just upstream of WA in Beaver Pond
Y	Y	Y	3. Overall potential for sediment trapping exists in the wetland.	*Fine Sediment coats rocks*
N	N	Y	4. Potential sources of excess nutrients present in the watershed above the wetland.	
Y	N	Y	5. Wetland saturated for most of the season. Ponded water is present in the wetland.	
N	N	Y	6. Deep organic/sediment deposits are present.	
Y	Y	Y	7. Slowly drained mineral, fine grained, or organic soils, are present.	
N	Y	Y	8. Dense vegetation is present.	*In WB locally dense woody, but not herbaceous vegetation*
N	Y	Y	9. Emergent vegetation and/or dense woody stems are dominant.	
Y	N	N	10. Aquatic diversity/abundance sufficient to utilize nutrients.	*WC:Macroinvertebtrates not abundant*
Y	Y	Y	11. Opportunity for nutrient attenuation exists.	*Mostly nutrients of natural origin*
Y	Y	Y	12. Vegetation diversity/abundance sufficient to utilize nutrients.	*Many deep-rooted trees, shrubs*
			STOP HERE IF WETLAND IS NOT ASSOCIATED WITH A WATERCOURSE.	
	Y	N	13. Waterflow through this wetland is diffuse.	*WC: not streamflow; WB: Through lower portion (not steep)*
	N	Y	14. Water retention/detention time in this wetland is increased by constricted outlet or thick vegetation.	
	N	Y	15. Water moves slowly through this wetland.	Moves slowly across stream terraces & in WC1 & WC2
			16. Other	*Setbacks to yards wide enough, that opportunity is low, except from upper watershed*

Y	**Y**	**P**	Present? (Y/N) Principal? (P)

The Highway Methodology Workbook:
Wetland Functions and Values, a Descriptive Approach
(Continued)

PRODUCTION EXPORT (Nutrient)

Wetland A	Wetland B	Wetland C	CONSIDERATIONS/QUALIFIERS	
Y	Y	Y	1. Wildlife food sources grow within this wetland.	
Y	Y	Y	2. Detritus development is present within this wetland	
Y	Y	Y	3. Economically or commercially used products found in this wetland.	*Lumber, firewood*
Y	Y	Y	4. Evidence of wildlife use found within this wetland.	*Food chain: foliage insects; tree seeds & fruits*
Y	Y	Y	5. Higher trophic level consumers are utilizing this wetland.	*Owls, fox expected*
Y	Y	Y	6. Fish or shellfish develop or occur in this wetland.	*Small fish may visit WC*
N	Y	Y	7. High vegetation density is present.	*Closed tree canopy,good regeneration; dense herbs in WC4 & WC3*
Y	Y	Y	8. Wetland exhibits high degree of plant community structure/species diversity.	
Y	N	N	9. High aquatic diversity/abundance is present.	WA: Productive vernal pool - wood frog tadpoles
N	Y	Y	10. Nutrients exported in wetland watercourses (permanent outlet present).	*Nutrients from Leaf litter detritus*
N	Y	Y	11. "Flushing" of relatively large amounts of organic plant material occurs from this wetland.	*Leaf detritus*
Y	Y	Y	12. Wetland contains flowering plants that are used by nectar-gathering insects.	*Most spring ephemerals*
Y	Y	Y	13. Indications of export are present.	Denser & more diverse vegetation in WC, hence more export
Y	Y	Y	14. High production levels occurring however, no visible signs of export (assumes export is attenuated).	
Y	Y	Y	15. Other	*WC is a large system. WC3: Export of Japanese barberry fruits not desirable*

P	Y	P	Present? (Y/N) Principal? (P)

The Highway Methodology Workbook:
Wetland Functions and Values, a Descriptive Approach
(Continued)

SEDIMENT/SHORELINE STABILIZATION

Wetland A	Wetland B	Wetland C	CONSIDERATIONS/QUALIFIERS	
N	N	Y	1. Indications of erosion or siltation present.	*In WC1*
N	Y	N	2. Topographical gradient is present in wetland.	*In Wetland B; brook in WC is low-gradient & wetlands nearly level.*
N	N	N	3. Potential sediment sources are present up-slope.	*Sediment is discharged in to WB from Southford Rd*
N	Y	N	4. No distinct shoreline or bank is evident between the waterbody and the wetland or upland.	
Y	N	Y	5. A distinct step between the open waterbody or stream and the adjacent land exists (i.e. sharp bank) with dense roots throughout.	
Y	Y	Y	6. Wide wetland (>10') bordering watercourse, lake, or pond.	
N	Y	N	7. High flow velocities in the wetland.	*Only on the steeper slopes in Wetland B*
N	N	Y	8. Potential sediment sources present upstream.	*Sedimetn sources in ~100-acre upper watershed, partly developed*
N	Y	Y	9. The watershed is of sufficient size to produce channelized flow.	
Y	N	N	10. Open water fetch is present.	*Open water in vernal pool (Wetland A) is too small for erosive wave build-up*
N	N	N	11. Boating activity is present.	
Y	Y	Y	12. Dense vegetation is bordering watercourse, lake, or pond.	
Y	Y	Y	13. High percentage of energy absorbing emergents and/or shrubs bordering watercourse, lake or pond.	
Y	Y	Y	14. Vegetation comprised of large trees and shrubs that withstand major flood events or erosive incidents and stabilize the shoreline on a large scale (feet).	Both woody & herbaceous shoreline vegetation is dense.
Y	Y	Y	15. Vegetation comprised of dense resilient herbaceous layer that stabilizes sediments and the shoreline on a small scale (inches) during minor flood events or potentially erosive events.	*Shear stress minimal in WA, WC*
N	Y	Y	16. Other	*If flow volumes increased substanially due to future urbanization, WB & WC banks would be stabilized.*

N	**Y**	**Y**	Present? (Y/N) Principal? (P)

The Highway Methodology Workbook:
Wetland Functions and Values, a Descriptive Approach
(Continued)

WILDLIFE HABITAT

Wetland A	Wetland B	Wetland C	CONSIDERATIONS/QUALIFIERS
Y	Y	Y	1. Wetland is not degraded by human activity.
Y	Y	Y	2. Water quality of the watercourse, pond, or lake associated with this wetland meets or exceeds Class A or B standards. *Nutrient levels in vernal pool slightly elevated after winter decompostion*
Y	Y	Y	3. Wetland is not fragmented by development.
Y	Y	Y	4. Upland surrounding this wetland is undeveloped. *Wetlands are all well buffered.*
Y	Y	Y	5. More than 40% of this wetland edge is bordered by upland wildlife habitat (e.g., brushland, wood land, active farmland, or idle land) at least 500 feet in width.
Y	Y	Y	6. Wetland contiguous with other wetland systems connected by watercourse or lake.
Y	Y	Y	7. Wildlife overland access to other wetlands is present.
Y	Y	Y	8. Wildlife food sources are within this wetland or are nearby.
Y	N	Y	9. Wetland exhibits a high degree of interspersion of vegetation classes and/or open water.
N	N	Y	10. Two or more islands or inclusions of upland within the wetland are present. WC: old causeway
Y	Y	Y	11. Dominant wetland class includes deep or shallow marsh or wooded swamp. *Wooded swamp*
N	N	N	12. More than three acres of shallow permanent open water (less than 6.6 feet deep), including streams in or adjacent to wetland are present. *Nearby beaver pond*
Y	Y	Y	13. Density of the wetland vegetation is high.
Y	N	Y	14. Wetland exhibits a high degree of plant species diversity.
Y	N	Y	15. Wetland exhibits a high degree of diversity in plant community structure (e.g. tree, shrub, vine, grasses, mosses, etc.) Few herbs under barberry shrubs at base of WB
Y	Y	Y	16. Plant/animal indicator species present. *Golden ragwort indicates clean mineral-rich ground-water*
Y	N	Y	17. Animal signs observed (tracks, scats. nesting areas, etc.) *Wood frog egg masses in WA*
Y	Y	Y	18. Seasonal uses vary for wildlife, and wetland appears to support varied population diversity/abundance during different seasons.
Y	Y	Y	19. Wetland contains or has potential to contain a high population of insects. *Espcially foliage & bark insects*

The Highway Methodology Workbook:
Wetland Functions and Values, a Descriptive Approach
(Continued)

WILDLIFE HABITAT *(Continued)*

Wetland A	Wetland B	Wetland C	CONSIDERATIONS/QUALIFIERS	
Y	Y	Y	20. Wetland contains or has potential to contain large amphibian populations.	Wood frogs, stream sals & red-back sals
N	N	N	21. Wetland has a high avian utilization or its potential.	*Moderate, not high avian potential - Habitat "island"*
Y	Y	Y	22. Indications of less disturbance-tolerant species present.	*Seepage plant species in WC4, e.g.Swamp saxifrage*
N	N	N	23. Signs of wildlife habitat enhancement present (birdhouses, nesting boxes, food sources, etc.).	
Y	Y	Y	24. Other	*Diverse, mature trees with dense foliage screen neighboring residential properties to south & east*
P	**Y**	**P**	Present? (Y/N) Principal? (P)	

RECREATION

Wetland A	Wetland B	Wetland C	CONSIDERATIONS/QUALIFIERS	
N	N	N	1. Wetland is part of a recreation area, park, forest, or refuge.	*Privately owned*
N	N	N	2. Fishing is available within or from the wetland.	
N	N	N	3. Hunting is permitted in the wetland.	
Y	Y	Y	4. Hiking occurs or has potential to occur within the wetland.	*Trails present, easy walking, thin underbrush*
Y	Y	Y	5. Wetland is a valuable wildlife habitat.	
Y	Y	Y	6. The watercourse, pond, or lake, associated with the wetland is unpolluted.	*Some sedimentation in WC3*
Y	Y	Y	7. High visual/aesthetic quality of this potential recreation site.	*Tall, fine trees, barberry locally dense in WC3*
N	N	N	8. Access to water is available at this potential recreation site for boating, canoeing, or fishing.	
N	N	N	9. The watercourse associated with this wetland is wide and deep enough to accommodate canoeing and/or non-powered boating.	
Y	Y	Y	10. Off-road public parking available at the potential recreation site.	*Unpaved terminus of Northwood Road*
Y	Y	Y	11. Accessibility and travel ease is present at this site.	
Y	Y	Y	12. The wetland is within a short drive or safe walk from highly populated public and private areas.	
Y	Y	Y	13. Other	*Tree diversity makes for outstanding fall color*
P	**Y**	**P**	Present? (Y/N) Principal? (P)	

The Highway Methodology Workbook:
Wetland Functions and Values, a Descriptive Approach
(Continued)

EDUCATIONAL/SCIENTIFIC VALUE

Wetland A	Wetland B	Wetland C	CONSIDERATIONS/QUALIFIERS	
Y	Y	Y	1. Wetland contains or is known to contain threatened, rare, or endangered species.	
Y	Y	Y	2. Little or no disturbance is occurring in this wetland.	*Some Invasive barberry, by historic fill sites*
			3. Potential educational site contains a diversity of wetland classes that are accessible or potentially	
Y	Y	Y	accessible.	*All are forested wetlands, but there is a range of hydrogic regimes, geomorphic settings*
Y	Y	Y	4. Potential educational site is undisturbed and natural.	*Japanese barberry impairs parts of WB, WC3*
Y	Y	Y	5. Wetland is considered to be a valuable wildlife habitat.	*Developed landscape setting limits bird diversity*
Y	Y	Y	6. Wetland is located within a nature preserve or wildlife management area.	*Shelter Falls Park-walking distance*
N	N	N	7. Signs of wildlife habitat enhancement present (bird houses, nesting boxes, food sources, etc.).	
N	N	N	8. Off-road parking at potential educational site suitable for school bus access in or near wetland.	
Y	Y	Y	9. Potential educational site is within safe walking distance or a short drive to schools.	
Y	Y	Y	10. Potential educational site within safe walking distance to other plant communities.	
N	N	N	11. Direct access to perennial stream at potential educational site available.	*Ed. Value limited by small size*
Y	N	N	12. Direct access to pond or lake at potential educational site available.	*WA: Vernal pool has educ. value*
Y	Y	Y	13. No known safety hazards within the potential educational site.	*Rocky footing in WB*
Y	Y	Y	14. Public access to the potential educational site is controlled.	
N	N	N	15. Handicap accessibility is available.	*Could be developed : gentle grades and existing dirt roads*
N	N	N	16. Site is currently used for educational or scientific purposes.	
Y	Y	Y	17. Other	*WC4: Diverse herbs and mosses of seepage wetlands of botanical interest*

