

City of Tucker

Invitation to Bid
ITB # 2023 – 022

FITZGERALD PARK IMPROVEMENTS
PHASE II



BID MANUAL

City of Tucker
1975 Lakeside Parkway, Suite 350
Tucker, Georgia 30084

**CITY OF TUCKER INVITATION TO BID
ITB #2023-022 FITZGERALD PARK IMPROVEMENTS
PHASE II**

INVITATION: The City of Tucker (City), requests that interested parties submit formal electronic bids for the construction of improvements to Fitzgerald Park. The improvements generally consist of demolition of existing buildings and parking lots, moderate earthwork and clearing and grubbing, construction of new parking lots and driveways including stormwater infrastructure, concrete flatwork, retaining walls, artificial turf playing field, and a restroom/concession building including water and sewer connections. Proposals will be accepted until the date and time listed below and will be awarded to the lowest responsible and responsive bidder. The City reserves the right to negotiate with the lowest responsible and responsive bidder as provided for in O.C.G.A. § 36-91-21. Addenda and updates to this bid manual will be posted on the City of Tucker website https://www.tuckerga.gov/government/rfp_rfq/index.php or may be requested by email procurement@tuckerga.gov.

BID ACTIVITY SCHEDULE	
Bid Issued	May 30, 2023
Pre-Bid Conference	June 6, 2023
Deadline for Questions	June 13, 2023, at 5:00 p.m.
Responses to Questions Posted (Addenda)	June 15, 2023
Bid Deadline	June 27, 2023, at 2:00 P.M.
Bid Opening at City Hall	June 27, 2023, at 2:15 P.M.
Award at Council Meeting	July 10, 2023 (tentative)
Completion from Notice to Proceed	180 days

SCOPE OF WORK: Refer to Exhibit A.

QUESTIONS: Submit all questions in writing to procurement@tuckerga.gov Reference Bid #2023-022.

PRE-BID CONFERENCE: A mandatory pre-bid conference is scheduled for Tuesday, June 6th, 2023 at 10:00 A.M. EDT. Attendees will meet at Fitzgerald Park located at 4877 Lawrenceville Hwy, Tucker, GA 30084.

ADDENDA: Responses to the questions received will be by addenda and will be posted on the City website https://www.tuckerga.gov/government/rfp_rfq/index.php. The signed acknowledgement issued with each addendum must be submitted with the proposal. It is the vendors responsibility to verify if any addenda were created.

SUBMITTAL REQUIREMENTS: Submit an electronic copy of the full proposal to procurement@tuckerga.gov no later than June 27, 2023, at 2:00 P.M. Be sure to name the proposal file with ITB #2023-022 and your company name.

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BID TABULATION: Preliminary Bid results will be posted on the City’s website, https://www.tuckerga.gov/government/rfp_rfq/index.php, following the opening of bids.

BID DOCUMENT SUBMITTAL REQUIREMENTS:

1. Cost Proposal Form (Exhibit B)
2. W-9 Form
3. Certificate of Insurance
4. Contractor Affidavit
5. Subcontractor Affidavit
6. Bid Bond Form
7. Contact Form
8. Proposed List of Subcontractors
9. Related Experience and References
10. Acknowledgement of Addendum issued with each Addendum

Your response must be received by the date and time specified. (Addenda will show any schedule updates) Late receipt of bids will not be considered regardless of postmark/carrier or email issues. Proposals received after the opening time will be filed unopened. The City of Tucker reserves the right to reject any and all proposals or any part, to waive any formalities or informalities to make an award and to re-advertise in the best interest of the City. No proposals received orally/phone.

If a sample contract is attached to this manual, by submitting a bid, you consent, upon award, to executing such an agreement and/or to substantially similar contract language.

Exhibit A:
Project Specifications / Scope of Work
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PURPOSE, INTENT AND PROJECT DESCRIPTION

The City of Tucker (City), requests that interested parties submit formal electronic bids for the construction of improvements to Fitzgerald Park. The improvements generally consist of demolition of existing buildings and parking lots, moderate earthwork and clearing and grubbing, construction of new parking lots and driveways including stormwater infrastructure, concrete flatwork, retaining walls, artificial turf playing field, and a restroom/concession building including water and sewer connections.

The complete scope, plans, and other relevant information for ITB 2023-024 Fitzgerald Park Improvements – Phase II is available for download on the City of Tucker website: <http://tuckerga.gov> or request via email to procurement@tuckerga.gov.

GENERAL CONDITIONS

The contractor shall execute the work according to and meet the requirements of the following:

- Georgia Department of Transportation (GDOT) Specifications, Standards, and Details;
- DeKalb County Department of Watershed Management Design & Construction Standards Manual
- The Contract Documents including but not limited to the scope of work, plans, and specifications;
- City of Tucker ordinances and regulations;
- OSHA standards and guidelines; and
- MUTCD Guidelines

The contractor will be responsible for providing all labor, materials, and equipment necessary to perform the work. This is a unit price bid. Payment will be made based on actual work completed.

The contractor is responsible for inspecting the jobsite prior to submitting a bid. No change orders will be issued for differing site conditions.

The successful bidder must have verifiable experience at construction of similar projects in accordance with these specifications. Bidder shall provide at least three examples and reference information (including company name, project name, contact name, phone number and email address) demonstrating experience successfully completing projects of similar scope.

10% retainage will be withheld from the total amount due the contractor until Final Acceptance of work is issued by the City. The City will inspect the work as it progresses.

Payment shall be made in arrears upon satisfactory completion of work.

PROSECUTION AND PROGRESS

The Contractor will mobilize with sufficient forces such that all construction identified as part of this contract shall be substantially completed within 180 days of Notice to Proceed. The contractor will be considered substantially complete when all work required by this contract has been completed (excluding final punch list work).

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Upon Notice of Award, the Contractor will be required to submit a Progress Schedule.

Normal workday for this project shall be 7:00AM to 7:00PM and the normal workweek shall be Monday through Friday. Lane closures are limited to the hours of 9:00AM to 4:00PM. The City will consider extended workdays or workweeks upon written request by the Contractor on a case by case basis. No work will be allowed on national holidays (i.e. Memorial Day, July 4th, Labor Day, etc.).

The work will require bidder to provide all labor, administrative forces, equipment, materials and other incidental items to complete all required work. The City shall perform a Final Inspection upon substantial completion of the work. The contractor will be allowed to participate in the Final Inspection. All repairs shall be completed by the contractor at contractor's expense prior to issuance of Final Acceptance.

The contractor shall be assessed liquidated damages in the amount of \$200.00 per calendar day for any contract work (excluding punch list items) that is not completed within 180 days of Notice to Proceed. Liquidated damages shall be deducted from the 10% retainage held by the City. The contractor will also be assessed liquidated damages in the amount of \$200.00 per calendar day for not completing any required Punch List work within 45 calendar days.

The contractor shall provide all material, labor, and equipment necessary to perform the work without delay until final completion.

The contractor shall provide a project progress schedule prior to or at the preconstruction meeting. This schedule should accurately represent the intended work and cannot be vague or broad such as listing every road in the contract.

The contractor shall submit a two-week advance schedule every **Friday by 2:00p.m.**, detailing scheduled activities for the following week.

All submittals are to be provided to the Owner by the Contractor prior to commencing any work.

PERMITS AND LICENSES

The contractor shall procure all permits and licenses, pay all charges, taxes and fees, and give all notices necessary and incidental to the due and lawful prosecution of the work.

RIGHT OF WAY AND EASEMENTS

This project does not require any Right of Ways or Easements.

BONDING AND INSURANCE REQUIREMENTS

No bid may be withdrawn for a period of forty-five (45) days after the time has been called on the date of opening.

All bids must be accompanied by a Bid Bond of a reputable bonding company authorized to do business in the State of Georgia, in an amount equal to at least five percent (5%) of the total amount of the bid.

Upon Notice of Award, the successful contractor shall submit a Performance Bond payable to the City of Tucker in the amount of 100% of the total contract price. The successful contractor shall also submit a

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Payment Bond in the amount of 100% pursuant to O.C.G.A. § 36- 91-70 and 90.

Upon Notice of Award, the successful contractor shall procure and maintain a General Liability Insurance Policy with minimum limits of \$1,000,000 per person and \$3,000,000 per occurrence.

EXISTING CONDITIONS / DEVIATION OF QUANTITIES

All information given in this ITB concerning quantities, scope of work, existing conditions, etc. is for information purposes only. It is the Contractor’s responsibility to inspect the project site to verify existing conditions and quantities prior to submitting their bid. This is a Unit Price bid and no payment will be made for additional work without prior written approval from the City. At no time will Contractor proceed with work outside the prescribed scope of services for which additional payment will be requested without the written authorization of the City.

The City reserves the right to add, modify, or delete quantities. The City may also elect to add or eliminate certain work locations at its discretion. The Contractor will not be entitled to any adjustment of unit prices or any other form of additional compensation because of adjustments made to quantities and/or work locations. Contractor will be paid for actual in-place quantities completed and accepted for pay items listed in the Bid Schedule. All other work required by this ITB, plans, specs, standards, etc. but not specifically listed in the Bid Schedule shall be considered “incidental work” and included in the bid prices for items on the Bid Schedule.

PROTECTION AND RESTORATION OF PROPERTY AND LANDSCAPE

The contractor shall be responsible for the preservation of all public and private property, crops, fish ponds, trees, monuments, highway signs and markers, fences, grassed and sodded areas, etc. along and adjacent to the highway, road or street, and shall use every precaution necessary to prevent damage or injury thereto, unless the removal, alteration, or destruction of such property is provided for under the contract.

When or where any direct or indirect damage or injury is done to public or private property by or on account of any act, omission, neglect or misconduct in the execution of the work, or in consequence of the non-execution thereof by the contractor, he shall restore, at his/her own expense, such property to a condition similar or equal to that existing before such damage or injury was done, by repairing, rebuilding or otherwise restoring as may be directed, or she/he shall make good such damage or injury in an acceptable manner. The contractor shall correct all disturbed areas before retainage will be released.

ADJUSTING UTILITY STRUCTURES TO GRADE

All sewer manholes and water valves are to be adjusted to grade by the contractor.

CLEANUP

All restoration and clean-up work shall be performed daily. Operations shall be suspended if the contractor fails to accomplish restoration and clean-up within an acceptable period of time. Asphalt and other debris shall be removed from gutters, sidewalks, yards, driveways, etc. Failure to perform clean-up activities may result in suspension of the work.

SAFETY

Beginning with mobilization and ending with acceptance of work, the contractor shall be responsible for providing a clean and safe work environment at the project site. The contractor shall comply with all OSHA

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regulations as they pertain to this project.

SPECIAL CONDITIONS

1. Contractor to call 811 for utility locates. Minor field adjustments may be necessary or directed by the City.

SUBCONTRACTOR

Any contractor utilizing a subcontractor must submit a proposed list of subcontractors and a Subcontractor Affidavit (Exhibit E-2).

RESTROOM AND CONCESSION BUILDING

The scope of the project is to be the Design and providing a set of Issued for Construction documents for a new +/- 3,200 sf Single Story Free Standing Building that will contain the following Spaces:

- Public Restrooms (men’s & women’s separate spaces)
- 2(ea) Family Restrooms
- Concession Area
- Stock Room adjoining the Concession w/ interior door for access
- Storage, Janitor, Mechanical and Electrical Room
- Maintenance Chase (with access) Separating Men’s & Women’s Restrooms

Design Criteria

Code Compliances:

- Applicable Design Codes by local municipality building authorities requirements
- U.S. Department of Justice A.D.A. Standards for Accessible Design (ADA) – 2010 edition
- State Registered Architect/Engineer/Design Professional Signed, Sealed & Dated w/registration number on all sheets
- Construction Type: VB
- Occupancy Classification: Assembly
- Fire Rating Construction: Non-Rated Building
- Sprinkler Requirement: Non-Sprinkled
- Allowable Building Height & Area: Single Story & (area to be determined)
- Occupancy Load Calculations (per LSC) (to be determined)
- Plumbing Fixture Requirements / (to be determined)
- Proposed Fixture Count (including calc’s)

Design Loads:

- Live Loads:

Exhibit A:

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- o 20 PSF ROOF
- o 30 PSF ATTIC
- o 100 PSF FLOORS
- Wind Design Data:
 - o Risk Category: Category II
 - o Exposure Category: Category C
 - o Basic Design Wind Speed: V=106mph
 - o Allowable Stress Design Wind Speed: V=89mph
 - o Enclosure Classification: Enclosed
 - o Internal Pressure Coefficient: +/- 0.18

Seismic Design Data:

- o Risk Category: Category II
- o Seismic Importance Factor: 1.0
- o Mapped Spectral Response Accelerations: (to be determined)
- o Site Class: (to be determined)
- o Design Base Shear: (to be determined)
- Snow Loads: Ground Snow Load: 5 PSF

Scope of Material

ARCHITECTURAL

Foundation - (see Structural below for further information)

- 4” reinforced concrete monolithic slab, 3000 PSI

Exterior Walls - (see Structural below for further information)

- Concrete reinforced masonry units (CMU)
- Mortar joint: Gray
- Unit Size: Typical Nominal 8”x16”x8”
- Surface Finishes: Split Face
- Block Color: Standard Gray
- Exterior block to have anti-graffiti coating

Roof System - (see Structural below for further information)

- Commercial Grade Standing Seam System
- Sheath with APA rated sheathing
- Insulation (per code)
- Gutter and Downspouts
- Metal canopy / continuation of roof system extending over window service area of the Concession Stand

Exterior Doors and Frames

- Exterior insulated composite metal doors (Level III, 16 gauge, extra heavy duty, model two

Exhibit A:

Project Specifications / Scope of Work

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- seamless w/polyurethane core)
- Welded steel frame (16 gauge w/backbend turns)
- Both doors and frames to be powder coated (color selected by owner)

Exterior Windows

- Concession window covered with Lexan type material, with service openings
- Concession window to have a commercial metal counter roll-up shutter system

Interior Walls - (see Structural below for further information)

- Concrete reinforced masonry units (CMU)
- Mortar joint: Gray
- Unit Size: Typical nominal 8"x16"x6"
- Surface Finishes: Standard (smooth)
- Block Color: Standard Gray

Interior Ceilings

- Hard surface - smooth, washable and mildew resistant surface finish - all rooms including service chase

Interior Doors and Frames

- Insulated composite metal doors (Level III, 16 gauge, extra heavy duty, model two seamless w/polyurethane core)
- Welded steel frame (16 gauge w/backbend turns)
- Both doors and frames to be powder coated (color selected by owner)

Hardware

- Stainless steel ball bearing heavy duty hinges
- Heavy duty door closers
- Doors to have stainless steel kick plates (both sides) w/ aluminum thresholds for exterior doors
- Doors to have grade 2, lever locks with latch plate guards
- Restroom doors to have magnetic locking system w/ locked indicator light
- Hardware to meet ADA compliance

ADA Restrooms

- Wall mounted, top supply, stainless steel toilets w/ exposed sensor flush valves
- Wall mounted top supply, stainless steel urinals with exposed sensor flush valves
- Wall mounted stainless steel sinks w/ motion sensor faucets, hardwired with transformer
- Surface mounted mirrors with stainless steel frames
- Wall mounted light fixture above mirror at sinks
- Wall mounted stainless steel 2-roll toilet paper dispensers
- Wall mounted stainless steel soap dispensers
- Wall mounted stainless steel electric hand dryers
- Floor to Ceiling composite type material partitions (graffiti resistant)
- Surface mounted diaper deck
- ADA grab bars to meet code and fixture count

Exhibit A:

Project Specifications / Scope of Work

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Concession Area

(plumbing fixtures)

- Stainless Steel 3-Compartment convenience store sink
- Stainless Steel One Compartment prep sink
- Stainless Steel Hand Sink
- (owner supplied commercial equipment for electrical load demand)
- 1-Door merchandising counter top freezer
- 1-Door merchandising reach in cooler
- Mobile heated cabinet
- Counter top oven (small)
- Warming drawers
- Menu board (digital)
- Coffee and tea equipment
- Ice Machine w/ Bin
- Commercial Microwave
- (owner supplied fixtures)
- Stainless Steel service window countertop (Belly up)
- Stainless Steel 24”x60” tables w/ under shelf
- Merchandising shelves
- Condiment holder

Finishes - (colors selected by owners)

- Concrete floor to be stained and sealed
- Walls to receive 4” rubber cove base
- Painted surfaces to receive prime coat and one finish coat
- All rooms to receive epoxy paint

Miscellaneous

- Surface mounted stainless steel bi-level drinking fountain w/ bottle filler & pet bowl

STRUCTURAL

(see Architectural for other structural associated information)

Foundation

- Continuous reinforced concrete spread footings.
- Allowable soil bearing pressure presumed to be 2,000 psf, to be confirmed with geotechnical exploration
- Reinforced slab on grade on 4” compacted GAB
- Concrete:
 - o F’c= 3,000 psi for footings
 - o F’c= 4,000 psi for slabs. Provide air entrainment for exposed slabs on grade

Wall Framing

- Exterior walls: 8” reinforced split face cmu, F’m = 2,000psi
- Interior walls: 8” reinforced standard cmu, F’m = 2,000psi

Exhibit A:

Project Specifications / Scope of Work

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Roof Level

- Pre-engineered roof trusses 24” on center with attic space at center, as practical
- Roof trusses to span from exterior wall to exterior wall
- Hold downs sized for up lift loads
- Roof sheathing: 19/32” APA rated sheathing, exposure 1
- Slip joint connections between partition walls and roof trusses

MECHANICAL, ELECTRICAL & PLUMBING

(see Architectural for other MEP associated information)

HVAC

- Electric heaters located in each restroom and concessions area
- Restrooms, exhaust fan vented to outside of building. Exhaust fans to be energized via wall switch. Intake will be via wall louvers
- Concessions area, exhaust fan for circulation. Intake will be via concessions service windows

Electrical

- New electrical panel sized for the new concessions/restroom building
- Motion sensor interior lights. Comcheck report for lighting to confirm code compliance
- Exterior Security wall pack lights (photocell)
- Wall outlets and required GFI outlets per code
- Circuiting for lighting and electric outlets
- Circuiting for the electric heaters and water heater
- Circuiting for the concessions area equipment
- Provide (2ea) 1” PVC conduits from electrical panel to outside of building for future needs

Plumbing

- Frost free hose bibs w/ recessed security box located on each exterior wall
- Frost free hose bibs w/ recessed security box located in each space (except service chase)
- Water service to include isolation valves and backflow preventer
- Waste and vent system to include cleanouts, sealing roof penetrations and tie-into sewer system
- Floor Drains in each space with trap primers
- Tank type water heater serving the lavatories in the restrooms and the concessions area. Water heater to be located in the Mechanical Storage room
- Thermostatic mixing valve for the hot water serving the toilet room lavatories to prevent scald

**Exhibit A:
Project Specifications / Scope of Work
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13 - ARTIFICIAL GRASS

PART 1 - GENERAL

1.1 SUMMARY

- A. Furnish all labor, materials, tools and equipment necessary to install slit-film/monofilament artificial grass FieldTurf as indicated on the plans and as specified herein; including components and accessories required for a complete installation. including but not limited to
 - 1. Acceptance of prepared sub-base.
 - 2. Coordination with related trades to ensure a complete, integrated, and timely installation: Aggregate base course, sub-base material (tested for permeability), grading and compacting, piping and drain components (when required); as provided under its respective trade section.

1.2 REFERENCE STANDARDS

- A. FM Factory Mutual
 - 1. P7825 - Approval Guide; Factory Mutual Research Corporation; current edition
- B. ASTM – American Society for Testing and Materials.
 - 1. D1577 - Standard Test Method for Linear Density of Textile Fiber
 - 2. D5848 - Standard Test Method for Mass Per Unit Area of Pile Yarn Floor Covering
 - 3. D1338 - Standard Test Method for Tuft Bind of Pile Yarn Floor Covering
 - 4. D1682 - Standard Method of Test for Breaking Load and Elongation of Textile Fabrics
 - 5. D5034 - Standard Test Method of Breaking Strength and Elongation of Textile Fabrics (Grab Test)
 - 6. F1015 - Standard Test Method for Relative Abrasiveness of Synthetic Turf Playing Surfaces
 - 7. D4491 - Standard Test Methods for Water Permeability of Geotextiles by Permittivity
 - 8. D2859 - Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials
 - 9. F355 - Standard Test Method for Shock-Absorbing Properties of Playing Surfaces.
 - 10. F1936 - Standard Test Method for Shock-Absorbing Properties of North American Football Field Playing Systems as Measured in the Field

1.3 SUBMITTALS

- 1. Provide substantiation that proposed system does not violate any other manufacturer's patents, patents allowed or patents pending.
- 2. Provide a sample copy of insured, non-prorated warranty and insurance policy information.
- B. Comply with Submittals Procedures. Submit for approval prior to fabrication.
- C. Shop Drawings:
 - 1. Indicate field layout; field marking plan and details for the specified sports; i.e., NCAA

Exhibit A:

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- Football; roll/seaming layout; methods of attachment, field openings and perimeter conditions.
2. Show installation methods and construction indicating field verified conditions, clearances, measurements, terminations, drainage.
 3. Provide joint submission with related trades when requested by Architect.
- D. **Product Data: Due at time of bid.**
1. Submit manufacturer's catalog cuts, material safety data sheets (MSDS), brochures, specifications; preparation and installation instructions and recommendations; storage, handling requirements and recommendations.
 2. Submit fiber manufacturer's name, type of fiber and composition of fiber.
 3. Submit data in sufficient detail to indicate compliance with the contract documents.
 4. Submit manufacturer's instructions for installation.
 5. Submit manufacturer's instructions for maintenance for the proper care and preventative maintenance of the synthetic turf system, including painting and markings.
- E. **Samples: Due at time of bid.** Submit a synthetic turf sample, 12 x 12 inches, representing the turf carpet portion of the product proposed for this project.
- F. **Product Certification:**
1. Submit manufacturer's certification that products and materials comply with requirements of the specifications.
 2. Submit test results indicating compliance with Reference Standards.
- G. **Project Record Documents:** Record actual locations of seams, drains and other pertinent information in accordance with Division 1 Specifications Series, General Requirements.
- H. **List of existing installations:** Submit list including respective Owner's representative and telephone number.
- I. **Warranties:** Submit warranty and ensure that forms have been completed in Owner's name and registered with approved manufacturer.
- J. **Testing data to the Owner to substantiate that the finished field meets the required shock attenuation, as per ASTM F1936.**
- K. **Submit Bills of Lading/Material Delivery Receipts for synthetic turf infill materials.** Bills of lading shall bear the name of the project/delivery address, quantity of materials delivered, source/location of origin of infill materials and/or manufacturer, and date of delivery.
- L. **Testing Certification:** Submit certified copies of independent (third-party) laboratory reports on ASTM testing:
1. Pile Height, Face Weight & Total Fabric Weight, ASTM D5848.
 2. Primary & Secondary Backing Weights, ASTM D5848.
 3. Tuft Bind, ASTM D1335.
 4. Grab Tear Strength, ASTM D1682 or D5034.
 5. Shock Attenuation, ASTM F1936

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6. Water Permeability, ASTM D4491

1.4 QUALITY ASSURANCE

- A. Comply with Section 01 43 00, Quality Assurance.
- B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section. The turf contractor and/or the turf manufacturer:
 1. Shall be experienced in the manufacture and installation of specified type of infilled slit-film/monofilament synthetic grass system for a minimum of three years. This includes a slit-film/monofilament fiber, backing, the backing coating, and the installation method.
 2. Shall have 2000 fields or more in play for at least two years. Fields shall be 65,000 ft² or more
 3. Shall have a minimum of 500 fields that are at least 8 years old, which is equal to the respective warranty period.
 4. The manufacturer must have ISO 9001, ISO 14001 and OHSAS 18001 certifications demonstrating its manufacturing efficiency with regards to quality, environment and safety management systems.
 5. The manufacturer must be a Preferred Producer by all of the following major international governing bodies: FIFA, World Rugby, International Hockey Federation (FIH)
 6. Shall have a minimum of 100 installations in the State of GA.
 7. Shall have a minimum of 1 FIFA Quality Pro recommended field in North America.
 8. Shall have a minimum of 5 NFL game and/or practice fields in play for the previous year.
 9. Shall have minimum 25 NCAA Division 1 game and/or practice fields installed for (football or soccer).
 10. Shall have a minimum of 1000 installations in North America, each of 65,000 ft² or more.
 11. Shall provide third-party laboratory testing providing heat reduction qualities of the same infill materials used in the proposed turf system including the top layer Cooling composite.
 12. Manufacturer must provide proof that its turf systems have been subject to long-term independent, epidemiological and peer reviewed studies proving its ability to provide for a safe surface.
- C. Installer: Company shall specialize in performing the work of this section. The Contractor shall provide competent workmen skilled in this specific type of synthetic grass installation.
 1. The designated Supervisory Personnel on the project shall be certified, in writing by the turf manufacturer, as competent in the installation of specified slit-film/monofilament material, including sewing seams and proper installation of the infill mixture.
 2. Installer shall be certified by the manufacturer and licensed.
 3. The installer supervisor shall have a minimum of 5 years experience as either a construction manager or a supervisor of synthetic turf installations.
- D. Pre-Installation Conference: Conduct conference at project site at time to be determined by

Exhibit A:

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Architect. Review methods and procedures related to installation including, but not limited to, the following:

1. Inspect and discuss existing conditions and preparatory work performed under other contracts.
2. In addition to the Contractor and the installer, arrange for the attendance of installers affected by the Work, The Owner’s representative, and the Architect.

- E. The Contractor shall verify special conditions required for the installation of the system.
- F. The Contractor shall notify the Architect of any discrepancies.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Prevent contact with materials that may cause dysfunction.
- B. Deliver and store components with labels intact and legible.
- C. Store materials/components in a safe place, under cover, and elevated above grade.
- D. Protect from damage during delivery, storage, handling and installation. Protect from damage by other trades.
- E. Inspect all delivered materials and products to ensure they are undamaged and in good condition.
- F. Comply with manufacturer’s recommendations.

1.6 SEQUENCING AND SCHEDULING

- A. Coordinate the Work with installation of work of related trades as the Work proceeds.
- B. Sequence the Work in order to prevent deterioration of installed system.

1.7 WARRANTY AND GUARANTEE

- A. The Contractor shall provide a warranty to the Owner that covers defects in materials and workmanship of the turf for a period of eight (8) years from the date of substantial completion. The turf manufacturer must verify that their representative has inspected the installation and that the work conforms to the manufacturer's requirements. The manufacturer's warranty shall include general wear and damage caused from UV degradation. The warranty shall specifically exclude vandalism, and acts of God beyond the control of the Owner or the manufacturer. The warranty shall be fully third party insured; pre paid for the entire 8 year term and be non-prorated. The Contractor shall provide a warranty to the Owner that covers defects in the installation workmanship, and further warrant that the installation was done in accordance with both the manufacturer's recommendations and any written directives of the manufacturer's representative. Prior to final payment for the synthetic turf, the Contractor shall submit to owner notification in writing that the field is officially added to the annual policy coverage, guaranteeing the warranty to the Owner. The insurance policy must be underwritten by an “AM Best” A rated carrier and must reflect the following values:

- Pre-Paid 8-year insured warranty from a single source.

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- Maximum per claim coverage amount of \$33,000,000.
- Minimum of thirty-three million dollars (\$33,000,000) annual.
- Must cover full 100% replacement value of total square footage installed, minimum of \$7.00 per sq ft. (in case of complete product failure, which will include removal and disposal of the existing surface)
- Provide a sample copy of insured, non-prorated warranty and insurance policy information.
- Policy cannot include any form of deductible to be paid by the Owner.

C. The artificial grass system must maintain a G-max of less than 200 for the life of the Warranty as per ASTM F1936.

1.8 MAINTENANCE SERVICE

- A. Contractor shall train the Owner's facility maintenance staff in the use of the turf manufacturer's recommended maintenance equipment.
- B. Manufacturer must provide maintenance guidelines to the facility maintenance staff.

PART 2 - PRODUCTS

2.1 MATERIALS AND PRODUCTS

- A. Artificial grass system materials shall consist of the following:
 - 1. Carpet made of slit-film and monofilament polyethylene fibers tufted together into each individual stitch, into a non-perforated backing. Alternating row monofilament and slit-film carpet constructions are not permitted.
 - 2. Infill: Controlled mixture of graded sand and cryogenic rubber crumb that partially covers the carpet. A top infill layer of the Cooling extruded composite is mandatory.
 - 3. Glue, thread, paint, seaming fabric and other materials used to install and mark the artificial grass slit-film/monofilament Turf.

B. The installed artificial grass slit-film/monofilament Turf shall have the following properties:

<u>Standard</u>	<u>Property</u>	<u>Specification</u>
ASTM D1577	Pile Yarn Type	UV-resistant polyethylene
	Yarn Structure – A	Slit-Film
	Yarn Denier - A	5,000
	Yarn Structure – B	Ridged Monofilament
ASTM D5823	Yarn Denier – B	14,500
	Pile Height	2.25”
ASTM D5793	Stitch Gauge	3/4”
ASTM D5848	Pile Weight	43+oz/square yard

Exhibit A:

Project Specifications / Scope of Work

ITB #2023-022 FITZGERALD PARK IMPROVEMENTS – PHASE II

ASTM D5848	Primary Backing	7+oz/square yard
ASTM D5848	Secondary Backing	14+oz/square yard
ASTM D5848	Total Weight	64+oz/square yard
ASTM D1335	Tuft Bind (Without Infill)	8+lbs
ASTM D5034	Grab Tear (Width)	200 lbs/force
ASTM D5034	Grab Tear (Length)	200 lbs/force
ASTM D4491	Carpet Permeability	>40 inches/hour
ASTM F1936	Impact Attenuation (Gmax)	<200
	Infill Material Depth	1.5 inches
	CoolPlay Composite	0.6lbs/square foot
	Sand Infill Component	6.2lbs/square foot
	Cryogenic Infill Component	1.6lbs/square foot
	Total Product Weight	1274oz/square yard

Variation of +/- 5% on above listed properties is within normal manufacturing tolerances

- C. Carpet shall consist of slit-film/monofilament fibers tufted into a primary backing with a secondary backing.
- D. Carpet Rolls shall be 15' wide rolls.
 - 1. Rolls shall be long enough to go from field sideline to sideline.
 - 2. Where the playing field is for football, the perimeter white line shall be tufted into the individual sideline rolls.
- E. Backing:
 - 1. Primary backing shall be a double-layered polypropylene fabric.
 - 2. Secondary backing shall consist of an application of porous, heat-activated urethane to permanently lock the fiber tufts in place.
 - 3. Perforated (with punched holes), backed carpet are unacceptable.
- F. Monofilament fibers shall be 14,500 denier, slit-film fibers shall be 5000 denier - both fibers shall be low friction, and UV-resistant, measuring not less than 2.25 inches high.
 - 1. Systems with less than 2.25 inch fibers are unacceptable.
- G. Infill materials shall be approved by the manufacturer.
 - 1. Infill shall consist of a resilient layered granular system, comprising selected and graded sand and cryogenically hammer-milled SBR rubber crumb with a top layer of the extruded CoolPlay composite.
 - 2. Artificial Grass products without cryogenically processed rubber and a top layer of the extruded CoolPlay composite will not be acceptable.
 - 3. Cooling composite must have a bulk density of 0.55g/cm³ +/- 15% and a specific gravity of greater than 1.
- H. Non-tufted or inlaid lines and markings shall be painted with paint approved by the synthetic turf manufacturer.
- I. Thread for sewing seams of turf shall be as recommended by the synthetic turf manufacturer.

Exhibit A:

Project Specifications / Scope of Work

ITB #2023-022 FITZGERALD PARK IMPROVEMENTS – PHASE II

- J. Glue and seaming fabric for inlaying lines and markings shall be as recommended by the synthetic turf manufacturer.

1.2 QUALITY CONTROL IN MANUFACTURING

- G. The manufacturer shall own and operate its own manufacturing plant in North America. Both tufting of the field fibers into the backing materials and coating of the turf system must be done in-house by the turf manufacturer. Outsourcing of either is unacceptable.
- H. The manufacturer shall have full-time certified in-house inspectors at their manufacturing plant that are experts with industry standards.
- I. The manufacturer’s full-time in-house certified inspectors shall perform pre-tufting fiber testing on tensile strength, elongation, tenacity, denier, shrinkage, and twist i.e., turns per inch, upon receipt of fiber spools from fiber manufacturer.
- J. Primary backing shall be inspected by the manufacturer’s full-time certified in-house inspectors before tufting begins.
- K. The manufacturer’s full-time in-house certified inspectors shall verify “pick count”, yarn density in relation to the backing, to ensure the accurate amount of face yarn per square inch.
- L. The manufacturer’s full-time, in-house, certified inspectors shall perform turf inspections at all levels of production including during the tufting process and at the final stages before the turf is loaded onto the truck for delivery.
- M. The manufacturer shall have its own, in-house laboratory where samples of turf are retained and analyzed, based on standard industry tests, performed by full-time, in-house, certified inspectors.
- N. The manufacturer must have ISO 9001, ISO 14001 and OHSAS 18001 certifications demonstrating its manufacturing efficiency with regards to quality, environment and safety management systems.

1.3 FIELD GROOMER & SWEEPER

- G. Supply field groomer as part of the work.
 - 1. Field Groomer shall include a towing attachment compatible with a field utility vehicle.
 - 2. Field Groomer shall be included.
 - 3. Field Sweeper shall include a towing attachment compatible with a field utility vehicle.
 - 4. Field Sweeper shall be included.

PART 2 - EXECUTION

2.1 EXAMINATION

- G. Verify that all sub-base leveling is complete prior to installation.
- H. Installer shall examine the surface to receive the synthetic turf and accept the sub-base planarity in writing prior to the beginning of installation.
 - 1. Acceptance is dependent upon the Owner’s test results indicating compaction and

Exhibit A:

Project Specifications / Scope of Work

ITB #2023-022 FITZGERALD PARK IMPROVEMENTS – PHASE II

planarity are in compliance with manufacturer's specifications.

2. The surface shall be accepted by Installer as "clean" as installation commences and shall be maintained in that condition throughout the process.
- I. Compaction of the aggregate base shall be 95%, in accordance with ASTM D1557 (Modified Proctor procedure); and the surface tolerance shall not exceed 0-1/4 inch over 10 feet and 0-1/2" from design grade.
- J. Correct conditions detrimental to timely and proper completion of Work.
- K. Do not proceed until unsatisfactory conditions are corrected.
- L. Beginning of installation means acceptance of existing conditions.

2.2 PREPARATION

- G. Prior to the beginning of installation, inspect the sub-base for tolerance to grade.
- H. Sub-base acceptance shall be subject to receipt of test results (by others) for compaction and planarity that sub-base is in compliance with manufacturer's specifications and recommendations.
- I. Dimensions of the field and locations for markings shall be measured by a registered surveyor to verify conformity to the specifications and applicable standards. A record of the finished field as-built measurements shall be made.
- J. When requested by Architect, installed sub-base shall be tested for porosity prior to the installation of the slit-film/monofilament turf. A sub base that drains poorly is an unacceptable substrate

2.3 INSTALLATION - GENERAL

- G. The installation shall be performed in full compliance with approved Shop Drawings.
- H. Only trained technicians, skilled in the installation of athletic caliber synthetic turf systems working under the direct supervision of the approved installer supervisors, shall undertake any cutting, sewing, gluing, shearing, topdressing or brushing operations.
- I. The designated Supervisory personnel on the project must be certified, in writing by the turf manufacturer, as competent in the installation of this material, including sewing seams and proper installation of the Infill mixture.
- J. Designs, markings, layouts, and materials shall conform to all currently applicable National Collegiate Athletic Association rules, NFHS rules, and/or other rules or standards that may apply to this type of synthetic grass installation. Designs, markings and layouts shall first be approved by the Architect or Owner in the form of final shop drawings. All markings will be in full compliance with final shop drawings.

2.4 INSTALLATION

- G. Install at location(s) indicated, to comply with final shop drawings, manufacturers'/installer's instructions.
- H. The Contractor shall strictly adhere to specified procedures. Any variance from these requirements

Exhibit A:**Project Specifications / Scope of Work****ITB #2023-022 FITZGERALD PARK IMPROVEMENTS – PHASE II**

shall be provided in writing, by the manufacturer's on-site representative, and submitted to the Architect and/or Owner, verifying that the changes do not in any way affect the Warranty. Infill materials shall be approved by the manufacturer and installed in accordance with the manufacturer's standard procedures.

- I. Carpet rolls shall be installed directly over the properly prepared aggregate base. Extreme care shall be taken to avoid disturbing the aggregate base, both in regard to compaction and planarity.
 1. Repair and properly compact any disturbed areas of the aggregate base as recommended by manufacturer
- J. Full width rolls shall be laid out across the field.
 1. Turf shall be of sufficient length to permit full cross-field installation from sideline to sideline.
 2. No cross seams will be allowed in the main playing area between the sidelines.
 3. Each roll shall be attached to the next roll utilizing standard state-of-the-art sewing procedures.
 4. When all of the rolls of the playing surface have been installed, the sideline areas shall be installed at right angles to the playing surface.
- K. Artificial turf panel seams shall be sewn along the selvedge edging flap of the turf roll. Seams secured by other means including gluing are unacceptable. Installation shall be 99% sewn.
 1. Minimum gluing will only be permitted to repair problem areas, corner completions, and to cut in any logos or inlaid lines as required by the specifications.
 2. Seams shall be flat, tight, and permanent with no separation or fraying.
 3. In the case of all lines and logos, field fibers must be sheared to the backing (do not cut the backing) and adhered using hot melt adhesives.
- L. Infill Materials:
 1. Infill materials shall be applied in numerous thin lifts. The turf shall be brushed as the mixture is applied. The infill material shall be installed to a depth determined by the manufacturer.
 2. Three-layered infill shall be installed in a systematic order.
 3. Infill materials shall be installed to fill the voids between the fibers and allow the fibers to remain vertical and non-directional. The Infill installation consists of a base layer of sand followed by a mix of sand and cryogenic SBR rubber. A final application of the specifically sized Cooling composite completes the system. The Infill shall be installed to a minimum depth of 1 1/2".
- M. Non-tufted or inlaid lines and markings shall be painted in accordance with turf and paint manufacturers' recommendations. Number of applications will be dependent upon installation and field conditions.
- N. Synthetic turf shall be attached to the perimeter edge detail in accordance with the manufacturer's standard procedures.
- O. Upon completion of installation, the finished field shall be inspected by the installation crew and

Exhibit A:
Project Specifications / Scope of Work
ITB #2023-022 FITZGERALD PARK IMPROVEMENTS – PHASE II

an installation supervisor.

2.5 FIELD MARKINGS

- G. Field markings shall be installed in accordance with approved shop drawings. If football is designated as the primary sport, all five yard lines will be tufted-in.
- H. Balance of sports markings will be inlaid or painted in accordance with the Drawings.
- I. Center field logo shall be inlaid according to artwork indicated on Drawings and in accordance with manufacturer's standard palette of turf colors.
- J. End-zone letters and logos shall be inlaid according to artwork and fonts indicated on the Drawings, and in accordance with manufacturer's standard palette of turf colors.

2.6 ADJUSTMENT AND CLEANING

- G. Do not permit traffic over unprotected surface.
- H. Contractor shall provide the labor, supplies, and equipment as necessary for final cleaning of surfaces and installed items.
- I. All usable remnants of new material shall become the property of the Owner.
- J. The Contractor shall keep the area clean throughout the project and clear of debris.
- K. Surfaces, recesses, enclosures, and related spaces shall be cleaned as necessary to leave the work area in a clean, immaculate condition ready for immediate occupancy and use by the Owner.

2.7 PROTECTION

- G. Protect installation throughout construction process until date of final completion.

Exhibit B:
UNIT PRICE BID PROPOSAL FORM
ITB #2023-022 FITZGERALD PARK IMPROVEMENTS – PHASE II

ITEM NO.	DESCRIPTION	UNIT	ESTIMATE D QUANTITY	BID UNIT PRICE	BID PRICE
1.	Mobilization	LS	1		
2.	Traffic Control	LS	1		
3.	Erosion Control	LS	1		
4.	Demolition	LS	1		
5.	Earthwork	LS	1		
6.	Turf Football Field	LS	1		
7.	Bathroom/Concession Building	LS	1		
8.	Dumpster Pad and Enclosure	LS	1		
9.	Graded Aggregate Base, 6 IN	SY	1520		
10.	Graded Aggregate Base, 8 IN	SY	15220		
11.	Asph Conc 9.5 MM Superpave	TN	1300		
12.	Asph Conc 12.5 MM Superpave	TN	1675		
13.	Tack Coat	GL	1540		
14.	Mill Asph Conc Pavement, 1.5 IN	SY	470		
15.	Concrete Sidewalk, 4 IN	SY	1300		
16.	Concrete Sidewalk, 8 IN	SY	60		
17.	Concrete Header Curb, 6 IN, TP 2	LF	592		
18.	Flush Concrete Header Curb, 6 IN	LF	1910		
19.	Concrete Curb & Gutter, 6 IN X 24 IN, TP 2	LF	5882		
20.	Curb Cut Wheel Chair Ramp, Type B	EA	4		
21.	Curb Cut Wheel Chair Ramp, Type D	EA	5		
22.	Detectable Warning Strips	EA	15		
23.	Precast Wheel Stop	EA	203		
24.	Retaining Wall Concrete Swale	CY	18		
25.	Retaining Wall #1	SF	592		
26.	Field #2 Retaining Wall #1	SF	431		
27.	Field #2 Retaining Wall #2	SF	135		
28.	Galv Steel Pipe Handrail	LF	140		
29.	Stop Sign	EA	4		
30.	Do Not Enter Sign	EA	3		
31.	Handicap Parking Sign	EA	10		
32.	Solid Traffic Stripe, 5 IN, White	LF	4520		
33.	Solid Traffic Stripe, 5 IN, Yellow	LF	120		
34.	Solid Traffic Stripe, 5 IN, Colored	LF	630		
35.	Skip Traffic Stripe, 5 IN, Colored	LF	630		
36.	Solid Traffic Stripe, 8 IN, White	LF	662		
37.	Solid Traffic Stripe, 24 IN, White	LF	55		
38.	Traffic Stripe, White	SY	110		
39.	Pavement Marking, Handicap Symbol	EA	10		
40.	Pavement Marking, Arrow, Type 1, White	EA	9		
41.	Pavement Marking, Arrow, Type 2, White	EA	2		

**Exhibit B:
UNIT PRICE BID PROPOSAL FORM
ITB #2023-022 FITZGERALD PARK IMPROVEMENTS – PHASE II**

42.	Pavement Marking, Arrow, Type 3, White	EA	1		
43.	Pavement Marking, Arrow, Type 5, White	EA	1		
44.	Storm Drain Pipe, PVC, 8 IN	LF	44		
45.	Storm Drain Pipe, RCP, 15 IN	LF	203		
46.	Storm Drain Pipe, RCP, 18 IN	LF	960		
47.	Storm Drain Pipe, RCP, 24 IN	LF	740		
48.	Storm Drain Pipe, HDPE, 15 IN	LF	340		
49.	Storm Drain Pipe, HDPE, 30 IN	LF	75		
50.	Flared End Section, RCP, 18 IN	EA	2		
51.	Flared End Section, RCP, 24 IN	EA	1		
52.	Flared End Section, RCP, 30 IN	EA	1		
53.	STN Dumped Rip Rap, TP 3, 18 IN	SY	84		
54.	Single Wing Catch Basin, 1033D	EA	5		
55.	Double Wing Catch Basin, 1034D	EA	3		
56.	Combination Drop Inlet	EA	8		
57.	GDOT 1019B Grate Inlet	EA	4		
58.	Manhole	EA	6		
59.	4' Weir Inlet	EA	2		
60.	5' Weir Inlet	EA	1		
61.	Ditch Drop Inlet - GDOT D-4	EA	1		
62.	Nyloplast 18 IN Pedestrian Grate Inlet	EA	1		
63.	Rip Rap Ditch	SY	115		
64.	Plastic Filter Fabric	SY	200		
65.	Proprietary System 1	LS	1		
66.	Proprietary System 2	LS	1		
67.	Proprietary System 3	LS	1		
68.	Adjust Manhole to Grade	EA	7		
69.	Sewer Lateral	EA	1		
70.	Water Service Lateral	EA	1		
71.	Quercus Nutali, 'Nuttall Oak'	EA	18		
72.	Taxodium Distichum, 'Bald Cypress'	EA	15		
73.	Cercis Canadensis, 'Forest Pansy Redbud'	EA	36		
74.	Amelanchier x grandiflora, 'Autumn Brilliance Serviceberry'	EA	13		
75.	Double Hammered Hardwood Mulch	SF	9500		
76.	TifTuf Bermuda Sod	SF	7200		
77.					
78.					
79.					
80.					
TOTAL BID AMOUNT:					

*In case of discrepancy between the unit price and the total price on the completed Bid Schedule, the unit price will prevail, and the total price will be corrected

**Exhibit B:
UNIT PRICE BID PROPOSAL FORM
ITB #2023-022 FITZGERALD PARK IMPROVEMENTS – PHASE II**

Proposal Price Certification

In compliance with the attached specification, the undersigned understands the City’s minimum scope requirements.

The undersigned offers and agrees that if this proposal is accepted by the Mayor and City Council within one hundred twenty (120) days of the date of proposal opening, that the undersigned will furnish any or all of the deliverables and additional services offered, at the quoted price, to the designated point(s) within the time specified.

COMPANY _____

ADDRESS _____

AUTHORIZED SIGNATURE _____

PRINT / TYPE NAME _____

CONTACT’S PHONE NUMBER _____

CONTACT’S EMAIL ADDRESS _____

Request for Taxpayer Identification Number and Certification

**Give Form to the
requester. Do not
send to the IRS.**

▶ Go to www.irs.gov/FormW9 for instructions and the latest information.

Print or type. See Specific Instructions on page 3.	<p>1 Name (as shown on your income tax return). Name is required on this line; do not leave this line blank.</p> <hr/> <p>2 Business name/disregarded entity name, if different from above</p> <hr/> <p>3 Check appropriate box for federal tax classification of the person whose name is entered on line 1. Check only one of the following seven boxes.</p> <p><input type="checkbox"/> Individual/sole proprietor or single-member LLC <input type="checkbox"/> C Corporation <input type="checkbox"/> S Corporation <input type="checkbox"/> Partnership <input type="checkbox"/> Trust/estate</p> <p><input type="checkbox"/> Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=Partnership) ▶ _____</p> <p>Note: Check the appropriate box in the line above for the tax classification of the single-member owner. Do not check LLC if the LLC is classified as a single-member LLC that is disregarded from the owner unless the owner of the LLC is another LLC that is not disregarded from the owner for U.S. federal tax purposes. Otherwise, a single-member LLC that is disregarded from the owner should check the appropriate box for the tax classification of its owner.</p> <p><input type="checkbox"/> Other (see instructions) ▶ _____</p>		<p>4 Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3):</p> <p>Exempt payee code (if any) _____</p> <p>Exemption from FATCA reporting code (if any) _____</p> <p><small>(Applies to accounts maintained outside the U.S.)</small></p>
	<p>5 Address (number, street, and apt. or suite no.) See instructions.</p> <hr/> <p>6 City, state, and ZIP code</p> <hr/> <p>7 List account number(s) here (optional)</p>	<p>Requester's name and address (optional)</p> <hr/> <hr/>	

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on line 1 to avoid backup withholding. For individuals, this is generally your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the instructions for Part I, later. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN*, later.

Note: If the account is in more than one name, see the instructions for line 1. Also see *What Name and Number To Give the Requester* for guidelines on whose number to enter.

Social security number					
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%; border: 1px solid black; height: 20px;"></td> <td style="width: 5%; text-align: center;">-</td> <td style="width: 25%; border: 1px solid black; height: 20px;"></td> <td style="width: 5%; text-align: center;">-</td> <td style="width: 40%; border: 1px solid black; height: 20px;"></td> </tr> </table>		-		-	
	-		-		
OR					
Employer identification number					
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%; border: 1px solid black; height: 20px;"></td> <td style="width: 5%; text-align: center;">-</td> <td style="width: 70%; border: 1px solid black; height: 20px;"></td> </tr> </table>		-			
	-				

Part II Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me); and
2. I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding; and
3. I am a U.S. citizen or other U.S. person (defined below); and
4. The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions for Part II, later.

Sign Here

Signature of
U.S. person ▶

Date ▶

General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Future developments. For the latest information about developments related to Form W-9 and its instructions, such as legislation enacted after they were published, go to www.irs.gov/FormW9.

Purpose of Form

An individual or entity (Form W-9 requester) who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) which may be your social security number (SSN), individual taxpayer identification number (ITIN), adoption taxpayer identification number (ATIN), or employer identification number (EIN), to report on an information return the amount paid to you, or other amount reportable on an information return. Examples of information returns include, but are not limited to, the following.

- Form 1099-INT (interest earned or paid)

- Form 1099-DIV (dividends, including those from stocks or mutual funds)
 - Form 1099-MISC (various types of income, prizes, awards, or gross proceeds)
 - Form 1099-B (stock or mutual fund sales and certain other transactions by brokers)
 - Form 1099-S (proceeds from real estate transactions)
 - Form 1099-K (merchant card and third party network transactions)
 - Form 1098 (home mortgage interest), 1098-E (student loan interest), 1098-T (tuition)
 - Form 1099-C (canceled debt)
 - Form 1099-A (acquisition or abandonment of secured property)
- Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN.

If you do not return Form W-9 to the requester with a TIN, you might be subject to backup withholding. See *What is backup withholding*, later.



GEORGIA SECURITY AND IMMIGRATION COMPLIANCE ACT AFFIDAVIT

GEORGIA E-Verify and Public Contracts: The Georgia E-Verify law requires contractors and all sub-contractors on Georgia public contract (contracts with a government agency) for the physical performance of services over \$2,499 in value to enroll in E-Verify, regardless of the number of employees.

Contractor Name:	
Subcontractor's (Your) Name	
Solicitation/Bid number or Project Description:	

By executing this affidavit, the undersigned subcontractor verifies its compliance with O.C.G.A. § 13-10-91, stating affirmatively that the individual, entity or corporation which is engaged in the physical performance of services under a contract on behalf of the City of Tucker, Georgia has registered with, is authorized to use and uses the federal work authorization program commonly known as E-Verify, or any subsequent replacement program, in accordance with the applicable provisions and deadlines established in O.C.G.A. § 13-10-91.

Furthermore, the undersigned subcontractor will continue to use the federal work authorization program throughout the contract period as required by O.C.G.A. § 13-10-91(b) and the undersigned subcontractor will contract for the physical performance of services in satisfaction of such contract only with sub-subcontractors who present and affidavit to the contractor with the information required by O.C.G.A. § 13-10-91(b). Subcontractor hereby attests that its federal work authorization user identification number and date of authorization are as follows:

Federal Work Authorization User Identification Number
(EEV/E-Verify Company Identification Number)

Date of Authorization

Name of Subcontractor

I hereby declare under penalty of perjury that the foregoing is true and correct

Printed Name (of Authorized Officer or Agent of Contractor)

Title (of Authorized Officer or Agent of Contractor)

Signature (of Authorized Officer or Agent)

Date Signed

SUBSCRIBED AND SWORN BEFORE ME ON THIS THE

____ DAY OF _____, 20____

Notary Public

[NOTARY SEAL]

My Commission Expires: _____



GEORGIA SECURITY AND IMMIGRATION COMPLIANCE ACT AFFIDAVIT

GEORGIA E-Verify and Public Contracts: The Georgia E-Verify law requires contractors and all sub-contractors on Georgia public contract (contracts with a government agency) for the physical performance of services over \$2,499 in value to enroll in E-Verify, regardless of the number of employees.

Contractor Name:	
Solicitation/Bid number or Project Description:	

By executing this affidavit, the undersigned contractor verifies its compliance with O.C.G.A. § 13-10-91, stating affirmatively that the individual, entity or corporation which is engaged in the physical performance of services under a contract on behalf of the City of Tucker, Georgia has registered with, is authorized to use and uses the federal work authorization program commonly known as E-Verify, or any subsequent replacement program, in accordance with the applicable provisions and deadlines established in O.C.G.A. § 13-10-91.

Furthermore, the undersigned contractor will continue to use the federal work authorization program throughout the contract period as required by O.C.G.A. § 13-10-91(b) and the undersigned contractor will contract for the physical performance of services in satisfaction of such contract only with subcontractors who present and affidavit to the contractor with the information required by O.C.G.A. § 13-10-91(b). Contractor hereby attests that its federal work authorization user identification number and date of authorization are as follows:

Federal Work Authorization User Identification Number
(EEV/E-Verify Company Identification Number)

Date of Authorization

Name of Contractor

I hereby declare under penalty of perjury that the foregoing is true and correct

Printed Name (of Authorized Officer or Agent of Contractor)

Title (of Authorized Officer or Agent of Contractor)

Signature (of Authorized Officer or Agent)

Date Signed

SUBSCRIBED AND SWORN BEFORE ME ON THIS THE

____ DAY OF _____, 20____

[NOTARY SEAL]

Notary Public

My Commission Expires: _____

Contact Information Form

Please fill out this sheet with the appropriate contact information for your company.

Full Legal Name of Company: _____

Contractor Information:

Primary Contact Person: _____

Title: _____ Telephone Number: _____

Secondary Contact Person: _____

Title: _____ Telephone Number: _____

Address: _____

City / State / Zip: _____

Mailing Address (If different than above): _____

City / State / Zip: _____

E-mail Address: _____

Federal Employee ID Number (FEIN): _____

BID BOND

KNOW ALL MEN BY THESE PRESENTS, THAT

(Name of Contractor) _____ at

(Address of Contractor) _____

(Corporation, Partnership and / or Individual) hereinafter called Principal, and

(Name of Surety) _____

(Address of Surety) _____

A corporation of the State of _____, and a surety authorized by law to do business in the State of Georgia, hereinafter called Surety, are held, and firmly bound unto

(Name of Oblige) City of Tucker Georgia

(Address of Oblige) 1975 Lakeside Parkway, Suite 350, Tucker, Georgia 30084

Hereinafter referred to as Oblige, in the penal sum of _____ Dollars (\$ _____) in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

WHEREAS, the Principal is about to submit, or has submitted, to the City of Tucker, Georgia, a proposal for furnishing materials, labor, and equipment for:

**ITB # 2023-022
FITZGERALD PARK IMPROVEMENTS – PHASE II**

WHEREAS, the Principal desires to file this Bond in accordance with law in lieu of a certified Bidder's check otherwise required to accompany this Proposal.

NOW, THEREFORE, the conditions of this obligation are such that if the bid is accepted, the Principal shall within ten days after receipt of notification of the acceptance execute a Contract in accordance with the Bid and upon the terms, conditions, and prices set forth in the form and manner required by the City of Tucker, Georgia, and execute a sufficient and satisfactory Performance Bond and Payment Bond payable to the City of Tucker, Georgia, each in an amount of 100% of the total Contract Price, in form and with security satisfactory to said the City of Tucker, Georgia, and otherwise, to be and remain in full force and virtue in law; and the Surety shall, upon failure of the Principal to comply with any or all of the foregoing requirements within the time specified above, immediately pay to the City of Tucker, Georgia,

upon demand, the amount hereof in good and lawful money of the United States of America, not as a penalty, but as liquidated damages.

PROVIDED, FURTHER, that Principal and Surety agree and represent that this bond is executed pursuant, to and in accordance with the applicable provisions of the Official Code of Georgia Annotated, as Amended, including, but not limited to, O.C.G.A. SS 13-10-1, et. Seg. And SS 36- 86-101, et. Seg. And is intended to be and shall be constructed as a bond in compliance with the requirements thereof.

Signed, sealed, and dated this _____ day of _____ A.D., 20 ____ .

ATTEST:

(Principal Secretary)

(Principal)

(SEAL)

BY: _____

(Witness to Principal)

(Address)

(Address)

(Surety)

ATTEST:

BY: _____
(Attorney-in-Fact) and Resident Agent

(Attorney-in-Fact)

(SEAL)

(Address)

(Witness as to Surety)

Construction Drawings for the Fitzgerald Field Park Improvements Phase Two

4877 Lawrenceville Hwy
Tucker, GA
May 30, 2023

OWNED BY:
City of Tucker
4898 Lavista Rd.
Tucker, GA 30084
(470) 273-3076
Contacts: Rip Robertson

DEVELOPED BY:
Keck & Wood, Inc.
3090 Premier Parkway, Suite 200
Duluth, GA 30097
(678) 417-4025
Contacts: Adam Shelton

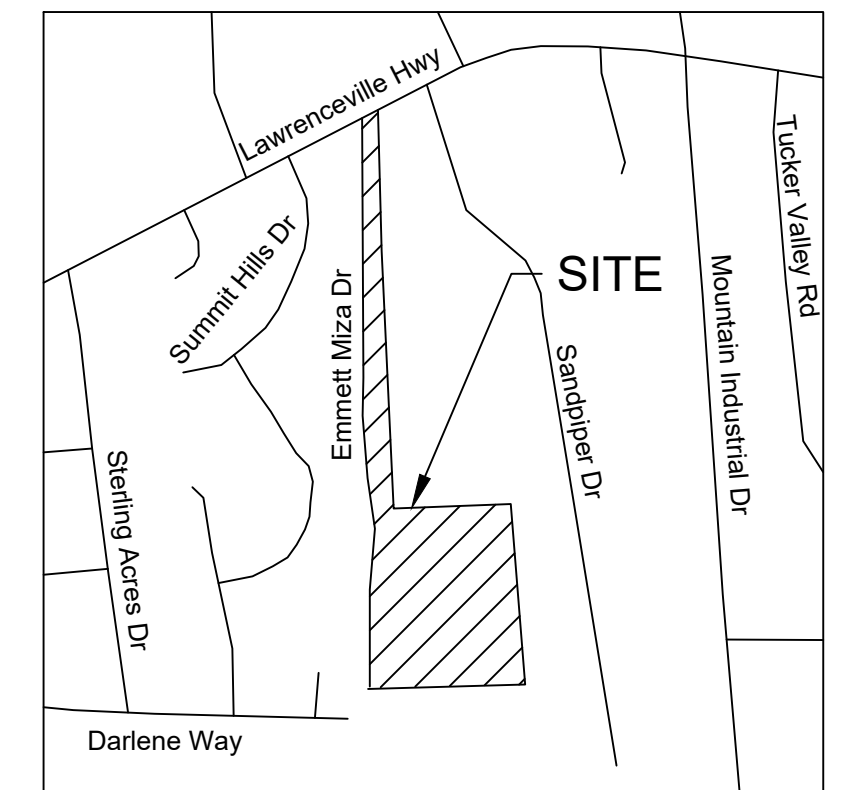
UTILITY PROVIDERS:

WATER/SEWER/ELECTRIC
DeKalb County Water OPS
1580 Roadhaven Dr.
Stone Mountain, GA 30083
(770) 621-7200

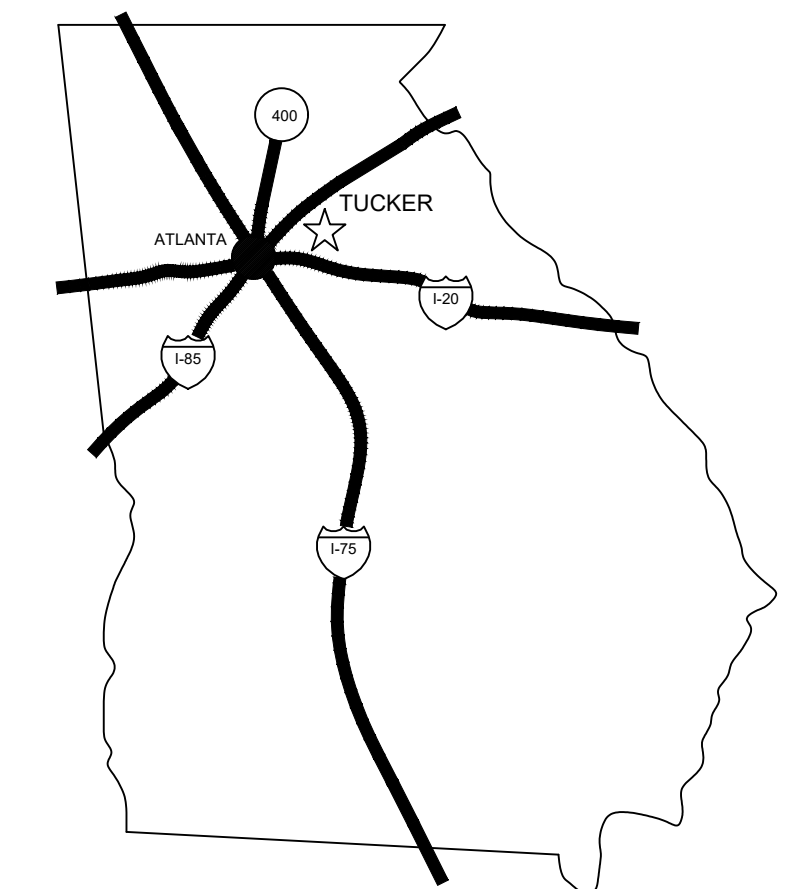
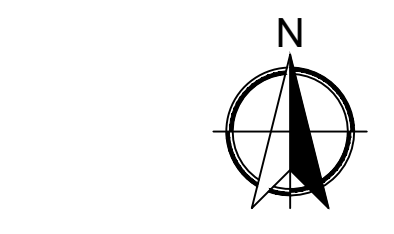
CABLE/INTERNET
Xfinity by Comcast
1575 Church St. Suite 230
Decatur, GA 30033
(800) 934-6489

ELECTRIC
Georgia Power
1697 Montreal Cir.
Tucker, GA 30084
(888) 660-5890

TELEPHONE
Comcast
1575 Church St. Suite 230
Decatur, Ga 30033
(800) 934-6489



LOCATION MAP
SCALE: 1 = 1500'



AREA MAP
N.T.S.

SITE PLANS

SHEET NUMBER	SHEET TITLE
C0.0	COVER SHEET
C0.1	GENERAL NOTES
C1.0	EXISTING CONDITIONS PLAN
C2.0	DEMOLITION PLAN
C3.0	SITE PLAN
C3.1	DIMENSION PLAN
C4.0	OVERALL GRADING PLAN
C4.1	GRADING PLAN - SPOT GRADES
C4.2	GRADING PLAN - SPOT GRADES
C4.3	GRADING PLAN - SPOT GRADES
C4.4	GRADING PLAN - SPOT GRADES
C4.5	GRADING PLAN - SPOT GRADES
C4.6	RETAINING WALL PLAN AND PROFILE
C4.7	RETAINING WALL PLAN AND PROFILE
C4.8	RETAINING WALL PLAN AND PROFILE
C5.0	DRIVEWAY PROFILE
C5.1	DRIVEWAY PROFILE
C5.2	DRIVEWAY PROFILE
C5.3	DRIVEWAY PROFILE
C6.0	STORM SEWER PLAN
C6.1	STORM SEWER SYSTEM PROFILE
C6.2	STORM SEWER SYSTEM PROFILE
C6.3	STORM SEWER SYSTEM PROFILE
C6.4	STORM SEWER SYSTEM PROFILE
C6.5	STORM SEWER SYSTEM PROFILE
C7.0	UTILITY PLAN
C8.0	STRIPING PLAN
D1.0	CONSTRUCTION DETAILS
D2.0	CONSTRUCTION DETAILS
D3.0	CONSTRUCTION DETAILS
D4.0	CONSTRUCTION DETAILS
D5.0	CONSTRUCTION DETAILS
D6.0	CONSTRUCTION DETAILS
D7.0	CONSTRUCTION DETAILS
D8.0	CONSTRUCTION DETAILS
D9.0	CONSTRUCTION DETAILS
D10.0	CONSTRUCTION DETAILS
D11.0	CONSTRUCTION DETAILS
D12.0	CONSTRUCTION DETAILS
EC0.1	ESPCP NOTES
EC0.2	ESPCP NOTES
EC0.3	ESPCP LEGEND
EC1.0	ESPCP - PHASE 1
EC1.1	ESPCP - PHASE 2
EC1.2	ESPCP - PHASE 3
EC2.0	ESPCP CHECKLIST
EC3.0	ESPCP DETAILS
EC3.1	ESPCP DETAILS
L1.0	OVERALL LANDSCAPE PLAN
L1.1	LANDSCAPE PLAN
L1.2	LANDSCAPE PLAN
L2.0	LANDSCAPE DETAILS



NO.	DATE	REVISION

Fitzgerald Park Improvements - Phase 2
4877 Lawrenceville Hwy
Tucker, Georgia
COVER SHEET

THIS BAR IS 1 INCH LONG PLOTTED FULL SCALE

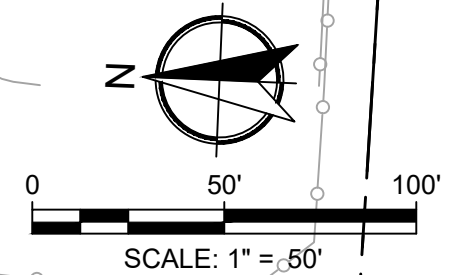
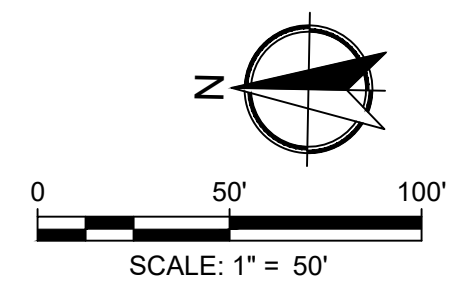
Project Manager:	CAS
Drawn By:	BAF
Checked By:	CAS
Date:	05/30/2023
Scale:	As Shown

Project No.: 200147
Drawing No.: C0.0



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NO.	DATE	REVISION

Fitzgerald Park Improvements - Phase 2
4877 Lawrenceville Hwy
Tucker, Georgia

EXISTING CONDITIONS PLAN

THIS BAR IS
1 INCH LONG
PLOTTED FULL SCALE

Project Manager:
CAS

Drawn By: BAF Checked By: CAS

Date: 05/30/2023

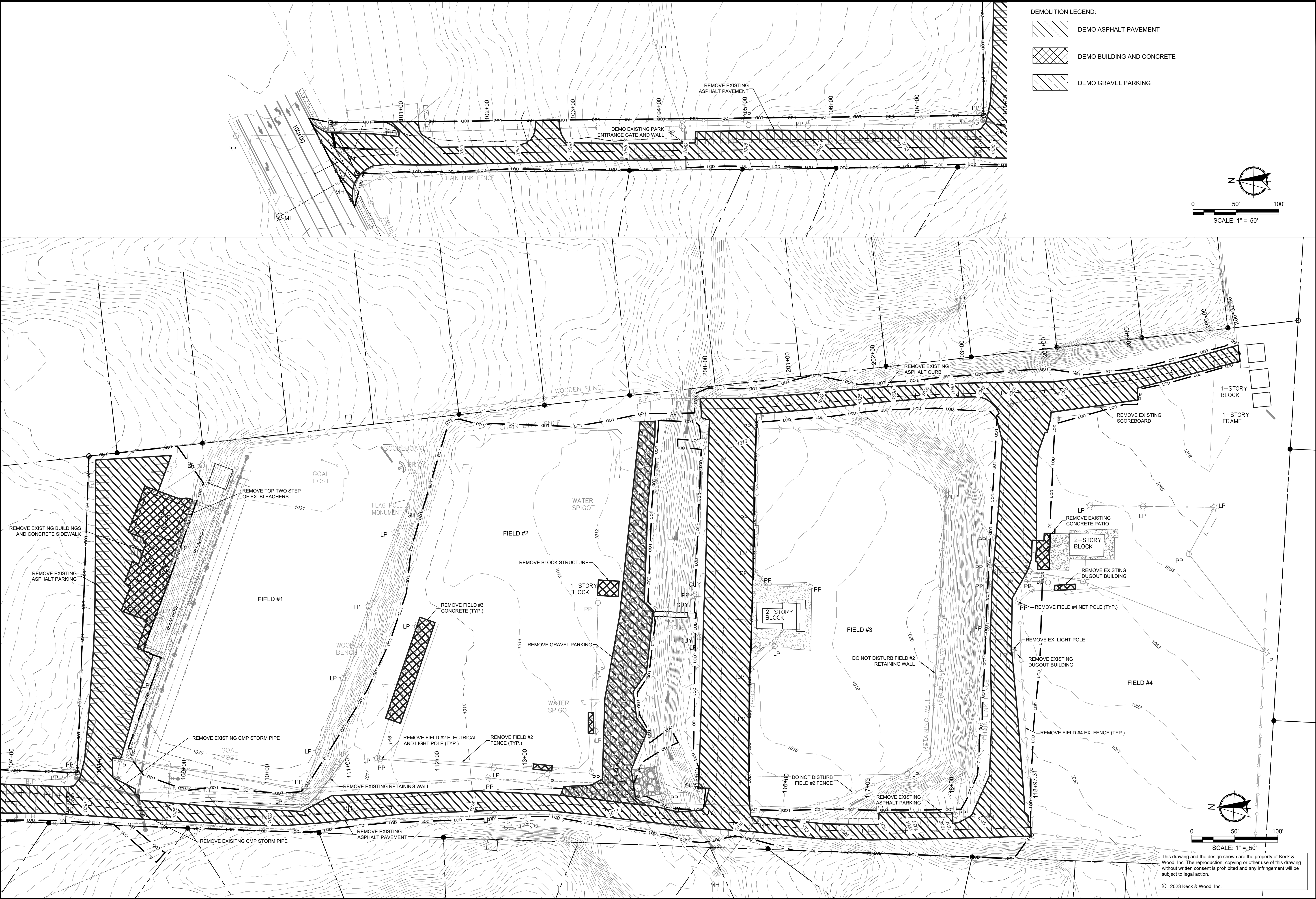
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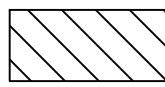


Project No.:
200147

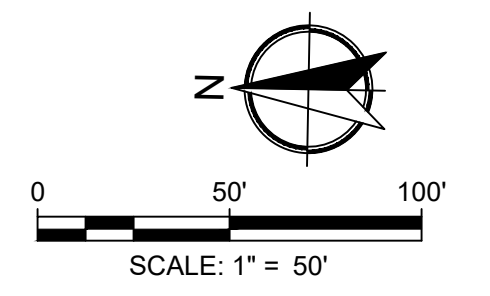
Drawing No.:
C1.0

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- DEMOLITION LEGEND:
-  DEMO ASPHALT PAVEMENT
 -  DEMO BUILDING AND CONCRETE
 -  DEMO GRAVEL PARKING



NO.	DATE	REVISION

Fitzgerald Park Improvements - Phase 2
 4877 Lawrenceville Hwy
 Tucker, Georgia
DEMOLITION PLAN

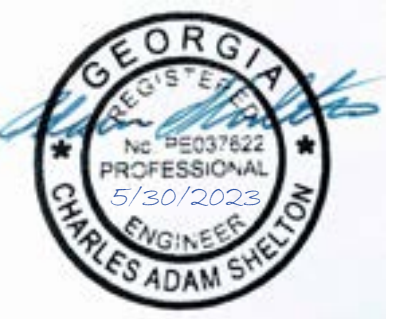
THIS BAR IS
 1 INCH LONG
 PLOTTED FULL SCALE

Project Manager:
 CAS
 Drawn By: BAF Checked By: CAS
 Date: 05/30/2023
 Scale: As Shown

Project No.:
200147
 Drawing No.:
C2.0

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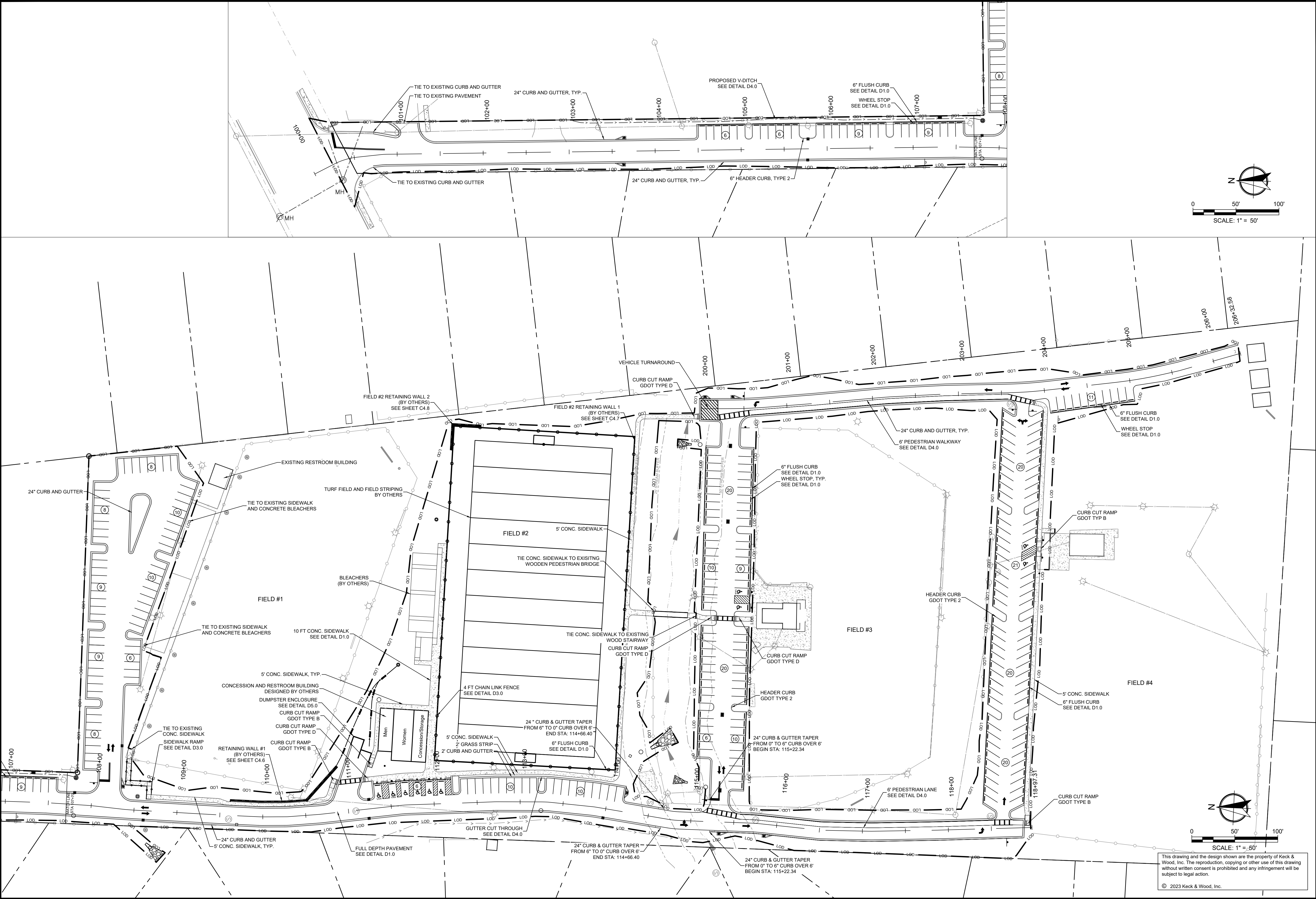
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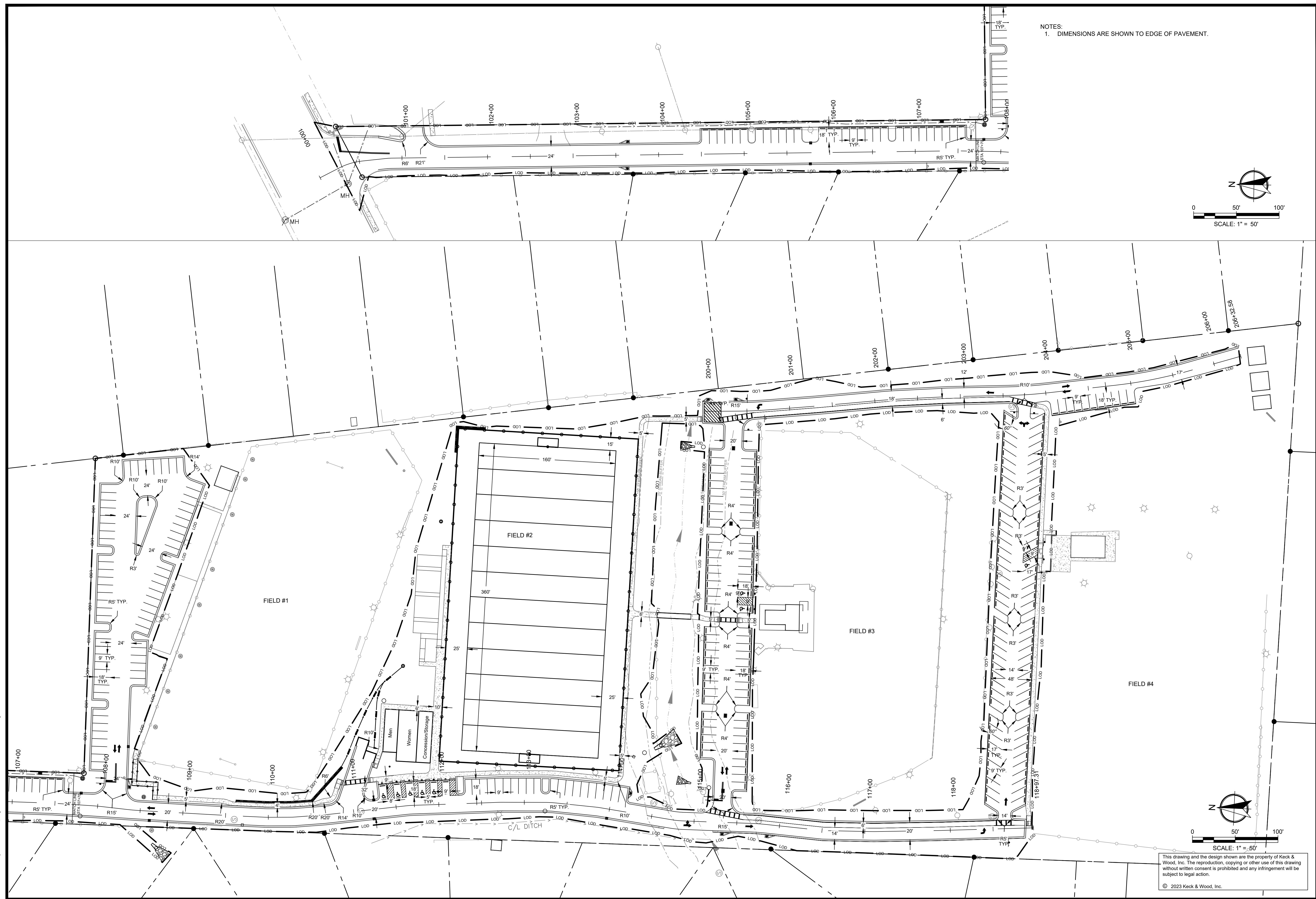
Fitzgerald Park Improvements - Phase 2
 4877 Lawrenceville Hwy
 Tucker, Georgia
SITE PLAN

THIS BAR IS 1 INCH LONG PLOTTED FULL SCALE	
Project Manager: CAS	Checked By: CAS
Drawn By: BAF	Date: 05/30/2023
Scale: As Shown	
Project No.: 200147	
Drawing No.: C3.0	

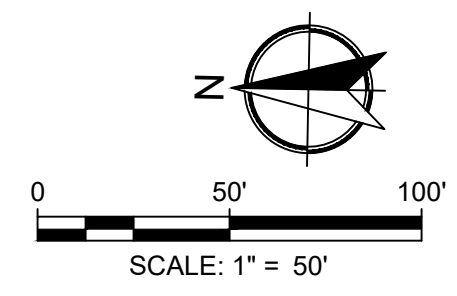


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NOTES:
1. DIMENSIONS ARE SHOWN TO EDGE OF PAVEMENT.



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Fitzgerald Park Improvements - Phase 2
4877 Lawrenceville Hwy
 Tucker, Georgia
DIMENSION PLAN

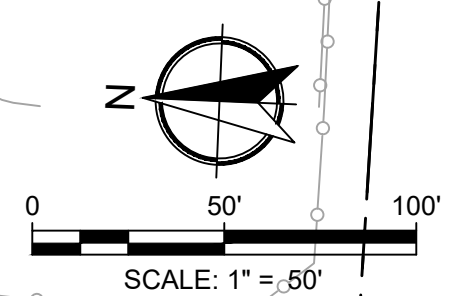
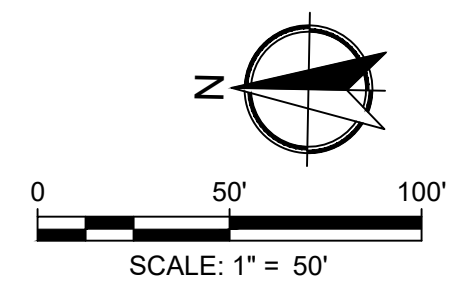
THIS BAR IS
1 INCH LONG
PLOTTED FULL SCALE

Project Manager:
CAS
 Drawn By: BAF Checked By: CAS
 Date: 05/30/2023
 Scale: As Shown

Project No.:
200147
 Drawing No.:
C3.1

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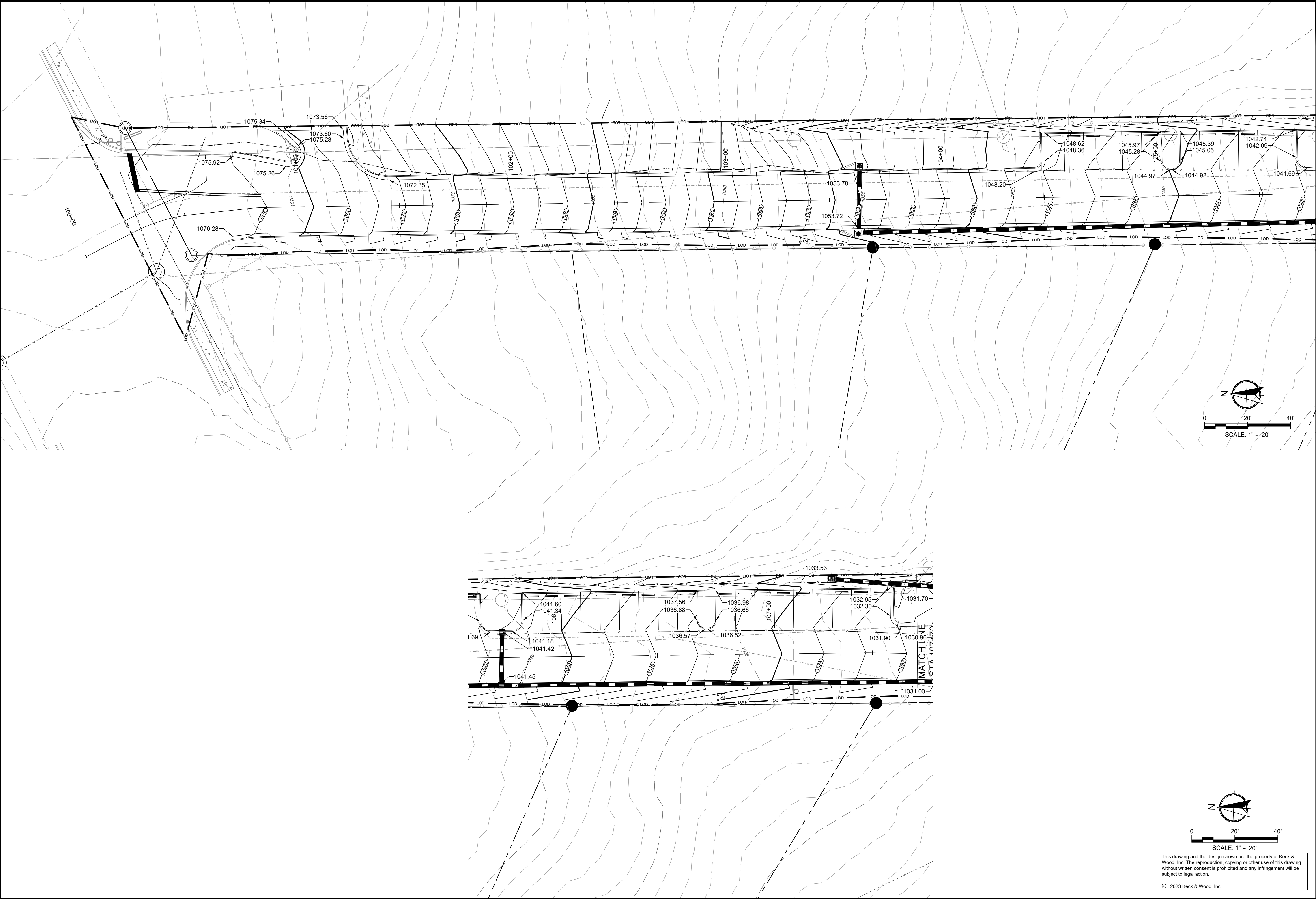
NO.	DATE	REVISION

Fitzgerald Park Improvements - Phase 2
 4877 Lawrenceville Hwy
 Tucker, Georgia
OVERALL GRADING PLAN

THIS BAR IS
 1 INCH LONG
 PLOTTED FULL SCALE

Project Manager:
 CAS
 Drawn By: BAF Checked By: CAS
 Date: 05/30/2023
 Scale: As Shown

Project No.:
200147
 Drawing No.:
C4.0



NO.	DATE	REVISION

Fitzgerald Park Improvements - Phase 2
 4877 Lawrenceville Hwy
 Tucker, Georgia

GRADING PLAN - SPOT GRADES

THIS BAR IS 1 INCH LONG PLOTTED FULL SCALE	
Project Manager:	CAS
Drawn By:	BAF
Checked By:	CAS
Date:	05/30/2023
Scale:	As Shown
Project No.:	200147
Drawing No.:	C4.1

SCALE: 1" = 20'

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NO.	DATE	REVISION

Fitzgerald Park Improvements - Phase 2
 4877 Lawrenceville Hwy
 Tucker, Georgia

GRADING PLAN - SPOT GRADES

THIS BAR IS
 1 INCH LONG
 PLOTTED FULL SCALE

Project Manager:
 CAS

Drawn By: Checked By:
 BAF CAS

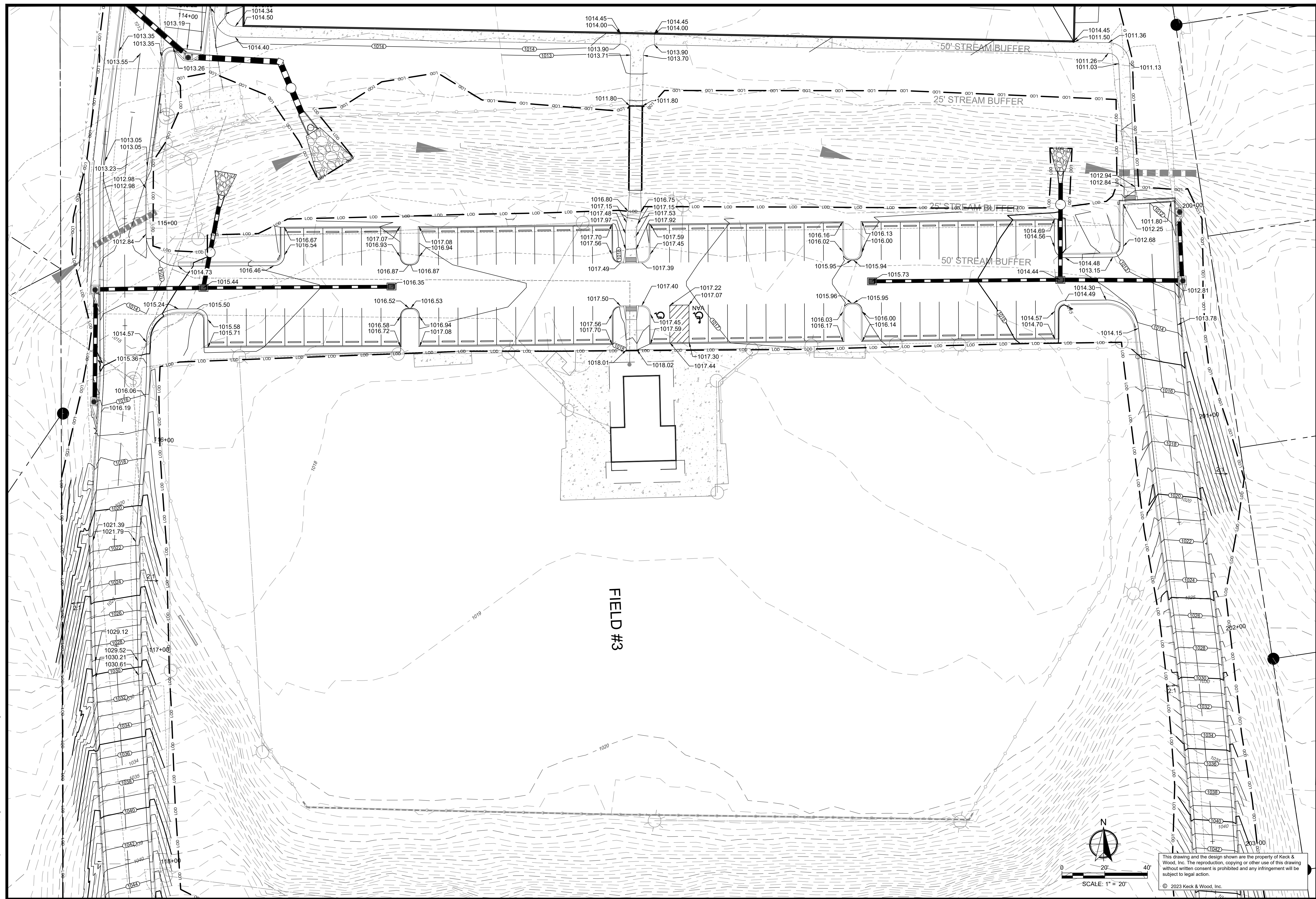
Date: 05/30/2023

Scale: As Shown

Project No.:
200147

Drawing No.:
C4.3

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Fitzgerald Park Improvements - Phase 2
4877 Lawrenceville Hwy
 Tucker, Georgia

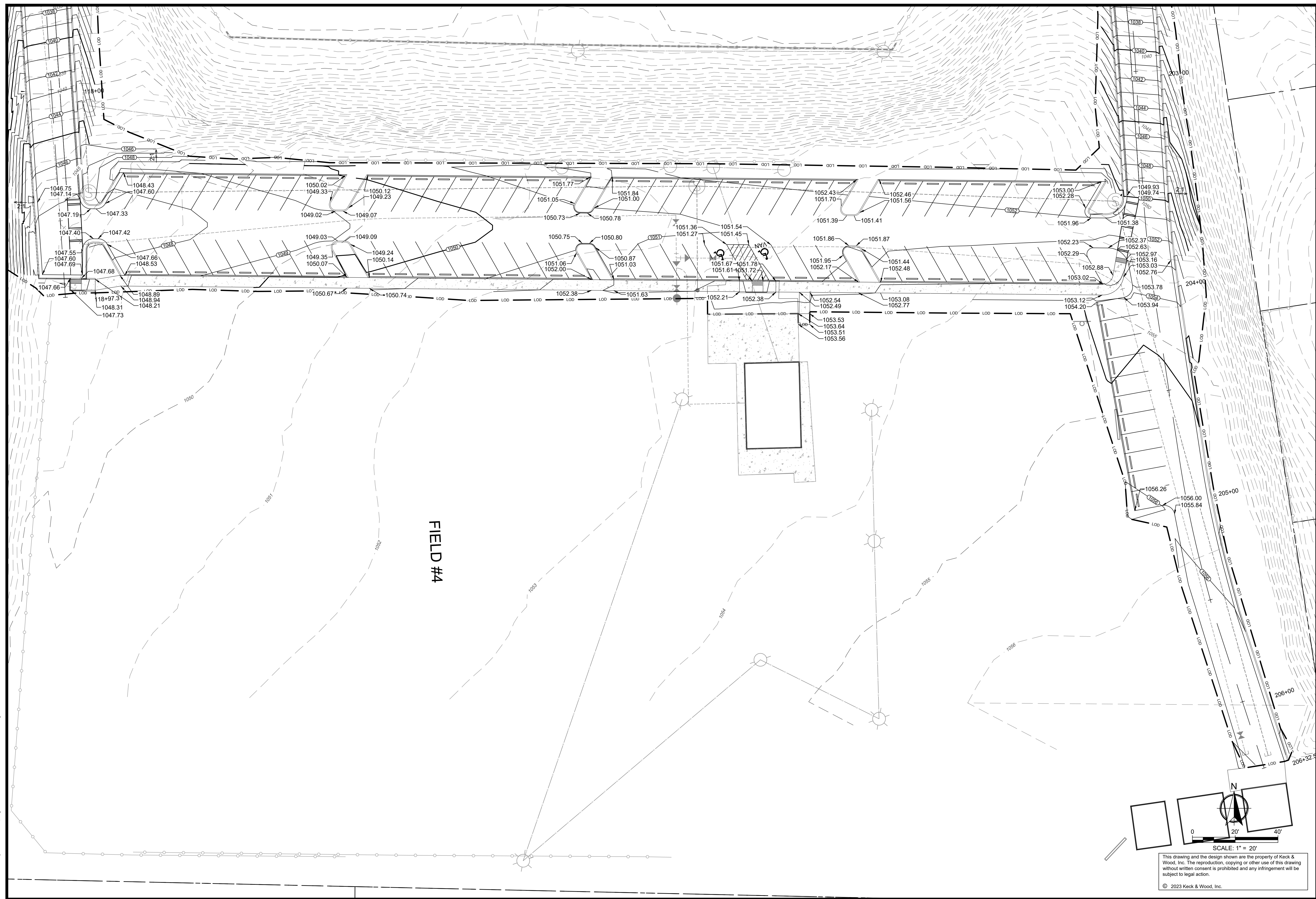
GRADING PLAN - SPOT GRADES

THIS BAR IS
 1 INCH LONG
 PLOTTED FULL SCALE

Project Manager: CAS	Checked By: CAS
Drawn By: BAF	Date: 05/30/2023
Scale: As Shown	Project No.: 200147
Drawing No.: C4.4	

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Fitzgerald Park Improvements - Phase 2
4877 Lawrenceville Hwy
 Tucker, Georgia

GRADING PLAN - SPOT GRADES

THIS BAR IS
 1 INCH LONG
 PLOTTED FULL SCALE

Project Manager:
 CAS

Drawn By: Checked By:
 BAF CAS

Date: 05/30/2023

Scale: As Shown

Project No.:
200147

Drawing No.:
C4.5

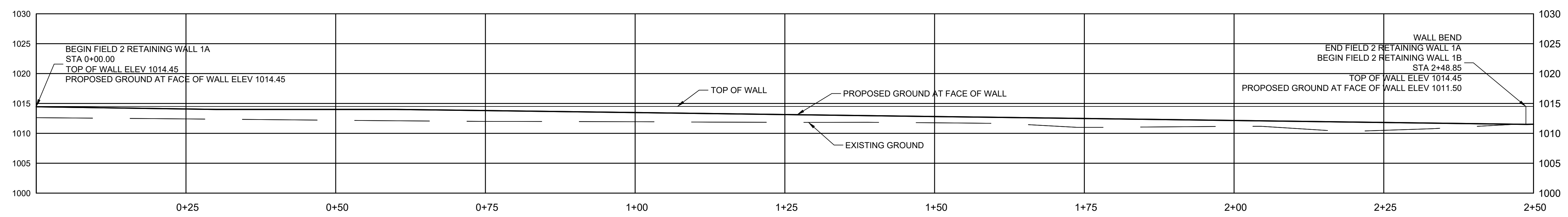
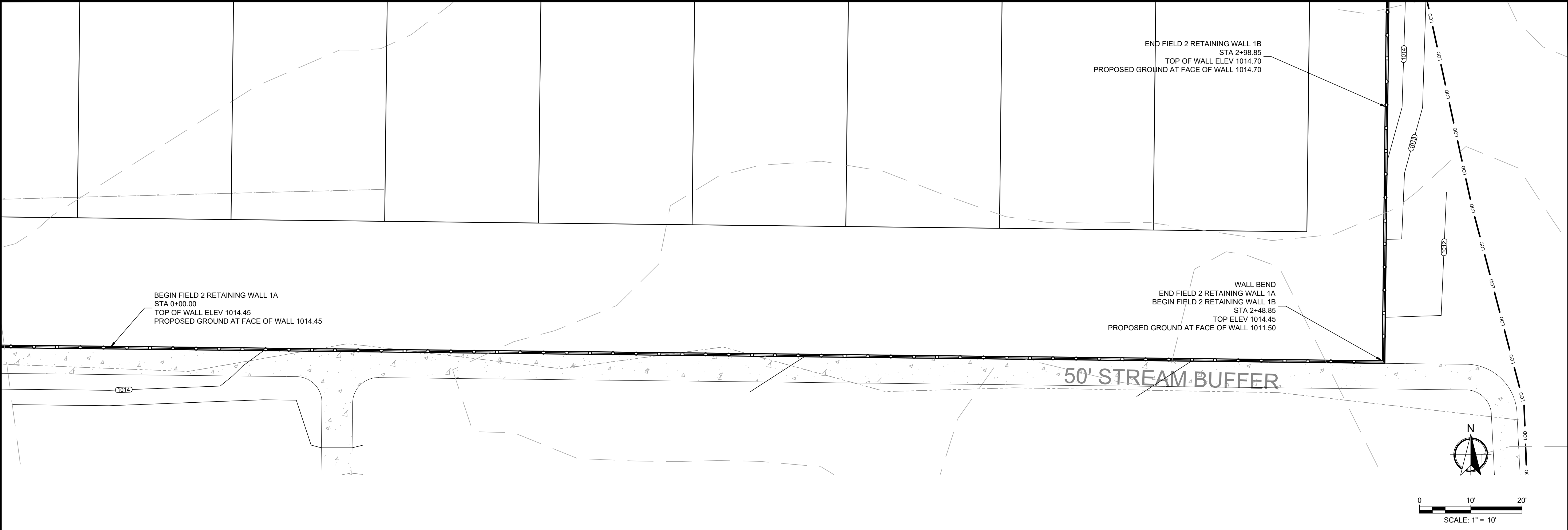
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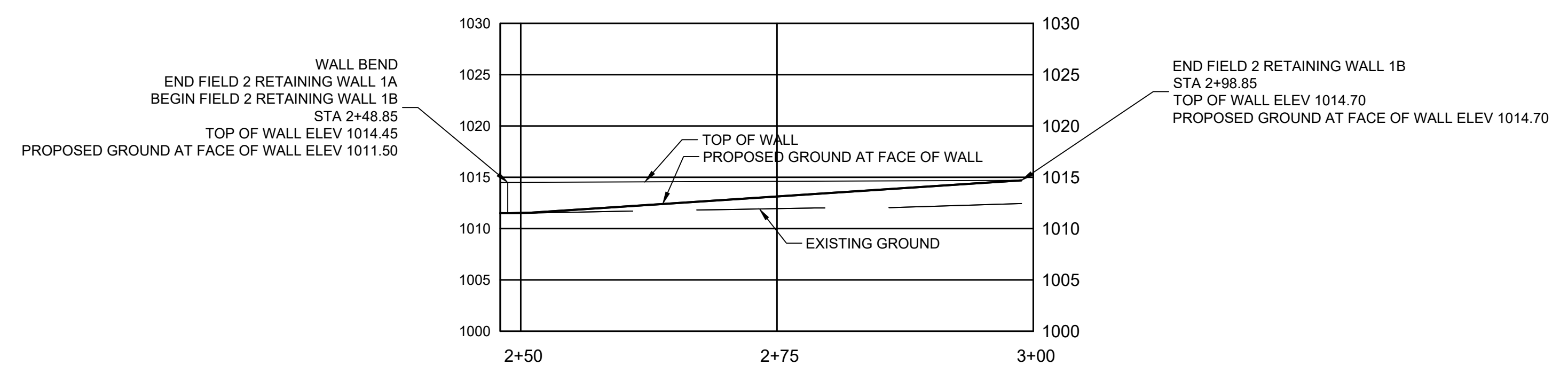
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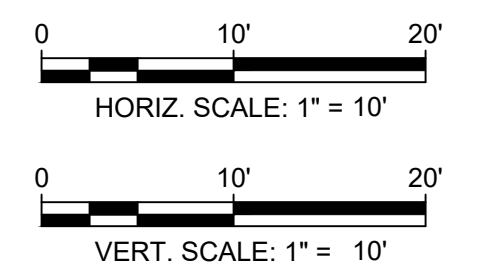


FIELD 2 RETAINING WALL 1A



FIELD 2 RETAINING WALL 1B

NOTES:
1. RETAINING WALL PLAN AND PROFILE PROVIDED FOR REFERENCE ONLY. RETAINING WALL TO BE DESIGNED BY OTHERS.



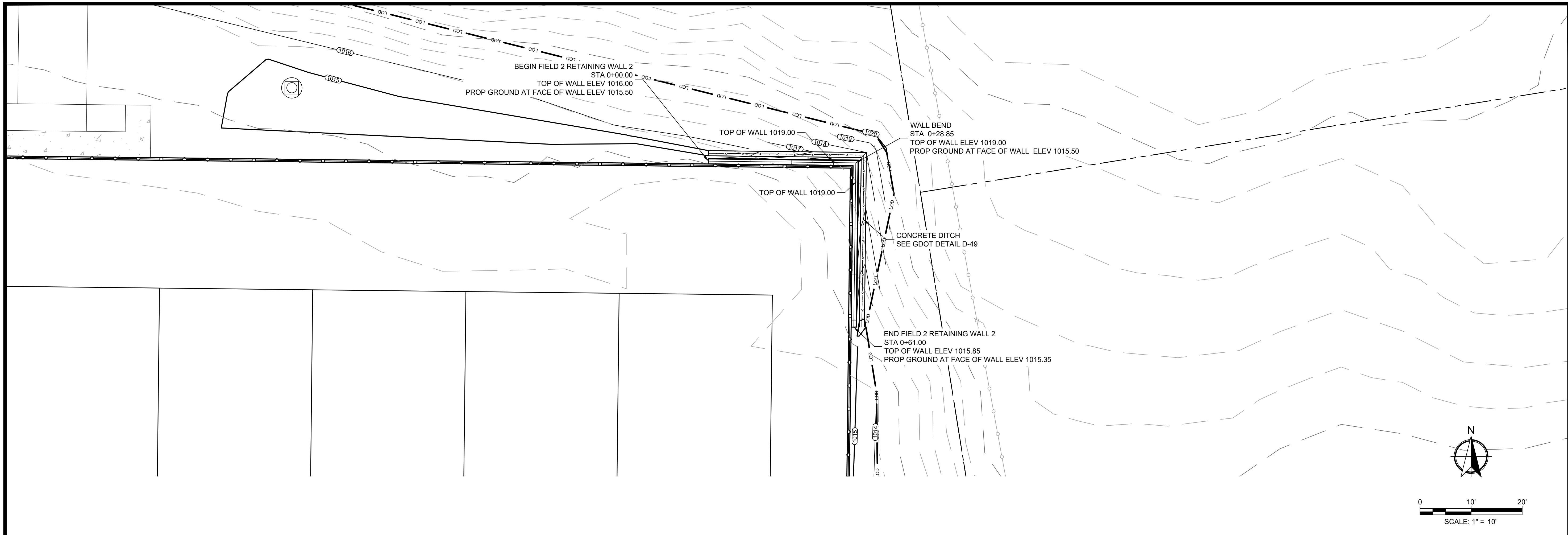
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Fitzgerald Park Improvements - Phase 2
4877 Lawrenceville Hwy
Tucker, Georgia
RETAINING WALL PLAN AND PROFILE

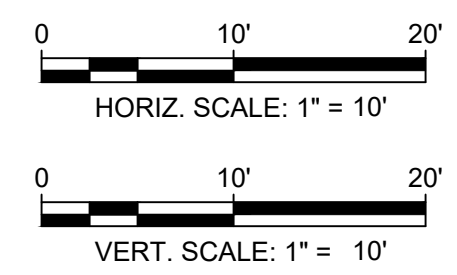
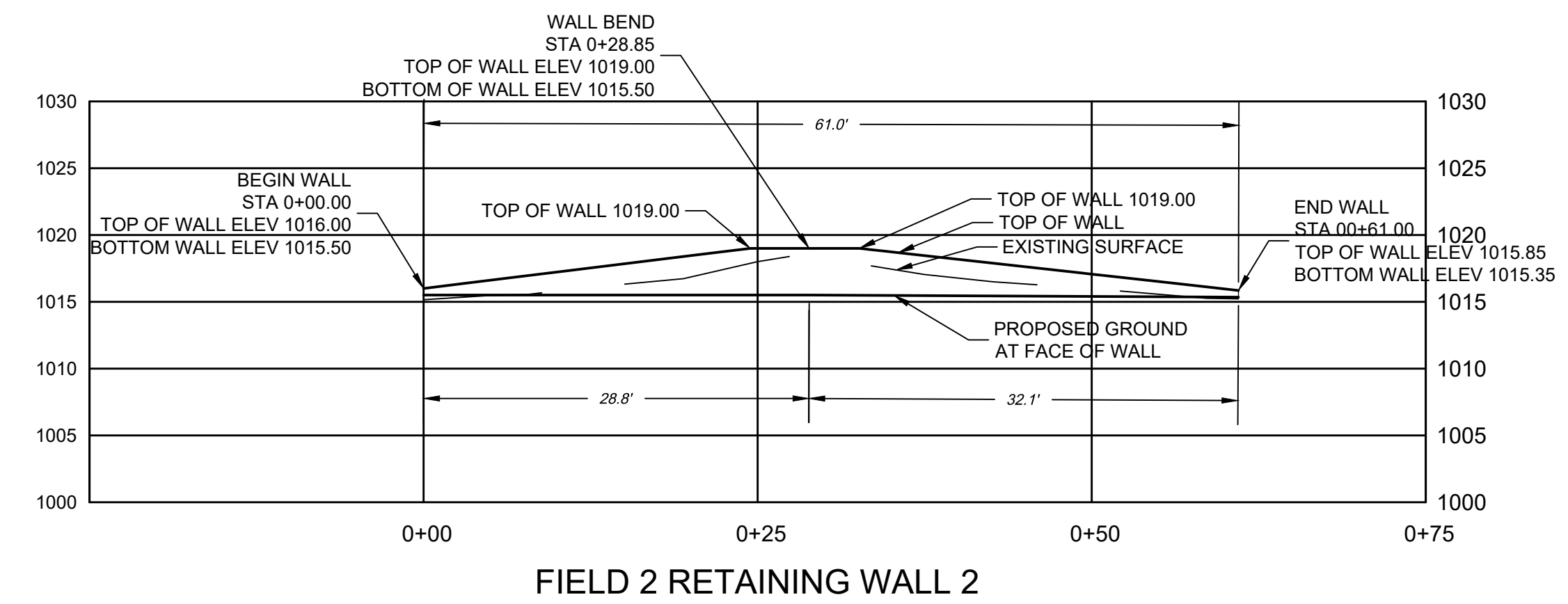
THIS BAR IS 1 INCH LONG PLOTTED FULL SCALE

Project Manager: CAS
Drawn By: BAF Checked By: CAS
Date: 05/30/2023
Scale: As Shown

Project No.: 200147
Drawing No.: C.4.7



NOTES:
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Fitzgerald Park Improvements - Phase 2
 4877 Lawrenceville Hwy
 Tucker, Georgia

RETAINING WALL PLAN AND PROFILE

THIS BAR IS
 1 INCH LONG
 PLOTTED FULL SCALE

Project Manager:
 CAS

Drawn By: Checked By:
 BAF CAS

Date: 05/30/2023

Scale: As Shown

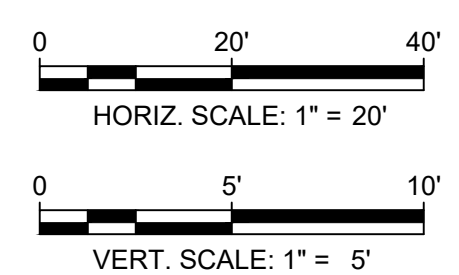
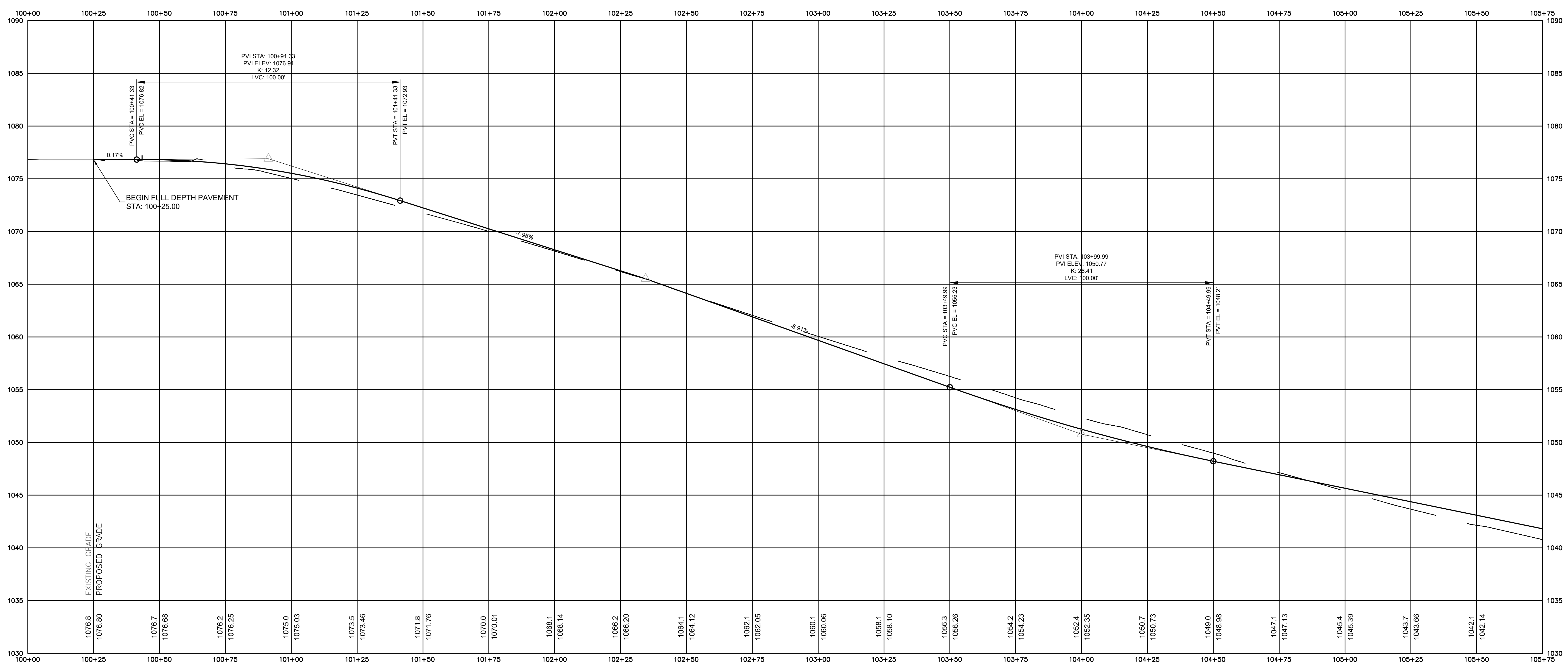
Project No.:
 200147

Drawing No.:
 C.4.8



NO.	DATE	REVISION

Fitzgerald Park Improvements - Phase 2
4877 Lawrenceville Hwy
 Tucker, Georgia
DRIVEWAY PROFILE



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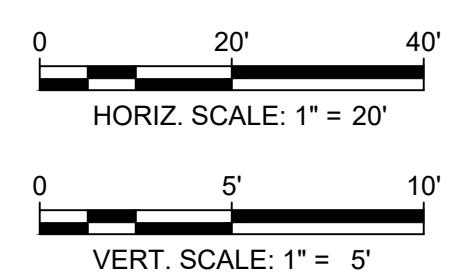
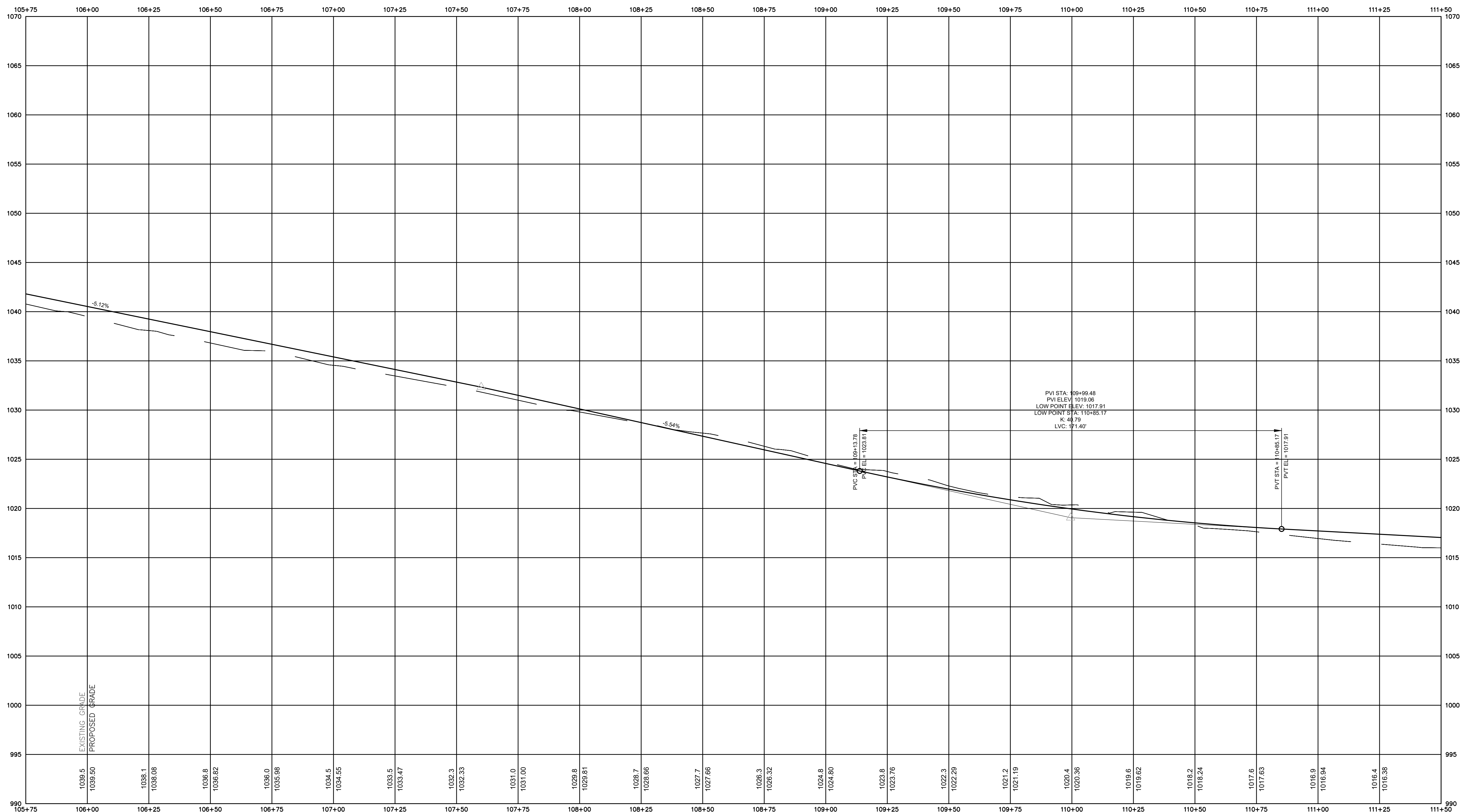
Project Manager: CAS	Checked By: CAS
Drawn By: BAF	Date: 05/30/2023
Scale: As Shown	

Project No.:
200147
 Drawing No.:
C5.0



NO.	DATE	REVISION

Fitzgerald Park Improvements - Phase 2
4877 Lawrenceville Hwy
Tucker, Georgia
DRIVEWAY PROFILE

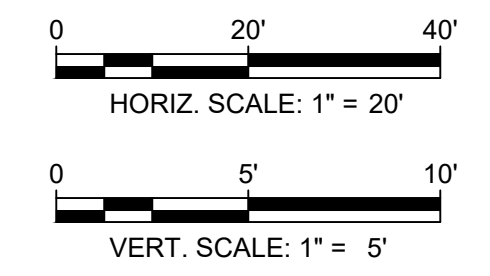
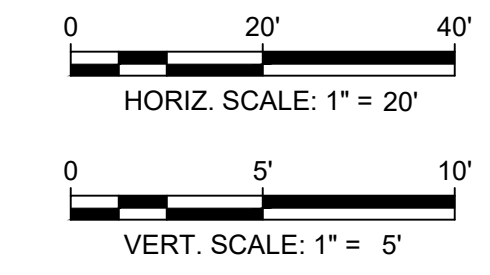
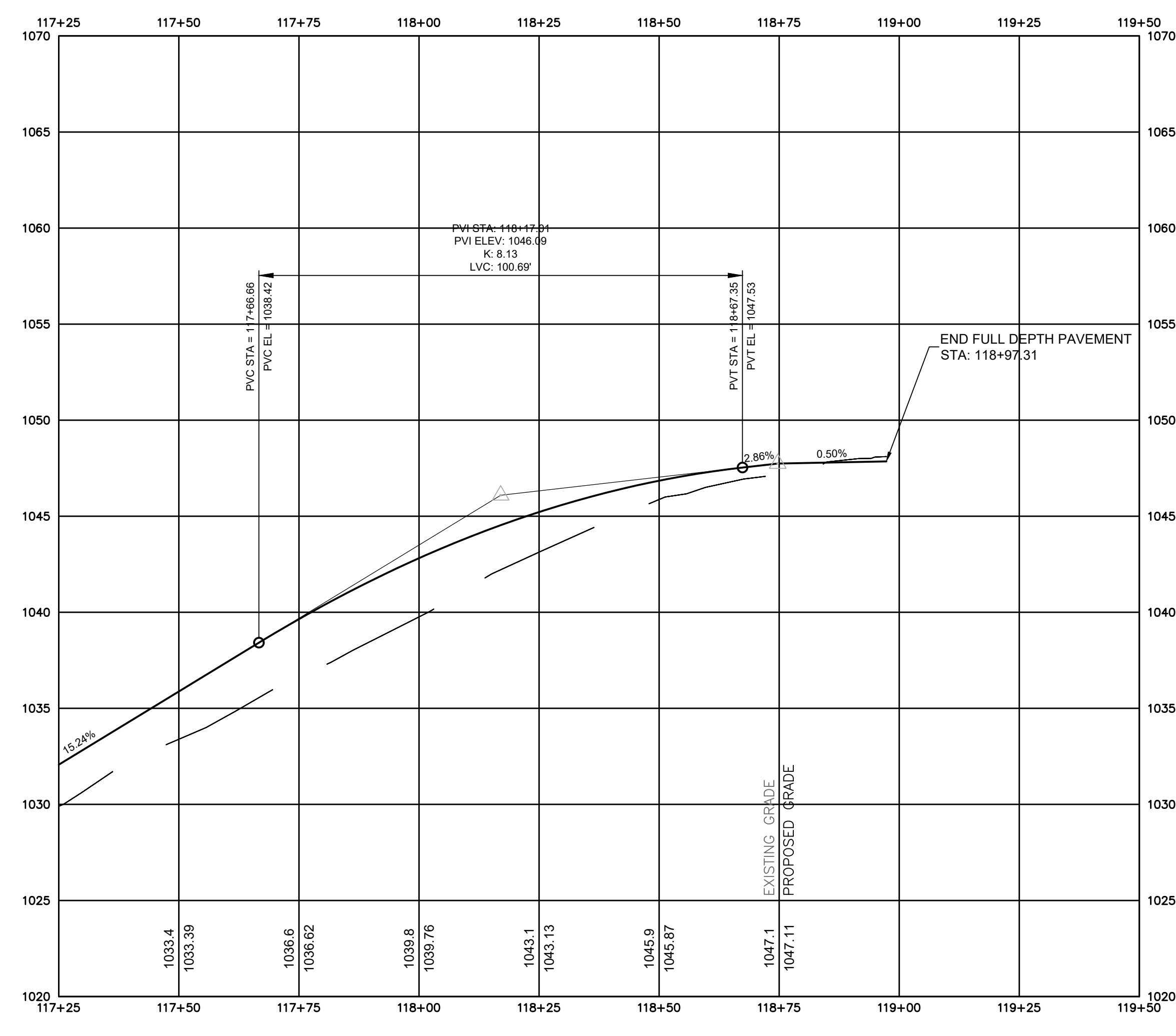
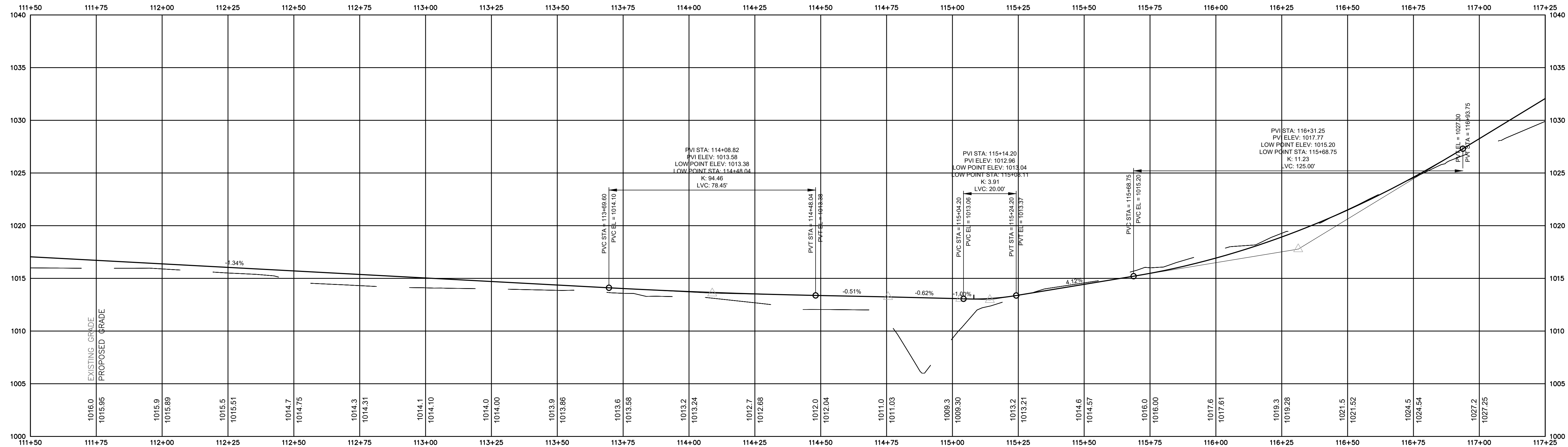


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PLOTTED FULL SCALE

Project Manager:
CAS
Drawn By:
BAF
Checked By:
CAS
Date: 05/30/2023
Scale: As Shown

Project No.:
200147
Drawing No.:
C5.1



NO.	DATE	REVISION

Fitzgerald Park Improvements - Phase 2
4877 Lawrenceville Hwy
Tucker, Georgia
DRIVEWAY PROFILE

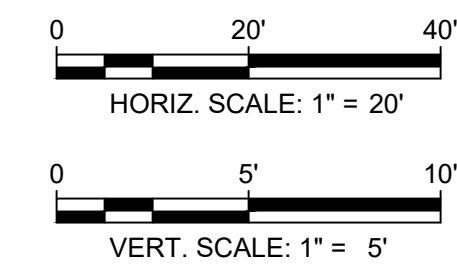
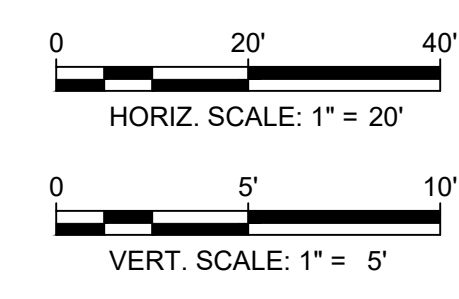
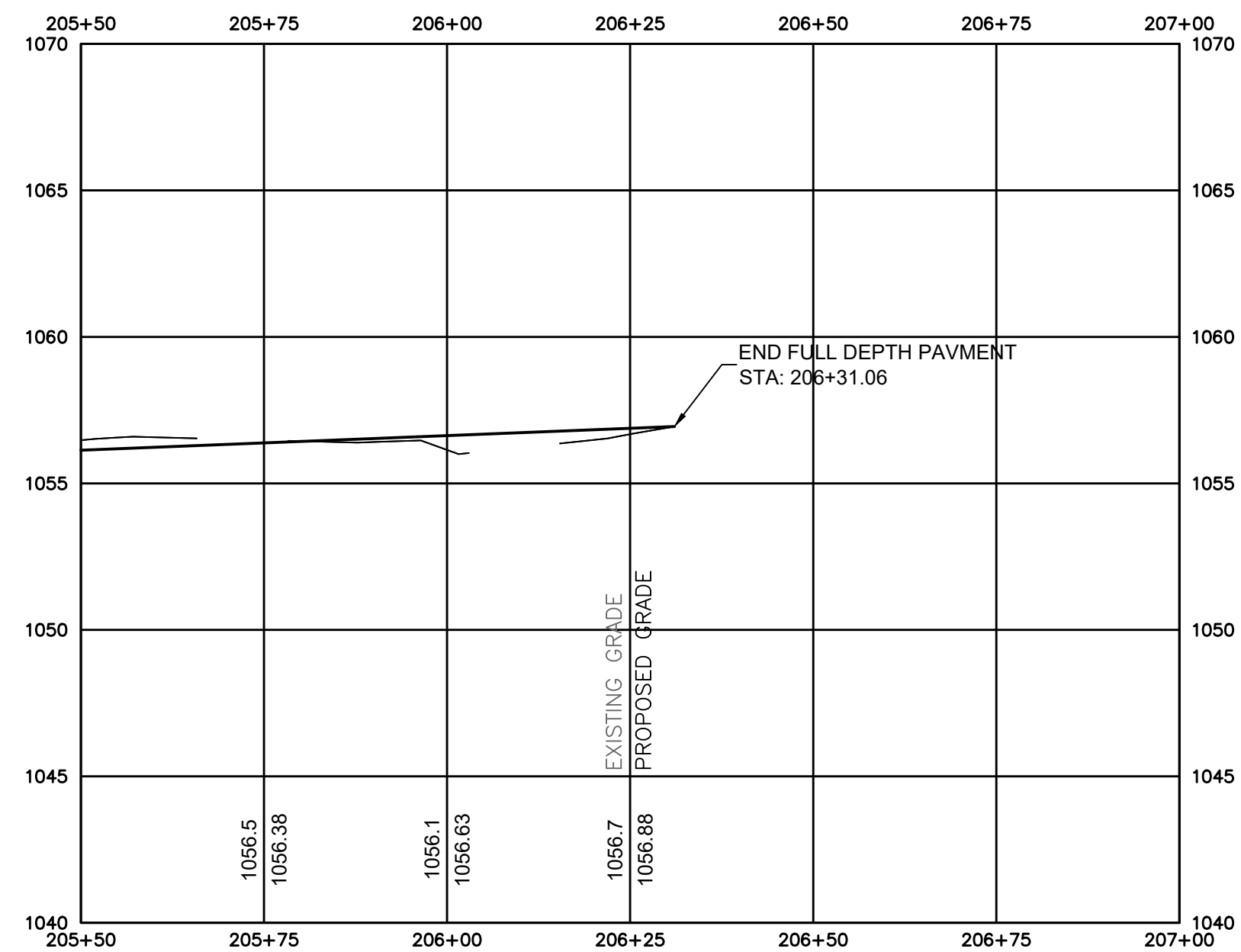
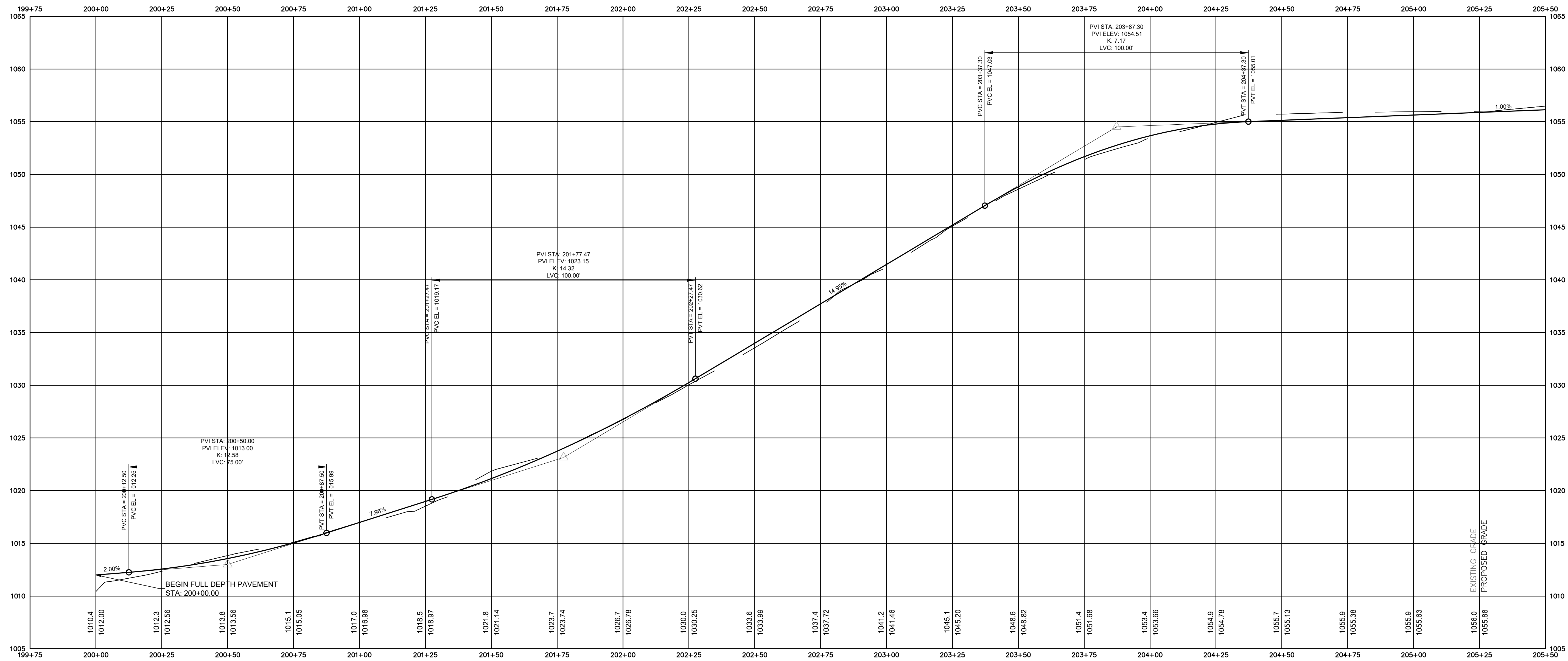
THIS BAR IS 1 INCH LONG PLOTTED FULL SCALE

Project Manager: CAS
 Drawn By: BAF Checked By: CAS
 Date: 05/30/2023
 Scale: As Shown

Project No.: 200147
 Drawing No.: C5.2

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C:\Shared\Drawings\2023\Projects\00147 - Tucker, Fitzgerald Park\Phase 2 - Park Plan\200147 - Phase 2 Grading Phase 2.dwg



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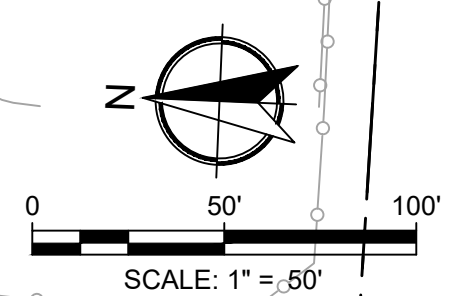
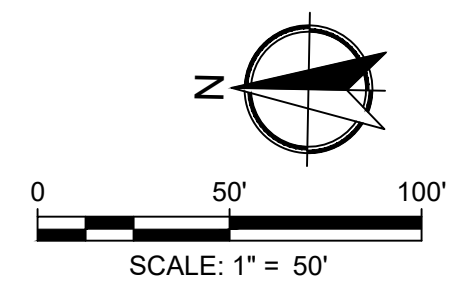
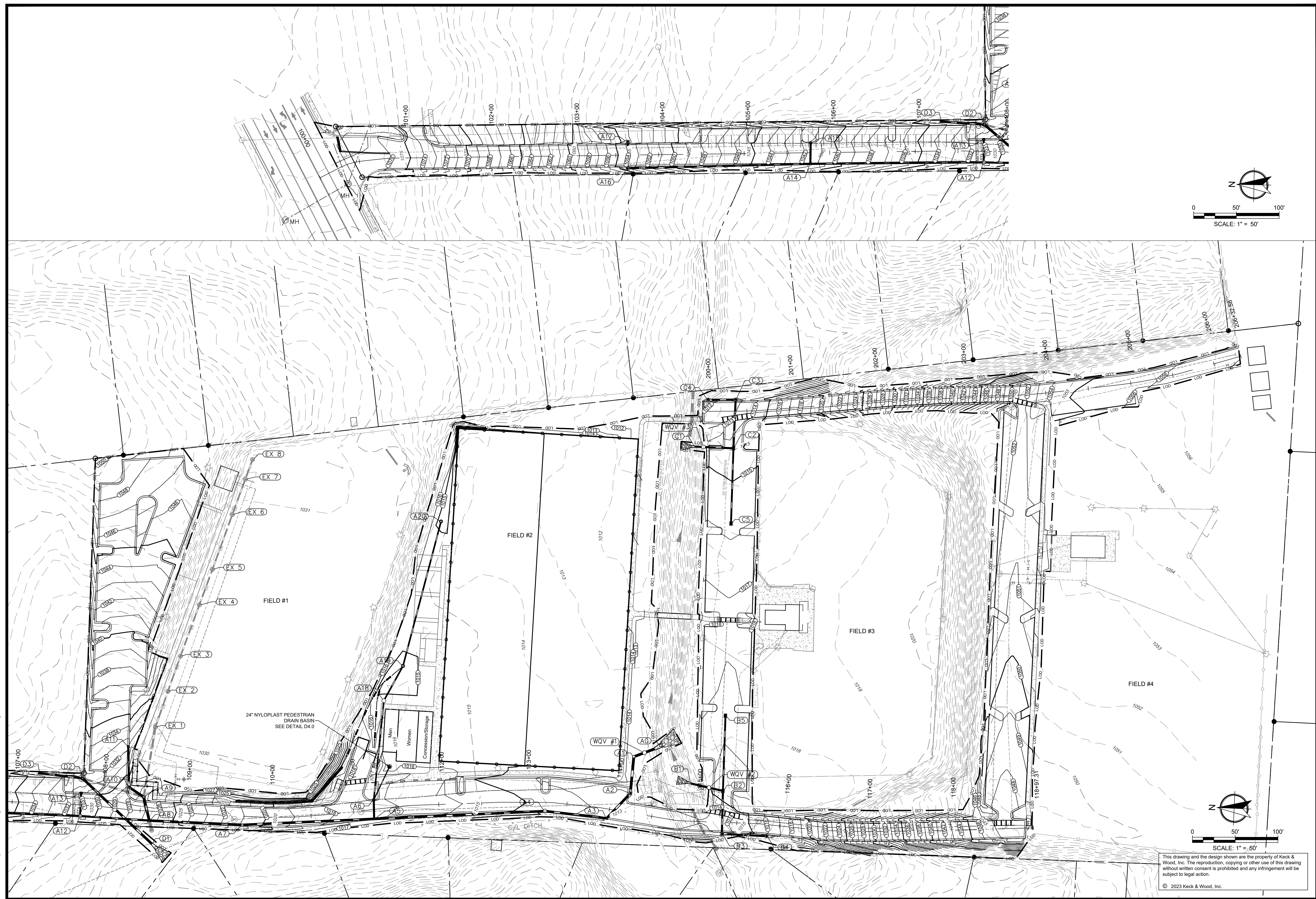


NO.	DATE	REVISION

Fitzgerald Park Improvements - Phase 2
4877 Lawrenceville Hwy
 Tucker, Georgia

DRIVEWAY PROFILE

THIS BAR IS 1 INCH LONG PLOTTED FULL SCALE	
Project Manager:	CAS
Drawn By:	BAF
Checked By:	CAS
Date:	05/30/2023
Scale:	As Shown
Project No.:	200147
Drawing No.:	C5.3



NO.	DATE	REVISION

Fitzgerald Park Improvements - Phase 2
 4877 Lawrenceville Hwy
 Tucker, Georgia
STORM SEWER PLAN

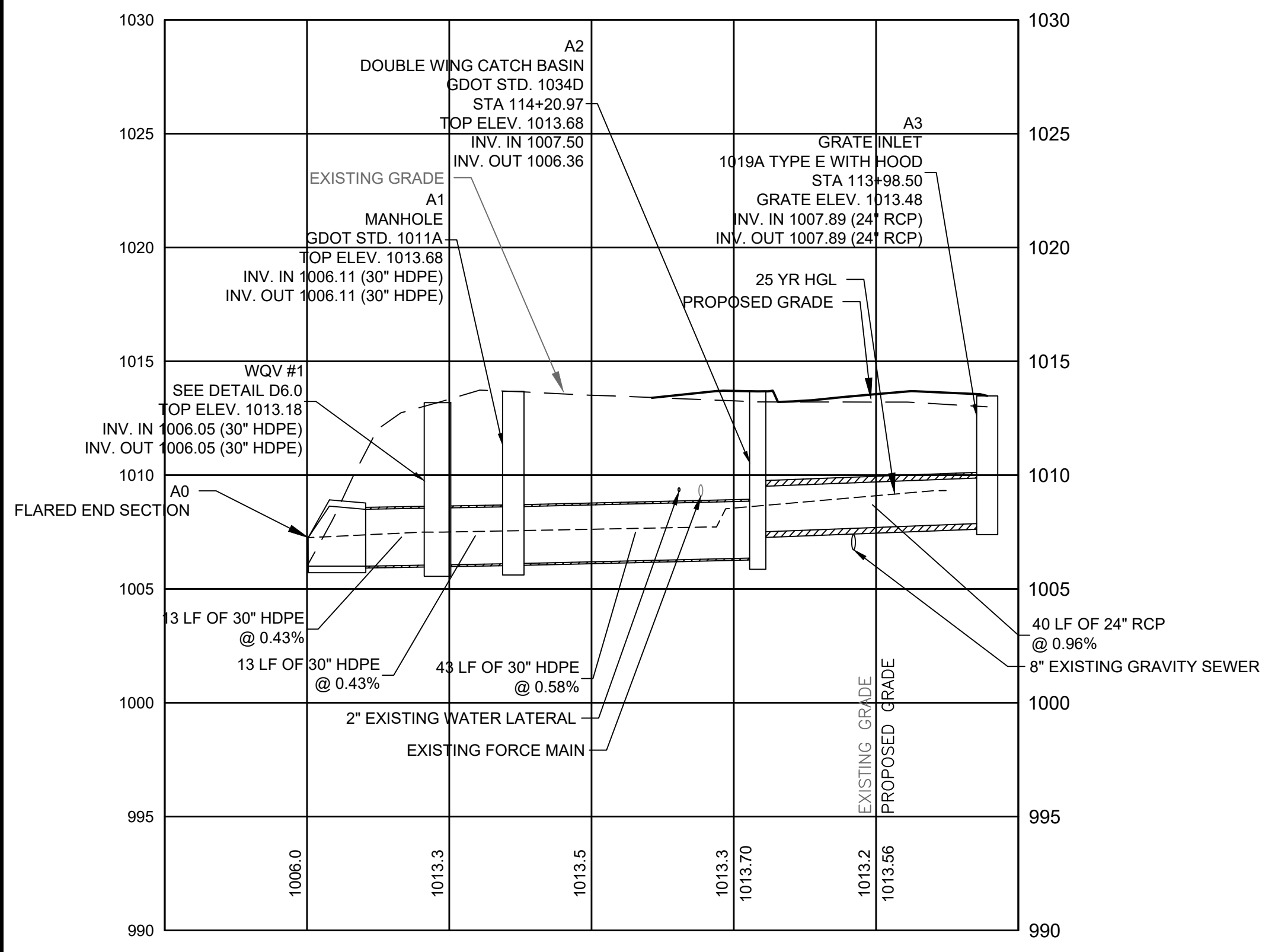
THIS BAR IS
 1 INCH LONG
 PLOTTED FULL SCALE

Project Manager:
 CAS
 Drawn By: BAF Checked By: CAS
 Date: 05/30/2023
 Scale: As Shown

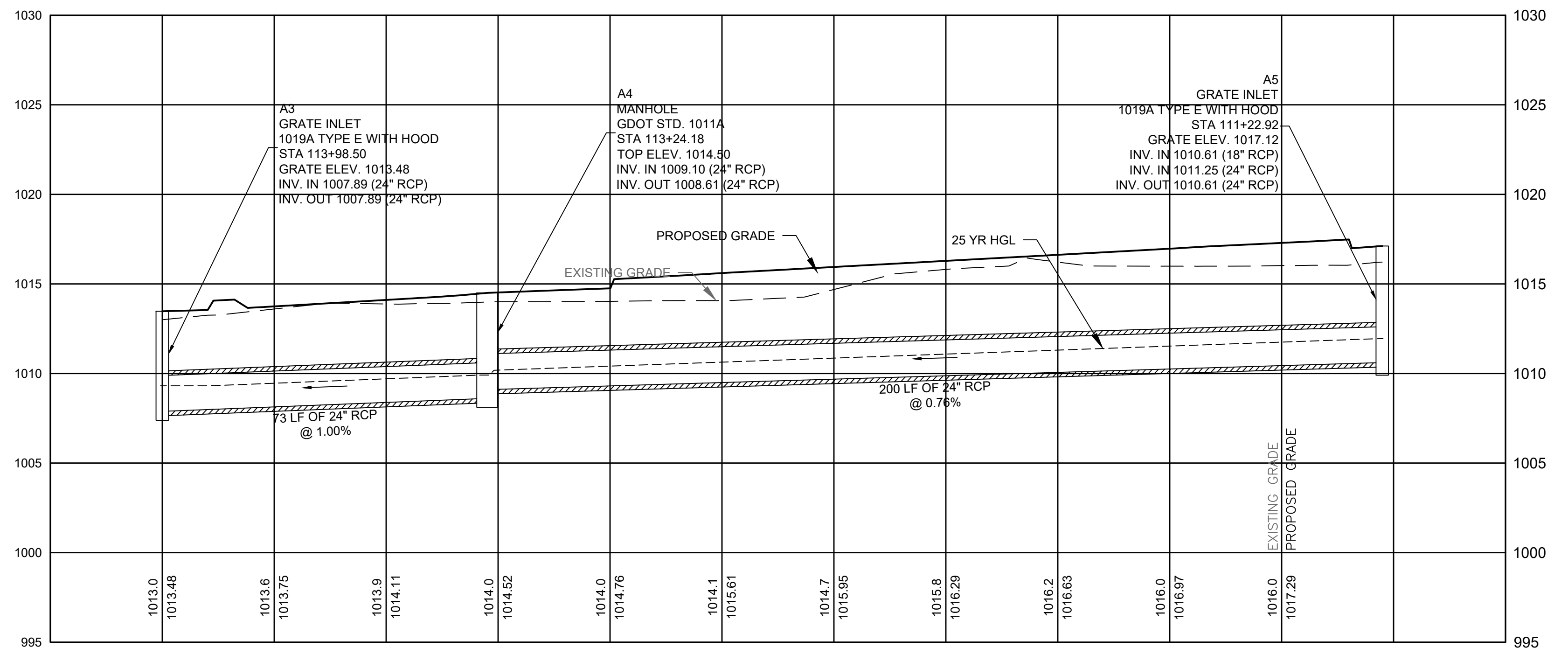
Project No.:
200147
 Drawing No.:
C6.0

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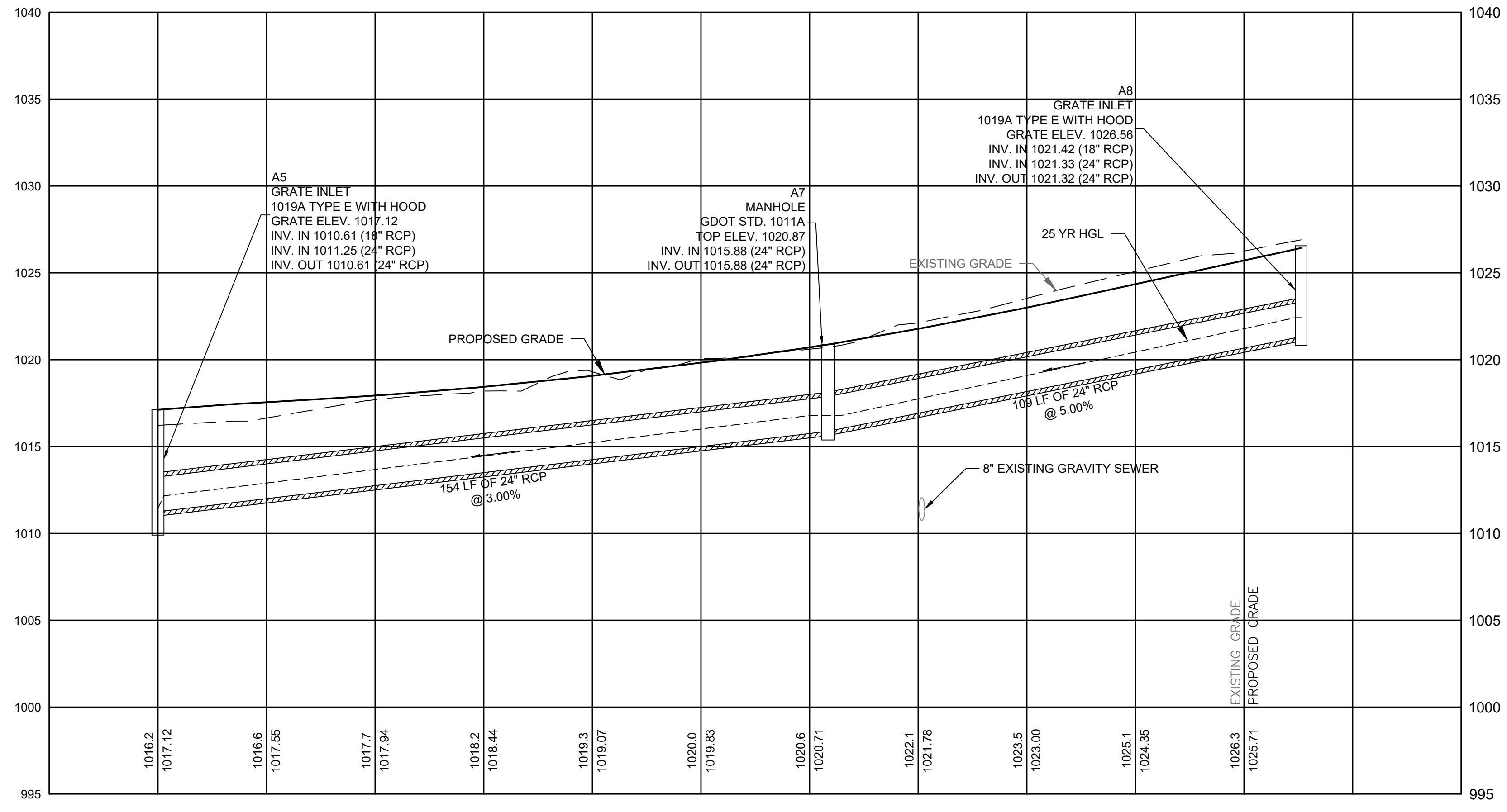
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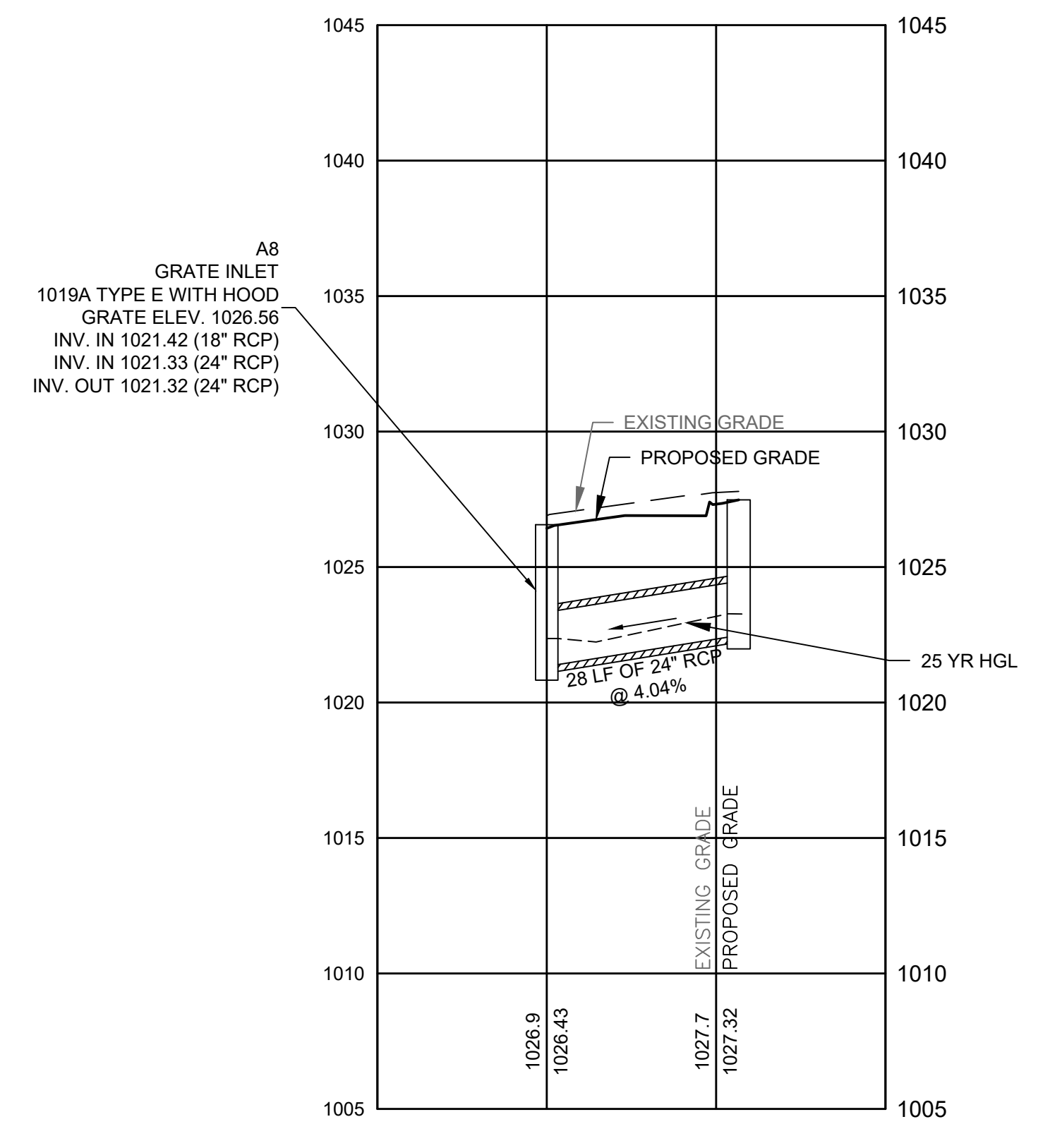
STORM SYSTEM A0 TO A3



STORM SYSTEM A3 TO A5

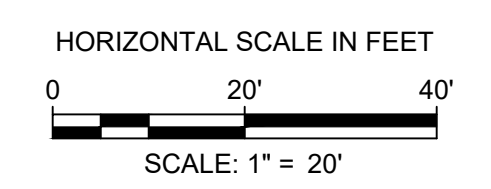
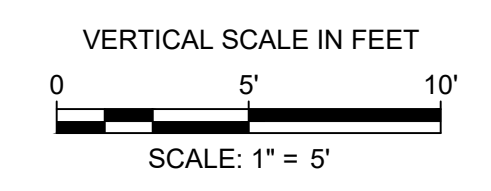


STORM SYSTEM A5 TO A8



STORM SYSTEM A8 TO A9

- NOTES:
1. ALL UTILITY LOCATIONS ARE APPROXIMATE. CONTRACTOR TO FIELD VERIFY UTILITY LOCATIONS AND ELEVATIONS.
 2. CONCRETE COLLAR TO BE INSTALLED BETWEEN FORCE MAIN AND STORM PIPE CROSSINGS.



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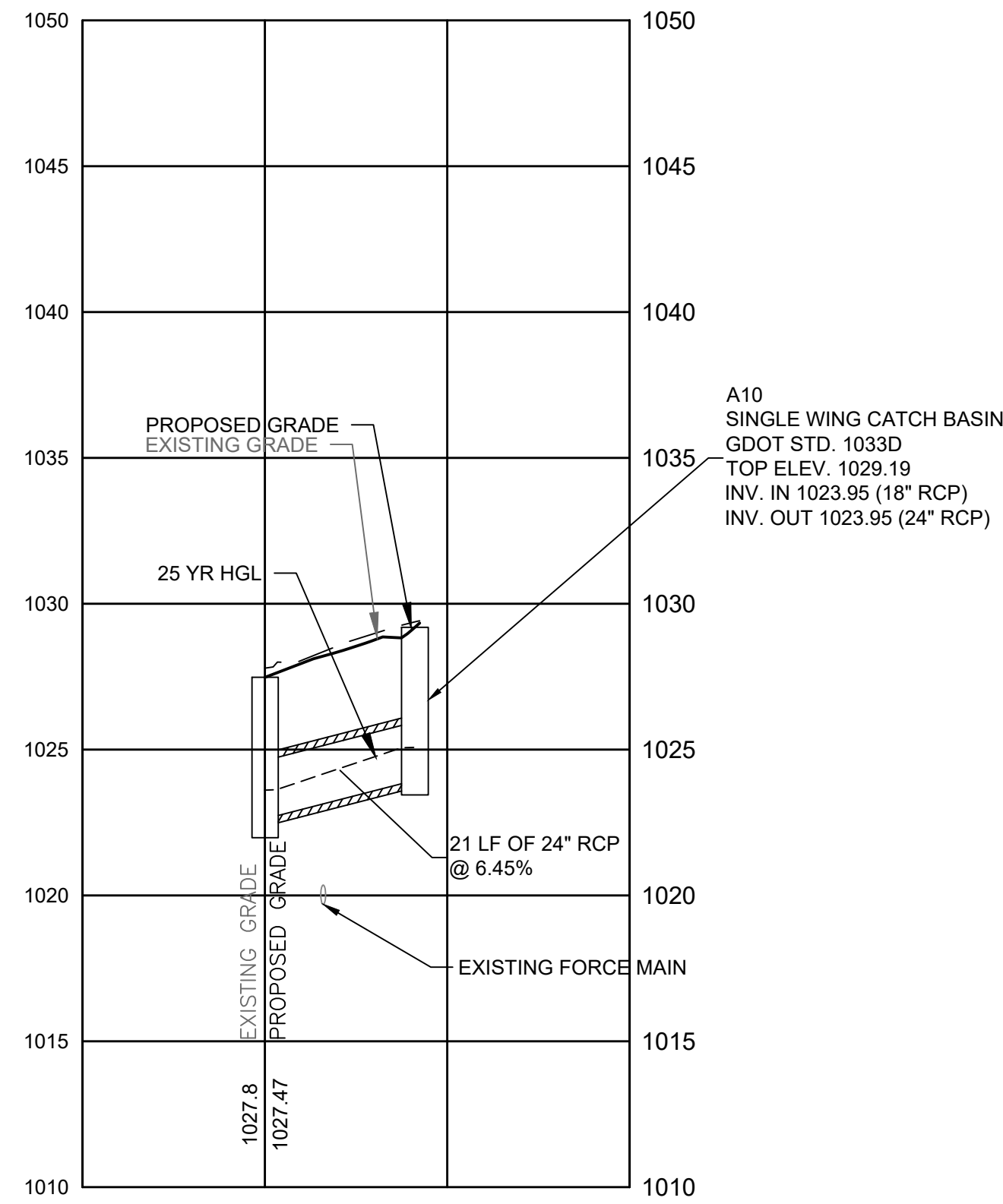
NO.	DATE	REVISION

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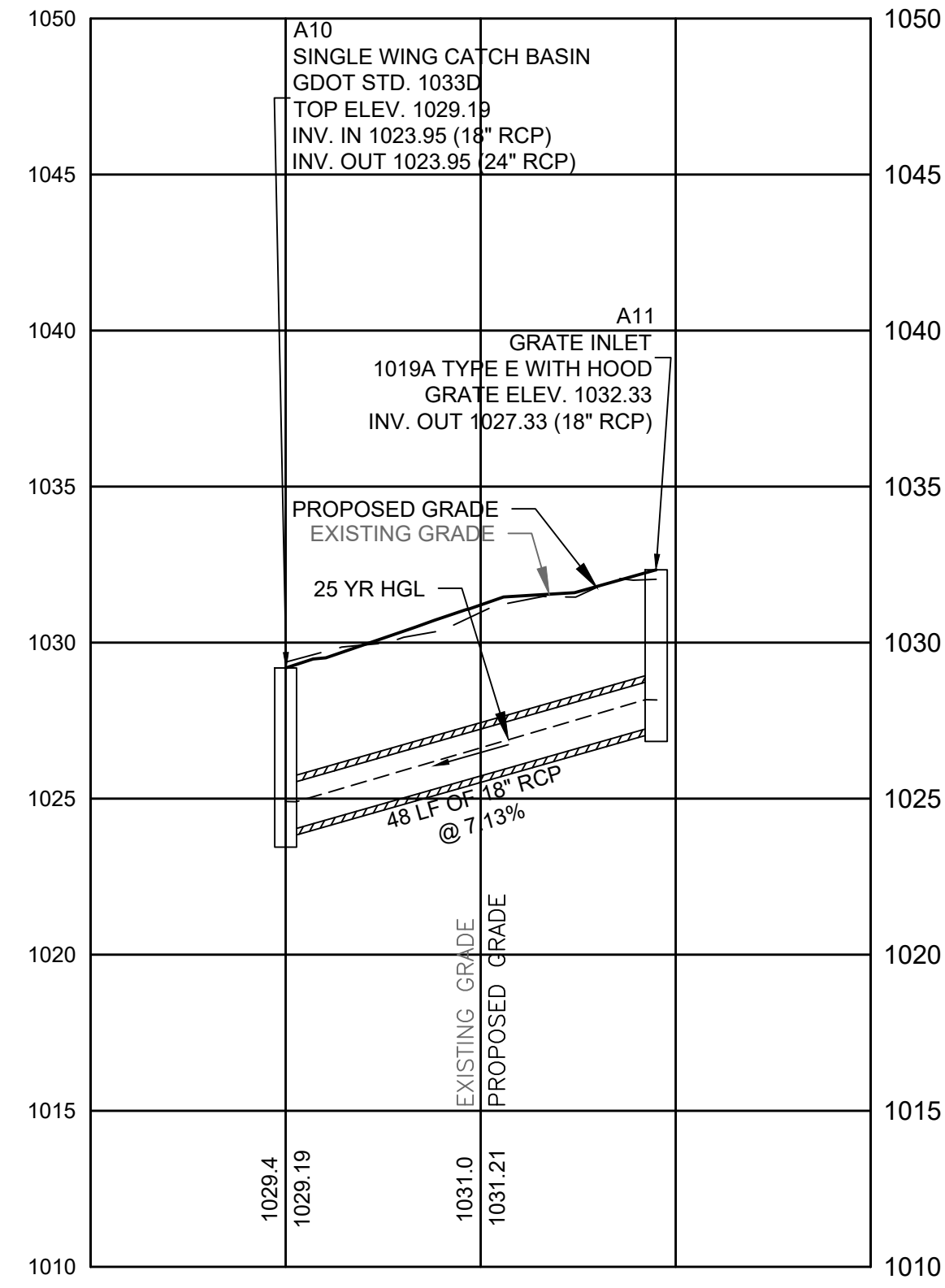
STORM SEWER SYSTEM PROFILE

THIS BAR IS 1 INCH LONG PLOTTED FULL SCALE	
Project Manager:	CAS
Drawn By:	BAF
Checked By:	CAS
Date:	05/30/2023
Scale:	As Shown
Project No.:	200147
Drawing No.:	C6.1

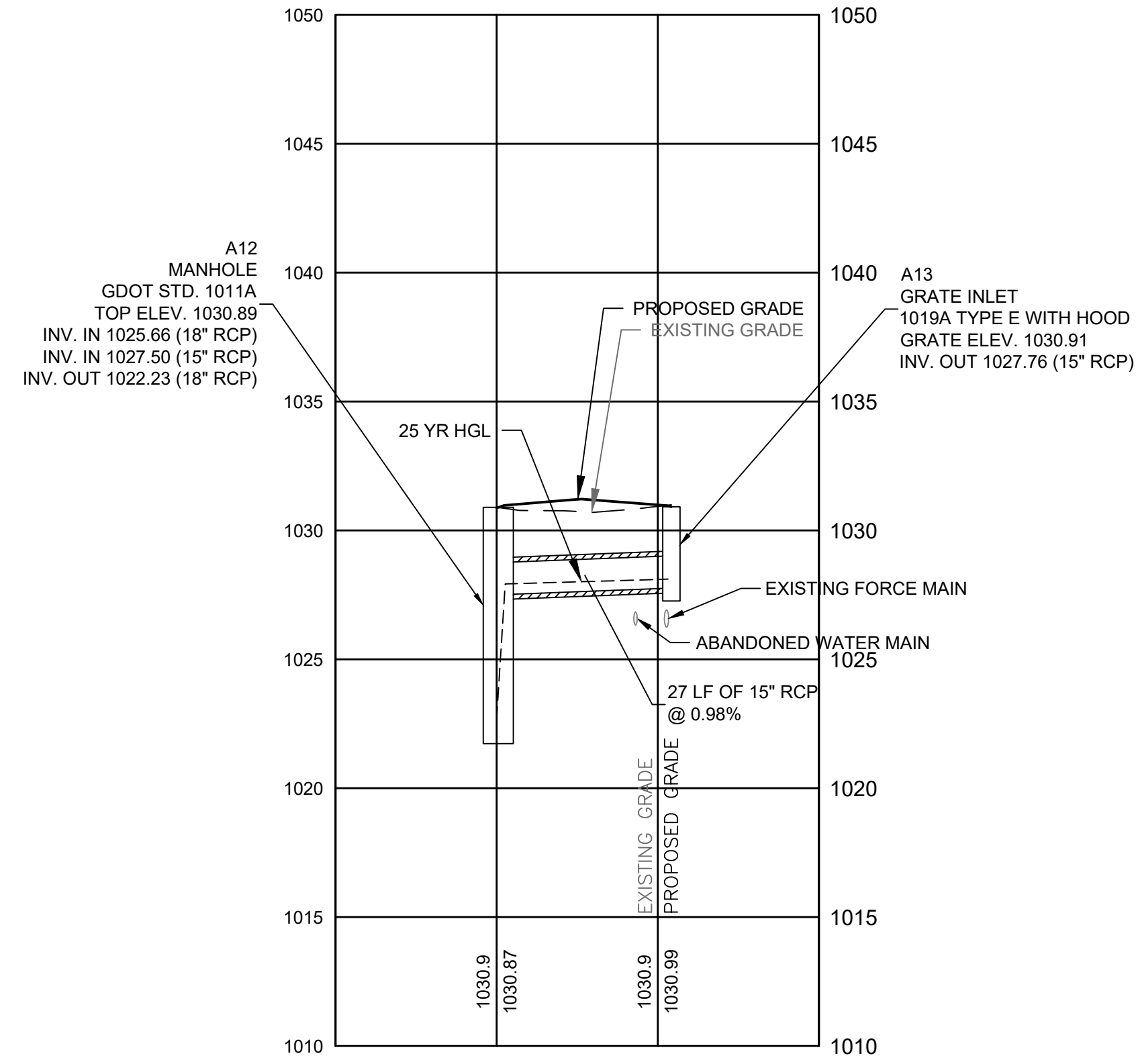
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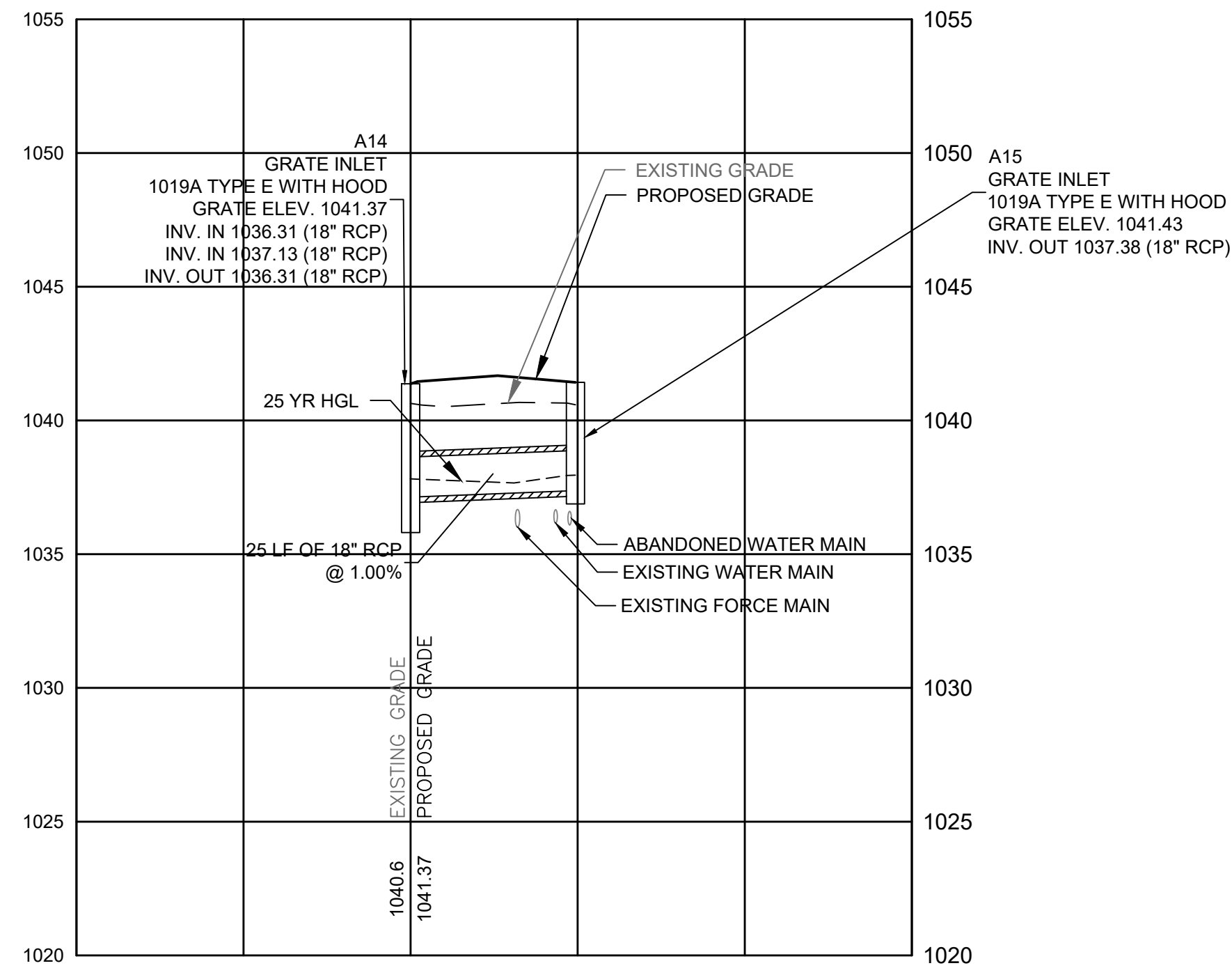
STORM SYSTEM A9 TO A10



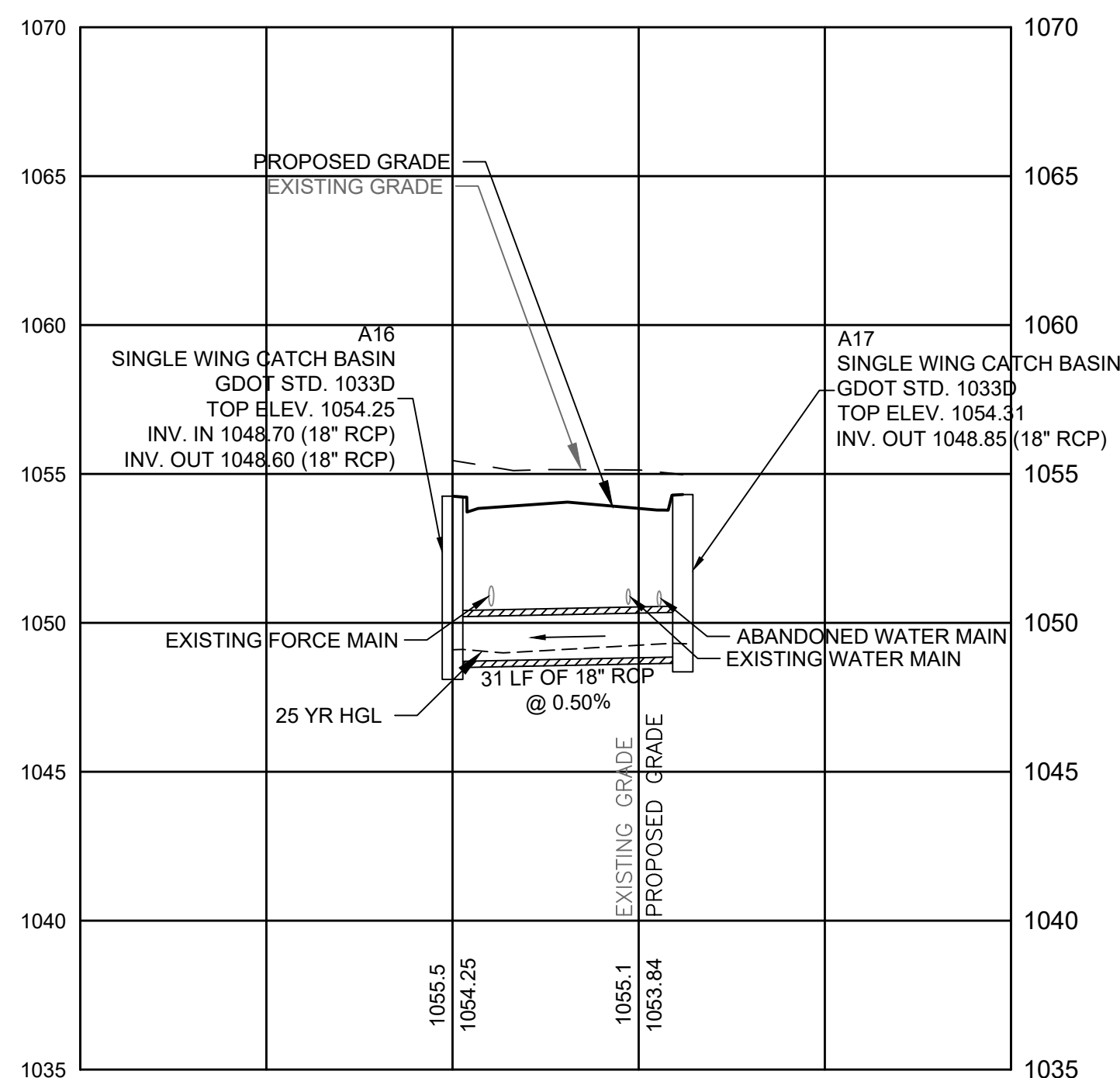
STORM SYSTEM A10 TO A11



STORM SYSTEM A12 TO A13



STORM SYSTEM A14 TO A15



STORM SYSTEM A16 TO A17

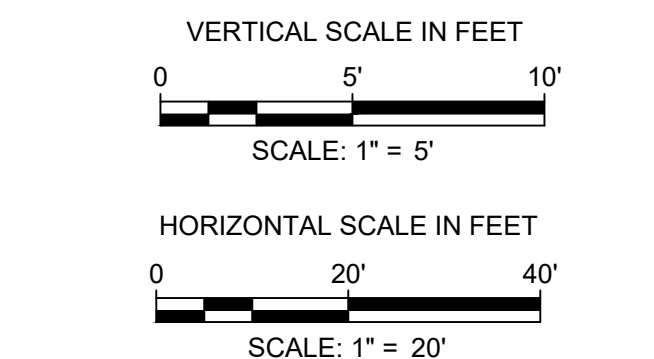
Line	To	Line	Incr.	Total	Runoff	Incr.	Total	Inlet	Time	Rnfal	Total	Adnl	Total	Capac	Vel	Pipe	Pipe	Inv Elev	Inv Elev	HGL Dn	HGL Up	Grnd/Rim	Grnd/Rim	Line Id
	Lin	Leng	Area	Area	Coef	Cx	Cx	Tim	Cor	In	Run	Flow	Flow	Full	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
1	Outfall	22.148	0.00	5.72	0.00	0	2.93	0.0	24.3	4.9	14.38	0.00	14.38	31.31	5.97	30	0.50	1006.00	1006.11	1007.19	1007.39	1006.00	1013.00	A0-A1
2	1	49.710	0.50	5.72	0.67	0.34	2.93	15.0	24.0	4.9	14.48	0.00	14.48	31.51	5.73	30	0.50	1006.11	1006.36	1007.39	1007.64	1013.00	1013.04	A1-A2
3	2	40.050	0.13	5.22	0.84	0.11	2.59	5.0	23.8	5.0	12.87	0.00	12.87	24.18	6.91	24	0.97	1007.50	1007.89	1008.54	1009.18	1013.04	1013.16	A2-A3
4	3	72.570	0.00	5.09	0.00	0	2.48	0.0	23.5	5.0	12.42	0.00	12.42	24.41	5.86	24	0.99	1007.89	1008.61	1009.18	1009.88	1013.16	1014.15	A3-A4
5	4	199.890	0.09	5.09	0.86	0.08	2.48	5.0	22.8	5.1	12.67	0.00	12.67	21.30	6.52	24	0.76	1009.18	1010.61	1010.21	1011.89	1014.15	1017.02	A4-A5
6	5	154.240	0.00	2.73	0.00	0	1.65	0.0	21.9	5.2	8.59	0.00	8.59	42.45	7.56	24	3.00	1011.25	1015.88	1011.89	1016.92	1017.02	1020.86	A5-A7
7	6	108.909	0.10	2.73	0.86	0.09	1.65	5.0	21.2	5.3	8.74	0.00	8.74	54.76	5.24	24	4.99	1015.88	1021.32	1016.92	1022.37	1020.86	1026.54	A7-A8
8	7	81.071	0.00	0.71	0.00	0	0.59	0.0	14.0	6.6	3.89	0.00	3.89	11.37	3.83	18	1.00	1021.42	1022.23	1022.37	1022.98	1026.54	1030.92	A8-A12
9	8	202.660	0.08	0.58	0.86	0.07	0.47	5.0	12.4	7.1	3.31	0.00	3.31	26.08	7.12	18	5.26	1025.66	1036.31	1026.02	1037.00	1030.92	1041.40	A8-A14
10	9	213.702	0.14	0.36	0.86	0.12	0.29	6.0	9.7	7.9	2.28	0.00	2.28	27.28	3.28	18	5.75	1036.31	1048.60	1037.00	1049.17	1041.40	1053.74	A14-A16
11	10	31.000	0.22	0.22	0.76	0.17	0.17	9.0	9.0	8.2	1.37	0.00	1.37	7.91	3.04	18	0.48	1048.70	1048.85	1049.17	1049.29	1053.74	1053.80	A16-A17
12	9	24.667	0.14	0.14	0.79	0.11	0.11	7.0	7.0	9.1	1.01	0.00	1.01	11.45	3.46	18	1.01	1037.13	1037.38	1037.43	1037.75	1041.44	1041.44	A14-A15
13	7	28.330	0.00	1.92	0.00	0	0.97	0.0	21.0	5.4	5.21	0.00	5.21	49.37	3.78	24	4.06	1021.33	1022.48	1022.37	1023.28	1026.54	1027.48	A8-A9
14	13	82.804	1.26	1.26	0.31	0.39	0.39	19.0	19.0	5.7	2.21	0.00	2.21	38.65	2.98	24	2.49	1022.64	1024.70	1023.28	1025.22	1027.48	1028.95	CMP
15	8	27.110	0.13	0.13	0.91	0.12	0.12	5.0	5.0	10.2	1.21	0.00	1.21	6.85	3.71	15	0.96	1027.50	1027.76	1027.86	1028.19	1030.92	1030.93	A12 - A13
16	13	22.048	0.06	0.66	0.92	0.06	0.58	5.0	7.3	8.9	5.22	0.00	5.22	27.94	5.88	18	6.03	1022.62	1023.95	1023.28	1024.83	1027.48	1028.95	A9-A10
17	16	47.620	0.60	0.60	0.88	0.53	0.53	7.0	7.0	9.1	4.80	0.00	4.80	30.31	4.58	18	7.10	1023.95	1027.33	1024.83	1028.17	1028.95	1032.33	A10-A11
18	5	22.020	0.41	2.27	0.59	0.24	0.76	7.0	19.5	5.6	4.24	0.00	4.24	8.04	3.57	18	0.50	1010.61	1010.72	1011.89	1011.51	1017.02	1017.35	A5-A6
19	18	116.570	0.00	1.86	0.00	0	0.52	0.0	18.7	5.7	2.95	0.00	2.95	4.93	3.93	15	0.50	1010.72	1011.30	1011.51	1011.99	1017.35	1015.62	A6-A20
20	19	46.301	1.18	1.86	0.30	0.35	0.52	16.0	18.4	5.8	2.98	0.00	2.98	5.04	4.27	15	0.52	1011.30	1011.54	1011.99	1012.23	1015.62	1014.50	A20-A18
21	20	174.582	0.68	0.68	0.24	0.16	0.16	15.0	15.0	6.4	1.05	0.00	1.05	4.94	2.29	15	0.50	1011.54	1012.41	1012.23	1012.81	1014.50	1014.50	A18-A19

1	Outfall	44.087	1.25	4.34	0.26	0.33	1.76	18.0	22.4	5.2	9.04	0.00	9.04	22.31	9.00	18	4.51	1008.08	1010.07	1008.75	1011.23	1010.80	1016.44	B1-B2
2	1	46.751	0.03	2.64	0.85	0.03	1.17	5.0	22.2	5.2	6.08	0.00	6.08	10.53	4.64	18	1.01	1010.07	1010.54	1011.23	1011.49	1016.44	1015.54	B2-B3
3	2	52.424	2.61	2.61	0.44	1.15	1.15	22.0	22.0	6.2	5.98	0.00	5.98	9.14	6.42	15	2.00	1010.68	1011.73	1011.49	1012.72	1015.54	1016.73	B3-B4
4	1	87.687	0.45	0.45	0.57	0.26	0.26	17.0	6.0	1.54	0.00	1.54	9.12	2.47	15	2.00	1010.25	1012.00	1011.23	1012.49	1016.44	1017.00	B2-B5	
5	Outfall	50.687	0.53	2.16	0.36	0.19	0.92	15.0	18.3	5.8	5.32	0.00	5.32	16.62	6.63	18	2.51	1005.00	1006.27	1005.58	1007.16	1005.80	1014.71	C1-C2
6	5	88.186	0.25	0.25	0.70	0.18	0.18	15.0	6.4	1.12	0.00	1.12	12.92	4.79	15	4.00	1007.47	1011.00	1007.72	1011.42	1014.71	1016.00	C2-C5	
7	5	54.770	0.46	1.38	0.75	0.35	0.56	6.0	17.8	5.9	3.26	0.00	3.26	10.52	3.56	18	1.00	1006.27	1006.82	1007.16	1007.51	1014.71	1012.66	C2-C3
8	7	35.352	0.92	0.92	0.23	0.21	0.21	17.0	6.0	1.27	0.00	1.27	7.49	2.37	18	0.51	1006.82	1007.00	1007.51	1007.42	1012.66	1011.83	C3-C4	

1	Outfall	111.366	4.94	6.70	0.44	2.17	3.14	17.0	18.3	5.8	18.16	0.00	18.16	21.28	7.32	24	0.75	1024.00	1024.84	1025.42	1026.37	1024.00	1031.70	D1-D2
2	1	49.869	1.76	1.76	0.55	0.97	0.97	18.0	18.0	5.8	5.64	0.00	5.64	16.11	6.65	18	2.01	1026.50	1027.50	1027.11	1028.42	1031.70	1033.52	D2-D3

NOTES:

- ALL UTILITY LOCATIONS ARE APPROXIMATE. CONTRACTOR TO FIELD VERIFY UTILITY LOCATIONS AND ELEVATIONS.
- CONCRETE COLLAR TO BE INSTALLED BETWEEN FORCE MAIN AND STORM PIPE CROSSINGS.

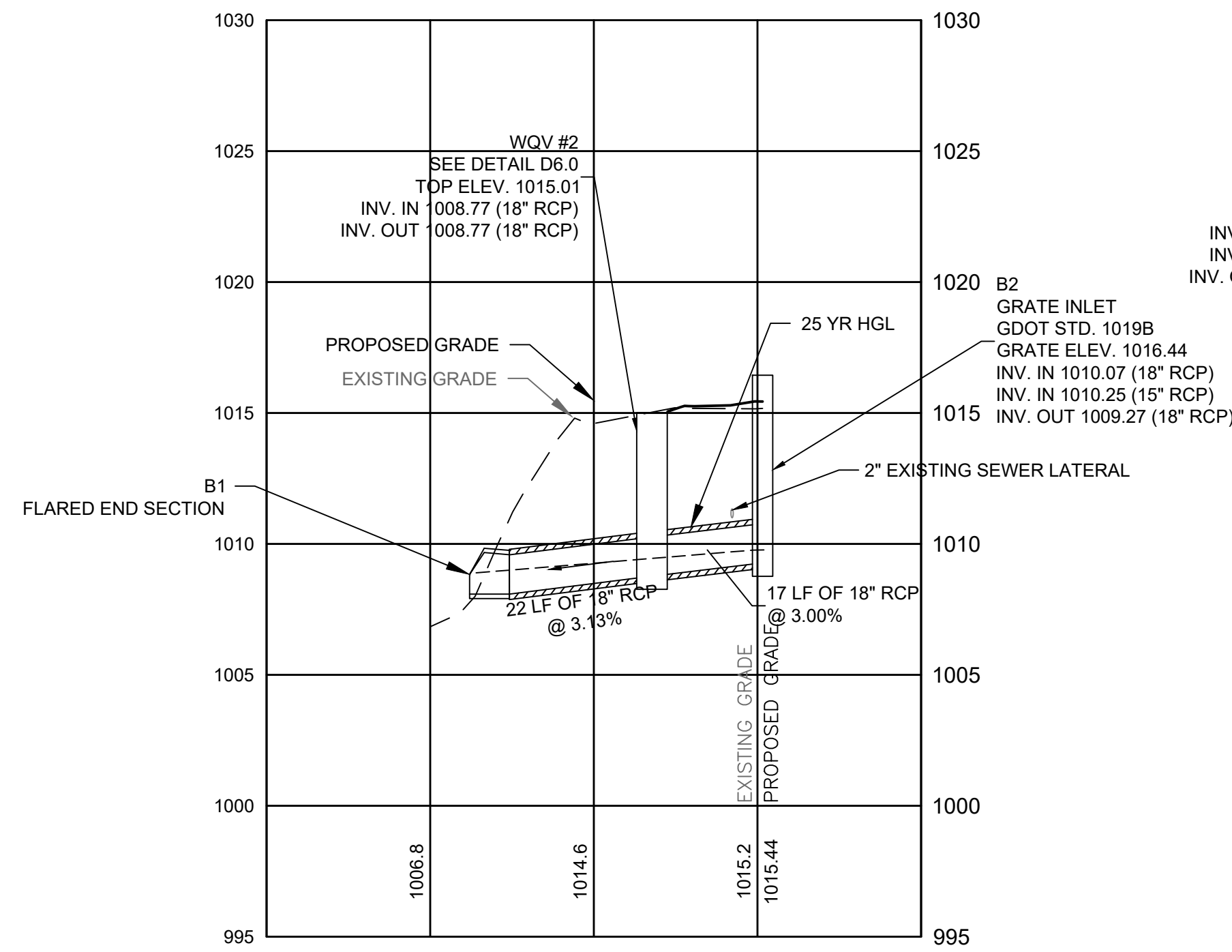


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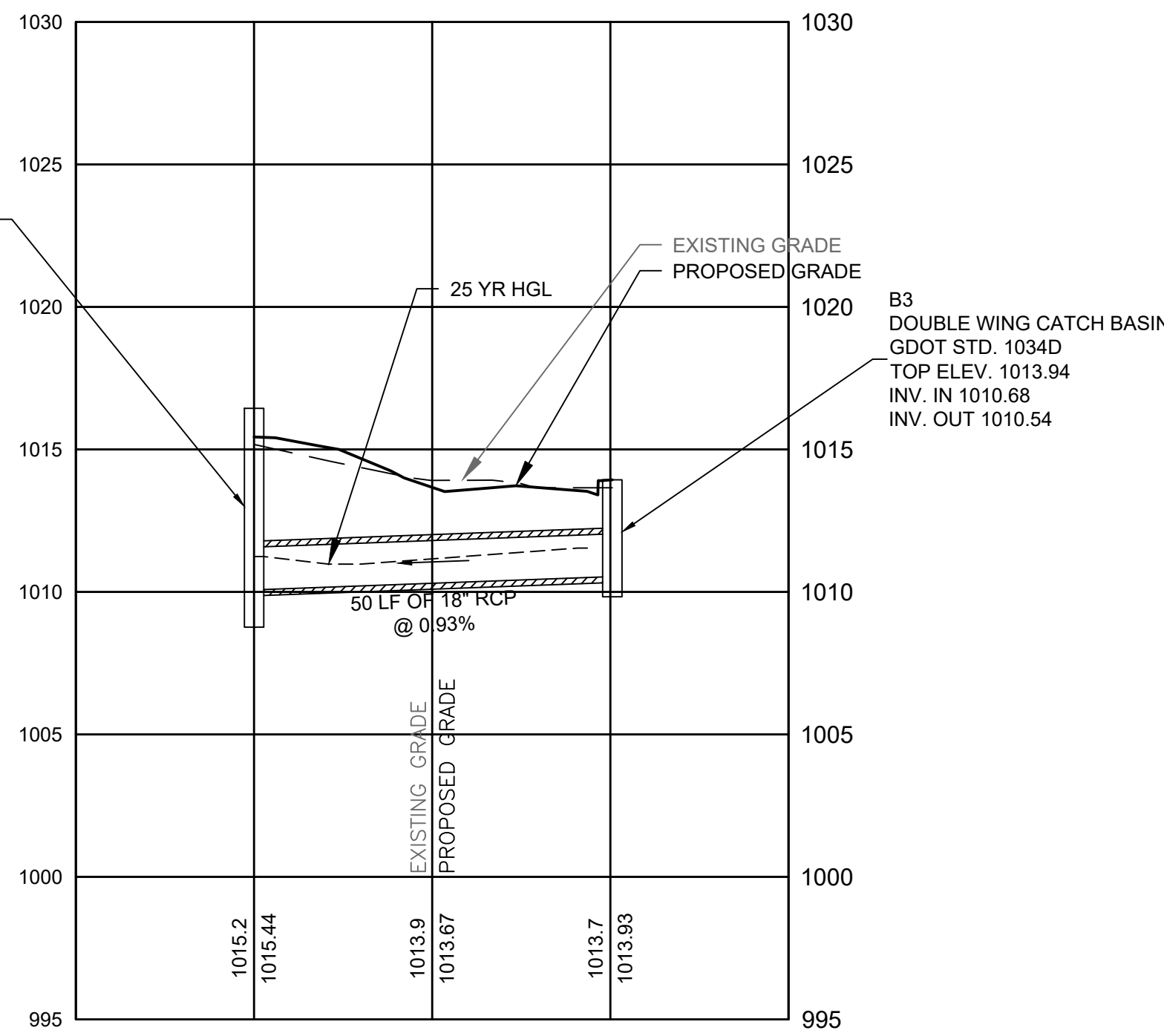


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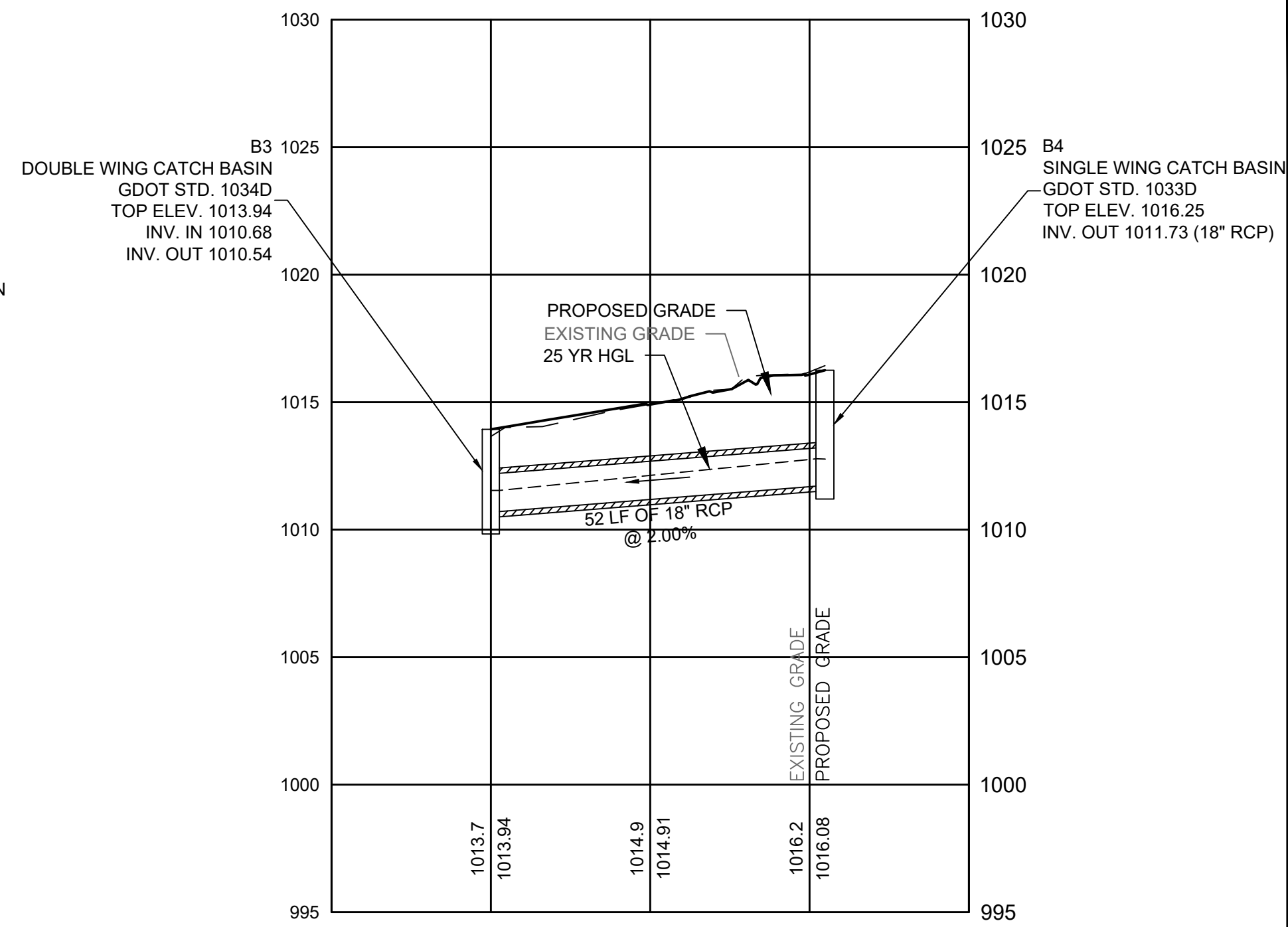
Fitzgerald Park Improvements - Phase 2
4877 Lawrenceville Hwy
Tucker, Georgia
STORM SEWER SYSTEM PROFILE



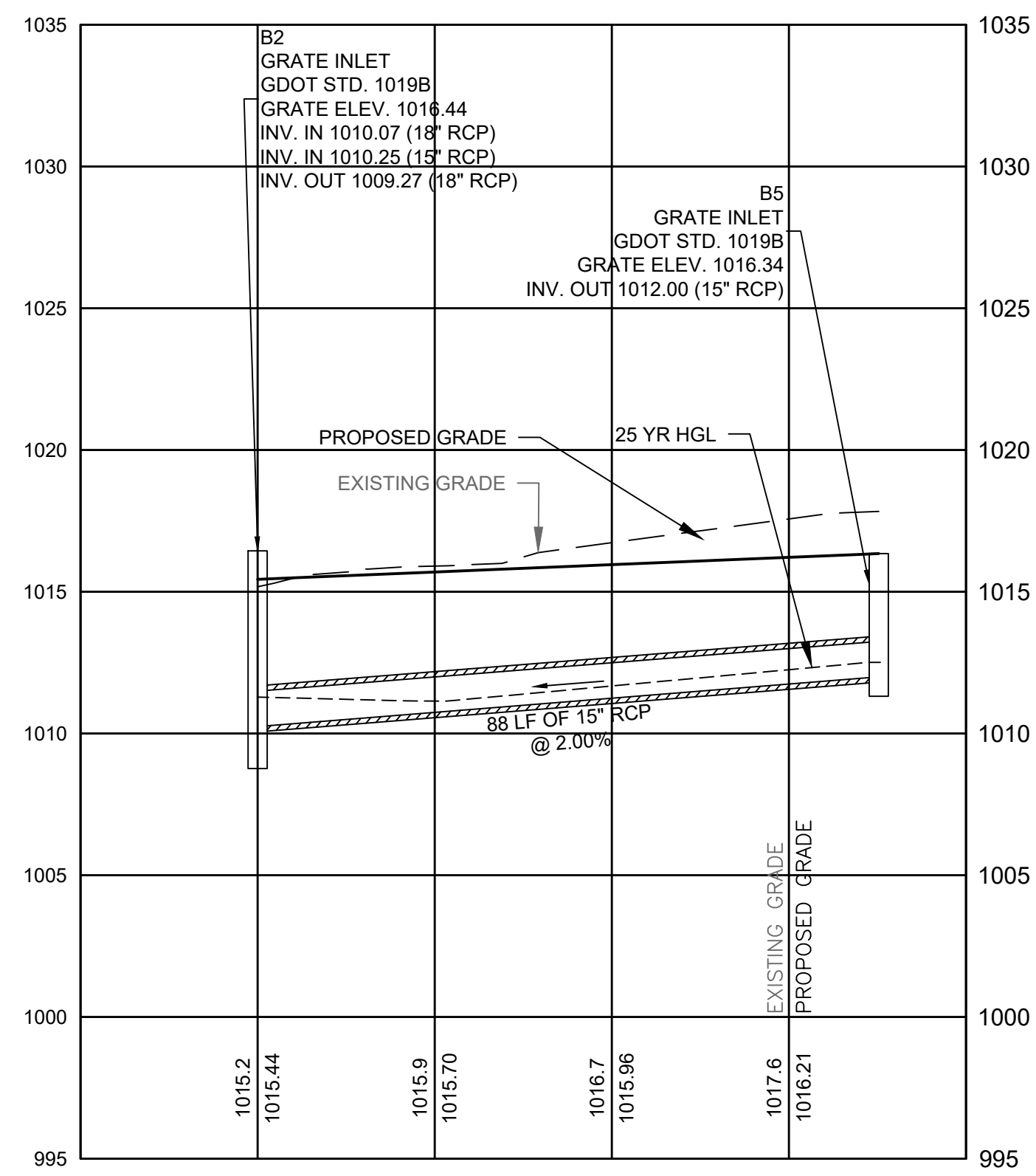
STORM SYSTEM B1 TO B2



STORM SYSTEM B2 TO B3

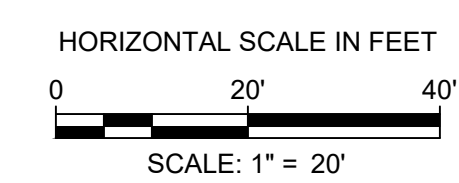
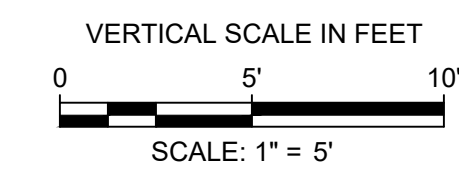


STORM SYSTEM B3 TO B4



STORM SYSTEM B2 TO B5

- NOTES:
1. ALL UTILITY LOCATIONS ARE APPROXIMATE. CONTRACTOR TO FIELD VERIFY UTILITY LOCATIONS AND ELEVATIONS.
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NO.	DATE	REVISION

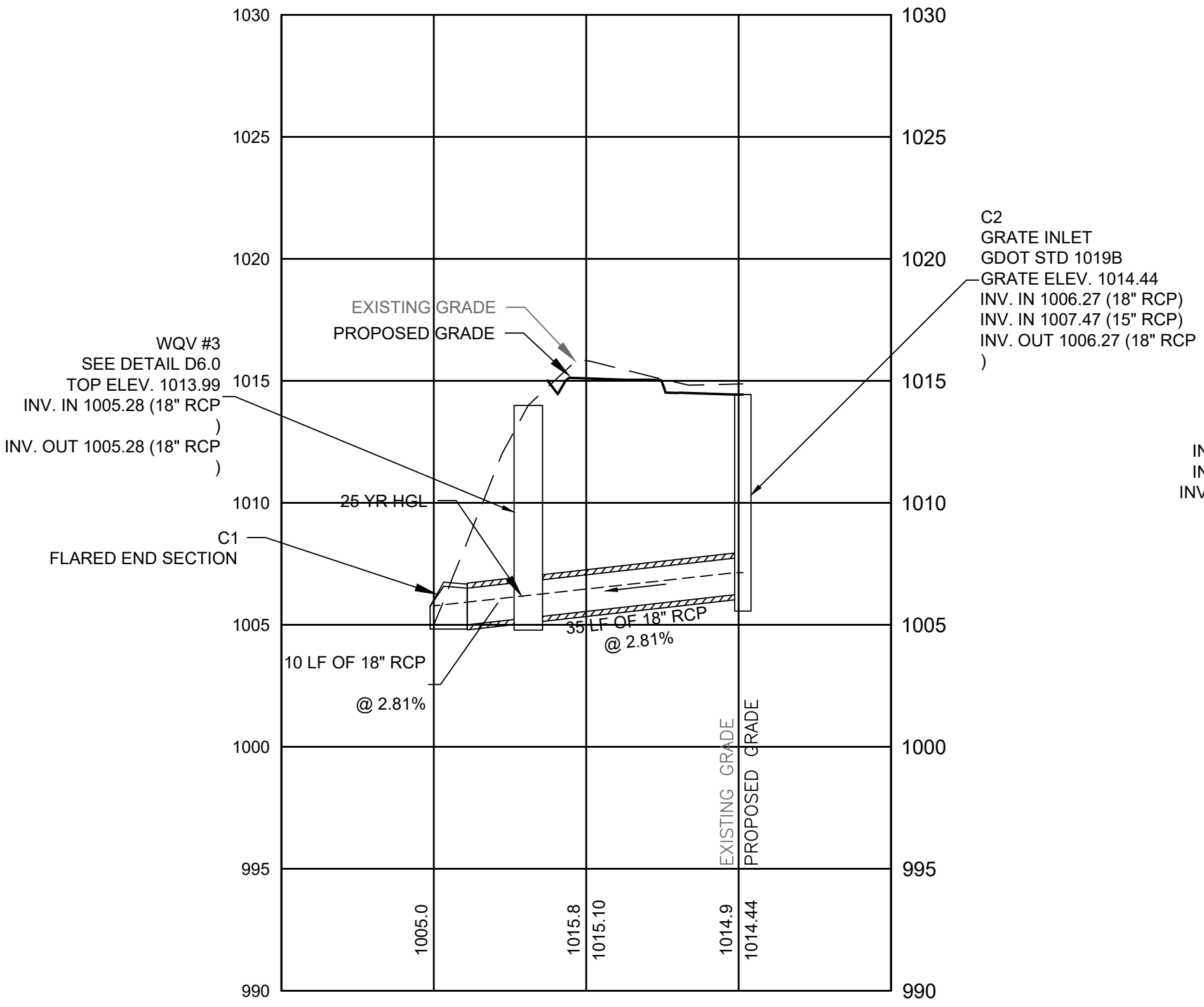
Fitzgerald Park Improvements - Phase 2
 4877 Lawrenceville Hwy
 Tucker, Georgia

STORM SEWER SYSTEM PROFILE

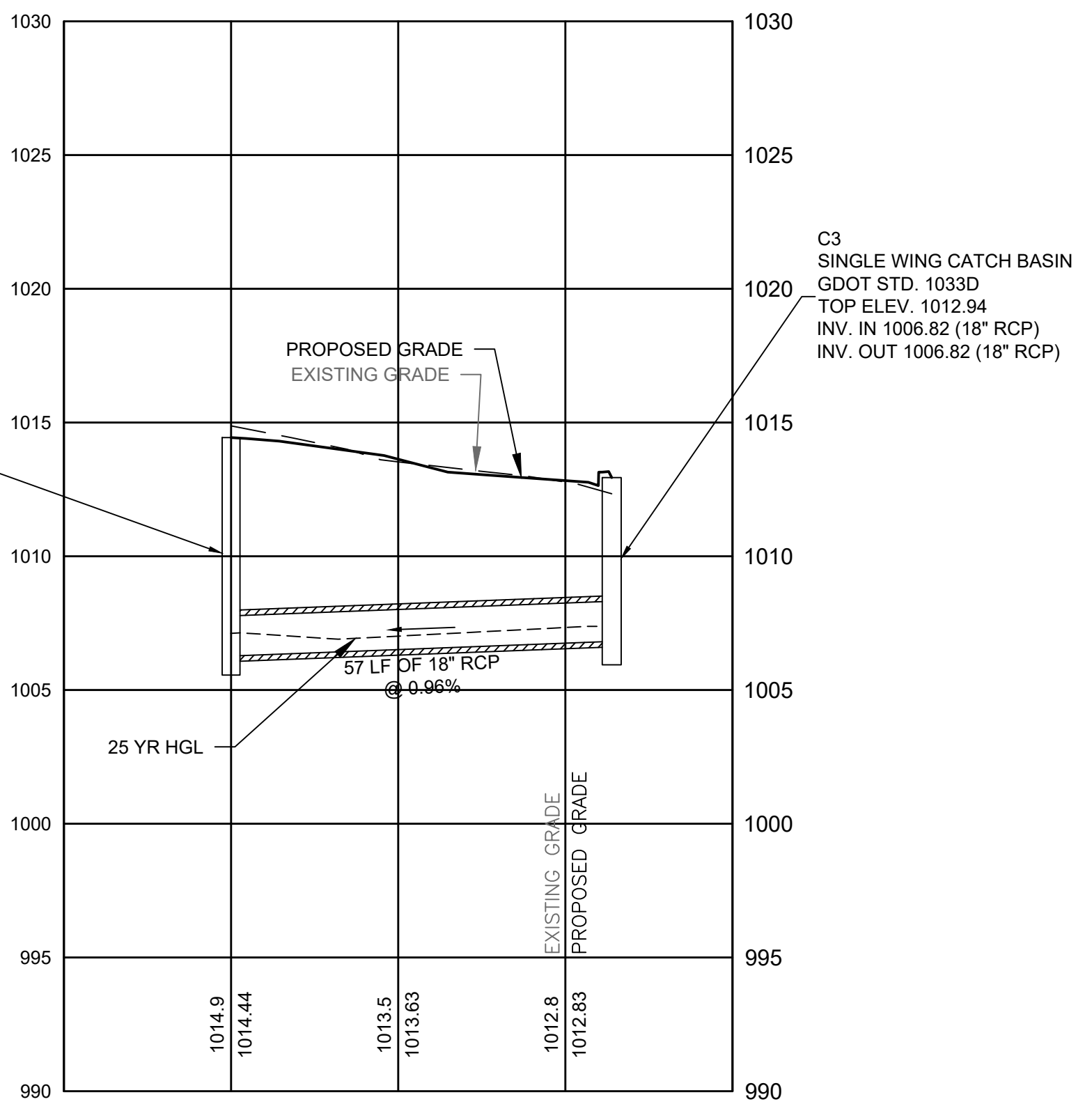
THIS BAR IS 1 INCH LONG PLOTTED FULL SCALE	
Project Manager:	CAS
Drawn By:	BAF
Checked By:	CAS
Date:	05/30/2023
Scale:	As Shown
Project No.:	200147
Drawing No.:	C6.4



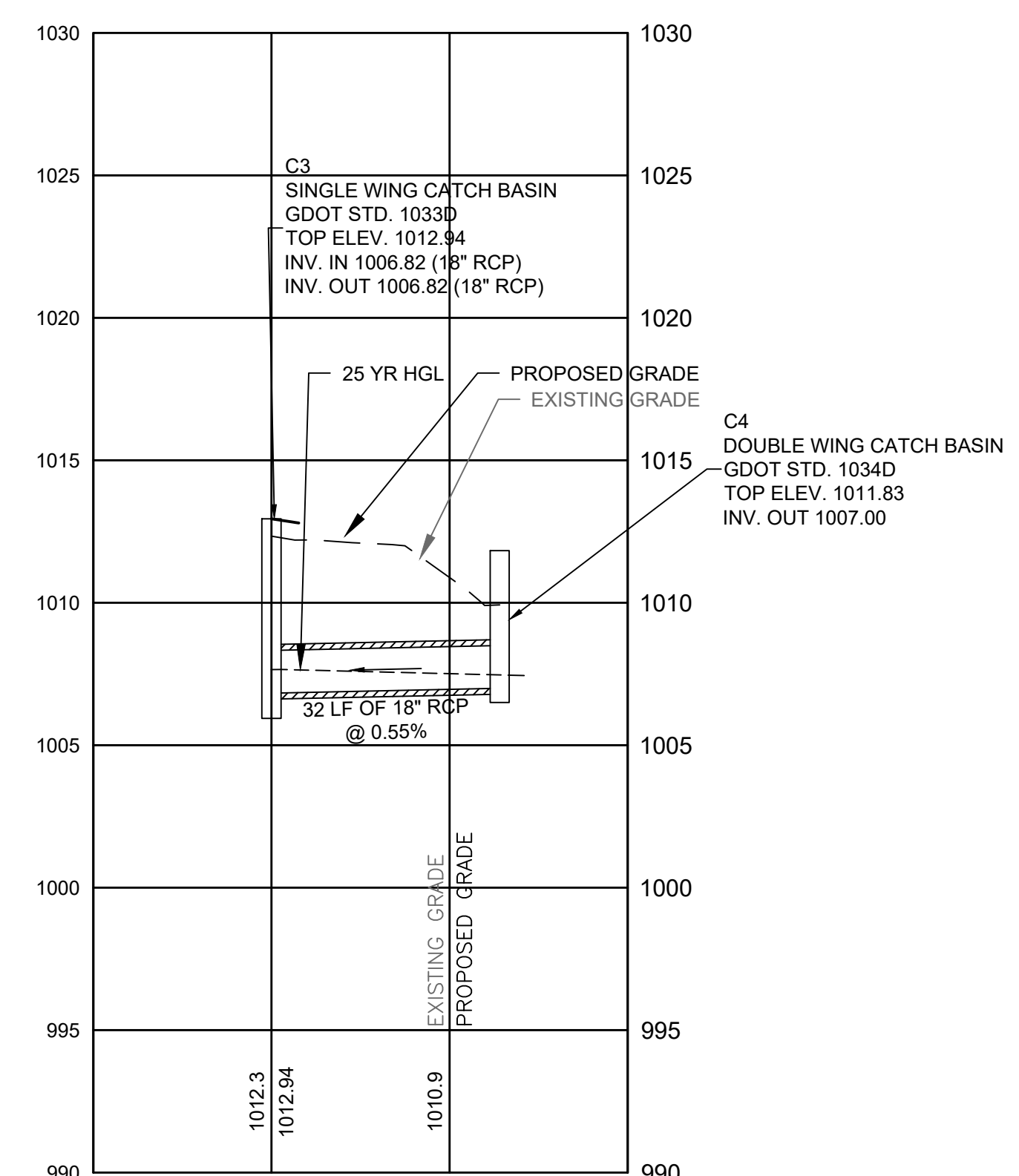
NO.	DATE	REVISION



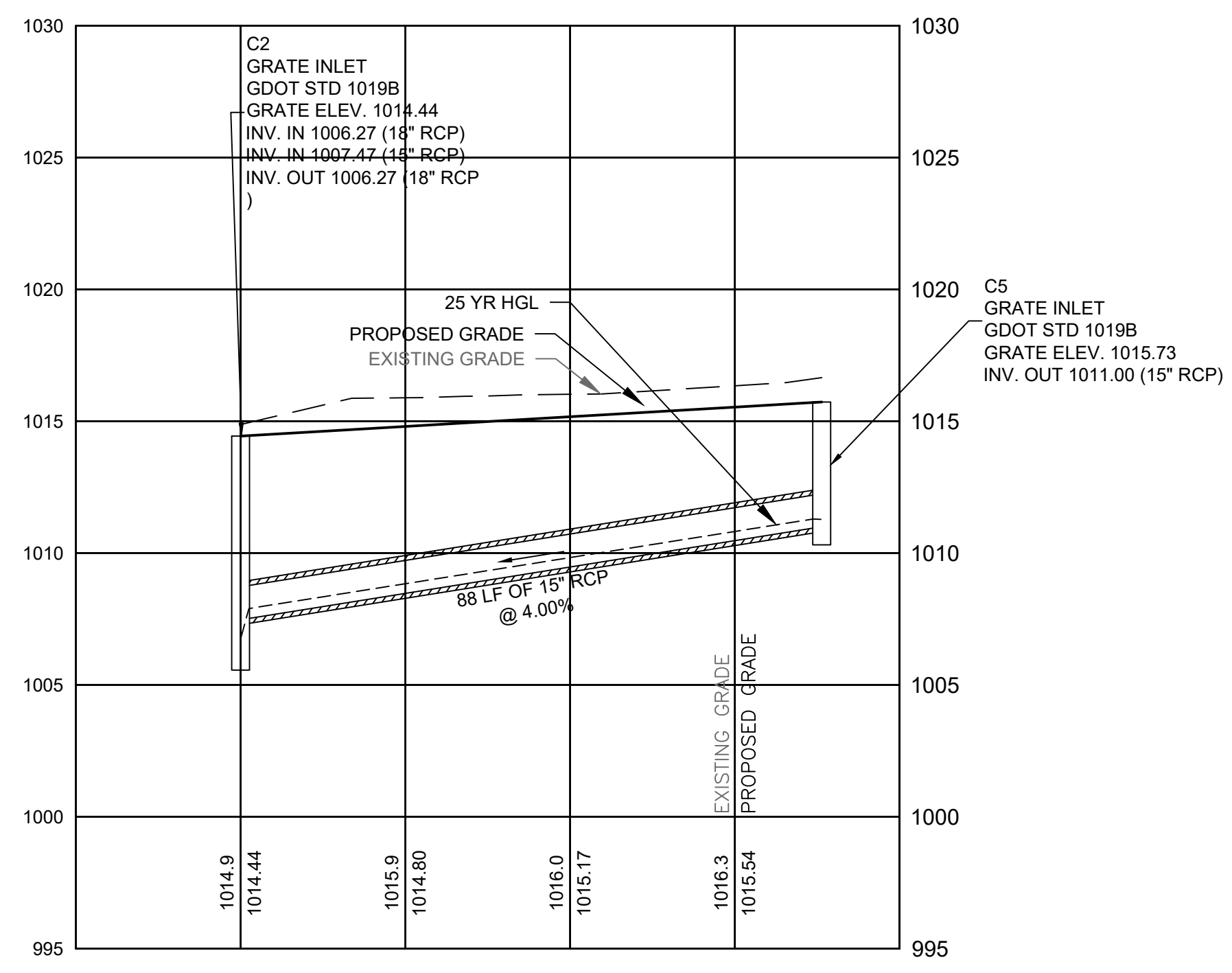
STORM SYSTEM C1 TO C2



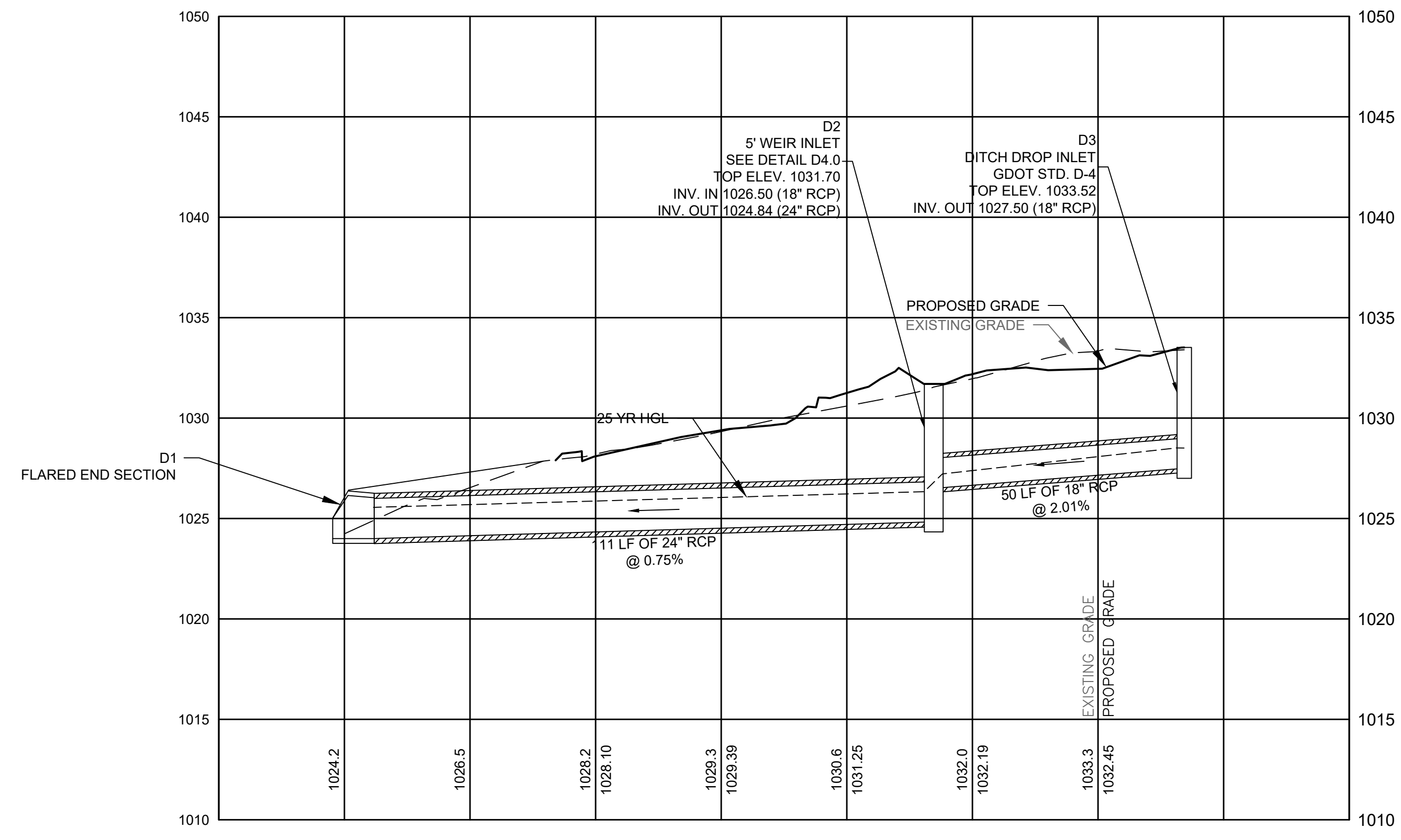
STORM SYSTEM C2 TO C3



STORM SYSTEM C3 TO C4

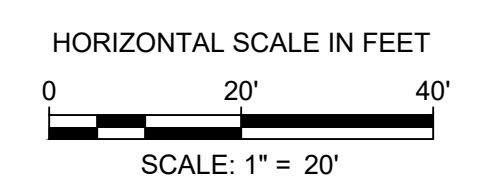
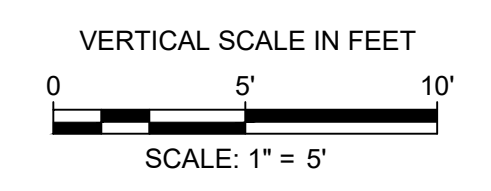


STORM SYSTEM C2 TO C5



STORM SYSTEM D1 TO D3

- NOTES:
- ALL UTILITY LOCATIONS ARE APPROXIMATE. CONTRACTOR TO FIELD VERIFY UTILITY LOCATIONS AND ELEVATIONS.
 - CONCRETE COLLAR TO BE INSTALLED BETWEEN FORCE MAIN AND STORM PIPE CROSSINGS.

