

July 30, 2026

Mithila Chakraborty, Ph.D.

Connecticut Department of Housing

505 Hudson Street

Hartford, CT 06106

Re: Lot 1 (22 Oakwood Drive), Beacon Falls, Connecticut

Dear Dr. Chakraborty:

I have reviewed the Scoping Review comment letter and would like to respond by providing the missing information that they are requesting. This project has received specific approval from the local health dept. for phase 1, and the test hole data has been approved for the other phases. A Stormwater pollution control plan has also been prepared for the Stormwater general permit for construction activities per the DEEP requirements.

The Scoping Review Comments

1. Effect on water quality, including surface water and groundwater.

Melissa Fahnestock, Water Planning and Management Division, Melissa.Fahnestock@ct.gov

The proposed construction site is not located in an Aquifer Protection Area nor is it located in an area of coarse-grained deposits as shown on the CT Surficial Aquifer Potential Map indicating that it is not a current or future source for groundwater. There are no concerns related to the Aquifer Protection Area Program.

R. We concur

Melissa Mostowy, Water Planning and Management Division, Melissa.Mostowy@ct.gov

The entirety of the project site is within the Aquarion Water Company – Valley System service area, so public water supply will be available to the development if needed. It is unlikely that the development will require more than 50,000 gallons of water per day, the jurisdictional threshold of the Consumptive Water Diversion Program. However, if in the future, the development requires an excess of 50,000 gallons of water per day to support



its operation, Consumptive Water Diversion Program staff should be contacted to inquire whether a permit will be needed.

- R. We concur the Project's water usage is 28,200 gallons per day, assuming a standard state average of 300 gallons per day per household. Which is less than 50.000 gallons per day.**

Emma Coffey, Water Planning and Management Division, Emma.Coffey@ct.gov

The proposed development is located approximately 1 mile south-east of Hockanum Brook (CT6900-28_01) which subsequently drains to the Naugatuck River (CT6900-00_02). These two waterways are both impaired, not supporting recreation and habitat for fish, other aquatic life and wildlife, respectively. Additionally, both waterways have Bacteria Total Maximum Daily Loads (TMDLs); Hockanum Brook Bacteria TMDL & Naugatuck River Bacteria TMDL.

The proposed project will create a significant amount of new impervious cover in the form of 94 single family homes across a 59-acre forested area. Studies have shown a link between increasing impervious cover and degrading water quality conditions in a watershed (CWP, 2003).

CT DEEP recognizes the proposed 2 detention ponds for storm drainage and encourages additional use of Green Infrastructure and/or Low Impact Development where feasible in this project to minimize/reduce the impact of polluted stormwater from reaching the nearby impaired waterways. Furthermore, CT DEEP recommends environmentally friendly lawn care and landscaping practices, such as reducing or eliminating fertilizer and pesticide use, as well as encouraging residents to properly dispose of pet waste, as recommended in the Connecticut NPS Management Program Plan (2024).

- R. Impervious area has been minimized with the current proposal by clustering the units in the northern portion of the property. The property is located at the divide of two watersheds. The majority of the proposed development is located on the northern watershed, which discharges to a wetlands area along the Beacon Heights landfill and then on to a tributary of the Hackanum Brook. A Smaller portion of the development discharges south towards a wetland area, which then flows into a tributary of Hopp Brook. The project avoids developing near wetland areas and limits its disturbance to the northern portion of the property, and preserves the sensitive wetlands areas and watersheds to the south. The project includes best management practices, including a storm water treatment train that includes deep sump catch basins, 4- hydrodynamic separators, 2 wet bottom retention ponds, and 2 level spreaders to promote groundwater recharge and water quality from the proposed site. Please see attached Pollution control plan and Engineering report as Appendix A**

2. Effect on flooding, in-stream flows, erosion, or sedimentation.



Susan Jacobson, Land and Water Resources Division, Susan.Jacobson@ct.gov

Flood Management Certification: If proposed activities are being funded or conducted by a state agency AND are being conducted within a FEMA designated floodplain, the applicant should consult with the DEEP's Land and Water Resources Division for information on how to comply with the States Flood Management Statutes and Regulations. For information on identifying if the site is in a flood zone, please see FEMA's website: FEMA Flood Map Service Center. For information on Flood Management Certification, please see DEEP's website: Flood Management Certification Fact Sheet.

R. The Project is not in or near a flood zone.

3. Effect on natural communities and upon critical plant and animal species and their habitat; interference with the movement of any resident or migratory fish or wildlife species.

Robin Blum, NDDDB Program, Wildlife Division, Robin.Blum@ct.gov

This project was recently submitted to NDDDB. Review work is currently initiated but is not yet complete. Upon completion, a determination letter will be issued to address potential impacts to listed species.

R. NDDDB Letter has been received and its recommendations, the Recommended protection measures which will be strictly implemented to ensure no impacts to listed species

4. Use of pesticides, toxic or hazardous materials or any other substance in such quantities as to cause unreasonable adverse effects on the environment.

No comments submitted at this time.

5. A substantial increase in the type or rate of energy use as a direct or indirect result of the action.



No comments submitted at this time.

6. Effect on air quality.

No comments submitted at this time.

7. Effect on existing land resources and landscapes, including coastal and inland wetlands.

Danielle Missell, LWRD, Danielle.Missell@ct.gov

Details about on-site wetlands and any proposed fill placed in wetlands have not been provided. Any wetland permitting requirements would likely be handled at the local and/or federal level.

- R. No filling or activity within 100 feet of wetlands is proposed, approval from the local inland wetlands agency in Beacon Falls has been received for the project as proposed.**

8. Adequacy of existing or proposed utilities and infrastructure.

No comments submitted at this time.

9. Effect on greenhouse gas emissions as a direct or indirect result of the action.

No comments submitted at this time.

10. Effect of a changing climate on the action, including any resiliency measures incorporated into the action.

No comments submitted at this time.



11. Additional Comments/ Concerns:

No additional comments/concerns submitted at this time.

Should you require any additional information, please do not hesitate to contact our office.

Sincerely,


Manuel J. Silva
Project Manager



Connecticut
Department of Energy &
Environmental Protection

portal.ct.gov/DEEP

6/30/2026

Manuel Silva
ROSE TISO & COMPANY LLC
35 Brentwood Ave
Fairfield, CT 06825
msilva@rosetiso.com

Subject: Hopp Brook Estates

Filing #: 123167

NDDB - New Determination Number: 202608003

Expiration Date: 6/30/2028

I have reviewed the application and materials for the Hopp Brook Estates project in Beacon Falls, CT. The following listed species is found within the vicinity of your project area:

- Eastern box turtle (*Terrapene carolina carolina*) – State Special Concern

Below, I have provided protection measures which must be implemented to ensure no impacts to listed species. NDDB accepts and appreciates your commitment to transferring 40.27 acres of the south portion of the site, referred to as Lot 2 in the attached map, by deed to The Town for open space.

- 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.
- Residential areas contain bird seed, pet food, and garbage which can attract nest predators such as raccoons and skunks. Their nest predation can destroy the majority of a location's reproductive output each year. This species does not reproduce until it is 10 years old.
- Female turtles looking for nesting habitat are frequently killed by vehicles when crossing roads. These turtles of reproductive age are the most valuable individuals in the population to maintain population persistence. Highways with high traffic are impenetrable barriers that isolate populations.
- High traffic road surfaces and high traffic facilities (>100 vehicle/lane/day, 5-10 cars per hour) should use curbs and fencing to deflect animals off into wildlife underpasses or around high traffic areas.
- Low traffic road surfaces should (rate) should use Cape Cod-style curbing or no curb alternatives to

allow animals to cross road unimpeded.

- Cluster development to reduce the amount of roadway needed and place housing as far from high use areas as possible.
- Do not use road surfaces and side slopes that will mimic sandy nesting areas for females.
- Land disturbance activities need to consider local habitat features and apply fencing and/or time of year restrictions as appropriate. We recommend you consult with a herpetologist familiar with preferred habitats to assist you with proper techniques to ensure the best protection strategies are employed for your site and the scope of your project.
- To prevent turtle access and entry into your work zone between April 1- November 1:
 - Exclusionary practices will be used to prevent any turtle access into disturbance areas. These measures will need to be installed at the limits of disturbance as shown on the plans, or specifically designated by a herpetologist who can assess the conditions at your site.
 - Exclusionary fencing be at least 20 in tall and must be secured to and remain in contact with the ground and be regularly maintained (at least bi-weekly and after major weather events) to secure any gaps or openings at ground level that may let animal pass through.
 - All staging and storage areas, regardless of the duration of time they will be utilized, must be reviewed to remove individuals and exclude them from re-entry.
 - All construction personnel working within the turtle habitat must be apprised of the species description and the possible presence of a listed species.
 - The Contractor must search the work area each morning prior to any work being done.
 - Any turtles encountered within the immediate work area shall be carefully moved to an adjacent area outside of the excluded area and fencing should be inspected to identify and remove access point. This animal is protected by law and should not be relocated off-site.
 - In areas where silt fence is used for exclusion, it shall be removed as soon as the area is stable and disturbance is finished to allow for reptile and amphibian passage to resume.
- If land disturbance will occur in suitable overwintering forested habitat you will need to take precautions to avoid mortality of hibernating adults. If practicable, small projects, under the supervision of a qualified herpetologist, may be able to utilize a combination of exclusionary fencing installed before October 15, combined with and surveys to ensure that no turtles are within the enclosed fencing. Work can then be conducted within the fenced area at any time of year as long as the fencing is maintained. Projects that will impact large blocks of forest or significant overwintering habitat may need to restrict your land disturbance activities in forested habitat to the turtle active season. These projects would need to restrict land disturbance activities to occur only between April 1- October 31.
- Your project is located in a large block of suitable habitat for this species. Work with biologists to plan your activities so they minimize the impact on this species. Individual turtles will have best chance of survival in blocks of undeveloped habitat >100ha (247 acres). Populations will have the best chance of viability if they consist of 300 individuals in unfragmented habitat totaling at least 500 acres. Densities of >1km of road/km² with moderate traffic >100 vehicle/lane/day will result in population decline.
- Landscape Planning: Use partnerships and landscape scale planning to protect important conservation areas for this species.
- Nesting Area Management: identify and protect nesting areas for this species. Work with biologists to plan your site use and nesting site management. Recreational activities may increase incidental collection and impact nesting behavior, which both contribute to local turtle population decline. Most often turtles collected are adult females traveling to and from nesting. These turtles of reproductive age are the most valuable individuals in the population to maintain population persistence. Due to slow maturity and low reproductive success, even infrequent collection poses a long-term conservation problem.
- To avoid collection by the public, do not post signs alerting the public to the presence of this species.
- Litter from recreation can pose a choking hazard. Ensure there is a plan for how garbage will be managed. Work with biologists to plan any recreational area so that it minimizes the effect on this species.

Your submission information indicates that your project does not require a state permit, license, registration, or authorization and does not utilize state funding or involve state agency action. Therefore, this NDDB - New determination **MAY NOT** be utilized to fulfill the Endangered and Threatened Species requirements for state-issued permit applications, licenses, registration submissions, and authorizations. If, at a later date, it is determined that the project will require a state permit, license, registration, or authorization, or, your project now utilizes state funding or includes state agency action, you will need to re-submit a Request for Review and answer "Yes" to the appropriate question.

Please be aware of the following limitations and conditions:

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. New information may result in additional review, and new or modified restrictions or conditions may be necessary to remain in compliance with certain state permits.

- During your work listed species may be encountered on site. A report must be submitted by the observer to the Natural Diversity Database promptly and additional review and restrictions or conditions may be necessary to remain in compliance with certain state permits. Please fill out the [appropriate survey form](#) and follow the instructions for submittal.
- If your project involves preparing an Environmental Impact Assessment, this NDDB consultation and determination should not be substituted for biological field surveys assessing on-site habitat and species presence.
- The NDDB - New determination for the Hopp Brook Estates as described in the submitted information and summarized at the end of this document is valid until 6/30/2028. This determination applies only to the project as described in the submission and summarized at the end of this letter. Please re-submit an updated Request for Review if the project's scope of work and/or timeframe changes, including if work has not begun by 6/30/2028.

If you have further questions, please contact me at the following:

Anna Toledo
CT DEEP Bureau of Natural Resources
Wildlife Division
Natural Diversity Database
79 Elm Street
Hartford, CT 06106-5127

Anna.Toledo@ct.gov

Please reference the Determination Number 202608003 when you e-mail or write. Thank you for consulting the Natural Diversity Data Base.

Anna Toledo
Wildlife Division- Natural Diversity Data Base
79 Elm Street
Hartford, CT 06106-5127

Anna.Toledo@ct.gov



Appendix A

Pollution control plan and Engineering report

STORMWATER POLLUTION PREVENTION & CONTROL PLAN

For The Proposed:
Hopp Brook Estates

Located At:
22 Oakwood Drive
Beacon Falls, Connecticut
Job # 2215

Prepared On:
June 1, 2026

Prepared For:
Hopp Brook Developers LLC

Prepared By:




Manuel J. Silva
Project Manager

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Appendix A

Coastal Area Site Plan Application
Coastal Area Management Correspondence with
DEEP Coastal Site Plan Review Approval

Appendix B

Site Inspection Checklist

Appendix C

Stormwater Monitoring Report

APPENDIX D

Contractor Certificate

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Copy of Notice of Termination Form

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Engineering Report

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1.0 Introduction

This Stormwater Pollution Control Plan (SWPCP) has been prepared in support of the Connecticut Department of Energy and Environmental Protection *General Permit for Stormwater and Dewatering Wastewaters from Construction Activities* (CTDEEP General Permit) for the proposed Hopp Brook Estates Phase 1. The project site is located at 22 Oak Wood Lane in Beacon Falls, Connecticut. The site is currently undeveloped with a large wooded area on a 56.27-acre parcel, of which 7.5 acres are to be disturbed for the construction of Phase 1 and the 2 retention ponds.

The SWPCP is prepared pursuant to the requirements of Section 5(b) of the CTDEEP General Permit issued August 21, 2013. This General Permit was issued by the CTDEEP pursuant to Section 22a-430b of the Connecticut General Statutes, as amended by Public Act 91-263. See Appendix A for a complete copy of the CTDEEP General Permit. A location map showing the general boundaries of the construction activity is attached as Figure 1.

The project proposes to construct 15 single family houses, 2 storm water retention ponds. Along with supporting roads and utilities.

2.0 SITE DESCRIPTION (SECTION 5(B)(1)(b)(ii) OF GENERAL PERMIT)

2.1 Construction Activity (Section 5(b)(1)(B)(ii) of General Permit)

Hopp Brook Developers, LLC is proposing the construction of a phase 1 (15 houses) of a 6-phase single-family development located on 22 Oakwood Drive, in Beacon Falls. Proposed Phase development includes The project proposes to construct 15 single family houses, 2 storm water retention ponds. Along with supporting roads and utilities.

Currently, the property is comprised of a single 56.27-acre parcel. The existing site is an undeveloped wooded area. The existing soil condition consists of silty sand with gravel, cobbles and boulders. Woodbridge fine sandy loam has been found existing in much of the site.

Overall, the site slopes from the center to the northwest, draining to a wetlands area located near the end of Oakwood Drive, and from the center to the south to an existing wetland off the property to the south. The maximum elevation is approximately 708 feet. The minimum elevation is approximately 686 feet.

2.2 Area of Site and Area of Disturbance (Section 5(b)(1)(B)(ii) of General Permit)

The total area of the project site is approximately 17.69 acres. The area of site disturbance during the construction phase and demolition phase totals approximately 7.5 acres.

2.3 Proposed Stormwater Runoff (Section 5(b)(1)(B)(ii) of General Permit)

The plans are designed to minimize potential impacts to adjacent properties and the existing storm water infrastructure.

Without storm water quality measures, proposed development of this site will increase the Weighted Runoff Coefficient (WRC) and decrease the Time of Concentration (Tc), resulting in an increase in the peak rate of storm water runoff. However, the construction of, two (2) Storm Water Management Areas (SWMA) actually result in a reduction of post-development rate of runoff relative to predevelopment conditions.

Design details for these systems are presented on Sheet SP-2 (part of the overall Project Documents). The system will drain the roofs, sidewalks, grassy areas, Club house, and parking lot associated with the 94 single-family homes development. The roofs and parking lots will be the major elements of the total impervious area on the site. (calculations included as Appendix A, Gutter flow analysis included as Appendix B) The roof, grassy areas, sidewalks and driveways will contribute to the runoff totals seen in table 2.

The northwesterly SWMA (Pond 1) has a total storage volume of approximately 96,503 c. f. and the maximum water depth has been calculated to be 10 feet. This SWMA will reduce the post development peak rate of runoff by 2.47 cfs for the one hundred year storm. The southwesterly SWMA (Pond 2) has a total storage volume of approximately 133,331 c. f. and the maximum water depth has been calculated to be 6 feet. This SWMA will reduce the post development peak rate of runoff by 37.48 cfs for the one hundred year storm. As indicated in the following summary and attached computations, the proposed development will reduce the peak rate of runoff to less than the pre-developed condition for both the Northwesterly and Southeasterly water sheds on site.

The development as proposed will not have an adverse impact on the surrounding wetlands or watercourses.

2.4 Receiving Waters (Section 5(b)(1)(B)(ii) of General Permit)

The proposed drainage system's control structures throughout the site where a metered discharge will enter the adjacent wetlands areas.

(Section 5(b)(1)(B)(ii) of General Permit)

Approximately 1.01 acres of wetlands exist along the north westr limit of the site.

3.0 CONSTRUCTION SEQUENCING (SECTION 5(b)(1)(B)(iii) OF GENERAL PERMIT)

3.1 Phase I Sequence and Estimated Timetable of Major Activities

1. Construction begins – August 2027
2. Contact Town of Beacon falls Inland Wetland Agent, Zoning Official and Building Inspector at least forty-eight (48) hours prior to commencement of any demolition, construction or regulated activity on this project.
3. Clearing limits shall be physically marked in the field and approved by the Town of Beacon Falls, Zoning Official and Building Inspector prior to the start of work on the site. Install tree protection and perimeter silt fence.
4. Install stabilized construction entrance/exit.
5. Silt fence to be installed around the site along the limit of disturbance as specified (clear only those areas necessary to install silt fence).
6. Prepare temporary parking and storage areas.
7. Halt all activities and contact the engineer of record to perform inspection and certification of best management practices (BMP's).
8. General contractor shall schedule and conduct the stormwater pre-construction meeting with the engineer, agencies and ground-disturbing contractor before proceeding with construction.
9. Construct and stabilized sediment basin(s) and sediment trap(s) with appropriate outfalls structures (clear only those areas necessary to install basins and traps).
10. Demolish existing structures as per approved Demo plan.
11. The site will be cleared and grubbed.
12. Excavate all stumps located in the structural area and remove to a disposal site or stockpile area to be chipped. No stumps are to be buried within 100' of wetland or 100' from a watercourse. Stumps are to be disposed of in accordance with current state law.
13. Begin grading the site.
14. Start construction of building pad and structures.

3.2 Phase II Sequence and Estimated Timetable of Major Activities

1. Temporarily seed, throughout construction, denuded areas that will be inactive for 14 days or more.
2. Install utilities, underdrains, storm sewers, curbs, and gutters.
3. Install rip rap around outlet structures as each outlet structure is installed.
4. Install inlet protection at all storm sewer structures as each inlet structure is installed.
5. Permanently stabilize areas to be vegetated as they are brought to final grade.
6. Prepare for site paving.

7. Pave site.
8. Install appropriate inlet protection devices for paved areas as work progresses.
9. Complete grading and installation of permanent stabilization over all areas including out lots.
10. Construct construction driveway entrance.
11. Backfill temporary sediment traps.
12. Install water quality control devices and associated drainage pipes.
13. Construct sidewalk.
14. Obtain concurrence with the construction manager that the site has been fully stabilized.
15. Remove all remaining temporary erosion and sediment control devices.
16. Stabilize any areas disturbed by the removal of BMP's
17. Ask the Construction Manager to contact the engineer to complete the engineer's on-site inspection and report.
18. Continue daily inspection reports until the final daily inspection report is signed by the construction manager and submitted.

4.0 CONTROL MEASURES (SECTION 5(b)(1)(B)(iv) OF GENERAL PERMIT)

The stabilization practices, structural practices and maintenance procedures are described on the Grading & Drainage Plan, the Soil Erosion & Sediment Control Plans and the Soil Erosion & Sediment Control Notes & Details. The locations of these control measures will be designed and constructed in accordance with the *Guidelines for Soil Erosion and Sediment Control* published by the Connecticut Council on Soil and Water Conservation.

4.1 Sediment removal controls

Soil Erosion and Sediment Control measures will be installed to mitigate runoff from the site associated with construction. These measures include temporary diversion swales, stone check dams, temporary sediment traps, silt fence with hay-bale protection, inlet protection and construction entrance. Details can be found in the Erosion Control Plan, see Sheet SP-7.

5.0 RUNOFF REDUCTION AND LOW IMPACT DEVELOPMENT INFORMATION (SECTION 5(b)(1)(B)(v) OF GENERAL PERMIT)

The proposed Phase 1 development results in an increase in impervious area of approximately 1.72 acres when compared to existing conditions. The project includes the construction of 2 retention ponds and the installation of Stormceptor water quality control units up-gradient of the Ponds. The Ponds and water quality control units serve to treat the water quality volume from associated contributing drainage areas

These measures will result in an enhancement to the stormwater discharge from the site. Details of these measures can be found on the included plans and Engineering Report. Narratives regarding the purpose and implementation of runoff reduction practices and calculations for proposed ground cover and water quality volumes on site can also be found in the Engineering Report, included in Appendix F of this SWPCP.

6.0 INSPECTION (SECTION 5(b)(1)(B)(vi) OF GENERAL PERMIT)

6.1 Inspection by Qualified Personnel

All construction activities submitting a registration for this general permit shall be inspected initially for Plan implementation and then weekly for routine inspections. Inspectors from the CT-DEEP and the appropriate District may inspect the site for compliance with this general permit at any time construction activities are ongoing and upon completion of construction activities to verify the final stabilization of the site and/or the installation of post-construction stormwater management measures pursuant to Section 6(a) of the general permit.

6.1.1 Plan Implementation Inspections

Within the first 30 days following commencement of the construction activity on the site, the permittee shall contact: (1) the appropriate District; or (2) a qualified soil erosion and sediment control professional or a qualified professional engineer to inspect the site. The site shall be inspected at least once and no more than three times during the first 90 days to confirm compliance with the general permit and proper initial implementation of all controls measures designated in the Plan for the site for the initial phase of construction. For sites not inspected by District personnel, the inspector shall be someone who:

- a. is not an employee, as defined by the Internal Revenue Service in the Internal Revenue code of 1986, of the registrant, and
- b. has not engaged in any activities associated with the preparation, planning, designing or engineering of such plan for soil erosion and sediment control or plan for engineered stormwater management systems on behalf of such registrant, and
- c. is not under the same employ as any person who engaged in any activities associated with the preparation, planning, designing or engineering of such plans and specifications for soil erosion and sediment control or plans and specifications for engineered stormwater management systems on behalf of such registrant, and
- d. has no ownership interest of any kind in the project for which the registration is being submitted.

The permittee may use, if they wish, the same person(s) that provided the Plan Review Certification.

6.1.2 Routine Inspections

The permittee shall routinely inspect the site for compliance with the general permit and the Plan for the site until a Notice of Termination has been submitted. Inspection procedures for these routine inspections shall be addressed and implemented in the following manner. The permittee shall maintain a rain gauge on-site to document rainfall amounts. At least once a week and within 24 hours of the end of a storm that generates a discharge, a qualified inspector (provided by the permittee). As defined in the “Definitions” section (Section 2) of the general permit, shall inspect, at a minimum, the following: disturbed areas of the construction activity that have not been finally stabilized; all erosion and sedimentation control measures; all structural control measures; soil stockpile areas; washout areas and locations where vehicles enter or exit the site. These areas shall be inspected for evidence of, or the potential for, pollutants entering the drainage system and impacts to the receiving waters. Locations where vehicles enter or exit the site shall also be inspected for evidence of off-site sediment tracking. For storms that end on a weekend, holiday or other time after which normal working hours will not commence within 24 hours, an inspection is required within 24 hours only for storms that equal or exceed 0.1 inches. For storms of less than 0.1 inches, an inspection shall occur immediately upon the start of the subsequent normal working hours. Where sites have been temporarily or finally stabilized, such inspection shall be conducted at least once every month for three months.

The qualified inspector(s) shall evaluate the effectiveness of erosion and sediment controls, structural controls, stabilization practices, and any other controls implemented to prevent pollution and determine if it is necessary to install, maintain, or repair such controls and/or practices to improve the quality of stormwater discharges.

6.1.3 Inspection Report

A report shall be prepared and retained as part of the Plan. This report shall summarize: the scope of the inspection; name(s) and qualifications of personnel making the inspection; the date(s) of the inspection; weather conditions including precipitation information; major observations relating to erosion and sediment controls and the implementation of the Plan; a description of the stormwater discharges from the site; and any water quality monitoring performed during the inspection. The report shall be signed by the permittee or his/her authorized representative in accordance with the “Certification of Documents” section of the general permit. A copy(s) of the Weekly Construction Inspection Report is located in Appendix B.

The report shall include a statement that, in the judgment of the qualified inspector(s) conducting the site inspection, the site is either in compliance or out of compliance with the terms and conditions of the Plan and permit. If the site inspection indicates that the site is out of compliance, the inspection report shall include a summary of the remedial actions

required to bring the site back into compliance. Non-engineered corrective actions (as identified in the Guidelines) shall be implemented on site within 24 hours and incorporated into a revised Plan within three calendar days of the date of inspection unless another schedule is specified in the Guidelines. Engineered corrective actions (as identified in the Guidelines) shall be implemented on site within seven days and incorporated into a revised Plan within ten days of the date of inspection, unless another schedule is specified in the Guidelines or is approved by the commissioner. During the period in which any corrective actions are being developed and have not yet been fully implemented, interim measures shall be implemented to minimize the potential for the discharge of pollutants from the site.

7.0 MONITORING (SECTION 5(b)(1)(B)(vii) and 5(c) OF GENERAL PERMIT

7.1 Turbidity Monitoring Requirements

7.1.1 Monitoring Frequency

Sampling shall be conducted at least once every month, when there is a discharge of stormwater from the site while construction activity is ongoing, until final stabilization of the drainage area associated with each outfall is achieved. Sampling is only required during normal working hours. If sampling is discontinued due to the end of normal working hours, sampling shall resume the following morning or the morning of the next working day following a weekend or holiday, as long as the discharge continues. Sampling may be temporarily suspended any time conditions exist that may reasonably pose a threat to the safety of the person taking the sample. Such conditions may include high winds, lightning, impinging wave or tidal activity, intense rainfall or other hazardous condition. Once the unsafe condition is no longer present, sampling shall resume. If there is no stormwater discharge during a month, sampling is not required.

7.1.2 Sample Collection

All samples shall be collected from discharges resulting from a storm event that occurs at least 24 hours after any previous storm event generating a stormwater discharge. Any sample containing snow or ice melt must be identified on the Stormwater Monitoring Report Form, a copy(s) is included in Appendix E. Sampling of snow or ice melt in the absence of a storm event is not a valid sample. Samples shall be grab samples taken at least three separate times during a storm event and shall be representative of the flow and characteristics of the discharge(s). Samples may be taken manually or by an in-situ turbidity probe or other automatic sampling device equipped to take individual turbidity readings (i.e. not composite). The first sample shall be taken within the first hour of stormwater discharge from the site. In cases where samples are collected manually and the discharge begins outside of normal working hours, the first sample shall be taken at the start of normal working hours.

7.1.3 Sampling Locations

Sampling is required of all point source discharges of stormwater from disturbed areas. Where there are two or more discharge points that discharge substantially identical runoff, based on similarities of the exposed soils, slope, and type of stormwater controls used, a sample may be taken from just one of the discharge points. In such case, the permittee shall report that the results also apply to the substantially identical discharge point(s). No more than 5 substantially identical outfalls may be identified for one representative discharge. If such project is planned to continue for more than one year, the permittee shall rotate twice per year the location where samples are taken so that a different discharge point is sampled every six months. The Plan must identify each outfall authorized by this permit and describe the rationale for any substantially identical outfall determinations. All sampling point(s) shall be identified in the Plan and be clearly marked in the field with a flag, stake, or other visible marker.

Sampling and analysis shall be prescribed by 40 CFR Part 136.

7.1.4 Turbidity Values

The stormwater discharge turbidity value for each sampling point shall be determined by taking the average of the turbidity values of all samples taken at that sampling point during a given storm.

7.2 Stormwater Monitoring Reports

Within 30 days following the end of each month, the permittee shall enter the stormwater sampling result(s) on the Stormwater Monitoring Report (SMR) form (available at www.ct.gov/deep/stormwater) and submit it in accordance with the NetDMR provisions in subsection 7.2.1, below, or, if the permittee has opted out of NetDMR, to the following address:

Bureau of Materials Management and Compliance Assurance
Water Permitting and Enforcement Division (Attn: DMR Processing)
Connecticut Department of Energy and Environmental Protection
79 Elm Street
Hartford, CT 06106-5127

If there was no discharge during any given monitoring period, the permittee shall submit the form as required with the words “no discharge” entered in place of the monitoring results.

If the permittee monitors any discharge more frequently than required by the CTDEEP General Permit, the results of this monitoring shall be included in additional SMRs for the month in which the samples were collected.

If sampling protocols are modified due to the limitations of normal working hours or unsafe conditions, a description of and reason for the modifications shall be included with the SMR.

If the permittee samples a discharge that is representative of two or more substantially identical discharge points, the permittee shall include the names or locations of the other discharge points.

7.3 NetDMR Reporting Requirements

Prior to 180 days after the issuance of the CTDEEP General Permit, the Permittee may either submit monitoring data and other reports to the Department in hard copy form or electronically using NetDMR, a web-based tool that allows Permittees to electronically submit stormwater monitoring reports through a secure internet connection. Unless otherwise approved in writing by the commissioner, no later than 180 days after the issuance of the General Permit the Permittee shall begin reporting electronically using NetDMR. Specific requirements regarding subscription to NetDMR and submittal of data and reports in hard copy form and for submittal using NetDMR are described in Section 5(c)(2)(F) of the CTDEEP General Permit.

7.3.1 Reporting and Record Keeping Requirements

For a period of at least five years from the date that construction is complete, the permittee shall retain copies of the Plan and all reports required by this general permit, and records of all data used to complete the registration for this general permit, unless the commissioner specified another time period in writing. Inspection records must be retained as part of the Plan for a period of five years after the date of inspection.

The permittee shall retain an updated copy of the Plan required by this general permit at the construction site from the date construction is initiated at the site until the date construction at the site is completed.

8.0 CONTRACTORS (SECTION 5(b)(1)(B)(viii) OF GENERAL PERMIT)

Contained in Appendix D is a copy of the certification statement required for all contractors and subcontractors that will perform action on this site.

8.1 Certification Statement

Copies of the certification statement have been included in Appendix C which is required for all contractors and subcontractors that will perform action on this site. This certification shall be signed by each contractor and subcontractor identified in the Plan and will include the name and title of the person providing the signature, the name, address and telephone number of the contracting firm; the address of the site; and the date of the certification.

8.2 Subdivisions

The project site is one contiguous property and therefore this requirement is not applicable.

9.0 IMPAIRED WATERS (SECTION 5(b)(1)(B)(ix) OF GENERAL PERMIT)

Construction activities from this project do not discharge into impaired waters.

10.0 STORMWATER CONTROL MEASURES (SECTION 5(b)(2) OF GENERAL PERMIT)

10.1 Erosion and Sediment Controls (Section 5(b)(2)(A) of General Permit)

The stabilization practices, structural practices and maintenance procedures are described on the Grading & Utility Plan (Sp-3, Sp-4), and Erosion Control Plan (Sp-5, Sp-6). The location of these controls is shown on the above referenced plans. All erosion and sediment

control measures are designed and will be constructed in accordance with the *Guidelines for Soil Erosion and Sediment Control* published by the Connecticut Council on Soil and Water Conservation.

10.1.1 Soil Stabilization and Protection

The soil erosion and sediment control measures that will be proposed as part of this project include geotextile silt fences, temporary sediment traps, stone check dams, temporary diversion swales, construction entrances, dust control measures, riprap stabilization, and inlet protection for existing and proposed drainage features.

10.1.2 Structural Measures

Structural practices included in the Soil Erosion & Sedimentation Control Plans that are intended to divert flows away from exposed soils, store flows and limit runoff and discharge of pollutants from the site include but are not limited to: earth berms, diversion ditches and sediment traps. The temporary sediment traps will be excavated to detain sediment-laden runoff from contributing drainage areas located within the project's limits of disturbance. The sediment traps are proposed in the low-lying areas of each contributing drainage area and have been sized to provide a minimum storage volume of 134 cubic yards per acre of drainage area per *2023 Connecticut Guidelines for Soil Erosion and Sediment Control* and shall be maintained until final stabilization of the contributing area. For additional detail regarding structural practices refer to the Soil Erosion & Sedimentation Control Plans (2.31 and 2.32) and the Soil Erosion & Sedimentation Control Notes & Details (2.41, 2.42, and 2.43).

10.1.3 Maintenance

The contractor shall be responsible for the proper construction and stabilization, and maintenance of all temporary erosion and sediment control measures and related items, and shall also be responsible for the proper construction and stabilization of all pertinent erosion and sedimentation control measures and related items.

The contractor shall also issue a report summarizing the scope of his inspection, time, personnel used, observations and action taken for each inspection. These reports shall be retained as part of the erosion and sedimentation control plan.

The silt fence shall be inspected once every seven calendar days or after every storm event producing 0.1 inches of rainfall or greater. Any necessary repairs shall be made immediately. Accumulated sediments shall be removed as required to keep the fence functional. Deposits shall be removed when accumulations reach one-half the above ground height of the fence. Undercutting or erosion of the toe anchor shall be replaced immediately with rock filters.

The stabilized construction entrances shall be inspected at the end of each workday. The thickness shall be constantly maintained to the specified thickness by adding additional rock. A stockpile of rock material shall be maintained on-site for this purpose. At the end of each workday, any sediment deposited on the public roadways shall be removed and returned to the construction site. Washing of the roadway with water shall not be permitted.

Inlet filters shall be inspected once a week or after every storm event, whichever comes first. Any necessary repairs shall be made immediately. Accumulated sediments shall be removed as required to keep the filter functional.

11.0 DEWATERING WASTEWATERS (SECTION 5(b)(2)(B) OF GENERAL PERMIT)

According to the Geotechnical Report done by Coastal Materials Testing Lab, and Terracon Nationwide in August of 2024. The logs of these wells, numbered , are attached (see Appendix G for full report) and the locations noted on the test pit location plan. That investigation reported silty sand with gravel, cobbles, and boulders. Bedrock (Gneiss / Schist) has been found at approximately 9-10 feet below existing grade elevations in much of the site.

Groundwater was observed in the one test pits at elevation 170 near the proposed Texas Roadhouse near the stream and seems to be water pitched in the ledge. Therefore, little of no dewatering is anticipated.

12.0 POST CONSTRUCTION STORMWATER MANAGEMENT (SECTION 5(B)(2)(C) OF GENERAL PERMIT)

12.1 Runoff Reduction and Low Impact Development Practices

A proposed stormwater conveyance system, consisting of a series of pipes and catch basins, will collect the majority of the runoff from the proposed impervious areas. These areas include the proposed roof, driveways and parking fields.

Methods for runoff reduction and low impact development on site include drainage swales and catch basins with minimum two-foot sumps. These measures will result in an enhancement to the stormwater discharge from the site.

12.2 Suspended Solids and Floatables Removal

In an effort to improve the quality of the stormwater discharged from the site, the project will include Stormceptor water quality units, hooded catch basins with two-foot sumps,

and vegetated drainage swales. These stormwater quality measures are intended to provide removal of suspended solids before runoff reaches Long Island Sound.

13.0 OTHER CONTROLS (SECTION 5(b)(2)(D) OF GENERAL PERMIT)

13.1 Waste Disposal

Best management practices shall be implemented to minimize the discharge of litter, debris, building materials, hardened concrete waste, or similar materials to waters of the State. These include periodic inspections by the contractor and removal of all debris within 24 hours of inspection.

13.2 Washout Areas

Washout of applicators, containers, vehicles and equipment for concrete, paint and other materials shall be conducted in a designated washout area. There shall be no surface discharge of washout wastewaters from this area. Such washout shall be conducted: (1) outside of any buffers and at least 50 feet from any stream, wetland or other sensitive resource; or (2) in an entirely self-contained washout system. The permittee shall clearly flag off and designate areas to be used for washing and conduct such activities only in these areas. The permittee shall direct all wash water into a container or pit designed such that no overflows can occur during rainfall or after snowmelt.

In addition, dumping of liquid wastes in storm sewers is prohibited. The permittee shall move and dispose of hardened concrete waste consistent with practices developed for the "Waste Disposal" section (subparagraph 13.1 above). At least once per week, the permittee must inspect any containers or pits used for washout to ensure structural integrity, adequate holding capacity, and to check for leaks or overflows. If there are signs of leaks, holes or overflows in the containers or pits that could lead to a discharge, the permittee shall repair them prior to further use. For concrete washout areas, the permittee shall remove hardened concrete waste whenever the hardened concrete has accumulated to a height of half of the container or pit or as necessary to avoid overflows.

13.3 Vehicle Tracking

Off-site vehicle tracking of sediments and the generation of dust shall be minimized. Wet dust suppression shall be used, in accordance with section 22a-174-18(b) of the Connecticut General Statutes, for any construction activity that causes airborne particulates. The volume of water sprayed for controlling dust shall be minimized so as to prevent the runoff of water. No discharge of dust control water shall contain or cause visible oil sheen, floating solids, visible discoloration, or foaming in the receiving stream.

13.4 Post-Construction

All post-construction stormwater structures shall be cleaned of construction sediment and any remaining silt fence shall be removed upon stabilization of the site.

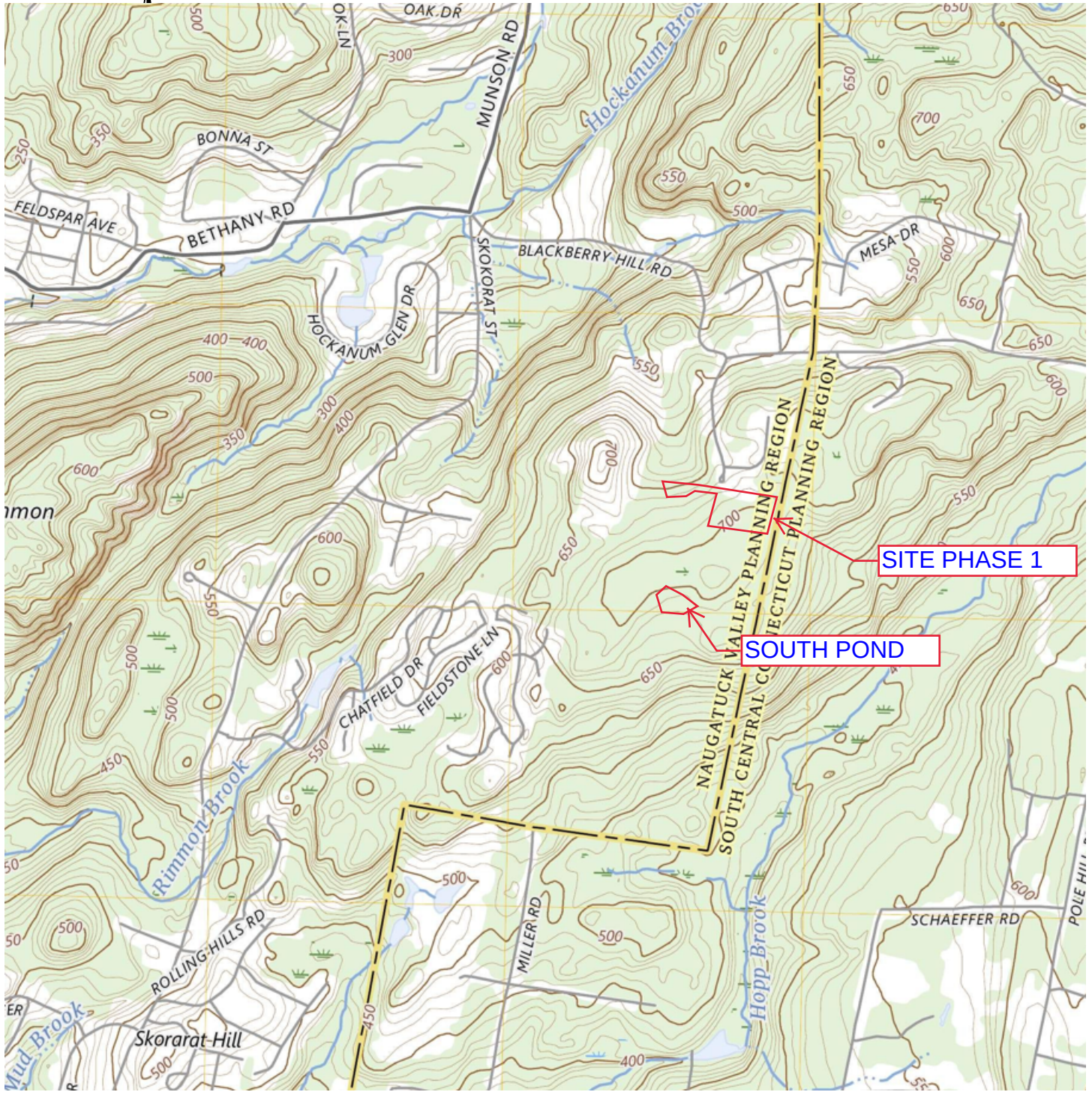
All chemical and petroleum product containers stored on the site (excluding those contained within vehicles and equipment) shall be provided with impermeable containment which will hold at least 110% of the volume of the largest container, or 10% of the total volume of all containers in the area, whichever is larger, without overflow from the containment area. All chemicals and their containers shall be stored under a roofed area except for those chemicals stored in containers of 100 gallon capacity or more, in which case a roof is not required. Double-walled tanks satisfy this requirement.

14.0 NOTICE OF TERMINATION FORM

At the conclusion of Site construction and within *30 days of the last Site inspection* of construction activities and cleaning out of all stormwater control structures, a Notice of Termination Form (see Appendix H) shall be completed and submitted to the CTDEEP. A copy of the receipt of the Notice of Termination Form or other correspondence associated to/or from CT DEEP shall be placed in the Appendix E of the Stormwater Pollution Control Plan Notebook.

LIST OF FIGURES

Site Location Map (Figure 1)
Natural Diversity Data Base Map (Figure 2)



ROSE
•TISO
& CO. LLC.
ARCHITECTS • SURVEYORS • ENGINEERS

WWW.ROSETISO.COM
38 BIRCHWOOD AVENUE, SUITE 3, FAIRFIELD, CT 06824
TEL: (203) 610-6262 • FAX: (203) 610-6404

HOPP BROOK ESTATES
PHASE 1
22 OAKWOOD DRIVE
BEACON FALLS CT

DRAWN BY: SFS
CHECKED BY: MJS
CAD FILE:
DESIGN BY: SFS
SCALE: 1"=2,000'
DATE: 05-22-25

FIGURE:

1

Natural Diversity Data Base Areas

BEACON FALLS, CT
December 2025

-  State and Federal Listed Species
-  Critical Habitat
-  Town Boundary

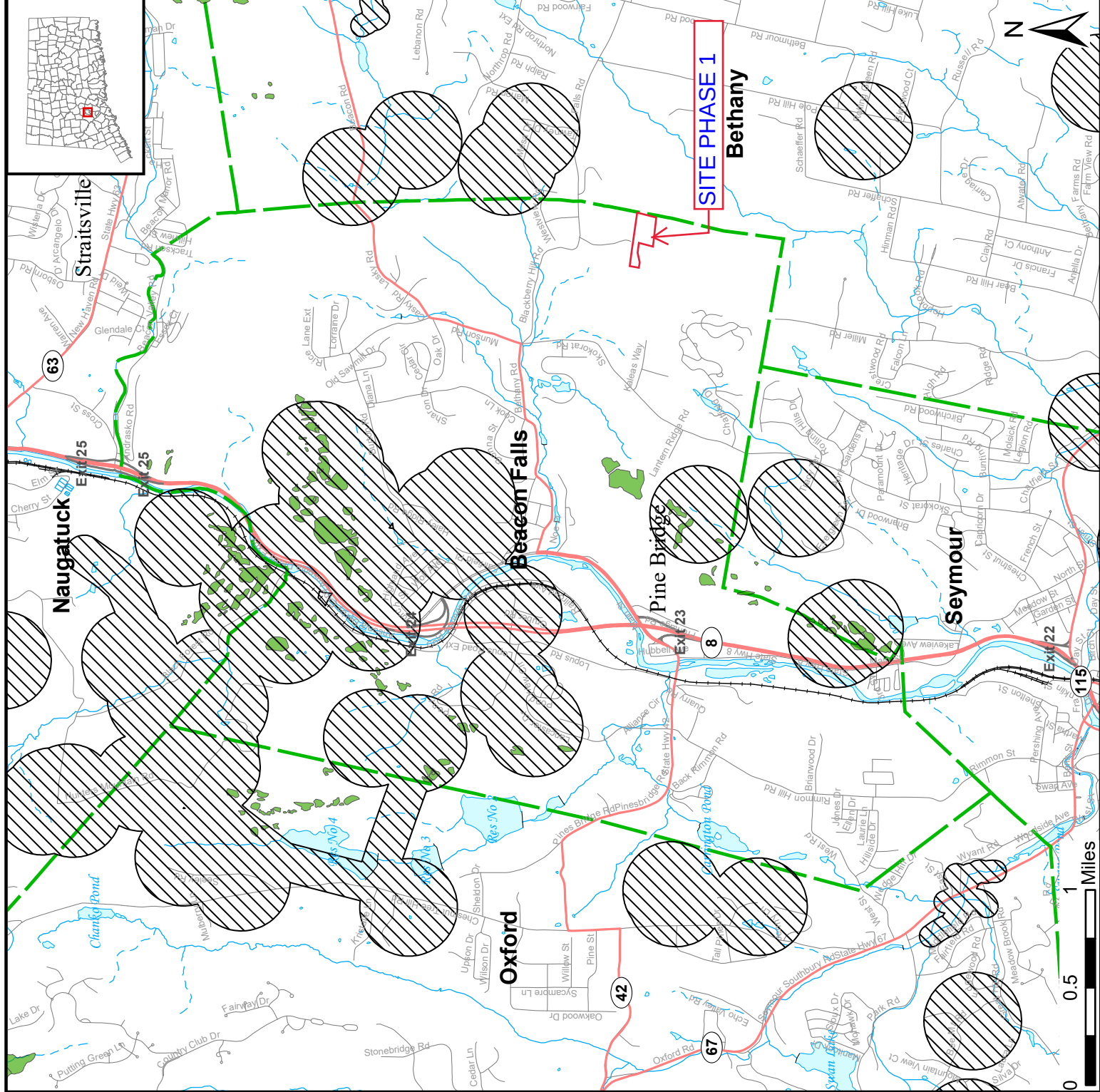
NOTE: This map shows known locations of State and Federal Listed Species and Critical Habitats. Information on listed species is collected and compiled by the Natural Diversity Data Base (NDDB) from a variety of data sources. Exact locations of species have been buffered to produce the generalized locations.

This map is intended for use as a preliminary screening tool for conducting a Natural Diversity Data Base Review Request. To use the map, locate the project boundaries and any additional affected areas. If the project is within a hatched area there may be a potential conflict with a listed species. For more information, use DEEP ezFile <https://efilings.deep.ct.gov/DEEPPortal/> to submit a Request for Natural Diversity Data Base State Listed Species Review or Site Assessment. More detailed instructions are provided along with the request form on our website.

<https://portal.ct.gov/deep-nddbrequest>

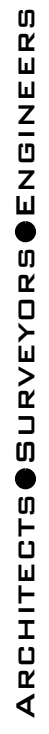
Use the CTECO Interactive Map Viewers at <http://cteco.uconn.edu> to more precisely search for and locate a site and to view aerial imagery with NDDB Areas.

QUESTIONS: Department of Energy and Environmental Protection (DEEP)
79 Elm St, Hartford, CT 06106
email: deep.nddbrequest@ct.gov
Phone: (860) 424-3011



LIST OF DRAWINGS

Site Layout Plan (SP-0,SP-1 thru Sp-1d)
Grading & Utility Plan (SP-2, thru Sp-2d)
Erosion Control Plan (SP-3 thru ,Sp-3d & SP-7)



WWW.ROSETISO.COM
35 BRENTWOOD AVENUE, FAIRFIELD, CT 06825
TEL: (203) 610-6262 • FAX: (203) 610-6404

REVIEWS	
702	WETLANDS DOCUMENTATION
8	STAFF COMMENTS
9	STAFF COMMENTS
10	STAFF COMMENTS
11	STAFF COMMENTS
12	ENGINEERING COMMENTS
13	LOT LINES ADDED
14	ENGINEERING COMMENTS
15	ROAD EXPOSURE, OFFICE & ROAD VIEWS
16	PERVIOUS LOT / PHASE LINES RESTORED
17	WATER TOWER REMOVED
18	ISSUED TO HEALTH DEPT FOR PH1 PERM
19	ALL PROPOSED SEPTIC LOCATION ADDED
20	HEALTH DEPARTMENT COMMENTS

PROJECT TITLE

HOPP BROOK ESTATES FINAL SITE PLANS

**OAKWOOD LANE
BEACON FALLS, CT.**

Prepared For:

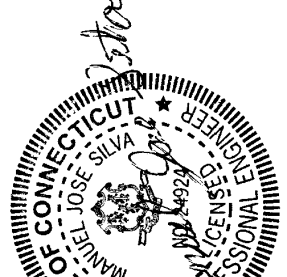
HOPP BROOK DEVELOPERS LLC

37111 133HS

OVERALL PROPERTY MAP

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CHECKED BY: MJS	PROJECT NUMBER: 2215
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SEAL



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8.	MJS 08-05-21	STAFF COMMENTS
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10.	MJS 6-21-24	STAFF COMMENTS
11.	MJS 9-27-24	STAFF COMMENTS
12.	MJS 10-24-24	ENGINEERING COMMENTS
13.	MJS 12-13-24	LOT LINES ADDED
14.	MJS 02-12-25	ENGINEERING COMMENTS
15.	MJS 06-04-25	ROAD ESPALANDE, OFFICE & ROAD NAMES
16.	MJS 06-19-25	PERVIOUS LOT/ PHASE LINES RESTORED
17.	MJS 07-15-25	WATER TOWER REMOVED
18.	MJS 11-18-25	ISSUED TO HEALTH DEPT FOR PH1 PERMIT
19.	MJS 02-10-26	ALL PROPOSED SEPTIC LOCATION ADDED
20.	MJS 05-06-26	HEALTH DEPARTMENT COMMENTS

HOPP BROOK ESTATES
FINAL SITE PLANS

OAKWOOD LANE
BEACON FALLS, CT.