Y	**Y**	**Y**	Present? (Y/N) Principal? (P)

The Highway Methodology Workbook:
Wetland Functions and Values, a Descriptive Approach
(Continued)

UNIQUENESS/HERITAGE

Wetland A	Wetland B	Wetland C	CONSIDERATIONS/QUALIFIERS	
Y	Y	Y	1. Upland surrounding wetland primarily urban.	
Y	Y	Y	2. Upland surrounding wetland developing rapidly.	*Housing for U Conn Storrs*
N	N	N	3. More than 3 acres of shallow permanent open water occur in wetlands (less than 6.6 feet deep) including streams.	
N	N	N	4. Three or more wetland classes present.	
Y	Y	Y	5. Deep and/or shallow marsh, or wooded swamp dominant.	
Y	Y	Y	6. High degree of interspersion of vegetation and/or open water occurring in this wetland.	
N	Y	Y	7. Well-vegetated stream corridor (15 feet on each side of the stream) occurs in this wetland.	
Y	Y	Y	8. Potential educational site is within a short drive or a safe walk from schools.	*U.Conn is v. short drive away*
N	N	N	9. Off-road parking at potential educational site is suitable for school buses.	
Y	N	Y	10. No known safety hazards exist within this potential educational site.	*WB2 rocky steep terrain*
N	N	N	11. Direct access to perennial stream or lake at potential educational site.	*WC4 stream has 61.2-ac. Wshd*
N	N	N	12. Two or more wetland classes visible from primary viewing locations.	
N	N	N	13. Low-growing wetlands (marshes, scrub-shrub, bogs, open water) visible from primary viewing locations.	
N	N	Y	14. Half an acre of open water or 200 feet of stream is visible from the primary viewing locations.	
Y	Y	Y	15. Large area of wetland is dominated by flowering plants, or plants that turn vibrant colors in different seasons.	*Red maples, violets,*
Y	Y	Y	16. General appearance of the wetland visible from primary viewing locations is unpolluted and/or undisturbed.	
Y	Y	Y	17. Overall view of the wetland is available from the surrounding upland.	*In winter at least*

The Highway Methodology Workbook:
Wetland Functions and Values, a Descriptive Approach
(Continued)

UNIQUENESS/HERITAGE ***(Continued)***

Wetland A	Wetland B	Wetland C	CONSIDERATIONS/QUALIFIERS
Y	Y	Y	18. Quality of the water associated with the wetland is high. *Road pollutants in upper portion of WC3*
Y	Y	Y	19. Opportunities for wildlife observations are available.
N	N	N	20. Historical buildings occur within the wetland.
Y	N	Y	21. Presence of pond or pond site and remains of a dam occur within the wetland. *vernal pool*
N	N	N	22. Wetland within 50 yards of the nearest perennial watercourse.
N	Y	Y	23. Visible stone or earthen foundations, berms, dams, standing structures or associated features occur within the wetland. Stone wall at S. end of WB. *Old stone culvert at far south end of WC4*
N	N	N	24. Wetland contains critical habitat for a state or federally listed threatened or endangered species.
N	N	N	25. Wetland is known to be a study site for scientific research.
N	N	N	26. Wetland is a natural landmark or recognized by the state natural heritage inventory authority as an exemplary natural community.
Y	Y	Y	27. Wetland has local significance because it serves several functional values.
N	N	Y	28. Wetland has local significance because it has biological, geological, or other features that are locally rare or unique. *WC4: Saturated stream terrace with deep peat and seepage plants*
N	N	N	29. Wetland is known to contain an important archaeological site.
N	N	N	30. Wetland is hydrologically connected to a state or federally designated scenic river.
Y	Y	Y	31. Wetland is located in an area experiencing a high wetland loss rate.
N	N	N	32. Other *Stream macroinvertebrate community in WC is limited by intermittent flow*
N	**N**	**N**	Present? (Y/N) Principal? (P)

The Highway Methodology Workbook:
Wetland Functions and Values, a Descriptive Approach
(Continued)

VISUAL QUALITY/AESTHETICS

Wetland A	Wetland B	Wetland C	CONSIDERATIONS/QUALIFIERS	
N	N	N	1. Multiple wetland classes visible from primary viewing locations.	
N	N	N	2. Emergent marsh and/or open water visible from primary viewing locations.	
Y	Y	Y	3. Diversity of vegetation species visible from primary viewing locations.	*Large trees from road*
Y	Y	Y	4. Wetland dominated by flowering plants, or plants that turn vibrant colors in different seasons.	
Y	Y	Y	5. Land use surrounding the wetland is undeveloped as seen from primary viewing locations.	
Y	Y	Y	6. Visible surrounding land use form contrasts with wetland.	*Level brook terrace contrasts with forested slopes*
Y	Y	Y	7. Wetland views absent of trash, debris, and signs of disturbance.	*Old irregular fill by upland island*
Y	Y	Y	8. Wetland is considered to be a valuable wildlife habitat.	
Y	N	Y	9. Wetland is easily accessed. *WB: Terrain steep and somewhat rocky*	
Y	Y	Y	10. Low noise level at primary viewing locations.	
Y	Y	Y	11. Unpleasant odors absent at primary viewing locations.	
Y	Y	Y	12. Relatively unobstructed sight line exists through wetland.	*In winter season*
N	N	N	13. Other	*Localized Japanese barberry & Asiatic bittersweet infestations mar wetlands' beauty*

P	**Y**	**P**	Present? (Y/N) Principal? (P)

The Highway Methodology Workbook:
Wetland Functions and Values, a Descriptive Approach
(Continued)

ENDANGERED SPECIES HABITAT

Wetland A	Wetland B	Wetland C	CONSIDERATIONS/QUALIFIERS
N	N	N	1. Wetland contains or is known to contain threatened or endangered species.
N	N	N	2. Wetland contains critical habitat for a state or federally listed threatened or endangered species.
			3. Other

N	N	N	Present? (Y/N) Principal? (P)

FISH AND SHELLFISH HABITAT (Supporting marine resources)

Wetland A	Wetland B	Wetland C	CONSIDERATIONS/QUALIFIERS	
N	N	N	1. Special aquatic sites (tidal marsh, mud flats, eelgrass beds) are present.	
N	N	N	2. Suitable spawning habitat is present at the site or in the area.	*Gravel beds*
N	N	N	3. Commercially or recreationally important species are present or suitable habitat exists.	
N	N	N	4. The wetland/waterway supports prey for higher trophic level marine organisms.	
N	N	N	5. The waterway provides migratory habitat for anadromous fish.	*Scotland dam (Shepaurg R.) lacks fishway*
N	N	N	6. Other	

N	N	N	Present? (Y/N) Principal? (P)

Department of Planning and Development

Date: March 30, 2016

To: Mansfield Inland Wetlands Agency

From: Jennifer Kaufman, Inland Wetlands Agent

Subject: Receipt of New Application for Wetlands License
Meadowbrook Lane (73 Meadowbrook Lane to Sunny Acres Park) (IWA File #W1565)
Uniglobe Investment, LLC
Description of work: construction of a sidewalk

Project Description

The applicants propose to construct a 5 foot bituminous sidewalk starting at the Whispering Glen multifamily apartment complex at 73 Meadowbook Lane to Sunny Acres Park. The sidewalk will be installed in the Town Right of Way and was a condition of approval by PZC (PZC File #1283). Construction of the sidewalk includes a block retaining wall and installation of a new catch basin to direct stormwater from the edge of pavement to the brook through paved leak offs. The applicants estimate that there will be approximately 72 square feet of disturbance to in the wetlands and approximately 2800 square feet of disturbance in the upland review area.

Because the sidewalk is for a public infrastructure enhancement and will be constructed in the Town Right of Way, the applicants are requesting that the Agency waive the application fee. Pursuant to Section 19.6.A. of the Regulations, if the activity applied for would clearly result in substantial public benefit to the environment or to the public health and safety, the Agency may waive all or part of the application fee.

☒ The project includes work in wetlands.
☒ The project includes work in the 150 foot upland review area.
☐ The project is located in a Public Water Supply Watershed.

Application Fees and Notifications

☐ The applicant has paid the required application fee (Request for Fee Waiver)
☒ The applicant has submitted copies of the notice mailed to neighbors and a list of abutters to be notified. Certified mail receipts must be submitted prior to action on the application.

Receipt Motion

_____ MOVES, _____ seconds to receive the application submitted by Uniglobe Investment, LLC (IWA File #W1565) under the Wetlands and Watercourses

Department of Planning and Development

Regulations of the Town of Mansfield for the construction of a sidewalk on property located at Meadowbrook Lane (73 Meadowbrook Lane to Sunny Acres Park) as shown on a map dated 9/21/2015 and as described in application submissions, to refer said application to staff and the Conservation Commission for review and comments, and waive the application fee pursuant to section 19.6.A of Mansfield's Inland Wetlands and Watercourses Regulations.

APPLICATION FOR PERMIT
MANSFIELD INLAND WETLANDS AGENCY
4 SOUTH EAGLEVILLE ROAD, STORRS, CT 06268
860-429-3015x6204 (DIRECT) TEL: 860-429-3330 OR
FAX: 860-429-6863

FOR OFFICE USE ONLY

File #
W_____
Fee Paid _____
Official Date of Receipt _____

Applicants are referred to the Mansfield Inland Wetlands and Watercourses Regulations for complete requirements, and are obligated to follow them. For assistance, please contact the Inland Wetlands Agent at the telephone numbers above.

Please print or type or use similar format for computer; attach additional pages as necessary.

Part A - Applicant

Name Uniglobe Investment, LLC

Mailing Address 73 Meadowbrook Lane

Mansfield Center, CT Zip 06250

Phone Scott Garrett 203-260-5325 Email scott.garrett13@gmail.com
and/or Bob Magi 203-692-5222 Email rmagi1@icloud.com

Title and Brief Description of Project

Reference File# W1424, Special Permit File# 1284-2, PZC File# 1283

Construction of walkway associated with the Whispering Glen project.

Location of Project 73 Meadowbrook Lane - 290' North of Circle Drive

Intended Start Date April 2016

Part B - Property Owner (if applicant is the owner, just write "same")

Name same as applicant

Mailing Address _____

_____ Zip _____

Phone _____ Email _____

Owner's written consent to the filing of this application, if owner is not the applicant:

Signature _____ date _____

Applicant's interest in the land: (if other than owner) _____

Part C - Project Description (attach extra pages, if necessary)

1) Describe in detail the proposed activity here or on an attached page. (**See guidelines at end of application)**
   Please include a description of all activity or construction or disturbance:

a) ***in*** the wetland/watercourse
b) ***in*** the area ***adjacent*** to (within 150 feet from the edge of) the wetland/watercourse, even if wetland/watercourse is ***off*** your property

Construction of block retaining wall, 5' wide bituminous walk and installation of new catch basin to direct storm water from edge of pavement presently directed to brook by means of paved leakoffs.

a) Rip-rap stilling basin for catch basin outlet.

b) Block retaining wall and bituminous walk.

2) Describe the amount or area of disturbance (in square feet or cubic yards or acres):

a) ***in*** the wetland/watercourse
b) ***in*** the area ***adjacent*** to (within 150 feet from the edge of) the wetland/watercourse, even if wetland/watercourse is **off** your property

a) 72 sq.ft. ±

b) 2800 sq.ft. ±

3) Describe the type of materials you are using for the project: Bituminous pavement for walk, process gravel for base, concrete blocks for retaining wall, rip-rap for stilling basin.

a) include ***type*** of material used as fill or to be excavated gravel fill
b) include ***volume*** of material to be filled or excavated Approximately 20 yds of gravel fill between retaining wall and edge of Meadowbrook Lane.

4) Describe measures to be taken to minimize or avoid any adverse impacts on the wetlands and regulated areas (silt fence, staked hay bales or other Erosion and Sedimentation control measures).

Silt fencing will be used to minimize erosion and sediment from traveling down gradient into brook.

Part D - Site Description

Describe the general character of the land. (Hilly? Flat? Wooded? Well drained? etc.)

Majority of proposed walk is flat except in the area of existing brook crossing.

Part E - Alternatives

Have you considered any alternatives to your proposal that would meet your needs and might have less impact on the wetland/watercourse? Please list these alternatives.

Yes, original design for walk was proposed on the other side of Meadowbrook Lane.