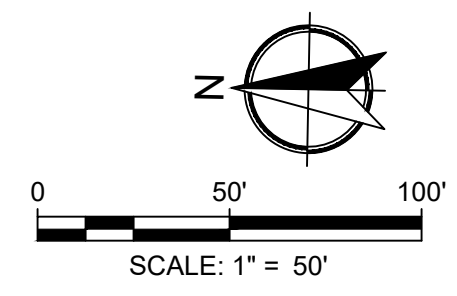
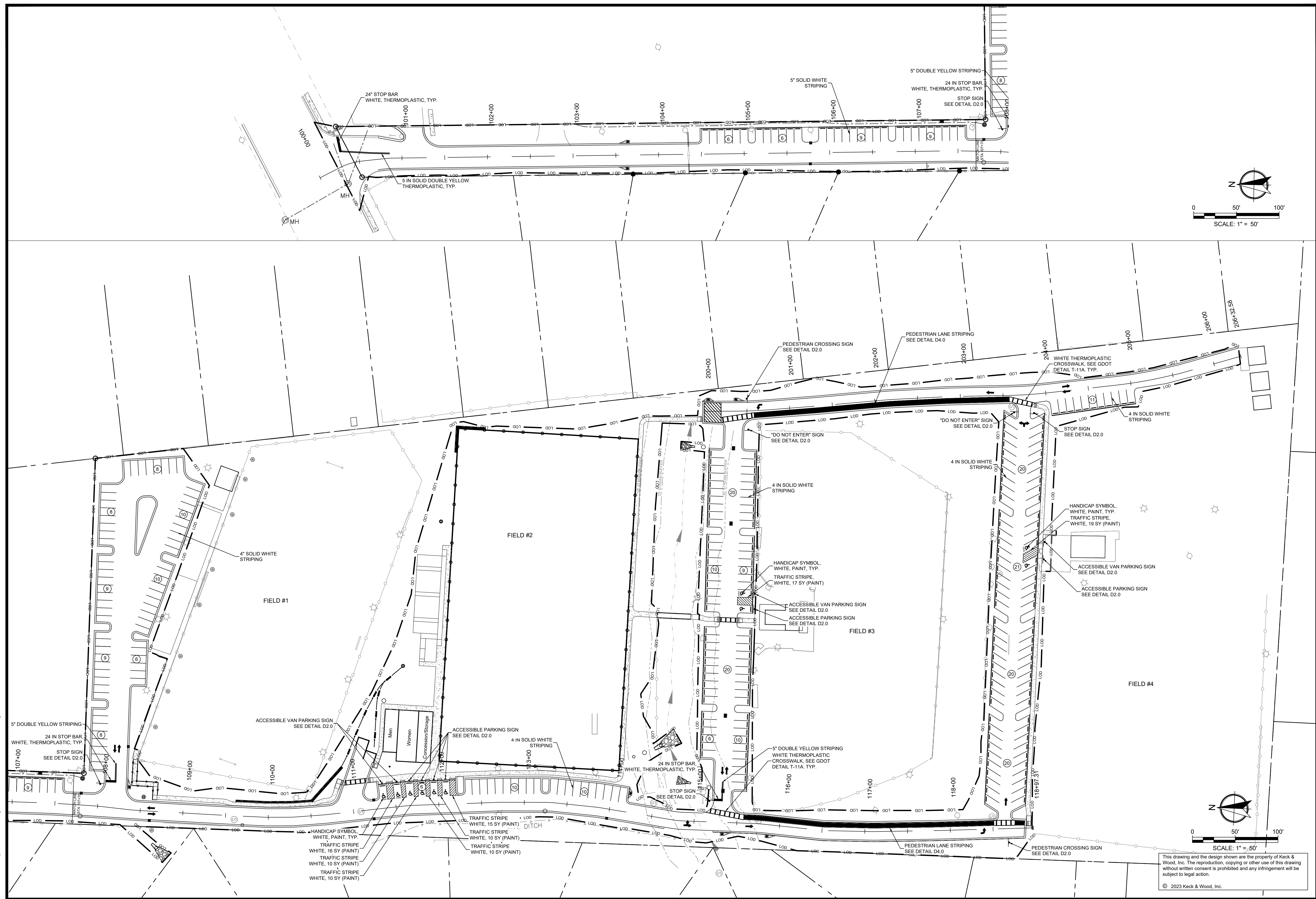


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STORM SEWER SYSTEM PROFILE

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Drawn By:	BAF
Checked By:	CAS
Date:	05/30/2023
Scale:	As Shown
Project No.:	200147
Drawing No.:	C6.5



NO.	DATE	REVISION

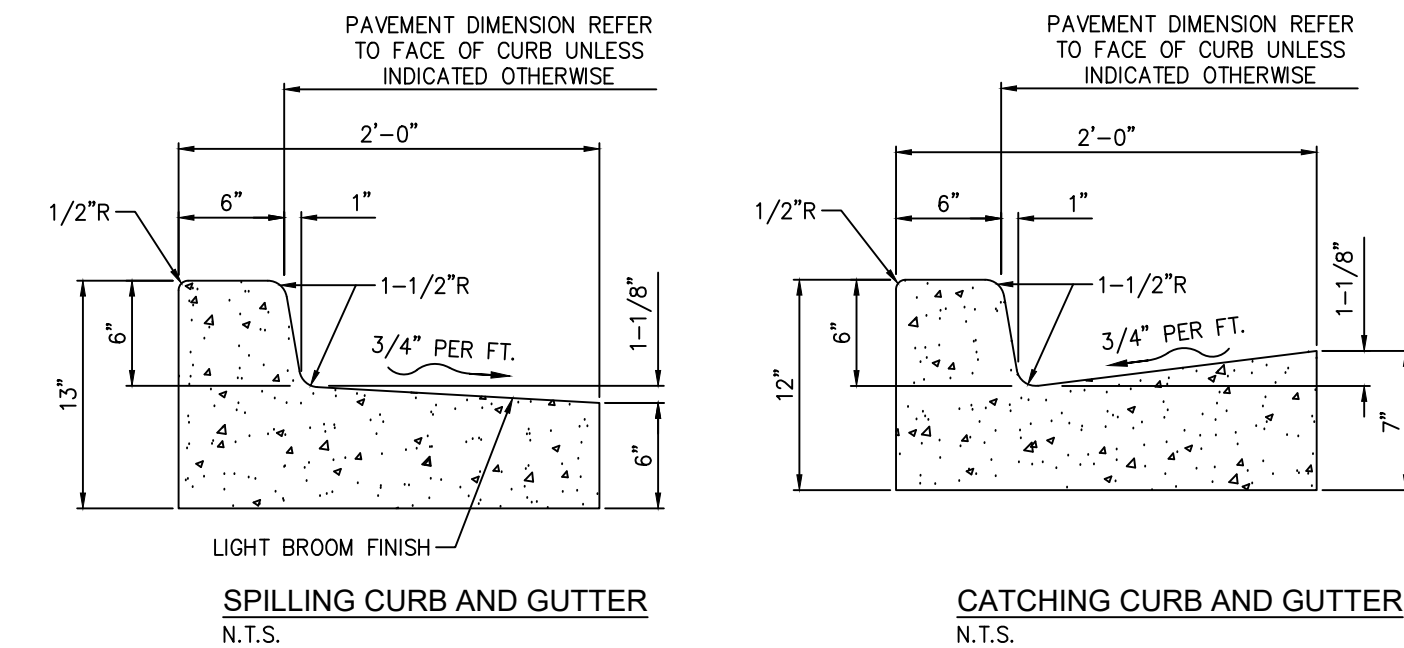
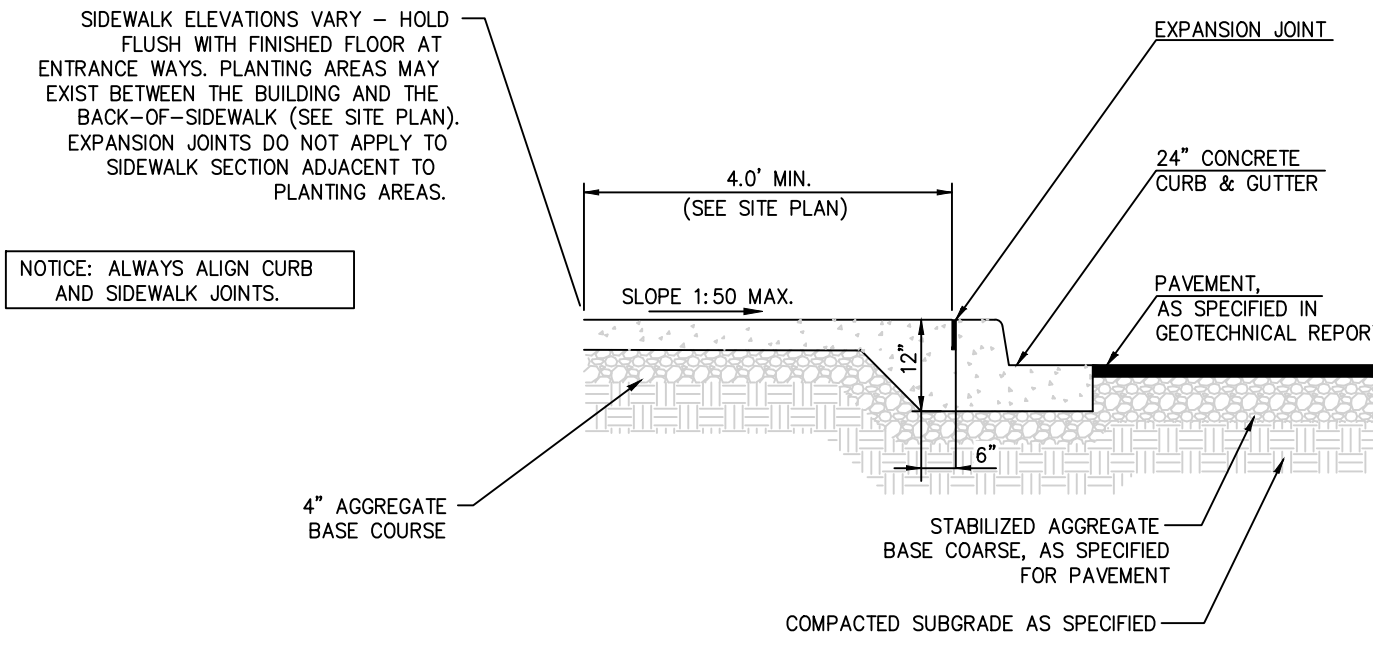
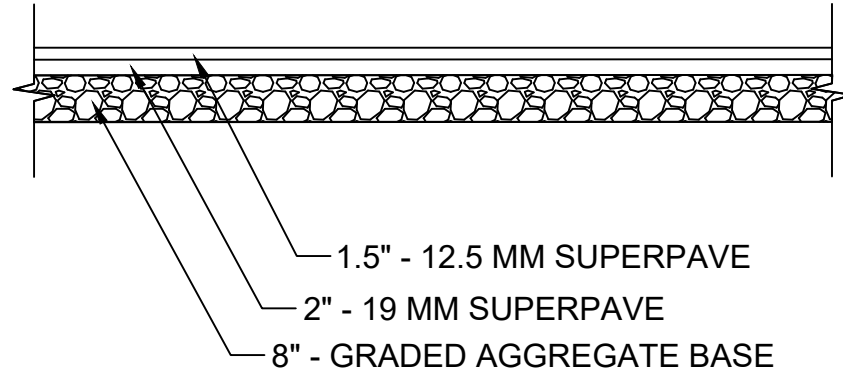
Fitzgerald Park Improvements - Phase 2
 4877 Lawrenceville Hwy
 Tucker, Georgia

STRIPING PLAN

THIS BAR IS 1 INCH LONG PLOTTED FULL SCALE	
Project Manager:	CAS
Drawn By:	BAF
Checked By:	CAS
Date:	05/30/2023
Scale:	As Shown
Project No.:	200147
Drawing No.:	C8.0

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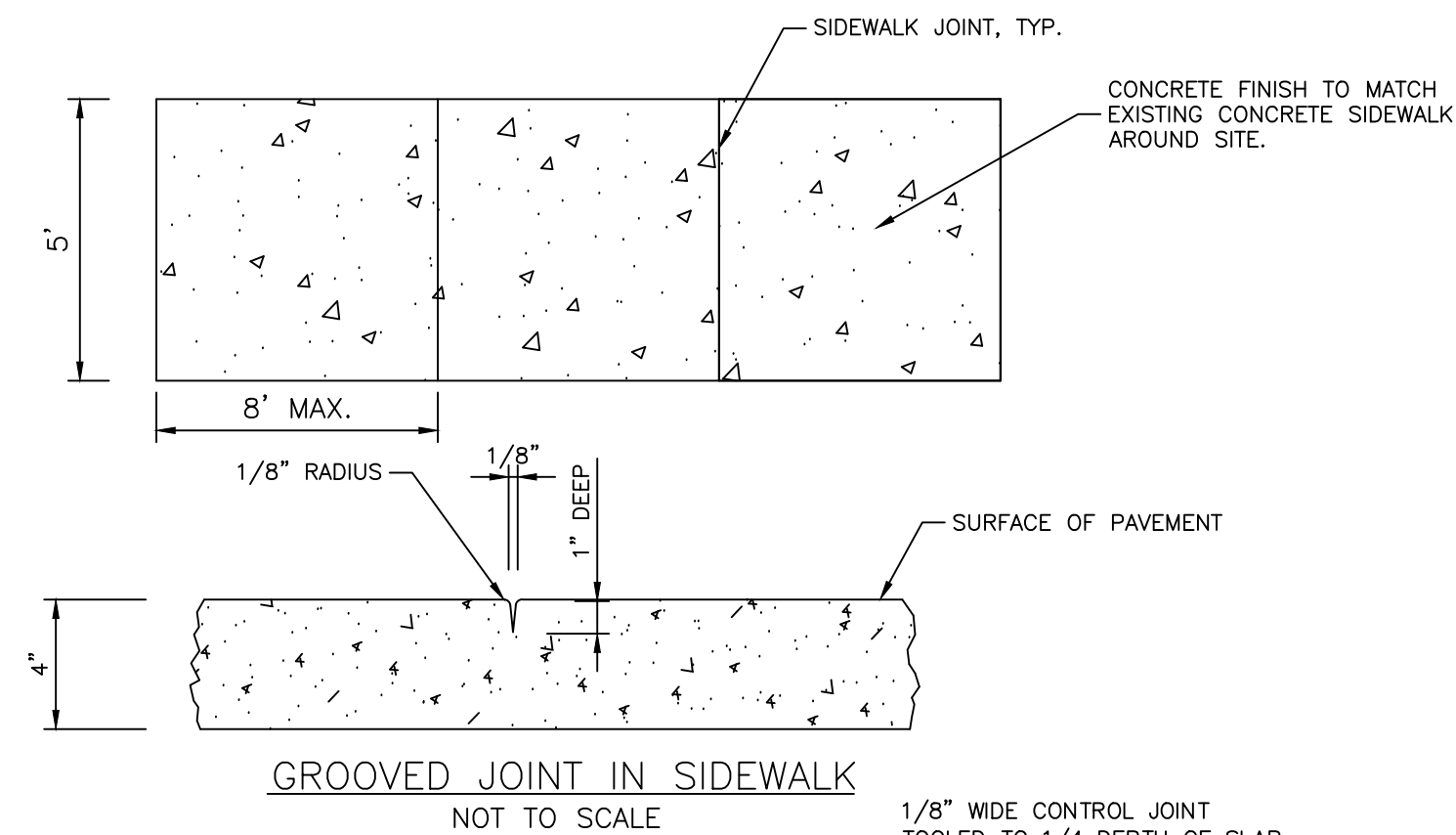
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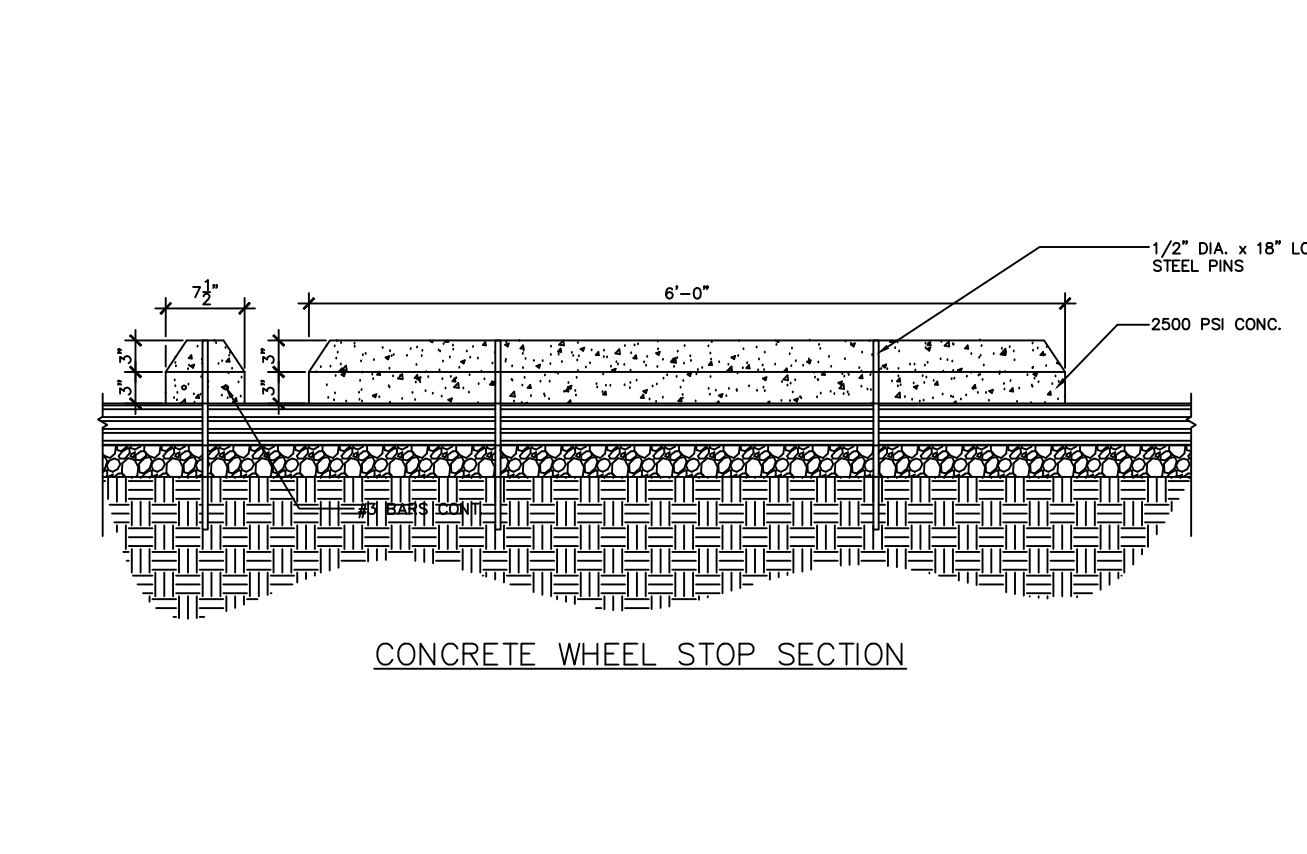
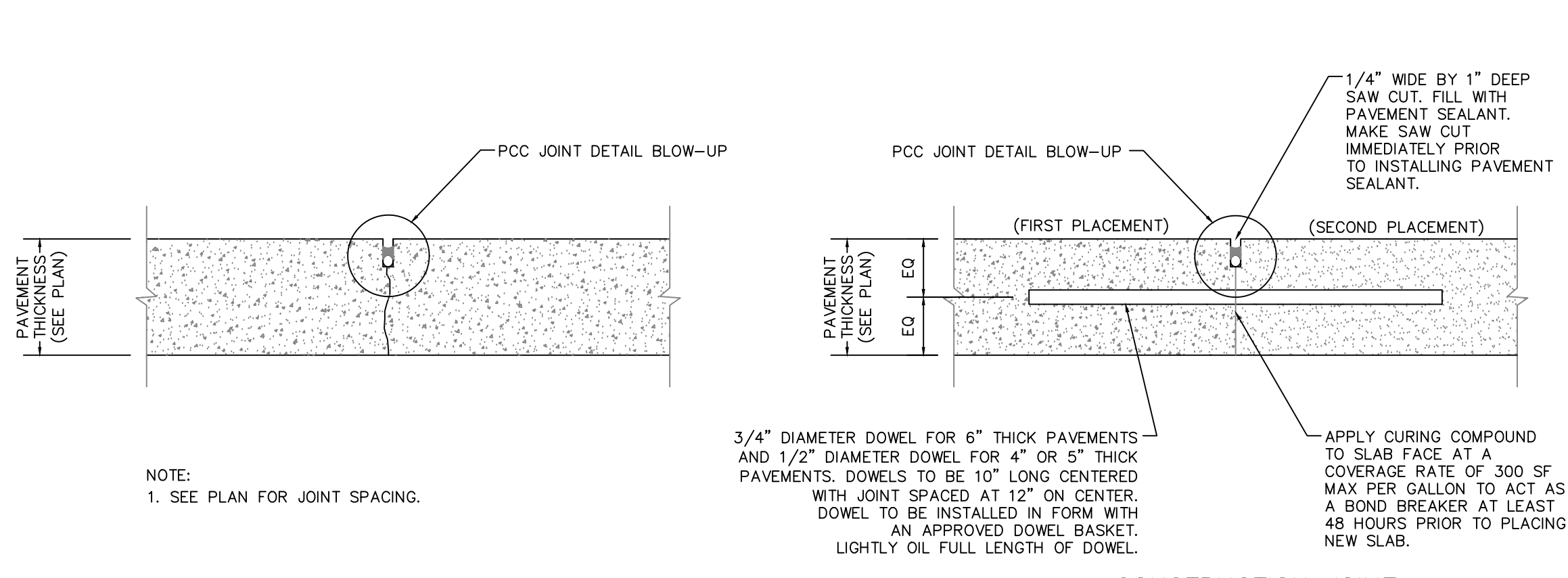
1 FULL DEPTH PAVEMENT SECTION

2 CONCRETE CURB AND GUTTER

3 SPILLING AND CATCHING CURB & GUTTER

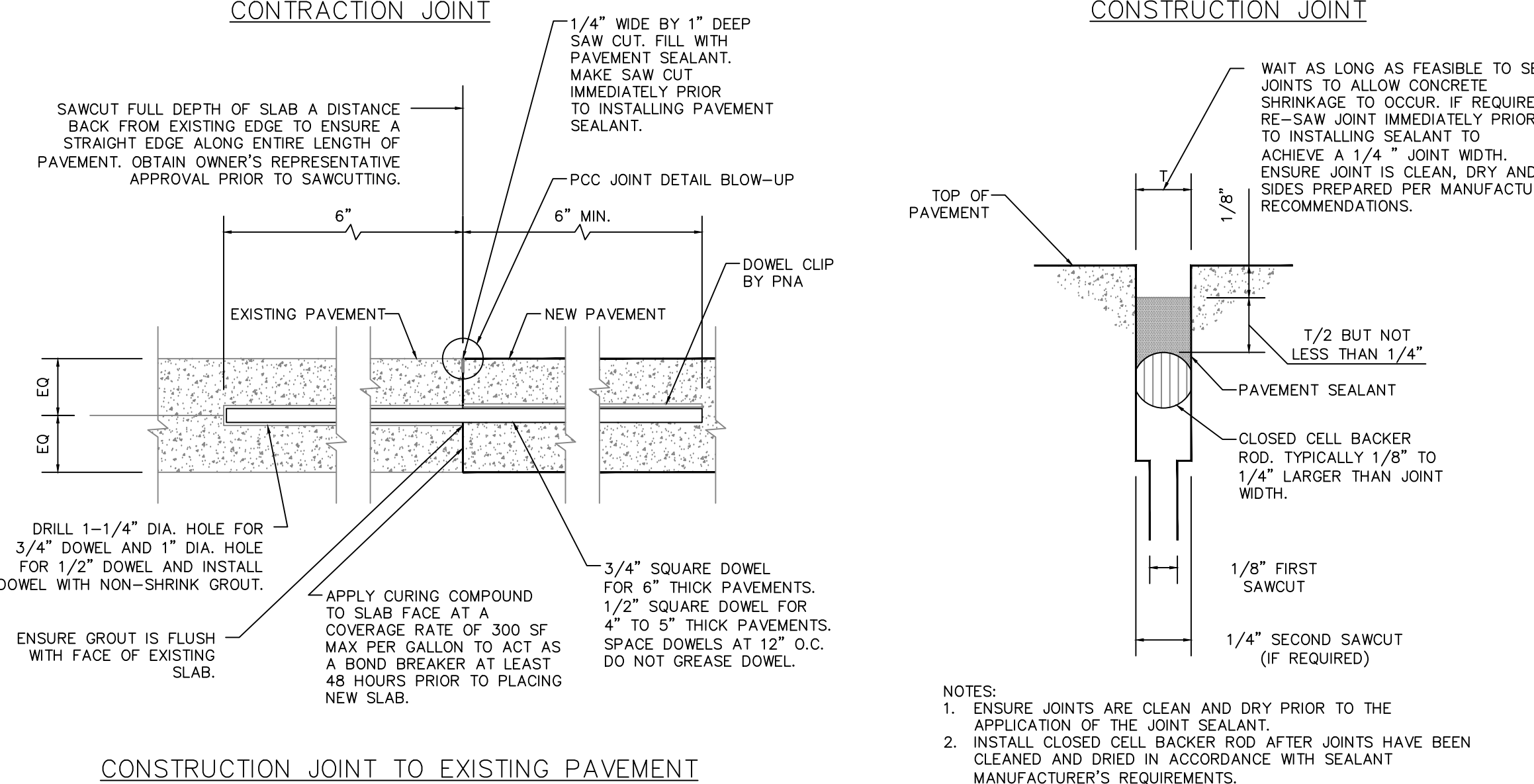


- GENERAL NOTES:
- SIDEWALK FINISH IS TO BE A BROOM FINISH AND TO THE SATISFACTION OF THE CITY OF NORCROSS. CITY & ENGINEER TO REVIEW FIRST POUR, PRIOR TO MOVING FORWARD WITH REMAINING CONCRETE PLACEMENT.
 - A GROOVE JOINT 1" DEEP WITH 1/8" RADII SHALL BE REQUIRED IN THE CONCRETE SIDEWALK AT MAXIMUM 8' INTERVALS. ONE 1/2" EXPANSION JOINT WILL BE REQUIRED AT MAXIMUM 48' INTERVALS. A 1/2" EXPANSION JOINT WILL BE REQUIRED WHERE THE SIDEWALK JOINS ANY RIGID STRUCTURE. SEE PLANS FOR JOINT LOCATIONS.
 - JOINT SEALANT SHALL COMPLY WITH GDOT STANDARD SPECIFICATIONS.
 - SIDEWALKS SHALL HAVE A MAXIMUM CROSS SLOPE OF 2.00% AND A MAXIMUM LONGITUDINAL SLOPE OF 8.3%.
 - ALL CONCRETE TO BE A MINIMUM 3,500 PSI.

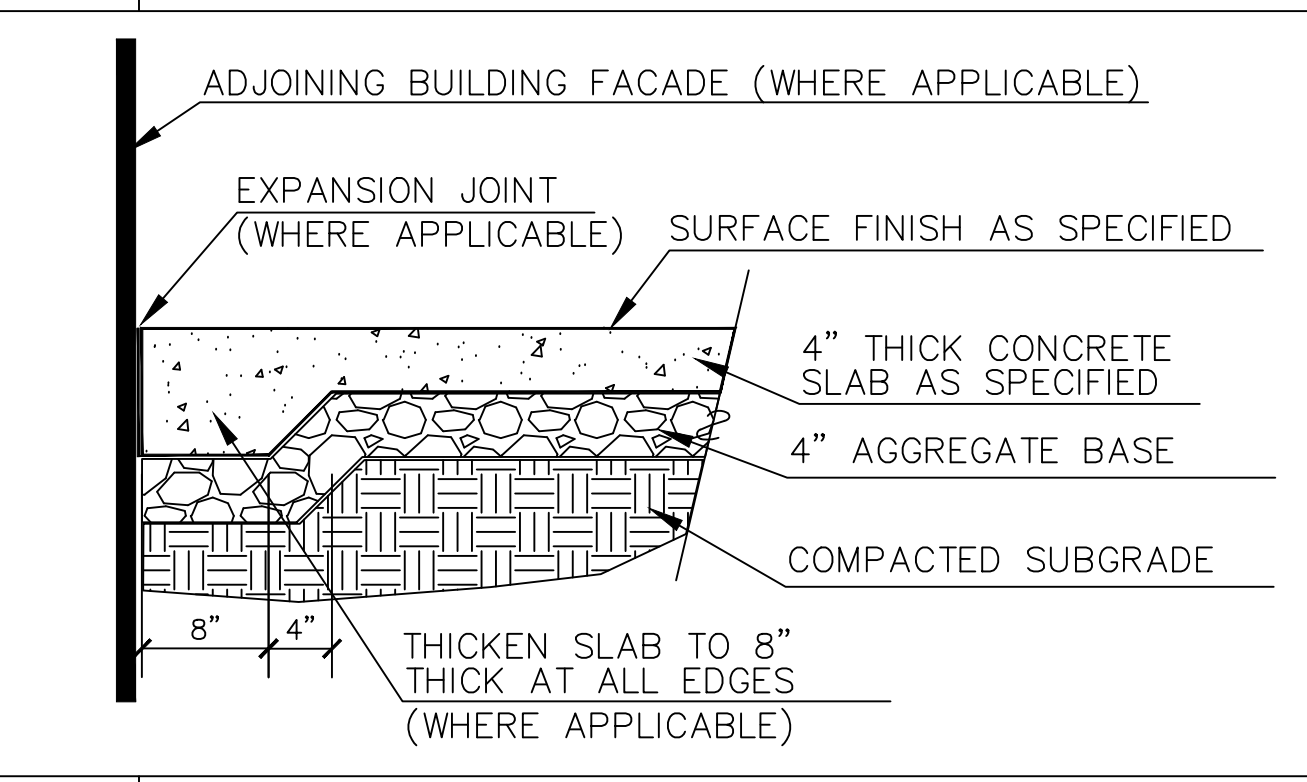


5 CONCRETE WHEEL STOP

4 CONCRETE SIDEWALK

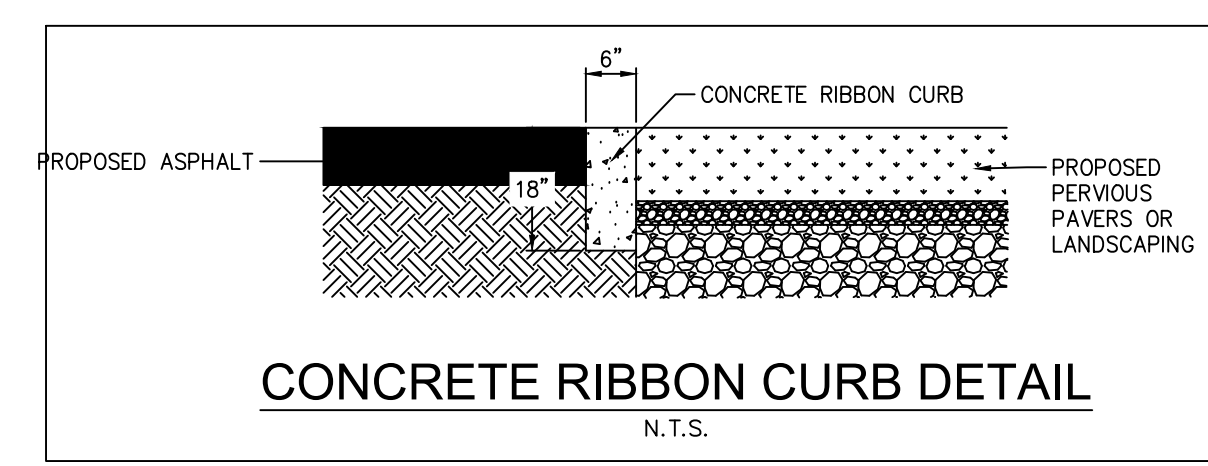


CONCRETE JOINT DETAILS
N.T.S.



5 SIDEWALK DETAIL AT BUILDING FACE

6 CONCRETE RIBBON CURB



7 CONCRETE JOINT

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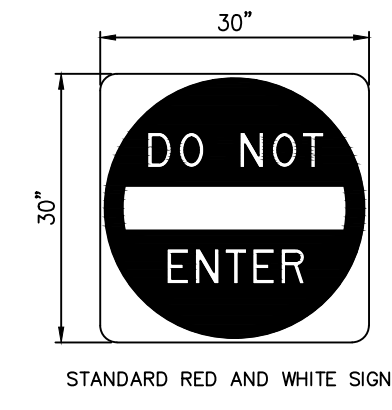
NO.	DATE	REVISION

Fitzgerald Park Improvements - Phase 2
4877 Lawrenceville Hwy
Tucker, Georgia
CONSTRUCTION DETAILS

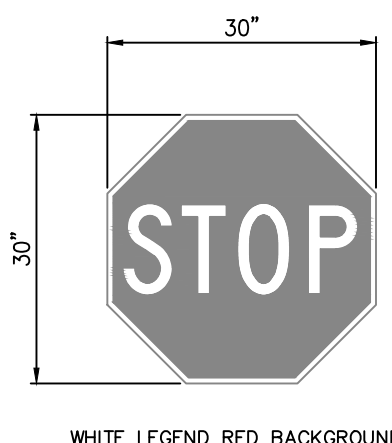
THIS BAR IS
1 INCH LONG
PLOTTED FULL SCALE

Project Manager:
CAS
Drawn By: BAF
Checked By: CAS
Date: 05/30/2023
Scale: As Shown

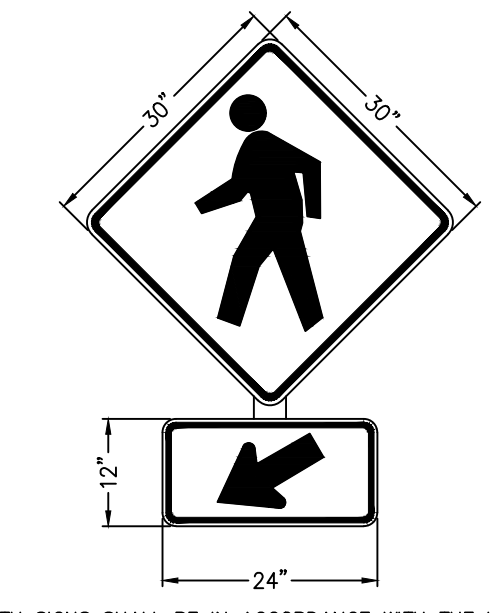
Project No.:
200147
Drawing No.:
D1.0



R5-1
"DO NOT ENTER" SIGN
N.T.S.



R1-1
30"X30"
"STOP" SIGN
N.T.S.



"PEDESTRIAN CROSSING" SIGN
N.T.S.

1

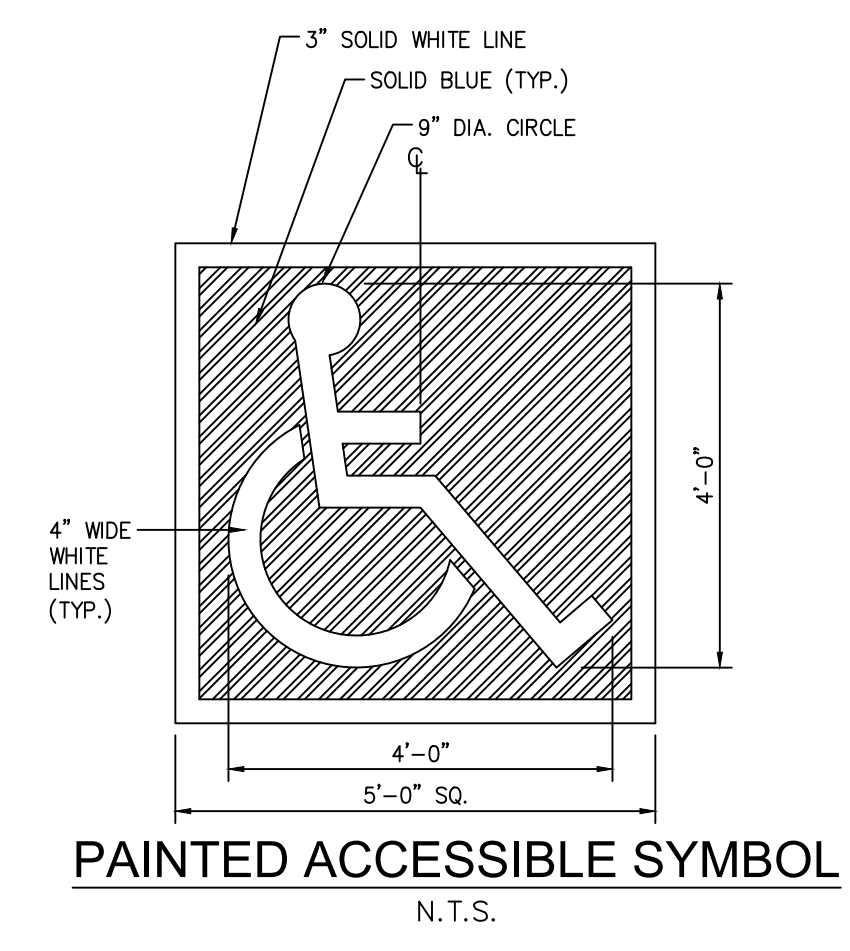
DO NOT ENTER SIGN

2

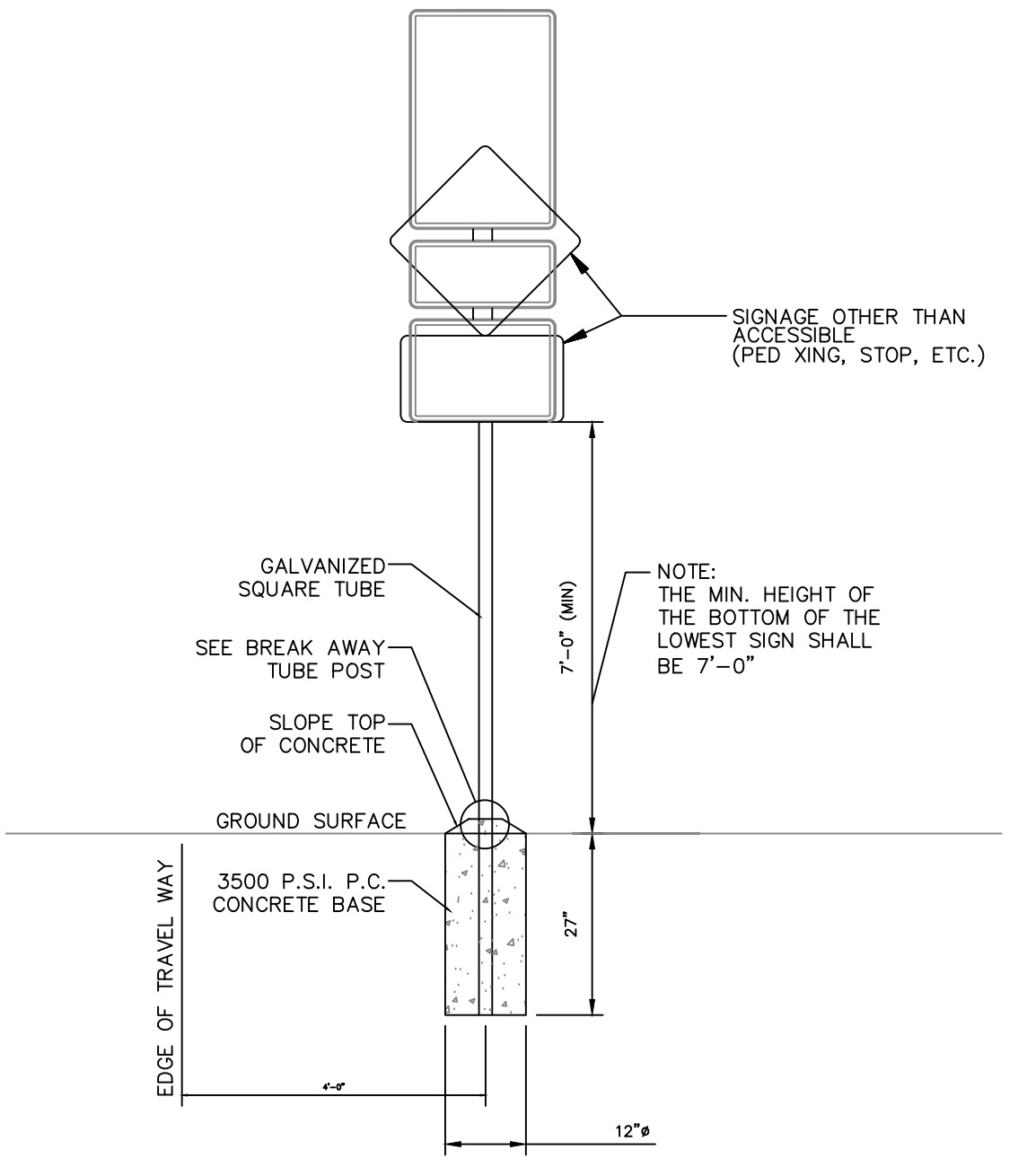
STOP SIGN

3

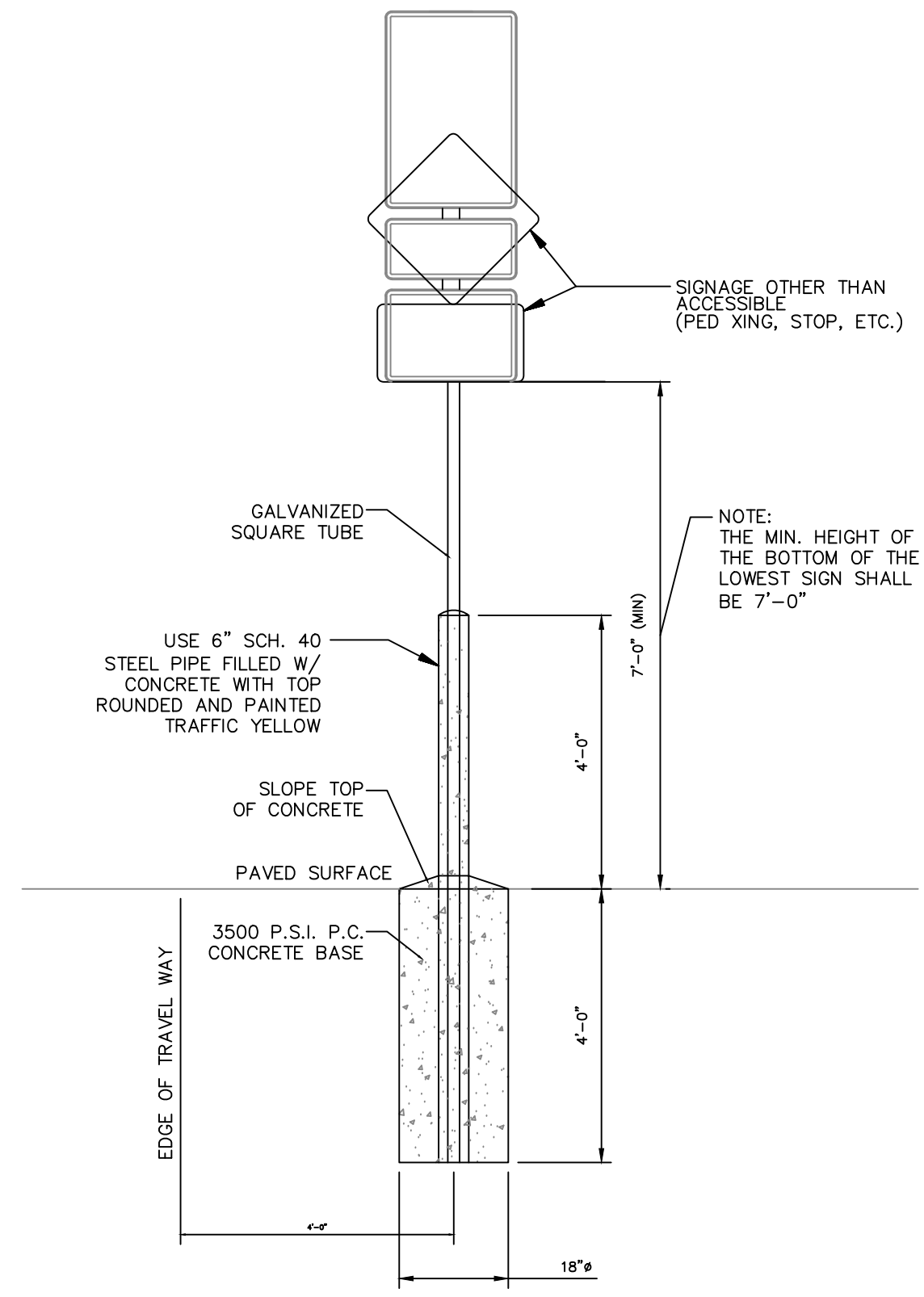
PEDESTRIAN CROSSING SIGN



PAINTED ACCESSIBLE SYMBOL
N.T.S.



SINGLE POST
N.T.S.

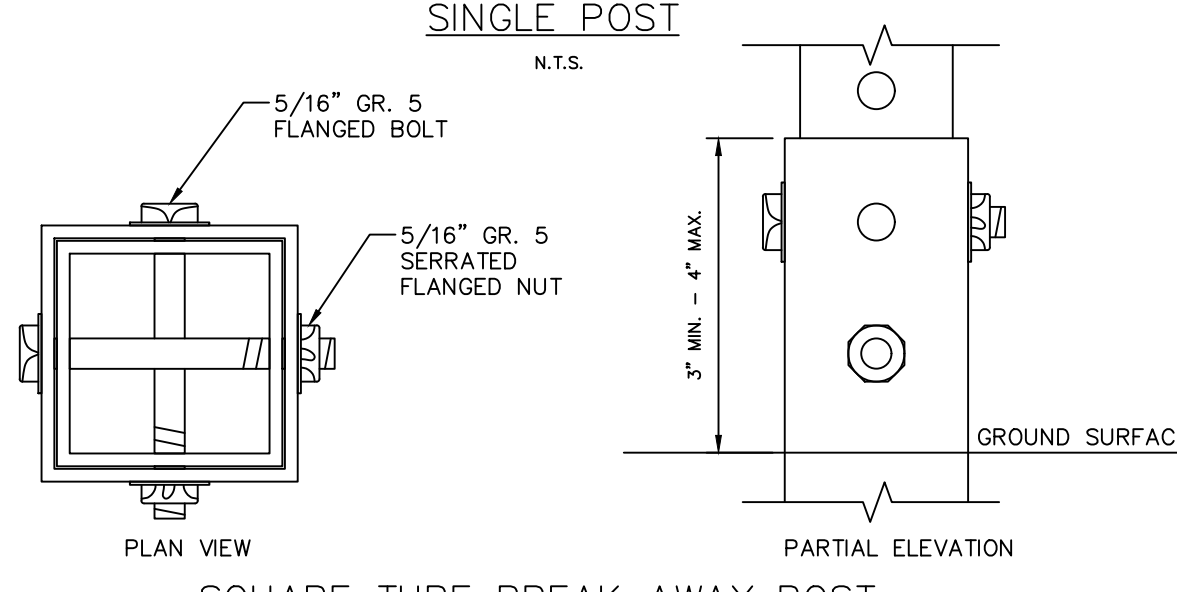


SINGLE POST
N.T.S.

- NOTES:
- ALL SIGNS SHALL COMPLY WITH U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL HIGHWAY ADMINISTRATION'S "MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES", LOCAL CODES AND AS SPECIFIED. MOUNT SIGNS TO POST IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
 - GALVANIZED SQUARE TUBE
POST TUBES - 2"x2"x3/16" 14ga
POST TUBE SHALL MEET ASTM A1011 GRADE 50.
POST TUBE GALVANIZED AS PER ASTM A653 GRADE 90.

SIGN MOUNTING AND BASE WITH BOLLARD
(USE WHERE SIGN IS NOT WITHIN CURBED ISLAND)

N.T.S.



SQUARE TUBE BREAK AWAY POST
N.T.S.

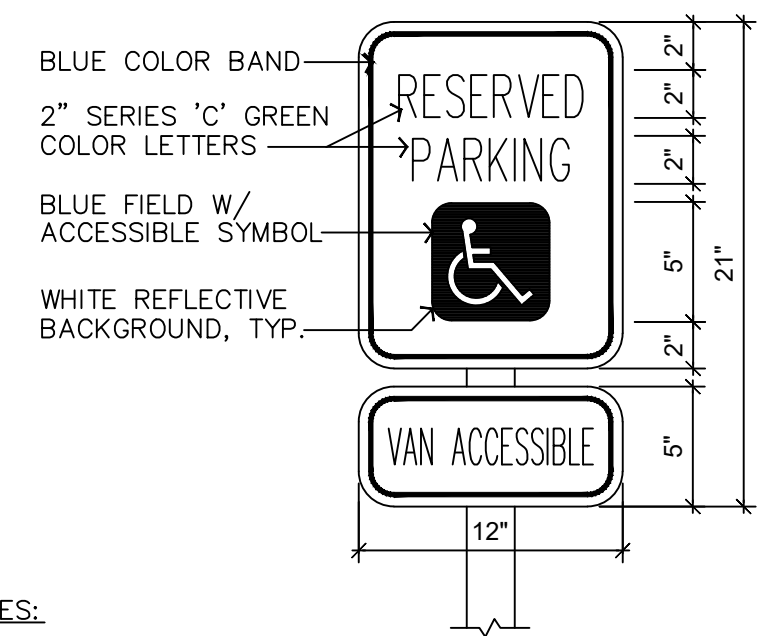
- NOTES:
- ALL SIGNS SHALL COMPLY WITH U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL HIGHWAY ADMINISTRATION'S "MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES", LOCAL CODES AND AS SPECIFIED. MOUNT SIGNS TO POST IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
 - GALVANIZED SQUARE TUBE
POST TUBES - 2"x2"x3/16" 14ga
POST TUBE SHALL MEET ASTM A1011 GRADE 50.
POST TUBE GALVANIZED AS PER ASTM A653 GRADE 90.
ANCHOR TUBE - 2-1/4"x2-1/4"x3/16" 14ga
HEAVY DUTY ANCHOR TUBE SHALL MEET ASTM A500 GRADE B.
STRUCTURAL TUBE AND STEEL SHALL BE HOT DIP GALVANIZED PER ASTM A123.
THE UPPER SIGN POST SHALL TELESCOPE INSIDE THE ANCHOR TUBE A MINIMUM OF 12". THE ANCHOR TUBE SHALL BE A MINIMUM 27" DEEP WITH 3" MIN. 4" MAX. EXPOSED ABOVE FINISH GRADE.

SIGN MOUNTING AND BASE
(USE WHERE SIGN IS WITHIN CURBED ISLAND)

N.T.S.

4

PAINTED ACCESSIBLE SYMBOL



- NOTES:
- LOCATE BOTTOM OF SIGN NOT LESS THAN 7'-0" FEET ABOVE GRADE ON TWO INCH DIAMETER STEEL POLE.
 - SIGNS SHOULD BE PROPERLY CENTERED WITHIN THE PARKING SPACE.
 - THE SIGN FACE SHOULD BE LOCATED NO FURTHER THAN SIX FEET FROM THE FRONT OF EACH PARKING SPACE.
 - REFER TO SITE PLAN DRAWING FOR LOCATION.
 - SIGN TO CONFORM TO LOCAL ORDINANCE FOR SIZE AND LETTERING.
 - PROVIDE "VAN ACCESSIBLE" SIGN WHERE REQUIRED.

ACCESSIBLE PARKING SIGN
N.T.S.

5

ACCESSIBLE PARKING SIGN

6

SIGN MOUNTING AND BASE

NO.	DATE	REVISION

Fitzgerald Park Improvements - Phase 2
4877 Lawrenceville Hwy
Tucker, Georgia

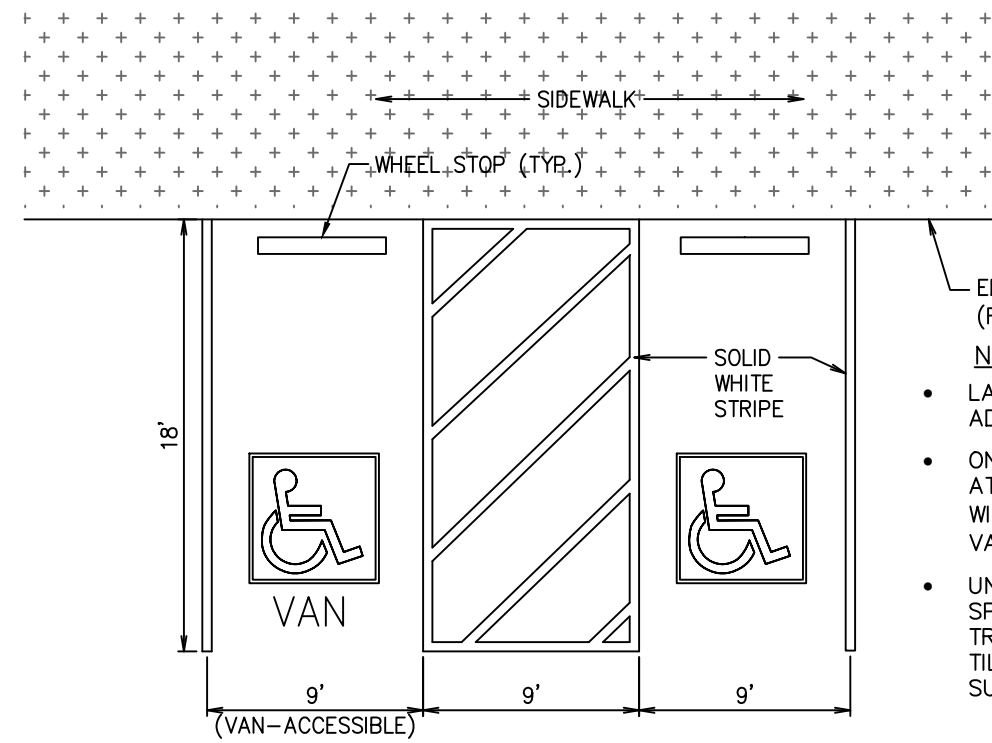
CONSTRUCTION DETAILS

THIS BAR IS
1 INCH LONG
PLOTTED FULL SCALE

Project Manager: CAS	Checked By: CAS
Drawn By: BAF	Date: 05/30/2023
Scale: As Shown	

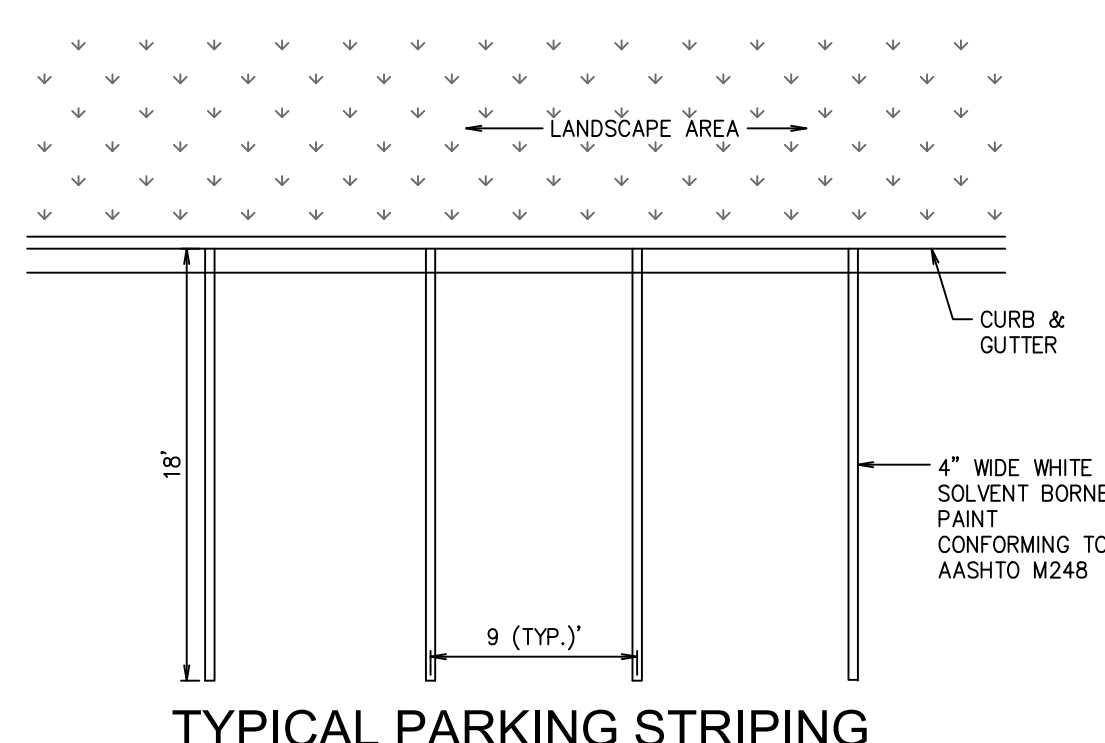
Project No.:
200147
Drawing No.:
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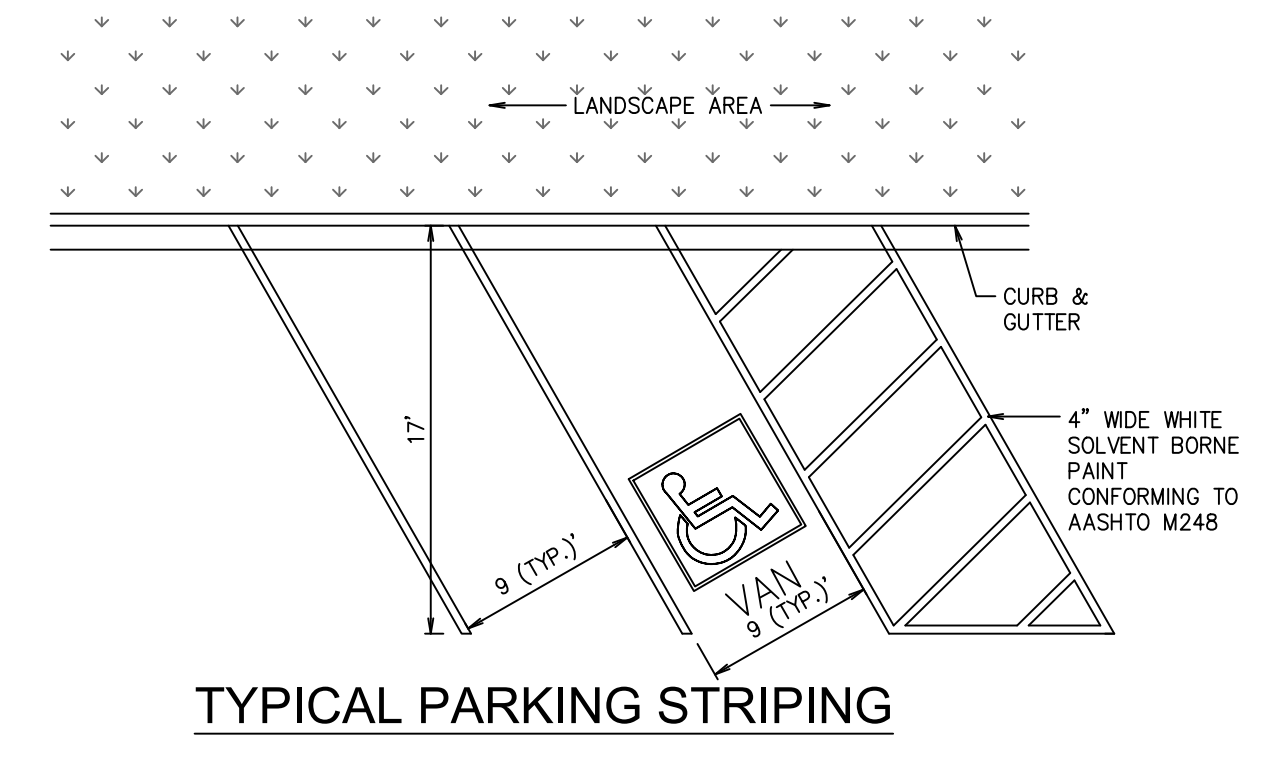


- EDGE OF SIDEWALK (FLUSH)
- NOTES:
- LAYOUT & STRIPE ACCESSIBLE PARKING SPACE(S) PER ADA & LOCAL ACCESSIBILITY CODE.
 - ONE OF EVERY EIGHT ACCESSIBLE SPACES, BUT ALWAYS AT LEAST ONE IS TO BE VAN- ACCESSIBLE. NORMAL WIDTH OF STRIPED LANE IS 5', WHILE FOR A VAN-ACCESSIBLE SPOT THE WIDTH IS 8'.
 - UNLESS REQUIRED BY LOCAL JURISDICTION OR TENANT SPECIFICATION, DETECTABLE WARNING SHALL BE TRUNCATED DUMES INSTALLED USING CAST IN PLACE TILES. COLOR SHALL CONTRAST FROM ADJACENT WALKING SURFACE

ADA PARKING STRIPING
N.T.S.



TYPICAL PARKING STRIPING
SCALE: N.T.S.



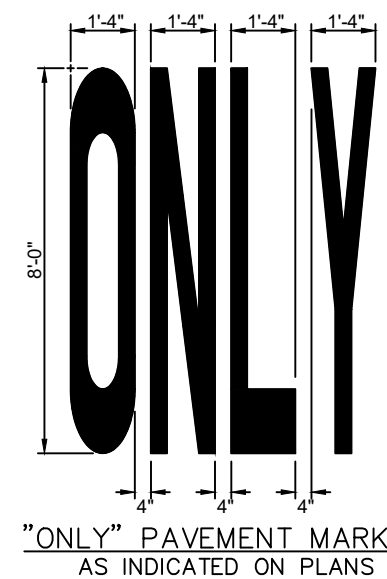
TYPICAL PARKING STRIPING

1 **ADA PARKING STRIPING**

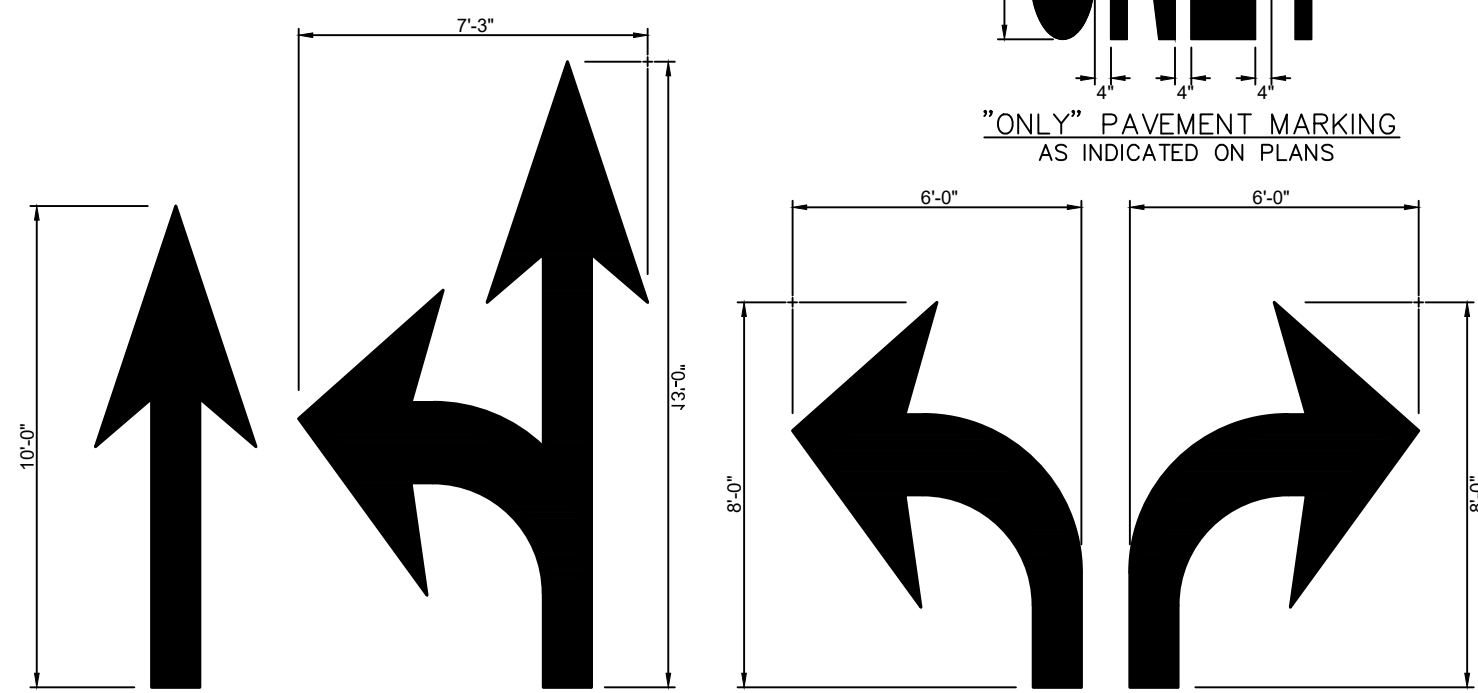
2 **TYPICAL PARKING STRIPING**

3 **DIAGONAL PARKING STRIPING**

- NOTES:
- WORDS AND ARROWS SHALL BE APPLIED IN ACCORDANCE WITH SECTION 3B.20 OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS.
 - THESE WORDS ARE TO BE PAINTED "RETROREFLECTIVE WHITE WITH GLASS BEADS", PER SPECIFICATIONS, WHEN AT EXITS FROM PARKING LOT TO PUBLIC STREETS.



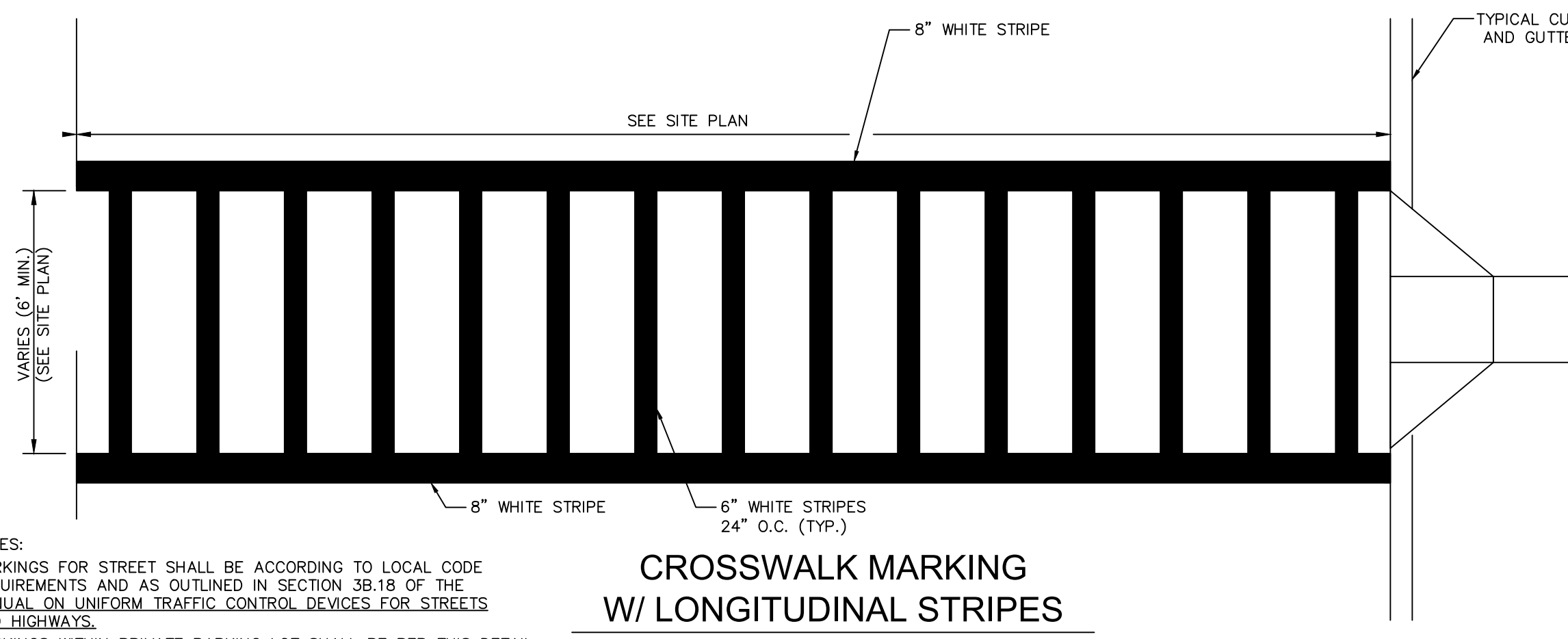
"ONLY" PAVEMENT MARKING AS INDICATED ON PLANS



SOLID ARROW MARKINGS AS INDICATED ON PLANS PAINTED "RETROREFLECTIVE WHITE"

ROADWAY SOLID ARROW PAVEMENT MARKINGS
N.T.S.

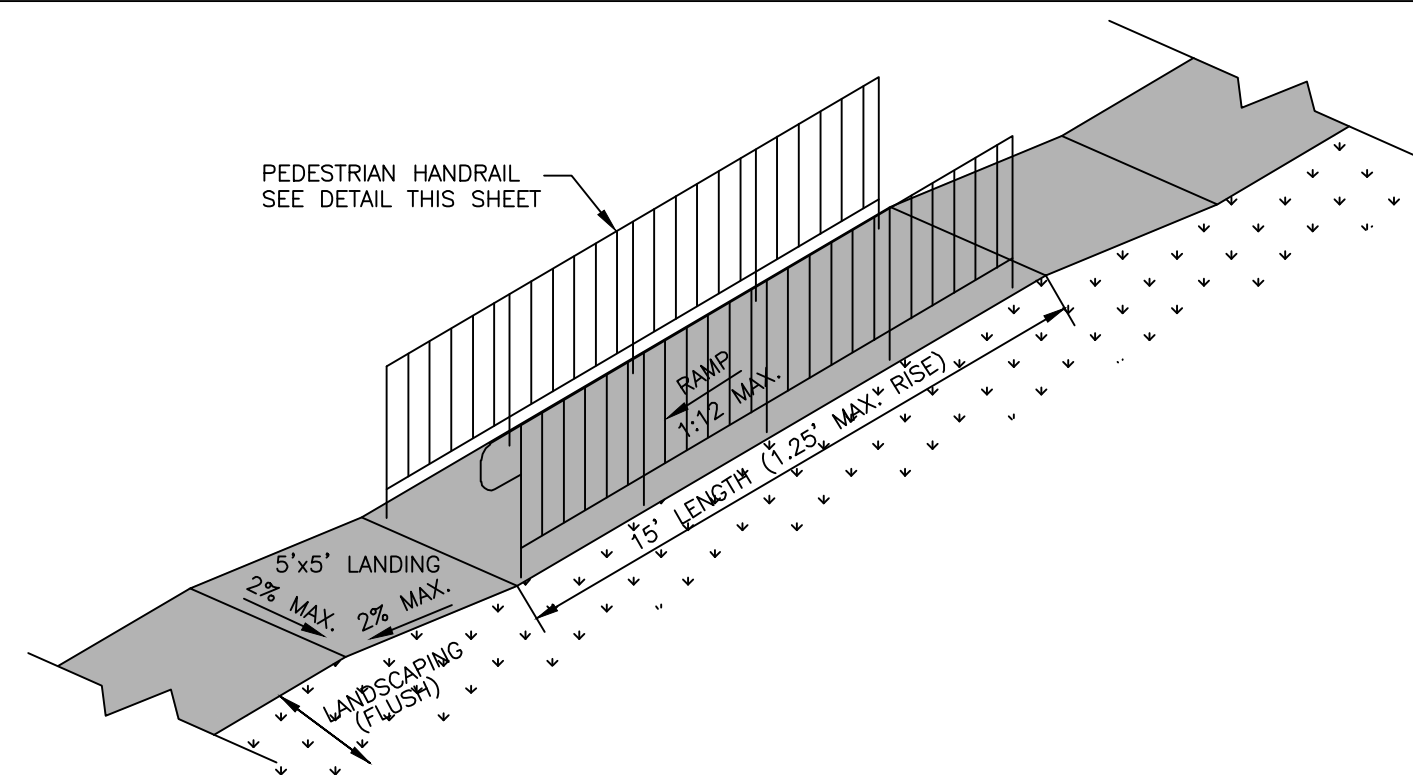
4 **ROADWAY SOLID ARROW PAVEMENT MARKINGS**



- NOTES:
- MARKINGS FOR STREET SHALL BE ACCORDING TO LOCAL CODE REQUIREMENTS AND AS OUTLINED IN SECTION 3B.18 OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS.
 - MARKINGS WITHIN PRIVATE PARKING LOT SHALL BE PER THIS DETAIL.
 - THESE MARKINGS ARE TO BE PAINTED RETROREFLECTIVE WHITE.

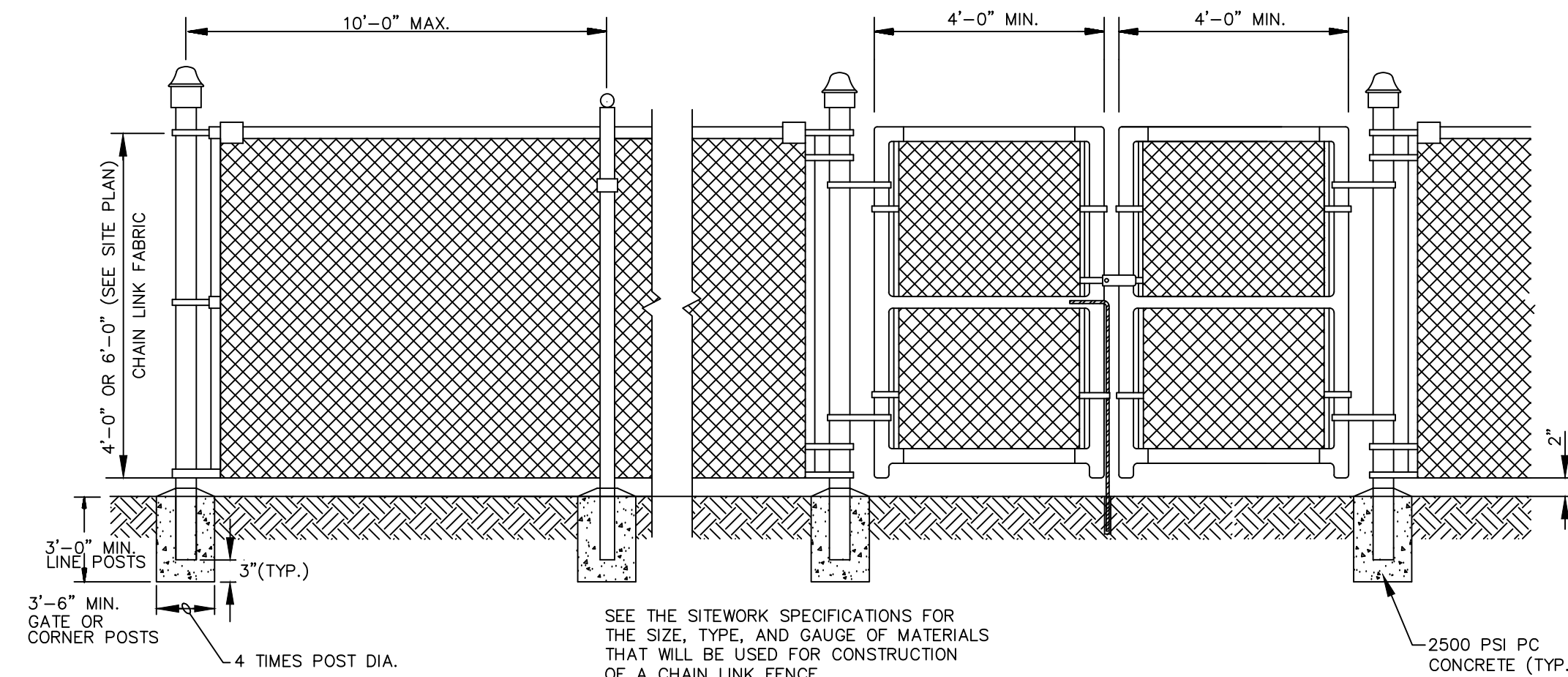
CROSSWALK MARKING W/ LONGITUDINAL STRIPES
N.T.S.

5 **CROSSWALK MARKING W/ LONGITUDINAL STRIPES**



SIDEWALK RAMP DETAIL
N.T.S.

6 **SIDEWALK RAMP DETAIL**



CHAIN LINK FENCE W/4' DOUBLE GATE
N.T.S.

7 **CHAIN LINK FENCE**

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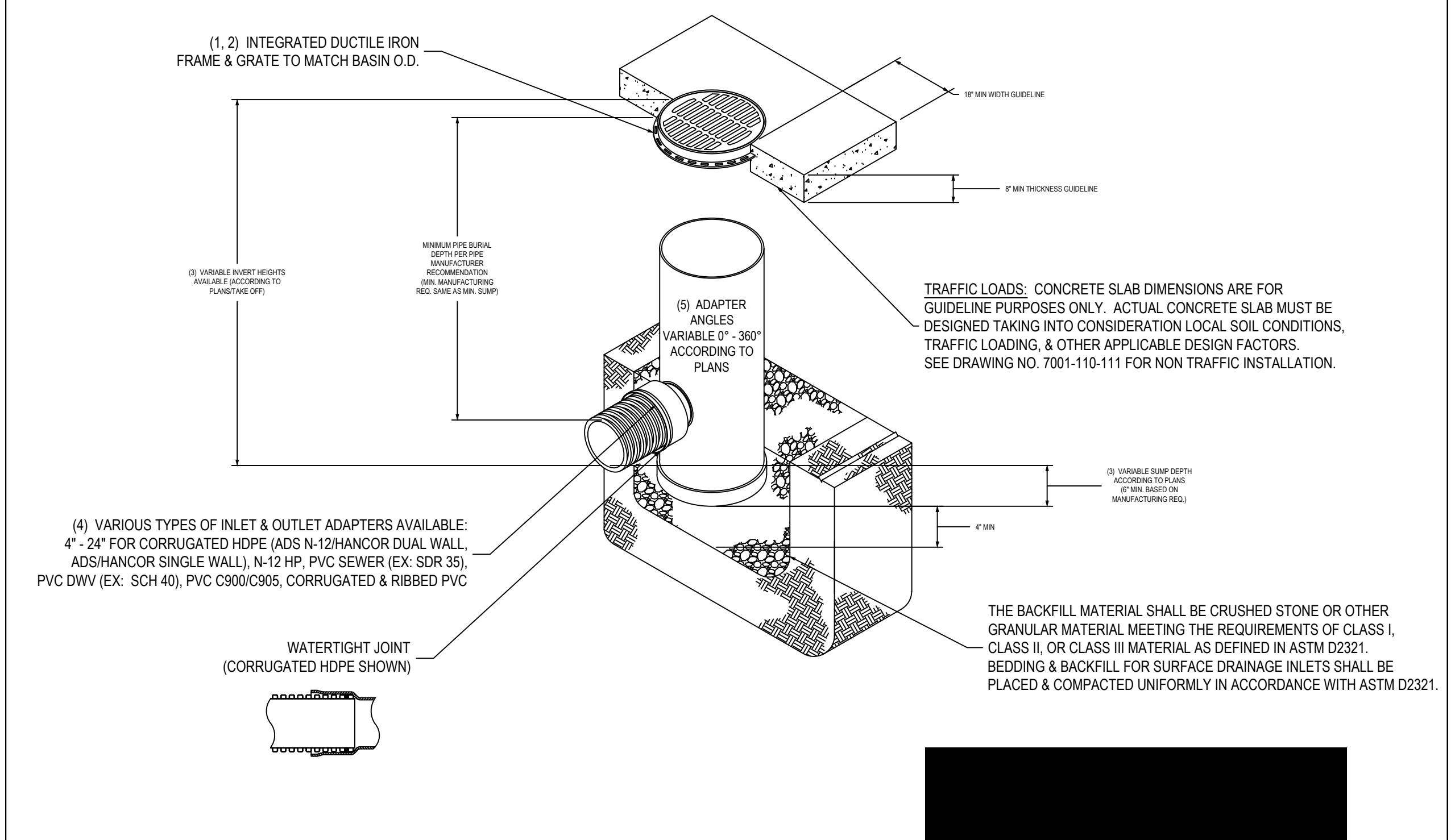
NO.	DATE	REVISION

THIS BAR IS 1 INCH LONG PLOTTED FULL SCALE

Project Manager: CAS
Drawn By: BAF
Checked By: CAS
Date: 05/30/2023
Scale: As Shown

Project No.: 200147
Drawing No.: D3.0

NYLOPLAST 24" DRAIN BASIN: 2824AG __X



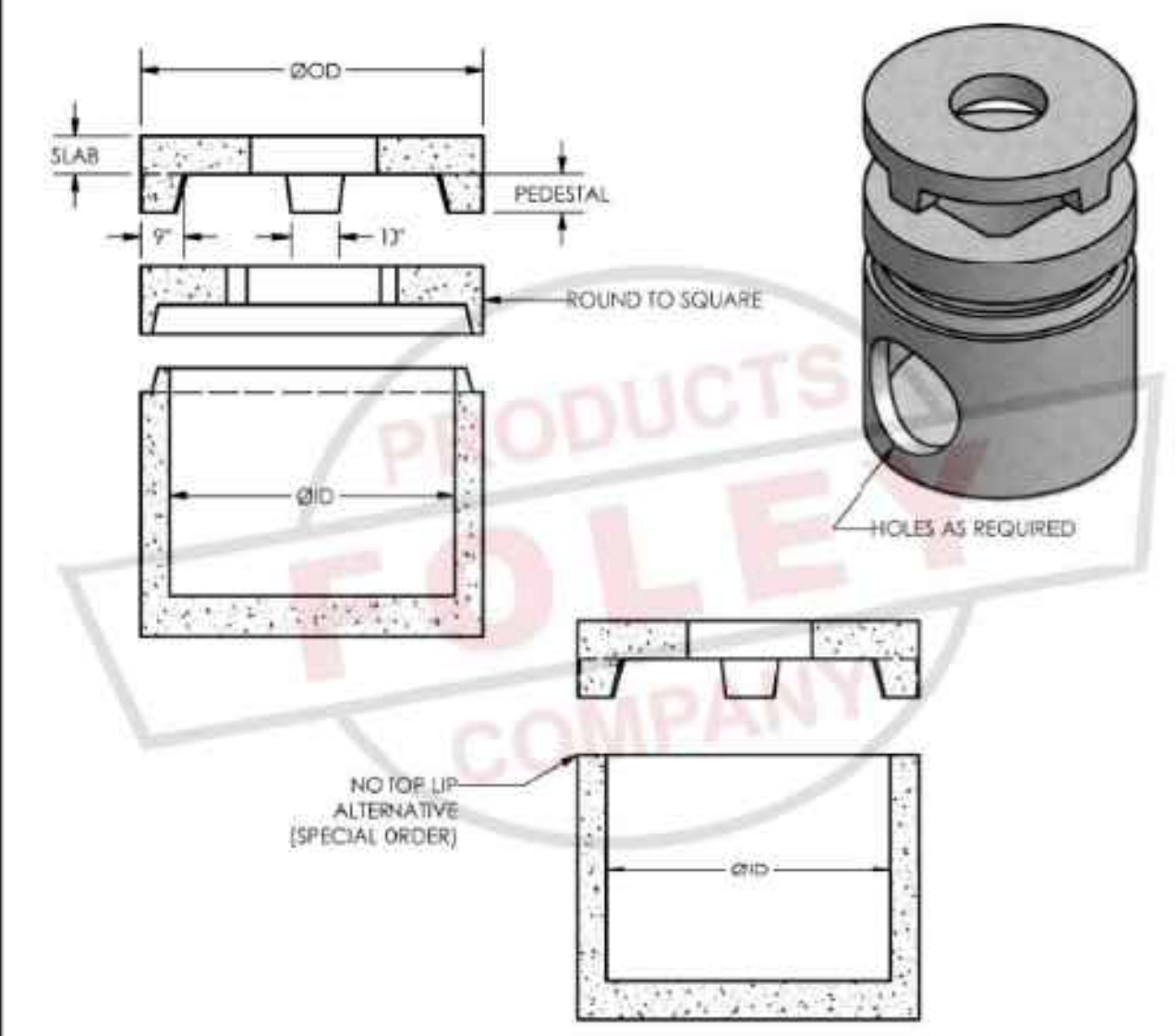
- GRATES/SOLID COVER SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05.
- FRAMES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05.
- DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS. RISERS ARE NEEDED FOR BASINS OVER 84" DUE TO SHIPPING RESTRICTIONS. SEE DRAWING NO. 7001-110-065.
- DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS N-12/HANCOR DUAL WALL), N-12 HP & PVC SEWER.
- ADAPTERS CAN BE MOUNTED ON ANY ANGLE 0° TO 360°. TO DETERMINE MINIMUM ANGLE BETWEEN ADAPTERS SEE DRAWING NO. 7001-110-012.

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DRAWN BY	EBC	MATERIAL	
DATE	04-03-06	PROJECT NO./NAME	
REVISED BY	NMH		
DATE	03-14-16		
DWG SIZE	A	SCALE	1:40 SHEET 1 OF 1

		3130 VERONA AVE BUFORD, GA 30518 PHN (770) 932-2443 FAX (770) 932-2490 www.nyloplast-us.com	
TITLE 24 IN DRAIN BASIN QUICK SPEC INSTALLATION DETAIL			
DWG NO.	7001-110-192	REV	E

ID	OD	PEDESTAL	SLAB	TONS
48"	58"	6.0"	6"	0.69
60"	72"	8.0"	8"	1.41
72"	86"	8.0"	8"	2.02
84"	98"	7.0"	8"	2.42
96"	114"	7.5"	8"	3.54



MATERIALS:
CONCRETE: 4,000 PSI, TYPE I/II CEMENT REINFORCEMENT PER ASTM C-478

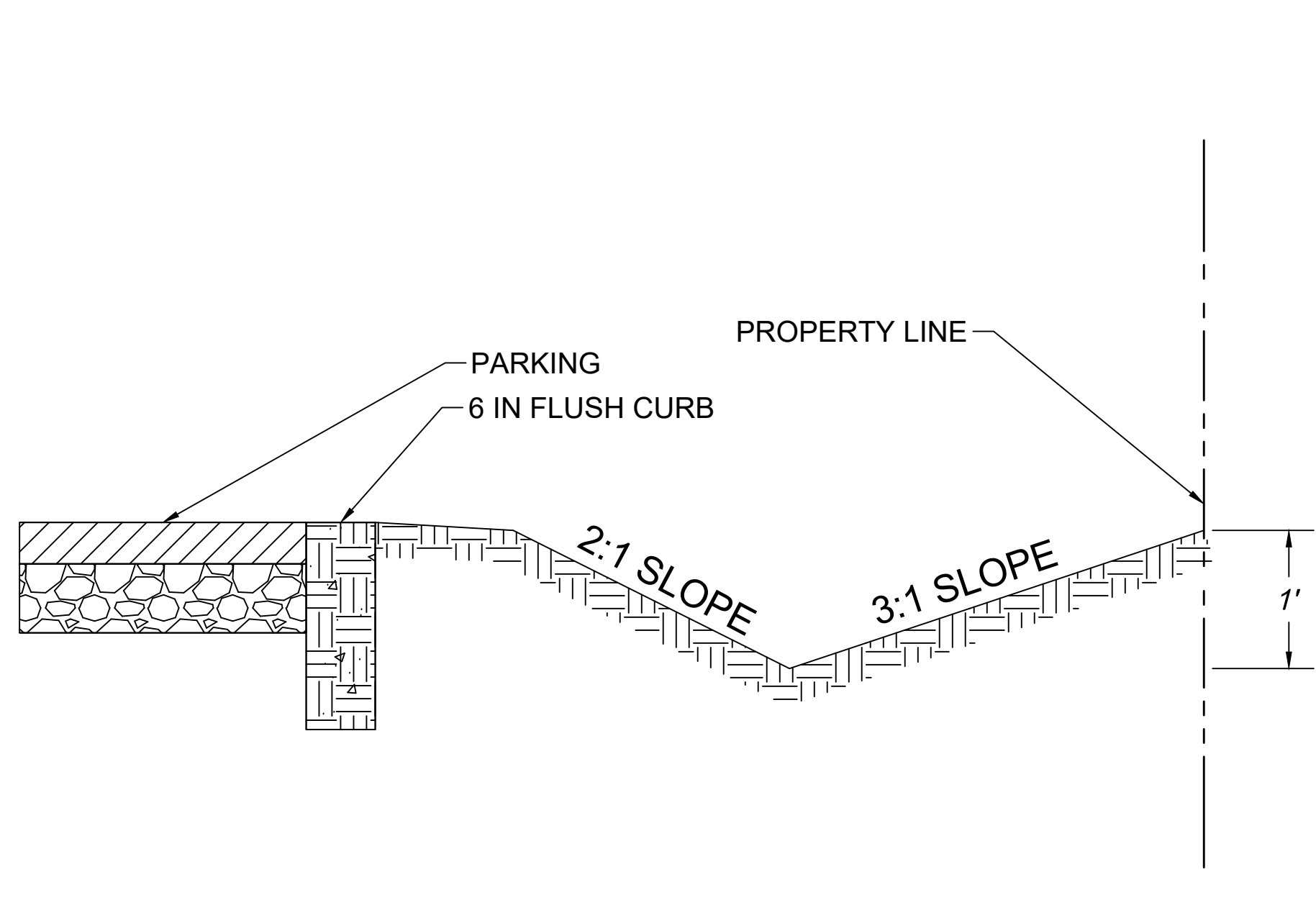
NOTES:
FLEXIBLE CONNECTORS ARE AVAILABLE

PARTS SHOWN:
Ø60" PEDESTAL TOP
Ø60" ROUND TO SQUARE
Ø60" 4'-0" BASE W/ Ø34" HOLE

PRODUCTS FOLEY COMPANY	ROUND PRECAST PEDESTAL TOPS	1.7
-------------------------------------	---------------------------------------	------------

NOTE: CONTRACTOR SHALL USE FOLEY ROUND PRECAST PEDESTAL TOP OR APPROVED EQUAL.

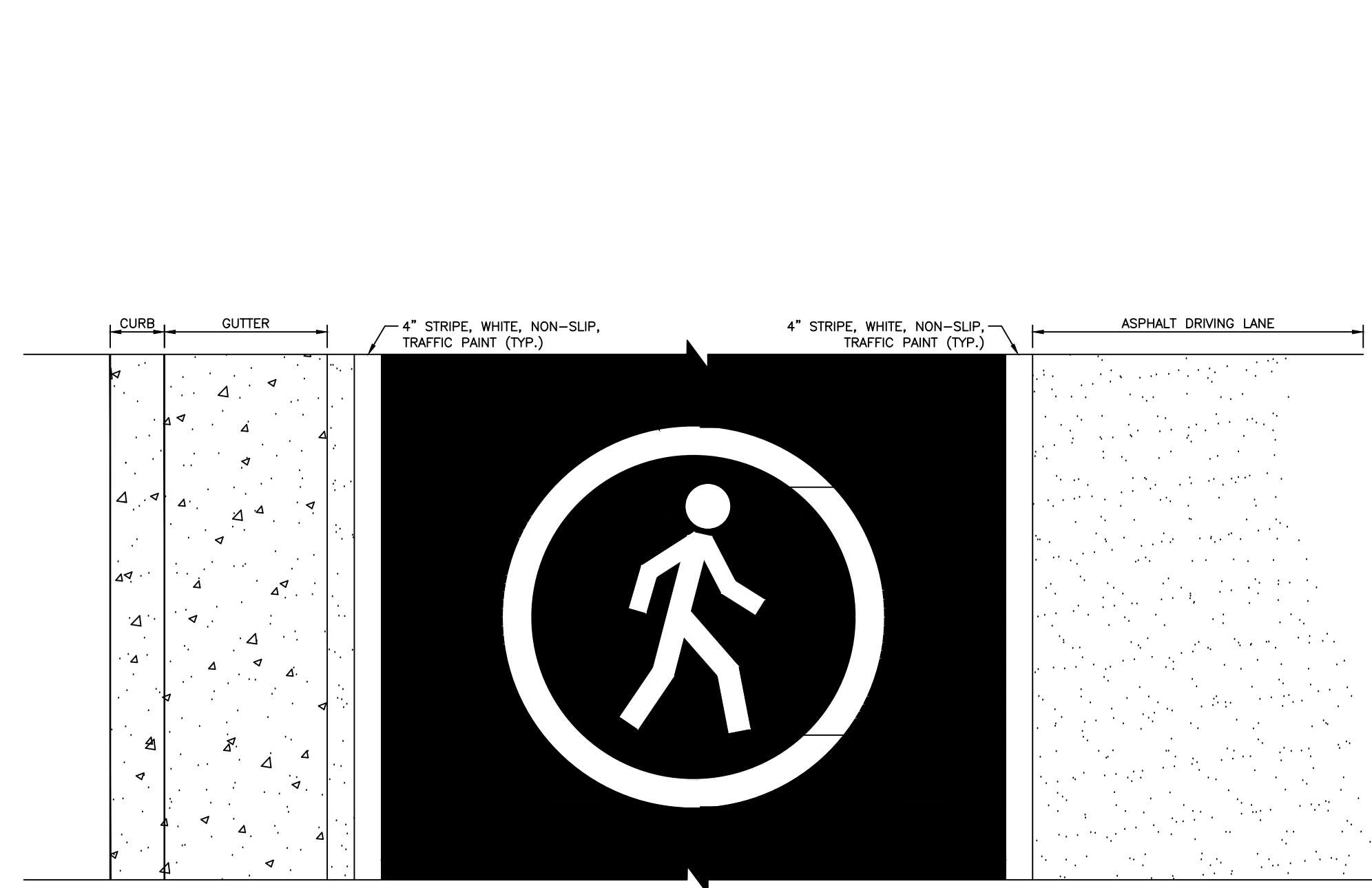
1 24" NYLOPLAST DRAIN BASIN



- NOTES:
- V-DITCH LINED WITH TURF REINFORCEMENT MAT AND PERMANENT SEEDING.
 - TIE 3:1 SLOPE INTO EXISTING ELEVATION AT PROPERTY LINE.
 - MAINTAIN POSITIVE DRAINAGE TO STORM INLETS.

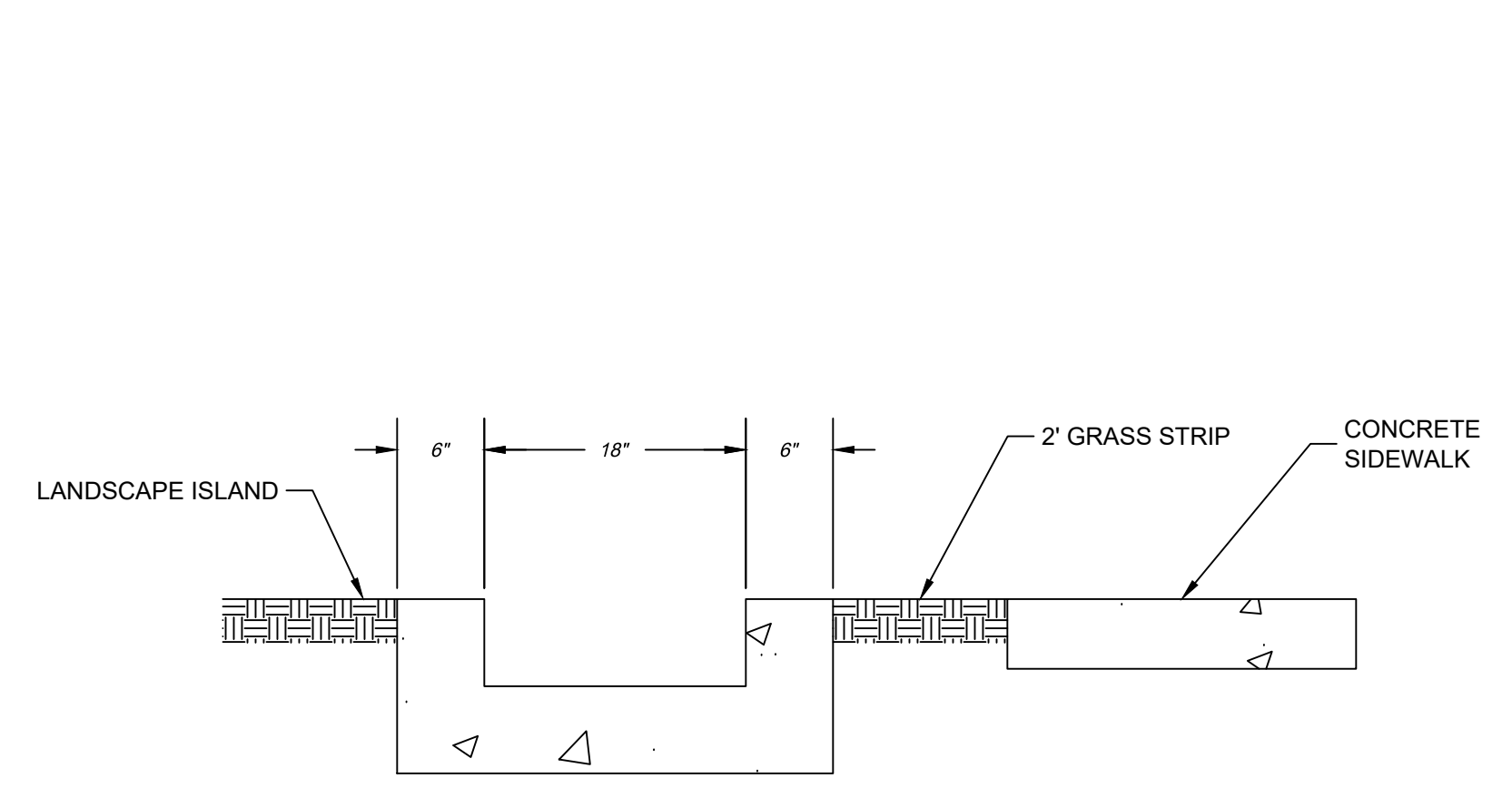
3 V-DITCH

2 WEIR INLET



4 PEDESTRIAN WALKING LANE

5 GUTTER CUT THROUGH



- NOTES:
- GUTTER CUT THROUGH CURB TO FOLLOW GDOT 9032B STANDARDS.
 - ENSURE POSITIVE DRAINAGE THROUGH GUTTER CUT THROUGH.

5 GUTTER CUT THROUGH

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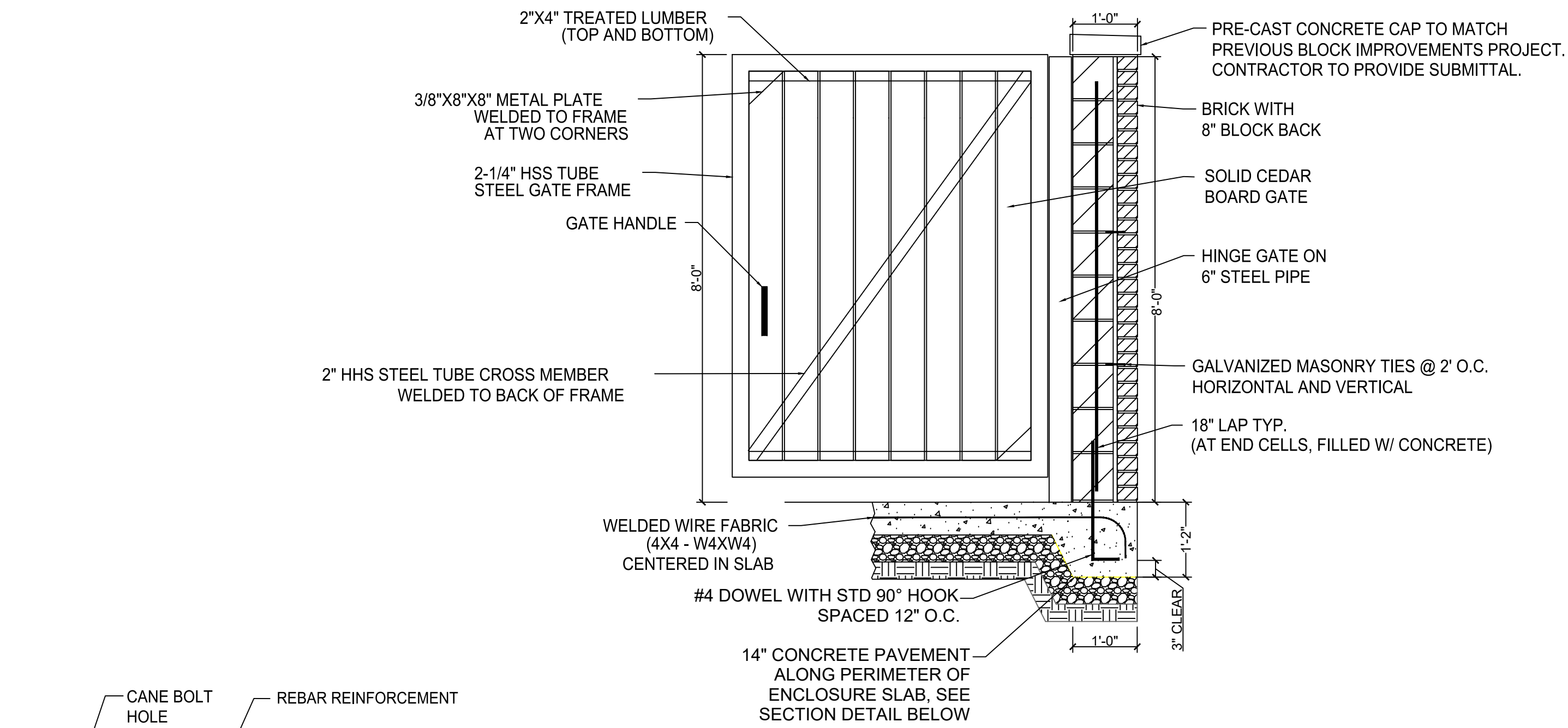
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NO.	DATE	REVISION

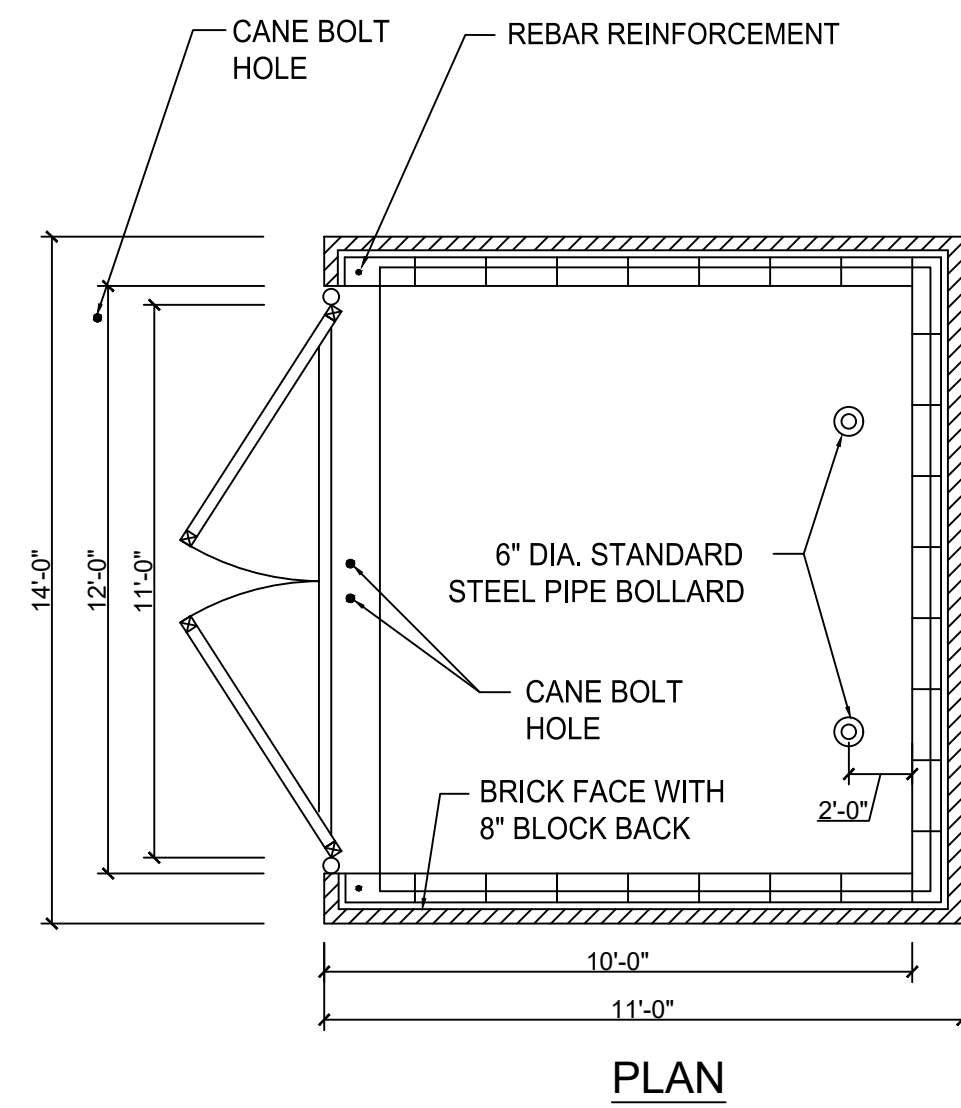
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Project Manager:	CAS
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Checked By:	CAS
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Scale:	As Shown

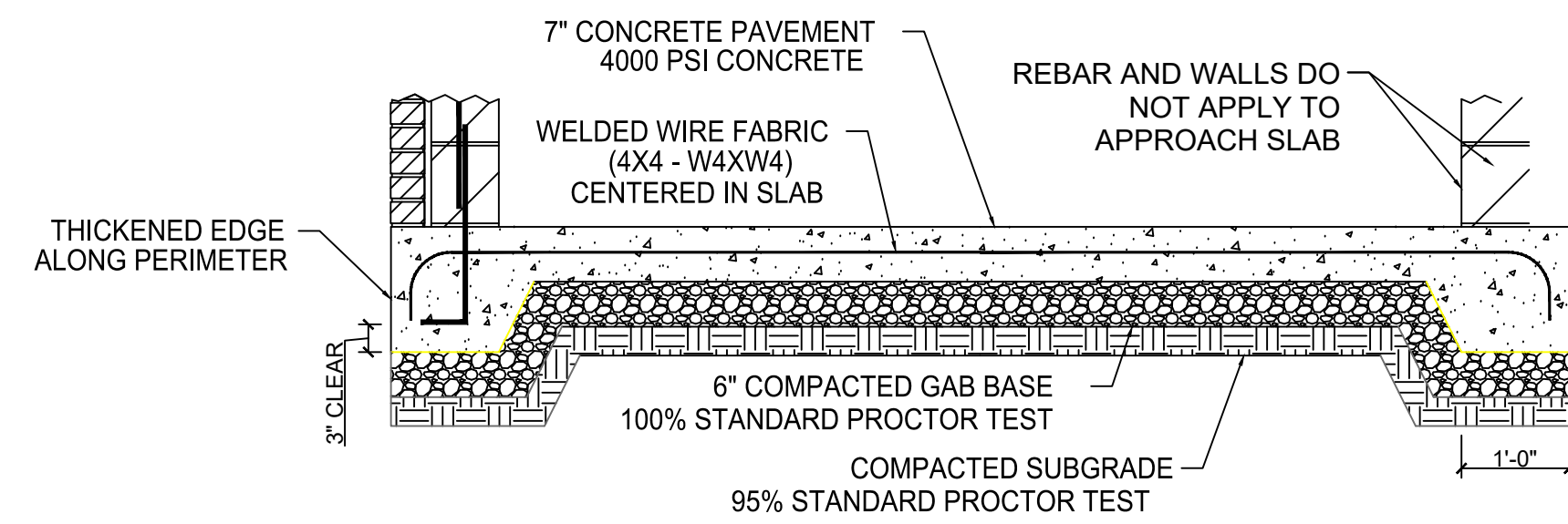
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Drawing No.:	D4.0



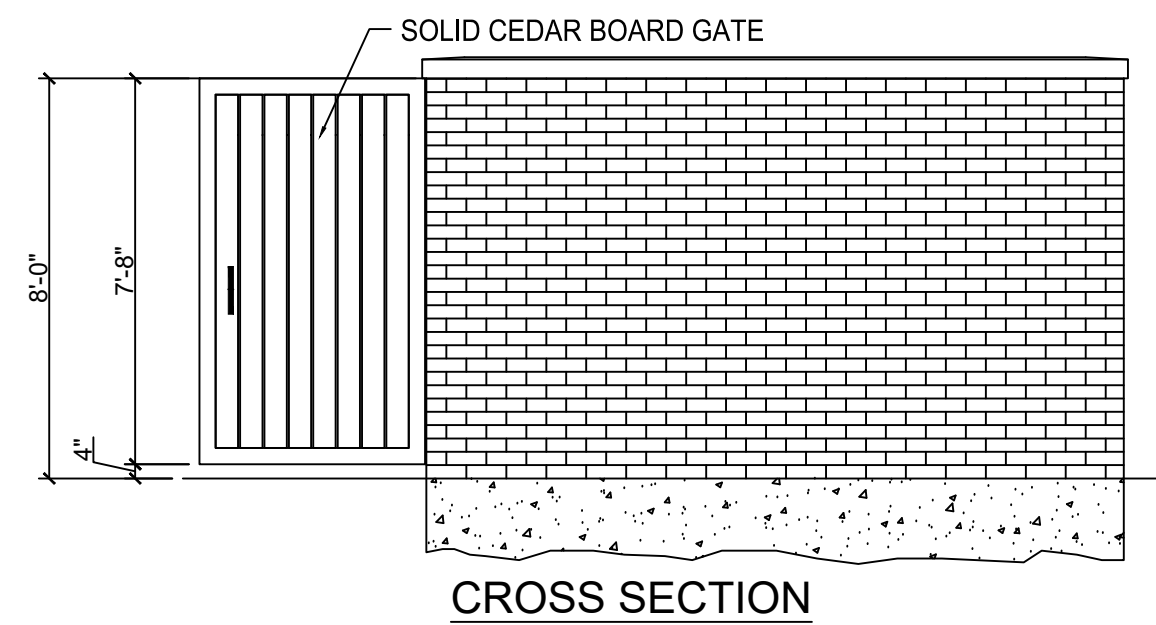
FRONT SECTION



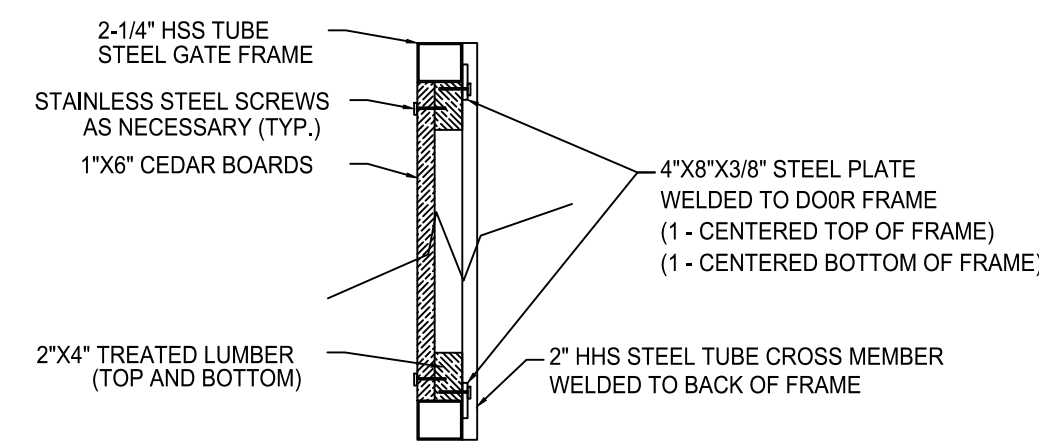
PLAN



SECTION THRU CENTER OF FOUNDATION FOR ENCLOSURE SLAB AND APPROACH SLAB



CROSS SECTION



GATE CROSS SECTION

- NOTES:
- 1.) ALL FABRICATED METAL SHALL BE PAINTED FLAT BLACK WITH OUTDOOR APPROVED PAINT. (3 COAT MIN.)
 - 2.) ALL GATE HINGES ARE TO BE BARREL TYPE WITH APPROPRIATE WEIGHT RATINGS AND CONTAIN GREASE FITTINGS. GATE HANDLES ARE TO BE "U" SHAPED STEEL.

NO.	DATE	REVISION

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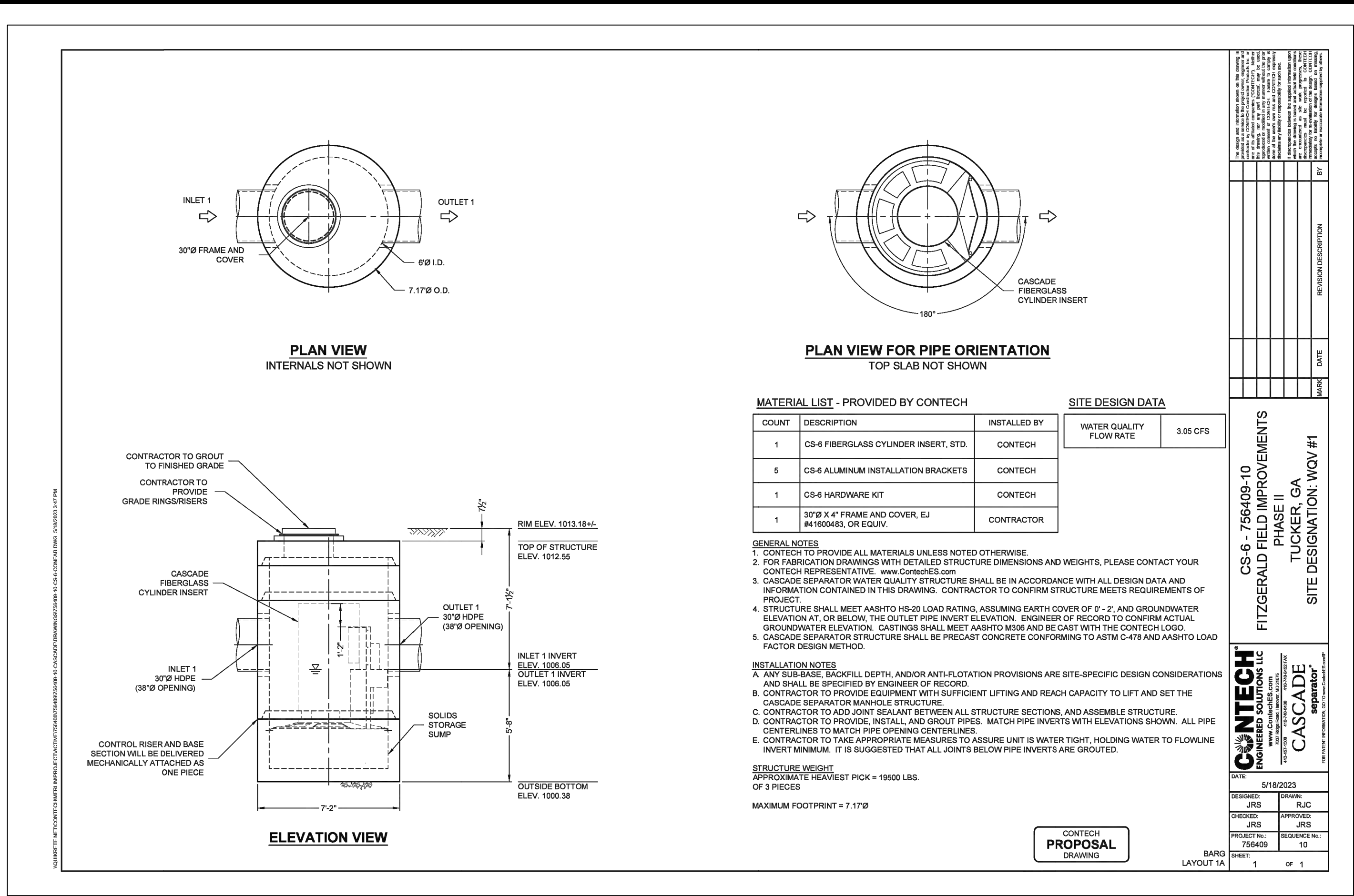
CONSTRUCTION DETAILS

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PLOTTED FULL SCALE

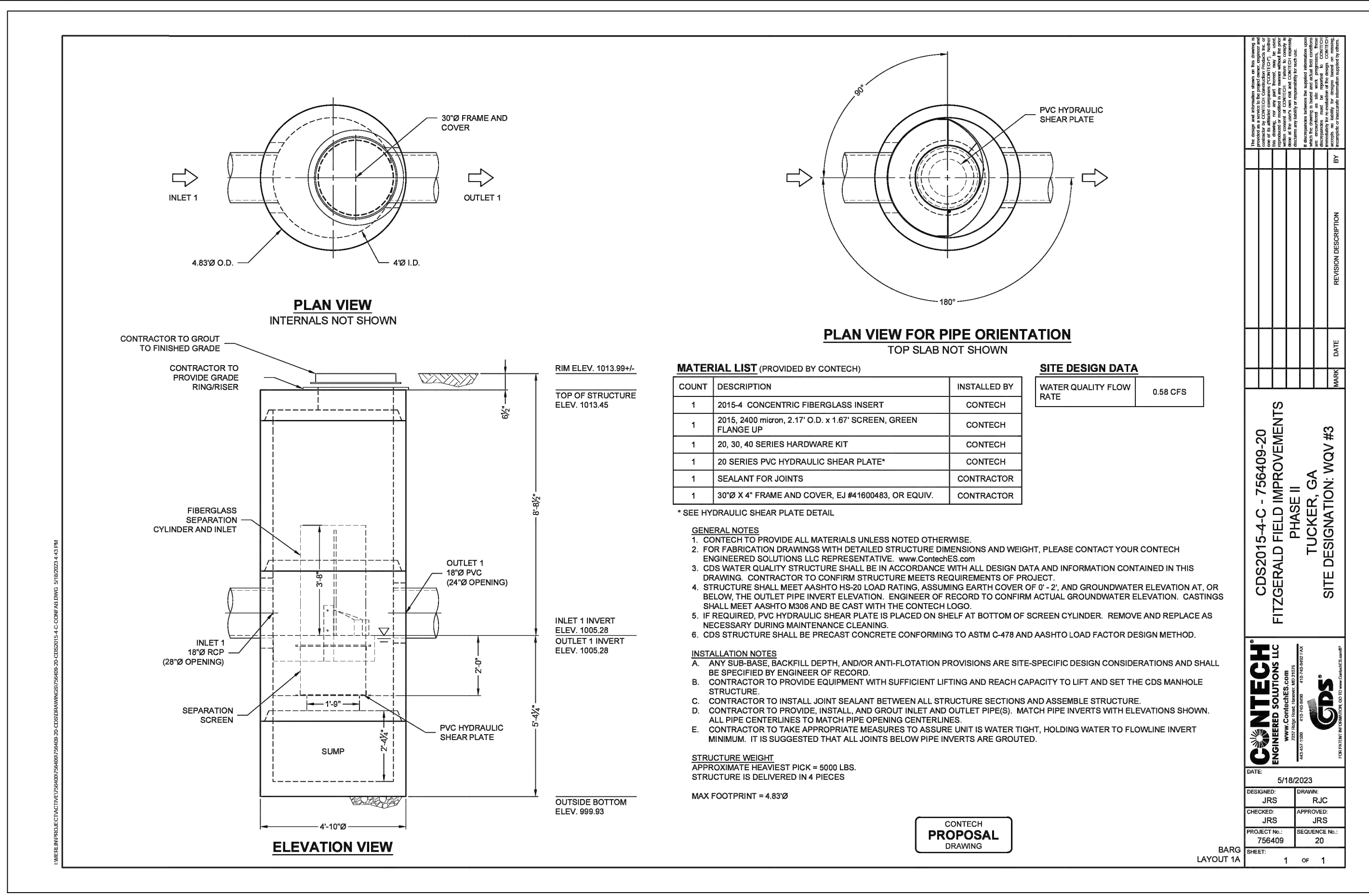
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Checked By:	CAS
Date:	05/30/2023
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Project No.:
200147
Drawing No.:
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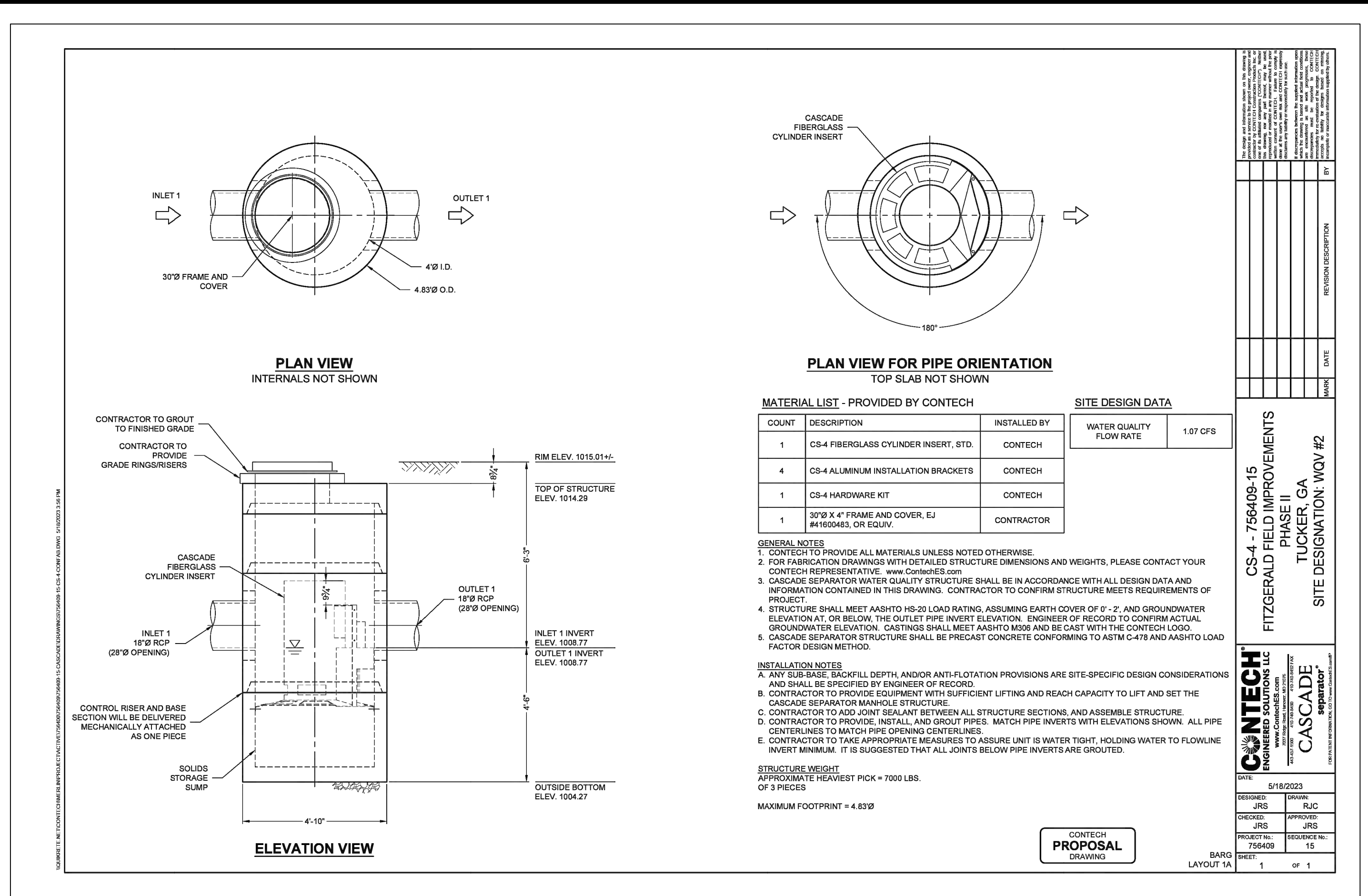


WATER QUALITY VAULT #1

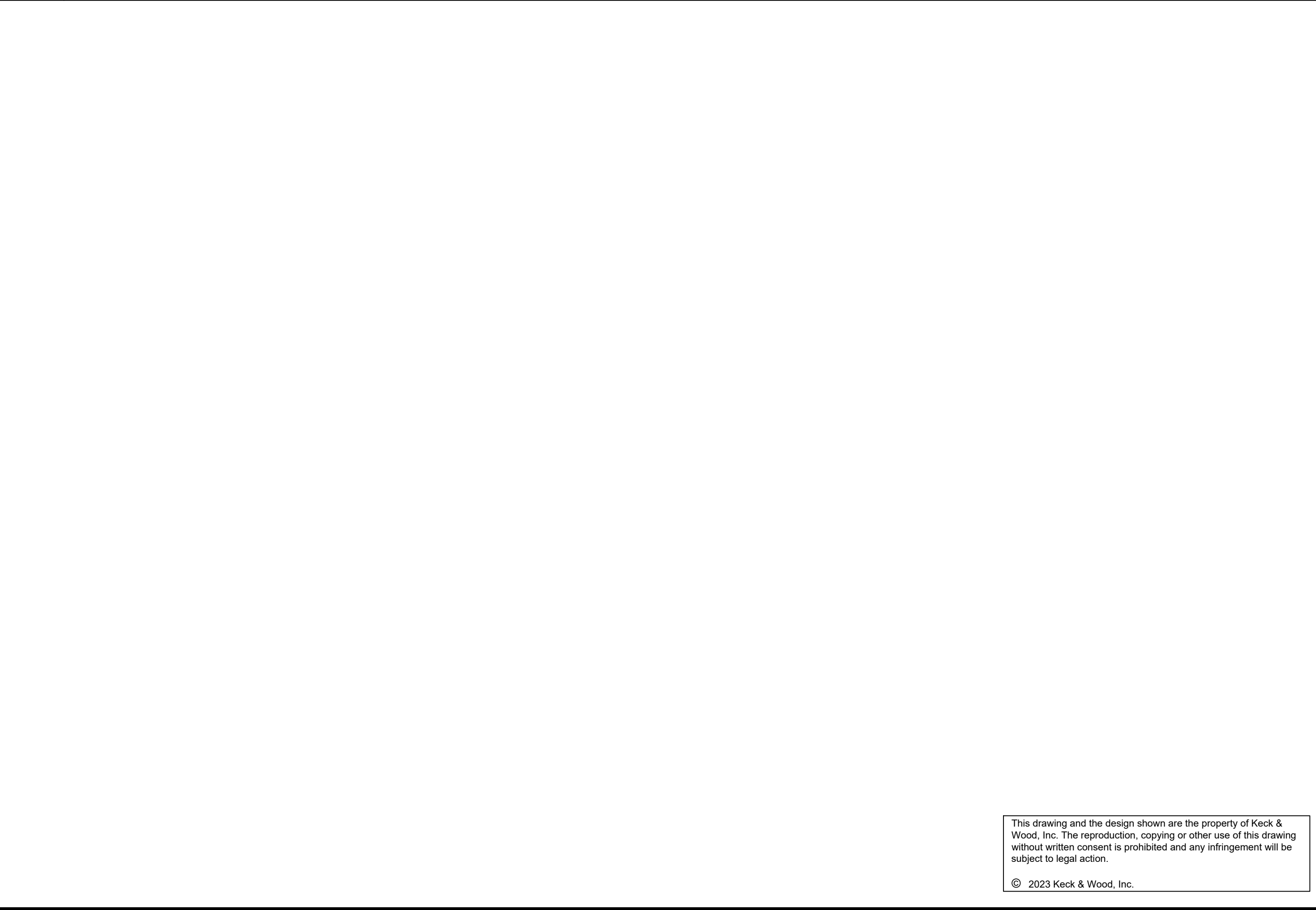


WATER QUALITY VAULT #2

WATER QUALITY VAULT #3



WATER QUALITY VAULT #2



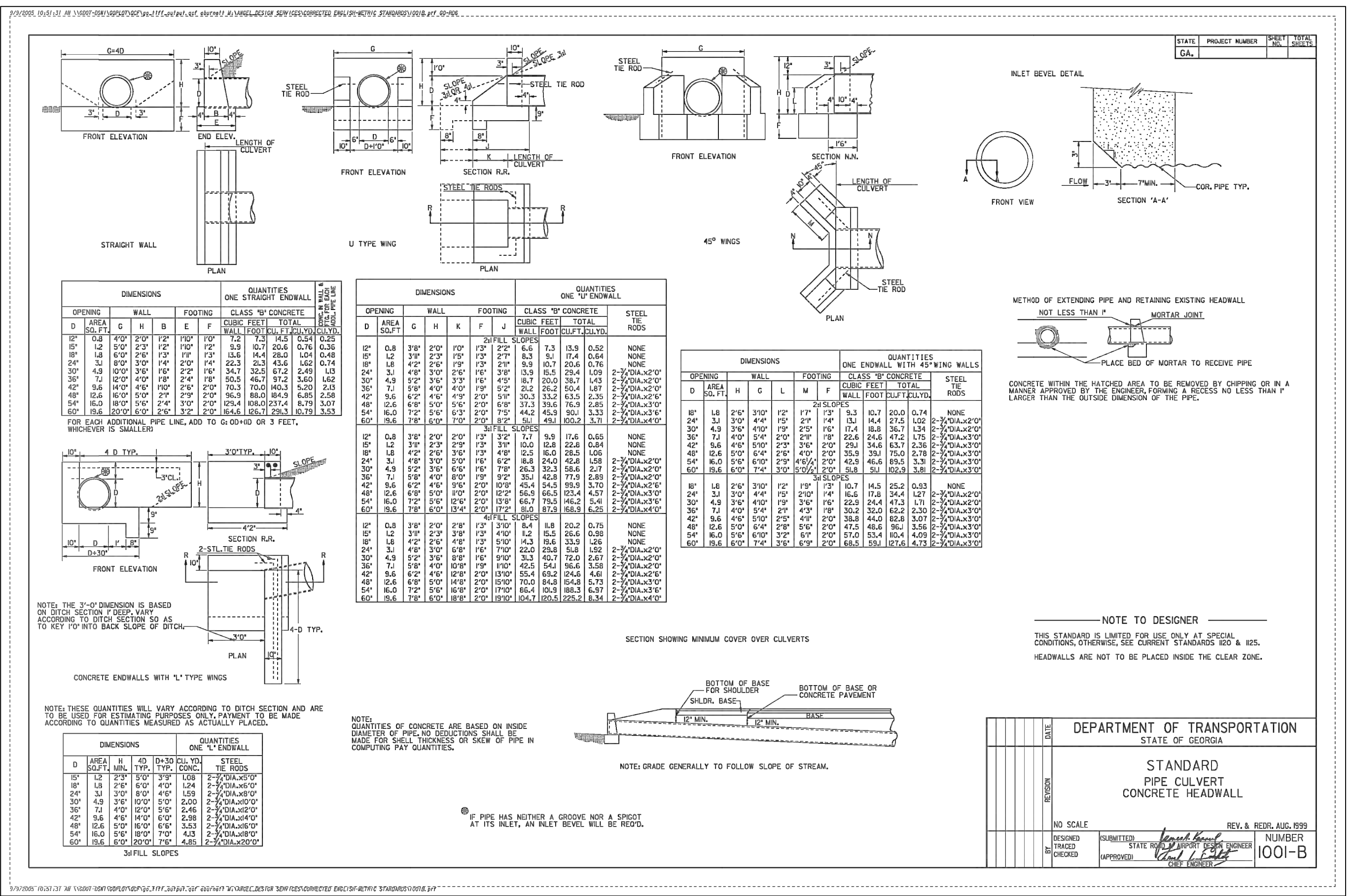
NO.	DATE	REVISION

Fitzgerald Park Improvements - Phase 2
 4877 Lawrenceville Hwy
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CONSTRUCTION DETAILS

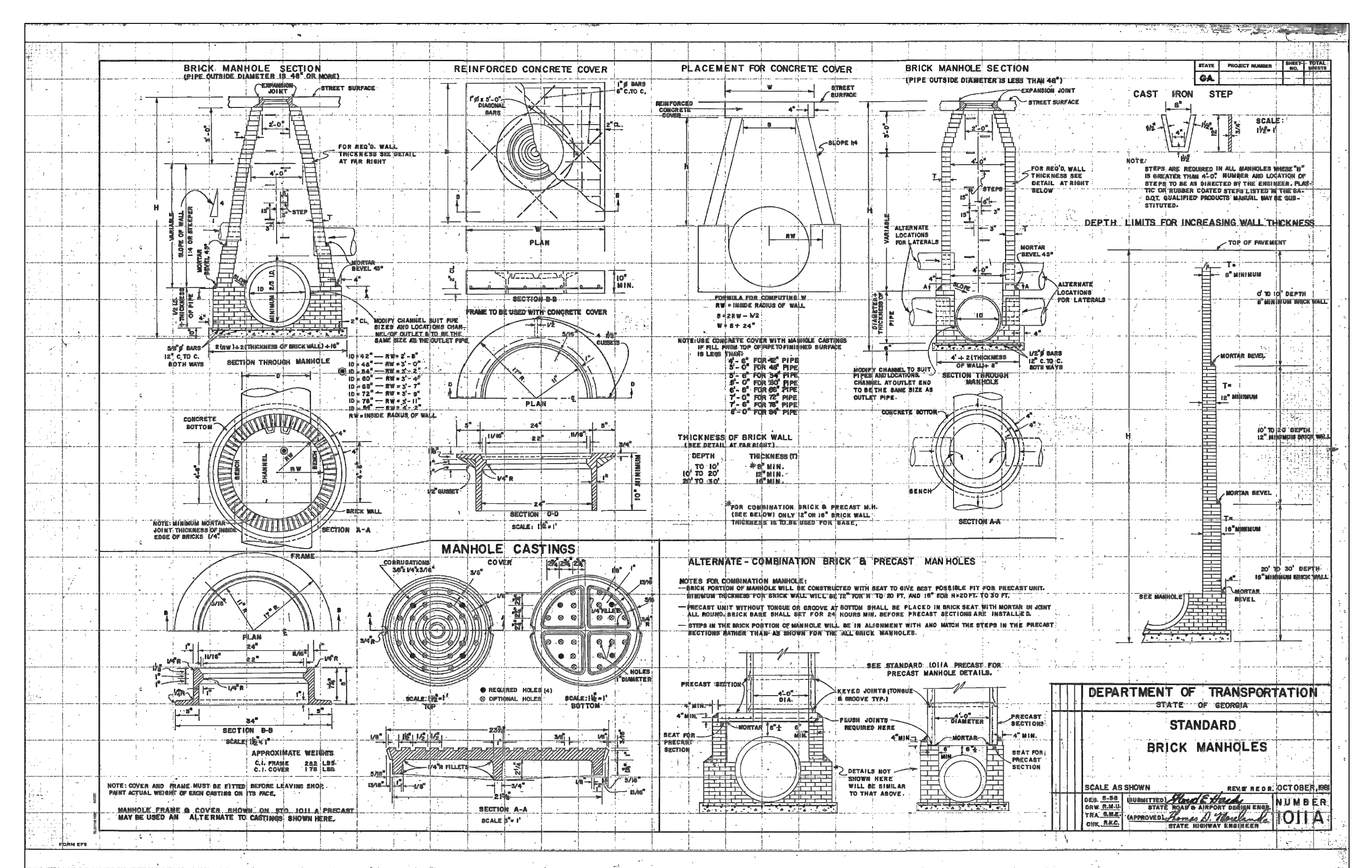
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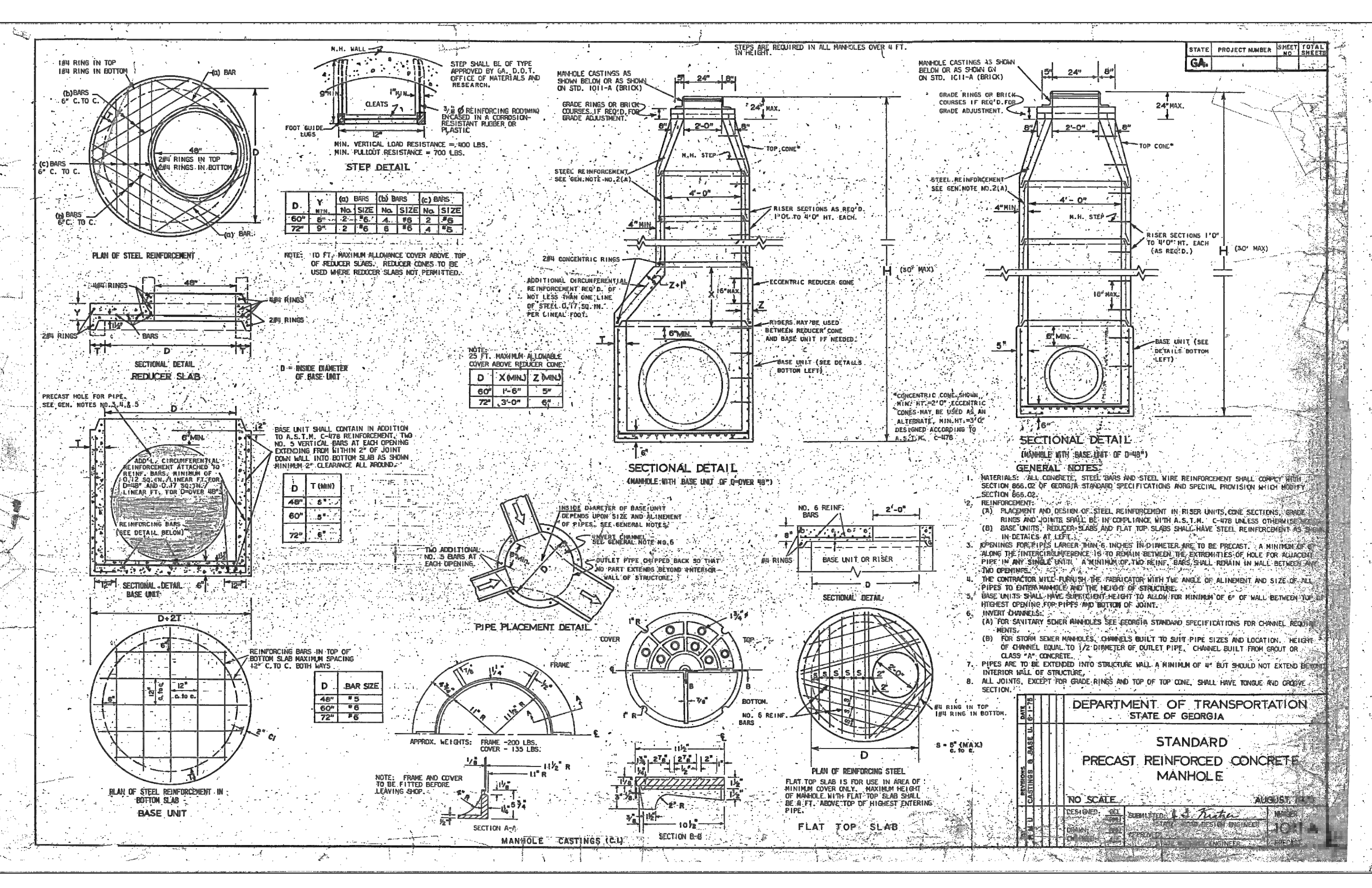
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CONCRETE HEADWALL - GDOT 1001-B



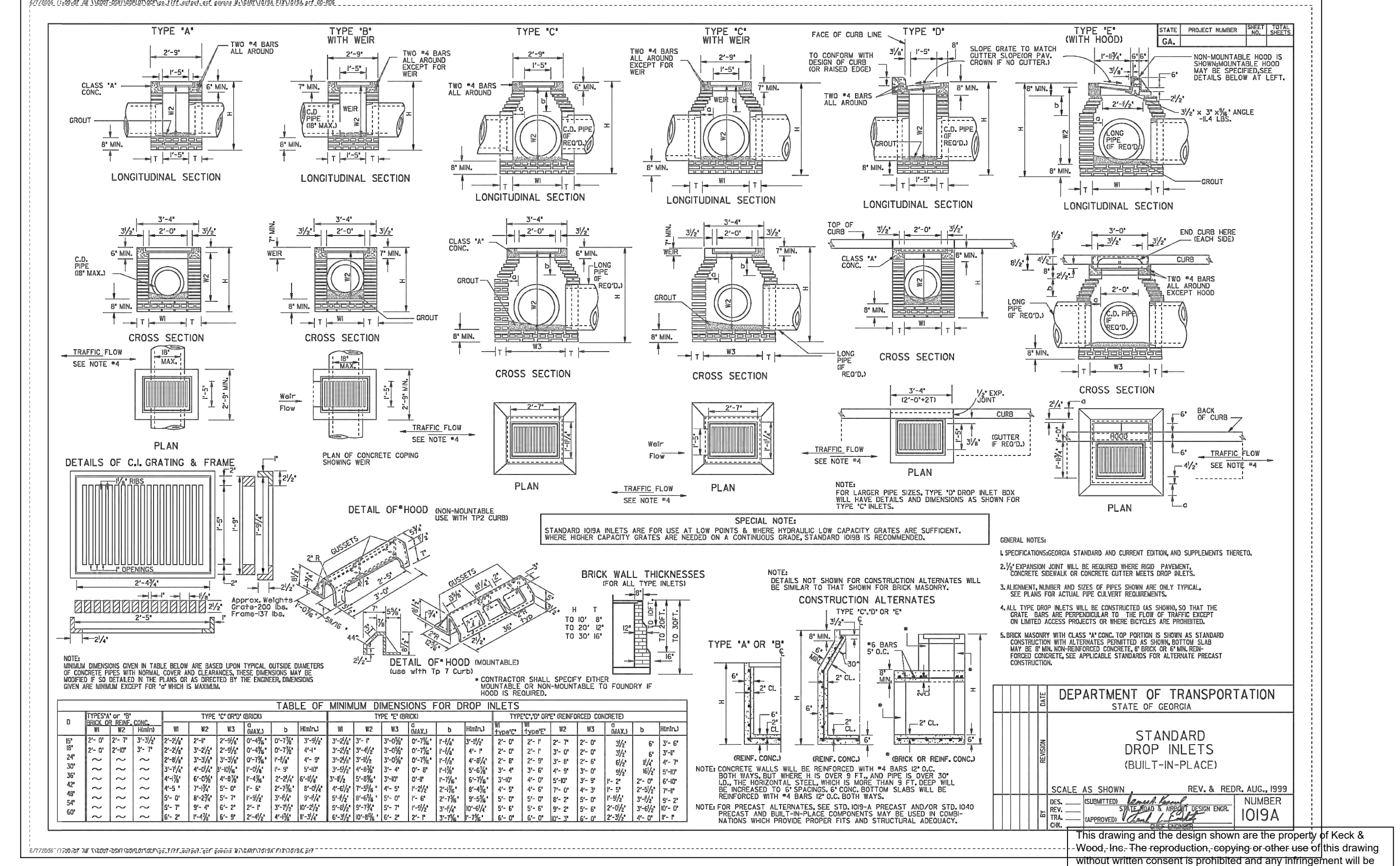
2

BRICK MANHOLES - GDOT 1011A



3

PRECAST CONCRETE MANHOLE - GDOT 1011A



4

DROP INLET - GDOT 1019A

NO.	DATE	REVISION

GRAVITY WALL - GDOT 9031L

DETAIL OF EXPANSION JOINT
SEE GENERAL NOTE #3

TYPICAL SECTION A
NEW JERSEY BARRIER FACE

TYPICAL SECTION B
NEW JERSEY BARRIER FACE

TYPICAL SECTION C
SINGLE SLOPE BARRIER FACE

DETAIL OF RAISING HEADWALL

TYPICAL PIPE PLUG

D	T	PIPE PLUG
12"	8"	0.0594
18"	8"	0.0456
24"	8"	0.0776
30"	8"	0.0202
36"	8"	0.0745
42"	8"	0.2376
48"	12"	0.3002
54"	12"	0.5890
60"	12"	0.7272
66"	12"	0.8799
72"	12"	1.0472

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

STANDARD
GRAVITY WALL TYPICAL SECTIONS,
RAISING HEADWALL, AND
TYPICAL PIPE PLUG

NO SCALE
REV. A REPR. SEPT. 2016
SUBMITTED BY: [Signature]
APPROVED BY: [Signature]
DATE: 05/30/2023
NUMBER: 9031L
SHEET 1 OF 2

1

PIPE HANDRAIL - GDOT 9031R

DETAIL FOR PLACING ROOF DRAIN PIPE UNDER SIDEWALK

DETAIL OF RAMP TYPE BARRICADE

DETAIL OF PIPE HANDRAIL FOR RETAINING WALL

DETAIL OF PIPE HANDRAIL FOR CONCRETE STEPS

NOTES FOR PIPE HANDRAILING

1. JOINTS -
a) Standard or special galvanized steel or galvanized iron fittings may be used if joints (see above).
b) Joints may be welded. If welded, all exposed joints shall be finished to grade or better, to give a neat appearance. All joints shall be properly sealed with a suitable sealant.
c) Pipe may be embedded with 1" x 1" galvanized floor plates with 4" x 2" x 1/2" galvanized bolts (see above).
d) Pipe may be secured in 6" deep, 3" diam. hole. The hole shall be filled with concrete. The hole shall be finished to give same finish as if floor plates were used.

2. FOOTINGS -
a) Footings shall be placed on a firm, stable base. The footing shall be finished to give same finish as if floor plates were used.
b) 1/2" (galv. steel pipe) denotes O.D. for all sections. L.D. = 1/2".

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

STANDARD
PIPE HANDRAIL FOR RETAINING WALL,
PIPE HANDRAIL FOR CONCRETE STEPS,
AND BARRICADE

NO SCALE
REV. A REPR. SEPT. 2016
SUBMITTED BY: [Signature]
APPROVED BY: [Signature]
DATE: 05/30/2023
NUMBER: 9031R
SHEET 1 OF 2

2

CURB & GUTTER - GDOT 9032B

RAISED EDGE WITH CONCRETE GUTTER

CONCRETE MEDIAN (Between Curbs)

CONCRETE MEDIAN (Integral)

CONCRETE CURB & GUTTER

CONCRETE DOWELED INTEGRAL CURBS

CONCRETE INTEGRAL CURB

CONCRETE HEADER CURBS

DETAILS OF RECESSED CURB FOR DRIVEWAYS

CURB FACE DESIGN

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

STANDARD
CONCRETE CURB & GUTTER
CONCRETE CURBS, CONCRETE MEDIANS

NO SCALE
REV. A REPR. SEPT. 2016
SUBMITTED BY: [Signature]
APPROVED BY: [Signature]
DATE: 05/30/2023
NUMBER: 9032B
SHEET 1 OF 2

3

CURB CUT (WHEELCHAIR) RAMPS - GDOT A3

TYPICAL LOCATIONS FOR CURB CUT RAMPS - PLAN VIEW

GUTTER TRANSITION DETAILS

Skewed Ramp Details

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

SPECIAL DETAIL
CONCRETE SIDEWALK DETAILS
CURB CUT (WHEELCHAIR) RAMPS

NO SCALE
REV. A REPR. SEPT. 2016
SUBMITTED BY: [Signature]
APPROVED BY: [Signature]
DATE: 05/30/2023
NUMBER: A3
SHEET 1 OF 2

4

Keck+Wood
COLLABORATION BY DESIGN
3090 Premiere Parkway, Suite 200
Duluth, GA 30097
(678) 417-4000
keckwood.com

GEORGIA
REGISTERED PROFESSIONAL ENGINEER
No. 95037622
5/30/2023
CHARLES ADAM SHELLON

NO.	DATE	REVISION

Fitzgerald Park Improvements - Phase 2
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Tucker, Georgia

CONSTRUCTION DETAILS

THIS BAR IS
1 INCH LONG
PLOTTED FULL SCALE

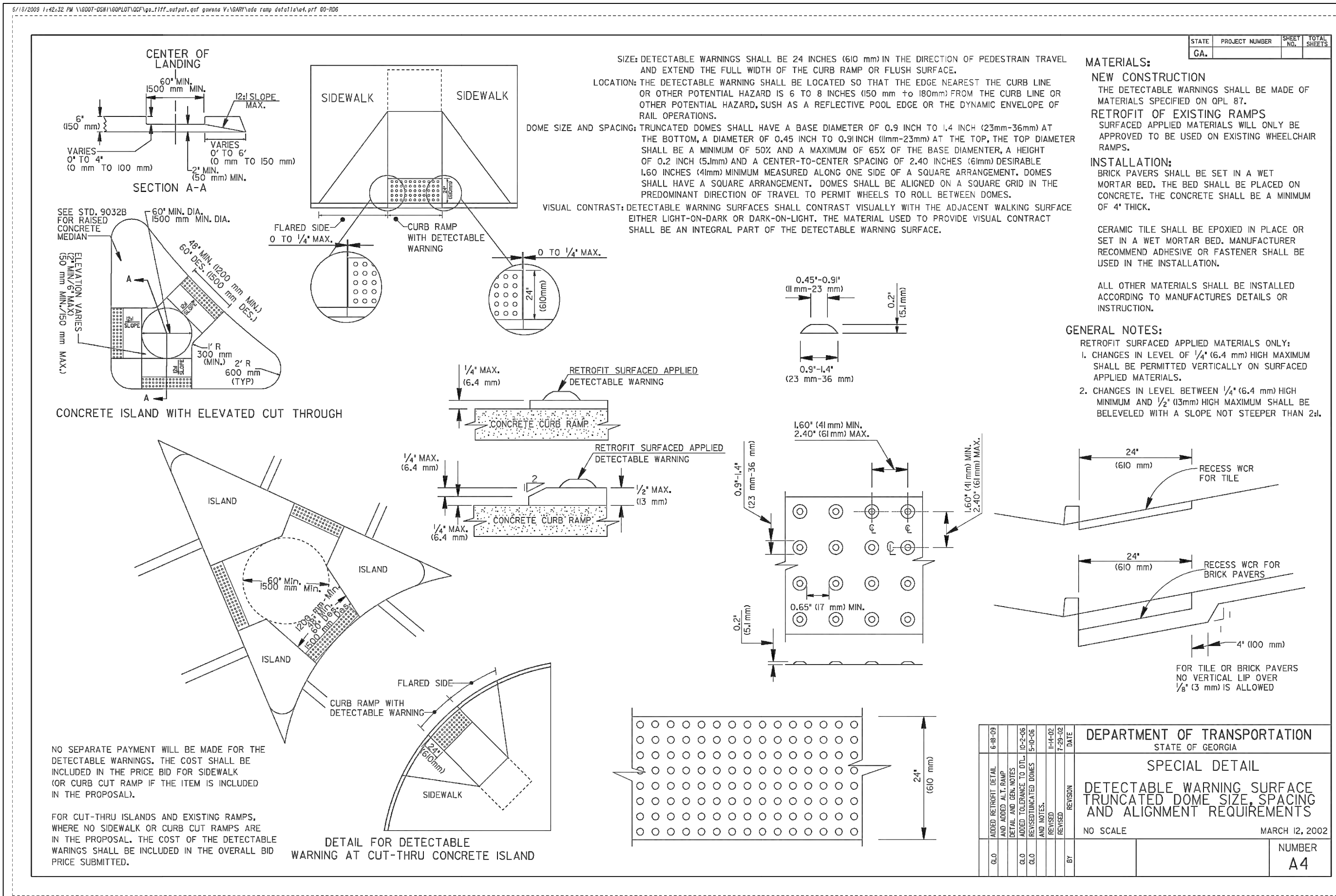
Project Manager:
CAS

Drawn By: BAF
Checked By: CAS

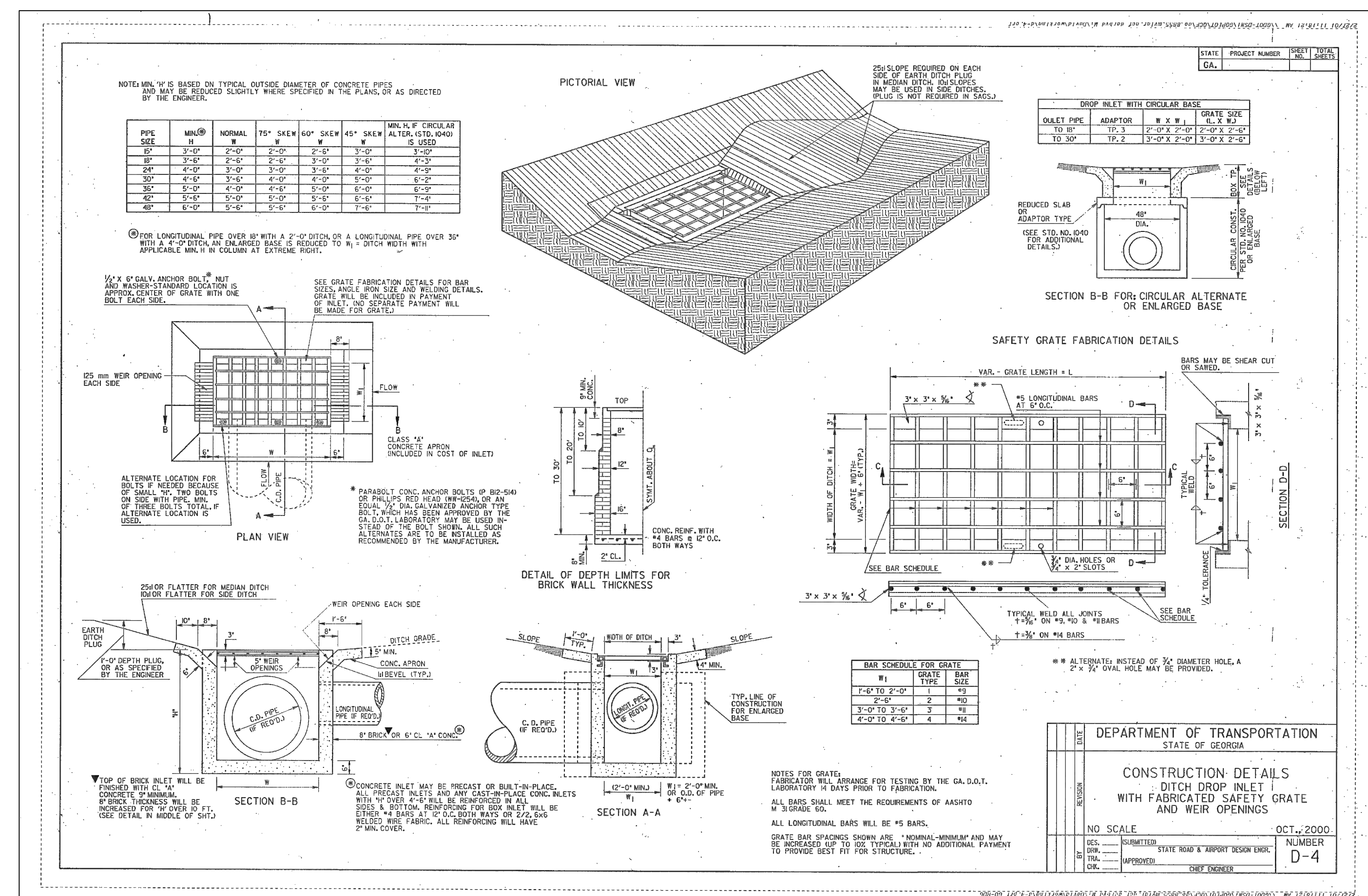
Date: 05/30/2023
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Project No.: 200147
Drawing No.: D9.0

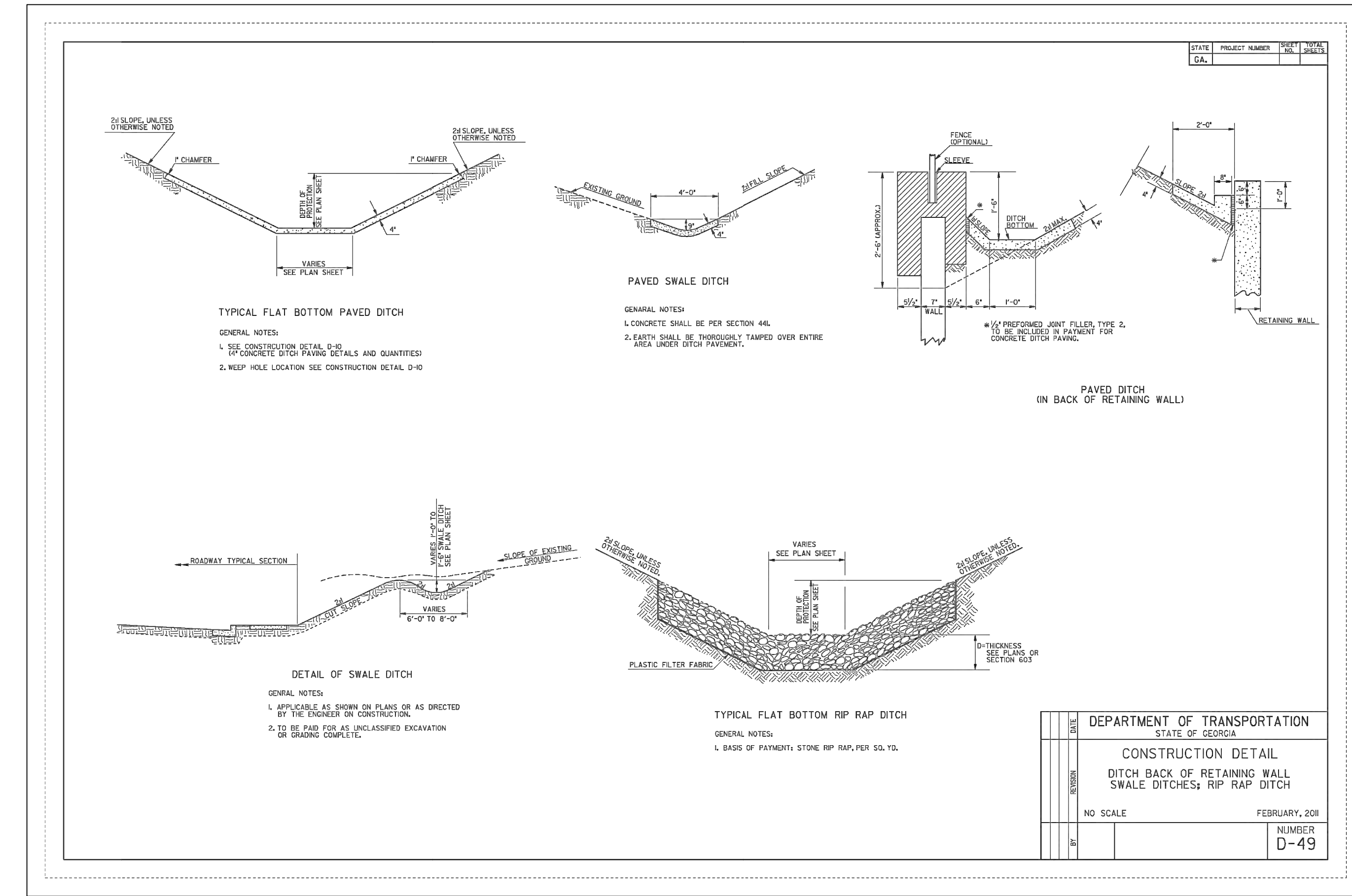
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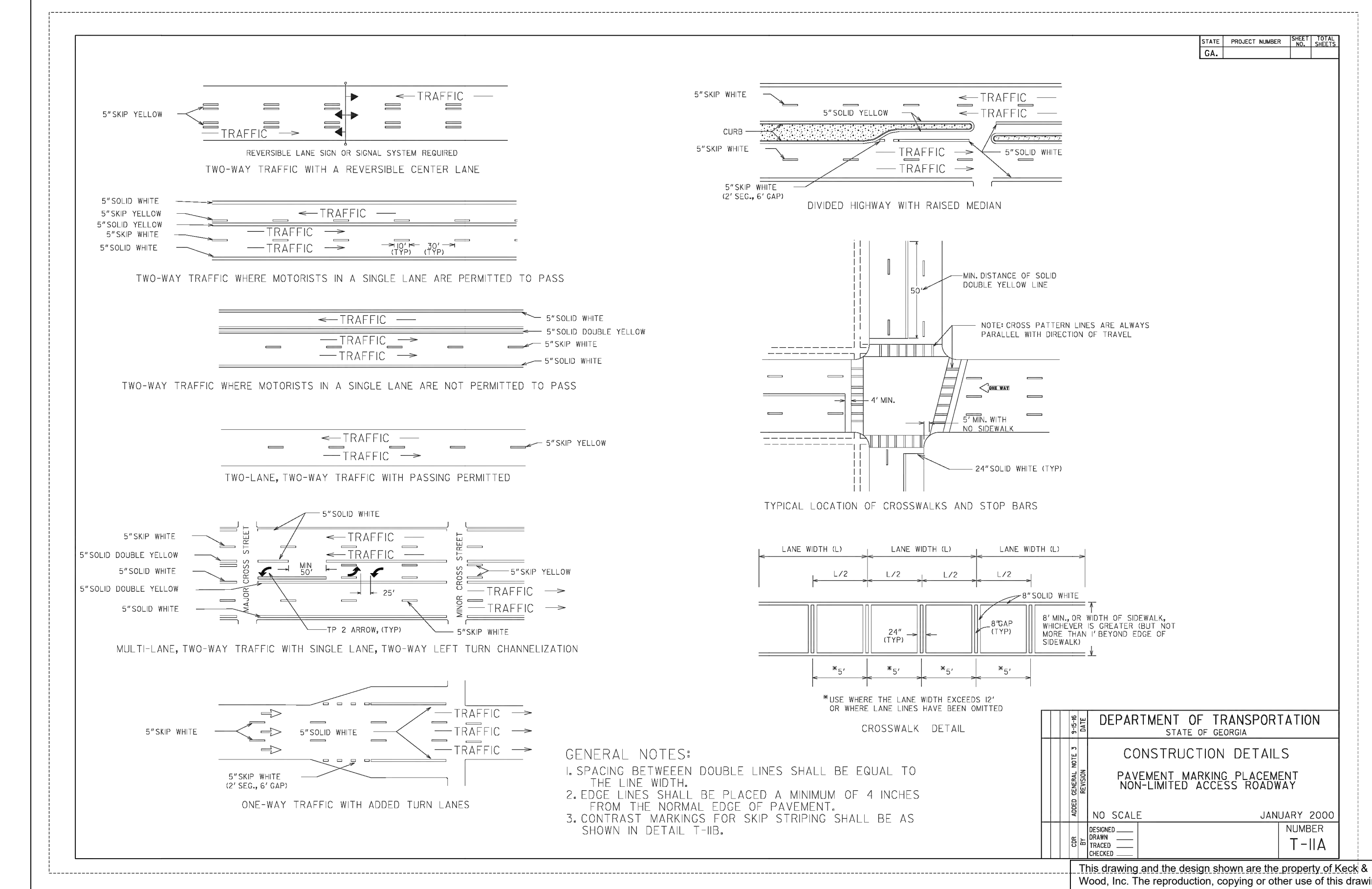
1 DETECTABLE WARNING SURFACE - GDOT A4



2 DITCH DROP INLET - GDOT D-4



3 DITCH BACK OF RETAINING WALL - GDOT D-49



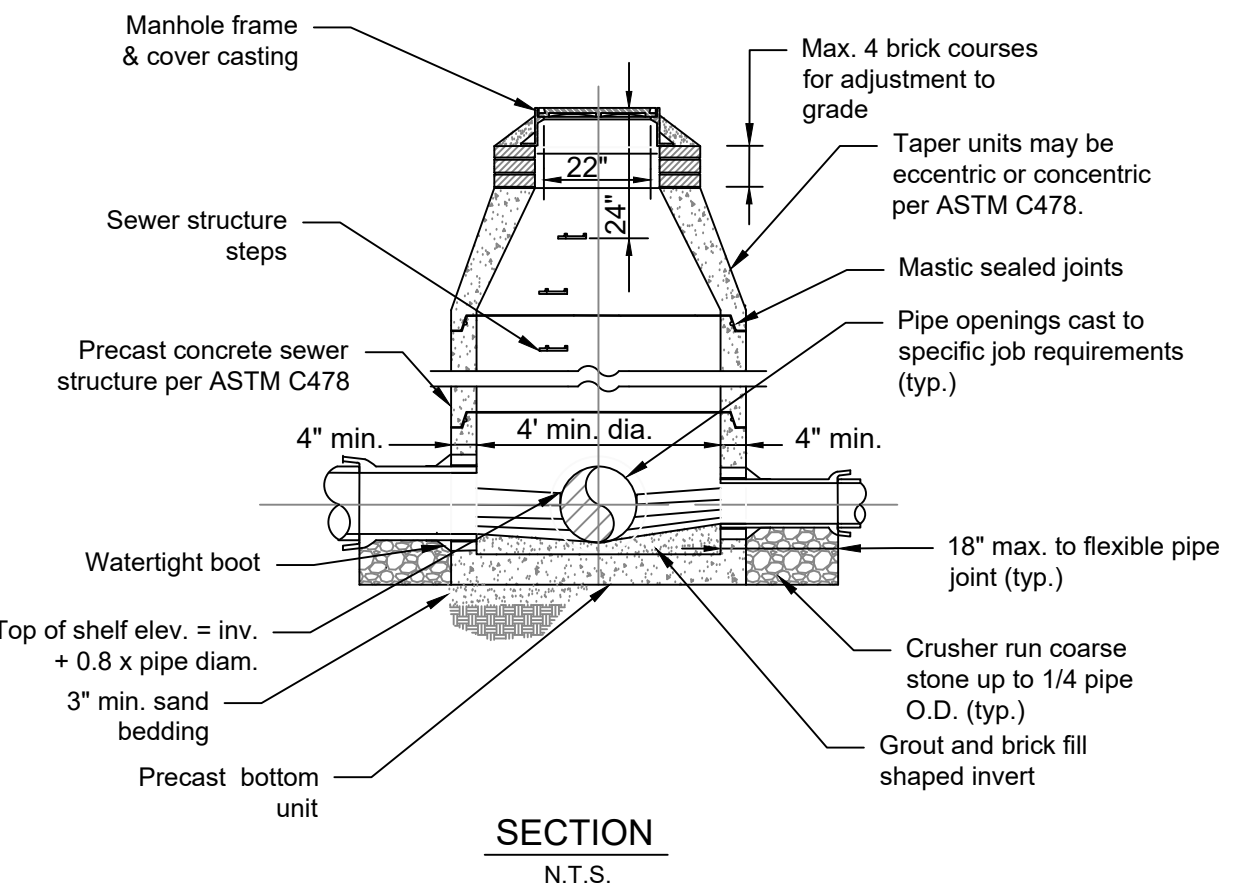
4 PAVEMENT MARKING - GDOT T-11A

NO.	DATE	REVISION

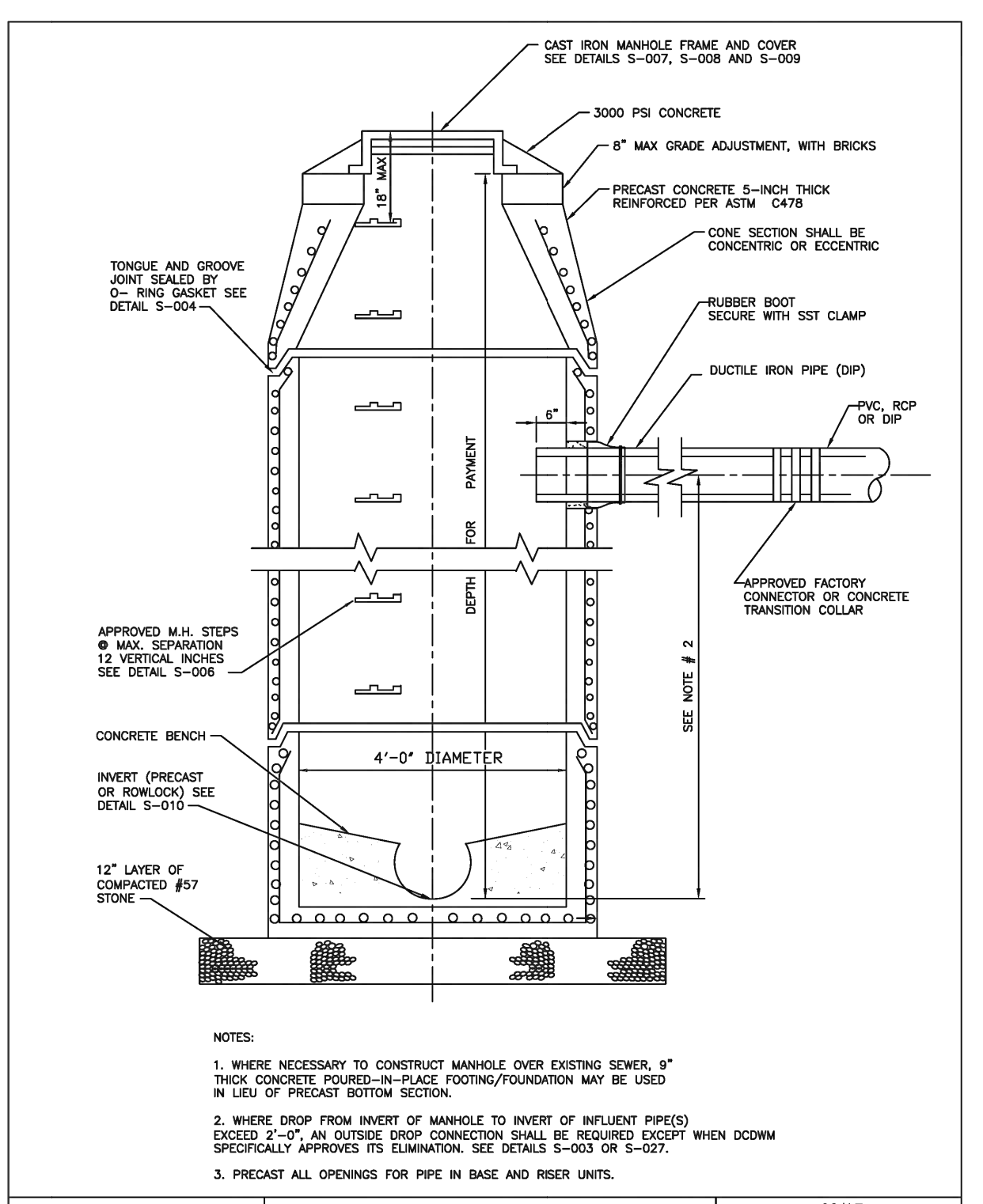
THIS BAR IS
 1 INCH LONG
 PLOTTED FULL SCALE

Project Manager:
 CAS
 Drawn By: BAF
 Checked By: CAS
 Date: 05/30/2023
 Scale: As Shown

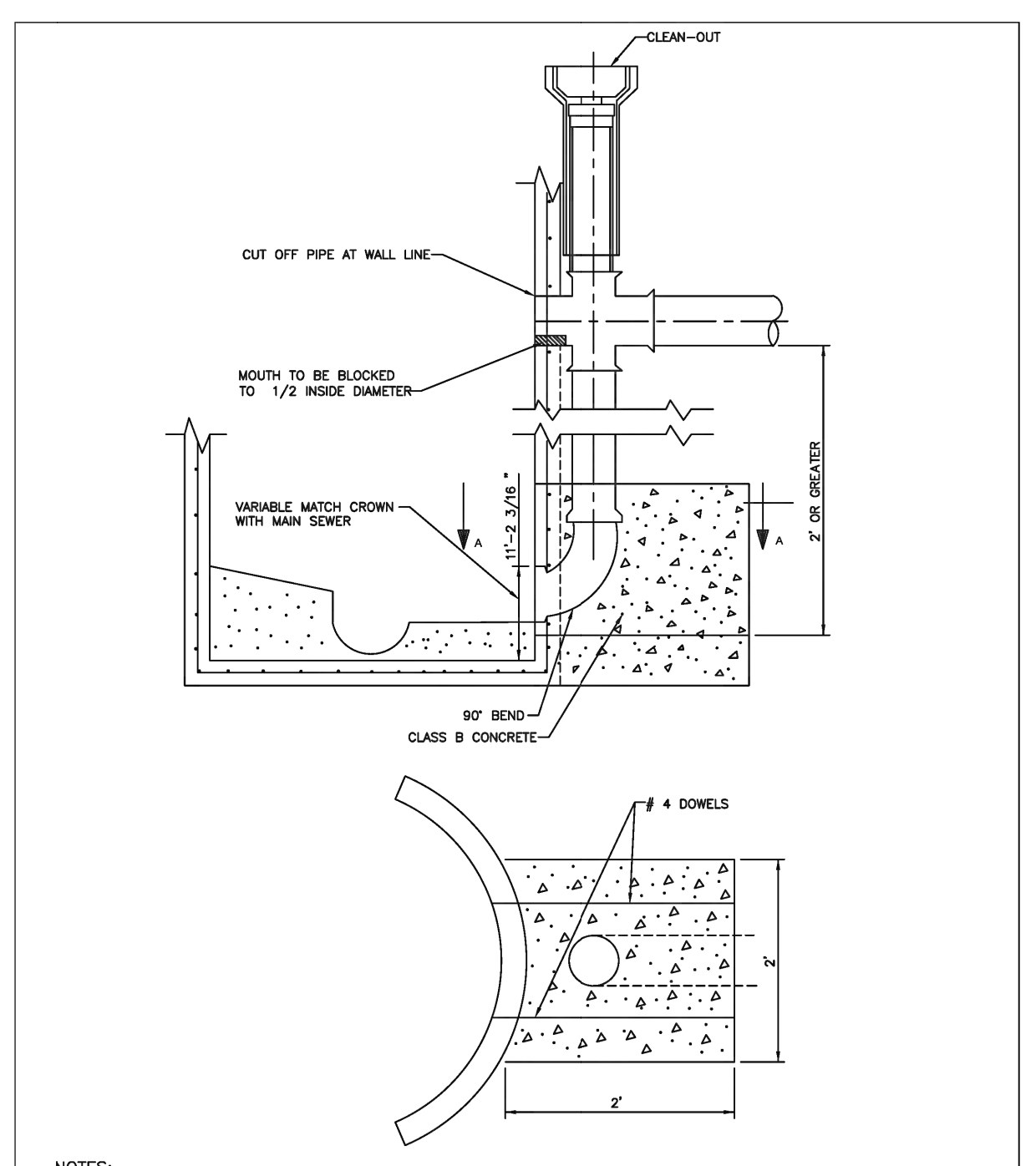
Project No.:
 200147
 Drawing No.:
 D10.0



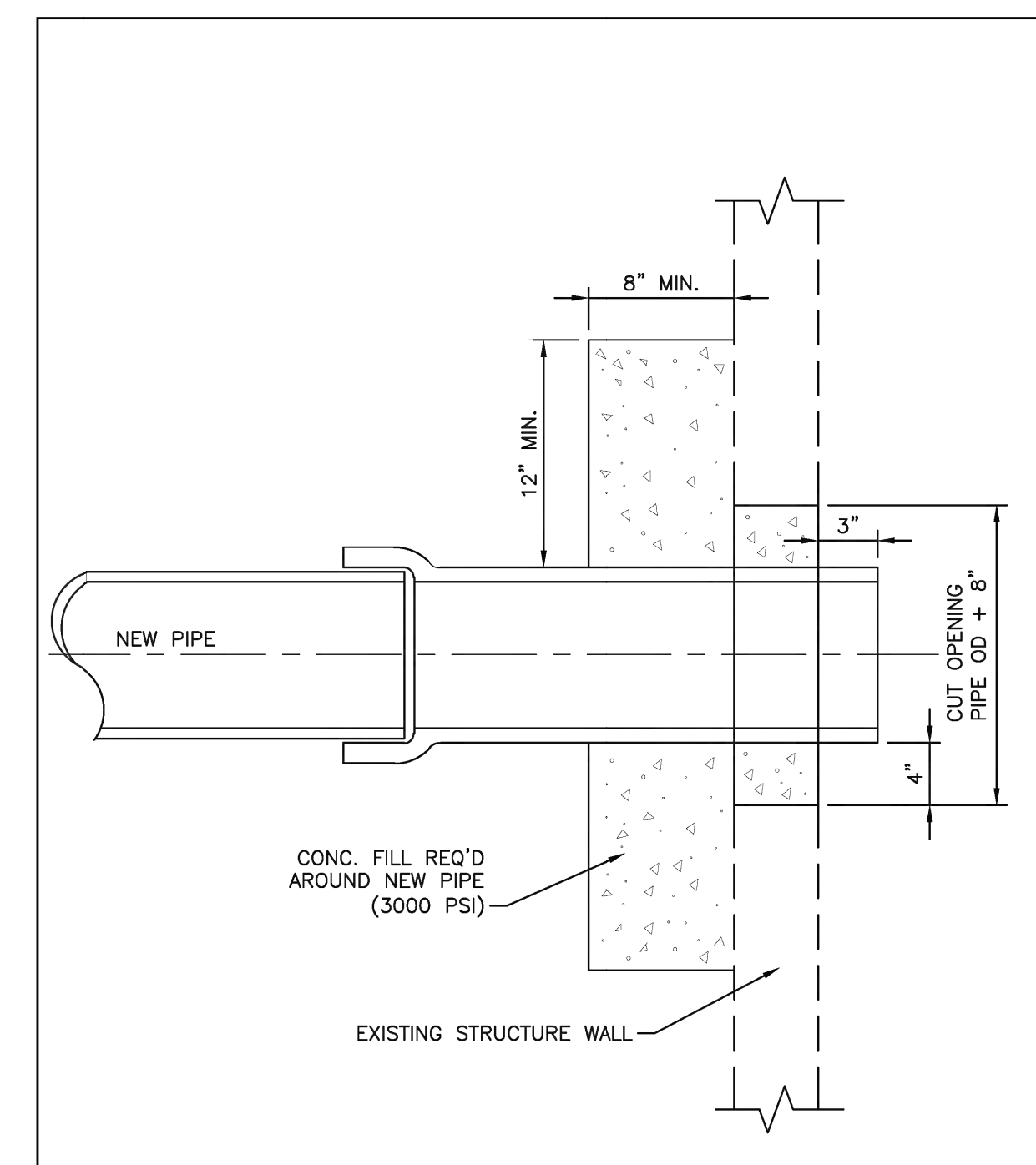
- NOTES:**
- SEWER STRUCTURE STEP REQUIREMENTS:** Provide individual steps, mortared or cast into walls and conical tops of all manholes and similar structures. Align steps so as to form a continuous ladder with steps equally spaced vertically, no more than 16 inches apart, using steps having a minimum length of 10-inches and which project a minimum clear distance of four inches from the wall. Steps, fastenings and installation must be capable of supporting a single concentrated load of 300 pounds. Use designs based on imposed loads being concentrated at such points as will cause maximum stresses in the structural element being considered. Construct individual steps as one piece, ferrous casting or plastic coated steel meeting requirements of ASTM D4101-95b and A 615 grade 60.
 - Provide watertight boot sleeve of high quality synthetic rubber. Terminate the sleeve at one end in a substantial serrated flange of the same material and cast into the wall of the manhole base to form a water stop. Embed the flange in the wall no less than 4-inches around the entire pipe. Fit the other end of the sleeve around the outside of the pipe and secure to the pipe by means of a stainless steel strap clamp, draw bolt and nut. Furnish synthetic rubber suitable for use in sewage service.



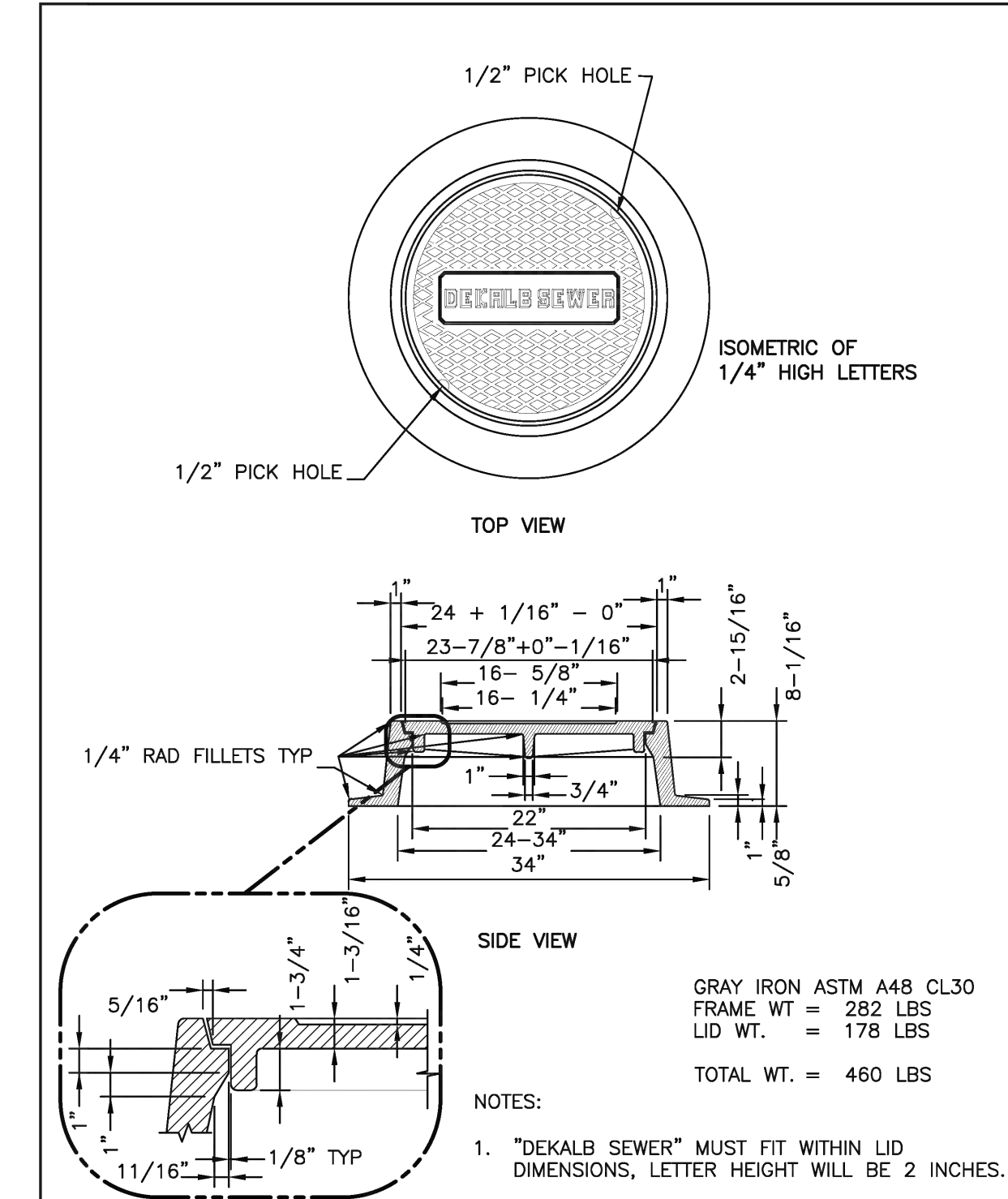
	STANDARD DETAILS	09/17
	Standard Precast Manhole	
	NOT TO SCALE	DETAIL NO. S-001



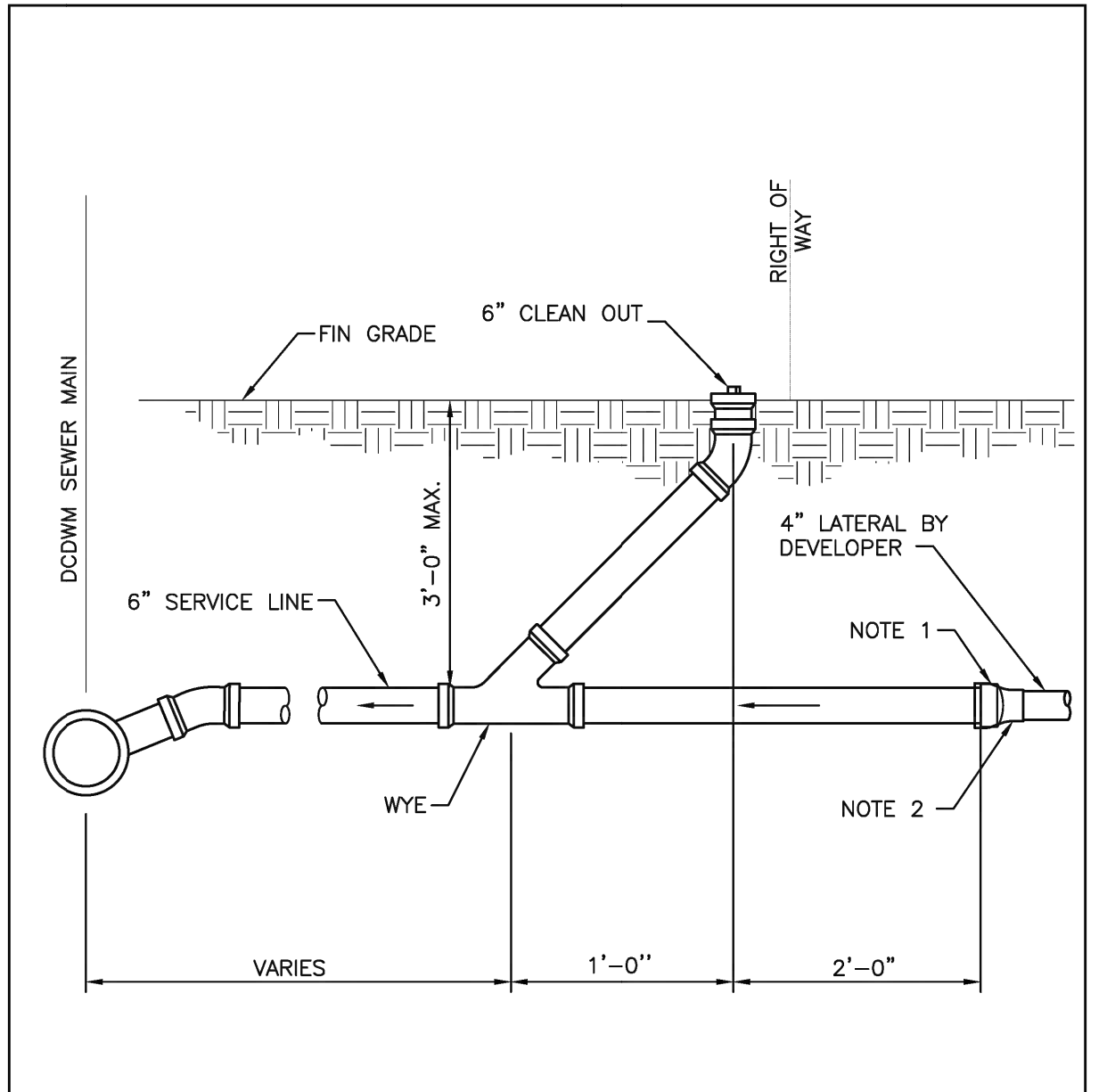
	STANDARD DETAILS	09/17
	Outside Drop Connection For Precast Manhole	
	NOT TO SCALE	DETAIL NO. S-003



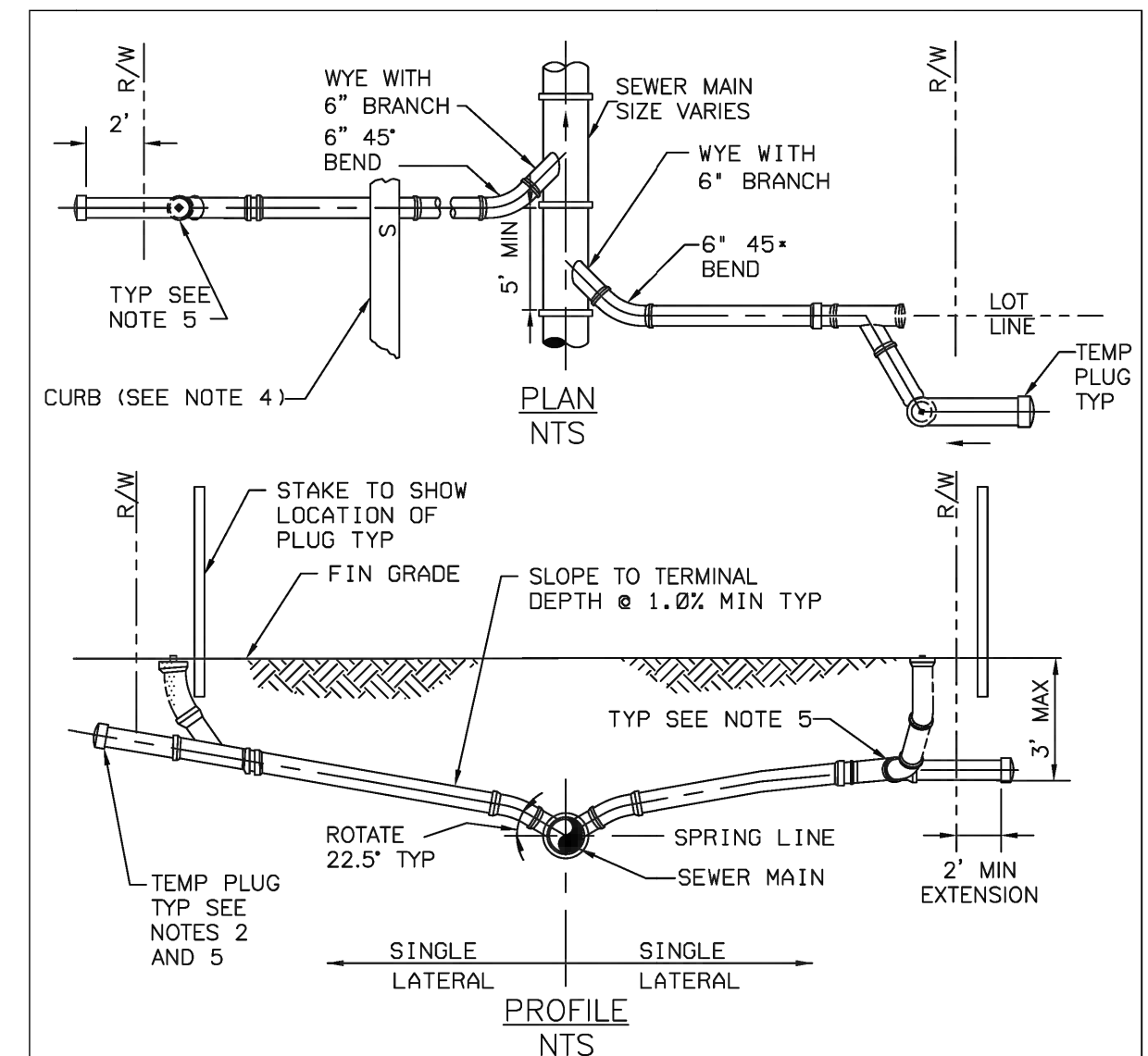
	STANDARD DETAILS	09/17
	New Line Connection to an Existing Structure	
	NOT TO SCALE	DETAIL NO. S-011



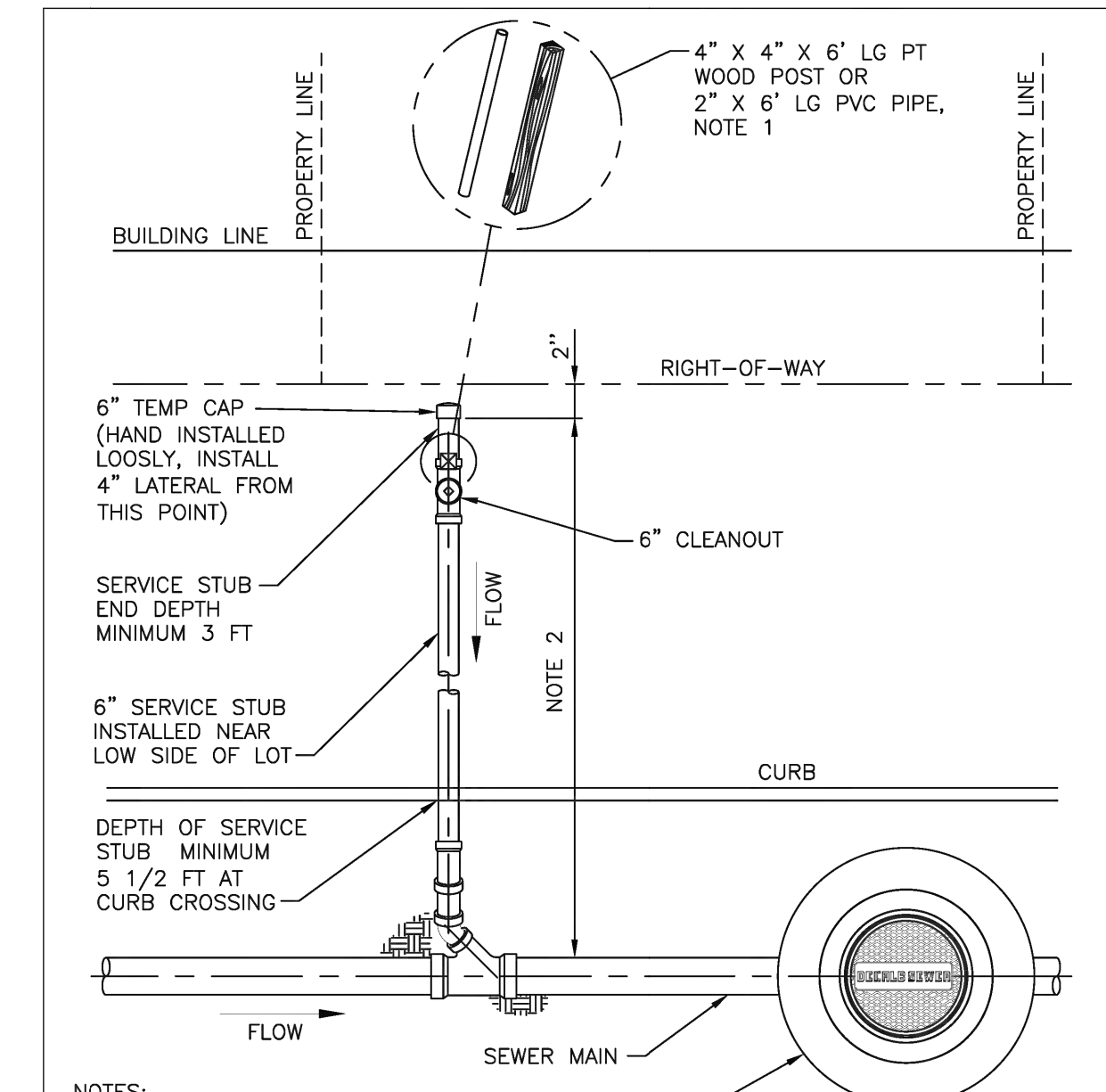
	STANDARD DETAILS	09/17
	Traffic Manhole Frame and Cover	
	NOT TO SCALE	DETAIL NO. S-009



	STANDARD DETAILS	09/17
	Typical Service Line and Clean Out Detail	
	NOT TO SCALE	DETAIL NO. S-012



	STANDARD DETAILS	09/17
	SANITARY SEWER LATERAL CONNECTION	
	NOT-TO-SCALE	DETAIL NO. S-017



	STANDARD DETAILS	09/17
	Service Stub Location Detail	
	NOT TO SCALE	DETAIL NO. S-018

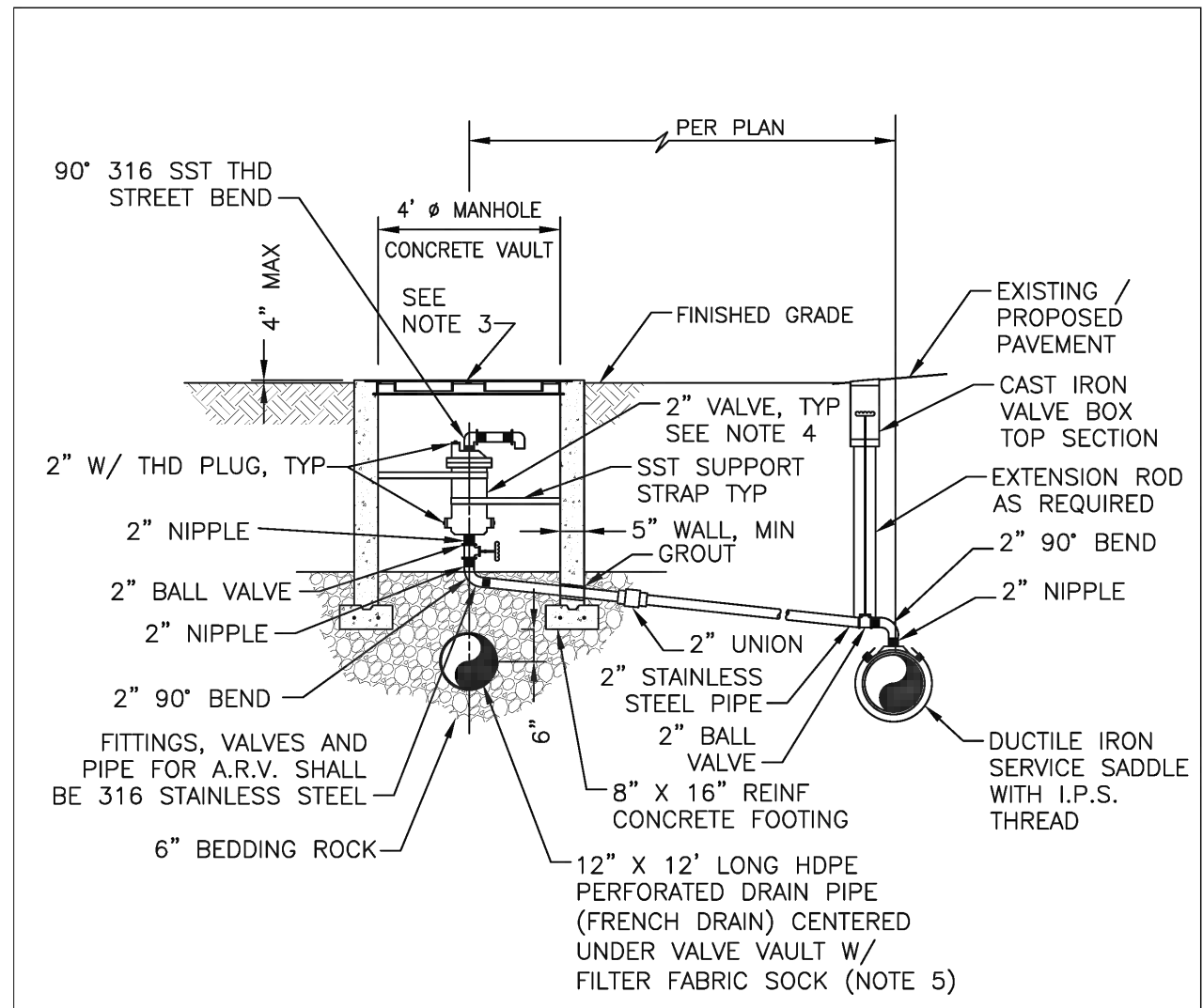
NO.	DATE	REVISION

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1 INCH LONG
PLOTTED FULL SCALE

Project Manager: CAS	Checked By: CAS
Drawn By: BAF	Date: 05/30/2023
Scale: As Shown	

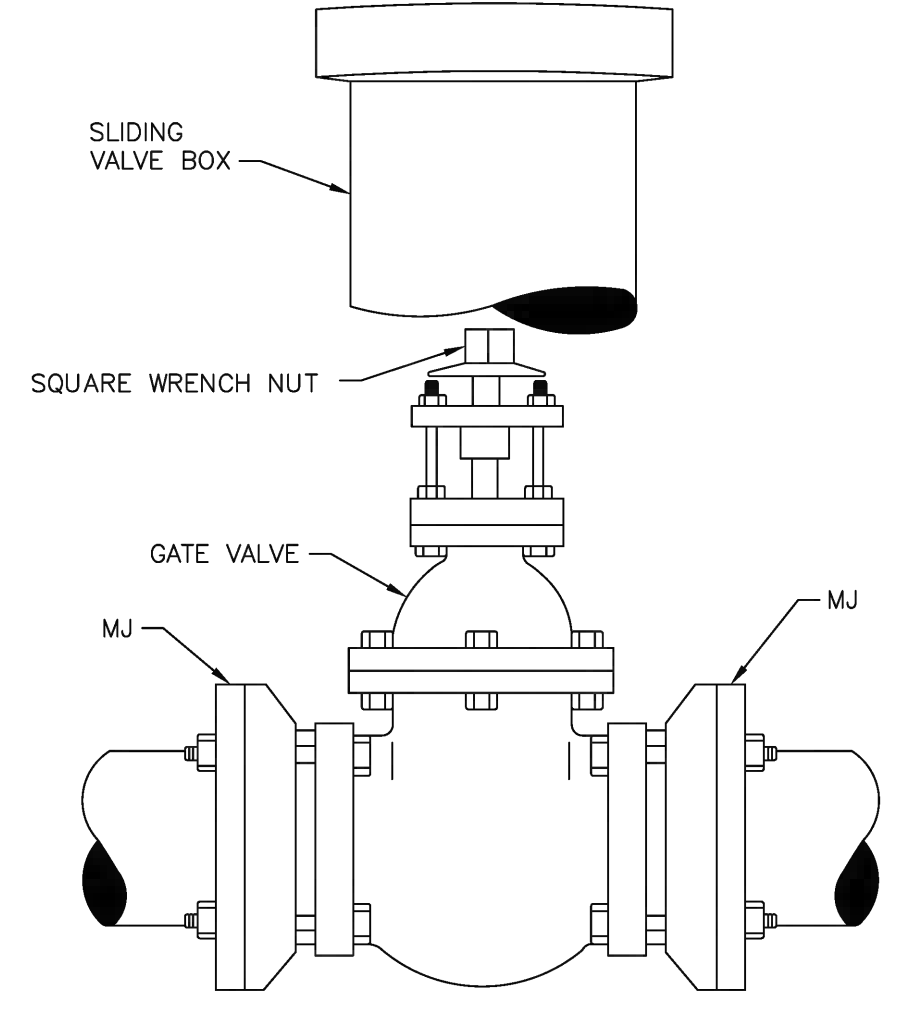
Project No.: 200147
Drawing No.: D11.0

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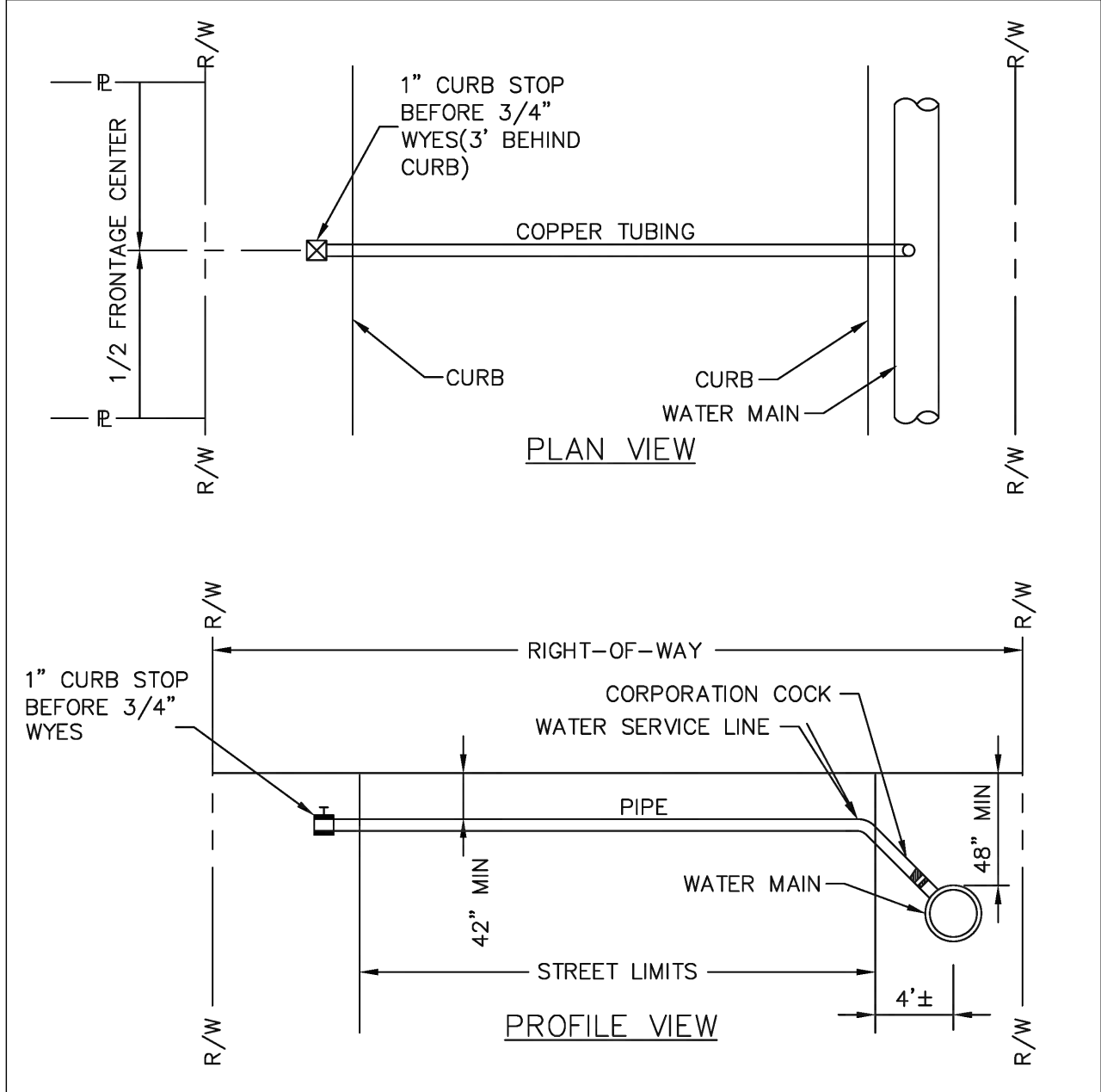


- NOTES:
1. ABOVE DETAIL IS BASED ON 2" AIR RELEASE VALVE. CHANGE PIPE AND FITTINGS BY THE DEVELOPER'S ENGINEER AND APPROVED BY DCDWM PRIOR TO INSTALLATION.
 2. THE MINIMUM DIMENSION FROM THE TOP OF THE WATERMAIN TO FINISHED GRADE SHALL BE 4.0 FEET.
 3. FRAME AND COVER SHALL BE EQUIVALENT TO U.S. FOUNDRY USF 170-E-ORS.
 4. FOR POTABLE WATER AND REUSE WATER MAINS, VALVE SHALL BE APCO #200 (2") OR EQUIVALENT.
 5. FRENCH DRAIN BEDDING BEYOND VALVE VAULT SHALL CONSIST OF 24" X 24" TRENCH LINED W/ 6" MIN #57 BEDDING AROUND FRENCH DRAIN CENTERED IN TRENCH.

