

**INLAND WETLANDS COMMISSION
MINUTES
Special Meeting of November 12, 2020 at 7:30 p.m.**

Zoom Meeting

Website link:

<https://zoom.us/j/97931538354>

Call-in Number: 1 (646) 558-8656

Meeting ID #979 3153 8354

These Minutes are subject to Approval by the Inland Wetland Commission

Present: Sharon Salling, Mike McCabe, Kendal Horch, Kristen Hammar, Megan Thorn, Craig Ferris, Suzanne Guidera

Staff Present: Steve Hnatuk, Land Use Officer, Dawn Fried, Clerk

Ms. Salling opened the meeting at 7:32 p.m.

PUBLIC HEARING

Application #20-27 by Negreiro & Sons Construction LLC, property located at 203 & 211 Berkshire Road to construct 15 single family homes and a 1,550 ft. road with associated improvements.

Mr. McCabe read the public notice in to the record. Ms. Salling welcomed the public and described the expectations for the public hearing process.

Larry Edwards, Civil Engineer and Land Surveyor, J. Edwards & Associates, LLC, Easton CT and Steven Danzer, Soil Scientist, Senior Professional Wetland Scientist, Arborist, Ph.D. & Associates, LLC, Stamford, represented the applicant, Negreiro & Sons Construction LLC.

Mr. Edwards stated this property is an overgrown farm with 73-acres. The applicant is proposing to construct 16 lots, 15 of which will have newly constructed homes and one existing house which will be renovated.

The road will be 1,550 ft. long with a proposed cul-de-sac.

Mr. Edwards stated that soil testing has been done on each lot and the Health department has signed off in accordance with Newtown's health regulations. The road is also in accordance with Newtown's regulations and meets the town's criteria in terms of design.

The property will require a small wetlands crossing which will run west to east of the new road. There will be 1,500 sq. ft. of disturbance to the wetlands. The applicant is proposing mitigation of the

disturbance by creating a wetland along the edge of the existing wetlands. Environmental experts have designed a wetland creation area.

The primary wetland activity will be the crossing. Several lots have activity, as well, but are within the review area and have no direct disturbance on wetlands.

There is a large wetland corridor along the western part of property which Mr. Edwards stated “they will be staying well away from”.

The wetland on the westerly portion of the site will have a storm water management component with a storm water infiltration basin located to the north of the proposed crossing.

There will be a cross culvert located where the water crossing takes place that will pass the water from the upland area into a conduit which will directly flow into a storm water management basin and be treated. The water from the conduit will not be interrupted by the road. The road drainage is separate and will be treated and directed into the road’s storm water basin.

There is also an erosion control plan that is part of the application package.

Ms. Salling asked whether the details or the engineering plans have been submitted for the wetlands crossing. Mr. Edwards stated the complete details are in the package. There will be a 24" culvert under the road where the water will pass thru the wetland crossing area. The water from the outlet will then go thru a riprap pad.

Mr. Ferris asked whether the existing crossing located upstream will be removed. Mr. Edwards did not plan on it but has no problem removing it. Mr. Edwards will consider removing as part of the proposal.

Ms. Thorn asked where the water flows. Mr. Edwards stated the water comes from the wetland corridor on the western portion of the site and flows into the wetlands on the eastern portion of the site.

Dr. Danzer gave a brief overview of the wetland areas. The first major wetland area is located on the western side of the property and is 25 acres. It is the prime wetland and the best quality wetland on site with deep organic soils. The second wetland is also on the western side and is smaller with 3 1/2 acres that has shallow mineral soils and is thickly wooded. The third major wetland is the intermittent stream crossing which has two parts. One part being a man-made drainage ditch that was used to drain the farm fields. The other part is more natural and steep and discharges into the main wetland system.

There are two smaller sloped wetland areas that are located near the proposed houses which are not steep and have upland vegetation.

Dr. Danzer gave an overview of the mitigation. Dr. Danzer stated the wetland disturbance for the stream crossing would be 2,000 sq. ft. (differed from Mr. Edwards). The proposed mitigation would be 4,500 sq. ft. which is a 2 to 1 ratio of wetland creation to wetland disturbance. The chosen creation

area would benefit the existing wetland as well as require the least amount of disturbance to create it. The proposed area of creation would border the existing wetlands. Two trees would be removed and 16 inches of soil would be excavated to match the grade of the existing wetlands as well as allow the same hydrology to be shared. The wetland creation will include 6 trees, 81 shrubs and a wetland seed mix. The wetland creation will be supervised by the project landscape architect.

Mr. Ferris appreciated the project avoiding any direct impacts to the wetlands except for the wetland crossing. Mr. Ferris asked Dr. Danzer for his professional opinion regarding whether this project will affect the hydrology of the wetlands in the eastern wetland. Mr. Danzer gave an overview of the eastern wetland and stated that there is a relatively small proportion of inputs that are going to be altered by this proposal. Dr. Danzer stands by his report stating that the development will not impact the functions or values of the eastern wetland corridor.

Ms. Horch had not seen the soil test reports and asked the following questions: Where was the ground water? How far below the surface did you hit ground water? Where are the locations for the test holes for the water quality basins and the rain gardens? Mr. Edwards stated the test results and data can be found in the complete set of plans. Overall, the result of the test holes run between 24 and 36 inches which is typical for this type of soil. Percolation tests were good as well, most being between 10 to 20 inches. The Health department has signed off on the septic feasibility and approximately 100 test holes have been done with the consistency being very uniform. Rain gardens are not done at this stage and will be reviewed before the individual house permits are given.

Ms. Thorn asked whether animals or wildlife would be effected. Dr. Danzer stated there were no vernal pools and since the wildlife corridor is being preserved the wildlife should not be effected. Dr. Danzer stated there were no endangered species on this site in accordance with the national database. Ms. Salling confirmed with Mr. Hnatuk that typically wildlife is not included in the wetland report unless the wetland area is significantly impacted. Mr. Hnatuk confirmed that was correct.

Mr. Hnatuk asked whether there will be any significant impact to the eastern wetlands from storm water coming from the detention basin during high flow events or from ground water. Dr. Danzer stated the principal function of the intermittent water course is hydrological not ecological. Dr. Danzer doesn't foresee any negative impacts.

Mr. Edwards stated they are in compliance with the appropriate requirements stated in the storm water management manual. Mr. Hnatuk asked whether they anticipated any absorption from road salts, nutrient pollution, or dissolved solids. Mr. Edwards reiterated that the storm water management manual and the State DEEP dictates the design and storage capacity and as well as addresses the suspended solids pollutants in the ground water discharge.

Mr. Hnatuk asked where in the plans are the construction details and material list for the culvert. Mr. Edwards stated the width is so narrow it is part of the road construction plan but he will add the details if requested. Mr. Hnatuk asked whether an open bottom culvert was considered. Mr. Edwards stated they thought about an open bottom culvert but didn't feel it was warranted because of the size of the corridor and the minimal amounts of flow going through.

Mr. Hnatuk asked how many linear feet of stream will be disturbed. Mr. Edwards stated there will be roughly 70 ft. of pipe.

Mr. Hnatuk asked whether a cost estimate was done on the mitigation to create the wetland. Dr. Danzer did not compute the cost. Mr. Hnatuk stated the estimate may be useful for a bond down the road.

Ms. Guidera was concerned about the area beyond the crossing that looked to be wetlands. Ms. Guidera asked how many trees are going to be removed and how was the area delineated. Dr. Danzer stated the wetland boundaries were originally delineated a few years ago. Dr. Danzer recently went out to proof those delineated boundaries. Dr. Danzer stated he made a couple of minor adjustments that included adding flags to areas that were extended. Dr. Danzer stated he specifically reflagged the area in question, drilled the holes by hand and was confident on the delineation.

In regards to the tree removal Dr. Danzer stated he did not note each individual tree but instead summarized the trees by either forest or field. Dr. Danzer stated there will not be significant tree removal. Ms. Guidera asked whether removing a substantial number of trees would create additional water flow down towards the wetland or cause the wetland to enlarge. Dr. Danzer stated most of the development is above the slope and has enough flat area to slow the water down. The storm water design will also mitigate the water.

Mr. McCabe commented that lots 11, 12 and 14 have a concentrated area of development. Mr. McCabe asked whether there was a prudent option to cut back on the dense activity. Mr. Edwards stated they are not in close proximity of the wetlands and there will be no significant impact to the wetlands. The applicant has maintained a 100 feet of separation between the lots and wetlands. Mr. Hnatuk stated that as long as there is no significant impact to the wetlands then it's up to Commission to take the expert's information at face value or hire a 3rd party.

Mr. Edwards stated that the applicant presented a viable application and they are ready to move forward.

PUBLIC PARTICIPATION

Karen Pierce, 10 Chestnut Hill Road

Ms. Pierce questioned whether there has been any consideration regarding the impact the new lots will have on the water table, aquifer and wells. Ms. Pierce also questioned what is the impact of the amount of run off versus lack of percolation from adding new structures? What is the impact to the wetlands from the fertilizer? Ms. Salling stated the well questions are not the purview of the IWC. The health district handles the well questions. Mr. Edwards stated the water runoff design is part of the storm water management plan and the CT DEEP Regulations. These plans dictate the water quality and quantity. Mr. Edwards also stated that each lot will have an infiltration system. In regards to the fertilizer, Mr. Edwards stated the wetlands are between 100 ft. and 200 ft. from the lots and therefore the water runoff will be diluted and treated before entering the wetlands.

Michael Wilmot, 5 Harvest Common Road

Mr. Wilmot has concerns with the wells and stated that his neighbors' wells have run dry.

Mr. Wilmot asked whether the Commission has done their own analysis or hired their own expert or is the Commission just using the experts hired by the developer. Ms. Salling stated it is not customary to have the town pay to hire another expert unless there are reasons that are overlooked. The individuals hired by the applicant are well qualified and well known. Mr. Hnatuk stated that Mr. Edwards and Dr. Danzer are putting their professional reputation and licensing at their disposal.

Chandravir Ahuja, 1 Great Ring Road

Mr. Ahuja had three areas of concern. 1. For the record, Mr. Ahuja is concerned for the animals.

2. For the record, Mr. Ahuja is concerned about the traffic flow on Rt. 34. 3. Mr. Ahuja questioned a small patch of wetlands on Lot 1. Mr. Ahuja was concerned that and if this wetland became flooded in the spring will it cause repercussions on his property, which is directly across the street. Mr. Ahuja questioned what time of year did Dr. Danzer look at the property. Dr. Danzer explained that wetlands are based on soil types and not determined by a "dry" year or a "wet" year. Dr. Danzer stated that yes, Lot 1 is a wetland based on soil type. Dr. Danzer was at the property between August and mid-October of this year. Mr. Edwards stated the flow of water from Berkshire Road will not impact the property across the street because the wetlands is 6 feet lower than Berkshire Road.

Dennis Casey, 23 Paugussett Road

Mr. Casey stated that his property abuts the proposed development. Mr. Casey is concerned about his well and any disturbance to the wetlands. Mr. Casey asked where the public can address concerns about their wells and water run-off. Ms. Salling stated the IWC is precluded about having any discussions regarding wells. Mr. Hnatuk understood his concerns and asked that Mr. Casey call the Land Use Agency to get the information needed to contact the proper channels.

Bill Boroskey, 27 Paugussett Road

Mr. Boroskey asked the following questions: Who is going to maintain the detention areas, water quality basins and the rain gardens? Who is going to make sure they are working, as designed, for the lifetime of the system? Has there been a study on rainfall amounts and potential runoff from non-permeable surfaces like sidewalks and driveways? Mr. Edwards stated the town takes over the maintenance of the stormwater basins and the home owners maintain the individual lot systems. Mr. Edwards stated that yes the stormwater management system takes in to account impervious areas. Mr. Boroskey asked who to turn to regarding flooding on Paugussett Road. Mr. Edwards stated there is no reason for flooding. Ms. Salling suggested going to the Land Use Agency to look at the site plans.

Tracey Gehm, 6 Paugussett Road

Ms. Gehm is concerned about the wildlife impact. Ms. Salling stated that the IWC is not responsible unless the animal is on the Natural diversity data base that DEEP publishes. There were not any endangered species on the list. Ms. Gehm is concerned with the water run off at the bottom of the eastern wetland. Ms. Salling encouraged Ms. Gehm to look at the plans. Mr. Edwards stated it would be part of the town engineer review. Ms. Gehm questioned the expected value of the new homes and whether they would impact property values? Ms. Salling stated that property values are not the IWC purview.

Kristen Werner, 217 Berkshire Road

Ms. Werner asked the following questions: Are trees going to be replaced after they are knocked down? Is the existing house up to code? Is the home behind us going to affect our property?

Mr. Edwards stated the existing house is not inhabitable and will require new permits, septic, etc.

Mr. Edwards stated the trees being replaced will be subject to each individual lot. Mr. Edwards stated the road drainage is taken to the central storm basin directed away from the property and shouldn't have an adverse impact.

Ms. Salling thanked the public and thanked Mr. Edwards and Dr. Danvers for their presentations.

Mr. Hnatuk requested Mr. Edwards to submit a detailed engineering schematic for the crossing area and requested Dr. Danvers to submit a cost estimate for the proposed mitigation area. Mr. Edwards and Dr. Danvers stated they would be happy to provide the information.

The Commission recommended that the public hearing remain open and to be continued to the next regularly scheduled meeting of the Inland Wetland Commission on Wednesday, December 9, 2020 at 7:30 pm via Zoom, <https://zoom.us/j/98330638274>, Meeting ID: 983 3063 8274, Call-in Number (646) 558-8656

APPROVAL OF MINUTES for the Special Meeting of October 14, 2020

The Commission found no substantive errors. Mr. McCabe moved to accept the minutes from October 14, 2020. Ms. Horch seconded. Ms. Guidera and Mr. Ferris abstained. All remaining in favor. The minutes from October 14, 2020 were approved.

OTHER BUSINESS

Ms. Salling stated she received an email from CACIWC regarding the annual conference which will be held via Zoom this year. Ms. Salling will forward the email to Ms. Fried to be distributed to the IW Commission.

ADJOURNMENT

With no additional business, Mr. Ferris moved to adjourn. Mr. McCabe seconded. All in favor. The meeting of November 12, 2020 was adjourned at 9:30 pm.

Respectfully Submitted, Dawn Fried



STEVEN DANZER, PhD & ASSOCIATES LLC

Wetlands & Environmental Consulting

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WETLAND BOUNDARIES • POND & LAKE MANAGEMENT • CONSTRUCTION FEASIBILITY CONSULTATIONS • ENVIRONMENTAL STUDIES

Environmental Report

203 & 211 Berkshire Road, Newtown

Date: October 30, 2020

By: Steven Danzer Ph.D.

- Soil Scientist – Certified Nationally by the Soil Science Society of America (#353463).
– Registered with the Society of Soil Scientists of Southern New England.
- Senior Professional Wetland Scientist - PWS #1321, Society of Wetland Scientists.
- Arborist - CT DEEP License S-5639; ISA Certified NE-7409A.
- Ph.D. - Renewable Natural Resource Studies.

INTRODUCTION

A 15 lot subdivision is being proposed at 203 and 211 Berkshire Road, Newtown, Connecticut. The 73.2 acre site is currently a mixture of forest, old fields, and currently farmed fields.

Activities associated with the development of the site include the clearing of vegetation, land grading, construction of 14 residential lots (with preservation of the existing residence as the 15th lot), installation of subsurface drainage systems and stormwater basins, installation of septic systems, a road with a stream crossing, and wetland creation, all as indicated by submitted engineering plans prepared by J. Edwards & Associates LLC and landscape plans prepared by Tracy Chalifoux, R.L.A.

Only 7 of the 16 proposed lots will have activity within the 100 foot Upland Review Area. In addition to the site development for each residential lot, there will also be a new road (“Holly Lane”) with a stream crossing over an intermittent watercourse located

in the central region of the site. The disturbance for the stream crossing will be offset by wetland creation in the western region of the site.

Not all of the 73.2 acre site will be developed. A significant portion, 33.2 acres, or 45% of the site, will be preserved as Open Space.

Several wetland/watercourses systems are located on site within proximity to the proposed work. These include:

- 1) A 25 acre forested wetland corridor located on the east side of the site.
- 2) A 3.5 acre forested wetland corridor located within the southwestern corner of the site.
- 3) An intermittent stream corridor located in the central portion of the site, connecting the two larger forested wetland corridors.
- 4) A sloped wetland and intermittent stream corridor located in the northern portion of site (north of lots 7 and 8).
- 5) A sloped wetland and intermittent stream corridor located in the southern portion of site (between lots 13 and 14/16).

All of the wetland/watercourse systems ultimately drain to the east, towards the Half Way River / Lake Zoar / Housatonic watercourse system.

The purpose of this report is to document existing conditions, and then to assess impacts to the wetland resources due to the proposed activities pursuant to the requirements of the Newtown Inland Wetland Regulations and to provide an assessment of environmental issues pursuant to the Newton Subdivision Regulations.

1.0 LANDSCAPE, LAND USE AND WATERSHED CONTEXT

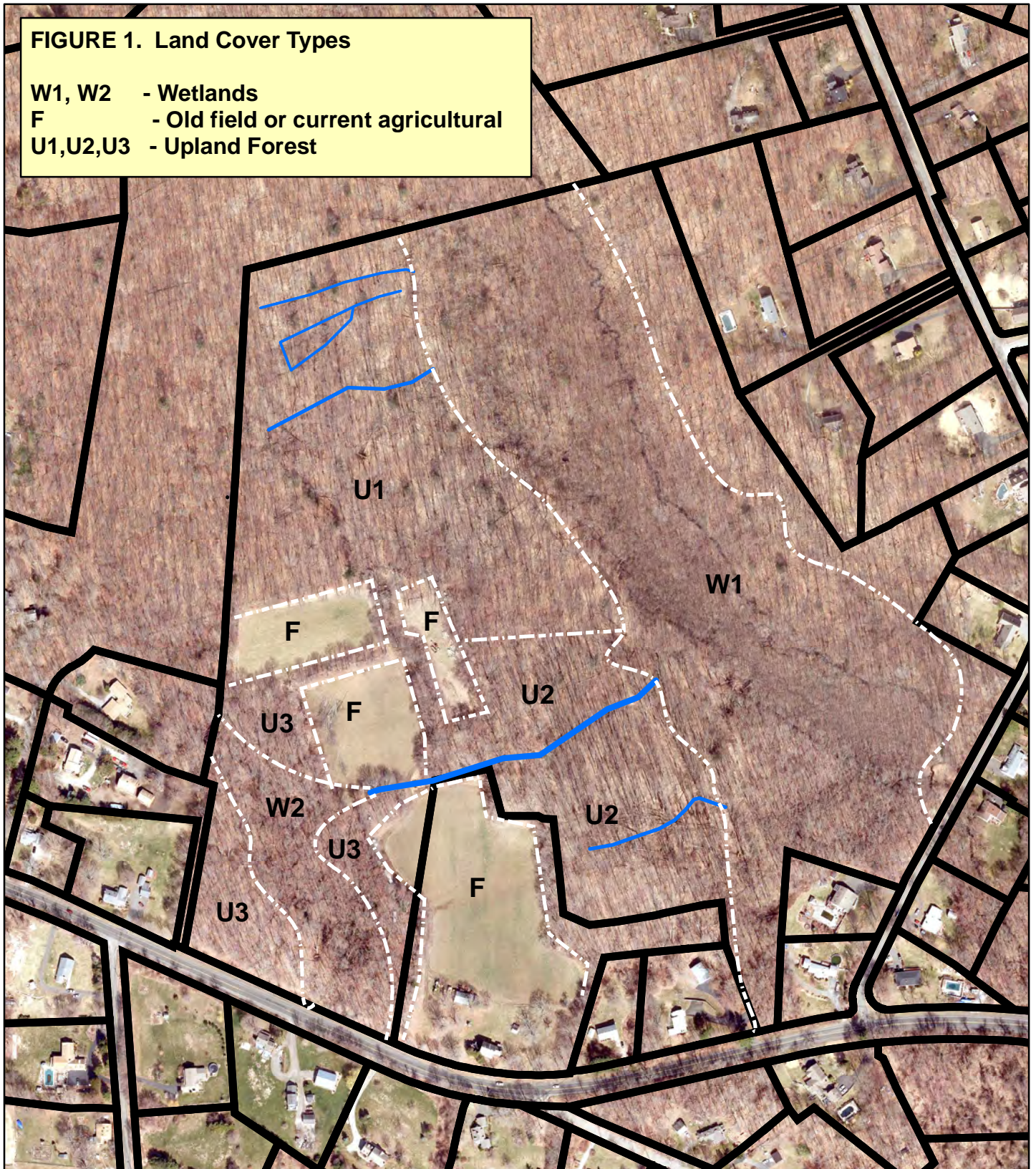
The roughly 73.2 acre site is bounded by Berkshire Road to the south, residences along Paugussett Road and Mountain Laurel Lane to the east, forest and residences along Homer Clark Road to the west, and forest to the north. Land cover within the site itself is currently a mixture of forest, old fields, and currently farmed or recently fallowed fields, as depicted in Figure 1 “Land Cover Types”. Adjacent land-use is residential on the eastern and western sides of the site, with typical lot sizes ranging from 1.02 acres to 5.76 acres.

The center of the site, where the residences are proposed, slopes to the east towards the larger forested wetland corridor located in the eastern portion of the site. Overall, the slopes on site trend from nearly level in the area of the fields, to moderately steep and very steep within the forest habitat approaching the eastern wetland corridor.

203 & 211 Berkshire Rd., Newtown

FIGURE 1. Land Cover Types

W1, W2 - Wetlands
F - Old field or current agricultural
U1,U2,U3 - Upland Forest



Steven Danzer Ph.D. & Associates LLC
www.CTWetlandsConsulting.com

Feet
0 125 250 500 750 1,000

The two main wetland systems on site include a 3.5 acre forested wetland corridor located within the southwestern region of the site, and a larger 25 acre forested wetland corridor located along the eastern region of the site. The smaller 3.5 acre system appears to drain to the larger 25 acre eastern wetlands through the intermittent stream corridor located in the central region of the site. The eastern wetland system drains south and then ultimately east off-site, into the Half Way River / Lake Zoar / Housatonic watercourse system.

2.0 UPLANDS

Figure 1 depicts the dominant land cover types that occur throughout the site. Uplands on the site (U1, U2, and U3) include forest and field. The field habitat include both fallow farm fields now reverting back into old field (e.g. portions of the fields in the north and northeast), and actively cropped fields. Old field vegetation included hay species, Goldenrod, and Multi-flora rose.

Like most farmed areas, large portions of the adjacent forest areas were at some point in the past cleared for farming and then abandoned, leading to the current mosaic of new and older forest stands now existing on site.

A series of drainage ditches extends throughout the field areas. It is plausible that before conversion to agriculture many years ago, the eastern wetlands may have extended at least slightly into what is now upland field.

The upland forest within the site is comprised of three habitat units, differing based upon dominant species composition and size classes.

The *U1 forest type* was dominated by young and intermediate sized Red maple and mature Sugar maple in the overstory, and dense clumps of Spice bush in shrub story. Invasive Japanese stiltgrass dominates the ground cover in the more open patches.

The *U2 forest type* was more biologically diverse, also containing Red maple, Sugar maple, and Spicebush, but also a sizable amount of mature Tulip trees, Black birch and Red oak. The herbaceous understory included Christmas fern.

The *U3 forest type* was similar in composition to the U1 unit, but with younger trees and relatively denser concentrations of Spicebush.

3.0 WETLANDS/WATERCOURSES

The wetlands on the site had been previously mapped by Cynthia Rabinowitz some years ago. Portions of that wetland boundary in proximity to the proposed work was recently

reflagged by the surveyor (Jason Edwards Associates LLC) and located on a survey provided to me for review. These boundaries were then field verified. There were five areas which required flag adjustments. They included:

1. An additional flag along Berkshire Road in the southwest corner of Lot 2.
2. The southern boundary of the intermittent watercourse on Lots 7 and 8.
3. Portions of the central intermittent watercourse (west of the crossing) that connects the eastern wetland corridor to the western wetland corridor.
4. The lower segment of the central intermittent watercourse (east of the crossing)
5. The lower segment of the intermittent watercourse on Lots 13 and 12.

The rest of the wetland boundary (including the large wetland corridor to the west) was judged to be substantially accurate.

Several wetland/watercourses systems are located on site within proximity to the proposed work. These include:

1. A 25 acre forested wetland corridor located on the east side of the site.
2. A 3.5 acre forested wetland corridor located on the southwestern corner of the site.
3. An intermittent stream corridor located in the central portion of the site, connecting the two larger forested wetland corridors.
4. A sloped wetland and intermittent stream corridor located in the northern portion of site (north of lots 7 and 8).
5. A sloped wetland and intermittent stream corridor located in the southern portion of site (between lots 13 and 16).

Wetland/watercourse descriptions are as follows:

3.1 FORESTED WETLAND CORRIDOR - EASTERN REGION

The 25 acre forested wetland corridor is located in the eastern region of the site. Part of a larger wetland system, the portion within the site extends roughly 1700 feet (0.5 miles) in length and approximately up to 500 feet in width. The northern extent of the wetland system starts off site, just south of Osbourne Hill Road, and flows through the site until its outlet at Paugussett Road. The wetland corridor then continues off site, crossing under Berkshire Road, and continuing towards the Half Way River.

The western slope to the eastern wetland corridor in proximity to the proposed building lots is fairly steep and is incised by several small intermittent watercourses/sloped wetland systems which drain down towards the eastern wetland corridor. Below the slope, an old farm road parallels the wetland corridor in the central region. A stream channel is located in the center of the wetland corridor. Flow through the system is maintained from upstream, from the intermittent watercourses and seeps located on the side slopes, and from non-channelized overland flow down the side slopes.

Soils within most of the wetland corridor are deep and organic, best characterized as within the Catden and Freetown soil mapping unit. Similarly organic Timakwa and Natchaug soils are located nearer to the outlet of the wetland.

Representative vegetation growing within the wetland corridor includes Red maple, Spice bush, Sweet pepperbush, Highbush blueberry, Royal fern, Cinnamon fern, and Tussock sedge.

The existing functions and values of the wetland corridor were evaluated using the New England Army Corp Highway Methodology Descriptive Approach, as modified for application to local conditions. This methodology has been proven useful in similar projects intended for review by municipal wetland commissions, and was chosen as the most appropriate methodology for the assessment of the area due to the assessment's descriptive emphasis.

The functions and values of the system are described below:

The wetland system provides *groundwater discharge* along its slopes and *recharge* within the central corridor, *floodflow alteration* due to its size and storage capacity, *sediment/toxicant/pathogen retention* due to its location adjacent to residential development, *nutrient removal/retention/transformation* due to its deep organic soils and robust vegetation, *production export* due to its robust vegetation, *wildlife habitat* due to its size and location, and (potentially) *recreation* due to the suitability of walking along its length. The channel appears to be too shallow and intermittent for the system to provide *fish habitat*.

3.2 FORESTED WETLANDS – SOUTHWESTERN REGION

The 3.5 acre forested wetland corridor is located in the southwestern region of the site, and is shaped like an elongated bowl. The wetland appears to drain to the east into the intermittent watercourse located in the central portion of the site between the two farm fields, though it certainly possible that this drainage only occurs when the wetland is fully hydrated. The wetland received overland flow from the adjacent residential properties to the west, and from Berkshire Road. A channel is located in the center of the wetlands. The western wetland buffer is thickly wooded while the eastern wetland buffer is thinly wooded as the transitions to field.

Soils within most of the wetland corridor are shallower and more mineral than the larger wetland corridor to the east. Soils are best characterized as within the Ridgebury, Leicester, and Whitman soils, extremely stony soil mapping unit.

Representative vegetation growing within the wetland corridor includes Red maple, Red oak, Spice bush, Sweet pepperbush, Viburnum, Skunk cabbage, Cinnamon fern, and Tussock sedge. Sumac, Tulip tree, Sugar maple, Black cherry, and Japanese stiltgrass are

located on its eastern periphery, while the western periphery is dominated by Red maple, sugar maple and Spicebush.

The existing functions and values of the wetland corridor were evaluated using the New England Army Corp Highway Methodology Descriptive Approach, as modified for application to local conditions. The functions and values of the system are described below:

The wetland system provides *groundwater discharge* along its slopes and *recharge* within the central corridor, *floodflow alteration* due to its moderate size and potential for storage capacity, *sediment/toxicant/pathogen retention* due to its location adjacent to residential development, a moderate level of *nutrient removal/retention/transformation* due to its ability to attenuate farming pollutants, *production export* due to its robust vegetation, and a moderate level of *wildlife habitat* due to its location and dense vegetative cover.

3.3 INTERMITTENT WATERCOURSE – CENTRAL REGION

The intermittent watercourse corridor is located in the central region of the site, bisecting the site and connecting the two larger forested wetland corridors located to the west and to the east. The corridor is approximately 850 feet total in length. The western portion flows between two farm fields, within a 90 foot wide wooded corridor.

The western portion of the watercourse resembles an incised ditch and is undoubtedly of manmade origin, probably constructed to drain the western wetlands away from the fields, and to provide drainage from the adjacent fields. During the repeated field investigations during the summer and fall of 2020, the watercourse was always dry.

A dirt farm road crosses the watercourse over a culvert. East of that culvert the watercourse continues for roughly another 125 feet between and through a stone wall into the forest, where the stream gradient becomes rapidly steeper. The watercourse then continues down the slope into the larger 25 acre eastern wetland corridor. The proposed road crossing is located in this eastern forested portion of the watercourse.

Representative vegetation growing within the western portion of this intermittent wetland corridor includes Red maple, Multiflora rose, Spice bush, willow, Asiatic bittersweet, Winged euonymus, Highbush blueberry, and Goldenrod. Vegetation along the more forested eastern portion was mainly indistinguishable from its adjacent upland and includes Red maple, Tulip tree, Elm, Spicebush, and dead Ash.

The existing functions and values of the intermittent wetland corridor were evaluated using the New England Army Corp Highway Methodology Descriptive Approach, as modified for application to local conditions. The functions and values of the system are described below:

The watercourse system mainly provides hydrological rather than ecological functions: *stormwater conveyance* from runoff from the adjacent fields, and overflow flow from the western wetland system. The system provides *groundwater discharge* in the lower areas where the channel may intercept seasonally high groundwater seepage from the adjacent slopes. There is no storage capacity for the system to provide *floodflow alteration*, and its gradient is too steep in the lower section to provide the retention time to attenuate *sediment/toxicant/pathogens*, or to provide *nutrient removal/retention/transformation*. In the forested sections, the habitat is essentially upland habitat and of value to wildlife. The system is too narrow and potentially dry to support a fish population.

3.4 SLOPED WETLANDS AND INTERMITTENT WATERCOURSE SYSTEMS— IN THE NORTHERN AND SOUTHERN REGIONS

In addition to the central intermittent stream corridor, there are two sloped wetland and intermittent stream corridors within proximity to the proposed development.

The first system is located in the northern portion of site (north of lots 7 and 8). The second system located in the southern portion of site (between lots 13 and 16). Both systems are embedded within the forest, and drain down to the 25 acre eastern wetland corridor.

Slopes along the length of these watercourse systems vary from level to fairly steep. The channels vary as well, from sloped seepy areas devoid of a central channel near their headwaters to fairly incised channels along the mid and lower stream reaches that accommodate flow during the wetter seasons. Vegetation was mainly indistinguishable from the adjacent upland, with Red maple, Sugar maple, Spicebush, and Royal fern in the northern system near lots 7 and 8, and Red maple, Beech, Sugar maple, Tulip tree, dead Ash, and Spicebush in the southern system near lots 13 and 16. It is possible that there may be additional hydrophytes as well such as Skunk cabbage that were not viewable due to the lateness of the season.

Functions and values were similar to the central intermittent wetland corridor, except that flow is anticipated to be less since there are no connecting wetlands upstream to either of these systems. The system provides *groundwater discharge* where the channel may intercept seasonally high groundwater seepage from the adjacent slopes. There is no storage capacity for *floodflow alteration*. Gradients are too steep to attenuate *sediment/toxicant/pathogens*, or provide *nutrient removal/retention/transformation*. The habitat is essentially upland habitat and of value to *wildlife*. The system is too narrow, steep, and dry to support a fish population.

4.0 NDDB SEARCH AND SITE FAUNA

According the CT DEEP Natural Diversity Database layer on CT ECO (cteco.uconn.edu) (webpage from 10/26/20 attached at the end of this report) there are no polygons on or

directly adjacent to the site that indicate the presence of any Endangered, Threatened, or Species of Special Concern. The nearest polygon is >0.21 miles away to the east, centered in the wetland system adjacent to Stone Bridge Trail. Nor are there any polygons on or directly adjacent to the site that indicates the presence of any Critical Habitat.

During the field visits in July, August, September and October 2020 wildlife usage was noted. This included both direct observation and signs such as scat and tracks. Wildlife noted included deer, squirrel, chipmunk, red tailed hawk, crow, cardinal, goldfinch, flicker, hairy woodpecker, mourning dove, titmouse, catbird, mockingbird, robin, blue jay. Despite lack of direct evidence, it is also reasonable to expect usage by other mammals commonly found in the region including fox, coyote, bobcat, bear, opossum, weasel, rabbit, skunk, raccoon, mice, moles, and voles. It is also reason to expect usage by reptiles and amphibians including but not limited to Snapping turtle, American toad, Pickerel frog, Red-backed salamander, Black rat snake, Garter snake, Northern brown snake, and Green snake.

5.0 SUBDIVISION DESIGN AND ECOLOGICAL IMPACTS

Not all of the 73.2 acre site will be developed. A significant portion, 33.2 acres, or 45% of the site, will be preserved as Open Space.

Furthermore, even though 16 lots are being proposed, only 15 will be constructed. The existing residence along the road frontage will be preserved within a single lot.

The subdivision has been designed with several ecological design principals in mind. They include:

- Minimizing the fragmentation and proposing preservation of the ecologically valuable forested wetland corridor and forested uplands in the eastern and the far northern region of the property by locating development elsewhere;
- Minimizing the grading and alteration of terrain by locating the residences away from the steeper terrain whenever possible;
- Minimizing impacts to the wetlands and maintaining existing wetland functions by limiting construction disturbance whenever possible (except for the stormwater basin) to outside of the 100 foot offset to wetlands and watercourses.
- Offering wetland creation as mitigation to offset permanent disturbance due to the road crossing over the intermittent stream corridor in the central region of the site.

To explain further, the most ecologically valuable portion of the property will be preserved as open space. This will preserve a large swath of contiguous forest and

wetland habitat along the eastern and northern regions of the property. Roughly 36 acres of forest and wetlands within the 73.2 acre site will be left undeveloped, or which 33.2 acres will be dedicated as Open Space, preserving this area for wildlife habitat and wildlife passage.

Notably, *the majority of the development will occur outside of the 100 foot upland review area.* Table 1 summarizes the disturbances by lot that will occur within the 100 foot upland review area.

Table 1. Lot Disturbances within the 100 foot upland review area

LOT	Lot Size (acre)	Land Cover	Disturbance within the 100 ft upland review area (sf / acre)
1	3.43	Forest	681 sf / 0.02 ac
2	3.75	Field	0
3	2.66	Forest	1443 sf / 0.03 ac
4	2.03	Field	0
5	2.92	Field	0
6	2.04	Forest	0
7	2.74	Forest	363 sf / 0.01 ac
8	3.30	Forest	773 sf / 0.02 ac
9	2.41	Forest	0
10	2.41	Forest	0
11	2.41	Forest	7020 sf / 0.16 ac
12	2.21	Forest	5373 sf / 0.12 ac
13	2.22	Forest	831 sf / 0.02 ac
14	2.01	Field	0
*15	2.05	Field	0
16	3.03	Forest	0

Total disturbance (exclusive of road) 16,484 sf / 0.38 ac

Road disturbance 7,350 sf / 0.70 ac

Data courtesy of J. Edwards Associates.

In summary, disturbances within the 100 foot zone will only occur within 7 of the 16 lots, of which the stormwater basin in lot 11 and the residence of lot 12 represent the greatest intrusions. This is due to their proximity to the intermittent watercourse rather than to the eastern wetland corridor.

Total site disturbance within the 100 foot zone will be 1.08 acres, constituting only 5.2% of the upland review zone, a relatively small percentage for a large subdivision. The remaining 94.8% of the 100 foot upland review zone will be preserved.

The upland disturbance throughout each lot (regardless of the 100 ft review zone) was also quantified in order to provide a relative understanding of the effort made by the site plan designers to limit disturbance and preserve the landscape.

Table 2 indicates the percentage of each lot that will remain undisturbed.

Table 2. Lot Disturbance Calculations

LOT	Lot Size (acre)	Land Cover	Undisturbed Area (acre)	Percent Undisturbed
1	3.43	Forest	2.68	78%
2	3.75	Field	3.10	83%
3	2.66	Forest	2.21	83%
4	2.03	Field	1.38	68%
5	2.92	Field	2.40	82%
6	2.04	Forest	1.48	73%
7	2.74	Forest	2.26	82%
8	3.30	Forest	2.68	81%
9	2.41	Forest	1.75	73%
10	2.41	Forest	1.76	73%
11	2.41	Forest	1.31	54%
12	2.21	Forest	1.68	76%
13	2.22	Forest	1.71	77%
14	2.01	Field	1.29	64%
*15	2.05	Field	-	-
16	3.03	Forest	2.53	83%

Data courtesy of J. Edwards Associates.

The percentages in the above table range from 54% to 83% with the majority of the lots preserving over 73% of their lot area.

Overall, 77% (32.3 acres) of the total lot acreage (41.6 acres) will be preserved.

6.0 WETLAND IMPACTS

Map SK-0 “Overall Site Sketch”, attached to this report, is a simplified map that depicts proposed activity within the 100 foot upland review area.

Figure 2 depicts the approximate location of each residence, overlayed on an aerial photo.

In summary:

- Disturbances within the 100 foot zone due to the residential development will only occur within 7 of the 16 lots.
- The stormwater basin in lot 11 and the residence of lot 12 represent the greatest intrusions by SF.
- The proposed road will also slightly intrude into the review area in lot 1 and in the area leading to the proposed stream crossing.

Potential impacts will be discussed below, organized according to the wetland system in closest proximity.

6.1 THE WESTERN FORESTED WETLANDS – PROPOSED ACTIVITIES

There is no activity proposed in the western forested wetlands.

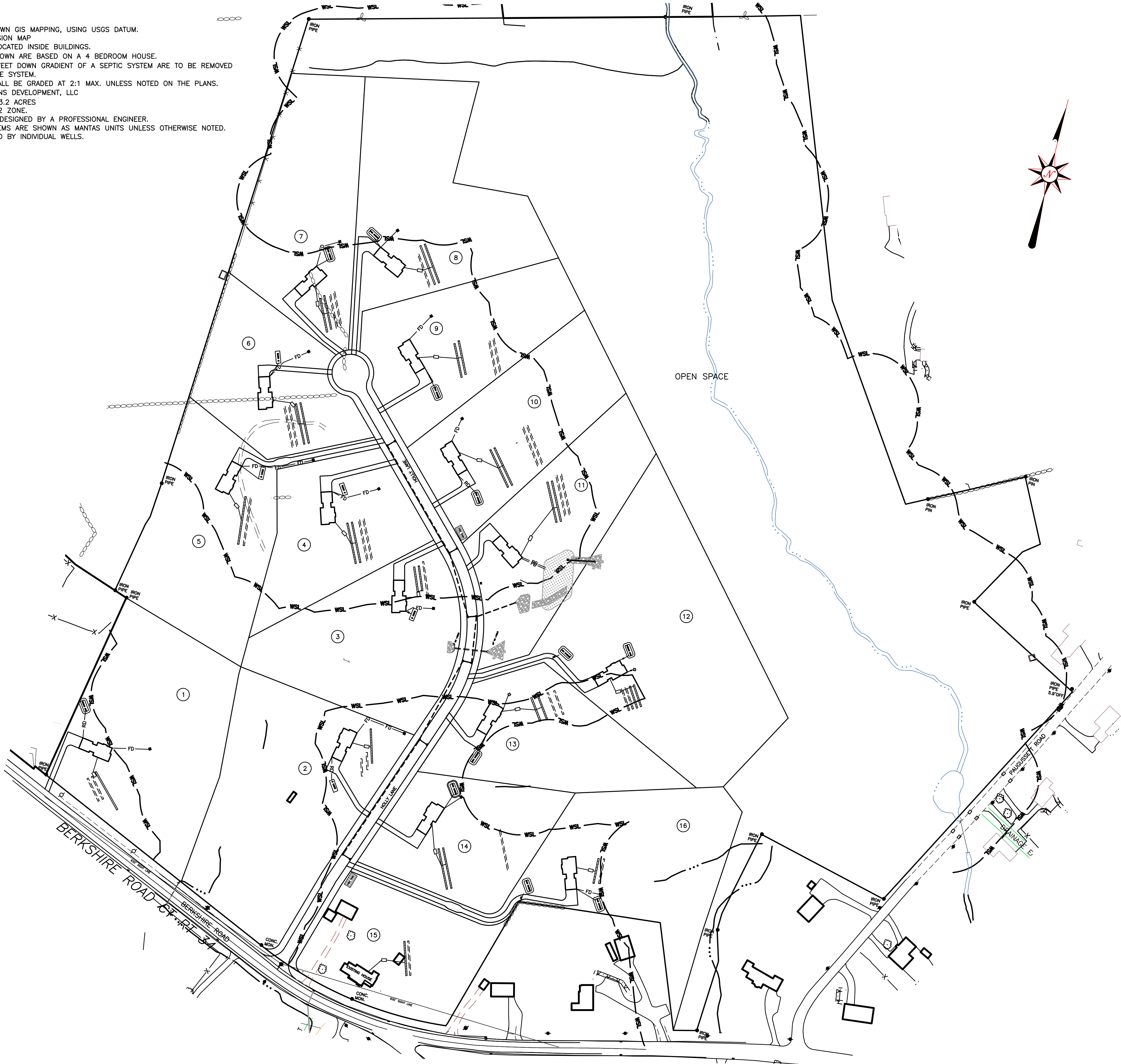
Lots 1, 2 and 5 border the western forested wetlands. Lots 2 and 5 are proposed in open field areas which will not require a significant removal of woody vegetation in the upland. Lot 1 will require removal of forest vegetation, however almost all of the disturbance will occur greater than 100 feet from the wetlands, largely preserving the wetland buffer.

The only disturbance within the 100 foot upland review (other than the proposed wetland creation) will occur in lot 1, where a footing drain is proposed. Clearing for this drain will require approximately 681 sf of disturbance, a slight intrusion that will still preserve enough wooded wetland buffer to prevent impacts to the wetland corridor.

Mitigation: Wetland creation is proposed on the east side of the wetlands, on lot 2, as indicated in the site plan and the detail plans prepared by Tracy Chalifoux Landscape Architect. Photos of the area under existing conditions are included at the end of the report.

Four thousand five hundred (4500) SF of wetlands will be created as mitigation for the 2000 SF of disturbance due to the proposed stream crossing over the central intermittent stream corridor. The proposed location was selected as the most desirable location for mitigation as it would require the least removal of woody vegetation (2 live trees) and to

NOTES:
CONTOURS ARE BASED ON TOWN GIS MAPPING, USING USGS DATUM.
BEARINGS BASED ON SUBDIVISION MAP
ALL OIL TANKS ARE TO BE LOCATED INSIDE BUILDINGS.
ALL NEW SEPTIC SYSTEMS SHOWN ARE BASED ON A 4 BEDROOM HOUSE.
ALL STONEWALLS WITHIN 50 FEET DOWN GRADIENT OF A SEPTIC SYSTEM ARE TO BE REMOVED PRIOR TO INSTALLATION OF THE SYSTEM.
ALL CUT AND FILL AREAS SHALL BE GRADED AT 2:1 MAX. UNLESS NOTED ON THE PLANS.
APPLICANT : NEGREIRO & SONS DEVELOPMENT, LLC
TOTAL ACREAGE OF SITE = 73.2 ACRES
PROPERTY IS LOCATED IN R2 ZONE.
ALL SEPTIC SYSTEMS TO BE DESIGNED BY A PROFESSIONAL ENGINEER.
ALL PROPOSED SEPTIC SYSTEMS ARE SHOWN AS MANTAS UNITS UNLESS OTHERWISE NOTED.
ALL LOTS ARE TO BE SERVED BY INDIVIDUAL WELLS.