Part F - Map/Site Plan (all applications)

1) Attach to the application a map or site plan showing **existing conditions** and the **proposed project** in relation to wetland/ watercourses. Scale of map or site plan should be 1" = 40'; if this is not possible, please indicate the scale that you are using. A sketch map may be sufficient for small, minor projects. **(See guidelines at end of application)**

2) Applicant's map date and date of last revision September 21, 2015

3) Zone Classification R-20

4) Is your property in a flood zone? _____Yes X No _____ Don't Know

Part G - Major Applications Requiring Full Review and a Public Hearing

See Section 6 of the Mansfield Regulations for additional requirements.

Part H - Notice to Abutting Property Owners

1) Attach list of abutters, name, and address

2) **Proof of Written Notice to Abutters.** You must notify abutting (neighboring) property owners (any property immediately contiguous with the subject property, including those across the street) by certified mail, return receipt requested, stating that a wetland application is in progress, and that abutters may contact the Mansfield Inland Wetlands Agent for more information. Include a brief description of your project. ***Postal receipts of your notice to abutters must accompany your application.*** To generate an abutters list go to http://www.mainstreetmaps.com/CT/Mansfield/

Part I - Additional Notices, if necessary

Notice to Windham Water Works and CT Department of Public Health is attached. If this application is in the public watershed for the Windham Water Works (WWW), you must notify the WWW and the Department of Public Health of your project within 7 days of sending the application to Mansfield--sending it by certified mail, return receipt requested. Contact the Mansfield Inland Wetlands Agent to find out if you are in this watershed.

Notice to Adjoining Town. If your property is within 500 feet of an adjoining town, you must also send a copy of the application, on the same day you sent one to Mansfield, to the Inland Wetlands Agency of the adjoining town, by certified mail, return receipt requested.

The Statewide Reporting Form shall be part of the application and specified parts must be completed and returned with this application.

Part J - Other Impacts To Adjoining Towns, if applicable

1) Will a significant portion of the traffic to the completed project on the site use streets within the adjoining municipality to enter or exit the site?___Yes_X_No___Don't Know

2) Will sewer or water drainage from the project site flow through and impact the sewage or drainage system within the adjoining municipality?____ Yes _X_No ____ Don't Know

3) Will water run-off from the improved site impact streets or other municipal or private property within the adjoining municipality?____ Yes _X_No ____Don't Know

Part K - Additional Information from the Applicant

Set forth (or attach) any other information which would assist the Agency in evaluating your application. (*Please provide extra copies of any lengthy documents or reports, and extra copies of maps larger than 8.5" x 11", which are not easily copied.)*

Part L - Filing Fee

Application fees shall be in accordance with the current Mansfield Code of Ordinance fee Schedule, pursuant to Section 8-1c of the Connecticut General Statutes. The fee schedule includes provisions for applicant-funded consultant studies and reports. The current fee schedule is available in the Planning and Zoning office.

Note: The Agency may require additional information about the upland review area or about wetlands or watercourses affected by the regulated activity. If the Agency, upon review of your application, finds the activity proposed may involve a "significant activity" as defined in the Regulations, additional information and/or a public hearing may be required.

Certification

I hereby certify that:

- I am familiar with the information contained in this form and that such information is true and correct to the best of my knowledge.
- I understand the penalties for obtaining a permit through deception or through inaccurate or misleading information.

_____ _____

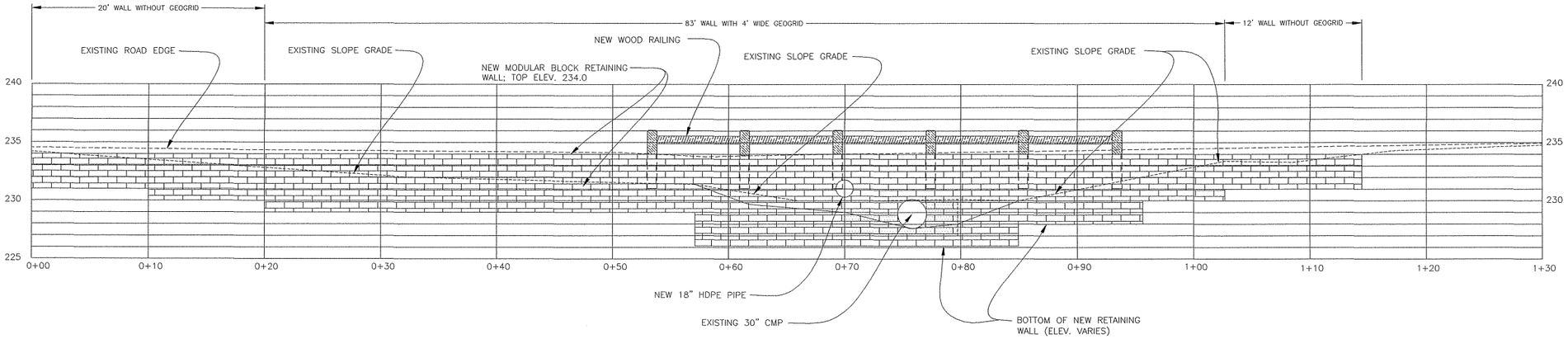
Signature Date

Authorization to Enter Property

The undersigned hereby consent to necessary and proper inspections of the above-mentioned property by members and agents of the Inland Wetlands Agency at reasonable times, both before and after the permit in question has been issued by the Agency.

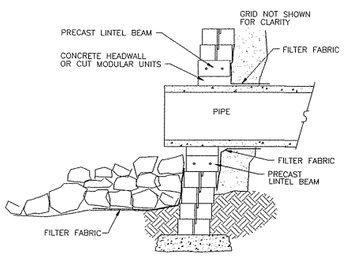
_____ _____

Signature Date

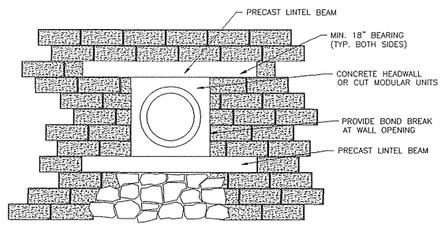


DOWNSTREAM WALL ELEVATION

SCALE: 1" = 5'



SECTION



PROFILE

LINTEL NOTES:

1. SUBMIT SHOP DRAWING FOR FINAL BEAM SIZE, REINFORCEMENT, AND CONFIGURATION TO BE APPROVED BY ENGINEER.
2. LINTEL BEAMS SHALL BE PRECAST WITH MIN. 7 DAYS CURE.
3. HEIGHT OF BEAM SHALL CORRESPOND TO HEIGHT OF MODULAR UNIT(S).
4. PLACE LINTEL ON COURSE ABOVE DRAINAGE PIPE.
5. PIPE TO EXTEND BEYOND BASE COURSE OF WALL NO LESS THAN 6".
6. GEOTEXTILE FABRIC SHALL BE INSTALLED AROUND PIPE OPENING.
7. LINTEL TO EXTEND MINIMUM 18" EITHER SIDE OF OPENING.