	STANDARD DETAILS	09/17
	Air Release Valve Installation Detail	
NOT TO SCALE		DETAIL NO. W-019

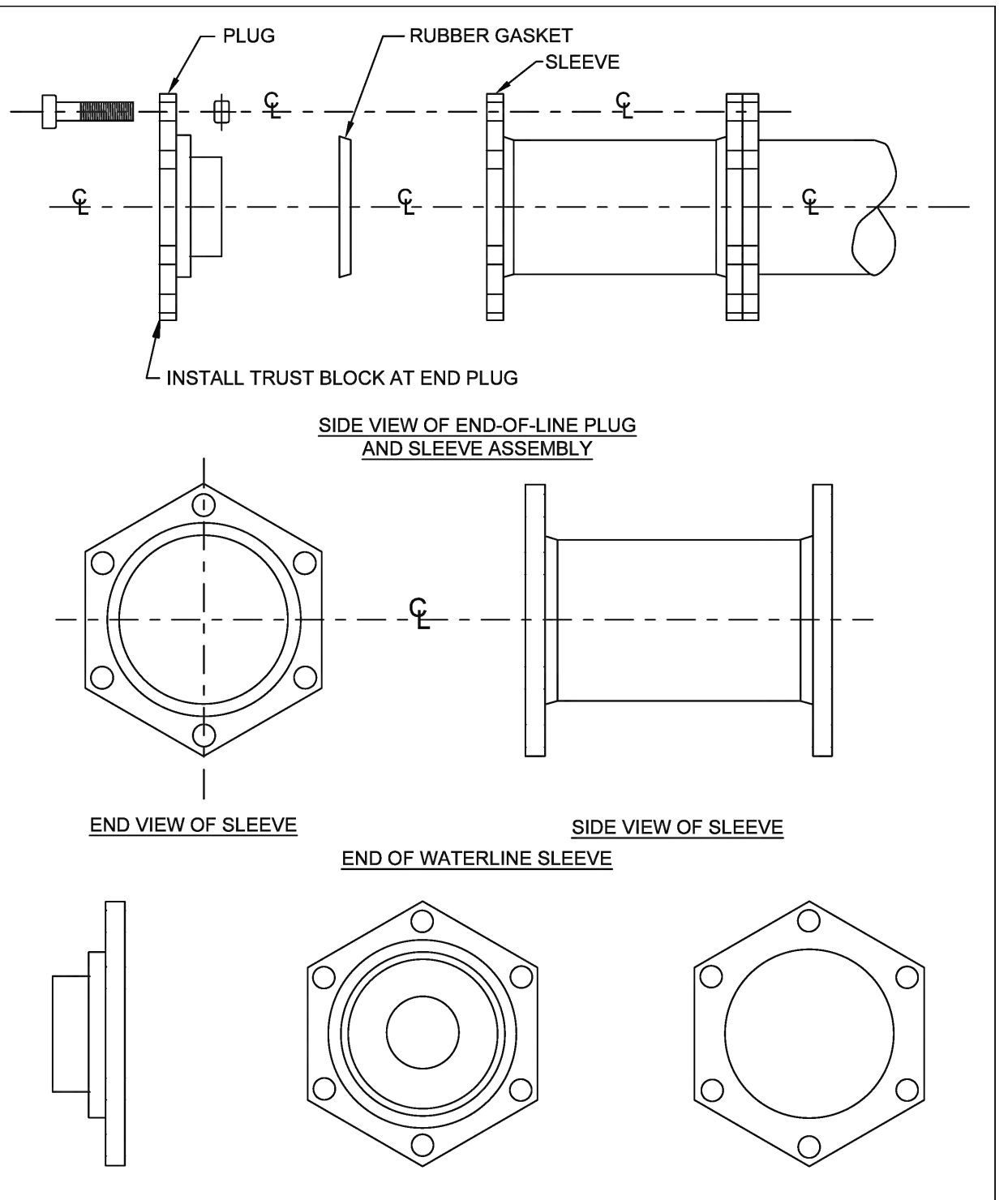


	STANDARD DETAILS	09/17
	Typical Gate Valve Installation	
NOT TO SCALE		DETAIL NO. W-007

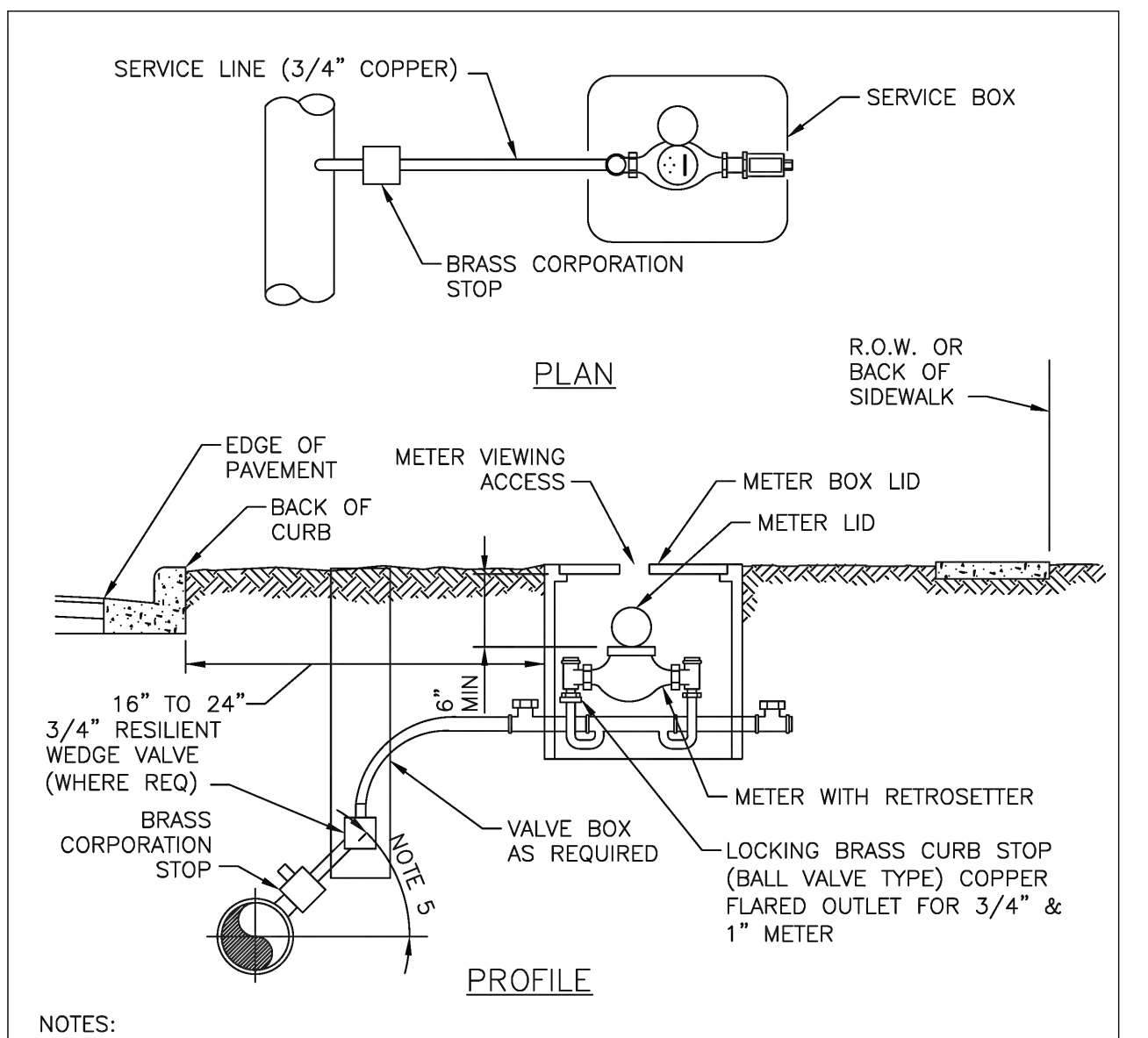


- NOTES:
1. SERVICE LINES 1 INCH AND SMALLER SHALL BE INSTALLED USING COPPER TUBING WITH FLARE X MIPT.
 2. LARGER SERVICE LINE MATERIAL SHALL BE AS SPECIFIED ON THE DRAWING, AND REQUIRES COUNTY APPROVAL.

	STANDARD DETAILS	09/17
	Typical Service Line Installation	
NOT TO SCALE		DETAIL NO. W-008



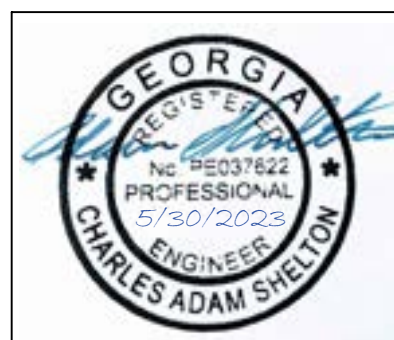
	STANDARD DETAILS	09/17
	End of Water Line Plug & Sleeve Assembly	
NOT TO SCALE		DETAIL NO. W-024



- NOTES:
1. METER SHALL BE INSTALLED BETWEEN SIDEWALK AND CURB AND IN NO CASE SHALL IT BE INSTALLED IN SIDEWALK OR OTHER PAVED AREAS.
 2. ALL POTABLE WATER IRRIGATION METERS REQUIRE AN APPROVED BACKFLOW PREVENTER.
 3. ALL PROPERTIES WITH ALTERNATIVE WATER SYSTEMS (WELL, ETC.) REQUIRE BACKFLOW PREVENTERS.
 4. SERVICE LINES SHALL NOT BE LESS THAN METER SIZE.
 5. SERVICE TAP SHALL BE BETWEEN 10:00 O'CLOCK AND 2:00 O'CLOCK WITHOUT SADDLE TAP.

	STANDARD DETAILS	09/17
	Residential Water Meter Installation Detail	
NOT TO SCALE		DETAIL NO. W-021

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NO.	DATE	REVISION

Fitzgerald Park Improvements - Phase 2
4877 Lawrenceville Hwy
Tucker, Georgia
CONSTRUCTION DETAILS

THIS BAR IS
1 INCH LONG
PLOTTED FULL SCALE

Project Manager: CAS	Checked By: CAS
Drawn By: BAF	Date: 05/30/2023
Scale: As Shown	

Project No.:
200147
Drawing No.:
D12.0

- GENERAL NOTES**
- ITEM # 5 1. OWNER CITY OF TUCKER, PARKS AND RECREATION DEPARTMENT
4898 LAVISTA ROAD
TUCKER, GEORGIA 30084
- ITEM # 4 2. EMERGENCY NAME: RIP ROBERTSON
24-HOUR PARKS AND RECREATION DIRECTOR
CONTACT OFFICE # (470) 273-3076 / MOBILE # (470) 481-0205
- ITEM # 6 3. TOTAL SITE AREA: 18.05 ACRES DISTURBED AREA: 7.82 ACRES
- ITEM # 9 4. DESCRIPTION: THE CONSTRUCTION ACTIVITIES GENERALLY INCLUDE CLEARING, GRADING, AND EARTHWORK REQUIRED TO RECONSTRUCT EXISTING PARK DRIVEWAYS, ADD CURB & GUTTER, CONSTRUCT PARKING LOTS, INSTALL STORM DRAINAGE, RETAINING WALLS, TURF FIELD, SIDEWALK, SANITARY SEWER AND WATER LATERALS, BLEACHERS, AND RESTROOM AND CONCESSION BUILDING.
5. EXISTING SITE CONDITIONS AND ADJACENT AREAS: THE MAJORITY OF THE EXISTING SITE IS VEGETATED AND/OR WOODED ALONG A COMBINATION OF ROADWAY RIGHT-OF-WAYS AND PRIVATE PROPERTY. SLOPES VARY FROM GENTLE TO STEEP AND THE VEGETATION VARIES FROM GRASS AND SOD TO MOSS AND DIRT SCATTERED WITH GRAVEL.
6. THIS SITE DOES NOT CONTAIN WETLANDS OR ANY KNOWN CEMETERIES.
7. NO UNIQUE VEGETATION, INCLUDING WETLAND VEGETATION, HAVE BEEN FOUND TO EXIST WITHIN THE LIMITS OF THIS PROJECT.
8. PROJECT SITE CONTAINS STATE WATERS REQUIRING UNDISTURBED BUFFERS, 25'.
- ITEM # 11 9. CAMP CREEK IS THE RECEIVING WATERS.
10. THIS PROJECT DOES NOT DISCHARGE STORM WATER INTO AN IMPAIRED STREAM SEGMENT AND IS NOT WITHIN 1 MILE UPSTREAM OF AND WITHIN THE SAME WATERSHED AS ANY PORTION OF A BIOTA IMPAIRED STREAM SEGMENT.
- ITEM # 18 11. NO EXISTING STORM DRAIN PIPES OR WEIRS WILL BE AFFECTED.
12. WASTE MATERIALS SHALL NOT BE DISCHARGED TO WATERS OF THE STATE, EXCEPT AS AUTHORIZED BY A SECTION 404 PERMIT.
13. SITES ARE LOCATED IN THE CITY OF TUCKER UNLESS OTHERWISE NOTED.
14. ALL LAND DISTURBING ACTIVITY IS LOCATED WITHIN RESIDENTIAL AND RURAL AREAS.
15. ALL SPECIAL FLOOD HAZARD AREA INFORMATION TAKEN FROM PANELS ON FIRM MAPS DATED 9/29/2006.
16. WORK ZONES WILL BE SET UP ACCORDING TO M.U.T.C.D. MANUAL.
17. RETAINING WALLS OVER 4' IN HEIGHT AND PART OF INITIAL INFRASTRUCTURE WILL BE REQUIRED TO BE INSPECTED BY DESIGN PROFESSIONAL OR REPRESENTATIVE AND INSPECTION REPORT WILL BE REQUIRED AT TIME OF C.O.
18. ALL MANHOLES OR CATCH BASINS MAY NOT BE COVERED DURING OR AFTER CONSTRUCTION AND SHALL BE VISIBLE AND CLEAN ON FINAL INSPECTION.
19. SHOULDER RESTORATION WILL BE LEVEL WITH EXISTING ASPHALT AND SLOPING TO DITCH LINE.
20. ALL DRIVEWAY APRONS MUST BE INSPECTED WHEN FORMED AND AFTER POURED.
21. CONTRACTOR MUST CALL CITY PUBLIC WORKS ENGINEERS OFFICE FOR INSPECTION OF ALL STORM DRAIN SYSTEMS (PIPES, BOXES, CATCH BASINS, ETC.) BEFORE BACKFILLING.
22. CONCRETE TRUCK DRUMS SHALL NOT BE WASHED OUT ONSITE AND SURPLUS CONCRETE WILL NOT BE DISCARDED ONSITE.
23. CONCRETE TRUCK SHOOTS AND TOOLS WILL BE WASHED OUT INTO THE WORKING TRENCH PRIOR TO BACKFILL. NO WATER FROM WASHING OFF TOOLS OR SHOOTS WILL LEAVE THE SITE OR DRAIN ONTO UNDISTURBED AREAS.
24. ANY SOIL OR DEBRIS ON ROAD WILL BE REMOVED DAILY OR IMMEDIATELY IF A HAZARDOUS ROAD CONDITION EXISTS.
- ITEM # 27 25. PROVIDE COVER (E.G. PLASTIC SHEETING, TEMPORARY ROOFS) FOR BUILDING MATERIALS, BUILDING PRODUCTS, CONSTRUCTION WASTES, TRASH, LANDSCAPE MATERIALS, FERTILIZERS, PESTICIDES, HERBICIDES, DETERGENTS, SANITARY WASTE, AND OTHER MATERIALS PRESENT ON THE SITE. COVER WILL BE UTILIZED TO MINIMIZE THE EXPOSURE OF THESE PRODUCTS TO PRECIPITATION AND TO NEGATE STORMWATER DISCHARGE OF POLLUTANTS FROM THESE AREAS.
- ITEM # 28 26. LIMIT OF DISTURBANCE SHALL BE NO GREATER THAN 50 ACRES AT ANY ONE TIME WITHOUT PRIOR WRITTEN AUTHORIZATION FROM THE EPD DISTRICT OFFICE.
27. THE USE OF PERMANENT SEEDING, SODDING, AND WATER QUALITY VAULTS WILL BE USED TO REDUCE STORM WATER POLLUTANTS AFTER CONSTRUCTION OPERATIONS HAVE BEEN COMPLETED.
- ITEM # 28 28. THE USE OF SILT FENCE, CHECK DAMS, TEMPORARY CONSTRUCTION ENTRANCE, TEMPORARY INLET SEDIMENT PROTECTION TRAPS, AND SEEDING WILL BE USED TO REDUCE STORM WATER POLLUTANTS.

PUBLIC UTILITIES NOTES

1. DEKALB COUNTY WATER OPS SHALL BE NOTIFIED 24 HOURS PRIOR TO ANY WATER OR SANITARY SEWER LINE CONSTRUCTION OR REPAIRS. ONLY CONTRACTORS APPROVED BY GAINESVILLE PUBLIC UTILITIES DEPARTMENT WILL BE ALLOWED TO PERFORM CONSTRUCTION OR REPAIRS CONNECTED TO SAID WATER OR SANITARY SEWER MAINS. CALL ENGINEERING INSPECTOR'S OFFICE AT (470)371-4918 PRIOR TO BEGINNING CONSTRUCTION OR TO BECOME AN APPROVED CONTRACTOR.
2. ALL WATER MAIN AND SANITARY SEWER MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE DEKALB COUNTY WATER AND SEWER STANDARDS.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING A MARKED-UP SET OF CONTRACT DRAWINGS SHOWING "AS-BUILT" CONDITIONS. THESE "RECORD DRAWINGS" SHALL BE MADE AVAILABLE TO THE ENGINEER AND/OR THE CITY INSPECTOR UPON REQUEST. THE MARK-UPS SHALL BE AT THE SITE AT ALL TIMES AND SHALL BE UTILIZED TO DEVELOP FINAL RECORD DRAWINGS. FINAL ACCEPTANCE OF WATER AND/OR SEWER MAIN CONSTRUCTION WILL NOT BE GRANTED UNTIL AS-BUILT DRAWINGS HAVE BEEN RECEIVED BY DEKALB COUNTY WATER OPS.
4. MAINTAIN A MINIMUM 10 FEET HORIZONTAL DISTANCE BETWEEN WATER & SEWER LINE.
5. MAINTAIN A MINIMUM 18 INCH VERTICAL DISTANCE BETWEEN WATER AND SEWER LINE.
6. WHERE WATER AND SANITARY SEWER LINES CROSS, THE WATER MAIN SHALL BE 18 INCHES ABOVE THE SEWER. IF THE SEWER MUST BE ABOVE THE WATER MAIN, THE SEWER SHALL BE AT LEAST 18 INCHES ABOVE AND ENCASED IN CONCRETE A MINIMUM OF 10 FEET ON EACH SIDE OF THE WATER MAIN. JOINTS SHALL BE SPACED TO PROVIDE MAXIMUM DISTANCE FROM CROSSING.
7. WHERE WATER OR SANITARY SEWER MAINS CROSS STORM DRAINS, MINIMUM 18 INCHES VERTICAL SEPARATION SHALL BE MAINTAINED.

EROSION CONTROL NOTES

- ITEM # 19 1. INSTALLATION: THE ESCAPE OF SEDIMENT FROM THE SITE SHALL BE PREVENTED BY THE INSTALLATION OF EROSION AND SEDIMENT CONTROL MEASURES AND PRACTICES PRIOR TO, OR CONCURRENT WITH, LAND DISTURBING ACTIVITIES.
- ITEM # 20 2. MAINTENANCE: EROSION CONTROL MEASURES WILL BE MAINTAINED AT ALL TIMES. IF FULL IMPLEMENTATION OF THE APPROVED PLAN DOES NOT PROVIDE FOR EFFECTIVE EROSION CONTROL, ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE IMPLEMENTED TO CONTROL OR TREAT THE SEDIMENT SOURCE.
- ITEM # 21 3. ANY DISTURBED AREA LEFT EXPOSED FOR A PERIOD GREATER THAN 14 DAYS SHALL BE STABILIZED WITH MULCH OR TEMPORARY SEEDING.
4. EROSION CONTROL MEASURES SHOWN ON THE DRAWINGS ARE MINIMUM REQUIREMENTS. ADDITIONAL EROSION CONTROL MEASURES SHALL BE EMPLOYED BY THE CONTRACTOR WHERE DETERMINED NECESSARY BY LOCAL AUTHORITIES OR THE ENGINEER BASED UPON ACTUAL SITE CONDITIONS. CHECK DAMS (Cd) WILL BE USED AS NEEDED.
5. EROSION CONTROL MEASURES MAY HAVE TO BE ALTERED FROM THAT SHOWN ON THE DRAWINGS IF DRAINAGE PATTERNS DURING CONSTRUCTION ARE DIFFERENT FROM THE DRAINAGE PATTERNS SHOWN ON THE DRAWINGS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ACCOMPLISH EROSION CONTROL FOR ALL DRAINAGE PATTERNS CREATED AT VARIOUS STAGES DURING CONSTRUCTION. ADDITIONAL SEDIMENT BARRIERS WILL BE PLACED AS REQUIRED BY INSPECTOR.
6. MAINTENANCE OF ALL SOIL EROSION AND SEDIMENTATION CONTROL PRACTICES, WHETHER TEMPORARY OR PERMANENT, SHALL BE AT ALL TIMES THE RESPONSIBILITY OF THE CONTRACTOR DURING CONSTRUCTION. PROVISIONS TO PREVENT EROSION OF SOIL FROM SITE SHALL BE, AT A MINIMUM, IN CONFORMANCE WITH THE LATEST REVISION OF THE "MANUAL FOR EROSION AND SEDIMENTATION CONTROL IN GEORGIA."
7. FAILURE TO INSTALL, OPERATE, OR MAINTAIN ALL EROSION CONTROL MEASURES WILL RESULT IN ALL CONSTRUCTION BEING STOPPED ON THE JOB SITE UNTIL SUCH MEASURES ARE CORRECTED.
8. IF FINES OR PENALTIES ARE LEVIED AGAINST THE PROPERTY OR THE PROPERTY OWNER BECAUSE OF A LACK OF EROSION OR SEDIMENTATION CONTROL, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PAYMENT OF SUCH FINES OR PENALTIES, OR THE COST OF SUCH FINES OR PENALTIES SHALL BE DEDUCTED FROM THE CONTRACT AMOUNT.
- ITEM # 18 10. WASTE MATERIALS SHALL NOT BE DISCHARGED TO WATERS OF THE STATE, EXCEPT AS AUTHORIZED BY A SECTION 404 PERMIT.
11. ALL MATERIALS SPILLED, DROPPED, WASHED, OR TRACKED FROM VEHICLE OR SITE ONTO PUBLIC ROADWAYS OR INTO STORM DRAINAGE SHALL BE KEPT TO A MINIMUM & REMOVED BY THE END OF THE DAY.

EROSION CONTROL NOTES (CONT.)

- ITEM # 26 12. THE INSTALLATION OF EROSION CONTROL MEASURES AND PRACTICES SHALL TAKE PLACE PRIOR TO, OR CONCURRENT WITH, LAND DISTURBING ACTIVITIES.
13. TEMPORARY MULCHING SHALL BE PROVIDED TO DISTURBED AREAS DAILY.
14. LIMITS OF CONSTRUCTION SHALL BE CONTAINED WITHIN THE RIGHT OF WAY AND EASEMENTS OBTAINED BY THE PUBLIC UTILITIES DEPARTMENT.
15. PRIOR TO COMMENCING LAND DISTURBANCE ACTIVITY, THE LIMITS OF LAND DISTURBANCE SHALL BE CLEARLY AND ACCURATELY DEMARCATED WITH STAKES, RIBBONS, OR OTHER APPROPRIATE MEANS. THE LOCATION AND EXTENT OF ALL AUTHORIZED LAND DISTURBANCE ACTIVITY SHALL BE DEMARCATED FOR THE DURATION OF THE CONSTRUCTION ACTIVITY. NO DISTURBANCE ACTIVITY SHALL OCCUR OUTSIDE THE LIMITS INDICATED ON THE DRAWINGS.
16. ALL EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICES (BMPs) WILL BE INSPECTED DAILY, AND ANY DEFICIENCIES WILL BE CORRECTED BY THE END OF EACH DAY. ADDITIONAL EROSION CONTROL BMPs WILL BE INSTALLED IF DEEMED NECESSARY BY ON SITE INSPECTION BY THE ISSUING AUTHORITY.
17. SEDIMENT CONTROL MEASURES WILL BE MAINTAINED UNTIL ALL UPSTREAM DISTURBED GROUND WITHIN THE CONSTRUCTION AREA HAS BEEN COMPLETELY STABILIZED WITH PERMANENT VEGETATION AND ALL ROADS/PARKING HAVE BEEN PAVED.
18. CONTRACTOR SHALL INSPECT AND REPAIR EROSION CONTROL MEASURES AT LEAST DAILY AND PRIOR TO EACH ANTICIPATED RAINFALL.
19. THE CONTRACTOR SHALL REMOVE ACCUMULATED SILT FROM SEDIMENT BARRIERS AND CHECK DAMS WHICH BECOME SILTED ABOVE ONE-HALF OF THEIR ORIGINAL HEIGHT.
20. ALL AREAS TO BE PAVED SHALL BE STABILIZED WITH BASE MATERIAL AS SOON AS PRACTICAL. TEMPORARY OR PERMANENT VEGETATIVE STABILIZATION SHALL BE PROVIDED IMMEDIATELY AFTER REACHING FINAL GRADE FOR ALL AREAS NOT TO BE PAVED.
21. THE CONSTRUCTION ACTIVITIES AT THESE SITES WILL NOT RESULT IN FLOODING OR CHANNEL DEGRADATION DOWNSTREAM.
22. NO CUT OR FILL SLOPES STEEPER THAN 2:1 ARE ALLOWED. SPECIAL ATTENTION WILL BE GIVEN TO FILLS OVER 5 FEET IN HEIGHT.
23. ALL FILL SLOPES WILL HAVE SILT FENCES AT THE TOE OF SLOPES.
24. SURFACE ROUGHENING (Su): ALL CUT AND FILL SLOPES SHALL BE SURFACE ROUGHENED AND VEGETATED WITHIN (3) THREE DAYS AFTER GRADING IS COMPLETED.
25. AT THE END OF EACH WORK DAY, ALL SLOPES 2:1 OR STEEPER AND HIGHER THAN 5 FEET SHALL RECEIVE SURFACE ROUGHENING, POLYMERS, AND MATTING.
26. DOUBLE ROW TYPE C SILT FENCE REQUIRED WHEN PLACED ALONG STATE WATERS AND AT THE TOE OF SLOPES EXCEEDING 10' VERTICAL.
27. CHECK DAMS SHALL HAVE A MAXIMUM SPACING OF 150 FEET IN DITCH LINE.
28. AN UNDISTURBED VEGETATIVE BUFFER (MEETING COUNTY & STATE REGULATIONS) AND THE APPROPRIATE IMPERVIOUS SETBACK ADJACENT TO ALL STATE WATERS WILL BE PRESERVED.
29. SIGN EVERY LOT OR EVERY 100', WHICHEVER IS LESS, STATING: "STREAMSIDE BUFFER - DO NOT REMOVE OR ALTER EXISTING NATIVE VEGETATION."
30. CRITICAL AREAS: RIP RAP AND/OR STONE CHECK DAMS SHALL BE PLACED AT ALL CRITICAL EROSION AREAS INCLUDING, BUT NOT LIMITED TO, STREAM CROSSINGS.
31. PERMANENT VEGETATION SHALL BE PROVIDED AT THE EARLIEST SUITABLE GROWING SEASON.
32. WHEN ANY CONSTRUCTION BORDERS A DRAINAGE COURSE, THE CONTRACTOR SHALL NOT DEPOSIT ANY BUILDING OR OTHER EXCAVATION SPOIL DIRT, CONSTRUCTION TRASH OR DEBRIS, ECT. IN THE DRAINAGE COURSE OR ASSOCIATED FLOOD PLAIN.
33. GRADING EQUIPMENT MUST CROSS FLOWING STREAMS BY THE MEANS OF BRIDGING OR CULVERTS, EXCEPT WHEN SUCH METHODS ARE NOT FEASIBLE; ALL STREAM CROSSINGS WILL BE PERFORMED IN ACCORDANCE WITH THE LATEST REVISION OF THE "MANUAL FOR EROSION AND SEDIMENTATION CONTROL IN GEORGIA."
34. DISCHARGE OF STORM-WATER RUN-OFF FROM DISTURBED AREAS TO A STREAM SHALL BE CONTROLLED TO THE EXTENT THAT TURBIDITY OF THE STREAM DOWNSTREAM FROM THE DISCHARGE SHALL NOT EXCEED 50 NEPHELOMETRIC TURBIDITY UNITS HIGHER THAN THE TURBIDITY LEVEL OF THE RECEIVING STREAM IMMEDIATELY UPSTREAM FROM THE STORM-WATER RUN-OFF DISCHARGE AT THE TIME OF SUCH DISCHARGE.
35. DISPOSE OF WASTE SOILS AND CLEARED AND GRUBBED & CONSTRUCTION DEBRIS OFF-SITE AT AN APPROVED LANDFILL SECURED BY THE CONTRACTOR, AND IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REGULATIONS.
36. ALL SOLID WASTE IS TO BE HAULLED OFF-SITE. STUMPS AND CONSTRUCTION DEBRIS SHALL BE DEPOSITED IN A PROPERLY PERMITTED LANDFILL.
37. CONSTRUCTION EXIT IS PROVIDED TO MINIMIZE THE AMOUNT OF OFF-SITE VEHICLE TRACKING OF DIRT, SOILS, AND SEDIMENTS AND DUST GENERATION. THE CONSTRUCTION ENTRANCE/EXIT ALSO ACTS AS A FUELING AREA WHICH WILL PROVIDE REMEDIATION OF PETROLEUM SPILLS AND LEAKS.
- ITEM # 15 38. NON-EXEMPT ACTIVITIES SHALL NOT BE CONDUCTED WITHIN THE 25 OR 50-FOOT UNDISTURBED STREAM BUFFER AS MEASURED FROM THE POINT OF WRESTED VEGETATION WITHOUT FIRST ACQUIRING THE NECESSARY VARIANCES AND PERMITS, EXCEPT AS PERMITTED UNDER GEN. NPDES PERMIT # GAR100001 PART IV (i), (ii), AND (iii).
- ITEM # 14 39. UPON NOTIFICATION BY THE PRIMARY PERMITTEE, THE DESIGN PROFESSIONAL WHO PREPARED THE ES&PC PLAN SHALL INSPECT THE INSTALLATION OF THE INITIAL SEDIMENT STORAGE REQUIREMENTS AND PERIMETER CONTROL BMP'S WITHIN SEVEN (7) DAYS AFTER INSTALLATION.
- ITEM # 17 40. ANY AMENDMENTS/REVISIONS TO THE ES&PC PLAN WHICH HAVE A SIGNIFICANT EFFECT ON BMPs WITH A HYDRAULIC COMPONENT MUST BE CERTIFIED BY THE DESIGN PROFESSIONAL.
41. THESE PLANS HAVE BEEN PREPARED TO MEET THE REQUIREMENTS UNDER THE STATE OF GEORGIA, DEPT. OF NATURAL RESOURCES, ENVIRONMENTAL PROTECTION DIVISION (EPD), GENERAL PERMIT NO. GAR 100001 FOR AUTHORIZATION TO DISCHARGE UNDER THE NPDES, STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY FOR THIS PROJECT
42. RETAINING WALLS OVER 4' IN HEIGHT AND PART OF INITIAL INFRASTRUCTURE WILL BE REQUIRED TO BE INSPECTED BY DESIGN PROFESSIONAL OR REPRESENTATIVE AND AN INSPECTION REPORT WILL BE REQUIRED AT TIME OF C.O.
43. SEE DETAIL PAGES FOR CHART WITH SYMBOLS, DETAILS, AND DESCRIPTIONS OF FULL EROSION CONTROL MEASURES.
44. GPS LOCATION OF CONSTRUCTION EXIT: 33°51'55.93" N 84°11'30.21" W
45. CONTRACTOR IS TO ENSURE SITE WILL HAVE THE APPROPRIATE STAGING & ACCESS REQUIREMENTS FOR CONSTRUCTION EQUIPMENT.

SOIL CLEANUP AND CONTROL PRACTICES

1. LOCAL, STATE AND MANUFACTURER'S RECOMMENDED METHODS FOR SPILL CLEANUP WILL BE CLEARLY POSTED AND PROCEDURES WILL BE MADE AVAILABLE TO SITE PERSONNEL.
2. MATERIAL AND EQUIPMENT NECESSARY FOR SPILL CLEANUP WILL BE KEPT IN THE MATERIAL STORAGE AREAS. TYPICAL MATERIALS AND EQUIPMENT INCLUDES, BUT IS NOT LIMITED TO, BROOMS, DUSTPANS, MAPS, RAGS, GLOVES, GOGGLES, CAT LITTER, SAND, SAWDUST AND PROPERLY LABELED PLASTIC AND METAL WASTE CONTAINERS.
3. SPILL PREVENTION PRACTICES AND PROCEDURES WILL BE REVIEWED AFTER A SPILL AND ADJUSTED AS NECESSARY TO PREVENT FUTURE SPILLS.
4. ALL SPILLS WILL BE CLEANED UP IMMEDIATELY UPON DISCOVERY. ALL SPILLS WILL BE REPORTED AS REQUIRED BY LOCAL, STATE AND FEDERAL REGULATIONS.
5. FOR SPILLS THAT IMPACT SURFACE WATER (LEAVE A SHEEN ON SURFACE WATER), THE NATIONAL RESPONSE CENTER (NRC) WILL BE CONTACTED WITHIN 24 HOURS AT 1-800-424-8802.
6. FOR SPILLS OF AN UNKNOWN AMOUNT, THE NATIONAL RESPONSE CENTER (NRC) WILL BE CONTACTED WITHIN 24 HOURS AT 1-800-424-8802.
7. FOR SPILLS GREATER THAN 25 GALLONS AND NO SURFACE WATER IMPACT, THE GEORGIA EPD WILL BE CONTACTED WITHIN 24 HOURS.
8. FOR SPILLS LESS THAN 25 GALLONS AND NO SURFACE WATER IMPACT, THE SPILL WILL BE CLEANED UP AND LOCAL AGENCIES WILL BE CONTACTED AS REQUIRED.
9. THE CONTRACTOR SHALL NOTIFY THE LICENSED PROFESSIONAL WHO PREPARED THIS PLAN IF MORE THAN 1,320 GALLONS OF PETROLEUM IS STORED ONSITE (THIS INCLUDES CAPACITIES OF EQUIPMENT) OR IF ANY ONE PIECE OF EQUIPMENT HAS A CAPACITY GREATER THAN 660 GALLONS. THE CONTRACTOR WILL NEED A SPILL PREVENTION CONTAINMENT AND COUNTERMEASURES PLAN PREPARED BY THAT LICENSED PROFESSIONAL.
10. SPILL AREA WILL BE KEPT WELL VENTILATED AND PERSONNEL WILL WEAR APPROPRIATE PROTECTIVE CLOTHING TO PREVENT INJURY FROM CONTACT WITH A HAZARDOUS SUBSTANCE
11. SPILLS OF TOXIC OR HAZARDOUS MATERIAL WILL BE REPORTED TO THE APPROPRIATE STATE OR LOCAL GOVERNMENT AGENCY REGARDLESS OF THE SIZE.
12. THE SPILL PREVENTION PLAN WILL BE ADJUSTED TO INCLUDE MEASURES TO PREVENT THIS TYPE OF SPILL FROM REOCCURRING AND HOW TO CLEAN UP THE SPILL. IF THERE IS ANOTHER ONE, A DESCRIPTION OF THE SPILL, WHAT CAUSED IT, AND THE CLEANUP MEASURES WILL ALSO BE INCLUDED.
13. THE CONTRACTOR'S SITE SUPERINTENDENT RESPONSIBLE FOR THE DAY-TO-DAY SITE OPERATIONS WILL BE THE SPILL PREVENTION AND CLEANUP COORDINATOR. HE WILL DESIGNATE AT LEAST ONE OTHER SITE PERSON WHO WILL RECEIVE SPILL PREVENTION AND CLEANUP TRAINING. THIS INDIVIDUAL WILL BECOME RESPONSIBLE FOR A PARTICULAR PHASE OF PREVENTION AND CLEANUP. THE NAMES OF RESPONSIBLE SPILL PERSONNEL WILL BE POSTED IN THE MATERIAL STORAGE AREA AND IN THE OFFICE TRAILER ONSITE (OR DESIGNATED ONSITE JOB LOCATION).

PRODUCT SPECIFIC PRACTICES

- ITEM # 25 1. PETROLEUM BASED PRODUCTS - CONTAINERS FOR PRODUCTS SUCH AS FUELS, LUBRICANTS AND TARS WILL BE INSPECTED DAILY FOR LEAKS AND SPILLS. THIS INCLUDES ON-SITE VEHICLE AND MACHINERY DAILY INSPECTIONS AND REGULAR PREVENTATIVE MAINTENANCE OF SUCH EQUIPMENT. EQUIPMENT MAINTENANCE AREAS WILL BE LOCATED AWAY FROM STATE WATERS, NATURAL DRAINS AND STORM WATER DRAINAGE INLETS. IN ADDITION, TEMPORARY FUELING TANKS SHALL HAVE A SECONDARY CONTAINMENT LINER TO PREVENT/MINIMIZE SITE CONTAMINATION. DISCHARGE OF OILS, FUELS AND LUBRICANTS IS PROHIBITED. PROPER DISPOSAL METHODS WILL INCLUDE COLLECTION IN A SUITABLE CONTAINER AND DISPOSAL AS REQUIRED BY LOCAL AND STATE REGULATIONS.
2. PAINTS/FINISHES/SOLVENTS - ALL PRODUCTS WILL BE STORED IN TIGHTLY SEALED ORIGINAL CONTAINERS WHEN NOT IN USE. EXCESS PRODUCT WILL NOT BE DISCHARGED TO THE STORM WATER COLLECTION SYSTEM. EXCESS PRODUCT, MATERIALS USED WITH THESE PRODUCTS AND PRODUCT CONTAINERS WILL BE DISPOSED OF ACCORDING TO MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS.
3. CONCRETE TRUCK WASHING - NO CONCRETE TRUCKS WILL BE ALLOWED TO WASH OUT OR DISCHARGE SURPLUS CONCRETE OR DRUM WASH WATER ONSITE.
4. FERTILIZER/HERBICIDES - THESE PRODUCTS WILL BE APPLIED AT RATES THAT DO NOT EXCEED THE MANUFACTURER'S SPECIFICATIONS OR ABOVE THE GUIDELINES SET FORTH IN THE CROP ESTABLISHMENT OR IN THE GSWC MANUAL FOR EROSION AND SEDIMENT CONTROL IN GEORGIA. ANY STORAGE OF THESE MATERIALS WILL BE UNDER ROOF IN SEALED CONTAINERS.
5. BUILDING MATERIALS - NO BUILDING OR CONSTRUCTION MATERIALS WILL BE BURIED OR DISPOSED OF ONSITE. ALL SUCH MATERIAL WILL BE DISPOSED OF USING PROPER WASTE DISPOSAL PROCEDURES.

CONCRETE TRUCKS

- ITEM # 23 1. CONCRETE TRUCK DRUMS WILL NOT BE WASHED OUT ONSITE.
2. SURPLUS CONCRETE WILL NOT BE DISCARDED ONSITE.
3. CONCRETE TRUCK SHOOTS AND TOOLS WILL BE WASHED OUT INTO THE WORKING TRENCH PRIOR TO BACKFILL.
4. NO WATER FROM WASHING OFF TOOLS OR SHOOTS WILL LEAVE THE SITE OR DRAIN ONTO UNDISTURBED AREAS.

SANITARY WASTE

1. A MINIMUM OF ONE PORTABLE SANITARY UNIT WILL BE PROVIDED FOR EVERY TEN WORKERS ON THE SITE. ALL SANITARY WASTE WILL BE COLLECTED FROM THE PORTABLE UNITS A MINIMUM OF ONE TIME PER WEEK BY A LICENSED PORTABLE FACILITY PROVIDER IN COMPLETE COMPLIANCE WITH LOCAL AND STATE REGULATIONS.
2. ALL SANITARY WASTE UNITS WILL BE LOCATED IN AN AREA WHERE THE LIKELIHOOD OF THE UNIT CONTRIBUTING TO STORM WATER DISCHARGE IS NEGLIGIBLE. ADDITIONAL CONTAINMENT BMPs MUST BE IMPLEMENTED, SUCH AS GRAVEL BAGS OR SPECIALLY DESIGNED PLASTIC SKID CONTAINERS AROUND THE BASE TO PREVENT WASTE FROM CONTRIBUTING TO STORM WATER DISCHARGES. THE LOCATION OF SANITARY WASTE UNITS MUST BE IDENTIFIED ON THE EROSION CONTROL PLAN GRADING PHASE.

INSPECTIONS

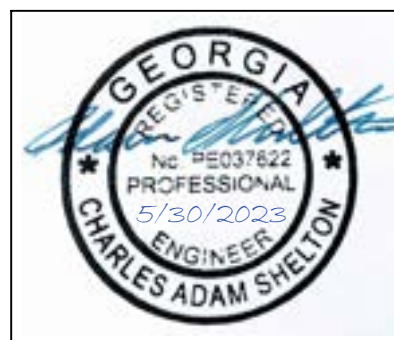
- ITEM # 30 PRIMARY PERMITTEE RESPONSIBILITIES. THE DESIGN PROFESSIONAL WHO PREPARED THIS ES&PC PLAN IS TO INSPECT THE INSTALLATION OF THE INITIAL SEDIMENT REQUIREMENTS AND PERIMETER.
1. EACH DAY WHEN ANY TYPE OF CONSTRUCTION ACTIVITY HAS TAKEN PLACE AT A PRIMARY PERMITTEE'S SITE, CERTIFIED PERSONNEL PROVIDED BY THE PRIMARY PERMITTEE SHALL INSPECT: (A) ALL AREAS AT THE PRIMARY PERMITTEE'S SITE WHERE PETROLEUM PRODUCTS ARE STORED, USED, OR HANDLED FOR SPILLS AND LEAKS FROM VEHICLES AND EQUIPMENT AND (B) ALL LOCATIONS AT THE PRIMARY PERMITTEE'S SITE WHERE VEHICLES ENTER OR EXIT THE SITE FOR EVIDENCE OF OFF-SITE SEDIMENT TRACKING. THESE INSPECTIONS MUST BE CONDUCTED UNTIL A NOTICE OF TERMINATION IS SUBMITTED.
2. MEASURE AND RECORD RAINFALL WITHIN DISTURBED AREAS OF THE SITE THAT HAVE NOT MET FINAL STABILIZATION ONCE EVERY 24 HOURS EXCEPT ANY NON-WORKING SATURDAY, NON-WORKING SUNDAY AND NON-WORKING FEDERAL HOLIDAY. THE DATA COLLECTED FOR THE PURPOSE OF COMPLIANCE WITH THIS PERMIT SHALL BE REPRESENTATIVE OF THE MONITORED ACTIVITY. MEASUREMENT OF RAINFALL MAY BE SUSPENDED IF ALL AREAS OF THE SITE HAVE UNDERGONE FINAL STABILIZATION OR ESTABLISHED A CROP OF ANNUAL VEGETATION AND A SEEDING OF TARGET PERENNIALS APPROPRIATE FOR THE REGION.
3. CERTIFIED PERSONNEL (PROVIDED BY PRIMARY PERMITTEE) SHALL INSPECT THE FOLLOWING AT LEAST ONCE EVERY SEVEN (7) CALENDAR DAYS AND WITHIN 24 HOURS OF THE END OF A STORM THAT IS 0.5 INCHES RAINFALL OR GREATER (UNLESS SUCH STORM ENDS AFTER 5:00 PM ON ANY FRIDAY OR ON ANY NON-WORKING SATURDAY, NON-WORKING SUNDAY OR ANY NON-WORKING FEDERAL HOLIDAY IN WHICH CASE THE INSPECTION SHALL BE COMPLETED BY THE END OF THE NEXT BUSINESS DAY AND/OR WORKING DAY, WHICHEVER OCCURS FIRST): (A) DISTURBED AREAS OF THE PRIMARY PERMITTEE'S CONSTRUCTION SITE, (B) AREAS USED BY THE PRIMARY PERMITTEE FOR STORAGE OF MATERIALS THAT ARE EXPOSED TO PRECIPITATION; AND (C) STRUCTURAL CONTROL MEASURES. EROSION AND SEDIMENT CONTROL MEASURES IDENTIFIED IN THE PLAN APPLICABLE TO THE PRIMARY PERMITTEE'S SITE 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(S). FOR AREAS OF A SITE THAT HAVE UNDERGONE FINAL STABILIZATION OR ESTABLISHED A CROP OF ANNUAL VEGETATION AND A SEEDING OF TARGET PERENNIALS APPROPRIATE FOR THE REGION, THE PERMITTEE MUST COMPLY WITH PART IV.D.4.A.(4). THESE INSPECTIONS MUST BE CONDUCTED UNTIL A NOTICE OF TERMINATION IS SUBMITTED.
4. CERTIFIED PERSONNEL (PROVIDED BY THE PRIMARY PERMITTEE) SHALL INSPECT AT LEAST ONCE PER MONTH DURING THE TERM OF THIS PERMIT (I.E., UNTIL A NOTICE OF TERMINATION IS SUBMITTED TO EPD) THE AREAS OF THE SITE THAT HAVE UNDERGONE FINAL STABILIZATION OR ESTABLISHED A CROP OF ANNUAL VEGETATION AND A SEEDING OF TARGET PERENNIALS APPROPRIATE FOR THE REGION. THESE AREAS SHALL BE INSPECTED FOR EVIDENCE OF, OR THE POTENTIAL FOR, POLLUTANTS ENTERING THE DRAINAGE SYSTEM AND THE RECEIVING WATER(S), EROSION AND SEDIMENT CONTROL MEASURES IDENTIFIED IN THE PLAN 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(S).
5. BASED ON THE RESULTS OF EACH INSPECTION, THE SITE DESCRIPTION AND THE POLLUTION PREVENTION AND CONTROL MEASURES IDENTIFIED IN THE EROSION, SEDIMENTATION AND POLLUTION CONTROL PLAN, THE PLAN SHALL BE REVISED AS APPROPRIATE NOT LATER THAN SEVEN (7) CALENDAR DAYS FOLLOWING EACH INSPECTION. IMPLEMENTATION OF SUCH CHANGES SHALL BE MADE AS SOON AS PRACTICAL BUT IN NO CASE LATER THAN SEVEN (7) CALENDAR DAYS FOLLOWING EACH INSPECTION.
6. A REPORT OF EACH INSPECTION THAT INCLUDES THE NAME(S) OF CERTIFIED PERSONNEL MAKING EACH INSPECTION, THE DATE(S) OF EACH INSPECTION, CONSTRUCTION PHASE (I.E., INITIAL, INTERMEDIATE OR FINAL), MAJOR OBSERVATIONS RELATING TO THE IMPLEMENTATION OF THE EROSION, SEDIMENTATION AND POLLUTION CONTROL PLAN, AND ACTIONS TAKEN IN ACCORDANCE WITH PART IV.D.4.A.(5). OF THE PERMIT SHALL BE MADE AND RETAINED AT THE SITE OR BE READILY AVAILABLE AT A DESIGNATED ALTERNATIVE LOCATION UNTIL THE ENTIRE SITE OR THAT PORTION OF A CONSTRUCTION PROJECT THAT HAS BEEN PHASED HAS UNDERGONE FINAL STABILIZATION AND A NOTICE OF TERMINATION IS SUBMITTED TO EPD. SUCH REPORTS SHALL BE READILY AVAILABLE BY END OF THE SECOND BUSINESS DAY AND/OR WORKING DAY AND SHALL IDENTIFY ALL INCIDENTS OF BEST MANAGEMENT PRACTICES THAT HAVE NOT BEEN PROPERLY INSTALLED AND/OR MAINTAINED AS DESCRIBED IN THE PLAN. WHERE THE REPORT DOES NOT IDENTIFY ANY INCIDENTS, THE INSPECTION REPORT SHALL CONTAIN A STATEMENT THAT THE BEST MANAGEMENT PRACTICES ARE IN COMPLIANCE WITH THE EROSION, SEDIMENTATION AND POLLUTION CONTROL PLAN. THE REPORT SHALL BE SIGNED IN ACCORDANCE WITH PART V.G.2. OF THIS PERMIT.

SAMPLING REQUIREMENTS

- THIS PERMIT REQUIRES THE MONITORING OF NEPHELOMETRIC TURBIDITY IN RECEIVING WATER(S) OR OUTFALLS IN ACCORDANCE WIT THIS PERMIT. THE FOLLOWING PROCEDURES SUBSTITUTE EPD'S GUIDELINES FOR SAMPLING TURBIDITY.
- A. SAMPLING REQUIREMENTS SHALL INCLUDE THE FOLLOWING:
1. A USGA TOPOGRAPHIC MAP, A TOPOGRAPHIC MAP OR A DRAWING (REFERRED TO AS A TOPOGRAPHIC MAP) THAT IS A SCALE EQUAL TO OR MORE DETAILED THAN A 1:24000 MAP SHOWING THE LOCATION OF THE INFRASTRUCTURE CONSTRUCTION; (A) THE LOCATION OF ALL PERENNIAL AND INTERMITTENT STREAMS AND OTHER WATER BODIES AS SHOWN ON A USGS TOPOGRAPHIC MAP, AND ALL OTHER PERENNIAL AND INTERMITTENT STREAMS AND OTHER WATER BODIES LOCATED DURING MANDATORY FIELD VERIFICATION, INTO WHICH THE STORM WATER IS DISCHARGED AND (B) THE RECEIVING WATER AND/OR OUTFALL SAMPLING LOCATIONS FOR EACH REPRESENTATIVE STORMWATER OUTFALL. WHEN THE PERMITTEE HAS CHOSEN TO USE A USGS TOPOGRAPHIC MAP AND THE RECEIVING WATER(S) IS NOT SHOWN ON THE USGS TOPOGRAPHIC MAP, THE LOCATION OF THE RECEIVING WATER(S) MUST BE HAND-DRAWN ON THE USGS TOPOGRAPHIC MAP FROM WHERE THE STORM WATER(S) ENTERS THE RECEIVING WATER(S) TO THE POINT WHERE THE RECEIVING WATER(S) COMBINES WITH THE FIRST BLUE LINE STREAM SHOWN ON THE USGS TOPOGRAPHIC MAP;
2. A WRITTEN NARRATIVE OF SITE SPECIFIC ANALYTICAL METHODS USED TO COLLECT AND ANALYZE THE SAMPLES INCLUDING QUALITY CONTROL/QUALITY ASSURANCE PROCEDURES. THIS NARRATIVE MUST INCLUDE PRECISE SAMPLING METHODOLOGY FOR EACH SAMPLING LOCATION;
3. WHEN THE PERMITTEE HAS DETERMINED THAT SOME OR ALL OUTFALLS WILL BE SAMPLED, A RATIONALE MUST BE INCLUDED ON THE PLAN FOR THE NTU LIMIT(S) SELECTED FROM APPENDIX B. THIS RATIONALE MUST INCLUDE THE SIZE OF THE CONSTRUCTION SITE, THE CALCULATION OF THE SIZE OF THE SURFACE WATER DRAINAGE AREA, AND THE TYPE OF RECEIVING WATER(S) (I.E., TROUT STREAM OR SUPPORTING WARM WATER FISHERIES); AND
4. ANY ADDITIONAL INFORMATION EPD DETERMINES NECESSARY TO BE PART OF THE PLAN. EPD WILL PROVIDE WRITTEN NOTICE TO THE PERMITTEE OF THE INFORMATION NECESSARY AND THE TIME LINE FOR SUBMITTAL.

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NO.	DATE	REVISION

Fitzgerald Park Improvements - Phase 2
4877 Lawrenceville Hwy
Tucker, Georgia

ESPCP NOTES

THIS BAR IS 1 INCH LONG PLOTTED FULL SCALE

Project Manager:	CAS
Drawn By:	BAF
Checked By:	CAS
Date:	05/30/2023
Scale:	As Shown

Project No.: 200147
Drawing No.: EC0.1

CHARLES A. SHELTON, P.E. - LEVEL II CERTIFICATION #0000074473

SAMPLING REQUIREMENTS

- B. SAMPLE TYPE: ALL SAMPLING SHALL BE COLLECTED BY "GRAB SAMPLES" AND THE ANALYSIS OF THESE SAMPLES MUST BE CONDUCTED IN ACCORDANCE WITH METHODOLOGY AND TEST PROCEDURES ESTABLISHED BY 40 CFR PART 136 (UNLESS OTHER TEST PROCEDURES HAVE BEEN APPROVED); THE GUIDANCE DOCUMENT TITLED "NPDES STORM WATER SAMPLING GUIDANCE DOCUMENT, EPA 833-B-92-001" AND GUIDANCE DOCUMENTS THAT MAY BE PREPARED BY THE EPD.
- SAMPLE CONTAINERS SHOULD BE LABELED PRIOR TO COLLECTING THE SAMPLES.
 - SAMPLES SHOULD BE WELL MIXED BEFORE TRANSFERRING TO A SECONDARY CONTAINER.
 - LARGE MOUTH, WELL CLEANED AND RINSED GLASS OR PLASTIC JARS SHOULD BE USED FOR COLLECTING SAMPLES. THE JARS SHOULD BE CLEANED THOROUGHLY TO AVOID CONTAMINATION.
 - MANUAL, AUTOMATIC OR RISING STAGE SAMPLING MAY BE UTILIZED. SAMPLES REQUIRED BY THIS PERMIT SHOULD BE ANALYZED IMMEDIATELY, BUT IN NO CASE LATER THAN 48 HOURS AFTER COLLECTION. HOWEVER, SAMPLES FROM AUTOMATIC SAMPLERS MUST BE COLLECTED NO LATER THAN THE NEXT BUSINESS DAY AFTER THEIR ACCUMULATION, UNLESS FLOW THROUGH AUTOMATED ANALYSIS IS UTILIZED. IF AUTOMATIC SAMPLING IS UTILIZED AND THE AUTOMATIC SAMPLER IS NOT ACTIVATED DURING THE QUALIFYING EVENT, THE PERMITTEE MUST UTILIZE MANUAL SAMPLING OR RISING STAGE SAMPLING DURING THE NEXT QUALIFYING EVENT. DILUTION OF SAMPLES IS NOT REQUIRED. SAMPLES MAY BE ANALYZED DIRECTLY WITH A PROPERLY CALIBRATED TURBIDIMETER. SAMPLES ARE NOT REQUIRED TO BE COOLED.
 - SAMPLING AND ANALYSIS OF THE RECEIVING WATER(S) OR OUTFALLS BEYOND THE MINIMUM FREQUENCY STATED IN THIS PERMIT MUST BE REPORTED TO EPD AS SPECIFIED IN PART IV.E.
- C. SAMPLING POINTS
- FOR CONSTRUCTION ACTIVITIES THE PRIMARY PERMITTEE MUST SAMPLE ALL PERENNIAL AND INTERMITTENT STREAMS AND OTHER WATER BODIES SHOWN ON THE USGS TOPOGRAPHIC MAP AND ALL OTHER FIELD VERIFIED PERENNIAL AND INTERMITTENT STREAMS AND OTHER WATER BODIES, OR ALL OUTFALLS INTO SUCH STREAMS AND OTHER WATER BODIES, OR A COMBINATION THEREOF. HOWEVER, PROVIDED FOR IN AND IN ACCORDANCE WITH PART IV.D.6.C(2) OF THIS PERMIT, PRIMARY PERMITTEES ON AN INFRASTRUCTURE CONSTRUCTION PROJECT MAY SAMPLE THE REPRESENTATIVE PERENNIAL AND INTERMITTENT STREAMS, OTHER WATER BODIES OR OUTFALLS, OR A COMBINATION THEREOF. SAMPLES TAKEN FOR THE PURPOSE OF COMPLIANCE WITH THIS PERMIT SHALL BE REPRESENTATIVE OF THE MONITORED ACTIVITY AND REPRESENTATIVE OF THE WATER QUALITY OF THE RECEIVING WATER(S) AND/OR THE STORM WATER OUTFALLS USING THE FOLLOWING MINIMUM GUIDELINES:
 - THE UPSTREAM SAMPLE FOR EACH RECEIVING WATER(S) MUST BE TAKEN IMMEDIATELY UPSTREAM OF THE CONFLUENCE OF THE FIRST STORM WATER DISCHARGE FROM THE PERMITTED ACTIVITY (I.E., THE DISCHARGE FARTHEST UPSTREAM AT THE SITE) BUT DOWNSTREAM OF ANY OTHER STORM WATER DISCHARGE NOT ASSOCIATED WITH THE PERMITTED ACTIVITY. WHERE APPROPRIATE, SEVERAL UPSTREAM SAMPLES FROM ACROSS THE RECEIVING WATER(S) MAY NEED TO BE TAKEN AND THE ARITHMETIC AVERAGE OF THE TURBIDITY OF THESE SAMPLES USED FOR THE UPSTREAM TURBIDITY VALUE.
 - DOWNSTREAM SAMPLE FOR EACH RECEIVING WATER(S) MUST BE TAKEN DOWNSTREAM OF THE CONFLUENCE OF THE LAST STORM WATER DISCHARGE FROM THE PERMITTED ACTIVITY (I.E., THE DISCHARGE FARTHEST DOWNSTREAM AT THE SITE) BUT UPSTREAM OF ANY OTHER STORM WATER DISCHARGE NOT ASSOCIATED WITH THE PERMITTED ACTIVITY. WHERE APPROPRIATE, SEVERAL DOWNSTREAM SAMPLES FROM ACROSS THE RECEIVING WATER(S) MAY NEED TO BE TAKEN AND THE ARITHMETIC AVERAGE OF THE TURBIDITY OF THESE SAMPLES USED FOR THE DOWNSTREAM TURBIDITY VALUE.
 - IDEALLY THE SAMPLES SHOULD BE TAKEN FROM THE HORIZONTAL AND VERTICAL CENTER OF THE RECEIVING WATER(S) OR THE STORM WATER OUTFALL CHANNEL(S)
 - CARE SHOULD BE TAKEN TO AVOID STIRRING THE BOTTOM SEDIMENTS IN THE RECEIVING WATER(S) OR IN THE OUTFALL STORM WATER CHANNEL.
 - THE SAMPLING CONTAINER SHOULD BE HELD SO THAT THE OPENING FACES UPSTREAM.
 - THE SAMPLES SHOULD BE KEPT FREE FROM FLOATING DEBRIS.
 - PERMITTEES DO NOT HAVE TO SAMPLE SHEETFLOW THAT FLOWS ONTO UNDISTURBED NATURAL AREAS OR AREAS STABILIZED BY THE PROJECT. FOR PURPOSES OF THIS SECTION, STABILIZED SHALL MEAN, FOR UNPAVED AREAS AND AREA NOT COVERED BY PERMANENT STRUCTURES, 100% OF THE SOIL SURFACE IS UNIFORMLY COVERED IN PERMANENT VEGETATION WITH A DENSITY OF 70% OR GREATER, OR LANDSCAPED ACCORDING TO THE PLAN (UNIFORMLY COVERED WITH LANDSCAPING MATERIALS IN PLANNED LANDSCAPED AREAS), OR EQUIVALENT PERMANENT STABILIZATION MEASURES AS DEFINED IN THE MANUAL (EXCLUDING A CROP OF ANNUAL VEGETATION AND A SEEDING OF TARGET CROP PERENNIALS APPROPRIATE FOR THE REGION). FOR INFRASTRUCTURE CONSTRUCTION PROJECTS ON LAND USED FOR AGRICULTURE OR SILVICULTURAL PURPOSES, FINAL STABILIZATION MAY BE ACCOMPLISHED BY STABILIZING THE DISTURBED LAND FOR ITS AGRICULTURAL OR SILVICULTURAL USE.
 - ALL SAMPLING PURSUANT TO THIS PERMIT MUST BE DONE IN SUCH A WAY (INCLUDING GENERALLY ACCEPTED SAMPLING METHODS, LOCATIONS, TIMING, AND FREQUENCY) AS TO ACCURATELY REFLECT WHETHER STORM WATER RUNOFF FROM THE CONSTRUCTION SITE IS IN COMPLIANCE WITH THE STANDARD SET FORTH IN PARTS III.D.3. OR III.D.4., WHICHEVER IS APPLICABLE.
- FOR INFRASTRUCTURE CONSTRUCTION PROJECTS, THE PERMITTEE IS NOT REQUIRED TO SAMPLE A PERENNIAL OR INTERMITTENT STREAM OR OTHER WATER BODIES (OR THE ASSOCIATED OUTFALL, IF APPLICABLE) IF THE DESIGN PROFESSIONAL PREPARING THE PLAN CERTIFIES THAT AN INCREASE IN THE TURBIDITY OF A SPECIFIC IDENTIFIED RECEIVING WATER TO BE SAMPLED WILL BE REPRESENTATIVE OF THE INCREASE IN THE TURBIDITY OF A SPECIFIC IDENTIFIED UN-SAMPLED RECEIVING WATER. A WRITTEN JUSTIFICATION AND DETAILED ANALYSIS SHALL BE PREPARED BY THE DESIGN PROFESSIONAL JUSTIFYING SUCH PROPOSED SAMPLING. A SUMMARY CHART OF THE JUSTIFICATION AND ANALYSIS FOR THE REPRESENTATIVE SAMPLING MUST BE INCLUDED ON THE PLAN. THE JUSTIFICATION AND ANALYSIS SHALL INCLUDE THE LOCATION AND DESCRIPTION OF THE SPECIFIED SAMPLED AND UN-SAMPLED RECEIVING WATER AND SHALL CONTAIN A DETAILED COMPARISON AND DISCUSSION OF EACH SUCH RECEIVING WATER IN THE FOLLOWING AREAS:
 - SITE LAND DISTURBANCES AND CHARACTERISTICS;
 - RECEIVING WATER WATERSHED SIZES AND CHARACTERISTICS; AND
 - SITE AND WATERSHED CHARACTERISTICS UTILIZING THE METHODS IN APPENDIX A-1 (UNITED STATES DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE'S TR-55, URBAN HYDROLOGY FOR SMALL WATERSHEDS) OF THE MOST RECENT VERSION OF THE "MANUAL FOR EROSION AND SEDIMENTATION CONTROL IN GEORGIA" FOR THE VARIOUS PRECIPITATION EVENTS AND ANY OTHER SUCH CONSIDERATIONS NECESSARY TO SHOW THAT THE INCREASE IN THE TURBIDITY OF A SPECIFIC IDENTIFIED SAMPLED RECEIVING WATER WILL BE REPRESENTATIVE OF THE INCREASES IN THE TURBIDITY OF A SPECIFIC IDENTIFIED UN-SAMPLED RECEIVING WATERS.
 - FOR INFRASTRUCTURE CONSTRUCTION PROJECTS, WHEN THE PERMITTEE DETERMINES THAT SOME RECEIVING WATER(S) WILL NOT BE SAMPLED DUE TO REPRESENTATIVE SAMPLING, THE DESIGN PROFESSIONAL MAKING THIS DETERMINATION AND PREPARING THE PLAN MUST INCLUDE AND SIGN THE FOLLOWING CERTIFICATION IN THE PLAN:

"I CERTIFY THAT THE PERMITTEE'S EROSION, SEDIMENTATION AND POLLUTION CONTROL PLAN PROVIDES FOR THE MONITORING OF: (A) ALL PERENNIAL AND INTERMITTENT STREAMS AND OTHER WATER BODIES SHOWN ON THE USGS TOPOGRAPHIC MAP AND ALL OTHER FIELD VERIFIED PERENNIAL AND INTERMITTENT STREAMS AND OTHER WATER BODIES, OR (B) WHERE ANY SUCH SPECIFIC IDENTIFIED PERENNIAL OR INTERMITTENT STREAM AND OTHER WATER BODY IS NOT PROPOSED TO BE SAMPLED, I HAVE DETERMINED IN MY PROFESSIONAL JUDGEMENT, UTILIZING THE FACTORS REQUIRED IN THE GENERAL NPDES PERMIT NO. GAR 1000002, THAT THE INCREASE IN THE TURBIDITY OF EACH SPECIFIC IDENTIFIED SAMPLED RECEIVING WATER WILL BE REPRESENTATIVE OF THE INCREASE IN THE TURBIDITY OF A SPECIFIC IDENTIFIED UN-SAMPLED RECEIVING WATER."
 - FOR INFRASTRUCTURE CONSTRUCTION PROJECTS, IF AT ANY TIME DURING THE LIFE OF THE PROJECT A SELECTED RECEIVING WATER NO LONGER REPRESENTS ANOTHER RECEIVING WATER, THEN THE PERMITTEE SHALL SAMPLE THE LATTER RECEIVING WATER UNTIL SELECTION OF AN ALTERNATIVE REPRESENTATIVE RECEIVING WATER.
 - FOR INFRASTRUCTURE CONSTRUCTION PROJECTS, IF AT ANY TIME DURING THE LIFE OF THE PROJECT A RECEIVING WATER IS DETERMINED NOT TO BE REPRESENTED AS CERTIFIED IN THE PLAN, THE PERMITTEE SHALL SAMPLE THAT RECEIVING WATER UNTIL A NOTICE OF TERMINATION IS SUBMITTED OR UNTIL THE APPLICABLE PHASE IS STABILIZED IN ACCORDANCE WITH THIS PERMIT.
 - FOR INFRASTRUCTURE CONSTRUCTION PROJECTS, MONITORING OBLIGATIONS SHALL CEASE FOR ANY PHASE OF THE PROJECT THAT HAS BEEN STABILIZED IN ACCORDANCE WITH PART IV.D.6.C.(1),(G)
- D. SAMPLING FREQUENCY
- THE PRIMARY PERMITTEE MUST SAMPLE IN ACCORDANCE WITH THE PLAN AT LEAST ONCE FOR EACH RAINFALL EVENT DESCRIBED BELOW. FOR A QUALIFYING EVENT, THE PERMITTEE SHALL SAMPLE AT THE BEGINNING OF ANY STORM WATER DISCHARGE TO A MONITORED RECEIVING WATER AND/OR FROM A MONITORED OUTFALL LOCATION WITHIN FORTY-FIVE (45) MINUTES OR AS SOON AS POSSIBLE.
 - HOWEVER, WHERE MANUAL AND AUTOMATIC SAMPLING ARE IMPOSSIBLE (AS DEFINED IN THIS PERMIT), OR ARE BEYOND THE PERMITTEE'S CONTROL, THE PERMITTEE SHALL TAKE SAMPLES AS SOON AS POSSIBLE, BUT IN NO CASE MORE THAN TWELVE (12) HOURS AFTER THE BEGINNING OF THE STORM WATER DISCHARGE.
 - SAMPLING BY THE PERMITTEE SHALL OCCUR FOR THE FOLLOWING QUALIFYING EVENTS:
 - FOR EACH AREA OF THE SITE THAT DISCHARGES TO A RECEIVING WATER OR FROM AN OUTFALL, THE FIRST RAIN EVENT THAT REACHES OR EXCEEDS 0.5 INCH WITH A STORM WATER DISCHARGE THAT OCCURS DURING NORMAL BUSINESS HOURS AS DEFINED IN THIS PERMIT, AFTER ALL CLEARING AND GRUBBING OPERATIONS HAVE BEEN COMPLETED, BUT PRIOR TO COMPLETION OF MASS GRADING OPERATIONS, IN THE DRAINAGE AREA OF THE LOCATION SELECTED AS THE REPRESENTATIVE SAMPLING LOCATION;

SAMPLING REQUIREMENTS (CONT.)

- IN ADDITION TO (A) ABOVE, FOR EACH AREA OF THE SITE THAT DISCHARGES TO A RECEIVING WATER OR FROM AN OUTFALL, THE FIRST RAIN EVENT THAT REACHES OR EXCEEDS 0.5 INCH WITH A STORM WATER DISCHARGE THAT OCCURS DURING NORMAL BUSINESS HOURS AS DEFINED IN THIS PERMIT EITHER 90 DAYS AFTER THE FIRST SAMPLING EVENT OR AFTER ALL MASS GRADING OPERATIONS HAVE BEEN COMPLETED, BUT PRIOR TO SUBMITTAL OF A NOT, IN THE DRAINAGE AREA OF THE LOCATION SELECTED AS THE REPRESENTATIVE SAMPLING LOCATION, WHICHEVER COMES FIRST.
 - AT THE TIME OF SAMPLING PERFORMED PURSUANT TO (A) AND (B) ABOVE, IF BMPs IN ANY AREA OF THE SITE THAT DISCHARGES TO A RECEIVING WATER OR FROM AN OUTFALL ARE NOT PROPERLY DESIGNED, INSTALLED AND MAINTAINED, CORRECTIVE ACTION SHALL BE DEFINED AND IMPLEMENTED WITHIN TWO (2) BUSINESS DAYS, AND TURBIDITY SAMPLES SHALL BE TAKEN FROM DISCHARGES FROM THAT AREA OF THE SITE FOR EACH SUBSEQUENT RAIN EVENT THAT REACHES OR EXCEEDS 0.5 INCH DURING NORMAL BUSINESS HOURS" UNTIL THE SELECTED TURBIDITY STANDARD IS ATTAINED, OR UNTIL POST-STORM EVENT INSPECTIONS DETERMINE THAT BMPs ARE PROPERLY DESIGNED, INSTALLED AND MAINTAINED.
 - WHERE SAMPLING PURSUANT TO (A), (B) OR (C) ABOVE IS REQUIRED BUT NOT POSSIBLE (OR NOT REQUIRED BECAUSE THERE WAS NO DISCHARGE), THE PERMITTEE, IN ACCORDANCE WITH PART IV.D.4.(6), MUST INCLUDE A WRITTEN JUSTIFICATION IN THE INSPECTION REPORT OF WHY SAMPLING WAS NOT PERFORMED. PROVIDING THIS JUSTIFICATION DOES NOT RELIEVE THE PERMITTEE OF ANY SUBSEQUENT SAMPLING OBLIGATIONS UNDER (A), (B) OR (C) ABOVE; AND
 - EXISTING CONSTRUCTION ACTIVITIES, I.E., THOSE THAT ARE OCCURRING ON OR BEFORE THE EFFECTIVE DATE OF THIS PERMIT, THAT HAVE MET THE SAMPLING REQUIRED BY (A) ABOVE SHALL SAMPLE IN ACCORDANCE WITH (B). THOSE EXISTING CONSTRUCTION ACTIVITIES THAT HAVE MET THE SAMPLING REQUIRED BY (B) ABOVE SHALL NOT BE REQUIRED TO CONDUCT ADDITIONAL SAMPLING OTHER THAN AS REQUIRED BY (C) ABOVE.

*NOTE THAT THE PERMITTEE MAY CHOOSE TO MEET THE REQUIREMENTS OF (A) AND (B) ABOVE BY COLLECTING TURBIDITY SAMPLES FROM ANY RAIN EVENT THAT REACHES OR EXCEEDS 0.5 INCHES AND ALLOWS FOR SAMPLING AT ANY TIME OF THE DAY OR WEEK.
- NON-STORMWATER DISCHARGES** EXCEPT FOR FLOWS FROM FIRE FIGHTING ACTIVITIES, SOURCES OF NON-STORM WATER LISTED IN PART III.A.2. OF THIS PERMIT THAT ARE COMBINED WITH STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY MUST BE IDENTIFIED IN THE PLAN. THE PLAN SHALL IDENTIFY AND ENSURE THE IMPLEMENTATION OF APPROPRIATE POLLUTION PREVENTION MEASURES FOR THE NON-STORM WATER COMPONENT(S) OF THE DISCHARGE.

REPORTING

- THE APPLICABLE PERMITTEES ARE REQUIRED TO SUBMIT THE SAMPLING RESULTS TO THE EPD AT THE ADDRESS SHOWN IN PART II.C BY THE FIFTEENTH DAY OF THE MONTH FOLLOWING THE REPORTING PERIOD. REPORTING PERIODS ARE MONTHS DURING WHICH SAMPLES ARE TAKEN IN ACCORDANCE WITH THIS PERMIT. SAMPLING RESULTS SHALL BE IN A CLEARLY LEGIBLE FORMAT. UPON WRITTEN NOTIFICATION, EPD MAY REQUIRE THE APPLICABLE PERMITTEE TO SUBMIT THE SAMPLING RESULTS ON A MORE FREQUENT BASIS. SAMPLING AND ANALYSIS OF ANY STORM WATER DISCHARGE(S) OR THE RECEIVING WATER(S) BEYOND THE MINIMUM FREQUENCY STATED IN THIS PERMIT MUST BE REPORTED IN A SIMILAR MANNER TO THE EPD. THE SAMPLING REPORTS MUST BE SIGNED IN ACCORDANCE WITH PART V.G.2. SAMPLING REPORTS MUST BE SUBMITTED TO EPD UNTIL SUCH TIME AS A NOT IS SUBMITTED IN ACCORDANCE WITH PART VI.
- ALL SAMPLING REPORTS SHALL INCLUDE THE FOLLOWING INFORMATION:
 - THE RAINFALL AMOUNT, DATE, EXACT PLACE AND TIME OF SAMPLING OR MEASUREMENTS;
 - THE NAME(S) OF THE CERTIFIED PERSONNEL WHO PERFORMED THE SAMPLING AND MEASUREMENTS;
 - THE DATE(S) ANALYSES WERE PERFORMED;
 - THE TIME(S) ANALYSES WERE INITIATED;
 - THE NAME(S) OF THE CERTIFIED PERSONNEL WHO PERFORMED THE ANALYSES;
 - REFERENCES AND WRITTEN PROCEDURES, WHEN AVAILABLE, FOR THE ANALYTICAL TECHNIQUES OR METHODS USED;
 - THE RESULTS OF SUCH ANALYSES, INCLUDING THE BENCH SHEETS, INSTRUMENT READOUTS, COMPUTER DISKS OR TAPES, ETC., USED TO DETERMINE THESE RESULTS.
 - RESULTS WHICH EXCEED 1000 NTU SHALL BE REPORTED AS "EXCEEDS 1000 NTU;" AND
 - CERTIFICATION STATEMENT THAT SAMPLING WAS CONDUCTED AS PER THE PLAN.
- ALL WRITTEN CORRESPONDENCE REQUIRED BY THIS PERMIT SHALL BE SUBMITTED BY RETURN RECEIPT CERTIFIED MAIL (OR SIMILAR SERVICE) TO THE APPROPRIATE DISTRICT OFFICE OF THE EPD ACCORDING TO THE SCHEDULE IN APPENDIX A OF THIS PERMIT. THE PERMITTEE SHALL RETAIN A COPY OF THE PROOF OF SUBMITTAL AT THE CONSTRUCTION SITE OR THE PROOF OF SUBMITTAL SHALL BE READILY AVAILABLE AT A DESIGNATED LOCATION FROM COMMENCEMENT OF CONSTRUCTION UNTIL SUCH TIME AS A NOT IS SUBMITTED IN ACCORDANCE WITH PART VI. IF AN ELECTRONIC SUBMITTAL IS PROVIDED BY EPD THEN THE WRITTEN CORRESPONDENCE MAY BE SUBMITTED ELECTRONICALLY; IF REQUIRED, A PAPER COPY MUST ALSO BE SUBMITTED BY RETURN RECEIPT CERTIFIED MAIL OR SIMILAR SERVICE.

RETENTION OF RECORDS

- THE PRIMARY PERMITTEE SHALL RETAIN THE FOLLOWING RECORDS AT THE CONSTRUCTION SITE OR THE RECORDS SHALL BE READILY AVAILABLE AT A DESIGNATED ALTERNATE LOCATION FROM COMMENCEMENT OF CONSTRUCTION UNTIL SUCH TIME AS A NOT IS SUBMITTED IN ACCORDANCE WITH PART VI:
 - A COPY OF ALL NOTICES OF INTENT SUBMITTED TO EPD;
 - A COPY OF THE EROSION, SEDIMENTATION AND POLLUTION CONTROL PLAN REQUIRED BY THIS PERMIT;
 - THE DESIGN PROFESSIONAL'S REPORT OF THE RESULTS OF THE INSPECTION CONDUCTED IN ACCORDANCE WITH PART IV.A.5. OF THIS PERMIT.
 - A COPY OF ALL SAMPLING INFORMATION, RESULTS, AND REPORTS REQUIRED BY THIS PERMIT;
 - A COPY OF ALL INSPECTION REPORTS GENERATED IN ACCORDANCE WITH PART IV.D.4.A. OF THIS PERMIT;
 - A COPY OF ALL VIOLATION SUMMARIES AND VIOLATION SUMMARY REPORTS GENERATED IN ACCORDANCE WITH PART III.D.2. OF THIS PERMIT; AND
 - DAILY RAINFALL INFORMATION COLLECTED IN ACCORDANCE WITH PART IV.D.4.A. (2) OF THIS PERMIT.
- COPIES OF ALL NOTICES OF INTENT, NOTICES OF TERMINATION, INSPECTION REPORTS, SAMPLING REPORTS (INCLUDING ALL CALIBRATION AND MAINTENANCE RECORDS AND ALL ORIGINAL STRIP CHART RECORDINGS FOR CONTINUOUS MONITORING INSTRUMENTATION), OR OTHER REPORTS REQUESTED BY THE EPD, EROSION, SEDIMENTATION AND POLLUTION CONTROL PLANS, RECORDS OF ALL DATA USED TO COMPLETE THE NOTICE OF INTENT TO BE COVERED BY THIS PERMIT AND ALL OTHER RECORDS REQUIRED BY THIS PERMIT SHALL BE RETAINED BY THE PERMITTEE WHO EITHER PRODUCED OR USED IT FOR A PERIOD OF AT LEAST THREE YEARS FROM THE DATE THAT THE NOT IS SUBMITTED IN ACCORDANCE WITH PART VI OF THIS PERMIT. THESE RECORDS MUST BE MAINTAINED AT THE PERMITTEES PRIMARY PLACE OF BUSINESS OR AT A DESIGNATED ALTERNATE LOCATION ONCE THE CONSTRUCTION ACTIVITY HAS CEASED AT THE PERMITTED SITE. THIS PERIOD MAY BE EXTENDED BY REQUEST OF THE EPD AT ANY TIME UPON WRITTEN NOTIFICATION TO THE PERMITTEE.

APPENDIX B - NTU VALUE

- THE SURFACE WATER DRAINAGE AREA IS LESS THAN 5 MILES FOR THE SITE AND THE SITE SIZE IS UNDER 10 ACRES. THIS SITE DRAINS TO WARM WATERS. THEREFORE, THE NTU VALUE FOR THE SITE IS 50.

APPENDIX B: NEPHELOMETRIC TURBIDITY UNITS (NTU) TABLE		WARM WATER (SUPPORTING WARM WATER FISHERIES)						
ITEM #	SURFACE WATER DRAINAGE AREA, SQUARE MILES							
	0-4.99	5-9.99	10-24.99	25-49.99	50-99.99	100-249.99	250-499.99	500+
1.00-10	75	150	200	400	750	750	750	750
10.01-25	50	100	100	200	300	500	750	750
25.01-50	50	50	100	100	200	300	750	750
50.01-100	50	50	150	100	100	150	300	600
100.01+	50	50	50	50	50	100	200	100

Ds1

DISTURBED AREA STABILIZATION (WITH MULCHING ONLY) ESTABLISHING TEMPORARY PROTECTION FOR DISTURBED AREAS WHERE SEEDINGS MAY NOT HAVE A SUITABLE GROWING SEASON TO PRODUCE AN EROSION RETARDING COVER.

Ds2

TEMPORARY

Ds3

PERMANENT

RATES PER 1,000 SQUARE FEET

AREA	SOWING SEASON	SPECIES	SEED	FERTILIZER	LIMESTONE	MAINTENANCE	MULCH
FLAT TO ROLLING TERRAIN WITH SLOPES LESS THAN 3:1	8/1 - 4/1 4/1 - 9/1	RYEGRASS SUNDANGRASS	4.0 LBS. 1.4 LBS.	12 LBS. (10-10-10) 12 LBS. (10-10-10)	92 LBS. 92 LBS.	7 LBS. (10-10-10) 7 LBS. (10-10-10)	115 LBS. 115 LBS.
EMBANKMENTS WITH SLOPES GREATER THAN 3:1	3/15 - 6/15	WEEPING LOVEGRASS	0.1 LB.	12 LBS. (10-10-10)	92 LBS.	7 LBS. (10-10-10)	115 LBS.
FLAT TO ROLLING TERRAIN WITH SLOPES LESS THAN 3:1	3/1 - 6/15 8/15 - 10/30	COMMON BERMUDA (HULLED SEED) FESCUE, TALL	1.4 LBS. 0.05 LBS. 1.1 LBS.	35 LBS. (6-12-12) 35 LBS. (6-12-12)	92 LBS. 92 LBS.	10 LBS. (10-10-10) 10 LBS. (10-10-10)	115 LBS. 115 LBS.
EMBANKMENTS WITH SLOPES GREATER THAN 3:1	3/1 - 6/30 9/1 - 3/30	COMMON BERMUDA (HULLED SEED) *LESPEDEZA SERICEA	0.2 LB. 1.7 LBS.	35 LBS. (6-12-12) 35 LBS. (6-12-12)	92 LBS. 92 LBS.	10 LBS. (10-10-10) 10 LBS. (10-10-10)	115 LBS. 115 LBS.

THE PROJECT SITE IS LOCATED IN THE PIEDMONT REGION.

SEEDING REQUIREMENTS

EROSION CONTROL CERTIFICATION:

"I CERTIFY THAT THE PERMITTEE'S EROSION, SEDIMENTATION AND POLLUTION CONTROL PLAN PROVIDES FOR THE MONITORING OF: (A) ALL PERENNIAL AND INTERMITTENT STREAMS AND OTHER WATER BODIES SHOWN ON THE USGS TOPOGRAPHIC MAP AND ALL OTHER FIELD VERIFIED PERENNIAL AND INTERMITTENT STREAMS AND OTHER WATER BODIES, OR (B) WHERE ANY SUCH SPECIFIC IDENTIFIED PERENNIAL OR INTERMITTENT STREAM AND OTHER WATER BODY IS NOT PROPOSED TO BE SAMPLED, I HAVE DETERMINED IN MY PROFESSIONAL JUDGMENT, UTILIZING THE FACTORS REQUIRED IN THE GENERAL NPDES PERMIT NO. GAR100001, THAT THE INCREASE IN THE TURBIDITY OF EACH SPECIFIC IDENTIFIED SAMPLED RECEIVING WATER WILL BE REPRESENTATIVE OF THE INCREASE IN THE TURBIDITY OF A SPECIFIC IDENTIFIED UN-SAMPLED RECEIVING WATER."

Sam Shelton
DESIGN PROFESSIONAL

DESIGN PROFESSIONAL 7-DAY VISIT CERTIFICATION

DATE OF INSPECTION: _____

I CERTIFY THE SITE WAS IN COMPLIANCE WITH THE ES&PC PLAN ON THE DATE OF INSPECTION

GSWCC LEVEL II DESIGN CERTIFICATION # _____

INSPECTION REVEALED THE FOLLOWING DISCREPANCIES FROM THE ES&PC PLAN:

THESE DEFICIENCIES MUST BE ADDRESSED IMMEDIATELY AND A RE-INSPECTION SCHEDULED. WORK SHALL NOT PROCEED ON THE SITE UNTIL DESIGN PROFESSIONAL CERTIFICATION IS OBTAINED

EROSION, SEDIMENTATION AND POLLUTION CONTROL PLAN CERTIFICATION:

THE EROSION, SEDIMENTATION AND POLLUTION CONTROL PLANS FOR THE CITY OF TUCKER, GA FITZGERALD FIELD IMPROVEMENTS - PHASE II WERE DEVELOPED UNDER THE DIRECT SUPERVISION OF CHARLES A. SHELTON, PE., GSWCC LEVEL II CERTIFIED DESIGN PROFESSIONAL, CERTIFICATION NO. 0000074473.

SYMBOL	ITEM #	SOIL TYPE	SLOPE %
Ca	47	CARTECAY SILT LOAM	0 TO 2
Ud		URBAN LAND	0 TO 2
CuC		CECIL-URBAN LAND COMPLEX	2 TO 10
PuE		PACOLET-URBAN LAND COMPLEX	10 TO 25

EROSION CONTROL SITE VISIT CERTIFICATION:

"I HEREBY CERTIFY UNDER PENALTY OF THE LAW THAT THE EROSION AND SEDIMENTATION CONTROL PLANS FOR THIS PROJECT WERE PREPARED AFTER A SITE VISIT TO THE LOCATIONS DESCRIBED HEREIN BY MYSELF OR MY AUTHORIZED AGENT, UNDER MY DIRECT SUPERVISION."

Sam Shelton
DESIGN PROFESSIONAL

EROSION CONTROL CERTIFICATION:

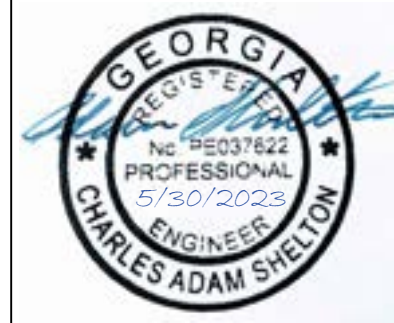
"I CERTIFY THAT THE PERMITTEE'S EROSION, SEDIMENTATION AND POLLUTION CONTROL PLAN PROVIDES FOR AN APPROPRIATE AND COMPREHENSIVE SYSTEM OF BEST MANAGEMENT PRACTICES REQUIRED BY THE GEORGIA WATER QUALITY CONTROL ACT AND THE DOCUMENT "MANUAL FOR EROSION AND SEDIMENT CONTROL IN GEORGIA" (MANUAL) PUBLISHED BY THE GEORGIA SOIL AND WATER CONSERVATION COMMISSION AS OF JANUARY 1 OF THE YEAR IN WHICH THE LAND-DISTURBING ACTIVITY WAS PERMITTED, PROVIDES FOR THE SAMPLING OF THE RECEIVING WATER(S) OR THE SAMPLING OF THE STORM WATER OUTFALLS AND THAT THE DESIGNED SYSTEM OF BEST MANAGEMENT PRACTICES AND SAMPLING METHODS IS EXPECTED TO MEET THE REQUIREMENTS CONTAINED IN THE GENERAL NPDES PERMIT NO. GAR 100001."

Sam Shelton
DESIGN PROFESSIONAL

EROSION CONTROL CERTIFICATION:

"I CERTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION IN ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT CERTIFIED PERSONNEL PROPERLY GATHER AND EVALUATE THE INFORMATION SUBMITTED. BASED ON MY INQUIRY OF THE PERSON OR PERSONS WHO MANAGE THE SYSTEM, OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR GATHERING THE INFORMATION, THE INFORMATION SUBMITTED IS, TO THE BEST OF MY KNOWLEDGE AND BELIEF, TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS.

Sam Shelton
DESIGN PROFESSIONAL



NO.	DATE	REVISION

Fitzgerald Park Improvements - Phase 2
4877 Lawrenceville Hwy
Tucker, Georgia

ESPCP NOTES

THIS BAR IS 1 INCH LONG PLOTTED FULL SCALE

Project Manager: CAS
 Drawn By: BAF Checked By: CAS
 Date: 05/30/2023
 Scale: As Shown

Project No.: 200147
 Drawing No.: EC.02

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GEORGIA UNIFORM CODING SYSTEM FOR SOIL EROSION AND SEDIMENTATION CONTROL PRACTICES

GEORGIA SOIL AND WATER CONSERVATION COMMISSION

STRUCTURAL PRACTICES

CODE	PRACTICE	DETAIL	MAP SYMBOL	DESCRIPTION
Co	CONCRETE CURB			A small temporary barrier or curb constructed from a rigid, durable material to prevent erosion on a slope.
Cp	CONCRETE PAVING			Permanent paving on a slope to prevent erosion on a slope.
Cs	CONCRETE SLOPE			A permanent slope constructed from concrete to prevent erosion on a slope.
Cr	CONCRETE RETAINING WALL			A permanent retaining wall constructed from concrete to prevent erosion on a slope.
Dc	CONCRETE DRAINAGE			A permanent drainage system constructed from concrete to prevent erosion on a slope.
Df	CONCRETE FLOOR			A permanent floor constructed from concrete to prevent erosion on a slope.
Dp	CONCRETE PAVEMENT			A permanent pavement constructed from concrete to prevent erosion on a slope.
Ds	CONCRETE SIDEWALK			A permanent sidewalk constructed from concrete to prevent erosion on a slope.
Dt	CONCRETE TERRACE			A permanent terrace constructed from concrete to prevent erosion on a slope.
Dv	CONCRETE VESTIBULE			A permanent vestibule constructed from concrete to prevent erosion on a slope.
Dw	CONCRETE WALL			A permanent wall constructed from concrete to prevent erosion on a slope.
Dx	CONCRETE YARD			A permanent yard constructed from concrete to prevent erosion on a slope.
Dy	CONCRETE ZONE			A permanent zone constructed from concrete to prevent erosion on a slope.
Dz	CONCRETE ZONE			A permanent zone constructed from concrete to prevent erosion on a slope.
D1	CONCRETE ZONE			A permanent zone constructed from concrete to prevent erosion on a slope.
D2	CONCRETE ZONE			A permanent zone constructed from concrete to prevent erosion on a slope.
D3	CONCRETE ZONE			A permanent zone constructed from concrete to prevent erosion on a slope.
D4	CONCRETE ZONE			A permanent zone constructed from concrete to prevent erosion on a slope.
D5	CONCRETE ZONE			A permanent zone constructed from concrete to prevent erosion on a slope.
D6	CONCRETE ZONE			A permanent zone constructed from concrete to prevent erosion on a slope.
D7	CONCRETE ZONE			A permanent zone constructed from concrete to prevent erosion on a slope.
D8	CONCRETE ZONE			A permanent zone constructed from concrete to prevent erosion on a slope.
D9	CONCRETE ZONE			A permanent zone constructed from concrete to prevent erosion on a slope.
D0	CONCRETE ZONE			A permanent zone constructed from concrete to prevent erosion on a slope.

STRUCTURAL PRACTICES

CODE	PRACTICE	DETAIL	MAP SYMBOL	DESCRIPTION
Sr	STRIP CURB			A temporary curb of concrete or other material to prevent erosion on a slope.
Ss	STRIP CURB			A temporary curb of concrete or other material to prevent erosion on a slope.
Su	STRIP CURB			A temporary curb of concrete or other material to prevent erosion on a slope.
Tc	TERRACE			A temporary terrace of concrete or other material to prevent erosion on a slope.
Tp	TERRACE			A temporary terrace of concrete or other material to prevent erosion on a slope.
Tv	TERRACE			A temporary terrace of concrete or other material to prevent erosion on a slope.
Tw	TERRACE			A temporary terrace of concrete or other material to prevent erosion on a slope.

VEGETATIVE PRACTICES

CODE	PRACTICE	DETAIL	MAP SYMBOL	DESCRIPTION
Bf	BANK PROTECTION			Use of vegetation to stabilize a bank.
Ga	GRASSING			Planting grass to stabilize a slope.
Da	DRY CHANNEL			Planting vegetation in a dry channel.
Dca	DRY CHANNEL			Planting vegetation in a dry channel.
Dcb	DRY CHANNEL			Planting vegetation in a dry channel.
Dcc	DRY CHANNEL			Planting vegetation in a dry channel.
Dcd	DRY CHANNEL			Planting vegetation in a dry channel.
Dce	DRY CHANNEL			Planting vegetation in a dry channel.
Dcf	DRY CHANNEL			Planting vegetation in a dry channel.
Dcg	DRY CHANNEL			Planting vegetation in a dry channel.
Dch	DRY CHANNEL			Planting vegetation in a dry channel.
Dci	DRY CHANNEL			Planting vegetation in a dry channel.
Dcj	DRY CHANNEL			Planting vegetation in a dry channel.
Dck	DRY CHANNEL			Planting vegetation in a dry channel.
Dcl	DRY CHANNEL			Planting vegetation in a dry channel.
Dcm	DRY CHANNEL			Planting vegetation in a dry channel.
Dcn	DRY CHANNEL			Planting vegetation in a dry channel.
Dco	DRY CHANNEL			Planting vegetation in a dry channel.
Dcp	DRY CHANNEL			Planting vegetation in a dry channel.
Dcq	DRY CHANNEL			Planting vegetation in a dry channel.
Dcr	DRY CHANNEL			Planting vegetation in a dry channel.
Dcs	DRY CHANNEL			Planting vegetation in a dry channel.
Dct	DRY CHANNEL			Planting vegetation in a dry channel.
Dcu	DRY CHANNEL			Planting vegetation in a dry channel.
Dcv	DRY CHANNEL			Planting vegetation in a dry channel.
Dcw	DRY CHANNEL			Planting vegetation in a dry channel.
Dcx	DRY CHANNEL			Planting vegetation in a dry channel.
Dcy	DRY CHANNEL			Planting vegetation in a dry channel.
Dcz	DRY CHANNEL			Planting vegetation in a dry channel.
D1	DRY CHANNEL			Planting vegetation in a dry channel.
D2	DRY CHANNEL			Planting vegetation in a dry channel.
D3	DRY CHANNEL			Planting vegetation in a dry channel.
D4	DRY CHANNEL			Planting vegetation in a dry channel.
D5	DRY CHANNEL			Planting vegetation in a dry channel.
D6	DRY CHANNEL			Planting vegetation in a dry channel.
D7	DRY CHANNEL			Planting vegetation in a dry channel.
D8	DRY CHANNEL			Planting vegetation in a dry channel.
D9	DRY CHANNEL			Planting vegetation in a dry channel.
D0	DRY CHANNEL			Planting vegetation in a dry channel.

DEFINITION

Applying plant residues or other suitable materials, produced on the site if possible, to the soil surface.

CONDITIONS

Mulch or temporary grassing shall be applied to all exposed areas within 14 days of disturbance. Mulch can be used as a singular erosion control device for up to six months, but it shall be applied at the appropriate depth, depending on the material used, anchored, and have a continuous 90% cover or greater of the soil surface. Maintenance shall be required to maintain appropriate depth and 90% cover. Temporary vegetation may be employed instead of mulch if the area will remain undisturbed for less than six months. If an area will remain undisturbed for greater than six months, permanent vegetation techniques shall be employed.

SPECIFICATIONS

MULCHING WITHOUT SEEDING

This standard applies to grades or cleared areas where seedlings may not have a suitable growing season to produce an erosion retardant cover. Mulch can be stabilized with a mulch cover.

Site Preparation

- Grade to permit the use of equipment for applying and anchoring mulch.
- Install needed erosion control measures as required such as dikes, diversions, berms, terraces and sediment barriers.
- Loosen compact soil to a minimum depth of 3 inches.

Mulching Materials

Select one of the following materials and apply at the depth indicated.

- Dry straw or hay shall be applied at a depth of 2 to 4 inches providing complete soil coverage. One advantage of this material is easy application.

Ds1 DISTURBED AREA STABILIZATION (WITH MULCHING ONLY)

DEFINITION

Wood waste (chips, sawdust or bark) shall be applied at a depth of 2 to 3 inches. Organic material from the clearing stage of development should remain on site, be chipped, and applied as mulch. This method of mulching can greatly reduce erosion control costs.

- Cutback asphalt (slow curing) shall be applied at 1200 gallons per acre (or 1/4 gallon per sq.yd.).
- Polyethylene film shall be secured over banks or stockpiled soil material for temporary protection. This material can be salvaged and reused.

Applying Mulch

- When mulch is used without seeding, mulch shall be applied to provide full coverage of the exposed area.
- Dry straw or hay mulch and wood chips shall be applied uniformly by hand or by mechanical equipment.
- If the area will eventually be covered with perennial vegetation, 20-30 pounds of nitrogen per acre in addition to the normal amount shall be applied to offset the uptake of nitrogen caused by the decomposition of the organic mulches.
- Cutback asphalt shall be applied uniformly. Care should be taken in areas of pedestrian traffic due to problems of tracking in or damage to shoes, clothing, etc.
- Apply polyethylene film on exposed areas.

Anchoring Mulch

Straw or hay mulch can be pressed into the soil with a disk harrow with the disk set straight or with a special "packer disk." Disks may be smooth or serrated and should be 20 inches or more in diameter and 8 to 12 inches apart. The edges of the disk should be dull enough not to cut the mulch but to press it into the soil leaving much of it in an erect position. Straw or hay mulch shall be anchored immediately after application. Straw or hay mulch spread with special blower-type equipment may be anchored with emulsified asphalt (Grade AP-5 or SS-1). The asphalt emulsion shall be sprayed onto the mulch as it is ejected from the machine. Use

400 gallons of emulsified asphalt and 100 gallons of water per ton of mulch. Tacklers and binders can be substituted for emulsified asphalt. Please refer to specification 7b - Tacklers and Binders. Plastic mesh or netting with mesh no larger than one inch by one inch shall be installed according to manufacturer's specifications.

- Netting of the appropriate size shall be used to anchor wood waste. Openings of the netting shall not be larger than the average size of the wood waste chips.
- Polyethylene film shall be anchored trenched at the top as well as incrementally as necessary.

DEFINITION

The planting of permanent vegetation such as trees, shrubs, vines, grasses, or legumes on exposed areas for soil preservation stabilization. Permanent permanent vegetation shall be used to restore soil resources.

CONDITIONS

Permanent permanent vegetation to be used to provide a protective cover for exposed areas including curb, fill, fence, and other disturbed areas.

SPECIFICATIONS

Grading and shaping may not be required where hydraulic seeding and berthing equipment is to be used. Vertical berms shall be shaped to enable plant establishment.

When conventional seeding and berthing are to be done, grade and slope shall be suitable for planting, and the equipment used shall be used only during seeded preparation, seeding, and during maintenance of the vegetation.

Seeding will be done with a specially prepared seed broadcast machine, or hand seeding, or other treatment practices shall conform with the appropriate standards and specifications.

Seedbed Preparation

Seedbed preparation may not be required where hydraulic seeding and berthing equipment is to be used. When conventional seeding is to be used, seeded preparation will be done as follows:

1. Tillage at a minimum, shall adequately break the soil to a depth of 1 to 4 inches, disperse and incorporate any weed seeds, and break up clumps of soil. The soil shall be prepared to receive seed, and the seed shall be uniformly distributed and planted at the proper depth.
2. Tillage may be done with any suitable equipment.

Individual Plants
Shrubs, vines and sprigs may be placed with vegetation planters or hand tools. They must be planted normally in the ground. Each plant shall be set in a manner that will ensure proper growth. Plants shall be planted at the same depth or slightly deeper than the zone of the soil. The top of the stem shall be at or slightly above the ground surface. When individual plants are set, fertilizer shall be placed at the bottom of the hole. Two inches of soil shall be added and the plant shall be set in the hole.

Ds3 DISTURBED AREA STABILIZATION (WITH PERMANENT VEGETATION)

DEFINITION

The establishment of temporary vegetative cover with fast growing seedlings for seasonal protection on disturbed or denuded areas.

CONDITIONS

Temporary grassing, instead of mulch, can be applied to rough graded areas that will be exposed for less than six months. Temporary vegetative measures should be coordinated with permanent measures to ensure economical and effective stabilization. Most types of temporary vegetation are ideal to use as companion crops until the permanent vegetation is established, seeded.

SEEDING RATES FOR TEMPORARY SEEDING

SPECIES	RATE Per 1,000 sq. ft.	RATE Per Acre**	PLANTING DATES**
Rye	3.9 pounds	3 bu.	9/1-3/1
Ryegrass	0.9 pound	40 lbs.	1/15-4/1
Annual Lupine	0.9 pound	40 lbs.	1/15-3/15
Weeping Lovegrass	0.4 pound	4 lbs.	2/15-4/15
Sudangrass	1.4 pounds	60 lbs.	3/1-8/1
Browntop Millet	0.9 pound	40 lbs.	4/1-7/15
Wheat	4.1 pounds	3 bu.	9/15-2/1

* Unusual site conditions may require heavier seeding rates

** Seeding dates may need to be altered to fit temperature variations and conditions.

Ds2 DISTURBED AREA STABILIZATION (WITH TEMPORARY SEEDING)

DEFINITION

The combination of asphalt emulsion and water shall consist of a homogeneous mixture suitable for spraying. The mixture shall consist of 100 gallons of grade 88 1b or 88 1c emulsified asphalt and 100 gallons of water per ton of mulch.

1. Dry straw or hay of good quality and free of weed seeds can be used. Dry straw shall be applied at the rate of 1 ton per acre. Dry hay shall be applied at a rate of 1/2 ton per acre.
2. Wood mulch or wood chips shall be used with hydraulic seeding. It shall be applied at the rate of 200 pounds per acre. Dry straw or hay shall be applied at the rate of 100 pounds per acre. Hydraulic seeding shall be done with a hydraulic seeder. Use the broadcast spreader of wood mulch or wood chips. Each machine shall be used with hydraulic seeding at a rate of 1/2 ton per acre.
3. Surface preparation for conventional seeding shall be applied at a rate of 1/2 ton per acre.
4. Fine straw or hay shall be applied at a thickness of 1/2 inch for bedding purposes. Other suitable materials in sufficient quantity may be used where circumstances or other ground cover are desired. This is not appropriate for seeded areas.
5. When areas temporary water control ditches or banks are to be seeded, the seed shall be applied to the surface of the ditch or bank. The seed shall be applied to the surface of the ditch or bank. The seed shall be applied to the surface of the ditch or bank.

Wood mulch and wood chips shall be applied to banks and ditches. The seed shall be applied to the surface of the ditch or bank. The seed shall be applied to the surface of the ditch or bank.

SEEDING RATES FOR PERMANENT SEEDING

SPECIES	RATE Per 1,000 sq. ft.	RATE Per Acre**	PLANTING DATES**
BAMA	1.4 POUNDS	60 LBS.	4/1-12/1
BORSTATA	1.1 POUNDS	49 LBS.	2/15-7/1
CESTRUM	1.1 POUNDS	49 LBS.	4/1-12/1
LEUCOPHYLLA	1.1 POUNDS	49 LBS.	4/1-12/1
WEEDING	1.1 POUNDS	49 LBS.	4/1-12/1
SWITCH GRASS	1.1 POUNDS	49 LBS.	4/1-12/1

* Unusual site conditions may require heavier seeding rates

** Seeding dates may need to be altered to fit temperature variations and conditions.

DEFINITION

A permanent vegetation using sods on highly erodible or critically eroded lands.

CONDITIONS

This application is appropriate for areas which require intensive vegetation recovery, deep slopes, grass swales, and waterways with intermittent flow.

CONSTRUCTION SPECIFICATIONS INSTALLATION

Soil Preparation
1. Bring soil surface to final grade. Clear surface of trash, weeds, debris, stones and debris larger than 1/2". Apply soil and soil surface to soil and soil surface, or gravel type soil.

Table 4-4.1. Fertilizer Requirements for Soil Surface Application

Fertilizer Type (lb./ton)	Fertilizer Rate (lb./acre)	Fertilizer Rate (tons/acre)	Notes
10-10-10	1000	.225	Full

Table 4-4.2. Soil Planting Requirements

Species	Planting Time	Fertilizer (lb./acre)	Rate (tons/acre)	Notes
Bromegrass	Common	M-L-P-C		Warm Weather
Timothy	P-C			Warm Weather
Timothy	P-C			Warm Weather
Budagrass	P-C			Warm Weather
Orchardgrass	P-C			Warm Weather
St. Augustine	Common	C		Warm Weather
St. Augustine	Common	C		Warm Weather
Zoysia	Common	P-C		Warm Weather
Tall Fescue	Kentucky	M-L-P		Cool Weather

Table 4-4.3. Fertilizer Requirements for Sod

Types of Species	Planting Time	Fertilizer (lb./acre)	Rate (tons/acre)	Notes
Cool Season	Fert	4-12-12	1000	50-100
Warm Season	Fert	4-12-12	1000	50-100
Warm Season	Fert	4-12-12	1000	50-100
Cool Season	Macro	10-10-10	500	50

Table 4-4.4. Sod Planting Requirements

Types of Species	Planting Time	Fertilizer (lb./acre)	Rate (tons/acre)	Notes
Cool Season	Fert	4-12-12	1000	50-100
Warm Season	Fert	4-12-12	1000	50-100
Warm Season	Fert	4-12-12	1000	50-100
Cool Season	Macro	10-10-10	500	50

Ds4 DISTURBED AREA STABILIZATION (WITH SODDING)

SPECIFICATIONS

Grading and Shaping

Excessive water run-off shall be reduced by properly designed and installed erosion control practices such as closed drains, ditches, dikes, diversions, sediment barriers and others.

No shaping or grading is required if slopes can be stabilized by hand-seeded vegetation or if hydraulic seeding equipment is to be used.

Seedbed Preparation

When a hydraulic seeder is used, seedbed preparation is not required. When using conventional or hand-seeding, seedbed preparation is not required if the soil material is loose and not sealed by rainfall.

When soil has been sealed by rainfall or consists of smooth cut slopes, the soil shall be pitted, trenched or otherwise scarified to provide a place for seed to lodge and germinate.

Lime and Fertilizer

Agricultural lime is required unless soil tests indicate otherwise. Apply agricultural lime at a rate of one ton per acre. Graded areas require lime application. Soils can be tested to determine if fertilizer is needed. For soils with very low fertility, 500 to 700 pounds of 10-10-10 fertilizer or the equivalent per acre (12-16 lbs. 1,500 sq. ft.) shall be applied. Fertilizer should be applied before final preparation and incorporated with a disk, ripper or chisel.

Seeding

Select a grass or grass-legume mixture suitable to the area and season of the year. Seed shall be applied uniformly by hand, cyclone seeder, drill, cultipacker seeder, or hydraulic seeder (slurry including seed and fertilizer). Drill or cultipacker seeders should normally place seed one-quarter to one-half inch deep. Appropriate depth of planting is ten times the seed diameter. Soil should be "raked" lightly to cover seed with soil if seeded by hand.

Mulching

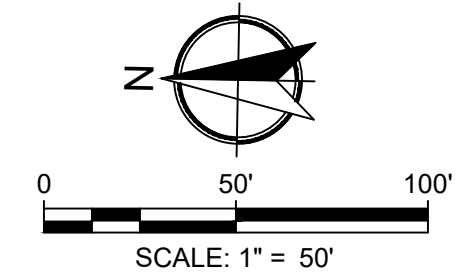
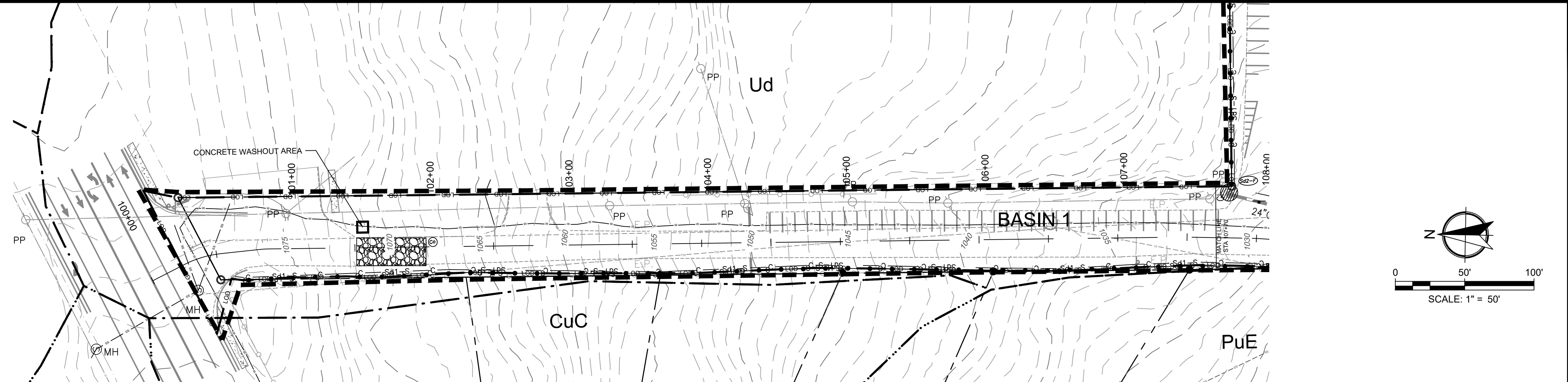
Temporary vegetation can, in most cases, be established without the use of mulch. Mulch without seeding should be considered for short term protection. Refer to Ds1 - Disturbed Area Stabilization (With Mulching Only).

Irrigation

During times of drought, water shall be applied at a rate not causing runoff and erosion. The soil shall be thoroughly wetted to a depth that will insure germination of the seed. Subsequent applications should be made when needed.

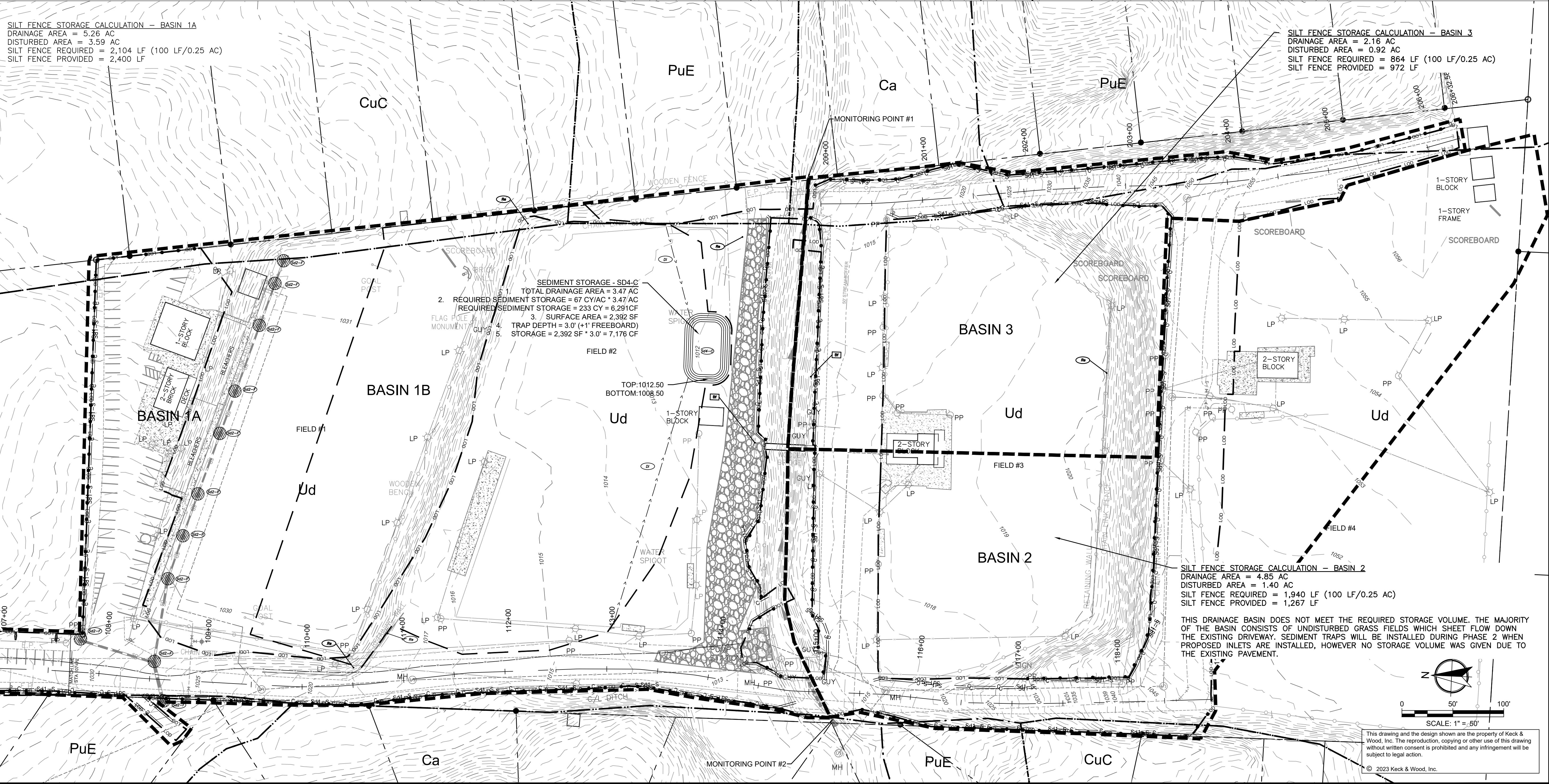
Keck+Wood
COLLABORATION BY DESIGN
3000 Premiere Parkway

1. THE ESCAPE OF SEDIMENT FROM THE SITE SHALL BE PREVENTED BY THE INSTALLATION OF EROSION AND SEDIMENT CONTROL MEASURES AND PRACTICES PRIOR TO LAND DISTURBING ACTIVITIES. EROSION CONTROL DEVICES MAY HAVE TO BE ALTERED FROM THAT SHOWN ON THE APPROVED PLANS IF DRAINAGE PATTERNS DURING CONSTRUCTION ARE DIFFERENT FROM THE FINAL PROPOSED DRAINAGE PATTERNS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ACCOMPLISH EROSION CONTROL FOR ALL DRAINAGE PATTERNS CREATED AT VARIOUS STAGES DURING CONSTRUCTION. ANY DIFFICULTY IN CONTROLLING EROSION DURING ANY PHASE OF CONSTRUCTION SHALL BE REPORTED TO THE ENGINEER IMMEDIATELY.
2. EROSION AND SEDIMENTATION CONTROL MEASURES AND PRACTICES SHALL BE MAINTAINED AT ALL TIMES. IF FULL IMPLEMENTATION OF THE APPROVED PLAN DOES NOT PROVIDE FOR EFFECTIVE EROSION AND SEDIMENT CONTROL, ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE IMPLEMENTED TO CONTROL OR TREAT THE SEDIMENT SOURCE.
3. ALL EROSION AND SEDIMENT CONTROL MEASURES WILL BE CHECKED DAILY AND ANY DEFICIENCIES NOTED WILL BE CORRECTED BY THE END OF EACH DAY. ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES WILL BE INSTALLED IF DEEMED NECESSARY AFTER ON-SITE INSPECTION BY ISSUING AUTHORITY.
4. REMOVAL ALL DEBRIS FROM THE PROJECT SITE AND DISPOSE OF IT IN A LEGAL MANNER.
5. THIS DRAWING IS FOR EROSION CONTROL PURPOSES ONLY. PROVISIONS TO PREVENT EROSION OF THE SOIL OFF THE SITE SHALL CONFORM TO THE REQUIREMENTS OF THE EROSION AND SEDIMENTATION ACT OF 1975 AS SHOWN HEREON AND STIPULATED IN THE MANUAL FOR EROSION AND SEDIMENT CONTROL IN GEORGIA BY STATE SOIL AND WATER CONSERVATION COMMISSION. THE PROVISIONS IN THE MANUAL SHALL BE FOLLOWED AND INSTALLED IN A MANNER SO AS TO MINIMIZE EROSION OF THE DISTURBED AREAS AND PREVENT SEDIMENT FROM LEAVING THE SITE.
6. THE EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES TAKE PLACE AND SHALL BE MAINTAINED IN PROPER WORKING ORDER UNTIL ALL DISTURBED AREAS ARE STABILIZED AND PERMANENT VEGETATION HAS BEEN ESTABLISHED.
7. THE EROSION CONTROL MEASURES DETAILED HERE ON SHALL BE CONTINUED UNTIL THE PERMANENT VEGETATION ON PLATED GRADES AND SLOPES IS SUFFICIENTLY ESTABLISHED TO BE AN EFFECTIVE EROSION DETERRENT. THE SEDIMENT REMOVED FROM THE CONTROL STRUCTURES SHALL BE EVENLY DISTRIBUTED UPSTREAM OF EROSION CONTROL MEASURES. DISPOSED SEDIMENT SHALL BE PERMANENTLY GRASSSED.
8. SILT FENCE SHALL BE PLACED DOWN GRADIENT OF ALL STOCKPILED SOIL OR BORROW AREAS AND ON ALL SLOPES THAT EXCEED 1.5:1.
9. ALL VEGETATIVE STABILIZATION SHALL BE ACCOMPLISHED AS SOON AS CONSTRUCTION PERMITS. IF LAND-DISTURBING ACTIVITIES CEASE FOR MORE THAN 14 DAYS, CONTRACTOR IS RESPONSIBLE FOR STABILIZING DISTURBED AREAS WITH TEMPORARY VEGETATION OR MULCH.
10. CONTRACTOR SHALL MAINTAIN ALL EROSION CONTROL MEASURES UNTIL PERMANENT VEGETATION HAS BEEN ESTABLISHED. CONTRACTOR SHALL INSPECT EROSION CONTROL MEASURES AT THE END OF EACH WORKING DAY TO ENSURE MEASURES ARE FUNCTIONING PROPERLY.



SILT FENCE STORAGE CALCULATION - BASIN 1A
 DRAINAGE AREA = 5.26 AC
 DISTURBED AREA = 3.59 AC
 SILT FENCE REQUIRED = 2,104 LF (100 LF/0.25 AC)
 SILT FENCE PROVIDED = 2,400 LF

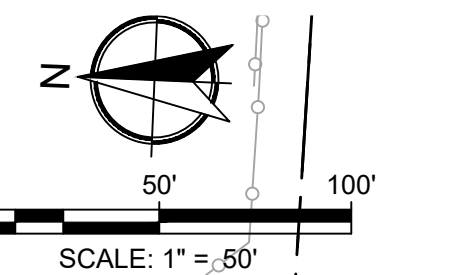
SILT FENCE STORAGE CALCULATION - BASIN 3
 DRAINAGE AREA = 2.16 AC
 DISTURBED AREA = 0.92 AC
 SILT FENCE REQUIRED = 864 LF (100 LF/0.25 AC)
 SILT FENCE PROVIDED = 972 LF



SEDIMENT STORAGE - SD4-C
 1. TOTAL DRAINAGE AREA = 3.47 AC
 2. REQUIRED SEDIMENT STORAGE = 67 CY/AC * 3.47 AC
 REQUIRED SEDIMENT STORAGE = 233 CY = 6,291 CF
 3. SURFACE AREA = 2,392 SF
 4. TRAP DEPTH = 3.0' (+1' FREEBOARD)
 5. STORAGE = 2,392 SF * 3.0' = 7,176 CF

SILT FENCE STORAGE CALCULATION - BASIN 2
 DRAINAGE AREA = 4.85 AC
 DISTURBED AREA = 1.40 AC
 SILT FENCE REQUIRED = 1,940 LF (100 LF/0.25 AC)
 SILT FENCE PROVIDED = 1,267 LF

THIS DRAINAGE BASIN DOES NOT MEET THE REQUIRED STORAGE VOLUME. THE MAJORITY OF THE BASIN CONSISTS OF UNDISTURBED GRASS FIELDS WHICH SHEET FLOW DOWN THE EXISTING DRIVEWAY. SEDIMENT TRAPS WILL BE INSTALLED DURING PHASE 2 WHEN PROPOSED INLETS ARE INSTALLED, HOWEVER NO STORAGE VOLUME WAS GIVEN DUE TO THE EXISTING PAVEMENT.



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NO.	DATE	REVISION

Fitzgerald Park Improvements - Phase 2
 4877 Lawrenceville Hwy
 Tucker, Georgia
ESPCP - PHASE 1

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Project Manager:	CAS
Drawn By:	BAF
Checked By:	CAS
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*INLETS SHOWN ON THE PLAN AS SD2-F/P SHALL BE CONVERTED FROM AN SD2-F TO AN SD2-P AS THE PAVEMENT IS INSTALLED.



SEDIMENT STORAGE:
THE SITE HAS A TOTAL DISTURBED AREA OF 7.82 ACRES. THE FOLLOWING TABLE SUMMARIZES THE REQUIRED AND AVAILABLE SEDIMENT STORAGE FOR EVERY OUTFALL ON THIS PROJECT. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN THE STORAGE VOLUMES FOR THE BMPs SPECIFIED IN THIS TABLE.

OUTFALL ID	DRAINAGE AREA (ACRES)	DISTURBED AREA (ACRES)	REQUIRED SEDIMENT STORAGE VOLUME (CY)	TOTAL STORAGE VOLUME PROVIDED (CY)	TOTAL STORAGE VOLUME NOT PROVIDED (CY)	INLET SEDIMENT TRAPS		SILT FENCE	
						# OF DEVICES	TOTAL VOLUME (CY)	LENGTH (FT)	TOTAL VOLUME (CY)
1	8.73	5.50	585	240.6	X	3	129.3	2,404	111.30
2	4.85	1.40	325	X	X	X	X	1,267	58.66
3	2.16	0.92	144	X	X	X	X	972	45

SEE NOTES AT INLETS FOR EXPLANATIONS AS TO WHY REQUIRED STORAGE CANNOT BE MET.

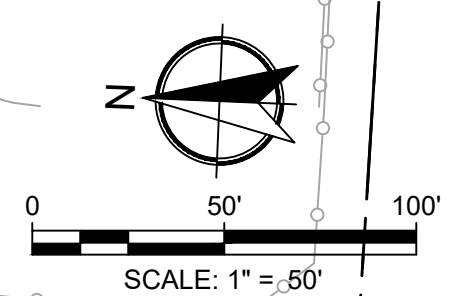
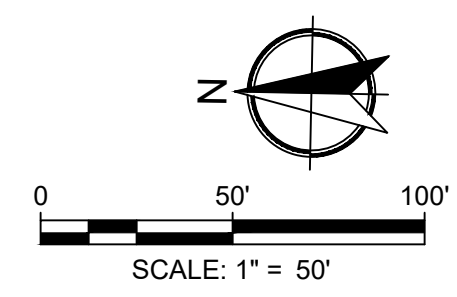
SILT FENCE STORAGE CALCULATION - BASIN 1
 1. ACRES DRAINED FOR INITIAL PHASE = 5.72 ACRES
 2. REQUIRED SEDIMENT STORAGE = 67 CY/AC * ACRES DRAINED
 REQUIRED SEDIMENT STORAGE = 67 CY/AC * 5.72 = 383 CY
 3. ASSUME SEDIMENT DEPTH OF 6" AGAINST SILT FENCE
 4. DETERMINE IF ADEQUATE SEDIMENT STORAGE AREA ALONG SILT FENCE IS POSSIBLE
 LENGTH OF SILT FENCE (LF) = 2,404
 DEPTH OF SEDIMENT (D") = 6"
 WIDTH OF SEDIMENT STORAGE AREA (W) = 5'
 5. $1/2 \times L \times D \times W = 3,005 \text{ CF} = 111.30 \text{ CY}$

SILT FENCE STORAGE CALCULATION - BASIN 3
 1. ACRES DRAINED FOR INITIAL PHASE = 2.16 ACRES
 2. REQUIRED SEDIMENT STORAGE = 67 CY/AC * ACRES DRAINED
 REQUIRED SEDIMENT STORAGE = 67 CY/AC * 2.16 = 144 CY
 3. ASSUME SEDIMENT DEPTH OF 6" AGAINST SILT FENCE
 4. DETERMINE IF ADEQUATE SEDIMENT STORAGE AREA ALONG SILT FENCE IS POSSIBLE
 LENGTH OF SILT FENCE (LF) = 972
 DEPTH OF SEDIMENT (D") = 6"
 WIDTH OF SEDIMENT STORAGE AREA (W) = 5'
 5. $1/2 \times L \times D \times W = 1,215 \text{ CF} = 45 \text{ CY}$

THIS DRAINAGE BASIN DOES NOT MEET THE REQUIRED STORAGE VOLUME. THE MAJORITY OF THE BASIN CONSISTS OF UNDISTURBED GRASS FIELDS WHICH SHEET FLOW DOWN THE EXISTING DRIVEWAY. SEDIMENT TRAPS WILL BE INSTALLED DURING PHASE 2 WHEN PROPOSED INLETS ARE INSTALLED, HOWEVER NO STORAGE VOLUME WAS GIVEN DUE TO THE EXISTING PAVEMENT.

SILT FENCE STORAGE CALCULATION - BASIN 2
 1. ACRES DRAINED FOR INITIAL PHASE = 2.24 ACRES
 2. REQUIRED SEDIMENT STORAGE = 67 CY/AC * ACRES DRAINED
 REQUIRED SEDIMENT STORAGE = 67 CY/AC * 2.24 = 261 CY
 3. ASSUME SEDIMENT DEPTH OF 6" AGAINST SILT FENCE
 4. DETERMINE IF ADEQUATE SEDIMENT STORAGE AREA ALONG SILT FENCE IS POSSIBLE
 LENGTH OF SILT FENCE (LF) = 1,267
 DEPTH OF SEDIMENT (D") = 6"
 WIDTH OF SEDIMENT STORAGE AREA (W) = 5'
 5. $1/2 \times L \times D \times W = 1,583.75 \text{ CF} = 58.66 \text{ CY}$

THIS DRAINAGE BASIN DOES NOT MEET THE REQUIRED STORAGE VOLUME. THE MAJORITY OF THE BASIN CONSISTS OF UNDISTURBED GRASS FIELDS WHICH SHEET FLOW DOWN THE EXISTING DRIVEWAY. SEDIMENT TRAPS WILL BE INSTALLED DURING PHASE 2 WHEN PROPOSED INLETS ARE INSTALLED, HOWEVER NO STORAGE VOLUME WAS GIVEN DUE TO THE EXISTING PAVEMENT.



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Fitzgerald Park Improvements - Phase 2
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Fitzgerald Park Improvements - Phase 2
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ESPCP - PHASE 3

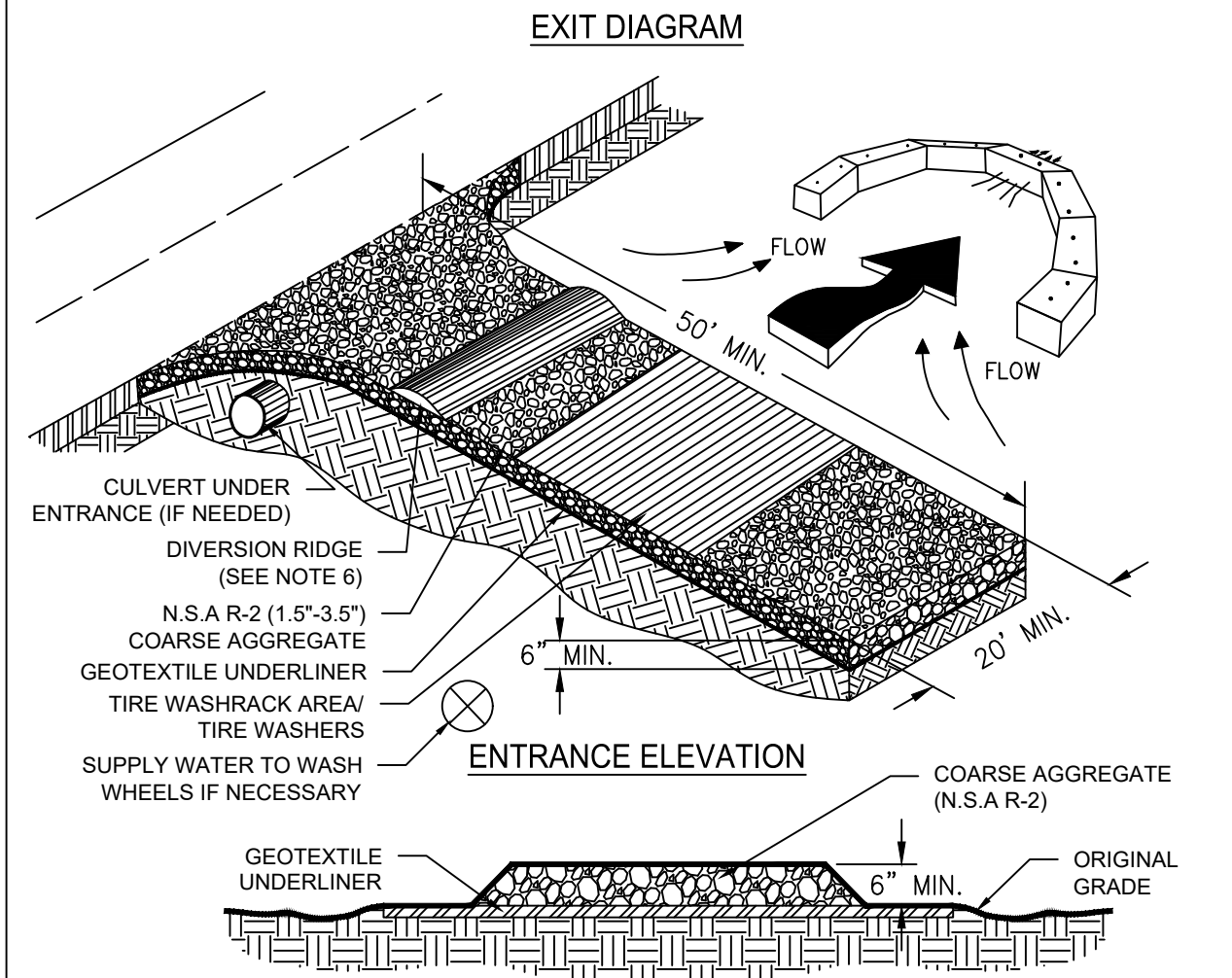
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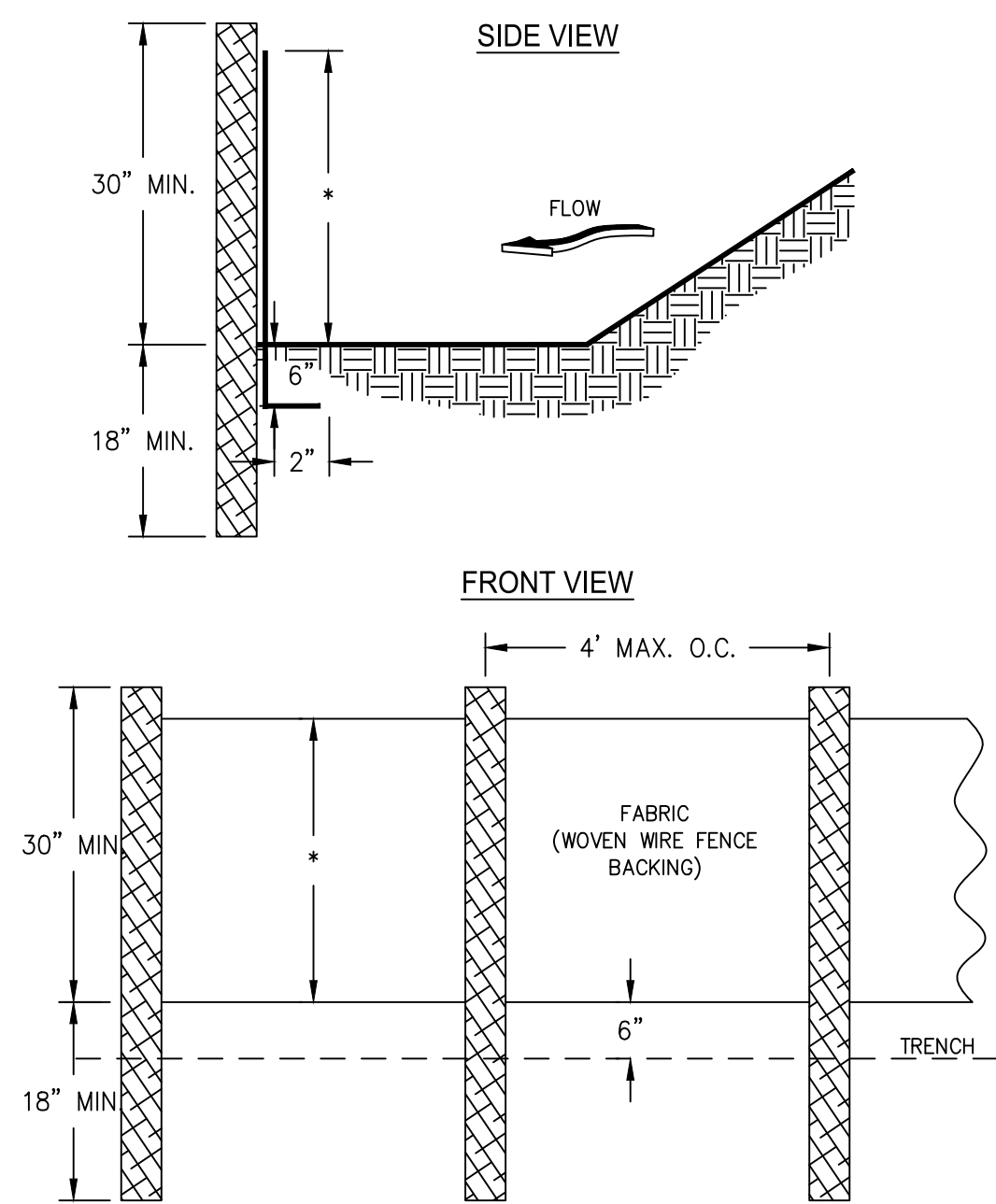
CRUSHED STONE CONSTRUCTION EXIT



- NOTES:**
1. AVOID LOCATING ON STEEP SLOPES OR AT CURVES ON PUBLIC ROADS.
 2. REMOVE ALL VEGETATION AND OTHER UNSUITABLE MATERIAL FROM THE FOUNDATION AREA, GRADE, AND CROWN FOR POSITIVE DRAINAGE.
 3. AGGREGATE SIZE SHALL BE IN ACCORDANCE WITH NATIONAL STONE ASSOCIATION R-2 (1.5"-3.5" STONE).
 4. GRAVEL PAD SHALL HAVE A MINIMUM THICKNESS OF 6".
 5. PAD WIDTH SHALL BE EQUAL FULL WIDTH AT ALL POINTS OF VEHICULAR EGRESS, BUT NO LESS THAN 20'.
 6. A DIVERSION RIDGE SHOULD BE CONSTRUCTED WHEN GRADE TOWARD PAVED AREA IS GREATER THAN 2%.
 7. INSTALL PIPE UNDER THE ENTRANCE IF NEEDED TO MAINTAIN DRAINAGE DITCHES.
 8. WHEN WASHING IS REQUIRED, IT SHOULD BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN (DIVERT ALL SURFACE RUNOFF AND DRAINAGE FROM THE ENTRANCE TO A SEDIMENT CONTROL DEVICE).
 9. WASHRACKS AND/OR TIRE WASHERS MAY BE REQUIRED DEPENDING ON SCALE AND CIRCUMSTANCE. IF NECESSARY, WASHRACK DESIGN MAY CONSIST OF ANY MATERIAL SUITABLE FOR TRUCK TRAFFIC THAT REMOVE MUD AND DIRT.
 10. MAINTAIN AREA IN A WAY THAT PREVENTS TRACKING AND/OR FLOW OF MUD ONTO PUBLIC RIGHTS-OF-WAYS. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.

CONSTRUCTION EXIT - Co

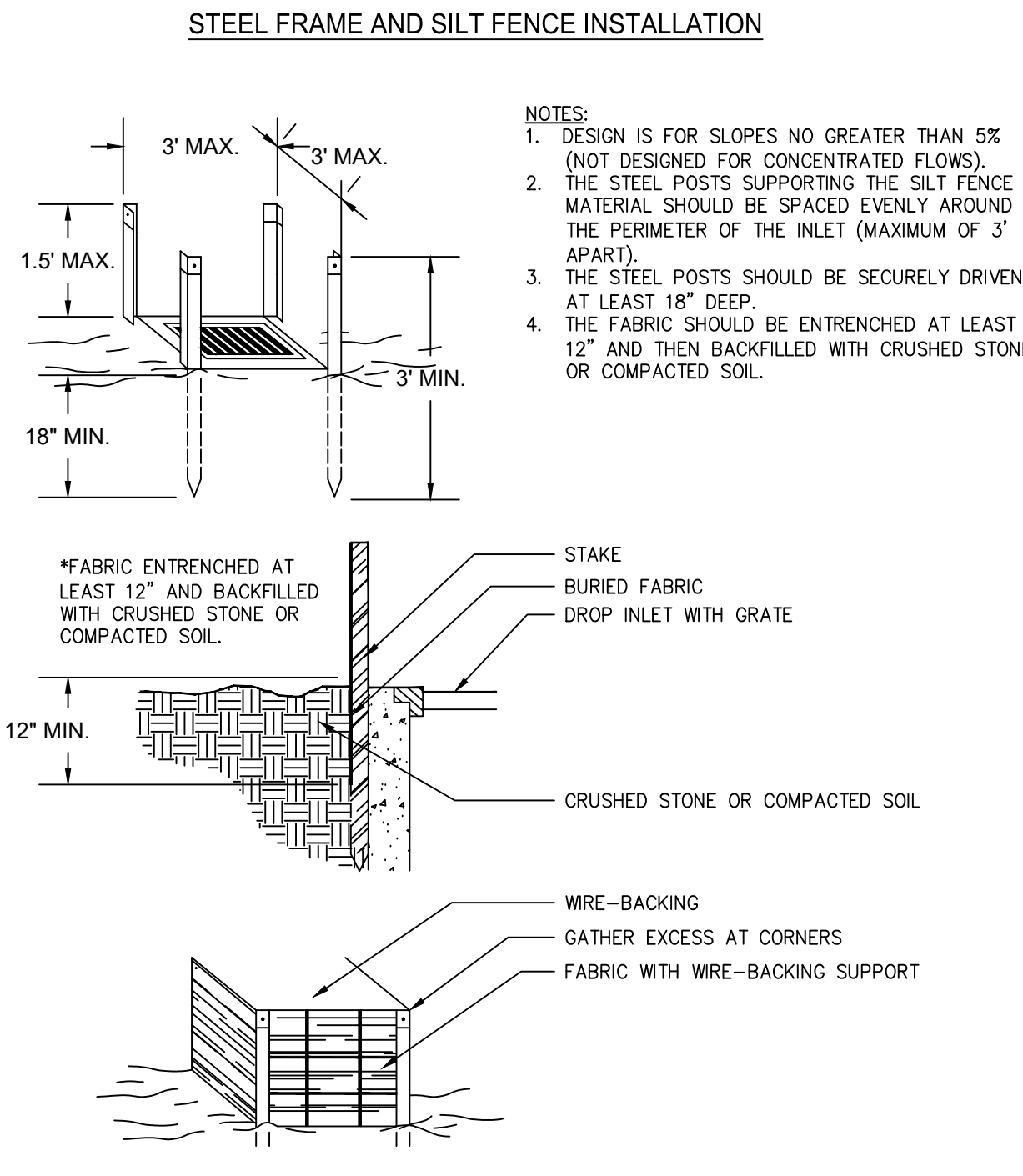
SILT FENCE - TYPE SENSITIVE



- NOTES:**
1. USE STEEL OR WOOD POSTS OR AS SPECIFIED BY THE EROSION, SEDIMENTATION, AND POLLUTION CONTROL PLAN.
 2. HEIGHT (*) IS TO BE SHOWN ON THE EROSION, SEDIMENTATION, AND POLLUTION CONTROL PLAN.

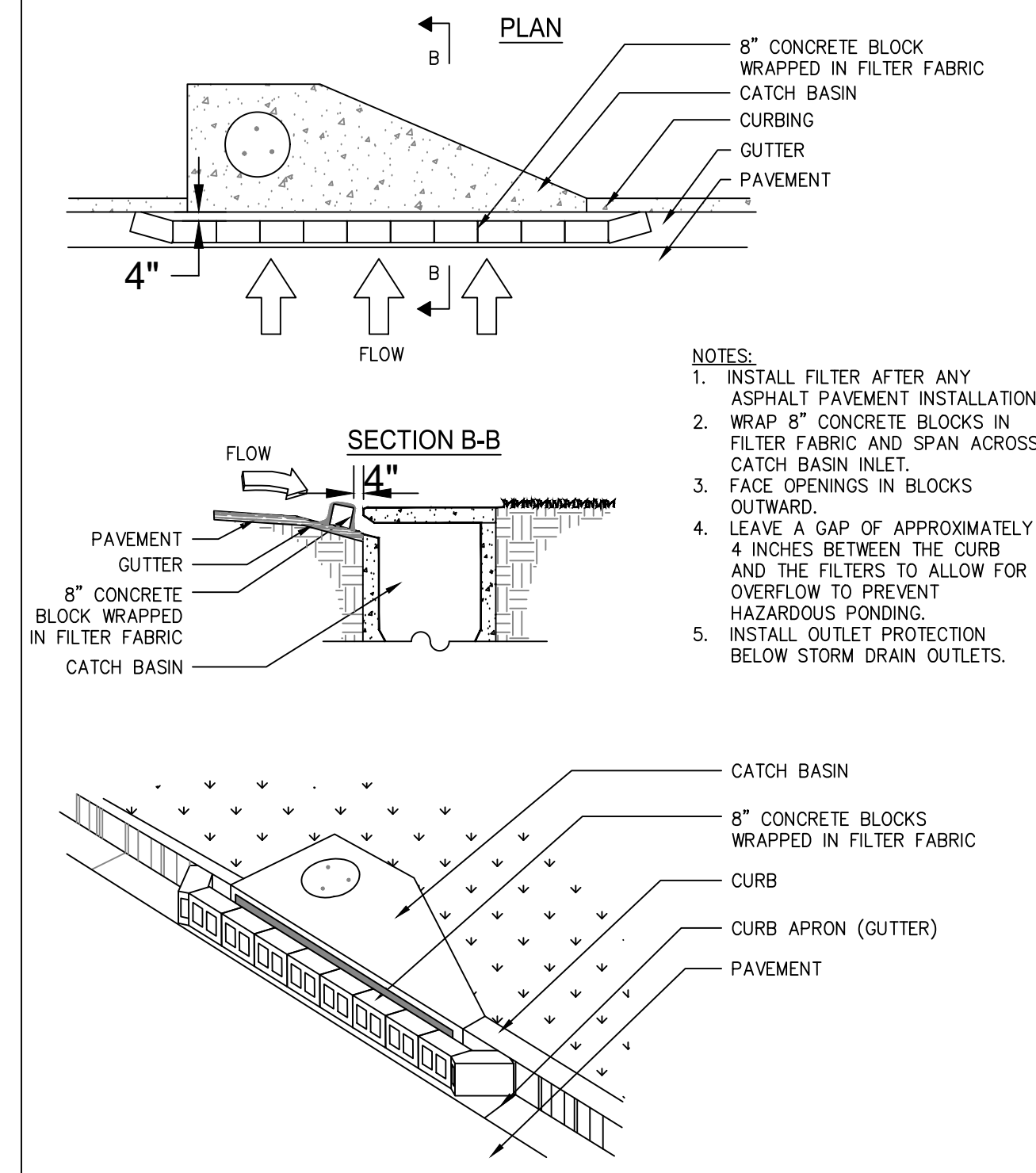
SILT FENCE - SENSITIVE - Sd1-S

FABRIC AND SUPPORTING FRAME FOR INLET PROTECTION



INLET PROTECTION - Sd2-F

CURB INLET FILTER "PIGS IN BLANKET"



INLET PROTECTION - Sd2-P

TEMPORARY METHODS

MULCHES. SEE STANDARD DS1 - DISTURBED AREA STABILIZATION (WITH MULCHING ONLY). SYNTHETIC RESINS MAY BE USED INSTEAD OF ASPHALT TO BIND MULCH MATERIAL. REFER TO STANDARD TB-TACKIFIERS AND BINDERS. RESINS SUCH AS CURASOL OR TERRATAK SHOULD BE USED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.

VEGETATIVE COVER. SEE STANDARD DS2 - DISTURBED AREA STABILIZATION (WITH TEMPORARY SEEDING).

SPRAY-ON ADHESIVES. THESE ARE USED ON MINERAL SOILS (NOT EFFECTIVE ON MUCK SOILS). KEEP TRAFFIC OFF THESE AREAS. REFER TO STANDARD TB-TACKIFIERS AND BINDERS.

TILLAGE. THIS PRACTICE IS DESIGNED TO ROUGHEN AND BRING DOWN CLODS TO THE SURFACE. IT IS AN EMERGENCY MEASURE WHICH SHOULD BE USED BEFORE WIND EROSION STARTS.

IRRIGATION. THIS IS GENERALLY DONE AS AN EMERGENCY TREATMENT. SITE IS SPRINKLED WITH WATER UNTIL THE SURFACE IS WET. REPEAT AS NEEDED.

BARRIERS. SOLID BOARD FENCES, SNOWFLAKES, BURLAP FENCES, CRATE WALLS, BALES OF HAY AND SIMILAR MATERIAL CAN BE USED TO CONTROL AIR CURRENTS AND SOIL BLOWING. BARRIERS PLACED AT RIGHT ANGLES TO PREVAILING CURRENTS AT INTERVALS OF ABOUT 15 TIMES THEIR HEIGHT ARE EFFECTIVE IN CONTROLLING WIND EROSION.

CALCIUM CHLORIDE. APPLY AT RATE THAT WILL KEEP SURFACE MOIST. MAY NEED RETREATMENT.

PERMANENT METHODS

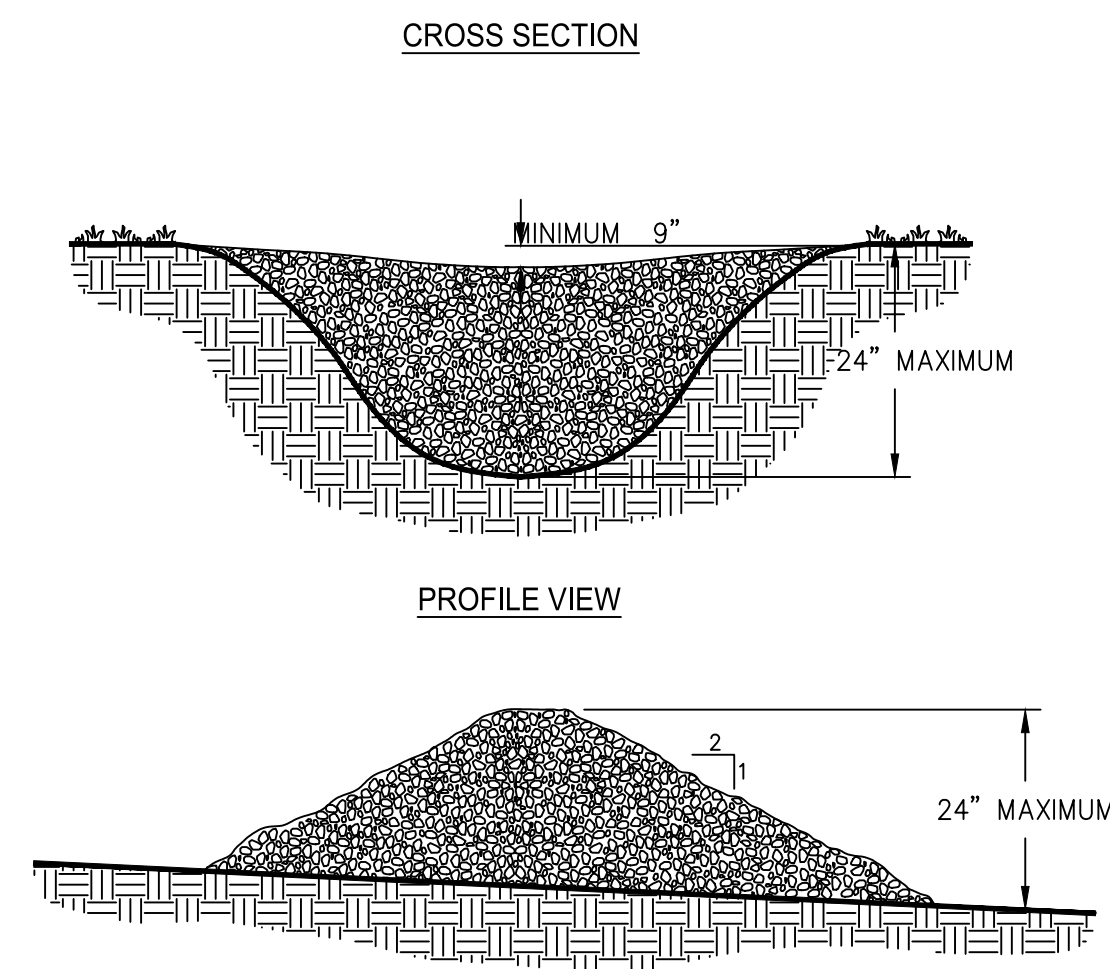
PERMANENT VEGETATION. SEE STANDARD DS3 - DISTURBED AREA STABILIZATION (WITH PERMANENT VEGETATION). EXISTING TREES AND LARGE SHRUBS MAY AFFORD VALUABLE PROTECTION IF LEFT IN PLACE.

TOPSOILING. THIS ENTAILS COVERING THE SURFACE WITH LESS EROSION SOIL MATERIAL. SEE STANDARD TP - TOPSOILING.

STONE. COVER SURFACE WITH CRUSHED STONE OR COARSE GRAVEL. SEE STANDARD CR-CONSTRUCTION ROAD STABILIZATION.

DUST CONTROL - Du

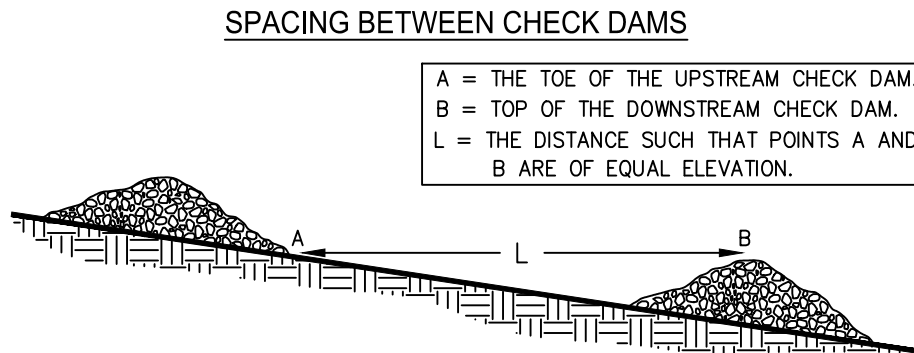
STONE CHECK DAM



- NOTES:**
1. CHECK DAMS ARE TO BE USED ONLY IN SMALL OPEN CHANNELS (THEY ARE NOT TO BE USED IN LIVE STREAMS).
 2. THE DRAINAGE AREA FOR STONE CHECK DAMS SHALL NOT EXCEED TWO ACRES.
 3. THE CENTER OF THE CHECK DAM MUST BE AT LEAST 9 INCHES LOWER THAN THE OUTER EDGES.
 4. THE DAM HEIGHT SHOULD BE A MAXIMUM OF 2 FEET FROM CENTER TO RIM EDGE.
 5. THE SIDE SLOPES OF THE CHECK DAM SHALL NOT EXCEED A 2:1 SLOPE.
 6. GEOTEXTILE SHALL BE USED TO PREVENT THE MITIGATION OF SUBGRADE SOIL PARTICLES INTO THE STONES (REFER TO AASHTO M288-96, SECTION 7.3, TABLE 3).

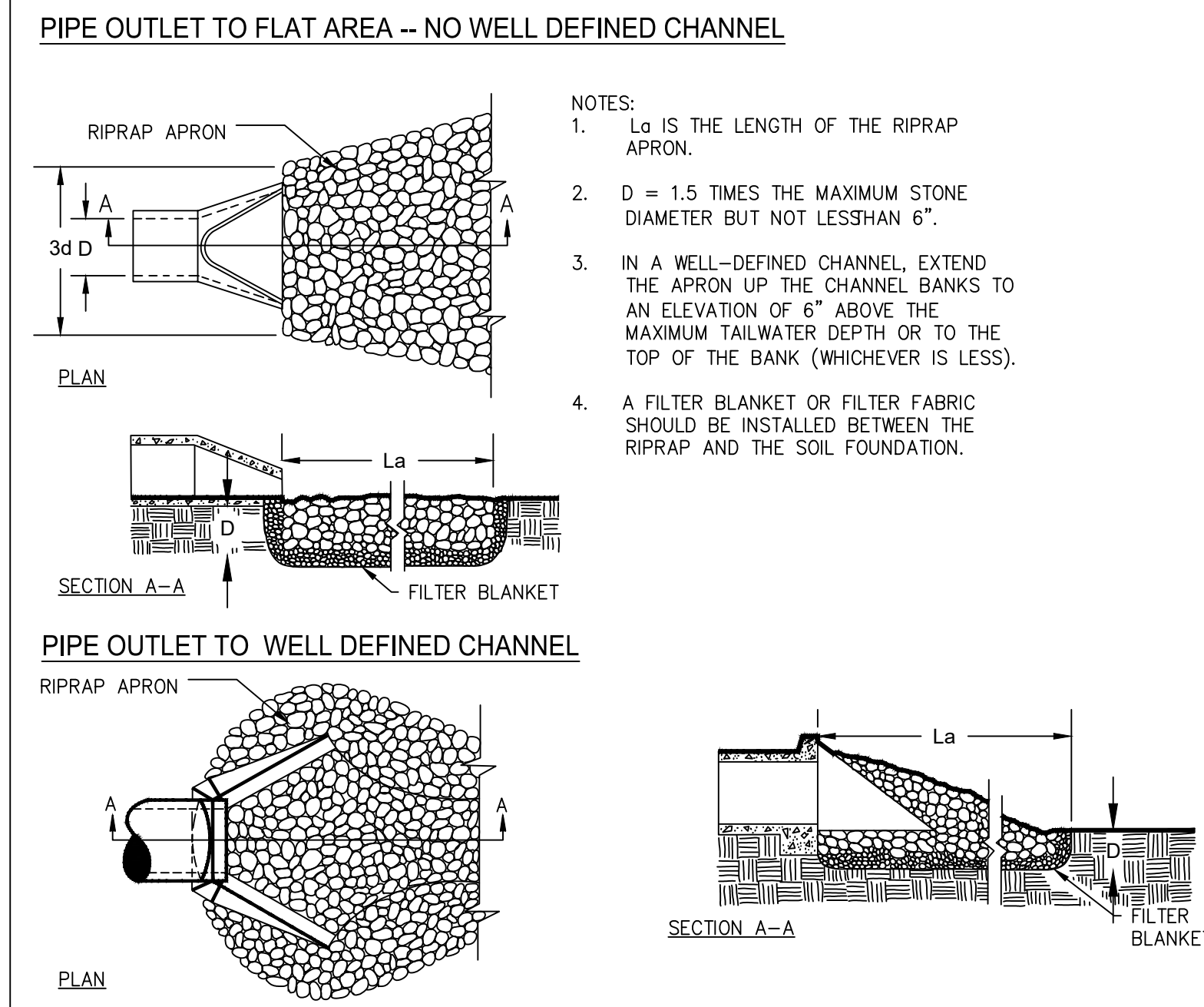
STONE CHECK DAM - Cd-S

STONE CHECK DAM



STONE CHECK DAM - Cd-S

RIPRAP OUTLET PROTECTION



RIPRAP OUTLET PROTECTION - St

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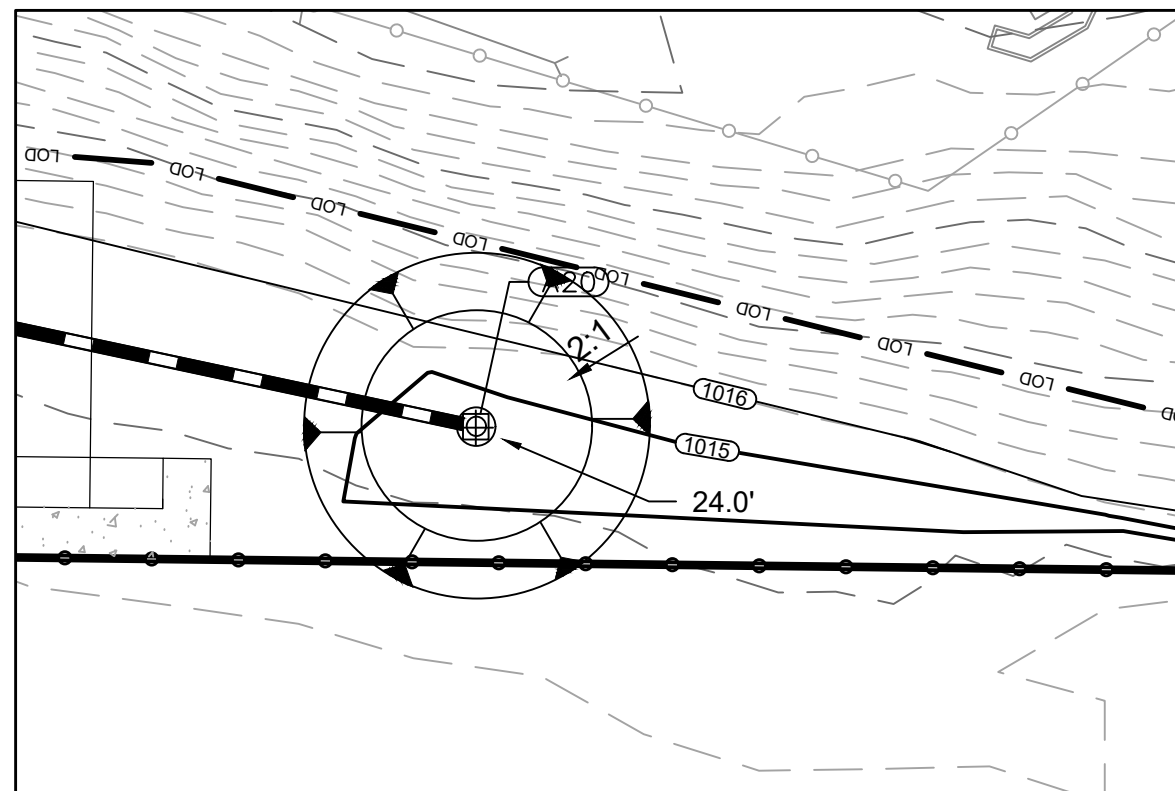
Fitzgerald Park Improvements - Phase 2
4877 Lawrenceville Hwy
Tucker, Georgia
ESPCP DETAILS

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Project Manager:	CAS
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Project No.: 200147
Drawing No.: EC3.0

CHARLES A. SHELTON, P.E. - LEVEL II CERTIFICATION #0000074473



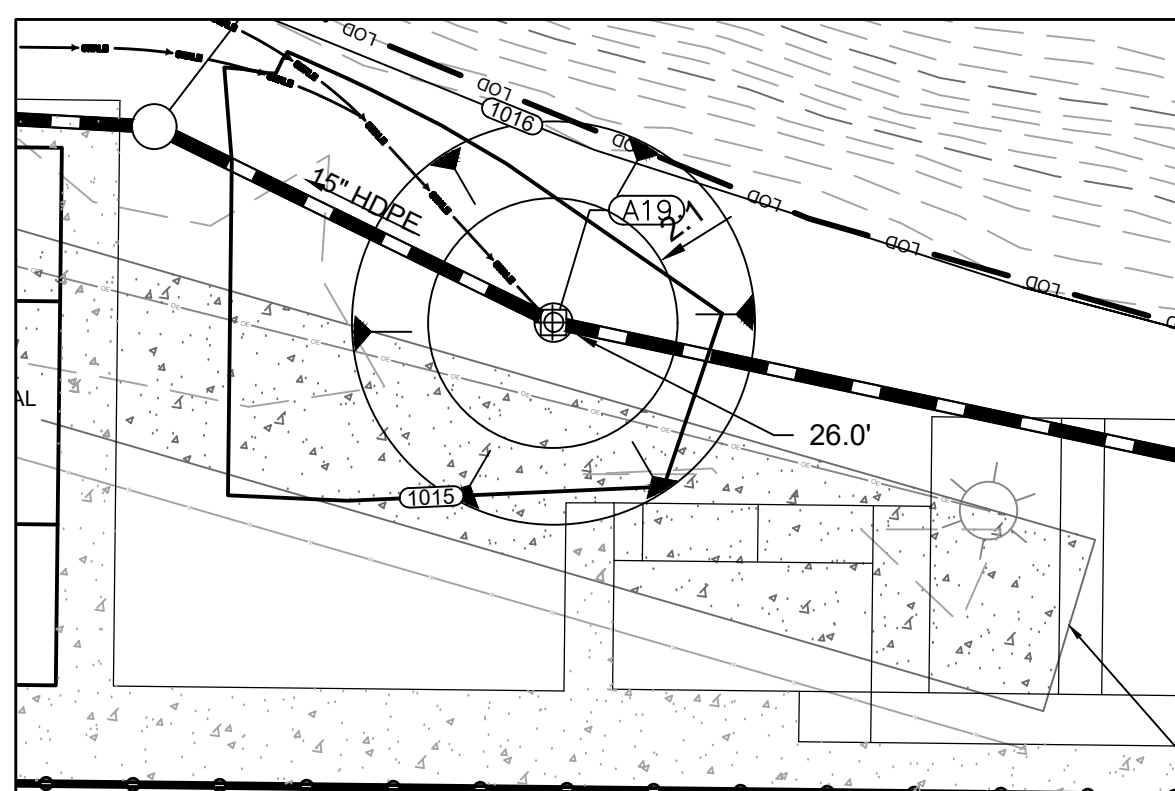
TO BE SHOWN ON THE EROSION AND SEDIMENT CONTROL PLAN

If the **EXCAVATED INLET SEDIMENT TRAP** is used, show the following information:

1. Drainage area = 0.68 ac
2. Required sediment storage = 67 cy/ac * drainage area
Required sediment storage = 67 cy/ac * 0.68 ac
Required sediment storage = 45.6 cy = 1,230 cf
3. Assume excavation depth (minimum of 1.5 ft.) = 3 ft
4. Assume slope of sides (shall not be steeper than 2:1) = 2 :1
5. Determine required surface area
 $SA_{min} = \text{Required sediment storage} / \text{excavation depth}$
 $SA_{min} = 45.6 \text{ cy} / 3 \text{ ft}$
 $SA_{min} = 410 \text{ sf}$
6. Assume shape of excavation and determine dimensions.
(A rectangular shape with 2:1 length to width ratio is recommended.)
Shape: CIRCLE
Dimensions: l = N/A ft w = N/A ft diameter (if applicable) = 24 ft

Provide a detail showing the depth, length and width, or diameter (if applicable), and side slopes of the excavation.

EXCAVATED INLET SEDIMENT TRAP #1



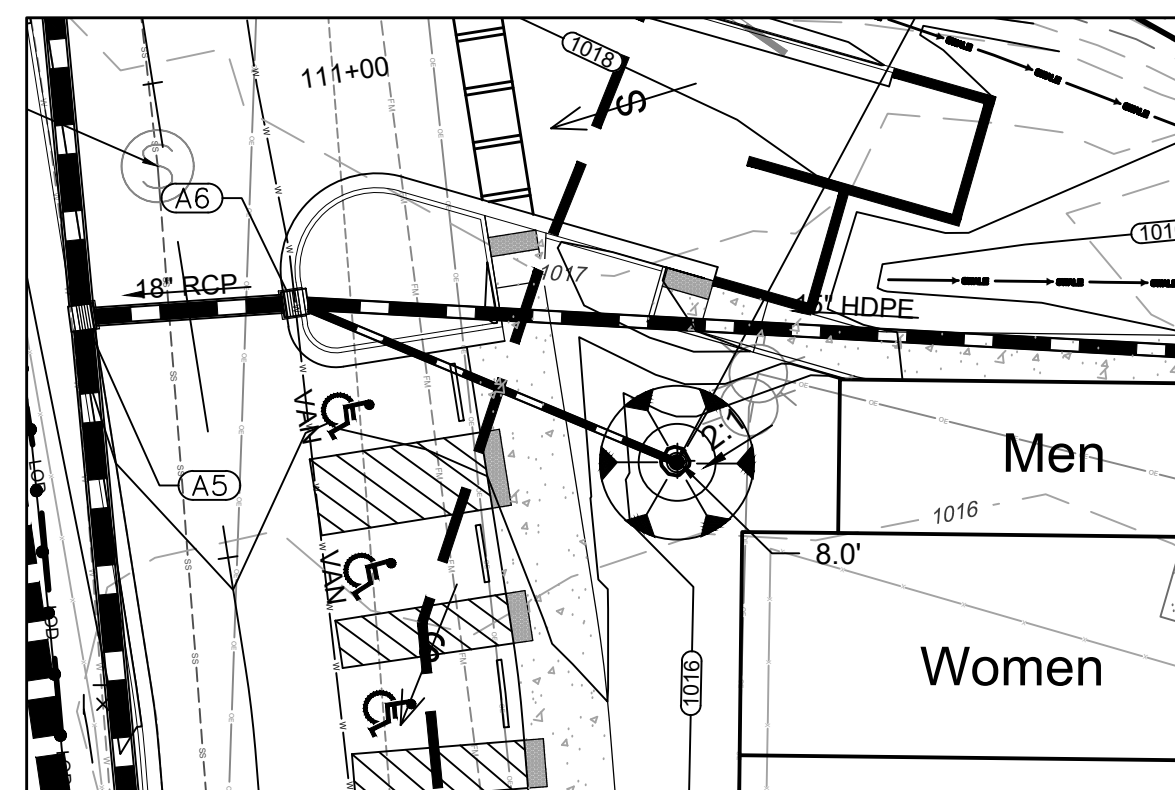
TO BE SHOWN ON THE EROSION AND SEDIMENT CONTROL PLAN

If the **EXCAVATED INLET SEDIMENT TRAP** is used, show the following information:

1. Drainage area = 1.18 ac
2. Required sediment storage = 67 cy/ac * drainage area
Required sediment storage = 67 cy/ac * 1.18 ac
Required sediment storage = 79 cy = 2,133 cf
3. Assume excavation depth (minimum of 1.5 ft.) = 4 ft
4. Assume slope of sides (shall not be steeper than 2:1) = 2 :1
5. Determine required surface area
 $SA_{min} = \text{Required sediment storage} / \text{excavation depth}$
 $SA_{min} = 79 \text{ cy} / 4 \text{ ft}$
 $SA_{min} = 533 \text{ sf}$
6. Assume shape of excavation and determine dimensions.
(A rectangular shape with 2:1 length to width ratio is recommended.)
Shape: CIRCLE
Dimensions: l = N/A ft w = N/A ft diameter (if applicable) = 26 ft

Provide a detail showing the depth, length and width, or diameter (if applicable), and side slopes of the excavation.

EXCAVATED INLET SEDIMENT TRAP #2



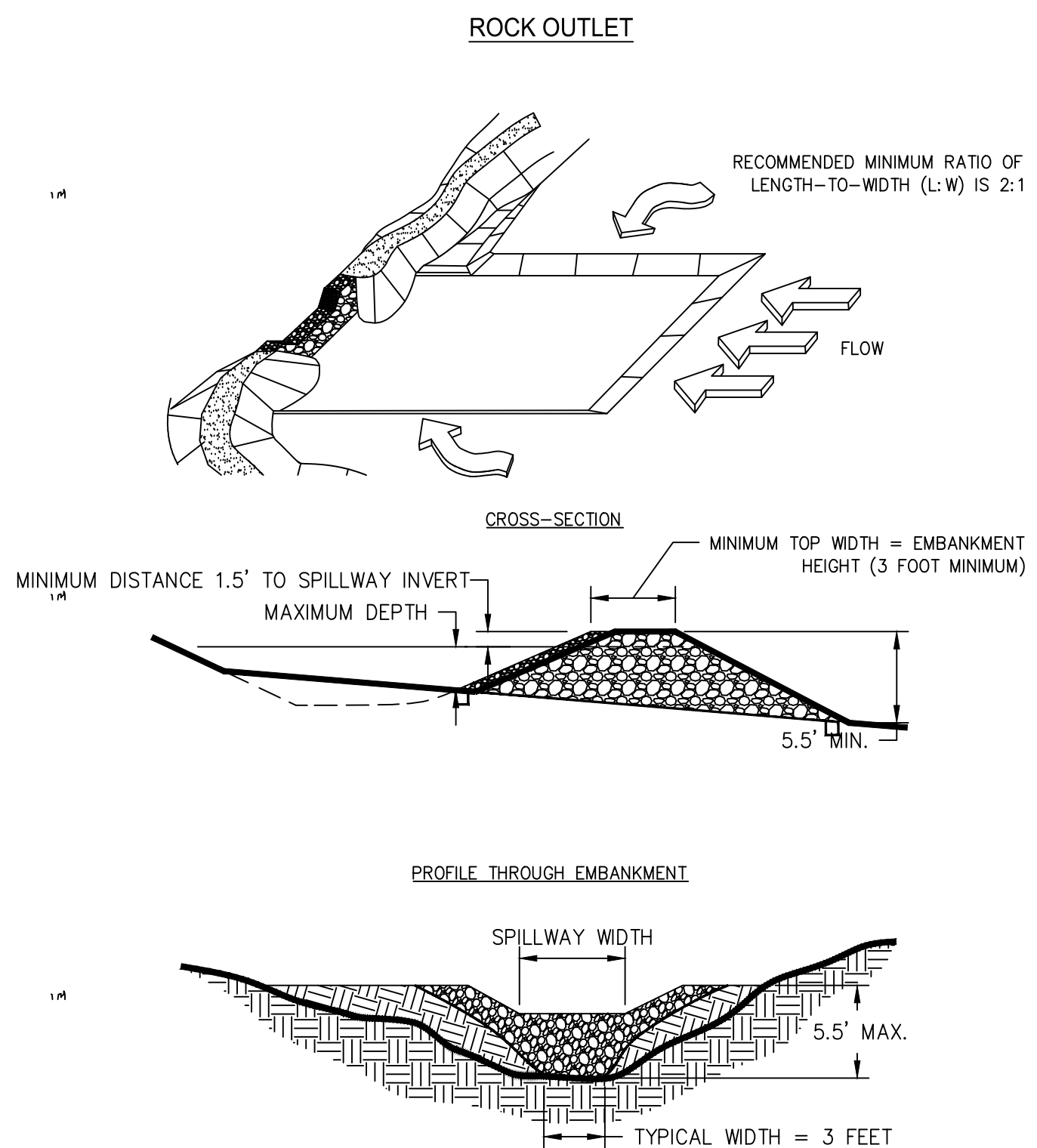
TO BE SHOWN ON THE EROSION AND SEDIMENT CONTROL PLAN

If the **EXCAVATED INLET SEDIMENT TRAP** is used, show the following information:

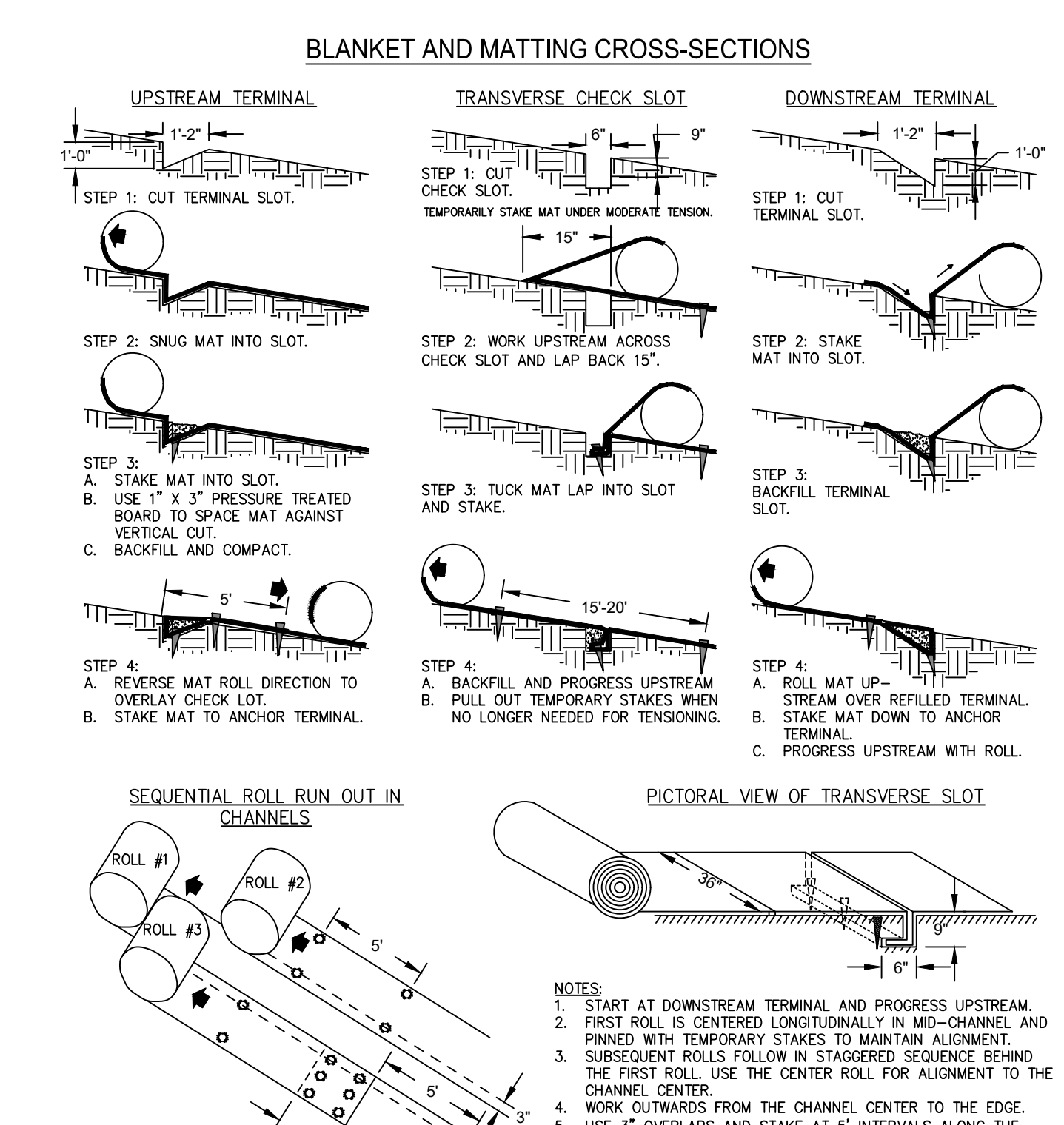
1. Drainage area = 0.07 ac
2. Required sediment storage = 67 cy/ac * drainage area
Required sediment storage = 67 cy/ac * 0.07 ac
Required sediment storage = 4.7 cy = 127 cf
3. Assume excavation depth (minimum of 1.5 ft.) = 2 ft
4. Assume slope of sides (shall not be steeper than 2:1) = 2 :1
5. Determine required surface area
 $SA_{min} = \text{Required sediment storage} / \text{excavation depth}$
 $SA_{min} = 4.7 \text{ cy} / 2 \text{ ft}$
 $SA_{min} = 63.5 \text{ sf}$
6. Assume shape of excavation and determine dimensions.
(A rectangular shape with 2:1 length to width ratio is recommended.)
Shape: CIRCLE
Dimensions: l = N/A ft w = N/A ft diameter (if applicable) = 8 ft

Provide a detail showing the depth, length and width, or diameter (if applicable), and side slopes of the excavation.

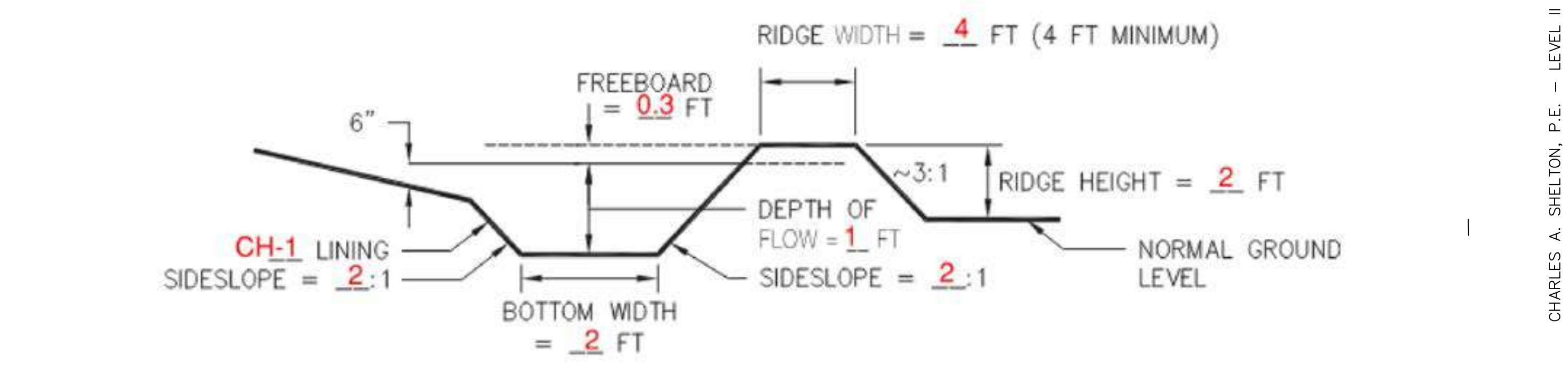
EXCAVATED INLET SEDIMENT TRAP #3



TEMPORARY SEDIMENT TRAP - SD4-C



SLOPE STABILIZATION - Ss



DIVERSION CHANNEL - Di

NO.	DATE	REVISION

Fitzgerald Park Improvements - Phase 2
4877 Lawrenceville Hwy
Tucker, Georgia
ESPCP DETAILS

THIS BAR IS 1 INCH LONG PLOTTED FULL SCALE

Project Manager:	CAS
Drawn By:	BAF
Checked By:	CAS
Date:	05/30/2023
Scale:	As Shown
Project No.:	200147
Drawing No.:	EC3.1


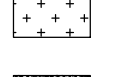





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GENERAL NOTES:

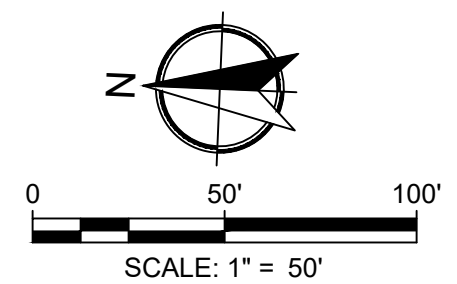
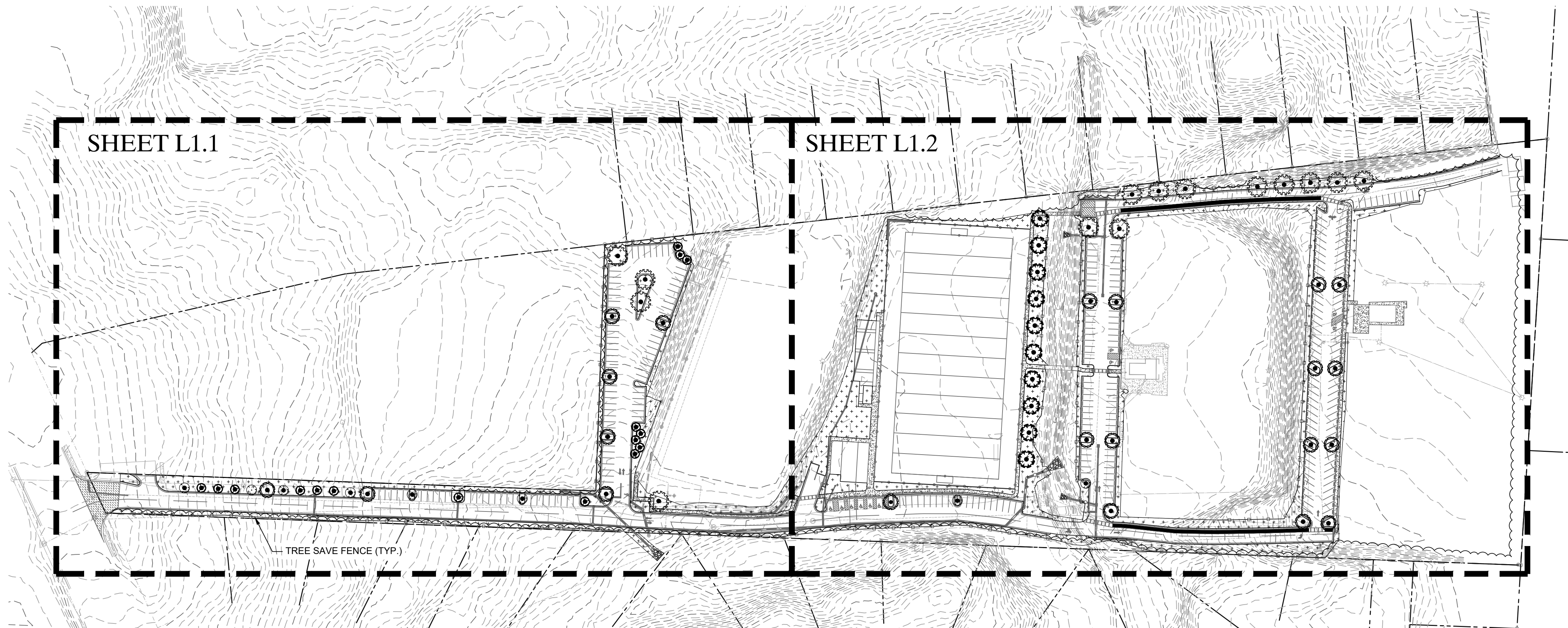
1. THE LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFICATION OF QUANTITIES IN THE PLANT LIST. ANY DISCREPANCIES BETWEEN QUANTITIES ON PLAN AND PLANT LIST SHALL BE BROUGHT TO THE ATTENTION OF THE LANDSCAPE ARCHITECT AND ANY FIELD ADJUSTMENTS OR QUANTITY ADJUSTMENTS MUST BE AUTHORIZED BY LANDSCAPE ARCHITECT PRIOR TO PLANTING.
2. ALL TREES, SHRUBS AND PLANTS SHALL CONFORM TO ACCEPTED STANDARDS ESTABLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN AND THE PROJECT SPECIFICATIONS.
3. ALL PLANT MATERIAL SHALL BE SOAKED WITH WATER AND MULCHED IMMEDIATELY FOLLOWING PLANTING.
4. THE TOP OF ALL ROOT BALLS SHALL BE 2" ABOVE FINISHED GRADE IN WELL DRAINED SOILS. IN POORLY DRAINED SOILS, ROOT BALLS SHALL BE 4" HEIGHT OF ROOT BALL ABOVE FINISHED GRADE.
5. ALL ROOT BALLS REMOVED FROM CANS SHALL BE SCARIFIED PRIOR TO BACKFILLING.
6. ALL PLANTS SHALL BE GUARANTEED TO BE IN HEALTHY CONDITION FOR ONE (1) YEAR AFTER ACCEPTANCE BY OWNER OF ALL PLANT MATERIAL. THE CONTRACTOR IS RESPONSIBLE FOR ALL MAINTENANCE/FERTILIZATION/WATERING DURING THE WARRANTY PERIOD.
7. MULCH A MIN. 4 FOOT AREA AROUND EACH TREE. MULCH A CONTINUOUS AREA AROUND ALL SHRUB BEDS, AS INDICATED ON THE PLAN, WITHIN 2 DAYS AFTER PLANTS ARE INSTALLED. MULCH SHALL BE 3-4" OF DOUBLE HAMMERED HARDWOOD.
8. LANDSCAPE CONTRACTOR SHALL REMOVE TOP 1/3 OF ALL WIRE BASKETS, TOP 1/3 OF BURLAP AND ASSOCIATED TWINE AND STRAPPING FROM TREE ROOT BALLS PRIOR TO FINAL ACCEPTANCE OF PLANTS.
9. TOPSOIL SHALL BE PROVIDED BY LANDSCAPE CONTRACTOR AND USED FOR BACKFILLING ALL PITS AND BED ESTABLISHMENT FOR PLANTS. PROVIDE TOPSOIL WHICH IS FERTILE, FRIABLE, NATURAL LOAM, SURFACE SOIL, REASONABLY FREE OF SUB-SOIL, CLAY LUMPS, BRUSH, WEEDS AND OTHER LITTER AND FREE OF ROOTS, STUMPS, STONES LARGER THAN 1" IN ANY DIMENSION, AND OTHER EXTRANEIOUS OF TOXIC MATTER HARMFUL TO PLANT GROWTH. TOPSOIL SHALL HAVE 2-5% ORGANIC MATTER(MINIMUM), A 60% MAXIMUM CLAY CONTENT, AND PH VALVE OF 6-6.5%.
10. SOIL AMENDMENT SHALL BE PROVIDED BY LANDSCAPE CONTRACTOR AND USED FOR BACKFILLING AND BED ESTABLISHMENT. SOIL AMENDMENT SHALL CONSIST OF THE BELOW PERCENTAGES AND HAVE A PH RANGE BETWEEN 5.5 AND 7%. SOIL AMENDMENT SHALL NOT BE USED IN FROZEN OR MUDDY CONDITIONS. CONTRACTOR TO SUBMIT VENDOR INFORMATION FOR ALL SOIL AMENDMENTS. ALL BEDS SHOULD BE TILLED PRIOR TO ADDING PLANTING SOIL. PLANTING SOIL SHALL CONSIST OF 2/3 TOPSOIL AND 1/3 SOIL AMENDMENT. SEE PLANTING BED ESTABLISHMENT DETAIL FOR MORE INFORMATION.
11. CONTRACTOR IS RESPONSIBLE FOR HAVING ALL UNDERGROUND UTILITIES LOCATED AND CLEARLY PAINTED WITHIN 10 DAYS OF ANY GROUND DISTURBING ACTIVITY. OWNER WILL NOT PAY FOR UTILITY REPAIRS DUE TO FAILURE TO MARK AND OBSERVE UTILITY LOCATIONS.
12. CONTRACTOR TO ENSURE POSITIVE DRAINAGE IN ALL PLANTING AREAS AND NO PONDING SHALL OCCUR. POORLY DRAINED SOILS SHALL BE BROUGHT TO THE ATTENTION OF THE LANDSCAPE ARCHITECT. ALL POORLY DRAINED SOILS SHALL BE CORRECTED BEFORE PLANTING OCCURS BY IMPORTING SUITABLE SOILS OR ADDING A DRAINAGE SYSTEM.
13. ALL PLANTING BEDS SHALL HAVE 50Z. MINIMUM WEED CONTROL FABRIC.
14. ALL EXISTING TURF/LAWN/WEEDS SHALL BE ERADICATED FROM PLANTING AREAS BEFORE TILLAGE.

PLANTING LEGEND

	QUERCUS NUTTALLI / NUTTALL OAK		BERMUDA GRASS
	TAXODIUM DISTICHUM / BALD CYPRESS		HARDWOOD MULCH
	ACER BUERGERANUM / TRIDENT MAPLE		
	LAGERSTROEMIA FAUREI 'SIOUX' / SIOUX CRAPE MYRTLE		
	CERCIS CANADENSIS 'FOREST PANSY' / FOREST PANSY REDBUD		

Fitzgerald Field, Phase 2 - Planting Schedule

Qty.	Symbol	Scientific Name	Common Name	Size	Notes
Trees					
15	QN	Quercus nuttalli	Nuttall Oak	3.5" Cal. 16' Min. Ht.	
10	TD	Taxodium distichum	Bald Cypress	3.5" Cal. 16' Min. Ht.	
21	AB	Acer buergerianum	Trident Maple	3.5" Cal. 16' Min. Ht.	
8	LS	Lagerstroemia faurei 'Sioux'	Sioux Crape Myrtle	3.5" Cal. 16' Min. Ht.	Single-stem
16	CC	Cercis canadensis 'Forest Pansy'	Forest Pansy Redbud	2.5" Cal. 12' Min. Ht.	
Total	70				
Mulch					
2,000	SF	Double Hammered Hardwood Mulch			Or approved equal
Total	2,000				
Lawn					
92,000	SF	TifTuf Bermuda Sod	Bermuda Grass 'TifTuf'		Or approved equal
Total	92,000				



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NO.	DATE	REVISION

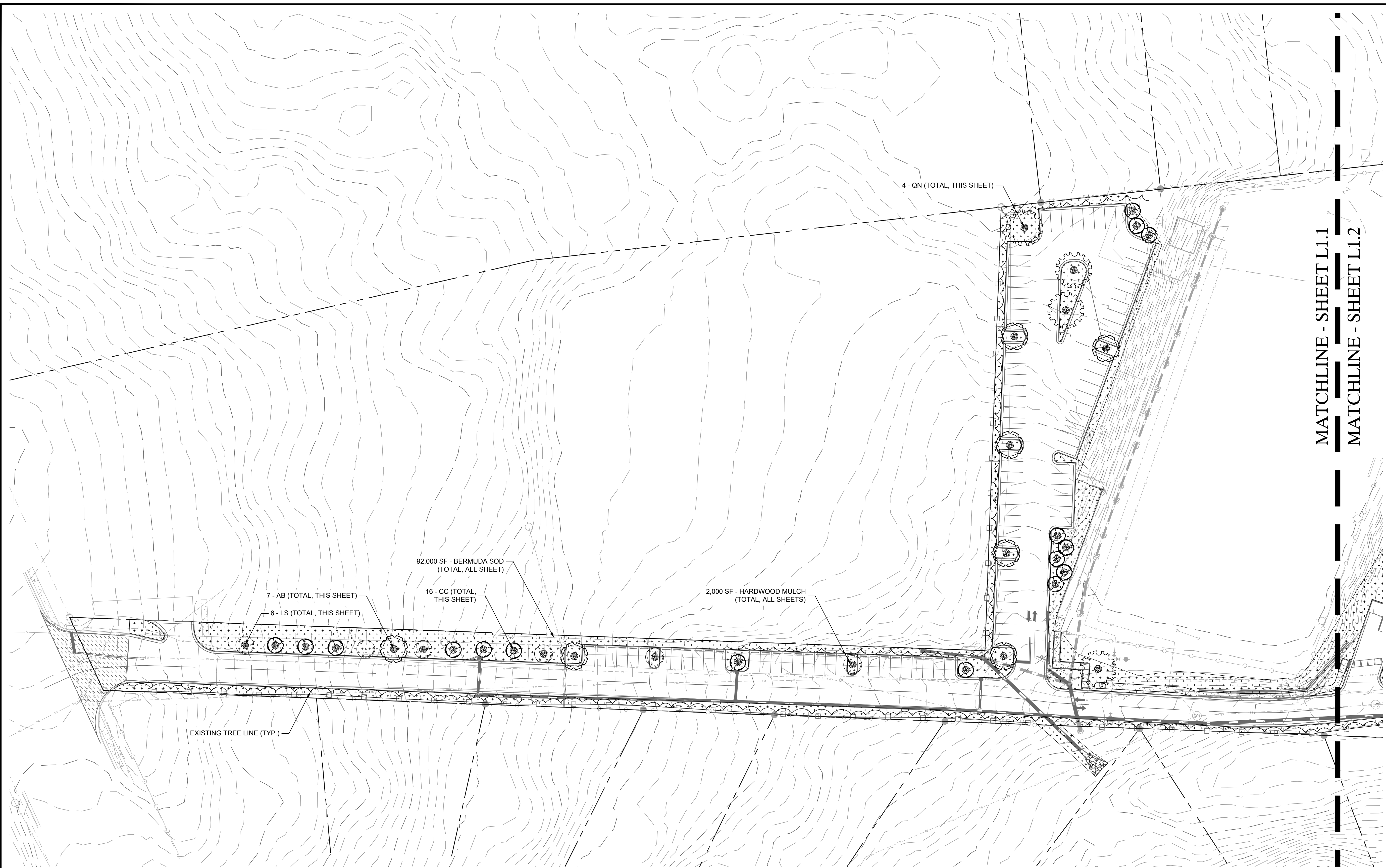
Fitzgerald Park Improvements - Phase 2
 4877 Lawrenceville Hwy
 Tucker, Georgia

OVERALL LANDSCAPE PLAN

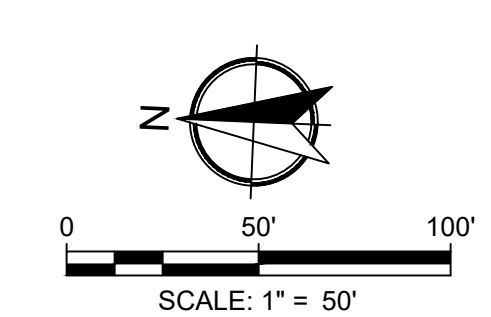
THIS BAR IS 1 INCH LONG PLOTTED FULL SCALE

Project Manager:	CAS
Drawn By:	TRB
Checked By:	CEB
Date:	05/30/2023
Scale:	As Shown

Project No.:	200147
Drawing No.:	L1.0



MATCHLINE - SHEET L1.1
 MATCHLINE - SHEET L1.2



SCALE: 1" = 50'
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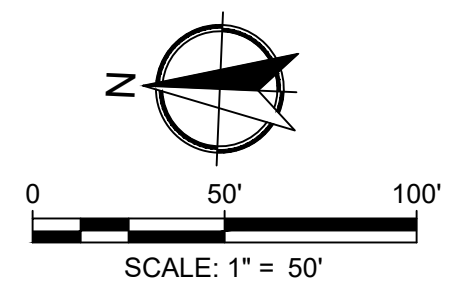
Fitzgerald Park Improvements - Phase 2
 4877 Lawrenceville Hwy
 Tucker, Georgia
LANDSCAPE PLAN

THIS BAR IS
 1 INCH LONG
 PLOTTED FULL SCALE

Project Manager:
 CAS
 Drawn By: TRB Checked By: CEB
 Date: 05/30/2023
 Scale: As Shown

Project No.:
200147
 Drawing No.:
L1.1

MATCHLINE - SHEET L1.1
 MATCHLINE - SHEET L1.2



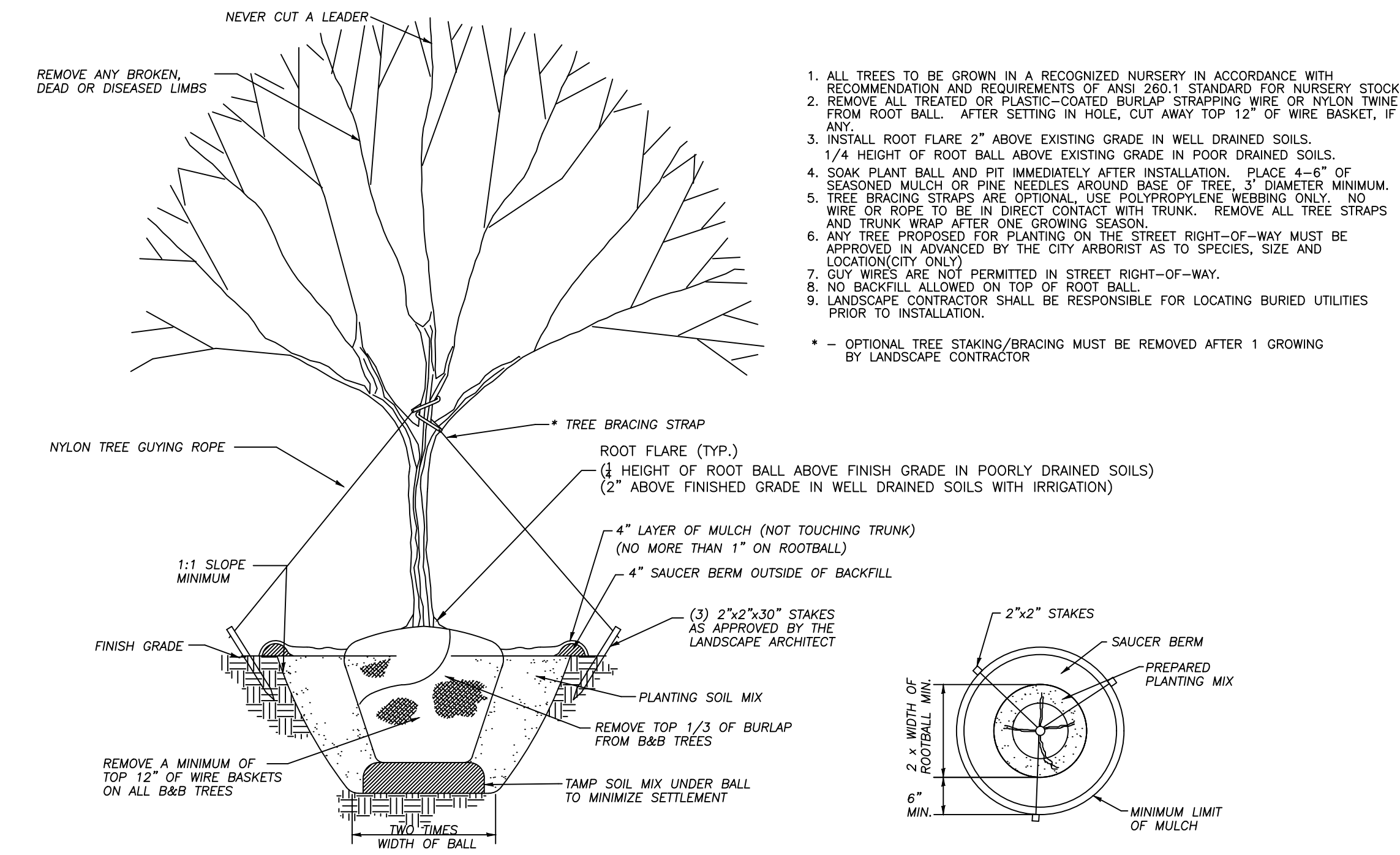
SCALE: 1" = 50'
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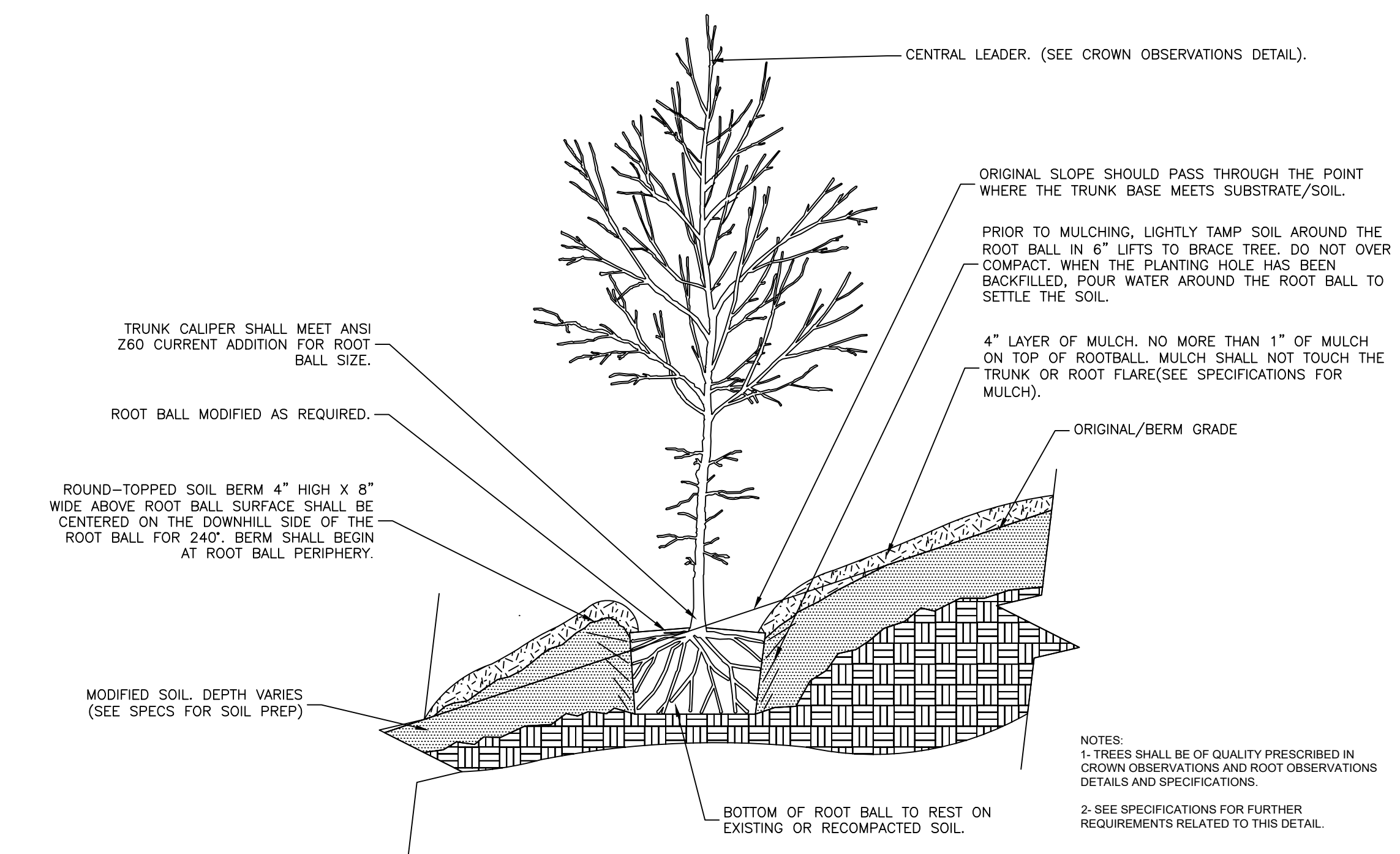
Fitzgerald Park Improvements - Phase 2
 4877 Lawrenceville Hwy
 Tucker, Georgia
LANDSCAPE PLAN

THIS BAR IS 1 INCH LONG PLOTTED FULL SCALE	
Project Manager:	CAS
Drawn By:	TRB
Checked By:	CEB
Date:	05/30/2023
Scale:	As Shown
Project No.:	200147
Drawing No.:	L1.2



STANDARD TREE DETAIL

1. ALL TREES TO BE GROWN IN A RECOGNIZED NURSERY IN ACCORDANCE WITH RECOMMENDATION AND REQUIREMENTS OF ANSI Z60.1 STANDARD FOR NURSERY STOCK.
 2. REMOVE ALL TREATED OR PLASTIC-COATED BURLAP STRAPPING WIRE OR NYLON TWINE FROM ROOT BALL. AFTER SETTING IN HOLE, CUT AWAY TOP 12" OF WIRE BASKET, IF ANY.
 3. INSTALL ROOT FLARE 2" ABOVE EXISTING GRADE IN WELL DRAINED SOILS. 1/4 HEIGHT OF ROOT BALL ABOVE FINISHED GRADE IN POOR DRAINED SOILS.
 4. SOAK PLANT BALL AND PIT IMMEDIATELY AFTER INSTALLATION. PLACE 4-6" OF SEASONED MULCH OR PINE NEEDLES AROUND BASE OF TREE, 3" DIAMETER MINIMUM.
 5. TREE BRACING STRAPS ARE OPTIONAL. USE POLYPROPYLENE WEBBING ONLY. NO WIRE OR ROPE TO BE IN DIRECT CONTACT WITH TRUNK. REMOVE ALL TREE STRAPS AND TRUNK WRAP AFTER ONE GROWING SEASON.
 6. ANY TREE PROPOSED FOR PLANTING ON THE STREET RIGHT-OF-WAY MUST BE APPROVED IN ADVANCED BY THE CITY ARBORIST AS TO SPECIES, SIZE AND LOCATION(CITY ONLY).
 7. GUY WIRES ARE NOT PERMITTED IN STREET RIGHT-OF-WAY.
 8. NO BACKFILL ALLOWED ON TOP OF ROOT BALL.
 9. LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING BURIED UTILITIES PRIOR TO INSTALLATION.
- * - OPTIONAL TREE STAKING/BRACING MUST BE REMOVED AFTER 1 GROWING BY LANDSCAPE CONTRACTOR



TREE ON SLOPE (20:1) TO (2:1)

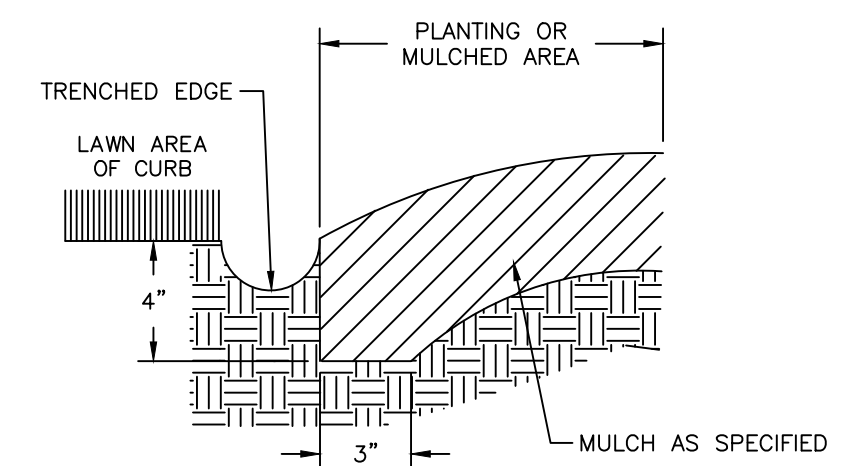
1 TREE PLANTING DETAILS

N.T.S.