HOLLY ESTATES
203 & 211 BERKSHIRE ROAD
NEWTOWN CONNECTICUT

REVISIONS		
#	DATE	DESCRIPTION

DATE: 09-30-20
PROJECT #: 2759
DRAWING FILE: SITE
DRAWN BY: IE
SCALE: 1"=100'

TITLE

OVERALL
SITE
SKETCH

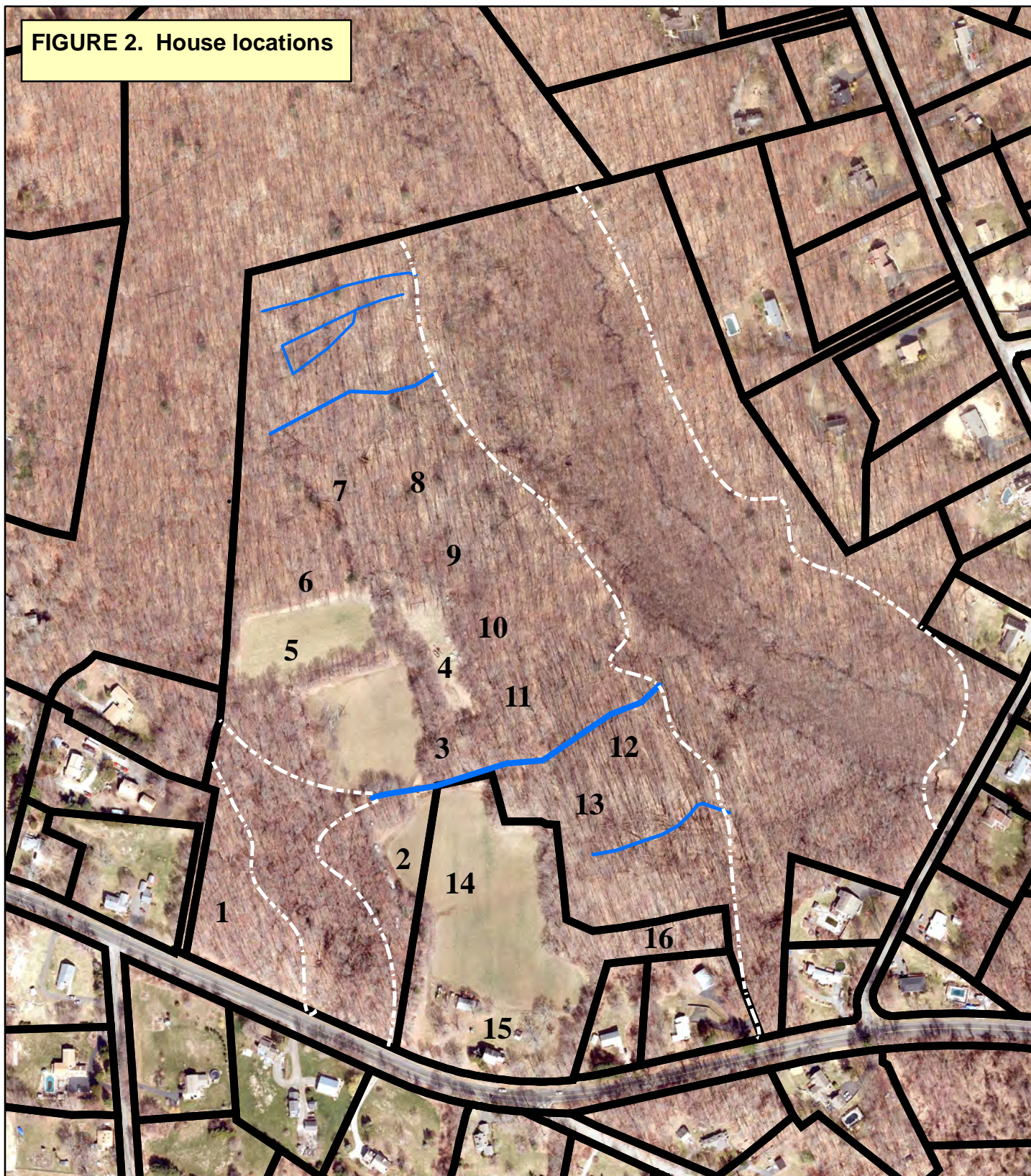
SHEET NUMBER

SK-0

- LEGEND**
- 48B SOIL TYPE
 - EXISTING CONTOUR
 - PROPOSED CONTOUR
 - EXISTING SPOT ELEVATION
 - PROPOSED SPOT ELEVATION
 - WETLAND AREA
 - WETLAND SETBACK LINE
 - TEST HOLE
 - PERCOLATION TEST
 - EXISTING CATCH BASIN
 - PROPOSED DRAINAGE
 - WATERCOURSE
 - PROPOSED RIP RAP
 - EXISTING WATER LINE
 - PROPOSED WATER LINE
 - PROPOSED ELECTRIC LINE
 - PROPOSED FOOTING/ROOF DRAIN
 - PROPOSED PRIMARY SEPTIC SYSTEM
 - PROPOSED RESERVE SEPTIC SYSTEM
 - PROPOSED RAIN GARDEN

203 & 211 Berkshire Rd., Newtown

FIGURE 2. House locations



Steven Danzer Ph.D. & Associates LLC
www.CTWetlandsConsulting.com

Feet
0 125 250 500 750 1,000



be the most benefit to the existing wetland with regard to habitat. The mitigation area will be excavated to a depth of approximately 16 inches below grade to match the adjacent existing wetland grades and hydrology. Six (6) wetland trees and eighty-one (81) wetland shrubs will be planted in a matrix of wetland seed mix. All work, including the excavation, will be performed under supervision of the project Landscape Architect in order to maximize potential for success.

6.2 THE EASTERN FORESTED WETLANDS – PROPOSED ACTIVITIES

There is no activity proposed in the eastern forested wetlands.

Lots 8 -12, and 16 border the eastern forested wetlands. All of these lots are located in the forest, and will require the removal of woody vegetation in the upland.

Overall, the residences are proposed to be located away from the steeper terrain whenever possible, minimizing the grading and alteration of terrain, and avoiding direct impacts to the wetland corridor. As a consequence, fragmentation of the wetland corridor has been minimized and the existing wetland functions (documented in an above section) will be maintained.

Only lot 12 will require work in the 100 foot upland review area. For the other lots bordering the eastern wetlands, no activity is proposed within the review area (though a portion of the stormwater basin in lot 11 will be located in the review area for the intermittent watercourse, which drains towards the eastern wetland corridor).

Regarding lot 12, even though the septic will be greater than 100 feet from the wetland corridor, the excavation for the galleries will necessitate clearing approximately another 10 feet into the review area, leaving roughly 90 feet of wooded buffer intact adjacent to the wetlands. The rain garden will also intrude into the review area, northeast of the residence.

6.3 THE CENTRAL INTERMITTENT STREAM CORRIDOR – PROPOSED ACTIVITIES

Lots 3,12, and 13 border the intermittent watercourse on its southern side. Lots 3,4, and 11 border the intermittent watercourse on its northern site. There is no activity in the 100 foot upland review area within lot 4.

The larger land disturbances in this region will be the stormwater basin, the stream crossing, and activities associated with the development of lot 12. The only activity in the wetland/watercourse itself will be the proposed stream crossing.

Construction within lot 3 will disturb 1443 SF within the 100 foot review zone. Proposed land disturbances will include the southern portion of the residence, infiltration galleries, the footing drain, and associated clearing. Most of the activity on the lot, including the activity within the 100 foot zone, will occur in the forest, and will require the removal of woody vegetation.

Construction directly associated with the residence within lot 11 will occur outside the 100 foot upland review zone, however the proposed stormwater basin will occur within the 100 foot zone. Both the residential development and the development for the stormwater basin will occur within forest, requiring the removal of woody vegetation over a 7020 SF area. The forest within proximity to the basin and the intermittent watercourse exhibits a relatively high level of woody diversity as compared to the upland within the rest of the site. However, the loss of forest values in this area should be evaluated with consideration of the gain in benefit in water quality mitigation due to the performance of the basin. Photos of the area where the stormwater basin will be located are included at the end of the report.

Construction within lot 13 will disturb 831 SF within the 100 foot review zone. Proposed land disturbances will include the northwest edge of the residence, the footing drain, and associated grading for the residence and edge of the septic field. All of the activity will occur in forest. The intrusions are minor in size and far enough as to not be expected to impact the function of the intermittent watercourse.

Construction within lot 12 will disturb 5373 SF within the 100 foot review zone, a comparatively larger amount of disturbance than any of the other proposed residential lots. Disturbances will include the northeastern portion of the residence, the well, the rain garden, the driveway, and associated grading and land clearing. All of the lot is located in forest with a relatively high level of biodiversity. The lot borders both the eastern wetland corridor as well as the intermittent watercourse, and has been configured to avoid impact to the more valuable eastern wetland corridor. An alternative configuration within the same lot lines could place the bulk of the site development more to the south, preserving more of the wetland buffer to the intermittent corridor but resulting in more intrusion towards the eastern wetland corridor and/or towards the intermittent stream corridor located to the south.

The proposed crossing will result in 2000 SF of disturbance directly in the stream corridor. Wetland creation is being proposed as mitigation for this disturbance. Four thousand five hundred (4500) SF of wetlands will be created adjacent to the western wetlands within lot 2.

The wetland crossing will require piping of roughly 120 linear feet of watercourse through a 24 inch culvert surrounded by 150 cy of fill. The crossing will be located in the forest within the eastern segment of the intermittent watercourse. Photos of the area are included at the end of the report. There was no flow in the crossing area at the time of field investigations (summer and fall 2020). The channel substrate within the area of the crossing is best characterized as cobbles and boulders, some covered with moss. The

steepness of the slope is moderate. Immediately downstream from the proposed crossing the watercourse becomes progressively steeper and the channel wider and more defined.

As described in a previous section, the vegetation types (as observed during the summer and fall of 2020) along the intermittent watercourse in the area of the crossing were virtually indistinguishable from the adjacent upland vegetation. As such, the watercourse system mainly provides hydrological rather than wetland specific ecological functions; primarily *stormwater conveyance* and *groundwater discharge*. Neither of these functions will be significantly impacted or impeded by the proposed crossing, which will allow flow underneath.

6.4 THE SLOPED WETLANDS / INTERMITTENT STREAM CORRIDORS IN THE NORTH AND SOUTH REGIONS – PROPOSED ACTIVITIES

Northern system: The northern sloped wetland system described in the earlier section of this report is located 100+ feet north of the residential development of lots 7 and 8. Almost all of the substantive development activities for these two lots will be located out of the 100 foot review zone. All development will occur in forest.

Within lot 7, only the northern limit of grading for the rain garden will be within the review zone. Within lot 8, the rain garden and the footing drain for the residence will be located in the review zone, a 773 SF disturbance. None of these disturbances will impact the wetland system, which principally functions to convey discharged groundwater towards the larger eastern wetland system.

Southern System: The southern sloped wetland system described in the earlier section of this report is located between lots 12/13 and lots 14/16.

There is no development proposed within the 100 foot review area within lots 14 or 16, which are located on the southern side of the wetland system.

On the northern side of the wetland system, the rain garden for lot 13 will intrude 831 SF into the 100 foot review area. The southern edge of the septic field for lot 12 will be located in the review area. Both intrusions into the review are relatively minor in area and are not expected to impact the intermittent stream corridor.

Functions and values of this wetland system (principally *groundwater discharge*) are similar to the central intermittent wetland corridor, except that flow is anticipated to be less since there are no connecting wetlands upstream to either of this system. The wetland habitat is essentially the same as the upland habitat. None of the above proposed disturbances will impact the ability of the wetland system to perform these functions.

Thank you for the opportunity to comment.

Respectfully submitted,

Signed,



Steven Danzer Ph.D.

Professional Wetland Scientist, Soil Scientist, Arborist,
Ph.D. in Renewable Natural Resource Studies



--5 attachments

1. Figure 1 – Land Cover Types
2. Map SK-0
3. Figure 2 – House Locations
4. Appendix A. Photos
5. NDDDB Map from CT ECO

APPENDIX A. PHOTOS



Photo 1. Proposed location for wetland creation. Looking North. 10/22/20



Photo 2. Proposed location for wetland creation. Looking South. 10/22/20



Photo 3. Area of stream crossing. Looking upstream. 10/22/20



Photo 4. Area of stream crossing. Looking downstream. 10/22/20

Map

Find Data

Coordinates

Draw

Print/Export/Share



Tool Labels



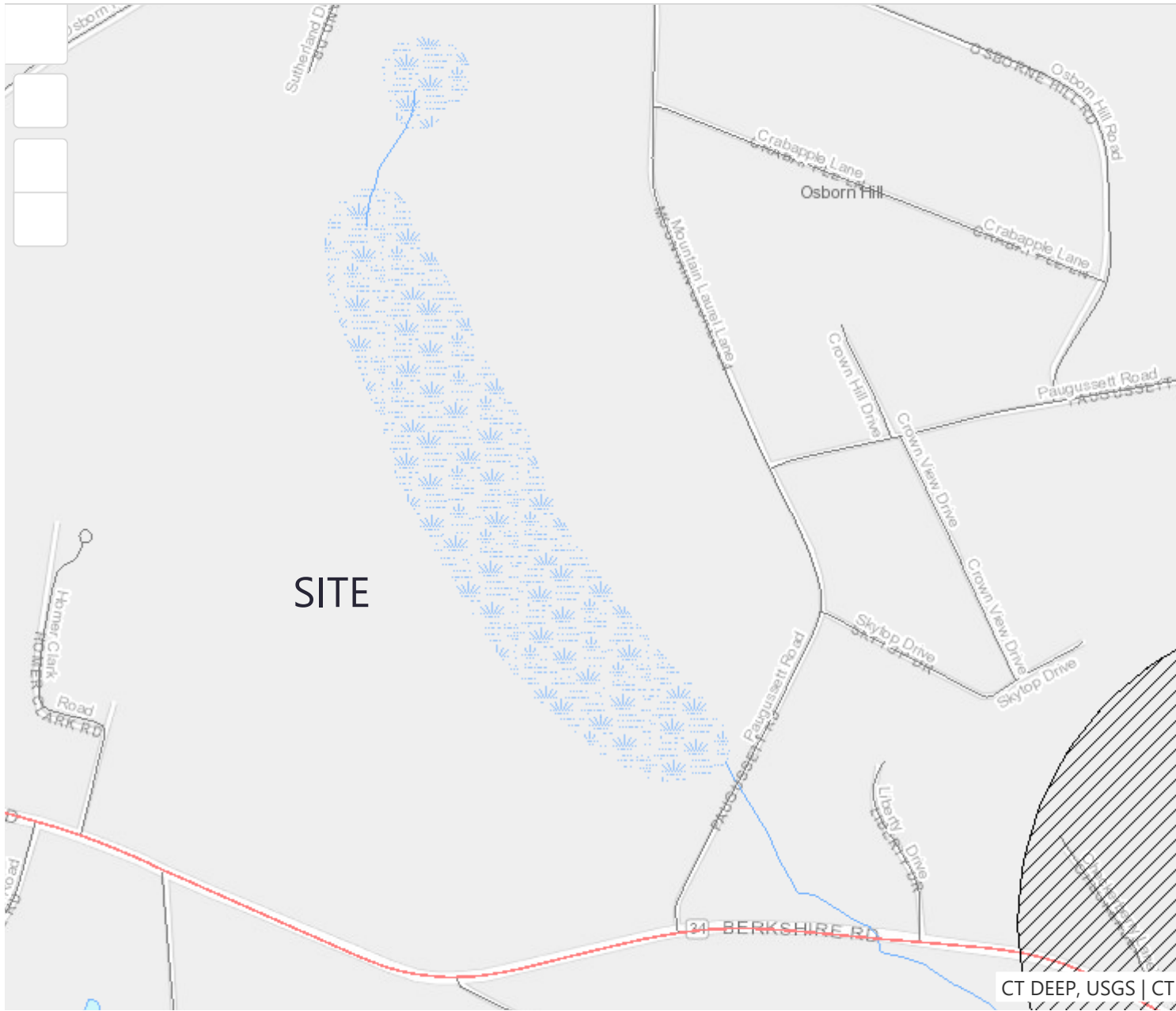
Print



Export



Share



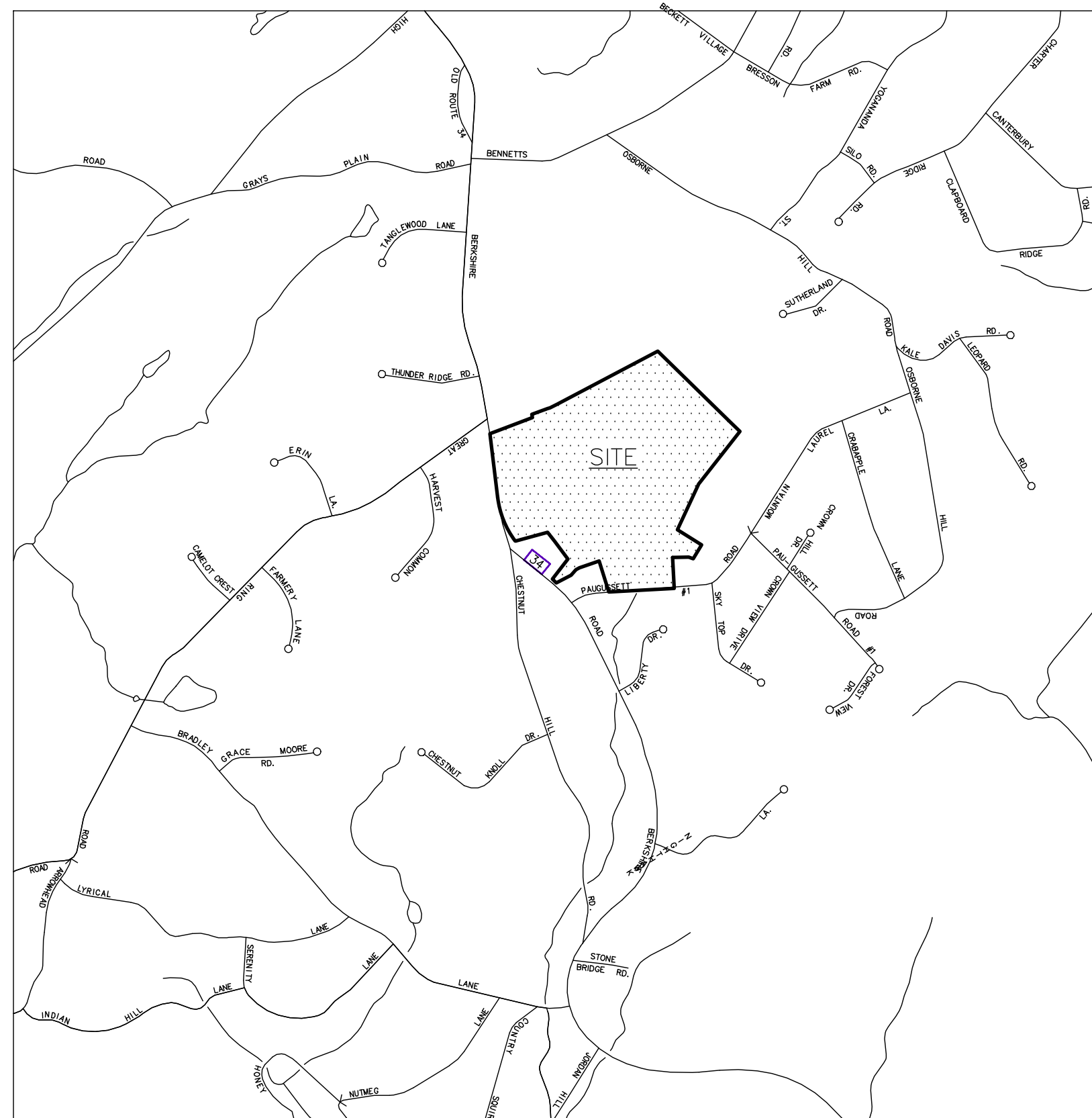
Base Map

0 300 600ft

"HOLLY ESTATES "
NEWTOWN CONNECTICUT
203 & 211 BERKSHIRE ROAD
A
SUBDIVISION PLAN

DEVELOPER:

NEGREIRO & SONS CONSTRUCTION, LLC

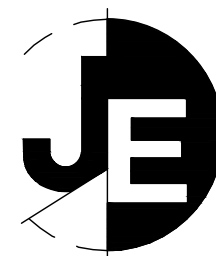


VICINITY MAP
1"=1200'

CONTENTS:

TITLE SHEET	
EX-1	EXISTING CONDITIONS PLAN
S-1	SUBDIVISION PLAN
SC-1	SITE CONTEXT PLAN
SD-0	OVERALL SITE PLAN
SD-1 - SD-7	40 SCALE SITE PLAN
PP-1 - PP-2	PLAN AND PROFILE
EC-1 - EC-2	EROSION CONTROL PLAN
D-1	STANDARD DETAILS
D-2	EROSION CONTROL DETAILS

Prepared By:



J. EDWARDS & ASSOCIATES, LLC
Engineering and Surveying
227 Stepney Road
Easton, CT. 06612
(203)-268-4205
www.jedwardsassoc.com

TO MY KNOWLEDGE AND BELIEF, THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON.
THIS MAP IS NOT VALID UNLESS EMBOSSED WITH THE SEAL OR AFFIXED WITH
THE LIVE STAMP OF THE SIGNATORY.

LARRY EDWARDS, P.E. No. 10937

SEPTEMBER 30, 2020

REVISIONS

[illegible]

NOTES:

1. THIS SURVEY (OR MAP) HAS BEEN PREPARED PURSUANT TO THE REGULATIONS OF CONNECTICUT STATE AGENCIES SECTIONS 20-300b-1 THRU 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. IT IS A IMPROVEMENT LOCATION SURVEY BASED ON A DEPENDENT RESURVEY CONFORMING TO HORIZONTAL ACCURACY CLASS A-2.

2. REFERENCE MAP ENTITLED: "SUBDIVISION MAP PREPARE FOR SYLVESTER COCIVI BERKSHIRE & PAUGUSSET ROADS, NEWTOWN CT" PREPARED BY BRAUTIGAM LAND SURVEYORS, P.C.; DATED 02/04/99.

3. REFERENCE IS MADE TO RECORD MAPS 381, 382, 622, 2574, 2732, 2733, 2882, 2980, 3365, 3978, 4064, 4246, 4434, 4604, 4985, 5576, 5812, 5913 ON FILE IN THE NEWTOWN LAND RECORDS.

3. PLAN PREPARED FOR NEGREIRO & SONS CONSTRUCTION

4. LOT CORNER MARKERS DEPICTED HEREON WERE FOUND AND/OR SET DURING COMPLETION OF THIS SURVEY. ALL CORNER MARKERS FOR THIS LOT ARE TO BE PLACED AS PART OF SUBDIVISION IMPROVEMENTS AND HAVE BEEN BONDED TO THE TOWN.

5. BEARINGS BASED ON CT STATE PLANE COORDINATES (NAD 83)

6. LOCATION OF UNDERGROUND UTILITIES DEPICTED HEREON ARE APPROXIMATE.

7. CERTIFICATION OF THIS MAP APPLIES TO CONDITIONS AS OF THE ORIGINAL DATE OR REVISED DATE DEPICTED HEREON. EXISTING CONDITIONS ON THIS PROPERTY MAY HAVE CHANGED SINCE THAT DATE AND AN UPDATED SURVEY IS RECOMMENDED TO ACCURATELY DEPICT THE CURRENT CONDITIONS.

8. LIMIT OF WETLAND SOILS DEPICTED PER CONNSOIL 3/10/97. VERIFIED BY STEVEN DANZER PHD 09/2020 WITH SOME REVISIONS.

9. TOPOGRAPHY DEPICTED PER TOWN OF NEWTOWN GIS DATA.

8 HOMER CLARK LANE
N/F
JESSIE L. LEVINE
TRUST
M-B-L 50-8-18

6 HOMER CLARK LANE
N/F
LESLIE A. &
DONNA L. RICHARDS
M-B-L 50-8-21

4 HOMER CLARK LANE
N/F
JOYCE NAGEL
M-B-L 50-8-20

199 BERKSHIRE ROAD
N/F
CARL F. &
CECILIA DALZELL
M-B-L 50-8-23-B

LEGEND

- EXISTING CONTOUR
- WATERCOURSE
- LIMIT OF WETLANDS
- WETLAND SETBACK LINE
- STONE WALL
- EDGE OF PAVEMENT
- CURB LINE
- LIMIT OF APPROXIMATE LOCATION OF 20' WIDE AT&T EASEMENT

JASON EDWARDS, L.S. No. 70308

REVISED LIMITS OF WETLANDS
PER STEVE DANZER. (TYP)
SEE NOTE 8.

18 MOUNTAIN LAUREL LANE
N/F
CHRISTOPHER &
MARY BRAND
M-B-L 53-2-107-72

26 MOUNTAIN LAUREL LANE
N/F
MARK D. &
ANGELA DUKATE
M-B-L 53-2-150-6

28 MOUNTAIN LAUREL LANE
N/F
CHRISTOPHER A. &
JEANNE MARIE K. CARNEY
M-B-L 53-2-151-5

23 PAUGUSSET ROAD
N/F
DENNIS &
DEBORAH CASEY
M-B-L 53-2-153-4

21 PAUGUSSET ROAD
N/F
LOUIS C.
BIANCO
M-B-L 53-2-18-7A

19 PAUGUSSET ROAD
N/F
PATRICK FLECK &
KATHLEEN MILLER
M-B-L 53-2-19

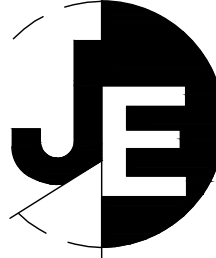
17 PAUGUSSET ROAD
N/F
JOHN R. &
JANET A. MERRIFIELD
M-B-L 53-2-20

3 PAUGUSSET ROAD
N/F
MADELINE A.
WRIGHT
M-B-L 54-11-5

225 BERKSHIRE ROAD
N/F
CIL
REALTY INC.
M-B-L 54-11-4

219 BERKSHIRE ROAD
N/F
JOHN D. &
TERI A. MOORE
M-B-L 54-11-3

217 BERKSHIRE ROAD
N/F
KRISTEN V. WERNER
& JUDITH JOHNSON
M-B-L 54-11-2



**J. EDWARDS &
ASSOCIATES LLC**
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Phone: 203.268.4205 Fax: 203.268.5604
www.jedwardsassoc.com

HOLLY ESTATES
203 & 211 BERKSHIRE ROAD
NEWTOWN CONNECTICUT

REVISIONS

#	DATE	DESCRIPTION

DATE: 09-30-20
PROJECT #: 2759
DRAWING FILE: SITE
DRAWN BY: IE
SCALE: 1"=100'

TITLE

EXISTING
CONDITIONS
SURVEY

SHEET NUMBER

EX-1

CONTOURS ARE BASED ON TOWN GIS MAPPING, USING USGS DATUM.
 3. BEARINGS BASED ON SUBDIVISION MAP
 4. ALL OIL TANKS ARE TO BE LOCATED INSIDE BUILDINGS.
 5. ALL NEW SEPTIC SYSTEMS SHOWN ARE BASED ON A 4 BEDROOM HOUSE.
 6. ALL STONEWALLS WITHIN 50 FEET DOWN GRADIENT OF A SEPTIC SYSTEM ARE TO BE REMOVED PRIOR TO INSTALLATION OF THE SYSTEM.
 7. ALL CUT AND FILL AREAS SHALL BE GRADED AT 2:1 MAX. UNLESS NOTED ON THE PLANS.
 8. APPLICANT : NEGREIRO & SONS DEVELOPMENT, LLC
 9. TOTAL ACREAGE OF SITE = 73.2 ACRES
 10. PROPERTY IS LOCATED IN R2 ZONE.
 11. ALL SEPTIC SYSTEMS TO BE DESIGNED BY A PROFESSIONAL ENGINEER.
 12. ALL PROPOSED SEPTIC SYSTEMS ARE SHOWN AS MANTAS UNITS UNLESS OTHERWISE NOTED.
 13. ALL LOTS ARE TO BE SERVED BY INDIVIDUAL WELLS.

OPEN SPACE CALCULATIONS
TOTAL AREA = 73.2 AC
AREA STEEP SLOPES AND WETLANDS = 29.8 AC (40.7%)
OPEN SPACE REQUIRED = $72.3 \times 0.15 = 10.8$ AC
USEABLE OPEN SPACE REQUIRED = $10.8 \times (100 - 40.3) = 6.4$ AC

TOTAL OPEN SPACE PROVIDED = 33.2 AC
OPEN SPACE STEEP SLOPES AND WETLANDS = 20.6 AC
USABLE OPEN SPACE = 33.2 AC - 20.6 AC = 12.6 AC

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HOLLY ESTATES
203 & 211 BERKSHIRE ROAD
NEWTOWN CONNECTICUT

REVISIONS

[illegible]

DATE: 09-30-20
PROJECT #: 2759
DRAWING FILE: SITE
DRAWN BY: IE
SCALE: 1"=100'

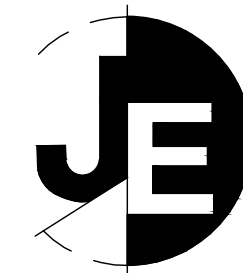
TITLE

OVERALL SITE DEVELOPMENT PLAN

SHEET NUMBER

SD-0





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HOLLY ESTATES
203 & 211 BERKSHIRE ROAD
NEWTOWN CONNECTICUT

REVISIONS

#	DATE	DESCRIPTION

DATE: 09-30-20
PROJECT #: 2759
DRAWING FILE: SITE
DRAWN BY: IE
SCALE: 1"=40'

TITLE

DETAILED
SITE
DEVELOPMENT
PLAN

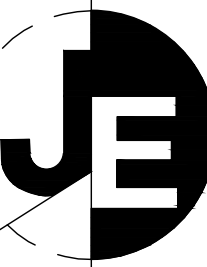
SHEET NUMBER

SD-1

WETLAND MITIGATION AREA
SEE DETAILED PLAN

LEGEND

- SOIL TYPE
- EXISTING CONTOUR
- PROPOSED CONTOUR
- EXISTING SPOT ELEVATION
- PROPOSED SPOT ELEVATION
- WETLAND AREA
- WETLAND SETBACK LINE
- TEST HOLE
- PERCOLATION TEST
- EXISTING CATCH BASIN
- PROPOSED DRAINAGE
- WATERCOURSE
- PROPOSED RIP RAP
- EXISTING WATER LINE
- PROPOSED WATER LINE
- PROPOSED ELECTRIC LINE
- PROPOSED FOOTING/ROOF DRAIN
- PROPOSED PRIMARY SEPTIC SYSTEM
- PROPOSED RESERVE SEPTIC SYSTEM
- PROPOSED RAIN GARDEN
- PROPOSED INFILTRATION SYSTEM



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HOLLY ESTATES
203 & 211 BERKSHIRE ROAD
NEWTOWN CONNECTICUT

REVISIONS

#	DATE	DESCRIPTION

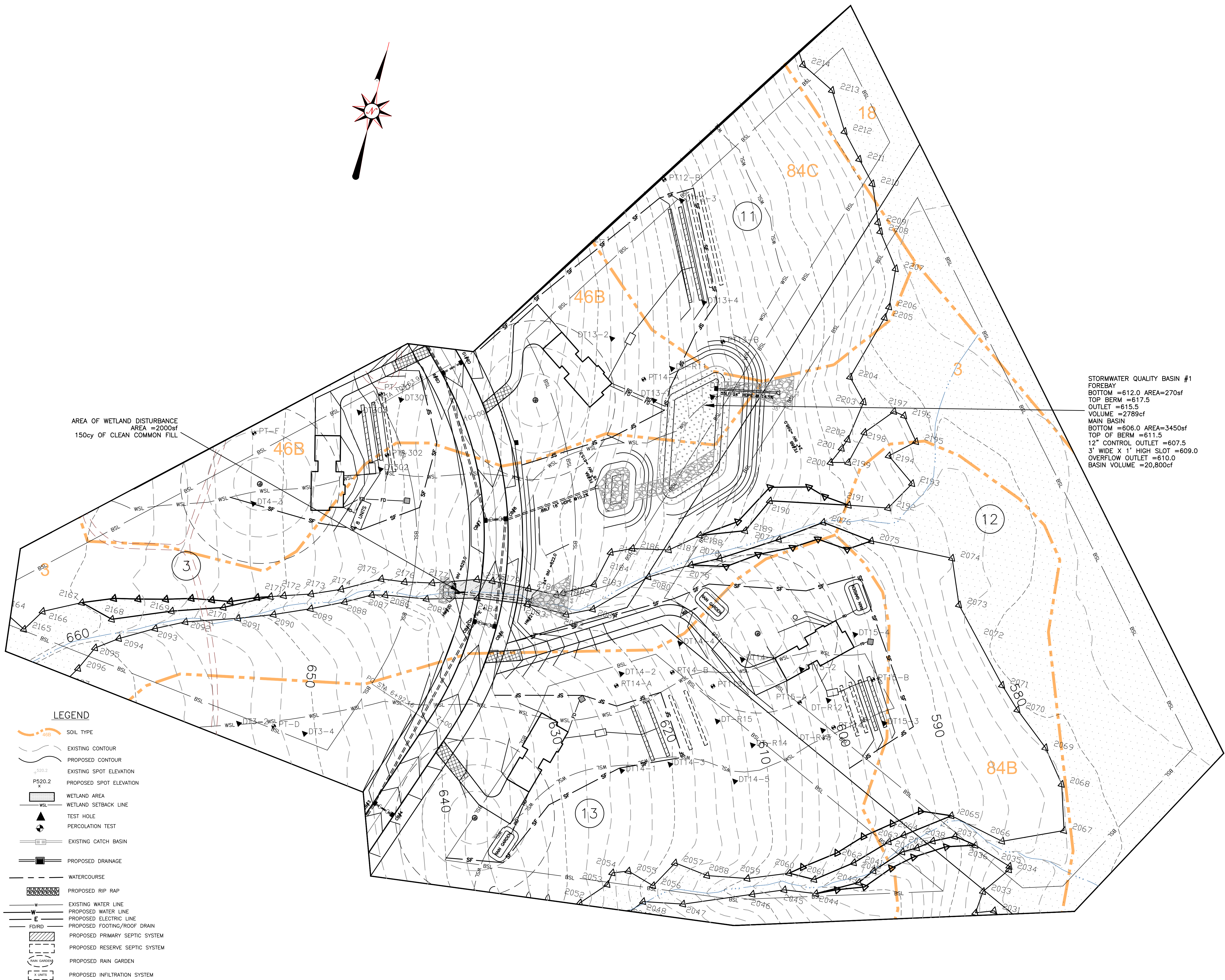
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PROJECT #: 2759
DRAWING FILE: SITE
DRAWN BY: IE
SCALE: 1"=40'

TITLE

DETAILED
SITE
DEVELOPMENT
PLAN

SHEET NUMBER

SD-2



STORMWATER QUALITY BASIN #1
FOREBAY
BOTTOM =612.0 AREA=270sf
TOP BERM =617.5
OUTLET =615.5
VOLUME =2789cf
MAIN BASIN
BOTTOM =606.0 AREA=3450sf
TOP OF BERM =611.5
12" CONTROL OUTLET =607.5
3' WIDE X 1' HIGH SLOT =609.0
OVERFLOW OUTLET =610.0
BASIN VOLUME =20,800cf

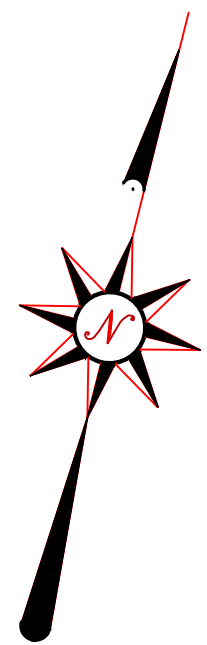
AREA OF WETLAND DISTURBANCE
AREA =2000sf
150cy OF CLEAN COMMON FILL

LEGEND

- SOIL TYPE
- EXISTING CONTOUR
- PROPOSED CONTOUR
- EXISTING SPOT ELEVATION
- PROPOSED SPOT ELEVATION
- WETLAND AREA
- WETLAND SETBACK LINE
- TEST HOLE
- PERCOLATION TEST
- EXISTING CATCH BASIN
- PROPOSED DRAINAGE
- WATERCOURSE
- PROPOSED RIP RAP
- EXISTING WATER LINE
- PROPOSED WATER LINE
- PROPOSED ELECTRIC LINE
- PROPOSED FOOTING/ROOF DRAIN
- PROPOSED PRIMARY SEPTIC SYSTEM
- PROPOSED RESERVE SEPTIC SYSTEM
- PROPOSED RAIN GARDEN
- PROPOSED INFILTRATION SYSTEM



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DATE: 09-30-20
PROJECT #: 2759
DRAWING FILE: SITE
DRAWN BY: IE
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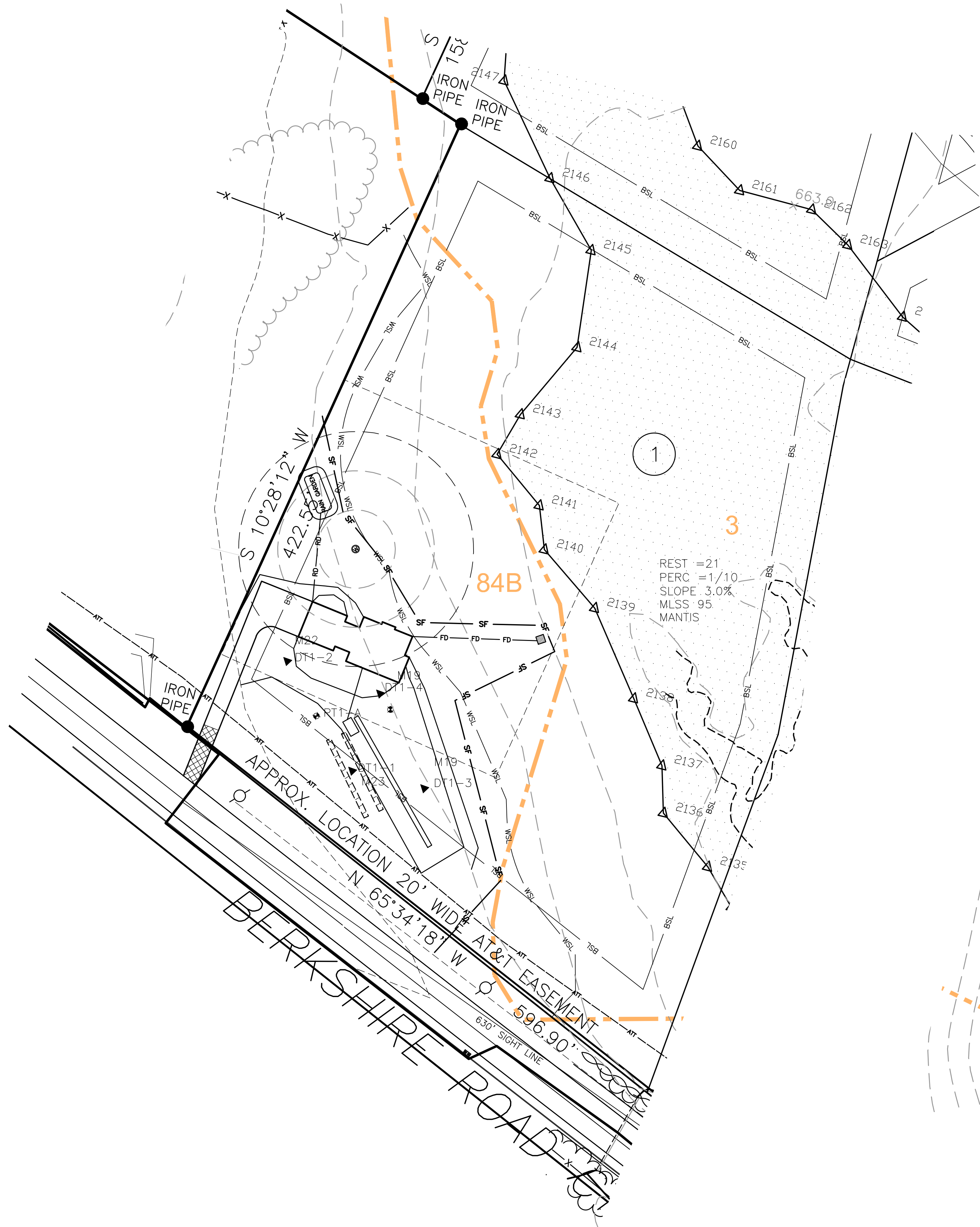
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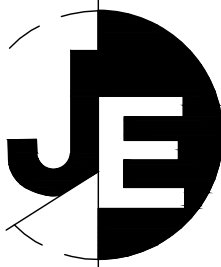
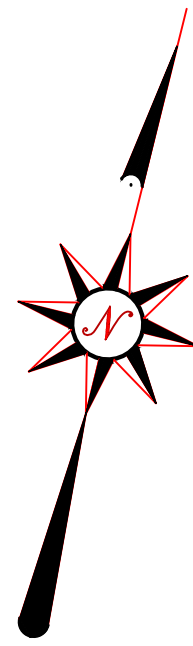
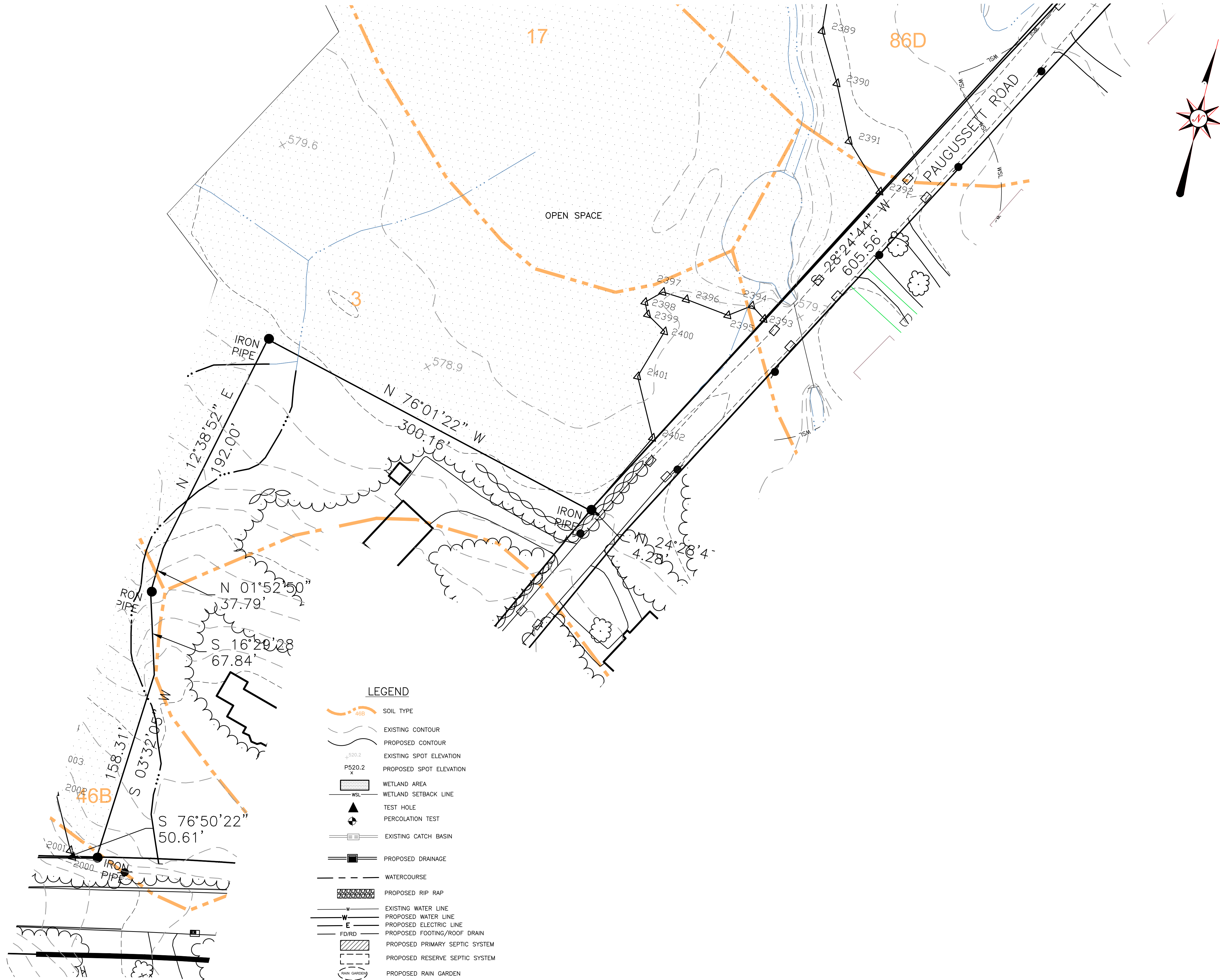
DETAILED
SITE
DEVELOPMENT
PLAN

SHEET NUMBER

SD-3







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REVISIONS

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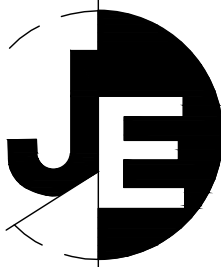
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DRAWING FILE: SITE
DRAWN BY: IE
SCALE: 1"=40'

TITLE

DETAILED
SITE
DEVELOPMENT
PLAN

SHEET NUMBER

SD-5



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REVISIONS

#	DATE	DESCRIPTION

DATE: 09-30-20
PROJECT #: 2759
DRAWING FILE: SITE
DRAWN BY: IE
SCALE: 1"=40'

TITLE

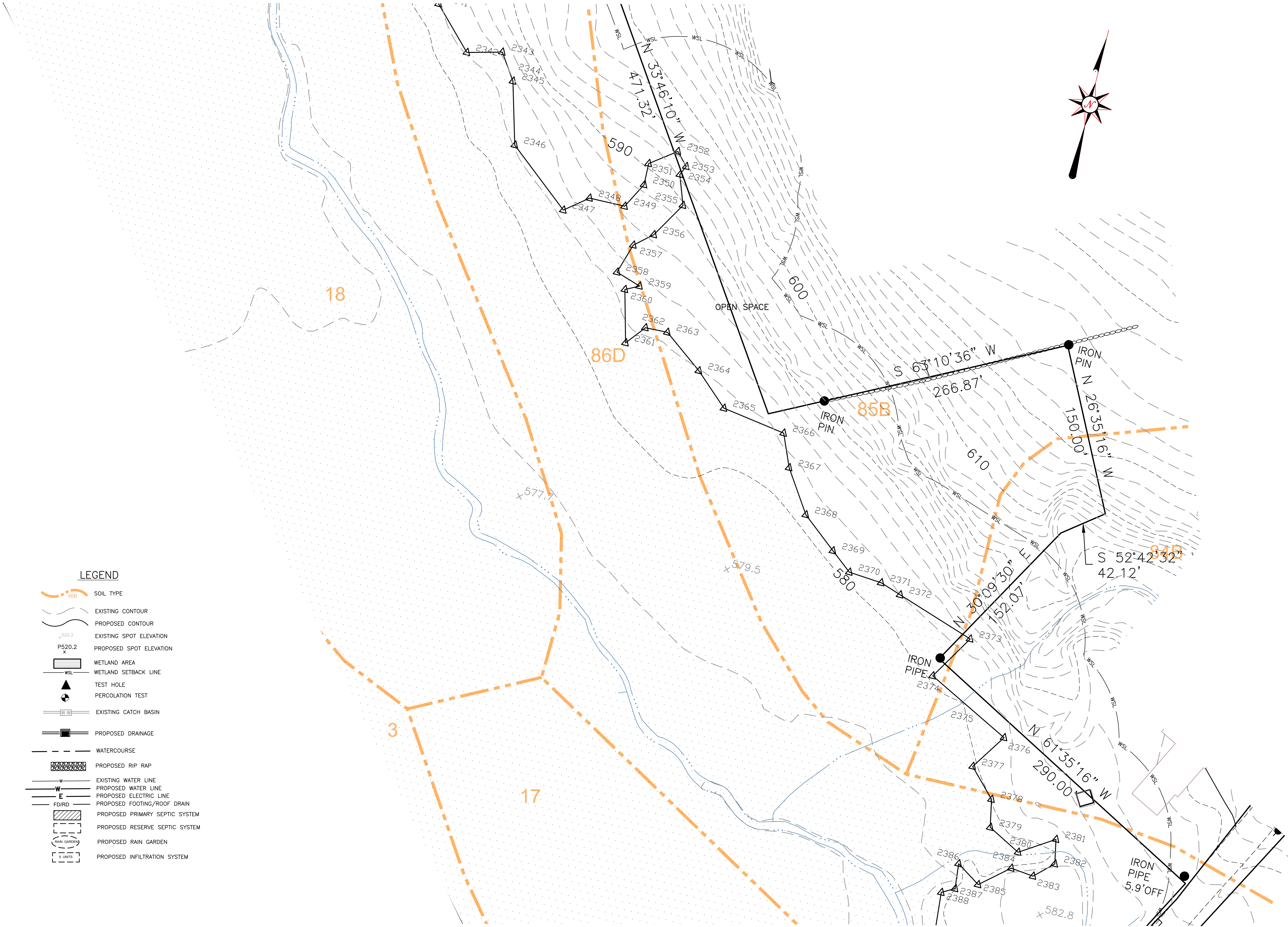
DETAILED
SITE
DEVELOPMENT
PLAN

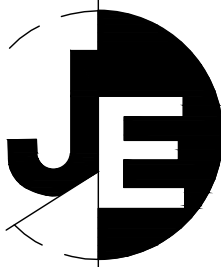
SHEET NUMBER

SD-6



- LEGEND**
- SOIL TYPE
 - EXISTING CONTOUR
 - PROPOSED CONTOUR
 - EXISTING SPOT ELEVATION
 - PROPOSED SPOT ELEVATION
 - WETLAND AREA
 - WETLAND SETBACK LINE
 - TEST HOLE
 - PERCOLATION TEST
 - EXISTING CATCH BASIN
 - PROPOSED DRAINAGE
 - WATERCOURSE
 - PROPOSED RIP RAP
 - EXISTING WATER LINE
 - PROPOSED WATER LINE
 - PROPOSED ELECTRIC LINE
 - PROPOSED FOOTING/ROOF DRAIN
 - PROPOSED PRIMARY SEPTIC SYSTEM
 - PROPOSED RESERVE SEPTIC SYSTEM
 - PROPOSED RAIN GARDEN
 - PROPOSED INFILTRATION SYSTEM