WALL WITH PIPE PENETRATION

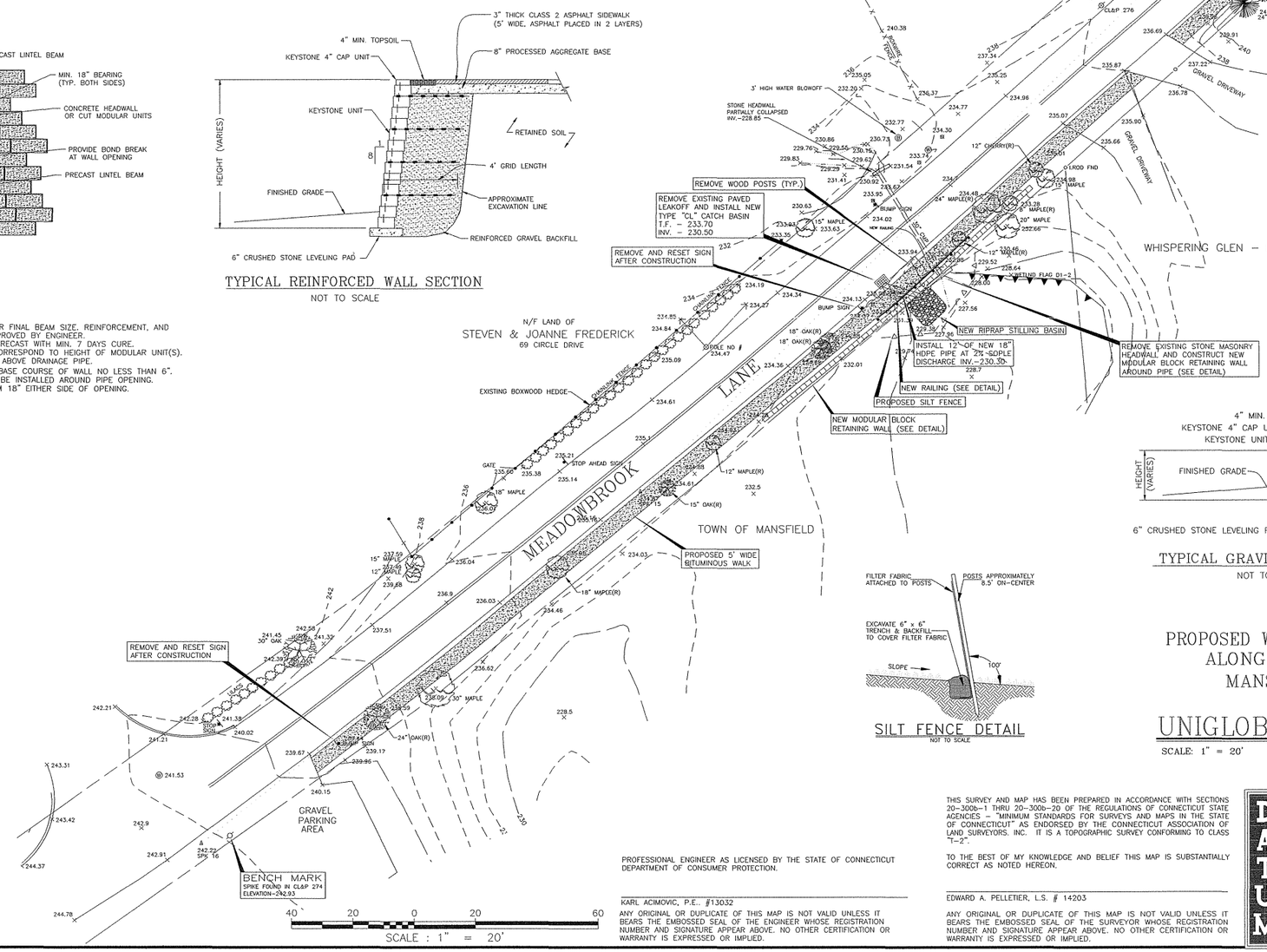
NOT TO SCALE

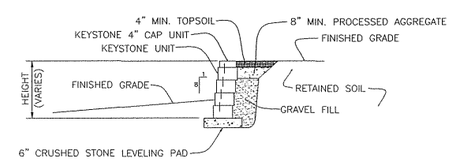
TYPICAL REINFORCED WALL SECTION

NOT TO SCALE

NOTES

1. MODULAR WALL UNITS SHALL BE KEYSTONE RETAINING WALL STANDARD SERIES II UNITS MANUFACTURED IN ACCORDANCE WITH ASTM C-90 AND ASTM C-140 AND SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI, STANDARD WEIGHT, WITH A MAXIMUM ABSORPTION OF 8%.
2. CONNECTION PINS SHALL BE 1/2" DIAMETER THERMOSET ISOPTHALIC POLYESTER RESIN-PULTRUDED FIBERGLASS REINFORCEMENT RODS SUPPLIED BY KEYSTONE.
3. FILL FOR UNITS SHALL BE FREE DRAINING CRUSHED STONE OR GRAVEL, 1/2" TO 3/4" AGGREGATE.
4. BACKFILL MATERIAL FOR ALL WALL SECTIONS SHALL BE A FREE DRAINING COMPACTED GRAVEL CONFORMING TO THE MATERIAL SPECIFICATIONS OF SECTION M.02.06, GRADATION A, OF CONNECTICUT DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROADS, BRIDGES AND INCIDENTAL CONSTRUCTION, FORM 816, LATEST REVISION.
5. GEOGRID SHALL BE MIRAGRID 2XT, AS MANUFACTURED BY TENCATE GEOSYNTHETICS.
6. ALL INSTALLATION (INCLUDING WALL SECTIONS AND GEOGRID) SHALL FOLLOW KEYSTONE DESIGN AND CONSTRUCTION MANUAL. CONTRACTOR TO PROVIDE SHOP DRAWINGS FROM BLOCK SUPPLIER FOR REVIEW AND APPROVAL SUBSEQUENT TO EXCAVATION AND IDENTIFICATION OF ANY SITE UTILITIES, NOTING ANY DEVIATIONS IN GEOGRID LAYOUT DUE TO POTENTIAL CONFLICTS WITH UTILITIES OR DRAINAGE FEATURES.
7. FENCING OR RAILING SHALL BE PLACED BEHIND THE NEW RETAINING WALL UNLESS OTHERWISE DIRECTED.
8. PROCESSED AGGREGATE FOR THE ASPHALT SIDEWALK BASE AREAS SHALL CONFORM TO THE MATERIAL SPECIFICATIONS OF SECTION M.05.01-1 OF DOT FORM 816, LATEST REVISION, EXCEPT THAT THE MAXIMUM AGGREGATE SHALL BE NO GREATER THAN 1" IN SIZE.
9. EXCAVATION, FILLING, BACKFILLING, AND COMPACTION SHALL BE IN CONFORMITY WITH THEIR RESPECTIVE SECTIONS OF DOT FORM 816. IN NO CASE SHALL LIFTS EXCEED 6 INCHES FOR MATERIALS BENEATH OR ADJACENT TO STRUCTURES OR 12 INCHES FOR ALL OTHER AREAS PRIOR TO COMPACTION. DRY DENSITY OF EACH LAYER FOR INDIVIDUAL MATERIALS AFTER COMPACTION SHALL BE NOT LESS THAN 95% FOR RANDOM FILL, 95% FOR GRAVEL FILL AND 100% FOR STRUCTURAL FILL WHEN TESTED IN ACCORDANCE WITH AASHTO T180, METHOD D.





TYPICAL GRAVITY WALL SECTION

NOT TO SCALE

SILT FENCE DETAIL

NOT TO SCALE

PROPOSED WALKWAY - WHISPERING GLEN ALONG MEADOWBROOK LANE MANSFIELD CENTER, CT.

PREPARED FOR

UNIGLOBE INVESTMENT, LLC

SCALE: 1" = 20'

DATE: SEPT. 21, 2015

SHEET 1 OF 2

PROFESSIONAL ENGINEER AS LICENSED BY THE STATE OF CONNECTICUT DEPARTMENT OF CONSUMER PROTECTION.

KARL ACIMOVIC, P.E.. #13032

ANY ORIGINAL OR DUPLICATE OF THIS MAP IS NOT VALID UNLESS IT BEARS THE EMBOSSED SEAL OF THE ENGINEER WHOSE REGISTRATION NUMBER AND SIGNATURE APPEAR ABOVE. NO OTHER CERTIFICATION OR WARRANTY IS EXPRESSED OR IMPLIED.

THIS SURVEY AND MAP HAS BEEN PREPARED IN ACCORDANCE WITH SECTIONS 20-300b-1 THRU 20-300b-20 OF THE REGULATIONS OF CONNECTICUT STATE AGENCIES - "MINIMUM STANDARDS FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT" AS ENDORSED BY THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS. INC. IT IS A TOPOGRAPHIC SURVEY CONFORMING TO CLASS "T-2".

TO THE BEST OF MY KNOWLEDGE AND BELIEF THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON.

EDWARD A. PELLETIER, L.S. # 14203

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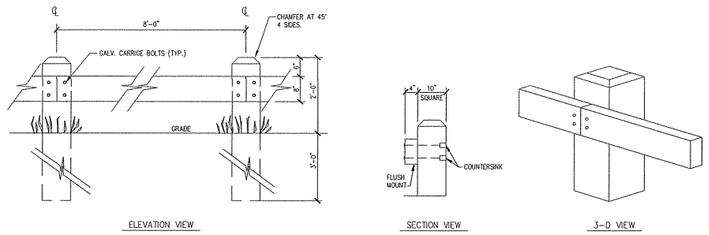
DATUM

ENGINEERING & SURVEYING, LLC

132 CONANTVILLE ROAD
MANSFIELD CENTER, CT 06250
TEL (860)456-1357 FAX (860)456-1840

JOB NO. 215013

CHECKED BY:_____ CORRECTIONS BY:_____

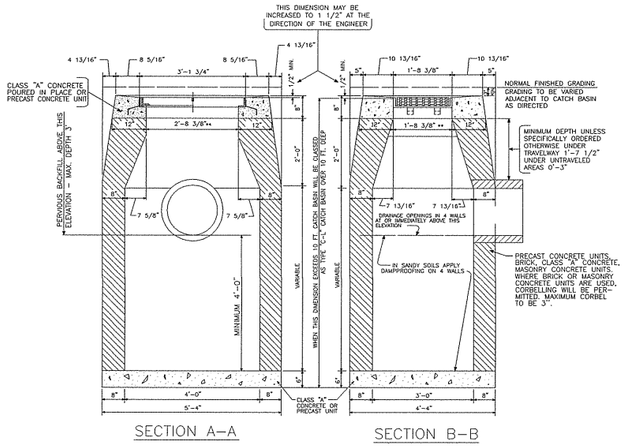


WOOD RAILING

NOT TO SCALE

WALKWAY DETAIL

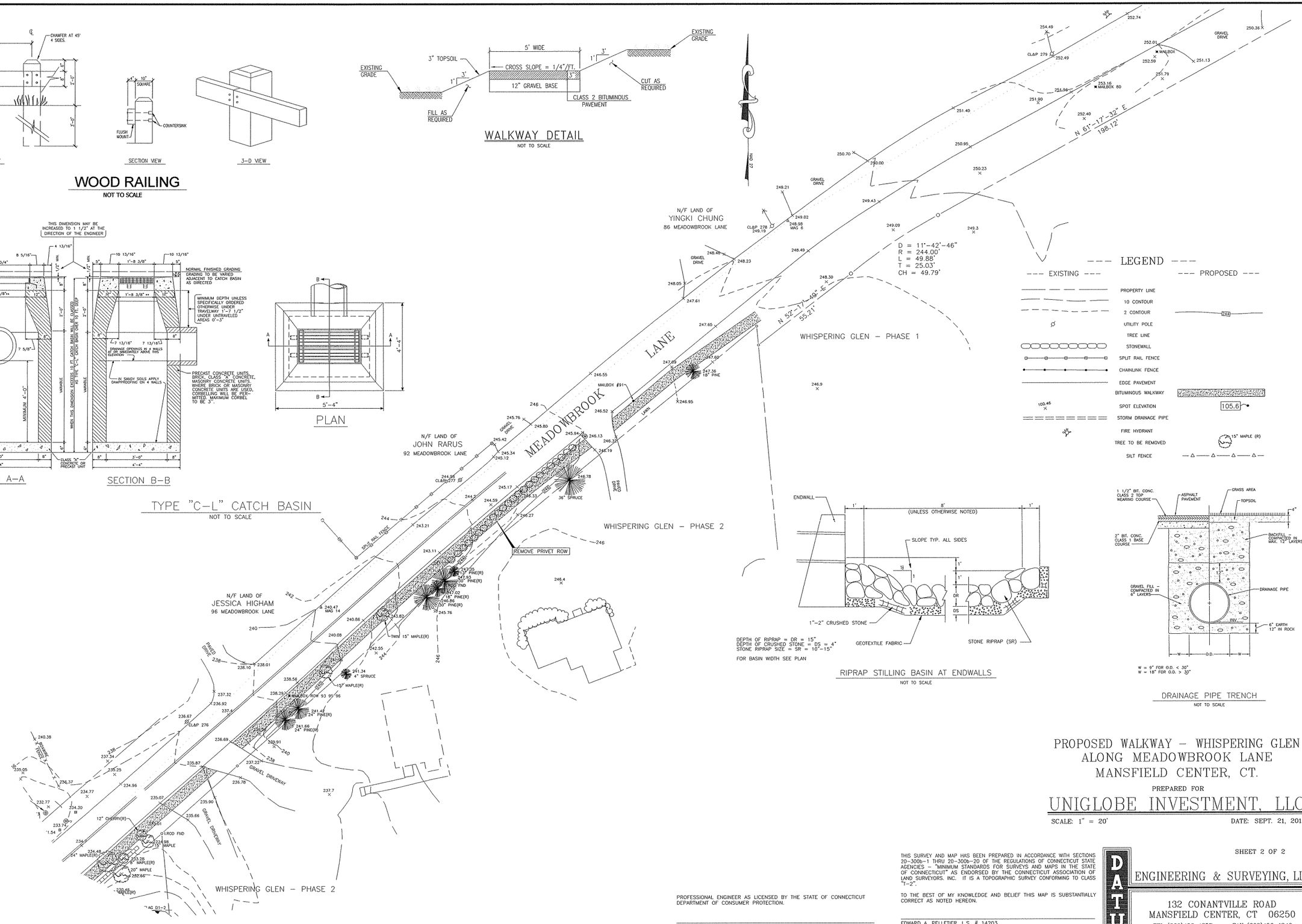
NOT TO SCALE



PLAN

TYPE "C-L" CATCH BASIN

NOT TO SCALE



RIPRAP STILLING BASIN AT ENDWALLS

NOT TO SCALE

DRAINAGE PIPE TRENCH

NOT TO SCALE

PROPOSED WALKWAY - WHISPERING GLEN ALONG MEADOWBROOK LANE MANSFIELD CENTER, CT.

PREPARED FOR

UNIGLOBE INVESTMENT, LLC

SCALE: 1" = 20'

DATE: SEPT. 21, 2015

SHEET 2 OF 2

PROFESSIONAL ENGINEER AS LICENSED BY THE STATE OF CONNECTICUT DEPARTMENT OF CONSUMER PROTECTION.

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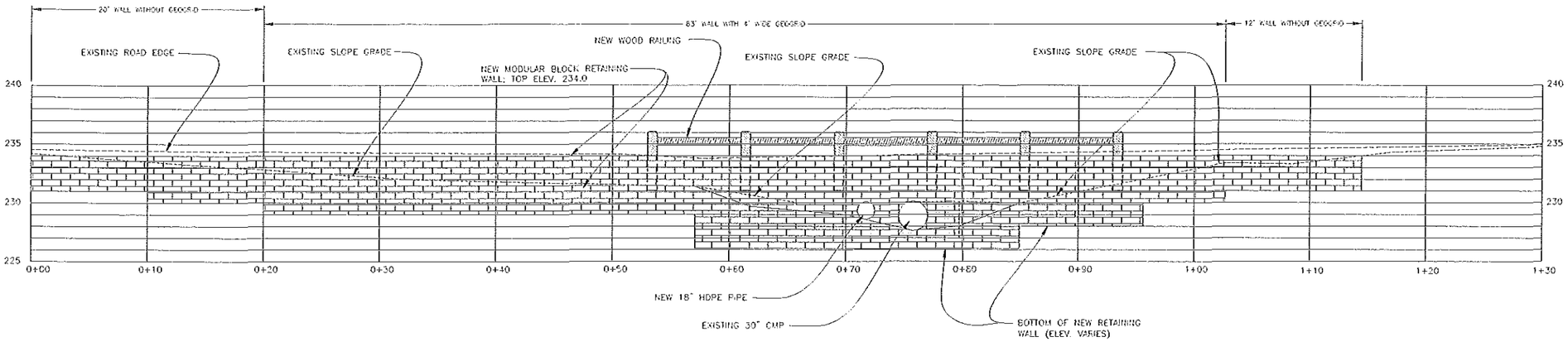
DATUM

ENGINEERING & SURVEYING, LLC

132 CONANTVILLE ROAD
MANSFIELD CENTER, CT 06250
TEL (860)456-1357 FAX (860)456-1840

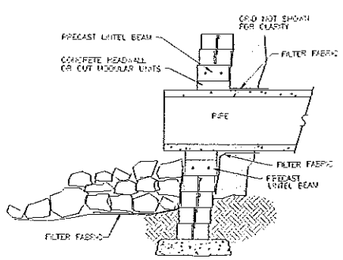
JOB NO. 215013

CHECKED BY:_____ CORRECTIONS BY:_____

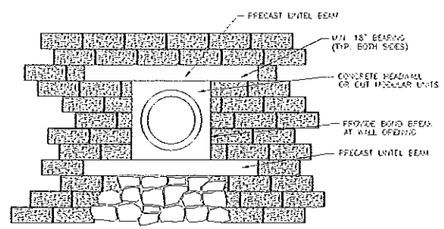


DOWNSTREAM WALL ELEVATION

SCALE: 1" = 5'