Prepared For:

HOPP BROOK DEVELOPERS LLC

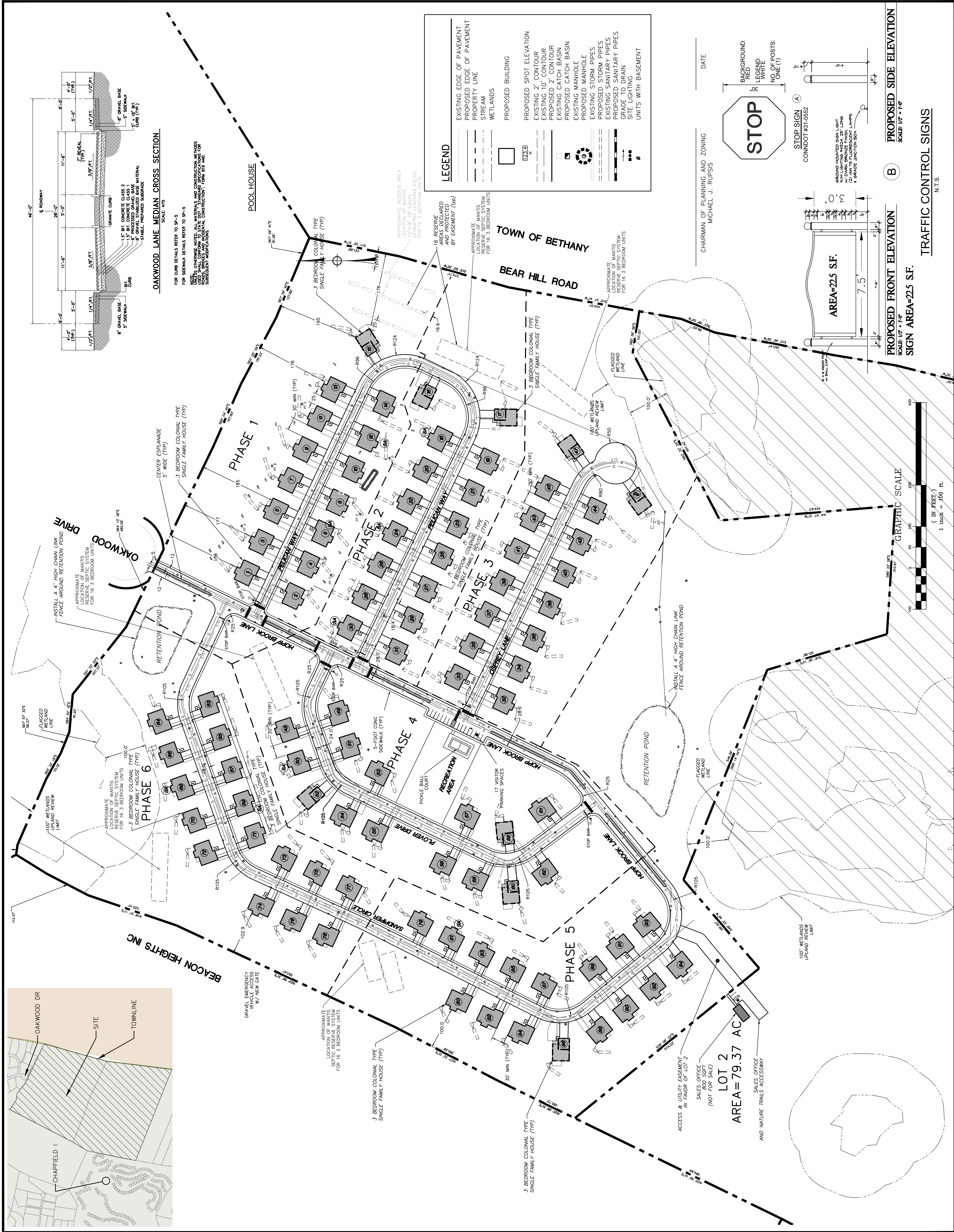
PHASE PLAN

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19.	MJS 02-10-26	ALL PROPOSED SEPTIC LOCATION ADDED
20.	MJS 05-06-26	HEALTH DEPARTMENT COMMENTS

PROJECT TITLE

HOPP BROOK ESTATES
FINAL SITE PLANS

OAKWOOD LANE
BEACON FALLS, CT.

Prepared For:
HOPP BROOK DEVELOPERS LLC

SHEET TITLE

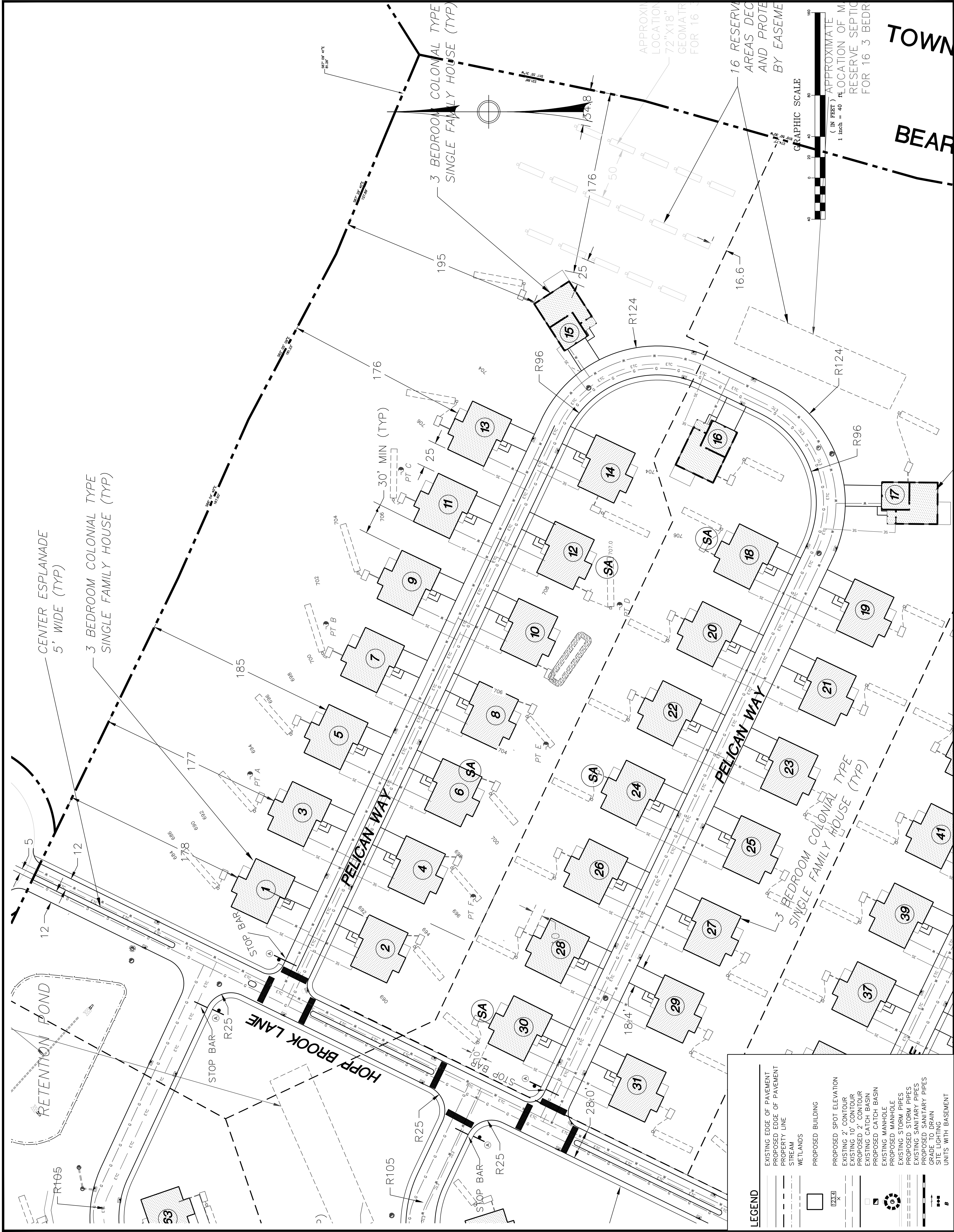
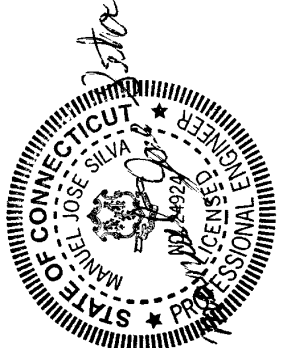
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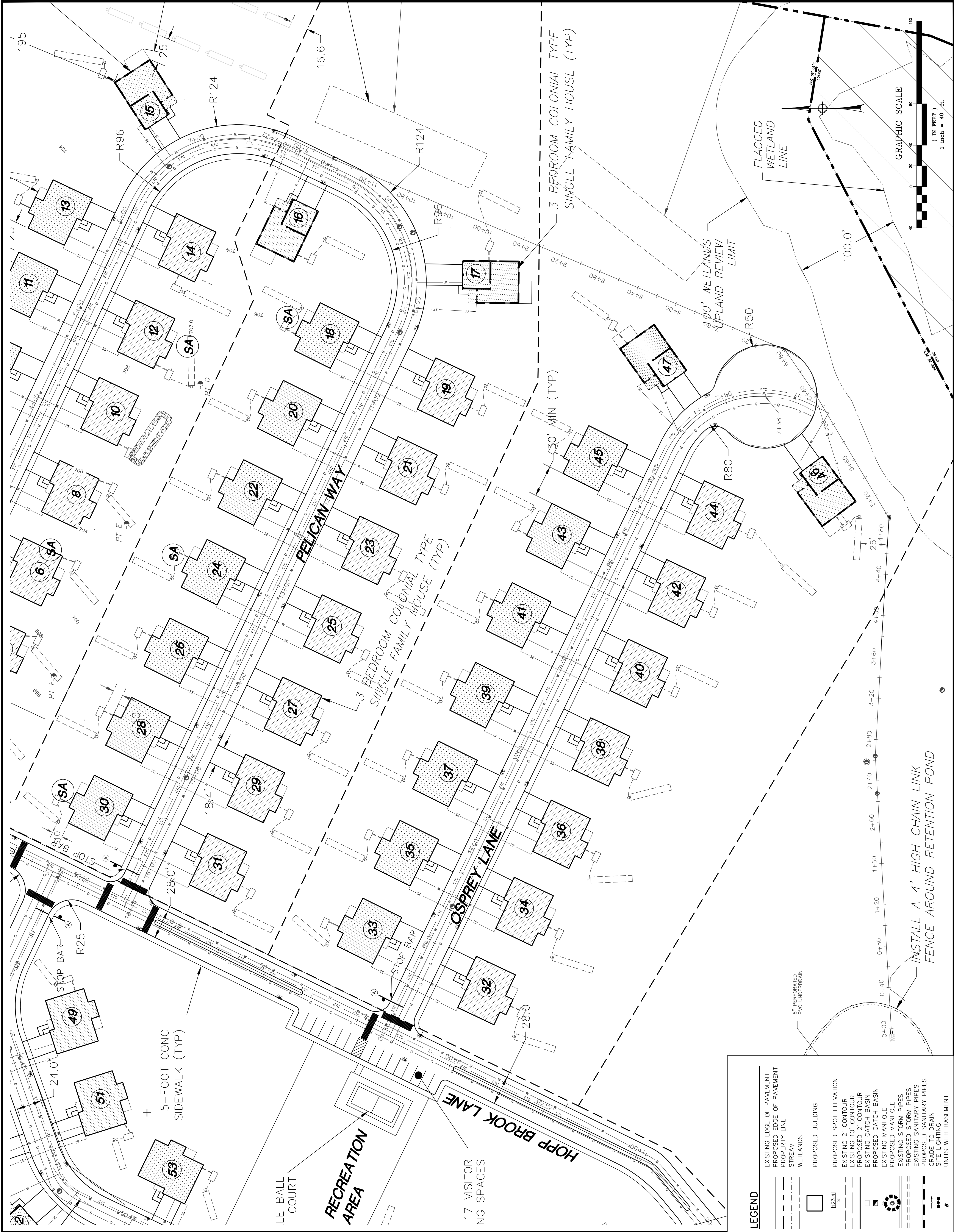
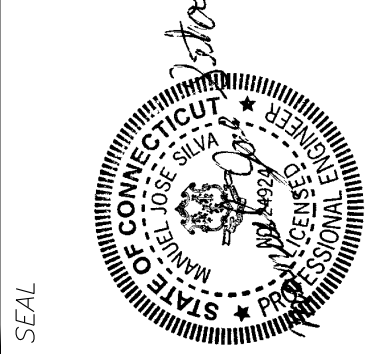


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19.	WIS 02-10-26 ALL PROPOSED SEPTIC LOCATIONS ADDED
20.	WIS 05-06-26 HEALTH DEPARTMENT COMMENTS

HOPP BROOK DEVELOPERS LLC

SITE PLAN

DESIGNED BY: MJS	SCALE: 1"=40'
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PROJECT TITLE

HOPP BROOK ESTATES
FINAL SITE PLANS

OAKWOOD LANE
BEACON FALLS, CT.

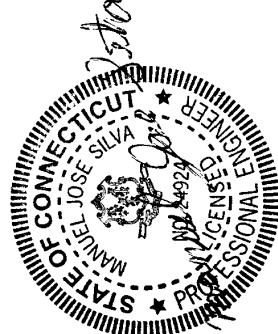
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SHEET TITLE

GRADING & UTILITY PLAN

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SHEET NUMBER

SP-2



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13.	MJS 12-13-24	LOT LINES ADDED
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PROJECT TITLE

HOPP BROOK ESTATES
FINAL SITE PLANS

OAKWOOD LANE
BEACON FALLS, CT.

Prepared For:
HOPP BROOK DEVELOPERS LLC

SHEET TITLE

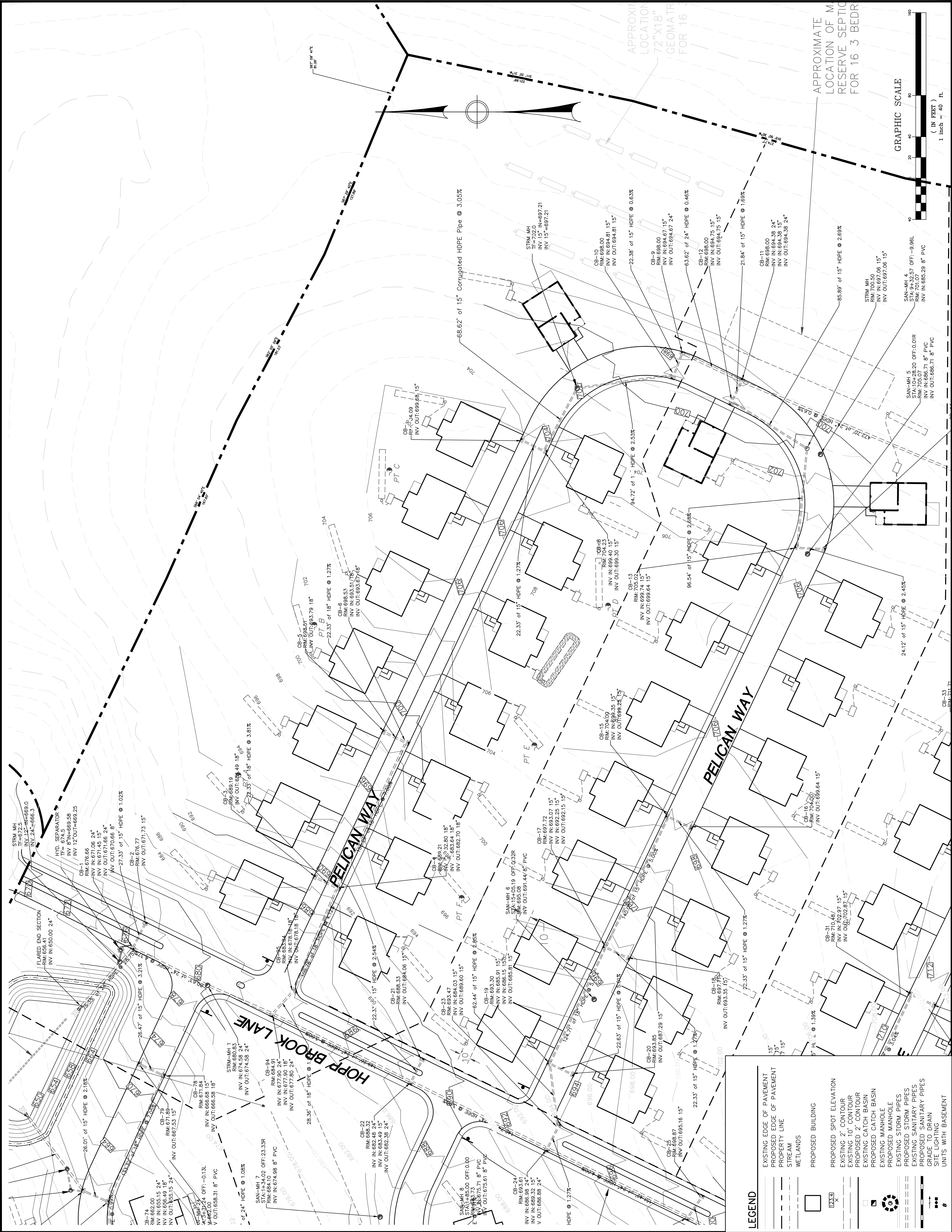
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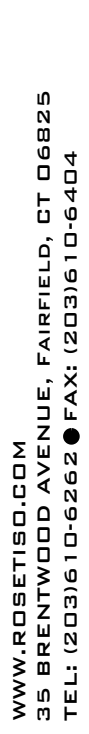
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SP-2a





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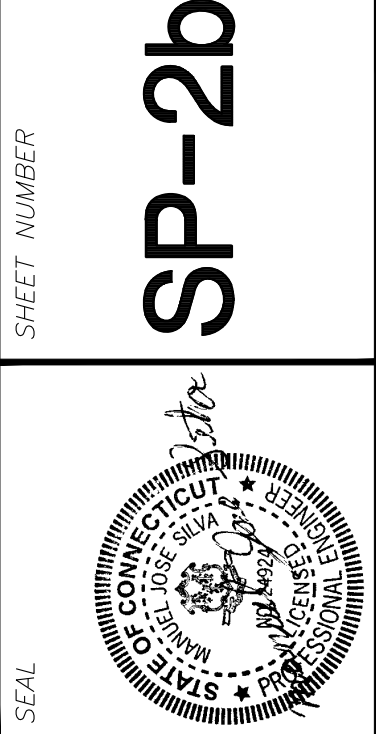
HOPP BROOK ESTATES FINAL SITE PLANS

OAKWOOD LANE
BEACON FALLS, CT.

Prepared For:
HOPP BROOK DEVELOPERS LLC

GRADING & UTILITY PLAN

DESIGNED BY: MJS	SCALE: 1"=40'
DRAWN BY: MJS	DATE: 2-23-18
CHECKED BY: MJS	PROJECT NUMBER: 2215
CAD FILE: 2215	





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REVIEWS	
19.	MUS 03-04-21 WETLANDS/RESUMPTION
8.	MUS 08-05-21 STAFF COMMENTS
9.	MUS 11-23-23 STAFF COMMENTS
10.	MUS 6-21-24 STAFF COMMENTS
11.	MUS 9-27-24 STAFF COMMENTS
12.	MUS 10-24-24 ENGINEERING COMMENTS
13.	MUS 12-13-24 LOT LINES ADDED
14.	MUS 02-12-25 ENGINEERING COMMENTS
15.	MUS 06-04-25 ROAD EXCHANGE, OFFICE & ROAD NAMES
16.	MUS 09-19-25 PERVIOUS LOT, PHASE LINES RESTORED
17.	MUS 07-15-25 WATER TOWER REMOVED
18.	MUS 11-18-25 ISSUED TO HEALTH DEPT FOR PH1 PERMIT
19.	MUS 02-10-26 ALL PROPOSED SEPTIC LOCATIONS ADED
20.	MUS 05-06-26 HEALTH DEPARTMENT COMMENTS

PROJECT TITLE

HOPP BROOK ESTATES FINAL SITE PLANS

OAKWOOD LANE
BEACON FALLS, CT

Prepared For:

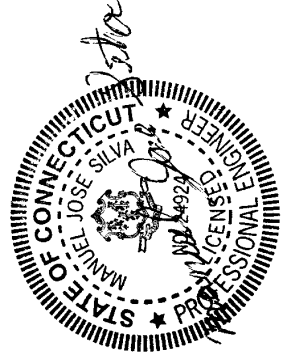
HOPP BROOK DEVELOPERS LLC

SHEET TITLE

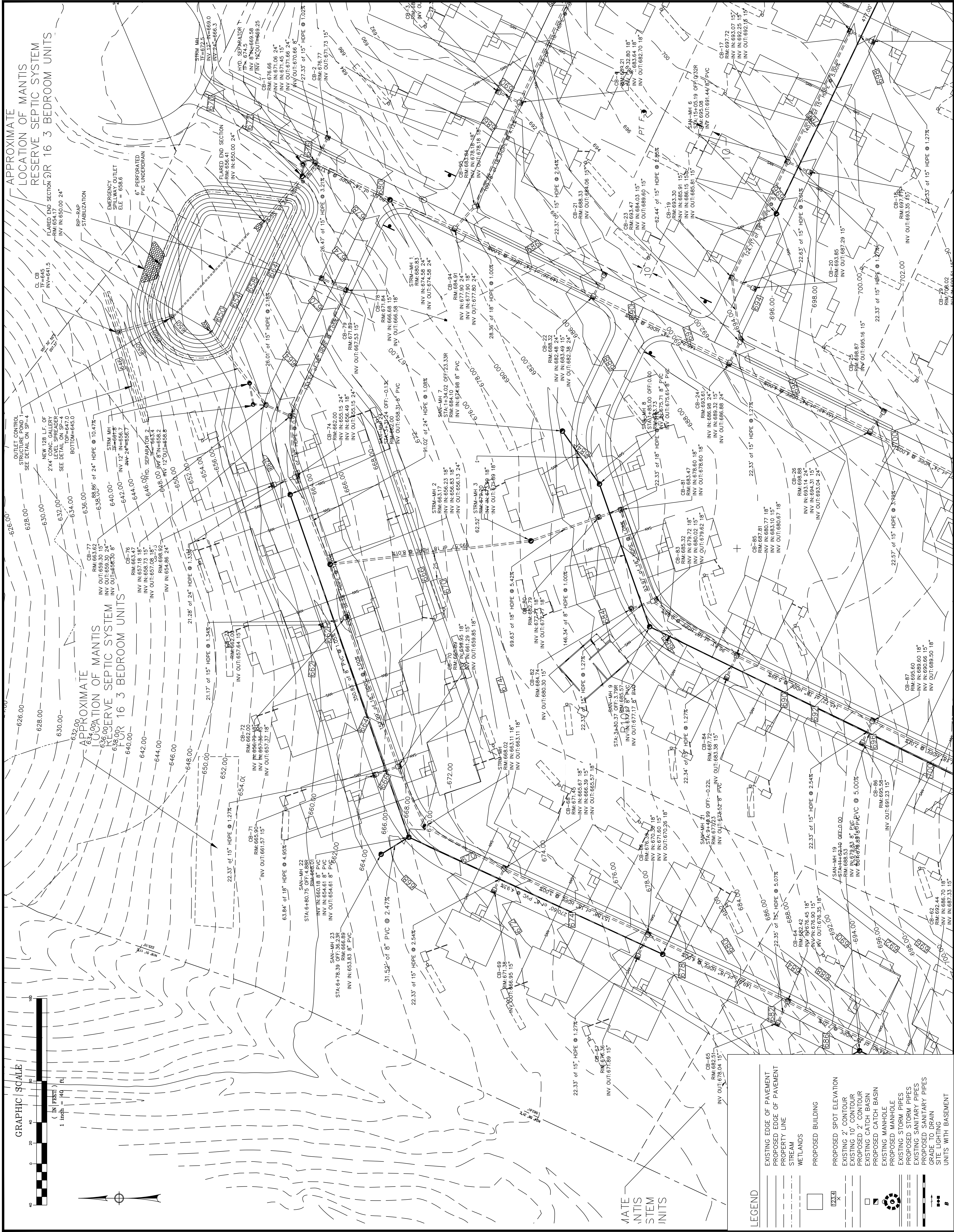
GRADING & UTILITY PLAN

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SFAI SHEET NUMBER



SP-20





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REVIEWS	
7/20/18	0.5-0.8E-21 NETLANDS RECOMMENDATION
8/1/18	MUS 08-05-21 STAFF COMMENTS
9/1/18	MUS 11-23-23 STAFF COMMENTS
10/1/18	MUS 6-21-24 STAFF COMMENTS
11/1/18	MUS 9-27-24 STAFF COMMENTS
12/1/18	MUS 10-24-24 ENGINEERING COMMENTS
1/2/19	MUS 12-13-24 LOD LINES ADDED
1/14/19	MUS 02-12-25 ENGINEERING COMMENTS
1/15/19	MUS 06-04-25 ROAD RESURFACE, OFFICE & ROAD NAMES
1/16/19	MUS 08-19-25 PERIODIC LOT PHASE LINES RESTORED
1/17/19	MUS 07-19-25 WATER TOWER REMOVED
1/18/19	MUS 11-18-25 ISSUED TO HEALTH DEPT FOR PH1 PERMIT
1/19/19	MUS 02-10-26 ALL PROPOSED SEPTIC LOCATIONS ADDED
2/1/19	MUS 05-08-26 HEALTH DEPARTMENT COMMENTS

HOPP BROOK ESTATES FINAL SITE PLANS

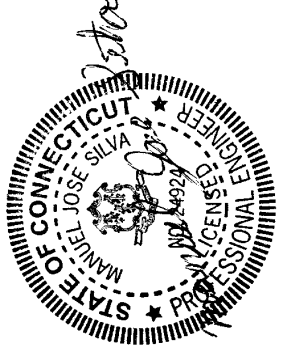
OAKWOOD LANE
BEACON FALLS, CT.

Prepared For:

HOPP BROOK DEVELOPERS LLC

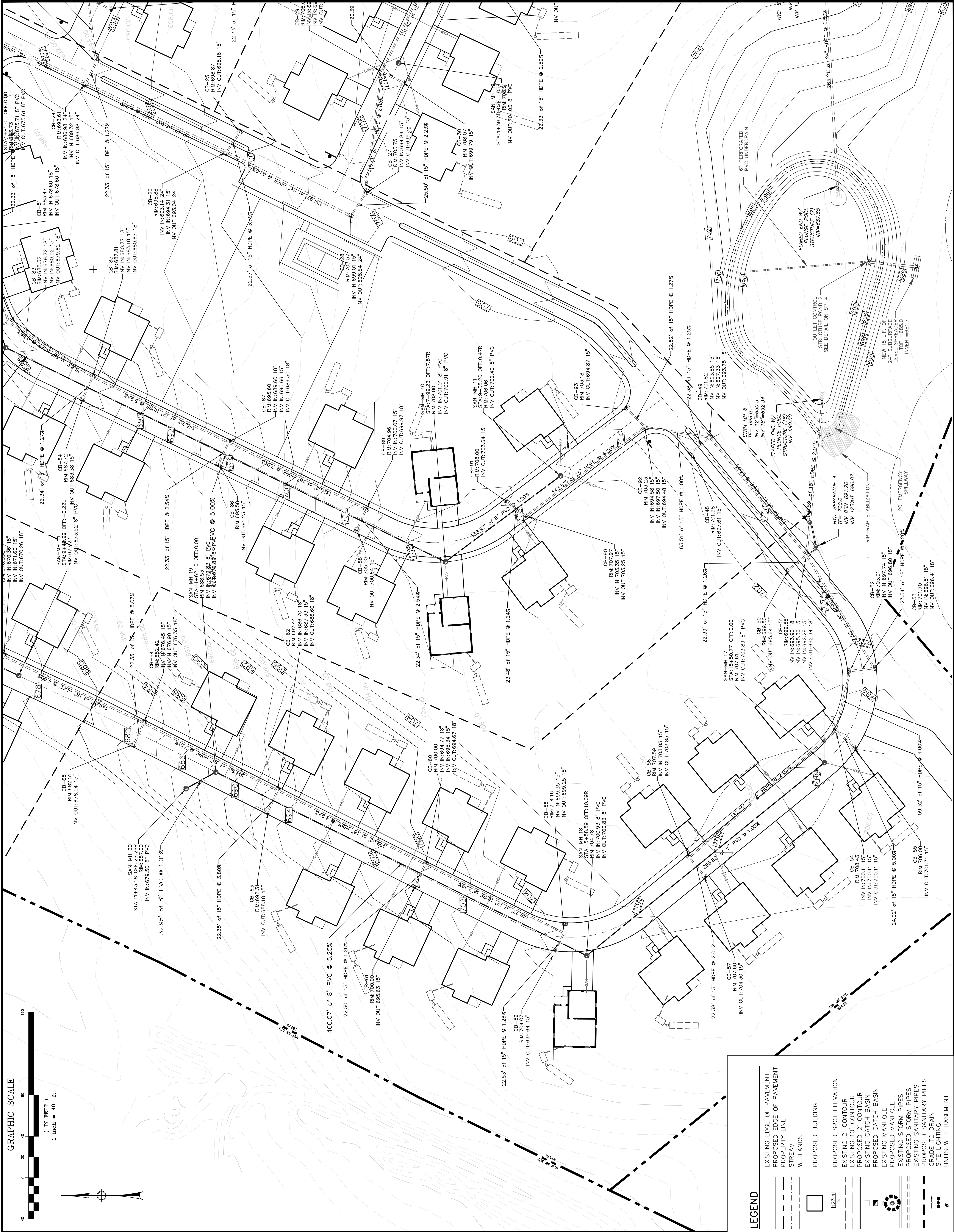
GRADING & UTILITY PLAN

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SHEET NUMBER

SP-2d





REVISIONS	
NO.	DATE/DESCRIPTION
1.	W/2, W/3 03-08-15-21 WETLANDS RECONSTRUCTION
8.	W/3 08-05-21 STAFF COMMENTS
9.	W/3 11-23-23 STAFF COMMENTS
10.	W/3 6-21-24 STAFF COMMENTS
11.	W/3 9-27-24 STAFF COMMENTS
12.	W/3 10-24-24 ENGINEERING COMMENTS
13.	W/3 12-13-24 LOT LINES ADDED
14.	W/3 02-12-25 ENGINEERING COMMENTS
15.	W/3 06-04-25 ROAD EXPANSION, OFFICE & ROAD NAMES
16.	W/3 06-19-25 PERIODIC LOT / PHASE LINES RESTORED
17.	W/3 07-15-25 WATER TOWER REMOVED
18.	W/3 11-18-25 ISSUED TO HEALTH DEPT FOR PH1 PERMIT
19.	W/3 02-10-26 ALL PROPOSED SEPTIC LOCATIONS ADDED
20.	W/3 05-06-26 HEALTH DEPARTMENT COMMENTS

PROJECT TITLE

HOPP BROOK ESTATES FINAL SITE PLANS

OAKWOOD LANE
BEACON FALLS, CT.

Prepared For:

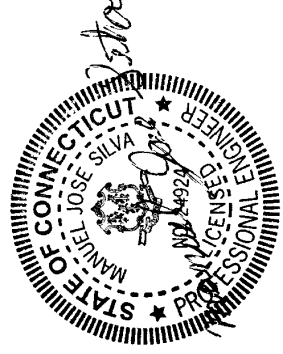
HOPP BROOK DEVELOPERS LLC

37111 133HS

SOIL EROSION CONTROL PLAN

DESIGNED BY: MJS	SCALE: 1"=100'
DRAWN BY: MJS	DATE: 2-23-18
CHECKED BY: MJS	PROJECT NUMBER: 2215
CAD FILE: 2215	

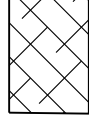
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S

SOILS EROSION NOTE:

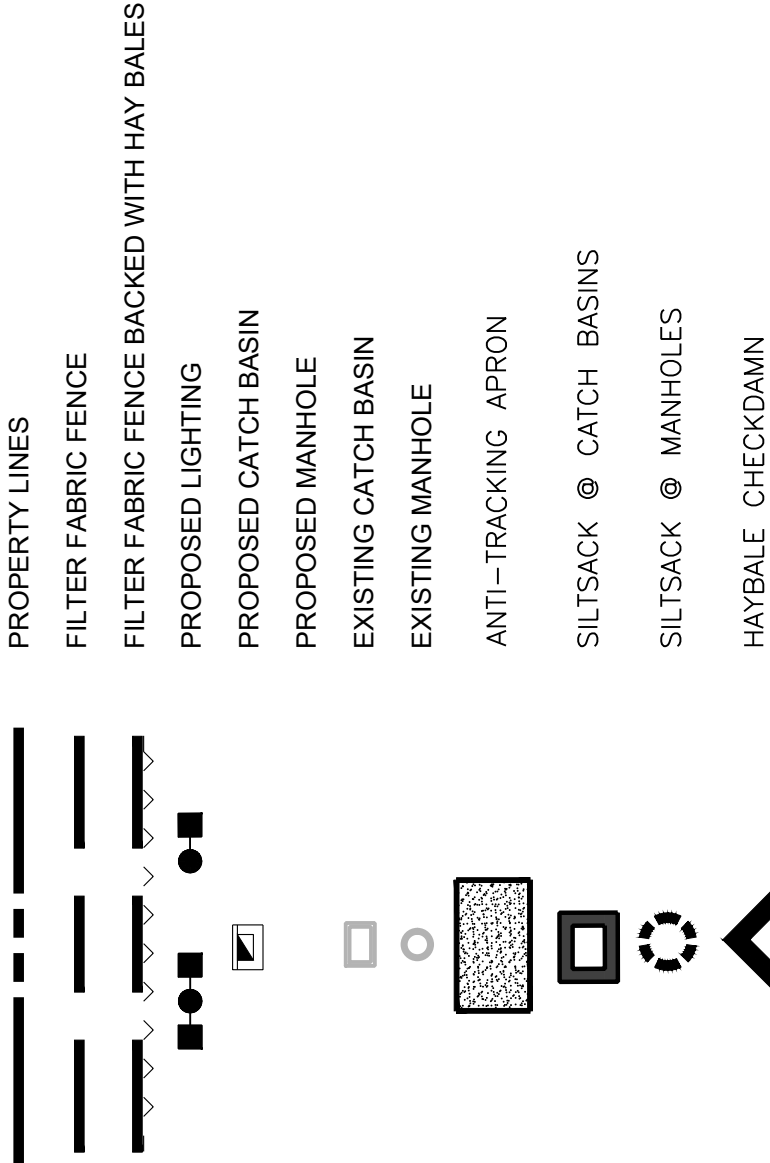
1. GRADES STEEPER THEN 2:1 WILL REQUIRE EROSION CONTROL BLANKETS TO STABILIZE SOILS
2. WATER BARS ARE TO BE USED ALONG ROADWAYS AND GRADES IN EXCESS OF 15%



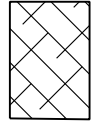
AREAS REQUIRING SOIL EROSION BLANKETS



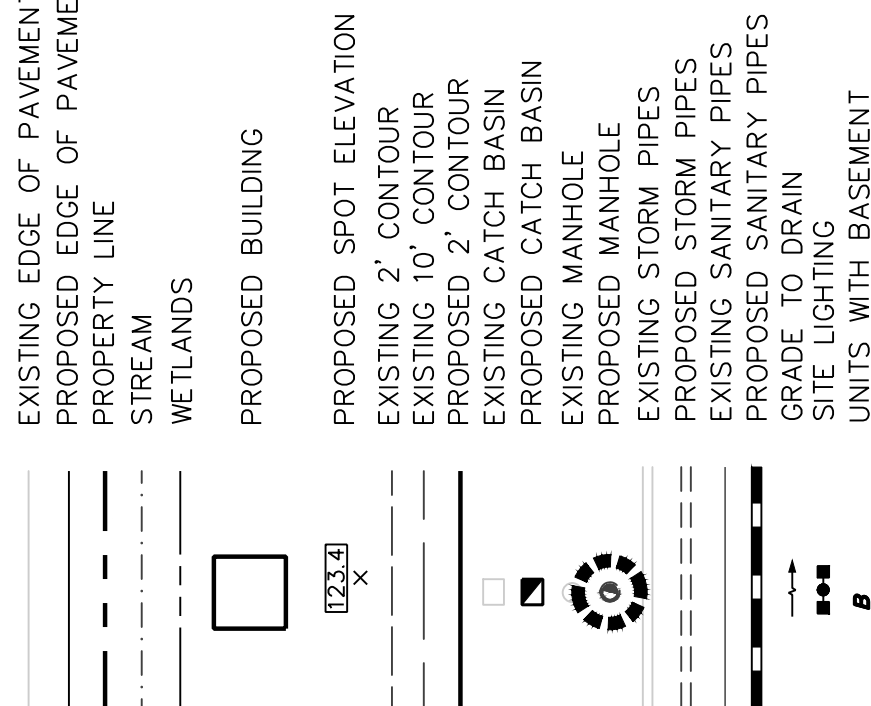
LEGEND



AREAS REQUIRING SOIL EROSION BLANKETS



LEGEND



PROJECT TITLE

OAKWOOD LANE
BEACON FALLS, CT.

SOIL EROSION CONTROL PLAN

SEAL SHEET NUMBER



REVISIONS	
NO.	DATE
1	03-21
2	03-21
3	03-21
4	03-21
5	03-21
6	03-21
7	03-21
8	03-21
9	03-21
10	03-21
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15	03-21
16	03-21
17	03-21
18	03-21
19	03-21
20	03-21

PROJECT TITLE

HOPP BROOK ESTATES
FINAL SITE PLANS

OAKWOOD LANE
BEACON FALLS, CT.

Prepared For:
HOPP BROOK DEVELOPERS LLC

SHEET TITLE

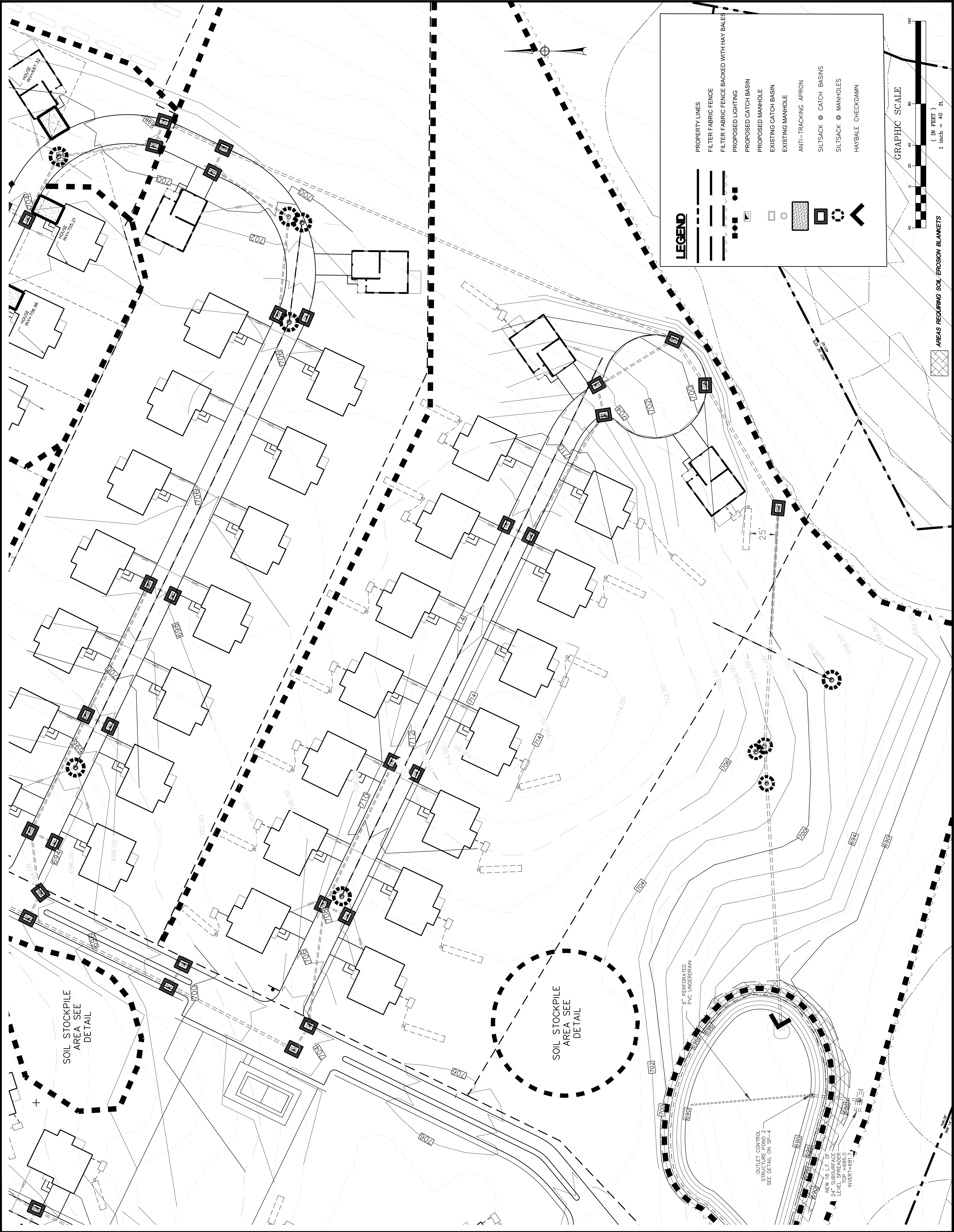
SOIL EROSION
CONTROL PLAN

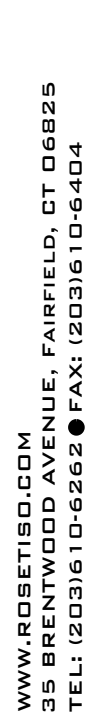
DESIGNED BY: MJS	SCALE: 1"=40'
DRAWN BY: MJS	DATE: 2-23-18
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CAD FILE: 2215	

SEAL

SHEET NUMBER

SP-3b





PROJECT TITLE

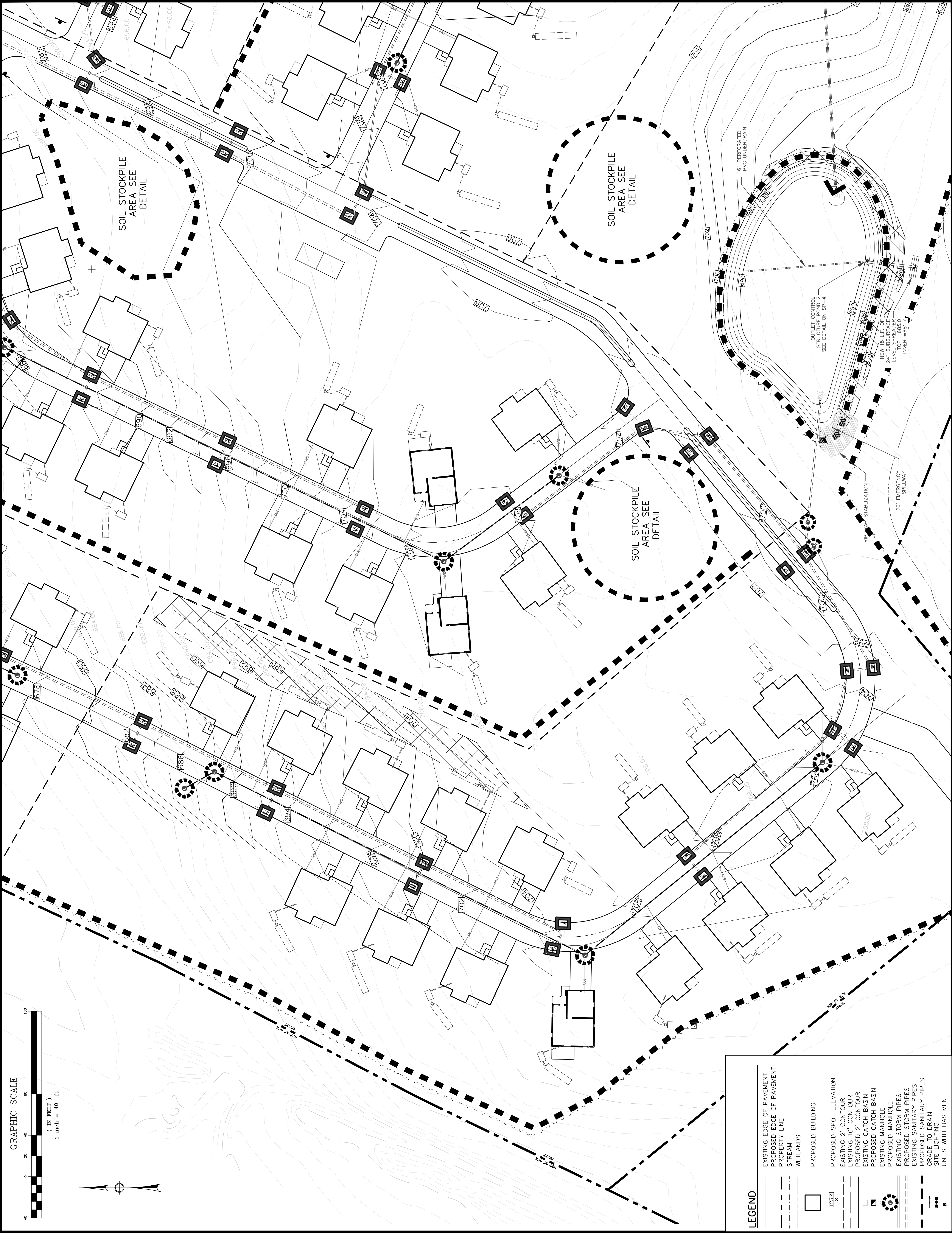
**HOPP BROOK ESTATES
FINAL SITE PLANS**

**OAKWOOD LANE
BEACON FALLS, CT.**

Prepared For:

HOPP BROOK DEVELOPERS LLC

DESIGNED BY: MJS	SCALE: 1"=40'
DRAWN BY: MJS	DATE: 2-23-18
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R

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REVISIONS	
NO. / DATE	DESCRIPTION
8. / MJS 08-05-21	STAFF COMMENTS
9. / MJS 11-23-23	STAFF COMMENTS
10. / MJS 6-21-24	STAFF COMMENTS
11. / MJS 9-27-24	STAFF COMMENTS
12. / MJS 10-24-24	ENGINEERING COMMENTS
13. / MJS 12-13-24	LOT LINES ADDED
14. / MJS 02-12-25	ENGINEERING COMMENTS
15. / MJS 06-04-25	ROAD ESPALADE, OFFICE & ROAD NAMES
16. / MJS 06-19-25	REMOVED LOT / PHASE LINES RESTORED
17. / MJS 07-15-25	WATER TOWER REMOVED
18. / MJS 11-18-25	ISSUED TO HEALTH DEPT FOR PH1 PERMIT
19. / MJS 02-10-26	ALL PROPOSED SEPTIC LOCATION ADDED
20. / MJS 05-06-26	HEALTH DEPARTMENT COMMENTS

PROJECT TITLE

HOPP BROOK ESTATES
FINAL SITE PLANS

OAKWOOD LANE
BEACON FALLS, CT.

Prepared For:
HOPP BROOK DEVELOPERS LLC

SHEET TITLE

SOIL EROSION
CONTROL PLAN

DESIGNED BY: MJS	SCALE: 1"=40'
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SEAL

SHEET NUMBER

SP-3d

PHASING CONSTRUCTION SEQUENCE:

- PHASE 0
1. INSTALL SOIL EROSION CONTROLS IN THE AREA OF THE PROPOSED RETENTION PONDS INCLUDING ANTI-TRACING PAD AT THE SITE ENTRANCE.
 2. CLEAR AND GRUB RETENTION POND AREAS. INSTALL UTILITY CONTROL STRUCTURES, INLETS, LEVELSPREADERS AND SOIL STABILIZING MATS AS REQUIRED.
 3. CONSTRUCT PIPE RUNS FROM BOTH PONDS TO THE PHASE 1 AREA.