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NEWTOWN CONNECTICUT

REVISIONS

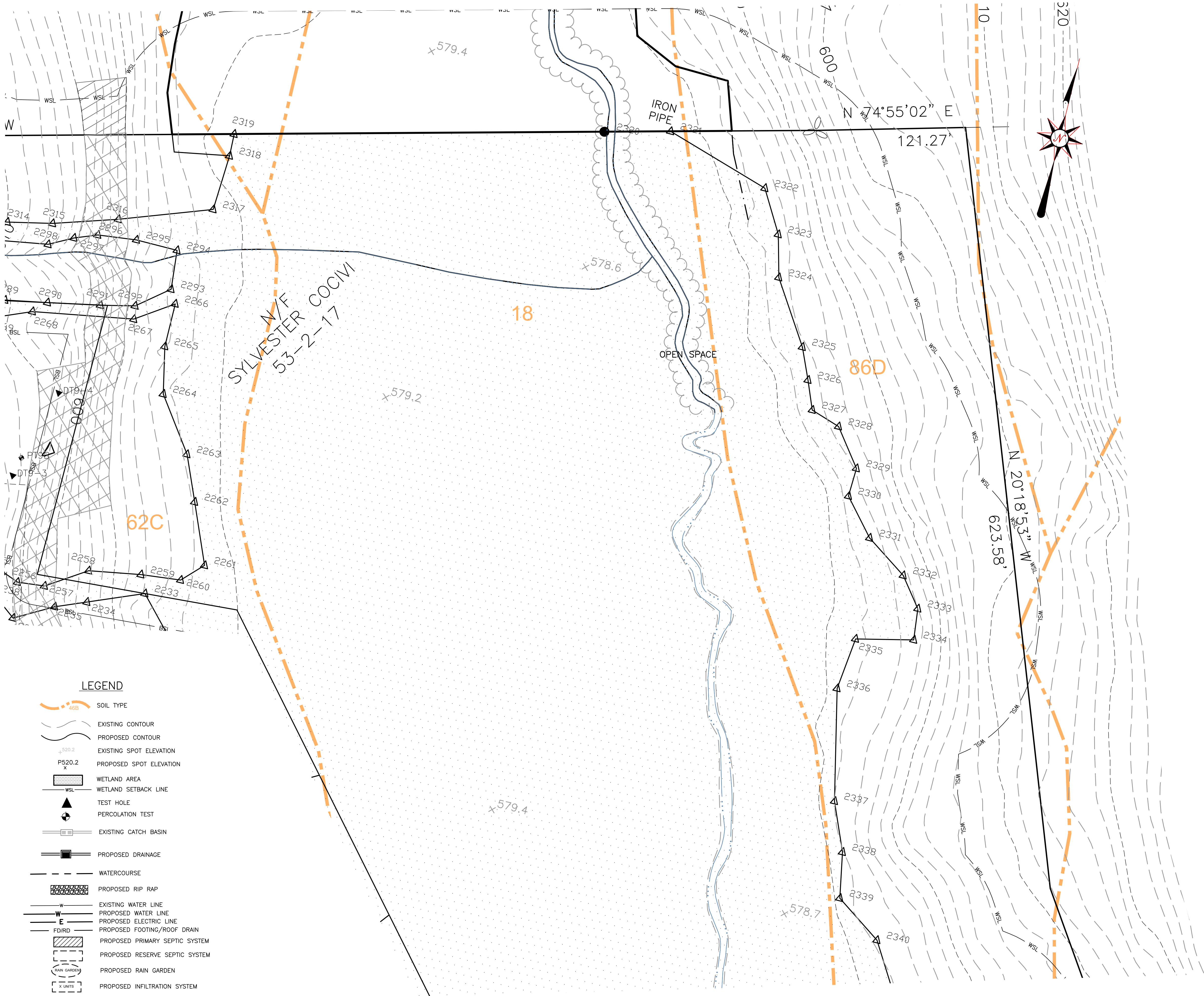
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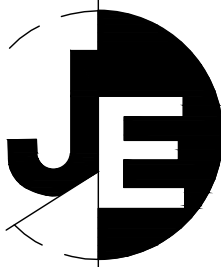
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TITLE

DETAILED
SITE
DEVELOPMENT
PLAN

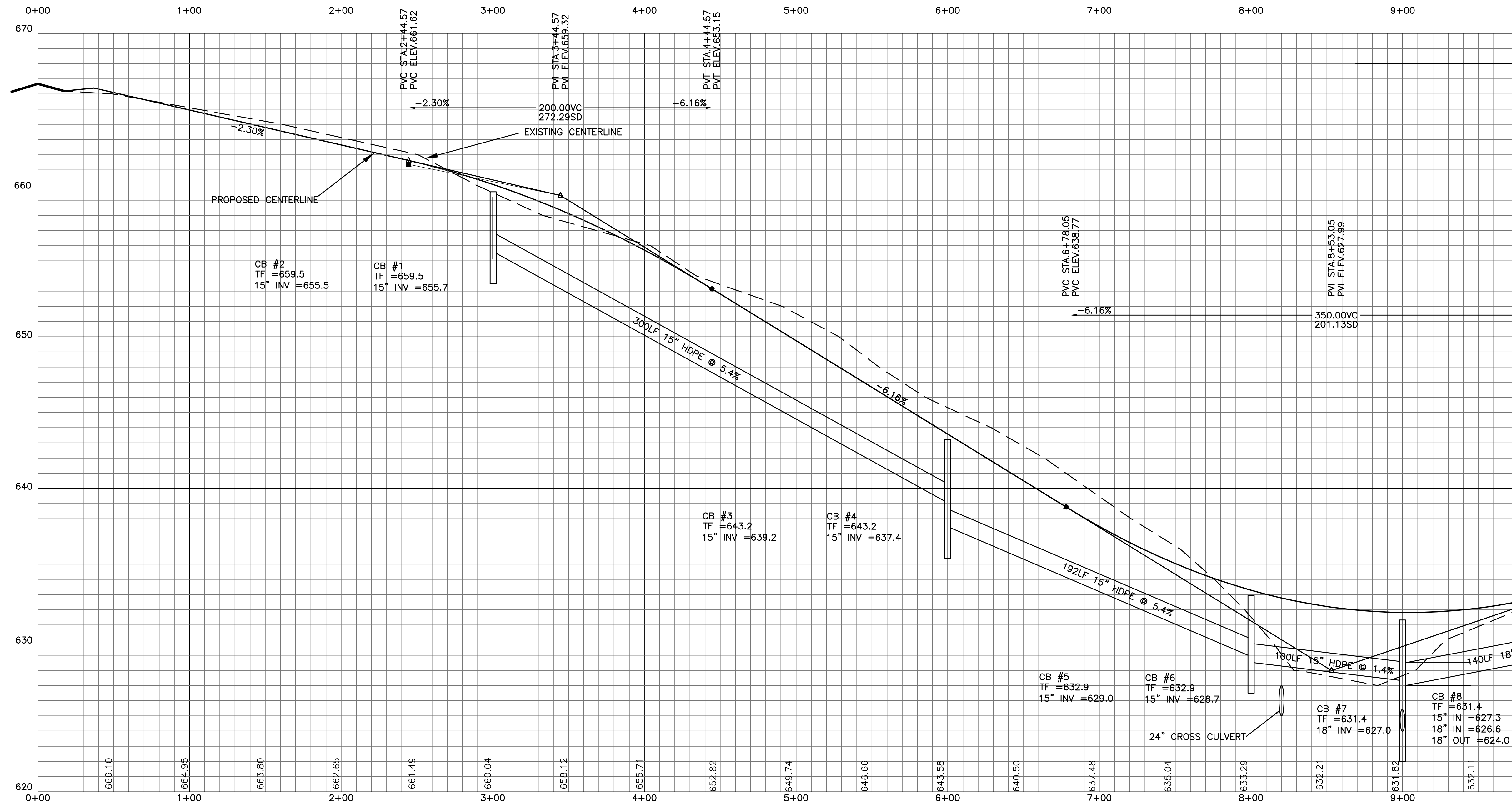
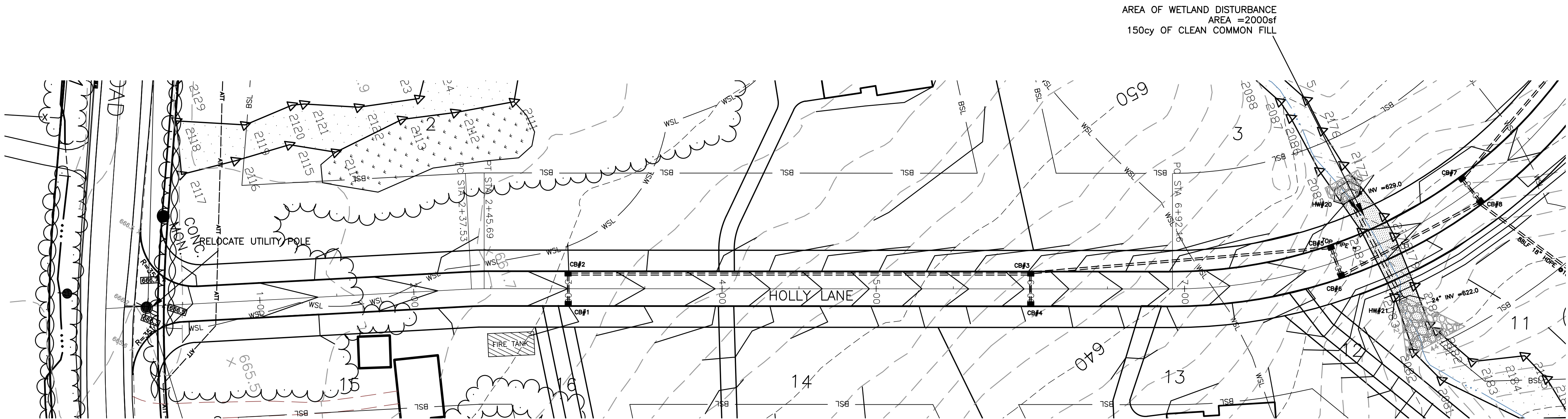
SHEET NUMBER





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LEGEND

- SOIL TYPE
- EXISTING CONTOUR
- PROPOSED CONTOUR
- EXISTING SPOT ELEVATION
- PROPOSED SPOT ELEVATION
- WETLAND AREA
- WETLAND SETBACK LINE
- TEST HOLE
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HOLLY ESTATES
203 & 211 BERKSHIRE ROAD
NEWTOWN CONNECTICUT

REVISIONS

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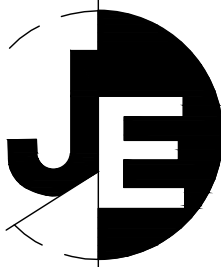
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PROJECT #: 2759
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DRAWN BY: IE
SCALE: H= 1"=40 V=1"=4'

TITLE

HOLLY LANE
PLAN & PROFILE

SHEET NUMBER

PP-1



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NEWTOWN CONNECTICUT

REVISIONS

#	DATE	DESCRIPTION

DATE: 09-30-20
PROJECT #: 2759
DRAWING FILE: SITE
DRAWN BY: IE
SCALE: H= 1"=40 V=1"=4'

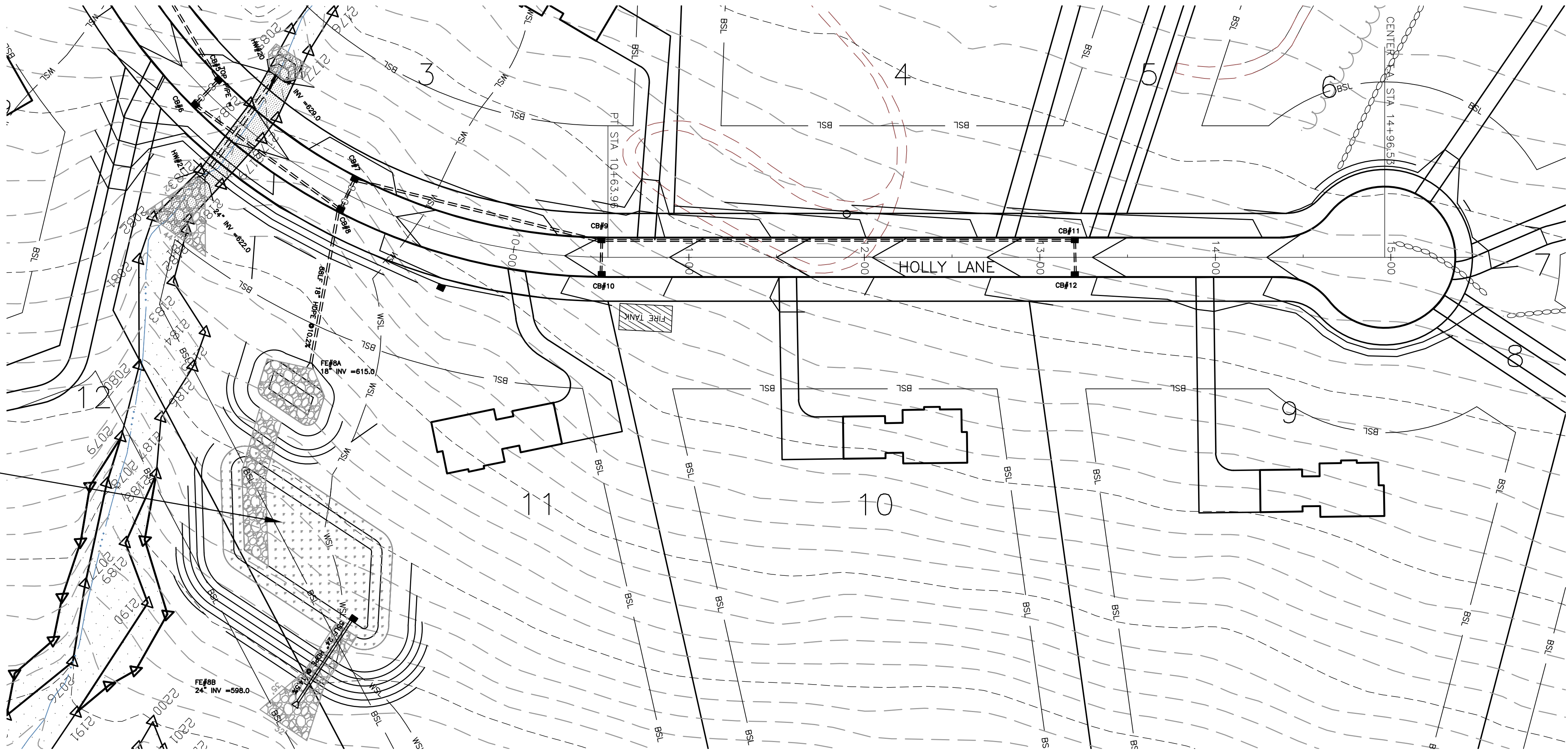
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HOLLY LANE
PLAN & PROFILE

SHEET NUMBER

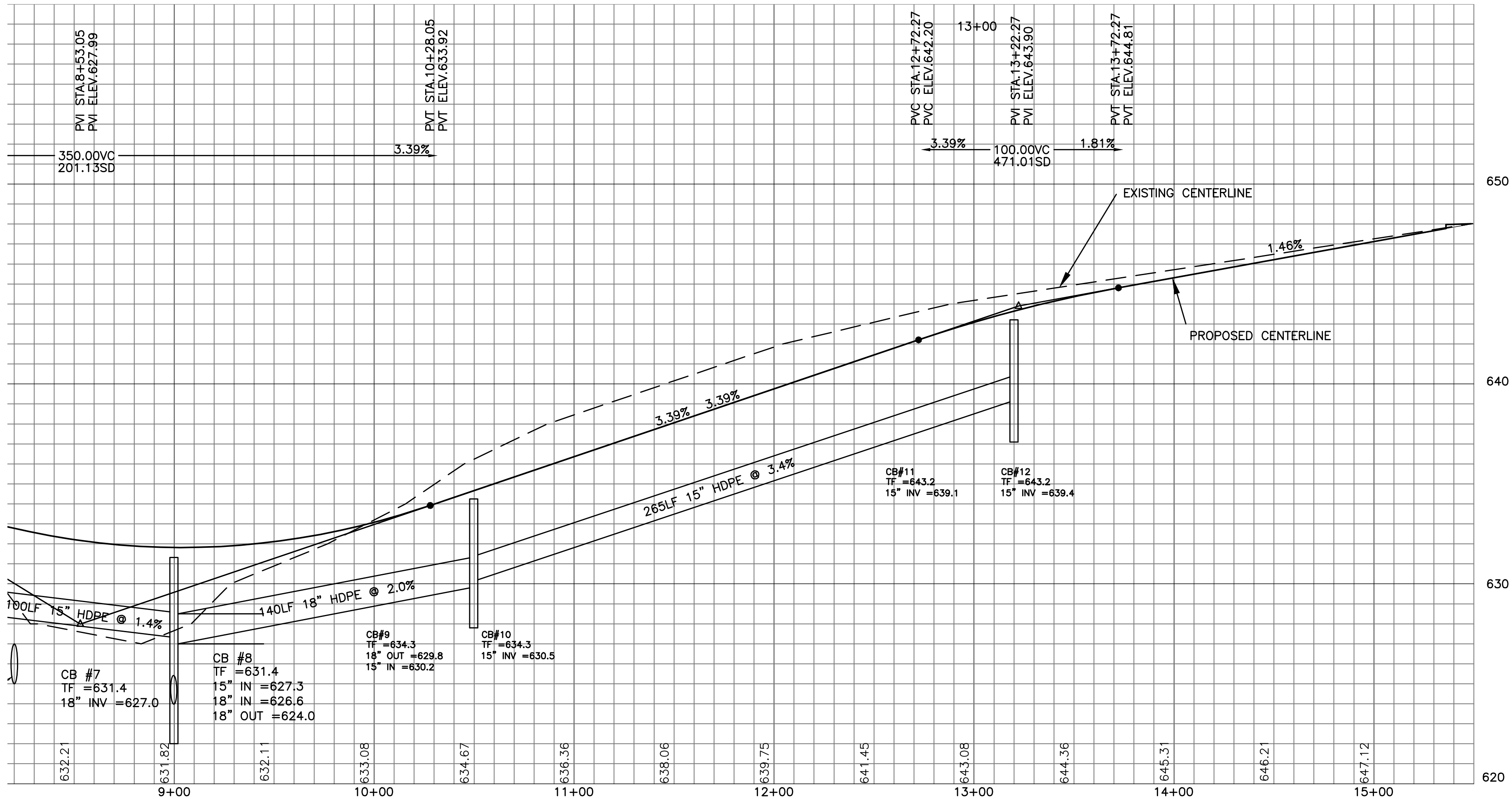
PP-1

STORMWATER QUALITY BASIN #1
FOREBAY
BOTTOM = 612.0 AREA=270sf
TOP BERM = 617.5
OUTLET = 615.5
VOLUME = 2789cf
MAIN BASIN
BOTTOM = 606.0 AREA=3450sf
TOP OF BERM = 611.2
12" CONTROL OUTLET = 607.5
4" WIDE X 1' HIGH SLOT = 608.7
24" OUTLET = 606.0
EMERGENCY OVERFLOW OUTLET = 610.0
BASIN VOLUME = 20,800cf

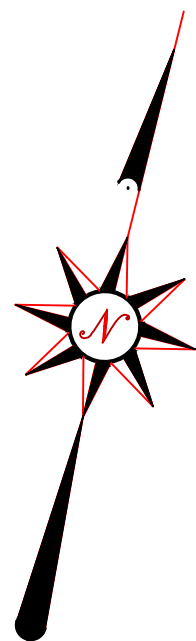


LEGEND

- SOIL TYPE
- EXISTING CONTOUR
- PROPOSED CONTOUR
- EXISTING SPOT ELEVATION
- PROPOSED SPOT ELEVATION
- WETLAND AREA
- WETLAND SETBACK LINE
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- PROPOSED FOOTING/ROOF DRAIN
- PROPOSED PRIMARY SEPTIC SYSTEM
- PROPOSED RESERVE SEPTIC SYSTEM
- PROPOSED RAIN GARDEN
- PROPOSED INFILTRATION SYSTEM



SEDIMENT TRAP #1
AREA TO TRAP =3.0 ACRES
REQUIRED VOLUME =3.0ac X 134cy/ac = 402cy (10,854cf)
WET STORAGE = 0.85 X 3200 X 2 =5440cf
DRY STORAGE = (3200+4200)/2 X2 =7400
TOTAL STORAGE =12,840cf



SEDIMENT TRAP #1
BOTTOM ELEV=627.0 AREA=2200sf
BOTTOM DIKE=630.0 AREA=3200sf
SPILLWAY=632.0 AREA=4200sf
TOP BERM=633.0

AREA OF WETLAND DISTURBANCE
AREA =2000sf
150cy OF CLEAN COMMON FILL

INSTALL SILT SACKS IN ALL
CATCHBASINS

TEMP. DIVERSION SWALE (TYP)
SILT FENCE (TYP)
CLEARING LIMITS (TYP)
STONE CHECK DAM (TYP)
WATER BREAK (TYP)

LEGEND

- EXISTING CONTOUR
- PROPOSED CONTOUR
- TEMPORARY SEDIMENT TRAP
- HAY BALE DAM
- SF SINGLE ROW SILT FENCE
- DSF DOUBLE ROW SILT FENCE
- CL CLEARING LIMITS
- TEMP. DIVERSION SWALE
- WB TEMP. WATER BREAK
- TEMP. BERM
- STONE CHECK DAM
- WOODLINE/TREELINE



HOLLY ESTATES
203 & 211 BERKSHIRE ROAD
NEWTOWN CONNECTICUT

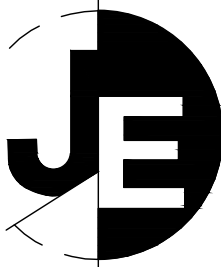
REVISIONS		
#	DATE	DESCRIPTION

DATE: 09-30-20
PROJECT #: 2759
DRAWING FILE: SITE
DRAWN BY: IE
SCALE: 1"=50'

TITLE
EROSION
CONTROL
PLAN
ROAD
CONSTRUCTION

SHEET NUMBER

SEDIMENT TRAP #2
AREA TO TRAP =6.0 ACRES
REQUIRED VOLUME =6.0ac X 134cy/ac = 804cy (21,708cf)
WET STORAGE = 0.85 X 5800 X 2 =9860cf
DRY STORAGE = (5800+7200)/2 X 2 =13,000cf
TOTAL STORAGE =22,860cf



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NEWTOWN CONNECTICUT

REVISIONS		
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SCALE: 1"=50'

TITLE
EROSION
CONTROL
PLAN
ROAD
CONSTRUCTION

SHEET NUMBER

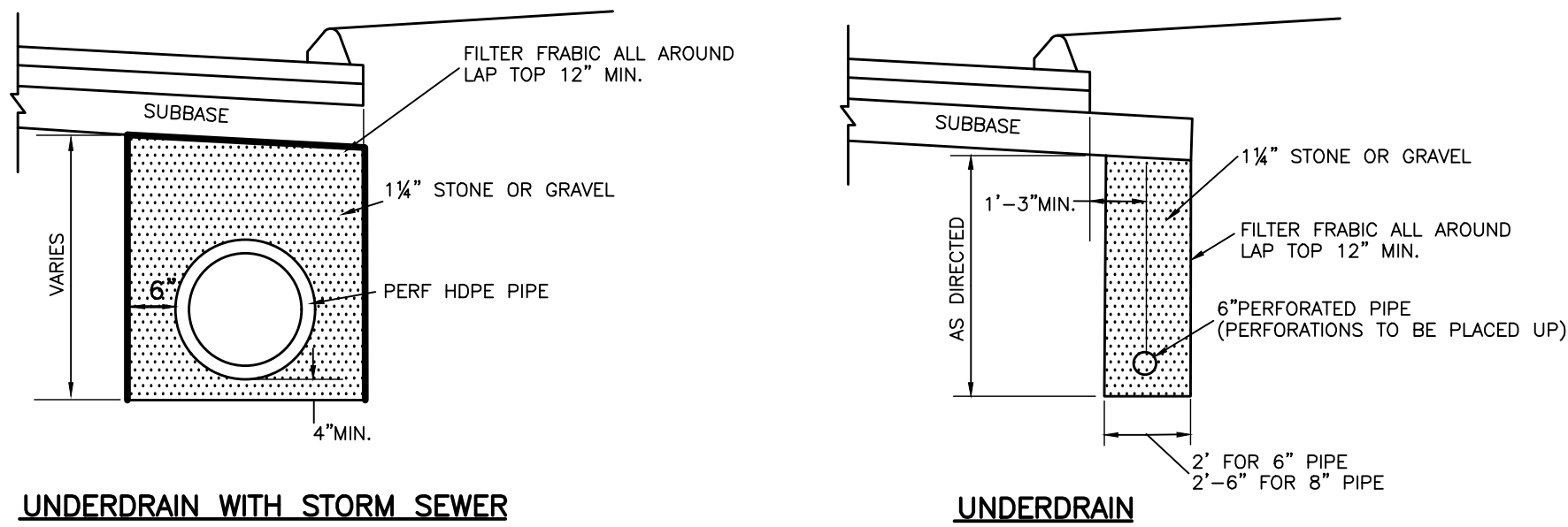
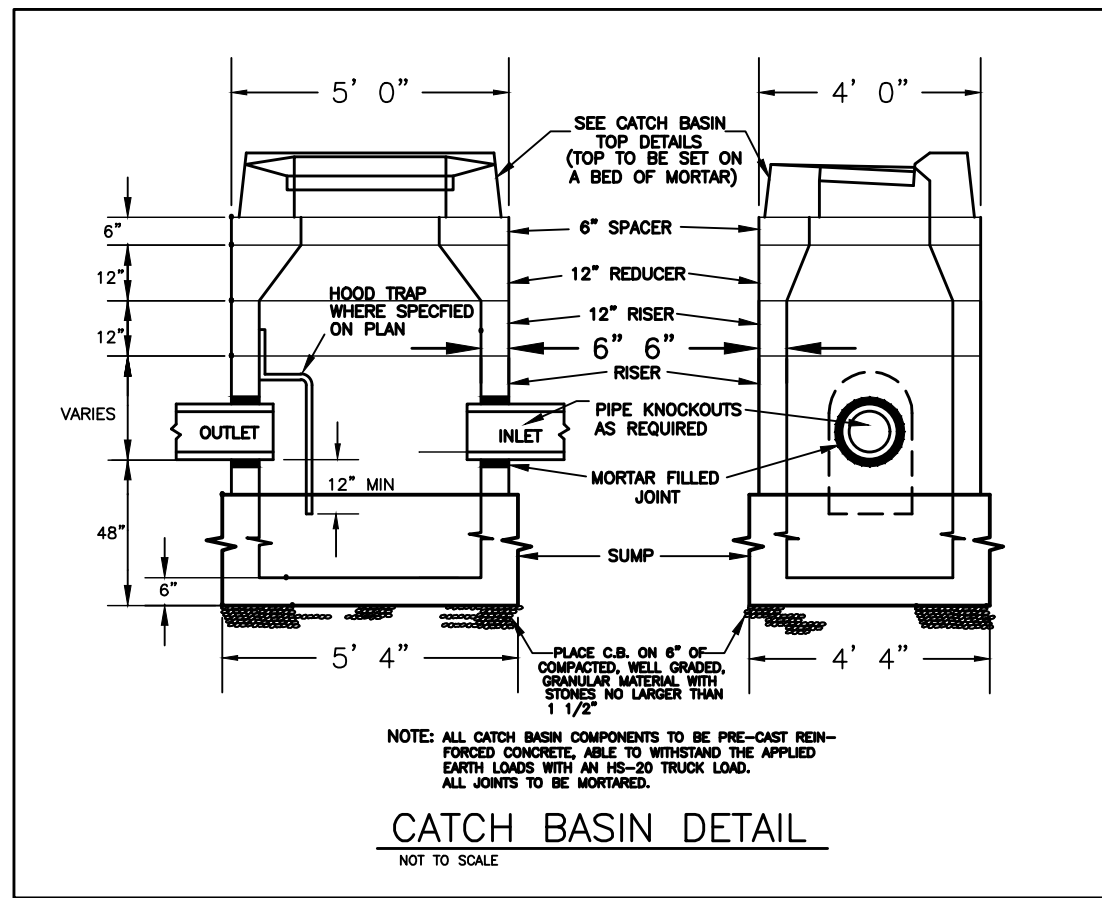
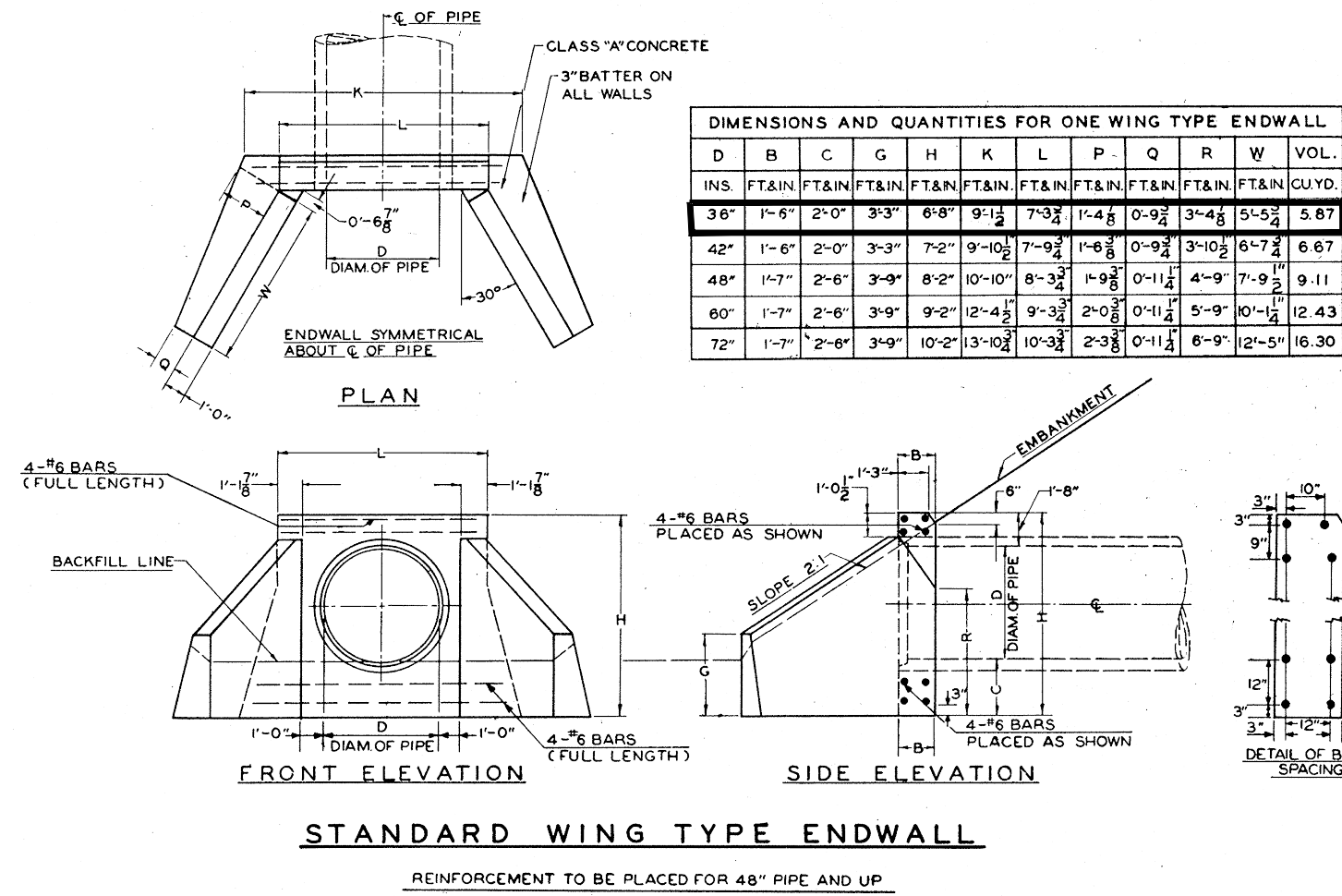
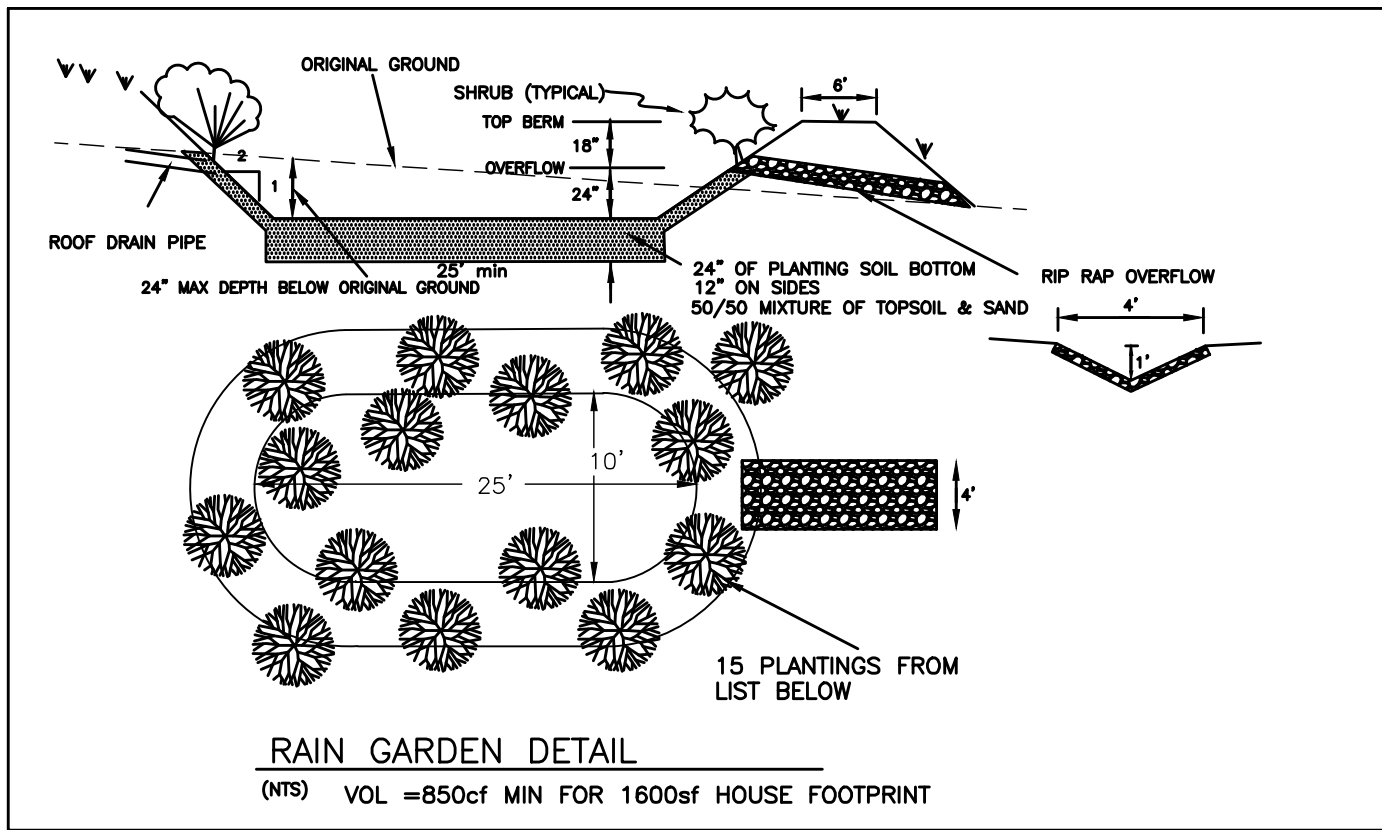


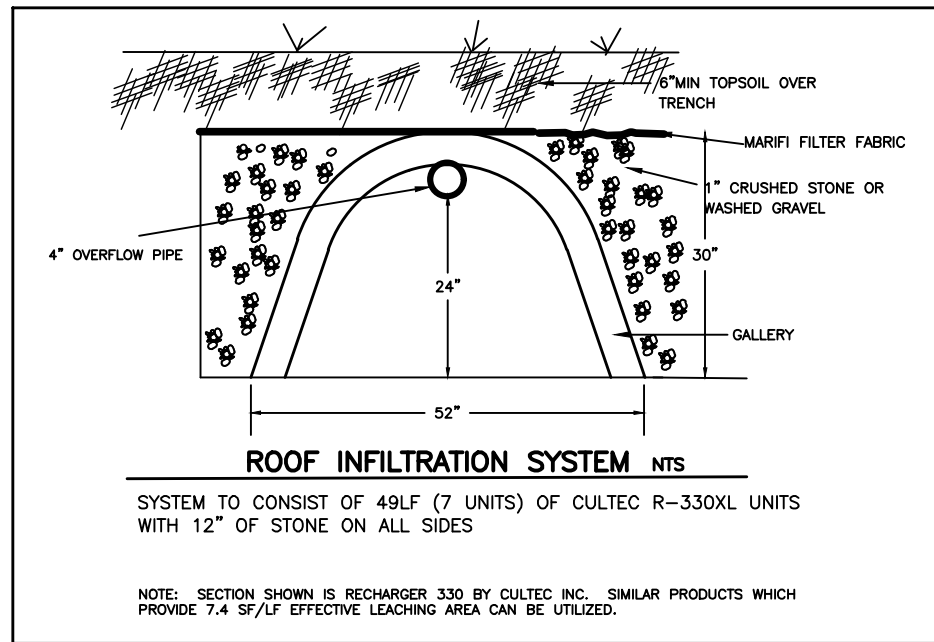
Table 1a: Herbaceous Seed Mix for Rain Garden
New England Erosion Control/Restoration Mix (NEW)*

Scientific Name	Common Name
Aster novae angliae	New England aster
Bidens cernua	Nodding bur marigold
Eupatorium maculatum	Joe Pye
Eupatorium perfoliatum	Boneset
Eryngium yuccifolium	Virginia wild yie
Euthamia graminifolia	Grassleaf goldenrod
Festuca rubra	Creeping red fescue
Juncus effusus	Soft rush
Panicum virgatum	Switchgrass
Scirpus atrovirens	Green bulrush
Verbena hastata	Blue vervain



INFILTRATION SYSTEM FOR ROOF RUNOFF

1. THE ROOF RUNOFF COLLECTION SYSTEM SHOULD BE SIZED TO COLLECT THE 1st 2" OF RUNOFF FROM PROPOSED HOUSE ROOF. THE SUBDIVISION SITE PLAN SHOWS A TYPICAL SYSTEM COMPRISING OF 5 CULTEC R-330XL UNITS. THE ACTUAL SYSTEM SIZE WILL DEPEND ON THE SIZE OF THE HOUSE FOOTPRINT.
2. THE REQUIRED STORAGE CAPACITY CAN BE PROVIDED BY A IN GROUND SYSTEM OR SURFACE RAIN GARDEN AS LONG AS THE REQUIRED CAPACITY IS PROVIDED
3. THE TYPICAL DETAIL SHOWN REPRESENT THE REQUIRED REQUIRED STORAGE FOR TYPICAL HOUSE SIZES WOULD BE:
2000sf HOUSE 335cf OF STORAGE
2500sf HOUSE 420cf
3000sf HOUSE 500cf
3500sf HOUSE 585cf
4. THE FINAL SHAPE AND DEPTH OF THE RAIN GARDEN CAN BE ADJUSTED TO MEET ON SITE CONDITIONS. THE FINAL VOLUME SHOULD BE VERIFIED PRIOR TO FINAL LANDSCAPING.