SECTION



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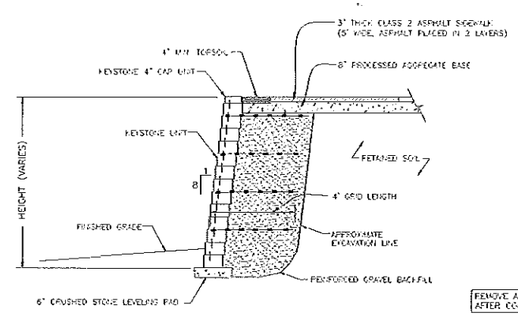
WALL WITH PIPE PENETRATION

NOT TO SCALE



TYPICAL REINFORCED WALL SECTION

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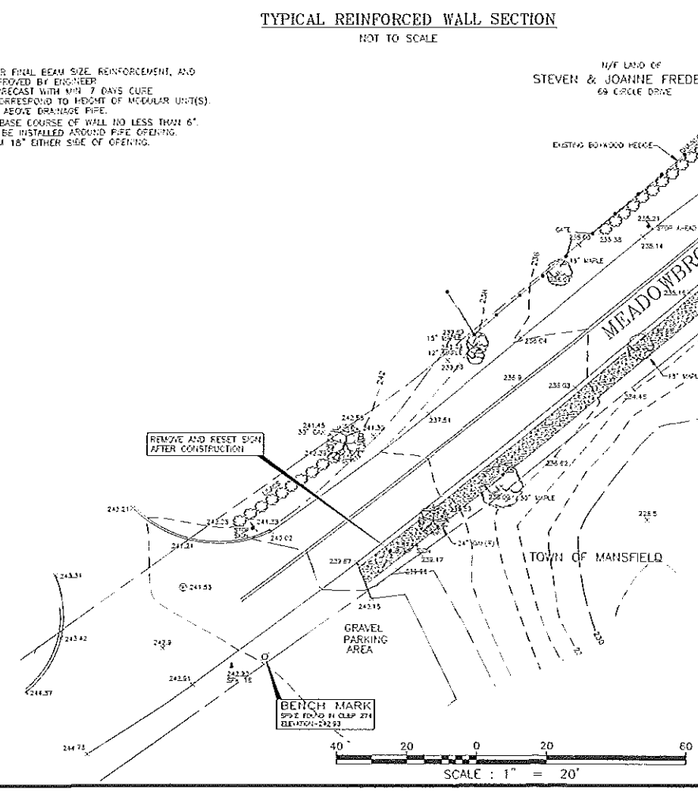

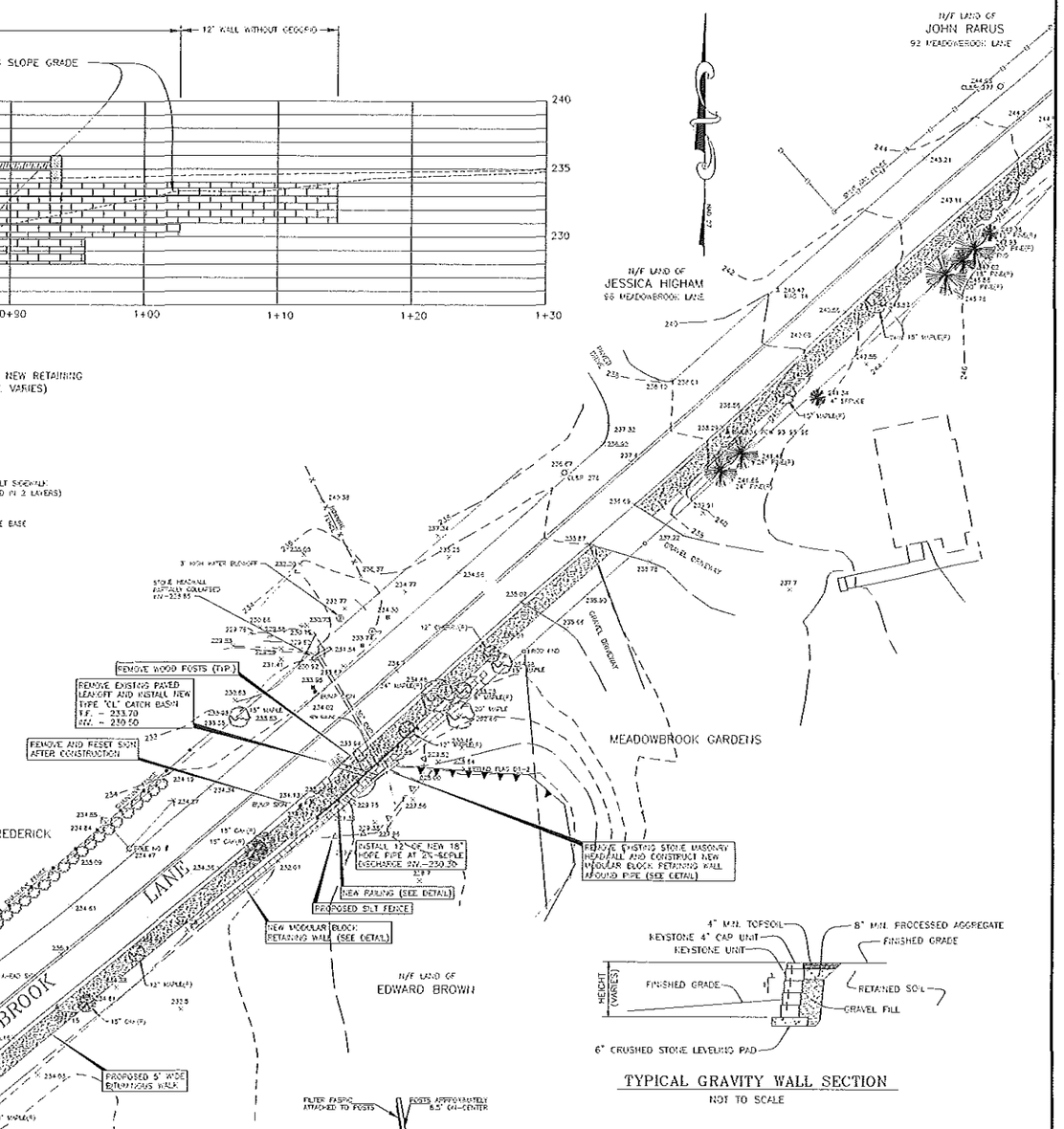

TYPICAL GRAVITY WALL SECTION

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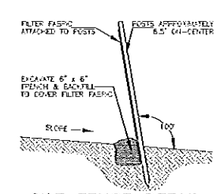

SILT FENCE DETAIL

NOT TO SCALE

NOTES

1. MODULAR WALL UNITS SHALL BE KEYSTONE RETAINING WALL STANDARD SERIES II UNITS MANUFACTURED IN ACCORDANCE WITH ASTM C-90 AND ASTM C-140 AND SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI, STANDARD WEIGHT, WITH A MAXIMUM ABSORPTION OF 8%.
2. CONNECTION PINS SHALL BE 1/2" DIAMETER THERMOSET ISOPTHALIC POLYESTER RESIN-PULTRUDED FIBERGLASS REINFORCEMENT RODS SUPPLIED BY KEYSTONE.
3. FILL FOR UNITS SHALL BE FREE DRAINING CRUSHED STONE OR GRAVEL, 1/2" TO 3/4" AGGREGATE.
4. BACKFILL MATERIAL FOR ALL WALL SECTIONS SHALL BE A FREE DRAINING COMPACTED GRAVEL CONFORMING TO THE MATERIAL SPECIFICATIONS OF SECTION M.02.06, GRADATION A, OF CONNECTICUT DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROADS, BRIDGES AND INCIDENTAL CONSTRUCTION, FORM 816, LATEST REVISION.
5. GEOGRID SHALL BE MIRAGRID 2XT, AS MANUFACTURED BY TENCATE GEOSYNTHETICS.
6. ALL INSTALLATION (INCLUDING WALL SECTIONS AND GEOGRID) SHALL FOLLOW KEYSTONE DESIGN AND CONSTRUCTION MANUAL. CONTRACTOR TO PROVIDE SHOP DRAWINGS FROM BLOCK SUPPLIER FOR REVIEW AND APPROVAL SUBSEQUENT TO EXCAVATION AND IDENTIFICATION OF ANY SITE UTILITIES, NOTING ANY DEVIATIONS IN GEOGRID LAYOUT DUE TO POTENTIAL CONFLICTS WITH UTILITIES OR DRAINAGE FEATURES.
7. FENCING OR RAILING SHALL BE PLACED BEHIND THE NEW RETAINING WALL UNLESS OTHERWISE DIRECTED.
8. PROCESSED AGGREGATE FOR THE ASPHALT SIDEWALK BASE AREAS SHALL CONFORM TO THE MATERIAL SPECIFICATIONS OF SECTION M.05.01-1 OF DOT FORM 816, LATEST REVISION, EXCEPT THAT THE MAXIMUM AGGREGATE SHALL BE NO GREATER THAN 1" IN SIZE.
9. EXCAVATION, FILLING, BACKFILLING, AND COMPACTION SHALL BE IN CONFORMITY WITH THEIR RESPECTIVE SECTIONS OF DOT FORM 816. IN NO CASE SHALL LIFTS EXCEED 6 INCHES FOR MATERIALS BENEATH OR ADJACENT TO STRUCTURES OR 12 INCHES FOR ALL OTHER AREAS PRIOR TO COMPACTION. DRY DENSITY OF EACH LAYER FOR INDIVIDUAL MATERIALS AFTER COMPACTION SHALL BE NOT LESS THAN 95% FOR RANDOM FILL, 95% FOR GRAVEL FILL AND 100% FOR STRUCTURAL FILL WHEN TESTED IN ACCORDANCE WITH AASHTO T180, METHOD D.

PROPOSED WALKWAY – WHISPERING GLEN ALONG MEADOWBROOK LANE MANSFIELD CENTER, CT.

PREPARED FOR

UNIGLOBE INVESTMENT, LLC

SCALE 1" = 20'

DATE SEPT. 21, 2015

REVISED. MARCH 31, 2016

SHEET 1 OF 2

PROFESSIONAL ENGINEER AS LICENSED BY THE STATE OF CONNECTICUT DEPARTMENT OF CONSUMER PROTECTION.

KARL ADAMOVIC, P.E., #12032

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THIS SURVEY AND MAP HAS BEEN PREPARED IN ACCORDANCE WITH SECTIONS 20-300b-1 THRU 20-300b-20 OF THE REGULATIONS OF CONNECTICUT STATE AGENCIES – "MINIMUM STANDARDS FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT" AS ENDORSED BY THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS, INC. IT IS A TOPOGRAPHIC SURVEY CONFORMING TO CLASS "T-2".

TO THE BEST OF MY KNOWLEDGE AND BELIEF THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON.

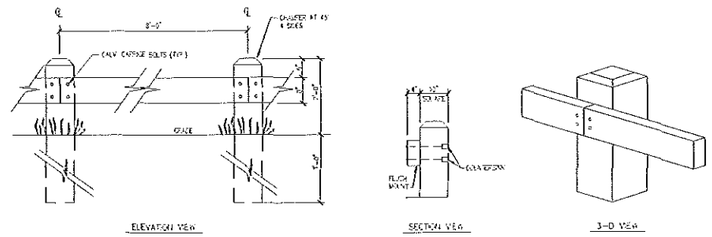
EDWARD A. FELLETIER, L.S. # 14203

ANY ORIGINAL OR DUPLICATE OF THIS MAP IS NOT VALID UNLESS IT BEARS THE EMBOSSED SEAL OF THE SURVEYOR WHOSE REGISTRATION NUMBER AND SIGNATURE APPEAR ABOVE. NO OTHER CERTIFICATION OR WARRANTY IS EXPRESSED OR IMPLIED.