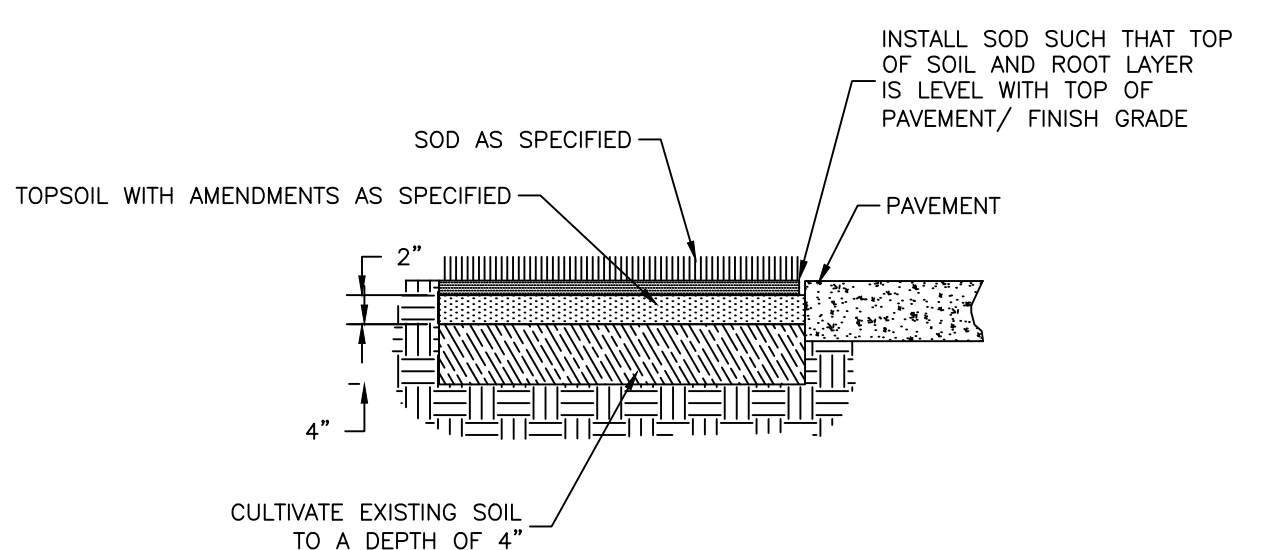
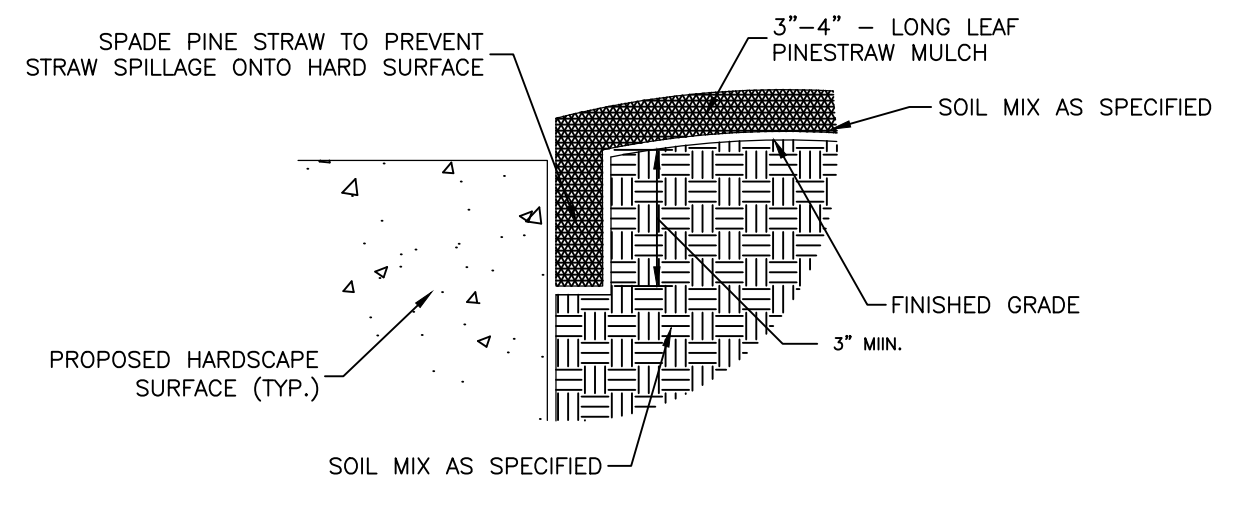
SEED SCHEDULE	
APPLICABLE FOR ALL NATURAL GRASS SEEDING SPECIFICATIONS	
SEEDING	
PER 1000 SF	
OCTOBER 15 - MARCH 15	MAY 1 - JULY 1
4 LBS - KENTUCKY FESCUE #31	2 LBS - BERMUDA GRASS
4 LBS - RYE GRASS	1 LBS - KENTUCKY FESCUE #31
1 LBS - BERMUDA GRASS	1 LBS - BROWN TOP MILLET
	2 LBS - CENTIPEDE GRASS
*ALL SLOPES GREATER THAN 3:1 REQUIRE MATTING	

2

SEED SCHEDULE



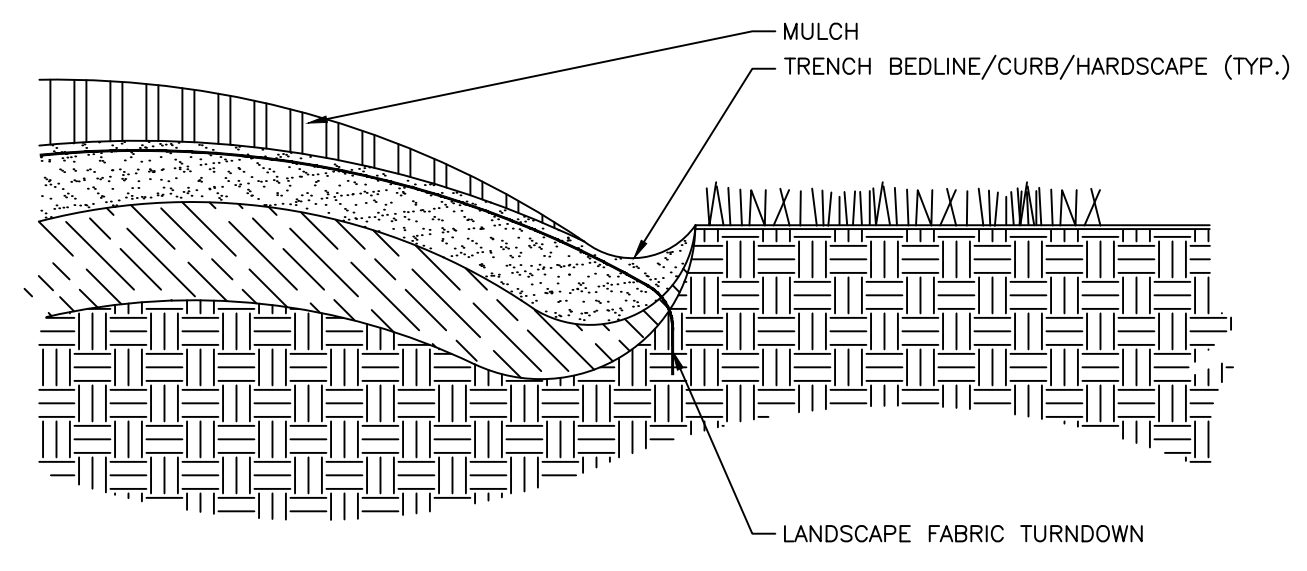
NOTE: TRENCH EDGE SHALL CREATE CLEAN SEPARATION BETWEEN AREAS AND SHALL FOLLOW SMOOTH BEDLINES PRE LANDSCAPE PLAN



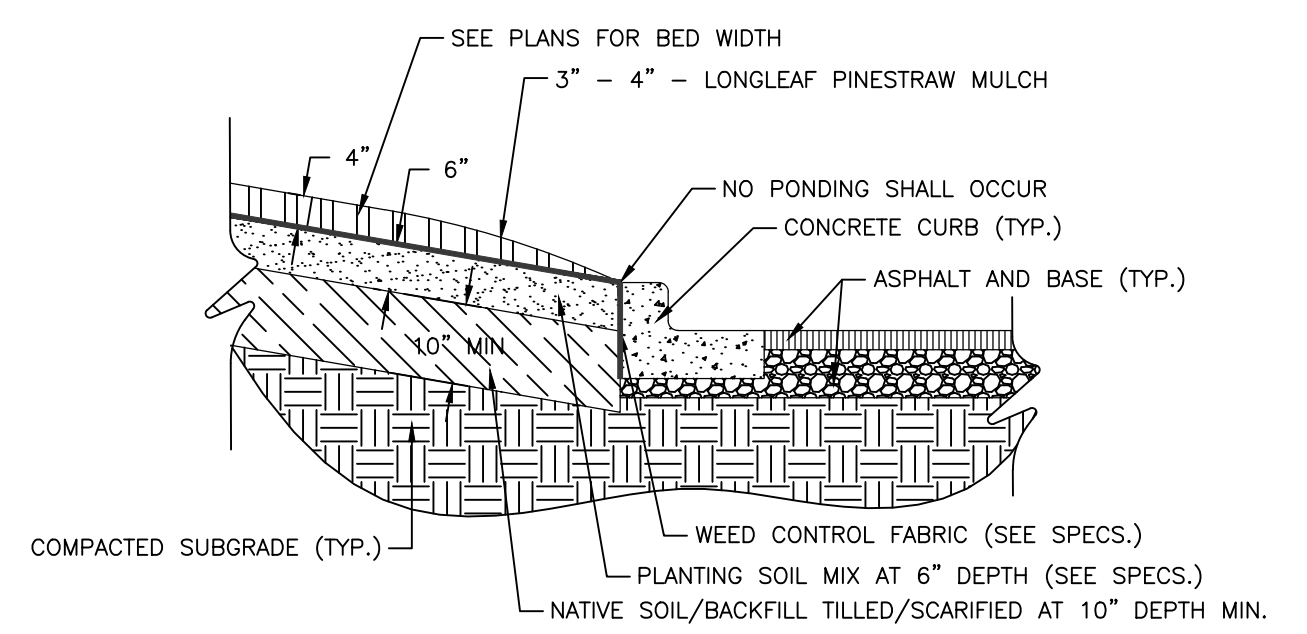
3

SOD AND MULCH DETAILS

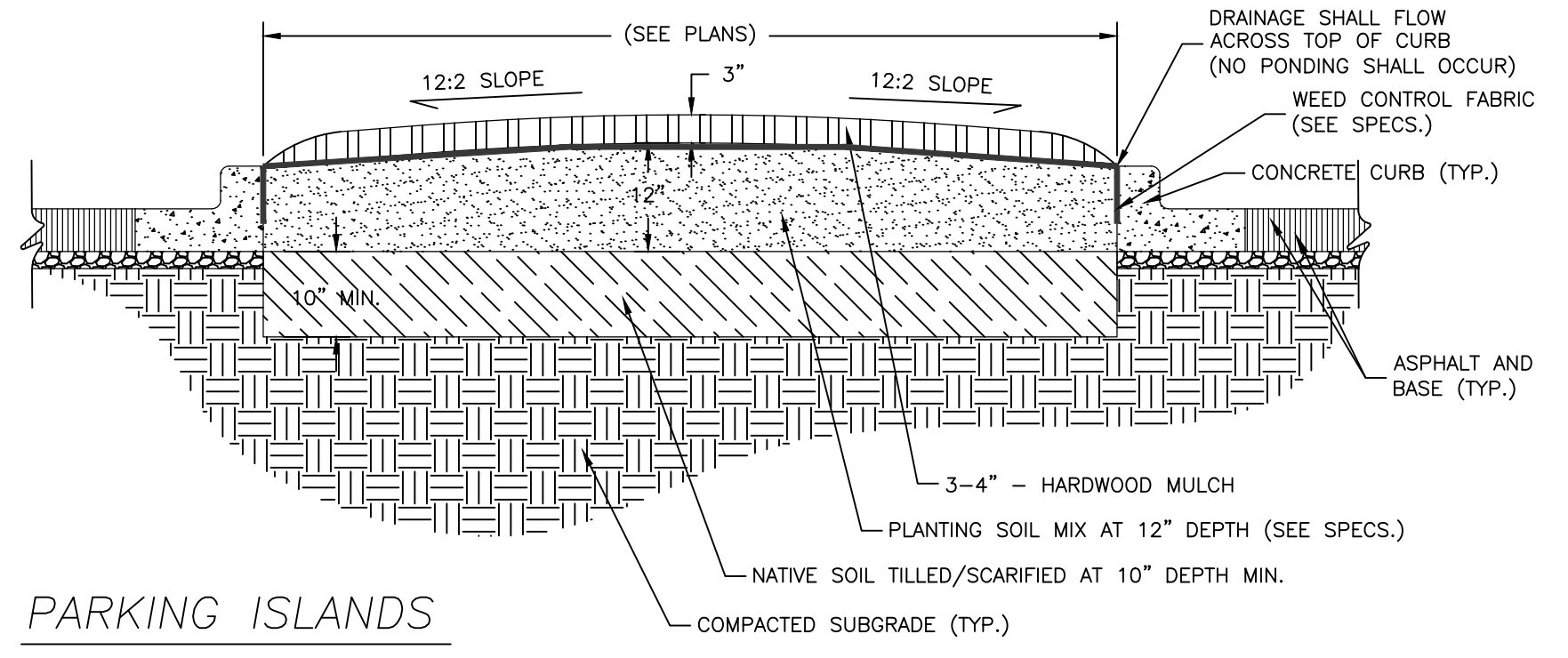
N.T.S.



PLANTING ISLANDS



PLANTING BEDS



PARKING ISLANDS

- NOTES:
1. REFER TO SPECIFICATIONS FOR MORE DETAIL.
 2. CONTRACTOR TO REMOVE ALL CONSTRUCTION DEBRIS, ROCKS, OR ANY FOREIGN OBJECTS FROM THE NATIVE SOIL.
 3. ALL PLANTING BEDS SHALL HAVE POSITIVE DRAINAGE AND NO PONDING SHALL OCCUR.
 4. ALL PLANTING BEDS SHALL HAVE WEED CONTROL FABRIC (5 OZ. MIN.)
 5. ALL GRASSES/WEEDS SHALL BE ERADICATED BEFORE PLANTING.
 6. IRRIGATION LINE SHALL BE COVERED WITH MULCH AND NOT VISIBLE.
 7. PLANTING SOIL SHALL BE COMPOSED OF 2/3 TOPSOIL AND 1/3 SOIL AMENDMENT. SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION.

4

PLANT BED ESTABLISHMENT DETAILS

N.T.S.

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NO.	DATE	REVISION

Fitzgerald Park Improvements - Phase 2
4877 Lawrenceville Hwy
Tucker, Georgia

LANDSCAPE DETAILS

THIS BAR IS 1 INCH LONG PLOTTED FULL SCALE

Project Manager: CAS
Drawn By: TRB Checked By: CEB
Date: 05/30/2023
Scale: As Shown

Project No.: 200147
Drawing No.: L2.0

STORMWATER MANAGEMENT REPORT

FITZGERALD FIELD IMPROVEMENTS – PHASE II
DEKALB COUNTY
TUCKER, GA

Location:
4877 Lawrenceville Hwy.
Tucker, Georgia 30084

Prepared by:



3090 Premiere Parkway, Suite 200
Duluth, GA 30097

K+W PROJECT NO. 200147
May 17, 2023
Revised: xx/xx/xxxx



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STORMWATER MANAGEMENT REPORT

PURPOSE

The purpose of this report is to evaluate the drainage impacts associated with the proposed Fitzgerald Field Improvements – Phase II located at 4877 Lawrenceville Hwy in Tucker, GA. This report gives a range of drainage related information pertaining to this project, such as methodology, pre- and post-development flow calculations, and stormwater routing calculations. The Georgia Stormwater Management Manual (GSMM) has been used as the basis for the design of the proposed stormwater facilities. This drainage evaluation includes analysis of runoff reduction/water quality, stream channel protection, overbank flood protection and extreme flood protection. This report also includes an analysis of the storm sewer piping. A quad map, drainage basin maps, and other drawings and exhibits have been provided for reference in the attached appendices.

SITE BOUNDARY AND NATURAL RESOURCES

The site to be developed is one parcel which is 18.01 acres. The property is bounded on the north by Lawrenceville Highway, northeast by Glory House World Church, industrial facilities to the south, and residential parcels on the remaining directions. All of the property is owned by the City of Tucker.

TOPOGRAPHY

The site exhibits approximately 76 feet of relief from the high point of 1077 on the north side to a low area along Camp Creek Tributary A located in the center of the site which has an elevation of 1001. The site generally slopes from the north and south ends of the site to Camp Creek Tributary A located in the center of the site. The Pre-Developed Drainage Map shown in Appendix A shows these drainage basins.

According to the FEMA Flood Insurance Rate Map (FIRM) panel numbers 13089C0077L dated 8/15/2019, this property lies in Zone X, and is in a 100-year flood plain. This determination was made by graphically positioning the site on said FIRM maps.

METHODOLOGY AND ASSUMPTIONS

- The SCS (Soil Conservation Service), currently National Resources Conservation Service (NRCS), TR-55 method and Tabular Hydrograph method based on TR-20 has been utilized for the computation of pre development and post development runoff quantities.
- SCS Type II rainfall distribution has been utilized for generating peak flows and hydrographs for the various drainage areas.
- A shape factor of 484 has been utilized in the calculations.
- The charts, graphs, coefficients and other hydraulic parameters in this study have been taken from the Georgia Stormwater Management Manual.
- Onsite storm drainage structures have been sized for post development overall onsite flow rates using the Rational Method with a 25-year storm event.
- Hydraflow Hydrographs and Storm Sewers was utilized, computer program extensions developed by AutoDesk (AutoCAD Civil 3D 2022) for computation of pre and post development flow rates.
- The Time of Concentration (Tc) is determined by evaluating the time taken to convey stormwater from the most distant location in a particular drainage sub-basin to that sub-basins outfall. The TR-55 method was used to compute the Tc's for each sub-basin. The TR-55 method accounts for sheet flow, shallow concentrated flow, and channelized flow when Tc calculations are performed. The minimum Tc utilized is 5 minutes.

PRE-DEVELOPMENT SITE CONDITIONS

The Study Area contains two study points, which include upstream offsite area from adjacent property and from the Lawrenceville Hwy right of way. The pre-development Study Area is shown on the Pre-Developed Drainage Map in Appendix A. As shown on this map, the study area consists of two study points: the first (Study Point 1) at the existing downstream 36" CMP storm sewer, and the second (Study Point 2) evaluates offsite stormwater from residential neighborhoods to the west of the project site at the culvert where Camp Creek Tributary A enters the site. At Study Point 2, the Camp Creek Tributary A crosses an existing road in

the park. The existing roadway conditions result in the road being a spillway for the creek crossing. The creek crossing overtops the roadway between the 2- and 5-year storm events at an elevation of 1013.07.

Flow rates were calculated at the study points to establish pre-development conditions based on the surface cover of the sub-basins as shown on the Pre-developed Drainage Map. The existing conditions of the site area are woods or forest, grass, paving, residential, and gravel.

Below is a summary of the basin characteristics and calculated flow rates. Curve numbers were selected based on hydrologic soil group (HSG) B per NRCS Soil Survey found in Appendix B. The SCS's Tabular Hydrograph method is used by HydraFlow Hydrographs to compute peak discharges and hydrographs for rural and urban areas based on the computed Time of Concentration (Tc). Input data needed to develop peak discharges and hydrographs include the following parameters:

- 24-hour rainfall in inches for 1, 2, 5, 10, 25, 50, and 100-year storm events;
- Rainfall values were selected based on requirements from the City of Tucker stormwater checklist rather than NOAA Atlas 14;
- Time of Concentration (Tc) based on the flow paths as shown on the drainage basin maps;
- Runoff curve number (CN);
- Drainage area in acres.

The 24-hour rainfall depths used for predevelopment and post development flow computations are as follows:

1 Year = 3.27"	5 Year = 4.40"	25 Year = 5.90"	
2 Year = 3.69"	10 Year = 5.01"	50 Year = 6.62"	100 Year = 7.36"

The weighted curve numbers were calculated based on the following surface cover conditions based on HSG Group B:

Wood or forest land, good cover:	CN = 55
Residential, 1 acre:	CN = 68
Landscaped Areas:	CN = 61
Gravel Area:	CN = 85
Impervious areas:	CN = 98

PRE-DEVELOPED STUDY POINT ANALYSIS

Pre-Developed Basins 1, 2, 3 and Offsite 2 drainage to Study Point 1 by sheet flow into Camp Creek Tributary 1.

Pre-developed basins offsite 1A, 1B, 1C, 1D, and 1E drain to Study Point 2 which is all runoff from offsite residential properties and Glory House World Church. Offsite basin 1 was divided into five separate sections to simulate the routing of offsite stormwater through four separate culverts which occur at street crossings. Offsite Basin 1E connects to Offsite Basin 1D by an existing storm sewer pipe.

PRE-DEVELOPED ONSITE BASIN 1 – SP1

- Drainage Area = 5.36 acres
- Weighted Curve Number (Cn) = 71
- Time of Concentration (Tc) = 16 Minutes

PRE-DEVELOPED ONSITE BASIN 2 – SP1

- Drainage Area = 5.55 acres
- Weighted Curve Number (Cn) = 64
- Time of Concentration (Tc) = 17 Minutes

PRE-DEVELOPED ONSITE BASIN 3 – SP1

- Drainage Area = 3.12 acres
- Weighted Curve Number (Cn) = 79
- Time of Concentration (Tc) = 18 Minutes

PRE-DEVELOPED OFFSITE BASIN 1A – SP2

- A. Drainage Area = 8.59 acres
- B. Weighted Curve Number (Cn) = 68 (assumes 1 acre residential)
- C. Time of Concentration (Tc) = 14 Minutes

PRE-DEVELOPED OFFSITE BASIN 1B – SP2

- A. Drainage Area = 25.01 acres
- B. Weighted Curve Number (Cn) = 68 (assumes 1 acre residential)
- C. Time of Concentration (Tc) = 21 Minutes

PRE-DEVELOPED OFFSITE BASIN 1C – SP2

- A. Drainage Area = 9.64 acres
- B. Weighted Curve Number (Cn) = 68 (assumes 1 acre residential)
- C. Time of Concentration (Tc) = 21 Minutes

PRE-DEVELOPED OFFSITE BASIN 1D – SP2

- A. Drainage Area = 32.63 acres
- B. Weighted Curve Number (Cn) = 68 (assumes 1 acre residential)
- C. Time of Concentration (Tc) = 18 Minutes

PRE-DEVELOPED OFFSITE BASIN 1E – SP2

- A. Drainage Area = 6.65 acres
- B. Weighted Curve Number (Cn) = 73
- C. Time of Concentration (Tc) = 17 Minutes

PRE-DEVELOPED OFFSITE BASIN 2 – SP1

- A. Drainage Area = 1.67 acres
- B. Weighted Curve Number (Cn) = 63
- C. Time of Concentration (Tc) = 18 Minutes

POST-DEVELOPMENT SITE CONDITIONS

The post-developed site conditions were analyzed using the same study points as the pre-developed site conditions. The property will be developed to provide additional parking, curb and gutter, turf field, restroom concession building, bleachers, storm sewer, and sidewalk to the existing park. The road crossing Camp Creek Tributary A will match the same elevations as the pre-development conditions to maintain the spillway performance and to avoid flooding in the upstream neighborhoods. The proposed stormwater facilities area is designed to provide for runoff reduction/water quality, channel protection, overbank flood protection, and extreme flood detention for the entirety of the proposed development.

The site is being graded such that the vast majority of the proposed development will enter into the stormwater facilities via a combination of overland flow and underground piping. The area shown as post-developed is separated into two areas divided by the Camp Creek Tributary A. One side of the creek consists of On-site 1A, On-site 1B – Bypass, On-Site 1C – Bypass and Offsite 2. On-Site 1B sheet flows to SP1 and On-Site 1C – Bypass sheet flows offsite to SP2. The other side of the creek is made up of On-Site Basins 2A, 2B – Turf, 2C - Bypass, 2D – Bypass, 3A, 3B – Bypass, 3C, and 3D – Bypass. On-site 2C – Bypass sheet flows to SP1. On-site 3B - Bypass sheet flows to Offsite 1E which drains to SP2. Onsite 2D – Bypass and Onsite 3D – Bypass sheet flow offsite to SP2.

POST-DEVELOPED ONSITE BASIN 1A TO SP1

- A. Drainage Area = 4.87 acres
- B. Weighted Curve Number (Cn) = 73
- C. Time of Concentration (Tc) = 18 Minutes

POST-DEVELOPED ONSITE BASIN 1B – BYPASS TO SP1

- A. Drainage Area = 0.32 acres
- B. Weighted Curve Number (Cn) = 62
- C. Time of Concentration (Tc) = 5 Minutes

POST-DEVELOPED ONSITE BASIN 1C – BYPASS TO SP2

- D. Drainage Area = 0.1 acres
- E. Weighted Curve Number (Cn) = 55
- F. Time of Concentration (Tc) = 5 Minutes

POST-DEVELOPED ONSITE BASIN 2A TO SP1

- A. Drainage Area = 2.61 acres
- B. Weighted Curve Number (Cn) = 71
- C. Time of Concentration (Tc) = 16 Minutes

POST-DEVELOPED ONSITE BASIN 2B – TURF FIELD TO SP1

- A. Drainage Area = 1.93 acres
- B. Weighted Curve Number (Cn) = 75
- C. Time of Concentration (Tc) = 6 Minutes

POST-DEVELOPED ONSITE BASIN 2C - BYPASS TO SP1

- A. Drainage Area = 1.01 acres
- B. Weighted Curve Number (Cn) = 62
- C. Time of Concentration (Tc) = 12 Minutes

POST-DEVELOPED ONSITE BASIN 2D – BYPASS – SP2

- A. Drainage Area = 0.04 acres
- B. Weighted Curve Number (Cn) = 55
- C. Time of Concentration (Tc) = 5 Minutes

POST-DEVELOPED ONSITE BASIN 3A TO SP1

- A. Drainage Area = 1.71 acres
- B. Weighted Curve Number (Cn) = 91
- C. Time of Concentration (Tc) = 7 Minutes

POST-DEVELOPED ONSITE BASIN 3B - BYPASS TO SP2

- A. Drainage Area = 0.06 acres
- B. Weighted Curve Number (Cn) = 55
- C. Time of Concentration (Tc) = 5 Minutes

POST-DEVELOPED ONSITE BASIN 3C TO SP1

- A. Drainage Area = 1.29 acres
- B. Weighted Curve Number (Cn) = 66
- C. Time of Concentration (Tc) = 19 Minutes

POST-DEVELOPED ONSITE BASIN 3D - BYPASS TO SP2

- A. Drainage Area = 0.06 acres
- B. Weighted Curve Number (Cn) = 57
- C. Time of Concentration (Tc) = 5 Minutes

The offsite basins from the pre-developed section above do not change to the post-developed condition and drain to the same study points as in the pre-developed condition.

PRE DEVELOPMENT VS. POST DEVELOPMENT FLOW RATES

A comparison between the pre- and post-development discharge rates at Study Points 1 and 2 are presented in the tables below.

STUDY POINT 1

Storm Event (Year)	Pre Development Discharge at Study Point 1 (cfs)	Post Development Discharge at Study Point 1 (cfs)
1	41.27	39.92
2	49.97	48.40
5	102.16	100.64
10	148.00	144.99
25	207.31	201.58
50	254.75	247.07
100	302.10	292.76

STUDY POINT 2

Storm Event (Year)	Pre Development Discharge at Study Point 2 (cfs)	Pre Development Max Elevation at Study Point 2 (ft)	Post Development Discharge at Study Point 2 (cfs)	Post Development Max Elevation at Study Point 2 (ft)
1	33.04	1012.40	33.05	1012.41
2	42.60	1013.17	42.67	1013.17
5	88.55	1013.65	88.67	1013.65
10	126.37	1013.93	126.55	1013.93
25	173.30	1014.21	173.53	1014.22
50	210.24	1014.42	210.49	1014.42
100	247.19	1014.61	247.48	1014.61

The flow rates from pre-development to post-development conditions slightly increased. The slight increase was caused by the addition of area draining to Study Point 2. All onsite area added to Study Point 2 from pre- to post-development conditions were caused by tie in slopes from basins On-Site 1C – Bypass, On-Site 2D - Bypass, On-Site 3B - Bypass, and On-Site 3D - Bypass. Due to the increased flow rates, the maximum elevation

for the 1 and 25-year storms increased by 0.01 feet, while the 2, 5, 10, 50, and 100-year storm events result in the same maximum elevation. The minuscule increase in max elevation does not increase the threat of flooding upstream of SP2.

WATER QUALITY/RUNOFF REDUCTION VOLUME

Three proprietary devices are being used in conjunction with three vegetative filter strips (A & B soils) to meet water quality requirements. The proprietary devices are installed on the downstream ends of each storm system before outfalling into Camp Creek Tributary A as shown on the storm sewer plan and in the storm sewer profiles. Storm System A and the Turf Field are combined at structure A1 and then travel through proprietary system 1. Storm System B is treated by Proprietary System 2 and Storm System C is treated by Proprietary System 3.

There are fringe areas that cannot be directed to the proprietary devices and will bypass due to topography and access requirements. These bypass areas drain via overland flow and have been included in the analysis supporting the 80% TSS removal requirements.

Calculations specific to water quality are provided in Appendix C along with a Water Quality Review Tool spreadsheet supporting 80% TSS removal for the development.

CHANNEL PROTECTION

Channel protection for sites must be provided in accordance with section 2.2.4.2 of the Georgia Stormwater Management Manual. Channel protection is not required for this site due to the decrease in flows for the 1, 2, 5, 10, 25, 50, and 100-year storm events at SP1.

OVERBANK FLOOD PROTECTION ANALYSIS

As shown in the summary tables on the following pages, there is a decrease in peak flow rate at Study Point 1 and a minor increase in flow at Study Point 2. However, the maximum elevation of Study Point 2 for the Pre- and Post-Development conditions are equal for the 2, 5, 10, 50, 100-year storm events. As a result of this decrease in peak flow rate at SP1, downstream adverse impacts are not expected from this project and overbank flood protection has been achieved.

EXTREME FLOOD PROTECTION ANALYSIS

As shown in the summary tables on the following pages, there is a decrease in peak flow rates at Study Point 1 and a miniscule increase in peak flow rates at Study Point 2 for the 100-yr, 24-hr storm event. The maximum elevation for Study Point 2 does not increase for the 100-yr, 24-hr storm event. The requirement from the GSMM section 2.2.4.4 indicates that extreme flood protection is achieved by controlling the peak flow rate such that the existing 100-yr floodplain is maintained. As a result of this decrease in 100-yr, 24-hr storm peak flow rate, adverse impacts are not expected from this project and extreme flood protection requirements have been met.

DOWNSTREAM ANALYSIS

According to the GSMM, section 3.1.9, the ten-percent rule recognizes the fact that a structural control providing detention has a “zone of influence” downstream where its effectiveness can be felt. Beyond this zone of influence the structural control becomes relatively small and insignificant compared to the runoff from the total drainage area at that point. Based on studies and master planning results for a large number of sites, that zone of influence is considered to be the point where the drainage area controlled by the detention or storage facility comprises 10% of the total drainage area.

A downstream analysis was not performed because detention is not required at this site. Detention is not required because there is a decreased in peak flow rates for all storm events at the downstream study point. Due to the decrease in peak flow rates at the downstream study point, existing pipes and culverts will not be negatively affected.

ONSITE DRAINAGE SYSTEM

The onsite drainage system has been designed for the proposed development to convey all runoff to Camp Creek Tributary A via a combination of surface flow and through a system of inlets and storm sewer pipes.

The storm pipe system was designed using the 25-year storm event. HydraFlow Storm Sewers was used for the calculation, utilizing the Rational Method. See Appendix F for the pipe calculation output.

As the peak flow rate from the development has been reduced, the downstream pipe system should not be adversely affected.

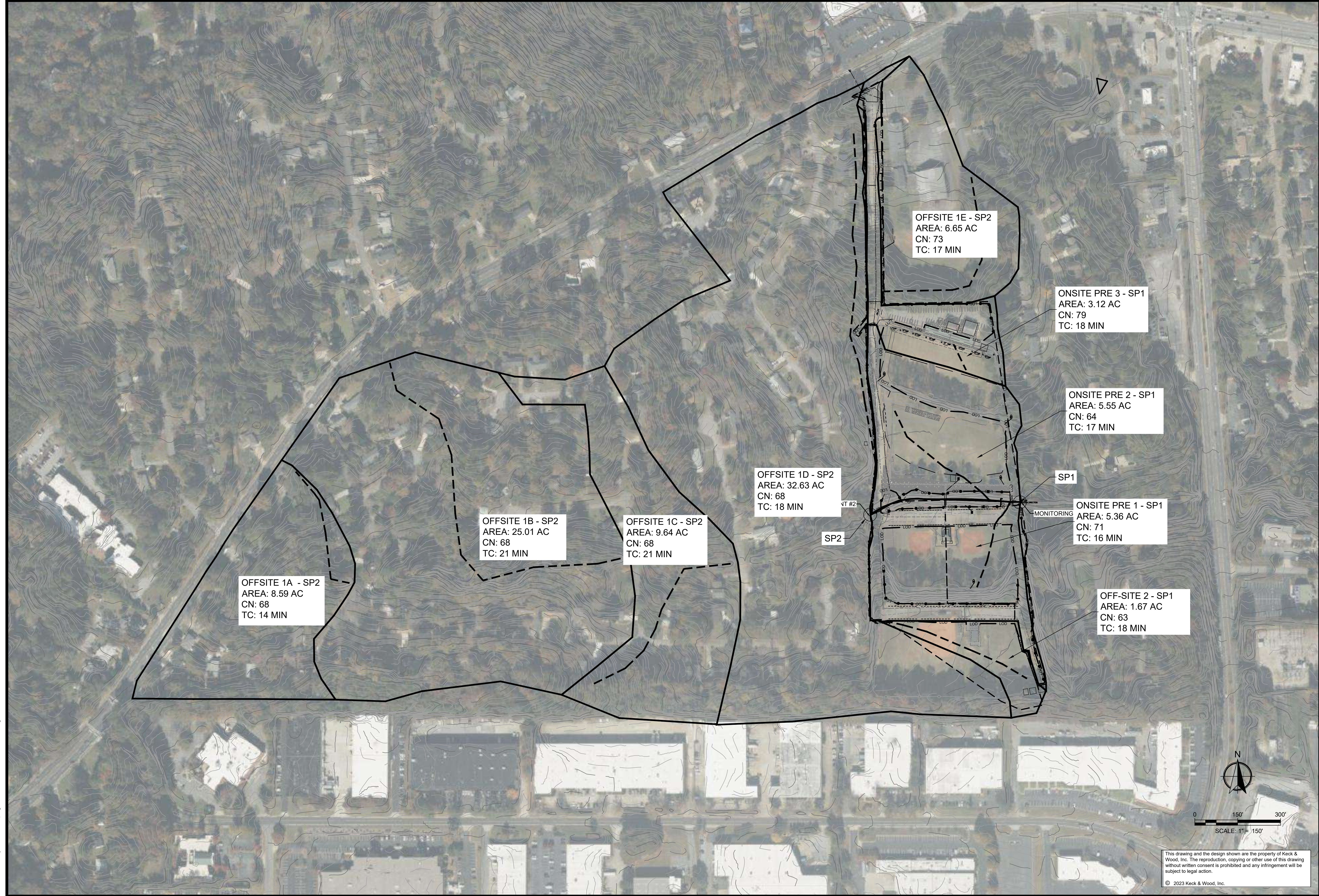
CONCLUSION

1. Water quality and channel protection volume requirements are being met by the vegetated filter strips and proprietary devices.
2. The downstream analysis has determined that the post-developed peak flows at the 10% points will be less than the pre-developed peak flows.

REFERENCES

1. *Georgia Stormwater Management Manual, 2016 Edition.*

APPENDIX A



OFFSITE 1A - SP2
 AREA: 8.59 AC
 CN: 68
 TC: 14 MIN

OFFSITE 1B - SP2
 AREA: 25.01 AC
 CN: 68
 TC: 21 MIN

OFFSITE 1C - SP2
 AREA: 9.64 AC
 CN: 68
 TC: 21 MIN

OFFSITE 1D - SP2
 AREA: 32.63 AC
 CN: 68
 TC: 18 MIN

OFFSITE 1E - SP2
 AREA: 6.65 AC
 CN: 73
 TC: 17 MIN

ONSITE PRE 3 - SP1
 AREA: 3.12 AC
 CN: 79
 TC: 18 MIN

ONSITE PRE 2 - SP1
 AREA: 5.55 AC
 CN: 64
 TC: 17 MIN

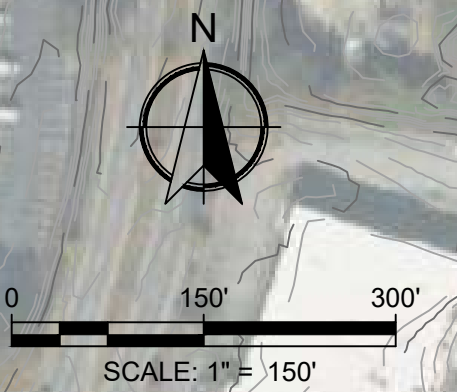
ONSITE PRE 1 - SP1
 AREA: 5.36 AC
 CN: 71
 TC: 16 MIN

OFF-SITE 2 - SP1
 AREA: 1.67 AC
 CN: 63
 TC: 18 MIN

SP2

SP1

MONITORING



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NO.	DATE	REVISION

Fitzgerald Park Improvements - Phase 2
 4877 Lawrenceville Hwy
 Tucker, Georgia
PRE-DEV DRAINAGE MAP

THIS BAR IS
 1 INCH LONG
 PLOTTED FULL SCALE

Project Manager:
 CAS

Drawn By: Checked By:
 BAF CAS

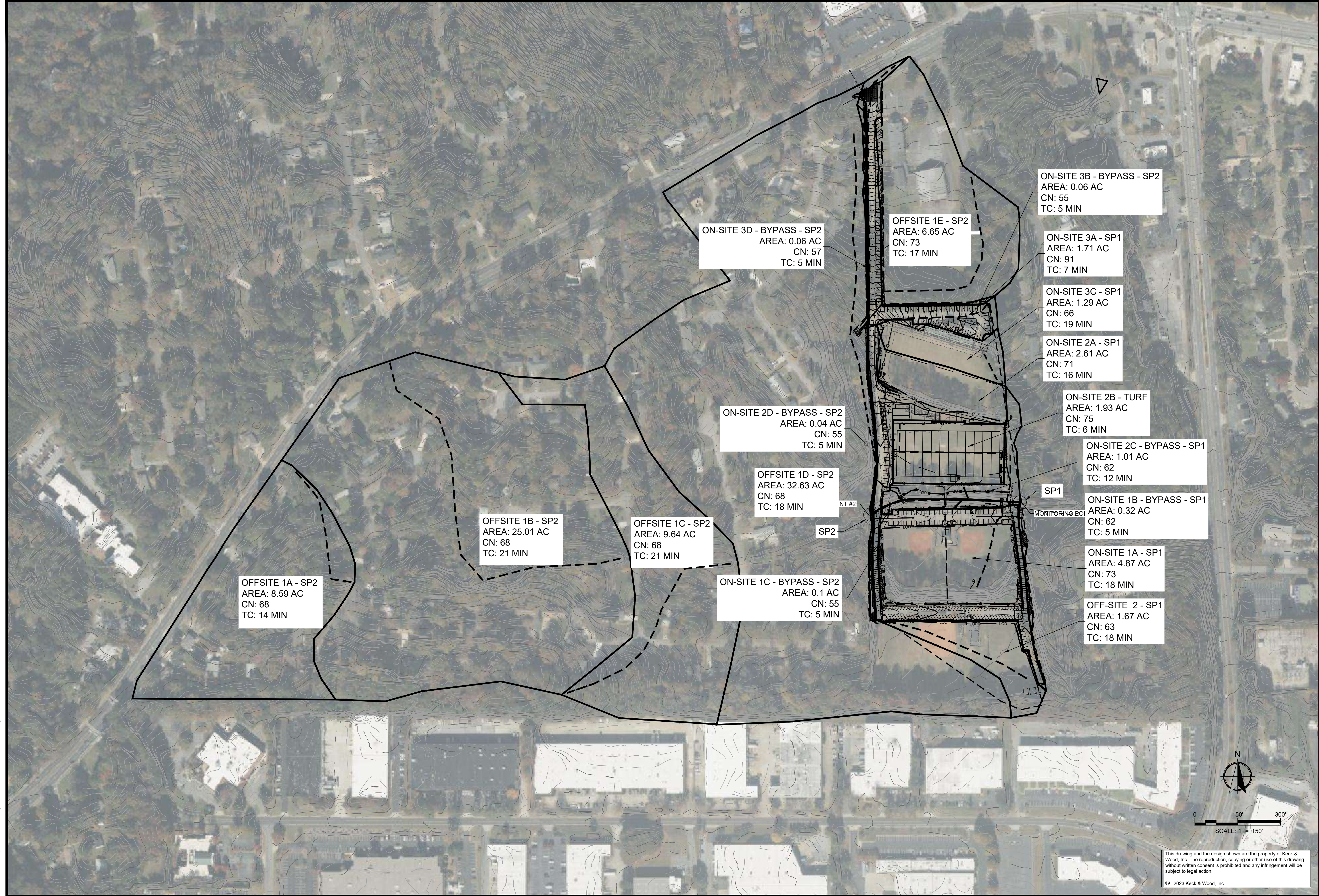
Date: 05/17/2023

Scale: As Shown

Project No.:
200147

Drawing No.:
PRE

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OFFSITE 1A - SP2
 AREA: 8.59 AC
 CN: 68
 TC: 14 MIN

OFFSITE 1B - SP2
 AREA: 25.01 AC
 CN: 68
 TC: 21 MIN

OFFSITE 1C - SP2
 AREA: 9.64 AC
 CN: 68
 TC: 21 MIN

ON-SITE 1C - BYPASS - SP2
 AREA: 0.1 AC
 CN: 55
 TC: 5 MIN

OFFSITE 1D - SP2
 AREA: 32.63 AC
 CN: 68
 TC: 18 MIN

ON-SITE 2D - BYPASS - SP2
 AREA: 0.04 AC
 CN: 55
 TC: 5 MIN

OFFSITE 1E - SP2
 AREA: 6.65 AC
 CN: 73
 TC: 17 MIN

ON-SITE 3D - BYPASS - SP2
 AREA: 0.06 AC
 CN: 57
 TC: 5 MIN

ON-SITE 3B - BYPASS - SP2
 AREA: 0.06 AC
 CN: 55
 TC: 5 MIN

ON-SITE 3A - SP1
 AREA: 1.71 AC
 CN: 91
 TC: 7 MIN

ON-SITE 3C - SP1
 AREA: 1.29 AC
 CN: 66
 TC: 19 MIN

ON-SITE 2A - SP1
 AREA: 2.61 AC
 CN: 71
 TC: 16 MIN

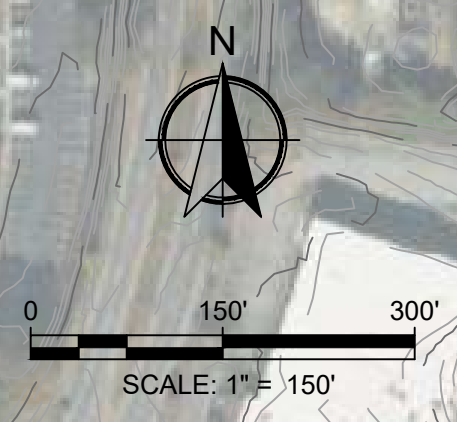
ON-SITE 2B - TURF
 AREA: 1.93 AC
 CN: 75
 TC: 6 MIN

ON-SITE 2C - BYPASS - SP1
 AREA: 1.01 AC
 CN: 62
 TC: 12 MIN

ON-SITE 1B - BYPASS - SP1
 AREA: 0.32 AC
 CN: 62
 TC: 5 MIN

ON-SITE 1A - SP1
 AREA: 4.87 AC
 CN: 73
 TC: 18 MIN

OFF-SITE 2 - SP1
 AREA: 1.67 AC
 CN: 63
 TC: 18 MIN



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NO.	DATE	REVISION

Fitzgerald Park Improvements - Phase 2
 4877 Lawrenceville Hwy
 Tucker, Georgia
POST-DEV DRAINAGE MAP

THIS BAR IS
 1 INCH LONG
 PLOTTED FULL SCALE

Project Manager:
 CAS

Drawn By: Checked By:
 BAF CAS

Date: 05/17/2023

Scale: As Shown

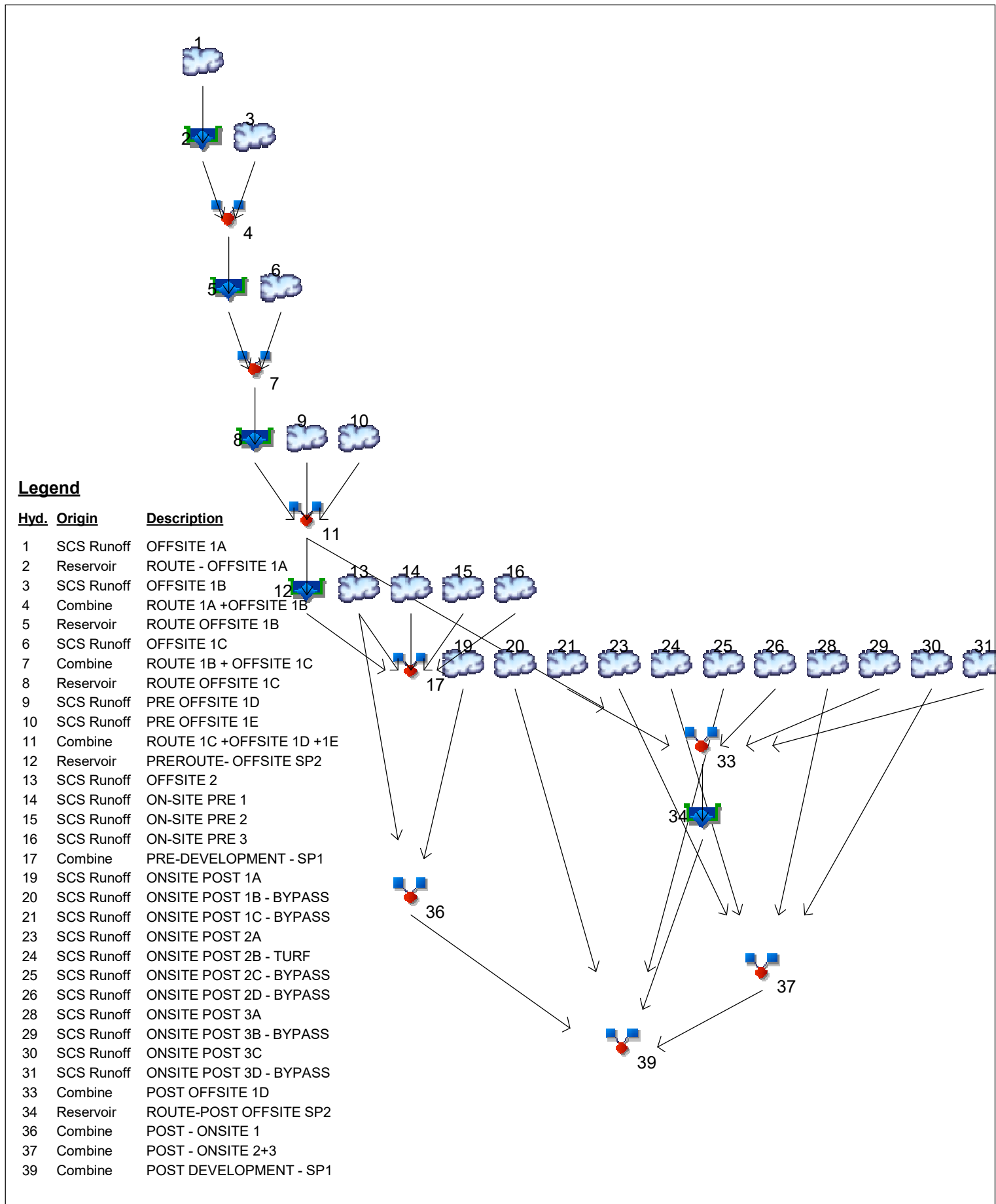
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 POST

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Watershed Model Schematic

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023



APPENDIX B



NOAA Atlas 14, Volume 9, Version 2
Location name: Tucker, Georgia, USA*
Latitude: 33.8634°, Longitude: -84.1953°
Elevation: m/ft**
 * source: ESRI Maps
 ** source: USGS



POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Deborah Martin, Sandra Pavlovic, Ishani Roy, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Michael Yekta, Geoffery Bonnin

NOAA, National Weather Service, Silver Spring, Maryland

[PF_tabular](#) | [PF_graphical](#) | [Maps_&_aerials](#)

PF tabular

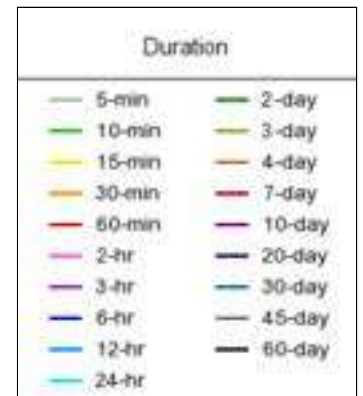
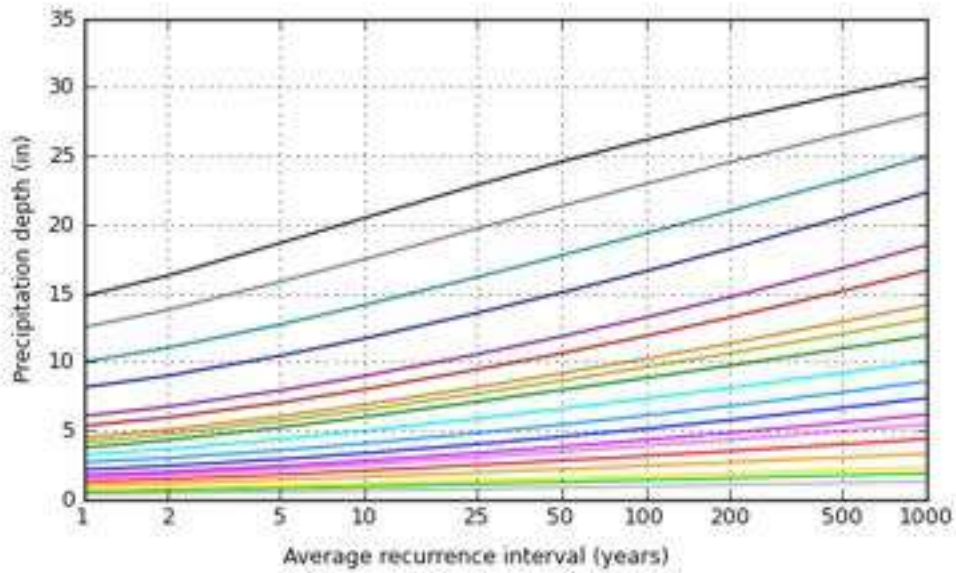
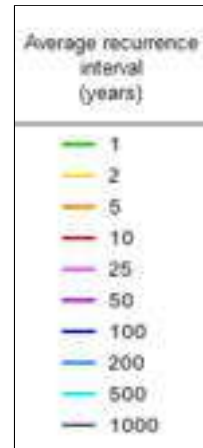
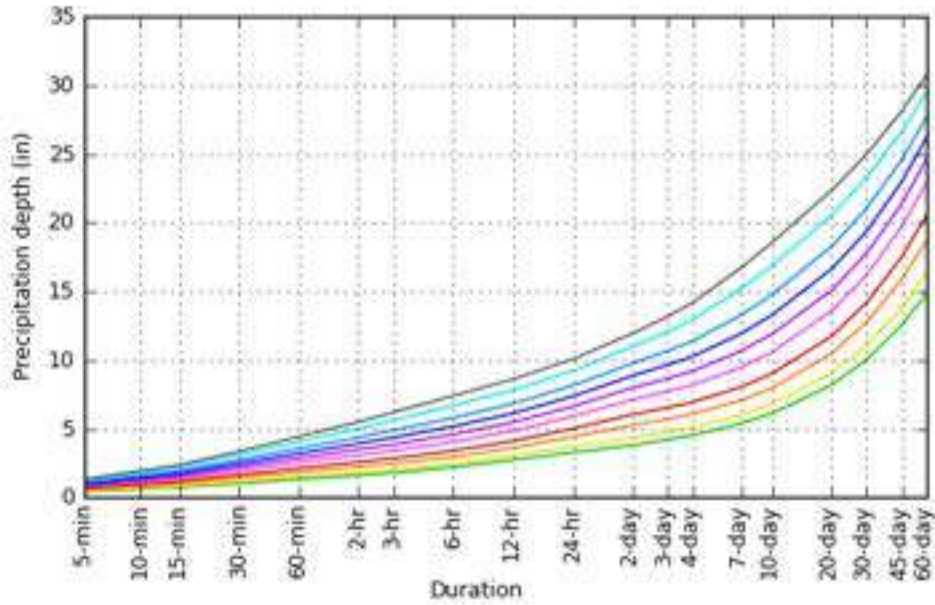
PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.405 (0.324-0.517)	0.467 (0.372-0.595)	0.569 (0.452-0.726)	0.655 (0.519-0.838)	0.777 (0.603-1.01)	0.873 (0.666-1.14)	0.971 (0.723-1.29)	1.07 (0.776-1.44)	1.21 (0.851-1.64)	1.32 (0.908-1.80)
10-min	0.594 (0.474-0.756)	0.683 (0.545-0.871)	0.833 (0.662-1.06)	0.959 (0.760-1.23)	1.14 (0.883-1.48)	1.28 (0.975-1.67)	1.42 (1.06-1.88)	1.57 (1.14-2.10)	1.77 (1.25-2.40)	1.93 (1.33-2.63)
15-min	0.724 (0.578-0.922)	0.833 (0.665-1.06)	1.02 (0.808-1.30)	1.17 (0.927-1.50)	1.39 (1.08-1.81)	1.56 (1.19-2.04)	1.73 (1.29-2.29)	1.92 (1.39-2.57)	2.16 (1.52-2.93)	2.35 (1.62-3.21)
30-min	1.02 (0.817-1.30)	1.18 (0.940-1.50)	1.44 (1.15-1.84)	1.66 (1.32-2.12)	1.97 (1.53-2.56)	2.21 (1.69-2.90)	2.46 (1.83-3.26)	2.72 (1.97-3.64)	3.07 (2.16-4.16)	3.34 (2.30-4.56)
60-min	1.31 (1.05-1.67)	1.50 (1.20-1.92)	1.83 (1.46-2.34)	2.11 (1.68-2.70)	2.52 (1.96-3.29)	2.85 (2.17-3.73)	3.19 (2.38-4.22)	3.54 (2.57-4.75)	4.03 (2.84-5.48)	4.41 (3.05-6.02)
2-hr	1.60 (1.29-2.00)	1.83 (1.48-2.29)	2.22 (1.79-2.79)	2.57 (2.06-3.24)	3.07 (2.42-3.96)	3.48 (2.70-4.51)	3.91 (2.96-5.12)	4.36 (3.21-5.78)	4.99 (3.57-6.70)	5.49 (3.85-7.40)
3-hr	1.78 (1.45-2.22)	2.03 (1.65-2.52)	2.46 (1.99-3.06)	2.84 (2.29-3.54)	3.40 (2.71-4.35)	3.86 (3.02-4.96)	4.35 (3.32-5.66)	4.87 (3.62-6.42)	5.60 (4.05-7.48)	6.19 (4.38-8.28)
6-hr	2.19 (1.81-2.68)	2.46 (2.03-3.02)	2.94 (2.42-3.62)	3.38 (2.77-4.16)	4.04 (3.26-5.10)	4.58 (3.64-5.81)	5.16 (4.01-6.63)	5.79 (4.37-7.53)	6.68 (4.90-8.80)	7.39 (5.31-9.75)
12-hr	2.72 (2.28-3.28)	3.04 (2.54-3.67)	3.60 (3.00-4.35)	4.10 (3.40-4.97)	4.84 (3.97-6.02)	5.46 (4.39-6.82)	6.12 (4.81-7.73)	6.82 (5.22-8.73)	7.81 (5.82-10.1)	8.60 (6.27-11.2)
24-hr	3.27 (2.77-3.89)	3.69 (3.12-4.38)	4.39 (3.72-5.23)	5.01 (4.22-5.98)	5.90 (4.88-7.19)	6.61 (5.38-8.11)	7.35 (5.86-9.13)	8.14 (6.31-10.2)	9.21 (6.96-11.8)	10.1 (7.45-12.9)
2-day	3.79 (3.26-4.43)	4.34 (3.73-5.08)	5.25 (4.50-6.16)	6.03 (5.15-7.08)	7.12 (5.96-8.52)	7.98 (6.58-9.62)	8.86 (7.15-10.8)	9.76 (7.67-12.1)	11.0 (8.42-13.8)	11.9 (8.98-15.1)
3-day	4.18 (3.62-4.85)	4.75 (4.11-5.51)	5.71 (4.93-6.63)	6.53 (5.62-7.60)	7.71 (6.53-9.17)	8.66 (7.21-10.4)	9.64 (7.85-11.7)	10.7 (8.46-13.1)	12.1 (9.33-15.1)	13.2 (9.99-16.5)
4-day	4.52 (3.94-5.21)	5.09 (4.43-5.86)	6.07 (5.27-7.00)	6.93 (6.00-8.01)	8.17 (6.97-9.68)	9.19 (7.71-10.9)	10.3 (8.42-12.4)	11.4 (9.10-13.9)	12.9 (10.1-16.1)	14.2 (10.8-17.7)
7-day	5.37 (4.73-6.10)	5.98 (5.27-6.80)	7.06 (6.20-8.04)	8.03 (7.03-9.16)	9.46 (8.18-11.1)	10.6 (9.06-12.5)	11.9 (9.92-14.2)	13.3 (10.8-16.1)	15.2 (12.0-18.7)	16.7 (12.9-20.6)
10-day	6.10 (5.41-6.87)	6.77 (6.00-7.63)	7.94 (7.03-8.97)	9.00 (7.94-10.2)	10.6 (9.21-12.3)	11.9 (10.2-13.9)	13.3 (11.1-15.7)	14.7 (12.1-17.7)	16.8 (13.4-20.6)	18.5 (14.5-22.7)
20-day	8.18 (7.36-9.06)	9.02 (8.12-10.0)	10.5 (9.40-11.6)	11.7 (10.5-13.1)	13.6 (12.0-15.5)	15.1 (13.1-17.3)	16.6 (14.1-19.3)	18.3 (15.2-21.6)	20.5 (16.6-24.6)	22.3 (17.8-27.0)
30-day	10.0 (9.11-11.0)	11.1 (10.0-12.1)	12.7 (11.5-14.0)	14.2 (12.8-15.6)	16.2 (14.4-18.2)	17.8 (15.5-20.1)	19.4 (16.6-22.2)	21.0 (17.6-24.5)	23.2 (19.0-27.6)	25.0 (20.0-29.9)
45-day	12.5 (11.5-13.6)	13.8 (12.6-15.0)	15.9 (14.5-17.3)	17.5 (15.9-19.1)	19.7 (17.6-21.8)	21.4 (18.8-23.8)	23.0 (19.8-26.0)	24.6 (20.7-28.3)	26.6 (21.9-31.2)	28.1 (22.8-33.3)
60-day	14.8 (13.6-16.0)	16.3 (15.0-17.6)	18.7 (17.2-20.2)	20.5 (18.8-22.2)	22.9 (20.5-25.0)	24.6 (21.7-27.2)	26.2 (22.7-29.4)	27.7 (23.4-31.6)	29.5 (24.4-34.2)	30.7 (25.1-36.2)

¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS). Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values. Please refer to NOAA Atlas 14 document for more information.

[Back to Top](#)

PF graphical

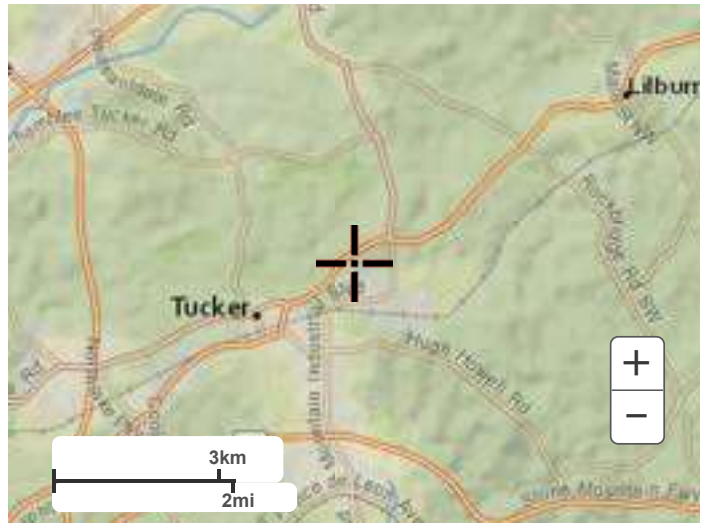
PDS-based depth-duration-frequency (DDF) curves
 Latitude: 33.8634°, Longitude -84.1953°



[Back to Top](#)

Maps & aeriels

Small scale terrain



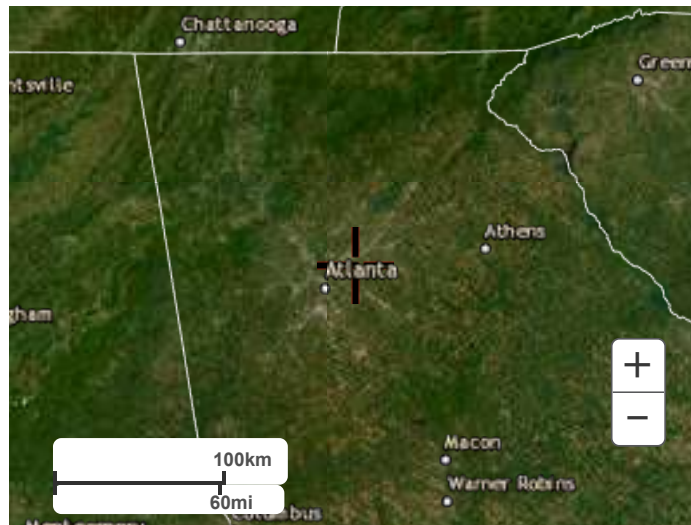
Large scale terrain



Large scale map



Large scale aerial



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Questions?: HDSC.Questions@noaa.gov

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NOAA Atlas 14, Volume 9, Version 2
Location name: Tucker, Georgia, USA*
Latitude: 33.8634°, Longitude: -84.1953°
Elevation: m/ft**
 * source: ESRI Maps
 ** source: USGS



POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Deborah Martin, Sandra Pavlovic, Ishani Roy, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Michael Yekta, Geoffery Bonnin

NOAA, National Weather Service, Silver Spring, Maryland

[PF_tabular](#) | [PF_graphical](#) | [Maps_&_aerials](#)

PF tabular

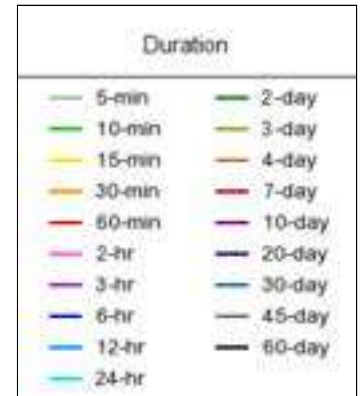
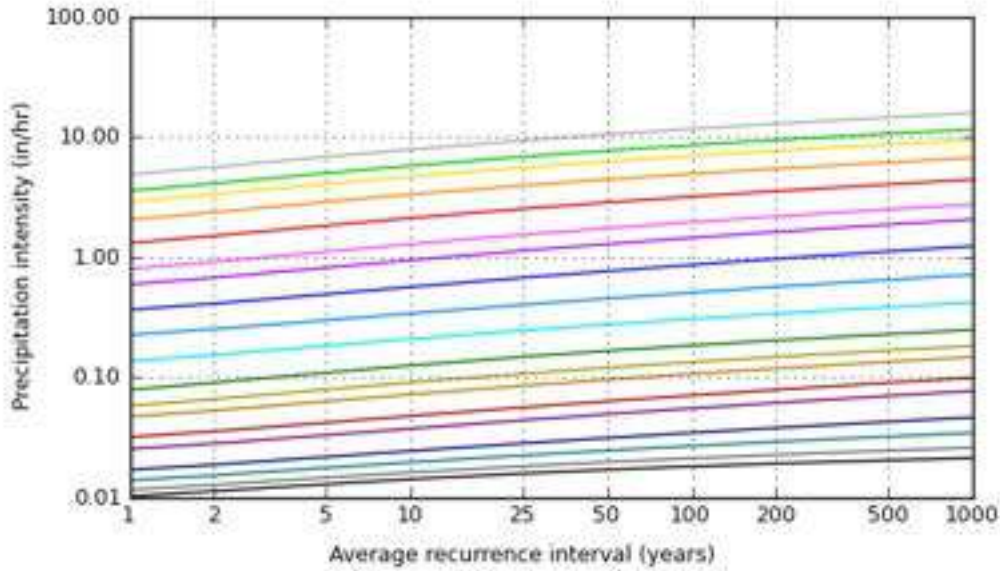
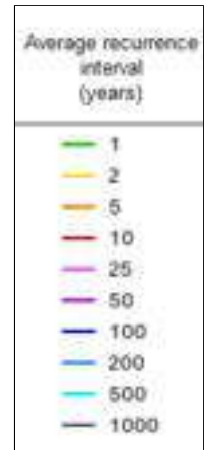
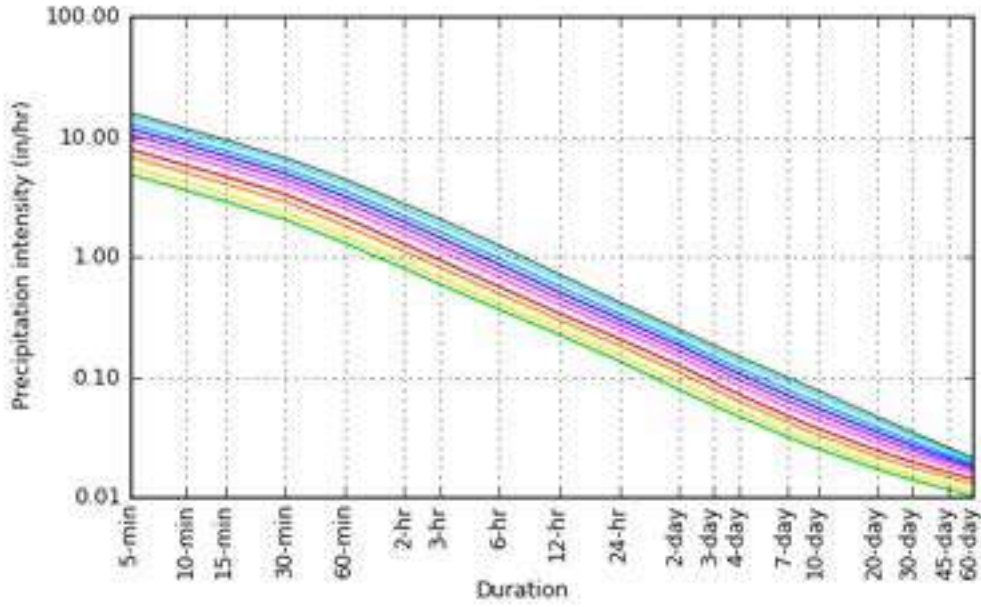
PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour)¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	4.86 (3.89-6.20)	5.60 (4.46-7.14)	6.83 (5.42-8.71)	7.86 (6.23-10.1)	9.32 (7.24-12.1)	10.5 (7.99-13.7)	11.7 (8.68-15.4)	12.9 (9.31-17.2)	14.5 (10.2-19.7)	15.8 (10.9-21.6)
10-min	3.56 (2.84-4.54)	4.10 (3.27-5.23)	5.00 (3.97-6.37)	5.75 (4.56-7.36)	6.83 (5.30-8.88)	7.67 (5.85-10.0)	8.53 (6.35-11.3)	9.42 (6.82-12.6)	10.6 (7.48-14.4)	11.6 (7.98-15.8)
15-min	2.90 (2.31-3.69)	3.33 (2.66-4.25)	4.06 (3.23-5.18)	4.68 (3.71-5.98)	5.55 (4.30-7.22)	6.24 (4.76-8.16)	6.94 (5.17-9.18)	7.66 (5.54-10.3)	8.64 (6.08-11.7)	9.40 (6.49-12.8)
30-min	2.05 (1.63-2.61)	2.36 (1.88-3.01)	2.88 (2.29-3.67)	3.32 (2.63-4.24)	3.94 (3.06-5.12)	4.43 (3.38-5.79)	4.93 (3.67-6.52)	5.44 (3.94-7.29)	6.14 (4.32-8.33)	6.67 (4.61-9.11)
60-min	1.31 (1.05-1.67)	1.50 (1.20-1.92)	1.83 (1.46-2.34)	2.11 (1.68-2.70)	2.52 (1.96-3.29)	2.85 (2.17-3.73)	3.19 (2.38-4.22)	3.54 (2.57-4.75)	4.03 (2.84-5.48)	4.41 (3.05-6.02)
2-hr	0.798 (0.646-1.00)	0.914 (0.738-1.15)	1.11 (0.896-1.40)	1.28 (1.03-1.62)	1.54 (1.21-1.98)	1.74 (1.35-2.25)	1.95 (1.48-2.56)	2.18 (1.60-2.89)	2.49 (1.79-3.35)	2.74 (1.92-3.70)
3-hr	0.594 (0.484-0.739)	0.675 (0.549-0.840)	0.818 (0.664-1.02)	0.944 (0.764-1.18)	1.13 (0.901-1.45)	1.29 (1.00-1.65)	1.45 (1.11-1.88)	1.62 (1.21-2.14)	1.87 (1.35-2.49)	2.06 (1.46-2.76)
6-hr	0.365 (0.302-0.448)	0.411 (0.339-0.504)	0.492 (0.404-0.604)	0.565 (0.463-0.695)	0.674 (0.545-0.852)	0.765 (0.608-0.970)	0.862 (0.669-1.11)	0.967 (0.729-1.26)	1.12 (0.818-1.47)	1.23 (0.886-1.63)
12-hr	0.226 (0.189-0.273)	0.252 (0.211-0.305)	0.299 (0.249-0.361)	0.340 (0.283-0.412)	0.402 (0.329-0.500)	0.453 (0.365-0.566)	0.508 (0.399-0.642)	0.566 (0.433-0.725)	0.648 (0.483-0.841)	0.714 (0.520-0.930)
24-hr	0.136 (0.116-0.162)	0.154 (0.130-0.183)	0.183 (0.155-0.218)	0.209 (0.176-0.249)	0.246 (0.203-0.300)	0.275 (0.224-0.338)	0.306 (0.244-0.381)	0.339 (0.263-0.427)	0.384 (0.290-0.490)	0.419 (0.310-0.538)
2-day	0.079 (0.068-0.092)	0.090 (0.078-0.106)	0.109 (0.094-0.128)	0.126 (0.107-0.147)	0.148 (0.124-0.178)	0.166 (0.137-0.200)	0.184 (0.149-0.225)	0.203 (0.160-0.252)	0.229 (0.175-0.288)	0.249 (0.187-0.315)
3-day	0.058 (0.050-0.067)	0.066 (0.057-0.076)	0.079 (0.068-0.092)	0.091 (0.078-0.106)	0.107 (0.091-0.127)	0.120 (0.100-0.144)	0.134 (0.109-0.162)	0.148 (0.118-0.182)	0.168 (0.130-0.209)	0.183 (0.139-0.230)
4-day	0.047 (0.041-0.054)	0.053 (0.046-0.061)	0.063 (0.055-0.073)	0.072 (0.062-0.083)	0.085 (0.073-0.101)	0.096 (0.080-0.114)	0.107 (0.088-0.129)	0.119 (0.095-0.145)	0.135 (0.105-0.167)	0.148 (0.113-0.184)
7-day	0.032 (0.028-0.036)	0.036 (0.031-0.040)	0.042 (0.037-0.048)	0.048 (0.042-0.055)	0.056 (0.049-0.066)	0.063 (0.054-0.075)	0.071 (0.059-0.085)	0.079 (0.064-0.096)	0.090 (0.071-0.111)	0.099 (0.077-0.123)
10-day	0.025 (0.023-0.029)	0.028 (0.025-0.032)	0.033 (0.029-0.037)	0.037 (0.033-0.042)	0.044 (0.038-0.051)	0.049 (0.042-0.058)	0.055 (0.046-0.065)	0.061 (0.050-0.074)	0.070 (0.056-0.086)	0.077 (0.060-0.095)
20-day	0.017 (0.015-0.019)	0.019 (0.017-0.021)	0.022 (0.020-0.024)	0.024 (0.022-0.027)	0.028 (0.025-0.032)	0.031 (0.027-0.036)	0.035 (0.029-0.040)	0.038 (0.032-0.045)	0.043 (0.035-0.051)	0.047 (0.037-0.056)
30-day	0.014 (0.013-0.015)	0.015 (0.014-0.017)	0.018 (0.016-0.019)	0.020 (0.018-0.022)	0.022 (0.020-0.025)	0.025 (0.022-0.028)	0.027 (0.023-0.031)	0.029 (0.024-0.034)	0.032 (0.026-0.038)	0.035 (0.028-0.041)
45-day	0.012 (0.011-0.013)	0.013 (0.012-0.014)	0.015 (0.013-0.016)	0.016 (0.015-0.018)	0.018 (0.016-0.020)	0.020 (0.017-0.022)	0.021 (0.018-0.024)	0.023 (0.019-0.026)	0.025 (0.020-0.029)	0.026 (0.021-0.031)
60-day	0.010 (0.009-0.011)	0.011 (0.010-0.012)	0.013 (0.012-0.014)	0.014 (0.013-0.015)	0.016 (0.014-0.017)	0.017 (0.015-0.019)	0.018 (0.016-0.020)	0.019 (0.016-0.022)	0.020 (0.017-0.024)	0.021 (0.017-0.025)

¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS). Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values. Please refer to NOAA Atlas 14 document for more information.

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PF graphical

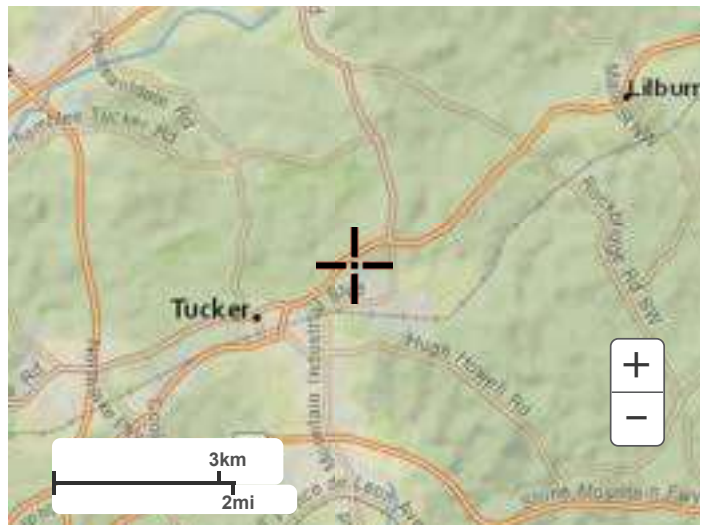
PDS-based intensity-duration-frequency (IDF) curves
 Latitude: 33.8634°, Longitude -84.1953°



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Maps & aerials

Small scale terrain



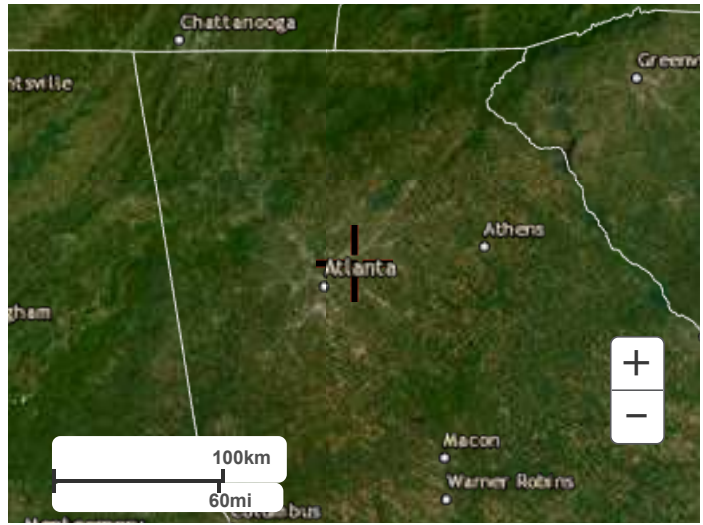
Large scale terrain



Large scale map



Large scale aerial



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Could not retrieve elevation data due to Cross-Origin permissions.

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The following discussion will give some guidance for adjusting curve numbers for different types of impervious areas.

Connected Impervious Areas

The CNs provided in **Table 3.1.5-1** for various land cover types were developed for typical land use relationships based on specific assumed percentages of impervious area. These CN values were developed on the assumptions that:

- (a) Pervious urban areas are equivalent to pasture in good hydrologic condition, and
- (b) Impervious areas have a CN of 98 and are directly connected to the drainage system.

If all of the impervious area is directly connected to the drainage system, but the impervious area percentages or the pervious land use assumptions in **Table 3.1.5-1** are not applicable, use **Figure 3.1.5-3** to compute a composite CN. For example, **Table 3.1.5-1** gives a CN of 70 for a 1/2-acre lot in hydrologic soil group B, with an assumed impervious area of 25%. However, if the lot has 20% impervious area and a pervious area CN of 61, the composite CN obtained from **Figure 3.1.5-3** is 68. The CN difference between 70 and 68 reflects the difference in percent impervious area.

Unconnected Impervious Areas

Runoff from these areas is spread over a pervious area as sheet flow. To determine CN when all or part of the impervious area is not directly connected to the drainage system, (1) use **Figure 3.1.5-4** if total impervious area is less than 30% or (2) use **Figure 3.1.5-3** if the total impervious area is equal to or greater than 30%, because the absorptive capacity of the remaining pervious areas will not significantly affect runoff.

Table 3.1.5-1 Runoff Curve Numbers¹

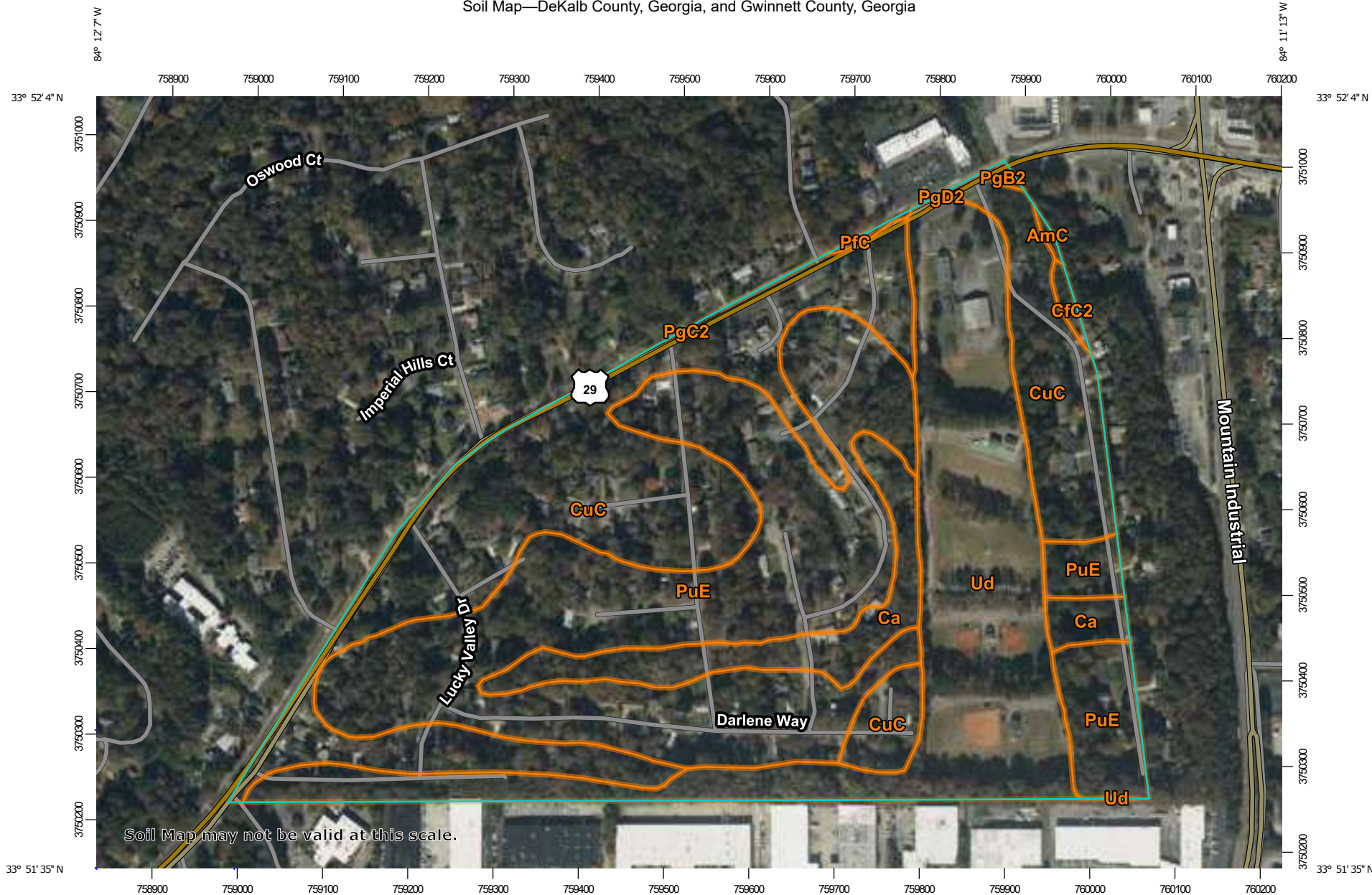
Cover description	Curve numbers for hydrological soil groups			
	A	B	C	D
<i>Cover type and hydrologic condition</i>	<i>Average percent impervious area²</i>			
Cultivated land: without conservation treatment	72	81	88	91
with conservation treatment	62	71	78	81
Pasture or range land: poor condition	68	79	86	89
good condition	39	61	74	80
Meadow: good	30	58	71	78
Wood or forest land: thin stand, poor cover	45	66	77	83
good cover	25	55	70	77
Open space (lawn, parks, golf courses, cemeteries, etc) ³ : Poor condition (grass cover <50%)	68	79	86	89
Fair condition (grass cover 50% to 75%)	49	69	79	84
Good condition (grass cover >75%)	39	61	74	80
Impervious areas: Paved parking lots, roofs, driveways, etc (excluding right-of-way)	98	98	98	98
Streets and roads: Paved; curbs and storm drains (excluding right-of-way)	98	98	98	98
Paved; open ditches (including right-of-way)	83	89	92	93
Gravel (including right-of-way)	76	85	89	91
Dirt (including right-of-way)	72	82	87	89
Urban Districts: Commercial and business	85%	89	92	94
Industrial	72%	81	88	91
Residential districts by average lot size: 1/8 acre or less (townhouses)	65%	77	85	90
1/4 acre	38%	61	75	83
1/3 acre	30%	57	72	81
1/2 acre	25%	54	70	80
1 acre	20%	51	68	79
2 acres	12%	46	65	77
Developing urban areas and newly graded areas (pervious areas only, no vegetation)	77	86	91	94

¹Average runoff condition, and $I_a = 0.25$

²The average percent impervious area shown was used to develop the composite CNs. Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. If the impervious area is not connected, the NRCS TR-55 method has an adjustment to reduce the effect.

³CNs shown are equivalent to those of pasture. Composite CNs may be computed for other combinations of open space cover type.

Soil Map—DeKalb County, Georgia, and Gwinnett County, Georgia



Map Scale: 1:6,360 if printed on A landscape (11" x 8.5") sheet.




Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)




















Soils






 Soil Map Unit Polygons

 Soil Map Unit Lines


 Soil Map Unit Points

Special Point Features






-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh or swamp
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot

-  Spoil Area
-  Stony Spot
-  Very Stony Spot
-  Wet Spot
-  Other
-  Special Line Features

Water Features

 Streams and Canals

Transportation

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

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

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

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

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

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: DeKalb County, Georgia
 Survey Area Data: Version 14, Sep 12, 2022

Soil Survey Area: Gwinnett County, Georgia
 Survey Area Data: Version 13, Sep 13, 2022

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

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

Date(s) aerial images were photographed: Nov 17, 2021—Nov 20, 2021

MAP LEGEND

MAP INFORMATION

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
AmC	Appling sandy loam, 6 to 10 percent slopes	0.1	0.1%
Ca	Cartecay silt loam, frequently flooded	8.1	6.4%
CfC2	Cecil sandy clay loam, 2 to 10 percent slopes, eroded	0.4	0.3%
CuC	Cecil-Urban land complex, 2 to 10 percent slopes	41.4	32.6%
PfC	Pacolet sandy loam, 2 to 10 percent slopes	0.1	0.1%
PgC2	Pacolet sandy clay loam, 2 to 10 percent slopes, eroded	0.0	0.0%
PgD2	Pacolet sandy clay loam, 10 to 15 percent slopes, moderately eroded	0.0	0.0%
PuE	Pacolet-Urban land complex, 10 to 25 percent slopes	46.1	36.3%
Ud	Urban land	30.6	24.1%
Subtotals for Soil Survey Area		126.8	99.8%
Totals for Area of Interest		127.0	100.0%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
PgB2	Pacolet sandy clay loam, 2 to 6 percent slopes, moderately eroded	0.2	0.2%
Subtotals for Soil Survey Area		0.2	0.2%
Totals for Area of Interest		127.0	100.0%



APPENDIX C

Georgia Stormwater Management Manual

Stormwater Quality Site Development Review Tool

Version 2.2

General Information

Name of Developer:	City of Tucker	Date Submitted:	
Development Name:	Fitzgerald Field Improvements -	Permit Number:	
Site Location / Address:	4877 Lawrenceville Hwy	Developer Contact:	Rip Robertson
	Tucker, GA 30084	Phone Number:	470-481-0205
		Name of Engineer(s):	Brian Faulkner
Development Type:		Maintenance Responsibility:	

Site Summary

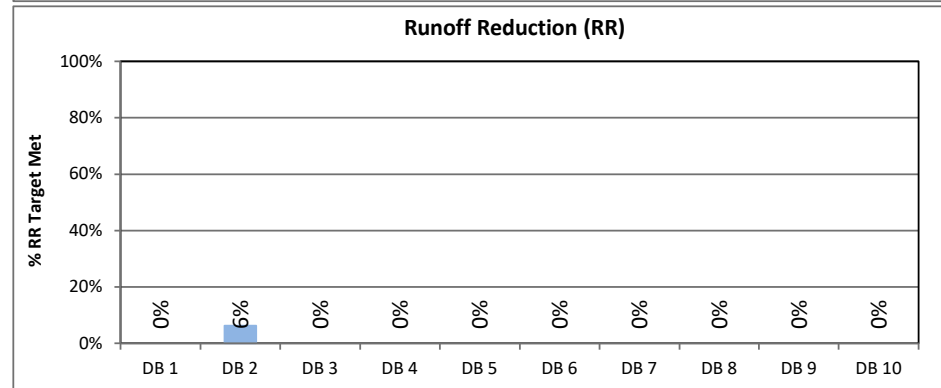
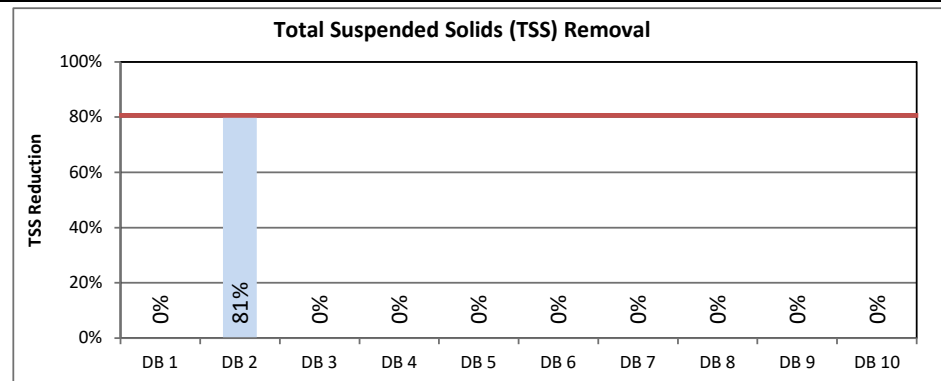
Total Pre-Development Area (ac): #REF!
 Total Post-Development Area (ac): #REF!
 Total Treated Area (ac): #REF!
 Total Untreated Area (ac): #REF!

		I (ac)	P (ac)	CA (ac)
#REF!	DB 1	#REF!	#REF!	#REF!
On-Site Basins	DB 2	4.17	9.86	0.00
#REF!	DB 3	#REF!	#REF!	#REF!
#REF!	DB 4	#REF!	#REF!	#REF!
Drainage Basin 5	DB 5	0.00	0.00	0.00
Drainage Basin 6	DB 6	0.00	0.00	0.00
Drainage Basin 7	DB 7	0.00	0.00	0.00
Drainage Basin 8	DB 8	0.00	0.00	0.00
Drainage Basin 9	DB 9	0.00	0.00	0.00
Drainage Basin 10	DB 10	0.00	0.00	0.00
TOTAL		#REF!	#REF!	#REF!

I = Impervious Area, P = Pervious Area, CA = Conservation Area

Target Runoff Reduction Volume Achieved? #REF!
 Target TSS Removal Achieved? **No**

Total Target Runoff Reduction Volume (cf) #REF!
 Runoff Reduction Volume Achieved (cf) #REF!
 Total Target Water Quality Volume (cf) #REF!
 % TSS Removal Achieved 0%



Official Use Only

Tracking #: _____
 Reviewed By: _____
 Date Approved: _____

Conditions of Approval: _____

#REF!

Georgia Stormwater Management Manual

Stormwater Quality Site Development Review Tool, v2.2

Development Name: **Fitzgerald Field Improvements - Phase II**
 Drainage Basin Name: **On-Site Basins**

data input cells
 calculation cells
 constant values

Site Data

Indicate Pre-Development Land Cover and Runoff Curve Numbers in the Site's Disturbed Area

Cover Type	HSG* A (acres)	CN	HSG B (acres)	CN	HSG C (acres)	CN	HSG D (acres)	CN	Total	% Cover
Impervious		98	3.55	98		98		98	3.55	25%
Open space - Good condition (grass cover > 75%)		39	7.74	61		74		80	7.74	55%
Woods - Good Condition		30	2.26	55		70		77	2.26	16%
Select a land cover type...		0		0		0		0	0.00	0%
Select a land cover type...		0		0		0		0	0.00	0%
Local Jurisdiction Input			0.48	85					0.48	3%
Other									0.00	0%
Total	0.00		14.03		0.00		0.00		14.03	100%

*HSG = hydrologic soil group

Impervious (ac) 3.55
 Weighted CN 70
 Potential Max Soil Retention, S_{pre} (in) 4.24

Indicate Post-Development Land Cover and Runoff Curve Numbers in the Site's Disturbed Area

Cover Type	HSG A (acres)	CN	HSG B (acres)	CN	HSG C (acres)	CN	HSG D (acres)	CN	Total	% Cover
Impervious		98	4.17	98		98		98	4.17	30%
Open space - Good condition (grass cover > 75%)		39	5.95	61		74		80	5.95	42%
Woods - Good Condition		30	1.94	55		70		77	1.94	14%
Select a land cover type...		0		0		0		0	0.00	0%
Select a land cover type...		0		0		0		0	0.00	0%
Local Jurisdiction Input			0.08	85					0.08	1%
Turf Field			1.89	74					1.89	13%
Total	0.00		14.03		0.00		0.00		14.03	100%

Impervious (ac) 4.17
 Rv 0.32
 Weighted CN 73
 Potential Max Soil Retention, S_{post} (in) 3.69

Conservation Area Credits

Scenario 1: Natural Conservation Area *See the GSMM Volume 2, Section 2.3.3.3 for more information.

Check the box if a portion of the post-developed area is protected by a conservation easement or equivalent form of protection.

Area (ac) of development protected by a conservation easement or equivalent form of protection.

Note: The green cell will unlock if the Scenario 1 box above is checked

Scenario 3: Soil Restoration *See the GSMM Volume 2, Section 4.23 for more information.

Check the box if a portion of the post-developed area employs soil restoration and is protected by a conservation easement or equivalent form of protection.

Area (ac) of development with restored soils and protected by a conservation easement or equivalent form of protection.

Note: The green cell will unlock if the Scenario 3 box above is checked

Scenario 2: Site Reforestation/Revegetation *See the GSMM Volume 2, Section 4.22 for more information.

Check the box if a portion of the post-developed area employs site reforestation/revegetation and is protected by a conservation easement or equivalent form of protection.

Area (ac) of development reforested/revegetated and protected by a conservation easement or equivalent form of protection.

Note: The green cell will unlock if the Scenario 2 box above is checked

Scenario 4: Site Reforestation/Revegetation & Soil Restoration

*See the GSMM Volume 2, Section 4.22 and 4.23 for more information.

Check the box if the same portion of the post-developed area employs site reforestation/revegetation and soil restoration, and is protected by a conservation easement or equivalent form of protection.

Area (ac) with restored soils in a reforested & revegetated area and protected by a conservation easement or equivalent form of protection.

Note: The green cell will unlock if the Scenario 4 box above is checked

Total Conservation Area Credit (acres) 0.00

Georgia Stormwater Management Manual

Stormwater Quality Site Development Review Tool, v2.2

Development Name: **Fitzgerald Field Improvements - Phase II**
 Drainage Basin Name: **On-Site Basins**

data input cells
 calculation cells
 constant values

Water Quality Goals

Target Runoff Reduction Storm (in) **1.00**

Total Site Area for Water Quality Volume (acres)	14.03
Target Runoff Reduction Volume (cf)	16,170
Target Water Quality Volume (cf)	19,404

Select BMPs for Runoff Reduction and Water Quality

		Area Draining to Each BMP			Storage Volume Provided by BMP (cf)	RR Conveyance Volume Provided by BMP (cf)	Down-stream BMP	Runoff Reduction Calculations					WQ Calculations		
		On-site Pervious Area (acres)	On-site Impervious Area (acres)	Offsite Area (acres)				RR Volume from Direct Drainage (cf)	RR Volume from Upstream Practices (cf)	Total RR Volume Received by BMP (cf)	Runoff Reduction %	RR Achieved (cf)	Remaining RR Volume (cf)	WQ _v from Direct Drainage (cf)	Effective TSS Removal %
BMP 1	Vegetated Filter Strip (A & B hydrologic soils)	3.00				544		544	0	544	50%	272	272	653	60%
BMP 2	Vegetated Filter Strip (A & B hydrologic soils)	1.89	0.04			481		481	0	481	50%	240	240	577	60%
BMP 3	Vegetated Filter Strip (A & B hydrologic soils)	2.25	0.18			1,035		1,035	0	1,035	50%	518	518	1,243	60%
BMP 4	Proprietary System	2.14	2.19	2.43				7,941	0	7,941	0%	0	7,941	9,529	80%
BMP 5	Proprietary System	1.52	0.66					2,552	0	2,552	0%	0	2,552	3,062	80%
BMP 6	Proprietary System	1.45	1.16	3.00				4,264	0	4,264	0%	0	4,264	5,117	80%
BMP 7	Select a BMP...							0	0	0	N/A	0	0	0	N/A
BMP 8	Select a BMP...							0	0	0	N/A	0	0	0	N/A
BMP 9	Select a BMP...							0	0	0	N/A	0	0	0	N/A
BMP 10	Select a BMP...							0	0	0	N/A	0	0	0	N/A
TOTAL		12.25	4.23	5.43				16,817				1,030		20,180	
UNTREATED AREA (acres)		0.00	0.00												

Target Runoff Reduction Volume (cf)	16,170
Target Achieved?	No
Remaining Runoff Reduction Volume (cf)	15,140

Target Water Quality Volume (cf)	19,404
% TSS Removal Achieved	81%
Target Achieved?	Yes!
Remaining TSS Removal %	0%

Georgia Stormwater Management Manual

Stormwater Quality Site Development Review Tool, v2.2

Development Name: **Fitzgerald Field Improvements - Phase II**
 Drainage Basin Name: **On-Site Basins**

data input cells
 calculation cells
 constant values

Channel and Flood Protection Calculations

	1-yr, 24-hr storm	2-yr, 24-hr storm	25-yr, 24-hr storm	100-yr, 24-hr storm
Target Rainfall Event (in)				

	1-yr, 24-hr storm	2-yr, 24-hr storm	25-yr, 24-hr storm	100-yr, 24-hr storm
Pre-Development Runoff Volume (in)	0.00	0.00	0.00	0.00
Post Development Runoff Volume (in) with no BMPs	0.00	0.00	0.00	0.00
Post-Development Runoff Volume (in) with BMPs	0.00	0.00	0.00	0.00
Adjusted CN	0	0	0	0

*See Stormwater Management Standards to Determine Detention Requirements.

Comments

Worksheet 3: Time of Concentration (T_c) or Travel time (T_t)

Project Fitzgerald Field 2 By BAF Date 3/28/23
 Location Off Site Pre 2 Checked CAS Date _____
 Circle One: Present Developed _____
 Circle One: T_c T_t through subarea _____

NOTES: Space for as many as two segments per flow type can be used for each worksheet.
 Include a map, schematic, or description of flow segments

Sheet flow (Applicable to T_c Only)

1. Surface description
2. Manning's roughness coeff., n
3. Flow length, L (total L ≤ 300 ft)
4. Two-yr 24-hr rainfall, P₂
5. Land slope, s

6. $T_t = \frac{0.007 (nL)^{0.8}}{(P_2)^{0.5} (s)^{0.4}}$ Compute T_t

Segment ID	SF-1		
	Dense Grass		
	0.24		
ft	100		
in	3.69		
ft/ft	0.017		
hr	0.236	+	0.236

Shallow concentrated flow

7. Surface description
8. Flow length, L
9. Watercourse slope, s
10. Average velocity, V

11. $T_t = \frac{L}{3600 V}$ Compute T_t

Segment ID	SC-1		
	Paved	Unpaved	
ft		434.00	
ft/ft		0.0165	
ft/s		2.07	
hr		0.0582	0.0582

Channel flow

12. Cross sectional flow area, a
13. Wetted perimeter, p_w
14. Hydraulic radius, $r = \frac{a}{P_w}$
15. Channel slope, s
16. Manning's roughness coeff., n

17. $V = \frac{1.49 r^{2/3} s^{1/2}}{n}$ Compute V

18. Flow length, L

19. $T_t = \frac{L}{3600 V}$ Compute T_t

20. Watershed or subarea T_c or T_t (add T_t in steps 6, 11, and 19)

Segment ID	C-1	C-2	
ft ²			
ft			
ft			
ft/ft			
ft/s			
ft			
hr			0.0000
		+	0.2945

18 minutes

Worksheet 3: Time of Concentration (T_c) or Travel time (T_t)

Project Fitzgerald Field 2 By BAF Date 3/28/23
 Location On Site Pre 1 Checked CAS Date _____
 Circle One: Present Developed _____
 Circle One: T_c T_t through subarea _____

NOTES: Space for as many as two segments per flow type can be used for each worksheet.
 Include a map, schematic, or description of flow segments

Sheet flow (Applicable to T_c Only)

1. Surface description
2. Manning's roughness coeff., n
3. Flow length, L (total L ≤ 300 ft)
4. Two-yr 24-hr rainfall, P₂
5. Land slope, s

6. $T_t = \frac{0.007 (nL)^{0.8}}{(P_2)^{0.5} (s)^{0.4}}$ Compute T_t

Segment ID	SF-1		
	Dense Grass		
	0.24		
ft	100		
in	3.69		
ft/ft	0.014		
hr	0.254	+	0.254

Shallow concentrated flow

7. Surface description
8. Flow length, L
9. Watercourse slope, s
10. Average velocity, V

11. $T_t = \frac{L}{3600 V}$ Compute T_t

Segment ID	SC-1		
	Paved	Unpaved	
ft	48.00	127.00	
ft/ft	0.032	0.0185	
ft/s	3.62	2.19	
hr	0.0037	0.0161	0.0198

Channel flow

12. Cross sectional flow area, a
13. Wetted perimeter, p_w
14. Hydraulic radius, $r = \frac{a}{P_w}$
15. Channel slope, s
16. Manning's roughness coeff., n

17. $V = \frac{1.49 r^{2/3} s^{1/2}}{n}$ Compute V

18. Flow length, L

19. $T_t = \frac{L}{3600 V}$ Compute T_t

20. Watershed or subarea T_c or T_t (add T_t in steps 6, 11, and 19)

Segment ID	C-1	C-2	
ft ²			
ft			
ft			
ft/ft			
ft/s			
ft			
hr			0.0000
		+	0.2738

16 minutes

Worksheet 3: Time of Concentration (T_c) or Travel time (T_t)

Project Fitzgerald Field 2 By BAF Date 3/7/23
 Location On-Site Pre 3 Checked CAS Date _____
 Circle One: Present Developed _____
 Circle One: T_c T_t through subarea _____

NOTES: Space for as many as two segments per flow type can be used for each worksheet.
 Include a map, schematic, or description of flow segments

Sheet flow (Applicable to T_c Only)

1. Surface description
2. Manning's roughness coeff., n
3. Flow length, L (total L ≤ 300 ft)
4. Two-yr 24-hr rainfall, P₂
5. Land slope, s

6. $T_t = \frac{0.007 (nL)^{0.8}}{(P_2)^{0.5} (s)^{0.4}}$ Compute T_t

Segment ID	SF-1		
	Dense Grass		
	0.24		
ft	100		
in	3.69		
ft/ft	0.014		
hr	0.255	+	= 0.255

Shallow concentrated flow

7. Surface description
8. Flow length, L
9. Watercourse slope, s
10. Average velocity, V

11. $T_t = \frac{L}{3600 V}$ Compute T_t

Segment ID	SC-1		
	Paved	Unpaved	
ft		329.00	
ft/ft		0.0316	
ft/s		2.87	
hr		0.0319	= 0.0319

Channel flow

12. Cross sectional flow area, a
13. Wetted perimeter, p_w
14. Hydraulic radius, $r = \frac{a}{P_w}$
15. Channel slope, s
16. Manning's roughness coeff., n

17. $V = \frac{1.49 r^{2/3} s^{1/2}}{n}$ Compute V

18. Flow length, L

19. $T_t = \frac{L}{3600 V}$ Compute T_t

20. Watershed or subarea T_c or T_t (add T_t in steps 6, 11, and 19)

Segment ID	C-1	C-2	
ft ²			
ft			
ft			
ft/ft			
ft/s			
ft			
hr		+	= 0.0000
			hr 0.2873

17 minutes

Worksheet 3: Time of Concentration (T_c) or Travel time (T_t)

Project Fitzgerald Field 2 By BAF Date 3/7/23
 Location On-Site Pre 3 Checked CAS Date _____
 Circle One: Present Developed _____
 Circle One: T_c T_t through subarea _____

NOTES: Space for as many as two segments per flow type can be used for each worksheet.
 Include a map, schematic, or description of flow segments

Sheet flow (Applicable to T_c Only)

1. Surface description
2. Manning's roughness coeff., n
3. Flow length, L (total L ≤ 300 ft)
4. Two-yr 24-hr rainfall, P₂
5. Land slope, s

6. $T_t = \frac{0.007 (nL)^{0.8}}{(P_2)^{0.5} (s)^{0.4}}$ Compute T_t

Segment ID	SF-1		
	Dense Grass	Asphalt	
	0.24		
ft	100		
in	3.69		
ft/ft	0.010		
hr	0.292	+	0.292

Shallow concentrated flow

7. Surface description
8. Flow length, L
9. Watercourse slope, s
10. Average velocity, V

11. $T_t = \frac{L}{3600 V}$ Compute T_t

Segment ID	SC-1		
	Paved	Unpaved	
ft			
ft/ft			
ft/s			
hr			0.0000

Channel flow

12. Cross sectional flow area, a
13. Wetted perimeter, p_w
14. Hydraulic radius, $r = \frac{a}{P_w}$
15. Channel slope, s
16. Manning's roughness coeff., n

17. $V = \frac{1.49 r^{2/3} s^{1/2}}{n}$ Compute V

18. Flow length, L

19. $T_t = \frac{L}{3600 V}$ Compute T_t

Segment ID	C-1	C-2	
ft ²			
ft			
ft			
ft/ft			
ft/s			
ft			
hr		+	0.0000
			hr 0.2922

20. Watershed or subarea T_c or T_t (add T_t in steps 6, 11, and 19)

18 minutes

Worksheet 3: Time of Concentration (T_c) or Travel time (T_t)

Project Fitzgerald Field 2 By BAF Date 3/28/23
 Location Offsite Basin 1a Checked CAS Date _____
 Circle One: Present Developed _____
 Circle One: T_c T_t through subarea _____

NOTES: Space for as many as two segments per flow type can be used for each worksheet.
 Include a map, schematic, or description of flow segments

Sheet flow (Applicable to T_c Only)

1. Surface description
2. Manning's roughness coeff., n
3. Flow length, L (total $L \leq 300$ ft)
4. Two-yr 24-hr rainfall, P_2
5. Land slope, s

6. $T_t = \frac{0.007 (nL)^{0.8}}{(P_2)^{0.5} (s)^{0.4}}$ Compute T_t

Segment ID	SF-1		
	Light Underbrush		
	0.40		
ft	100		
in	3.69		
ft/ft	0.060		
hr	0.215	+	= 0.215

Shallow concentrated flow

7. Surface description
8. Flow length, L
9. Watercourse slope, s
10. Average velocity, V

11. $T_t = \frac{L}{3600 V}$ Compute T_t

Segment ID	SC-1		
	Paved	Unpaved	
ft	375.00	375.00	
ft/ft	0.0635	0.0635	
ft/s	4.06	4.06	
hr	0.0256	0.0256	= 0.0256

Channel flow

12. Cross sectional flow area, a
13. Wetted perimeter, p_w
14. Hydraulic radius, $r = \frac{a}{p_w}$
15. Channel slope, s
16. Manning's roughness coeff., n

17. $V = \frac{1.49 r^{2/3} s^{1/2}}{n}$ Compute V

18. Flow length, L

19. $T_t = \frac{L}{3600 V}$ Compute T_t

Segment ID	C-1	C-2	
ft ²			
ft			
ft			
ft/ft			
ft/s			
ft			
hr		+	= 0.0000
			hr 0.2404

20. Watershed or subarea T_c or T_t (add T_t in steps 6, 11, and 19)

14 minutes

Worksheet 3: Time of Concentration (T_c) or Travel time (T_t)

Project Fitzgerald Field 2 By BAF Date 3/28/23
 Location Offsite Basin 1b Checked CAS Date _____
 Circle One: Present Developed _____
 Circle One: T_c T_t through subarea _____

NOTES: Space for as many as two segments per flow type can be used for each worksheet.
 Include a map, schematic, or description of flow segments

Sheet flow (Applicable to T_c Only)

1. Surface description
2. Manning's roughness coeff., n
3. Flow length, L (total L ≤ 300 ft)
4. Two-yr 24-hr rainfall, P₂
5. Land slope, s

6. $T_t = \frac{0.007 (nL)^{0.8}}{(P_2)^{0.5} (s)^{0.4}}$ Compute T_t

Segment ID	SF-1			
	Dense Grass			
	0.40			
ft	100			
in	3.69			
ft/ft	0.043			
hr	0.245	+		= 0.245

Shallow concentrated flow

7. Surface description
8. Flow length, L
9. Watercourse slope, s
10. Average velocity, V

11. $T_t = \frac{L}{3600 V}$ Compute T_t

Segment ID	SC-1			
	Paved	Unpaved		
ft		1271.00		
ft/ft		0.0408		
ft/s		3.26		
hr		0.1084		= 0.1084

Channel flow

12. Cross sectional flow area, a
13. Wetted perimeter, p_w
14. Hydraulic radius, $r = \frac{a}{P_w}$
15. Channel slope, s
16. Manning's roughness coeff., n

17. $V = \frac{1.49 r^{2/3} s^{1/2}}{n}$ Compute V

18. Flow length, L

19. $T_t = \frac{L}{3600 V}$ Compute T_t

Segment ID	C-1	C-2		
ft ²				
ft				
ft				
ft/ft				
ft/s				
ft				
hr			+	= 0.0000
				hr 0.3535

20. Watershed or subarea T_c or T_t (add T_t in steps 6, 11, and 19)

21 minutes

Worksheet 3: Time of Concentration (T_c) or Travel time (T_t)

Project Fitzgerald Field 2 By BAF Date 3/28/23
 Location Offsite Basin 1c Checked CAS Date _____
 Circle One: Present Developed _____
 Circle One: T_c T_t through subarea _____

NOTES: Space for as many as two segments per flow type can be used for each worksheet.
 Include a map, schematic, or description of flow segments

Sheet flow (Applicable to T_c Only)

1. Surface description
2. Manning's roughness coeff., n
3. Flow length, L (total L ≤ 300 ft)
4. Two-yr 24-hr rainfall, P₂
5. Land slope, s

6. $T_t = \frac{0.007 (nL)^{0.8}}{(P_2)^{0.5} (s)^{0.4}}$ Compute T_t

Segment ID	SF-1		
	Dense Underbrush		
	0.80		
ft	100		
in	3.69		
ft/ft	0.101		
hr	0.304	+	= 0.304

Shallow concentrated flow

7. Surface description
8. Flow length, L
9. Watercourse slope, s
10. Average velocity, V

11. $T_t = \frac{L}{3600 V}$ Compute T_t

Segment ID	SC-1		
	Paved	Unpaved	
ft		694.00	
ft/ft		0.0883	
ft/s		4.79	
hr		0.0402	= 0.0402

Channel flow

12. Cross sectional flow area, a
13. Wetted perimeter, p_w
14. Hydraulic radius, $r = \frac{a}{P_w}$
15. Channel slope, s
16. Manning's roughness coeff., n

17. $V = \frac{1.49 r^{2/3} s^{1/2}}{n}$ Compute V

18. Flow length, L

19. $T_t = \frac{L}{3600 V}$ Compute T_t

20. Watershed or subarea T_c or T_t (add T_t in steps 6, 11, and 19)

Segment ID	C-1	C-2	
ft ²			
ft			
ft			
ft/ft			
ft/s			
ft			
hr		+	= 0.0000
			hr 0.3440

21 minutes

Worksheet 3: Time of Concentration (T_c) or Travel time (T_t)

Project Fitzgerald Field 2 By BAF Date 3/28/23
 Location Offsite Basin 1d Checked CAS Date _____
 Circle One: Present Developed _____
 Circle One: T_c T_t through subarea _____

NOTES: Space for as many as two segments per flow type can be used for each worksheet.
 Include a map, schematic, or description of flow segments

Sheet flow (Applicable to T_c Only)

1. Surface description
2. Manning's roughness coeff., n
3. Flow length, L (total $L \leq 300$ ft)
4. Two-yr 24-hr rainfall, P_2
5. Land slope, s

6. $T_t = \frac{0.007 (nL)^{0.8}}{(P_2)^{0.5} (s)^{0.4}}$ Compute T_t

Segment ID	SF-1		
	Light Underbrush		Asphalt
	0.40		
ft	100		
in	3.69		
ft/ft	0.081		
hr	0.190	+	0.190

Shallow concentrated flow

7. Surface description
8. Flow length, L
9. Watercourse slope, s
10. Average velocity, V

11. $T_t = \frac{L}{3600 V}$ Compute T_t

Segment ID	SC-1		
	Paved		Unpaved
ft	1340.81		
ft/ft	0.0463		
ft/s	3.47		
hr	0.1073		0.1073

Channel flow

12. Cross sectional flow area, a
13. Wetted perimeter, p_w
14. Hydraulic radius, $r = \frac{a}{p_w}$
15. Channel slope, s
16. Manning's roughness coeff., n

17. $V = \frac{1.49 r^{2/3} s^{1/2}}{n}$ Compute V

18. Flow length, L

19. $T_t = \frac{L}{3600 V}$ Compute T_t

20. Watershed or subarea T_c or T_t (add T_t in steps 6, 11, and 19)

Segment ID	C-1	C-2	
ft ²			
ft			
ft			
ft/ft			
ft/s			
ft			
hr	#DIV/0!	+	#DIV/0!
			#DIV/0!

#DIV/0! minutes

Worksheet 3: Time of Concentration (T_c) or Travel time (T_t)

Project Fitzgerald Field 2 By BAF Date 3/28/23
 Location Offsite Basin 1e Checked CAS Date _____
 Circle One: Present Developed _____
 Circle One: T_c T_t through subarea _____

NOTES: Space for as many as two segments per flow type can be used for each worksheet.
 Include a map, schematic, or description of flow segments

Sheet flow (Applicable to T_c Only)

1. Surface description
2. Manning's roughness coeff., n
3. Flow length, L (total L ≤ 300 ft)
4. Two-yr 24-hr rainfall, P₂
5. Land slope, s

6. $T_t = \frac{0.007 (nL)^{0.8}}{(P_2)^{0.5} (s)^{0.4}}$ Compute T_t

Segment ID	SF-1		
	Dense Grasses	Asphalt	
	0.24		
ft	100		
in	3.69		
ft/ft	0.048		
hr	0.156	+	0.156

Shallow concentrated flow

7. Surface description
8. Flow length, L
9. Watercourse slope, s
10. Average velocity, V

11. $T_t = \frac{L}{3600 V}$ Compute T_t

Segment ID	SC-1		
	Paved	Unpaved	
ft		1419.73	
ft/ft		0.037	
ft/s		3.10	
hr		0.1271	0.1271

Channel flow

12. Cross sectional flow area, a
13. Wetted perimeter, p_w
14. Hydraulic radius, $r = \frac{a}{P_w}$
15. Channel slope, s
16. Manning's roughness coeff., n

17. $V = \frac{1.49 r^{2/3} s^{1/2}}{n}$ Compute V

18. Flow length, L

19. $T_t = \frac{L}{3600 V}$ Compute T_t

20. Watershed or subarea T_c or T_t (add T_t in steps 6, 11, and 19)

Segment ID	C-1	C-2	
ft ²			
ft			
ft			
ft/ft			
ft/s			
ft			
hr			0.0000
		+	0.2832

17 minutes

Worksheet 3: Time of Concentration (T_c) or Travel time (T_t)

Project Fitzgerald Field - Phase 2 By Baf Date 3/30/23
 Location Onsite Post 1A Checked CAS Date _____
 Circle One: Present Developed
 Circle One: T_c T_t through subarea

NOTES: Space for as many as two segments per flow type can be used for each worksheet.
 Include a map, schematic, or description of flow segments

Sheet flow (Applicable to T_c Only)

1. Surface description
2. Manning's roughness coeff., n
3. Flow length, L (total $L \leq 300$ ft)
4. Two-yr 24-hr rainfall, P_2
5. Land slope, s

6. $T_t = \frac{0.007 (nL)^{0.8}}{(P_2)^{0.5} (s)^{0.4}}$

Compute T_t

Segment ID	SF-1		
	Dense Grass		
	0.24		
ft	100		
in	3.69		
ft/ft	0.011		
hr	0.281	+	= 0.281

Shallow concentrated flow

7. Surface description
8. Flow length, L
9. Watercourse slope, s
10. Average velocity, V

11. $T_t = \frac{L}{3600 V}$

Compute T_t

Segment ID	SC-1			
	Paved	Unpaved		
ft	44.00	99.00		
ft/ft	0.005	0.0094		
ft/s	1.44	1.56		
hr	0.0085	+	0.0176	= 0.0261

Channel flow

12. Cross sectional flow area, a
13. Wetted perimeter, p_w
14. Hydraulic radius, $r = \frac{a}{p_w}$
15. Channel slope, s
16. Manning's roughness coeff., n

17. $V = \frac{1.49 r^{2/3} s^{1/2}}{n}$

Compute r

Compute V

18. Flow length, L

19. $T_t = \frac{L}{3600 V}$

Compute T_t

Segment ID	C-1	C-2	
ft ²			
ft			
ft			
ft/ft			
ft/s			
ft			
hr		+	= 0.0000
			hr 0.3074

20. Watershed or subarea T_c or T_t (add T_t in steps 6, 11, and 19)

18 minutes

Worksheet 3: Time of Concentration (T_c) or Travel time (T_t)

Project Fitzgerald Field - Phase 2 By Baf Date 3/30/23
 Location Onsite Post 2A Checked CAS Date _____
 Circle One: Present Developed
 Circle One: T_c T_t through subarea _____

NOTES: Space for as many as two segments per flow type can be used for each worksheet.
 Include a map, schematic, or description of flow segments

Sheet flow (Applicable to T_c Only)

1. Surface description
2. Manning's roughness coeff., n
3. Flow length, L (total L ≤ 300 ft)
4. Two-yr 24-hr rainfall, P₂
5. Land slope, s

6. $T_t = \frac{0.007 (nL)^{0.8}}{(P_2)^{0.5} (s)^{0.4}}$ Compute T_t

Segment ID	SF-1		
	Dense Grass		
	0.24		
ft	100		
in	3.69		
ft/ft	0.014		
hr	0.255	+	= 0.255

Shallow concentrated flow

7. Surface description
8. Flow length, L
9. Watercourse slope, s
10. Average velocity, V

11. $T_t = \frac{L}{3600 V}$ Compute T_t

Segment ID	SC-1		
	Paved	Unpaved	
ft		67.00	
ft/ft		0.22	
ft/s		7.57	
hr		0.0025	= 0.0025

Channel flow

12. Cross sectional flow area, a
13. Wetted perimeter, p_w
14. Hydraulic radius, $r = \frac{a}{P_w}$ Compute r
15. Channel slope, s
16. Manning's roughness coeff., n

17. $V = \frac{1.49 r^{2/3} s^{1/2}}{n}$ Compute V

18. Flow length, L

19. $T_t = \frac{L}{3600 V}$ Compute T_t

Segment ID	C-1	C-2	
ft ²	3.140		
ft	6.28		
ft	0.50		
ft/ft	0.030		
	0.013		
ft/s	12.502		
ft	498.00		
hr	0.0111	+	= 0.0111
			hr 0.2690

20. Watershed or subarea T_c or T_t (add T_t in steps 6, 11, and 19)

16 minutes

Worksheet 3: Time of Concentration (T_c) or Travel time (T_t)

Project Fitzgerald Field - Phase 2 By Baf Date 3/30/23
 Location Onsite Post 2B - Turf Checked CAS Date _____
 Circle One: Present Developed _____
 Circle One: T_c T_t through subarea _____

NOTES: Space for as many as two segments per flow type can be used for each worksheet.
 Include a map, schematic, or description of flow segments

Sheet flow (Applicable to T_c Only)

1. Surface description
2. Manning's roughness coeff., n
3. Flow length, L (total $L \leq 300$ ft)
4. Two-yr 24-hr rainfall, P_2
5. Land slope, s

6. $T_t = \frac{0.007 (nL)^{0.8}}{(P_2)^{0.5} (s)^{0.4}}$ Compute T_t

Segment ID	SF-1			
	Dense Grass			
	0.01			
ft	100			
in	3.69			
ft/ft	0.005			
hr	0.033	+	=	0.033

Shallow concentrated flow

7. Surface description
8. Flow length, L
9. Watercourse slope, s
10. Average velocity, V

11. $T_t = \frac{L}{3600 V}$ Compute T_t

Segment ID	SC-1			
	Paved		Unpaved	
ft	462.00			
ft/ft	0.010			
ft/s	2.03			
hr	0.0631	+	=	0.0631

Channel flow

12. Cross sectional flow area, a
13. Wetted perimeter, p_w
14. Hydraulic radius, $r = \frac{a}{p_w}$ Compute r
15. Channel slope, s
16. Manning's roughness coeff., n

17. $V = \frac{1.49 r^{2/3} s^{1/2}}{n}$ Compute V

18. Flow length, L

19. $T_t = \frac{L}{3600 V}$ Compute T_t

Segment ID	C-1	C-2		
ft ²				
ft				
ft				
ft/ft				
ft/s				
ft				
hr		+	=	0.0000
				0.0959

20. Watershed or subarea T_c or T_t (add T_t in steps 6, 11, and 19)

hr

6 minutes

Worksheet 3: Time of Concentration (T_c) or Travel time (T_t)

Project Fitzgerald Field - Phase 2 By BAF Date 4/3/23
 Location Onsite Post 2C - Bypass Checked CAS Date _____
 Circle One: Present Developed
 Circle One: T_c T_t through subarea

NOTES: Space for as many as two segments per flow type can be used for each worksheet.
 Include a map, schematic, or description of flow segments

Sheet flow (Applicable to T_c Only)

1. Surface description
2. Manning's roughness coeff., n
3. Flow length, L (total L ≤ 300 ft)
4. Two-yr 24-hr rainfall, P₂
5. Land slope, s

6. $T_t = \frac{0.007 (nL)^{0.8}}{(P_2)^{0.5} (s)^{0.4}}$ Compute T_t

Segment ID	SF-1			
	Dense Grass			
	0.24			
ft	100			
in	3.69			
ft/ft	0.025			
hr	0.203	+	=	0.203

Shallow concentrated flow

7. Surface description
8. Flow length, L
9. Watercourse slope, s
10. Average velocity, V

11. $T_t = \frac{L}{3600 V}$ Compute T_t

Segment ID	SC-1			
	Paved	Unpaved		
ft		61.00		
ft/ft		0.152		
ft/s		6.29		
hr		0.0027	+	0.0027

Channel flow

12. Cross sectional flow area, a
13. Wetted perimeter, p_w
14. Hydraulic radius, $r = \frac{a}{P_w}$
15. Channel slope, s
16. Manning's roughness coeff., n

17. $V = \frac{1.49 r^{2/3} s^{1/2}}{n}$ Compute V

18. Flow length, L

19. $T_t = \frac{L}{3600 V}$ Compute T_t

20. Watershed or subarea T_c or T_t (add T_t in steps 6, 11, and 19)

Segment ID	C-1	C-2		
ft ²				
ft				
ft				
ft/ft				
ft/s				
ft				
hr			+	0.0000
			=	0.2056

12 minutes

Worksheet 3: Time of Concentration (T_c) or Travel time (T_t)

Project Fitzgerald Field - Phase 2 By Baf Date 3/30/23
 Location Onsite Post 3A Checked CAS Date _____
 Circle One: Present Developed
 Circle One: T_c T_t through subarea _____

NOTES: Space for as many as two segments per flow type can be used for each worksheet.
 Include a map, schematic, or description of flow segments

Sheet flow (Applicable to T_c Only)

1. Surface description
2. Manning's roughness coeff., n
3. Flow length, L (total L ≤ 300 ft)
4. Two-yr 24-hr rainfall, P₂
5. Land slope, s

6. $T_t = \frac{0.007 (nL)^{0.8}}{(P_2)^{0.5} (s)^{0.4}}$ Compute T_t

Segment ID	SF-1	
	Dense Grass	Asphalt
	0.24	0.01
ft	38.32	61.78
in	3.69	3.69
ft/ft	0.031	0.05
hr	0.086	0.009
	+	= 0.095

Shallow concentrated flow

7. Surface description
8. Flow length, L
9. Watercourse slope, s
10. Average velocity, V

11. $T_t = \frac{L}{3600 V}$ Compute T_t

Segment ID	SC-1	
	Paved	Unpaved
ft	247.50	
ft/ft	0.054	
ft/s	4.72	
hr	0.0146	= 0.0146

Channel flow

12. Cross sectional flow area, a
13. Wetted perimeter, p_w
14. Hydraulic radius, $r = \frac{a}{P_w}$ Compute r
15. Channel slope, s
16. Manning's roughness coeff., n

17. $V = \frac{1.49 r^{2/3} s^{1/2}}{n}$ Compute V

18. Flow length, L

19. $T_t = \frac{L}{3600 V}$ Compute T_t

20. Watershed or subarea T_c or T_t (add T_t in steps 6, 11, and 19)

Segment ID	C-1	C-2
ft ²		
ft		
ft		
ft/ft		
ft/s		
ft		
hr		= 0.0000
	+	= 0.1097 hr

7 minutes

Worksheet 3: Time of Concentration (T_c) or Travel time (T_t)

Project Fitzgerald Field - Phase 2 By BAF Date 3/30/23
 Location Onsite Post 3C - Bypass Checked CAS Date _____
 Circle One: Present Developed _____
 Circle One: T_c T_t through subarea _____

NOTES: Space for as many as two segments per flow type can be used for each worksheet.
 Include a map, schematic, or description of flow segments

Sheet flow (Applicable to T_c Only)

1. Surface description
2. Manning's roughness coeff., n
3. Flow length, L (total L ≤ 300 ft)
4. Two-yr 24-hr rainfall, P₂
5. Land slope, s

6. $T_t = \frac{0.007 (nL)^{0.8}}{(P_2)^{0.5} (s)^{0.4}}$ Compute T_t

Segment ID	SF-1		
	Dense Grass		
	0.24		
ft	100		
in	3.69		
ft/ft	0.009		
hr	0.312	+	= 0.312

Shallow concentrated flow

7. Surface description
8. Flow length, L
9. Watercourse slope, s
10. Average velocity, V

11. $T_t = \frac{L}{3600 V}$ Compute T_t

Segment ID	SC-1		
	Paved	Unpaved	
ft			
ft/ft			
ft/s	0.00	0.00	
hr		+	= 0.0000

Channel flow

12. Cross sectional flow area, a
13. Wetted perimeter, p_w
14. Hydraulic radius, $r = \frac{a}{P_w}$
15. Channel slope, s
16. Manning's roughness coeff., n

17. $V = \frac{1.49 r^{2/3} s^{1/2}}{n}$ Compute V

18. Flow length, L

19. $T_t = \frac{L}{3600 V}$ Compute T_t

Segment ID	C-1	C-2	
ft ²			
ft			
ft		#DIV/0!	
ft/ft			
ft/s		#DIV/0!	
ft			
hr		+	= 0.0000
			hr 0.3119

20. Watershed or subarea T_c or T_t (add T_t in steps 6, 11, and 19)

19 minutes

Worksheet 3: Time of Concentration (T_c) or Travel time (T_t)

Project _____ By Baf Date _____
 Location _____ Checked _____ Date _____
 Circle One: Present Developed _____
 Circle One: T_c T_t through subarea _____

NOTES: Space for as many as two segments per flow type can be used for each worksheet.
 Include a map, schematic, or description of flow segments

Sheet flow (Applicable to T_c Only)

1. Surface description
2. Manning's roughness coeff., n
3. Flow length, L (total L ≤ 300 ft)
4. Two-yr 24-hr rainfall, P₂
5. Land slope, s

6. $T_t = \frac{0.007 (nL)^{0.8}}{(P_2)^{0.5} (s)^{0.4}}$ Compute T_t

Segment ID	SF-1		
	Dense Grass	Asphalt	
	0.24	0.01	
ft			
in	3.69	3.69	
ft/ft			
hr	#DIV/0!	+	#DIV/0! = #DIV/0!

Shallow concentrated flow

7. Surface description
8. Flow length, L
9. Watercourse slope, s
10. Average velocity, V

11. $T_t = \frac{L}{3600 V}$ Compute T_t

Segment ID	SC-1		
	Paved	Unpaved	
ft			
ft/ft			
ft/s	0.00	0.00	
hr	#DIV/0!	+	#DIV/0! = #DIV/0!

Channel flow

12. Cross sectional flow area, a
13. Wetted perimeter, p_w
14. Hydraulic radius, $r = \frac{a}{P_w}$
15. Channel slope, s
16. Manning's roughness coeff., n

17. $V = \frac{1.49 r^{2/3} s^{1/2}}{n}$ Compute V

18. Flow length, L

19. $T_t = \frac{L}{3600 V}$ Compute T_t

20. Watershed or subarea T_c or T_t (add T_t in steps 6, 11, and 19)

Segment ID	C-1	C-2	
ft ²	19.230		
ft	10.99		
ft	1.75	#DIV/0!	
ft/ft			
	0.023		
ft/s	0.000	#DIV/0!	
ft			
hr	#DIV/0!	+	#DIV/0! = #DIV/0!
			hr #DIV/0!

#DIV/0! minutes

APPENDIX D

Hydrograph Return Period Recap

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

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	-----	7.482	10.22	-----	15.27	19.95	27.32	33.55	40.13	OFFSITE 1A
2	Reservoir	1	6.958	9.546	-----	14.21	17.30	21.90	24.86	27.54	ROUTE - OFFSITE 1A
3	SCS Runoff	-----	17.80	24.61	-----	37.21	48.86	66.89	82.28	98.66	OFFSITE 1B
4	Combine	2, 3	24.67	33.96	-----	51.11	66.16	88.79	107.00	125.67	ROUTE 1A +OFFSITE 1B
5	Reservoir	4	19.80	28.46	-----	42.66	56.30	73.67	85.69	95.16	ROUTE OFFSITE 1B
6	SCS Runoff	-----	6.859	9.487	-----	14.34	18.83	25.78	31.71	38.03	OFFSITE 1C
7	Combine	5, 6	25.79	36.93	-----	55.54	72.93	95.93	112.87	127.02	ROUTE 1B + OFFSITE 1C
8	Reservoir	7	25.62	36.22	-----	54.76	70.86	90.93	105.24	120.72	ROUTE OFFSITE 1C
9	SCS Runoff	-----	25.61	35.23	-----	52.97	69.36	94.97	116.81	139.92	PRE OFFSITE 1D
10	SCS Runoff	-----	7.497	9.735	-----	13.78	17.50	23.16	27.87	32.79	PRE OFFSITE 1E
11	Combine	8, 9, 10	53.10	74.45	-----	111.82	145.14	193.03	230.73	267.37	ROUTE 1C +OFFSITE 1D +1E
12	Reservoir	11	33.04	42.60	-----	88.55	126.37	173.30	210.24	247.19	PREROUTE- OFFSITE SP2
13	SCS Runoff	-----	0.798	1.211	-----	2.004	2.755	3.938	4.955	6.061	OFFSITE 2
14	SCS Runoff	-----	5.823	7.679	-----	11.07	14.21	19.02	23.04	27.26	ON-SITE PRE 1
15	SCS Runoff	-----	2.972	4.405	-----	7.119	9.675	13.69	17.14	20.88	ON-SITE PRE 2
16	SCS Runoff	-----	4.951	6.164	-----	8.295	10.18	12.99	15.29	17.67	ON-SITE PRE 3
17	Combine	12, 13, 14, 15, 16	41.27	49.97	-----	102.16	148.00	207.31	254.75	302.10	PRE-DEVELOPMENT - SP1
19	SCS Runoff	-----	5.490	7.130	-----	10.09	12.82	16.96	20.41	24.01	ONSITE POST 1A
20	SCS Runoff	-----	0.242	0.358	-----	0.575	0.780	1.101	1.375	1.667	ONSITE POST 1B - BYPASS
21	SCS Runoff	-----	0.025	0.050	-----	0.104	0.157	0.243	0.318	0.400	ONSITE POST 1C - BYPASS
23	SCS Runoff	-----	2.836	3.739	-----	5.388	6.919	9.260	11.22	13.28	ONSITE POST 2A
24	SCS Runoff	-----	3.748	4.721	-----	6.441	7.993	10.37	12.33	14.36	ONSITE POST 2B - TURF
25	SCS Runoff	-----	0.567	0.874	-----	1.456	2.008	2.879	3.628	4.430	ONSITE POST 2C - BYPASS
26	SCS Runoff	-----	0.010	0.020	-----	0.042	0.063	0.097	0.127	0.160	ONSITE POST 2D - BYPASS
28	SCS Runoff	-----	6.127	7.118	-----	8.787	10.21	12.29	13.95	15.66	ONSITE POST 3A
29	SCS Runoff	-----	0.015	0.030	-----	0.062	0.094	0.146	0.191	0.240	ONSITE POST 3B - BYPASS
30	SCS Runoff	-----	0.848	1.205	-----	1.872	2.494	3.461	4.301	5.193	ONSITE POST 3C
31	SCS Runoff	-----	0.022	0.040	-----	0.075	0.109	0.163	0.210	0.261	ONSITE POST 3D - BYPASS
33	Combine	11, 21, 26, 29, 31, 33	53.12	74.48	-----	111.88	145.22	193.16	230.89	267.57	POST OFFSITE 1D
34	Reservoir	33	33.05	42.67	-----	88.67	126.55	173.53	210.49	247.48	ROUTE-POST OFFSITE SP2
36	Combine	13, 19,	6.288	8.341	-----	12.08	15.53	20.88	25.36	30.08	POST - ONSITE 1

Hydrograph Return Period Recap

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

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	
37	Combine	23, 24, 28, 30,	12.51	15.53	-----	20.88	25.66	32.85	38.80	44.99	POST - ONSITE 2+3
39	Combine	20, 25, 34, 36, 37,	39.92	48.40	-----	100.64	144.99	201.58	247.07	292.76	POST DEVELOPMENT - SP1

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	7.482	2	724	23,439	-----	-----	-----	OFFSITE 1A
2	Reservoir	6.958	2	726	23,437	1	1051.16	1,375	ROUTE - OFFSITE 1A
3	SCS Runoff	17.80	2	728	71,242	-----	-----	-----	OFFSITE 1B
4	Combine	24.67	2	728	94,679	2, 3	-----	-----	ROUTE 1A +OFFSITE 1B
5	Reservoir	19.80	2	734	94,672	4	1027.58	11,561	ROUTE OFFSITE 1B
6	SCS Runoff	6.859	2	728	27,460	-----	-----	-----	OFFSITE 1C
7	Combine	25.79	2	734	122,132	5, 6	-----	-----	ROUTE 1B + OFFSITE 1C
8	Reservoir	25.62	2	734	122,131	7	1015.82	2,487	ROUTE OFFSITE 1C
9	SCS Runoff	25.61	2	726	91,317	-----	-----	-----	PRE OFFSITE 1D
10	SCS Runoff	7.497	2	726	24,811	-----	-----	-----	PRE OFFSITE 1E
11	Combine	53.10	2	730	238,259	8, 9, 10	-----	-----	ROUTE 1C +OFFSITE 1D +1E
12	Reservoir	33.04	2	744	238,252	11	1012.40	30,567	PREROUTE- OFFSITE SP2
13	SCS Runoff	0.798	2	726	3,340	-----	-----	-----	OFFSITE 2
14	SCS Runoff	5.823	2	724	17,462	-----	-----	-----	ON-SITE PRE 1
15	SCS Runoff	2.972	2	726	11,927	-----	-----	-----	ON-SITE PRE 2
16	SCS Runoff	4.951	2	724	15,737	-----	-----	-----	ON-SITE PRE 3
17	Combine	41.27	2	730	286,718	12, 13, 14, 15, 16	-----	-----	PRE-DEVELOPMENT - SP1
19	SCS Runoff	5.490	2	726	18,170	-----	-----	-----	ONSITE POST 1A
20	SCS Runoff	0.242	2	718	557	-----	-----	-----	ONSITE POST 1B - BYPASS
21	SCS Runoff	0.025	2	720	92	-----	-----	-----	ONSITE POST 1C - BYPASS
23	SCS Runoff	2.836	2	724	8,503	-----	-----	-----	ONSITE POST 2A
24	SCS Runoff	3.748	2	718	7,498	-----	-----	-----	ONSITE POST 2B - TURF
25	SCS Runoff	0.567	2	722	1,933	-----	-----	-----	ONSITE POST 2C - BYPASS
26	SCS Runoff	0.010	2	720	37	-----	-----	-----	ONSITE POST 2D - BYPASS
28	SCS Runoff	6.127	2	718	14,426	-----	-----	-----	ONSITE POST 3A
29	SCS Runoff	0.015	2	720	55	-----	-----	-----	ONSITE POST 3B - BYPASS
30	SCS Runoff	0.848	2	726	3,178	-----	-----	-----	ONSITE POST 3C
31	SCS Runoff	0.022	2	718	68	-----	-----	-----	ONSITE POST 3D - BYPASS
33	Combine	53.12	2	730	238,512	11, 21, 26, 29, 31, 33	-----	-----	POST OFFSITE 1D
34	Reservoir	33.05	2	744	238,505	33	1012.41	30,597	ROUTE-POST OFFSITE SP2
36	Combine	6.288	2	726	21,510	13, 19,	-----	-----	POST - ONSITE 1
Fitzgerald Field.gpw					Return Period: 1 Year			Monday, 05 / 8 / 2023	

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

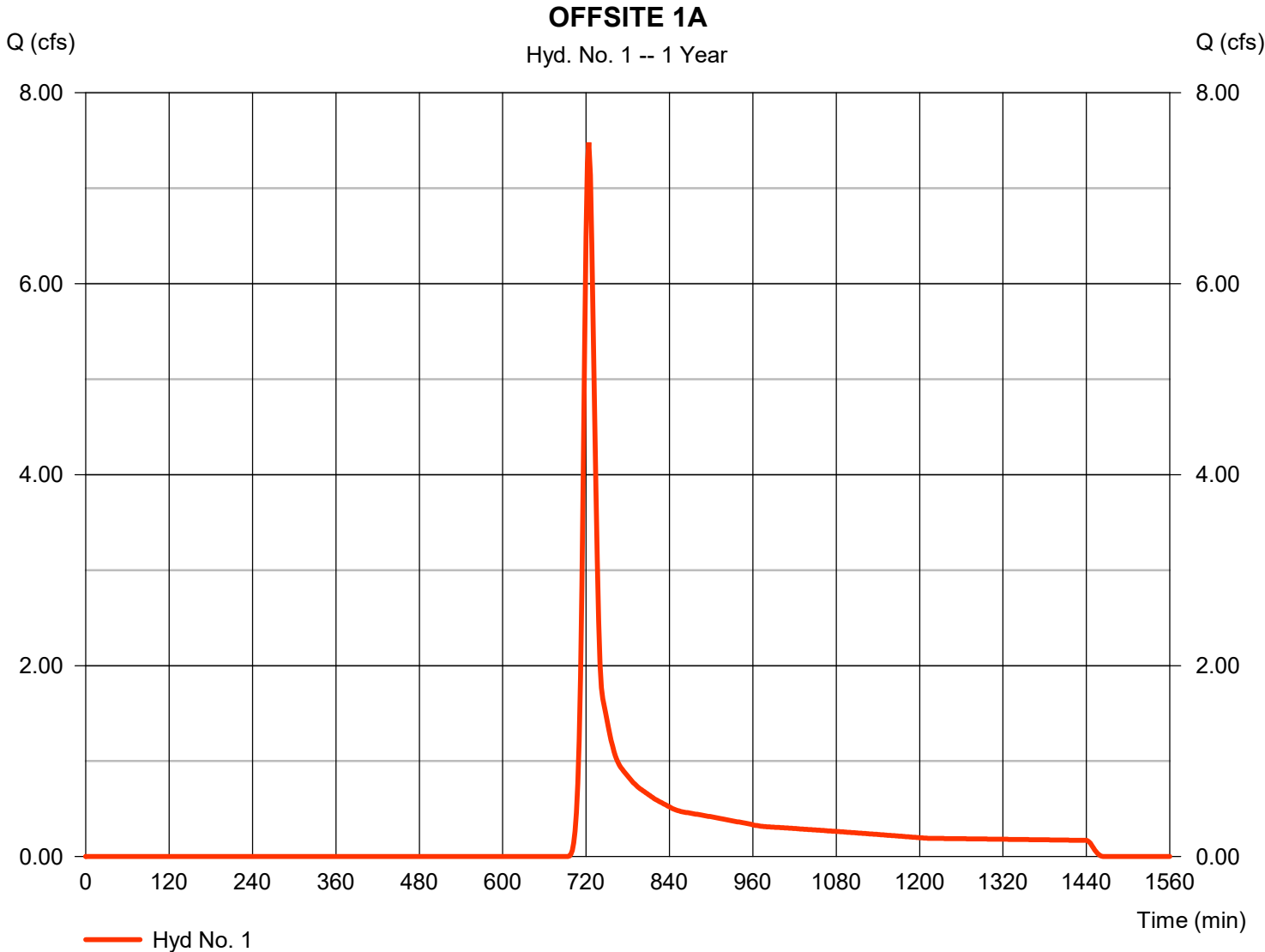
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description	
37	Combine	12.51	2	718	33,605	23, 24, 28, 30,	-----	-----	POST - ONSITE 2+3	
39	Combine	39.92	2	730	296,110	20, 25, 34, 36, 37,	-----	-----	POST DEVELOPMENT - SP1	
Fitzgerald Field.gpw					Return Period: 1 Year			Monday, 05 / 8 / 2023		

Hydrograph Report

Hyd. No. 1

OFFSITE 1A

Hydrograph type	= SCS Runoff	Peak discharge	= 7.482 cfs
Storm frequency	= 1 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 23,439 cuft
Drainage area	= 8.590 ac	Curve number	= 68
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 14.00 min
Total precip.	= 3.27 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

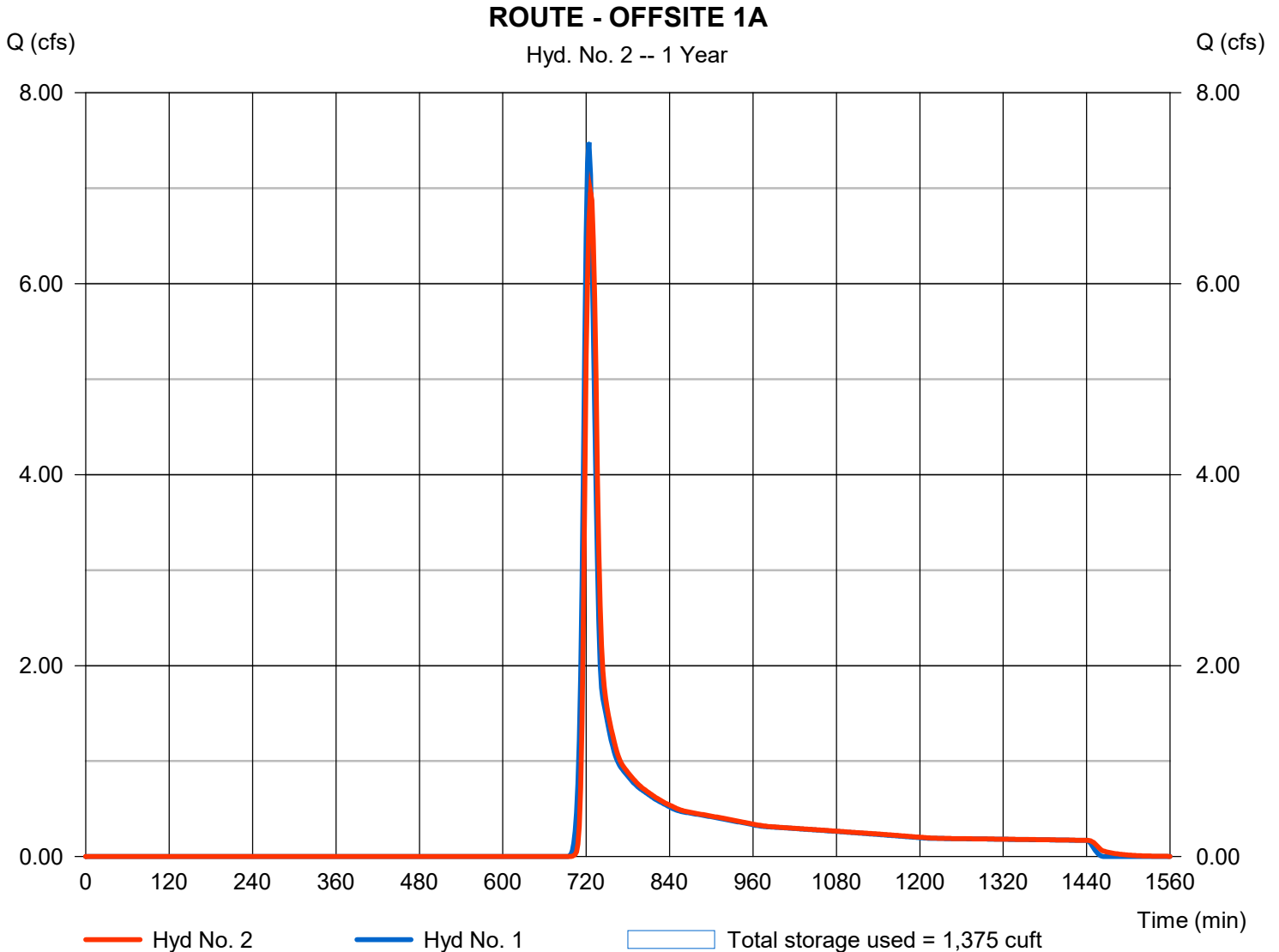
Monday, 05 / 8 / 2023

Hyd. No. 2

ROUTE - OFFSITE 1A

Hydrograph type	= Reservoir	Peak discharge	= 6.958 cfs
Storm frequency	= 1 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 23,437 cuft
Inflow hyd. No.	= 1 - OFFSITE 1A	Max. Elevation	= 1051.16 ft
Reservoir name	= OFFSITE 1A	Max. Storage	= 1,375 cuft

Storage Indication method used.

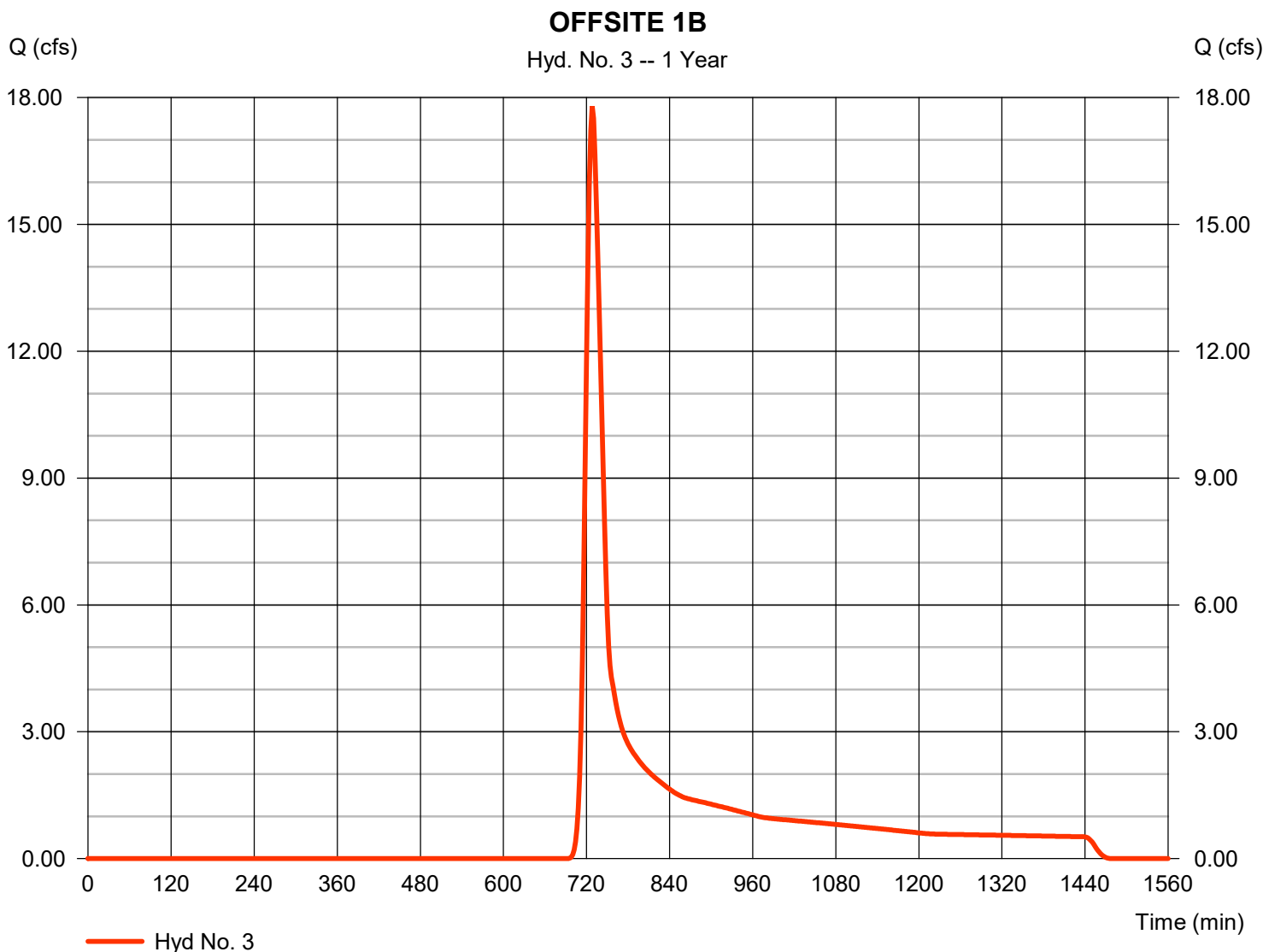


Hydrograph Report

Hyd. No. 3

OFFSITE 1B

Hydrograph type	= SCS Runoff	Peak discharge	= 17.80 cfs
Storm frequency	= 1 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 71,242 cuft
Drainage area	= 25.010 ac	Curve number	= 68
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 21.00 min
Total precip.	= 3.27 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

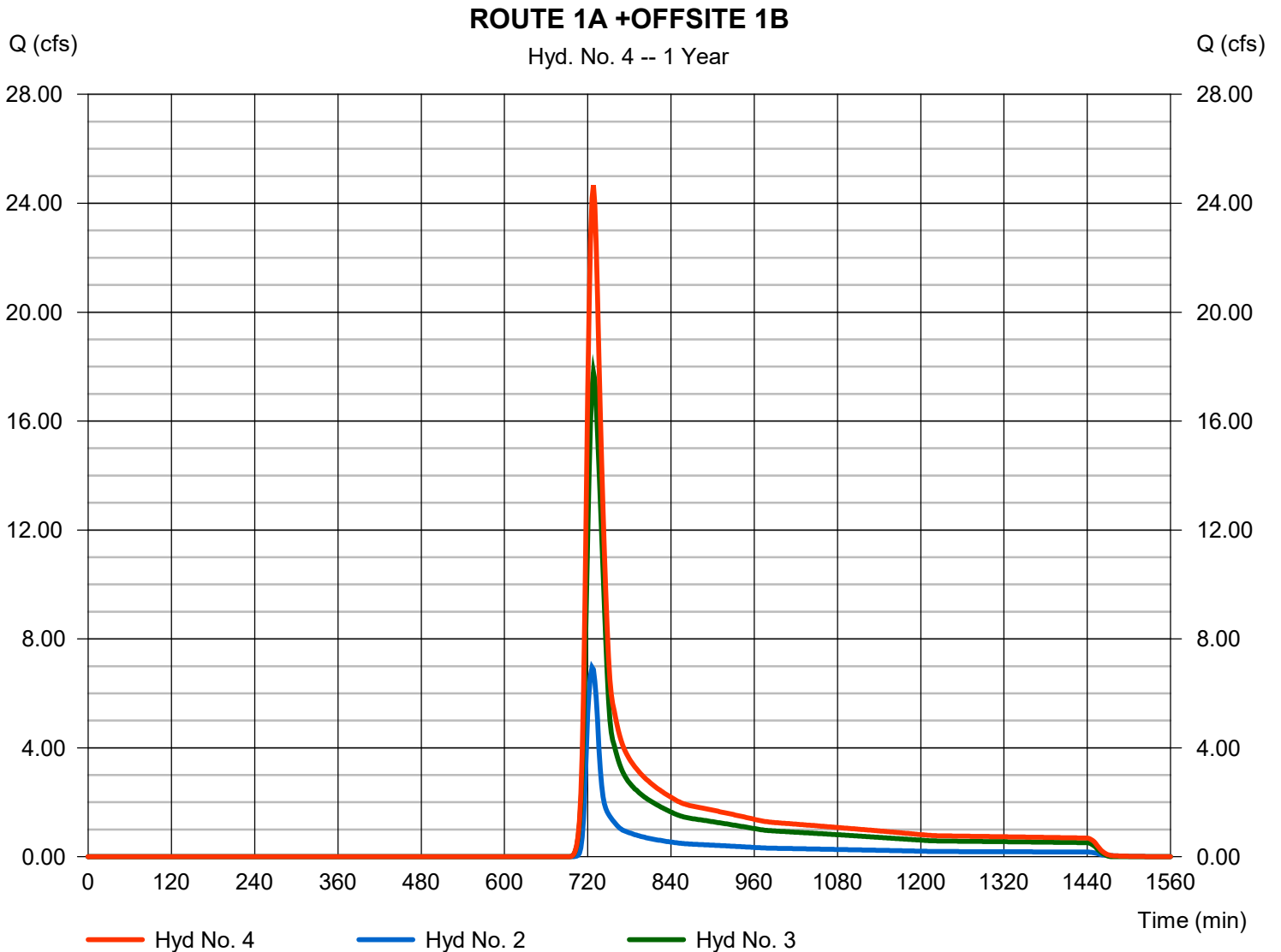
Monday, 05 / 8 / 2023

Hyd. No. 4

ROUTE 1A +OFFSITE 1B

Hydrograph type = Combine
Storm frequency = 1 yrs
Time interval = 2 min
Inflow hyds. = 2, 3

Peak discharge = 24.67 cfs
Time to peak = 728 min
Hyd. volume = 94,679 cuft
Contrib. drain. area = 25.010 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

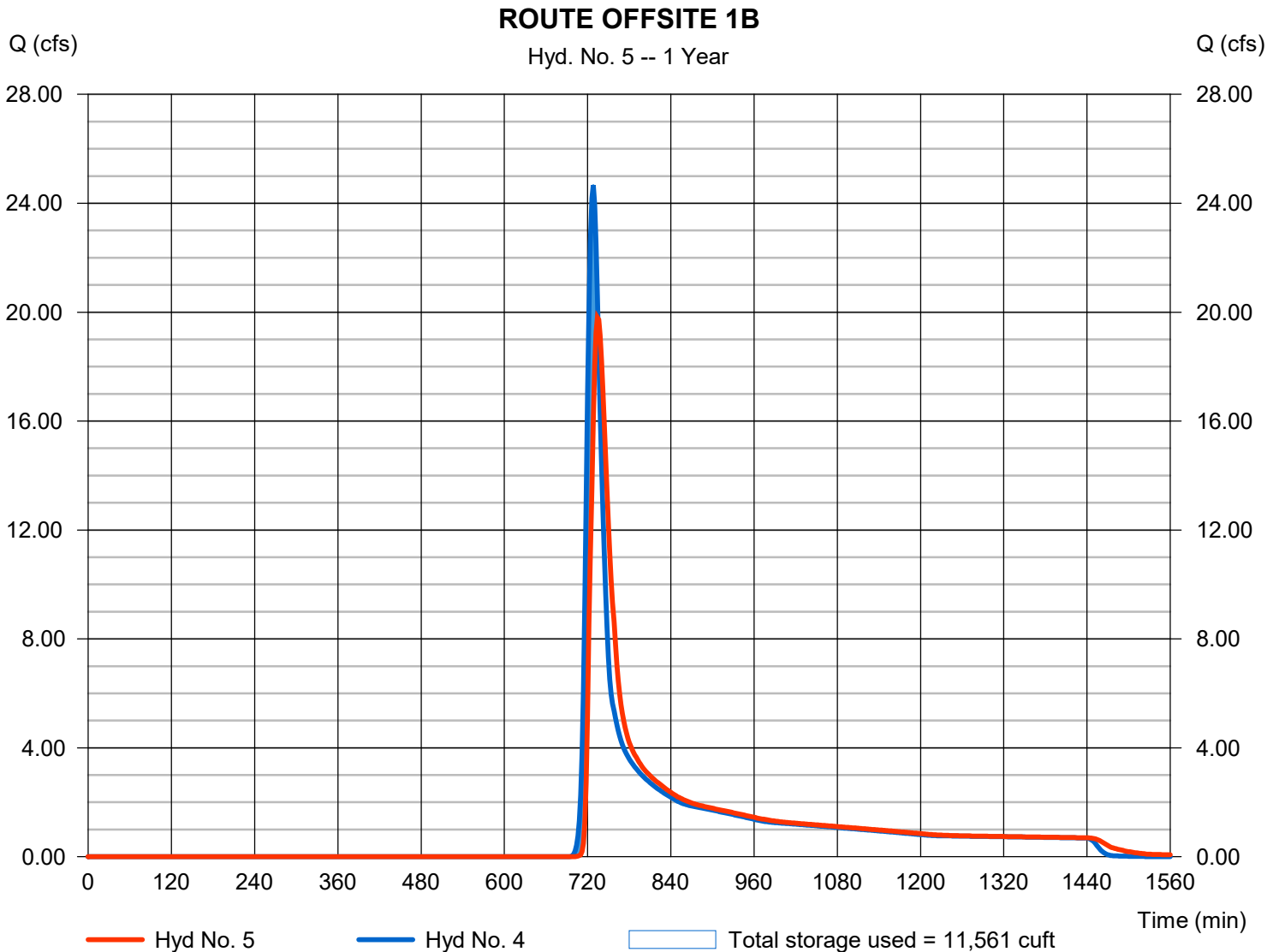
Monday, 05 / 8 / 2023

Hyd. No. 5

ROUTE OFFSITE 1B

Hydrograph type	= Reservoir	Peak discharge	= 19.80 cfs
Storm frequency	= 1 yrs	Time to peak	= 734 min
Time interval	= 2 min	Hyd. volume	= 94,672 cuft
Inflow hyd. No.	= 4 - ROUTE 1A +OFFSITE 1B	Max. Elevation	= 1027.58 ft
Reservoir name	= OFFSITE 1B	Max. Storage	= 11,561 cuft

Storage Indication method used.

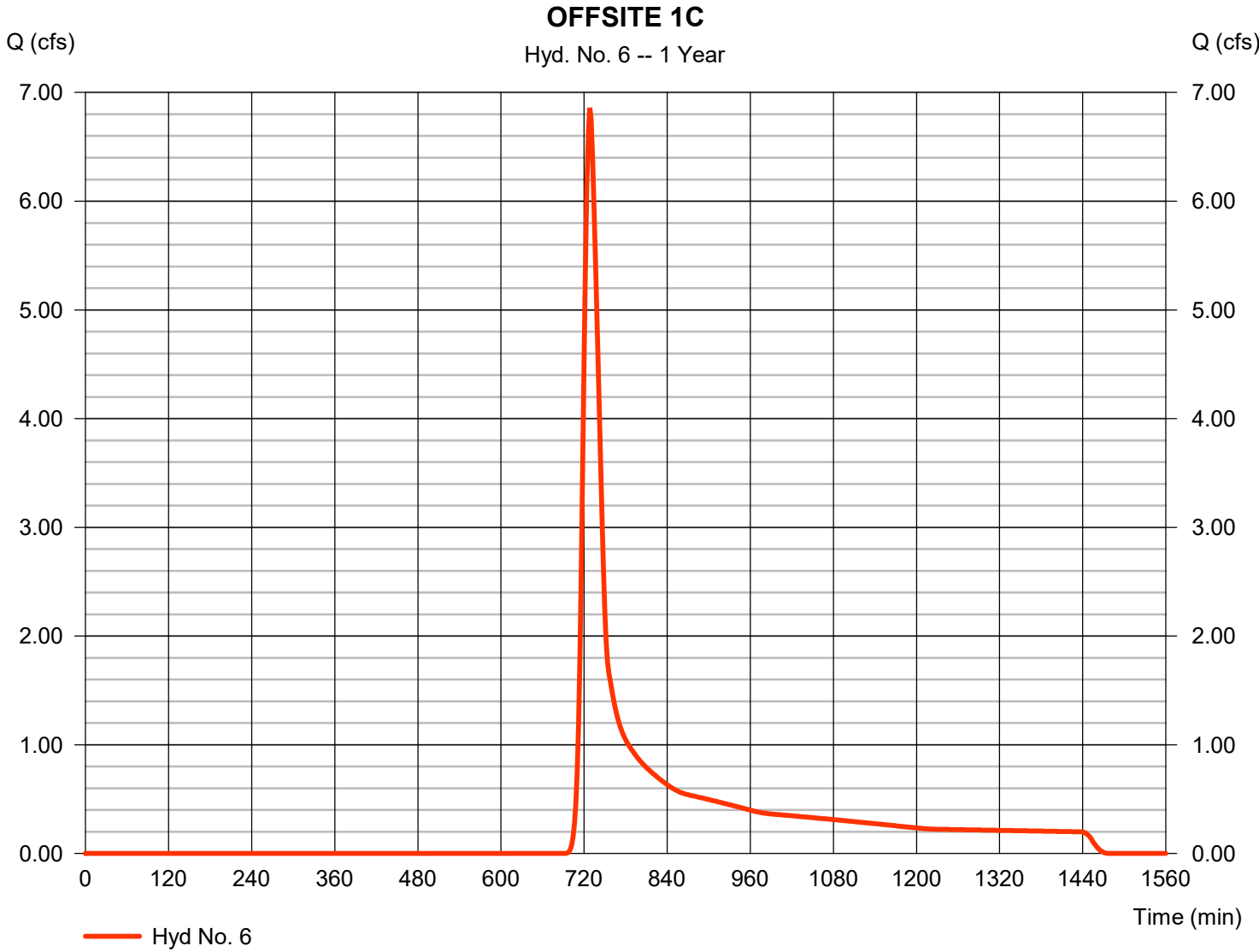


Hydrograph Report

Hyd. No. 6

OFFSITE 1C

Hydrograph type	= SCS Runoff	Peak discharge	= 6.859 cfs
Storm frequency	= 1 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 27,460 cuft
Drainage area	= 9.640 ac	Curve number	= 68
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 21.00 min
Total precip.	= 3.27 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



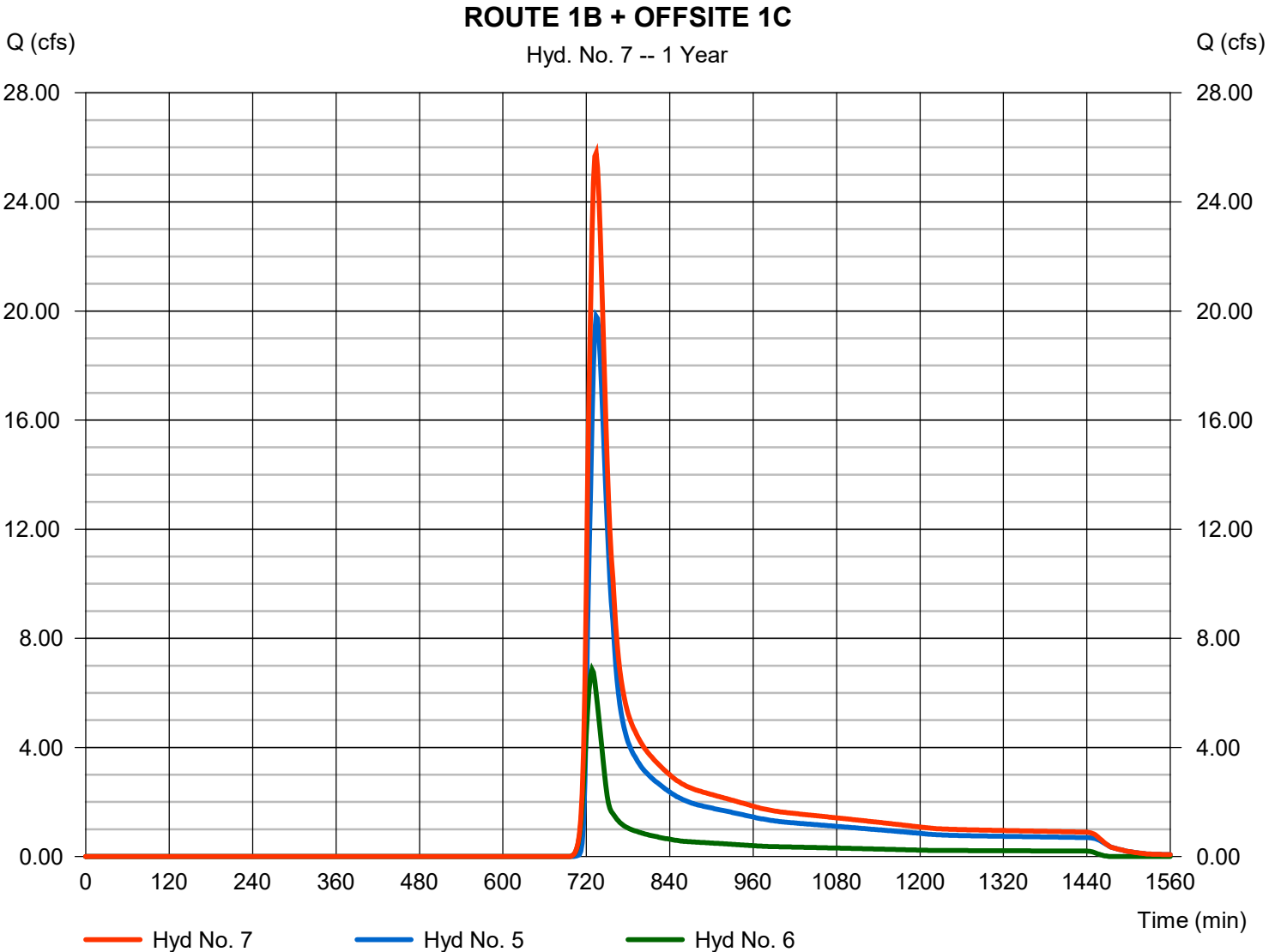
Hydrograph Report

Hyd. No. 7

ROUTE 1B + OFFSITE 1C

Hydrograph type = Combine
Storm frequency = 1 yrs
Time interval = 2 min
Inflow hyds. = 5, 6

Peak discharge = 25.79 cfs
Time to peak = 734 min
Hyd. volume = 122,132 cuft
Contrib. drain. area = 9.640 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

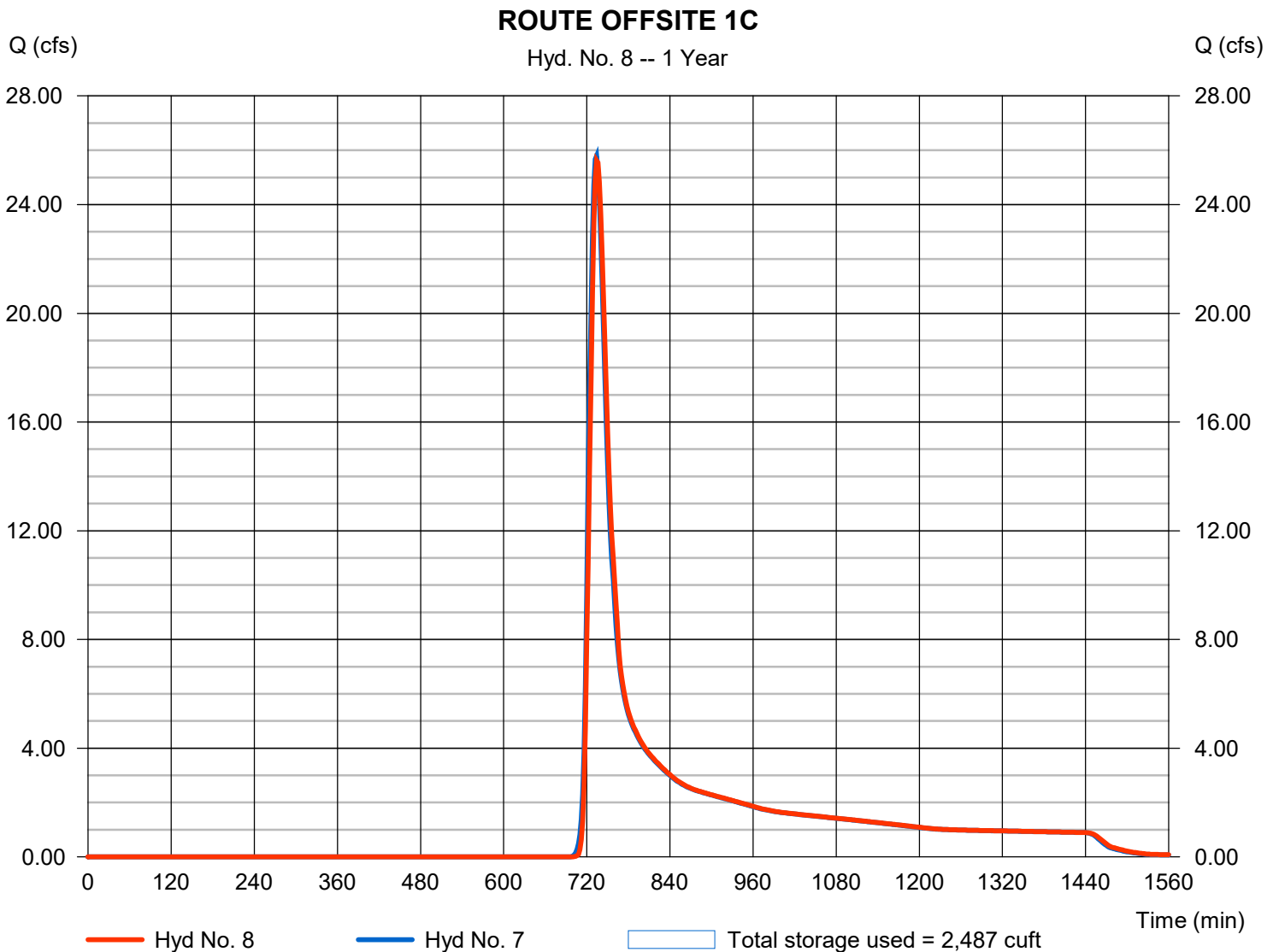
Monday, 05 / 8 / 2023

Hyd. No. 8

ROUTE OFFSITE 1C

Hydrograph type	= Reservoir	Peak discharge	= 25.62 cfs
Storm frequency	= 1 yrs	Time to peak	= 734 min
Time interval	= 2 min	Hyd. volume	= 122,131 cuft
Inflow hyd. No.	= 7 - ROUTE 1B + OFFSITE 1C	Max. Elevation	= 1015.82 ft
Reservoir name	= OFFSITE 1C	Max. Storage	= 2,487 cuft

Storage Indication method used.

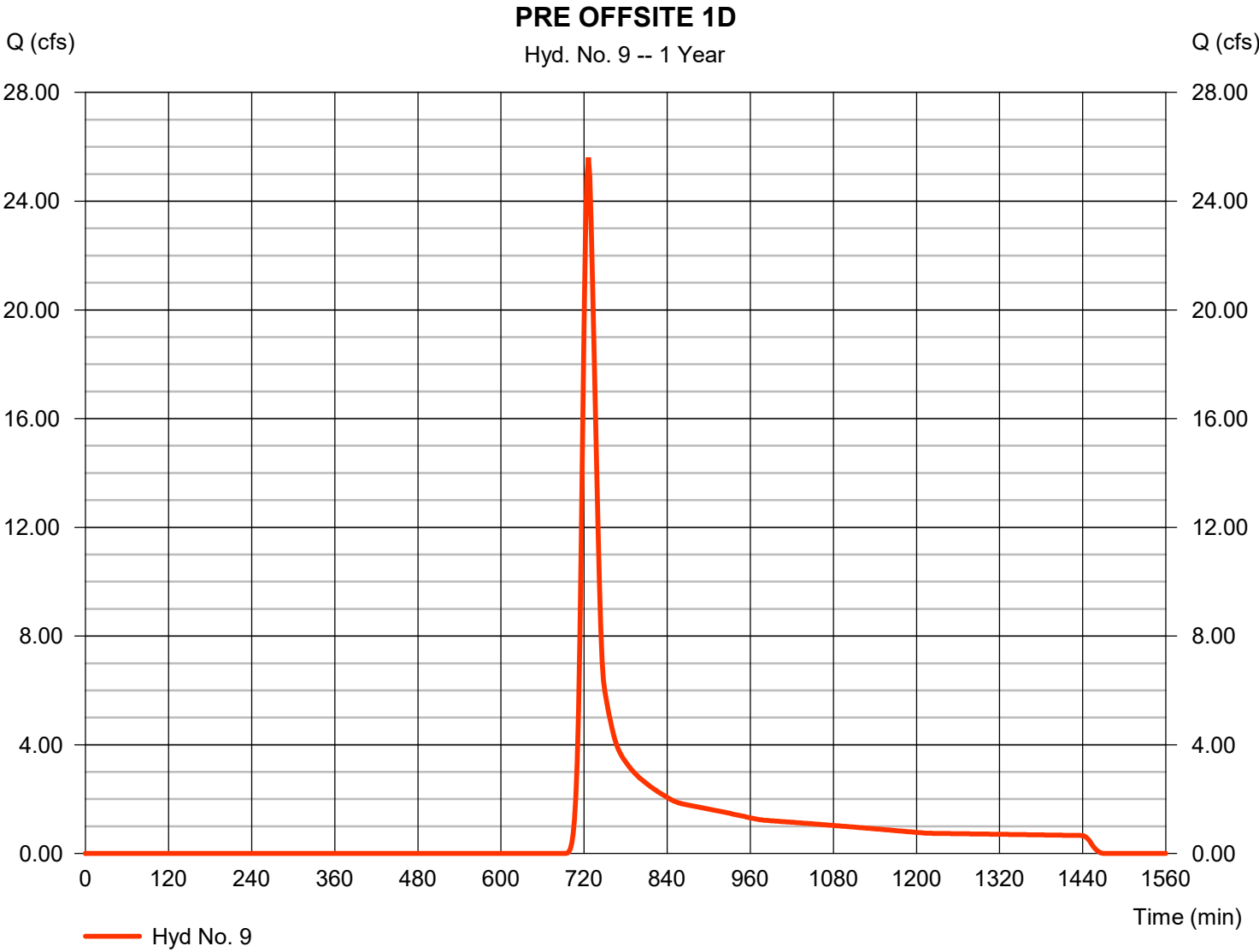


Hydrograph Report

Hyd. No. 9

PRE OFFSITE 1D

Hydrograph type	= SCS Runoff	Peak discharge	= 25.61 cfs
Storm frequency	= 1 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 91,317 cuft
Drainage area	= 32.630 ac	Curve number	= 68
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 18.00 min
Total precip.	= 3.27 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

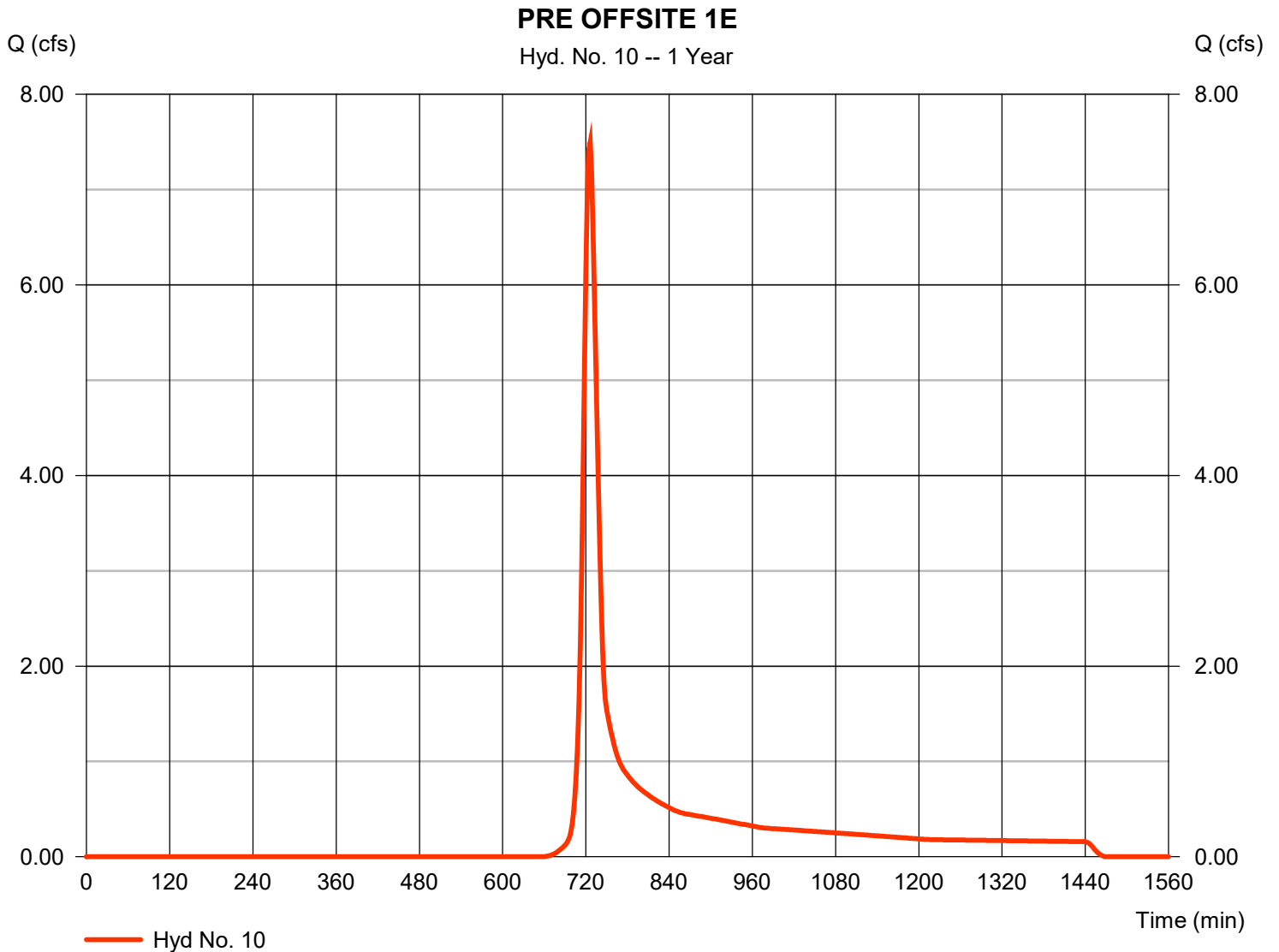
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 10

PRE OFFSITE 1E

Hydrograph type	= SCS Runoff	Peak discharge	= 7.497 cfs
Storm frequency	= 1 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 24,811 cuft
Drainage area	= 6.650 ac	Curve number	= 73
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 17.00 min
Total precip.	= 3.27 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

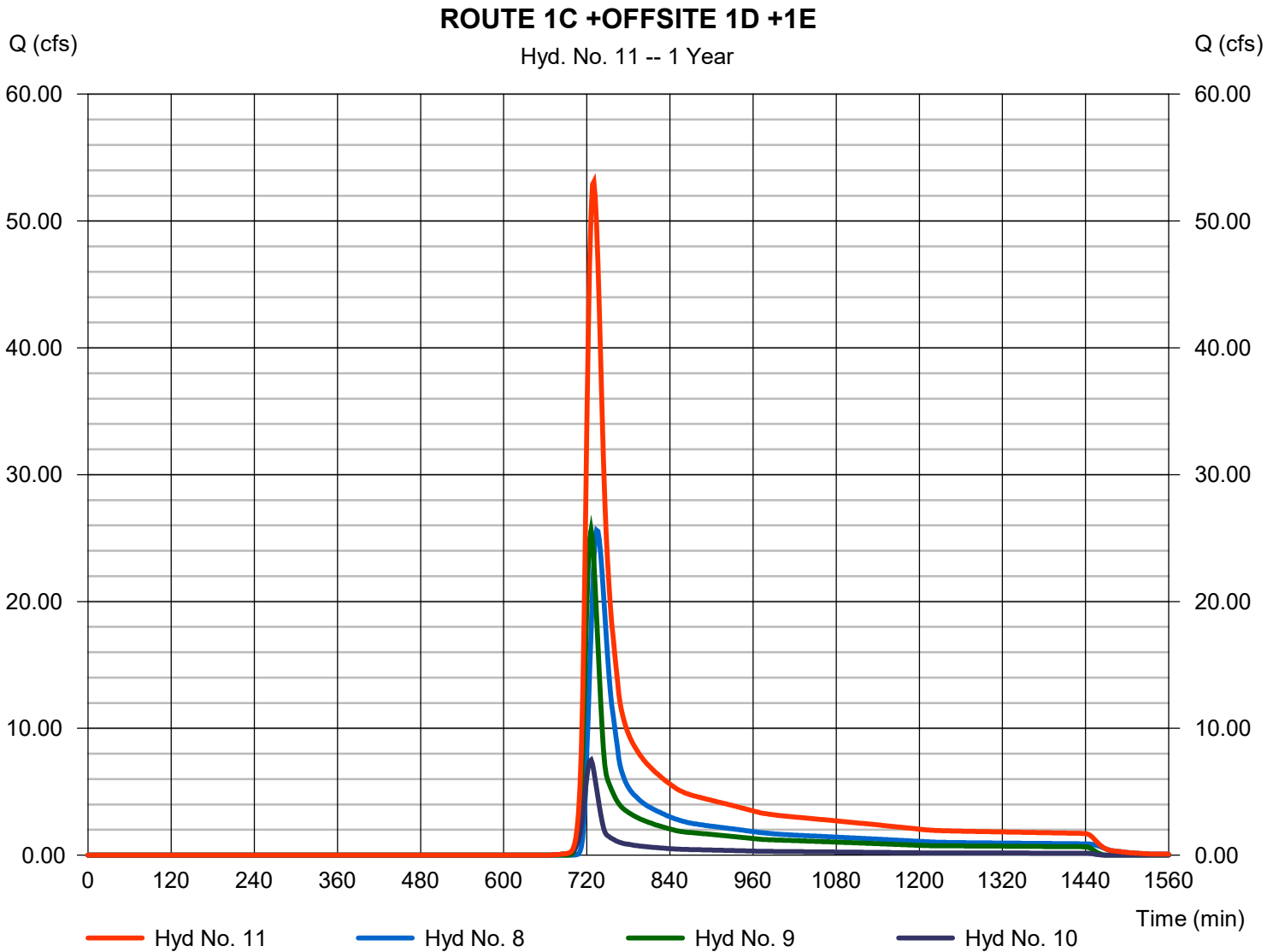
Monday, 05 / 8 / 2023

Hyd. No. 11

ROUTE 1C +OFFSITE 1D +1E

Hydrograph type = Combine
Storm frequency = 1 yrs
Time interval = 2 min
Inflow hyds. = 8, 9, 10

Peak discharge = 53.10 cfs
Time to peak = 730 min
Hyd. volume = 238,259 cuft
Contrib. drain. area = 39.280 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

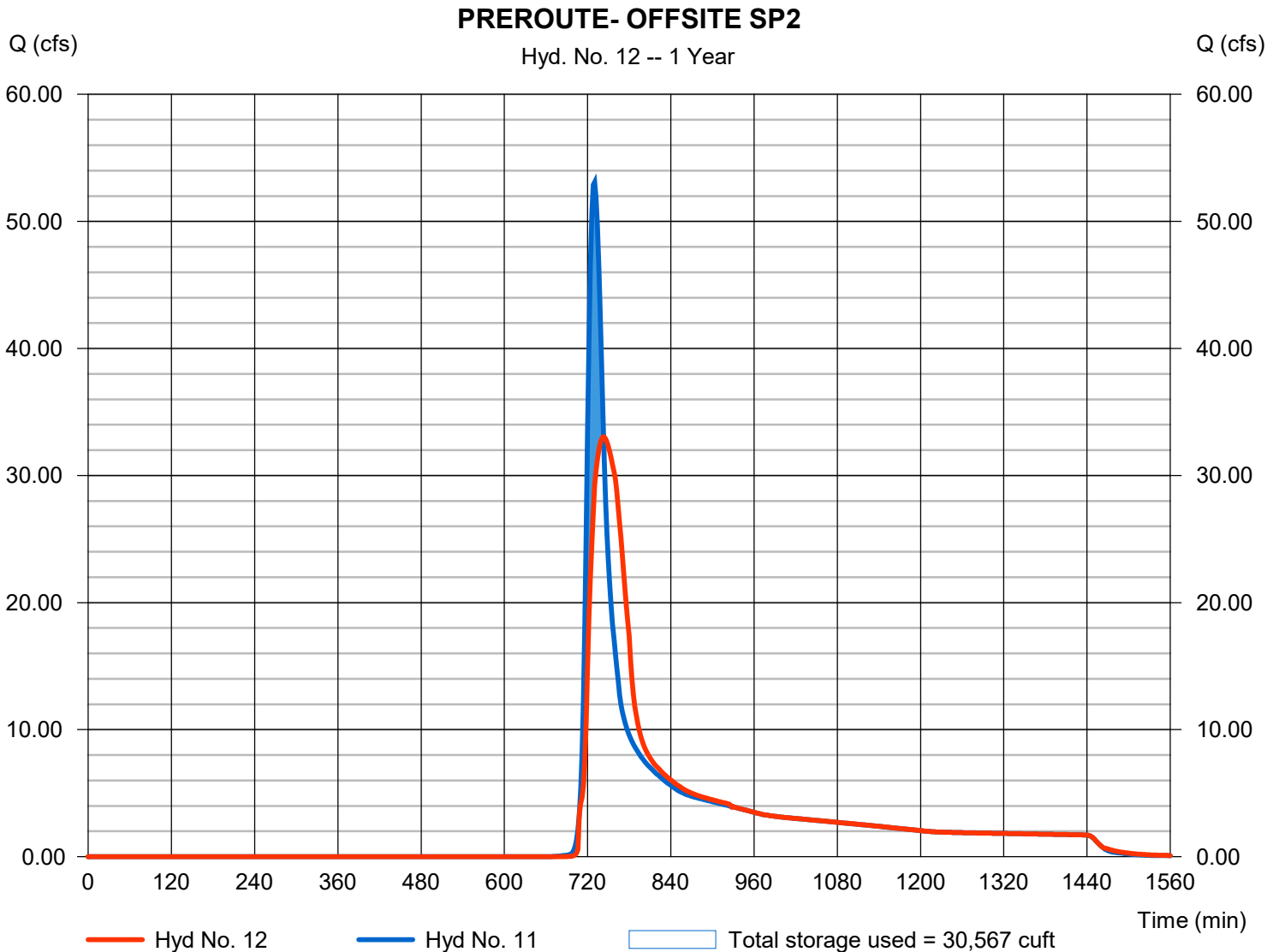
Monday, 05 / 8 / 2023

Hyd. No. 12

PREROUTE- OFFSITE SP2

Hydrograph type	= Reservoir	Peak discharge	= 33.04 cfs
Storm frequency	= 1 yrs	Time to peak	= 744 min
Time interval	= 2 min	Hyd. volume	= 238,252 cuft
Inflow hyd. No.	= 11 - ROUTE 1C +OFFSITE 1D	Max Elevation	= 1012.40 ft
Reservoir name	= OFFSITE 1D	Max. Storage	= 30,567 cuft

Storage Indication method used.