SOIL TYPES FOUND ON SITE PER WEB SOIL SURVEY

SYMBOL	NAME
3	Ridgebury, Leicester, and Whitman soils, 0 to 8 percent slopes, extremely stony
17	Timokwa and Natchaug soils, 0 to 2 percent slopes
18	Catden and Freetown soils, 0 to 2 percent slopes
38C	Hinckley loamy sand, 3 to 15 percent slopes
45A	Woodbridge fine sandy loam, 0 to 3 percent slopes
45B	Woodbridge fine sandy loam, 3 to 8 percent slopes
46B	Woodbridge fine sandy loam, 0 to 8 percent slopes, very stony
47C	Woodbridge fine sandy loam, 3 to 15 percent slopes, extremely stony
50B	Sutton fine sandy loam, 3 to 8 percent slopes
60B	Canton and Charlton fine sandy loams, 3 to 8 percent slopes
60C	Canton and Charlton fine sandy loams, 8 to 15 percent slopes
60D	Canton and Charlton soils, 15 to 25 percent slopes
61B	Canton and Charlton fine sandy loams, 0 to 8 percent slopes, very stony
61C	Canton and Charlton fine sandy loams, 8 to 15 percent slopes, very stony
62C	Canton and Charlton fine sandy loams, 3 to 15 percent slopes, extremely stony
62D	Canton and Charlton fine sandy loams, 15 to 35 percent slopes, extremely stony
73C	Charlton-Chatfield complex, 0 to 15 percent slopes, very rocky
75C	Hollis-Chatfield-Rock outcrop complex, 3 to 15 percent slopes
75E	Hollis-Chatfield-Rock outcrop complex, 15 to 45 percent slopes
84B	Paxton and Montauk fine sandy loams, 3 to 8 percent slopes
84C	Paxton and Montauk fine sandy loams, 8 to 15 percent slopes
85B	Paxton and Montauk fine sandy loams, 3 to 8 percent slopes, very stony
85C	Paxton and Montauk fine sandy loams, 8 to 15 percent slopes, very stony
86C	Paxton and Montauk fine sandy loams, 3 to 15 percent slopes, extremely stony
86D	Paxton and Montauk fine sandy loams, 15 to 35 percent slopes, extremely stony

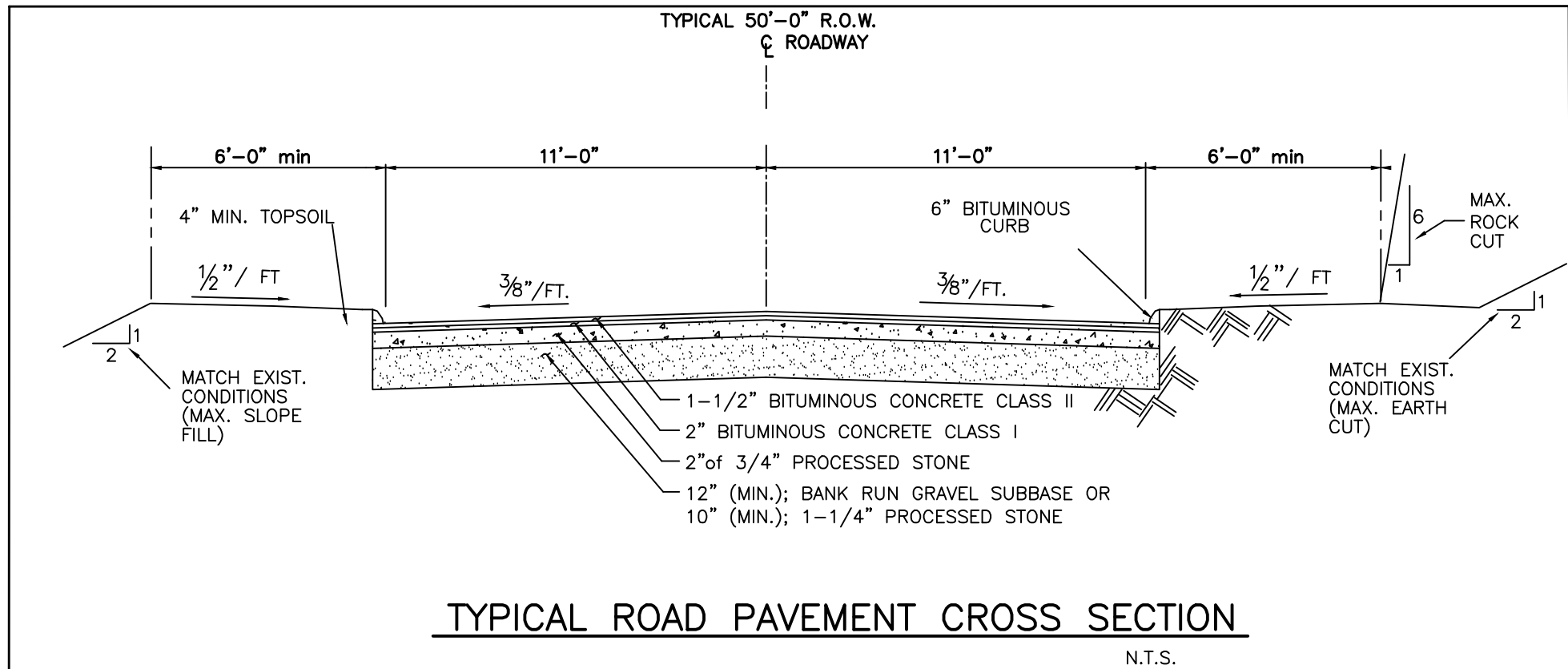


Table 2. PLANTINGS FOR RAIN GARDENS

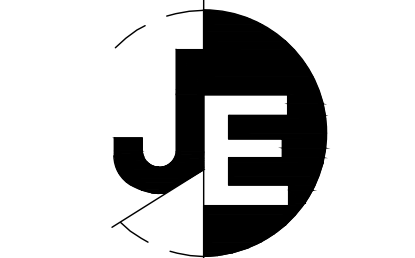
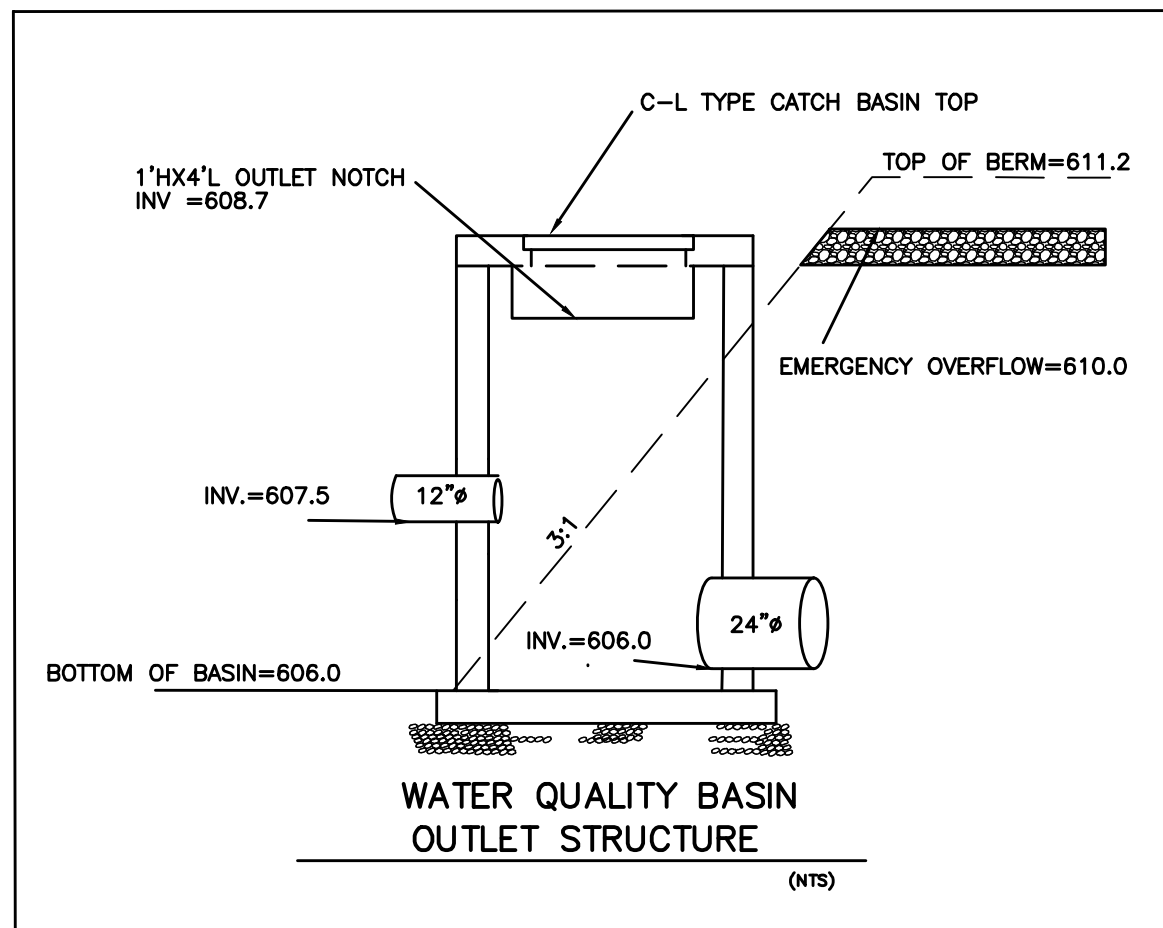
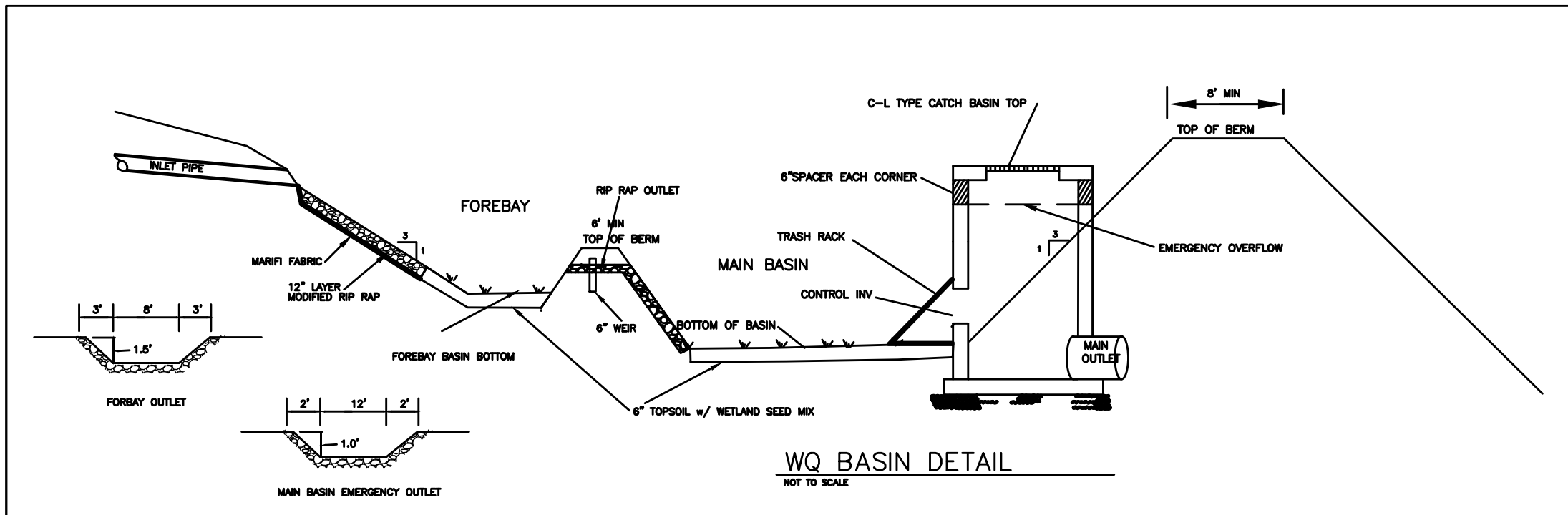
Table 1b: Shrubs for Rain Garden

Scientific Name	Common Name
Aronia arbutifolia	Red Chokeberry
Ceanothus americanus	Sweet pepperbush
Cornus amomum	Silky dogwood
Flex verticillata	Winterberry
Myrica pensylvanica	Bayberry
Sambucus canadensis	Elderberry
Salix discolor	Pussy willow
Vaccinium corymbosum	Highbush blueberry
Viburnum dentatum	Arrowwood

* Available from New England Wetland Plants (NEWP) in Amherst, Massachusetts

OPEN SPACE CALCULATIONS
TOTAL AREA = 73.2 AC
AREA STEEP SLOPES AND WETLANDS = 29.8 AC (40.7%)
OPEN SPACE REQUIRED = 72.3 X 0.15 = 10.8 AC
USEABLE OPEN SPACE REQUIRED = 10.8 X (100-40.3) = 6.4 AC

TOTAL OPEN SPACE PROVIDED = 33.2 AC
OPEN SPACE STEEP SLOPES AND WETLANDS = 20.6 AC
USABLE OPEN SPACE = 33.2 AC - 20.6 AC = 12.6 AC



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HOLLY ESTATES
203 & 211 BERKSHIRE ROAD
NEWTOWN CONNECTICUT

REVISIONS

#	DATE	DESCRIPTION

DATE: 09-30-20
PROJECT #: 2759
DRAWING FILE: SITE
DRAWN BY: IE
SCALE: NTS

TITLE

CONSTRUCTION
DETAILS

SHEET NUMBER

**INLAND WETLANDS AND WATERCOURSE REGULATIONS
of the Town and Borough of Newtown, Connecticut**

APPENDIX D

Permit / Permit Modification Application Form

(Please note: Failure to provide all of the information requested may result in your application being considered incomplete and rejected without prejudice by the commission.)

☒ **Permit, or**

☐ **Permit Modification** (existing permit application # _____) or

☐ **Request for Extension** (existing permit application # _____)

1. Name of Applicant: NEGREIRO & SONS CONSTRUCTION LLC

Address: 17 WOODBINE ROAD, WOODBRIDGE CT 06525

Phone: (Home) _____ (Business) 203-605-5888

2. Owner's Name: ESTATE OF SYLVESTER COCIVI

Address: PO BOX 745 SOUTH BURY CT 06488

Phone: (Home) _____ (Business) 203-586-8327

Note: If applicant is not the property owner, the owner's written consent to the application must be attached to this application form.

3. Project Location: 203 & 211 BERKSHIRE ROAD

Map: 54 Block: 11 Lot: 1 Newtown Tax Account # 7194 & 10354
53 2 17

a. Is project located in the Aquifer Protection District? Yes _____ No X

If yes then the applicant must notify CTDPH as defined in P.A. 06-53

b. Is the project located within a Public Water Supply Watershed? Yes _____ No X

If yes then the applicant must notify CTDPH as defined in P.A. 06-53

c. Is the project located within 500 ft of the border with an adjoining municipality? Yes _____ No X

d. List the current zoned use for which the proposed activity is to occur and present use:

2 ACRES SINGLE FAMILY RESIDENTIAL

INLAND WETLANDS AND WATERCOURSE REGULATIONS
of the Town and Borough of Newtown, Connecticut

4. Quantitative Information:

- a. Wetland Soil Type(s): 3,17,18
- b. Upland Soil Type(s): 45, 50, 60, 73, 84
- c. Amount of wetlands proposed for alteration: 2000sf
- d. Amount in linear feet of stream proposed for alteration: 120ft
- e. Amount of total area proposed for alteration: 15.0ac
- f. Amount of material to be removed or deposited in wetlands or watercourse: 150cy
- g. Amount of total material to be removed or deposited: 2000cy ROAD CONSTRUCTION MATERIALS
200cy MAX. PER LOT

5. Describe the proposed activity and estimated time for completion of the project: _____

CONSTRUCT 1550ft ROAD AND ASSOCIATED IMPROVEMENTS TO PROVIDE
ACCESS TO 15 NEW SINGLE FAMILY HOMES.

ROAD CONSTRUCTION 6 MONTHS, HOMES 2 TO 3 YEARS

4. Describe the purpose of the proposed activity: _____

DIRECT DISTURBANCE: ROAD STA 8+30; PIPE WATERCOURSE AND FILL 2000sf OR WETLANDS
PROPOSED MITIGATION: CONSTRUCT APPROX 4500sf OF NEW WETLAND ON LOT 2

PLEASE NOTE: The Commission may require additional data, information, or reports as it deems necessary in order to adequately evaluate the application. Signature of the applicant is a release for access to the parcel for all persons necessary to the determination of said application.

I have personally examined the information submitted in this document and certify that the information is true, accurate, and complete to the best of my knowledge. I understand that providing false information MAY BE PUNISHABLE AS A CRIMINAL OFFENSE in accordance with Section 22a-6 of the Connecticut General Statutes.

Submitted By: _____

JOSE NEGREIRO
Printed

Signature

9/23/20
Date

Office use only

Fee Received: _____ Date: _____ Receiving Individual: _____

STORMWATER MANAGEMENT PLAN

FOR

HOLLY ESTATES

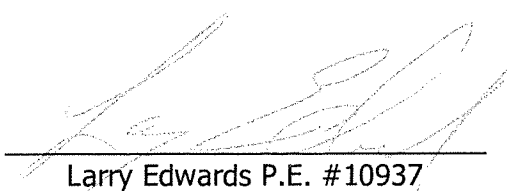
203 & 211 BERKSHIRE ROAD

NEWTOWN, CONNECTICUT

September, 15, 2020



Prepared by
J. Edwards & Associates, LLC
227 Stepney Road, Easton, CT 06612



Larry Edwards P.E. #10937

PROJECT NARRATIVE

This project consists of a 73.2 acre parcel located On Berkshire Road in Newtown, Connecticut. The site will be developed as a 16 lot residential subdivision

The westerly portion of the property is a mix of woods and open farmland which slopes easterly to a large wetland and watercourse system. Another wetland area is located in the southwest corner of the property. In total approximately 30.2 acres of the site is classified as wetland soils. All of the site runoff flows into this wetland. The USDA Soil Survey classifies the majority of the developable portion of the site as soil group C.

The site contains one existing home. A total of 15 new homes are proposed. These home sites will be accessed by a new 1550' long residential street.

All of the runoff from the new road will be collected and treated by a water quality basin. This basin will also treat the driveway runoff from the 6 lots located uphill of the proposed road. The driveway runoff from the remaining 9 new lots will be treated by individual rain gardens. Roof runoff from each of the new homes will be collected and discharged to either an inground infiltration system or rain garden.

The drainage analysis for the site includes 2, 10, 25 and 100 year storm events. A summary of the analysis is provided.

STORM WATER QUALITY CALCULATIONS

Water Quality Volume

This volume represents the amount of storm water runoff that should be captured and treated in order to remove the majority pollutants on an average annual basis. The study area includes the total project site along with any off site area passing through. The building runoff will be collected separately and discharged to an infiltration system.

The total drainage area flowing to the water quality basin, including undisturbed areas will be 3.8 acres. This includes all of the proposed development area.

$$WQV = (1'')(R)(A)/12$$

$$R = (0.05) + (0.009)(\% \text{ impervious})$$

WQ Basin	Area	Imperv. Area	% Imperv.	R	WQV Required (cf)	WQV Proposed (cf)
1	9.82	1.22	12.4	0.16	5703	8920

The basin forebay will provide 2789cf of treatment capacity or 49% of the total required.

Individual infiltration systems have been proposed to collect runoff from all house roof area. Additional rain gardens will collect runoff from all driveways which are not treated by water quality basin #1. All of these systems have been sized to treat the first 1" of runoff.

Ground Water Recharge Volume

This requirement is intended to maintain pre-development annual groundwater recharge volume by capturing and infiltrating the storm water runoff.

Ground water recharge will be provided through the upper wetland storage area and the water quality basin. The total site impervious area is 1.1 acres.

$$GWV = D \times A \times I / 12$$

Soil recharge depth calculation:

Soil group c D = 0.1

Site	Area	% Imperv.	GWV Required (cf)	GWV Proposed (cf)
	9.82	12.4%	442	10,376

Stream Channel Protection

The design criteria will be to limit the 2 year 24 hour post development flow rate to 50% of the pre development 2 year 24 hour flow rate.

NOTE: Values come from the HydroCAD report.

WQ Basin	2yr Exist	2yr Prop
1	7.23	3.20

Outlet Protection

The water quality basin outlet will be protected with a rip rap pad sized in accordance with the Connecticut Erosion Control guidelines

$$\text{LENGTH} = L_a = 1.7(Q) / (D_o)^{3/2} + 8(D_o)$$

$$\text{WIDTH} = 3(D_o) + L_a$$

WQ BASIN 1

Q25yr = 19.8cfs outlet pipe 18"

$$L_a = (1.7)(19.8) / (1.83) + 8(1.5) = 30.4' \text{ (32' provided)}$$

$$W = 3(1.5) + 30.4 = 34.9 \text{ (35' provided)}$$

$$V = 19.8 / 35 = 0.6 \text{fps}$$

OUTLET CROSS CULVERT STA 8+25

Q25yr = 21.9cfs outlet pipe = 24"

$$L_a = 1.7(21.9) / (2.8) + 8(2) = 30.89$$

$$W = 3(2.0) + 38 = 44'$$

Conveyance Protection

In accordance with the Monroe land use regulations, all project drainage improvements have been designed to handle a minimum 10 year storm event with outlet overflow from the basin designed to handle a 100 year storm.

Peak Runoff Attenuation

The storm management system for this project will control post development peak runoff for the 2, 10, 25 and 100 year storm events to levels less than or equal to the pre development rates. See summary below.

Emergency Outlet Protection

The emergency outlet controls have been designed to handle a 100 year storm event. See Hydrocad analysis.

Downstream Analysis

The drainage study for this project has also looked at the overall project impact to downstream off site water courses. Peak runoff from the total site will not exceed pre development levels.

SUMMARY TOTAL STUDY AREA

AREA	2 YR EXIST	2 YR PROP	10 YR EXIST	10 YR PROP	25 YR EXIST	25 YR PROP	100 YR EXIST	100 YR PROP
<i>Total site</i>	48.48	39.80	104.76	98.89	142.0	136.12	200.77	194.96



(new Pond)



Q EXISTING



Q TO BASIN 1



FOREBAY



MAIN BASIN



PROPOSED HOUSES
LOTS 2-7



HOUSES SYSTEMS
LOTS 2-7



BYPASS 9 HOUSES &
DRIVEWAYS



LOTS 1, 8-10, 12, 16
SYSTEMS



BYPASS BASIN



(new Reach)



EXISTING HOUSE



HOUSE PROPOSED



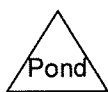
(new Pond)



Subcat



Reach



Pond



Link

Drainage Diagram for 2759

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
7.500	74	>75% Grass cover, Good, HSG C (2S, 10S)
76.523	76	Woods/grass comb., Fair, HSG C (1S, 2S, 3S, 10S)
30.000	79	Woods, Fair, HSG D (10S)
30.000	83	Woods, Poor, HSG D (1S)
0.460	98	Paved parking, HSG B (8S)
1.318	98	Paved parking, HSG C (2S)
0.689	98	Roofs, HSG C (4S, 6S, 8S)
146.490	78	TOTAL AREA

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Type III 24-hr 100 yr Rainfall=7.98"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Q EXISTING

Runoff Area=73.200 ac 0.00% Impervious Runoff Depth>5.09"
Flow Length=2,450' Tc=51.6 min CN=79 Runoff=200.77 cfs 31.064 af

Subcatchment2S: Q TO BASIN 1

Runoff Area=9.925 ac 13.28% Impervious Runoff Depth>5.00"
Flow Length=720' Tc=38.4 min CN=78 Runoff=31.20 cfs 4.135 af

Subcatchment3S: EXISTING HOUSE

Runoff Area=2,000 sf 0.00% Impervious Runoff Depth>4.82"
Tc=5.0 min CN=76 Runoff=0.28 cfs 0.018 af

Subcatchment4S: HOUSE PROPOSED

Runoff Area=2,000 sf 100.00% Impervious Runoff Depth>7.13"
Tc=5.0 min CN=98 Runoff=0.36 cfs 0.027 af

Subcatchment6S: PROPOSED HOUSES

Runoff Area=12,000 sf 100.00% Impervious Runoff Depth>7.13"
Tc=5.0 min CN=98 Runoff=2.17 cfs 0.164 af

Subcatchment8S: BYPASS 9 HOUSES &

Runoff Area=36,055 sf 100.00% Impervious Runoff Depth>7.13"
Tc=10.0 min CN=98 Runoff=5.61 cfs 0.492 af

Subcatchment10S: BYPASS BASIN

Runoff Area=62.170 ac 0.00% Impervious Runoff Depth>4.87"
Tc=51.6 min CN=77 Runoff=163.83 cfs 25.206 af

Reach 15R: (new Reach)

Inflow=194.96 cfs 29.186 af
Outflow=194.96 cfs 29.186 af

Pond 5P: (new Pond)

Peak Elev=601.58' Storage=271 cf Inflow=0.36 cfs 0.027 af
Discarded=0.01 cfs 0.014 af Primary=0.27 cfs 0.011 af Outflow=0.28 cfs 0.025 af

Pond 7P: HOUSES SYSTEMS LOTS 2-7

Peak Elev=651.58' Storage=1,626 cf Inflow=2.17 cfs 0.164 af
Discarded=0.07 cfs 0.082 af Primary=1.62 cfs 0.068 af Outflow=1.70 cfs 0.150 af

Pond 9P: LOTS 1, 8-10,12, 16 SYSTEMS

Peak Elev=1.17' Storage=3,979 cf Inflow=5.61 cfs 0.492 af
Discarded=0.20 cfs 0.163 af Primary=3.87 cfs 0.325 af Outflow=4.07 cfs 0.488 af

Pond 12P: (new Pond)

Pond 16P: MAIN BASIN

Peak Elev=610.23' Storage=22,461 cf Inflow=31.51 cfs 4.066 af
Discarded=0.34 cfs 0.221 af Primary=30.63 cfs 3.655 af Outflow=30.97 cfs 3.875 af

Pond 17P: FOREBAY

Peak Elev=616.49' Storage=4,407 cf Inflow=31.20 cfs 4.135 af
Discarded=0.09 cfs 0.070 af Primary=31.08 cfs 3.998 af Outflow=31.16 cfs 4.068 af

Total Runoff Area = 146.490 ac Runoff Volume = 61.107 af Average Runoff Depth = 5.01"
98.32% Pervious = 144.023 ac 1.68% Impervious = 2.467 ac

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Type III 24-hr 100 yr Rainfall=7.98"

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Summary for Subcatchment 1S: Q EXISTING

Runoff = 200.77 cfs @ 12.69 hrs, Volume= 31.064 af, Depth> 5.09"

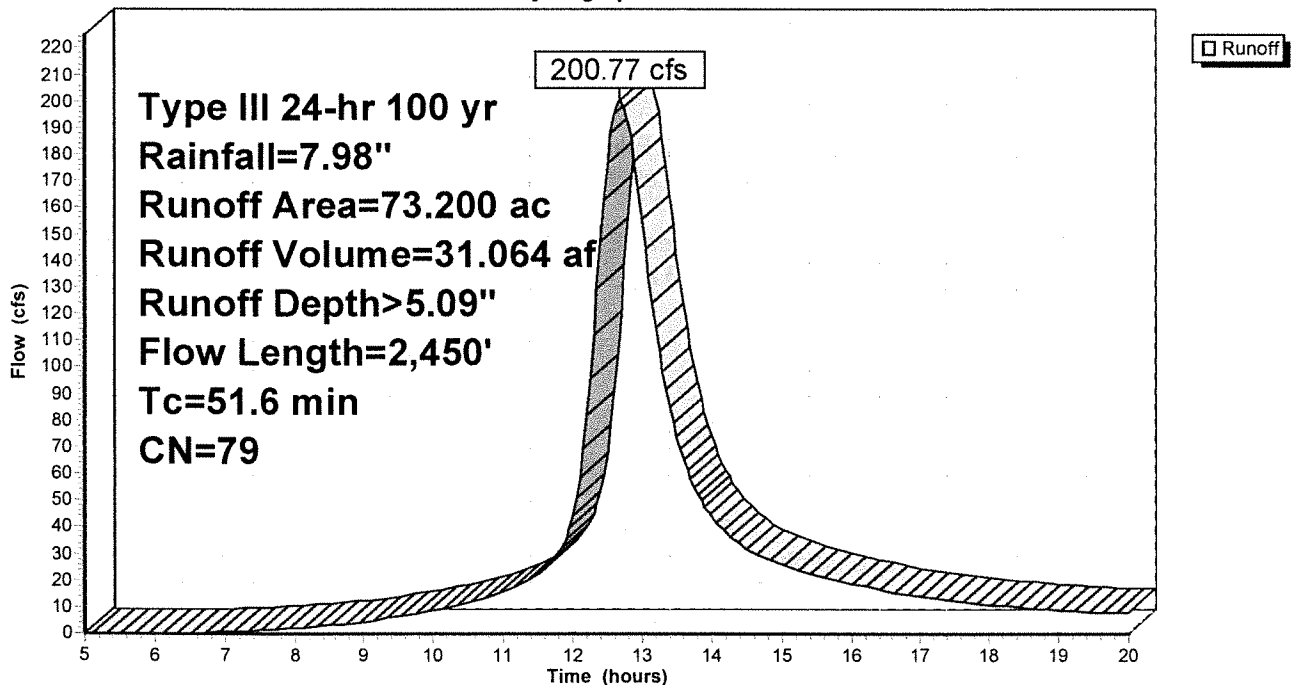
Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr Rainfall=7.98"

Area (ac)	CN	Description
43.200	76	Woods/grass comb., Fair, HSG C
30.000	83	Woods, Poor, HSG D
73.200	79	Weighted Average
73.200		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.6	150	0.0600	0.13		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.40"
6.3	650	0.1200	1.73		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
26.7	1,650	0.0030	1.03	10.30	Channel Flow, Area= 10.0 sf Perim= 12.0' r= 0.83' n= 0.070 Sluggish weedy reaches w/pools
51.6	2,450	Total			

Subcatchment 1S: Q EXISTING

Hydrograph



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Summary for Subcatchment 2S: Q TO BASIN 1

Runoff = 31.20 cfs @ 12.52 hrs, Volume= 4.135 af, Depth> 5.00"

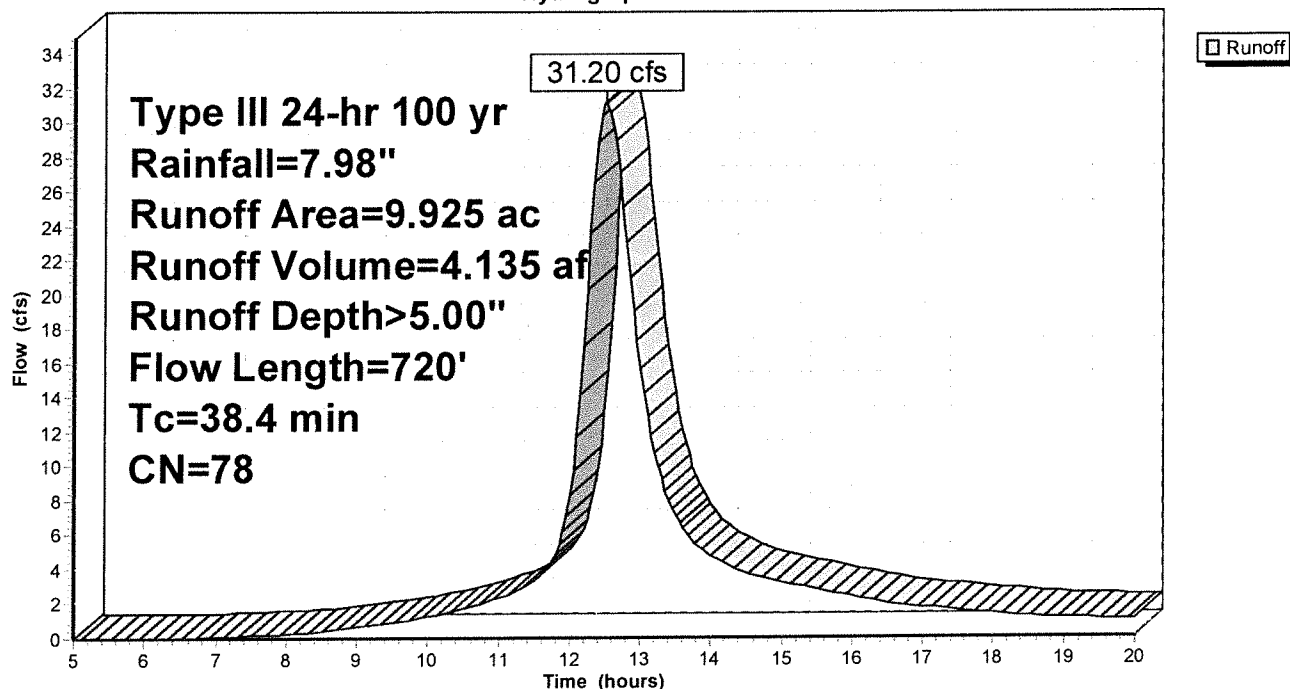
Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr Rainfall=7.98"

Area (ac)	CN	Description
5.607	76	Woods/grass comb., Fair, HSG C
1.318	98	Paved parking, HSG C
3.000	74	>75% Grass cover, Good, HSG C
9.925	78	Weighted Average
8.607		86.72% Pervious Area
1.318		13.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
32.3	150	0.0150	0.08		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.40"
5.7	420	0.0600	1.22		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.4	150	0.0100	6.22	7.63	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.011 Concrete pipe, bends & connections
38.4	720	Total			

Subcatchment 2S: Q TO BASIN 1

Hydrograph



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Type III 24-hr 100 yr Rainfall=7.98"

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Summary for Subcatchment 3S: EXISTING HOUSE

Runoff = 0.28 cfs @ 12.07 hrs, Volume= 0.018 af, Depth> 4.82"

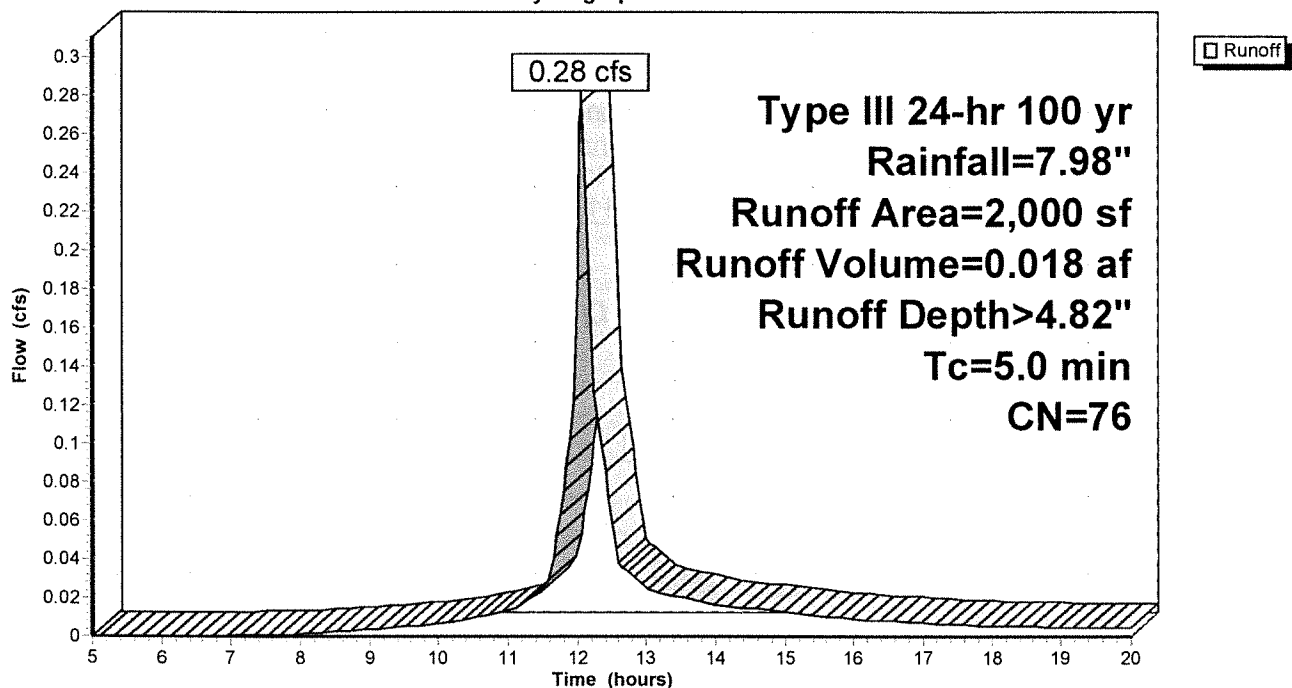
Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr Rainfall=7.98"

Area (sf)	CN	Description
2,000	76	Woods/grass comb., Fair, HSG C
2,000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment 3S: EXISTING HOUSE

Hydrograph



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Type III 24-hr 100 yr Rainfall=7.98"

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Summary for Subcatchment 4S: HOUSE PROPOSED

Runoff = 0.36 cfs @ 12.07 hrs, Volume= 0.027 af, Depth> 7.13"

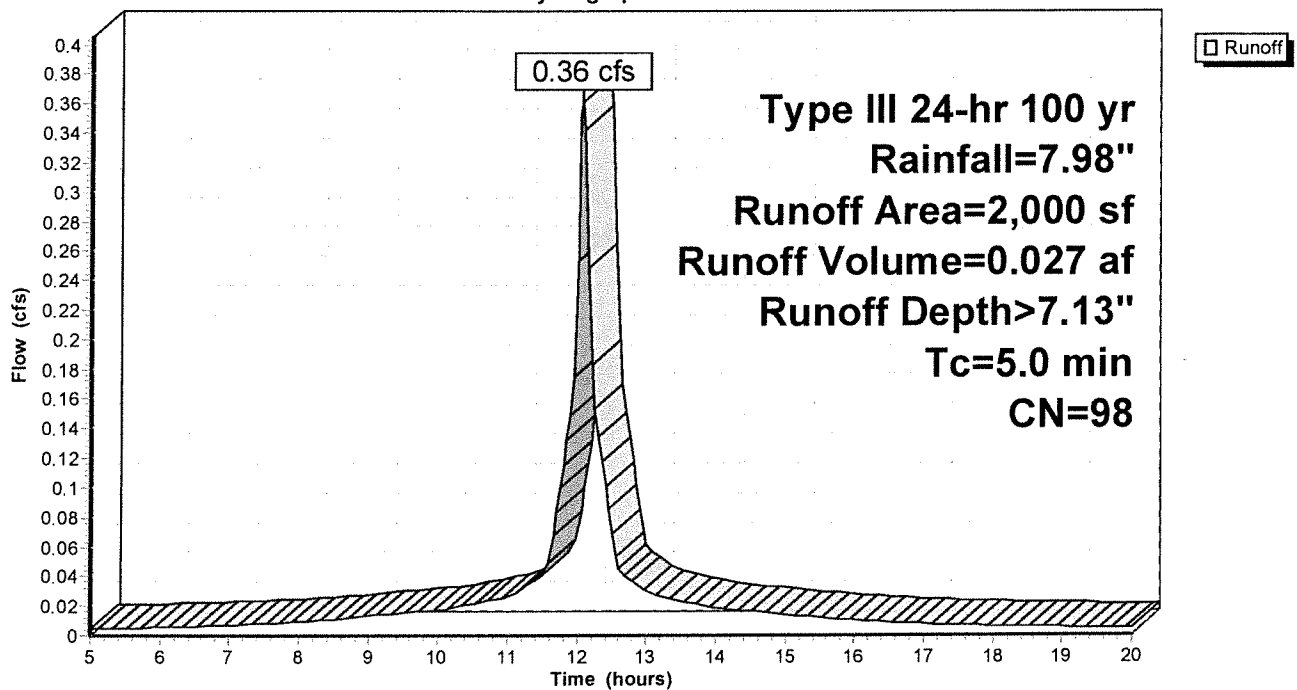
Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr Rainfall=7.98"

Area (sf)	CN	Description
2,000	98	Roofs, HSG C
2,000		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Subcatchment 4S: HOUSE PROPOSED

Hydrograph



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Type III 24-hr 100 yr Rainfall=7.98"

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Summary for Subcatchment 6S: PROPOSED HOUSES LOTS 2-7

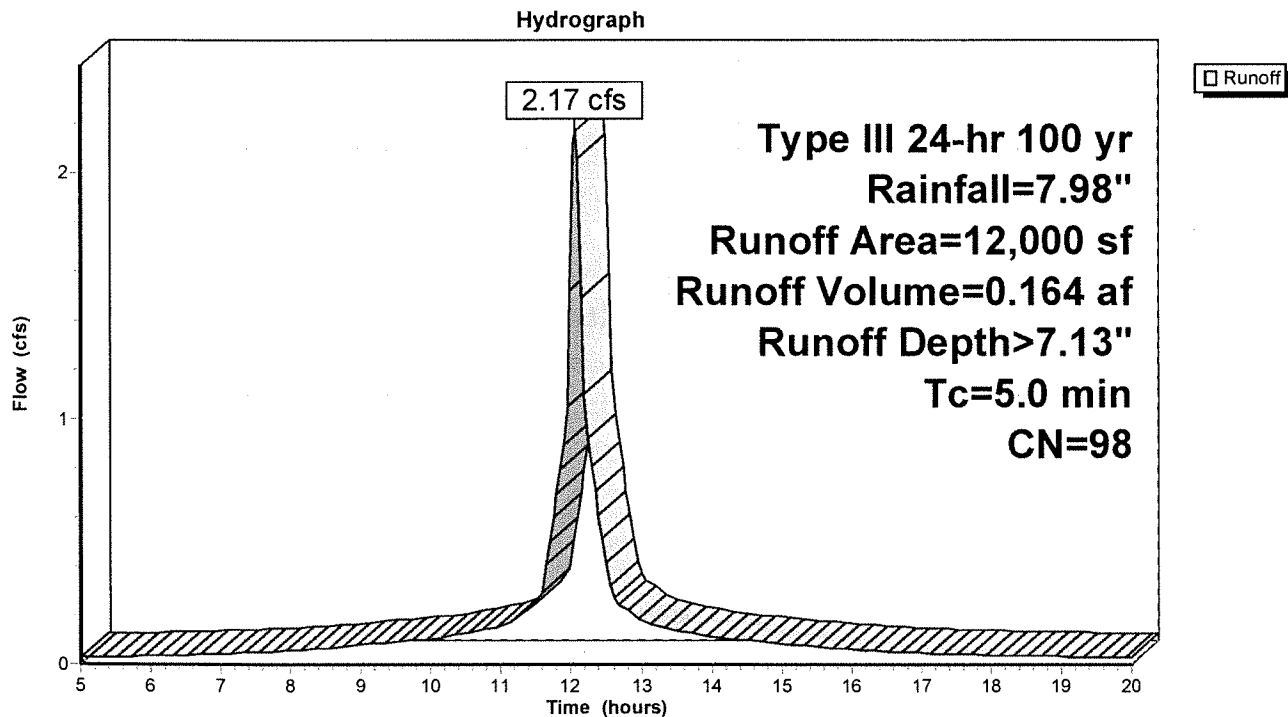
Runoff = 2.17 cfs @ 12.07 hrs, Volume= 0.164 af, Depth> 7.13"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Type III 24-hr 100 yr Rainfall=7.98"

Area (sf)	CN	Description
12,000	98	Roofs, HSG C
12,000		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry, ASSUMED

Subcatchment 6S: PROPOSED HOUSES LOTS 2-7

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Type III 24-hr 100 yr Rainfall=7.98"

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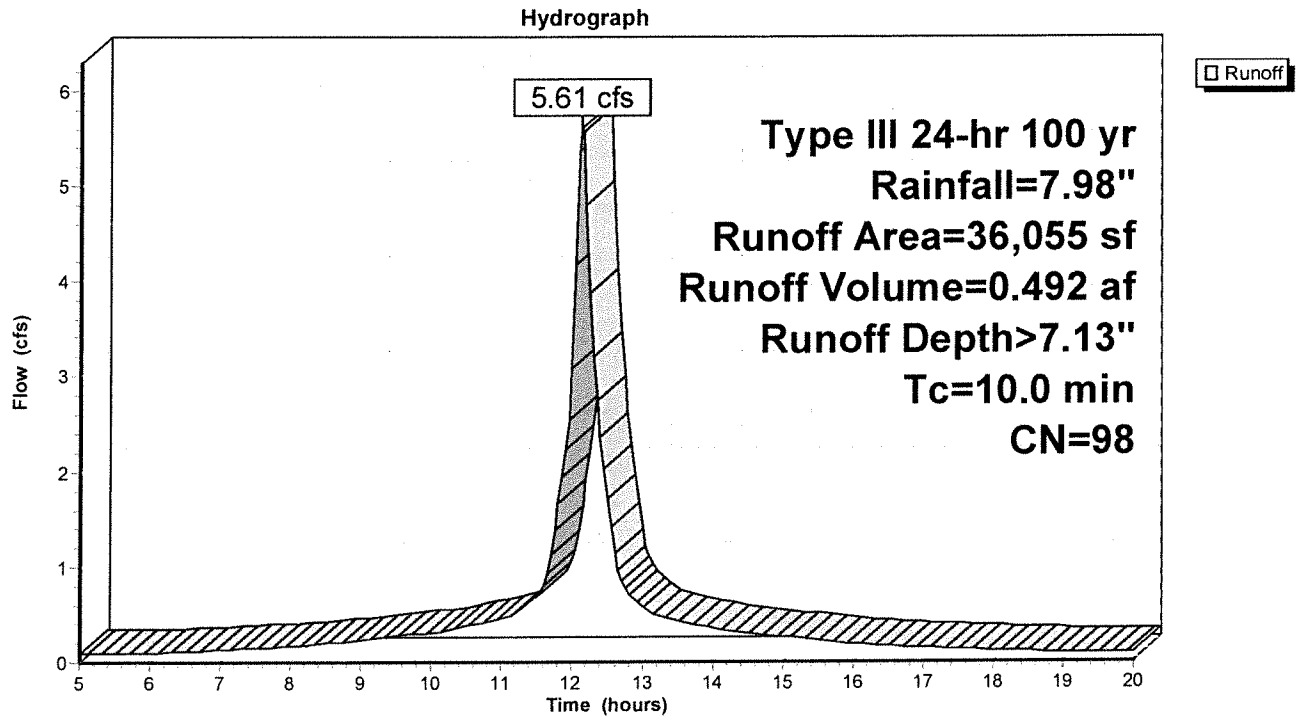
Summary for Subcatchment 8S: BYPASS 9 HOUSES & DRIVEWAYS

Runoff = 5.61 cfs @ 12.14 hrs, Volume= 0.492 af, Depth> 7.13"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr Rainfall=7.98"

Area (sf)	CN	Description
16,000	98	Roofs, HSG C
20,055	98	Paved parking, HSG B
36,055	98	Weighted Average
36,055		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry, ASSUME

Subcatchment 8S: BYPASS 9 HOUSES & DRIVEWAYS

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Type III 24-hr 100 yr Rainfall=7.98"

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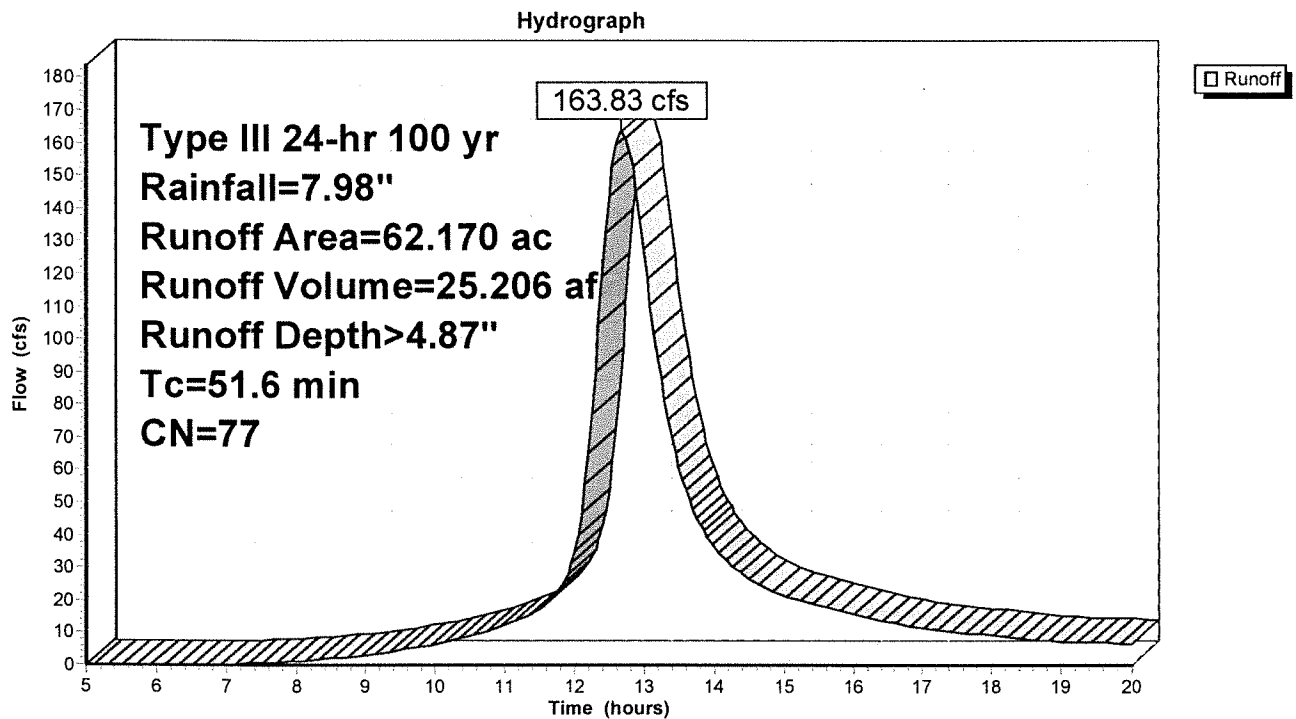
Summary for Subcatchment 10S: BYPASS BASIN

Runoff = 163.83 cfs @ 12.69 hrs, Volume= 25.206 af, Depth> 4.87"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr Rainfall=7.98"

Area (ac)	CN	Description
27.670	76	Woods/grass comb., Fair, HSG C
30.000	79	Woods, Fair, HSG D
4.500	74	>75% Grass cover, Good, HSG C
62.170	77	Weighted Average
62.170		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
51.6					Direct Entry, SAME AS EXISTING

Subcatchment 10S: BYPASS BASIN

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Type III 24-hr 100 yr Rainfall=7.98"

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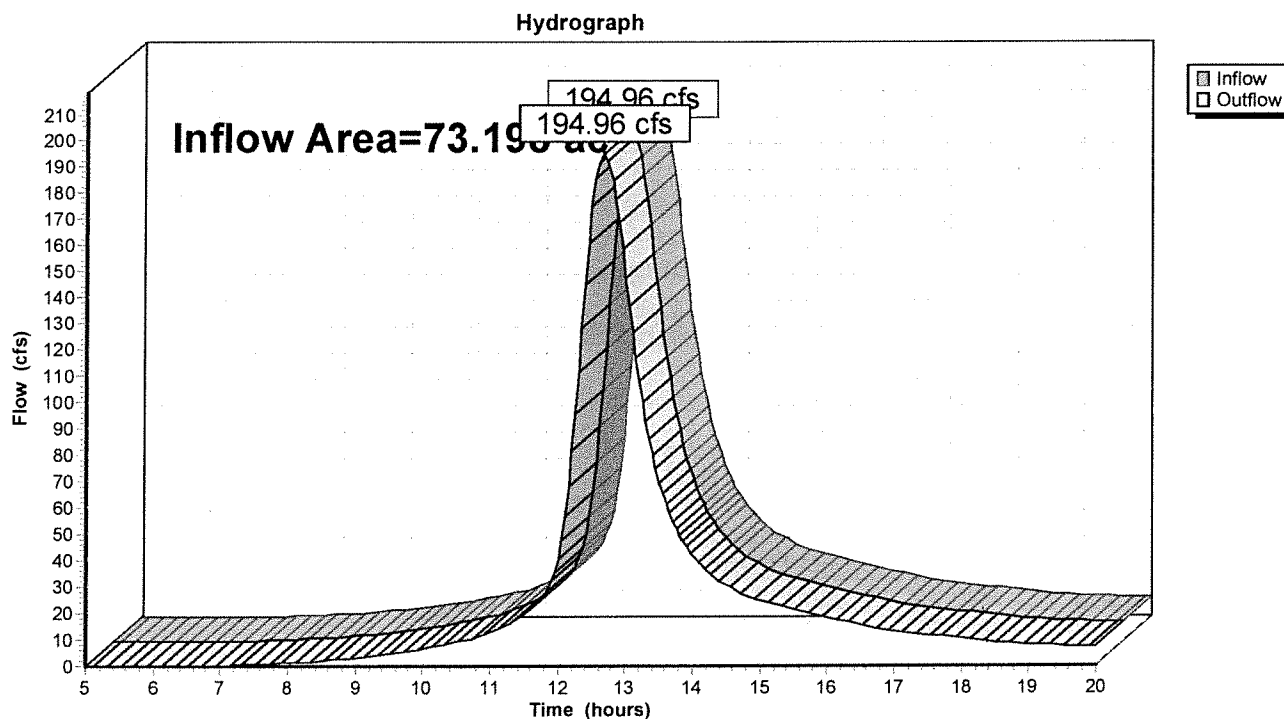
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Summary for Reach 15R: (new Reach)