DATUM
ENGINEERING & SURVEYING, LLC
132 CONANTVILLE ROAD
MANSFIELD CENTER, CT 06250
TEL (860)456-1357 FAX (860)456-1840

JOB NO. 215013

CHECKED BY _____ CORRECTIONS BY _____

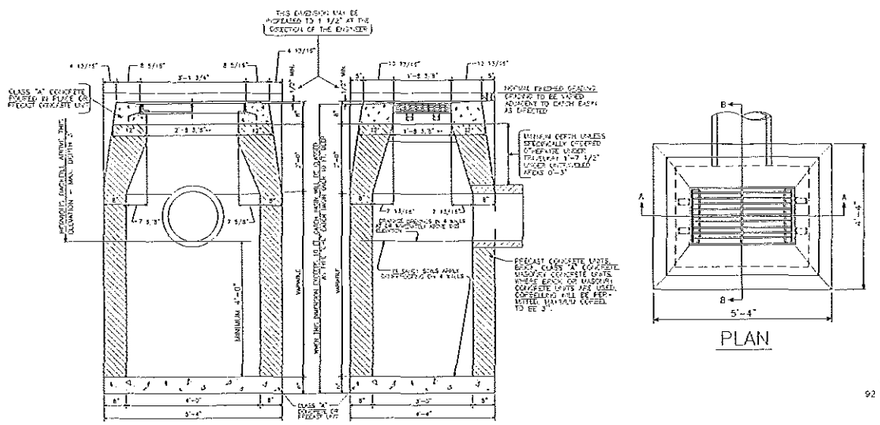


WOOD RAILING

NOT TO SCALE

WALKWAY DETAIL

NOT TO SCALE



TYPE "C-L" CATCH BASIN

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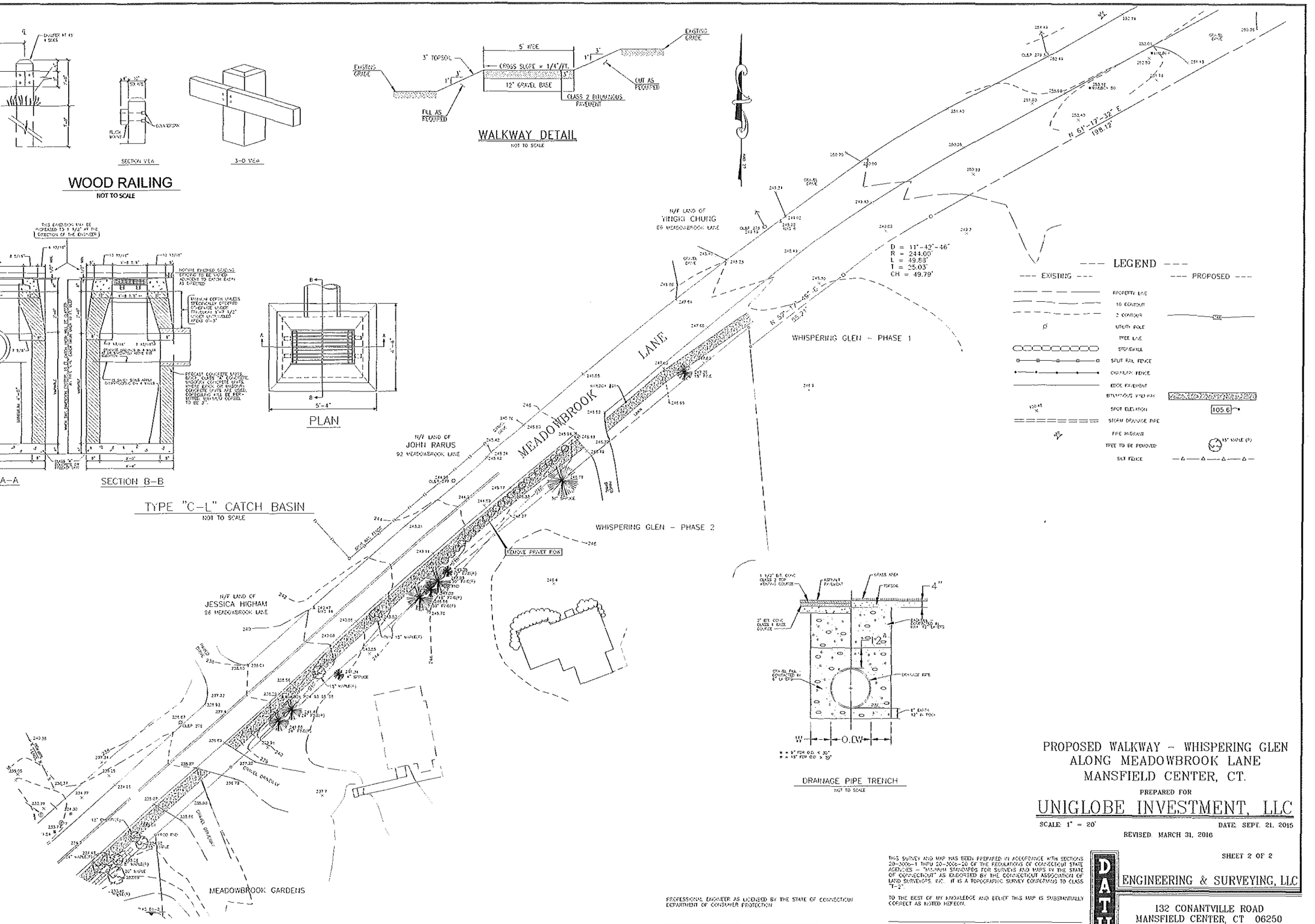

DRAINAGE PIPE TRENCH

NOT TO SCALE

40 20 0 20 60

SCALE : 1" = 20'

PROPOSED WALKWAY - WHISPERING GLEN
ALONG MEADOWBROOK LANE
MANSFIELD CENTER, CT.

PREPARED FOR

UNIGLOBE INVESTMENT, LLC

SCALE 1" = 20' DATE SEPT. 21, 2015

REVISED MARCH 31, 2016

SHEET 2 OF 2

PROFESSIONAL ENGINEER AS LICENSED BY THE STATE OF CONNECTICUT DEPARTMENT OF CONSUMER PROTECTION

KARL ACMOVIC, P.E., #13032

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DATUM
ENGINEERING & SURVEYING, LLC
132 CONANTVILLE ROAD
MANSFIELD CENTER, CT 06250
TEL (860)456-1357 FAX (860)456-1640

JOB NO. 215013

CHECKED BY _____ CORRECTIONS BY _____

Open Space Preservation Committee
Tuesday, March 15, 2016
DRAFT Minutes
Mansfield Town Hall, Conference Room B
7:00p.m.

Members present: Jim Morrow (chair), Ken Feathers, Quentin Kessel, Michael Soares, Roberta Coughlin, and Jennifer Kaufman (staff).

The meeting was called to order at 7:02 pm.

Michael Soares was appointed secretary.

Minutes of the February 2016 joint meeting with Conservation Commission were approved.

Opportunity for public comment – No members of the public were present.

Old Business

- Town Council Update – Jennifer shared that she has spoken with Amy Paterson, Ex. Director of CT Land Conservation Council (CLCC). Amy will attend the April meeting to assist OSPC's discussion of how to permanently preserve Town-owned parks and open space lands. Parks Advisory Committee and Agricultural Committee will be informed of Amy's visit and invited to the meeting.

- Model Easement – Jennifer provided a few distinct conservation easements. These were reviewed, and it was decided that members should read through these examples and provide comments to Jennifer before the April meeting.

- Biking in Certain Town Parks – The Town received a letter from CFPA, regarding a request by some residents to allow biking on Town trails, which includes the blue-blazed Nipmuck Trail managed by CFPA. The letter explains that CFPA's Trail Committee reviewed the request and decided to maintain their existing policy and allow foot travel only. It also expressed that, if the Town does decide to allow biking in its parks, that we work closely with CFPA staff to find the best ways to protect trails and manage possible landowner issues.

- Meeting with Amy Paterson – see Town Council Update above.

New Business

- PZC referral Meadowbrook Gardens Multi-Family Development – OSPC reviewed the provided plans and recommends that:
    - the proposed sidewalk along Meadowbrook Lane remain on that side along its entirety and does not cross the road. This sidewalk was omitted from the Landscape-Lighting-Sighting Plan.

- the proposed sidewalk along Meadowbrook Lane be extended to access the nearest bus stop at the ECSU ballfields.
- the sidewalks within the development are connected to one another, and that this network is extended to connect to the proposed sidewalk along Meadowbrook Lane.
- a guardrail and plantings are added to the south side of the southernmost parking area. Since this parking is very close to the slope leading to the stream, OSPC feels that some improvements are necessary for this location's safety, aesthetics, and management of runoff (plantings for filtration).
- the applicant provide more information on plans for the northernmost portion of the site, located along Meadowbrook Lane and east of the main entrance.
- PZC review the current parking plan and ensure it meet best practices.
- PZC requests a community benefits assessment for Sunny Acres Park.

Communications

- CFPA letter, RE: Nipmuck Trail. Dated 3/14/2016
- Updates from Jennifer:
  - Bicentennial Pond:
    - The Town was awarded a grant of $253,000 for construction of an all-access trail around the pond. Total project cost is $316,000.
    - An application has been submitted to Inland Wetlands for sediment removal and management via herbicide of water chestnut, and aquatic invasive species.
  - Eagleville Lake – Continued management via herbicide of the aquatic invasive fanwort will occur this year. Similar to last year, the cost of $28,000 is shared with the Town of Coventry. The Town of Mansfield received a grant this time of $6,500, leaving the Town with $8,500. Kessel asked if this cost was in the proposed Town budget, recalling that open space funds were used for the fanwort control last year and that OSPC urged that any management following the 2015 season be funded through the Town budget. Jennifer said that the item did not appear in the proposed budget and she would inquire about it.

The meeting was adjourned at 8:40.

DRAFT MINUTES
MANSFIELD PLANNING AND ZONING COMMISSION
Regular Meeting
Monday, April 4, 2016 adjourned to Wednesday, April 6, 2016
Council Chamber, Audrey P. Beck Municipal Building

Members present:	J. Goodwin, B. Chandy, R. Hall, K. Rawn, V. Ward
Members absent:	C. Ausburger, G. Lewis, B. Ryan, S. Westa
Alternates present:	T. Berthelot
Alternates absent:	P. Aho
Staff present:	Linda Painter, Director of Planning and Development
	Janell Mullen, Assistant Planner/Zoning Enforcement Officer

Chairman Goodwin called the meeting to order at 6:47 p.m. and appointed alternate Berthelot to act.

Approval of Minutes:

a. March 16, 2016, Regular Meeting:
Hall MOVED, Chandy seconded, to approve the 3-16-2016 minutes as presented. MOTION PASSED UNANIMOUSLY.

Zoning Agent's Report:

Janell Mullen, Zoning Agent, requested the Commission add a New Business Item to the Agenda regarding a Certificate of Compliance for Quester's Way. Ward MOVED, Chandy seconded to add the Request for a Certificate of Compliance for Quester's Way as a New Business Item. MOTION TO ADD TO THE AGENDA PASSED UNANIMOUSLY.

Old Business:

a. Draft Zoning Regulations
This item was tabled until after all other business.

b. Zoning Map Amendment Application, 91 & 93 Meadowbrook Lane, PZC File #1338
Item is tabled pending a 5/2/16 Public Hearing.

c. Special Permit Application, Meadowbrook Gardens, 91 & 93 Meadowbrook Lane, PZC File #1284-3
Item is tabled pending a 5/2/16 Public Hearing, Field Trip set for 4/13/16.

d. Ad Hoc Committee on Rental Regulations and Enforcement
Chairman Goodwin tabled this discussion.

New Business:

a. Request for Interpretation of Lot Frontage Requirements
WARD moved, Chandy seconded, to table this item for discussion to when more members are present.

b. Request for Certificate of Compliance, Quester's Way
Chairman Goodwin disqualified herself and Ward was appointed as Acting Chair for this item.
Janell Mullen, Zoning Agent reviewed her 4/6/16 memo.
Rawn MOVED, Hall seconded, to authorize the Zoning Agent to issue the Certificate of Zoning Compliance for Quester's Way (PZC File #432-6). The Zoning Agent will verify that the work has been completed by the end of the month. Failure to construct the Zen Garden per the landscaping plan will result in citations and fines. MOTION PASSED UNANIMOUSLY.

Reports from Officers and Committees:
In addition to The Director's Report, it was noted that a Field Trip is scheduled for 4-13-16; and that Ward attended the Land Use Academy's Advanced Training.

Communications and Bills:
Noted.