Hydrograph Report

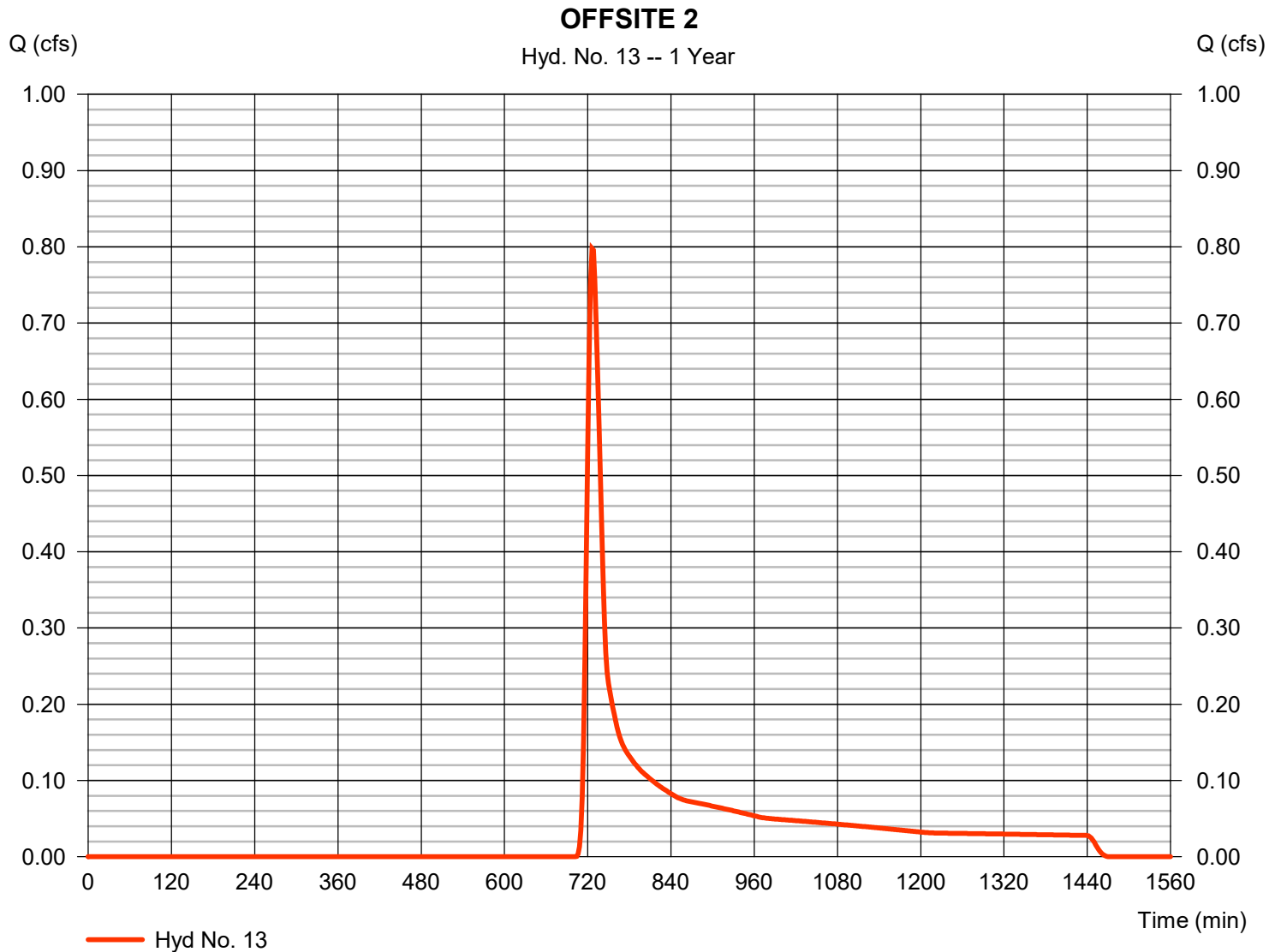
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 13

OFFSITE 2

Hydrograph type	= SCS Runoff	Peak discharge	= 0.798 cfs
Storm frequency	= 1 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 3,340 cuft
Drainage area	= 1.670 ac	Curve number	= 63
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 18.00 min
Total precip.	= 3.27 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

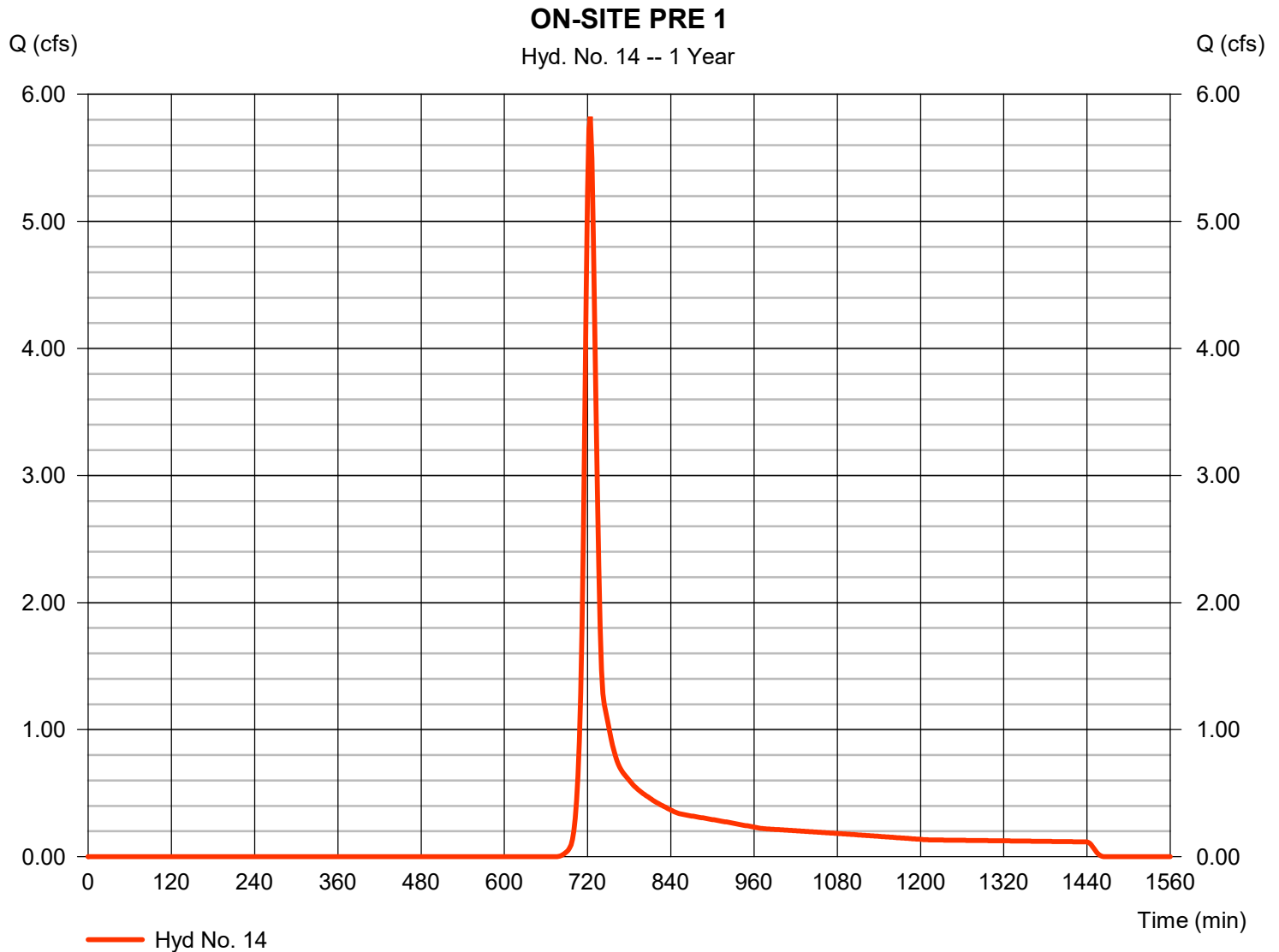


Hydrograph Report

Hyd. No. 14

ON-SITE PRE 1

Hydrograph type	= SCS Runoff	Peak discharge	= 5.823 cfs
Storm frequency	= 1 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 17,462 cuft
Drainage area	= 5.360 ac	Curve number	= 71
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 16.00 min
Total precip.	= 3.27 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

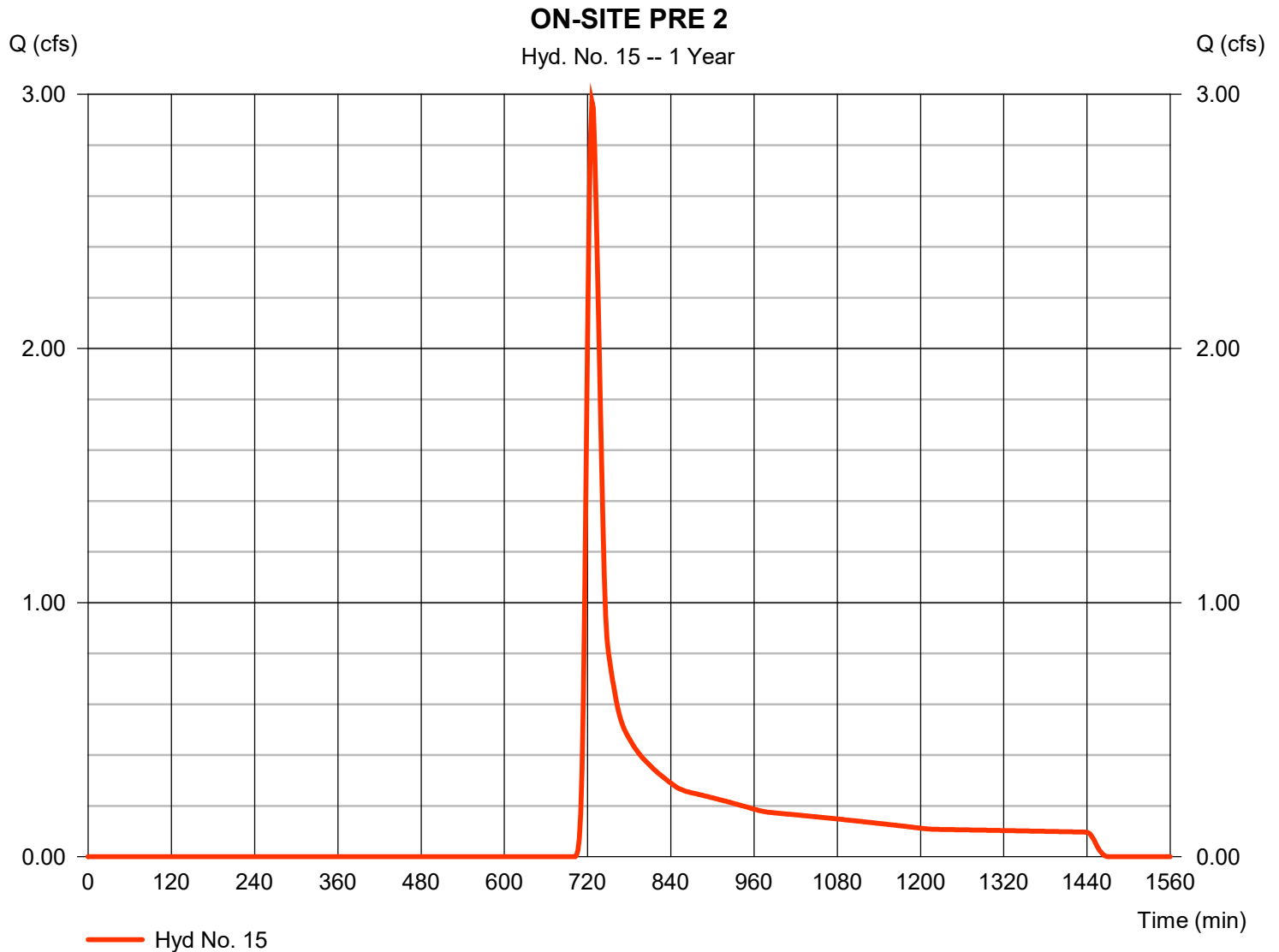


Hydrograph Report

Hyd. No. 15

ON-SITE PRE 2

Hydrograph type	= SCS Runoff	Peak discharge	= 2.972 cfs
Storm frequency	= 1 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 11,927 cuft
Drainage area	= 5.550 ac	Curve number	= 64
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 17.00 min
Total precip.	= 3.27 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

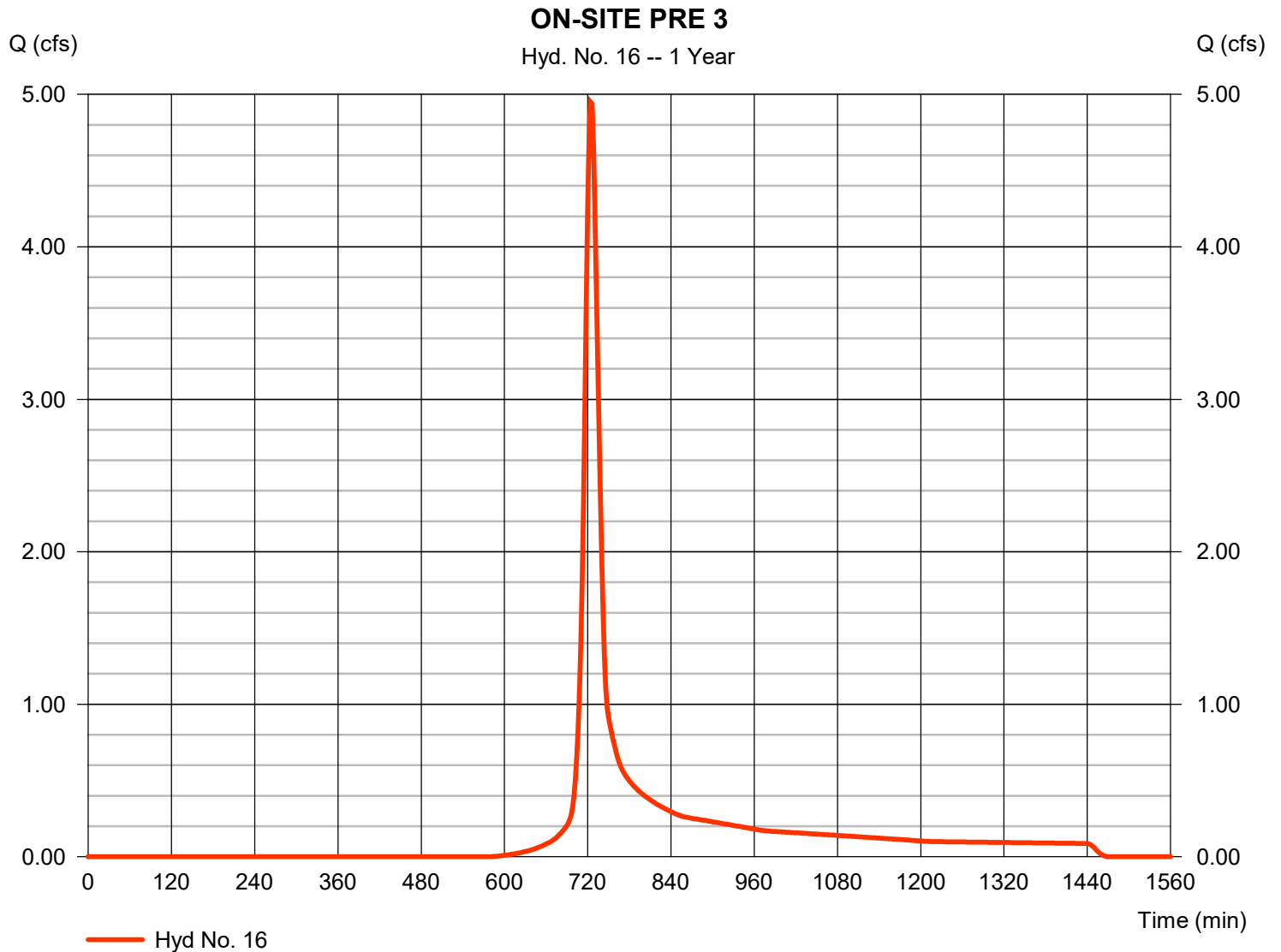


Hydrograph Report

Hyd. No. 16

ON-SITE PRE 3

Hydrograph type	= SCS Runoff	Peak discharge	= 4.951 cfs
Storm frequency	= 1 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 15,737 cuft
Drainage area	= 3.120 ac	Curve number	= 79
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 18.00 min
Total precip.	= 3.27 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

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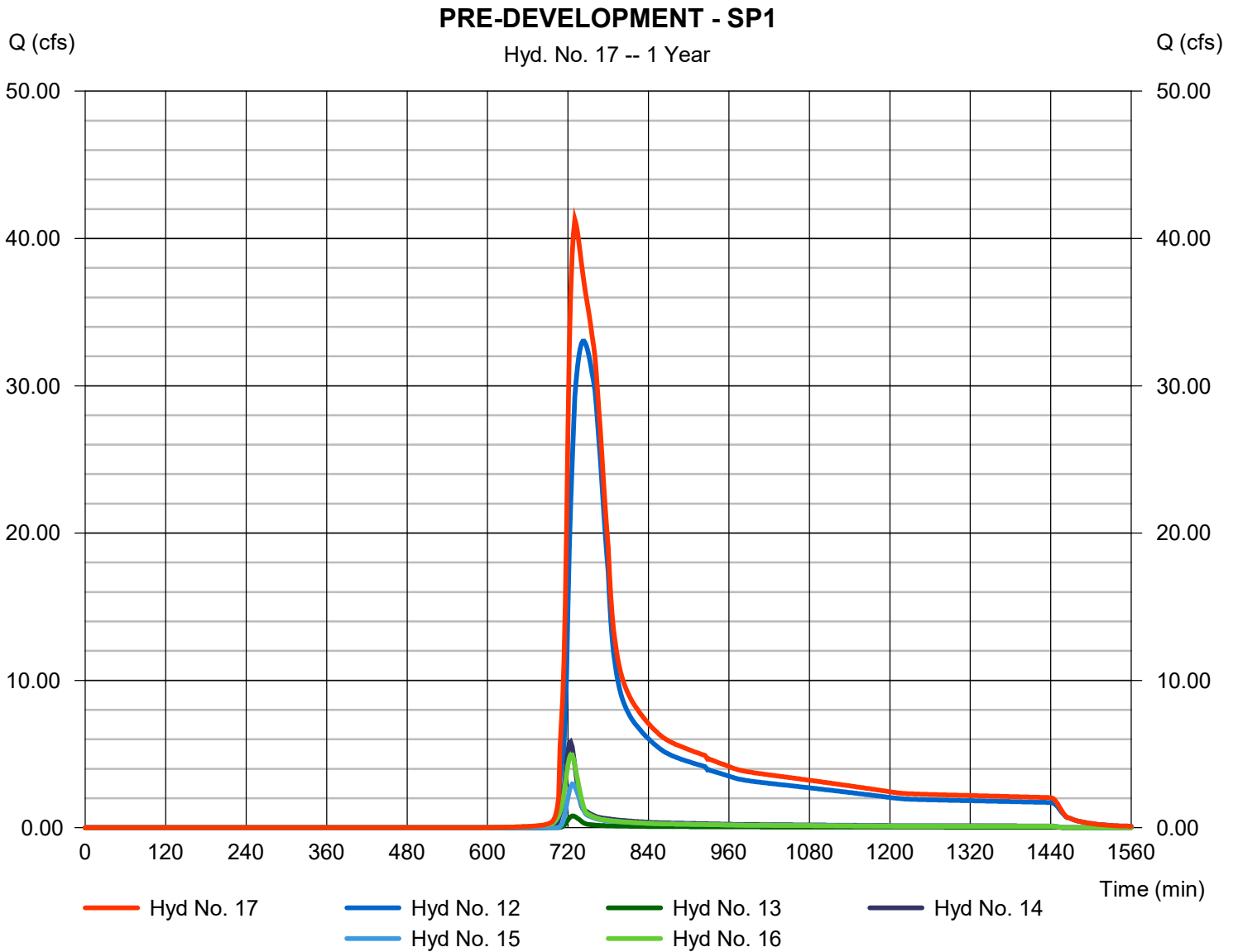
Monday, 05 / 8 / 2023

Hyd. No. 17

PRE-DEVELOPMENT - SP1

Hydrograph type = Combine
Storm frequency = 1 yrs
Time interval = 2 min
Inflow hyds. = 12, 13, 14, 15, 16

Peak discharge = 41.27 cfs
Time to peak = 730 min
Hyd. volume = 286,718 cuft
Contrib. drain. area = 15.700 ac

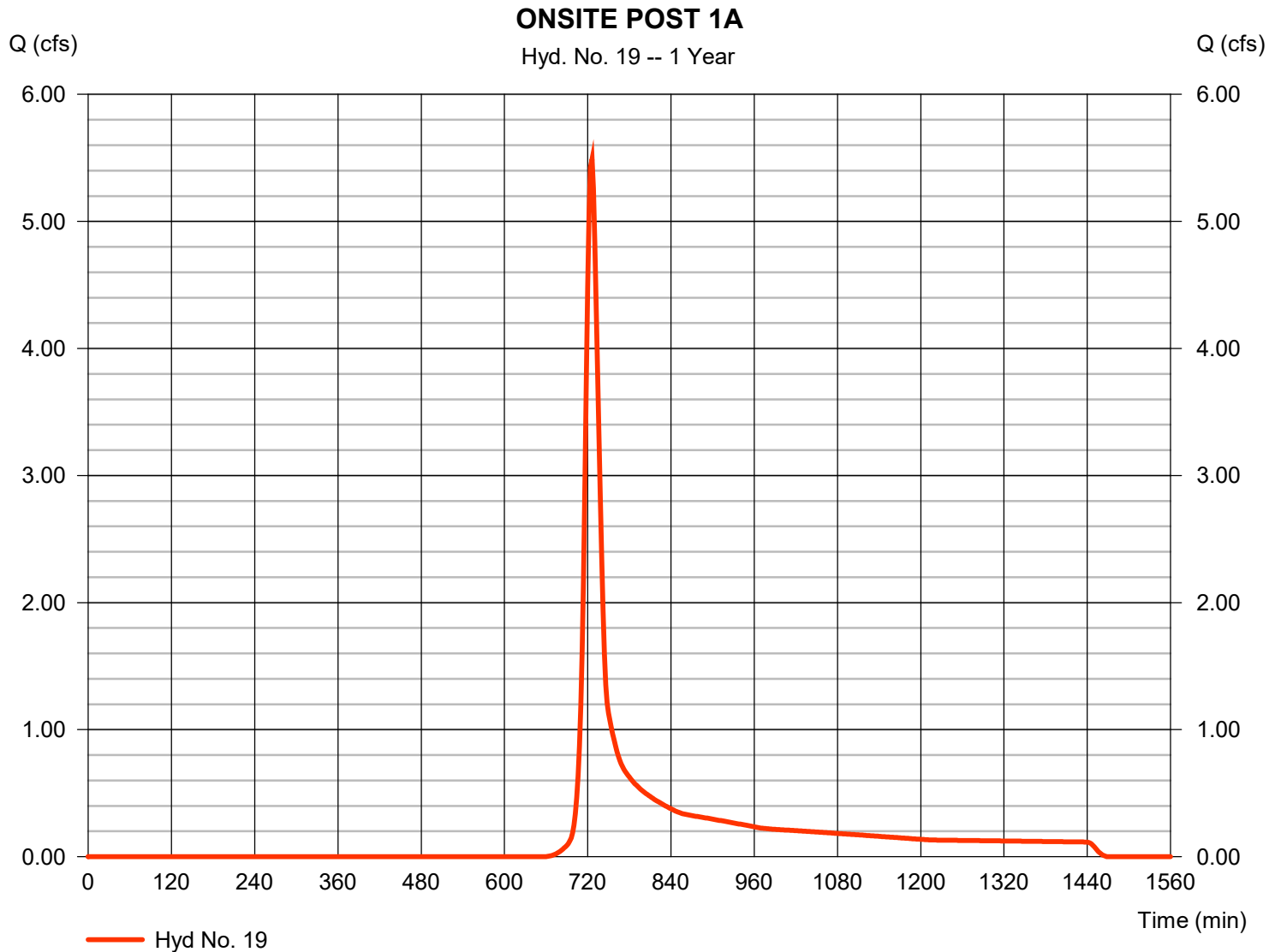


Hydrograph Report

Hyd. No. 19

ONSITE POST 1A

Hydrograph type	= SCS Runoff	Peak discharge	= 5.490 cfs
Storm frequency	= 1 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 18,170 cuft
Drainage area	= 4.870 ac	Curve number	= 73
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 18.00 min
Total precip.	= 3.27 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

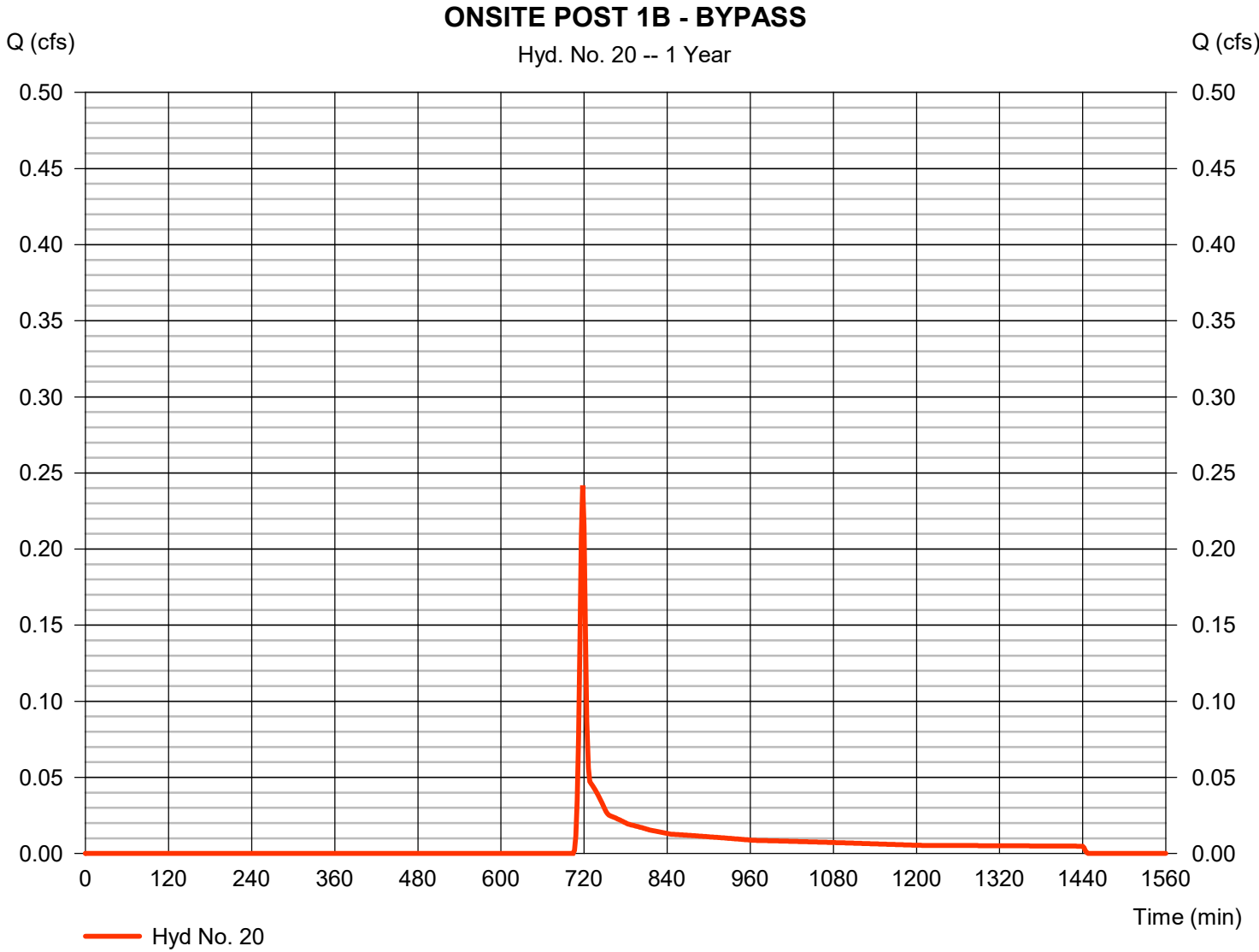


Hydrograph Report

Hyd. No. 20

ONSITE POST 1B - BYPASS

Hydrograph type	= SCS Runoff	Peak discharge	= 0.242 cfs
Storm frequency	= 1 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 557 cuft
Drainage area	= 0.320 ac	Curve number	= 62
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.27 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

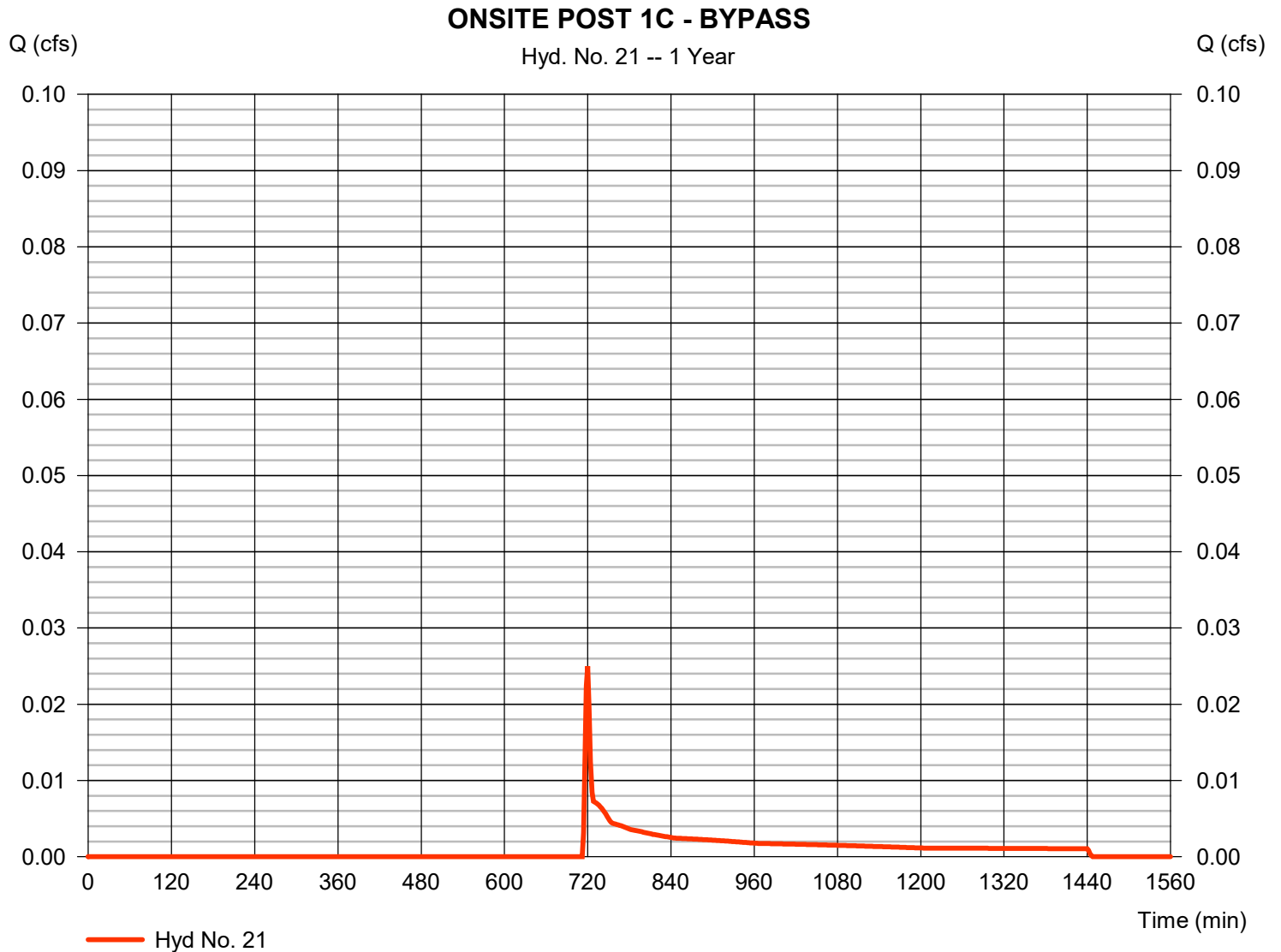
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Monday, 05 / 8 / 2023

Hyd. No. 21

ONSITE POST 1C - BYPASS

Hydrograph type	= SCS Runoff	Peak discharge	= 0.025 cfs
Storm frequency	= 1 yrs	Time to peak	= 720 min
Time interval	= 2 min	Hyd. volume	= 92 cuft
Drainage area	= 0.100 ac	Curve number	= 55
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.27 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

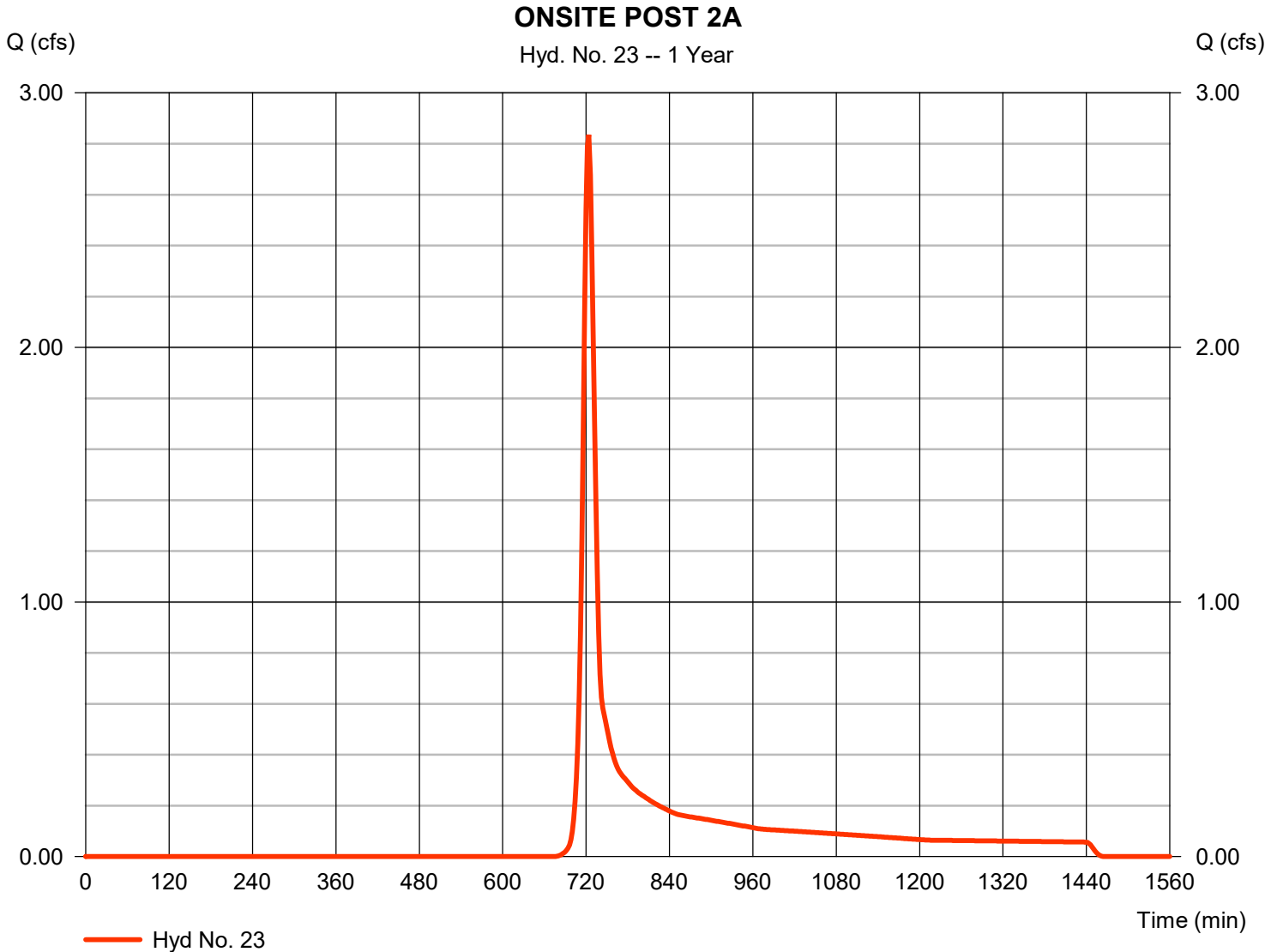


Hydrograph Report

Hyd. No. 23

ONSITE POST 2A

Hydrograph type	= SCS Runoff	Peak discharge	= 2.836 cfs
Storm frequency	= 1 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 8,503 cuft
Drainage area	= 2.610 ac	Curve number	= 71
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 16.00 min
Total precip.	= 3.27 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

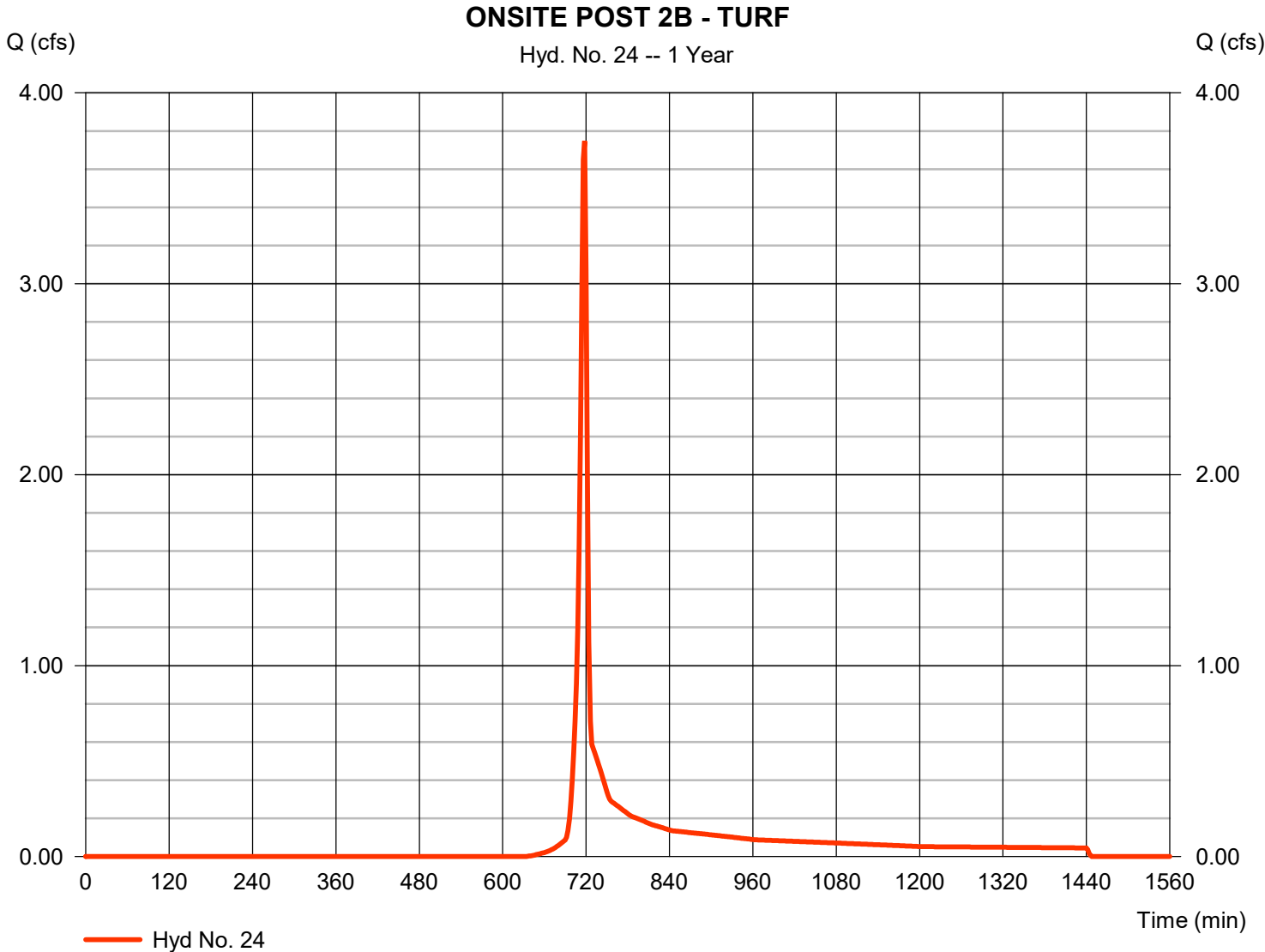


Hydrograph Report

Hyd. No. 24

ONSITE POST 2B - TURF

Hydrograph type	= SCS Runoff	Peak discharge	= 3.748 cfs
Storm frequency	= 1 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 7,498 cuft
Drainage area	= 1.930 ac	Curve number	= 75
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 3.27 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

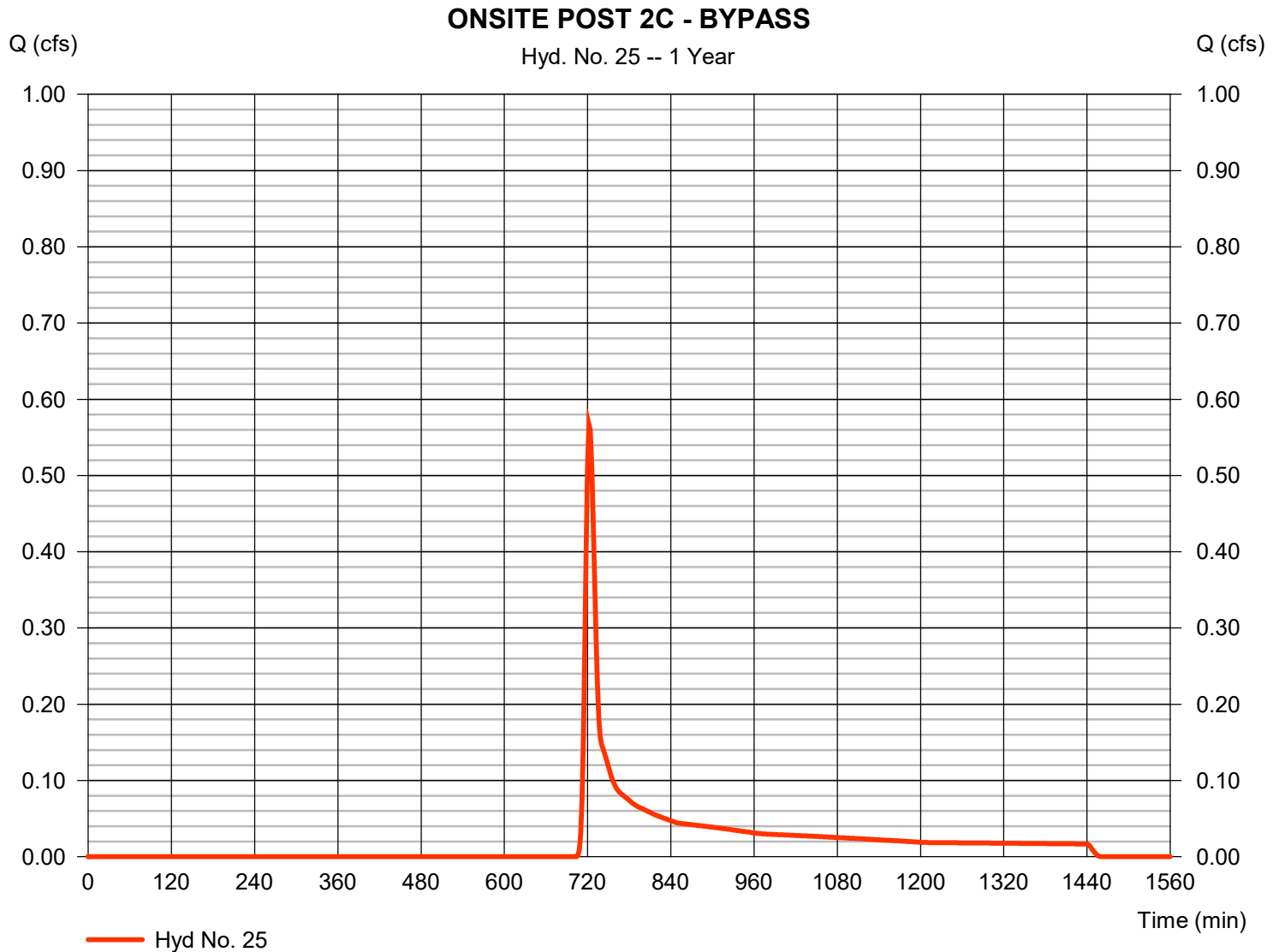
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Monday, 05 / 8 / 2023

Hyd. No. 25

ONSITE POST 2C - BYPASS

Hydrograph type	= SCS Runoff	Peak discharge	= 0.567 cfs
Storm frequency	= 1 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 1,933 cuft
Drainage area	= 1.010 ac	Curve number	= 62
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 12.00 min
Total precip.	= 3.27 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

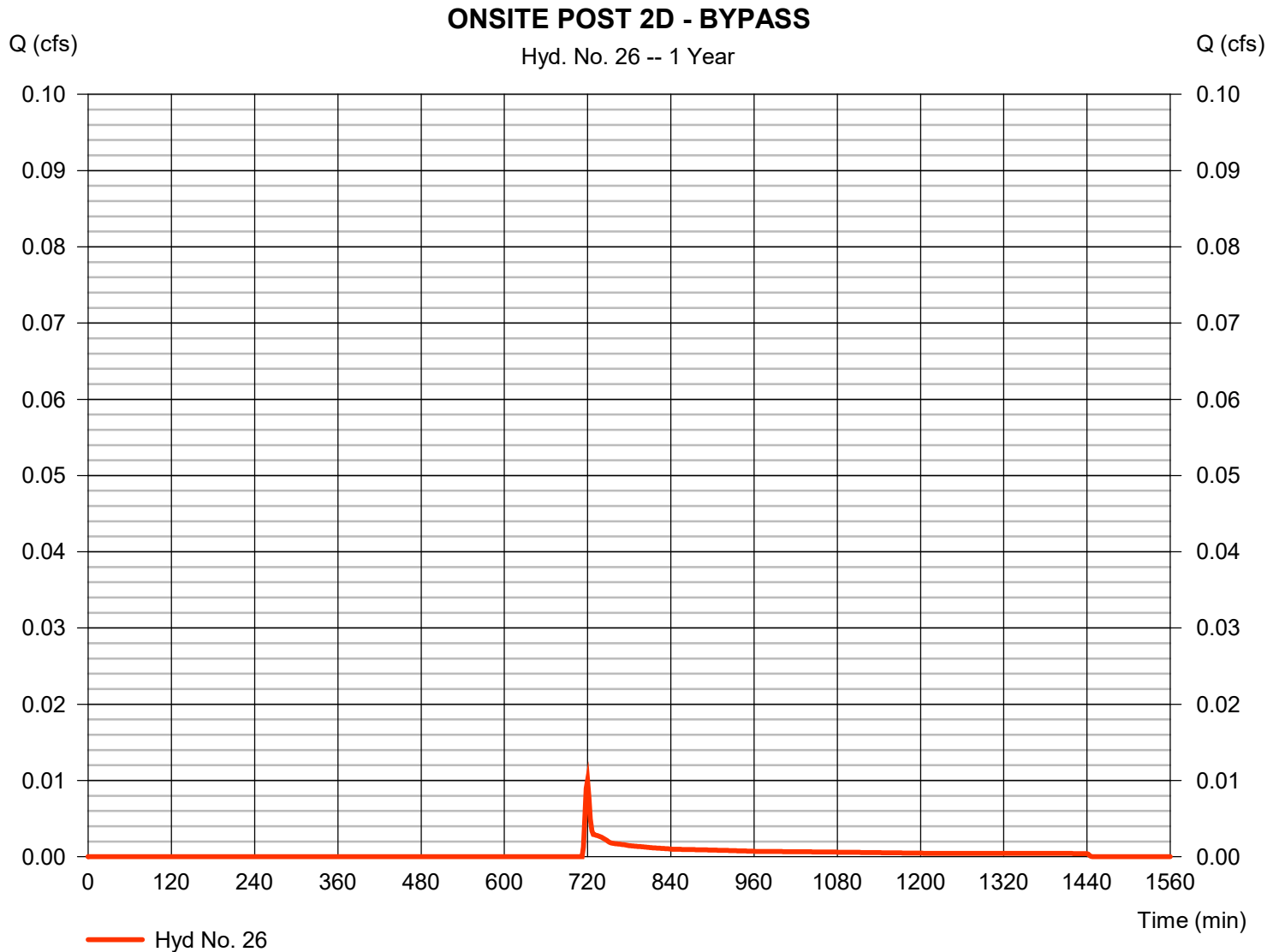
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Monday, 05 / 8 / 2023

Hyd. No. 26

ONSITE POST 2D - BYPASS

Hydrograph type	= SCS Runoff	Peak discharge	= 0.010 cfs
Storm frequency	= 1 yrs	Time to peak	= 720 min
Time interval	= 2 min	Hyd. volume	= 37 cuft
Drainage area	= 0.040 ac	Curve number	= 55
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.27 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

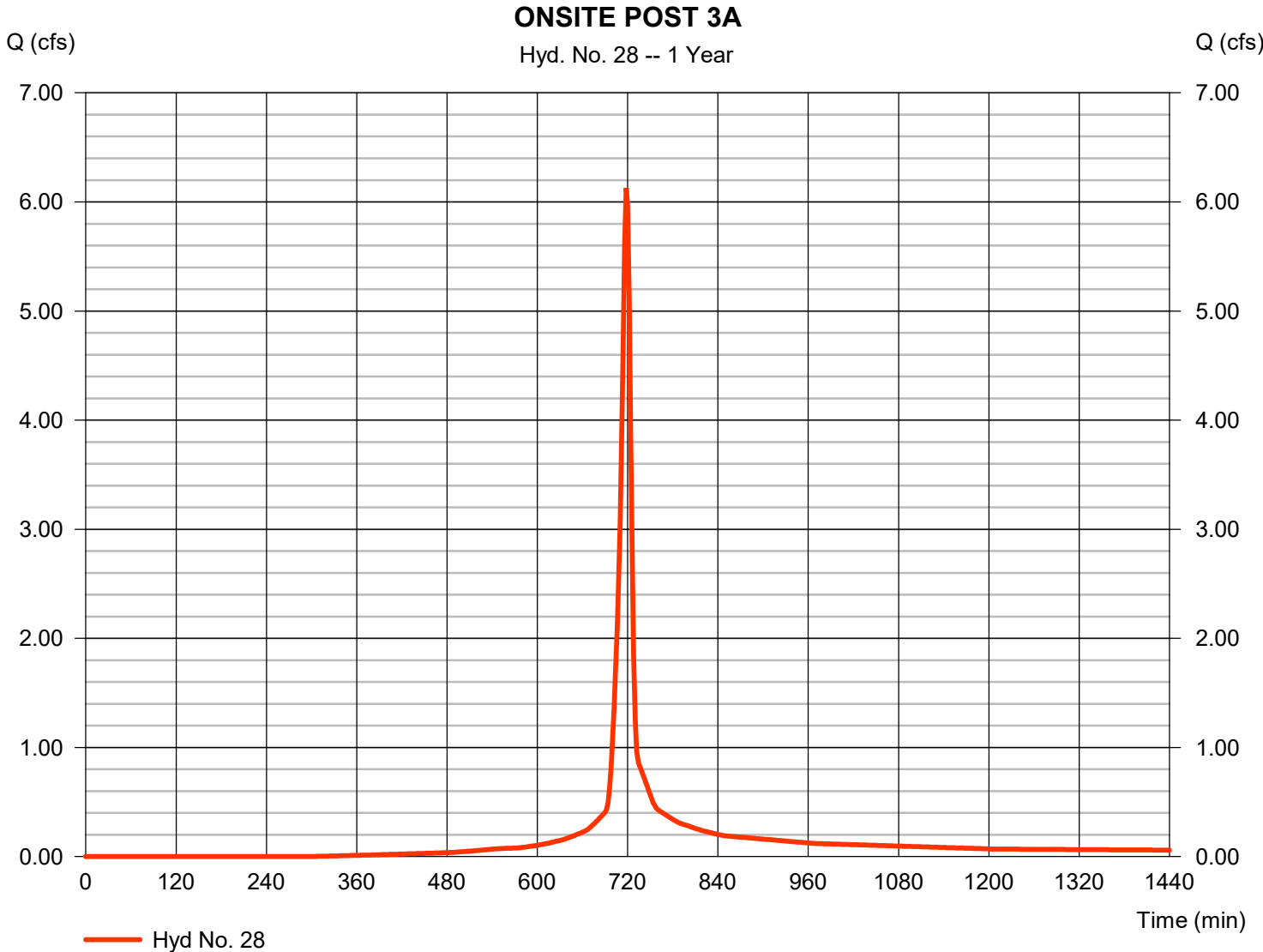


Hydrograph Report

Hyd. No. 28

ONSITE POST 3A

Hydrograph type	= SCS Runoff	Peak discharge	= 6.127 cfs
Storm frequency	= 1 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 14,426 cuft
Drainage area	= 1.710 ac	Curve number	= 91
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 7.00 min
Total precip.	= 3.27 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

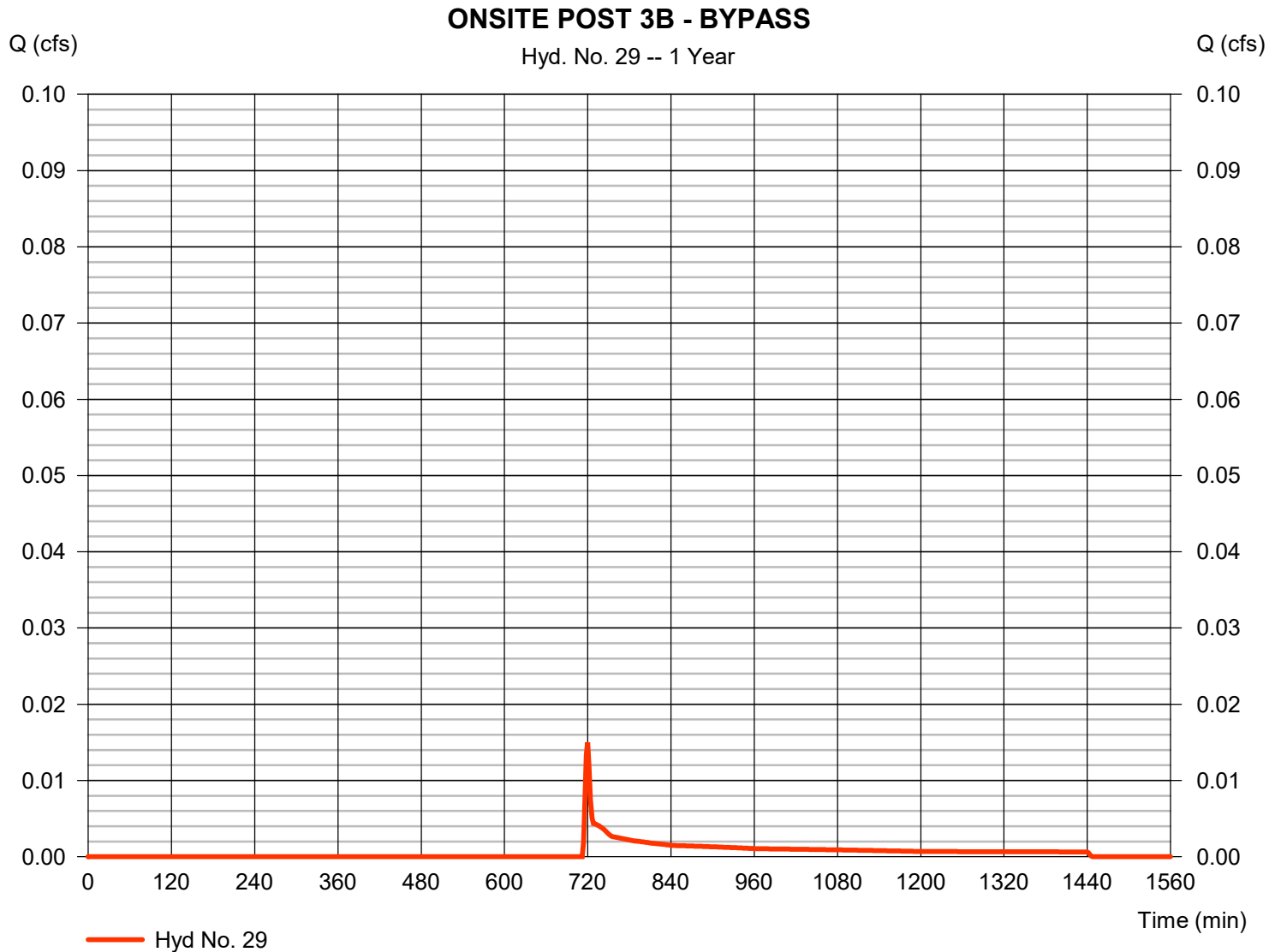
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

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Hyd. No. 29

ONSITE POST 3B - BYPASS

Hydrograph type	= SCS Runoff	Peak discharge	= 0.015 cfs
Storm frequency	= 1 yrs	Time to peak	= 720 min
Time interval	= 2 min	Hyd. volume	= 55 cuft
Drainage area	= 0.060 ac	Curve number	= 55
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.27 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

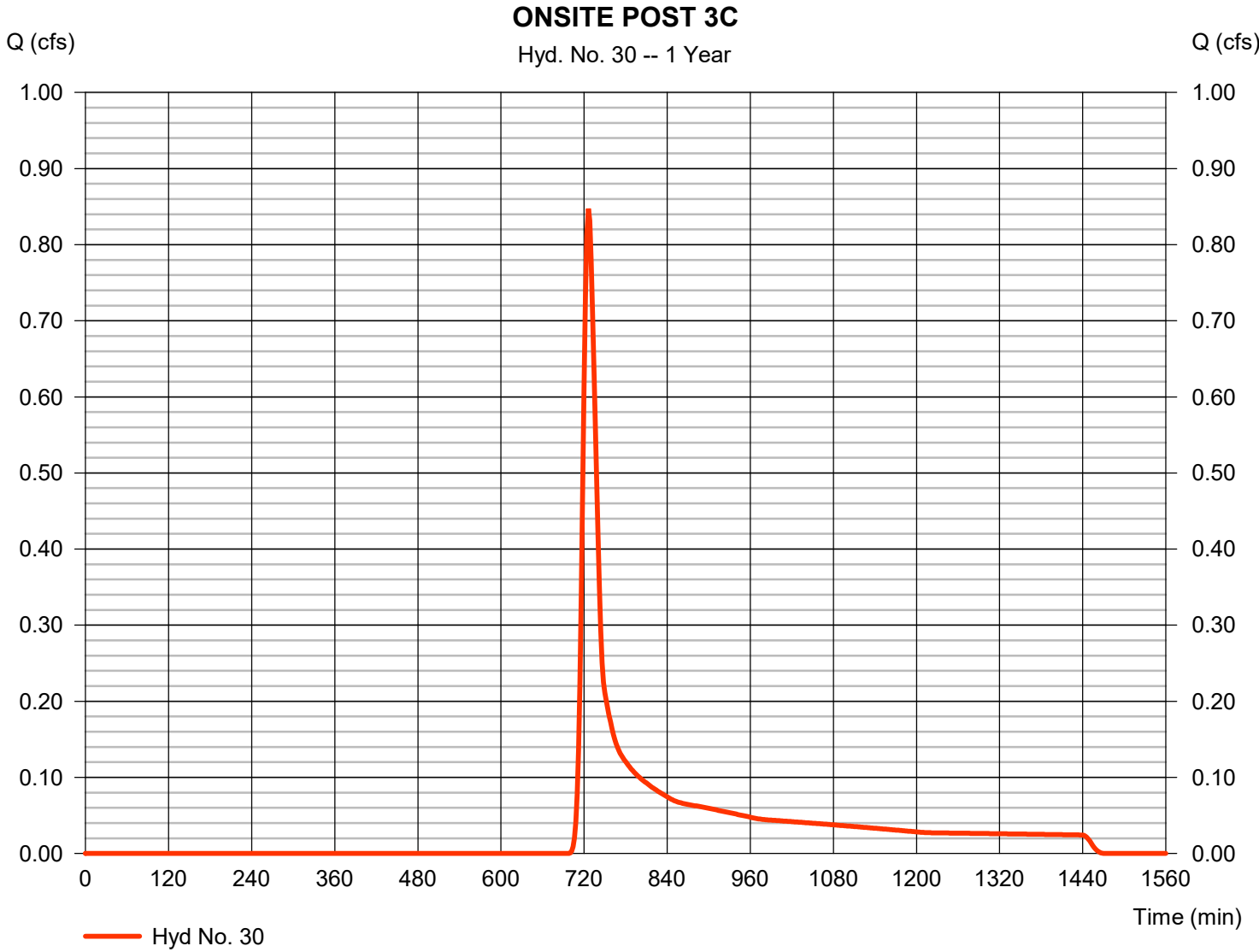


Hydrograph Report

Hyd. No. 30

ONSITE POST 3C

Hydrograph type	= SCS Runoff	Peak discharge	= 0.848 cfs
Storm frequency	= 1 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 3,178 cuft
Drainage area	= 1.290 ac	Curve number	= 66
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 19.00 min
Total precip.	= 3.27 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

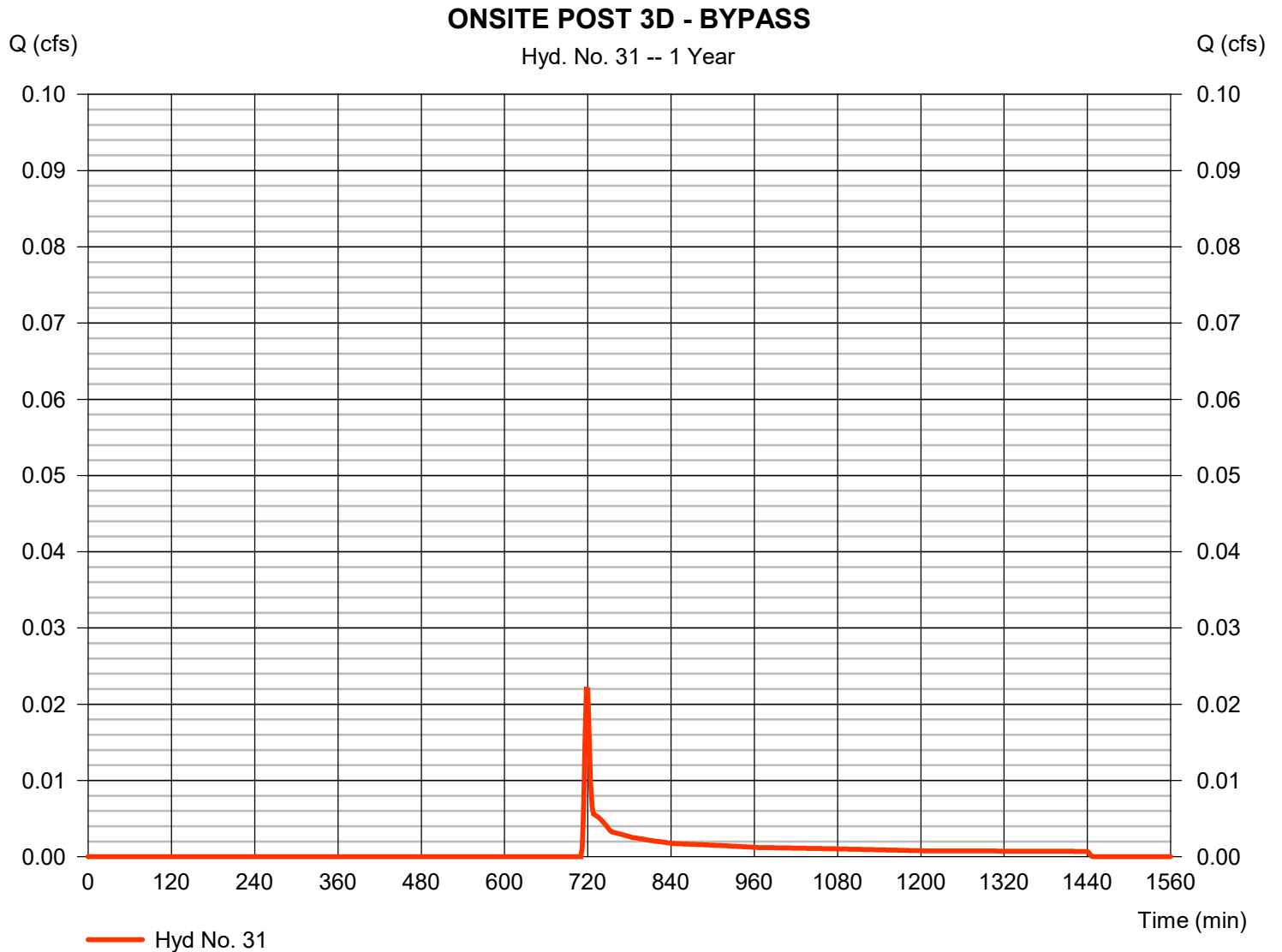
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Monday, 05 / 8 / 2023

Hyd. No. 31

ONSITE POST 3D - BYPASS

Hydrograph type	= SCS Runoff	Peak discharge	= 0.022 cfs
Storm frequency	= 1 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 68 cuft
Drainage area	= 0.060 ac	Curve number	= 57
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.27 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

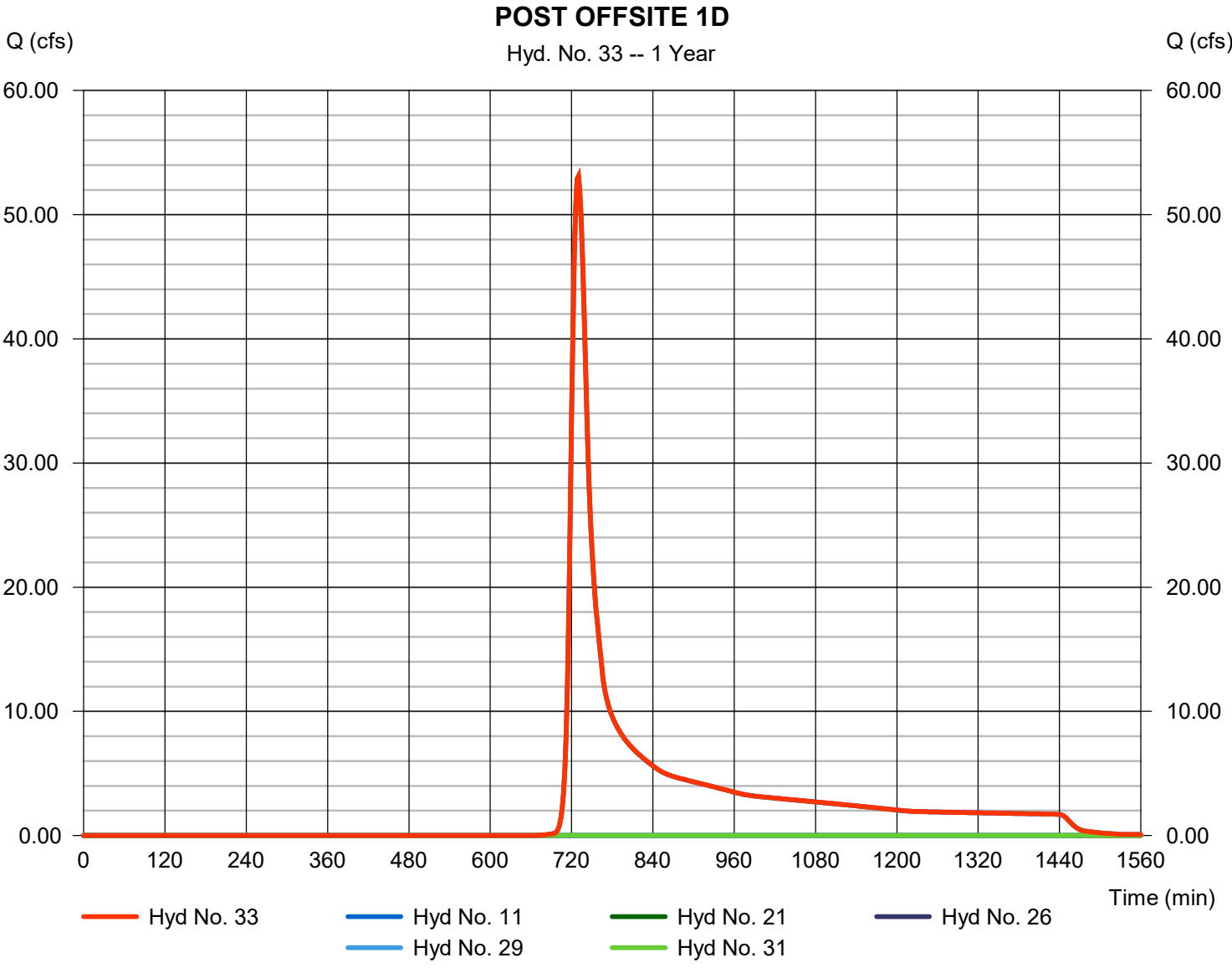
Monday, 05 / 8 / 2023

Hyd. No. 33

POST OFFSITE 1D

Hydrograph type = Combine
Storm frequency = 1 yrs
Time interval = 2 min
Inflow hyds. = 11, 21, 26, 29, 31

Peak discharge = 53.12 cfs
Time to peak = 730 min
Hyd. volume = 238,512 cuft
Contrib. drain. area = 0.260 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

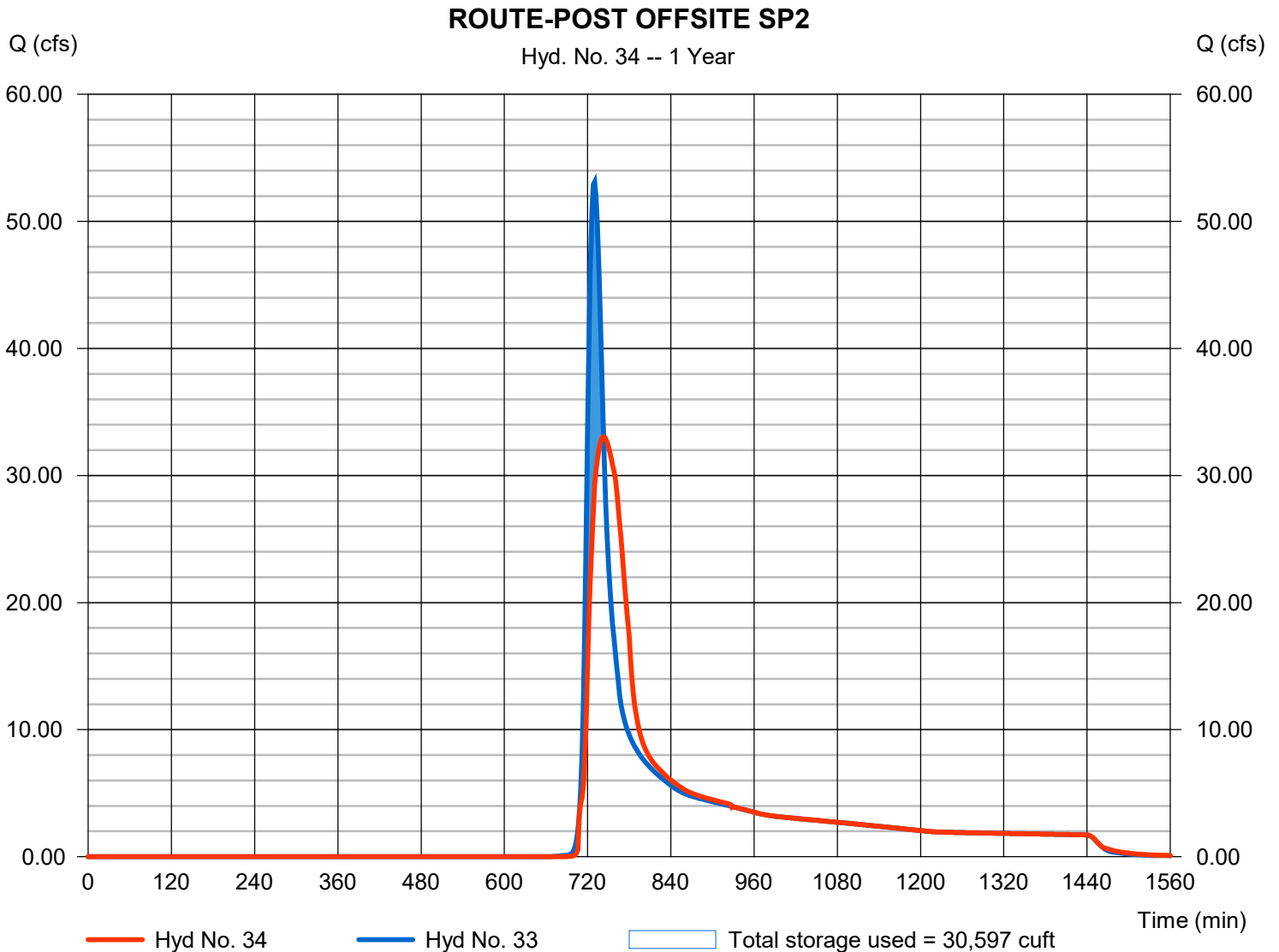
Monday, 05 / 8 / 2023

Hyd. No. 34

ROUTE-POST OFFSITE SP2

Hydrograph type	= Reservoir	Peak discharge	= 33.05 cfs
Storm frequency	= 1 yrs	Time to peak	= 744 min
Time interval	= 2 min	Hyd. volume	= 238,505 cuft
Inflow hyd. No.	= 33 - POST OFFSITE 1D	Max. Elevation	= 1012.41 ft
Reservoir name	= OFFSITE 1D	Max. Storage	= 30,597 cuft

Storage Indication method used.



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

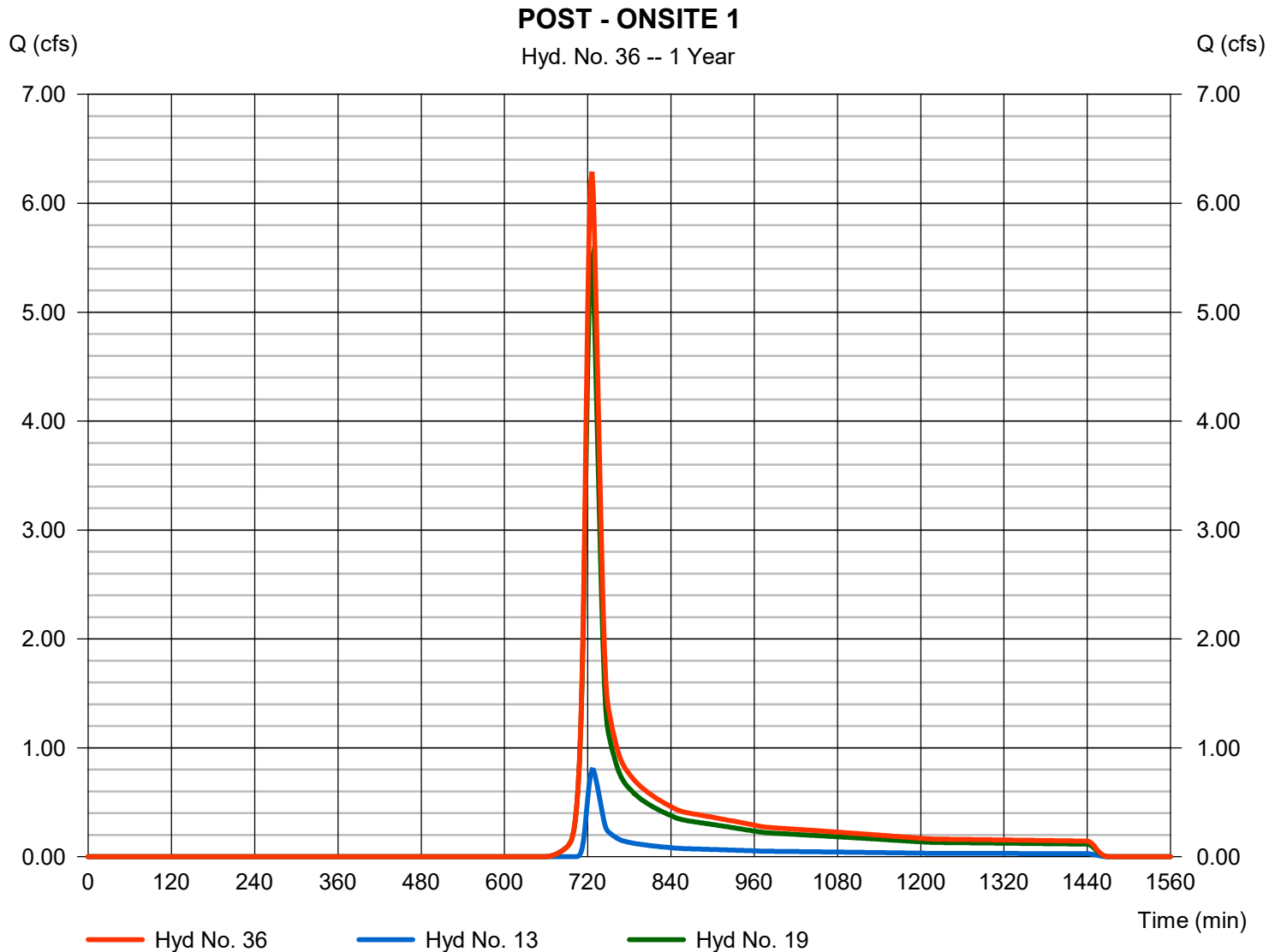
Monday, 05 / 8 / 2023

Hyd. No. 36

POST - ONSITE 1

Hydrograph type = Combine
Storm frequency = 1 yrs
Time interval = 2 min
Inflow hyds. = 13, 19

Peak discharge = 6.288 cfs
Time to peak = 726 min
Hyd. volume = 21,510 cuft
Contrib. drain. area = 6.540 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

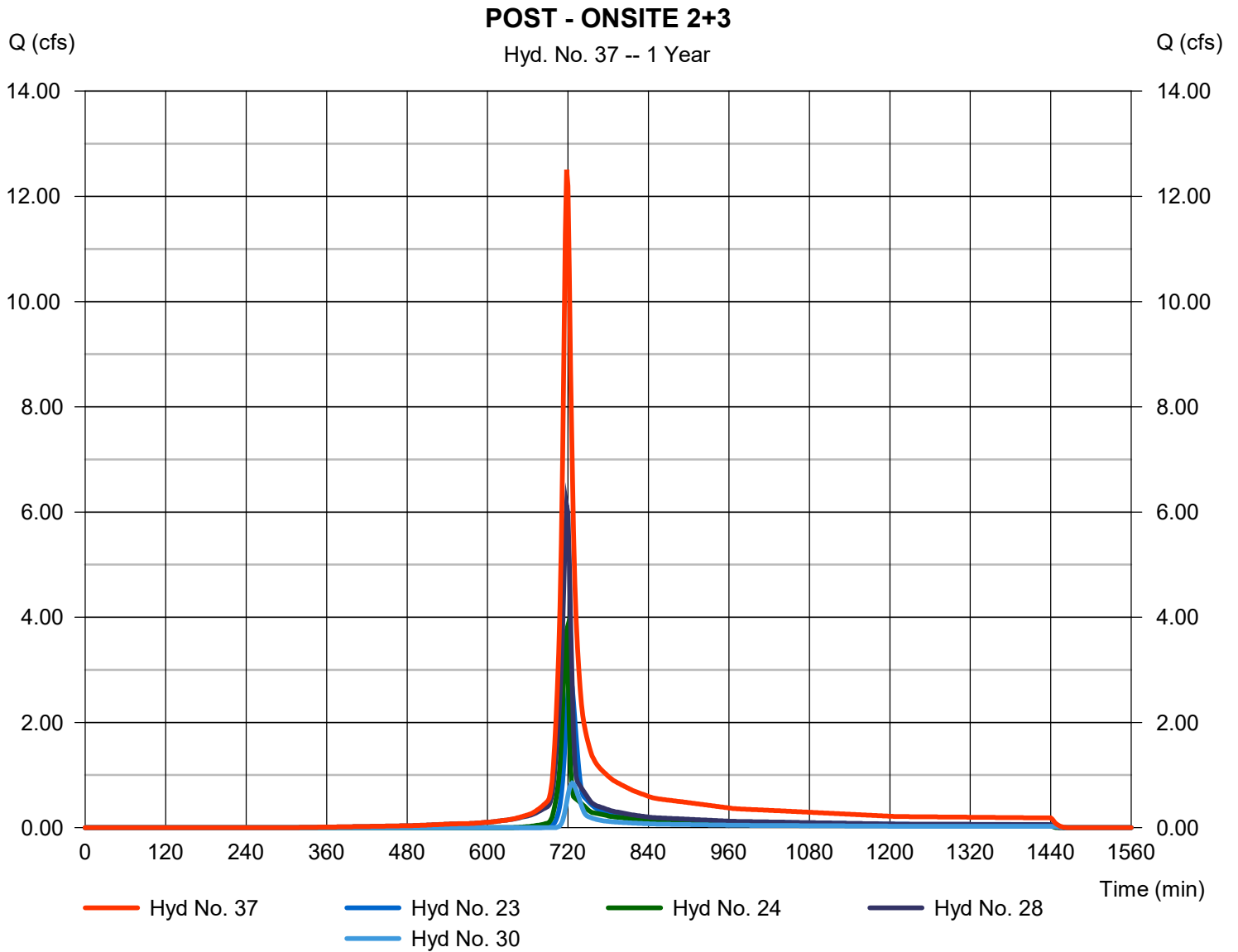
Monday, 05 / 8 / 2023

Hyd. No. 37

POST - ONSITE 2+3

Hydrograph type = Combine
 Storm frequency = 1 yrs
 Time interval = 2 min
 Inflow hyds. = 23, 24, 28, 30

Peak discharge = 12.51 cfs
 Time to peak = 718 min
 Hyd. volume = 33,605 cuft
 Contrib. drain. area = 7.540 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

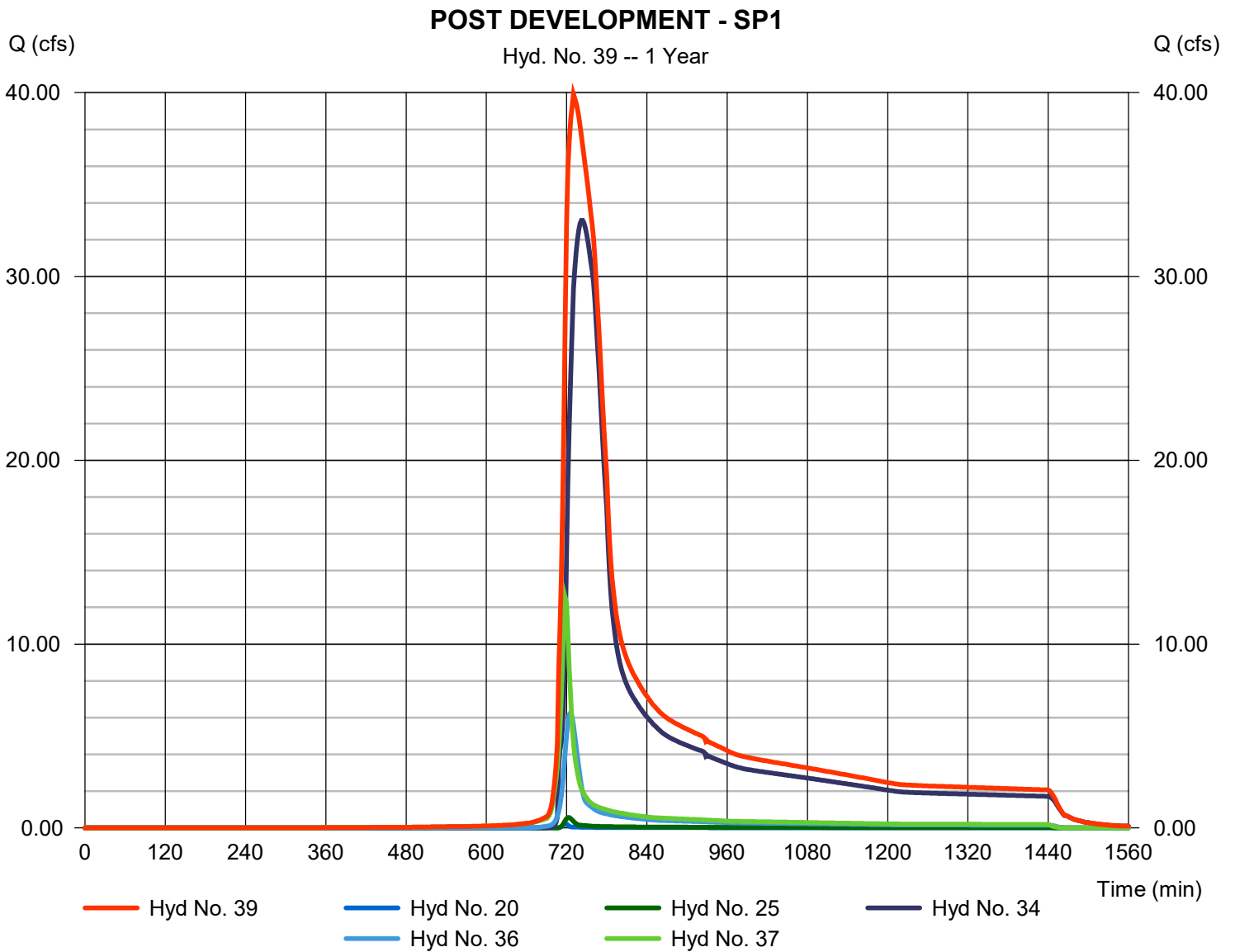
Monday, 05 / 8 / 2023

Hyd. No. 39

POST DEVELOPMENT - SP1

Hydrograph type = Combine
Storm frequency = 1 yrs
Time interval = 2 min
Inflow hyds. = 20, 25, 34, 36, 37

Peak discharge = 39.92 cfs
Time to peak = 730 min
Hyd. volume = 296,110 cuft
Contrib. drain. area = 1.330 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	10.22	2	724	30,815	-----	-----	-----	OFFSITE 1A
2	Reservoir	9.546	2	726	30,814	1	1051.41	1,866	ROUTE - OFFSITE 1A
3	SCS Runoff	24.61	2	728	93,663	-----	-----	-----	OFFSITE 1B
4	Combine	33.96	2	728	124,477	2, 3	-----	-----	ROUTE 1A +OFFSITE 1B
5	Reservoir	28.46	2	734	124,471	4	1027.93	14,944	ROUTE OFFSITE 1B
6	SCS Runoff	9.487	2	728	36,102	-----	-----	-----	OFFSITE 1C
7	Combine	36.93	2	732	160,573	5, 6	-----	-----	ROUTE 1B + OFFSITE 1C
8	Reservoir	36.22	2	734	160,572	7	1016.22	3,664	ROUTE OFFSITE 1C
9	SCS Runoff	35.23	2	726	120,057	-----	-----	-----	PRE OFFSITE 1D
10	SCS Runoff	9.735	2	726	31,601	-----	-----	-----	PRE OFFSITE 1E
11	Combine	74.45	2	728	312,230	8, 9, 10	-----	-----	ROUTE 1C +OFFSITE 1D +1E
12	Reservoir	42.60	2	744	312,222	11	1013.17	51,396	PREROUTE- OFFSITE SP2
13	SCS Runoff	1.211	2	726	4,572	-----	-----	-----	OFFSITE 2
14	SCS Runoff	7.679	2	724	22,507	-----	-----	-----	ON-SITE PRE 1
15	SCS Runoff	4.405	2	726	16,184	-----	-----	-----	ON-SITE PRE 2
16	SCS Runoff	6.164	2	724	19,423	-----	-----	-----	ON-SITE PRE 3
17	Combine	49.97	2	728	374,909	12, 13, 14, 15, 16	-----	-----	PRE-DEVELOPMENT - SP1
19	SCS Runoff	7.130	2	726	23,142	-----	-----	-----	ONSITE POST 1A
20	SCS Runoff	0.358	2	718	769	-----	-----	-----	ONSITE POST 1B - BYPASS
21	SCS Runoff	0.050	2	718	140	-----	-----	-----	ONSITE POST 1C - BYPASS
23	SCS Runoff	3.739	2	724	10,960	-----	-----	-----	ONSITE POST 2A
24	SCS Runoff	4.721	2	718	9,444	-----	-----	-----	ONSITE POST 2B - TURF
25	SCS Runoff	0.874	2	722	2,672	-----	-----	-----	ONSITE POST 2C - BYPASS
26	SCS Runoff	0.020	2	718	56	-----	-----	-----	ONSITE POST 2D - BYPASS
28	SCS Runoff	7.118	2	718	16,893	-----	-----	-----	ONSITE POST 3A
29	SCS Runoff	0.030	2	718	84	-----	-----	-----	ONSITE POST 3B - BYPASS
30	SCS Runoff	1.205	2	726	4,241	-----	-----	-----	ONSITE POST 3C
31	SCS Runoff	0.040	2	718	100	-----	-----	-----	ONSITE POST 3D - BYPASS
33	Combine	74.48	2	728	312,610	11, 21, 26, 29, 31, 33	-----	-----	POST OFFSITE 1D
34	Reservoir	42.67	2	744	312,602	33	1013.17	51,443	ROUTE-POST OFFSITE SP2
36	Combine	8.341	2	726	27,715	13, 19,	-----	-----	POST - ONSITE 1
Fitzgerald Field.gpw					Return Period: 2 Year			Monday, 05 / 8 / 2023	

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

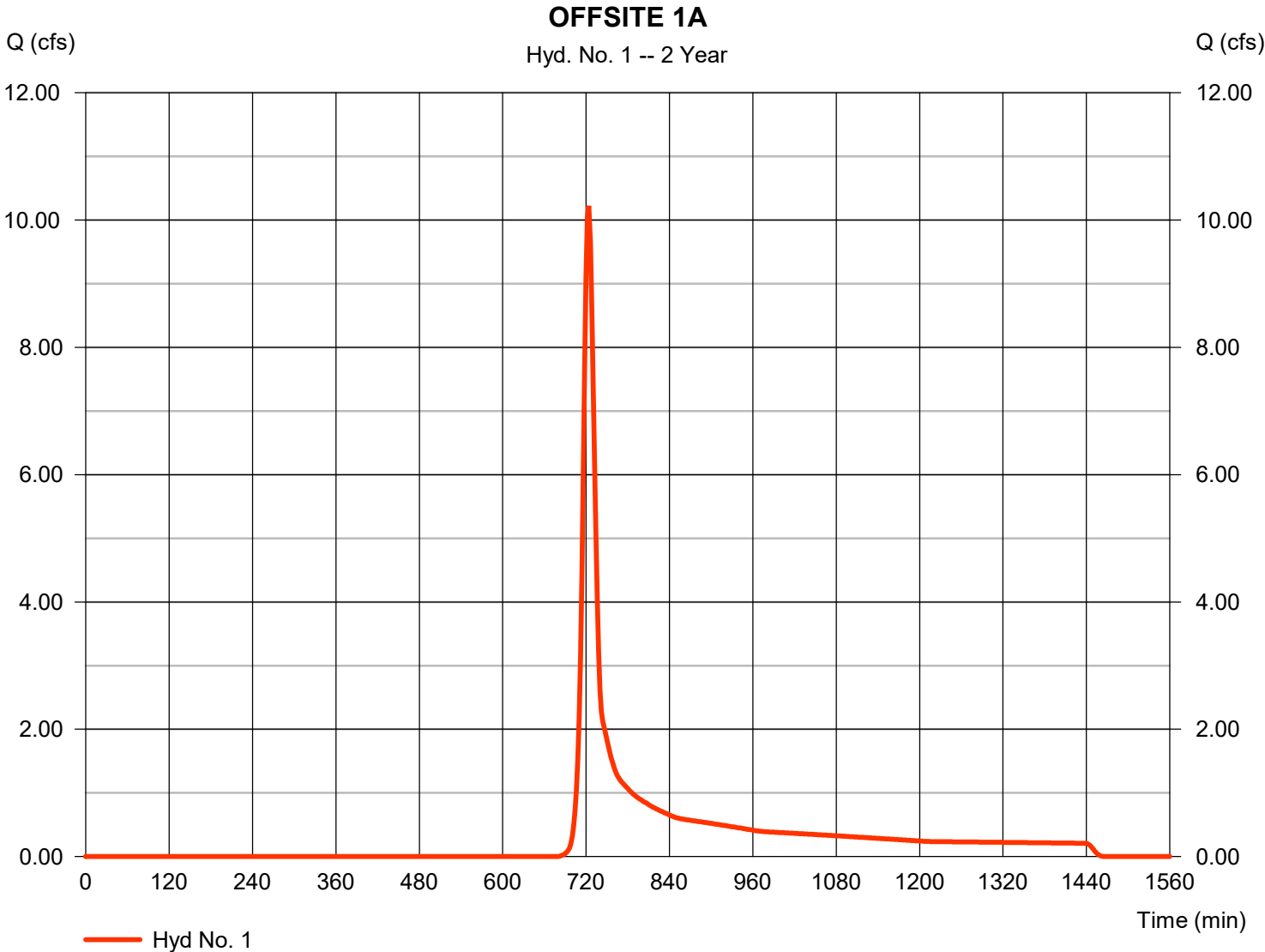
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description	
37	Combine	15.53	2	718	41,538	23, 24, 28, 30,	-----	-----	POST - ONSITE 2+3	
39	Combine	48.40	2	726	385,296	20, 25, 34, 36, 37,	-----	-----	POST DEVELOPMENT - SP1	
Fitzgerald Field.gpw					Return Period: 2 Year			Monday, 05 / 8 / 2023		

Hydrograph Report

Hyd. No. 1

OFFSITE 1A

Hydrograph type	= SCS Runoff	Peak discharge	= 10.22 cfs
Storm frequency	= 2 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 30,815 cuft
Drainage area	= 8.590 ac	Curve number	= 68
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 14.00 min
Total precip.	= 3.69 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

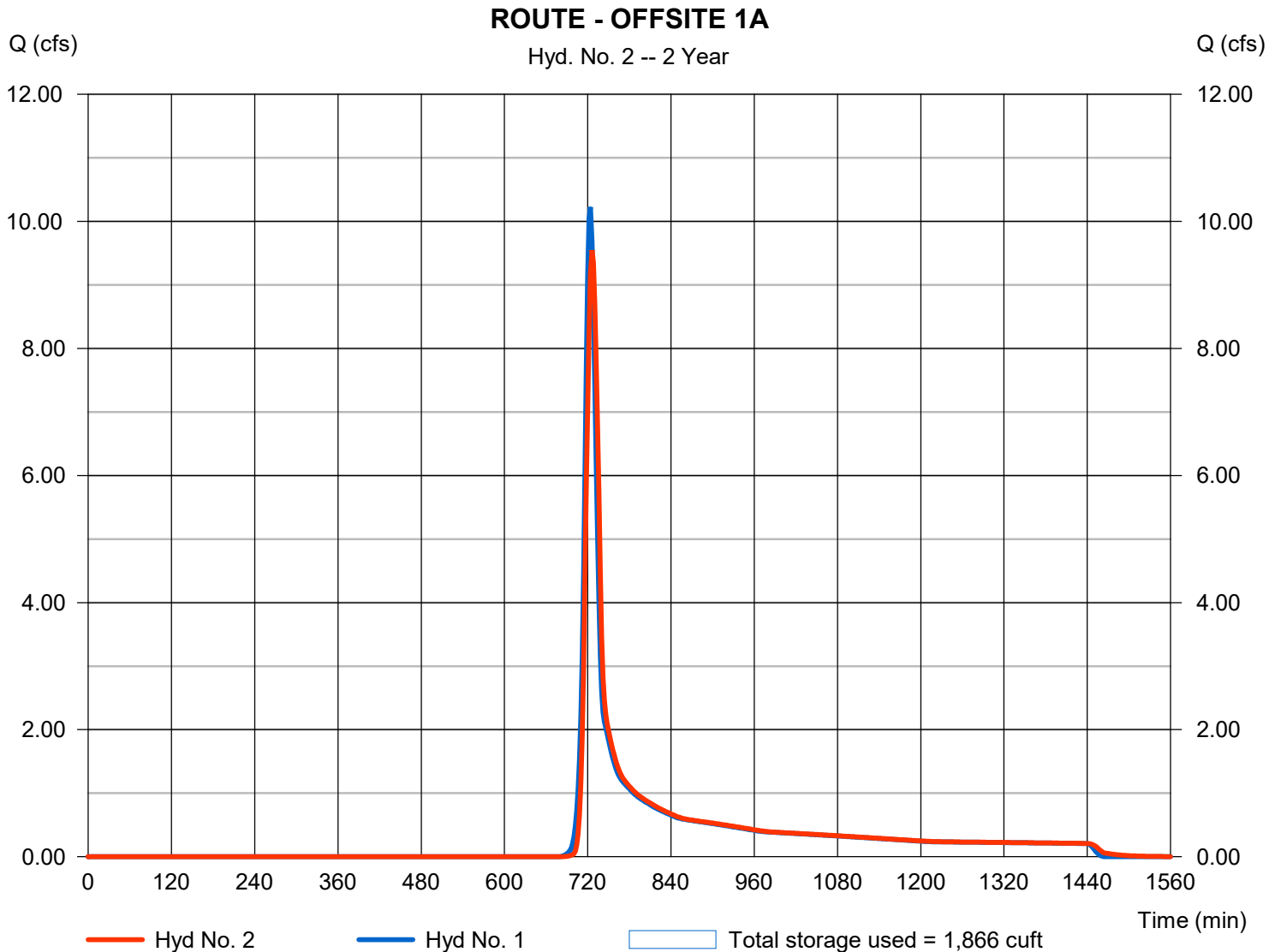
Monday, 05 / 8 / 2023

Hyd. No. 2

ROUTE - OFFSITE 1A

Hydrograph type	= Reservoir	Peak discharge	= 9.546 cfs
Storm frequency	= 2 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 30,814 cuft
Inflow hyd. No.	= 1 - OFFSITE 1A	Max. Elevation	= 1051.41 ft
Reservoir name	= OFFSITE 1A	Max. Storage	= 1,866 cuft

Storage Indication method used.

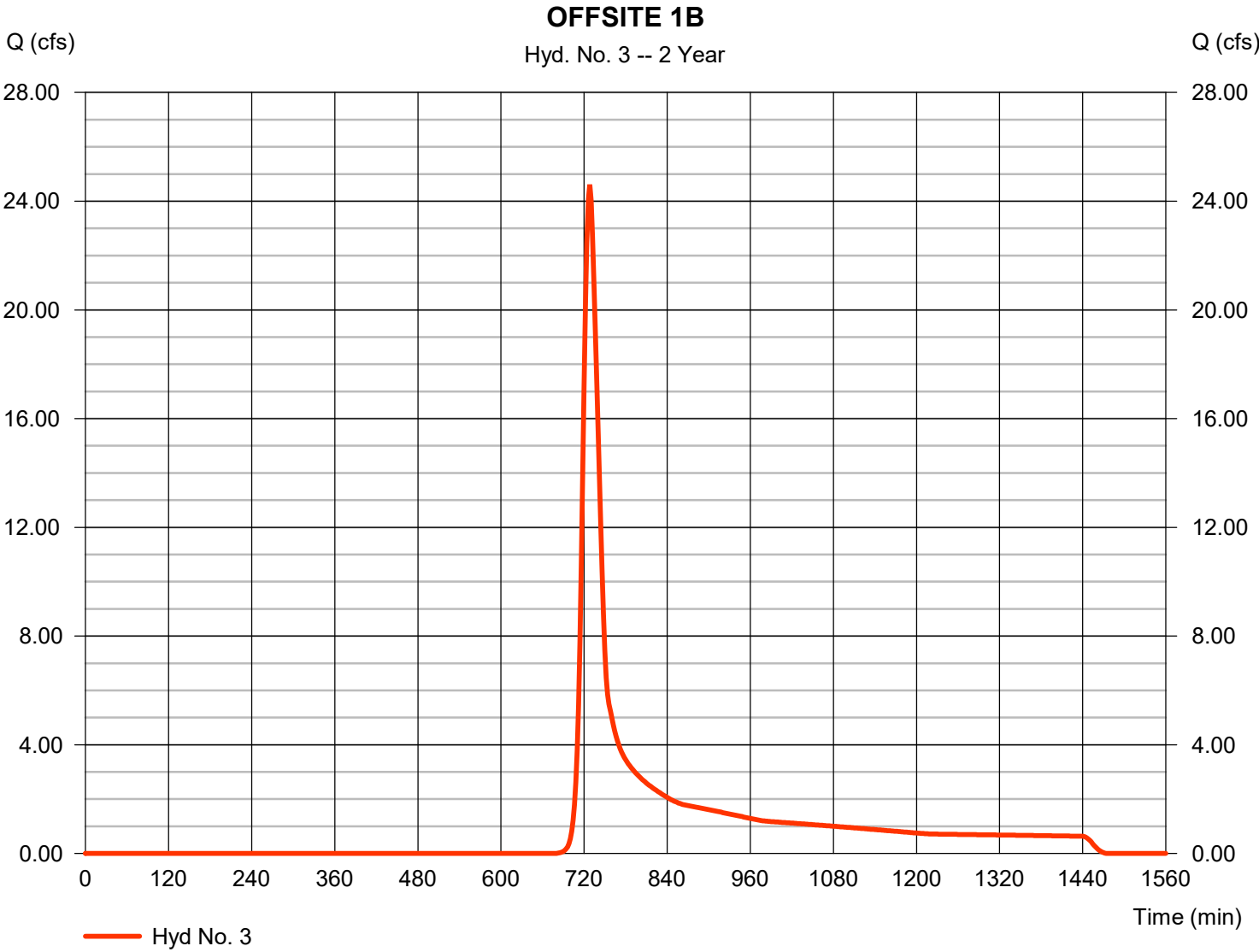


Hydrograph Report

Hyd. No. 3

OFFSITE 1B

Hydrograph type	= SCS Runoff	Peak discharge	= 24.61 cfs
Storm frequency	= 2 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 93,663 cuft
Drainage area	= 25.010 ac	Curve number	= 68
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 21.00 min
Total precip.	= 3.69 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

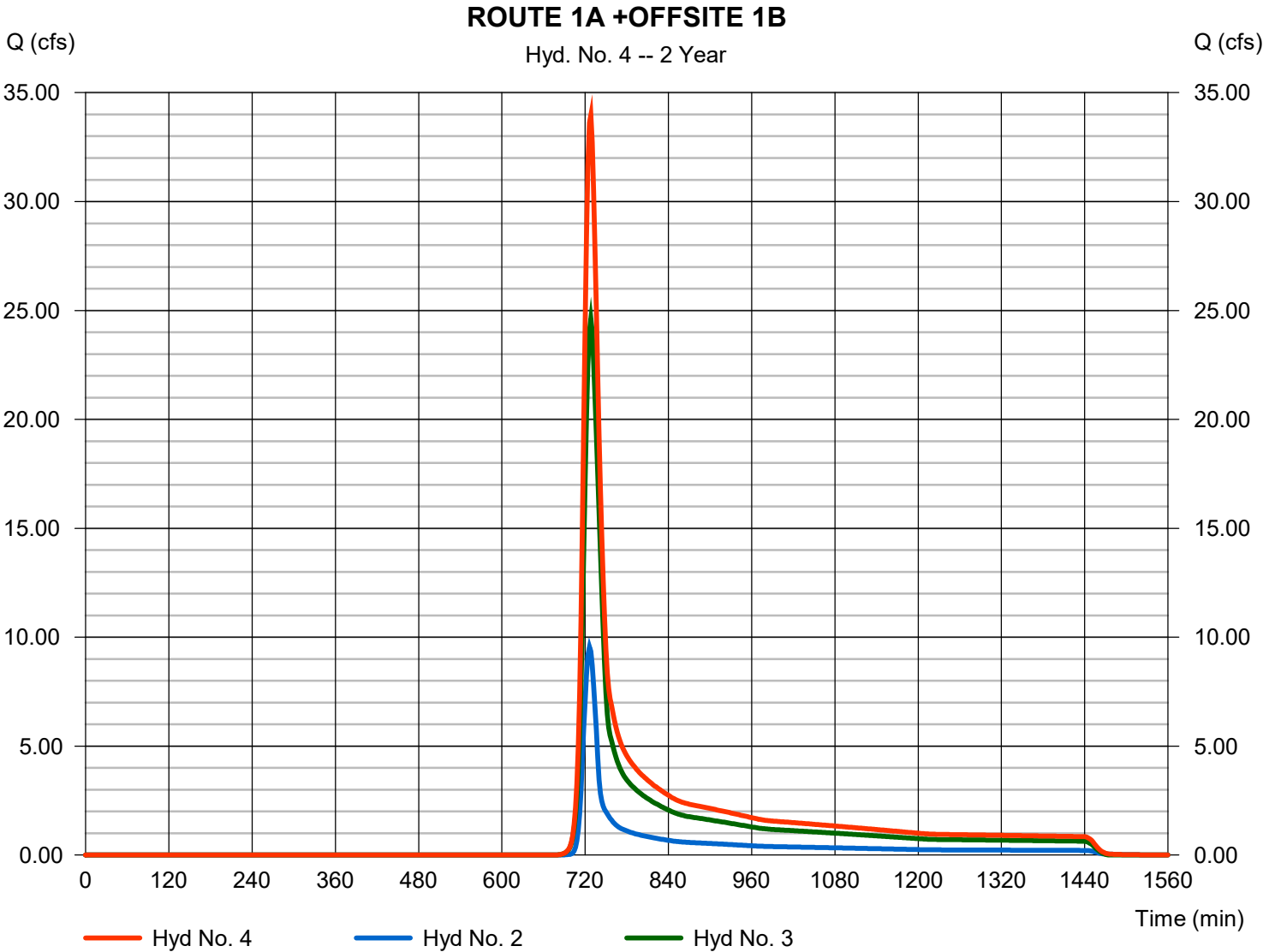
Monday, 05 / 8 / 2023

Hyd. No. 4

ROUTE 1A +OFFSITE 1B

Hydrograph type = Combine
Storm frequency = 2 yrs
Time interval = 2 min
Inflow hyds. = 2, 3

Peak discharge = 33.96 cfs
Time to peak = 728 min
Hyd. volume = 124,477 cuft
Contrib. drain. area = 25.010 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

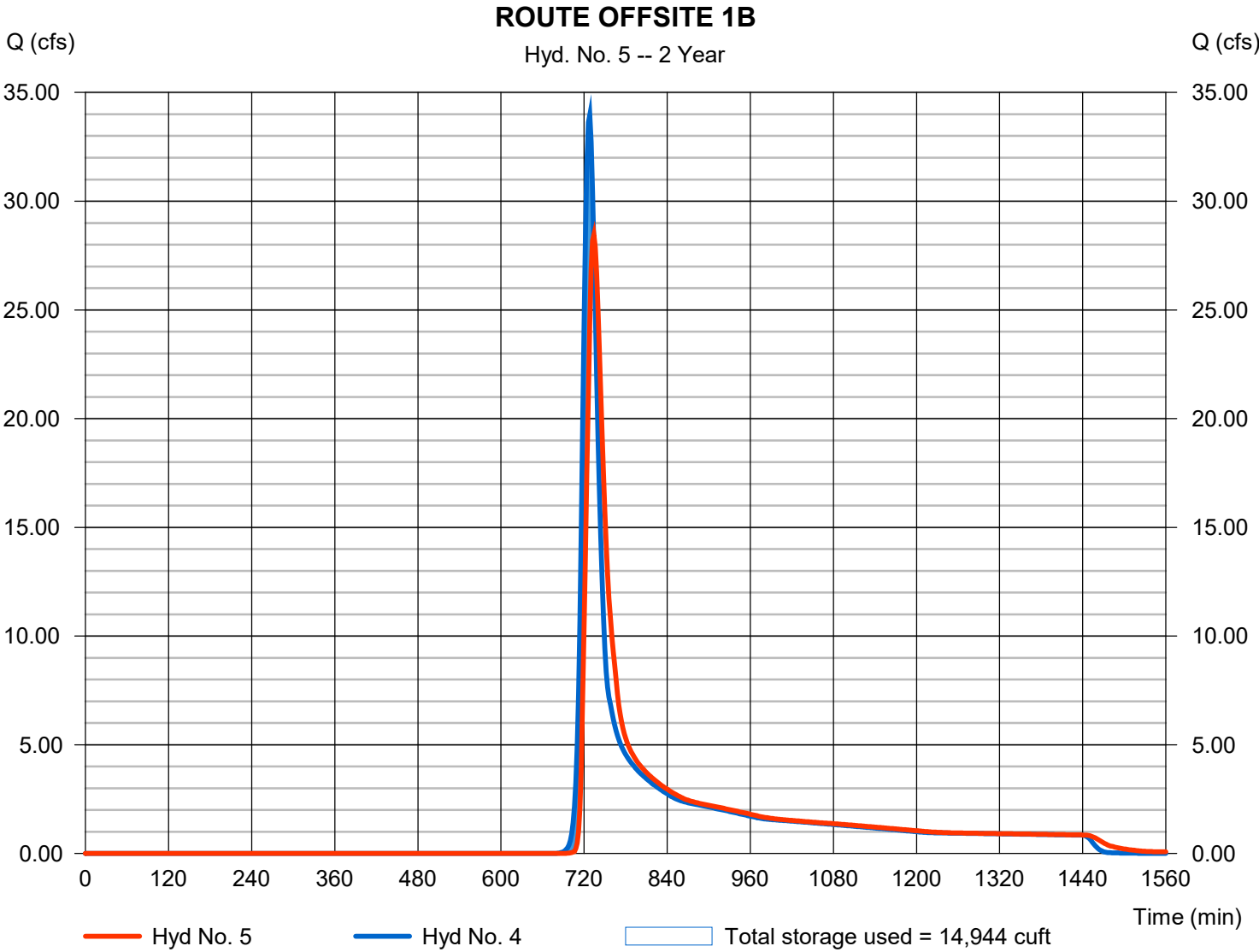
Monday, 05 / 8 / 2023

Hyd. No. 5

ROUTE OFFSITE 1B

Hydrograph type	= Reservoir	Peak discharge	= 28.46 cfs
Storm frequency	= 2 yrs	Time to peak	= 734 min
Time interval	= 2 min	Hyd. volume	= 124,471 cuft
Inflow hyd. No.	= 4 - ROUTE 1A +OFFSITE 1B	Max. Elevation	= 1027.93 ft
Reservoir name	= OFFSITE 1B	Max. Storage	= 14,944 cuft

Storage Indication method used.

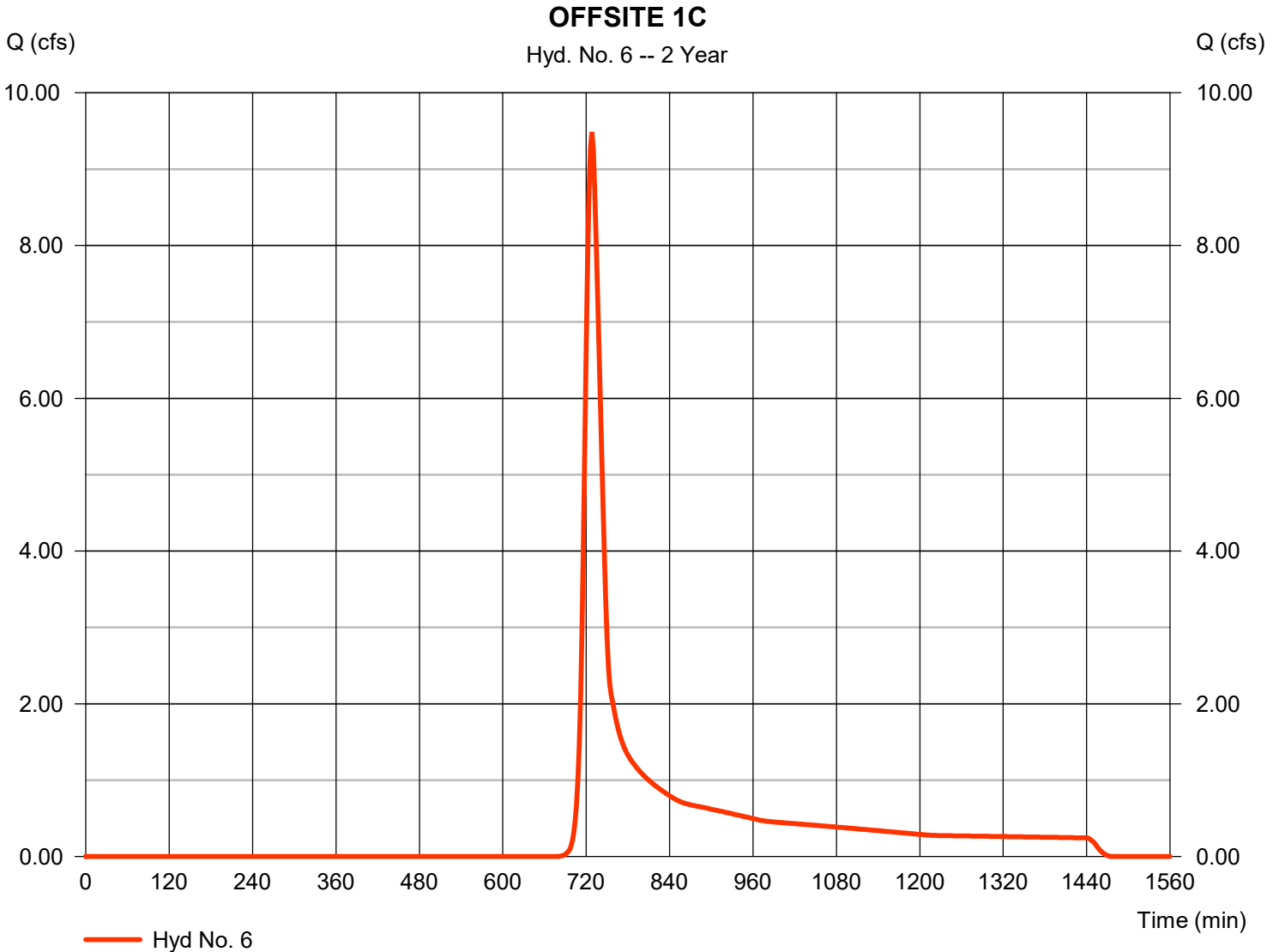


Hydrograph Report

Hyd. No. 6

OFFSITE 1C

Hydrograph type	= SCS Runoff	Peak discharge	= 9.487 cfs
Storm frequency	= 2 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 36,102 cuft
Drainage area	= 9.640 ac	Curve number	= 68
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 21.00 min
Total precip.	= 3.69 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

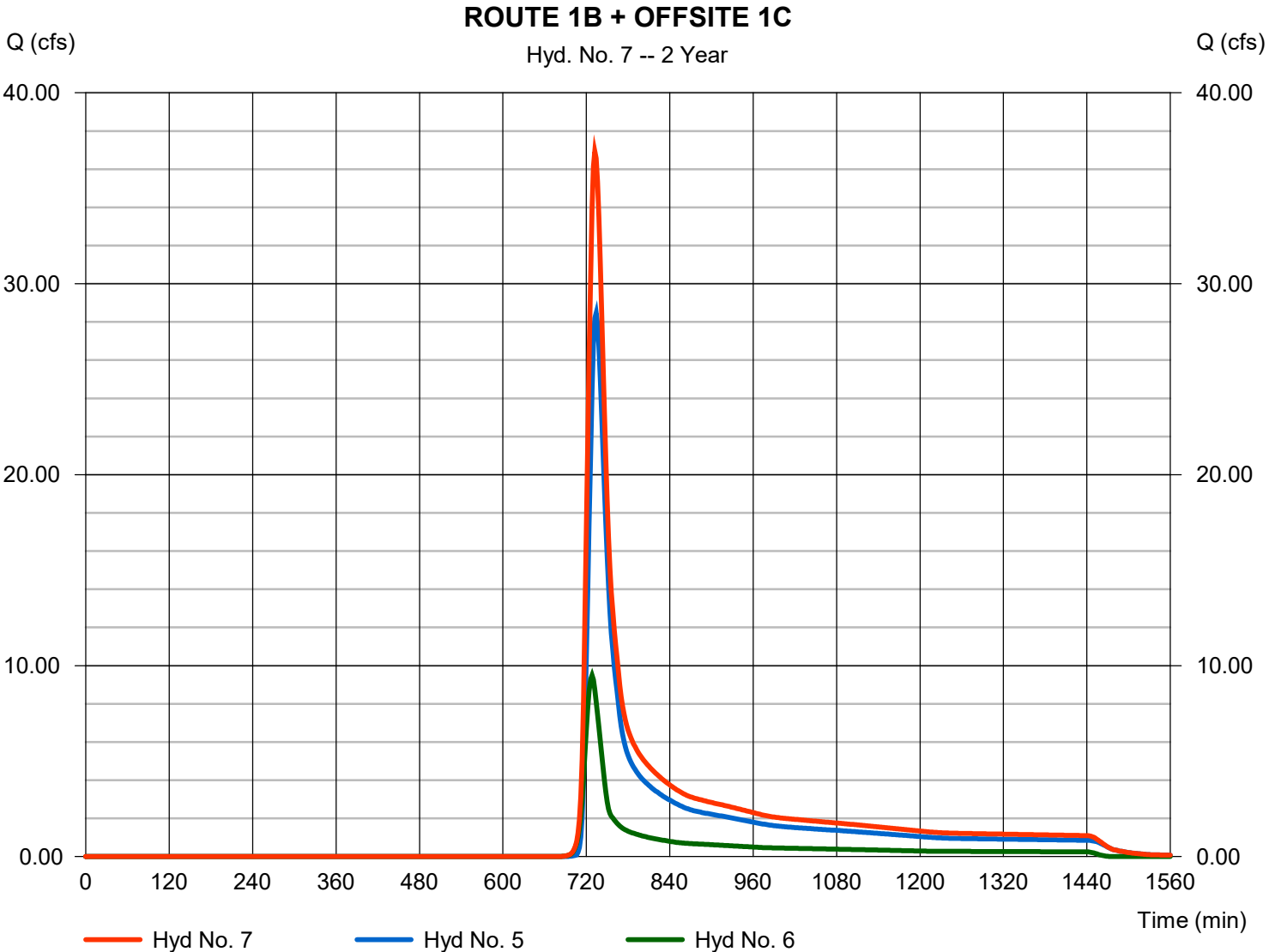
Monday, 05 / 8 / 2023

Hyd. No. 7

ROUTE 1B + OFFSITE 1C

Hydrograph type = Combine
Storm frequency = 2 yrs
Time interval = 2 min
Inflow hyds. = 5, 6

Peak discharge = 36.93 cfs
Time to peak = 732 min
Hyd. volume = 160,573 cuft
Contrib. drain. area = 9.640 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

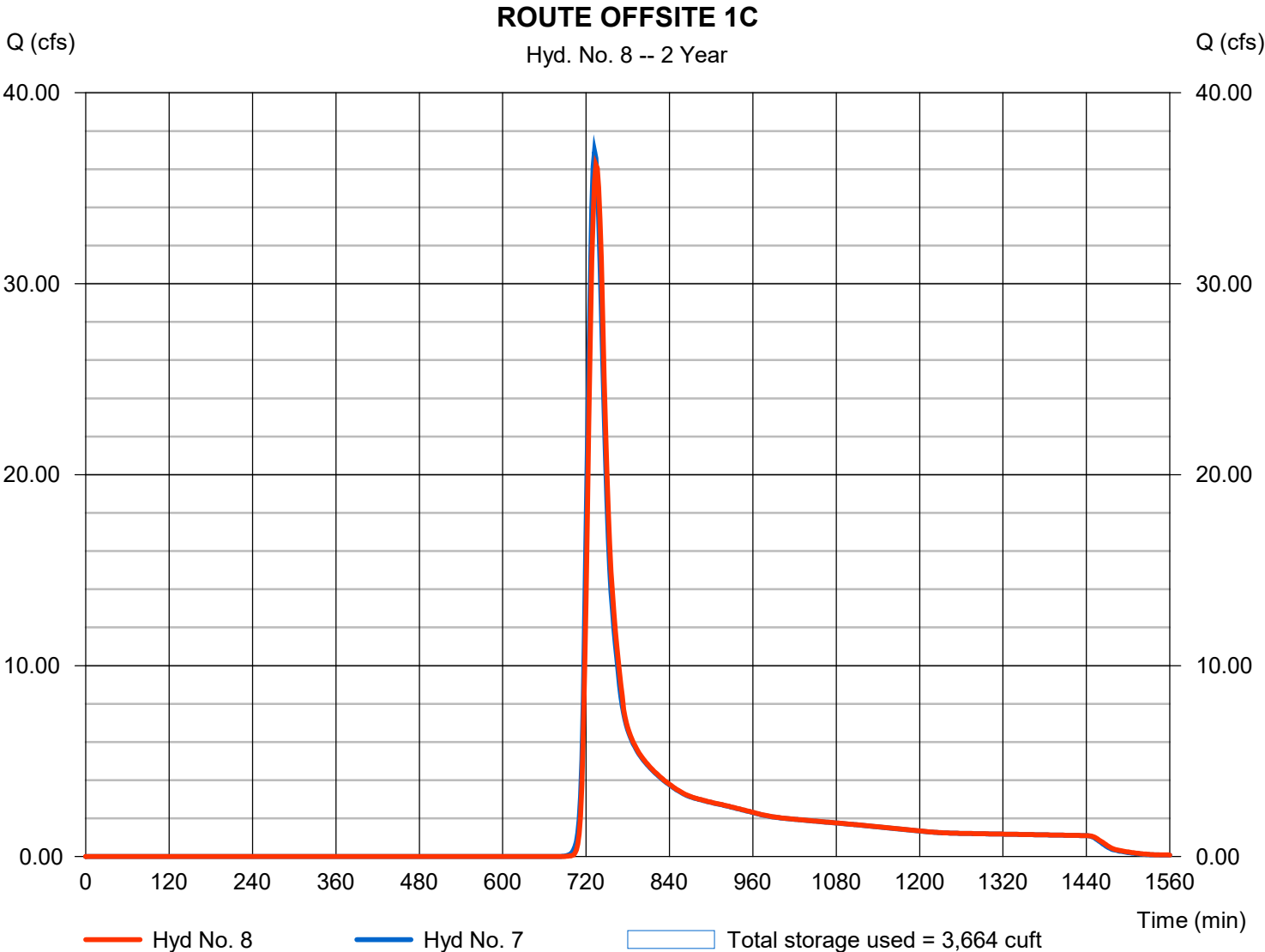
Monday, 05 / 8 / 2023

Hyd. No. 8

ROUTE OFFSITE 1C

Hydrograph type	= Reservoir	Peak discharge	= 36.22 cfs
Storm frequency	= 2 yrs	Time to peak	= 734 min
Time interval	= 2 min	Hyd. volume	= 160,572 cuft
Inflow hyd. No.	= 7 - ROUTE 1B + OFFSITE 1C	Max. Elevation	= 1016.22 ft
Reservoir name	= OFFSITE 1C	Max. Storage	= 3,664 cuft

Storage Indication method used.

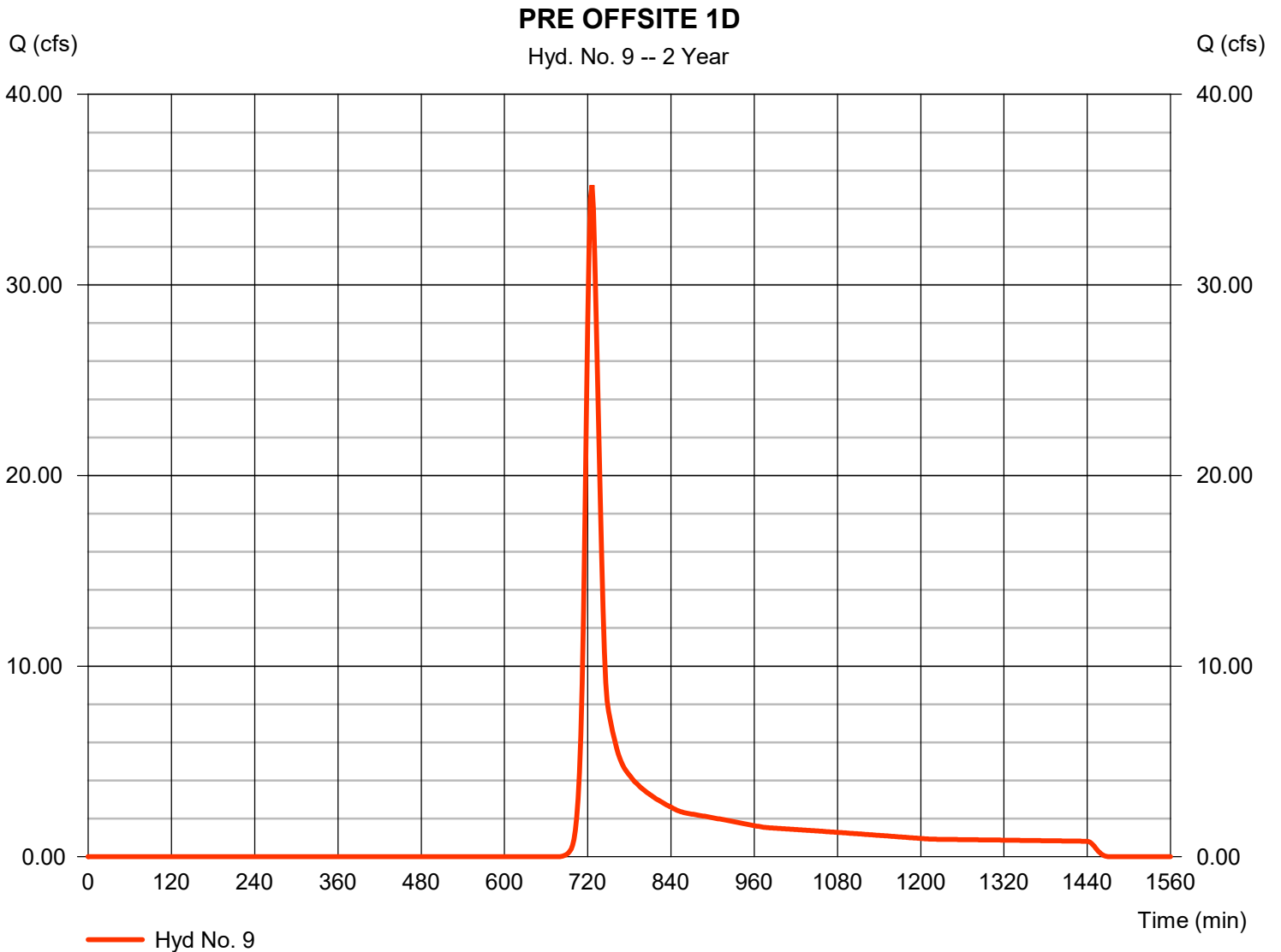


Hydrograph Report

Hyd. No. 9

PRE OFFSITE 1D

Hydrograph type	= SCS Runoff	Peak discharge	= 35.23 cfs
Storm frequency	= 2 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 120,057 cuft
Drainage area	= 32.630 ac	Curve number	= 68
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 18.00 min
Total precip.	= 3.69 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

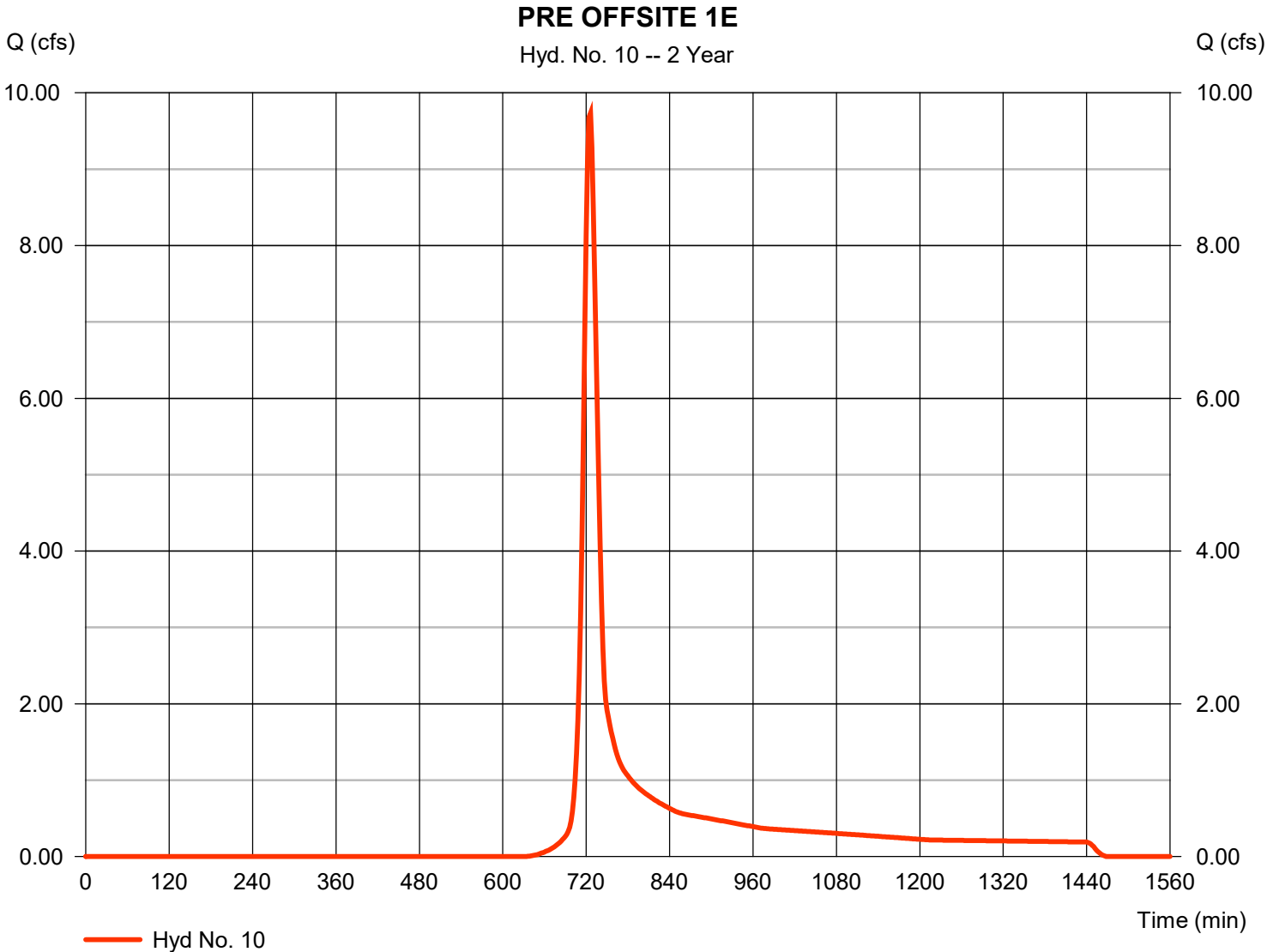


Hydrograph Report

Hyd. No. 10

PRE OFFSITE 1E

Hydrograph type	= SCS Runoff	Peak discharge	= 9.735 cfs
Storm frequency	= 2 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 31,601 cuft
Drainage area	= 6.650 ac	Curve number	= 73
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 17.00 min
Total precip.	= 3.69 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

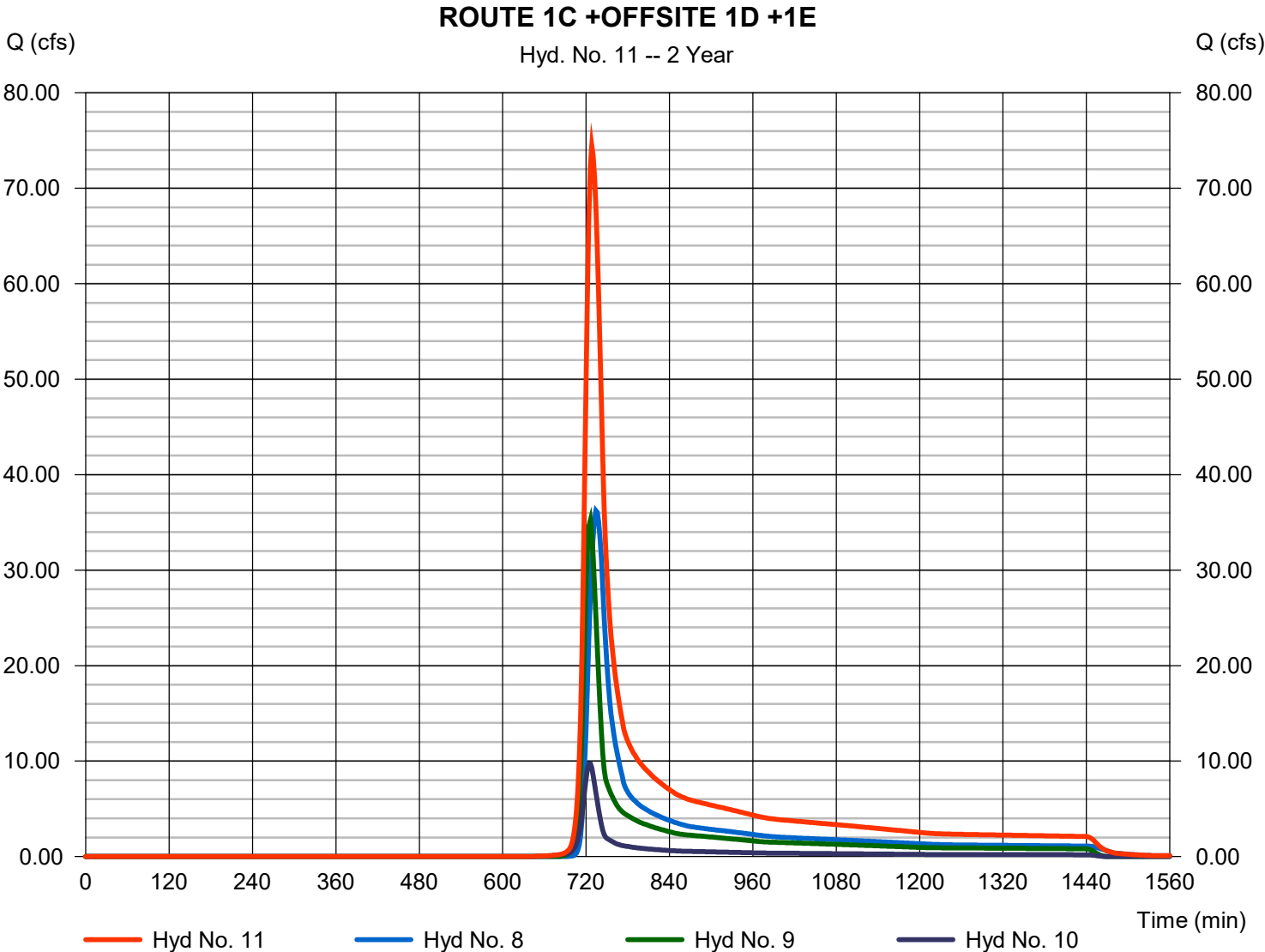
Monday, 05 / 8 / 2023

Hyd. No. 11

ROUTE 1C +OFFSITE 1D +1E

Hydrograph type = Combine
Storm frequency = 2 yrs
Time interval = 2 min
Inflow hyds. = 8, 9, 10

Peak discharge = 74.45 cfs
Time to peak = 728 min
Hyd. volume = 312,230 cuft
Contrib. drain. area = 39.280 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

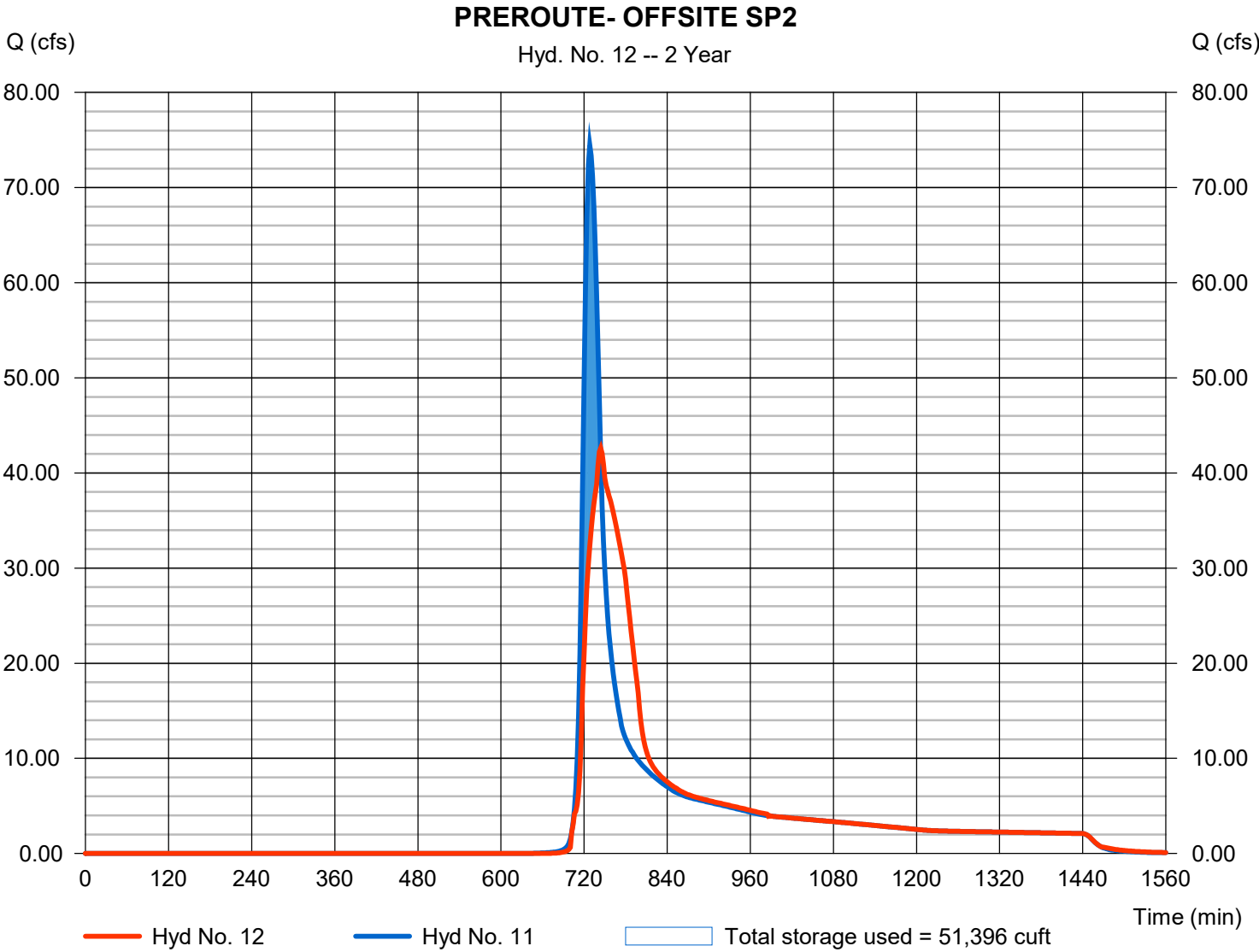
Monday, 05 / 8 / 2023

Hyd. No. 12

PREROUTE- OFFSITE SP2

Hydrograph type	= Reservoir	Peak discharge	= 42.60 cfs
Storm frequency	= 2 yrs	Time to peak	= 744 min
Time interval	= 2 min	Hyd. volume	= 312,222 cuft
Inflow hyd. No.	= 11 - ROUTE 1C +OFFSITE 1D	Max Elevation	= 1013.17 ft
Reservoir name	= OFFSITE 1D	Max. Storage	= 51,396 cuft

Storage Indication method used.

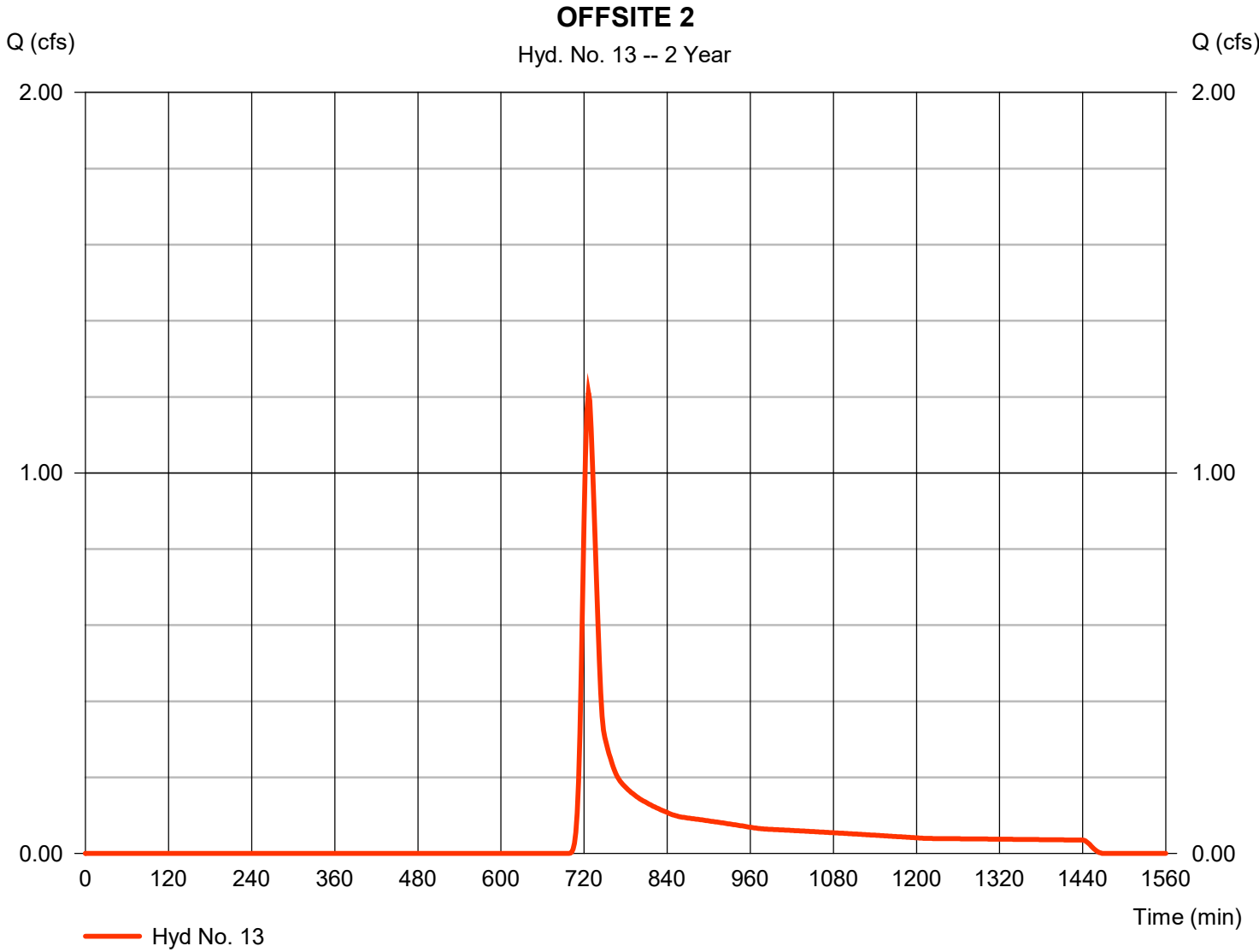


Hydrograph Report

Hyd. No. 13

OFFSITE 2

Hydrograph type	= SCS Runoff	Peak discharge	= 1.211 cfs
Storm frequency	= 2 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 4,572 cuft
Drainage area	= 1.670 ac	Curve number	= 63
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 18.00 min
Total precip.	= 3.69 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

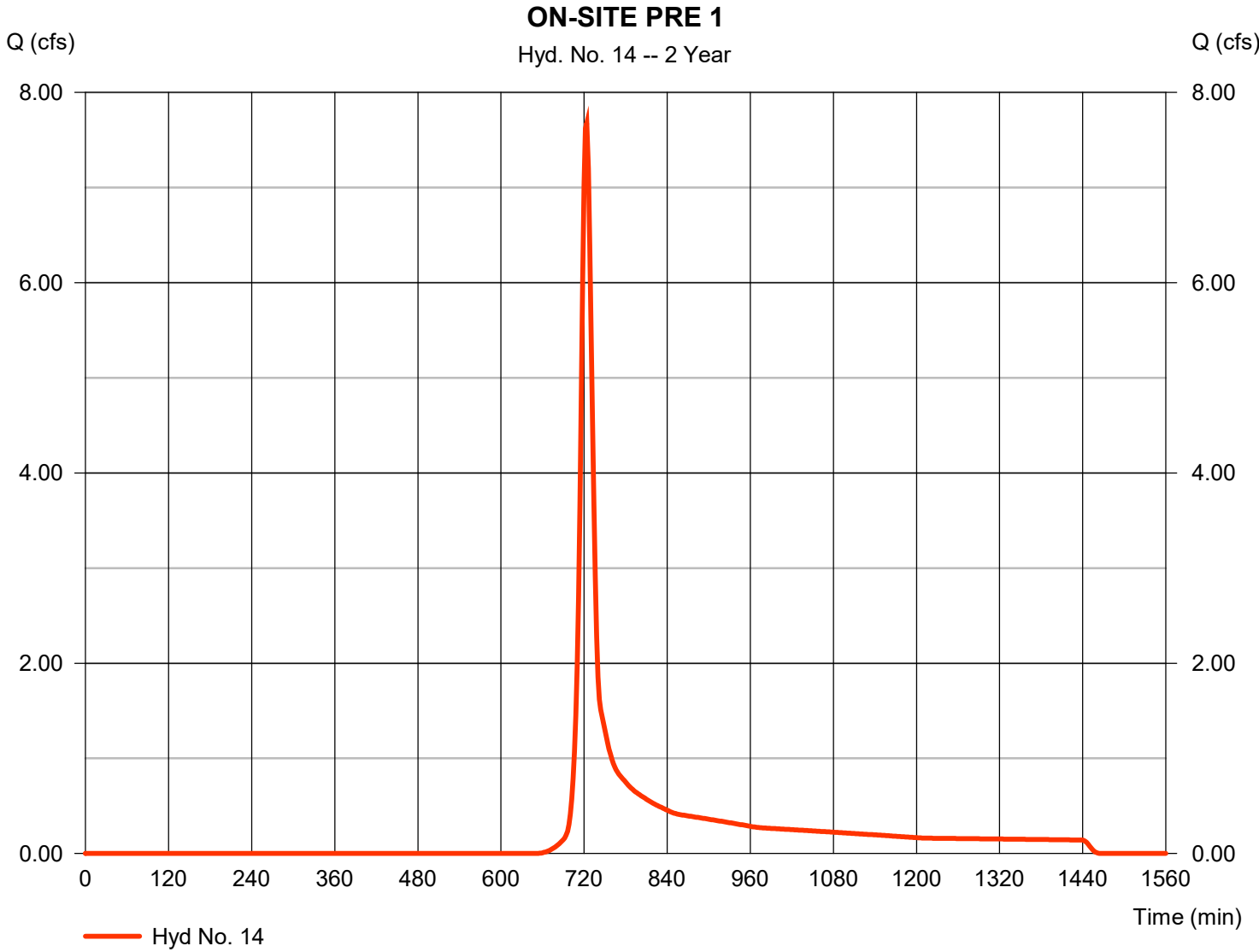


Hydrograph Report

Hyd. No. 14

ON-SITE PRE 1

Hydrograph type	= SCS Runoff	Peak discharge	= 7.679 cfs
Storm frequency	= 2 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 22,507 cuft
Drainage area	= 5.360 ac	Curve number	= 71
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 16.00 min
Total precip.	= 3.69 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

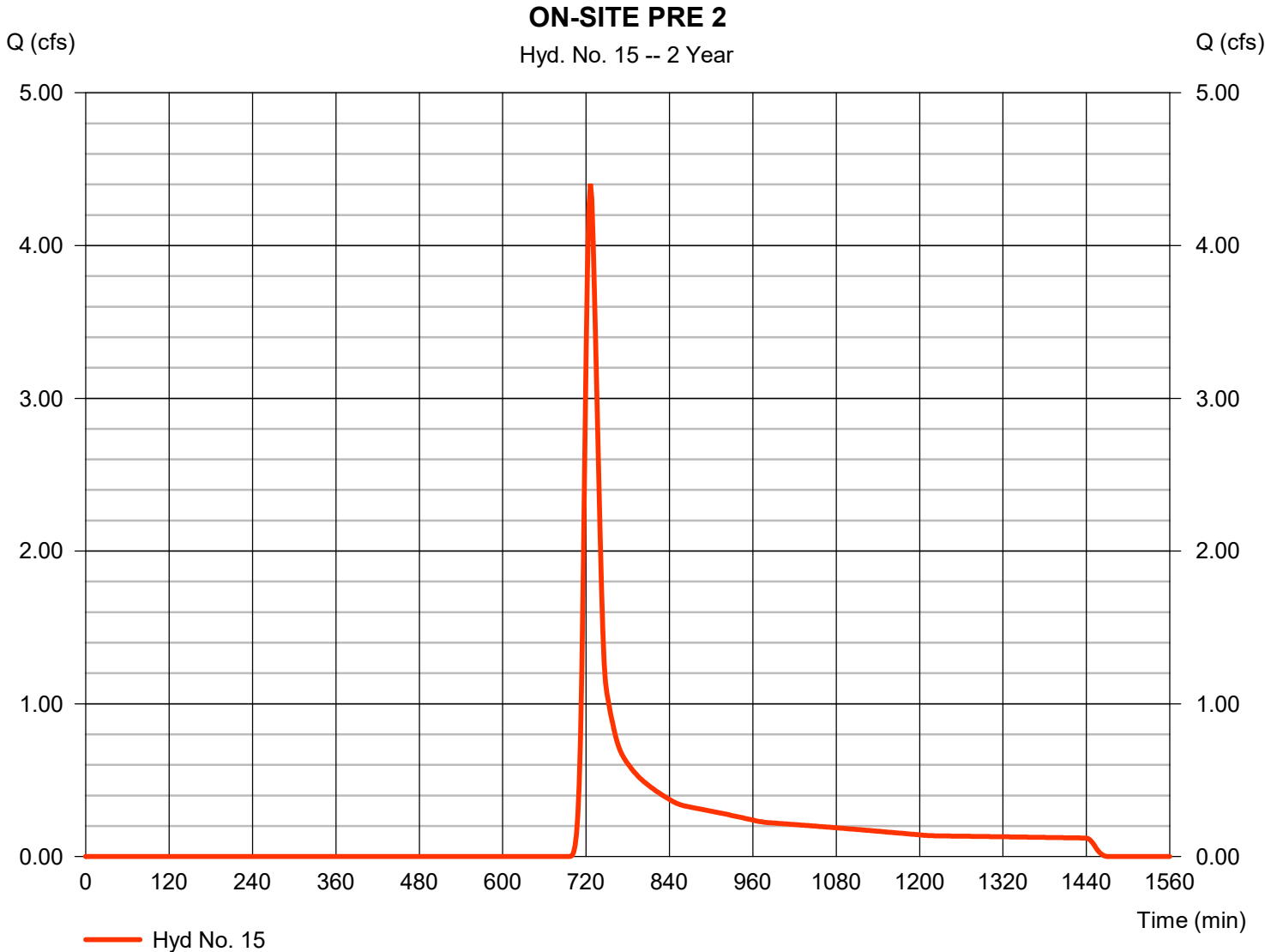


Hydrograph Report

Hyd. No. 15

ON-SITE PRE 2

Hydrograph type	= SCS Runoff	Peak discharge	= 4.405 cfs
Storm frequency	= 2 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 16,184 cuft
Drainage area	= 5.550 ac	Curve number	= 64
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 17.00 min
Total precip.	= 3.69 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

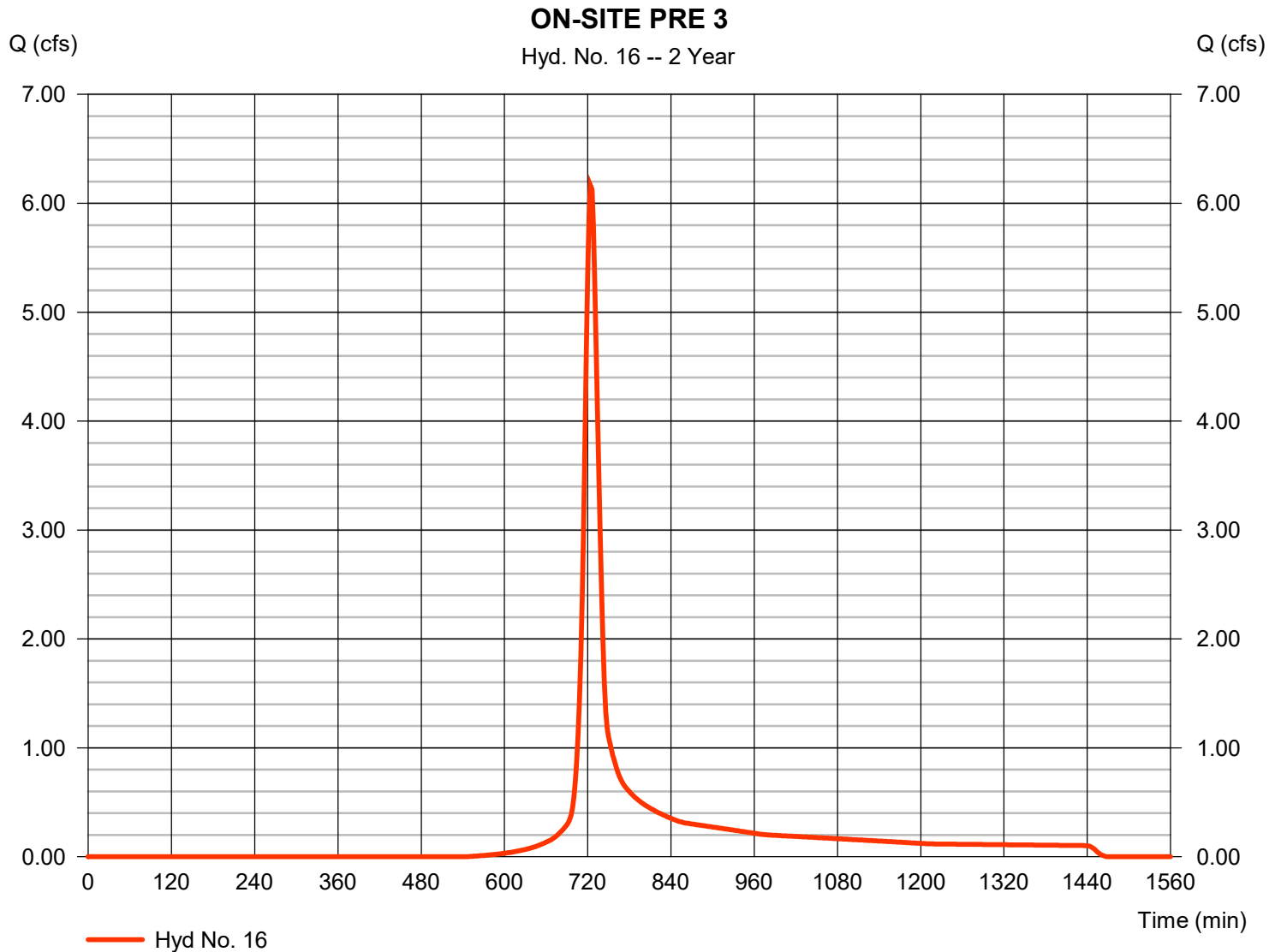
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Hyd. No. 16

ON-SITE PRE 3

Hydrograph type	= SCS Runoff	Peak discharge	= 6.164 cfs
Storm frequency	= 2 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 19,423 cuft
Drainage area	= 3.120 ac	Curve number	= 79
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 18.00 min
Total precip.	= 3.69 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

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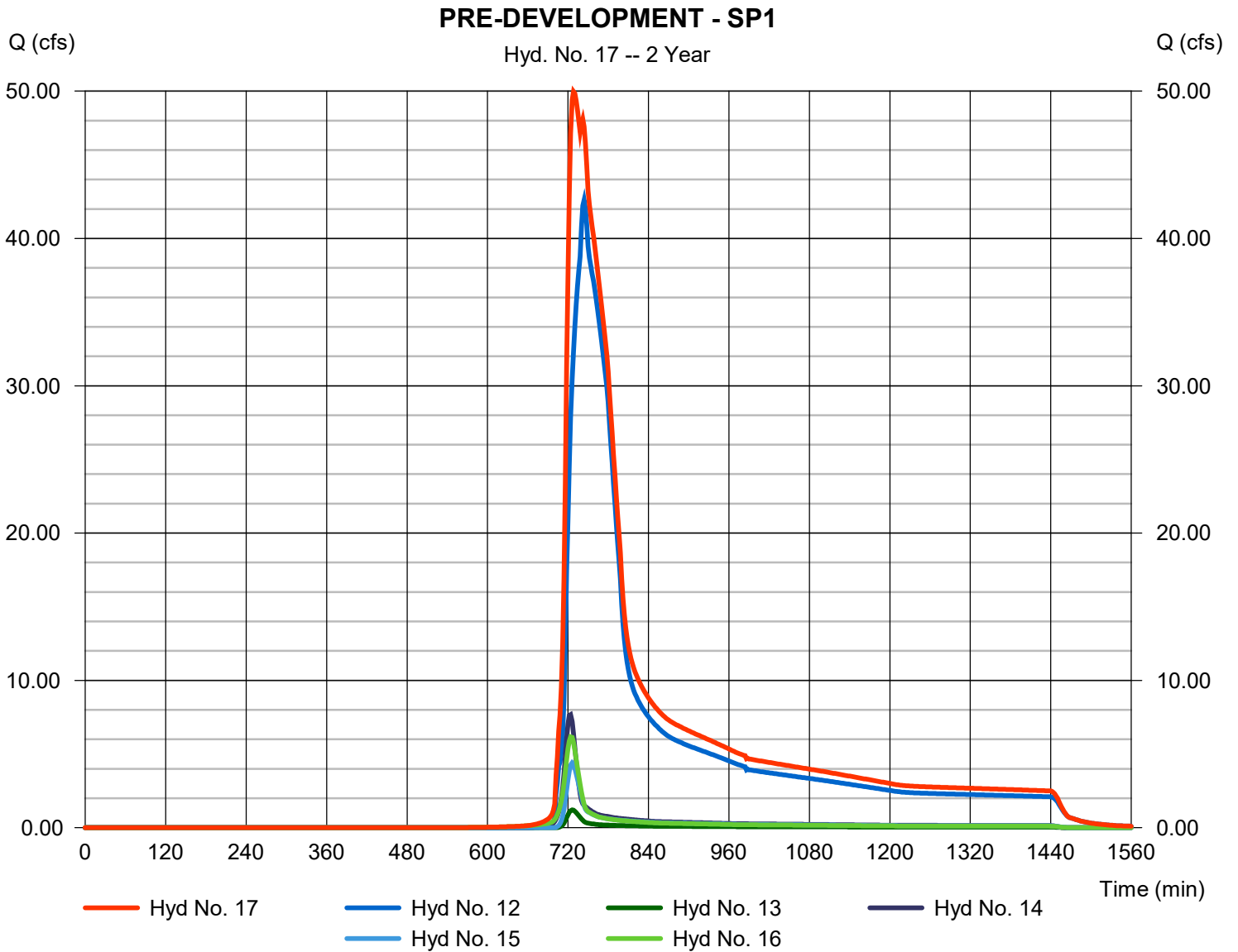
Monday, 05 / 8 / 2023

Hyd. No. 17

PRE-DEVELOPMENT - SP1

Hydrograph type = Combine
 Storm frequency = 2 yrs
 Time interval = 2 min
 Inflow hyds. = 12, 13, 14, 15, 16

Peak discharge = 49.97 cfs
 Time to peak = 728 min
 Hyd. volume = 374,909 cuft
 Contrib. drain. area = 15.700 ac



Hydrograph Report

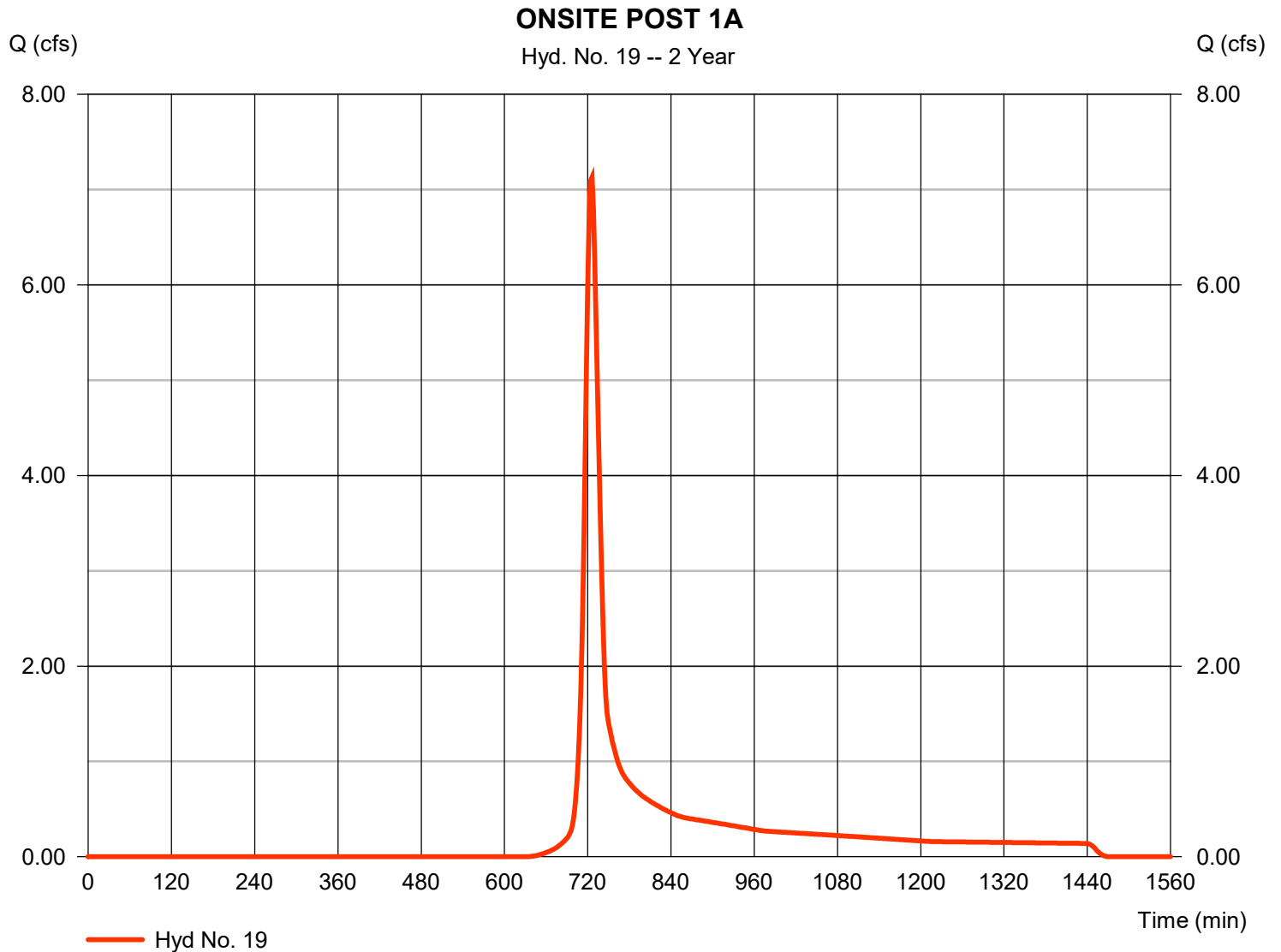
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Monday, 05 / 8 / 2023

Hyd. No. 19

ONSITE POST 1A

Hydrograph type	= SCS Runoff	Peak discharge	= 7.130 cfs
Storm frequency	= 2 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 23,142 cuft
Drainage area	= 4.870 ac	Curve number	= 73
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 18.00 min
Total precip.	= 3.69 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

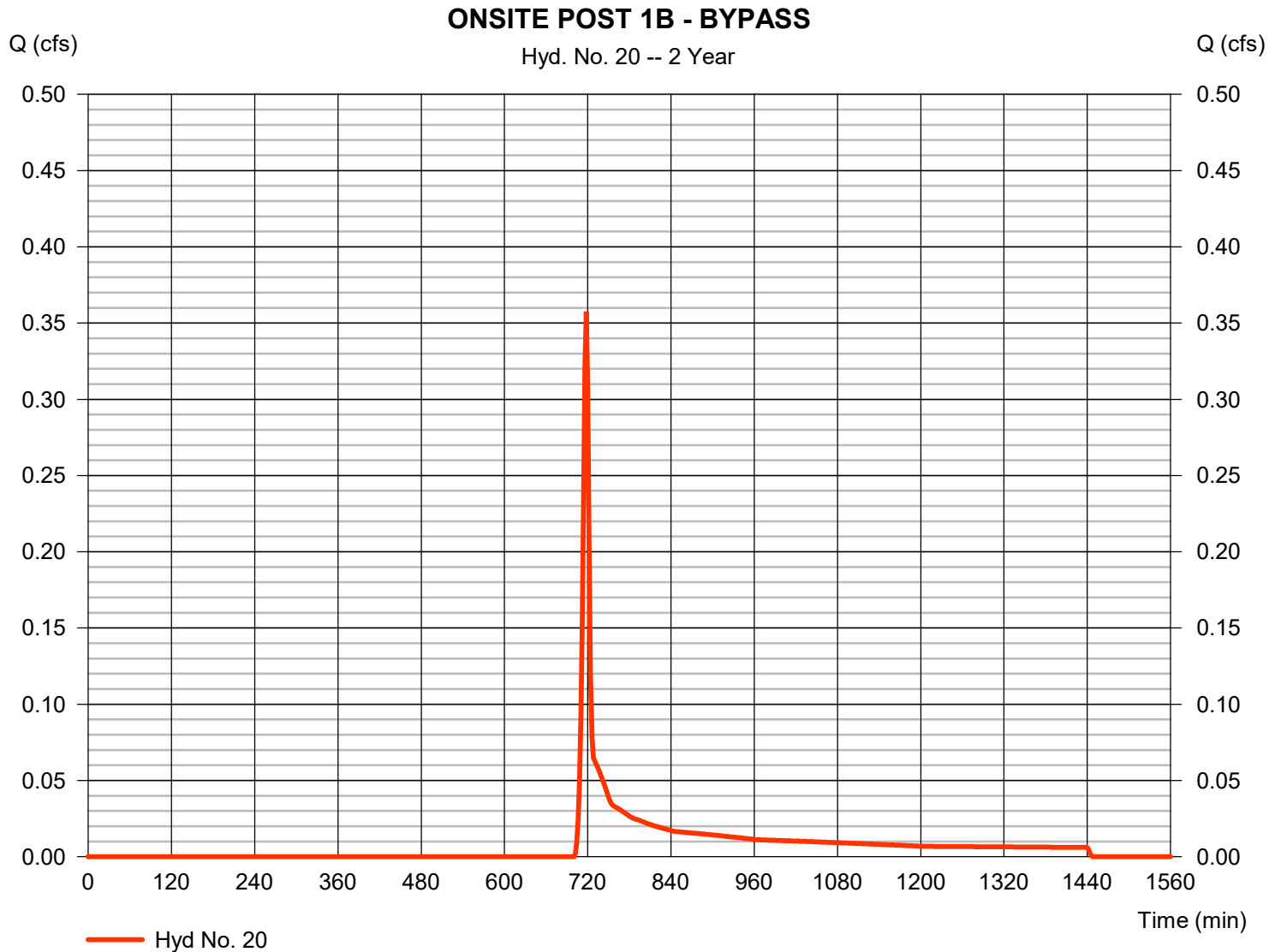
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Monday, 05 / 8 / 2023

Hyd. No. 20

ONSITE POST 1B - BYPASS

Hydrograph type	= SCS Runoff	Peak discharge	= 0.358 cfs
Storm frequency	= 2 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 769 cuft
Drainage area	= 0.320 ac	Curve number	= 62
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.69 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

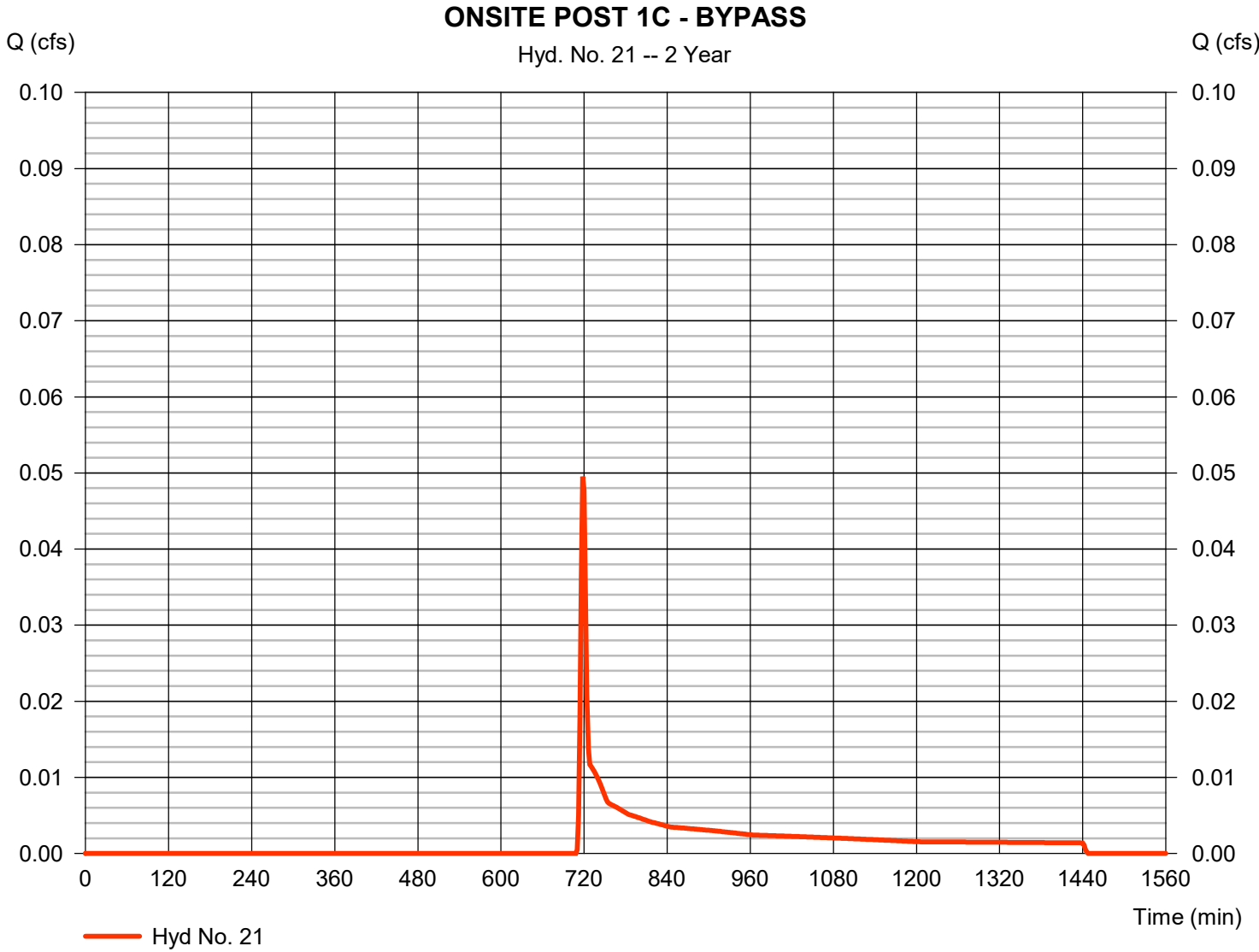


Hydrograph Report

Hyd. No. 21

ONSITE POST 1C - BYPASS

Hydrograph type	= SCS Runoff	Peak discharge	= 0.050 cfs
Storm frequency	= 2 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 140 cuft
Drainage area	= 0.100 ac	Curve number	= 55
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.69 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

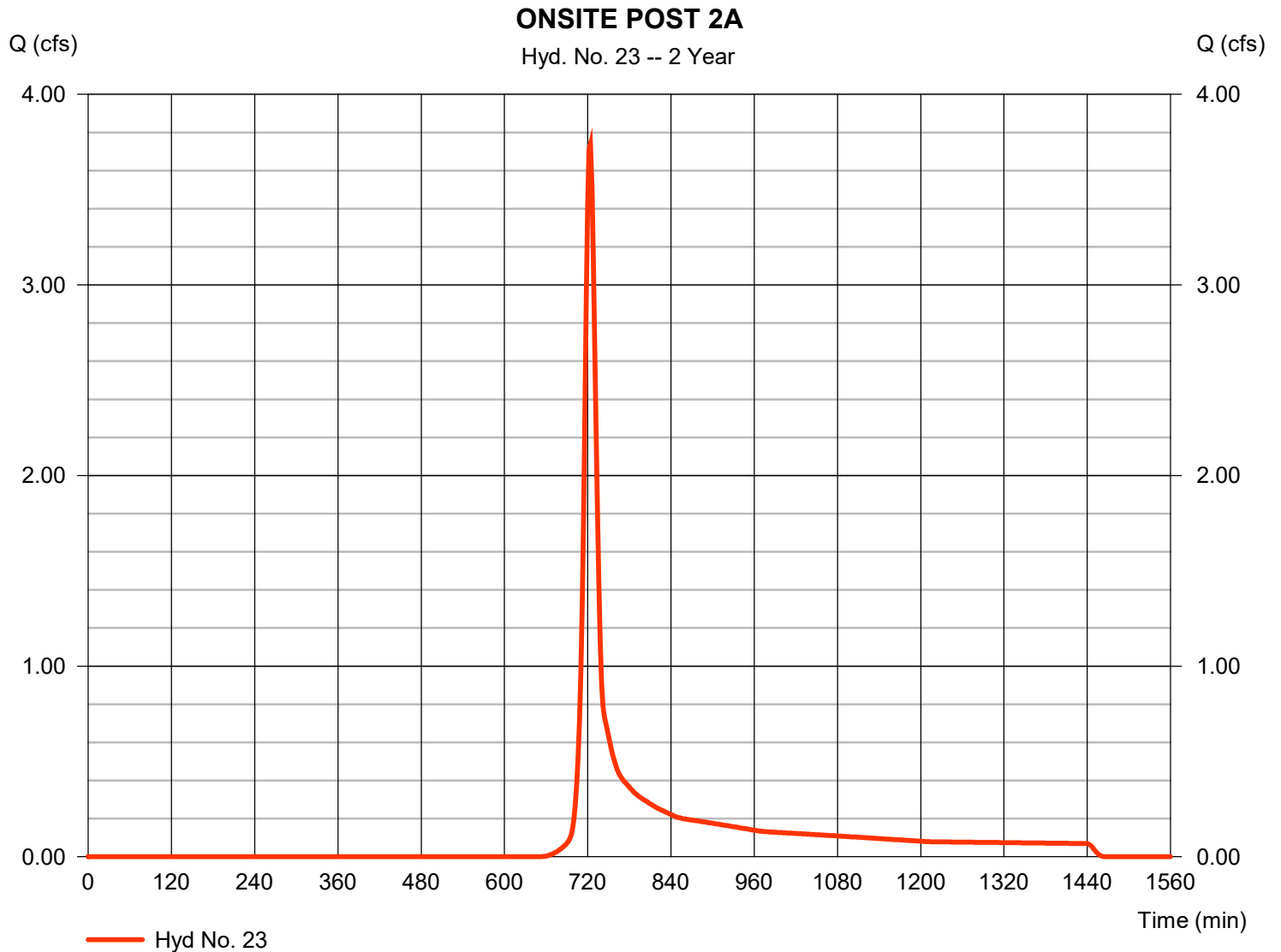
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Monday, 05 / 8 / 2023

Hyd. No. 23

ONSITE POST 2A

Hydrograph type	= SCS Runoff	Peak discharge	= 3.739 cfs
Storm frequency	= 2 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 10,960 cuft
Drainage area	= 2.610 ac	Curve number	= 71
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 16.00 min
Total precip.	= 3.69 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

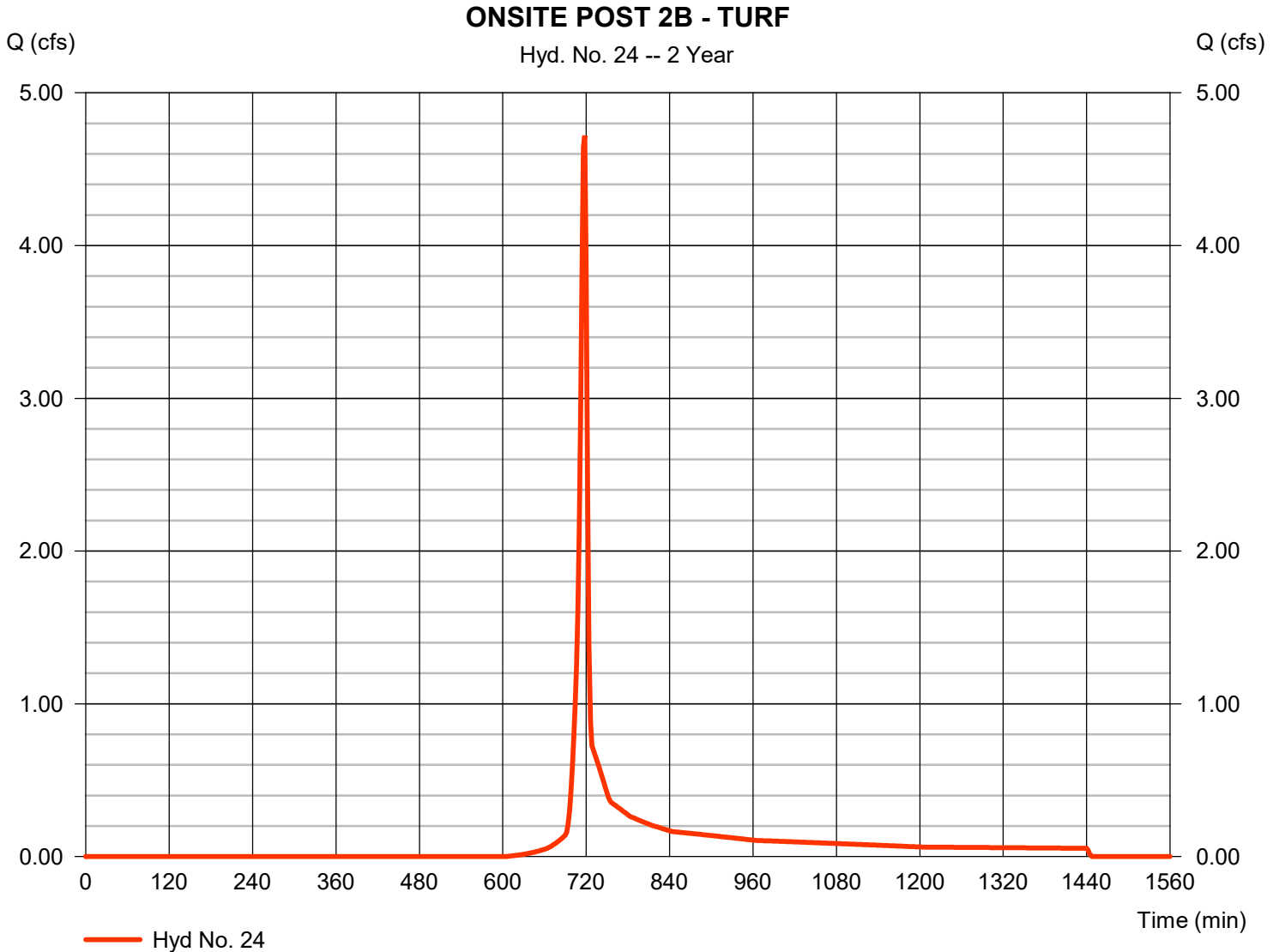


Hydrograph Report

Hyd. No. 24

ONSITE POST 2B - TURF

Hydrograph type	= SCS Runoff	Peak discharge	= 4.721 cfs
Storm frequency	= 2 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 9,444 cuft
Drainage area	= 1.930 ac	Curve number	= 75
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 3.69 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

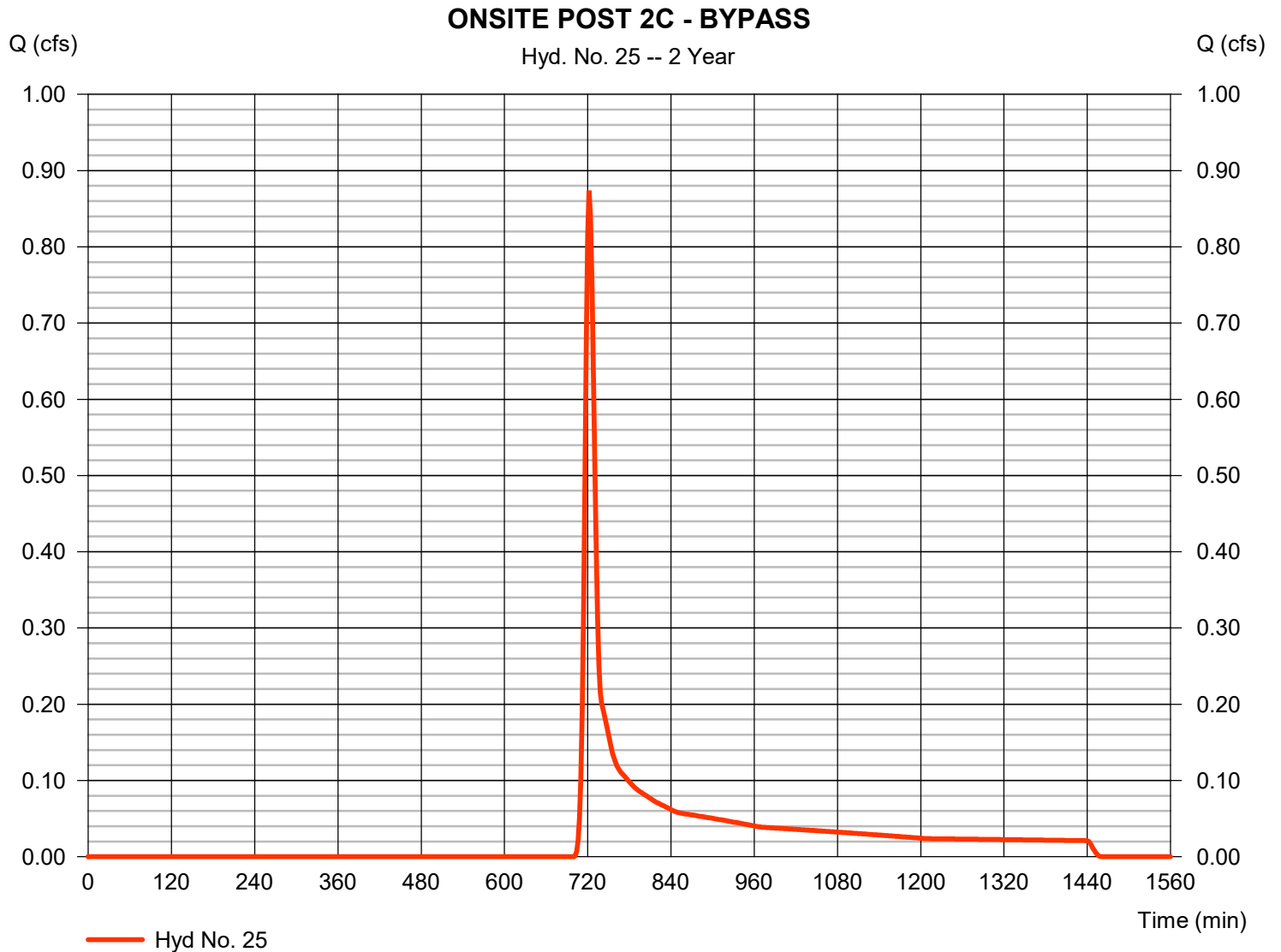
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Hyd. No. 25

ONSITE POST 2C - BYPASS

Hydrograph type	= SCS Runoff	Peak discharge	= 0.874 cfs
Storm frequency	= 2 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 2,672 cuft
Drainage area	= 1.010 ac	Curve number	= 62
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 12.00 min
Total precip.	= 3.69 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

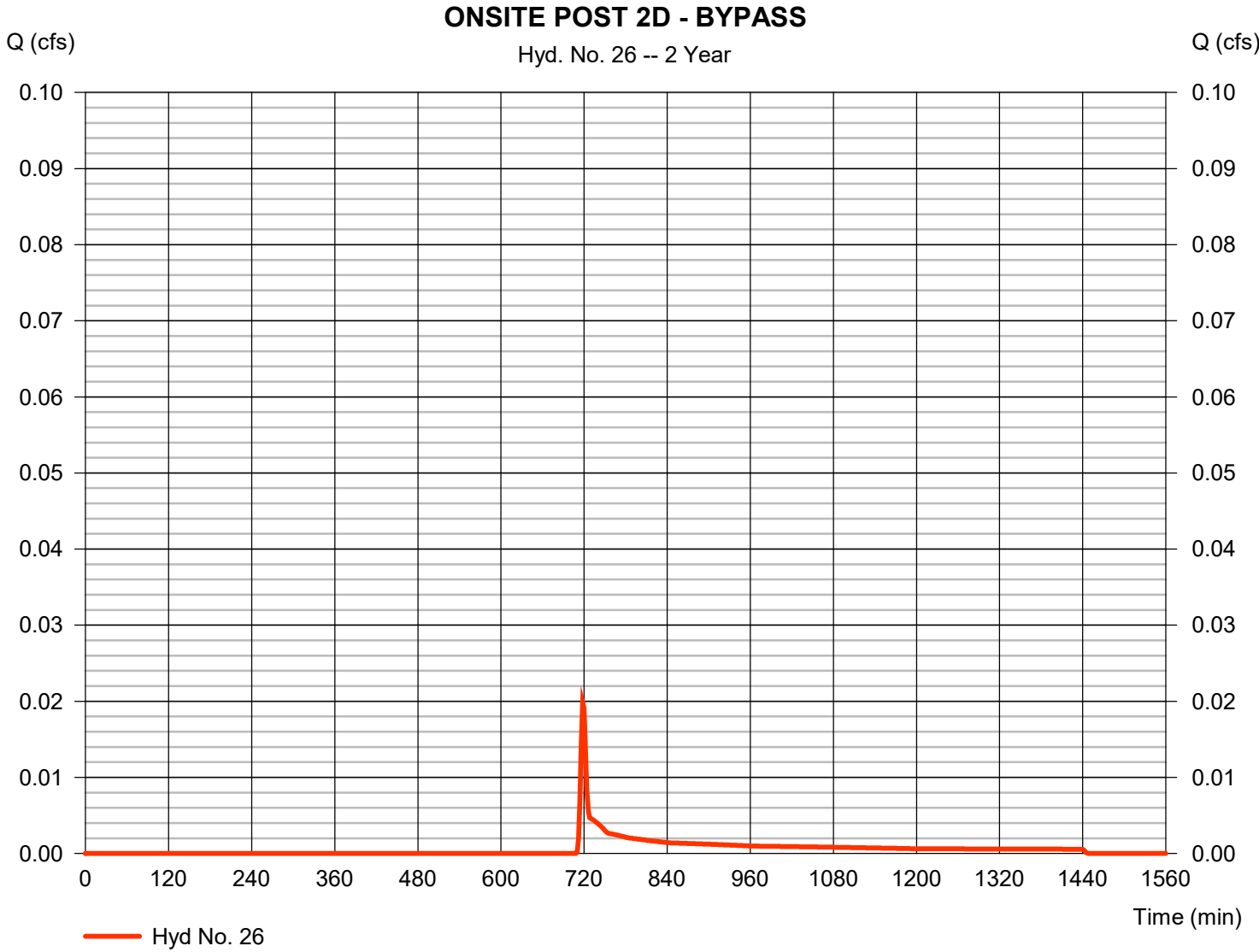


Hydrograph Report

Hyd. No. 26

ONSITE POST 2D - BYPASS

Hydrograph type	= SCS Runoff	Peak discharge	= 0.020 cfs
Storm frequency	= 2 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 56 cuft
Drainage area	= 0.040 ac	Curve number	= 55
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.69 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

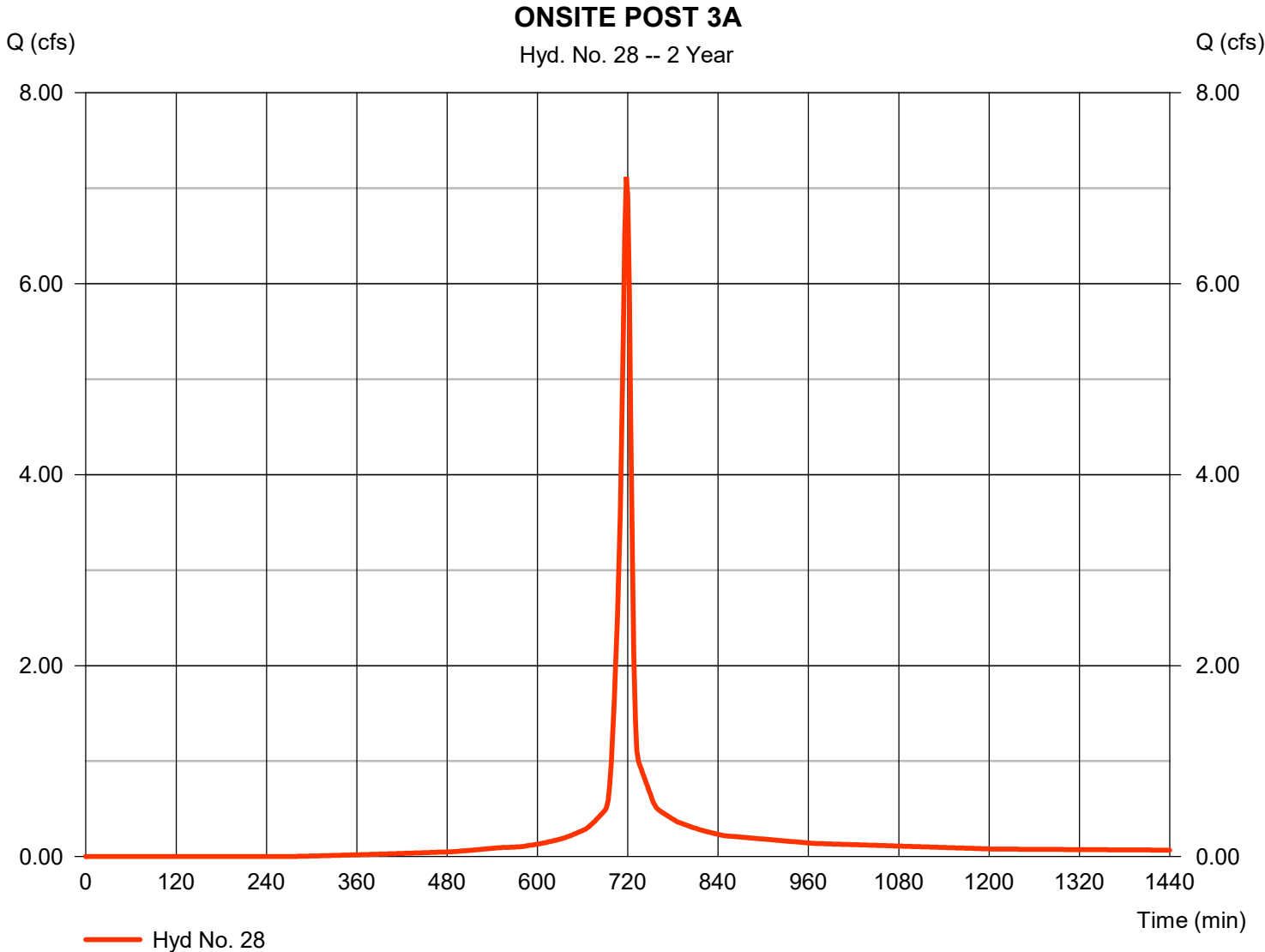


Hydrograph Report

Hyd. No. 28

ONSITE POST 3A

Hydrograph type	= SCS Runoff	Peak discharge	= 7.118 cfs
Storm frequency	= 2 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 16,893 cuft
Drainage area	= 1.710 ac	Curve number	= 91
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 7.00 min
Total precip.	= 3.69 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

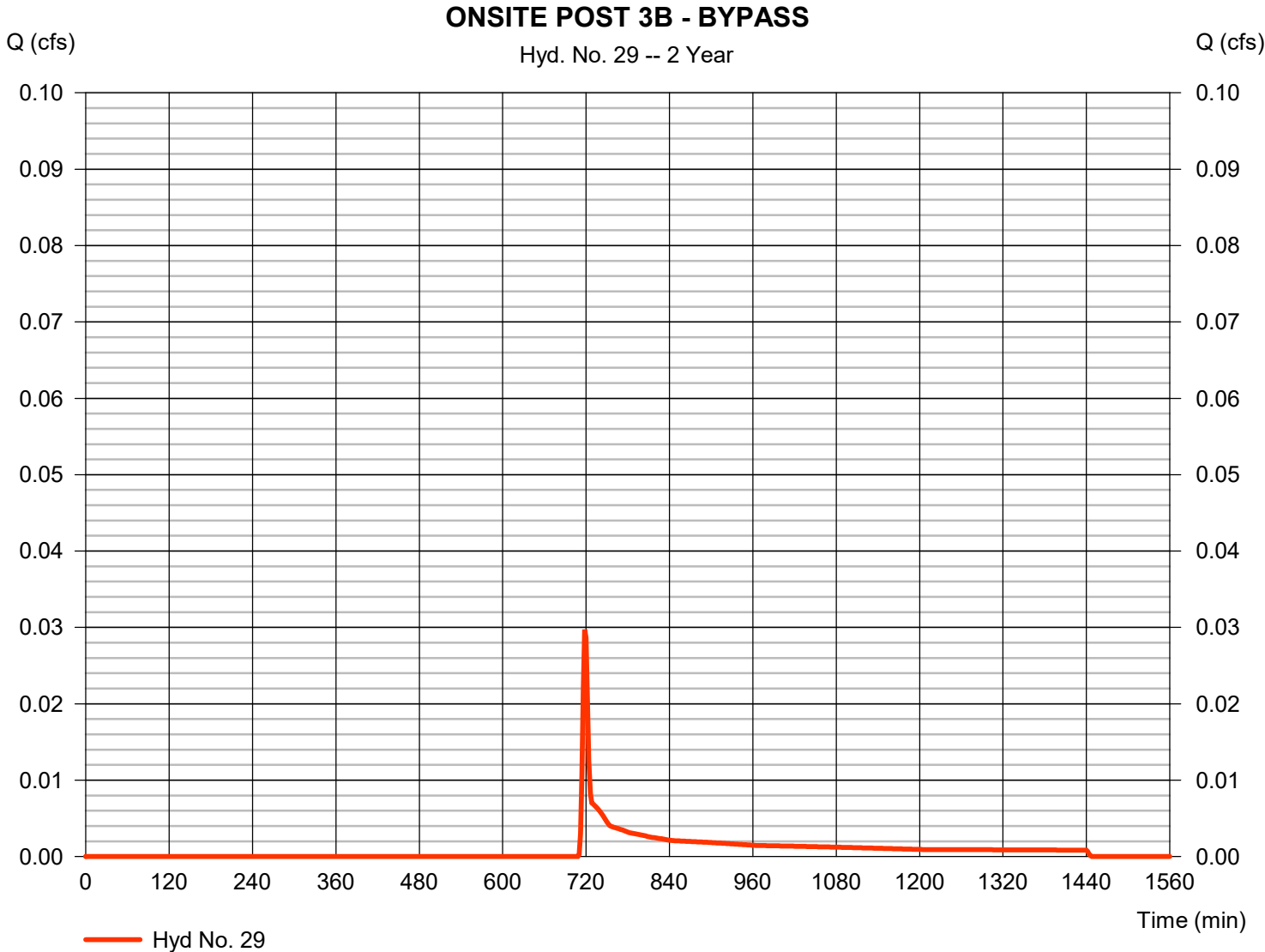
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Monday, 05 / 8 / 2023

Hyd. No. 29

ONSITE POST 3B - BYPASS

Hydrograph type	= SCS Runoff	Peak discharge	= 0.030 cfs
Storm frequency	= 2 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 84 cuft
Drainage area	= 0.060 ac	Curve number	= 55
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.69 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

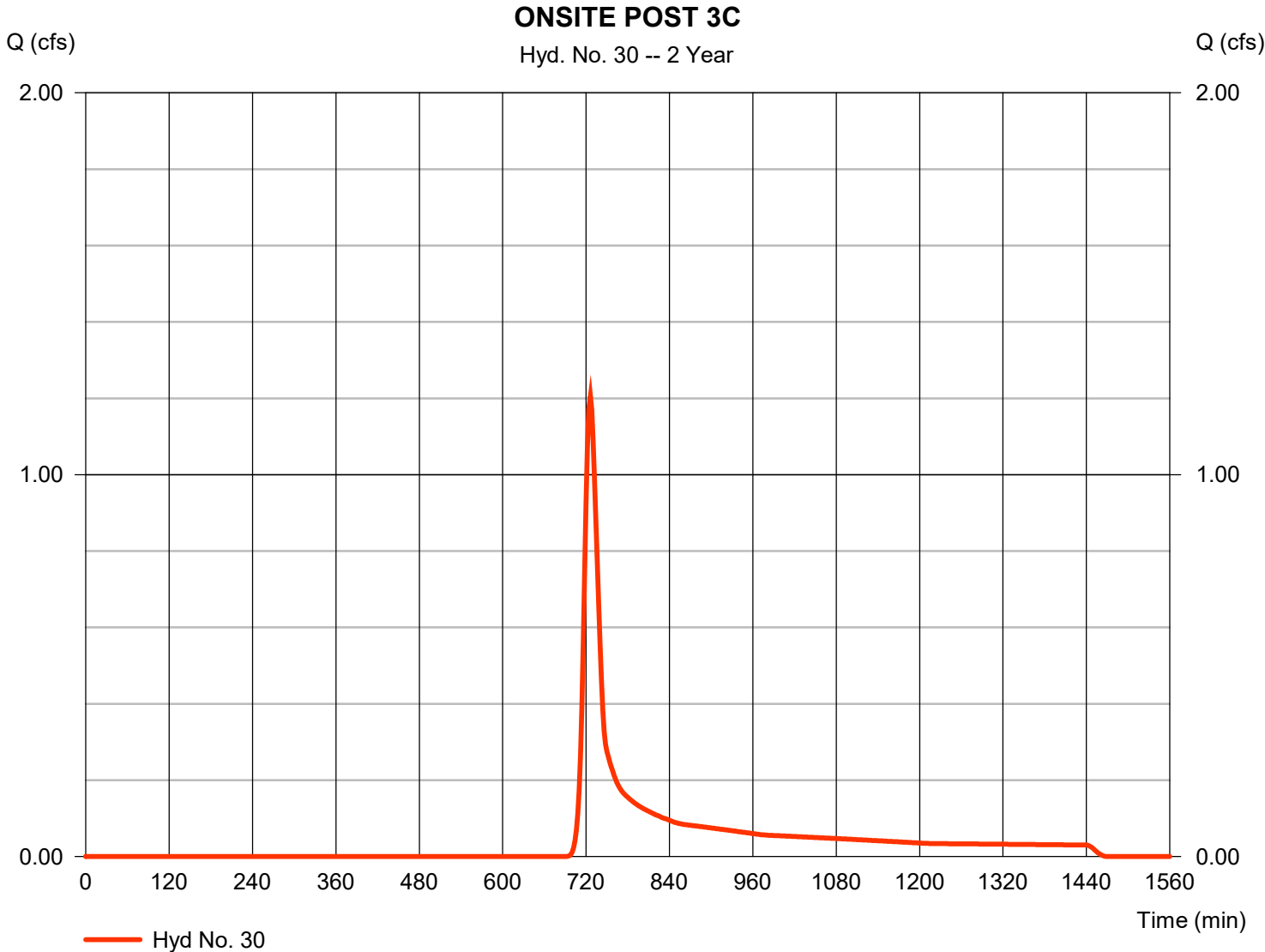


Hydrograph Report

Hyd. No. 30

ONSITE POST 3C

Hydrograph type	= SCS Runoff	Peak discharge	= 1.205 cfs
Storm frequency	= 2 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 4,241 cuft
Drainage area	= 1.290 ac	Curve number	= 66
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 19.00 min
Total precip.	= 3.69 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

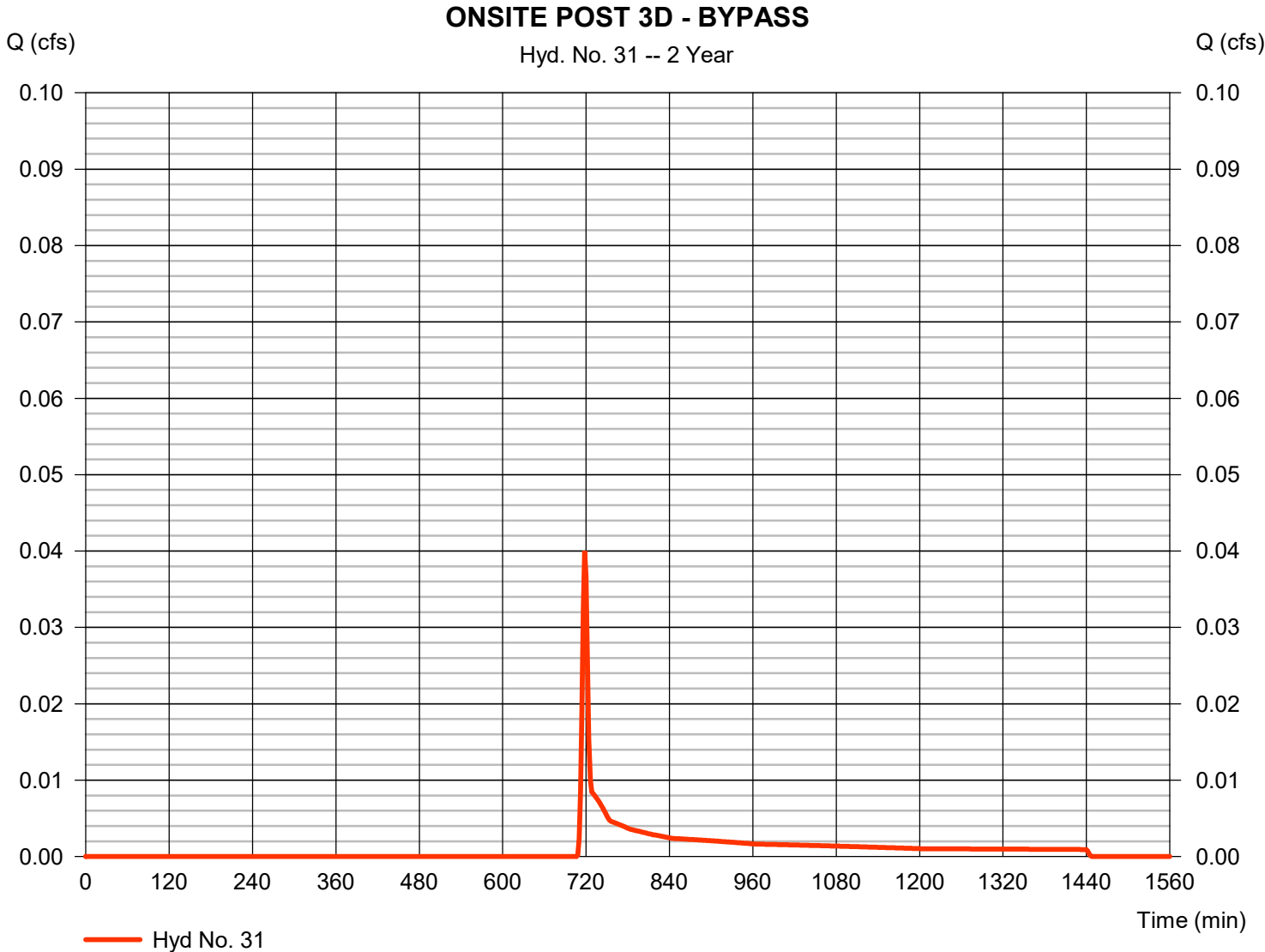


Hydrograph Report

Hyd. No. 31

ONSITE POST 3D - BYPASS

Hydrograph type	= SCS Runoff	Peak discharge	= 0.040 cfs
Storm frequency	= 2 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 100 cuft
Drainage area	= 0.060 ac	Curve number	= 57
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.69 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

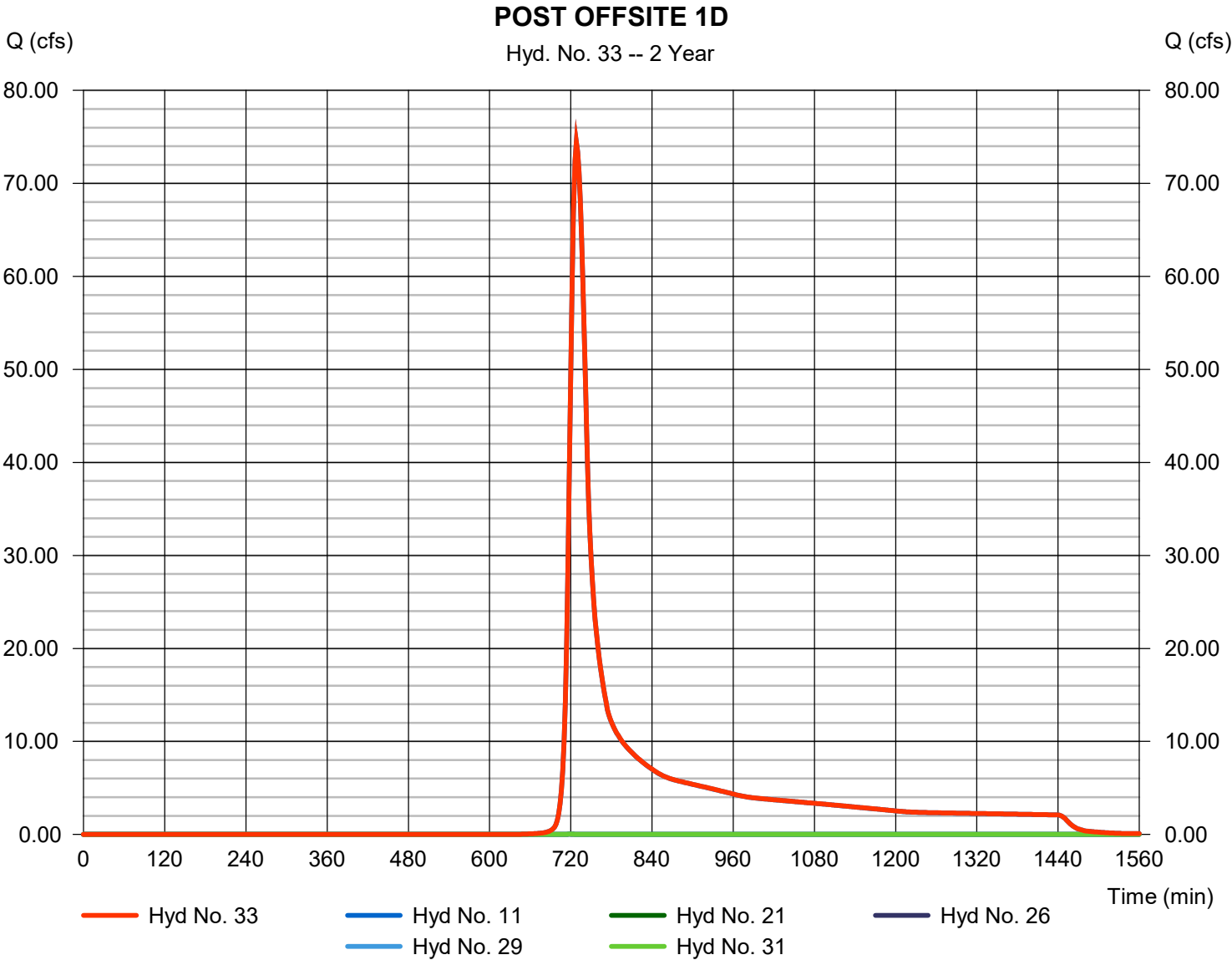
Monday, 05 / 8 / 2023

Hyd. No. 33

POST OFFSITE 1D

Hydrograph type = Combine
Storm frequency = 2 yrs
Time interval = 2 min
Inflow hyds. = 11, 21, 26, 29, 31

Peak discharge = 74.48 cfs
Time to peak = 728 min
Hyd. volume = 312,610 cuft
Contrib. drain. area = 0.260 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

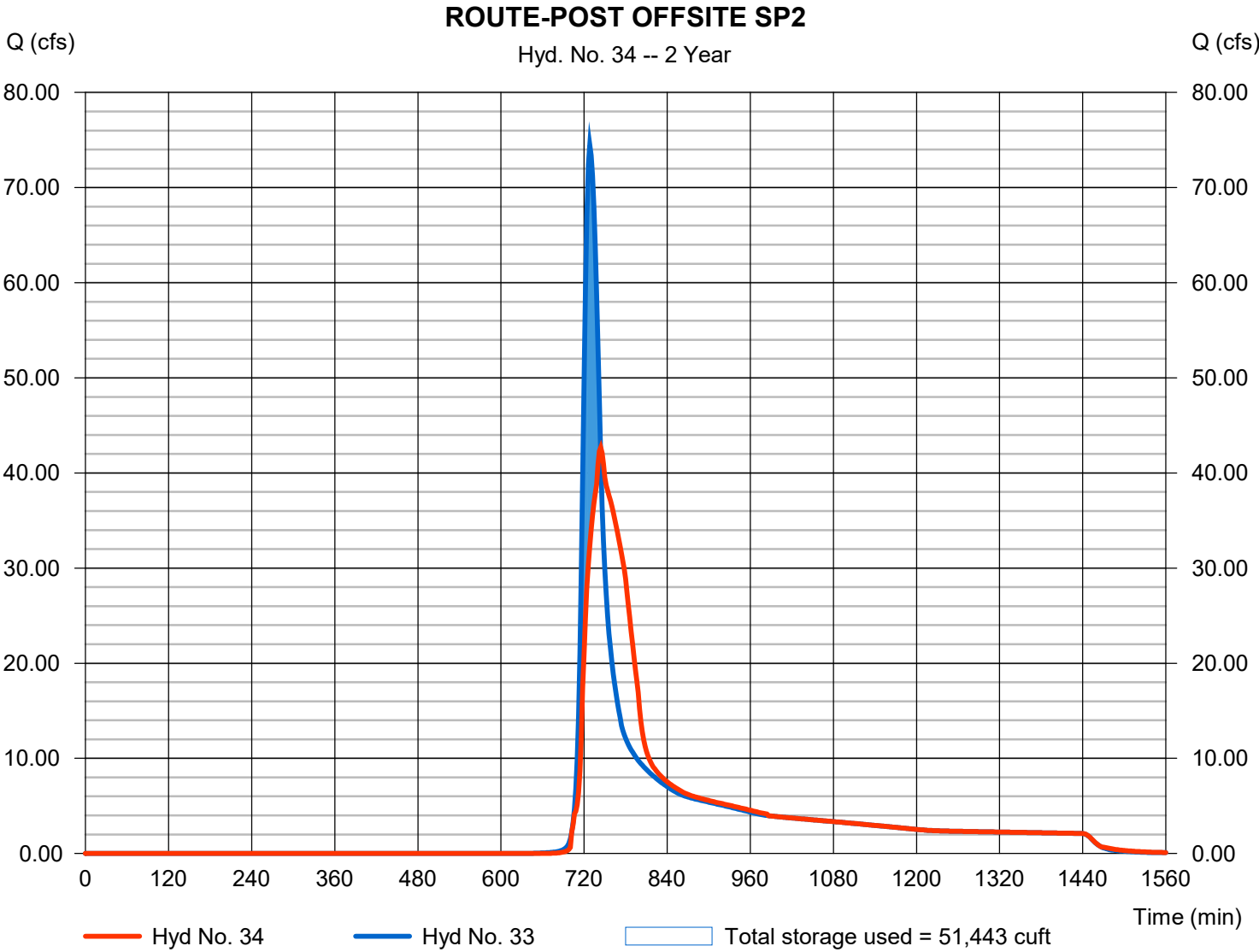
Monday, 05 / 8 / 2023

Hyd. No. 34

ROUTE-POST OFFSITE SP2

Hydrograph type	= Reservoir	Peak discharge	= 42.67 cfs
Storm frequency	= 2 yrs	Time to peak	= 744 min
Time interval	= 2 min	Hyd. volume	= 312,602 cuft
Inflow hyd. No.	= 33 - POST OFFSITE 1D	Max. Elevation	= 1013.17 ft
Reservoir name	= OFFSITE 1D	Max. Storage	= 51,443 cuft

Storage Indication method used.