PHASE 1

1. INSTALL PHASE 1 SOIL EROSION CONTROLS.
2. CONSTRUCT STORM DRAINAGE AND CONSTRUCT STORM DRAINAGE, AND ALL OTHER UTILITIES.
3. CLEAR AND GRUB INDIVIDUAL HOUSE AREAS AS NEEDED.
4. CONSTRUCT INDIVIDUAL HOUSE PER SEPTIC DRAWINGS
5. CONSTRUCT INDIVIDUAL SEPTIC SYSTEMS PER SEPTIC DRAWINGS
6. CONSTRUCT INDIVIDUAL SEPTIC SYSTEMS PER SEPTIC DRAWINGS
7. CONSTRUCT INDIVIDUAL SEPTIC SYSTEMS PER SEPTIC DRAWINGS
8. LOAM AND SEED ALL PERVIOUS SURFACES
9. REMOVE SOIL EROSION CONTROL EXCEPT FOR PERIMETER REINFORCED SILT FENCE.
10. REMOVE SOIL EROSION CONTROL EXCEPT FOR PERIMETER REINFORCED SILT FENCE.
11. CLEAN UP

PHASE 2

1. INSTALL PHASE 2 SOIL EROSION CONTROLS.
2. CONSTRUCT STORM DRAINAGE AND CONSTRUCT STORM DRAINAGE, AND ALL OTHER UTILITIES.
3. CLEAR AND GRUB INDIVIDUAL HOUSE AREAS AS NEEDED.
4. CONSTRUCT INDIVIDUAL HOUSE PER SEPTIC DRAWINGS
5. CONSTRUCT INDIVIDUAL SEPTIC SYSTEMS WITH IN PHASE 3
6. CONSTRUCT INDIVIDUAL SEPTIC SYSTEMS PER SEPTIC DRAWINGS
7. CONSTRUCT INDIVIDUAL SEPTIC SYSTEMS PER SEPTIC DRAWINGS
8. LOAM AND SEED ALL PERVIOUS SURFACES
9. REMOVE SOIL EROSION CONTROL EXCEPT FOR PERIMETER REINFORCED SILT FENCE.
10. REMOVE SOIL EROSION CONTROL EXCEPT FOR PERIMETER REINFORCED SILT FENCE.
11. CLEAN UP

PHASE 3

1. INSTALL PHASE 3 SOIL EROSION CONTROLS.
2. CONSTRUCT STORM DRAINAGE AND CONSTRUCT STORM DRAINAGE, AND ALL OTHER UTILITIES.
3. CLEAR AND GRUB INDIVIDUAL HOUSE AREAS AS NEEDED.
4. CONSTRUCT INDIVIDUAL HOUSES WITH IN PHASE 3
5. CONSTRUCT INDIVIDUAL SEPTIC SYSTEMS WITH IN PHASE 3
6. CONSTRUCT INDIVIDUAL SEPTIC SYSTEMS PER SEPTIC DRAWINGS
7. CONSTRUCT INDIVIDUAL SEPTIC SYSTEMS PER SEPTIC DRAWINGS
8. LOAM AND SEED ALL PERVIOUS SURFACES
9. REMOVE SOIL EROSION CONTROL EXCEPT FOR PERIMETER REINFORCED SILT FENCE.
10. REMOVE SOIL EROSION CONTROL EXCEPT FOR PERIMETER REINFORCED SILT FENCE.
11. CLEAN UP

PHASE 4

1. INSTALL PHASE 4 SOIL EROSION CONTROLS.
2. CONSTRUCT STORM DRAINAGE AND CONSTRUCT STORM DRAINAGE, AND ALL OTHER UTILITIES.
3. CLEAR AND GRUB INDIVIDUAL HOUSE AREAS AS NEEDED.
4. CONSTRUCT INDIVIDUAL HOUSES WITH IN PHASE 4
5. CONSTRUCT INDIVIDUAL SEPTIC SYSTEMS WITH IN PHASE 4
6. CONSTRUCT INDIVIDUAL SEPTIC SYSTEMS PER SEPTIC DRAWINGS
7. CONSTRUCT INDIVIDUAL SEPTIC SYSTEMS PER SEPTIC DRAWINGS
8. LOAM AND SEED ALL PERVIOUS SURFACES
9. REMOVE SOIL EROSION CONTROL EXCEPT FOR PERIMETER REINFORCED SILT FENCE.
10. REMOVE SOIL EROSION CONTROL EXCEPT FOR PERIMETER REINFORCED SILT FENCE.
11. CLEAN UP

PHASE 5

1. INSTALL PHASE 5 SOIL EROSION CONTROLS.
2. CONSTRUCT STORM DRAINAGE AND CONSTRUCT STORM DRAINAGE, AND ALL OTHER UTILITIES.
3. CLEAR AND GRUB INDIVIDUAL HOUSE AREAS AS NEEDED.
4. CONSTRUCT INDIVIDUAL HOUSES WITH IN PHASE 5
5. CONSTRUCT INDIVIDUAL SEPTIC SYSTEMS WITH IN PHASE 5
6. CONSTRUCT INDIVIDUAL SEPTIC SYSTEMS PER SEPTIC DRAWINGS
7. CONSTRUCT INDIVIDUAL SEPTIC SYSTEMS PER SEPTIC DRAWINGS
8. LOAM AND SEED ALL PERVIOUS SURFACES
9. REMOVE SOIL EROSION CONTROL EXCEPT FOR PERIMETER REINFORCED SILT FENCE.
10. REMOVE SOIL EROSION CONTROL EXCEPT FOR PERIMETER REINFORCED SILT FENCE.
11. CLEAN UP

PHASE 6

1. INSTALL PHASE 6 SOIL EROSION CONTROLS.
2. CONSTRUCT STORM DRAINAGE AND CONSTRUCT STORM DRAINAGE, AND ALL OTHER UTILITIES.
3. CLEAR AND GRUB INDIVIDUAL HOUSE AREAS AS NEEDED.
4. CONSTRUCT INDIVIDUAL HOUSES WITH IN PHASE 6
5. CONSTRUCT INDIVIDUAL SEPTIC SYSTEMS WITH IN PHASE 6
6. CONSTRUCT INDIVIDUAL SEPTIC SYSTEMS PER SEPTIC DRAWINGS
7. CONSTRUCT INDIVIDUAL SEPTIC SYSTEMS PER SEPTIC DRAWINGS
8. LOAM AND SEED ALL PERVIOUS SURFACES
9. REMOVE SOIL EROSION CONTROL EXCEPT FOR PERIMETER REINFORCED SILT FENCE.
10. REMOVE SOIL EROSION CONTROL EXCEPT FOR PERIMETER REINFORCED SILT FENCE.
11. CLEAN UP

PHASE 7

1. INSTALL PHASE 7 SOIL EROSION CONTROLS.
2. CONSTRUCT STORM DRAINAGE AND CONSTRUCT STORM DRAINAGE, AND ALL OTHER UTILITIES.
3. CLEAR AND GRUB INDIVIDUAL HOUSE AREAS AS NEEDED.
4. CONSTRUCT INDIVIDUAL HOUSES WITH IN PHASE 7
5. CONSTRUCT INDIVIDUAL SEPTIC SYSTEMS WITH IN PHASE 7
6. CONSTRUCT INDIVIDUAL SEPTIC SYSTEMS PER SEPTIC DRAWINGS
7. CONSTRUCT INDIVIDUAL SEPTIC SYSTEMS PER SEPTIC DRAWINGS
8. LOAM AND SEED ALL PERVIOUS SURFACES
9. REMOVE SOIL EROSION CONTROL EXCEPT FOR PERIMETER REINFORCED SILT FENCE.
10. REMOVE SOIL EROSION CONTROL EXCEPT FOR PERIMETER REINFORCED SILT FENCE.
11. CLEAN UP

4. MARBRATINE.

Hopp Brook Developers is proposing the construction of a 109 single family homes, located on an ten and five acre tract in Beacon Falls, Connecticut. Currently the property is comprised of a two parcels totaling 135 acres. Parcel 1 is 109.5 acres and Parcel 2 is 25.5 acres. The property is zoned R-1 (Residential Single-Family, 15.97 acres) Also proposed are two retention ponds a northerly one being 95,500 cubic feet and the other southerly being 133,300 cubic feet in size.

The Post Construction runoff coefficient for the site is estimated at 73 to pond 1 & 76 to pond 2

B. DESIGN CRITERIA:

1. Erosion and sedimentation control measures have been located with consideration given to slopes, wetlands, and watercourses, and in accordance with the Connecticut 2002 Guidelines for Soil Erosion and Sediment Control, of the Connecticut Council of Soil and Water Conservation, Latest Edition.
2. Temporary sediment traps/basins are located throughout the project site where initial earth disturbance and ground shaping will be performed. These sediment basins have been sized in accordance with the "2002 Guidelines for Soil and Sediment Control". All sediment traps/basins shall provide a minimum of 134 cubic yards of water storage per acre drained and shall be maintained until final stabilization of the contributing area.

C. INSTALLATION AND/OR APPLICATION PROCEDURES:

1. Erosion and sedimentation control devices and stormwater management facilities shall be constructed in accordance with the project plans and specifications.

D. OPERATION, MAINTENANCE PROGRAM, INSPECTIONS:

1. Prior to any construction, a pre construction conference is to be held among the Design Engineer, the Owners, the Contractor, the Town Engineer, the Wetlands Enforcement Officer, and the Zoning Enforcement Officer to review the erosion and sedimentation control measures to be taken.
2. All revisions after approval has been granted shall be forwarded to the appropriate commissions and the Town Engineer.
3. The Town zoning & wetlands departments shall receive written notification seventy two hours before the start of any construction.
4. All erosion control measures associated with the construction are to be installed and maintained in accordance with the schedule and requirements. Additional control measures shall be installed during the construction period as necessary and required.

5. All soil erosion and sediment control measures must be installed before any construction activities.
6. Filter fabric / silt fence will be installed along the toe of all critical cut and fill slopes.
7. Sediment removed from control measures must be disposed of at a location approved by the design engineer that will not cause additional sedimentation to the surrounding area.
8. Qualified personnel (provided by the Permittee) shall inspect disturbed areas of the construction activity that have not been finally stabilized, structure control measures, and locations where vehicles enter or exit the site at least once every seven (7) calendar days 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 (3) 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 that they are operating correctly. Where discharge locations or points are accessible, they shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving water. Locations where vehicles enter or exit the site shall be inspected for evidence of off-site sediment tracking.
- Based on the results of this inspection, this description of potential sources and pollution prevention measures identified in the plan shall be revised as appropriate or as soon as practicable after such inspection. Such modifications shall provide for timely implementation of any changes to the site plan. The plan shall be revised and the site contents updated in accordance with the findings of the inspection. The plan shall be revised and the site contents updated in accordance with sound engineering practices, the Guidelines and Subsections (4) and (6) (c) i 3) of the Storm Water General Permit.

- A report summarizing the scope of the inspection, named(s) and qualifications of personnel making the inspection, and the results of the inspection, major observations relating to the implementation of the plan for at least three (3) years after the date of inspection. The report shall be signed by the Permittee, or his authorizing representative.

- F. BEST MANAGEMENT PRACTICES: Erosion and sedimentation control measures shall be installed in accordance with the requirements of the general sequence of grading and construction activities, application of soil erosion and sediment control measures, and final stabilization of site as indicated on the plans.
- Relocating of equipment or machinery within twenty-five (25) feet of any wetland or watercourse shall be allowed only by direction of the Engineer. Relocating locations and procedures to be submitted for Commission approval after site contractor has been approved.
- No construction shall proceed until a written proposal of methods to prevent debris, paint, spent blasted materials or other materials from entering the wetland or watercourse has been submitted by the contractor to the Engineer and has been approved by the Engineer, and such methods have been approved by the Engineer. The methods shall be designed to prevent erosion, sedimentation, and environmentally safe manner, in accordance with all applicable Federal and State laws and regulations. The Engineer may order the contractor to cease such activity temporarily if, in the judgment of the Engineer, wind or storm conditions threaten to cause the deposit of materials into a waterway.

- No materials resulting from construction activities shall be placed in or contribute to the degradation of an adjacent wetland or watercourse. Disposal of any material shall be in accordance with Connecticut General Statutes including, but not limited to, Sections 22A-207 through 22A-209 with Connecticut General Statutes including, but not limited to, Sections 22A-207 through 22A-209.
- Fighting of streams with equipment shall be prohibited, except where approved by the Engineer. Equipment used for fighting streams shall be maintained. Where frequent equipment travel on stream banks and beds is necessary, the equipment shall be maintained in good condition and the equipment shall be required grade change will occur and no significant environmental impact will result. Approval will be required for any haul road or temporary structure placed in wetlands or watercourses.

- A construction sequencing plan and a water handling plan, including a contingency plan for flood control, shall be submitted to the Engineer for review and approval. The sequencing plan shall include commencement of any construction in a waterway. Water shall be kept deep enough in the channel to allow for the passage of fish and for the continuous flow of the watercourse as required by the Engineer.
- When dewatering is necessary, pumps shall only discharge directly into the wetlands or watercourse. Prior to dewatering the contractor must submit to the Engineer a written proposal for specific methods and devices to be used, and obtain the Engineer's approval of such method and devices to be used for dewatering activities including, but not limited to, pumping the water into a temporary sedimentation trap, providing surge protection at the inlet and outlet of pumps or treating the water with a chemical to prevent turbidity. The contractor shall be responsible for the cost of such time as means of controlling turbidity is submitted by the contractor and approved by the Engineer and implemented by the contractor.

- Work within and adjacent to watercourses shall be conducted during periods of low flow, whenever possible. Work shall be scheduled to avoid periods of high flow, and the contractor shall be responsible for activity to create shallow flow conditions threaten to cause excessive erosion, siltation or turbidity. The contractor shall make every effort to secure the work site before predicted major storms. A major storm shall be defined as a storm predicted by the NOAA Weather Service with warnings of flooding, severe thunderstorms, or similarly severe weather conditions or effects.
- All temporary fill shall be stabilized during use to prevent erosion and suitably contained to prevent sediment or other particulate matter from entering a wetland or watercourse. All areas affected by temporary fill must be restored to their original contours or is directed to that area and revegetated. The area extent of temporary fill or excavation shall be defined by the Engineer necessary to perform the work, as approved by the Engineer.

10. Dumping of oil, chemicals, or other deleterious materials on the ground is forbidden. The contractor shall provide a means of catching, retaining and properly disposing of drained oil, removed oil filters, or other deleterious material. All spills of such materials shall be reported immediately by the contractor to the DEP.

11. Application of Herbicides or Pesticides must be done by a Connecticut licensed applicator. The contractor shall submit to the Engineer the proposed application schedule, and must receive the Engineer's approval of the proposed applicator before such application is carried out.

12. During spawning seasons, discharges and construction activities in spawning area of the State waters shall be restricted so as not to disturb or inhibit aquatic species which are indigenous to the waters.

C. SOIL STABILIZATION MEASURES:

1. All topsoil not to be used for final grading/handscaped areas shall be removed from the site within 14 days of completion of construction. Topsoil shall be stored in landscaped areas shall be stored/stockpiled in accordance with applicable State and Local laws.
2. All areas within 500 feet of an inhabited dwelling shall be wetted as necessary to provide dust control.

3. Stabilization of all slopes greater than 3:1 shall include hydroseeding of the seed/fertilizer with erosion control matting to be installed as soon as feasible as grading progresses.
4. Sediment disposal areas and topsoil stockpiles not scheduled for construction activities within thirty (30) days shall be stabilized as follows:

- A. Ground limestone at a rate of 135 lbs. per 1,000 s.f.
 - B. Fertilizer at a rate of 14 lbs. per 1,000 s.f. using a 10-20-10 analysis or an equivalent.
 - C. Annual dry grass seeding applied at a rate of not less than 1 lb. per 1,000 s.f.
 - D. Mutch of newly seeded areas with 50 lbs. of salt hay or small grain straw per 1,000 s.f.
5. All disturbed areas are to be provided with at least 4" of topsoil before final seeding.

6. Permanent vegetation is to be seeded or sodded on all exposed areas within ten (10) days after final grading. Mowing is necessary for seed protection and establishment. Lime and fertilizer before permanent seeding.

7. Permanent vegetation:
 - A. Materials specifications for lawn areas:
 - (i) Sod: Minimum of 4" topsoil
 - (ii) Sod: 135 lbs. per 1,000 s.f.
 - (iii) Fertilizer: 14 lbs. per 1,000 s.f. using a 10-20-10 analysis or an equivalent.
 - (iv) Seed: 1 lb. per 1,000 s.f.

Permanent Vegetation — Lawn

Proportion by Weight	Common Name	Grass	Pure s.d.	Seed s.d.
45%	Kentucky Bluegrass	80	85	0.50
45%	Creeping Red Fescue	65	98	0.50
10%	Perennial Ryegrass	90	98	0.50

Permanent Vegetation — Detention Pond, Embankments, Out Slopes, etc. more than 25' from Unit

Seed Mixture	Lbs./Acre	Lbs./1,000 s.f.
Creeping Red Fescue (Pennlawn, Watergreen)	20	.45
Redtop (Streaker, Common)	2	.05
Tall Fescue (Kentucky 31) or Smooth Bromegrass (Saratoga, Lincoln)	20	.45
B. Mowing shall be done at a rate of seventy to ninety pounds per 1,000 s.f. with untreated soil		
C. Liquid mulch binders must be used to anchor salt hay, hay or straw mulches.		
C. Liquid mulch binders must be used to anchor salt hay, hay or straw mulches.		
D. Fill material shall be free from debris, petroleum or combustible material and frozen or wet earth generation of dust.		
E. Construction areas shall be periodically sprayed with water until the surface is wet to control the generation of dust.		
F. Seed preparation: (i) Topsoil should be a minimum of four inches deep (compacted) before seeding. (ii) have topsoil tested for pH, add lime as necessary to achieve pH of 6.5. Apply fertilizer at a rate of 300 pounds per acre or seven pounds per 4,000 s.f. using 10-20-10 or equivalent in dry form. (iii) Topsoil should be 4" deep and 300 pounds per acre or seven pounds per 4,000 s.f. using 10-20-10 or equivalent in dry form. (iv) Work line and fertilizer into soil as neatly as practical to a depth of four inches with a disc, springtooth harrow or other suitable equipment. The final harrowing or discing operation should be on the general contour. Continue all day or silty soil and coarse sands should be raked to firm the seed bed whenever feasible. (v) debris, such as wire, cable, tree roots, places of concrete, blocks, lumps or other unsuitable material (vi) need seed bed just before seeding. If traffic has left soil compact, the area must be reluffed and firmed as above.		

- G. RESPONSIBLE PARTIES:
HOPP BROOK DEVELOPERS, LLC
475 WHITNEY AVE, NEW HAVEN CT 06511
Tel. (203) 562-3111

OAKWOOD LANE
BEACON FALLS, CT.

Prepared For:

HOPP BROOK DEVELOPERS LLC

PROJECT TITLE

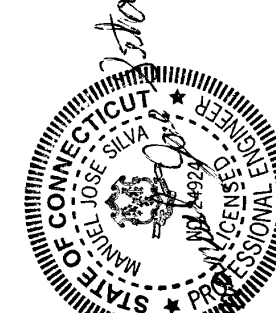
HOPP BROOK ESTATES
FINAL SITE PLANS

SHEET TITLE

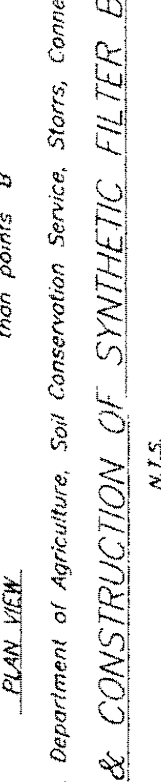
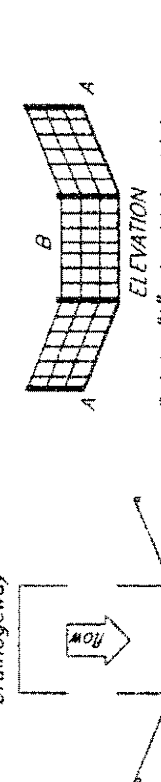
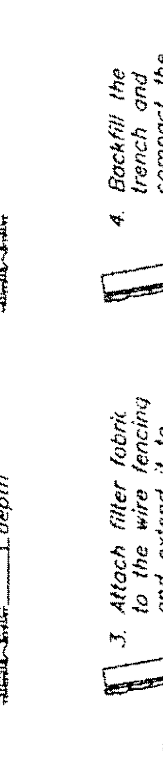
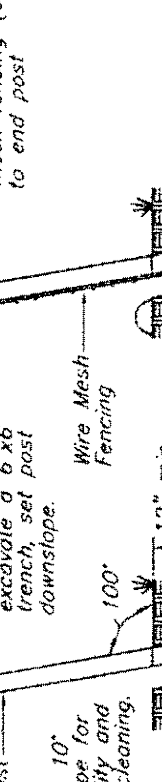
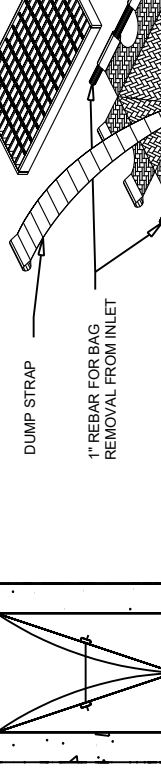
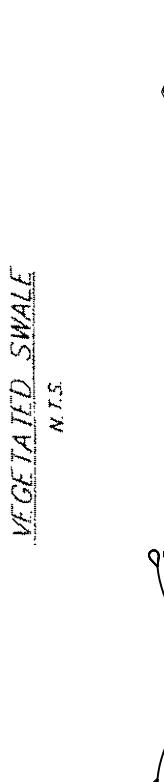
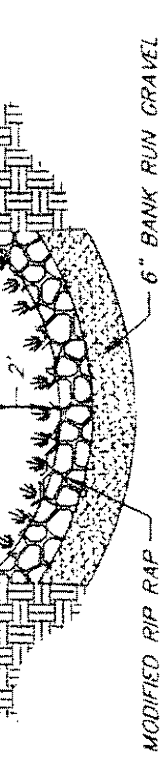
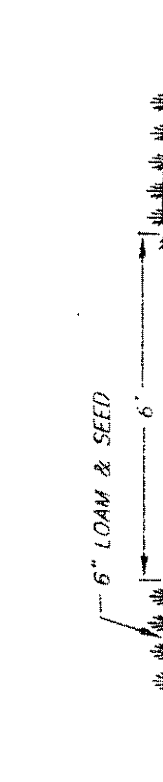
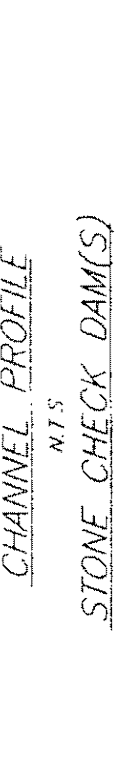
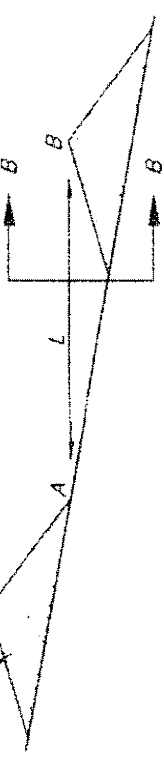
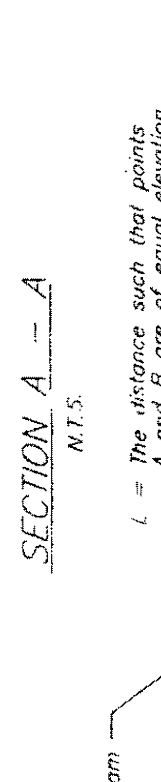
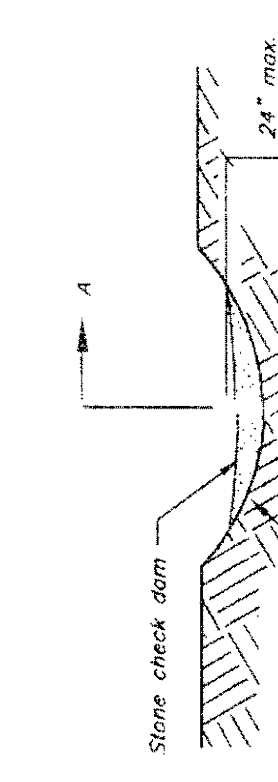
DETAILS

DESIGNED BY: MJS	SCALE: 1"=100'
DRAWN BY: MJS	DATE: 2-23-18
CHECKED BY: MJS	PROJECT NUMBER: 2215
QAD FILE: 2215	

SEAL



SP-7



Source: U.S. Department of Agriculture, Soil Conservation Service, Storms, Connecticut

LACEMENT & CONSTRUCTION OF SYNTHETIC FILTER BARRIER

N.T.S.

N.T.S.

POSSIBLE RETENTION POND PLANTINGS

APPENDIX A

**NO CAM APPROVAL REQUIRED SITE IS OUTSIDE
THE CAM AREA**

Coastal Area Site Plan Application
Coastal Area Management Correspondence with
DEEP Coastal Site Plan Review Approval

APPENDIX B

Site Inspection Checklist

Crown Point II
22 Oakwood Drive
Beacon Falls, Connecticut
Stormwater Pollution Control Plan
Weekly Construction Site Inspection checklist and Report for Temporary and Final Stabilized Areas

Date of Weekly Inspection: _____

Project/Construction Manager Name, Signature and Qualifications: _____

Areas/Items Inspected	Checked (Y/N)	Comments/Notes	Corrective Actions Taken (Explain)
1. All Disturbed/Unstabilized Soil Areas			
2. Soil Erosion and Sediment Control Measures (e.g., silt fences, haybales, inlet protection, etc.)			
3. Construction Entrances			
4. Material/Vehicle/Machinery/Equipment Storage Areas			
5. Catch Basins/Water Quality Units			
6. Sediment Traps/Detention Basins			
7. Soil Stockpile Areas			
8. Stormwater Discharge Points (e.g. riprap pads)			
9. Debris			
10. Waste Receptacles			
11. Litter			
12. On-site and Nearby Wetlands and Watercourses			
13. Other Relevant Areas or Items			

APPENDIX C

Stormwater Monitoring Report



Connecticut Department of
Energy & Environmental Protection
Bureau of Materials Management & Compliance Assurance
Water Permitting & Enforcement Division

General Permit for the Discharge of Stormwater and Dewatering Wastewaters from
Construction Activities, issued 8/21/13, effective 10/1/13
Stormwater Monitoring Report

SITE INFORMATION

Permittee:	_____
Mailing Address:	_____
Business Phone:	_____ ext.: _____ Fax: _____
Contact Person:	_____ Title: _____
Site Name:	_____
Site Address:	_____
Receiving Water (name, basin):	_____
Stormwater Permit No.	<u>GSN</u> _____

SAMPLING INFORMATION (Submit a separate form for each outfall)

Outfall Designation:	_____	Date/Time Collected:	_____
Outfall Location(s) (lat/lon or map link):	_____		
Person Collecting Sample:	_____		
Storm Magnitude (inches):	_____	Storm Duration (hours):	_____
Size of Disturbed Area at any time:	_____		

MONITORING RESULTS

Sample #	Parameter	Method	Results (units)	Laboratory (if applicable)
1	Turbidity			
2	Turbidity			
3	Turbidity			
4	Turbidity			

(provide an attachment if more than 4 samples were taken for this outfall)

Avg =

STATEMENT OF ACKNOWLEDGMENT

I certify that the data reported on this document were prepared under my direction or supervision in accordance with the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities. The information submitted is, to the best of my knowledge and belief, true, accurate and complete.

Authorized Official: _____
Signature: _____ Date: _____

Please send completed form to:

DEPARTMENT OF ENERGY & ENVIRONMENTAL PROTECTION
BUREAU OF MATERIALS MANAGEMENT AND COMPLIANCE ASSURANCE
79 ELM STREET
HARTFORD, CT 06106-5127
ATTN: NEAL WILLIAMS

APPENDIX D

Contractor Certificate

Contractor Certification Statement

The following certification must be signed by each contractor and subcontractor where appropriate.

"I hereby certify that I am a contractor licensed in the State of Connecticut. I am making this certification in connection with a registration under such general permit, submitted by:

Name of Contractor / Subcontractor

for an activity located at:

Address of Project or Activity

"I certify under penalty of the law that I have read and understand the terms and conditions of the General Permit for the Discharge of Stormwater and Dewatering Wastewaters 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."

Signature of Contractor / Subcontractor

Date

Name of Contractor / Subcontractor

Title

Name of Contracting Firm		
Mailing Address		City/Town
State	Zip Code	Business Phone

APPENDIX E

Notice of Termination



General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities

Notice of Termination Form

Please complete and submit this form in accordance with the general permit (DEP-PED-GP-015) in order to ensure the proper handling of your termination. Print or type unless otherwise noted.

Note: Ensure that for commercial and industrial facilities, registrations under the *General Permit for the Discharge of Stormwater Associated with Industrial Activity* (DEP-PED-GP-014) or the *General Permit for the Discharge of Stormwater from Commercial Activities* (DEP-PED-GP-004) have been filed where applicable. For questions about the applicability of these general permits, please call the Department at 860-424-3018.

Part I: Registrant Information

1. Permit number: **GSN**
2. Fill in the name of the registrant(s) as indicated on the registration certificate:
Registrant:
3. Site Address:
City/Town: _____ State: _____ Zip Code: _____
4. Date all storm drainage structures were cleaned of construction sediment:
Date of Completion of Construction: _____
Date of Last Inspection (must be at least three months after final stabilization pursuant to Section 6(b)(6)(D) of the general permit): _____
5. Check the post-construction activities at the site (check all that apply):
☐ Industrial ☐ Residential ☐ Commercial ☐ Capped Landfill
☐ Other (describe): _____

Part II: Certification

"I have personally examined and am familiar with the information submitted in this document and all attachments thereto, and I certify that, based on reasonable investigation, including my inquiry of those individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief. I understand that a false statement made in this document or its attachments may be punishable as a criminal offense, in accordance with Section 22a-6 of the Connecticut General Statutes, pursuant to Section 53a-157b of the Connecticut General Statutes, and in accordance with any other applicable statute."

Signature of Permittee

Date

Name of Permittee (print or type)

Title (if applicable)

Note: Please submit this Notice of Termination Form to:

STORMWATER PERMIT COORDINATOR
BUREAU OF WATER MANAGEMENT
DEPARTMENT OF ENVIRONMENTAL PROTECTION
79 ELM STREET
HARTFORD, CT 06106-5127

APPENDIX F

Engineering Report

For Phase 1-6

SITE ENGINEERING DESIGN REPORT

Hopp Brook Estates
Proposed Residential Development
Oakwood drive
Beacon Falls, Connecticut
Job No. 2215

Prepared For:
Hopp Brook Developers

Prepared By:



Manuel J. Silva
Project Manager

April 01, 2019
Revised 2-09-21
Revised 01-02-25
Revised 02-12-25

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Proposed Storm Water Drainage	3
Sanitary Sewer	5
Other Utilities	5
TABLES	
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Table 2	4
Appendix A	Storm Water Hydrographs
Appendix B	Inlet report (Gutter flow analysis for catch basin on site)
Appendix C	Drainage Statement
Appendix D	HGL storm sewer calculation 100-year storm
Appendix E	Level Spreader Calculations
Appendix F	Drainage Area Maps, Existing & Proposed Conditions

INTRODUCTION:

Hopp Brook Developers is proposing the construction of 109 new residential detached dwellings to be located on the two parcels totaling 135 acres at the end of Oakwood Drive. The majority of the proposed dwellings will have a total floor area of approximately 2,830 square feet, distributed over two (2) stories. This new construction is proposed within a previously proposed residential development known as "Chatfield II".

Currently, the property is made up of 2 parcels. The entire site in general is a wooded area with little under story with some wetland areas.

The storm water runoff from the site flows in two directions easterly to a large wetland area that flows southerly and forms an unnamed tributary to Hopp Brook and Northerly towards a wetland west of Oakwood Drive.

This site has an existing accessway to Oakwood Drive. One driveway is proposed for this development accessing Oakwood Drive in Beacon Falls. Upon completion of the development, parking will be provided for 393 cars, 188 of these spaces will be garage spaces located in the houses 2 car garages.

EXISTING STORMWATER RUNOFF

For analysis purposes, the site has been examined as having two drainage areas. These two drainage areas will be referred to as DA-S (East & Southern drainage area flowing to the large wetland to the east), and DA-N (West and Northern drainage area flowing to Wetland near Oakwood Drive).

The storm water runoff from the site flows in two directions southeasterly to a large wetland area that flows southerly and forms an unnamed tributary to Hopp Brook and northwesterly.

Based on the above, it is apparent that there is two points of interest associated with the existing drainage pattern, the point immediately prior to the southeasterly portion of the property to a large wetland area, where the site drains to the unnamed tributary to the Hopp Brook, and the point immediately prior to the Northwesterly portion of the property. Peak rates of storm water runoff, for 5, 10, 25, 50 and 100 year storm events, have been calculated for this point of interest. The rates are depicted on Table 1. The supporting calculations are included as Appendix A.

These existing flows will later be compared to post development flows as a means of assessing the potential flow impact on surrounding infrastructures.

TABLE 1
Existing Flows (CFS)

Existing Runoff from Northwestern watershed area to be developed				
<u>DA-N</u>				
5-year	10-year	25-year	50-year	100-year
25.69	36.52	52.33	64.57	78.23
Existing Runoff from Southeastern watershed area to be developed				
<u>DA-S</u>				
5-year	10-year	25-year	50-year	100-year
15.46	21.98	31.48	38.85	47.06

PROPOSED STORM WATER DRAINAGE

The plans are designed to minimize potential impacts to adjacent properties and the existing storm water infrastructure.

Without storm water quality measures, proposed development of this site will increase the Weighted Runoff Coefficient (WRC) and decrease the Time of Concentration (T_c), resulting in an increase in the peak rate of storm water runoff. However, the construction of, two (2) Storm Water Management Areas (SWMA) actually result in a reduction of post-development rate of runoff relative to predevelopment conditions.

Design details for these systems are presented on Sheet SP-2 (part of the overall Project Documents). The system will drain the roofs, sidewalks, grassy areas, Club house, pool area, and parking lot associated with the 94 single-family homes development. The roofs and parking lots will be the major elements of the total impervious area on the site. (calculations included as Appendix A, Gutter flow analysis included as Appendix B) The roof, grassy areas, sidewalks and driveways will contribute to the runoff totals seen in table 2.

The northwesterly SWMA (Pond 1) has a total storage volume of approximately 96,503 c. f. and the maximum water depth has been calculated to be 10 feet. This SWMA will reduce the post development peak rate of runoff by 2.47 cfs for the one hundred year storm. The southwesterly SWMA (Pond 2) has a total storage volume of approximately 133,331 c. f. and the maximum water depth has been calculated to be 6 feet. This SWMA will reduce the post development peak rate of runoff by 37.48 cfs for the one hundred year storm. As indicated in the following summary and attached computations, the proposed development will reduce the peak rate of runoff to less than the pre-developed condition for both the Northwesterly and Southeasterly water sheds on site.

The development as proposed will not have an adverse impact on the surrounding wetlands or watercourses.

Table 2, (below) represents the combined effect of these flow patterns on the existing infrastructures. Flows from the proposed systems will produce peak flows that are less than the existing peak flows from the two watersheds on the site.

TABLE 2

Proposed Flows (CFS) for new condition				
Proposed Runoff from Northwestern watershed area to be developed				
		<u>DA-n</u>		
5-year	10-year	25-year	50-year	100-year
24.47	33.88	44.76	58.88	75.76

Percent reduction of runoff from the site

5 year	10 year	25 year	50year	100year
5%	7.2%	14%	8.8%	3%

Proposed Runoff from Southeastern watershed area to be developed

		<u>DA-E</u>		
5-year	10-year	25-year	50-year	100-year
4.933	5.963	7.21	8.01	9.58

Percent reduction of runoff from the site

5 year	10 year	25 year	50year	100year
68%	72%	77%	79%	79%

SANITARY SEWER

Sanitary Sewer discharge will be through a proposed 8-inch PVC sanitary sewer line to a proposed septic system for each phase of the project. Each phase will have a system that can accommodate 16- 3 bedroom houses.

Using the technical standards of the Connecticut Public Health Code, the estimated sewage flow is 150 gallons per day per bedroom. This development will have no more than 48 bedrooms per phase or a total of 327:

16 units have 3 bedrooms per Phase/system and a total 109 units for all phases

$16 \times 3 = 48$; $109 \times 3 = 327$ total bedrooms

$48 \times 150 = 7,200$ gallons per day average flow max per phase

$327 \times 150 = 49,050$ gallons per day average total for all phases

Average Daily Flow = 5 gpm per phase; =34.06 all phases

$$\begin{aligned} \text{Peak flow estimate} &= \frac{5 \times 5 (\text{peaking factor})}{34 \times 5 (\text{peaking factor})} = \frac{25}{170} \end{aligned}$$

$$= 25 \text{ gpm Peak or } 0.055 \text{ cfs}$$

$$= 170 \text{ gpm Peak or } 0.37 \text{ cfs}$$

Other Utilities

All proposed utilities to the site will be through underground utility connections. Electrical service will be from existing aboveground electric utility line in proposed streets. Water service will be from an existing water main in the proposed streets.

APPENDIX A
STAGE HYDROGRAPHS

Hydrograph Return Period Recap..... 1

5 - Year

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Hydrograph No. 4, SCS Runoff, Proposed DA-2.....	8
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Hydrograph No. 5, Reservoir, pond 1 control.....	10
Pond Report - pond 1.....	11
Hydrograph No. 6, Reservoir, pond 2 control.....	12
Pond Report - pond 2.....	13

10 - Year

Hydrograph Reports.....	14
Hydrograph No. 1, SCS Runoff, ex da-1.....	14
Hydrograph No. 2, SCS Runoff, proposed da-1.....	15
Hydrograph No. 3, SCS Runoff, DA-2 Existing.....	16
Hydrograph No. 4, SCS Runoff, Proposed DA-2.....	17
Hydrograph No. 5, Reservoir, pond 1 control.....	18
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25 - Year

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Hydrograph No. 5, Reservoir, pond 1 control.....	24
Hydrograph No. 6, Reservoir, pond 2 control.....	25

50 - Year

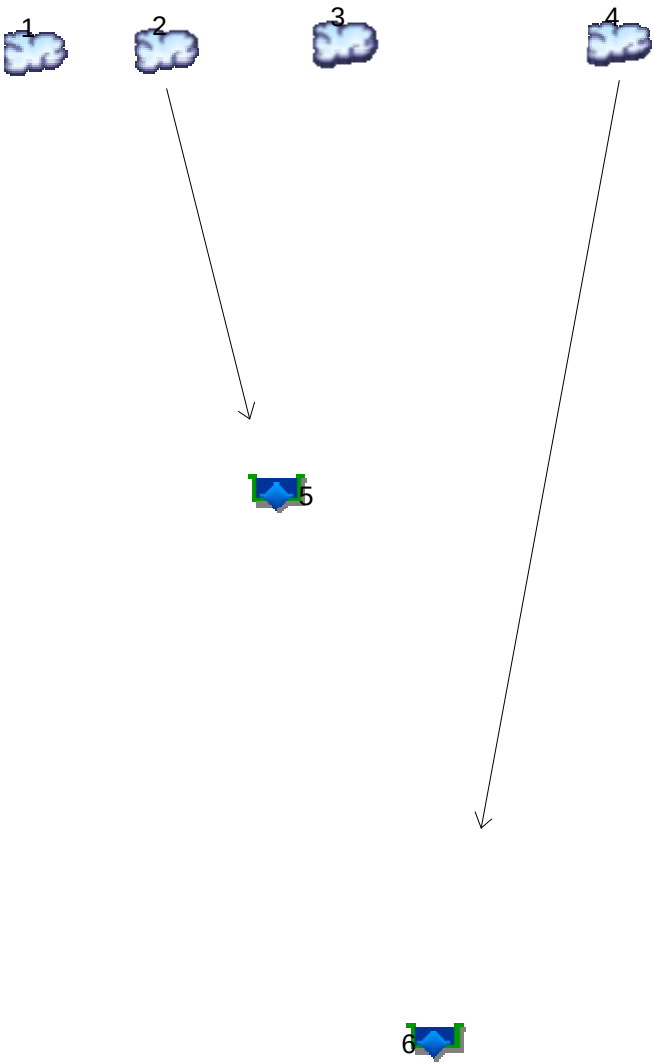
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100 - Year

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Watershed Model Schematic

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020



Legend

Hyd.	Origin	Description
1	SCS Runoff	ex da-1
2	SCS Runoff	proposed da-1
3	SCS Runoff	DA-2 Existing
4	SCS Runoff	Proposed DA-2
5	Reservoir	pond 1 control
6	Reservoir	pond 2 control

Hydrograph No. 3, SCS Runoff, DA-2 Existing.....	34
Hydrograph No. 4, SCS Runoff, Proposed DA-2.....	35
Hydrograph No. 5, Reservoir, pond 1 control.....	36
Hydrograph No. 6, Reservoir, pond 2 control.....	37
IDF Report.....	38

Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

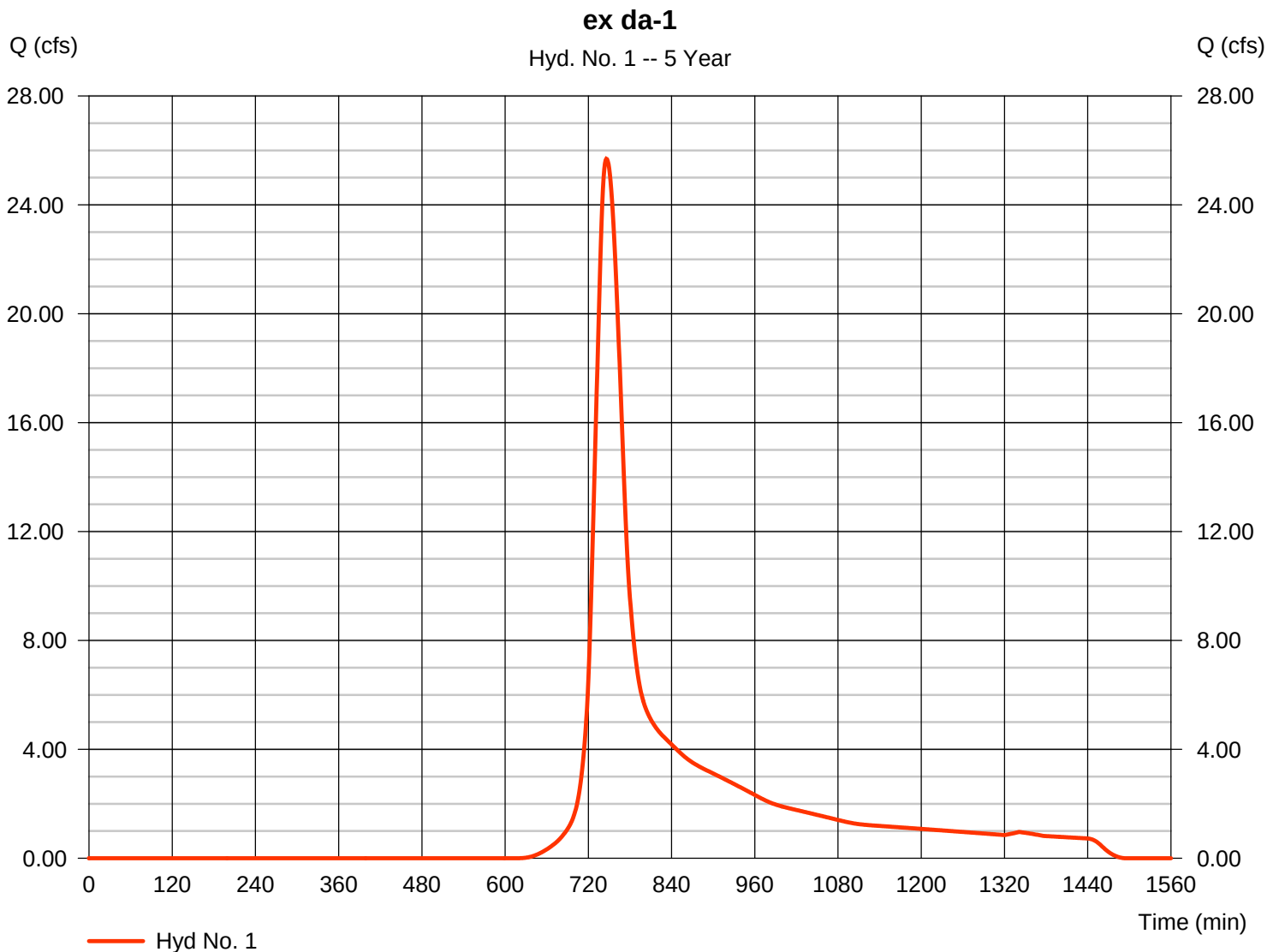
Thursday, 01 / 7 / 2021

Hyd. No. 1

ex da-1

Hydrograph type = SCS Runoff
 Storm frequency = 5 yrs
 Time interval = 1 min
 Drainage area = 24.700 ac
 Basin Slope = 0.0 %
 Tc method = TR55
 Total precip. = 4.71 in
 Storm duration = 24 hrs

Peak discharge = 25.69 cfs
 Time to peak = 746 min
 Hyd. volume = 150,276 cuft
 Curve number = 68
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 34.90 min
 Distribution = Type III
 Shape factor = 484



TR55 Tc Worksheet

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Hyd. No. 1

ex da-1

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>
Sheet Flow				
Manning's n-value	= 0.400	0.011	0.011	
Flow length (ft)	= 300.0	0.0	0.0	
Two-year 24-hr precip. (in)	= 3.62	0.00	0.00	
Land slope (%)	= 6.00	0.00	0.00	
Travel Time (min)	= 31.33	+	0.00	+
			0.00	= 31.33
Shallow Concentrated Flow				
Flow length (ft)	= 837.00	0.00	0.00	
Watercourse slope (%)	= 6.00	0.00	0.00	
Surface description	= Unpaved	Paved	Paved	
Average velocity (ft/s)	=3.95	0.00	0.00	
Travel Time (min)	= 3.53	+	0.00	+
			0.00	= 3.53
Channel Flow				
X sectional flow area (sqft)	= 0.00	0.00	0.00	
Wetted perimeter (ft)	= 0.00	0.00	0.00	
Channel slope (%)	= 0.00	0.00	0.00	
Manning's n-value	= 0.015	0.015	0.015	
Velocity (ft/s)	=0.00	0.00	0.00	
Flow length (ft)	(0)0.0	0.0	0.0	
Travel Time (min)	= 0.00	+	0.00	+
			0.00	= 0.00
Total Travel Time, Tc				34.90 min

Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 01 / 7 / 2021

Hyd. No. 2

proposed da-1

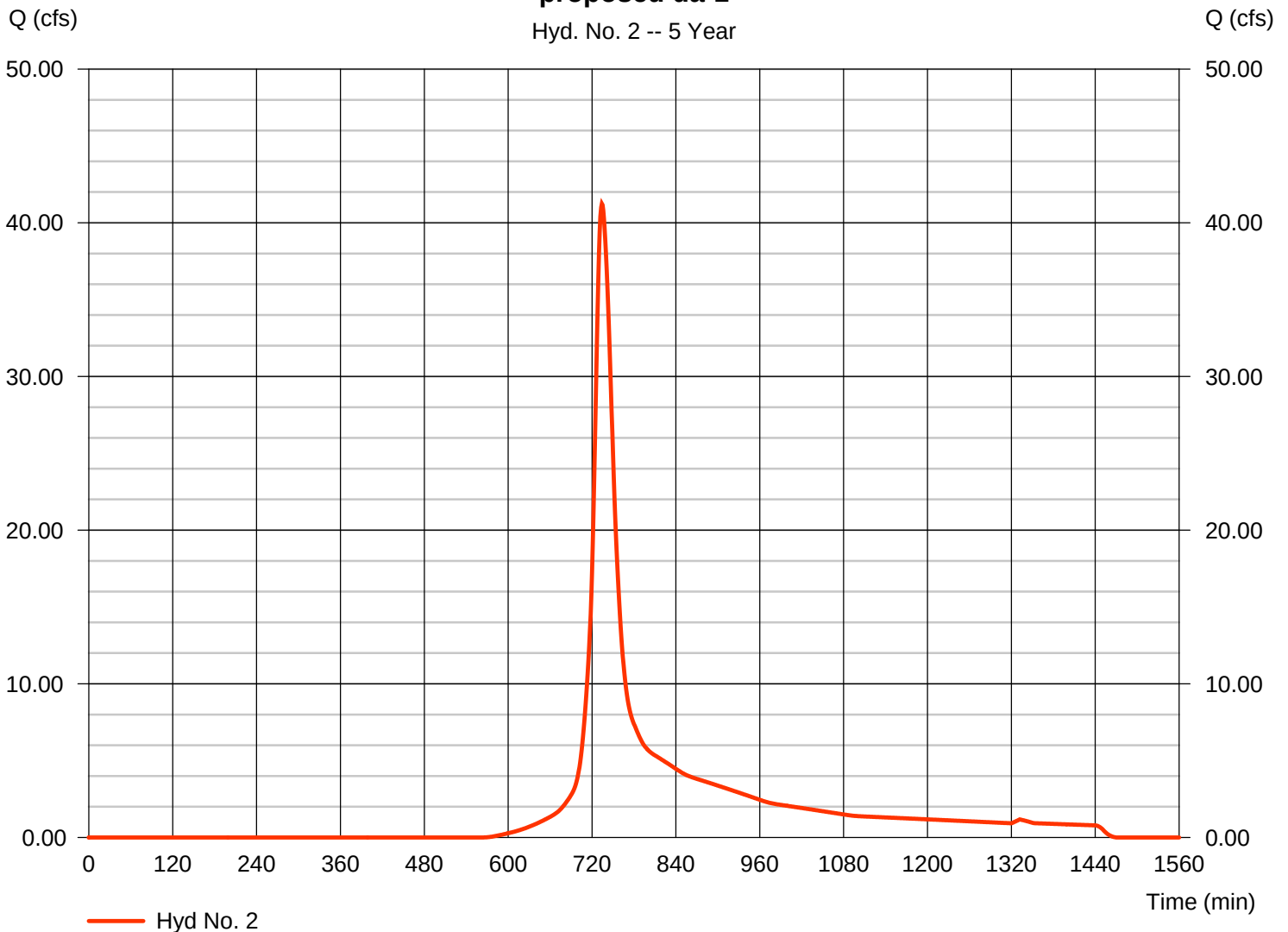
Hydrograph type = SCS Runoff
 Storm frequency = 5 yrs
 Time interval = 1 min
 Drainage area = 24.700 ac
 Basin Slope = 0.0 %
 Tc method = TR55
 Total precip. = 4.71 in
 Storm duration = 24 hrs

Peak discharge = 41.24 cfs
 Time to peak = 734 min
 Hyd. volume = 184,294 cuft
 Curve number = 73*
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 19.30 min
 Distribution = Type III
 Shape factor = 484

* Composite (Area/CN) = $[(16.650 \times 61) + (8.050 \times 98)] / 24.700$

proposed da-1

Hyd. No. 2 -- 5 Year



TR55 Tc Worksheet

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Hyd. No. 2

proposed da-1

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>			
Sheet Flow							
Manning's n-value	= 0.011	0.150	0.011				
Flow length (ft)	= 300.0	300.0	0.0				
Two-year 24-hr precip. (in)	= 3.62	3.62	0.00				
Land slope (%)	= 5.00	5.00	0.00				
Travel Time (min)	= 1.90	+	15.38	+	0.00	=	17.28
Shallow Concentrated Flow							
Flow length (ft)	= 0.00	0.00	0.00				
Watercourse slope (%)	= 0.00	0.00	0.00				
Surface description	= Paved	Paved	Paved				
Average velocity (ft/s)	=0.00	0.00	0.00				
Travel Time (min)	= 0.00	+	0.00	+	0.00	=	0.00
Channel Flow							
X sectional flow area (sqft)	= 1.76	0.00	0.00				
Wetted perimeter (ft)	= 4.71	0.00	0.00				
Channel slope (%)	= 0.50	0.00	0.00				
Manning's n-value	= 0.011	0.015	0.015				
Velocity (ft/s)	=4.95	0.00	0.00				
Flow length (ft)	600.0	0.0	0.0				
Travel Time (min)	= 2.02	+	0.00	+	0.00	=	2.02
Total Travel Time, Tc					19.30 min		

