Quarry Ridge

Response Narrative

August 30, 2023

Includes reports from:

DAVISON ENVIRONMENTAL

Biodiversity Studies • Wetland Delineation & Assessment • Habitat Management • GIS Mapping • Permitting

STEVEN DANZER, PHD & ASSOCIATES LLC
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203 451-8319

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Landscape Architecture & Environmental Planning
8 Knight Street, Suite 203, Norwalk, CT 06851
Tel: (203) 855-7879 Fax: (203) 855-7836

August 20, 2023

Cheryl A. Valerie
Zoning and Wetland Enforcement officer

Re: IWC-2023-03, File #1439
Address: 139, 141 & 201 Turkey Roost Road and 30 Cobblers Court, Monroe, Connecticut 06468

Dear Cheryl;

Below are responses to your comments listed in the letter you sent dated August 1, 2023. I have quoted your letter and provided the responses below each. Text in **Green Bold** are my responses. In some of the responses I have quoted reports prepared by other members of the project team. Those reports are attached to this letter.

1. *Question was raised whether the prudent and feasible alternatives put forth meet the definitions and requirements as stipulated in the IW Regulations? Alternative proposed gave only more intensive uses of the site, with no change or benefit to the wetlands. Possible use of other entrances should also be further explored, to reduce/eliminate the impact to Smith Pond wetlands and disturbance/loss of box turtle habitat.*

   This comment asks multiple questions. Responses to each are listed individually below:

   Question was raised whether the prudent and feasible alternatives put forth meet the definitions and requirements as stipulated in the IW Regulations? Alternative proposed gave only more intensive uses of the site, with no change or benefit to the wetlands.

   The IW regulation 7.5.f state as follows:
   7.5 All applications shall include the following information in writing and/or on maps or drawings:

   f. A minimum of two (2) other feasible alternative site plans that were considered relative to impacts on wetlands and watercourses and an explanation as to why the proposed plan was considered the most feasible and prudent alternative resulting in the least amount of impact to said wetlands and watercourses;

   "Prudent" - economically and otherwise reasonable in light of the social benefits to be derived from the proposed regulated activity provided cost may be considered in deciding what is prudent and further provided a mere showing of expense will not necessarily mean an alternative is imprudent.

   "Feasible" - able to be constructed or implemented consistent with sound engineering principles.

It should be noted that this regulation does not require that an applicant provide an alternative that is less impactful. It requires that the applicant demonstrate why the current plan is the most feasible and prudent design, that also achieves the desired outcome. The following response demonstrates that the current plan is the most feasible and prudent alternative resulting in the least amount of impact to said wetlands and watercourses.

The statements directly below are quoted from a report prepared by Steven Danzer Phd. The full report is attached to this letter.

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3. Alternative Analysis

Section 7.5(f) of the wetland regulations states as follows:

7.5 All applications shall include the following information in writing and/or on maps or drawings:
f. A minimum of two (2) other feasible alternative site plans that were considered relative to impacts on wetlands and watercourses and an explanation as to why the proposed plan was considered the most feasible and prudent alternative resulting in the least amount of impact to said wetlands and watercourses;

There are no significant impacts to wetlands or watercourses under the current plan. No homes are proposed within the 100 feet upland review area.

The current proposal includes only 1.5 acres of activity located within the 100 upland review area. This includes 1.1 acres of proposed activity within the existing driveway, and 0.4 acres of additional new activity outside of the driveway area.

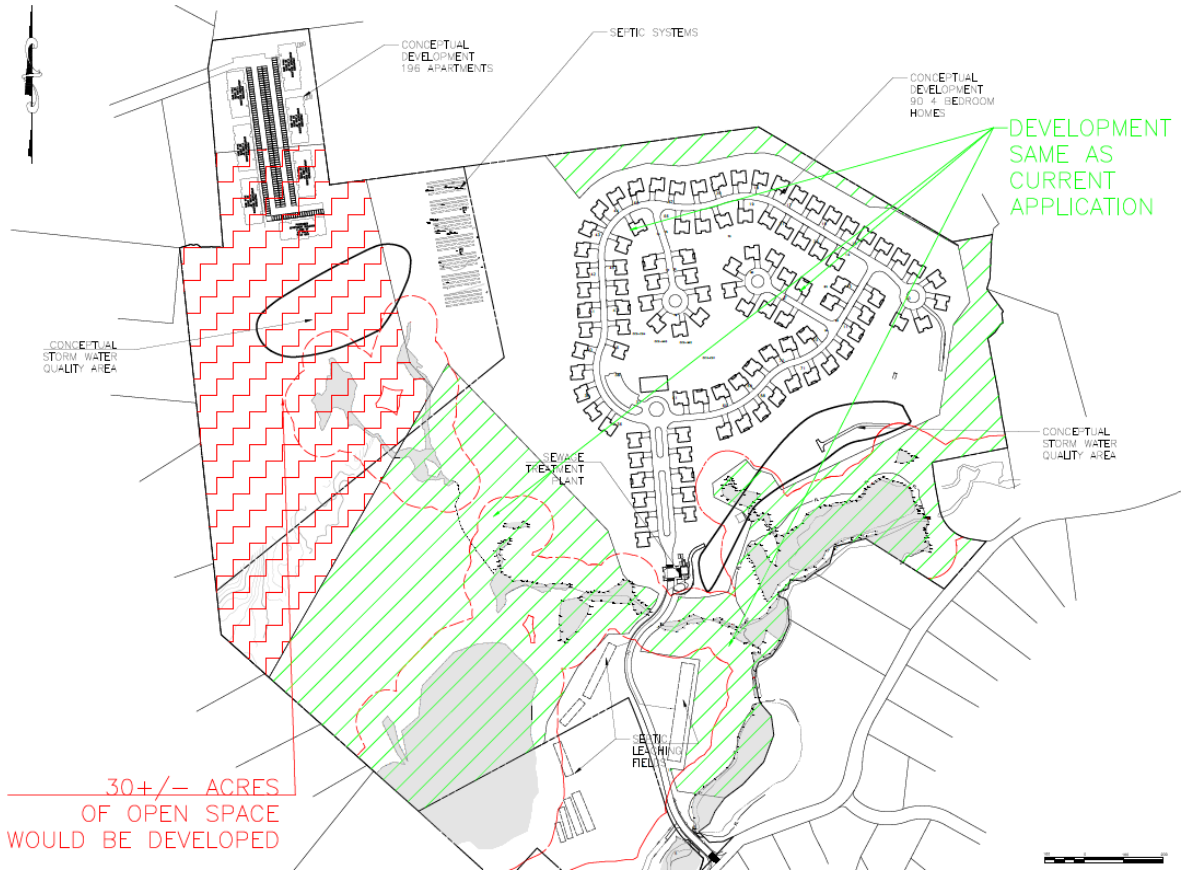
The 1.1 acres of improvements within the existing driveway area will involve road surface activity only, with no work proposed within any of the wetlands, watercourses, or waterbodies. Both existing driveway culverts will remain as is.

The 0.4 acres of activity outside of the driveway area is largely related to the stormwater treatment measures (i.e. piping and basins, etc..), and represents only 0.2% of the total site.

Additionally, the current plan incorporates 81 acres of open space.

The original plan set included 2 alternative site plans. They can be found on sheets S-1A and S-1B.

<u>S-1A</u> – This plan proposes the same 99 unit development that is part of the current application. However, it also includes a proposed multi-family development within the parcel known as 30 Cobblers Hill Court. This would result in a 30ac reduction of the proposed open space.

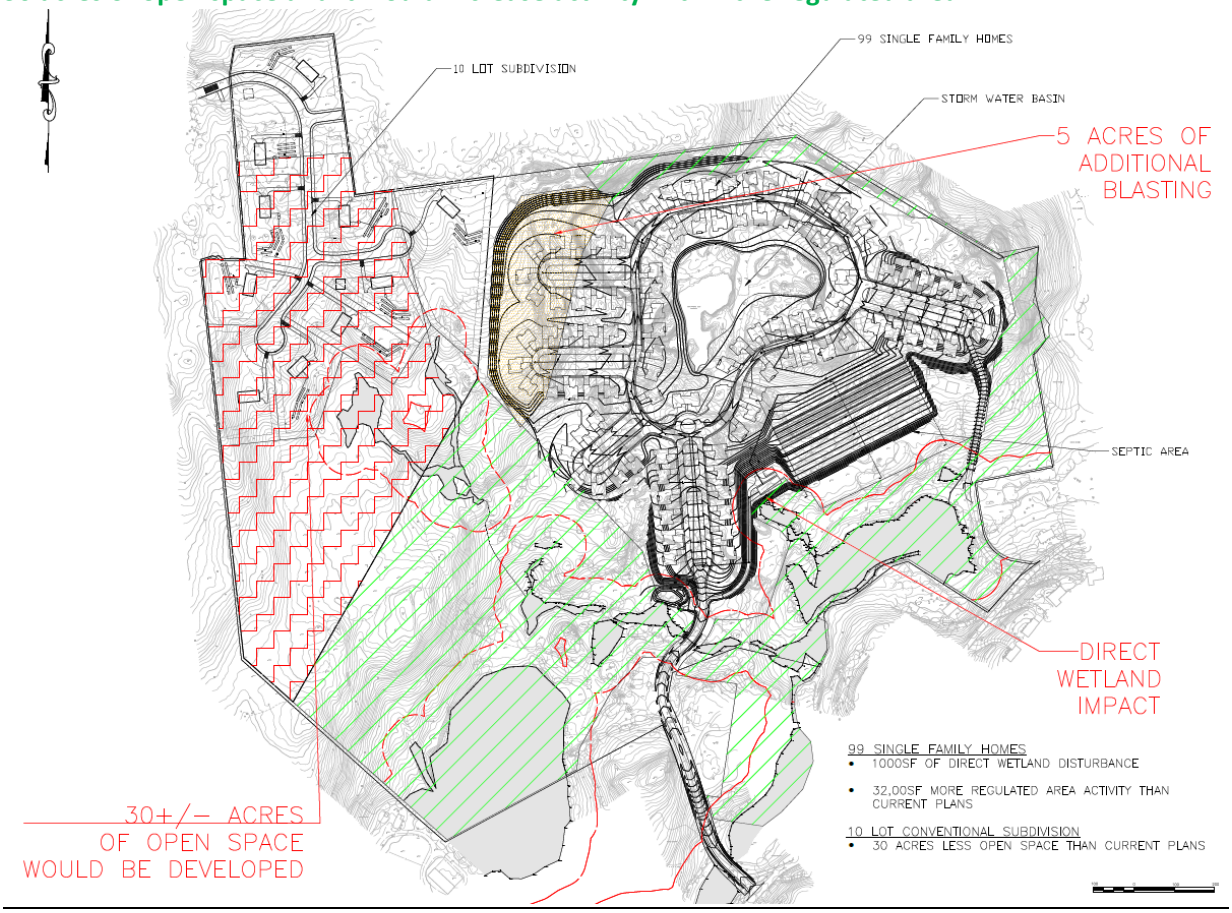


S-1B This plan proposes a multi-family development that is within the same disturbance area of the current application. It also includes a proposed multi-family development within the parcel known as 30 Cobblers Hill Court. This would result in a 81 ac reduction of the proposed open space.

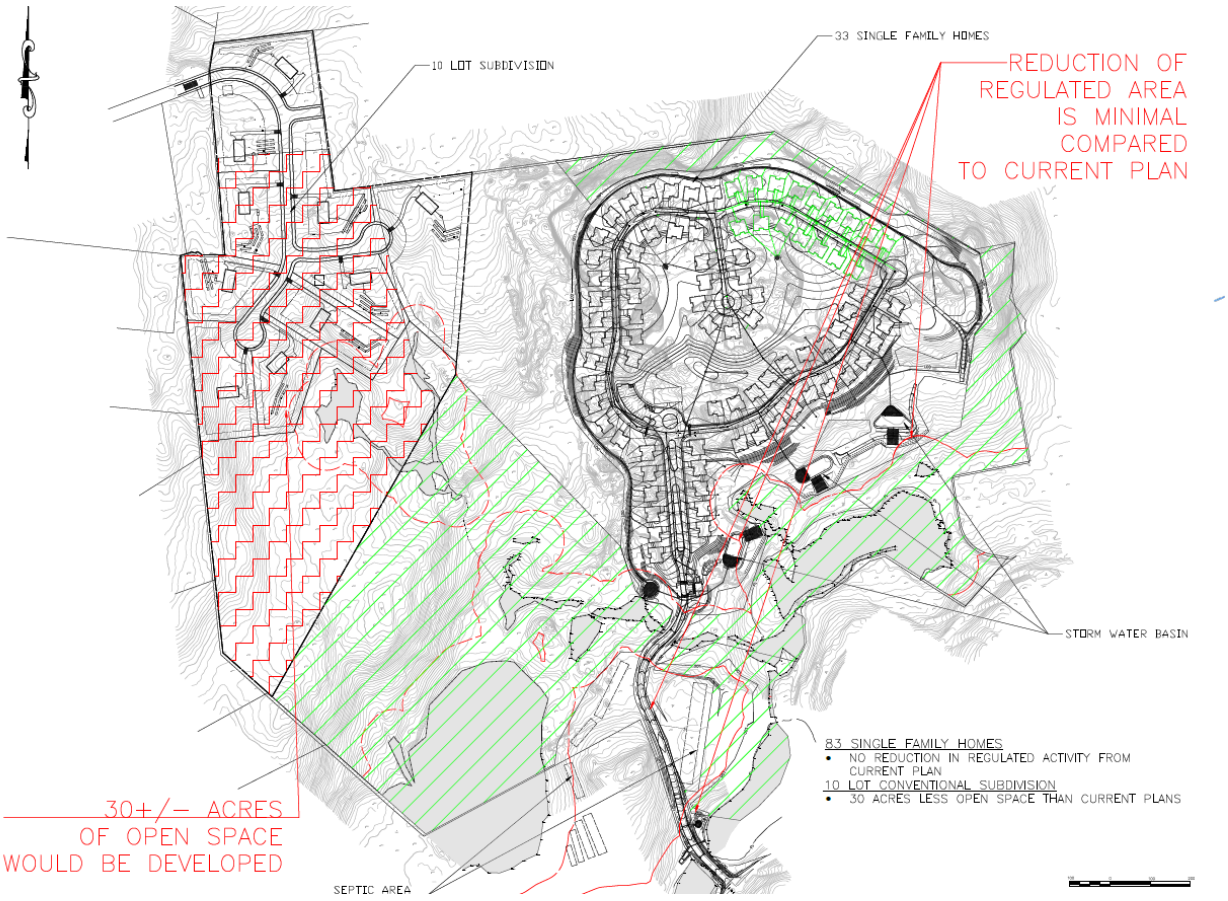


The following alternatives have been included with the latest submission

<u>S-1C</u> – This alternative includes a 99 unit development within 100 acre MFR zoned parcels. This is a plan that was submitted with an application in 2010. While still feasible, it would require that an adiitional 5 acres of blasting, it would also require direct wetland disturbance. Additionally, this plan includes a conventional 10 lot subdivision on the Cobbler Hill Cout parcel. This would result in a loss of 30 acres of open space and it would increase activity within the regulated area



S-1D – This plan includes a similar layout within the MFR area, however the unit count has been reduced to 83 (16%). This results in virtually no change in regulated activity, the storm water basins are slightly reduced in size, but the locations remain the same due to the site topography and need to keep the wetlands hydrated. This proposal would also include a 10 lot subdivision on the Cobblers Court Parcel, which results in a loss of 30 acres of open space. The 16%-unit reduction would force the developer to develop the additional units on Cobbler Court in order to mitigate the economic loss on the MFR parcel



S-1E – This plan includes the same 99 unit layout as the current proposal. On this alternate we utilized the existing driveway along the east side of the property for access. To reconstruct this driveway to comply with town standards will create significant wetland disturbance. An enlargement of this driveway can be found on page 10 of this report.



Assessment of alternatives vs proposed design

Plan	Units	Open space	Regulated Activity
			(less access driveway)
Current plan	99	81ac	0.4ac
SD-1A	295	50ac	0.6ac
SD-1B	796	0ac	0.6ac
SD-1C	109	50ac	1.2ac
SD-1D	93	50ac	0.3ac
S-1E	99	50ac	1.2

It should be noted that 1.1 acres of regulated activity on each alternative is related to the improvements of the access driveway. This work must be completed in order to access the site. However, this work is all outside of the wetlands and follows the path of the existing driveway.

The application now includes 5 alternatives. All of them include regulated activity of less than 2% of the total site area. What sets the current proposal apart and makes it the most prudent and feasible is the additional 31 acres of open space. Below is an excerpt from the attached report prepared by Steven Danzer, Phd which speaks to the importance of this open space. The full report is attached.

1. Preservation of Open Space and Wetland Avoidance as a mitigation strategy

The wetland regulations recognize prevention (i.e. avoidance) as a mitigation measure in its own right. Section 10.2(d) of the Regulations (Standards and Criteria for Decision) enables the Commission to consider the following:

Irreversible and irretrievable loss of wetland or watercourse resources which would be caused by the proposed regulated activity, including the extent to which such activity would foreclose a future ability to protect, enhance or restore such resources, and any mitigation measures which may be considered as a condition of issuing a permit for such activity including, but not limited to, measures to ***(1) prevent or minimize pollution or other environmental damage, (2) maintain or enhance existing environmental quality,*** *or (3) in the following order or priority: restore, enhance and create productive wetland or watercourse resources.*

Furthermore, Section 7.6(i) allows the Commission to consider management practices and other measures designed to mitigate the impact of proposed activity, including such measures that

- Avoid destruction or diminution of the wetland and/or watercourse functions (Section 7.6(1)1;Prevent flooding, degradation of water quality, erosion and sedimentation, and obstruction of drainage (Section 7.6(1)3;
- Are other legal measure designed to preserve and protect adjacent wetland and watercourse areas and natural buffers (Section 7.6(i)7.

As noted in the Narrative, the revised development parcel will contain an area of 147 acres. Within this area will be 81 acres of open space and 66 acres of developed or potentially developable area. The offering of 81 acres of open space contains habitat of high environmental quality. The proposed open space is predominately forest with an intermediately aged and younger aged forest canopy. The wooded open space provides excellent habitat, cover, and food for wetland and upland wildlife species. The trees (and their shrubby understory) also provide other significant ecological functions and benefits to the landscape such as shading, air purification, carbon sequestration as a buffer to climate change, physical stability to the soil, and the infiltration of rain and the prevention of erosion and sedimentation to downstream resources. The trees provide windbreaks and sound buffering as well.

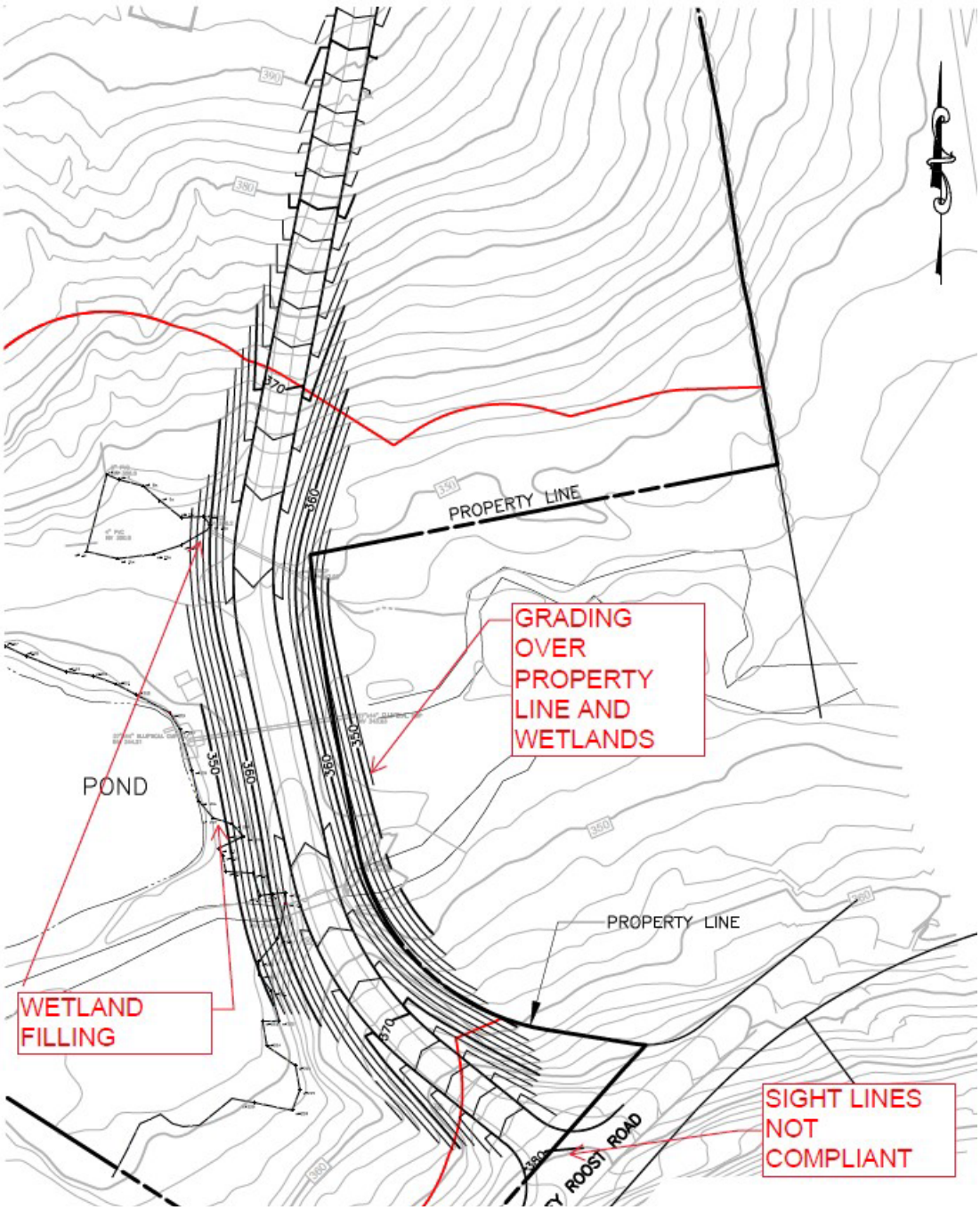
The proposed open space also contains a sloped wetland system within its interior. This system drains southwesterly towards the main wetland and waterbody system located in the southeastern region of the site. The forested open space is one of the headwaters areas for the pond system below. Consequently, the preservation of this area will prevent pollution to the waterbodies below and help maintain environmental quality of that downstream system.

This forested terrain is fully suitable to future residential development, and could be developed if not protected and preserved as open space. As such, avoidance of this area (as proposed in this Permit Application) should be recognized as a mitigation strategy under Section 10.2(d) in its own right as well as a management measure under Section 7.6(i) .

Preservation of this open space is a benefit to both the wetland system located within its interior, and to the wetland corridor located downstream within the MFR zone.

Possible use of other entrances should also be further explored, to reduce/eliminate the impact to Smith Pond wetlands and disturbance/loss of box turtle habitat.

The only other potentially feasible access option for this site is the existing driveway that currently provides access to the existing home on the east side of the project. This driveway is very steep and narrow. It also includes two existing wetland crossings. Below is a plan that depicts the work that would be required to reconstruct that access to town standards.



1. *During the presentation it was noted that all disturbed areas in the URA will be reverted to "meadow" habitat. Question was raised as to what these disturbed areas are classified as right now (pre-disturbance) so the Commission clearly understands what the loss/gains are.*

A description of the current site conditions is provided in the attached report prepared by Matthew Popp ASLA, Professional Wetland Scientist. An excerpt from the report is copied below..

The mainly undeveloped site is found on the north side of Turkey Roost Road. The following habitats are found onsite:

Quarry - The northeastern corner of the site was used as a rock quarry for more than 25 years. Quarry operations ended approximately eight years ago. This area contains rock cliffs, exposed bedrock, dirt access roads, and several structures. Vegetation consists of pioneer species such as Little Bluestem, Queen-Ann's Lace, Clover, Sweet Fern, Autumn Olive, Multiflora Rose, and a few Red Cedars. (SITE OF PROPOSED 99 HOMES)

Woodland - Approximately 50 acres of woods are found in the northwestern portion of the project site and includes both upland woods and wooded wetlands. Here the topography is steeply sloping in many of the upland areas. Several open test pits with adjacent soil stockpiles remain here. Woods are also found bordering the site's property boundaries and around the ponds. Vegetation observed within the woodlands includes Red Oak, Black Birch, American Beech, Huckleberry, and ferns (Hayscented, Sensitive, and Cinnamon). To the north of Smith Pond, an evergreen stand of mature White Pines was noted.

Pond - Three manmade ponds are located on the property. The 2.5± acre waterbody adjacent to Turkey Roost Road is referred to as "Smith Pond" and lies partly off the site. The largest pond measures approximately 4.25 acres and is located in the southwest corner of the property. The smallest, 1.25± acre pond is located near the eastern property line by the middle of the site. Pickerelweed and other emergent vegetation grow along the ponds' edges. Other waterbodies, such as intermittent watercourses, are also found on the site.

Meadow - Upland and wet meadow areas are found in former quarried areas and bordering the site's ponds. Vegetation observed within the upland meadows include those noted above within the quarried areas and Goldenrod, Path Rush, Mugwort, Grape, Daisy Fleabane, and Asiatic Bittersweet. Wet meadow vegetation observed includes Cattails, Woolgrass, Phragmites, Purple Loosestrife, and Smartweeds.

Thickets - A large thicket area is found to the northwest of the site's western pond. Thickets are also found along many of the meadow and woodland edges. Thicket areas are vegetated with the meadow plants noted above plus young woody vegetation (such as Olive).

Developed Land - This are located around the existing dwelling to be removed is vegetated with lawn grasses.



2. *Do wetlands exist near the outlet of Pond #4 that have not been delineated yet?*
   The potential wetland

The area in question is not within the applicant's property and therefore we did not have legal access to delineate wetlands. However, Jason Edwards and Steven Danzer PHD, walked the property and did identify potential wetlands on the abutter property. The approximate wetlands limits have now been depicted on the plans. It should be noted that the Pond 4 outlet has been relocated to be more than 200' from this area.

3. *Staff contends that a box turtle was seen basking on a rock near the road entrance in Smith Pond on 7/24/23. As the applicant saw another one on the west side of the property, it appears that there are possibly multiple habitats that must be documented and protected. It is also unclear if there are any other species on the site that would fall under the DEEP NDDB. As the Davison report confirms that there will be habitat loss, it is staffs belief that a more in depth investigation be performed to ascertain exactly what other species exist on site, that could possibly fall under the NDDB, including the extent of their habitat locations and possible disturbance or loss. Either CT DEEP or a qualified professional with the proper certifications should undertake this task.*

The reviewer indicates that it is "Staff's Belief" that a more depth investigation be completed. We have now provided a more detailed study as requested, however it must be noted that this is not a requirement of the Monroe Wetlands Regulations, nor is it a requirement of CT DEEP. The findings of this study indicate that no evidence of additional endangered species was found. The study was conducted by Matthew Popp, Professional Wetland Scientist. His report is attached to this letter and excerpts are included on page 13.

Additional responses to this comment have been provided in reports by 3 different reports prepared the environmental professionals associated with the project. Excerpts from each are quoted below. The full report from each has been attached.

Eric Davison, *Wildlife Biologist, Wetland Scientist, Registered Soil Scientist;*

Response:

Reports of box turtle basking in ponds are erroneous. This species does not inhabit open water wetlands or bask on exposed surfaces within open water. As I testified at the hearing, these observations are likely of painted turtle, a common aquatic species.

The eastern box turtle uses a mosaic of habitats seasonally, within a small home range. During the spring and early summer months, they favor early and late successional habitats and are often found along the edges of wetlands and small streams, with a shift to forested habitats during the late summer and fall seasons. Nesting occurs in sparsely vegetated early successional habitat, and hibernation occurs almost exclusively in forested uplands. Box turtle are not a wetland- dependent species, but sometimes use wetlands for cooling and hydrating during the dryer hotter summer months. There is evidence that certain populations of box turtles migrate annually to the edges of wetlands to hibernate.

A single eastern box turtle was observed within the western half of the Site, within the proposed open space, as noted in my March 20, 2023 *Wetland Assessment and Impact Evaluation* report. This observation was made incidentally during wetland delineation work.

With respect to other State-listed species that might be present on the Site, that is a possibility which was not explored because surveys for State-listed species are not a requirement of local inland wetland regulations. With respect to the current records of known State-listed species per the NDDB, an updated query conducted on August 25, 2023

indicates, as it did previously, that box turtle are the only currently known species. A copy of that query is attached to this letter.

A Wildlife study was completed by Matthew Popp, Professional Wetland Scientist on 8/15/23 The complete study is attached to this letter. An excerpt from the study is below. It should be noted that Matthew is certified by CT DEEP to collect and relocate endangered species.

Matthew Popp, ASLA, Professional Wetland Scientist

OBSERVED WILDLIFE

The following wildlife was noted on 8/15/23:

Amphibians and Reptiles
Green Frog

Birds

Great Blue Heron	Green Heron	Double-crested Cormorant
Red-tailed Hawk	Mourning Dove	Blue Jay
Downy Woodpecker	Eastern Wood-pewee	Eastern Phoebe
Eastern Kingbird	Tree Swallow	Barn Swallow
American Crow	Black-capped Chickadee	Tufted Titmouse
White-breasted Nuthatch	Carolina Wren	House Wren
Eastern Bluebird	American Robin	Grey Catbird
Common Yellowthroat	Northern Cardinal	American Goldfinch

Mammals
White-tailed Deer

ANTICIPATED WILDLIFE

It is anticipated that a range of additional wildlife species will utilize the site throughout the year. The following additional wildlife species that are likely to use the site during the breeding season, with the primary habitat they are associated with, is listed below:

Amphibians and Reptiles

Red-spotted Newt (W)	Redback Salamander (W)	Northern Spring Peeper (P)
Grey Treefrog (W)	Bullfrog (P)	Snapping Turtle (P)
Painted Turtle (P)	Box Turtle (W)	Northern Water Snake (P)
Eastern Garter Snake (M)	Black Rat Snake (W)	

Birds

Mute Swan (P)	Canada Goose (P)	Mallard (P)

Red-shouldered Hawk (W)	Eastern Screech Owl (W)	Great Horned Owl (W)
Ruby-throated Hummingbird (M)	Belted Kingfisher (P)	Wild Turkey (W)
Red-bellied Woodpecker (W)	Hairy Woodpecker (W)	Northern Flicker (W)
Pileated Woodpecker (W)	Eastern Phoebe (T)	Great-crested Flycatcher (W)
N. Rough-winged Swallow (M)	Tree Swallow (M)	Wood Thrush (W)
Veery (W)	Northern Mockingbird (T)	Cedar Waxwing (T)
European Starling (D)	Warbling Vireo (W)	Red-eyed Vireo (W)
Yellow Warbler (T)	Ovenbird (W)	Scarlet Tanager (W)
Rose-breasted Grosbeak (W)	Chipping Sparrow (D)	Song Sparrow (M)
Red-winged Blackbird (P)	Common Grackle (T)	Brown-headed Cowbird (W)
Northern Oriole (W)	House Finch (D)	House Sparrow (D)

Mammals

Opossum (W)	Eastern Mole (D)	Eastern Cottontail (D)
Eastern Chipmunk (T)	Woodchuck (M)	Grey Squirrel (W)
White-footed Mouse (D)	Meadow Vole (M)	Muskrat (P)
Norway Rat (D)	Red Fox (W)	Raccoon (W)
Striped Skunk (W)		

Insects

Eastern Tiger Swallowtail (M)	Cabbage White (M)	Pearl Crescent (M)
Question Mark (M)	American Lady (M)	Painted Lady (M)
Eyed Brown (M)	Monarch (M)	

Fish

Largemouth Bass (P)	White Sucker (P)	Dace sp. (P).
Shiner sp. (P)	Redfin Pickerel (P)	Bluegill (P)
Pumpkinseed Sunfish (P)		

(D)	=	Developed Land	(T)	=	Thicket
(M)	=	Meadow	(W)	=	Woodland
(P)	=	Pond			

NDDB

The CT DEEP Natural Diversity Data Base (NDDB) records indicate that Box Turtles are known to have been present on or near the site. The site plans incorporate detailed measures to protect Box Turtles (and other turtle species) throughout the development period. The Box Turtle protection measures will also be required as part of the State stormwater discharge permit. The proposed 81± acres of open space includes suitable habitat, such as woodland and meadows, for Box Turtles usage. The large size of the open space is a significant measure to aid in the long-term protection of this species. No listed NDDB species, plant or animal, was observed by our firm.

2. Eastern Box Turtle Habitat

Regarding staff's concern about the presence of box turtles on or adjacent to the site, I offer several comments for consideration:

First, it should be noted that the Davison report (dated March 20, 2023) does include an Eastern Box Turtle Protection Plan to be implemented during construction if construction is to occur during the active season (April 1-October 30).

Second, Eastern Box Turtles are upland species that are not solely dependent upon wetlands.

Third, in the advent there is upland habitat loss due to construction, there will be an abundance of acreage (81 acres) of contiguous and preserved open space, of similar or better quality, for any displaced turtles to migrate into.

Lastly, Section 10.5 of the Regulations stipulates that the Commission shall not deny or condition an application for a regulated activity in an area outside wetlands or watercourses on the basis of an impact or effect on aquatic, plant, or animal life unless such activity will likely impact or affect the physical characteristics of such wetlands or watercourses. Any loss of box turtle habitat that may occur due to the proposed construction will be within the upland, and therefore not impact the physical characteristics of the wetland/watercourse system.

4. *A mitigation plan that adequately addresses the box turtles habitat loss should be submitted.*

A mitigation plan was included with the initial submittal. Responses to this comment have been provided in the attached report prepared by Eric Davison Excerpts ~~from~~ the report have been quoted below. Additionally an area has been identified on the plans.

Eric Davison, *Wildlife Biologist, Wetland Scientist, Registered Soil Scientist;*

> Mitigation for box turtle impacts has been provided and is a two-fold approach, including: (1) construction protection measures to reduce the likelihood of mortality during construction; and (2) protection of 81 acres of habitat as designated open space that will be managed to promote box turtle habitat.
>
> During the NDDB approval process, they may require box turtle surveys to be conducted, and for what is referred to as a "box turtle protection plan" to be developed. In anticipation of this protection plan requirement, we have included such a plan as detailed in Appendix B of my 3-20- 23 *Wetland Assessment and Impact Evaluation* report. The purpose of this plan is to minimize the likelihood of mortality

of individual turtles during construction. The protection plan consists of the following components:

1. Isolation of the project perimeter using the erosion control measures
2. Targeted searches of the project area prior to construction
3. Periodic inspection and maintenance of isolation structures throughout construction period
4. Education of all contractors and sub-contractors prior to initiation of work on the site
5. Documentation and reporting submitted to the NDDB Program

The overall goal of this plan is to protect turtles during construction and allow them to persist in designated open space post-construction. The proposed open space will provide the same habitat components as the portion of the Site where the development is proposed. The plan to manage the open space for box turtle will greatly improve the quality of that remaining habitat post- construction. It includes meadow establishment and bi-annual mowing to maintain early- successional habitat favored by box turtle. It is recommended that the open space management plan include monitoring for the first few years, to determine if suitable habitat has been established.

One additional measure to avoid box turtle mortality in the future would be to cordon off the open space and prevent turtles from entering the residential habitats. This can be done with a wildlife exclusion fence installed along the easterly side of the open space to deter turtles from accessing the residential areas.

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5. *Please adequately address sections 7.6f, 7.6g (especially Ecological Integrity and possible alternatives to reduce impact to regulated areas), and 7.Gi.*

I have copied the sections of the regulations listed above and provided responses to each.

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f. An environmental impact study by an appropriate professional (including but not limited to the following):

The information listed in each can be found in the report entitled: Wetland Assessment and Impact Evaluation, Quarry Ridge Residential Development, Turkey Roost Road, Monroe. Prepared by Davision Environmental. This report was submitted with original application. . I have identified the section in the report which satisfies each requirement. Some responses have also been provided as part of this letter

1. A description of the ecological communities and functions and values of the wetlands or watercourses involved with the application;

3.0 WETLAND FUNCTIONS AND VALUES (page 6)

Table 1: Summary of Wetland Functions and Values

Wetland Functions and Values	Groundwater Recharge/Discharge	Sediment/Shoreline Stabilization	Floodflow Alteration	Fish & Shellfish Habitat	Sediment/Toxicant/ Pathogen Retention	Nutrient Removal/Attenuation	Production Export	Wildlife Habitat	Recreation	Educational/Scientific Value	Uniqueness/Heritage	Visual Quality/Aesthetics	Listed Species Habitat
Wetland 1	S	N/A	N/A	N/A	S	S	S	S	U	U	U	U	U
Wetland 2	P	S	P	S	P	P	S	S	U	U	U	U	U

Suitability

P = principal function

S = secondary function

U = function unlikely to be provided at a significant level

N/A = not applicable

2. Effects of the proposed activity(ies) on these communities and wetland functions;

5.2 Potential Long-term Impacts

Potential long-term Project impacts to wetlands and watercourses are most often related to the loss of wetland functions and values resulting from filling and water quality degradation resulting from stormwater discharges.

Proposed upland review area activities would primarily occur within portions of the Site which were previously occupied by the sand and gravel mine and have thus been disturbed. These areas no longer have native plant communities or soil. The topsoil and subsoil have been stripped and processed, and the topography radically altered. Therefore, wetland and hydrologic impacts resulting from such activities (carbon loss, soil compaction, habitat loss and alteration, alteration of groundwater infiltration patterns) have already occurred. In other words, the impacts to the wetland buffer (a.k.a. the upland review area) that result from development have already occurred at this Site.

Potential long-term impacts to water resources are primarily related to the loss of functions and values and/or water quality degradation resulting from wetland filling and stormwater discharges. In the case of the proposed development **no wetland filling is proposed**. With respect to degradation of water quality, the development incorporates *primary treatment* practices as described in CTDEP's 2004 Stormwater Quality Manual. This includes three stormwater treatment ponds and a settling basin fed by a rip-rap swale with stone check dams. Therefore, converting the former mining lands to residential development is unlikely to adversely affect principal wetland functions and values. This is because the proposed treatment system are designed to maximize the removal of stormwater pollutants including nutrients, sediment and hydrocarbons from stormwater runoff.

3. A narrative of how the applicant will change, diminish, or enhance the ecological communities and functions and values of the wetlands or watercourses involved in the application;

5.0 WETLAND IMPACT ASSESSMENT AND RECOMMENDATIONS (page 7)

1.1 Potential Short-term Impacts

Potential short-term Project impacts to wetlands and watercourses are primarily related to discharges during construction. In order to minimize the potential for these impacts, erosion and sediment ("E&S") control measures have been designed in accordance with the "2002 Connecticut Guidelines for Soil Erosion and Sediment Control", CT DEEP Bulletin No. 34, and all amendments and addenda thereto as published by the Connecticut Department of Energy and Environmental Protection. Sediment and erosion control measures proposed for this project include:

- Temporary sediment traps
- Anti-tracking pad
- Silt-sacks at catch basins
- Wood chip berms
- Geotextile silt fencing (including double rows)

At critical locations (e.g., upslope of Wetland 2) barrier controls consist of a wood chip berm as the interior control, backed by a double row of silt fencing. These measures in combination will be highly effective at slowing the flow of runoff and trapping sediment generated during construction.

Most wetland sedimentation impacts during construction occur because of contractor's not properly installing and maintaining the control measures as designed. Therefore, it is imperative that the contractor properly install and maintain these measures throughout the duration of construction. This should include daily inspection by the contractor of all Site controls, but in particular the outer barrier control

measures closest to wetlands just prior to, and after, a significant rainfall event.

1.2 Potential Long-term Impacts

Potential long-term Project impacts to wetlands and watercourses are most often related to the loss of wetland functions and values resulting from filling and water quality degradation resulting from stormwater discharges.

Proposed upland review area activities would primarily occur within portions of the Site which were previously occupied by the sand and gravel mine and have thus been disturbed. These areas no longer have native plant communities or soil. The topsoil and subsoil have been stripped and processed, and the topography radically altered. Therefore, wetland and hydrologic impacts

resulting from such activities (carbon loss, soil compaction, habitat loss and alteration, alteration of groundwater infiltration patterns) have already occurred. In other words, the impacts to the wetland buffer (a.k.a. the upland review area) that result from development have already occurred at this Site.

Potential long-term impacts to water resources are primarily related to the loss of functions and values and/or water quality degradation resulting from wetland filling and stormwater discharges. In the case of the proposed development no wetland filling is proposed. With respect to degradation of water quality, the development incorporates *primary treatment* practices as described in CTDEP's 2004 Stormwater Quality Manual. This includes three stormwater treatment ponds and a settling basin fed by a rip-rap swale with stone check dams. Therefore, converting the former mining lands to residential development is

unlikely to adversely affect principal wetland functions and values. This is because the proposed treatment system are designed to maximize the removal of stormwater pollutants including nutrients, sediment and hydrocarbons from stormwater runoff.

4. Alternative which would cause less or no environmental impact to wetlands or watercourses;

A detailed analysis of alternatives has been provided in this response as well as the original project narrative. Additionally, the current proposal includes no environmental impact to the wetlands or watercourses.

5. A description of why each alternative considered was deemed neither feasible nor prudent.

A detailed analysis of alternatives has been provided in this response as well as the original project narrative.

g. A current Wetland Assessment by an appropriate professional (including but not limited to the following):

1. General site description;

2.1 General Site Description (page 1)

Site photographs are provided in Appendix A. The Site is currently undeveloped and consists of a former gravel mine that has been left fallow for a number of years. The former mining areas were allowed to revegetate naturally, and now consist of "old field"[1] habitat dominated by invasive non-native species along with native pioneer species. Mining activity is visible on historical aerial photography as early as 1952 (source: Connecticut State Library). Mining activity was largely focused on the southern portions of the Site, where sand and gravel surficial material was present. The eastern half of the site consists of mixed hardwood forest and forested wetlands.

2. Wetland, watercourse and plant inventories;

2.3 Wetland Delineation and Soil Types

Wetlands and watercourses are regulated in the State of Connecticut General Statutes, Chapter 440, sections 22a-28 to 22a-45. Inland Wetlands "means land, including submerged land, not regulated pursuant to sections 22a-28 to 22a-35, inclusive, which consists of any

of the soil types designated as poorly drained, very poorly drained, alluvial, and floodplain by the National Cooperative Soils Survey, as may be amended from time to time, of the National Resources Conservation Service (NRCS) of the United States Department of Agriculture" section 22a-38(15).

Davison Environmental, LLC Registered Soil Scientists Michael Klein and Eric Davison delineated Site wetlands in June of 2020. Wetlands were delineated by walking across the Site and examining the soil profile using a hand auger to a minimum depth of 20 inches in order to determine soil drainage class.

Digitally available updated soil survey information was obtained from the Natural Resources Conservation Service and generally confirmed during the field investigation, with the exception of historic material extraction areas which presented as a modified condition of the relevant native soil. Soil classifications present on the property are as follows:

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3. Wetland associated wildlife;

2.5 Rare Species Habitat (page 6)

A Wildlife study was completed by Matthew Popp, Professional Wetland Scientist on 8/15/23 The complete study is attached to this letter. An excerpt from the study is can be found on page 14 of this report.. It should be noted that Matthew is certified by CT DEEP to collect and relocate endangered species please see resume attached

4. Wetland Functionality (rated in areas such as Ecological Integrity, Wildlife Habitat, Educational Potential, Visual/Aesthetic Quality, Flood Control, Nutrient Retention Opportunity/Removal Efficiency, Groundwater Recharge/Discharge);

3.0 WETLAND FUNCTIONS AND VALUES (page 6)

Table 1: Summary of Wetland Functions and Values

Wetland Functions and Values	Groundwater Recharge/Discharge	Sediment/Shoreline Stabilization	Floodflow Alteration	Fish & Shellfish Habitat	Sediment/Toxicant/ Pathogen Retention	Nutrient Removal/Attenuation	Production Export	Wildlife Habitat	Recreation	Educational/Scientific Value	Uniqueness/Heritage	Visual Quality/Aesthetics	Listed Species Habitat
Wetland 1	S	N/A	N/A	N/A	S	S	S	S	U	U	U	U	U
Wetland 2	P	S	P	S	P	P	S	S	U	U	U	U	U

Suitability
P = principal function
S = secondary function
U = function unlikely to be provided at a significant level
N/A = not applicable

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5. Potential direct and indirect impacts of proposed activities on the wetlands;

5.2 Potential Long-term Impacts (poge 9)

Potential long-term Project impacts to wetlands and watercourses are most often related to the loss of wetland functions and values resulting from filling and water quality degradation resulting from stormwater discharges.

Proposed upland review area activities would primarily occur within portions of the Site which were previously occupied by the sand and gravel mine and have thus been disturbed. These areas no longer have native plant communities or soil. The topsoil and subsoil have been stripped and processed, and the topography radically altered. Therefore, wetland and hydrologic impacts resulting from such activities (carbon loss, soil compaction, habitat loss and alteration, alteration of groundwater infiltration patterns) have already occurred.

In other words, the impacts to the wetland buffer (a.k.a. the upland review area) that result from development have already occurred at this Site.

Potential long-term impacts to water resources are primarily related to the loss of functions and values and/or water quality degradation resulting from wetland filling and stormwater discharges. In the case of the proposed development no wetland filling is proposed. With respect to degradation of water quality, the development incorporates *primary treatment* practices as described in CTDEP's 2004 Stormwater Quality Manual. This includes three stormwater treatment ponds and a settling basin fed by a rip-rap swale with stone check dams. Therefore, converting the former mining lands to residential development is unlikely to adversely affect principal wetland functions and values. This is because the proposed treatment system are designed to maximize the removal of stormwater pollutants including nutrients, sediment and hydrocarbons from stormwater runoff.

6. Recommendations and/or possible alternatives to reduce impacts to regulated areas;

A different version of this project was proposed and approved in 2010. That approval expired. In September of 2022 the 2010 application and plans (with minor modifications) were submitted. After staff and 3rd party review it was decided that the best course of action was to withdraw the application and bring the design into compliance with current guidelines. Those revisions included:

- **Update of stormwater treatment design to demonstrate compliance with DEEP guidelines**
- **Additional analysis of waste water treatment facilities**
- **Updated environmental assessments**
- **New landscape design**
- **The addition of the Cobblers Court Parcel, which is now proposed as 31 acres of open space**

This demonstrates that we have received recommendations and have implemented alternatives to reduce impacts to regulated areas.

The current design was submitted earlier this year. Town staff and 3rd party review provided recommendations and feedback which we have responded too with plan modifications that include:

- **Revised stormwater design that far exceeds DEEP guidelines for attention, water quality, and pollutant removal**
- **Additional LID components such as a rain garden, vegetated swale, disconnected impervious area**
- **Relocation of storm water outlet to increase separation from wetlands.**
- **Creating a safe area for box turtles**
- **Creating a white pine tree stand to increase bird nesting.**
- **Addition of bird houses**
- **Enhancing the upland review area by the addition of 3600 wetland plants**

The applicant has also engaged a team of 3 highly qualified environmental experts to review the design and provide recommendations. Additionally , the applicant is proposing donation of a high value 30 acre development parcel as open space.

All of the above make it clear that the environmental impact of this development has been fully considered and the necessary steps have been taken ensure the protection of the inland wetlands.

5.3 Recommendations (page 12)

1. Invasive non-native species dominate the proposed development area. It is recommended that an Invasive Species Control Plan be developed by a qualified herbicide applicator with experience in eradicating invasive species, particularly mugwort, autumn olive and multiflora rose. Efforts should focus on the limits of disturbance, particularly in areas that will include landscaping and stormwater wetlands along the margins of the development where

invasive plants could most easily reestablish after construction is completed.

2. During construction, the disposal of invasive plant material should comply with CT Invasive Plants Working Group guidelines (source: https://cipwg.uconn.edu/).

3. The limits of disturbance coincide with the areas of the former quarry that are either sparsely vegetated, or not vegetated at all as they consist of sorted gravel and cobble piles. It is recommended that these areas be restored with topsoil and vegetated with a native meadow or no-mow seed mix.

4. To protect the eastern box turtle during construction, it is recommended that the *Eastern Box Turtle Protection Plan* (see Appendix C) be implemented during construction if construction is proposed to occur during the turtle's active period (which typically occurs between April 1st and October 30th). Note that this plan is not intended to mitigate for the loss of habitat that will result from the proposed development project. Rather, it is intended to prevent incidental

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7. Mitigation Measures/Recommendations.

5.3 Recommendations

1. To maximize the pollutant uptake function of the stormwater basin the goal is to establish well- vegetated stormwater basins. The following construction sequence is recommended:

    a. Compaction of the wetland basins shall be minimized to the maximum extent feasible by using temporary construction matting, grading from outside of the creation area, using light equipment with turf tires, or wide track equipment. The contractor shall ensure that proper soil compaction levels (loose to friable) are maintained.

    b. If compaction does occur, the compacted zone shall be

tilled to refracture at least 12” of underlying natural soil.

c. Wetland topsoil consisting of a 1:1 mixture (or equal volumes) of organic and mineral materials that contains at least 12 percent organic carbon content by weight will be placed over the bottom of the creation area at a minimum depth of 6”. Clean leaf compost or commercially available compost (well to partially decomposed) is the preferred amendment to achieve this standard, though other materials may be used if approved by the supervising wetland scientist. Soil amendments should be uncontaminated and void of any woodchips or invasive species. Woody debris, comprised of native materials collected from the surrounding property, will be placed on the bottom of the creation area to enhance habitat value under the direction of the supervising wetland scientist.

   The qualified wetland scientist may determine that dewatering is needed during the grading and planting. If necessary, excess water will be discharged into a temporary sediment trap. The need for dewatering and any specific method for dewatering is site specific and may be modified by the Contractor to accommodate field conditions. The Contractor shall provide the means and methods of dewatering consistent with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control.

e. Basin plantings will take place once the above listed tasks have been completed. Seed non-ponded emergent areas with WetMix (product of New England Wetland Plants source: https://newp.com/catalog/seed-mixes/#wetland) or equivalent per the manufacturers specifications. Seed the side slopes with New England

Erosion Control/Restoration Mix for Detention Basins and Moist Sites (source: https://newp.com/catalog/seed-mixes/#erosionMoist) or equivalent.

f. All plantings to be spaced to provide a dense planting bed. Final plant locations shall be reviewed in the field and approved by a qualified wetland scientist. Live plugs are species contained within these seed mixes if field conditions or construction schedule do not favor seed mix establishment.

g. The contractor hired to construct the creation area shall be responsible for the careful installation, maintenance (including watering if necessary), and establishment of the plant material in the basin area. All plants shall be guaranteed by the contractor to remain alive and healthy for a full twenty four (24) month period.

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i. Description of management practices and other measures designed to mitigate the impact of the proposed activity. Such measures could include but are not limited to plans or actions that:

1. Avoid destruction or diminution of the wetland and/or watercourse functions;

The site plan has been developed to provide storm water quality controls that are in compliance with CT DEEP guidelines. The design has been reviewed by town engineering staff as well as 3 environmental professionals. The provided open space also demonstrates that avoidance is a priority. Below is quoted from the attached report prepared by Steven Danzer:

Preservation of this open space is a benefit to both the wetland system located within its interior, and to the wetland corridor located downstream within the MFR zone.

2. Create or enhance natural habitats and provide for recreational use;

The below is quoted from the report prepared by Matthew Popp

The Habitat Plan, prepared by our firm, proposes the following measures to enhance wildlife habitat on the site:

a. To maintain the site's habitat diversity, the meadow areas are to be maintained with a mowing once every two years to a 4-6" height during the winter months.

b. Two stands of White Pines are proposed to provide wildlife cover throughout the year as well as nesting sites.

c. Box Turtles are known to lay eggs within sandy areas. To enhance Box Turtle habitat, several (5) small sand piles, 1-3 cubic yards in size, shall be placed within the open space. The size and location of the sand pile shall be determined in the field by the project environmental consultant.

d. Ten bird nest boxes are proposed within the woodlands, pond edges, and meadows to provide cavity nesting sites for Wood Duck, Eastern Bluebirds, and Screech Owls.

3. Prevent flooding, degradation of water quality, erosion and sedimentation, and obstruction of drainage;

The proposed design has been designed in compliance with CT deep guidelines for stormwater management and erosion control. The design had been reviewed by the town engineer and 3 environmental professionals.. Additionally the plan provides 81 acres of open space. The following is an excerpt from the report prepared by Steven Danzer, PHD:

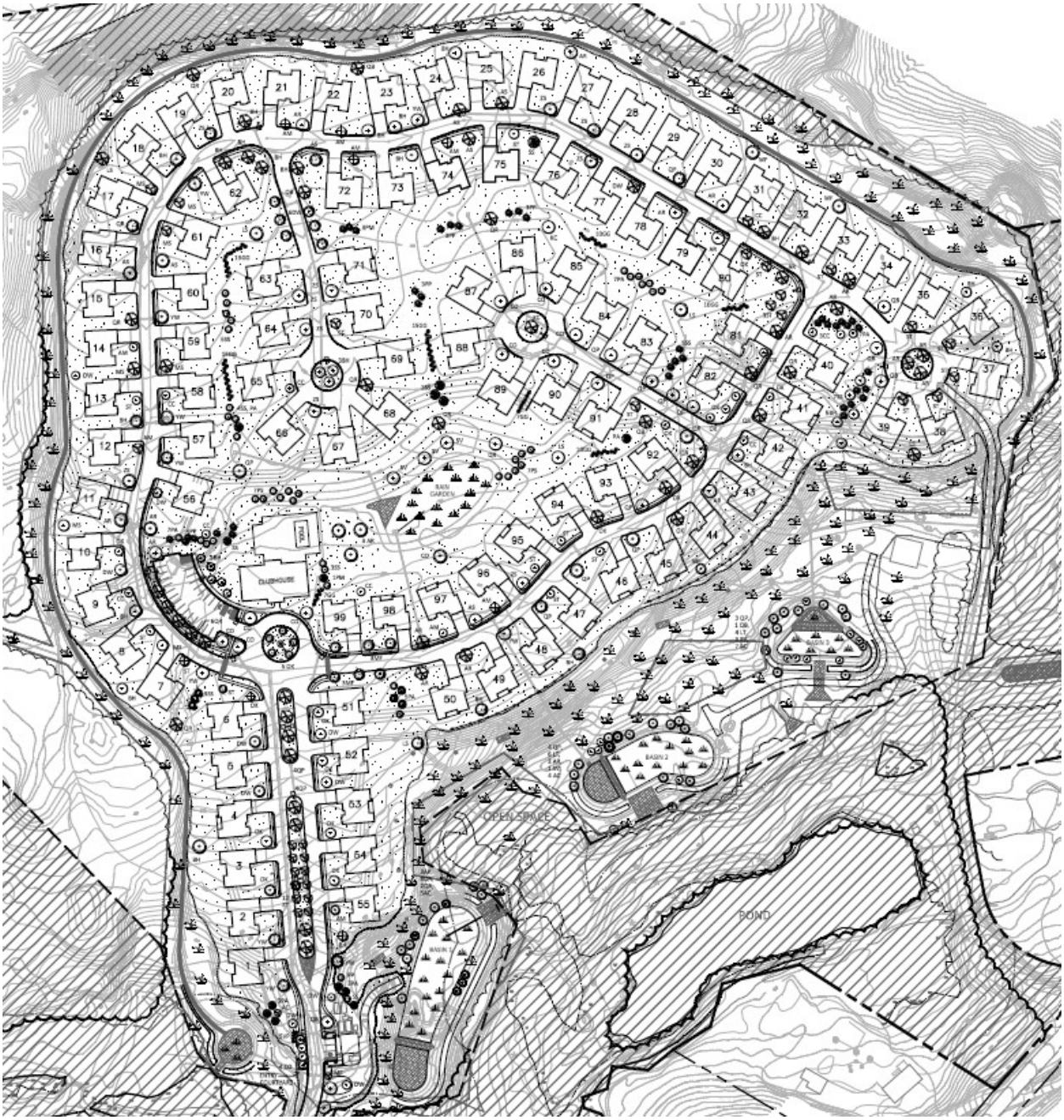
The proposed open space also contains a sloped wetland system within its interior. This system drains southwesterly towards the main wetland and waterbody system located in the southeastern region of the site. The forested open space is one of the headwaters areas for the pond system below. Consequently, the preservation of this area will prevent pollution to the waterbodies below and help maintain environmental quality of that downstream system.

4. Safeguard water resources;

The proposal includes 0.4 acres of new activity with the 100 regulated area. The other 1.1 acres of activity are within the existing accessway. This new activity represents 0.2% of the total site. Additionally the plan incorporates 81 acres of open space which provides permanent protection to the wetlands.

5. Provide for wetland/watercourse enhancement;

The proposed design incorporates 4 new water quality basins and a rain garden. The plant list for these basins is located on sheet LP-1. I have also copied it below. The list specifies that 3650 plants be placed within these areas.



BASIN PLANT LIST (TYP.)

QTY	KEY	BOTANICAL NAME	COMMON NAME	SIZE	ROOT	REMARKS
75	-----	CLETHRA ALNIFOLIA	CLETHRA	3-4' HT.	CONT.	TOE OF SLOPE
75	-----	ILEX VERTICILLATA	WINTERBERRY	3-4' HT.	CONT.	TOE OF SLOPE
1000	-----	ASCLEPIAS INCARNATA	SWAMP MILKWEED		PP/1 QT.	BASIN BOTTOM
1000	-----	EUPATORIUM PURPUREUM	JOE-PYE-WEED		PP/1 QT.	BASIN BOTTOM
500	-----	IRIS VERSICOLOR	BLUE FLAG IRIS		PP/1 QT.	BASIN BOTTOM
500	-----	VERBENA HASTATA	BLUE VERVAIN		PP/1 QT.	BASIN BOTTOM
500	-----	VERNONIA NOVEBORACENSIS	NEW YORK IRONWEED		PP/1 QT.	BASIN BOTTOM

NOTE: PLANT BASIN PLANTS EVENLY BETWEEN THE THREE BASINS AND RAIN GARDEN. HERBACEOUS PLANTS TO BE PLANTED WITHIN THE BASIN BOTTOM IN GROUPINGS OF TEN PLANTS.

6. Restore or more than replace lost wetland/watercourse habitat and functions;
The proposal includes no lost of wetland habitat or functions

7. Are other legal measure designed to preserve and protect adjacent wetland and watercourse areas and natural buffers.

The proposed includes 81 acres of open space. Below is an excerpt from the report prepared by Steven Danzer

1. Preservation of Open Space and Wetland Avoidance as a mitigation strategy

The wetland regulations recognize prevention (i.e. avoidance) as a mitigation measure in its own right.
Section 10.2(d) of the Regulations (Standards and Criteria for Decision) enables the Commission to consider the following:

Irreversible and irretrievable loss of wetland or watercourse resources which would be caused by the proposed regulated activity, including the extent to which such activity would foreclose a future ability to protect, enhance or restore such resources, and any mitigation measures which may be considered as a condition of issuing a permit for such activity including, but not limited to, measures to ***(1) prevent or minimize pollution or other environmental damage, (2) maintain or enhance existing environmental quality,*** *or (3) in the following order or priority: restore, enhance and create productive wetland or watercourse resources.*

Furthermore, Section 7.6(i) allows the Commission to consider management practices and other measures designed to mitigate the impact of proposed activity, including such measures that

- Avoid destruction or diminution of the wetland and/or watercourse functions (Section 7.6(1)1;
- Prevent flooding, degradation of water quality, erosion and sedimentation, and obstruction of drainage (Section 7.6(1)3;
- Are other legal measure designed to preserve and protect adjacent wetland and watercourse areas and natural buffers (Section 7.6(i)7.

As noted in the Narrative, the revised development parcel will contain an area of 147 acres. Within this area will be 81 acres of open space and 66 acres of developed or potentially developable area.

The offering of 81 acres of open space contains habitat of high environmental quality. The proposed open space is predominately forest with an intermediately aged and younger aged forest canopy. The wooded open space provides excellent habitat, cover, and food for wetland and upland wildlife species. The trees (and their shrubby understory) also provide other significant ecological functions and benefits to the landscape such as shading, air purification, carbon sequestration as a buffer to climate change, physical stability to the soil, and the infiltration of rain and the prevention of erosion and sedimentation to downstream resources. The trees provide windbreaks and sound buffering as well.

The proposed open space also contains a sloped wetland system within its interior. This system drains southwesterly towards the main wetland and waterbody system located in the southeastern region of the site. The forested open space is one of the headwaters areas for the pond system below. Consequently, the preservation of this area will prevent pollution to the waterbodies below and help maintain environmental quality of that downstream system.

This forested terrain is fully suitable to future residential development, and could be developed if not protected and preserved as open space. As such, avoidance of this area (as proposed in this Permit Application) should be recognized as a mitigation strategy under Section 10.2(d) in its own right as well as a management measure under Section 7.6(i) .

Preservation of this open space is a benefit to both the wetland system located within its interior, and to the wetland corridor located downstream within the MFR zone.

Sincerely;

Jason Edwards

STEVEN DANZER, PHD & ASSOCIATES LLC
Wetlands & Environmental Consulting
WWW.CTWETLANDSCONSULTING.COM
203 451-8319

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

To: Monroe Inland Wetlands Commission

From: Steven Danzer PhD

Date: September 1, 2023

Re: Quarry Ridge / Turkey Roost Road & Cobblers Court, Monroe, CT.

At the request of J. Edwards & Associates LLC I was asked to offer an expert opinion regarding the wetland mitigation strategy, wildlife impacts, and the alternative analysis for the proposed Quarry Ridge development. Materials reviewed included the site plan and Narrative by J. Edwards & Associates and the report and written comments prepared by Davison Environmental LLC. The site was visited during the month of August 2023.

1. Preservation of Open Space and Wetland Avoidance as a mitigation strategy

The wetland regulations recognize prevention (i.e. avoidance) as a mitigation measure in its own right. Section 10.2(d) of the Regulations (Standards and Criteria for Decision) enables the Commission to consider the following:

Irreversible and irretrievable loss of wetland or watercourse resources which would be caused by the proposed regulated activity, including the extent to which such activity would foreclose a future ability to protect, enhance or restore such resources, and any mitigation measures which may be considered as a condition of issuing a permit for such activity including, but not limited to, measures to ***(1) prevent or minimize pollution or other environmental damage, (2) maintain or enhance existing environmental quality,*** *or (3) in the following order or priority: restore, enhance and create productive wetland or watercourse resources.*

Furthermore, Section 7.6(i) allows the Commission to consider management practices and other measures designed to mitigate the impact of proposed activity, including such measures that

- Avoid destruction or diminution of the wetland and/or watercourse functions (Section 7.6(1)1;
- Prevent flooding, degradation of water quality, erosion and sedimentation, and obstruction of drainage (Section 7.6(1)3;
- Are other legal measure designed to preserve and protect adjacent wetland and watercourse areas and natural buffers (Section 7.6(i)7.

As noted in the Narrative, the revised development parcel will contain an area of 147 acres. Within this area will be 81 acres of open space and 66 acres of developed or potentially developable area. It is noted that under the Monroe Zoning Regulations for the proposed development, only 50 acres of open space is required, but the Applicant is proposing an additional 31 acres of open space to reach a total of 81 acres of open space. The

Applicant will file an easement or restrictive covenant that will ensure that this area is preserved as open space in perpetuity.

The offering of 81 acres of open space contains habitat of high environmental quality. The proposed open space is predominately forest with an intermediately aged and younger aged forest canopy. The wooded open space provides excellent habitat, cover, and food for wetland and upland wildlife species. The trees (and their shrubby understory) also provide other significant ecological functions and benefits to the landscape such as shading, air purification, carbon sequestration as a buffer to climate change, physical stability to the soil, and the infiltration of rain and the prevention of erosion and sedimentation to downstream resources. The trees provide windbreaks and sound buffering as well.

The proposed open space also contains a sloped wetland system within its interior. This system drains southwesterly towards the main wetland and waterbody system located in the southeastern region of the site. The forested open space is one of the headwaters areas for the pond system below. Consequently, the preservation of this area will prevent pollution to the waterbodies below and help maintain environmental quality of that downstream system.

This forested terrain is fully suitable for future residential development, and could be developed if not protected and preserved as open space. As such, avoidance of this area (as proposed in this Permit Application) should be recognized as a mitigation strategy under Section 10.2(d) in its own right as well as a management measure under Section 7.6(i) .

Preservation of this open space is a benefit to both the wetland system located within its interior, and to the wetland corridor located downstream within the MFR zone.

2. Eastern Box Turtle Habitat

Regarding staff's concern about the presence of box turtles on or adjacent to the site, I offer several comments for consideration:

First, it should be noted that the Davison report (dated March 20, 2023) does include an Eastern Box Turtle Protection Plan to be implemented during construction if construction is to occur during the active season (April 1-October 30).

Second, Eastern Box Turtles are upland species that are not solely dependent upon wetlands.

Third, in the advent there is upland habitat loss due to construction, there will be an abundance of acreage (81 acres) of contiguous and preserved open space, of similar or better quality, for any displaced turtles to migrate into.

Lastly, Section 10.5 of the Regulations stipulates that the Commission shall not deny or condition an application for a regulated activity in an area outside wetlands or watercourses on the basis of an impact or effect on aquatic, plant, or animal life unless such activity will likely impact or affect the physical characteristics of such

wetlands or watercourses. Any loss of box turtle habitat that may occur due to the proposed construction will be within the upland, and therefore not impact the physical characteristics of the wetland/watercourse system.

3. Alternative Analysis

Section 7.5(f) of the wetland regulations states as follows:

7.5 All applications shall include the following information in writing and/or on maps or drawings:
f. A minimum of two (2) other feasible alternative site plans that were considered relative to impacts on wetlands and watercourses and an explanation as to why the proposed plan was considered the most feasible and prudent alternative resulting in the least amount of impact to said wetlands and watercourses;

There are no significant impacts to wetlands or watercourses under the current plan. No homes are proposed within the 100 feet upland review area.

The current proposal includes only 1.5 acres of activity located within the 100 upland review area. This includes 1.1 acres of proposed activity within the existing driveway, and 0.4 acres of additional new activity outside of the driveway area.

The 1.1 acres of improvements within the existing driveway area will involve road surface activity only, with no work proposed within any of the wetlands, watercourses, or waterbodies. Both existing driveway culverts will remain as is.

The 0.4 acres of activity outside of the driveway area is largely related to the stormwater treatment measures (i.e. piping and basins, etc..), and represents only 0.2% of the total site.

Additionally, the current plan incorporates 81 acres of open space.

The five submitted alternatives (S-1A, S-1B, S-1C, S-1D, S-1E) all have more impact to the wetlands and watercourses than the current plan and/or less open space.

S-1A, with an additional multi-family development off of Cobblers Hill Court, has no immediate significant impacts to the wetlands and watercourses, but the plan will result in a 30 acre reduction of proposed open space.

S-1B uses a similar development footprint (with multi-family units) within the existing quarry region as the current proposal, with an additional multi-family development off of Cobblers Hill Court. Under this alternative, there will be no immediate significant impact to the wetlands and watercourses, but with no open space since there is no requirement for open space for multifamily developments (i.e. an 81 acre reduction in open space).

S-1C is similar to what was submitted in 2010 with regard to the quarry area, with an additional 10 lot subdivision accessed off of Cobblers Hill Court. This plan will have significant and direct wetland impacts, and a 30 acre reduction of proposed open space.

S-1D shares a similar development footprint as the current proposal with regard to the quarry area, but with less residential units with the quarry area, and a 10 lot subdivision accessed off of Cobblers Hill Court. There will be a 30 acre reduction of proposed open space.

S-1E shares the residential layout as the current proposal but utilizes the existing driveway along the eastern side. This plan will have substantial significant impacts to the wetlands to accommodate the driveway, as well as property line issues and site line issues.

Upon review, it is evident that the current proposal represents the preferred alternative. The current proposal avoids direct and significant impacts to the wetlands and watercourses within the site, and offers the maximal amount of open space of all the alternatives.

The larger open space component, as discussed in the earlier section of these comments, is an especially important consideration as it not only allows for more preservation of contiguous landscape for wildlife, but also provides more protection to both the upstream and downstream wetland and watercourse resources than any of the other alternatives.

Furthermore, the amount of open space offered (81 acres) also greatly exceeds the 50 acres of open space mandated by the zoning regulations for this type of development. If not preserved, this additional area is fully suitable for future residential development.

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

CPSS
Certified Professional
Soil Scientist

Environmental Land Solutions, LLC

Landscape Architecture & Environmental Planning
8 Knight Street, Suite 203, Norwalk, CT 06851
Tel: (203) 855-7879 Fax: (203) 855-7836

September 1, 2023

Quarry Ridge Associates, LLC
c/o David Bienashski, Member
43 Fox Street
Fairfield, CT 06824

Re: Wildlife Inventory and Project Discussion
Monroe IWC-2023-03, File #1439
139, 141 & 201Turkey Roost Road and 30 Cobblers Court, Monroe, CT

Dear Quarry Ridge Associates, LLC:

At your request, I have prepared this wildlife inventory of species observed, and that would be expected to breed, on the above referenced site. Quarry Ridge Associates, LLC is proposing to construct 99 dwelling on the 147 acre development site, with 81± acres of preserved open space. This inventory is based on calls, tracks, nests, and/or sightings made during my 8/15/23 site visit. I have also visited the property on 12/19/02, 1/10/07, 7/9/20, and 4/10/22. Due to the property's relatively large size and varying habitats, wildlife usage of the site is anticipated to be high.

HABITATS

The mainly undeveloped site is found on the north side of Turkey Roost Road. The following general habitats are found onsite:

Quarry - The northeastern corner of the site was used as a rock quarry for more than 25 years. Quarry operations ended approximately eight years ago. This area contains rock cliffs, exposed bedrock, dirt access roads, and several structures. Vegetation consists of pioneer species such as Little Bluestem, Queen-Ann's Lace, Clover, Sweet Fern, Autumn Olive, Multiflora Rose, and a few Red Cedars.

Woodland - Approximately 50 acres of woods are found in the northwestern portion of the project site and includes both upland woods and wooded wetlands. Here the topography is steeply sloping in many of the upland areas. Several open test pits with adjacent soil stockpiles remain here. Woods are also found bordering the site's property boundaries and around the ponds. Vegetation observed within the woodlands includes Red Oak, Black Birch, American Beech, Huckleberry, and ferns (Hayscented, Sensitive, and Cinnamon). To the north of Smith

Pond, an evergreen stand of mature White Pines was noted.

Pond - Three manmade ponds are located on the property. The 2.5± acre waterbody that is located adjacent to Turkey Roost Road is referred to as "Smith Pond" and lies partly off the site. The largest pond measures approximately 4.25 acres and is located in the southwest corner of the property. The smallest, 1.25± acre pond is located near the eastern property line by the middle of the site. Pickerelweed and other emergent vegetation grow along the ponds' edges. Other waterbodies, such as intermittent watercourses, are also found on the site.

Meadow - Upland and wet meadow areas are found in former quarried areas and bordering the site's ponds. Vegetation observed within the upland meadows include those noted above within the quarried areas and Goldenrod, Path Rush, Mugwort, Grape, Daisy Fleabane, and Asiatic Bittersweet. Wet meadow vegetation observed includes Cattails, Woolgrass, Phragmites, Purple Loosestrife, and Smartweeds.

Thickets - A large thicket area is found to the northwest of the site's western pond. Thickets are also found along many of the meadow and woodland edges. Thicket areas are vegetated with the meadow plants noted above plus young woody vegetation (such as Olive).

Developed Land - This area located around the existing dwelling to be removed is vegetated with lawn grasses.

OBSERVED WILDLIFE

The following wildlife species were observed on, or near, the site on 8/15/23:

Amphibians and Reptiles
Green Frog

Birds

Great Blue Heron	Green Heron	Double-crested Cormorant
Red-tailed Hawk	Mourning Dove	Blue Jay
Downy Woodpecker	Eastern Wood-pewee	Eastern Phoebe
Eastern Kingbird	Tree Swallow	Barn Swallow
American Crow	Black-capped Chickadee	Tufted Titmouse
White-breasted Nuthatch	Carolina Wren	House Wren
Eastern Bluebird	American Robin	Grey Catbird
Common Yellowthroat	Northern Cardinal	American Goldfinch

Mammals
White-tailed Deer

ANTICIPATED WILDLIFE

It is anticipated that a range of additional wildlife species will utilize the site throughout the year. The following additional wildlife species that are likely to use the site during the breeding season, with the primary habitat they are associated with, is listed below:

Amphibians and Reptiles

Red-spotted Newt (W)	Redback Salamander (W)	Northern Spring Peeper (P)
Grey Treefrog (W)	Bullfrog (P)	Snapping Turtle (P)
Painted Turtle (P)	Box Turtle (W)	Northern Water Snake (P)
Eastern Garter Snake (M)	Black Rat Snake (W)	

Birds

Mute Swan (P)	Canada Goose (P)	Mallard (P)
Red-shouldered Hawk (W)	Eastern Screech Owl (W)	Great Horned Owl (W)
Ruby-throated Hummingbird (M)	Belted Kingfisher (P)	Wild Turkey (W)
Red-bellied Woodpecker (W)	Hairy Woodpecker (W)	Northern Flicker (W)
Pileated Woodpecker (W)	Eastern Phoebe (T)	Great-crested Flycatcher (W)
N. Rough-winged Swallow (M)	Tree Swallow (M)	Wood Thrush (W)
Veery (W)	Northern Mockingbird (T)	Cedar Waxwing (T)
European Starling (D)	Warbling Vireo (W)	Red-eyed Vireo (W)
Yellow Warbler (T)	Ovenbird (W)	Scarlet Tanager (W)
Rose-breasted Grosbeak (W)	Chipping Sparrow (D)	Song Sparrow (M)
Red-winged Blackbird (P)	Common Grackle (T)	Brown-headed Cowbird (W)
Northern Oriole (W)	House Finch (D)	House Sparrow (D)

Mammals

Opossum (W)	Eastern Mole (D)	Eastern Cottontail (M)
Eastern Chipmunk (T)	Woodchuck (M)	Grey Squirrel (W)
White-footed Mouse (D)	Meadow Vole (M)	Muskrat (P)
Norway Rat (D)	Red Fox (W)	Raccoon (W)
Striped Skunk (W)		

Insects

Eastern Tiger Swallowtail (M)	Cabbage White (M)	Pearl Crescent (M)
Question Mark (M)	American Lady (M)	Painted Lady (M)
Eyed Brown (M)	Monarch (M)	

Fish

Largemouth Bass (P)	White Sucker (P)	Dace sp. (P).
Shiner sp. (P)	Redfin Pickerel (P)	Bluegill (P)
Pumpkinseed Sunfish (P)		

(D) = Developed Land; (T) = Thicket; (M) = Meadow; (W)= Woodland; (P) = Pond

NDDB

The CT DEEP Natural Diversity Data Base (NDDB) records indicate that Box Turtles are known to have been present on or near the site. The site plans incorporate detailed measures to protect Eastern Box Turtles (and other turtle species) throughout the development period. The Box Turtle protection measures will also be required as part of the State stormwater discharge permit. My attached DEEP Permit to Collect Wildlife for Scientific & Education Purposes permits me to "relocate Eastern Box Turtles from construction areas into suitable habitat within non-development portions of a work site according to NDDB Turtle Best Management Practice." The proposed 81± acres of open space include suitable habitat, such as woodland, thickets, and meadows, for Box Turtles usage. The large size of the open space is a significant measure to aid in the long-term protection of this species. No listed NDDB species, plant or animal, was observed by our firm on the site.

PROJECT DISCUSSION

The woodland to be preserved within the open space provides habitat for the majority of the species listed above. The preserved woodland is of significant enough size to provide habitat for interior nesting bird species, such as Wood Thrush, Scarlet Tanager, and Rose-breasted Grosbeak. The three onsite pond areas also placed within the proposed open space.

No vernal pools were observed on the site. Vernal pools would provide habitat for a range of additional amphibian wildlife species not listed above.

Other wildlife species, such as passerine and hawks, will use the site for short durations during the migration seasons. These species will generally rest and feed for short periods of time before continuing their migration. Other bird species (such as finches and sparrows) may overwinter on the site.

The proposed development is generally located on land that has been disturbed by the past quarry operation. The development proposes the removal of less than ten trees. The landscape plans propose a significant number of trees throughout the development area. Many of these are native large growing shade trees, such as the proposed Sweetgum, Hackberry, and Pin and Swamp White Oaks, that are known for their high wildlife value. The proposed rain garden and stormwater basins will provide long-term meadow habitats.

The current proposal proposes 10 additional dwellings which would be located near the center of the approved 89 unit development within a quarried area more than 600' from a downslope wetland or watercourse area. The 10 new dwellings are proposed in an area that would be vegetated primarily with lawn grasses. This area is currently vegetated primarily with nonnative Olive, Queen-Ann's Lace, and Mugwort. Based on these facts, no significant impact to wetlands, watercourses, and wildlife are anticipated by construction of the 10 additional dwellings.

The Habitat Management Plan, dated 9/1/23, prepared by our firm, proposes the following measures to enhance wildlife habitat on the site:

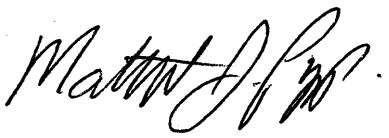
a. To maintain the site's habitat diversity, the meadow areas are to be maintained with a mowing once every two years to a 4-6" height during the winter months.

b. Two stands of White Pines are proposed to provide wildlife cover throughout the year as well as nesting sites.

c. Eastern Box Turtles are known to lay eggs within sandy areas. To enhance Eastern Box Turtle habitat, several (4) small sand piles, 1-3 cubic yards in size, shall be placed within the open space. The size and location of the sand pile shall be determined in the field by the project environmental consultant.

d. Ten bird nest boxes are proposed within the woodlands, pond edges, and meadows to provide cavity nesting sites for Wood Duck, Eastern Bluebirds, and Screech Owls.

Sincerely,



Matthew J. Popp, ASLA
Landscape Architect / Professional Wetland Scientist
turkey roost road-monroe-quarry ridge-2023 wildlife rpt.wpd

MATTHEW J. POPP

Landscape Architect / Senior Professional Wetland Scientist

PROFESSIONAL HISTORY:

1995 - Present	Principal / Landscape Architect / Senior Professional Wetland Scientist Environmental Land Solutions, LLC, Norwalk, Connecticut
1987-1995	Landscape Architect / Environmental Analyst Environmental Design Associates, PC, Wilton, Connecticut

EDUCATION:

1983	The University of Connecticut, Storrs Bachelor of Science in Horticulture
1987	The University of Georgia, Athens Master's of Landscape Architecture

LICENSES AND CERTIFICATIONS:

State of Connecticut:	Landscape Architect #630
State of Connecticut (DEEP):	Permit to Collect Wildlife for Scientific / Educational Purposes (0323001)
State of Massachusetts	Landscape Architect #4065
State of New Jersey:	Landscape Architect #21AS0013400
State of New York:	Landscape Architect #1509-1
Society of Wetland Scientists:	Senior Professional Wetland Scientist #1322

AWARDS:

"2009 Honor Award" - Site Design of Cove Island Wildlife Sanctuary, Stamford, Connecticut.
Outstanding Professional Achievement from the American Society of Landscape Architects, CT Chapter.

PUBLICATIONS AND PRESENTATIONS:

"Can Tidal Wetlands Really Be Restored? A Case Study of the Science and Law of Tidal Wetland Restoration." Co-author. Wetlands Watch. Vol. 1, No.2. Robinson & Cole, Hartford, CT. Spring, 1991.

PROFESSIONAL AFFILIATIONS:

Member (1986 to present):	American Society of Landscape Architects
Board Member (1999 to 2008):	Audubon Greenwich, CT - President (2002 to 2005), Secretary (2001)
Board Member (2003 to 2013):	Calf Island Conservancy, Inc., Greenwich, CT - Treasurer (2012-2013)
Member (1988 to present):	Connecticut Botanical Society
Member (1991 to present):	Connecticut Ornithological Association
Member (2016 to 2022):	Friends of Greenwich Point, Greenwich, CT - Conservation Committee
Board Member (1995 to 1999):	Greenwich Audubon Society, CT - Vice President (1998-1999)
Board Member (2022 to present):	Greenwich Board of Parks and Recreation
Member (1993 to 2009):	Inland Wetlands and Watercourses Agency, Town of Greenwich, CT
Member (2004 to present):	New England Hawk Watch
Volunteer (1995 to present):	Quaker Ridge Hawk Watch, Greenwich, CT - Director (1995-2002)
Member (2002 to present):	Society of Wetland Scientists - Senior Professional Wetland Scientist

EXPERIENCE:

The integration of landscape, ecology, design and culture to create sustainable site plans for a range of projects including parks, educational and health care institutions, mixed use and commercial developments, housing communities, single-family residences, and wetland restoration and mitigation. Natural resource inventories for both plant and wildlife communities. The preparation of environmental assessment reports with the evaluation of environmental impacts, mitigation, and alternatives for projects subject to local, state and federal review. Presentation of testimony at public hearings and meetings in support of our project. Site monitoring for permit compliance with regulatory permit conditions including erosion control and wildlife monitoring.

Connecticut
Department of Energy &
Environmental Protection

PERMIT TO COLLECT WILDLIFE FOR SCIENTIFIC & EDUCATIONAL PURPOSES

Under the authority of Connecticut General Statutes, Sections 26-60 and 26-57, this permit is hereby granted by the Department of Energy & Environmental Protection to:

Organization/ Institution:	Environmental Land Solutions, LLC	(203) 855-7879 **Work Phone**
Permittee:	Matthew Popp	(203) 219-5454 **Home Telephone**
Department:		matt@elsllc.net **Email Contact**
Address:	8 Knight St., Suite 203	
City, State, Zip Code:	Norwalk, CT 06851	

AUTHORIZED TO:

Species: Reptiles, Amphibians, Birds, and Insects

Location of Collection: Statewide, on private lands

Activities authorized: Conduct species inventories using visual and sound encounter surveys (birds), hand nets, dip nets, minnow traps, and callbacks. Permittee is authorized to relocate Eastern box turtles from construction areas into suitable habitat within non-development portions of a work site according to NDDB Turtle Best Management Practices (See attachment).

Subpermittees: Kate Throckmorton

Disposition of Specimens: No specimens shall be collected or marked; all specimens shall be released at the point of capture.

Special Conditions:

1. Please be sure to follow all recommended social distancing policies; stay six feet or more apart, wash your hands, and disinfect your field equipment frequently. *If you feel ill, please **do not** conduct **any** field work.* Be aware that your permit may need to be suspended if Covid-19 guidelines are modified.
2. Any state-listed species encountered during this research project shall be reported to Wildlife Biologists Michael Ravesi (Michael.J. Ravesi@ct.gov), Brian Hess (Brian.Hess@ct.gov) or Laura Saucier (Laura.Saucier@ct.gov) and on NDDB Special Animal Survey Forms with the annual report.
3. Any suspected cases of chytrid or rana virus or snake fungal disease shall be reported immediately to Wildlife Biologist Michael Ravesi (Michael.J.Ravesi@ct.gov). Any obviously ill animals shall be held for diagnostic examination by DEEP staff. Trap mortality shall be reported by species type and number to the Wildlife Division on the annual report.
4. To prevent disease transmission, all nets, footwear, and equipment used during this project shall be decontaminated between visits and between animals with a 3% bleach solution, or recommended concentrations for other disinfection chemicals, according to NEPARC disinfection protocols (See attached page). Hands shall be sanitized or new disposable gloves shall be worn between each individual.
5. Any collection devices left unattended may be subject to the risk of vandalism, storm damage or theft. All equipment shall be labeled as feasible with the following: Popp Permit #0326001.
6. The location of each minnow trap shall be clearly marked so that traps are not lost. Traps shall be checked every 24 hours and removed during periods of nonuse. Care should be taken to leave traps only partially submerged and placed in areas that are not in direct sunlight.

GENERAL CONDITIONS:

1. All persons that will assist in the collection of wildlife authorized by this permit shall work under the direction of the permittee and shall be provided a copy of this permit. Said permit shall be carried by any person assisting the permittee when such person is engaged in collecting wildlife authorized by this permit.
2. The permittee shall submit to the Department a report of all individuals taken or captured annually by **January 15th.** This report shall include, but not be limited to: numbers and species of all individuals handled, captured or taken; task accomplished; findings; conclusions and recommendations.
3. This permit shall not be substituted for a hunting license for the taking of game birds and mammals during the hunting and trapping seasons.
4. Such permit is subject to permission of the landowner on whose land collecting or relocation takes place.
5. Collection of any federally protected wildlife species requires the permittee to hold and carry the proper Federal permits in addition to this state permit.
6. **All equipment or materials (e.g., traps, nets, monitoring devices, bait stations) used to conduct the activities authorized by this permit must be removed from study sites by the expiration date of this permit.**

Permit Number: 0326001

Permit Duration: February 22, 2023 - February 21, 2026

Expiration: 02/21/2026

cc:
- Law Enforcement
- Michael Ravesi, Wildlife Division
- Brian Hess, Wildlife Division
- Laura Saucier, Wildlife Division
- Dawn McKay, Wildlife Division NDDB

Approved by:

Jenny Dickson, Director, Wildlife Division

Date: 04/21/2023

August 25, 2023

Quarry Ridge Associates, LLC
c/o David Bienashski, Member
43 Fox Street
Fairfield, CT 06824

RE: Eastern Box Turtle and NDDB Compliance
Monroe IWC-2023-03, File #1439
139, 141 & 201Turkey Roost Road and 30 Cobblers Court, Monroe, CT

Mr. Bienashski,

I am writing this letter to provide additional information requested in the August 1, 2023, Office of Inland Wetlands staff letter, items #4 and #5.

Firstly, as background, to allay commissioner's concerns regarding my qualifications with respect to assessing the impacts to and designing mitigation measures for, the eastern box turtle, I am Wildlife Biologist with over 20 years of experience studying amphibians and reptiles in Connecticut. I am the co-author of the publication *Conservation of Amphibians and Reptiles of Connecticut* published by the CT Department of Energy and Environmental Protection (CT DEEP) in 2021. I hold a CT DEEP Scientific Collectors Permit allowing the study and handling of eastern box turtle. I am considered a "Qualified Herpetologist" per CT DEEP Natural Diversity Database (NDDB) Standards.

Item #4*: Staff contends that a box turtle was seen basking on a rock near the road entrance in Smith Pond on 7/24/23. As the applicant saw another one on the west side of the property, it appears that there are possibly multiple habitats that must be documented and protected. It is also unclear if there are any other species on the site that would fall under the DEEP NDDB. As the Davison report confirms that there will be habitat loss, it is staffs belief that a more in depth investigation be performed to ascertain exactly what other species exist on site, that could possibly fall under the NDDB, including the extent of their habitat locations and possible disturbance or loss. Either CT DEEP or a qualified professional with the proper certifications should undertake this task.*

Response:

Reports of box turtle basking in ponds are erroneous. This species does not inhabit open water wetlands or bask on exposed surfaces within open water. As I testified at the hearing, these observations are likely of painted turtle, a common aquatic species.

The eastern box turtle uses a mosaic of habitats seasonally, within a small home range. During the spring and early summer months, they favor early and late successional habitats and are often found along the edges of wetlands and small streams, with a shift to forested habitats during the late summer and fall seasons. Nesting occurs in sparsely vegetated early successional habitat, and hibernation occurs almost exclusively in forested uplands. Box turtle are not a wetland-dependent species, but sometimes use wetlands for cooling and hydrating during the dryer hotter summer months. There is evidence that certain populations of box turtles migrate annually to the edges of wetlands to hibernate.

A single eastern box turtle was observed within the western half of the Site, within the proposed open space, as noted in my March 20, 2023 *Wetland Assessment and Impact Evaluation* report. This observation was made incidentally during wetland delineation work. Additional turtles are likely present given that the habitat across the Site is optimal. A targeted study to document box turtle habitat use, distribution and population size/demographics was not conducted. This is something that is typically not done during the IWWA permitting process, but rather is handled during the filing of a State stormwater general permit application which requires compliance with NDDB recommendations regarding State-listed species.

Suitable habitat exists throughout the property for box turtle. All habitat features utilized during a given season including basking, nesting and hibernation are present. As I testified during the IWWA hearing on 7-26, all box turtle habitat within the proposed development will be functionally lost. This is not to say that box turtles do not inhabit residential neighborhoods, but such areas are generally not viable long-term, as mortality rates are high because of nest predation from subsidized predators (i.e., raccoons), lawn mower and vehicle strikes.

With respect to other State-listed species that might be present on the Site, that is a possibility which was not explored because surveys for State-listed species are not a requirement of local inland wetland regulations. With respect to the current records of known State-listed species per the NDDB, an updated query conducted on August 25, 2023 indicates, as it did previously, that box turtle are the only currently known species. A copy of that query is attached to this letter.

Item #5: *A mitigation plan that adequately addresses the box turtles habitat loss should be submitted.*

Mitigation for box turtle impacts has been provided and is a two-fold approach, including: (1) construction protection measures to reduce the likelihood of mortality during construction; and (2) protection of 81 acres of habitat as designated open space that will be managed to promote box turtle habitat.

During the NDDB approval process, they may require box turtle surveys to be conducted, and for what is referred to as a "box turtle protection plan" to be developed. In anticipation of this protection plan requirement, we have included such a plan as detailed in Appendix B of my 3-20-23 *Wetland Assessment and Impact Evaluation* report. The purpose of this plan is to minimize the likelihood of mortality of individual turtles during construction. The protection plan consists of the following components:

1. Isolation of the project perimeter using the erosion control measures
2. Targeted searches of the project area prior to construction
3. Periodic inspection and maintenance of isolation structures throughout construction period
4. Education of all contractors and sub-contractors prior to initiation of work on the site
5. Documentation and reporting submitted to the NDDB Program

The overall goal of this plan is to protect turtles during construction and allow them to persist in designated open space post-construction. The proposed open space will provide the same habitat components as the portion of the Site where the development is proposed. The plan to manage the open space for box turtle will greatly improve the quality of that remaining habitat post-construction. It includes meadow establishment and bi-annual mowing to maintain early-successional habitat favored by box turtle. It is recommended that the open space management plan include monitoring for the first few years, to determine if suitable habitat has been established.

One additional measure to avoid box turtle mortality in the future would be to cordon off the open space and prevent turtles from entering the residential habitats. This can be done with a wildlife exclusion fence installed along the easterly side of the open space to deter turtles from accessing the residential areas.

If you have any questions regarding my findings, please feel free to contact me.

Respectfully submitted,



Eric Davison
Wildlife Biologist
Wetland Scientist
Registered Soil Scientist

Attachment 1: CT DEEP Natural Diversity Database Preliminary Site Assessment Results (8-25-23)

Connecticut Department of
ENERGY &
ENVIRONMENTAL
PROTECTION

79 Elm Street • Hartford, CT 06106-5127 www.ct.gov/deep Affirmative Action/Equal Opportunity Employer

Generated by eNDDB on:
8/25/2023

Eric Davison
Towns: Monroe
Preliminary Site Assessment: 1149429260

Subject: Quarry Ridge

Current data maintained by the Natural Diversity Database (NDDB) and housed in the DEEP ezFile portal, indicates that populations of the following State Endangered, Threatened, or Special Concern species (RCA Sec. 26-306) and/or Critical Habitats have been documented within or in close proximity to the area delineated. Please see the attached table for species and/or Critical Habitat information.

Please note that, for purposes of preliminary site assessments, certain sensitive species are not identified beyond their taxa. If additional information is required regarding sensitive species please email deep.nddbrequest@ct.gov, include a snapshot of your map (found at the end of this document), your last name, and the subject area town.

Please be advised that this is a preliminary assessment and not a Natural Diversity Database determination. The purpose of this information is to provide a general planning tool which identifies those species that have been reported and may occur on or near the mapped area. A more detailed application and review will be necessary to move forward with any environmental authorization, permit, license, or registration applications submitted to DEEP. If such review is required, please return to the DEEP's ezFile Portal and select Natural Diversity Database Review to begin the review process.

This Preliminary Site Assessment does not preclude the possibility that species not previously reported to the Natural Diversity Database may be encountered on the site. You are encouraged to report incidental observations to the Natural Diversity Database using the appropriate survey form and follow the instructions for submittal. We recommend field surveys be conducted in order to evaluate potential habitat and species presence. Field surveys should be performed by a qualified biologist with the appropriate scientific collecting permits at a time when these target species are identifiable. A report summarizing the results of such surveys should include:

1. Survey date(s) and duration
2. Site descriptions and photographs
3. List of component vascular plant and animal species within the survey area (including scientific binomials)
4. Data regarding population numbers and/or area occupied by State-listed species
5. Detailed maps of the area surveyed including the survey route and locations of State listed species
6. Statement/résumé indicating the biologist's qualifications

The site surveys report should be sent to the CT DEEP-NDDB Program (deep.nddbrequest@ct.gov) for further review by program biologists.

Natural Diversity Database information includes all information regarding listed species available to us at the time of the request. This information is a compilation of data collected over the years by the Department of Energy and Environmental Protection's Natural History Survey and cooperating units of DEEP, land owners, private conservation groups and the scientific community. This information is not necessarily the result of comprehensive or site-specific field investigations. Current research projects and new contributors continue to identify additional populations of species and locations of habitats of concern, as well as, enhance existing data. Such new information is incorporated into the Database and accessed through the ezFile portal as it becomes available.

This letter is computer generated from our existing records and carries no signature. If however, any clarification/error is noted, or, if you have further questions, please contact the following:

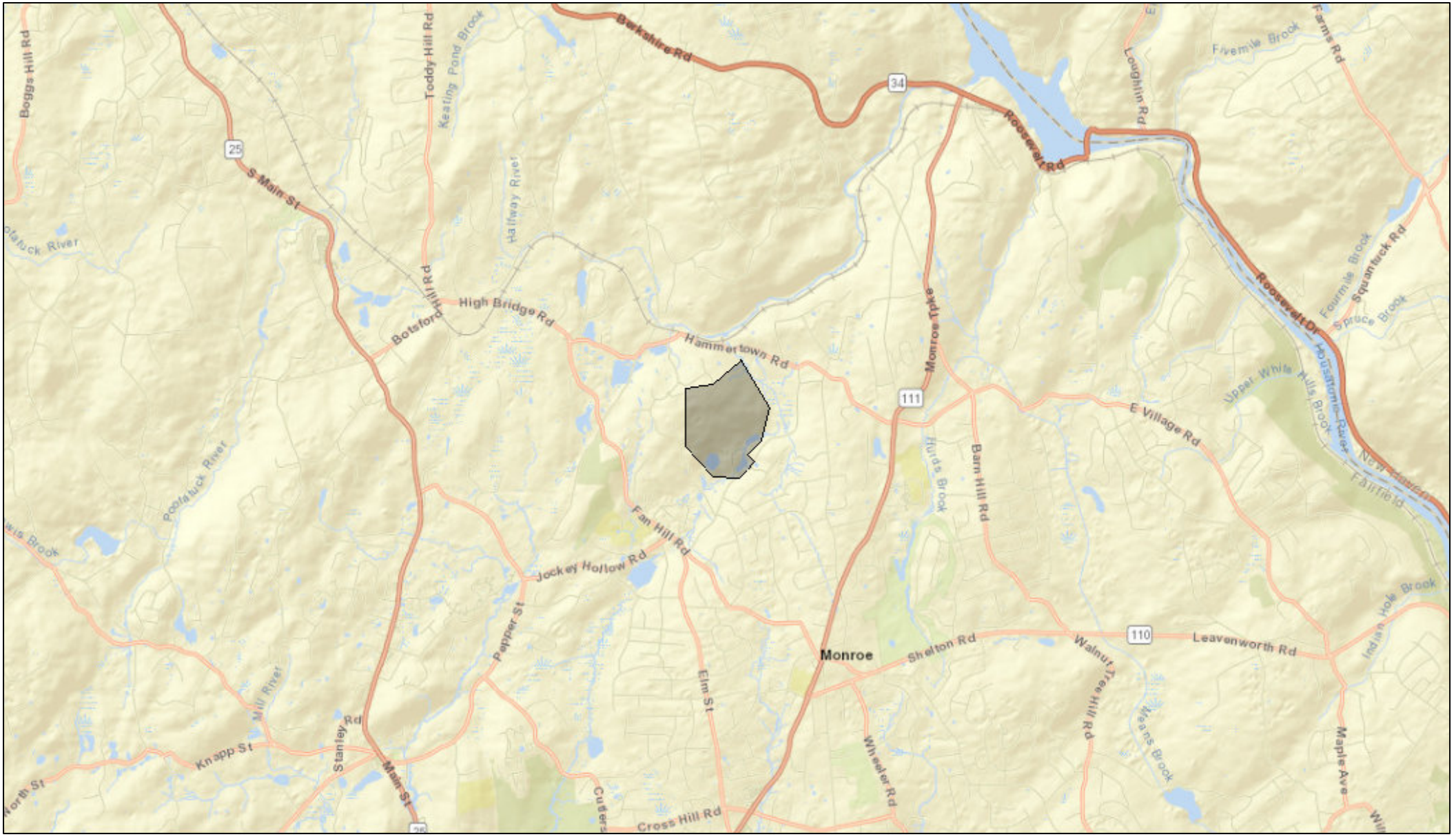
CT DEEP Bureau of Natural Resources
Wildlife Division
Natural Diversity Database
79 Elm Street
Hartford, CT 06106-5127
(860) 424-3011
deep.nddbrequest@ct.gov

Please include a snapshot of the map, your last name, and the subject area town when you e-mail or write. Thank you for consulting the Natural Diversity Data Base.

Common Name	Eastern box turtle
Scientific Name	*Terrapene carolina carolina*
Taxa	reptile
Status[1]	SC
General Ecology	In Connecticut, these turtles are found in well-drained forest bottomlands and a matrix of open deciduous forests, early successional habitat, fields, gravel pits, and or powerlines. Turtles are dormant between November 1 and April 1 and hibernate in only a few inches from the surface in forested habitat. The greatest threat to this species is habitat loss, fragmentation, and degradation due to development. This species is very sensitive to adult mortality because of late maturity (10 years old) and long life span (50-100years). Vehicular traffic, heavy equipment used for farming, and ATV use in natural areas are implicated specifically in adult mortality through collisions. Illegal collection by the pet trade and unknowing public for home pets exacerbates mortality rates and removes important individuals from the population. Predation rates are also unnaturally high because of increased predator populations (e.g. skunks, foxes, raccoons, and crows) that surround developed areas.

[1]E = State Endangered, T = State Threatened, SC = State Special Concern, FE = Federally Endangered, FT = Federally Threatened, NA = Not applicable.

Quarry Ridge Map



August 25, 2023

1:76,779

0 0.5 1 2 mi

0 1 2 4 km

Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

Wetland Assessment and Impact Evaluation

Quarry Ridge Residential Development
Turkey Roost Road, Monroe

Submitted To:
Jason Edwards
J. Edwards and Associates, LLC
225 Stepney Road
Easton, CT 06612

Prepared By:

Davison Environmental, LLC
Eric Davison,
Wildlife Biologist
Registered Soil Scientist
Certified Professional Wetland Scientist

March 20, 2023

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1.0 INTRODUCTION

Davison Environmental, LLC has prepared this wetland assessment and impact evaluation in conjunction with an Inland Wetlands and Watercourses Commission application to the Town of Monroe for a proposed development (the "Project" hereinafter) on a property located north of Turkey Roost Road in Monroe (the "Site" hereinafter). The Site is accessed from Turkey Roost Road to the south, and roughly borders Pinto Lane to the west and Morgan Lane to the north. See Appendix B - Figures 1 and 2 illustrating the Site location.

2.0 EXISTING ENVIRONMENT

2.1 General Site Description

Site photographs are provided in Appendix A. The Site is currently undeveloped and consists of a former gravel mine that has been left fallow for a number of years. The former mining areas were allowed to revegetate naturally, and now consist of "old field"[1] habitat dominated by invasive non-native species along with native pioneer species. Mining activity is visible on historical aerial photography as early as 1952 (source: Connecticut State Library). Mining activity was largely focused on the southern portions of the Site, where sand and gravel surficial material was present. The eastern half of the site consists of mixed hardwood forest and forested wetlands.

2.2 Surficial Geology and Watershed

The surficial materials at the site have been modified by the historic mining activity which stripped the upper layers of material from the Site. The Site's surficial geology is comprised of sand and gravel along the southern portions of the Site, with thin till dominated the northern portion of the Site. Most of the Site consists of thin glacial till. Tills are ice-laid deposits were derived directly from the ice and consist of non-sorted, generally non-stratified mixtures of grain-sizes ranging from clay to large boulders. The matrix of most tills is predominantly sand and silt and boulders can be sparse to abundant. Some tills contain lenses of sorted sand and gravel and occasionally masses of laminated fine-grained sediment.

Sand and gravel surficial materials are glacial meltwater deposits that were laid down in glacial streams, lakes and ponds which occupied the valleys and lowlands of Connecticut as the last ice sheet melted away to the north. They are composed of mixtures of gravel and sand within individual layers and as alternating layers. Sand and gravel layers generally range from 25 to 50 percent gravel particles and from 50 to 75 percent sand particles. They are often composed of

[1] Old Field habitat refers to habitats that contain an interspersion of shrubs and small trees (typically less than 30% total cover) interspersed with herbaceous vegetation consisting of grasses and forbs.

layers of well-to-poorly sorted sands, gravels, silts and clays with few to no boulders, and owing to their water-related depositional origins they have many characteristics that are favorable for development.

The Site is located within the Halfway River watershed. Along the southern portions of the Site is Smith Pond Brook which drains in a northeasterly direction into Copper Mill Brook which flows along the eastern side of the Site. Smith Pond Brook drains north into the Halfway River north of Hammertown Road. See Figure 1 – *Location Map* which illustrates these waterway locations.

2.3 Wetland Delineation and Soil Types

Wetlands and watercourses are regulated in the State of Connecticut General Statutes, Chapter 440, sections 22a-28 to 22a-45. Inland Wetlands "means land, including submerged land, not regulated pursuant to sections 22a-28 to 22a-35, inclusive, which consists of any of the soil types designated as poorly drained, very poorly drained, alluvial, and floodplain by the National Cooperative Soils Survey, as may be amended from time to time, of the National Resources Conservation Service (NRCS) of the United States Department of Agriculture" section 22a-38(15).

Davison Environmental, LLC Registered Soil Scientists Michael Klein and Eric Davison delineated Site wetlands in June of 2020. Wetlands were delineated by walking across the Site and examining the soil profile using a hand auger to a minimum depth of 20 inches in order to determine soil drainage class.

Digitally available updated soil survey information was obtained from the Natural Resources Conservation Service and generally confirmed during the field investigation, with the exception of historic material extraction areas which presented as a modified condition of the relevant native soil. Soil classifications present on the property are as follows:

Wetland Soils

Wetland soils on the site consist of the Ridgebury, Leicester and Whitman complex, Aquents, the Saco series and the Rippowam series. The Ridgebury, Leicester and Whitman complex is an undifferentiated mapping unit consisting of two poorly drained (Ridgebury and Leicester) and one very poorly drained (Whitman) soil developed on glacial till in depressions and drainageways in uplands and valleys. Their use interpretations are very similar, and they typically are so intermingled on the landscape that separation is not practical. The Ridgebury and Leicester series have a seasonal high water table at or near the surface (0-6") from fall through spring. They differ in that the Leicester soil has a more friable compact layer or hardpan, while the Ridgebury soils have a dense to very dense compact layer. The Whitman soil has a high water table for much of the year and may frequently be ponded.

The Aquents map unit is a miscellaneous land type used to denote man-made or man-disturbed areas that are wet. This soil condition dominates the former mining areas of the Site. These soils have an aquic soil moisture regime and can be expected to support hydrophytic vegetation. Typically, these soils occur in places where less than 2 feet of earthen material have been placed over poorly or very poorly drained soils; areas where the natural soils have been mixed so that the natural soil layers are not identifiable; or where the soil materials have been excavated to the watertable.

The Rippowam series consists of very deep, poorly drained loamy soils formed in alluvial sediments. They are nearly level soils on flood plains subject to frequent flooding. Permeability is moderate or moderately rapid in the loamy layers and rapid or very rapid in the underlying sandy materials.