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

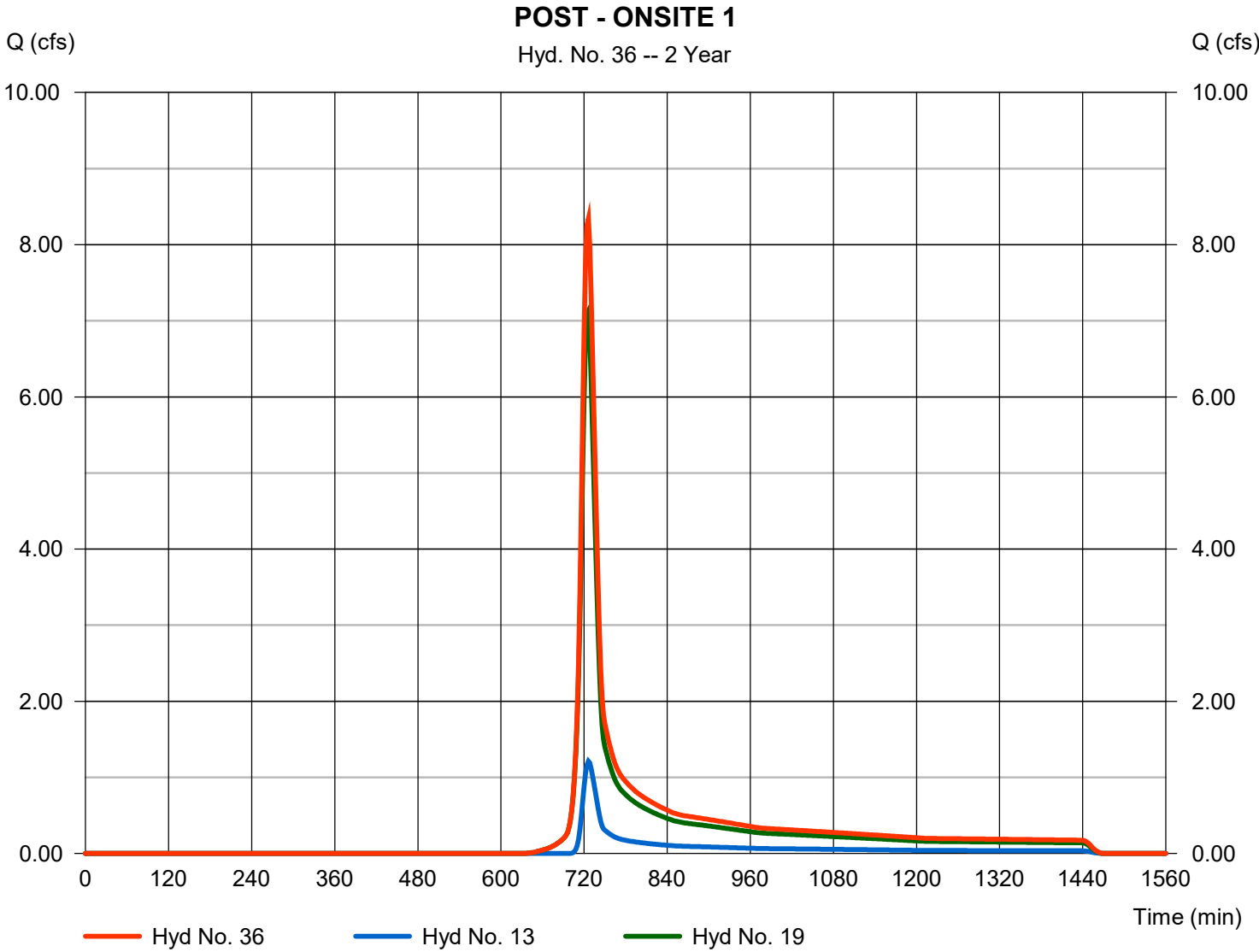
Monday, 05 / 8 / 2023

Hyd. No. 36

POST - ONSITE 1

Hydrograph type = Combine
Storm frequency = 2 yrs
Time interval = 2 min
Inflow hyds. = 13, 19

Peak discharge = 8.341 cfs
Time to peak = 726 min
Hyd. volume = 27,715 cuft
Contrib. drain. area = 6.540 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

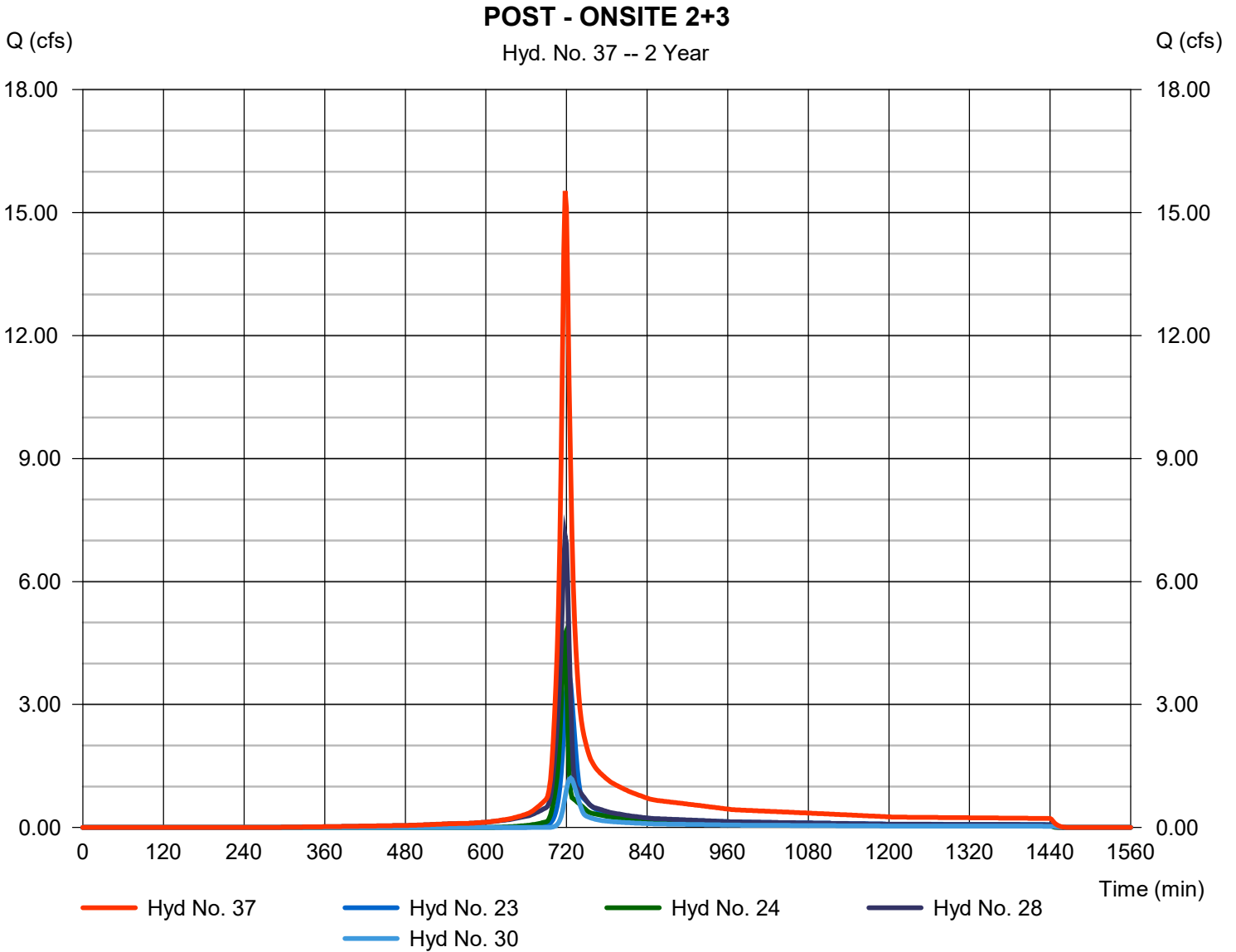
Monday, 05 / 8 / 2023

Hyd. No. 37

POST - ONSITE 2+3

Hydrograph type = Combine
Storm frequency = 2 yrs
Time interval = 2 min
Inflow hyds. = 23, 24, 28, 30

Peak discharge = 15.53 cfs
Time to peak = 718 min
Hyd. volume = 41,538 cuft
Contrib. drain. area = 7.540 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

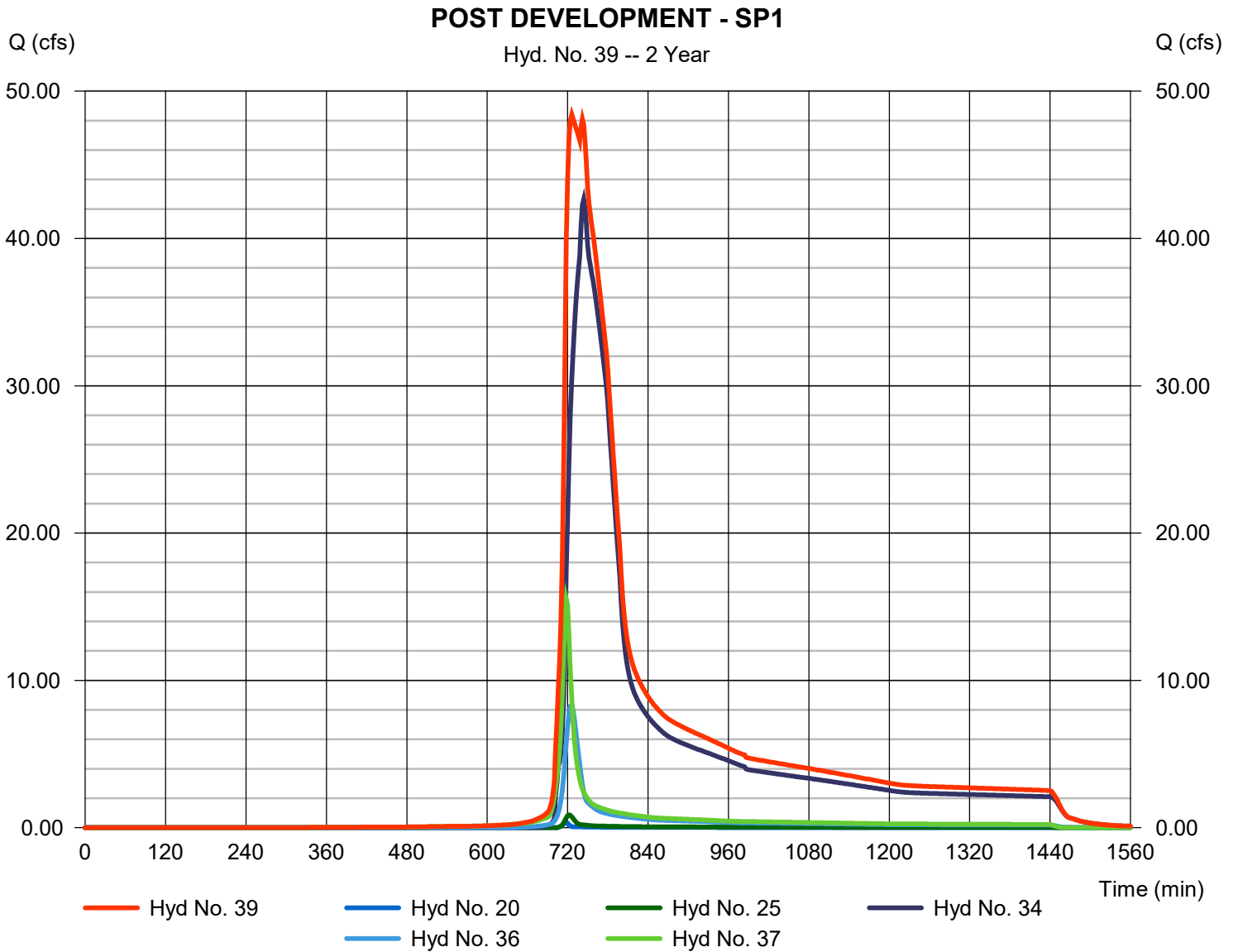
Monday, 05 / 8 / 2023

Hyd. No. 39

POST DEVELOPMENT - SP1

Hydrograph type = Combine
Storm frequency = 2 yrs
Time interval = 2 min
Inflow hyds. = 20, 25, 34, 36, 37

Peak discharge = 48.40 cfs
Time to peak = 726 min
Hyd. volume = 385,296 cuft
Contrib. drain. area = 1.330 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	15.27	2	724	44,547	-----	-----	-----	OFFSITE 1A
2	Reservoir	14.21	2	726	44,546	1	1051.87	2,788	ROUTE - OFFSITE 1A
3	SCS Runoff	37.21	2	728	135,401	-----	-----	-----	OFFSITE 1B
4	Combine	51.11	2	728	179,947	2, 3	-----	-----	ROUTE 1A +OFFSITE 1B
5	Reservoir	42.66	2	734	179,940	4	1028.44	21,581	ROUTE OFFSITE 1B
6	SCS Runoff	14.34	2	728	52,190	-----	-----	-----	OFFSITE 1C
7	Combine	55.54	2	732	232,130	5, 6	-----	-----	ROUTE 1B + OFFSITE 1C
8	Reservoir	54.76	2	734	232,129	7	1016.84	6,029	ROUTE OFFSITE 1C
9	SCS Runoff	52.97	2	726	173,556	-----	-----	-----	PRE OFFSITE 1D
10	SCS Runoff	13.78	2	724	43,948	-----	-----	-----	PRE OFFSITE 1E
11	Combine	111.82	2	728	449,634	8, 9, 10	-----	-----	ROUTE 1C +OFFSITE 1D +1E
12	Reservoir	88.55	2	738	449,626	11	1013.65	69,081	PREROUTE- OFFSITE SP2
13	SCS Runoff	2.004	2	726	6,931	-----	-----	-----	OFFSITE 2
14	SCS Runoff	11.07	2	722	31,764	-----	-----	-----	ON-SITE PRE 1
15	SCS Runoff	7.119	2	726	24,279	-----	-----	-----	ON-SITE PRE 2
16	SCS Runoff	8.295	2	724	25,967	-----	-----	-----	ON-SITE PRE 3
17	Combine	102.16	2	736	538,568	12, 13, 14, 15, 16	-----	-----	PRE-DEVELOPMENT - SP1
19	SCS Runoff	10.09	2	724	32,185	-----	-----	-----	ONSITE POST 1A
20	SCS Runoff	0.575	2	718	1,179	-----	-----	-----	ONSITE POST 1B - BYPASS
21	SCS Runoff	0.104	2	718	237	-----	-----	-----	ONSITE POST 1C - BYPASS
23	SCS Runoff	5.388	2	722	15,467	-----	-----	-----	ONSITE POST 2A
24	SCS Runoff	6.441	2	718	12,954	-----	-----	-----	ONSITE POST 2B - TURF
25	SCS Runoff	1.456	2	722	4,095	-----	-----	-----	ONSITE POST 2C - BYPASS
26	SCS Runoff	0.042	2	718	95	-----	-----	-----	ONSITE POST 2D - BYPASS
28	SCS Runoff	8.787	2	718	21,115	-----	-----	-----	ONSITE POST 3A
29	SCS Runoff	0.062	2	718	142	-----	-----	-----	ONSITE POST 3B - BYPASS
30	SCS Runoff	1.872	2	726	6,240	-----	-----	-----	ONSITE POST 3C
31	SCS Runoff	0.075	2	718	164	-----	-----	-----	ONSITE POST 3D - BYPASS
33	Combine	111.88	2	728	450,272	11, 21, 26, 29, 31, 33	-----	-----	POST OFFSITE 1D
34	Reservoir	88.67	2	738	450,265	33	1013.65	69,115	ROUTE-POST OFFSITE SP2
36	Combine	12.08	2	726	39,116	13, 19,	-----	-----	POST - ONSITE 1
Fitzgerald Field.gpw					Return Period: 5 Year			Monday, 05 / 8 / 2023	

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
37	Combine	20.88	2	718	55,776	23, 24, 28, 30,	-----	-----	POST - ONSITE 2+3
39	Combine	100.64	2	736	550,431	20, 25, 34, 36, 37,	-----	-----	POST DEVELOPMENT - SP1
Fitzgerald Field.gpw					Return Period: 5 Year			Monday, 05 / 8 / 2023	

Hydrograph Report

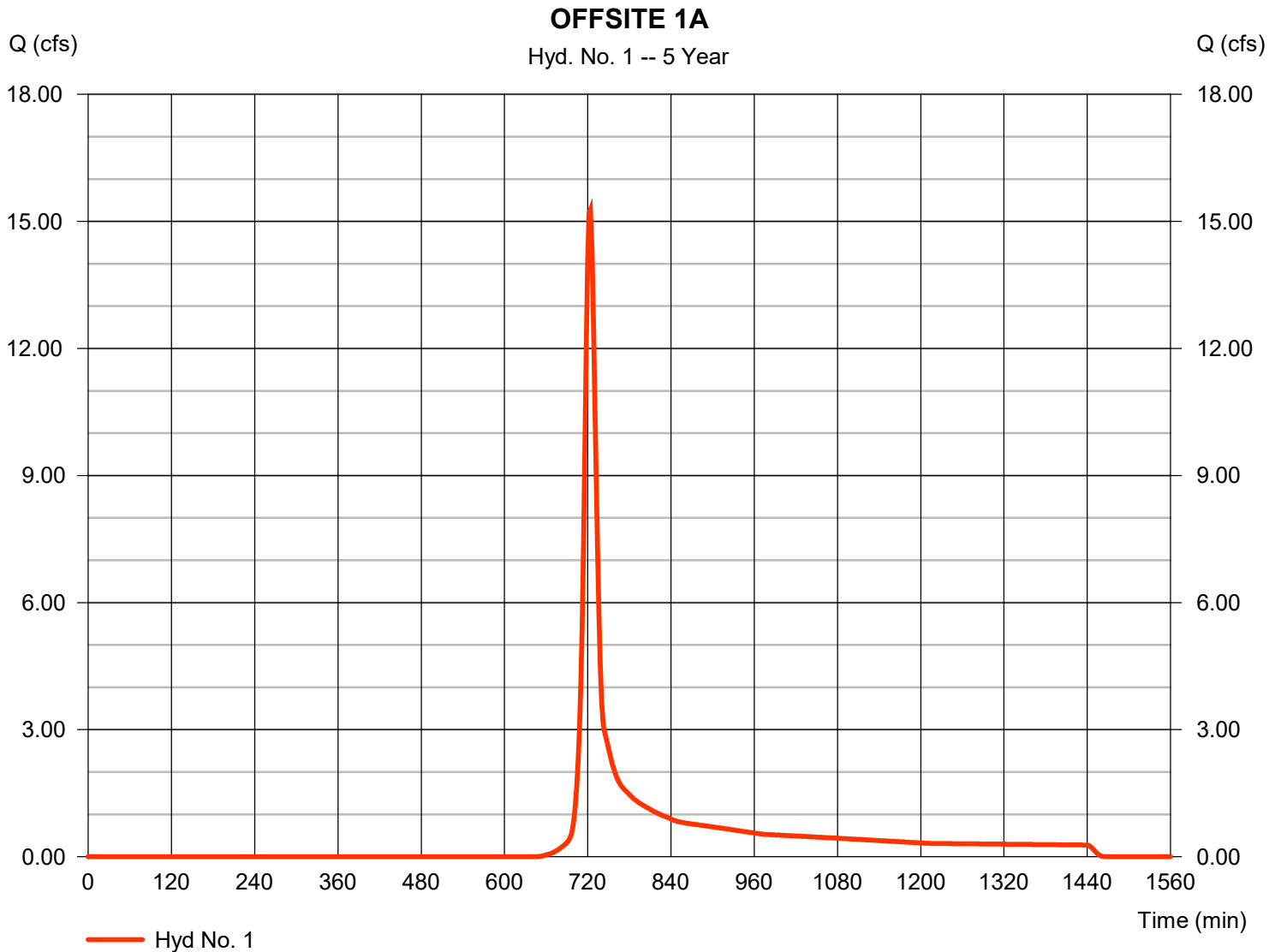
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 1

OFFSITE 1A

Hydrograph type	= SCS Runoff	Peak discharge	= 15.27 cfs
Storm frequency	= 5 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 44,547 cuft
Drainage area	= 8.590 ac	Curve number	= 68
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 14.00 min
Total precip.	= 4.40 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

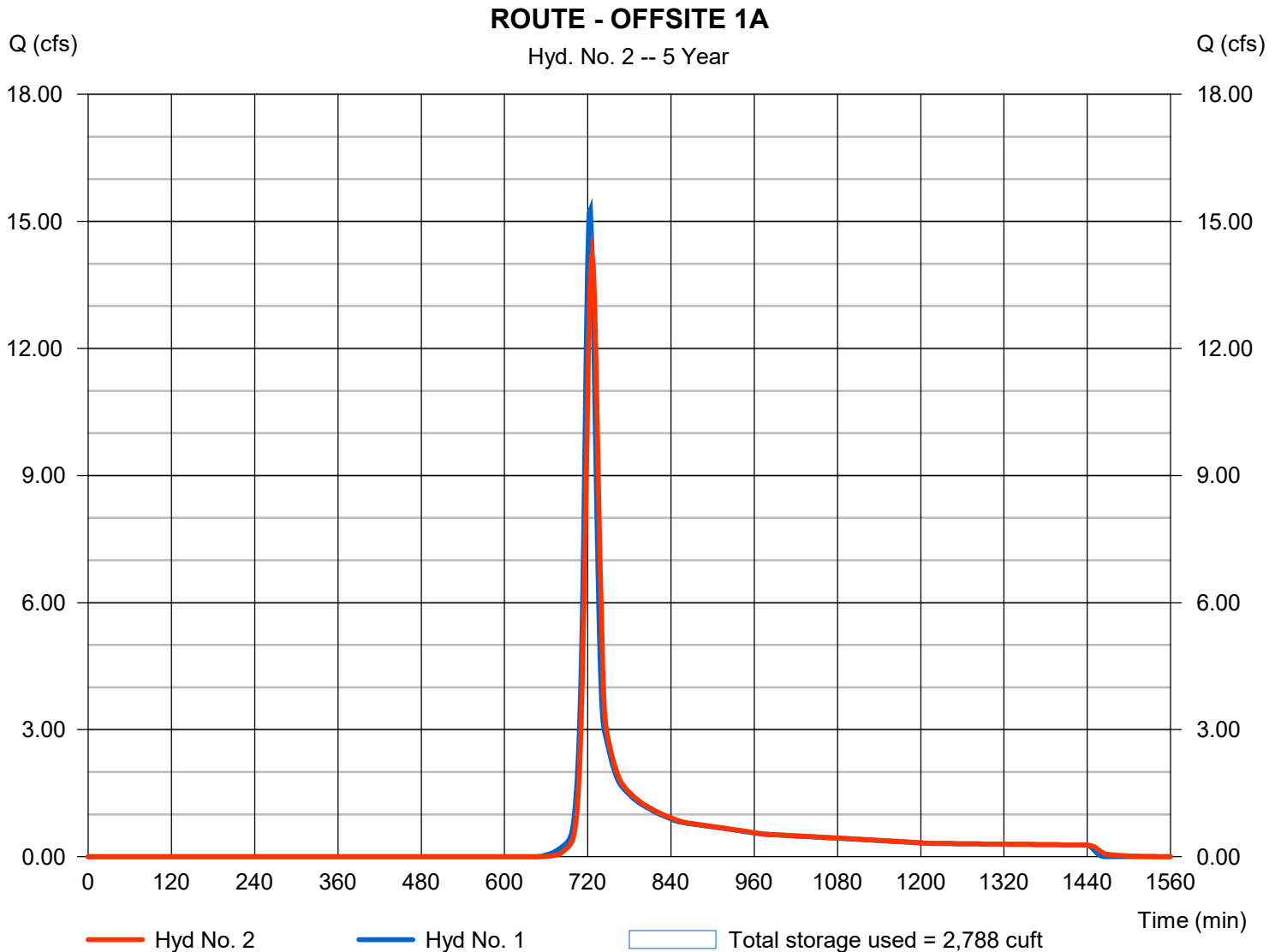
Monday, 05 / 8 / 2023

Hyd. No. 2

ROUTE - OFFSITE 1A

Hydrograph type	= Reservoir	Peak discharge	= 14.21 cfs
Storm frequency	= 5 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 44,546 cuft
Inflow hyd. No.	= 1 - OFFSITE 1A	Max. Elevation	= 1051.87 ft
Reservoir name	= OFFSITE 1A	Max. Storage	= 2,788 cuft

Storage Indication method used.



Hydrograph Report

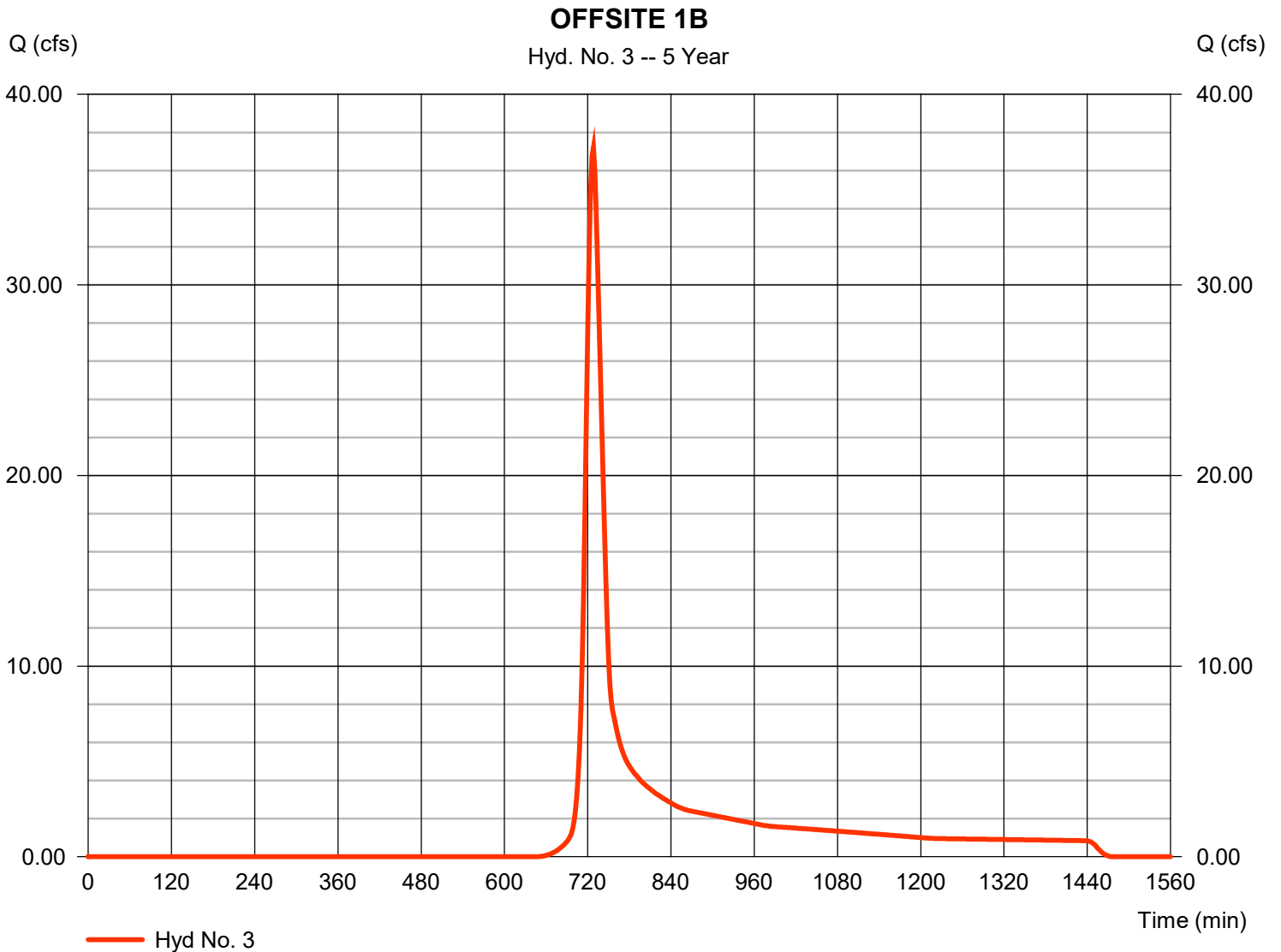
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 3

OFFSITE 1B

Hydrograph type	= SCS Runoff	Peak discharge	= 37.21 cfs
Storm frequency	= 5 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 135,401 cuft
Drainage area	= 25.010 ac	Curve number	= 68
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 21.00 min
Total precip.	= 4.40 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

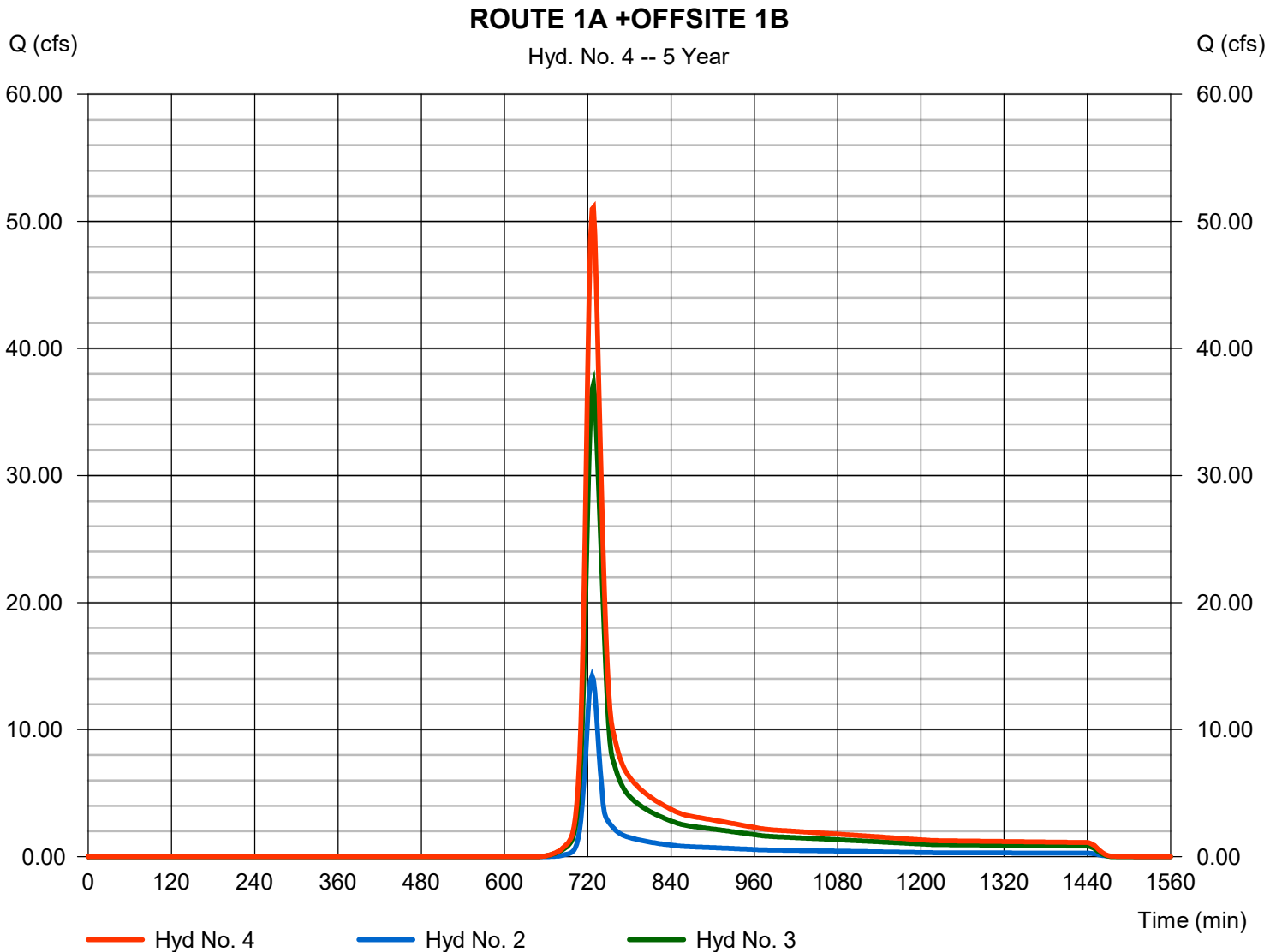
Monday, 05 / 8 / 2023

Hyd. No. 4

ROUTE 1A +OFFSITE 1B

Hydrograph type = Combine
Storm frequency = 5 yrs
Time interval = 2 min
Inflow hyds. = 2, 3

Peak discharge = 51.11 cfs
Time to peak = 728 min
Hyd. volume = 179,947 cuft
Contrib. drain. area = 25.010 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

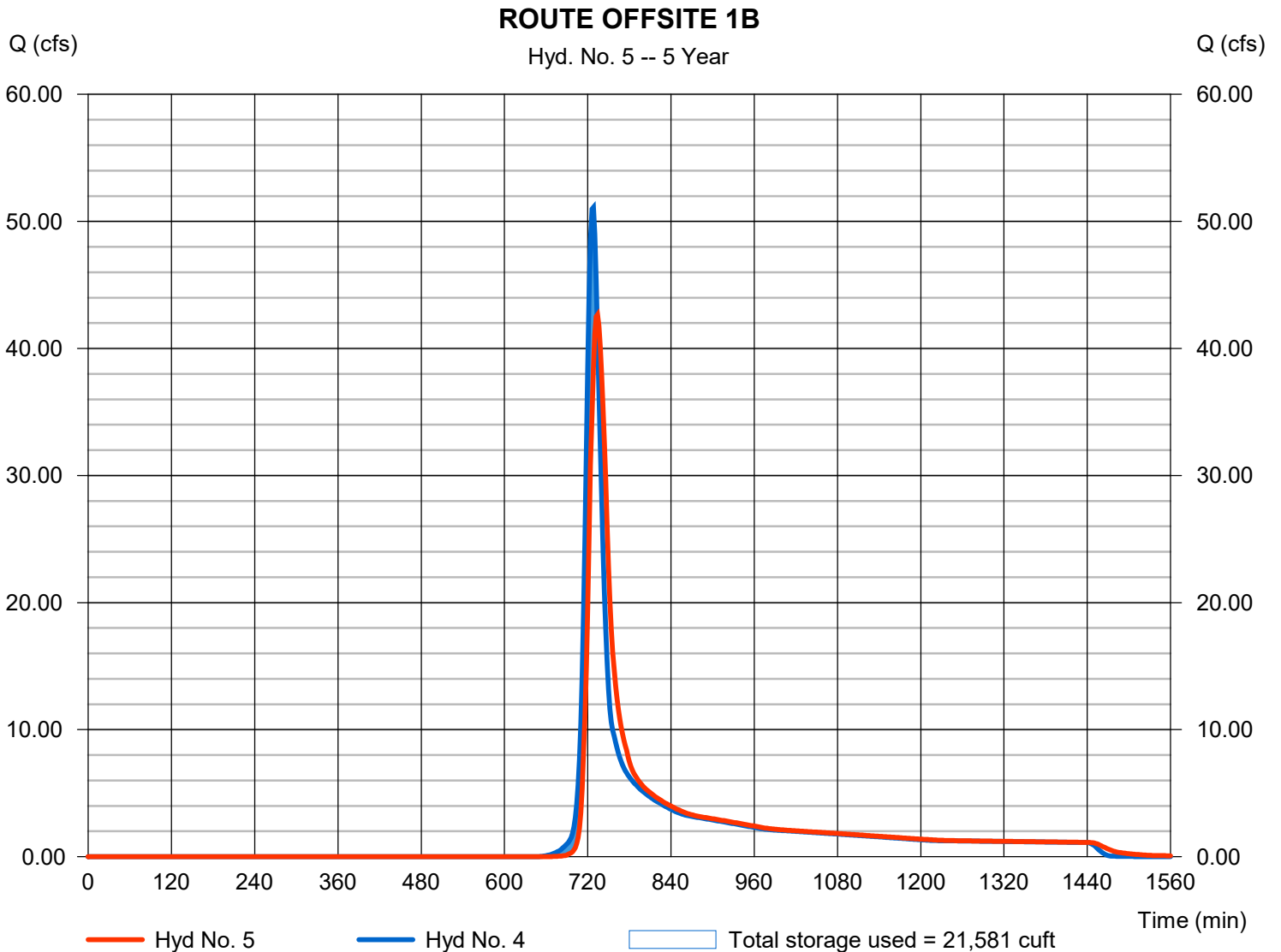
Monday, 05 / 8 / 2023

Hyd. No. 5

ROUTE OFFSITE 1B

Hydrograph type	= Reservoir	Peak discharge	= 42.66 cfs
Storm frequency	= 5 yrs	Time to peak	= 734 min
Time interval	= 2 min	Hyd. volume	= 179,940 cuft
Inflow hyd. No.	= 4 - ROUTE 1A +OFFSITE 1B	Max. Elevation	= 1028.44 ft
Reservoir name	= OFFSITE 1B	Max. Storage	= 21,581 cuft

Storage Indication method used.



Hydrograph Report

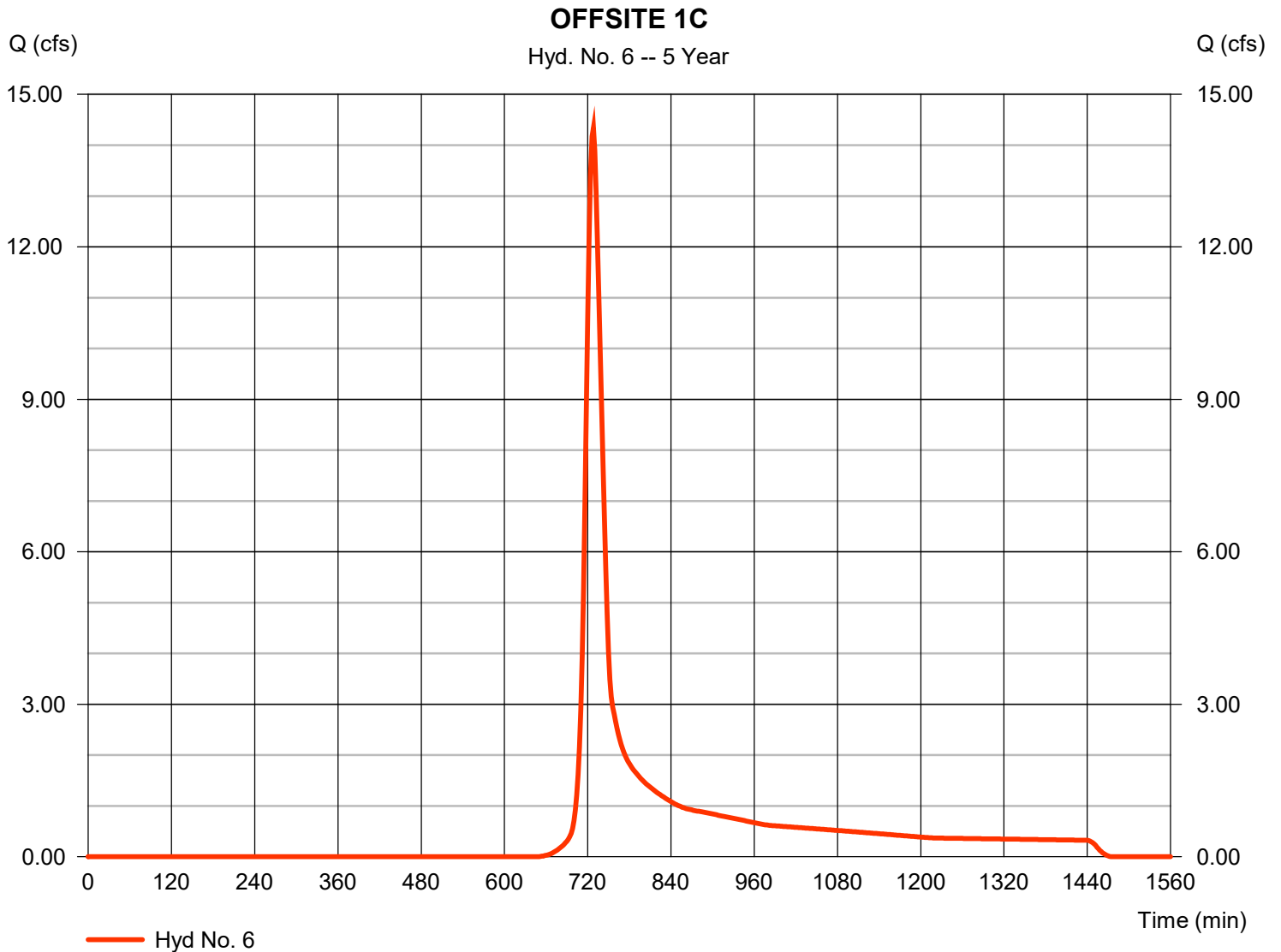
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 6

OFFSITE 1C

Hydrograph type	= SCS Runoff	Peak discharge	= 14.34 cfs
Storm frequency	= 5 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 52,190 cuft
Drainage area	= 9.640 ac	Curve number	= 68
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 21.00 min
Total precip.	= 4.40 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

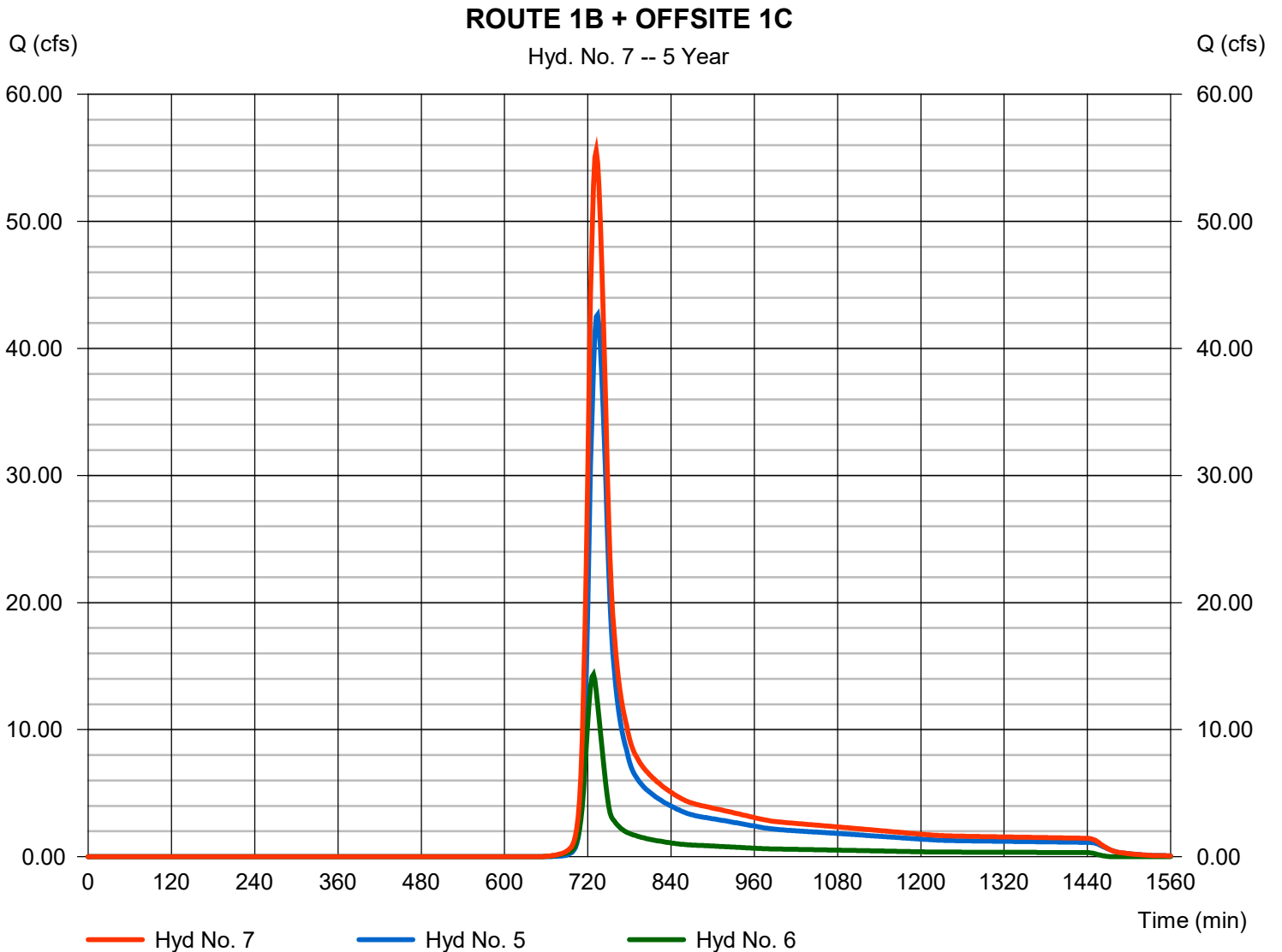
Monday, 05 / 8 / 2023

Hyd. No. 7

ROUTE 1B + OFFSITE 1C

Hydrograph type = Combine
Storm frequency = 5 yrs
Time interval = 2 min
Inflow hyds. = 5, 6

Peak discharge = 55.54 cfs
Time to peak = 732 min
Hyd. volume = 232,130 cuft
Contrib. drain. area = 9.640 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

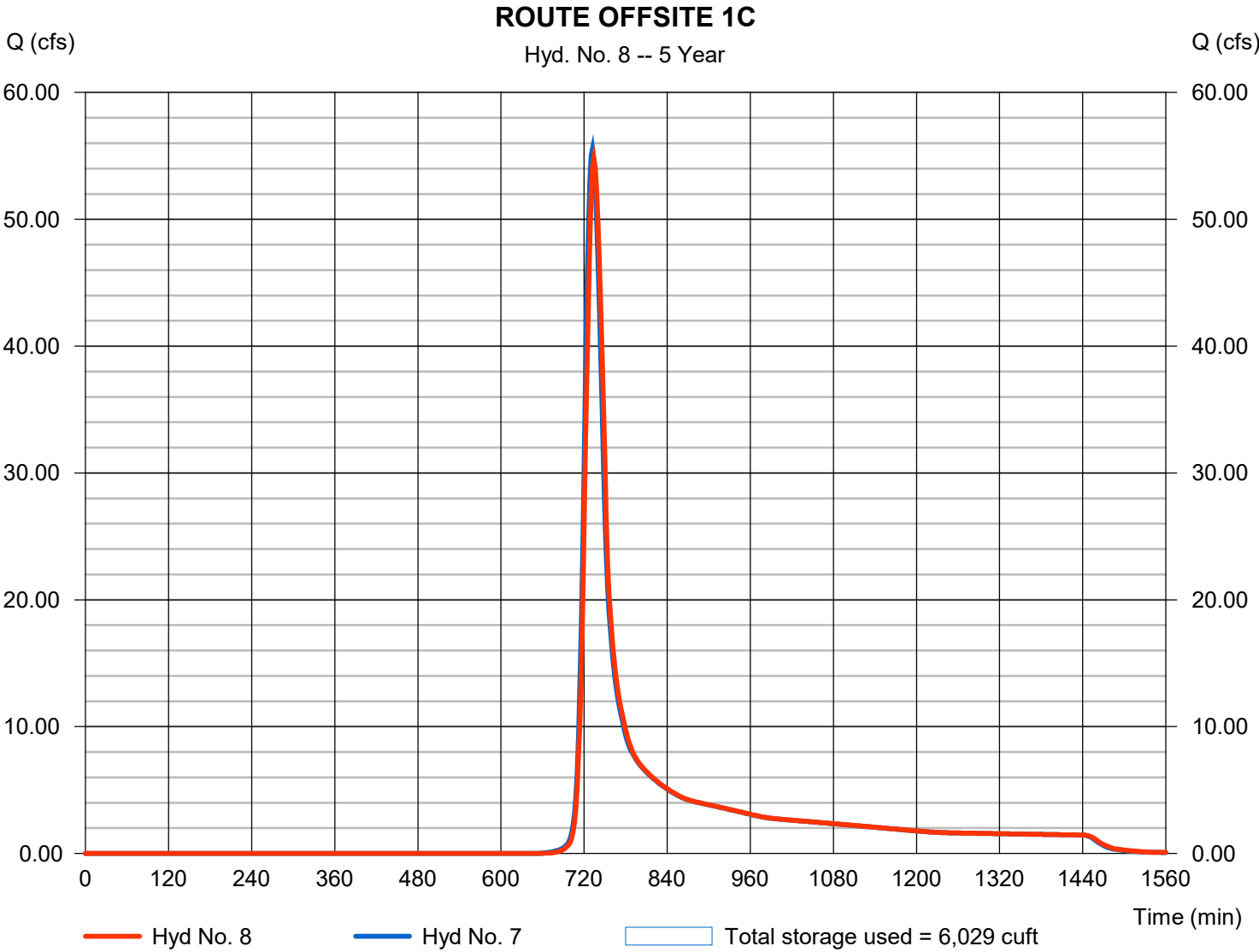
Monday, 05 / 8 / 2023

Hyd. No. 8

ROUTE OFFSITE 1C

Hydrograph type	= Reservoir	Peak discharge	= 54.76 cfs
Storm frequency	= 5 yrs	Time to peak	= 734 min
Time interval	= 2 min	Hyd. volume	= 232,129 cuft
Inflow hyd. No.	= 7 - ROUTE 1B + OFFSITE 1C	Max. Elevation	= 1016.84 ft
Reservoir name	= OFFSITE 1C	Max. Storage	= 6,029 cuft

Storage Indication method used.

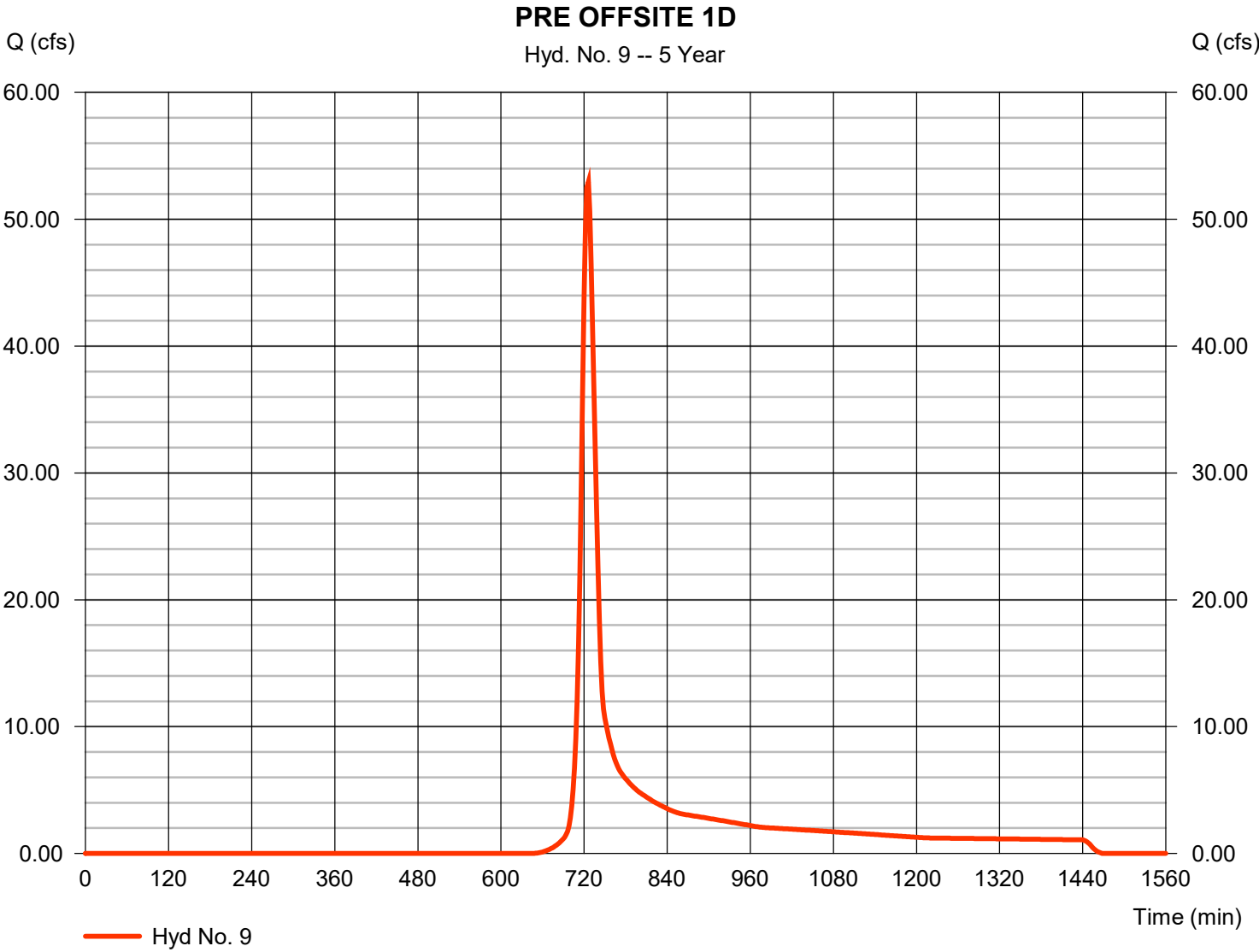


Hydrograph Report

Hyd. No. 9

PRE OFFSITE 1D

Hydrograph type	= SCS Runoff	Peak discharge	= 52.97 cfs
Storm frequency	= 5 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 173,556 cuft
Drainage area	= 32.630 ac	Curve number	= 68
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 18.00 min
Total precip.	= 4.40 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

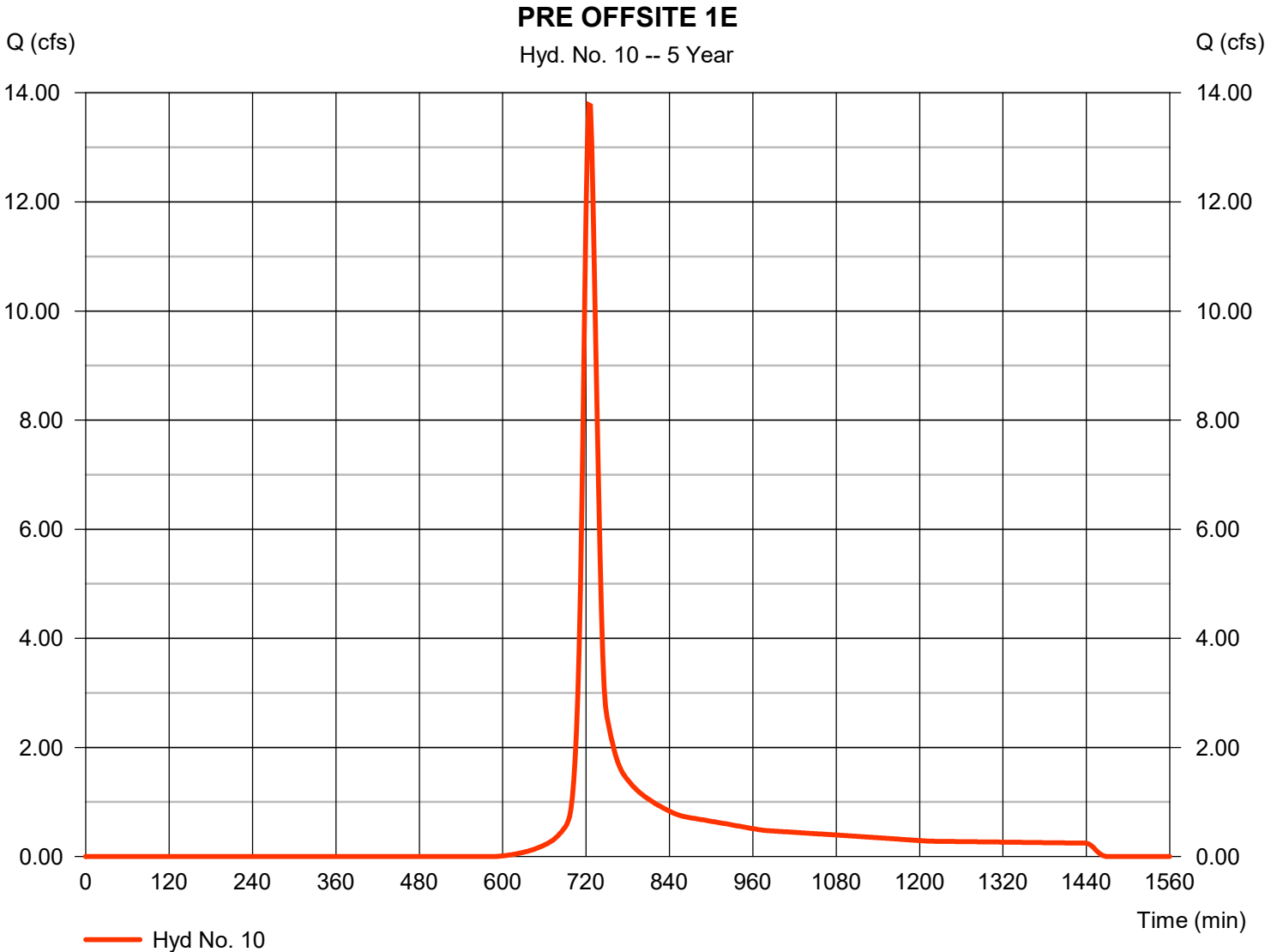


Hydrograph Report

Hyd. No. 10

PRE OFFSITE 1E

Hydrograph type	= SCS Runoff	Peak discharge	= 13.78 cfs
Storm frequency	= 5 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 43,948 cuft
Drainage area	= 6.650 ac	Curve number	= 73
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 17.00 min
Total precip.	= 4.40 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

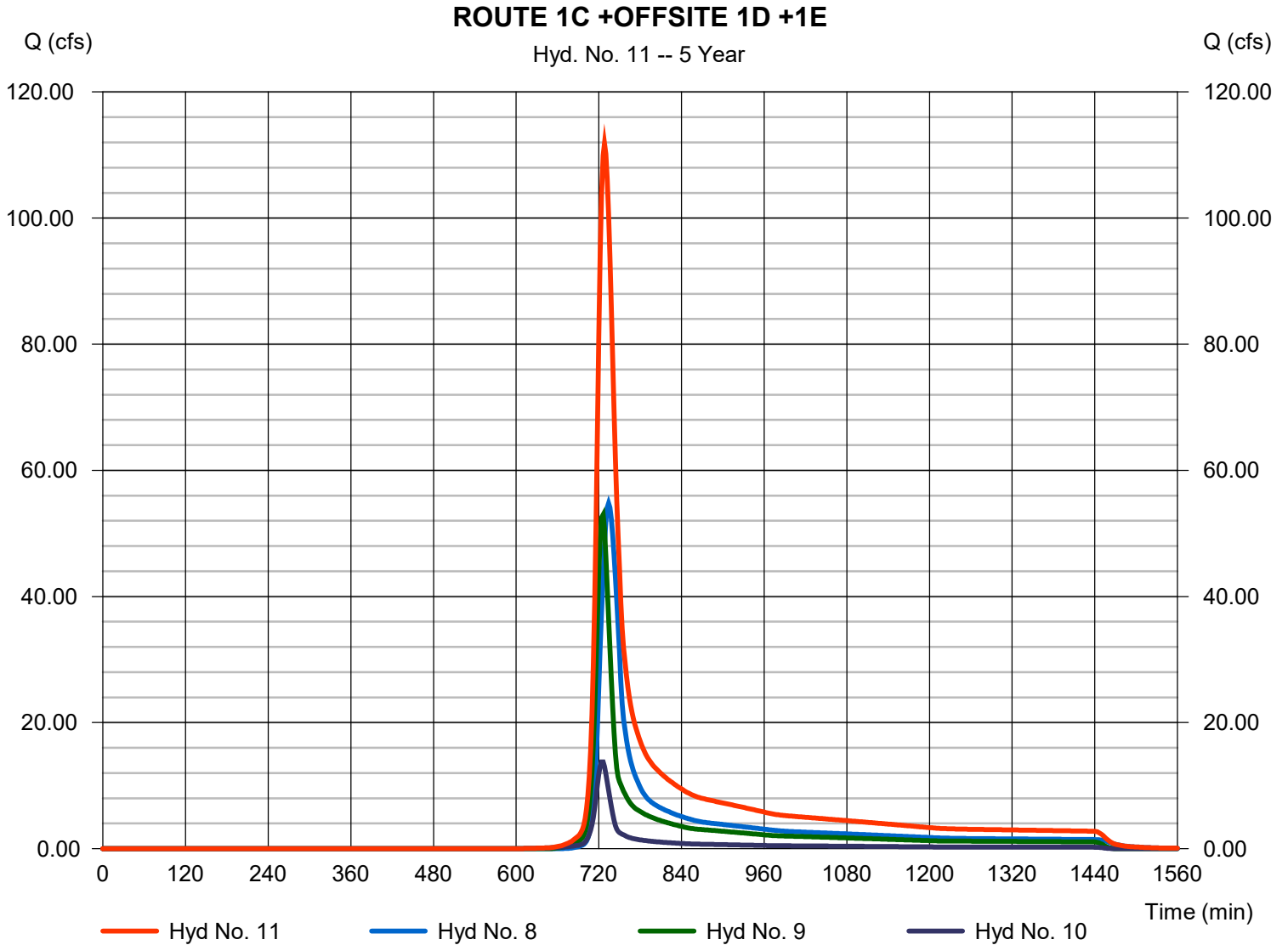
Monday, 05 / 8 / 2023

Hyd. No. 11

ROUTE 1C +OFFSITE 1D +1E

Hydrograph type = Combine
Storm frequency = 5 yrs
Time interval = 2 min
Inflow hyds. = 8, 9, 10

Peak discharge = 111.82 cfs
Time to peak = 728 min
Hyd. volume = 449,634 cuft
Contrib. drain. area = 39.280 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 12

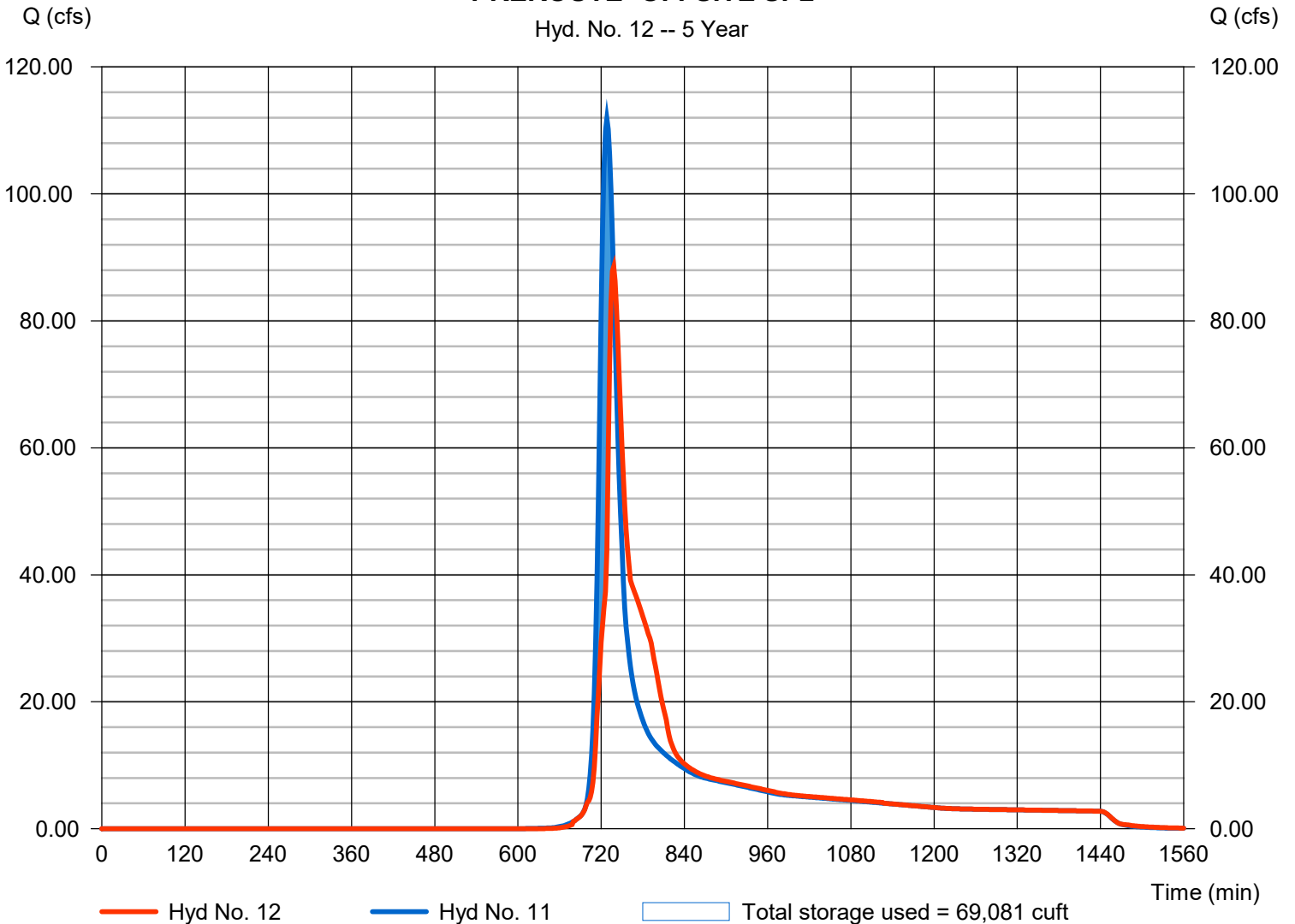
PREROUTE- OFFSITE SP2

Hydrograph type	= Reservoir	Peak discharge	= 88.55 cfs
Storm frequency	= 5 yrs	Time to peak	= 738 min
Time interval	= 2 min	Hyd. volume	= 449,626 cuft
Inflow hyd. No.	= 11 - ROUTE 1C +OFFSITE 1D	Max. Elevation	= 1013.65 ft
Reservoir name	= OFFSITE 1D	Max. Storage	= 69,081 cuft

Storage Indication method used.

PREROUTE- OFFSITE SP2

Hyd. No. 12 -- 5 Year



Hydrograph Report

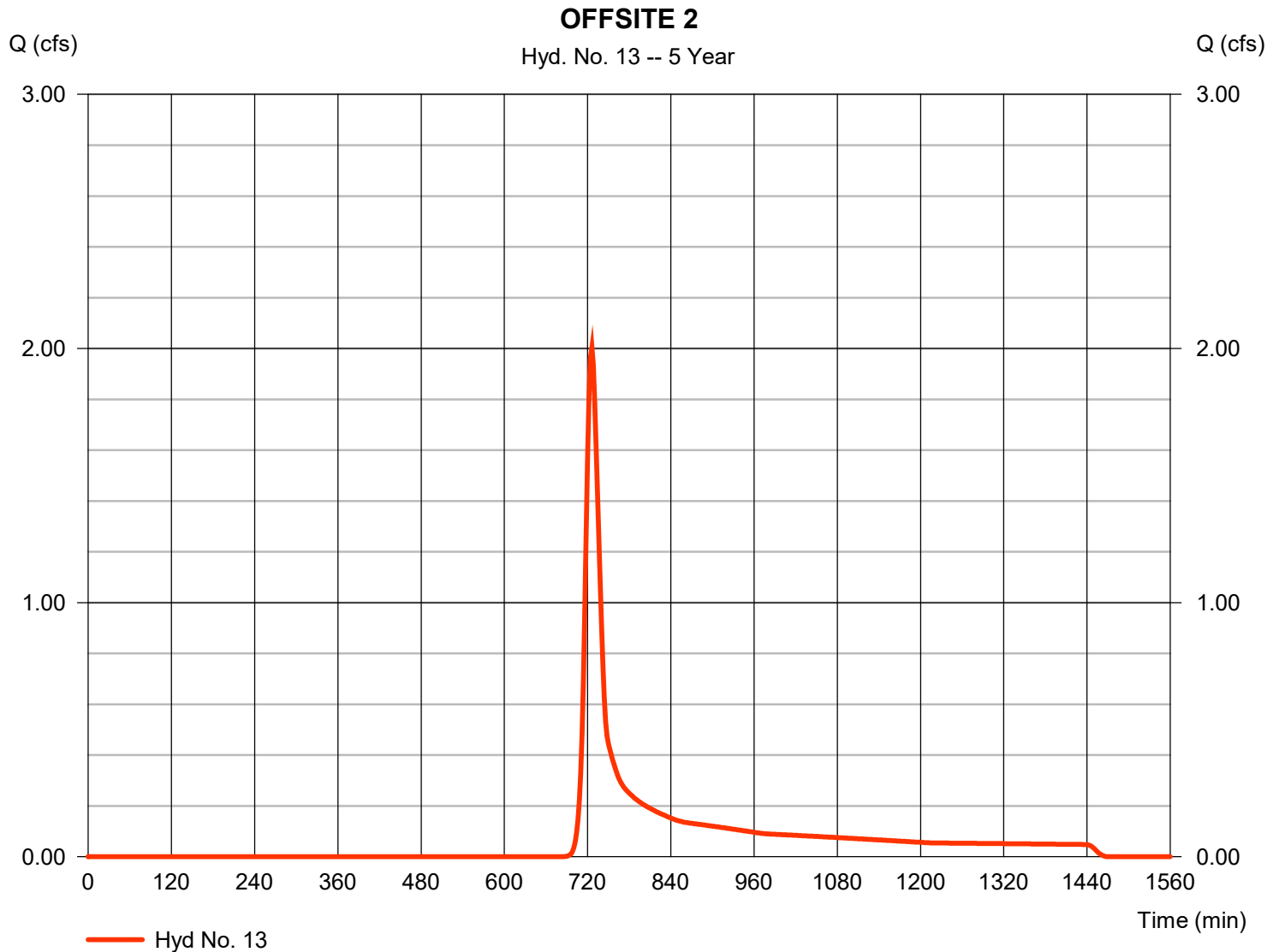
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 13

OFFSITE 2

Hydrograph type	= SCS Runoff	Peak discharge	= 2.004 cfs
Storm frequency	= 5 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 6,931 cuft
Drainage area	= 1.670 ac	Curve number	= 63
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 18.00 min
Total precip.	= 4.40 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

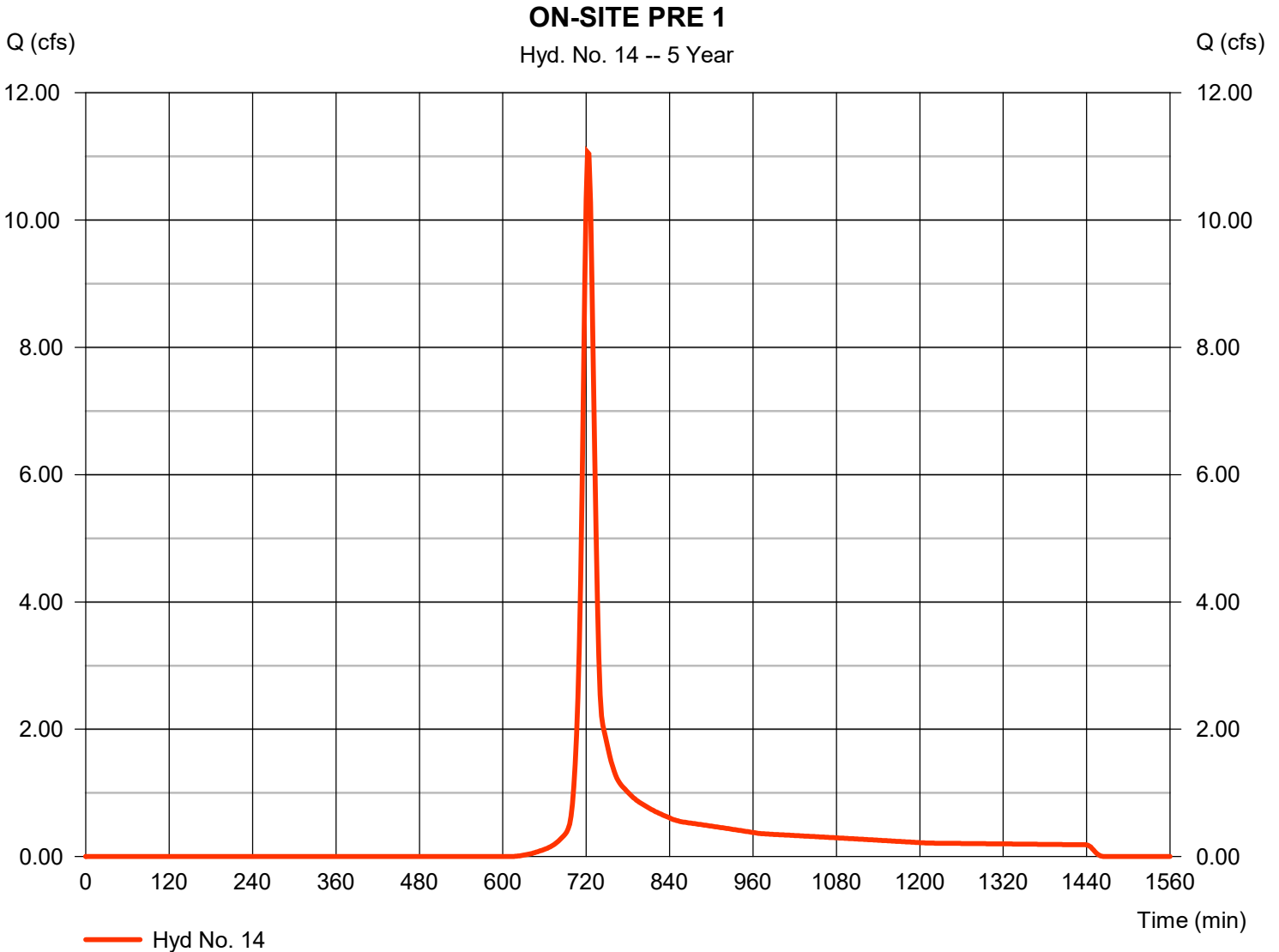


Hydrograph Report

Hyd. No. 14

ON-SITE PRE 1

Hydrograph type	= SCS Runoff	Peak discharge	= 11.07 cfs
Storm frequency	= 5 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 31,764 cuft
Drainage area	= 5.360 ac	Curve number	= 71
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 16.00 min
Total precip.	= 4.40 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

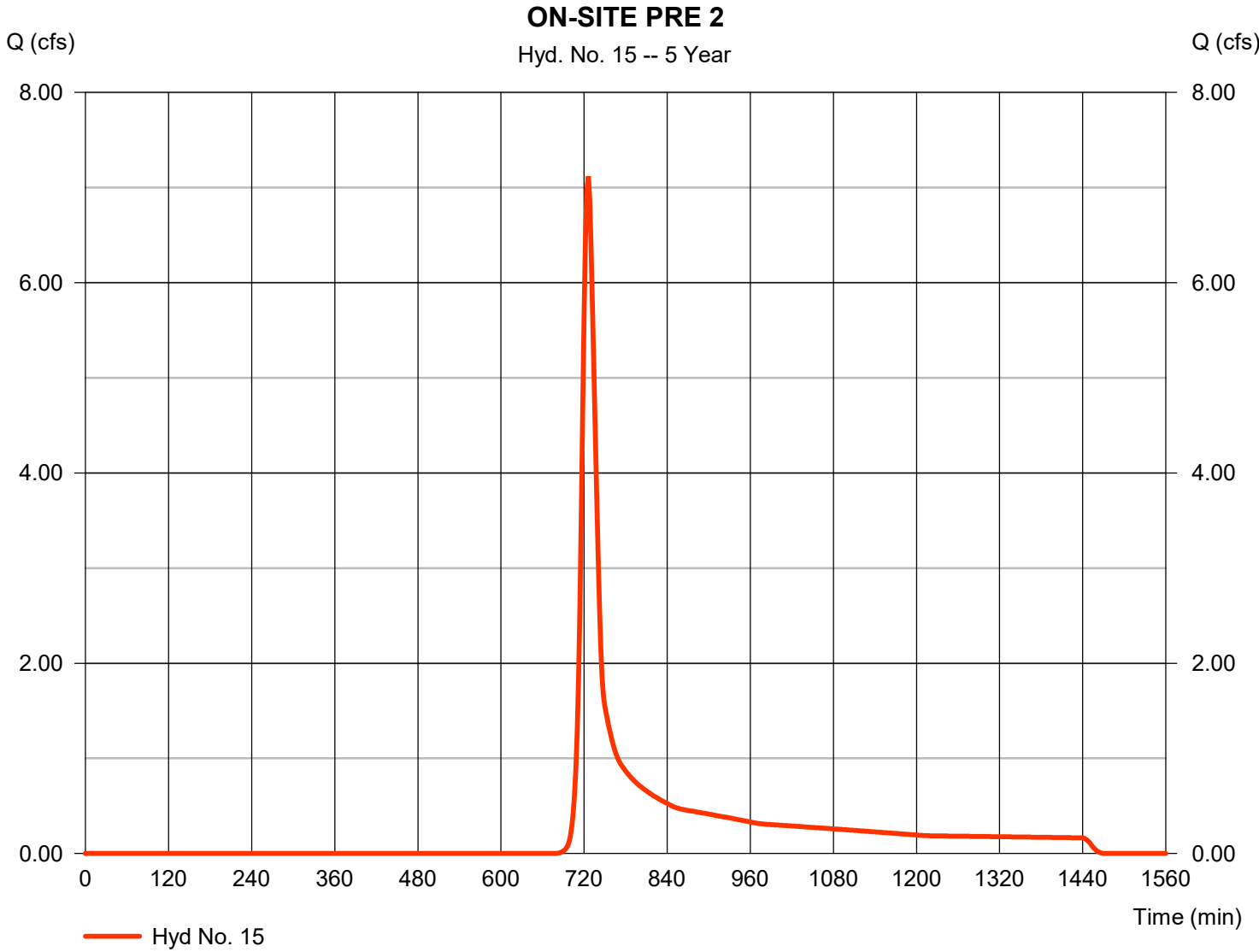


Hydrograph Report

Hyd. No. 15

ON-SITE PRE 2

Hydrograph type	= SCS Runoff	Peak discharge	= 7.119 cfs
Storm frequency	= 5 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 24,279 cuft
Drainage area	= 5.550 ac	Curve number	= 64
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 17.00 min
Total precip.	= 4.40 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

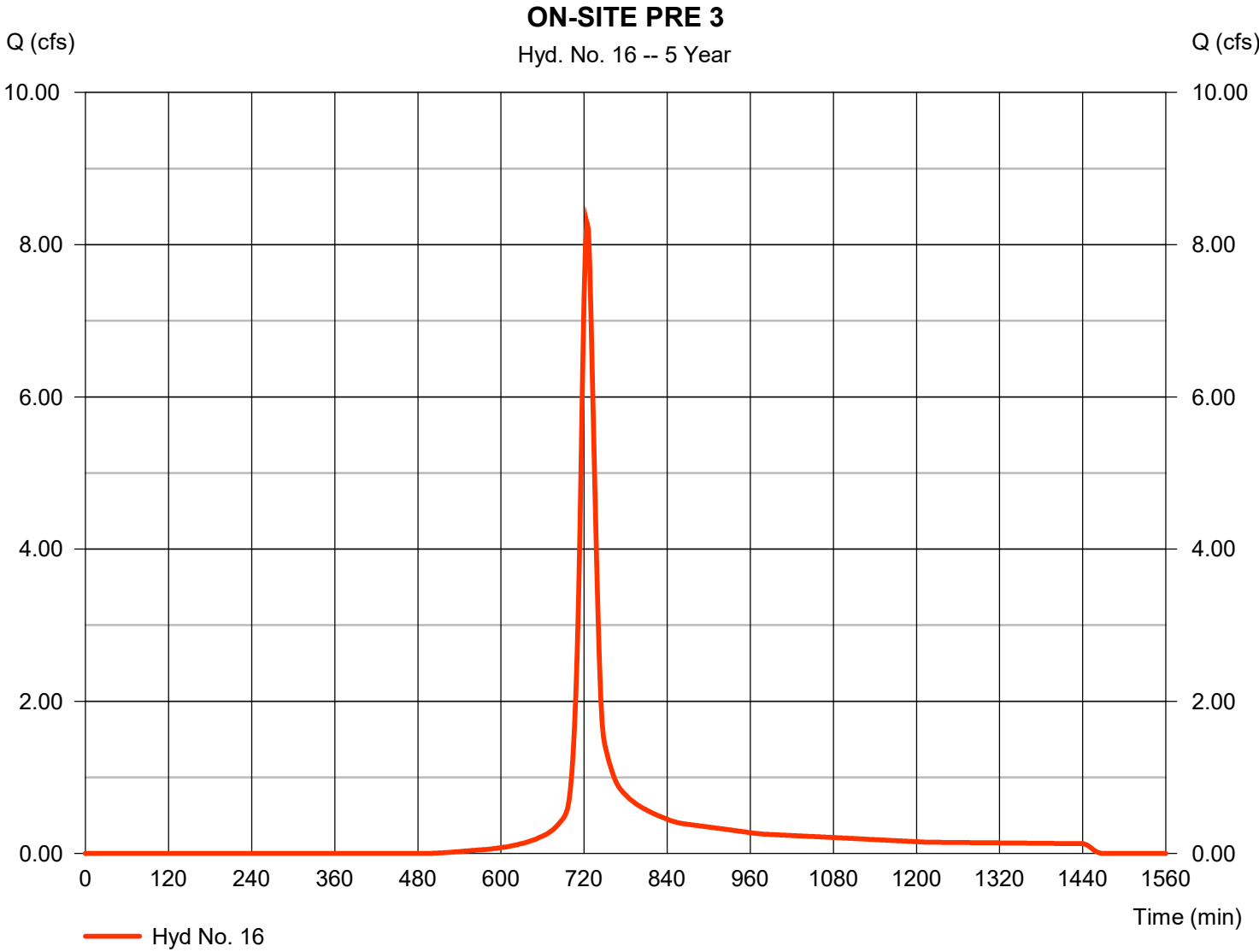


Hydrograph Report

Hyd. No. 16

ON-SITE PRE 3

Hydrograph type	= SCS Runoff	Peak discharge	= 8.295 cfs
Storm frequency	= 5 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 25,967 cuft
Drainage area	= 3.120 ac	Curve number	= 79
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 18.00 min
Total precip.	= 4.40 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

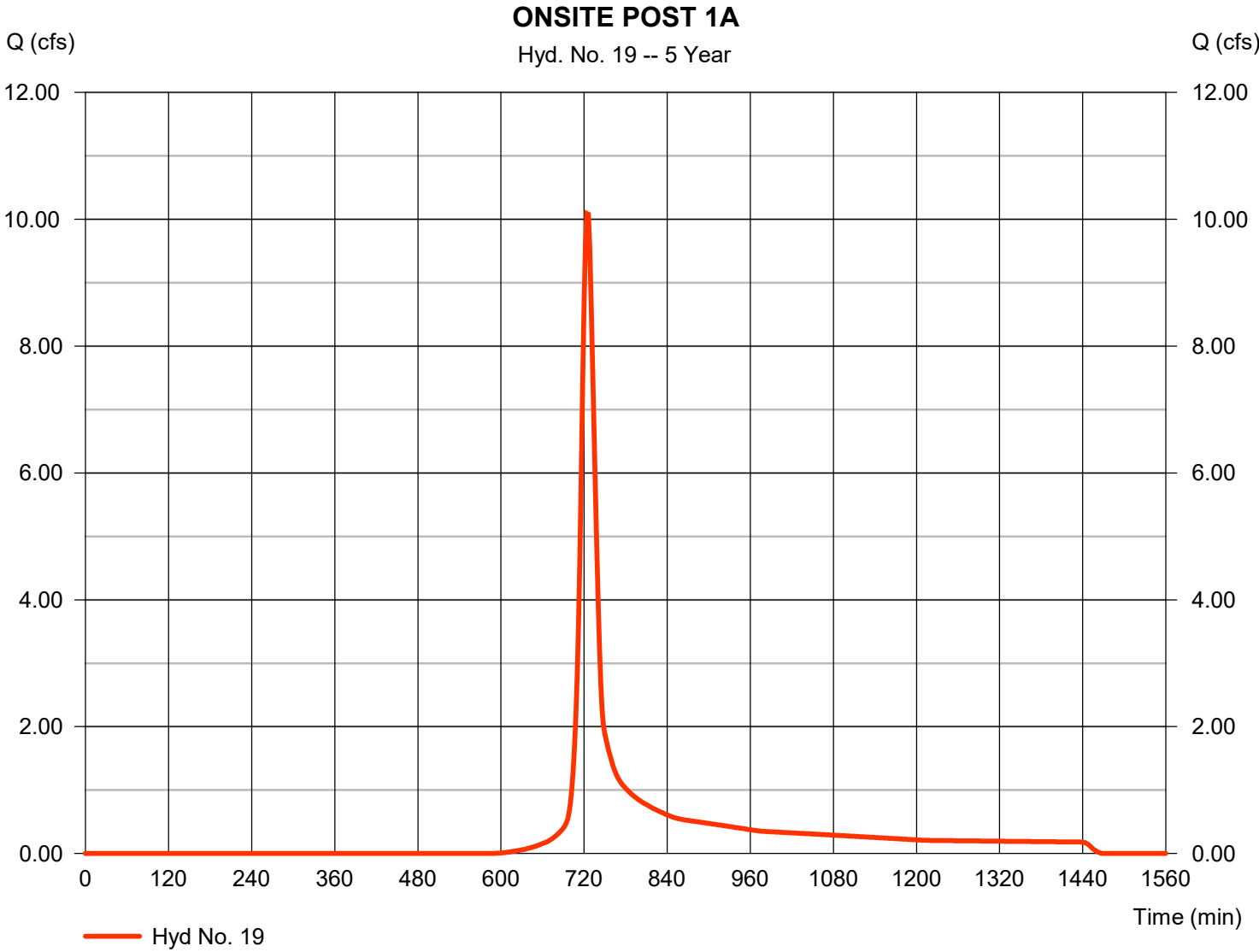


Hydrograph Report

Hyd. No. 19

ONSITE POST 1A

Hydrograph type	= SCS Runoff	Peak discharge	= 10.09 cfs
Storm frequency	= 5 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 32,185 cuft
Drainage area	= 4.870 ac	Curve number	= 73
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 18.00 min
Total precip.	= 4.40 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

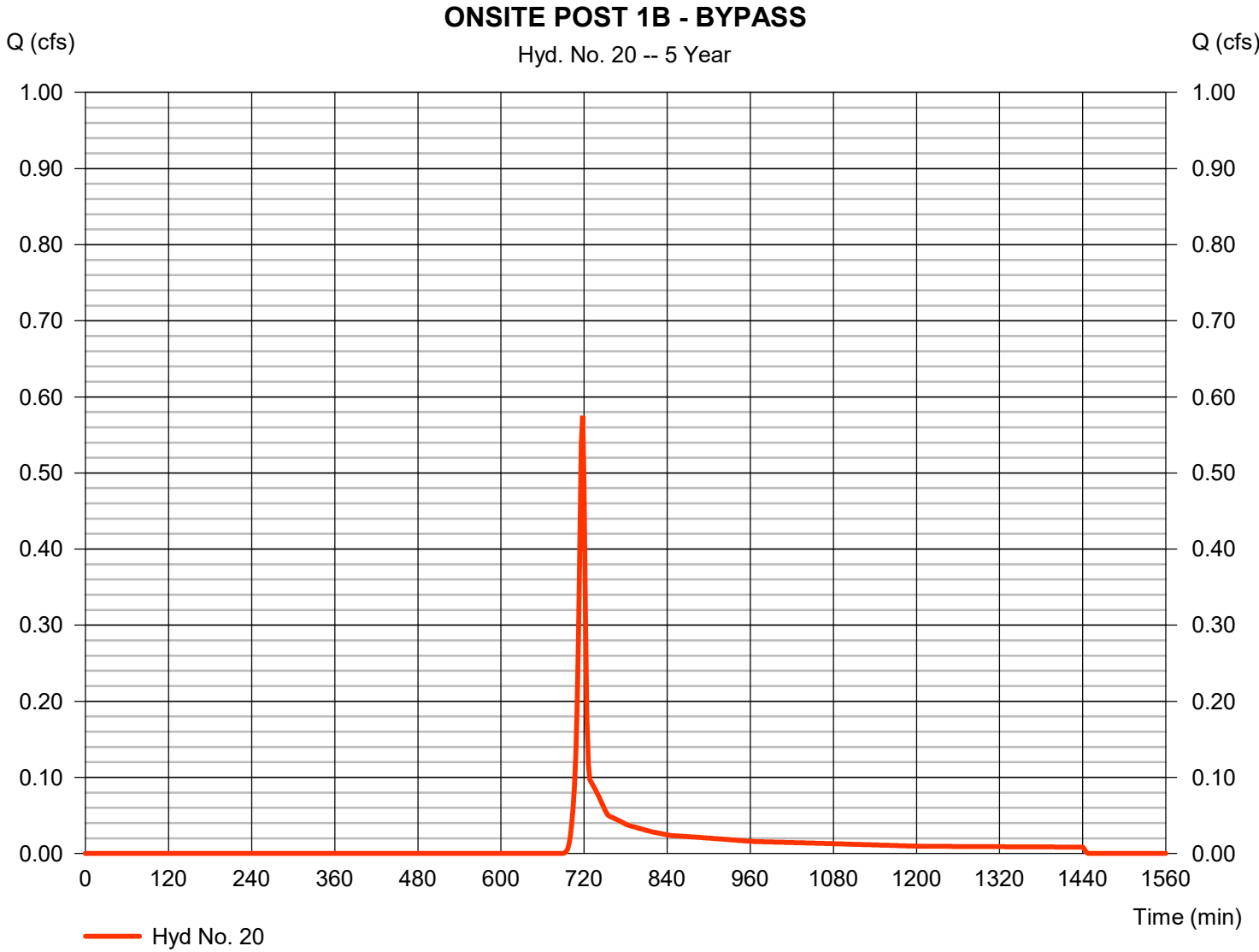


Hydrograph Report

Hyd. No. 20

ONSITE POST 1B - BYPASS

Hydrograph type	= SCS Runoff	Peak discharge	= 0.575 cfs
Storm frequency	= 5 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 1,179 cuft
Drainage area	= 0.320 ac	Curve number	= 62
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 4.40 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

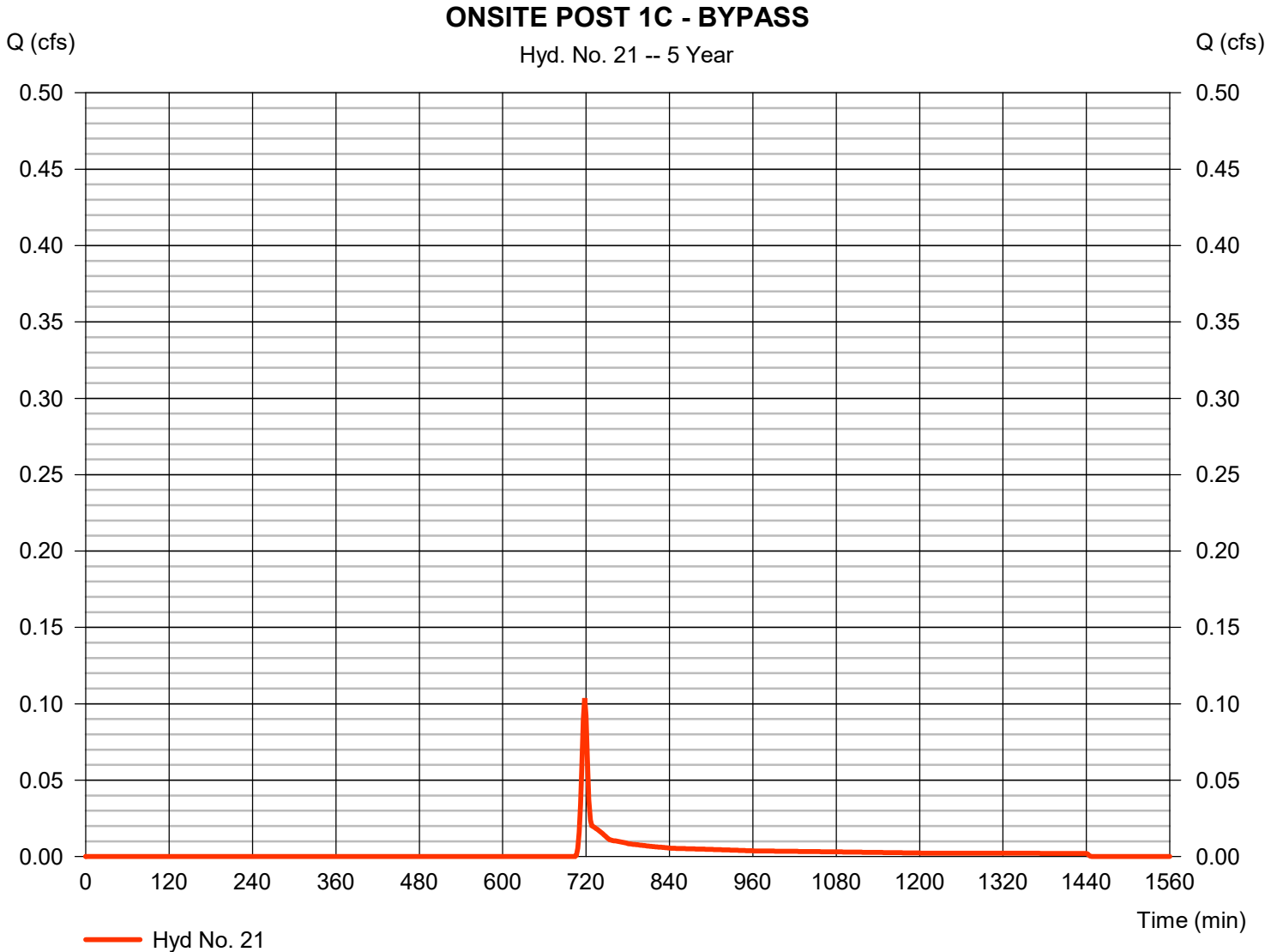


Hydrograph Report

Hyd. No. 21

ONSITE POST 1C - BYPASS

Hydrograph type	= SCS Runoff	Peak discharge	= 0.104 cfs
Storm frequency	= 5 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 237 cuft
Drainage area	= 0.100 ac	Curve number	= 55
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 4.40 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

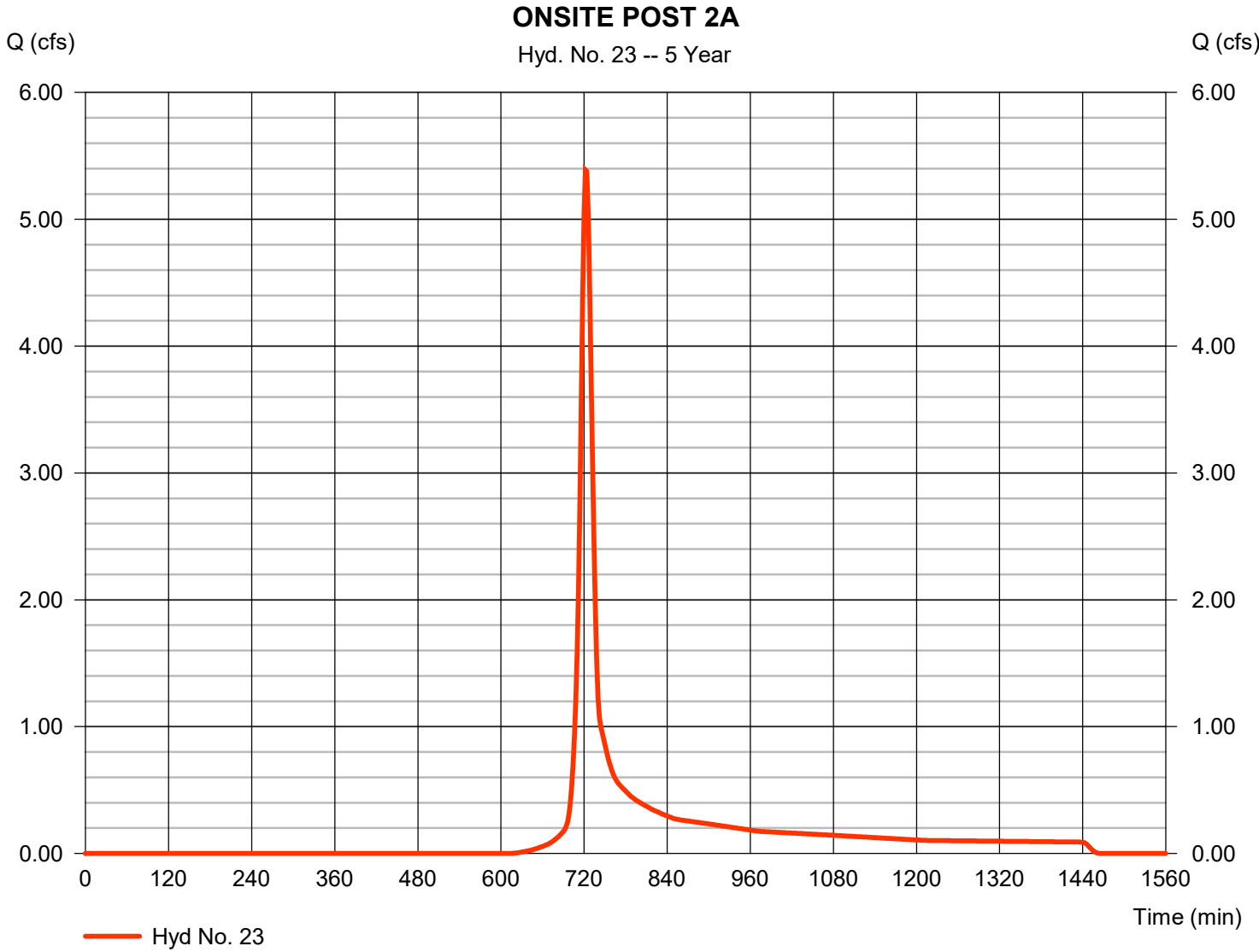


Hydrograph Report

Hyd. No. 23

ONSITE POST 2A

Hydrograph type	= SCS Runoff	Peak discharge	= 5.388 cfs
Storm frequency	= 5 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 15,467 cuft
Drainage area	= 2.610 ac	Curve number	= 71
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 16.00 min
Total precip.	= 4.40 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

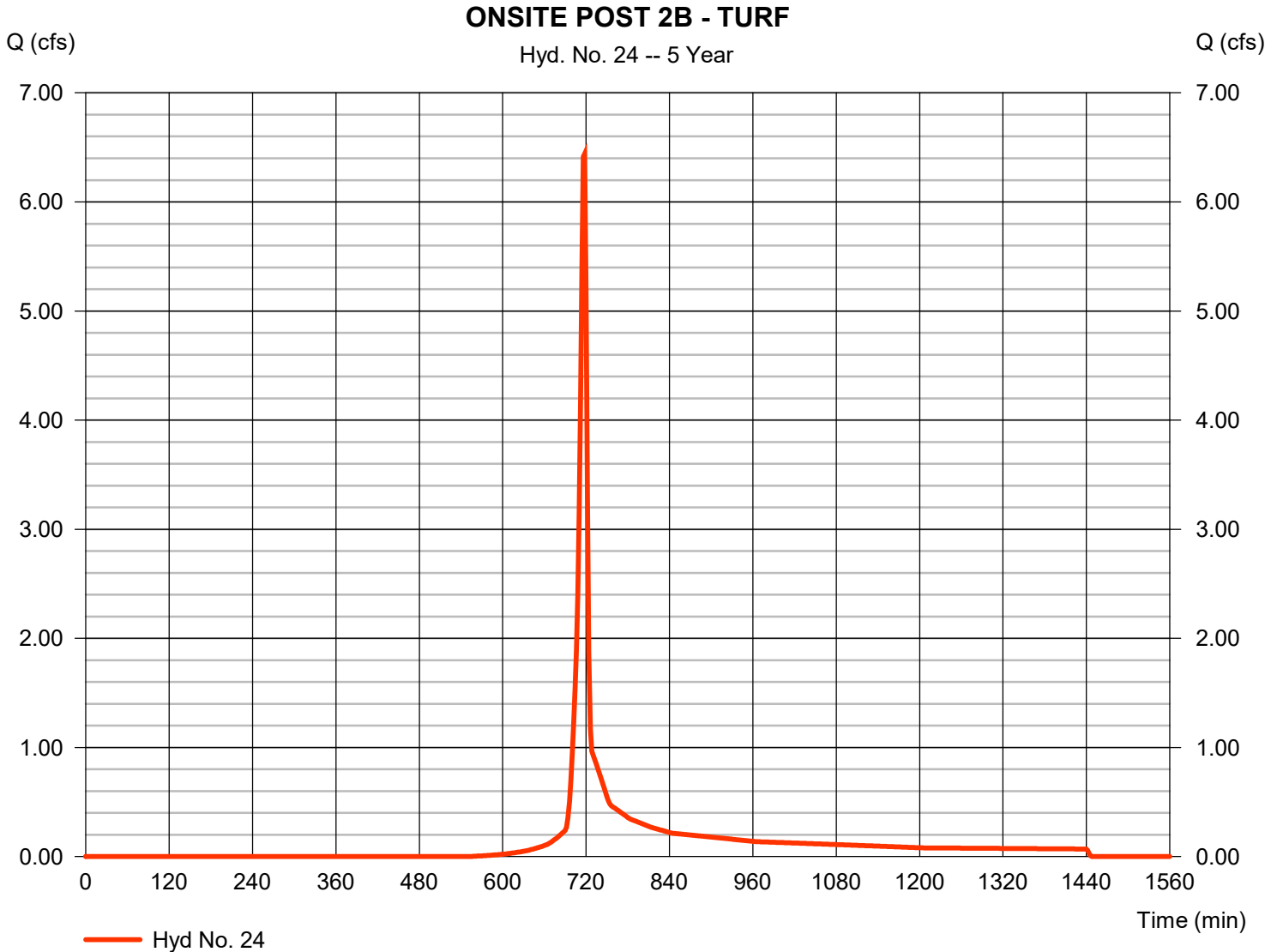


Hydrograph Report

Hyd. No. 24

ONSITE POST 2B - TURF

Hydrograph type	= SCS Runoff	Peak discharge	= 6.441 cfs
Storm frequency	= 5 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 12,954 cuft
Drainage area	= 1.930 ac	Curve number	= 75
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 4.40 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

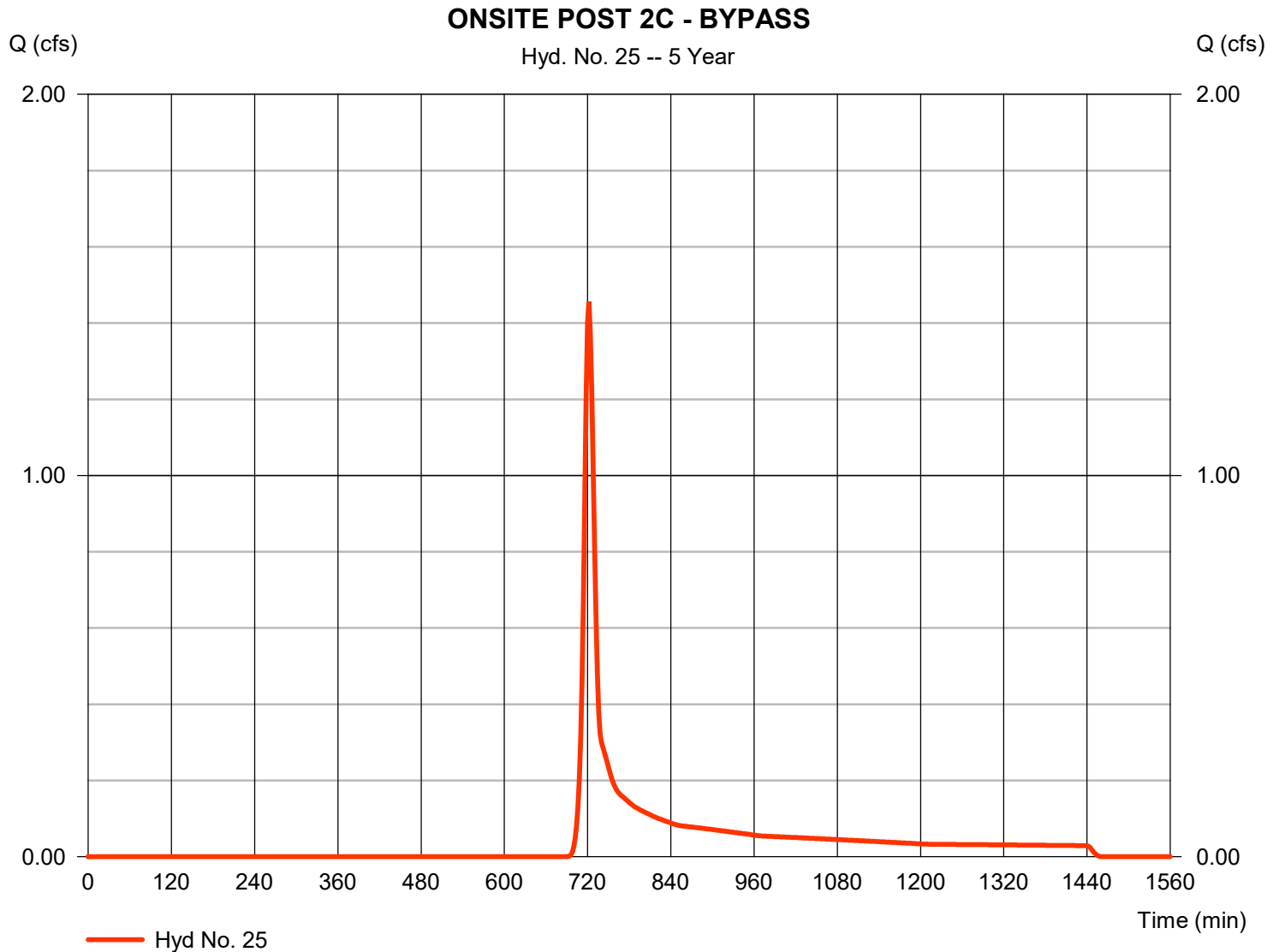
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Monday, 05 / 8 / 2023

Hyd. No. 25

ONSITE POST 2C - BYPASS

Hydrograph type	= SCS Runoff	Peak discharge	= 1.456 cfs
Storm frequency	= 5 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 4,095 cuft
Drainage area	= 1.010 ac	Curve number	= 62
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 12.00 min
Total precip.	= 4.40 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

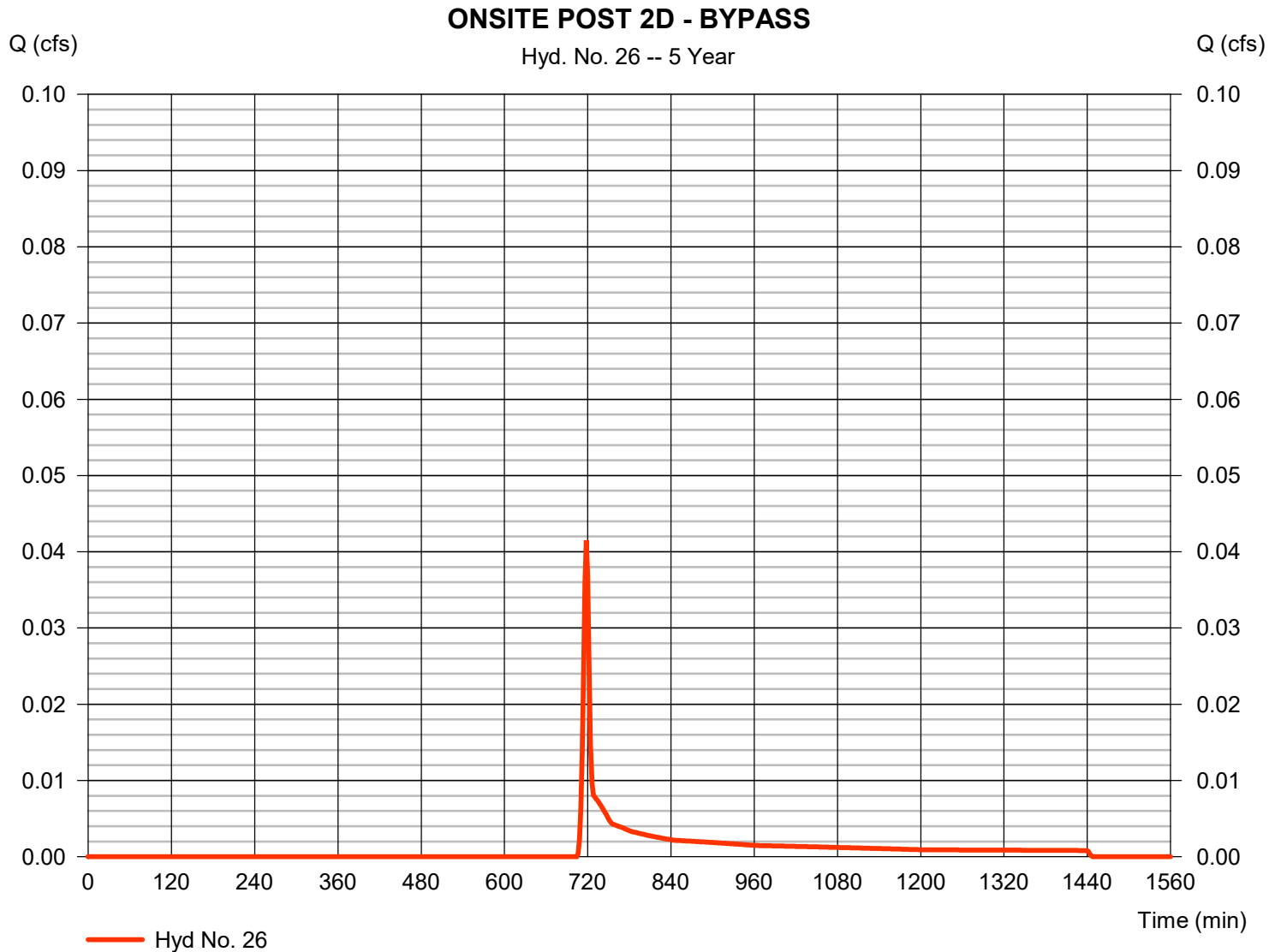
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Hyd. No. 26

ONSITE POST 2D - BYPASS

Hydrograph type	= SCS Runoff	Peak discharge	= 0.042 cfs
Storm frequency	= 5 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 95 cuft
Drainage area	= 0.040 ac	Curve number	= 55
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 4.40 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

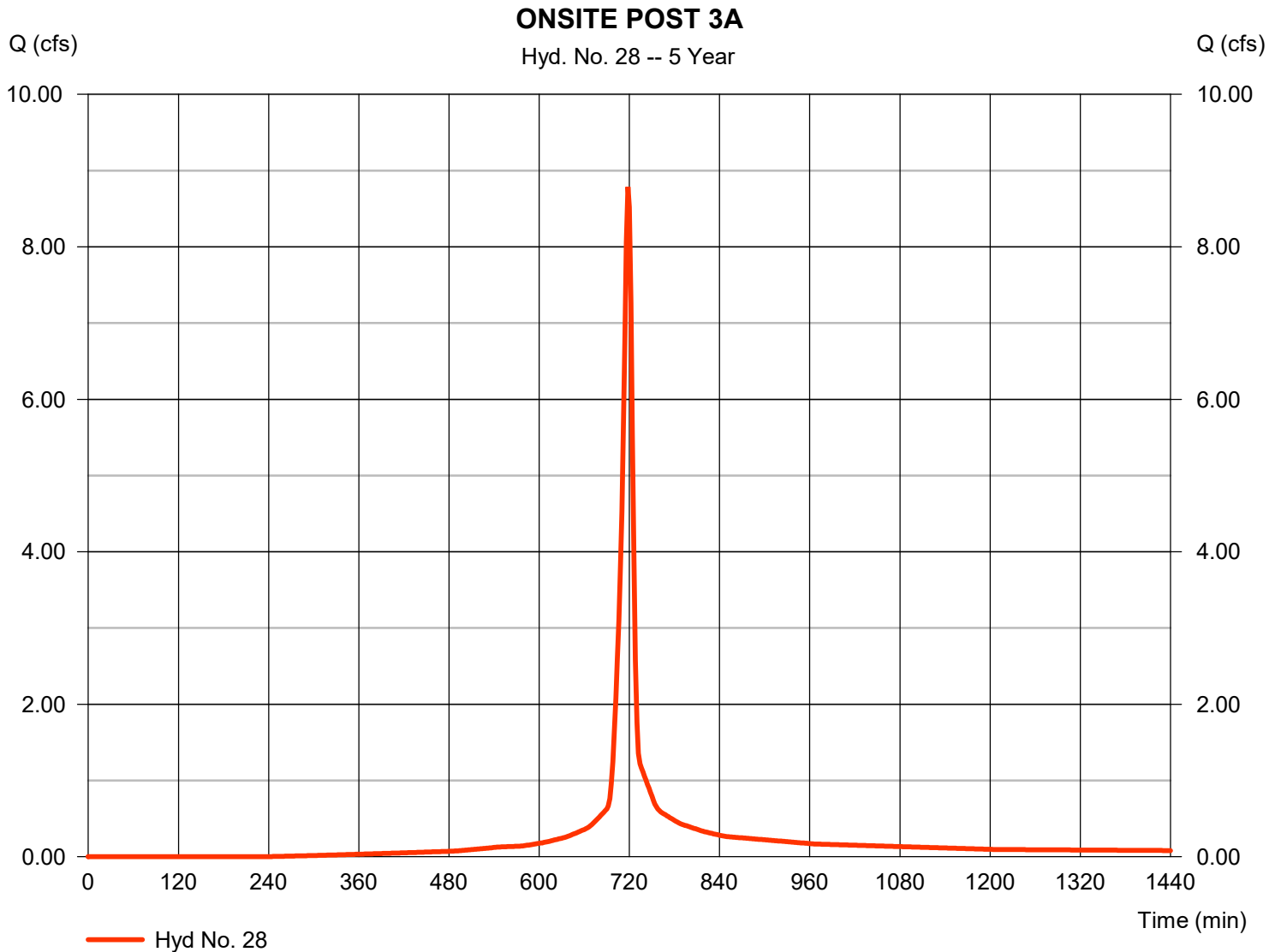
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 28

ONSITE POST 3A

Hydrograph type	= SCS Runoff	Peak discharge	= 8.787 cfs
Storm frequency	= 5 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 21,115 cuft
Drainage area	= 1.710 ac	Curve number	= 91
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 7.00 min
Total precip.	= 4.40 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

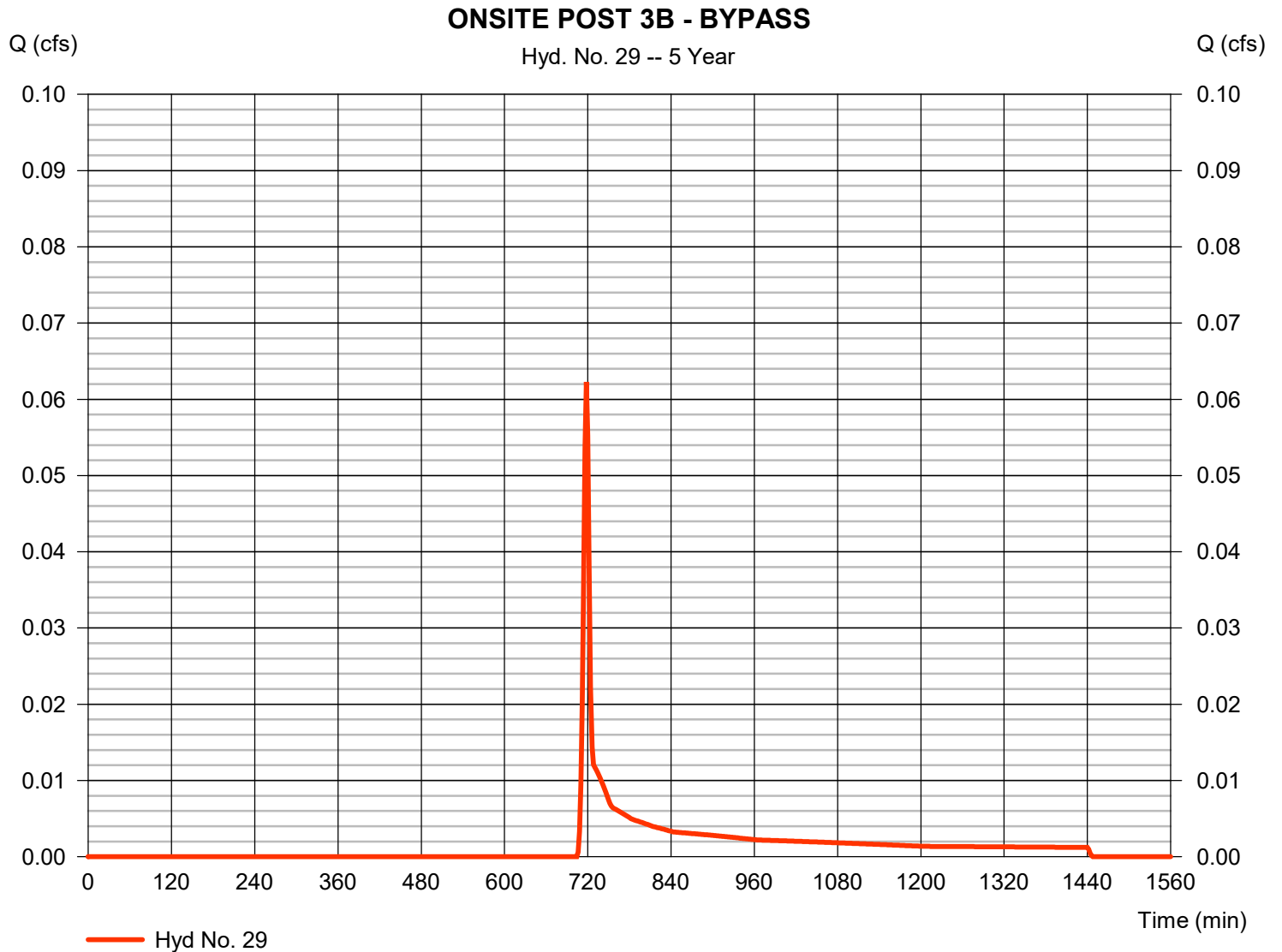
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 29

ONSITE POST 3B - BYPASS

Hydrograph type	= SCS Runoff	Peak discharge	= 0.062 cfs
Storm frequency	= 5 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 142 cuft
Drainage area	= 0.060 ac	Curve number	= 55
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 4.40 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

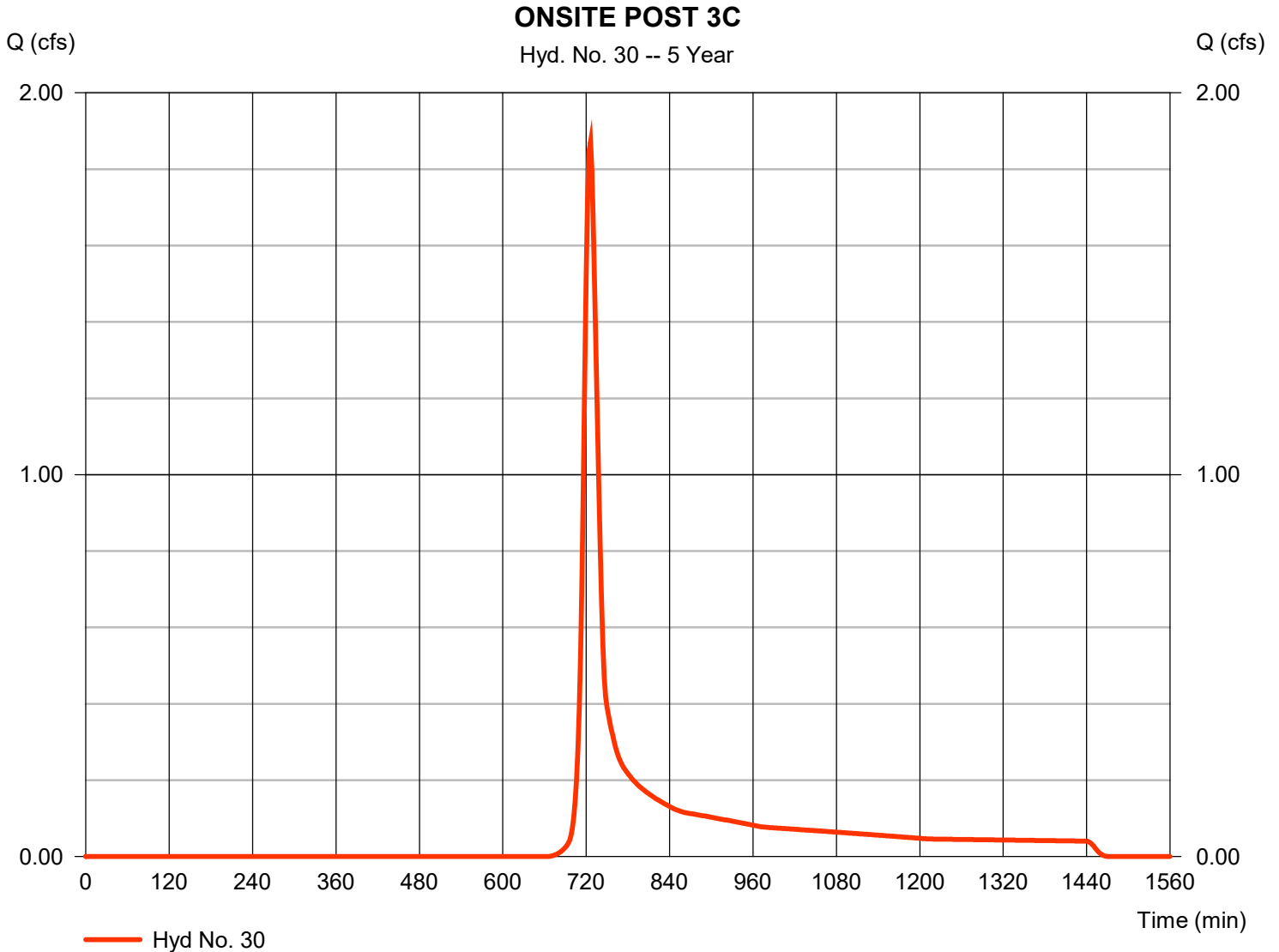


Hydrograph Report

Hyd. No. 30

ONSITE POST 3C

Hydrograph type	= SCS Runoff	Peak discharge	= 1.872 cfs
Storm frequency	= 5 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 6,240 cuft
Drainage area	= 1.290 ac	Curve number	= 66
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 19.00 min
Total precip.	= 4.40 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

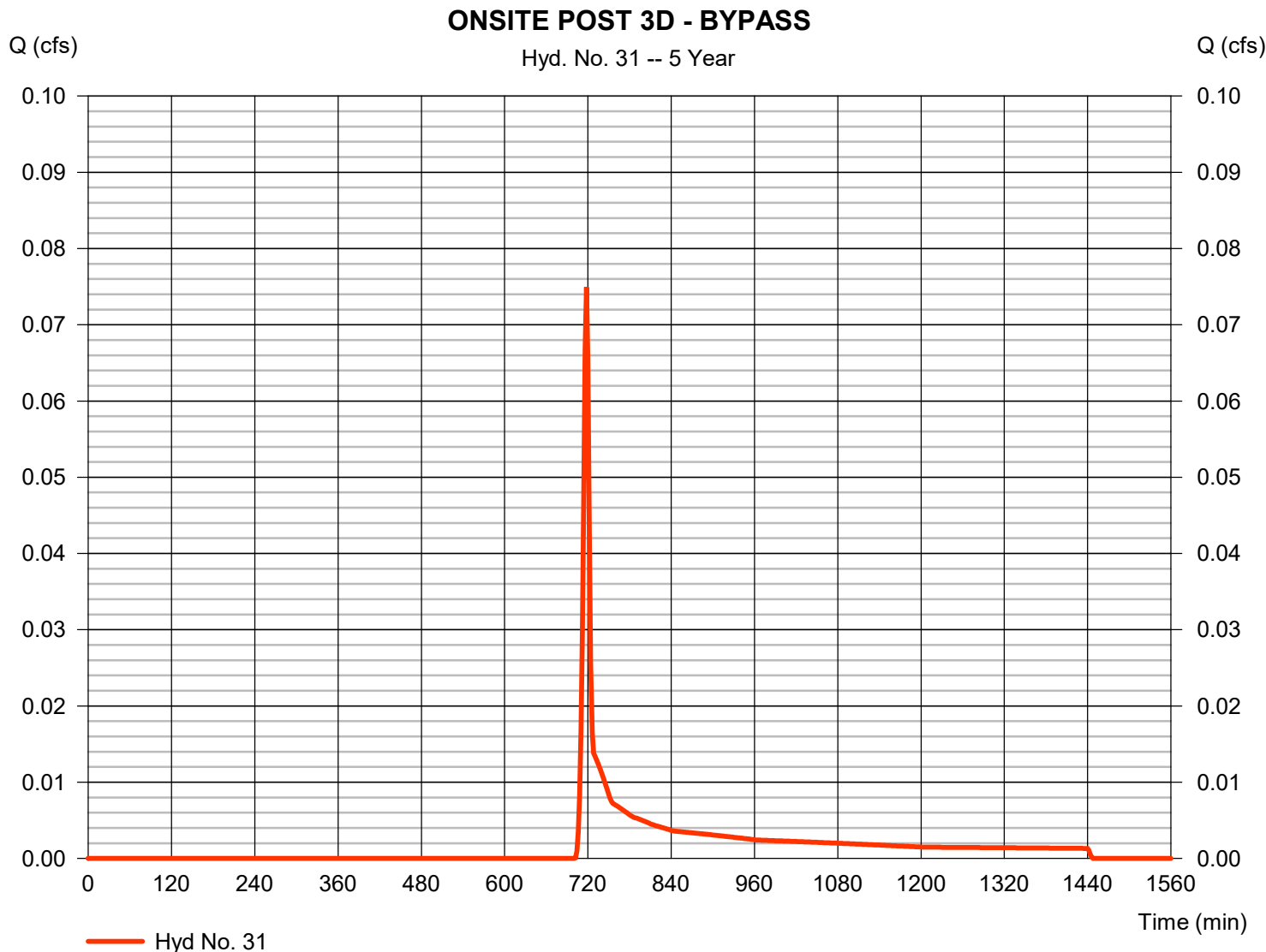
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 31

ONSITE POST 3D - BYPASS

Hydrograph type	= SCS Runoff	Peak discharge	= 0.075 cfs
Storm frequency	= 5 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 164 cuft
Drainage area	= 0.060 ac	Curve number	= 57
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 4.40 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



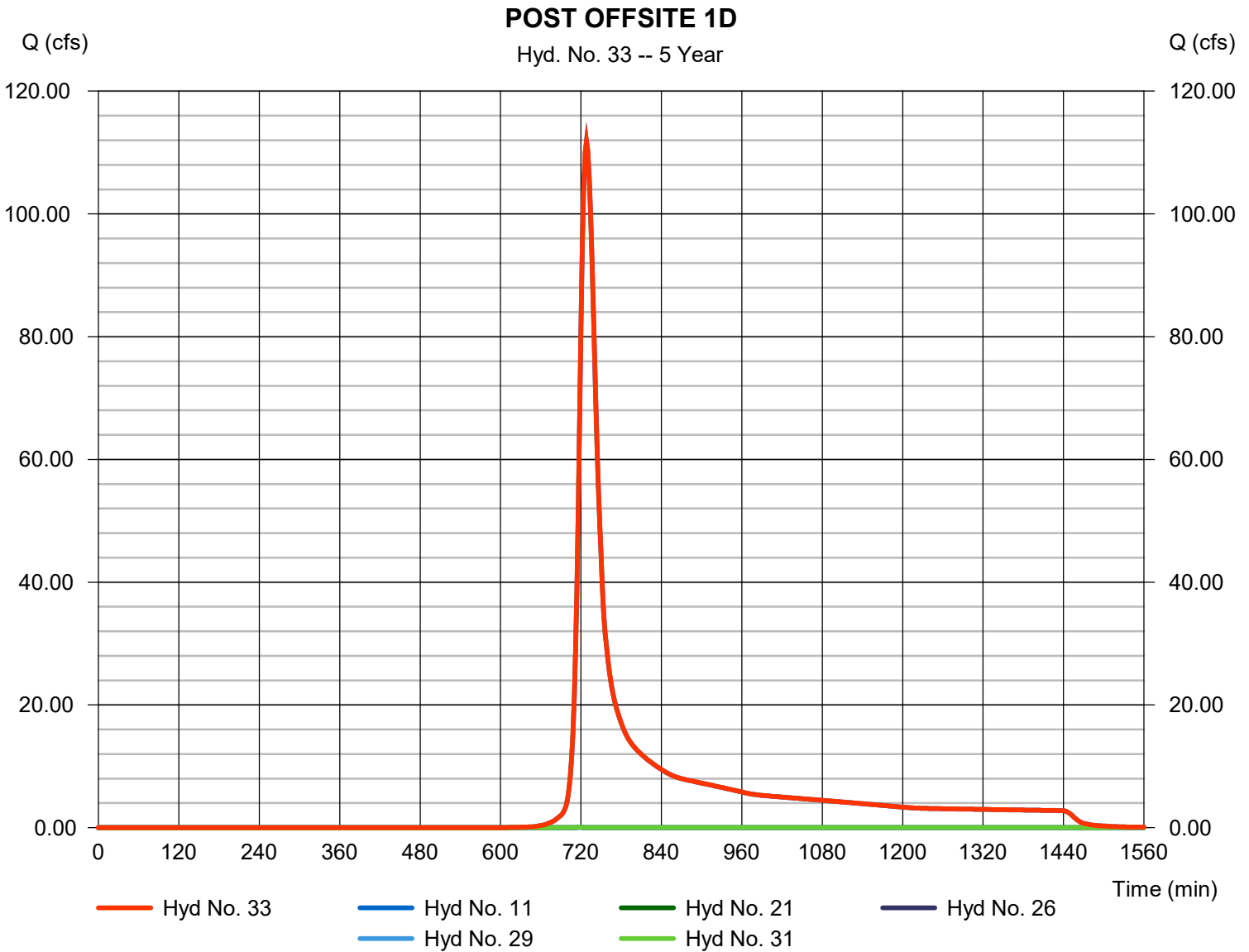
Hydrograph Report

Hyd. No. 33

POST OFFSITE 1D

Hydrograph type = Combine
Storm frequency = 5 yrs
Time interval = 2 min
Inflow hyds. = 11, 21, 26, 29, 31

Peak discharge = 111.88 cfs
Time to peak = 728 min
Hyd. volume = 450,272 cuft
Contrib. drain. area = 0.260 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 34

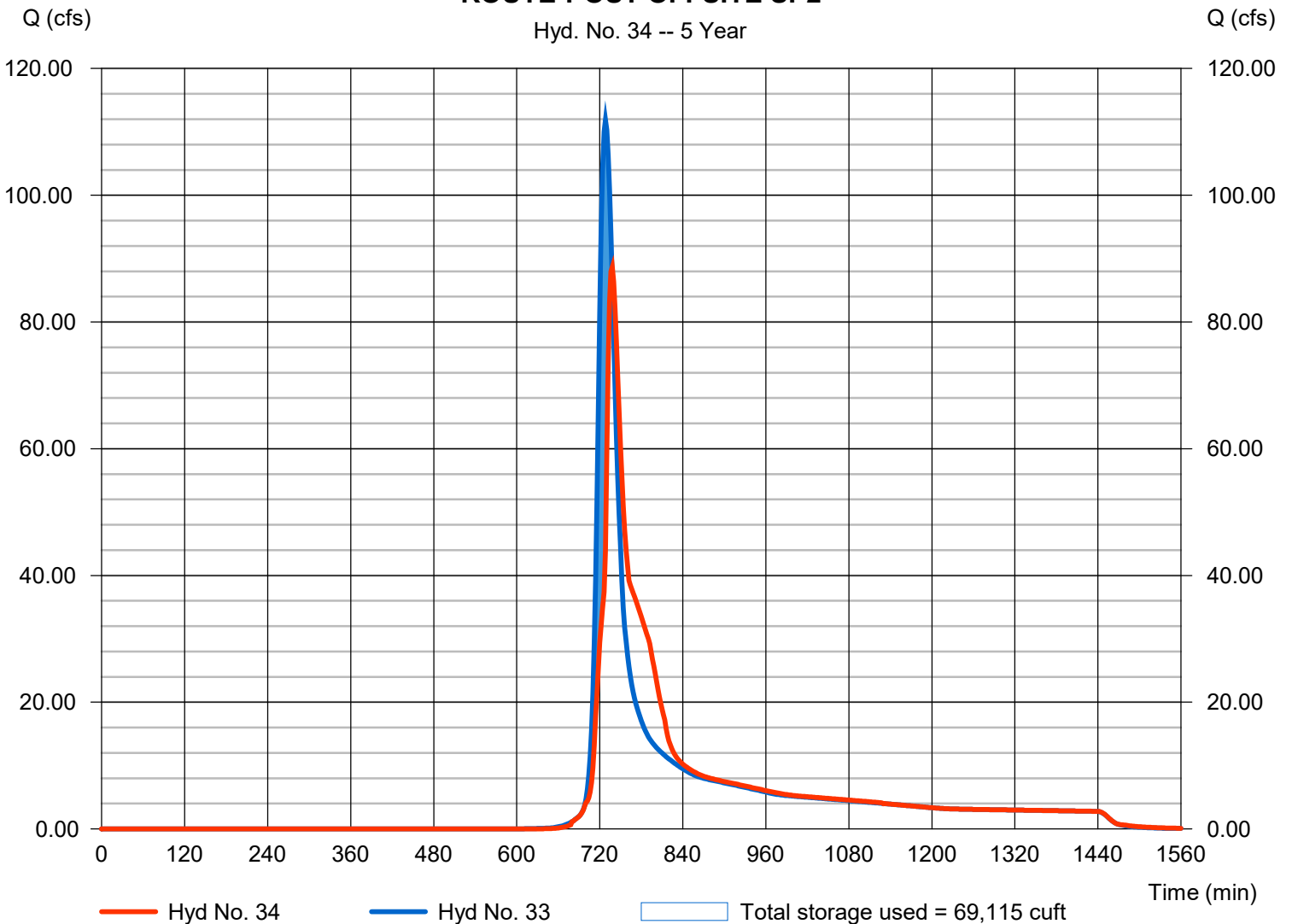
ROUTE-POST OFFSITE SP2

Hydrograph type	= Reservoir	Peak discharge	= 88.67 cfs
Storm frequency	= 5 yrs	Time to peak	= 738 min
Time interval	= 2 min	Hyd. volume	= 450,265 cuft
Inflow hyd. No.	= 33 - POST OFFSITE 1D	Max. Elevation	= 1013.65 ft
Reservoir name	= OFFSITE 1D	Max. Storage	= 69,115 cuft

Storage Indication method used.

ROUTE-POST OFFSITE SP2

Hyd. No. 34 -- 5 Year



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

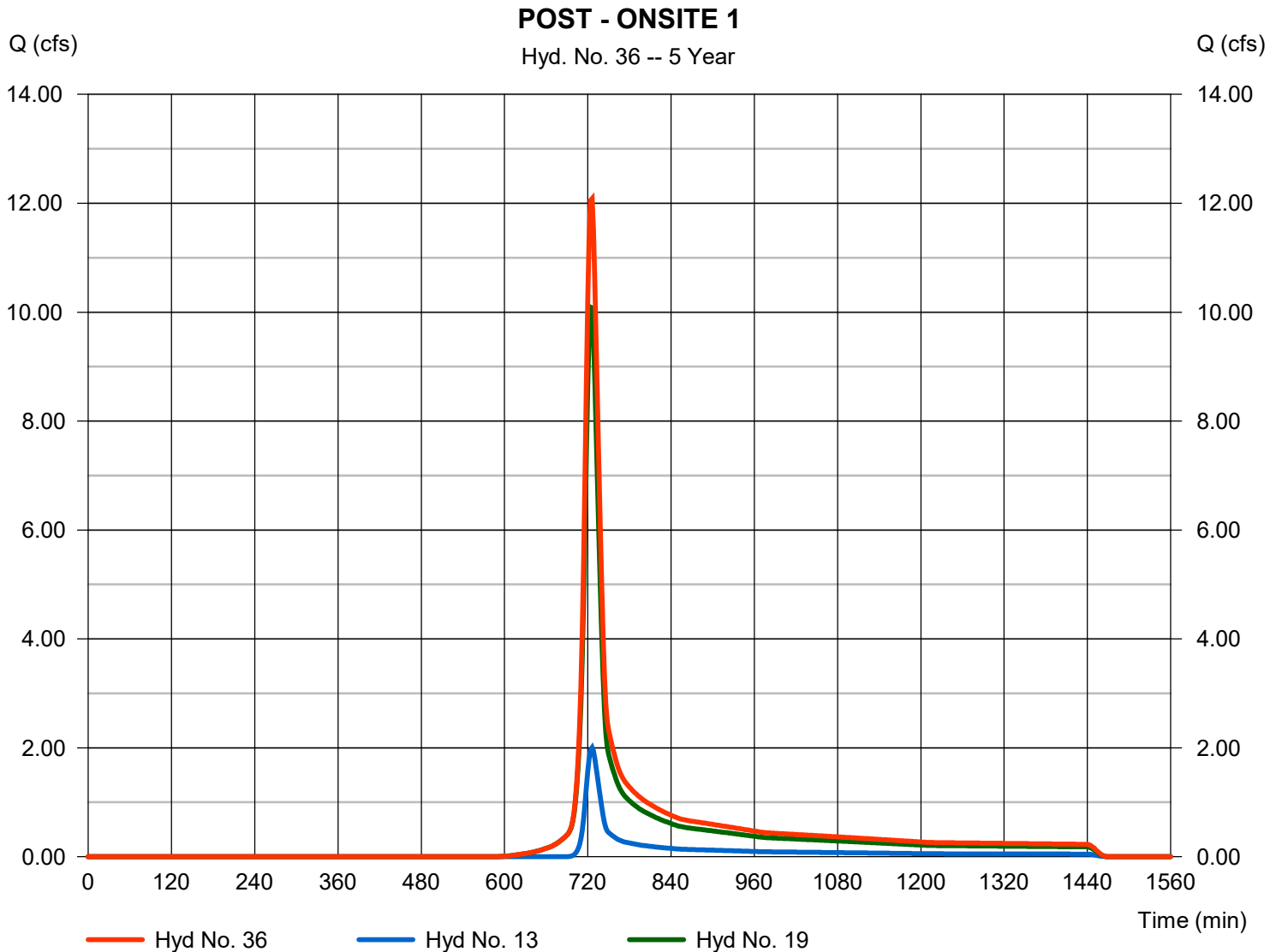
Monday, 05 / 8 / 2023

Hyd. No. 36

POST - ONSITE 1

Hydrograph type = Combine
Storm frequency = 5 yrs
Time interval = 2 min
Inflow hyds. = 13, 19

Peak discharge = 12.08 cfs
Time to peak = 726 min
Hyd. volume = 39,116 cuft
Contrib. drain. area = 6.540 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

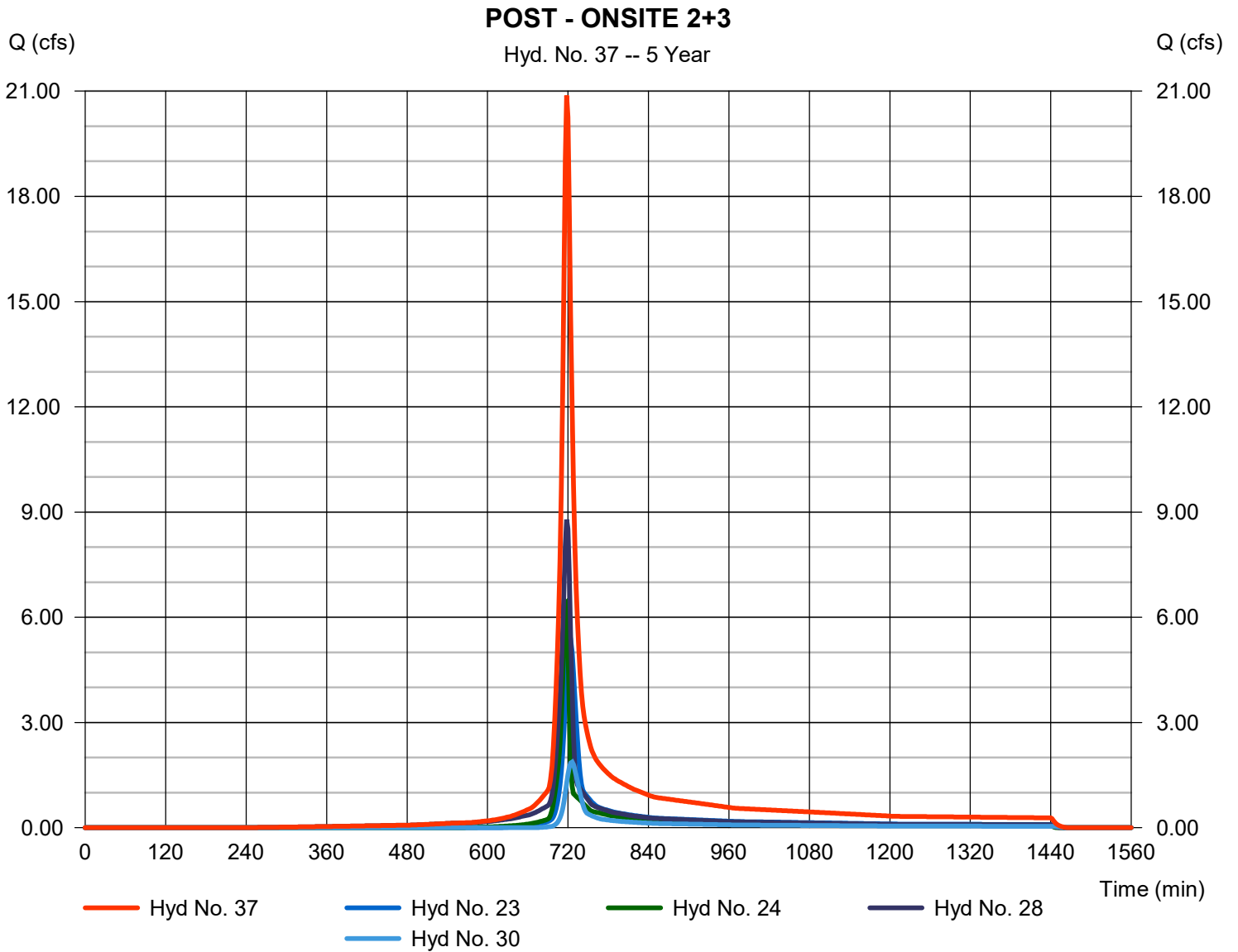
Monday, 05 / 8 / 2023

Hyd. No. 37

POST - ONSITE 2+3

Hydrograph type = Combine
Storm frequency = 5 yrs
Time interval = 2 min
Inflow hyds. = 23, 24, 28, 30

Peak discharge = 20.88 cfs
Time to peak = 718 min
Hyd. volume = 55,776 cuft
Contrib. drain. area = 7.540 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 39

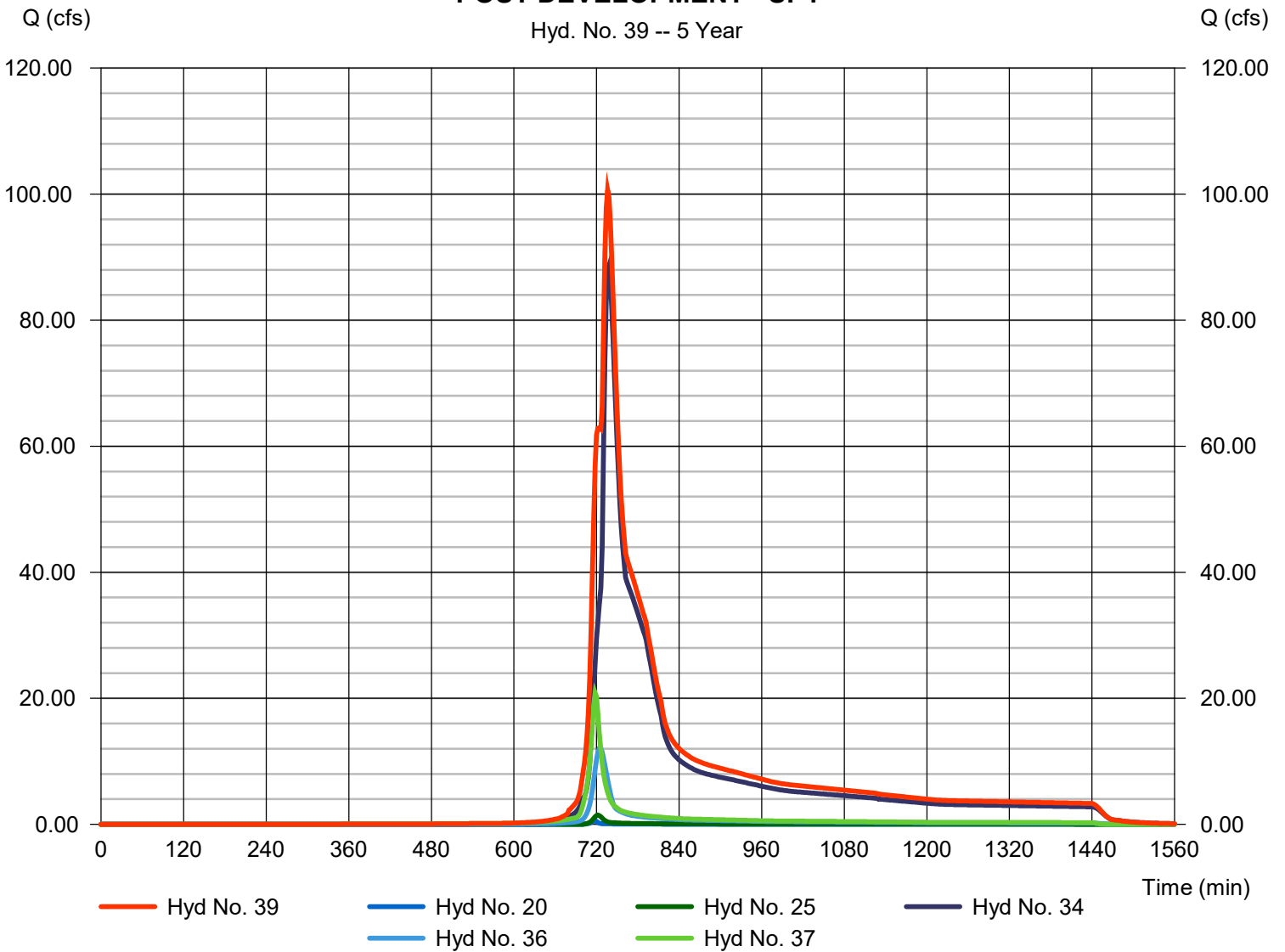
POST DEVELOPMENT - SP1

Hydrograph type = Combine
Storm frequency = 5 yrs
Time interval = 2 min
Inflow hyds. = 20, 25, 34, 36, 37

Peak discharge = 100.64 cfs
Time to peak = 736 min
Hyd. volume = 550,431 cuft
Contrib. drain. area = 1.330 ac

POST DEVELOPMENT - SP1

Hyd. No. 39 -- 5 Year



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	19.95	2	722	57,360	----	----	----	OFFSITE 1A
2	Reservoir	17.30	2	728	57,358	1	1052.31	4,070	ROUTE - OFFSITE 1A
3	SCS Runoff	48.86	2	728	174,346	----	----	----	OFFSITE 1B
4	Combine	66.16	2	728	231,705	2, 3	----	----	ROUTE 1A +OFFSITE 1B
5	Reservoir	56.30	2	734	231,698	4	1028.89	27,743	ROUTE OFFSITE 1B
6	SCS Runoff	18.83	2	728	67,201	----	----	----	OFFSITE 1C
7	Combine	72.93	2	732	298,899	5, 6	----	----	ROUTE 1B + OFFSITE 1C
8	Reservoir	70.86	2	734	298,898	7	1017.38	8,758	ROUTE OFFSITE 1C
9	SCS Runoff	69.36	2	726	223,475	----	----	----	PRE OFFSITE 1D
10	SCS Runoff	17.50	2	724	55,238	----	----	----	PRE OFFSITE 1E
11	Combine	145.14	2	728	577,611	8, 9, 10	----	----	ROUTE 1C +OFFSITE 1D +1E
12	Reservoir	126.37	2	734	577,604	11	1013.93	79,139	PREROUTE- OFFSITE SP2
13	SCS Runoff	2.755	2	726	9,185	----	----	----	OFFSITE 2
14	SCS Runoff	14.21	2	722	40,294	----	----	----	ON-SITE PRE 1
15	SCS Runoff	9.675	2	726	31,974	----	----	----	ON-SITE PRE 2
16	SCS Runoff	10.18	2	724	31,828	----	----	----	ON-SITE PRE 3
17	Combine	148.00	2	734	690,886	12, 13, 14, 15, 16	----	----	PRE-DEVELOPMENT - SP1
19	SCS Runoff	12.82	2	724	40,453	----	----	----	ONSITE POST 1A
20	SCS Runoff	0.780	2	718	1,573	----	----	----	ONSITE POST 1B - BYPASS
21	SCS Runoff	0.157	2	718	335	----	----	----	ONSITE POST 1C - BYPASS
23	SCS Runoff	6.919	2	722	19,621	----	----	----	ONSITE POST 2A
24	SCS Runoff	7.993	2	716	16,140	----	----	----	ONSITE POST 2B - TURF
25	SCS Runoff	2.008	2	722	5,462	----	----	----	ONSITE POST 2C - BYPASS
26	SCS Runoff	0.063	2	718	134	----	----	----	ONSITE POST 2D - BYPASS
28	SCS Runoff	10.21	2	718	24,778	----	----	----	ONSITE POST 3A
29	SCS Runoff	0.094	2	718	201	----	----	----	ONSITE POST 3B - BYPASS
30	SCS Runoff	2.494	2	726	8,122	----	----	----	ONSITE POST 3C
31	SCS Runoff	0.109	2	718	227	----	----	----	ONSITE POST 3D - BYPASS
33	Combine	145.22	2	728	578,509	11, 21, 26, 29, 31, 33	----	----	POST OFFSITE 1D
34	Reservoir	126.55	2	734	578,501	33	1013.93	79,182	ROUTE-POST OFFSITE SP2
36	Combine	15.53	2	724	49,638	13, 19,	----	----	POST - ONSITE 1
Fitzgerald Field.gpw					Return Period: 10 Year			Monday, 05 / 8 / 2023	

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description	
37	Combine	25.66	2	718	68,661	23, 24, 28, 30,	-----	-----	POST - ONSITE 2+3	
39	Combine	144.99	2	734	703,835	20, 25, 34, 36, 37,	-----	-----	POST DEVELOPMENT - SP1	
Fitzgerald Field.gpw					Return Period: 10 Year			Monday, 05 / 8 / 2023		

Hydrograph Report

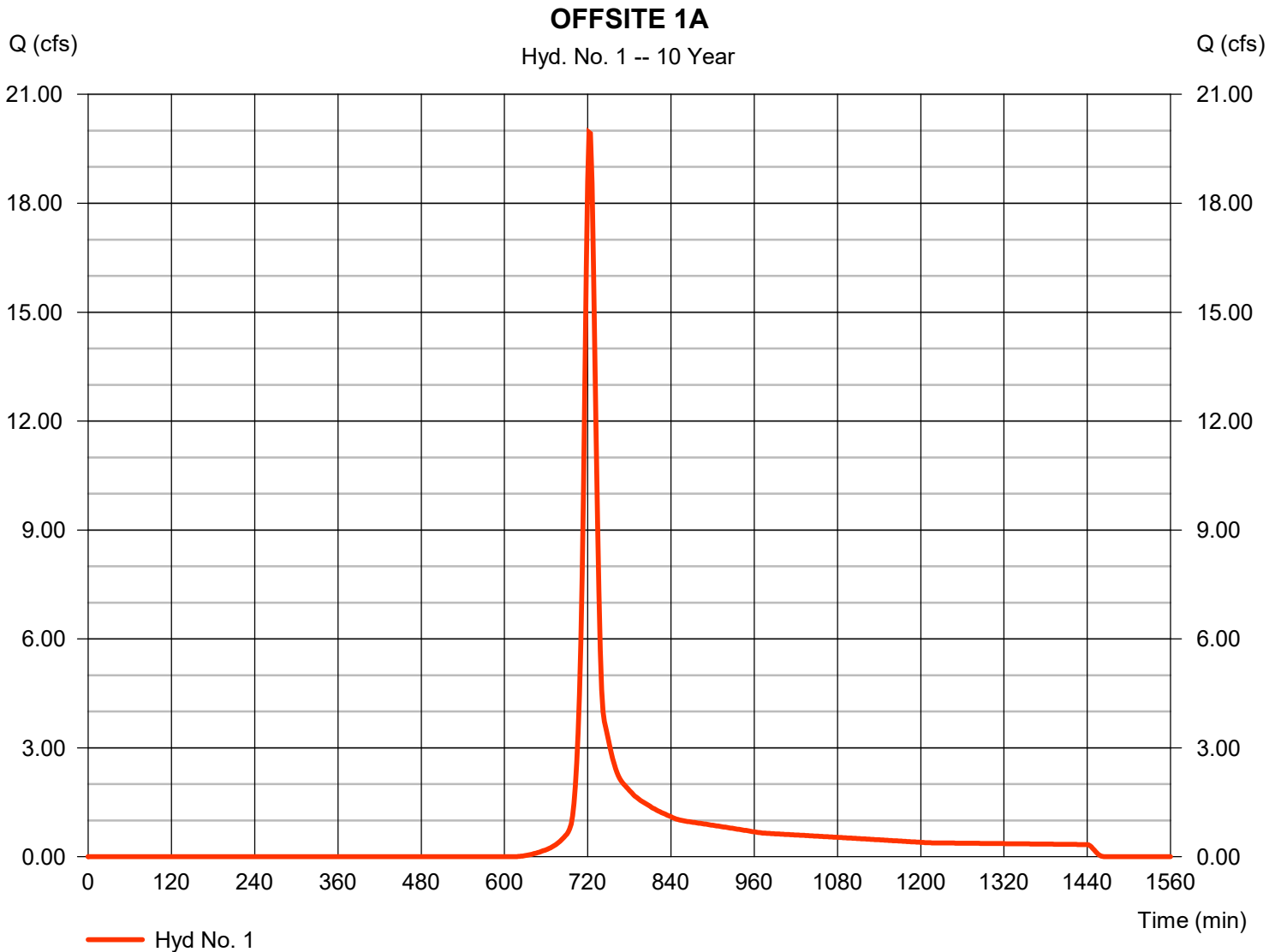
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 1

OFFSITE 1A

Hydrograph type	= SCS Runoff	Peak discharge	= 19.95 cfs
Storm frequency	= 10 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 57,360 cuft
Drainage area	= 8.590 ac	Curve number	= 68
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 14.00 min
Total precip.	= 5.01 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

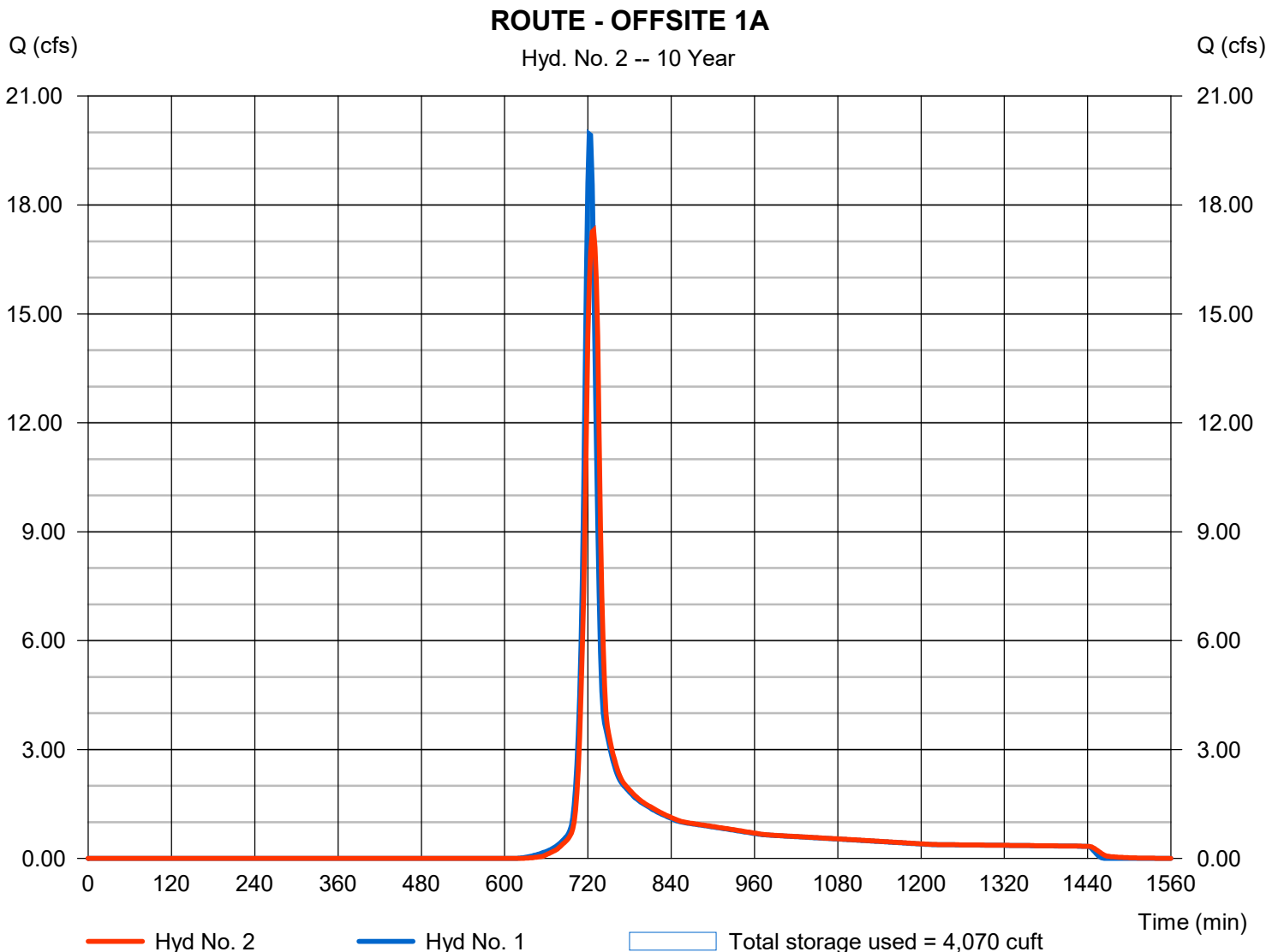
Monday, 05 / 8 / 2023

Hyd. No. 2

ROUTE - OFFSITE 1A

Hydrograph type	= Reservoir	Peak discharge	= 17.30 cfs
Storm frequency	= 10 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 57,358 cuft
Inflow hyd. No.	= 1 - OFFSITE 1A	Max. Elevation	= 1052.31 ft
Reservoir name	= OFFSITE 1A	Max. Storage	= 4,070 cuft

Storage Indication method used.



Hydrograph Report

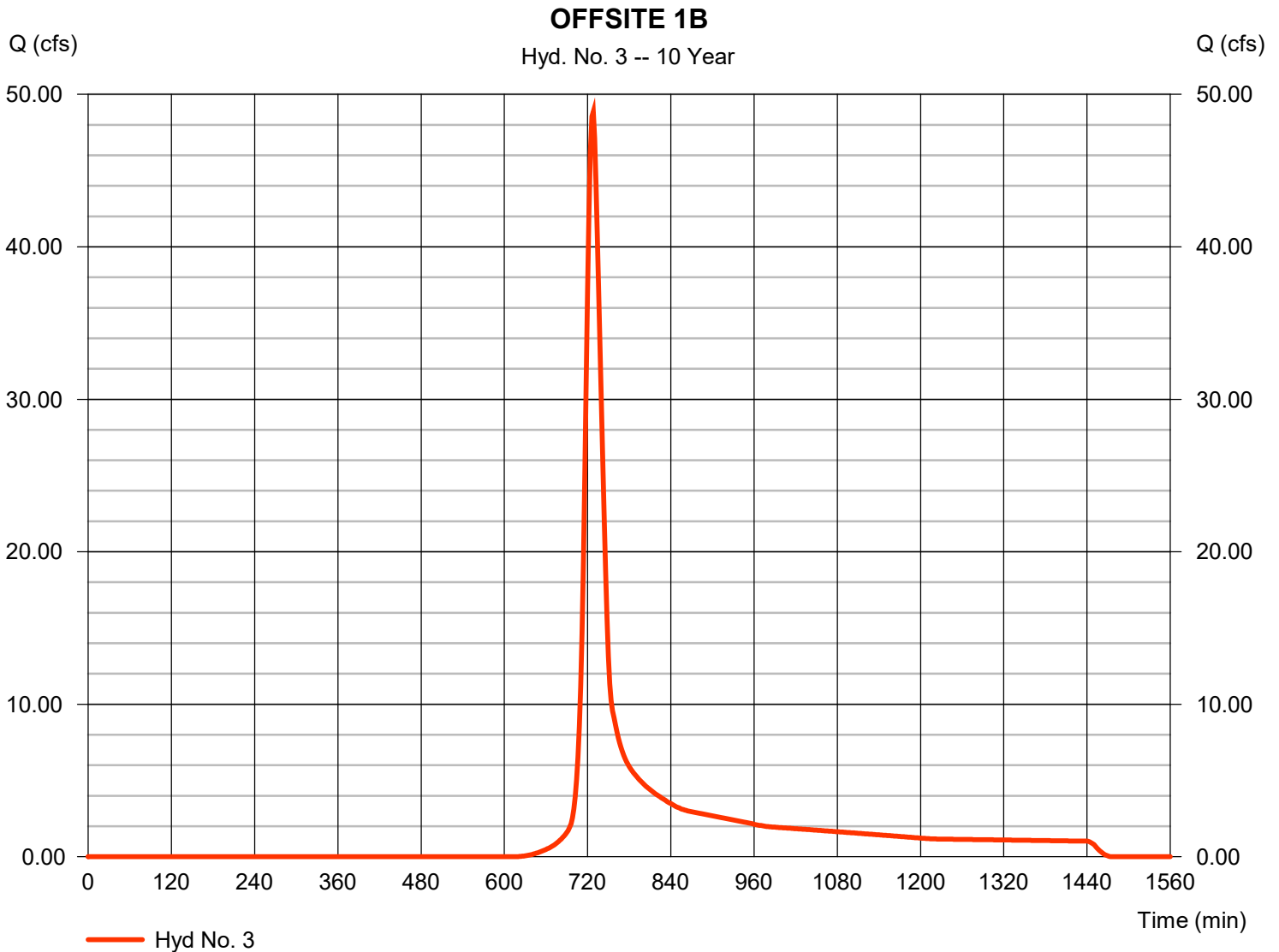
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 3

OFFSITE 1B

Hydrograph type	= SCS Runoff	Peak discharge	= 48.86 cfs
Storm frequency	= 10 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 174,346 cuft
Drainage area	= 25.010 ac	Curve number	= 68
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 21.00 min
Total precip.	= 5.01 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



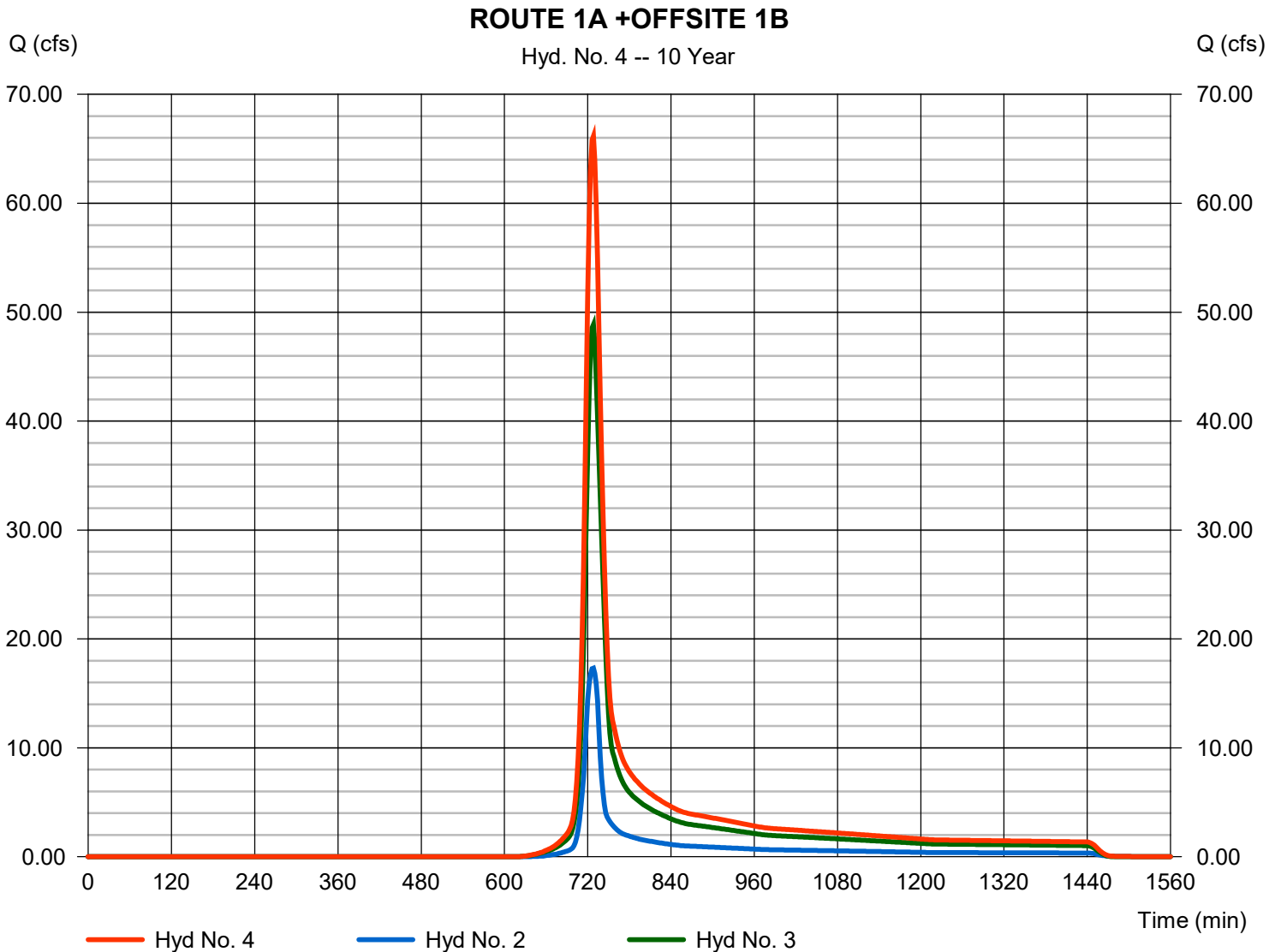
Hydrograph Report

Hyd. No. 4

ROUTE 1A +OFFSITE 1B

Hydrograph type = Combine
Storm frequency = 10 yrs
Time interval = 2 min
Inflow hyds. = 2, 3

Peak discharge = 66.16 cfs
Time to peak = 728 min
Hyd. volume = 231,705 cuft
Contrib. drain. area = 25.010 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

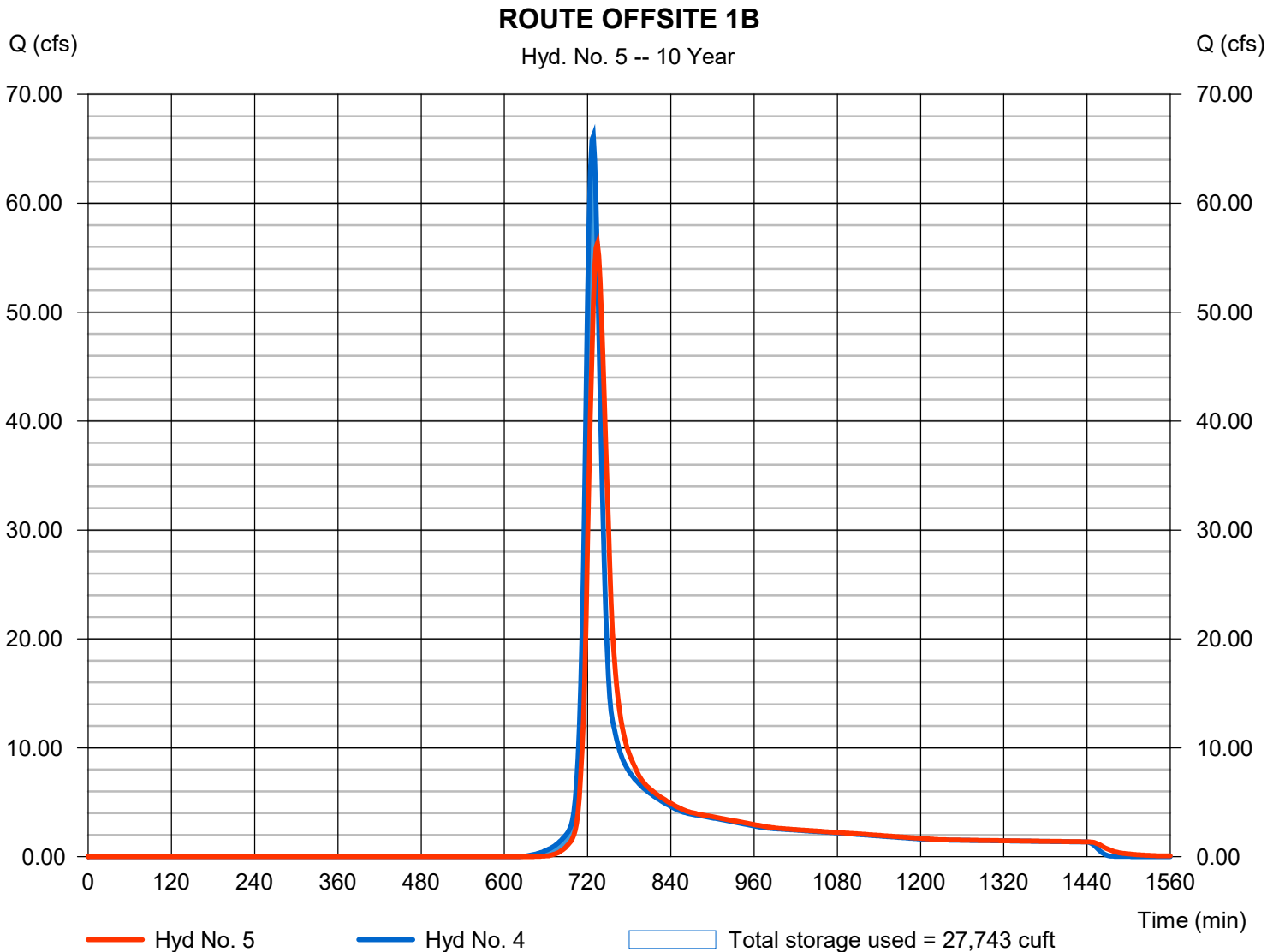
Monday, 05 / 8 / 2023

Hyd. No. 5

ROUTE OFFSITE 1B

Hydrograph type	= Reservoir	Peak discharge	= 56.30 cfs
Storm frequency	= 10 yrs	Time to peak	= 734 min
Time interval	= 2 min	Hyd. volume	= 231,698 cuft
Inflow hyd. No.	= 4 - ROUTE 1A +OFFSITE 1B	Max. Elevation	= 1028.89 ft
Reservoir name	= OFFSITE 1B	Max. Storage	= 27,743 cuft

Storage Indication method used.



Hydrograph Report

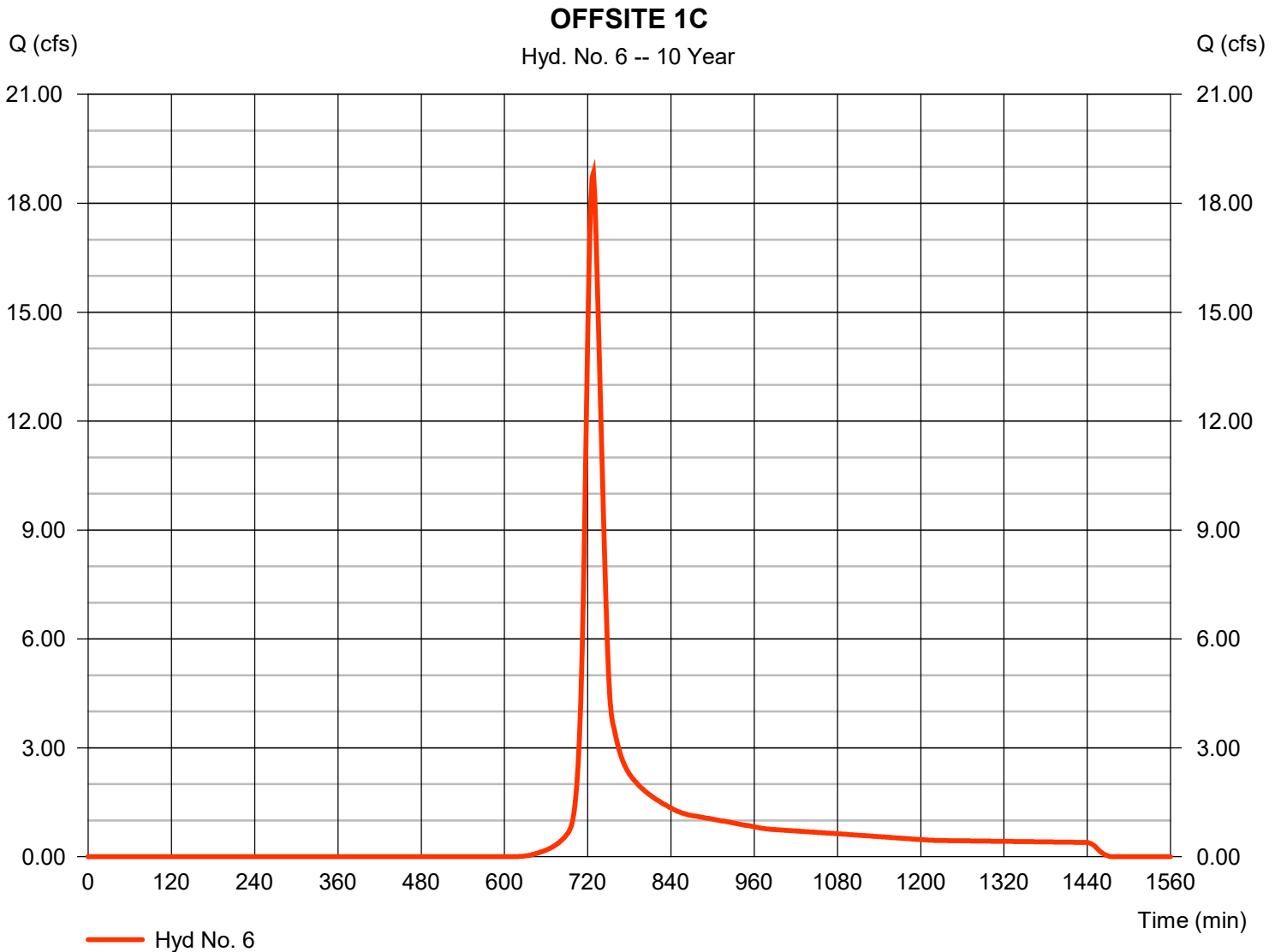
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 6

OFFSITE 1C

Hydrograph type	= SCS Runoff	Peak discharge	= 18.83 cfs
Storm frequency	= 10 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 67,201 cuft
Drainage area	= 9.640 ac	Curve number	= 68
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 21.00 min
Total precip.	= 5.01 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



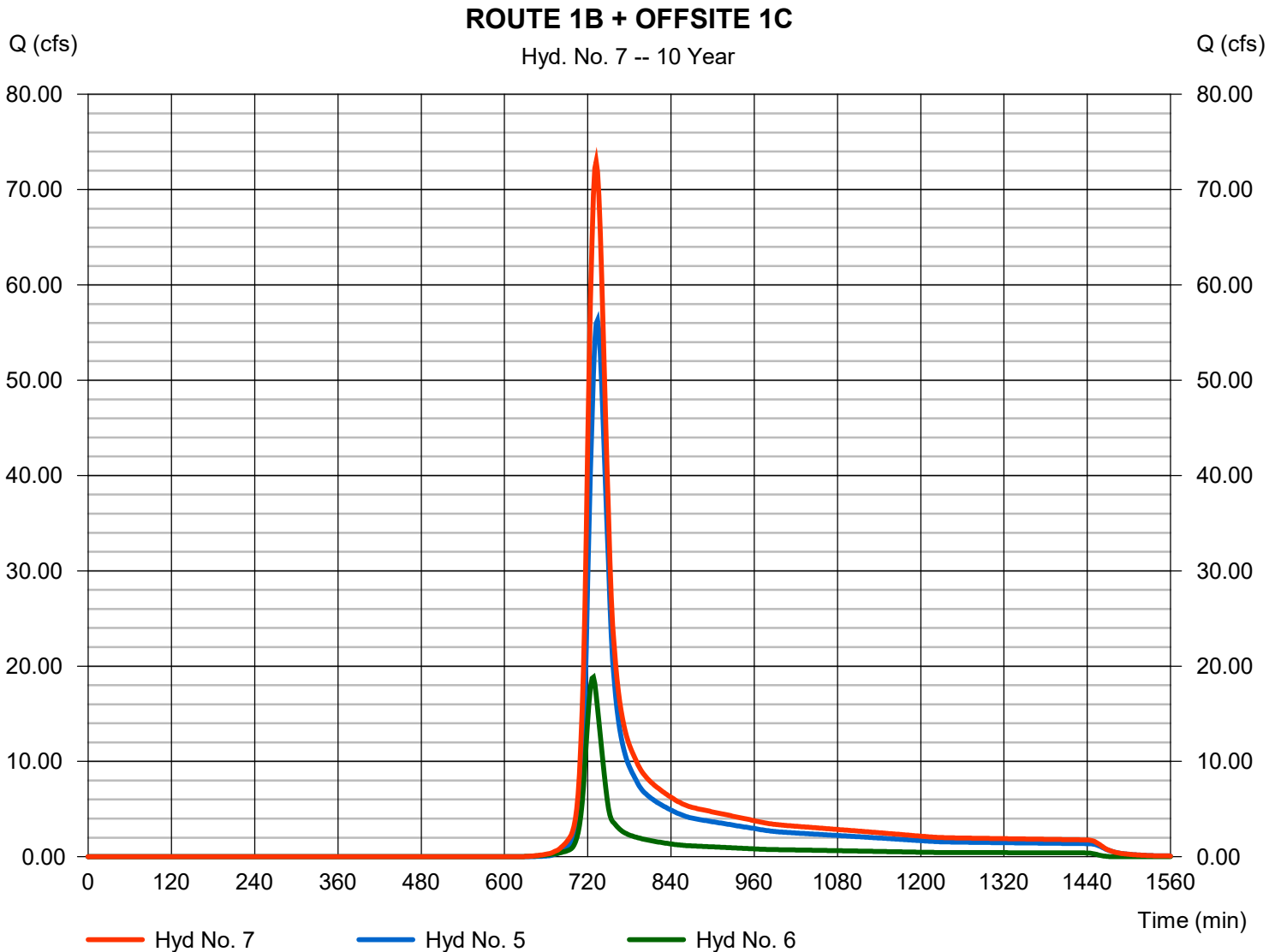
Hydrograph Report

Hyd. No. 7

ROUTE 1B + OFFSITE 1C

Hydrograph type = Combine
Storm frequency = 10 yrs
Time interval = 2 min
Inflow hyds. = 5, 6

Peak discharge = 72.93 cfs
Time to peak = 732 min
Hyd. volume = 298,899 cuft
Contrib. drain. area = 9.640 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

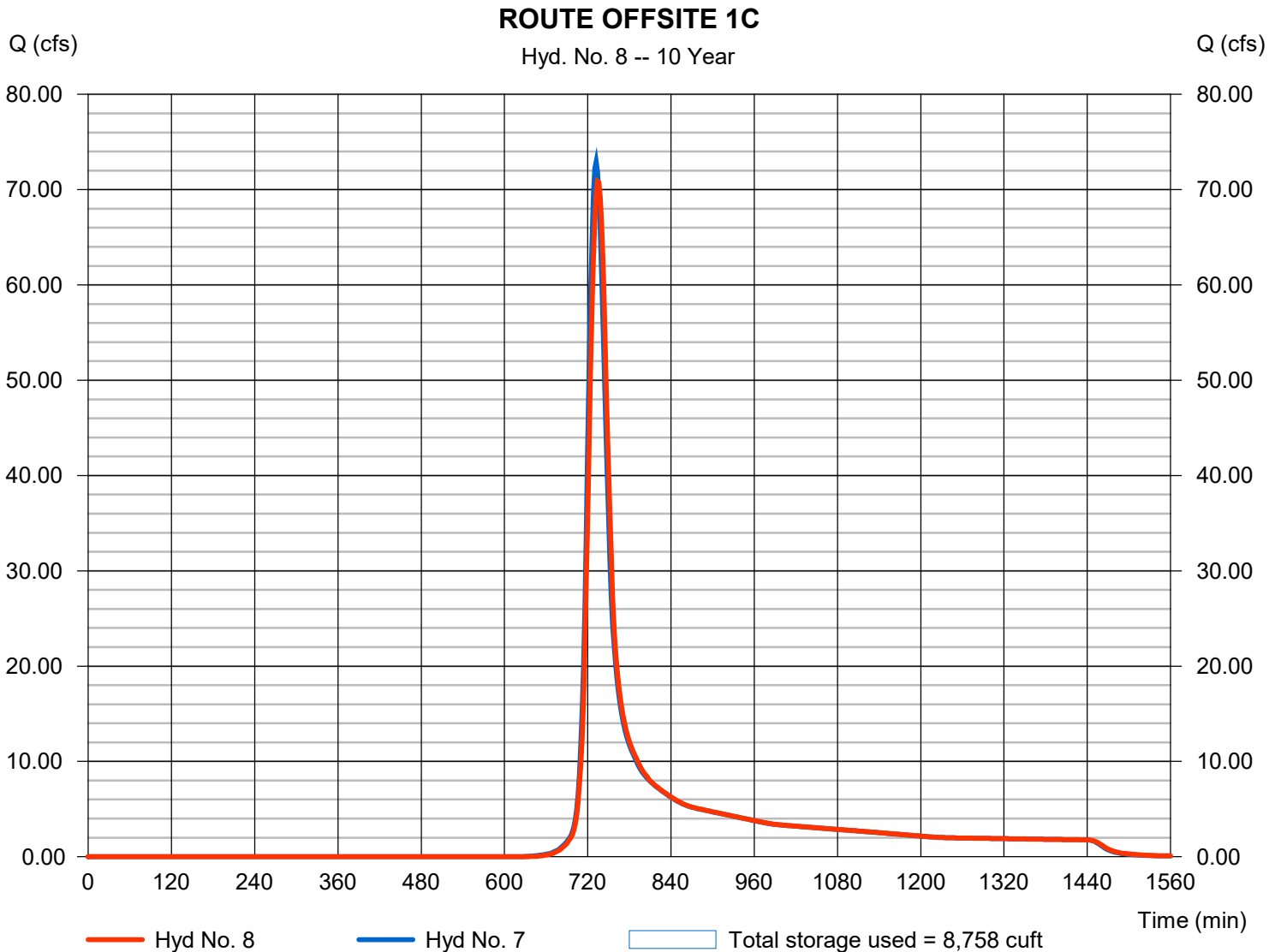
Monday, 05 / 8 / 2023

Hyd. No. 8

ROUTE OFFSITE 1C

Hydrograph type	= Reservoir	Peak discharge	= 70.86 cfs
Storm frequency	= 10 yrs	Time to peak	= 734 min
Time interval	= 2 min	Hyd. volume	= 298,898 cuft
Inflow hyd. No.	= 7 - ROUTE 1B + OFFSITE 1C	Max. Elevation	= 1017.38 ft
Reservoir name	= OFFSITE 1C	Max. Storage	= 8,758 cuft

Storage Indication method used.



Hydrograph Report

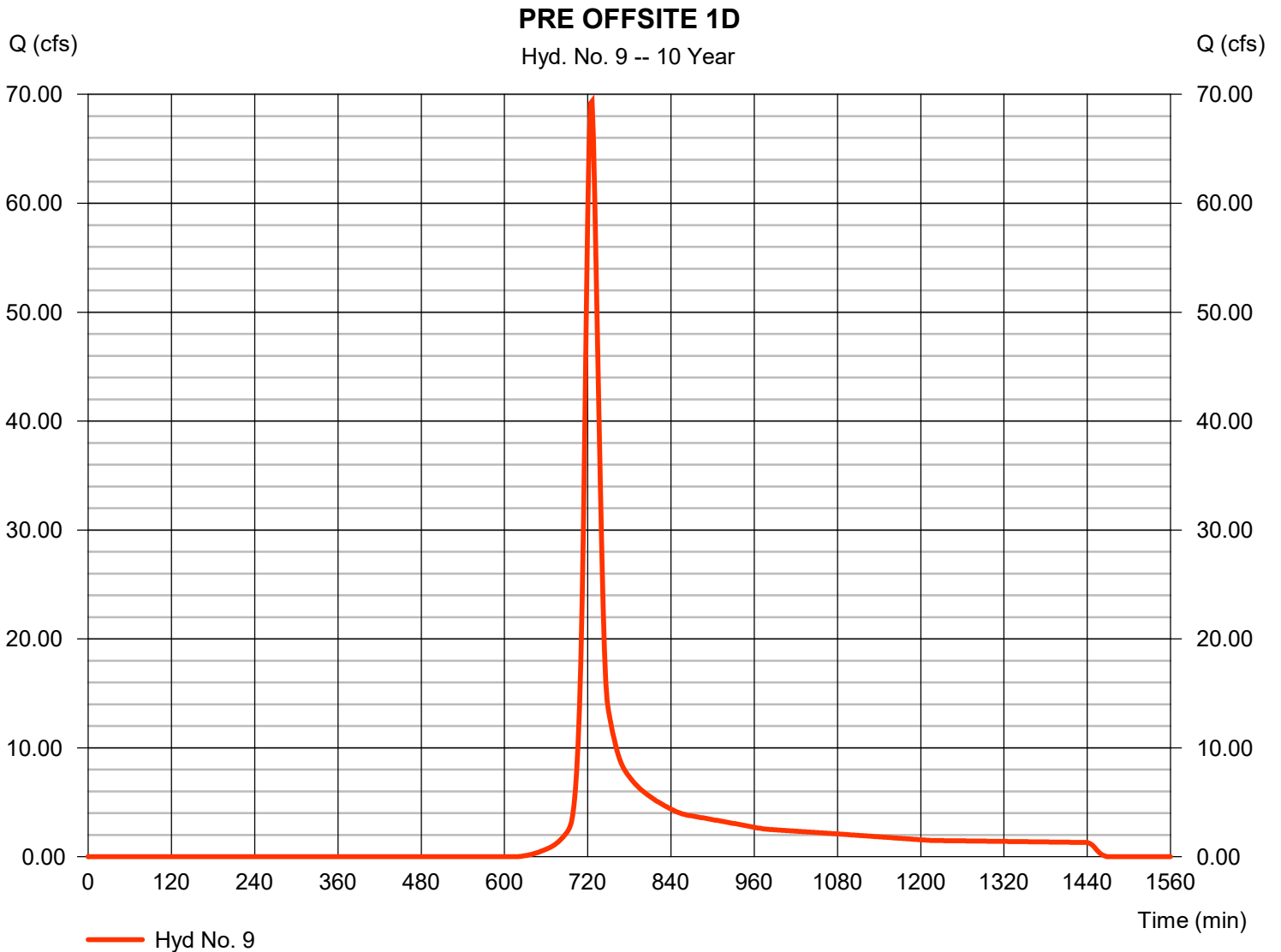
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 9

PRE OFFSITE 1D

Hydrograph type	= SCS Runoff	Peak discharge	= 69.36 cfs
Storm frequency	= 10 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 223,475 cuft
Drainage area	= 32.630 ac	Curve number	= 68
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 18.00 min
Total precip.	= 5.01 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

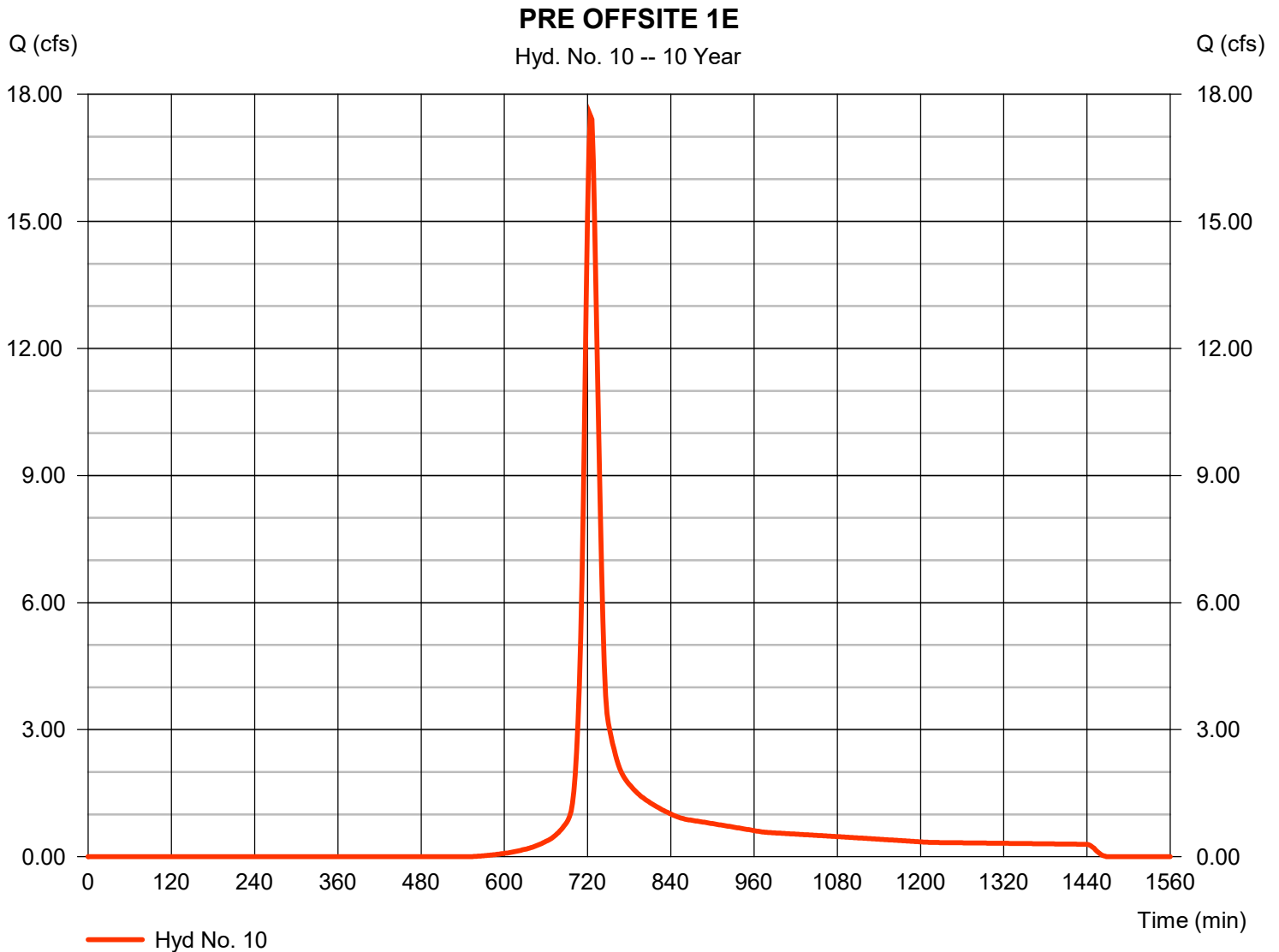
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 10

PRE OFFSITE 1E

Hydrograph type	= SCS Runoff	Peak discharge	= 17.50 cfs
Storm frequency	= 10 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 55,238 cuft
Drainage area	= 6.650 ac	Curve number	= 73
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 17.00 min
Total precip.	= 5.01 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 11

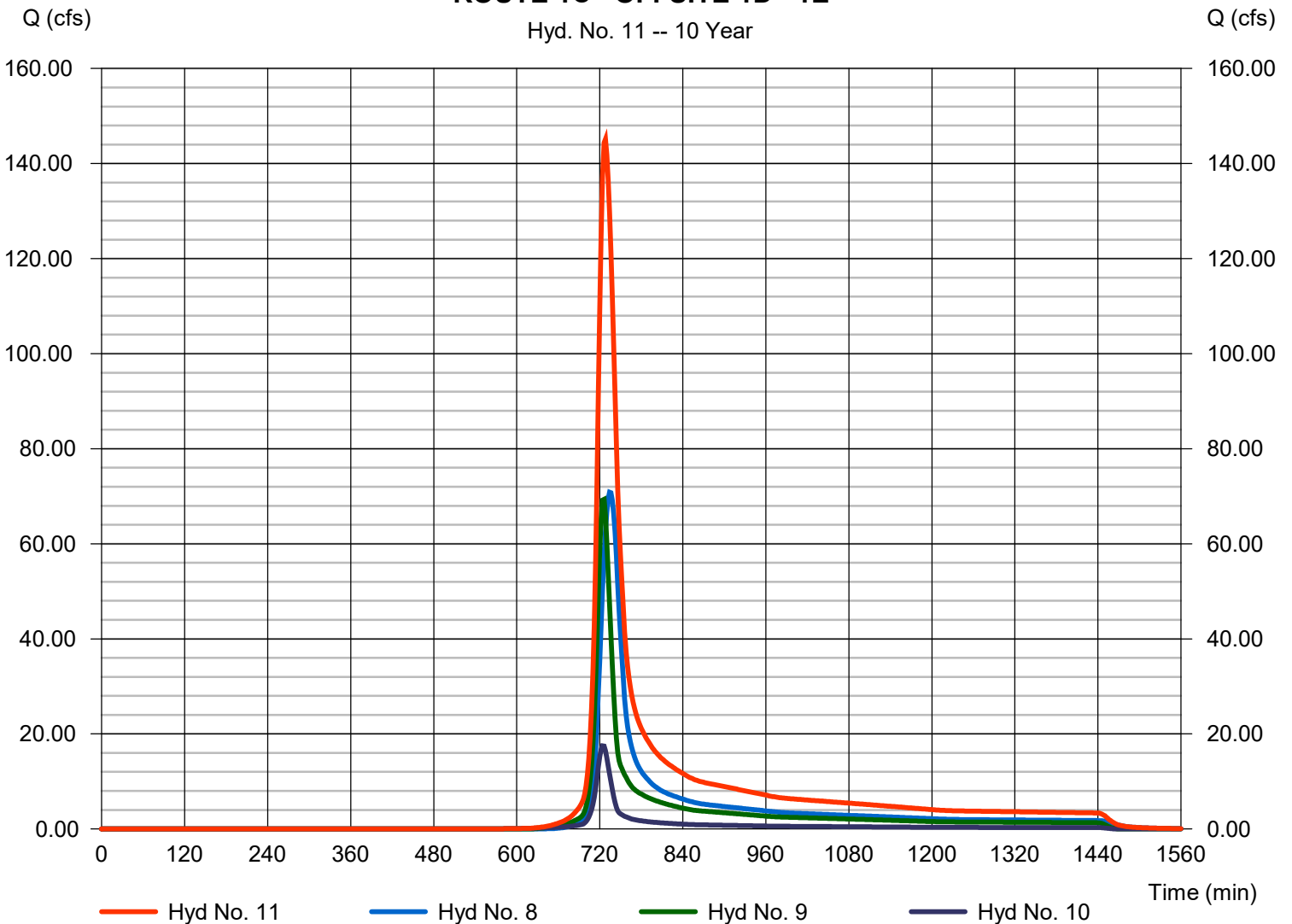
ROUTE 1C +OFFSITE 1D +1E

Hydrograph type = Combine
 Storm frequency = 10 yrs
 Time interval = 2 min
 Inflow hyds. = 8, 9, 10

Peak discharge = 145.14 cfs
 Time to peak = 728 min
 Hyd. volume = 577,611 cuft
 Contrib. drain. area = 39.280 ac

ROUTE 1C +OFFSITE 1D +1E

Hyd. No. 11 -- 10 Year



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 12

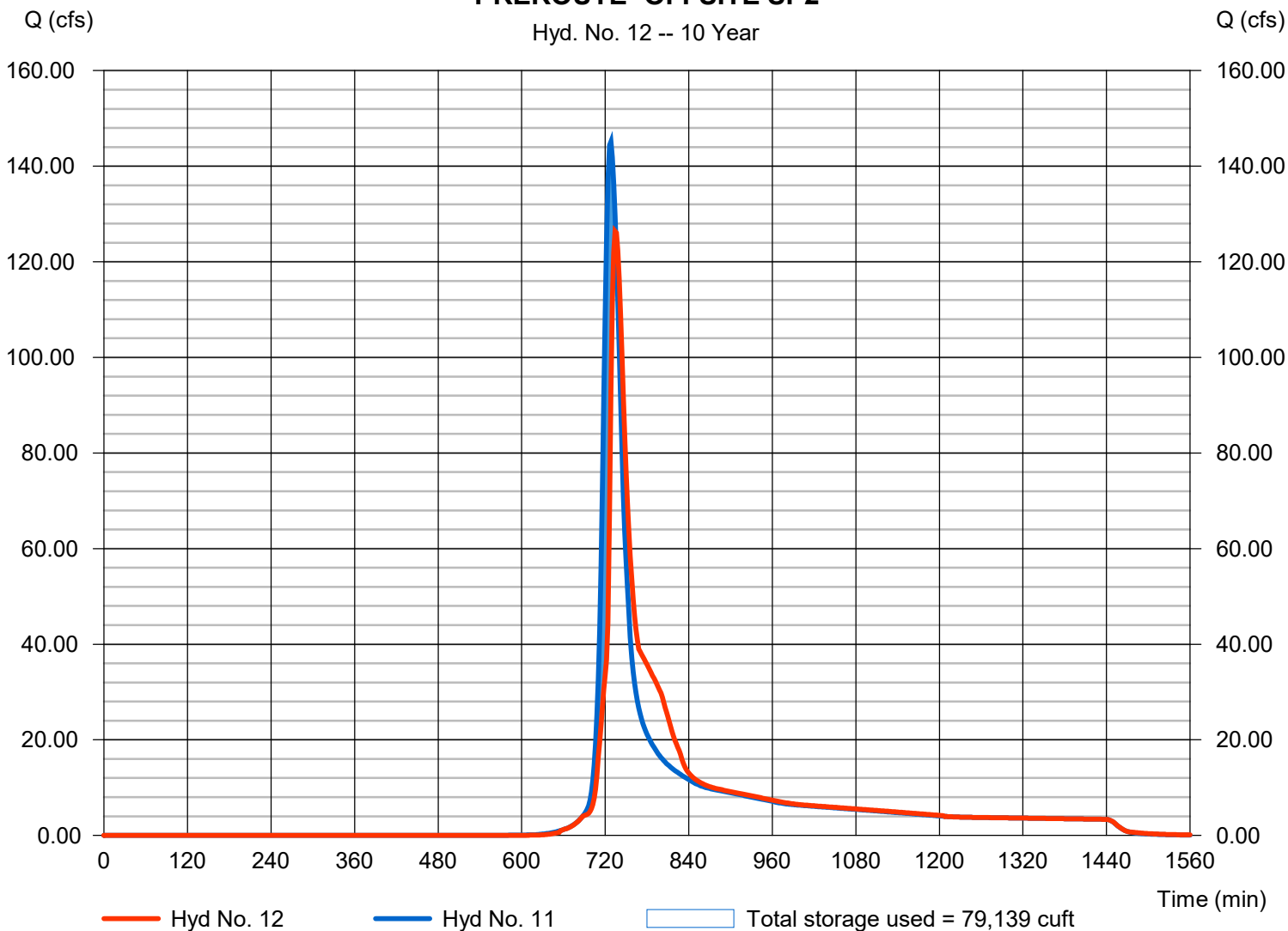
PREROUTE- OFFSITE SP2

Hydrograph type	= Reservoir	Peak discharge	= 126.37 cfs
Storm frequency	= 10 yrs	Time to peak	= 734 min
Time interval	= 2 min	Hyd. volume	= 577,604 cuft
Inflow hyd. No.	= 11 - ROUTE 1C +OFFSITE 1D	Max Elevation	= 1013.93 ft
Reservoir name	= OFFSITE 1D	Max. Storage	= 79,139 cuft

Storage Indication method used.