Inflow Area = 73.198 ac, 3.31% Impervious, Inflow Depth > 4.78" for 100 yr event
Inflow = 194.96 cfs @ 12.67 hrs, Volume= 29.186 af
Outflow = 194.96 cfs @ 12.67 hrs, Volume= 29.186 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 15R: (new Reach)



Summary for Pond 5P: (new Pond)

Inflow Area = 0.046 ac, 100.00% Impervious, Inflow Depth > 7.13" for 100 yr event
 Inflow = 0.36 cfs @ 12.07 hrs, Volume= 0.027 af
 Outflow = 0.28 cfs @ 12.14 hrs, Volume= 0.025 af, Atten= 22%, Lag= 4.0 min
 Discarded = 0.01 cfs @ 8.90 hrs, Volume= 0.014 af
 Primary = 0.27 cfs @ 12.14 hrs, Volume= 0.011 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 601.58' @ 12.14 hrs Surf.Area= 265 sf Storage= 271 cf

Plug-Flow detention time= 72.1 min calculated for 0.025 af (91% of inflow)
 Center-of-Mass det. time= 41.4 min (773.7 - 732.3)

Volume	Invert	Avail.Storage	Storage Description
#1	600.00'	174 cf	Cultec R-180 x 8 Inside #2 Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap
#2	600.00'	142 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 530 cf Overall - 174 cf Embedded = 356 cf x 40.0% Voids
		317 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
600.00	265	0	0
602.00	265	530	530

Device	Routing	Invert	Outlet Devices
#1	Discarded	600.00'	2.000 in/hr Exfiltration over Surface area
#2	Primary	601.00'	4.0" Vert. Orifice/Grate C= 0.600

Discarded OutFlow Max=0.01 cfs @ 8.90 hrs HW=600.02' (Free Discharge)
 ↗1=Exfiltration (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.27 cfs @ 12.14 hrs HW=601.57' (Free Discharge)
 ↗2=Orifice/Grate (Orifice Controls 0.27 cfs @ 3.07 fps)

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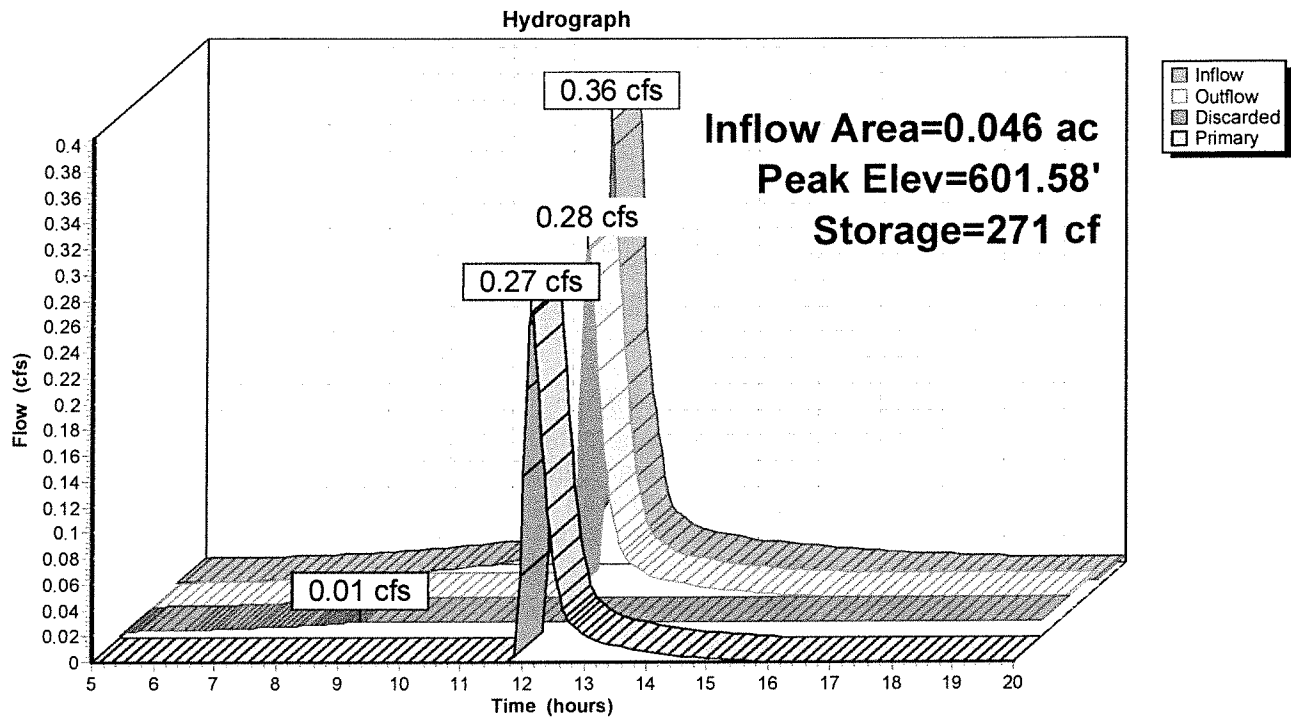
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Type III 24-hr 100 yr Rainfall=7.98"

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Pond 5P: (new Pond)



Summary for Pond 7P: HOUSES SYSTEMS LOTS 2-7

Inflow Area = 0.275 ac, 100.00% Impervious, Inflow Depth > 7.13" for 100 yr event
 Inflow = 2.17 cfs @ 12.07 hrs, Volume= 0.164 af
 Outflow = 1.70 cfs @ 12.14 hrs, Volume= 0.150 af, Atten= 22%, Lag= 4.0 min
 Discarded = 0.07 cfs @ 8.90 hrs, Volume= 0.082 af
 Primary = 1.62 cfs @ 12.14 hrs, Volume= 0.068 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 651.58' @ 12.14 hrs Surf.Area= 1,590 sf Storage= 1,626 cf

Plug-Flow detention time= 72.1 min calculated for 0.150 af (91% of inflow)
 Center-of-Mass det. time= 41.4 min (773.7 - 732.3)

Volume	Invert	Avail.Storage	Storage Description
#1	650.00'	854 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 3,180 cf Overall - 1,045 cf Embedded = 2,135 cf x 40.0% Voids
#2	650.00'	1,045 cf	Cultec R-180 x 48 Inside #1 Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap
		1,899 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
650.00	1,590	0	0
652.00	1,590	3,180	3,180

Device	Routing	Invert	Outlet Devices
#1	Primary	651.00'	4.0" Vert. Orifice/Grate X 6.00 C= 0.600
#2	Discarded	650.00'	2.000 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.07 cfs @ 8.90 hrs HW=650.02' (Free Discharge)
 ↗2=Exfiltration (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=1.61 cfs @ 12.14 hrs HW=651.57' (Free Discharge)
 ↗1=Orifice/Grate (Orifice Controls 1.61 cfs @ 3.07 fps)

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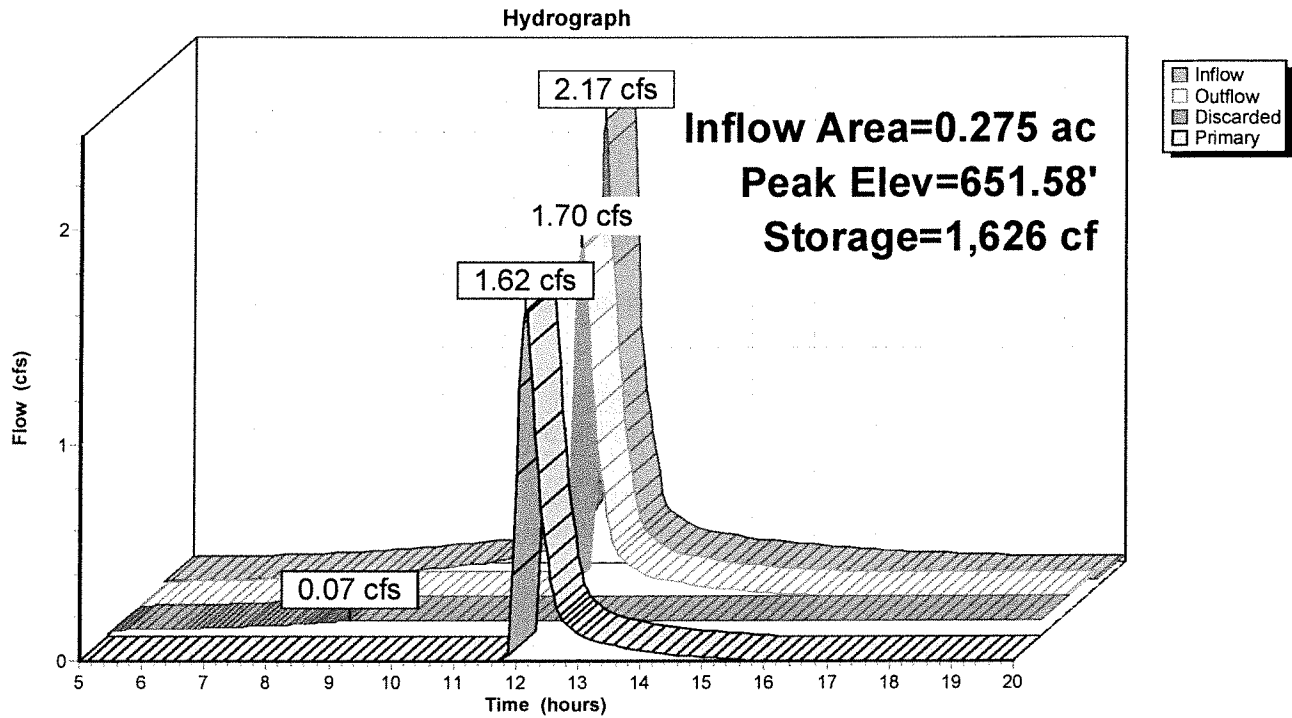
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Type III 24-hr 100 yr Rainfall=7.98"

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Pond 7P: HOUSES SYSTEMS LOTS 2-7



Summary for Pond 9P: LOTS 1, 8-10,12, 16 SYSTEMS

Inflow Area = 0.828 ac, 100.00% Impervious, Inflow Depth > 7.13" for 100 yr event
 Inflow = 5.61 cfs @ 12.14 hrs, Volume= 0.492 af
 Outflow = 4.07 cfs @ 12.25 hrs, Volume= 0.488 af, Atten= 28%, Lag= 6.6 min
 Discarded = 0.20 cfs @ 12.25 hrs, Volume= 0.163 af
 Primary = 3.87 cfs @ 12.25 hrs, Volume= 0.325 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 1.17' @ 12.25 hrs Surf.Area= 4,311 sf Storage= 3,979 cf

Plug-Flow detention time= 32.2 min calculated for 0.488 af (99% of inflow)
 Center-of-Mass det. time= 28.7 min (764.7 - 736.0)

Volume	Invert	Avail.Storage	Storage Description
#1	0.00'	14,700 cf	Custom Stage Data (Prismatic) Listed below (Recalc) x 10

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
0.00	250	0	0
2.00	560	810	810
3.00	760	660	1,470

Device	Routing	Invert	Outlet Devices
#1	Discarded	0.00'	2.000 in/hr Exfiltration over Surface area
#2	Primary	0.00'	Custom Weir/Orifice, Cv= 2.62 (C= 3.28)
			Elev. (feet) 0.00 2.00
			Width (feet) 0.00 4.00

Discarded OutFlow Max=0.20 cfs @ 12.25 hrs HW=1.17' (Free Discharge)
 ↳1=Exfiltration (Exfiltration Controls 0.20 cfs)

Primary OutFlow Max=3.86 cfs @ 12.25 hrs HW=1.17' (Free Discharge)
 ↳2=Custom Weir/Orifice (Weir Controls 3.86 cfs @ 2.83 fps)

2759

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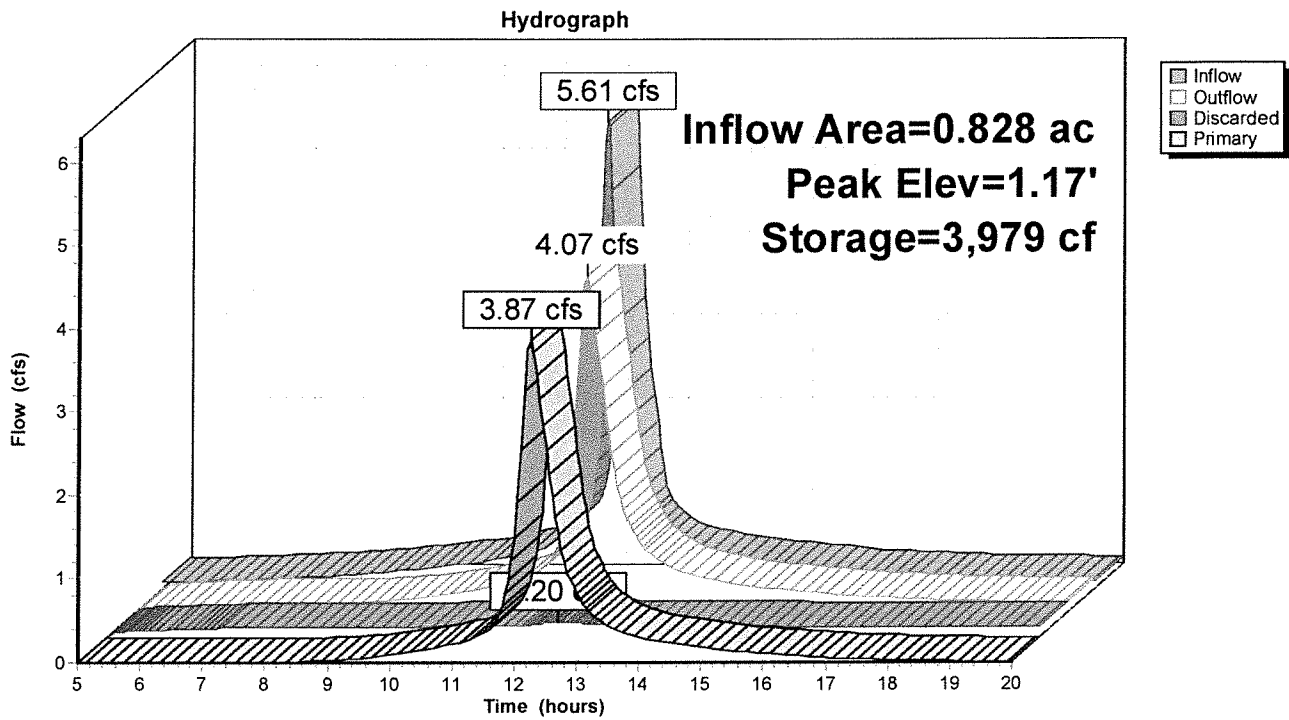
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Type III 24-hr 100 yr Rainfall=7.98"

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Pond 9P: LOTS 1, 8-10,12, 16 SYSTEMS



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Type III 24-hr 100 yr Rainfall=7.98"

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Summary for Pond 12P: (new Pond)

Routing by Stor-Ind method

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Summary for Pond 16P: MAIN BASIN

Inflow Area = 10.200 ac, 15.62% Impervious, Inflow Depth > 4.78" for 100 yr event
 Inflow = 31.51 cfs @ 12.52 hrs, Volume= 4.066 af
 Outflow = 30.97 cfs @ 12.59 hrs, Volume= 3.875 af, Atten= 2%, Lag= 3.9 min
 Discarded = 0.34 cfs @ 12.59 hrs, Volume= 0.221 af
 Primary = 30.63 cfs @ 12.59 hrs, Volume= 3.655 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 610.23' @ 12.59 hrs Surf.Area= 7,293 sf Storage= 22,461 cf

Plug-Flow detention time= 35.9 min calculated for 3.862 af (95% of inflow)
 Center-of-Mass det. time= 20.0 min (825.1 - 805.1)

Volume	Invert	Avail.Storage	Storage Description
#1	606.00'	28,375 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
606.00	3,450	0	0
608.00	5,150	8,600	8,600
610.00	7,050	12,200	20,800
611.00	8,100	7,575	28,375

Device	Routing	Invert	Outlet Devices
#1	Discarded	606.00'	2.000 in/hr Exfiltration over Surface area
#2	Primary	607.50'	12.0" Vert. Orifice/Grate C= 0.600
#3	Primary	610.00'	Custom Weir/Orifice, Cv= 2.62 (C= 3.28) Head (feet) 0.00 1.00 Width (feet) 12.00 16.00
#4	Primary	608.70'	Custom Weir/Orifice, Cv= 2.62 (C= 3.28) Head (feet) 0.00 1.00 1.10 Width (feet) 4.00 4.00 0.00

Discarded OutFlow Max=0.34 cfs @ 12.59 hrs HW=610.23' (Free Discharge)

↑ **1=Exfiltration** (Exfiltration Controls 0.34 cfs)

Primary OutFlow Max=30.54 cfs @ 12.59 hrs HW=610.23' (Free Discharge)

↑ **2=Orifice/Grate** (Orifice Controls 5.65 cfs @ 7.19 fps)

↑ **3=Custom Weir/Orifice** (Weir Controls 4.47 cfs @ 1.56 fps)

↑ **4=Custom Weir/Orifice** (Orifice Controls 20.43 cfs @ 4.86 fps)

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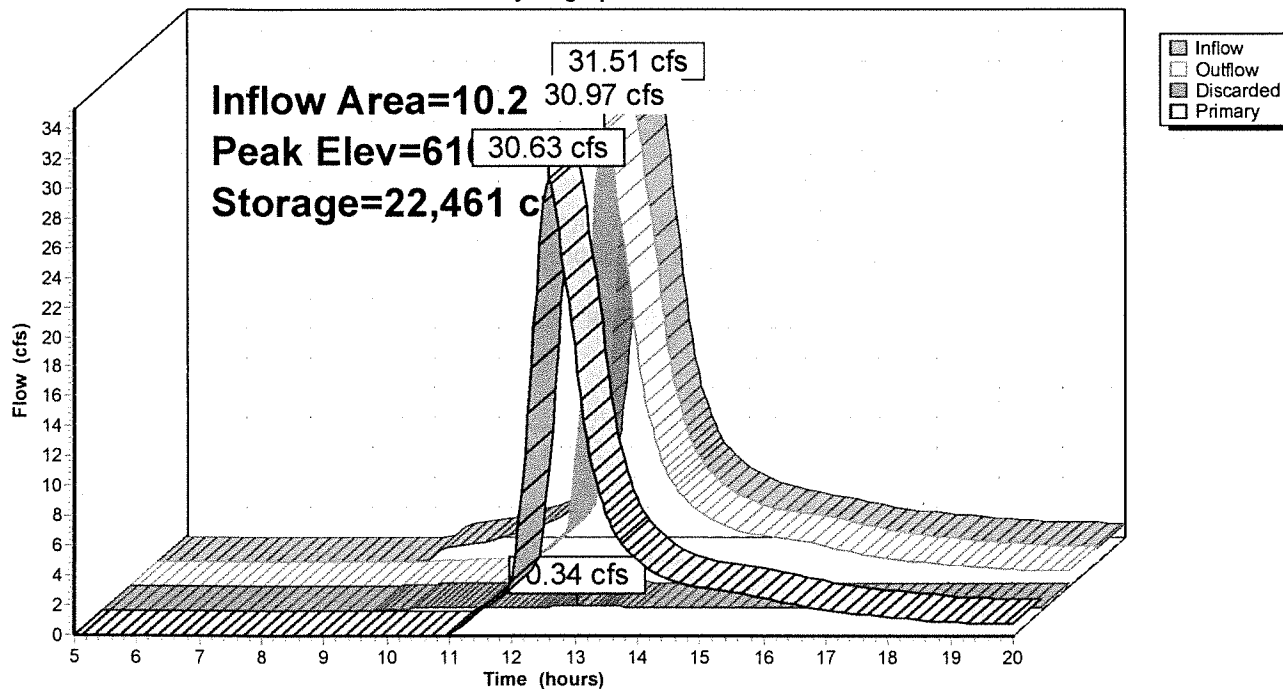
Type III 24-hr 100 yr Rainfall=7.98"

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Pond 16P: MAIN BASIN

Hydrograph



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Summary for Pond 17P: FOREBAY

Inflow Area = 9.925 ac, 13.28% Impervious, Inflow Depth > 5.00" for 100 yr event
 Inflow = 31.20 cfs @ 12.52 hrs, Volume= 4.135 af
 Outflow = 31.16 cfs @ 12.53 hrs, Volume= 4.068 af, Atten= 0%, Lag= 0.7 min
 Discarded = 0.09 cfs @ 12.53 hrs, Volume= 0.070 af
 Primary = 31.08 cfs @ 12.53 hrs, Volume= 3.998 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 616.49' @ 12.53 hrs Surf.Area= 1,857 sf Storage= 4,407 cf

Plug-Flow detention time= 11.7 min calculated for 4.068 af (98% of inflow)
 Center-of-Mass det. time= 5.6 min (806.6 - 801.1)

Volume	Invert	Avail.Storage	Storage Description
#1	612.00'	5,410 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
612.00	270	0	0
614.00	830	1,100	1,100
616.00	1,620	2,450	3,550
617.00	2,100	1,860	5,410

Device	Routing	Invert	Outlet Devices
#1	Primary	615.50'	Custom Weir/Orifice, Cv= 2.62 (C= 3.28) Head (feet) 0.00 1.50 Width (feet) 8.00 14.00
#2	Discarded	612.00'	2.000 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.09 cfs @ 12.53 hrs HW=616.49' (Free Discharge)
 ↗ **2=Exfiltration** (Exfiltration Controls 0.09 cfs)

Primary OutFlow Max=30.99 cfs @ 12.53 hrs HW=616.49' (Free Discharge)
 ↗ **1=Custom Weir/Orifice** (Weir Controls 30.99 cfs @ 3.13 fps)

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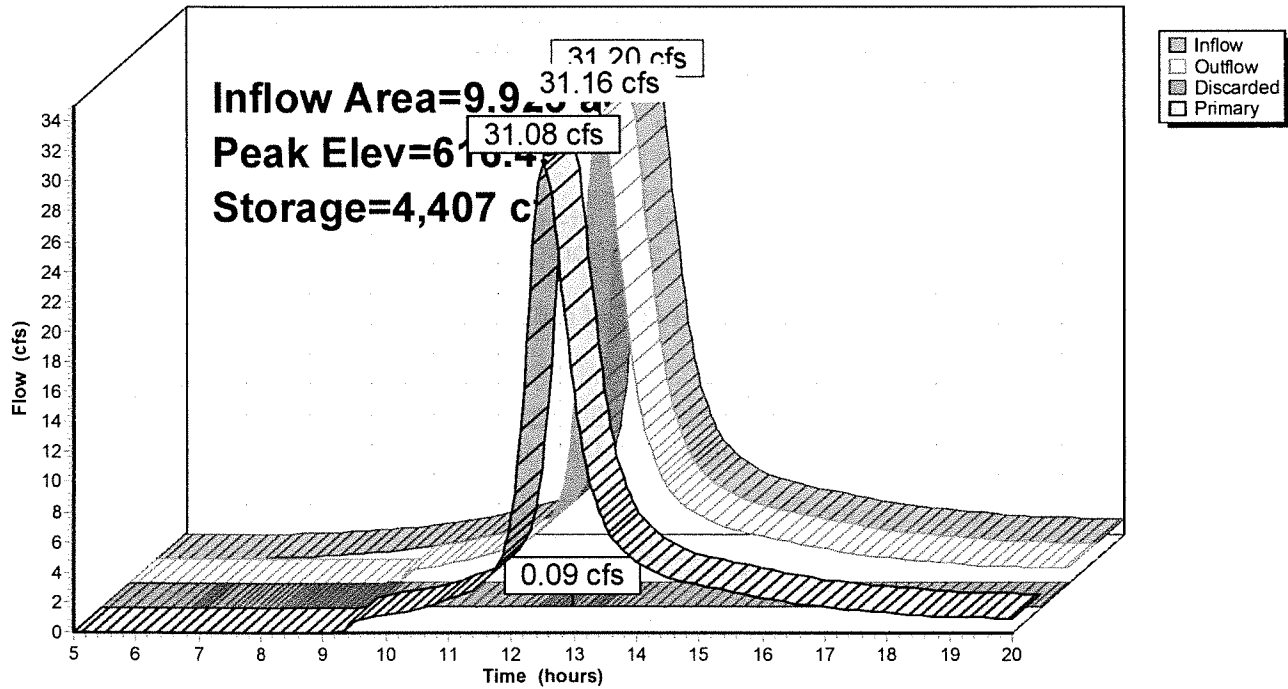
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Pond 17P: FOREBAY

Hydrograph



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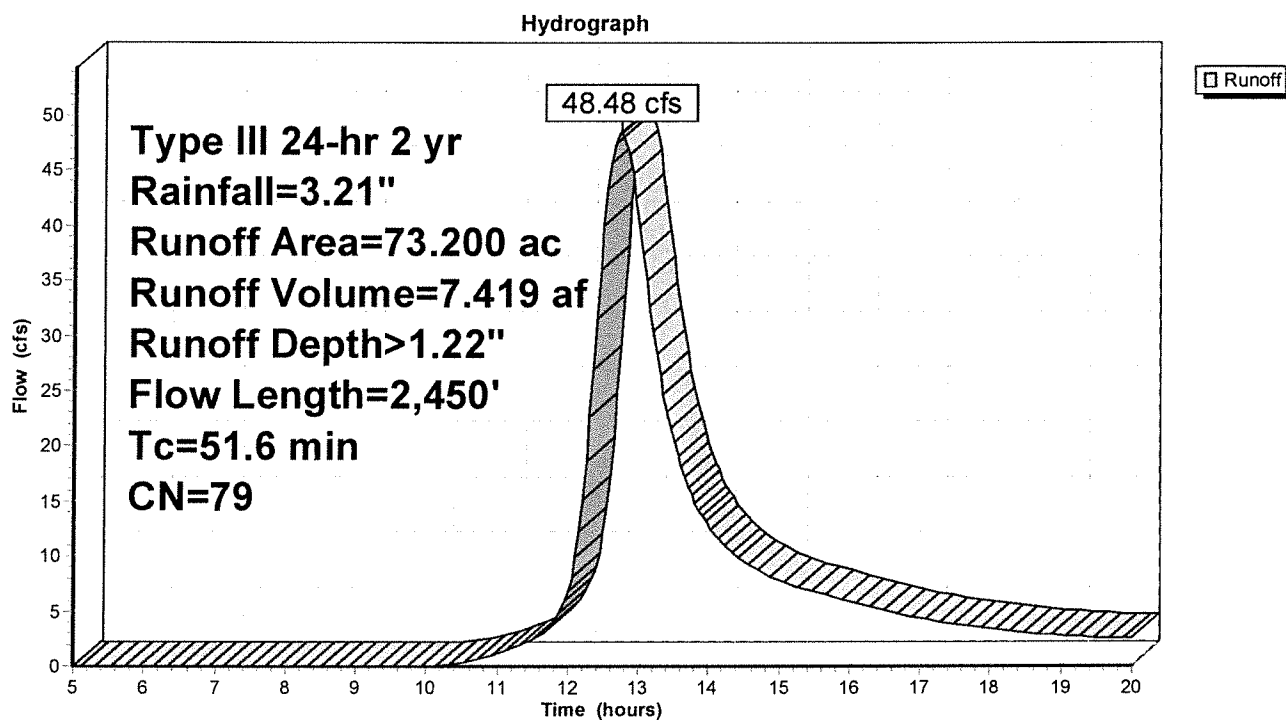
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Type III 24-hr 2 yr Rainfall=3.21"

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Page 1

Subcatchment 1S: Q EXISTING



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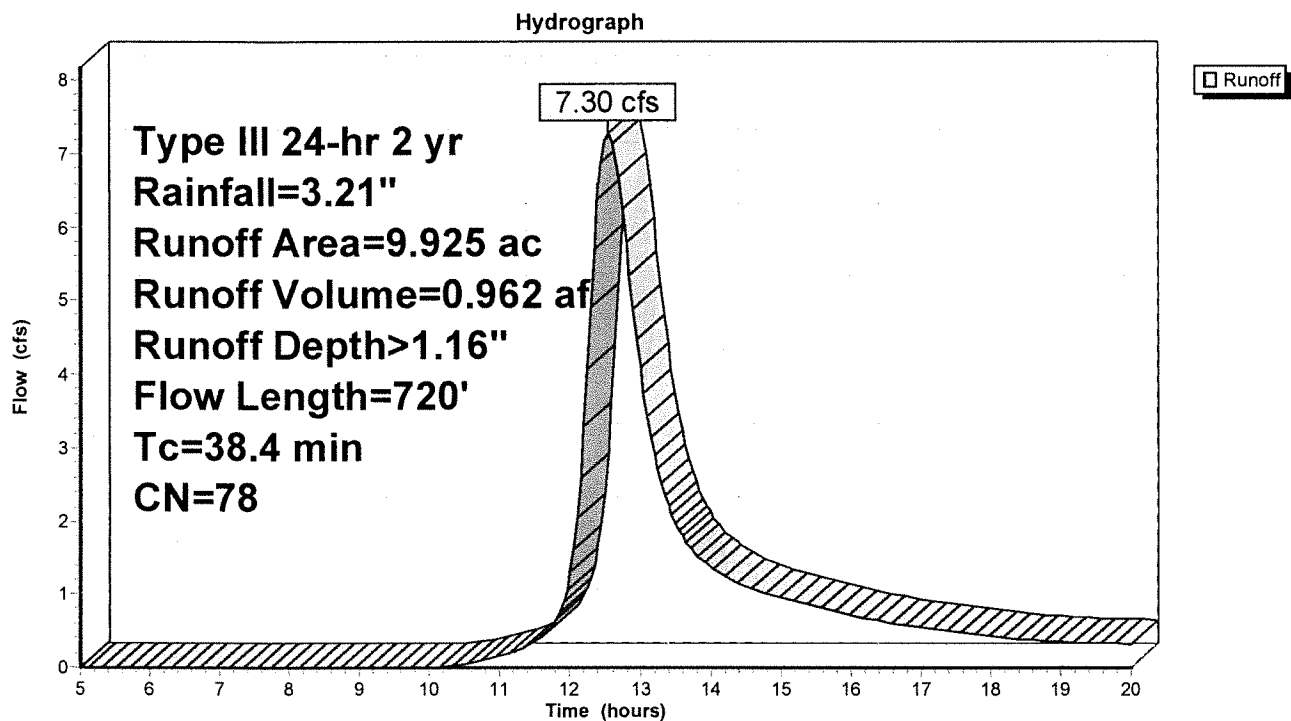
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Subcatchment 2S: Q TO BASIN 1



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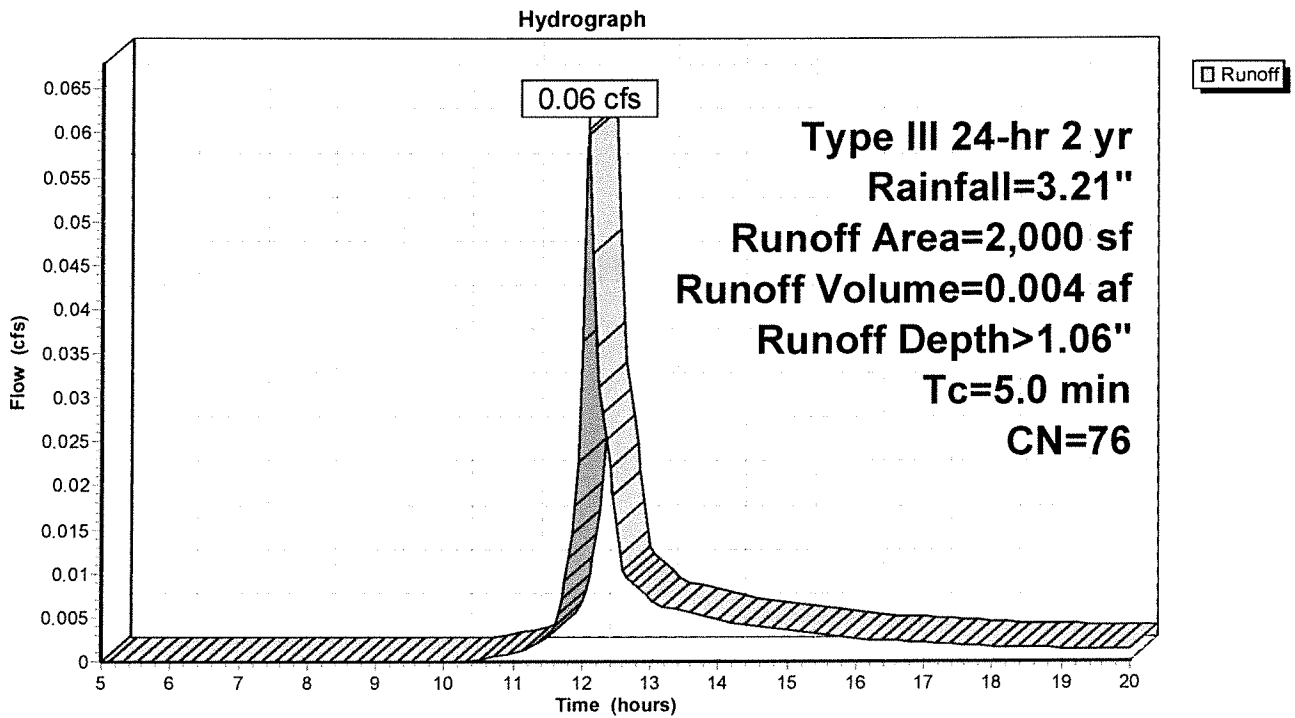
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Subcatchment 3S: EXISTING HOUSE



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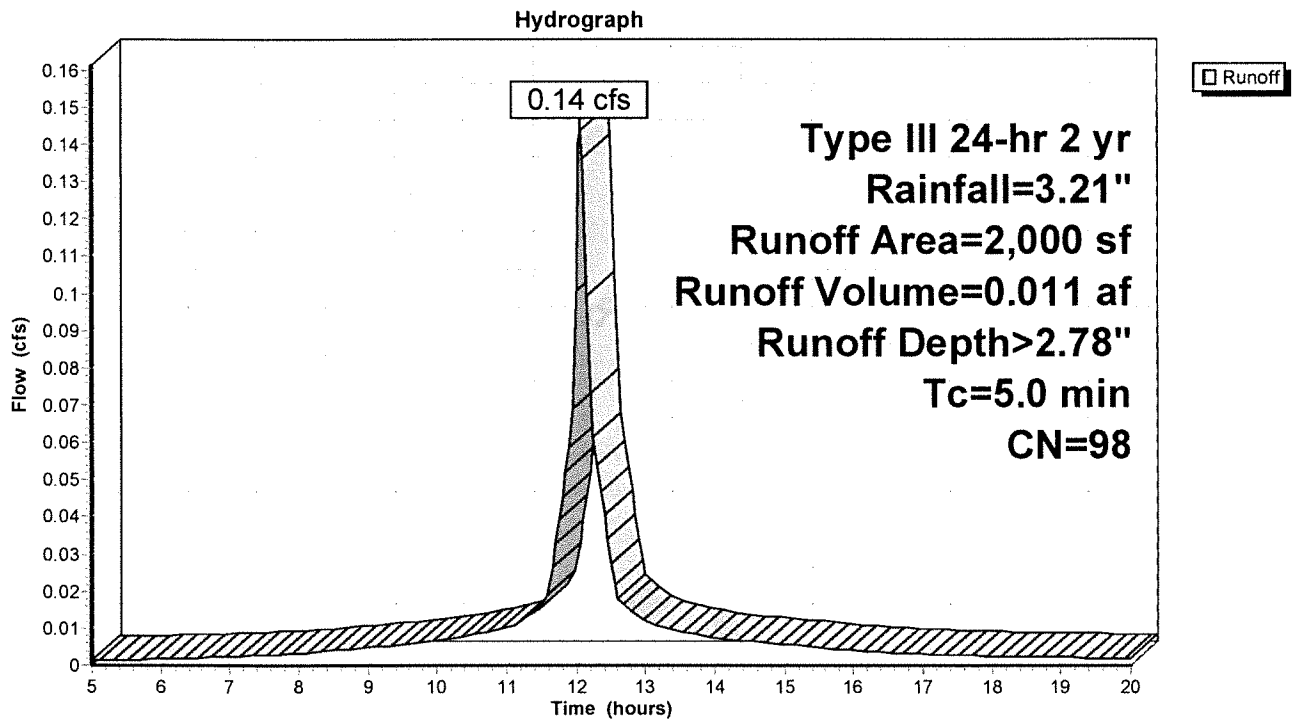
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Subcatchment 4S: HOUSE PROPOSED



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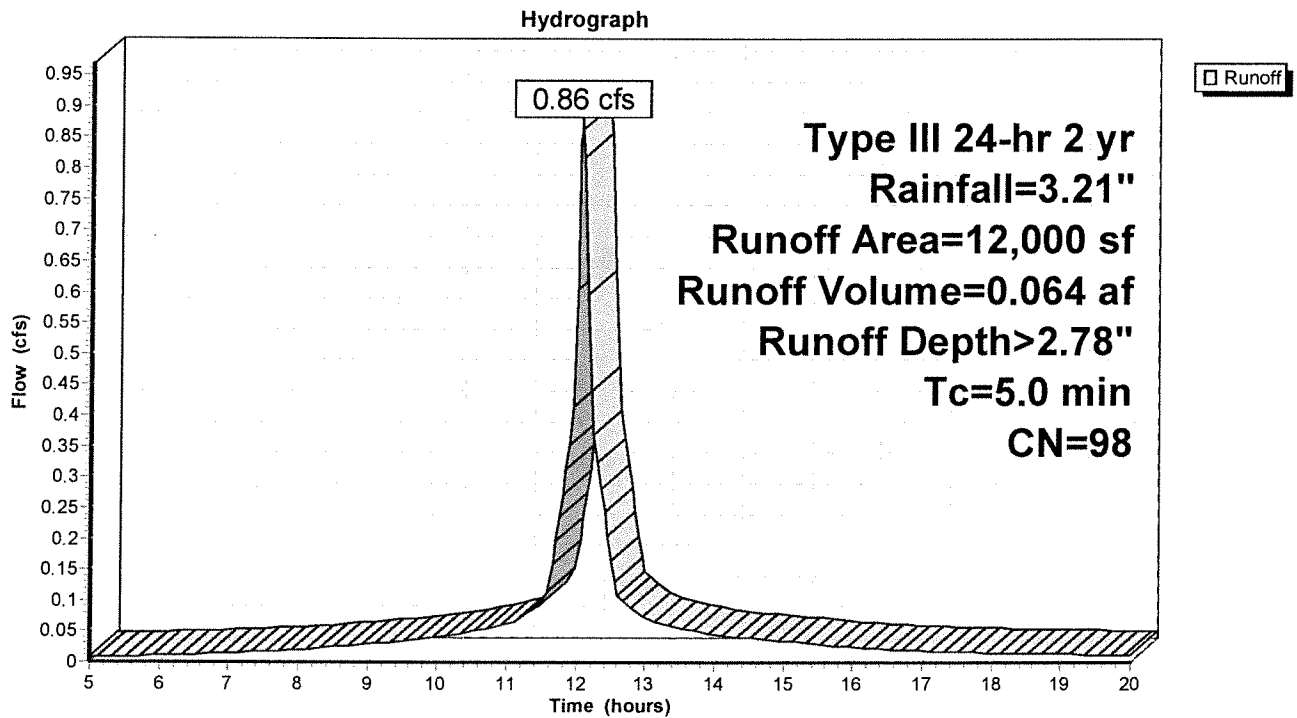
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Subcatchment 6S: PROPOSED HOUSES LOTS 2-7



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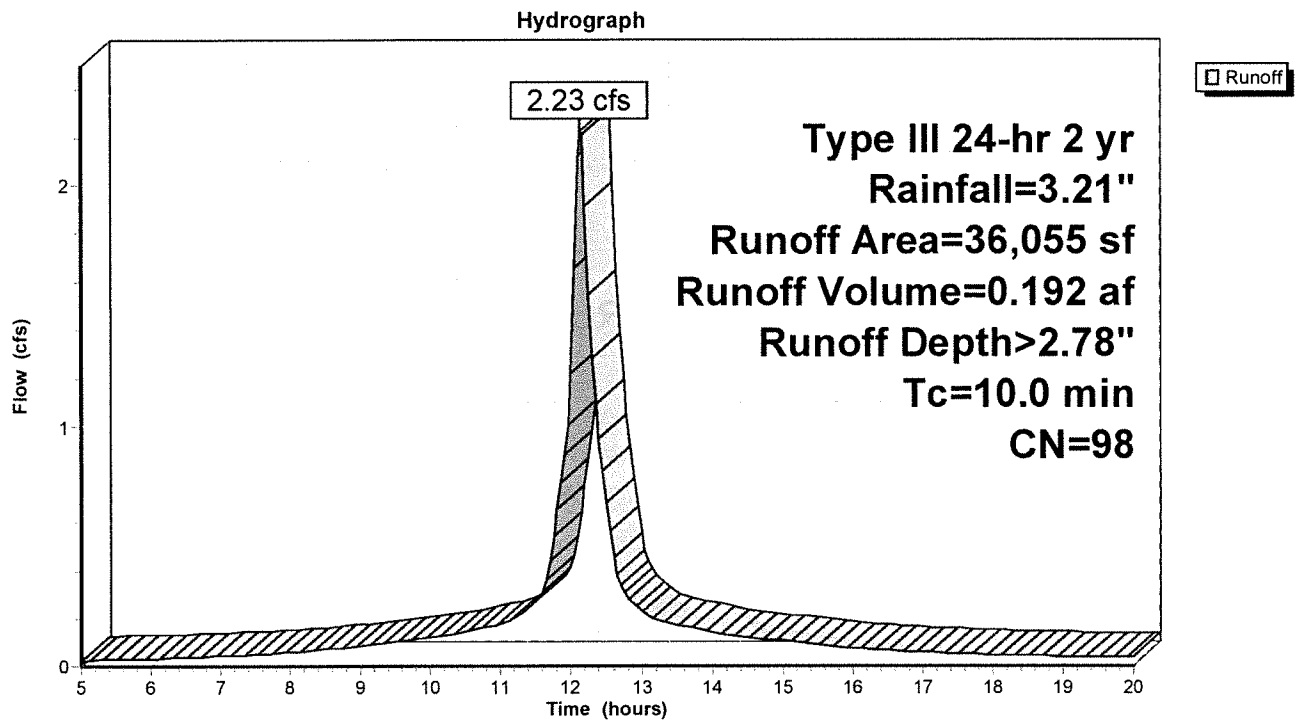
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Subcatchment 8S: BYPASS 9 HOUSES & DRIVEWAYS



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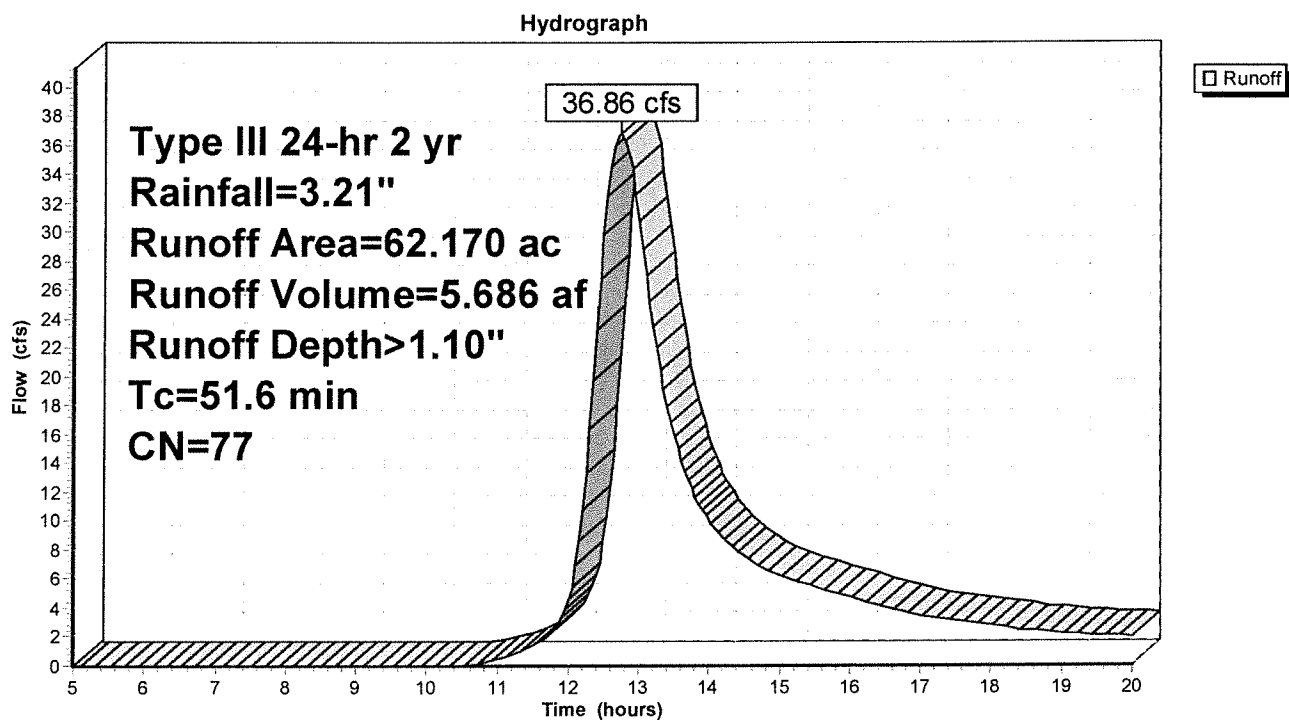
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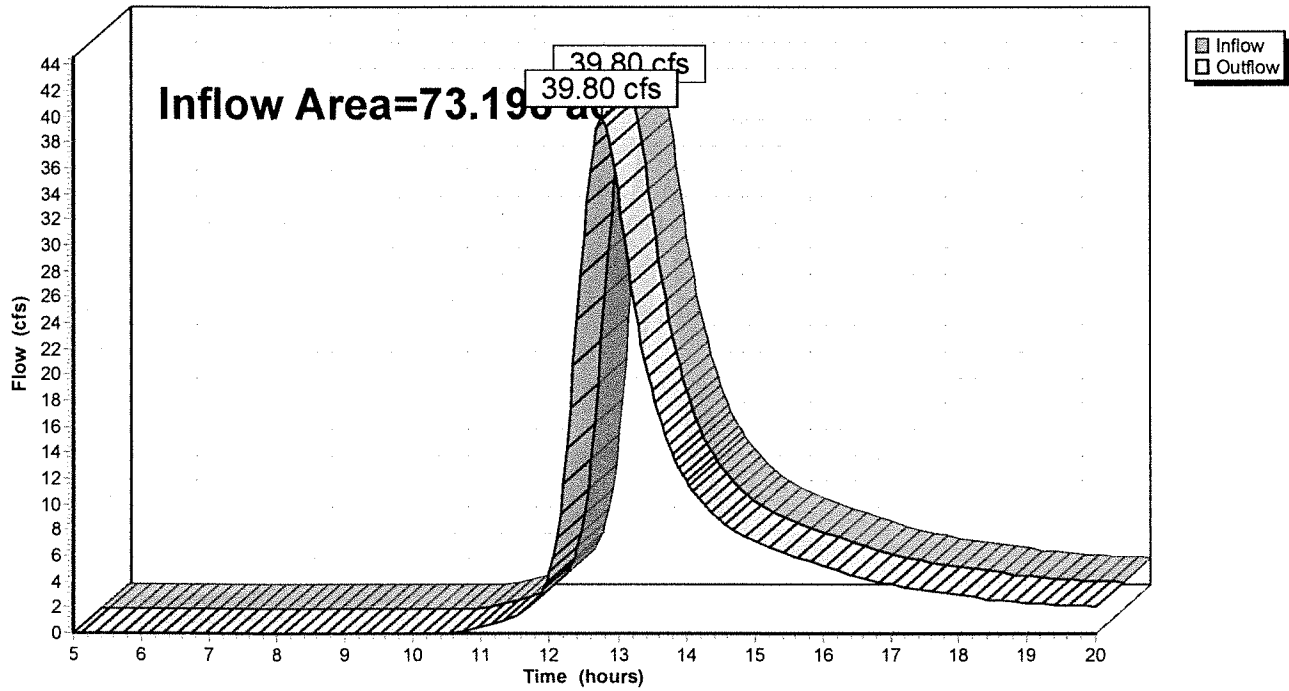
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Subcatchment 10S: BYPASS BASIN