Hydrograph Report

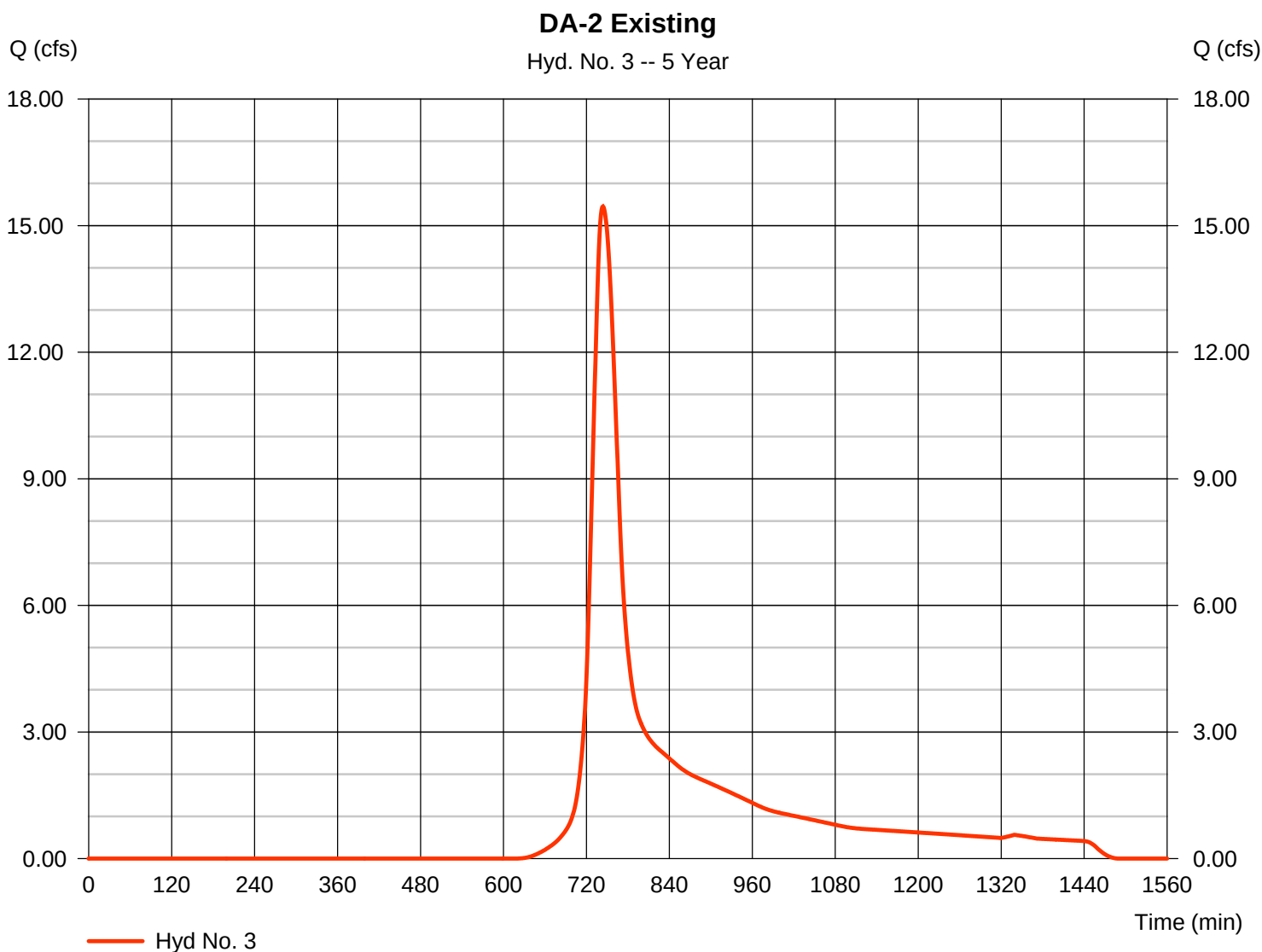
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 01 / 7 / 2021

Hyd. No. 3

DA-2 Existing

Hydrograph type	= SCS Runoff	Peak discharge	= 15.46 cfs
Storm frequency	= 5 yrs	Time to peak	= 744 min
Time interval	= 1 min	Hyd. volume	= 86,533 cuft
Drainage area	= 14.130 ac	Curve number	= 68
Basin Slope	= 6.0 %	Hydraulic length	= 300 ft
Tc method	= TR55	Time of conc. (Tc)	= 32.00 min
Total precip.	= 4.71 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



TR55 Tc Worksheet

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Hyd. No. 3

DA-2 Existing

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>
Sheet Flow				
Manning's n-value	= 0.400	0.011	0.011	
Flow length (ft)	= 300.0	0.0	0.0	
Two-year 24-hr precip. (in)	= 3.62	0.00	0.00	
Land slope (%)	= 6.00	0.00	0.00	
Travel Time (min)	= 31.33	+ 0.00	+ 0.00	= 31.33
Shallow Concentrated Flow				
Flow length (ft)	= 250.00	0.00	0.00	
Watercourse slope (%)	= 13.00	0.00	0.00	
Surface description	= Unpaved	Paved	Paved	
Average velocity (ft/s)	=5.82	0.00	0.00	
Travel Time (min)	= 0.72	+ 0.00	+ 0.00	= 0.72
Channel Flow				
X sectional flow area (sqft)	= 0.00	0.00	0.00	
Wetted perimeter (ft)	= 0.00	0.00	0.00	
Channel slope (%)	= 0.00	0.00	0.00	
Manning's n-value	= 0.015	0.015	0.015	
Velocity (ft/s)	=0.00	0.00	0.00	
Flow length (ft)	(0)0.0	0.0	0.0	
Travel Time (min)	= 0.00	+ 0.00	+ 0.00	= 0.00
Total Travel Time, Tc				32.00 min

Hydrograph Report

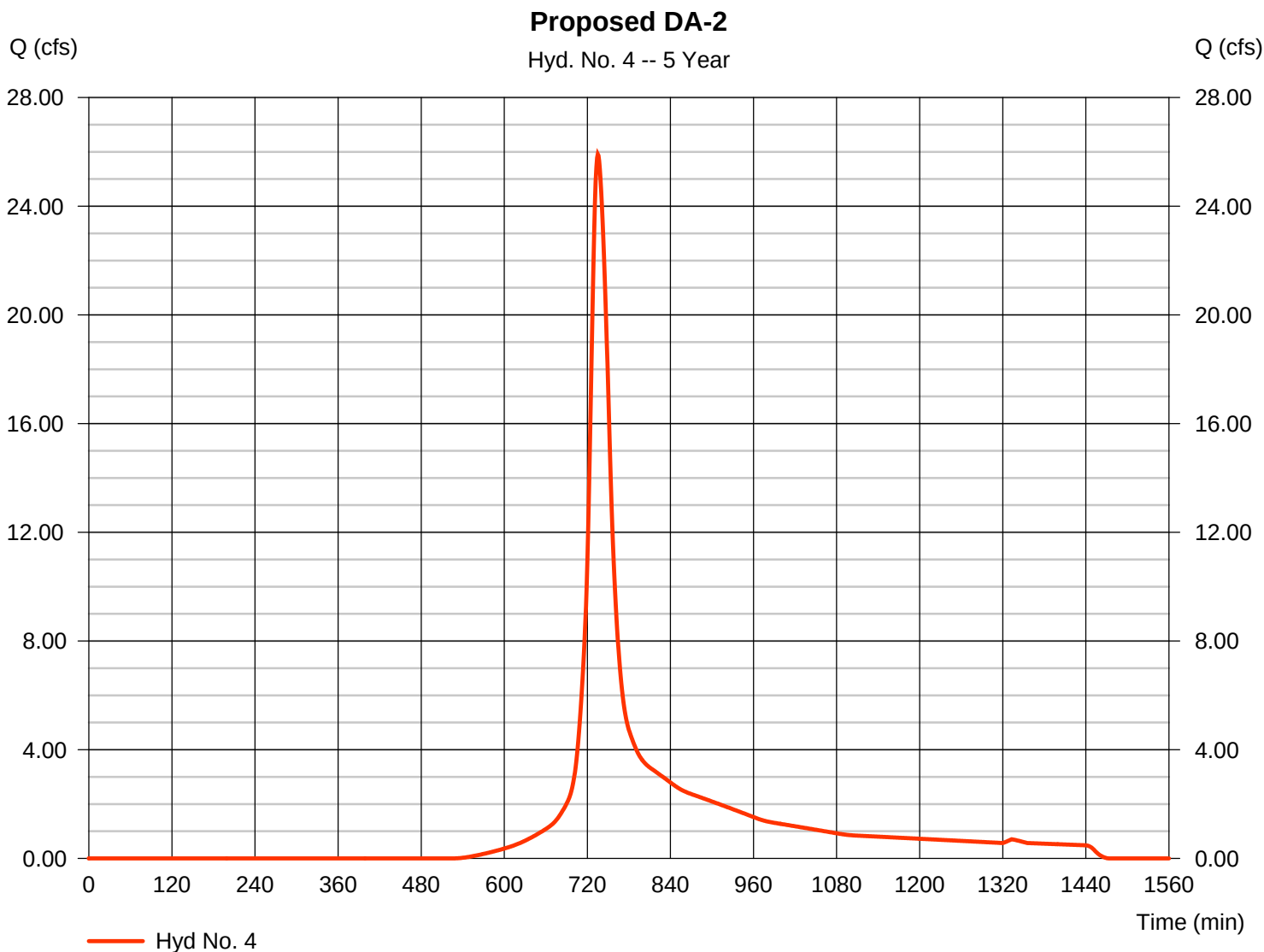
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 01 / 7 / 2021

Hyd. No. 4

Proposed DA-2

Hydrograph type	= SCS Runoff	Peak discharge	= 25.91 cfs
Storm frequency	= 5 yrs	Time to peak	= 735 min
Time interval	= 1 min	Hyd. volume	= 119,034 cuft
Drainage area	= 14.130 ac	Curve number	= 76*
Basin Slope	= 6.0 %	Hydraulic length	= 300 ft
Tc method	= TR55	Time of conc. (Tc)	= 21.60 min
Total precip.	= 4.71 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = $[(5.839 \times 98) + (8.290 \times 61)] / 14.130$ 

TR55 Tc Worksheet

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Hyd. No. 4

Proposed DA-2

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>			
Sheet Flow							
Manning's n-value	= 0.011	0.150	0.011				
Flow length (ft)	= 300.0	300.0	0.0				
Two-year 24-hr precip. (in)	= 3.62	3.62	0.00				
Land slope (%)	= 5.00	5.00	0.00				
Travel Time (min)	= 1.90	+	15.38	+	0.00	=	17.28
Shallow Concentrated Flow							
Flow length (ft)	= 0.00	0.00	0.00				
Watercourse slope (%)	= 0.00	0.00	0.00				
Surface description	= Paved	Paved	Paved				
Average velocity (ft/s)	=0.00	0.00	0.00				
Travel Time (min)	= 0.00	+	0.00	+	0.00	=	0.00
Channel Flow							
X sectional flow area (sqft)	= 1.76	0.00	0.00				
Wetted perimeter (ft)	= 4.71	0.00	0.00				
Channel slope (%)	= 0.50	0.00	0.00				
Manning's n-value	= 0.011	0.015	0.015				
Velocity (ft/s)	=4.95	0.00	0.00				
Flow length (ft)	((0})1287.0	0.0	0.0				
Travel Time (min)	= 4.33	+	0.00	+	0.00	=	4.33
Total Travel Time, Tc				21.60 min			

Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

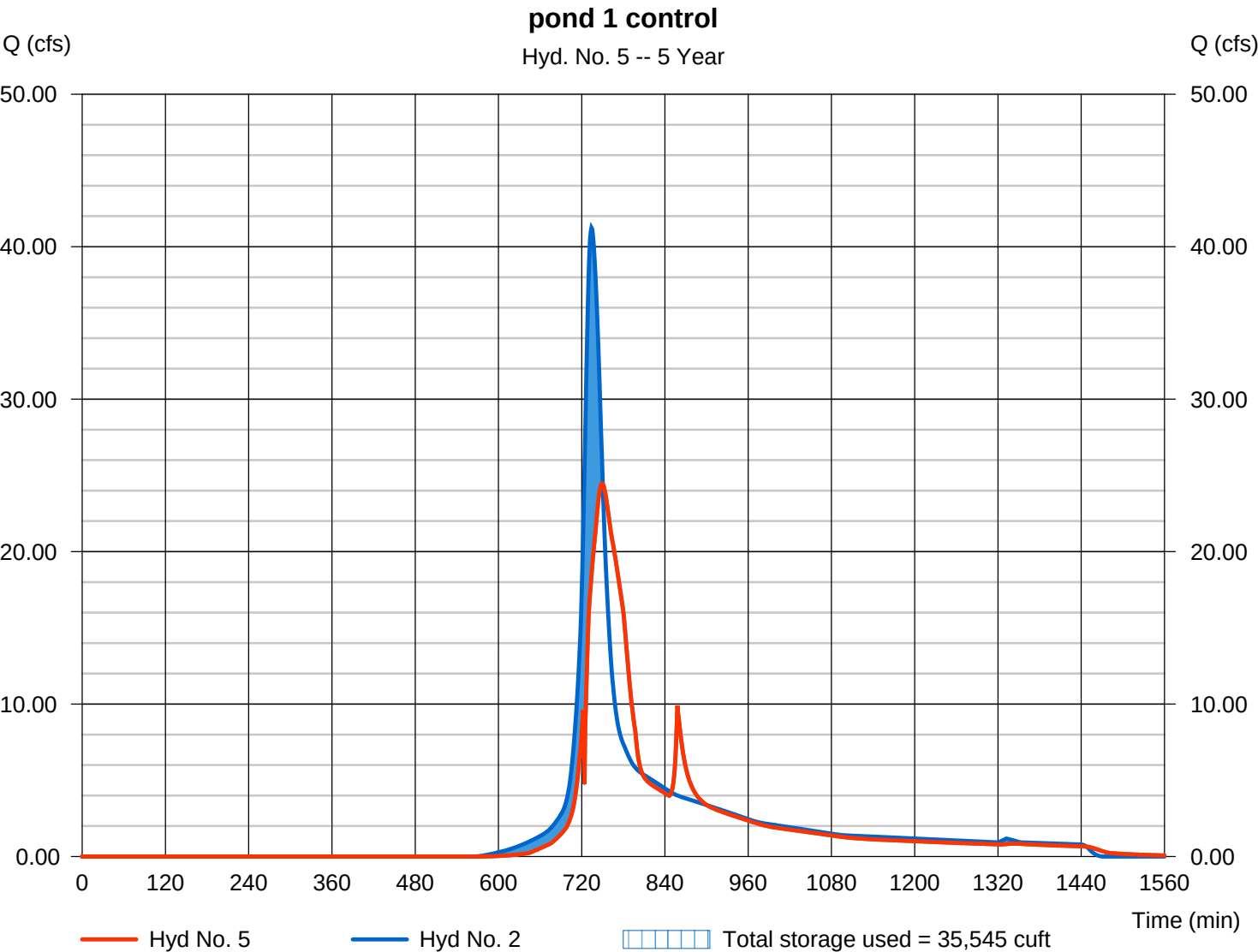
Thursday, 01 / 7 / 2021

Hyd. No. 5

pond 1 control

Hydrograph type	= Reservoir	Peak discharge	= 24.47 cfs
Storm frequency	= 5 yrs	Time to peak	= 749 min
Time interval	= 1 min	Hyd. volume	= 166,029 cuft
Inflow hyd. No.	= 2 - proposed da-1	Max. Elevation	= 654.67 ft
Reservoir name	= pond 1	Max. Storage	= 35,545 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond No. 1 - pond 1

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Beginning Elevation = 650.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	650.00	5,918	0	0
2.00	652.00	7,279	13,172	13,172
4.00	654.00	8,754	16,009	29,181
6.00	656.00	10,344	19,074	48,255
8.00	658.00	12,048	22,368	70,623
10.00	660.00	13,856	25,880	96,503

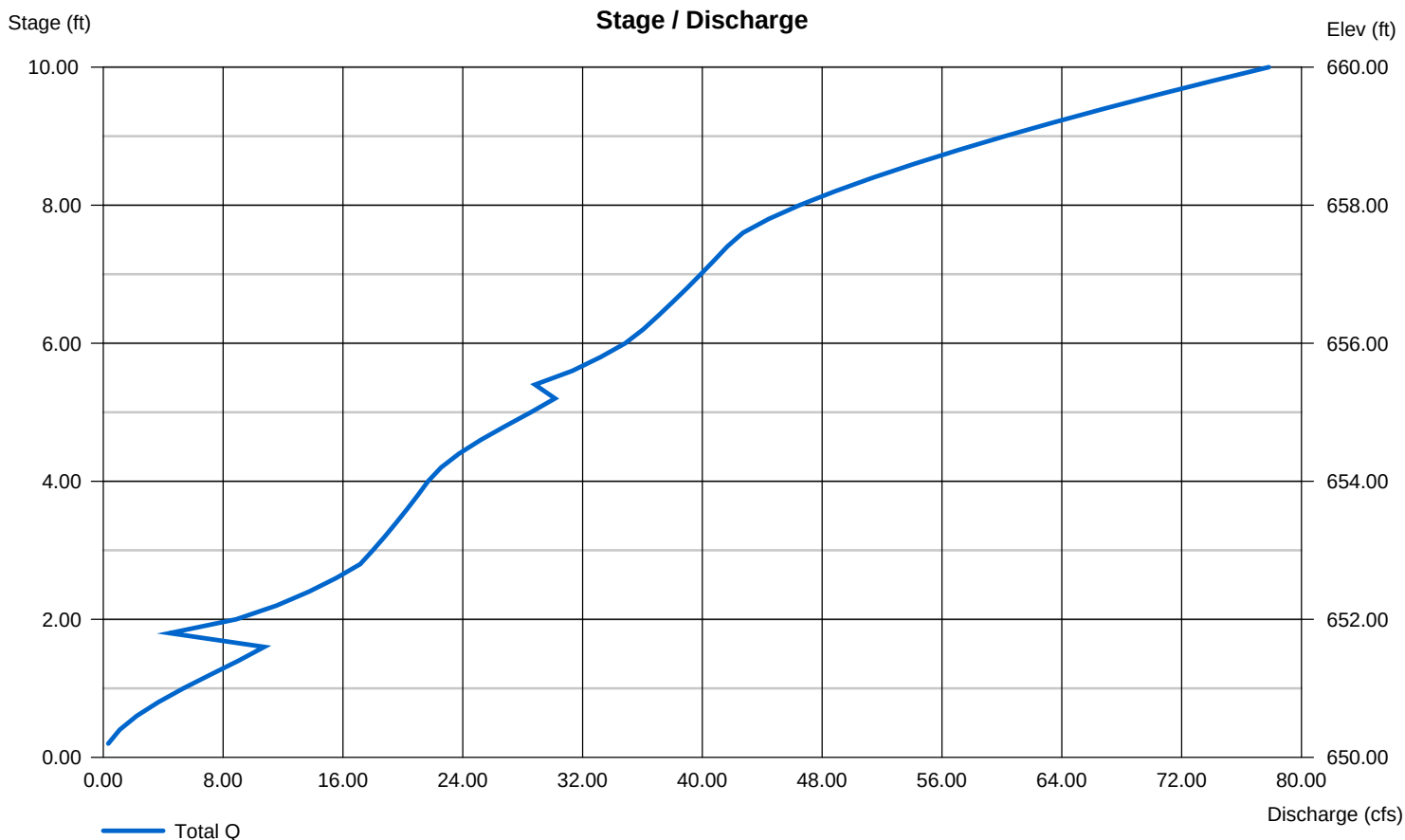
Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	21.00	15.50	0.00
Span (in)	= 0.00	21.00	15.50	0.00
No. Barrels	= 0	1	1	0
Invert El. (ft)	= 0.00	650.00	654.00	0.00
Length (ft)	= 0.00	0.50	0.50	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	2.00	0.00	0.00
Crest El. (ft)	= 0.00	657.50	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	Rect	---	---
Multi-Stage	= No	No	No	No
Exfil.(in/hr)	= 6.000 (by Contour)			
TW Elev. (ft)	= 0.00			

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



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

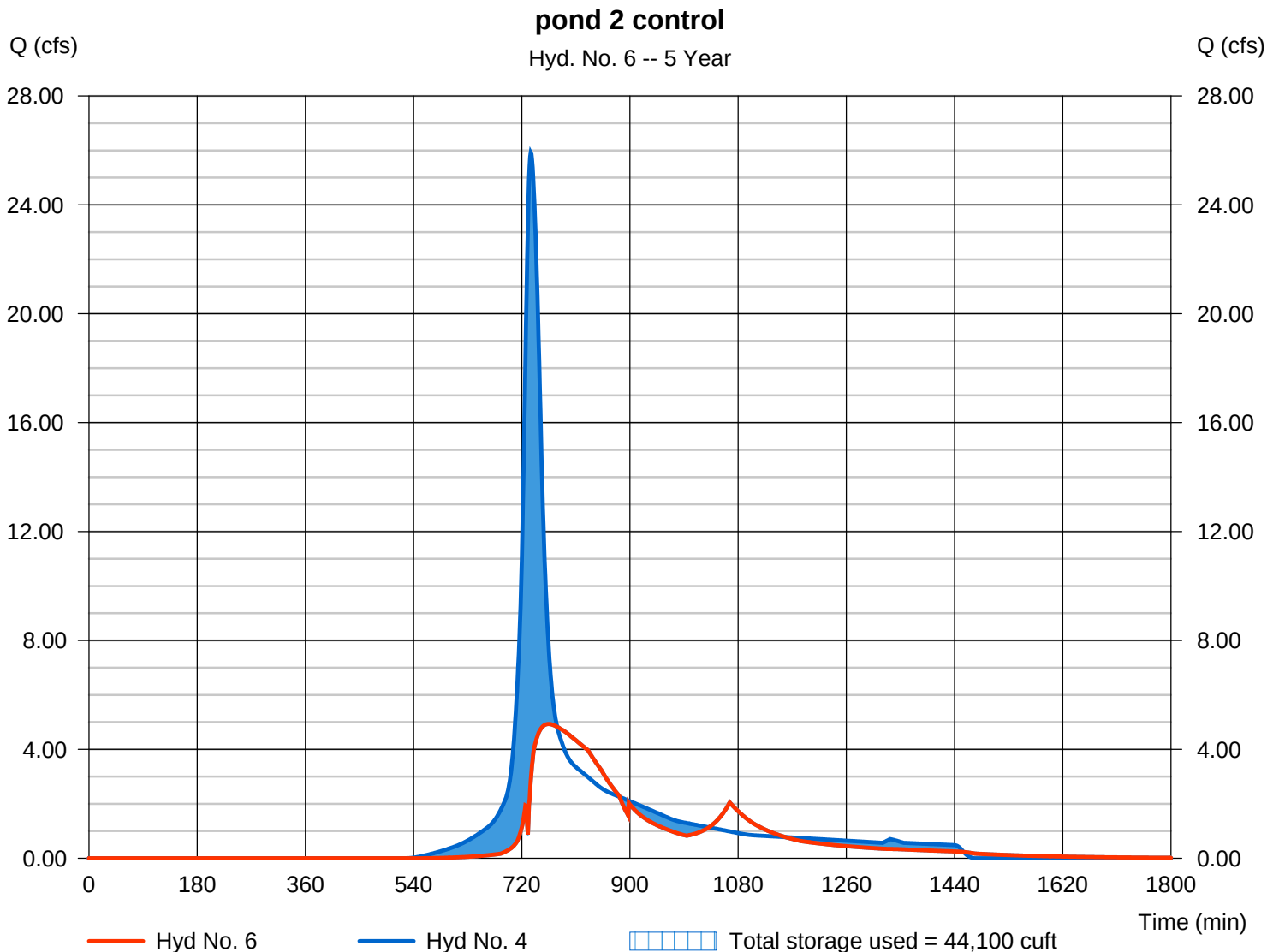
Thursday, 01 / 7 / 2021

Hyd. No. 6

pond 2 control

Hydrograph type	= Reservoir	Peak discharge	= 4.933 cfs
Storm frequency	= 5 yrs	Time to peak	= 764 min
Time interval	= 1 min	Hyd. volume	= 68,776 cuft
Inflow hyd. No.	= 4 - Proposed DA-2	Max. Elevation	= 692.20 ft
Reservoir name	= pond 2	Max. Storage	= 44,100 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond Report

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Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 01 / 7 / 2021

Pond No. 2 - pond 2

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Beginning Elevation = 690.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	690.00	18,677	0	0
2.00	692.00	20,975	39,626	39,626
4.00	694.00	23,406	44,354	83,980
6.00	696.00	25,972	49,351	133,331

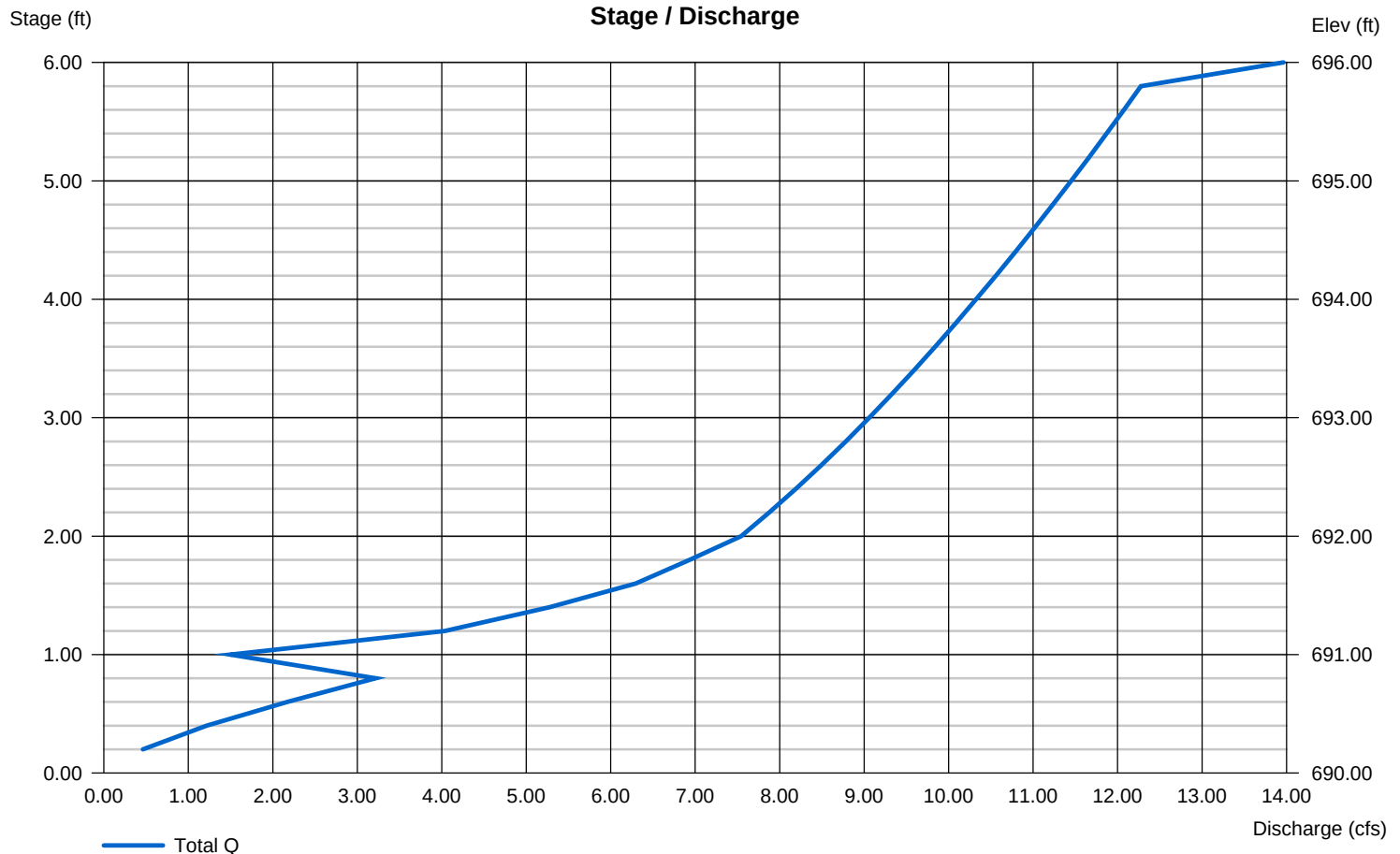
Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	12.00	0.00	0.00
Span (in)	= 0.00	12.00	0.00	0.00
No. Barrels	= 0	1	0	0
Invert El. (ft)	= 0.00	690.00	0.00	0.00
Length (ft)	= 0.00	0.50	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	5.00	0.00	0.00
Crest El. (ft)	= 0.00	695.80	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	Rect	---	---
Multi-Stage	= No	No	No	No
Exfil.(in/hr)	= 6.000 (by Contour)			
TW Elev. (ft)	= 0.00			

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



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 01 / 7 / 2021

Hyd. No. 1

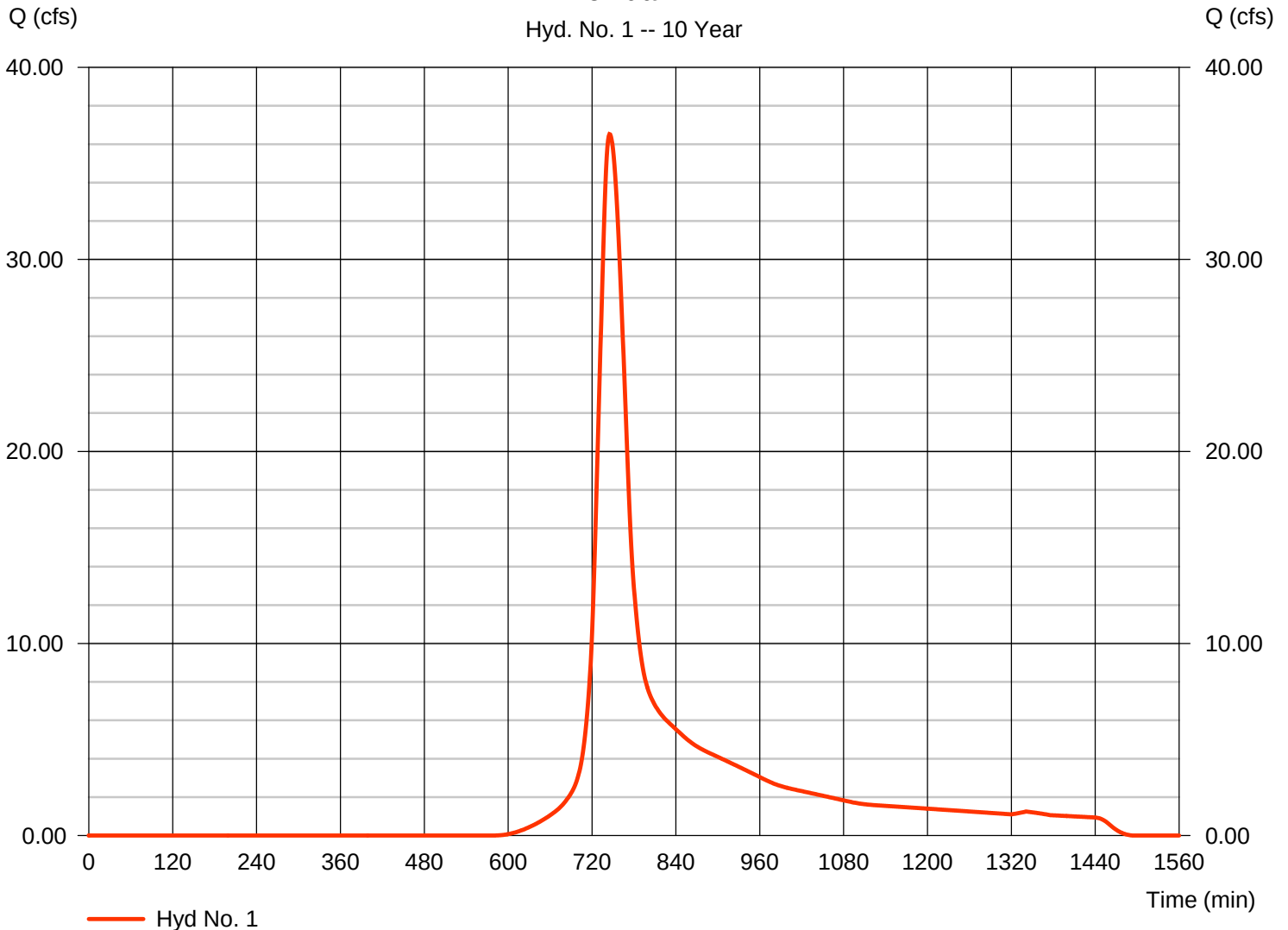
ex da-1

Hydrograph type = SCS Runoff
 Storm frequency = 10 yrs
 Time interval = 1 min
 Drainage area = 24.700 ac
 Basin Slope = 0.0 %
 Tc method = TR55
 Total precip. = 5.62 in
 Storm duration = 24 hrs

Peak discharge = 36.52 cfs
 Time to peak = 745 min
 Hyd. volume = 209,149 cuft
 Curve number = 68
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 34.90 min
 Distribution = Type III
 Shape factor = 484

ex da-1

Hyd. No. 1 -- 10 Year



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 01 / 7 / 2021

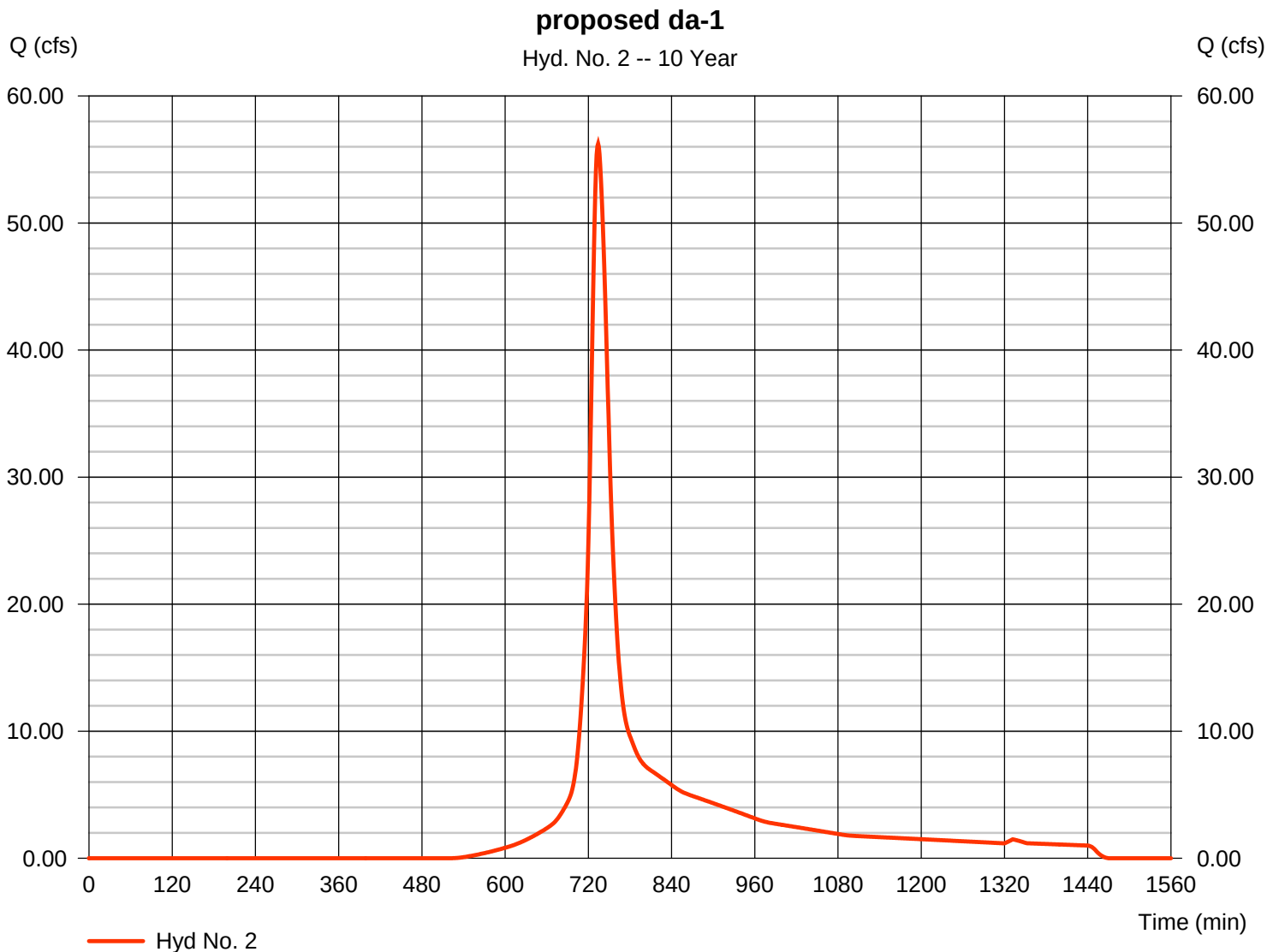
Hyd. No. 2

proposed da-1

Hydrograph type = SCS Runoff
 Storm frequency = 10 yrs
 Time interval = 1 min
 Drainage area = 24.700 ac
 Basin Slope = 0.0 %
 Tc method = TR55
 Total precip. = 5.62 in
 Storm duration = 24 hrs

Peak discharge = 56.24 cfs
 Time to peak = 734 min
 Hyd. volume = 248,920 cuft
 Curve number = 73*
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 19.30 min
 Distribution = Type III
 Shape factor = 484

* Composite (Area/CN) = $[(16.650 \times 61) + (8.050 \times 98)] / 24.700$



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

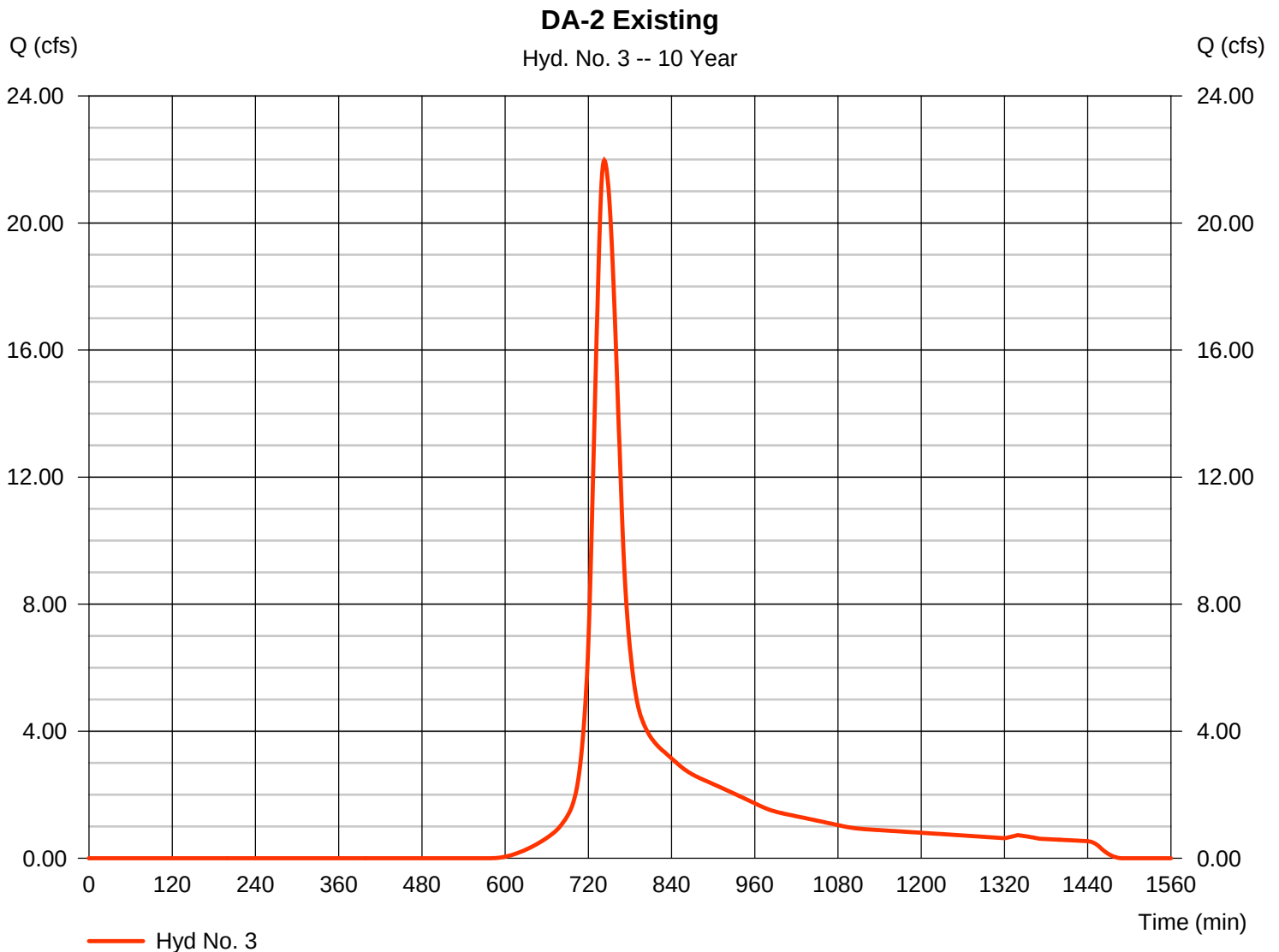
Thursday, 01 / 7 / 2021

Hyd. No. 3

DA-2 Existing

Hydrograph type = SCS Runoff
 Storm frequency = 10 yrs
 Time interval = 1 min
 Drainage area = 14.130 ac
 Basin Slope = 6.0 %
 Tc method = TR55
 Total precip. = 5.62 in
 Storm duration = 24 hrs

Peak discharge = 21.98 cfs
 Time to peak = 743 min
 Hyd. volume = 120,434 cuft
 Curve number = 68
 Hydraulic length = 300 ft
 Time of conc. (Tc) = 32.00 min
 Distribution = Type III
 Shape factor = 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 01 / 7 / 2021

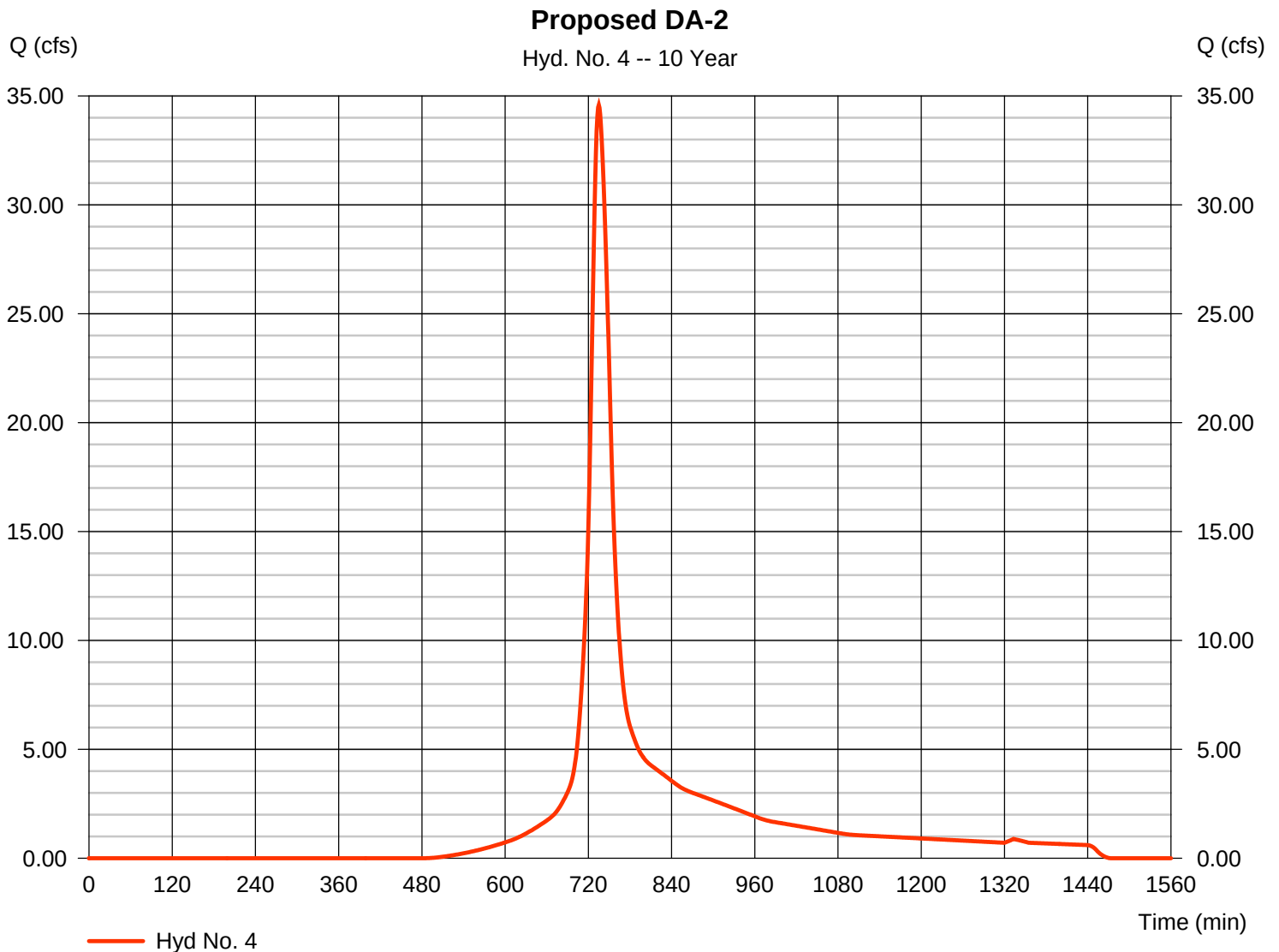
Hyd. No. 4

Proposed DA-2

Hydrograph type = SCS Runoff
 Storm frequency = 10 yrs
 Time interval = 1 min
 Drainage area = 14.130 ac
 Basin Slope = 6.0 %
 Tc method = TR55
 Total precip. = 5.62 in
 Storm duration = 24 hrs

Peak discharge = 34.59 cfs
 Time to peak = 735 min
 Hyd. volume = 158,187 cuft
 Curve number = 76*
 Hydraulic length = 300 ft
 Time of conc. (Tc) = 21.60 min
 Distribution = Type III
 Shape factor = 484

* Composite (Area/CN) = $[(5.839 \times 98) + (8.290 \times 61)] / 14.130$



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

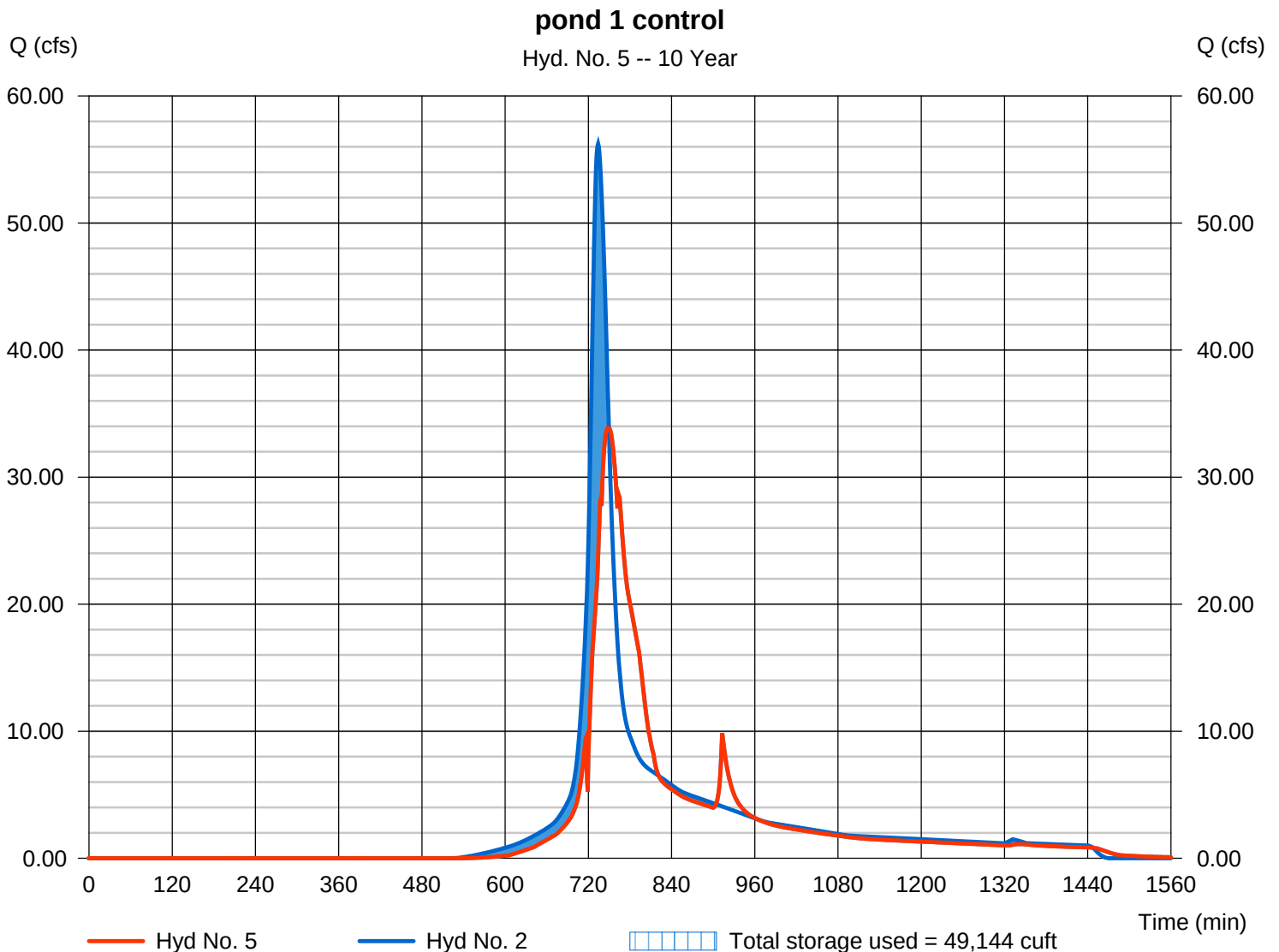
Thursday, 01 / 7 / 2021

Hyd. No. 5

pond 1 control

Hydrograph type	= Reservoir	Peak discharge	= 33.88 cfs
Storm frequency	= 10 yrs	Time to peak	= 749 min
Time interval	= 1 min	Hyd. volume	= 227,113 cuft
Inflow hyd. No.	= 2 - proposed da-1	Max. Elevation	= 656.08 ft
Reservoir name	= pond 1	Max. Storage	= 49,144 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