The Saco series consists of very deep, very poorly drained soils formed in silty alluvial deposits. They are nearly level soils on flood plains, subject to frequent flooding. Depth to the coarse-textured substratum layers is more than 40 inches. The surface soil is very dark gray to black silt loam, underlain directly by a mottled, gray to grayish brown substratum. Some pedons have a mucky surface up to 5 inches thick. The soils formed in depressions in recent silty alluvium. In places water is ponded on the surface from late fall through early spring. These soils flood in the spring and after periods of heavy rainfall.

Non-Wetland Soils

The non-wetland soils were not examined in detail, except as was necessary to determine the wetland boundary. Non-wetland soils consist primarily of Udorthents associated with the historic site disturbance. Native soil types present in whole or modified from mining activity include the Canton and Charlton complex and the Charlton-Chatfield complex.

The Canton series consists of very deep, well drained soils formed in a loamy mantle underlain by sandy glacial till. They are on nearly level to very steep glaciated plains, hills, and ridges. Permeability is moderately rapid in the solum and rapid in the substratum. The soils developed in a fine sandy loam mantle over acid sandy glacial till of Wisconsin age derived mainly from granite and gneiss and some fine-grained sandstone.

The Charlton series is a very deep, well drained loamy soil formed in friable till. They are nearly level to very steep soils on till plains and hills. Depth to bedrock and the seasonal high water table is commonly more than 6 feet.

The Chatfield series consists of moderately deep, well drained, and somewhat excessively drained soils formed in till. They are nearly level to very steep soils on glaciated plains, hills, and ridges. Crystalline bedrock is at depths of 20 to 40 inches. The soils formed in a moderately thick mantle of glacial till overlying granite, gneiss, or schist bedrock. Rock outcrops are rare to common and are limited to the more resistant bedrock.

2.4 Wetland Description

Wetlands consist of: (1) a single small, isolated wetland (Wetland 1) located in the northeast corner of the Site; and (2) a large, interconnected wetland system that runs along the southern and eastern portions of the Site (Wetland 2). The physical, hydrologic and vegetative conditions of these two wetland areas are described in detail in the following sections:

Wetland 1

Wetland 1 is demarcated by flags 1X-16X shown on Sheet S6. It is a small, isolate forested wetland with a temporarily flooded hydrology. The wetland appears to be entirely anthropogenic in origin, with the topography showing evidence of creation by heavy equipment. It has two inlets, one on the south side and one on the west side, and the internal flows discharges from the wetland into a culvert on the north side. The outlet culvert is partially buried in sediment.

The vegetation consists of upland tree cover of black birch (*Betula lenta*) on the banks of the wetland along with the invasive non-native autumn olive, with the interior being dominated by multiflora rose (*Rosa mutliflora*), along with goldenrods (*Solidago sp.*).

Wetland 2

Wetland 2 is a large, interconnected wetland system that flows east, draining into Smith Pond Brook. The entirety of the wetland has been altered by the former mining activities, with areas of wetland having been excavated, channelized, and culverts installed to accommodate road crossing. The wetland is described in five segments as noted below:

Wetland 2A: Wetland Area 2A is demarcated by flags 120-175 as shown in Sheet S2/S6. The wetland is a hillside groundwater slope wetland that extends up the slope towards the proposed development area. It terminates just east of proposed Lots 43-45. This wetland area was completely disturbed from the mining activities, and possibly, the wetland was entirely created as a result of the mining which lowered the ground surface elevation resulting in the interception of groundwater and the creation of a hydric soil conditions due to regular groundwater discharge.

Groundwater discharges into the wetland at the two upper slope “fingers” (at the westernmost end) which originate at the base of a steep embankment. Flow travels downslope to the east,

draining into the large northeast pond. Flow is concentrated into a defined channel which is averages approximately 3 feet wide and 1.5 feet in depth. The vegetation consists of young "pioneer" species consistent with a wetland that was recently created. The cover type is scrub-shrub but includes scattered small trees. The dominant canopy species is willow (*Salix sp.*), with the shrub layer being dominated by autumn olive and multiflora rose, the herb layer is dominated by Japanese stiltgrass (*Microstegium vimineum*) along with sedges (*Carex sp.*) and rushes (*Juncus sp.*). The immediately adjacent uplands consist of a dense growth of the invasive non-native mugwort (*Artemesia vulgaris*). The eastern portion of the wetland becomes more steeply sloped which results in the wetland narrowing in width, and the flow becoming higher velocity flow confined to a narrow well-defined channel.

Wetland 2B: Wetland Area 2B is the northeast pond demarcated by flags 96-120, and 175-196 shown on Sheets S2/S6. This is the receiving pond for Wetland 2A. This is a large man-made pond with a well-defined shoreline, with little bordering wetlands. The shoreline is well-vegetated with emergent marsh vegetation. The pond is separated from Smith Pond Brook by a narrow earthen berm along the southeast side of the pond. The pond eventually discharges to Smith Pond Brook near its confluence with Copper Mill Brook. Details of the ponds physical or water quality conditions are not known. The vegetation includes a dense cover of the floating aquatic duckweed (*Lemna minor*), and a shoreline that is densely vegetated with marsh species including the invasive non-native common reed (*Phragmites australis*), along with cattail (*Typha latifolia*), pickerelweed (*Pontederia cordata*), arrow tearthumb (*Persicaria sagittata*) and alder (*Alnus rugosa*).

Wetland 2C: Wetland Area 2C refers to the southwestern portion of the wetland (west of the main access road), demarcated by flags 1X-37X as shown on Sheet S2. Wetland hydrology ranges from semi-permanently flooded along the perimeter of the wetland, and permanently flooded within the interior of the wetland. It is presumed that the wetland's shape and topography resulted from alterations that occurred from the mining operation. It was likely used historically as a settling basin. Water drains out of this wetland slowly (due to the gently sloping topography) to the east where it drains into the culvert and discharges on the east side of the access road.

The vegetation within the interior low elevation portions of the wetland consists of a dense growth of American bur-reed (*Sparganium Americanum*), a grass-like aquatic plant. The dominant plant along the wetland edges is a dense growth of Japanese stiltgrass. The shoreline includes some willow trees, along with gray birch and black birch, but generally has an open canopy.

Wetland 2D: Wetland 2D is demarcated by wetland flags 44-59 and is located on the east side of the interior access road as shown on Sheet S2. It is fed by the culvert outlet from Wetland Area 2C, and discharges to a culvert on the east side of the wetland where there is another culvert crossing. The culvert is in poor condition and is partially buried in sediment. The wetland hydrology is perennial flow, with shallow gentle flow to the east. There is a low central channel bordered by steeply sided banks.

Wetland vegetation is dictated by the deep shade provided by the white pine (*Pinus strobus*) tree canopy bordering the southern side of the wetland. There is little interior wetland vegetation present except for a few small patches of American bur-reed and scattered poison ivy (*Toxicodendron radicans*). The banks of the wetland consist of a dense monoculture of Japanese barberry along with scattered autumn olive along with black birch and red maple (*Acer rubrum*).

Wetland 2E: Wetland Area 2E is located at the downstream side of the culvert discharge from Wetland Area 2D. This wetland area is a high-gradient perennial watercourse with a meandering channel alignment and a stony (gravel-to-cobble sized) stream bottom. The banks are steeply sloping with no bordering wetlands. This stream segment drains east into Smith Pond Brook.

The shoreline vegetation consists of hardwood tree species including black birch, red maple, sugar maple and hickories (*Carya sp.*). The shrub cover is dominated by autumn olive, and the groundcover consists of poison ivy, Christmas fern (*Polystichum acrostichoides*) and Asiatic bittersweet.

2.5 Rare Species Habitat

Field surveys to inventory Site wildlife were not conducted as a part of our work. Based on a review of the most recently updated (June 2021) Connecticut Department of Energy and Environmental Protection Natural Diversity Database (NDDB) mapping, NDDB records overlap the Site. Additionally, a single adult male eastern box turtle (*Terrapene c. carolina*), a State-listed species of special concern, was observed during the wetland delineation work in June, west of Sheet S2 in the 32.68 acre proposed open space parcel. The turtle was found basking at the edge of the mixed hardwood forest, near the forest/old field interface near the edge of a wetland.

3.0 WETLAND FUNCTIONS AND VALUES

3.1 Wetland Functions and Values

The functions and values of the wetland and watercourse which would be subject to filling or enhancement are summarized in Table 1. The *Highway Methodology* recognizes 13 separate wetland functions and values, including: groundwater recharge/discharge, floodwater storage,

fish and shellfish habitat, sediment/toxicant/pathogen retention, nutrient removal/retention/transformation, production export, sediment/shoreline stabilization, wetland wildlife habitat, recreational value, educational/scientific value, uniqueness, visual/aesthetic quality and threatened and endangered species habitat.

The degree to which a wetland provides each of these functions is determined by one or more of the following factors: landscape position, substrate, hydrology, vegetation, history of disturbance, and size. Each wetland may provide one or more of the listed functions at significant levels. The determining factors that affect the level of function provided by a wetland can often be broken into two categories. The effectiveness of a wetland to provide a specified function is generally dependent on factors within the wetland whereas the opportunity to provide a function is often influenced by the wetland's position in the landscape as well as adjacent land uses. For example, a depressed wetland with a restricted outlet may be considered highly effective in trapping sediment due to the long residence time of runoff water passing through the system. If this wetland is located in gently sloping woodland, however, there is no significant source of sediment in the runoff therefore the wetland is considered to have a small opportunity of providing this function.

Table 1: Summary of Wetland Functions and Values

Wetland Functions and Values	Groundwater Recharge/Discharge	Sediment/Shoreline Stabilization	Floodflow Alteration	Fish & Shellfish Habitat	Sediment/Toxicant/ Pathogen Retention	Nutrient Removal/Attenuation	Production Export	Wildlife Habitat	Recreation	Educational/Scientific Value	Uniqueness/Heritage	Visual Quality/Aesthetics	Listed Species Habitat
Wetland 1	S	N/A	N/A	N/A	S	S	S	S	U	U	U	U	U
Wetland 2	P	S	P	S	P	P	S	S	U	U	U	U	U

Suitability

P = principal function

S = secondary function

U = function unlikely to be provided at a significant level

N/A = not applicable

Wetland functions and values are heavily influenced by the site history. The wetlands throughout the site have been heavily disturbed, including large scale grading, filling, channelization and flow diversions. The wetlands are in essence "young wetlands" with soils, hydrology and vegetation still in the development stages. A brief description of the wetland's principal functions and values is provided below.

Wetland 1

Wetland 1 is a small historically disturbed wetland that provides few functions and values. It does not have a hydrology suitable for aquatic species, or species that require seasonal flooding (e.g., vernal pool species). The small size of the wetland is the primary limiting factor with respect to its ability to provide functions and values. The wetland's principal function is to convey flow to the downstream wetland system via the existing culvert system. The vegetation is dominated by invasive non-native species and therefore has relatively low plant species diversity.

Wetland 2

Wetland 2 is far more significant with respect to the functions and values it provides. This is largely the result of its large size, longer hydroperiod, and its surface water connection to Smith Pond Brook which makes its ability to provide water quality renovation functions important to protect downstream resources. Its principal functions include groundwater recharge/discharge, floodflow alteration, sediment/toxicant/pathogen retention, and nutrient removal/attenuation.

4.0 REGULATED ACTIVITIES

No activities are proposed within Site wetlands (i.e., there are no direct wetland impacts). Due to the needs of the proposed Project and the location and proximity of surrounding wetlands, activities are proposed within the Town of Monroe's 100-foot upland review area (URA). A total of 74,800 square feet of work is proposed within the URA. The majority of this work is related to the construction of the stormwater management basins. The closest activity to wetlands will occur at the entrance road which will require improvement on either side of the existing culvert crossing. Overall, most construction activity will occur a significant distance from wetlands. Estimating the distance of the activity from wetlands (using twelve of the closest activity locations), an average setback of ±60 feet from wetlands is proposed. Upon completion of construction, the closest proposed home to wetlands will be 102 feet.

5.0 WETLAND IMPACT ASSESSMENT AND RECOMMENDATIONS

5.1 Potential Short-term Impacts

Potential short-term Project impacts to wetlands and watercourses are primarily related to discharges during construction. In order to minimize the potential for these impacts, erosion and sediment ("E&S") control measures have been designed in accordance with the "2002 Connecticut Guidelines for Soil Erosion and Sediment Control", CT DEEP Bulletin No. 34, and all amendments and addenda thereto as published by the Connecticut Department of Energy and Environmental Protection. Sediment and erosion control measures proposed for this project include:

- Temporary sediment traps
- Anti-tracking pad
- Silt-sacks at catch basins
- Wood chip berms
- Geotextile silt fencing (including double rows)

At critical locations (e.g., upslope of Wetland 2) barrier controls consist of a wood chip berm as the interior control, backed by a double row of silt fencing. These measures in combination will be highly effective at slowing the flow of runoff and trapping sediment generated during construction.

Most wetland sedimentation impacts during construction occur because of contractor's not properly installing and maintaining the control measures as designed. Therefore, it is imperative that the contractor properly install and maintain these measures throughout the duration of construction. This should include daily inspection by the contractor of all Site controls, but in particular the outer barrier control measures closest to wetlands just prior to, and after, a significant rainfall event.

5.2 Potential Long-term Impacts

Potential long-term Project impacts to wetlands and watercourses are most often related to the loss of wetland functions and values resulting from filling and water quality degradation resulting from stormwater discharges.

Proposed upland review area activities would primarily occur within portions of the Site which were previously occupied by the sand and gravel mine and have thus been disturbed. These areas no longer have native plant communities or soil. The topsoil and subsoil have been stripped and processed, and the topography radically altered. Therefore, wetland and hydrologic impacts

resulting from such activities (carbon loss, soil compaction, habitat loss and alteration, alteration of groundwater infiltration patterns) have already occurred. In other words, the impacts to the wetland buffer (a.k.a. the upland review area) that result from development have already occurred at this Site.

Potential long-term impacts to water resources are primarily related to the loss of functions and values and/or water quality degradation resulting from wetland filling and stormwater discharges. In the case of the proposed development no wetland filling is proposed. With respect to degradation of water quality, the development incorporates *primary treatment* practices as described in CTDEP's 2004 Stormwater Quality Manual. This includes three stormwater treatment ponds and a settling basin fed by a rip-rap swale with stone check dams. Therefore, converting the former mining lands to residential development is unlikely to adversely affect principal wetland functions and values. This is because the proposed treatment system are designed to maximize the removal of stormwater pollutants including nutrients, sediment and hydrocarbons from stormwater runoff.

5.3 Recommendations

1. Invasive non-native species dominate the proposed development area. It is recommended that an Invasive Species Control Plan be developed by a qualified herbicide applicator with experience in eradicating invasive species, particularly mugwort, autumn olive and multiflora rose. Efforts should focus on the limits of disturbance, particularly in areas that will include landscaping and stormwater wetlands along the margins of the development where invasive plants could most easily reestablish after construction is completed.

2. During construction, the disposal of invasive plant material should comply with CT Invasive Plants Working Group guidelines (source: https://cipwg.uconn.edu/).

3. The limits of disturbance coincide with the areas of the former quarry that are either sparsely vegetated, or not vegetated at all as they consist of sorted gravel and cobble piles. It is recommended that these areas be restored with topsoil and vegetated with a native meadow or no-mow seed mix.

4. To protect the eastern box turtle during construction, it is recommended that the *Eastern Box Turtle Protection Plan* (see Appendix C) be implemented during construction if construction is proposed to occur during the turtle's active period (which typically occurs between April 1st and October 30th). Note that this plan is not intended to mitigate for the loss of habitat that will result from the proposed development project. Rather, it is intended to prevent incidental

mortality of turtles during construction (e.g., being crushed by equipment). This protection plan is a necessary measure as the proposed development areas represent suitable basking, foraging and nesting habitat for box turtle likely to be used during the late spring and early summer. Should the work occur during the turtle's dormancy period (roughly from October 1st through April 1st) this plan is not deemed necessary, as the development areas do not represent suitable overwintering habitat for box turtle due to the lack of tree cover, topsoil (and duff) and subsoil, along with the low vegetation density.

5. To maximize the pollutant uptake function of the stormwater basin the goal is to establish well-vegetated stormwater basins. The following construction sequence is recommended:

    a. Compaction of the wetland basins shall be minimized to the maximum extent feasible by using temporary construction matting, grading from outside of the creation area, using light equipment with turf tires, or wide track equipment. The contractor shall ensure that proper soil compaction levels (loose to friable) are maintained.

    b. If compaction does occur, the compacted zone shall be tilled to refracture at least 12" of underlying natural soil.

    c. Wetland topsoil consisting of a 1:1 mixture (or equal volumes) of organic and mineral materials that contains at least 12 percent organic carbon content by weight will be placed over the bottom of the creation area at a minimum depth of 6". Clean leaf compost or commercially available compost (well to partially decomposed) is the preferred amendment to achieve this standard, though other materials may be used if approved by the supervising wetland scientist. Soil amendments should be uncontaminated and void of any woodchips or invasive species. Woody debris, comprised of native materials collected from the surrounding property, will be placed on the bottom of the creation area to enhance habitat value under the direction of the supervising wetland scientist.

    d. The qualified wetland scientist may determine that dewatering is needed during the grading and planting. If necessary, excess water will be discharged into a temporary sediment trap. The need for dewatering and any specific method for dewatering is site specific and may be modified by the Contractor to accommodate field conditions. The Contractor shall provide the means and methods of

dewatering consistent with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control.

e. Basin plantings will take place once the above listed tasks have been completed. Seed non-ponded emergent areas with WetMix (product of New England Wetland Plants source: https://newp.com/catalog/seed-mixes/#wetland) or equivalent per the manufacturers specifications. Seed the side slopes with New England Erosion Control/Restoration Mix for Detention Basins and Moist Sites (source: https://newp.com/catalog/seed-mixes/#erosionMoist) or equivalent.

f. All plantings to be spaced to provide a dense planting bed. Final plant locations shall be reviewed in the field and approved by a qualified wetland scientist. Live plugs are species contained within these seed mixes if field conditions or construction schedule do not favor seed mix establishment.

g. The contractor hired to construct the creation area shall be responsible for the careful installation, maintenance (including watering if necessary), and establishment of the plant material in the basin area. All plants shall be guaranteed by the contractor to remain alive and healthy for a full twenty four (24) month period.

6.0 REFERENCES

Connecticut Environmental Conditions Online (CTECO) (http://www.cteco.uconn.edu/)

Dowhan, J. and R. J. Craig. 1976. Rare and Endangered Species of Connecticut and Their Habitats. State Geological and Natural History Survey of Connecticut.

Mitsch, W.J. and Gosselink, J.G. 2007. Wetlands, fourth edition. John Wiley and Sons, Inc.

U.S. Army Corp of Engineers. 1995. The Highway Methodology Workbook – Wetland Functions and Values: A Descriptive Approach.

Appendix A: Site Photographs



Photo 1: Wetland 1, overall view



Photo 2: Wetland 1 showing the southern 4” PVC discharge pipe.



Photo 3: upper reaches of Wetland 2A, immediately downslope of the former gravel mining limits.



Photo 4: lower reaches of Wetland 2A where the channelized flow drains into the lower pond.



Photo 5: Wetland 2C, historically created/ disturbed from mining activity. Note flooded central portions of wetland bordered by slopes dominated by a dense cover of the invasive Japanese stiltgrass.



Photo 6: Wetland 2D just downstream of road crossing, looking east.



Photo 7: outlet discharge to Wetland 2D, on the east side of the easternmost crossing.



Photo 8: easterly portion of Wetland 2D where perennial stream flow drains to Smith Pond Brook.



Photo 9: unvegetated slopes above Wetland 2A, at the limit of the historic mining area.



Photo 9: uplands within the proposed development area.

Appendix B: Figures



FIGURE 1
Location Map
Turkey Roost Rd
Monroe, CT

Legend

Site Boundary (approx)

Map Description: USGS topographic map (source USGS) showing approximate site boundary. This map is intended for general planning purposes only.

SCALE
0 450 900 Feet

N

DAVISON ENVIRONMENTAL
Davison Environmental, LLC
10 Maple Street
Chester, CT
www.davisonenvironmental.com



FIGURE 2
Aerial Site Map
Turkey Roost Rd
Monroe, CT

Legend

Site Boundary (approx)

Map Description: 2019 aerial photograph (source CT ECO) showing approximate site boundary. This map is intended for general planning purposes only.

SCALE
0 237.5 475
Feet

N

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Appendix C: Eastern Box Turtle Protection Plan

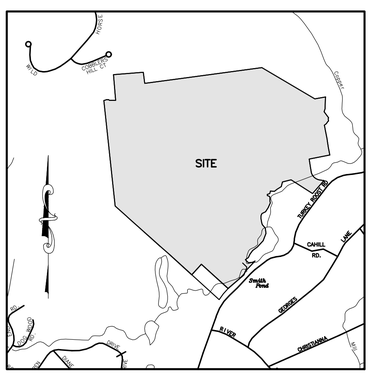
QUARRY RIDGE

IN

MONROE, CONNECTICUT

PREPARED FOR

QUARRY RIDGE ASSOCIATES, LLC



VICINITY MAP

1"=1000'

LIST OF DRAWINGS:

1/1	EXISTING CONDITIONS PLAN (BY OTHERS)
A-1	AREA PLAN
L-1 & L-2	LAYOUT PLAN
L-3	TEST HOLE LOCATION PLAN
L-4	WATERSHED ANALYSIS MAP
S-1 to S-7	SITE PLAN
S-1A - S1-E	SITE PLAN ALTERNATES
OS-1	OPEN SPACE PLAN
E-1 to E-6	EROSION CONTROL PLAN
WL-1	WETLANDS PLAN
LP-1 to LP-4	LANDSCAPE PLAN (BY OTHERS)
LP-5	PHOTOMETRIC PLAN
SP-1	SIGHTLINE PLAN AND PROFILE
P-1 to P-11	PLAN AND PROFILE
D-1 to D-7	DETAILS

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& 30 COBBLERS HILL COURT
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PREPARED FOR

QUARRY RIDGE ASSOCIATES, LLC

REVISIONS

#	DATE	DESCRIPTION
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2	07-26-23	IWWC
3	08-15-23	TOWN ENG.
4	08-30-23	IWWC

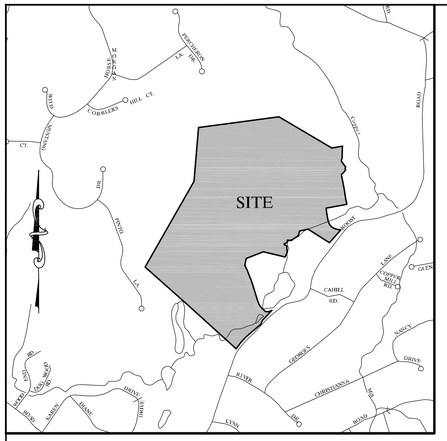
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DRAWN BY: NDC
SCALE:

TITLE

TITLE SHEET

SHEET NUMBER

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LOCATION MAP

SCALE: 1"=1000'

CURVE	RADIUS	ARC LENGTH	CHORD LENGTH	CHORD BEARING	DELTA ANGLE
C1	1323.14'	110.00'	109.97'	S 08°12'18" E	4°45'48"
C2	142.00'	174.23'	163.50'	S 45°44'12" E	70°18'01"
C3	450.00'	21.66'	21.65'	S 42°47'03" W	2°45'26"
C4	270.00'	4.55'	4.55'	S 45°30'19" E	0°57'53"
C5	270.00'	130.32'	129.06'	S 31°11'44" E	27°39'17"
C6	330.00'	164.84'	163.13'	S 31°40'41" E	28°37'10"
C7	2030.00'	304.49'	304.21'	N 21°39'55" W	8°35'39"

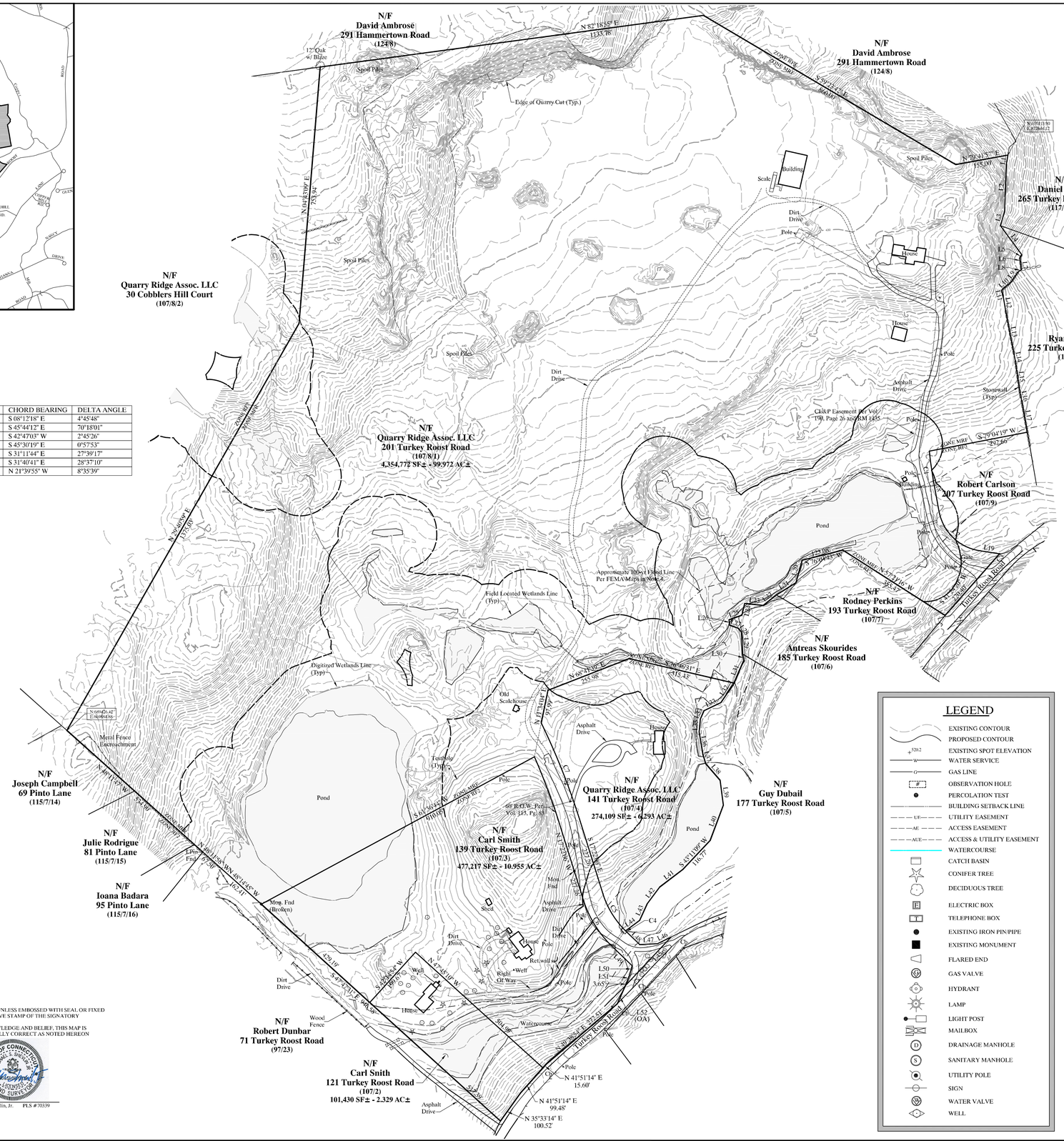
LINE	BEARING	DISTANCE
L1	S 09°17'00" W	23.10'
L2	S 02°24'02" W	143.67'
L3	S 16°26'53" W	42.53'
L4	S 36°18'04" E	106.16'
L5	S 39°00'27" W	9.31'
L6	S 07°13'34" E	11.43'
L7	S 06°34'41" E	25.25'
L8	S 57°09'34" W	10.47'
L9	S 35°04'37" W	37.86'
L10	S 49°54'46" W	35.70'
L11	S 13°42'56" E	20.12'
L12	S 10°03'47" E	39.32'
L13	S 10°49'10" E	134.73'
L14	S 10°49'54" E	15.96'
L15	S 08°18'23" E	99.07'
L16	S 12°43'28" E	18.63'
L17	S 10°20'06" E	95.63'
L18	S 10°35'12" E	70.00'
L19	S 80°53'13" E	55.00'
L20	S 15°28'28" W	68.37'
L21	S 57°58'32" W	67.38'
L22	S 51°31'14" W	49.44'
L23	N 84°10'44" W	54.92'
L24	S 13°18'15" W	35.30'
L25	S 70°21'34" W	40.23'
L26	S 08°58'44" E	16.32'
L27	S 70°39'36" E	27.48'
L28	S 35°17'13" E	14.46'
L29	S 03°03'17" E	63.84'
L30	S 09°07'01" E	18.79'
L31	S 23°10'10" W	72.13'
L32	S 33°48'04" W	68.49'
L33	S 64°28'59" W	55.32'
L34	S 23°02'24" W	27.20'
L35	S 05°26'49" W	37.95'
L36	S 09°34'16" E	67.12'
L37	S 17°04'26" E	28.07'
L38	S 40°44'46" E	64.41'
L39	S 07°30'36" E	73.34'
L40	S 20°33'29" W	110.39'
L41	S 52°50'44" W	85.49'
L42	S 36°36'44" W	61.72'
L43	S 24°18'59" W	52.80'
L44	S 53°18'34" W	51.87'
L45	S 43°13'14" W	195.90'
L46	N 63°59'40" E	44.45'
L47	N 87°00'30" E	52.01'
L48	N 45°59'16" W	53.31'
L49	N 45°59'16" W	79.97'
L50	N 14°06'17" E	25.80'
L51	N 21°28'14" E	32.78'
L52	N 23°35'29" E	61.52'

NOT VALID UNLESS EMBOSSED WITH SEAL OR FIXED WITH THE LIVE STAMP OF THE SIGNATORY

TO MY KNOWLEDGE AND BELIEF, THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON

STATE OF CONNECTICUT · 15083 · LICENSED LAND SURVEYOR

Michael S. Shevlin, Jr. PLS #70339


N/F
David Ambrose
291 Hammertown Road
(124/8)
N/F
Quarry Ridge Assoc. LLC
30 Cobblers Hill Court
(107/8/2)
N/F
Quarry Ridge Assoc. LLC
201 Turkey Roost Road
(107/8/1)
4,354,772 SF± - 99.972 AC±
N/F
Daniel Flynn
265 Turkey Roost Road
(117/1/3)
N/F
Ryan Carter
225 Turkey Roost Road
(117/1/1)
N/F
Robert Carlson
207 Turkey Roost Road
(107/9)
N/F
Rodney Perkins
193 Turkey Roost Road
(107/7)
N/F
Antreas Skourides
185 Turkey Roost Road
(107/6)
N/F
Guy Dubail
177 Turkey Roost Road
(107/5)
N/F
Quarry Ridge Assoc. LLC
141 Turkey Roost Road
(107/4)
274,109 SF± - 6.293 AC±
N/F
Carl Smith
139 Turkey Roost Road
(107/3)
477,217 SF± - 10.955 AC±
N/F
Joseph Campbell
69 Pinto Lane
(115/7/14)
N/F
Julie Rodrigue
81 Pinto Lane
(115/7/15)
N/F
Ioana Badara
95 Pinto Lane
(115/7/16)
N/F
Robert Dunbar
71 Turkey Roost Road
(97/23)
N/F
Carl Smith
121 Turkey Roost Road
(107/2)
101,430 SF± - 2.329 AC±
Turkey Roost Road
Hammertown Road
Edge of Quarry Cut (Typ.)
Spoil Piles
Building
Scale
Dirt Drive
Pole
Poles
House
Asphalt Drive
Stonewall (Typ.)
Pond
Approximate 100yr Flood Line Per FEMA Maps in Note 4
Field Located Wetlands Line (Typ.)
Digitized Wetlands Line (Typ.)
Old Scalehouse
Testhole (Typ.)
Metal Fence Encroachment
Mon. Fnd (Broken)
Shed
Well
Right Of Way
Retwall (Typ.)
Wood Fence
Watercourse
Gate
Iron Fnd
Mon. Fnd
Pipe
Catch Basin
C&P Easement per Vol. 198, Page 26 and RM 1455
or R.O.W. Per Vol. 135, Pg 84
ZONE MRF
ZONE RF2
ZONE RF1
ZONE MRF/RF2
N 87°18'55" E 1133.18'
S 89°43'55" E 1000.00'
N 70°41'5" E 155.00'
S 76°04'45" W 222.08'
S 70°04'19" W 392.86'
N 53°37'16" W 355.47'
S 37°46'40" W 203.00'
N 68°41'58" E 355.08'
S 26°46'31" E 315.43'
N 12°34'00" W 99.00'
S 50°30'45" W 610.00'
N 47°45'10" W 180.00'
S 47°45'10" E 400.00'
N 20°40'00" E 175.00'
N 18°43'00" E 758.94'
N 46°17'57" W 53.00'
N 89°58'WM 46°14'45" W 170.41'
N 41°51'14" E 15.60'
N 41°51'14" E 99.48'
N 35°33'14" E 100.52'
N 89°05.42' E 1405.85'
N 69°05.42' E 1405.85'
N 69°05.42' E 1405.85'
N 69

LEGEND:

DIRECTION OF FLOW

NOTE:

1984 TOWN OF MONROE TOPOGRAPHIC MAPPING USED TO SHOW OFFSITE FLOW PATTERNS THE ONSITE TOPOGRAPHY HAS BEEN SIGNIFICANTLY MODIFIED BY THE QUARRY OPERATION. SEE DATA ACCUMULATION MAP FOR CURRENT TOPOGRAPHIC CONDITIONS.



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STATE OF CONNECTICUT — JASON EDWARDS — No. 10937 — LICENSED PROFESSIONAL ENGINEER

STATE OF CONNECTICUT — JASON EDWARDS — LICENSED LAND SURVEYOR

139, 141, & 201 TURKEY ROOST ROAD
& 30 COBBLERS HILL COURT
MONROE, CONNECTICUT

PREPARED FOR

QUARRY RIDGE ASSOCIATES, LLC

REVISIONS

#	DATE	DESCRIPTION
1	06-28-23	IWWC
2	07-26-23	IWWC
3	08-15-23	TOWN ENG.
4	08-30-23	IWWC

DATE: MAY 1, 2023
PROJECT #: 3302
DRAWING FILE:
DRAWN BY: NDC
SCALE: SCALE:1"=200

TITLE

AREA PLAN

SHEET NUMBER

A-1

K:\PROJECTS\3302 BIENASHSKI\DRAWINGS\ALTERNATE 5\A-1.DWG



LEGEND

- EXISTING CONTOUR
- PROPOSED CONTOUR
- 520.2 EXISTING SPOT ELEVATION
- 520.2 PROPOSED SPOT ELEVATION
- EXISTING DRAINAGE
- PROPOSED DRAINAGE
- EXISTING SANITARY
- PROPOSED SANITARY
- FL 100 YEAR FLOOD PLAIN
- L SANITARY LATERALS
- FM FORCE MAIN
- FD FOOTING DRAIN
- RD ROOF DRAIN
- W WATER SERVICE
- G GAS LINE
- UG
- COTG CLEAN OUT TO GRADE
- FF FINISHED FLOOR
- GF GARAGE FLOOR
- BS BASEMENT SLAB
- TST TEMPORARY SEDIMENT TRAP
- W-27 INLAND WETLANDS WITH FLAG #
- XXX OBSERVATION HOLE
- PERCOLATION TEST
- GTD GRADE TO DRAIN
- SF SYNTHETIC FILTER BARRIER
- WATER BREAK
- LOD LIMIT OF DISTURBANCE
- BUILDING SETBACK LINE
- UPLAND REVIEW LIMIT
- WATERCOURSE OFFSET
- AV AIRVALVE
- BV BLOW OFF VALVE
- GATE VALVE
- HYDRANT

TREE ASSESSMENT

TOTAL EXISTING TREES: 2,791±
TREES WITH L.O.D: 74±
TREES TO REMAIN: 2,712±
NEW TREES PROPOSED: 417±
TOTAL TREES POST CONSTRUCTION:3,129 ±

IT IS ESTIMATED THAT 9 TREES WILL BE REMOVED WITHIN THE REGULATED AREA

TREE COUNT BASED ON AERIAL PHOTOGRAPHY ACQUIRED 03.23.2023.
COUNT INCLUDES TREES GREATER THAN 12" DIAMETER

200 0 200 400

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DATE: MAY 1, 2023
PROJECT #: 3302
DRAWING FILE:
DRAWN BY: NDC
SCALE: SCALE:1"=200'

TITLE

ON-SITE LAYOUT PLAN

SHEET NUMBER

L-1

K:\PROJECTS\3302 BIENASHSKI\DRAWINGS\ALTERNATE 5\L-1.DWG



UPON COMPLETION OF WATER SERVICE INSTALLATION, UTILITY TRENCH EXCAVATION TO BE REPAVED.
WATER SERVICE INSTALLATION TO BE INCORPORATED IN PHASE ONE OF CONSTRUCTION.

LEGEND

- APPROXIMATE LOCATION OF EXISTING WATER MAIN
- ALIGNMENT OF WATER MAIN. FINAL LOCATION TO BE DETERMINED BY LOCAL WATER COMPANY
- HYDRANT. FINAL LOCATION TO BE DETERMINED BY LOCAL FIRE MARSHALL.

NOTE:
THIS PLAN IS COMPILED FROM THE TOWN OF MONROE ASSESSORS PROPERTY MAPPING.

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STATE OF CONNECTICUT — JASON EDWARDS — LICENSED LAND SURVEYOR

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& 30 COBBLERS HILL COURT
MONROE, CONNECTICUT

PREPARED FOR
QUARRY RIDGE ASSOCIATES, LLC

REVISIONS

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2	07-26-23	IWWC
3	08-15-23	TOWN ENG.
4	08-30-23	IWWC

DATE: MAY 1, 2023
PROJECT #: 3302
DRAWING FILE:
DRAWN BY: NDC
SCALE: SCALE:1"=250'

TITLE

OFF-SITE LAYOUT PLAN

SHEET NUMBER

L-2

K:\PROJECTS\3302 BIENASHSKI\DRAWINGS\ALTERNATE 5\L-2.DWG

EXCAVATION ANALYSIS
CUT VOLUME: 131,098± CY
FILL VOLUME: 128,780± CY
NET CUT: 2,318 CY

TOPSOIL ANALYSIS
EXISTING TOPSOIL
STOCKPILE VOLUME: 35,000CY
ESTIMATED TOPSOIL REQUIRED: 30,346CY

POST BLASTING
TEST PIT (TYPICAL)

DEEP TEST HOLE (TYP.)

DEPTHS OF POST BLASTING HOLES

Hole	Depth to Ledge	Elev. Existing	Elev. Proposed
A1	115"	452	449.8
A2	160"	443.9	448.4
A3	96"	442	446.1
A4	96"	440.7	444.5
A5	80"	438.4	442.7
A6	104"	438	436.7
A7	125"	456.2	wa
B1	140"	449.7	452
B2	130"	448.5	452.5
B3	97"	446.8	452.6
B4	132"	445.2	444.7
B5	106"	443.6	443.1
B6	120"	445.8	448
B7	112"	442.8	444.6
B8	72"	440.7	443.6
B9	32"	439.1	435.9
B10	65"	439.8	434.2
B11	60"	436.5	438.25
C1	115"	448.7	445.5
C2	150"	445.4	451.9
C3	120"	443.6	451
C4	108"	443.27	450.5
C5	130"	442.7	449.7
C6	117"	444.8	442.3
C7	105"	440.9	439.9
C8	57"	439.9	437.1
C9	51"	438.88	439.4
C10	12"	437.2	439.3
C11	41"	435.4	430.9
D1	64"	448.7	444.6
D2	67"	446.7	449.8
D3	108"	444.7	451.3
D4	66"	443	450
D5	70"	441.7	447.1
D6	81"	440.8	446
D7	48"	440.4	440.8
D8	85"	438	442
D9	100"	438	441
D10	12"	439	433.75
D11	106"	435.2	435
D12	96"	432.5	434.6
D13	123"	431.3	426.3
E1	66"	445.4	440.5
E2	49"	443.2	447.6
E3	96"	441	446
E4	25"	440.1	444
E5	120"	437.6	439
E6	112"	436.9	443
E7	96"	435	442.2
E8	36"	438.4	438.2
E9	102"	437.4	435.5
E10	130"	434.8	433.8
E11	98"	431.4	431.8
E12	69"	429.6	431
E13	49"		
F1	120"	443.7	445
F2	120"	442.9	443.3
F3	156"	441.4	444
F4	60"	437.4	436.65
F5	98"	435.1	440.8
F6	132"	435.9	434.7
F7	72"	434.3	435.6
F8	156"	433.8	430.2
F9	120"	436.2	436.5
F10	60"	434.4	434
G1	96"	442.2	435.8
G2	72"	437.7	441
G3	1"	438.1	440.5
G4	96"	435.2	439.5
G5	132"	432.7	440
G6	60"	432.9	433
G7	96"	432.3	433
G8	120"	432.1	431.4
G9	96"	429	432
H1	120"	437.6	437.3
H2	40"	436.2	437
H3	108"	433.61	438
H4	156"	430.5	431.5
H5	108"	429.3	425
H6	96"	429	422
H7	108"	428	426
H8	132"	426.2	420.8
I1	96"	441.3	428
I2	72"	435.2	435.2
I3	72"	430	430
I4	120"	426.4	427
I5	120"	426.3	425
I6	60"	425.9	422
I7	120"	424.4	425.5
I8	120"	424.6	426.3
I9	48"	420.1	426
I10	96"	416.8	421.1
I11	150"		
J1	60"	430	429
J2	56"	425	426.5
J3	132"	423.2	427
J4	72"	422.4	415.6
J5	82"	419.6	423.5
J6	112"	418.6	425
J7	120"	419.4	424.3
J8	166"	413.2	424.3
K1	144"	428.9	428
K2	164"	429.3	430.1
K3	120"	421	424
K4	120"	418.7	421
K5	162"	418.4	420.6
K6	150"	413	421.8
K7	153"	411	423.7
K8	136"	410.7	418
L1	168"	428.7	428
L2	60"	417.6	421.2
L3	84"	415.3	418
L4	210"	414.4	418.6
L5	175"	410	414
L6	165"	409.3	414
M1	48"	422.4	422.4
M2	120"	413	412
M3	145"	410.4	413.3
M4	160"	408.5	414.9
N1	80"	413	413
N2	120"	406.7	410
N3	120"	406.6	410.8
N4	144"	404	407.8
N5	144"	400.7	402
O1	120"	398.8	403
O2	120"	399	403
2049	52"	376	371.2
2049C	114"	376.6	373.5
2045D	15'	376	373.5
2046	84"	376	373
2027	56"	380	377
2048	60"	382	378

60 0 60 120

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MONROE, CONNECTICUT

PREPARED FOR

QUARRY RIDGE ASSOCIATES, LLC

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3	08-15-23	TOWN ENG.
4	08-30-23	IWWC

DATE: MAY 1, 2023
PROJECT #: 3302
DRAWING FILE:
DRAWN BY: NDC
SCALE: SCALE:1"=150'

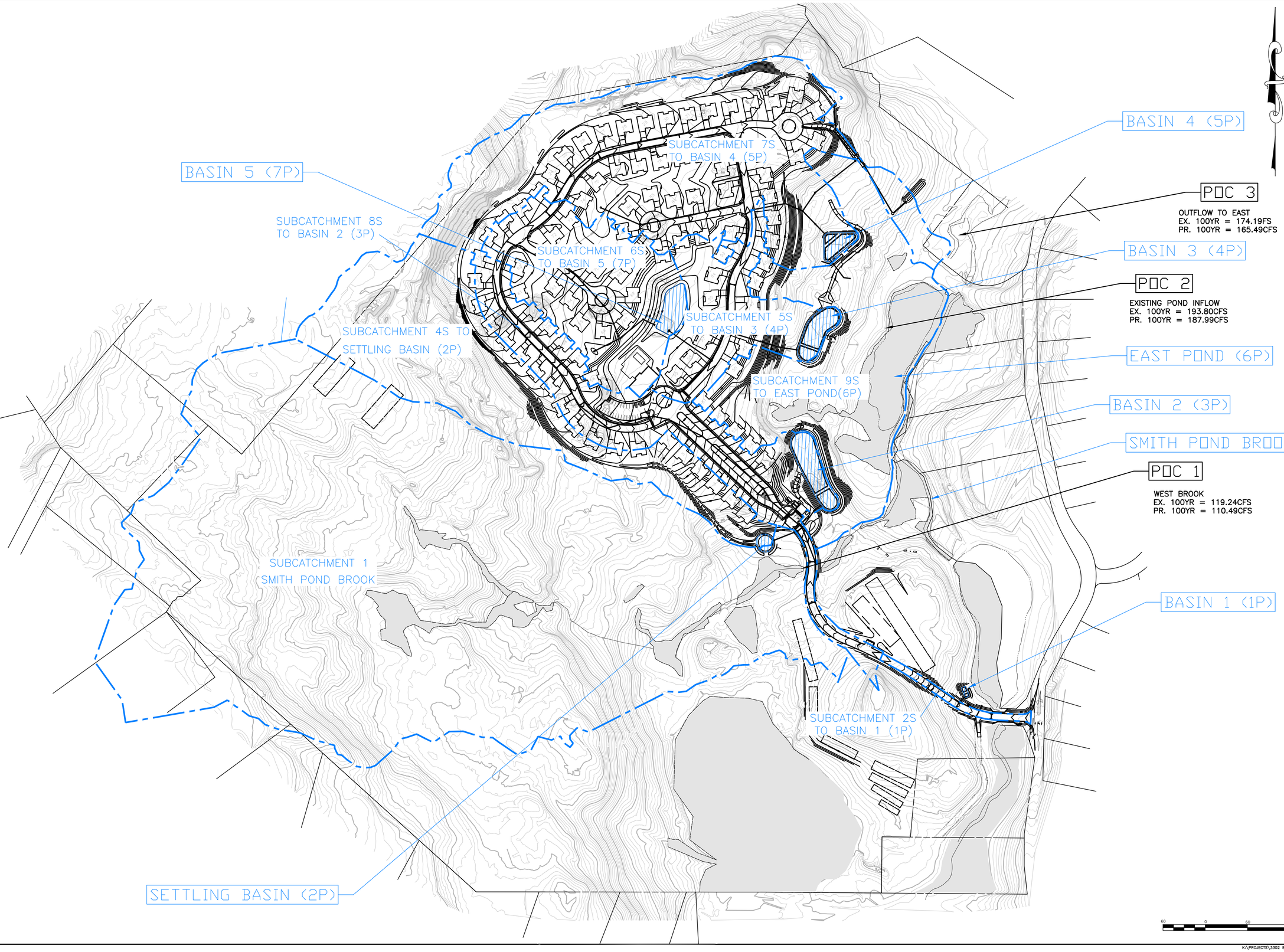
TITLE

TEST HOLE LOCATION PLAN

SHEET NUMBER

L-3

K:\PROJECTS\3302 BIENASHSKI\DRAWINGS\ALTERNATE 5\L-3.DWG



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DATE: MAY 1, 2023
PROJECT #: 3302
DRAWING FILE:
DRAWN BY: NDC
SCALE: SCALE:1"=150'

TITLE

WATERSHED MAP

SHEET NUMBER

L-4

K:\PROJECTS\3302 BIENASHSKI\DRAWINGS\ALTERNATE 5\L-4.DWG

SEE DWG S-2

POSSIBLE FUTURE RECREATION AREA WITH PLAYING COURTS AND PLAYGROUND

POSSIBLE FUTURE 3 PARKING SPACES

DRIVEWAY TO BE REMOVED

BAFFLE D-BOX

SUBSURFACE WASTEWATER ABSORPTION SYSTEM

SEE SHEET D-5

POLE TO BE REMOVED

DWELLING TO BE REMOVED

FLOOD ZONE LINE (TYP)

TROUT POND ROAD

6" UNDERDRAIN

POLE TO BE REMOVED

SMITH POND

N/F DUBAIL

6' x 9' RIPRAP SPILLWAY W/RIGID LIP EL 373.6

RIPRAP BERM

STORMWATER TREATMENT POND 1 (1P) TOP 374.9 BOTT 371.2

N/F SMITH IRREVOCABLE TRUST

EXISTING 3'X6' BOX CULVERT TO REMAIN 50 LF @ 1.08% INV (W) 369.03 INV (E) 368.49

RIPRAP APRON

BLOCK RETAINING WALL DETAILED DRAWINGS TO BE PROVIDED PRIOR TO CONSTRUCTION

APPARENT WETLANDS

RECONSTRUCT DRIVEWAY

POLE TO BE REMOVED

GUARDRAIL (TYP)

DRIVEWAY TO BE REMOVED, LOAMED, AND SEEDED

PROPOSED PROPERTY LINE

BLOCK RETAINING WALL

382.3 HP

PAVEMENT STRIPING

STOP SIGN

RIPRAP

12" WHITE STOP BAR

DRIVEWAY TO BE REMOVED, LOAMED, AND SEEDED

PAVED LEAK-OFF

PAVEMENT STRIPING

TURKEY ROOST ROAD

TH-100 TH-101 TH-102 TH-103 TH-104 TH-105 TH-106 TH-107 TH-108 TH-109 TH-110 TH-111 TH-112 TH-113 TH-114 TH-115 TH-116 TH-117 TH-118 TH-119 TH-120 TH-121 TH-122 TH-123 TH-124 TH-125 TH-126 TH-127 TH-128 TH-129 TH-130 TH-131 TH-132 TH-133 TH-134 TH-135 TH-136 TH-137 TH-138 TH-139 TH-140 TH-141 TH-142 TH-143 TH-144 TH-145 TH-146 TH-147 TH-148 TH-149 TH-150 TH-151 TH-152 TH-153 TH-154 TH-155 TH-156 TH-157 TH-158 TH-159 TH-160 TH-161 TH-162 TH-163 TH-164 TH-165 TH-166 TH-167 TH-168 TH-169 TH-170 TH-171 TH-172 TH-173 TH-174 TH-175 TH-176 TH-177 TH-178 TH-179 TH-180 TH-181 TH-182 TH-183 TH-184 TH-185 TH-186 TH-187 TH-188 TH-189 TH-190 TH-191 TH-192 TH-193 TH-194 TH-195 TH-196 TH-197 TH-198 TH-199 TH-200 TH-201 TH-202 TH-203 TH-204 TH-205 TH-206 TH-207 TH-208 TH-209 TH-210 TH-211 TH-212 TH-213 TH-214 TH-215 TH-216 TH-217 TH-218 TH-219 TH-220 TH-221 TH-222 TH-223 TH-224 TH-225 TH-226 TH-227 TH-228 TH-229 TH-230 TH-231 TH-232 TH-233 TH-234 TH-235 TH-236 TH-237 TH-238 TH-239 TH-240 TH-241 TH-242 TH-243 TH-244 TH-245 TH-246 TH-247 TH-248 TH-249 TH-250 TH-251 TH-252 TH-253 TH-254 TH-255 TH-256 TH-257 TH-258 TH-259 TH-260 TH-261 TH-262 TH-263 TH-264 TH-265 TH-266 TH-267 TH-268 TH-269 TH-270 TH-271 TH-272 TH-273 TH-274 TH-275 TH-276 TH-277 TH-278 TH-279 TH-280 TH-281 TH-282 TH-283 TH-284 TH-285 TH-286 TH-287 TH-288 TH-289 TH-290 TH-291 TH-292 TH-293 TH-294 TH-295 TH-296 TH-297 TH-298 TH-299 TH-300 TH-301 TH-302 TH-303 TH-304 TH-305 TH-306 TH-307 TH-308 TH-309 TH-310 TH-311 TH-312 TH-313 TH-314 TH-315 TH-316 TH-317 TH-318 TH-319 TH-320 TH-321 TH-322 TH-323 TH-324 TH-325 TH-326 TH-327 TH-328 TH-329 TH-330 TH-331 TH-332 TH-333 TH-334 TH-335 TH-336 TH-337 TH-338 TH-339 TH-340 TH-341 TH-342 TH-343 TH-344 TH-345 TH-346 TH-347 TH-348 TH-349 TH-350 TH-351 TH-352 TH-353 TH-354 TH-355 TH-356 TH-357 TH-358 TH-359 TH-360 TH-361 TH-362 TH-363 TH-364 TH-365 TH-366 TH-367 TH-368 TH-369 TH-370 TH-371 TH-372 TH-373 TH-374 TH-375 TH-376 TH-377 TH-378 TH-379 TH-380 TH-381 TH-382 TH-383 TH-384 TH-385 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TH-815 TH-816 TH-817 TH-818 TH-819 TH-820 TH-821 TH-822 TH-823 TH-824 TH-825 TH-826 TH-827 TH-828 TH-829 TH-830 TH-831 TH-832 TH-833 TH-834 TH-835 TH-836 TH-837 TH-838 TH-839 TH-840 TH-841 TH-842 TH-843 TH-844 TH-845 TH-846 TH-847 TH-848 TH-849 TH-850 TH-851 TH-852 TH-853 TH-854 TH-855 TH-856 TH-857 TH-858 TH-859 TH-860 TH-861 TH-862 TH-863 TH-864 TH-865 TH-866 TH-867 TH-868 TH-869 TH-870 TH-871 TH-872 TH-873 TH-874 TH-875 TH-876 TH-877 TH-878 TH-879 TH-880 TH-881 TH-882 TH-883 TH-884 TH-885 TH-886 TH-887 TH-888 TH-889 TH-890 TH-891 TH-892 TH-893 TH-894 TH-895 TH-896 TH-897 TH-898 TH-899 TH-900 TH-901 TH-902 TH-903 TH-904 TH-905 TH-906 TH-907 TH-908 TH-909 TH-910 TH-911 TH-912 TH-913 TH-914 TH-915 TH-916 TH-917 TH-918 TH-919 TH-920 TH-921 TH-922 TH-923 TH-924 TH-925 TH-926 TH-927 TH-928 TH-929 TH-930 TH-931 TH-932 TH-933 TH-934 TH-935 TH-936 TH-937 TH-938 TH-939 TH-940 TH-941 TH-942 TH-943 TH-944 TH-945 TH-946 TH-947 TH-948 TH-949 TH-950 TH-951 TH-952 TH-953 TH-954 TH-955 TH-956 TH-957 TH-958 TH-959 TH-960 TH-961 TH-962 TH-963 TH-964 TH-965 TH-966 TH-967 TH-968 TH-969 TH-970 TH-971 TH-972 TH-973 TH-974 TH-975 TH-976 TH-977 TH-978 TH-979 TH-980 TH-981 TH-982 TH-983 TH-984 TH-985 TH-986 TH-987 TH-988 TH-989 TH-990 TH-991 TH-992 TH-993 TH-994 TH-995 TH-996 TH-997 TH-998 TH-999 TH-1000

SUBSURFACE WASTEWATER ABSORPTION SYSTEM

SUBSURFACE WASTEWATER ABSORPTION SYSTEM

SUBSURFACE WASTEWATER ABSORPTION SYSTEM

LEGEND

- EXISTING CONTOUR
- PROPOSED CONTOUR
- EXISTING SPOT ELEVATION
- PROPOSED SPOT ELEVATION
- EXISTING DRAINAGE
- PROPOSED DRAINAGE
- EXISTING SANITARY
- PROPOSED SANITARY
- FL — 100 YEAR FLOOD PLAIN
- L — SANITARY LATERALS
- FM — FORCE MAIN
- FD — FOOTING DRAIN
- RD — ROOF DRAIN
- W — WATER SERVICE
- G — GAS LINE
- COTG — CLEAN OUT TO GRADE
- FF — FINISHED FLOOR
- GF — GARAGE FLOOR
- BS — BASEMENT SLAB
- TST — TEMPORARY SEDIMENT TRAP
- INLAND WETLANDS WITH FLAG #
- XXX — OBSERVATION HOLE
- DEEP TEST
- PERCOLATION TEST
- GTD — GRADE TO DRAIN
- SF — SYNTHETIC FILTER BARRIER
- WATER BREAK
- LOD — LIMIT OF DISTURBANCE
- BUILDING SETBACK LINE
- UPLAND REVIEW LIMIT
- WATERCOURSE OFFSET
- AV — AIRVALVE
- BV — BLOW OFF VALVE
- GATE VALVE
- HYDRANT
- ROCK TO BE EXCAVATED

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STATE OF CONNECTICUT — JASON EDWARDS — LICENSED LAND SURVEYOR

139, 141, & 201 TURKEY ROOST ROAD & 30 COBBLERS HILL COURT MONROE, CONNECTICUT

PREPARED FOR

QUARRY RIDGE ASSOCIATES, LLC

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4	08-30-23	IWWC

DATE: MAY 1, 2023
PROJECT #: 3302
DRAWING FILE:
DRAWN BY: NDC
SCALE: SCALE:1"=40'

TITLE

SITE PLAN

SHEET NUMBER

S-1

K:\PROJECTS\3302 BIENASHSKI\DRAWINGS\ALTERNATE 5\S-1.DWG

TYPICAL UNIT DETAIL
SCALE: 1"=30'

SEE DWG S-3



SEE DWG S-1

LEGEND

- EXISTING CONTOUR
- PROPOSED CONTOUR
- 520.2 EXISTING SPOT ELEVATION
- 520.2 x PROPOSED SPOT ELEVATION
- EXISTING DRAINAGE
- PROPOSED DRAINAGE
- EXISTING SANITARY
- PROPOSED SANITARY
- FL 100 YEAR FLOOD PLAIN
- L SANITARY LATERALS
- FM FORCE MAIN
- FD FOOTING DRAIN
- RD ROOF DRAIN
- W WATER SERVICE
- G GAS LINE
- COTG CLEAN OUT TO GRADE
- FF FINISHED FLOOR
- GF GARAGE FLOOR
- BS BASEMENT SLAB
- TST TEMPORARY SEDIMENT TRAP
- WC 27 INLAND WETLANDS WITH FLAG #
- XXX OBSERVATION HOLE
- DEEP TEST
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- GTD GRADE TO DRAIN
- SF SYNTHETIC FILTER BARRIER
- WATER BREAK
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40 0 40 80

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DRAWN BY: NDC
SCALE: SCALE:1"=40'

TITLE

SITE PLAN

SHEET NUMBER

S-2

K:\PROJECTS\3302 BIENASHSKI\DRAWINGS\ALTERNATE 5\S-2.DWG

SEE DWG S-4

4' SIDEWALK (TYP)

11
FF 439.0
GF 436.88

56
FF 440.65
GF 438.48

NO PARKING SIGN

10
FF 437.0
GF 434.89

POSSIBLE DUMPSTER LOCATION W/ENCLOSURE

PATIO

POOL

6' WIDE BIT WALK

CLUBHOUSE
FF 428.0

CROSSWALK SIGN

9
FF. 434.8
GF 432.65

8
FF 432.3
GF 430.18

7
FF 429.8
GF 427.65

12" WHITE STOP BAR (TYP)

NO PARKING SIGN

HANDICAP RAMP (TYP)

STOP SIGNS

KEEP RIGHT SIGN

CROSSWALK BRICK PAVERS (TYP)

WIND SWEPT CIRCLE

KEEP RIGHT SIGN

STOP SIGN

HYDRANT (TYP)

FOOTING DRAIN AND ROOF DRAIN TO BE SEPARATE PIPES (TYP)

6
FF 424.3
GF 422.1

RIPRAP SWALE

NO PARKING SIGNS

5
FF 420.6
GF 418.4

STONE CHECK DAM (TYP)

TROUT POND ROAD

51
FF 424.5
GF 422.39

52
FF 420.8
GF 418.65

99
FF 424.6
GF 422.46

98
FF 425.6
GF 423.46

97
FF 426.6
GF 424.45

96
FF 427.6
GF 425.45

95
FF 428.5
GF 426.35

94
FF 429.1
GF 426.93

93
FF 429.8
GF 427.6

50
FF 426.2
WO 417.2
GF 424.04

49
FF 426.9
WO 417.9
GF 424.7

48
FF 427.5
WO 418.5
GF 425.36

47
FF 428.2
WO 419.2
GF 426.04

46
FF 429.3
WO 420.3
GF 427.18

45
FF 430.1
WO 421.1
GF 427.94

STORMWATER TREATMENT POND 5 (7P) (RAIN GARDEN) BOT EL 422.0

50 LF UNDERDRAIN

CROSS COUNTRY RUN 1

CROSSWALK SIGN

NO PARKING SIGN

NO PARKING SIGN

NO PARKING SIGN

4' x 4' MODIFIED RIPRAP PAD (TYP)

INSTALL SPLIT RAIL FENCE

CROSS COUNTRY RUN 2

2046

SEE DWG S-6

SEE DWG S-2

LEGEND

- EXISTING CONTOUR
- PROPOSED CONTOUR
- 520.2 EXISTING SPOT ELEVATION
- 520.2 PROPOSED SPOT ELEVATION
- EXISTING DRAINAGE
- PROPOSED DRAINAGE
- EXISTING SANITARY
- PROPOSED SANITARY
- FL 100 YEAR FLOOD PLAIN
- L SANITARY LATERALS
- FM FORCE MAIN
- FD FOOTING DRAIN
- RD ROOF DRAIN
- W WATER SERVICE
- G GAS LINE
- COTG CLEAN OUT TO GRADE
- FF FINISHED FLOOR
- GF GARAGE FLOOR
- BS BASEMENT SLAB
- TST TEMPORARY SEDIMENT TRAP
- WL 27 INLAND WETLANDS WITH FLAG #
- XXX OBSERVATION HOLE
- DEEP TEST
- PERCOLATION TEST
- GTD GRADE TO DRAIN
- SF SYNTHETIC FILTER BARRIER
- WATER BREAK
- LOD LIMIT OF DISTURBANCE
- BUILDING SETBACK LINE
- UPLAND REVIEW LIMIT
- WATERCOURSE OFFSET
- AV AIRVALVE
- BV BLOW OFF VALVE
- GATE VALVE
- HYDRANT
- ROCK TO BE EXCAVATED

40 0 40 80

K:\PROJECTS\3302 BIENASHSKI\DRAWINGS\ALTERNATE 5\S-3.DWG

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139, 141, & 201 TURKEY ROOST ROAD
& 30 COBBLERS HILL COURT
MONROE, CONNECTICUT

PREPARED FOR
QUARRY RIDGE ASSOCIATES, LLC

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#	DATE	DESCRIPTION
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3	08-15-23	TOWN ENG.
4	08-30-23	IWWC

DATE: MAY 1, 2023
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DRAWING FILE:
DRAWN BY: NDC
SCALE: SCALE:1"=40'

TITLE

SITE PLAN

SHEET NUMBER

S-3

INSTALL 4' HIGH GALVANIZED CHAIN LINK FENCE

1:1 ROCK CUT

RIPRAP SWALE

HYDRANT (TYP)

12" WHITE STOP BAR

STOP SIGN

NO PARKING SIGN

HANDICAP RAMP (TYP)

KEEP RIGHT SIGN

SANITARY RUN 1

CROSS COUNTRY RUN 1

RETAINING WALL TO BE DESIGNED BY LICENSED STRUCTURAL ENGINEER.

4' SIDEWALK (TYP)

STONES THROW COURT

WIND SWEPT CIRCLE

ACORN WAY

1	FF 451.44 GF 453.6	#B1
2	FF 454.5 GF 452.4	#C1
3	FF 455.6 GF 453.47	#B2
4	FF 455.5 GF 445.5	#B3
5	FF 454.6 GF 452.49	#A2
6	FF 453.7 GF 451.53	#B4
7	FF 452.1 GF 450.0	#B5
8	FF 450.6 GF 448.43	#A3
9	FF 447.86 GF 445.69	#B6
10	FF 449.2 GF 447.06	#A4
11	FF 446.43 GF 444.26	#A5
12	FF 444.9 GF 442.74	#B7
13	FF 443.2 GF 441.08	#B8
14	FF 441.5 GF 439.38	#B9
15	FF 448.9 GF 446.71 WO 439.9	#C7
16	FF 446.1 GF 443.96	#C8
17	FF 444.4 GF 442.26	#C9
18	FF 442.75 GF 440.58	#D10
19	FF 441.0 GF 438.92	#B10
20	FF 451.3 GF 449.08 WO 442.3	#C6
21	FF 453.3 GF 451.11	#C5
22	FF 451.95 GF 449.78	#C4
23	FF 453.5 GF 451.31	#D5
24	FF 449.7 GF 447.58	#E2
25	FF 448.05 GF 445.88	#E5
26	FF 448.05 GF 445.88	#E3
27	FF 445.65 GF 443.38	#E6
28	FF 445.65 GF 443.48	#E4
29	FF 447.32 GF 445.15	#F3
30	FF 443.74 GF 441.57	#F4
31	FF 444.9 GF 442.73	#G2
32	FF 442.5 GF 440.38	#G3
33	FF 442.52 GF 440.35	#G4
34	FF 441.9 GF 439.73 WO 432.9	#G5
35	FF 442.22 GF 440.05 WO 433.22	#G6
36	FF 443.74 GF 441.57	#F5
37	FF 444.63 GF 442.46	#F7
38	FF 445.21 GF 443.04	#E7
39	FF 444.21 GF 442.04	#D8
40	FF 443.05 GF 440.88	#D9
41	FF 440.42 GF 438.25	#E8
42	FF 437.87 GF 435.7	#F10
43	FF 440.42 GF 438.25 WO 431.42	#G7
44	FF 443.03 GF 440.86 WO 434.03	#F8
45	FF 437.87 GF 435.7 WO 428.87	#G9
46	FF 442.4 GF 440.23	#H1
47	FF 449.5 GF 447.4	#E1
48	FF 447.19 GF 445.02	#F1
49	FF 444.8 GF 442.63	#G1
50	FF 453.5 GF 451.31	#D5
51	FF 451.7 GF 449.56	#D1
52	FF 455.6 GF 453.53	#C3

SEE DWG S-3

SEE DWG S-5

LEGEND

- EXISTING CONTOUR
- PROPOSED CONTOUR
- EXISTING SPOT ELEVATION
- PROPOSED SPOT ELEVATION
- EXISTING DRAINAGE
- PROPOSED DRAINAGE
- EXISTING SANITARY
- PROPOSED SANITARY
- 100 YEAR FLOOD PLAIN
- SANITARY LATERALS
- FORCE MAIN
- FOOTING DRAIN
- ROOF DRAIN
- WATER SERVICE
- GAS LINE
- CLEAN OUT TO GRADE
- FINISHED FLOOR
- GARAGE FLOOR
- BASEMENT SLAB
- TEMPORARY SEDIMENT TRAP
- INLAND WETLANDS WITH FLAG #
- OBSERVATION HOLE
- DEEP TEST
- PERCOLATION TEST
- GRADE TO DRAIN
- SYNTHETIC FILTER BARRIER
- WATER BREAK
- LIMIT OF DISTURBANCE
- BUILDING SETBACK LINE
- UPLAND REVIEW LIMIT
- WATERCOURSE OFFSET
- AIRVALVE
- BLOW OFF VALVE
- GATE VALVE
- HYDRANT
- ROCK TO BE EXCAVATED

40 0 40 80

K:\PROJECTS\3302 BIENASHSKI\DRAWINGS\ALTERNATE 5\S-4.DWG

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DRAWN BY: NDC
SCALE: SCALE:1"=40'

TITLE

SITE PLAN

SHEET NUMBER

S-4



LEGEND

- EXISTING CONTOUR
- PROPOSED CONTOUR
- EXISTING SPOT ELEVATION
- PROPOSED SPOT ELEVATION
- EXISTING DRAINAGE
- PROPOSED DRAINAGE
- EXISTING SANITARY
- PROPOSED SANITARY
- FL — 100 YEAR FLOOD PLAIN
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DRAWING FILE:
DRAWN BY: NDC
SCALE: SCALE:1"=40'

TITLE

SITE PLAN

SHEET NUMBER

S-5

K:\PROJECTS\3302 BIENASHSKI\DRAWINGS\ALTERNATE 5\S-5.DWG

SEE DWG S-5

SEE DWG S-3

WIND SWEPT CIRCLE

NO PARKING SIGN

RIPRAP BERM

8'X20' RIPRAP PAD EL 402.0

STORMWATER TREATMENT POND #4 (5P)
TOP 382.5
BOTT 377.0
INV 377.0

2027A

2027

10' GRAVEL MAINTENANCE DRIVE

ACCESS DRIVE CROSSING SEE DETAIL

376.0

INV 376.0

107 LF 10" PVC SCH40 @ 0.93% W/45° ELBOW & ANTI-SEEP COLLAR & TRASH RACK

15'W x 20'L RIPRAP SPILLWAY EL 380.0

40' WIDE MODIFIED RIPRAP LEVEL SPREADER 1.25' THICK

100 LF 18" CPP @ 10%

62 LF 36" CPP @ 1%

PREFORMED SCOUR HOLE

80' WIDE RIGID LIP EL 365.0

STM MH4
TF 371.25
INV IN 18" 367.12
INV OUT (SINGLE 36") 365.62

INSTALL RIGID LIP (CONCRETE WHEEL STOPS OR APPROVED EQUAL) (TYP 6 PLACES)

CROSS COUNTRY RUN 2

STORMWATER TREATMENT POND #3 (4P)
TOP 378.0
BOTT 373.0

2046

INV 374.7

39 LF 10" PVC SCH40 @ 12.05% W/ANTI-SEEP COLLAR & TRASH RACK

INV 370.0

8'X20' RIPRAP PAD EL 400.0

40'W x 17.5' RIPRAP SPILLWAY EL 376.15

40' WIDE MODIFIED RIPRAP LEVEL SPREADER 1.25' THICK

EXISTING STABILIZED AREA NOT TO BE DISTURBED

APPARENT WETLANDS

N/F CARLSON

EXISTING POND (6P)

EXISTING 102 LF 27" ELLIPTICAL CMP @ 0.27% TO REMAIN

EXISTING 41 LF 78" CMP @ 0.2% TO REMAIN

EMERGENCY ACCESS DRIVE

EXISTING GATE, EMERGENCY LOCK BOX TO BE INSTALLED

SMITH POND BROOK

N/F PERKINS

TURKEY ROOST ROAD

2045D

2045C

2045

2045A

40 0 40 80

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LICENSED PROFESSIONAL ENGINEER

STATE OF CONNECTICUT
JOHN EDWARDS
LICENSED LAND SURVEYOR

139, 141, & 201 TURKEY ROOST ROAD
& 30 COBBLERS HILL COURT
MONROE, CONNECTICUT

PREPARED FOR

QUARRY RIDGE ASSOCIATES, LLC

REVISIONS

#	DATE	DESCRIPTION
1	06-28-23	IWWC
2	07-26-23	IWWC
3	08-15-23	TOWN ENG.
4	08-30-23	IWWC

DATE: MAY 1, 2023
PROJECT #: 3302
DRAWING FILE:
DRAWN BY: NDC
SCALE: SCALE:1"=40'

TITLE

SITE PLAN

SHEET NUMBER

S-6



LEGEND

- EXISTING CONTOUR
- PROPOSED CONTOUR
- 520.2 EXISTING SPOT ELEVATION
- 520.2 PROPOSED SPOT ELEVATION
- EXISTING DRAINAGE
- PROPOSED DRAINAGE
- EXISTING SANITARY
- PROPOSED SANITARY
- FL 100 YEAR FLOOD PLAIN
- L SANITARY LATERALS
- FM FORCE MAIN
- FD FOOTING DRAIN
- RD ROOF DRAIN
- W WATER SERVICE
- G GAS LINE
- COTG CLEAN OUT TO GRADE
- FF FINISHED FLOOR
- GF GARAGE FLOOR
- BS BASEMENT SLAB
- TST TEMPORARY SEDIMENT TRAP
- INLAND WETLANDS WITH FLAG #
- XXX OBSERVATION HOLE
- DEEP TEST
- PERCOLATION TEST
- GTD GRADE TO DRAIN
- SF SYNTHETIC FILTER BARRIER
- WATER BREAK
- LOD LIMIT OF DISTURBANCE
- BUILDING SETBACK LINE
- UPLAND REVIEW LIMIT
- WATERCOURSE OFFSET
- AV AIRVALVE
- BV BLOW OFF VALVE
- GATE VALVE
- HYDRANT
- ROCK TO BE EXCAVATED

50 0 50 100

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STATE OF CONNECTICUT — JASON EDWARDS — LICENSED LAND SURVEYOR

139, 141, & 201 TURKEY ROOST ROAD
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PROJECT #: 3302
DRAWING FILE:
DRAWN BY: NDC
SCALE: SCALE:1"=50'

TITLE

SITE PLAN

SHEET NUMBER

S-7

K:\PROJECTS\3302 BIENASHSKI\DRAWINGS\ALTERNATE 5\S-7.DWG



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PROJECT #: 3302
DRAWING FILE:
DRAWN BY: NDC
SCALE: 1"= 100'

TITLE

SITE PLAN
ALTERNATE

SHEET NUMBER

S-1A

K:\PROJECTS\3302 BIENASHSKI\DRAWINGS\ALTERNATE 5\S-1A ALTERNATE.DWG

CONCEPTUAL DEVELOPMENT 196 APARTMENTS

SEPTIC SYSTEMS

REVISED PROPERTY LINE

CONCEPTUAL DEVELOPMENT 10 50 BEDROOM APARTMENT BUILDINGS

CONCEPTUAL STORM WATER QUALITY AREA

CONCEPTUAL STORM WATER QUALITY AREA

SEPTIC LEACHING FIELDS

100 0 100 200

K:\PROJECTS\3302 BIENASHSKI\DRAWINGS\ALTERNATE 5\S-1B ALTERNATE.DWG

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STATE OF CONNECTICUT JASON E. EDWARDS No. 15 LICENSED LAND SURVEYOR

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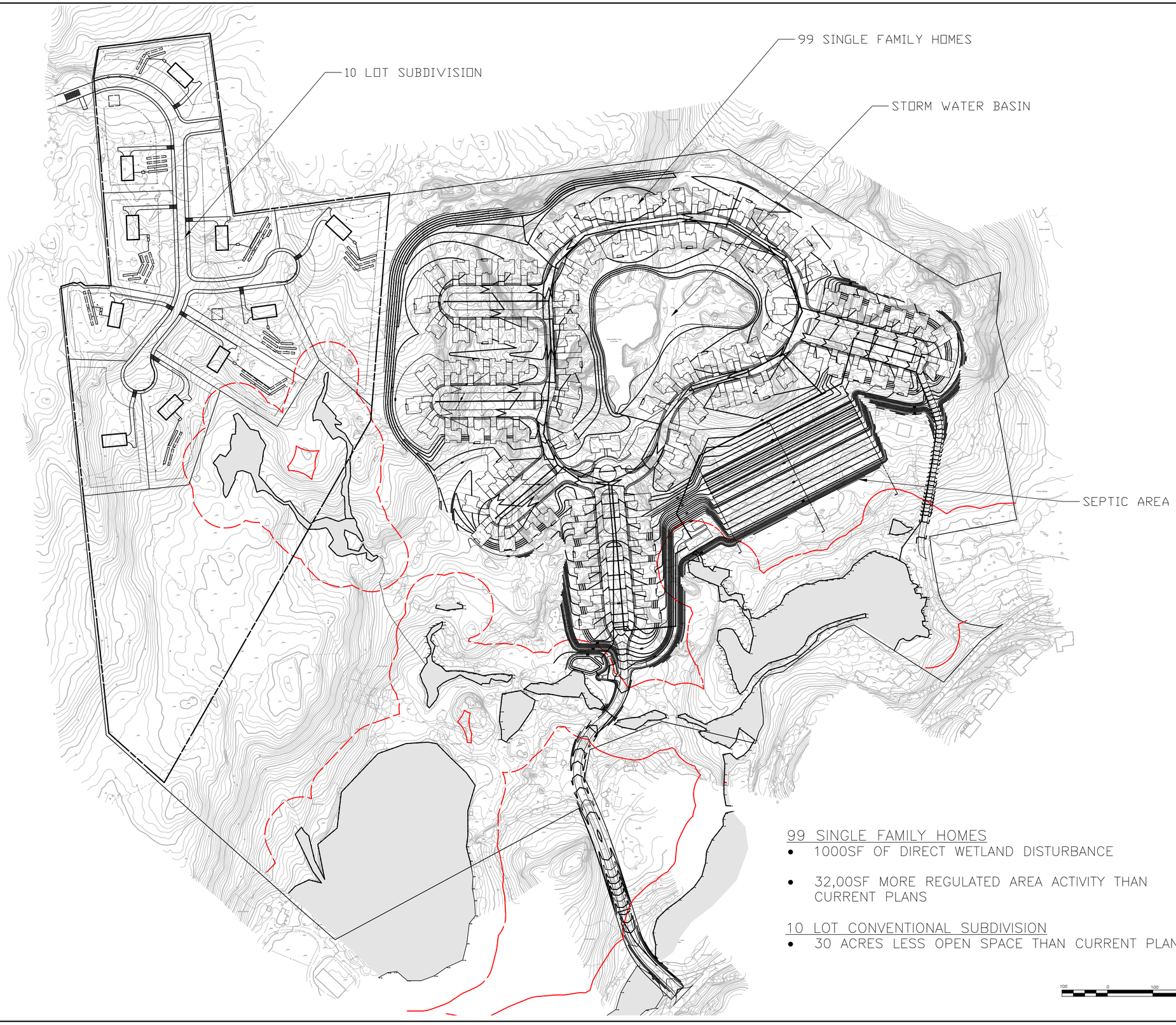
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SCALE: 1"= 100'

TITLE

SITE PLAN ALTERNATE

SHEET NUMBER

S-1B



99 SINGLE FAMILY HOMES

- 1000SF OF DIRECT WETLAND DISTURBANCE
- 32,00SF MORE REGULATED AREA ACTIVITY THAN CURRENT PLANS

10 LOT CONVENTIONAL SUBDIVISION

- 30 ACRES LESS OPEN SPACE THAN CURRENT PLANS

100 0 100 200

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PROJECT #: 3302
DRAWING FILE:
DRAWN BY: NDC
SCALE: 1"= 100'

TITLE

SITE PLAN ALTERNATE

SHEET NUMBER

S-1C

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PROJECT #: 3302
DRAWING FILE:
DRAWN BY: NDC
SCALE: 1"= 100'

TITLE

SITE PLAN
ALTERNATE

SHEET NUMBER

S-1D

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STATE OF CONNECTICUT — GLEN EDWARDS — LICENSED LAND SURVEYOR

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PROJECT #: 3302
DRAWING FILE:
DRAWN BY: NDC
SCALE: 1"= 100'

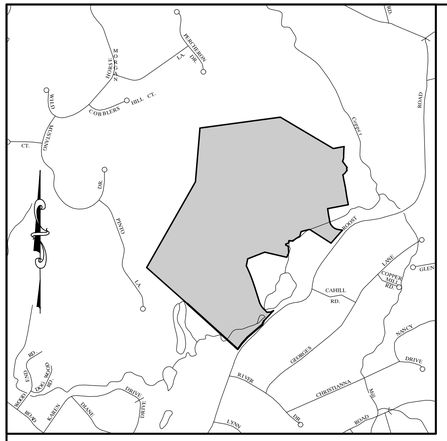
TITLE

SITE PLAN
ALTERNATE

SHEET NUMBER

S-1E

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LOCATION MAP
SCALE: 1"=1000'

CURVE	RADIUS	ARC LENGTH	CHORD LENGTH	CHORD BEARING	DELTA ANGLE
C1	1323.14'	110.00'	109.97'	S 08°12'18" E	4°45'48"
C2	142.00'	174.23'	163.50'	S 45°44'12" E	70°18'01"
C3	450.00'	21.66'	21.65'	S 42°47'03" W	2°45'26"
C4	270.00'	4.55'	4.55'	S 45°30'19" E	0°57'53"
C5	270.00'	130.32'	129.06'	S 31°11'44" E	27°39'17"
C6	330.00'	164.84'	163.13'	S 31°40'41" E	28°37'10"
C7	2030.00'	304.49'	304.21'	N 21°39'55" W	8°35'39"

OPEN SPACE ANALYSIS
MFR ZONING REQUIRES 50% OPEN SPACE
TOTAL AREA OF MFR = 99 ACRES
AREA OF MFR OPEN SPACE PROV 49.5 (50%) ACRES
ADDITIONAL OPEN SPACE PROVIDED 31 ACRES
TOTAL OPEN SPACE PROVIDED 80.5 (81%) ACRES

LINE	BEARING	DISTANCE
L1	S 09°17'00" W	23.10'
L2	S 02°24'02" W	143.67'
L3	S 16°26'53" W	42.53'
L4	S 36°18'04" E	106.16'
L5	S 39°00'27" W	9.31'
L6	S 07°13'34" E	11.43'
L7	S 06°34'41" E	25.25'
L8	S 57°09'34" W	10.47'
L9	S 35°04'37" W	37.86'
L10	S 49°54'46" W	35.70'
L11	S 13°42'56" E	20.12'
L12	S 10°03'47" E	39.32'
L13	S 10°49'10" E	134.73'
L14	S 10°49'54" E	15.96'
L15	S 08°18'23" E	99.07'
L16	S 12°43'28" E	18.63'
L17	S 10°20'06" E	95.63'
L18	S 10°35'12" E	70.00'
L19	S 80°53'13" E	55.00'
L20	S 15°28'28" W	68.37'
L21	S 57°58'32" W	67.38'
L22	S 51°31'14" W	49.44'
L23	N 84°10'44" W	54.92'
L24	S 13°18'15" W	35.30'
L25	S 70°21'34" W	40.23'
L26	S 08°58'44" E	16.32'
L27	S 70°39'36" E	27.48'
L28	S 35°17'13" E	14.46'
L29	S 03°03'17" E	63.84'
L30	S 09°07'01" E	18.79'
L31	S 23°10'10" W	72.13'
L32	S 33°48'04" W	68.49'
L33	S 64°28'59" W	55.32'
L34	S 23°02'24" W	27.20'
L35	S 05°26'49" W	37.95'
L36	S 09°34'16" E	67.12'
L37	S 17°04'26" E	28.07'
L38	S 40°44'46" E	64.41'
L39	S 07°30'36" E	73.34'
L40	S 20°33'29" W	110.39'
L41	S 52°50'44" W	85.49'
L42	S 36°36'44" W	61.72'
L43	S 24°18'59" W	52.80'
L44	S 53°18'34" W	51.87'
L45	S 43°13'14" W	195.90'
L46	N 63°59'40" E	44.45'
L47	N 87°00'30" E	52.01'
L48	N 45°59'16" W	53.31'
L49	N 45°59'16" W	79.97'
L50	N 14°06'17" E	25.80'
L51	N 21°28'14" E	32.78'
L52	N 23°35'29" E	61.52'

N/F
David Ambrose
291 Hammertown Road
(124/8)

N/F
Daniel Flynn
265 Turkey Roost Road
(117/1/3)

N/F
Ryan Carter
225 Turkey Roost Road
(117/1/1)

N/F
Robert Carlson
207 Turkey Roost Road
(107/9)

N/F
Rodney Perkins
193 Turkey Roost Road
(107/7)

N/F
Antreas Skourides
185 Turkey Roost Road
(107/6)

N/F
Guy Dubail
177 Turkey Roost Road
(107/5)

N/F
Quarry Ridge Assoc. LLC
141 Turkey Roost Road
(107/4)
274,109 SF± - 6.293 AC±

N/F
Carl Smith
139 Turkey Roost Road
(107/3)
EX AREA 477,217 SF± - 10.955 AC±
REV. AREA 115,344 2.64 AC

N/F
Carl Smith
121 Turkey Roost Road
(107/2)

N/F
Robert Dunbar
71 Turkey Roost Road
(97/23)

N/F
Joseph Campbell
69 Pinto Lane
(115/7/14)

N/F
Julie Rodrigue
81 Pinto Lane
(115/7/15)

N/F
Ioana Badara
95 Pinto Lane
(115/7/16)

N/F
Quarry Ridge Assoc. LLC
201 Turkey Roost Road
(107/8/1)
EX. AREA 4,354,772 SF± - 99.972 AC±
REV. AREA 6,402,907SF± 147.00 AC±

N/F
Quarry Ridge Assoc. LLC
30 Cobblers Hill Court
EX. AREA 1,587,203 SF 36.43 AC.
REV. AREA 175,111 4.019 AC.
(107/8/2)

MFR OPEN SPACE

REVISED PROPERTY LINE

ZONE LINE
(FORMER PROPERTY LINE)

FORMER PROPERTY LINE

ADDITIONAL OPEN SPACE

N 59°23'42" E 860.00'
N 79°41'57" E 355.00'
N 82°18'55" E 1357.56'
N 82°18'55" E 516.22'
S 07°41'05" E 600.54'
S 04°43'09" W 753.94'
N 85°12'19" E 416.78'
N 73°23'23" E 12.75'
S 74°28'59" E 11.13'
S 88°01'42" E 44.89'
S 53°56'38" E 19.51'
S 71°58'26" E 20.50'
N 73°39'05" E 23.36'
N 88°12'13" E 39.85'
S 29°40'58" W 375.05'
N 66°06'35" W 1492.27'
N 48°11'47" W 244.85'
N 48°11'47" W 534.90'
N 48°11'58" W 67.50'
S 48°14'45" W 162.41'
S 47°47'31" E 946.58'
N 48°55'25" W 416.23'
N 46°57'17" E 278.27'
N 47°45'10" W 504.99'
S 47°14'54" W 199.67'
N 41°51'14" E 15.60'
N 41°51'14" E 99.98'
N 35°33'14" E 100.52'
N 17°22'06" E 227.26'
S 17°22'06" W 227.26'
N 17°14'20" E 116.77'
S 72°04'13" E 97.46'
N 68°20'05" E 265.98'
S 66°28'31" E 129.43'
N 66°28'31" W 129.43'
S 46°28'54" E 272.51'
S 43°31'06" E 220.40'
N 57°21'16" W 355.47'

NOTES:

1. This survey and map has been prepared in accordance with the Sections 20–300b–1 through 20–300b–20 of the Regulations of Connecticut State Agencies – "Minimum Standards for Survey and Maps in the State of Connecticut" as endorsed by the Connecticut Association of Land Surveyors, Inc. It is an "Existing Conditions Plan" based on a Resurvey and conforms to Horizontal Accuracy Class A–2 and Topographical Classes T–2 and T–3.
2. Reference is made to the following maps:
   A. RM 580
   B. RM 891
   C. RM 919
   D. RM 1088
   E. RM 1094
   F. RM 1435
   G. RM 1554
   H. RM 1573
   I. RM 1695
   J. RM 1787
   K. RM 1803
   L. RM 2174
   M. RM 2646
   N. RM 2731
   O. RM 2873
   P. RM 2921
3. The underground utilities shown, if any, have been located from visible field survey information. The surveyor makes no guarantees that the underground utilities shown comprise all such utilities in the area either in service or abandoned. The surveyor further does not warrant that the underground utilities shown are in the exact location indicated although the surveyor does hereby declare that they are located as accurately as possible from information available. The surveyor has not physically located the underground utilities.
4. Property is Located in Zones X and AE per Flood Insurance Rate Map #09001C0276F and #09001C0277F (Panels 276 and 277 of 626) Effective Date: June 18, 2010.
5. Unauthorized alterations or additions to this survey, which bears the surveyor's embossed seal, renders any declaration shown hereon null and void.
6. All monumentation, found or set, is depicted hereon.

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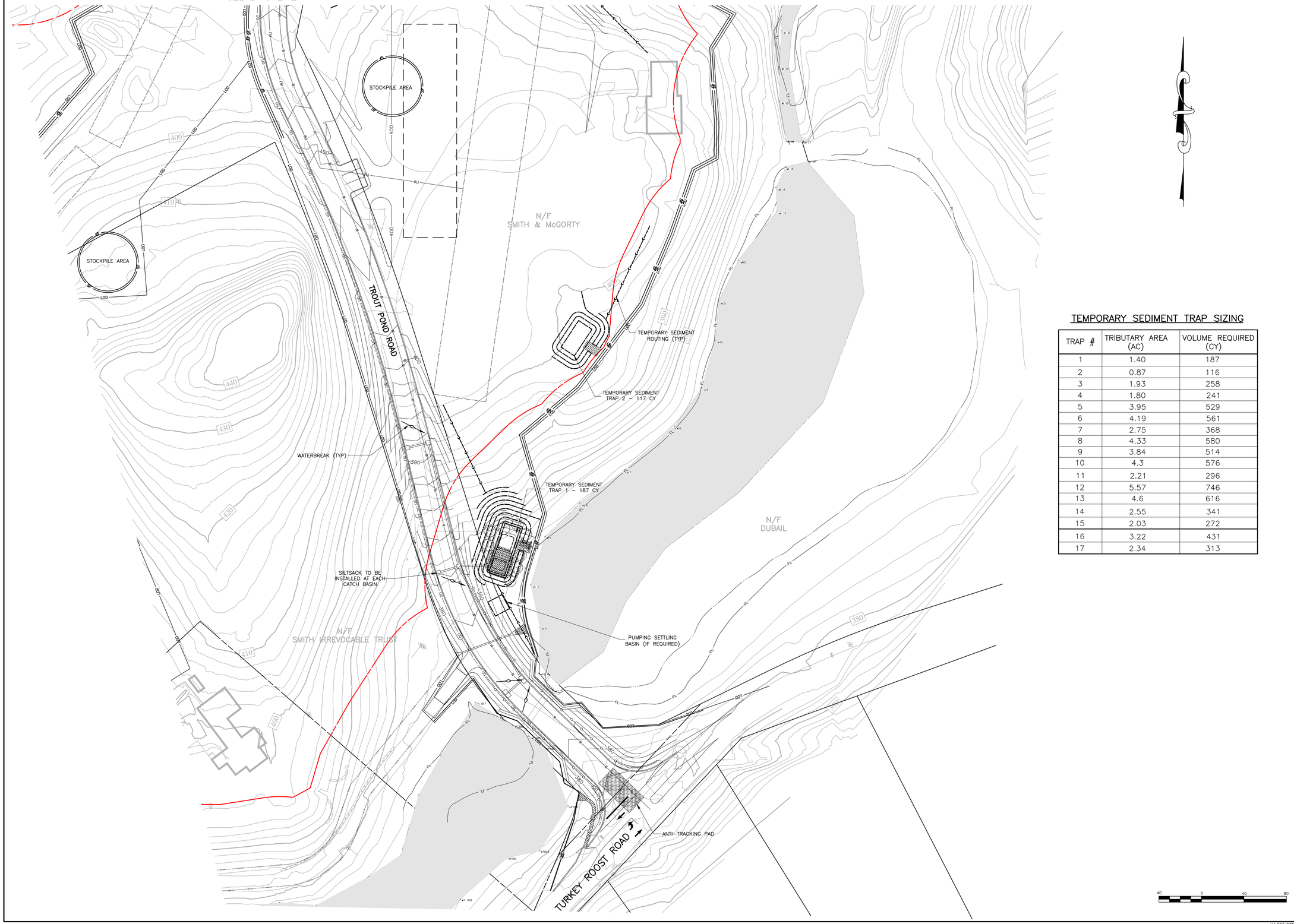
TITLE

OPEN SPACE PLAN

SHEET NUMBER

OS–1

K:\PROJECTS\3302 BIENASHSKI\DRAWINGS\ALTERNATE 5\OS–1.DWG



TEMPORARY SEDIMENT TRAP SIZING

TRAP #	TRIBUTARY AREA (AC)	VOLUME REQUIRED (CY)
1	1.40	187
2	0.87	116
3	1.93	258
4	1.80	241
5	3.95	529
6	4.19	561
7	2.75	368
8	4.33	580
9	3.84	514
10	4.3	576
11	2.21	296
12	5.57	746
13	4.6	616
14	2.55	341
15	2.03	272
16	3.22	431
17	2.34	313

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EROSION CONTROL PLAN

SHEET NUMBER

E-1

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SEE DWG E-3

HAYBALE BARRIER (TYP)

TROUT POND ROAD

STOCKPILE AREA

TEMPORARY SEDIMENT TRAP 5 - 529CY

STORMWATER TREATMENT POND 2

PUMPING SETTLING BASIN (IF REQUIRED)

2' HIGH WOOD CHIP BERM (TYP)

TEMPORARY SEDIMENT TRAP 4 - 241CY

SILTSACK TO BE INSTALLED AT EACH CATCH BASIN

TEMPORARY SEDIMENT ROUTING (TYP)

DOUBLE ROW SILT FENCE (TYP)

TEMPORARY SEDIMENT TRAP 3 - 258CY

SEE DWG E-1

40 0 40 80

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TITLE

EROSION CONTROL PLAN

SHEET NUMBER

E-2

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SEE DWG E-4

TEMPORARY SEDIMENT TRAP 10 – 576CY

TEMPORARY SEDIMENT TRAP 15 – 272CY

CONCRETE WASHOUT BASIN

REFUELING STATION

STOCKPILE AREA

SILTSACK TO BE INSTALLED AT EACH CATCH BASIN

TEMPORARY SEDIMENT TRAP 7 – 368CY

TEMPORARY SEDIMENT TRAP 6 – 561CY

WIND SWEPT CIRCLE

TROUT POND ROAD

SEE DWG E-6

SEE DWG E-2

40 0 40 80

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SCALE: SCALE:1"=40'

TITLE

EROSION CONTROL PLAN

SHEET NUMBER

E-3



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& 30 COBBLERS HILL COURT
MONROE, CONNECTICUT

PREPARED FOR

QUARRY RIDGE ASSOCIATES, LLC

REVISIONS

#	DATE	DESCRIPTION
1	06–28–23	IWWC
2	07–26–23	IWWC
3	08–15–23	TOWN ENG.
4	08–30–23	IWWC

DATE: MAY 1, 2023
PROJECT #: 3302
DRAWING FILE:
DRAWN BY: NDC
SCALE: SCALE:1"=40'

TITLE

EROSION CONTROL PLAN

SHEET NUMBER

E–4

K:\PROJECTS\3302 BIENASHSKI\DRAWINGS\ALTERNATE 5\E–4.DWG



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J. EDWARDS & ASSOCIATES LLC
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227 Stepney Road Easton, CT 06612
Phone:203.268.4205 Fax: 203.268.5604
www.jedwardsassoc.com

STATE OF CONNECTICUT — JASON E. EDWARDS — No. 10937 — LICENSED PROFESSIONAL ENGINEER

STATE OF CONNECTICUT — JASON EDWARDS — LICENSED LAND SURVEYOR

139, 141, & 201 TURKEY ROOST ROAD
& 30 COBBLERS HILL COURT
MONROE, CONNECTICUT

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DATE: MAY 1, 2023
PROJECT #: 3302
DRAWING FILE:
DRAWN BY: NDC
SCALE: SCALE:1"=40'

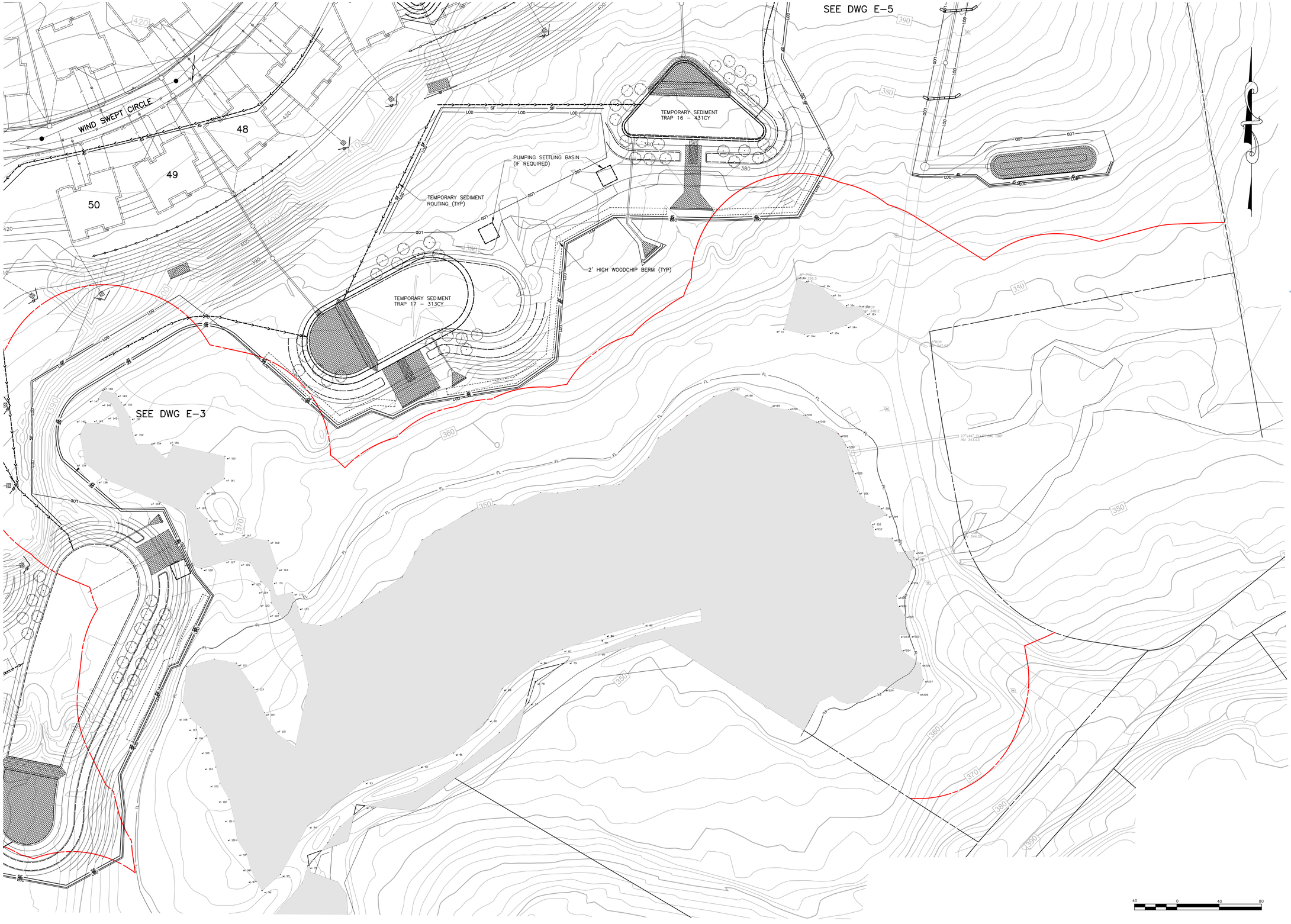
TITLE

EROSION CONTROL PLAN

SHEET NUMBER

E-5

K:\PROJECTS\3302 BIENASHSKI\DRAWINGS\ALTERNATE 5\E-5.DWG



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227 Stepney Road Easton, CT 06612
Phone:203.268.4205 Fax: 203.268.5604
www.jedwardsassoc.com

STATE OF CONNECTICUT
JASON S. EDWARDS
No. 19937
LICENSED PROFESSIONAL ENGINEER

STATE OF CONNECTICUT
JASON EDWARDS
LICENSED LAND SURVEYOR

139, 141, & 201 TURKEY ROOST ROAD
& 30 COBBLERS HILL COURT
MONROE, CONNECTICUT

PREPARED FOR

QUARRY RIDGE ASSOCIATES, LLC

REVISIONS

#	DATE	DESCRIPTION
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2	07-26-23	IWWC
3	08-15-23	TOWN ENG.
4	08-30-23	IWWC

DATE: MAY 1, 2023
PROJECT #: 3302
DRAWING FILE:
DRAWN BY: NDC
SCALE: SCALE:1"=40'

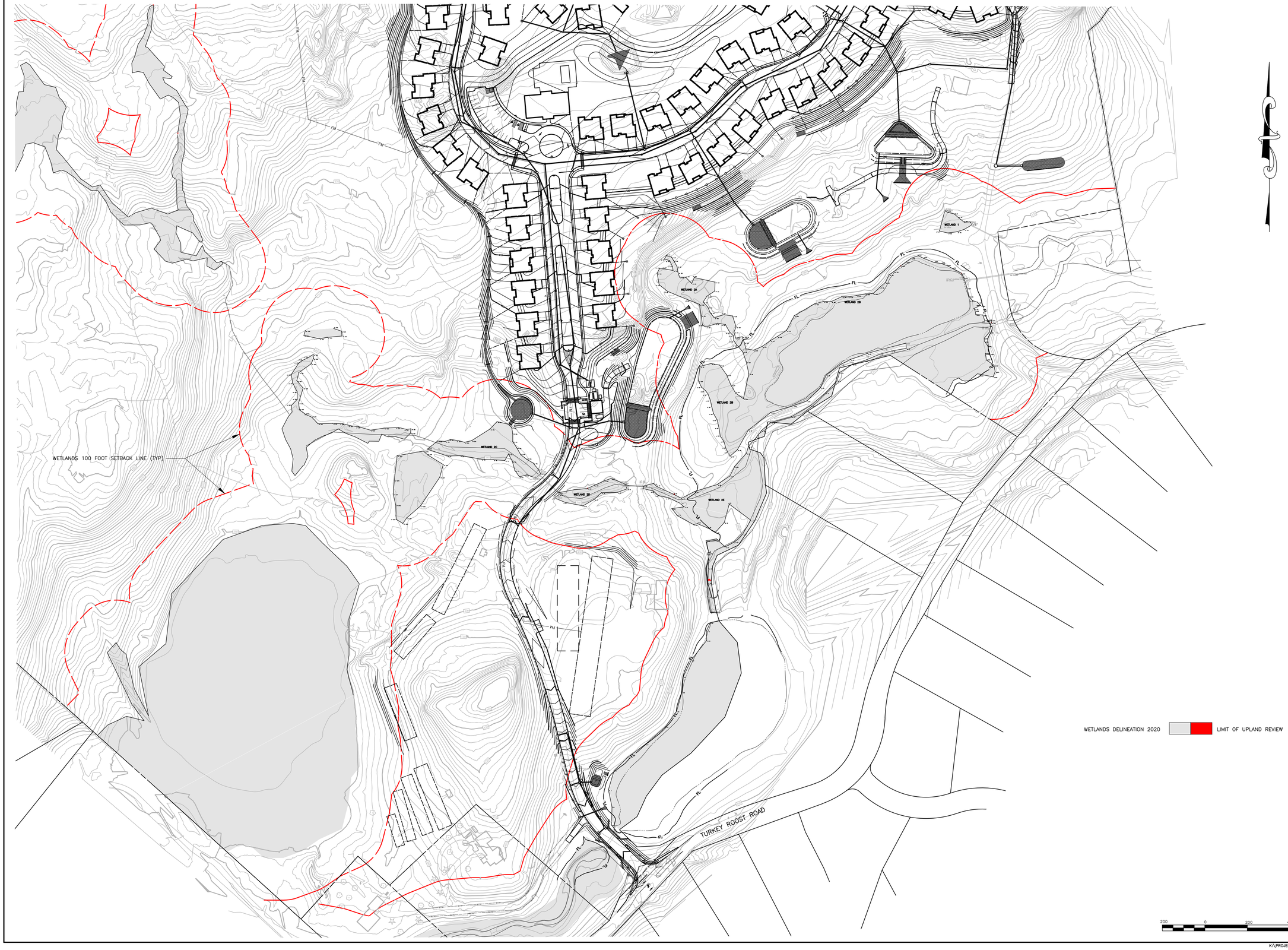
TITLE

EROSION CONTROL PLAN

SHEET NUMBER

E-6

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227 Stepney Road Easton, CT 06612
Phone:203.268.4205 Fax: 203.268.5604
www.jedwardsassoc.com

STATE OF CONNECTICUT
JOSEPH R. EDWARDS
No. 10937
LICENSED PROFESSIONAL ENGINEER

STATE OF CONNECTICUT
JASON EDWARDS
No. 21601
LICENSED LAND SURVEYOR

139, 141, & 201 TURKEY ROOST ROAD
& 30 COBBLERS HILL COURT
MONROE, CONNECTICUT

PREPARED FOR
QUARRY RIDGE ASSOCIATES, LLC

REVISIONS

#	DATE	DESCRIPTION
1	06-28-23	IWWC
2	07-26-23	IWWC
3	08-15-23	TOWN ENG.
4	08-30-23	IWWC

DATE: MAY 1, 2023
PROJECT #: 3302
DRAWING FILE:
DRAWN BY: NDC
SCALE: SCALE:1"=200'

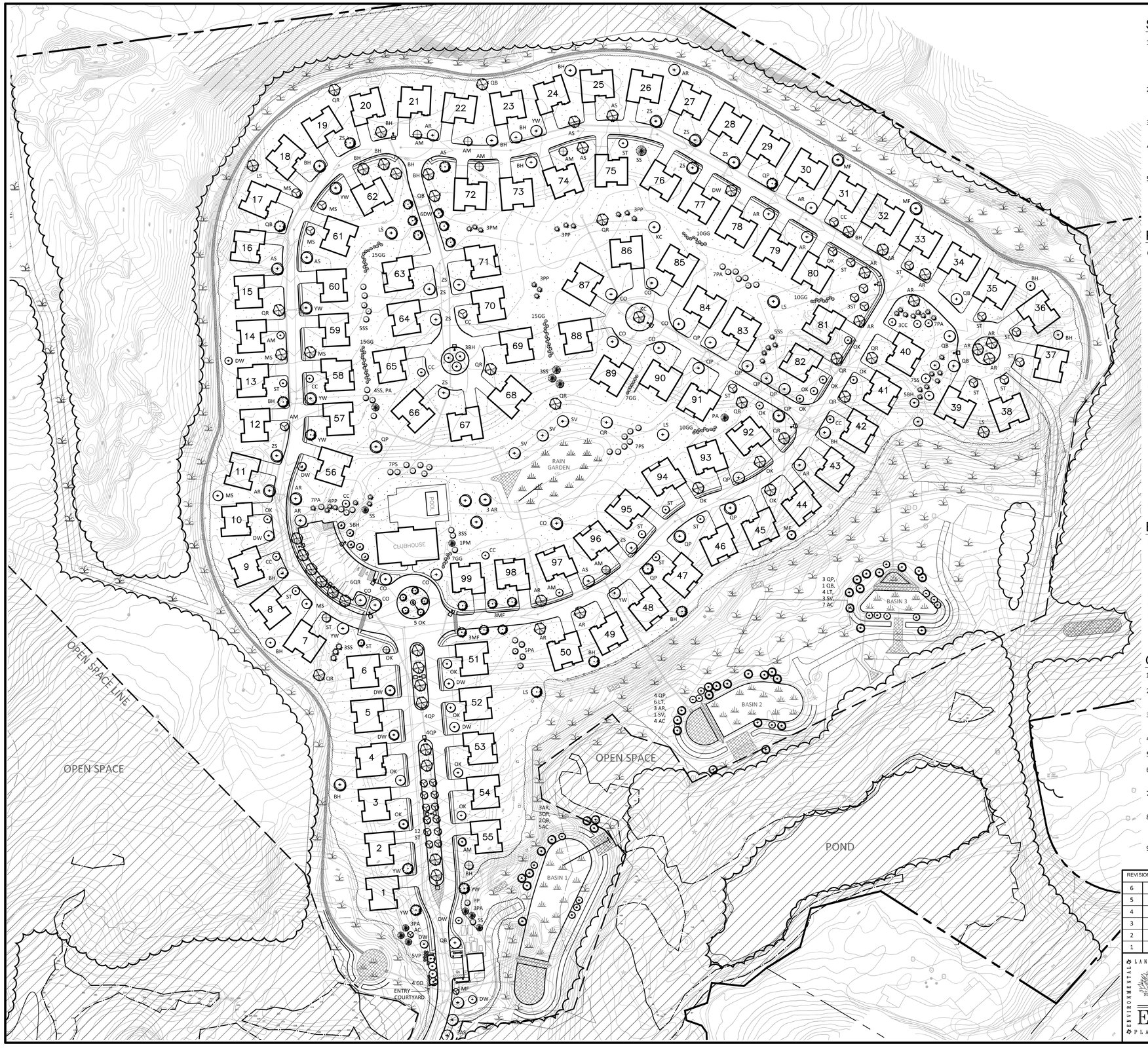
TITLE

WETLANDS PLAN

SHEET NUMBER

WL-1

K:\PROJECTS\3302 BIENASHSKI\DRAWINGS\ALTERNATE 5\WL-1.DWG



SEEDING NOTES:

1. FOR ALL SEEDING AREAS, APPLY SEED MIX AT THE METHODS AND 125 % THE RATE RECOMMENDED BY THE MANUFACTURER. SEED MIX SUBSTITUTIONS SHALL BE APPROVED BY THE PROJECT LANDSCAPE ARCHITECT PRIOR TO USE. APPLY SOIL AMENDMENTS AS NEEDED TO ESTABLISH PROPER SEED GERMINATION AND GROWTH.
2. RAIN GARDEN AND BASIN BOTTOM: SEED THIS AREA WITH "NEW ENGLAND EROSION CONTROL / RESTORATION MIX FOR DETENTION BASINS AND MOIST SITES" BY NEW ENGLAND WETLAND PLANTS, INC. (413-548-8000).
3. BASIN SIDE SLOPES: SEED THIS AREA WITH "NEW ENGLAND CONSERVATION / WILDLIFE MIX" BY NEW ENGLAND WETLAND PLANTS, INC. (413-548-8000).
4. UPLAND MEADOW: UNLESS ROCK, SEED DISTURBED MEADOW AREAS WITH "NEW ENGLAND CONSERVATION / WILDLIFE MIX" BY NEW ENGLAND WETLAND PLANTS, INC. (413-548-8000).
5. LAWN : SEED NEW LAWN AREAS WITH A HIGH QUALITY TURF TYPE SEED MIXTURE CONSISTING OF BLUEGRASS, FESCUE AND PERENNIAL RYEGRASS. APPLY SEED MIX AT THE METHODS AND 125% THE RATE RECOMMENDED BY THE MANUFACTURER. SEED MIX SUBSTITUTIONS SHALL BE APPROVED BY THE PROJECT LANDSCAPE ARCHITECT PRIOR TO USE. APPLY SOIL AMENDMENTS AS NEEDED TO ESTABLISH PROPER SEED GERMINATION AND GROWTH.