PREROUTE- OFFSITE SP2

Hyd. No. 12 -- 10 Year



Hydrograph Report

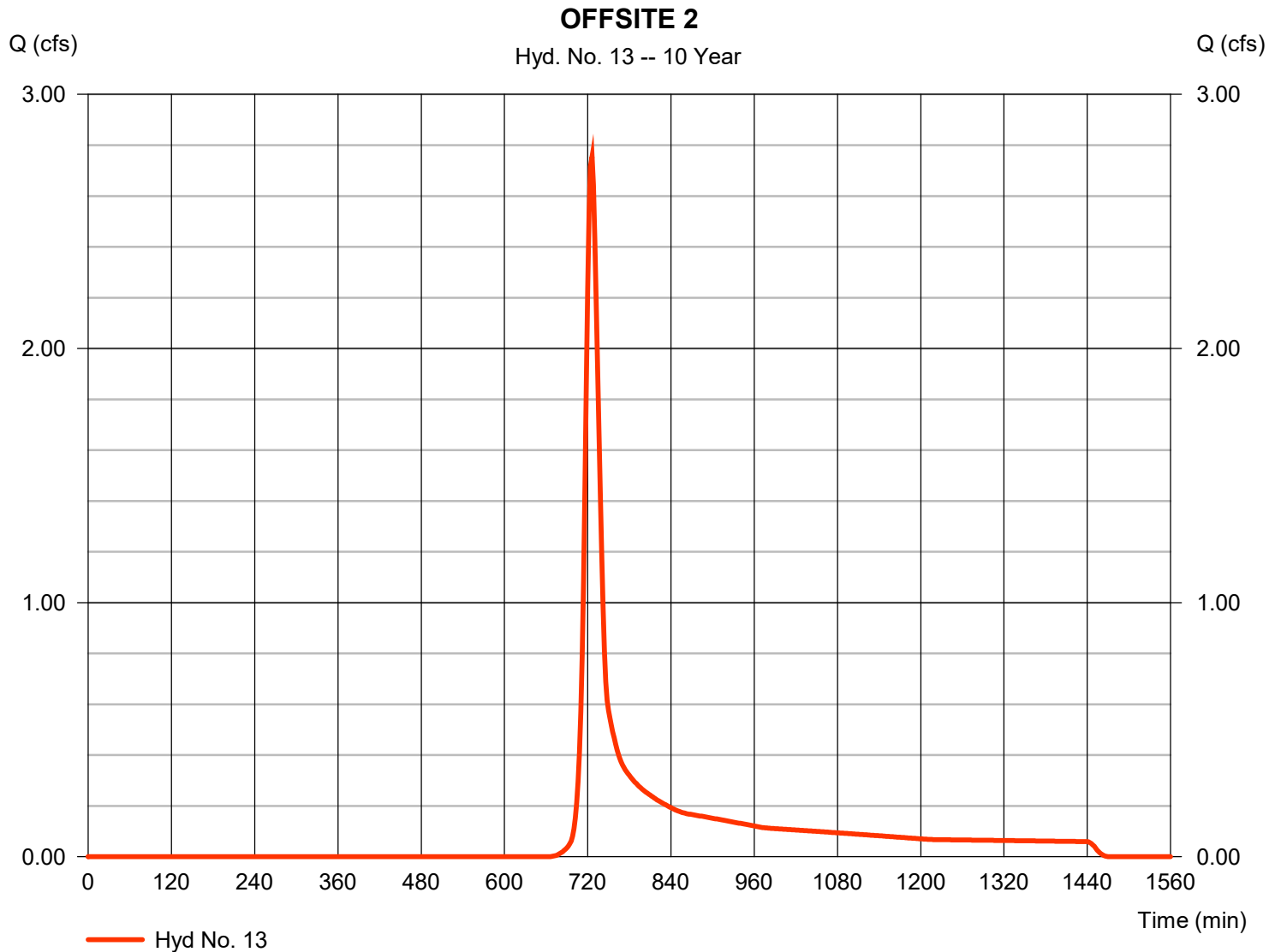
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 13

OFFSITE 2

Hydrograph type	= SCS Runoff	Peak discharge	= 2.755 cfs
Storm frequency	= 10 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 9,185 cuft
Drainage area	= 1.670 ac	Curve number	= 63
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 18.00 min
Total precip.	= 5.01 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

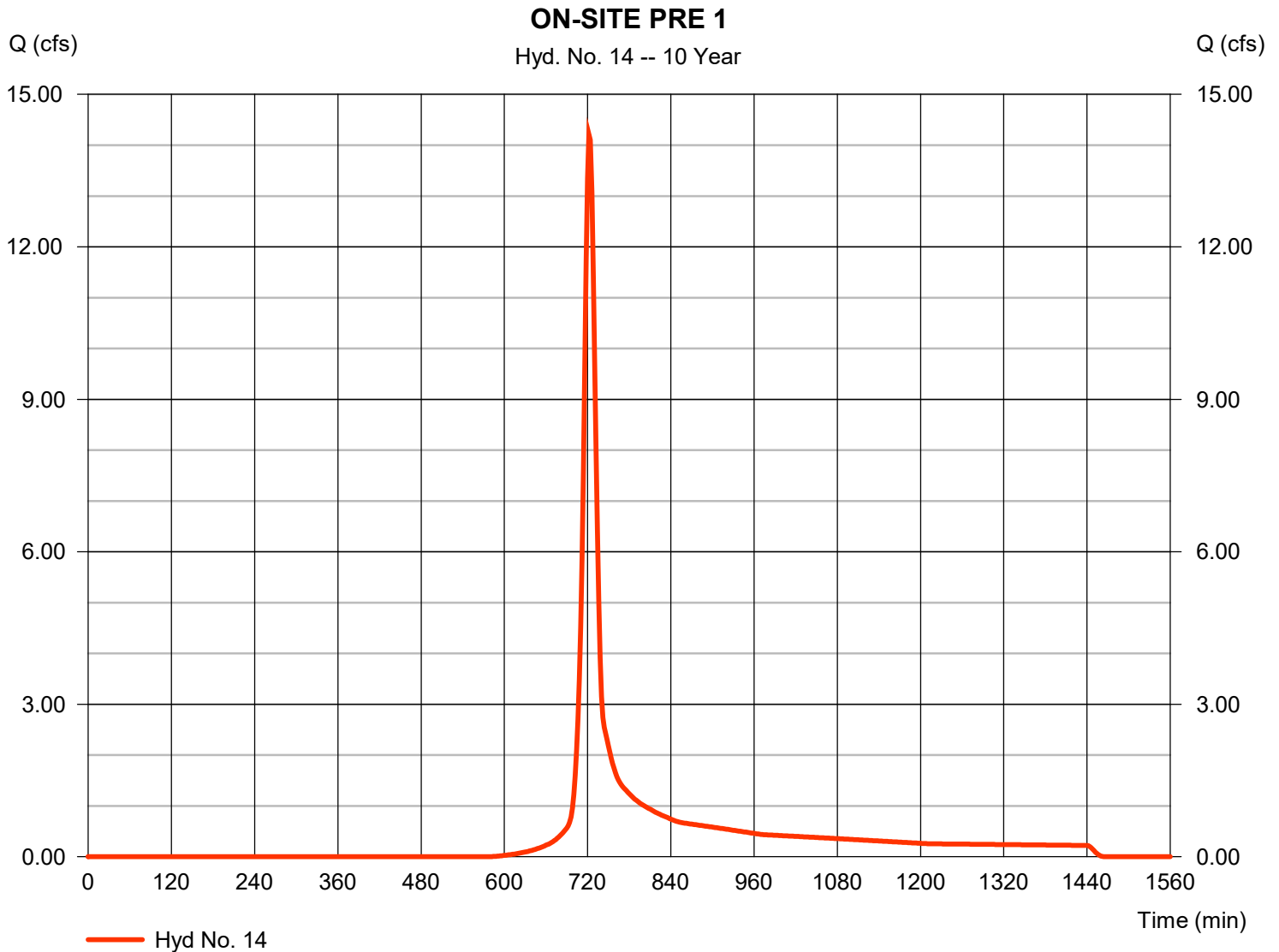
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 14

ON-SITE PRE 1

Hydrograph type	= SCS Runoff	Peak discharge	= 14.21 cfs
Storm frequency	= 10 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 40,294 cuft
Drainage area	= 5.360 ac	Curve number	= 71
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 16.00 min
Total precip.	= 5.01 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

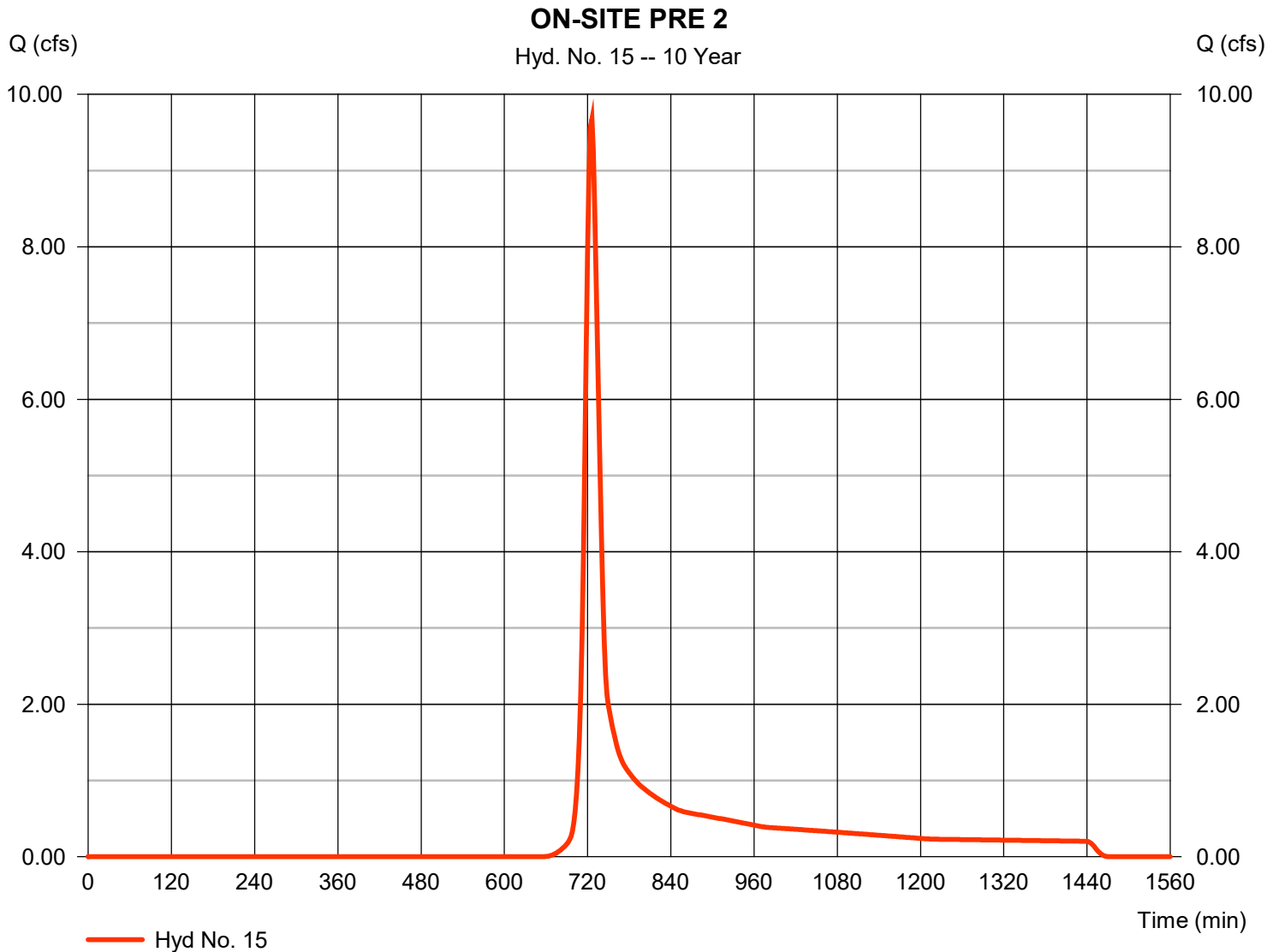
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 15

ON-SITE PRE 2

Hydrograph type	= SCS Runoff	Peak discharge	= 9.675 cfs
Storm frequency	= 10 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 31,974 cuft
Drainage area	= 5.550 ac	Curve number	= 64
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 17.00 min
Total precip.	= 5.01 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

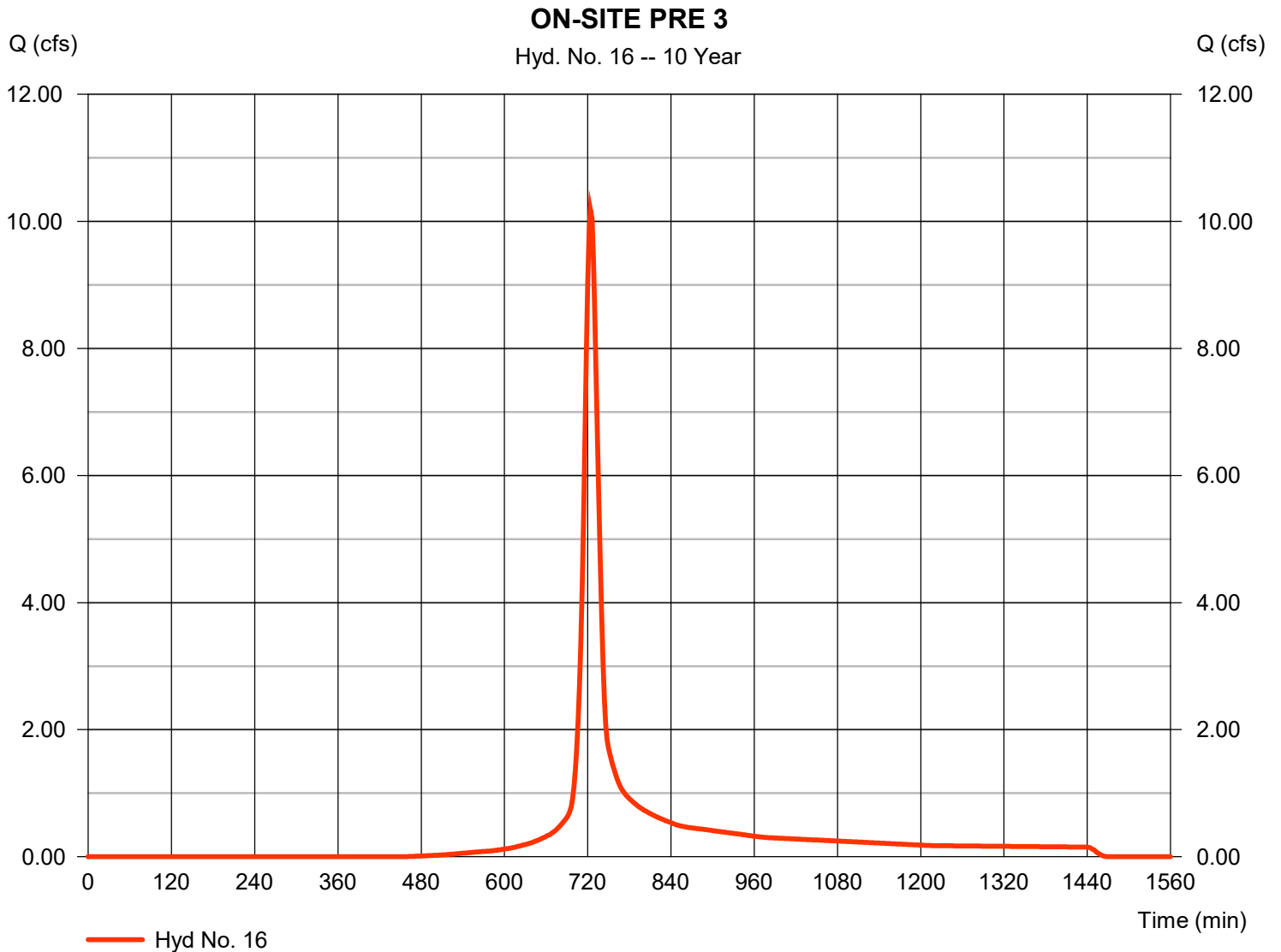
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 16

ON-SITE PRE 3

Hydrograph type	= SCS Runoff	Peak discharge	= 10.18 cfs
Storm frequency	= 10 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 31,828 cuft
Drainage area	= 3.120 ac	Curve number	= 79
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 18.00 min
Total precip.	= 5.01 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

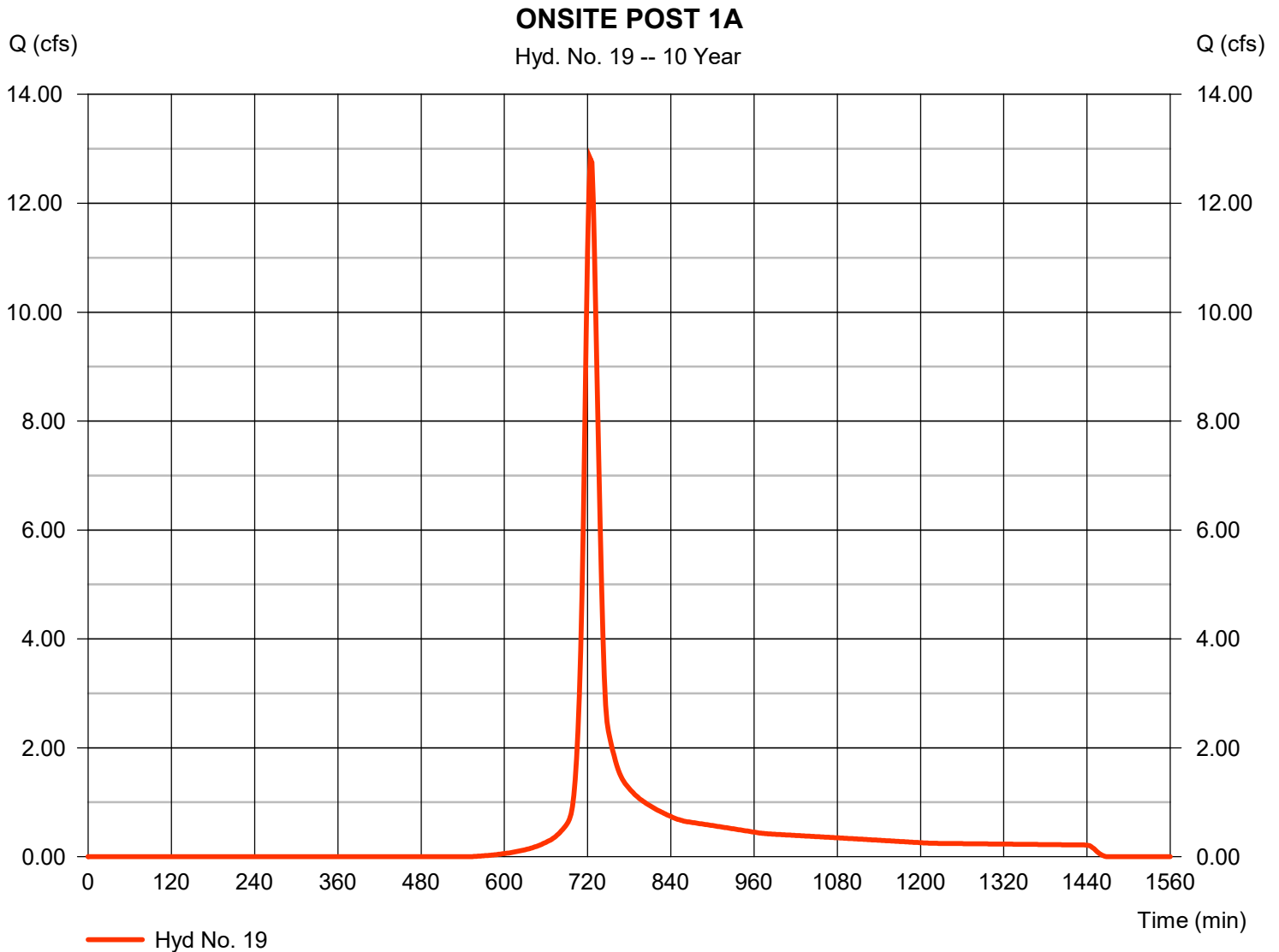
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 19

ONSITE POST 1A

Hydrograph type	= SCS Runoff	Peak discharge	= 12.82 cfs
Storm frequency	= 10 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 40,453 cuft
Drainage area	= 4.870 ac	Curve number	= 73
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 18.00 min
Total precip.	= 5.01 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

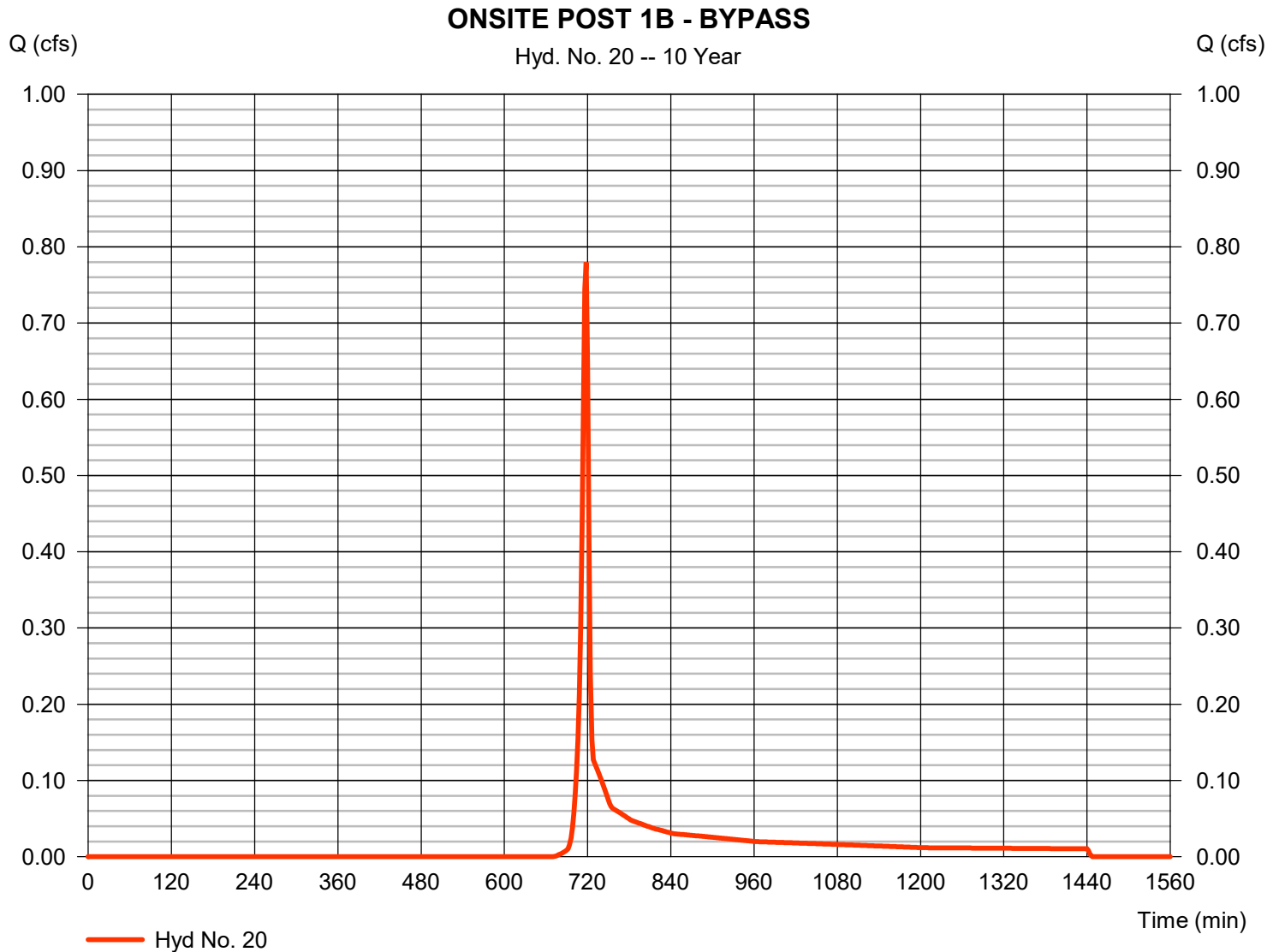
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 20

ONSITE POST 1B - BYPASS

Hydrograph type	= SCS Runoff	Peak discharge	= 0.780 cfs
Storm frequency	= 10 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 1,573 cuft
Drainage area	= 0.320 ac	Curve number	= 62
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.01 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

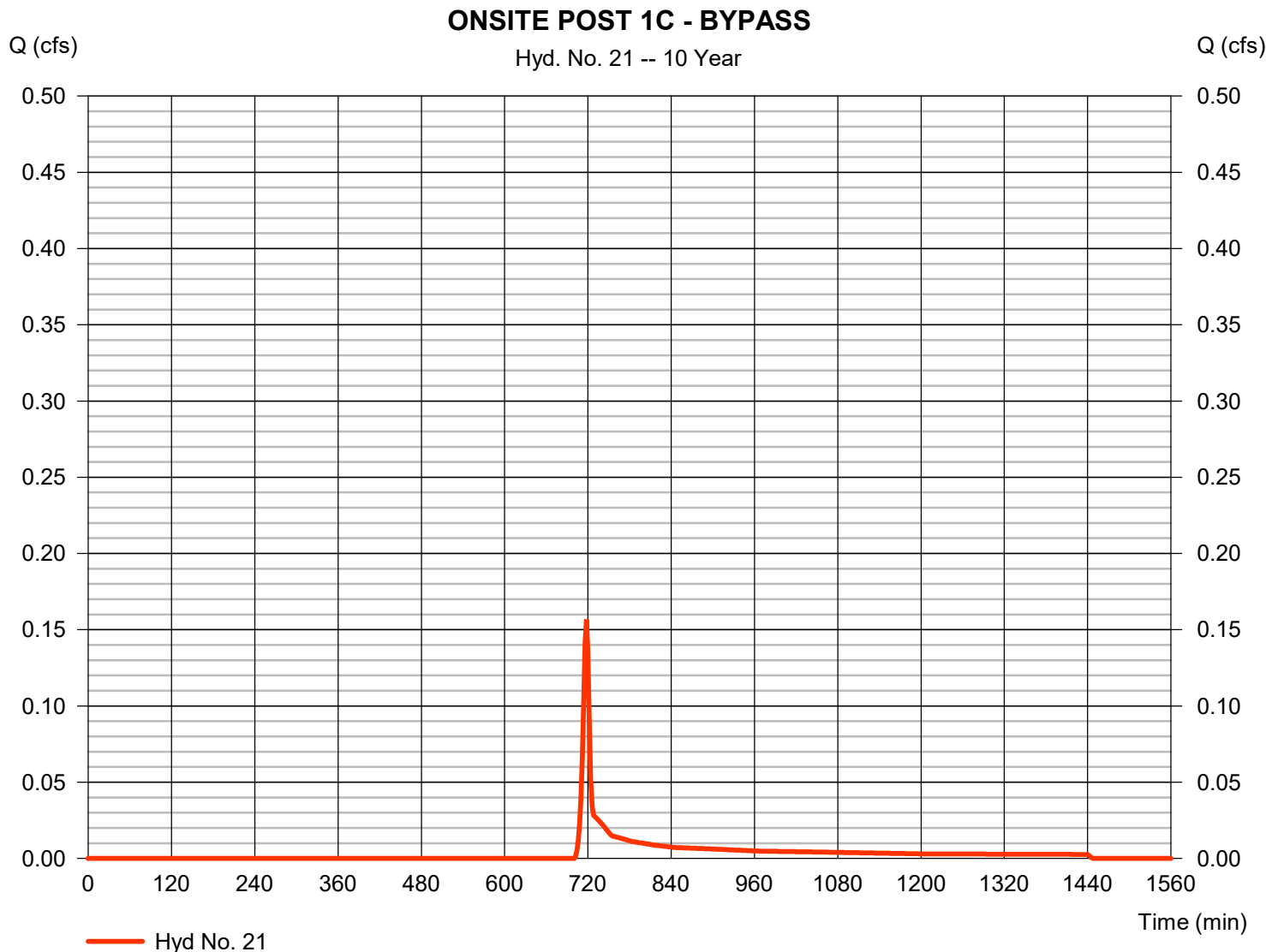
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 21

ONSITE POST 1C - BYPASS

Hydrograph type	= SCS Runoff	Peak discharge	= 0.157 cfs
Storm frequency	= 10 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 335 cuft
Drainage area	= 0.100 ac	Curve number	= 55
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.01 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

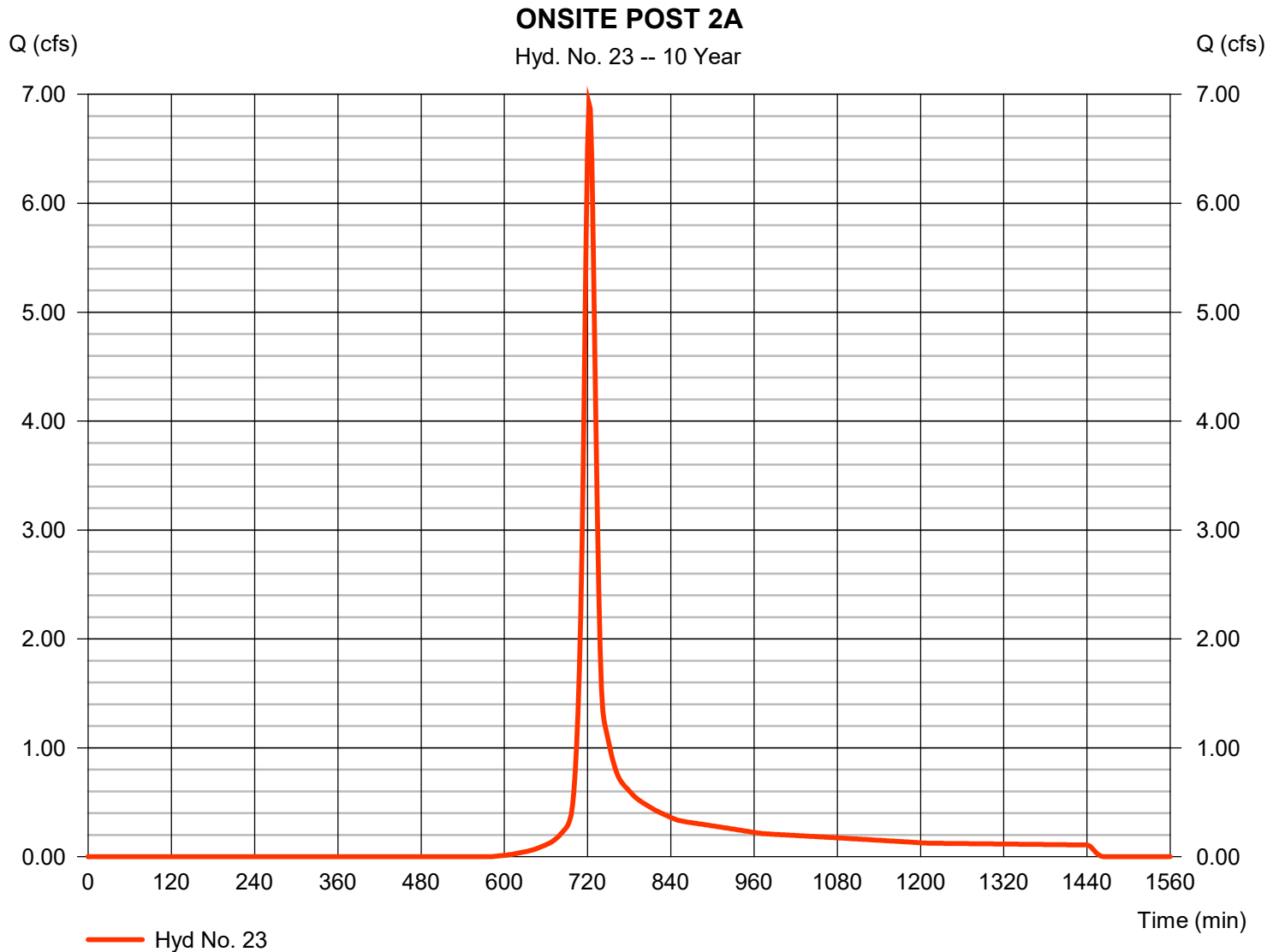
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 23

ONSITE POST 2A

Hydrograph type	= SCS Runoff	Peak discharge	= 6.919 cfs
Storm frequency	= 10 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 19,621 cuft
Drainage area	= 2.610 ac	Curve number	= 71
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 16.00 min
Total precip.	= 5.01 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

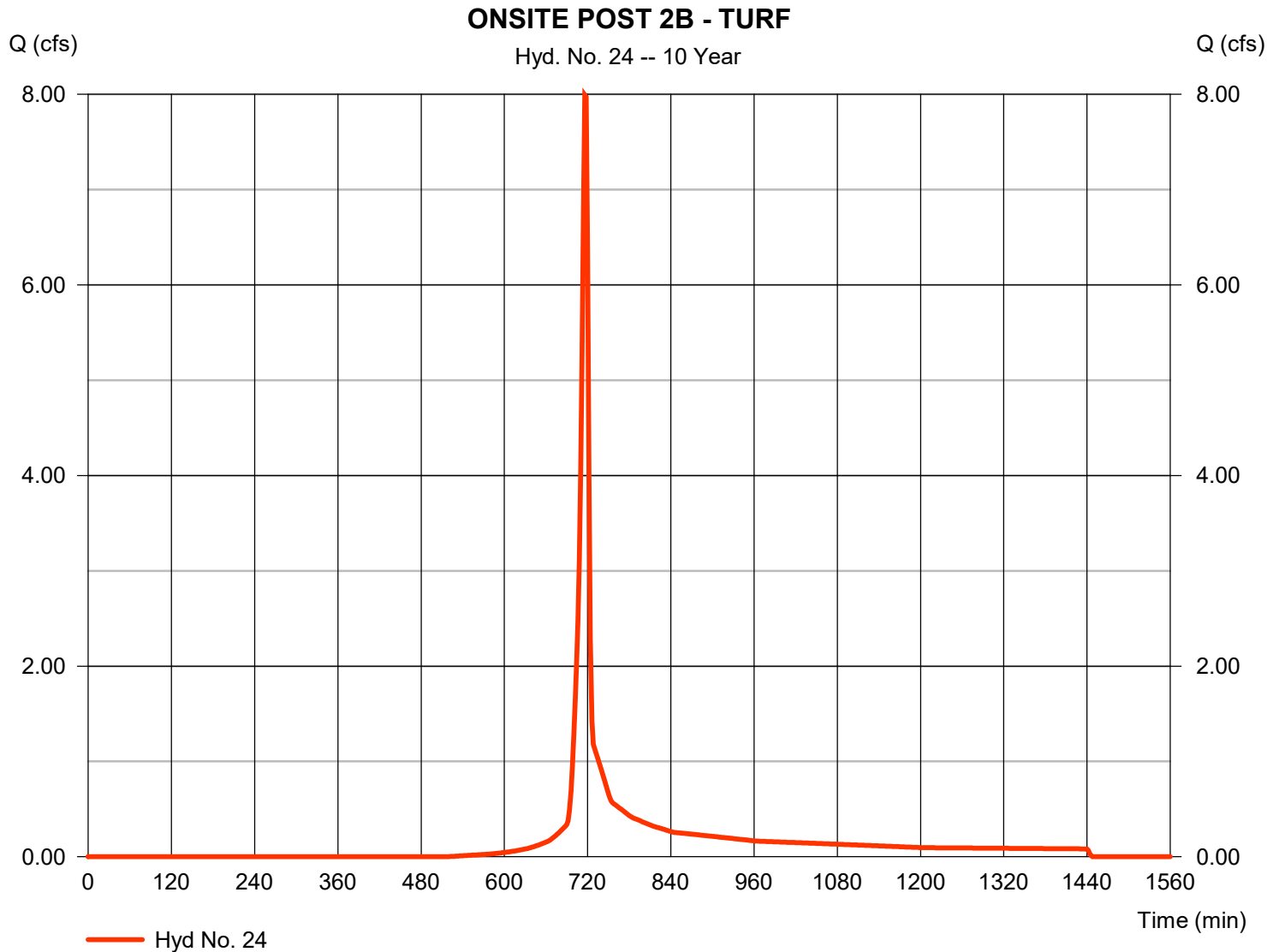
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 24

ONSITE POST 2B - TURF

Hydrograph type	= SCS Runoff	Peak discharge	= 7.993 cfs
Storm frequency	= 10 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 16,140 cuft
Drainage area	= 1.930 ac	Curve number	= 75
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 5.01 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

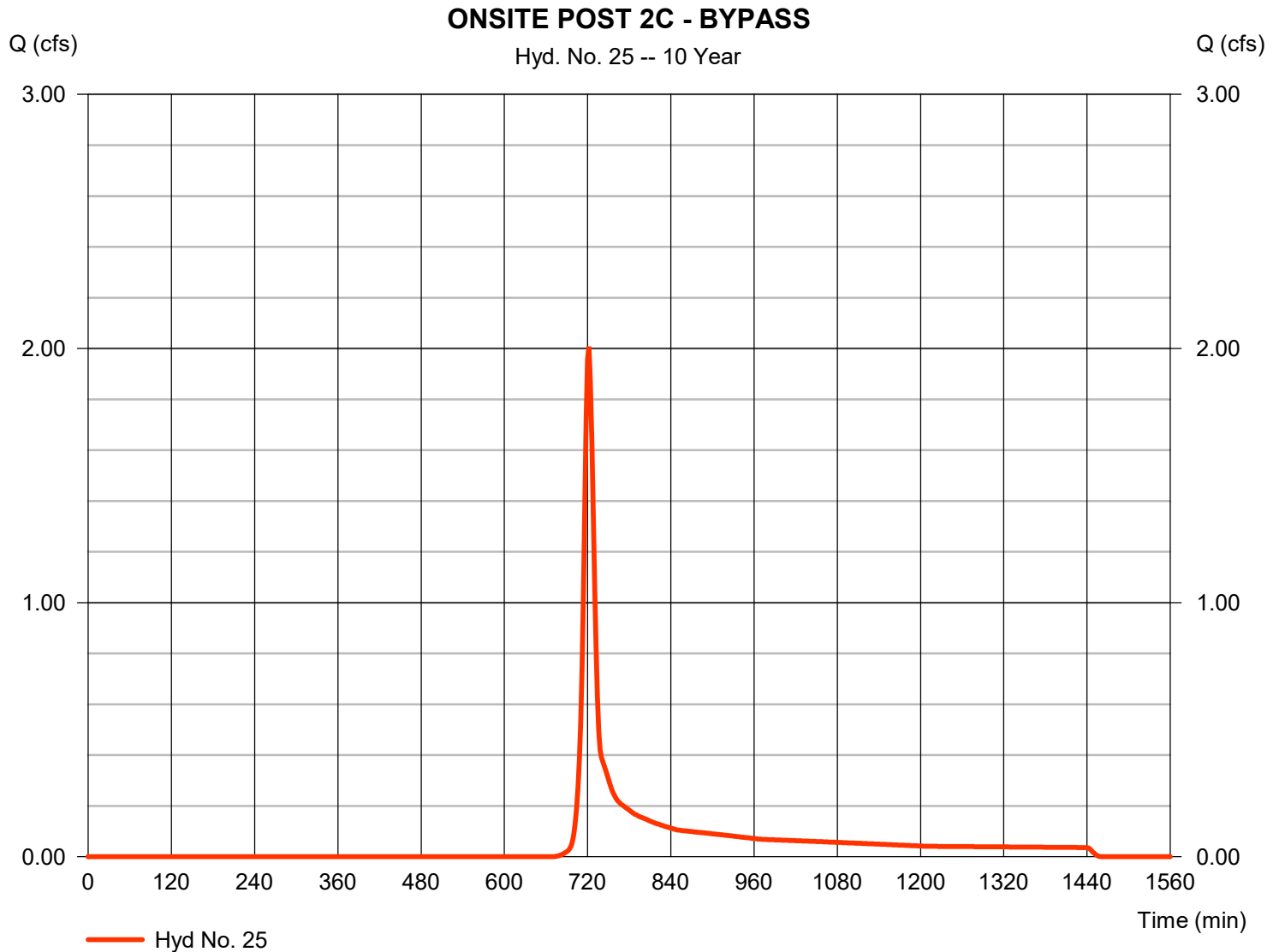
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 25

ONSITE POST 2C - BYPASS

Hydrograph type	= SCS Runoff	Peak discharge	= 2.008 cfs
Storm frequency	= 10 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 5,462 cuft
Drainage area	= 1.010 ac	Curve number	= 62
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 12.00 min
Total precip.	= 5.01 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

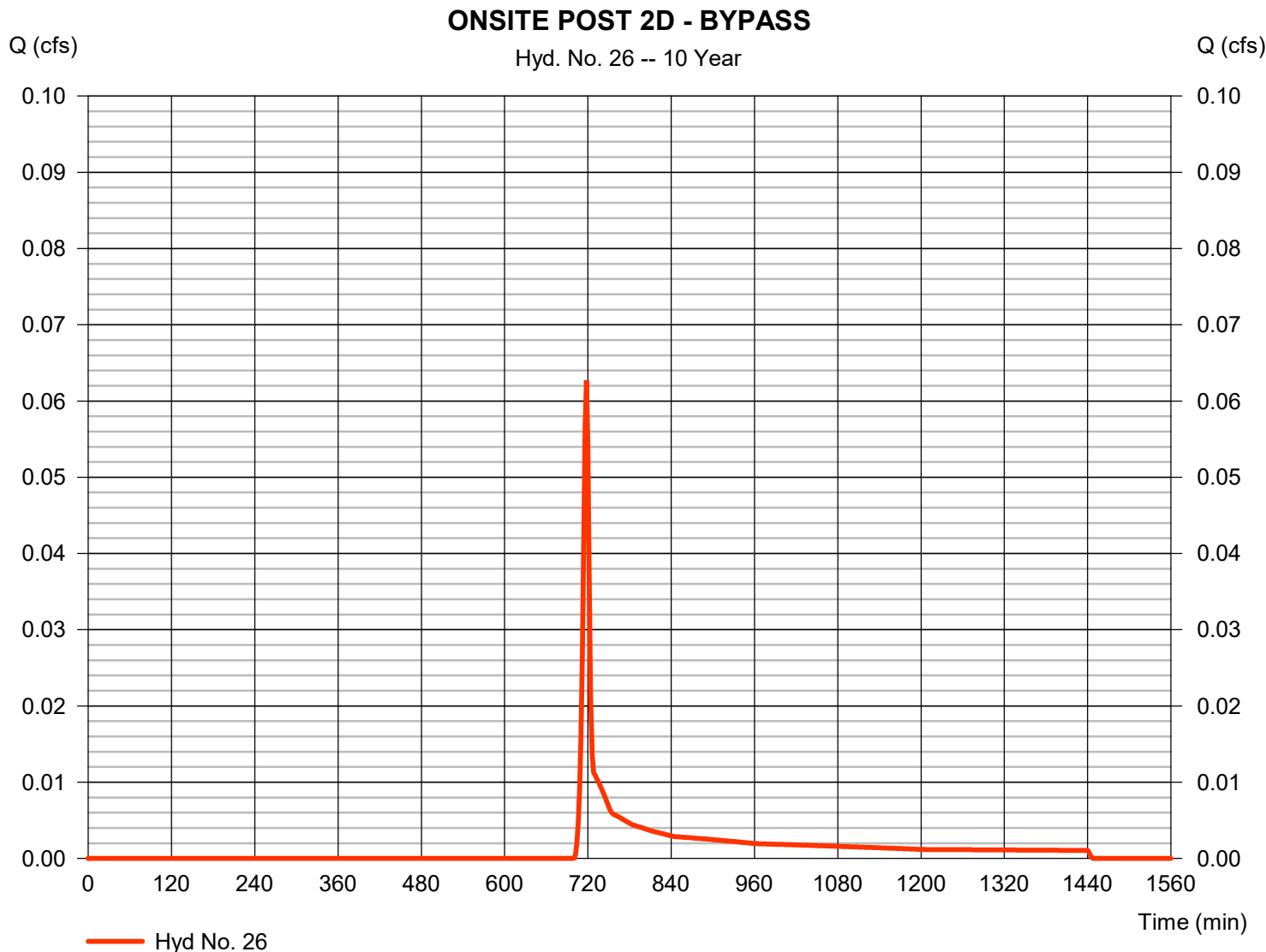
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 26

ONSITE POST 2D - BYPASS

Hydrograph type	= SCS Runoff	Peak discharge	= 0.063 cfs
Storm frequency	= 10 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 134 cuft
Drainage area	= 0.040 ac	Curve number	= 55
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.01 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

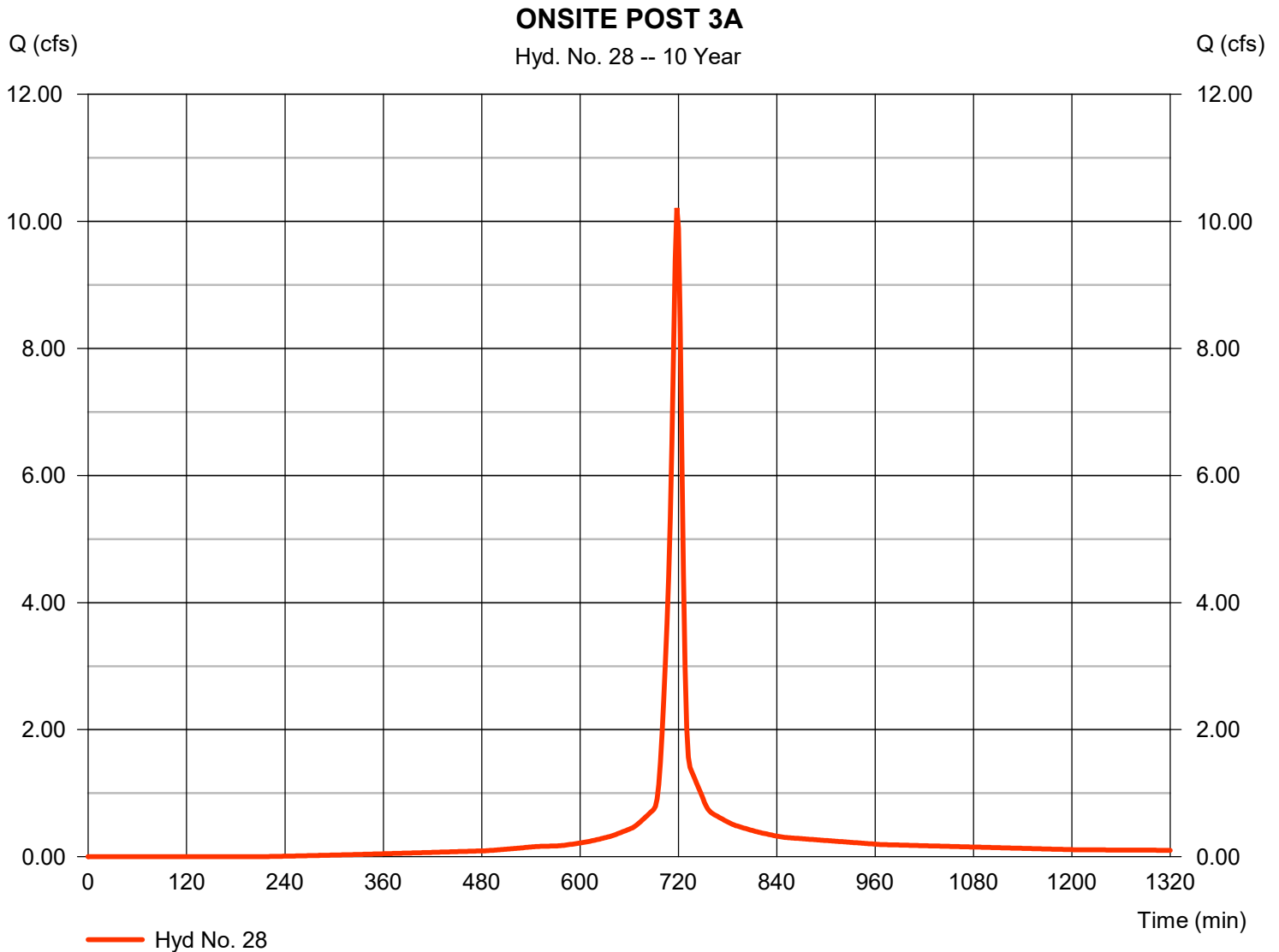
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 28

ONSITE POST 3A

Hydrograph type	= SCS Runoff	Peak discharge	= 10.21 cfs
Storm frequency	= 10 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 24,778 cuft
Drainage area	= 1.710 ac	Curve number	= 91
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 7.00 min
Total precip.	= 5.01 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

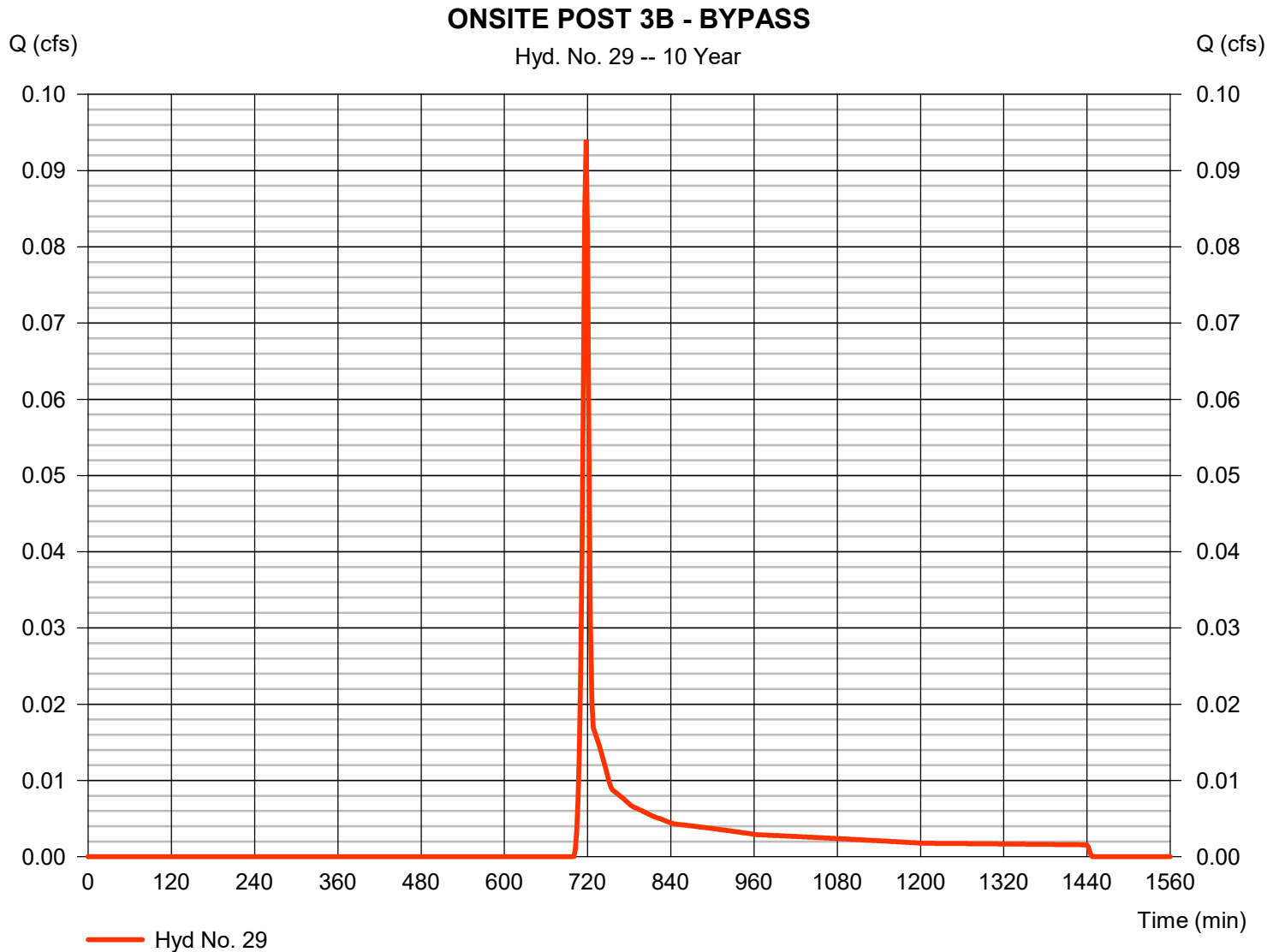
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 29

ONSITE POST 3B - BYPASS

Hydrograph type	= SCS Runoff	Peak discharge	= 0.094 cfs
Storm frequency	= 10 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 201 cuft
Drainage area	= 0.060 ac	Curve number	= 55
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.01 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

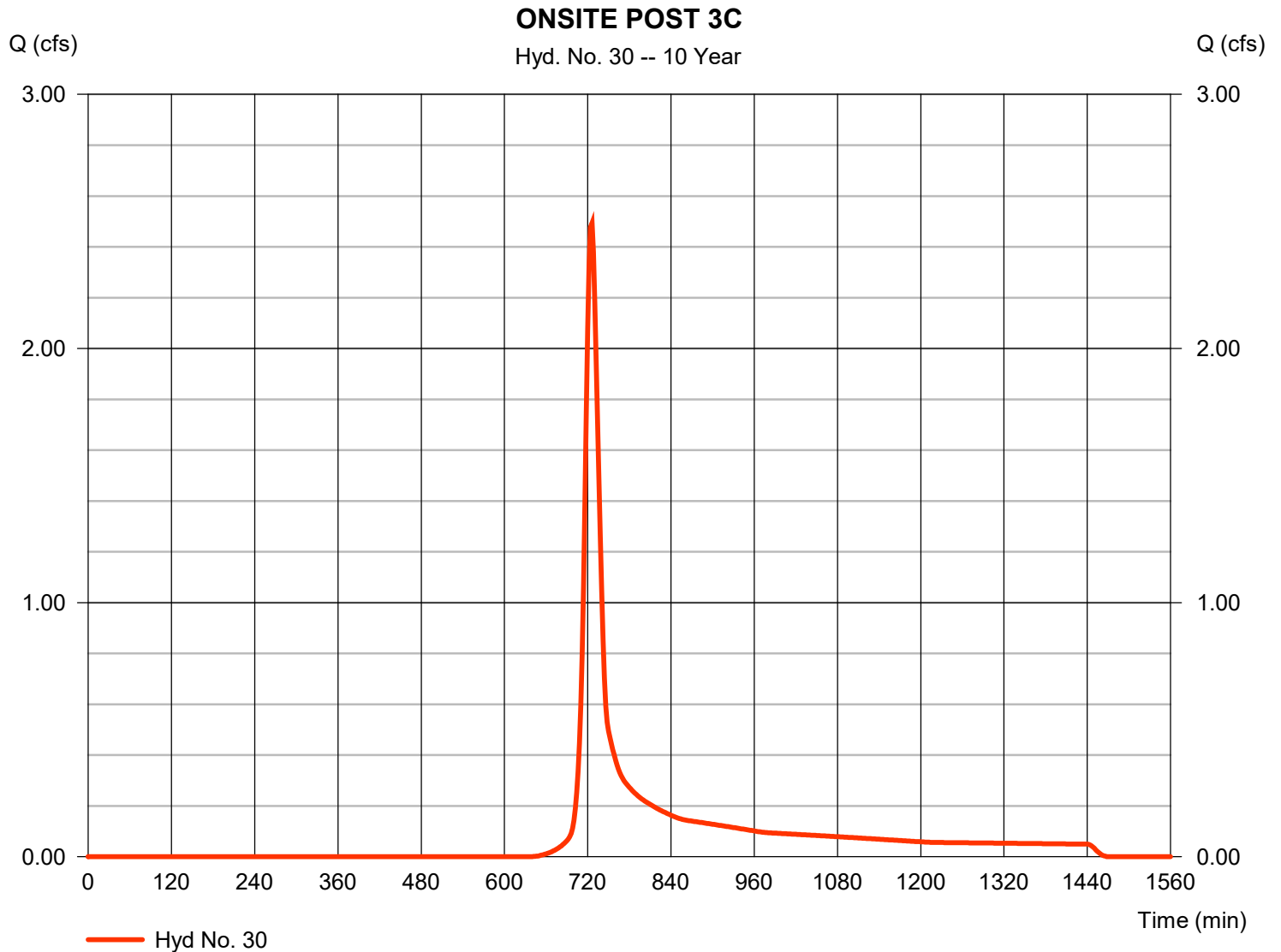
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 30

ONSITE POST 3C

Hydrograph type	= SCS Runoff	Peak discharge	= 2.494 cfs
Storm frequency	= 10 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 8,122 cuft
Drainage area	= 1.290 ac	Curve number	= 66
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 19.00 min
Total precip.	= 5.01 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

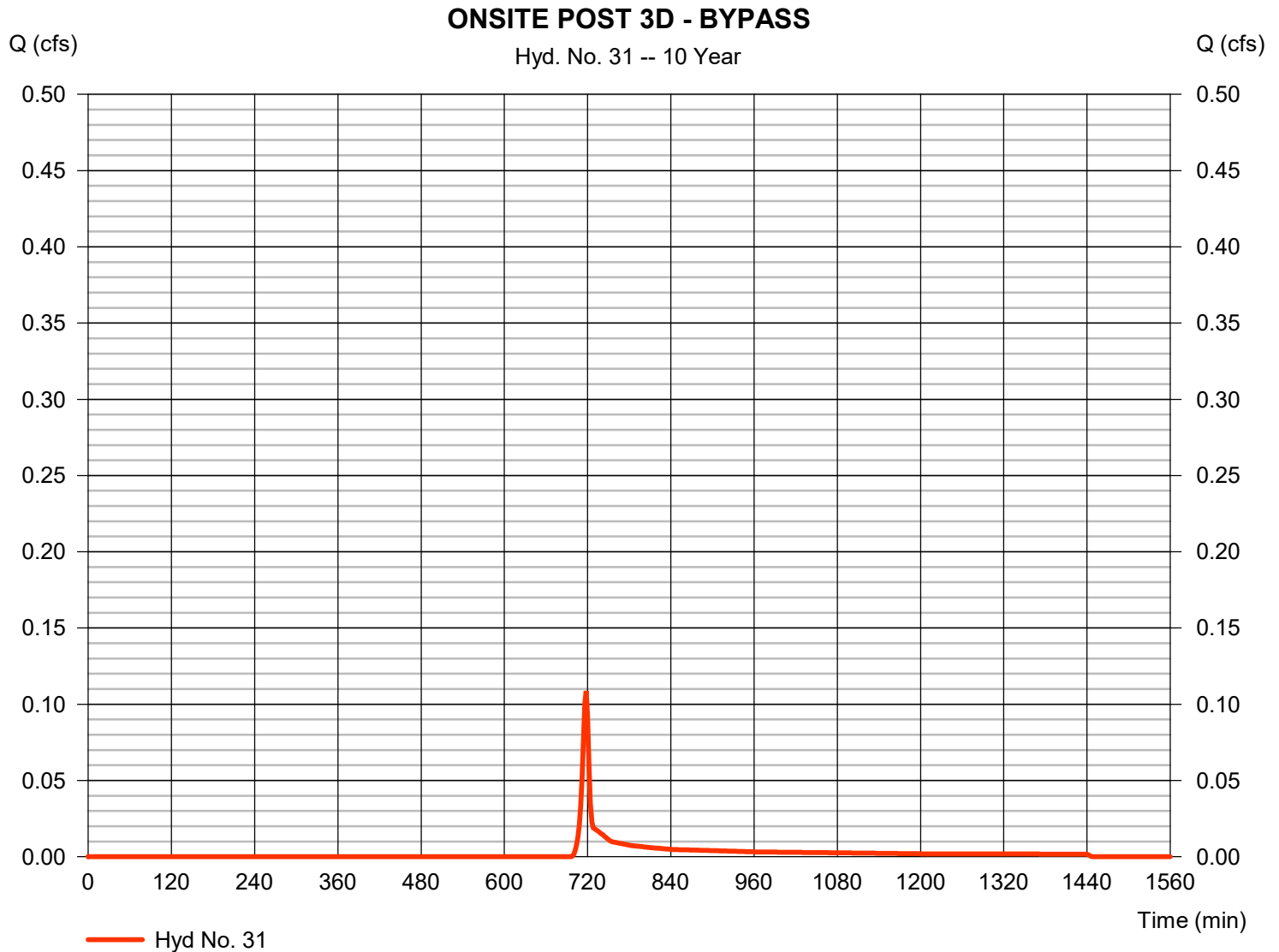
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 31

ONSITE POST 3D - BYPASS

Hydrograph type	= SCS Runoff	Peak discharge	= 0.109 cfs
Storm frequency	= 10 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 227 cuft
Drainage area	= 0.060 ac	Curve number	= 57
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.01 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

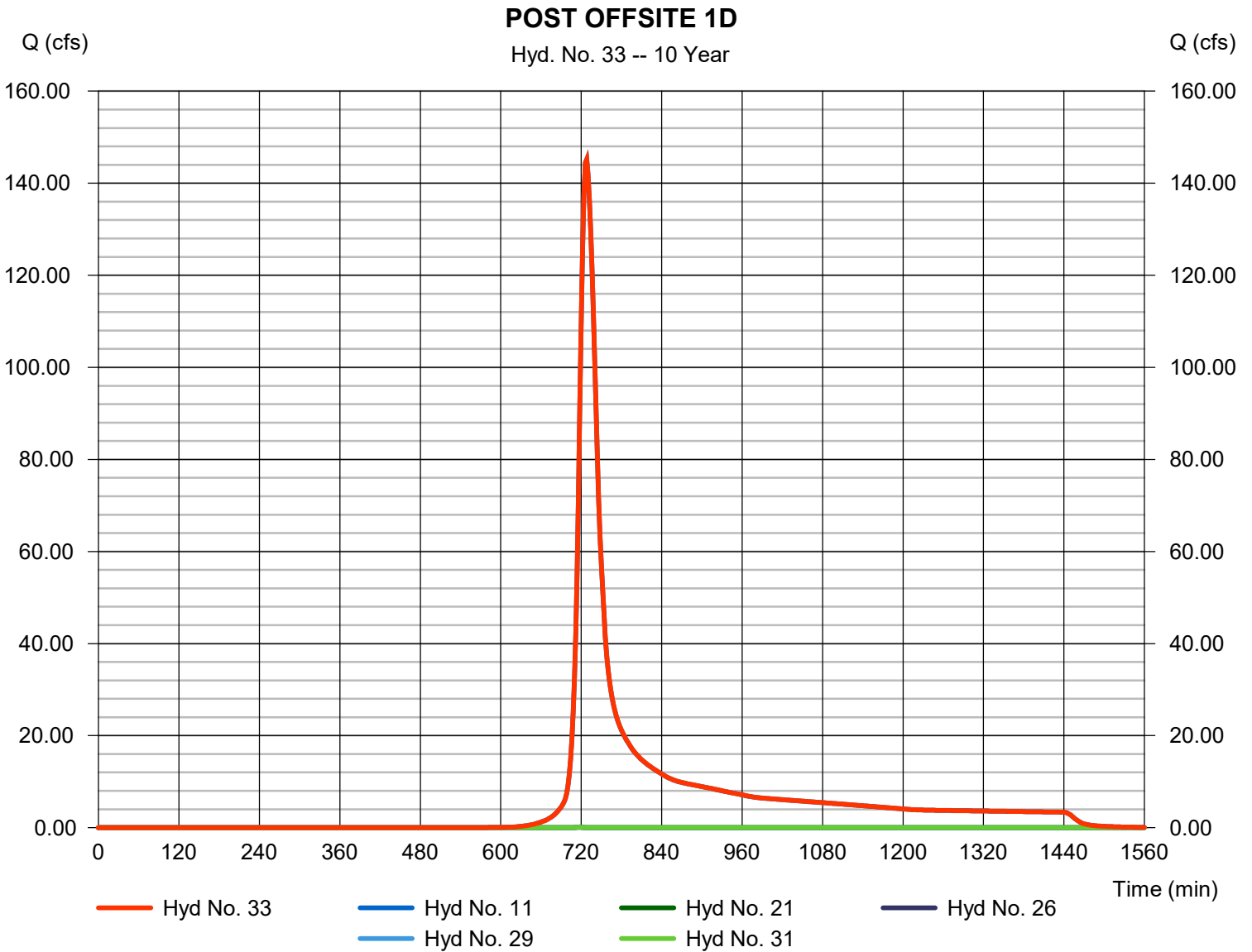
Monday, 05 / 8 / 2023

Hyd. No. 33

POST OFFSITE 1D

Hydrograph type = Combine
 Storm frequency = 10 yrs
 Time interval = 2 min
 Inflow hyds. = 11, 21, 26, 29, 31

Peak discharge = 145.22 cfs
 Time to peak = 728 min
 Hyd. volume = 578,509 cuft
 Contrib. drain. area = 0.260 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 34

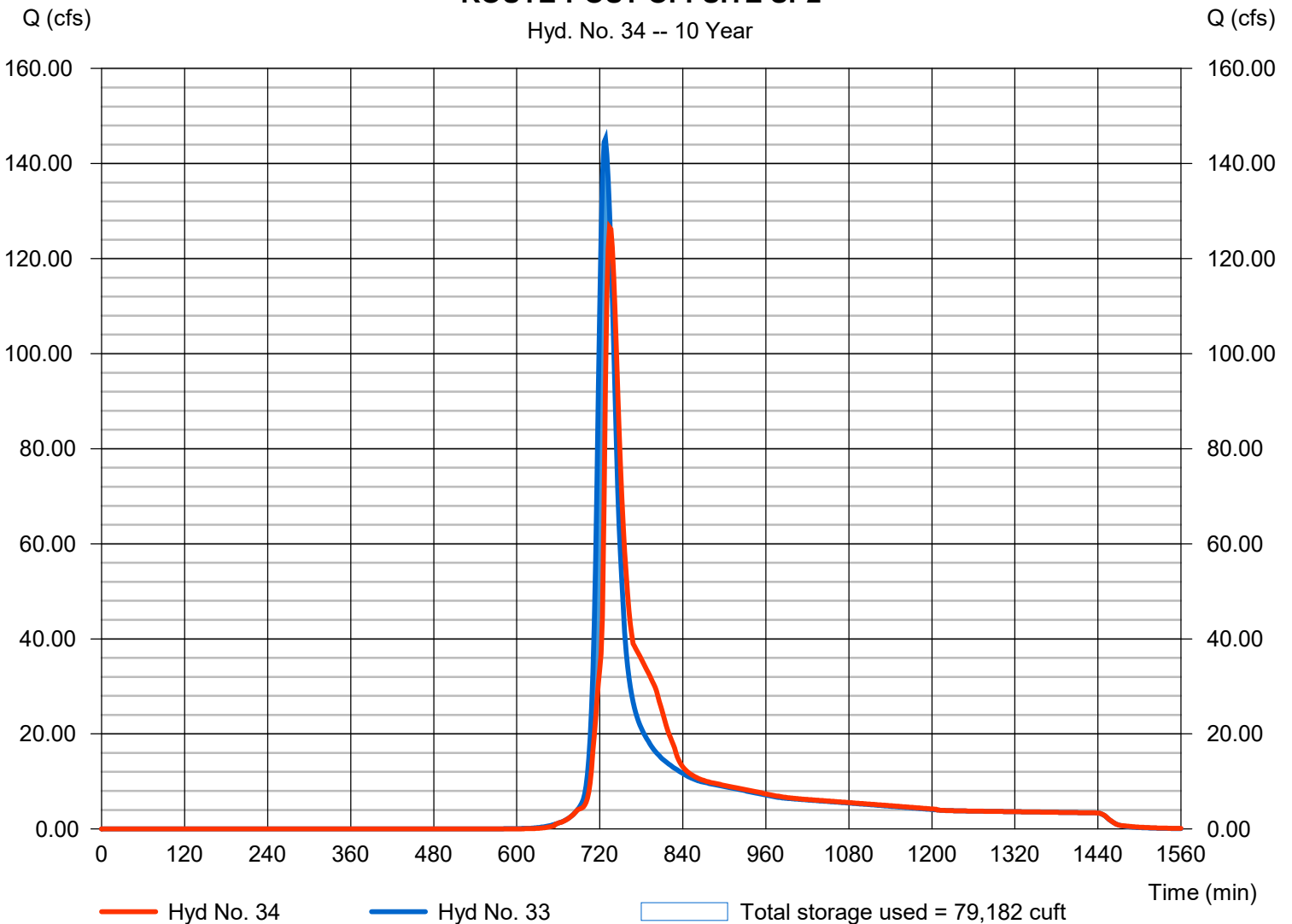
ROUTE-POST OFFSITE SP2

Hydrograph type	= Reservoir	Peak discharge	= 126.55 cfs
Storm frequency	= 10 yrs	Time to peak	= 734 min
Time interval	= 2 min	Hyd. volume	= 578,501 cuft
Inflow hyd. No.	= 33 - POST OFFSITE 1D	Max. Elevation	= 1013.93 ft
Reservoir name	= OFFSITE 1D	Max. Storage	= 79,182 cuft

Storage Indication method used.

ROUTE-POST OFFSITE SP2

Hyd. No. 34 -- 10 Year



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

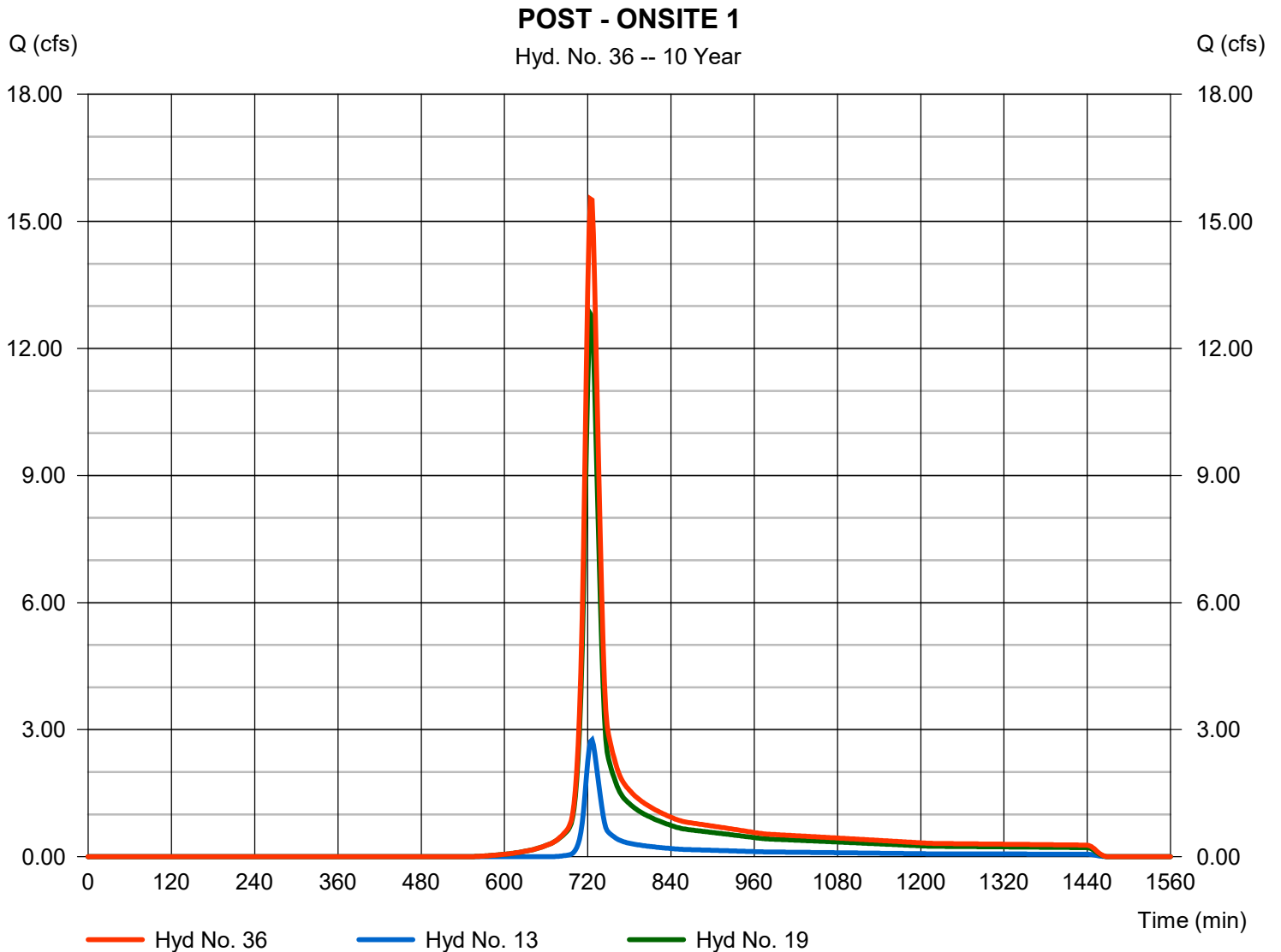
Monday, 05 / 8 / 2023

Hyd. No. 36

POST - ONSITE 1

Hydrograph type = Combine
 Storm frequency = 10 yrs
 Time interval = 2 min
 Inflow hyds. = 13, 19

Peak discharge = 15.53 cfs
 Time to peak = 724 min
 Hyd. volume = 49,638 cuft
 Contrib. drain. area = 6.540 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

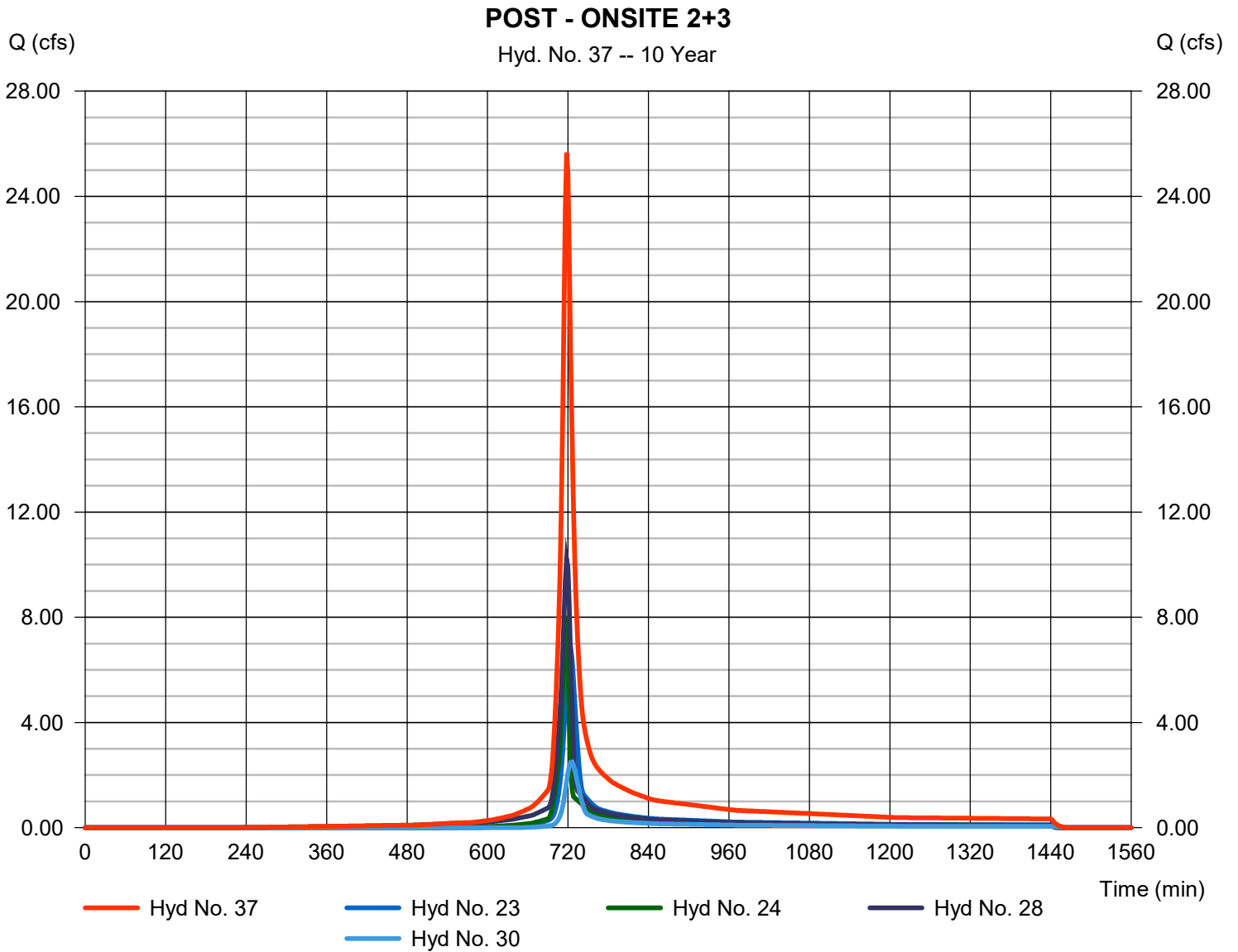
Monday, 05 / 8 / 2023

Hyd. No. 37

POST - ONSITE 2+3

Hydrograph type = Combine
 Storm frequency = 10 yrs
 Time interval = 2 min
 Inflow hyds. = 23, 24, 28, 30

Peak discharge = 25.66 cfs
 Time to peak = 718 min
 Hyd. volume = 68,661 cuft
 Contrib. drain. area = 7.540 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description	
1	SCS Runoff	27.32	2	722	77,352	-----	-----	-----	OFFSITE 1A	
2	Reservoir	21.90	2	728	77,351	1	1053.10	6,836	ROUTE - OFFSITE 1A	
3	SCS Runoff	66.89	2	728	235,112	-----	-----	-----	OFFSITE 1B	
4	Combine	88.79	2	728	312,463	2, 3	-----	-----	ROUTE 1A +OFFSITE 1B	
5	Reservoir	73.67	2	734	312,457	4	1029.48	37,906	ROUTE OFFSITE 1B	
6	SCS Runoff	25.78	2	728	90,623	-----	-----	-----	OFFSITE 1C	
7	Combine	95.93	2	732	403,080	5, 6	-----	-----	ROUTE 1B + OFFSITE 1C	
8	Reservoir	90.93	2	736	403,079	7	1018.26	14,493	ROUTE OFFSITE 1C	
9	SCS Runoff	94.97	2	724	301,365	-----	-----	-----	PRE OFFSITE 1D	
10	SCS Runoff	23.16	2	724	72,559	-----	-----	-----	PRE OFFSITE 1E	
11	Combine	193.03	2	726	777,003	8, 9, 10	-----	-----	ROUTE 1C +OFFSITE 1D +1E	
12	Reservoir	173.30	2	732	776,995	11	1014.21	92,449	PREROUTE- OFFSITE SP2	
13	SCS Runoff	3.938	2	726	12,772	-----	-----	-----	OFFSITE 2	
14	SCS Runoff	19.02	2	722	53,466	-----	-----	-----	ON-SITE PRE 1	
15	SCS Runoff	13.69	2	726	44,169	-----	-----	-----	ON-SITE PRE 2	
16	SCS Runoff	12.99	2	724	40,664	-----	-----	-----	ON-SITE PRE 3	
17	Combine	207.31	2	730	928,067	12, 13, 14, 15, 16	-----	-----	PRE-DEVELOPMENT - SP1	
19	SCS Runoff	16.96	2	724	53,137	-----	-----	-----	ONSITE POST 1A	
20	SCS Runoff	1.101	2	718	2,202	-----	-----	-----	ONSITE POST 1B - BYPASS	
21	SCS Runoff	0.243	2	718	497	-----	-----	-----	ONSITE POST 1C - BYPASS	
23	SCS Runoff	9.260	2	722	26,035	-----	-----	-----	ONSITE POST 2A	
24	SCS Runoff	10.37	2	716	20,998	-----	-----	-----	ONSITE POST 2B - TURF	
25	SCS Runoff	2.879	2	722	7,646	-----	-----	-----	ONSITE POST 2C - BYPASS	
26	SCS Runoff	0.097	2	718	199	-----	-----	-----	ONSITE POST 2D - BYPASS	
28	SCS Runoff	12.29	2	718	30,164	-----	-----	-----	ONSITE POST 3A	
29	SCS Runoff	0.146	2	718	298	-----	-----	-----	ONSITE POST 3B - BYPASS	
30	SCS Runoff	3.461	2	726	11,081	-----	-----	-----	ONSITE POST 3C	
31	SCS Runoff	0.163	2	718	330	-----	-----	-----	ONSITE POST 3D - BYPASS	
33	Combine	193.16	2	726	778,326	11, 21, 26, 29, 31, 33	-----	-----	POST OFFSITE 1D	
34	Reservoir	173.53	2	732	778,320	33	1014.22	92,514	ROUTE-POST OFFSITE SP2	
36	Combine	20.88	2	724	65,910	13, 19,	-----	-----	POST - ONSITE 1	
Fitzgerald Field.gpw					Return Period: 25 Year			Monday, 05 / 8 / 2023		

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description	
37	Combine	32.85	2	718	88,277	23, 24, 28, 30,	-----	-----	POST - ONSITE 2+3	
39	Combine	201.58	2	732	942,355	20, 25, 34, 36, 37,	-----	-----	POST DEVELOPMENT - SP1	
Fitzgerald Field.gpw					Return Period: 25 Year			Monday, 05 / 8 / 2023		

Hydrograph Report

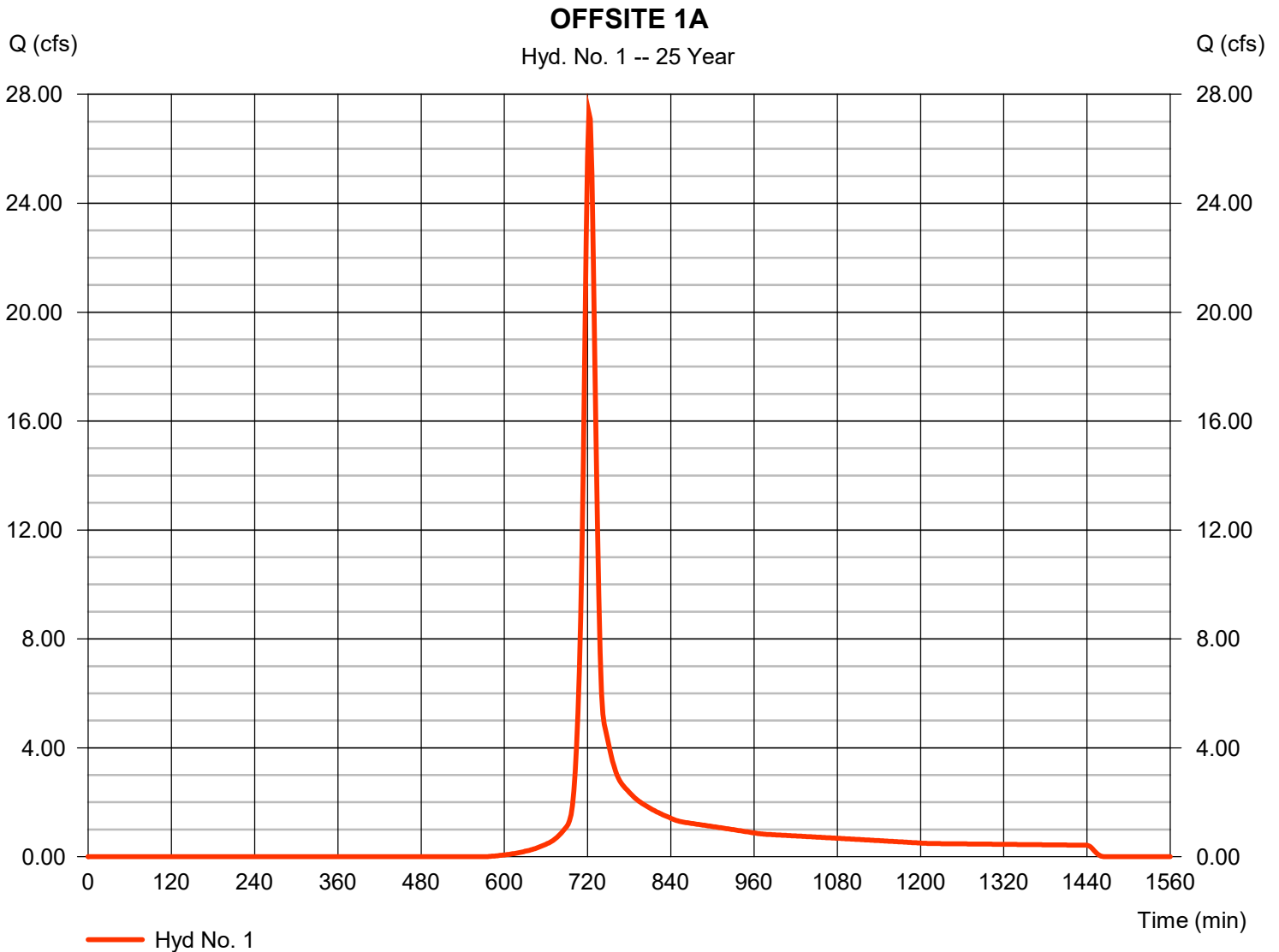
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 1

OFFSITE 1A

Hydrograph type	= SCS Runoff	Peak discharge	= 27.32 cfs
Storm frequency	= 25 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 77,352 cuft
Drainage area	= 8.590 ac	Curve number	= 68
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 14.00 min
Total precip.	= 5.90 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

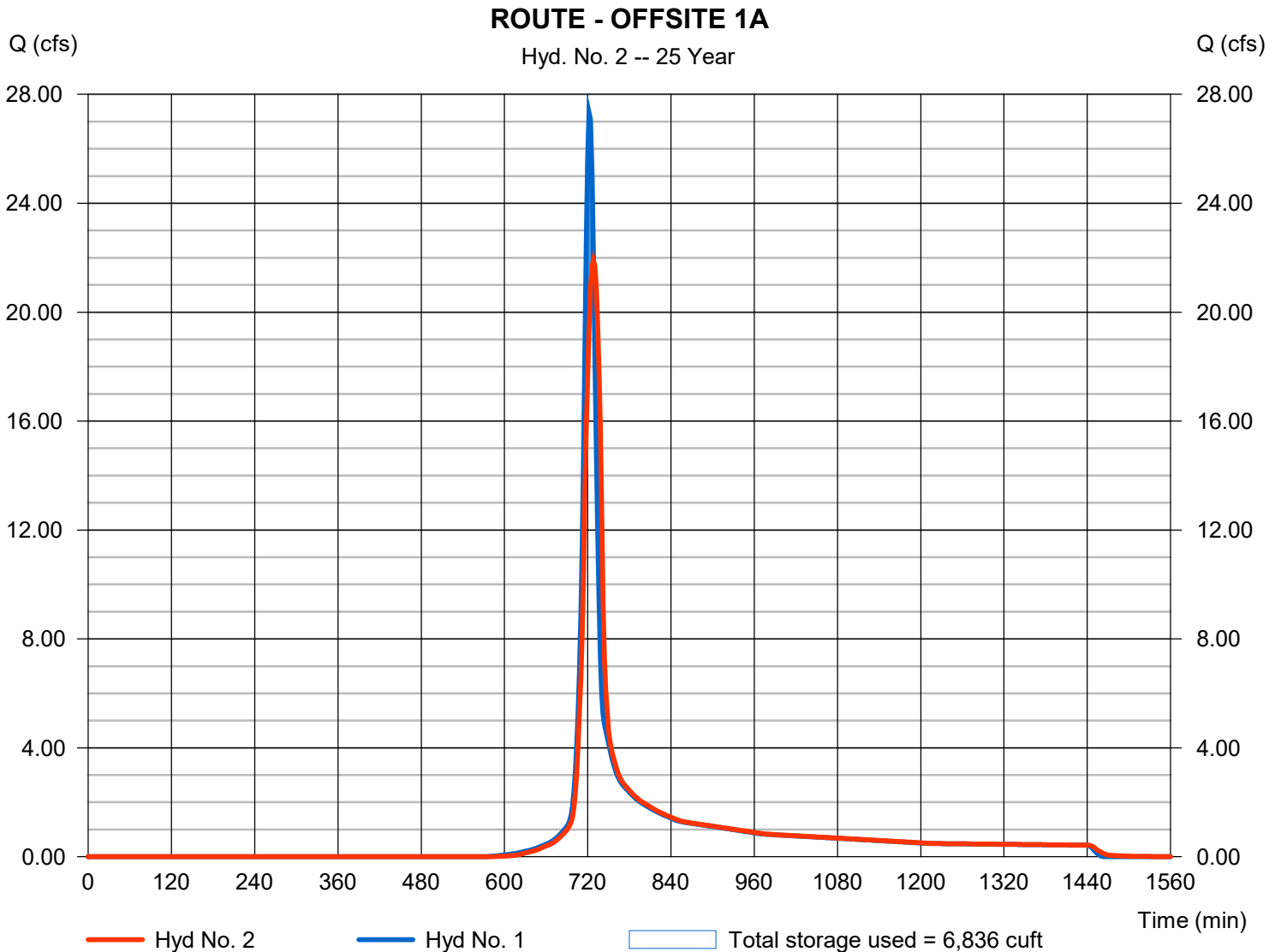
Monday, 05 / 8 / 2023

Hyd. No. 2

ROUTE - OFFSITE 1A

Hydrograph type	= Reservoir	Peak discharge	= 21.90 cfs
Storm frequency	= 25 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 77,351 cuft
Inflow hyd. No.	= 1 - OFFSITE 1A	Max. Elevation	= 1053.10 ft
Reservoir name	= OFFSITE 1A	Max. Storage	= 6,836 cuft

Storage Indication method used.



Hydrograph Report

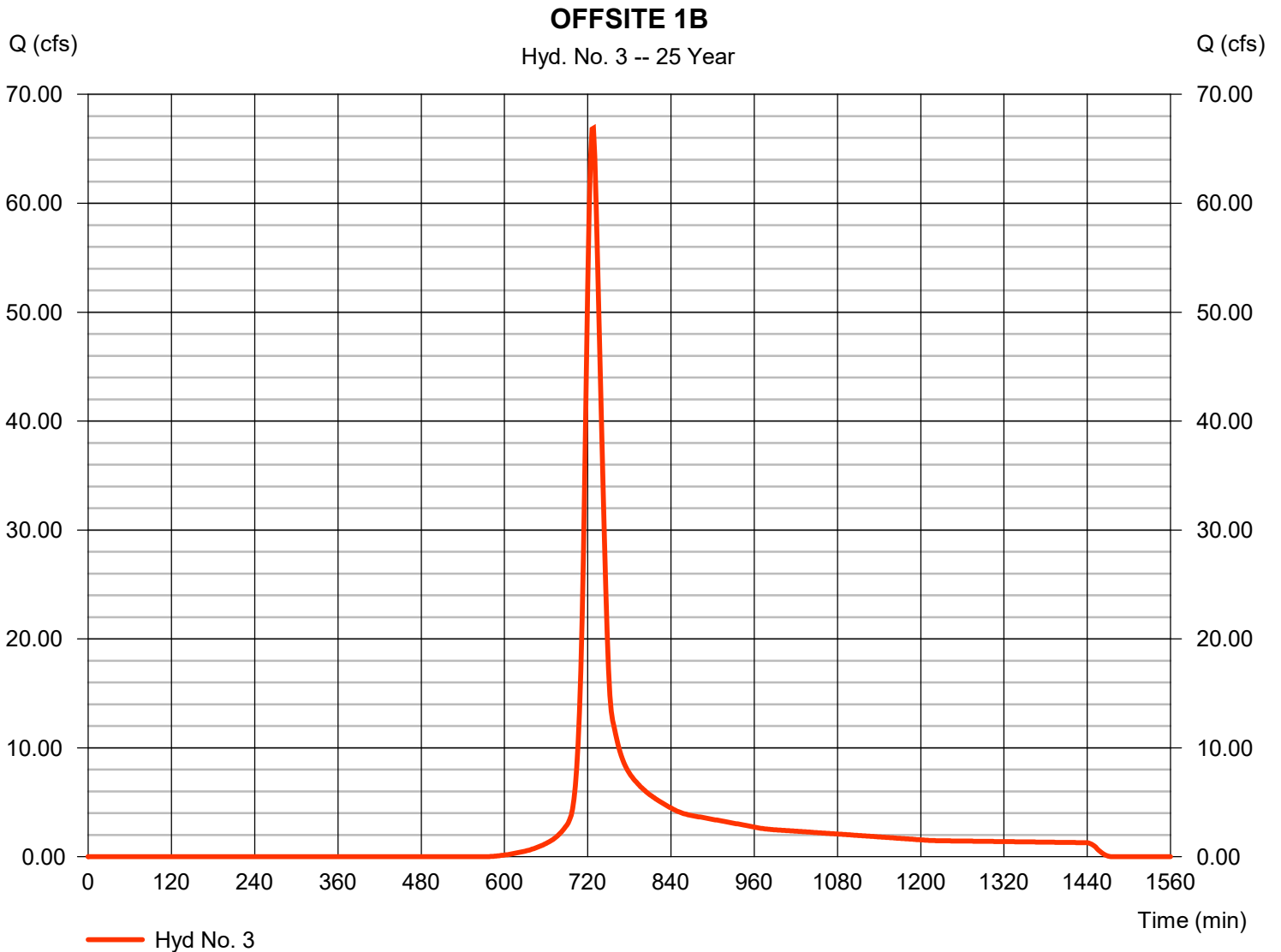
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 3

OFFSITE 1B

Hydrograph type	= SCS Runoff	Peak discharge	= 66.89 cfs
Storm frequency	= 25 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 235,112 cuft
Drainage area	= 25.010 ac	Curve number	= 68
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 21.00 min
Total precip.	= 5.90 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

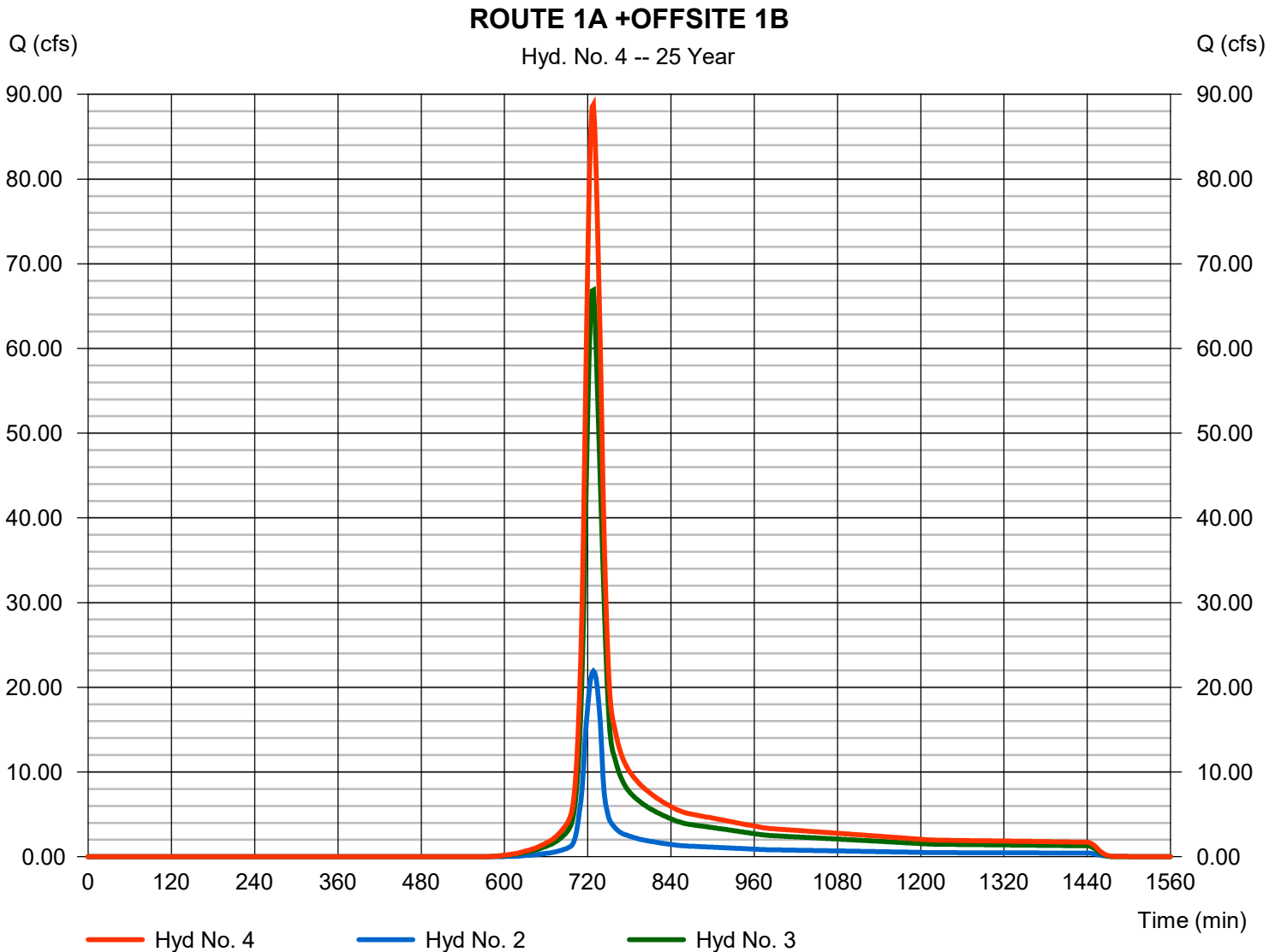
Monday, 05 / 8 / 2023

Hyd. No. 4

ROUTE 1A +OFFSITE 1B

Hydrograph type = Combine
Storm frequency = 25 yrs
Time interval = 2 min
Inflow hyds. = 2, 3

Peak discharge = 88.79 cfs
Time to peak = 728 min
Hyd. volume = 312,463 cuft
Contrib. drain. area = 25.010 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

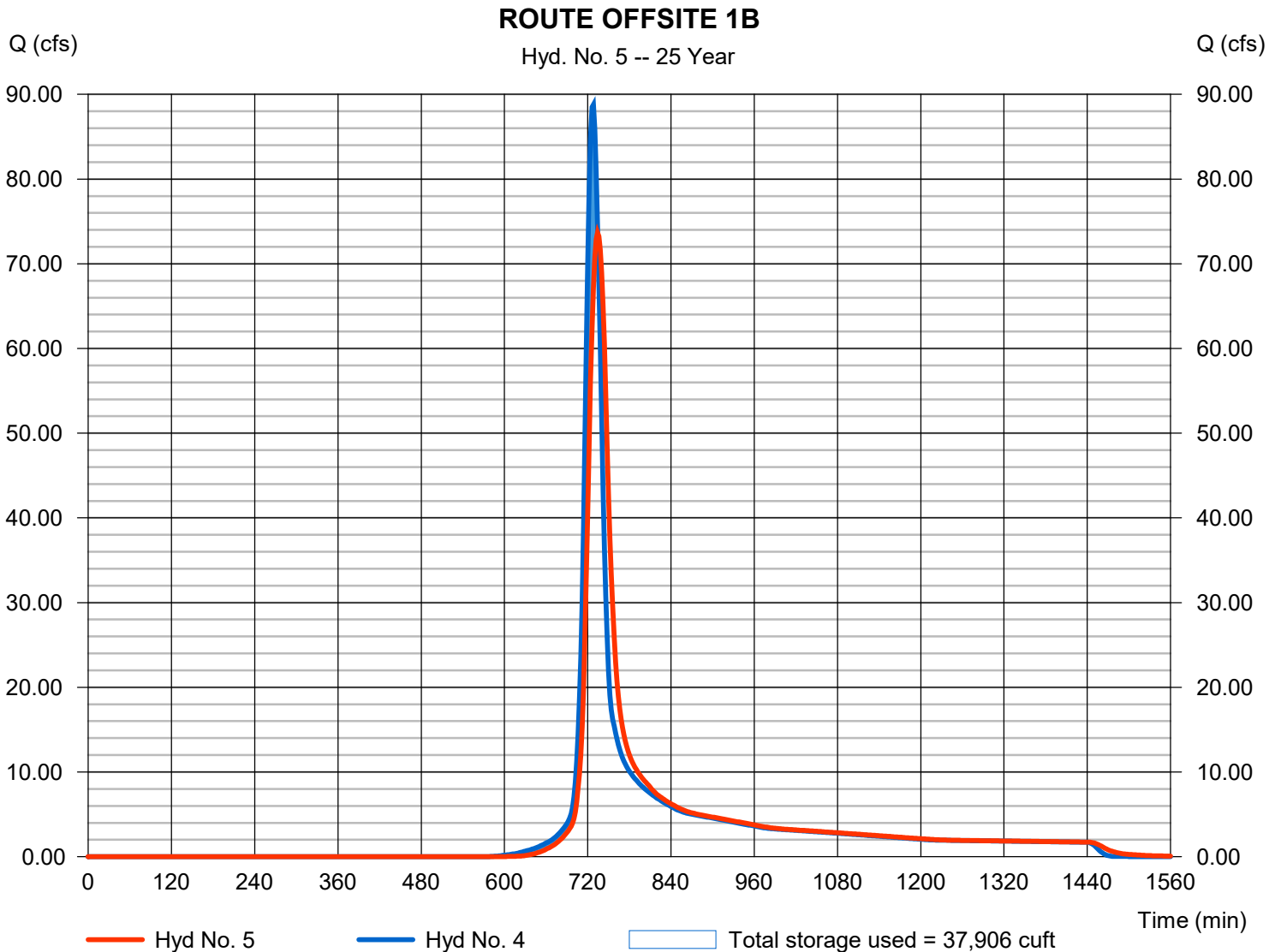
Monday, 05 / 8 / 2023

Hyd. No. 5

ROUTE OFFSITE 1B

Hydrograph type	= Reservoir	Peak discharge	= 73.67 cfs
Storm frequency	= 25 yrs	Time to peak	= 734 min
Time interval	= 2 min	Hyd. volume	= 312,457 cuft
Inflow hyd. No.	= 4 - ROUTE 1A +OFFSITE 1B	Max. Elevation	= 1029.48 ft
Reservoir name	= OFFSITE 1B	Max. Storage	= 37,906 cuft

Storage Indication method used.



Hydrograph Report

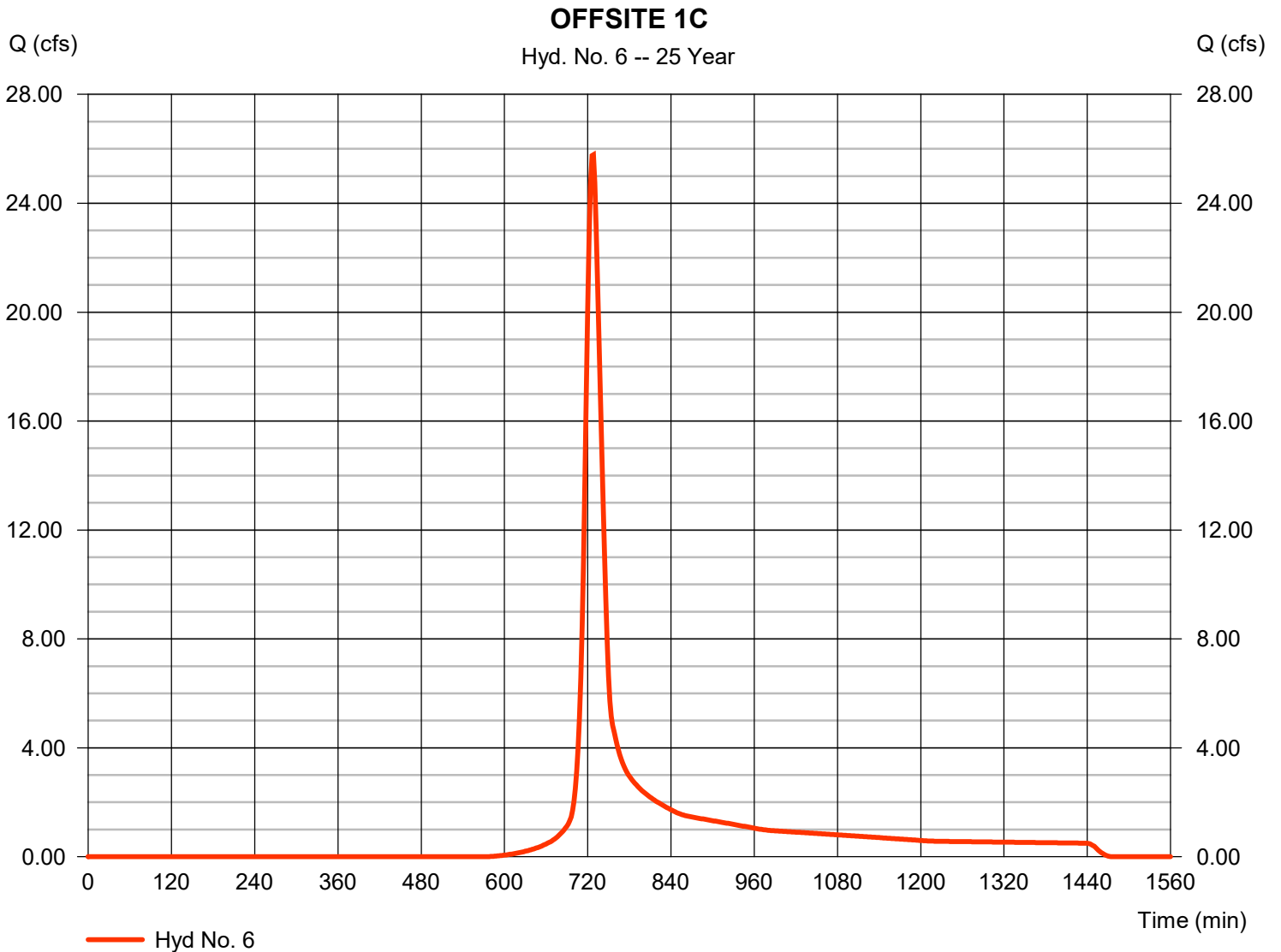
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 6

OFFSITE 1C

Hydrograph type	= SCS Runoff	Peak discharge	= 25.78 cfs
Storm frequency	= 25 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 90,623 cuft
Drainage area	= 9.640 ac	Curve number	= 68
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 21.00 min
Total precip.	= 5.90 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

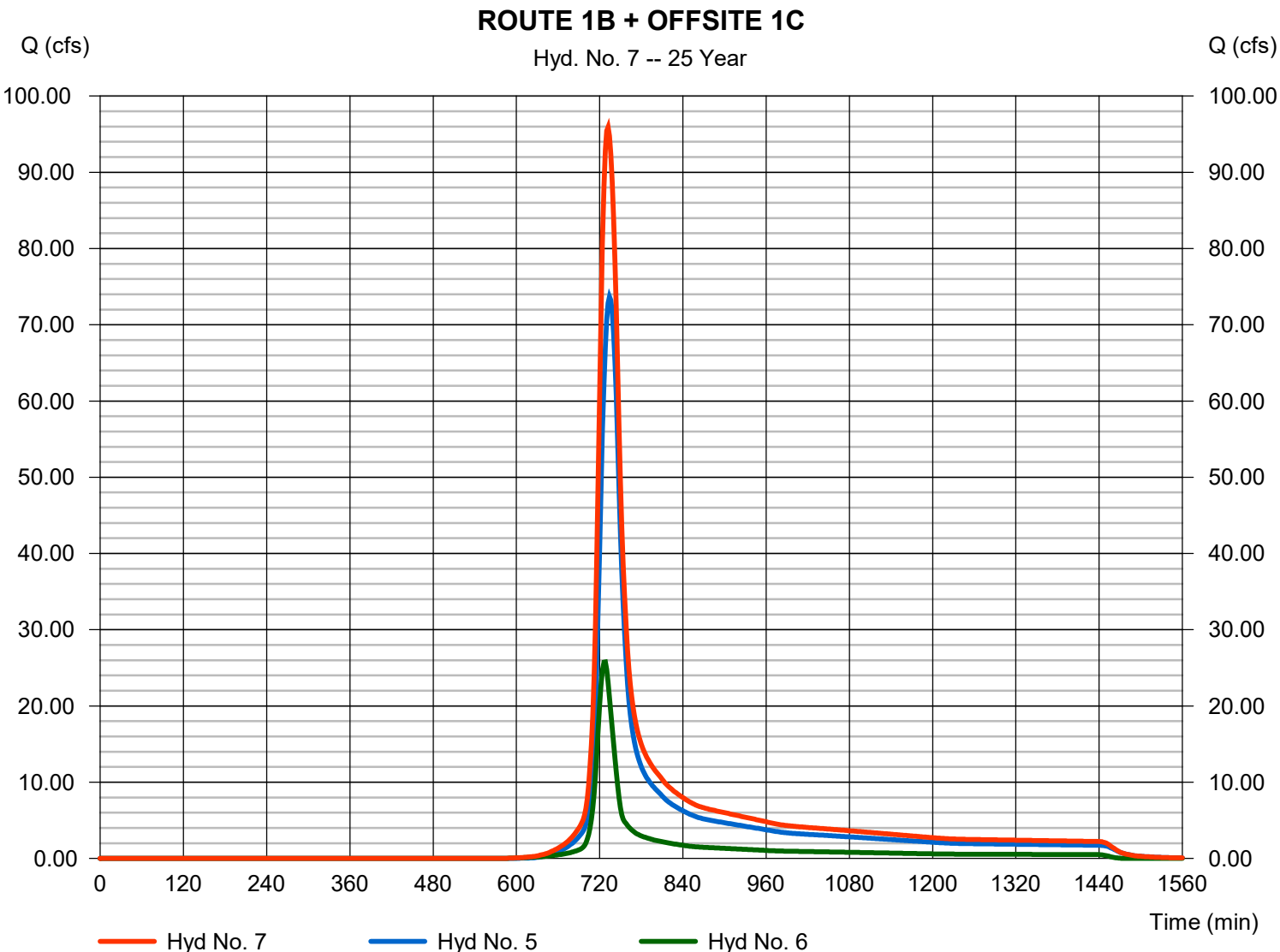
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 7

ROUTE 1B + OFFSITE 1C

Hydrograph type	= Combine	Peak discharge	= 95.93 cfs
Storm frequency	= 25 yrs	Time to peak	= 732 min
Time interval	= 2 min	Hyd. volume	= 403,080 cuft
Inflow hyds.	= 5, 6	Contrib. drain. area	= 9.640 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

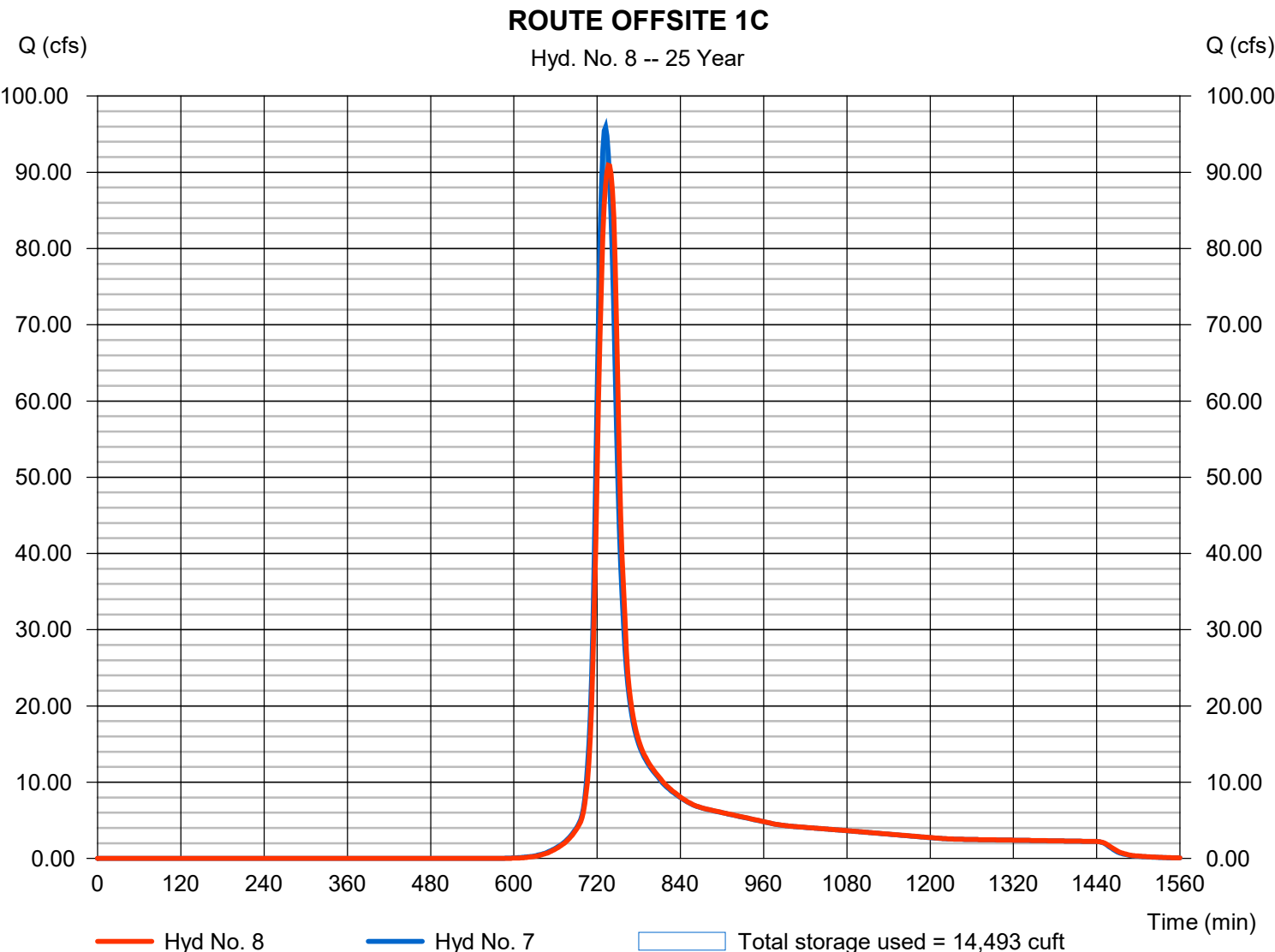
Monday, 05 / 8 / 2023

Hyd. No. 8

ROUTE OFFSITE 1C

Hydrograph type	= Reservoir	Peak discharge	= 90.93 cfs
Storm frequency	= 25 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 403,079 cuft
Inflow hyd. No.	= 7 - ROUTE 1B + OFFSITE 1C	Max. Elevation	= 1018.26 ft
Reservoir name	= OFFSITE 1C	Max. Storage	= 14,493 cuft

Storage Indication method used.



Hydrograph Report

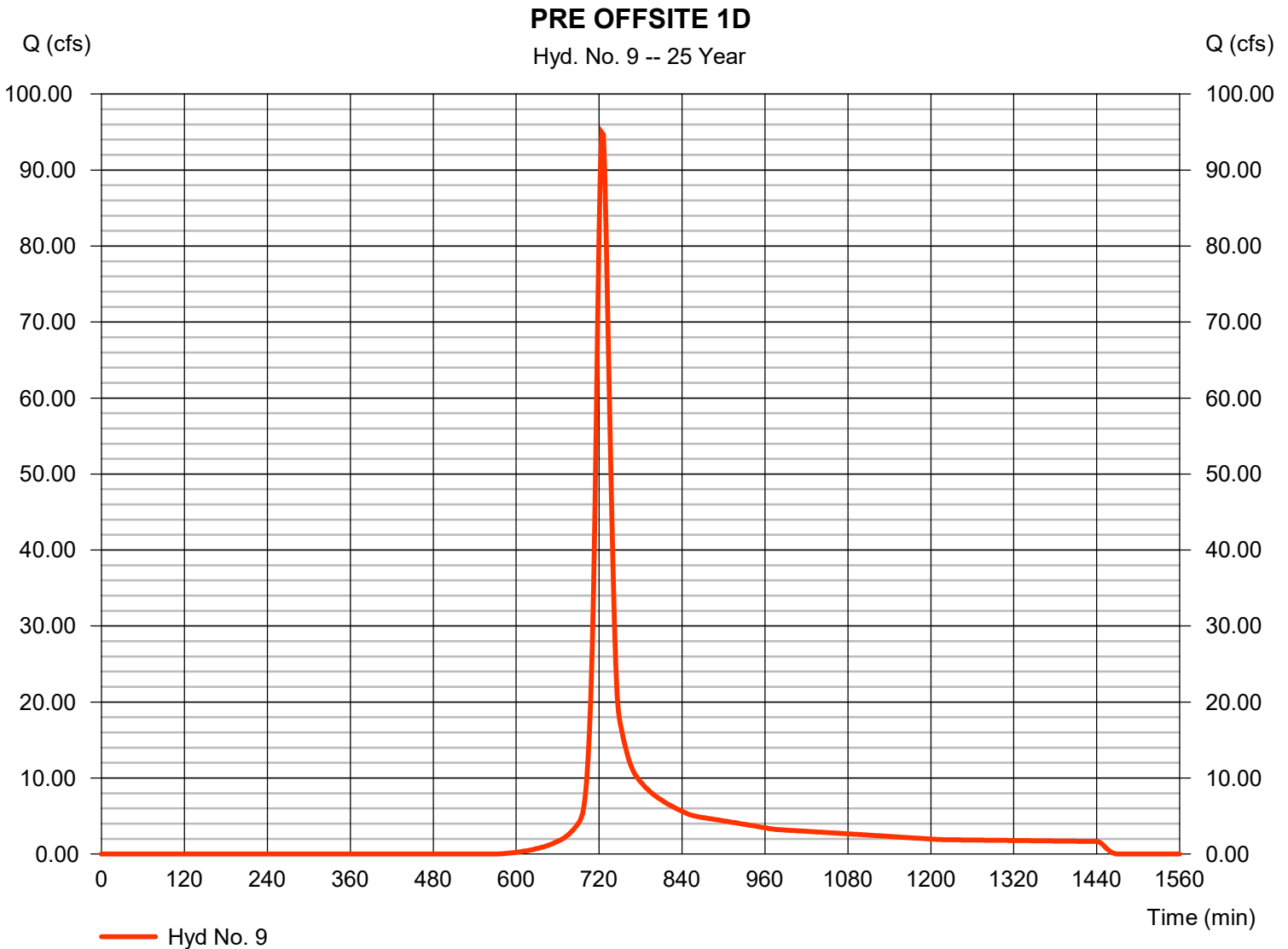
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 9

PRE OFFSITE 1D

Hydrograph type	= SCS Runoff	Peak discharge	= 94.97 cfs
Storm frequency	= 25 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 301,365 cuft
Drainage area	= 32.630 ac	Curve number	= 68
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 18.00 min
Total precip.	= 5.90 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

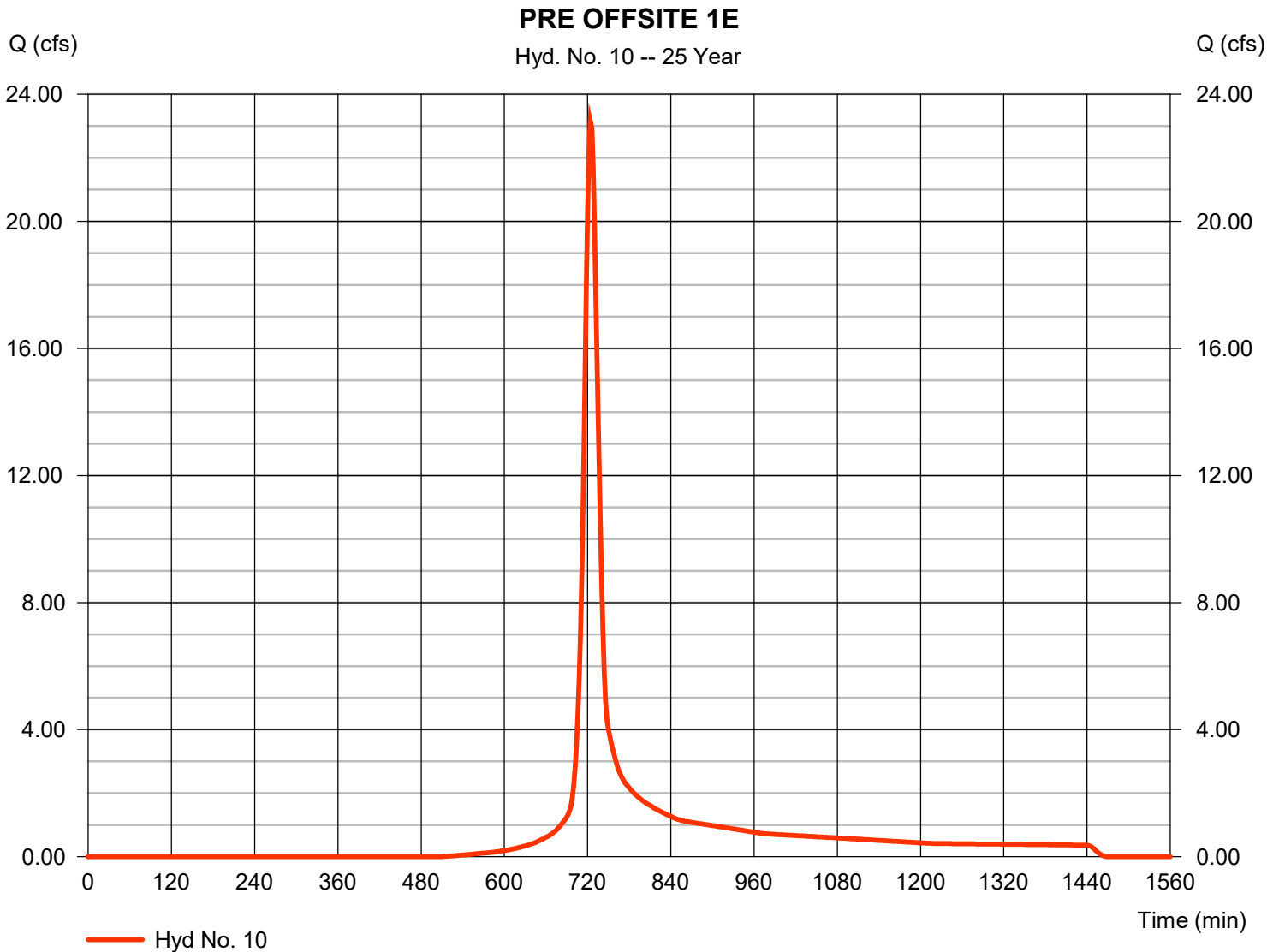
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 10

PRE OFFSITE 1E

Hydrograph type	= SCS Runoff	Peak discharge	= 23.16 cfs
Storm frequency	= 25 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 72,559 cuft
Drainage area	= 6.650 ac	Curve number	= 73
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 17.00 min
Total precip.	= 5.90 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 11

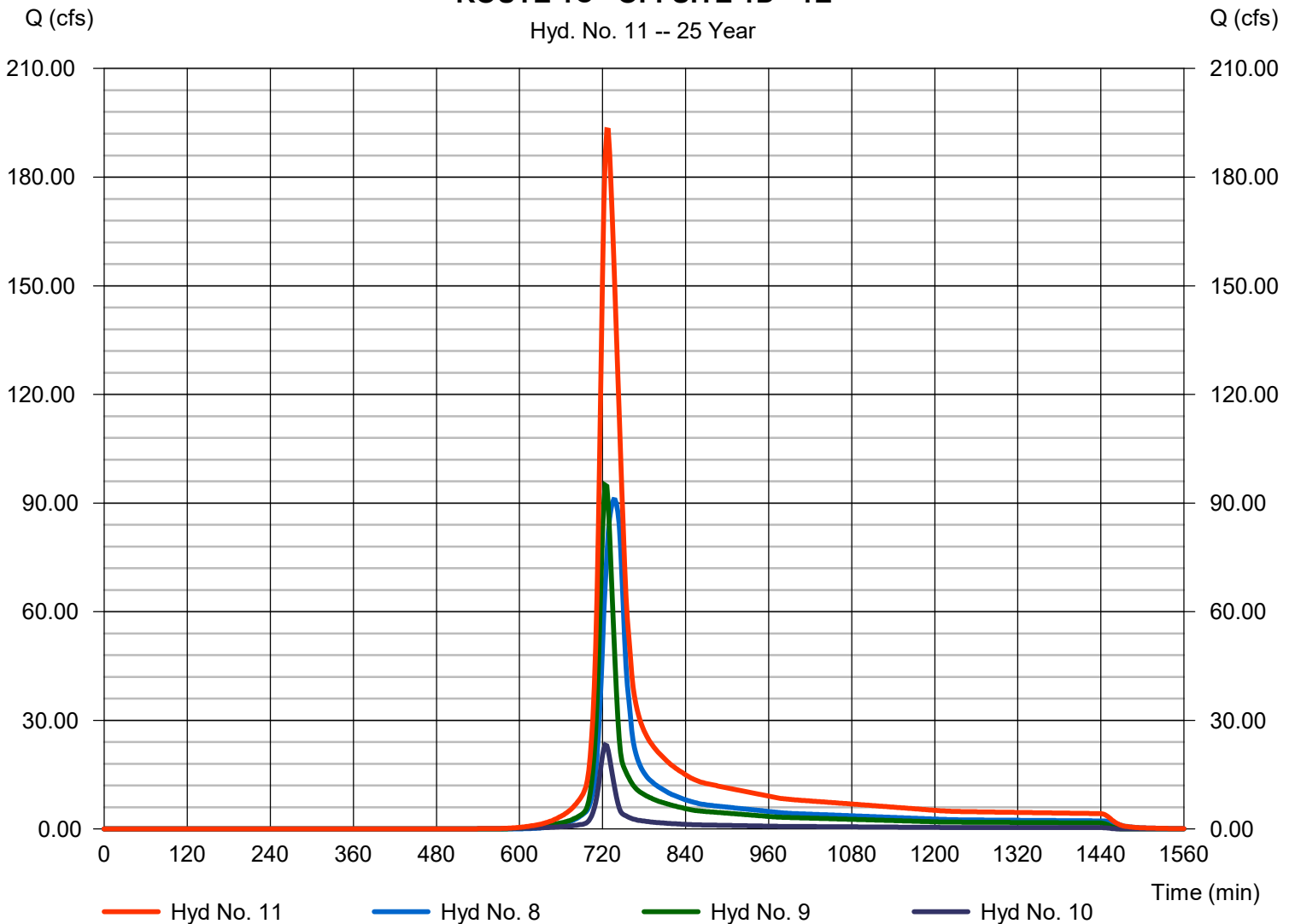
ROUTE 1C +OFFSITE 1D +1E

Hydrograph type = Combine
 Storm frequency = 25 yrs
 Time interval = 2 min
 Inflow hyds. = 8, 9, 10

Peak discharge = 193.03 cfs
 Time to peak = 726 min
 Hyd. volume = 777,003 cuft
 Contrib. drain. area = 39.280 ac

ROUTE 1C +OFFSITE 1D +1E

Hyd. No. 11 -- 25 Year



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 12

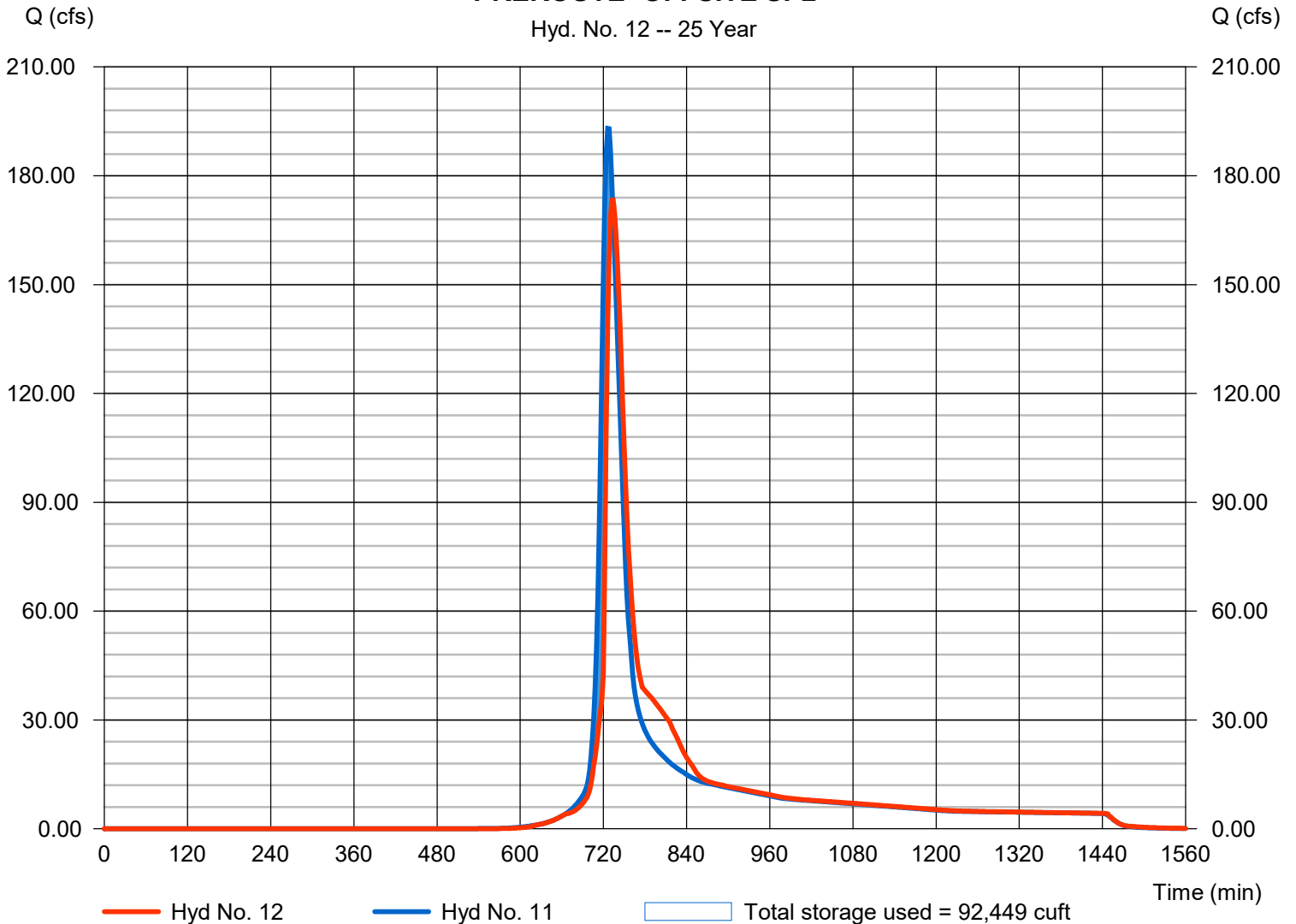
PREROUTE- OFFSITE SP2

Hydrograph type	= Reservoir	Peak discharge	= 173.30 cfs
Storm frequency	= 25 yrs	Time to peak	= 732 min
Time interval	= 2 min	Hyd. volume	= 776,995 cuft
Inflow hyd. No.	= 11 - ROUTE 1C +OFFSITE 1D	Max Elevation	= 1014.21 ft
Reservoir name	= OFFSITE 1D	Max. Storage	= 92,449 cuft

Storage Indication method used.

PREROUTE- OFFSITE SP2

Hyd. No. 12 -- 25 Year



Hydrograph Report

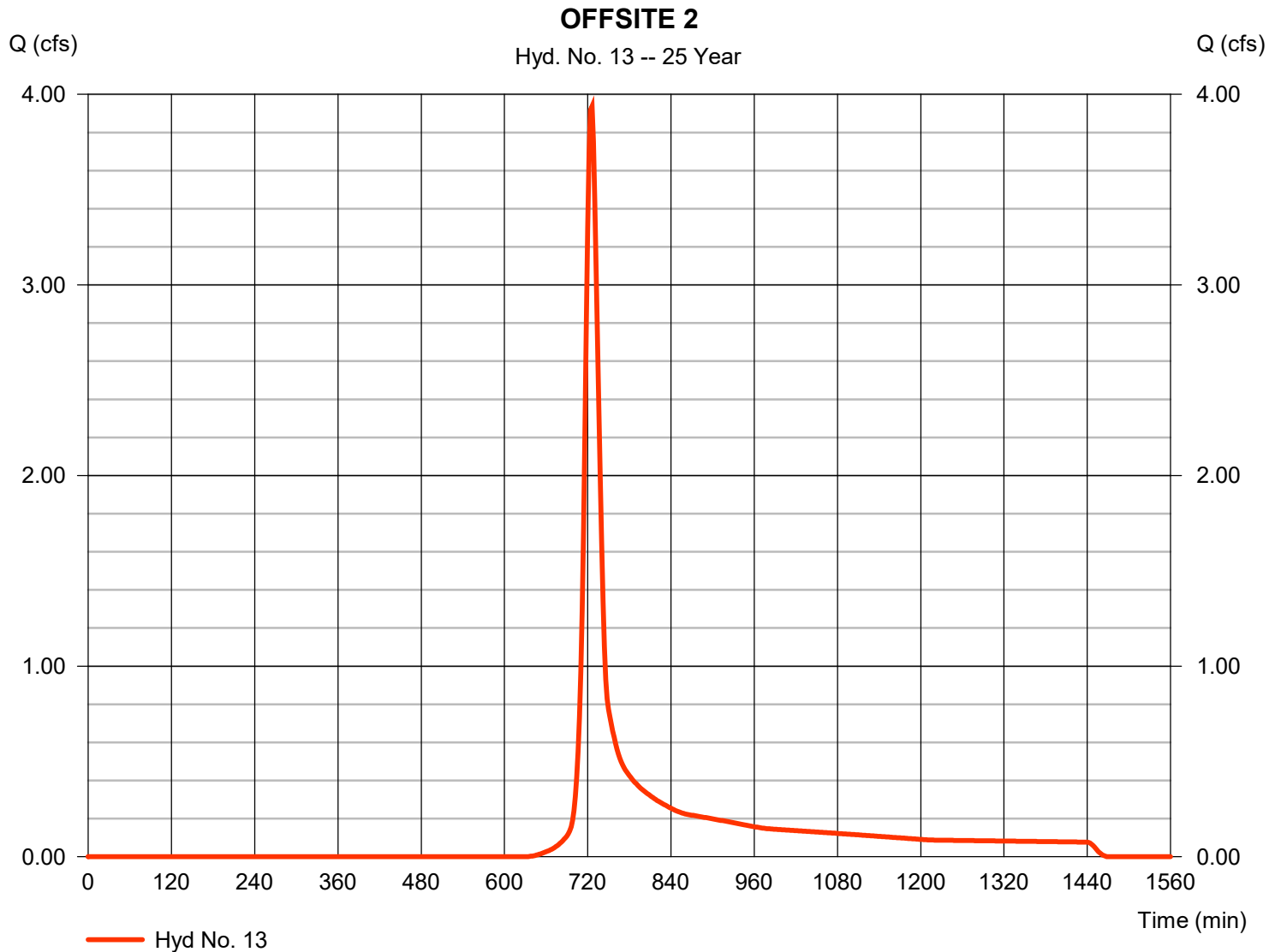
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 13

OFFSITE 2

Hydrograph type	= SCS Runoff	Peak discharge	= 3.938 cfs
Storm frequency	= 25 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 12,772 cuft
Drainage area	= 1.670 ac	Curve number	= 63
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 18.00 min
Total precip.	= 5.90 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

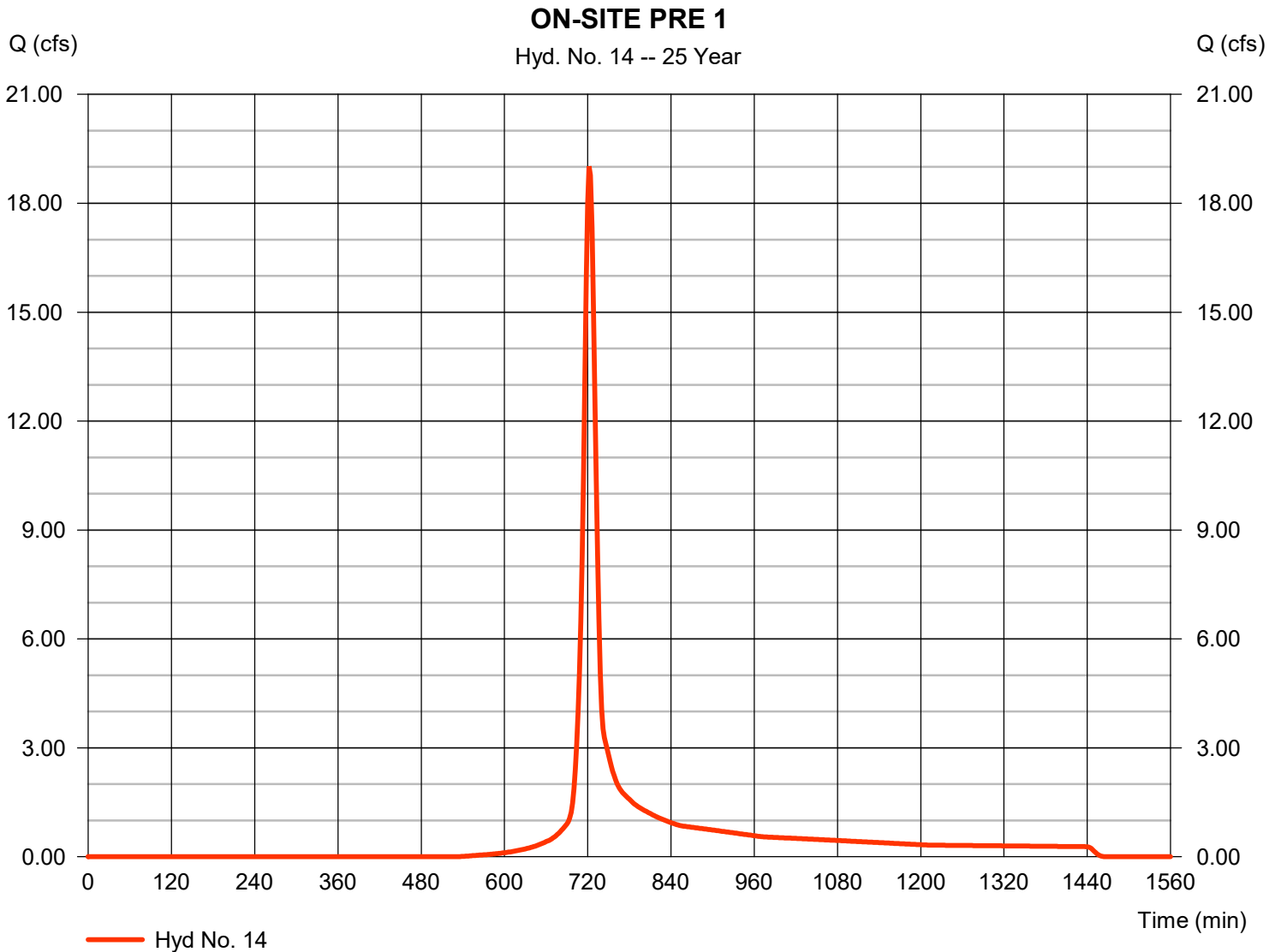
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 14

ON-SITE PRE 1

Hydrograph type	= SCS Runoff	Peak discharge	= 19.02 cfs
Storm frequency	= 25 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 53,466 cuft
Drainage area	= 5.360 ac	Curve number	= 71
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 16.00 min
Total precip.	= 5.90 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

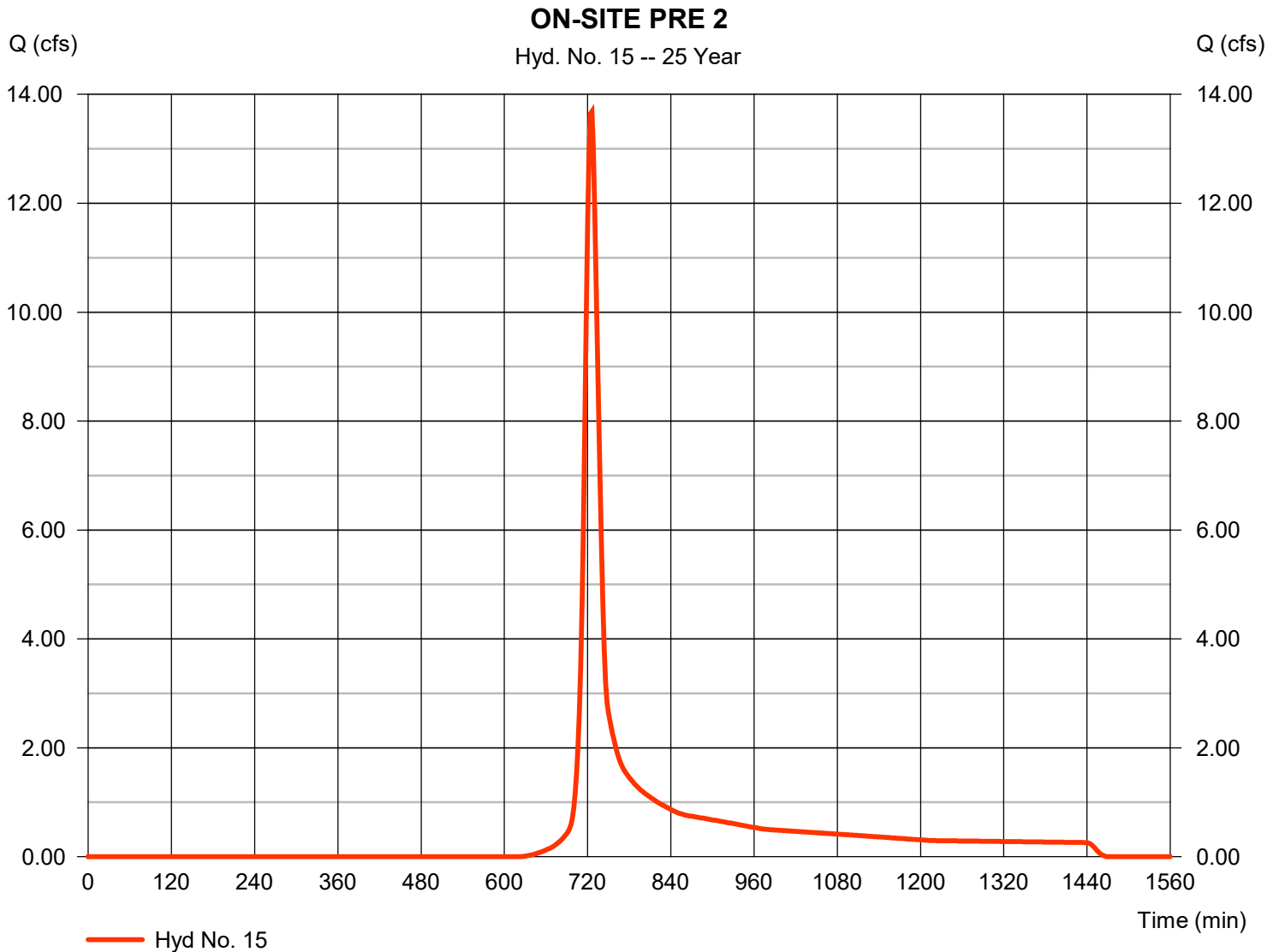
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 15

ON-SITE PRE 2

Hydrograph type	= SCS Runoff	Peak discharge	= 13.69 cfs
Storm frequency	= 25 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 44,169 cuft
Drainage area	= 5.550 ac	Curve number	= 64
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 17.00 min
Total precip.	= 5.90 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

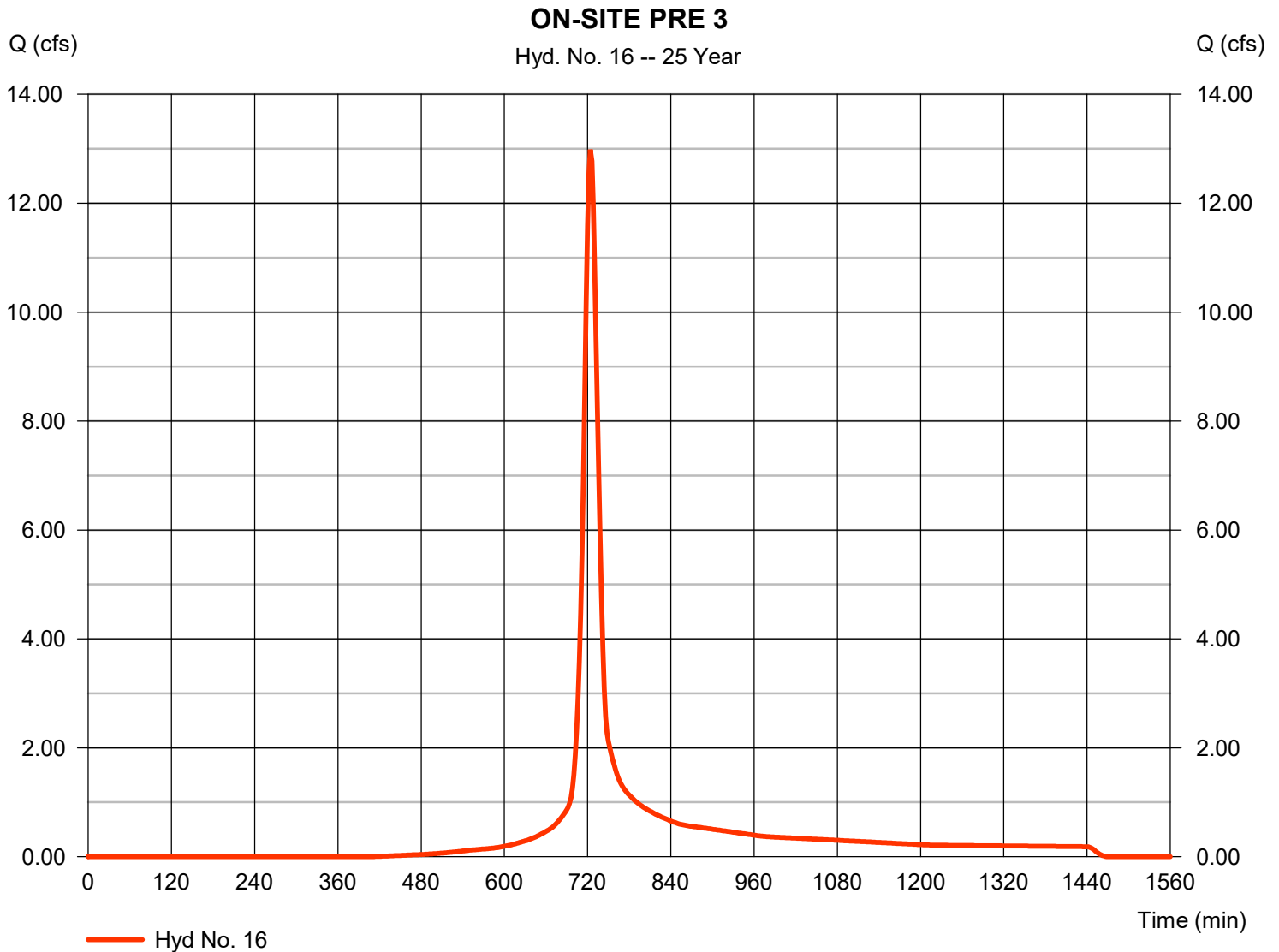
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 16

ON-SITE PRE 3

Hydrograph type	= SCS Runoff	Peak discharge	= 12.99 cfs
Storm frequency	= 25 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 40,664 cuft
Drainage area	= 3.120 ac	Curve number	= 79
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 18.00 min
Total precip.	= 5.90 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 17

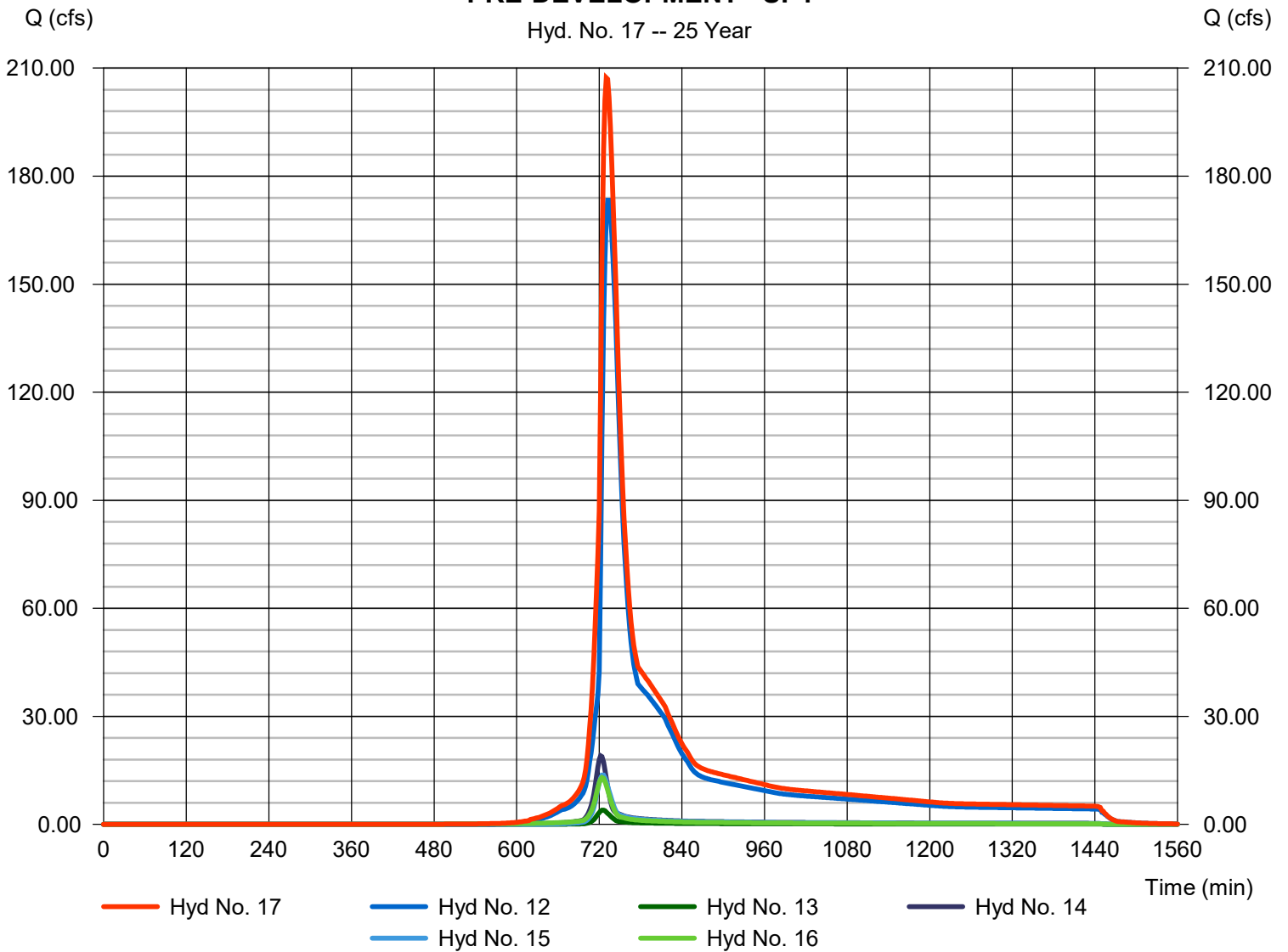
PRE-DEVELOPMENT - SP1

Hydrograph type = Combine
 Storm frequency = 25 yrs
 Time interval = 2 min
 Inflow hyds. = 12, 13, 14, 15, 16

Peak discharge = 207.31 cfs
 Time to peak = 730 min
 Hyd. volume = 928,067 cuft
 Contrib. drain. area = 15.700 ac

PRE-DEVELOPMENT - SP1

Hyd. No. 17 -- 25 Year



Hydrograph Report

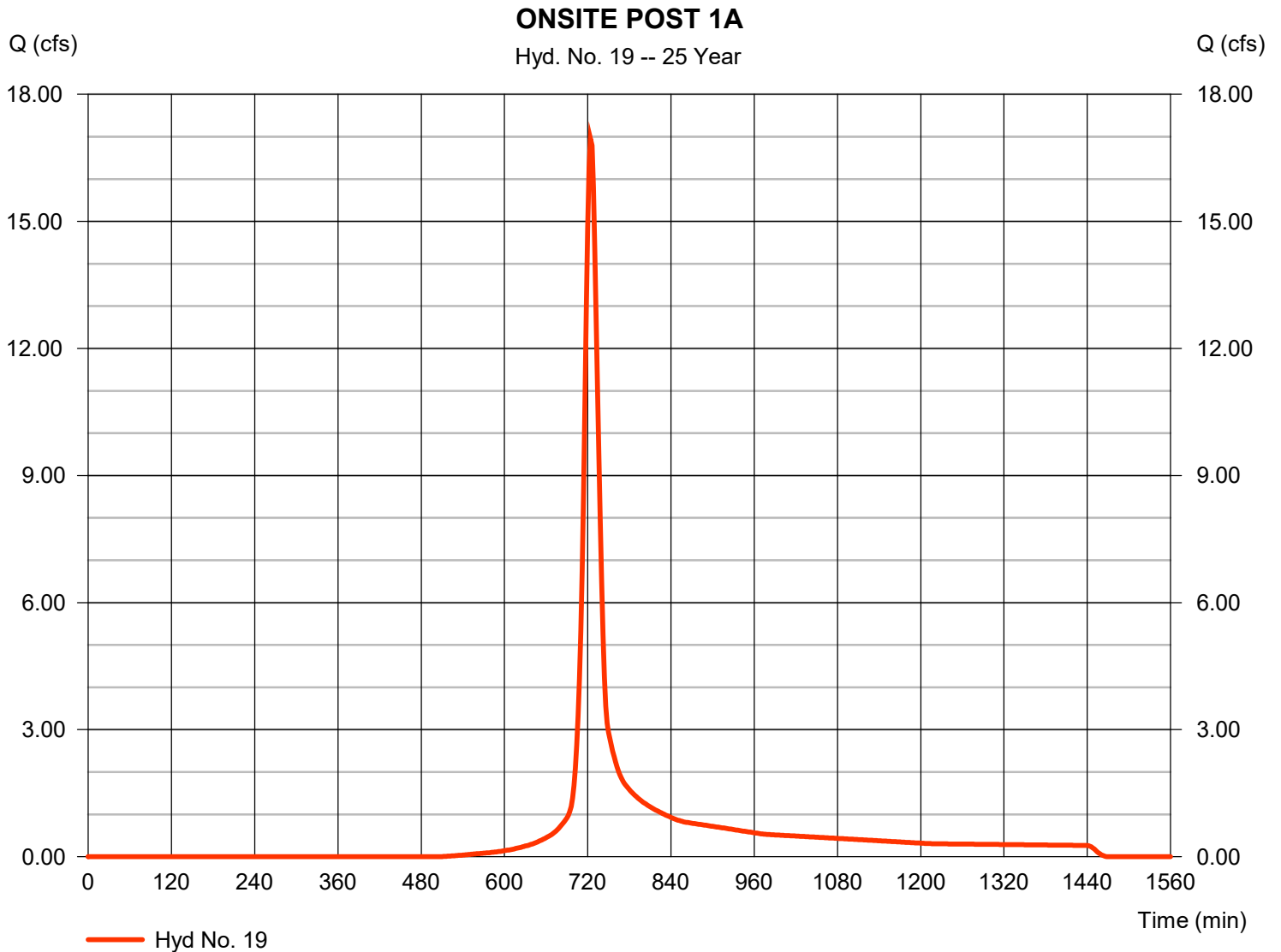
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 19

ONSITE POST 1A

Hydrograph type	= SCS Runoff	Peak discharge	= 16.96 cfs
Storm frequency	= 25 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 53,137 cuft
Drainage area	= 4.870 ac	Curve number	= 73
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 18.00 min
Total precip.	= 5.90 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

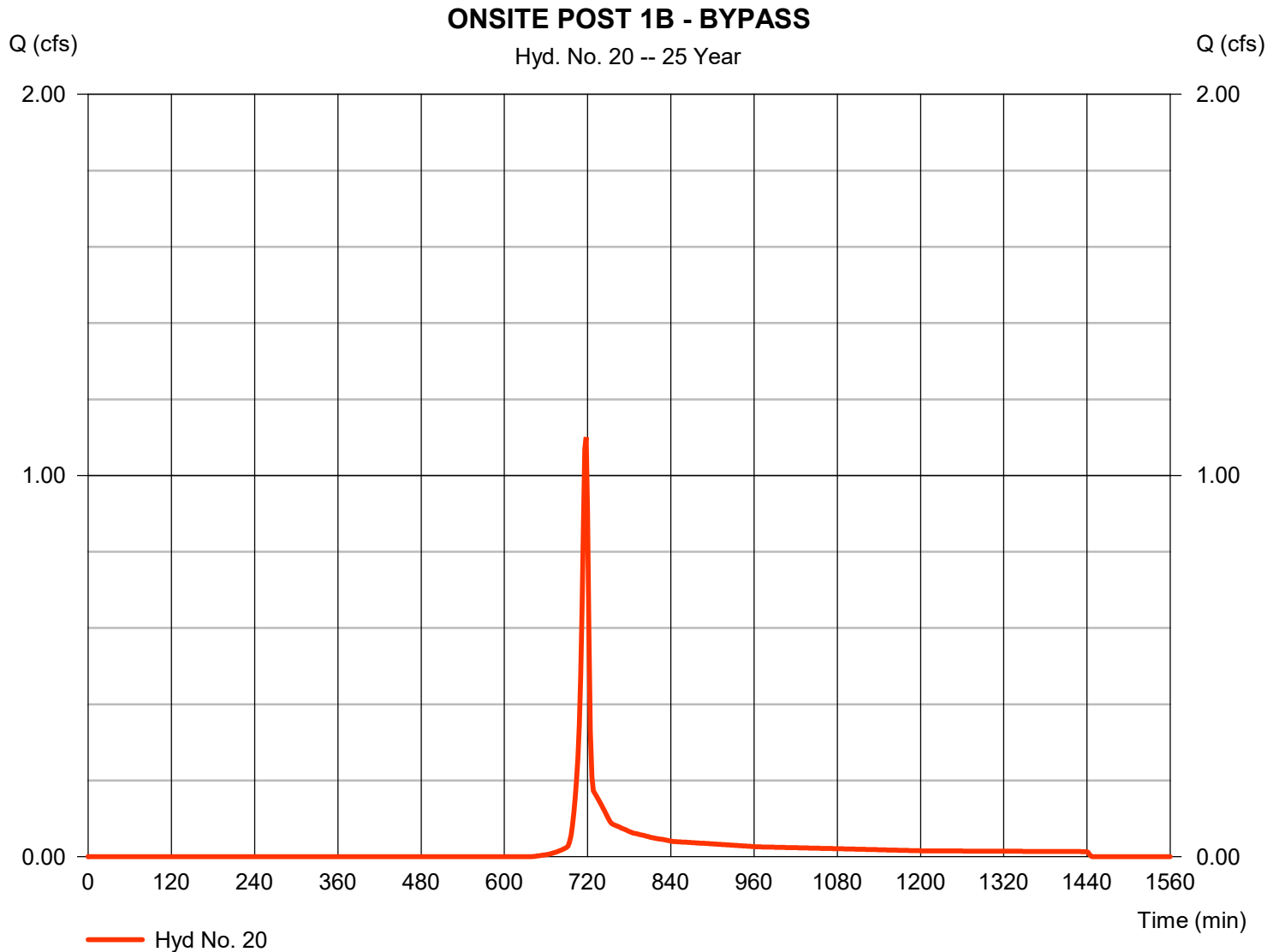
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 20

ONSITE POST 1B - BYPASS

Hydrograph type	= SCS Runoff	Peak discharge	= 1.101 cfs
Storm frequency	= 25 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 2,202 cuft
Drainage area	= 0.320 ac	Curve number	= 62
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.90 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

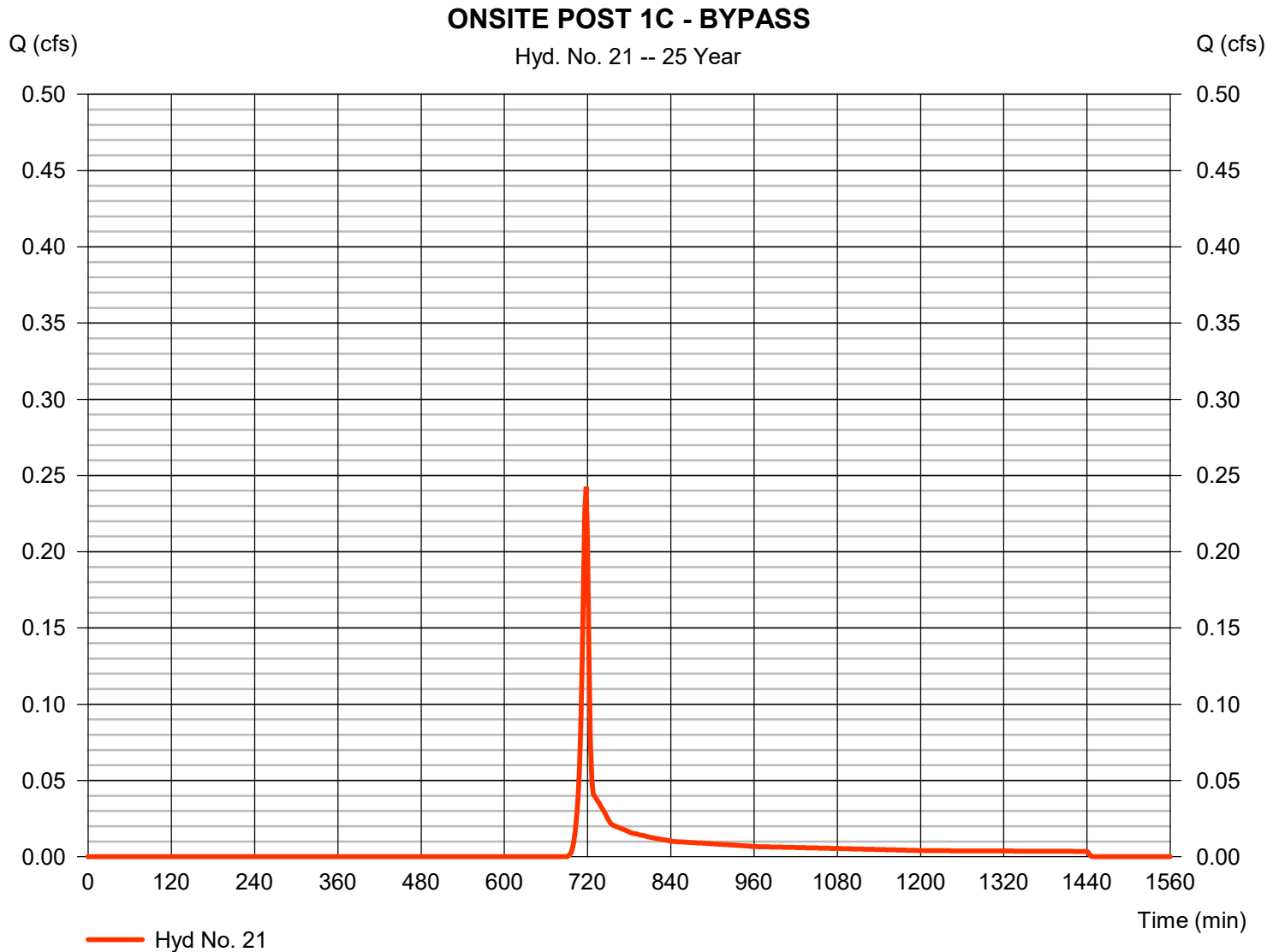
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 21

ONSITE POST 1C - BYPASS

Hydrograph type	= SCS Runoff	Peak discharge	= 0.243 cfs
Storm frequency	= 25 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 497 cuft
Drainage area	= 0.100 ac	Curve number	= 55
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.90 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

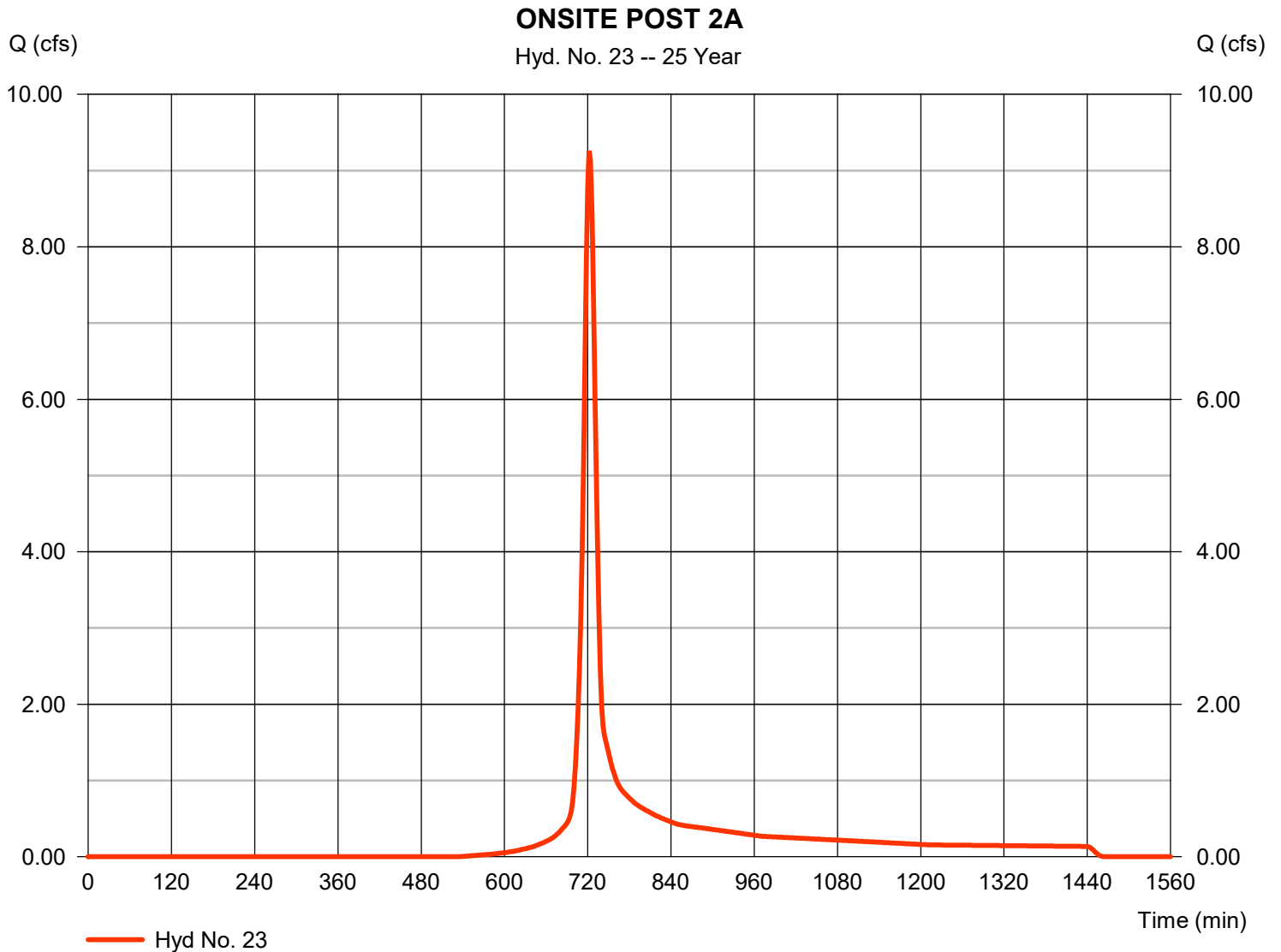
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 23

ONSITE POST 2A

Hydrograph type	= SCS Runoff	Peak discharge	= 9.260 cfs
Storm frequency	= 25 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 26,035 cuft
Drainage area	= 2.610 ac	Curve number	= 71
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 16.00 min
Total precip.	= 5.90 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

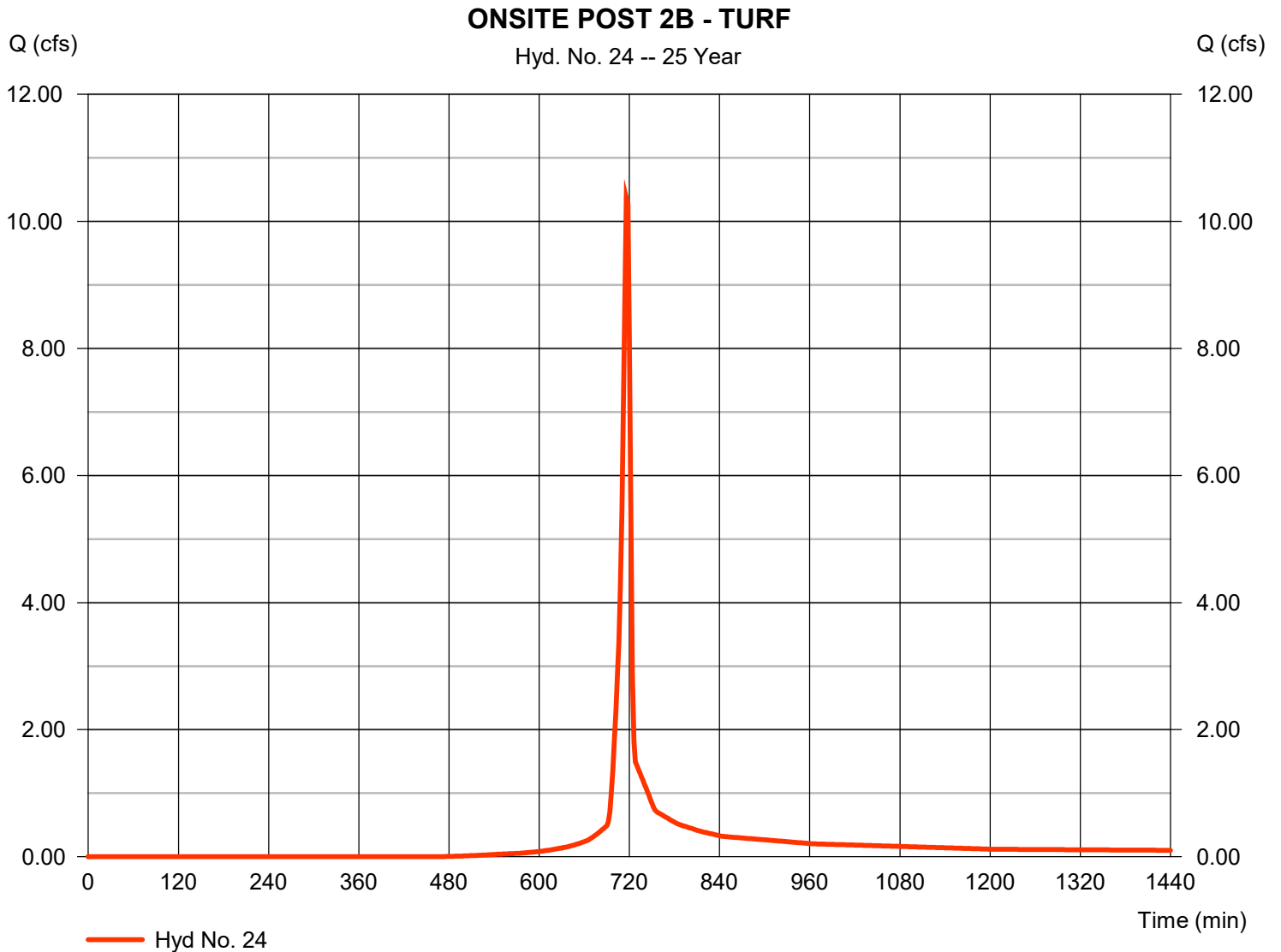
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 24

ONSITE POST 2B - TURF

Hydrograph type	= SCS Runoff	Peak discharge	= 10.37 cfs
Storm frequency	= 25 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 20,998 cuft
Drainage area	= 1.930 ac	Curve number	= 75
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 5.90 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

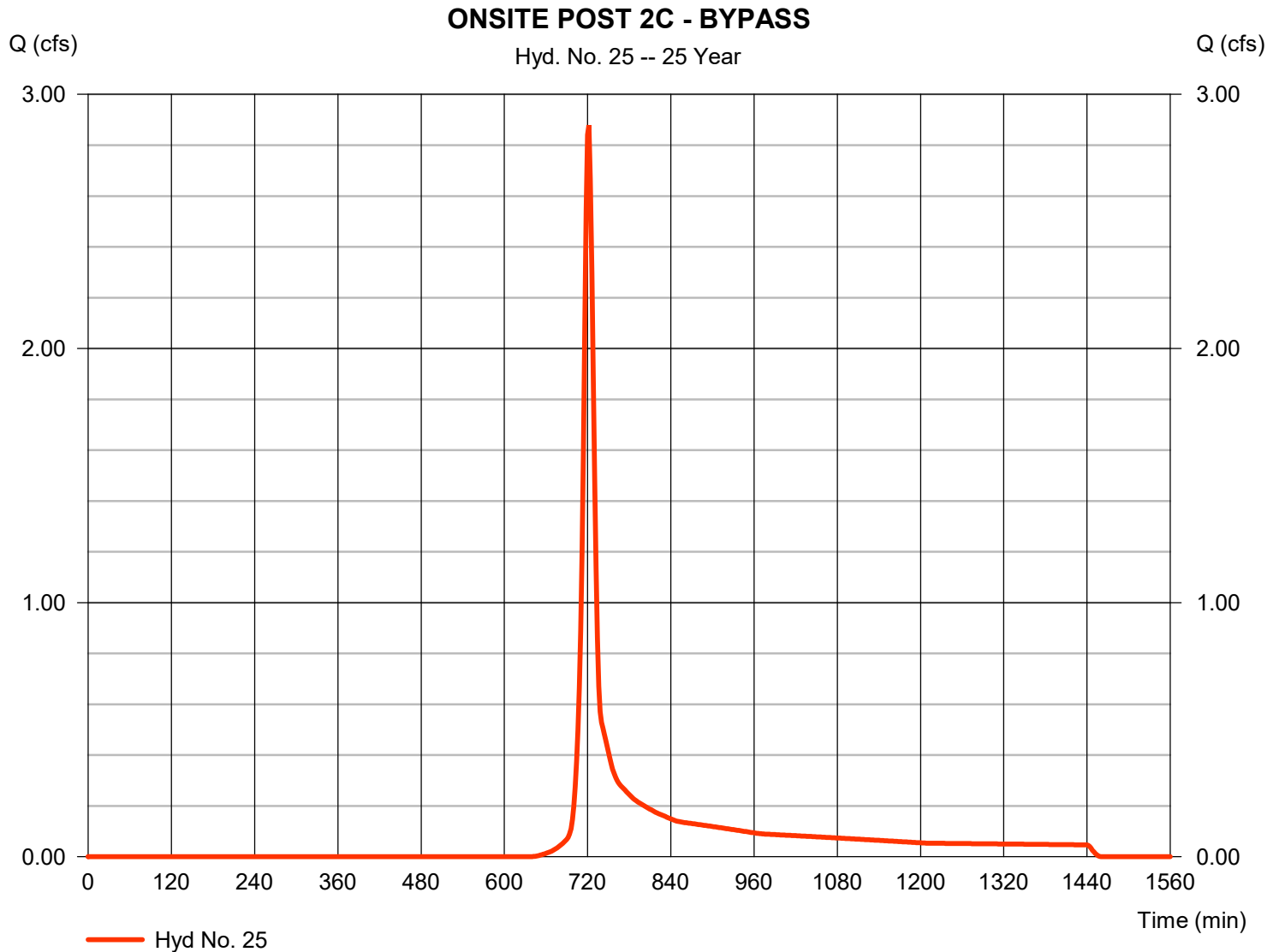
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 25

ONSITE POST 2C - BYPASS

Hydrograph type	= SCS Runoff	Peak discharge	= 2.879 cfs
Storm frequency	= 25 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 7,646 cuft
Drainage area	= 1.010 ac	Curve number	= 62
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 12.00 min
Total precip.	= 5.90 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

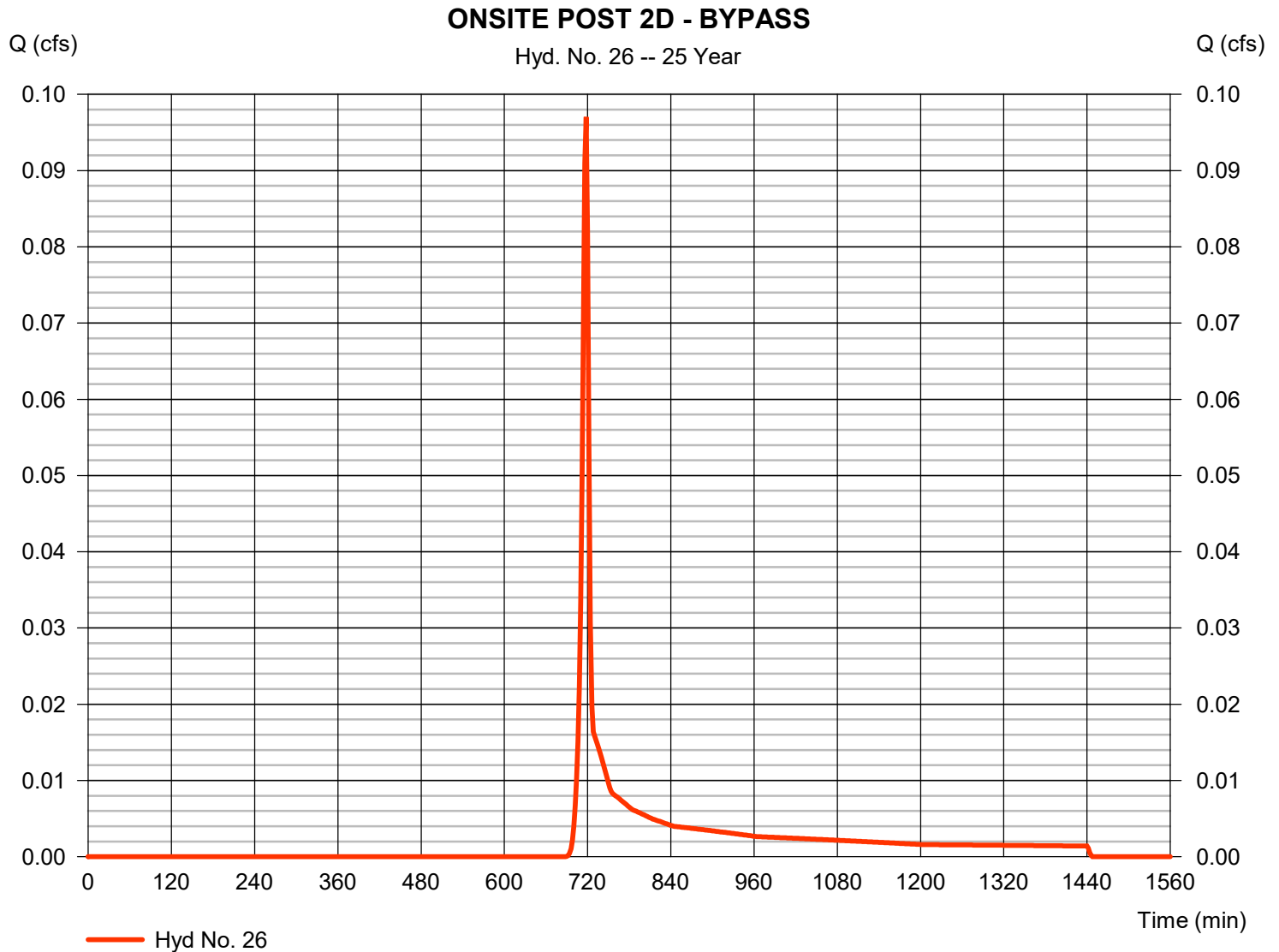
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 26

ONSITE POST 2D - BYPASS

Hydrograph type	= SCS Runoff	Peak discharge	= 0.097 cfs
Storm frequency	= 25 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 199 cuft
Drainage area	= 0.040 ac	Curve number	= 55
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.90 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

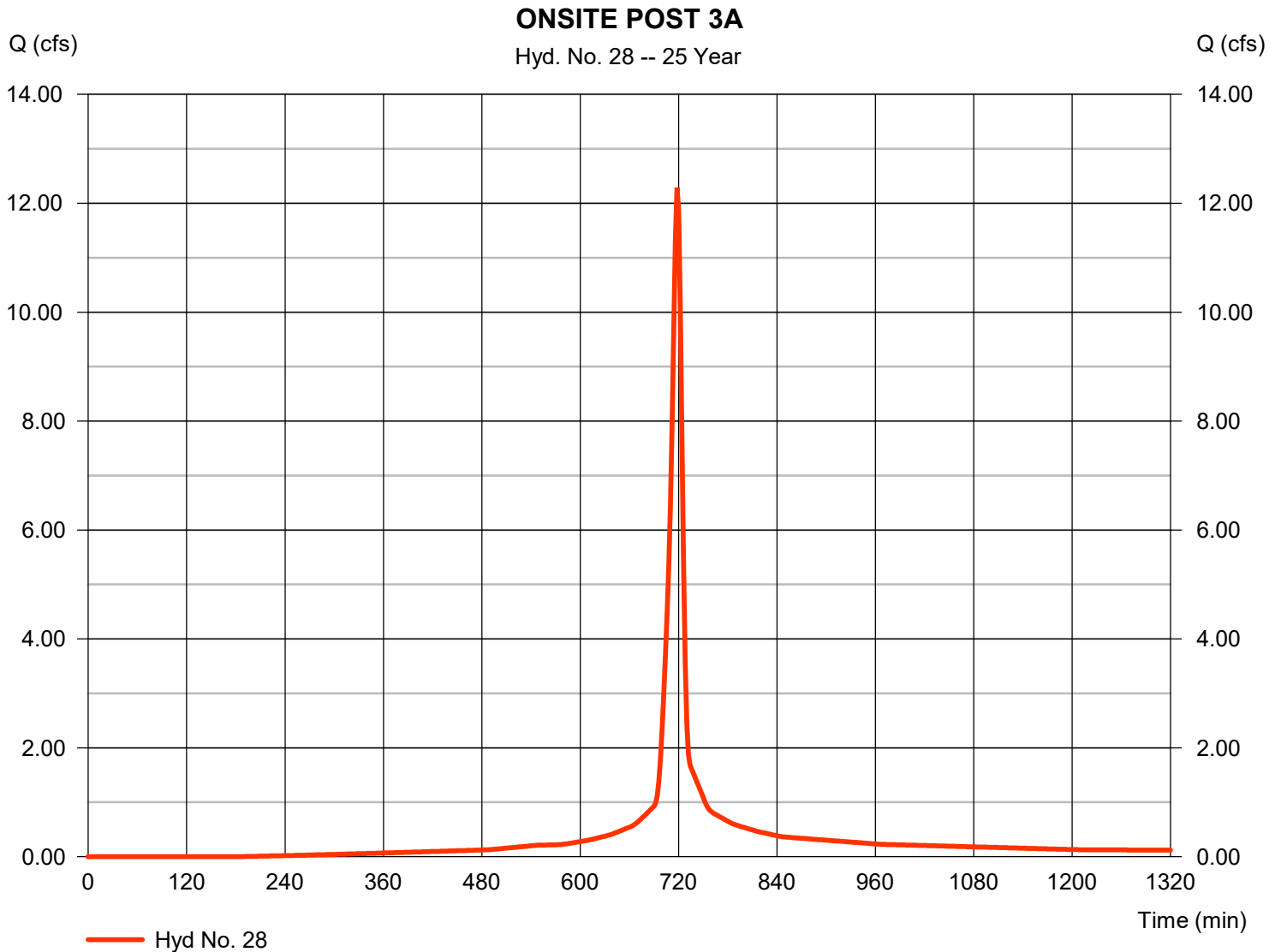
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 28

ONSITE POST 3A

Hydrograph type	= SCS Runoff	Peak discharge	= 12.29 cfs
Storm frequency	= 25 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 30,164 cuft
Drainage area	= 1.710 ac	Curve number	= 91
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 7.00 min
Total precip.	= 5.90 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

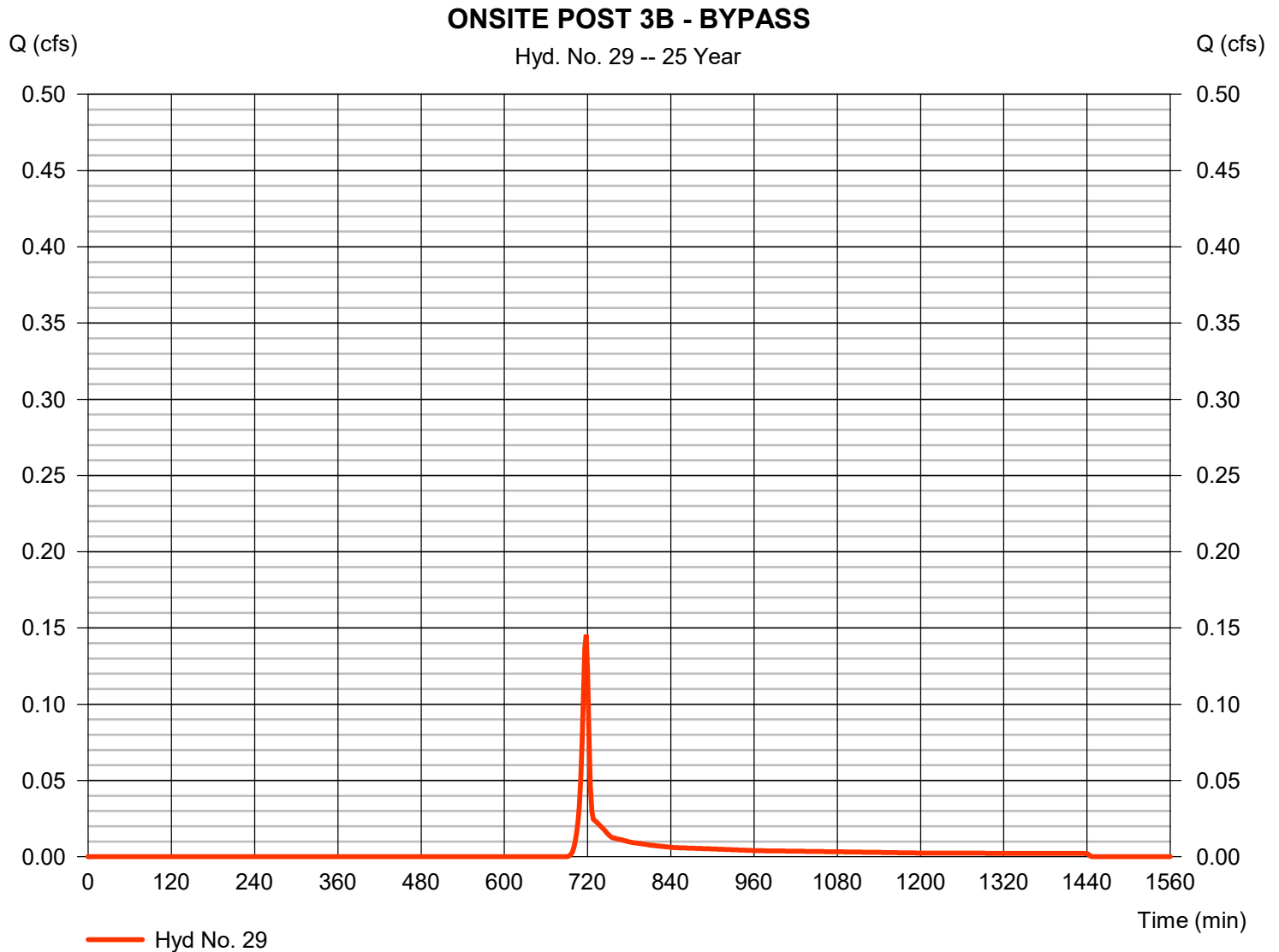
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 29

ONSITE POST 3B - BYPASS

Hydrograph type	= SCS Runoff	Peak discharge	= 0.146 cfs
Storm frequency	= 25 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 298 cuft
Drainage area	= 0.060 ac	Curve number	= 55
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.90 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

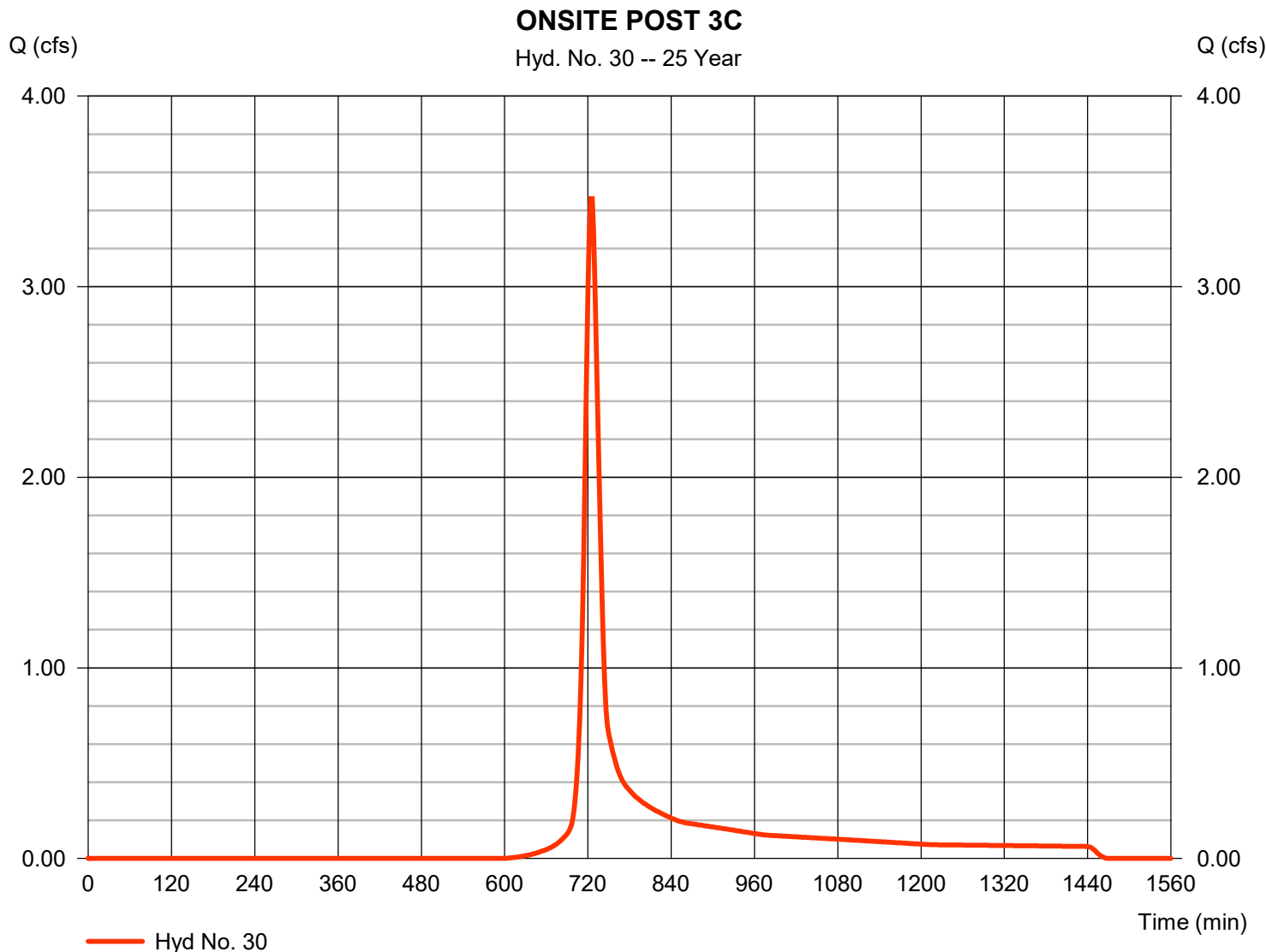
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 30

ONSITE POST 3C

Hydrograph type	= SCS Runoff	Peak discharge	= 3.461 cfs
Storm frequency	= 25 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 11,081 cuft
Drainage area	= 1.290 ac	Curve number	= 66
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 19.00 min
Total precip.	= 5.90 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

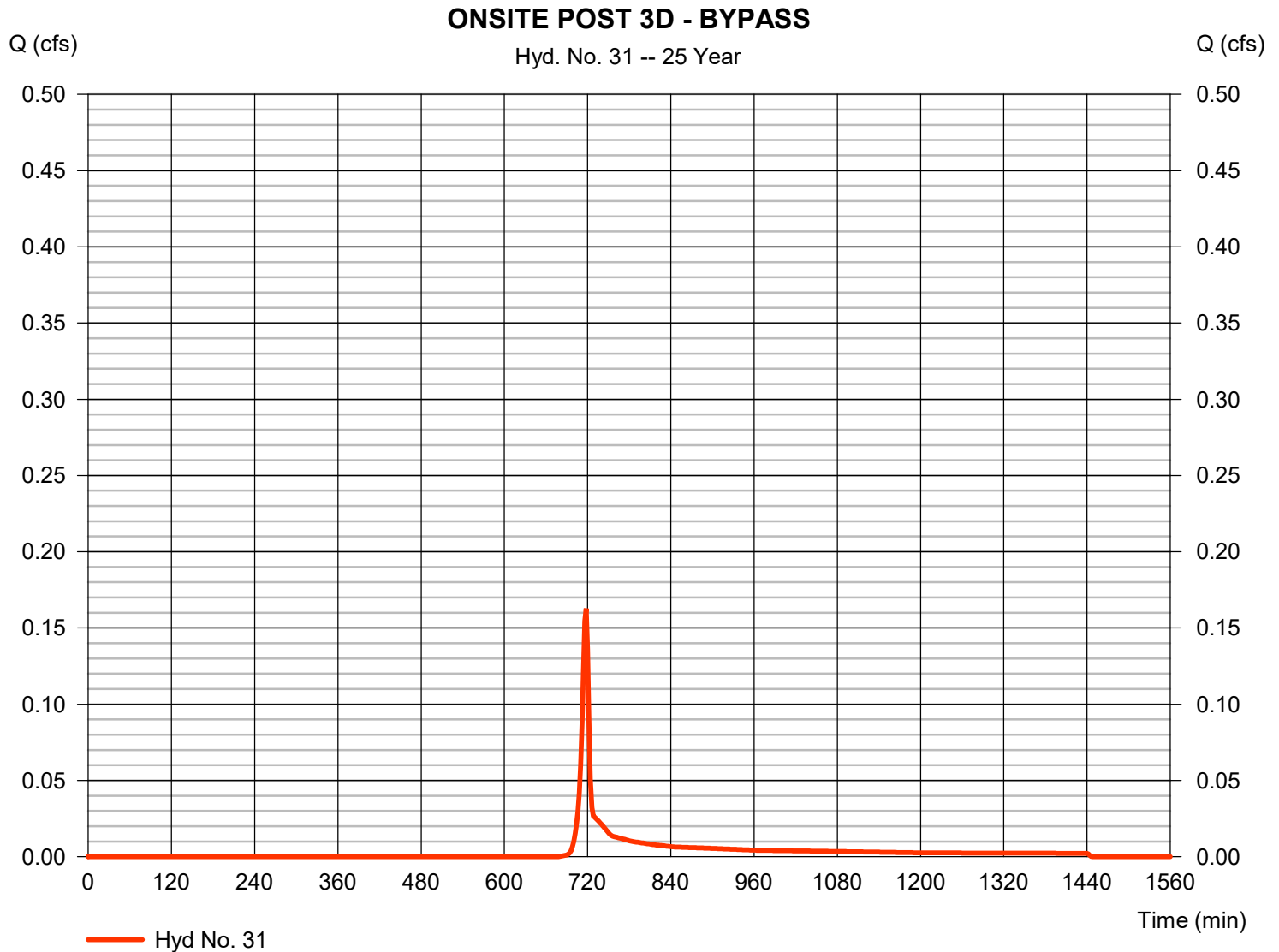
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 31

ONSITE POST 3D - BYPASS

Hydrograph type	= SCS Runoff	Peak discharge	= 0.163 cfs
Storm frequency	= 25 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 330 cuft
Drainage area	= 0.060 ac	Curve number	= 57
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.90 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

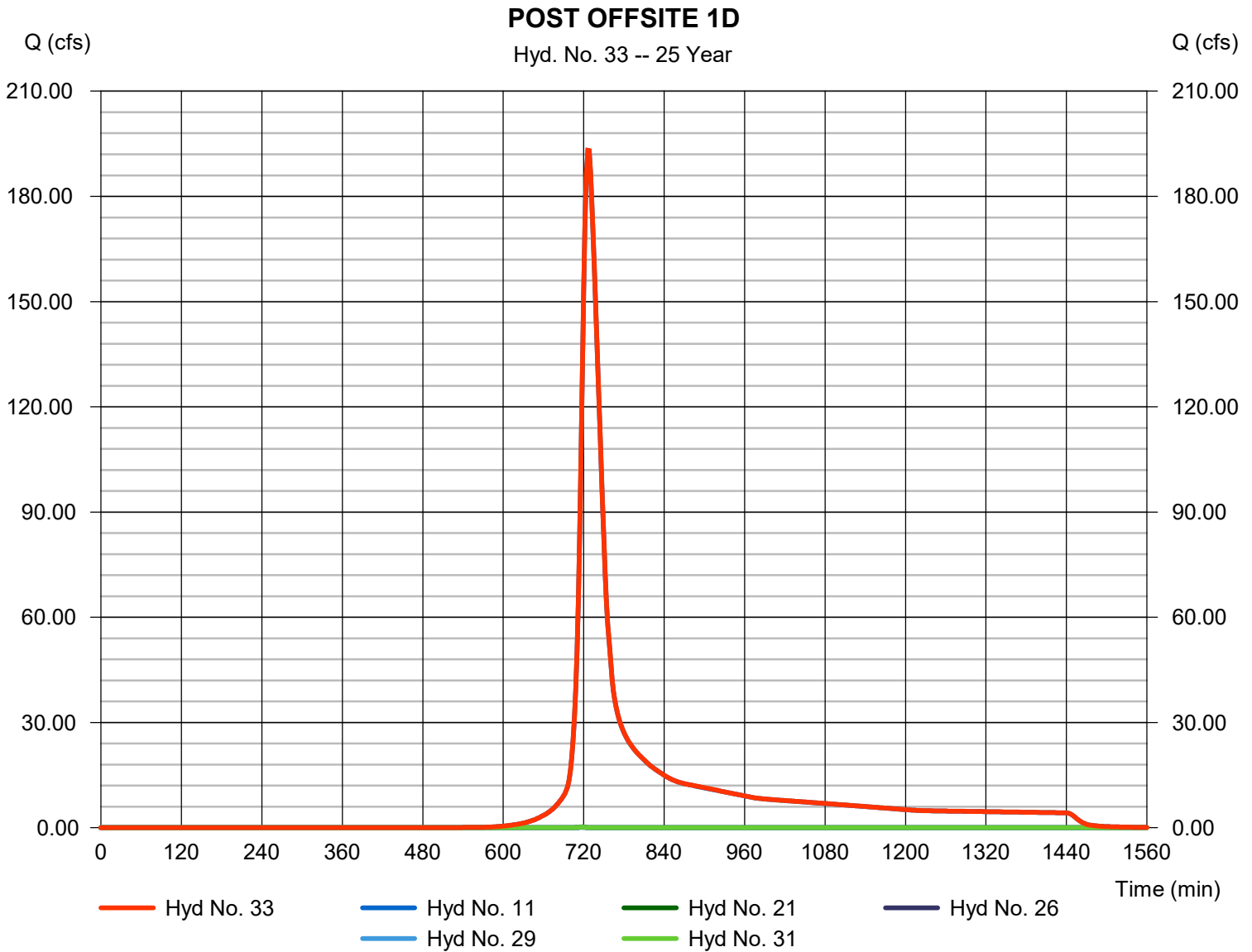
Monday, 05 / 8 / 2023

Hyd. No. 33

POST OFFSITE 1D

Hydrograph type = Combine
 Storm frequency = 25 yrs
 Time interval = 2 min
 Inflow hyds. = 11, 21, 26, 29, 31

Peak discharge = 193.16 cfs
 Time to peak = 726 min
 Hyd. volume = 778,326 cuft
 Contrib. drain. area = 0.260 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 34

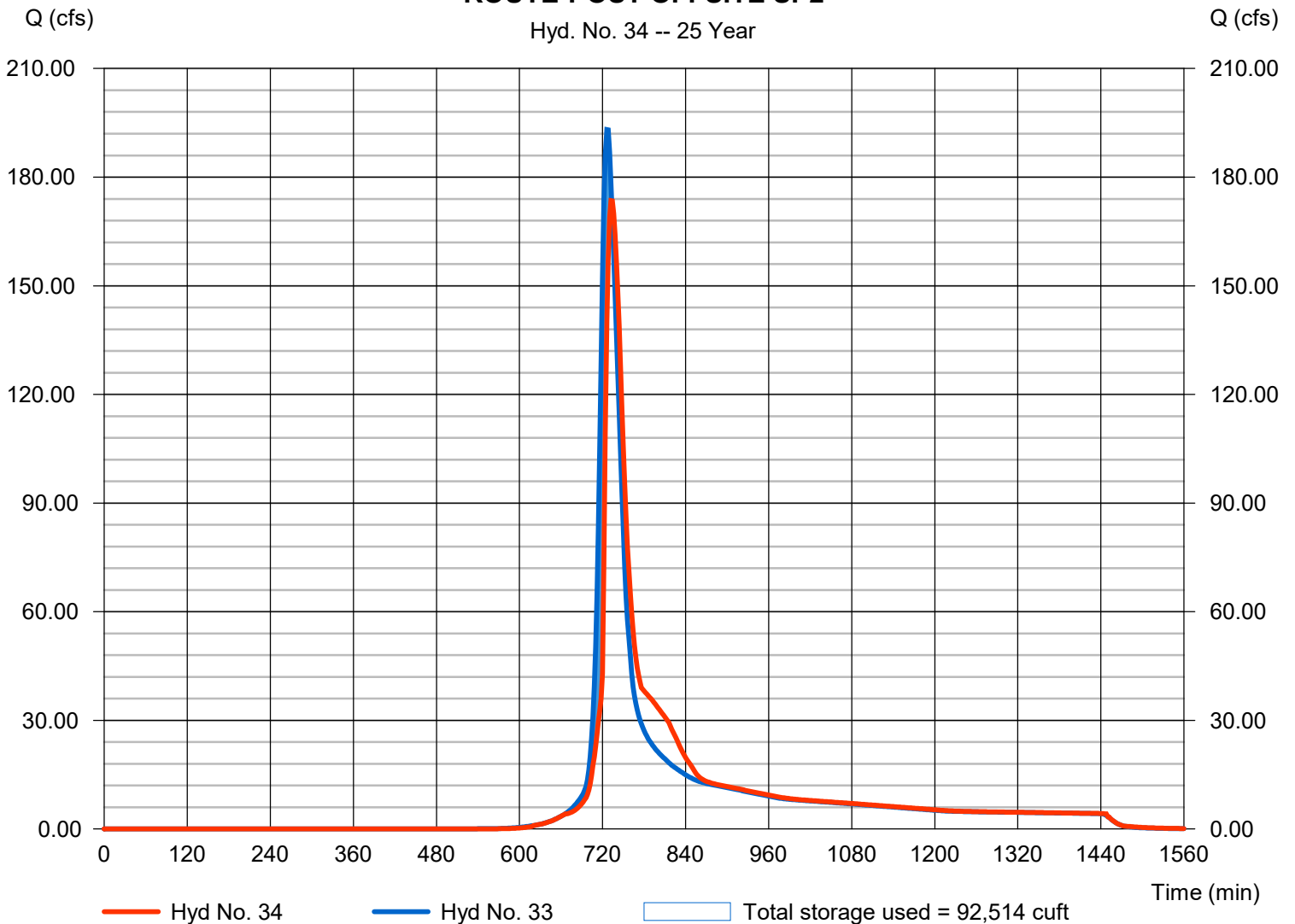
ROUTE-POST OFFSITE SP2

Hydrograph type	= Reservoir	Peak discharge	= 173.53 cfs
Storm frequency	= 25 yrs	Time to peak	= 732 min
Time interval	= 2 min	Hyd. volume	= 778,320 cuft
Inflow hyd. No.	= 33 - POST OFFSITE 1D	Max. Elevation	= 1014.22 ft
Reservoir name	= OFFSITE 1D	Max. Storage	= 92,514 cuft

Storage Indication method used.

ROUTE-POST OFFSITE SP2

Hyd. No. 34 -- 25 Year



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

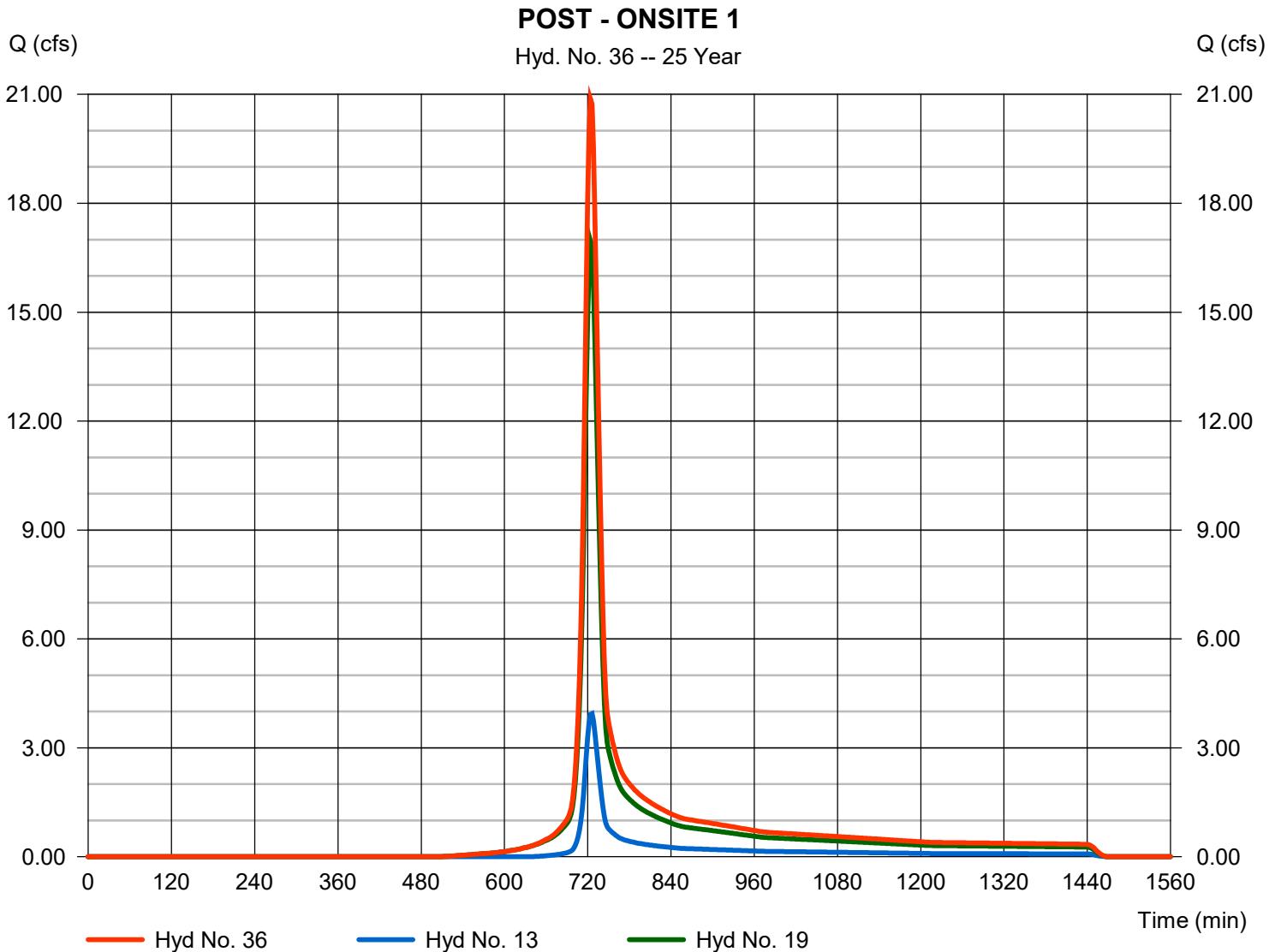
Monday, 05 / 8 / 2023

Hyd. No. 36

POST - ONSITE 1

Hydrograph type = Combine
Storm frequency = 25 yrs
Time interval = 2 min
Inflow hyds. = 13, 19

Peak discharge = 20.88 cfs
Time to peak = 724 min
Hyd. volume = 65,910 cuft
Contrib. drain. area = 6.540 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

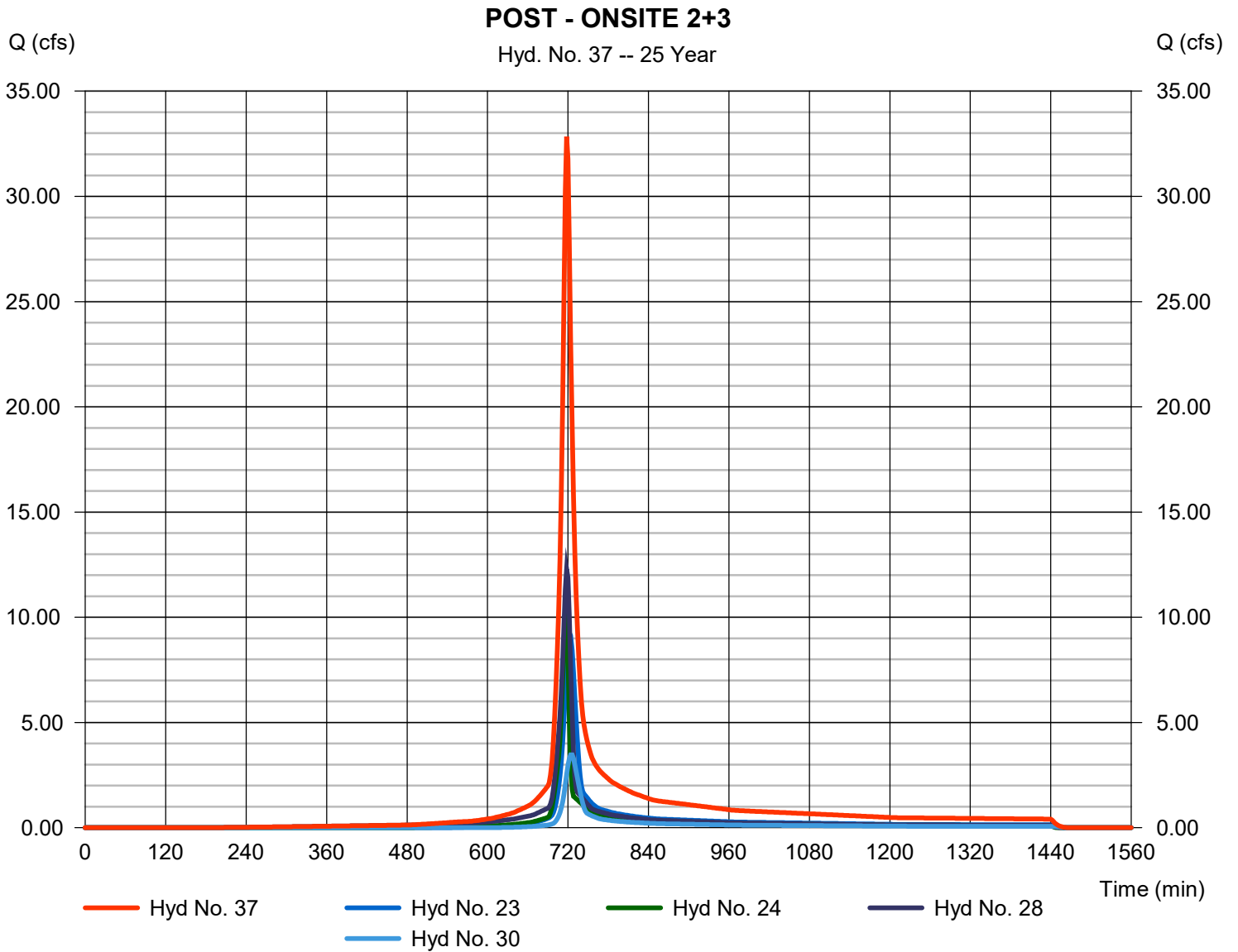
Monday, 05 / 8 / 2023

Hyd. No. 37

POST - ONSITE 2+3

Hydrograph type = Combine
 Storm frequency = 25 yrs
 Time interval = 2 min
 Inflow hyds. = 23, 24, 28, 30

Peak discharge = 32.85 cfs
 Time to peak = 718 min
 Hyd. volume = 88,277 cuft
 Contrib. drain. area = 7.540 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 39

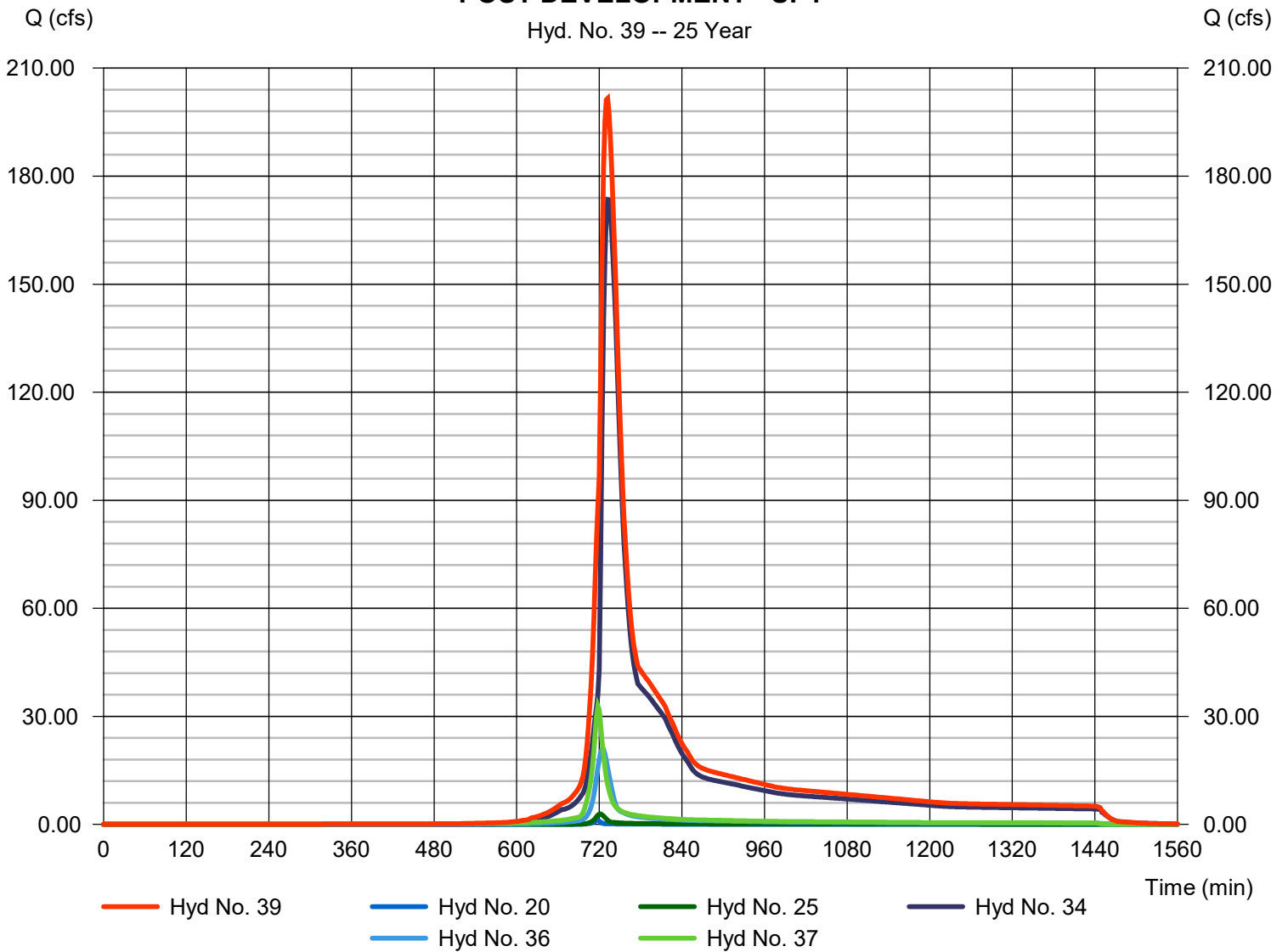
POST DEVELOPMENT - SP1

Hydrograph type = Combine
 Storm frequency = 25 yrs
 Time interval = 2 min
 Inflow hyds. = 20, 25, 34, 36, 37

Peak discharge = 201.58 cfs
 Time to peak = 732 min
 Hyd. volume = 942,355 cuft
 Contrib. drain. area = 1.330 ac

POST DEVELOPMENT - SP1

Hyd. No. 39 -- 25 Year



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description	
1	SCS Runoff	33.55	2	722	94,412	-----	-----	-----	OFFSITE 1A	
2	Reservoir	24.86	2	728	94,410	1	1053.70	9,786	ROUTE - OFFSITE 1A	
3	SCS Runoff	82.28	2	726	286,965	-----	-----	-----	OFFSITE 1B	
4	Combine	107.00	2	728	381,376	2, 3	-----	-----	ROUTE 1A +OFFSITE 1B	
5	Reservoir	85.69	2	736	381,369	4	1030.01	47,509	ROUTE OFFSITE 1B	
6	SCS Runoff	31.71	2	726	110,610	-----	-----	-----	OFFSITE 1C	
7	Combine	112.87	2	730	491,979	5, 6	-----	-----	ROUTE 1B + OFFSITE 1C	
8	Reservoir	105.24	2	738	491,978	7	1019.02	21,111	ROUTE OFFSITE 1C	
9	SCS Runoff	116.81	2	724	367,829	-----	-----	-----	PRE OFFSITE 1D	
10	SCS Runoff	27.87	2	724	87,138	-----	-----	-----	PRE OFFSITE 1E	
11	Combine	230.73	2	726	946,944	8, 9, 10	-----	-----	ROUTE 1C +OFFSITE 1D +1E	
12	Reservoir	210.24	2	732	946,938	11	1014.42	102,524	PREROUTE- OFFSITE SP2	
13	SCS Runoff	4.955	2	726	15,882	-----	-----	-----	OFFSITE 2	
14	SCS Runoff	23.04	2	722	64,611	-----	-----	-----	ON-SITE PRE 1	
15	SCS Runoff	17.14	2	724	54,705	-----	-----	-----	ON-SITE PRE 2	
16	SCS Runoff	15.29	2	724	47,998	-----	-----	-----	ON-SITE PRE 3	
17	Combine	254.75	2	730	1,130,132	12, 13, 14, 15, 16	-----	-----	PRE-DEVELOPMENT - SP1	
19	SCS Runoff	20.41	2	724	63,814	-----	-----	-----	ONSITE POST 1A	
20	SCS Runoff	1.375	2	718	2,750	-----	-----	-----	ONSITE POST 1B - BYPASS	
21	SCS Runoff	0.318	2	718	642	-----	-----	-----	ONSITE POST 1C - BYPASS	
23	SCS Runoff	11.22	2	722	31,462	-----	-----	-----	ONSITE POST 2A	
24	SCS Runoff	12.33	2	716	25,067	-----	-----	-----	ONSITE POST 2B - TURF	
25	SCS Runoff	3.628	2	722	9,547	-----	-----	-----	ONSITE POST 2C - BYPASS	
26	SCS Runoff	0.127	2	718	257	-----	-----	-----	ONSITE POST 2D - BYPASS	
28	SCS Runoff	13.95	2	718	34,545	-----	-----	-----	ONSITE POST 3A	
29	SCS Runoff	0.191	2	718	385	-----	-----	-----	ONSITE POST 3B - BYPASS	
30	SCS Runoff	4.301	2	724	13,621	-----	-----	-----	ONSITE POST 3C	
31	SCS Runoff	0.210	2	718	422	-----	-----	-----	ONSITE POST 3D - BYPASS	
33	Combine	230.89	2	726	948,651	11, 21, 26, 29, 31, 33	-----	-----	POST OFFSITE 1D	
34	Reservoir	210.49	2	732	948,643	33	1014.42	102,589	ROUTE-POST OFFSITE SP2	
36	Combine	25.36	2	724	79,695	13, 19,	-----	-----	POST - ONSITE 1	
Fitzgerald Field.gpw					Return Period: 50 Year			Monday, 05 / 8 / 2023		

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
37	Combine	38.80	2	718	104,694	23, 24, 28, 30,	-----	-----	POST - ONSITE 2+3
39	Combine	247.07	2	730	1,145,329	20, 25, 34, 36, 37,	-----	-----	POST DEVELOPMENT - SP1
Fitzgerald Field.gpw					Return Period: 50 Year			Monday, 05 / 8 / 2023	

Hydrograph Report

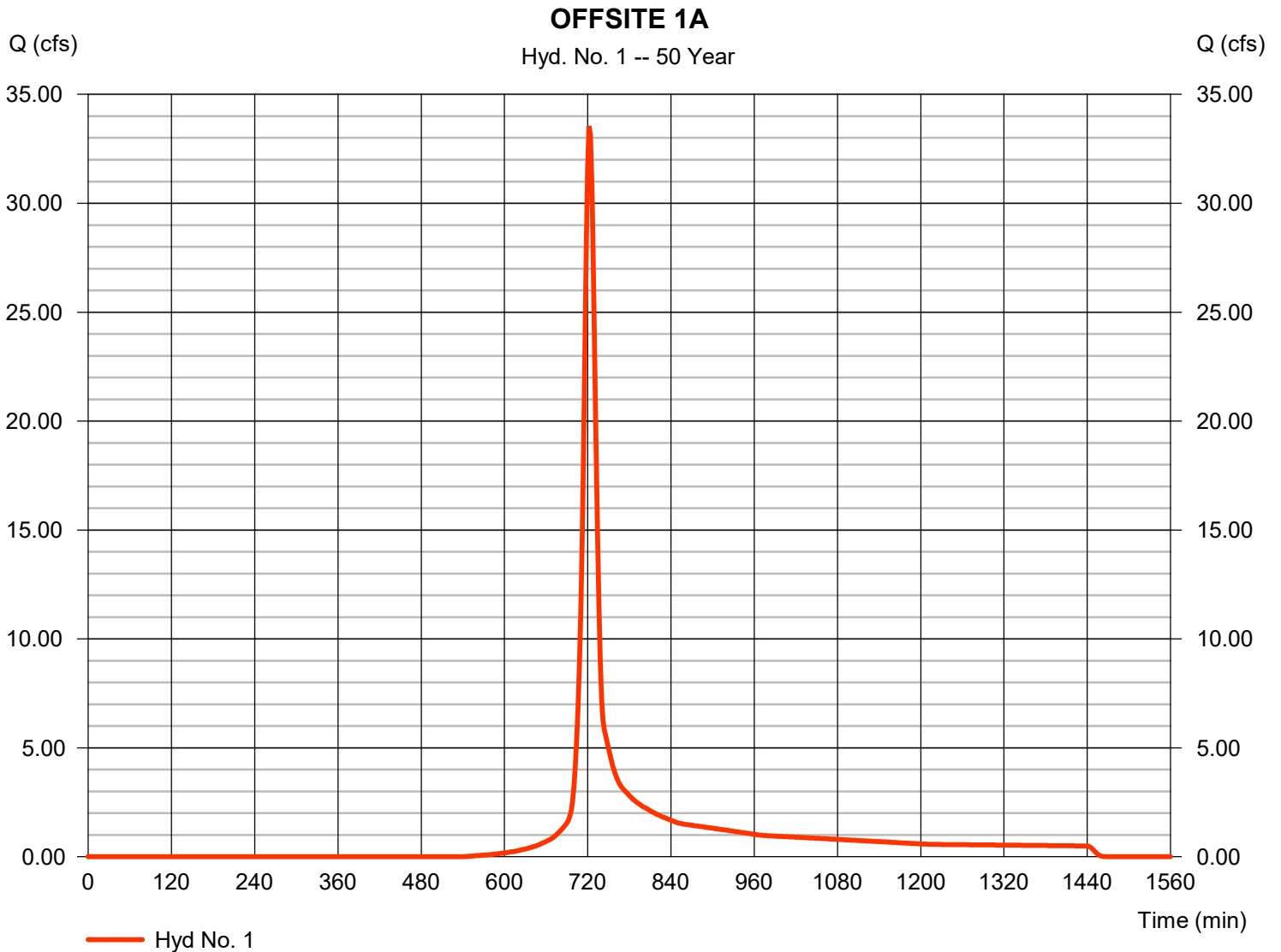
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 1

OFFSITE 1A

Hydrograph type	= SCS Runoff	Peak discharge	= 33.55 cfs
Storm frequency	= 50 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 94,412 cuft
Drainage area	= 8.590 ac	Curve number	= 68
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 14.00 min
Total precip.	= 6.62 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

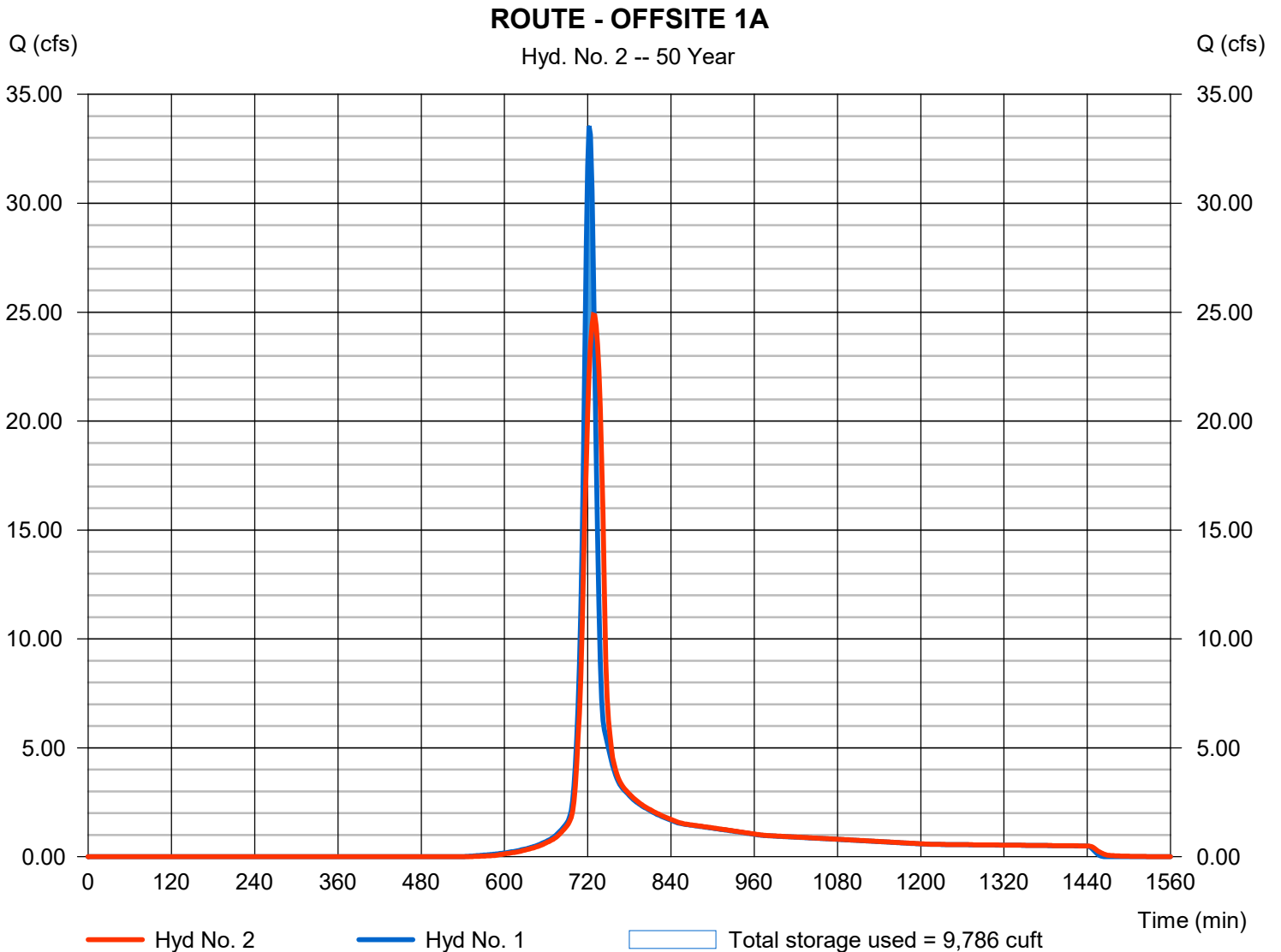
Monday, 05 / 8 / 2023

Hyd. No. 2

ROUTE - OFFSITE 1A

Hydrograph type	= Reservoir	Peak discharge	= 24.86 cfs
Storm frequency	= 50 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 94,410 cuft
Inflow hyd. No.	= 1 - OFFSITE 1A	Max. Elevation	= 1053.70 ft
Reservoir name	= OFFSITE 1A	Max. Storage	= 9,786 cuft

Storage Indication method used.