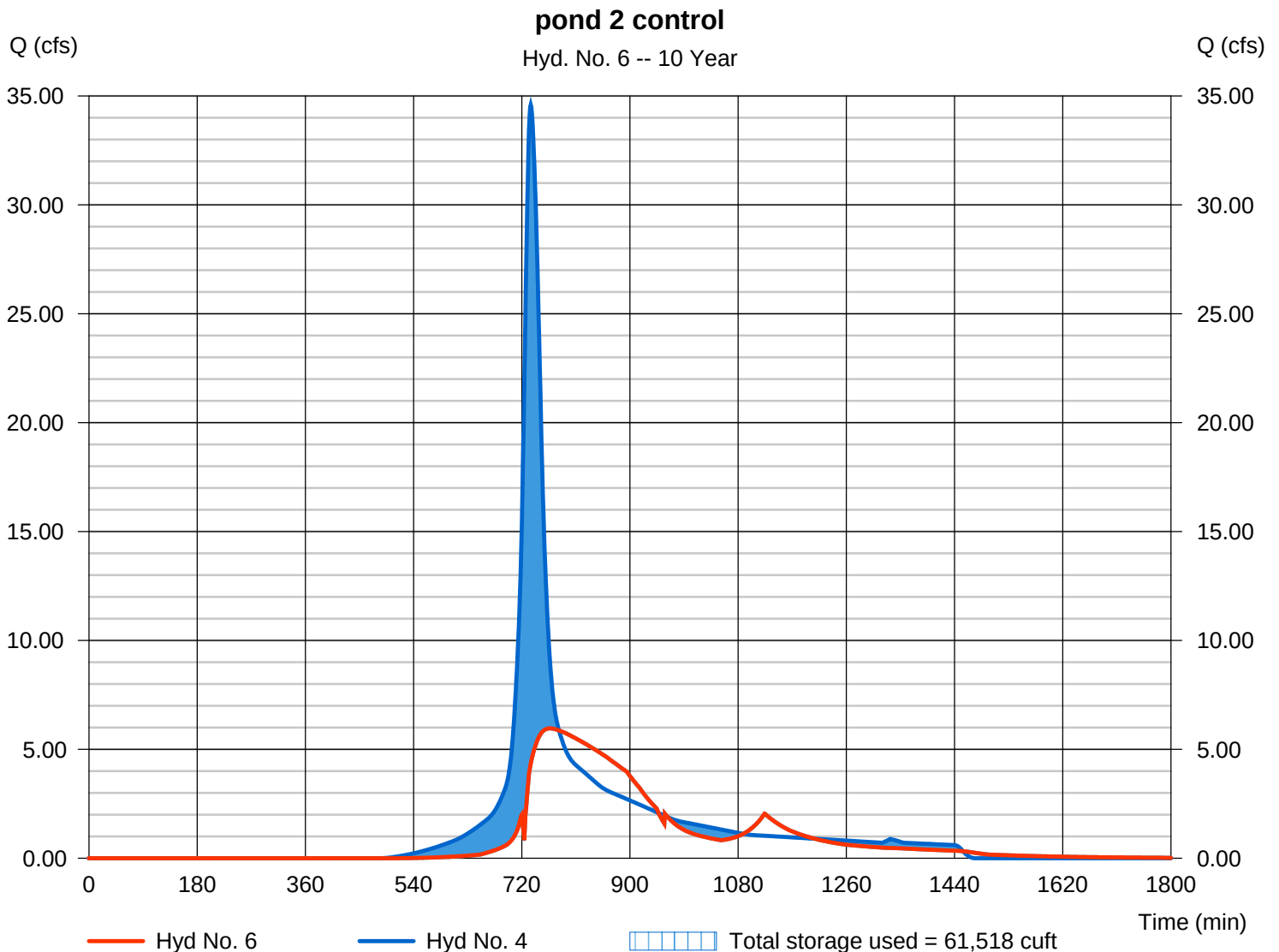
Thursday, 01 / 7 / 2021

Hyd. No. 6

pond 2 control

Hydrograph type	= Reservoir	Peak discharge	= 5.963 cfs
Storm frequency	= 10 yrs	Time to peak	= 767 min
Time interval	= 1 min	Hyd. volume	= 94,639 cuft
Inflow hyd. No.	= 4 - Proposed DA-2	Max. Elevation	= 692.99 ft
Reservoir name	= pond 2	Max. Storage	= 61,518 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

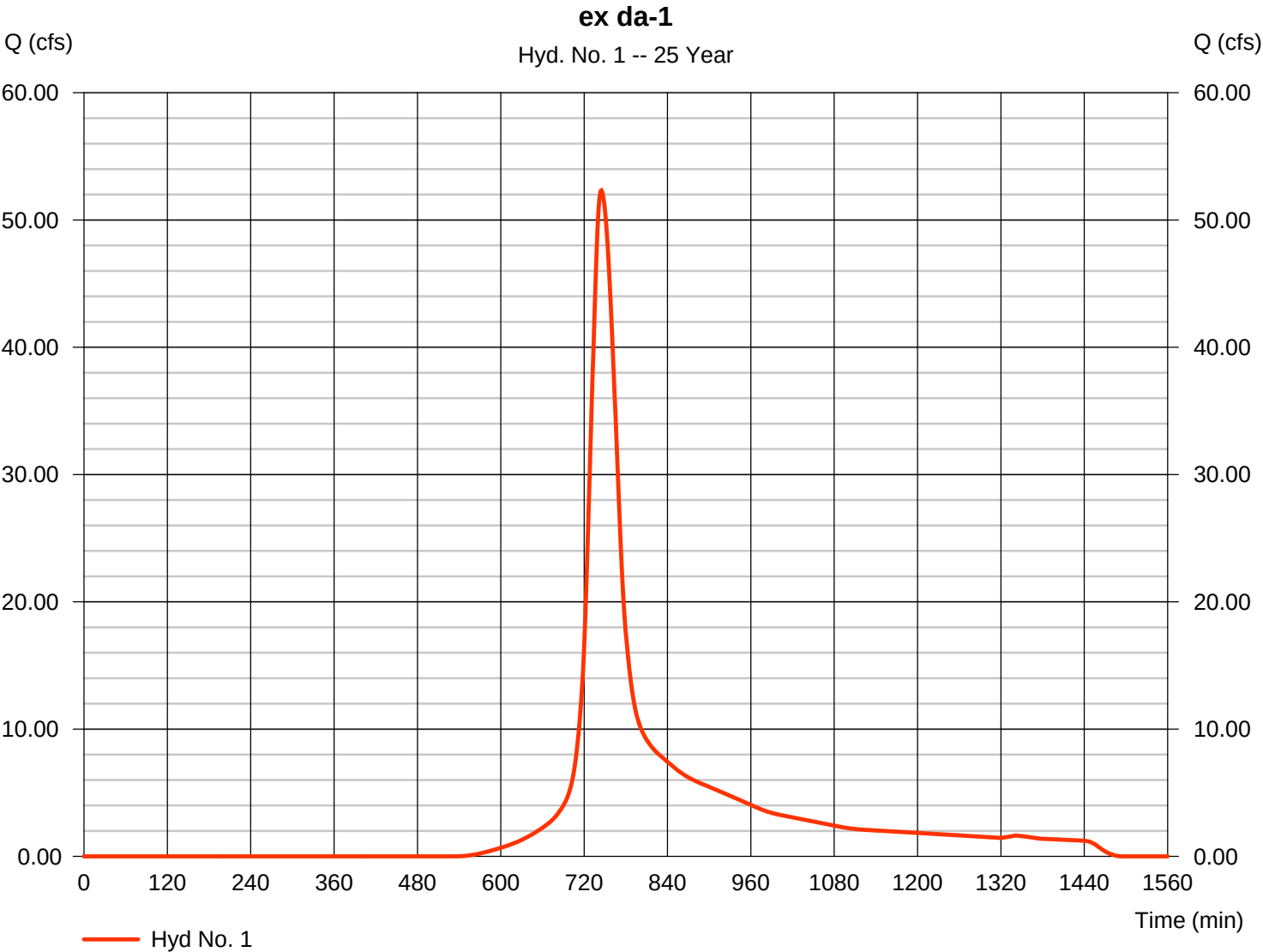
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 01 / 7 / 2021

Hyd. No. 1

ex da-1

Hydrograph type	=	SCS Runoff	Peak discharge	=	52.33 cfs
Storm frequency	=	25 yrs	Time to peak	=	745 min
Time interval	=	1 min	Hyd. volume	=	295,636 cuft
Drainage area	=	24.700 ac	Curve number	=	68
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	34.90 min
Total precip.	=	6.86 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 01 / 7 / 2021

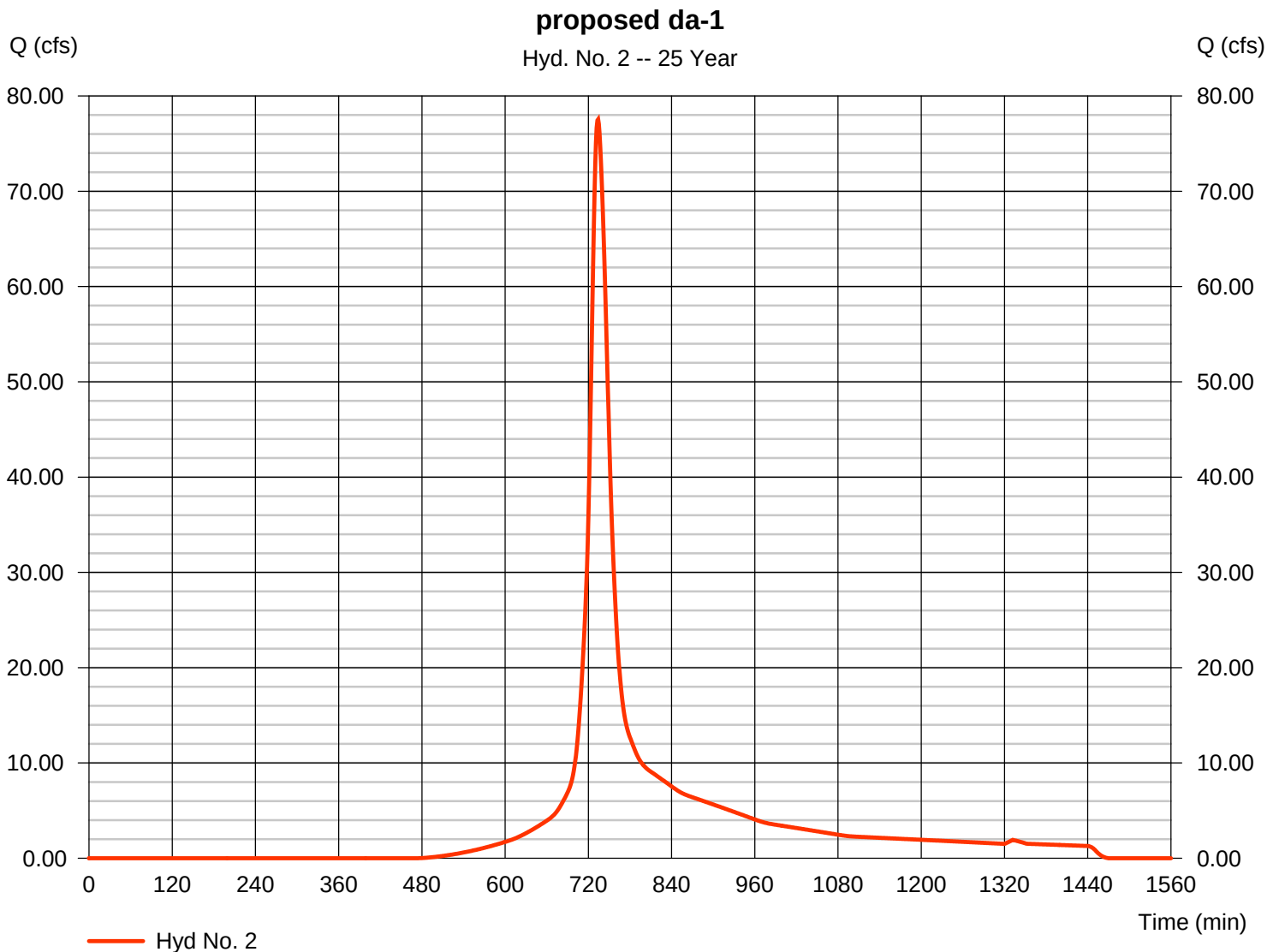
Hyd. No. 2

proposed da-1

Hydrograph type = SCS Runoff
 Storm frequency = 25 yrs
 Time interval = 1 min
 Drainage area = 24.700 ac
 Basin Slope = 0.0 %
 Tc method = TR55
 Total precip. = 6.86 in
 Storm duration = 24 hrs

Peak discharge = 77.54 cfs
 Time to peak = 734 min
 Hyd. volume = 342,044 cuft
 Curve number = 73*
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 19.30 min
 Distribution = Type III
 Shape factor = 484

* Composite (Area/CN) = $[(16.650 \times 61) + (8.050 \times 98)] / 24.700$



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 01 / 7 / 2021

Hyd. No. 3

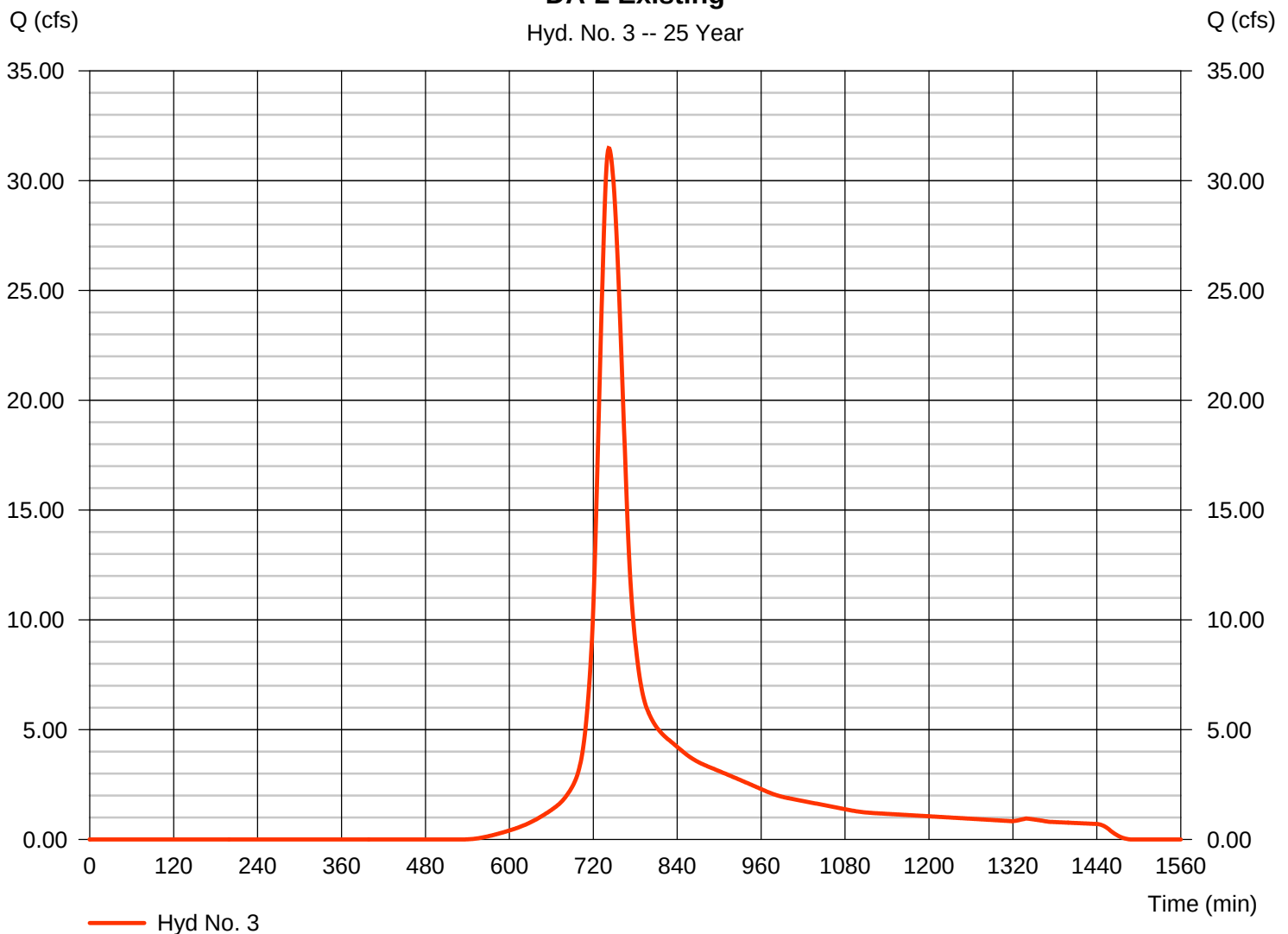
DA-2 Existing

Hydrograph type = SCS Runoff
 Storm frequency = 25 yrs
 Time interval = 1 min
 Drainage area = 14.130 ac
 Basin Slope = 6.0 %
 Tc method = TR55
 Total precip. = 6.86 in
 Storm duration = 24 hrs

Peak discharge = 31.48 cfs
 Time to peak = 742 min
 Hyd. volume = 170,236 cuft
 Curve number = 68
 Hydraulic length = 300 ft
 Time of conc. (Tc) = 32.00 min
 Distribution = Type III
 Shape factor = 484

DA-2 Existing

Hyd. No. 3 -- 25 Year



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 01 / 7 / 2021

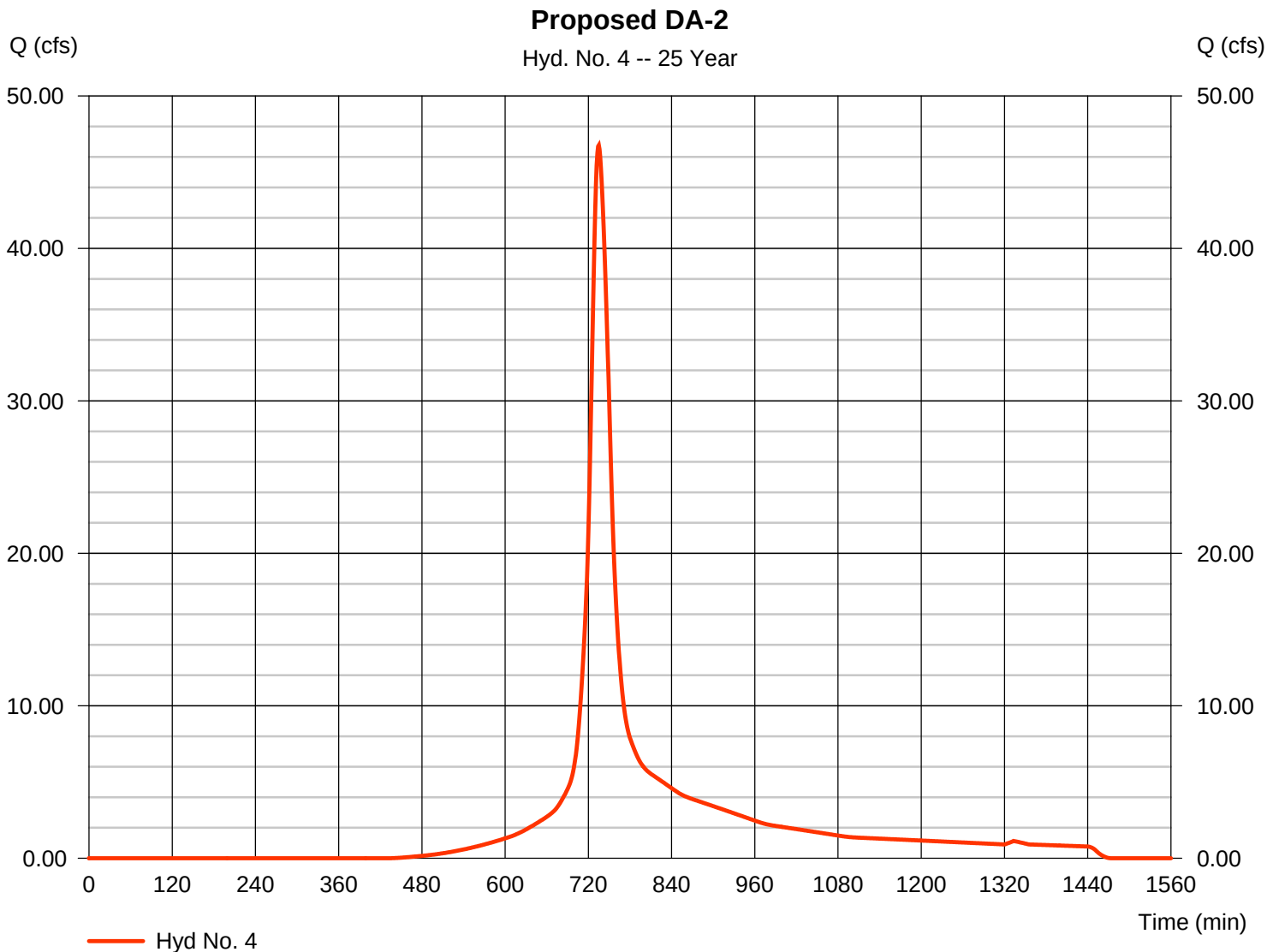
Hyd. No. 4

Proposed DA-2

Hydrograph type = SCS Runoff
 Storm frequency = 25 yrs
 Time interval = 1 min
 Drainage area = 14.130 ac
 Basin Slope = 6.0 %
 Tc method = TR55
 Total precip. = 6.86 in
 Storm duration = 24 hrs

Peak discharge = 46.76 cfs
 Time to peak = 735 min
 Hyd. volume = 214,026 cuft
 Curve number = 76*
 Hydraulic length = 300 ft
 Time of conc. (Tc) = 21.60 min
 Distribution = Type III
 Shape factor = 484

* Composite (Area/CN) = $[(5.839 \times 98) + (8.290 \times 61)] / 14.130$



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

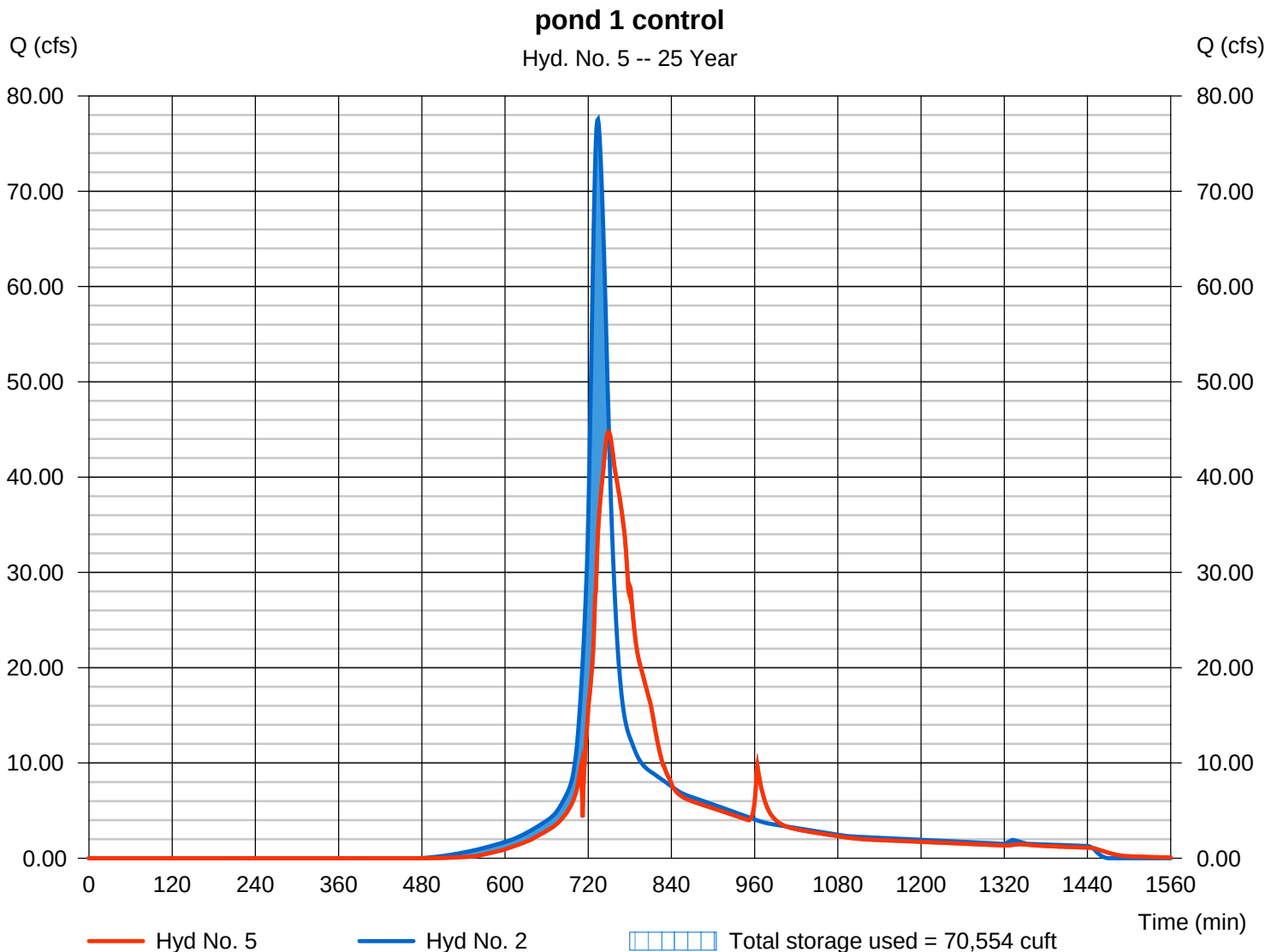
Thursday, 01 / 7 / 2021

Hyd. No. 5

pond 1 control

Hydrograph type	= Reservoir	Peak discharge	= 44.76 cfs
Storm frequency	= 25 yrs	Time to peak	= 749 min
Time interval	= 1 min	Hyd. volume	= 315,550 cuft
Inflow hyd. No.	= 2 - proposed da-1	Max. Elevation	= 658.00 ft
Reservoir name	= pond 1	Max. Storage	= 70,554 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

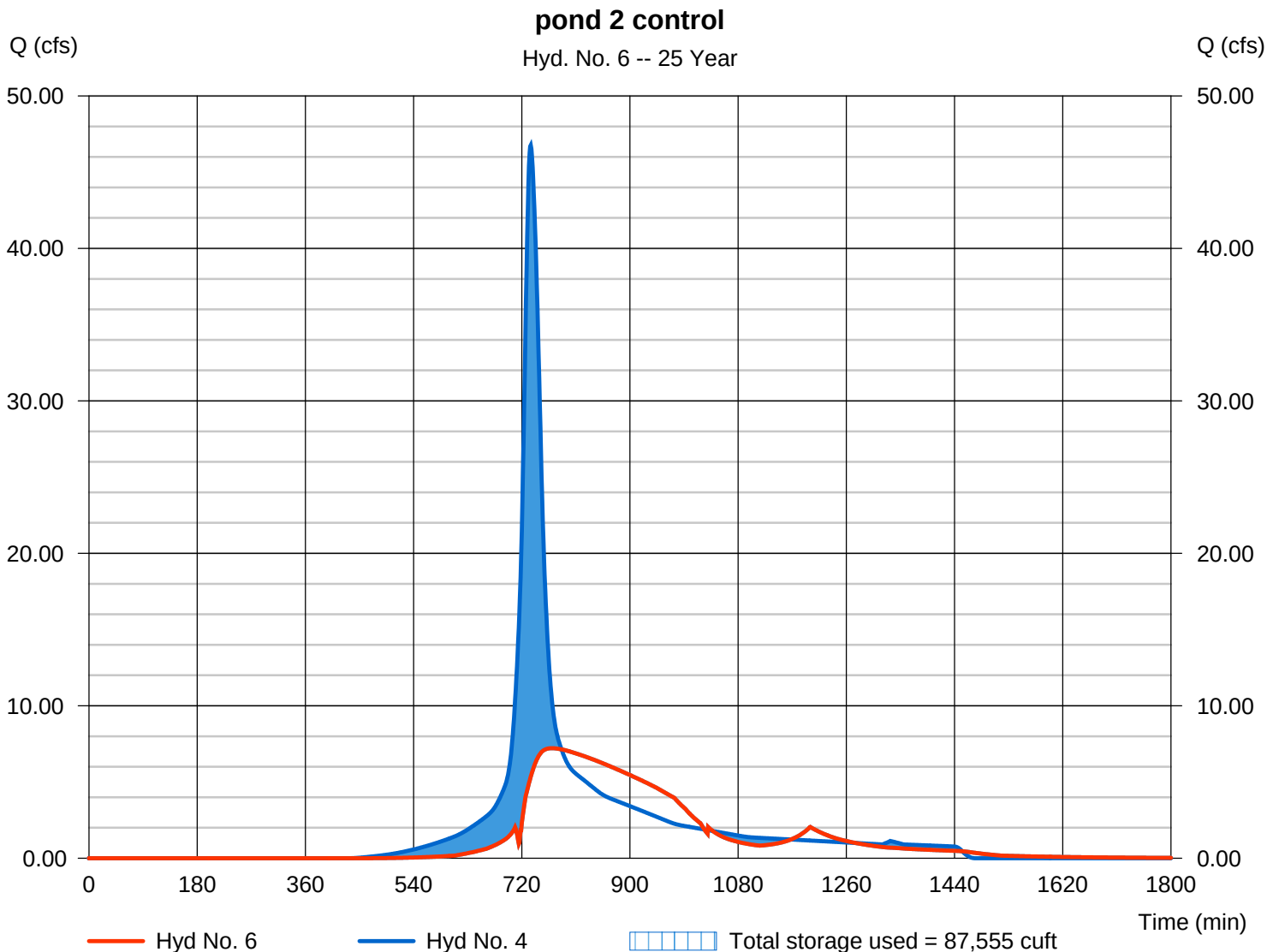
Thursday, 01 / 7 / 2021

Hyd. No. 6

pond 2 control

Hydrograph type	= Reservoir	Peak discharge	= 7.218 cfs
Storm frequency	= 25 yrs	Time to peak	= 770 min
Time interval	= 1 min	Hyd. volume	= 133,365 cuft
Inflow hyd. No.	= 4 - Proposed DA-2	Max. Elevation	= 694.15 ft
Reservoir name	= pond 2	Max. Storage	= 87,555 cuft

Storage Indication method used. Exfiltration extracted from Outflow.

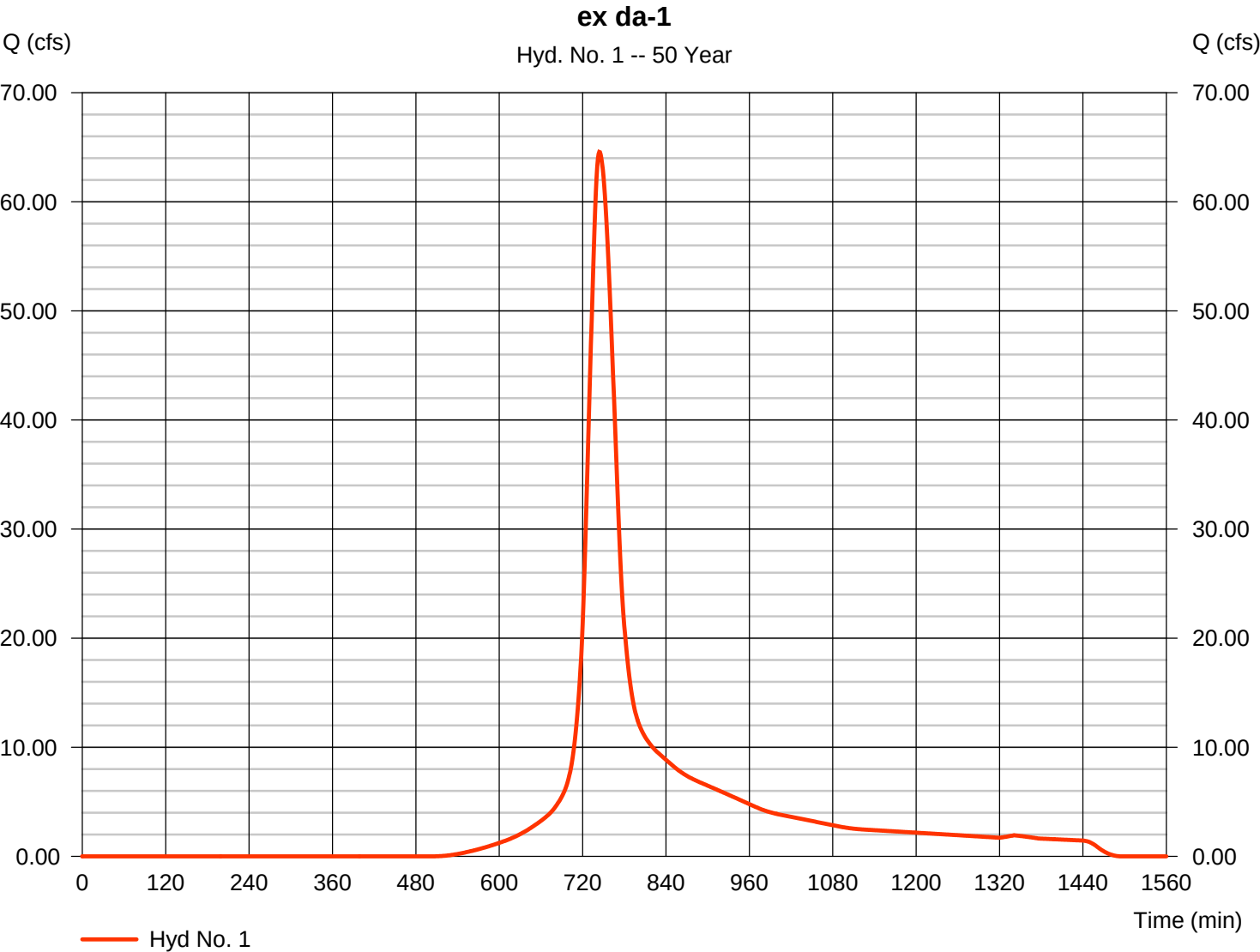


Hydrograph Report

Hyd. No. 1

ex da-1

Hydrograph type	= SCS Runoff	Peak discharge	= 64.57 cfs
Storm frequency	= 50 yrs	Time to peak	= 744 min
Time interval	= 1 min	Hyd. volume	= 363,231 cuft
Drainage area	= 24.700 ac	Curve number	= 68
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 34.90 min
Total precip.	= 7.78 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 01 / 7 / 2021

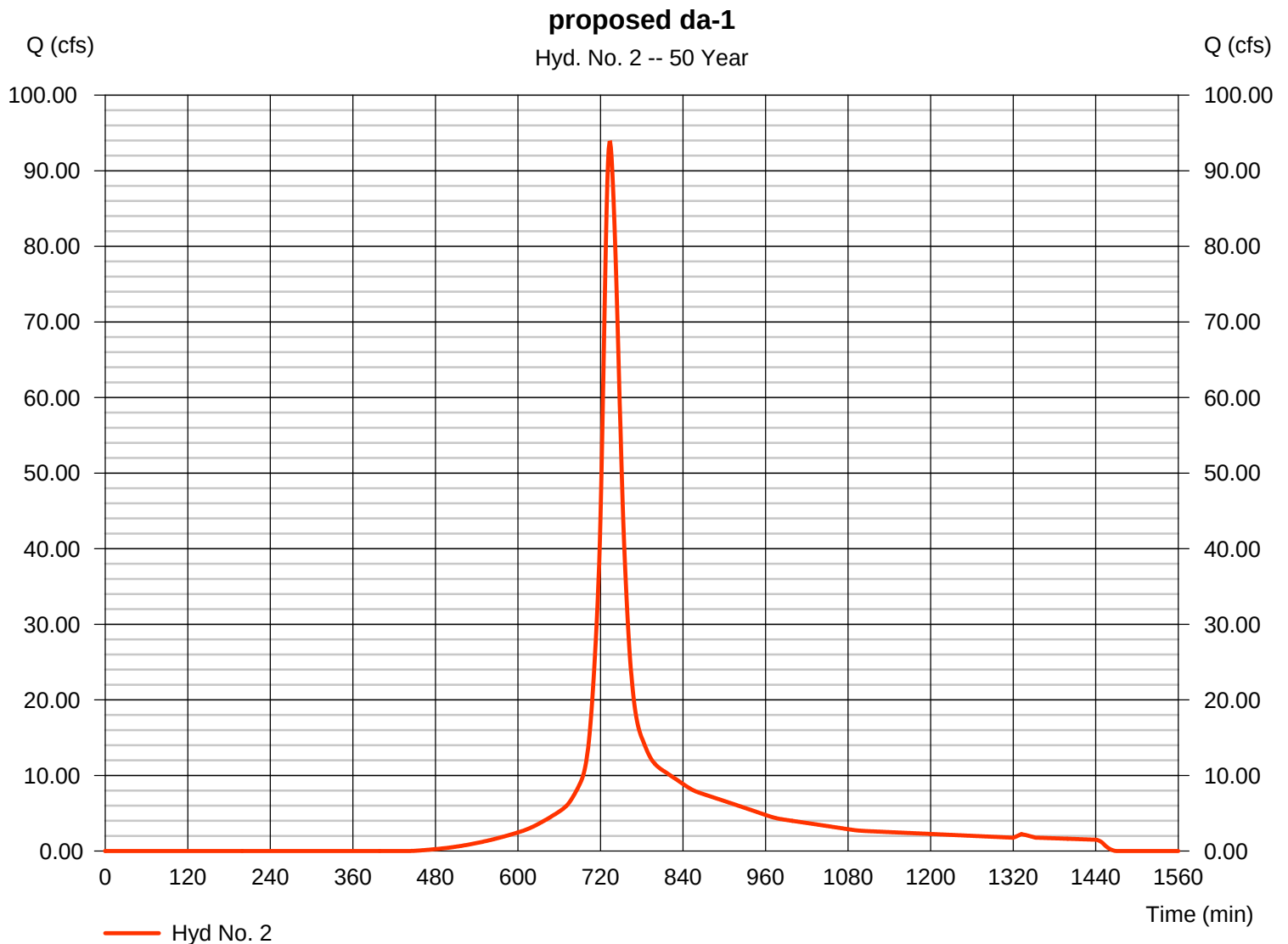
Hyd. No. 2

proposed da-1

Hydrograph type = SCS Runoff
 Storm frequency = 50 yrs
 Time interval = 1 min
 Drainage area = 24.700 ac
 Basin Slope = 0.0 %
 Tc method = TR55
 Total precip. = 7.78 in
 Storm duration = 24 hrs

Peak discharge = 93.73 cfs
 Time to peak = 734 min
 Hyd. volume = 413,831 cuft
 Curve number = 73*
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 19.30 min
 Distribution = Type III
 Shape factor = 484

* Composite (Area/CN) = $[(16.650 \times 61) + (8.050 \times 98)] / 24.700$



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 01 / 7 / 2021

Hyd. No. 3

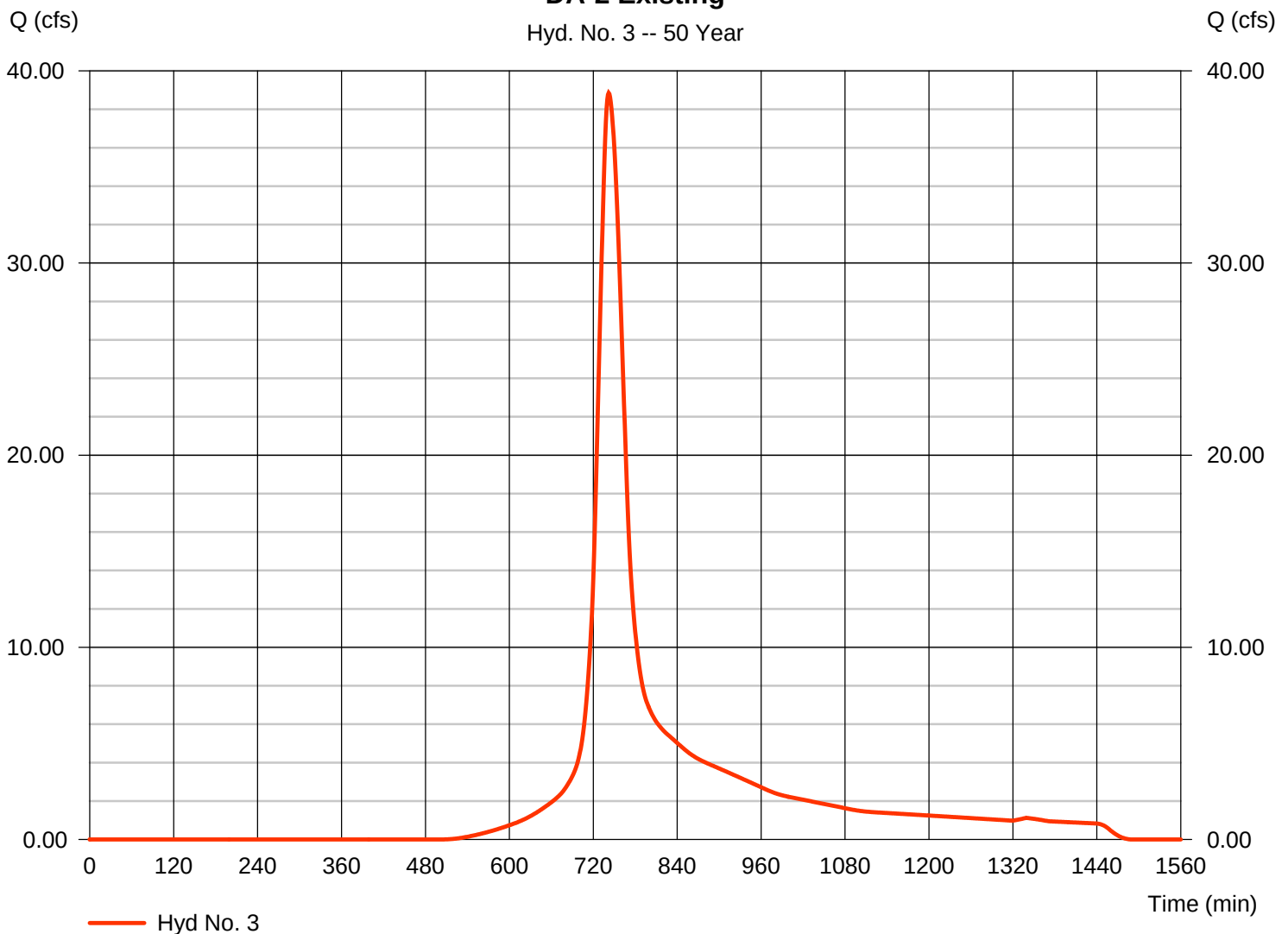
DA-2 Existing

Hydrograph type = SCS Runoff
 Storm frequency = 50 yrs
 Time interval = 1 min
 Drainage area = 14.130 ac
 Basin Slope = 6.0 %
 Tc method = TR55
 Total precip. = 7.78 in
 Storm duration = 24 hrs

Peak discharge = 38.85 cfs
 Time to peak = 742 min
 Hyd. volume = 209,159 cuft
 Curve number = 68
 Hydraulic length = 300 ft
 Time of conc. (Tc) = 32.00 min
 Distribution = Type III
 Shape factor = 484

DA-2 Existing

Hyd. No. 3 -- 50 Year



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 01 / 7 / 2021

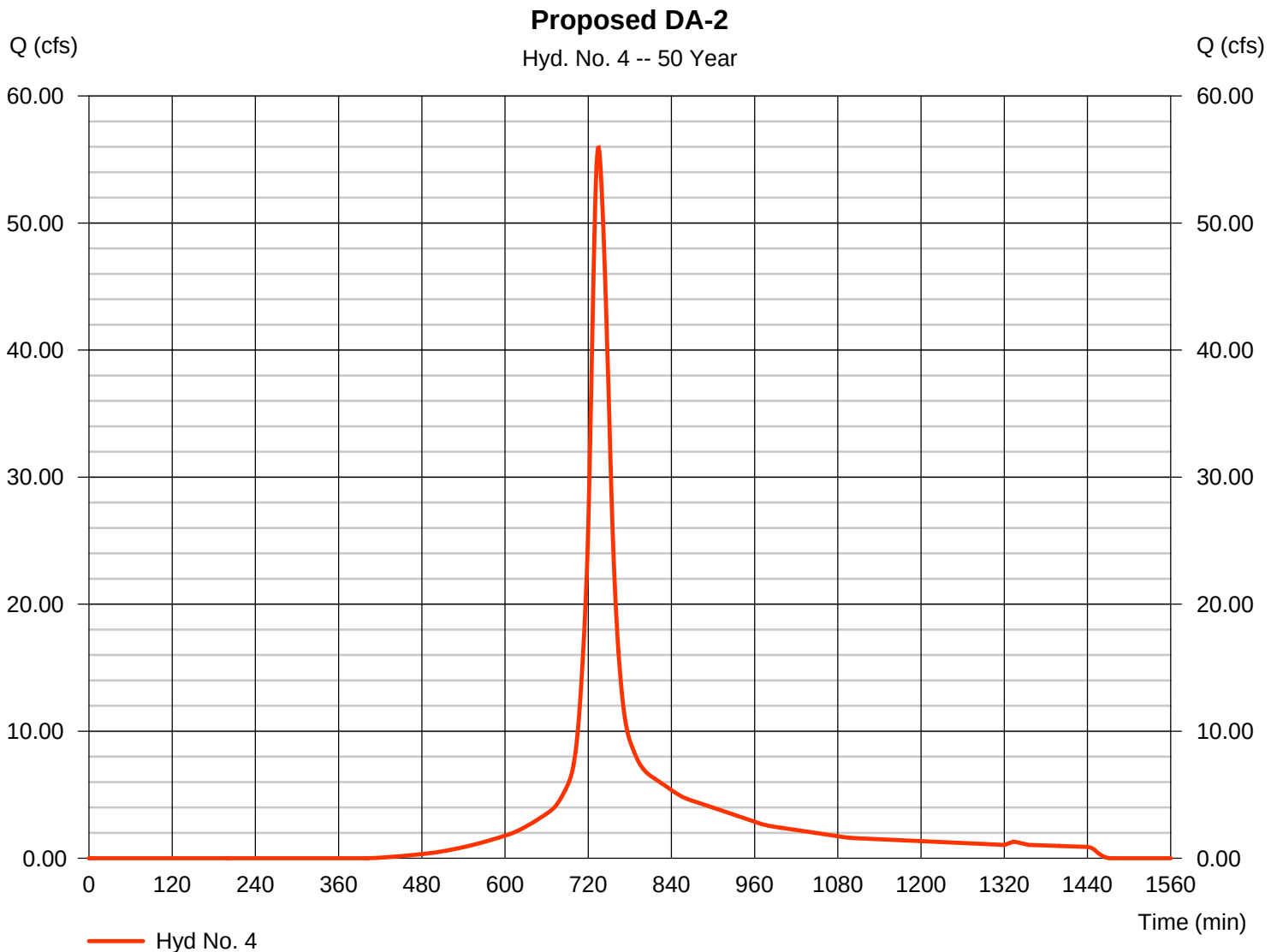
Hyd. No. 4

Proposed DA-2

Hydrograph type = SCS Runoff
 Storm frequency = 50 yrs
 Time interval = 1 min
 Drainage area = 14.130 ac
 Basin Slope = 6.0 %
 Tc method = TR55
 Total precip. = 7.78 in
 Storm duration = 24 hrs

Peak discharge = 55.94 cfs
 Time to peak = 735 min
 Hyd. volume = 256,757 cuft
 Curve number = 76*
 Hydraulic length = 300 ft
 Time of conc. (Tc) = 21.60 min
 Distribution = Type III
 Shape factor = 484

* Composite (Area/CN) = $[(5.839 \times 98) + (8.290 \times 61)] / 14.130$



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

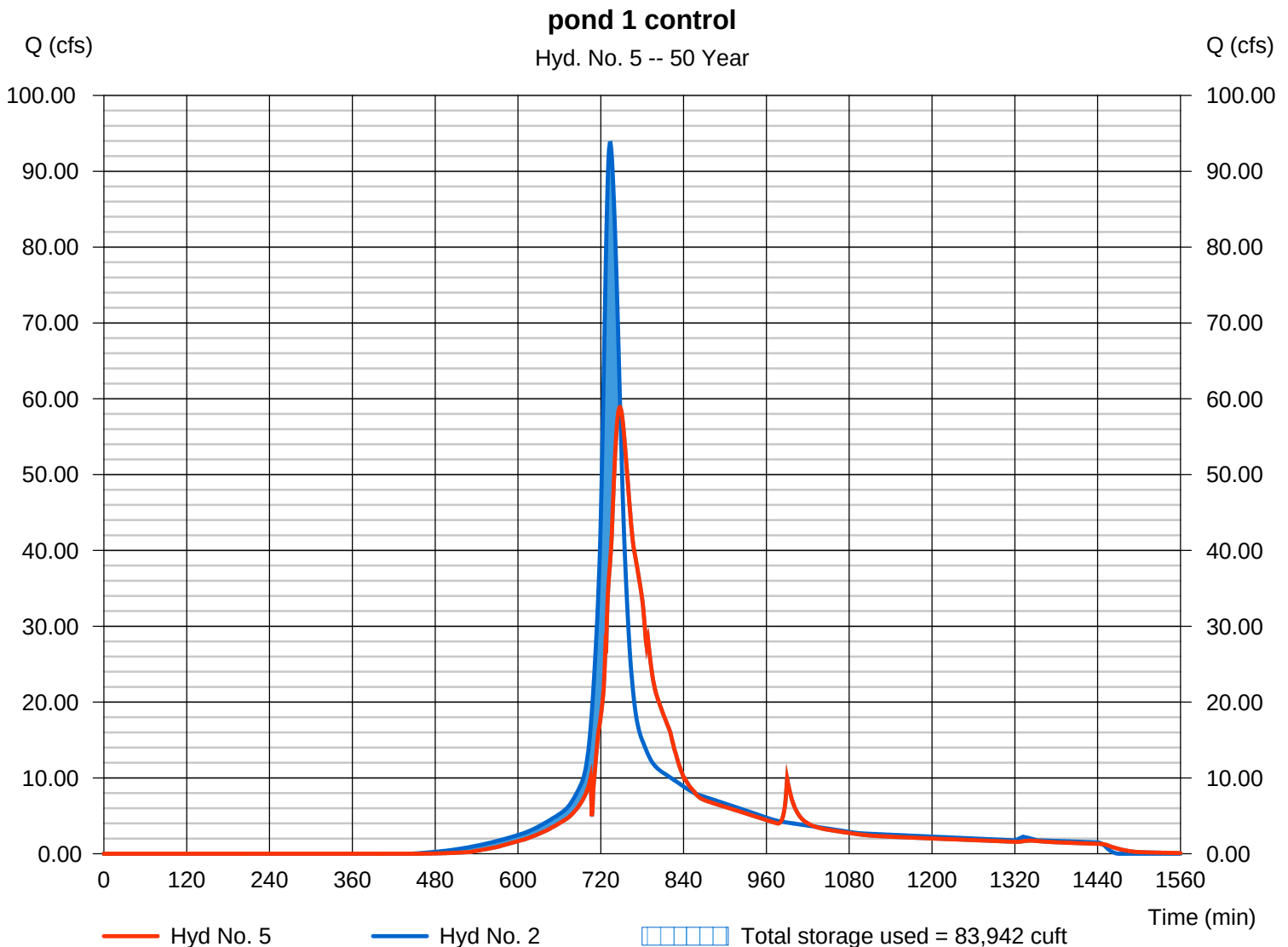
Thursday, 01 / 7 / 2021

Hyd. No. 5

pond 1 control

Hydrograph type	= Reservoir	Peak discharge	= 58.88 cfs
Storm frequency	= 50 yrs	Time to peak	= 748 min
Time interval	= 1 min	Hyd. volume	= 384,191 cuft
Inflow hyd. No.	= 2 - proposed da-1	Max. Elevation	= 659.03 ft
Reservoir name	= pond 1	Max. Storage	= 83,942 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