LEGEND

- NEW BOLLARD LIGHT
- NEW FLAG POLE
- NEW SINGLE / DOUBLE FIXTURE LIGHT POLE
- TREE LINE (APPROX.)
- NEW / EX. LAWN AREA
- BASIN BOTTOM SEEDED AREA
- BASIN SIDE SLOPES AND UPLAND MEADOW SEEDED AREA
- PROPOSED OPEN SPACE

PLANT LIST (TYPICAL)

QTY	KEY	BOTANICAL NAME	COMMON NAME	SIZE	ROOT	REMARKS
28	AR	ACER RUBRUM	RED MAPLE	2 1/2-3" CAL.	B&B	
10	AS	ACER 'GREEN MOUNTAIN'	SUGAR MAPLE	2-2 1/2" CAL.	B&B	
7	SV	ACER SACCHARINUM	SILVER MAPLE	2-2 1/2" CAL.	B&B	
14	CO	CELTIS OCCIDENTALIS	HACKBERRY	2-2 1/2" CAL.	B&B	
2	KC	GYMNOCLADUS DIOCIA	KENTUCKY COFFEETREE	2-2 1/2" CAL.	B&B	
6	LS	LIQUIDAMBAR STYRACIFLUA	SWEET GUM	2-2 1/2" CAL.	B&B	
10	LT	LIRIODENDRON TULIPIFERA	TULIPTREE	1 1/2-2" CAL.	B&B	
11	QB	QUERCUS BICOLOR	SWAMP WHITE OAK	2 1/2-3" CAL.	B&B	
31	QP	QUERCUS PALUSTRIS	PIN OAK	2 1/2-3" CAL.	B&B	
23	QR	QUERCUS RUBRA	RED OAK	2-2 1/2" CAL.	B&B	FULL
11	ZS	ZELKOVA SERRATA	ZELKOVA	2 1/2-3" CAL.	B&B	
17	AC	AMELANCHIER CANADENSIS	SHADBLOW	4-5' HT.	B&B	MULTISTEM
9	AM	AMELANCHIER 'AUTUMN BRILLIANCE'	SHAD (TREE FORM)	8-9' HT.	B&B	SINGLE STEM
28	BH	BETULA NIGRA 'DURA HEAT'	DURA HEAT BIRCH	9-10' HT.	B&B	
0	JM	BETULA JACQUEMONTI	JACQUEMONTI BIRCH	8-9' HT.	B&B	3 STEMS
11	CC	CERCIS CANADENSIS	RED BUD	8-9' HT.	B&B	SINGLE STEM
10	YW	CLADRASTIS LUTEA	YELLOWWOOD	2 1/2-3" CAL.	B&B	
5	VP	VIBURNUM 'MOHAWK'	MOHAWK VIBURNUM	3-4' HT.	B&B	
7	MS	MAGNOLIA SOULANGIANA	SAUCER MAGNOLIA	2-2 1/2" CAL.	B&B	
17	DW	MALUS 'SNOWDRIFT'	SNOWDRIFT CRABAPPLE	2-2 1/2" CAL.	B&B	FULL
29	ST	MALUS 'SUGAR TYME'	SUGAR TYME CRAB	2-2 1/2" CAL.	B&B	MATCHING
10	MF	MALUS FLORIBUNDA	JAPANESE FLOWERING CRAB	2-2 1/2" CAL.	B&B	
24	OK	PRUNUS 'OKAME'	OKAME CHERRY	2 1/2-3" CAL.	B&B	
34	PA	PICEA ABIES	NORWAY SPRUCE	8-10' HT.	B&B	
23	SS	PICEA OMORIKA	SERBIAN SPRUCE	8-10' HT.	B&B	
14	PP	PICEA PUNGENS	BLUE SPRUCE	7-8' HT.	B&B	
14	PS	PINUS STROBUS	WHITE PINE	8-10' HT.	B&B	
4	PM	PSEUDOTSUGA MENZIESII	DOUGLASFIR	8-10' HT.	B&B	
89	GG	THUJA 'GREEN GIANT'	GREEN GIANT ARBORVITAE	5-6' HT.	B&B	

BASIN PLANT LIST (TYP.)

QTY	KEY	BOTANICAL NAME	COMMON NAME	SIZE	ROOT	REMARKS
75	-----	CLETHRA ALNIFOLIA	CLETHRA	3-4' HT.	CONT.	TOE OF SLOPE
75	-----	ILEX VERTICILLATA	WINTERBERRY	3-4' HT.	CONT.	TOE OF SLOPE
1000	-----	ASCLEPIAS INCARNATA	SWAMP MILKWEED		PP/1 QT.	BASIN BOTTOM
1000	-----	EUPATORIUM PURPUREUM	JOE-PYE-WEED		PP/1 QT.	BASIN BOTTOM
500	-----	IRIS VERSICOLOR	BLUE FLAG IRIS		PP/1 QT.	BASIN BOTTOM
500	-----	VERBENA HASTATA	BLUE VERVAIN		PP/1 QT.	BASIN BOTTOM
500	-----	VERNONIA NOVEBORACENSIS	NEW YORK IRONWEED		PP/1 QT.	BASIN BOTTOM

NOTE: PLANT BASIN PLANTS EVENLY BETWEEN THE THREE BASINS AND RAIN GARDEN. HERBACEOUS PLANTS TO BE PLANTED WITHIN THE BASIN BOTTOM IN GROUPINGS OF TEN PLANTS.

GENERAL NOTES:

1. SITE PLAN INFORMATION TAKEN FROM A DIGITAL AUTOCADD SITE PLAN SUPPLIED BY J. EDWARDS & ASSOCIATES, LLC.
2. EXACT LOCATION OF PLANTINGS, SPECIES TYPES AND QUANTITIES MAY VARY FROM THIS PLAN BASED ON SITE PLAN REVISIONS AND/OR ACTUAL FIELD CONDITIONS.
3. SPRAY NEW PLANTINGS WITH A WHITE-TAILED DEER REPELLENT IMMEDIATELY AFTER PLANTING AND AS NEEDED TO MAINTAIN NEW PLANTINGS FREE OF SIGNIFICANT DEER BROWSING.
4. THIS PLAN FOR PLANTING PURPOSES ONLY. SEE PLANS BY OTHERS FOR ADDITIONAL INFORMATION.
5. PLANT SPECIES SUBSTITUTIONS MAY BE MADE WITH THE APPROVAL OF THE PROJECT LANDSCAPE ARCHITECT PRIOR TO PLANTING.
6. ALL PLANTING METHODS SHALL BE IN ACCORDANCE WITH THE "AMERICAN STANDARDS FOR NURSERY STOCK", LATEST EDITION, AS PUBLISHED BY THE AMERICAN NURSERY & LANDSCAPE ASSOCIATION.
7. 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.
8. ALL LIGHTING INFORMATION AND PLANS PREPARED BY ENVIRONMENTAL LAND SOLUTIONS, LLC ARE DESIGNED FOR AESTHETIC PURPOSES ONLY AND SHALL BE USED ONLY FOR SUCH PURPOSES. LIGHTING INFORMATION SHOWN ON THIS PLAN SHALL NOT BE USED FOR SECURITY OR SAFETY LIGHTING PURPOSES.
9. SEE SHEET LP-2 FOR ADDITIONAL INFORMATION.

REVISIONS:					
6	3/13/23	REV. SITE PLAN			
5	1/25/22	83 UNIT PLAN			
4	12/17/21	SEEDING INFO ADDED			
3	6/22/21	PER REVISED SITE PLAN			
2	8/6/10	CHANGE PROJECT NAME	8	8.25.23	DRAINAGE
1	5/15/10	PER REVISED SITE PLAN	7	5/1/23	99 UNIT PLAN

ENVIRONMENTAL LAND SOLUTIONS, LLC
LANDSCAPE ARCHITECTURE AND ENVIRONMENTAL PLANNING

8 Knight Street, Suite 203
Norwalk, Connecticut 06851

Tel: (203) 855-7879 Fax: (203) 855-7836
email: landscape@snet.net

DRAWING TITLE: SITE LANDSCAPE PLAN

PROJECT: QUARRY RIDGE
MONROE, CONNECTICUT

PREPARED FOR: QUARRY RIDGE ASSOCIATES, LLC

DATE: APRIL 2007

SCALE: 1"=80'

DRAWING NO.: LP-1



HABITAT MAINTENANCE NOTES (TYP.):

1. MEADOW MAINTENANCE: CUT PROPOSED OPEN SPACE MEADOW AREAS ONCE EVERY TWO YEARS DURING THE WINTER MONTHS TO A 4-8" HEIGHT.
2. THICKET MAINTENANCE: CUT THICKET AREAS ONCE EVERY FIVE YEARS TO A 6-12" HEIGHT. IF DESIRED, THICK AREAS MAY BE LEFT UNCUT TO ALLOW TO EVOLVE NATURALLY TO A WOODED STATE.
3. WOODLAND MAINTENANCE: BACKFILL EXISTING TEST PITS WITHIN OPEN SPACE AREAS USING ADJACENT STOCKPILED SOILS. REMOVE DEER STAND.
4. REMOVE ANY ACCUMULATED LITTER FROM OPEN SPACE ONCE PER SEASON FROM OPEN SPACE AREAS.
5. ANY REMOVAL OF NONNATIVE PLANT SPECIES THAT IS CUT OR PULLED SHALL BE DISPOSED OF APPROPRIATELY AND COMPLY WITH THE 2004 DEEP / UCONN "GUIDELINES FOR DISPOSAL OF TERRESTRIAL INVASIVE PLANTS." ALL CUTTINGS SHALL BE COLLECTED AND PLACED ONSITE ON A PLASTIC TARP (OR ON AN ASPHALT PAVEMENT AREA) AND SUN DRIED UNTIL DEAD. AVOID CUTTINGS FROM BEING IN CONTACT WITH ANY SOIL. DEAD PLANTS SHALL BE BAGGED AND DEPOSITED AT AN INCINERATOR WASTE FACILITY (NOT A COMPOSTING FACILITY).
6. WHITE PINE GROVE: PLANT WHITE PINES APPROXIMATELY 12-18' O.C. WITHIN SPECIFIED AREA. CARE SHALL BE TAKEN TO NOT CUT THEM WHILE MAINTAINING ADJACENT MEADOW AND THICKET AREAS.
7. SAND PILE FOR BOX TURTLES TO BE 1-3 CY YARDS IN SIZE AND LOCATED BASED ON FIELD CONDITIONS RECOMMENDED BY THE PROJECT ENVIRONMENTAL CONSULTANT.

LEGEND

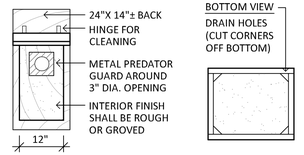
- TREE LINE (APPROX.)
- OPEN SPACE LIMIT
- BOX TURTLE HABTAT AREA
- NEW / EX. LAWN AREA
- PROPOSED MEADOW AREAS
- PROPOSED OPEN SPACE
- BOX TURTLE THICKET HABITAT
- O — NEW SCREECH OWL NEST BOX (QTY=5)
- W — NEW WOOD DUCK NEST BOX (QTY=2)
- NEW BLUEBIRD NEST BOX (QTY=3)
- 1-3 CY SAND PILE (FOR BOX TURTLE HABITAT ENHANCEMENT)

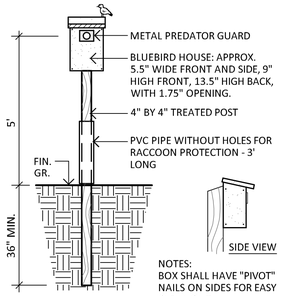
RAIN GARDEN AND BASIN NOTES (TYP.):

1. CONSTRUCT RAIN GARDEN AND BASINS PER DETAIL. AVOID VEHICLE TRAFFIC OVER PROPOSED RAIN GARDEN AREAS. SCARIFIED SUBSOIL AS NEEDED IF SOILS ARE COMPACTED.
2. DO NOT FERTILIZE RAIN GARDEN AREAS UNLESS DIRECTED BY THE PROJECT LANDSCAPE ARCHITECT.
3. TO AVOID EROSION, THE PROPOSED RAIN GARDEN AND BASIN SEEDED AREAS SHALL BE ESTABLISHED WITH VEGETATION PRIOR TO AREA RECEIVING STORMWATER RUNOFF IF FEASIBLE.
4. DURING THE FIRST GROWING SEASON WATER RAIN GARDEN PLANTINGS AS NEEDED UNTIL THEY BECOME ESTABLISHED.
5. MOW RAIN GARDEN AND BASINS SEEDED AREAS MONTHLY TO A 4-6" HEIGHT DURING THE FIRST GROWING SEASON AFTER SEEDING TO CONTROL WEED PLANTS. AFTER THE FIRST YEAR, MOW RAIN GARDEN TO A 6" HT. ONCE PER YEAR DURING THE WINTER MONTHS TO MAINTAIN A MEADOW HABITAT.
6. ROUTINE BIYEARLY MAINTENANCE OF RAIN GARDEN AND BASINS SHALL INCLUDE THE REMOVAL OF INVASIVE NONNATIVE PLANT SPECIES (BY HAND PULLING OR SPOT HERBICIDE TREATMENTS), RESEEDING BARE AND THINLY VEGETATED AREAS WITH THE SPECIFIED SEED MIXTURE, REMULCHING PLANTINGS AS NEEDED, REMOVAL OF ACCUMULATED SEDIMENT WITHIN BASIN BOTTOM BY HAND, REMOVAL OF LITTER, KEEPING THE OUTLET STRUCTURE FREE OF DEBRIS, AND REMOVAL OF DEAD, DISEASED, OR UNHEALTHY PLANTS. IF MACHINE ACCESS WITHIN THE RAIN GARDEN IS REQUIRED, NOTIFY THE INLAND WETLANDS AGENCY PRIOR TO ACTION.

PLANT LIST - OPEN SPACE

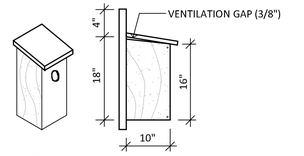
QTY	KEY	BOTANICAL NAME	COMMON NAME	SIZE	ROOT
100	WP	PINUS STROBUS	WHITE PINE	2-3' HT.	CONT.





BLUE BIRD NEST BOX

SCALE: NOT TO SCALE



NOTES:
1. BOX SHALL HAVE "PIVOT" NAILS ON SIDES FOR EASY CLEAN OUT.
2. PLACE SCREECH OWL BOX IN TREE BETWEEN 15 AND 30' ABOVE GRADE. PLACE WOOD DUCK BOX ON A POLE (OR IN A TREE) IN A SECLUDED POND EDGE AT 5-20' ABOVE GRADE.
3. WOOD TO BE 3/4" THICK MADE OF CEDAR.
4. NEST BOX SHALL BE UNTREATED AND UNPAINTED.
5. ALL NAILS, WOOD SCREWS, AND HINGES SHALL BE RUST PROOF.
6. ADD 2-3" OF WOOD SHAVINGS AT BOTTOM OF BOX.

SCREECH OWL AND WOOD DUCK NEST BOX (TYP.)

SCALE: NOT TO SCALE

REVISIONS:

DRAWING TITLE: HABITAT MANAGEMENT PLAN

PROJECT: QUARRY RIDGE, MONROE, CONNECTICUT

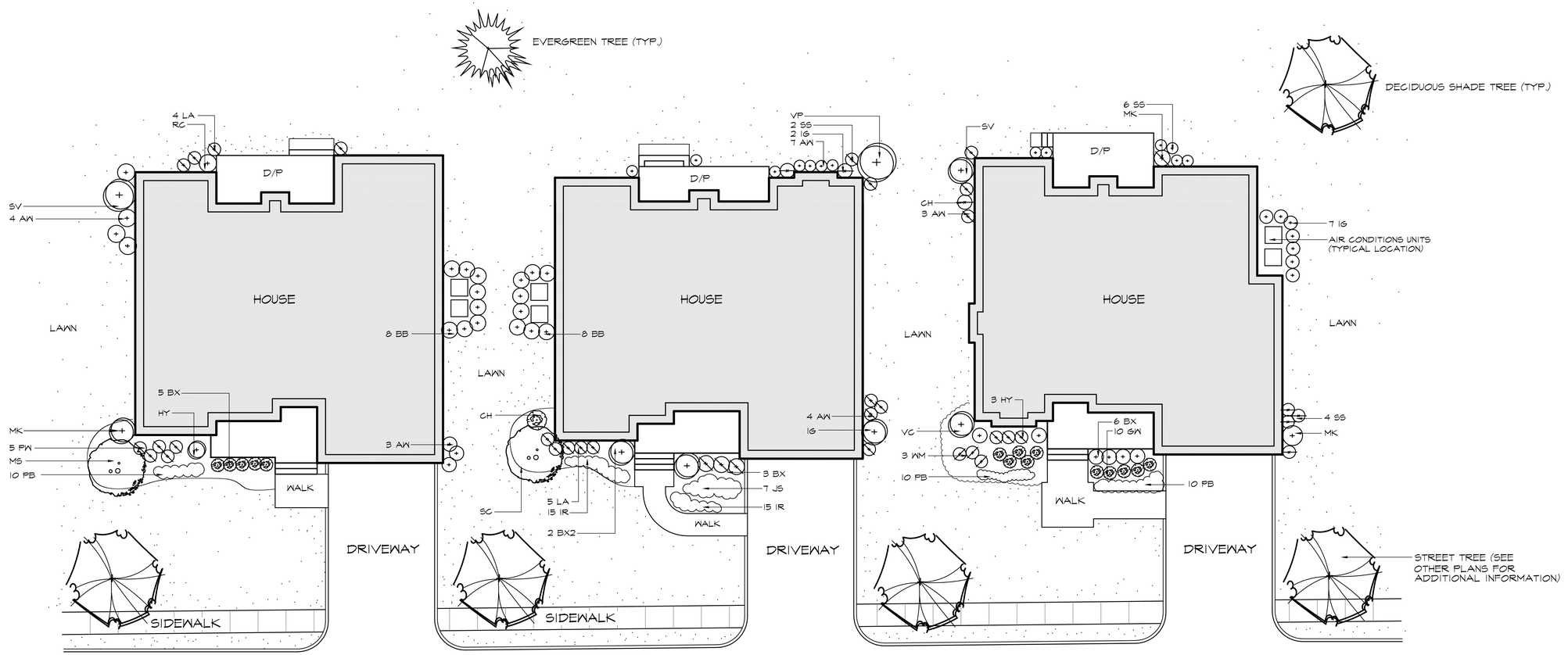
PREPARED FOR: QUARRY RIDGE ASSOCIATES, LLC

ENVIRONMENTAL LAND SOLUTIONS, LLC
LANDSCAPE ARCHITECTURE AND ENVIRONMENTAL PLANNING
8 Knight Street, Suite 203
Norwalk, Connecticut 06851
Tel: (203) 855-7879 Fax: (203) 855-7836
email: landscape@snet.net

DATE: 9.1.23

SCALE: 1"=200'

DRAWING NO.: LP-5



PLANT LIST (TYP.)

QTY	KEY	BOTANICAL NAME	COMMON NAME	SIZE	ROOT	REMARKS
0	AC	AMELANCHIER CANADENSIS	SHADBLOW	6-7' HT.	B&B	MULTISTEM
0	FD	CORNUS FLORIDA	FLOWERING DOGWOOD	7-8' HT.	B&B	
0	CK	CORNUS KOUSA 'MILKY WAY'	KOUSA DOGWOOD	7-8' HT.	B&B	SPECIMEN
1	MS	MAGNOLIA STELLATA 'CENTENNIAL'	CENTENNIAL MAGNOLIA	5-6' HT.	B&B	SPECIMEN
1	SC	MALUS SARGENTI	SARGENT CRAB	6-7' HT.	B&B	
10	GW	AZALEA 'GUMPO WHITE'	GUMPO WHITE AZALEA	15-18" HT.	CONT.	
5	PW	AZALEA 'PLEASANT WHITE' (3'X3')	PLEASANT WHITE AZALEA	2-3' HT.	CONT.	
0	PD	BUDDLEIA 'PINK DELIGHT'	PINK DELIGHT	2-3' HT.	CONT.	
14	BX	BUXUS SEMP. 'VARDEN VALLEY'	BOXWOOD	18-24" HT.	CONT.	
2	BX2	BUXUS SEMP. 'VARDEN VALLEY'	BOXWOOD	30-36" HT.	CONT.	
2	CH	CLETHRA ALNIFOLIA 'HUMMINGBIRD'	HUMMINGBIRD CLETHRA	2-3' HT.	CONT.	
4	HY	HYDRANGEA MAC. 'NIKKO BLUE'	NIKKO BLUE HYDRANGEA	15-18" HT.	2 GAL.	
0	IC	ILEX CRENATA 'CHESAPEAKE'-7' HT	CHESAPEAKE HOLLY	3-4' HT.	CONT.	
0	ST	ILEX CRENATA 'SOFT TOUCH' 2'X3'	SOFT TOUCH HOLLY	15-18" HT.	CONT.	
7	IG	ILEX GLABRA 'SHAMROCK'	INKBERRY	2-3' HT.	CONT.	
7	JS	JUNIPERUS 'SARGENT'	SARGENT JUNIPER	18-24" SPR.	2 GAL.	
9	LA	LEUCOTHOE AXILLARIS	LEUCOTHOE	18-24" HT.	CONT.	
0	MP	MYRICA PENSYLVANICA	BAYBERRY	2-3' HT.	CONT.	
16	BB	PIERIS 'BROUNER'S BEAUTY'	BROUNER'S BEAUTY PIERIS	36-42" HT.	B&B	
1	RC	RHODODENDRON 'CHIONOIDES'	CHIONOIDES RHODODENDRON	36-42" HT.	B&B	
3	WM	ROSA 'WHITE MEIDILAND'	WHITE MEIDILAND ROSE	2-3' SPR.	CONT.	
21	AW	SPIRAEA 'ANTHONY WATERER'	ANTHONY WATERER SPIREA	2-3' SPR.	CONT.	
13	SS	SPIRAEA 'SHIROBANA'	SHIROBANA SPIREA	18-24" HT.	CONT.	
3	MK	SYRINGA PATULA 'MISS KIM'	MISS KIM LILAC	30-36" HT.	CONT.	
2	SV	SYRINGA 'POCAHONTAS'	POCAHONTAS LILAC	3-4' HT.	B&B	
0	TO	THUJA 'NIGRA'	ARBORVITAE	3-4' HT.	B&B	
1	VC	VIBURNUM CARLESII	MAYFLOWER VIBURNUM	3-4' HT.	B&B	
1	VP	VIBURNUM PL. TOMENTOSA 'SHASTA'	SHASTA VIBURNUM	4-5' HT.	B&B	
30	PB	ASTILBE 'PEACH BLOSSOM'	ASTILBE		1 GAL.	
0	GN	LYSIMACHIA CLETHROIDES	GOOSENECK LOOSESTRIFE		2 GAL.	
30	IR	IRIS 'BUTTER AND EGGS'	WHITE IRIS		2 GAL.	
0	EG	MISCANTHUS SIN. 'PURPURESCENS'	EULALIA GRASS		2 GAL.	
0	PH	PENNISETUM ALOP. 'HAMELN'	HAMELN FOUNTAIN GRASS		2 GAL.	
0	CF	POLYSTICHUM ACROSTICHOIDES	CHRISTMAS FERN		2 GAL.	
0	VM	VINCA MINOR	VINCA		BR	

NOTE: THIS PLAN ILLUSTRATES A TYPICAL FOUNDATION PLANTING DESIGN FOR INDIVIDUAL HOUSE SITES. PLANT SPECIES LISTED ABOVE WITH A QTY OF "0" MAY ALSO BE USED AS FOUNDATION PLANTS.

NOTES:

1. THIS PLAN REPRESENTS A GRAPHIC ILLUSTRATION OF TYPICAL LANDSCAPED UNITS. THE LOCATION OF LANDSCAPE ELEMENTS (I.E.; WALKS, DRIVEWAY, LIGHTING, AND PLANTING LOCATIONS, SPECIES AND QUANTITIES) MAY VARY FROM THIS PLAN BASED ON ACTUAL FIELD CONDITIONS AND THE OWNERS PREFERENCES.
2. SURVEY AND PROPOSED SITE INFORMATION TAKEN FROM A DIGITAL AUTOCADD SITE PLAN PREPARED BY SPATH-BJORKLUND ASSOCIATES, INC.
3. THE LANDSCAPE CONTRACTOR SHALL VERIFY WITH THE PROJECT ENGINEER THAT THE PROPOSED PLANTINGS DO NOT INTERFERE WITH EXISTING AND/OR PROPOSED UTILITIES, SIGHT LINES, AND/OR STRUCTURES.
4. SEED NEW LAWN AREAS WITH A HIGH QUALITY TURF TYPE SEED MIXTURE CONSISTING OF BLUEGRASS, FESCUE AND PERENNIAL RYEGRASS SUCH AS "TRI-PLEX SHADE" MIX AVAILABLE FROM LOFTS SEED, INC. APPLY SOIL AMENDMENTS AS NEEDED TO ESTABLISH PROPER SEED GERMINATION AND GROWTH. LAWN AREAS SHALL HAVE A MINIMUM 4-6" LAYER OF TOPSOIL.
5. SPRAY NEW PLANTINGS WITH A WHITE-TAILED DEER REPELLENT IMMEDIATELY AFTER PLANTING AND AS NEEDED TO MAINTAIN NEW PLANTINGS FREE OF SIGNIFICANT DEER BROWSING.
6. THIS PLAN FOR PLANTING PURPOSES ONLY. SEE PLANS BY OTHERS FOR ADDITIONAL INFORMATION.
7. 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.
8. THE LANDSCAPE CONTRACTOR SHALL TEST THE SOIL IN AREAS TO BE LANDSCAPED FOR DETERMINING THE NEED OF ADDING SOIL AMENDMENTS TO SUPPORT PROPER PLANT GROWTH. SUCH AMENDMENTS SHALL BE PROVIDED BY THE LANDSCAPE CONTRACTOR IF NEEDED.
9. ALL PLANTING METHODS SHALL BE IN ACCORDANCE WITH THE "AMERICAN STANDARDS FOR NURSERY STOCK", LATEST EDITION, AS PUBLISHED BY THE AMERICAN NURSERY & LANDSCAPE ASSOCIATION.
10. 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.
11. IF REQUESTED BY THE OWNER/CLIENT, THE LANDSCAPE CONTRACTOR SHALL PROVIDE AN IRRIGATION PLAN FOR ALL LANDSCAPED AREAS. THE CONTRACTOR SHALL INCLUDE A PRICE FOR PREPARATION OF AN IRRIGATION PLAN AND INSTALLATION OF SYSTEM TO THE OWNER/CLIENT.
12. MULCH PLANTING BEDS AND TREES WITH A 2.5" THICK LAYER OF SHREDDED BARK MULCH. MAINTAIN 4" AREA SURROUNDING TREE TRUNKS FREE OF MULCH.
13. ALL LIGHTING INFORMATION AND PLANS PREPARED BY ENVIRONMENTAL LAND SOLUTIONS, LLC ARE DESIGNED FOR AESTHETIC PURPOSES ONLY AND SHALL BE USED ONLY FOR SUCH PURPOSES. LIGHTING INFORMATION SHOWN ON THIS PLAN SHALL NOT BE USED FOR SECURITY OR SAFETY LIGHTING PURPOSES.
14. HOUSE DIMENSIONS ARE APPROXIMATE, ADJUST PLANTINGS AS REQUIRED TO MEET INTENT OF PLAN.
15. DECK/PATIO (D/P) SHAPES ARE TYPICAL AND MAY VARY FROM THAT SHOWN.
16. EACH UNIT MAY HAVE WALL MOUNTED AND/OR POLE LIGHT FIXTURES.

REVISIONS:		
3	6/22/21	PER REVISED SITE PLAN
2	8/6/10	CHANGE PROJECT NAME
1	5/15/10	PER REVISED SITE PLAN

DRAWING TITLE: TYPICAL UNIT LANDSCAPING

PROJECT: QUARRY RIDGE, MONROE, CONNECTICUT

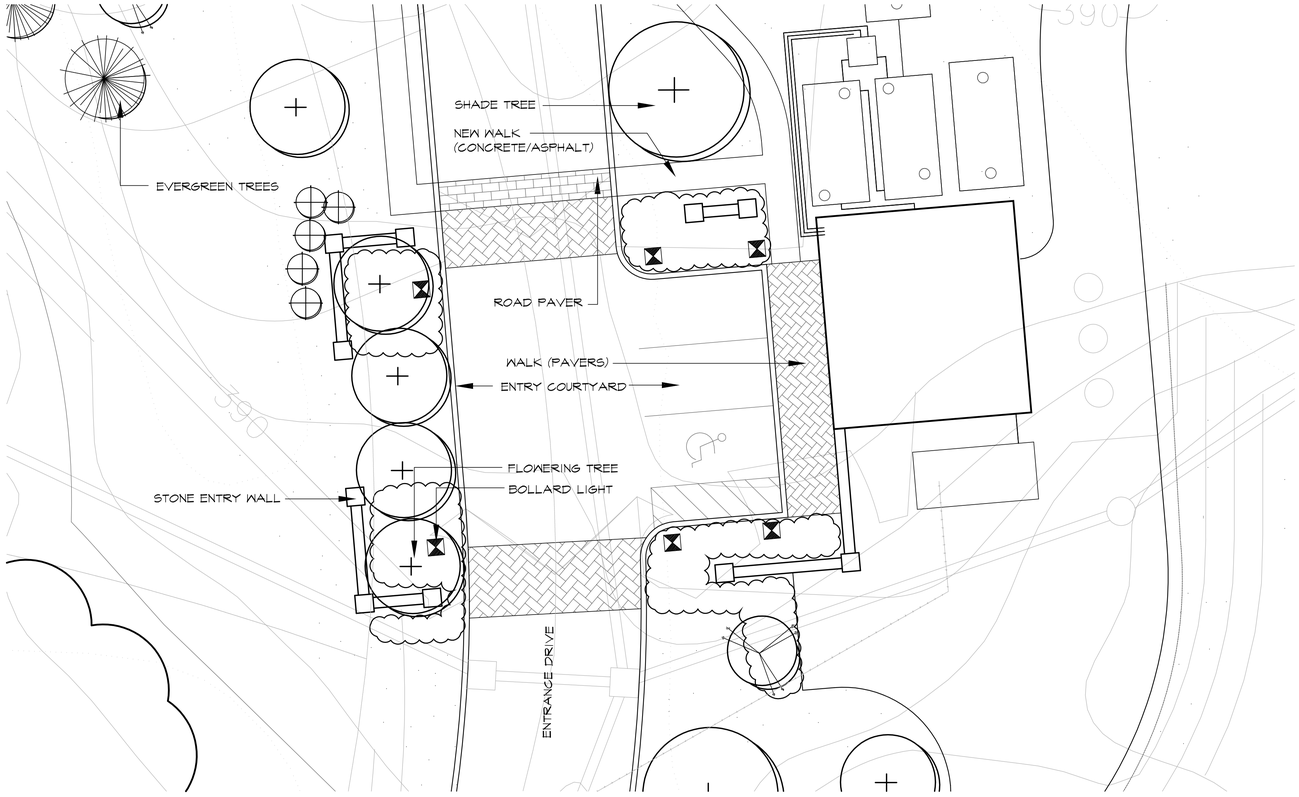
PREPARED FOR: QUARRY RIDGE ASSOCIATES, LLC

ENVIRONMENTAL LAND SOLUTIONS, LLC
LANDSCAPE ARCHITECTURE AND ENVIRONMENTAL PLANNING
8 Knight Street, Suite 203
Norwalk, Connecticut 06851
Tel: (203) 855-7879 Fax: (203) 855-7836
email: landscape@snet.net

DATE: APRIL 2007

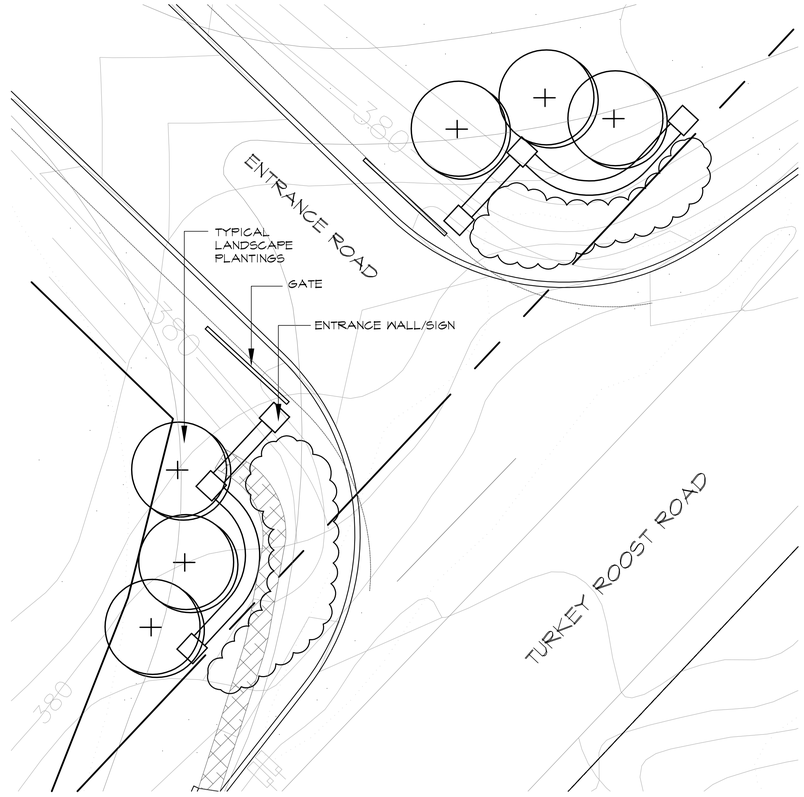
SCALE: 1"=20'

DRAWING NO.: LP-2



ENTRY COURTYARD - PLAN ELEVATION

SCALE: 1"=10'

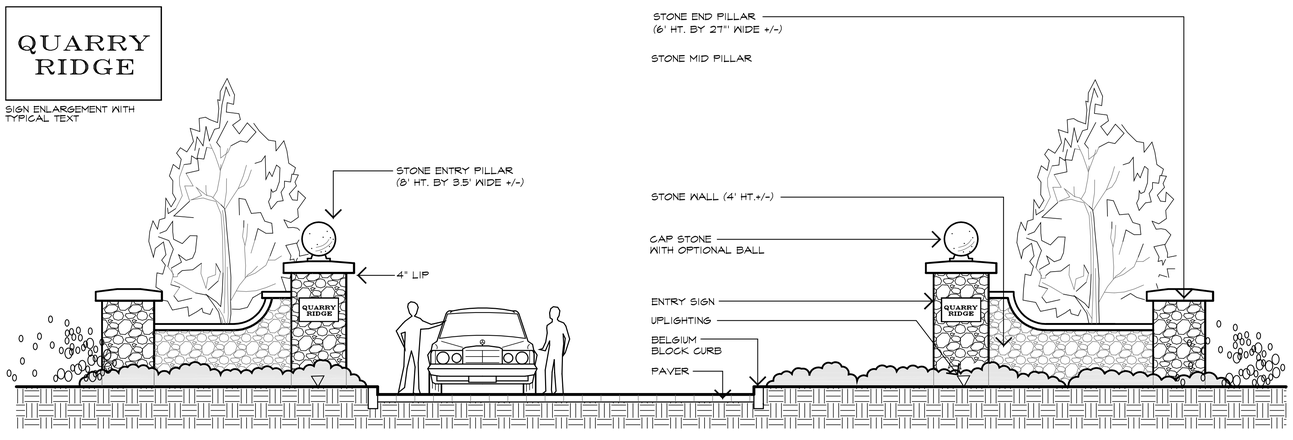


ENTRY SIGNAGE

SCALE: 1"=10'

QUARRY
RIDGE

SIGN ENLARGEMENT WITH
TYPICAL TEXT



ENTRY COURTYARD - TYPICAL ELEVATION

SCALE: NOT TO SCALE

NOTE: THIS ELEVATION IS A CONCEPTUAL VIEW OF THE ENTRANCE TO THE COURTYARD. ENTRANCE WALL, CAP, AND PILLAR HEIGHT AND SHAPE MAY VARY FROM THAT SHOWN.

REVISIONS:		
3	6/22/21	PER REVISED SITE PLAN
2	8/6/10	CHANGE PROJECT NAME
1	5/15/10	PER REVISED SITE PLAN

LANDSCAPE ARCHITECTURE ENVIRONMENTAL PLANNING
ELS
ENVIRONMENTAL LAND SOLUTIONS, LLC
LANDSCAPE ARCHITECTURE AND ENVIRONMENTAL PLANNING
8 Knight Street, Suite 203
Norwalk, Connecticut 06851
Tel: (203) 855-7879 Fax: (203) 855-7836
email: landscape@snet.net

DRAWING TITLE: LANDSCAPE ENLARGEMENTS

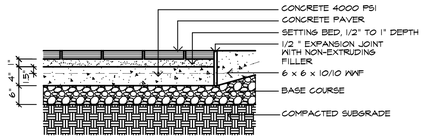
PROJECT: QUARRY RIDGE
MONROE, CONNECTICUT

PREPARED FOR: QUARRY RIDGE ASSOCIATES, LLC

DATE: APRIL 2007

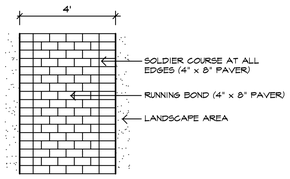
SCALE: AS SHOWN

DRAWING NO.: LP-3



NOTES:
1. PAVER SHALL HAVE A MIN. 8,000 PSI COMPRESSIVE STRENGTH, SHALL MEET ASTM C936-82 PAVING BRICK STANDARDS, AND SHALL HAVE 5% WATER ABSORPTION RATE. PAVER COLOR SHALL BE TAN/SAND.
2. PITCH ALL RAMPS & WALKS AT 1/8" PER 1' FROM SIDE TO SIDE.
3. PAVERS TO BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

SECTION

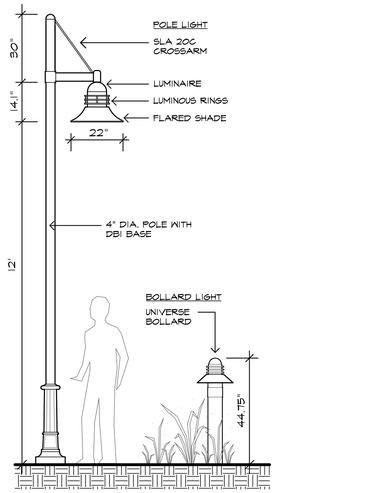


PLAN

PATTERN IS TYPICAL.

PRECAST CONCRETE WALK PAVEMENT

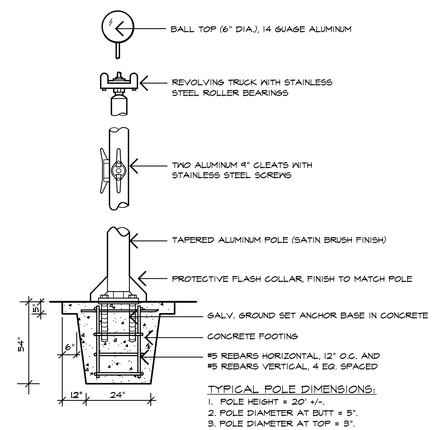
SCALE: NOT TO SCALE



NOTES:
1. LIGHTING BY ARCHITECTURAL AREA LIGHTING, UNIVERSE COLLECTION.
2. POLE, BOLLARDCOLOR AND FIXTURES SHALL BE DARK GREEN IN COLOR.
3. SINGLE FIXTURE POLE IS SHOWN ABOVE. DOUBLE FIXTRE POLE HAS TWO LUMINARES.

POLE & BOLLARD LIGHT

SCALE: NOT TO SCALE

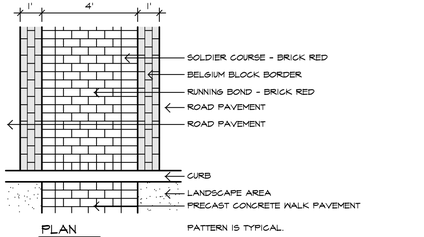


TYPICAL POLE DIMENSIONS:
1. POLE HEIGHT = 20' +/-.
2. POLE DIAMETER AT BUTT = 5".
3. POLE DIAMETER AT TOP = 3".
4. POLE THICKNESS = .188".

NOTE: INSTALL POLE PER MANUFACTURER'S RECOMMENDATIONS.

FLAG POLE (TYPICAL)

SCALE: NOT TO SCALE



NOTES:
1. PAVER SHALL HAVE A MIN. 8,000 PSI COMPRESSIVE STRENGTH.
2. PITCH ALL AREAS TO DRAIN.
3. PAVERS TO BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

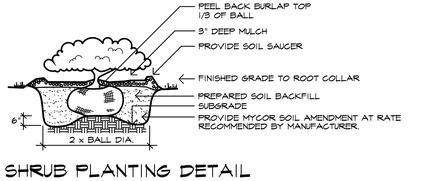
SECTION

PLAN

PATTERN IS TYPICAL.

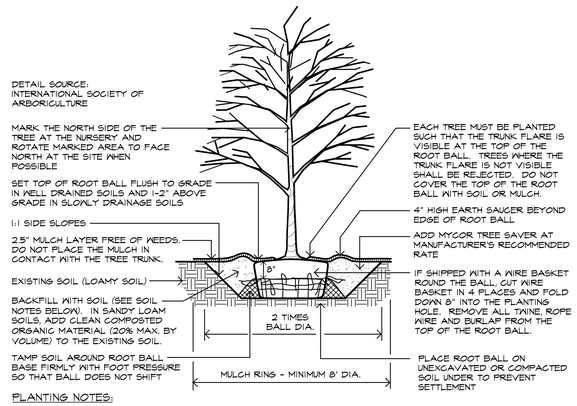
PRECAST CONCRETE CROSSWALK PAVEMENT

SCALE: NOT TO SCALE



SHRUB PLANTING DETAIL

SCALE: NOT TO SCALE



PLANTING NOTES:
1. DO NOT HEAVILY PRUNE THE TREE AT PLANTING. PRUNE ONLY CROSSOVER LIMBS, CO-DOMINANT LEADERS, AND BROKEN OR DEAD BRANCHES. SOME INTERIOR TWIGS AND LATERAL BRANCHES MAY BE PRUNED; HOWEVER, DO NOT REMOVE THE TERMINAL BUDS OF BRANCHES THAT EXTEND TO THE EDGE OF THE CROWN.
2. STAKE TREE BASED ON CRITERIA BELOW OR AS REQUESTED BY THE LANDSCAPE ARCHITECT.
3. WRAP TREE TRUNKS ONLY UPON THE APPROVAL OF THE LANDSCAPE ARCHITECT.

SOIL NOTES:
1. CLEAN FILL MATERIAL SHALL BE A LOAMY SOIL. LOAMY SOILS INCLUDE THE FOLLOWING USDA TEXTURAL CLASSIFICATIONS AND HAVE A CLAY CONTENT BETWEEN 7% TO 27%: LOAM, SANDY LOAM AND SILT LOAM. NOTE THAT SOILS AT THE OUTER LIMITS OF THE LOAM CLASSIFICATION MAY PRESENT SPECIAL PLANTINGS PROBLEMS NOT ANTICIPATED BY THE DETAIL.
2. LOAMY SOILS ARE DEFINED AS A GRANULAR OR BLOCKY FRIABLE SOILS, A MIXTURE OF SAND, SILT AND CLAY PARTICLES WITH A WITH A MINIMUM OF 1.5% BY DRY WEIGHT OF ORGANIC MATTER. THE SOIL MUST NOT BE SO COMPACTED AS TO IMPEDED ROOT GROWTH OR DRAINAGE. THE SOIL STRUCTURE SHALL NOT BE PLATY OR MASSIVE.

STAKING NOTES:
1. STAKE TREES ONLY IF IT IS EXPECTED THAT THE TREE WILL NOT BE ABLE TO SUPPORT ITSELF AND REMAIN STRAIGHT. STAKE TREES FOR THE FOLLOWING REASONS:
   A. THE TREE IS INSTALLED WITHIN VERY SANDY SOIL OR VERY WET CLAY SOIL.
   B. THE TREE IS LOCATED IN A PLACE OF EXTREMELY WINDY CONDITIONS.
2. CONTACT THE PROJECT LANDSCAPE ARCHITECT FOR STAKING DETAIL IF NEEDED.

TREE PLANTING DETAIL (IN ALL SOIL TYPES)

SCALE: NOT TO SCALE

REVISIONS:

3	6/22/21	PER REVISED SITE PLAN
2	8/6/10	CHANGE PROJECT NAME
1	5/15/10	PER REVISED SITE PLAN

DRAWING TITLE: LANDSCAPE DETAILS

PROJECT: QUARRY RIDGE, MONROE, CONNECTICUT

PREPARED FOR: QUARRY RIDGE ASSOCIATES, LLC

LANDSCAPE ARCHITECTURE ENVIRONMENTAL PLANNING ELS

ENVIRONMENTAL LAND SOLUTIONS, LLC
LANDSCAPE ARCHITECTURE AND ENVIRONMENTAL PLANNING

8 Knight Street, Suite 203
Norwalk, Connecticut 06851

Tel: (203) 855-7879 Fax: (203) 855-7836
email: landscape@snet.net

DATE: APRIL 2007

SCALE: AS SHOWN

DRAWING NO.: LP-4



LUMINAIRE SCHEDULE

CALLOUT	SYMBOL	LAMP	DESCRIPTION	BALLAST	MOUNTING	MODEL	VOLTS	NOTE 1	NOTE 2	NOTE 3	QUANTITY
L1		(1) C-70-CRIWTH CLEAR LENSDATA SHOWN IS ABSOLUTE.Sports, Street, Walkway, Direct, Wet Location	UNIVERSE COLLECTION LARGE 2.0	ELECTRONIC	POLE	ARCHITECTURAL AREA LIGHTING, UCL2-ANG-72L-310-3K7-5Q-CL	120V 1P 2W			LED 70 3000k	20

150 0 150 300

K:\PROJECTS\3302 BIENASHSKI\DRAWINGS\ALTERNATE 5\LP-5.DWG

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& 30 COBBLERS HILL COURT
MONROE, CONNECTICUT

PREPARED FOR
QUARRY RIDGE ASSOCIATES, LLC

REVISIONS

#	DATE	DESCRIPTION
1	06-28-23	IWWC
2	07-26-23	IWWC
3	08-15-23	TOWN ENG.
4	08-30-23	IWWC

DATE: MAY 1, 2023
PROJECT #: 3302
DRAWING FILE:
DRAWN BY: NDC
SCALE: SCALE:1"=150'

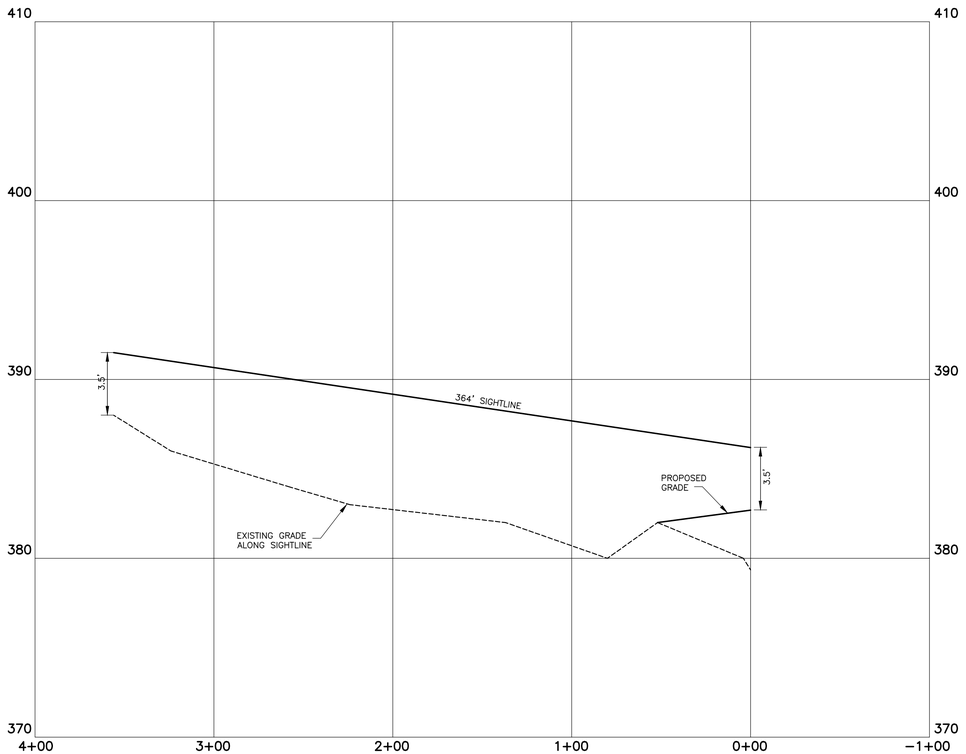
TITLE

PHOTOMETRIC CALCULATION PLAN

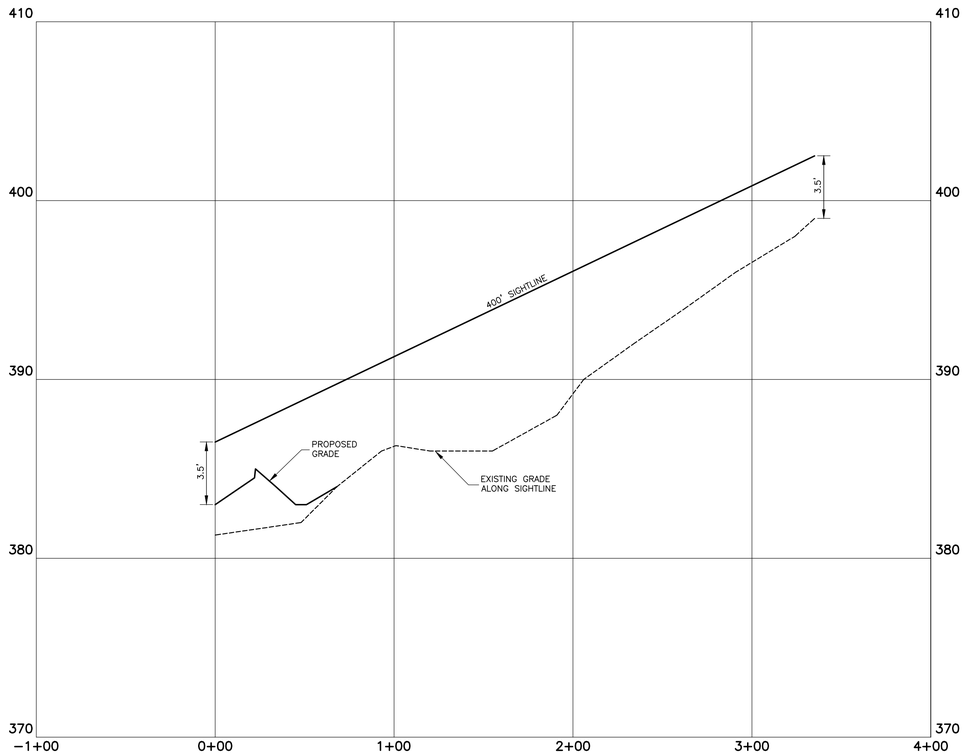
SHEET NUMBER

LP-5





SIGHTLINE NORTHEAST



SIGHTLINE SOUTHWEST

SCALE: 1"=40' H, 1"=4' V

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STATE OF CONNECTICUT — JOHN EDWARDS — LICENSED LAND SURVEYOR

139, 141, & 201 TURKEY ROOST ROAD
& 30 COBBLERS HILL COURT
MONROE, CONNECTICUT

PREPARED FOR

QUARRY RIDGE ASSOCIATES, LLC

REVISIONS

#	DATE	DESCRIPTION
1	06-28-23	IWWC
2	07-26-23	IWWC
3	08-15-23	TOWN ENG.
4	08-30-23	IWWC

DATE: MAY 1, 2023
PROJECT #: 3302
DRAWING FILE:
DRAWN BY: NDC
SCALE: AS NOTED

TITLE

SIGHTLINE PLAN AND PROFILE

SHEET NUMBER

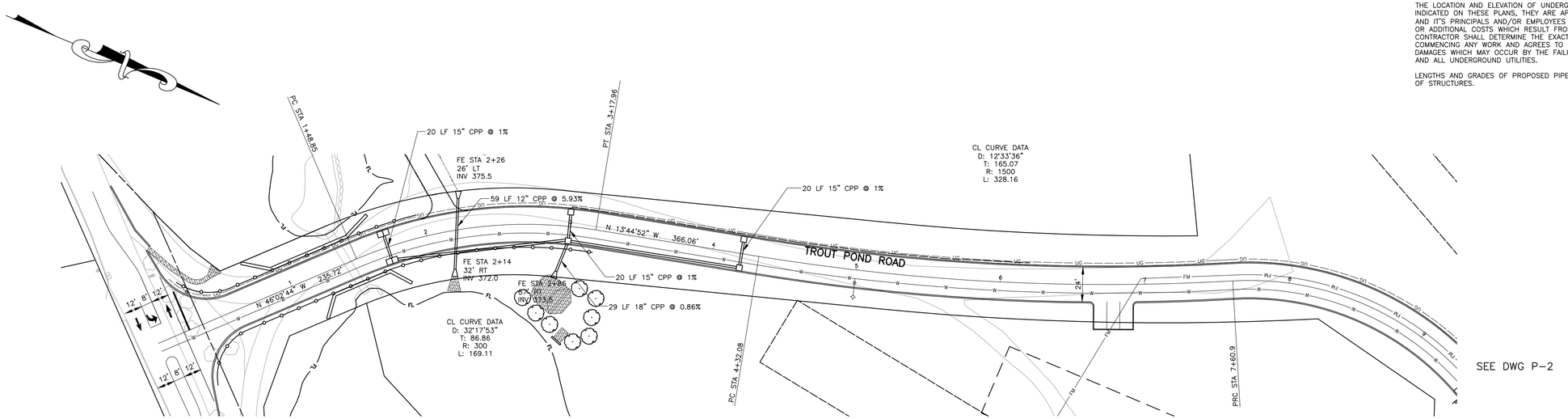
SP-1

K:\PROJECTS\3302 BIENASHSKI\DRAWINGS\ALTERNATE 5\SP-1 REVISED.DWG

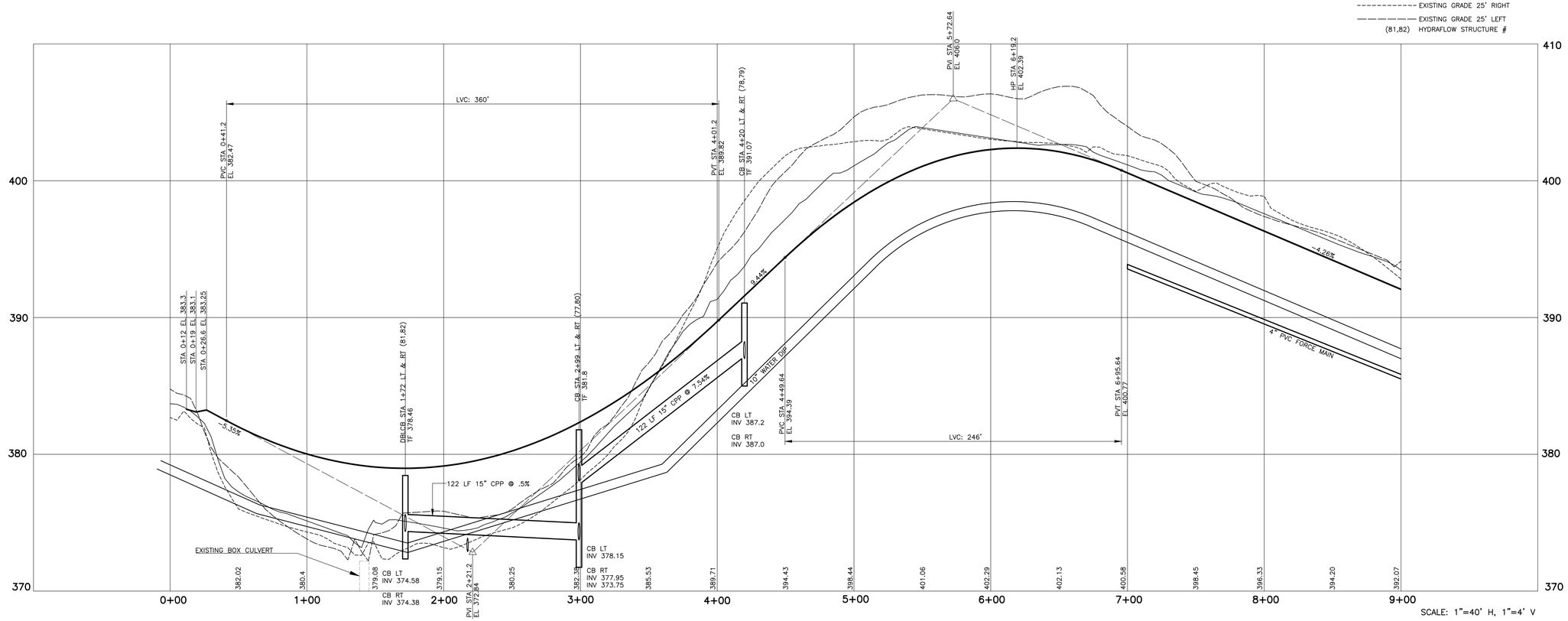
NOTES:

THE LOCATION AND ELEVATION OF UNDERGROUND UTILITIES ARE UNKNOWN. IF THEY ARE INDICATED ON THESE PLANS, THEY ARE APPROXIMATE AND J.EDWARDS & ASSOCIATES AND IT'S PRINCIPALS AND/OR EMPLOYEES SHALL NOT BE RESPONSIBLE FOR ANY DAMAGES OR ADDITIONAL COSTS WHICH RESULT FROM THE EXISTENCE OF SAID UTILITIES. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING ANY WORK AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MAY OCCUR BY THE FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

LENGTHS AND GRADES OF PROPOSED PIPES ARE NOTED FROM CENTERLINE TO CENTERLINE OF STRUCTURES.



SCALE: 1"=40'



SCALE: 1"=40' H, 1"=4' V

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139, 141, & 201 TURKEY ROOST ROAD
& 30 COBBLERS HILL COURT
MONROE, CONNECTICUT

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4	08-30-23	IWWC

DATE: MAY 1, 2023
PROJECT #: 3302
DRAWING FILE:
DRAWN BY: NDC
SCALE: AS NOTED

TITLE

PLAN-PROFILE

SHEET NUMBER

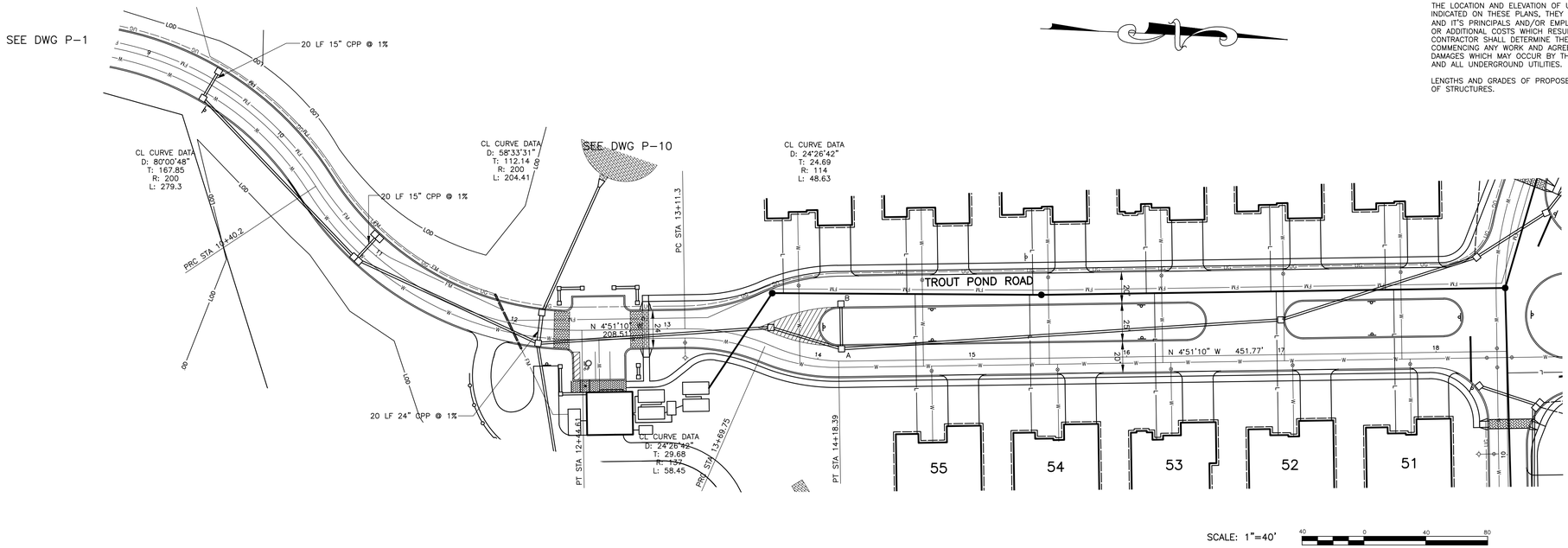
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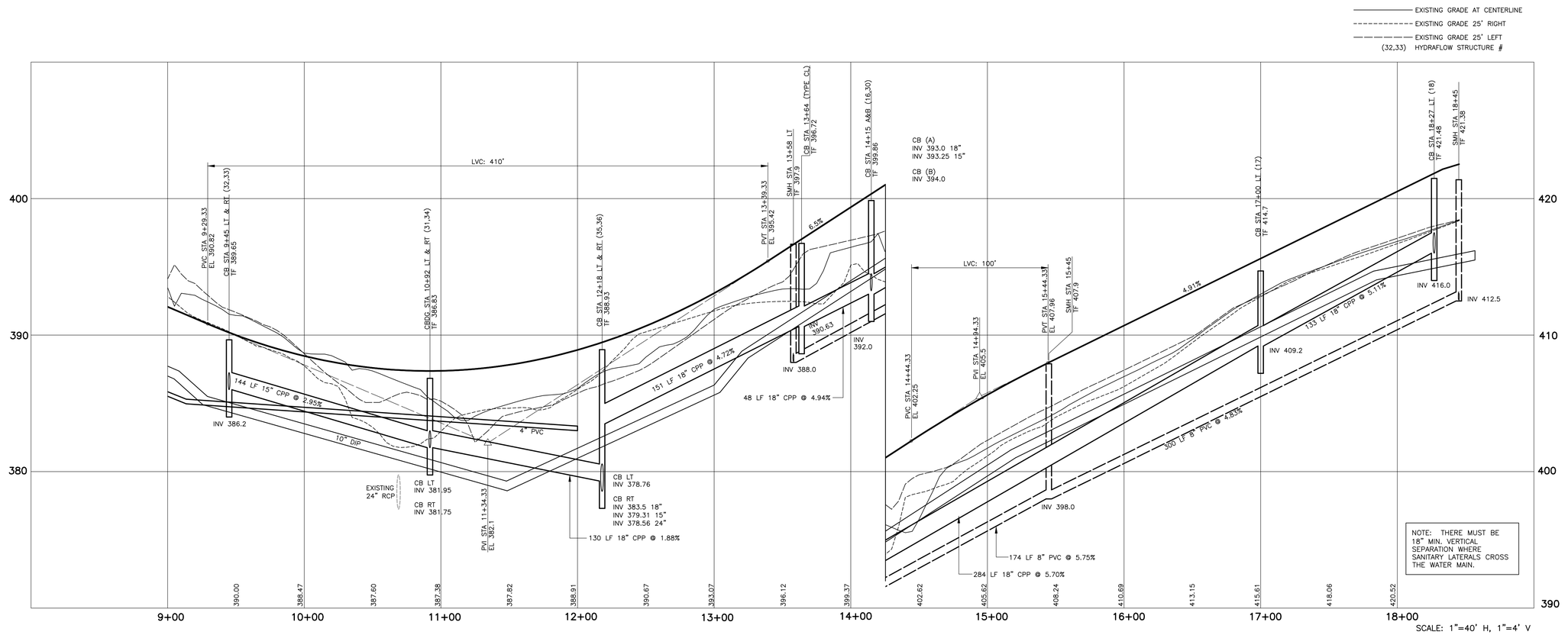
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SCALE: 1"=40'



SCALE: 1"=40' H, 1"=4' V

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& 30 COBBLERS HILL COURT
MONROE, CONNECTICUT

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DRAWING FILE:
DRAWN BY: NDC
SCALE: AS NOTED

TITLE

PLAN-PROFILE

SHEET NUMBER

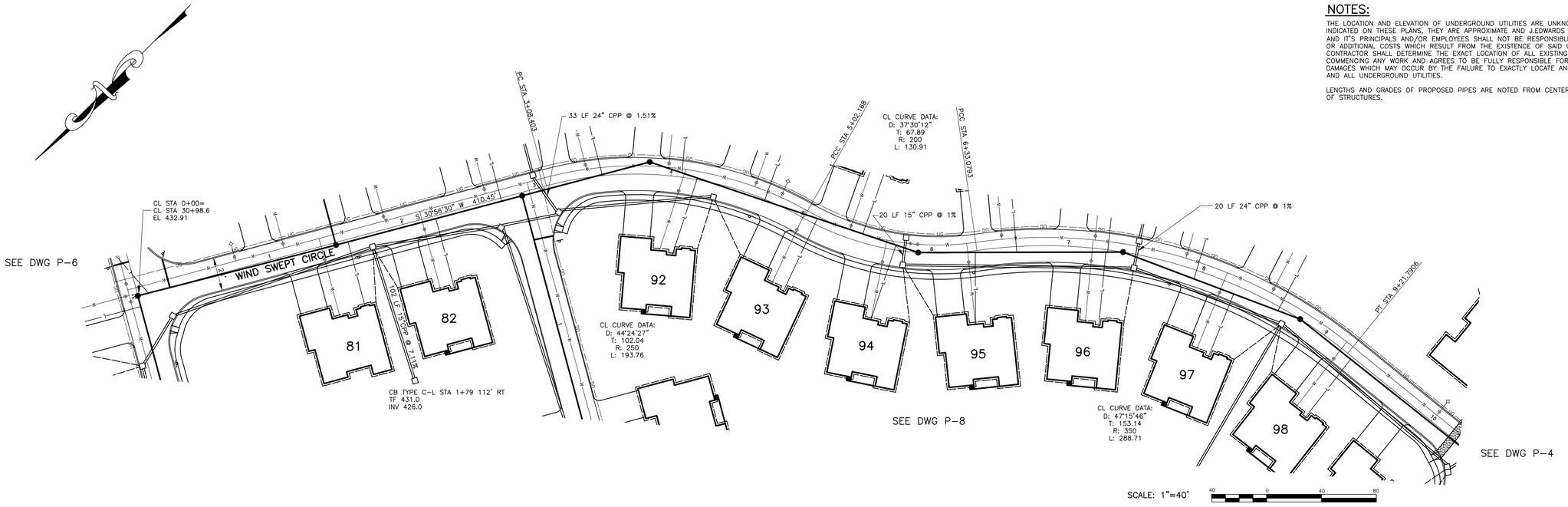
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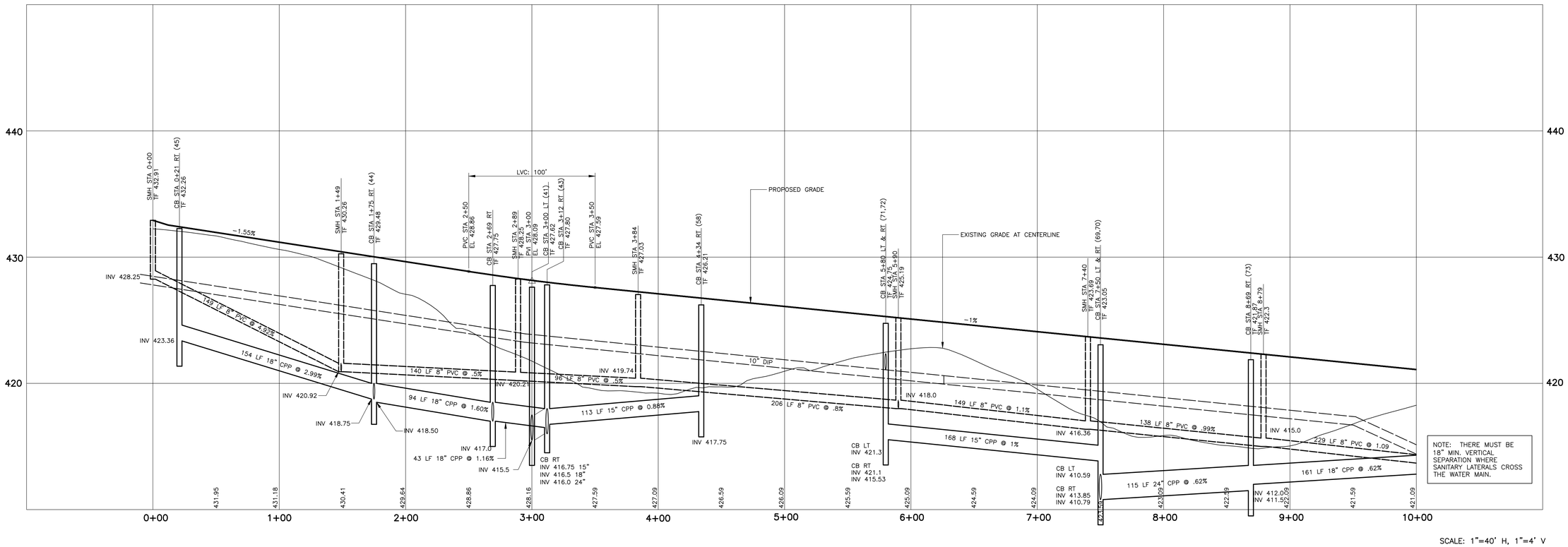
K:\PROJECTS\3302 BIENASHSKI\DRAWINGS\ALTERNATE 5\P-2.DWG

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SCALE: 1"=40' H, 1"=4' V

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STATE OF CONNECTICUT — JASON EDWARDS — LICENSED LAND SURVEYOR

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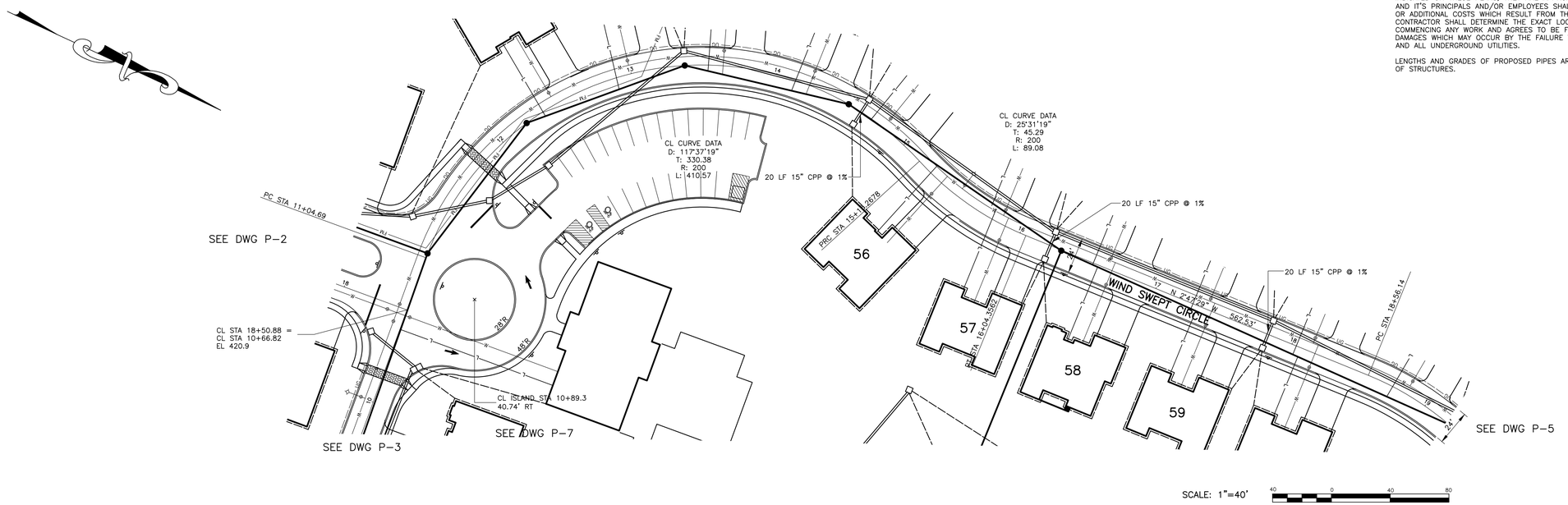
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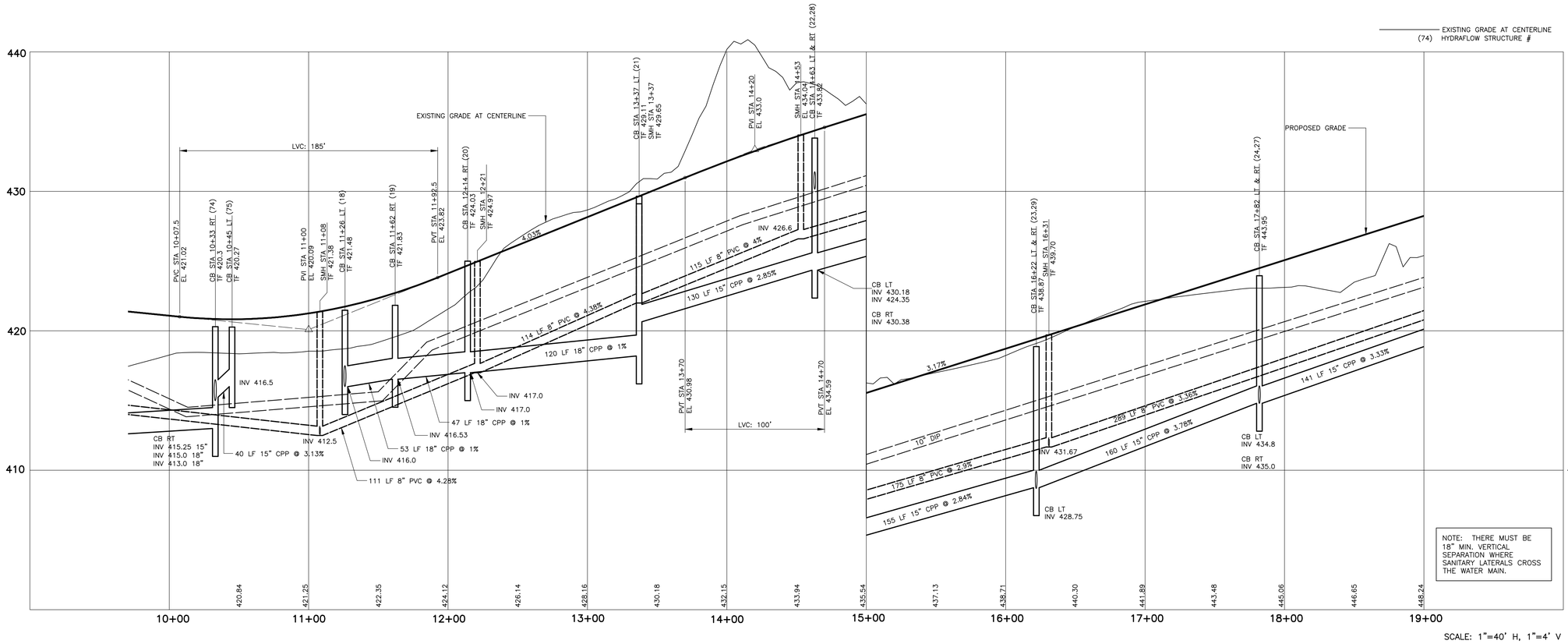
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STATE OF CONNECTICUT — JASON EDWARDS — LICENSED LAND SURVEYOR

139, 141, & 201 TURKEY ROOST ROAD
& 30 COBBLERS HILL COURT
MONROE, CONNECTICUT

PREPARED FOR
QUARRY RIDGE ASSOCIATES, LLC

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PROJECT #: 3302
DRAWING FILE:
DRAWN BY: NDC
SCALE: AS NOTED

TITLE

PLAN-PROFILE

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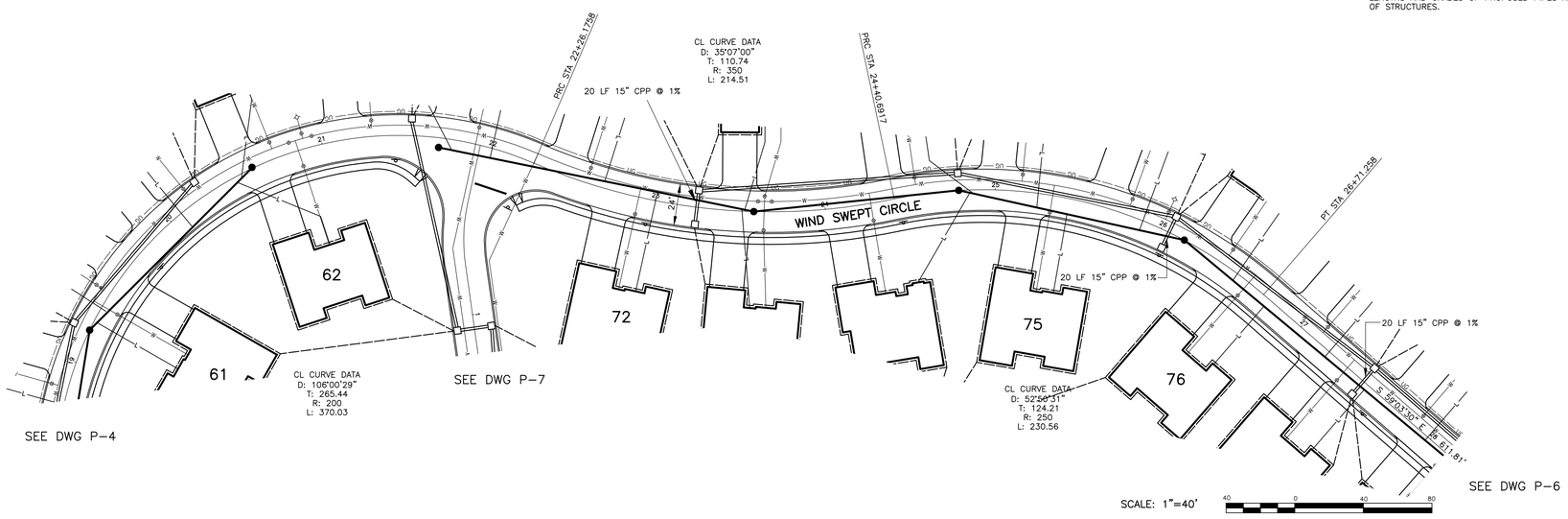
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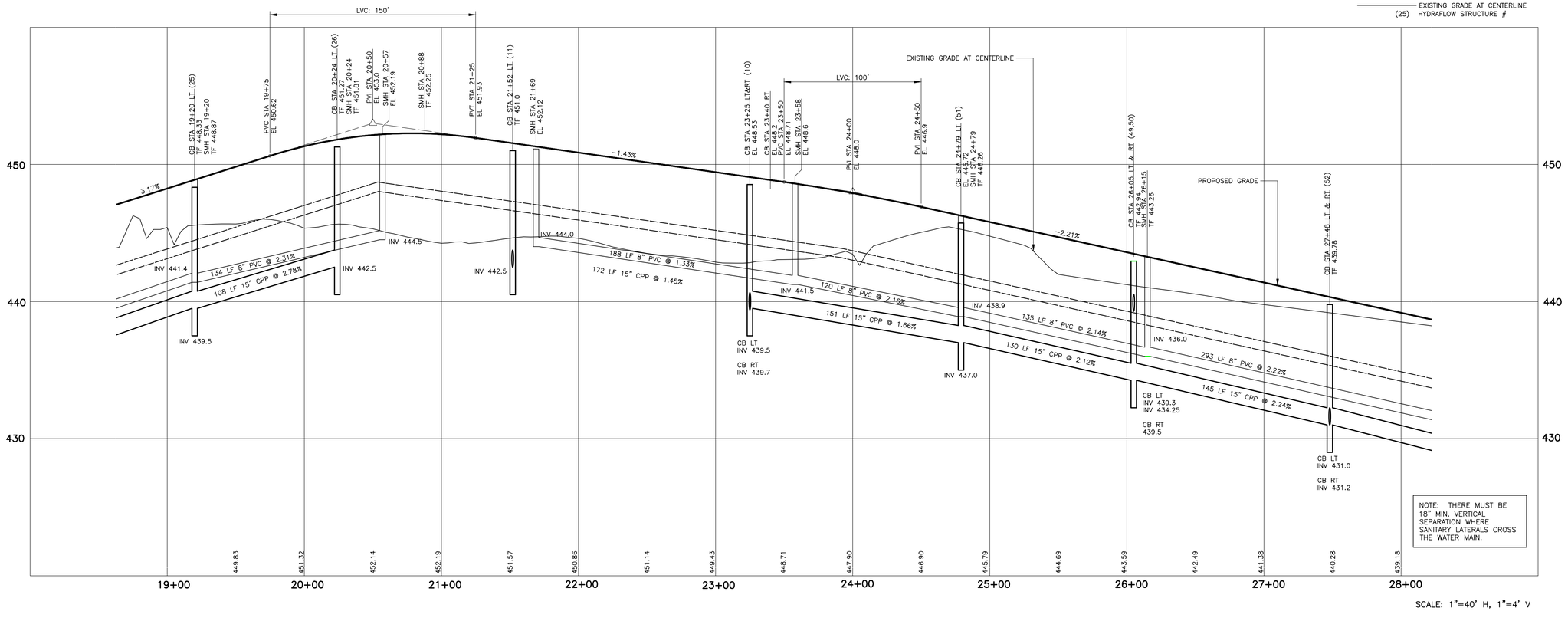
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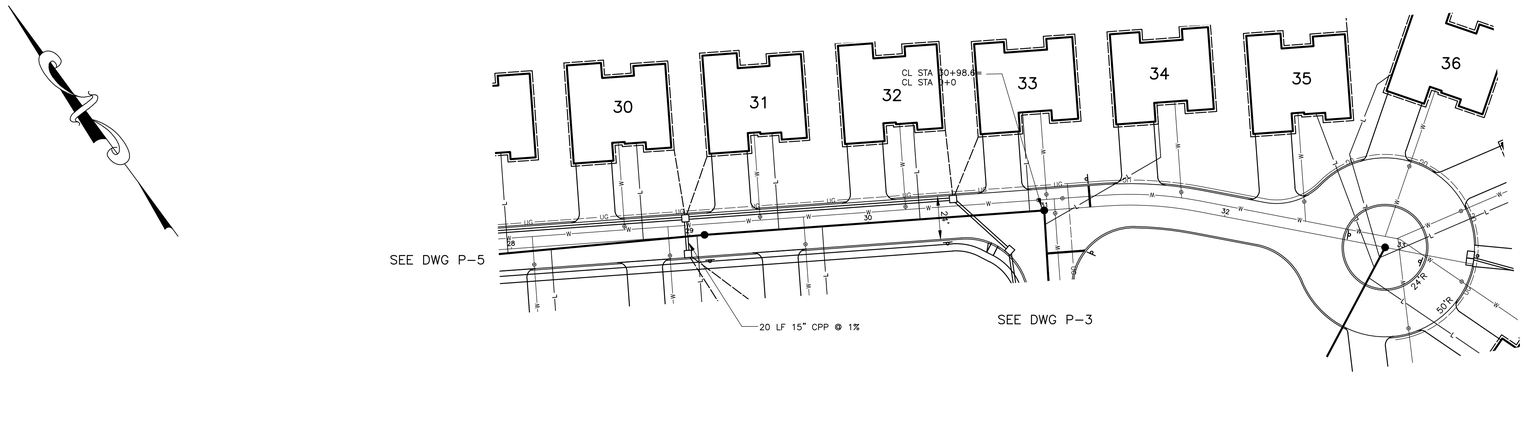
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PLAN-PROFILE

SHEET NUMBER

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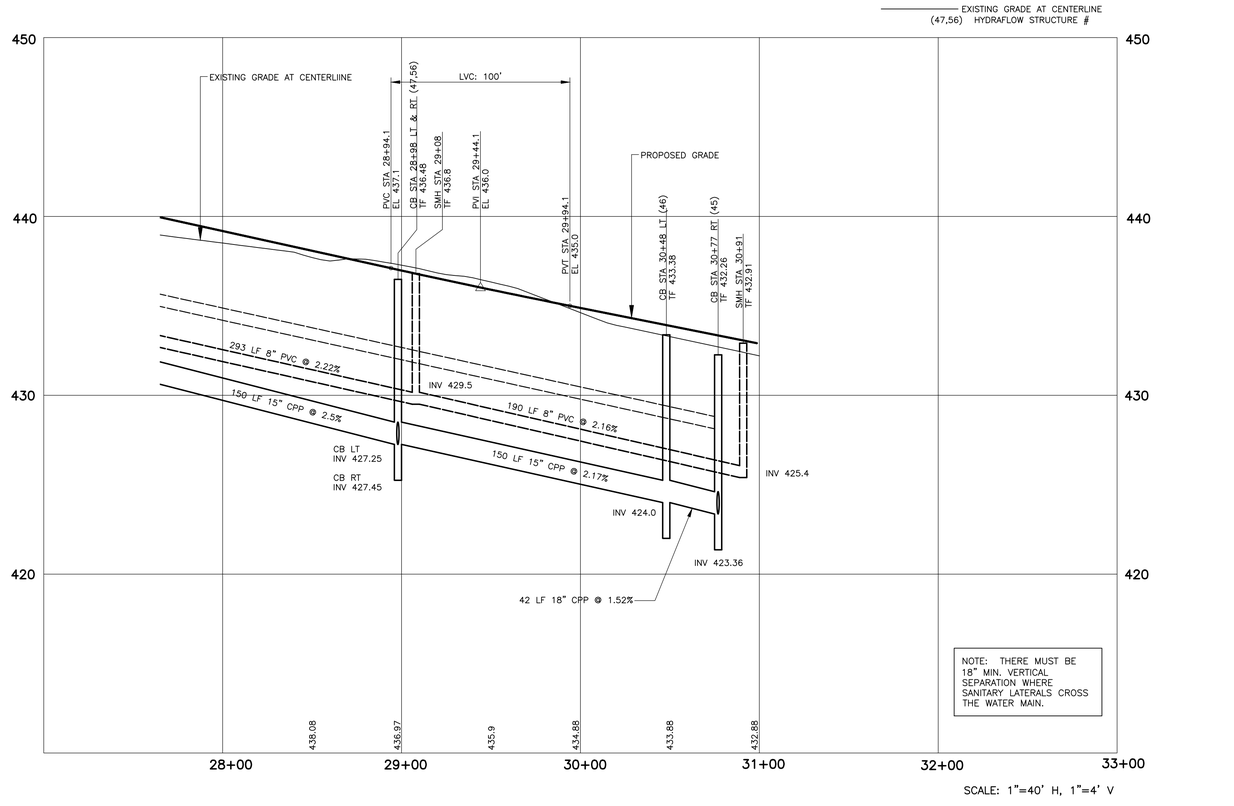


SCALE: 1"=40' 40 0 40 80

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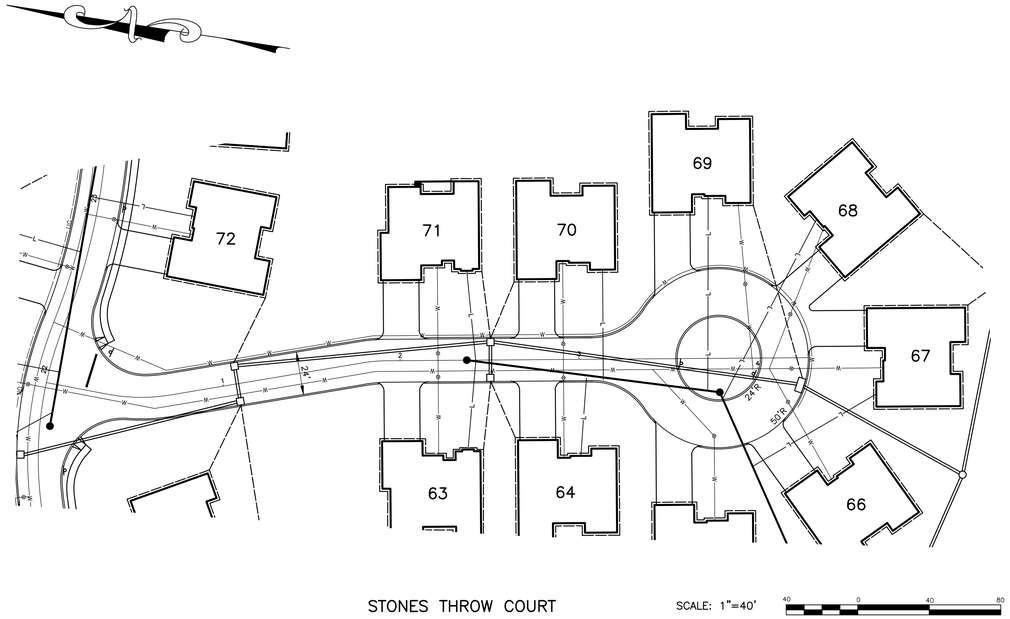
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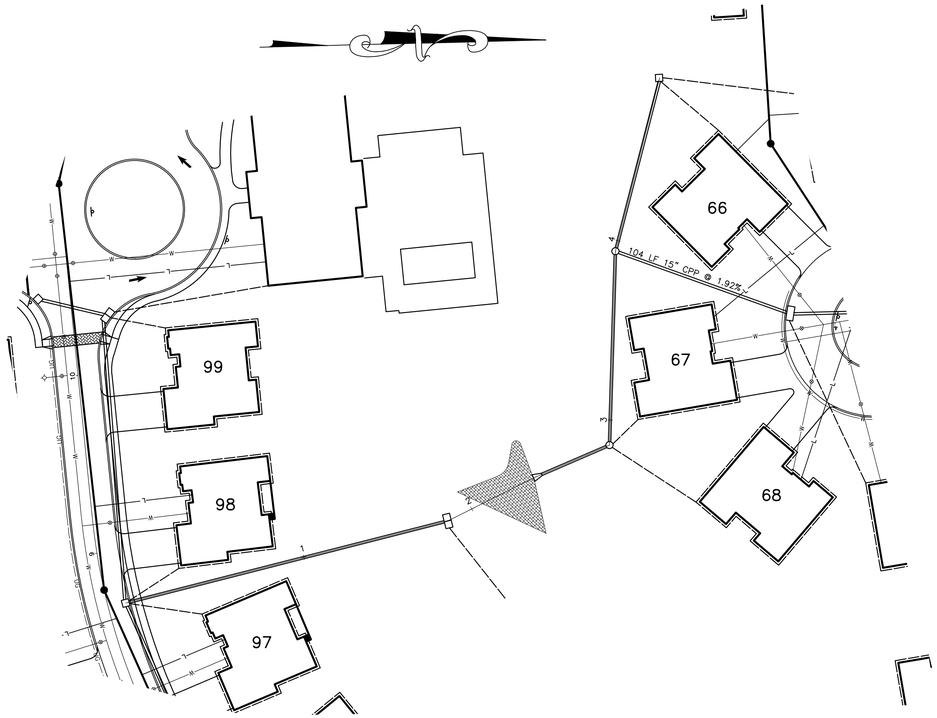
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STONES THROW COURT

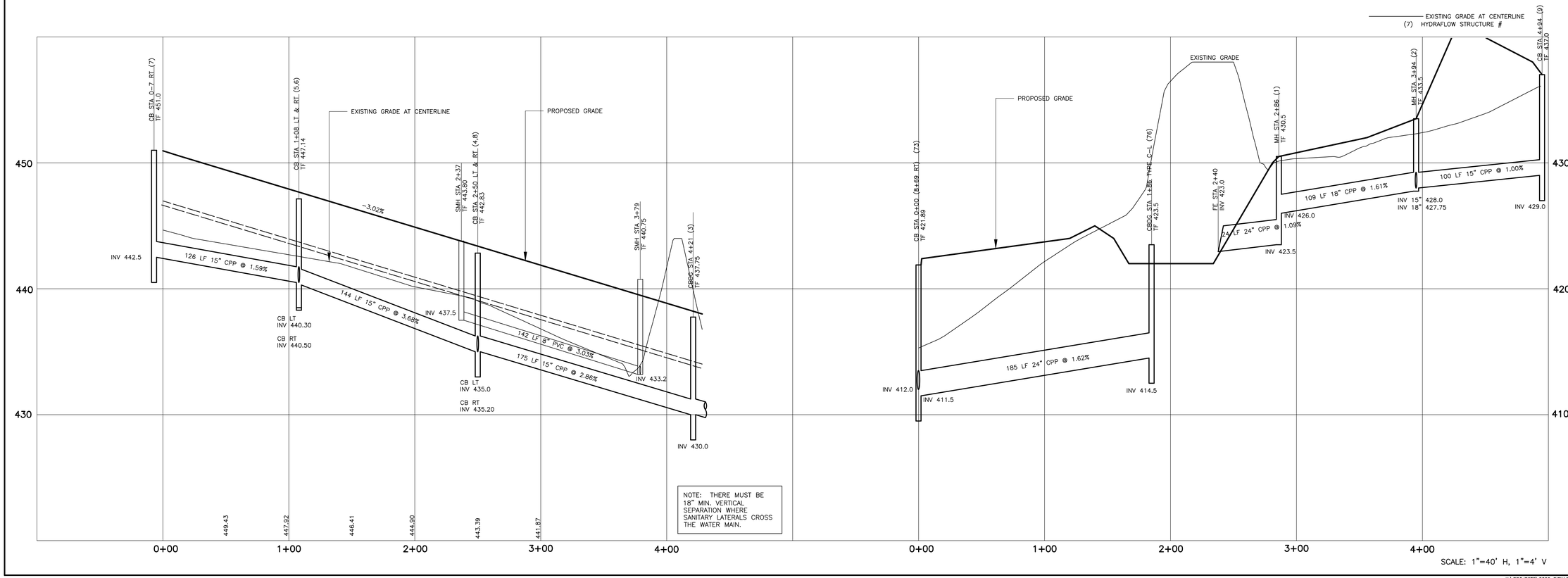
SCALE: 1"=40'



SEE THIS DWG

CROSS COUNTRY RUN 1

SCALE: 1"=40'



NOTE: THERE MUST BE 18" MIN. VERTICAL SEPARATION WHERE SANITARY LATERALS CROSS THE WATER MAIN.