Old Business Continued:

a. Draft Zoning Regulations

Painter distributed a handout with four potential options to address Commission concerns regarding potential for development of properties located outside the proposed water pipeline overlay district to bypass restrictions by acquiring an easement to access public water and potentially increase density. After discussion, members identified the addition of language prohibiting the use of such easements as justification for increased density as the preferred option.

Painter also distributed a handout with potential changes to the draft live music/amplified music regulations based on concerns identified by the Town Manager and Resident Trooper with the current draft regulations. After discussion, members recommended amending the current draft to delete references to live/amplified music associated with residential uses and specify the number of violations of noise and nuisance ordinances that would result in revocation. Based on the discussion, members requested that revised language be prepared for the April 18th meeting for the purpose of setting a public hearing date in June on the draft stormwater, water service connection/water pipeline overlay district, alcoholic liquor and live/amplified music regulations.

Adjournment:
The Chair declared the meeting adjourned at 7:33 p.m.

Respectfully submitted,

Vera S. Ward, Secretary

DRAFT Minutes
Mansfield Inland Wetlands Agency
Regular Meeting
Monday, April 4, 2016 adjourned to Wednesday, April 6, 2016
Council Chambers, Audrey P. Beck Municipal Building

Members present: J. Goodwin, B. Chandy, R. Hall, K. Rawn, V. Ward
Members absent: C. Ausburger, G. Lewis, B. Ryan, S. Westa
Alternates present: T. Berthelot
Alternates absent: P. Aho
Staff present: J. Kaufman, Wetlands Agent

Chairman Goodwin called the meeting to order at 6:33 p.m. and appointed alternate Berthelot to act.

Approval of Minutes:

a. **03/07/2016 Regular Meeting**:
Chandy MOVED and Ward seconded to approve the 3/7/2016 minutes as corrected. MOTION PASSED.

b. **03/16/2016 Field Trip**:
The notes from the 3/16/2016 field trip were noted.

Communications:

The Conservation Commission meeting minutes and Kaufman's monthly business memo were noted.

Public Hearing:

W1561– H. Raphaelson, Dog Lane, 2 lot subdivision

Chairman Goodwin opened the Public Hearing at 6:36 pm. Members present were Chandy, Goodwin, Hall, Rawn, Ward, and alternate Berthelot who was appointed to act. Jennifer Kaufman, Wetlands Agent read the Legal Notice as it appeared in The Chronicle on 3/22/16 and 3/30/16 and noted the following communications received and distributed to members: an undated letter from Kathryn Ratcliff of 60 Bundy Lane; a 3/14/2016 memo from Sherry McGann, Eastern Highlands Health District; a 3/28/16 letter from DEEP regarding the NDDN Determination; and a 3/29/16 memo from J. Kaufman, Wetland Agent.

At 6:39 p.m. Rawn MOVED, Hall SECONDED, to adjourn the public hearing on the lot split application (W1561) submitted by H. Raphaelson, adjacent to 128 Dog Lane, to May 2, 2016. MOTION PASSED UNAMIOUSLY.

Old Business:

a. **W1561– H. Raphaelson, Dog Lane, 2 lot subdivision**
Item tabled pending continued public hearing on 5/2/16.

b. **W1562-Meadowbrook Gardens, 91 & 93 Meadowbrook Lane, 36 Units**
Item tabled pending 5/2/16 Public Hearing.

c. **W1563-Bicentennial Pond, Aquatic Weed Management and Sediment Removal**
Chandy MOVED, Rawn seconded, to grant an Inland Wetlands License, pursuant to the Inland Wetlands and Watercourses Regulations of the Town of Mansfield to the Town of Mansfield (File #W1563) for aquatic weed management and sediment removal on property owned by the applicant and located at Bicentennial Pond (Assessor's Parcel ID 23.60.7) as shown on plans dated 10/27/2015 and as described in application submissions.
This action is based on a finding of no anticipated significant impact on the wetlands, and is conditioned on the following provisions being met:

1. Appropriate erosion and sedimentation controls shall be in place prior to the activity, maintained during the activity and removed when disturbed areas are completely stabilized;
2. Herbicide treatments shall be conducted in accordance with a CT DEEP Aquatics Pesticide Use Permit and shall be coordinated with the Town of Mansfield's Parks and Recreation Department to ensure that no treatments occur during the swim/camp season; and
3. Material removed from the pond will be immediately removed from the site for dewatering.

This approval is valid for five years (until April 4, 2021) unless additional time is requested by the applicant and granted by the Inland Wetlands Agency. The applicant shall notify the Wetlands Agent before any work begins and all work shall be completed within one year. Any extension of the activity period shall come before this Agency for further review and comment.
MOTION PASSED UNANIMOUSLY.

New Business:

a. W1564- Storrs Lodges, 218 Units, Hunting Lodge Road (Parcel I.D. 15.21.3)

Rawn MOVED, Ward seconded, to:

1) Receive the application submitted by Storrs Lodges LLC (IWA File #1564) under the Inland Wetlands and Watercourses Regulations of the Town of Mansfield for the construction of a 218-unit apartment complex on property owned by the applicants and located at Hunting Lodge Road (Assessor's Parcel ID 15.21.3) as shown on plans dated 3/18/2016 and as described in application submissions, schedule a public hearing on June 6, 2016, and refer said application to the Conservation Commission for review and comment.
2) Authorize staff to engage the services of GEI Consultants to provide independent review of the application. Pursuant to section 8.6 of Mansfield's Inland Wetlands and Watercourses Regulations, fees incurred for this review will be the responsibility of the applicants; a deposit in the amount of the estimated cost shall be provided prior to issuance of a notice to proceed.

MOTION PASSED UNANIMOUSLY.

b. W1565- Uniglobe Investment, LLC., Meadowbrook Road, Sidewalk

Ward MOVED, Hall seconded, to receive the application submitted by Uniglobe Investment, LLC (IWA File #W1565) under the Wetlands and Watercourses Regulations of the Town of Mansfield for the construction of a sidewalk on property located at Meadowbrook Lane (73 Meadowbrook Lane to Sunny Acres Park) as shown on a map dated 9/21/2015 and as described in application submissions, to refer said application to staff and the Conservation Commission for review and comments, and to waive the application fee pursuant to section 19.6.A of Mansfield's Inland Wetlands and Watercourses Regulations. MOTION PASSED UNANIMOUSLY.

Reports from Officers and Committees: A Field Trip was scheduled for 4/13/16 at 2:30 p.m.

Other Communications: None.

Adjournment: The Chairman declared the meeting adjourned at 6:46 p.m.

Respectfully submitted,
Vera S. Ward, Secretary

Joshua's Trust News

Protecting Land and Preserving Heritage. Forever.

Spring 2016 *Published Quarterly by Joshua's Tract Conservation and Historic Trust* *www.joshuastrust.org*

Let the celebration begin!

The year was 1966, and the Connecticut General Assembly enacted two laws that pleased conservationists and preservationists all over the state.

Both measures were reactions to the development of housing, industry, and commerce that had burgeoned after many years of restricted money and materials during the Great Depression of the 1930s and World War II (1941-1945).

The rampant growth resulted in the destruction of historic buildings and sites, seemingly without any consideration for the conservation and preservation of the state's natural and historic resources.

Fortunately, as Trust historian Rudy Favretti reported in the paragraphs above, like-minded individuals in Connecticut's so-called "Quiet Corner" also understood the pressures and potential for harmful side effects of development; and in 1966 they organized one of the first land trusts in the state: Joshua's Tract Conservation and Historic Trust.

Fifty years later, we have grown. Joshua's Trust, as it is now more commonly known, currently protects over 4,000 acres in 14 area towns, including properties we own outright and those we protect through conservation easements. Not long ago we added another historic property – the Atwood Farm in Mansfield.

To mark this significant anniversary, we are planning a year of celebration, with many different activities culminating in our gala annual dinner and award ceremony in October.

The festivities begin on April 23 with the publication of "50 Years of Trust," Favretti's full-length history of our organization.

The well-known author and former University of Connecticut professor will be on hand to chat with Trust members and sign copies of his book at the Eagleville Firehouse at the inter-

Continued on Page 3

Stewards —the Trust's backbone

Stewards – the overseers and curators of our Trust properties – are some of our most essential volunteers.

With proper stewardship, we are able to maintain and up-grade our many properties. Without their tireless commitment, the Trust would not be able to keep its promise to conserve and preserve the land and buildings for which we are responsible.

Each of our preserves has different characteristics, and stewards have a responsibility for determining how best to protect the property, including working with property abutters to ensure that boundary lines are respected, keeping invasive species at bay, maintaining or creating trails if appropriate, and generally assuring that the property is one the Trust can be proud of.

Ann Dunnack, Trustee and chair of the stewardship committee, and Ann Lewis, our conservation coordinator, have been working together for the past several months to re-organize the trails subcommittee, and it is now showing results.

There are new name signs and kiosks, clearer trail markings, and better training for new stewards and regional coordinators as to what their responsibilities are.

Continued on Page 5

Rob Beach paints one of our new property signs during a sign-making party at Joe Charron's workshop.

Pull out and save the guide to anniversary events — Pages 3 and 4.

Joshua's Trust

Mailing address:
P.O. BOX 4
Mansfield Center, CT 06250

Email:
administration@joshuastrust.org
www.joshuastrust.org

Visit us at:
The Atwood Farm,
624 Wormwood Hill Rd., Mansfield.
Office hours: Tues. Thurs. noon– 5 p.m.
Phone: 860-429-9023

OFFICERS:
President: Doug Hughes
Past President: Fran Funk
Vice President: Nancy Silander
VP Land Acquisition: Warren Church
VP Historic Properties:
Secretary: Karen Zimmer
Treasurer: Allison Burchell-Robinson

STAFF
Executive Director: Michael Hveem
Conservation Coordinator: Ann Lewis
Finance Administrator Tish Ignatowicz

BOARD OF TRUSTEES

Peter Andersen, Willington
Gail Bruhn, Mansfield
Donald Cianci, Columbia
Ann Dunnack, Columbia
Rudy Favretti, Mansfield
Fran Funk, Coventry
Brent Gottier, Tolland
Gwen Haaland, Ashford
Angelika Hansen, Hampton
Doug Hughes, Mansfield
Bill Ingalls, Lebanon
Carl Lindquist, Chaplin
Scott R. Matthies, Chaplin
Greg Padick, Mansfield
Dave Parry, Windham
Jim Russel, Windham
Nancy Silander, Mansfield

The accreditation seal recognizes land conservation organizations that meet national standards for excellence, uphold the public trust and ensure that conservation efforts are permanent.

Big plans in works

TRUST NOTES

By Doug Hughes
Joshua's Trust President

Joshua's Trust has done the incredible in its first 50 years of existence: Since 1966, we've grown from a handful of friends with a dream of conserving land to stand now among the largest land trusts in the state of Connecticut, accredited to the high standards of the national Land Trust Association.

We are going to celebrate this remarkable Golden Anniversary with all the fanfare it deserves – you can see the current slate of activities listed in the pull-out schedule in this newsletter. (Pages 3 and 4.)

The schedule kicks off with a party at the Eagleville Firehouse on April 23 (where Rudy Favretti will sign copies of his new book on the history of Joshua's Trust!), and culminates in a gala dinner at our annual membership meeting October 15. In between, we'll have more than 25 walks, open houses and other events.

We hope you will join us for as many as you can.

While this is a time for celebration and reflection of the past, it also coincides with an intense effort of JT's Board of Trustees to reshape our organization to better address the future and its challenges.

After a Board retreat last fall identified ways to improve our self-governance, we are now considering changes to our committee and leadership structures that will improve the efficiency of the organization and ensure that we continue to bring in new ideas and people to keep the Trust going strong in perpetuity.

Later this spring, the Board will turn to creating a new Strategic Plan that will help us focus our efforts on what's most important to our mission in the future.

When the Strategic Plan is complete, at the end of this year, the Board will in turn consider creating a resource-building plan for ensuring a robust development effort so we can have the financial means to meet our past promises of preservation and continue to grow our capacity for more.

We are what we are now because of the generous support of our members, who have brought us to this point of strength.

Membership support is also a signal to grants-making organizations, and so we've received significant support in the past year from the Land Trust Alliance, the Norcross Wildlife Foundation, and the 1772 Foundation.

Many thanks to all who've helped us to the half-century mark, and to those who will help us through to the next. Let the celebrations begin! — *Doug*

Final Eco-Forum presentation on 'Climate Change' scheduled for April 14

The last of four presentations in our popular Eco-Forum is scheduled for April 14 when Western Connecticut State University ecologist Mitch Wagener will talk about "Climate Change and its Effects."