Reach 15R: (new Reach)

Hydrograph



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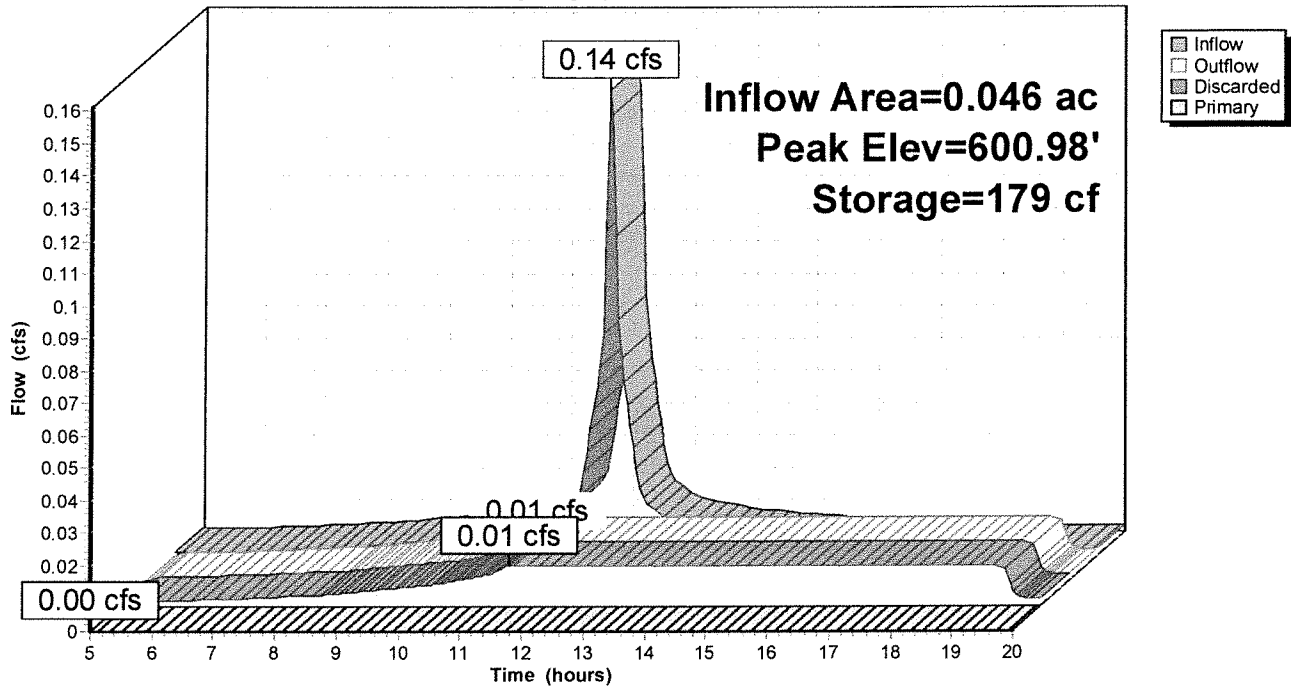
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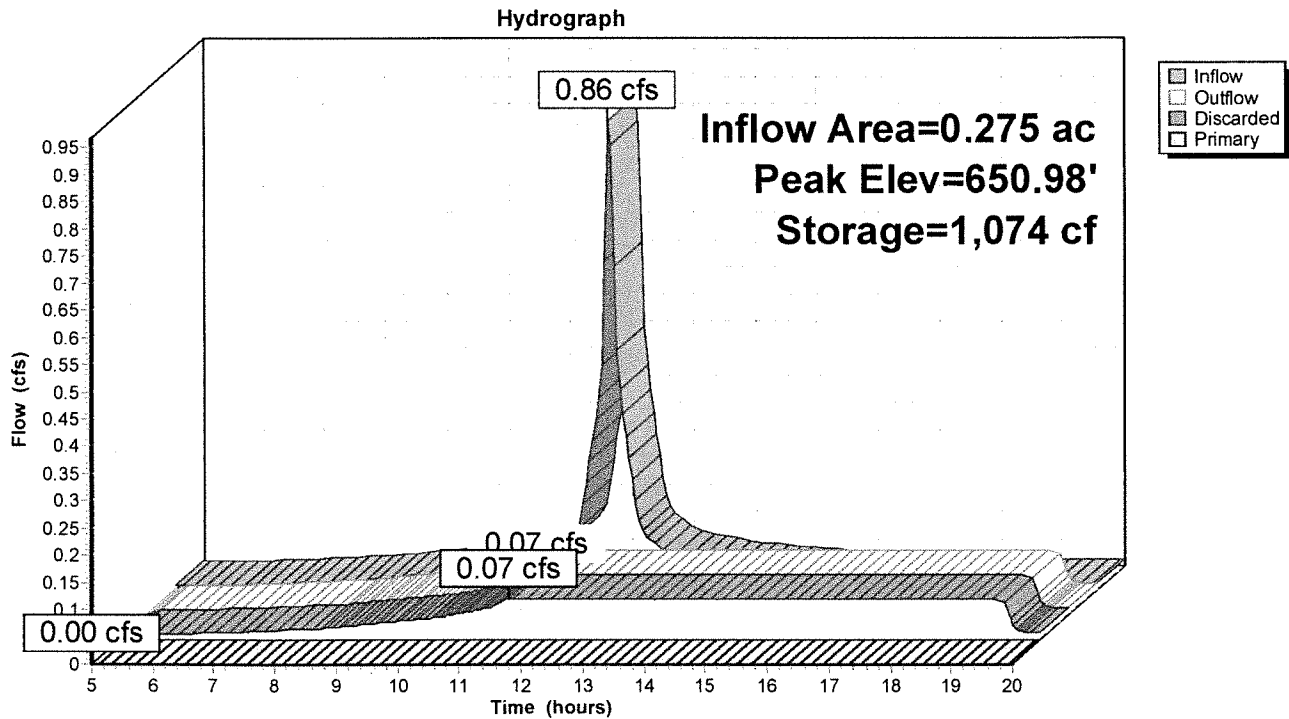
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Pond 5P: (new Pond)

Hydrograph



Pond 7P: HOUSES SYSTEMS LOTS 2-7

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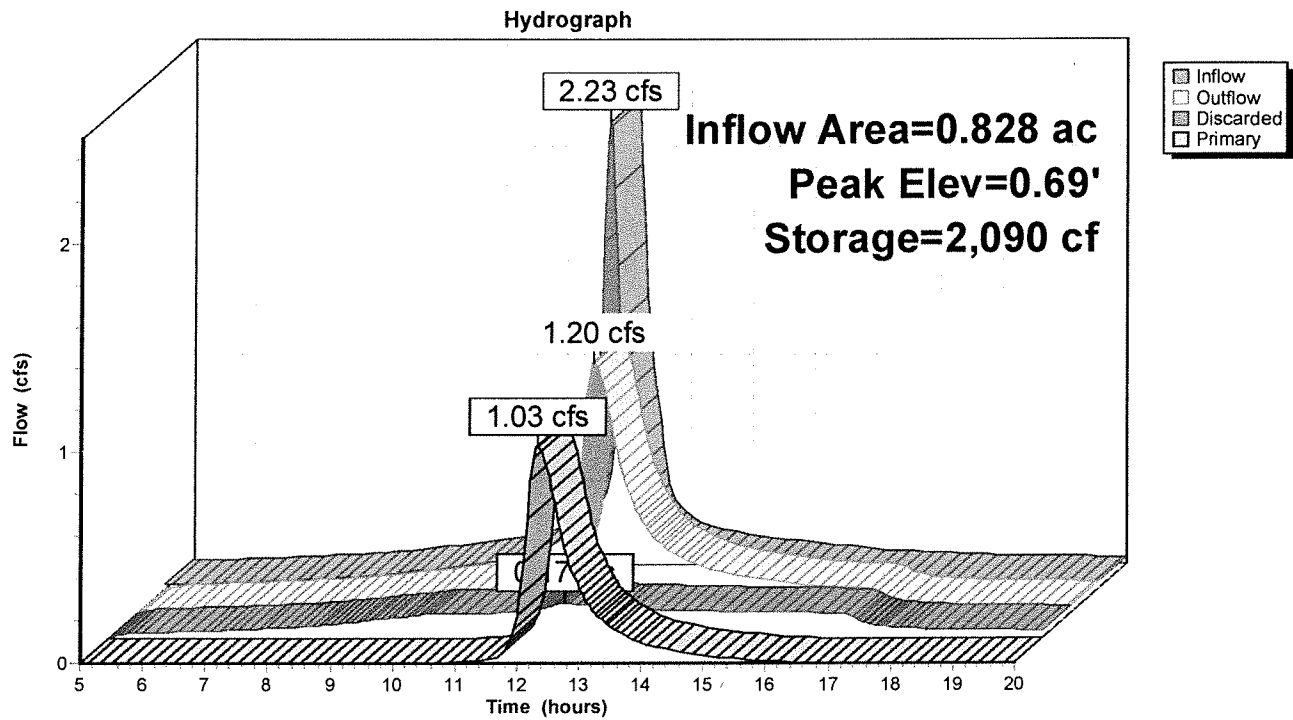
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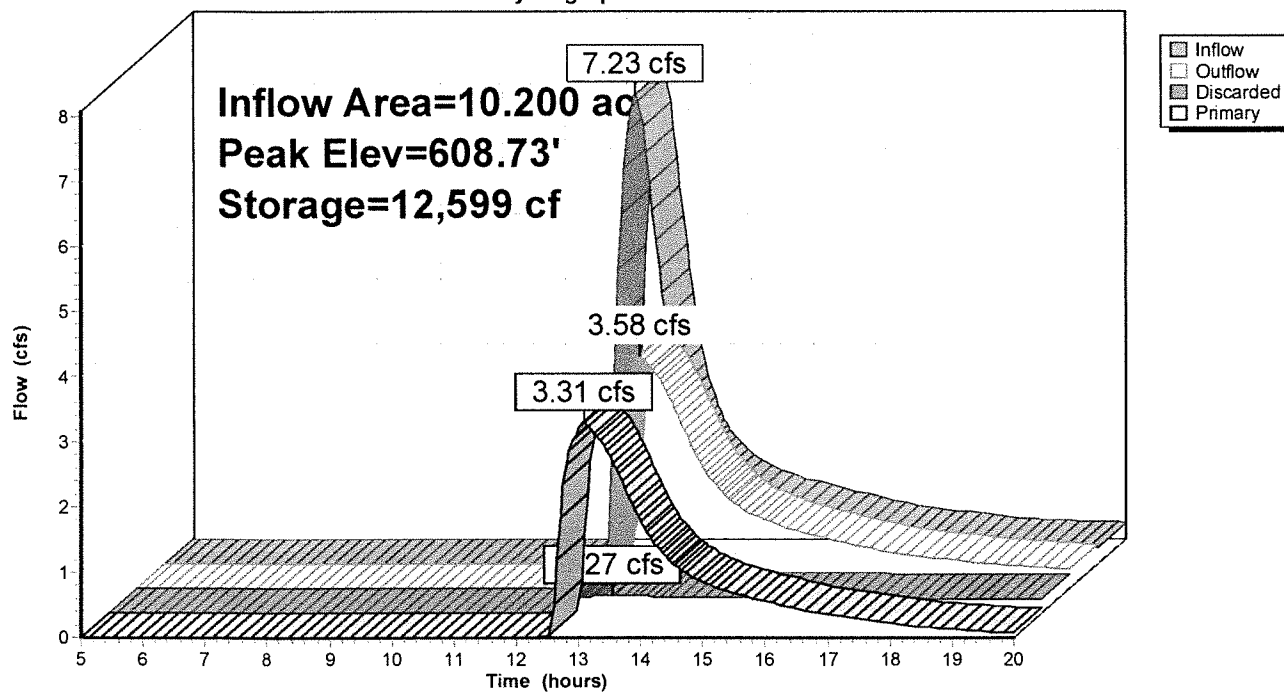
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Pond 9P: LOTS 1, 8-10,12, 16 SYSTEMS



Pond 16P: MAIN BASIN

Hydrograph



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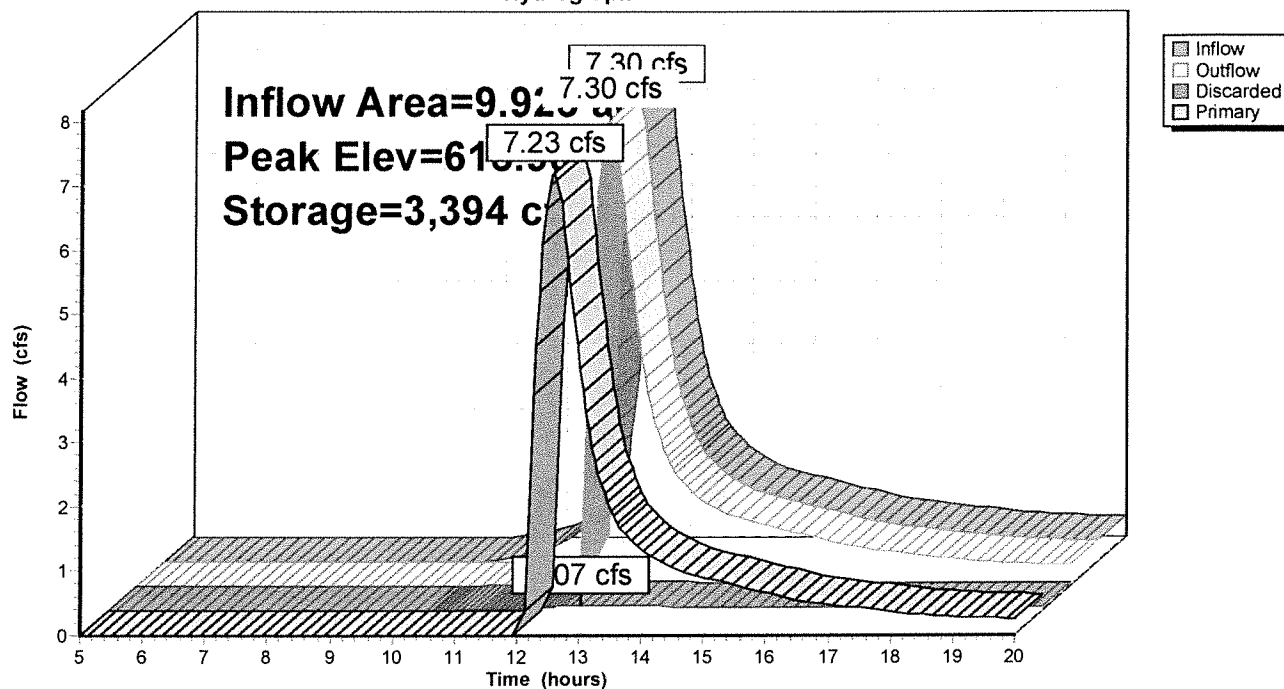
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Pond 17P: FOREBAY

Hydrograph



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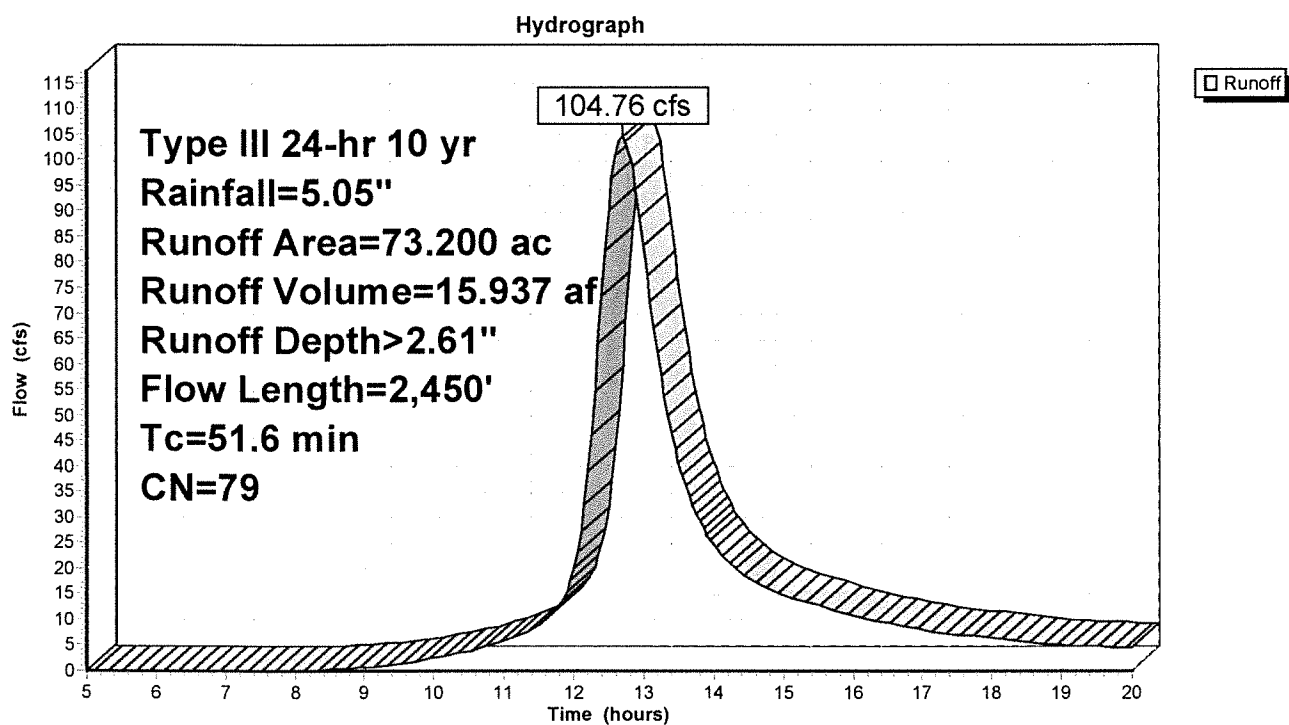
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Type III 24-hr 10 yr Rainfall=5.05"

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Subcatchment 1S: Q EXISTING



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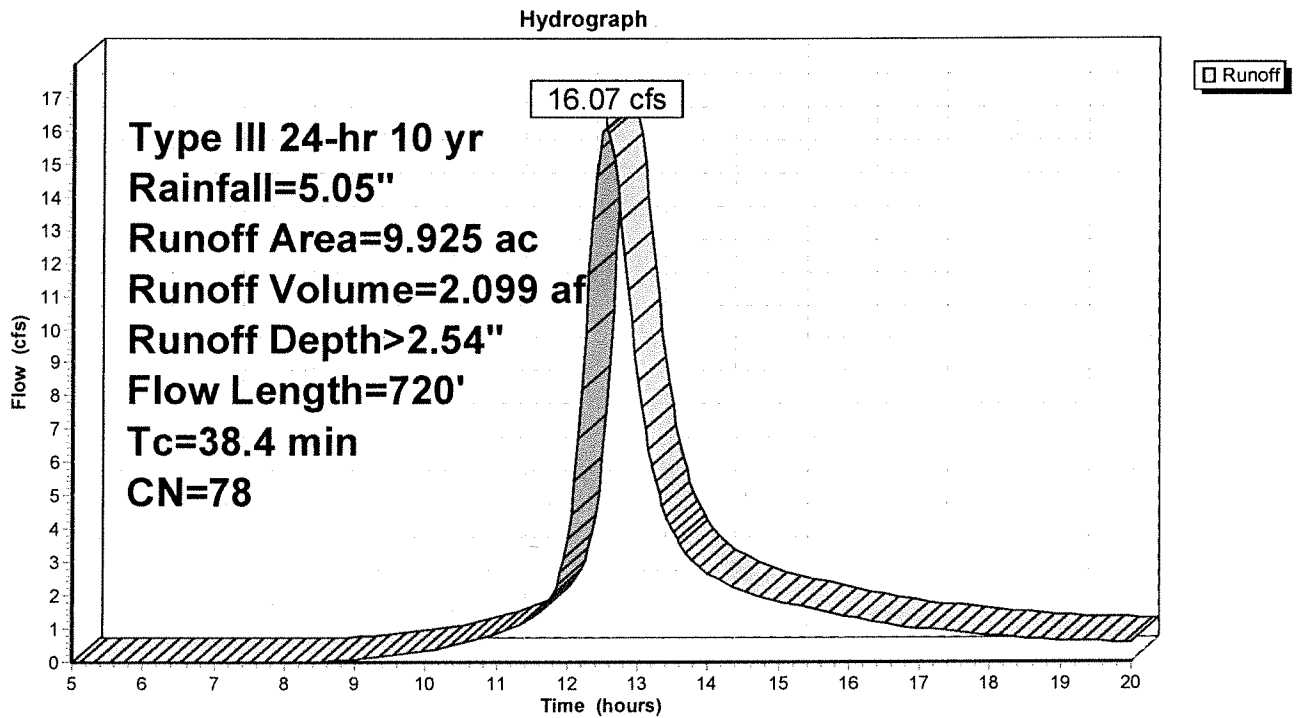
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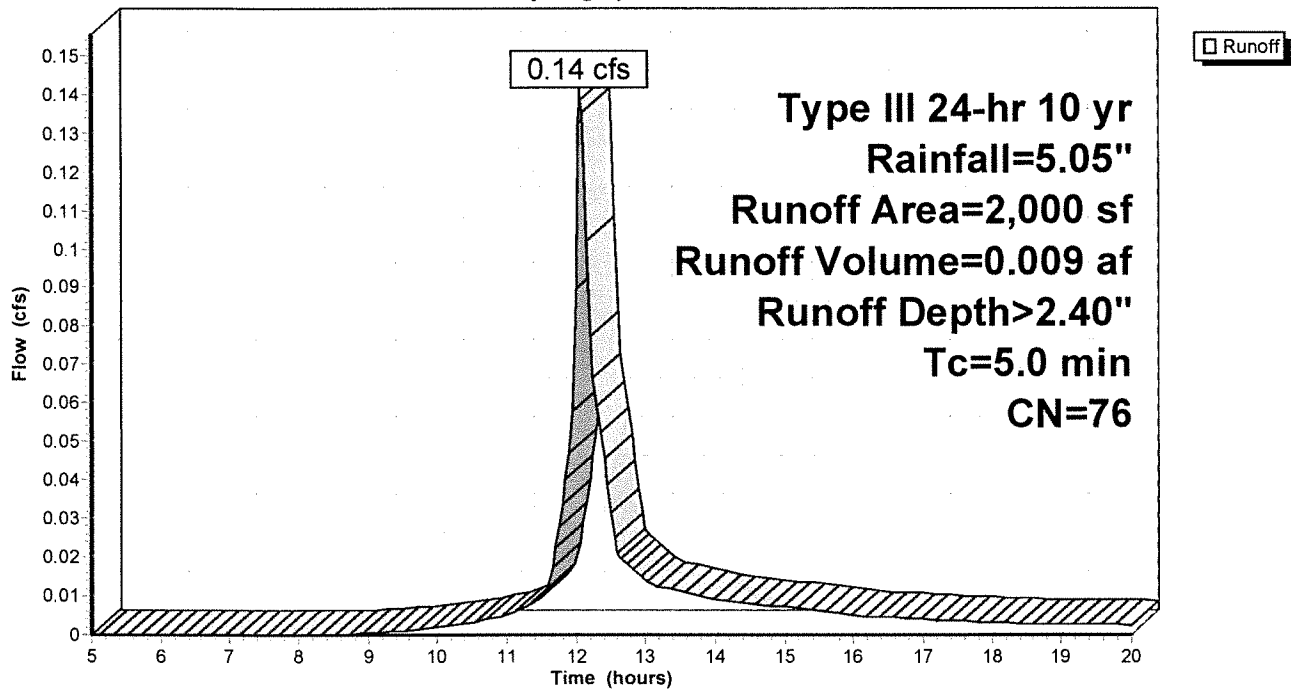
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Subcatchment 2S: Q TO BASIN 1



Subcatchment 3S: EXISTING HOUSE

Hydrograph



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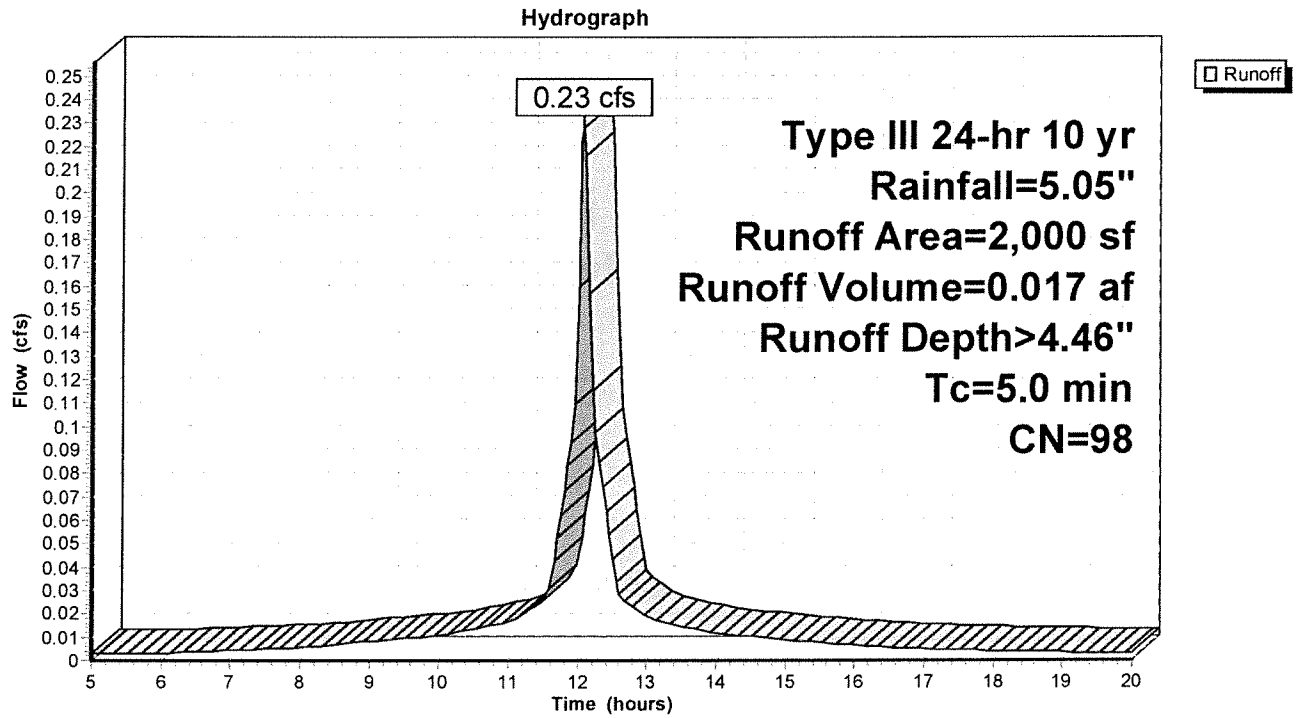
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Subcatchment 4S: HOUSE PROPOSED



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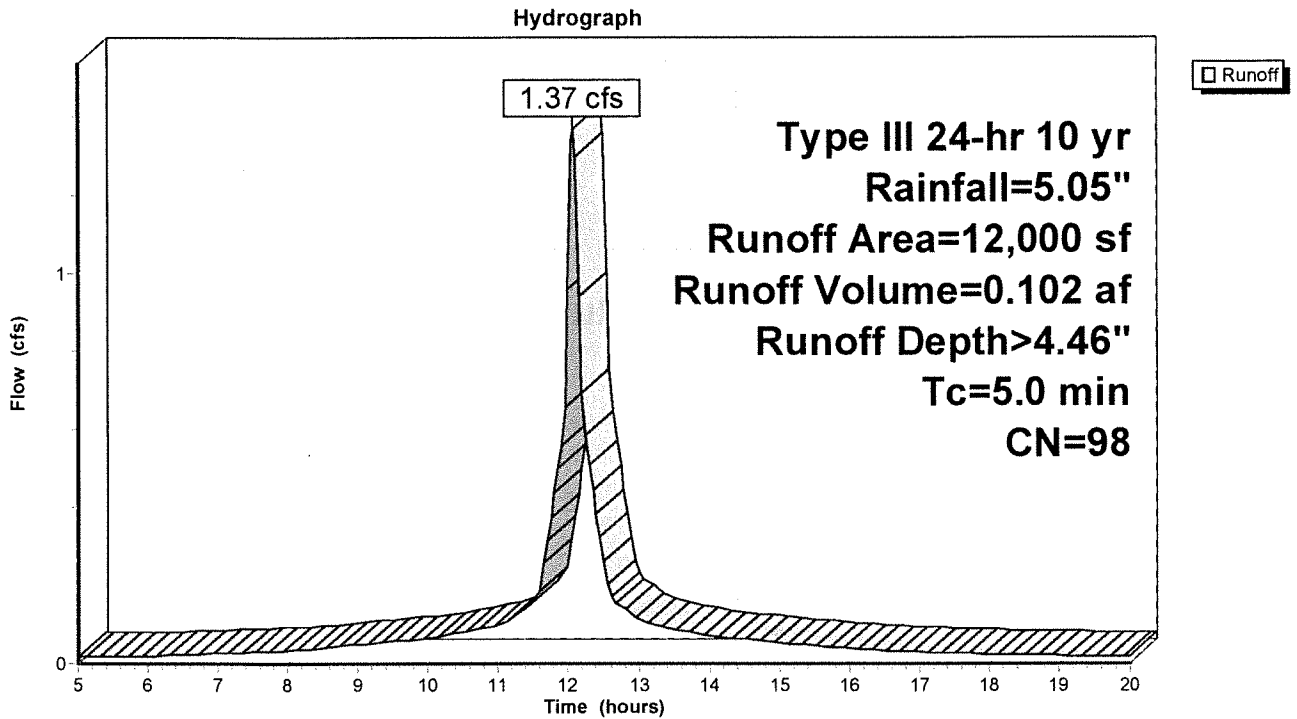
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Subcatchment 6S: PROPOSED HOUSES LOTS 2-7



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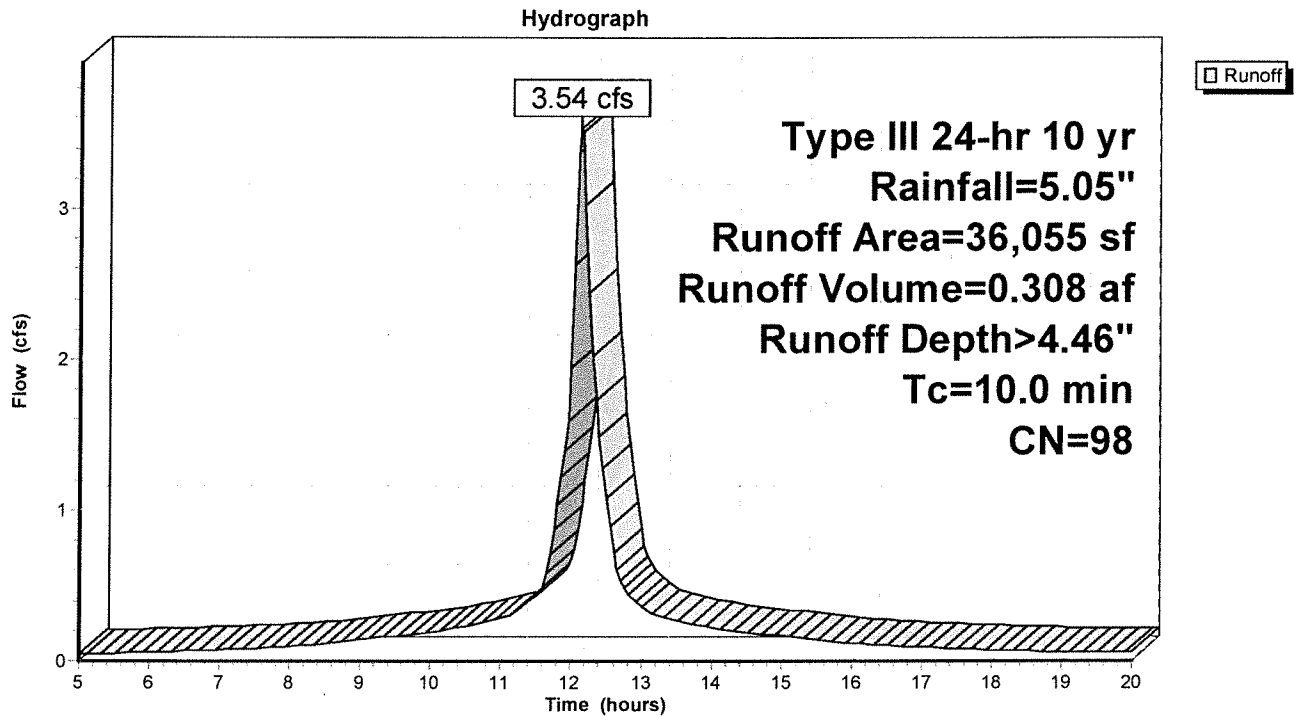
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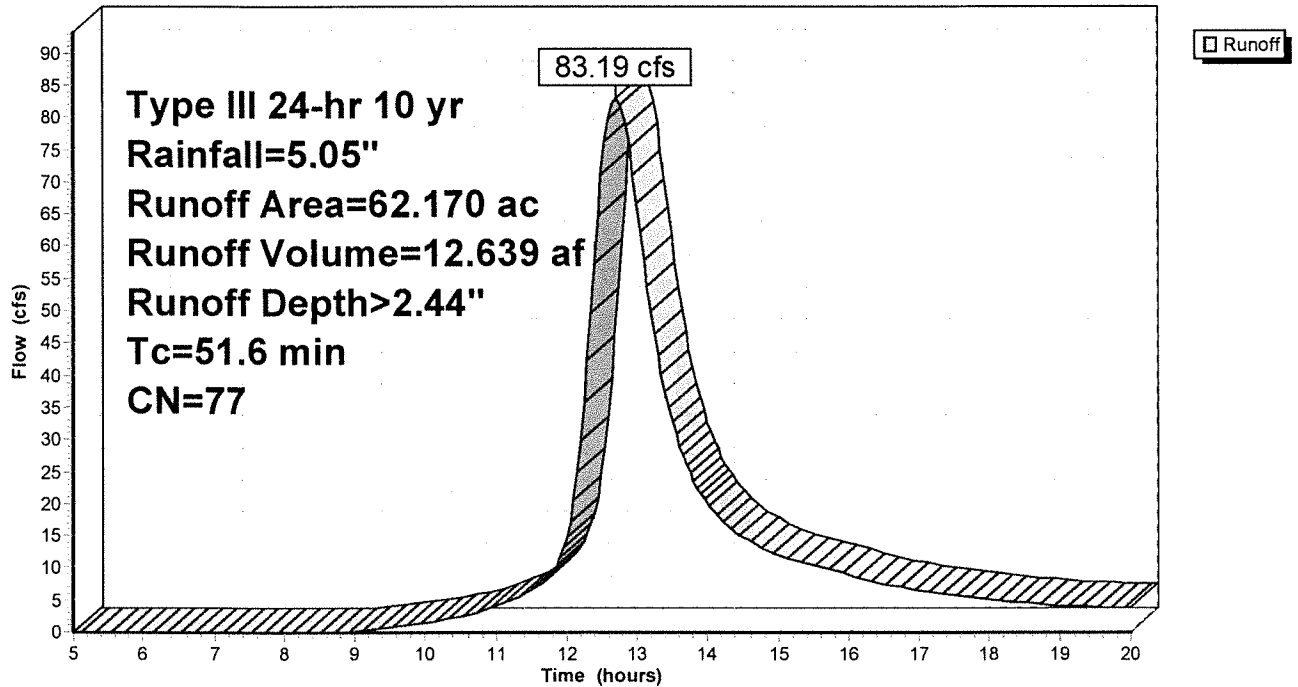
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Subcatchment 8S: BYPASS 9 HOUSES & DRIVEWAYS



Subcatchment 10S: BYPASS BASIN

Hydrograph



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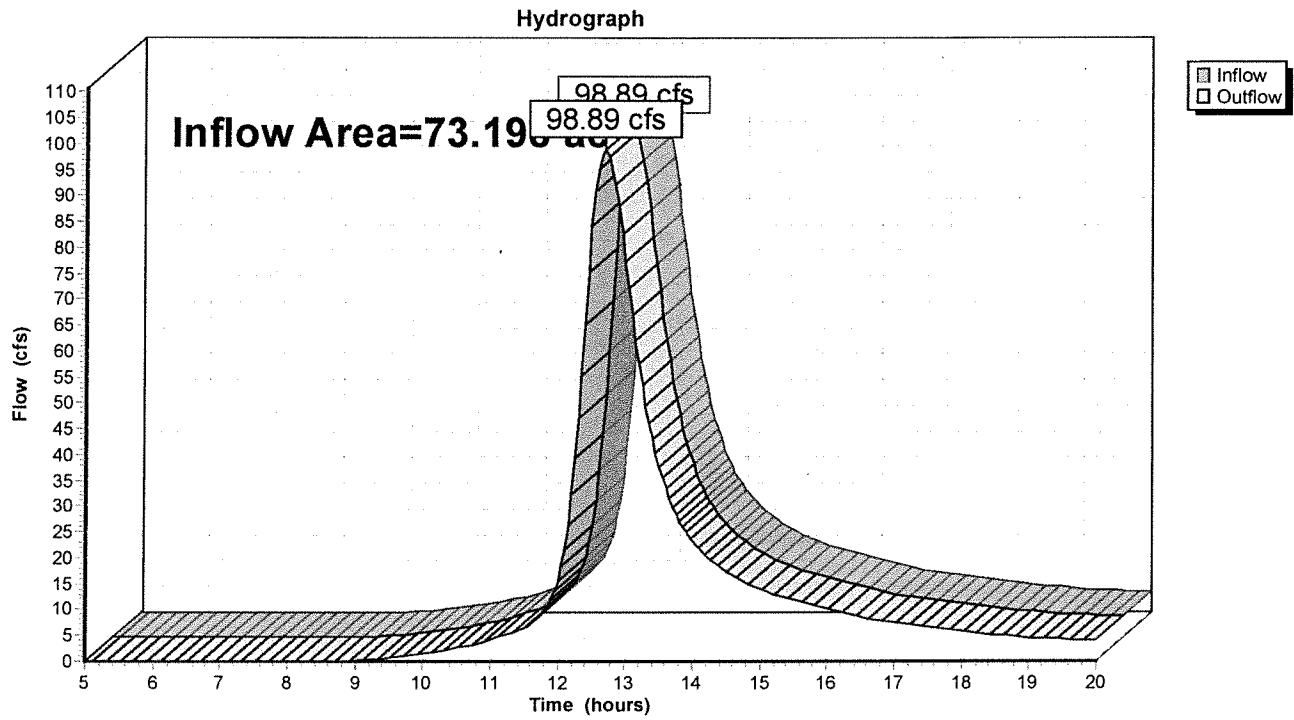
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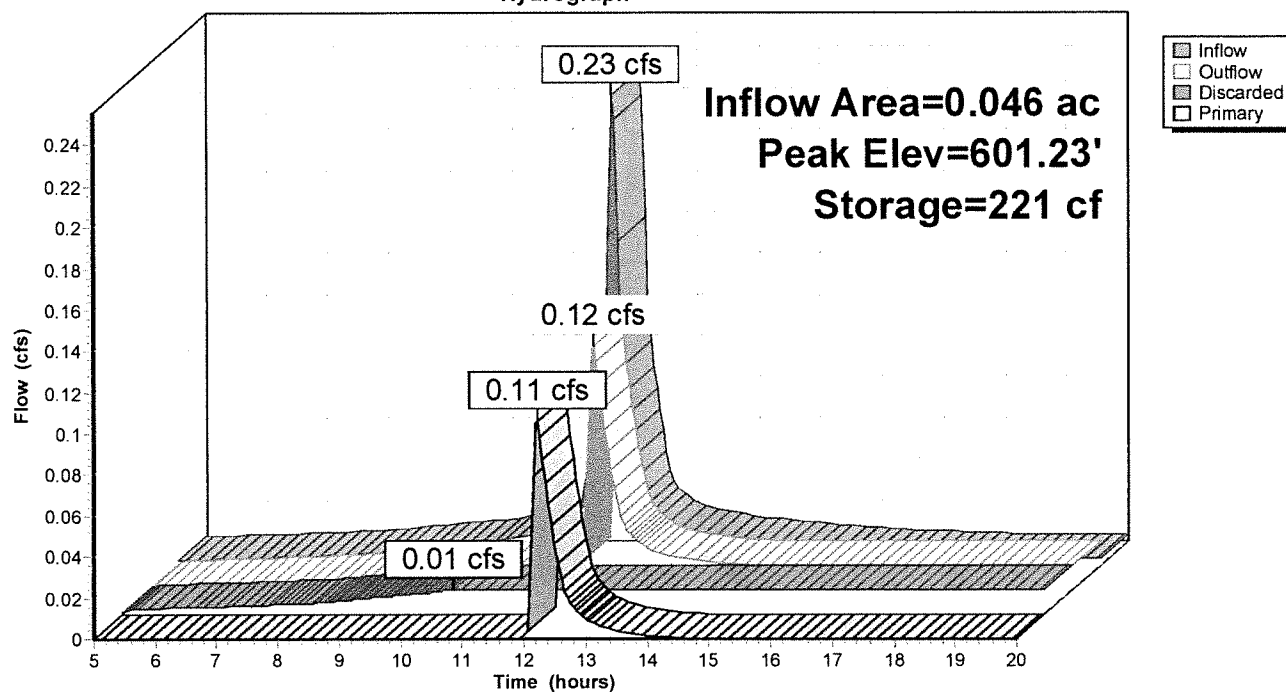
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Reach 15R: (new Reach)



Pond 5P: (new Pond)

Hydrograph



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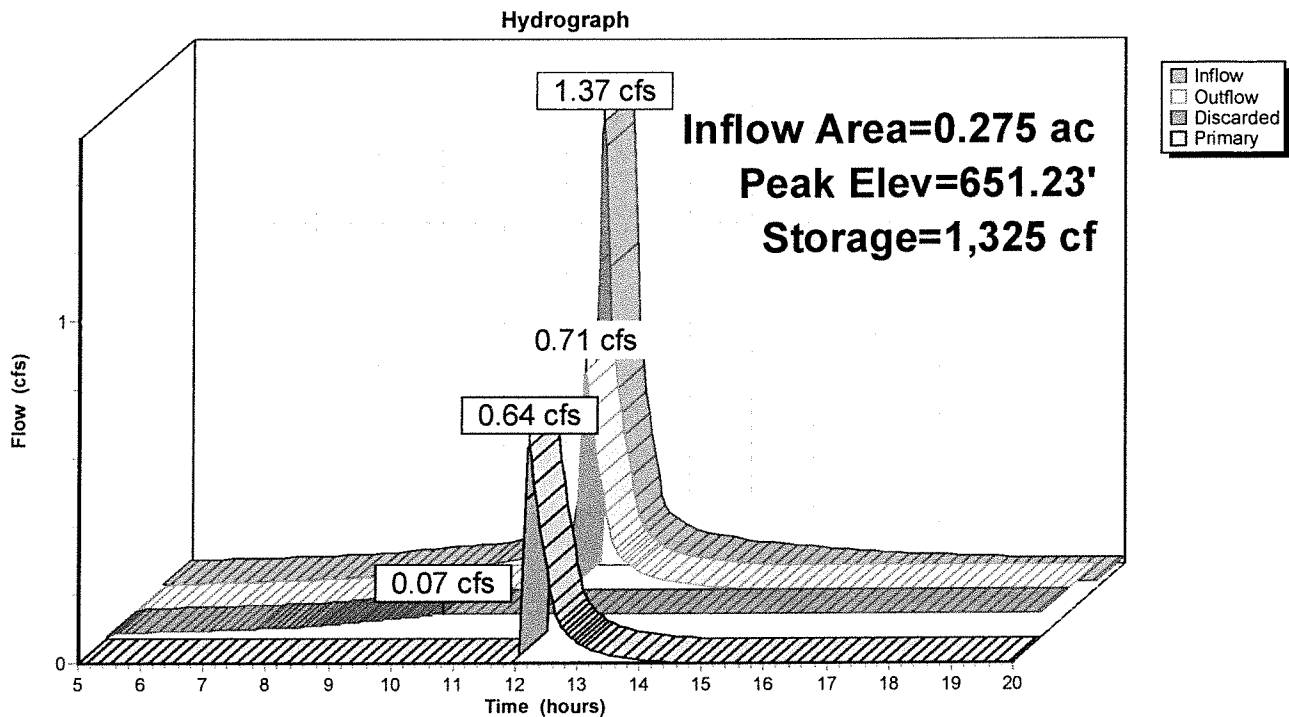
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Pond 7P: HOUSES SYSTEMS LOTS 2-7