SCALE: 1"=40' H, 1"=4' V

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P-7

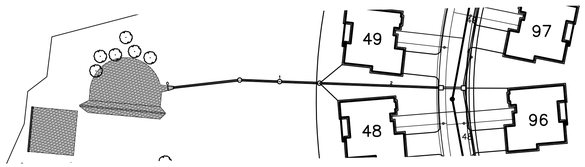
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SEE DWG P-3



CROSS COUNTRY RUN 2

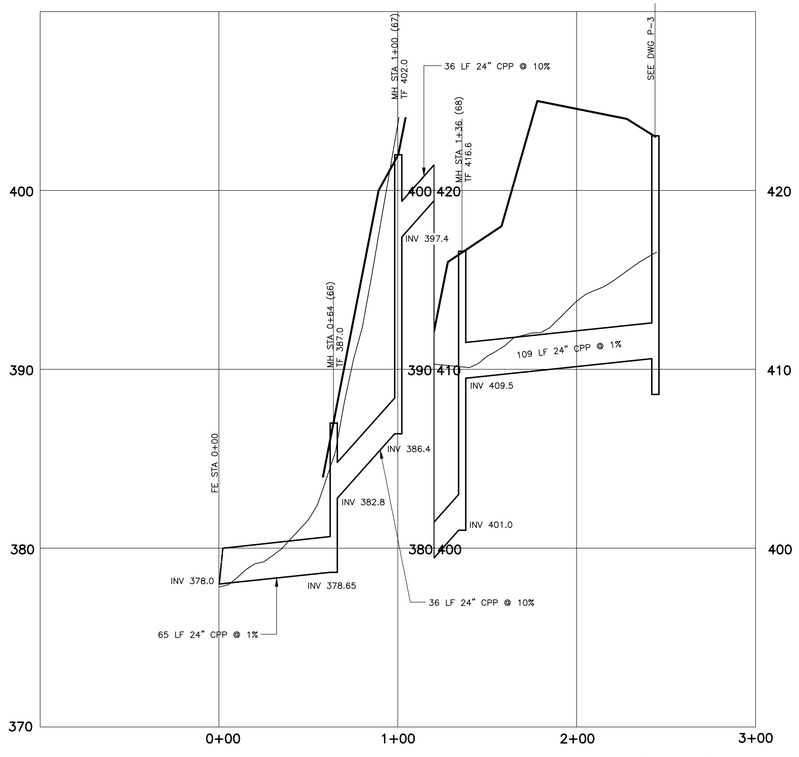
SCALE: 1"=40'

SEE DWG P-4

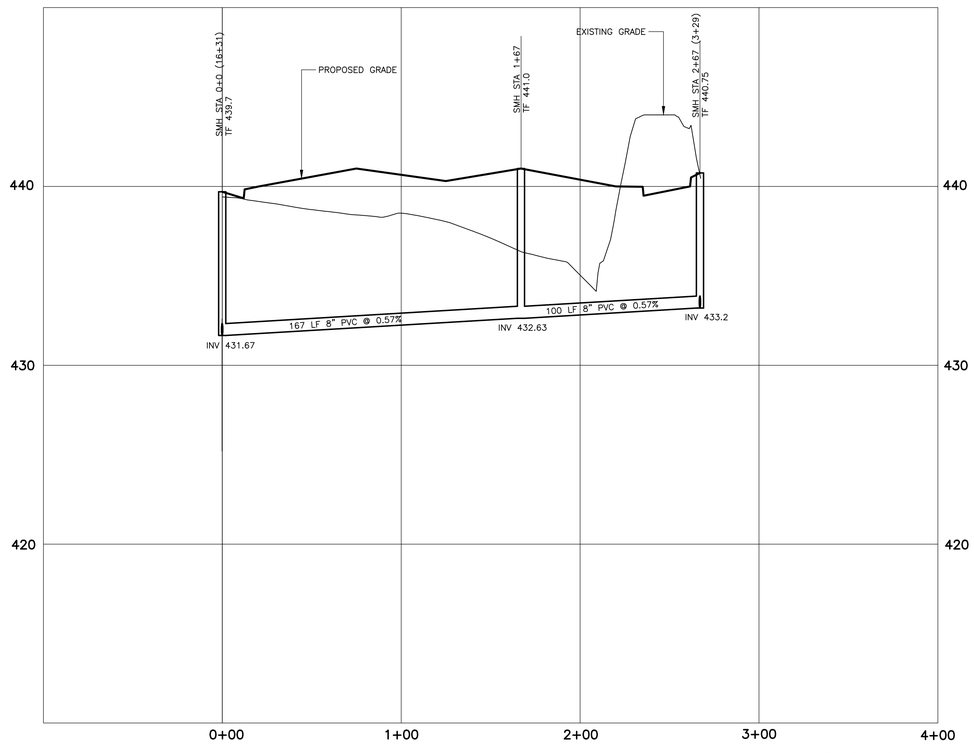


SANITARY RUN 1

SCALE: 1"=40'



SCALE: 1"=40' H, 1"=4' V



SCALE: 1"=40' H, 1"=4' V

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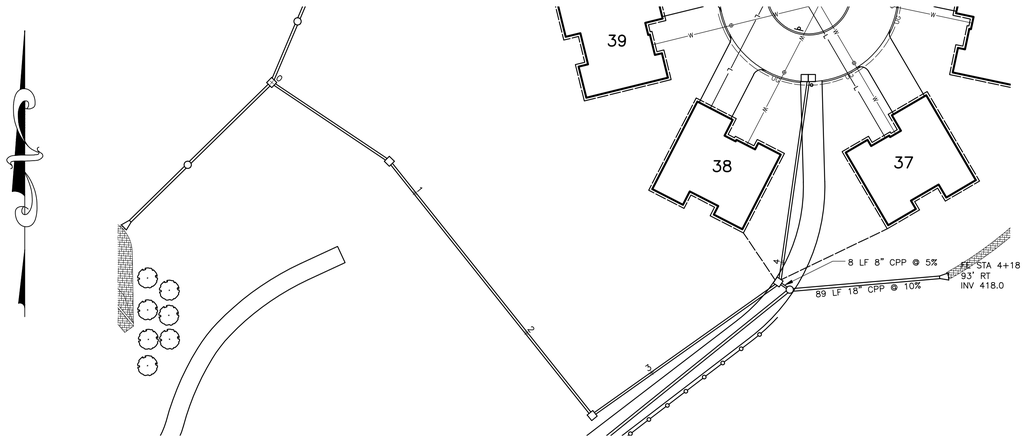
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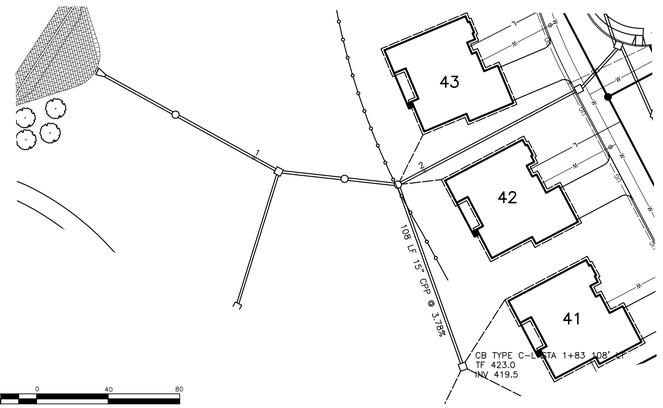
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CROSS COUNTRY RUN 4

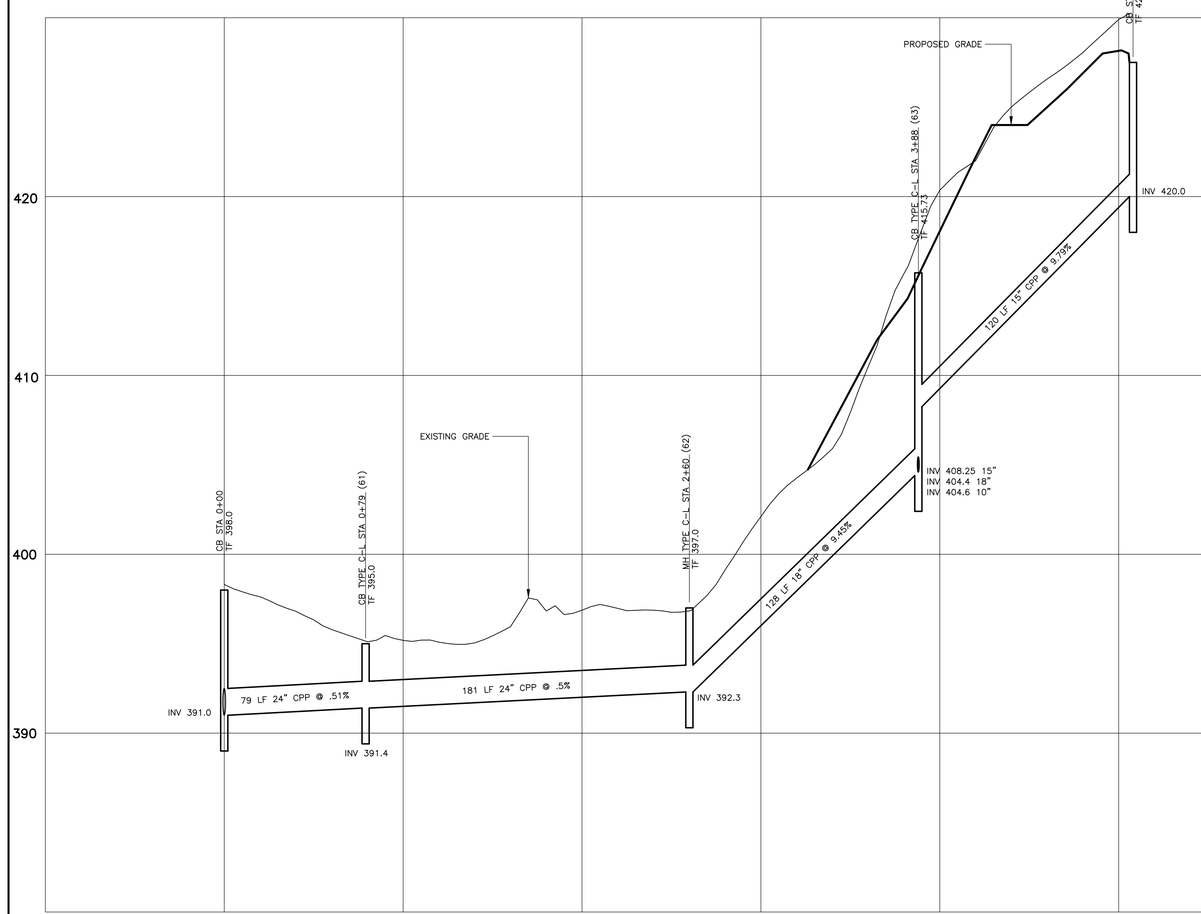


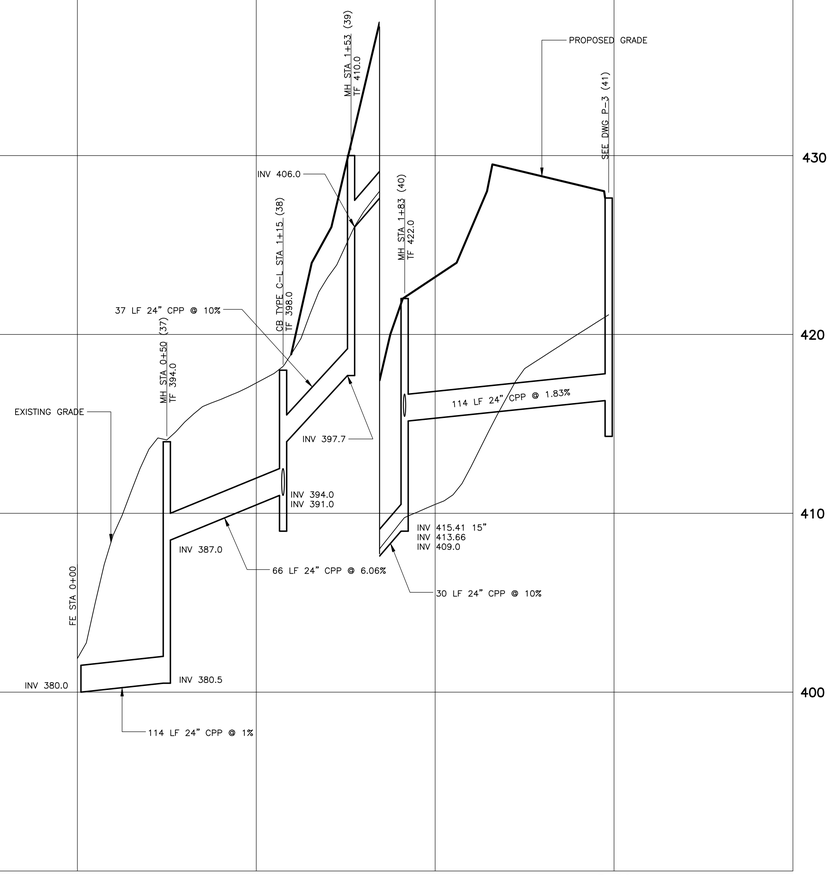
CROSS COUNTRY RUN 3

SCALE: 1"=40'

40 0 40 80

EXISTING GRADE AT CENTERLINE
(65) HYDRAFLOW STRUCTURE #





SCALE: 1"=40' H, 1"=4' V

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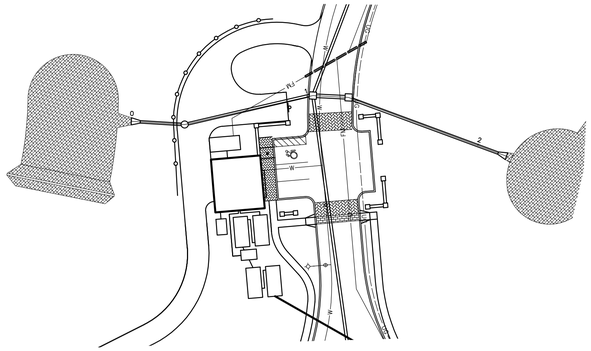
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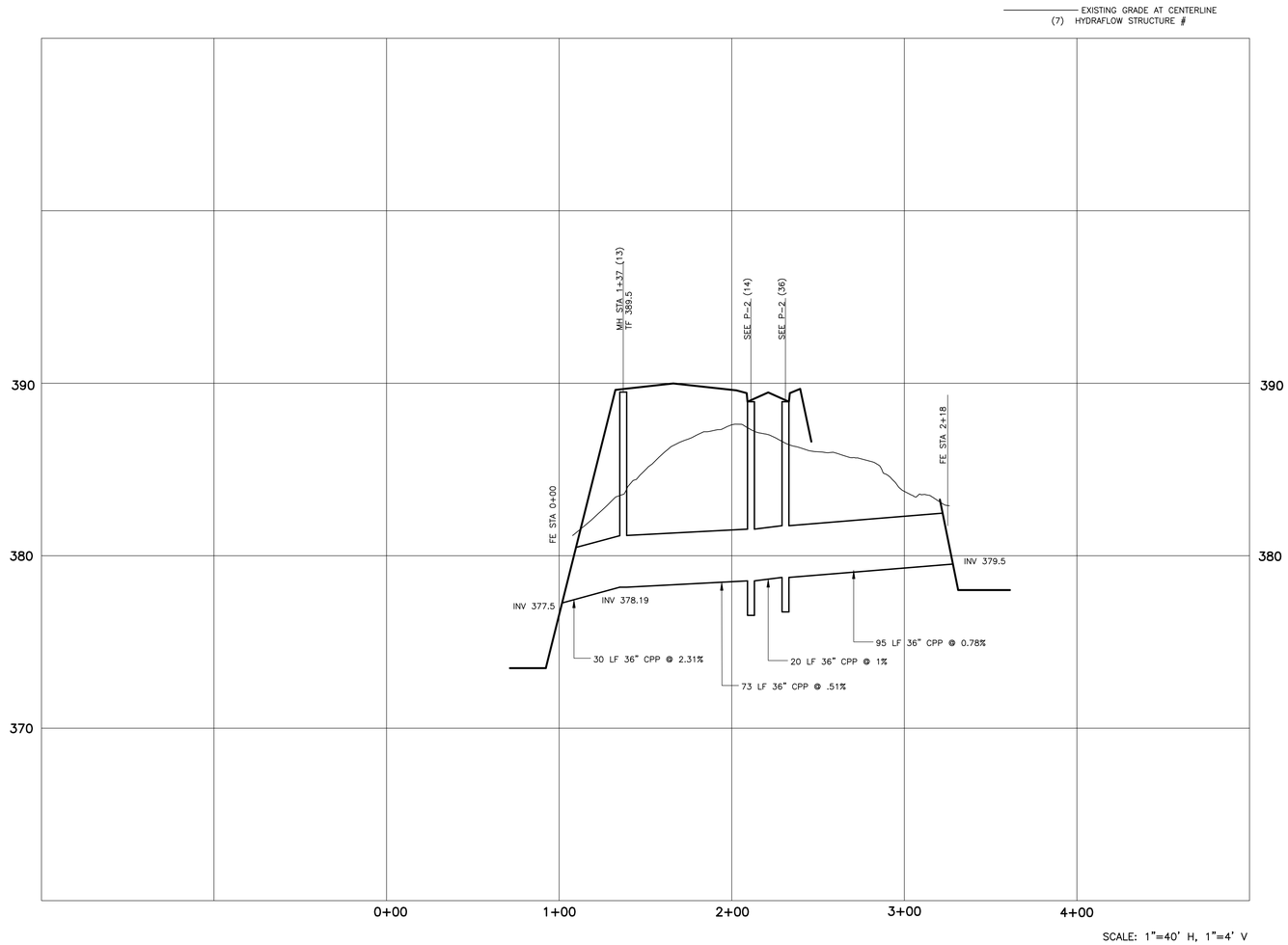
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SCALE: 1"=40' 40 0 40 80



SCALE: 1"=40' H, 1"=4' V

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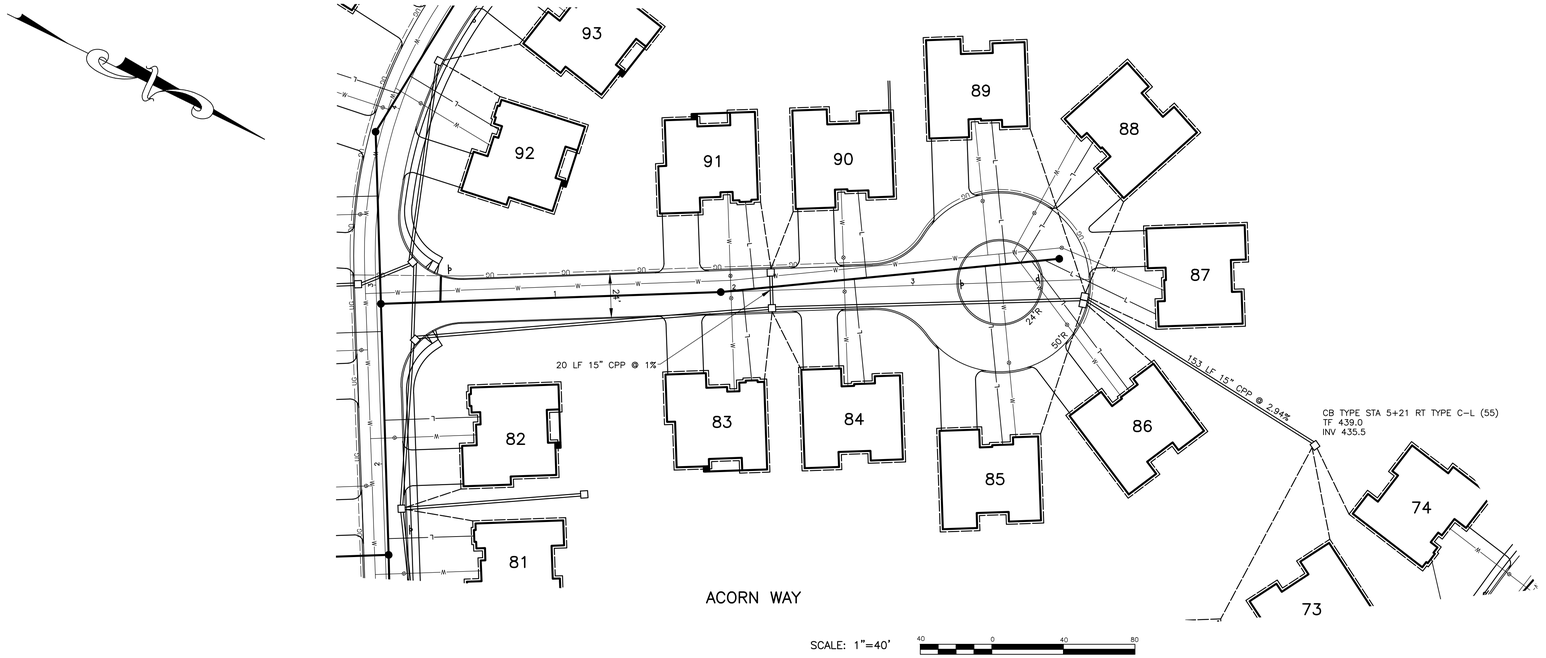
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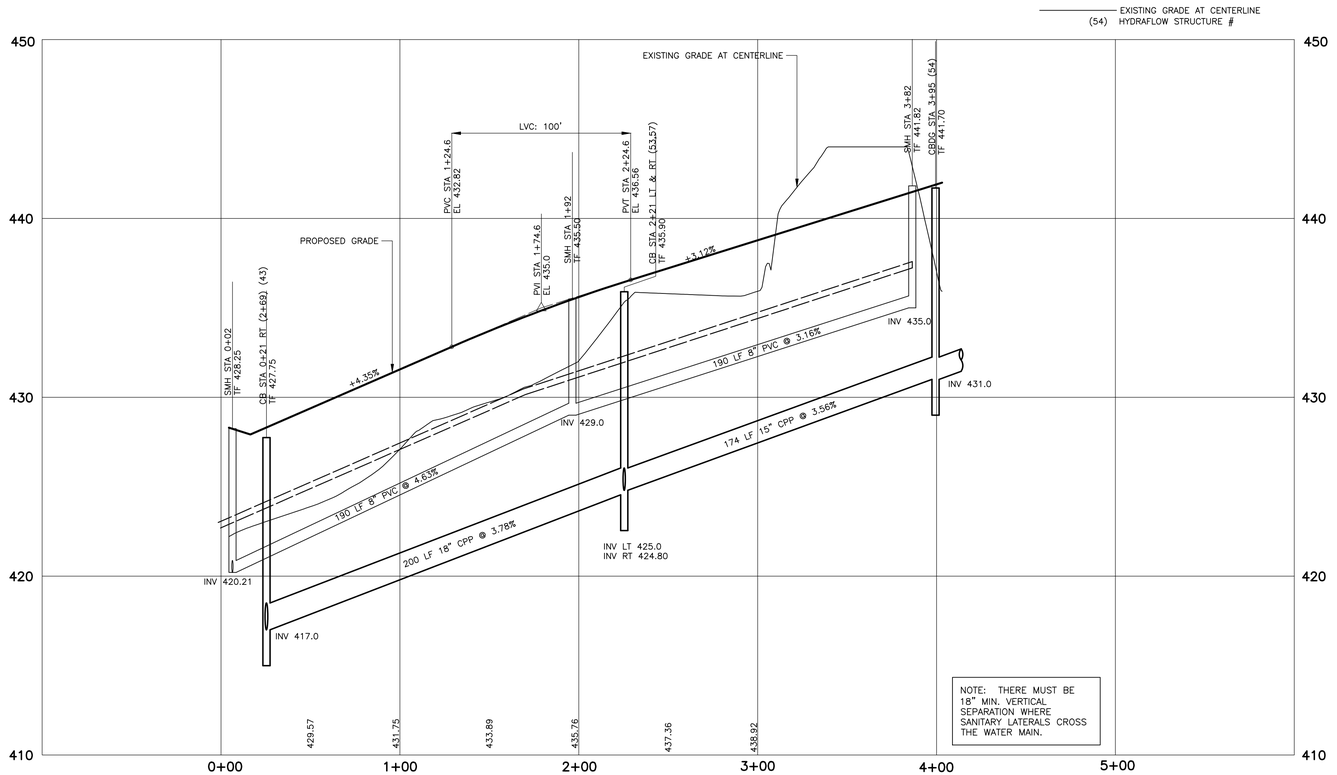
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TITLE

PLAN-PROFILE

SHEET NUMBER

P-11

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GENERAL NOTES

1. These plans are for regulatory approval only and are not to be used for construction.

2. The proposed improvements indicated on these plans are shown as one of many possible layouts. Any variation from these plans is to be approved by a professional engineer.

3. Topographic data and property lines based upon "Existing Conditions Plan, Prepared For Quarry Ridge Associates, LLC, #121,139, 141, and 201 Turkey Roost Road, Monroe, Connecticut, Scale:1"=150' dated 8-17-21 certified Horizontal Accuracy Class A-2 and Topographical Classes T-2 and T-3, by Shevlin Land Surveying, LLC.

4. Owner/Applicant: Quarry Ridge Associates, LLC
C/o David Bienashski, mbr
43 Fox Street
Fairfield, CT 06824

5. Total area of site is 153.65 acres.

6. Total area of on-site wetlands is 15.72 acres.

7. The site is located in zone RF2/MFR,

8. Inland wetlands were delineated in the field by Eric Davison, Registered Soil Scientist, of Davison Environmental. Wetland flags were located by Shevlin Land Surveying LLC.

9. The site will be served with public water and a private underground sewage disposal system.

10. The location of underground utilities, if any, is unknown. Call Before You Dig 1-800-922-4455.

11. Retaining walls are to be designed by a structural engineer.

12. It is the contractor's responsibility to verify all on-site and off-site field conditions and establish that no changes have occurred since the issuance of this plan. The design engineer is to be notified of any field conditions which conflict with this plan.

13. Proposed utilities, catv, gas and electric are to be underground.

14. Utility transformer locations to be approved by the Town of Monroe prior to installation.

15. Water main and hydrant location subject to the local water company and Fire Marshall requirements and approvals.

16. Prior to commencement of construction, a preconstruction conference is to be held with the design engineer, the owner, the contractor, the Town Engineer and representatives from the Planning and Zoning and Conservation Administrations to review construction and time tables.

17. Construction will begin shortly after necessary approvals are obtained. Construction is anticipated to be completed within five years from the time of commencement.

18. The site drains to Smiths Pond Brook

STORMWATER POLLUTION CONTROL PLAN

1. The proposal will create ninety nine dwelling units with a club house. The dwellings will be accessed by 5985 linear feet of new roadway. The development will be serviced by public water and a private subsurface sewage disposal system falling under the jurisdiction of the Connecticut Department of Environmental Protection. An extensive portion of the site has been previously cleared and brought to grade under a restoration plan approved by the Monroe Planning and Zoning Commission on May 1, 2003.

2. All erosion and sediment control measures will be constructed in accordance with the standards and specifications of the "2002 Connecticut Guidelines for Soil Erosion and Sediment Control."

3. The Stormwater Pollution Control Plan shall include all erosion and sedimentation control shown on the approved maps and detail sheets. These controls are assumed to be the minimum required, and the contractor may be required to install additional measures as site conditions and weather warrant.

4. All erosion and sediment control devices will be installed prior to the start of clearing and grubbing operations and excavation work. All the devices will be maintained as specified in this document until the disturbed earth has been paved or vegetated, at which time the devices will be removed.

5. All construction methods, materials and system installations are to conform to all applicable local and state regulations.

6. Grading to be according to all applicable regulations and normal standards of good practice.

7. Land disturbance will be kept to a minimum; re-stabilization will be scheduled as soon as practicable.

8. Stockpiles of topsoil and common fill shall be surrounded with silt fence and temporarily stabilized by seeding with a 50-50 mix of annual and perennial rye grass at the rate of one pound per 1,000 square feet of surface area shall be employed between March 15 and June 15 or August 1 and October 1. Mulch with straw or hay at the rate of 70 to 90 pounds per 1,000 square feet until stabilized.

9. All control measures will be maintained in effective condition throughout the construction period until the area is stabilized.

10. Maintenance of the erosion controls shall consist of inspection at the start of each work day with special attention afforded following storm events. Noted deficiencies shall be corrected immediately. Accumulated sediment shall be removed from the erosion control device and dispersed temporarily on the upland portion of the disturbed area. Additional seeding or mulching shall be employed as required.

11. Where riprap is specified on the plan, it shall be modified riprap conforming to the guidelines unless otherwise noted.

12. The contractor is to inspect the site daily during construction to insure the integrity of the erosion controls.

13. The contractor is to have available at all times extra silt fence, hay bale mulch, grass seed and riprap to implement additional erosion control measures not foreseen in this plan.

14. Prior to closing the site down for winter, if required, the contractor shall schedule a meeting with the project engineer to review site conditions and make recommendations to minimize erosion during the winter. The meeting is to be held no later than October 1,of any given year.

15. Accumulated sediment is to be disposed of in an area approved by the design engineer.

16. This plan and report may be modified by the engineer based upon field conditions.

17. Catch basins shall be protected with silt sacks, haybales, and/or silt fence during construction until all disturbed areas are stabilized.

18. The design engineer will inspect the entire site at additional cost to the developer/owner every 30-days during the construction. He shall recommend repairs and additional measures, if necessary.

19. Water breaks, silt fence, haybales and other measures are to be maintained until drainage is complete and site is stabilized with vegetable cover.

20. Plunge pools and/or riprap aprons are to be constructed at the outlets of all major drainage systems.

21. Stabilization practices may include silt fences, temporary seeding, permanent seeding, mulching, geotextiles, sod stabilization, vegetative buffer strips, protection of trees, preservation of mature vegetation and other vegetative and non-structural measures as identified in the Guidelines. Where construction activities have permanently ceased or have temporarily been suspended for more than seven days or when final grades are reached in any portion of the site, stabilization practices shall be implemented within three days. Areas which remain disturbed but inactive for at least thirty days shall receive temporary seeding and/or mulching in accordance with the Guidelines. Areas that will remain disturbed beyond the planting season, shall receive long-term, non-vegetative stabilization sufficient to protect the site through the winter. Areas to be graded with slopes steeper than 3:1 (horizontal:vertical) and higher than fifteen feet shall be graded with appropriate slope benches in accordance with the Guidelines.

22. Structural practices include but are not limited to earth dikes (diversions), drainage swales, sediment traps, check dams, subsurface drains, pipe slope drains, level spreaders, storm drain inlet protection, outlet protection, reinforced soil retained systems, gabions, and temporary or permanent sediment basins and chambers. Unless specifically approved in writing, structural measures shall be installed in upland soils.

23. De-watering waste waters might be generated during the construction of the underground utilities and the excavation for basements. Contractors shall arrange for the pumping of water in excavations to occur in temporary sediment traps or pumping settling basins.

24. All contractors and subcontractors working on site will ensure that no litter, debris, building material or similar material is discharged to the waters of the State.

25. Contractors will implement techniques to control the generation of dust. Such methods may include mechanical sweeping on paved areas, application of water on exposed soil surfaces on unpaved travelways, and application of non-asphaltic soil tackifier such as calcium chloride.

26. All post construction storm water structures will be cleaned of construction sediment and any remaining silt fence shall be removed prior to filing the termination notice pursuant to Section 5 of the General Permit.

27. Stabilization practices are listed in the construction sequencing for the construction of the roadways and drainage systems for the site. House sites will have their anti-tracking pads installed at all points where construction traffic exits the lot to paved surfaces and silt fence installed as shown on the plans or as required downhill of areas of disturbed earth. Refer to the detail drawings for specifics on proposed measures.

POST CONSTRUCTION STORM WATER MANAGEMENT PLAN/SITE MAINTENANCE PLAN:

This Site Maintenance Plan and Schedule highlights the maintenance procedures for the development. However, this does not preclude the maintenance personnel's responsibility to perform maintenance procedures properly, add other procedures as necessary and conduct maintenance in accordance with current state laws and regulations.

After construction is completed, the HOA will be assigned the responsibility for implementing this Site Maintenance Plan. This responsibility includes the inspection and maintenance of control measures and informing parties engaged in activities on the site of the requirements and objectives of the plan. When the land is transferred to the Homeowners Association, this Site Maintenance Plan shall be conveyed to the Association. It shall become the responsibility of the new owners to implement the Plan. The Plan, as with any land use approval, shall run with the land.

Roadway and Parking Areas

The roadway and parking areas shall be swept with a mechanical sweeper or broom at least twice a year. One cleaning will be in the fall after the leaves are off the trees. The second will be in the spring after the last snow fall. Use of high velocity blowers is not recommended as they often "defeat the basic purpose of sweeping in an environmentally sound manner."

The sweepings shall be collected and removed from the site. The disposal method shall be determined by the personnel conducting the sweeping and shall comply with all applicable laws. In no case shall the sweepings or fall cleanup materials be allowed to enter the Storm Water Detention Basins.

Pavement markings, directional arrows and stop bars shall be inspected annually. All pavement markings and directional signs shall be replaced as necessary to insure they are clear, visible and reflective to maintain safe traffic flow.

Paved surfaces shall be crack sealed on a yearly basis and inspected for "Pot Holes". Required patching shall be done on a yearly basis every spring. Paved surfaces should be replaced every 20 years, or as site conditions warrant.

Catch Basins

The catch basins shall be cleaned twice per year. The cleaning shall be in the late fall after leaves have fallen and before snowfall. The second cleaning shall be in springtime after snow melt to remove accumulated debris and sand from the catch basin sumps. In no case, shall the sediment level exceed 50% of the sump volume of the catch basins.

A vactor truck may be used to clean the catch basins. Disposal of liquids and solids contained in the vactor truck requires specific disposal protocol and discharge permits. Operators shall be aware of the regulations. Decanted water from the catch basins may not be returned to the catch basin.

Stormwater Treatment Ponds

The ponds, forebays, and any associated outlet structures should be inspected annually in the fall to evaluate plant sustainability, water levels, slope stability and overall operation. In the case of the forebay areas sediment shall be removed when one-half capacity of the forebays have been reached.

During the first two growing seasons after the initial seeding of the basin and its surrounding upland meadow, reseeding bare and thinly vegetated areas with the specified seed mixture. The dead plant material should be removed from these areas. Any maintenance of the areas should be conduced outside of vegetative growing and wildlife seasons.

No fertilizer shall be applied to the basin or the upland review area.

The storm drainage pipe outlets hall be inspected for erosion at least annually and after major storm events.

INSPECTION

Qualified personnel (provided by the permittee) shall inspect disturbed areas of the construction activity that have not been finally stabilized, structural control measures and locations where vehicles enter or exit the site at least once every seven calendar days and within 24 hours of the end of a storm that is 0.1 inches or greater. Where sites have been temporarily or finally stabilized, such inspection shall be conducted at least once every month for three months.

Disturbed areas and areas used for storage of materials that are exposed to precipitation shall be inspected for evidence of or the potential for pollutants entering the drainage system. Erosion and sediment control measures shall be observed to ensure they are operating correctly. Where discharge locations or points are assessable they shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters. Locations where vehicles enter or exit the site shall be inspected for evidence of off-site sediment tracking.

Based on the results of the inspection, the description of potential sources and pollution prevention measures identified in the plan shall be revised as appropriate as soon as practicable after such inspection. Such modifications shall provide for timely implementation of any changes to the site within 24 hours and any changes to the plan within 3 calendar days following the inspection. The plan shall be revised and the site controls updated in accordance with sound engineering practices, the Guidelines.

A report summarizing the scope of the inspection, name(s) and qualifications of personnel making the inspection, the date(s) of the inspection, major observations relating to the implementation of the plan and actions taken will be made and retained as part of the plan for at least three years after the date of the observation. The report will be signed by the Permittee or his authorized representative.

Reporting and record keeping requirements

The Permittee shall retain copies of the plan and all reports required by the General Permit, and records of all data used to complete the registration to be authorized by the General Permit, for a period of at least three years from the date that construction at the site is completed unless the Commissioner specifies another time period in writing.

The Permittee shall retain an updated copy of the plan required by the General Permit at the construction site from the date construction is initiated at the site until the date construction at the site is completed.

Contractors:

The plan shall clearly identify each Contractor and Subcontractor that will perform actions on the site which may reasonably be expected to cause or have the potential to cause pollution of the waters of the state and shall include a copy of the certification statement shown below signed by each Contractor and Subcontractor. All certifications will be included in the plan.

Responsibility:

David Bienashski, phone#(203)556-1976, is assigned the responsibility for implementing this Stormwater Pollution Control Plan during the construction of the road and storm water control facilities. This responsibility includes the installation and maintenance of control measures, informing all parties engaged on the construction site of the requirements and objectives of the plan.

_____ _____
Registrant date

CERTIFICATION STATEMENT:

"I certify under penalty of law that I have read and understand the Terms and Conditions of the General Permit for the Discharge of Storm Water and Dewatering Waste Waters from Construction Activities. I understand that as a contractor or subcontractor at the site, I am authorized by this General Permit and must comply with the Terms and Conditions of this General Permit, including but not limited to the requirements of the Stormwater Pollution Control Plan prepared for the site."

The certification will include the name and title of the person providing the signature; the name, address and telephone number of the contracting firm; the address (or other identifying description)of the site and the date the Certification is made.

_____ _____ _____
Contractor date

_____ _____ _____
Contractor date

_____
Contractor _____

ON-SITE CONSTRUCTION SEQUENCE

The following sequence is a suggested procedure for the construction of a full built-out of the Quarry Ridge project. Deviations may apply from the sequence outlined below dependant upon the quantity and timing of actual unit construction.

Sequence may occur simultaneously with the water main extension from Fan Hill Road to the project site.

PHASE ONE: (9.3 ac.)

1. Install anti-tracking apron as shown where construction traffic enters the public right-of-way.
2. Install silt fencing, wood chip berms extending northerly from the site entrance up to and including the sewage treatment plant and stormwater pond #2 and then extending northerly along the westrnmost riprap swale until unit 7. Construct temporary sediment trap (TST) numbers 1-5 and associated temporary sediment routing measures as indicated on the erosion control plans.
3. Construct riprap swale that commences behind unit 1 and traverses the perimeter of the western portion of the site terminating in proximity of unit 7. Install stone dams every 100 feet behind units 1-5 to retard flow velocities.
4. Clear and stump Phase One construction area not previously prepared. Care should be taken as to not adversely impact soils in the areas of the subsurface wastewater absorption systems.
5. No burying of stumps, slash and grubbing material is allowed on any site. Materials must be chipped or removed from the site and disposed of at a permitted location.
6. Scrape and stockpile loam, if required, in construction areas.
7. Surround loam stockpile with silt fence, seed piles for dust control or treat with calcium chloride.
8. Storm water runoff from the construction areas is to be directed with swales and diversion berms as necessary to flow into the temporary sediment traps.
9. Construct retaining walls adjacent to entrance roadway from station 1+0-2+0.
10. Rough grade Trout Pond Road from Sta. 0+0-13+0.
11. Demolish and remove existing dwelling and driveway (#141 Turkey Roost Road).
12. Rough grade underground wastewater absorption system sites, and wastewater pretreatment facility.
13. Construct wastewater pretreatment facility and wastewater absorption systems.
14. Install drainage pipes and structures beginning at the outlets Install other underground utilities.
15. Install sanitary piping beginning at the wastewater pretreatment facility and proceeding to adsorption fields.
16. Place silt sacks in new catch basins.
17. Fine grade proposed paved areas and remove water breaks.
18. Install binder course in paved areas, curb roadway and shape shoulders.
19. Loam, seed, and mulch disturbed earth in areas that will not be paved.
20. Remove temporary sediment traps 1-3. The temporary sediment traps located within the proposed stormwater treatment ponds will have the accumulated sediment removed and the final grading and berms constructed along with outfall structures and protection. If de-watering practices are required for final construction/planting of the treatment ponds, utilize pumping settling basins as shown on erosion control plans.
21. Apply final grading for stormwater pond 1 and install associated plantings.

PHASE TWO: (8.6 ac.)

1. Install anti-tracking apron where construction traffic enters paved areas.
2. Install silt fencing, wood chip berms extending northerly from the sewage treatment plant to the intersection of Windswept Circle then extending easterly to unit 94. Construct temporary sediment trap (TST) numbers 6,7,10, & 17 and associated temporary sediment routing measures as indicated on the erosion control plans.
3. Clear and stump Phase Two construction area not previously prepared.
4. No burying of stumps, slash and grubbing material is allowed on any site. Materials must be chipped or removed from the site and disposed of at a permitted location.
5. Scrape and stockpile loam, if required, in construction areas.
6. Surround loam stockpile with silt fence, seed piles for dust control or treat with calcium chloride.
7. Storm water runoff from the construction areas is to be directed with swales and diversion berms as necessary to flow into the temporary sediment traps.
8. Rough grade remainder of Trout Pond Road and portion of Windswept Circle.
9. Remove TST #6.
10. Rough grade dwelling building pads of units 1-7, 48-55, & 95-99.
11. Install sanitary piping beginning at the wastewater pretreatment facility and proceeding upstream.
12. Install drainage pipes and structures beginning at the outlets. Install other underground utilities.
13. Place silt sacks in new catch basins.
14. Commence building construction.
15. Fine grade proposed paved areas and remove water breaks.
16. Fine grade dwelling sites.
17. Install binder course in paved areas, curb roadway and shape shoulders.
18. Install sidewalks.
19. Loam, seed, and mulch disturbed earth in areas that will not be paved.
20. Remove temporary sediment traps. The temporary sediment traps located within the proposed stormwater treatment ponds will have the accumulated sediment removed and the final grading and berms constructed along with outfall structures and protection. If de-watering practices are required for final construction/planting of the treatment ponds, utilize pumping settling basins as shown on erosion control plans.

PHASE THREE: (12.1 ac.)

1. Install anti-tracking apron where construction traffic enters paved areas.
2. Install silt fencing, wood chip berms extending easterly along Windswept Circle to the roadway intersection by unit 40. Construct temporary sediment trap (TST) numbers 13, 15. 16. and associated temporary sediment routing measures as indicated on the erosion control plans.
3. Clear and stump Phase Three construction area not previously prepared.
4. No burying of stumps, slash and grubbing material is allowed on any site. Materials must be chipped or removed from the site and disposed of at a permitted location.
5. Scrape and stockpile loam, if required, in construction areas.
6. Surround loam stockpile with silt fence, seed piles for dust control or treat with calcium chloride.
7. Storm water runoff from the construction areas is to be directed with swales and diversion berms as necessary to flow into the temporary sediment traps.
8. Construct easternmost riprap perimeter swale extending northerly to unit 35.
9. Rough grade remaining portion of Windswept Circle, cul-de-sac and emergency access drive.
10. Rough grade remaining portion of Windswept Circle, cul-de-sac and emergency access drive.
11. Remove TST number 15.
12. Rough grade dwelling building pads of units 35, 37-41 & 81-82.
13. Install preformed scour hole on eastern portion of site.
14. Install drainage piping and structures extending from outlets upstream. Install other underground utilities.
15. Install sanitary piping.
16. Place silt sacks in new catch basins.
17. Commence building construction.
18. Fine grade proposed paved areas and remove water breaks.
19. Fine grade dwelling sites.
20. Install binder course in paved areas, curb roadway and shape shoulders.
21. Install sidewalks.
22. Loam, seed, and mulch disturbed earth in areas that will not be paved.
23. Remove temporary sediment traps. The temporary sediment traps located within the proposed stormwater treatment ponds will have the accumulated sediment removed and the final grading and berms constructed along with outfall structures and protection. If de-watering practices are required for final construction/planting of the treatment ponds, utilize pumping settling basins as shown on erosion control plans.

J. EDWARDS & ASSOCIATES LLC
ENGINEERING • SURVEYING • SITE PLANNING

227 Stepney Road Easton, CT 06612
Phone:203.268.4205 Fax: 203.268.5604
www.jedwardsassoc.com

STATE OF CONNECTICUT — JOSEPH E. EDWARDS — No. 10937 — LICENSED PROFESSIONAL ENGINEER

STATE OF CONNECTICUT — JASON EDWARDS — LICENSED LAND SURVEYOR

139, 141, & 201 TURKEY ROOST ROAD
& 30 COBBLERS HILL COURT
MONROE, CONNECTICUT

PREPARED FOR

QUARRY RIDGE ASSOCIATES, LLC

REVISIONS

#	DATE	DESCRIPTION
1	06-28-23	IWWC
2	07-26-23	IWWC
3	08-15-23	TOWN ENG.
4	08-30-23	IWWC

DATE: MAY 1, 2023
PROJECT #: 3302
DRAWING FILE:
DRAWN BY: NDC
SCALE:

TITLE

DETAILS

SHEET NUMBER

D-1

K:\PROJECTS\3302 BIENASHSKI\DRAWINGS\ALTERNATE 5\D-1.DWG

PHASE FOUR: (3.6 ac.)

1. Install anti–tracking apron where construction traffic enters paved areas.
2. Install silt fencing extending westerly along Acorn Way and adjacent to units 92–94. Construct temporary sediment trap (TST) number 14 and associated temporary sediment routing measures as indicated on the erosion control plans.
3. Clear and stump Phase Four construction area not previously prepared.
4. No burying of stumps, slash and grubbing material is allowed on any site. Materials must be chipped or removed from the site and disposed of at a permitted location.
5. Storm water runoff from the construction areas is to be directed with swales and diversion berms as necessary to flow into the temporary sediment trap.
6. Rough grade Acorn Way.
7. Rough grade dwelling building pads of units 83–91.
8. Remove TST number 14.
9. Rough grade dwelling building pads of units 92–94.
10. Install sanitary piping beginning at Windswept Circle and proceed upstream.
11. Install drainage piping and structures extending from Windswept Circle upstream. Install other underground utilities.
12. Place silt sacks in new catch basins.
13. Commence building construction.
14. Fine grade proposed paved areas and remove water breaks.
15. Fine grade dwelling sites.
16. Install binder course in paved areas, curb roadway and shape shoulders.
17.
18. Loam, seed, and mulch disturbed earth in areas that will not be paved.

PHASE FIVE: (9.8 ac.)

1. Install anti–tracking apron where construction traffic enters paved areas.
2. Install silt fencing extending northerly along Trout Pond Drive to unit 20 and for Stones Throw Court. Construct temporary sediment trap (TST) numbers 7,8, & 9 and associated temporary sediment routing measures as indicated on the erosion control plans.
3. Clear and stump Phase Five construction area not previously prepared.
4. No burying of stumps, slash and grubbing material is allowed on any site. Materials must be chipped or removed from the site and disposed of at a permitted location.
5. Storm water runoff from the construction areas is to be directed with swales and diversion berms as necessary to flow into the temporary sediment traps.
6. Construct riprap western perimeter swale from unit 8 to unit 20.
6. Rough grade Windswept Circle from Sta. 12+20 to intersection of Stones Throw Court and rough grade Stones Throw Court.
7. Rough grade dwelling building pads of units 9–13, 16, 18–20, and 56–71.
8. Remove TST numbers 8 and 9.
9. Rough grade dwelling building pads of units 14, 15, & 17.
10. Install sanitary piping beginning at Windswept Circle Sta. 12+20 and proceed upstream.
11. Install drainage piping and structures extending from Windswept Circle Sta. 12+20 and from stormwater pond #5 extending upstream. Install other underground utilities.
12. Place silt sacks in new catch basins.
13. Commence building construction.
14. Fine grade proposed paved areas and remove water breaks.
15. Fine grade dwelling sites.
16. Install binder course in paved areas, curb roadway and shape shoulders.
17. Install sidewalks.
18. Loam, seed, and mulch disturbed earth in areas that will not be paved.

PHASE SIX: (6.8 ac.)

1. Install anti–tracking apron where construction traffic enters paved areas.
2. Install silt fencing extending along the remainder of Windswept Circle. Construct temporary sediment trap (TST) numbers 11, 12, & 13 and associated temporary sediment routing measures as indicated on the erosion control plans.
3. Clear and stump Phase Six construction area not previously prepared.
4. No burying of stumps, slash and grubbing material is allowed on any site. Materials must be chipped or removed from the site and disposed of at a permitted location.
5. Storm water runoff from the construction areas is to be directed with swales and diversion berms as necessary to flow into the temporary sediment traps.
6. Construct easternmost riprap perimeter swale extending northerly to unit 28.
7. Rough grade remainder of Windswept Circle.
8. Rough grade dwelling building pads of units 9–13, 16, 18–20, and 56–71.
9. Install remainder of sanitary piping for Windswept Circle.
10. Install remainder of drainage piping and structures for Windswept Circle. Install other underground utilities.
11. Place silt sacks in new catch basins.
12. Remove TST #12.
13. Construct remainder of easternmost riprap perimeter swale
14. Commence building construction.
15. Fine grade proposed paved areas and remove water breaks.
16. Fine grade dwelling sites.
17. Install binder course in paved areas, curb roadway and shape shoulders.
18. Install sidewalks.
19. Loam, seed, and mulch disturbed earth in areas that will not be paved.
20. Remove all temporary sediment traps. The temporary sediment trap located within the proposed stormwater treatment pond #5 will have the accumulated sediment removed and the final grading and berms constructed along with outfall structures and protection.

FINAL PHASE

1. Place final blacktop course for all roadways.
2. Install all landscape features and associated plantings for the stormwater basins.
3. Clean all catch basins of accumulated sediment.
4. Install all road signage and apply pavement markings.
3. Remove erosion controls when uphill areas are stabilized.

STORMWATER TREATMENT POND CONSTRUCTION

Materials

Earthen berms shall be used for stormwater treatment ponds. They shall be constructed on stable soils and shall be free of topsoil, organic matter and debris. The fill material for the embankment shall be taken from approved borrow areas. It shall be clean mineral soil, free of roots, woody vegetation, stumps, sod, oversized stones, rocks or other organic or unsuitable material. The Material selected shall have enough strength for the embankment to remain stable and be tight enough, when properly compacted, to prevent excessive seepage of water through the dam. The embankment materials for this work shall conform to the following gradation.

Sieve size	Percent passing
6"	0–20
3/4"	60–85
#4	45–75
#40	30–60
#200	15–50

No stones larger than 6 inches shall be allowed within the compacted embankment. Within 2 feet of any structure, the maximum size shall be 3 inches.

The soil intended for the embankment shall be laboratory tested with a written report by a professional engineer licensed to practice in Connecticut, experienced in the field of soil mechanics. The report shall carry the Engineer's findings and suggested design parameters if at variance with those proposed in the design.

Construction methods

The top width of the berm is to be a minimum of 8 feet. The downstream (outer) slope of the berm shall be at a slope of two horizontal to one vertical. The upstream (inner) slope of the berm shall be at a slope of three horizontal to one vertical with a planted vegetative cover. This slope can be increased to 2:1 if protected by stone riprap.

The area beneath the berm shall be known as the subgrade. All soft and yielding material and other portions of the subgrade which will not compact readily when rolled, vibrated or tamped shall be removed and replaced with suitable material.

Construction shall not take place during cold periods where temperatures are consistently lower than 40 degrees Fahrenheit. All topsoil, organic matter and debris shall be removed from the area of the berm.

The surface of the subgrade shall be compacted uniformly by rolling with an approved power roller having a minimum compression of three hundred pounds per inch of width of tread on the rear wheel or wheels and weighing not less than ten tons, or with an equivalent vibratory roller or compactor. The contractor shall protect the subgrade from damage by exercising such precautions as are necessary. At all times the subgrade surface shall be kept in such condition that it will drain readily and correctly. The subgrade shall be checked by the Engineer before any berm material is placed thereon. Should the subgrade become churned up and mixed with the berm material at any time, the contractor shall remove the mixture and replace it with new subgrade material. Such replaced
subgrade material shall be thoroughly compacted.

The subgrade shall be excavated to a depth to allow the berm material to be notched into the subgrade a minimum of eighteen inches. The subgrade shall be covered with woven geotextile before the placement of the berm material.

Compaction

The fill material shall contain the proper amount of moisture to ensure that 90%–95% standard proctor compaction will be achieved. Special care shall be taken in compacting around the anti–seep collars, conduits and structures to avoid damage and achieve desired compaction.

The berm material shall be placed in layers of not over six inches in depth. The surface shall be compacted uniformly by rolling with an approved power roller having a minimum compression of three hundred pounds per inch of width of tread on the rear wheel or wheels and weighing not less than ten tons or with an equivalent vibratory roller or compactor.

The dry density after compaction shall not be less than 95 percent of the dry density for that berm material when tested in accordance with AASHTO T–180, Method D.

Planted vegetation cover

Prior to placing any topsoil all surfaces shall be scarified by raking, discing or other approved means to a minimum depth of 2 inches. On sloped areas the raking or discing shall be done parallel to the contours to minimize erosion. Topsoil shall be placed at a depth of six inches over all disturbed areas except the bottom of the basin.

The following materials shall then be applied:

Lime shall be standard commercial ground dolomitic limestone; fertilizer shall be a standard 10–6–4 mixture; in maintained area organic fertilizer shall be used and have a quality and mixture equal to spurzon, milorganite or turf builder. All fertilizer shall be delivered to the job in its original sealed containers.

Grass seed shall be from a new crop, fresh and clean. The seed is to be delivered to the site in its original containers which shall bear the dealer's guaranteed analysis indicating the proportions of each seed, the purity, and the germination. The following indicates the type of seed required and the minimum percentages of each:

Kind of grass	by weight	purity	germination
Chewings fescue	30%	97%	90%
Kentucky 31 fescue	30%	98%	90%
Kentucky bluegrass	20%	85%	80%
Domestic ryegrass	20%	98%	90%

Note: weeds and inert material shall not exceed 2%.

Areas seeded shall be mulched unless otherwise ordered by the Engineer. Wood–chip mulch shall not be used on seeded areas.

Hay (where used) shall be uniformly applied by an approved method to a placed depth of two inches (at a rate of two tons per acre).

EASTERN BOX TURTLE PROTECTION PLAN

Eastern Box Turtle, a State Special Concern species afforded protection under the Connecticut Endangered Species Act and listed as a Greatest Conservation Need species in Connecticut's Comprehensive Wildlife Conservation Strategy (CT DEEP 2005), is known to occur on the site. The following protective measures are recommended to satisfy requirements from the Connecticut Department of Energy & Environmental Protection ("CTDEEP") Wildlife Division and follow protocols developed from previous rare species consultations and state–approved protection plans. This plan is focused on preventing incidental mortality to eastern box turtle but will also serve to limit mortality to other herpetofauna located within the construction, including hognose snake, should they be present.

<u>This plan is intended to be implemented during the box turtle's active period which typically occurs between April 1st and October 30th.</u>

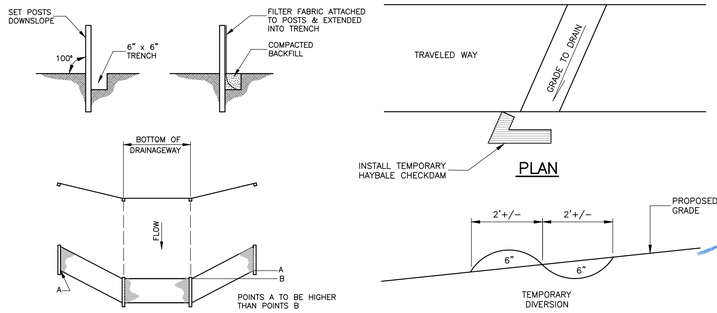
Davison Environmental, LLC will serve as the Environmental Monitor for this project to ensure that Eastern Box Turtle protection measures are implemented properly.

The Contractor shall contact Eric Davison at least 5 business days prior to the pre–construction meeting. Mr. Davison can be reached by phone at (860) 803–0938 or via email at eric@davisonenvironmental.com.

The recommended Eastern Box Turtle protection program consists of the following components:

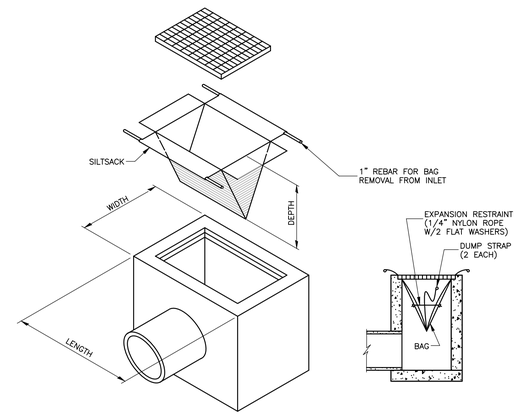
1. Isolation of the project perimeter
2. Targeted searches of the project area prior to construction
3. Periodic inspection and maintenance of isolation structures throughout construction period
4. Education of all contractors and sub–contractors prior to initiation of work on the site
5. Documentation and reporting submitted to the NDDB Program

1. Isolation Barrier (Erosion and Sedimentation Controls)
   a. Plastic netting used in a variety of erosion control products (i.e., erosion control blankets, fiber rolls [wattles], reinforced silt fence) has been found to entangle wildlife, including reptiles, amphibians, birds and small mammals. These products or reinforced silt fence <u>should not be used on the project</u>. Temporary erosion control products, either erosion control blankets, fiber rolls composed of processed fibers mechanically bound together to form a continuous matrix (netless) and/or netting composed of planar woven natural biodegradable fiber should be used to avoid/minimize wildlife entanglement.
   b. Installation of erosion and sedimentation controls (i.e., silt fencing), required for erosion control compliance and creation of a barrier to migrating/dispersing herpetofauna, should be installed by the Contractor prior to clearing activities or any earthwork. This fencing will need to be nearly continuous, as directed in the field by Davison Environmental.
   c. The fencing will consist of non–reinforced conventional erosion control woven fabric, installed approximately six inches below surface grade and staked at seven to ten–foot intervals using four–foot oak stakes or approved equivalent. The Contractor is responsible for daily inspections of the fencing for tears or breeches in the fabric and accumulation levels of sediment, particularly following storm events of 0.25 inch or greater. Davison Environmental will provide periodic inspections of the fencing throughout the duration of construction activities, generally on a biweekly frequency or more frequently if site conditions warrant.
   d. All openings in the isolation barrier, used during the work day for accessibility, should be closed with hay bales at the completion of each day. This should be done under the direction of Davison Environmental, with the understanding that during certain seasonal periods and construction phases, this may not be necessary at all work area entrances.
   e. All silt fencing shall be removed within 30 days of completion of work and permanent stabilization of site soils.
2. Targeted Searches – Pre–Construction
   a. Upon completion of the barrier fence installation, the project limits will be searched for eastern box turtle. The purpose of this work is to locate and remove all box turtles from within the construction zone.
   b. All turtles observed will removed from the project area just beyond the limits of work.
   c. The time of day, frequency and intensity of the pre–construction searches should be determined by the Environmental Monitor based on weather conditions and success of relocation progression. It is anticipated that searches will be conducted once per week at a minimum, with more intensive and frequent searches conducted during periods of high activity which would increase the likelihood of captures.
3. Contractor Education
   a. Prior to the start of construction, the Contractor shall attend an educational session at the pre–construction meeting with Davison Environmental. This orientation and educational session will consist of an introductory meeting with Davison Environmental providing photos of herpetofauna that may be encountered during construction activities, including eastern box turtles, emphasizing the non–aggressive nature of these species, the absence of need to destroy wildlife that might be encountered and the need to follow the prescribed protection measures.
   b. The Contractor will be provided with cell phone and email contacts for Davison Environmental to immediately report encounters with any turtles or other herpetofauna. Educational poster materials will be provided by Davison Environmental and displayed on the job site to maintain worker awareness as the project progresses.
4. Turtle Protective Measures – During Construction
   a. Prior to the start of construction each day, the Contractor shall search the entire work area for turtles. The Environmental Monitor will also conduct periodic inspections of the work area depending upon weather conditions, observed turtle activity, or other factors.
   b. If a turtle is found, it shall be immediately moved by carefully grasped in both hands, one on each side of the shell, between the turtle's forelimbs and the hind limbs, and placed just outside of the isolation barrier closest to where it was encountered. The Environmental Monitor should be notified of any observed eastern box turtle.
   c. Special care shall be taken by the Contractor during early morning hours and on overcast rainy days so that possible basking or foraging turtles are not harmed by construction activities.
5. Reporting
   a. Following completion of the construction project, Davison Environmental will provide a summary of observations of eastern box turtle (or other state listed species) including a submission of a Special Animal Survey Form to the CTDEEP with photo–documentation and with specific information on the location and disposition of the animals observed.

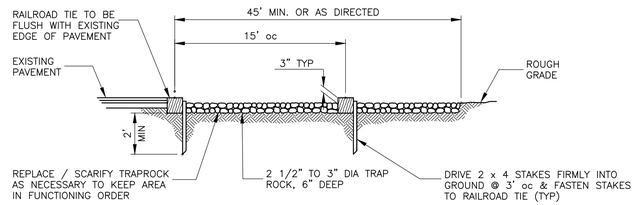


SYNTHETIC FILTER BARRIER

TEMPORARY WATER BREAK



SEDIMENT CONTROL AT INLET



NOTE:
MINIMUM WIDTH OF PAD TO BE 15' OR AS DIRECTED BY THE ENGINEER.

ANTI–TRACKING PAD

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STATE OF CONNECTICUT — JASON EDWARDS — 29 — LICENSED LAND SURVEYOR

139, 141, & 201 TURKEY ROOST ROAD
& 30 COBBLERS HILL COURT
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PREPARED FOR
QUARRY RIDGE ASSOCIATES, LLC

REVISIONS

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2	07–26–23	IWWC
3	08–15–23	TOWN ENG.
4	08–30–23	IWWC

DATE: MAY 1, 2023
PROJECT #: 3302
DRAWING FILE:
DRAWN BY: NDC
SCALE:

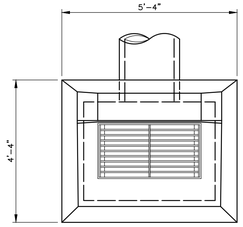
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DETAILS

SHEET NUMBER

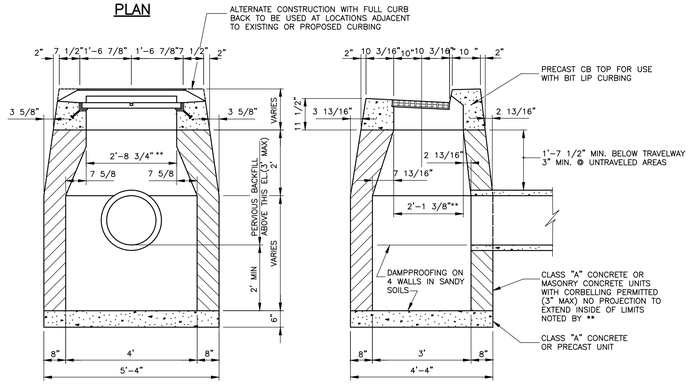
D–2

K:\PROJECTS\3302 BIENASHSKI\DRAWINGS\ALTERNATE 5\D–2.DWG



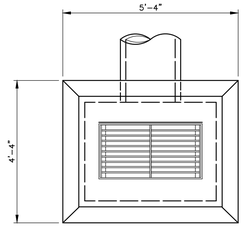
PLAN

NOTE:
WHERE PRECAST CONCRETE UNITS ARE USED FOR THE SUMP, THE TOP OF THE UNIT SHALL BE AT LEAST 6" BELOW THE BOTTOM OF THE PIPE OUTLETTING FROM THE CATCH BASIN



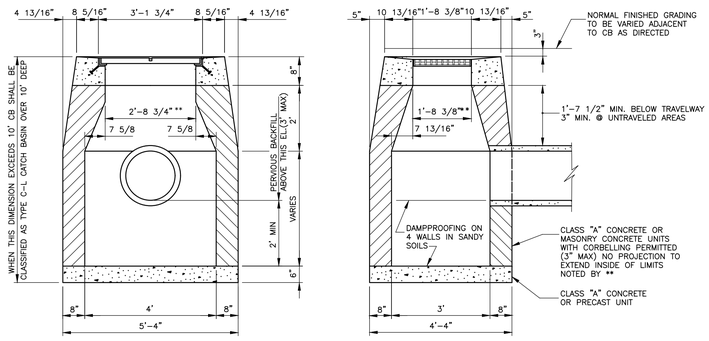
FRONT SIDE

TYPE "C" CATCH BASIN



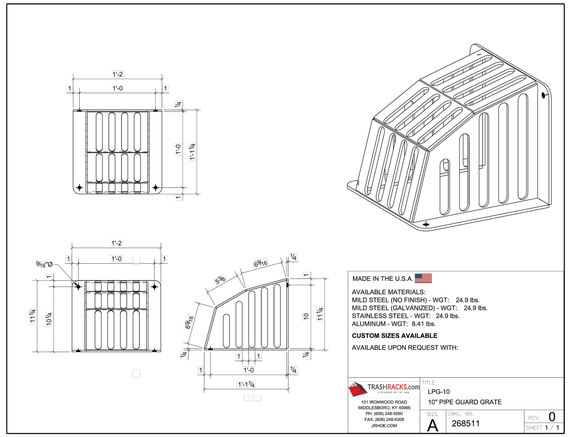
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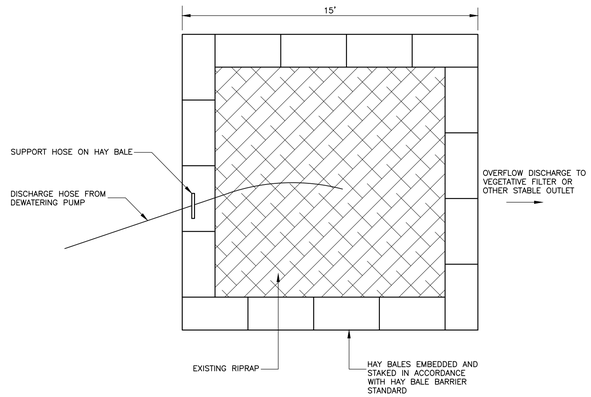


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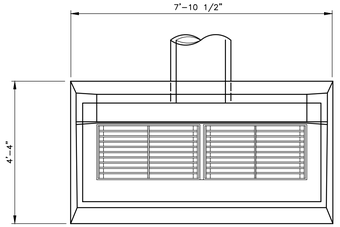
TYPE "C-L" CATCH BASIN



STORMWATER POND OUTLET TRASH RACK

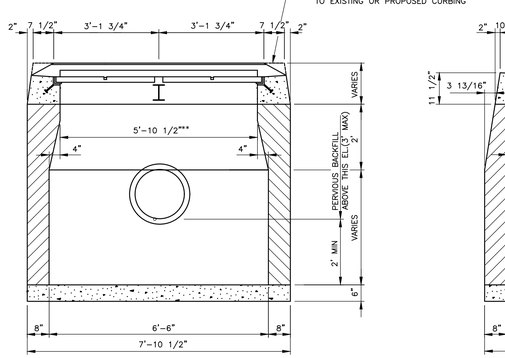


PUMPING SETTLING BASIN

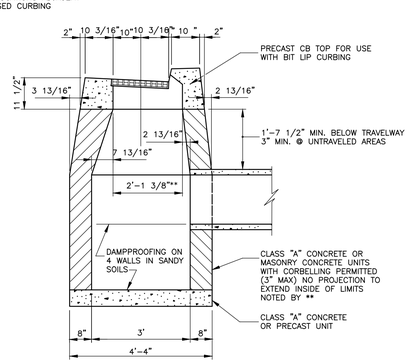


PLAN

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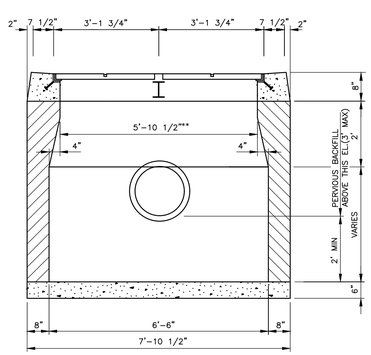
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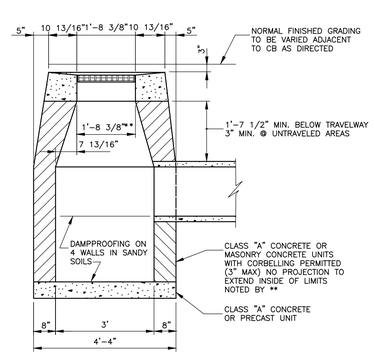
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TYPE "C" CATCH BASIN – DOUBLE GRATE

NOTE:
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FRONT



SIDE

TYPE "C-L" CATCH BASIN – DOUBLE GRATE

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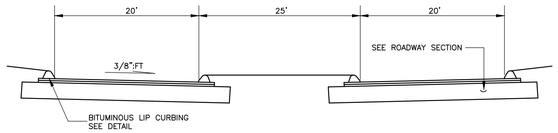
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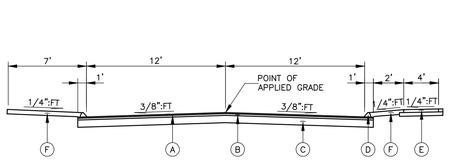
SHEET NUMBER

D-3

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ROADWAY SECTION AT BOULEVARD



ROADWAY SECTION

(A) 1.5" BITUMINOUS CONCRETE – CLASS 2

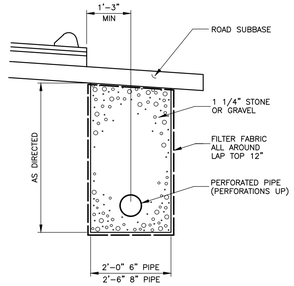
(B) 2.5" BITUMINOUS CONCRETE – CLASS 1

(C) PROCESSED AGGREGATE BASE
10" MIN AND 16" MAX

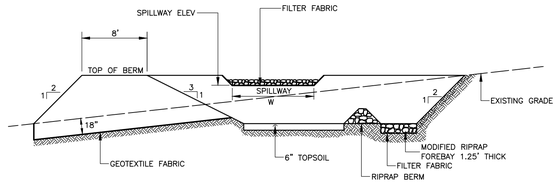
(D) 6" BITUMINOUS CONCRETE LIP CURBING

(E) BITUMINOUS CONCRETE SIDEWALK AS REQUIRED

(F) 6" TOPSOIL, FERTILIZE AND SEED

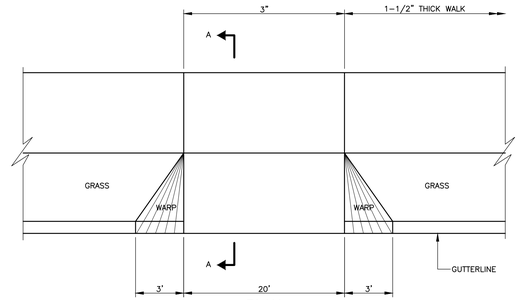


ROAD UNDERDRAIN

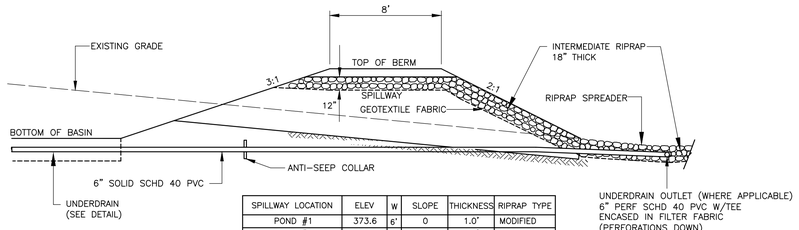


STORMWATER TREATMENT POND SECTION

POND LOCATION	BOT L	BOT W	FOREBAY VOLUME (CF)
#1	35'	13'	488
#2	153'	75'	7480
#3	156'	64'	3735
#4	69'	130'	1717
#5	245'	55'	--
SETTLING BASIN	50'	53'	--

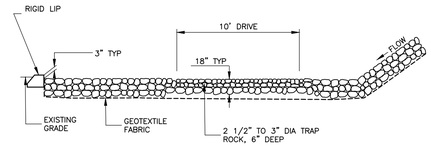


PLAN

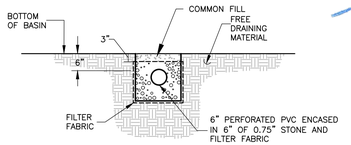


SPILLWAY LOCATION	ELEV	W	SLOPE	THICKNESS	RIPRAP TYPE
POND #1	373.6	6'	0	1.0'	MODIFIED
POND #2	378.5	30'	0	1.0'	MODIFIED
POND #3	376.15	40'	0	1.0'	MODIFIED
POND #4	380.0	15'	0	1.0'	MODIFIED
SETTLING BASIN	381.0	8'	0	1.0'	MODIFIED

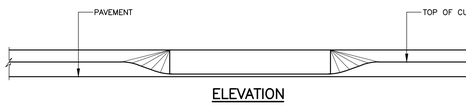
STORMWATER POND OUTLET SECTION



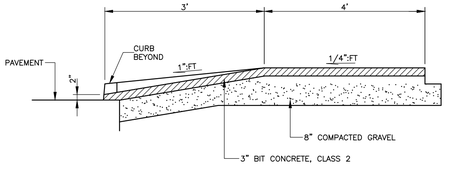
ACCESS DRIVE ACROSS POND #4 OUTLET



STORMWATER POND UNDERDRAIN

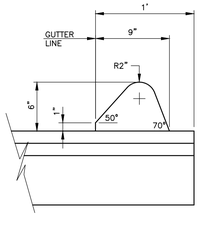


ELEVATION

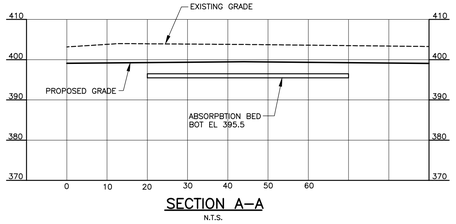


SECTION A–A

DRIVEWAY

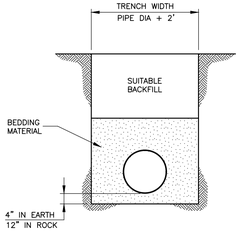


BITUMINOUS LIP CURBING



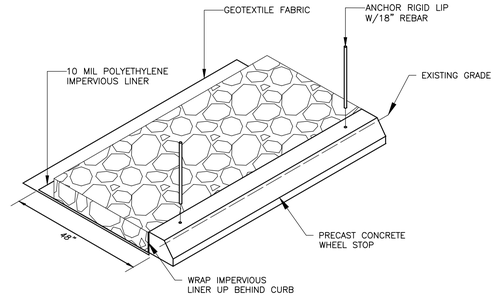
SECTION A–A

N.T.S.



BEDDING MATERIAL TO BE SAND OR SANDY SOIL WHICH PASSES A 3/8" SIEVE WITH NOT MORE THAN 10% PASSING A #200 SIEVE. WHEN GROUND WATER IS ENCOUNTERED, THE ENGINEER MAY ALLOW 3/4" STONE CONFORMING TO CT DOT FORM 814A ARTICLE M.01.01 TO BE USED INSTEAD.

DRAINAGE PIPE TRENCH

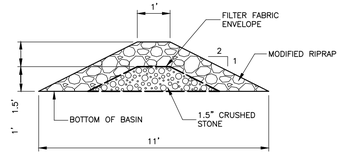


RIGID LIP

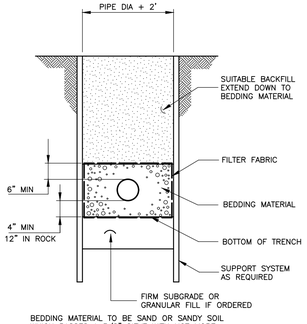


4'X4' ANTI–SEEP COLLAR

(BY SCHEIB DRAINAGE PRODUCTS OR APPROVED EQUAL)



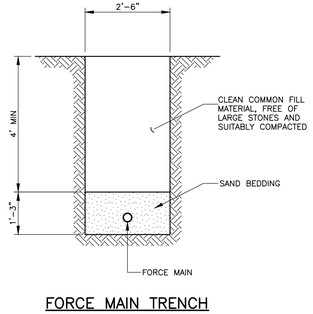
RIPRAP BERM



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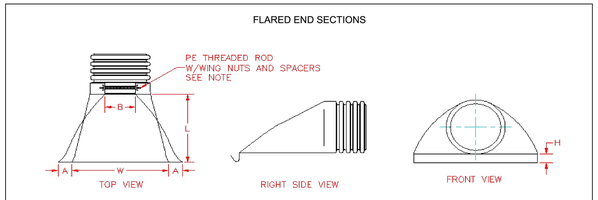
GRANULAR FILL TO CONFORM TO CT DOT FORM 816 ARTICLE M.02.01.

SEWER TRENCH



FORCE MAIN TRENCH

FLARED END SECTIONS



PART #	PIPE SIZE	A	B(MAX)	H	L	W
1015NP	10 in (250 mm)	3.8 in (95 mm)	10.0 in (254 mm)	6.5 in (165 mm)	28.0 in (711 mm)	34.5 in (876 mm)
1215NP	12 & 15 (300 & 375mm)	6.5 in (165 mm)	10.0 in (254 mm)	6.5 in (165 mm)	25.0 in (635 mm)	29.0 in (737 mm)
1810NP	18 in (450 mm)	7.5 in (191 mm)	15.0 in (381 mm)	6.5 in (165 mm)	32.0 in (813 mm)	35.0 in (889 mm)
2410NP	24 in (600 mm)	7.5 in (191 mm)	18.0 in (457 mm)	6.5 in (165 mm)	36.0 in (914 mm)	45.0 in (1143 mm)
3015NP	30 in (750 mm)	7.5 in (191 mm)	12.0 in (305 mm)	8.6 in (218 mm)	58.0 in (1473 mm)	63.0 in (1600 mm)
3615NP	36 in (900 mm)	7.5 in (191 mm)	25.0 in (635 mm)	8.6 in (218 mm)	58.0 in (1473 mm)	63.0 in (1600 mm)

NOTE: ALL DIMENSIONS ARE NOMINAL

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DRAWING #:	6070	
DRAWN BY:	JCB	01.17.07
APPROVED BY:	JCB	06.28.07
REVISIONS:	TJR	6/7/2016

FLARED END SECTIONS

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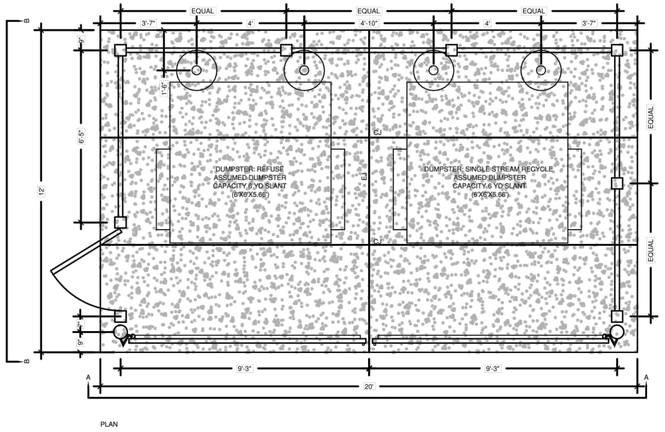
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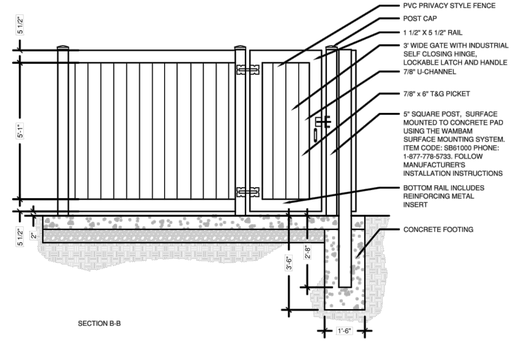
SHEET NUMBER

D-5

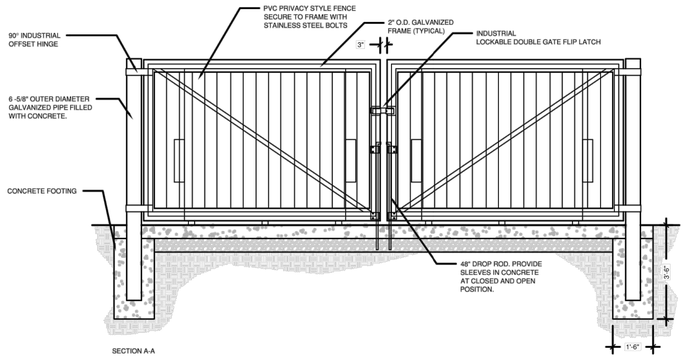
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PLAN

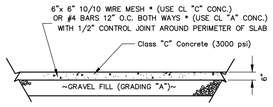


SECTION B-B



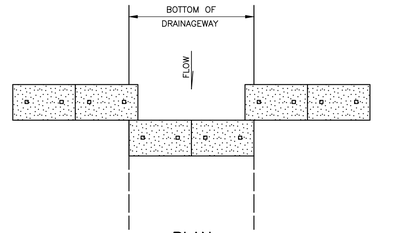
SECTION A-A

DOUBLE-WIDE DUMPSTER ENCLOSURE

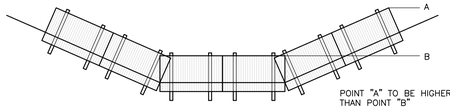


HEAVY DUTY CONCRETE PAD

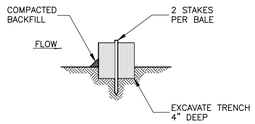
(DUMPSTER)



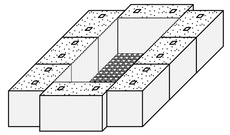
PLAN



ELEVATION



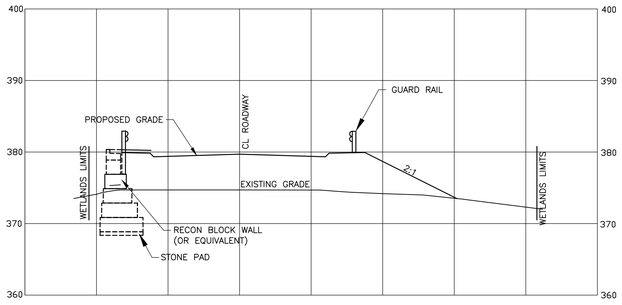
SECTION



AT CATCH BASIN

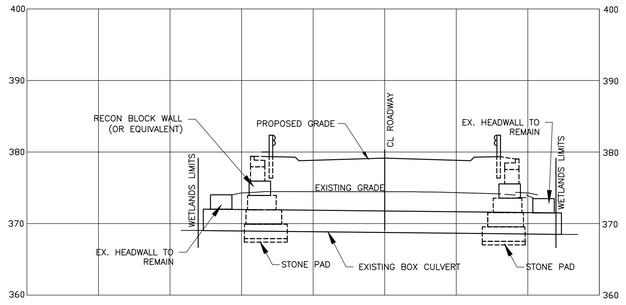
HAYBALE BARRIER

PROPOSED RETAINING WALLS
TO BE DESIGNED BY A LICENSED
STRUCTURAL ENGINEER



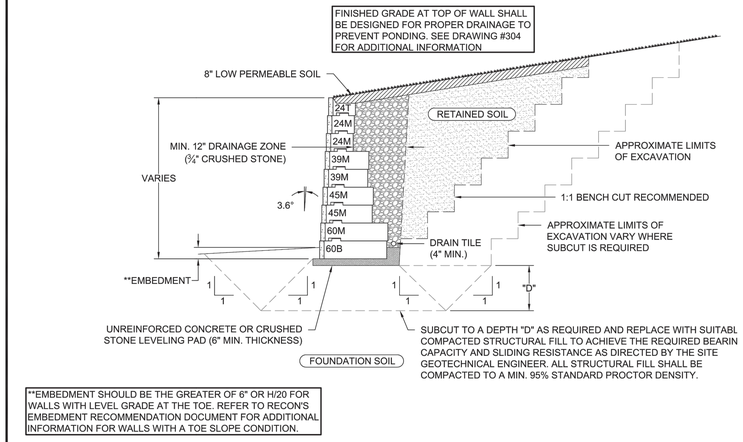
SCHEMATIC SECTION STA.1+12 TROUT POND ROAD

SCALE: 1"=10'



SCHEMATIC SECTION STA.1+42 TROUT POND ROAD

SCALE: 1"=10'



**EMBEDMENT SHOULD BE THE GREATER OF 6" OR H/20 FOR WALLS WITH LEVEL GRADE AT THE TOE. REFER TO RECON'S EMBEDMENT RECOMMENDATION DOCUMENT FOR ADDITIONAL INFORMATION FOR WALLS WITH A TOE SLOPE CONDITION.

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ReCon™ Retaining Walls

DRAWING #103

TYPICAL GRAVITY WALL CROSS SECTION

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STATE OF CONNECTICUT — JASON EDWARDS — LICENSED LAND SURVEYOR

139, 141, & 201 TURKEY ROOST ROAD
& 30 COBBLERS HILL COURT
MONROE, CONNECTICUT

PREPARED FOR

QUARRY RIDGE ASSOCIATES, LLC

REVISIONS

#	DATE	DESCRIPTION
1	06-28-23	IWWC
2	07-26-23	IWWC
3	08-15-23	TOWN ENG.
4	08-30-23	IWWC

DATE: MAY 1, 2023
PROJECT #: 3302
DRAWING FILE:
DRAWN BY: NDC
SCALE:

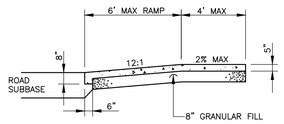
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DETAILS

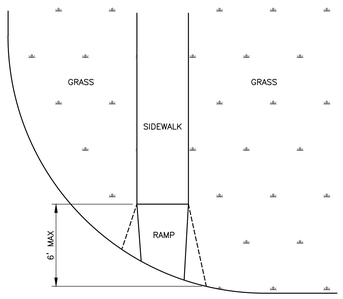
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D-6

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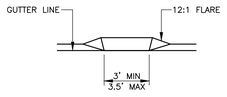


SECTION



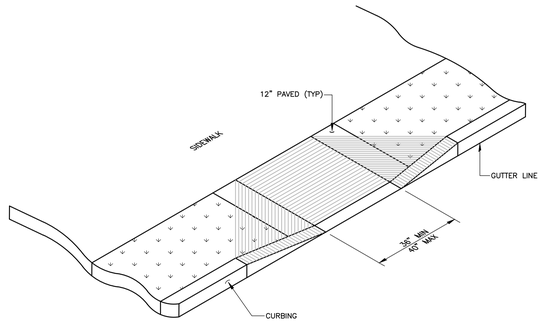
PLACE EXPANSION JOINT AT INTERSECTION OF RAMP AND CURB LINE

PLAN

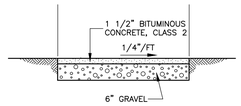


ELEVATION

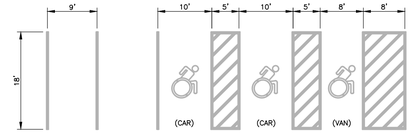
SIDEWALK RAMP



SIDEWALK FLARED CURB RAMP



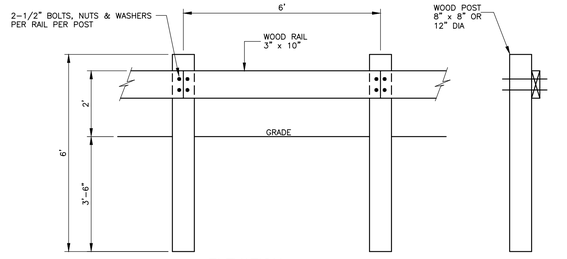
BITUMINOUS SIDEWALK



GUEST HANDICAP

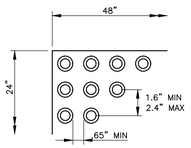
PARKING SPACES

NOTE:
HANDICAP PARKING SPACES SHALL NOT EXCEED 2% SLOPE IN ANY DIRECTION

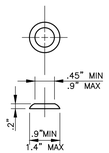


ELEVATION SECTION

WOOD GUARD RAIL



DETECTABLE WARNING



DOME DETAIL

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DATE: MAY 1, 2023
PROJECT #: 3302
DRAWING FILE:
DRAWN BY: NDC
SCALE:

TITLE

DETAILS

SHEET NUMBER

D-7

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STORMWATER MANAGEMENT REPORT

FOR THE PROPOSED DEVELOPMENT OF

QUARRY RIDGE

RESIDENTIAL DEVELOPMENT

LOCATED AT

TURKEY ROOST ROAD
MONROE, CT

PREPARED ON: May 10, 2023

REVISED: AUGUST 31, 2023

PREPARED BY:

J. EDWARDS & ASSOCIATES, LLC
227 STEPNEY ROAD, EASTON CT, 06612



Larry Edwards, P.E.

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APPENDIX A: NRCS MAP AND NOAA RAINFALL TABLES

APPENDIX B: PRE-DEVELOPMENT HYDROLOGICAL ANALYSIS

APPENDIX C: POST DEVELOPMENT HYDROLOGICAL ANALYSIS

APPENDIX D: HYDRAULIC ANALYIS OF PROPOSED PIPE NETWORK

INTRODUCTION:

J. Edwards & Associates has prepared this report to demonstrate compliance with local and state engineering guidelines. These guidelines include drainage design, sediment and erosion control and site grading.

PROJECT OVERVIEW:

This site is a former quarry that discontinued operation prior to 2009. Since that time, the quarry has been left unmaintained. The property supports several residential structures, one remaining commercial building, and gravel driveways. The present owner of the property is proposing to develop it as a 99-unit Residential Community. In 2009, Spath-Bjorklund Associates completed an analysis of the property. This report has been prepared to bring the design into conformance with the current stormwater management standards. Refer to the accompanying plans that include the design and layout of the proposed development and its associated improvements.

DRAINAGE ANALYSIS:

A Hydrologic analysis was completed using HydroCAD software which implements SCS-T20 methodology to compute runoff volumes. A Hydraulic analysis of the proposed piping was completed using Hydraflow Storm Sewer software. Rainfall intensities and depths were generated from the NOAA web site.

NOAA RAINFALL DEPTHS

EVENT	24 HR. DEPTH
2 YEAR	3.60
5 YEAR	4.69
10 YEAR	5.59
25 YEAR	6.83
50 YEAR	7.75
100 YEAR	8.74

The project area is completely with the approximately 126.300 acres of the property that is tributary to this analysis. The project area flows south toward Turkey Roost Road and either enters Smith Pond Brook or the pond located adjacent to the east driveway, identified as “East Pond”. East pond discharges under the driveway through an elliptical pipe. Along with an additional area to the east, these areas all combine as Smith Pond Brook as it flows onto the adjacent property to the east. The NRCS soil survey indicates areas of Hydraulic Soil Group (HSG) A, B, C, and D soils on the property. Existing conditions on the parcel include the abandoned quarry which has been stripped of all soil and is modeled as “Newly graded area, HSG D”.

The proposed development consists of single-family dwellings, roadways, driveways, community buildings, hardscapes, and landscaping. The development will result in an increase in impervious surfaces on the site by approximately 15.0 acres. A storm drainage network is proposed to collect, route, store, and infiltrate runoff from impervious surfaces. Five stormwater basins are proposed to detain and store

runoff from the proposed impervious surfaces. Basins 1,3, and 4 are retention basins. Basins 2 and 5 are underdrained. The retention basins also provide treatment for the water quality and groundwater recharge volume. The tables below include calculated peak flows and runoff volumes for the 2, 5, 10, 25, 50 & 100-year storm events. Peak flow from the site is decreased or maintained for all storm events.

Pre and Post Development Peak Flow Summary

Design Storm	Design Point	Existing Peak Flow (cfs)	Proposed Peak Flow (cfs)	Change in Peak Flow (cfs)
2	POC 1	17.97	17.52	-0.45
	POC 2	54.54	24.09	-30.45
	POC 3	36.17	24.55	-11.62
5	POC 1	35.57	33.93	-1.64
	POC 2	83.11	52.62	-30.49
	POC 3	62.36	49.96	-12.40
10	POC 1	52.37	49.39	-2.98
	POC 2	107.37	93.25	-14.12
	POC 3	87.60	73.75	-13.85
25	POC 1	77.52	72.46	-5.06
	POC 2	141.26	140.77	-0.49
	POC 3	121.90	109.12	-12.78
50	POC 1	97.26	90.49	-6.77
	POC 2	166.55	163.03	-3.52
	POC 3	147.11	136.28	-10.83
100	POC 1	119.24	110.49	-8.75
	POC 2	193.80	185.53	-8.27
	POC 3	174.19	164.32	-9.87

Pre and Post Development Runoff Volume Summary

Design Storm	Design Point	Existing Runoff Vol. (ac-ft)	Proposed Runoff Vol. (ac-ft)	Change in Peak Flow (ac-ft)
2	POC 1	4.72	4.51	-0.21
	POC 2	7.36	7.26	-0.10
	POC 3	12.23	12.17	-0.06
5	POC 1	8.51	8.02	-0.49
	POC 2	11.29	10.87	-0.41
	POC 3	20.03	19.17	-0.86
10	POC 1	12.06	11.29	-0.77
	POC 2	14.68	14.12	-0.56
	POC 3	27.07	26.75	-0.32
25	POC 1	17.42	16.20	-1.22
	POC 2	19.51	18.87	-0.65
	POC 3	37.37	37.09	-0.28
50	POC 1	21.65	20.06	-1.59
	POC 2	23.17	22.46	-0.70
	POC 3	45.35	45.11	-0.24
100	POC 1	26.39	24.40	-1.99
	POC 2	27.15	26.36	-0.79
	POC 3	54.17	53.98	-0.18

WATER QUALITY:

The state of Connecticut DEEP stormwater guidelines require that the first 1" of runoff be retained on site to provide an improvement in water quality. Below are calculations using the DEEP calculation worksheet.

TOTAL SITE AREA (A) = 126.300 acres

DRAINAGE AREAS

Drainage Area	Impervious Area	
Subcatchment-1	15.00	
Subcatchment-2		
Subcatchment-3		
Total Impervious	15.00	11.9%

WATER QUALITY VOLUME (WQV) CALCULATION

Design Precipitation (P) =	1	inch
% Impervious Cover (I) =	0.119	
Volumetric Runoff Coefficient (R) =	0.051	
WQV =	0.537	ac-ft
	23,381	cu-ft

WQ Basin	Provided Storage Volume (cf)
1	1,615
2	0
3	23,076
4	0
5	0
Total	24,691

Groundwater Recharge Volume

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

Groundwater recharge will be provided through the water quality basins. The basins' outlets are set above the basin bottoms which allows for retention of 56,092cf.

GRV = DxAxI/12

Soil recharge depth calculation:

Soil group B: D_B =0.35

Site	Area	% Imperv.	GRV Required (cf)	GRV Proposed (cf)
1	126.300Ac	11.9	19,095	24,691

Outlet Protection

The water quality basin outlets and all other stormwater discharges will be protected with rip rap pads sized in accordance with the state of Connecticut Department of transportation drainage design manual.

Conveyance Protection

All project drainage improvements have been designed to handle a minimum 25 year storm event with outlet overflow from the basin designed to handle a 100 year storm. Reference is made to complete drainage report for supporting documentation.

Peak Runoff Attenuation

The storm management system for this project will control post development peak runoff for the 2, 10, 25, 50, and 100-year storm events to levels less than or equal to the pre development rates.

Emergency Outlet Protection

The emergency outlets have been designed to handle a 100 year storm event. See the table below for freeboard and weir velocities for the 100-year storm. A minimum of 1 foot of freeboard is maintained and peak velocities are below 3 fps for all weirs.

	POND 1 (1P)	SETTLING BASIN (2P)	POND 2 (3P)	POND 3 (4P)	POND 4 (5P)	POND 5 (7P)
Weir Elevation	373.60	381.00	378.50	376.15	380.00	425.50
Top of Berm Elevation	374.90	382.15	380.25	378.00	382.50	N/A
100-YR Peak Storage Elevation	373.90	381.17	379.20	376.76	380.89	424.66
100-YR Weir Flow Depth (ft)	0.30	0.17	0.70	0.61	0.89	N/A
100-YR Freeboard (ft)	1.00	0.98	1.05	1.24	1.61	1.15
100-YR Weir Velocity (fps)	1.69	1.26	2.72	2.48	3.15	0.00
100-YR Weir Flow (cfs)	3.00	2.48	57.51	60.11	41.88	0.00
Forebay Volume (cf)	488	0	7480	3735	1717	0

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. See Drainage Summary Addendum attached to this report as well as the complete Drainage Report for supporting documentation.

Pollutant Reduction

The State of CT DEEP requires 80% removal of Total Suspended Solids, 60% removal of Phosphorus, and 40% removal of Nitrogen. The proposed BMPs exceed these standards.

Total Suspended Solids

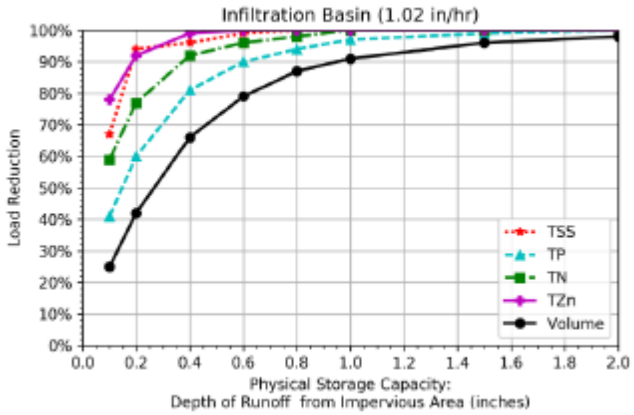
		Location:	CB -> Basin			
		A	B	C	D	E
			TSS Removal	Starting TSS	Amount	Remaining
		BMP[1]	Rate[1]	Load*	Removed (B*C)	Load (C-D)
TSS Removal Calculation Worksheet		**Deep Sump**	**0.25**	**1**	**0.25**	**0.75**
		Infil. Basin	**0.8**	**0.75**	**0.6**	**0.15**
				0.15	**0**	**0.15**
				0.15	**0**	**0.15**
				0.15	**0**	**0.15**
			Total TSS Removal =		**85%**	

	Location:	Grass Swale -> Basin			
	A	B	C	D	E
		TSS Removal	Starting TSS	Amount	Remaining
	BMP[1]	Rate[1]	Load*	Removed (B*C)	Load (C-D)
TSS Removal Calculation Worksheet	**Grass Swale**	**0.7**	**1**	**0.7**	**0.3**
	Infil. Basin	**0.8**	**0.3**	**0.24**	**0.06**
			0.06	**0**	**0.06**
			0.06	**0**	**0.06**
			0.06	**0**	**0.06**
		Total TSS Removal =		**94%**	

Phosphorus and Nitrogen Removal

Watershed Area	Runoff Depth (in)	Perc. Rate (in/hr)	Phosph-orus Removal	Nitrogen Removal
Driveway Basin (2S)	3.36	1.02	100%	100%
West-W WQ (4S)	1.07	1.02	97%	100%
West-E WQ (8S)	2.27	1.02	100%	100%
South WQ (5S)	2.02	1.02	100%	100%
Basin 5 (6S)	2.10	1.02	100%	100%
East WQ (7S)	1.94	1.02	99%	100%

Removal Rates are provided by the University of New Hampshire Stormwater Center. Graph and table below.



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Infiltration Rate (in/hr)	Depth of Runoff from Impervious Area (inches)	TSS	Phosphorus	Nitrogen	Zinc	Runoff Volume
1.02	0.1	67%	41%	59%	78%	25%
	0.2	94%	60%	77%	92%	42%
	0.4	96%	81%	92%	99%	66%
	0.6	99%	90%	96%	100%	79%
	0.8	100%	94%	98%	100%	87%
	1.0	100%	97%	100%	100%	91%
	1.5	100%	99%	100%	100%	96%
	2.0	100%	100%	100%	100%	98%

Drawdown Calculation

Based on standard infiltration rates, all basins will drawdown within the required 72hrs.

Equation:

DT = (V/A*12)/r

DT= Drawdown Time (hrs)
V=Storage Volume, below lowest outlet (ft^3)
A=System Footprint Area (ft^2)
r=Percolation Rate (in/hr)

System #	Storage Volume (ft3)	Footprint Area (ft2)	Perc. Rate (in/hr)	DT (hrs)
Pond #1 (1P)	1,615	395	1.02	48.10
Pond #2 (3P)	0	17,537	1.02	N/A
Pond #3 (4P)	23,076	12,590	1.02	21.56
Pond #4 (5P)	0	5,568	1.02	N/A
Pond #5 (7P)	0	3,129	1.02	N/A

Swale Sizing

Maximum velocity in a stone center vegetated swale is 8fps per 2002 Connecticut Guidelines for Soil Erosion and Sediment Control. Maximum velocity in the East and West Swales are as follows:

Storm Event	East Swale Velocity (fps)	West Swale Velocity (fps)
2yr	3.11	2.77
5yr	3.49	3.34
10yr	3.74	3.71
25yr	4.00	4.11
50yr	4.13	4.36
100yr	4.24	4.59

Level Spreader Outlet Protection computations

Trout Pond Road station 2+26 RT
Q 10yr = 0.56 cfs @ 7.4 fps, pipe dia = 12”
Use Type B Riprap apron:
From table 11.13.1 ConnDOT Drainage Manual, use minimum length of 10 feet.
W1= 3Sp min= 3 feet
W2= 3Sp + 0.4La= 7 feet: Use 10 feet.

Pond#2, 4” dia outlet
Q 100yr = 0.76 cfs @ 8.66 fps, pipe dia = 4”
Use Type B Riprap apron:
From table 11.13.1 ConnDOT Drainage Manual, use minimum length of 10 feet.
W1= 3Sp min= 1 foot: Use 2.0 feet
W2= 3Sp + 0.4La= 5 feet: Use 8 feet.

Pond#3, 10” dia outlet
Q 100yr = 3.36 cfs @ 6.16 fps, pipe dia = 10”
Use Type B Riprap apron:
From table 11.13.1 ConnDOT Drainage Manual, use minimum length of 10 feet.
W1= 3Sp min= 2.5 feet
W2= 3Sp + 0.4La= 6.5 feet: Use 15 feet.

Pond#4, 10” dia outlet
Q 100yr = 4.39 cfs @ 8.04 fps, pipe dia = 10”
Use Type B Riprap apron:
From table 11.13.1 ConnDOT Drainage Manual, use minimum length of 10 feet.
W1= 3Sp min= 2.5 feet
W2= 3Sp + 0.4La= 6.5 feet: Use 15 feet.

Spillway depth and size of material computations

Pond #1: Q 100yr = 3.0 cfs @ 1.69 fps
Refer to figure PW-4 pg. 5-6-23 2002 Connecticut Guidelines for Soil Erosion and Sediment Control
For modified riprap Maximum Permissible Velocity = 8 fps: 1.64 fps<8 fps therefore use modified riprap.

Refer to figure RR-5 pg. 5-5-11 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, riprap spillway layer thickness = 1.5 times the maximum stone diameter or 12" minimum.
D_{50} = 0.42' x 2 = 0.84' therefore use thickness = 1.0'.

Pond #2: Q 100yr = 57.51 @ 2.72 fps
For modified riprap Maximum Permissible Velocity = 8 fps: 2.77 fps<8 fps therefore use modified riprap.
D_{50} = 0.42' x 2 = 0.84' therefore use thickness = 1.0'.

Pond #3: Q 100yr = 60.11 cfs @ 2.48 fps
For modified riprap Maximum Permissible Velocity = 8 fps: 2.59 fps<8 fps therefore use modified riprap.
D_{50} = 0.42' x 2 = 0.84' therefore use thickness = 1.0'.

Pond #4: Q 100yr = 41.88 cfs @ 3.15 fps
For modified riprap Maximum Permissible Velocity = 8 fps: 2.84 fps<8 fps therefore use modified riprap.
D_{50} = 0.42' x 2 = 0.84' therefore use thickness = 1.0'.

Settling Basin: Q 100yr = 2.48 cfs @ 1.26 fps.
For modified riprap Maximum Permissible Velocity = 8 fps: 0.39 fps<8 fps therefore use modified riprap.
D50 = 0.42' x 2 = 0.84' therefore use thickness = 1.0'.

Preformed Scour Hole computations

From ConnDOT Drainage Manual 11.13-5 scour hole dimensions are dependent on discharge pipe diameter.
Using Type 2 scour hole with depression = full pipe rise:
Pipe dia = 3.0', therefore depression length = 3(Rp) = 9' min: 82' provided.
Depression width = 2(Rp) = 6' min: 6' provided.
Depression sits 3.0' below pipe invert = 365-3.0 = 362.0

Weir length (rigid lip) = 80': Q100yr weir discharge = 37.36 cfs @ 1.79 fps

Hydraulic Analysis

A hydraulic analysis of the proposed pipe network has been performed. All pipes have been adequately sized for the 25 year storm. Refer to Appendix “D” for a report created using Hydraflow Storm Sewer Extension.

4. CONCLUSION

The proposed development will increase the amount of impervious area on the site, resulting in higher peak runoff rates. However, with the installation of the proposed water quality basin systems, the original flow patterns will be maintained and there will be no increase in peak runoff for the 2, 5, 10, 25, 50 & 100-year storm events. In addition to controlling stormwater peak runoff, the proposed design incorporates stormwater treatment to control pollution and provide groundwater recharge capacity. The implementation of these techniques and the overall site design layout will result in a finished project that will minimize sediment and erosion impacts during construction and will have no adverse impacts to adjoining properties upon completion.