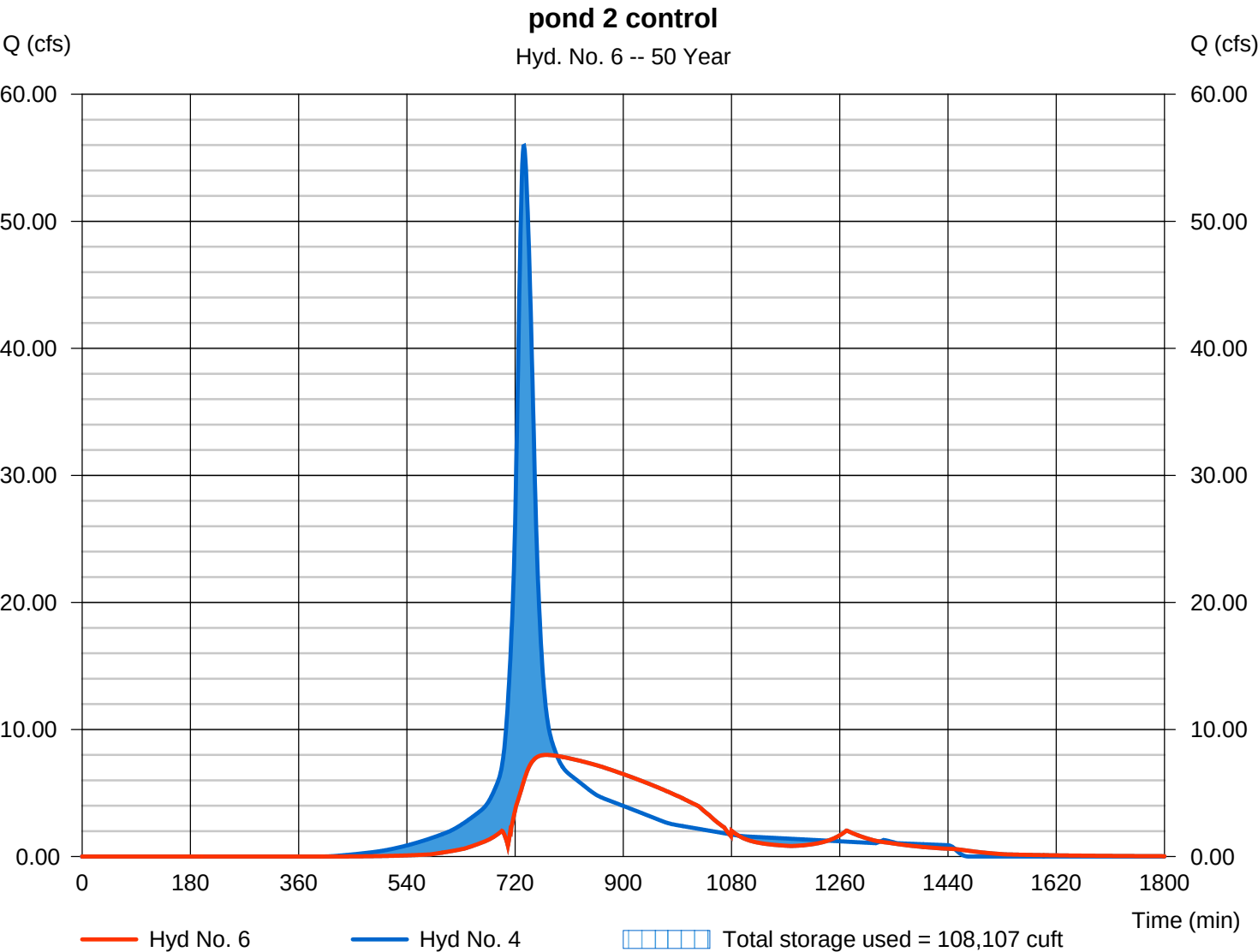
Thursday, 01 / 7 / 2021

Hyd. No. 6

pond 2 control

Hydrograph type	= Reservoir	Peak discharge	= 8.001 cfs
Storm frequency	= 50 yrs	Time to peak	= 772 min
Time interval	= 1 min	Hyd. volume	= 163,766 cuft
Inflow hyd. No.	= 4 - Proposed DA-2	Max. Elevation	= 694.98 ft
Reservoir name	= pond 2	Max. Storage	= 108,107 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

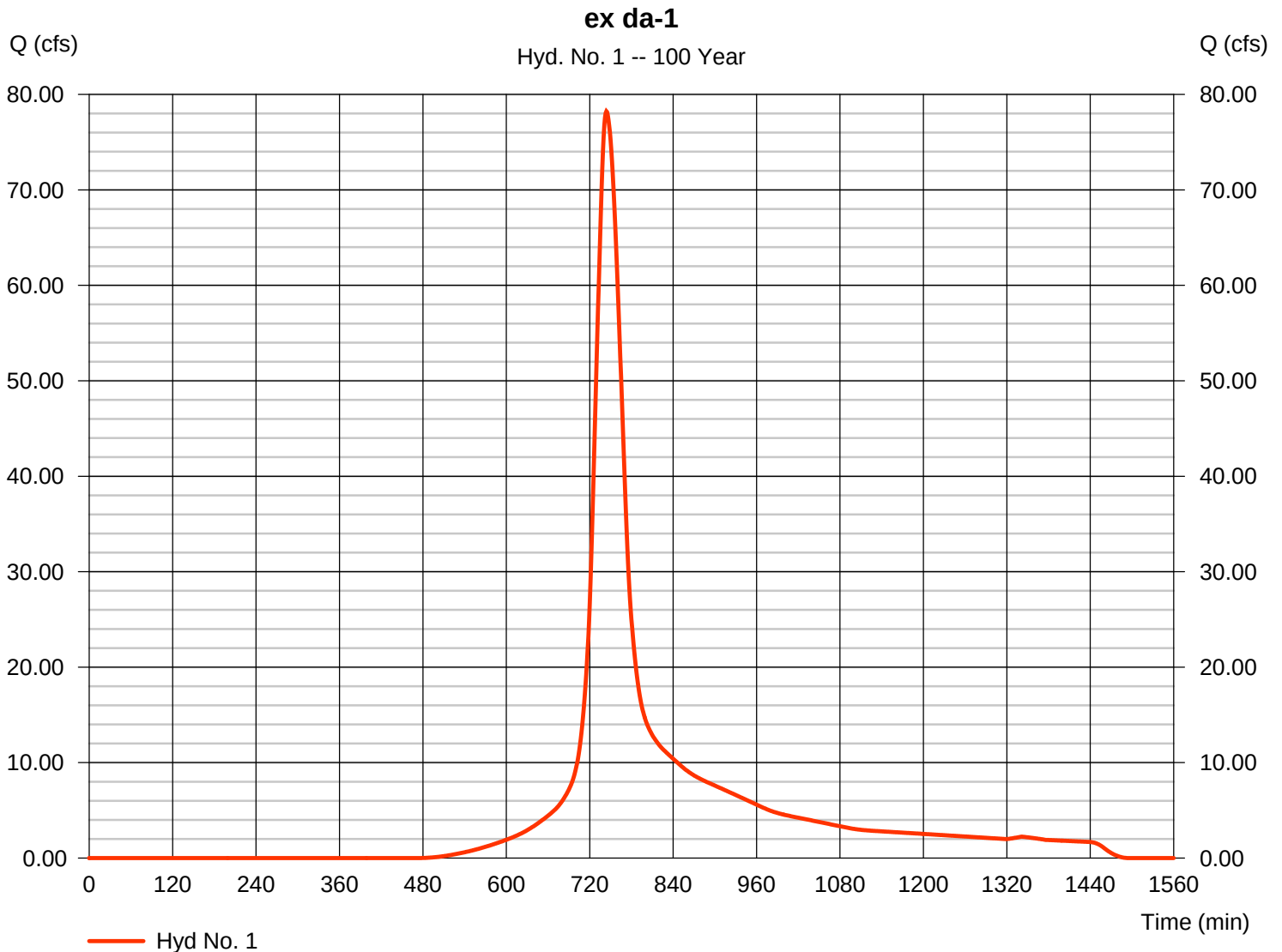
Thursday, 01 / 7 / 2021

Hyd. No. 1

ex da-1

Hydrograph type = SCS Runoff
 Storm frequency = 100 yrs
 Time interval = 1 min
 Drainage area = 24.700 ac
 Basin Slope = 0.0 %
 Tc method = TR55
 Total precip. = 8.78 in
 Storm duration = 24 hrs

Peak discharge = 78.23 cfs
 Time to peak = 744 min
 Hyd. volume = 439,182 cuft
 Curve number = 68
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 34.90 min
 Distribution = Type III
 Shape factor = 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 01 / 7 / 2021

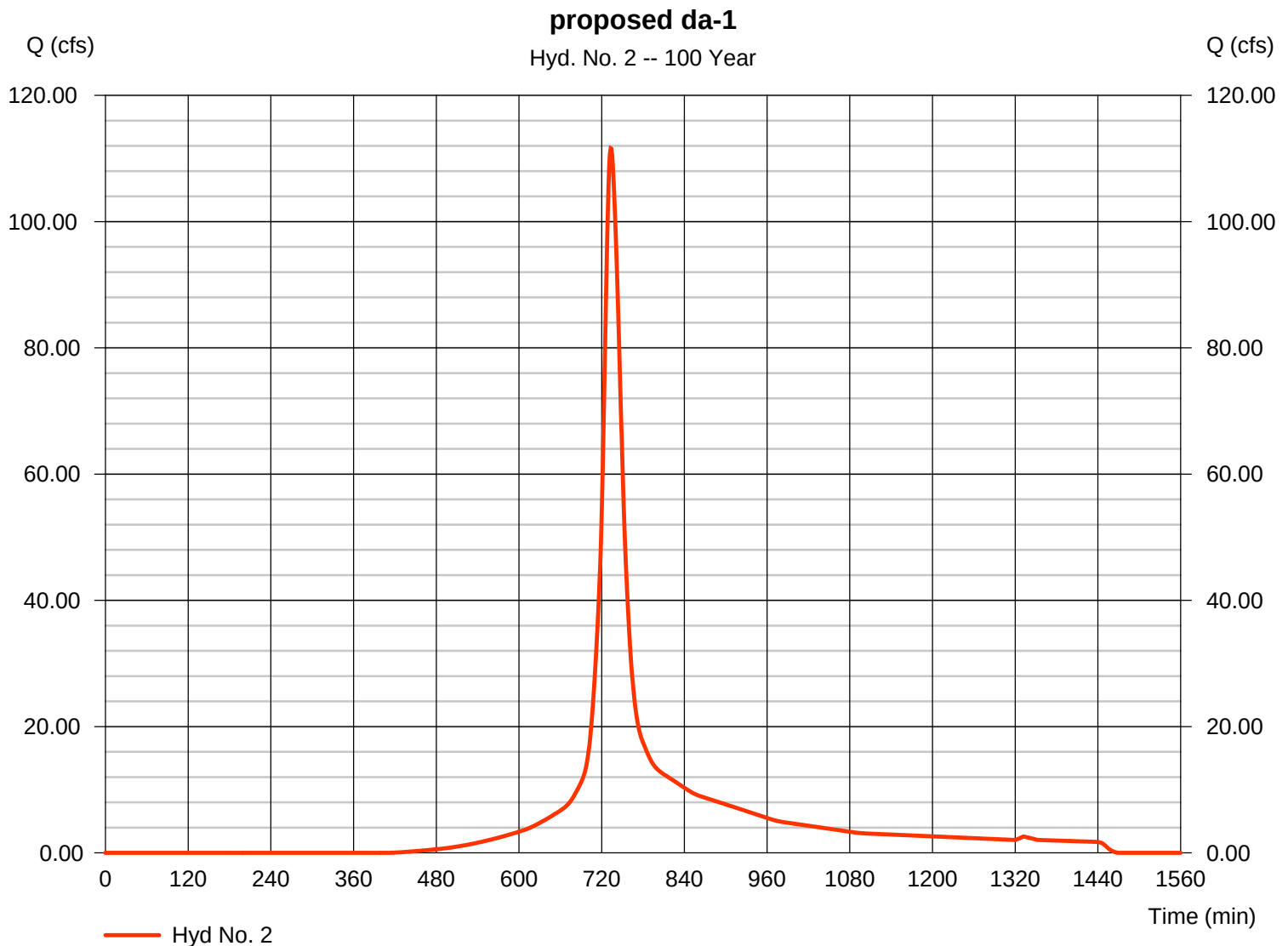
Hyd. No. 2

proposed da-1

Hydrograph type = SCS Runoff
 Storm frequency = 100 yrs
 Time interval = 1 min
 Drainage area = 24.700 ac
 Basin Slope = 0.0 %
 Tc method = TR55
 Total precip. = 8.78 in
 Storm duration = 24 hrs

Peak discharge = 111.62 cfs
 Time to peak = 733 min
 Hyd. volume = 493,762 cuft
 Curve number = 73*
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 19.30 min
 Distribution = Type III
 Shape factor = 484

* Composite (Area/CN) = $[(16.650 \times 61) + (8.050 \times 98)] / 24.700$



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 01 / 7 / 2021

Hyd. No. 3

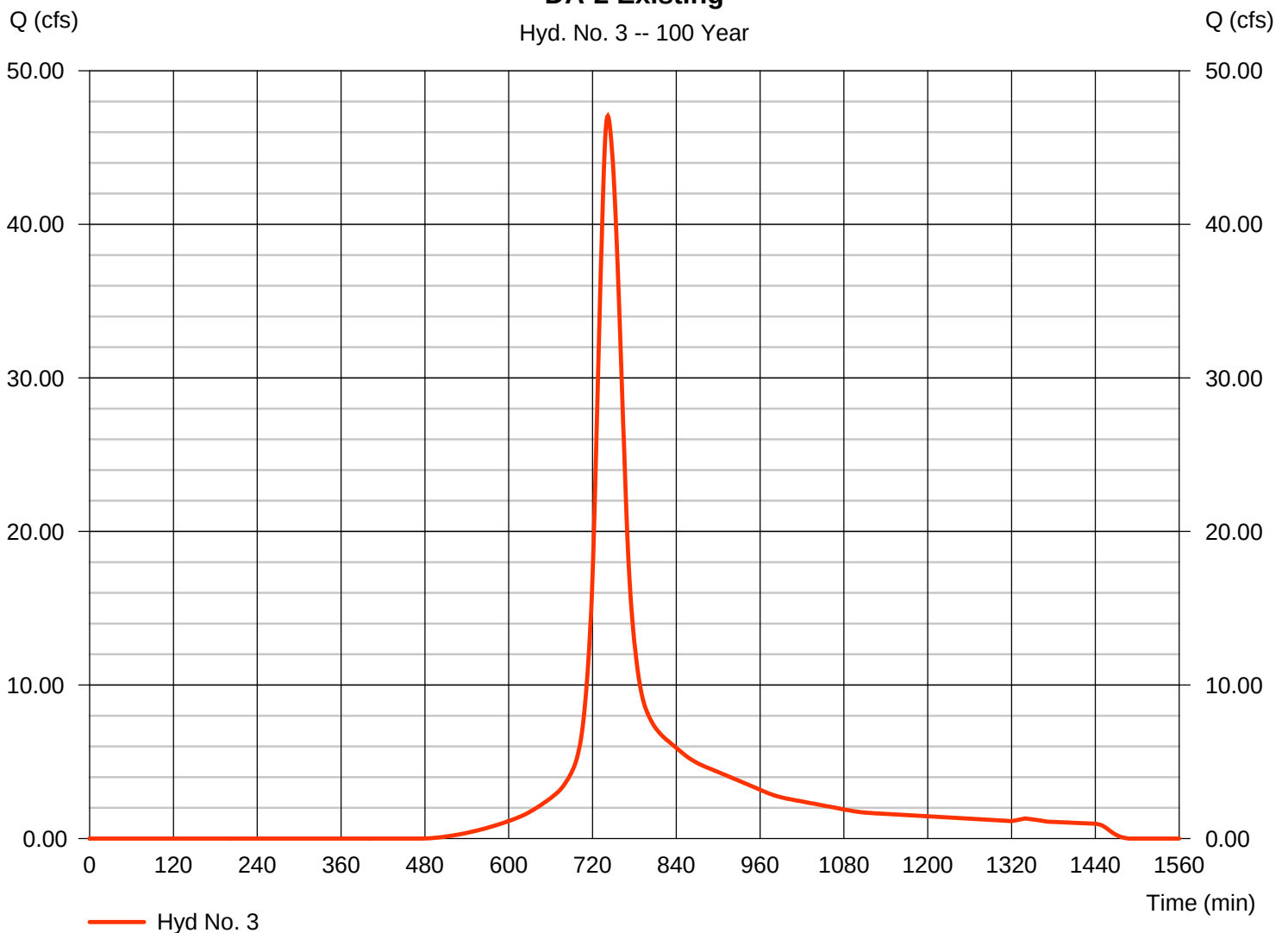
DA-2 Existing

Hydrograph type = SCS Runoff
 Storm frequency = 100 yrs
 Time interval = 1 min
 Drainage area = 14.130 ac
 Basin Slope = 6.0 %
 Tc method = TR55
 Total precip. = 8.78 in
 Storm duration = 24 hrs

Peak discharge = 47.06 cfs
 Time to peak = 742 min
 Hyd. volume = 252,894 cuft
 Curve number = 68
 Hydraulic length = 300 ft
 Time of conc. (Tc) = 32.00 min
 Distribution = Type III
 Shape factor = 484

DA-2 Existing

Hyd. No. 3 -- 100 Year



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 01 / 7 / 2021

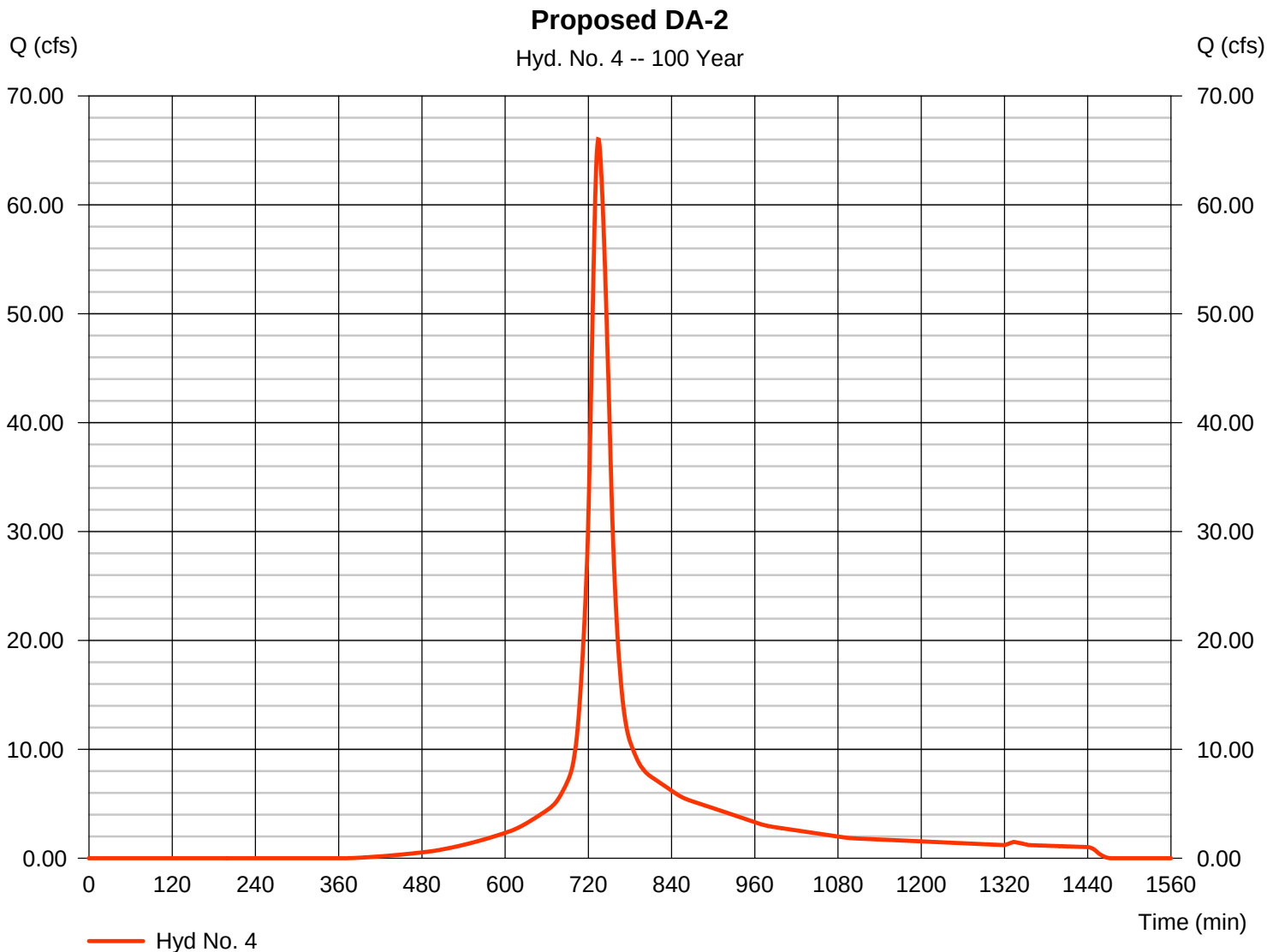
Hyd. No. 4

Proposed DA-2

Hydrograph type = SCS Runoff
 Storm frequency = 100 yrs
 Time interval = 1 min
 Drainage area = 14.130 ac
 Basin Slope = 6.0 %
 Tc method = TR55
 Total precip. = 8.78 in
 Storm duration = 24 hrs

Peak discharge = 66.01 cfs
 Time to peak = 734 min
 Hyd. volume = 304,110 cuft
 Curve number = 76*
 Hydraulic length = 300 ft
 Time of conc. (Tc) = 21.60 min
 Distribution = Type III
 Shape factor = 484

* Composite (Area/CN) = $[(5.839 \times 98) + (8.290 \times 61)] / 14.130$



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

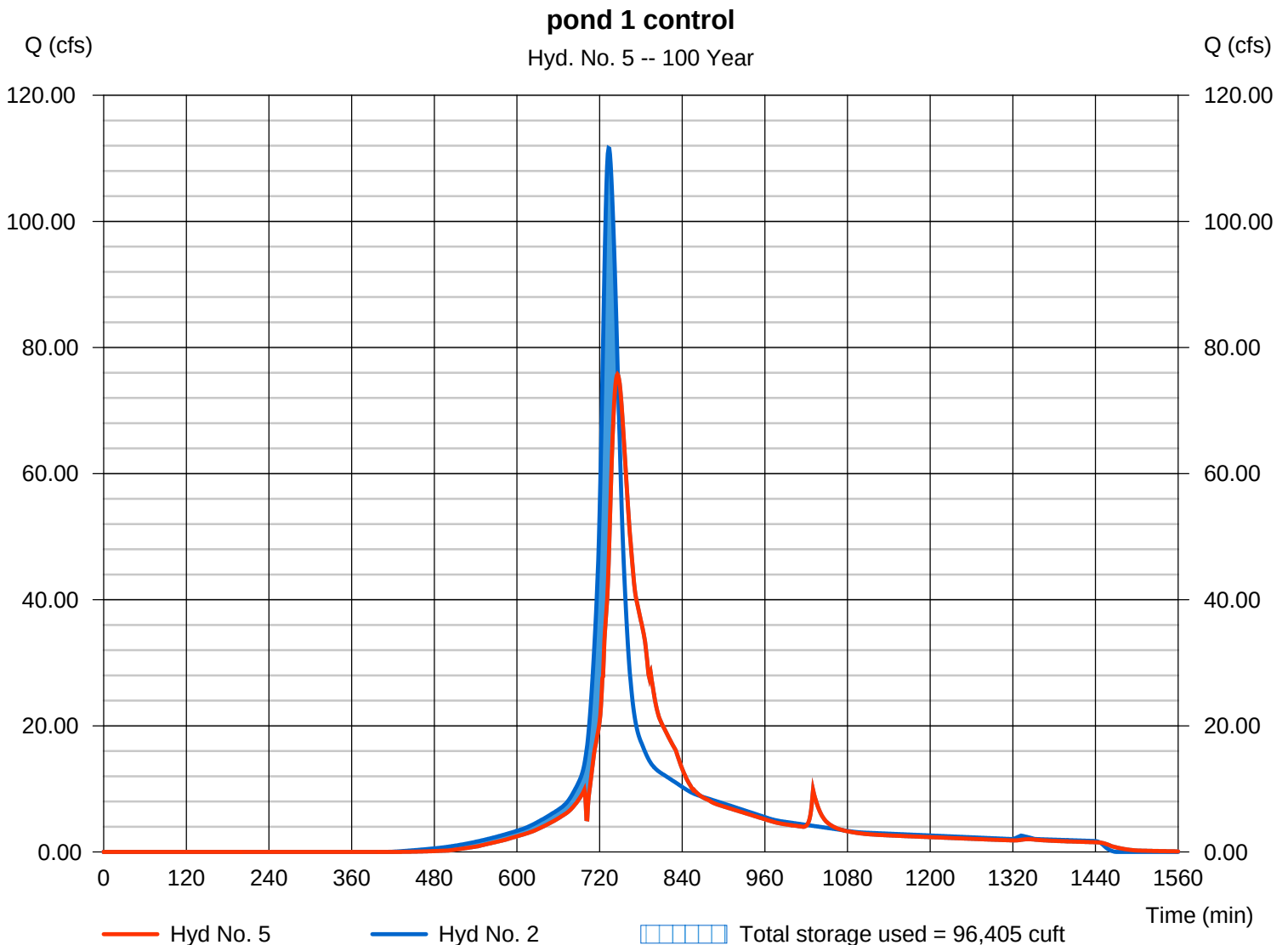
Thursday, 01 / 7 / 2021

Hyd. No. 5

pond 1 control

Hydrograph type	= Reservoir	Peak discharge	= 75.76 cfs
Storm frequency	= 100 yrs	Time to peak	= 746 min
Time interval	= 1 min	Hyd. volume	= 460,913 cuft
Inflow hyd. No.	= 2 - proposed da-1	Max. Elevation	= 659.99 ft
Reservoir name	= pond 1	Max. Storage	= 96,405 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

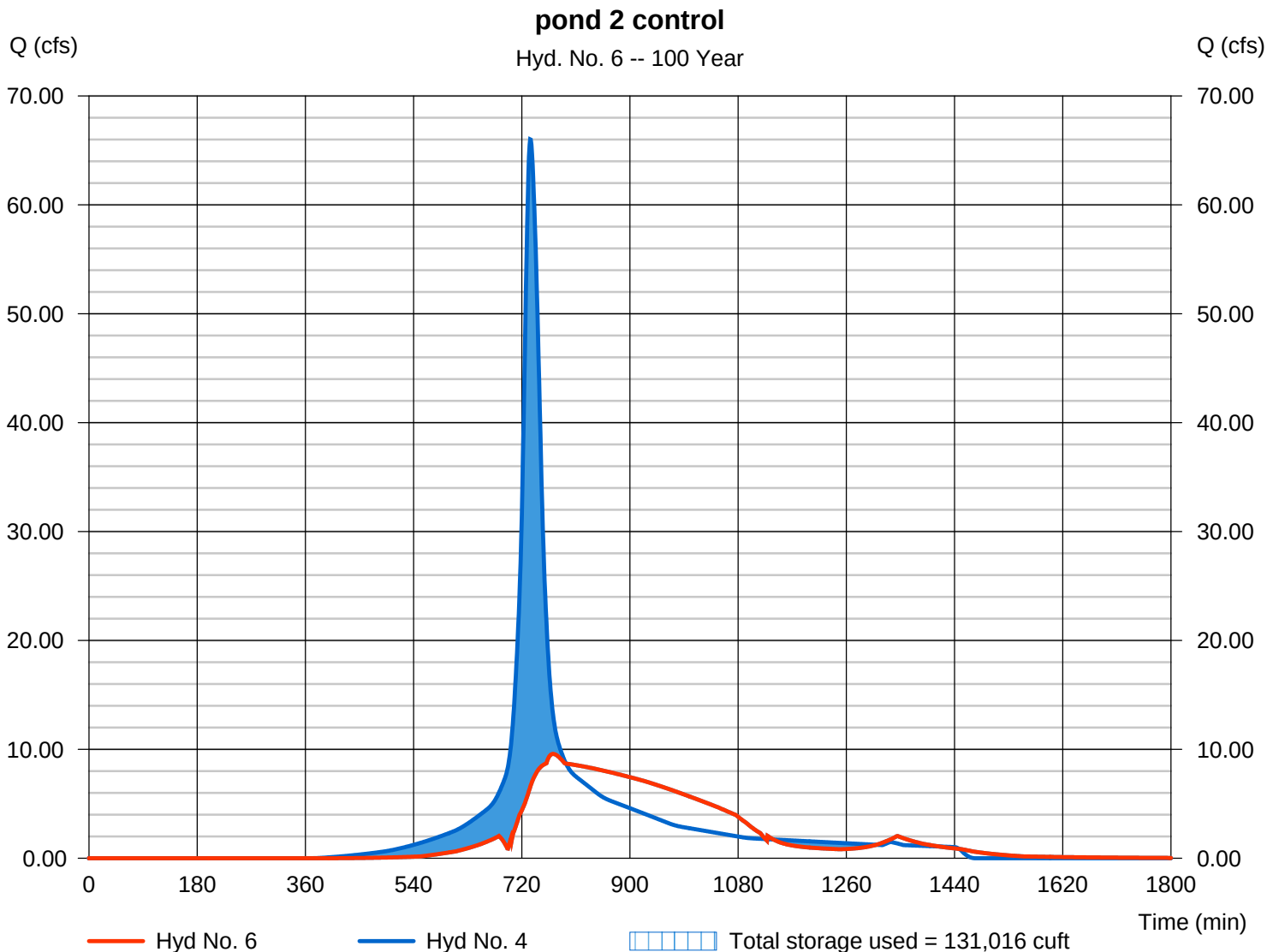
Thursday, 01 / 7 / 2021

Hyd. No. 6

pond 2 control

Hydrograph type	= Reservoir	Peak discharge	= 9.582 cfs
Storm frequency	= 100 yrs	Time to peak	= 772 min
Time interval	= 1 min	Hyd. volume	= 198,054 cuft
Inflow hyd. No.	= 4 - Proposed DA-2	Max. Elevation	= 695.91 ft
Reservoir name	= pond 2	Max. Storage	= 131,016 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Appendix B
Inlet report (Gutter flow analysis for catch basin on site)

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter								Inlet			Byp Line No	
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)				
1	Structure - (6)	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	5.00	0.020	0.020	0.011	0.00	0.00	0.00	0.00	0.00	0.0	Off	
2	Structure - (5)	0.07	0.00	0.07	0.00	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.04	1.76	0.04	1.76	0.04	1.76	0.0	3
3	Structure - (4)	0.45	0.00	0.38	0.06	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.45	0.07	3.45	0.07	3.45	0.0	4
4	Structure - (3)	0.45	0.15	0.48	0.11	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.08	3.85	0.08	3.85	0.08	3.85	0.0	Off
5	Structure - (54)	0.45	0.15	0.48	0.11	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.08	3.85	0.08	3.85	0.08	3.85	0.0	Off
6	Structure - (55)	0.45	0.06	0.42	0.09	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.60	0.07	3.60	0.07	3.60	0.0	5
7	Structure - (56)	0.45	0.00	0.38	0.06	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.45	0.07	3.45	0.07	3.45	0.0	6
8	Structure - (57)	0.45	0.00	0.38	0.06	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.45	0.07	3.45	0.07	3.45	0.0	17
9	Structure - (2)	0.45	0.06	0.42	0.09	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.60	0.07	3.60	0.07	3.60	0.0	Off
10	Structure - (15)	0.45	0.06	0.42	0.09	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.60	0.07	3.60	0.07	3.60	0.0	Off
11	Structure - (16)	0.45	0.00	0.38	0.06	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.45	0.07	3.45	0.07	3.45	0.0	10
12	Structure - (17)	0.45	0.00	0.38	0.06	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.45	0.07	3.45	0.07	3.45	0.0	9
13	Structure - (1)	0.45	0.06	0.42	0.09	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.60	0.07	3.60	0.07	3.60	0.0	Off
14	Structure - (12)	0.45	0.06	0.42	0.09	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.60	0.07	3.60	0.07	3.60	0.0	Off
15	Structure - (13)	0.45	0.00	0.38	0.06	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.45	0.07	3.45	0.07	3.45	0.0	14
16	Structure - (14)	0.45	0.00	0.38	0.06	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.45	0.07	3.45	0.07	3.45	0.0	13
17	Structure - (59)	0.45	0.06	0.42	0.09	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.60	0.07	3.60	0.07	3.60	0.0	4
18	Structure - (58)	0.45	0.00	0.38	0.06	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.45	0.07	3.45	0.07	3.45	0.0	5
19	Structure - (91)	0.45	0.09	0.44	0.09	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.70	0.07	3.70	0.07	3.70	0.0	Off
20	Structure - (92)	0.45	0.09	0.44	0.09	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.70	0.07	3.70	0.07	3.70	0.0	Off
21	Structure - (121)	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	5.00	0.020	0.020	0.011	0.00	0.00	0.00	0.00	0.00	0.0	Off	
22	Structure - (120)	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	5.00	0.020	0.020	0.011	0.00	0.00	0.00	0.00	0.00	0.0	Off	
23	Structure - (74)	0.45	0.09	0.44	0.09	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.70	0.07	3.70	0.07	3.70	0.0	Off
Project File: storm 5-15-19.stm															Number of lines: 89							Run Date: 2/9/2021		
NOTES: Inlet N-Values = 0.016; Intensity = 102.61 / (Inlet time + 16.50) ^ 0.82; Return period = 25 Yrs. ; * Indicates Known Q added. All curb inlets are throat.																								

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter								Inlet			Byp Line No	
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)				
24	Structure - (64)	0.45	0.09	0.44	0.09	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.70	0.07	3.70	0.07	3.70	0.0	Off
25	Structure - (65)	0.45	0.09	0.44	0.09	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.70	0.07	3.70	0.07	3.70	0.0	24
26	Structure - (66)	0.45	0.09	0.44	0.09	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.70	0.07	3.70	0.07	3.70	0.0	25
27	Structure - (67)	0.45	0.06	0.42	0.09	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.60	0.07	3.60	0.07	3.60	0.0	26
28	Structure - (68)	0.45	0.00	0.38	0.06	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.45	0.07	3.45	0.07	3.45	0.0	27
29	Structure - (69)	0.45	0.00	0.38	0.06	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.45	0.07	3.45	0.07	3.45	0.0	40
30	Structure - (93)	0.45	0.06	0.42	0.09	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.60	0.07	3.60	0.07	3.60	0.0	Off
31	Structure - (94)	0.45	0.00	0.38	0.06	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.45	0.07	3.45	0.07	3.45	0.0	30
32	Structure - (95)	0.45	0.09	0.44	0.09	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.70	0.07	3.70	0.07	3.70	0.0	Off
33	Structure - (96)	0.45	0.09	0.44	0.09	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.70	0.07	3.70	0.07	3.70	0.0	32
34	Structure - (97)	0.45	0.09	0.44	0.09	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.70	0.07	3.70	0.07	3.70	0.0	33
35	Structure - (98)	0.45	0.09	0.44	0.09	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.70	0.07	3.70	0.07	3.70	0.0	34
36	Structure - (99)	0.45	0.06	0.42	0.09	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.60	0.07	3.60	0.07	3.60	0.0	35
37	Structure - (100)	0.45	0.00	0.38	0.06	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.45	0.07	3.45	0.07	3.45	0.0	36
38	Structure - (101)	0.45	0.00	0.38	0.06	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.45	0.07	3.45	0.07	3.45	0.0	39
39	Structure - (112)	0.45	0.06	0.42	0.09	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.60	0.07	3.60	0.07	3.60	0.0	41
40	Structure - (70)	0.45	0.06	0.42	0.09	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.60	0.07	3.60	0.07	3.60	0.0	42
41	Structure - (111)	0.45	0.09	0.44	0.09	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.70	0.07	3.70	0.07	3.70	0.0	44
42	Structure - (72)	0.45	0.09	0.44	0.09	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.70	0.07	3.70	0.07	3.70	0.0	43
43	Structure - (73)	0.45	0.09	0.44	0.09	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.70	0.07	3.70	0.07	3.70	0.0	23
44	Structure - (110)	0.45	0.09	0.44	0.09	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.70	0.07	3.70	0.07	3.70	0.0	45
45	Structure - (109)	0.45	0.09	0.44	0.09	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.70	0.07	3.70	0.07	3.70	0.0	49
46	Structure - (102)	0.45	0.06	0.42	0.09	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.60	0.07	3.60	0.07	3.60	0.0	20
Project File: storm 5-15-19.stm															Number of lines: 89							Run Date: 2/9/2021		
NOTES: Inlet N-Values = 0.016; Intensity = 102.61 / (Inlet time + 16.50) ^ 0.82; Return period = 25 Yrs. ; * Indicates Known Q added. All curb inlets are throat.																								

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet				Gutter								Inlet				Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)		
47	Structure - (103)	0.45	0.00	0.38	0.06	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.45	0.07	3.45	0.07	3.45	0.0	46	
48	Structure - (104)	0.45	0.00	0.38	0.06	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.45	0.07	3.45	0.07	3.45	0.0	51	
49	Structure - (108)	0.45	0.09	0.44	0.09	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.70	0.07	3.70	0.07	3.70	0.0	Off	
50	Structure - (107)	0.45	0.00	0.38	0.06	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.45	0.07	3.45	0.07	3.45	0.0	52	
51	Structure - (105)	0.45	0.06	0.42	0.09	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.60	0.07	3.60	0.07	3.60	0.0	19	
52	Structure - (106)	0.45	0.06	0.42	0.09	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.60	0.07	3.60	0.07	3.60	0.0	Off	
53	Structure - (42)	0.45	0.09	0.44	0.09	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.70	0.07	3.70	0.07	3.70	0.0	Off	
54	Structure - (119)	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	5.00	0.020	0.020	0.011	0.00	0.00	0.00	0.00	0.00	0.0	Off		
55	Structure - (43)	0.45	0.09	0.44	0.09	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.70	0.07	3.70	0.07	3.70	0.0	53	
56	Structure - (44)	0.45	0.09	0.44	0.09	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.70	0.07	3.70	0.07	3.70	0.0	55	
57	Structure - (45)	0.45	0.09	0.44	0.09	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.70	0.07	3.70	0.07	3.70	0.0	56	
58	Structure - (46)	0.45	0.06	0.42	0.09	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.60	0.07	3.60	0.07	3.60	0.0	57	
59	Structure - (47)	0.45	0.00	0.38	0.06	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.45	0.07	3.45	0.07	3.45	0.0	58	
60	Structure - (53)	0.45	0.00	0.38	0.06	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.45	0.07	3.45	0.07	3.45	0.0	61	
61	Structure - (52)	0.45	0.06	0.42	0.09	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.60	0.07	3.60	0.07	3.60	0.0	65	
62	Structure - (114)	0.45	0.06	0.42	0.09	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.60	0.07	3.60	0.07	3.60	0.0	Off	
63	Structure - (115)	0.45	0.00	0.38	0.06	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.45	0.07	3.45	0.07	3.45	0.0	62	
64	Structure - (116)	0.45	0.00	0.38	0.06	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.45	0.07	3.45	0.07	3.45	0.0	66	
65	Structure - (51)	0.45	0.09	0.44	0.09	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.70	0.07	3.70	0.07	3.70	0.0	67	
66	Structure - (117)	0.45	0.06	0.42	0.09	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.60	0.07	3.60	0.07	3.60	0.0	Off	
67	Structure - (50)	0.45	0.09	0.44	0.09	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.70	0.07	3.70	0.07	3.70	0.0	68	
68	Structure - (48)	0.45	0.09	0.44	0.09	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.70	0.07	3.70	0.07	3.70	0.0	69	
69	Structure - (49)	0.45	0.09	0.44	0.09	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.70	0.07	3.70	0.07	3.70	0.0	Off	

Project File: storm 5-15-19.stm

Number of lines: 89

Run Date: 2/9/2021

NOTES: Inlet N-Values = 0.016; Intensity = 102.61 / (Inlet time + 16.50) ^ 0.82; Return period = 25 Yrs. ; * Indicates Known Q added. All curb inlets are throat.

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter								Inlet				Byp Line No	
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)					
70	Structure - (19)	0.45	0.18	0.50	0.13	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.08	3.90	0.08	3.90	0.08	3.90	0.0	Off	
71	Structure - (27)	0.45	0.09	0.44	0.09	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.70	0.07	3.70	0.07	3.70	0.0	70	
72	Structure - (28)	0.45	0.06	0.42	0.09	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.60	0.07	3.60	0.07	3.60	0.0	89	
73	Structure - (29)	0.45	0.06	0.42	0.09	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.60	0.07	3.60	0.07	3.60	0.0	Off	
74	Structure - (30)	0.45	0.09	0.44	0.09	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.70	0.07	3.70	0.07	3.70	0.0	71	
75	Structure - (31)	0.45	0.06	0.42	0.09	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.60	0.07	3.60	0.07	3.60	0.0	74	
76	Structure - (32)	0.45	0.00	0.38	0.06	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.45	0.07	3.45	0.07	3.45	0.0	75	
77	Structure - (33)	0.45	0.00	0.38	0.06	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.45	0.07	3.45	0.07	3.45	0.0	88	
78	Structure - (35)	0.45	0.00	0.38	0.06	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.45	0.07	3.45	0.07	3.45	0.0	72	
79	Structure - (36)	0.45	0.00	0.38	0.06	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.45	0.07	3.45	0.07	3.45	0.0	73	
80	Structure - (20)	0.45	0.09	0.44	0.09	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.70	0.07	3.70	0.07	3.70	0.0	70	
81	Structure - (21)	0.45	0.09	0.44	0.09	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.70	0.07	3.70	0.07	3.70	0.0	87	
82	Structure - (22)	0.45	0.06	0.42	0.09	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.60	0.07	3.60	0.07	3.60	0.0	81	
83	Structure - (23)	0.45	0.00	0.38	0.06	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.45	0.07	3.45	0.07	3.45	0.0	82	
84	Structure - (24)	0.45	0.00	0.38	0.06	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.45	0.07	3.45	0.07	3.45	0.0	86	
85	Structure - (34)	0.45	0.01	0.39	0.06	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.50	0.07	3.50	0.07	3.50	0.0	Off	
86	Structure - (26)	0.45	0.06	0.42	0.09	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.60	0.07	3.60	0.07	3.60	0.0	80	
87	Structure - (25)	0.45	0.09	0.44	0.09	Comb	4.0	3.00	0.00	3.00	2.00	0.050	5.00	0.020	0.020	0.011	0.07	3.70	0.07	3.70	0.07	3.70	0.0	Off	
88		0.45	0.06	0.50	0.01	Comb	4.0	3.00	0.00	3.00	2.00	0.020	2.00	0.050	0.020	0.013	0.13	3.41	0.13	3.41	0.13	3.41	0.0	85	
89		0.07	0.09	0.16	0.00	Comb	4.0	3.00	0.00	3.00	2.00	0.020	2.00	0.050	0.020	0.013	0.08	1.68	0.08	1.68	0.08	1.68	0.0	87	
Project File: storm 5-15-19.stm																	Number of lines: 89			Run Date: 2/9/2021					
NOTES: Inlet N-Values = 0.016; Intensity = 102.61 / (Inlet time + 16.50) ^ 0.82; Return period = 25 Yrs. ; * Indicates Known Q added. All curb inlets are throat.																									

APPENDIX C
Drainage Statement

Drainage Design Statement

The Proposed drainage system for the Hopp Brook Estates development at the end of Oakwood Drive has been designed to conform to the town of Beacon falls Engineering Standards. These standards prevent the increase of storm water discharge to the surrounding areas for the 100-year storm event. The storm water conveyance system (piping) is designed for the 100-year storm event, and the gutter flow analysis is based on the 10-year storm event. The development as proposed will not have an adverse impact on the surrounding wetlands or watercourses.

Should you have questions concerning the above, please contact Manny Silva.

Very truly yours,

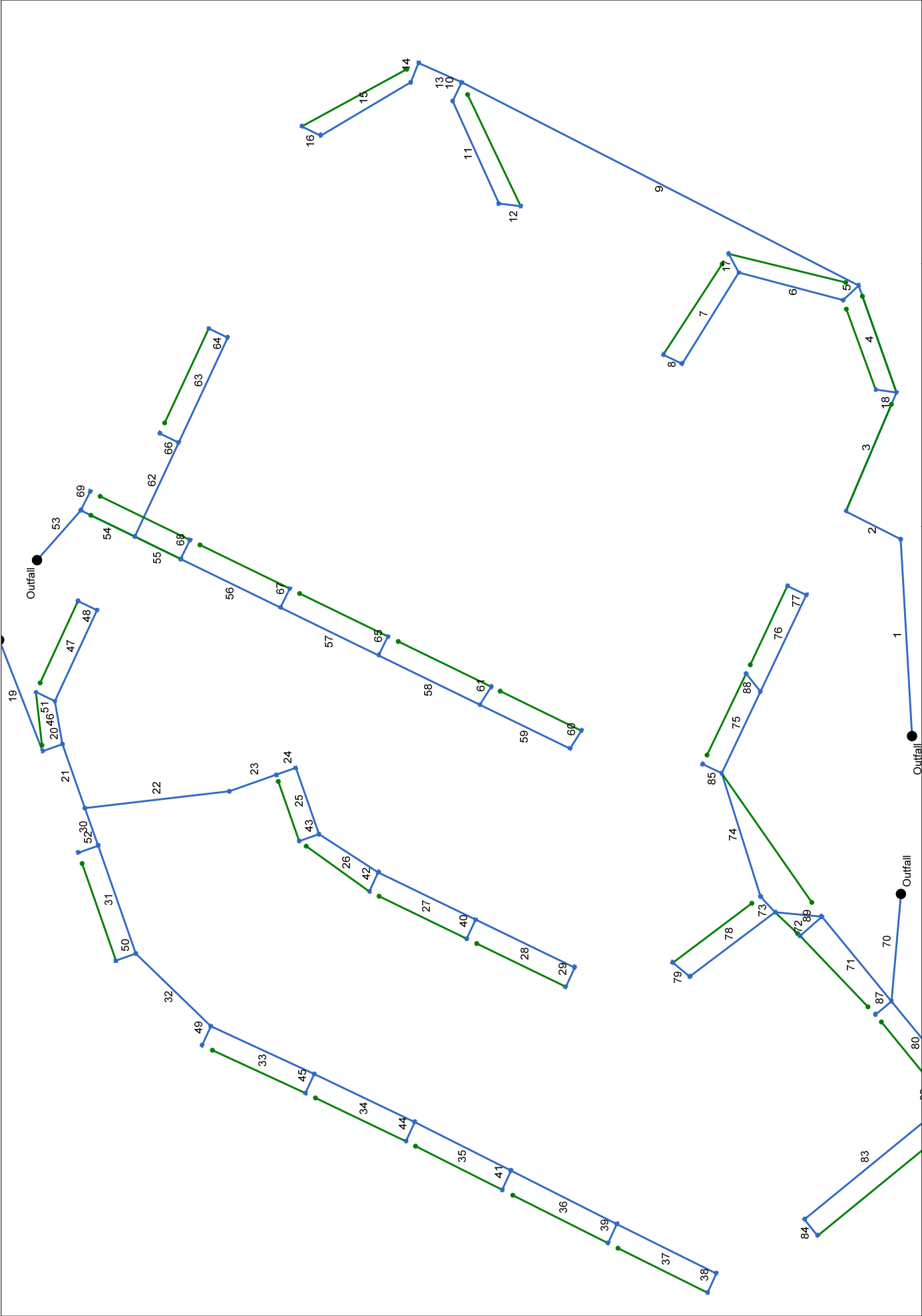


Manuel Jose Silva, P.E.