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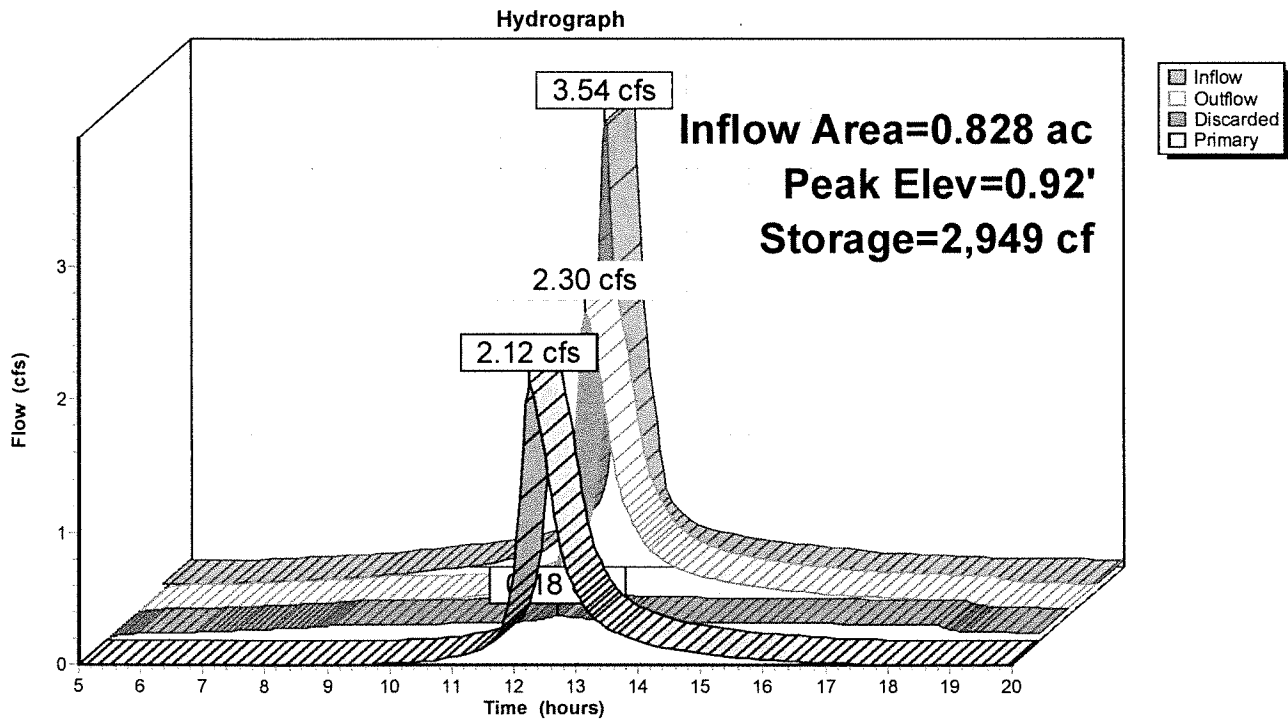
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Pond 9P: LOTS 1, 8-10,12, 16 SYSTEMS



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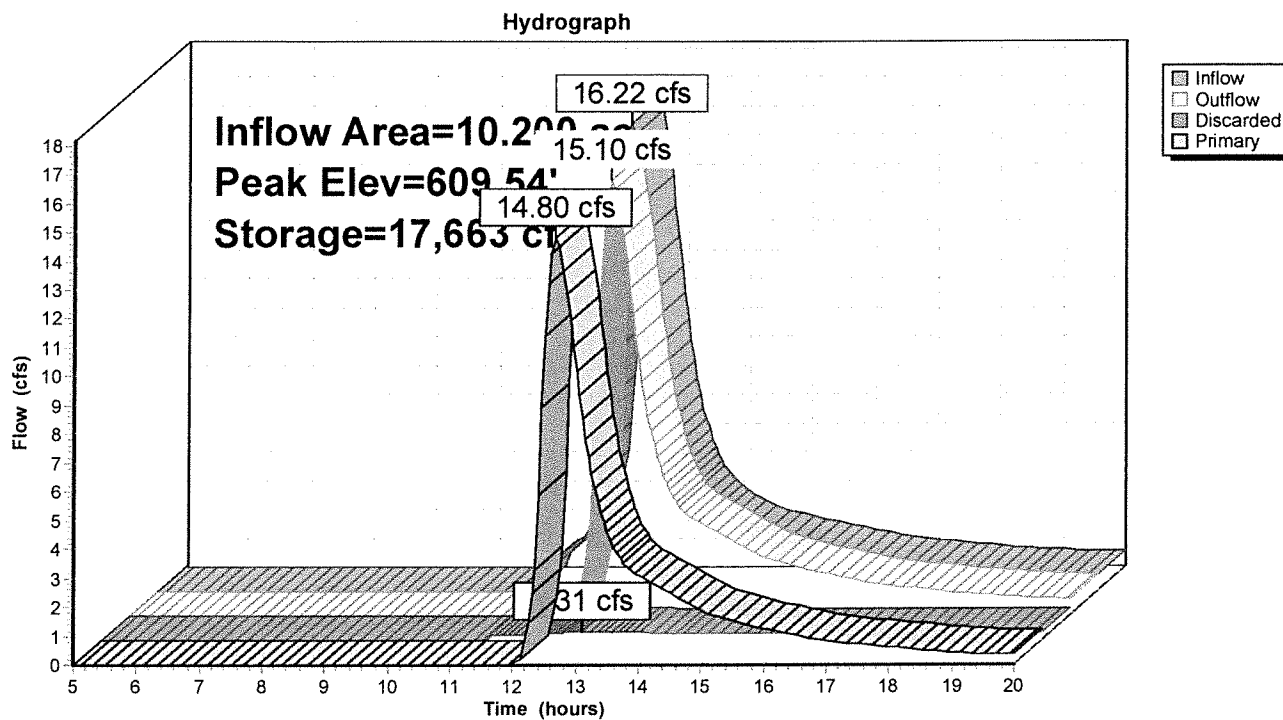
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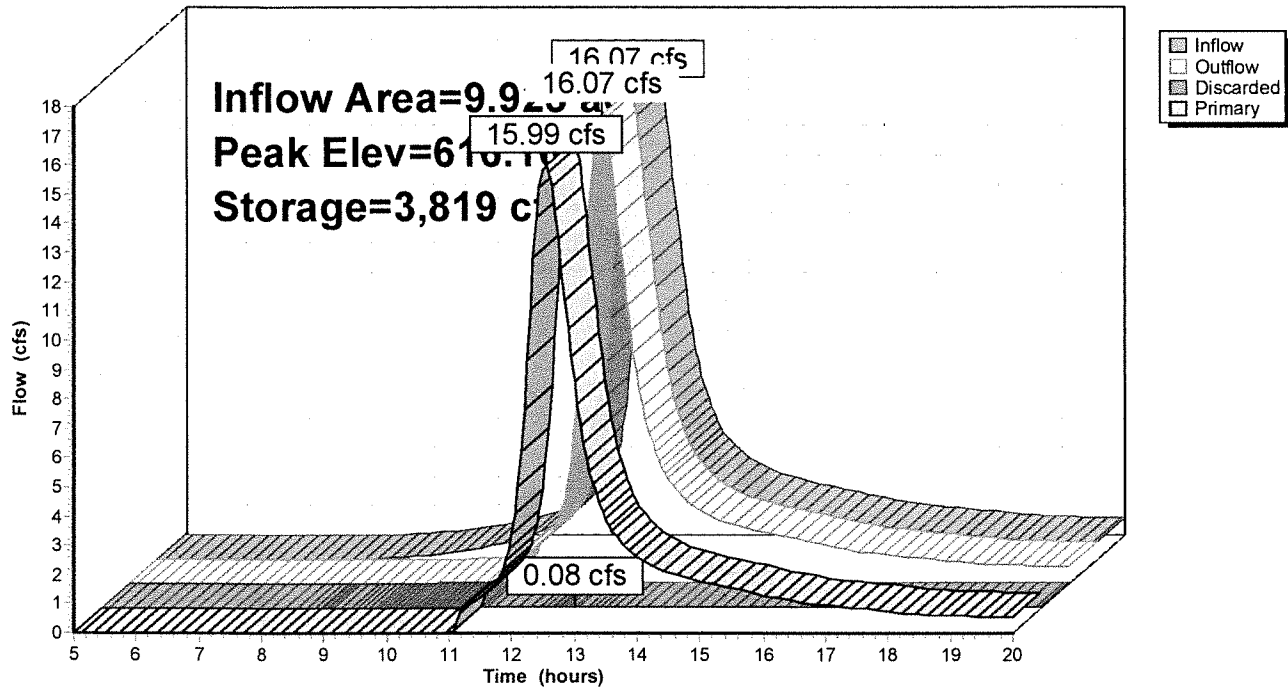
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Pond 16P: MAIN BASIN



Pond 17P: FOREBAY

Hydrograph



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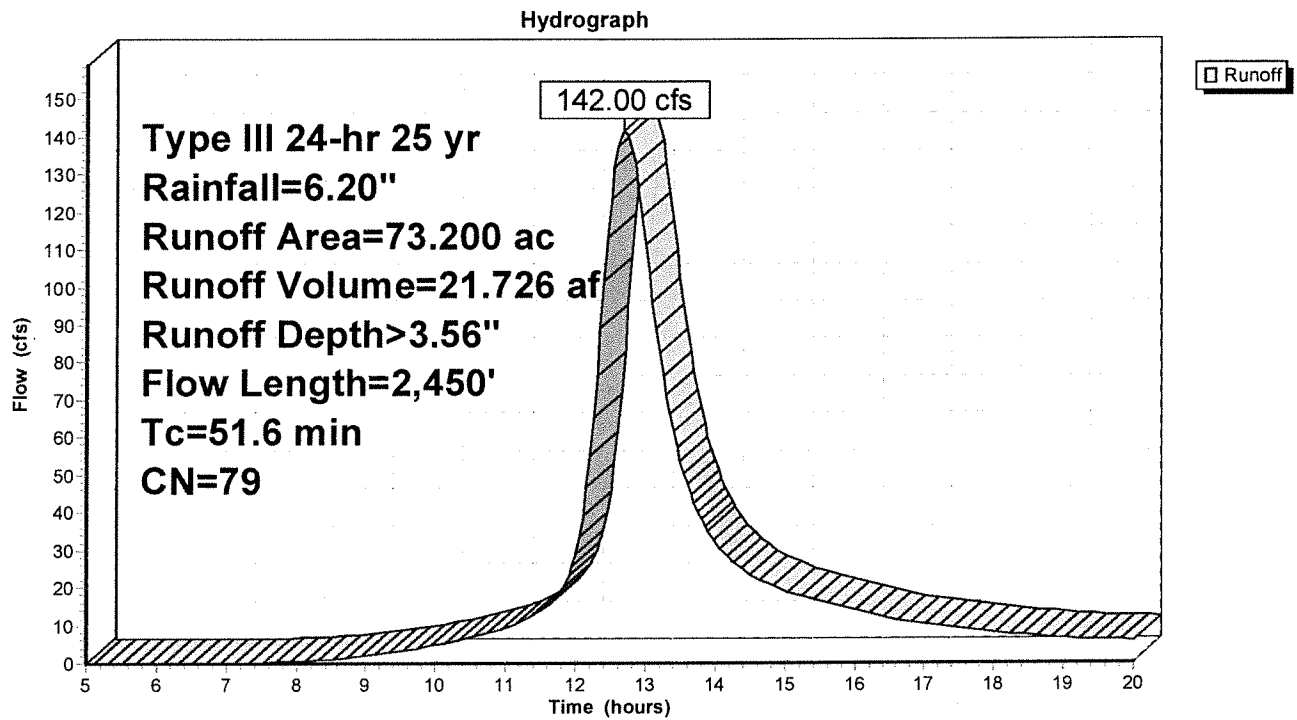
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Type III 24-hr 25 yr Rainfall=6.20"

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Subcatchment 1S: Q EXISTING



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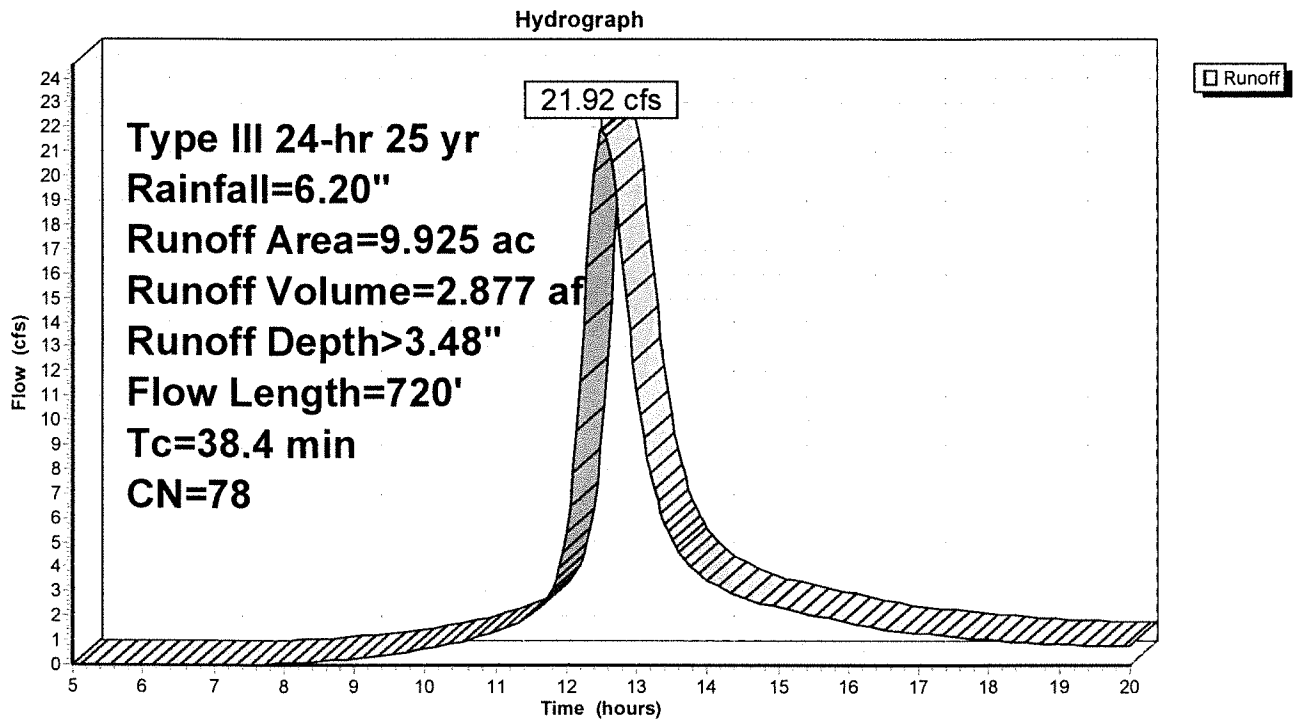
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Subcatchment 2S: Q TO BASIN 1



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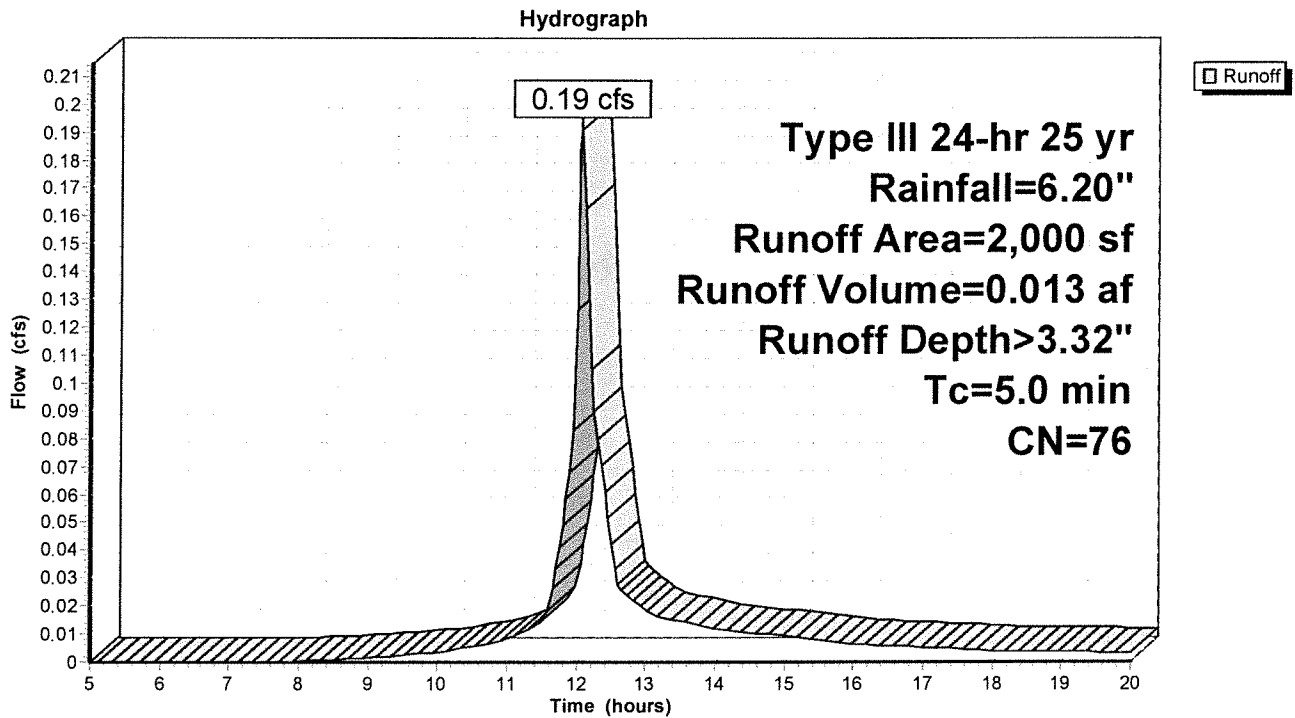
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Subcatchment 3S: EXISTING HOUSE



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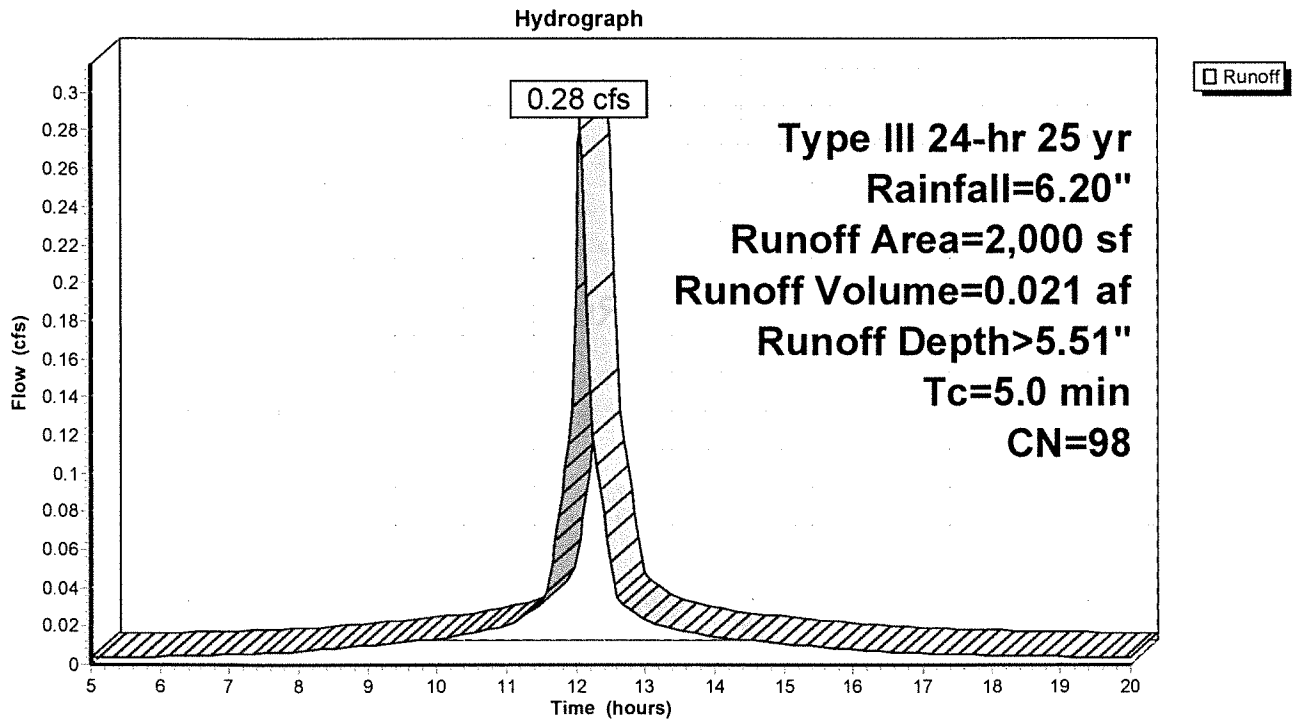
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Subcatchment 4S: HOUSE PROPOSED



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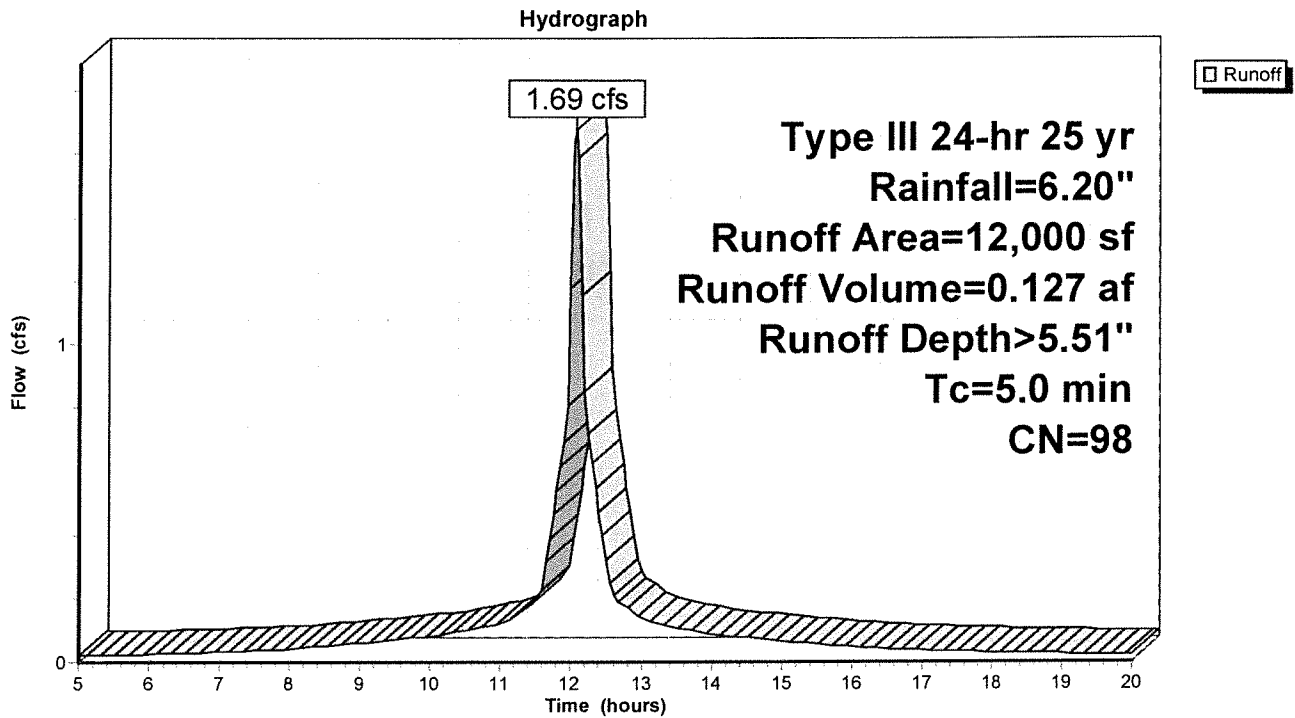
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Subcatchment 6S: PROPOSED HOUSES LOTS 2-7



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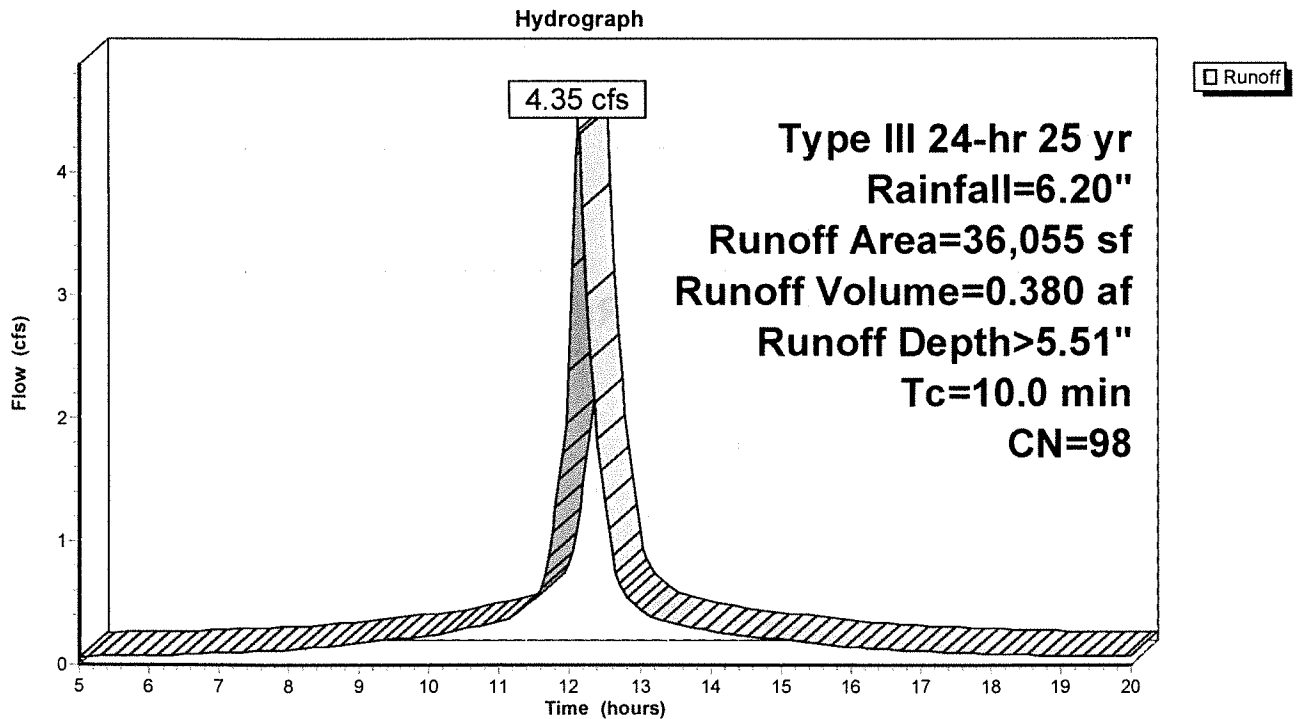
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Type III 24-hr 25 yr Rainfall=6.20"

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Subcatchment 8S: BYPASS 9 HOUSES & DRIVEWAYS



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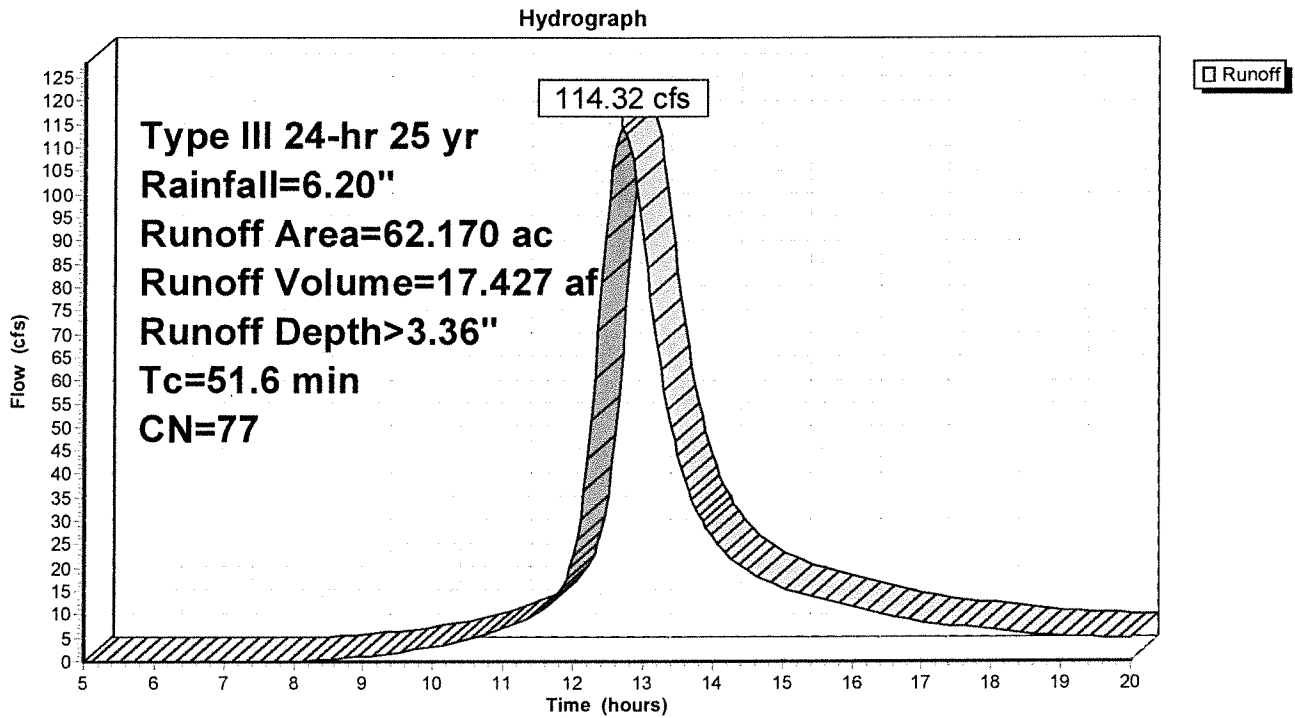
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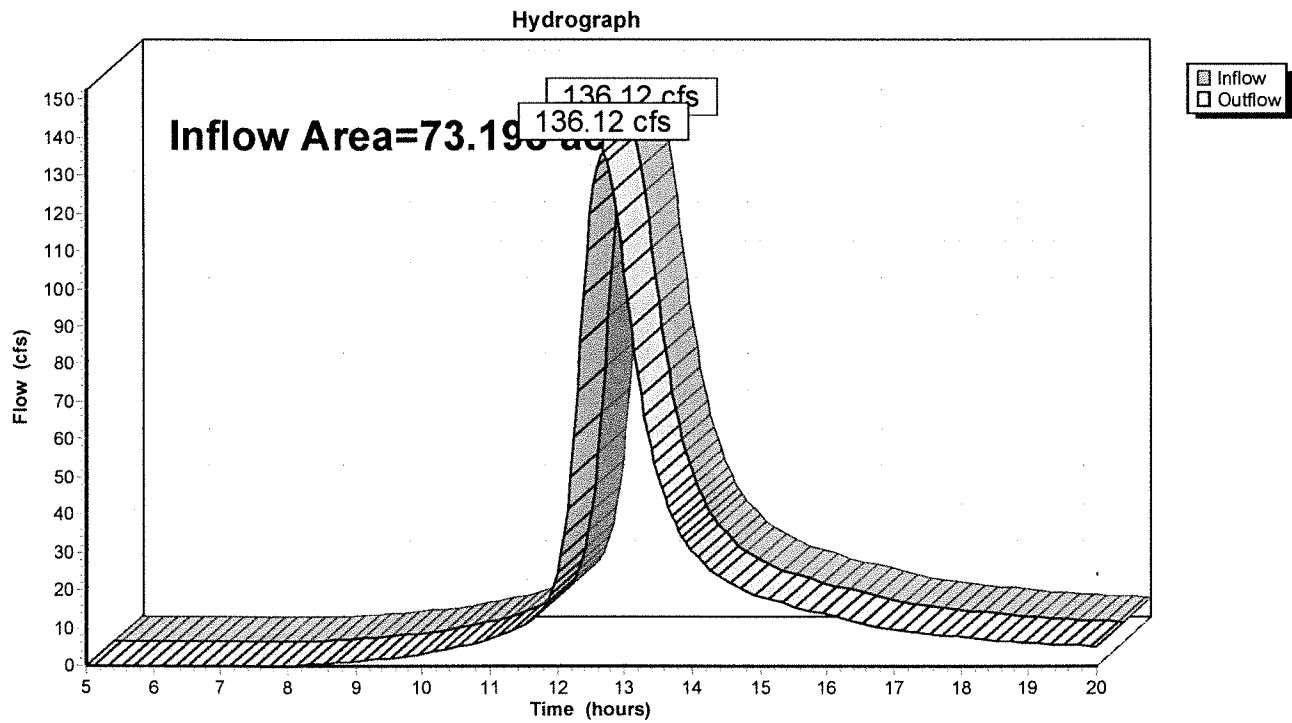
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Subcatchment 10S: BYPASS BASIN



Reach 15R: (new Reach)

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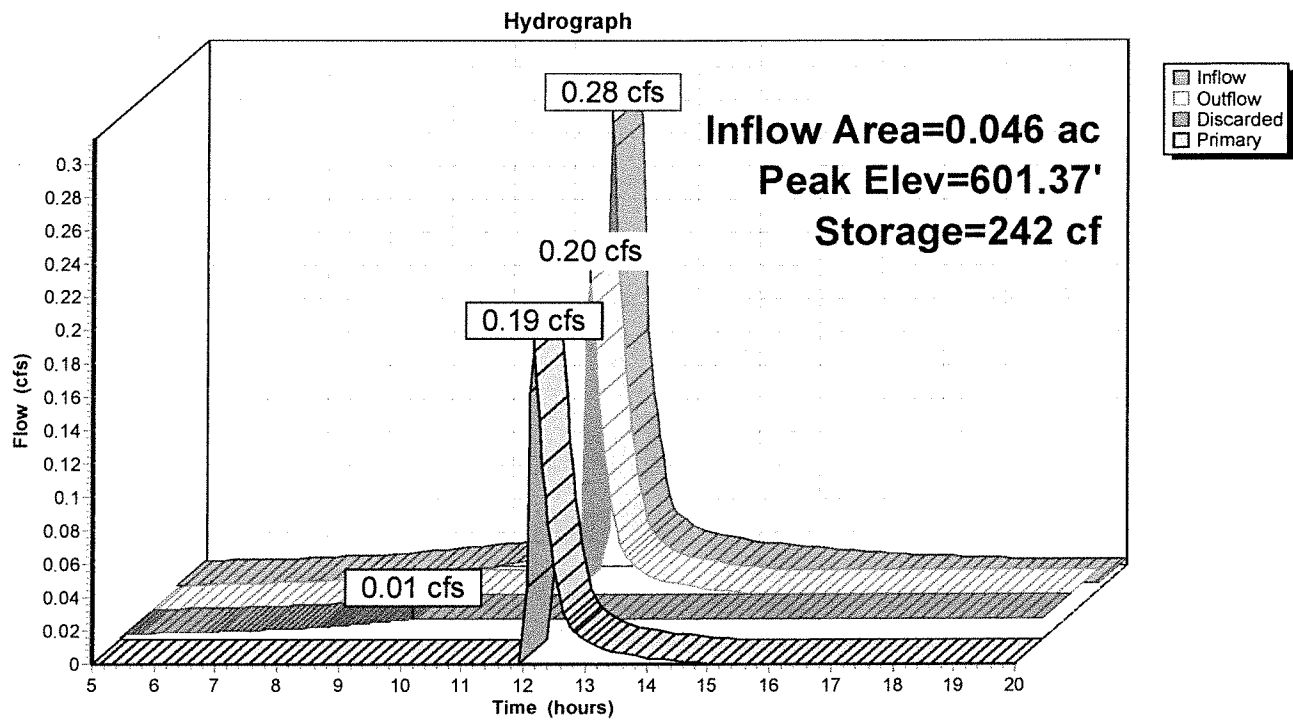
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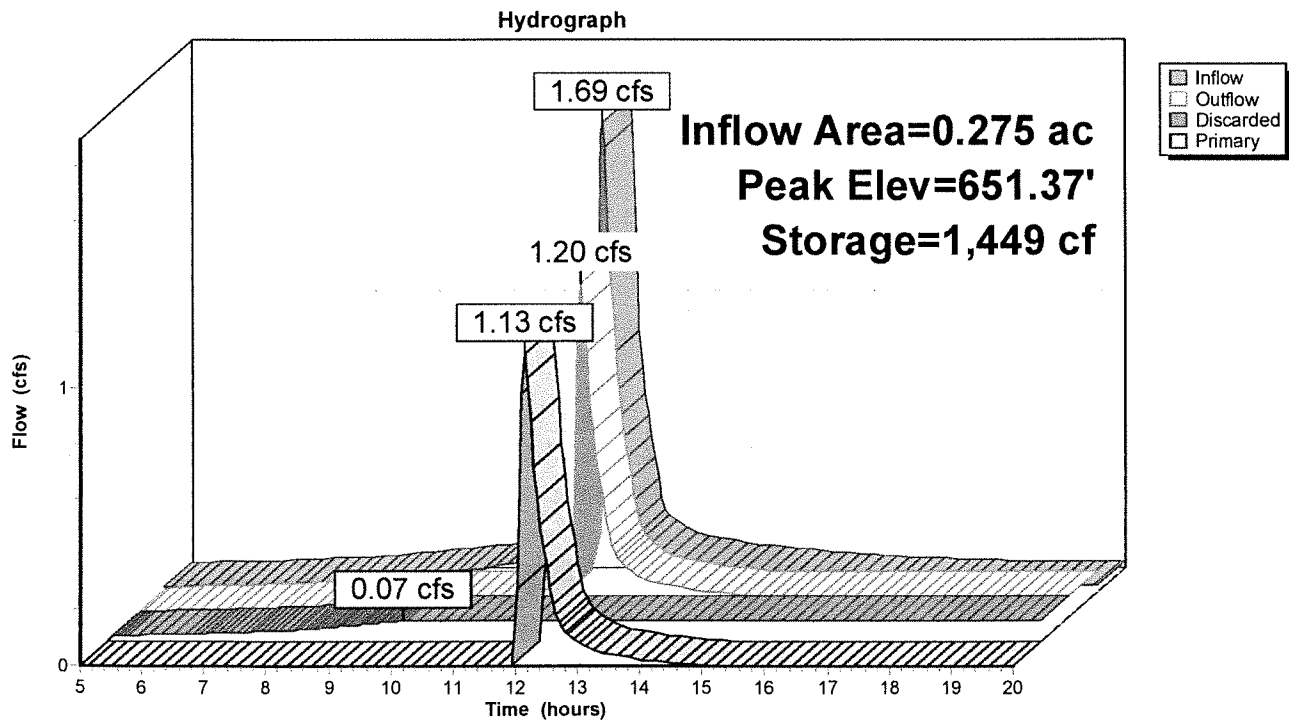
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Pond 5P: (new Pond)



Pond 7P: HOUSES SYSTEMS LOTS 2-7

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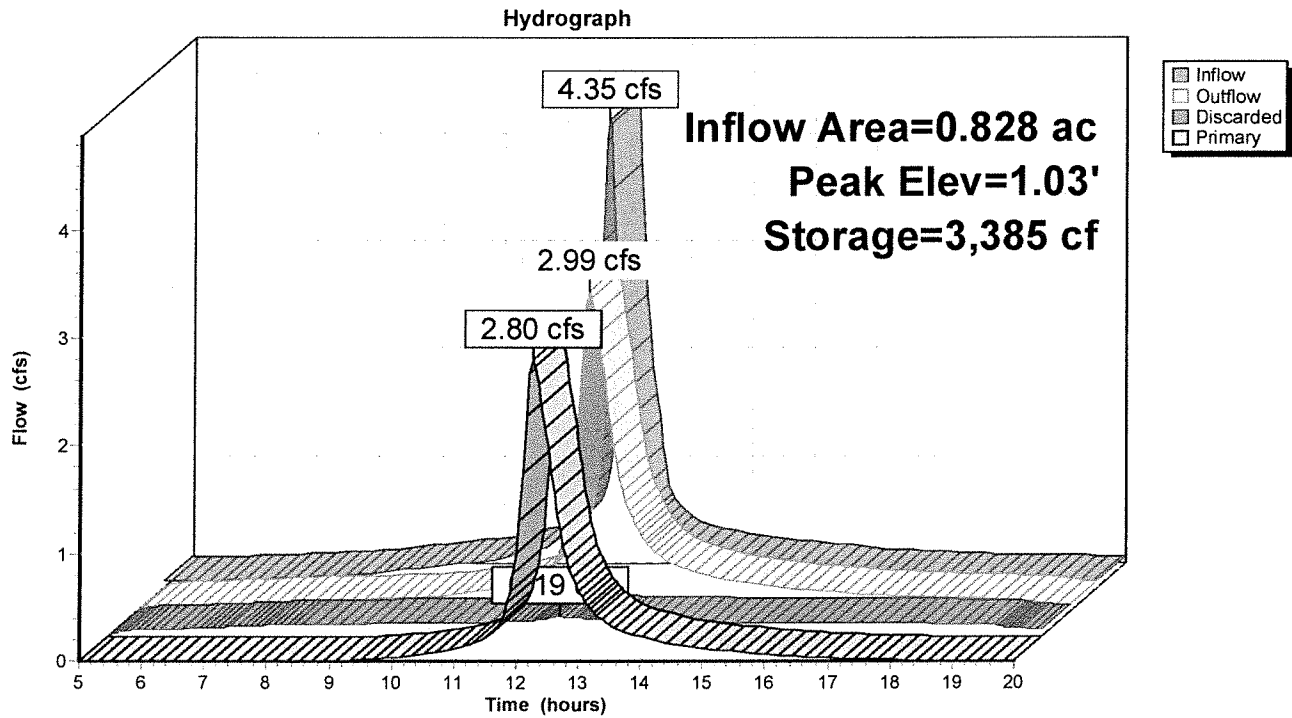
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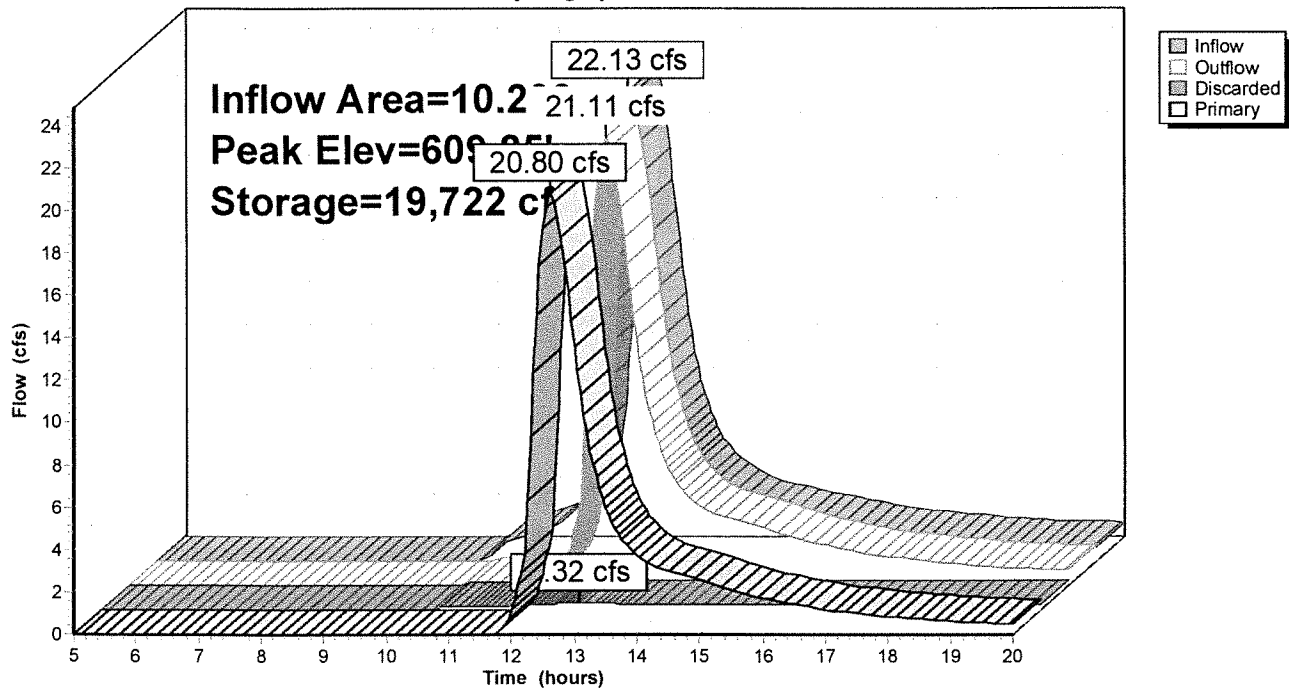
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Pond 9P: LOTS 1, 8-10,12, 16 SYSTEMS



Pond 16P: MAIN BASIN

Hydrograph



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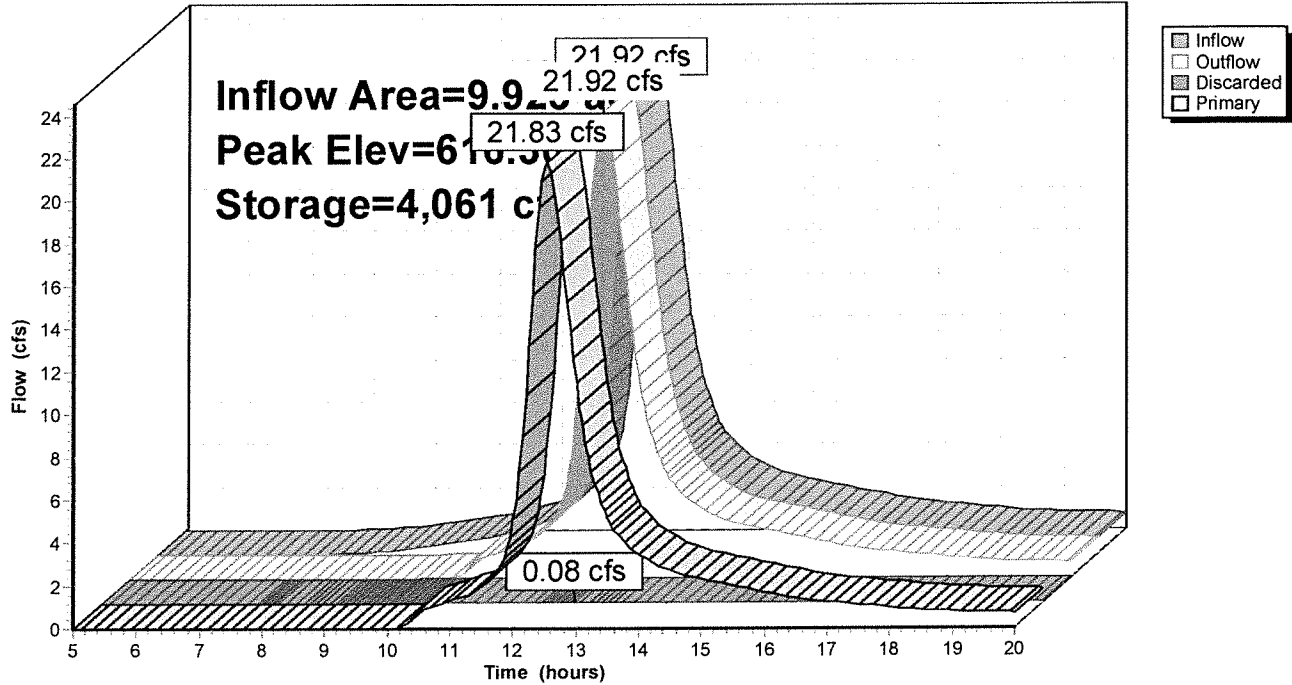
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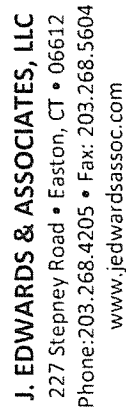
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Pond 17P: FOREBAY

Hydrograph





HOLLY ESTATES

DRAINAGE CHART

LOCATION		AREA		C	TIME FLOW			I	Q		DESIGN			PROFILE				
from	to	inc	total		to in	pipe	total		incr.	total	pipe size	slope %	capacity full	length (ft)	drop (ft)	invert in	invert out	vel. (fps)
1	2	0.1	0.1	0.75	5	-	5	5.5	10YR	0.41	15"	1.0	6.6					
2	3	0.7	0.8	0.50	15	-	15	4.6		1.84	15"	1.0	6.6					
3	5	1.5																
4	4	0.1	2.4	0.45	15	1	16	4.5		4.86	15"	1.0	6.6					
5	6	0.9	3.3	0.40	16	-	16	4.5		5.94	15"	1.0	6.6					
6	8	0.1	3.4	0.40	16	1	17	4.4		5.98	15"	1.0	6.6					
8	8A	0.1																
7	7	6.4	9.9	0.40	17	-	17	4.4		17.42	18"	3.0	20.0	2'hd				
12	11	0.2	0.2	0.75	5	-	5	5.5		0.82	15"	1.0	6.6					
11	9	2.2	2.4	0.50	15	-	15	4.6		5.52								
9	7	2.4																
10	10	0.1	4.9	0.40	15	1	16	4.5		8.82	18"	1.0	11.0					
7	8	1.5	6.4	0.40	16	-	16	4.5		11.52	18"	2.0	15.0					
4	3	0.1	0.1	0.75			5	5.5		0.41								
9	10	0.1	0.1	0.75			5	5.5		0.41								
20	21		19.8	0.35	30		30	4.5	100YR	31.2	24"	2'HD	43.8					

HDPE PIPE n =0.012

HDPE PIPE $n = 0.012$



STEVEN DANZER, PhD & ASSOCIATES LLC

Wetlands & Environmental Consulting

WWW.CTWETLANDSCONSULTING.COM

203 451-8319

WETLAND BOUNDARIES • POND & LAKE MANAGEMENT • CONSTRUCTION FEASIBILITY CONSULTATIONS • ENVIRONMENTAL STUDIES

Date: September 15, 2020

By: Steven Danzer Ph.D.