NOAA Atlas 14, Volume 10, Version 3
Location name: Monroe, Connecticut, USA*
Latitude: 41.3461°, Longitude: -73.2182°
Elevation: 514 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orlan Wilhite

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.365** (0.278-0.469)	**0.427** (0.325-0.549)	**0.529** (0.401-0.682)	**0.614** (0.463-0.793)	**0.730** (0.535-0.977)	**0.817** (0.588-1.11)	**0.909** (0.638-1.28)	**1.01** (0.677-1.44)	**1.16** (0.749-1.70)	**1.28** (0.810-1.90)
10-min	**0.517** (0.393-0.664)	**0.606** (0.460-0.778)	**0.750** (0.568-0.967)	**0.870** (0.655-1.12)	**1.03** (0.758-1.38)	**1.16** (0.834-1.58)	**1.29** (0.904-1.81)	**1.43** (0.960-2.04)	**1.64** (1.06-2.40)	**1.81** (1.15-2.70)
15-min	**0.609** (0.463-0.781)	**0.712** (0.541-0.915)	**0.882** (0.668-1.14)	**1.02** (0.771-1.32)	**1.22** (0.892-1.63)	**1.36** (0.982-1.86)	**1.52** (1.06-2.12)	**1.69** (1.13-2.40)	**1.93** (1.25-2.83)	**2.13** (1.35-3.18)
30-min	**0.843** (0.641-1.08)	**0.987** (0.750-1.27)	**1.22** (0.925-1.57)	**1.42** (1.07-1.83)	**1.68** (1.23-2.25)	**1.89** (1.36-2.56)	**2.10** (1.47-2.92)	**2.32** (1.55-3.31)	**2.63** (1.70-3.85)	**2.88** (1.82-4.28)
60-min	**1.08** (0.820-1.38)	**1.26** (0.958-1.62)	**1.56** (1.18-2.01)	**1.81** (1.36-2.34)	**2.15** (1.57-2.87)	**2.42** (1.73-3.27)	**2.68** (1.87-3.72)	**2.96** (1.98-4.21)	**3.33** (2.15-4.87)	**3.62** (2.29-5.38)
2-hr	**1.40** (1.07-1.78)	**1.64** (1.25-2.09)	**2.04** (1.55-2.61)	**2.37** (1.79-3.04)	**2.82** (2.08-3.75)	**3.16** (2.29-4.27)	**3.52** (2.48-4.90)	**3.92** (2.63-5.54)	**4.49** (2.91-6.53)	**4.96** (3.15-7.33)
3-hr	**1.61** (1.24-2.05)	**1.90** (1.46-2.42)	**2.37** (1.81-3.02)	**2.76** (2.10-3.53)	**3.30** (2.44-4.37)	**3.70** (2.69-4.99)	**4.12** (2.93-5.75)	**4.62** (3.11-6.51)	**5.34** (3.47-7.74)	**5.94** (3.78-8.75)
6-hr	**2.03** (1.57-2.56)	**2.41** (1.86-3.05)	**3.05** (2.34-3.86)	**3.57** (2.73-4.54)	**4.29** (3.20-5.66)	**4.83** (3.53-6.49)	**5.40** (3.86-7.51)	**6.08** (4.11-8.52)	**7.10** (4.63-10.2)	**7.96** (5.08-11.6)
12-hr	**2.49** (1.94-3.12)	**3.01** (2.34-3.77)	**3.85** (2.98-4.84)	**4.55** (3.50-5.75)	**5.51** (4.13-7.24)	**6.23** (4.58-8.33)	**7.00** (5.03-9.68)	**7.91** (5.36-11.0)	**9.28** (6.07-13.3)	**10.4** (6.68-15.2)
24-hr	**2.93** (2.29-3.65)	**3.60** (2.81-4.48)	**4.69** (3.65-5.85)	**5.59** (4.33-7.01)	**6.83** (5.15-8.92)	**7.75** (5.74-10.3)	**8.74** (6.34-12.1)	**9.95** (6.77-13.8)	**11.8** (7.74-16.8)	**13.4** (8.59-19.3)
2-day	**3.33** (2.62-4.12)	**4.15** (3.26-5.13)	**5.48** (4.30-6.80)	**6.59** (5.13-8.21)	**8.11** (6.16-10.6)	**9.23** (6.90-12.3)	**10.5** (7.66-14.4)	**12.0** (8.20-16.5)	**14.5** (9.52-20.4)	**16.6** (10.7-23.8)
3-day	**3.63** (2.87-4.47)	**4.52** (3.57-5.58)	**5.99** (4.71-7.40)	**7.20** (5.63-8.94)	**8.87** (6.77-11.5)	**10.1** (7.58-13.4)	**11.5** (8.42-15.8)	**13.2** (9.00-18.0)	**15.9** (10.5-22.4)	**18.3** (11.8-26.1)
4-day	**3.91** (3.09-4.80)	**4.85** (3.84-5.96)	**6.40** (5.05-7.89)	**7.69** (6.03-9.51)	**9.45** (7.22-12.2)	**10.7** (8.08-14.2)	**12.2** (8.97-16.7)	**14.0** (9.58-19.1)	**16.9** (11.1-23.7)	**19.4** (12.5-27.6)
7-day	**4.69** (3.73-5.73)	**5.73** (4.56-7.00)	**7.43** (5.89-9.11)	**8.84** (6.97-10.9)	**10.8** (8.27-13.8)	**12.2** (9.20-16.0)	**13.8** (10.1-18.7)	**15.7** (10.8-21.3)	**18.7** (12.4-26.1)	**21.3** (13.8-30.1)
10-day	**5.46** (4.36-6.64)	**6.56** (5.23-7.98)	**8.35** (6.64-10.2)	**9.84** (7.78-12.1)	**11.9** (9.12-15.2)	**13.4** (10.1-17.4)	**15.0** (11.0-20.2)	**17.0** (11.7-23.0)	**20.0** (13.2-27.7)	**22.5** (14.6-31.7)
20-day	**7.80** (6.27-9.42)	**9.00** (7.22-10.9)	**11.0** (8.77-13.3)	**12.6** (10.0-15.3)	**14.8** (11.4-18.7)	**16.5** (12.5-21.1)	**18.3** (13.4-24.1)	**20.2** (14.0-27.1)	**23.0** (15.3-31.7)	**25.2** (16.4-35.3)
30-day	**9.72** (7.84-11.7)	**11.0** (8.86-13.2)	**13.1** (10.5-15.8)	**14.8** (11.8-17.9)	**17.1** (13.2-21.4)	**18.9** (14.3-24.0)	**20.8** (15.1-27.0)	**22.7** (15.8-30.3)	**25.3** (16.9-34.6)	**27.3** (17.8-38.0)
45-day	**12.1** (9.79-14.5)	**13.4** (10.9-16.1)	**15.6** (12.6-18.8)	**17.4** (14.0-21.0)	**19.9** (15.4-24.7)	**21.8** (16.5-27.5)	**23.8** (17.3-30.6)	**25.6** (17.9-34.0)	**28.0** (18.8-38.3)	**29.8** (19.5-41.4)
60-day	**14.0** (11.4-16.8)	**15.4** (12.5-18.5)	**17.7** (14.3-21.2)	**19.6** (15.7-23.6)	**22.2** (17.2-27.4)	**24.2** (18.3-30.3)	**26.2** (19.1-33.5)	**28.1** (19.6-37.1)	**30.4** (20.4-41.3)	**32.0** (20.9-44.4)

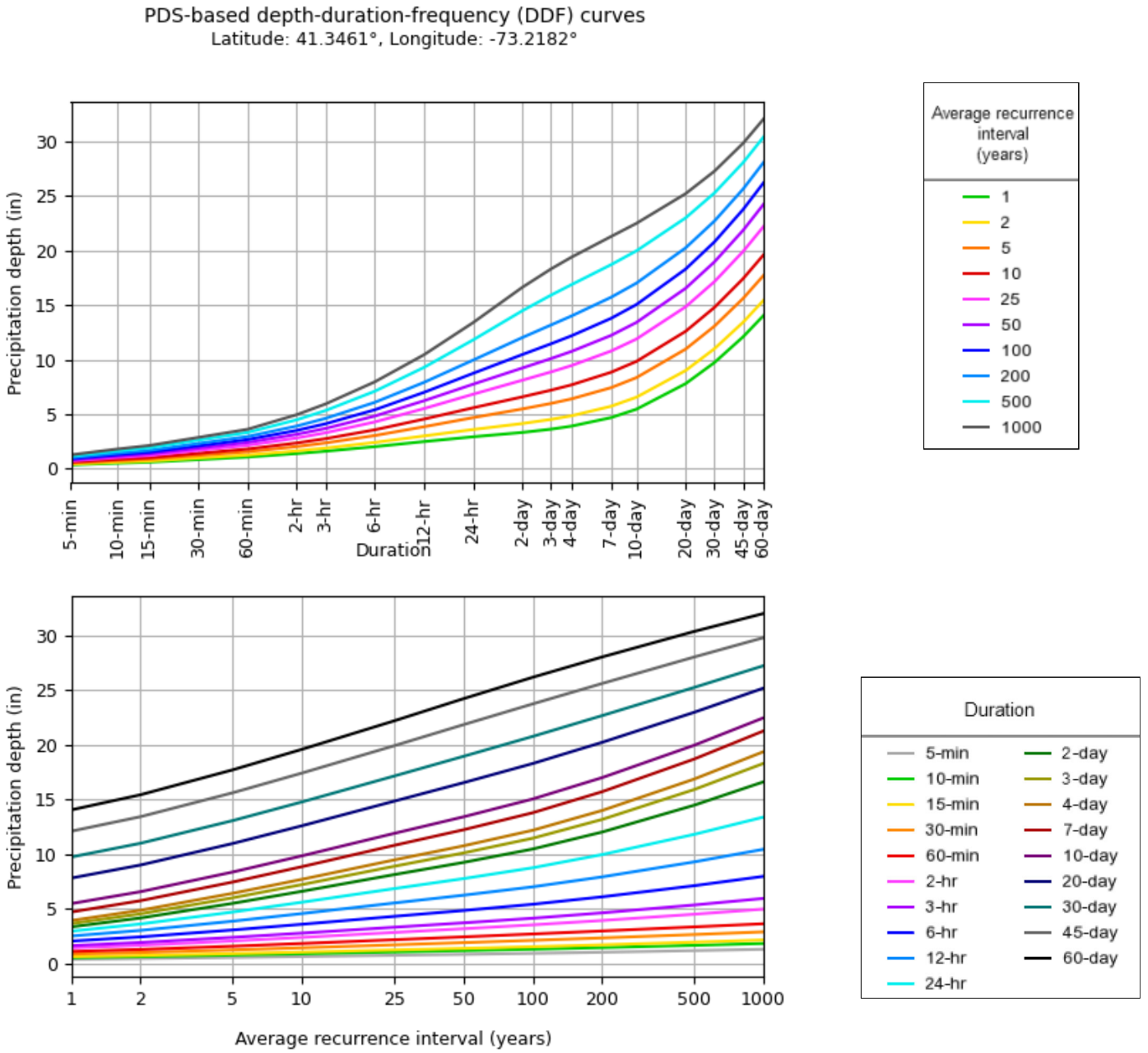
[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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PF graphical



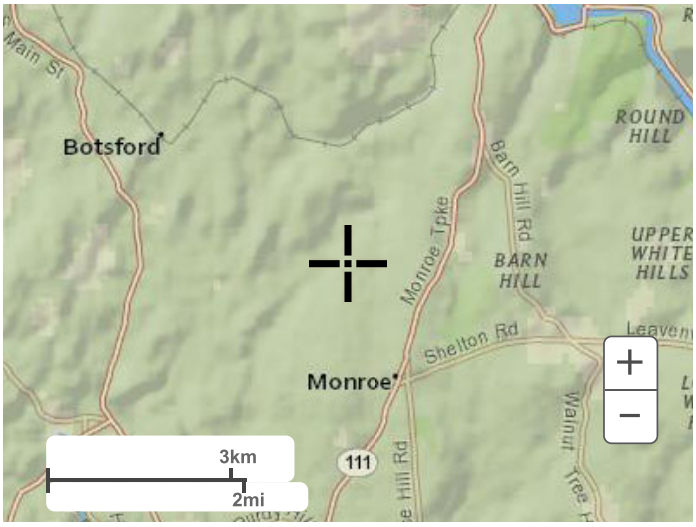
NOAA Atlas 14, Volume 10, Version 3

Created (GMT): Wed Jun 28 17:46:38 2023

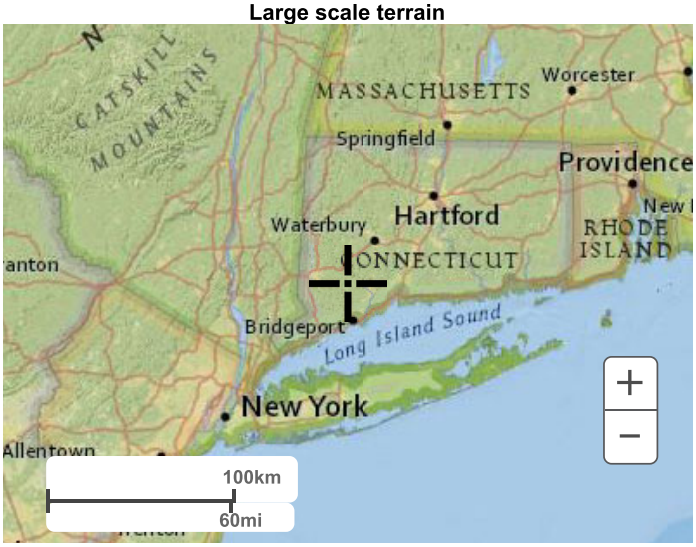
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Maps & aerials

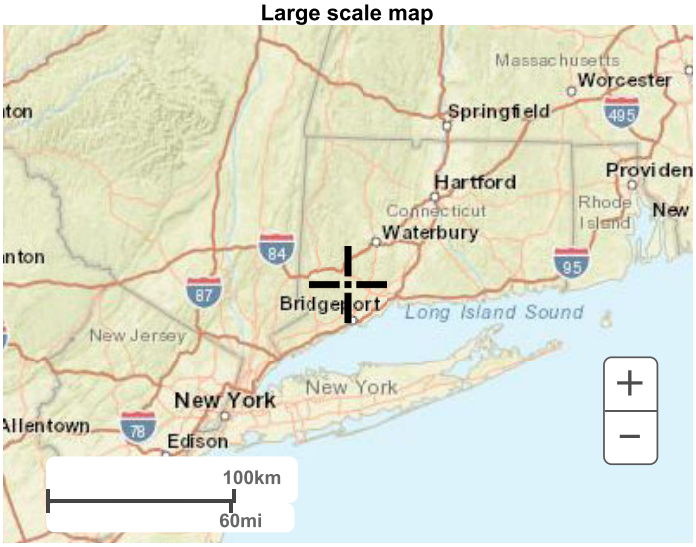
Small scale terrain



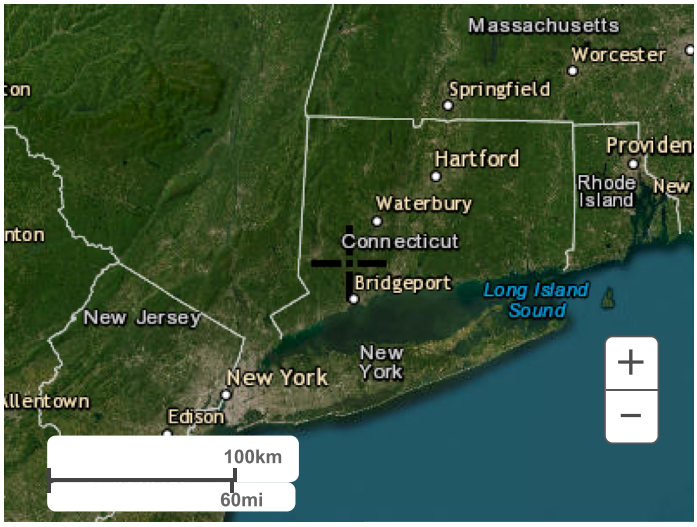
Large scale terrain



Large scale map



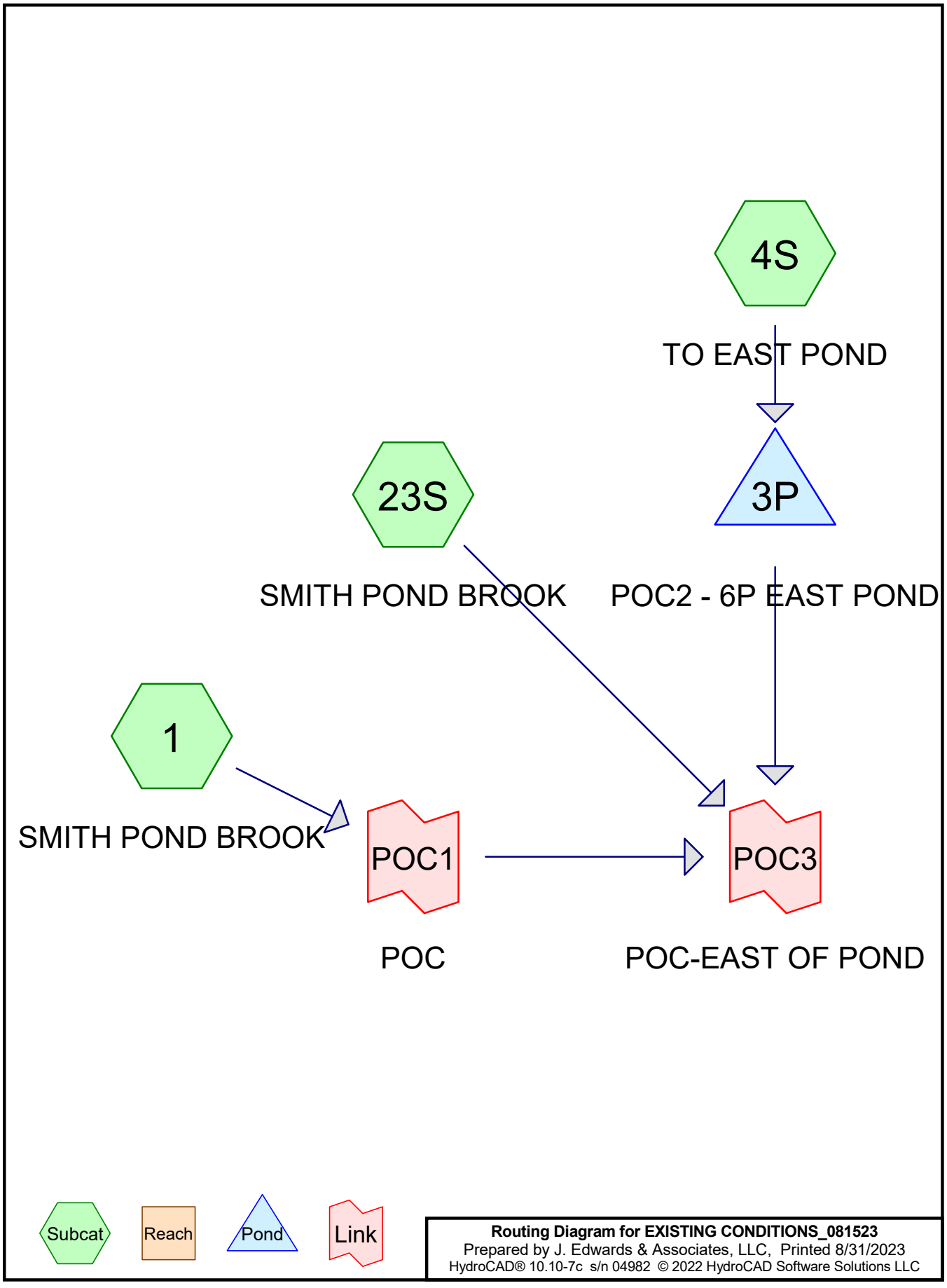
Large scale aerial



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US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer



Routing Diagram for EXISTING CONDITIONS_081523
Prepared by J. Edwards & Associates, LLC, Printed 8/31/2023
HydroCAD® 10.10-7c s/n 04982 © 2022 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.162	90	GRAVEL DRIVEWAY (4S, 23S)
26.046	94	Newly graded area, HSG D (4S)
0.398	98	Paved parking (4S)
0.272	98	Roofs, HSG B (1, 4S)
1.537	98	Water Surface (4S)
7.768	36	Woods, Fair, HSG A (1, 4S)
47.069	60	Woods, Fair, HSG B (1, 4S, 23S)
25.617	73	Woods, Fair, HSG C (1, 4S)
12.905	79	Woods, Fair, HSG D (1)

Summary for Subcatchment 1: SMITH POND BROOK

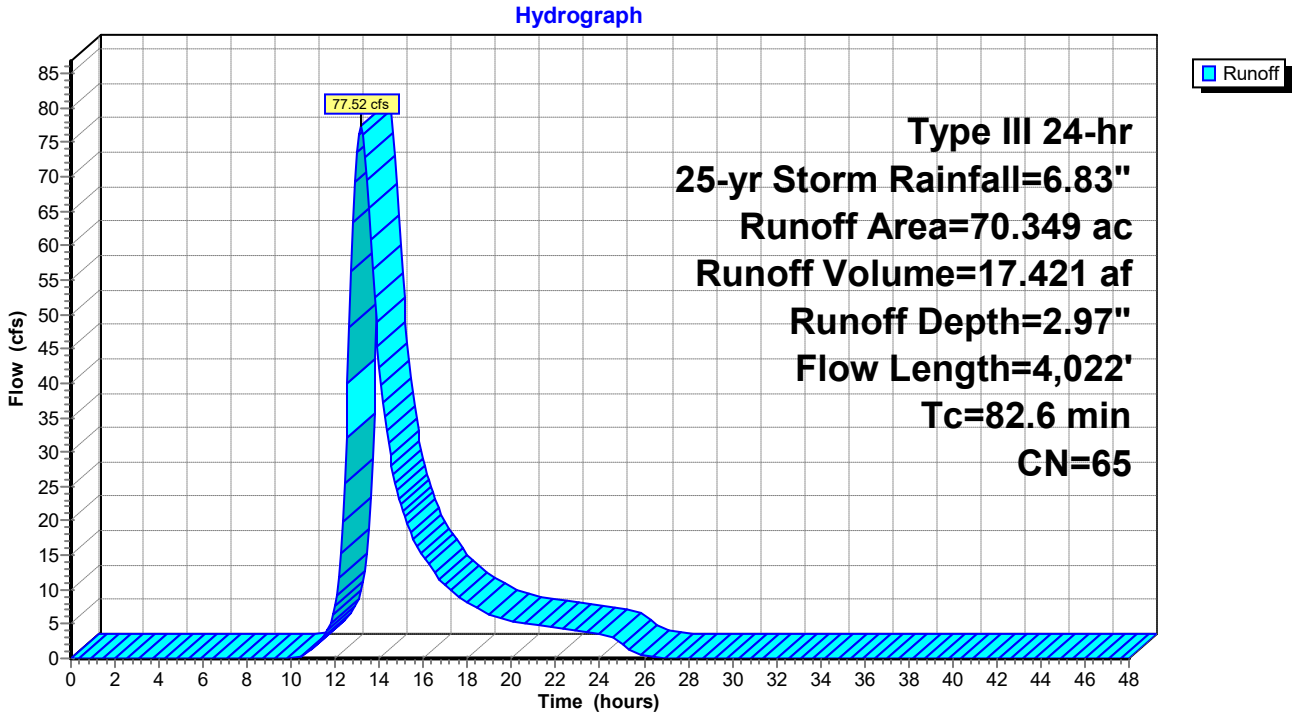
Runoff = 77.52 cfs @ 13.14 hrs, Volume= 17.421 af, Depth= 2.97"
Routed to Link POC1 : POC

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.08 hrs
Type III 24-hr 25-yr Storm Rainfall=6.83"

	Area (ac)	CN	Description
	0.000	39	>75% Grass cover, Good, HSG A
	0.000	80	>75% Grass cover, Good, HSG D
	4.658	36	Woods, Fair, HSG A
	38.000	60	Woods, Fair, HSG B
	14.735	73	Woods, Fair, HSG C
	12.905	79	Woods, Fair, HSG D
	0.000	94	Newly graded area, HSG D
*	0.000	98	Paved parking
*	0.000	90	GRAVEL DRIVEWAY
	0.051	98	Roofs, HSG B
	0.000	98	Water Surface
	70.349	65	Weighted Average
	70.298		99.93% Pervious Area
	0.051		0.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
42.0	190	0.0130	0.08		**Sheet Flow, AB** Woods: Light underbrush n= 0.400 P2= 3.30"
12.6	110	0.0880	0.15		**Sheet Flow, BC** Woods: Light underbrush n= 0.400 P2= 3.30"
21.6	1,880	0.0840	1.45		**Shallow Concentrated Flow, CD** Woodland Kv= 5.0 fps
6.4	1,842	0.0180	4.77	66.84	**Trap/Vee/Rect Channel Flow, DE** Bot.W=10.00' D=1.00' Z= 4.0 '/' Top.W=18.00' n= 0.035
82.6	4,022	Total			

Subcatchment 1: SMITH POND BROOK



Summary for Subcatchment 4S: TO EAST POND

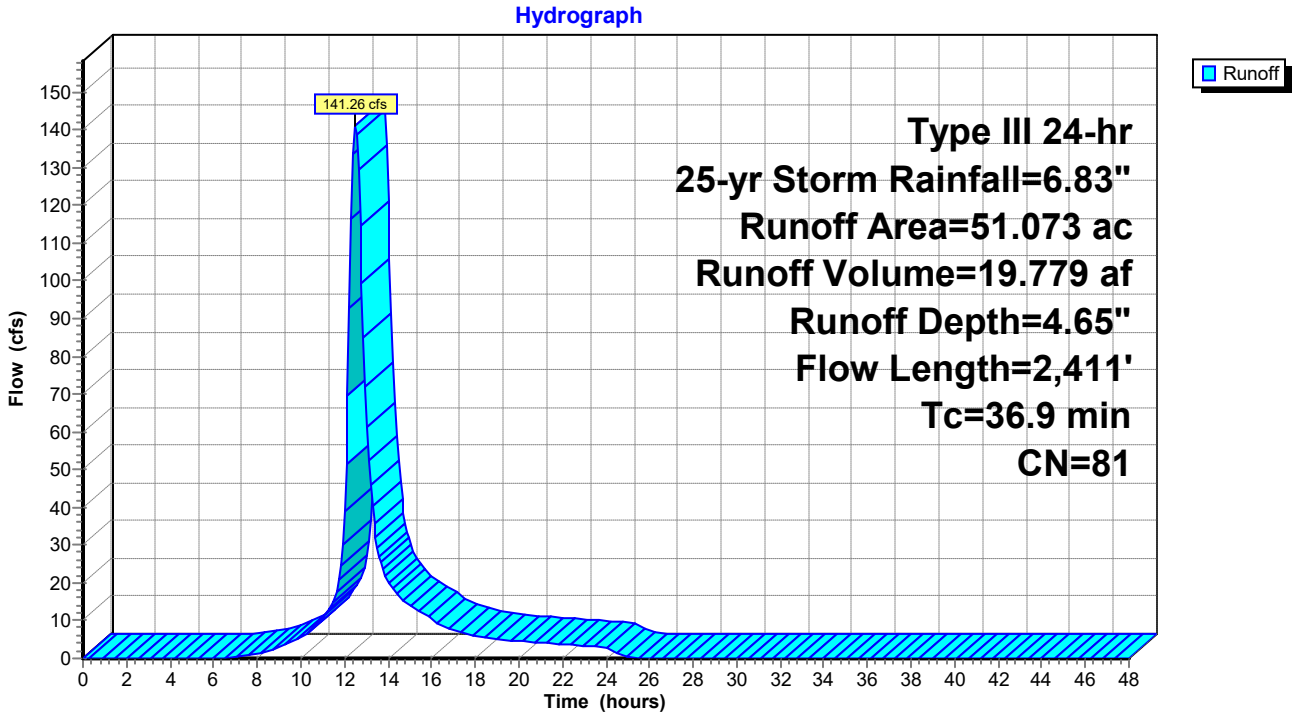
Runoff = 141.26 cfs @ 12.50 hrs, Volume= 19.779 af, Depth= 4.65"
Routed to Pond 3P : POC2 - 6P EAST POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.08 hrs
Type III 24-hr 25-yr Storm Rainfall=6.83"

	Area (ac)	CN	Description
	0.000	39	>75% Grass cover, Good, HSG A
	0.000	80	>75% Grass cover, Good, HSG D
	3.110	36	Woods, Fair, HSG A
	8.355	60	Woods, Fair, HSG B
	10.882	73	Woods, Fair, HSG C
	0.000	79	Woods, Fair, HSG D
	26.046	94	Newly graded area, HSG D
*	0.398	98	Paved parking
*	0.524	90	GRAVEL DRIVEWAY
	0.221	98	Roofs, HSG B
	1.537	98	Water Surface
	51.073	81	Weighted Average
	48.917		95.78% Pervious Area
	2.156		4.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	26	0.4600	0.21		**Sheet Flow, AB** Woods: Light underbrush n= 0.400 P2= 3.30"
14.1	74	0.0300	0.09		**Sheet Flow, BC-SHEET** Woods: Light underbrush n= 0.400 P2= 3.30"
2.5	131	0.0300	0.87		**Shallow Concentrated Flow, BC_SHALLOW** Woodland Kv= 5.0 fps
2.1	318	0.2500	2.50		**Shallow Concentrated Flow, CD** Woodland Kv= 5.0 fps
11.7	1,407	0.0400	2.00		**Shallow Concentrated Flow, DE** Nearly Bare & Untilled Kv= 10.0 fps
4.4	455	0.1200	1.73		**Shallow Concentrated Flow, EF** Woodland Kv= 5.0 fps
36.9	2,411	Total			

Subcatchment 4S: TO EAST POND



Summary for Subcatchment 23S: SMITH POND BROOK

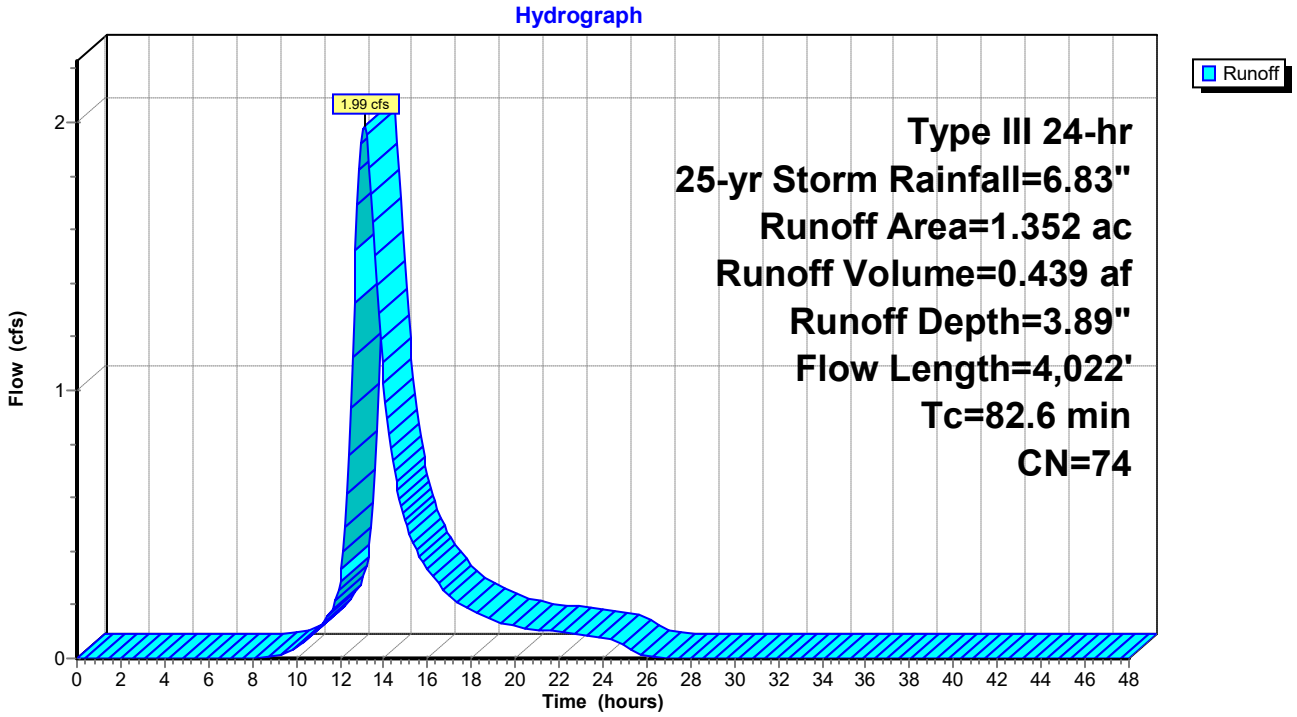
Runoff = 1.99 cfs @ 13.11 hrs, Volume= 0.439 af, Depth= 3.89"
Routed to Link POC3 : POC-EAST OF POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.08 hrs
Type III 24-hr 25-yr Storm Rainfall=6.83"

	Area (ac)	CN	Description
	0.000	39	>75% Grass cover, Good, HSG A
	0.000	80	>75% Grass cover, Good, HSG D
	0.000	36	Woods, Fair, HSG A
	0.714	60	Woods, Fair, HSG B
	0.000	73	Woods, Fair, HSG C
	0.000	79	Woods, Fair, HSG D
	0.000	94	Newly graded area, HSG D
*	0.000	98	Paved parking
*	0.638	90	GRAVEL DRIVEWAY
	0.000	98	Roofs, HSG B
	0.000	98	Water Surface
	1.352	74	Weighted Average
	1.352		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
42.0	190	0.0130	0.08		**Sheet Flow, AB** Woods: Light underbrush n= 0.400 P2= 3.30"
12.6	110	0.0880	0.15		**Sheet Flow, BC** Woods: Light underbrush n= 0.400 P2= 3.30"
21.6	1,880	0.0840	1.45		**Shallow Concentrated Flow, CD** Woodland Kv= 5.0 fps
6.4	1,842	0.0180	4.77	66.84	**Trap/Vee/Rect Channel Flow, DE** Bot.W=10.00' D=1.00' Z= 4.0 '/' Top.W=18.00' n= 0.035
82.6	4,022	Total			

Subcatchment 23S: SMITH POND BROOK



Summary for Pond 3P: POC2 - 6P EAST POND

Inflow Area = 51.073 ac, 4.22% Impervious, Inflow Depth = 4.65" for 25-yr Storm event
Inflow = 141.26 cfs @ 12.50 hrs, Volume= 19.779 af
Outflow = 42.51 cfs @ 13.25 hrs, Volume= 19.510 af, Atten= 70%, Lag= 44.7 min
Primary = 42.51 cfs @ 13.25 hrs, Volume= 19.510 af
Routed to Link POC3 : POC-EAST OF POND

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.08 hrs
Peak Elev= 349.09' @ 13.25 hrs Surf.Area= 93,142 sf Storage= 368,480 cf

Plug-Flow detention time= 161.7 min calculated for 19.478 af (98% of inflow)
Center-of-Mass det. time= 155.4 min (990.5 - 835.1)

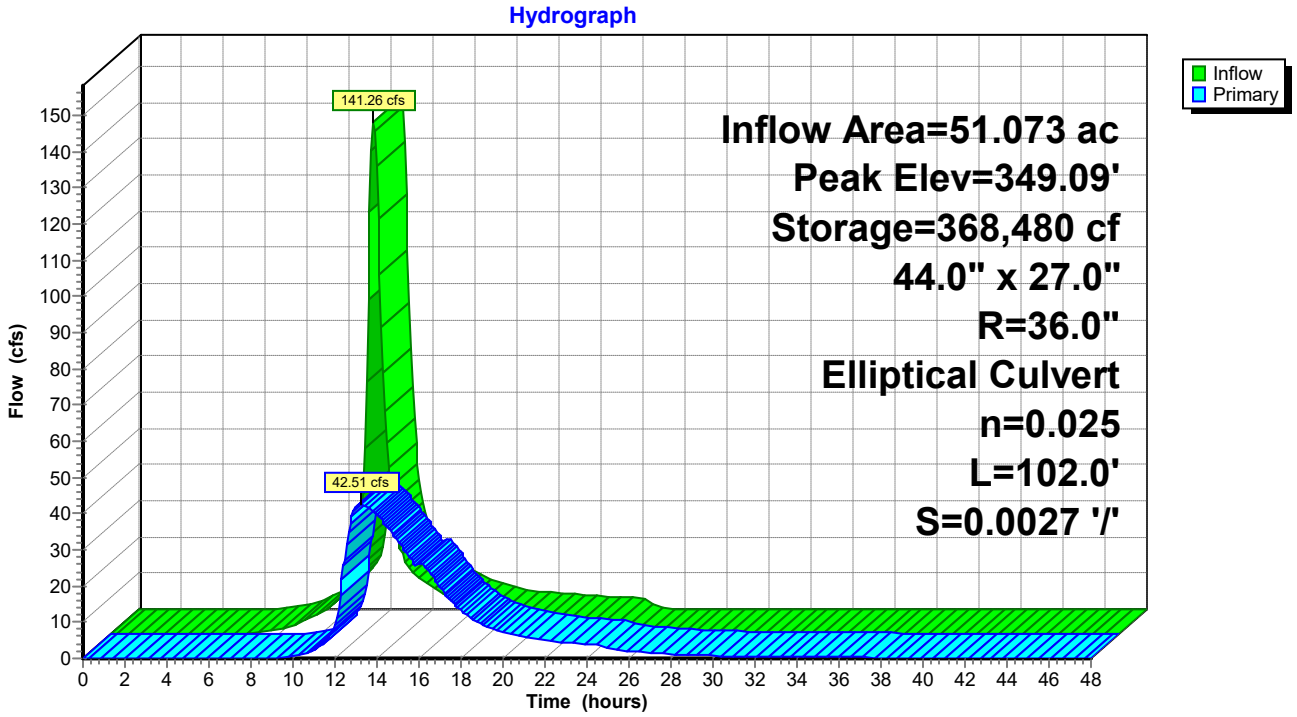
Volume	Invert	Avail.Storage	Storage Description
#1	344.20'	587,805 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
344.20	64,107	0	0	64,107
346.00	70,422	121,032	121,032	70,635
348.00	81,904	152,182	273,213	82,282
350.00	103,093	184,591	457,804	103,580
351.20	113,660	130,000	587,805	114,240

Device	Routing	Invert	Outlet Devices
#1	Primary	344.21'	**44.0" W x 27.0" H, R=36.0" Elliptical Culvert** L= 102.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 344.21' / 343.93' S= 0.0027 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 6.62 sf

Primary OutFlow Max=42.50 cfs @ 13.25 hrs HW=349.09' TW=0.00' (Dynamic Tailwater)
1=Culvert (Barrel Controls 42.50 cfs @ 6.42 fps)

Pond 3P: POC2 - 6P EAST POND



Stage-Area-Storage for Pond 3P: POC2 - 6P EAST POND

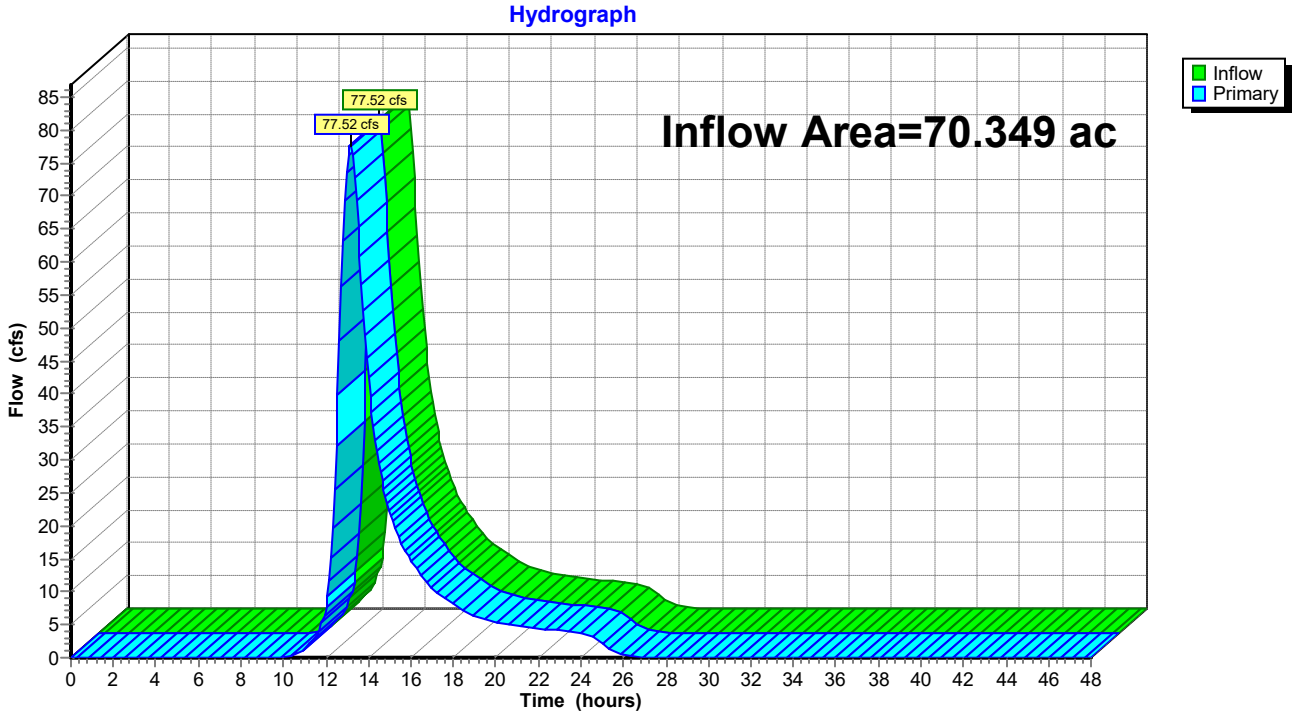
Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
344.20	64,107	0
344.30	64,450	6,428
344.40	64,794	12,890
344.50	65,139	19,387
344.60	65,485	25,918
344.70	65,831	32,484
344.80	66,179	39,084
344.90	66,528	45,719
345.00	66,877	52,390
345.10	67,227	59,095
345.20	67,579	65,835
345.30	67,931	72,611
345.40	68,284	79,421
345.50	68,638	86,268
345.60	68,993	93,149
345.70	69,349	100,066
345.80	69,706	107,019
345.90	70,063	114,007
346.00	70,422	121,032
346.10	70,976	128,101
346.20	71,531	135,227
346.30	72,089	142,408
346.40	72,649	149,645
346.50	73,211	156,938
346.60	73,776	164,287
346.70	74,342	171,693
346.80	74,911	179,155
346.90	75,482	186,675
347.00	76,055	194,252
347.10	76,630	201,886
347.20	77,207	209,578
347.30	77,787	217,328
347.40	78,368	225,135
347.50	78,952	233,001
347.60	79,538	240,926
347.70	80,126	248,909
347.80	80,717	256,951
347.90	81,309	265,053
348.00	81,904	273,213
348.10	82,906	281,454
348.20	83,913	289,794
348.30	84,927	298,236
348.40	85,947	306,780
348.50	86,973	315,426
348.60	88,005	324,175
348.70	89,043	333,027
348.80	90,087	341,984
348.90	91,138	351,045
349.00	92,194	360,211
349.10	93,257	369,484
349.20	94,325	378,863
349.30	95,400	388,349
349.40	96,481	397,943
349.50	97,567	407,646
349.60	98,660	417,457
349.70	99,759	427,378
349.80	100,865	437,409
349.90	101,976	447,551
350.00	103,093	457,804
350.10	103,954	468,157
350.20	104,818	478,595
350.30	105,686	489,120
350.40	106,558	499,733
350.50	107,433	510,432
350.60	108,312	521,219
350.70	109,194	532,095
350.80	110,080	543,058
350.90	110,970	554,111
351.00	111,863	565,253
351.10	112,760	576,484
351.20	**113,660**	**587,805**

Summary for Link POC1: POC

Inflow Area = 70.349 ac, 0.07% Impervious, Inflow Depth = 2.97" for 25-yr Storm event
Inflow = 77.52 cfs @ 13.14 hrs, Volume= 17.421 af
Primary = 77.52 cfs @ 13.14 hrs, Volume= 17.421 af, Atten= 0%, Lag= 0.0 min
Routed to Link POC3 : POC-EAST OF POND

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.08 hrs

Link POC1: POC

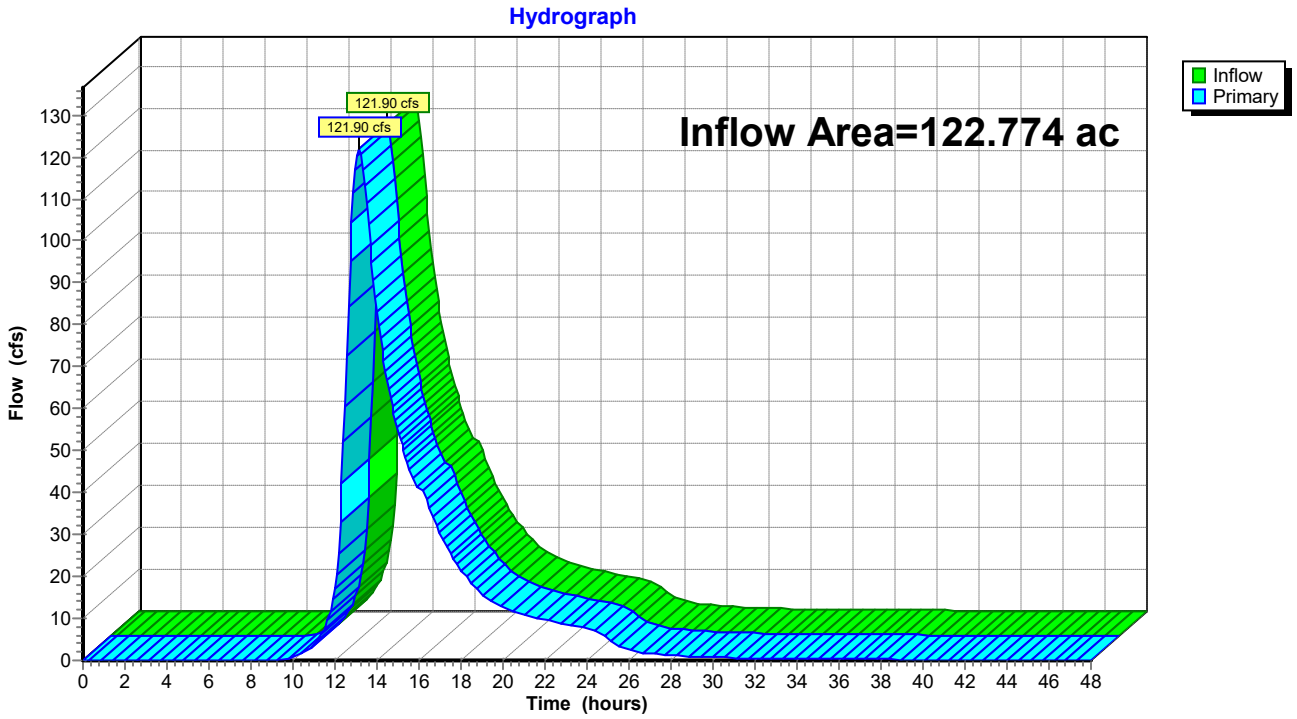


Summary for Link POC3: POC-EAST OF POND

Inflow Area = 122.774 ac, 1.80% Impervious, Inflow Depth > 3.65" for 25-yr Storm event
Inflow = 121.90 cfs @ 13.14 hrs, Volume= 37.370 af
Primary = 121.90 cfs @ 13.14 hrs, Volume= 37.370 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.08 hrs

Link POC3: POC-EAST OF POND



Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-yr Storm	Type III 24-hr		Default	24.00	1	3.60	2
2	5-yr Storm	Type III 24-hr		Default	24.00	1	4.69	2
3	10-yr Storm	Type III 24-hr		Default	24.00	1	5.59	2
4	25-yr Storm	Type III 24-hr		Default	24.00	1	6.83	2
5	50-yr Storm	Type III 24-hr		Default	24.00	1	7.75	2
6	100-yr Storm	Type III 24-hr		Default	24.00	1	8.74	2

Time span=0.00-48.00 hrs, dt=0.08 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: SMITH POND BROOK Runoff Area=70.349 ac 0.07% Impervious Runoff Depth=0.81"
Flow Length=4,022' Tc=82.6 min CN=65 Runoff=17.97 cfs 4.719 af

Subcatchment 4S: TO EAST POND Runoff Area=51.073 ac 4.22% Impervious Runoff Depth=1.79"
Flow Length=2,411' Tc=36.9 min CN=81 Runoff=54.54 cfs 7.618 af

Subcatchment 23S: SMITH POND BROOK Runoff Area=1.352 ac 0.00% Impervious Runoff Depth=1.31"
Flow Length=4,022' Tc=82.6 min CN=74 Runoff=0.64 cfs 0.148 af

Pond 3P: POC2 - 6P EAST POND Peak Elev=346.26' Storage=139,647 cf Inflow=54.54 cfs 7.618 af
44.0" x 27.0", R=36.0" Elliptical Culvert n=0.025 L=102.0' S=0.0027 '/' Outflow=17.57 cfs 7.362 af

Link POC1: POC Inflow=17.97 cfs 4.719 af
Primary=17.97 cfs 4.719 af

Link POC3: POC-EAST OF POND Inflow=36.17 cfs 12.229 af
Primary=36.17 cfs 12.229 af

Total Runoff Area = 122.774 ac Runoff Volume = 12.485 af Average Runoff Depth = 1.22"
98.20% Pervious = 120.567 ac 1.80% Impervious = 2.207 ac

Time span=0.00-48.00 hrs, dt=0.08 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: SMITH POND BROOK Runoff Area=70.349 ac 0.07% Impervious Runoff Depth=1.45"
Flow Length=4,022' Tc=82.6 min CN=65 Runoff=35.57 cfs 8.506 af

Subcatchment 4S: TO EAST POND Runoff Area=51.073 ac 4.22% Impervious Runoff Depth=2.71"
Flow Length=2,411' Tc=36.9 min CN=81 Runoff=83.11 cfs 11.547 af

Subcatchment 23S: SMITH POND BROOK Runoff Area=1.352 ac 0.00% Impervious Runoff Depth=2.12"
Flow Length=4,022' Tc=82.6 min CN=74 Runoff=1.07 cfs 0.239 af

Pond 3P: POC2 - 6P EAST POND Peak Elev=347.22' Storage=210,756 cf Inflow=83.11 cfs 11.547 af
44.0" x 27.0", R=36.0" Elliptical Culvert n=0.025 L=102.0' S=0.0027 '/' Outflow=26.30 cfs 11.286 af

Link POC1: POC Inflow=35.57 cfs 8.506 af
Primary=35.57 cfs 8.506 af

Link POC3: POC-EAST OF POND Inflow=62.36 cfs 20.030 af
Primary=62.36 cfs 20.030 af

Total Runoff Area = 122.774 ac Runoff Volume = 20.291 af Average Runoff Depth = 1.98"
98.20% Pervious = 120.567 ac 1.80% Impervious = 2.207 ac

Time span=0.00-48.00 hrs, dt=0.08 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: SMITH POND BROOK Runoff Area=70.349 ac 0.07% Impervious Runoff Depth=2.06"
Flow Length=4,022' Tc=82.6 min CN=65 Runoff=52.37 cfs 12.064 af

Subcatchment 4S: TO EAST POND Runoff Area=51.073 ac 4.22% Impervious Runoff Depth=3.51"
Flow Length=2,411' Tc=36.9 min CN=81 Runoff=107.37 cfs 14.948 af

Subcatchment 23S: SMITH POND BROOK Runoff Area=1.352 ac 0.00% Impervious Runoff Depth=2.84"
Flow Length=4,022' Tc=82.6 min CN=74 Runoff=1.45 cfs 0.320 af

Pond 3P: POC2 - 6P EAST POND Peak Elev=348.03' Storage=275,970 cf Inflow=107.37 cfs 14.948 af
44.0" x 27.0", R=36.0" Elliptical Culvert n=0.025 L=102.0' S=0.0027 '/' Outflow=33.93 cfs 14.683 af

Link POC1: POC Inflow=52.37 cfs 12.064 af
Primary=52.37 cfs 12.064 af

Link POC3: POC-EAST OF POND Inflow=87.60 cfs 27.067 af
Primary=87.60 cfs 27.067 af

Total Runoff Area = 122.774 ac Runoff Volume = 27.332 af Average Runoff Depth = 2.67"
98.20% Pervious = 120.567 ac 1.80% Impervious = 2.207 ac

Time span=0.00-48.00 hrs, dt=0.08 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: SMITH POND BROOK Runoff Area=70.349 ac 0.07% Impervious Runoff Depth=2.97"
Flow Length=4,022' Tc=82.6 min CN=65 Runoff=77.52 cfs 17.421 af

Subcatchment 4S: TO EAST POND Runoff Area=51.073 ac 4.22% Impervious Runoff Depth=4.65"
Flow Length=2,411' Tc=36.9 min CN=81 Runoff=141.26 cfs 19.779 af

Subcatchment 23S: SMITH POND BROOK Runoff Area=1.352 ac 0.00% Impervious Runoff Depth=3.89"
Flow Length=4,022' Tc=82.6 min CN=74 Runoff=1.99 cfs 0.439 af

Pond 3P: POC2 - 6P EAST POND Peak Elev=349.09' Storage=368,480 cf Inflow=141.26 cfs 19.779 af
44.0" x 27.0", R=36.0" Elliptical Culvert n=0.025 L=102.0' S=0.0027 '/' Outflow=42.51 cfs 19.510 af

Link POC1: POC Inflow=77.52 cfs 17.421 af
Primary=77.52 cfs 17.421 af

Link POC3: POC-EAST OF POND Inflow=121.90 cfs 37.370 af
Primary=121.90 cfs 37.370 af

Total Runoff Area = 122.774 ac Runoff Volume = 37.639 af Average Runoff Depth = 3.68"
98.20% Pervious = 120.567 ac 1.80% Impervious = 2.207 ac

Time span=0.00-48.00 hrs, dt=0.08 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: SMITH POND BROOK Runoff Area=70.349 ac 0.07% Impervious Runoff Depth=3.69"
Flow Length=4,022' Tc=82.6 min CN=65 Runoff=97.26 cfs 21.650 af

Subcatchment 4S: TO EAST POND Runoff Area=51.073 ac 4.22% Impervious Runoff Depth=5.51"
Flow Length=2,411' Tc=36.9 min CN=81 Runoff=166.55 cfs 23.437 af

Subcatchment 23S: SMITH POND BROOK Runoff Area=1.352 ac 0.00% Impervious Runoff Depth=4.70"
Flow Length=4,022' Tc=82.6 min CN=74 Runoff=2.41 cfs 0.530 af

Pond 3P: POC2 - 6P EAST POND Peak Elev=349.83' Storage=440,637 cf Inflow=166.55 cfs 23.437 af
44.0" x 27.0", R=36.0" Elliptical Culvert n=0.025 L=102.0' S=0.0027 '/' Outflow=47.63 cfs 23.166 af

Link POC1: POC Inflow=97.26 cfs 21.650 af
Primary=97.26 cfs 21.650 af

Link POC3: POC-EAST OF POND Inflow=147.11 cfs 45.347 af
Primary=147.11 cfs 45.347 af

Total Runoff Area = 122.774 ac Runoff Volume = 45.617 af Average Runoff Depth = 4.46"
98.20% Pervious = 120.567 ac 1.80% Impervious = 2.207 ac

Time span=0.00-48.00 hrs, dt=0.08 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: SMITH POND BROOK Runoff Area=70.349 ac 0.07% Impervious Runoff Depth=4.50"
Flow Length=4,022' Tc=82.6 min CN=65 Runoff=119.24 cfs 26.385 af

Subcatchment 4S: TO EAST POND Runoff Area=51.073 ac 4.22% Impervious Runoff Depth=6.44"
Flow Length=2,411' Tc=36.9 min CN=81 Runoff=193.80 cfs 27.424 af

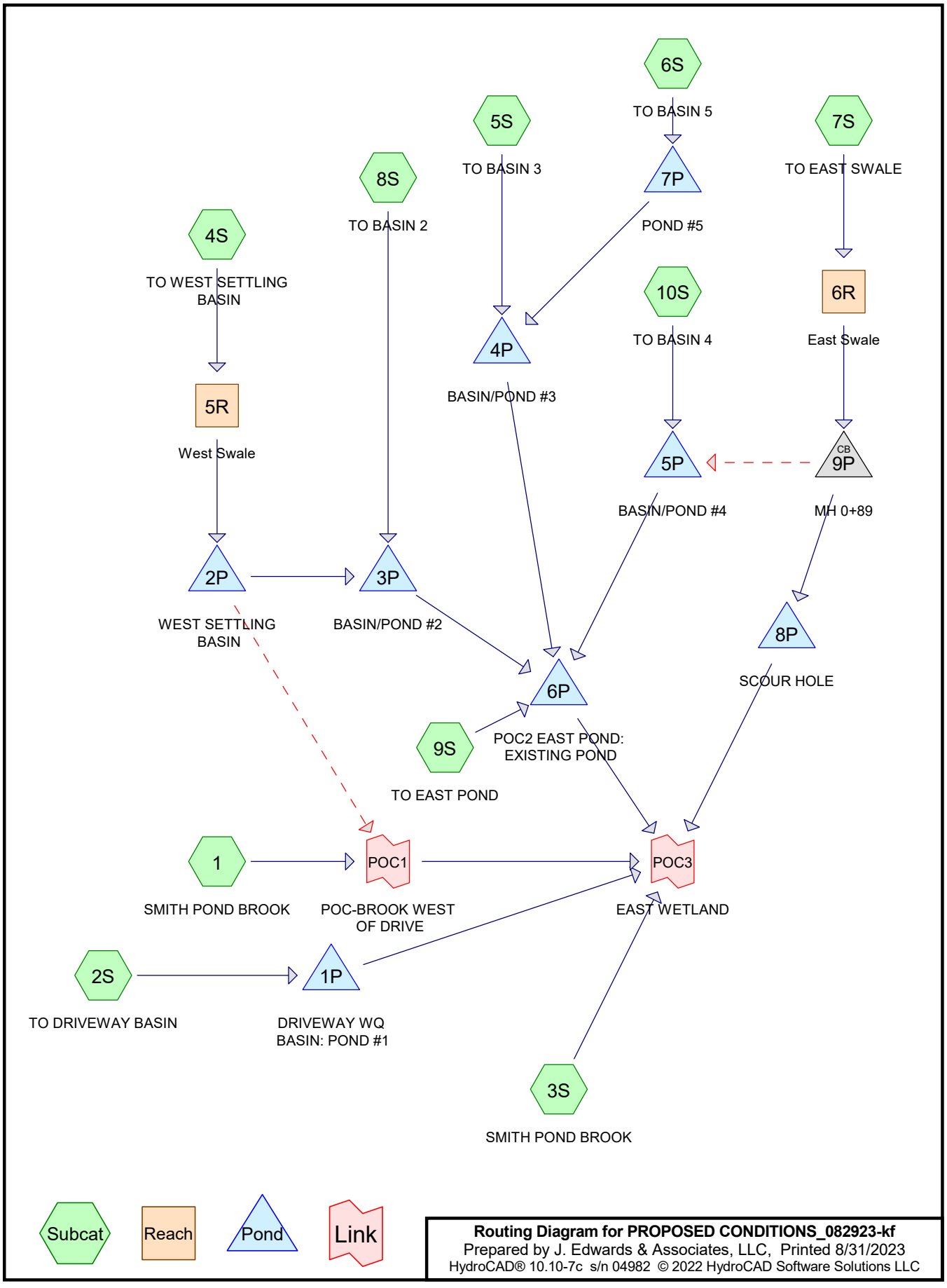
Subcatchment 23S: SMITH POND BROOK Runoff Area=1.352 ac 0.00% Impervious Runoff Depth=5.59"
Flow Length=4,022' Tc=82.6 min CN=74 Runoff=2.86 cfs 0.630 af

Pond 3P: POC2 - 6P EAST POND Peak Elev=350.60' Storage=520,903 cf Inflow=193.80 cfs 27.424 af
44.0" x 27.0", R=36.0" Elliptical Culvert n=0.025 L=102.0' S=0.0027 '/' Outflow=52.38 cfs 27.151 af

Link POC1: POC Inflow=119.24 cfs 26.385 af
Primary=119.24 cfs 26.385 af

Link POC3: POC-EAST OF POND Inflow=174.19 cfs 54.166 af
Primary=174.19 cfs 54.166 af

Total Runoff Area = 122.774 ac Runoff Volume = 54.438 af Average Runoff Depth = 5.32"
98.20% Pervious = 120.567 ac 1.80% Impervious = 2.207 ac



Routing Diagram for PROPOSED CONDITIONS_082923-kf
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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
6.745	61	>75% Grass cover, Good, HSG B (4S, 7S, 8S)
18.685	74	>75% Grass cover, Good, HSG C (1, 3S, 4S, 5S, 6S, 7S, 8S, 9S)
16.639	80	>75% Grass cover, Good, HSG D (4S, 5S, 6S, 7S, 8S)
0.130	90	GRAVEL DRIVEWAY (8S, 10S)
5.706	98	Paved parking (5S, 6S, 8S, 9S, 10S)
2.960	98	Paved parking, HSG A (10S)
0.350	98	Paved parking, HSG B (2S)
3.729	98	Roofs, HSG B (4S, 5S, 6S, 8S, 9S)
0.687	98	Unconnected pavement, HSG B (5S, 6S, 8S, 10S)
1.557	98	Water Surface (6S, 9S)
38.134	60	Woods, Fair, HSG B (1, 3S)
16.590	73	Woods, Fair, HSG C (1, 4S, 9S)
10.996	79	Woods, Fair, HSG D (1)

Summary for Subcatchment 1: SMITH POND BROOK

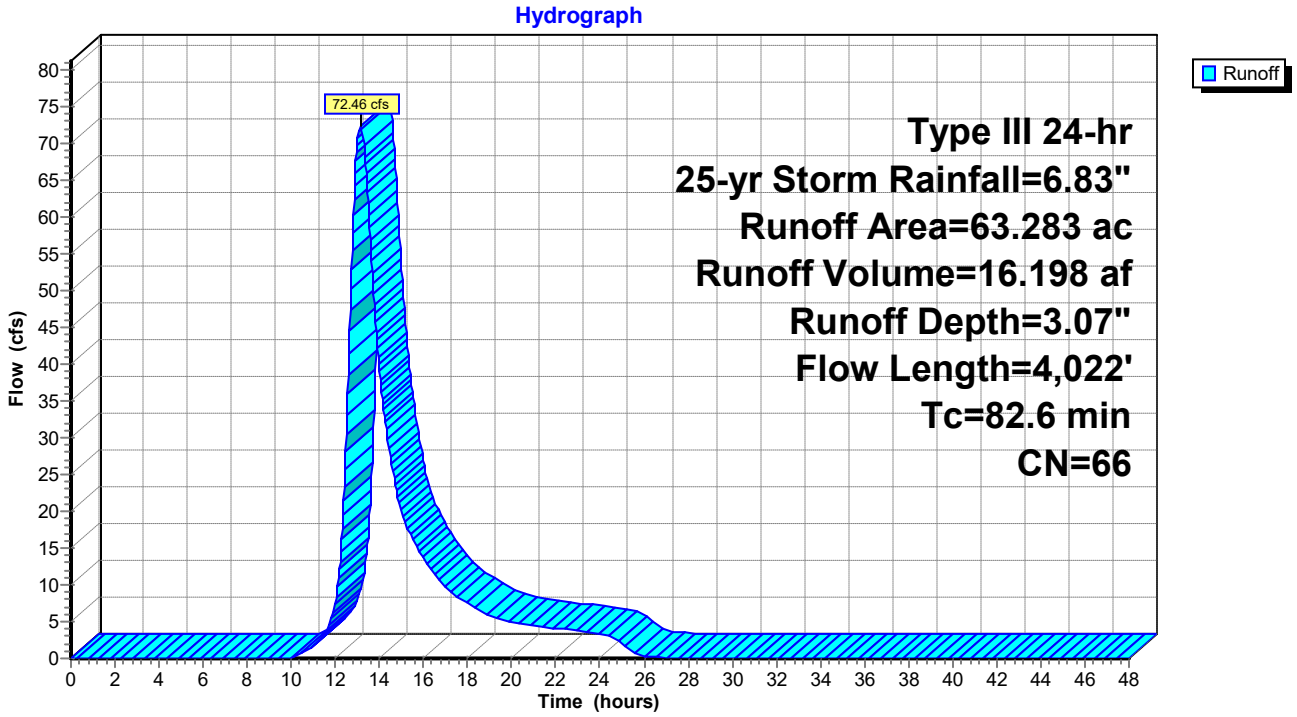
Runoff = 72.46 cfs @ 13.13 hrs, Volume= 16.198 af, Depth= 3.07"
Routed to Link POC1 : POC-BROOK WEST OF DRIVE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
Type III 24-hr 25-yr Storm Rainfall=6.83"

	Area (ac)	CN	Description
	0.000	39	>75% Grass cover, Good, HSG A
	7.562	74	>75% Grass cover, Good, HSG C
	0.000	80	>75% Grass cover, Good, HSG D
	0.000	36	Woods, Fair, HSG A
	37.420	60	Woods, Fair, HSG B
	7.305	73	Woods, Fair, HSG C
	10.996	79	Woods, Fair, HSG D
	0.000	94	Newly graded area, HSG D
*	0.000	98	Paved parking
*	0.000	90	GRAVEL DRIVEWAY
	0.000	98	Roofs, HSG B
	0.000	98	Water Surface
	63.283	66	Weighted Average
	63.283		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
42.0	190	0.0130	0.08		**Sheet Flow, AB** Woods: Light underbrush n= 0.400 P2= 3.30"
12.6	110	0.0880	0.15		**Sheet Flow, BC** Woods: Light underbrush n= 0.400 P2= 3.30"
21.6	1,880	0.0840	1.45		**Shallow Concentrated Flow, CD** Woodland Kv= 5.0 fps
6.4	1,842	0.0180	4.77	66.84	**Trap/Vee/Rect Channel Flow, DE** Bot.W=10.00' D=1.00' Z= 4.0 '/' Top.W=18.00' n= 0.035
82.6	4,022	Total			

Subcatchment 1: SMITH POND BROOK



Summary for Subcatchment 2S: TO DRIVEWAY BASIN

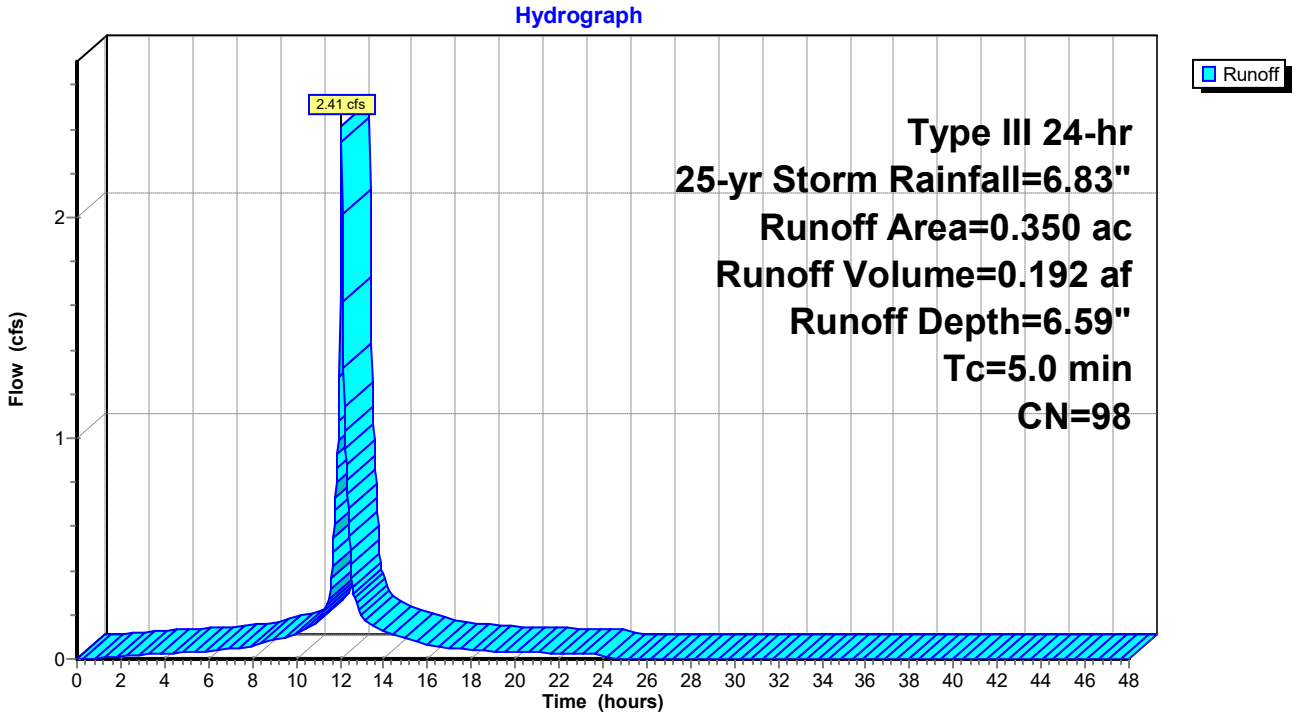
Runoff = 2.41 cfs @ 12.07 hrs, Volume= 0.192 af, Depth= 6.59"
Routed to Pond 1P : DRIVEWAY WQ BASIN: POND #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
Type III 24-hr 25-yr Storm Rainfall=6.83"

Area (ac)	CN	Description
0.350	98	Paved parking, HSG B
0.350		100.00% Impervious Area

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

Subcatchment 2S: TO DRIVEWAY BASIN



Summary for Subcatchment 3S: SMITH POND BROOK

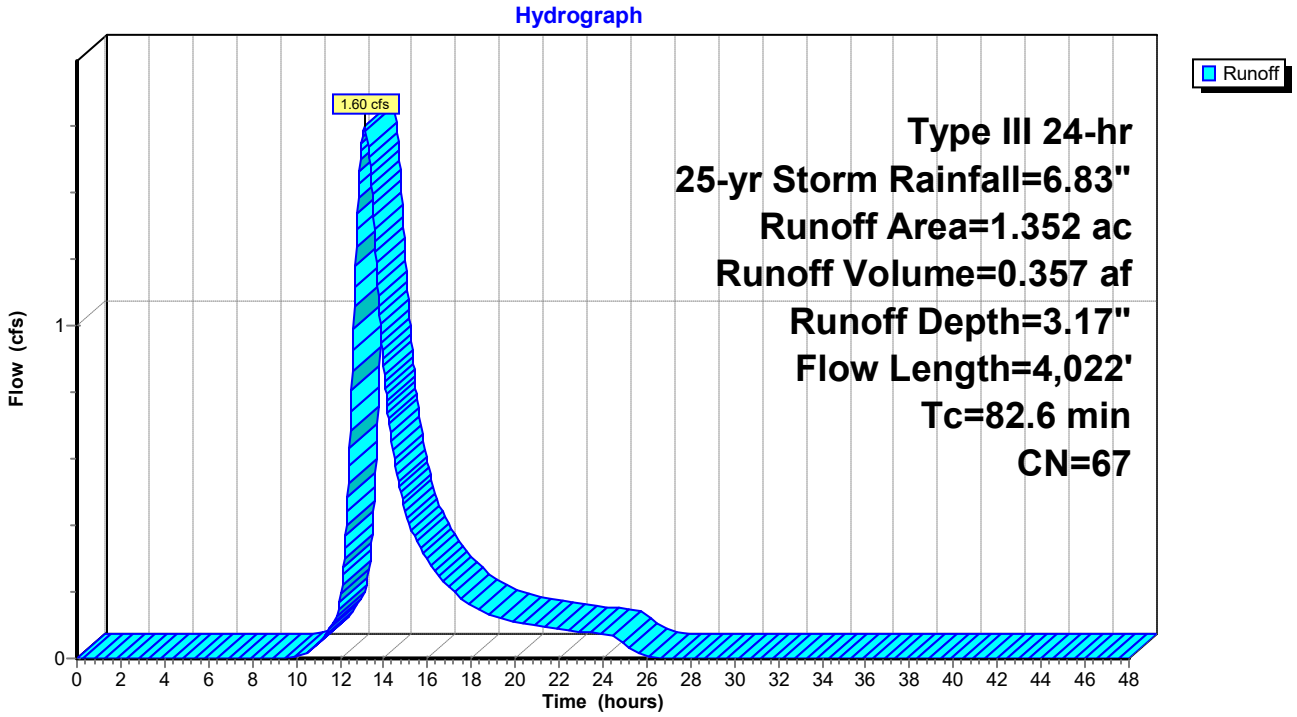
Runoff = 1.60 cfs @ 13.13 hrs, Volume= 0.357 af, Depth= 3.17"
Routed to Link POC3 : EAST WETLAND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
Type III 24-hr 25-yr Storm Rainfall=6.83"

	Area (ac)	CN	Description
	0.000	39	>75% Grass cover, Good, HSG A
	0.638	74	>75% Grass cover, Good, HSG C
	0.000	80	>75% Grass cover, Good, HSG D
	0.000	36	Woods, Fair, HSG A
	0.714	60	Woods, Fair, HSG B
	0.000	73	Woods, Fair, HSG C
	0.000	79	Woods, Fair, HSG D
	0.000	94	Newly graded area, HSG D
*	0.000	98	Paved parking
*	0.000	90	GRAVEL DRIVEWAY
	0.000	98	Roofs, HSG B
	0.000	98	Water Surface
	1.352	67	Weighted Average
	1.352		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
42.0	190	0.0130	0.08		**Sheet Flow, AB** Woods: Light underbrush n= 0.400 P2= 3.30"
12.6	110	0.0880	0.15		**Sheet Flow, BC** Woods: Light underbrush n= 0.400 P2= 3.30"
21.6	1,880	0.0840	1.45		**Shallow Concentrated Flow, CD** Woodland Kv= 5.0 fps
6.4	1,842	0.0180	4.77	66.84	**Trap/Vee/Rect Channel Flow, DE** Bot.W=10.00' D=1.00' Z= 4.0 '/' Top.W=18.00' n= 0.035
82.6	4,022	Total			

Subcatchment 3S: SMITH POND BROOK



Summary for Subcatchment 4S: TO WEST SETTLING BASIN

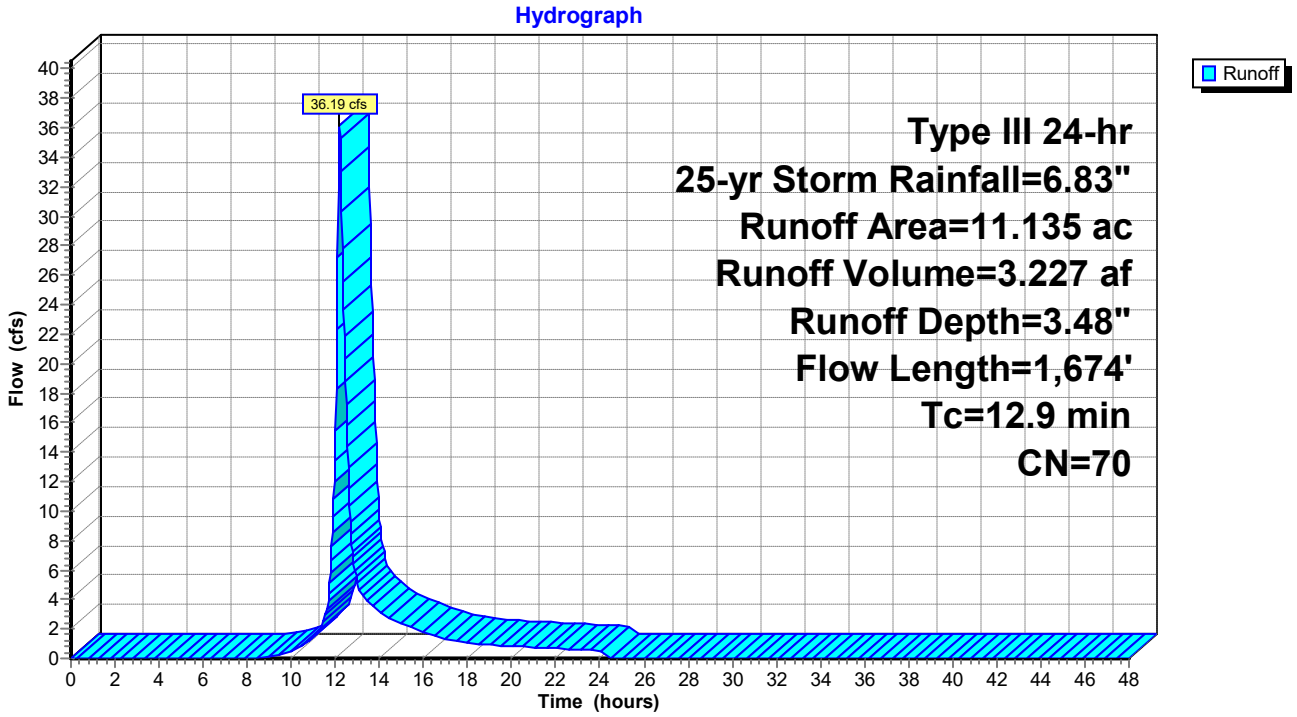
Runoff = 36.19 cfs @ 12.18 hrs, Volume= 3.227 af, Depth= 3.48"
Routed to Reach 5R : West Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
Type III 24-hr 25-yr Storm Rainfall=6.83"

	Area (ac)	CN	Description
	0.000	39	>75% Grass cover, Good, HSG A
	5.155	61	>75% Grass cover, Good, HSG B
	1.010	74	>75% Grass cover, Good, HSG C
	0.804	80	>75% Grass cover, Good, HSG D
	0.000	36	Woods, Fair, HSG A
	0.000	60	Woods, Fair, HSG B
	3.265	73	Woods, Fair, HSG C
	0.000	79	Woods, Fair, HSG D
	0.000	94	Newly graded area, HSG D
*	0.000	98	Paved parking
*	0.000	90	GRAVEL DRIVEWAY
	0.901	98	Roofs, HSG B
	0.000	98	Unconnected pavement, HSG B
	0.000	98	Water Surface
	11.135	70	Weighted Average
	10.234		91.91% Pervious Area
	0.901		8.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	100	0.5000	0.29		**Sheet Flow, AB** Woods: Light underbrush n= 0.400 P2= 3.30"
0.3	200	0.5000	10.61		**Shallow Concentrated Flow, BC** Grassed Waterway Kv= 15.0 fps
6.8	1,374	0.0500	3.35		**Shallow Concentrated Flow, CD** Grassed Waterway Kv= 15.0 fps
12.9	1,674	Total			

Subcatchment 4S: TO WEST SETTLING BASIN



Summary for Subcatchment 5S: TO BASIN 3

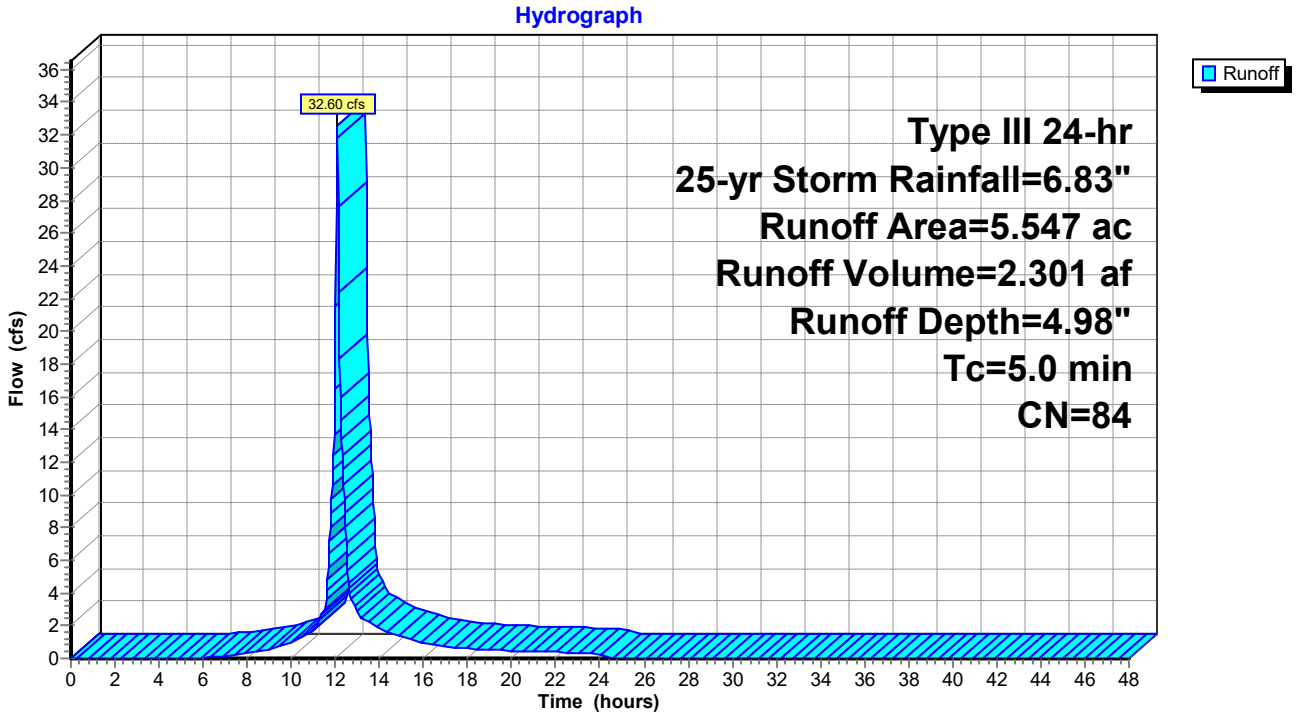
Runoff = 32.60 cfs @ 12.07 hrs, Volume= 2.301 af, Depth= 4.98"
Routed to Pond 4P : BASIN/POND #3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
Type III 24-hr 25-yr Storm Rainfall=6.83"

	Area (ac)	CN	Description
	0.000	39	>75% Grass cover, Good, HSG A
	0.384	74	>75% Grass cover, Good, HSG C
	3.703	80	>75% Grass cover, Good, HSG D
	0.000	36	Woods, Fair, HSG A
	0.000	60	Woods, Fair, HSG B
	0.000	73	Woods, Fair, HSG C
	0.000	79	Woods, Fair, HSG D
	0.000	94	Newly graded area, HSG D
*	0.645	98	Paved parking
*	0.000	90	GRAVEL DRIVEWAY
	0.760	98	Roofs, HSG B
	0.055	98	Unconnected pavement, HSG B
	0.000	98	Water Surface
	5.547	84	Weighted Average
	4.087		73.68% Pervious Area
	1.460		26.32% Impervious Area
	0.055		3.77% Unconnected

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

Subcatchment 5S: TO BASIN 3



Summary for Subcatchment 6S: TO BASIN 5

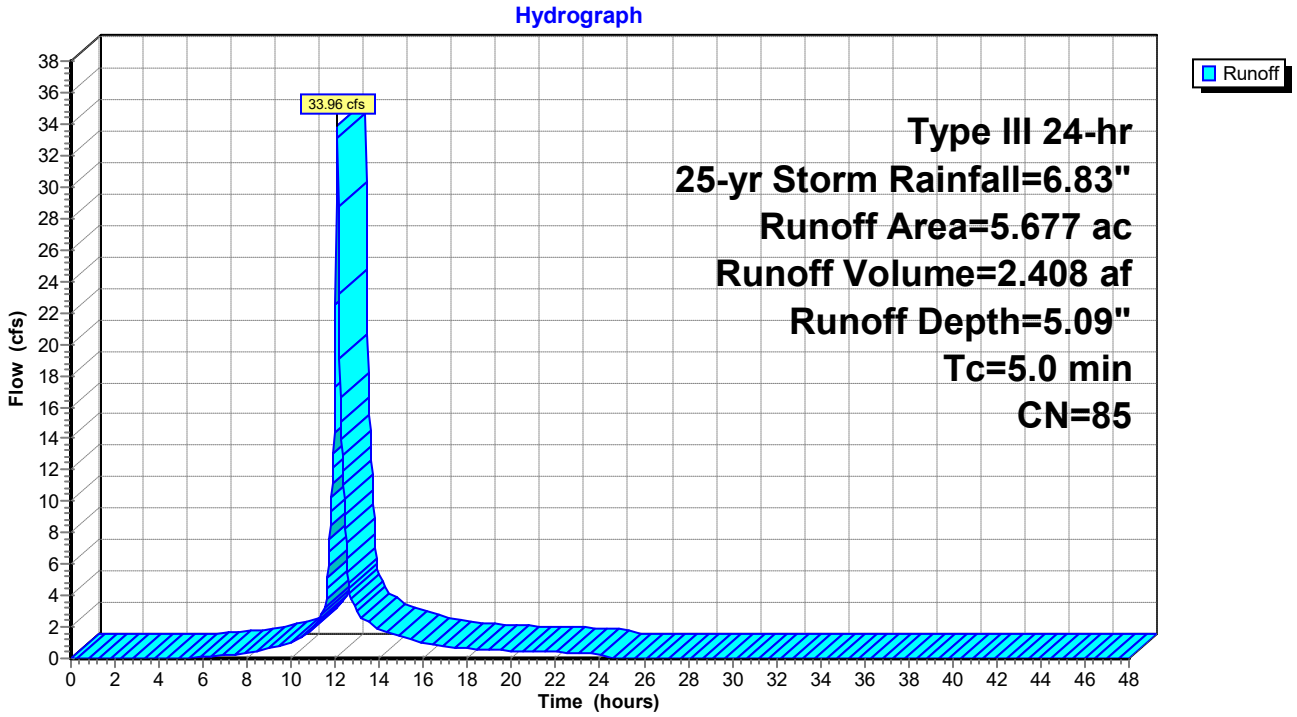
Runoff = 33.96 cfs @ 12.07 hrs, Volume= 2.408 af, Depth= 5.09"
Routed to Pond 7P : POND #5

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
Type III 24-hr 25-yr Storm Rainfall=6.83"

	Area (ac)	CN	Description
	0.000	39	>75% Grass cover, Good, HSG A
	0.487	74	>75% Grass cover, Good, HSG C
	3.396	80	>75% Grass cover, Good, HSG D
	0.000	36	Woods, Fair, HSG A
	0.000	60	Woods, Fair, HSG B
	0.000	73	Woods, Fair, HSG C
	0.000	79	Woods, Fair, HSG D
	0.000	94	Newly graded area, HSG D
*	0.750	98	Paved parking
*	0.000	90	GRAVEL DRIVEWAY
	0.878	98	Roofs, HSG B
	0.146	98	Unconnected pavement, HSG B
	0.020	98	Water Surface
	5.677	85	Weighted Average
	3.883		68.40% Pervious Area
	1.794		31.60% Impervious Area
	0.146		8.14% Unconnected

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

Subcatchment 6S: TO BASIN 5



Summary for Subcatchment 7S: TO EAST SWALE

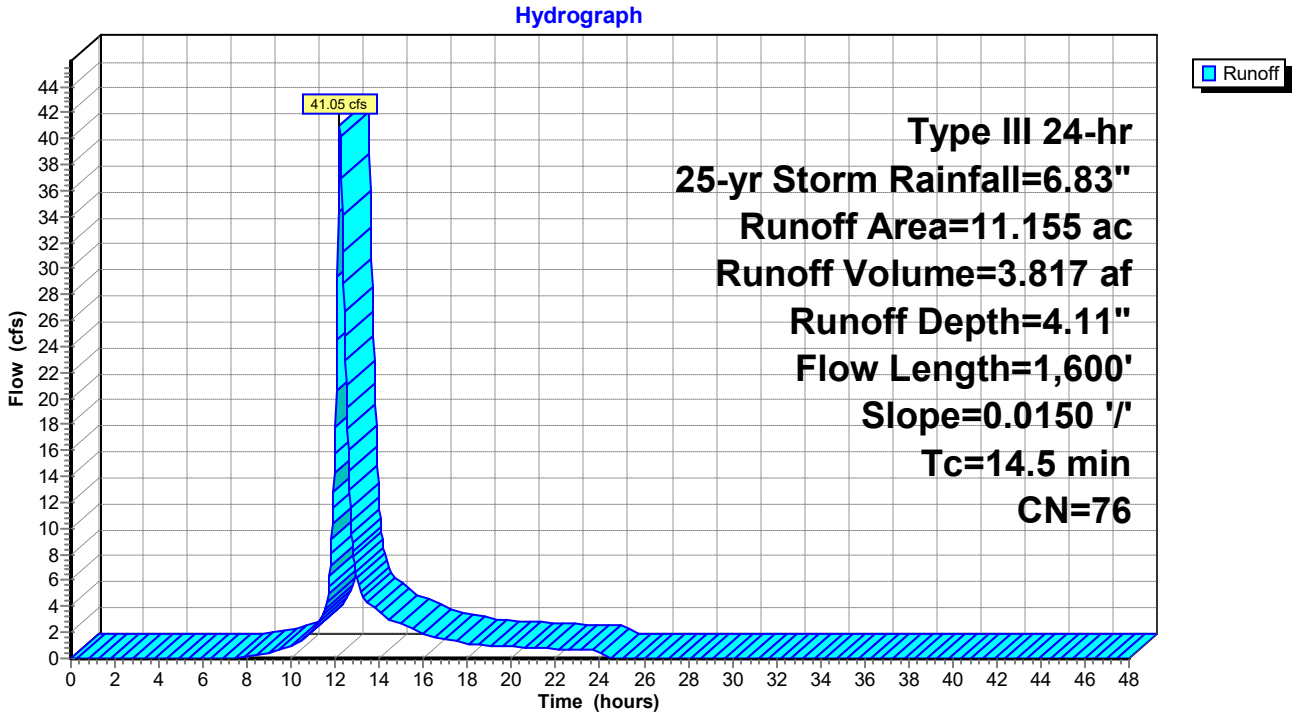
Runoff = 41.05 cfs @ 12.20 hrs, Volume= 3.817 af, Depth= 4.11"
Routed to Reach 6R : East Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
Type III 24-hr 25-yr Storm Rainfall=6.83"

	Area (ac)	CN	Description
	0.000	39	>75% Grass cover, Good, HSG A
	1.217	61	>75% Grass cover, Good, HSG B
	3.188	74	>75% Grass cover, Good, HSG C
	6.750	80	>75% Grass cover, Good, HSG D
	0.000	36	Woods, Fair, HSG A
	0.000	60	Woods, Fair, HSG B
	0.000	73	Woods, Fair, HSG C
	0.000	79	Woods, Fair, HSG D
	0.000	94	Newly graded area, HSG D
*	0.000	98	Paved parking
*	0.000	90	GRAVEL DRIVEWAY
	0.000	98	Unconnected pavement, HSG B
	0.000	98	Water Surface
	11.155	76	Weighted Average
	11.155		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.5	1,600	0.0150	1.84		**Shallow Concentrated Flow, swale** Grassed Waterway Kv= 15.0 fps

Subcatchment 7S: TO EAST SWALE



Summary for Subcatchment 8S: TO BASIN 2

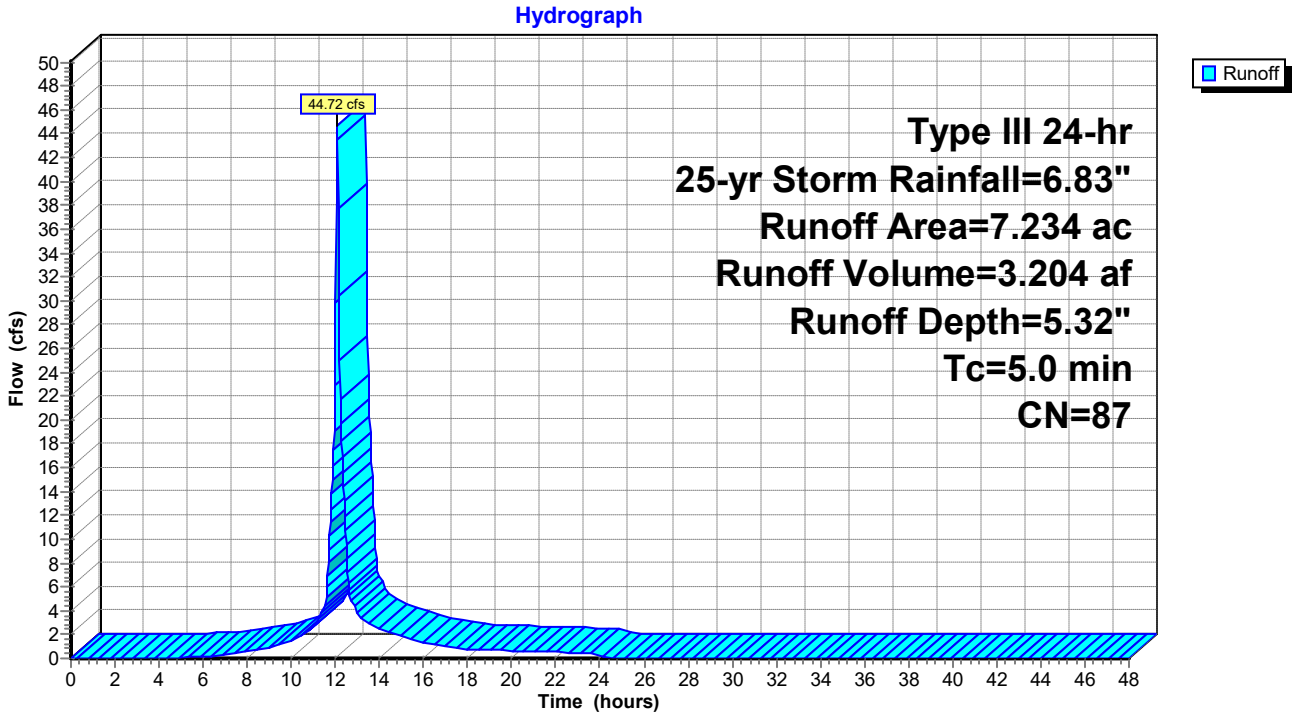
Runoff = 44.72 cfs @ 12.07 hrs, Volume= 3.204 af, Depth= 5.32"
Routed to Pond 3P : BASIN/POND #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
Type III 24-hr 25-yr Storm Rainfall=6.83"

	Area (ac)	CN	Description
	0.000	39	>75% Grass cover, Good, HSG A
	0.373	61	>75% Grass cover, Good, HSG B
	1.286	74	>75% Grass cover, Good, HSG C
	1.986	80	>75% Grass cover, Good, HSG D
	0.000	36	Woods, Fair, HSG A
	0.000	60	Woods, Fair, HSG B
	0.000	73	Woods, Fair, HSG C
	0.000	79	Woods, Fair, HSG D
	0.000	94	Newly graded area, HSG D
*	2.452	98	Paved parking
*	0.032	90	GRAVEL DRIVEWAY
	0.696	98	Roofs, HSG B
	0.409	98	Unconnected pavement, HSG B
	0.000	98	Water Surface
	7.234	87	Weighted Average
	3.677		50.83% Pervious Area
	3.557		49.17% Impervious Area
	0.409		11.50% Unconnected

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

Subcatchment 8S: TO BASIN 2



Summary for Subcatchment 9S: TO EAST POND

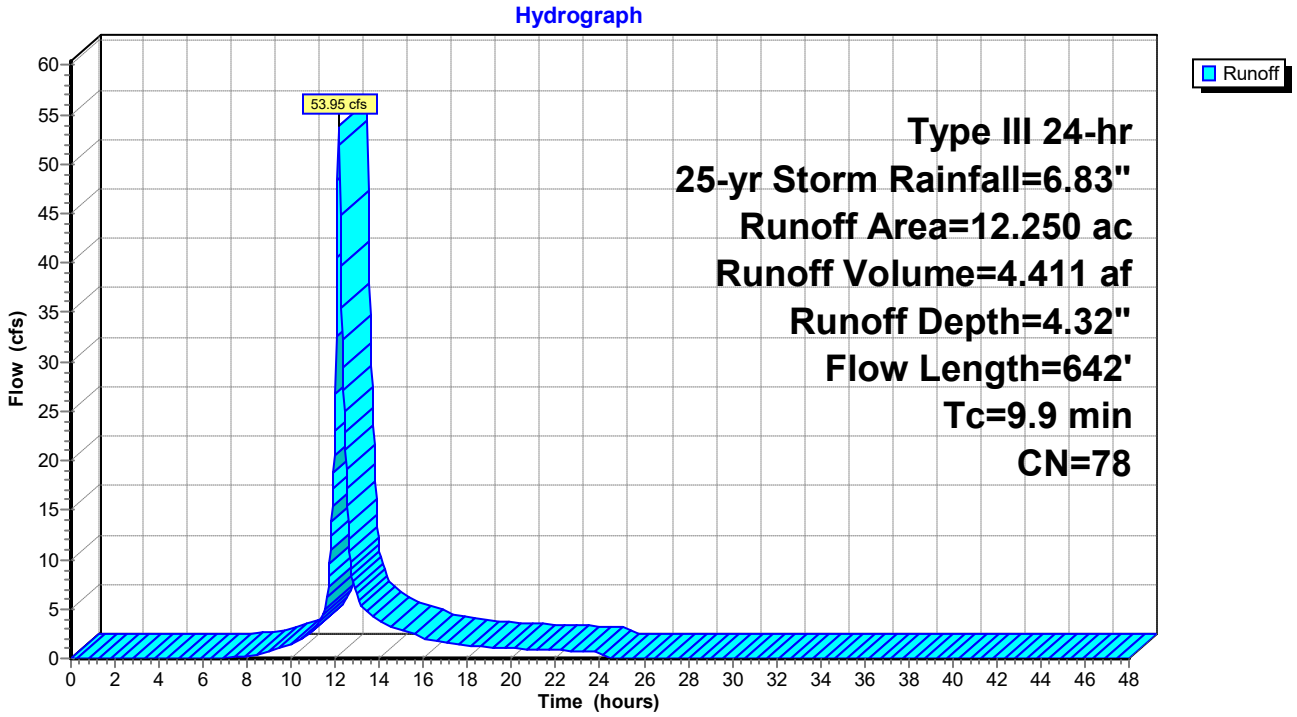
Runoff = 53.95 cfs @ 12.14 hrs, Volume= 4.411 af, Depth= 4.32"
Routed to Pond 6P : POC2 EAST POND: EXISTING POND

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
Type III 24-hr 25-yr Storm Rainfall=6.83"

	Area (ac)	CN	Description
	0.000	39	>75% Grass cover, Good, HSG A
	4.130	74	>75% Grass cover, Good, HSG C
	0.000	36	Woods, Fair, HSG A
	0.000	60	Woods, Fair, HSG B
	6.020	73	Woods, Fair, HSG C
	0.000	79	Woods, Fair, HSG D
	0.000	94	Newly graded area, HSG D
*	0.069	98	Paved parking
*	0.000	90	GRAVEL DRIVEWAY
	0.494	98	Roofs, HSG B
	1.537	98	Water Surface
	12.250	78	Weighted Average
	10.150		82.86% Pervious Area
	2.100		17.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	100	0.1100	0.23		**Sheet Flow, AB** Grass: Dense n= 0.240 P2= 3.30"
0.2	67	0.1100	4.97		**Shallow Concentrated Flow, BC** Grassed Waterway Kv= 15.0 fps
0.1	59	0.4100	9.60		**Shallow Concentrated Flow, CD** Grassed Waterway Kv= 15.0 fps
2.5	416	0.0800	2.83		**Shallow Concentrated Flow, DE** Nearly Bare & Untilled Kv= 10.0 fps
9.9	642	Total			

Subcatchment 9S: TO EAST POND



Summary for Subcatchment 10S: TO BASIN 4

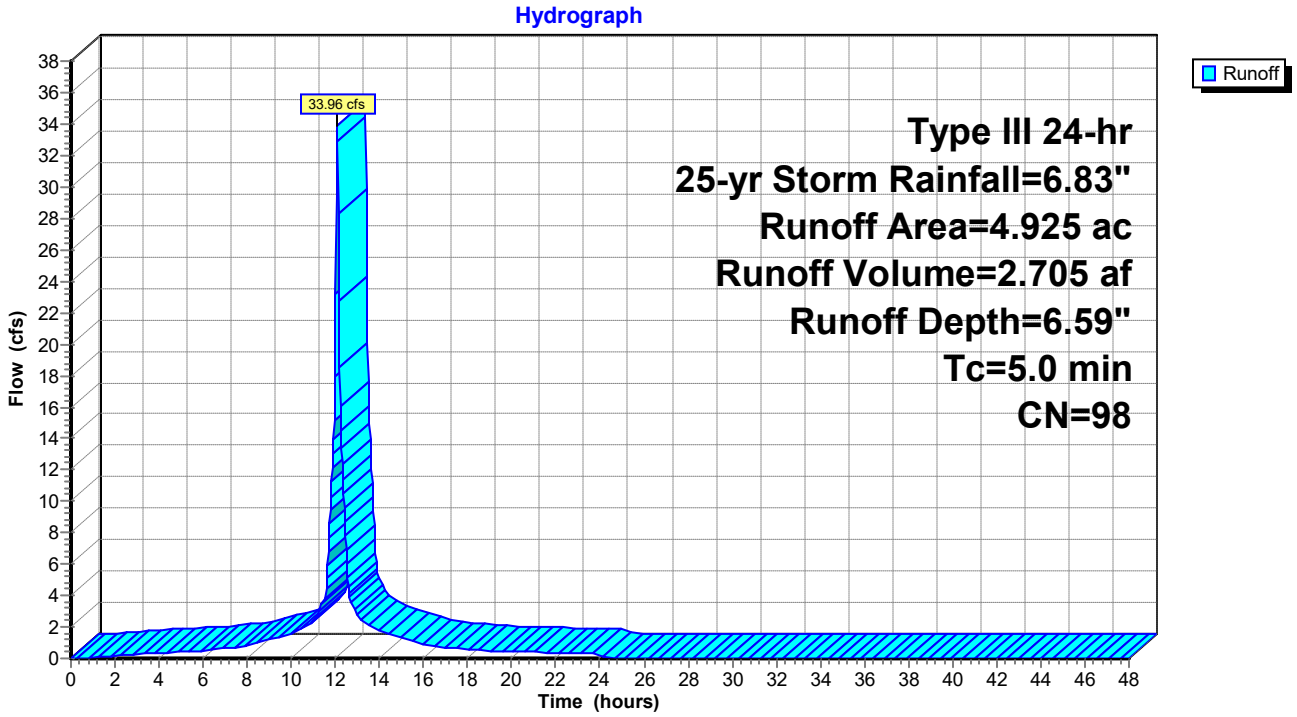
Runoff = 33.96 cfs @ 12.07 hrs, Volume= 2.705 af, Depth= 6.59"
Routed to Pond 5P : BASIN/POND #4

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
Type III 24-hr 25-yr Storm Rainfall=6.83"

	Area (ac)	CN	Description
	0.000	39	>75% Grass cover, Good, HSG A
	0.000	61	>75% Grass cover, Good, HSG B
	0.000	74	>75% Grass cover, Good, HSG C
	0.000	80	>75% Grass cover, Good, HSG D
	0.000	36	Woods, Fair, HSG A
	0.000	60	Woods, Fair, HSG B
	0.000	73	Woods, Fair, HSG C
	0.000	79	Woods, Fair, HSG D
	0.000	94	Newly graded area, HSG D
*	1.790	98	Paved parking
*	0.098	90	GRAVEL DRIVEWAY
	0.077	98	Unconnected pavement, HSG B
	0.000	98	Water Surface
	2.960	98	Paved parking, HSG A
	4.925	98	Weighted Average
	0.098		1.99% Pervious Area
	4.827		98.01% Impervious Area
	0.077		1.60% Unconnected

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

Subcatchment 10S: TO BASIN 4



Summary for Reach 5R: West Swale

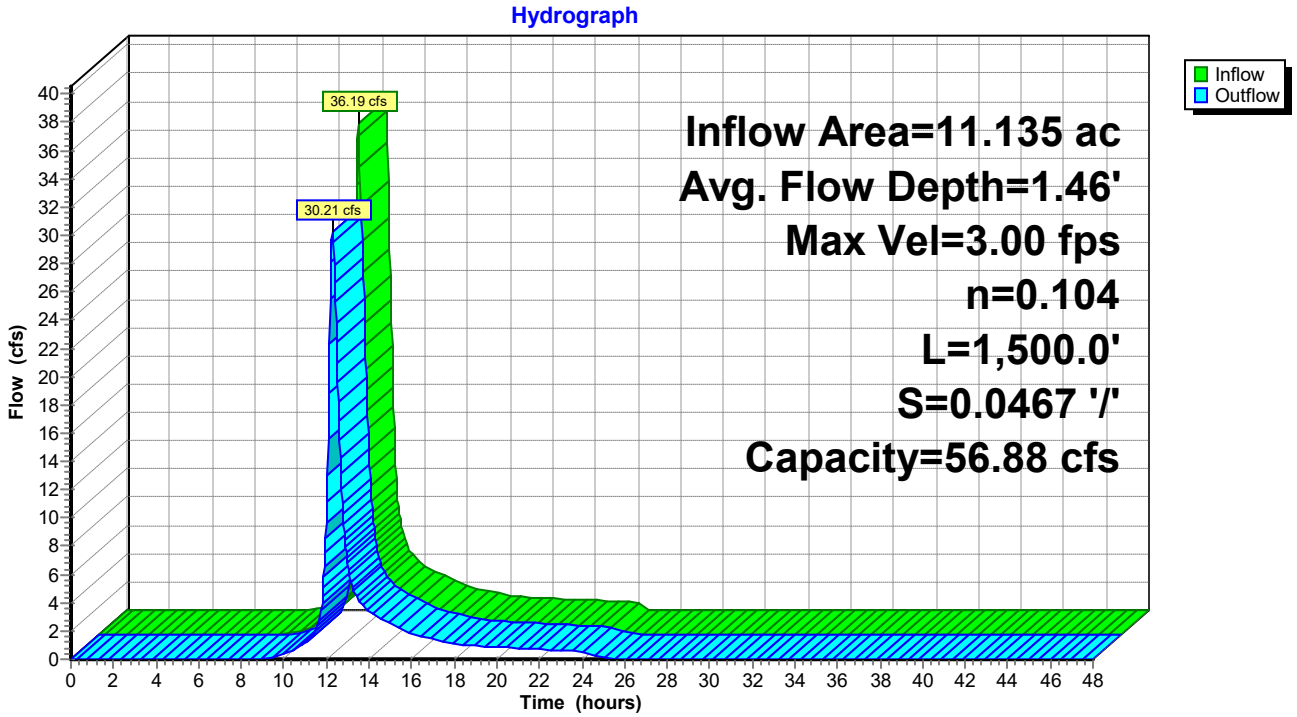
Inflow Area = 11.135 ac, 8.09% Impervious, Inflow Depth = 3.48" for 25-yr Storm event
Inflow = 36.19 cfs @ 12.18 hrs, Volume= 3.227 af
Outflow = 30.21 cfs @ 12.27 hrs, Volume= 3.227 af, Atten= 17%, Lag= 5.6 min
Routed to Pond 2P : WEST SETTLING BASIN