Wagener, who earned his doctorate in soil ecology during a 13-year stay in Alaska, teaches climate ecology, entomology, and related courses at WCSU in Danbury.

His presentation will be at the Buchanan Auditorium of the Mansfield Public Library on Route 89 in Mansfield. Doors will open at 6:45 p.m. with the presentation starting at 7.

This final Eco-Forum event is open to both Joshua's Trust members and non-members. For those who haven't already paid for their four-event package, costs for Trust members are $5 per presentation and $8 for guests.

Attendees must pre-register using forms available on the JT website.

Letterboxers needed!

The Trust is looking for people who do letterboxing to create and adopt letterboxes on our preserves. Contact Sue Beach if you are interested: zunibeach@mac.com.

Here's how we celebrate 50 years of conservation

Please keep this as a reference for the many activities happening in the next months as we celebrate our love of the land and the people who make our organization work. For up-to-date information please go to the web site: www.joshuastrust.org or call the Trust office at 860-429-9023.

Trust Book Signing

April 23 (Saturday), 2- 5 p.m.
Eagleville Firehouse (Rts. 32 and 275), Mansfield

A celebration of the Trust's beginning! Rudy Favretti will be signing his book on the history of the Trust (*50 Years of Trust*), and Hill Bullard and our "house" band the Juniper Hill Jumpers will play the music! Come eat, drink and celebrate with other Trust friends! (No cost).

Atwood Farm

June 11 (Saturday), 12- 4 p.m.
Atwood Farm, Wormwood Hill Rd, Mansfield

Connecticut Open House Day. Come see the historic property that is now our headquarters. A number of the outbuildings will be open including the Weaver's House, the Blacksmith Shop, the hen house, and the house itself.

Passport Walks

Spring weekends

Learn more about the Trust by taking guided walks on our properties. Walk leaders will give you a special passport for stamps for each walk you do. Collect 18 stamps from walks this year in your passport and you will get a Joshua's Trust string backpack – great for all those things you need for a walk. ***(See the list on the reverse of this page for places and times.)***

Summer Events

Please check the web site as well as the June newsletter for up-dated walk information.

Grist Mill Opening

May 15 (Sunday), 1- 5 p.m.
Grist Mill , Stone Mill Road, Mansfield.

The Gurleyville Grist Mill opens today and we will celebrate with docent tours. A film will be shown at the Atwood Farm at 3:00 p.m. that features the Grist Mill and some other places in Mansfield. Take a walk along the Fenton River on the blue trail at your leisure.

Art Exhibit and Cider Pressing

October 9, 2-4 p.m., Atwood Farm.

Come see what the plein air artists have been painting at the farm, as well as a display of fiber art by well-known Chaplin artist Cathy Smith. Cider pressing with apples from the Atwood Farm's trees.

Gala and Annual Dinner

October 15, 6-10 p.m.
Camp Horizons, South Windham

Our Gala and Annual Dinner will feature awards and music by John Paolillo. More details will be forthcoming in the late summer.

Anniversary celebration kicks off with a book signing

Continued from Page One

section of Routes 275 and 32 in Mansfield. Our "house" band, the Juniper Hill Jumpers, will provide music for the event.

Our "Passport Walks" begin the first weekend in April and continue through November. This program gives outdoor enthusiasts a chance to explore many of the Trust's well-marked and wonderful trails throughout the region.

Participants may obtain a passport book from individual walk leaders or at the Trust office and will receive a 50th anniversary stamp for each trail they walk. Collect 18 stamps to receive a string backpack decorated with our Joshua's Trust 50th Anniversary logo.

Our two historic properties will open with special tours: the Grist Mill on May 15, and the Atwood Farm on June 11. The latter will have a number of the outbuildings opened for the first time, including the blacksmith shop, the ice house and the hen house.

Rudy Favretti

Explore the Trust's trails, earn a backpack in this season's Passport Program for hikers

In this year's Passport Program, collect 18 stamps from walk leaders and receive a string backpack with a Joshua's Trust 50th Anniversary logo.

Get your passport book from any walk leader or at the Trust office. There will be over 25 Passport walks between April and November, so plenty of opportunities to get a stamp! For directions to the properties and to view trail maps, visit our list of properties at www.joshuastrust.org/property-list.

April 2, Saturday
Allanach -Wolf Preserve, Windham, 8 a.m.
Join David Parry for a birding walk at this beautiful tract in Windham.

April 9, Saturday
Two Sisters Preserve, Chaplin, 10:30 a.m.
Carl Lindquist will lead a walk of this 40- acre forested tract with multiple stone walls, rocky outcrops and glacial erratics. After a short, moderately steep initial climb, the trail is one mile long on gently rolling terrain.

April 16, Saturday
Josias Byles Sanctuary, Ashford, 9:30 a.m.
Marian Matthews helps walkers connect past to present by walking the Sanctuary trail and coming to the Historic Byles Homestead for snacks, drinks and a few stories. Enjoy the 2-mile long, easy-to-moderate loop trail as you pass a meadow, descend a short steep section to a stream, then travel through a bio-diverse climax forest.

April 23, Saturday
Pappenheimer Preserve, Scotland, 10 a.m.
Jim Russel will host a walk on the "Wild Side." Hike the 101-acre forest preserve, abutting Mohegan State Forest. Visit Red Maple swamp and a 5.5-acre grass covered swamp. A moderate walk, leashed dogs welcome. Pre-registration required.

April 30, Saturday
Friedman Memorial Forest, Ashford, 9 a.m.
George Jacobi will host "Walking the Woods for Wildlife" – a moderate walk.
He will discuss and practice deliberately walking to maximize wildlife sightings, while traversing a 2-mile loop with diverse ecosystems, including how to move (or not) and how to see and hear more effectively. No dogs, please.

May 7, Saturday
Tobiassen Memorial Forest, Tolland, 10 a.m.
Ken Hankinson –Vernal Pools.

May 14, Saturday
Pigeon Swamp, Lebanon, 10 a.m.
Deb Russel, May Wildflowers at Pigeon Swamp.

May 15, Sunday
Grist Mill , Mansfield 1 p.m.
Opening of the Grist Mill and walk along the Fenton River.
(See Page 3.)

May 15, Sunday
Knowlton Hill Preserve, Mansfield, 9 a.m.
Dr. Chris Elphick and Dr. Greg Anderson, Birding at Knowlton Hill.

May 21, Saturday
Hubbard Sanctuary and Agnes Pasture, Chaplin 1 p.m.
Warren Church, offers a history of the Joshua's Trust Properties.

May 28, Saturday
H. E. Preston Sanctuary, Hampton, 1 p.m.
Marcia Kilpatrick, Exploring We Will Go – a walk especially for children.

June 4, Saturday
Whetten Woods, Storrs, 11 a.m..
Led by Sue Beach. Letter boxing

June 5, Sunday
Couch Preserve, Coventry, 10 a.m.
Led by Eric Thomas. Woodland Wonders

June 18, Saturday
Bradley—Buchanan Woods, Mansfield, 12 p.m.
Led by Christine Hare: A Walk on the Trust's First Acquisition. A short, hilly .5 miles will take us past acres of mountain laurel, marsh areas, and wet and dry kettle holes formed by the glaciers.

Gary Griffin — One of the Trust's 'go to' people

For the past 20 years, Gary Griffin has been a tireless volunteer at the Trust.

A soils scientist at the University of Connecticut by profession, and a former member of the Willington Conservation Commission, Gary was encouraged by Dan Donahue and Betsy Treiber to become a member of the Trust. Never one to join and then sit -- Did you ever see him hustle around Mansfield Supply? -- he quickly became a Trustee, and then chaired the trails committee.

He has also done boundary work with Hill Bullard, and is currently working with foresters as the Trust organizes its first forest management program at Bernard Church Woods in Chaplin. He is happiest out of doors, doing field work, whether constructing or restoring trails, as well as maintaining the records of the work parties.

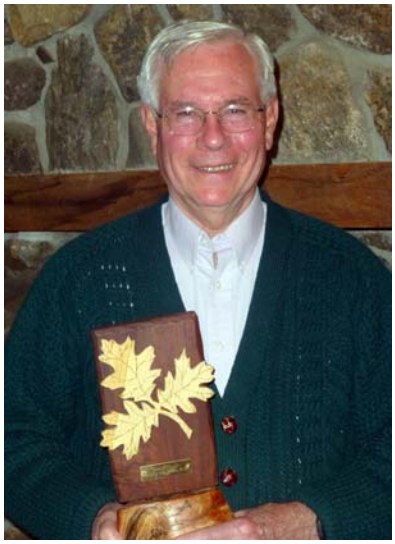
One of his favorite properties is the Utley Preserve in Columbia. He has fond memories of moving wheelbarrows of wood chips onto the poorly-maintained trail, with the reward of smoked salmon provided by Lance Magnusson and potato chips for a true fish and chips party.

Ann Lewis, the Trust's conservation coordinator, says that Gary continues "to serve as a reservoir of knowledge about how to get things done on our preserves and [is] our go to person."

He appreciates those volunteers who "really get caught up in it," as he feels that without them, the Trust would fall flat.

Gary encourages all the volunteers to "keep up the great work!" As long as he stays healthy and in shape, he will continue to give his time and energy to the Trust, he says.

In 2013, he was honored with the Mighty Oak Award by the Trust for long and steady stewardship service.



Gary Griffin

Stewards' essential work helps keep the Trust's conservation promise

Continued from Page 1

The project load has increased to the point that the Trails subcommittee chair can no longer supervise all the projects, so the committee has been divided into geographical area teams with varied areas of expertise: carpenters, chain saw operators, invasive removers, sign/kiosk builders, etc. This year these teams will work with the preserve's steward and regional coordinator to re-blaze and clean up trails as well as to assess any projects that require larger work parties, like invasive species removal or erosion control.

The hard work of our stewards and stewardship volunteers and their dedication will be celebrated in late May at the Atwood Farm.

If you are interested in helping our stewards, whether one time or more frequently, please contact Ann Lewis (ann.lewis@joshuastrust.org). There's always a property that can use more volunteers.

Katie Lynch passes

The Trust is saddened to report the death of long time Trust member, Catherine "Katie" Lynch on Dec. 5 of last year.

Dr. Lynch worked behind the scenes, serving on the Boundary Committee and as Co-Steward for the Hubbard Sanctuary/Agnes' Pasture. She retired from Eastern Connecticut State University, where she taught Asian history. Her history background served her well for the research necessary to locate boundaries of unsurveyed Trust lands and she became skilled enough to lead her own crew. Katie was dedicated to the mission of the Trust and has continued her support by leaving her car and house in Chaplin Village to the Trust, to be sold, the proceeds to be used as the Trust sees fit.

She will be missed by all who worked with her.

Save these dates for summer family fun!

Save the dates for summer family programs with Joshua's Trust and the Town of Mansfield! All are invited.

Preschool age: Join Maggie Ferron of Mansfield's Early Childhood Services for 45-minute nature walks in Mansfield's Whetten Woods. We will create collections, work on scavenger hunts, and play Pooh sticks. Three Thursdays**: June 23, July 21, and Aug. 25 at 3 p.m.**

For elementary age:

June 25, Saturday, the State Archaeologist, Dr. Brian Jones, will lead a walk at Mason's Mill preserve in Mansfield. Come hear about how archaeologists learn about the past.

July 9, Saturday, Dr. Will Ouimet of UConn will lead a geological exploration of the Bradley-Buchanan Woods behind the Mansfield Public Library. He will explain the preserve's kettle holes and identify common rocks and minerals.

Aug. 20, Saturday, Warren Church will lead a trail run at Chaplin's Hubbard Sanctuary. Gear up for the school year with a kids' trail race!

Be a Trust sponsor at this special time

Joshua's Trust celebrates its 50th anniversary beginning this spring; and we invite local businesses and individuals to help sponsor this special time in recognition of the Trust's ongoing role in conserving more than 4,000 acres in northeastern Connecticut. We hope you will consider becoming a sponsor at one of the levels described below: (See our website for an explanation of the benefits each level affords the donor.)

☐ **Diamond — $2,000 +** ☐ **Silver — $500** ☐ **Friend — $100**

☐ **Gold — $1,000** ☐ **Bronze — $250**

Please list me as a sponsor at the level checked . Amount enclosed $_____

Or please send me sponsorship information at the following address

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Mail to Joshua's Trust Sponsors, P.O. Box 4, Mansfield Center, CT 06250

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