- Soil Scientist, Senior Professional Wetland Scientist, Arborist
 - Nationally certified by the Soil Science Society of America (#353463).
 - Registered with the Society of Soil Scientists of Southern New England.
 - Certified PWS #1321 by the Society of Wetland Scientists
 - Certified Arborist by the International Society of Arboriculture (ISA) NE-7409A
 - CT Licensed Arborist DEEP S-5639
- Ph.D. in Renewable Natural Resource Studies.

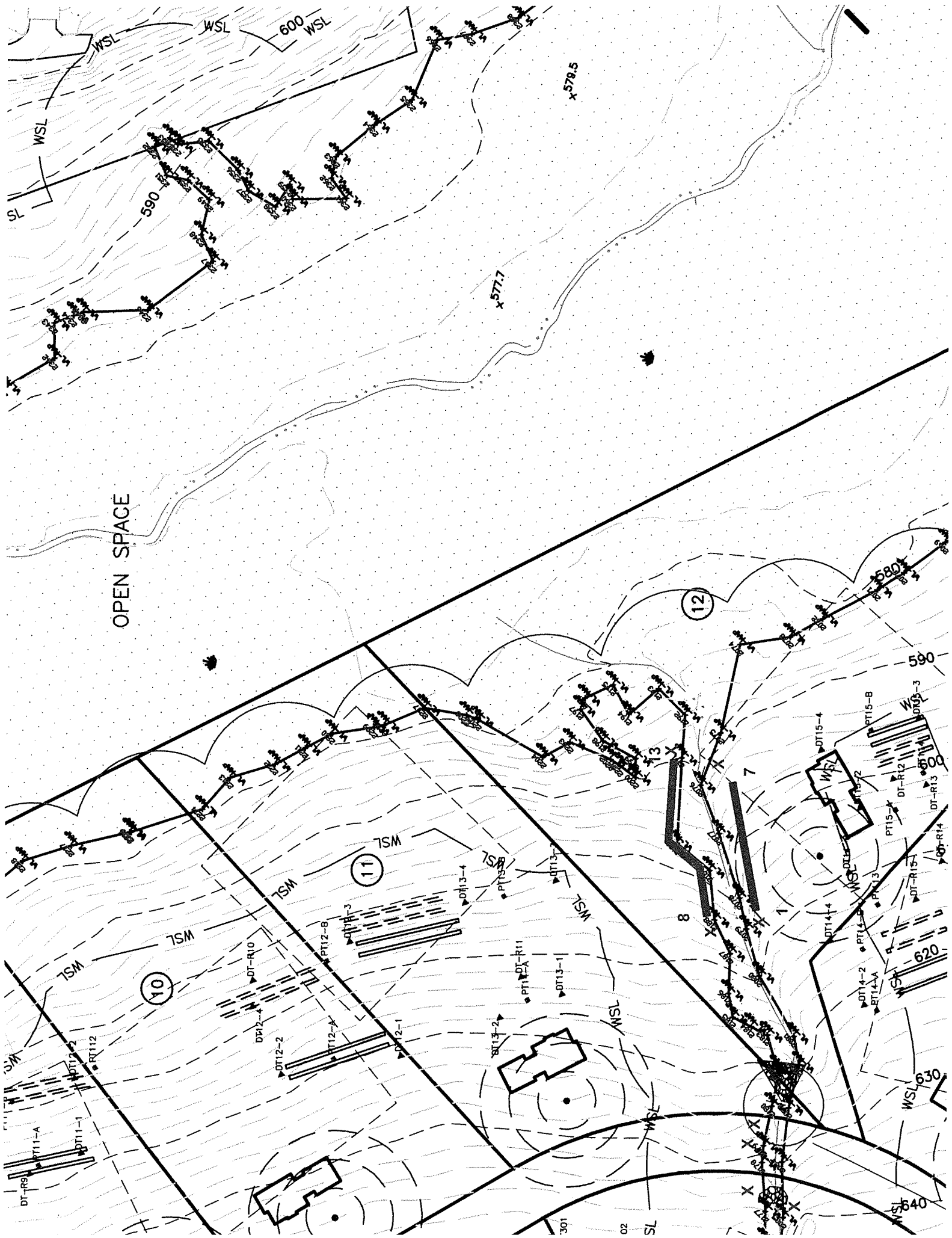
Project: 203 and 211 Berkshire Road, Newtown, CT.

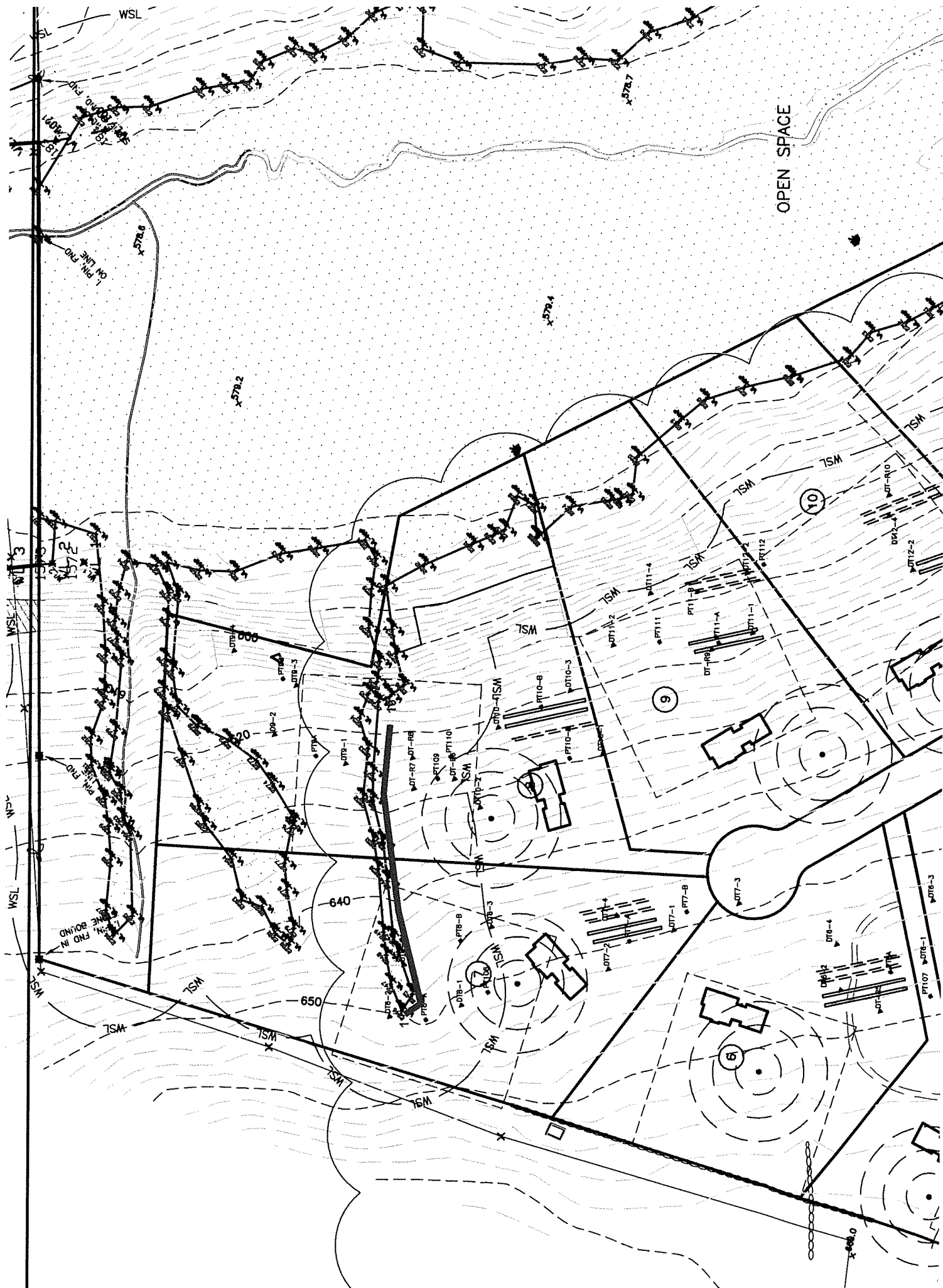
A wetlands investigation was performed at the above-referenced property. The wetlands on the site had been previously mapped by Cynthia Rabinowitz. That wetland boundary was recently reflagged by the surveyor (Jason Edwards Associates LLC) and located on a survey provided to me. The purpose of my investigation was to field verify the Rabinowitz boundary (blue flags on site) within proximity to the proposed development.

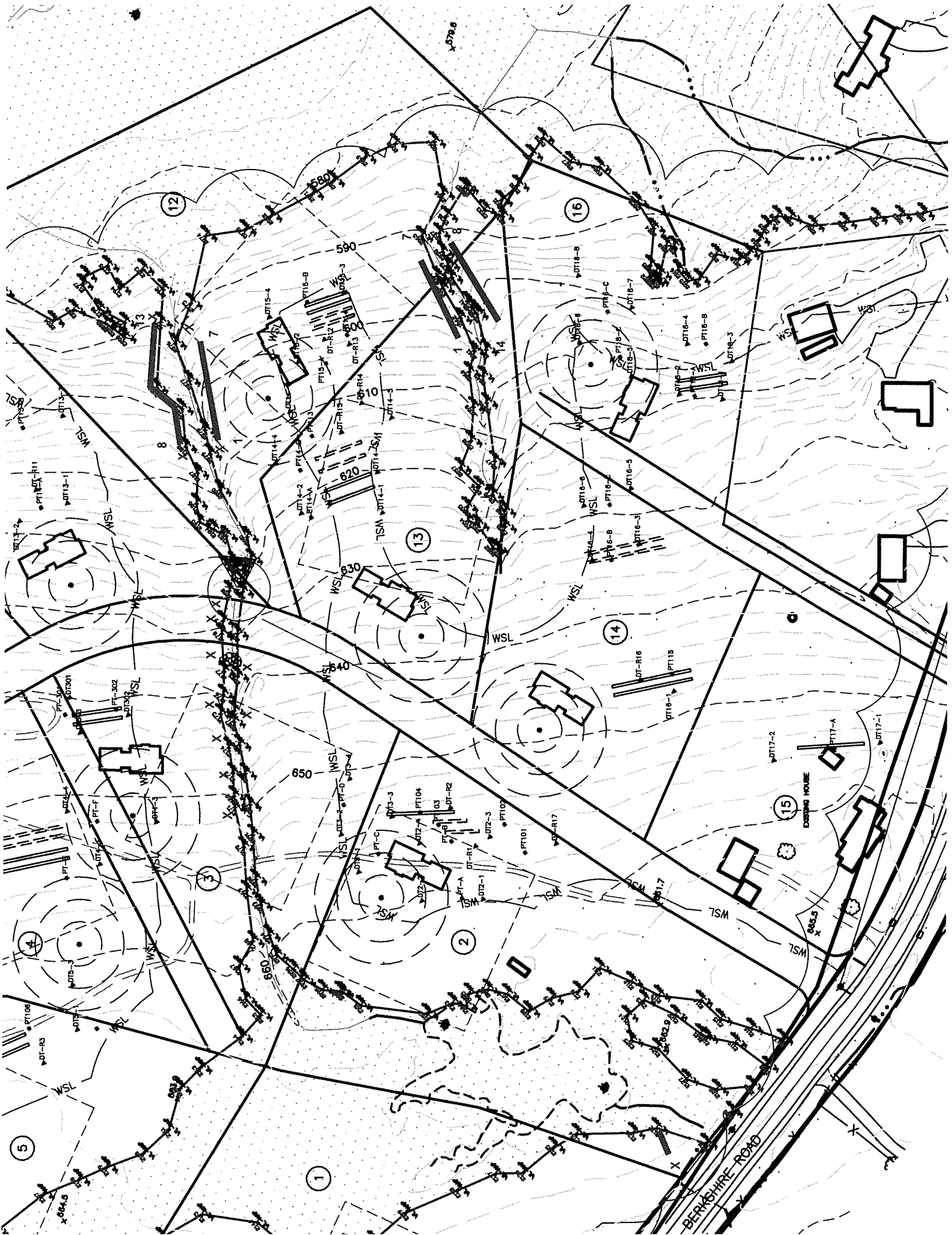
Several areas required adjustments. My additional flags were pink. They are depicted on the sketch map (in blue) attached to this memo. There were five areas which required flag adjustments.

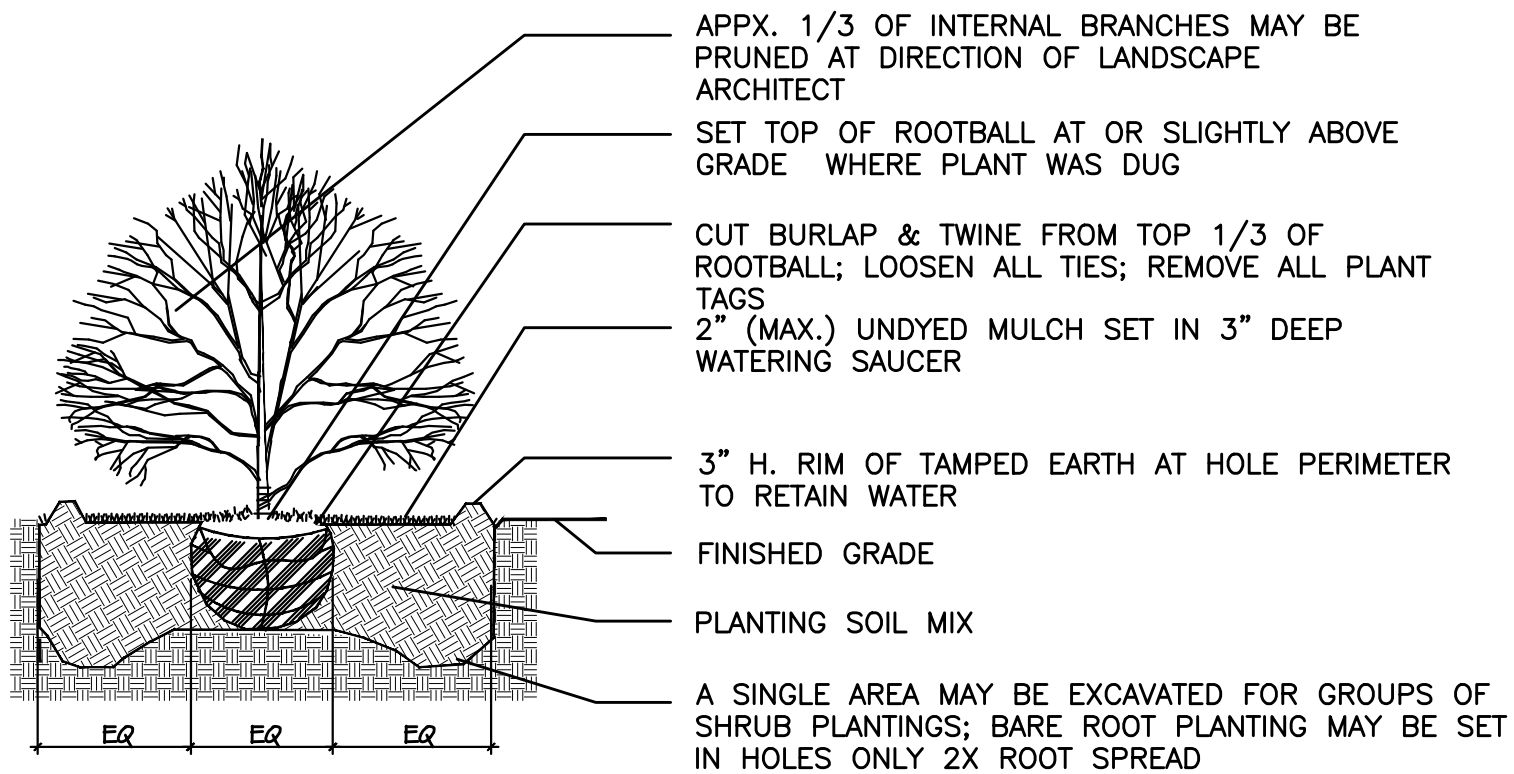
1. Additional flag along Berkshire Road in the southwest corner of Lot 2.
2. The southern boundary of the intermittent watercourse on Lots 7 and 8.
3. Portions of the central intermittent watercourse (west of the crossing) that connects the eastern wetland corridor to the western wetland corridor.
4. The lower segment of the central intermittent watercourse (east of the crossing)
5. The lower segment of the intermittent watercourse on Lots 13 and 12.

The rest of the wetland boundary (including the large wetland corridor to the west) was judged to be substantially accurate.





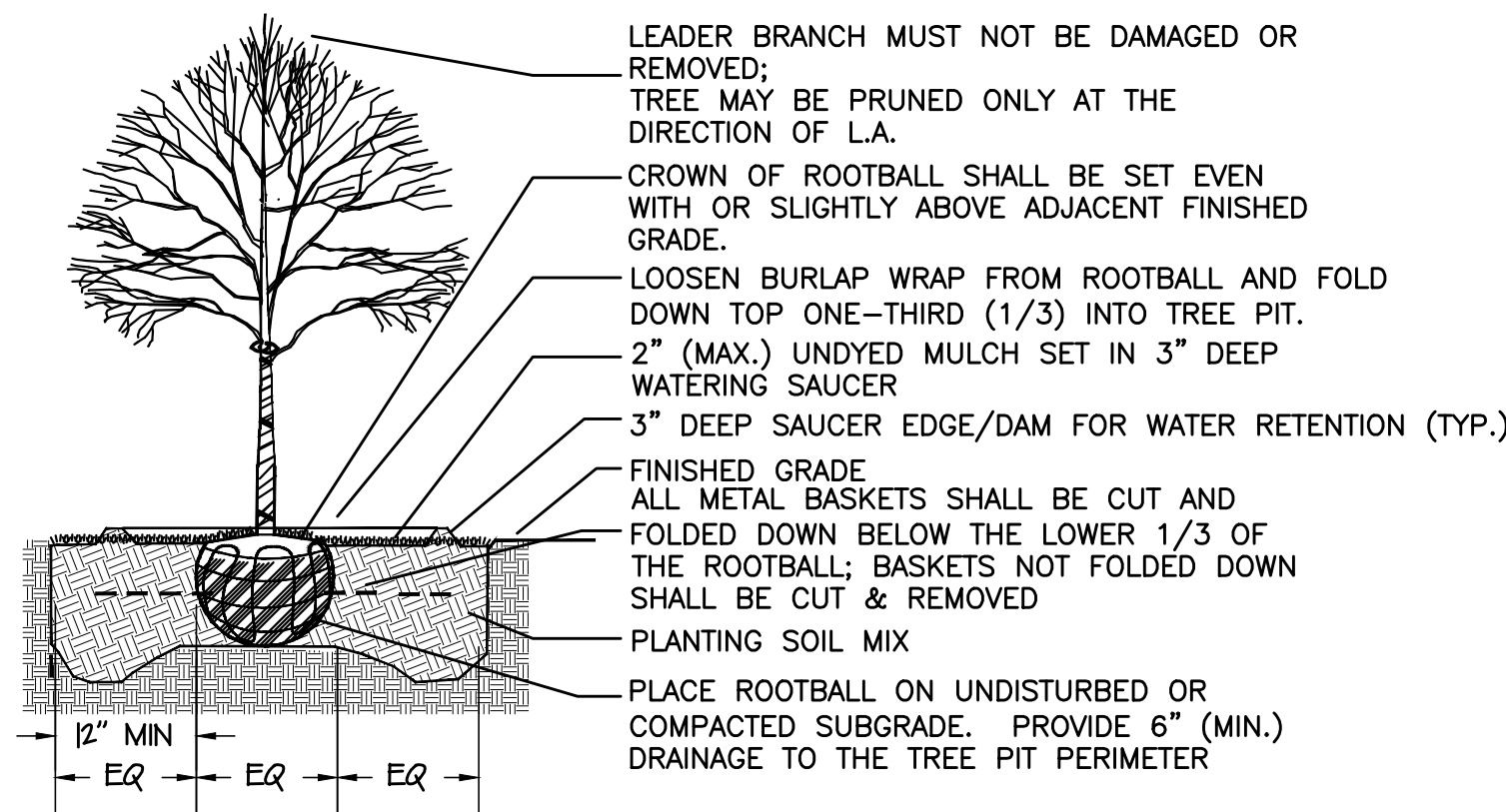




NOTE: FOR ALL CONTAINER GROWN PLANTS, REMOVE FROM CONTAINER JUST PRIOR TO PLANTING AND MAKE VERTICAL INCISIONS ALONG THE SURFACE OF THE ROOTBALL WITH A SHARP INSTRUMENT. CUT THROUGH CIRCULAR ROOTS AND GENTLY COMB OUT ROOTS.

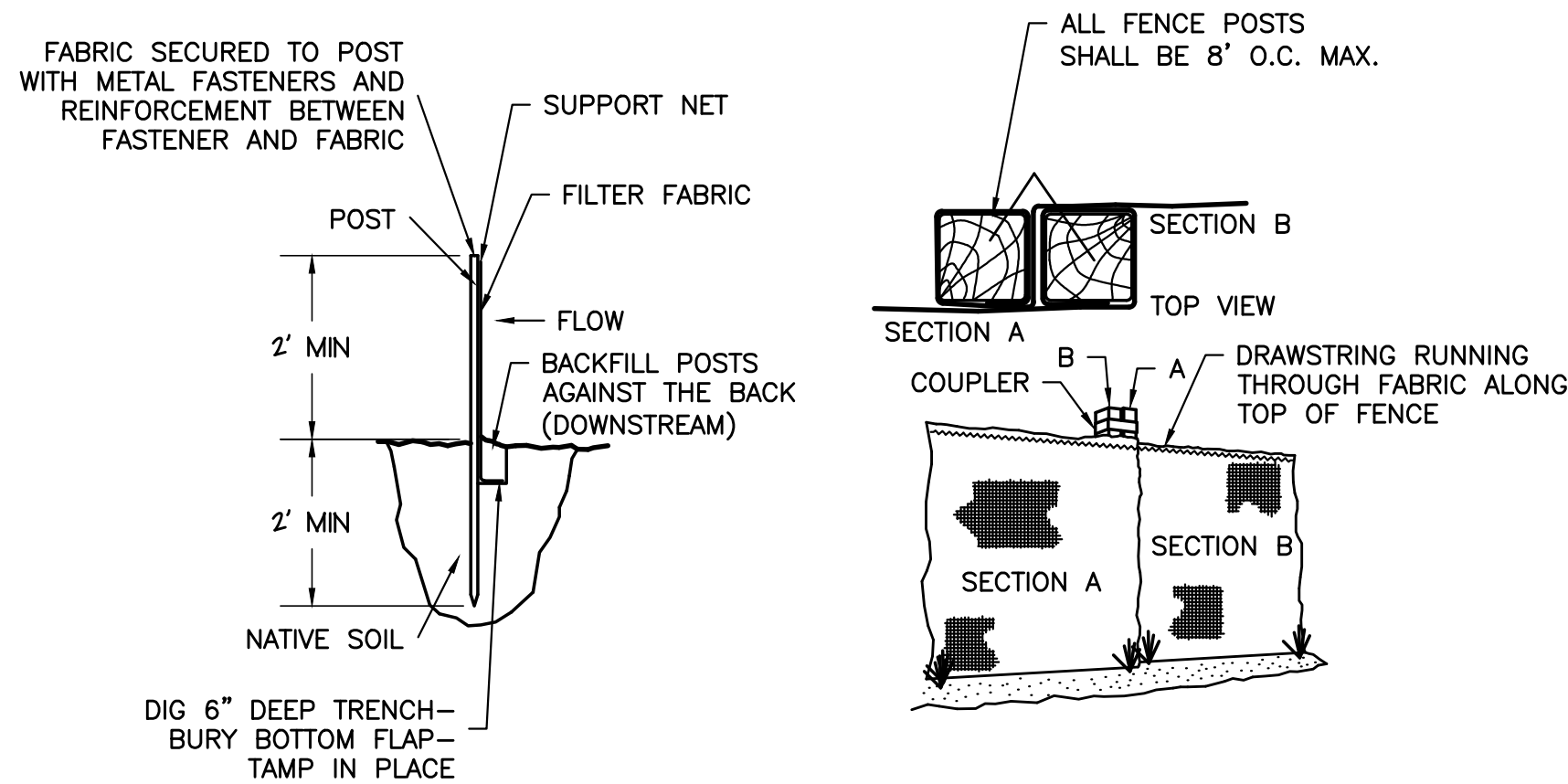
1 SHRUB PLANTING DETAIL

NOT TO SCALE



2 DECIDUOUS TREE PLANTING DETAIL

NOT TO SCALE



TOE-IN METHOD

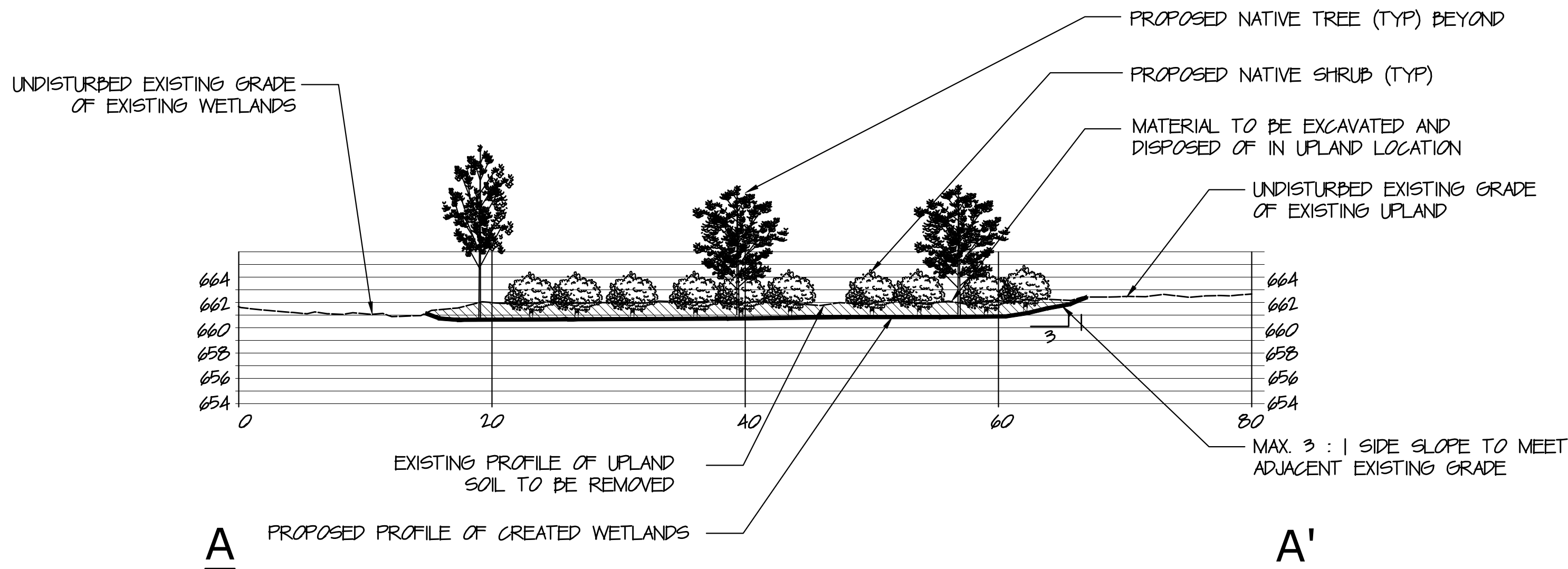
INSTALLATION NOTES:

1. ALL INSTALLATION AS PER ASTM STANDARDS
2. EXCAVATE A 6 INCH TRENCH ALONG THE LOWER PERIMETER OF THE SITE
3. UNROLL A SECTION AT A TIME AND POSITION WALL OF THE TRENCH (NET SIDE AWAY FROM DIRECTION OF FLOW)
4. DRIVE THE POST INTO THE GROUND UNTIL THE NETTING IS APPROXIMATELY 2 INCHES FROM THE TRENCH BOTTOM
5. LAY THE TOE-IN FLAP OF FABRIC ONTO THE UNDISTURBED BOTTOM OF THE TRENCH. BACKFILL THE TRENCH AND TAMP THE SOIL. STEEPER SLOPES REQUIRE AN INTERCEPT TRENCH
6. JOIN SECTIONS AS SHOWN ABOVE

JOINING SECTIONS OF FENCING

3 FABRIC SILTATION FENCE DETAIL

NOT TO SCALE

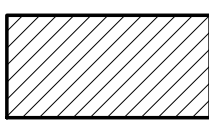




KEY

EXISTING MATERIAL TO BE EXCAVATED

PROPOSED PROFILE OF CREATED WETLANDS

EXISTING PROFILE OF UPLAND SOIL TO BE REMOVED



				<div>CT</div> <div>Tracy Chalifoux LLC</div> <div>Landscape Architect</div> <div>7 King Street, Cheshire, CT 06011</div> <div>Office: 845-564-1360</div> <div>E-mail: tchalifoux@gmail.com</div>		<div>Seal</div> <div></div>		<div>Project Title</div> <div>WETLAND CREATION PLAN</div> <div>HOLLY ESTATES</div> <div>DEVELOPER: NEGREIRO & SONS CONSTRUCTION, LLC</div>		<div>Graphic Scale and North Arrow</div>		<div>Drawing Title</div> <div>PLANTING RESTORATION DETAILS</div>		<div>Drawing No.</div> <div>WP-2</div>	
		<div>STEVEN DANZER, PHD & ASSOCIATES LLC</div> <div>Wetlands & Environmental Consulting</div> <div>www.CTWetlandsConsulting.com</div> <div>203 451-8319</div> <div>WETLAND BOUNDARIES • POND & LAKE MANAGEMENT • CONSTRUCTION FEASIBILITY CONSULTATIONS • ENVIRONMENTAL STUDIES</div>		<div>Location</div> <div>203 & 211 BERKSHIRE ROAD NEWTOWN, CONNECTICUT</div>		<div>Date</div> <div>October 27, 2020</div>		<div>Scale</div> <div>AS SHOWN</div>		<div>Checked</div> <div>SD</div>		<div>Drawn</div> <div>TLC</div>		<div>SHEET 2 OF 2</div>	
Revisions		Date													

PLANTING LEGEND

- PROPERTY LINE -----
- PROPOSED NATIVE SHRUBS ○
- PROPOSED NATIVE TREE ○ +
- EXISTING TREE TO BE REMOVED ○ X
- PROPOSED AREA OF WETLAND CREATION (EXCAVATE) [Hatched Box]
- PROPOSED AREA OF NEW ENGLAND WETMIX [Dotted Box]
- WETLAND LINE ---△---
- PROPOSED SILT FENCE ---●---●---

PLANTING NOTES:

- CONTACT CALL BEFORE YOU DIG AT 800-922-4455 TO HAVE UNDERGROUND UTILITY LINES MARKED PRIOR TO START OF ANY EXCAVATION WORK.
- ANY INVASIVE VEGETATION WITHIN THE WORK AREA TO BE REMOVED IS TO BE FLAGGED BY LANDSCAPE ARCHITECT, REMOVED BY HAND AND DISPOSED OF IN AN OFF-SITE LOCATION.
- EXACT LOCATION OF PLANTINGS, SPECIES TYPES AND QUANTITIES MAY VARY FROM THIS PLAN BASED ON SITE PLAN REVISIONS AND/OR ACTUAL FIELD CONDITIONS.
- PLANT SPECIES SUBSTITUTIONS MAY BE MADE WITH THE APPROVAL OF THE PROJECT LANDSCAPE ARCHITECT PRIOR TO PLANTING. SUBSTITUTED PLANTS SHALL BE AT AN EQUAL OR GREATER SIZE AS NOTED USING A SIMILAR TYPE PLANT.
- ALL PLANTING METHODS SHALL BE IN ACCORDANCE WITH THE 'AMERICAN STANDARDS FOR NURSERY STOCK' LATEST EDITION, AS PUBLISHED BY THE AMERICAN NURSERY AND LANDSCAPE ASSOCIATION.
- IN THE EVENT OF A DISCREPANCY BETWEEN THE QUANTITIES OF PLANTS IN THE PLANT LIST AND THE ACTUAL QUANTITIES SHOWN ON THE PLAN THE PLAN SHALL GOVERN.
- ALL PLANTING WORK SHALL BE PERFORMED EITHER BY HAND OR BY TRACKED EQUIPMENT.
- ANY PLANTINGS SUSCEPTIBLE TO DEER BROWSING SHALL BE SPRAYED WITH ORGANIC DEER REPELLENT.
- PLANTINGS SHALL BE HAND WATERED OR WATERED WITH A TEMPORARY IRRIGATION SYSTEM UNTIL ESTABLISHMENT.
- BASE MAP INFORMATION WAS TAKEN FROM 'DETAILED SITE DEVELOPMENT PLAN' PREPARED BY J. EDWARDS & ASSOCIATES, LLC ENGINEERING AND SURVEYING, DATED SEPTEMBER 30, 2010. ADDITIONAL INFORMATION WAS ADDED FROM MEASUREMENTS TAKEN BY TRACY CHALIFOUX LLC.

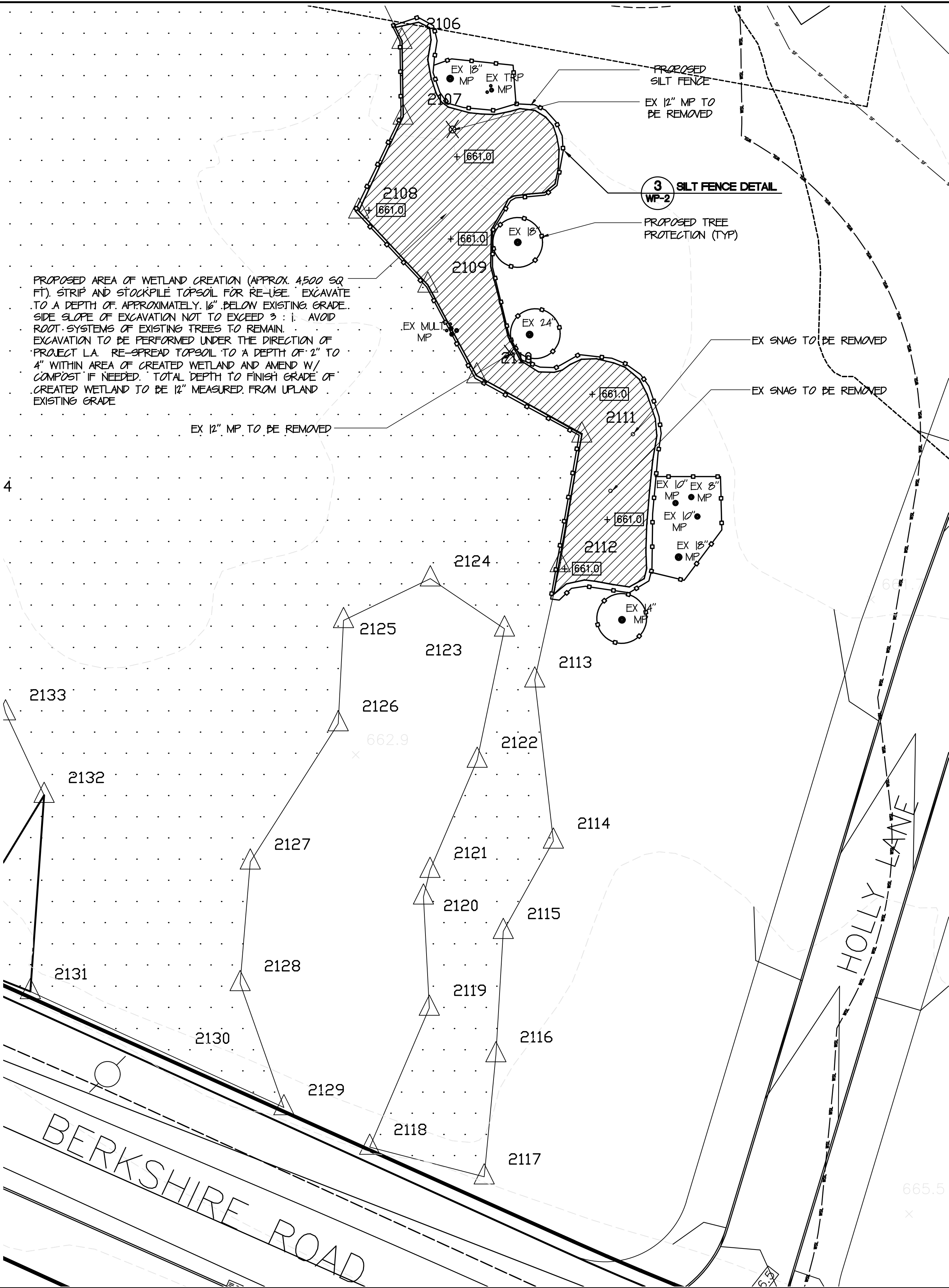
WORK SEQUENCE:

- INSTALL EROSION CONTROLS AND TREE PROTECTION AS SHOWN ON PLAN
- EXCAVATE NEW WETLAND AREA, STRIPPING AND STOCKPILING TOPSOIL FOR RE-USE. EXCAVATE NEW WETLAND AREA TO A DEPTH OF APPROXIMATELY 16 INCHES UNDER THE DIRECTION OF PROJECT LANDSCAPE ARCHITECT. SIDE SLOPES OF EXCAVATED AREA SHALL NOT EXCEED 3 : 1.
- RE-SPREAD STOCKPILED TOPSOIL TO A DEPTH OF APPROXIMATELY 2 TO 4 INCHES.
- INSTALL NATIVE TREES AND SHRUBS
- APPLY WETMIX WETLAND SEED MIX BY NEW ENGLAND WETLAND PLANTS, INC. AS PER MANUFACTURER INSTRUCTIONS
- PROVIDE 2" ON NON-DYED MULCH IMMEDIATELY BENEATH ALL NEW TREES AND SHRUBS
- FINE RAKE, SEED AND HAY MULCH TO RESTORE ALL DISTURBED LAWN AREAS
- REMOVE EROSION CONTROLS AFTER SITE IS STABLE

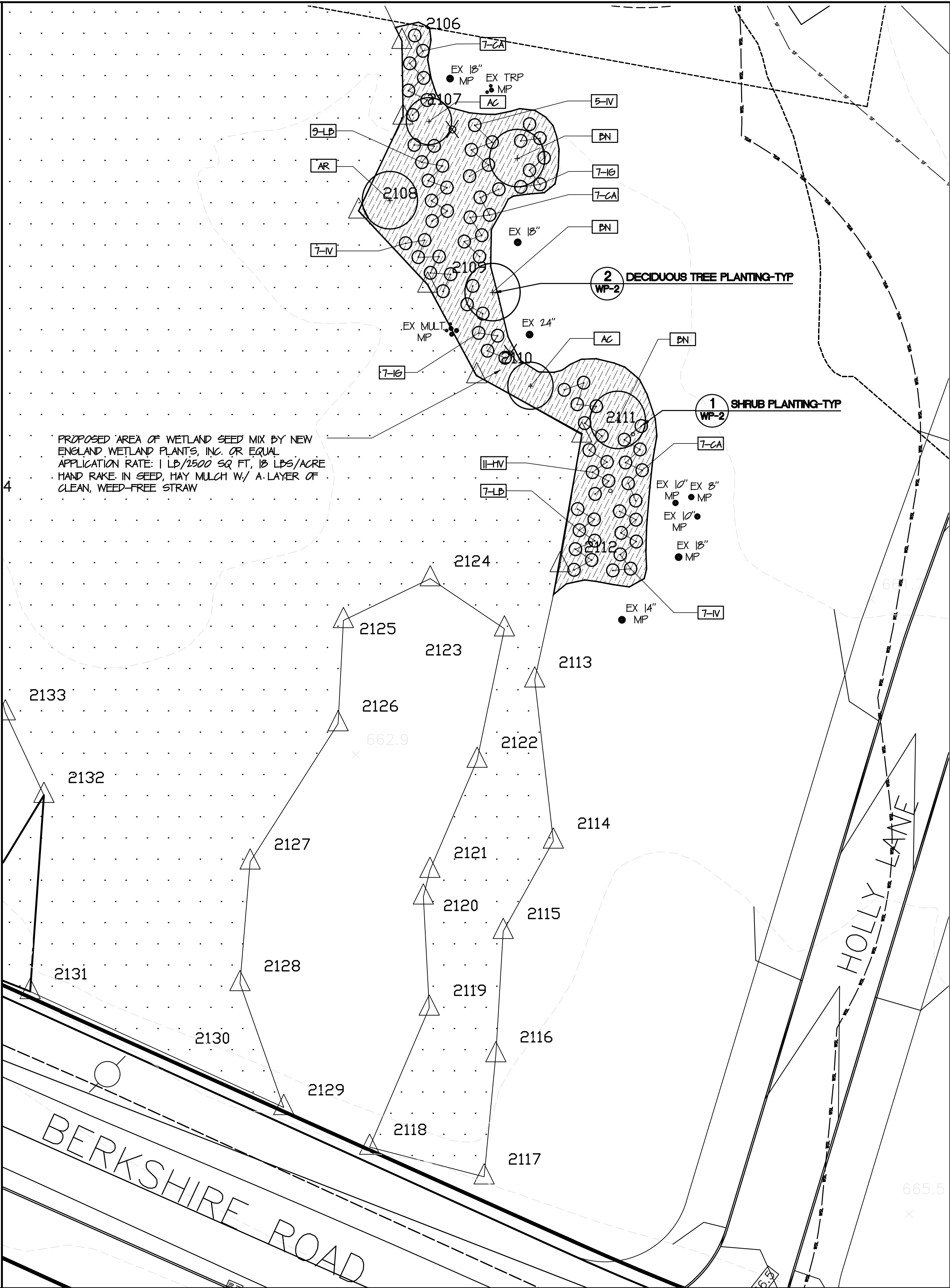
PLANT LIST-Holly Estates

QUANTITY	SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE	SPACING
TREES					
1	AR	Acer rubrum	Swamp Red Maple	2"-2 1/2" cal.	
2	AC	Amelanchier canadensis	Shadblow Serviceberry	8'-10' ht.	
3	BN	Betula nigra 'Heritage'	Heritage River Birch	8'-10' ht.	
SHRUBS					
21	CA	Clethra alnifolia	Sweet Pepperbush	3'-3 1/2' ht.	6' O.C.
11	HV	Hamamelis vernalis	Vernal Witchhazel	3'-3 1/2' ht.	6' O.C.
14	IG	Ilex glabra	Inkberry	3'-3 1/2' ht.	6' O.C.
19	IV	Ilex verticillata	Winterberry Holly	3'-3 1/2' ht.	6' O.C.
16	LB	Lindera benzoin	Spicebush	3'-3 1/2' ht.	6' O.C.

Note: Provide beneath trees and shrubs 2" of non-dyed bark mulch.



WETLAND CREATION PLAN
SCALE: 1" = 20'-0"



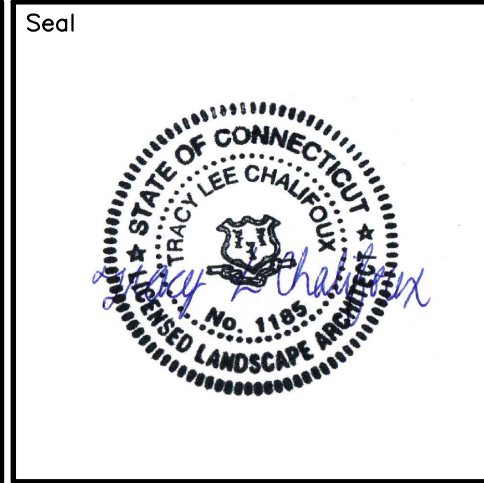
WETLAND PLANTING PLAN
SCALE: 1" = 20'-0"

Revisions	Date

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Landscape Architect
7 King Street, Danbury, CT 06811
Office: 845-364-1360
E-mail: tchalifoux@gmail.com

STEVEN DANZER, PhD & ASSOCIATES LLC
Wetlands & Environmental Consulting
www.CTWetlandsConsulting.com
203 451-8319



Project Title

WETLAND CREATION PLAN
HOLLY ESTATES
DEVELOPER: NEGREIRO & SONS CONSTRUCTION, LLC

Location

203 & 211 BERKSHIRE ROAD
NEWTOWN, CONNECTICUT

Graphic Scale and North Arrow

0 20' 40'

Date

October 27, 2020

Scale

1"=20'-0"

Checked

SD

Drawn

TLC

Drawing Title

WETLAND CREATION PLAN,
WETLAND PLANTING PLAN
AND PLANT LIST

Drawing No.

WP-1

SHEET 1 OF 2