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
Max. Velocity= 3.00 fps, Min. Travel Time= 8.3 min
Avg. Velocity = 0.72 fps, Avg. Travel Time= 34.5 min

Peak Storage= 15,109 cf @ 12.27 hrs
Average Depth at Peak Storage= 1.46' , Surface Width= 9.83'
Bank-Full Depth= 2.00' Flow Area= 16.0 sf, Capacity= 56.88 cfs

4.00' x 2.00' deep channel, n= 0.104 Riprap, 6-inch
Side Slope Z-value= 2.0 '/' Top Width= 12.00'
Length= 1,500.0' Slope= 0.0467 '/'
Inlet Invert= 450.00', Outlet Invert= 380.00'





Stage-Area-Storage for Reach 5R: West Swale

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
450.00	0.0	0
450.02	0.1	121
450.04	0.2	245
450.06	0.2	371
450.08	0.3	499
450.10	0.4	630
450.12	0.5	763
450.14	0.6	899
450.16	0.7	1,037
450.18	0.8	1,177
450.20	0.9	1,320
450.22	1.0	1,465
450.24	1.1	1,613
450.26	1.2	1,763
450.28	1.3	1,915
450.30	1.4	2,070
450.32	1.5	2,227
450.34	1.6	2,387
450.36	1.7	2,549
450.38	1.8	2,713
450.40	1.9	2,880
450.42	2.0	3,049
450.44	2.1	3,221
450.46	2.3	3,395
450.48	2.4	3,571
450.50	2.5	3,750
450.52	2.6	3,931
450.54	2.7	4,115
450.56	2.9	4,301
450.58	3.0	4,489
450.60	3.1	4,680
450.62	3.2	4,873
450.64	3.4	5,069
450.66	3.5	5,267
450.68	3.6	5,467
450.70	3.8	5,670
450.72	3.9	5,875
450.74	4.1	6,083
450.76	4.2	6,293
450.78	4.3	6,505
450.80	4.5	6,720
450.82	4.6	6,937
450.84	4.8	7,157
450.86	4.9	7,379
450.88	5.1	7,603
450.90	5.2	7,830
450.92	5.4	8,059
450.94	5.5	8,291
450.96	5.7	8,525
450.98	5.8	8,761
451.00	6.0	9,000
451.02	6.2	9,241
451.04	6.3	9,485
451.06	6.5	9,731
451.08	6.7	9,979
451.10	6.8	10,230
451.12	7.0	10,483
451.14	7.2	10,739
451.16	7.3	10,997
451.18	7.5	11,257
451.20	7.7	11,520
451.22	7.9	11,785
451.24	8.0	12,053
451.26	8.2	12,323
451.28	8.4	12,595
451.30	8.6	12,870
451.32	8.8	13,147
451.34	9.0	13,427
451.36	9.1	13,709
451.38	9.3	13,993
451.40	9.5	14,280
451.42	9.7	14,569
451.44	9.9	14,861
451.46	10.1	15,155
451.48	10.3	15,451
451.50	10.5	15,750
451.52	10.7	16,051
451.54	10.9	16,355
451.56	11.1	16,661
451.58	11.3	16,969
451.60	11.5	17,280
451.62	11.7	17,593
451.64	11.9	17,909
451.66	12.2	18,227
451.68	12.4	18,547
451.70	12.6	18,870
451.72	12.8	19,195
451.74	13.0	19,523
451.76	13.2	19,853
451.78	13.5	20,185
451.80	13.7	20,520
451.82	13.9	20,857
451.84	14.1	21,197
451.86	14.4	21,539
451.88	14.6	21,883
451.90	14.8	22,230
451.92	15.1	22,579
451.94	15.3	22,931
451.96	15.5	23,285
451.98	15.8	23,641
452.00	**16.0**	**24,000**

Summary for Reach 6R: East Swale

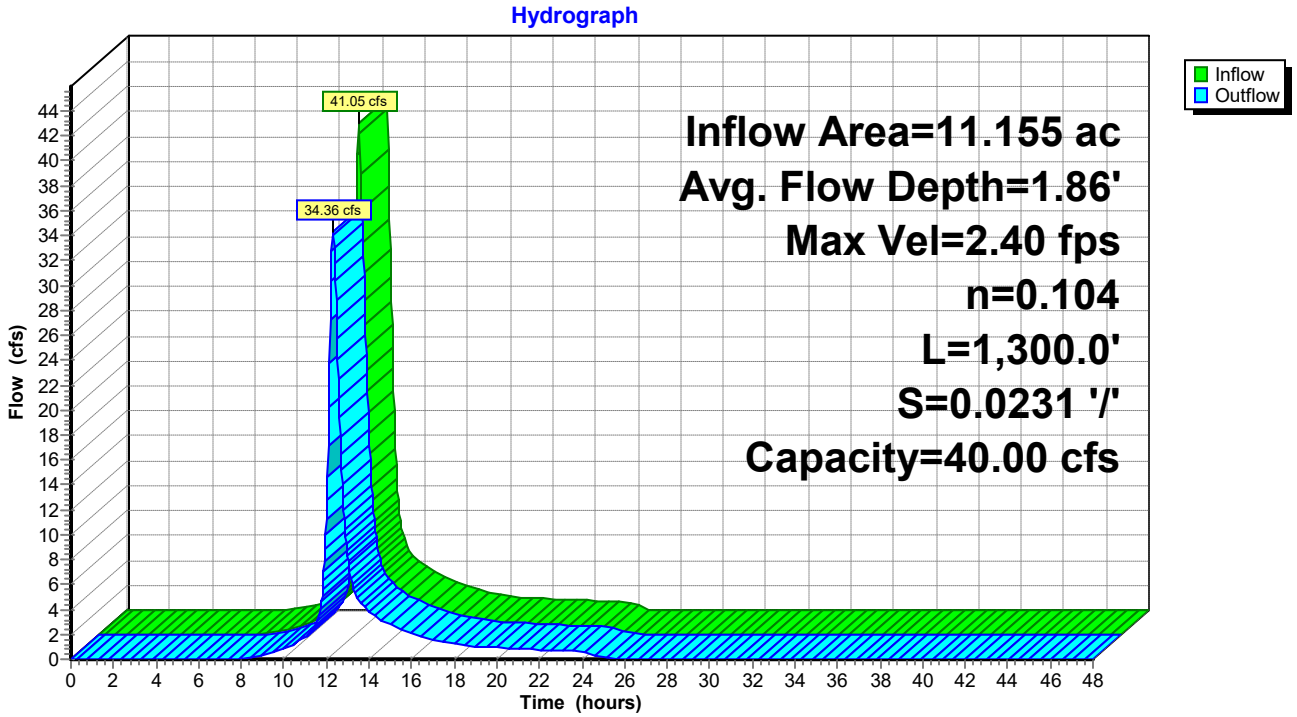
Inflow Area = 11.155 ac, 0.00% Impervious, Inflow Depth = 4.11" for 25-yr Storm event
Inflow = 41.05 cfs @ 12.20 hrs, Volume= 3.817 af
Outflow = 34.36 cfs @ 12.30 hrs, Volume= 3.817 af, Atten= 16%, Lag= 6.0 min
Routed to Pond 9P : MH 0+89

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
Max. Velocity= 2.40 fps, Min. Travel Time= 9.0 min
Avg. Velocity = 0.55 fps, Avg. Travel Time= 39.7 min

Peak Storage= 18,604 cf @ 12.30 hrs
Average Depth at Peak Storage= 1.86' , Surface Width= 11.42'
Bank-Full Depth= 2.00' Flow Area= 16.0 sf, Capacity= 40.00 cfs

4.00' x 2.00' deep channel, n= 0.104 Riprap, 6-inch
Side Slope Z-value= 2.0 '/' Top Width= 12.00'
Length= 1,300.0' Slope= 0.0231 '/'
Inlet Invert= 450.00', Outlet Invert= 420.00'





Stage-Area-Storage for Reach 6R: East Swale

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
450.00	0.0	0
450.02	0.1	105
450.04	0.2	212
450.06	0.2	321
450.08	0.3	433
450.10	0.4	546
450.12	0.5	661
450.14	0.6	779
450.16	0.7	899
450.18	0.8	1,020
450.20	0.9	1,144
450.22	1.0	1,270
450.24	1.1	1,398
450.26	1.2	1,528
450.28	1.3	1,660
450.30	1.4	1,794
450.32	1.5	1,930
450.34	1.6	2,069
450.36	1.7	2,209
450.38	1.8	2,351
450.40	1.9	2,496
450.42	2.0	2,643
450.44	2.1	2,791
450.46	2.3	2,942
450.48	2.4	3,095
450.50	2.5	3,250
450.52	2.6	3,407
450.54	2.7	3,566
450.56	2.9	3,727
450.58	3.0	3,891
450.60	3.1	4,056
450.62	3.2	4,223
450.64	3.4	4,393
450.66	3.5	4,565
450.68	3.6	4,738
450.70	3.8	4,914
450.72	3.9	5,092
450.74	4.1	5,272
450.76	4.2	5,454
450.78	4.3	5,638
450.80	4.5	5,824
450.82	4.6	6,012
450.84	4.8	6,203
450.86	4.9	6,395
450.88	5.1	6,589
450.90	5.2	6,786
450.92	5.4	6,985
450.94	5.5	7,185
450.96	5.7	7,388
450.98	5.8	7,593
451.00	6.0	7,800
451.02	6.2	8,009
451.04	6.3	8,220
451.06	6.5	8,433
451.08	6.7	8,649
451.10	6.8	8,866
451.12	7.0	9,085
451.14	7.2	9,307
451.16	7.3	9,531
451.18	7.5	9,756
451.20	7.7	9,984
451.22	7.9	10,214
451.24	8.0	10,446
451.26	8.2	10,680
451.28	8.4	10,916
451.30	8.6	11,154
451.32	8.8	11,394
451.34	9.0	11,637
451.36	9.1	11,881
451.38	9.3	12,127
451.40	9.5	12,376
451.42	9.7	12,627
451.44	9.9	12,879
451.46	10.1	13,134
451.48	10.3	13,391
451.50	10.5	13,650
451.52	10.7	13,911
451.54	10.9	14,174
451.56	11.1	14,439
451.58	11.3	14,707
451.60	11.5	14,976
451.62	11.7	15,247
451.64	11.9	15,521
451.66	12.2	15,797
451.68	12.4	16,074
451.70	12.6	16,354
451.72	12.8	16,636
451.74	13.0	16,920
451.76	13.2	17,206
451.78	13.5	17,494
451.80	13.7	17,784
451.82	13.9	18,076
451.84	14.1	18,371
451.86	14.4	18,667
451.88	14.6	18,965
451.90	14.8	19,266
451.92	15.1	19,569
451.94	15.3	19,873
451.96	15.5	20,180
451.98	15.8	20,489
452.00	**16.0**	**20,800**

Summary for Pond 1P: DRIVEWAY WQ BASIN: POND #1

Inflow Area = 0.350 ac,100.00% Impervious, Inflow Depth = 6.59" for 25-yr Storm event
Inflow = 2.41 cfs @ 12.07 hrs, Volume= 0.192 af
Outflow = 2.34 cfs @ 12.09 hrs, Volume= 0.155 af, Atten= 3%, Lag= 1.3 min
Primary = 2.34 cfs @ 12.09 hrs, Volume= 0.155 af
Routed to Link POC3 : EAST WETLAND

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
Peak Elev= 373.85' @ 12.09 hrs Surf.Area= 1,010 sf Storage= 1,860 cf

Plug-Flow detention time= 146.3 min calculated for 0.155 af (81% of inflow)
Center-of-Mass det. time= 70.7 min (813.0 - 742.4)

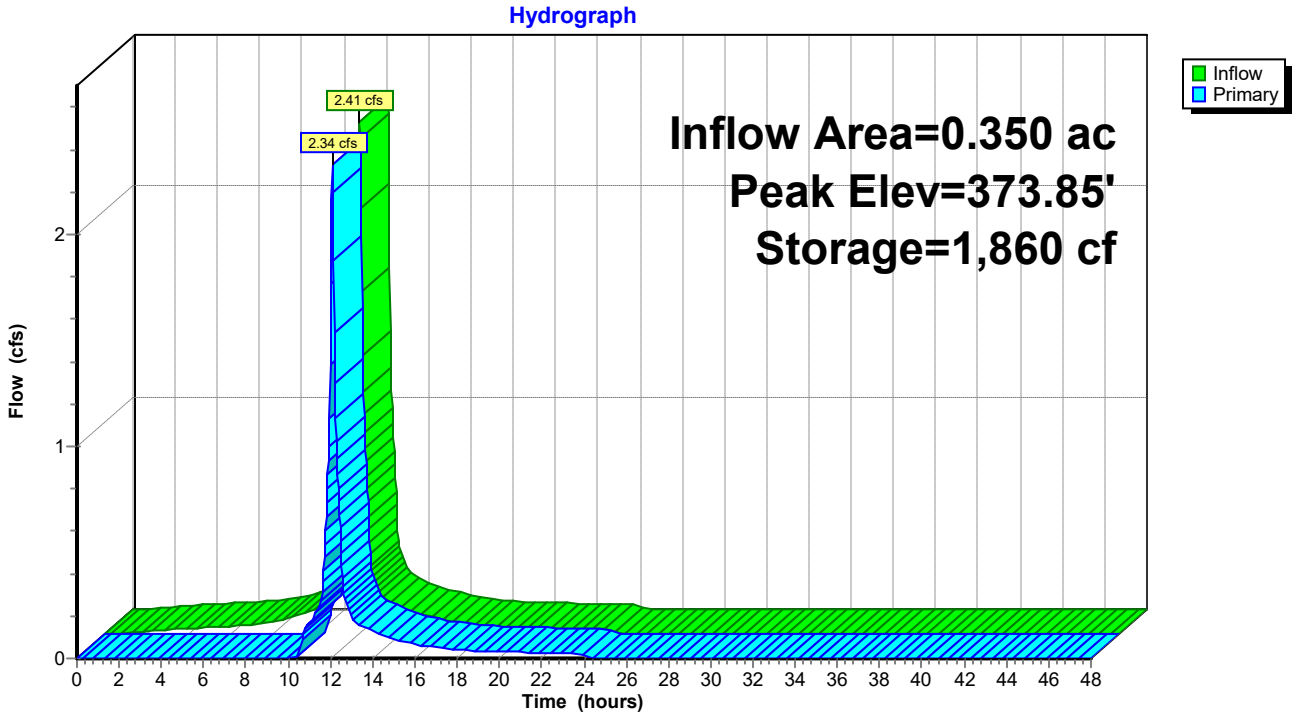
Volume	Invert	Avail.Storage	Storage Description
#1	371.20'	2,587 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
371.20	395	0	0	395
372.00	594	393	393	604
374.00	1,049	1,622	2,014	1,101
374.50	1,245	573	2,587	1,306

Device	Routing	Invert	Outlet Devices
#1	Primary	373.60'	**6.0' long (Profile 6) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 3.12 3.41 3.59

Primary OutFlow Max=2.33 cfs @ 12.09 hrs HW=373.85' TW=0.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 2.33 cfs @ 1.56 fps)

Pond 1P: DRIVEWAY WQ BASIN: POND #1



Stage-Area-Storage for Pond 1P: DRIVEWAY WQ BASIN: POND #1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
371.20	395	0
371.25	406	20
371.30	418	41
371.35	429	62
371.40	441	84
371.45	453	106
371.50	465	129
371.55	477	152
371.60	489	177
371.65	502	201
371.70	515	227
371.75	527	253
371.80	540	279
371.85	554	307
371.90	567	335
371.95	580	364
372.00	594	393
372.05	604	423
372.10	614	453
372.15	624	484
372.20	634	516
372.25	644	548
372.30	654	580
372.35	664	613
372.40	675	646
372.45	685	680
372.50	696	715
372.55	706	750
372.60	717	786
372.65	728	822
372.70	739	858
372.75	750	896
372.80	761	933
372.85	772	972
372.90	783	1,011
372.95	794	1,050
373.00	805	1,090
373.05	817	1,131
373.10	828	1,172
373.15	840	1,213
373.20	852	1,256
373.25	863	1,298
373.30	875	1,342
373.35	887	1,386
373.40	899	1,431
373.45	911	1,476
373.50	923	1,522
373.55	935	1,568
373.60	948	1,615
373.65	960	1,663
373.70	973	1,711
373.75	985	1,760
373.80	998	1,810
373.85	1,010	1,860
373.90	1,023	1,911
373.95	1,036	1,962
374.00	1,049	2,014
374.05	1,068	2,067
374.10	1,087	2,121
374.15	1,106	2,176
374.20	1,125	2,232
374.25	1,145	2,289
374.30	1,165	2,346
374.35	1,184	2,405
374.40	1,204	2,465
374.45	1,225	2,526
374.50	**1,245**	**2,587**

Summary for Pond 2P: WEST SETTLING BASIN

Inflow Area = 11.135 ac, 8.09% Impervious, Inflow Depth = 3.48" for 25-yr Storm event
Inflow = 30.21 cfs @ 12.27 hrs, Volume= 3.227 af
Outflow = 29.03 cfs @ 12.33 hrs, Volume= 3.227 af, Atten= 4%, Lag= 3.5 min
Primary = 29.03 cfs @ 12.33 hrs, Volume= 3.227 af
Routed to Pond 3P : BASIN/POND #2
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link POC1 : POC-BROOK WEST OF DRIVE

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
Peak Elev= 380.34' @ 12.33 hrs Surf.Area= 3,679 sf Storage= 6,742 cf

Plug-Flow detention time= 12.7 min calculated for 3.225 af (100% of inflow)
Center-of-Mass det. time= 12.8 min (866.5 - 853.7)

Volume	Invert	Avail.Storage	Storage Description
#1	378.00'	13,997 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

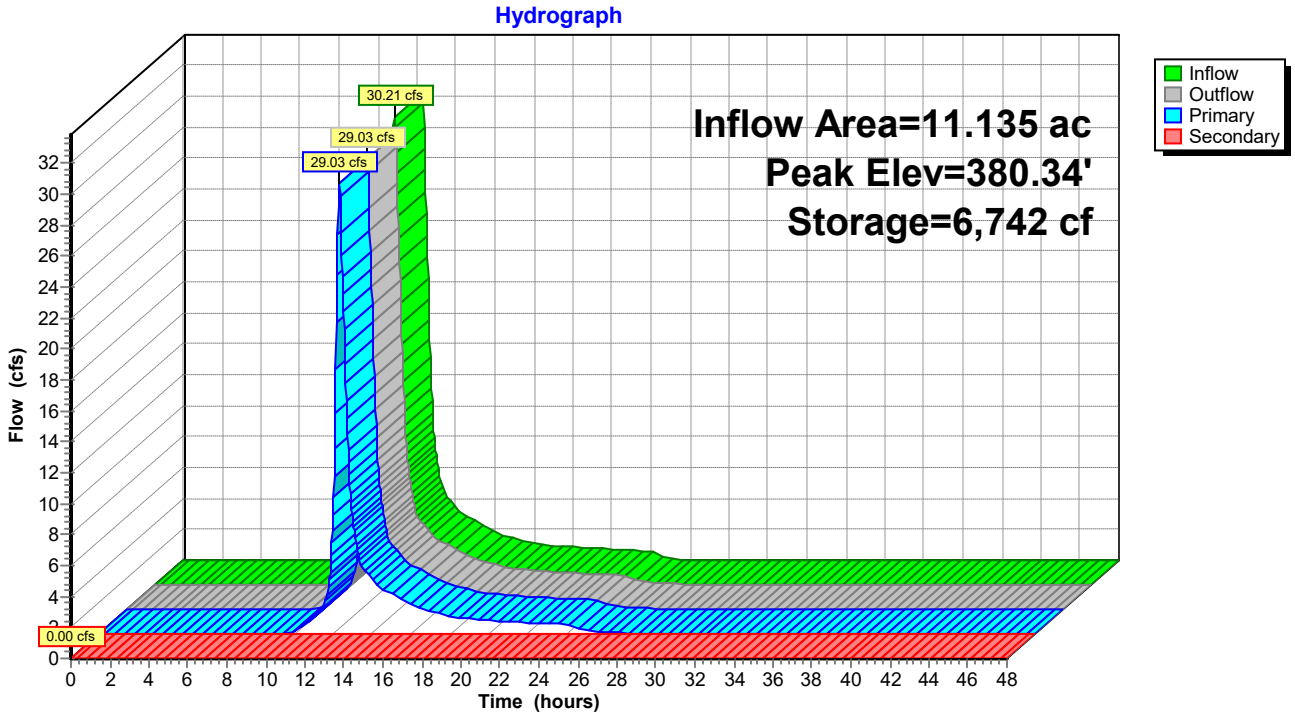
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
378.00	2,161	0	0	2,161
380.00	3,407	5,521	5,521	3,461
382.00	5,127	8,476	13,997	5,242

Device	Routing	Invert	Outlet Devices
#1	Primary	378.00'	**36.0" Round Culvert** L= 227.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 378.00' / 376.50' S= 0.0066 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf
#2	Secondary	381.00'	**12.0' long (Profile 6) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 3.12 3.41 3.59

Primary OutFlow Max=29.00 cfs @ 12.33 hrs HW=380.34' TW=378.13' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 29.00 cfs @ 6.74 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=378.00' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 2P: WEST SETTLING BASIN



Stage-Area-Storage for Pond 2P: WEST SETTLING BASIN

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
378.00	2,161	0
378.05	2,189	109
378.10	2,217	219
378.15	2,245	330
378.20	2,273	443
378.25	2,301	558
378.30	2,330	673
378.35	2,359	791
378.40	2,388	909
378.45	2,417	1,029
378.50	2,446	1,151
378.55	2,475	1,274
378.60	2,505	1,399
378.65	2,535	1,525
378.70	2,565	1,652
378.75	2,595	1,781
378.80	2,626	1,912
378.85	2,656	2,044
378.90	2,687	2,177
378.95	2,718	2,312
379.00	2,749	2,449
379.05	2,780	2,587
379.10	2,811	2,727
379.15	2,843	2,868
379.20	2,875	3,011
379.25	2,907	3,156
379.30	2,939	3,302
379.35	2,971	3,450
379.40	3,004	3,599
379.45	3,036	3,750
379.50	3,069	3,903
379.55	3,102	4,057
379.60	3,135	4,213
379.65	3,169	4,370
379.70	3,202	4,530
379.75	3,236	4,691
379.80	3,270	4,853
379.85	3,304	5,018
379.90	3,338	5,184
379.95	3,372	5,351
380.00	3,407	5,521
380.05	3,446	5,692
380.10	3,485	5,866
380.15	3,524	6,041
380.20	3,563	6,218
380.25	3,603	6,397
380.30	3,643	6,578
380.35	3,683	6,761
380.40	3,723	6,946
380.45	3,763	7,134
380.50	3,804	7,323
380.55	3,845	7,514
380.60	3,886	7,707
380.65	3,928	7,903
380.70	3,969	8,100
380.75	4,011	8,300
380.80	4,053	8,501
380.85	4,095	8,705
380.90	4,138	8,911
380.95	4,180	9,119
381.00	4,223	9,329
381.05	4,266	9,541
381.10	4,310	9,755
381.15	4,353	9,972
381.20	4,397	10,191
381.25	4,441	10,412
381.30	4,485	10,635
381.35	4,530	10,860
381.40	4,574	11,088
381.45	4,619	11,318
381.50	4,664	11,550
381.55	4,709	11,784
381.60	4,755	12,021
381.65	4,801	12,260
381.70	4,847	12,501
381.75	4,893	12,744
381.80	4,939	12,990
381.85	4,986	13,238
381.90	5,033	13,489
381.95	5,080	13,741
382.00	**5,127**	**13,997**

Summary for Pond 3P: BASIN/POND #2

Inflow Area = 18.369 ac, 24.27% Impervious, Inflow Depth = 4.20" for 25-yr Storm event
Inflow = 55.66 cfs @ 12.08 hrs, Volume= 6.431 af
Outflow = 24.91 cfs @ 12.59 hrs, Volume= 6.164 af, Atten= 55%, Lag= 30.5 min
Primary = 24.91 cfs @ 12.59 hrs, Volume= 6.164 af
Routed to Pond 6P : POC2 EAST POND: EXISTING POND

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
Peak Elev= 378.90' @ 12.59 hrs Surf.Area= 26,003 sf Storage= 119,861 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 507.6 min (1,335.6 - 828.0)

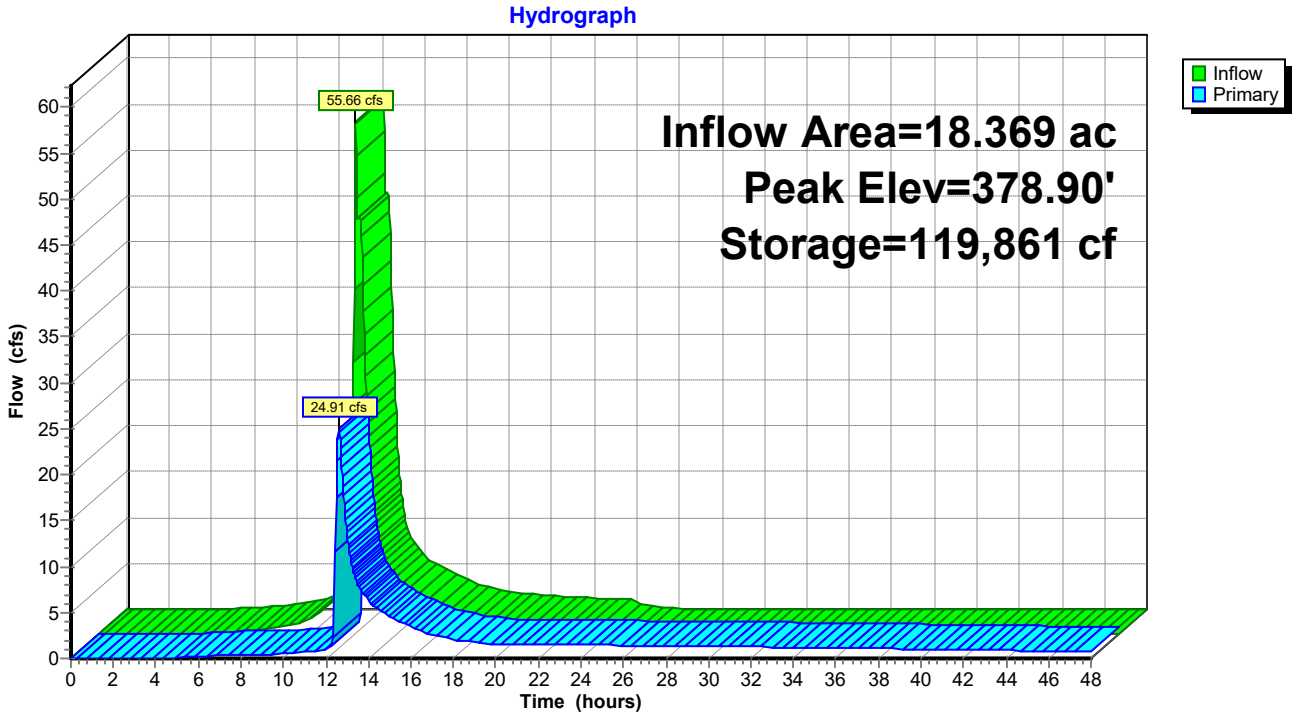
Volume	Invert	Avail.Storage	Storage Description
#1	373.50'	148,841 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
373.50	17,537	0	0	17,537
374.00	18,494	9,007	9,007	18,523
376.00	21,876	40,323	49,329	22,052
378.00	25,578	47,406	96,735	25,911
380.00	26,531	52,106	148,841	27,400

Device	Routing	Invert	Outlet Devices
#1	Primary	378.50'	**30.0' long (Profile 6) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 3.12 3.41 3.59
#2	Primary	372.50'	**4.0" Round Culvert** L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 372.50' / 371.50' S= 0.0200 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.09 sf
#3	Device 2	373.50'	**1.020 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 370.00'
#4	Primary	373.50'	**4.0" Round Culvert** L= 44.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 373.50' / 373.00' S= 0.0114 '/' Cc= 0.900 n= 0.010, Flow Area= 0.09 sf

Primary OutFlow Max=24.86 cfs @ 12.59 hrs HW=378.90' TW=347.49' (Dynamic Tailwater)
- **1=Broad-Crested Rectangular Weir** (Weir Controls 23.33 cfs @ 1.96 fps)
- **2=Culvert** (Barrel Controls 0.79 cfs @ 9.08 fps)
  - **3=Exfiltration** (Passes 0.79 cfs of 1.37 cfs potential flow)
- **4=Culvert** (Barrel Controls 0.74 cfs @ 8.43 fps)

Pond 3P: BASIN/POND #2



Stage-Area-Storage for Pond 3P: BASIN/POND #2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
373.50	17,537	0
373.60	17,726	1,763
373.70	17,917	3,545
373.80	18,108	5,347
373.90	18,301	7,167
374.00	18,494	9,007
374.10	18,656	10,864
374.20	18,819	12,738
374.30	18,983	14,628
374.40	19,148	16,535
374.50	19,313	18,458
374.60	19,479	20,397
374.70	19,645	22,353
374.80	19,813	24,326
374.90	19,981	26,316
375.00	20,150	28,323
375.10	20,319	30,346
375.20	20,489	32,386
375.30	20,660	34,444
375.40	20,832	36,518
375.50	21,004	38,610
375.60	21,177	40,719
375.70	21,351	42,846
375.80	21,525	44,989
375.90	21,700	47,151
376.00	21,876	49,329
376.10	22,054	51,526
376.20	22,233	53,740
376.30	22,413	55,973
376.40	22,593	58,223
376.50	22,774	60,491
376.60	22,956	62,778
376.70	23,139	65,082
376.80	23,322	67,406
376.90	23,506	69,747
377.00	23,691	72,107
377.10	23,876	74,485
377.20	24,062	76,882
377.30	24,249	79,298
377.40	24,437	81,732
377.50	24,625	84,185
377.60	24,814	86,657
377.70	25,004	89,148
377.80	25,195	91,658
377.90	25,386	94,187
378.00	25,578	96,735
378.10	25,625	99,295
378.20	25,673	101,860
378.30	25,720	104,430
378.40	25,767	107,004
378.50	25,815	109,583
378.60	25,862	112,167
378.70	25,910	114,756
378.80	25,957	117,349
378.90	26,005	119,947
379.00	26,052	122,550
379.10	26,100	125,158
379.20	26,148	127,770
379.30	26,195	130,387
379.40	26,243	133,009
379.50	26,291	135,636
379.60	26,339	138,267
379.70	26,387	140,904
379.80	26,435	143,545
379.90	26,483	146,191
380.00	**26,531**	**148,841**

Summary for Pond 4P: BASIN/POND #3

Inflow Area = 11.224 ac, 28.99% Impervious, Inflow Depth > 5.01" for 25-yr Storm event
Inflow = 55.79 cfs @ 12.07 hrs, Volume= 4.682 af
Outflow = 50.57 cfs @ 12.13 hrs, Volume= 4.108 af, Atten= 9%, Lag= 3.1 min
Primary = 50.57 cfs @ 12.13 hrs, Volume= 4.108 af
Routed to Pond 6P : POC2 EAST POND: EXISTING POND

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
Peak Elev= 376.67' @ 12.13 hrs Surf.Area= 17,293 sf Storage= 53,960 cf

Plug-Flow detention time= 190.7 min calculated for 4.108 af (88% of inflow)
Center-of-Mass det. time= 97.2 min (958.6 - 861.4)

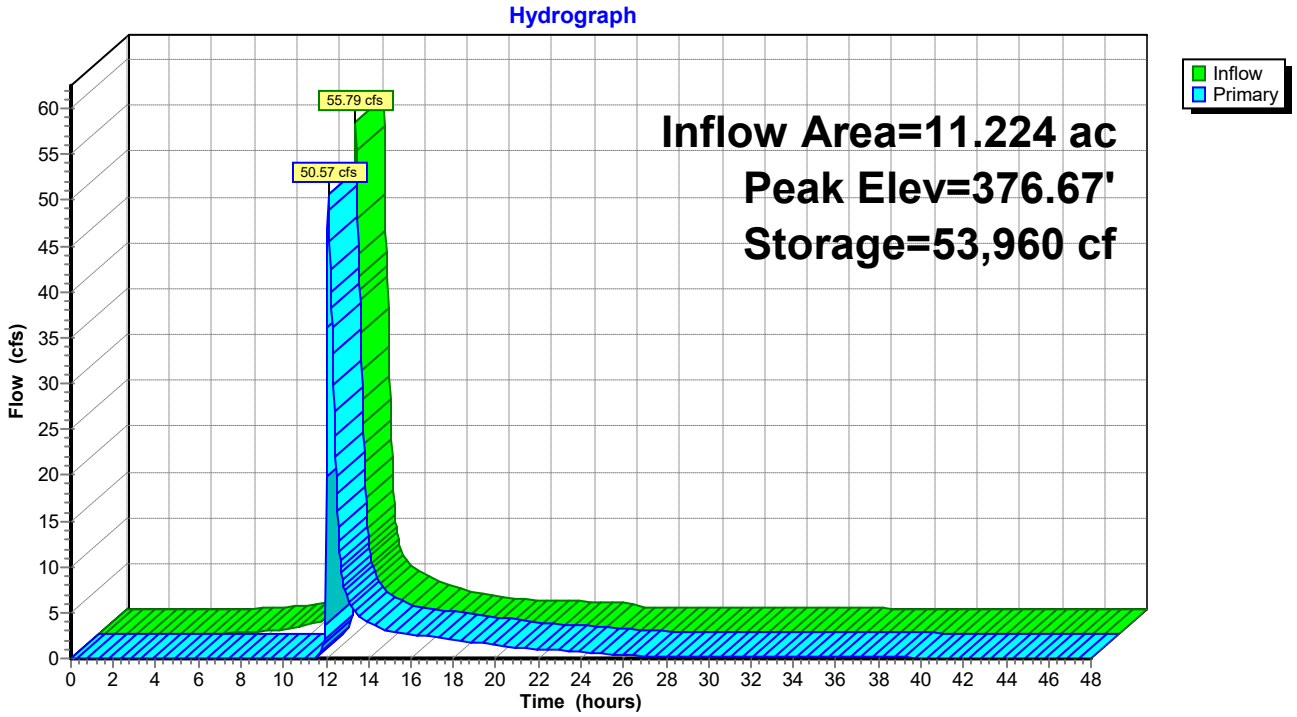
Volume	Invert	Avail.Storage	Storage Description
#1	373.00'	59,754 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
373.00	12,590	0	0	12,590
374.00	13,778	13,180	13,180	13,846
376.00	15,888	29,641	42,820	16,125
377.00	18,002	16,934	59,754	18,289

Device	Routing	Invert	Outlet Devices
#1	Primary	376.15'	**40.0' long (Profile 6) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 3.12 3.41 3.59
#2	Primary	374.70'	**10.0" Round Culvert** L= 39.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 374.70' / 370.00' S= 0.1205 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.55 sf

Primary OutFlow Max=50.17 cfs @ 12.13 hrs HW=376.67' TW=346.02' (Dynamic Tailwater)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 46.89 cfs @ 2.26 fps)
└─**2=Culvert** (Inlet Controls 3.27 cfs @ 6.00 fps)

Pond 4P: BASIN/POND #3



Stage-Area-Storage for Pond 4P: BASIN/POND #3

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
373.00	12,590	0
373.05	12,648	631
373.10	12,706	1,265
373.15	12,765	1,902
373.20	12,823	2,541
373.25	12,882	3,184
373.30	12,941	3,829
373.35	13,000	4,478
373.40	13,059	5,129
373.45	13,118	5,784
373.50	13,177	6,441
373.55	13,237	7,102
373.60	13,296	7,765
373.65	13,356	8,431
373.70	13,416	9,101
373.75	13,476	9,773
373.80	13,536	10,448
373.85	13,596	11,126
373.90	13,657	11,808
373.95	13,717	12,492
374.00	13,778	13,180
374.05	13,829	13,870
374.10	13,880	14,562
374.15	13,931	15,258
374.20	13,982	15,956
374.25	14,034	16,656
374.30	14,085	17,359
374.35	14,136	18,064
374.40	14,188	18,773
374.45	14,240	19,483
374.50	14,291	20,196
374.55	14,343	20,912
374.60	14,395	21,631
374.65	14,447	22,352
374.70	14,499	23,076
374.75	14,552	23,802
374.80	14,604	24,531
374.85	14,656	25,262
374.90	14,709	25,996
374.95	14,762	26,733
375.00	14,814	27,473
375.05	14,867	28,215
375.10	14,920	28,959
375.15	14,973	29,707
375.20	15,026	30,457
375.25	15,079	31,209
375.30	15,132	31,964
375.35	15,186	32,722
375.40	15,239	33,483
375.45	15,293	34,246
375.50	15,346	35,012
375.55	15,400	35,781
375.60	15,454	36,552
375.65	15,508	37,326
375.70	15,562	38,103
375.75	15,616	38,883
375.80	15,670	39,665
375.85	15,725	40,450
375.90	15,779	41,237
375.95	15,833	42,027
376.00	15,888	42,820
376.05	15,991	43,617
376.10	16,093	44,420
376.15	16,197	45,227
376.20	16,300	46,039
376.25	16,404	46,857
376.30	16,508	47,680
376.35	16,613	48,508
376.40	16,718	49,341
376.45	16,823	50,179
376.50	16,929	51,023
376.55	17,034	51,872
376.60	17,141	52,727
376.65	17,247	53,586
376.70	17,354	54,451
376.75	17,461	55,322
376.80	17,569	56,198
376.85	17,676	57,079
376.90	17,785	57,965
376.95	17,893	58,857
377.00	**18,002**	**59,754**

Summary for Pond 5P: BASIN/POND #4

Inflow Area = 4.925 ac, 98.01% Impervious, Inflow Depth = 11.97" for 25-yr Storm event
Inflow = 38.51 cfs @ 12.07 hrs, Volume= 4.912 af
Outflow = 35.70 cfs @ 12.11 hrs, Volume= 4.910 af, Atten= 7%, Lag= 2.2 min
Primary = 35.70 cfs @ 12.11 hrs, Volume= 4.910 af
Routed to Pond 6P : POC2 EAST POND: EXISTING POND

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
Peak Elev= 380.74' @ 12.11 hrs Surf.Area= 8,748 sf Storage= 26,624 cf

Plug-Flow detention time= 54.1 min calculated for 4.910 af (100% of inflow)
Center-of-Mass det. time= 53.6 min (869.6 - 816.0)

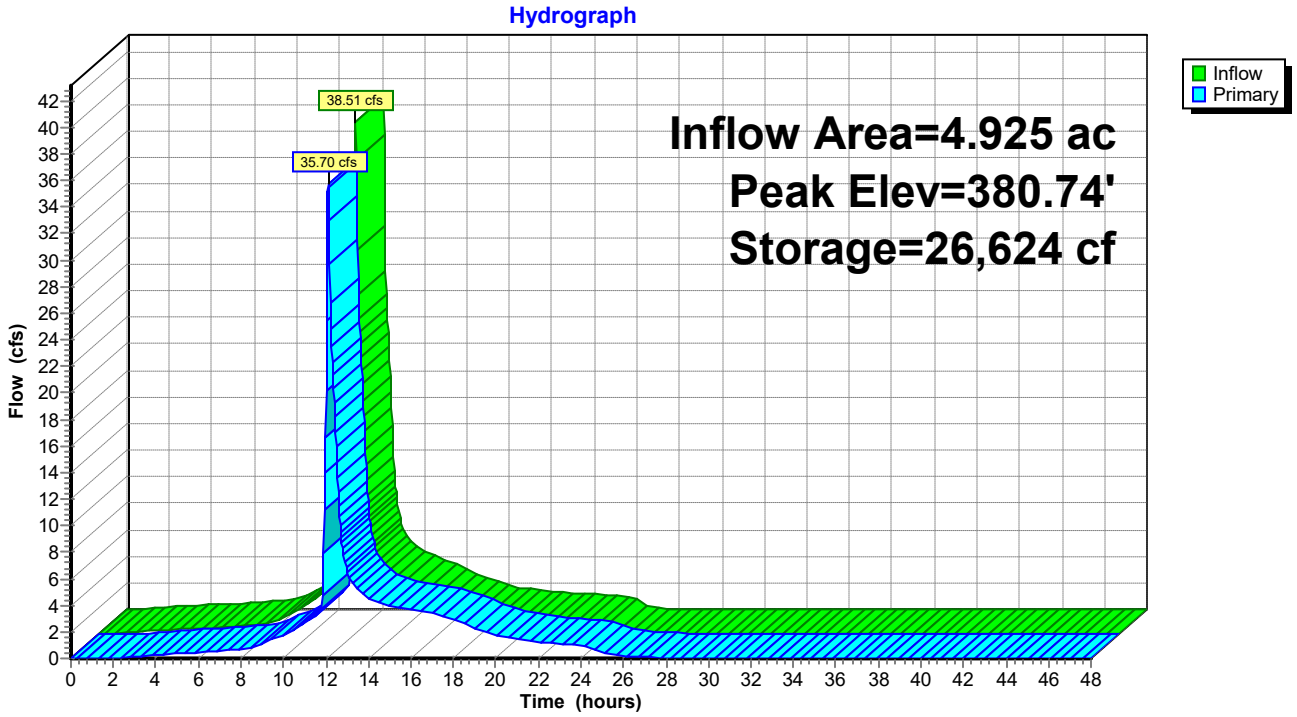
Volume	Invert	Avail.Storage	Storage Description
#1	377.00'	33,515 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
377.00	5,568	0	0	5,568
378.00	6,369	5,964	5,964	6,414
380.00	8,077	14,412	20,376	8,225
381.50	9,460	13,139	33,515	9,695

Device	Routing	Invert	Outlet Devices
#1	Primary	380.00'	**15.0' long (Profile 6) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 3.12 3.41 3.59
#2	Primary	377.00'	**10.0" Round Culvert** L= 107.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 377.00' / 376.00' S= 0.0093 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.55 sf

Primary OutFlow Max=35.37 cfs @ 12.11 hrs HW=380.74' TW=345.91' (Dynamic Tailwater)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 31.07 cfs @ 2.81 fps)
└─**2=Culvert** (Barrel Controls 4.31 cfs @ 7.89 fps)

Pond 5P: BASIN/POND #4



Stage-Area-Storage for Pond 5P: BASIN/POND #4

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
377.00	5,568	0
377.05	5,607	279
377.10	5,646	561
377.15	5,685	844
377.20	5,724	1,129
377.25	5,763	1,416
377.30	5,803	1,705
377.35	5,842	1,997
377.40	5,882	2,290
377.45	5,922	2,585
377.50	5,962	2,882
377.55	6,002	3,181
377.60	6,042	3,482
377.65	6,083	3,785
377.70	6,123	4,090
377.75	6,164	4,397
377.80	6,204	4,707
377.85	6,245	5,018
377.90	6,286	5,331
377.95	6,328	5,647
378.00	6,369	5,964
378.05	6,409	6,283
378.10	6,450	6,605
378.15	6,490	6,928
378.20	6,531	7,254
378.25	6,571	7,582
378.30	6,612	7,911
378.35	6,653	8,243
378.40	6,694	8,576
378.45	6,736	8,912
378.50	6,777	9,250
378.55	6,818	9,590
378.60	6,860	9,932
378.65	6,902	10,276
378.70	6,944	10,622
378.75	6,986	10,970
378.80	7,028	11,321
378.85	7,070	11,673
378.90	7,113	12,028
378.95	7,155	12,384
379.00	7,198	12,743
379.05	7,240	13,104
379.10	7,283	13,467
379.15	7,326	13,832
379.20	7,369	14,200
379.25	7,413	14,569
379.30	7,456	14,941
379.35	7,500	15,315
379.40	7,543	15,691
379.45	7,587	16,069
379.50	7,631	16,450
379.55	7,675	16,832
379.60	7,719	17,217
379.65	7,763	17,604
379.70	7,808	17,994
379.75	7,852	18,385
379.80	7,897	18,779
379.85	7,942	19,175
379.90	7,987	19,573
379.95	8,032	19,974
380.00	8,077	20,376
380.05	8,121	20,781
380.10	8,166	21,188
380.15	8,210	21,598
380.20	8,255	22,009
380.25	8,300	22,423
380.30	8,345	22,839
380.35	8,390	23,258
380.40	8,435	23,678
380.45	8,480	24,101
380.50	8,526	24,526
380.55	8,571	24,954
380.60	8,617	25,384
380.65	8,663	25,816
380.70	8,709	26,250
380.75	8,755	26,686
380.80	8,801	27,125
380.85	8,847	27,567
380.90	8,894	28,010
380.95	8,940	28,456
381.00	8,987	28,904
381.05	9,034	29,355
381.10	9,081	29,807
381.15	9,128	30,263
381.20	9,175	30,720
381.25	9,222	31,180
381.30	9,269	31,642
381.35	9,317	32,107
381.40	9,364	32,574
381.45	9,412	33,044
381.50	**9,460**	**33,515**

Summary for Pond 6P: POC2 EAST POND: EXISTING POND

Inflow Area = 46.768 ac, 31.30% Impervious, Inflow Depth > 5.03" for 25-yr Storm event
Inflow = 140.77 cfs @ 12.13 hrs, Volume= 19.592 af
Outflow = 31.25 cfs @ 13.04 hrs, Volume= 18.865 af, Atten= 78%, Lag= 54.9 min
Primary = 31.25 cfs @ 13.04 hrs, Volume= 18.865 af
Routed to Link POC3 : EAST WETLAND

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
Peak Elev= 347.75' @ 13.04 hrs Surf.Area= 80,431 sf Storage= 252,381 cf

Plug-Flow detention time= 187.1 min calculated for 18.865 af (96% of inflow)
Center-of-Mass det. time= 126.6 min (1,149.7 - 1,023.1)

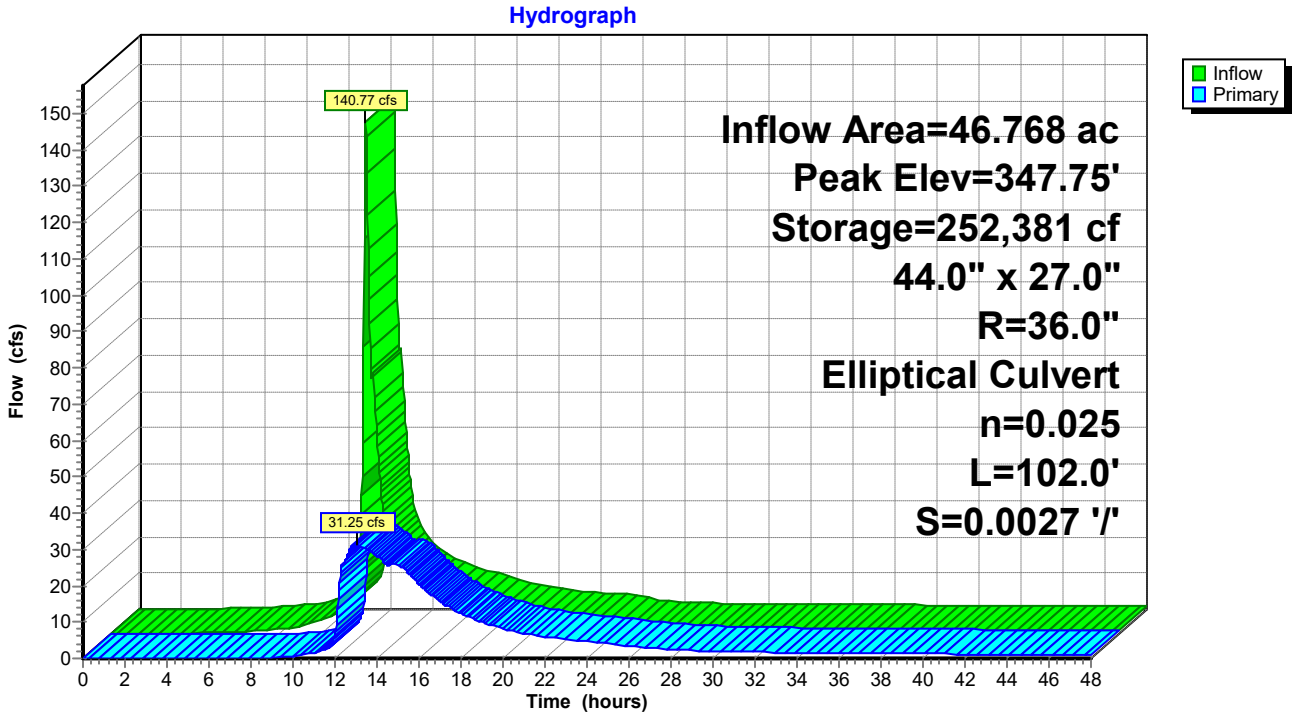
Volume	Invert	Avail.Storage	Storage Description
#1	344.21'	587,132 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
344.21	64,107	0	0	64,107
346.00	70,422	120,359	120,359	70,633
348.00	81,904	152,182	272,541	82,280
350.00	103,093	184,591	457,132	103,578
351.20	113,660	130,000	587,132	114,237

Device	Routing	Invert	Outlet Devices
#1	Primary	344.21'	**44.0" W x 27.0" H, R=36.0" Elliptical Culvert** L= 102.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 344.21' / 343.93' S= 0.0027 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 6.62 sf

Primary OutFlow Max=31.25 cfs @ 13.04 hrs HW=347.75' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 31.25 cfs @ 4.72 fps)

Pond 6P: POC2 EAST POND: EXISTING POND



Stage-Area-Storage for Pond 6P: POC2 EAST POND: EXISTING POND

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
344.21	64,107	0
344.31	64,452	6,428
344.41	64,798	12,890
344.51	65,145	19,388
344.61	65,492	25,919
344.71	65,841	32,486
344.81	66,191	39,088
344.91	66,541	45,724
345.01	66,893	52,396
345.11	67,245	59,103
345.21	67,598	65,845
345.31	67,953	72,623
345.41	68,308	79,436
345.51	68,664	86,284
345.61	69,021	93,168
345.71	69,379	100,088
345.81	69,738	107,044
345.91	70,097	114,036
346.01	70,477	121,064
346.11	71,031	128,139
346.21	71,587	135,270
346.31	72,145	142,457
346.41	72,705	149,699
346.51	73,268	156,998
346.61	73,832	164,353
346.71	74,399	171,764
346.81	74,968	179,232
346.91	75,539	186,758
347.01	76,112	194,340
347.11	76,687	201,980
347.21	77,265	209,678
347.31	77,845	217,433
347.41	78,427	225,247
347.51	79,011	233,119
347.61	79,597	241,049
347.71	80,185	249,038
347.81	80,776	257,086
347.91	81,369	265,194
348.01	82,004	273,360
348.11	83,006	281,611
348.21	84,014	289,962
348.31	85,029	298,414
348.41	86,049	306,968
348.51	87,076	315,624
348.61	88,109	324,383
348.71	89,147	333,246
348.81	90,192	342,213
348.91	91,243	351,284
349.01	92,300	360,462
349.11	93,363	369,745
349.21	94,432	379,134
349.31	95,508	388,631
349.41	96,589	398,236
349.51	97,676	407,949
349.61	98,770	417,772
349.71	99,870	427,704
349.81	100,975	437,746
349.91	102,087	447,899
350.01	103,179	458,163
350.11	104,040	468,524
350.21	104,905	478,971
350.31	105,773	489,505
350.41	106,645	500,126
350.51	107,521	510,835
350.61	108,400	521,631
350.71	109,283	532,515
350.81	110,169	543,487
350.91	111,059	554,549
351.01	111,953	565,699
351.11	**112,850**	**576,939**

Summary for Pond 7P: POND #5

Inflow Area = 5.677 ac, 31.60% Impervious, Inflow Depth = 5.09" for 25-yr Storm event
Inflow = 33.96 cfs @ 12.07 hrs, Volume= 2.408 af
Outflow = 23.02 cfs @ 12.15 hrs, Volume= 2.380 af, Atten= 32%, Lag= 4.9 min
Primary = 23.02 cfs @ 12.15 hrs, Volume= 2.380 af
Routed to Pond 4P : BASIN/POND #3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
Peak Elev= 424.28' @ 12.15 hrs Surf.Area= 14,702 sf Storage= 18,180 cf

Plug-Flow detention time= 135.1 min calculated for 2.380 af (99% of inflow)
Center-of-Mass det. time= 127.9 min (922.9 - 795.0)

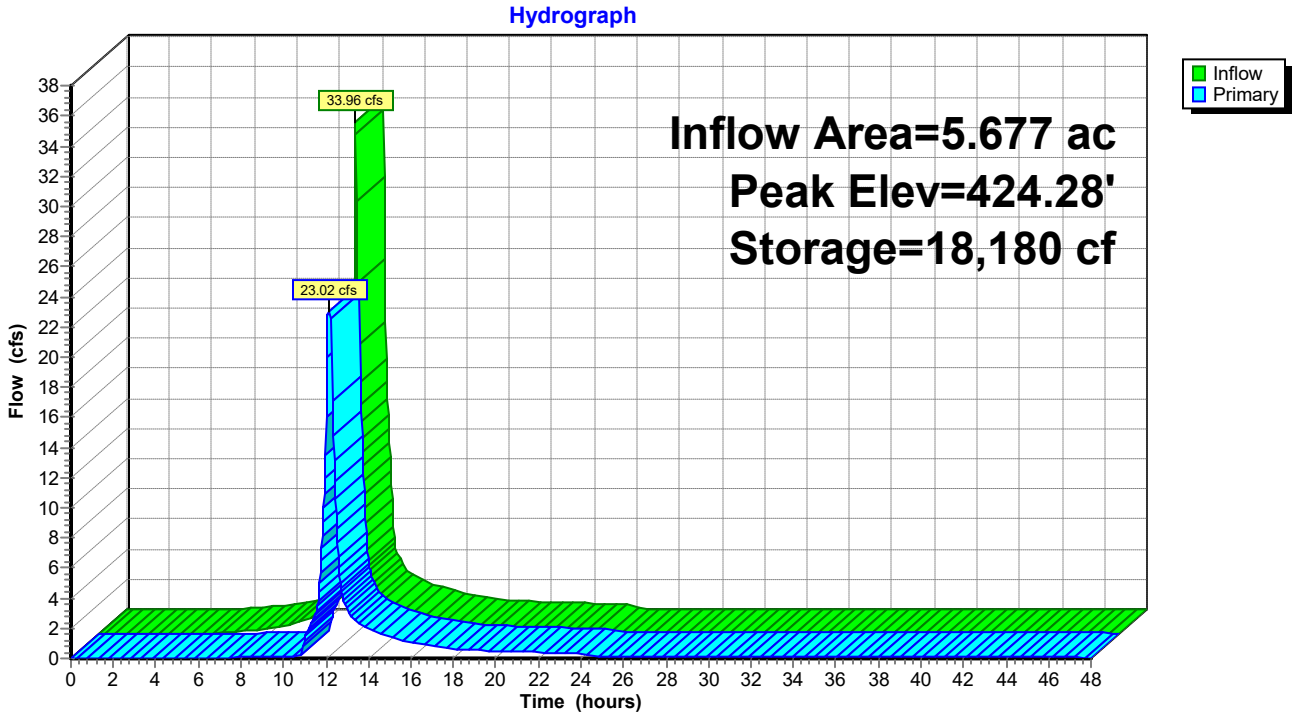
Volume	Invert	Avail.Storage	Storage Description
#1	422.00'	60,921 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
422.00	3,129	0	0
424.00	11,396	14,525	14,525
426.00	35,000	46,396	60,921

Device	Routing	Invert	Outlet Devices
#1	Primary	414.50'	**18.0" Round Culvert** L= 184.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 414.50' / 411.50' S= 0.0163 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf
#2	Device 1	423.50'	**1.5" x 3.0" Horiz. Orifice/Grate X 12.00 columns** X 20 rows C= 0.600 in 24.0" x 72.0" Grate (63% open area) Limited to weir flow at low heads
#3	Primary	425.00'	**30.0' long (Profile 26) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 3.06 3.13 3.13
#4	Primary	422.00'	**4.0" Round Culvert** L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 422.00' / 422.00' S= 0.0000 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.09 sf
#5	Device 4	422.00'	**0.520 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 418.00'

Primary OutFlow Max=23.02 cfs @ 12.15 hrs HW=424.28' TW=376.66' (Dynamic Tailwater)
- **1=Culvert** (Barrel Controls 22.79 cfs @ 12.90 fps)
  - **2=Orifice/Grate** (Passes 22.79 cfs of 31.86 cfs potential flow)
- **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
- **4=Culvert** (Passes 0.23 cfs of 0.42 cfs potential flow)
  - **5=Exfiltration** (Controls 0.23 cfs)

Pond 7P: POND #5



Stage-Area-Storage for Pond 7P: POND #5

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
422.00	3,129	0
422.05	3,336	162
422.10	3,542	334
422.15	3,749	516
422.20	3,956	708
422.25	4,162	911
422.30	4,369	1,125
422.35	4,576	1,348
422.40	4,782	1,582
422.45	4,989	1,827
422.50	5,196	2,081
422.55	5,402	2,346
422.60	5,609	2,621
422.65	5,816	2,907
422.70	6,022	3,203
422.75	6,229	3,509
422.80	6,436	3,826
422.85	6,642	4,153
422.90	6,849	4,490
422.95	7,056	4,838
423.00	7,263	5,196
423.05	7,469	5,564
423.10	7,676	5,943
423.15	7,883	6,332
423.20	8,089	6,731
423.25	8,296	7,141
423.30	8,503	7,561
423.35	8,709	7,991
423.40	8,916	8,431
423.45	9,123	8,882
423.50	9,329	9,344
423.55	9,536	9,815
423.60	9,743	10,297
423.65	9,949	10,790
423.70	10,156	11,292
423.75	10,363	11,805
423.80	10,569	12,328
423.85	10,776	12,862
423.90	10,983	13,406
423.95	11,189	13,960
424.00	11,396	14,525
424.05	11,986	15,110
424.10	12,576	15,724
424.15	13,166	16,367
424.20	13,756	17,040
424.25	14,347	17,743
424.30	14,937	18,475
424.35	15,527	19,236
424.40	16,117	20,028
424.45	16,707	20,848
424.50	17,297	21,698
424.55	17,887	22,578
424.60	18,477	23,487
424.65	19,067	24,426
424.70	19,657	25,394
424.75	20,248	26,391
424.80	20,838	27,418
424.85	21,428	28,475
424.90	22,018	29,561
424.95	22,608	30,677
425.00	23,198	31,822
425.05	23,788	32,997
425.10	24,378	34,201
425.15	24,968	35,434
425.20	25,558	36,698
425.25	26,149	37,990
425.30	26,739	39,312
425.35	27,329	40,664
425.40	27,919	42,045
425.45	28,509	43,456
425.50	29,099	44,896
425.55	29,689	46,366
425.60	30,279	47,865
425.65	30,869	49,394
425.70	31,459	50,952
425.75	32,050	52,540
425.80	32,640	54,157
425.85	33,230	55,804
425.90	33,820	57,480
425.95	34,410	59,186
426.00	**35,000**	**60,921**

Summary for Pond 8P: SCOUR HOLE

Inflow Area = 11.155 ac, 0.00% Impervious, Inflow Depth = 1.73" for 25-yr Storm event
Inflow = 25.83 cfs @ 12.30 hrs, Volume= 1.610 af
Outflow = 25.83 cfs @ 12.30 hrs, Volume= 1.517 af, Atten= 0%, Lag= 0.2 min
Primary = 25.83 cfs @ 12.30 hrs, Volume= 1.517 af
Routed to Link POC3 : EAST WETLAND

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
Peak Elev= 365.20' @ 12.30 hrs Surf.Area= 2,328 sf Storage= 4,508 cf

Plug-Flow detention time= 9.8 min calculated for 1.516 af (94% of inflow)
Center-of-Mass det. time= 3.2 min (758.6 - 755.3)

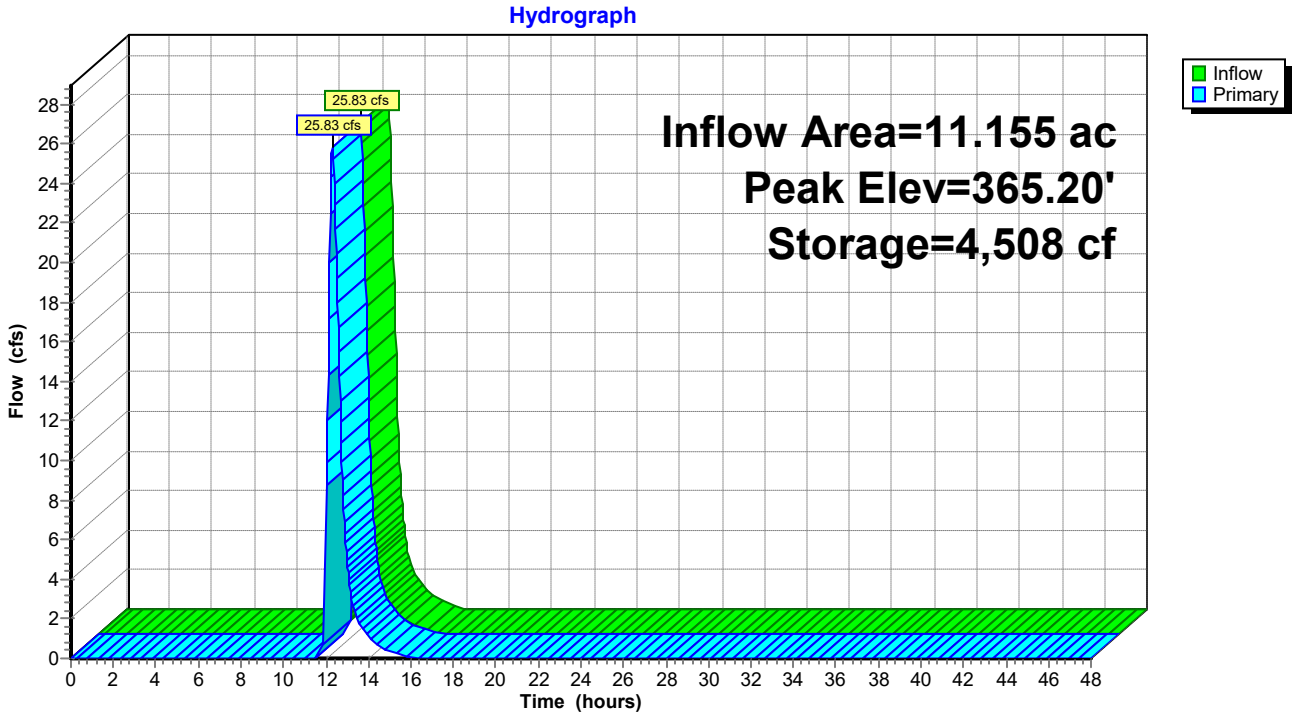
Volume	Invert	Avail.Storage	Storage Description
#1	362.00'	6,554 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
362.00	488	0	0
364.00	1,637	2,125	2,125
365.00	2,205	1,921	4,046
366.00	2,811	2,508	6,554

Device	Routing	Invert	Outlet Devices
#1	Primary	365.00'	**80.0' long (Profile 10) Broad-Crested Rectangular Weir** Head (feet) 1.97 2.46 2.95 3.94 4.92 Coef. (English) 3.51 3.48 3.42 3.48 3.57

Primary OutFlow Max=25.81 cfs @ 12.30 hrs HW=365.20' TW=0.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 25.81 cfs @ 1.58 fps)

Pond 8P: SCOUR HOLE



Stage-Area-Storage for Pond 8P: SCOUR HOLE

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
362.00	488	0
362.05	517	25
362.10	545	52
362.15	574	80
362.20	603	109
362.25	632	140
362.30	660	172
362.35	689	206
362.40	718	241
362.45	747	278
362.50	775	316
362.55	804	355
362.60	833	396
362.65	861	439
362.70	890	482
362.75	919	528
362.80	948	574
362.85	976	622
362.90	1,005	672
362.95	1,034	723
363.00	1,063	775
363.05	1,091	829
363.10	1,120	884
363.15	1,149	941
363.20	1,177	999
363.25	1,206	1,059
363.30	1,235	1,120
363.35	1,264	1,182
363.40	1,292	1,246
363.45	1,321	1,312
363.50	1,350	1,378
363.55	1,378	1,447
363.60	1,407	1,516
363.65	1,436	1,587
363.70	1,465	1,660
363.75	1,493	1,734
363.80	1,522	1,809
363.85	1,551	1,886
363.90	1,580	1,964
363.95	1,608	2,044
364.00	1,637	2,125
364.05	1,665	2,208
364.10	1,694	2,292
364.15	1,722	2,377
364.20	1,751	2,464
364.25	1,779	2,552
364.30	1,807	2,642
364.35	1,836	2,733
364.40	1,864	2,825
364.45	1,893	2,919
364.50	1,921	3,015
364.55	1,949	3,111
364.60	1,978	3,209
364.65	2,006	3,309
364.70	2,035	3,410
364.75	2,063	3,513
364.80	2,091	3,616
364.85	2,120	3,722
364.90	2,148	3,828
364.95	2,177	3,936
365.00	2,205	4,046
365.05	2,235	4,157
365.10	2,266	4,270
365.15	2,296	4,384
365.20	2,326	4,499
365.25	2,357	4,616
365.30	2,387	4,735
365.35	2,417	4,855
365.40	2,447	4,976
365.45	2,478	5,100
365.50	2,508	5,224
365.55	2,538	5,350
365.60	2,569	5,478
365.65	2,599	5,607
365.70	2,629	5,738
365.75	2,660	5,870
365.80	2,690	6,004
365.85	2,720	6,139
365.90	2,750	6,276
365.95	2,781	6,414
366.00	**2,811**	**6,554**

Summary for Pond 9P: MH 0+89

Inflow Area = 11.155 ac, 0.00% Impervious, Inflow Depth = 4.11" for 25-yr Storm event
Inflow = 34.36 cfs @ 12.30 hrs, Volume= 3.817 af
Outflow = 34.36 cfs @ 12.30 hrs, Volume= 3.817 af, Atten= 0%, Lag= 0.0 min
Primary = 25.83 cfs @ 12.30 hrs, Volume= 1.610 af
Routed to Pond 8P : SCOUR HOLE
Secondary = 8.53 cfs @ 12.30 hrs, Volume= 2.207 af
Routed to Pond 5P : BASIN/POND #4

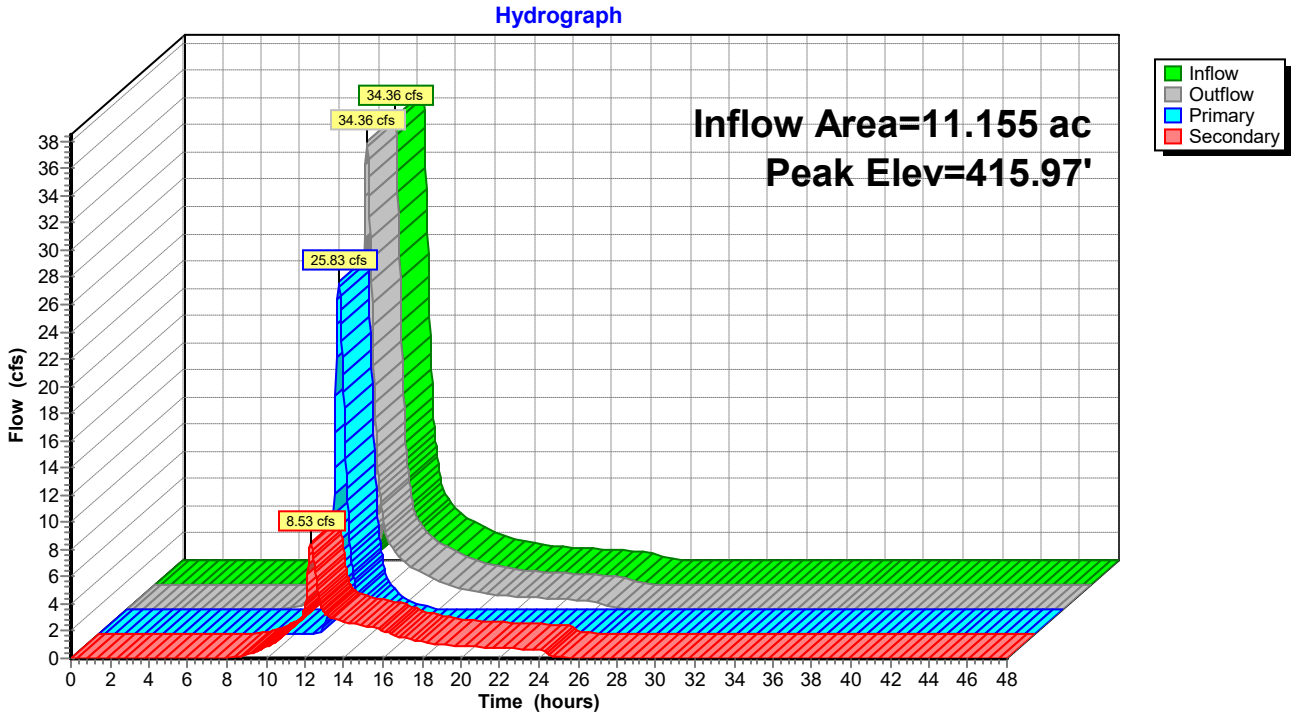
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs
Peak Elev= 415.97' @ 12.30 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	406.00'	**18.0" Round Culvert** L= 162.7' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 406.00' / 389.66' S= 0.1004 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Secondary	405.00'	**10.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 405.00' / 404.00' S= 0.0500 '/' Cc= 0.900 n= 0.010, Flow Area= 0.55 sf

Primary OutFlow Max=25.83 cfs @ 12.30 hrs HW=415.96' TW=365.20' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 25.83 cfs @ 14.61 fps)

Secondary OutFlow Max=8.53 cfs @ 12.30 hrs HW=415.96' TW=380.53' (Dynamic Tailwater)
↑—**2=Culvert** (Inlet Controls 8.53 cfs @ 15.64 fps)

Pond 9P: MH 0+89



Stage-Area-Storage for Pond 9P: MH 0+89

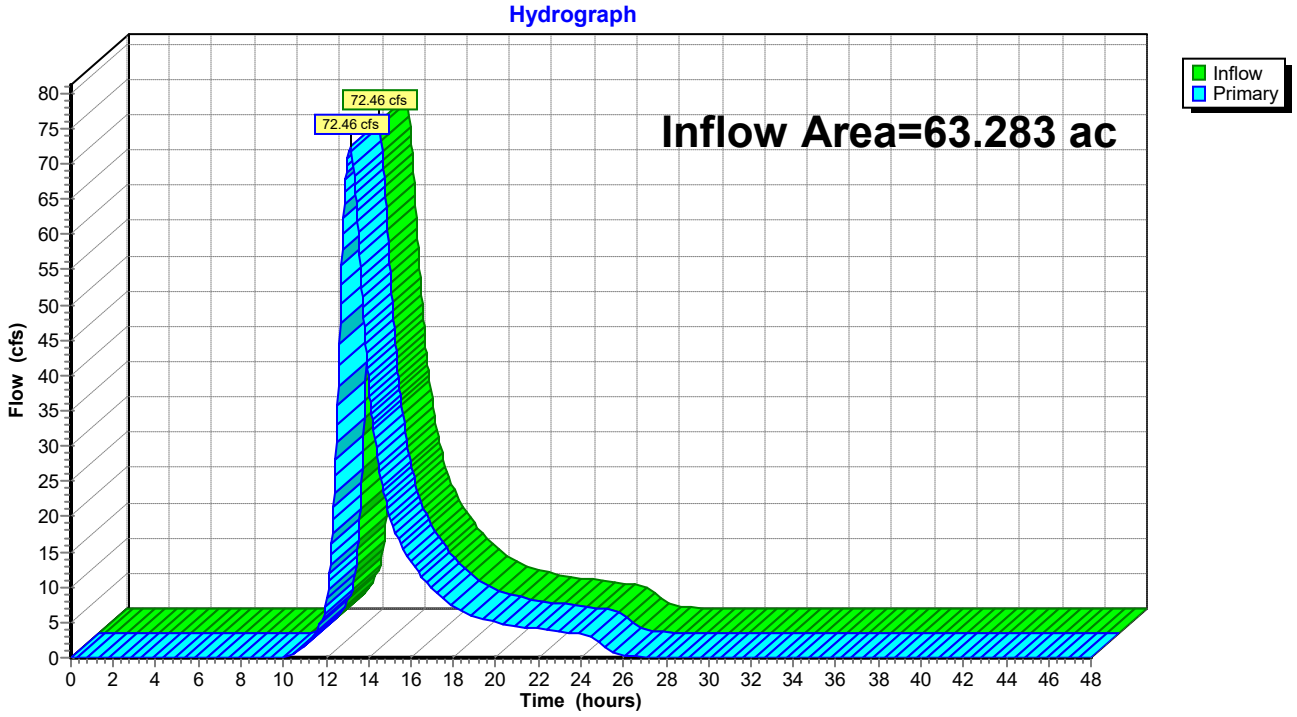
Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
405.00	**0.000**	410.20	0.000	415.40	0.000
405.10	0.000	410.30	0.000	415.50	0.000
405.20	0.000	410.40	0.000	415.60	0.000
405.30	0.000	410.50	0.000	415.70	0.000
405.40	0.000	410.60	0.000	415.80	0.000
405.50	0.000	410.70	0.000	415.90	0.000
405.60	0.000	410.80	0.000	416.00	0.000
405.70	0.000	410.90	0.000		
405.80	0.000	411.00	0.000		
405.90	0.000	411.10	0.000		
406.00	0.000	411.20	0.000		
406.10	0.000	411.30	0.000		
406.20	0.000	411.40	0.000		
406.30	0.000	411.50	0.000		
406.40	0.000	411.60	0.000		
406.50	0.000	411.70	0.000		
406.60	0.000	411.80	0.000		
406.70	0.000	411.90	0.000		
406.80	0.000	412.00	0.000		
406.90	0.000	412.10	0.000		
407.00	0.000	412.20	0.000		
407.10	0.000	412.30	0.000		
407.20	0.000	412.40	0.000		
407.30	0.000	412.50	0.000		
407.40	0.000	412.60	0.000		
407.50	0.000	412.70	0.000		
407.60	0.000	412.80	0.000		
407.70	0.000	412.90	0.000		
407.80	0.000	413.00	0.000		
407.90	0.000	413.10	0.000		
408.00	0.000	413.20	0.000		
408.10	0.000	413.30	0.000		
408.20	0.000	413.40	0.000		
408.30	0.000	413.50	0.000		
408.40	0.000	413.60	0.000		
408.50	0.000	413.70	0.000		
408.60	0.000	413.80	0.000		
408.70	0.000	413.90	0.000		
408.80	0.000	414.00	0.000		
408.90	0.000	414.10	0.000		
409.00	0.000	414.20	0.000		
409.10	0.000	414.30	0.000		
409.20	0.000	414.40	0.000		
409.30	0.000	414.50	0.000		
409.40	0.000	414.60	0.000		
409.50	0.000	414.70	0.000		
409.60	0.000	414.80	0.000		
409.70	0.000	414.90	0.000		
409.80	0.000	415.00	0.000		
409.90	0.000	415.10	0.000		
410.00	0.000	415.20	0.000		
410.10	0.000	415.30	0.000		

Summary for Link POC1: POC-BROOK WEST OF DRIVE

Inflow Area = 63.283 ac, 0.00% Impervious, Inflow Depth = 3.07" for 25-yr Storm event
Inflow = 72.46 cfs @ 13.13 hrs, Volume= 16.198 af
Primary = 72.46 cfs @ 13.13 hrs, Volume= 16.198 af, Atten= 0%, Lag= 0.0 min
Routed to Link POC3 : EAST WETLAND

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs

Link POC1: POC-BROOK WEST OF DRIVE

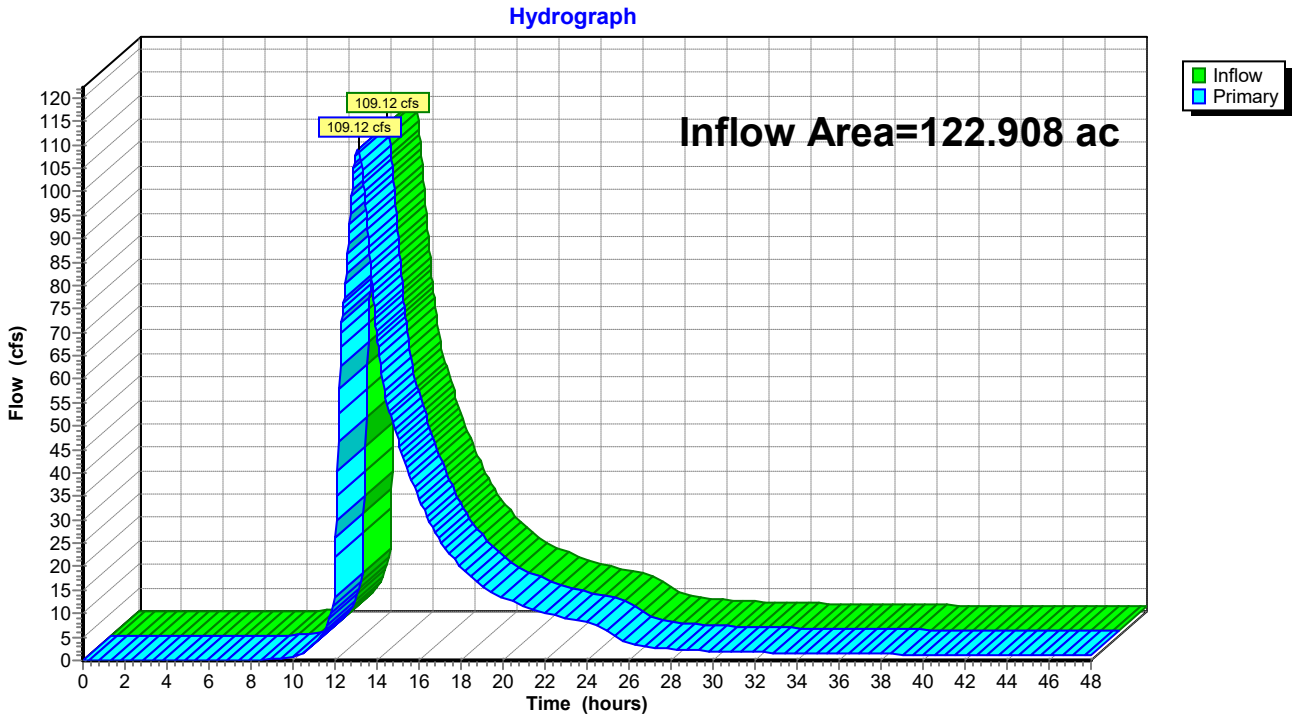


Summary for Link POC3: EAST WETLAND

Inflow Area = 122.908 ac, 12.20% Impervious, Inflow Depth > 3.62" for 25-yr Storm event
Inflow = 109.12 cfs @ 13.11 hrs, Volume= 37.093 af
Primary = 109.12 cfs @ 13.11 hrs, Volume= 37.093 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.03 hrs

Link POC3: EAST WETLAND



Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-yr Storm	Type III 24-hr		Default	24.00	1	3.60	2
2	5-yr Storm	Type III 24-hr		Default	24.00	1	4.69	2
3	10-yr Storm	Type III 24-hr		Default	24.00	1	5.59	2
4	25-yr Storm	Type III 24-hr		Default	24.00	1	6.83	2
5	50-yr Storm	Type III 24-hr		Default	24.00	1	7.75	2
6	100-yr Storm	Type III 24-hr		Default	24.00	1	8.74	2

Time span=0.00-48.00 hrs, dt=0.03 hrs, 1601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: SMITH POND BROOK Runoff Area=63.283 ac 0.00% Impervious Runoff Depth=0.86"
Flow Length=4,022' Tc=82.6 min CN=66 Runoff=17.52 cfs 4.510 af

Subcatchment 2S: TO DRIVEWAY BASIN Runoff Area=0.350 ac 100.00% Impervious Runoff Depth=3.37"
Tc=5.0 min CN=98 Runoff=1.26 cfs 0.098 af

Subcatchment 3S: SMITH POND BROOK Runoff Area=1.352 ac 0.00% Impervious Runoff Depth=0.91"
Flow Length=4,022' Tc=82.6 min CN=67 Runoff=0.40 cfs 0.102 af

Subcatchment 4S: TO WEST SETTLING Runoff Area=11.135 ac 8.09% Impervious Runoff Depth=1.07"
Flow Length=1,674' Tc=12.9 min CN=70 Runoff=10.29 cfs 0.993 af

Subcatchment 5S: TO BASIN 3 Runoff Area=5.547 ac 26.32% Impervious Runoff Depth=2.02"
Tc=5.0 min CN=84 Runoff=13.50 cfs 0.935 af

Subcatchment 6S: TO BASIN 5 Runoff Area=5.677 ac 31.60% Impervious Runoff Depth=2.10"
Tc=5.0 min CN=85 Runoff=14.41 cfs 0.995 af

Subcatchment 7S: TO EAST SWALE Runoff Area=11.155 ac 0.00% Impervious Runoff Depth=1.44"
Flow Length=1,600' Slope=0.0150 '/' Tc=14.5 min CN=76 Runoff=14.03 cfs 1.337 af

Subcatchment 8S: TO BASIN 2 Runoff Area=7.234 ac 49.17% Impervious Runoff Depth=2.27"
Tc=5.0 min CN=87 Runoff=19.76 cfs 1.370 af

Subcatchment 9S: TO EAST POND Runoff Area=12.250 ac 17.14% Impervious Runoff Depth=1.57"
Flow Length=642' Tc=9.9 min CN=78 Runoff=19.48 cfs 1.607 af

Subcatchment 10S: TO BASIN 4 Runoff Area=4.925 ac 98.01% Impervious Runoff Depth=3.37"
Tc=5.0 min CN=98 Runoff=17.76 cfs 1.382 af

Reach 5R: West Swale Avg. Flow Depth=0.70' Max Vel=2.03 fps Inflow=10.29 cfs 0.993 af
n=0.104 L=1,500.0' S=0.0467 '/' Capacity=56.88 cfs Outflow=7.71 cfs 0.993 af

Reach 6R: East Swale Avg. Flow Depth=1.02' Max Vel=1.75 fps Inflow=14.03 cfs 1.337 af
n=0.104 L=1,300.0' S=0.0231 '/' Capacity=40.00 cfs Outflow=10.81 cfs 1.337 af

Pond 1P: DRIVEWAY WQ BASIN: POND #1 Peak Elev=373.76' Storage=1,770 cf Inflow=1.26 cfs 0.098 af
Outflow=1.20 cfs 0.061 af

Pond 2P: WEST SETTLING BASIN Peak Elev=379.06' Storage=2,617 cf Inflow=7.71 cfs 0.993 af
Primary=7.43 cfs 0.993 af Secondary=0.00 cfs 0.000 af Outflow=7.43 cfs 0.993 af

Pond 3P: BASIN/POND #2 Peak Elev=376.47' Storage=59,793 cf Inflow=20.55 cfs 2.363 af
Outflow=1.19 cfs 2.363 af

Pond 4P: BASIN/POND #3 Peak Elev=375.75' Storage=38,812 cf Inflow=22.10 cfs 1.903 af
Outflow=2.08 cfs 1.330 af

Pond 5P: BASIN/POND #4 Peak Elev=380.24' Storage=22,333 cf Inflow=20.43 cfs 2.389 af
Outflow=9.49 cfs 2.387 af

Pond 6P: POC2 EAST POND: EXISTING Peak Elev=345.50' Storage=85,762 cf Inflow=24.09 cfs 7.686 af
44.0" x 27.0", R=36.0" Elliptical Culvert n=0.025 L=102.0' S=0.0027 '/' Outflow=7.58 cfs 7.263 af

Pond 7P: POND #5 Peak Elev=423.84' Storage=12,774 cf Inflow=14.41 cfs 0.995 af
Outflow=10.62 cfs 0.968 af

Pond 8P: SCOUR HOLE Peak Elev=365.10' Storage=4,273 cf Inflow=7.08 cfs 0.330 af
Outflow=9.23 cfs 0.237 af

Pond 9P: MH 0+89 Peak Elev=407.43' Inflow=10.81 cfs 1.337 af
Primary=7.08 cfs 0.330 af Secondary=3.73 cfs 1.007 af Outflow=10.81 cfs 1.337 af

Link POC1: POC-BROOK WEST OF DRIVE Inflow=17.52 cfs 4.510 af
Primary=17.52 cfs 4.510 af

Link POC3: EAST WETLAND Inflow=24.55 cfs 12.173 af
Primary=24.55 cfs 12.173 af

Total Runoff Area = 122.908 ac Runoff Volume = 13.329 af Average Runoff Depth = 1.30"
87.80% Pervious = 107.919 ac 12.20% Impervious = 14.989 ac

Time span=0.00-48.00 hrs, dt=0.03 hrs, 1601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: SMITH POND BROOK Runoff Area=63.283 ac 0.00% Impervious Runoff Depth=1.52"
Flow Length=4,022' Tc=82.6 min CN=66 Runoff=33.93 cfs 8.016 af

Subcatchment 2S: TO DRIVEWAY BASIN Runoff Area=0.350 ac 100.00% Impervious Runoff Depth=4.45"
Tc=5.0 min CN=98 Runoff=1.65 cfs 0.130 af

Subcatchment 3S: SMITH POND BROOK Runoff Area=1.352 ac 0.00% Impervious Runoff Depth=1.59"
Flow Length=4,022' Tc=82.6 min CN=67 Runoff=0.77 cfs 0.179 af

Subcatchment 4S: TO WEST SETTLING Runoff Area=11.135 ac 8.09% Impervious Runoff Depth=1.81"
Flow Length=1,674' Tc=12.9 min CN=70 Runoff=18.33 cfs 1.679 af

Subcatchment 5S: TO BASIN 3 Runoff Area=5.547 ac 26.32% Impervious Runoff Depth=2.99"
Tc=5.0 min CN=84 Runoff=19.91 cfs 1.381 af

Subcatchment 6S: TO BASIN 5 Runoff Area=5.677 ac 31.60% Impervious Runoff Depth=3.08"
Tc=5.0 min CN=85 Runoff=20.96 cfs 1.458 af

Subcatchment 7S: TO EAST SWALE Runoff Area=11.155 ac 0.00% Impervious Runoff Depth=2.28"
Flow Length=1,600' Slope=0.0150 '/' Tc=14.5 min CN=76 Runoff=22.71 cfs 2.122 af

Subcatchment 8S: TO BASIN 2 Runoff Area=7.234 ac 49.17% Impervious Runoff Depth=3.28"
Tc=5.0 min CN=87 Runoff=28.18 cfs 1.975 af

Subcatchment 9S: TO EAST POND Runoff Area=12.250 ac 17.14% Impervious Runoff Depth=2.45"
Flow Length=642' Tc=9.9 min CN=78 Runoff=30.68 cfs 2.502 af

Subcatchment 10S: TO BASIN 4 Runoff Area=4.925 ac 98.01% Impervious Runoff Depth=4.45"
Tc=5.0 min CN=98 Runoff=23.24 cfs 1.828 af

Reach 5R: West Swale Avg. Flow Depth=0.99' Max Vel=2.44 fps Inflow=18.33 cfs 1.679 af
n=0.104 L=1,500.0' S=0.0467 '/' Capacity=56.88 cfs Outflow=14.53 cfs 1.679 af

Reach 6R: East Swale Avg. Flow Depth=1.35' Max Vel=2.02 fps Inflow=22.71 cfs 2.122 af
n=0.104 L=1,300.0' S=0.0231 '/' Capacity=40.00 cfs Outflow=18.23 cfs 2.122 af

Pond 1P: DRIVEWAY WQ BASIN: POND #1 Peak Elev=373.79' Storage=1,803 cf Inflow=1.65 cfs 0.130 af
Outflow=1.59 cfs 0.093 af

Pond 2P: WEST SETTLING BASIN Peak Elev=379.51' Storage=3,929 cf Inflow=14.53 cfs 1.679 af
Primary=14.05 cfs 1.679 af Secondary=0.00 cfs 0.000 af Outflow=14.05 cfs 1.679 af

Pond 3P: BASIN/POND #2 Peak Elev=378.20' Storage=101,978 cf Inflow=31.98 cfs 3.654 af
Outflow=1.44 cfs 3.563 af

Pond 4P: BASIN/POND #3 Peak Elev=376.35' Storage=48,556 cf Inflow=36.46 cfs 2.812 af
Outflow=14.33 cfs 2.239 af

Pond 5P: BASIN/POND #4 Peak Elev=380.47' Storage=24,275 cf Inflow=26.50 cfs 3.250 af
Outflow=19.26 cfs 3.248 af

Pond 6P: POC2 EAST POND: EXISTING Peak Elev=345.99' Storage=119,329 cf Inflow=52.62 cfs 11.551 af
44.0" x 27.0", R=36.0" Elliptical Culvert n=0.025 L=102.0' S=0.0027 '/' Outflow=13.72 cfs 10.873 af

Pond 7P: POND #5 Peak Elev=423.99' Storage=14,361 cf Inflow=20.96 cfs 1.458 af
Outflow=17.88 cfs 1.431 af

Pond 8P: SCOUR HOLE Peak Elev=365.13' Storage=4,341 cf Inflow=13.16 cfs 0.699 af
Outflow=13.35 cfs 0.606 af

Pond 9P: MH 0+89 Peak Elev=409.14' Inflow=18.23 cfs 2.122 af
Primary=13.16 cfs 0.699 af Secondary=5.07 cfs 1.422 af Outflow=18.23 cfs 2.122 af

Link POC1: POC-BROOK WEST OF DRIVE Inflow=33.93 cfs 8.016 af
Primary=33.93 cfs 8.016 af

Link POC3: EAST WETLAND Inflow=49.96 cfs 19.768 af
Primary=49.96 cfs 19.768 af

Total Runoff Area = 122.908 ac Runoff Volume = 21.270 af Average Runoff Depth = 2.08"
87.80% Pervious = 107.919 ac 12.20% Impervious = 14.989 ac

Time span=0.00-48.00 hrs, dt=0.03 hrs, 1601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: SMITH POND BROOK Runoff Area=63.283 ac 0.00% Impervious Runoff Depth=2.14"
Flow Length=4,022' Tc=82.6 min CN=66 Runoff=49.39 cfs 11.290 af

Subcatchment 2S: TO DRIVEWAY BASIN Runoff Area=0.350 ac 100.00% Impervious Runoff Depth=5.35"
Tc=5.0 min CN=98 Runoff=1.97 cfs 0.156 af

Subcatchment 3S: SMITH POND BROOK Runoff Area=1.352 ac 0.00% Impervious Runoff Depth=2.23"
Flow Length=4,022' Tc=82.6 min CN=67 Runoff=1.10 cfs 0.251 af

Subcatchment 4S: TO WEST SETTLING Runoff Area=11.135 ac 8.09% Impervious Runoff Depth=2.48"
Flow Length=1,674' Tc=12.9 min CN=70 Runoff=25.59 cfs 2.305 af

Subcatchment 5S: TO BASIN 3 Runoff Area=5.547 ac 26.32% Impervious Runoff Depth=3.81"
Tc=5.0 min CN=84 Runoff=25.24 cfs 1.763 af

Subcatchment 6S: TO BASIN 5 Runoff Area=5.677 ac 31.60% Impervious Runoff Depth=3.92"
Tc=5.0 min CN=85 Runoff=26.43 cfs 1.853 af

Subcatchment 7S: TO EAST SWALE Runoff Area=11.155 ac 0.00% Impervious Runoff Depth=3.03"
Flow Length=1,600' Slope=0.0150 '/' Tc=14.5 min CN=76 Runoff=30.28 cfs 2.816 af

Subcatchment 8S: TO BASIN 2 Runoff Area=7.234 ac 49.17% Impervious Runoff Depth=4.13"
Tc=5.0 min CN=87 Runoff=35.15 cfs 2.487 af

Subcatchment 9S: TO EAST POND Runoff Area=12.250 ac 17.14% Impervious Runoff Depth=3.22"
Flow Length=642' Tc=9.9 min CN=78 Runoff=40.34 cfs 3.286 af

Subcatchment 10S: TO BASIN 4 Runoff Area=4.925 ac 98.01% Impervious Runoff Depth=5.35"
Tc=5.0 min CN=98 Runoff=27.75 cfs 2.197 af

Reach 5R: West Swale Avg. Flow Depth=1.20' Max Vel=2.71 fps Inflow=25.59 cfs 2.305 af
n=0.104 L=1,500.0' S=0.0467 '/' Capacity=56.88 cfs Outflow=20.84 cfs 2.305 af

Reach 6R: East Swale Avg. Flow Depth=1.58' Max Vel=2.20 fps Inflow=30.28 cfs 2.816 af
n=0.104 L=1,300.0' S=0.0231 '/' Capacity=40.00 cfs Outflow=24.84 cfs 2.816 af

Pond 1P: DRIVEWAY WQ BASIN: POND #1 Peak Elev=373.82' Storage=1,828 cf Inflow=1.97 cfs 0.156 af
Outflow=1.90 cfs 0.119 af

Pond 2P: WEST SETTLING BASIN Peak Elev=379.86' Storage=5,059 cf Inflow=20.84 cfs 2.305 af
Primary=20.12 cfs 2.304 af Secondary=0.00 cfs 0.000 af Outflow=20.12 cfs 2.304 af

Pond 3P: BASIN/POND #2 Peak Elev=378.63' Storage=112,931 cf Inflow=41.76 cfs 4.792 af
Outflow=5.86 cfs 4.582 af

Pond 4P: BASIN/POND #3 Peak Elev=376.52' Storage=51,355 cf Inflow=46.50 cfs 3.589 af
Outflow=31.15 cfs 3.015 af

Pond 5P: BASIN/POND #4 Peak Elev=380.62' Storage=25,574 cf Inflow=31.45 cfs 3.957 af
Outflow=27.78 cfs 3.954 af

Pond 6P: POC2 EAST POND: EXISTING Peak Elev=346.54' Storage=158,929 cf Inflow=93.25 cfs 14.837 af
44.0" x 27.0", R=36.0" Elliptical Culvert n=0.025 L=102.0' S=0.0027 '/' Outflow=21.35 cfs 14.122 af

Pond 7P: POND #5 Peak Elev=424.07' Storage=15,370 cf Inflow=26.43 cfs 1.853 af
Outflow=22.77 cfs 1.826 af

Pond 8P: SCOUR HOLE Peak Elev=365.16' Storage=4,412 cf Inflow=18.41 cfs 1.056 af
Outflow=18.40 cfs 0.963 af

Pond 9P: MH 0+89 Peak Elev=411.43' Inflow=24.84 cfs 2.816 af
Primary=18.41 cfs 1.056 af Secondary=6.44 cfs 1.760 af Outflow=24.84 cfs 2.816 af

Link POC1: POC-BROOK WEST OF DRIVE Inflow=49.39 cfs 11.290 af
Primary=49.39 cfs 11.290 af

Link POC3: EAST WETLAND Inflow=73.75 cfs 26.745 af
Primary=73.75 cfs 26.745 af

Total Runoff Area = 122.908 ac Runoff Volume = 28.404 af Average Runoff Depth = 2.77"
87.80% Pervious = 107.919 ac 12.20% Impervious = 14.989 ac

Time span=0.00-48.00 hrs, dt=0.03 hrs, 1601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: SMITH POND BROOK Runoff Area=63.283 ac 0.00% Impervious Runoff Depth=3.07"
Flow Length=4,022' Tc=82.6 min CN=66 Runoff=72.46 cfs 16.198 af

Subcatchment 2S: TO DRIVEWAY BASIN Runoff Area=0.350 ac 100.00% Impervious Runoff Depth=6.59"
Tc=5.0 min CN=98 Runoff=2.41 cfs 0.192 af

Subcatchment 3S: SMITH POND BROOK Runoff Area=1.352 ac 0.00% Impervious Runoff Depth=3.17"
Flow Length=4,022' Tc=82.6 min CN=67 Runoff=1.60 cfs 0.357 af

Subcatchment 4S: TO WEST SETTLING Runoff Area=11.135 ac 8.09% Impervious Runoff Depth=3.48"
Flow Length=1,674' Tc=12.9 min CN=70 Runoff=36.19 cfs 3.227 af

Subcatchment 5S: TO BASIN 3 Runoff Area=5.547 ac 26.32% Impervious Runoff Depth=4.98"
Tc=5.0 min CN=84 Runoff=32.60 cfs 2.301 af

Subcatchment 6S: TO BASIN 5 Runoff Area=5.677 ac 31.60% Impervious Runoff Depth=5.09"
Tc=5.0 min CN=85 Runoff=33.96 cfs 2.408 af

Subcatchment 7S: TO EAST SWALE Runoff Area=11.155 ac 0.00% Impervious Runoff Depth=4.11"
Flow Length=1,600' Slope=0.0150 '/' Tc=14.5 min CN=76 Runoff=41.05 cfs 3.817 af

Subcatchment 8S: TO BASIN 2 Runoff Area=7.234 ac 49.17% Impervious Runoff Depth=5.32"
Tc=5.0 min CN=87 Runoff=44.72 cfs 3.204 af

Subcatchment 9S: TO EAST POND Runoff Area=12.250 ac 17.14% Impervious Runoff Depth=4.32"
Flow Length=642' Tc=9.9 min CN=78 Runoff=53.95 cfs 4.411 af

Subcatchment 10S: TO BASIN 4 Runoff Area=4.925 ac 98.01% Impervious Runoff Depth=6.59"
Tc=5.0 min CN=98 Runoff=33.96 cfs 2.705 af

Reach 5R: West Swale Avg. Flow Depth=1.46' Max Vel=3.00 fps Inflow=36.19 cfs 3.227 af
n=0.104 L=1,500.0' S=0.0467 '/' Capacity=56.88 cfs Outflow=30.21 cfs 3.227 af

Reach 6R: East Swale Avg. Flow Depth=1.86' Max Vel=2.40 fps Inflow=41.05 cfs 3.817 af
n=0.104 L=1,300.0' S=0.0231 '/' Capacity=40.00 cfs Outflow=34.36 cfs 3.817 af

Pond 1P: DRIVEWAY WQ BASIN: POND #1 Peak Elev=373.85' Storage=1,860 cf Inflow=2.41 cfs 0.192 af
Outflow=2.34 cfs 0.155 af

Pond 2P: WEST SETTLING BASIN Peak Elev=380.34' Storage=6,742 cf Inflow=30.21 cfs 3.227 af
Primary=29.03 cfs 3.227 af Secondary=0.00 cfs 0.000 af Outflow=29.03 cfs 3.227 af

Pond 3P: BASIN/POND #2 Peak Elev=378.90' Storage=119,861 cf Inflow=55.66 cfs 6.431 af
Outflow=24.91 cfs 6.164 af

Pond 4P: BASIN/POND #3 Peak Elev=376.67' Storage=53,960 cf Inflow=55.79 cfs 4.682 af
Outflow=50.57 cfs 4.108 af

Pond 5P: BASIN/POND #4 Peak Elev=380.74' Storage=26,624 cf Inflow=38.51 cfs 4.912 af
Outflow=35.70 cfs 4.910 af

Pond 6P: POC2 EAST POND: Peak Elev=347.75' Storage=252,381 cf Inflow=140.77 cfs 19.592 af
44.0" x 27.0", R=36.0" Elliptical Culvert n=0.025 L=102.0' S=0.0027 '/' Outflow=31.25 cfs 18.865 af

Pond 7P: POND #5 Peak Elev=424.28' Storage=18,180 cf Inflow=33.96 cfs 2.408 af
Outflow=23.02 cfs 2.380 af

Pond 8P: SCOUR HOLE Peak Elev=365.20' Storage=4,508 cf Inflow=25.83 cfs 1.610 af
Outflow=25.83 cfs 1.517 af

Pond 9P: MH 0+89 Peak Elev=415.97' Inflow=34.36 cfs 3.817 af
Primary=25.83 cfs 1.610 af Secondary=8.53 cfs 2.207 af Outflow=34.36 cfs 3.817 af

Link POC1: POC-BROOK WEST OF DRIVE Inflow=72.46 cfs 16.198 af
Primary=72.46 cfs 16.198 af

Link POC3: EAST WETLAND Inflow=109.12 cfs 37.093 af
Primary=109.12 cfs 37.093 af

Total Runoff Area = 122.908 ac Runoff Volume = 38.821 af Average Runoff Depth = 3.79"
87.80% Pervious = 107.919 ac 12.20% Impervious = 14.989 ac

Time span=0.00-48.00 hrs, dt=0.03 hrs, 1601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: SMITH POND BROOK Runoff Area=63.283 ac 0.00% Impervious Runoff Depth=3.80"
Flow Length=4,022' Tc=82.6 min CN=66 Runoff=90.49 cfs 20.059 af

Subcatchment 2S: TO DRIVEWAY BASIN Runoff Area=0.350 ac 100.00% Impervious Runoff Depth=7.51"
Tc=5.0 min CN=98 Runoff=2.74 cfs 0.219 af

Subcatchment 3S: SMITH POND BROOK Runoff Area=1.352 ac 0.00% Impervious Runoff Depth=3.91"
Flow Length=4,022' Tc=82.6 min CN=67 Runoff=1.99 cfs 0.441 af

Subcatchment 4S: TO WEST SETTLING Runoff Area=11.135 ac 8.09% Impervious Runoff Depth=4.25"
Flow Length=1,674' Tc=12.9 min CN=70 Runoff=44.33 cfs 3.944 af

Subcatchment 5S: TO BASIN 3 Runoff Area=5.547 ac 26.32% Impervious Runoff Depth=5.86"
Tc=5.0 min CN=84 Runoff=38.06 cfs 2.707 af

Subcatchment 6S: TO BASIN 5 Runoff Area=5.677 ac 31.60% Impervious Runoff Depth=5.97"
Tc=5.0 min CN=85 Runoff=39.53 cfs 2.825 af

Subcatchment 7S: TO EAST SWALE Runoff Area=11.155 ac 0.00% Impervious Runoff Depth=4.93"
Flow Length=1,600' Slope=0.0150 '/' Tc=14.5 min CN=76 Runoff=49.17 cfs 4.584 af

Subcatchment 8S: TO BASIN 2 Runoff Area=7.234 ac 49.17% Impervious Runoff Depth=6.21"
Tc=5.0 min CN=87 Runoff=51.78 cfs 3.741 af

Subcatchment 9S: TO EAST POND Runoff Area=12.250 ac 17.14% Impervious Runoff Depth=5.16"
Flow Length=642' Tc=9.9 min CN=78 Runoff=64.17 cfs 5.268 af

Subcatchment 10S: TO BASIN 4 Runoff Area=4.925 ac 98.01% Impervious Runoff Depth=7.51"
Tc=5.0 min CN=98 Runoff=38.56 cfs 3.082 af

Reach 5R: West Swale Avg. Flow Depth=1.63' Max Vel=3.18 fps Inflow=44.33 cfs 3.944 af
n=0.104 L=1,500.0' S=0.0467 '/' Capacity=56.88 cfs Outflow=37.48 cfs 3.944 af

Reach 6R: East Swale Avg. Flow Depth=2.04' Max Vel=2.53 fps Inflow=49.17 cfs 4.584 af
n=0.104 L=1,300.0' S=0.0231 '/' Capacity=40.00 cfs Outflow=41.61 cfs 4.584 af

Pond 1P: DRIVEWAY WQ BASIN: POND #1 Peak Elev=373.87' Storage=1,882 cf Inflow=2.74 cfs 0.219 af
Outflow=2.66 cfs 0.182 af