Project Engineer

APPENDIX D

HGL storm sewer calculation 100-year storm



Project File: storm 5-15-19.stm		Number of lines: 89		Date: 5/30/2019
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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 - (6)	5.47	24	Cir	264.215	688.00	689.40	0.530	688.85	690.22	n/a	690.22 j	End	Manhole
2	Pipe - (5)	5.54	24	Cir	82.503	689.40	690.81	1.709	690.22	691.64	n/a	691.64	1	Combination
3	Pipe - (4)	5.64	24	Cir	173.387	689.81	690.66	0.490	691.64	691.50	n/a	691.50	2	Combination
4	Pipe - (3)	5.07	24	Cir	151.974	690.66	691.40	0.487	691.50	692.19	n/a	692.19 j	3	Combination
5	Pipe - (111)	2.12	18	Cir	28.586	691.40	691.86	1.609	692.19	692.41	n/a	692.41 j	4	Combination
6	Pipe - (46)	1.80	18	Cir	145.347	691.86	694.69	1.947	692.41	695.19	n/a	695.19 j	5	Combination
7	Pipe - (47)	1.02	18	Cir	144.154	694.79	703.44	6.001	695.19	703.82	n/a	703.82 j	6	Combination
8	Pipe - (48)	0.53	15	Cir	28.330	703.54	704.11	2.012	703.82	704.39	n/a	704.39	7	Combination
9	Pipe - (2)	3.53	24	Cir	599.685	691.40	694.38	0.497	692.19	695.04	n/a	695.04 j	4	Combination
10	Pipe - (112)	1.39	15	Cir	28.000	694.38	694.75	1.321	695.04	695.22	n/a	695.22 j	9	Combination
11	Pipe - (12)	1.02	15	Cir	150.725	694.75	699.64	3.244	695.22	700.04	n/a	700.04 j	10	Combination
12	Pipe - (13)	0.53	15	Cir	29.502	699.74	700.33	2.000	700.04	700.61	n/a	700.61 j	11	Combination
13	Pipe - (1)	1.85	24	Cir	63.713	694.38	694.67	0.455	695.04	695.14	n/a	695.14 j	9	Combination
14	Pipe - (113)	1.40	15	Cir	27.920	694.67	694.81	0.501	695.14	695.28	0.17	695.28	13	Combination
15	Pipe - (8)	1.02	15	Cir	140.819	694.81	699.30	3.188	695.28	699.70	n/a	699.70 j	14	Combination
16	Pipe - (9)	0.53	15	Cir	28.330	699.40	699.68	0.988	699.70	699.96	n/a	699.96 j	15	Combination
17	Pipe - (50)	0.53	15	Cir	28.307	696.10	696.38	0.989	696.33	696.66	n/a	696.66	6	Combination
18	Pipe - (49)	0.53	15	Cir	28.283	693.95	694.23	0.990	694.18	694.51	n/a	694.51	3	Combination
19	Pipe - (77)	11.72	24	Cir	159.998	650.00	654.76	2.978	651.25	655.99	n/a	655.99 j	End	Combination
20	Pipe - (78)	11.38	24	Cir	28.331	654.86	655.15	1.000	655.99	656.36	n/a	656.36	19	Combination
21	Pipe - (108)	9.60	18	Cir	90.949	655.15	656.13	1.078	656.36	657.33	n/a	657.33 j	20	Manhole
22	Pipe - (105)	3.99	18	Cir	195.574	656.23	671.89	8.007	657.33	672.65	n/a	672.65 j	21	Manhole
23	Pipe - (104)	4.03	18	Cir	66.624	673.99	677.77	5.668	674.38	678.54	0.15	678.54	22	Combination
24	Pipe - (106)	3.64	18	Cir	28.335	677.77	678.60	2.927	678.54	679.33	n/a	679.33 j	23	Combination

Project File: storm 5-15-19.stm

Number of lines: 89

Run Date: 5/30/2019

NOTES: Return period = 100 Yrs. ; 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 - (54)	3.30	18	Cir	94.156	678.60	679.62	1.083	679.33	680.31	n/a	680.31 j	24	Combination
26	Pipe - (55)	2.54	18	Cir	94.621	679.72	680.67	1.004	680.31	681.27	n/a	681.27	25	Combination
27	Pipe - (56)	1.79	18	Cir	145.593	680.77	689.50	5.996	681.27	690.00	n/a	690.00	26	Combination
28	Pipe - (57)	1.02	18	Cir	148.146	689.60	699.97	7.000	690.00	700.35	n/a	700.35 j	27	Combination
29	Pipe - (58)	0.53	15	Cir	28.331	700.07	700.64	2.012	700.35	700.92	n/a	700.92	28	Combination
30	Pipe - (107)	5.94	18	Cir	53.393	656.83	657.37	1.000	657.60	658.31	n/a	658.91	21	Combination
31	Pipe - (80)	5.28	18	Cir	153.073	656.79	659.85	1.999	658.91	660.73	n/a	660.73 j	30	Combination
32	Pipe - (81)	4.61	18	Cir	140.325	659.95	665.57	4.000	660.73	666.39	n/a	666.39	31	Combination
33	Pipe - (82)	3.93	18	Cir	153.082	665.67	670.26	2.998	666.39	671.02	n/a	671.02	32	Combination
34	Pipe - (83)	3.24	18	Cir	149.845	670.36	676.35	3.997	671.02	677.03	n/a	677.03	33	Combination
35	Pipe - (84)	2.52	18	Cir	144.966	676.45	686.60	7.002	677.03	687.20	n/a	687.20	34	Combination
36	Pipe - (85)	1.79	18	Cir	159.427	686.70	694.67	4.999	687.20	695.17	0.28	695.17	35	Combination
37	Pipe - (86)	1.02	18	Cir	149.376	694.77	699.25	2.999	695.17	699.63	n/a	699.63 j	36	Combination
38	Pipe - (87)	0.53	15	Cir	28.331	699.35	699.64	1.024	699.63	699.92	n/a	699.92	37	Combination
39	Pipe - (98)	0.53	15	Cir	28.331	695.34	695.63	1.024	695.57	695.91	n/a	695.91	36	Combination
40	Pipe - (59)	0.53	15	Cir	28.335	690.66	691.23	2.012	690.86	691.51	n/a	691.51	27	Combination
41	Pipe - (97)	0.53	15	Cir	28.331	687.33	688.18	3.000	687.51	688.46	n/a	688.46	35	Combination
42	Pipe - (60)	0.53	15	Cir	28.335	683.10	683.38	0.988	683.33	683.66	n/a	683.66	26	Combination
43	Pipe - (61)	0.53	15	Cir	28.335	680.02	680.30	0.988	680.31	680.58	n/a	680.58 j	25	Combination
44	Pipe - (96)	0.53	15	Cir	28.331	676.90	678.04	4.024	677.07	678.32	n/a	678.32	34	Combination
45	Pipe - (95)	0.53	15	Cir	28.331	671.60	671.89	1.024	671.83	672.17	n/a	672.17	33	Combination
46	Pipe - (88)	1.81	18	Cir	58.462	656.49	657.08	1.009	656.89	657.59	0.23	657.59	20	Combination
47	Pipe - (89)	1.02	18	Cir	134.322	657.18	666.58	6.998	657.59	666.96	n/a	666.96 j	46	Combination
48	Pipe - (90)	0.53	15	Cir	28.330	666.68	667.53	3.000	666.96	667.81	n/a	667.81	47	Combination

Project File: storm 5-15-19.stm	Number of lines: 89	Run Date: 5/30/2019
NOTES: Return period = 100 Yrs. ; 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 - (94)	0.53	15	Cir	28.331	666.39	666.95	2.000	666.58	667.24	n/a	667.24	32	Combination
50	Pipe - (93)	0.53	15	Cir	28.331	661.29	661.57	0.988	661.52	661.85	n/a	661.85	31	Combination
51	Pipe - (91)	0.53	15	Cir	28.330	658.73	659.30	2.012	658.93	659.58	n/a	659.58	46	Combination
52	Pipe - (92)	0.53	15	Cir	28.331	657.36	657.64	1.000	658.31	657.93	n/a	657.93	30	Combination
53	Pipe - (34)	5.32	24	Cir	89.000	650.00	671.06	23.663	650.29	671.87	n/a	672.35	End	Combination
54	Pipe - (35)	4.71	24	Cir	80.634	671.06	674.58	4.365	671.87	675.34	n/a	675.34 j	53	Manhole
55	Pipe - (35) (1)	3.42	24	Cir	68.613	674.58	677.80	4.693	675.34	678.45	n/a	678.45 j	54	Combination
56	Pipe - (36)	2.86	24	Cir	149.256	677.90	682.38	3.002	678.45	682.97	n/a	682.97	55	Combination
57	Pipe - (37)	2.27	24	Cir	146.742	682.48	686.88	2.998	682.97	687.40	n/a	687.40	56	Combination
58	Pipe - (38)	1.67	24	Cir	151.418	686.98	693.04	4.002	687.40	693.49	n/a	693.49	57	Combination
59	Pipe - (39)	1.02	24	Cir	134.937	693.14	698.54	4.002	693.49	698.89	0.18	698.89	58	Combination
60	Pipe - (45)	0.53	15	Cir	28.473	699.01	699.58	2.002	699.21	699.86	n/a	699.86	59	Combination
61	Pipe - (44)	0.53	15	Cir	28.473	694.31	695.16	2.985	694.49	695.44	n/a	695.44	58	Combination
62	Pipe - (99)	1.76	18	Cir	139.082	674.78	682.70	5.695	675.34	683.20	n/a	683.20 j	54	Combination
63	Pipe - (100)	1.01	18	Cir	155.291	684.09	693.41	6.002	684.29	693.78	n/a	693.78	62	Combination
64	Pipe - (101)	0.53	18	Cir	28.330	693.51	693.79	0.988	693.78	694.06	n/a	694.06 j	63	Combination
65	Pipe - (43)	0.53	15	Cir	28.331	689.32	689.60	0.988	689.55	689.88	n/a	689.88	57	Combination
66	Pipe - (102)	0.53	18	Cir	28.330	683.64	684.49	3.000	683.81	684.76	n/a	684.76	62	Combination
67	Pipe - (42)	0.53	15	Cir	28.331	683.49	684.06	2.012	683.69	684.34	n/a	684.34	56	Combination
68	Pipe - (40)	0.53	15	Cir	28.331	678.73	679.02	1.024	678.96	679.30	n/a	679.30	55	Combination
69	Pipe - (41)	0.53	15	Cir	28.331	670.45	670.73	1.000	672.35*	672.35*	0.00	672.35	53	Combination
70	Pipe - (14)	7.64	18	Cir	144.488	690.00	692.28	1.578	691.06	693.35	0.85	693.35	End	Combination
71	Pipe - (22)	4.51	15	Cir	147.158	692.28	693.75	0.999	693.35	694.61	n/a	694.61 j	70	Combination
72	Pipe - (23)	4.33	15	Cir	63.362	693.85	694.48	0.994	694.61	695.32	0.41	695.32	71	Combination

Project File: storm 5-15-19.stm

Number of lines: 89

Run Date: 5/30/2019

NOTES: Return period = 100 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 - (24)	3.05	15	Cir	28.495	694.58	694.87	1.000	695.32	695.57	n/a	695.57 j	72	Combination
74	Pipe - (25)	2.70	15	Cir	173.431	694.97	696.70	0.998	695.57	697.36	0.31	697.36	73	Combination
75	Pipe - (26)	1.87	15	Cir	121.264	696.80	698.01	0.998	697.36	698.55	n/a	698.55 j	74	Combination
76	Pipe - (27)	1.02	15	Cir	143.319	698.11	703.85	4.005	698.55	704.25	n/a	704.25 j	75	Combination
77	Pipe - (28)	0.53	15	Cir	28.330	703.95	704.23	0.988	704.25	704.51	n/a	704.51 j	76	Combination
78	Pipe - (30)	1.02	15	Cir	143.569	697.50	703.25	4.005	697.73	703.65	0.21	703.65	72	Combination
79	Pipe - (31)	0.53	15	Cir	29.172	703.35	703.64	0.994	703.65	703.92	n/a	703.92 j	78	Combination
80	Pipe - (15)	2.62	18	Cir	125.659	693.90	696.41	1.997	694.31	697.02	n/a	697.02	70	Combination
81	Pipe - (16)	2.21	18	Cir	28.199	696.51	696.80	1.028	697.02	697.36	0.24	697.36	80	Combination
82	Pipe - (17)	1.79	15	Cir	37.275	696.90	698.01	2.978	697.36	698.54	n/a	698.54	81	Combination
83	Pipe - (18)	1.02	15	Cir	221.992	698.11	702.55	2.000	698.54	702.95	n/a	702.95 j	82	Combination
84	Pipe - (19)	0.53	15	Cir	28.331	702.65	702.94	1.024	702.95	703.22	n/a	703.22 j	83	Combination
85	Pipe - (29)	0.53	15	Cir	28.330	700.78	701.63	3.000	700.96	701.91	n/a	701.91	74	Combination
86	Pipe - (21)	0.53	15	Cir	28.199	699.35	699.64	1.029	699.58	699.92	n/a	699.92	82	Combination
87	Pipe - (20)	0.53	15	Cir	28.000	695.36	695.64	1.007	695.59	695.93	n/a	695.93	70	Combination
88		0.53	15	Cir	30.776	700.22	701.14	2.989	700.40	701.42	n/a	701.42	75	Combination
89		0.09	15	Cir	39.000	697.33	697.72	1.000	697.43	697.83	n/a	697.83	71	Combination
Project File: storm 5-15-19.stm														Run Date: 5/30/2019
Number of lines: 89														
NOTES: Return period = 100 Yrs. ; *Surcharged (HGL above crown). ; j - Line contains hyd. jump.														

Hydraulic Grade Line Computations

Line	Size	Q (cfs) (3)	Downstream						Len (ft) (12)	Upstream						Check		JL coeff (K) (23)	Minor loss (ft) (24)				
			Invert elev (ft) (4)	HGL elev (ft) (5)	Depth (ft) (6)	Area (sqft) (7)	Vel (ft/s) (8)	Vel head (ft) (9)		EGL elev (ft) (10)	Sf (%) (11)	Invert elev (ft) (13)	HGL elev (ft) (14)	Depth (ft) (15)	Area (sqft) (16)	Vel (ft/s) (17)	Vel head (ft) (18)			EGL elev (ft) (19)	Sf (%) (20)	Ave Sf (%) (21)	Enrgy loss (ft) (22)
1	24	5.47	688.00	688.85	0.85	1.22	4.30	0.31	689.16	0.000	264.215	689.40	690.22 j	0.82**	1.22	4.48	0.31	690.54	0.000	0.000	n/a	0.89	n/a
2	24	5.54	689.40	690.22	0.82	1.22	4.53	0.31	690.54	0.000	82.503	690.81	691.64	0.83**	1.23	4.50	0.31	691.95	0.000	0.000	n/a	1.50	n/a
3	24	5.64	689.81	691.64	1.83	1.25	1.87	0.32	691.96	0.000	173.387	690.66	691.50	0.84**	1.25	4.52	0.32	691.81	0.000	0.000	n/a	1.50	n/a
4	24	5.07	690.66	691.50	0.84	1.16	4.06	0.30	691.79	0.000	151.974	691.40	692.19 j	0.79**	1.16	4.37	0.30	692.49	0.000	0.000	n/a	1.65	0.49
5	18	2.12	691.40	692.19	0.79	0.59	2.24	0.20	692.40	0.000	28.586	691.86	692.41 j	0.55**	0.59	3.62	0.20	692.61	0.000	0.000	n/a	1.31	0.27
6	18	1.80	691.86	692.41	0.55	0.52	3.07	0.18	692.59	0.000	145.347	694.69	695.19 j	0.50**	0.52	3.45	0.18	695.38	0.000	0.000	n/a	1.73	0.32
7	18	1.02	694.79	695.19	0.40	0.35	2.66	0.13	695.33	0.000	144.154	703.44	703.82 j	0.38**	0.35	2.94	0.13	703.95	0.000	0.000	n/a	1.49	n/a
8	15	0.53	703.54	703.82	0.28	0.20	2.63	0.10	703.92	0.000	28.330	704.11	704.39	0.28**	0.21	2.54	0.10	704.49	0.000	0.000	n/a	1.00	n/a
9	24	3.53	691.40	692.19	0.79	0.90	3.04	0.24	692.43	0.000	599.685	694.38	695.04 j	0.66**	0.90	3.93	0.24	695.28	0.000	0.000	n/a	1.69	n/a
10	15	1.39	694.38	695.04	0.66	0.42	2.13	0.17	695.21	0.000	28.000	694.75	695.22 j	0.47**	0.42	3.34	0.17	695.39	0.000	0.000	n/a	1.21	n/a
11	15	1.02	694.75	695.22	0.47	0.33	2.45	0.14	695.36	0.000	150.725	699.64	700.04 j	0.40**	0.33	3.05	0.14	700.18	0.000	0.000	n/a	1.32	0.19
12	15	0.53	699.74	700.04	0.30	0.21	2.38	0.10	700.14	0.000	29.502	700.33	700.61 j	0.28**	0.21	2.54	0.10	700.71	0.000	0.000	n/a	1.00	n/a
13	24	1.85	694.38	695.04	0.66	0.56	2.06	0.17	695.20	0.000	63.713	694.67	695.14 j	0.47**	0.56	3.28	0.17	695.31	0.000	0.000	n/a	1.50	0.25
14	15	1.40	694.67	695.14	0.47	0.42	3.32	0.17	695.32	0.000	27.920	694.81	695.28	0.47**	0.42	3.34	0.17	695.45	0.000	0.000	n/a	1.00	0.17
15	15	1.02	694.81	695.28	0.47	0.34	2.44	0.14	695.42	0.000	140.819	699.30	699.70 j	0.40**	0.34	3.05	0.14	699.84	0.000	0.000	n/a	1.29	0.19
16	15	0.53	699.40	699.70	0.30	0.21	2.38	0.10	699.80	0.000	28.330	699.68	699.96 j	0.28**	0.21	2.54	0.10	700.06	0.000	0.000	n/a	1.00	n/a
17	15	0.53	696.10	696.33	0.23*	0.16	3.34	0.10	696.43	0.000	28.307	696.38	696.66	0.28**	0.21	2.54	0.10	696.76	0.000	0.000	n/a	1.00	n/a
18	15	0.53	693.95	694.18	0.23*	0.16	3.34	0.10	694.28	0.000	28.283	694.23	694.51	0.28**	0.21	2.54	0.10	694.61	0.000	0.000	n/a	1.00	n/a
19	24	11.72	650.00	651.25	1.25	2.02	5.67	0.52	651.77	0.000	159.998	654.76	655.99 j	1.23**	2.02	5.79	0.52	656.51	0.000	0.000	n/a	1.50	0.78
20	24	11.38	654.86	655.99	1.13	1.83	6.23	0.51	656.50	0.000	28.331	655.15	656.36	1.21**	1.99	5.73	0.51	656.87	0.000	0.000	n/a	2.23	n/a
21	18	9.60	655.15	656.36	1.21	1.51	6.29	0.63	656.99	0.000	90.949	656.13	657.35 j	1.20**	1.51	6.36	0.63	657.95	0.000	0.000	n/a	0.98	n/a
Project File: storm 5-15-19.stm												Number of lines: 89						Run Date: 5/30/2019					
Notes: * depth assumed.; ** Critical depth.; j-Line contains hyd. jump. ; c = cir e = ellip b = box																							

Hydraulic Grade Line Computations

Line	Size	Q (cfs) (3)	Downstream								Len (ft) (12)	Upstream								Check		JL coeff (K) (23)	Minor loss (ft) (24)		
			Invert elev (ft) (4)	HGL elev (ft) (5)	Depth (ft) (6)	Area (sqft) (7)	Vel (ft/s) (8)	Vel head (ft) (9)	EGL elev (ft) (10)	Sf (%) (11)		Invert elev (ft) (13)	HGL elev (ft) (14)	Depth (ft) (15)	Area (sqft) (16)	Vel (ft/s) (17)	Vel head (ft) (18)	EGL elev (ft) (19)	Sf (%) (20)	Ave Sf (%) (21)	Enrgy loss (ft) (22)				
	(1)	(2)																							
22	18	3.99	656.23	657.33	1.10	0.90	2.88	0.30	657.63	0.000	195.574	671.89	672.65 j	0.76**	0.90	4.41	0.30	672.96	0.000	0.000	n/a	0.26	n/a		
23	18	4.03	673.99	674.38	0.39*	0.37	10.99	0.30	674.69	0.000	66.624	677.77	678.54	0.77**	0.91	4.43	0.30	678.84	0.000	0.000	n/a	0.50	0.15		
24	18	3.64	677.77	678.54	0.77	0.85	4.01	0.28	678.82	0.000	28.335	678.60	679.33 j	0.73**	0.85	4.28	0.28	679.61	0.000	0.000	n/a	1.50	0.43		
25	18	3.30	678.60	679.33	0.73	0.80	3.88	0.27	679.60	0.000	94.156	679.62	680.31 j	0.69**	0.80	4.15	0.27	680.58	0.000	0.000	n/a	1.50	0.40		
26	18	2.54	679.72	680.31	0.59	0.65	3.92	0.23	680.54	0.000	94.621	680.67	681.27	0.60**	0.66	3.82	0.23	681.50	0.000	0.000	n/a	1.49	n/a		
27	18	1.79	680.77	681.27	0.50	0.52	3.45	0.18	681.46	0.000	145.593	689.50	690.00	0.50**	0.52	3.45	0.18	690.19	0.000	0.000	n/a	1.50	n/a		
28	18	1.02	689.60	690.00	0.40	0.35	2.67	0.13	690.14	0.000	148.146	699.97	700.35 j	0.38**	0.35	2.94	0.13	700.48	0.000	0.000	n/a	1.50	n/a		
29	15	0.53	700.07	700.35	0.28	0.20	2.63	0.10	700.45	0.000	28.331	700.64	700.92	0.28**	0.21	2.54	0.10	701.02	0.000	0.000	n/a	1.00	n/a		
30	18	5.94	656.83	657.60	0.77*	0.91	6.50	0.40	658.01	0.000	53.393	657.37	658.31	0.94**	1.17	5.09	0.40	658.71	0.000	0.000	n/a	1.50	n/a		
31	18	5.28	656.79	658.91	1.50	1.08	2.99	0.14	659.05	0.216	153.073	659.85	660.73 j	0.88**	1.08	4.87	0.37	661.10	0.504	0.360	n/a	1.50	0.55		
32	18	4.61	659.95	660.73	0.78	0.93	4.95	0.33	661.07	0.000	140.325	665.57	666.39	0.82**	0.99	4.64	0.33	666.72	0.000	0.000	n/a	1.43	n/a		
33	18	3.93	665.67	666.39	0.72	0.84	4.69	0.30	666.69	0.000	153.082	670.26	671.02	0.76**	0.90	4.39	0.30	671.32	0.000	0.000	n/a	1.50	n/a		
34	18	3.24	670.36	671.02	0.66	0.75	4.34	0.26	671.28	0.000	149.845	676.35	677.03	0.68**	0.79	4.12	0.26	677.30	0.000	0.000	n/a	1.50	n/a		
35	18	2.52	676.45	677.03	0.58	0.64	3.96	0.23	677.26	0.000	144.966	686.60	687.20	0.60**	0.66	3.81	0.23	687.43	0.000	0.000	n/a	1.50	n/a		
36	18	1.79	686.70	687.20	0.50	0.52	3.47	0.18	687.39	0.000	159.427	694.67	695.17	0.50**	0.52	3.44	0.18	695.36	0.000	0.000	n/a	1.50	0.28		
37	18	1.02	694.77	695.17	0.40	0.35	2.67	0.13	695.31	0.000	149.376	699.25	699.63 j	0.38**	0.35	2.94	0.13	699.76	0.000	0.000	n/a	1.50	n/a		
38	15	0.53	699.35	699.63	0.28	0.20	2.63	0.10	699.73	0.000	28.331	699.64	699.92	0.28**	0.21	2.54	0.10	700.02	0.000	0.000	n/a	1.00	n/a		
39	15	0.53	695.34	695.57	0.23*	0.16	3.39	0.10	695.67	0.000	28.331	695.63	695.91	0.28**	0.21	2.54	0.10	696.01	0.000	0.000	n/a	1.00	n/a		
40	15	0.53	690.66	690.86	0.20*	0.12	4.29	0.10	690.96	0.000	28.335	691.23	691.51	0.28**	0.21	2.54	0.10	691.61	0.000	0.000	n/a	1.00	n/a		
41	15	0.53	687.33	687.51	0.18*	0.11	4.94	0.10	687.61	0.000	28.331	688.18	688.46	0.28**	0.21	2.54	0.10	688.56	0.000	0.000	n/a	1.00	n/a		
42	15	0.53	683.10	683.33	0.23*	0.16	3.34	0.10	683.43	0.000	28.335	683.38	683.66	0.28**	0.21	2.54	0.10	683.76	0.000	0.000	n/a	1.00	n/a		
Project File: storm 5-15-19.stm												Number of lines: 89								Run Date: 5/30/2019					
Notes: * depth assumed.; ** Critical depth.; j-Line contains hyd. jump. ; c = cir e = ellip b = box																									

Hydraulic Grade Line Computations

Line	Size	Q (cfs) (3)	Downstream								Len (ft) (12)	Upstream								Check		JL coeff (K) (23)	Minor loss (ft) (24)
			Invert elev (ft) (4)	HGL elev (ft) (5)	Depth (ft) (6)	Area (sqft) (7)	Vel (ft/s) (8)	Vel head (ft) (9)	EGL elev (ft) (10)	Sf (%) (11)		Invert elev (ft) (13)	HGL elev (ft) (14)	Depth (ft) (15)	Area (sqft) (16)	Vel (ft/s) (17)	Vel head (ft) (18)	EGL elev (ft) (19)	Sf (%) (20)	Ave Sf (%) (21)	Energy loss (ft) (22)		
(1)																							
43	15	0.53	680.02	680.31	0.29	0.21	2.44	0.10	680.41	0.000	28.335	680.30	680.58 j	0.28**	0.21	2.54	0.10	680.68	0.000	0.000	n/a	1.00	n/a
44	15	0.53	676.90	677.07	0.17*	0.10	5.48	0.10	677.17	0.000	28.331	678.04	678.32	0.28**	0.21	2.54	0.10	678.42	0.000	0.000	n/a	1.00	n/a
45	15	0.53	671.60	671.83	0.23*	0.16	3.39	0.10	671.93	0.000	28.331	671.89	672.17	0.28**	0.21	2.54	0.10	672.27	0.000	0.000	n/a	1.00	n/a
46	18	1.81	656.49	656.89	0.40*	0.38	4.73	0.19	657.08	0.000	58.462	657.08	657.59	0.51**	0.53	3.45	0.19	657.77	0.000	0.000	n/a	1.26	0.23
47	18	1.02	657.18	657.59	0.41	0.35	2.64	0.13	657.72	0.000	134.322	666.58	666.96 j	0.38**	0.35	2.94	0.13	667.09	0.000	0.000	n/a	1.50	n/a
48	15	0.53	666.68	666.96	0.28	0.20	2.63	0.10	667.06	0.000	28.330	667.53	667.81	0.28**	0.21	2.54	0.10	667.91	0.000	0.000	n/a	1.00	n/a
49	15	0.53	666.39	666.58	0.20*	0.12	4.29	0.10	666.68	0.000	28.331	666.95	667.24	0.28**	0.21	2.54	0.10	667.34	0.000	0.000	n/a	1.00	n/a
50	15	0.53	661.29	661.52	0.23*	0.16	3.34	0.10	661.62	0.000	28.331	661.57	661.85	0.28**	0.21	2.54	0.10	661.95	0.000	0.000	n/a	1.00	n/a
51	15	0.53	658.73	658.93	0.20*	0.12	4.29	0.10	659.03	0.000	28.330	659.30	659.58	0.28**	0.21	2.54	0.10	659.68	0.000	0.000	n/a	1.00	n/a
52	15	0.53	657.36	658.31	0.95	0.21	0.53	0.10	658.41	0.000	28.331	657.64	657.93	0.28**	0.21	2.54	0.10	658.03	0.000	0.000	n/a	1.00	n/a
53	24	5.32	650.00	650.29	0.29*	0.28	19.09	0.31	650.59	0.000	89.000	671.06	671.87	0.81**	1.20	4.44	0.31	672.18	0.000	0.000	n/a	1.56	n/a
54	24	4.71	671.06	671.87	0.81	1.10	3.93	0.28	672.16	0.000	80.634	674.58	675.34 j	0.76**	1.10	4.28	0.28	675.63	0.000	0.000	n/a	1.00	0.28
55	24	3.42	674.58	675.34	0.76	0.88	3.10	0.24	675.58	0.000	68.613	677.80	678.45 j	0.65**	0.88	3.89	0.24	678.68	0.000	0.000	n/a	1.50	0.35
56	24	2.86	677.90	678.45	0.55	0.70	4.11	0.21	678.66	0.000	149.256	682.38	682.97	0.59**	0.77	3.70	0.21	683.18	0.000	0.000	n/a	1.50	n/a
57	24	2.27	682.48	682.97	0.49	0.60	3.82	0.19	683.16	0.000	146.742	686.88	687.40	0.52**	0.65	3.47	0.19	687.59	0.000	0.000	n/a	1.50	n/a
58	24	1.67	686.98	687.40	0.42	0.49	3.44	0.16	687.56	0.000	151.418	693.04	693.49	0.45**	0.52	3.18	0.16	693.64	0.000	0.000	n/a	1.49	n/a
59	24	1.02	693.14	693.49	0.35	0.36	2.80	0.12	693.61	0.000	134.937	698.54	698.89	0.35**	0.37	2.79	0.12	699.01	0.000	0.000	n/a	1.49	0.18
60	15	0.53	699.01	699.21	0.20*	0.12	4.29	0.10	699.31	0.000	28.473	699.58	699.86	0.28**	0.21	2.54	0.10	699.96	0.000	0.000	n/a	1.00	n/a
61	15	0.53	694.31	694.49	0.18*	0.11	4.93	0.10	694.59	0.000	28.473	695.16	695.44	0.28**	0.21	2.54	0.10	695.54	0.000	0.000	n/a	1.00	n/a
62	18	1.76	674.78	675.34	0.56	0.51	2.90	0.18	675.53	0.000	139.082	682.70	683.20 j	0.50**	0.51	3.42	0.18	683.38	0.000	0.000	n/a	1.50	n/a
63	18	1.01	684.09	684.29	0.20*	0.14	7.44	0.13	684.42	0.000	155.291	693.41	693.78	0.37**	0.34	2.92	0.13	693.92	0.000	0.000	n/a	1.50	n/a
Project File: storm 5-15-19.stm										Number of lines: 89									Run Date: 5/30/2019				
Notes: * depth assumed.; ** Critical depth.; j-Line contains hyd. jump. ; c = cir e = ellip b = box																							

Hydraulic Grade Line Computations

Line	Size	Q (cfs) (3)	Downstream								Len (ft) (12)	Upstream								Check		JL coeff (K) (23)	Minor loss (ft) (24)	
			Invert elev (ft) (4)	HGL elev (ft) (5)	Depth (ft) (6)	Area (sqft) (7)	Vel (ft/s) (8)	Vel head (ft) (9)	EGL elev (ft) (10)	Sf (%) (11)		Invert elev (ft) (13)	HGL elev (ft) (14)	Depth (ft) (15)	Area (sqft) (16)	Vel (ft/s) (17)	Vel head (ft) (18)	EGL elev (ft) (19)	Sf (%) (20)	Ave Sf (%) (21)	Energy loss (ft) (22)			
64	18	0.53	693.51	693.78	0.27	0.22	2.41	0.09	693.88	0.000	28.330	693.79	694.06 j	0.27**	0.22	2.46	0.09	694.15	0.000	0.000	n/a	1.00	n/a	
65	15	0.53	689.32	689.55	0.23*	0.16	3.34	0.10	689.65	0.000	28.331	689.60	689.88	0.28**	0.21	2.54	0.10	689.98	0.000	0.000	n/a	1.00	n/a	
66	18	0.53	683.64	683.81	0.17*	0.11	4.82	0.09	683.91	0.000	28.330	684.49	684.76	0.27**	0.22	2.46	0.09	684.86	0.000	0.000	n/a	1.00	n/a	
67	15	0.53	683.49	683.69	0.20*	0.12	4.29	0.10	683.79	0.000	28.331	684.06	684.34	0.28**	0.21	2.54	0.10	684.44	0.000	0.000	n/a	1.00	n/a	
68	15	0.53	678.73	678.96	0.23*	0.16	3.39	0.10	679.06	0.000	28.331	679.02	679.30	0.28**	0.21	2.54	0.10	679.40	0.000	0.000	n/a	1.00	n/a	
69	15	0.53	670.45	672.35	1.25	1.23	0.43	0.00	672.35	0.006	28.331	670.73	672.35	1.25	1.23	0.43	0.00	672.35	0.006	0.006	0.002	1.00	0.00	
70	18	7.64	690.00	691.06	1.06	1.33	5.72	0.50	691.56	0.000	144.488	692.28	693.35	1.07**	1.35	5.67	0.50	693.85	0.000	0.000	n/a	1.70	0.85	
71	15	4.51	692.28	693.35	1.07	0.90	4.04	0.39	693.74	0.000	147.158	693.75	694.61 j	0.86**	0.90	5.01	0.39	695.00	0.000	0.000	n/a	1.50	0.59	
72	15	4.33	693.85	694.61	0.76	0.78	5.54	0.38	694.99	0.000	63.362	694.48	695.32	0.84**	0.88	4.92	0.38	695.70	0.000	0.000	n/a	1.08	0.41	
73	15	3.05	694.58	695.32	0.74	0.71	4.02	0.29	695.61	0.000	28.495	694.87	695.57 j	0.70**	0.71	4.30	0.29	695.86	0.000	0.000	n/a	0.72	n/a	
74	15	2.70	694.97	695.57	0.60	0.58	4.65	0.26	695.83	0.000	173.431	696.70	697.36	0.66**	0.66	4.12	0.26	697.62	0.000	0.000	n/a	1.16	0.31	
75	15	1.87	696.80	697.36	0.56	0.51	3.52	0.21	697.57	0.000	121.264	698.01	698.55 j	0.54**	0.51	3.65	0.21	698.76	0.000	0.000	n/a	1.38	n/a	
76	15	1.02	698.11	698.55	0.44	0.34	2.62	0.14	698.70	0.000	143.319	703.85	704.25 j	0.40**	0.34	3.05	0.14	704.39	0.000	0.000	n/a	1.50	0.22	
77	15	0.53	703.95	704.25	0.30	0.21	2.38	0.10	704.35	0.000	28.330	704.23	704.51 j	0.28**	0.21	2.54	0.10	704.61	0.000	0.000	n/a	1.00	n/a	
78	15	1.02	697.50	697.73	0.23*	0.15	6.64	0.14	697.87	0.000	143.569	703.25	703.65	0.40**	0.34	3.05	0.14	703.79	0.000	0.000	n/a	1.46	0.21	
79	15	0.53	703.35	703.65	0.30	0.21	2.38	0.10	703.75	0.000	29.172	703.64	703.92 j	0.28**	0.21	2.54	0.10	704.02	0.000	0.000	n/a	1.00	n/a	
80	18	2.62	693.90	694.31	0.41*	0.39	6.70	0.23	694.54	0.000	125.659	696.41	697.02	0.61**	0.68	3.86	0.23	697.26	0.000	0.000	n/a	1.50	n/a	
81	18	2.21	696.51	697.02	0.51	0.53	4.13	0.21	697.23	0.000	28.199	696.80	697.36	0.56**	0.60	3.66	0.21	697.57	0.000	0.000	n/a	1.13	0.24	
82	15	1.79	696.90	697.36	0.46	0.41	4.34	0.20	697.56	0.000	37.275	698.01	698.54	0.53**	0.50	3.60	0.20	698.74	0.000	0.000	n/a	1.68	n/a	
83	15	1.02	698.11	698.54	0.43	0.34	2.73	0.14	698.69	0.000	221.992	702.55	702.95 j	0.40**	0.34	3.05	0.14	703.09	0.000	0.000	n/a	1.50	0.22	
84	15	0.53	702.65	702.95	0.30	0.21	2.38	0.10	703.05	0.000	28.331	702.94	703.22 j	0.28**	0.21	2.54	0.10	703.32	0.000	0.000	n/a	1.00	n/a	
Project File: storm 5-15-19.stm												Number of lines: 89								Run Date: 5/30/2019				
Notes: * depth assumed.; ** Critical depth.; j-Line contains hyd. jump. ; c = cir e = ellip b = box																								

Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss	
			Invert elev (ft) (4)	HGL elev (ft) (5)	Depth (ft) (6)	Area (sqft) (7)	Vel (ft/s) (8)	Vel head (ft) (9)	EGL elev (ft) (10)	Sf (%) (11)		Depth (ft) (15)	Area (sqft) (16)	Vel (ft/s) (17)	Vel head (ft) (18)	EGL elev (ft) (19)	Sf (%) (20)	Ave Sf (%) (21)	Enrgy loss (ft) (22)					
	(1)	(2)	(3)																			(K) (23)	(ft) (24)	
85	15	0.53	700.78	700.96	0.18*	0.11	4.94	0.10	701.06	0.000	28.330	701.63	701.91	0.28**	0.21	2.54	0.10	702.01	0.000	0.000	n/a	1.00	n/a	
86	15	0.53	699.35	699.58	0.23*	0.16	3.39	0.10	699.68	0.000	28.199	699.64	699.92	0.28**	0.21	2.54	0.10	700.02	0.000	0.000	n/a	1.00	n/a	
87	15	0.53	695.36	695.59	0.23*	0.16	3.36	0.10	695.69	0.000	28.000	695.64	695.93	0.28**	0.21	2.54	0.10	696.03	0.000	0.000	n/a	1.00	n/a	
88	15	0.53	700.22	700.40	0.18*	0.11	4.93	0.10	700.50	0.000	30.776	701.14	701.42	0.28**	0.21	2.54	0.10	701.52	0.000	0.000	n/a	1.00	n/a	
89	15	0.09	697.33	697.43	0.10*	0.05	1.96	0.04	697.47	0.000	39.000	697.72	697.83	0.11**	0.06	1.58	0.04	697.87	0.000	0.000	n/a	1.00	n/a	
Project File: storm 5-15-19.stm											Number of lines: 89								Run Date: 5/30/2019					
Notes: * depth assumed.; ** Critical depth.; j-Line contains hyd. jump. ; c = cir e = ellip b = box																								

Hydraflow HGL Computation Procedure

General Procedure:

Hydraflow computes the HGL using the Bernoulli energy equation. Manning's equation is used to determine energy losses due to pipe friction. In a standard step, iterative procedure, Hydraflow assumes upstream HGLs until the energy equation balances. If the energy equation cannot balance, supercritical flow exists and critical depth is temporarily assumed at the upstream end. A supercritical flow Profile is then computed using the same procedure in a downstream direction using momentum principles.

- Col. 1 The line number being computed. Calculations begin at Line 1 and proceed upstream.
- Col. 2 The line size. In the case of non-circular pipes, the line rise is printed above the span.
- Col. 3 Total flow rate in the line.
- Col. 4 The elevation of the downstream invert.
- Col. 5 Elevation of the hydraulic grade line at the downstream end. This is computed as the upstream HGL + Minor loss of this line's downstream line.
- Col. 6 The downstream depth of flow inside the pipe (HGL - Invert elevation) but not greater than the line size.
- Col. 7 Cross-sectional area of the flow at the downstream end.
- Col. 8 The velocity of the flow at the downstream end, (Col. 3 / Col. 7).
- Col. 9 Velocity head (Velocity squared / 2g).
- Col. 10 The elevation of the energy grade line at the downstream end, HGL + Velocity head, (Col. 5 + Col. 9).
- Col. 11 The friction slope at the downstream end (the S or Slope term in Manning's equation).
- Col. 12 The line length.
- Col. 13 The elevation of the upstream invert.
- Col. 14 Elevation of the hydraulic grade line at the upstream end.
- Col. 15 The upstream depth of flow inside the pipe (HGL - Invert elevation) but not greater than the line size.
- Col. 16 Cross-sectional area of the flow at the upstream end.
- Col. 17 The velocity of the flow at the upstream end, (Col. 3 / Col. 16).
- Col. 18 Velocity head (Velocity squared / 2g).
- Col. 19 The elevation of the energy grade line at the upstream end, HGL + Velocity head, (Col. 14 + Col. 18) .
- Col. 20 The friction slope at the upstream end (the S or Slope term in Manning's equation).
- Col. 21 The average of the downstream and upstream friction slopes.
- Col. 22 Energy loss. Average $Sf/100 \times \text{Line Length}$ (Col. 21/100 x Col. 12). Equals (EGL upstream - EGL downstream) +/- tolerance.
- Col. 23 The junction loss coefficient (K).
- Col. 24 Minor loss. (Col. 23 x Col. 18). Is added to upstream HGL and used as the starting HGL for the next upstream line(s).

APPENDIX E

North POND 1

SUBSURFACE LEVEL SPREADER CALCULATION

$$L \text{ (length of level spreader pipe)} = Q / QL$$

$$QL \text{ (perforation flow rate)} = Cd * A * (2 * g * H)^{0.5}$$

$$Cd = \text{Coefficient of discharge (typically 0.60)}$$

$$A = \text{Cross sectional area of one perforation (ft}^2\text{)} = 0.00136$$

$$g = 32.2 \text{ ft/sec}^2$$

$$H = \text{head, average height of water above perforation (ft)} = 1.11$$

24-inch pipe with 24-0.5-in holes per linear foot

$$QL = 0.591$$

$$H = 0.418 \text{ feet}$$

$$Q = 75.76 \text{ cfs}$$

$$L = 75.76 \text{ cfs} / (0.591 \text{ cfs/ft})$$

$$= 128 \text{ L.F.}$$

128 L.F. LEVEL SPREADER PROPOSED

South POND 2

SUBSURFACE LEVEL SPREADER CALCULATION

$$L \text{ (length of level spreader pipe)} = Q / QL$$

$$QL \text{ (perforation flow rate)} = Cd * A * (2 * g * H)^{0.5}$$

$$Cd = \text{Coefficient of discharge (typically 0.60)}$$

$$A = \text{Cross sectional area of one perforation (ft}^2\text{)} = 0.00136$$

$$g = 32.2 \text{ ft/sec}^2$$

$$H = \text{head, average height of water above perforation (ft)} = 1.11$$

24-inch pipe with 24-0.5-in holes per linear foot

$$QL = 0.591$$

$$H = 0.418 \text{ feet}$$

$$Q = 9.582 \text{ cfs}$$

$$L = 9.582 \text{ cfs} / (0.591 \text{ cfs/ft})$$

$$= 16.23 \text{ L.F.}$$

18 L.F. LEVEL SPREADER PROPOSED

Hydro graph Run 25-yr storm 12 hour duration

Hydrograph Return Period Recap..... 1

25 - Year

Hydrograph Reports..... 2

Hydrograph No. 1, SCS Runoff, ex da-1..... 2

TR-55 Tc Worksheet..... 3

Hydrograph No. 2, SCS Runoff, proposed da-1..... 4

TR-55 Tc Worksheet..... 5

Hydrograph No. 3, SCS Runoff, DA-2 Existing..... 6

TR-55 Tc Worksheet..... 7

Hydrograph No. 4, SCS Runoff, Proposed DA-2..... 8

TR-55 Tc Worksheet..... 9

Hydrograph No. 5, Reservoir, pond 1 control..... 10

Pond Report - pond 1..... 11

Hydrograph No. 6, Reservoir, pond 2 control..... 12

Pond Report - pond 2..... 13

IDF Report..... 14

Hydrograph Return Period Recap

Hydroflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)								Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	SCS Runoff	-----	-----	-----	-----	-----	-----	83.30	-----	-----	ex da-1
2	SCS Runoff	-----	-----	-----	-----	-----	-----	114.11	-----	-----	proposed da-1
3	SCS Runoff	-----	-----	-----	-----	-----	-----	50.78	-----	-----	DA-2 Existing
4	SCS Runoff	-----	-----	-----	-----	-----	-----	62.92	-----	-----	Proposed DA-2
5	Reservoir	2	-----	-----	-----	-----	-----	68.30	-----	-----	pond 1 control
6	Reservoir	4	-----	-----	-----	-----	-----	7.564	-----	-----	pond 2 control
Proj. file: drainage 12-hours.gpw										Thursday, 01 / 7 / 2021	

Hydrograph Report

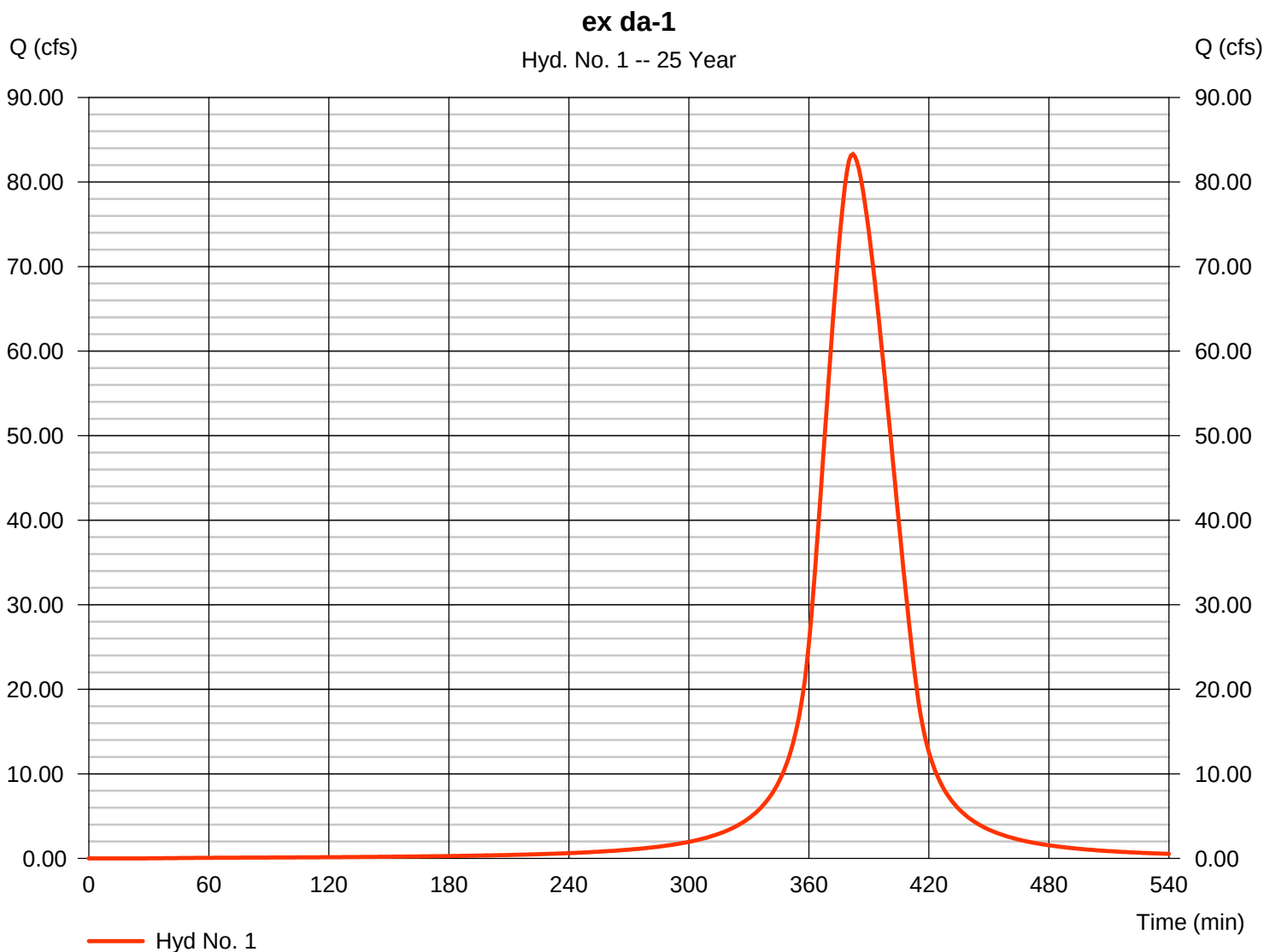
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 01 / 7 / 2021

Hyd. No. 1

ex da-1

Hydrograph type	= SCS Runoff	Peak discharge	= 83.30 cfs
Storm frequency	= 25 yrs	Time to peak	= 382 min
Time interval	= 1 min	Hyd. volume	= 242,069 cuft
Drainage area	= 24.700 ac	Curve number	= 68
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 34.90 min
Total precip.	= 2.70 in	Distribution	= Synthetic
Storm duration	= 12.00 hrs	Shape factor	= 484



TR55 Tc Worksheet

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Hyd. No. 1

ex da-1

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>
Sheet Flow				
Manning's n-value	= 0.400	0.011	0.011	
Flow length (ft)	= 300.0	0.0	0.0	
Two-year 24-hr precip. (in)	= 3.62	0.00	0.00	
Land slope (%)	= 6.00	0.00	0.00	
Travel Time (min)	= 31.33	+	0.00	+
			0.00	= 31.33
Shallow Concentrated Flow				
Flow length (ft)	= 837.00	0.00	0.00	
Watercourse slope (%)	= 6.00	0.00	0.00	
Surface description	= Unpaved	Paved	Paved	
Average velocity (ft/s)	=3.95	0.00	0.00	
Travel Time (min)	= 3.53	+	0.00	+
			0.00	= 3.53
Channel Flow				
X sectional flow area (sqft)	= 0.00	0.00	0.00	
Wetted perimeter (ft)	= 0.00	0.00	0.00	
Channel slope (%)	= 0.00	0.00	0.00	
Manning's n-value	= 0.015	0.015	0.015	
Velocity (ft/s)	=0.00	0.00	0.00	
Flow length (ft)	(0)0.0	0.0	0.0	
Travel Time (min)	= 0.00	+	0.00	+
			0.00	= 0.00
Total Travel Time, Tc				34.90 min

Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

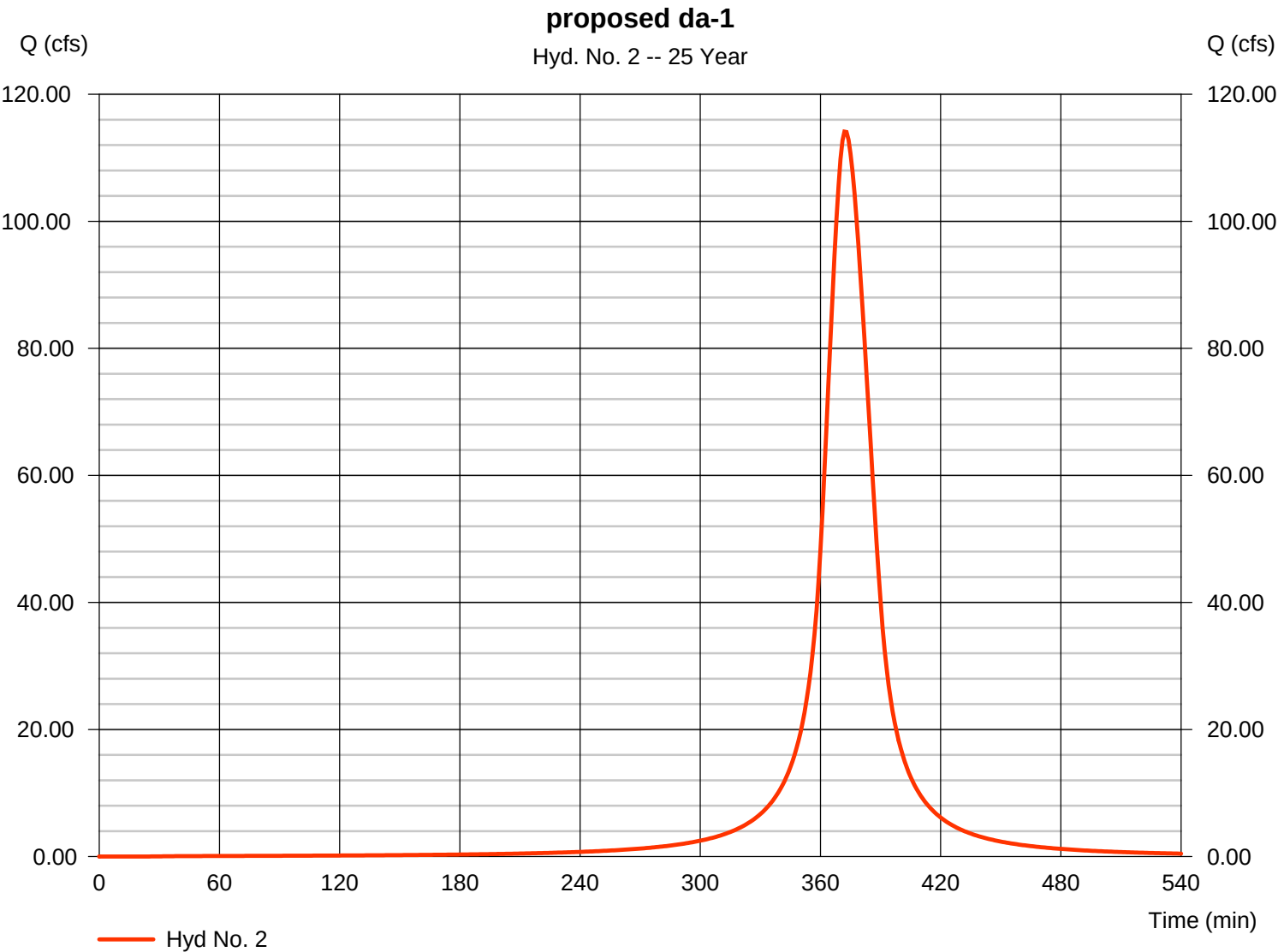
Thursday, 01 / 7 / 2021

Hyd. No. 2

proposed da-1

Hydrograph type	=	SCS Runoff	Peak discharge	=	114.11 cfs
Storm frequency	=	25 yrs	Time to peak	=	372 min
Time interval	=	1 min	Hyd. volume	=	242,069 cuft
Drainage area	=	24.700 ac	Curve number	=	73*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	19.30 min
Total precip.	=	2.70 in	Distribution	=	Synthetic
Storm duration	=	12.00 hrs	Shape factor	=	484

* Composite (Area/CN) = [(16.650 x 61) + (8.050 x 98)] / 24.700



TR55 Tc Worksheet

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Hyd. No. 2

proposed da-1

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>			
Sheet Flow							
Manning's n-value	= 0.011	0.150	0.011				
Flow length (ft)	= 300.0	300.0	0.0				
Two-year 24-hr precip. (in)	= 3.62	3.62	0.00				
Land slope (%)	= 5.00	5.00	0.00				
Travel Time (min)	= 1.90	+	15.38	+	0.00	=	17.28
Shallow Concentrated Flow							
Flow length (ft)	= 0.00	0.00	0.00				
Watercourse slope (%)	= 0.00	0.00	0.00				
Surface description	= Paved	Paved	Paved				
Average velocity (ft/s)	=0.00	0.00	0.00				
Travel Time (min)	= 0.00	+	0.00	+	0.00	=	0.00
Channel Flow							
X sectional flow area (sqft)	= 1.76	0.00	0.00				
Wetted perimeter (ft)	= 4.71	0.00	0.00				
Channel slope (%)	= 0.50	0.00	0.00				
Manning's n-value	= 0.011	0.015	0.015				
Velocity (ft/s)	=4.95	0.00	0.00				
Flow length (ft)	((0})600.0	0.0	0.0				
Travel Time (min)	= 2.02	+	0.00	+	0.00	=	2.02
Total Travel Time, Tc					19.30 min		

Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 01 / 7 / 2021

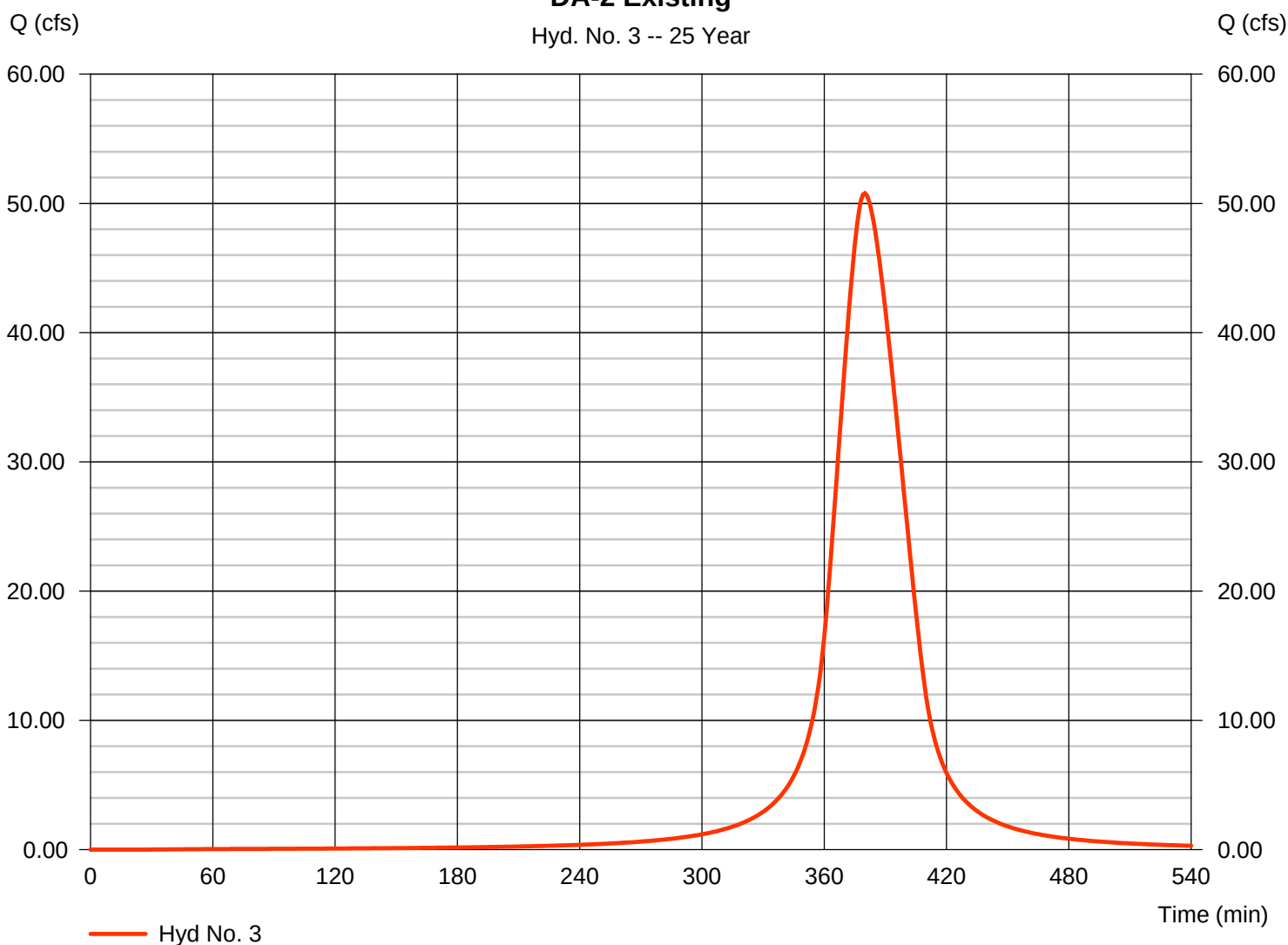
Hyd. No. 3

DA-2 Existing

Hydrograph type	= SCS Runoff	Peak discharge	= 50.78 cfs
Storm frequency	= 25 yrs	Time to peak	= 380 min
Time interval	= 1 min	Hyd. volume	= 139,390 cuft
Drainage area	= 14.130 ac	Curve number	= 68
Basin Slope	= 6.0 %	Hydraulic length	= 300 ft
Tc method	= TR55	Time of conc. (Tc)	= 32.00 min
Total precip.	= 2.70 in	Distribution	= Synthetic
Storm duration	= 12.00 hrs	Shape factor	= 484

DA-2 Existing

Hyd. No. 3 -- 25 Year



TR55 Tc Worksheet

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Hyd. No. 3

DA-2 Existing

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>
Sheet Flow				
Manning's n-value	= 0.400	0.011	0.011	
Flow length (ft)	= 300.0	0.0	0.0	
Two-year 24-hr precip. (in)	= 3.62	0.00	0.00	
Land slope (%)	= 6.00	0.00	0.00	
Travel Time (min)	= 31.33	+ 0.00	+ 0.00	= 31.33
Shallow Concentrated Flow				
Flow length (ft)	= 250.00	0.00	0.00	
Watercourse slope (%)	= 13.00	0.00	0.00	
Surface description	= Unpaved	Paved	Paved	
Average velocity (ft/s)	=5.82	0.00	0.00	
Travel Time (min)	= 0.72	+ 0.00	+ 0.00	= 0.72
Channel Flow				
X sectional flow area (sqft)	= 0.00	0.00	0.00	
Wetted perimeter (ft)	= 0.00	0.00	0.00	
Channel slope (%)	= 0.00	0.00	0.00	
Manning's n-value	= 0.015	0.015	0.015	
Velocity (ft/s)	=0.00	0.00	0.00	
Flow length (ft)	(0)0.0	0.0	0.0	
Travel Time (min)	= 0.00	+ 0.00	+ 0.00	= 0.00
Total Travel Time, Tc				32.00 min

Hydrograph Report

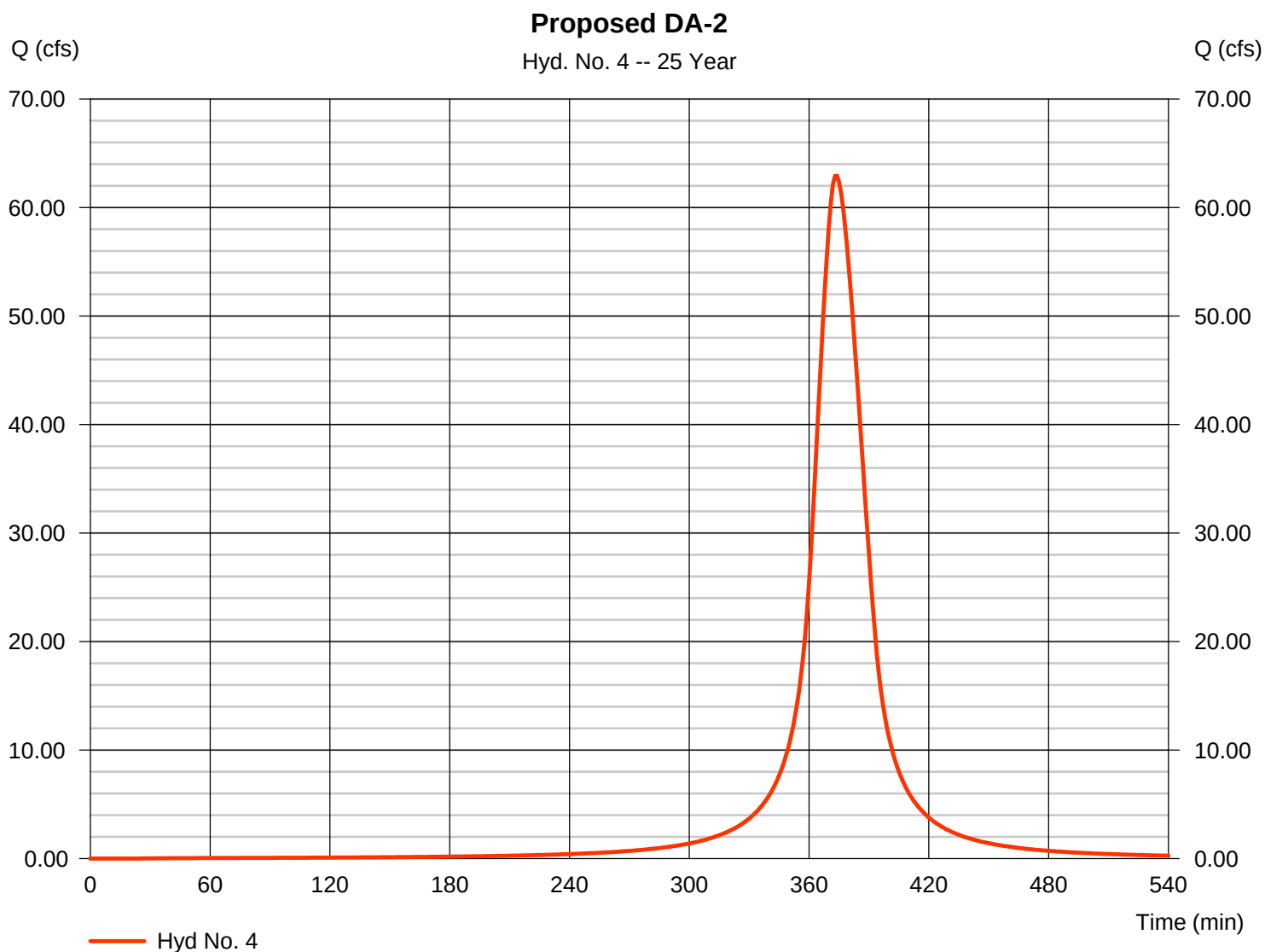
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 01 / 7 / 2021

Hyd. No. 4

Proposed DA-2

Hydrograph type	= SCS Runoff	Peak discharge	= 62.92 cfs
Storm frequency	= 25 yrs	Time to peak	= 374 min
Time interval	= 1 min	Hyd. volume	= 139,811 cuft
Drainage area	= 14.130 ac	Curve number	= 76*
Basin Slope	= 6.0 %	Hydraulic length	= 300 ft
Tc method	= TR55	Time of conc. (Tc)	= 21.60 min
Total precip.	= 2.70 in	Distribution	= Synthetic
Storm duration	= 12.00 hrs	Shape factor	= 484

* Composite (Area/CN) = $[(5.839 \times 98) + (8.290 \times 61)] / 14.130$ 

TR55 Tc Worksheet

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Hyd. No. 4

Proposed DA-2

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>			
Sheet Flow							
Manning's n-value	= 0.011	0.150	0.011				
Flow length (ft)	= 300.0	300.0	0.0				
Two-year 24-hr precip. (in)	= 3.62	3.62	0.00				
Land slope (%)	= 5.00	5.00	0.00				
Travel Time (min)	= 1.90	+	15.38	+	0.00	=	17.28
Shallow Concentrated Flow							
Flow length (ft)	= 0.00	0.00	0.00				
Watercourse slope (%)	= 0.00	0.00	0.00				
Surface description	= Paved	Paved	Paved				
Average velocity (ft/s)	=0.00	0.00	0.00				
Travel Time (min)	= 0.00	+	0.00	+	0.00	=	0.00
Channel Flow							
X sectional flow area (sqft)	= 1.76	0.00	0.00				
Wetted perimeter (ft)	= 4.71	0.00	0.00				
Channel slope (%)	= 0.50	0.00	0.00				
Manning's n-value	= 0.011	0.015	0.015				
Velocity (ft/s)	=4.95	0.00	0.00				
Flow length (ft)	((0})1287.0	0.0	0.0				
Travel Time (min)	= 4.33	+	0.00	+	0.00	=	4.33
Total Travel Time, Tc					21.60 min		

Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

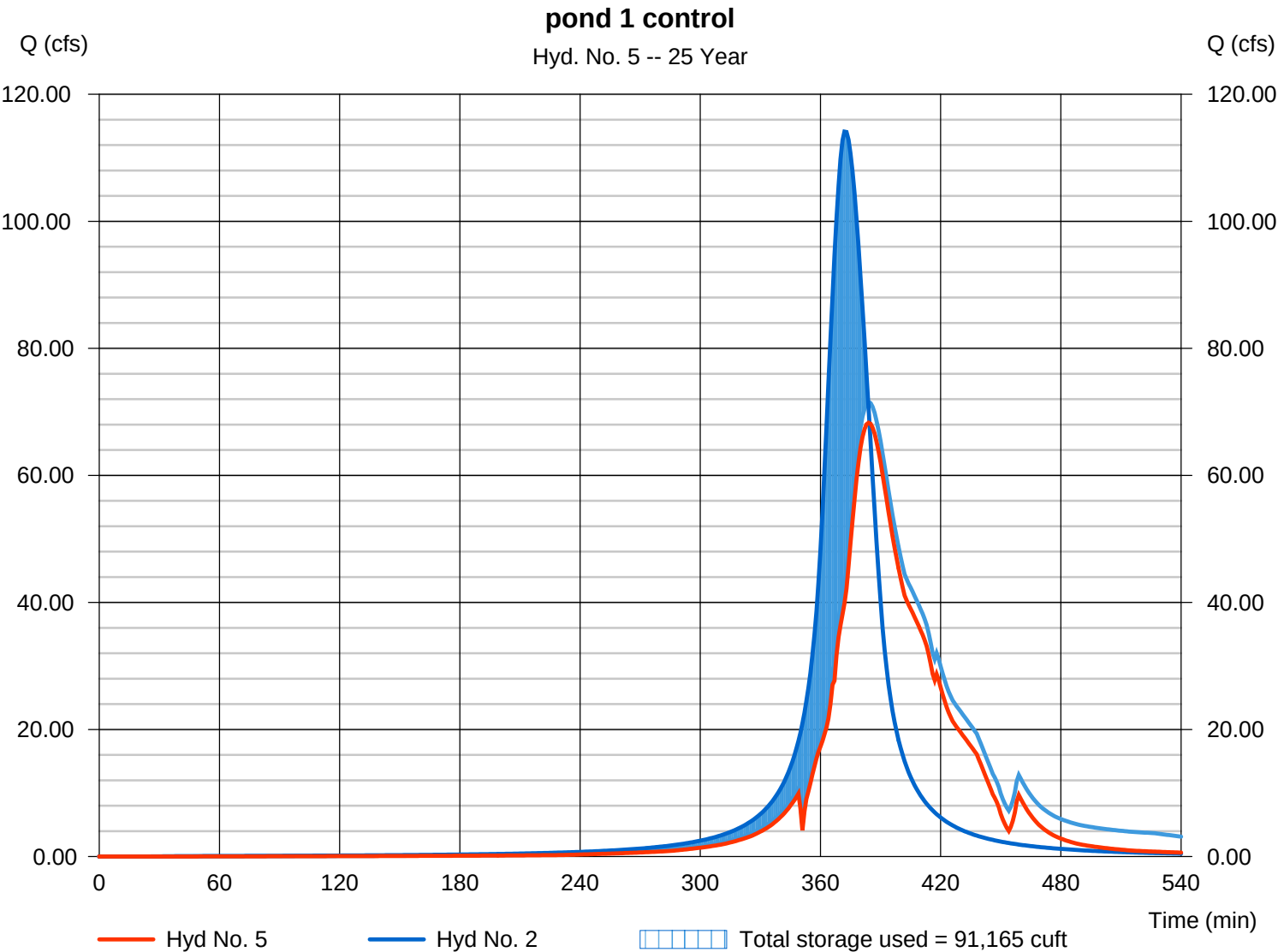
Thursday, 01 / 7 / 2021

Hyd. No. 5

pond 1 control

Hydrograph type	= Reservoir	Peak discharge	= 68.30 cfs
Storm frequency	= 25 yrs	Time to peak	= 384 min
Time interval	= 1 min	Hyd. volume	= 228,429 cuft
Inflow hyd. No.	= 2 - proposed da-1	Max. Elevation	= 659.59 ft
Reservoir name	= pond 1	Max. Storage	= 91,165 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond No. 1 - pond 1

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Beginning Elevation = 650.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	650.00	5,918	0	0
2.00	652.00	7,279	13,172	13,172
4.00	654.00	8,754	16,009	29,181
6.00	656.00	10,344	19,074	48,255
8.00	658.00	12,048	22,368	70,623
10.00	660.00	13,856	25,880	96,503

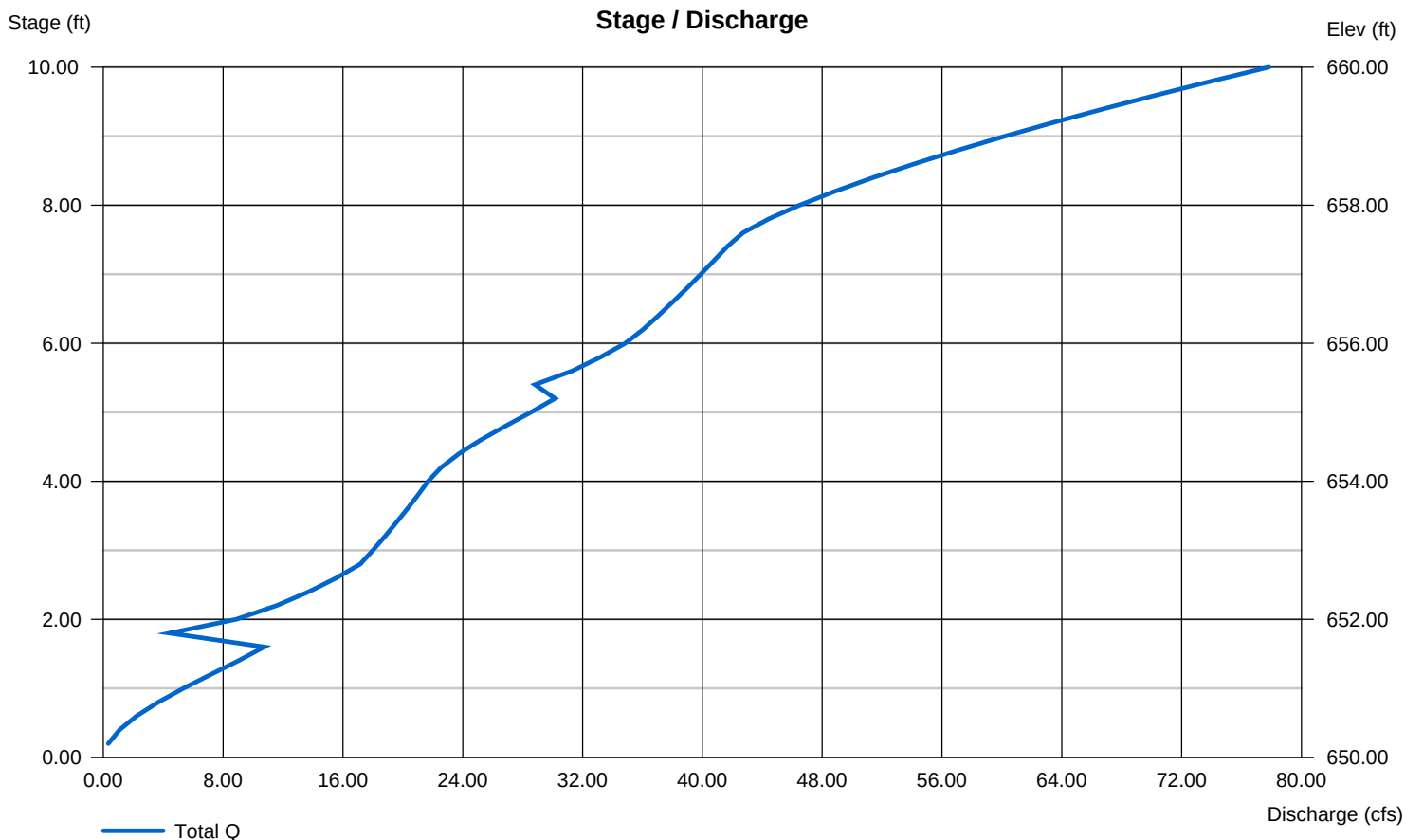
Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	21.00	15.50	0.00
Span (in)	= 0.00	21.00	15.50	0.00
No. Barrels	= 0	1	1	0
Invert El. (ft)	= 0.00	650.00	654.00	0.00
Length (ft)	= 0.00	0.50	0.50	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	2.00	0.00	0.00
Crest El. (ft)	= 0.00	657.50	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	Rect	---	---
Multi-Stage	= No	No	No	No
Exfil.(in/hr)	= 6.000 (by Contour)			
TW Elev. (ft)	= 0.00			

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



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

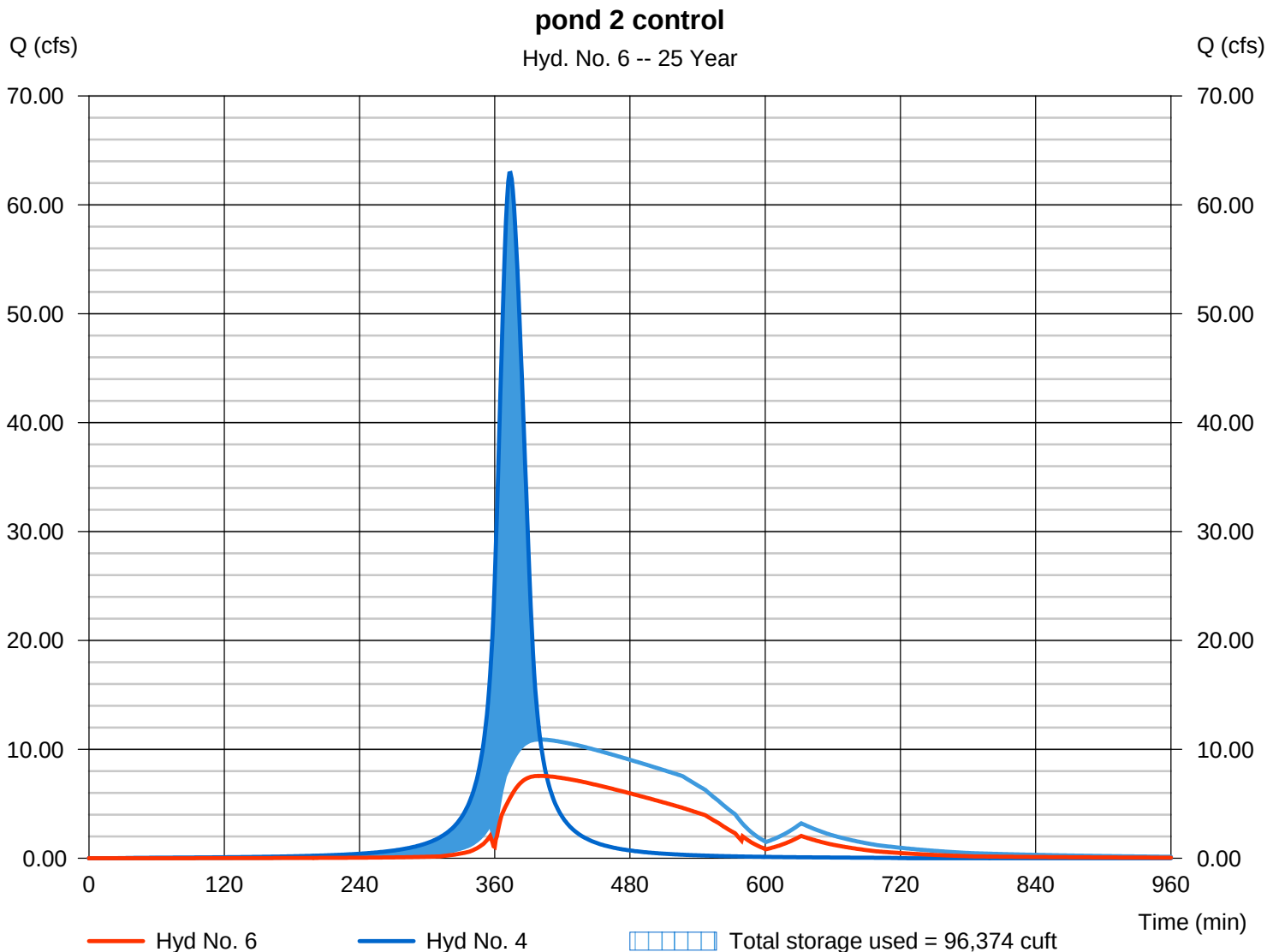
Thursday, 01 / 7 / 2021

Hyd. No. 6

pond 2 control

Hydrograph type	= Reservoir	Peak discharge	= 7.564 cfs
Storm frequency	= 25 yrs	Time to peak	= 400 min
Time interval	= 1 min	Hyd. volume	= 88,331 cuft
Inflow hyd. No.	= 4 - Proposed DA-2	Max. Elevation	= 694.50 ft
Reservoir name	= pond 2	Max. Storage	= 96,374 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond Report

13

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2020

Thursday, 01 / 7 / 2021

Pond No. 2 - pond 2

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Beginning Elevation = 690.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	690.00	18,677	0	0
2.00	692.00	20,975	39,626	39,626
4.00	694.00	23,406	44,354	83,980
6.00	696.00	25,972	49,351	133,331

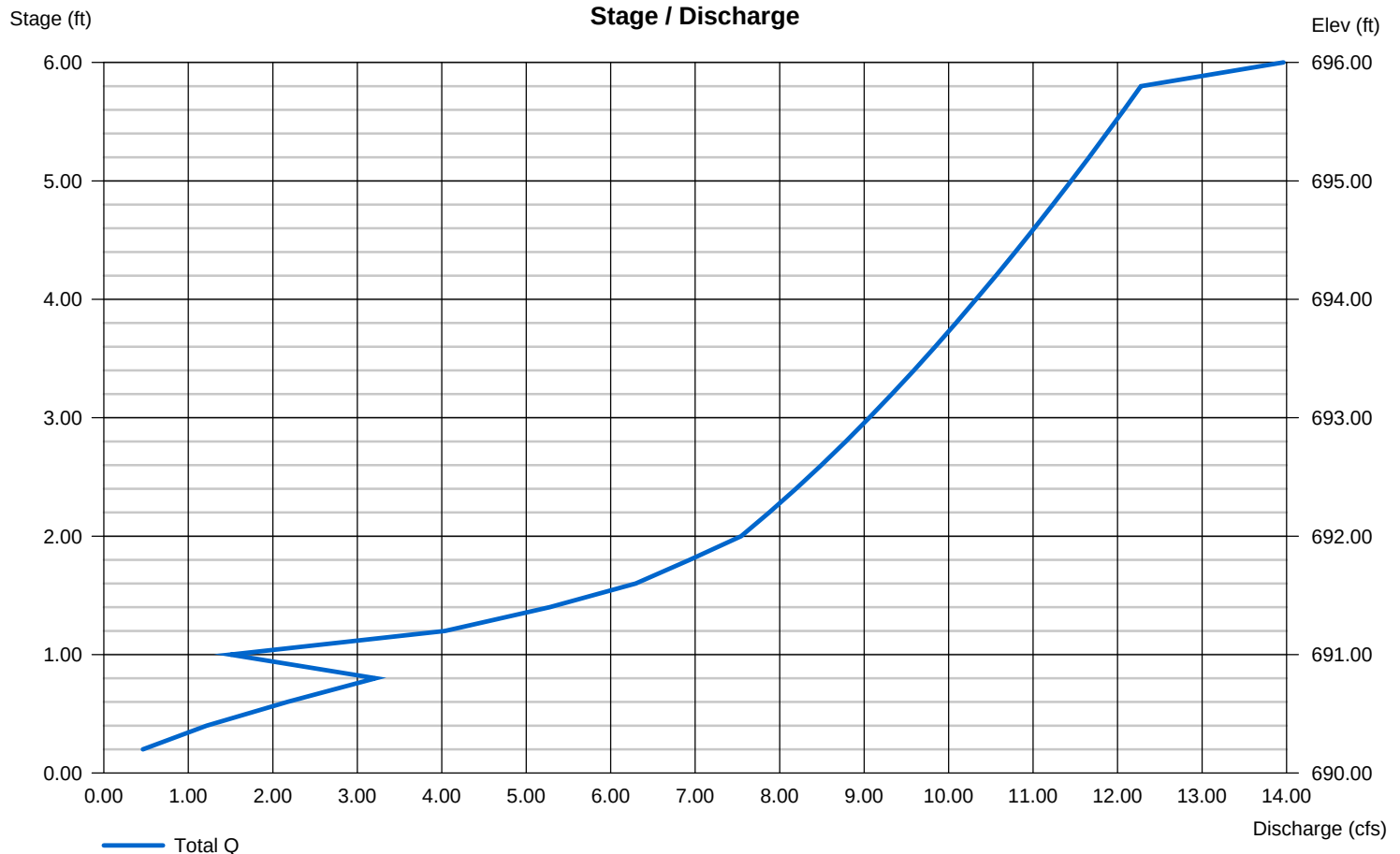
Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	12.00	0.00	0.00
Span (in)	= 0.00	12.00	0.00	0.00
No. Barrels	= 0	1	0	0
Invert El. (ft)	= 0.00	690.00	0.00	0.00
Length (ft)	= 0.00	0.50	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	5.00	0.00	0.00
Crest El. (ft)	= 0.00	695.80	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	Rect	---	---
Multi-Stage	= No	No	No	No
Exfil.(in/hr)	= 6.000 (by Contour)			
TW Elev. (ft)	= 0.00			

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



Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	-----
2	37.7795	9.5000	0.8133	-----
3	0.0000	0.0000	0.0000	-----
5	99.3592	15.3000	0.9554	-----
10	69.0361	11.6000	0.8412	-----
25	182.6736	18.0000	1.0144	-----
50	118.5118	13.6000	0.8977	-----
100	133.2439	13.2000	0.8997	-----

File name: Newhaven.idf

$$\text{Intensity} = B / (Tc + D)^E$$

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	4.29	3.37	2.80	2.41	2.12	1.90	1.72	1.58	1.46	1.36	1.28	1.20
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	5.60	4.54	3.82	3.30	2.91	2.60	2.35	2.15	1.98	1.83	1.71	1.60
10	6.50	5.21	4.37	3.78	3.34	3.00	2.73	2.50	2.32	2.16	2.02	1.90
25	7.59	6.22	5.26	4.56	4.02	3.60	3.26	2.97	2.73	2.53	2.35	2.20
50	8.59	6.94	5.84	5.05	4.46	4.00	3.63	3.32	3.07	2.85	2.66	2.50
100	9.79	7.87	6.60	5.70	5.03	4.50	4.08	3.73	3.44	3.20	2.98	2.80

Tc = time in minutes. Values may exceed 60.

Precip. file name: H:\LIBRARY\DEPT\SITE\hydraflow\beacon falls-noaa-ct.pcp

[illegible]

APPENDIX F
Drainage Area Maps



WWW.ROSETISO.COM
35 BRENTWOOD AVENUE, FAIRFIELD, CT 06825
TEL: (203) 610-6262 • FAX: (203) 610-6404

REVIEWS			DESCRIPTION
NO.	BY	DATE	
1.	MUS	8-08-19	WETLANDS SUBMISSION
2.	MUS	10-04-19	ENGINEERING COMMENTS
3.	SFS	3-17-20	ZONE CHANGE APPLICATION
4.	MUS	01-07-21	WETLANDS SUBMISSION
5.	MUS	01-27-21	WETLANDS COMMENTS
6.	MUS	03-18-21	WETLANDS COMMENTS
7.	MUS	03-31-21	WETLANDS COMMENTS
8.	MUS	08-05-21	STAFF COMMENTS
9.	MUS	11-23-23	STAFF COMMENTS
10.	MUS	6-21-24	STAFF COMMENTS
11.	MUS	9-27-24	STAFF COMMENTS
12.	MUS	10-24-24	ENGINEERING COMMENTS
13.	MUS	12-12-24	LOT LINES ADDED

PROJECT TITLE	PROJECT NUMBER	PROJECT TYPE	PROJECT STATUS	PROJECT START DATE	PROJECT END DATE	PROJECT BUDGET	PROJECT MANAGER	PROJECT TEAM	PROJECT DESCRIPTION	PROJECT COMMENTS
Project A	101	Software Development	In Progress	2023-01-15	2023-06-30	\$150,000	John Doe	John Doe, Jane Smith, Bob Johnson	Develop a new web application for customer management.	On track, minor delays in testing.
Project B	102	Hardware Upgrade	Completed	2022-03-01	2022-09-15	\$80,000	Jane Smith	Jane Smith, Bob Johnson	Upgrade server hardware and network infrastructure.	Completed ahead of schedule.
Project C	103	Marketing Campaign	On Hold	2023-07-01	2023-12-31	\$200,000	Bob Johnson	Bob Johnson, Jane Smith	Launch a new marketing campaign for Product X.	On hold due to budget constraints.
Project D	104	Research & Development	Planned	2024-01-01	2024-12-31	\$300,000	John Doe	John Doe, Jane Smith, Bob Johnson	Research and develop a new AI-powered tool.	Initial planning phase.
Project E	105	Infrastructure Upgrade	In Progress	2023-04-01	2023-11-30	\$120,000	Jane Smith	Jane Smith, Bob Johnson	Upgrade data center infrastructure and security.	Minor issues with hardware delivery.

HOPP BROOK ESTATES FINAL SITE PLANS

**OAKWOOD LANE
BEACON FALLS, CT.**

Prepared For:

HOPP BROOK DEVELOPERS LLC

37111 133HS

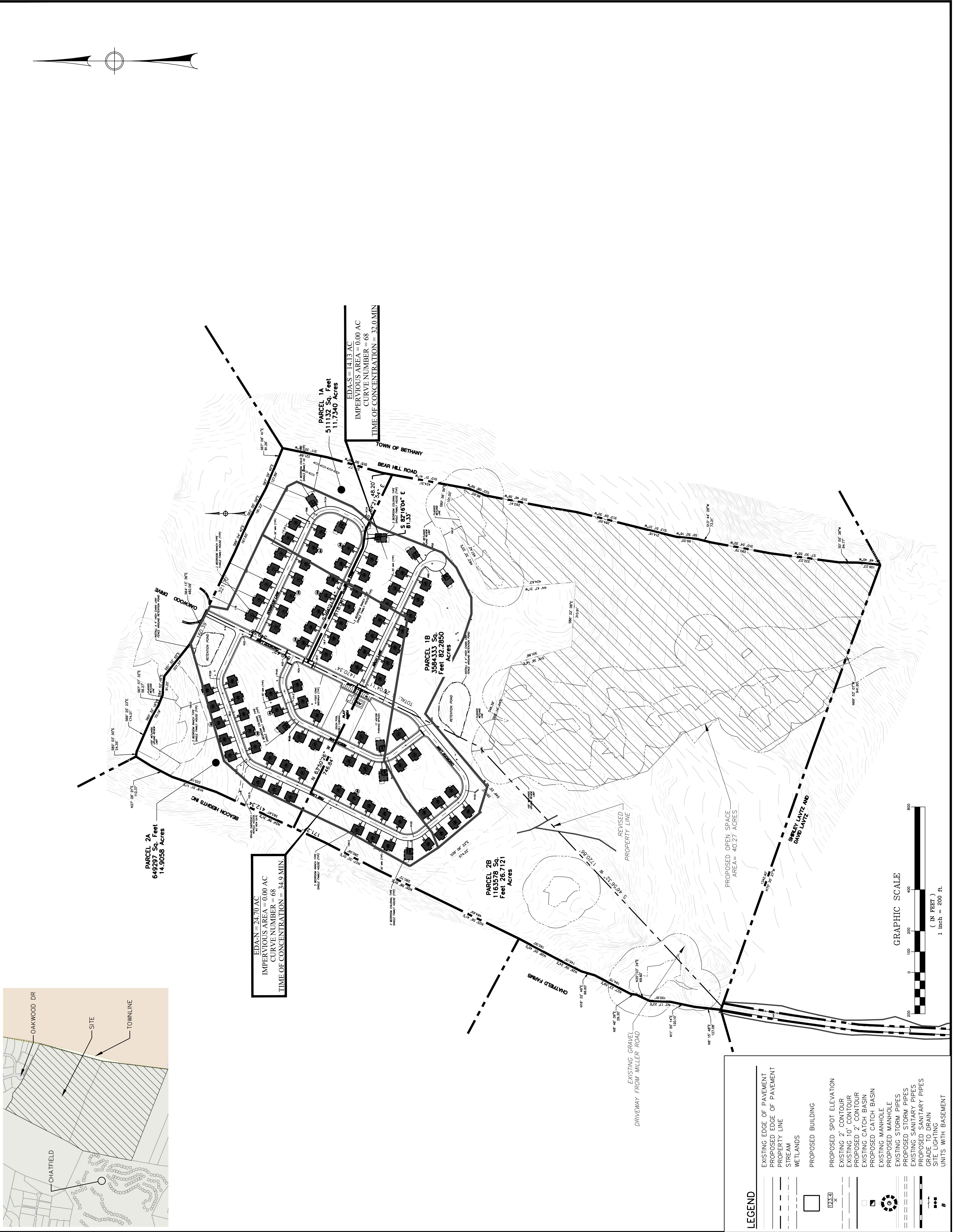
EXISTING DRAINAGE AREA MAP

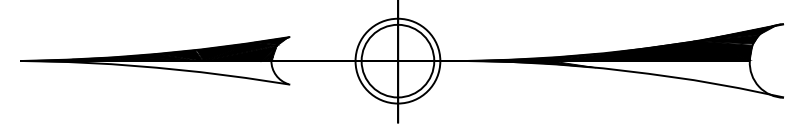
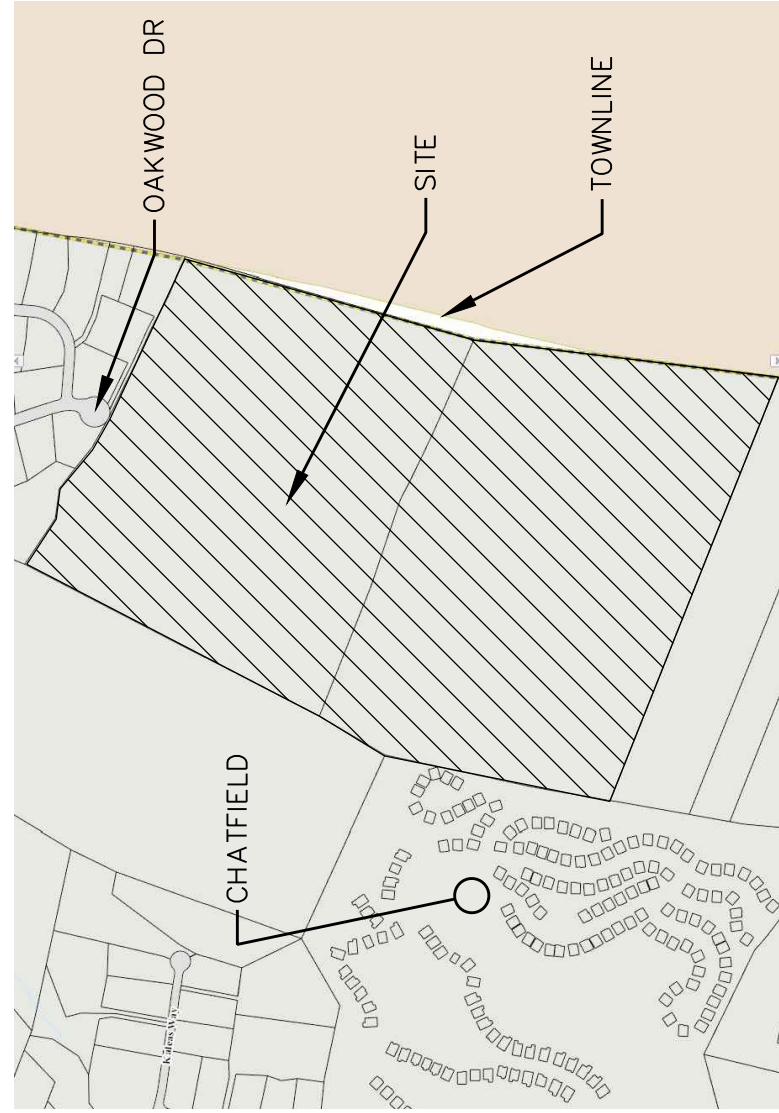
DESIGNED BY: MJS	SCALE: 1"=200'
DRAWN BY: MJS	DATE: 2-23-18
CHECKED BY: MJS	PROJECT NUMBER: 2215
C40: FILE: 2215	

SEAL

SHEET NUMBER

DA-EX





ROSE
TISO
& CO. LLC.
ARCHITECTS • SURVEYORS • ENGINEERS

WWW.ROSETISO.COM
35 BRENTWOOD AVENUE, FAIRFIELD, CT 06825
TEL: (203) 610-6262 • FAX: (203) 610-6404

REVISIONS		
NO.	BY	DATE DESCRIPTION
1.	MJS	8-08-19 WETLANDS SUBMISSION
2.	MJS	10-04-19 ENGINEERING COMMENTS
3.	SFS	3-17-20 ZONE CHANGE APPLICATION
4.	MJS	01-07-21 WETLANDS SUBMISSION
5.	MJS	01-27-21 WETLANDS COMMENTS
6.	MJS	03-18-21 WETLANDS COMMENTS
7.	MJS	03-31-21 WETLANDS COMMENTS
8.	MJS	08-05-21 STAFF COMMENTS
9.	MJS	11-23-23 STAFF COMMENTS
10.	MJS	6-21-24 STAFF COMMENTS
11.	MJS	9-27-24 STAFF COMMENTS
12.	MJS	10-24-24 ENGINEERING COMMENTS
13.	MJS	12-13-24 LOT LINES ADDED

PROJECT TITLE

HOPP BROOK ESTATES
FINAL SITE PLANS

OAKWOOD LANE
BEACON FALLS, CT.

Prepared For:
HOPP BROOK DEVELOPERS LLC

SHEET TITLE

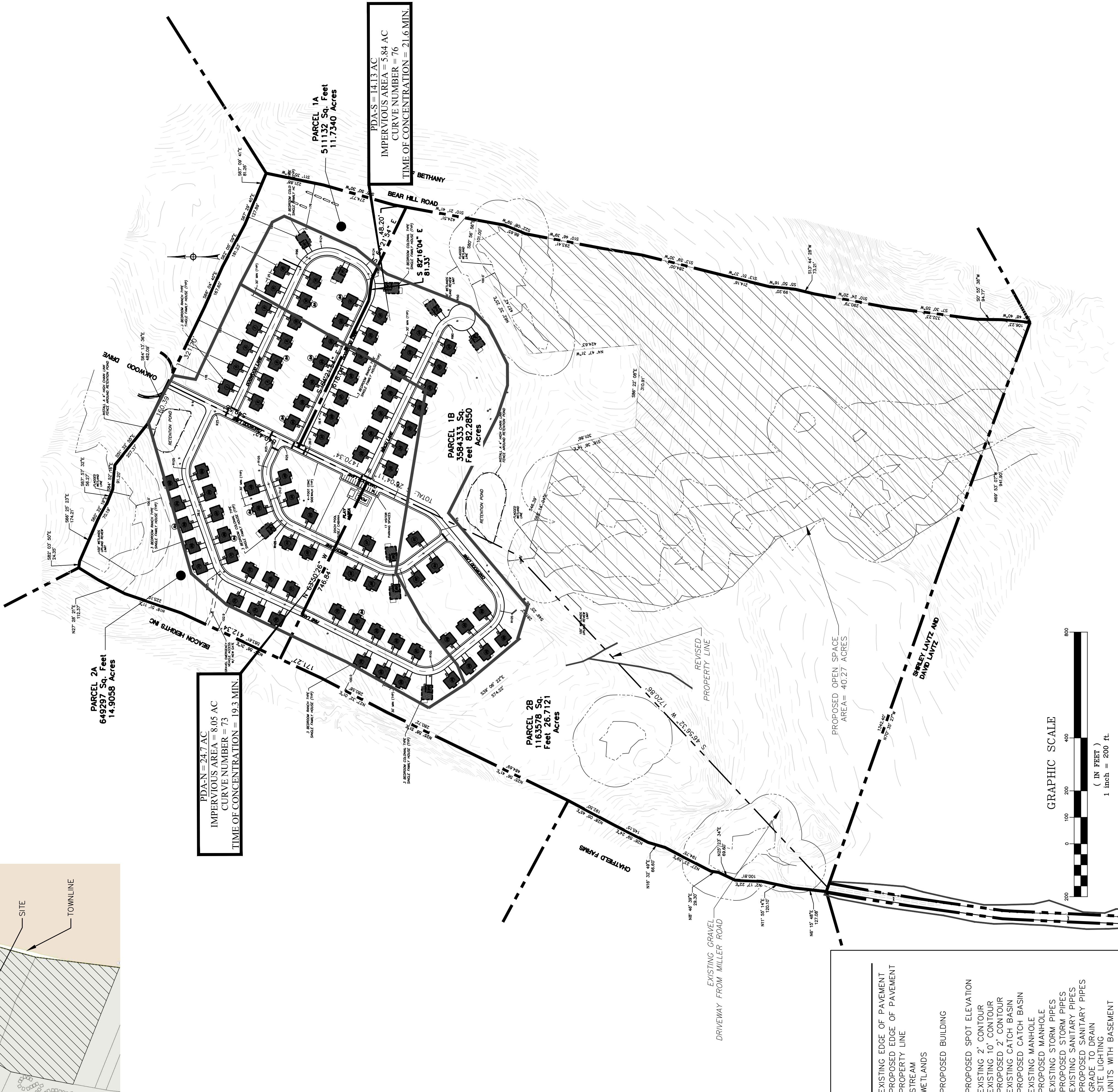
PROPOSED DRAINAGE
AREA MAP

DESIGNED BY: MJS	SCALE: 1"=200'
DRAWN BY: MJS	DATE: 2-23-18
CHECKED BY: MJS	PROJECT NUMBER: 2215
CAD FILE: 2215	

SEAL

SHEET NUMBER

DA-PR



LEGEND

- EXISTING EDGE OF PAVEMENT
- PROPOSED EDGE OF PAVEMENT
- PROPERTY LINE
- STREAM
- WETLANDS
- PROPOSED BUILDING
- PROPOSED SPOT ELEVATION
- EXISTING 2' CONTOUR
- EXISTING 10' CONTOUR
- PROPOSED 2' CONTOUR
- EXISTING CATCH BASIN
- PROPOSED CATCH BASIN
- EXISTING MANHOLE
- PROPOSED MANHOLE
- EXISTING STORM PIPES
- PROPOSED STORM PIPES
- EXISTING SANITARY PIPES
- PROPOSED SANITARY PIPES
- GRADE TO DRAIN
- SITE LIGHTING
- UNITS WITH BASEMENT