Pond 2P: WEST SETTLING BASIN Peak Elev=380.76' Storage=8,349 cf Inflow=37.48 cfs 3.944 af
Primary=35.00 cfs 3.943 af Secondary=0.00 cfs 0.000 af Outflow=35.00 cfs 3.943 af

Pond 3P: BASIN/POND #2 Peak Elev=379.08' Storage=124,576 cf Inflow=66.19 cfs 7.685 af
Outflow=43.33 cfs 7.392 af

Pond 4P: BASIN/POND #3 Peak Elev=376.72' Storage=54,800 cf Inflow=61.04 cfs 5.504 af
Outflow=57.85 cfs 4.930 af

Pond 5P: BASIN/POND #4 Peak Elev=380.82' Storage=27,268 cf Inflow=43.88 cfs 5.608 af
Outflow=40.99 cfs 5.605 af

Pond 6P: POC2 EAST POND: Peak Elev=348.64' Storage=327,018 cf Inflow=163.03 cfs 23.195 af
44.0" x 27.0", R=36.0" Elliptical Culvert n=0.025 L=102.0' S=0.0027 '/' Outflow=39.09 cfs 22.464 af

Pond 7P: POND #5 Peak Elev=424.46' Storage=21,028 cf Inflow=39.53 cfs 2.825 af
Outflow=23.23 cfs 2.798 af

Pond 8P: SCOUR HOLE Peak Elev=365.23' Storage=4,575 cf Inflow=31.44 cfs 2.058 af
Outflow=31.44 cfs 1.966 af

Pond 9P: MH 0+89 Peak Elev=420.41' Inflow=41.61 cfs 4.584 af
Primary=31.44 cfs 2.058 af Secondary=10.17 cfs 2.525 af Outflow=41.61 cfs 4.584 af

Link POC1: POC-BROOK WEST OF DRIVE Inflow=90.49 cfs 20.059 af
Primary=90.49 cfs 20.059 af

Link POC3: EAST WETLAND Inflow=136.28 cfs 45.111 af
Primary=136.28 cfs 45.111 af

Total Runoff Area = 122.908 ac Runoff Volume = 46.871 af Average Runoff Depth = 4.58"
87.80% Pervious = 107.919 ac 12.20% Impervious = 14.989 ac

Time span=0.00-48.00 hrs, dt=0.03 hrs, 1601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: SMITH POND BROOK Runoff Area=63.283 ac 0.00% Impervious Runoff Depth=4.62"
Flow Length=4,022' Tc=82.6 min CN=66 Runoff=110.49 cfs 24.372 af

Subcatchment 2S: TO DRIVEWAY BASIN Runoff Area=0.350 ac 100.00% Impervious Runoff Depth=8.50"
Tc=5.0 min CN=98 Runoff=3.09 cfs 0.248 af

Subcatchment 3S: SMITH POND BROOK Runoff Area=1.352 ac 0.00% Impervious Runoff Depth=4.74"
Flow Length=4,022' Tc=82.6 min CN=67 Runoff=2.43 cfs 0.534 af

Subcatchment 4S: TO WEST SETTLING Runoff Area=11.135 ac 8.09% Impervious Runoff Depth=5.11"
Flow Length=1,674' Tc=12.9 min CN=70 Runoff=53.26 cfs 4.738 af

Subcatchment 5S: TO BASIN 3 Runoff Area=5.547 ac 26.32% Impervious Runoff Depth=6.81"
Tc=5.0 min CN=84 Runoff=43.91 cfs 3.147 af

Subcatchment 6S: TO BASIN 5 Runoff Area=5.677 ac 31.60% Impervious Runoff Depth=6.93"
Tc=5.0 min CN=85 Runoff=45.51 cfs 3.278 af

Subcatchment 7S: TO EAST SWALE Runoff Area=11.155 ac 0.00% Impervious Runoff Depth=5.84"
Flow Length=1,600' Slope=0.0150 '/' Tc=14.5 min CN=76 Runoff=57.98 cfs 5.425 af

Subcatchment 8S: TO BASIN 2 Runoff Area=7.234 ac 49.17% Impervious Runoff Depth=7.17"
Tc=5.0 min CN=87 Runoff=59.35 cfs 4.323 af

Subcatchment 9S: TO EAST POND Runoff Area=12.250 ac 17.14% Impervious Runoff Depth=6.08"
Flow Length=642' Tc=9.9 min CN=78 Runoff=75.20 cfs 6.205 af

Subcatchment 10S: TO BASIN 4 Runoff Area=4.925 ac 98.01% Impervious Runoff Depth=8.50"
Tc=5.0 min CN=98 Runoff=43.51 cfs 3.488 af

Reach 5R: West Swale Avg. Flow Depth=1.79' Max Vel=3.35 fps Inflow=53.26 cfs 4.738 af
n=0.104 L=1,500.0' S=0.0467 '/' Capacity=56.88 cfs Outflow=45.53 cfs 4.738 af

Reach 6R: East Swale Avg. Flow Depth=2.23' Max Vel=2.63 fps Inflow=57.98 cfs 5.425 af
n=0.104 L=1,300.0' S=0.0231 '/' Capacity=40.00 cfs Outflow=49.39 cfs 5.425 af

Pond 1P: DRIVEWAY WQ BASIN: POND #1 Peak Elev=373.90' Storage=1,906 cf Inflow=3.09 cfs 0.248 af
Outflow=3.00 cfs 0.211 af

Pond 2P: WEST SETTLING BASIN Peak Elev=381.17' Storage=10,042 cf Inflow=45.53 cfs 4.738 af
Primary=41.09 cfs 4.714 af Secondary=2.53 cfs 0.024 af Outflow=43.62 cfs 4.738 af

Pond 3P: BASIN/POND #2 Peak Elev=379.20' Storage=127,876 cf Inflow=77.63 cfs 9.037 af
Outflow=59.10 cfs 8.729 af

Pond 4P: BASIN/POND #3 Peak Elev=376.76' Storage=55,492 cf Inflow=67.03 cfs 6.397 af
Outflow=64.12 cfs 5.823 af

Pond 5P: BASIN/POND #4 Peak Elev=380.89' Storage=27,927 cf Inflow=49.72 cfs 6.344 af
Outflow=46.71 cfs 6.342 af

Pond 6P: POC2 EAST POND: Peak Elev=349.53' Storage=410,323 cf Inflow=185.53 cfs 27.099 af
44.0" x 27.0", R=36.0" Elliptical Culvert n=0.025 L=102.0' S=0.0027 '/' Outflow=45.65 cfs 26.364 af

Pond 7P: POND #5 Peak Elev=424.66' Storage=24,629 cf Inflow=45.51 cfs 3.278 af
Outflow=23.47 cfs 3.250 af

Pond 8P: SCOUR HOLE Peak Elev=365.26' Storage=4,642 cf Inflow=37.44 cfs 2.569 af
Outflow=37.44 cfs 2.476 af

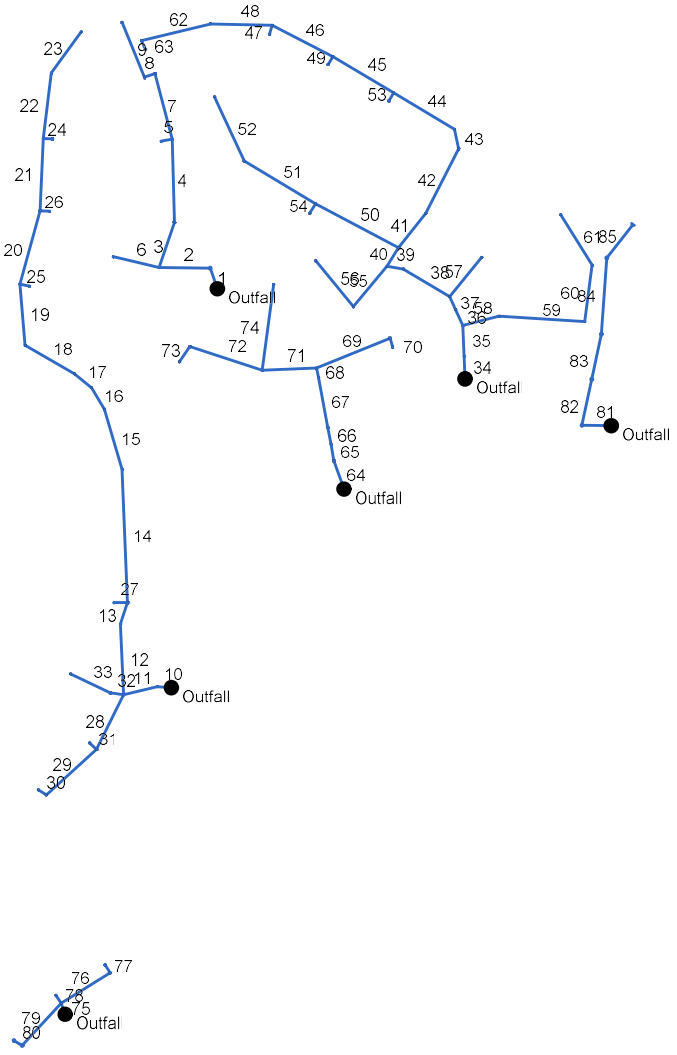
Pond 9P: MH 0+89 Peak Elev=426.11' Inflow=49.39 cfs 5.425 af
Primary=37.44 cfs 2.569 af Secondary=11.95 cfs 2.855 af Outflow=49.39 cfs 5.425 af

Link POC1: POC-BROOK WEST OF DRIVE Inflow=110.49 cfs 24.396 af
Primary=110.49 cfs 24.396 af

Link POC3: EAST WETLAND Inflow=164.32 cfs 53.982 af
Primary=164.32 cfs 53.982 af

Total Runoff Area = 122.908 ac Runoff Volume = 55.760 af Average Runoff Depth = 5.44"
87.80% Pervious = 107.919 ac 12.20% Impervious = 14.989 ac

Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan



Project File: 3302-KWF-with hydrocad flowrates 062723-3.stm	Number of lines: 85	Date: 8/15/2023

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr Line No.	Line Length (ft)	Defl angle (deg)	Junc Type	Known Q (cfs)	Drng Area (ac)	Runoff Coeff (C)	Inlet Time (min)	Invert El Dn (ft)	Line Slope (%)	Invert El Up (ft)	Line Size (in)	Line Shape	N Value (n)	J-Loss Coeff (K)	Inlet/ Rim El (ft)	
1	End	46.280	-109.316	MH	0.01	0.00	0.00	0.0	423.00	1.08	423.50	15	Cir	0.012	0.95	431.19	Pipe - (93)
2	1	108.498	-69.880	Grate	0.01	0.00	0.00	0.0	423.50	3.92	427.75	15	Cir	0.012	1.96	433.50	Pipe - (103)
3	2	101.762	108.050	Grate	2.58	0.00	0.00	0.0	429.00	0.98	430.00	15	Cir	0.012	0.60	437.75	Pipe - (91)
4	3	177.051	-20.470	Grate	1.31	0.00	0.00	0.0	430.00	2.82	435.00	15	Cir	0.012	2.04	442.83	Pipe - (90)
5	4	24.000	-99.074	Grate	1.55	0.00	0.00	0.0	435.00	0.83	435.20	15	Cir	0.012	1.00	437.06	Pipe - (95)
6	2	99.706	12.458	Grate	1.69	0.00	0.00	0.0	428.00	1.00	429.00	15	Cir	0.012	1.00	437.00	Pipe - (96)
7	4	144.046	-13.000	Grate	0.47	0.00	0.00	0.0	435.20	3.33	440.00	15	Cir	0.012	1.50	447.14	Pipe - (89)
8	7	24.000	-94.114	Grate	0.42	0.00	0.00	0.0	440.30	0.83	440.50	15	Cir	0.012	1.50	447.14	Pipe - (88)
9	8	126.174	86.768	Grate	1.18	0.00	0.00	0.0	440.50	1.59	442.50	15	Cir	0.012	1.00	451.00	Pipe - (94)
10	End	30.000	-176.500	MH	4.78	0.00	0.00	0.0	376.50	0.67	376.70	36	Cir	0.012	0.34	389.50	Pipe - (83)
11	10	73.386	-17.000	Grate	0.01	0.00	0.00	0.0	376.70	0.65	377.18	36	Cir	0.012	2.15	415.05	Pipe - (82)
12	11	150.569	100.995	Grate	2.05	0.00	0.00	0.0	383.50	4.74	390.63	18	Cir	0.012	0.61	415.80	Pipe - (74)
13	12	47.994	20.707	Grate	1.78	0.00	0.00	0.0	390.63	4.94	393.00	18	Cir	0.012	1.50	416.05	Pipe - (73)
14	13	284.334	-20.554	Grate	1.92	0.00	0.00	0.0	393.00	5.70	409.20	18	Cir	0.012	0.50	417.47	Pipe - (72)
15	14	133.139	-13.986	Grate	1.27	0.00	0.00	0.0	409.20	5.11	416.00	18	Cir	0.012	0.50	421.48	Pipe - (71)
16	15	53.198	-14.690	Grate	1.50	0.00	0.00	0.0	416.00	1.00	416.53	18	Cir	0.012	0.58	421.83	Pipe - (67)
17	16	47.067	-19.423	Grate	1.55	0.00	0.00	0.0	416.53	1.00	417.00	18	Cir	0.012	0.50	424.03	Pipe - (66)
18	17	120.653	-9.419	Grate	1.55	0.00	0.00	0.0	417.00	0.99	418.20	18	Cir	0.012	1.27	429.11	Pipe - (65)
19	18	130.403	54.984	Grate	1.55	0.00	0.00	0.0	420.65	2.84	424.35	15	Cir	0.012	1.50	433.82	Pipe - (64)
20	19	161.656	20.177	Grate	1.36	0.00	0.00	0.0	424.35	3.34	429.75	15	Cir	0.012	1.47	439.06	Pipe - (63)
21	20	154.069	-12.665	Grate	0.98	0.00	0.00	0.0	429.75	3.28	434.80	15	Cir	0.012	1.50	443.95	Pipe - (62)
22	21	140.369	4.401	Grate	0.01	0.00	0.00	0.0	434.80	3.35	439.50	15	Cir	0.012	0.81	448.33	Pipe - (61)
23	22	107.999	28.774	Grate	0.01	0.00	0.00	0.0	439.50	2.78	442.50	15	Cir	0.012	1.00	451.27	Pipe - (60)

Project File: 3302-KWF-with hydrocad flowrates 062723-3.stm

Number of lines: 85

Date: 8/15/2023

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr Line No.	Line Length (ft)	Defl angle (deg)	Junc Type	Known Q (cfs)	Drng Area (ac)	Runoff Coeff (C)	Inlet Time (min)	Invert El Dn (ft)	Line Slope (%)	Invert El Up (ft)	Line Size (in)	Line Shape	N Value (n)	J-Loss Coeff (K)	Inlet/ Rim El (ft)	
24	21	20.089	90.444	Grate	0.01	0.00	0.00	0.0	434.80	1.00	435.00	15	Cir	0.012	1.00	443.95	Pipe - (70)
25	19	20.249	107.575	Grate	0.01	0.00	0.00	0.0	430.18	0.99	430.38	15	Cir	0.012	1.00	433.82	Pipe - (69)
26	20	19.915	77.472	Grate	1.59	0.00	0.00	0.0	429.75	1.00	429.95	15	Cir	0.012	1.00	439.06	Pipe - (68)
27	13	28.928	-107.619	Grate	1.03	0.00	0.00	0.0	393.25	2.59	394.00	15	Cir	0.012	1.00	399.86	Pipe - (75)
28	11	129.835	-50.282	Grate	0.00	0.00	0.00	0.0	379.06	1.88	381.50	18	Cir	0.012	1.50	386.83	Pipe - (78)
29	28	143.637	21.543	Grate	1.83	0.00	0.00	0.0	381.75	3.10	386.20	15	Cir	0.012	1.46	389.65	Pipe - (77)
30	29	20.226	74.652	Grate	0.89	0.00	0.00	0.0	386.20	0.99	386.40	15	Cir	0.012	1.00	389.65	Pipe - (76)
31	28	20.197	108.231	Grate	1.41	0.00	0.00	0.0	381.75	0.99	381.95	15	Cir	0.012	1.00	386.83	Pipe - (79)
32	11	29.000	21.738	Grate	1.45	0.00	0.00	0.0	377.18	0.66	377.37	36	Cir	0.012	0.53	388.93	Pipe - (81)
33	32	93.000	17.579	Grate	29.30	0.00	0.00	0.0	377.37	0.68	378.00	36	Cir	0.012	1.00	382.40	Pipe - (80)
34	End	48.007	-92.256	Grate	1.45	0.00	0.00	0.0	379.50	1.04	380.00	24	Cir	0.012	0.50	394.00	Pipe - (43)
35	34	65.929	-0.056	Grate	1.45	0.00	0.00	0.0	387.00	5.31	390.50	24	Cir	0.012	1.47	398.00	Pipe - (42)
36	35	37.291	-22.364	Grate	1.36	0.00	0.00	0.0	393.50	9.92	397.20	24	Cir	0.012	0.50	410.00	Pipe - (41)
37	36	29.905	-0.219	Grate	2.25	0.00	0.00	0.0	405.50	10.03	408.50	24	Cir	0.012	1.37	422.00	Pipe - (40)
38	37	114.159	-34.174	Grate	1.22	0.00	0.00	0.0	413.66	1.87	415.80	24	Cir	0.012	0.61	427.62	Pipe - (39)
39	38	35.144	-20.837	Grate	1.41	0.00	0.00	0.0	415.80	0.57	416.00	24	Cir	0.012	2.01	420.61	Pipe - (38)
40	39	46.275	111.195	Grate	2.26	0.00	0.00	0.0	416.50	0.54	416.75	18	Cir	0.012	1.50	427.75	Pipe - (101)
41	40	93.041	7.158	Grate	2.95	0.00	0.00	0.0	416.75	1.88	418.50	18	Cir	0.012	0.50	429.48	Pipe - (37)
42	41	154.272	-11.637	Grate	1.22	0.00	0.00	0.0	418.50	2.99	423.11	18	Cir	0.012	1.01	432.26	Pipe - (36)
43	42	42.372	-38.754	Grate	1.31	0.00	0.00	0.0	423.11	1.51	423.75	18	Cir	0.012	1.16	433.38	Pipe - (56)
44	43	150.146	-47.123	Grate	1.55	0.00	0.00	0.0	424.00	2.16	427.25	15	Cir	0.012	1.50	436.48	Pipe - (55)
45	44	150.143	0.038	Grate	3.26	0.00	0.00	0.0	427.25	2.50	431.00	15	Cir	0.012	1.50	439.78	Pipe - (54)
46	45	145.164	-3.588	Grate	1.45	0.00	0.00	0.0	431.00	2.24	434.25	15	Cir	0.012	1.67	442.94	Pipe - (53)

Project File: 3302-KWF-with hydrocad flowrates 062723-3.stm | Number of lines: 85 | Date: 8/15/2023

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr Line No.	Line Length (ft)	Defl angle (deg)	Junc Type	Known Q (cfs)	Drng Area (ac)	Runoff Coeff (C)	Inlet Time (min)	Invert El Dn (ft)	Line Slope (%)	Invert El Up (ft)	Line Size (in)	Line Shape	N Value (n)	J-Loss Coeff (K)	Inlet/ Rim El (ft)	
47	46	20.331	-101.174	Grate	2.16	0.00	0.00	0.0	439.30	0.98	439.50	15	Cir	0.012	1.00	442.94	Pipe - (57)
48	46	130.074	-26.117	Grate	0.01	0.00	0.00	6.0	434.25	2.11	437.00	15	Cir	0.012	0.50	445.72	Pipe - (52)
49	45	20.184	-90.562	Grate	0.01	0.00	0.00	0.0	431.00	0.99	431.20	15	Cir	0.012	1.00	439.78	Pipe - (58)
50	40	198.814	-93.279	Grate	0.00	0.00	0.00	0.0	417.00	4.02	425.00	18	Cir	0.012	1.50	435.90	Pipe - (100)
51	50	176.323	2.970	Grate	1.08	0.00	0.00	0.0	425.00	3.40	431.00	15	Cir	0.012	0.93	441.70	Pipe - (99)
52	51	150.436	34.355	Grate	1.45	0.00	0.00	0.0	431.00	2.99	435.50	15	Cir	0.012	1.00	439.00	Pipe - (98)
53	44	19.955	-90.012	Grate	1.45	0.00	0.00	0.0	427.25	1.00	427.45	15	Cir	0.012	1.00	436.48	Pipe - (59)
54	50	24.000	-86.511	Grate	1.55	0.00	0.00	0.0	424.80	0.83	425.00	15	Cir	0.012	1.00	435.90	Pipe - (102)
55	39	111.814	-60.442	Grate	1.31	0.00	0.00	0.0	416.50	1.13	417.76	18	Cir	0.012	1.50	426.21	Pipe - (45)
56	55	127.017	101.133	Grate	2.10	0.00	0.00	0.0	421.00	1.57	423.00	15	Cir	0.012	1.00	427.00	Pipe - (44)
57	37	108.029	64.013	Grate	1.64	0.00	0.00	0.0	415.41	3.79	419.50	15	Cir	0.012	1.00	423.00	Pipe - (46)
58	35	79.019	78.015	Grate	1.45	0.00	0.00	0.0	390.50	0.51	390.90	24	Cir	0.012	0.54	395.00	Pipe - (50)
59	58	181.944	17.880	Grate	3.71	0.00	0.00	0.0	390.90	0.49	391.80	24	Cir	0.012	1.50	397.00	Pipe - (49)
60	59	121.251	-86.188	Grate	2.34	0.00	0.00	0.0	392.30	9.98	404.40	18	Cir	0.012	1.02	414.30	Pipe - (48)
61	60	126.000	-39.286	Grate	1.41	0.00	0.00	0.0	408.00	9.52	420.00	15	Cir	0.012	1.00	427.50	Pipe - (51)
62	48	151.000	-15.000	Curb	0.01	0.00	0.00	0.0	437.00	1.66	439.50	15	Cir	0.012	1.50	448.53	
63	62	20.000	-101.000	Curb	0.01	0.00	0.00	0.0	439.50	1.00	439.70	15	Cir	0.012	1.00	448.53	
64	End	64.098	-109.316	Grate	0.80	0.00	0.00	0.0	378.00	1.01	378.65	24	Cir	0.012	0.50	422.29	Pipe - (25)
65	64	36.295	8.835	Grate	0.00	0.00	0.00	0.0	382.80	9.92	386.40	24	Cir	0.012	0.50	422.47	Pipe - (24)
66	65	35.254	0.102	Grate	27.07	0.00	0.00	0.0	397.40	10.21	401.00	24	Cir	0.012	0.50	422.64	Pipe - (23)
67	66	108.716	-0.157	Grate	0.75	0.00	0.00	0.0	409.50	1.00	410.59	24	Cir	0.012	0.50	423.19	Pipe - (22)
68	67	20.237	-0.808	Grate	0.00	0.00	0.00	0.0	410.59	0.99	410.79	24	Cir	0.012	1.48	423.29	Pipe - (21)
69	68	168.359	79.156	Grate	0.61	0.00	0.00	0.0	413.85	1.00	415.53	15	Cir	0.012	1.50	424.75	Pipe - (29)

Project File: 3302-KWF-with hydrocad flowrates 062723-3.stm | Number of lines: 85 | Date: 8/15/2023

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr Line No.	Line Length (ft)	Defl angle (deg)	Junc Type	Known Q (cfs)	Drng Area (ac)	Runoff Coeff (C)	Inlet Time (min)	Invert El Dn (ft)	Line Slope (%)	Invert El Up (ft)	Line Size (in)	Line Shape	N Value (n)	J-Loss Coeff (K)	Inlet/ Rim El (ft)	
70	69	19.738	96.881	Grate	1.17	0.00	0.00	0.0	421.10	1.01	421.30	15	Cir	0.012	1.00	424.75	Pipe - (28)
71	68	115.221	-80.955	Grate	3.23	0.00	0.00	0.0	410.79	0.62	411.50	24	Cir	0.012	1.50	425.10	Pipe - (20)
72	71	161.486	20.347	Grate	0.52	0.00	0.00	0.0	412.00	0.62	413.00	18	Cir	0.012	1.45	424.67	Pipe - (19)
73	72	39.226	-73.613	Grate	0.84	0.00	0.00	0.0	415.25	3.19	416.50	15	Cir	0.012	1.00	420.27	Pipe - (27)
74	71	183.745	99.797	Grate	15.22	0.00	0.00	0.0	411.25	1.63	414.25	18	Cir	0.012	1.00	423.50	Pipe - (97)
75	End	25.195	-109.316	Grate	0.52	0.00	0.00	0.0	373.25	0.99	373.50	18	Cir	0.012	1.50	381.80	Pipe - (32)
76	75	122.000	77.404	Grate	1.27	0.00	0.00	0.0	377.95	7.42	387.00	15	Cir	0.012	1.50	391.07	Pipe - (31)
77	76	20.216	-89.493	Grate	11.64	0.00	0.00	0.0	387.00	0.99	387.20	15	Cir	0.012	1.00	391.07	Pipe - (30)
78	75	20.027	-15.103	Grate	3.47	0.00	0.00	0.0	377.95	1.00	378.15	15	Cir	0.012	1.00	381.80	Pipe - (33)
79	75	122.337	-118.049	Grate	0.52	0.00	0.00	0.0	373.75	0.51	374.38	15	Cir	0.012	1.47	378.46	Pipe - (35)
80	79	20.035	77.965	Grate	0.52	0.00	0.00	0.0	374.38	1.00	374.58	15	Cir	0.012	1.00	378.46	Pipe - (34)
81	End	62.000	-179.000	MH	0.00	0.00	0.00	0.0	365.00	1.00	365.62	36	Cir	0.012	1.00	371.25	
82	81	100.000	101.000	MH	0.00	0.00	0.00	0.0	367.12	10.00	377.12	18	Cir	0.012	0.15	384.30	
83	82	98.000	0.000	MH	0.00	0.00	0.00	0.0	380.50	7.65	388.00	18	Cir	0.012	0.17	394.00	
84	83	162.660	-8.000	MH	0.00	0.00	0.00	0.0	389.66	10.05	406.00	18	Cir	0.012	0.61	415.70	
85	84	89.340	34.000	Hdwl	34.36	0.00	0.00	0.0	409.00	10.07	418.00	18	Cir	0.012	1.00	419.50	

Structure Report

Struct No.	Structure ID	Junction Type	Rim Elev (ft)	Structure			Line Out			Line In		
				Shape	Length (ft)	Width (ft)	Size (in)	Shape	Invert (ft)	Size (in)	Shape	Invert (ft)
1	2+86	Manhole	431.19	Cir	4.00	4.00	15	Cir	423.50	15	Cir	423.50
2	3+94	Grate	433.50	Rect	4.00	4.50	15	Cir	427.75	15 15	Cir Cir	429.00 428.00
3	4+21	Grate	437.75	Rect	4.00	7.00	15	Cir	430.00	15	Cir	430.00
4	2+50 LT	Grate	442.83	Rect	4.00	7.00	15	Cir	435.00	15 15	Cir Cir	435.00 435.20
5	2+50 RT	Grate	437.06	Rect	4.00	4.00	15	Cir	435.20			
6	4+94	Grate	437.00	Rect	4.00	4.50	15	Cir	429.00			
7	1+08 LT	Grate	447.14	Rect	4.00	7.00	15	Cir	440.00	15	Cir	440.30
8	1+08 RT	Grate	447.14	Rect	4.00	7.00	15	Cir	440.50	15	Cir	440.50
9	21+52	Grate	451.00	Rect	4.00	4.50	15	Cir	442.50			
10	XC5	Manhole	389.50	Rect	4.00	4.50	36	Cir	376.70	36	Cir	376.70
11	12+18RT	Grate	415.05	Rect	4.00	4.50	36	Cir	377.18	18 18 36	Cir Cir Cir	383.50 379.06 377.18
12	13+95	Grate	415.80	Rect	4.00	4.50	18	Cir	390.63	18	Cir	390.63
13	14+XRT	Grate	416.05	Rect	4.00	4.50	18	Cir	393.00	18 15	Cir Cir	393.00 393.25
14	17+0	Grate	417.47	Rect	4.00	4.50	18	Cir	409.20	18	Cir	409.20
15	11+26LT	Grate	421.48	Rect	4.00	4.50	18	Cir	416.00	18	Cir	416.00
16	11+62RT	Grate	421.83	Rect	4.00	4.50	18	Cir	416.53	18	Cir	416.53
17	12+14RT	Grate	424.03	Rect	4.00	4.50	18	Cir	417.00	18	Cir	417.00
18	13+37LT	Grate	429.11	Rect	4.00	4.50	18	Cir	418.20	15	Cir	420.65
19	14+63LT	Grate	433.82	Rect	4.00	4.50	15	Cir	424.35	15 15	Cir Cir	424.35 430.18
20	16+28lt	Grate	439.06	Rect	4.00	4.50	15	Cir	429.75	15 15	Cir Cir	429.75 429.75

Project File: 3302-KWF-with hydrocad flowrates 062723-3.stm | Number of Structures: 85 | Run Date: 8/15/2023

Structure Report

Struct No.	Structure ID	Junction Type	Rim Elev (ft)	Structure			Line Out			Line In		
				Shape	Length (ft)	Width (ft)	Size (in)	Shape	Invert (ft)	Size (in)	Shape	Invert (ft)
21	17+28LT	Grate	443.95	Rect	4.00	4.50	15	Cir	434.80	15 15	Cir Cir	434.80 434.80
22	19+20	Grate	448.33	Rect	4.00	4.50	15	Cir	439.50	15	Cir	439.50
23	20+24	Grate	451.27	Rect	4.00	4.50	15	Cir	442.50			
24	17+28RT	Grate	443.95	Rect	4.00	4.50	15	Cir	435.00			
25	14+63RT	Grate	433.82	Rect	4.00	4.50	15	Cir	430.38			
26	16+28RT	Grate	439.06	Rect	4.00	4.50	15	Cir	429.95			
27	14+XLT	Grate	399.86	Rect	4.00	4.50	15	Cir	394.00			
28	10+92RT	Grate	386.83	Rect	4.00	4.50	18	Cir	381.50	15 15	Cir Cir	381.75 381.75
29	9+45RT	Grate	389.65	Rect	4.00	4.50	15	Cir	386.20	15	Cir	386.20
30	9+45LT	Grate	389.65	Rect	4.00	4.50	15	Cir	386.40			
31	10+92LT	Grate	386.83	Rect	4.00	4.50	15	Cir	381.95			
32	12+18LT	Grate	388.93	Rect	4.00	4.50	36	Cir	377.37	36	Cir	377.37
33	FE-IN	Grate	382.40	Rect	4.00	4.50	36	Cir	378.00			
34	Structure - (52)	Grate	394.00	Rect	4.00	4.50	24	Cir	380.00	24	Cir	387.00
35	CC CB7	Grate	398.00	Rect	4.00	4.50	24	Cir	390.50	24 24	Cir Cir	393.50 390.50
36	CC MH3	Grate	410.00	Rect	4.00	4.50	24	Cir	397.20	24	Cir	405.50
37	CC MH2	Grate	422.00	Rect	4.00	4.50	24	Cir	408.50	24 15	Cir Cir	413.66 415.41
38	3+0 LT	Grate	427.62	Rect	4.00	4.50	24	Cir	415.80	24	Cir	415.80
39	3+0 RT	Grate	420.61	Rect	4.00	4.50	24	Cir	416.00	18 18	Cir Cir	416.50 416.50
40	0+21-RT	Grate	427.75	Rect	4.00	4.50	18	Cir	416.75	18 18	Cir Cir	416.75 417.00

Structure Report

Struct No.	Structure ID	Junction Type	Rim Elev (ft)	Structure			Line Out			Line In		
				Shape	Length (ft)	Width (ft)	Size (in)	Shape	Invert (ft)	Size (in)	Shape	Invert (ft)
41	1+75 RT	Grate	429.48	Rect	4.00	4.50	18	Cir	418.50	18	Cir	418.50
42	30+78RT	Grate	432.26	Rect	4.00	4.50	18	Cir	423.11	18	Cir	423.11
43	30+48LT	Grate	433.38	Rect	4.00	4.50	18	Cir	423.75	15	Cir	424.00
44	28+98LT	Grate	436.48	Rect	4.00	4.50	15	Cir	427.25	15 15	Cir Cir	427.25 427.25
45	27+48LT	Grate	439.78	Rect	4.00	4.50	15	Cir	431.00	15 15	Cir Cir	431.00 431.00
46	26+05LT	Grate	442.94	Rect	4.00	4.50	15	Cir	434.25	15 15	Cir Cir	439.30 434.25
47	26_05RT	Grate	442.94	Rect	4.00	4.50	15	Cir	439.50			
48	24+79LT	Grate	445.72	Rect	4.00	4.50	15	Cir	437.00	15	Cir	437.00
49	27+48RT	Grate	439.78	Rect	4.00	4.50	15	Cir	431.20			
50	2+21-RT	Grate	435.90	Rect	4.00	4.50	18	Cir	425.00	15 15	Cir Cir	425.00 424.80
51	3+95	Grate	441.70	Rect	4.00	4.50	15	Cir	431.00	15	Cir	431.00
52	5+21	Grate	439.00	Rect	4.00	4.50	15	Cir	435.50			
53	28+98RT	Grate	436.48	Rect	4.00	4.50	15	Cir	427.45			
54	2+21-LT	Grate	435.90	Rect	4.00	4.50	15	Cir	425.00			
55	4+34 RT	Grate	426.21	Rect	4.00	4.50	18	Cir	417.76	15	Cir	421.00
56	CC CB 1	Grate	427.00	Rect	4.00	4.50	15	Cir	423.00			
57	CC CB6	Grate	423.00	Rect	4.00	4.50	15	Cir	419.50			
58	CC CB5A	Grate	395.00	Rect	4.00	4.50	24	Cir	390.90	24	Cir	390.90
59	CC CB 5	Grate	397.00	Rect	4.00	4.50	24	Cir	391.80	18	Cir	392.30
60	CC CB4	Grate	414.30	Rect	4.00	4.50	18	Cir	404.40	15	Cir	408.00
61	33+47	Grate	427.50	Rect	4.00	4.50	15	Cir	420.00			

Structure Report

Struct No.	Structure ID	Junction Type	Rim Elev (ft)	Structure			Line Out			Line In		
				Shape	Length (ft)	Width (ft)	Size (in)	Shape	Invert (ft)	Size (in)	Shape	Invert (ft)
62	CB STA 23+25	Curb-	448.53	Rect	4.00	4.00	15	Cir	439.50	15	Cir	439.50
63	CB 23+25 RT	Curb-	448.53	Rect	4.00	4.00	15	Cir	439.70			
64	Structure - (32)	Grate	422.29	Rect	4.00	4.50	24	Cir	378.65	24	Cir	382.80
65	Structure - (31)	Grate	422.47	Rect	4.00	4.50	24	Cir	386.40	24	Cir	397.40
66	Structure - (30)	Grate	422.64	Rect	4.00	4.50	24	Cir	401.00	24	Cir	409.50
67	7+50LT	Grate	423.19	Rect	4.00	4.50	24	Cir	410.59	24	Cir	410.59
68	7+50RT	Grate	423.29	Rect	4.00	4.50	24	Cir	410.79	15 24	Cir Cir	413.85 410.79
69	5+80RT	Grate	424.75	Rect	4.00	4.50	15	Cir	415.53	15	Cir	421.10
70	5+80LT	Grate	424.75	Rect	4.00	4.50	15	Cir	421.30			
71	8+69RT	Grate	425.10	Rect	4.00	4.50	24	Cir	411.50	18 18	Cir Cir	412.00 411.25
72	10+33RT	Grate	424.67	Rect	4.00	4.50	18	Cir	413.00	15	Cir	415.25
73	10+45LT	Grate	420.27	Rect	4.00	4.50	15	Cir	416.50			
74	2+10	Grate	423.50	Rect	4.00	4.50	18	Cir	414.25			
75	2+99RT	Grate	381.80	Rect	4.00	4.50	18	Cir	373.50	15 15 15	Cir Cir Cir	377.95 377.95 373.75
76	4+20RT	Grate	391.07	Rect	4.00	4.50	15	Cir	387.00	15	Cir	387.00
77	4+20LT	Grate	391.07	Rect	4.00	4.50	15	Cir	387.20			
78	2+99LT	Grate	381.80	Rect	4.00	4.50	15	Cir	378.15			
79	1+67RT	Grate	378.46	Cir	4.00	4.50	15	Cir	374.38	15	Cir	374.38
80	1+67LT	Grate	378.46	Cir	4.00	4.50	15	Cir	374.58			
81	MH4+50	Manhole	371.25	Cir	4.00	4.00	36	Cir	365.62	18	Cir	367.12
82	MH3+50	Manhole	384.30	Cir	4.00	4.00	18	Cir	377.12	18	Cir	380.50

Structure Report

Struct No.	Structure ID	Junction Type	Rim Elev (ft)	Structure			Line Out			Line In		
				Shape	Length (ft)	Width (ft)	Size (in)	Shape	Invert (ft)	Size (in)	Shape	Invert (ft)
83	MH2+50	Manhole	394.00	Cir	4.00	4.00	18	Cir	388.00	18	Cir	389.66
84	MH0+89	Manhole	415.70	Cir	4.00	4.00	18	Cir	406.00	18	Cir	409.00
85	FE0+0	OpenHeadwall	419.50	n/a	n/a	n/a	18	Cir	418.00			

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
1	Pipe - (93)	9.22	15	Cir	46.280	423.00	423.50	1.080	424.18*	424.97*	0.83	425.80	End	Manhole
2	Pipe - (103)	9.21	15	Cir	108.498	423.50	427.75	3.917	425.80	428.91	n/a	428.91 j	1	Grate
3	Pipe - (91)	7.51	15	Cir	101.762	429.00	430.00	0.983	430.25*	431.42*	0.35	431.77	2	Grate
4	Pipe - (90)	4.93	15	Cir	177.051	430.00	435.00	2.824	431.77	435.90	n/a	435.90 j	3	Grate
5	Pipe - (95)	1.55	15	Cir	24.000	435.00	435.20	0.833	435.90	435.69	0.18	435.69	4	Grate
6	Pipe - (96)	1.69	15	Cir	99.706	428.00	429.00	1.003	428.91	429.52	n/a	429.52 j	2	Grate
7	Pipe - (89)	2.07	15	Cir	144.046	435.20	440.00	3.332	435.90	440.57	n/a	440.57 j	4	Grate
8	Pipe - (88)	1.60	15	Cir	24.000	440.30	440.50	0.833	440.73	441.00	n/a	441.00	7	Grate
9	Pipe - (94)	1.18	15	Cir	126.174	440.50	442.50	1.585	441.00	442.93	n/a	442.93 j	8	Grate
10	Pipe - (83)	57.84	36	Cir	30.000	376.50	376.70	0.667	378.92	379.16	n/a	379.16	End	Manhole
11	Pipe - (82)	53.06	36	Cir	73.386	376.70	377.18	0.654	379.16	379.55	n/a	379.55	10	Grate
12	Pipe - (74)	18.17	18	Cir	150.569	383.50	390.63	4.735	384.45	392.08	1.02	392.08	11	Grate
13	Pipe - (73)	16.12	18	Cir	47.994	390.63	393.00	4.938	392.08	394.43	n/a	394.43 j	12	Grate
14	Pipe - (72)	13.31	18	Cir	284.334	393.00	409.20	5.698	394.43	410.56	n/a	410.56 j	13	Grate
15	Pipe - (71)	11.39	18	Cir	133.139	409.20	416.00	5.107	410.56	417.29	n/a	417.29 j	14	Grate
16	Pipe - (67)	10.12	18	Cir	53.198	416.00	416.53	0.996	417.29	417.75	n/a	417.75 j	15	Grate
17	Pipe - (66)	8.62	18	Cir	47.067	416.53	417.00	0.999	417.75	418.14	n/a	418.14 j	16	Grate
18	Pipe - (65)	7.07	18	Cir	120.653	417.00	418.20	0.995	418.14	419.23	n/a	419.23 j	17	Grate
19	Pipe - (64)	5.52	15	Cir	130.403	420.65	424.35	2.837	421.25	425.30	0.71	425.30	18	Grate
20	Pipe - (63)	3.96	15	Cir	161.656	424.35	429.75	3.340	425.30	430.55	n/a	430.55 j	19	Grate
21	Pipe - (62)	1.01	15	Cir	154.069	429.75	434.80	3.278	430.55	435.19	n/a	435.19 j	20	Grate
22	Pipe - (61)	0.02	15	Cir	140.369	434.80	439.50	3.348	435.19	439.55	n/a	439.55 j	21	Grate
23	Pipe - (60)	0.01	15	Cir	107.999	439.50	442.50	2.778	439.55	442.54	n/a	442.54 j	22	Grate
24	Pipe - (70)	0.01	15	Cir	20.089	434.80	435.00	0.996	435.19	435.04	n/a	435.04	21	Grate

Project File: 3302-KWF-with hydrocad flowrates 062723-3.stm | Number of lines: 85 | Run Date: 8/15/2023

NOTES: Return period = 25 Yrs. ; *Surcharged (HGL above crown). ; j - Line contains hyd. jump.

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
25	Pipe - (69)	0.01	15	Cir	20.249	430.18	430.38	0.988	430.22	430.42	n/a	430.42	19	Grate
26	Pipe - (68)	1.59	15	Cir	19.915	429.75	429.95	1.004	430.55	430.45	n/a	430.45	20	Grate
27	Pipe - (75)	1.03	15	Cir	28.928	393.25	394.00	2.593	394.43	394.40	n/a	394.40 j	13	Grate
28	Pipe - (78)	4.13	18	Cir	129.835	379.06	381.50	1.879	379.59	382.28	n/a	382.28	11	Grate
29	Pipe - (77)	2.72	15	Cir	143.637	381.75	386.20	3.098	382.28	386.86	0.39	386.86	28	Grate
30	Pipe - (76)	0.89	15	Cir	20.226	386.20	386.40	0.989	386.86	386.77	n/a	386.77	29	Grate
31	Pipe - (79)	1.41	15	Cir	20.197	381.75	381.95	0.990	382.28	382.42	n/a	382.42 j	28	Grate
32	Pipe - (81)	30.75	36	Cir	29.000	377.18	377.37	0.655	379.55	379.17	0.40	379.17	11	Grate
33	Pipe - (80)	29.30	36	Cir	93.000	377.37	378.00	0.677	379.17	379.75	n/a	379.75 j	32	Grate
34	Pipe - (43)	44.83	24	Cir	48.007	379.50	380.00	1.042	381.47*	383.02*	1.58	384.60	End	Grate
35	Pipe - (42)	43.38	24	Cir	65.929	387.00	390.50	5.309	388.31	392.46	4.39	392.46	34	Grate
36	Pipe - (41)	33.02	24	Cir	37.291	393.50	397.20	9.922	394.41	399.10	n/a	399.10	35	Grate
37	Pipe - (40)	31.66	24	Cir	29.905	405.50	408.50	10.032	406.39	410.38	2.27	410.38	36	Grate
38	Pipe - (39)	27.77	24	Cir	114.159	413.66	415.80	1.875	415.05	417.62	0.81	417.62	37	Grate
39	Pipe - (38)	26.55	24	Cir	35.144	415.80	416.00	0.569	417.80*	418.21*	2.23	420.45	38	Grate
40	Pipe - (101)	21.73	18	Cir	46.275	416.50	416.75	0.540	420.45*	422.13*	3.53	425.66	39	Grate
41	Pipe - (37)	15.39	18	Cir	93.041	416.75	418.50	1.881	425.66*	427.36*	0.59	427.95	40	Grate
42	Pipe - (36)	12.44	18	Cir	154.272	418.50	423.11	2.988	427.95*	429.80*	0.78	430.58	41	Grate
43	Pipe - (56)	11.22	18	Cir	42.372	423.11	423.75	1.510	430.58*	430.99*	0.73	431.72	42	Grate
44	Pipe - (55)	9.91	15	Cir	150.146	424.00	427.25	2.165	431.72*	434.73*	1.52	436.25	43	Grate
45	Pipe - (54)	6.91	15	Cir	150.143	427.25	431.00	2.498	436.25*	437.72*	0.74	438.46	44	Grate
46	Pipe - (53)	3.64	15	Cir	145.164	431.00	434.25	2.239	438.46*	438.85*	0.23	439.08	45	Grate
47	Pipe - (57)	2.16	15	Cir	20.331	439.30	439.50	0.984	439.78	440.09	0.23	440.09	46	Grate
48	Pipe - (52)	0.03	15	Cir	130.074	434.25	437.00	2.114	439.08*	439.08*	0.00	439.08	46	Grate

Project File: 3302-KWF-with hydrocad flowrates 062723-3.stm | Number of lines: 85 | Run Date: 8/15/2023

NOTES: Return period = 25 Yrs. ; *Surcharged (HGL above crown). ; j - Line contains hyd. jump.

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
49	Pipe - (58)	0.01	15	Cir	20.184	431.00	431.20	0.991	438.46*	438.46*	0.00	438.46	45	Grate
50	Pipe - (100)	4.08	18	Cir	198.814	417.00	425.00	4.024	425.66	425.93	0.29	426.22	40	Grate
51	Pipe - (99)	2.53	15	Cir	176.323	425.00	431.00	3.403	426.22	431.64	n/a	431.64 j	50	Grate
52	Pipe - (98)	1.45	15	Cir	150.436	431.00	435.50	2.991	431.64	435.98	n/a	435.98 j	51	Grate
53	Pipe - (59)	1.45	15	Cir	19.955	427.25	427.45	1.002	436.25*	436.26*	0.02	436.28	44	Grate
54	Pipe - (102)	1.55	15	Cir	24.000	424.80	425.00	0.833	426.22	426.23	0.02	426.26	50	Grate
55	Pipe - (45)	3.41	18	Cir	111.814	416.50	417.76	1.127	420.45*	420.55*	0.09	420.63	39	Grate
56	Pipe - (44)	2.10	15	Cir	127.017	421.00	423.00	1.575	421.42	423.58	0.22	423.58	55	Grate
57	Pipe - (46)	1.64	15	Cir	108.029	415.41	419.50	3.786	415.70	420.01	n/a	420.01	37	Grate
58	Pipe - (50)	8.91	24	Cir	79.019	390.50	390.90	0.506	392.46	391.96	n/a	391.96	35	Grate
59	Pipe - (49)	7.46	24	Cir	181.944	390.90	391.80	0.495	391.96	392.77	n/a	392.77 j	58	Grate
60	Pipe - (48)	3.75	18	Cir	121.251	392.30	404.40	9.979	392.77	405.14	n/a	405.14	59	Grate
61	Pipe - (51)	1.41	15	Cir	126.000	408.00	420.00	9.524	408.22	420.47	n/a	420.47	60	Grate
62		0.02	15	Cir	151.000	437.00	439.50	1.656	439.08	439.56	n/a	439.58 j	48	Curb-
63		0.01	15	Cir	20.000	439.50	439.70	1.000	439.58	439.74	n/a	439.74 j	62	Curb-
64	Pipe - (25)	50.21	24	Cir	64.098	378.00	378.65	1.014	379.99*	382.61*	1.99	384.59	End	Grate
65	Pipe - (24)	49.41	24	Cir	36.295	382.80	386.40	9.919	384.59	388.38	n/a	388.38	64	Grate
66	Pipe - (23)	49.41	24	Cir	35.254	397.40	401.00	10.212	398.55	402.98	n/a	402.98	65	Grate
67	Pipe - (22)	22.34	24	Cir	108.716	409.50	410.59	1.003	411.00	412.27	0.49	412.27	66	Grate
68	Pipe - (21)	21.59	24	Cir	20.237	410.59	410.79	0.988	412.27	412.45	n/a	412.45 j	67	Grate
69	Pipe - (29)	1.78	15	Cir	168.359	413.85	415.53	0.998	414.28	416.06	0.30	416.06	68	Grate
70	Pipe - (28)	1.17	15	Cir	19.738	421.10	421.30	1.013	421.44	421.73	n/a	421.73	69	Grate
71	Pipe - (20)	19.81	24	Cir	115.221	410.79	411.50	0.616	412.49	413.20	1.13	414.33	68	Grate
72	Pipe - (19)	1.36	18	Cir	161.486	412.00	413.00	0.619	414.33	414.35	0.01	414.37	71	Grate

Project File: 3302-KWF-with hydrocad flowrates 062723-3.stm | Number of lines: 85 | Run Date: 8/15/2023

NOTES: Return period = 25 Yrs. ; *Surcharged (HGL above crown). ; j - Line contains hyd. jump.

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
73	Pipe - (27)	0.84	15	Cir	39.226	415.25	416.50	3.187	415.47	416.86	0.13	416.86	72	Grate
74	Pipe - (97)	15.22	18	Cir	183.745	411.25	414.25	1.633	414.33*	417.62*	1.15	418.77	71	Grate
75	Pipe - (32)	17.94	18	Cir	25.195	373.25	373.50	0.992	374.70*	375.32*	2.40	377.72	End	Grate
76	Pipe - (31)	12.91	15	Cir	122.000	377.95	387.00	7.418	378.70	388.22	2.61	388.22	75	Grate
77	Pipe - (30)	11.64	15	Cir	20.216	387.00	387.20	0.989	388.25*	388.81*	1.40	390.21	76	Grate
78	Pipe - (33)	3.47	15	Cir	20.027	377.95	378.15	0.999	378.57	378.90	n/a	378.90	75	Grate
79	Pipe - (35)	1.04	15	Cir	122.337	373.75	374.38	0.515	377.72*	377.75*	0.02	377.77	75	Grate
80	Pipe - (34)	0.52	15	Cir	20.035	374.38	374.58	0.998	377.77*	377.77*	0.00	377.77	79	Grate
81		34.36	36	Cir	62.000	365.00	365.62	1.000	366.46	367.52	n/a	367.52	End	Manhole
82		34.36	18	Cir	100.000	367.12	377.12	10.000	368.29	378.62	n/a	378.62	81	Manhole
83		34.36	18	Cir	98.000	380.50	388.00	7.653	382.00*	390.94*	1.00	391.94	82	Manhole
84		34.36	18	Cir	162.660	389.66	406.00	10.045	391.94	407.50	n/a	407.50	83	Manhole
85		34.36	18	Cir	89.340	409.00	418.00	10.074	410.17	419.50	n/a	419.50	84	OpenHeadwall

Project File: 3302-KWF-with hydrocad flowrates 062723-3.stm | Number of lines: 85 | Run Date: 8/15/2023

NOTES: Return period = 25 Yrs. ; *Surcharged (HGL above crown). ; j - Line contains hyd. jump.

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	46.280	0.00	0.00	0.00	0.00	0.00	0.0	5.2	0.0	9.22	7.27	7.60	15	1.08	423.00	423.50	424.18	424.97	424.44	431.19	Pipe - (93)
2	1	108.498	0.00	0.00	0.00	0.00	0.00	0.0	4.9	0.0	9.21	13.85	7.63	15	3.92	423.50	427.75	425.80	428.91	431.19	433.50	Pipe - (103)
3	2	101.762	0.00	0.00	0.00	0.00	0.00	0.0	4.7	0.0	7.51	6.93	6.12	15	0.98	429.00	430.00	430.25	431.42	433.50	437.75	Pipe - (91)
4	3	177.051	0.00	0.00	0.00	0.00	0.00	0.0	3.9	0.0	4.93	11.76	4.62	15	2.82	430.00	435.00	431.77	435.90	437.75	442.83	Pipe - (90)
5	4	24.000	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.55	6.39	2.54	15	0.83	435.00	435.20	435.90	435.69	442.83	437.06	Pipe - (95)
6	2	99.706	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.69	7.01	2.65	15	1.00	428.00	429.00	428.91	429.52	433.50	437.00	Pipe - (96)
7	4	144.046	0.00	0.00	0.00	0.00	0.00	0.0	2.5	0.0	2.07	12.77	3.35	15	3.33	435.20	440.00	435.90	440.57	442.83	447.14	Pipe - (89)
8	7	24.000	0.00	0.00	0.00	0.00	0.00	0.0	2.2	0.0	1.60	6.39	3.90	15	0.83	440.30	440.50	440.73	441.00	447.14	447.14	Pipe - (88)
9	8	126.174	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.18	8.81	2.87	15	1.59	440.50	442.50	441.00	442.93	447.14	451.00	Pipe - (94)
10	End	30.000	0.00	0.00	0.00	0.00	0.00	0.0	371.2	0.0	57.84	58.99	9.40	36	0.67	376.50	376.70	378.92	379.16	0.00	389.50	Pipe - (83)
11	10	73.386	0.00	0.00	0.00	0.00	0.00	0.0	371.0	0.0	53.06	58.43	8.71	36	0.65	376.70	377.18	379.16	379.55	389.50	415.05	Pipe - (82)
12	11	150.569	0.00	0.00	0.00	0.00	0.00	0.0	370.8	0.0	18.17	24.76	12.84	18	4.74	383.50	390.63	384.45	392.08	415.05	415.80	Pipe - (74)
13	12	47.994	0.00	0.00	0.00	0.00	0.00	0.0	370.7	0.0	16.12	25.28	9.25	18	4.94	390.63	393.00	392.08	394.43	415.80	416.05	Pipe - (73)
14	13	284.334	0.00	0.00	0.00	0.00	0.00	0.0	370.0	0.0	13.31	27.15	7.79	18	5.70	393.00	409.20	394.43	410.56	416.05	417.47	Pipe - (72)
15	14	133.139	0.00	0.00	0.00	0.00	0.00	0.0	369.7	0.0	11.39	25.71	6.91	18	5.11	409.20	416.00	410.56	417.29	417.47	421.48	Pipe - (71)
16	15	53.198	0.00	0.00	0.00	0.00	0.00	0.0	369.5	0.0	10.12	11.36	6.41	18	1.00	416.00	416.53	417.29	417.75	421.48	421.83	Pipe - (67)
17	16	47.067	0.00	0.00	0.00	0.00	0.00	0.0	369.4	0.0	8.62	11.37	5.79	18	1.00	416.53	417.00	417.75	418.14	421.83	424.03	Pipe - (66)
18	17	120.653	0.00	0.00	0.00	0.00	0.00	0.0	368.9	0.0	7.07	11.35	5.20	18	0.99	417.00	418.20	418.14	419.23	424.03	429.11	Pipe - (65)
19	18	130.403	0.00	0.00	0.00	0.00	0.00	0.0	368.4	0.0	5.52	11.78	7.48	15	2.84	420.65	424.35	421.25	425.30	429.11	433.82	Pipe - (64)
20	19	161.656	0.00	0.00	0.00	0.00	0.00	0.0	367.6	0.0	3.96	12.79	4.35	15	3.34	424.35	429.75	425.30	430.55	433.82	439.06	Pipe - (63)
21	20	154.069	0.00	0.00	0.00	0.00	0.00	0.0	364.4	0.0	1.01	12.67	2.12	15	3.28	429.75	434.80	430.55	435.19	439.06	443.95	Pipe - (62)
22	21	140.369	0.00	0.00	0.00	0.00	0.00	0.0	220.9	0.0	0.02	12.80	0.57	15	3.35	434.80	439.50	435.19	439.55	443.95	448.33	Pipe - (61)

Project File: 3302-KWF-with hydrocad flowrates 062723-3.stm | Number of lines: 85 | Run Date: 8/15/2023

NOTES:Intensity = 102.61 / (Inlet time + 16.50) ^ 0.82; Return period =Yrs. 25 ; c = cir e = ellip b = box

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
23	22	107.999	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.01	11.66	0.72	15	2.78	439.50	442.50	439.55	442.54	448.33	451.27	Pipe - (60)
24	21	20.089	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.01	6.98	0.47	15	1.00	434.80	435.00	435.19	435.04	443.95	443.95	Pipe - (70)
25	19	20.249	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.01	6.95	0.96	15	0.99	430.18	430.38	430.22	430.42	433.82	433.82	Pipe - (69)
26	20	19.915	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.59	7.01	2.69	15	1.00	429.75	429.95	430.55	430.45	439.06	439.06	Pipe - (68)
27	13	28.928	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.03	11.26	1.96	15	2.59	393.25	394.00	394.43	394.40	416.05	399.86	Pipe - (75)
28	11	129.835	0.00	0.00	0.00	0.00	0.00	0.0	1.5	0.0	4.13	15.60	5.96	18	1.88	379.06	381.50	379.59	382.28	415.05	386.83	Pipe - (78)
29	28	143.637	0.00	0.00	0.00	0.00	0.00	0.0	0.5	0.0	2.72	12.31	4.83	15	3.10	381.75	386.20	382.28	386.86	386.83	389.65	Pipe - (77)
30	29	20.226	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.89	6.96	2.14	15	0.99	386.20	386.40	386.86	386.77	389.65	389.65	Pipe - (76)
31	28	20.197	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.41	6.96	3.11	15	0.99	381.75	381.95	382.28	382.42	386.83	386.83	Pipe - (79)
32	11	29.000	0.00	0.00	0.00	0.00	0.00	0.0	0.4	0.0	30.75	58.48	6.05	36	0.66	377.18	377.37	379.55	379.17	415.05	388.93	Pipe - (81)
33	32	93.000	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	29.30	59.47	6.74	36	0.68	377.37	378.00	379.17	379.75	388.93	382.40	Pipe - (80)
34	End	48.007	0.00	0.00	0.00	0.00	0.00	0.0	286.8	0.0	44.83	25.01	14.29	24	1.04	379.50	380.00	381.47	383.02	382.13	394.00	Pipe - (43)
35	34	65.929	0.00	0.00	0.00	0.00	0.00	0.0	286.7	0.0	43.38	56.46	16.84	24	5.31	387.00	390.50	388.31	392.46	394.00	398.00	Pipe - (42)
36	35	37.291	0.00	0.00	0.00	0.00	0.00	0.0	286.6	0.0	33.02	77.18	17.16	24	9.92	393.50	397.20	394.41	399.10	398.00	410.00	Pipe - (41)
37	36	29.905	0.00	0.00	0.00	0.00	0.00	0.0	286.6	0.0	31.66	77.61	16.87	24	10.03	405.50	408.50	406.39	410.38	410.00	422.00	Pipe - (40)
38	37	114.159	0.00	0.00	0.00	0.00	0.00	0.0	286.4	0.0	27.77	33.55	10.59	24	1.87	413.66	415.80	415.05	417.62	422.00	427.62	Pipe - (39)
39	38	35.144	0.00	0.00	0.00	0.00	0.00	0.0	286.3	0.0	26.55	18.48	8.45	24	0.57	415.80	416.00	417.80	418.21	427.62	420.61	Pipe - (38)
40	39	46.275	0.00	0.00	0.00	0.00	0.00	0.0	286.2	0.0	21.73	8.36	12.30	18	0.54	416.50	416.75	420.45	422.13	420.61	427.75	Pipe - (101)
41	40	93.041	0.00	0.00	0.00	0.00	0.00	0.0	286.1	0.0	15.39	15.60	8.71	18	1.88	416.75	418.50	425.66	427.36	427.75	429.48	Pipe - (37)
42	41	154.272	0.00	0.00	0.00	0.00	0.00	0.0	285.7	0.0	12.44	19.67	7.04	18	2.99	418.50	423.11	427.95	429.80	429.48	432.26	Pipe - (36)
43	42	42.372	0.00	0.00	0.00	0.00	0.00	0.0	285.6	0.0	11.22	13.98	6.35	18	1.51	423.11	423.75	430.58	430.99	432.26	433.38	Pipe - (56)
44	43	150.146	0.00	0.00	0.00	0.00	0.00	0.0	285.3	0.0	9.91	10.29	8.08	15	2.16	424.00	427.25	431.72	434.73	433.38	436.48	Pipe - (55)

Project File: 3302-KWF-with hydrocad flowrates 062723-3.stm | Number of lines: 85 | Run Date: 8/15/2023

NOTES:Intensity = 102.61 / (Inlet time + 16.50) ^ 0.82; Return period =Yrs. 25 ; c = cir e = ellip b = box

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
45	44	150.143	0.00	0.00	0.00	0.00	0.00	0.0	284.8	0.0	6.91	11.06	5.63	15	2.50	427.25	431.00	436.25	437.72	436.48	439.78	Pipe - (54)
46	45	145.164	0.00	0.00	0.00	0.00	0.00	0.0	284.0	0.0	3.64	10.47	2.97	15	2.24	431.00	434.25	438.46	438.85	439.78	442.94	Pipe - (53)
47	46	20.331	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	2.16	6.94	4.41	15	0.98	439.30	439.50	439.78	440.09	442.94	442.94	Pipe - (57)
48	46	130.074	0.00	0.00	0.00	0.00	0.00	6.0	195.3	0.0	0.03	10.17	0.02	15	2.11	434.25	437.00	439.08	439.08	442.94	445.72	Pipe - (52)
49	45	20.184	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.01	6.96	0.01	15	0.99	431.00	431.20	438.46	438.46	439.78	439.78	Pipe - (58)
50	40	198.814	0.00	0.00	0.00	0.00	0.00	0.0	3.5	0.0	4.08	22.82	2.92	18	4.02	417.00	425.00	425.66	425.93	427.75	435.90	Pipe - (100)
51	50	176.323	0.00	0.00	0.00	0.00	0.00	0.0	2.1	0.0	2.53	12.90	3.05	15	3.40	425.00	431.00	426.22	431.64	435.90	441.70	Pipe - (99)
52	51	150.436	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.45	12.10	2.84	15	2.99	431.00	435.50	431.64	435.98	441.70	439.00	Pipe - (98)
53	44	19.955	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.45	7.00	1.18	15	1.00	427.25	427.45	436.25	436.26	436.48	436.48	Pipe - (59)
54	50	24.000	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.55	6.39	1.26	15	0.83	424.80	425.00	426.22	426.23	435.90	435.90	Pipe - (102)
55	39	111.814	0.00	0.00	0.00	0.00	0.00	0.0	1.2	0.0	3.41	12.08	1.93	18	1.13	416.50	417.76	420.45	420.55	420.61	426.21	Pipe - (45)
56	55	127.017	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	2.10	8.78	4.83	15	1.57	421.00	423.00	421.42	423.58	426.21	427.00	Pipe - (44)
57	37	108.029	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.64	13.61	5.49	15	3.79	415.41	419.50	415.70	420.01	422.00	423.00	Pipe - (46)
58	35	79.019	0.00	0.00	0.00	0.00	0.00	0.0	4.1	0.0	8.91	17.43	4.05	24	0.51	390.50	390.90	392.46	391.96	398.00	395.00	Pipe - (50)
59	58	181.944	0.00	0.00	0.00	0.00	0.00	0.0	2.8	0.0	7.46	17.23	4.67	24	0.49	390.90	391.80	391.96	392.77	395.00	397.00	Pipe - (49)
60	59	121.251	0.00	0.00	0.00	0.00	0.00	0.0	1.8	0.0	3.75	35.94	6.12	18	9.98	392.30	404.40	392.77	405.14	397.00	414.30	Pipe - (48)
61	60	126.000	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.41	21.59	6.64	15	9.52	408.00	420.00	408.22	420.47	414.30	427.50	Pipe - (51)
62	48	151.000	0.00	0.00	0.00	0.00	0.00	0.0	40.9	0.0	0.02	9.00	0.53	15	1.66	437.00	439.50	439.08	439.56	445.72	448.53	
63	62	20.000	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.01	7.00	0.60	15	1.00	439.50	439.70	439.58	439.74	448.53	448.53	
64	End	64.098	0.00	0.00	0.00	0.00	0.00	0.0	5.1	0.0	50.21	24.67	15.99	24	1.01	378.00	378.65	379.99	382.61	421.97	422.29	Pipe - (25)
65	64	36.295	0.00	0.00	0.00	0.00	0.00	0.0	5.1	0.0	49.41	77.17	16.19	24	9.92	382.80	386.40	384.59	388.38	422.29	422.47	Pipe - (24)
66	65	35.254	0.00	0.00	0.00	0.00	0.00	0.0	5.1	0.0	49.41	78.30	21.06	24	10.21	397.40	401.00	398.55	402.98	422.47	422.64	Pipe - (23)
67	66	108.716	0.00	0.00	0.00	0.00	0.00	0.0	4.8	0.0	22.34	24.53	8.38	24	1.00	409.50	410.59	411.00	412.27	422.64	423.19	Pipe - (22)

Project File: 3302-KWF-with hydrocad flowrates 062723-3.stm | Number of lines: 85 | Run Date: 8/15/2023

NOTES:Intensity = 102.61 / (Inlet time + 16.50) ^ 0.82; Return period =Yrs. 25 ; c = cir e = ellip b = box

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
68	67	20.237	0.00	0.00	0.00	0.00	0.00	0.0	4.8	0.0	21.59	24.36	7.69	24	0.99	410.59	410.79	412.27	412.45	423.19	423.29	Pipe - (21)
69	68	168.359	0.00	0.00	0.00	0.00	0.00	0.0	0.3	0.0	1.78	6.99	4.18	15	1.00	413.85	415.53	414.28	416.06	423.29	424.75	Pipe - (29)
70	69	19.738	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.17	7.04	3.71	15	1.01	421.10	421.30	421.44	421.73	424.75	424.75	Pipe - (28)
71	68	115.221	0.00	0.00	0.00	0.00	0.00	0.0	4.5	0.0	19.81	19.23	6.96	24	0.62	410.79	411.50	412.49	413.20	423.29	425.10	Pipe - (20)
72	71	161.486	0.00	0.00	0.00	0.00	0.00	0.0	1.0	0.0	1.36	8.95	0.79	18	0.62	412.00	413.00	414.33	414.35	425.10	424.67	Pipe - (19)
73	72	39.226	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.84	12.49	4.33	15	3.19	415.25	416.50	415.47	416.86	424.67	420.27	Pipe - (27)
74	71	183.745	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	15.22	14.54	8.61	18	1.63	411.25	414.25	414.33	417.62	425.10	423.50	Pipe - (97)
75	End	25.195	0.00	0.00	0.00	0.00	0.00	0.0	3.2	0.0	17.94	11.33	10.20	18	0.99	373.25	373.50	374.70	375.32	375.36	381.80	Pipe - (32)
76	75	122.000	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	12.91	19.05	13.62	15	7.42	377.95	387.00	378.70	388.22	381.80	391.07	Pipe - (31)
77	76	20.216	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	11.64	6.96	9.49	15	0.99	387.00	387.20	388.25	388.81	391.07	391.07	Pipe - (30)
78	75	20.027	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	3.47	6.99	5.09	15	1.00	377.95	378.15	378.57	378.90	381.80	381.80	Pipe - (33)
79	75	122.337	0.00	0.00	0.00	0.00	0.00	0.0	0.8	0.0	1.04	5.02	0.85	15	0.51	373.75	374.38	377.72	377.75	381.80	378.46	Pipe - (35)
80	79	20.035	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.52	6.99	0.42	15	1.00	374.38	374.58	377.77	377.77	378.46	378.46	Pipe - (34)
81	End	62.000	0.00	0.00	0.00	0.00	0.00	0.0	0.4	0.0	34.36	72.25	8.67	36	1.00	365.00	365.62	366.46	367.52	368.00	371.25	
82	81	100.000	0.00	0.00	0.00	0.00	0.00	0.0	0.3	0.0	34.36	35.97	21.31	18	10.00	367.12	377.12	368.29	378.62	371.25	384.30	
83	82	98.000	0.00	0.00	0.00	0.00	0.00	0.0	0.2	0.0	34.36	31.47	19.45	18	7.65	380.50	388.00	382.00	390.94	384.30	394.00	
84	83	162.660	0.00	0.00	0.00	0.00	0.00	0.0	0.1	0.0	34.36	36.06	19.45	18	10.05	389.66	406.00	391.94	407.50	394.00	415.70	
85	84	89.340	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	34.36	36.11	21.35	18	10.07	409.00	418.00	410.17	419.50	415.70	419.50	

Project File: 3302-KWF-with hydrocad flowrates 062723-3.stm

Number of lines: 85

Run Date: 8/15/2023

NOTES:Intensity = 102.61 / (Inlet time + 16.50) ^ 0.82; Return period =Yrs. 25 ; c = cir e = ellip b = box

MyReport

Line No.	Area Dn (sqft)	Area Up (sqft)	Byp Ln No	Coeff C1 (C)	Coeff C2 (C)	Coeff C3 (C)	Capac Full (cfs)	Crit Depth (ft)	Cross Sl, Sw (ft/ft)	Cross Sl, Sx (ft/ft)	Curb Len (ft)	Defl Ang (Deg)	Depth Dn (ft)	Depth Up (ft)	DnStm Ln No	Drng Area (ac)	Easting X (ft)	EGL Dn (ft)	EGL Up (ft)	Energy Loss (ft)
1	1.20	1.23	n/a	0.20	0.50	0.90	7.27	1.16	....	....	....	-109.316	1.18	1.25	Outfall	0.00	871641.32	425.10	425.85	0.750
2	1.19	1.19	Offsite	0.20	0.50	0.90	13.85	1.16	0.050	0.020	....	-69.880	1.25	1.16**	1	0.00	871532.83	426.68	429.84	1.754
3	1.23	1.23	Offsite	0.20	0.50	0.90	6.93	1.09	0.050	0.020	....	108.050	1.25	1.25	2	0.00	871565.71	430.83	432.01	1.173
4	0.95	0.95	Offsite	0.20	0.50	0.90	11.76	0.90	0.050	0.020	....	-20.470	1.25	0.90**	3	0.00	871560.72	432.02	436.32	1.024
5	0.45	0.45	Offsite	0.20	0.50	0.90	6.39	0.49	0.050	0.020	....	-99.074	0.90	0.49**	4	0.00	871537.14	436.08	435.88	0.000
6	0.48	0.48	Offsite	0.20	0.50	0.90	7.01	0.52	0.050	0.020	....	12.458	0.91	0.52**	2	0.00	871435.78	429.11	429.71	0.000
7	0.55	0.55	Offsite	0.20	0.50	0.90	12.77	0.57	0.050	0.020	....	-13.000	0.70	0.57**	4	0.00	871524.37	436.12	440.79	0.000
8	0.37	0.46	Offsite	0.20	0.50	0.90	6.39	0.50	0.050	0.020	....	-94.114	0.43	0.50**	7	0.00	871501.64	440.92	441.19	0.000
9	0.37	0.37	Offsite	0.20	0.50	0.90	8.81	0.43	0.050	0.020	....	86.768	0.50	0.43**	8	0.00	871454.46	441.16	443.08	0.000
10	6.11	6.20	n/a	0.20	0.50	0.90	58.99	2.46	....	....	....	-176.500	2.42	2.46**	Outfall	0.00	871529.16	380.27	380.51	0.000
11	5.98	5.98	Offsite	0.20	0.50	0.90	58.43	2.36	0.050	0.020	....	-17.000	2.46	2.36**	10	0.00	871457.81	380.39	380.77	0.000
12	1.19	1.75	Offsite	0.20	0.50	0.90	24.76	1.45	0.050	0.020	....	100.995	0.95	1.45**	11	0.00	871451.23	386.13	393.76	0.000
13	1.73	1.73	Offsite	0.20	0.50	0.90	25.28	1.43	0.050	0.020	....	20.707	1.45	1.43**	12	0.00	871466.22	393.43	395.77	0.000
14	1.68	1.68	Offsite	0.20	0.50	0.90	27.15	1.36	0.050	0.020	....	-20.554	1.43	1.36**	13	0.00	871454.55	395.40	411.53	0.000
15	1.61	1.61	Offsite	0.20	0.50	0.90	25.71	1.29	0.050	0.020	....	-13.986	1.36	1.29**	14	0.00	871417.10	411.33	418.06	0.000
16	1.54	1.54	Offsite	0.20	0.50	0.90	11.36	1.22	0.050	0.020	....	-14.690	1.29	1.22**	15	0.00	871389.68	417.96	418.42	0.000
17	1.44	1.44	Offsite	0.20	0.50	0.90	11.37	1.14	0.050	0.020	....	-19.423	1.22	1.14**	16	0.00	871353.38	418.31	418.70	0.000
18	1.29	1.29	Offsite	0.20	0.50	0.90	11.35	1.03	0.050	0.020	....	-9.419	1.14	1.03**	17	0.00	871249.03	418.60	419.69	0.000
19	0.58	1.00	Offsite	0.20	0.50	0.90	11.78	0.95	0.050	0.020	....	54.984	0.60	0.95**	18	0.00	871237.92	421.72	425.77	0.000
20	0.83	0.83	Offsite	0.20	0.50	0.90	12.79	0.80	0.050	0.020	....	20.177	0.95	0.80**	19	0.00	871280.56	425.65	430.90	0.000
21	0.33	0.33	Offsite	0.20	0.50	0.90	12.67	0.39	0.050	0.020	....	-12.665	0.80	0.39**	20	0.00	871287.62	430.70	435.34	0.000
22	0.02	0.02	Offsite	0.20	0.50	0.90	12.80	0.05	0.050	0.020	....	4.401	0.39	0.05**	21	0.00	871304.79	435.21	439.57	0.000
23	0.01	0.01	Offsite	0.20	0.50	0.90	11.66	0.04	0.050	0.020	....	28.774	0.05	0.04**	22	0.00	871367.97	439.57	442.55	0.000

Project File: 3302-KWF-with hydrocad flowrates 062723-3.stm | Number of lines: 85 | Date: 8/15/2023

NOTES: ** Critical depth

MyReport

Line No.	Area Dn (sqft)	Area Up (sqft)	Byp Ln No	Coeff C1 (C)	Coeff C2 (C)	Coeff C3 (C)	Capac Full (cfs)	Crit Depth (ft)	Cross Sl, Sw (ft/ft)	Cross Sl, Sx (ft/ft)	Curb Len (ft)	Defl Ang (Deg)	Depth Dn (ft)	Depth Up (ft)	DnStm Ln No	Drng Area (ac)	Easting X (ft)	EGL Dn (ft)	EGL Up (ft)	Energy Loss (ft)
24	0.01	0.01	Offsite	0.20	0.50	0.90	6.98	0.04	0.050	0.020	....	90.444	0.39	0.04**	21	0.00	871307.68	435.21	435.05	0.000
25	0.01	0.01	Offsite	0.20	0.50	0.90	6.95	0.04	0.050	0.020	....	107.575	0.04	0.04**	19	0.00	871257.68	430.23	430.43	0.000
26	0.46	0.46	Offsite	0.20	0.50	0.90	7.01	0.50	0.050	0.020	....	77.472	0.80	0.50**	20	0.00	871300.45	430.74	430.64	0.000
27	0.34	0.34	Offsite	0.20	0.50	0.90	11.26	0.40	0.050	0.020	....	-107.619	1.18	0.40**	13	0.00	871437.29	394.57	394.54	0.000
28	0.55	0.93	Offsite	0.20	0.50	0.90	15.60	0.78	0.050	0.020	....	-50.282	0.53	0.78**	11	0.00	871400.45	379.90	382.59	0.000
29	0.49	0.66	Offsite	0.20	0.50	0.90	12.31	0.66	0.050	0.020	....	21.543	0.53	0.66**	28	0.00	871294.11	382.54	387.13	0.000
30	0.30	0.30	Offsite	0.20	0.50	0.90	6.96	0.37	0.050	0.020	....	74.652	0.66	0.37**	29	0.00	871277.03	386.99	386.90	0.000
31	0.42	0.42	Offsite	0.20	0.50	0.90	6.96	0.47	0.050	0.020	....	108.231	0.53	0.47**	28	0.00	871386.03	382.45	382.59	0.000
32	4.42	4.42	Offsite	0.20	0.50	0.90	58.48	1.80	0.050	0.020	....	21.738	2.36	1.80**	11	0.00	871429.11	380.30	379.92	0.000
33	4.28	4.28	Offsite	0.20	0.50	0.90	59.47	1.75	0.050	0.020	....	17.579	1.80	1.75**	32	0.00	871345.39	379.89	380.48	0.000
34	3.13	3.14	Offsite	0.20	0.50	0.90	25.01	1.97	0.050	0.020	....	-92.256	1.97	2.00	Outfall	0.00	872179.53	384.66	386.19	1.532
35	2.19	3.13	Offsite	0.20	0.50	0.90	56.46	1.96	0.050	0.020	....	-0.056	1.31	1.96**	34	0.00	872176.87	391.30	395.45	0.000
36	1.40	3.08	Offsite	0.20	0.50	0.90	77.18	1.90	0.050	0.020	....	-22.364	0.91	1.90**	35	0.00	872161.31	396.20	400.88	0.000
37	1.35	3.07	Offsite	0.20	0.50	0.90	77.61	1.88	0.050	0.020	....	-0.219	0.89	1.88**	36	0.00	872148.72	408.04	412.04	0.000
38	2.33	3.00	Offsite	0.20	0.50	0.90	33.55	1.82	0.050	0.020	....	-34.174	1.39	1.82**	37	0.00	872050.79	416.38	418.95	0.000
39	3.14	3.14	Offsite	0.20	0.50	0.90	18.48	1.80	0.050	0.020	....	-20.837	2.00	2.00	38	0.00	872016.19	418.91	419.32	0.413
40	1.77	1.77	Offsite	0.20	0.50	0.90	8.36	1.48	0.050	0.020	....	111.195	1.50	1.50	39	0.00	872040.23	422.80	424.49	1.689
41	1.77	1.77	Offsite	0.20	0.50	0.90	15.60	1.41	0.050	0.020	....	7.158	1.50	1.50	40	0.00	872098.08	426.84	428.54	1.703
42	1.77	1.77	Offsite	0.20	0.50	0.90	19.67	1.33	0.050	0.020	....	-11.637	1.50	1.50	41	0.00	872167.66	428.73	430.57	1.845
43	1.77	1.77	Offsite	0.20	0.50	0.90	13.98	1.28	0.050	0.020	....	-38.754	1.50	1.50	42	0.00	872158.89	431.20	431.62	0.412
44	1.23	1.23	Offsite	0.20	0.50	0.90	10.29	1.18	0.050	0.020	....	-47.123	1.25	1.25	43	0.00	872030.10	432.73	435.75	3.014
45	1.23	1.23	Offsite	0.20	0.50	0.90	11.06	1.05	0.050	0.020	....	0.038	1.25	1.25	44	0.00	871901.36	436.75	438.21	1.465
46	1.23	1.23	Offsite	0.20	0.50	0.90	10.47	0.77	0.050	0.020	....	-3.588	1.25	1.25	45	0.00	871772.47	438.59	438.99	0.393

Project File: 3302-KWF-with hydrocad flowrates 062723-3.stm | Number of lines: 85 | Date: 8/15/2023

NOTES: ** Critical depth

MyReport

Line No.	Area Dn (sqft)	Area Up (sqft)	Byp Ln No	Coeff C1 (C)	Coeff C2 (C)	Coeff C3 (C)	Capac Full (cfs)	Crit Depth (ft)	Cross Sl, Sw (ft/ft)	Cross Sl, Sx (ft/ft)	Curb Len (ft)	Defl Ang (Deg)	Depth Dn (ft)	Depth Up (ft)	DnStm Ln No	Drng Area (ac)	Easting X (ft)	EGL Dn (ft)	EGL Up (ft)	Energy Loss (ft)
47	0.43	0.56	Offsite	0.20	0.50	0.90	6.94	0.59	0.050	0.020	....	-101.174	0.48	0.59**	46	0.00	871766.79	440.01	440.31	0.000
48	1.23	1.23	Offsite	0.20	0.50	0.90	10.17	0.07	0.050	0.020	....	-26.117	1.25	1.25	46	0.00	871642.42	439.08	439.08	0.000
49	1.23	1.23	Offsite	0.20	0.50	0.90	6.96	0.04	0.050	0.020	....	-90.562	1.25	1.25	45	0.00	871891.15	438.46	438.46	0.000
50	1.77	1.15	Offsite	0.20	0.50	0.90	22.82	0.77	0.050	0.020	....	-93.279	1.50	0.93	40	0.00	871864.70	425.74	426.13	0.383
51	0.63	0.63	Offsite	0.20	0.50	0.90	12.90	0.64	0.050	0.020	....	2.970	1.22	0.64**	50	0.00	871713.53	426.48	431.89	0.000
52	0.43	0.43	Offsite	0.20	0.50	0.90	12.10	0.48	0.050	0.020	....	34.355	0.64	0.48**	51	0.00	871650.75	431.81	436.15	0.000
53	1.23	1.23	Offsite	0.20	0.50	0.90	7.00	0.48	0.050	0.020	....	-90.012	1.25	1.25	44	0.00	872019.85	436.27	436.28	0.009
54	1.23	1.22	Offsite	0.20	0.50	0.90	6.39	0.49	0.050	0.020	....	-86.511	1.25	1.23	50	0.00	871852.16	426.25	426.26	0.011
55	1.77	1.77	Offsite	0.20	0.50	0.90	12.08	0.70	0.050	0.020	....	-60.442	1.50	1.50	39	0.00	871944.84	420.50	420.60	0.100
56	0.36	0.55	Offsite	0.20	0.50	0.90	8.78	0.58	0.050	0.020	....	101.133	0.42	0.58**	55	0.00	871864.54	421.64	423.80	0.000
57	0.22	0.47	Offsite	0.20	0.50	0.90	13.61	0.51	0.050	0.020	....	64.013	0.29	0.51**	37	0.00	872216.87	415.89	420.20	0.000
58	1.70	1.70	Offsite	0.20	0.50	0.90	17.43	1.06	0.050	0.020	....	78.015	1.96	1.06**	35	0.00	872253.45	392.89	392.39	0.000
59	1.51	1.51	Offsite	0.20	0.50	0.90	17.23	0.97	0.050	0.020	....	17.880	1.06	0.97**	58	0.00	872435.03	392.34	393.15	0.000
60	0.47	0.87	Offsite	0.20	0.50	0.90	35.94	0.74	0.050	0.020	....	-86.188	0.47	0.74**	59	0.00	872450.64	393.06	405.43	0.000
61	0.14	0.42	Offsite	0.20	0.50	0.90	21.59	0.47	0.050	0.020	....	-39.286	0.22	0.47**	60	0.00	872384.08	408.39	420.64	0.000
62	0.02	0.02	Sag	0.20	0.50	0.90	9.00	0.05	0.050	0.020	4.00	-15.000	1.25	0.06**	48	0.00	871495.74	439.08	439.57	0.451
63	0.01	0.01	Sag	0.20	0.50	0.90	7.00	0.04	0.050	0.020	4.00	-101.000	0.08	0.04**	62	0.00	871504.11	439.59	439.75	0.000
64	3.14	3.14	Offsite	0.20	0.50	0.90	24.67	1.98	0.050	0.020	....	-109.316	1.99	2.00	Outfall	0.00	871903.67	383.97	386.58	2.614
65	2.97	3.14	Offsite	0.20	0.50	0.90	77.17	1.98	0.050	0.020	....	8.835	1.79	1.98**	64	0.00	871897.07	388.45	392.24	0.000
66	1.87	3.14	Offsite	0.20	0.50	0.90	78.30	1.98	0.050	0.020	....	0.102	1.15	1.98**	65	0.00	871890.72	402.41	406.84	0.000
67	2.52	2.82	Offsite	0.20	0.50	0.90	24.53	1.68	0.050	0.020	....	-0.157	1.50	1.68**	66	0.00	871870.84	411.97	413.25	0.000
68	2.79	2.79	Offsite	0.20	0.50	0.90	24.36	1.66	0.050	0.020	....	-0.808	1.68	1.66**	67	0.00	871866.86	413.21	413.38	0.000
69	0.37	0.49	Offsite	0.20	0.50	0.90	6.99	0.53	0.050	0.020	....	79.156	0.43	0.53**	68	0.00	872022.76	414.48	416.26	0.000

Project File: 3302-KWF-with hydrocad flowrates 062723-3.stm | Number of lines: 85 | Date: 8/15/2023

NOTES: ** Critical depth

MyReport

Line No.	Area Dn (sqft)	Area Up (sqft)	Byp Ln No	Coeff C1 (C)	Coeff C2 (C)	Coeff C3 (C)	Capac Full (cfs)	Crit Depth (ft)	Cross Sl, Sw (ft/ft)	Cross Sl, Sx (ft/ft)	Curb Len (ft)	Defl Ang (Deg)	Depth Dn (ft)	Depth Up (ft)	DnStm Ln No	Drng Area (ac)	Easting X (ft)	EGL Dn (ft)	EGL Up (ft)	Energy Loss (ft)
70	0.28	0.37	Offsite	0.20	0.50	0.90	7.04	0.43	0.050	0.020	....	96.881	0.34	0.43**	69	0.00	872027.97	421.60	421.88	0.000
71	2.84	2.85	Offsite	0.20	0.50	0.90	19.23	1.60	0.050	0.020	....	-80.955	1.70	1.70	68	0.00	871751.73	413.24	413.95	0.709
72	1.77	1.68	Offsite	0.20	0.50	0.90	8.95	0.44	0.050	0.020	....	20.347	1.50	1.35	71	0.00	871598.20	414.34	414.36	0.022
73	0.15	0.29	Offsite	0.20	0.50	0.90	12.49	0.36	0.050	0.020	....	-73.613	0.22	0.36**	72	0.00	871576.01	415.60	416.99	0.000
74	1.77	1.77	Offsite	0.20	0.50	0.90	14.54	1.41	0.050	0.020	....	99.797	1.50	1.50	71	0.00	871775.72	415.48	418.77	3.290
75	1.75	1.77	Offsite	0.20	0.50	0.90	11.33	1.45	0.050	0.020	....	-109.316	1.45	1.50	Outfall	0.00	871325.67	376.34	376.92	0.588
76	0.77	1.22	Offsite	0.20	0.50	0.90	19.05	1.22	0.050	0.020	....	77.404	0.75	1.22**	75	0.00	871429.23	380.44	389.96	0.000
77	1.23	1.23	Offsite	0.20	0.50	0.90	6.96	1.21	0.050	0.020	....	-89.493	1.25	1.25	76	0.00	871418.69	389.65	390.21	0.560
78	0.61	0.77	Offsite	0.20	0.50	0.90	6.99	0.75	0.050	0.020	....	-15.103	0.62	0.75**	75	0.00	871314.35	378.89	379.22	0.000
79	1.23	1.23	Offsite	0.20	0.50	0.90	5.02	0.40	0.050	0.020	....	-118.049	1.25	1.25	75	0.00	871242.80	377.74	377.76	0.027
80	1.23	1.23	Offsite	0.20	0.50	0.90	6.99	0.28	0.050	0.020	....	77.965	1.25	1.25	79	0.00	871225.56	377.77	377.77	0.001
81	3.41	4.73	n/a	0.20	0.50	0.90	72.25	1.90	....	....	....	-179.000	1.46	1.90**	Outfall	0.00	872429.32	367.28	368.34	0.000
82	1.48	1.77	n/a	0.20	0.50	0.90	35.97	1.50	....	....	....	101.000	1.17	1.50**	81	0.00	872450.11	374.17	384.50	0.000
83	1.77	1.77	n/a	0.20	0.50	0.90	31.47	1.50	....	....	....	0.000	1.50	1.50**	82	0.00	872470.49	387.88	396.82	8.942
84	1.77	1.77	n/a	0.20	0.50	0.90	36.06	1.50	....	....	....	-8.000	1.50	1.50**	83	0.00	872481.84	397.82	413.38	14.531
85	1.48	1.77	n/a	0.20	0.50	0.90	36.11	1.50	....	....	....	34.000	1.17	1.50**	84	0.00	872536.84	416.05	425.38	0.000

Project File: 3302-KWF-with hydrocad flowrates 062723-3.stm | Number of lines: 85 | Date: 8/15/2023

NOTES: ** Critical depth

MyReport

Flow Rate (cfs)	Sf Ave (ft/ft)	Sf Dn (ft/ft)	Grate Area (sqft)	Grate Len (ft)	Grate Width (ft)	Gnd/Rim El Dn (ft)	Gnd/Rim El Up (ft)	Gutter Depth (ft)	Gutter Slope (ft/ft)	Gutter Spread (ft)	Gutter Width (ft)	HGL Dn (ft)	HGL Up (ft)	HGL Jnct (ft)	HGL Jmp Dn (ft)	HGL Jmp Up (ft)	Incr CxA	Incr Q (cfs)	Inlet Depth (ft)	Inlet Eff (%)
9.22	1.620	1.502	....	....	....	424.44	431.19	....	....	....	....	424.18	424.97	425.80	....	....	0.00	0.01	....	....
9.21	1.617	1.734	....	1.00	2.00	431.19	433.50	0.02	0.050	0.50	2.00	425.80	428.91 j	428.91	426.45	426.22	0.00	0.01	0.02	100
7.51	1.153	1.153	....	11.07	2.00	433.50	437.75	0.19	0.050	6.30	2.00	430.25	431.42	431.77	....	....	0.00	2.58	0.19	89
4.93	0.579	0.497	....	9.19	2.00	437.75	442.83	0.15	0.050	4.48	2.00	431.77	435.90 j	435.90	431.75	431.24	0.00	1.31	0.15	94
1.55	0.000	0.000	....	9.46	2.00	442.83	437.06	0.16	0.050	4.90	2.00	435.90	435.69	435.69	....	....	0.00	1.55	0.16	93
1.69	0.000	0.000	....	9.65	2.00	433.50	437.00	0.16	0.050	5.13	2.00	428.91	429.52 j	429.52	428.89	428.65	0.00	1.69	0.16	92
2.07	0.000	0.000	....	7.95	2.00	442.83	447.14	0.10	0.050	2.24	2.00	435.90	440.57 j	440.57	436.25	436.15	0.00	0.47	0.10	100
1.60	0.000	0.000	....	7.77	2.00	447.14	447.14	0.10	0.050	2.03	2.00	440.73	441.00	441.00	....	....	0.00	0.42	0.10	100
1.18	0.000	0.000	....	9.10	2.00	447.14	451.00	0.14	0.050	4.23	2.00	441.00	442.93 j	442.93	441.13	441.05	0.00	1.18	0.14	95
57.84	0.000	0.000	....	....	....	0.00	389.50	....	....	....	....	378.92	379.16	379.16	....	....	0.00	4.78	....	....
53.06	0.000	0.000	....	1.00	2.00	389.50	415.05	0.02	0.050	0.50	2.00	379.16	379.55	379.55	....	....	0.00	0.01	0.02	100
18.17	0.000	0.000	....	10.18	2.00	415.05	415.80	0.17	0.050	5.64	2.00	384.45	392.08	392.08	....	....	0.00	2.05	0.17	91
16.12	0.000	0.000	....	9.77	2.00	415.80	416.05	0.17	0.050	5.26	2.00	392.08	394.43 j	394.43	392.29	392.45	0.00	1.78	0.17	92
13.31	0.000	0.000	....	9.98	2.00	416.05	417.47	0.17	0.050	5.46	2.00	394.43	410.56 j	410.56	395.98	395.88	0.00	1.92	0.17	91
11.39	0.000	0.000	....	9.15	2.00	417.47	421.48	0.15	0.050	4.41	2.00	410.56	417.29 j	417.29	411.17	411.11	0.00	1.27	0.15	95
10.12	0.000	0.000	....	9.39	2.00	421.48	421.83	0.16	0.050	4.82	2.00	417.29	417.75 j	417.75	417.28	417.27	0.00	1.50	0.16	93
8.62	0.000	0.000	....	9.46	2.00	421.83	424.03	0.16	0.050	4.90	2.00	417.75	418.14 j	418.14	417.72	417.69	0.00	1.55	0.16	93
7.07	0.000	0.000	....	9.46	2.00	424.03	429.11	0.16	0.050	4.90	2.00	418.14	419.23 j	419.23	418.15	418.08	0.00	1.55	0.16	93
5.52	0.000	0.000	....	9.46	2.00	429.11	433.82	0.16	0.050	4.90	2.00	421.25	425.30	425.30	....	....	0.00	1.55	0.16	93
3.96	0.000	0.000	....	9.27	2.00	433.82	439.06	0.15	0.050	4.58	2.00	425.30	430.55 j	430.55	425.69	425.57	0.00	1.36	0.15	94
1.01	0.000	0.000	....	8.91	2.00	439.06	443.95	0.14	0.050	3.80	2.00	430.55	435.19 j	435.19	430.65	430.57	0.00	0.98	0.14	97
0.02	0.000	0.000	....	1.00	2.00	443.95	448.33	0.02	0.050	0.50	2.00	435.19	439.55 j	439.55	435.32	435.31	0.00	0.01	0.02	100
0.01	0.000	0.000	....	1.00	2.00	448.33	451.27	0.02	0.050	0.50	2.00	439.55	442.54 j	442.54	439.84	439.83	0.00	0.01	0.02	100

Project File: 3302-KWF-with hydrocad flowrates 062723-3.stm | Number of lines: 85 | Date: 8/15/2023

NOTES: ** Critical depth

MyReport

Flow Rate (cfs)	Sf Ave (ft/ft)	Sf Dn (ft/ft)	Grate Area (sqft)	Grate Len (ft)	Grate Width (ft)	Gnd/Rim El Dn (ft)	Gnd/Rim El Up (ft)	Gutter Depth (ft)	Gutter Slope (ft/ft)	Gutter Spread (ft)	Gutter Width (ft)	HGL Dn (ft)	HGL Up (ft)	HGL Jnct (ft)	HGL Jmp Dn (ft)	HGL Jmp Up (ft)	Incr CxA	Incr Q (cfs)	Inlet Depth (ft)	Inlet Eff (%)
0.01	0.000	0.000	....	1.00	2.00	443.95	443.95	0.02	0.050	0.50	2.00	435.19	435.04	435.04	....	....	0.00	0.01	0.02	100
0.01	0.000	0.000	....	1.00	2.00	433.82	433.82	0.02	0.050	0.50	2.00	430.22	430.42	430.42	....	....	0.00	0.01	0.02	100
1.59	0.000	0.000	....	9.50	2.00	439.06	439.06	0.16	0.050	4.97	2.00	430.55	430.45	430.45	....	....	0.00	1.59	0.16	93
1.03	0.000	0.000	....	8.95	2.00	416.05	399.86	0.14	0.050	3.91	2.00	394.43	394.40 j	394.40	394.38	394.21	0.00	1.03	0.14	97
4.13	0.000	0.000	....	1.00	2.00	415.05	386.83	0.00	0.050	0.00	2.00	379.59	382.28	382.28	....	....	0.00	0.00	0.00	0
2.72	0.000	0.000	....	9.85	2.00	386.83	389.65	0.17	0.050	5.34	2.00	382.28	386.86	386.86	....	....	0.00	1.83	0.17	92
0.89	0.000	0.000	....	8.80	2.00	389.65	389.65	0.13	0.050	3.58	2.00	386.86	386.77	386.77	....	....	0.00	0.89	0.13	98
1.41	0.000	0.000	....	9.28	2.00	386.83	386.83	0.15	0.050	4.66	2.00	382.28	382.42 j	382.42	382.24	382.22	0.00	1.41	0.15	94
30.75	0.000	0.000	....	9.32	2.00	415.05	388.93	0.15	0.050	4.73	2.00	379.55	379.17	379.17	....	....	0.00	1.45	0.15	94
29.30	0.000	0.000	....	9.39	2.00	388.93	382.40	0.40	0.050	17.21	2.00	379.17	379.75 j	379.75	379.19	379.12	0.00	29.30	0.40	50
44.83	3.191	3.034	....	9.32	2.00	382.13	394.00	0.15	0.050	4.73	2.00	381.47	383.02	384.60	....	....	0.00	1.45	0.15	94
43.38	0.000	0.000	....	9.32	2.00	394.00	398.00	0.15	0.050	4.73	2.00	388.31	392.46	392.46	....	....	0.00	1.45	0.15	94
33.02	0.000	0.000	....	9.27	2.00	398.00	410.00	0.15	0.050	4.58	2.00	394.41	399.10	399.10	....	....	0.00	1.36	0.15	94
31.66	0.000	0.000	....	10.52	2.00	410.00	422.00	0.18	0.050	5.90	2.00	406.39	410.38	410.38	....	....	0.00	2.25	0.18	90
27.77	0.000	0.000	....	9.13	2.00	422.00	427.62	0.15	0.050	4.31	2.00	415.05	417.62	417.62	....	....	0.00	1.22	0.15	95
26.55	1.174	1.175	....	9.28	2.00	427.62	420.61	0.15	0.050	4.66	2.00	417.80	418.21	420.45	....	....	0.00	1.41	0.15	94
21.73	3.649	3.650	....	10.52	2.00	420.61	427.75	0.18	0.050	5.91	2.00	420.45	422.13	425.66	....	....	0.00	2.26	0.18	90
15.39	1.831	1.831	....	11.69	2.00	427.75	429.48	0.19	0.050	6.70	2.00	425.66	427.36	427.95	....	....	0.00	2.95	0.19	89
12.44	1.196	1.196	....	9.13	2.00	429.48	432.26	0.15	0.050	4.31	2.00	427.95	429.80	430.58	....	....	0.00	1.22	0.15	95
11.22	0.973	0.973	....	9.19	2.00	432.26	433.38	0.15	0.050	4.48	2.00	430.58	430.99	431.72	....	....	0.00	1.31	0.15	94
9.91	2.007	2.008	....	9.46	2.00	433.38	436.48	0.16	0.050	4.90	2.00	431.72	434.73	436.25	....	....	0.00	1.55	0.16	93
6.91	0.976	0.976	....	12.20	2.00	436.48	439.78	0.20	0.050	7.01	2.00	436.25	437.72	438.46	....	....	0.00	3.26	0.20	88
3.64	0.271	0.271	....	9.32	2.00	439.78	442.94	0.15	0.050	4.73	2.00	438.46	438.85	439.08	....	....	0.00	1.45	0.15	94

Project File: 3302-KWF-with hydrocad flowrates 062723-3.stm | Number of lines: 85 | Date: 8/15/2023

NOTES: ** Critical depth

MyReport

Flow Rate (cfs)	Sf Ave (ft/ft)	Sf Dn (ft/ft)	Grate Area (sqft)	Grate Len (ft)	Grate Width (ft)	Gnd/Rim El Dn (ft)	Gnd/Rim El Up (ft)	Gutter Depth (ft)	Gutter Slope (ft/ft)	Gutter Spread (ft)	Gutter Width (ft)	HGL Dn (ft)	HGL Up (ft)	HGL Jnct (ft)	HGL Jmp Dn (ft)	HGL Jmp Up (ft)	Incr CxA	Incr Q (cfs)	Inlet Depth (ft)	Inlet Eff (%)
2.16	0.000	0.000	....	10.37	2.00	442.94	442.94	0.18	0.050	5.79	2.00	439.78	440.09	440.09	....	....	0.00	2.16	0.18	90
0.03	0.000	0.000	....	1.00	2.00	442.94	445.72	0.02	0.050	0.50	2.00	439.08	439.08	439.08	....	....	0.00	0.01	0.02	100
0.01	0.000	0.000	....	1.00	2.00	439.78	439.78	0.02	0.050	0.50	2.00	438.46	438.46	438.46	....	....	0.00	0.01	0.02	100
4.08	0.193	0.129	....	1.00	2.00	427.75	435.90	0.00	0.050	0.00	2.00	425.66	425.93	426.22	....	....	0.00	0.00	0.00	0
2.53	0.000	0.000	....	9.01	2.00	435.90	441.70	0.14	0.050	4.02	2.00	426.22	431.64 j	431.64	426.24	426.12	0.00	1.08	0.14	96
1.45	0.000	0.000	....	9.32	2.00	441.70	439.00	0.15	0.050	4.73	2.00	431.64	435.98 j	435.98	431.93	431.83	0.00	1.45	0.15	94
1.45	0.043	0.043	....	9.32	2.00	436.48	436.48	0.15	0.050	4.73	2.00	436.25	436.26	436.28	....	....	0.00	1.45	0.15	94
1.55	0.047	0.049	....	9.46	2.00	435.90	435.90	0.16	0.050	4.90	2.00	426.22	426.23	426.26	....	....	0.00	1.55	0.16	93
3.41	0.090	0.090	....	9.19	2.00	420.61	426.21	0.15	0.050	4.48	2.00	420.45	420.55	420.63	....	....	0.00	1.31	0.15	94
2.10	0.000	0.000	....	10.27	2.00	426.21	427.00	0.17	0.050	5.71	2.00	421.42	423.58	423.58	....	....	0.00	2.10	0.17	91
1.64	0.000	0.000	....	9.57	2.00	422.00	423.00	0.16	0.050	5.05	2.00	415.70	420.01	420.01	....	....	0.00	1.64	0.16	92
8.91	0.000	0.000	....	9.32	2.00	398.00	395.00	0.15	0.050	4.73	2.00	392.46	391.96	391.96	....	....	0.00	1.45	0.15	94
7.46	0.000	0.000	....	12.92	2.00	395.00	397.00	0.21	0.050	7.42	2.00	391.96	392.77 j	392.77	391.96	391.93	0.00	3.71	0.21	88
3.75	0.000	0.000	....	10.65	2.00	397.00	414.30	0.18	0.050	6.01	2.00	392.77	405.14	405.14	....	....	0.00	2.34	0.18	90
1.41	0.000	0.000	....	9.28	2.00	414.30	427.50	0.15	0.050	4.66	2.00	408.22	420.47	420.47	....	....	0.00	1.41	0.15	94
0.02	0.298	0.000	....	....	....	445.72	448.53	0.07	Sag	1.34	2.00	439.08	439.56 j	439.58	439.08	439.05	0.00	0.01	0.07	100
0.01	0.000	0.000	....	....	....	448.53	448.53	0.07	Sag	1.34	2.00	439.58	439.74 j	439.74	439.58	439.56	0.00	0.01	0.07	100
50.21	4.078	3.957	....	8.70	2.00	421.97	422.29	0.13	0.050	3.34	2.00	379.99	382.61	384.59	....	....	0.00	0.80	0.13	98
49.41	0.000	0.000	....	1.00	2.00	422.29	422.47	0.00	0.050	0.00	2.00	384.59	388.38	388.38	....	....	0.00	0.00	0.00	0
49.41	0.000	0.000	....	34.68	2.00	422.47	422.64	0.39	0.050	16.69	2.00	398.55	402.98	402.98	....	....	0.00	27.07	0.39	93
22.34	0.000	0.000	....	8.65	2.00	422.64	423.19	0.12	0.050	3.20	2.00	411.00	412.27	412.27	....	....	0.00	0.75	0.12	99
21.59	0.000	0.000	....	1.00	2.00	423.19	423.29	0.00	0.050	0.00	2.00	412.27	412.45 j	412.45	412.27	412.30	0.00	0.00	0.00	0
1.78	0.000	0.000	....	8.41	2.00	423.29	424.75	0.12	0.050	2.77	2.00	414.28	416.06	416.06	....	....	0.00	0.61	0.12	100

Project File: 3302-KWF-with hydrocad flowrates 062723-3.stm | Number of lines: 85 | Date: 8/15/2023

NOTES: ** Critical depth

MyReport

Flow Rate (cfs)	Sf Ave (ft/ft)	Sf Dn (ft/ft)	Grate Area (sqft)	Grate Len (ft)	Grate Width (ft)	Gnd/Rim El Dn (ft)	Gnd/Rim El Up (ft)	Gutter Depth (ft)	Gutter Slope (ft/ft)	Gutter Spread (ft)	Gutter Width (ft)	HGL Dn (ft)	HGL Up (ft)	HGL Jnct (ft)	HGL Jmp Dn (ft)	HGL Jmp Up (ft)	Incr CxA	Incr Q (cfs)	Inlet Depth (ft)	Inlet Eff (%)
1.17	0.000	0.000	....	9.09	2.00	424.75	424.75	0.14	0.050	4.21	2.00	421.44	421.73	421.73	....	....	0.00	1.17	0.14	96
19.81	0.616	0.616	....	12.14	2.00	423.29	425.10	0.20	0.050	6.98	2.00	412.49	413.20	414.33	....	....	0.00	3.23	0.20	88
1.36	0.013	0.014	....	8.16	2.00	425.10	424.67	0.11	0.050	2.44	2.00	414.33	414.35	414.37	....	....	0.00	0.52	0.11	100
0.84	0.000	0.000	....	8.78	2.00	424.67	420.27	0.13	0.050	3.45	2.00	415.47	416.86	416.86	....	....	0.00	0.84	0.13	98
15.22	1.790	1.791	....	9.32	2.00	425.10	423.50	0.33	0.050	13.32	2.00	414.33	417.62	418.77	....	....	0.00	15.22	0.33	60
17.94	2.334	2.181	....	8.16	2.00	375.36	381.80	0.11	0.050	2.44	2.00	374.70	375.32	377.72	....	....	0.00	0.52	0.11	100
12.91	0.000	0.000	....	9.15	2.00	381.80	391.07	0.15	0.050	4.41	2.00	378.70	388.22	388.22	....	....	0.00	1.27	0.15	95
11.64	2.769	2.770	....	22.67	2.00	391.07	391.07	0.30	0.050	11.97	2.00	388.25	388.81	390.21	....	....	0.00	11.64	0.30	89
3.47	0.000	0.000	....	12.55	2.00	381.80	381.80	0.20	0.050	7.21	2.00	378.57	378.90	378.90	....	....	0.00	3.47	0.20	88
1.04	0.022	0.022	....	8.16	2.00	381.80	378.46	0.11	0.050	2.44	2.00	377.72	377.75	377.77	....	....	0.00	0.52	0.11	100
0.52	0.006	0.006	....	8.16	2.00	378.46	378.46	0.11	0.050	2.44	2.00	377.77	377.77	377.77	....	....	0.00	0.52	0.11	100
34.36	0.000	0.000	....	....	....	368.00	371.25	....	....	....	....	366.46	367.52	367.52	....	....	0.00	0.00	....	....
34.36	0.000	0.000	....	....	....	371.25	384.30	....	....	....	....	368.29	378.62	378.62	....	....	0.00	0.00	....	....
34.36	9.125	9.126	....	....	....	384.30	394.00	....	....	....	....	382.00	390.94	391.94	....	....	0.00	0.00	....	....
34.36	8.934	9.126	....	....	....	394.00	415.70	....	....	....	....	391.94	407.50	407.50	....	....	0.00	0.00	....	....
34.36	0.000	0.000	....	....	....	415.70	419.50	....	....	....	....	410.17	419.50	419.50	....	....	0.00	34.36	....	100

Project File: 3302-KWF-with hydrocad flowrates 062723-3.stm | Number of lines: 85 | Date: 8/15/2023

NOTES: ** Critical depth

MyReport

Inlet ID	Inlet Loc	(ft)	Inlet Time (min)	i Sys (in/hr)	i Inlet (in/hr)	Invert Dn (ft)	Invert Up (ft)	Jump Loc (ft)	Jump Len (ft)	Vel Hd Jmp Dn (ft)	Vel Hd Jmp Up (ft)	J-Loss Coeff	Junct Type	Known Q (cfs)	Cost RCP	Cost CMP	Cost PVC	Line ID
2+86	Sag		0.0	0.00	0.00	423.00	423.50	....	....	0.00	0.00	0.95	MH	0.01	1,710	1,539	1,454	Pipe - (93)
3+94	On Grade		0.0	0.00	0.00	423.50	427.75	43.40	6.25	0.88	2.08	1.96 z	Grate	0.01	4,373	3,935	3,717	Pipe - (103)
4+21	On Grade		0.0	0.00	0.00	429.00	430.00	....	....	0.00	0.00	0.60	Grate	2.58	3,958	3,562	3,364	Pipe - (91)
2+50 LT	On Grade		0.0	0.00	0.00	430.00	435.00	17.71	6.25	0.25	1.30	2.04 z	Grate	1.31	7,210	6,489	6,129	Pipe - (90)
2+50 RT	On Grade		0.0	0.00	0.00	435.00	435.20	....	....	0.00	0.00	1.00 z	Grate	1.55	930	837	791	Pipe - (95)
4+94	On Grade		0.0	0.00	0.00	428.00	429.00	19.94	3.47	0.09	0.34	1.00 z	Grate	1.69	4,013	3,611	3,411	Pipe - (96)
1+08 LT	On Grade		0.0	0.00	0.00	435.20	440.00	14.40	2.86	0.22	0.69	1.50 z	Grate	0.47	5,890	5,301	5,007	Pipe - (89)
1+08 RT	On Grade		0.0	0.00	0.00	440.30	440.50	....	....	0.00	0.00	1.50 z	Grate	0.42	1,090	981	927	Pipe - (88)
21+52	On Grade		0.0	0.00	0.00	440.50	442.50	12.62	2.14	0.16	0.35	1.00 z	Grate	1.18	5,350	4,815	4,548	Pipe - (94)
XC5	Sag		0.0	0.00	0.00	376.50	376.70	....	....	0.00	0.00	0.34 z	MH	4.78	1,508	1,357	1,282	Pipe - (83)
12+18RT	On Grade		0.0	0.00	0.00	376.70	377.18	....	....	0.00	0.00	2.15 z	Grate	0.01	7,472	6,725	6,351	Pipe - (82)
13+95	On Grade		0.0	0.00	0.00	383.50	390.63	....	....	0.00	0.00	0.61 z	Grate	2.05	11,288	10,159	9,594	Pipe - (74)
14+XRT	On Grade		0.0	0.00	0.00	390.63	393.00	4.80	7.13	1.34	1.69	1.50 z	Grate	1.78	3,563	3,206	3,028	Pipe - (73)
17+0	On Grade		0.0	0.00	0.00	393.00	409.20	28.43	6.80	0.97	2.42	0.50 z	Grate	1.92	18,690	16,821	15,887	Pipe - (72)
11+26LT	On Grade		0.0	0.00	0.00	409.20	416.00	13.31	6.44	0.77	1.64	0.50 z	Grate	1.27	6,043	5,438	5,136	Pipe - (71)
11+62RT	On Grade		0.0	0.00	0.00	416.00	416.53	5.32	6.14	0.66	0.74	0.58 z	Grate	1.50	2,240	2,016	1,904	Pipe - (67)
12+14RT	On Grade		0.0	0.00	0.00	416.53	417.00	4.71	5.69	0.56	0.65	0.50 z	Grate	1.55	2,150	1,935	1,828	Pipe - (66)
13+37LT	On Grade		0.0	0.00	0.00	417.00	418.20	12.07	5.16	0.46	0.62	1.27 z	Grate	1.55	6,168	5,551	5,242	Pipe - (65)
14+63LT	On Grade		0.0	0.00	0.00	420.65	424.35	....	....	0.00	0.00	1.50 z	Grate	1.55	5,990	5,391	5,092	Pipe - (64)
16+28lt	On Grade		0.0	0.00	0.00	424.35	429.75	16.17	4.02	0.35	0.93	1.47 z	Grate	1.36	7,408	6,667	6,296	Pipe - (63)
17+28LT	On Grade		0.0	0.00	0.00	429.75	434.80	15.41	1.97	0.14	0.54	1.50 z	Grate	0.98	7,070	6,363	6,010	Pipe - (62)
19+20	On Grade		0.0	0.00	0.00	434.80	439.50	14.04	0.27	0.02	0.08	0.81 z	Grate	0.01	6,440	5,796	5,474	Pipe - (61)
20+24	On Grade		0.0	0.00	0.00	439.50	442.50	10.80	0.19	0.01	0.04	1.00 z	Grate	0.01	4,978	4,480	4,231	Pipe - (60)

Project File: 3302-KWF-with hydrocad flowrates 062723-3.stm | Number of lines: 85 | Date: 8/15/2023

NOTES: Intensity = 102.61 / (Inlet time + 16.50) ^ 0.82 -- Return period = 25 Yrs. ; ** Critical depth

MyReport

Inlet ID	Inlet Loc	(ft)	Inlet Time (min)	i Sys (in/hr)	i Inlet (in/hr)	Invert Dn (ft)	Invert Up (ft)	Jump Loc (ft)	Jump Len (ft)	Vel Hd Jmp Dn (ft)	Vel Hd Jmp Up (ft)	J-Loss Coeff	Junct Type	Known Q (cfs)	Cost RCP	Cost CMP	Cost PVC	Line ID
17+28RT	On Grade		0.0	0.00	0.00	434.80	435.00	....	....	0.00	0.00	1.00 z	Grate	0.01	1,040	936	884	Pipe - (70)
14+63RT	On Grade		0.0	0.00	0.00	430.18	430.38	....	....	0.00	0.00	1.00 z	Grate	0.01	700	630	595	Pipe - (69)
16+28RT	On Grade		0.0	0.00	0.00	429.75	429.95	....	....	0.00	0.00	1.00 z	Grate	1.59	1,018	916	865	Pipe - (68)
14+XLT	On Grade		0.0	0.00	0.00	393.25	394.00	23.14	2.67	0.07	0.34	1.00 z	Grate	1.03	1,755	1,580	1,492	Pipe - (75)
10+92RT	On Grade		0.0	0.00	0.00	379.06	381.50	....	....	0.00	0.00	1.50 z	Grate	0.00	8,850	7,965	7,523	Pipe - (78)
9+45RT	On Grade		0.0	0.00	0.00	381.75	386.20	....	....	0.00	0.00	1.46 z	Grate	1.83	4,880	4,392	4,148	Pipe - (77)
9+45LT	On Grade		0.0	0.00	0.00	386.20	386.40	....	....	0.00	0.00	1.00 z	Grate	0.89	700	630	595	Pipe - (76)
10+92LT	On Grade		0.0	0.00	0.00	381.75	381.95	2.02	2.36	0.17	0.22	1.00 z	Grate	1.41	820	738	697	Pipe - (79)
12+18LT	On Grade		0.0	0.00	0.00	377.18	377.37	....	....	0.00	0.00	0.53 z	Grate	1.45	3,082	2,774	2,620	Pipe - (81)
FE-IN	On Grade		0.0	0.00	0.00	377.37	378.00	9.30	8.79	0.72	0.87	1.00 z	Grate	29.30	6,060	5,454	5,151	Pipe - (80)
Structure - (52)	On Grade		0.0	0.00	0.00	379.50	380.00	....	....	0.00	0.00	0.50	Grate	1.45	2,832	2,548	2,407	Pipe - (43)
CC CB7	On Grade		0.0	0.00	0.00	387.00	390.50	....	....	0.00	0.00	1.47 z	Grate	1.45	3,536	3,182	3,006	Pipe - (42)
CC MH3	On Grade		0.0	0.00	0.00	393.50	397.20	....	....	0.00	0.00	0.50 z	Grate	1.36	2,284	2,056	1,941	Pipe - (41)
CC MH2	On Grade		0.0	0.00	0.00	405.50	408.50	....	....	0.00	0.00	1.37 z	Grate	2.25	1,885	1,696	1,602	Pipe - (40)
3+0 LT	On Grade		0.0	0.00	0.00	413.66	415.80	....	....	0.00	0.00	0.61 z	Grate	1.22	7,290	6,561	6,197	Pipe - (39)
3+0 RT	On Grade		0.0	0.00	0.00	415.80	416.00	....	....	0.00	0.00	2.01	Grate	1.41	2,075	1,867	1,763	Pipe - (38)
0+21-RT	On Grade		0.0	0.00	0.00	416.50	416.75	....	....	0.00	0.00	1.50	Grate	2.26	2,290	2,061	1,947	Pipe - (101)
1+75 RT	On Grade		0.0	0.00	0.00	416.75	418.50	....	....	0.00	0.00	0.50	Grate	2.95	5,265	4,739	4,475	Pipe - (37)
30+78RT	On Grade		0.0	0.00	0.00	418.50	423.11	....	....	0.00	0.00	1.01	Grate	1.22	8,253	7,427	7,015	Pipe - (36)
30+48LT	On Grade		0.0	0.00	0.00	423.11	423.75	....	....	0.00	0.00	1.16	Grate	1.31	2,240	2,016	1,904	Pipe - (56)
28+98LT	On Grade		0.0	0.00	0.00	424.00	427.25	....	....	0.00	0.00	1.50	Grate	1.55	6,890	6,201	5,857	Pipe - (55)
27+48LT	On Grade		0.0	0.00	0.00	427.25	431.00	....	....	0.00	0.00	1.50	Grate	3.26	6,890	6,201	5,857	Pipe - (54)
26+05LT	On Grade		0.0	0.00	0.00	431.00	434.25	....	....	0.00	0.00	1.67	Grate	1.45	6,665	5,999	5,665	Pipe - (53)

Project File: 3302-KWF-with hydrocad flowrates 062723-3.stm | Number of lines: 85 | Date: 8/15/2023

NOTES: Intensity = 102.61 / (Inlet time + 16.50) ^ 0.82 -- Return period = 25 Yrs. ; ** Critical depth

MyReport

Inlet ID	Inlet Loc	(ft)	Inlet Time (min)	i Sys (in/hr)	i Inlet (in/hr)	Invert Dn (ft)	Invert Up (ft)	Jump Loc (ft)	Jump Len (ft)	Vel Hd Jmp Dn (ft)	Vel Hd Jmp Up (ft)	J-Loss Coeff	Junct Type	Known Q (cfs)	Cost RCP	Cost CMP	Cost PVC	Line ID
26_05RT	On Grade		0.0	0.00	0.00	439.30	439.50	....	....	0.00	0.00	1.00 z	Grate	2.16	700	630	595	Pipe - (57)
24+79LT	On Grade		6.0	0.00	0.00	434.25	437.00	....	....	0.00	0.00	0.50	Grate	0.01	5,990	5,391	5,092	Pipe - (52)
27+48RT	On Grade		0.0	0.00	0.00	431.00	431.20	....	....	0.00	0.00	1.00	Grate	0.01	1,040	936	884	Pipe - (58)
2+21-RT	On Grade		0.0	0.00	0.00	417.00	425.00	....	....	0.00	0.00	1.50	Grate	0.00	11,068	9,961	9,407	Pipe - (100)
3+95	On Grade		0.0	0.00	0.00	425.00	431.00	17.63	3.18	0.25	0.83	0.93 z	Grate	1.08	8,950	8,055	7,608	Pipe - (99)
5+21	On Grade		0.0	0.00	0.00	431.00	435.50	15.04	2.38	0.18	0.59	1.00 z	Grate	1.45	6,140	5,526	5,219	Pipe - (98)
28+98RT	On Grade		0.0	0.00	0.00	427.25	427.45	....	....	0.00	0.00	1.00	Grate	1.45	1,018	916	865	Pipe - (59)
2+21-LT	On Grade		0.0	0.00	0.00	424.80	425.00	....	....	0.00	0.00	1.00	Grate	1.55	1,350	1,215	1,148	Pipe - (102)
4+34 RT	On Grade		0.0	0.00	0.00	416.50	417.76	....	....	0.00	0.00	1.50	Grate	1.31	4,973	4,475	4,227	Pipe - (45)
CC CB 1	On Grade		0.0	0.00	0.00	421.00	423.00	....	....	0.00	0.00	1.00 z	Grate	2.10	4,545	4,091	3,863	Pipe - (44)
CC CB6	On Grade		0.0	0.00	0.00	415.41	419.50	....	....	0.00	0.00	1.00 z	Grate	1.64	3,895	3,506	3,311	Pipe - (46)
CC CB5A	On Grade		0.0	0.00	0.00	390.50	390.90	....	....	0.00	0.00	0.54 z	Grate	1.45	3,872	3,485	3,291	Pipe - (50)
CC CB 5	On Grade		0.0	0.00	0.00	390.90	391.80	18.19	4.87	0.37	0.44	1.50 z	Grate	3.71	8,106	7,295	6,890	Pipe - (49)
CC CB4	On Grade		0.0	0.00	0.00	392.30	404.40	....	....	0.00	0.00	1.02 z	Grate	2.34	5,658	5,092	4,809	Pipe - (48)
33+47	On Grade		0.0	0.00	0.00	408.00	420.00	....	....	0.00	0.00	1.00 z	Grate	1.41	5,170	4,653	4,395	Pipe - (51)
CB STA 23+25	Sag		0.0	0.00	0.00	437.00	439.50	120.80	0.41	0.01	0.03	1.50	Curb	0.01	6,935	6,242	5,895	
CB 23+25 RT	Sag		0.0	0.00	0.00	439.50	439.70	2.00	0.30	0.00	0.02	1.00 z	Curb	0.01	1,040	936	884	
Structure - (32)	On Grade		0.0	0.00	0.00	378.00	378.65	....	....	0.00	0.00	0.50	Grate	0.80	5,440	4,896	4,624	Pipe - (25)
Structure - (31)	On Grade		0.0	0.00	0.00	382.80	386.40	....	....	0.00	0.00	0.50 z	Grate	0.00	3,060	2,754	2,601	Pipe - (24)
Structure - (30)	On Grade		0.0	0.00	0.00	397.40	401.00	....	....	0.00	0.00	0.50 z	Grate	27.07	2,975	2,678	2,529	Pipe - (23)
7+50LT	On Grade		0.0	0.00	0.00	409.50	410.59	....	....	0.00	0.00	0.50 z	Grate	0.75	7,755	6,980	6,592	Pipe - (22)
7+50RT	On Grade		0.0	0.00	0.00	410.59	410.79	2.02	8.32	0.93	0.99	1.48 z	Grate	0.00	1,560	1,404	1,326	Pipe - (21)
5+80RT	On Grade		0.0	0.00	0.00	413.85	415.53	....	....	0.00	0.00	1.50 z	Grate	0.61	7,700	6,930	6,545	Pipe - (29)

Project File: 3302-KWF-with hydrocad flowrates 062723-3.stm | Number of lines: 85 | Date: 8/15/2023

NOTES: Intensity = 102.61 / (Inlet time + 16.50) ^ 0.82 -- Return period = 25 Yrs. ; ** Critical depth

MyReport

Inlet ID	Inlet Loc	(ft)	Inlet Time (min)	i Sys (in/hr)	i Inlet (in/hr)	Invert Dn (ft)	Invert Up (ft)	Jump Loc (ft)	Jump Len (ft)	Vel Hd Jmp Dn (ft)	Vel Hd Jmp Up (ft)	J-Loss Coeff	Junct Type	Known Q (cfs)	Cost RCP	Cost CMP	Cost PVC	Line ID
5+80LT	On Grade		0.0	0.00	0.00	421.10	421.30	....	....	0.00	0.00	1.00 z	Grate	1.17	685	617	582	Pipe - (28)
8+69RT	On Grade		0.0	0.00	0.00	410.79	411.50	....	....	0.00	0.00	1.50	Grate	3.23	8,210	7,389	6,979	Pipe - (20)
10+33RT	On Grade		0.0	0.00	0.00	412.00	413.00	....	....	0.00	0.00	1.45	Grate	0.52	9,625	8,663	8,181	Pipe - (19)
10+45LT	On Grade		0.0	0.00	0.00	415.25	416.50	....	....	0.00	0.00	1.00 z	Grate	0.84	1,623	1,460	1,379	Pipe - (27)
2+10	On Grade		0.0	0.00	0.00	411.25	414.25	....	....	0.00	0.00	1.00	Grate	15.22	10,450	9,405	8,883	Pipe - (97)
2+99RT	On Grade		0.0	0.00	0.00	373.25	373.50	....	....	0.00	0.00	1.50	Grate	0.52	1,135	1,022	965	Pipe - (32)
4+20RT	On Grade		0.0	0.00	0.00	377.95	387.00	....	....	0.00	0.00	1.50 z	Grate	1.27	3,975	3,578	3,379	Pipe - (31)
4+20LT	On Grade		0.0	0.00	0.00	387.00	387.20	....	....	0.00	0.00	1.00	Grate	11.64	735	662	625	Pipe - (30)
2+99LT	On Grade		0.0	0.00	0.00	377.95	378.15	....	....	0.00	0.00	1.00 z	Grate	3.47	700	630	595	Pipe - (33)
1+67RT	On Grade		0.0	0.00	0.00	373.75	374.38	....	....	0.00	0.00	1.47	Grate	0.52	4,713	4,241	4,006	Pipe - (35)
1+67LT	On Grade		0.0	0.00	0.00	374.38	374.58	....	....	0.00	0.00	1.00	Grate	0.52	740	666	629	Pipe - (34)
MH4+50	Sag		0.0	0.00	0.00	365.00	365.62	....	....	0.00	0.00	1.00 z	MH	0.00	3,156	2,840	2,683	
MH3+50	Sag		0.0	0.00	0.00	367.12	377.12	....	....	0.00	0.00	0.15 z	MH	0.00	4,325	3,893	3,676	
MH2+50	Sag		0.0	0.00	0.00	380.50	388.00	....	....	0.00	0.00	0.17	MH	0.00	3,972	3,575	3,376	
MH0+89	Sag		0.0	0.00	0.00	389.66	406.00	....	....	0.00	0.00	0.61 z	MH	0.00	7,460	6,714	6,341	
FE0+0	Sag		0.0	0.00	0.00	409.00	418.00	....	....	0.00	0.00	1.00 z	Hdwall	34.36	3,276	2,948	2,785	

Project File: 3302-KWF-with hydrocad flowrates 062723-3.stm | Number of lines: 85 | Date: 8/15/2023

NOTES: Intensity = 102.61 / (Inlet time + 16.50) ^ 0.82 -- Return period = 25 Yrs. ; ** Critical depth

MyReport

Line Length (ft)	Line Size (in)	Line Slope (%)	Line Type	Local Depr (in)	n-val Gutter	n-val Pipe	Minor Loss (ft)	Northing Y (ft)	Pipe Travel (min)	Q Byp (cfs)	Q Capt (cfs)	Q Carry (cfs)	Line Rise (in)	Runoff Coeff (C)	Line Span (in)	Area A1 (ac)	Area A2 (ac)	Area A3 (ac)	Tc (min)	Throat Ht (in)
46.280	15	1.08	Cir	....	....	0.012	0.83	690742.74	0.10	....	....	....	15	0.00	15	0.00	0.00	0.00	5.2	....
108.498	15	3.92	Cir	0.0	0.013	0.012	n/a	690744.26	0.24	0.00	0.01	0.00	15	0.00	15	0.00	0.00	0.00	4.9	....
101.762	15	0.98	Cir	0.0	0.013	0.012	0.35	690840.56	0.28	0.28	2.30	0.00	15	0.00	15	0.00	0.00	0.00	4.7	....
177.051	15	2.82	Cir	0.0	0.013	0.012	n/a	691017.54	0.73	0.07	1.24	0.00	15	0.00	15	0.00	0.00	0.00	3.9	....
24.000	15	0.83	Cir	0.0	0.013	0.012	0.18	691013.09	0.32	0.11	1.44	0.00	15	0.00	15	0.00	0.00	0.00	0.0	....
99.706	15	1.00	Cir	0.0	0.013	0.012	n/a	690767.13	1.21	0.13	1.56	0.00	15	0.00	15	0.00	0.00	0.00	0.0	....
144.046	15	3.33	Cir	0.0	0.013	0.012	n/a	691156.93	1.42	0.00	0.47	0.00	15	0.00	15	0.00	0.00	0.00	2.5	....
24.000	15	0.83	Cir	0.0	0.013	0.012	n/a	691149.22	0.31	0.00	0.42	0.00	15	0.00	15	0.00	0.00	0.00	2.2	....
126.174	15	1.59	Cir	0.0	0.013	0.012	n/a	691266.24	2.19	0.05	1.13	0.00	15	0.00	15	0.00	0.00	0.00	0.0	....
30.000	36	0.67	Cir	....	....	0.012	n/a	689852.16	0.06	....	....	....	36	0.00	36	0.00	0.00	0.00	371.2	....
73.386	36	0.65	Cir	0.0	0.013	0.012	n/a	689835.03	0.16	0.00	0.01	0.00	36	0.00	36	0.00	0.00	0.00	371.0	....
150.569	18	4.74	Cir	0.0	0.013	0.012	1.02	689985.46	0.24	0.19	1.86	0.00	18	0.00	18	0.00	0.00	0.00	370.8	....
47.994	18	4.94	Cir	0.0	0.013	0.012	n/a	690031.05	0.09	0.15	1.63	0.00	18	0.00	18	0.00	0.00	0.00	370.7	....
284.334	18	5.70	Cir	0.0	0.013	0.012	n/a	690315.14	0.63	0.17	1.75	0.00	18	0.00	18	0.00	0.00	0.00	370.0	....
133.139	18	5.11	Cir	0.0	0.013	0.012	n/a	690442.91	0.34	0.07	1.20	0.00	18	0.00	18	0.00	0.00	0.00	369.7	....
53.198	18	1.00	Cir	0.0	0.013	0.012	n/a	690488.49	0.15	0.10	1.40	0.00	18	0.00	18	0.00	0.00	0.00	369.5	....
47.067	18	1.00	Cir	0.0	0.013	0.012	n/a	690518.46	0.16	0.11	1.44	0.00	18	0.00	18	0.00	0.00	0.00	369.4	....
120.653	18	0.99	Cir	0.0	0.013	0.012	n/a	690579.02	0.50	0.11	1.44	0.00	18	0.00	18	0.00	0.00	0.00	368.9	....
130.403	15	2.84	Cir	0.0	0.013	0.012	0.71	690708.95	0.48	0.11	1.44	0.00	15	0.00	15	0.00	0.00	0.00	368.4	....
161.656	15	3.34	Cir	0.0	0.013	0.012	n/a	690864.89	0.83	0.08	1.28	0.00	15	0.00	15	0.00	0.00	0.00	367.6	....
154.069	15	3.28	Cir	0.0	0.013	0.012	n/a	691018.79	3.12	0.03	0.95	0.00	15	0.00	15	0.00	0.00	0.00	364.4	....
140.369	15	3.35	Cir	0.0	0.013	0.012	n/a	691158.11	143.55	0.00	0.01	0.00	15	0.00	15	0.00	0.00	0.00	220.9	....
107.999	15	2.78	Cir	0.0	0.013	0.012	n/a	691245.70	220.89	0.00	0.01	0.00	15	0.00	15	0.00	0.00	0.00	0.0	....

Project File: 3302-KWF-with hydrocad flowrates 062723-3.stm | Number of lines: 85 | Date: 8/15/2023

NOTES: ** Critical depth

MyReport

Line Length (ft)	Line Size (in)	Line Slope (%)	Line Type	Local Depr (in)	n-val Gutter	n-val Pipe	Minor Loss (ft)	Northing Y (ft)	Pipe Travel (min)	Q Byp (cfs)	Q Capt (cfs)	Q Carry (cfs)	Line Rise (in)	Runoff Coeff (C)	Line Span (in)	Area A1 (ac)	Area A2 (ac)	Area A3 (ac)	Tc (min)	Throat Ht (in)
20.089	15	1.00	Cir	0.0	0.013	0.012	n/a	691017.72	41.09	0.00	0.01	0.00	15	0.00	15	0.00	0.00	0.00	0.0	....
20.249	15	0.99	Cir	0.0	0.013	0.012	n/a	690704.50	41.42	0.00	0.01	0.00	15	0.00	15	0.00	0.00	0.00	0.0	....
19.915	15	1.00	Cir	0.0	0.013	0.012	n/a	690863.93	0.26	0.12	1.47	0.00	15	0.00	15	0.00	0.00	0.00	0.0	....
28.928	15	2.59	Cir	0.0	0.013	0.012	n/a	690031.34	0.57	0.04	0.99	0.00	15	0.00	15	0.00	0.00	0.00	0.0	....
129.835	18	1.88	Cir	0.0	0.013	0.012	n/a	689718.55	0.93	-nan(ind).00	-nan(ind).00	0.00	18	0.00	18	0.00	0.00	0.00	1.5	....
143.637	15	3.10	Cir	0.0	0.013	0.012	0.39	689622.00	1.08	0.15	1.68	0.00	15	0.00	15	0.00	0.00	0.00	0.5	....
20.226	15	0.99	Cir	0.0	0.013	0.012	n/a	689632.84	0.46	0.02	0.87	0.00	15	0.00	15	0.00	0.00	0.00	0.0	....
20.197	15	0.99	Cir	0.0	0.013	0.012	n/a	689732.70	0.29	0.09	1.32	0.00	15	0.00	15	0.00	0.00	0.00	0.0	....
29.000	36	0.66	Cir	0.0	0.013	0.012	0.40	689839.19	0.11	0.09	1.36	0.00	36	0.00	36	0.00	0.00	0.00	0.4	....
93.000	36	0.68	Cir	0.0	0.013	0.012	n/a	689879.69	0.37	14.54	14.76	0.00	36	0.00	36	0.00	0.00	0.00	0.0	....
48.007	24	1.04	Cir	0.0	0.013	0.012	1.58	690555.33	0.06	0.09	1.36	0.00	24	0.00	24	0.00	0.00	0.00	286.8	....
65.929	24	5.31	Cir	0.0	0.013	0.012	4.39	690621.21	0.08	0.09	1.36	0.00	24	0.00	24	0.00	0.00	0.00	286.7	....
37.291	24	9.92	Cir	0.0	0.013	0.012	n/a	690655.09	0.06	0.08	1.28	0.00	24	0.00	24	0.00	0.00	0.00	286.6	....
29.905	24	10.03	Cir	0.0	0.013	0.012	2.27	690682.22	0.05	0.22	2.03	0.00	24	0.00	24	0.00	0.00	0.00	286.6	....
114.159	24	1.87	Cir	0.0	0.013	0.012	0.81	690740.90	0.22	0.06	1.16	0.00	24	0.00	24	0.00	0.00	0.00	286.4	....
35.144	24	0.57	Cir	0.0	0.013	0.012	2.23	690747.06	0.07	0.09	1.32	0.00	24	0.00	24	0.00	0.00	0.00	286.3	....
46.275	18	0.54	Cir	0.0	0.013	0.012	3.53	690786.60	0.06	0.23	2.03	0.00	18	0.00	18	0.00	0.00	0.00	286.2	....
93.041	18	1.88	Cir	0.0	0.013	0.012	0.59	690859.47	0.18	0.34	2.61	0.00	18	0.00	18	0.00	0.00	0.00	286.1	....
154.272	18	2.99	Cir	0.0	0.013	0.012	0.78	690997.16	0.37	0.06	1.16	0.00	18	0.00	18	0.00	0.00	0.00	285.7	....
42.372	18	1.51	Cir	0.0	0.013	0.012	0.73	691038.62	0.11	0.07	1.24	0.00	18	0.00	18	0.00	0.00	0.00	285.6	....
150.146	15	2.16	Cir	0.0	0.013	0.012	1.52	691115.80	0.31	0.11	1.44	0.00	15	0.00	15	0.00	0.00	0.00	285.3	....
150.143	15	2.50	Cir	0.0	0.013	0.012	0.74	691193.06	0.44	0.38	2.88	0.00	15	0.00	15	0.00	0.00	0.00	284.8	....
145.164	15	2.24	Cir	0.0	0.013	0.012	0.23	691259.83	0.82	0.09	1.36	0.00	15	0.00	15	0.00	0.00	0.00	284.0	....

Project File: 3302-KWF-with hydrocad flowrates 062723-3.stm | Number of lines: 85 | Date: 8/15/2023

NOTES: ** Critical depth

MyReport

Line Length (ft)	Line Size (in)	Line Slope (%)	Line Type	Local Depr (in)	n-val Gutter	n-val Pipe	Minor Loss (ft)	Northing Y (ft)	Pipe Travel (min)	Q Byp (cfs)	Q Capt (cfs)	Q Carry (cfs)	Line Rise (in)	Runoff Coeff (C)	Line Span (in)	Area A1 (ac)	Area A2 (ac)	Area A3 (ac)	Tc (min)	Throat Ht (in)
20.331	15	0.98	Cir	0.0	0.013	0.012	0.23	691240.31	0.19	0.21	1.95	0.00	15	0.00	15	0.00	0.00	0.00	0.0	....
130.074	15	2.11	Cir	0.0	0.013	0.012	0.00	691262.70	88.68	0.00	0.01	0.00	15	0.00	15	0.00	0.00	0.00	195.3	....
20.184	15	0.99	Cir	0.0	0.013	0.012	0.00	691175.65	41.28	0.00	0.01	0.00	15	0.00	15	0.00	0.00	0.00	0.0	....
198.814	18	4.02	Cir	0.0	0.013	0.012	0.29	690879.97	1.44	-nan(ind).00	-nan(ind).00	0.00	18	0.00	18	0.00	0.00	0.00	3.5	....
176.323	15	3.40	Cir	0.0	0.013	0.012	n/a	690970.73	1.43	0.04	1.04	0.00	15	0.00	15	0.00	0.00	0.00	2.1	....
150.436	15	2.99	Cir	0.0	0.013	0.012	n/a	691107.44	2.12	0.09	1.36	0.00	15	0.00	15	0.00	0.00	0.00	0.0	....
19.955	15	1.00	Cir	0.0	0.013	0.012	0.02	691098.68	0.28	0.09	1.36	0.00	15	0.00	15	0.00	0.00	0.00	0.0	....
24.000	15	0.83	Cir	0.0	0.013	0.012	0.02	690859.51	0.32	0.11	1.44	0.00	15	0.00	15	0.00	0.00	0.00	0.0	....
111.814	18	1.13	Cir	0.0	0.013	0.012	0.09	690660.97	0.97	0.07	1.24	0.00	18	0.00	18	0.00	0.00	0.00	1.2	....
127.017	15	1.57	Cir	0.0	0.013	0.012	0.22	690759.38	1.24	0.20	1.90	0.00	15	0.00	15	0.00	0.00	0.00	0.0	....
108.029	15	3.79	Cir	0.0	0.013	0.012	n/a	690766.04	1.35	0.12	1.52	0.00	15	0.00	15	0.00	0.00	0.00	0.0	....
79.019	24	0.51	Cir	0.0	0.013	0.012	n/a	690640.72	0.46	0.09	1.36	0.00	24	0.00	24	0.00	0.00	0.00	4.1	....
181.944	24	0.49	Cir	0.0	0.013	0.012	n/a	690629.35	1.28	0.45	3.26	0.00	24	0.00	24	0.00	0.00	0.00	2.8	....
121.251	18	9.98	Cir	0.0	0.013	0.012	n/a	690749.59	0.95	0.24	2.10	0.00	18	0.00	18	0.00	0.00	0.00	1.8	....
126.000	15	9.52	Cir	0.0	0.013	0.012	n/a	690856.57	1.83	0.09	1.32	0.00	15	0.00	15	0.00	0.00	0.00	0.0	....
151.000	15	1.66	Cir	0.0	....	0.012	n/a	691226.85	154.42	0.00	0.01	0.00	15	0.00	15	0.00	0.00	0.00	40.9	4.0
20.000	15	1.00	Cir	0.0	....	0.012	n/a	691208.69	40.91	0.00	0.01	0.00	15	0.00	15	0.00	0.00	0.00	0.0	4.0
64.098	24	1.01	Cir	0.0	0.013	0.012	1.99	690333.30	0.07	0.01	0.79	0.00	24	0.00	24	0.00	0.00	0.00	5.1	....
36.295	24	9.92	Cir	0.0	0.013	0.012	n/a	690368.99	0.04	-nan(ind).00	-nan(ind).00	0.00	24	0.00	24	0.00	0.00	0.00	5.1	....
35.254	24	10.21	Cir	0.0	0.013	0.012	n/a	690403.67	0.04	2.03	25.04	0.00	24	0.00	24	0.00	0.00	0.00	5.1	....
108.716	24	1.00	Cir	0.0	0.013	0.012	0.49	690510.55	0.25	0.01	0.74	0.00	24	0.00	24	0.00	0.00	0.00	4.8	....
20.237	24	0.99	Cir	0.0	0.013	0.012	n/a	690530.39	0.05	-nan(ind).00	-nan(ind).00	0.00	24	0.00	24	0.00	0.00	0.00	4.8	....
168.359	15	1.00	Cir	0.0	0.013	0.012	0.30	690593.97	1.93	0.00	0.61	0.00	15	0.00	15	0.00	0.00	0.00	0.3	....

Project File: 3302-KWF-with hydrocad flowrates 062723-3.stm | Number of lines: 85 | Date: 8/15/2023

NOTES: ** Critical depth

MyReport

Line Length (ft)	Line Size (in)	Line Slope (%)	Line Type	Local Depr (in)	n-val Gutter	n-val Pipe	Minor Loss (ft)	Northing Y (ft)	Pipe Travel (min)	Q Byp (cfs)	Q Capt (cfs)	Q Carry (cfs)	Line Rise (in)	Runoff Coeff (C)	Line Span (in)	Area A1 (ac)	Area A2 (ac)	Area A3 (ac)	Tc (min)	Throat Ht (in)
19.738	15	1.01	Cir	0.0	0.013	0.012	n/a	690574.94	0.35	0.05	1.12	0.00	15	0.00	15	0.00	0.00	0.00	0.0	....
115.221	24	0.62	Cir	0.0	0.013	0.012	1.13	690525.78	0.30	0.38	2.85	0.00	24	0.00	24	0.00	0.00	0.00	4.5	....
161.486	18	0.62	Cir	0.0	0.013	0.012	0.01	690575.81	3.50	0.00	0.52	0.00	18	0.00	18	0.00	0.00	0.00	1.0	....
39.226	15	3.19	Cir	0.0	0.013	0.012	0.13	690543.46	0.96	0.02	0.82	0.00	15	0.00	15	0.00	0.00	0.00	0.0	....
183.745	18	1.63	Cir	0.0	0.013	0.012	1.15	690707.95	0.36	6.10	9.12	0.00	18	0.00	18	0.00	0.00	0.00	0.0	....
25.195	18	0.99	Cir	0.0	0.013	0.012	2.40	689179.09	0.04	0.00	0.52	0.00	18	0.00	18	0.00	0.00	0.00	3.2	....
122.000	15	7.42	Cir	0.0	0.013	0.012	2.61	689243.58	0.19	0.07	1.20	0.00	15	0.00	15	0.00	0.00	0.00	0.0	....
20.216	15	0.99	Cir	0.0	0.013	0.012	1.40	689260.83	0.04	1.22	10.42	0.00	15	0.00	15	0.00	0.00	0.00	0.0	....
20.027	15	1.00	Cir	0.0	0.013	0.012	n/a	689195.61	0.12	0.41	3.06	0.00	15	0.00	15	0.00	0.00	0.00	0.0	....
122.337	15	0.51	Cir	0.0	0.013	0.012	0.02	689089.09	2.41	0.00	0.52	0.00	15	0.00	15	0.00	0.00	0.00	0.8	....
20.035	15	1.00	Cir	0.0	0.013	0.012	0.00	689099.29	0.79	0.00	0.52	0.00	15	0.00	15	0.00	0.00	0.00	0.0	....
62.000	36	1.00	Cir	....	....	0.012	n/a	690408.77	0.21	....	....	....	36	0.00	36	0.00	0.00	0.00	0.4	....
100.000	18	10.00	Cir	....	....	0.012	n/a	690506.58	0.09	....	....	....	18	0.00	18	0.00	0.00	0.00	0.3	....
98.000	18	7.65	Cir	....	....	0.012	1.00	690602.44	0.08	....	....	....	18	0.00	18	0.00	0.00	0.00	0.2	....
162.660	18	10.05	Cir	....	....	0.012	n/a	690764.71	0.14	....	....	....	18	0.00	18	0.00	0.00	0.00	0.1	....
89.340	18	10.07	Cir	....	....	0.012	n/a	690835.11	0.08	0.00	34.36	0.00	18	0.00	18	0.00	0.00	0.00	0.0	....

Project File: 3302-KWF-with hydrocad flowrates 062723-3.stm | Number of lines: 85 | Date: 8/15/2023

NOTES: ** Critical depth

MyReport

Total Area (ac)	Total CxA	Total Runoff (cfs)	Vel Ave (ft/s)	Vel Dn (ft/s)	Vel Hd Dn (ft)	Vel Hd Up (ft)	Vel Up (ft/s)	Cover Dn (ft)	Cover Up (ft)	Storage (cft)
0.00	0.00	0.00	7.60	7.68	0.92	0.88	7.51	0.19	6.44	56.58
0.00	0.00	0.00	7.63	7.51	0.88	0.93	7.75	6.44	4.50	132.43
0.00	0.00	0.00	6.12	6.12	0.58	0.58	6.12	3.25	6.50	124.86
0.00	0.00	0.00	4.62	4.02	0.25	0.42	5.22	6.50	6.58	208.91
0.00	0.00	0.00	2.54	1.64	0.18	0.18	3.45	6.58	0.61	16.82
0.00	0.00	0.00	2.65	1.76	0.19	0.19	3.54	4.25	6.75	72.01
0.00	0.00	0.00	3.35	2.93	0.22	0.22	3.77	6.38	5.89	90.40
0.00	0.00	0.00	3.90	4.32	0.19	0.19	3.48	5.59	5.39	9.95
0.00	0.00	0.00	2.87	2.57	0.16	0.16	3.18	5.39	7.25	52.39
0.00	0.00	0.00	9.40	9.47	1.35	1.35	9.32	n/a	9.80	184.70
0.00	0.00	0.00	8.71	8.55	1.23	1.23	8.88	9.80	34.87	447.02
0.00	0.00	0.00	12.84	15.31	1.68	1.68	10.38	30.05	23.67	226.29
0.00	0.00	0.00	9.25	9.21	1.34	1.34	9.29	23.67	21.55	83.65
0.00	0.00	0.00	7.79	7.67	0.97	0.97	7.90	21.55	6.77	486.44
0.00	0.00	0.00	6.91	6.76	0.77	0.77	7.06	6.77	3.98	219.71
0.00	0.00	0.00	6.41	6.27	0.67	0.67	6.55	3.98	3.80	84.03
0.00	0.00	0.00	5.79	5.58	0.56	0.56	6.00	3.80	5.53	70.16
0.00	0.00	0.00	5.20	4.93	0.47	0.47	5.47	5.53	9.41	164.63
0.00	0.00	0.00	7.48	9.44	0.47	0.47	5.51	7.21	8.22	104.12
0.00	0.00	0.00	4.35	3.95	0.35	0.35	4.74	8.22	8.06	148.72
0.00	0.00	0.00	2.12	1.21	0.14	0.14	3.04	8.06	7.90	89.73
0.00	0.00	0.00	0.57	0.06	0.02	0.02	1.08	7.90	7.58	22.21
0.00	0.00	0.00	0.72	0.54	0.01	0.01	0.91	7.58	7.52	1.58

Project File: 3302-KWF-with hydrocad flowrates 062723-3.stm | Number of lines: 85 | Date: 8/15/2023

NOTES: ** Critical depth

MyReport

Total Area (ac)	Total CxA	Total Runoff (cfs)	Vel Ave (ft/s)	Vel Dn (ft/s)	Vel Hd Dn (ft)	Vel Hd Up (ft)	Vel Up (ft/s)	Cover Dn (ft)	Cover Up (ft)	Storage (cft)
0.00	0.00	0.00	0.47	0.03	0.01	0.01	0.91	7.90	7.70	3.05
0.00	0.00	0.00	0.96	1.00	0.01	0.01	0.91	2.39	2.19	0.21
0.00	0.00	0.00	2.69	1.90	0.19	0.19	3.47	8.06	7.86	12.88
0.00	0.00	0.00	1.96	0.86	0.15	0.15	3.05	21.55	4.61	23.10
0.00	0.00	0.00	5.96	7.45	0.31	0.31	4.46	34.49	3.83	95.86
0.00	0.00	0.00	4.83	5.52	0.27	0.27	4.13	3.83	2.20	82.66
0.00	0.00	0.00	2.14	1.35	0.13	0.13	2.93	2.20	2.00	9.68
0.00	0.00	0.00	3.11	2.86	0.17	0.17	3.35	3.83	3.63	9.22
0.00	0.00	0.00	6.05	5.14	0.75	0.75	6.96	34.87	8.56	151.37
0.00	0.00	0.00	6.74	6.63	0.73	0.73	6.84	8.56	1.40	404.57
0.00	0.00	0.00	14.29	14.31	3.19	3.17	14.27	0.63	12.00	150.72
0.00	0.00	0.00	16.84	19.81	2.99	2.99	13.86	5.00	5.50	179.60
0.00	0.00	0.00	17.16	23.61	1.78	1.78	10.71	2.50	10.80	86.58
0.00	0.00	0.00	16.87	23.43	1.65	1.65	10.32	2.50	11.50	68.40
0.00	0.00	0.00	10.59	11.93	1.33	1.33	9.24	6.34	9.82	307.17
0.00	0.00	0.00	8.45	8.45	1.11	1.11	8.45	9.82	2.61	110.39
0.00	0.00	0.00	12.30	12.30	2.35	2.35	12.30	2.61	9.50	81.76
0.00	0.00	0.00	8.71	8.71	1.18	1.18	8.71	9.50	9.48	164.38
0.00	0.00	0.00	7.04	7.04	0.77	0.77	7.04	9.48	7.65	272.57
0.00	0.00	0.00	6.35	6.35	0.63	0.63	6.35	7.65	8.13	74.86
0.00	0.00	0.00	8.08	8.08	1.01	1.01	8.08	8.13	7.98	184.22
0.00	0.00	0.00	5.63	5.63	0.49	0.49	5.63	7.98	7.53	184.22
0.00	0.00	0.00	2.97	2.97	0.14	0.14	2.97	7.53	7.44	178.11

Project File: 3302-KWF-with hydrocad flowrates 062723-3.stm | Number of lines: 85 | Date: 8/15/2023

NOTES: ** Critical depth

MyReport

Total Area (ac)	Total CxA	Total Runoff (cfs)	Vel Ave (ft/s)	Vel Dn (ft/s)	Vel Hd Dn (ft)	Vel Hd Up (ft)	Vel Up (ft/s)	Cover Dn (ft)	Cover Up (ft)	Storage (cft)
0.00	0.00	0.00	4.41	4.99	0.23	0.23	3.82	2.39	2.19	10.14
0.00	0.00	0.00	0.02	0.02	0.00	0.00	0.02	7.44	7.47	159.59
0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.01	7.53	7.33	24.76
0.00	0.00	0.00	2.92	2.31	0.08	0.19	3.54	9.25	9.40	330.95
0.00	0.00	0.00	3.05	2.07	0.25	0.25	4.03	9.65	9.45	169.44
0.00	0.00	0.00	2.84	2.31	0.18	0.18	3.38	9.45	2.25	79.45
0.00	0.00	0.00	1.18	1.18	0.02	0.02	1.18	7.98	7.78	24.48
0.00	0.00	0.00	1.26	1.26	0.02	0.02	1.27	9.85	9.65	29.44
0.00	0.00	0.00	1.93	1.93	0.06	0.06	1.93	2.61	6.95	197.55
0.00	0.00	0.00	4.83	5.87	0.22	0.22	3.79	3.96	2.75	57.79
0.00	0.00	0.00	5.49	7.48	0.19	0.19	3.51	5.34	2.25	36.78
0.00	0.00	0.00	4.05	2.85	0.43	0.43	5.24	5.50	2.10	198.03
0.00	0.00	0.00	4.67	4.39	0.38	0.38	4.94	2.10	3.20	291.94
0.00	0.00	0.00	6.12	7.93	0.29	0.29	4.32	3.20	8.40	80.98
0.00	0.00	0.00	6.64	9.92	0.17	0.17	3.35	5.05	6.25	34.78
0.00	0.00	0.00	0.53	0.02	0.00	0.02	1.04	7.47	7.78	143.69
0.00	0.00	0.00	0.60	0.30	0.01	0.01	0.91	7.78	7.58	0.43
0.00	0.00	0.00	15.99	15.99	3.98	3.97	15.98	41.97	41.64	201.32
0.00	0.00	0.00	16.19	16.63	3.86	3.86	15.76	37.49	34.07	111.24
0.00	0.00	0.00	21.06	26.36	3.86	3.86	15.76	23.07	19.64	91.45
0.00	0.00	0.00	8.38	8.85	0.97	0.97	7.91	11.14	10.60	291.18
0.00	0.00	0.00	7.69	7.65	0.93	0.93	7.74	10.60	10.50	56.78
0.00	0.00	0.00	4.18	4.76	0.20	0.20	3.60	8.19	7.97	73.08

Project File: 3302-KWF-with hydrocad flowrates 062723-3.stm | Number of lines: 85 | Date: 8/15/2023

NOTES: ** Critical depth

MyReport

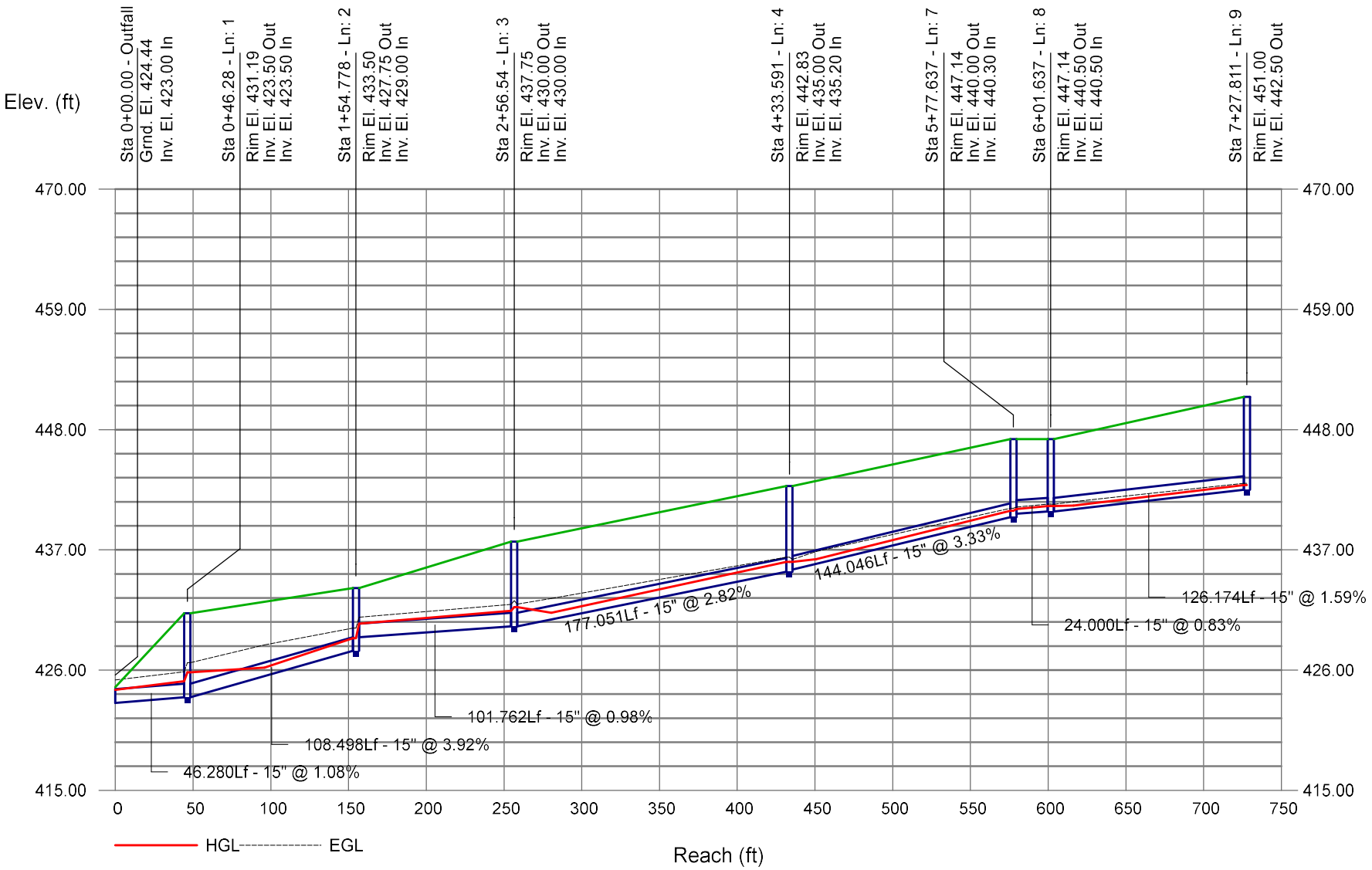
Total Area (ac)	Total CxA	Total Runoff (cfs)	Vel Ave (ft/s)	Vel Dn (ft/s)	Vel Hd Dn (ft)	Vel Hd Up (ft)	Vel Up (ft/s)	Cover Dn (ft)	Cover Up (ft)	Storage (cft)
0.00	0.00	0.00	3.71	4.25	0.16	0.16	3.17	2.40	2.20	6.35
0.00	0.00	0.00	6.96	6.96	0.75	0.75	6.96	10.50	11.60	327.85
0.00	0.00	0.00	0.79	0.77	0.01	0.01	0.81	11.60	10.17	282.85
0.00	0.00	0.00	4.33	5.78	0.13	0.13	2.88	8.17	2.52	8.48
0.00	0.00	0.00	8.61	8.61	1.15	1.15	8.61	12.35	7.75	324.64
0.00	0.00	0.00	10.20	10.26	1.64	1.60	10.15	0.61	6.80	44.44
0.00	0.00	0.00	13.62	16.67	1.74	1.74	10.57	2.60	2.82	125.31
0.00	0.00	0.00	9.49	9.49	1.40	1.40	9.49	2.82	2.62	24.80
0.00	0.00	0.00	5.09	5.68	0.32	0.32	4.51	2.60	2.40	13.83
0.00	0.00	0.00	0.85	0.85	0.01	0.01	0.85	6.80	2.83	150.10
0.00	0.00	0.00	0.42	0.42	0.00	0.00	0.42	2.83	2.63	24.58
0.00	0.00	0.00	8.67	10.06	0.82	0.82	7.27	0.00	2.63	252.62
0.00	0.00	0.00	21.31	23.17	5.88	5.88	19.45	2.63	5.68	164.90
0.00	0.00	0.00	19.45	19.45	5.88	5.88	19.44	2.30	4.50	173.15
0.00	0.00	0.00	19.45	19.45	5.88	5.88	19.45	2.84	8.20	287.38
0.00	0.00	0.00	21.35	23.25	5.88	5.88	19.45	5.20	0.00	147.12

Project File: 3302-KWF-with hydrocad flowrates 062723-3.stm | Number of lines: 85 | Date: 8/15/2023

NOTES: ** Critical depth

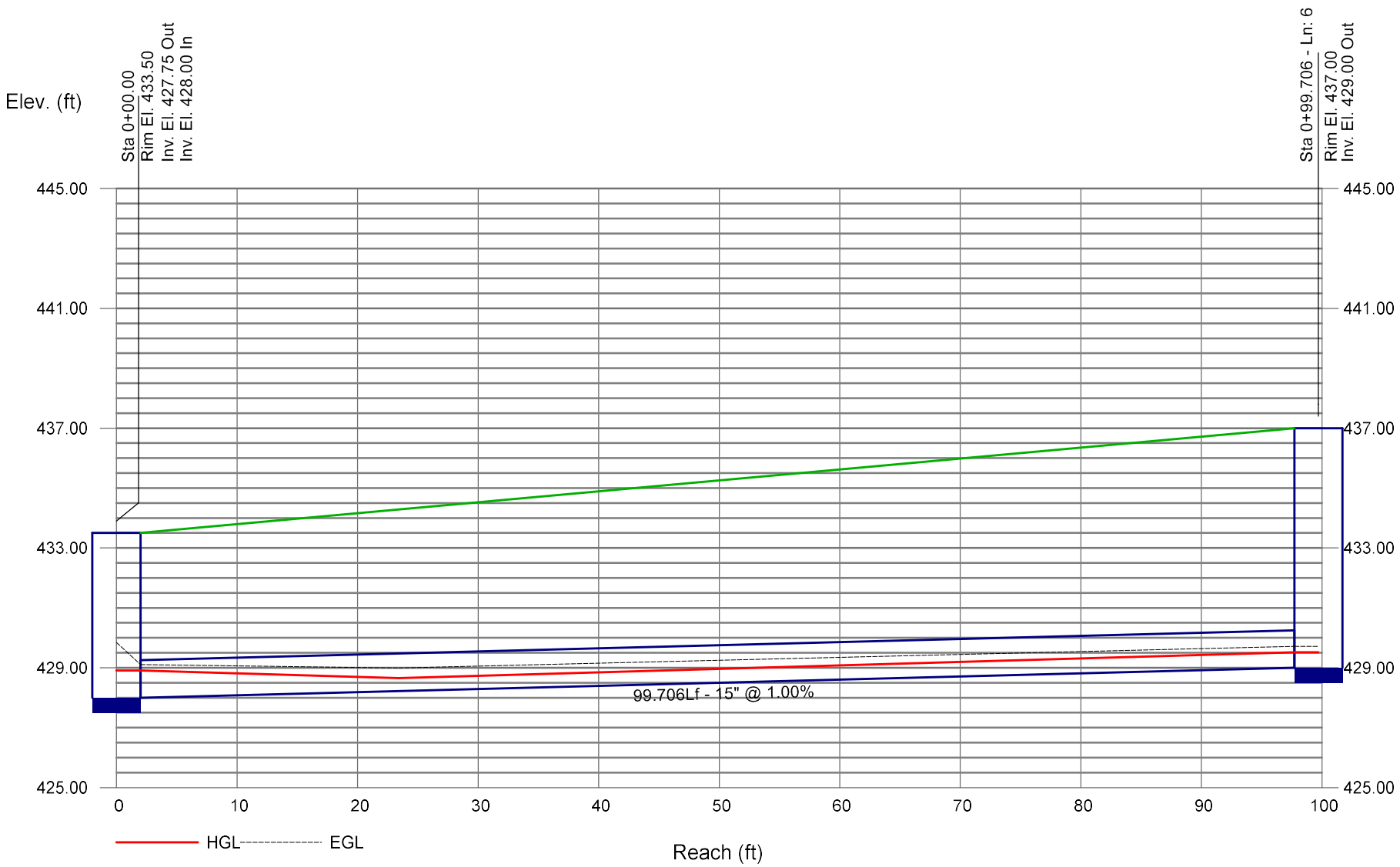
Storm Sewer Profile

Proj. file: 3302-KWF-with hydrocad flowrates 062723-3.stm



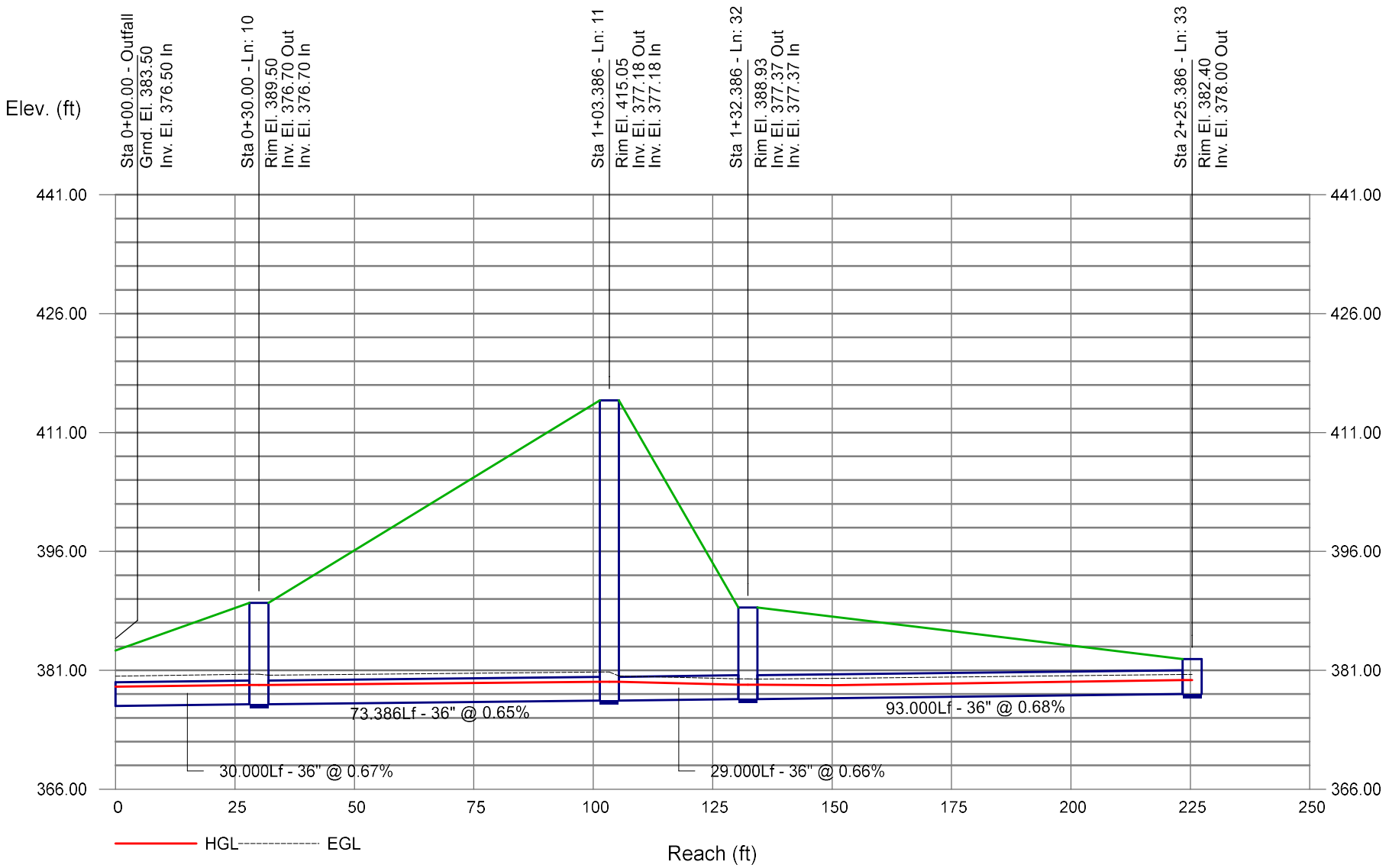
Storm Sewer Profile

Proj. file: 3302-KWF-with hydrocad flowrates 062723-3.stm



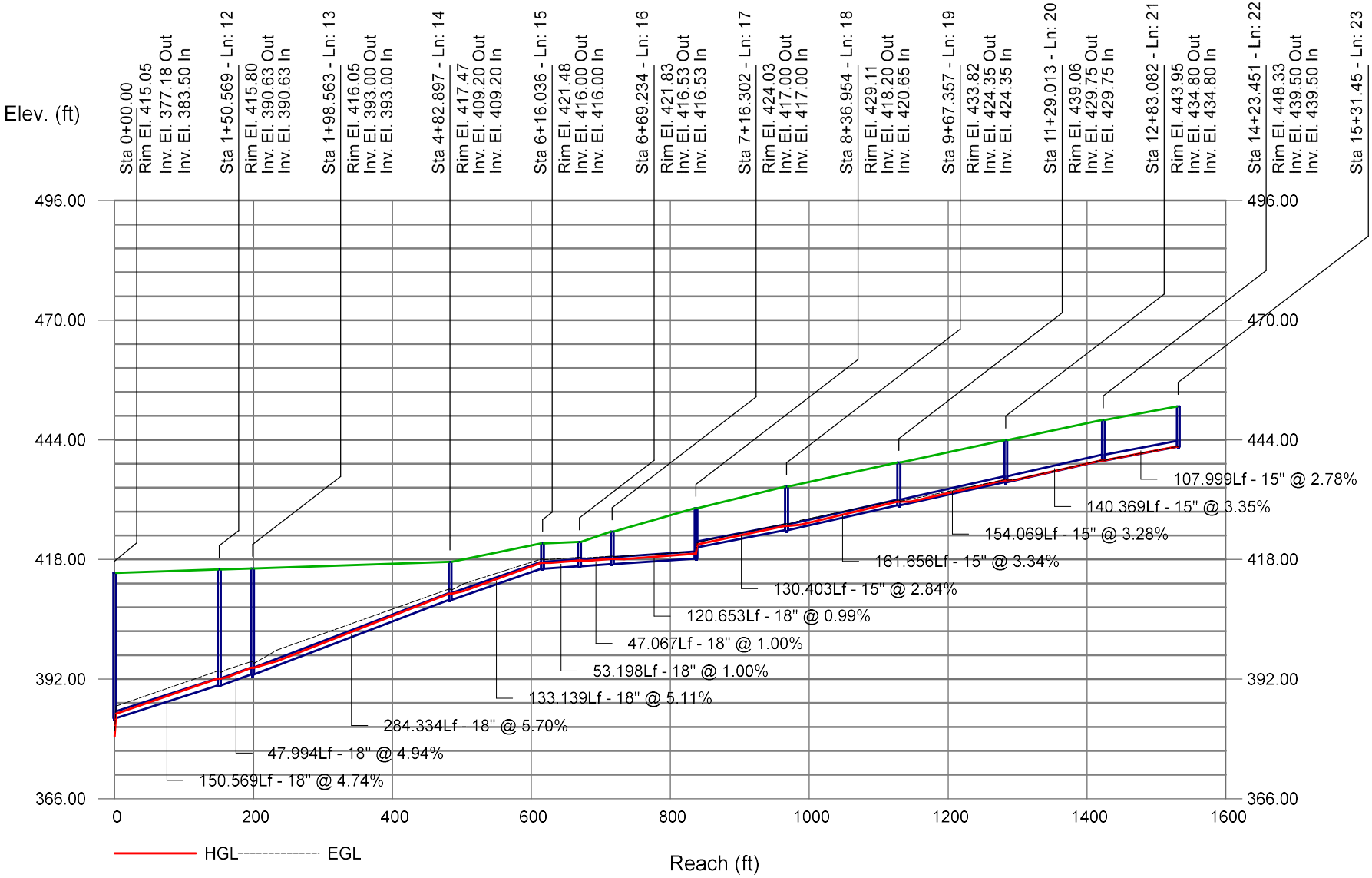
Storm Sewer Profile

Proj. file: 3302-KWF-with hydrocad flowrates 062723-3.stm



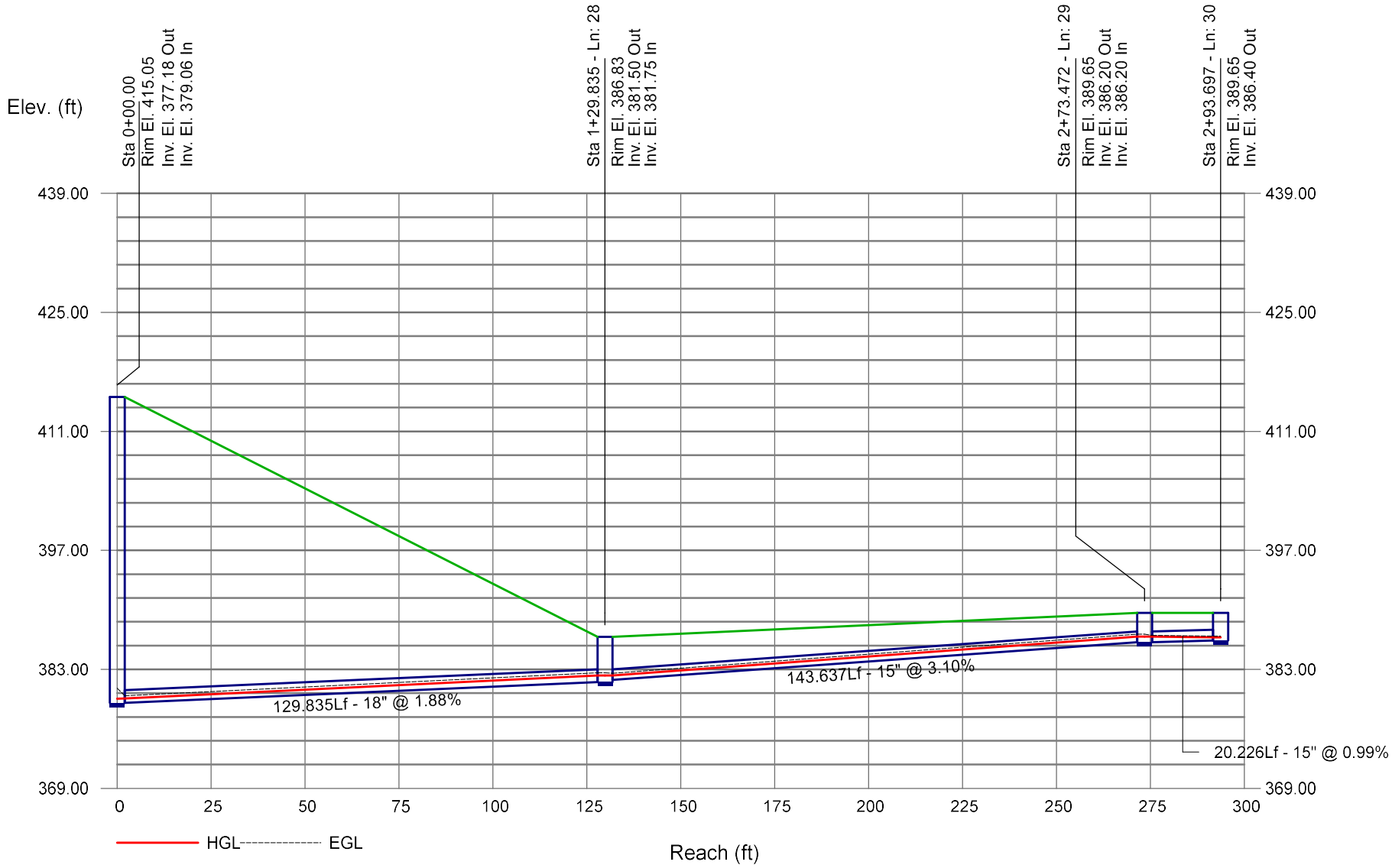
Storm Sewer Profile

Proj. file: 3302-KWF-with hydrocad flowrates 062723-3.stm



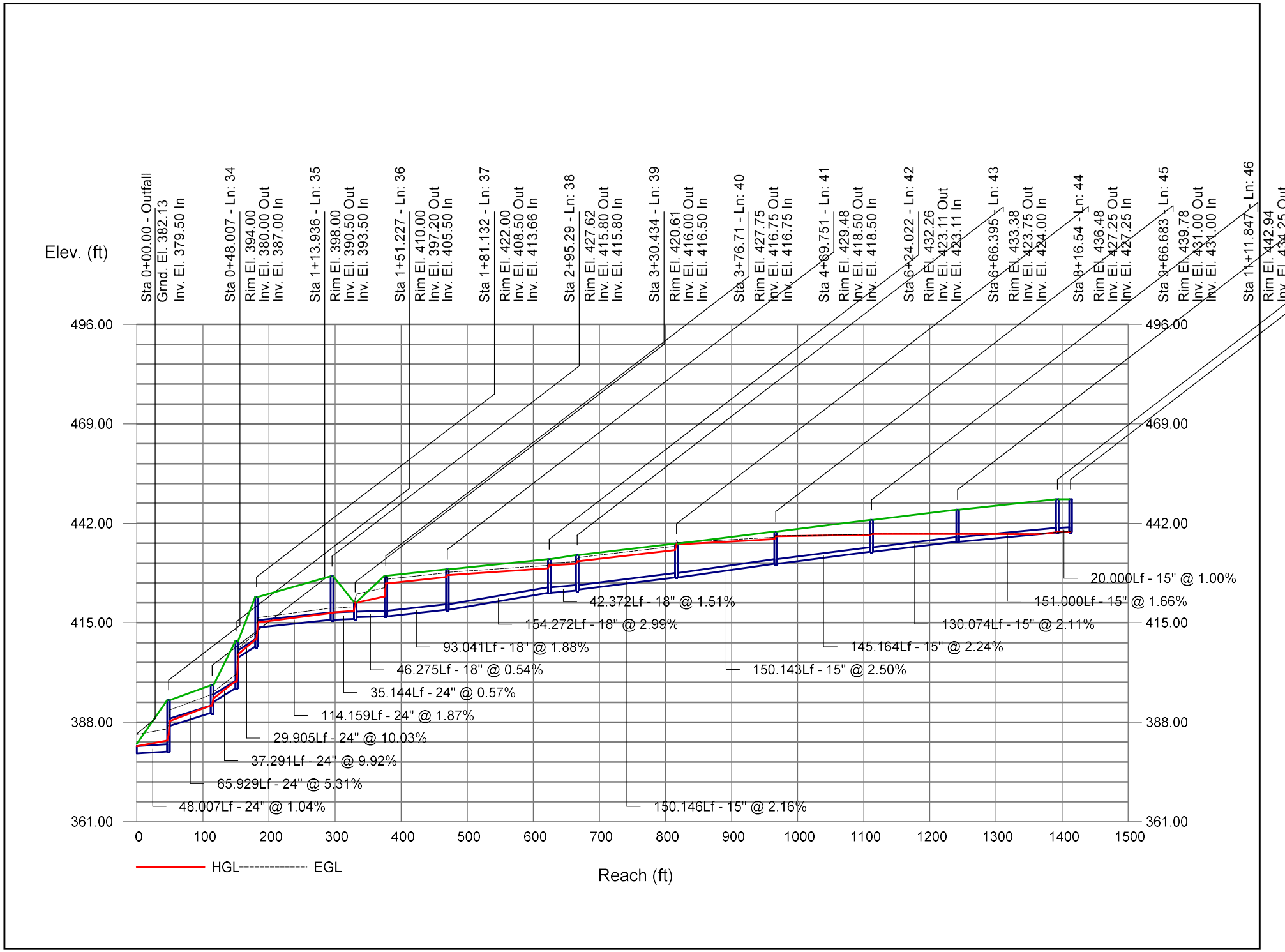
Storm Sewer Profile

Proj. file: 3302-KWF-with hydrocad flowrates 062723-3.stm



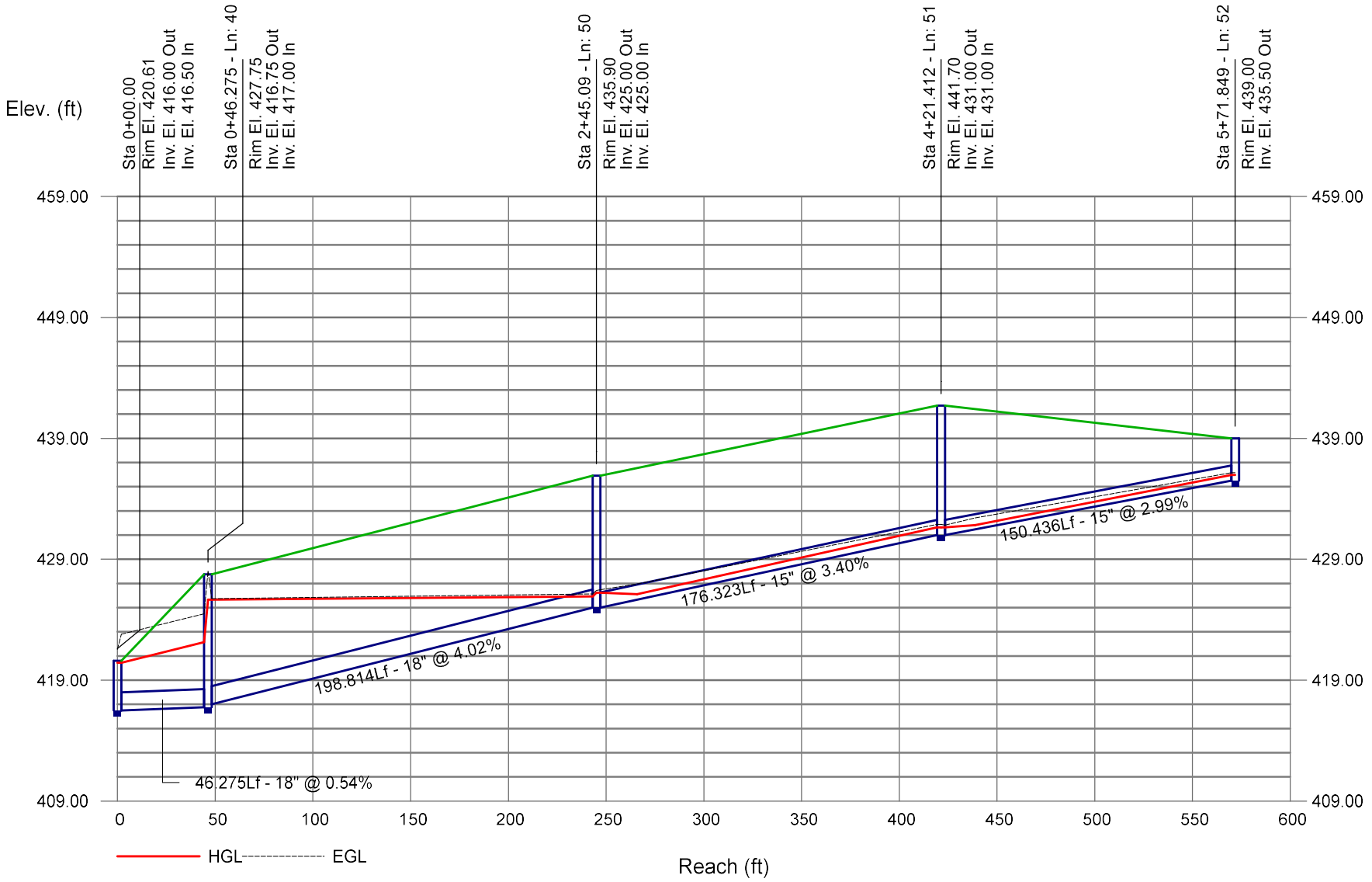
Storm Sewer Profile

Proj. file: 3302-KWF-with hydrocad flowrates 062723-3.stm



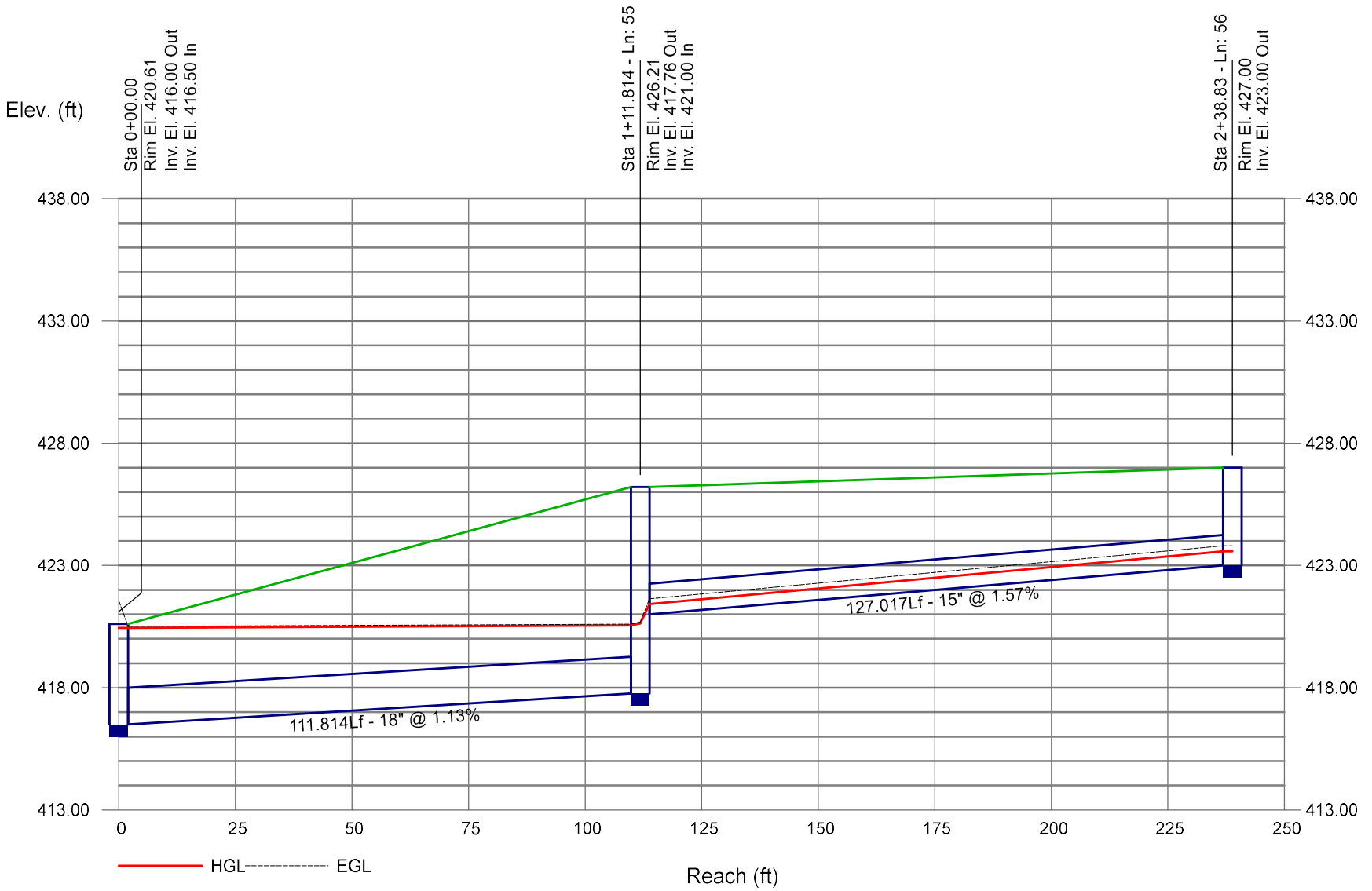
Storm Sewer Profile

Proj. file: 3302-KWF-with hydrocad flowrates 062723-3.stm



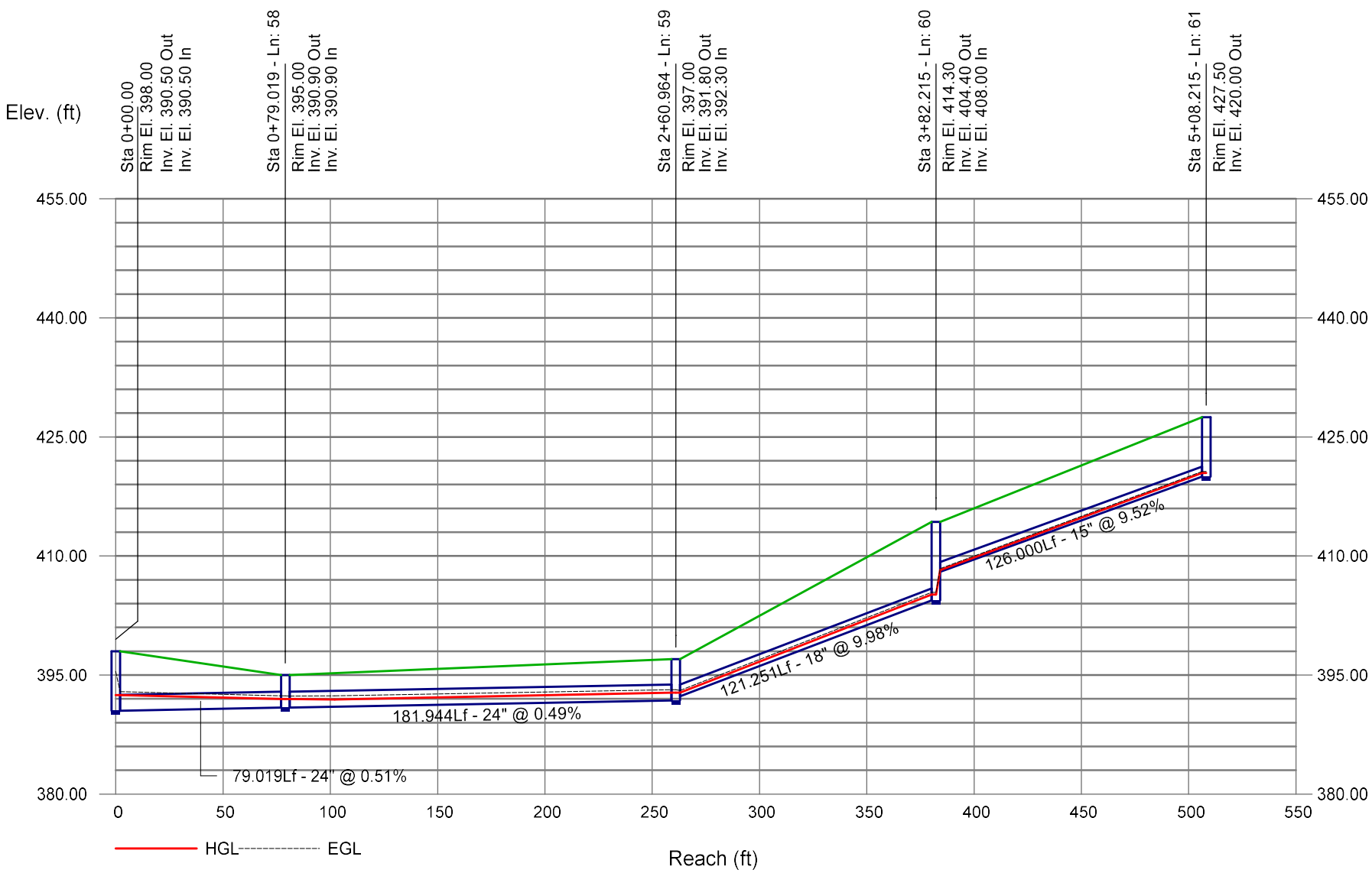
Storm Sewer Profile

Proj. file: 3302-KWF-with hydrocad flowrates 062723-3.stm



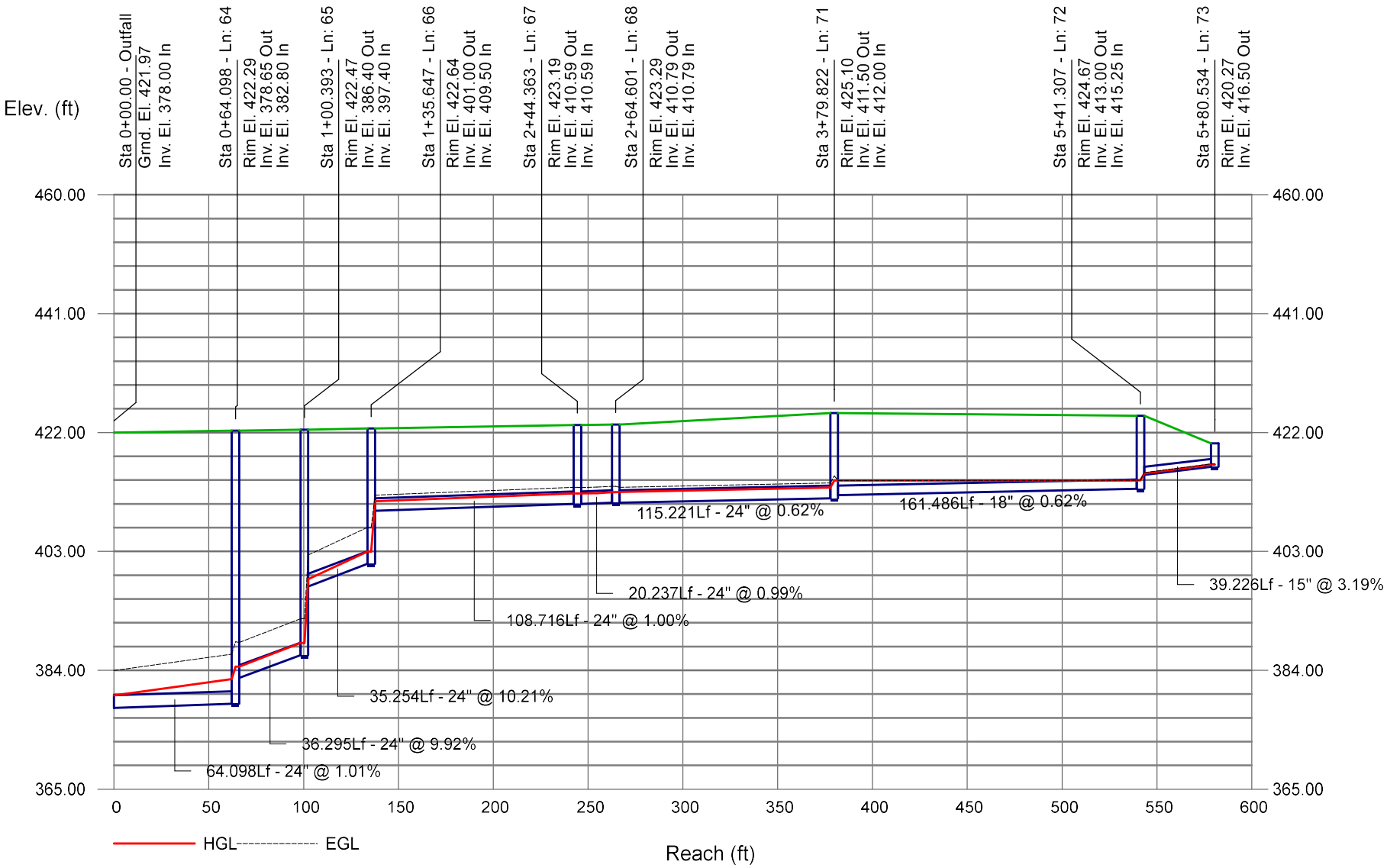
Storm Sewer Profile

Proj. file: 3302-KWF-with hydrocad flowrates 062723-3.stm



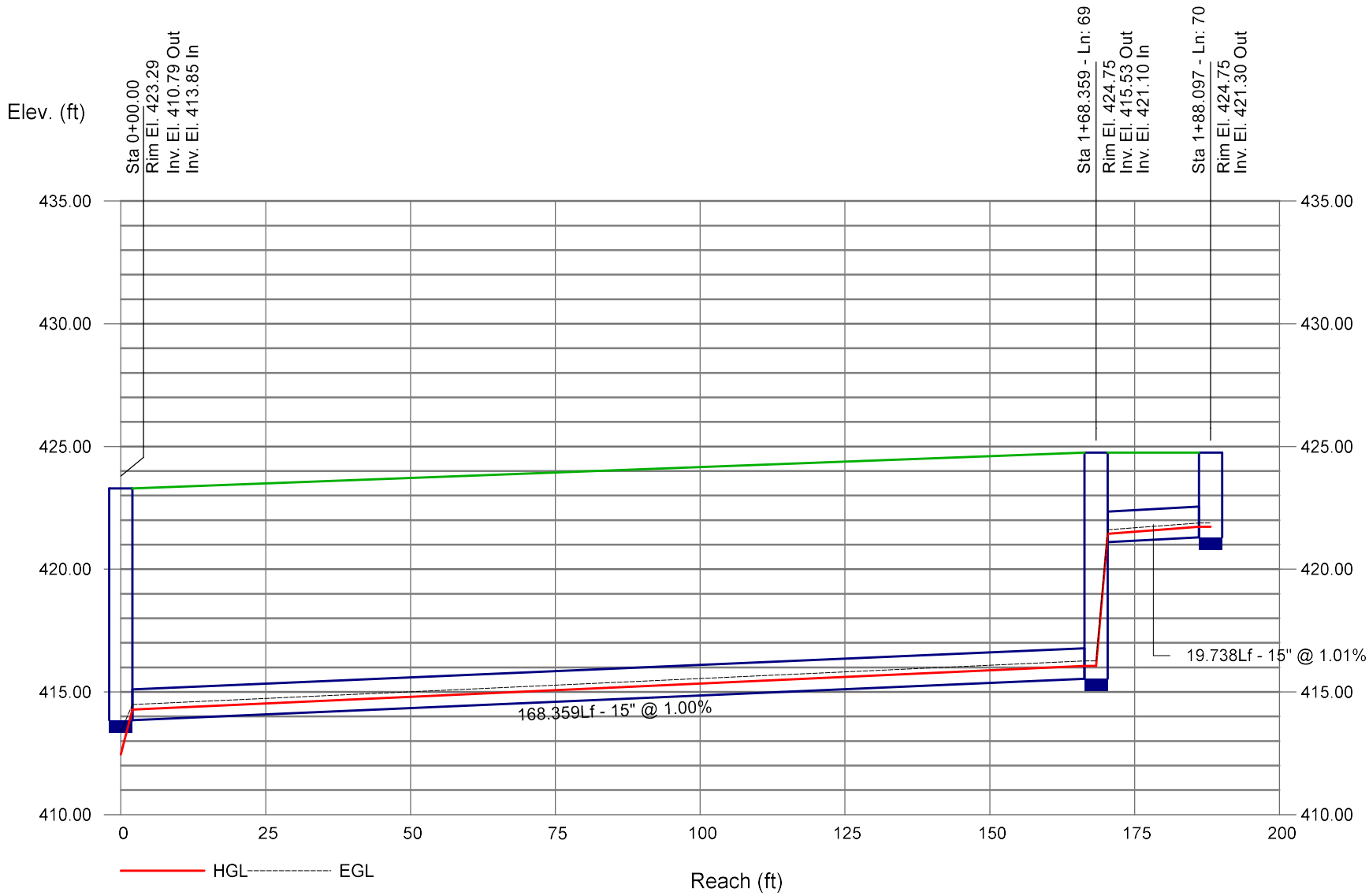
Storm Sewer Profile

Proj. file: 3302-KWF-with hydrocad flowrates 062723-3.stm



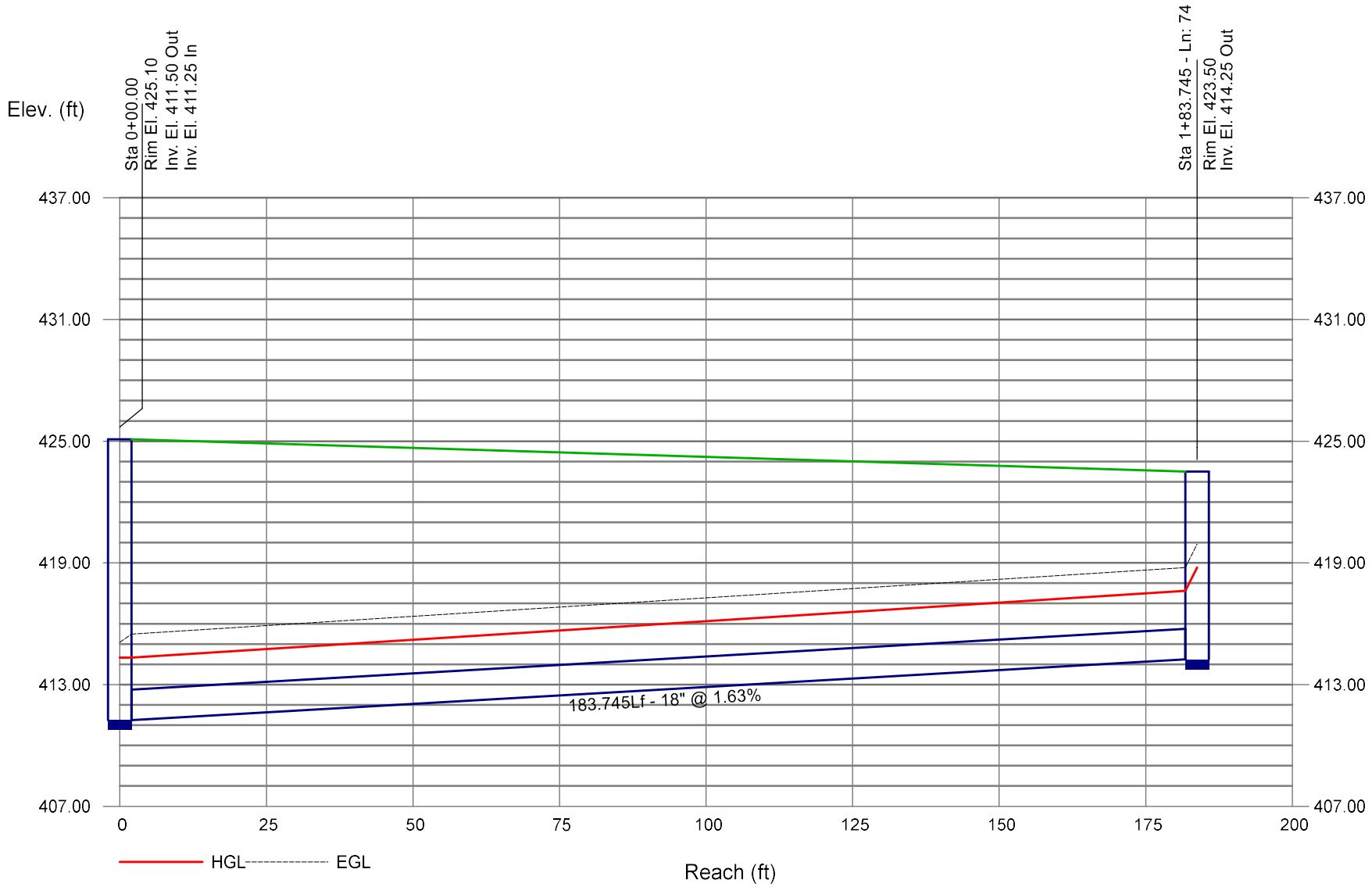
Storm Sewer Profile

Proj. file: 3302-KWF-with hydrocad flowrates 062723-3.stm



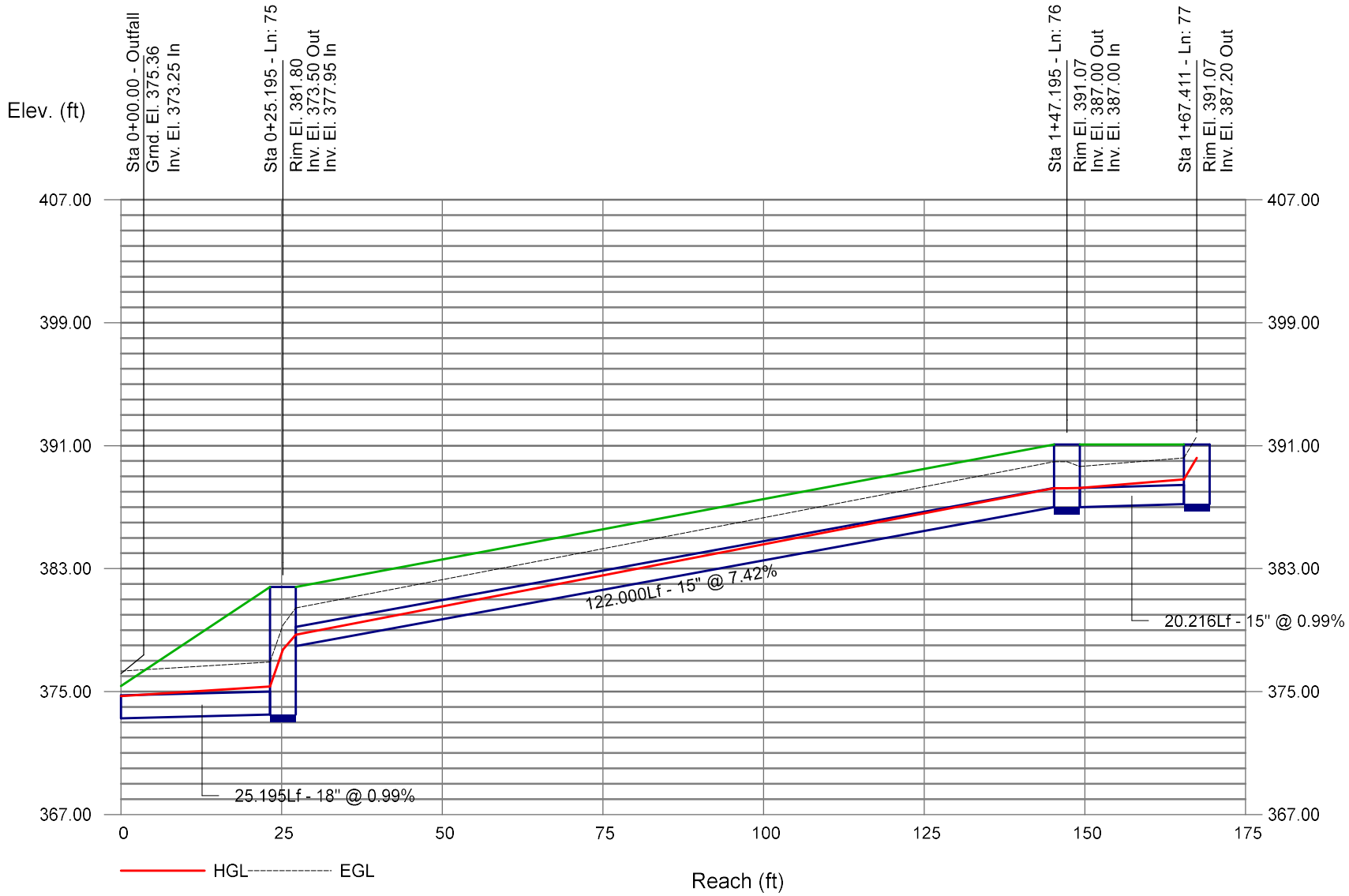
Storm Sewer Profile

Proj. file: 3302-KWF-with hydrocad flowrates 062723-3.stm



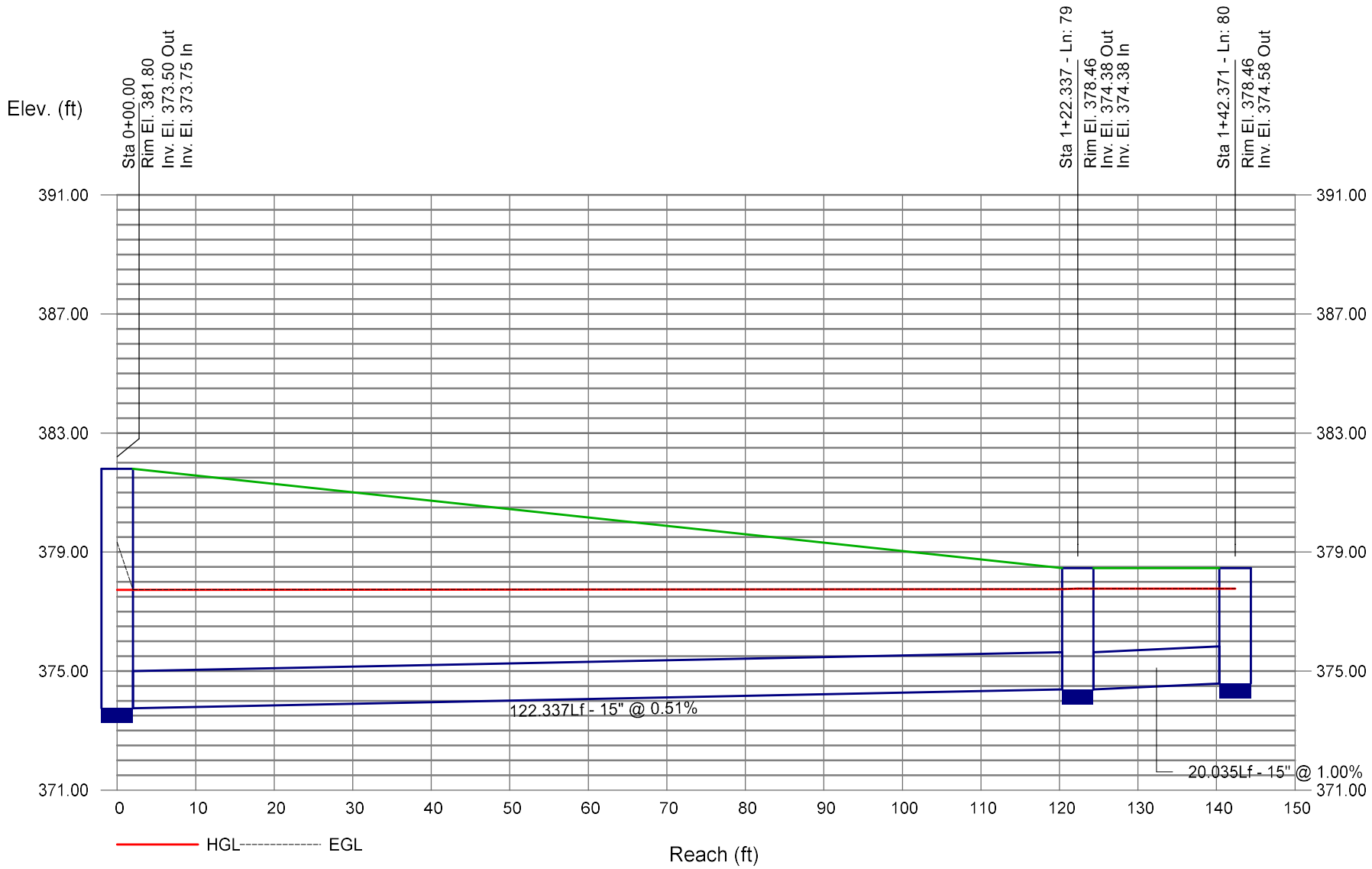
Storm Sewer Profile

Proj. file: 3302-KWF-with hydrocad flowrates 062723-3.stm



Storm Sewer Profile

Proj. file: 3302-KWF-with hydrocad flowrates 062723-3.stm



Storm Sewer Profile

Proj. file: 3302-KWF-with hydrocad flowrates 062723-3.stm