Hydrograph Report

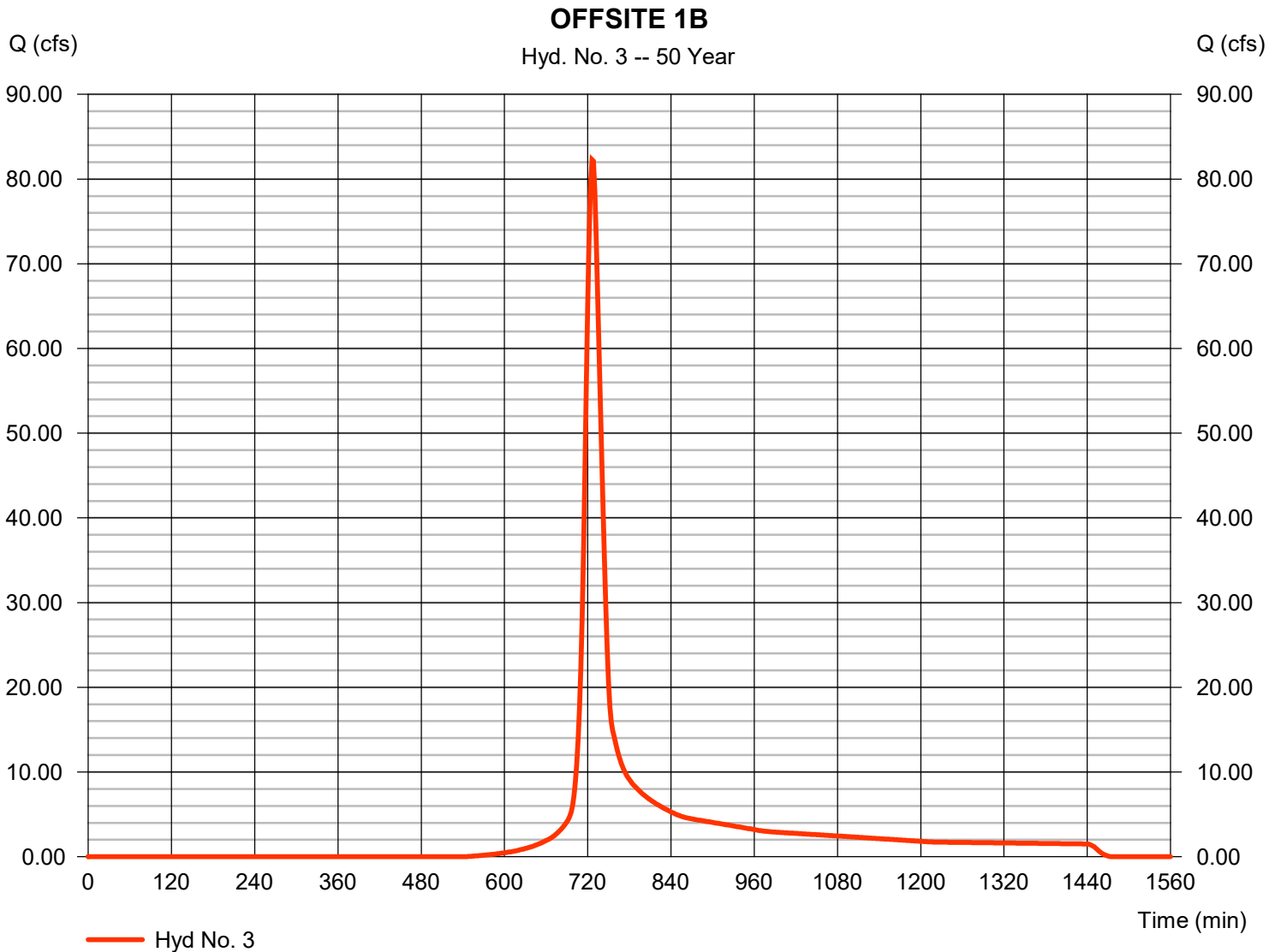
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 3

OFFSITE 1B

Hydrograph type	= SCS Runoff	Peak discharge	= 82.28 cfs
Storm frequency	= 50 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 286,965 cuft
Drainage area	= 25.010 ac	Curve number	= 68
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 21.00 min
Total precip.	= 6.62 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 4

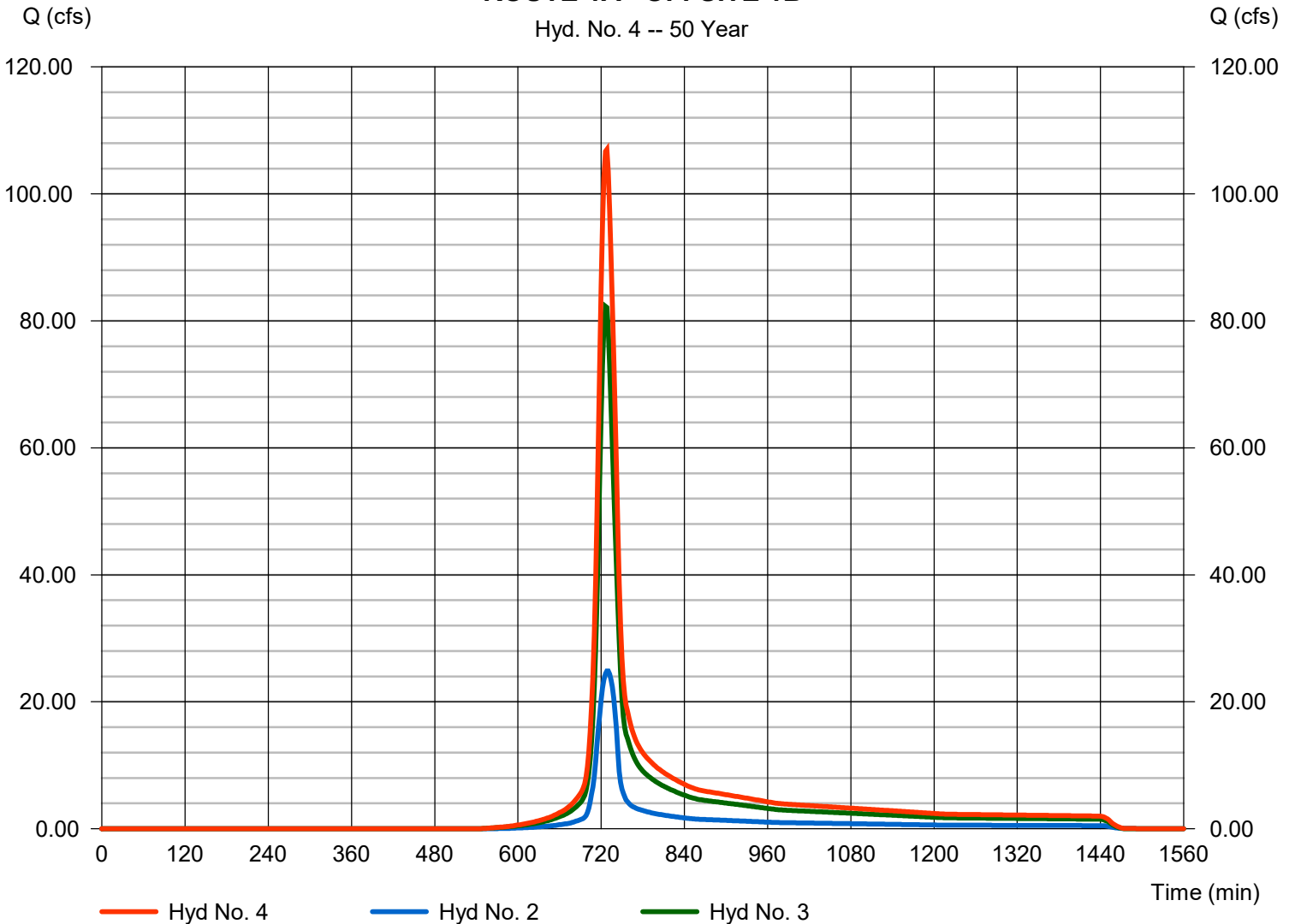
ROUTE 1A +OFFSITE 1B

Hydrograph type = Combine
Storm frequency = 50 yrs
Time interval = 2 min
Inflow hyds. = 2, 3

Peak discharge = 107.00 cfs
Time to peak = 728 min
Hyd. volume = 381,376 cuft
Contrib. drain. area = 25.010 ac

ROUTE 1A +OFFSITE 1B

Hyd. No. 4 -- 50 Year



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 5

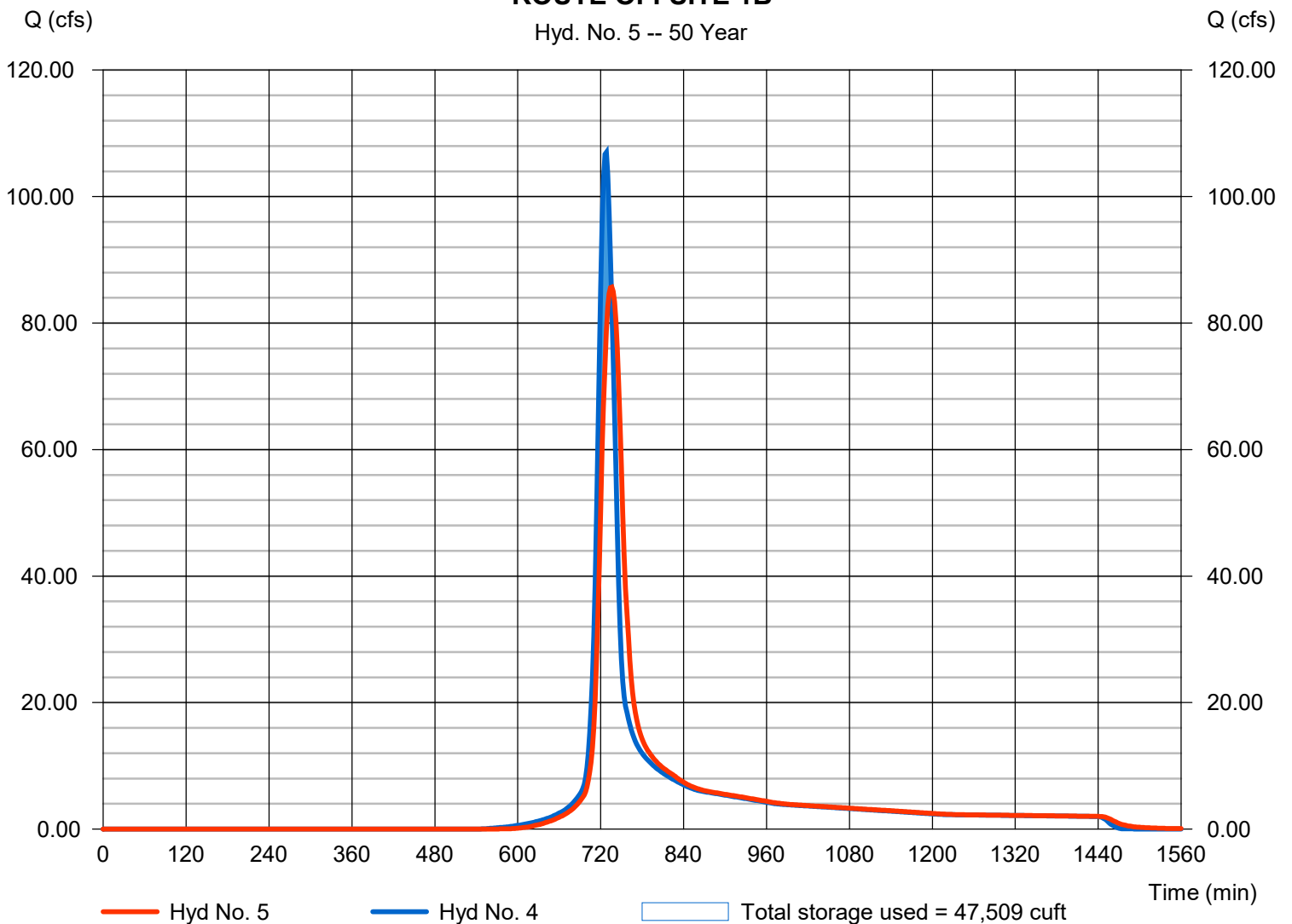
ROUTE OFFSITE 1B

Hydrograph type	= Reservoir	Peak discharge	= 85.69 cfs
Storm frequency	= 50 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 381,369 cuft
Inflow hyd. No.	= 4 - ROUTE 1A +OFFSITE 1B	Max. Elevation	= 1030.01 ft
Reservoir name	= OFFSITE 1B	Max. Storage	= 47,509 cuft

Storage Indication method used.

ROUTE OFFSITE 1B

Hyd. No. 5 -- 50 Year



Hydrograph Report

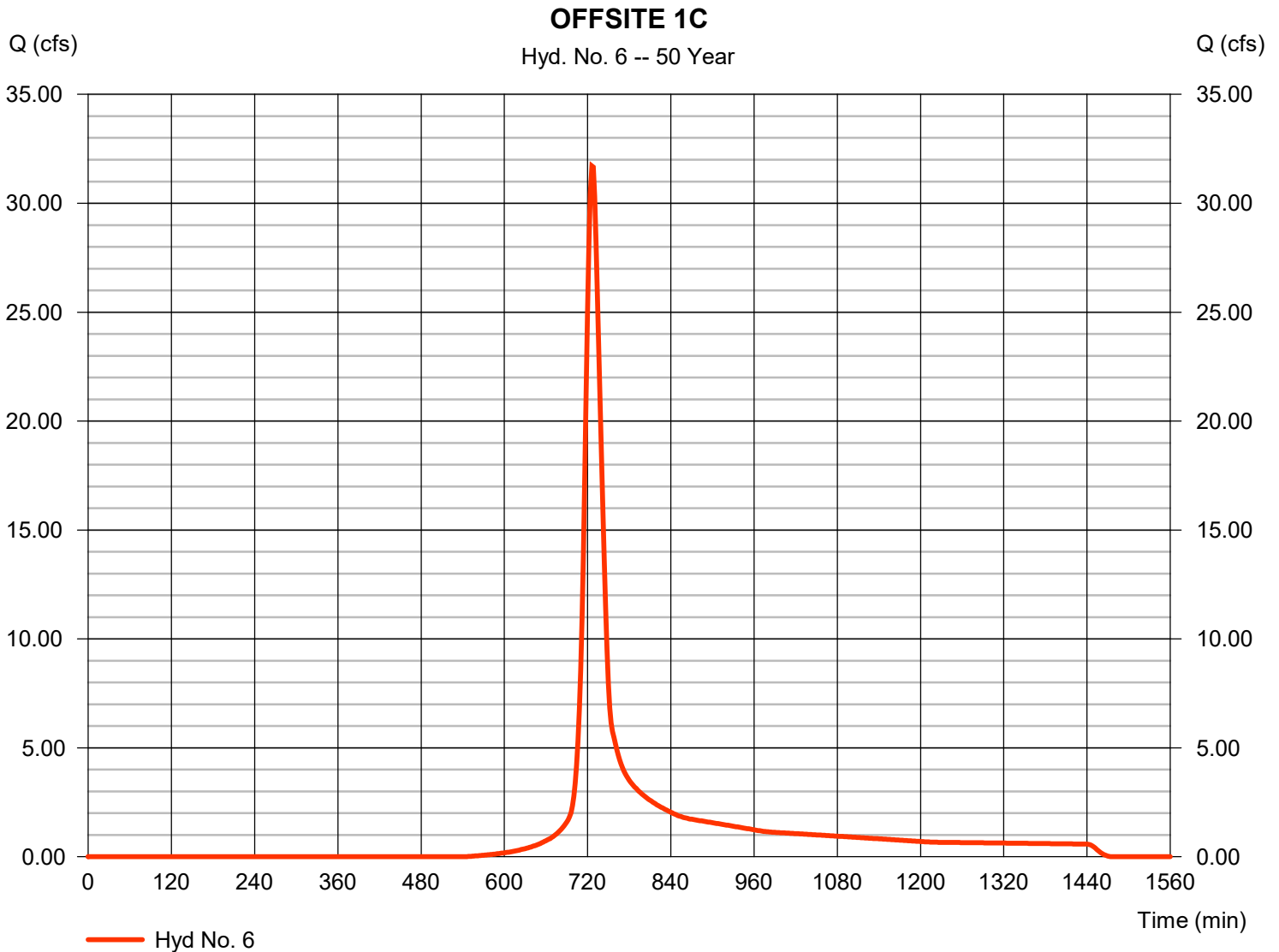
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 6

OFFSITE 1C

Hydrograph type	= SCS Runoff	Peak discharge	= 31.71 cfs
Storm frequency	= 50 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 110,610 cuft
Drainage area	= 9.640 ac	Curve number	= 68
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 21.00 min
Total precip.	= 6.62 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 7

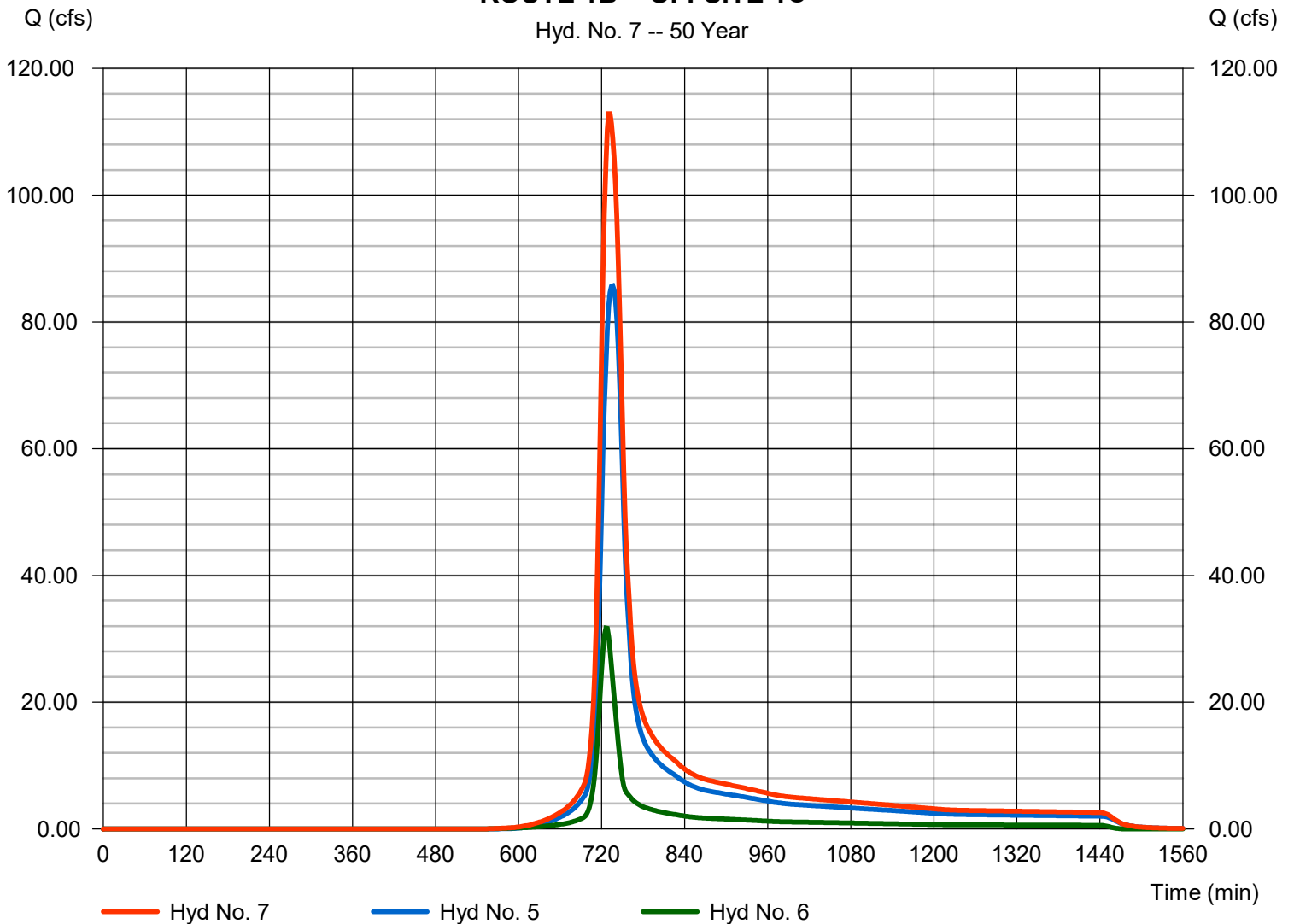
ROUTE 1B + OFFSITE 1C

Hydrograph type = Combine
 Storm frequency = 50 yrs
 Time interval = 2 min
 Inflow hyds. = 5, 6

Peak discharge = 112.87 cfs
 Time to peak = 730 min
 Hyd. volume = 491,979 cuft
 Contrib. drain. area = 9.640 ac

ROUTE 1B + OFFSITE 1C

Hyd. No. 7 -- 50 Year



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 8

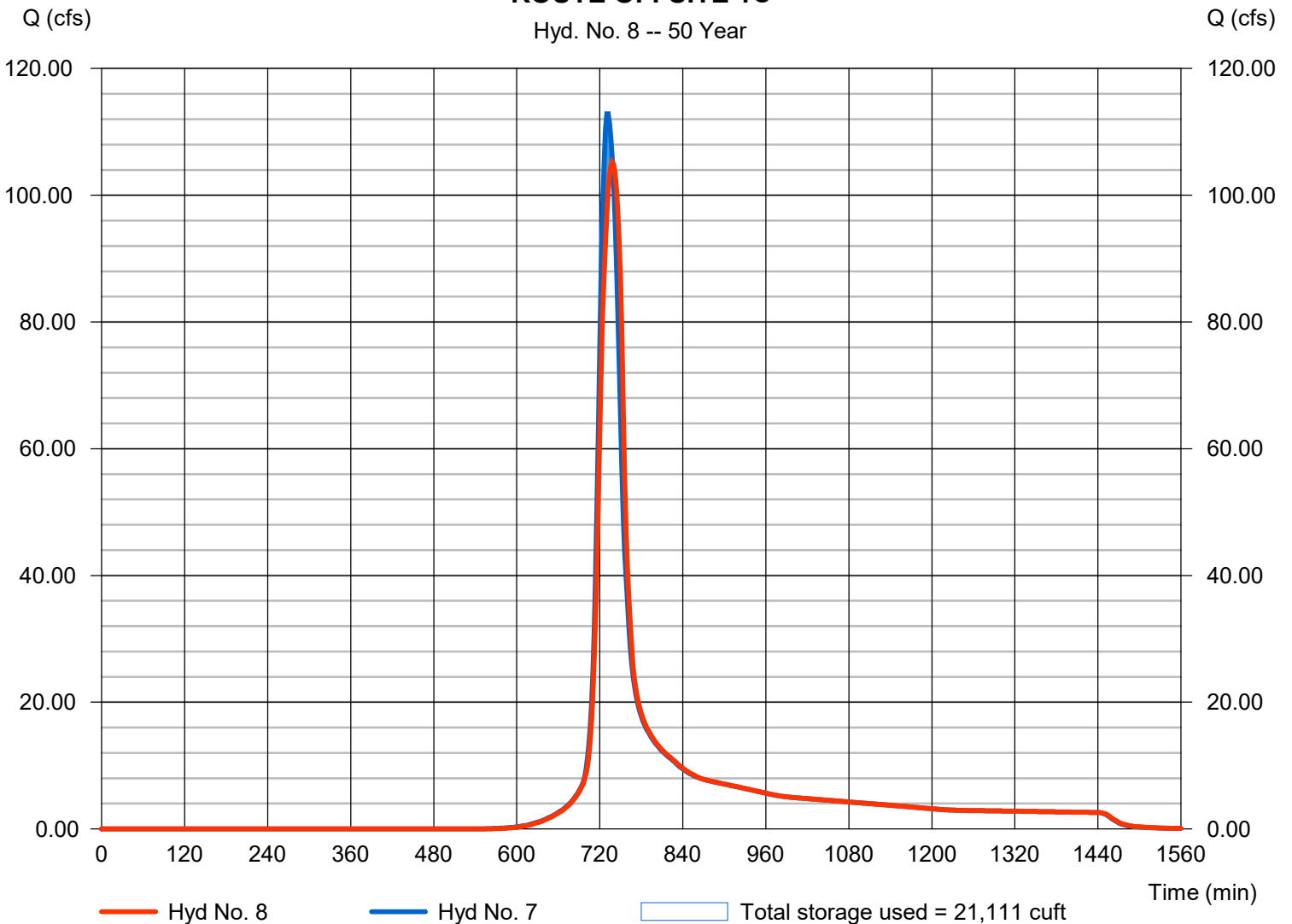
ROUTE OFFSITE 1C

Hydrograph type	= Reservoir	Peak discharge	= 105.24 cfs
Storm frequency	= 50 yrs	Time to peak	= 738 min
Time interval	= 2 min	Hyd. volume	= 491,978 cuft
Inflow hyd. No.	= 7 - ROUTE 1B + OFFSITE 1C	Max. Elevation	= 1019.02 ft
Reservoir name	= OFFSITE 1C	Max. Storage	= 21,111 cuft

Storage Indication method used.

ROUTE OFFSITE 1C

Hyd. No. 8 -- 50 Year



Hydrograph Report

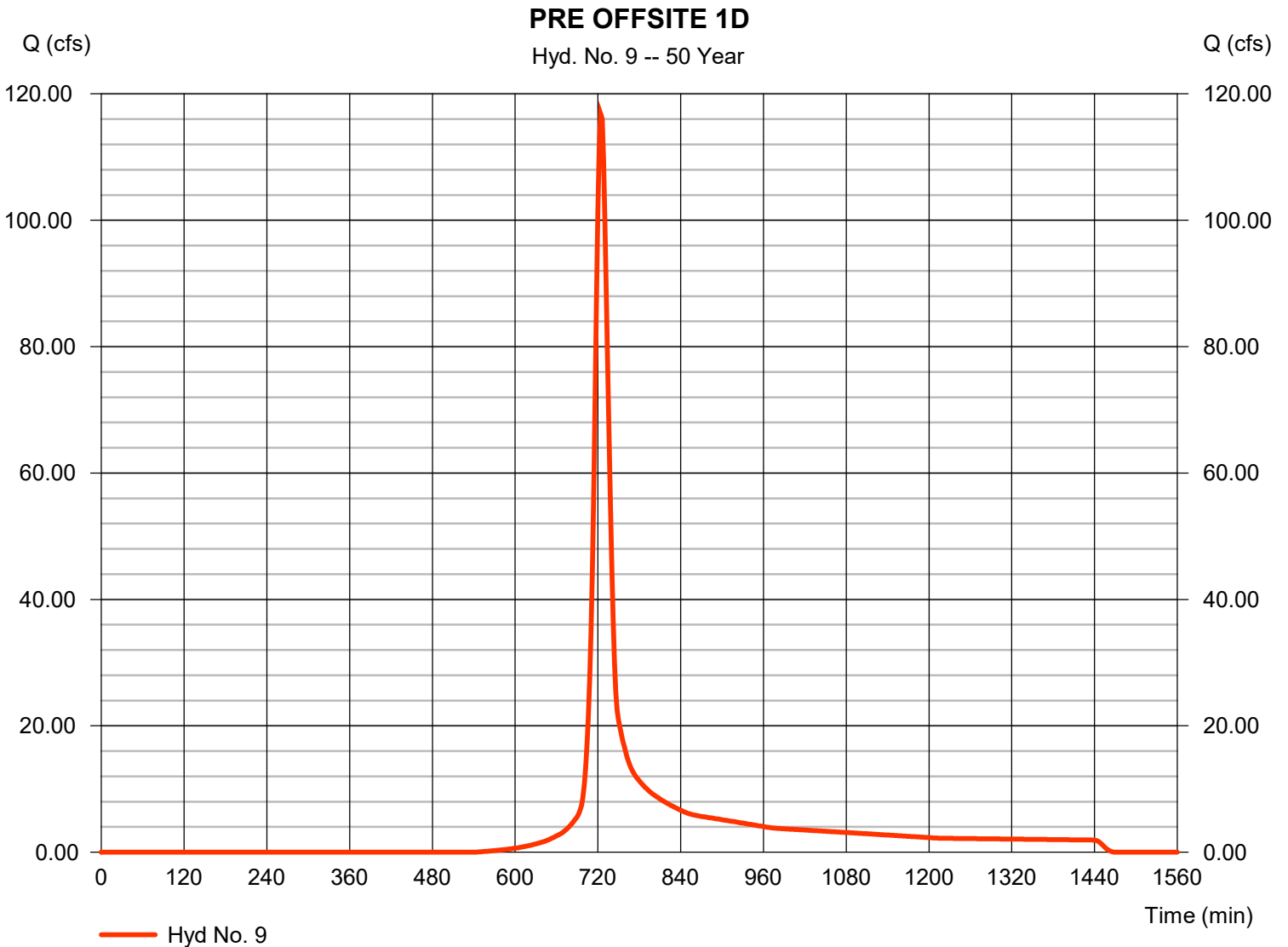
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Monday, 05 / 8 / 2023

Hyd. No. 9

PRE OFFSITE 1D

Hydrograph type	= SCS Runoff	Peak discharge	= 116.81 cfs
Storm frequency	= 50 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 367,829 cuft
Drainage area	= 32.630 ac	Curve number	= 68
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 18.00 min
Total precip.	= 6.62 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

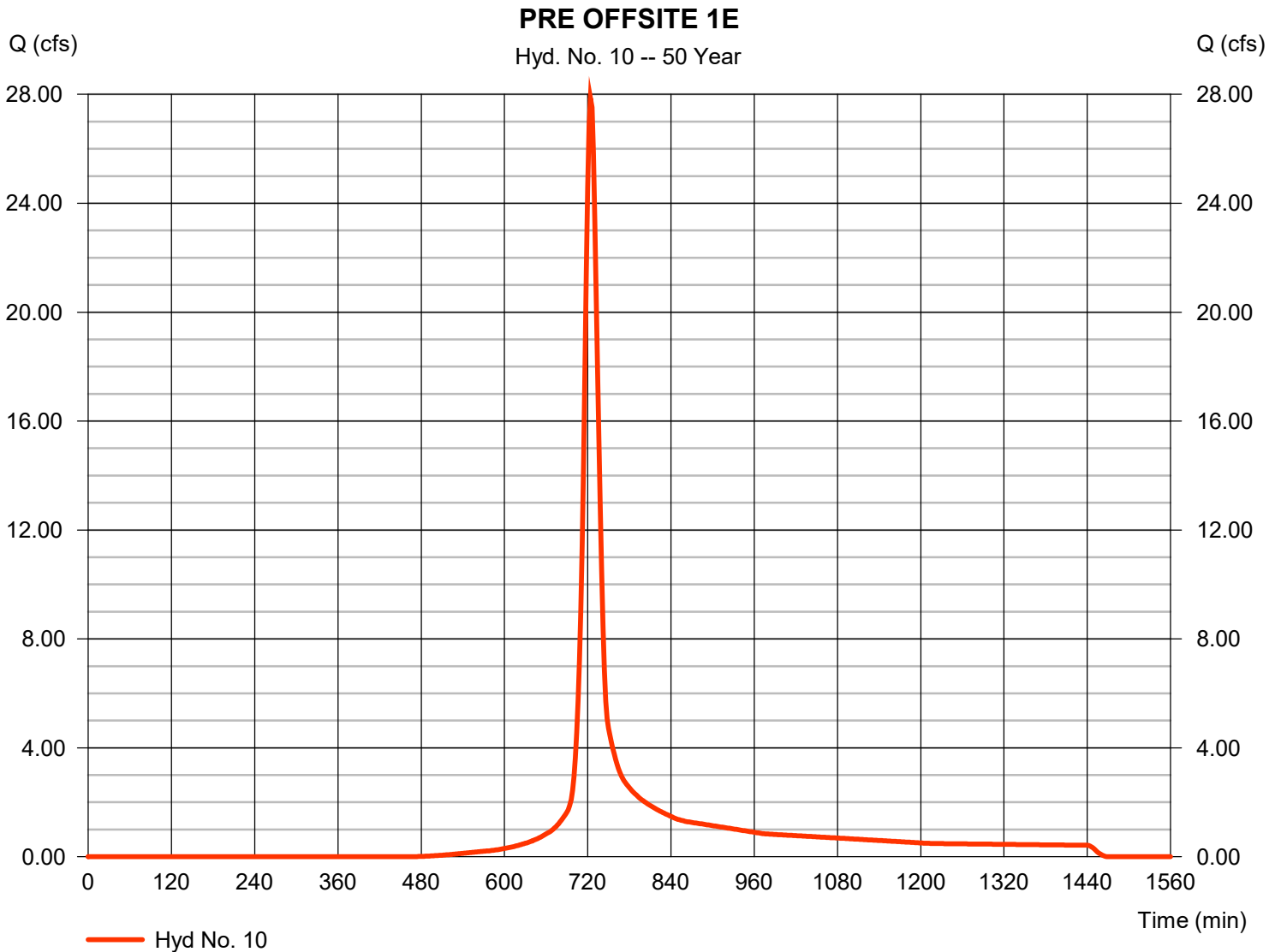
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 10

PRE OFFSITE 1E

Hydrograph type	= SCS Runoff	Peak discharge	= 27.87 cfs
Storm frequency	= 50 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 87,138 cuft
Drainage area	= 6.650 ac	Curve number	= 73
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 17.00 min
Total precip.	= 6.62 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 11

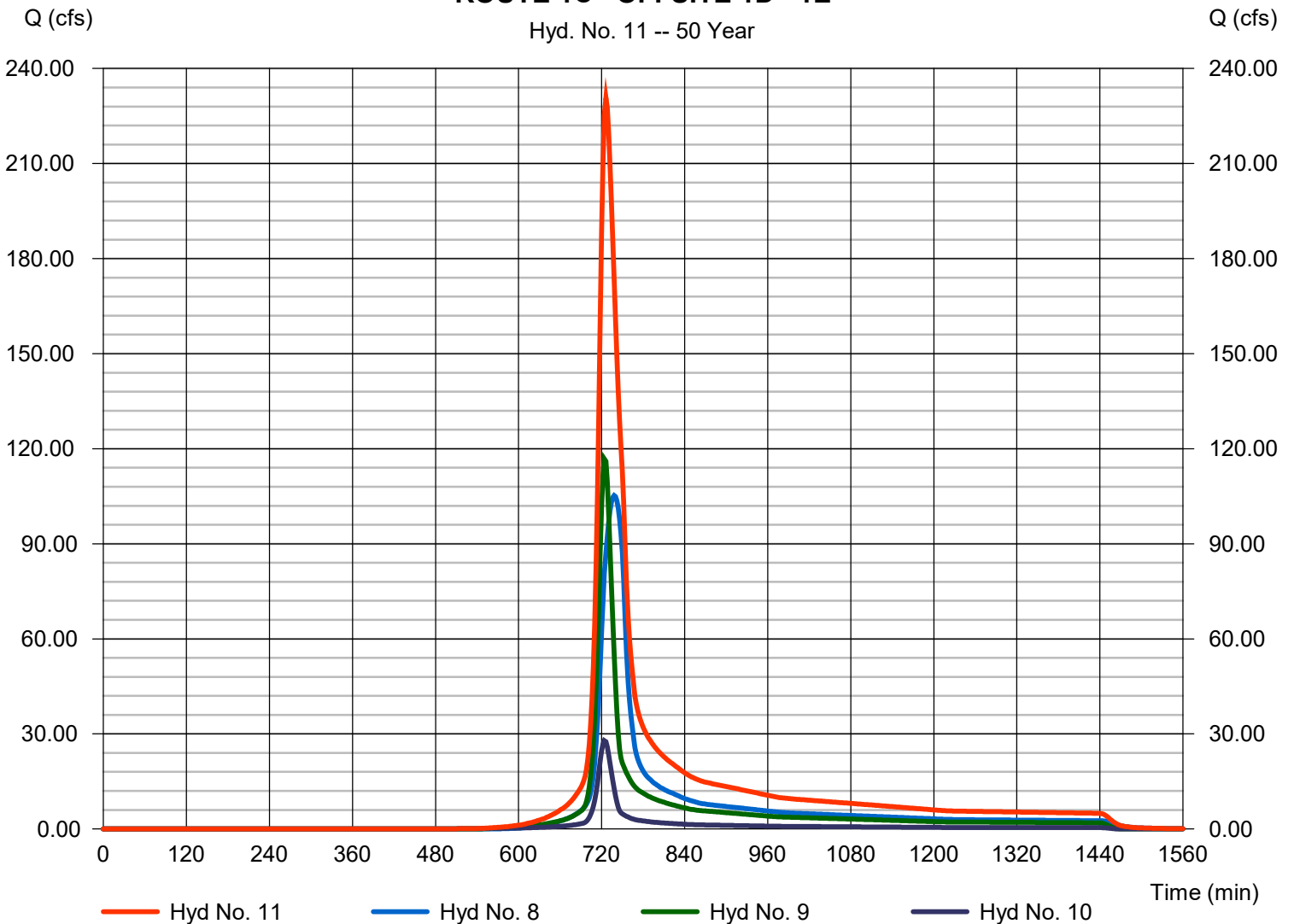
ROUTE 1C +OFFSITE 1D +1E

Hydrograph type = Combine
 Storm frequency = 50 yrs
 Time interval = 2 min
 Inflow hyds. = 8, 9, 10

Peak discharge = 230.73 cfs
 Time to peak = 726 min
 Hyd. volume = 946,944 cuft
 Contrib. drain. area = 39.280 ac

ROUTE 1C +OFFSITE 1D +1E

Hyd. No. 11 -- 50 Year



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 12

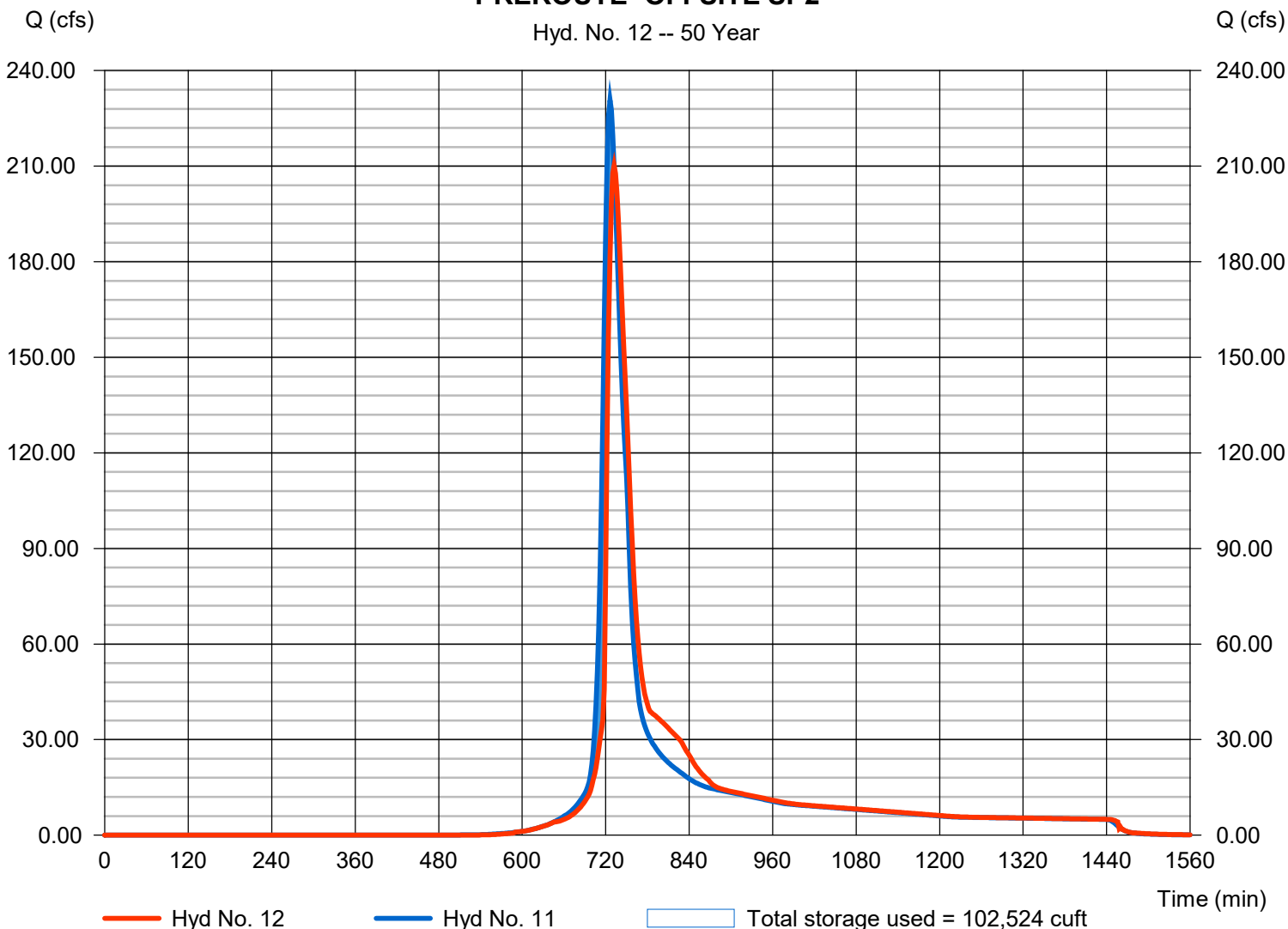
PREROUTE- OFFSITE SP2

Hydrograph type	= Reservoir	Peak discharge	= 210.24 cfs
Storm frequency	= 50 yrs	Time to peak	= 732 min
Time interval	= 2 min	Hyd. volume	= 946,938 cuft
Inflow hyd. No.	= 11 - ROUTE 1C +OFFSITE 1D	Max. Elevation	= 1014.42 ft
Reservoir name	= OFFSITE 1D	Max. Storage	= 102,524 cuft

Storage Indication method used.

PREROUTE- OFFSITE SP2

Hyd. No. 12 -- 50 Year



Hydrograph Report

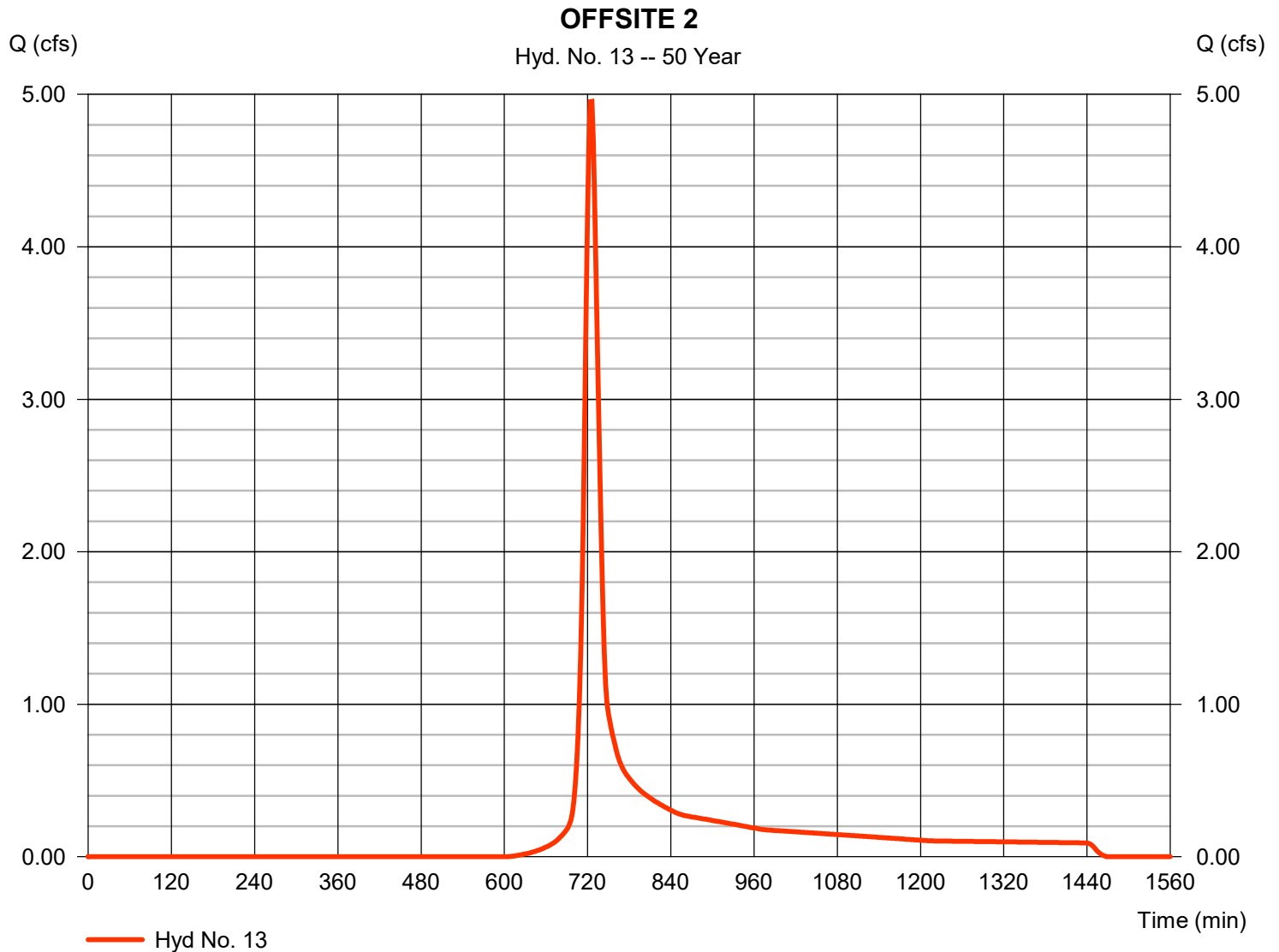
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Monday, 05 / 8 / 2023

Hyd. No. 13

OFFSITE 2

Hydrograph type	= SCS Runoff	Peak discharge	= 4.955 cfs
Storm frequency	= 50 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 15,882 cuft
Drainage area	= 1.670 ac	Curve number	= 63
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 18.00 min
Total precip.	= 6.62 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

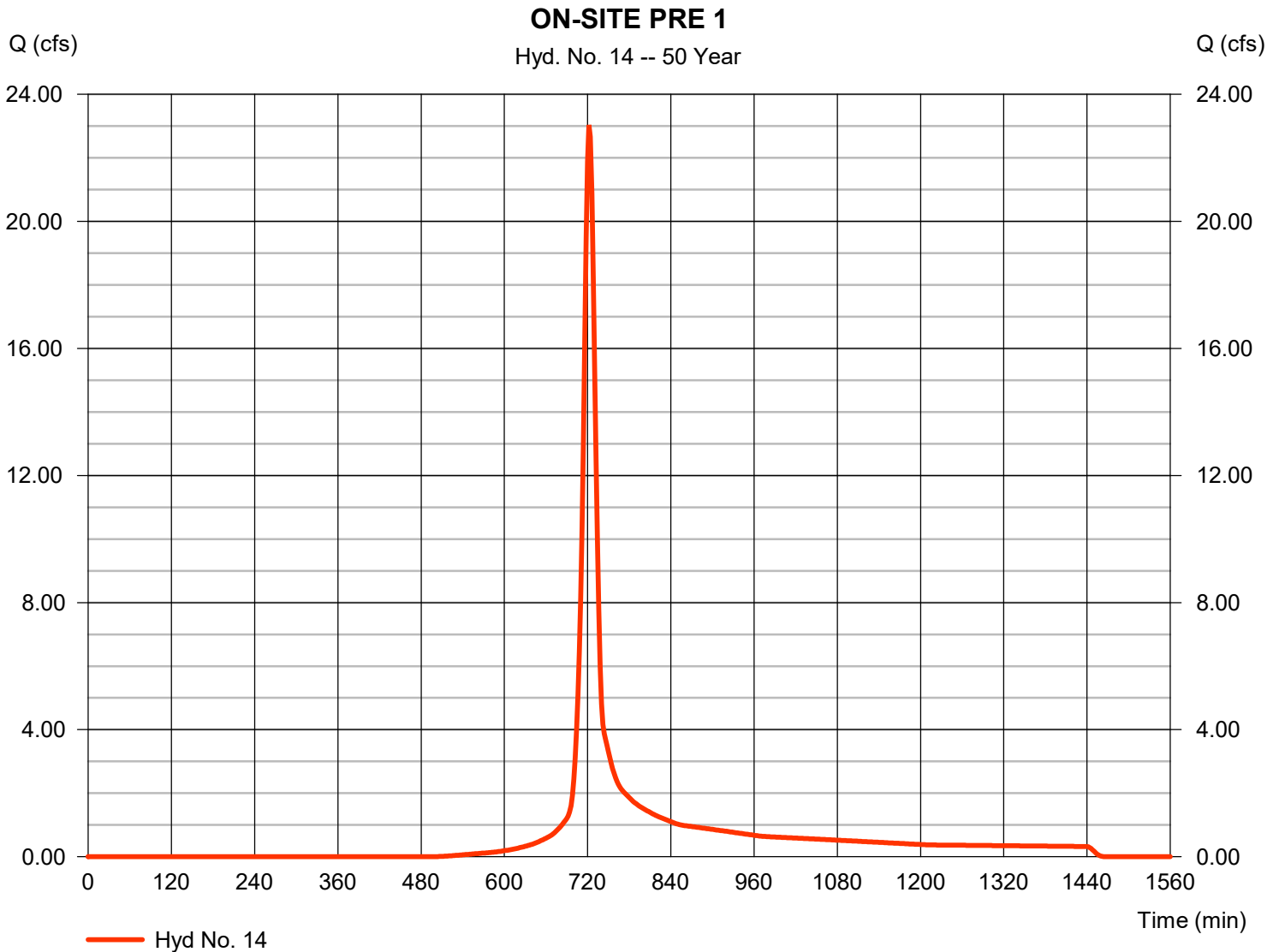
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Monday, 05 / 8 / 2023

Hyd. No. 14

ON-SITE PRE 1

Hydrograph type	= SCS Runoff	Peak discharge	= 23.04 cfs
Storm frequency	= 50 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 64,611 cuft
Drainage area	= 5.360 ac	Curve number	= 71
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 16.00 min
Total precip.	= 6.62 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

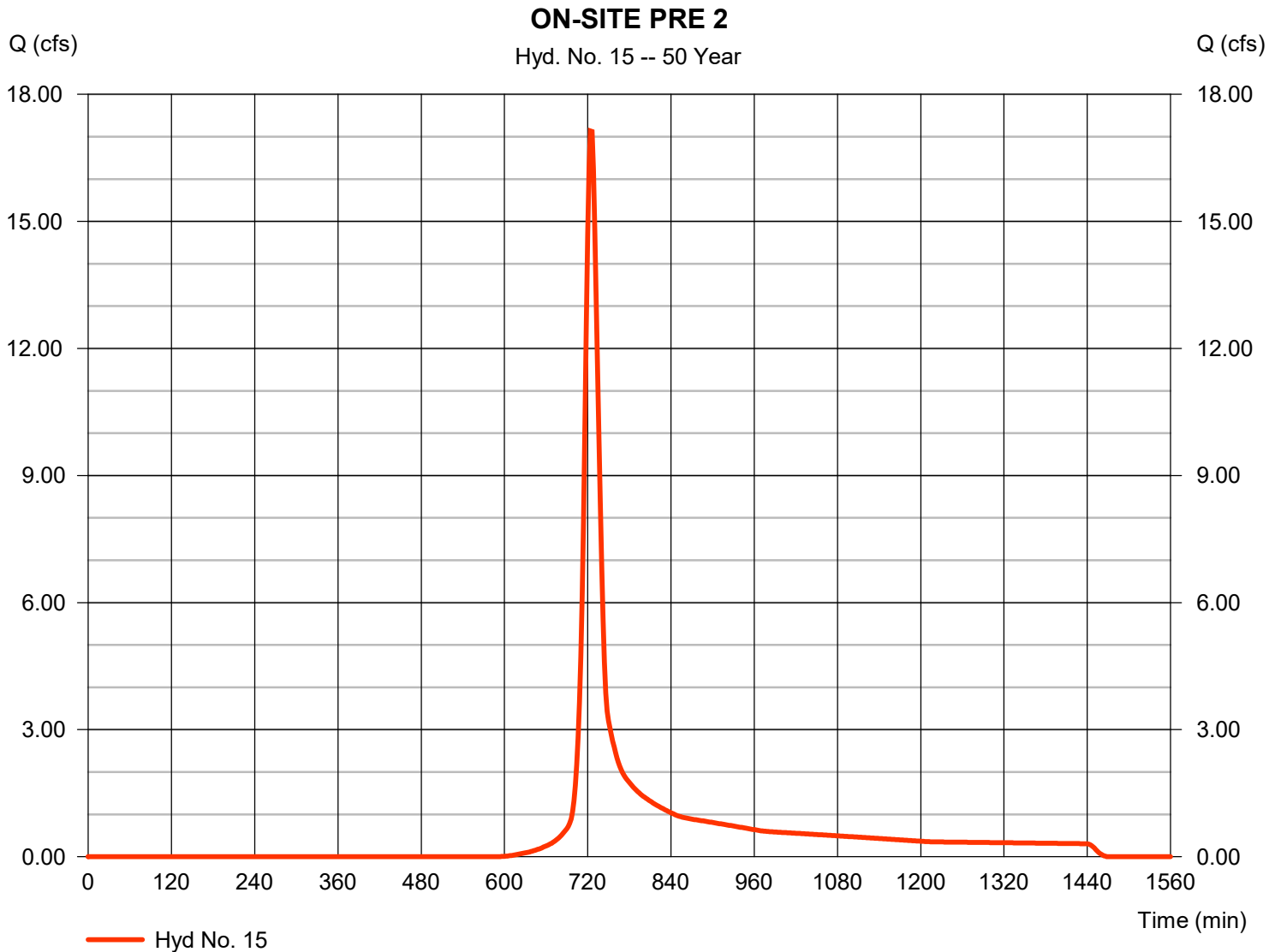
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Monday, 05 / 8 / 2023

Hyd. No. 15

ON-SITE PRE 2

Hydrograph type	= SCS Runoff	Peak discharge	= 17.14 cfs
Storm frequency	= 50 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 54,705 cuft
Drainage area	= 5.550 ac	Curve number	= 64
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 17.00 min
Total precip.	= 6.62 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

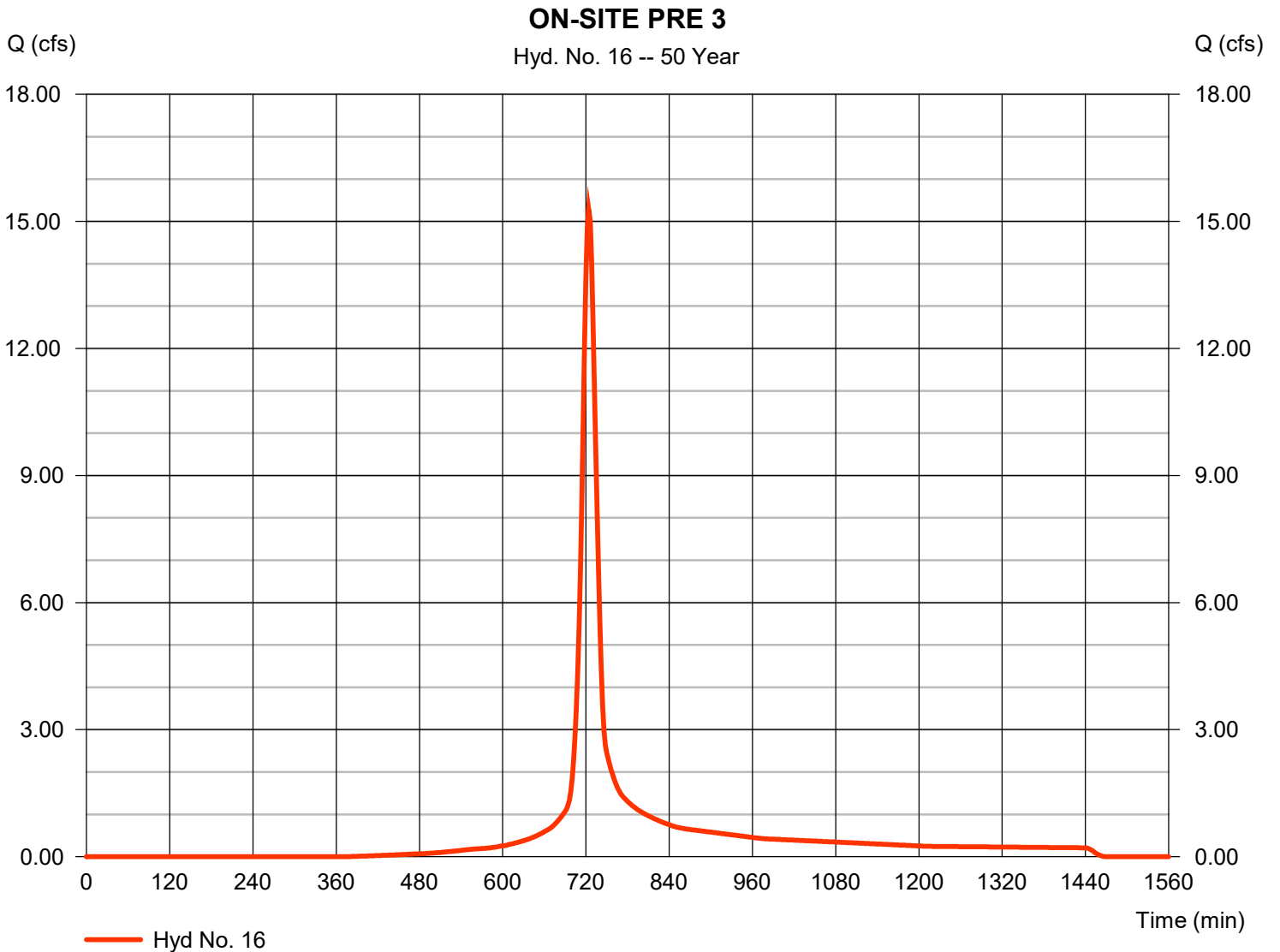
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Monday, 05 / 8 / 2023

Hyd. No. 16

ON-SITE PRE 3

Hydrograph type	= SCS Runoff	Peak discharge	= 15.29 cfs
Storm frequency	= 50 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 47,998 cuft
Drainage area	= 3.120 ac	Curve number	= 79
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 18.00 min
Total precip.	= 6.62 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

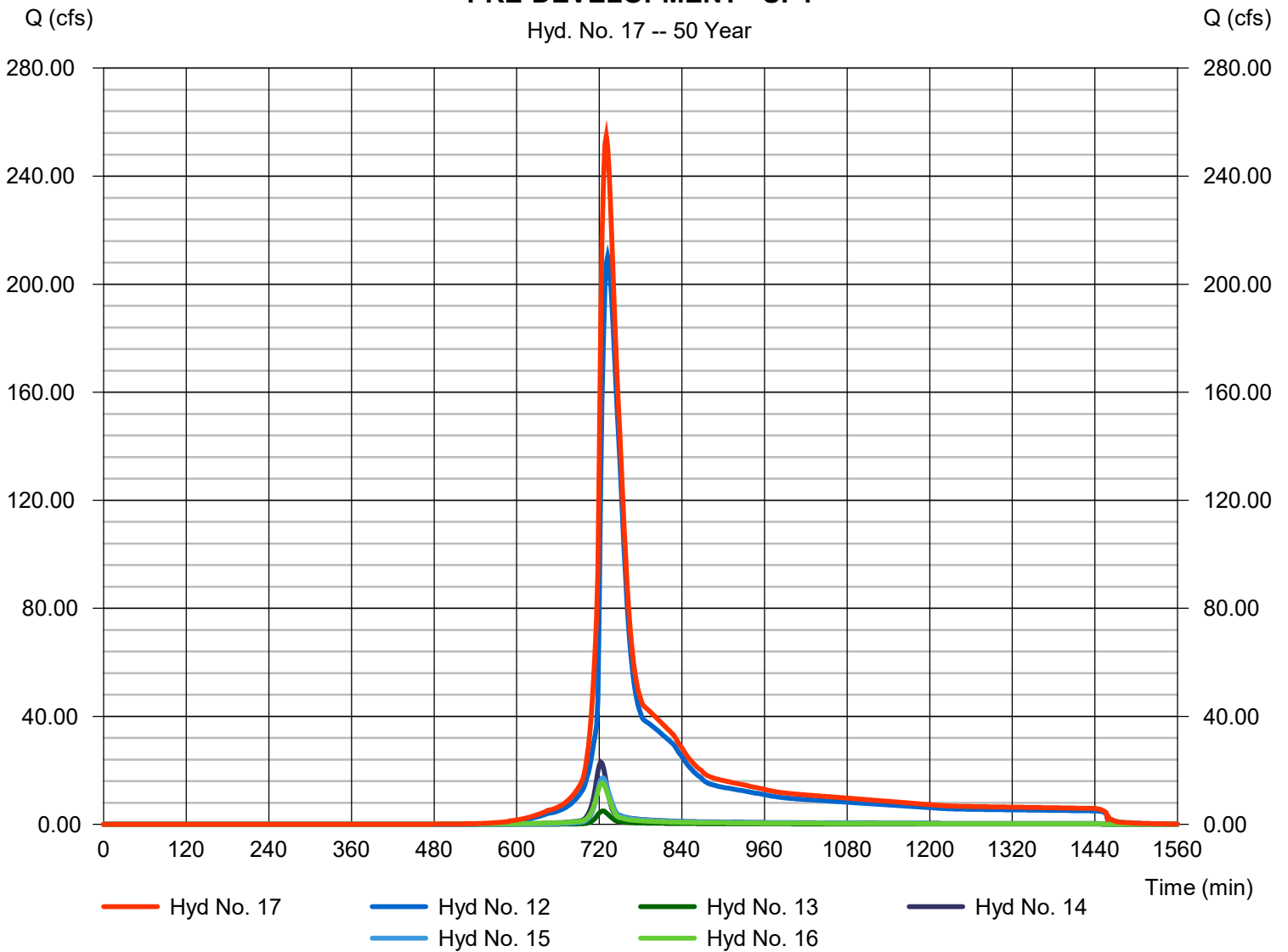
Hyd. No. 17

PRE-DEVELOPMENT - SP1

Hydrograph type	= Combine	Peak discharge	= 254.75 cfs
Storm frequency	= 50 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 1,130,132 cuft
Inflow hyds.	= 12, 13, 14, 15, 16	Contrib. drain. area	= 15.700 ac

PRE-DEVELOPMENT - SP1

Hyd. No. 17 -- 50 Year



Hydrograph Report

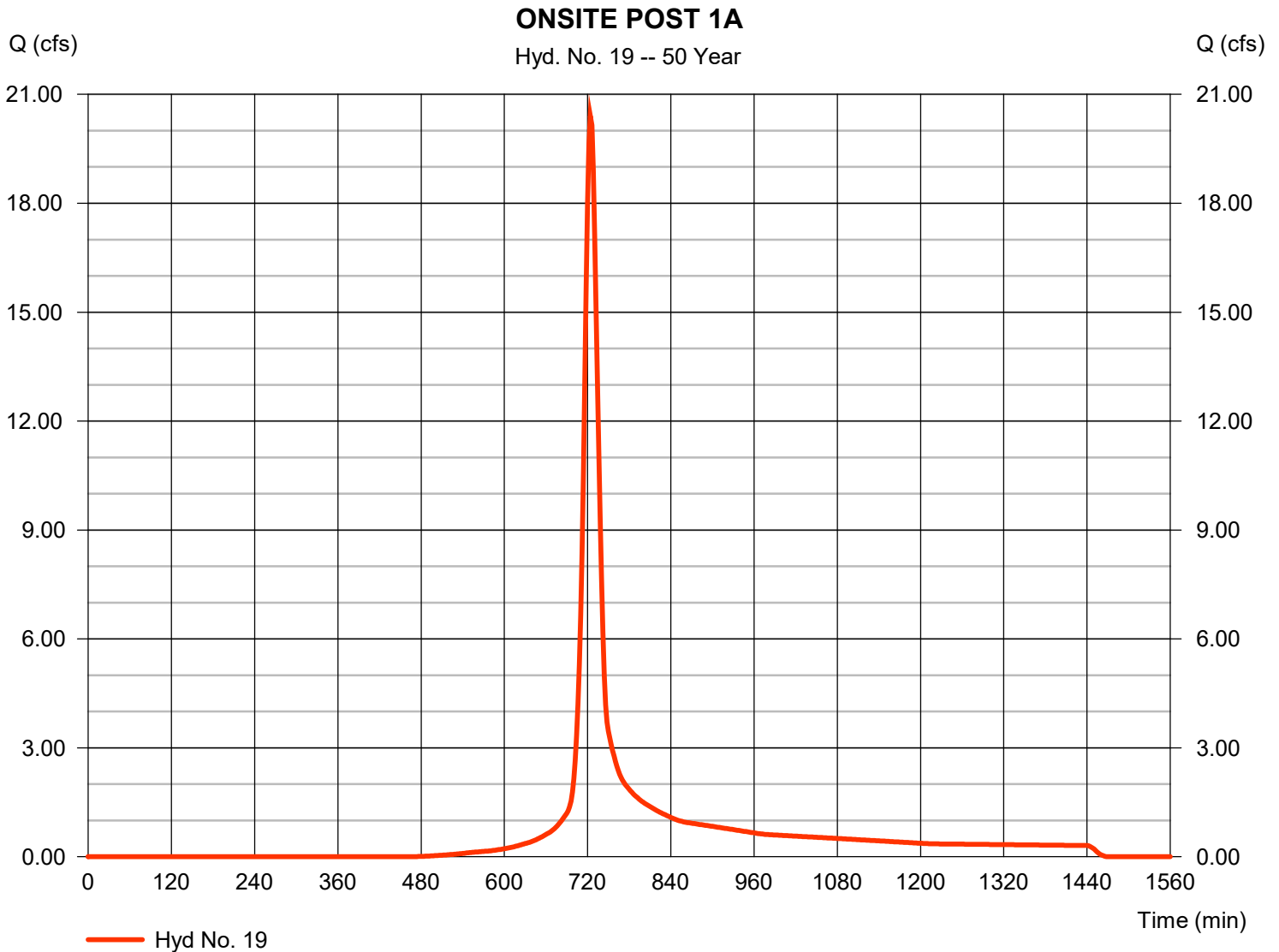
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Monday, 05 / 8 / 2023

Hyd. No. 19

ONSITE POST 1A

Hydrograph type	= SCS Runoff	Peak discharge	= 20.41 cfs
Storm frequency	= 50 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 63,814 cuft
Drainage area	= 4.870 ac	Curve number	= 73
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 18.00 min
Total precip.	= 6.62 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

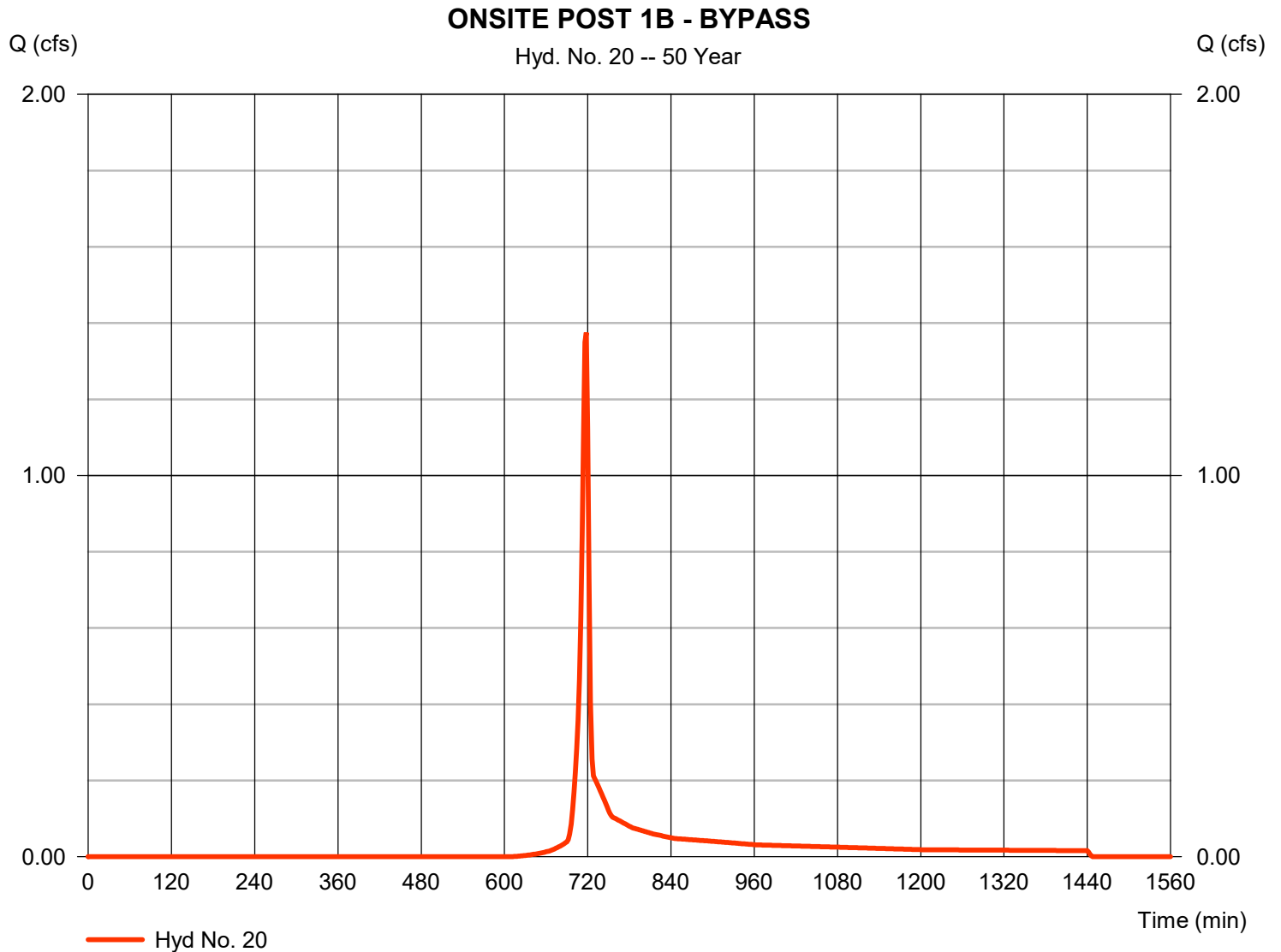
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Monday, 05 / 8 / 2023

Hyd. No. 20

ONSITE POST 1B - BYPASS

Hydrograph type	= SCS Runoff	Peak discharge	= 1.375 cfs
Storm frequency	= 50 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 2,750 cuft
Drainage area	= 0.320 ac	Curve number	= 62
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.62 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

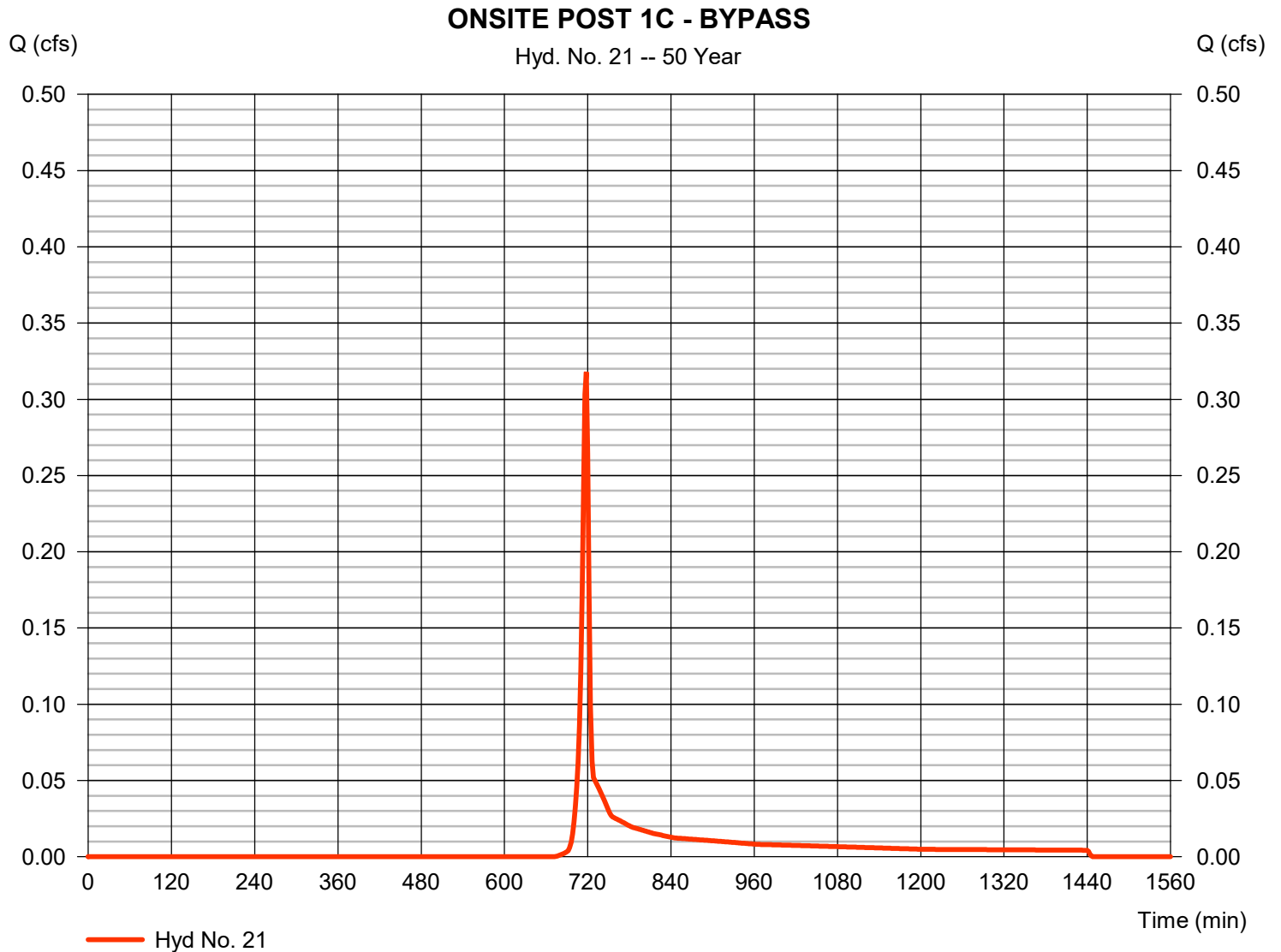
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Monday, 05 / 8 / 2023

Hyd. No. 21

ONSITE POST 1C - BYPASS

Hydrograph type	= SCS Runoff	Peak discharge	= 0.318 cfs
Storm frequency	= 50 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 642 cuft
Drainage area	= 0.100 ac	Curve number	= 55
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.62 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

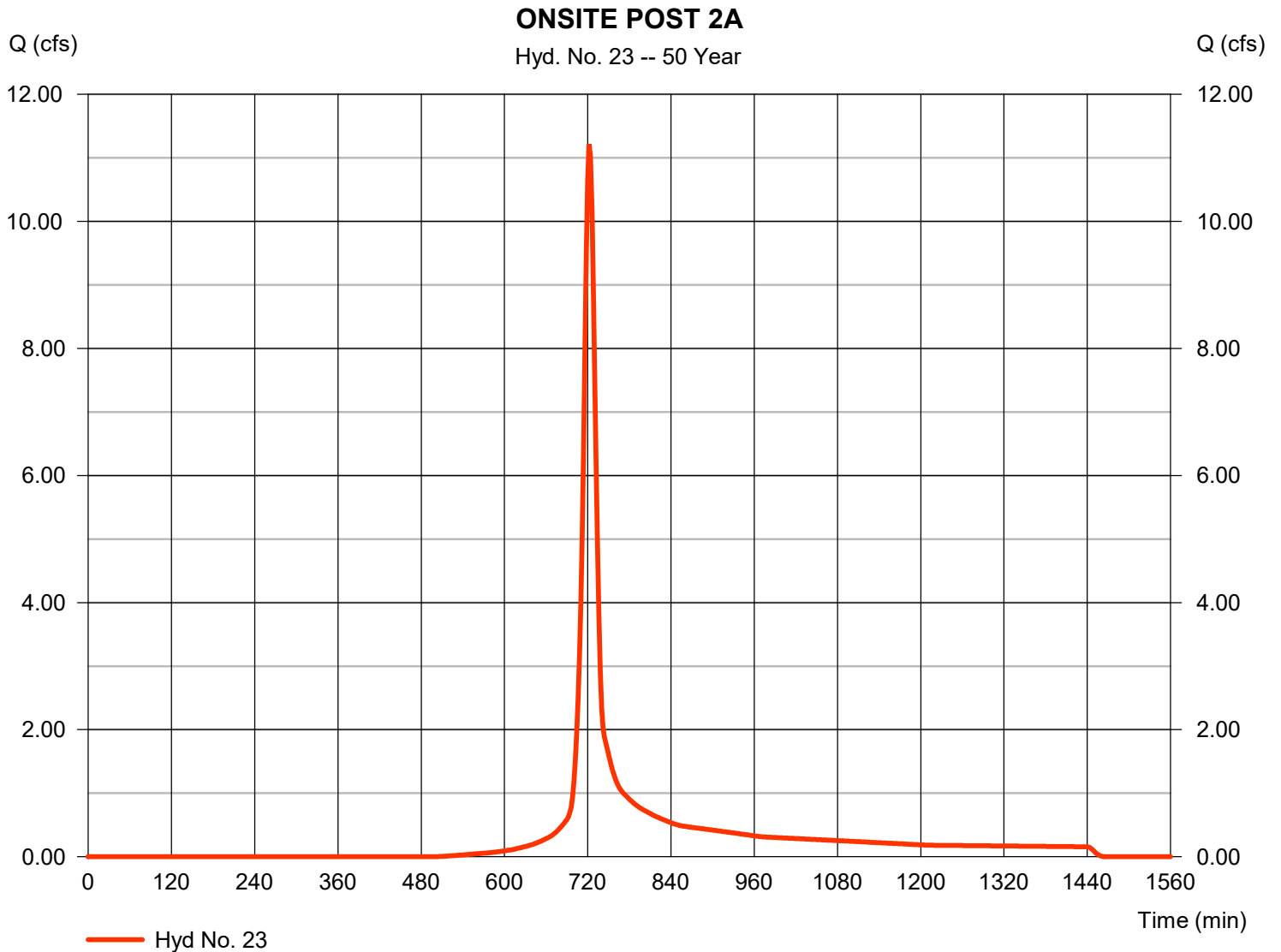
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Monday, 05 / 8 / 2023

Hyd. No. 23

ONSITE POST 2A

Hydrograph type	= SCS Runoff	Peak discharge	= 11.22 cfs
Storm frequency	= 50 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 31,462 cuft
Drainage area	= 2.610 ac	Curve number	= 71
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 16.00 min
Total precip.	= 6.62 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

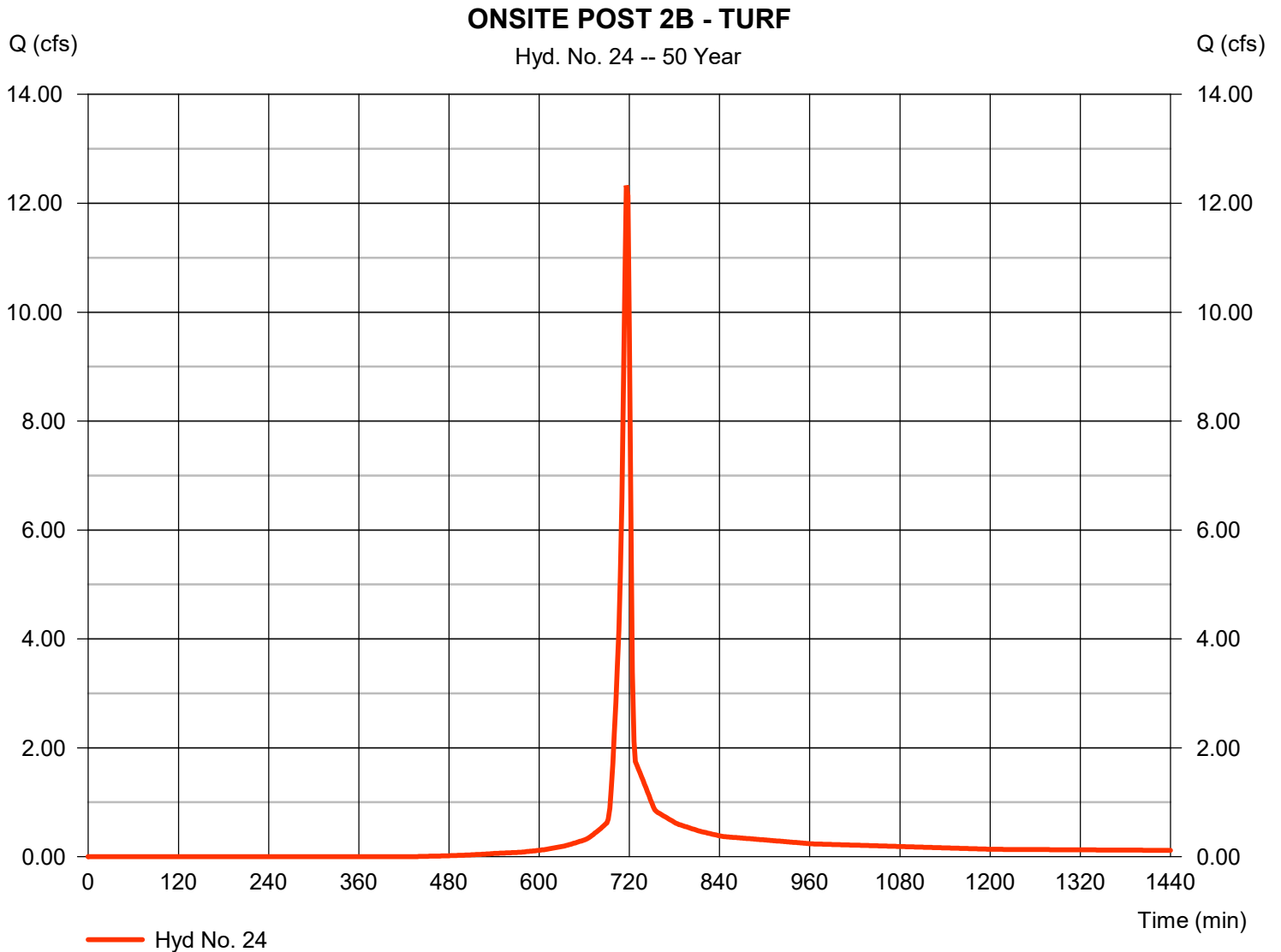
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Monday, 05 / 8 / 2023

Hyd. No. 24

ONSITE POST 2B - TURF

Hydrograph type	= SCS Runoff	Peak discharge	= 12.33 cfs
Storm frequency	= 50 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 25,067 cuft
Drainage area	= 1.930 ac	Curve number	= 75
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 6.62 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

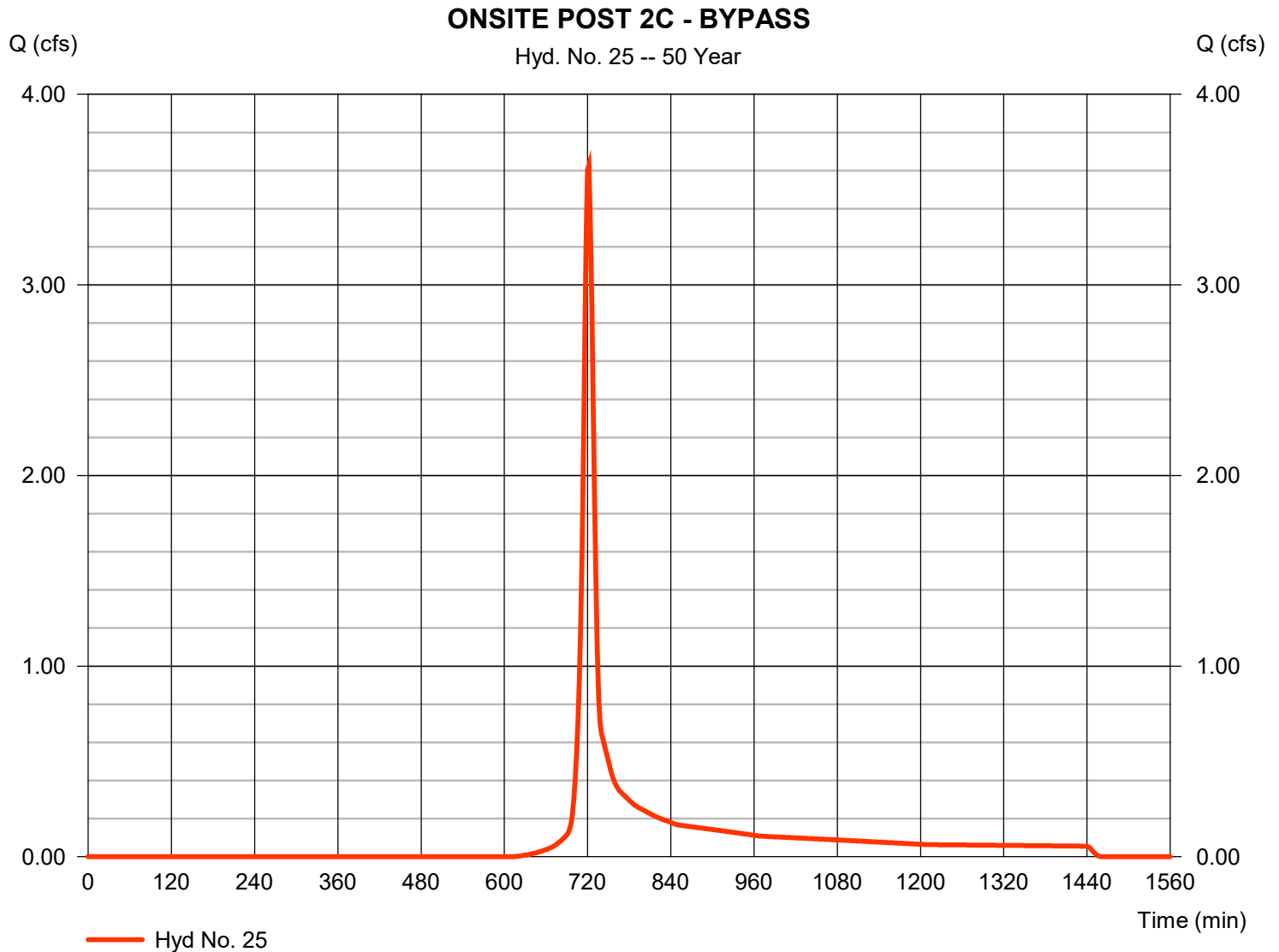
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Monday, 05 / 8 / 2023

Hyd. No. 25

ONSITE POST 2C - BYPASS

Hydrograph type	= SCS Runoff	Peak discharge	= 3.628 cfs
Storm frequency	= 50 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 9,547 cuft
Drainage area	= 1.010 ac	Curve number	= 62
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 12.00 min
Total precip.	= 6.62 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

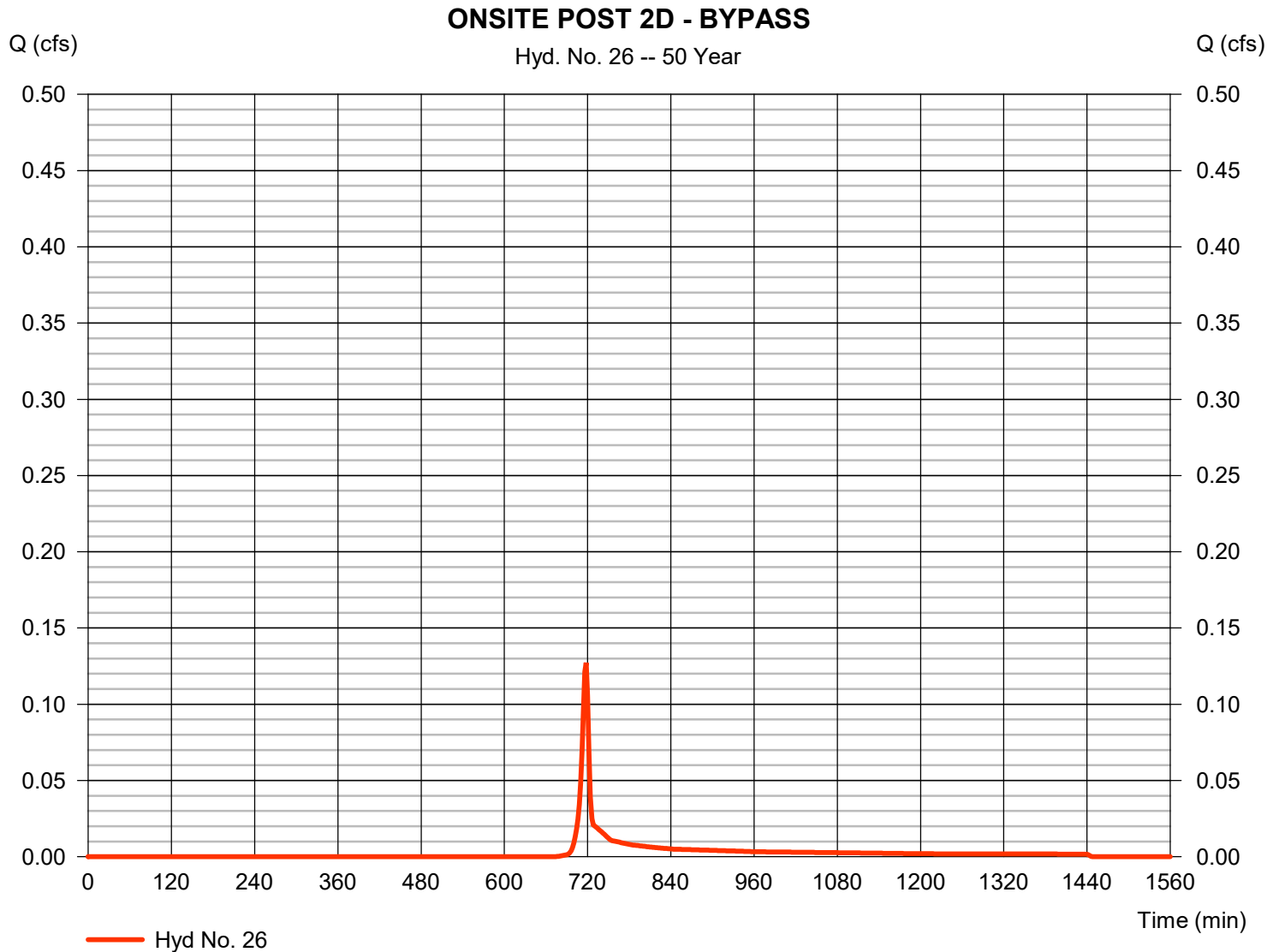
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Monday, 05 / 8 / 2023

Hyd. No. 26

ONSITE POST 2D - BYPASS

Hydrograph type	= SCS Runoff	Peak discharge	= 0.127 cfs
Storm frequency	= 50 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 257 cuft
Drainage area	= 0.040 ac	Curve number	= 55
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.62 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

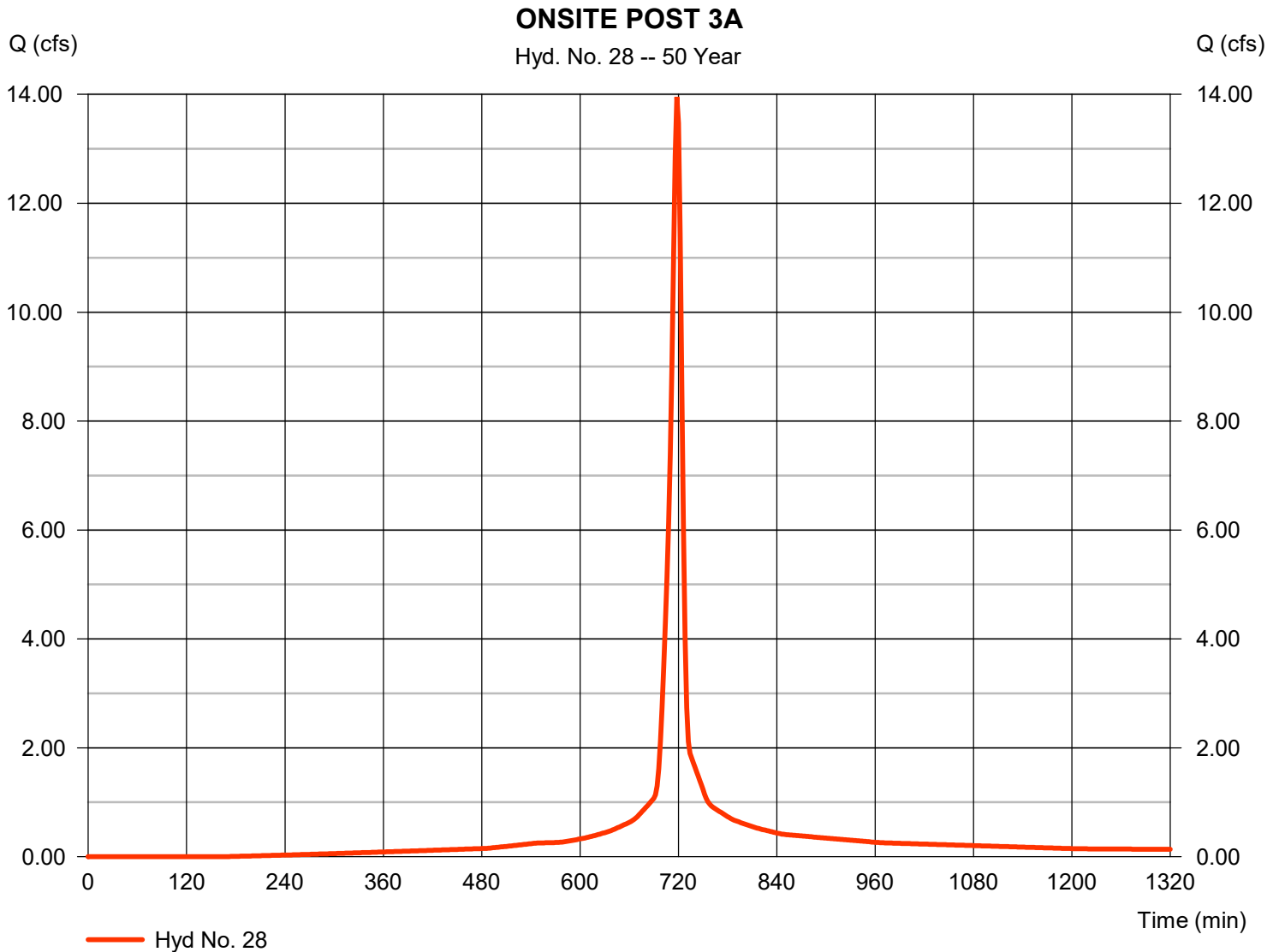
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Monday, 05 / 8 / 2023

Hyd. No. 28

ONSITE POST 3A

Hydrograph type	= SCS Runoff	Peak discharge	= 13.95 cfs
Storm frequency	= 50 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 34,545 cuft
Drainage area	= 1.710 ac	Curve number	= 91
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 7.00 min
Total precip.	= 6.62 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

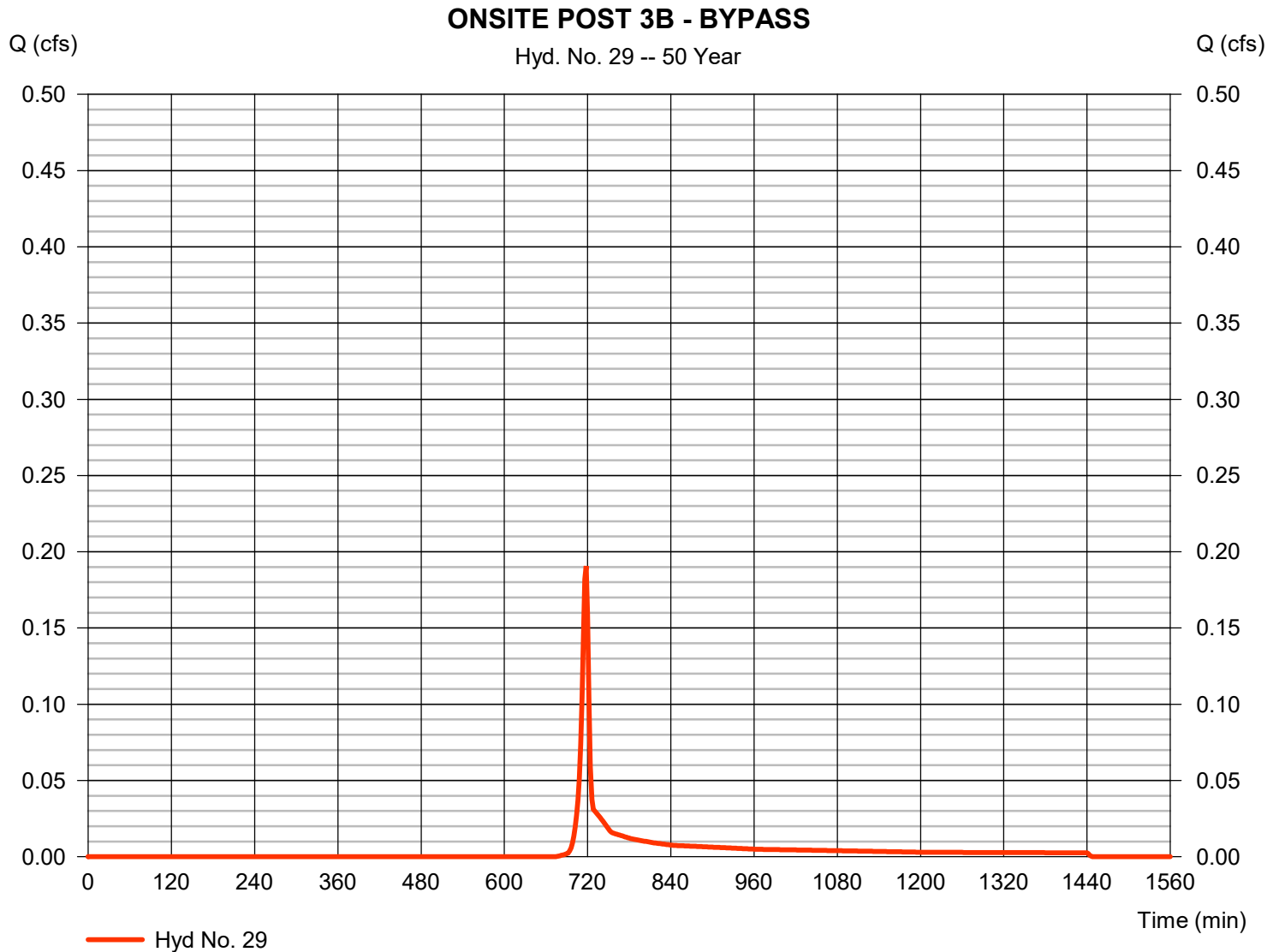
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Monday, 05 / 8 / 2023

Hyd. No. 29

ONSITE POST 3B - BYPASS

Hydrograph type	= SCS Runoff	Peak discharge	= 0.191 cfs
Storm frequency	= 50 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 385 cuft
Drainage area	= 0.060 ac	Curve number	= 55
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.62 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

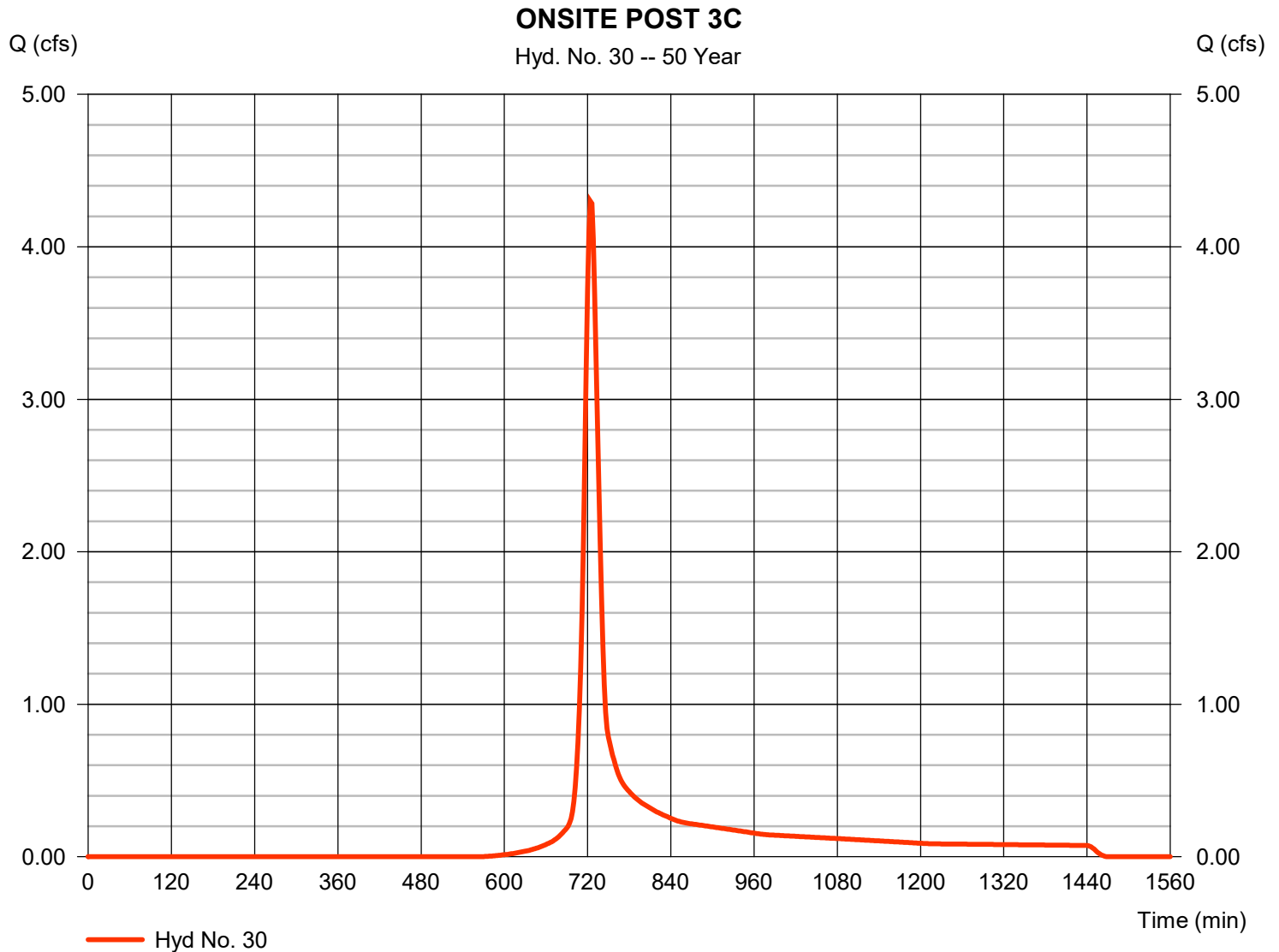
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 30

ONSITE POST 3C

Hydrograph type	= SCS Runoff	Peak discharge	= 4.301 cfs
Storm frequency	= 50 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 13,621 cuft
Drainage area	= 1.290 ac	Curve number	= 66
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 19.00 min
Total precip.	= 6.62 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

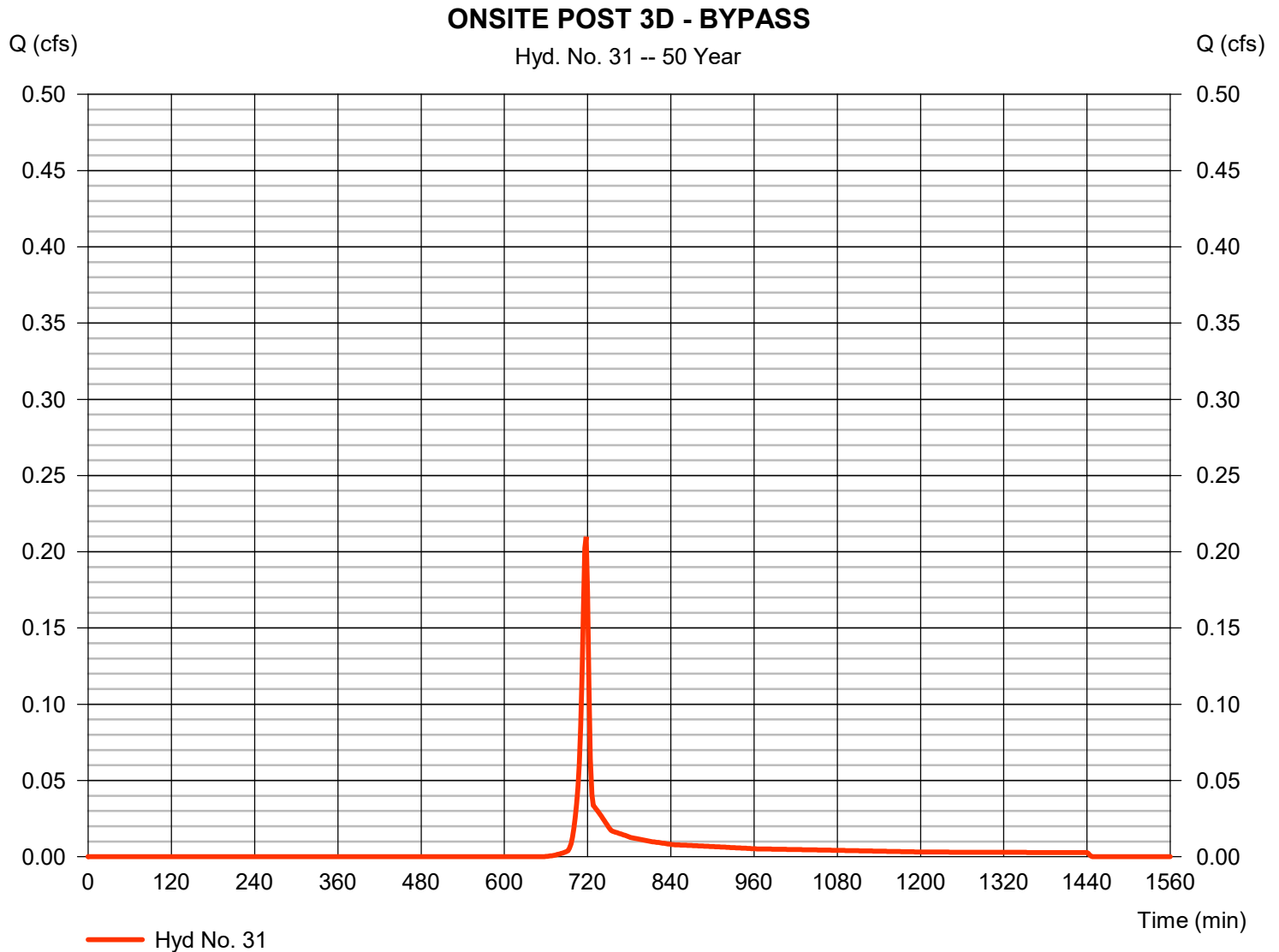
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Monday, 05 / 8 / 2023

Hyd. No. 31

ONSITE POST 3D - BYPASS

Hydrograph type	= SCS Runoff	Peak discharge	= 0.210 cfs
Storm frequency	= 50 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 422 cuft
Drainage area	= 0.060 ac	Curve number	= 57
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.62 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

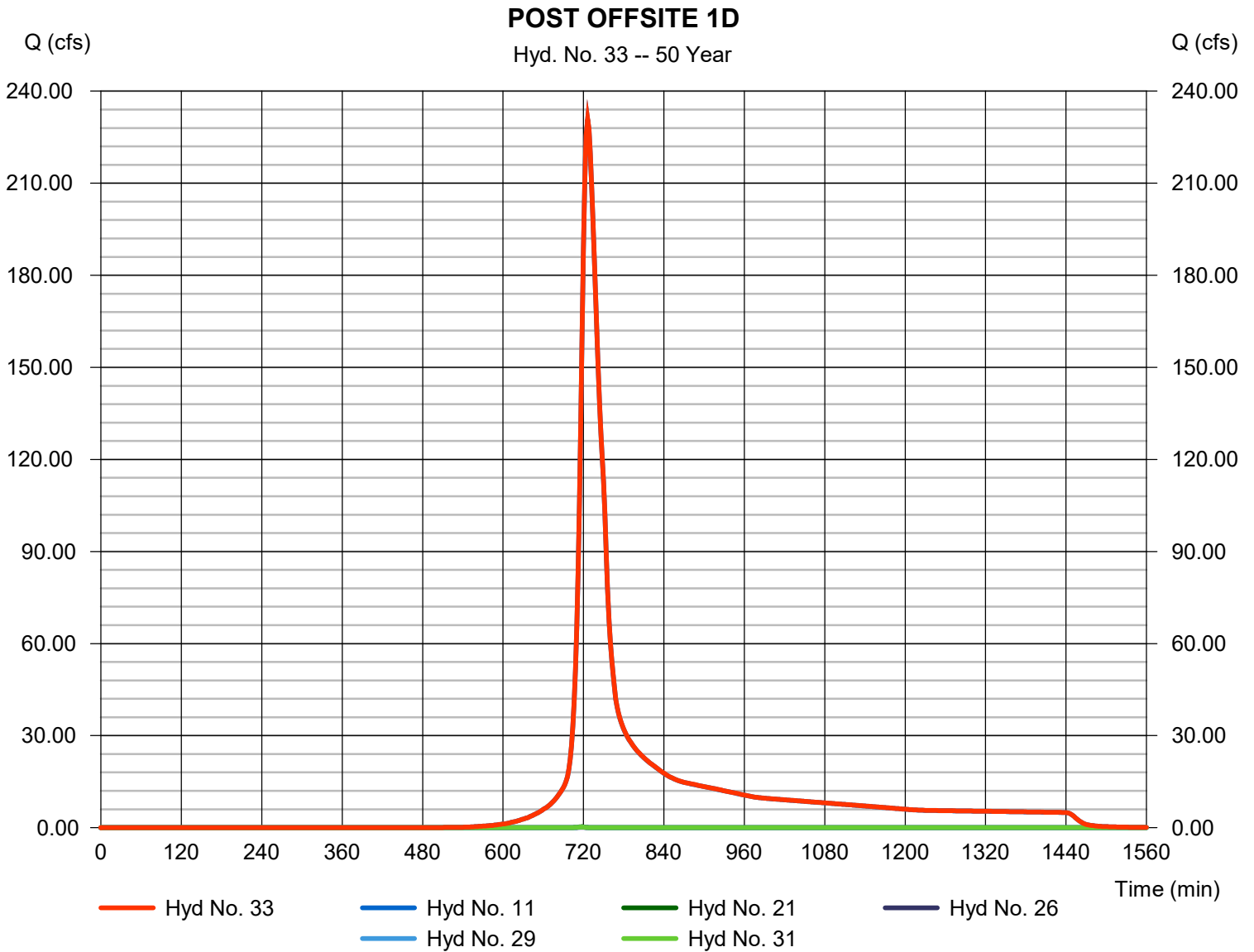
Monday, 05 / 8 / 2023

Hyd. No. 33

POST OFFSITE 1D

Hydrograph type = Combine
 Storm frequency = 50 yrs
 Time interval = 2 min
 Inflow hyds. = 11, 21, 26, 29, 31

Peak discharge = 230.89 cfs
 Time to peak = 726 min
 Hyd. volume = 948,651 cuft
 Contrib. drain. area = 0.260 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 34

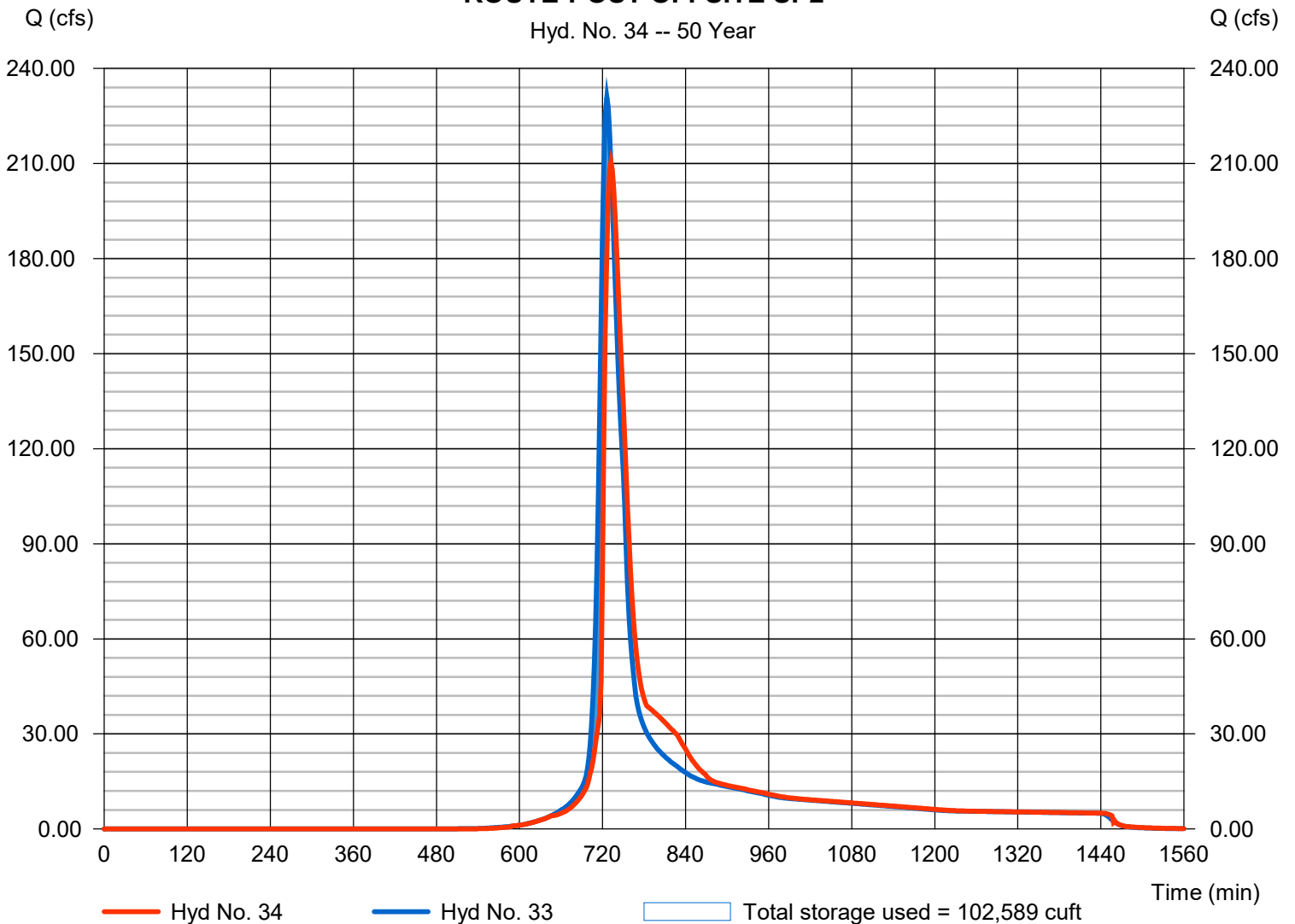
ROUTE-POST OFFSITE SP2

Hydrograph type	= Reservoir	Peak discharge	= 210.49 cfs
Storm frequency	= 50 yrs	Time to peak	= 732 min
Time interval	= 2 min	Hyd. volume	= 948,643 cuft
Inflow hyd. No.	= 33 - POST OFFSITE 1D	Max. Elevation	= 1014.42 ft
Reservoir name	= OFFSITE 1D	Max. Storage	= 102,589 cuft

Storage Indication method used.

ROUTE-POST OFFSITE SP2

Hyd. No. 34 -- 50 Year



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

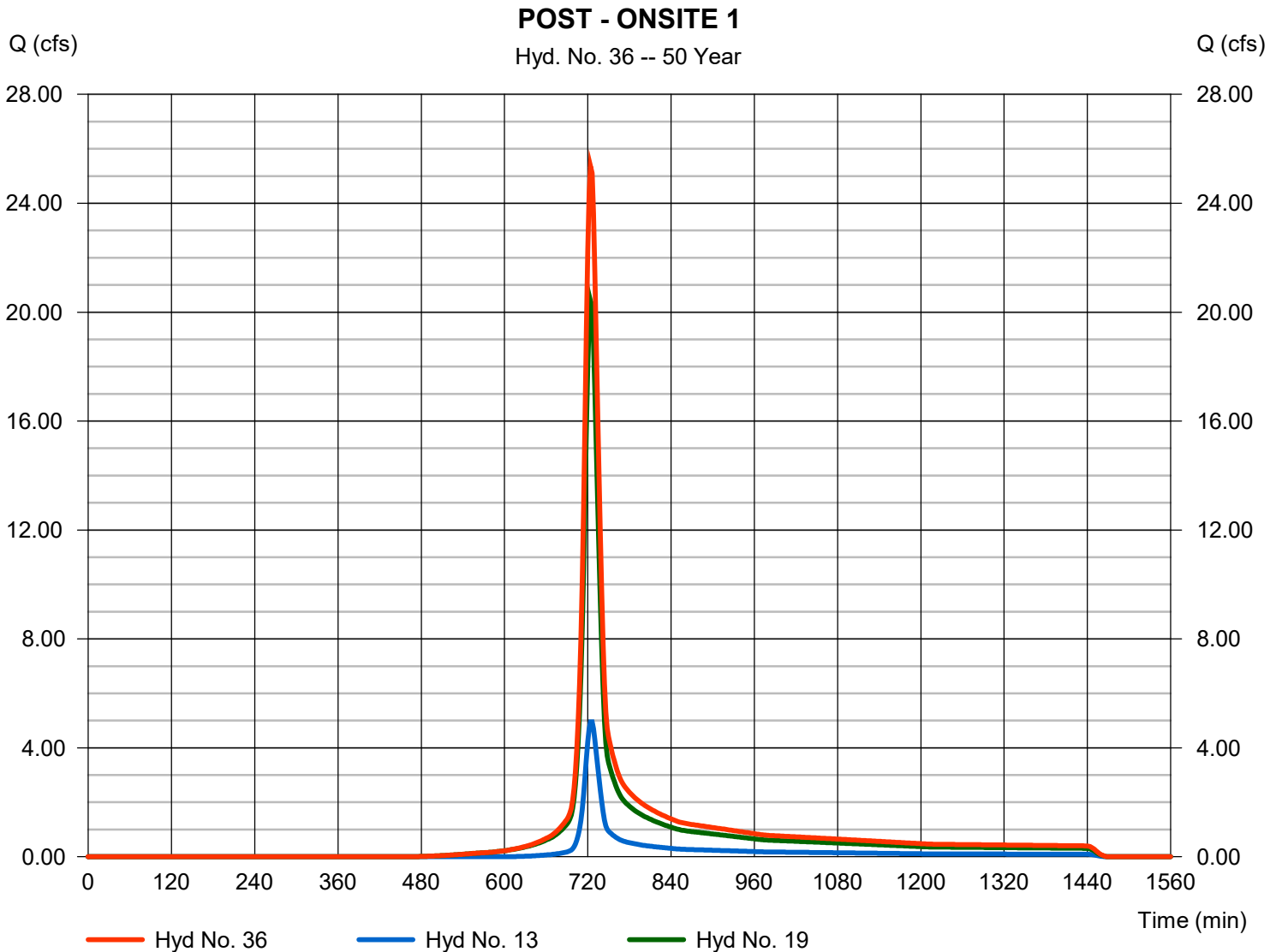
Monday, 05 / 8 / 2023

Hyd. No. 36

POST - ONSITE 1

Hydrograph type = Combine
 Storm frequency = 50 yrs
 Time interval = 2 min
 Inflow hyds. = 13, 19

Peak discharge = 25.36 cfs
 Time to peak = 724 min
 Hyd. volume = 79,695 cuft
 Contrib. drain. area = 6.540 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

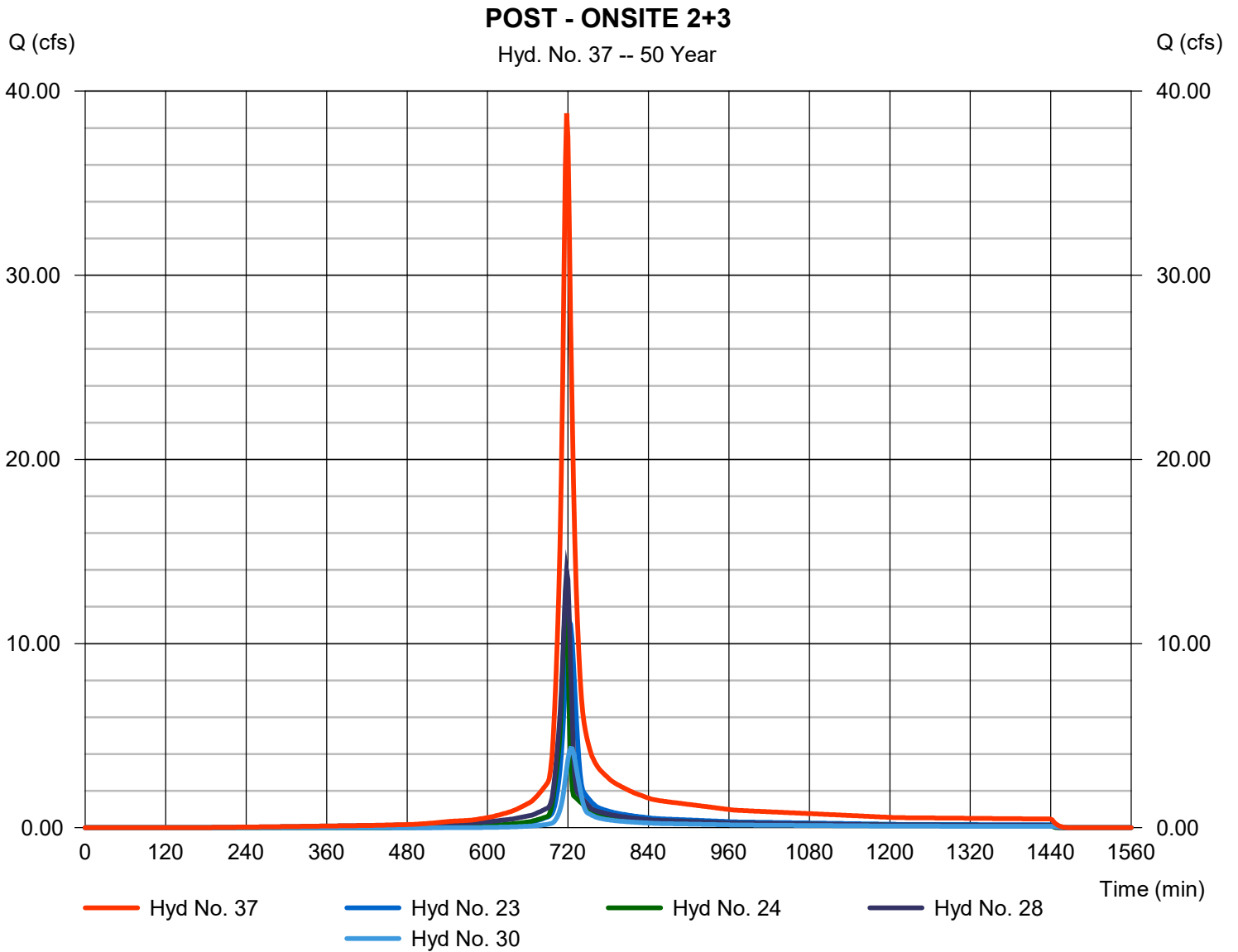
Monday, 05 / 8 / 2023

Hyd. No. 37

POST - ONSITE 2+3

Hydrograph type = Combine
Storm frequency = 50 yrs
Time interval = 2 min
Inflow hyds. = 23, 24, 28, 30

Peak discharge = 38.80 cfs
Time to peak = 718 min
Hyd. volume = 104,694 cuft
Contrib. drain. area = 7.540 ac



Hydrograph Report

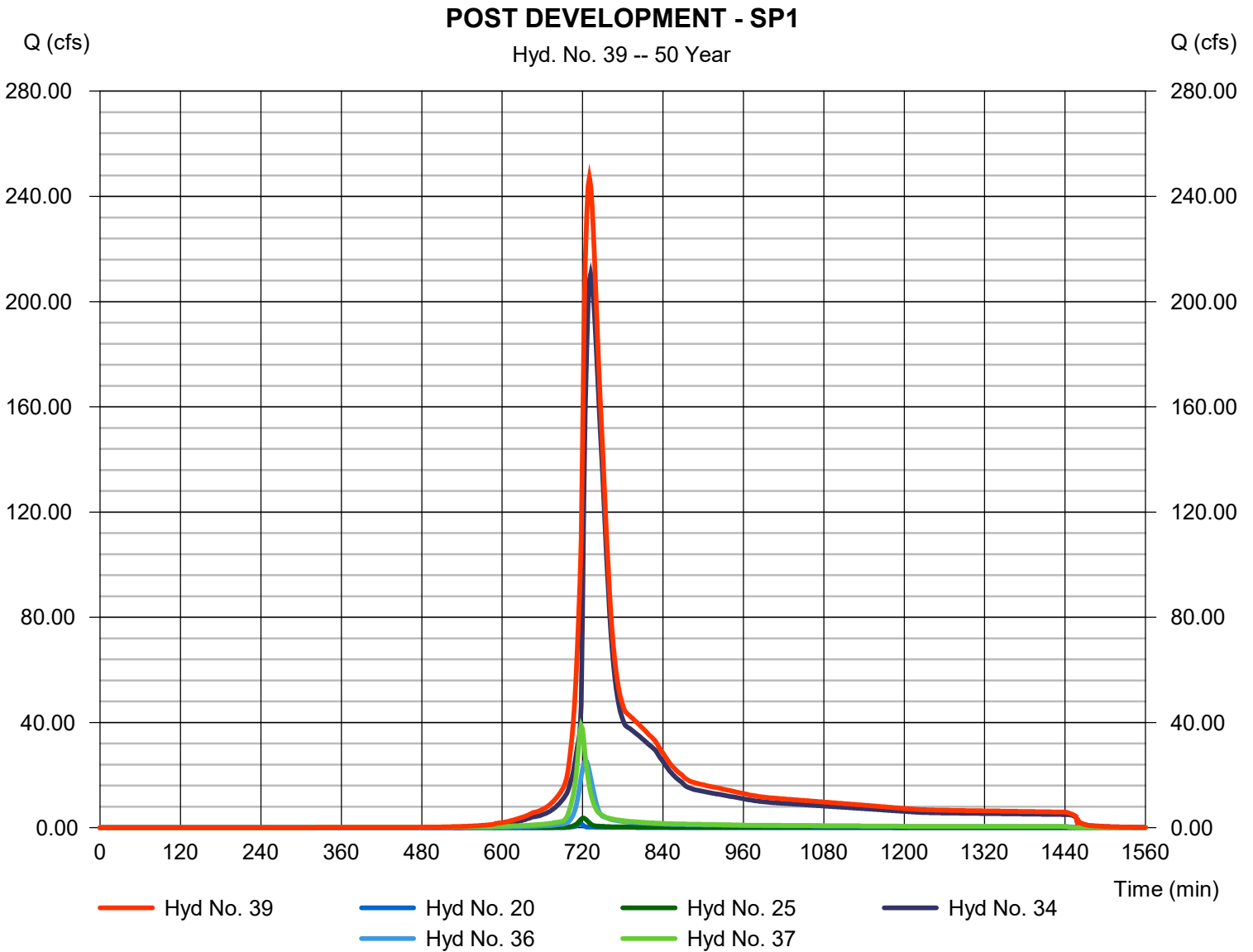
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 39

POST DEVELOPMENT - SP1

Hydrograph type	= Combine	Peak discharge	= 247.07 cfs
Storm frequency	= 50 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 1,145,329 cuft
Inflow hyds.	= 20, 25, 34, 36, 37	Contrib. drain. area	= 1.330 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	40.13	2	722	112,597	-----	-----	-----	OFFSITE 1A
2	Reservoir	27.54	2	730	112,595	1	1054.32	13,530	ROUTE - OFFSITE 1A
3	SCS Runoff	98.66	2	726	342,239	-----	-----	-----	OFFSITE 1B
4	Combine	125.67	2	728	454,834	2, 3	-----	-----	ROUTE 1A +OFFSITE 1B
5	Reservoir	95.16	2	736	454,828	4	1030.48	60,132	ROUTE OFFSITE 1B
6	SCS Runoff	38.03	2	726	131,915	-----	-----	-----	OFFSITE 1C
7	Combine	127.02	2	730	586,743	5, 6	-----	-----	ROUTE 1B + OFFSITE 1C
8	Reservoir	120.72	2	738	586,741	7	1019.39	26,047	ROUTE OFFSITE 1C
9	SCS Runoff	139.92	2	724	438,678	-----	-----	-----	PRE OFFSITE 1D
10	SCS Runoff	32.79	2	724	102,529	-----	-----	-----	PRE OFFSITE 1E
11	Combine	267.37	2	726	1,127,948	8, 9, 10	-----	-----	ROUTE 1C +OFFSITE 1D +1E
12	Reservoir	247.19	2	732	1,127,942	11	1014.61	111,921	PREROUTE- OFFSITE SP2
13	SCS Runoff	6.061	2	724	19,234	-----	-----	-----	OFFSITE 2
14	SCS Runoff	27.26	2	722	76,420	-----	-----	-----	ON-SITE PRE 1
15	SCS Runoff	20.88	2	724	66,037	-----	-----	-----	ON-SITE PRE 2
16	SCS Runoff	17.67	2	724	55,665	-----	-----	-----	ON-SITE PRE 3
17	Combine	302.10	2	730	1,345,297	12, 13, 14, 15, 16	-----	-----	PRE-DEVELOPMENT - SP1
19	SCS Runoff	24.01	2	724	75,085	-----	-----	-----	ONSITE POST 1A
20	SCS Runoff	1.667	2	718	3,341	-----	-----	-----	ONSITE POST 1B - BYPASS
21	SCS Runoff	0.400	2	718	802	-----	-----	-----	ONSITE POST 1C - BYPASS
23	SCS Runoff	13.28	2	722	37,212	-----	-----	-----	ONSITE POST 2A
24	SCS Runoff	14.36	2	716	29,347	-----	-----	-----	ONSITE POST 2B - TURF
25	SCS Runoff	4.430	2	722	11,601	-----	-----	-----	ONSITE POST 2C - BYPASS
26	SCS Runoff	0.160	2	718	321	-----	-----	-----	ONSITE POST 2D - BYPASS
28	SCS Runoff	15.66	2	718	39,064	-----	-----	-----	ONSITE POST 3A
29	SCS Runoff	0.240	2	718	481	-----	-----	-----	ONSITE POST 3B - BYPASS
30	SCS Runoff	5.193	2	724	16,341	-----	-----	-----	ONSITE POST 3C
31	SCS Runoff	0.261	2	718	522	-----	-----	-----	ONSITE POST 3D - BYPASS
33	Combine	267.57	2	726	1,130,073	11, 21, 26, 29, 31, 33	-----	-----	POST OFFSITE 1D
34	Reservoir	247.48	2	732	1,130,066	33	1014.61	111,990	ROUTE-POST OFFSITE SP2
36	Combine	30.07	2	724	94,319	13, 19,	-----	-----	POST - ONSITE 1
Fitzgerald Field.gpw					Return Period: 100 Year			Monday, 05 / 8 / 2023	

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
37	Combine	44.99	2	718	121,964	23, 24, 28, 30,	-----	-----	POST - ONSITE 2+3
39	Combine	292.76	2	730	1,361,292	20, 25, 34, 36, 37,	-----	-----	POST DEVELOPMENT - SP1
Fitzgerald Field.gpw					Return Period: 100 Year			Monday, 05 / 8 / 2023	

Hydrograph Report

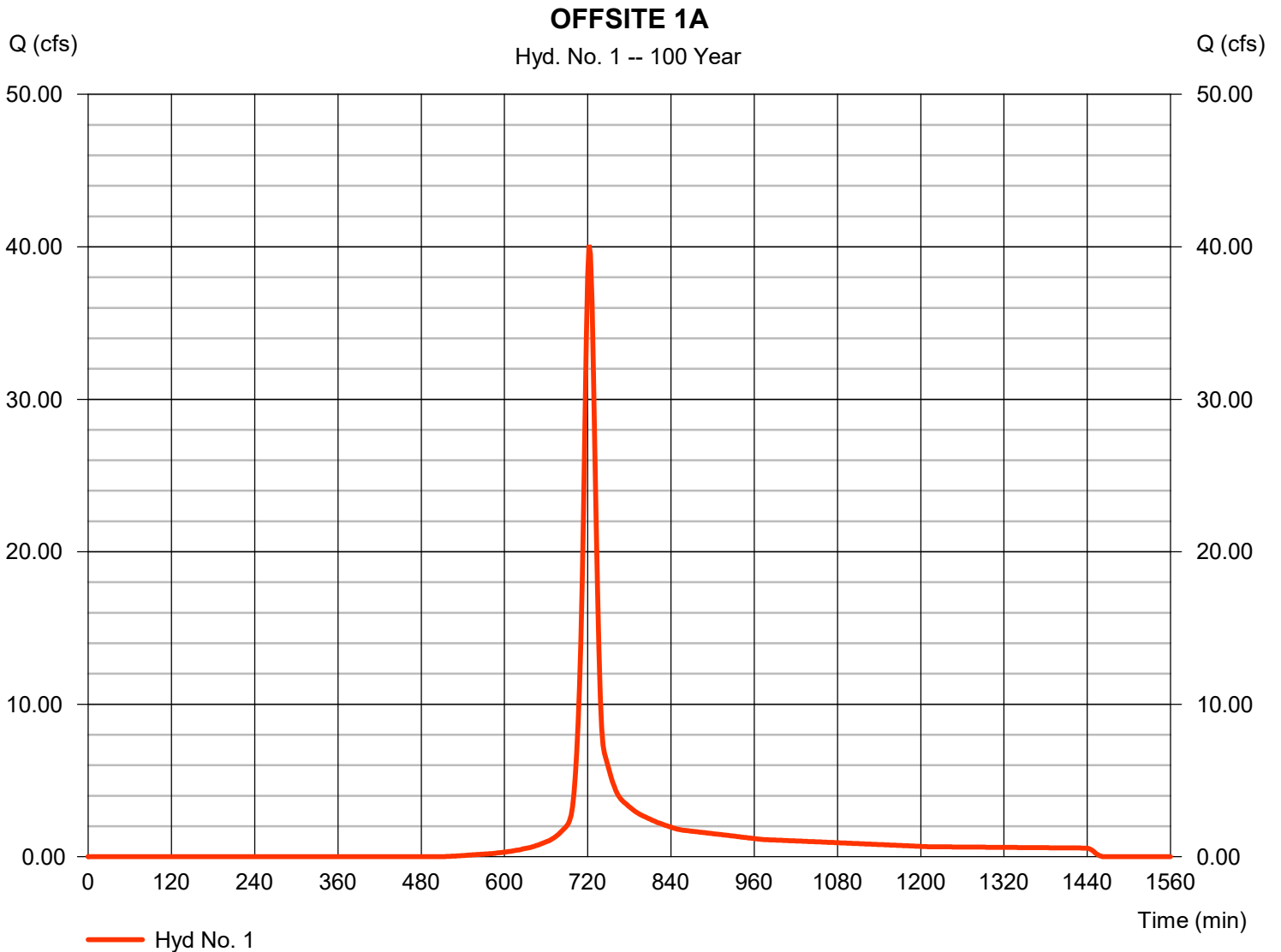
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 1

OFFSITE 1A

Hydrograph type	= SCS Runoff	Peak discharge	= 40.13 cfs
Storm frequency	= 100 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 112,597 cuft
Drainage area	= 8.590 ac	Curve number	= 68
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 14.00 min
Total precip.	= 7.36 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

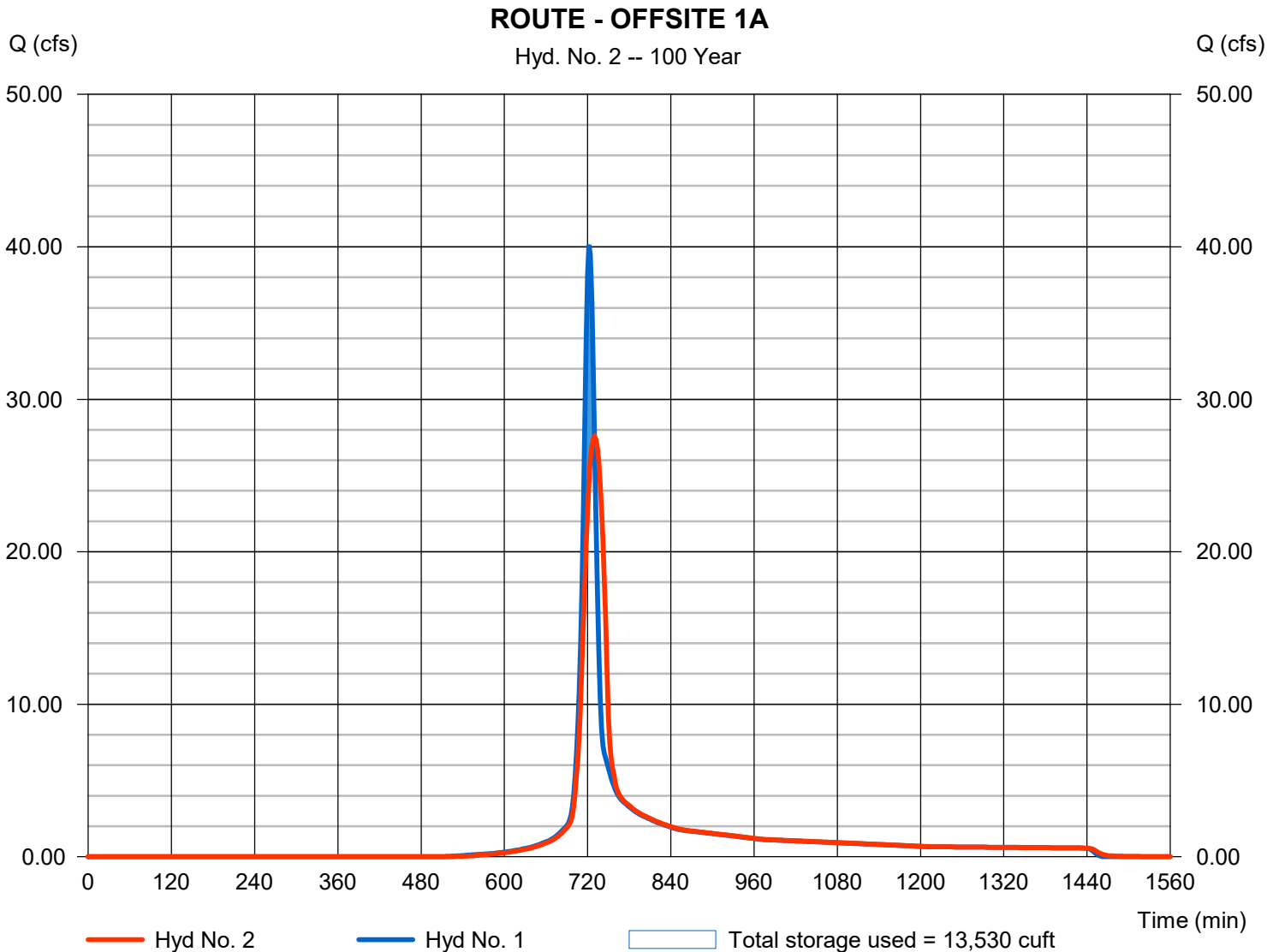
Monday, 05 / 8 / 2023

Hyd. No. 2

ROUTE - OFFSITE 1A

Hydrograph type	= Reservoir	Peak discharge	= 27.54 cfs
Storm frequency	= 100 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 112,595 cuft
Inflow hyd. No.	= 1 - OFFSITE 1A	Max. Elevation	= 1054.32 ft
Reservoir name	= OFFSITE 1A	Max. Storage	= 13,530 cuft

Storage Indication method used.



Hydrograph Report

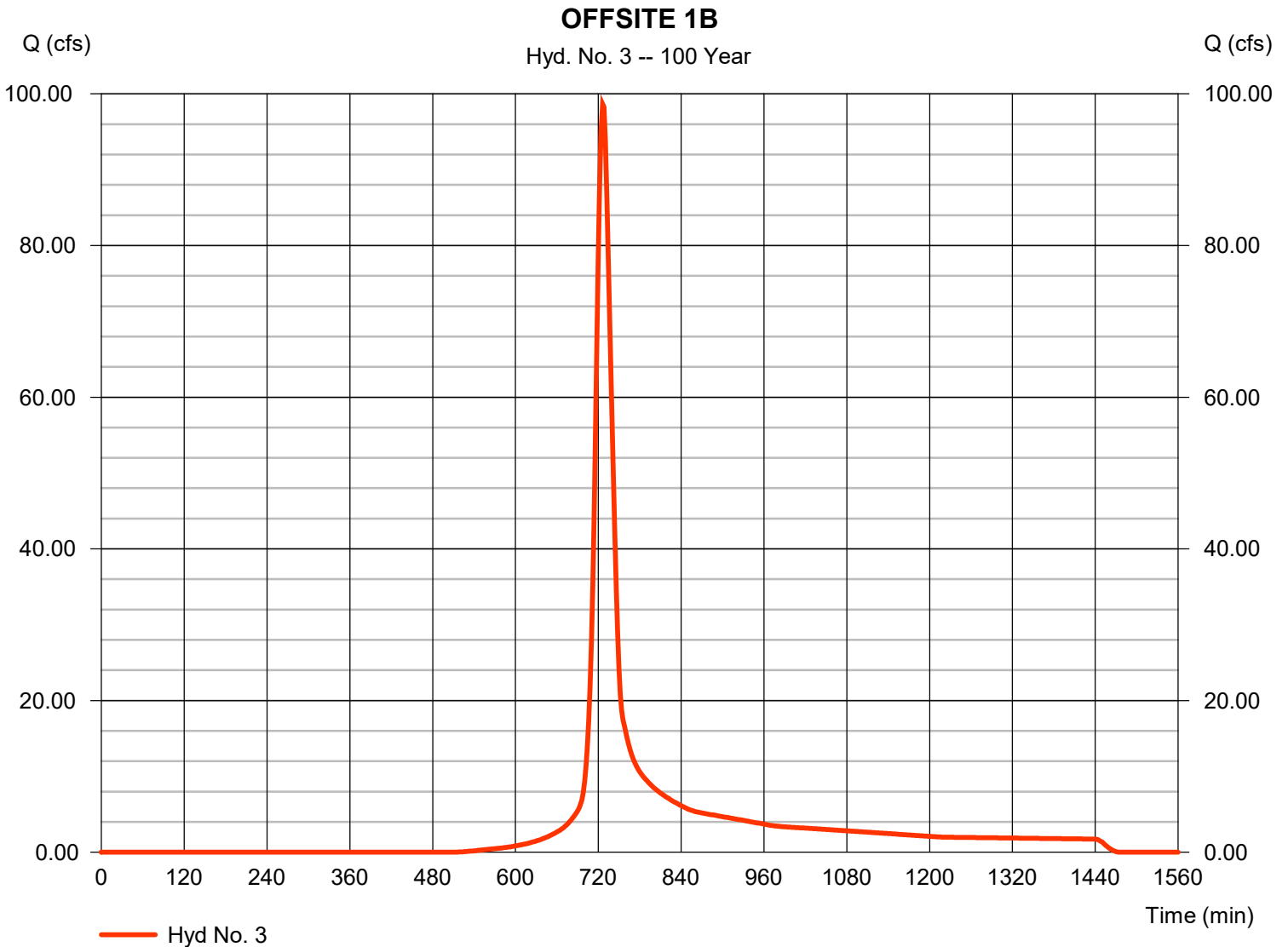
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 3

OFFSITE 1B

Hydrograph type	= SCS Runoff	Peak discharge	= 98.66 cfs
Storm frequency	= 100 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 342,239 cuft
Drainage area	= 25.010 ac	Curve number	= 68
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 21.00 min
Total precip.	= 7.36 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 4

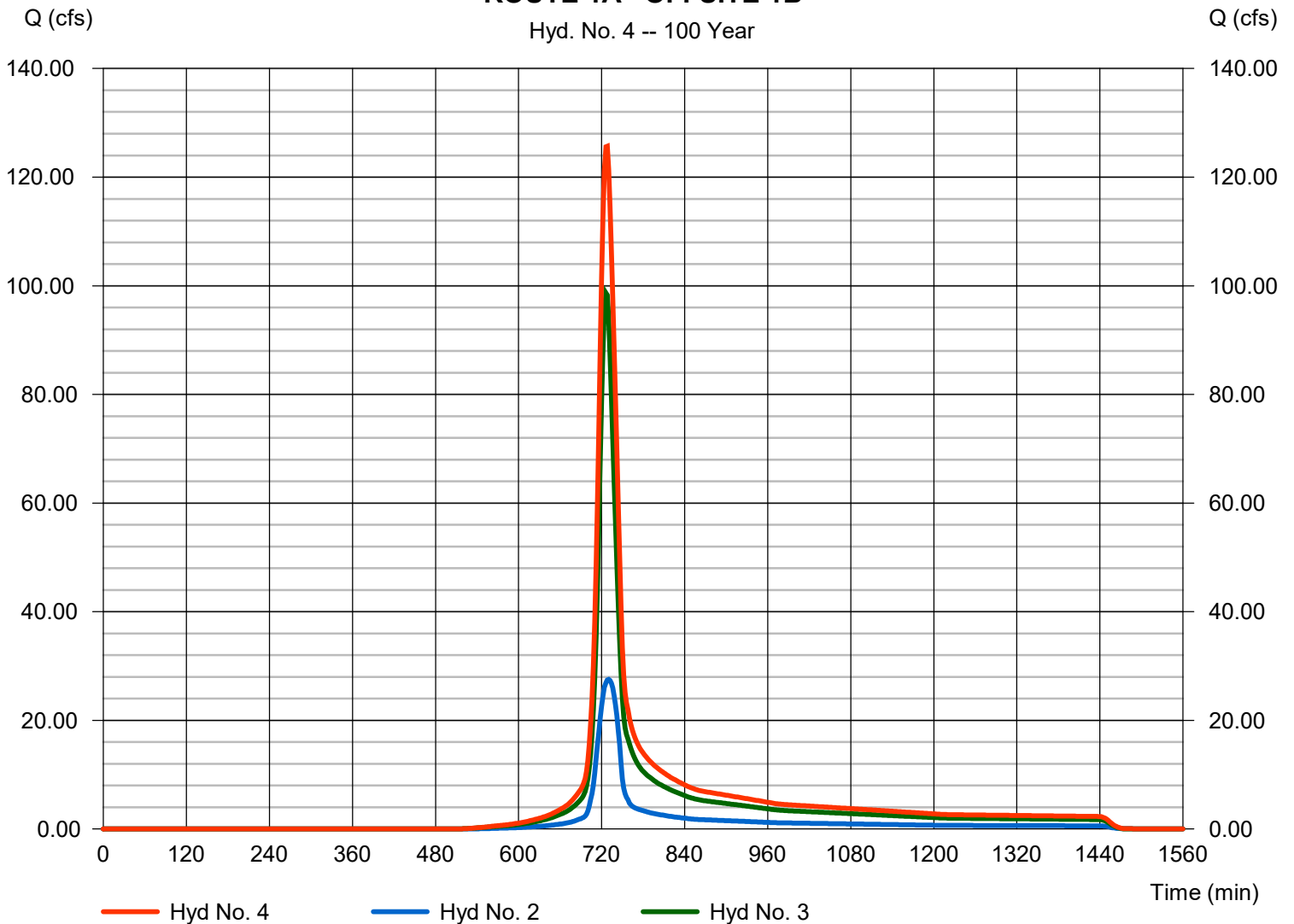
ROUTE 1A +OFFSITE 1B

Hydrograph type = Combine
Storm frequency = 100 yrs
Time interval = 2 min
Inflow hyds. = 2, 3

Peak discharge = 125.67 cfs
Time to peak = 728 min
Hyd. volume = 454,834 cuft
Contrib. drain. area = 25.010 ac

ROUTE 1A +OFFSITE 1B

Hyd. No. 4 -- 100 Year



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 5

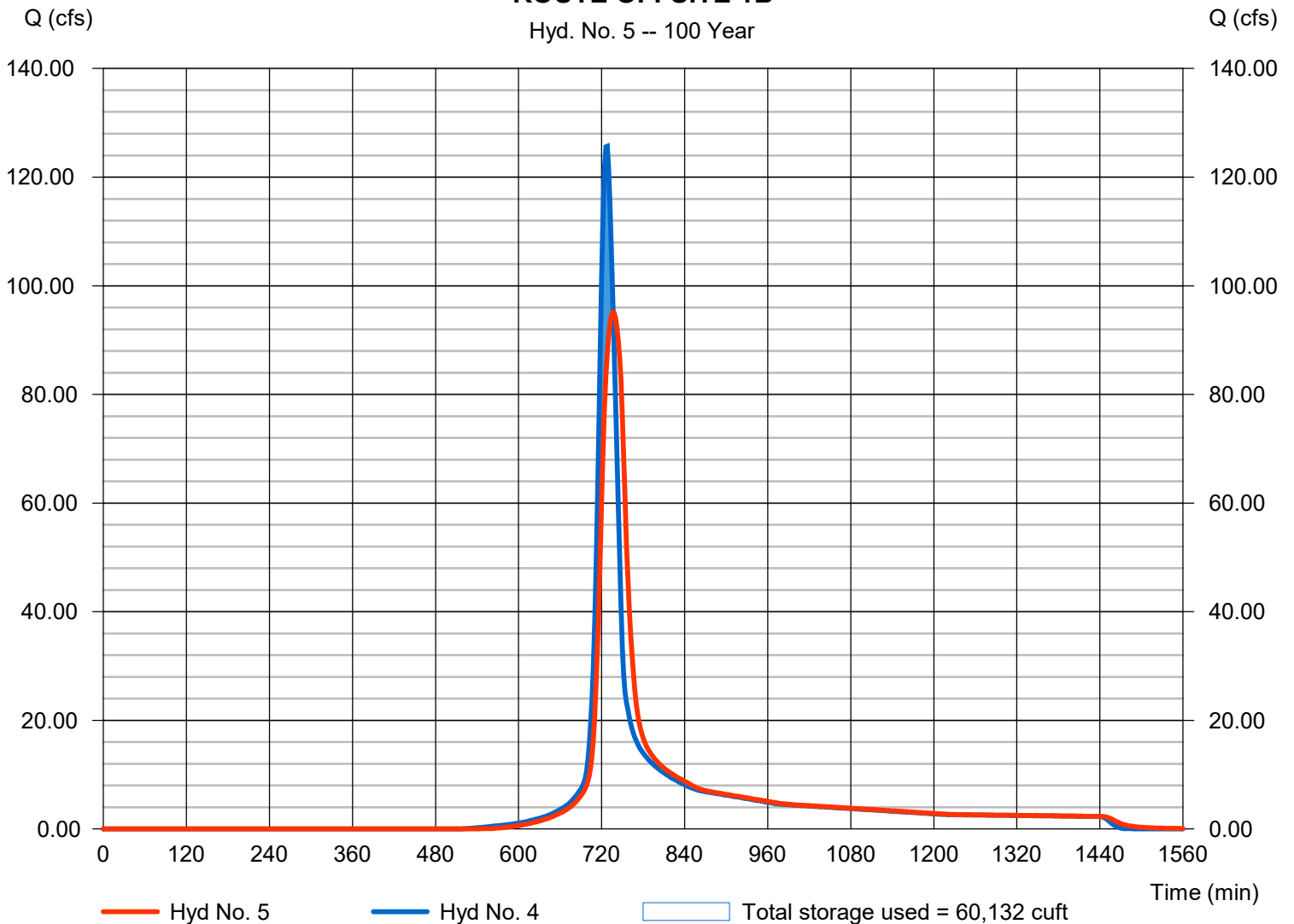
ROUTE OFFSITE 1B

Hydrograph type	= Reservoir	Peak discharge	= 95.16 cfs
Storm frequency	= 100 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 454,828 cuft
Inflow hyd. No.	= 4 - ROUTE 1A +OFFSITE 1B	Max. Elevation	= 1030.48 ft
Reservoir name	= OFFSITE 1B	Max. Storage	= 60,132 cuft

Storage Indication method used.

ROUTE OFFSITE 1B

Hyd. No. 5 -- 100 Year



Hydrograph Report

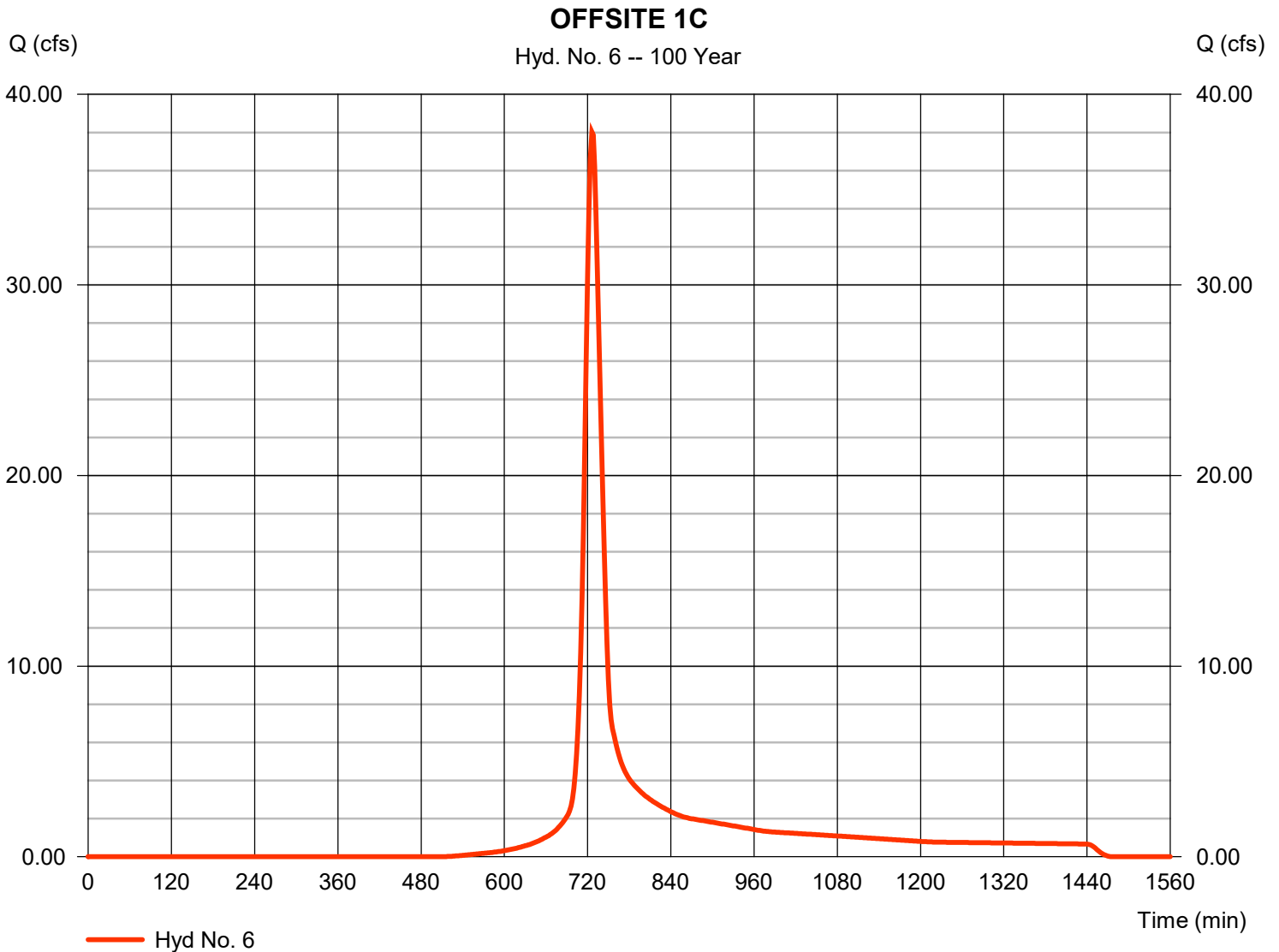
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 6

OFFSITE 1C

Hydrograph type	= SCS Runoff	Peak discharge	= 38.03 cfs
Storm frequency	= 100 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 131,915 cuft
Drainage area	= 9.640 ac	Curve number	= 68
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 21.00 min
Total precip.	= 7.36 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 7

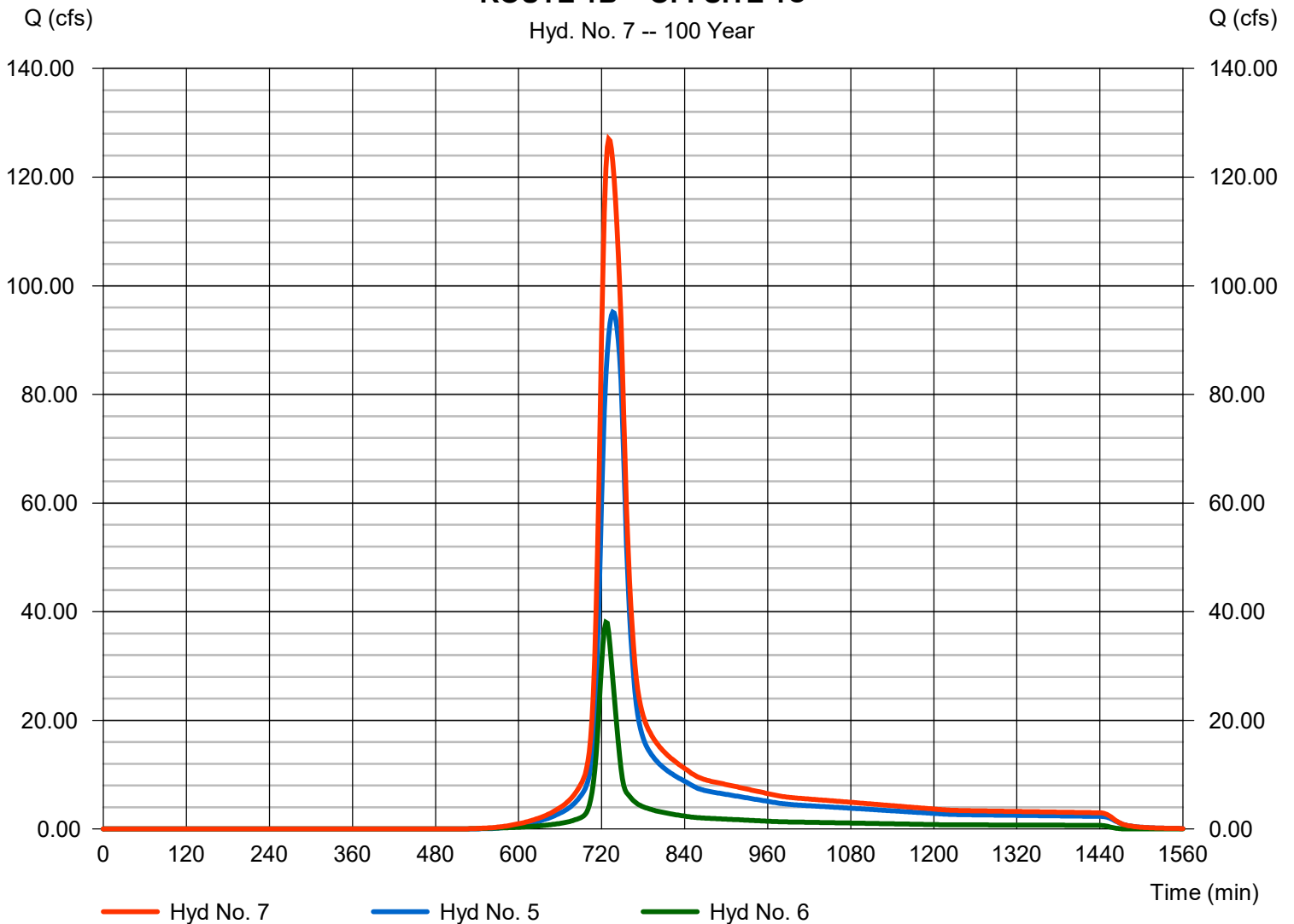
ROUTE 1B + OFFSITE 1C

Hydrograph type = Combine
 Storm frequency = 100 yrs
 Time interval = 2 min
 Inflow hyds. = 5, 6

Peak discharge = 127.02 cfs
 Time to peak = 730 min
 Hyd. volume = 586,743 cuft
 Contrib. drain. area = 9.640 ac

ROUTE 1B + OFFSITE 1C

Hyd. No. 7 -- 100 Year



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 8

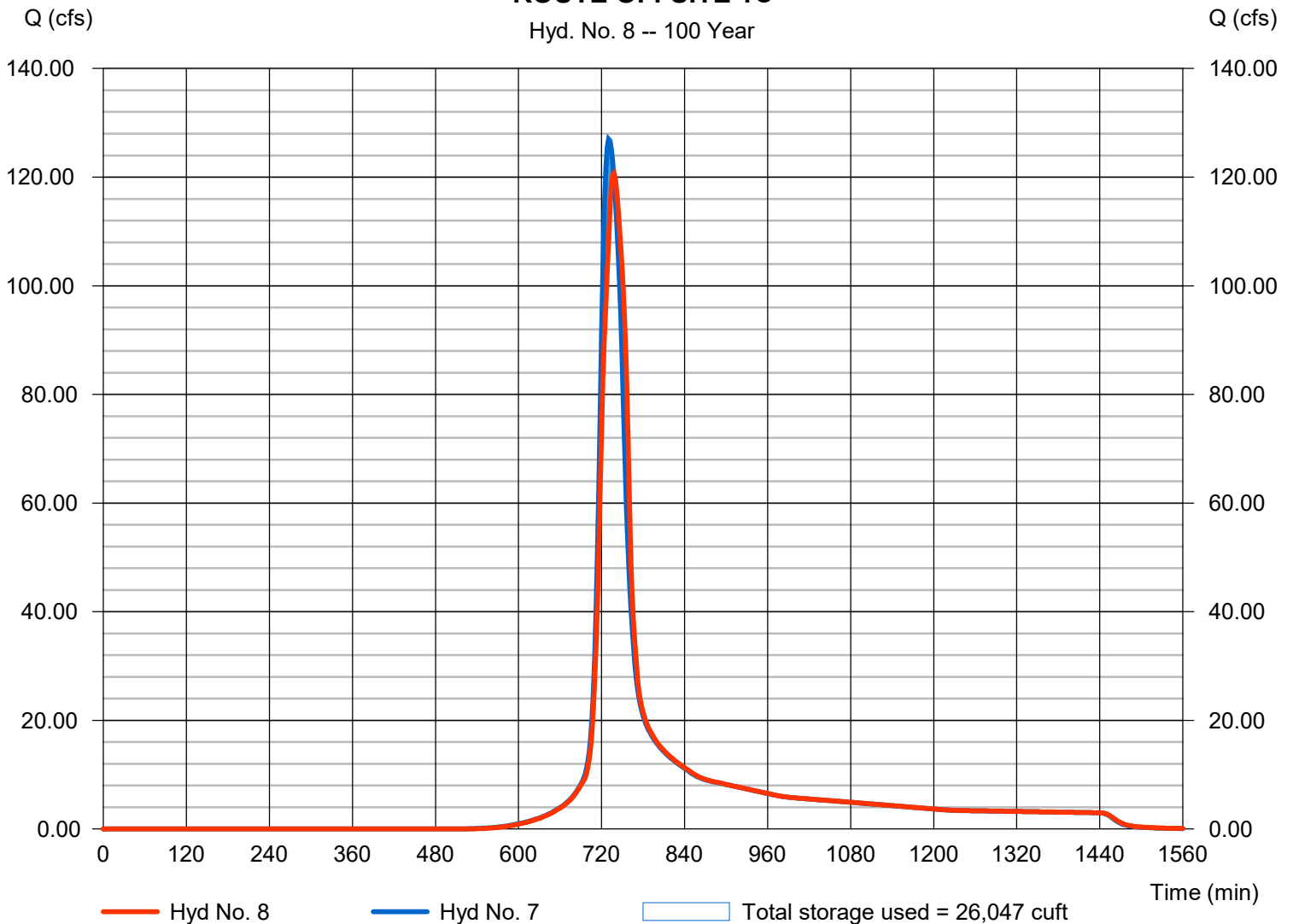
ROUTE OFFSITE 1C

Hydrograph type	= Reservoir	Peak discharge	= 120.72 cfs
Storm frequency	= 100 yrs	Time to peak	= 738 min
Time interval	= 2 min	Hyd. volume	= 586,741 cuft
Inflow hyd. No.	= 7 - ROUTE 1B + OFFSITE 1C	Max. Elevation	= 1019.39 ft
Reservoir name	= OFFSITE 1C	Max. Storage	= 26,047 cuft

Storage Indication method used.

ROUTE OFFSITE 1C

Hyd. No. 8 -- 100 Year



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

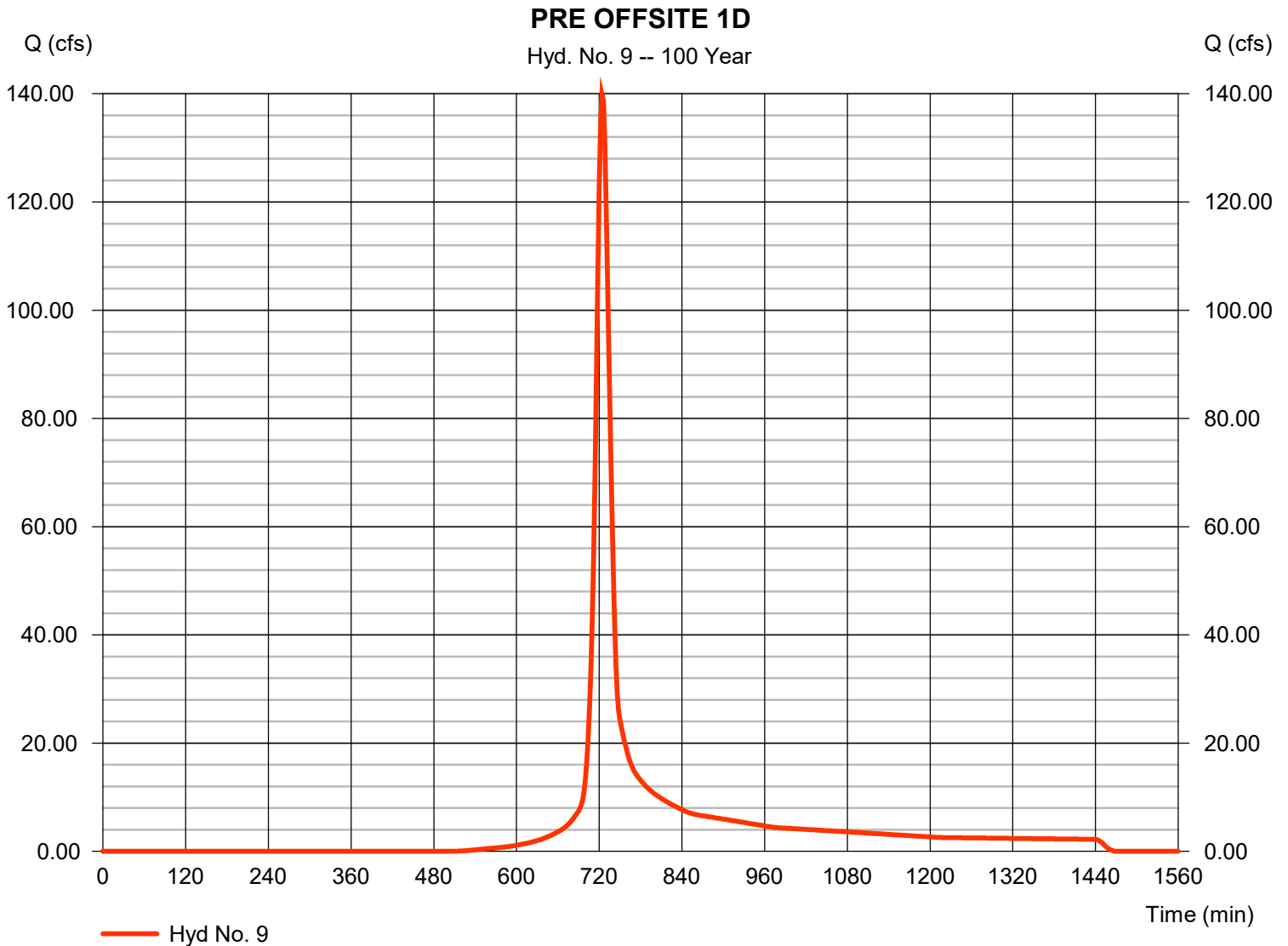
Monday, 05 / 8 / 2023

Hyd. No. 9

PRE OFFSITE 1D

Hydrograph type = SCS Runoff
 Storm frequency = 100 yrs
 Time interval = 2 min
 Drainage area = 32.630 ac
 Basin Slope = 0.0 %
 Tc method = User
 Total precip. = 7.36 in
 Storm duration = 24 hrs

Peak discharge = 139.92 cfs
 Time to peak = 724 min
 Hyd. volume = 438,678 cuft
 Curve number = 68
 Hydraulic length = 0 ft
 Time of conc. (Tc) = 18.00 min
 Distribution = Type II
 Shape factor = 484



Hydrograph Report

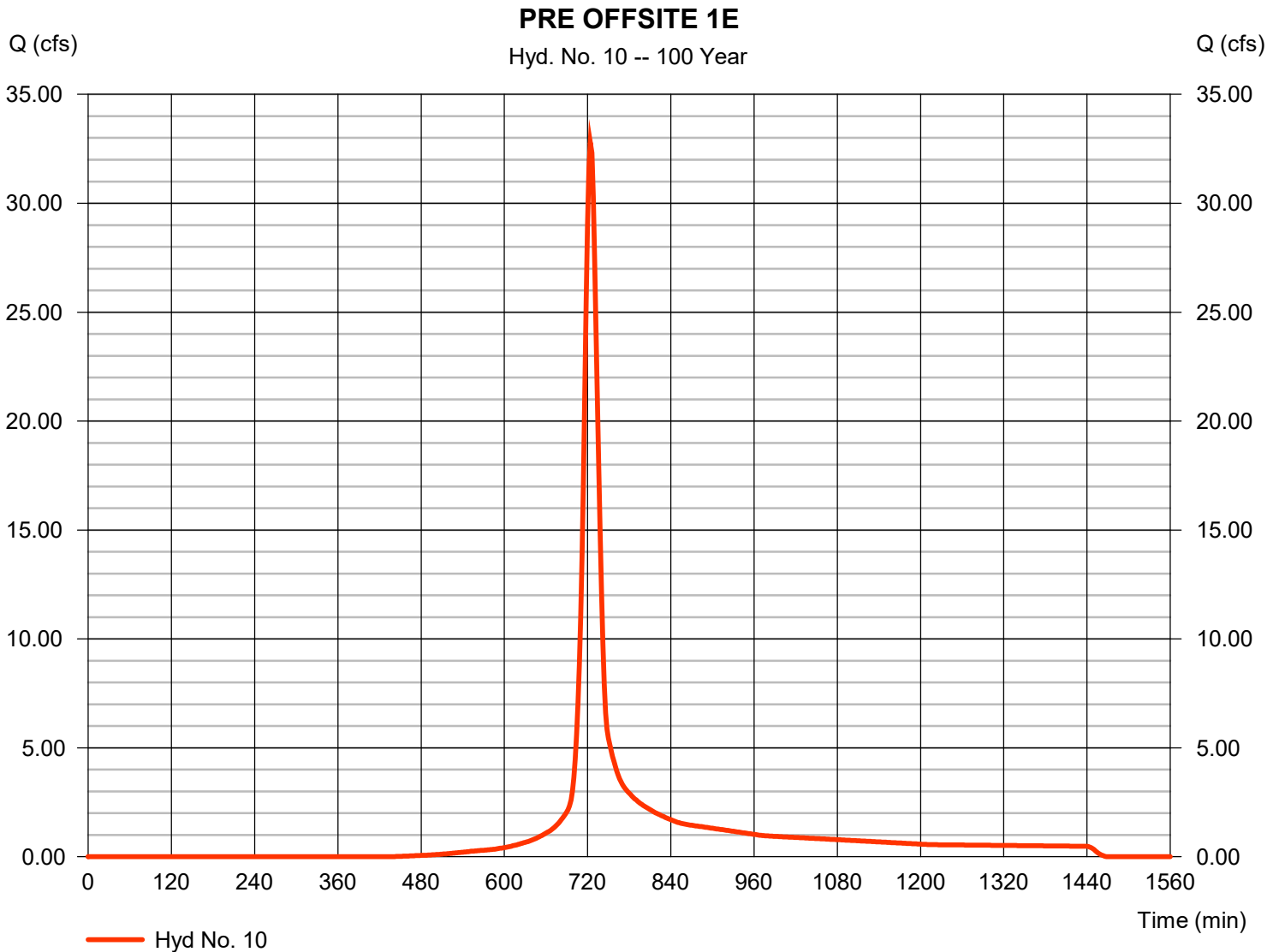
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 10

PRE OFFSITE 1E

Hydrograph type	= SCS Runoff	Peak discharge	= 32.79 cfs
Storm frequency	= 100 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 102,529 cuft
Drainage area	= 6.650 ac	Curve number	= 73
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 17.00 min
Total precip.	= 7.36 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

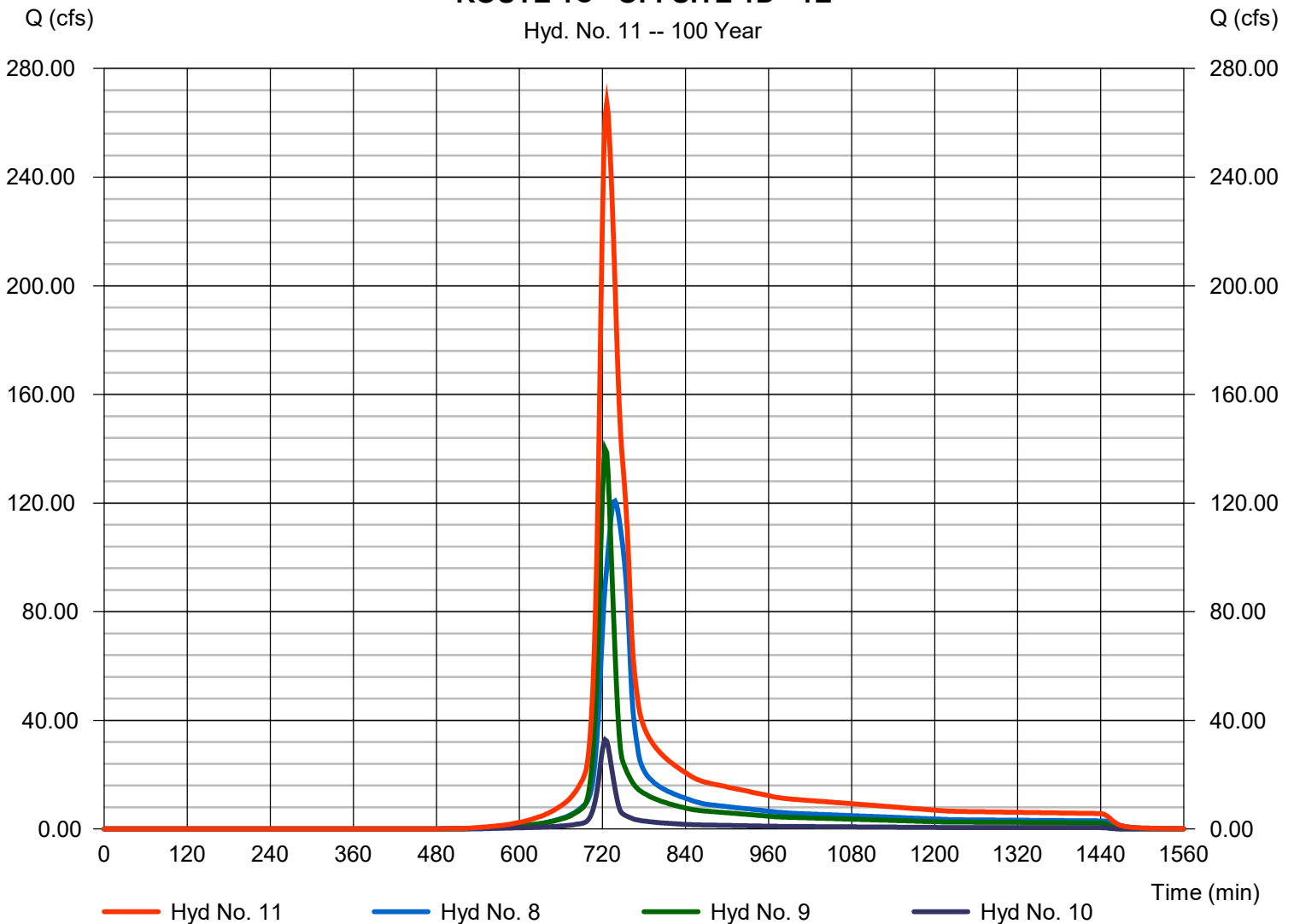
Hyd. No. 11

ROUTE 1C +OFFSITE 1D +1E

Hydrograph type	= Combine	Peak discharge	= 267.37 cfs
Storm frequency	= 100 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 1,127,948 cuft
Inflow hyds.	= 8, 9, 10	Contrib. drain. area	= 39.280 ac

ROUTE 1C +OFFSITE 1D +1E

Hyd. No. 11 -- 100 Year



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

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Hyd. No. 12

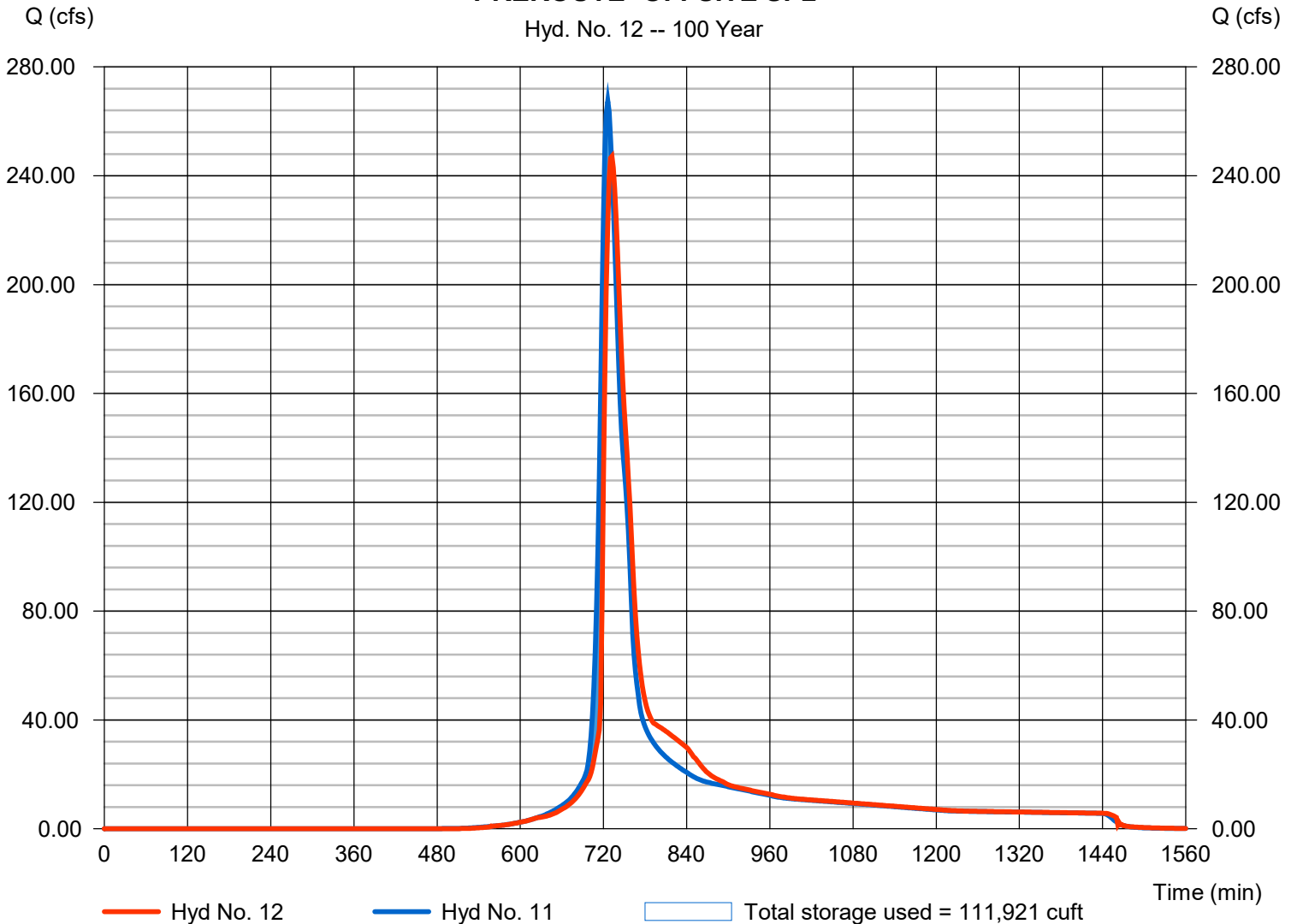
PREROUTE- OFFSITE SP2

Hydrograph type	= Reservoir	Peak discharge	= 247.19 cfs
Storm frequency	= 100 yrs	Time to peak	= 732 min
Time interval	= 2 min	Hyd. volume	= 1,127,942 cuft
Inflow hyd. No.	= 11 - ROUTE 1C +OFFSITE 1D	Max Elevation	= 1014.61 ft
Reservoir name	= OFFSITE 1D	Max. Storage	= 111,921 cuft

Storage Indication method used.

PREROUTE- OFFSITE SP2

Hyd. No. 12 -- 100 Year



Hydrograph Report

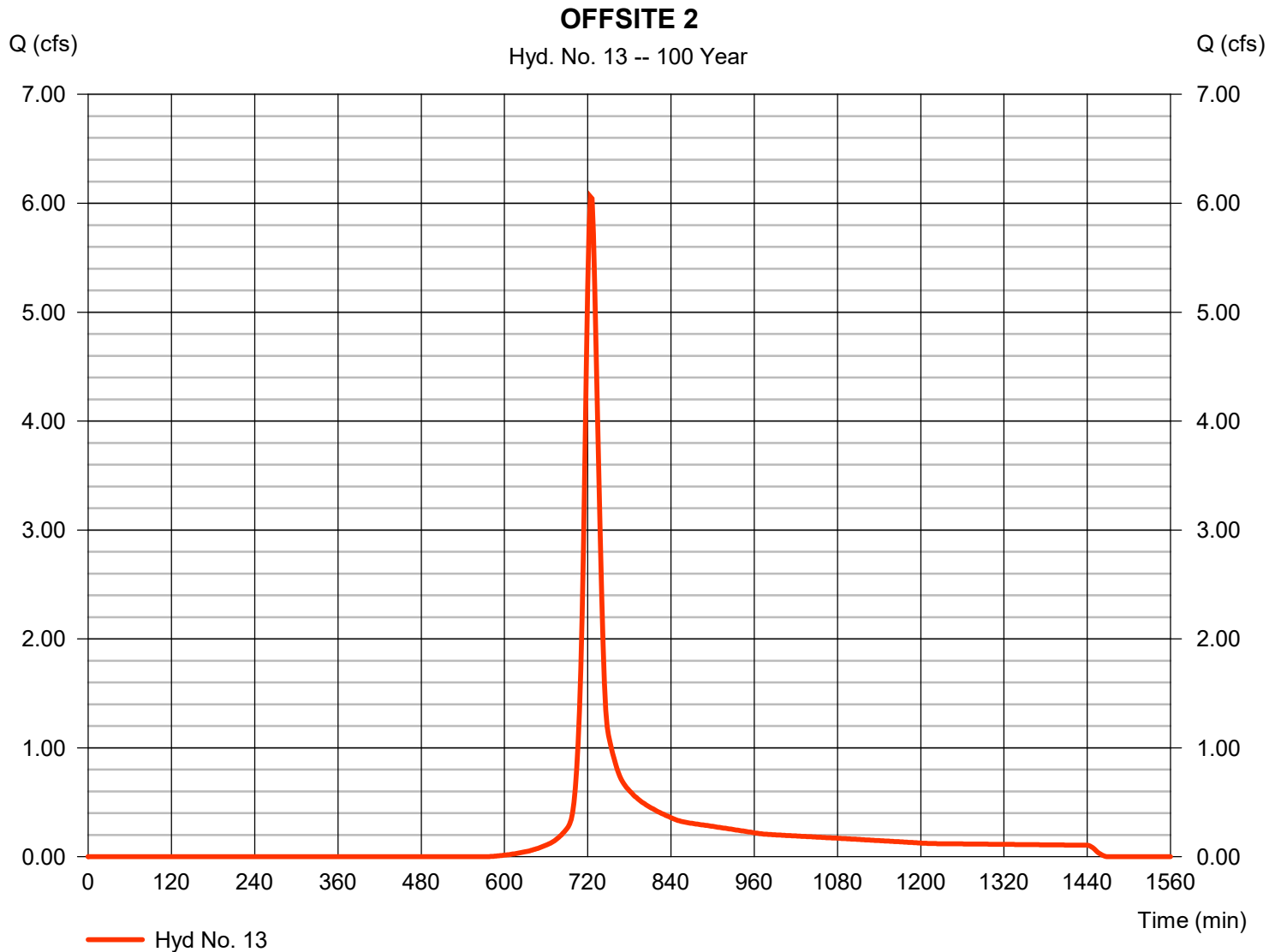
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 13

OFFSITE 2

Hydrograph type	= SCS Runoff	Peak discharge	= 6.061 cfs
Storm frequency	= 100 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 19,234 cuft
Drainage area	= 1.670 ac	Curve number	= 63
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 18.00 min
Total precip.	= 7.36 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

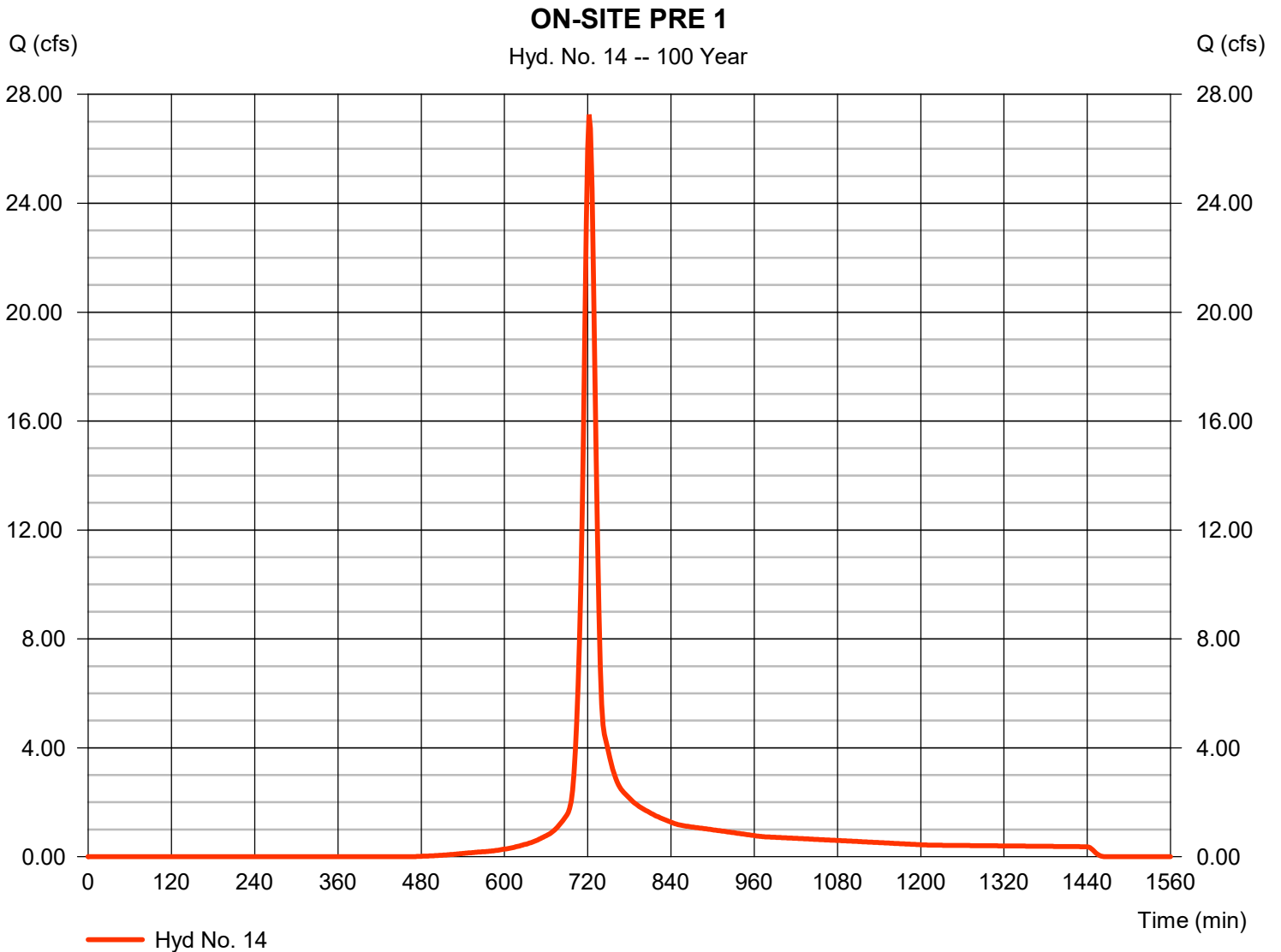
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 14

ON-SITE PRE 1

Hydrograph type	= SCS Runoff	Peak discharge	= 27.26 cfs
Storm frequency	= 100 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 76,420 cuft
Drainage area	= 5.360 ac	Curve number	= 71
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 16.00 min
Total precip.	= 7.36 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

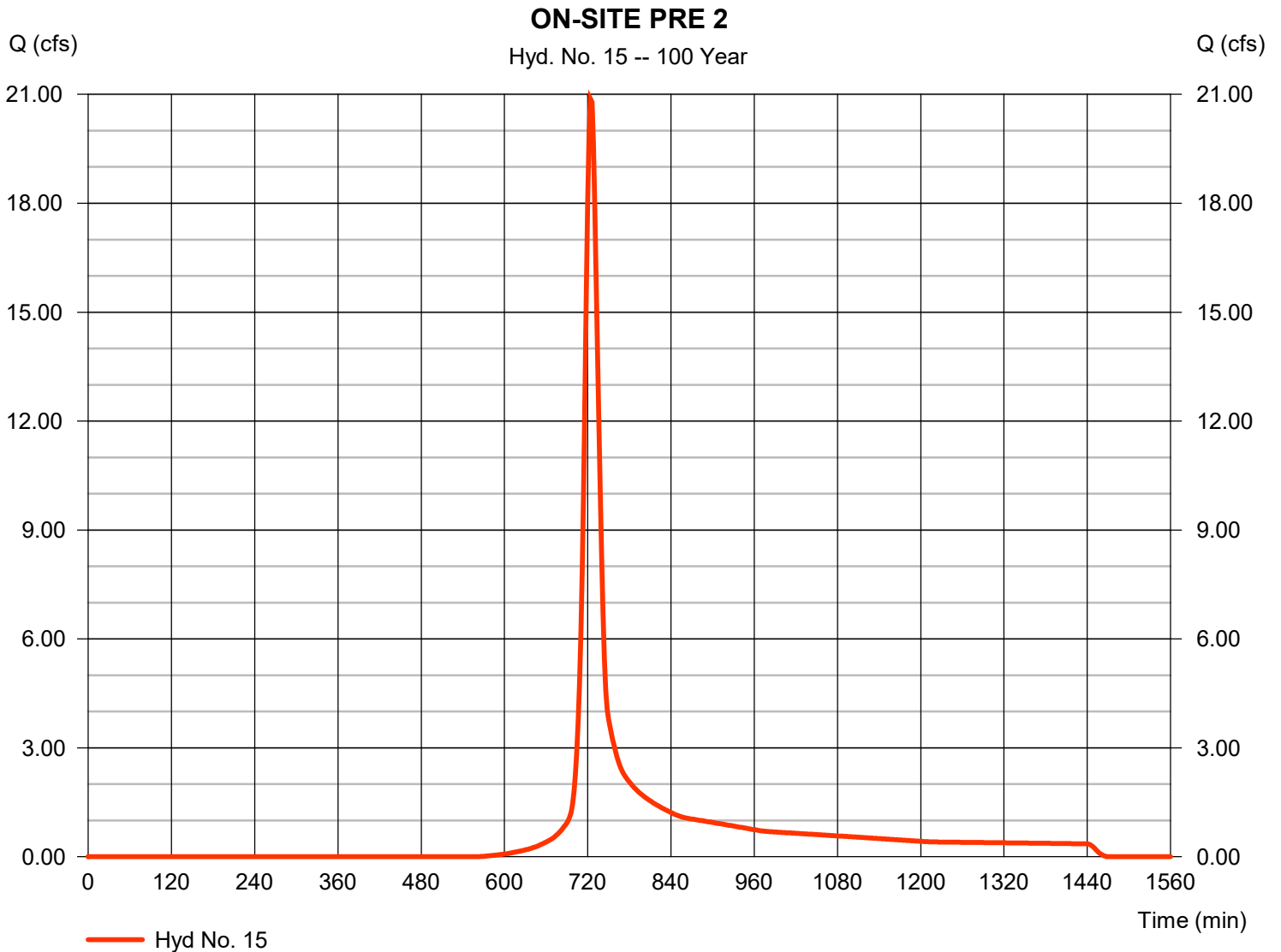
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 15

ON-SITE PRE 2

Hydrograph type	= SCS Runoff	Peak discharge	= 20.88 cfs
Storm frequency	= 100 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 66,037 cuft
Drainage area	= 5.550 ac	Curve number	= 64
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 17.00 min
Total precip.	= 7.36 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

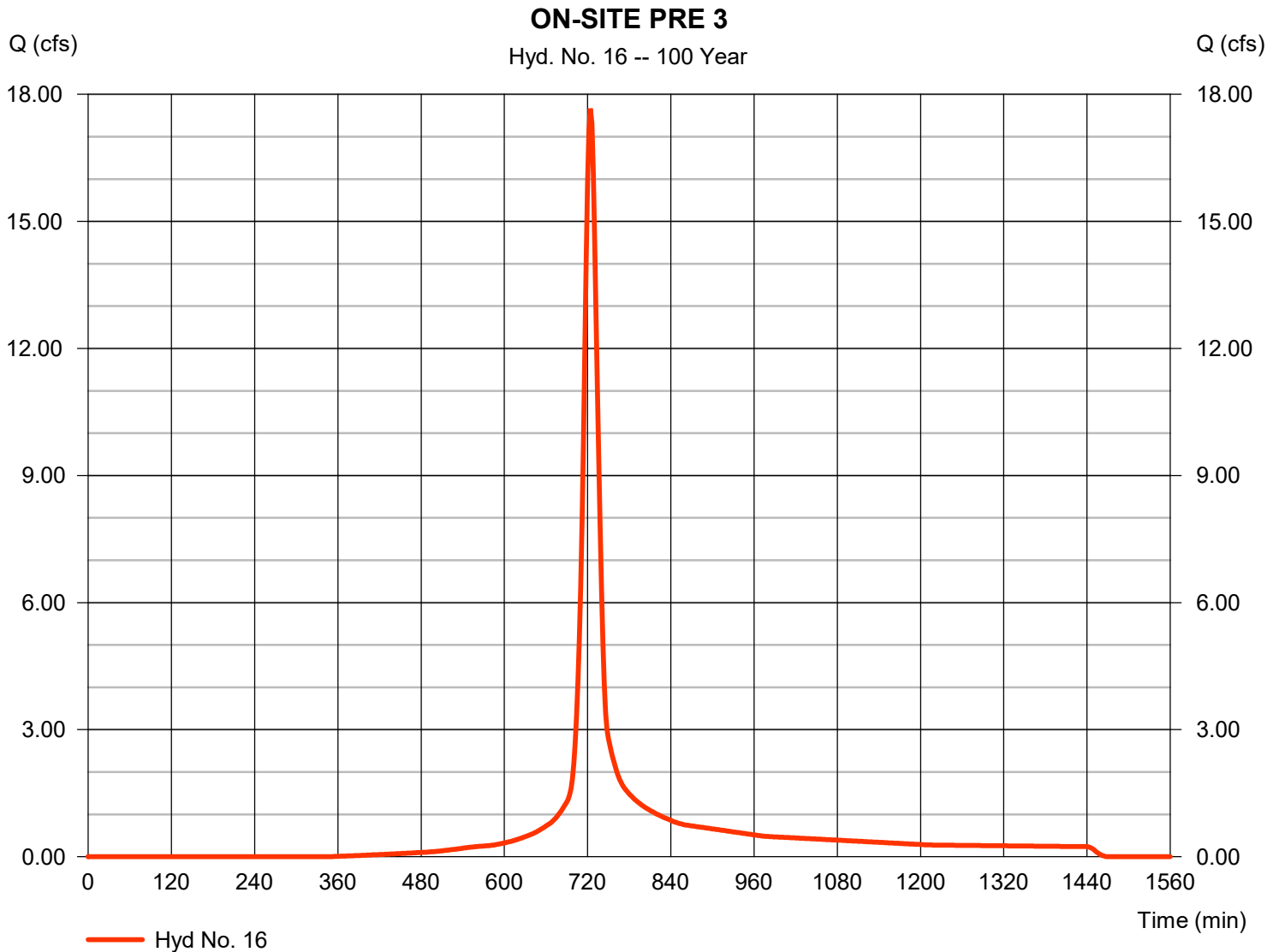
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 16

ON-SITE PRE 3

Hydrograph type	= SCS Runoff	Peak discharge	= 17.67 cfs
Storm frequency	= 100 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 55,665 cuft
Drainage area	= 3.120 ac	Curve number	= 79
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 18.00 min
Total precip.	= 7.36 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

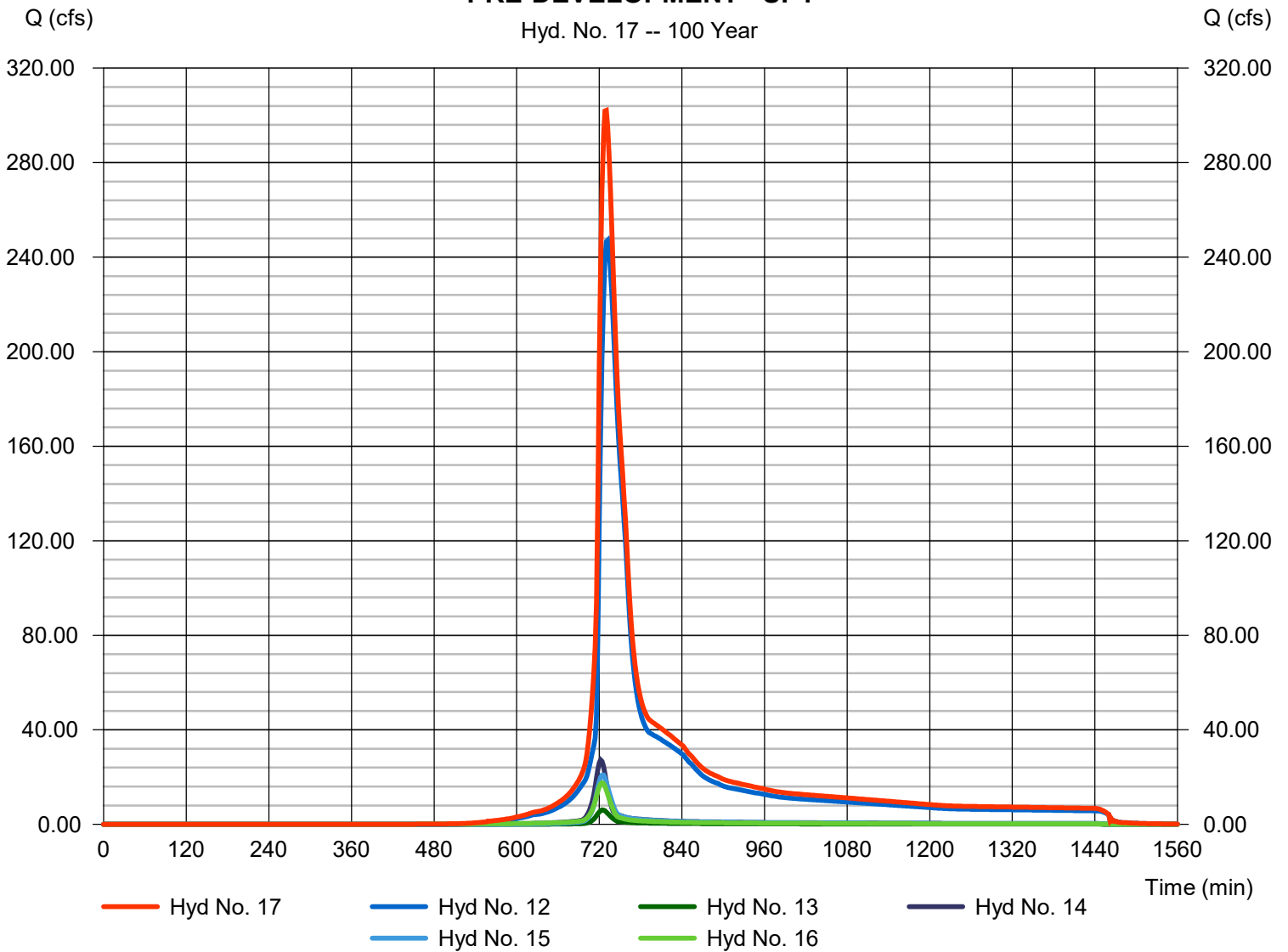
Hyd. No. 17

PRE-DEVELOPMENT - SP1

Hydrograph type	= Combine	Peak discharge	= 302.10 cfs
Storm frequency	= 100 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 1,345,297 cuft
Inflow hyds.	= 12, 13, 14, 15, 16	Contrib. drain. area	= 15.700 ac

PRE-DEVELOPMENT - SP1

Hyd. No. 17 -- 100 Year



Hydrograph Report

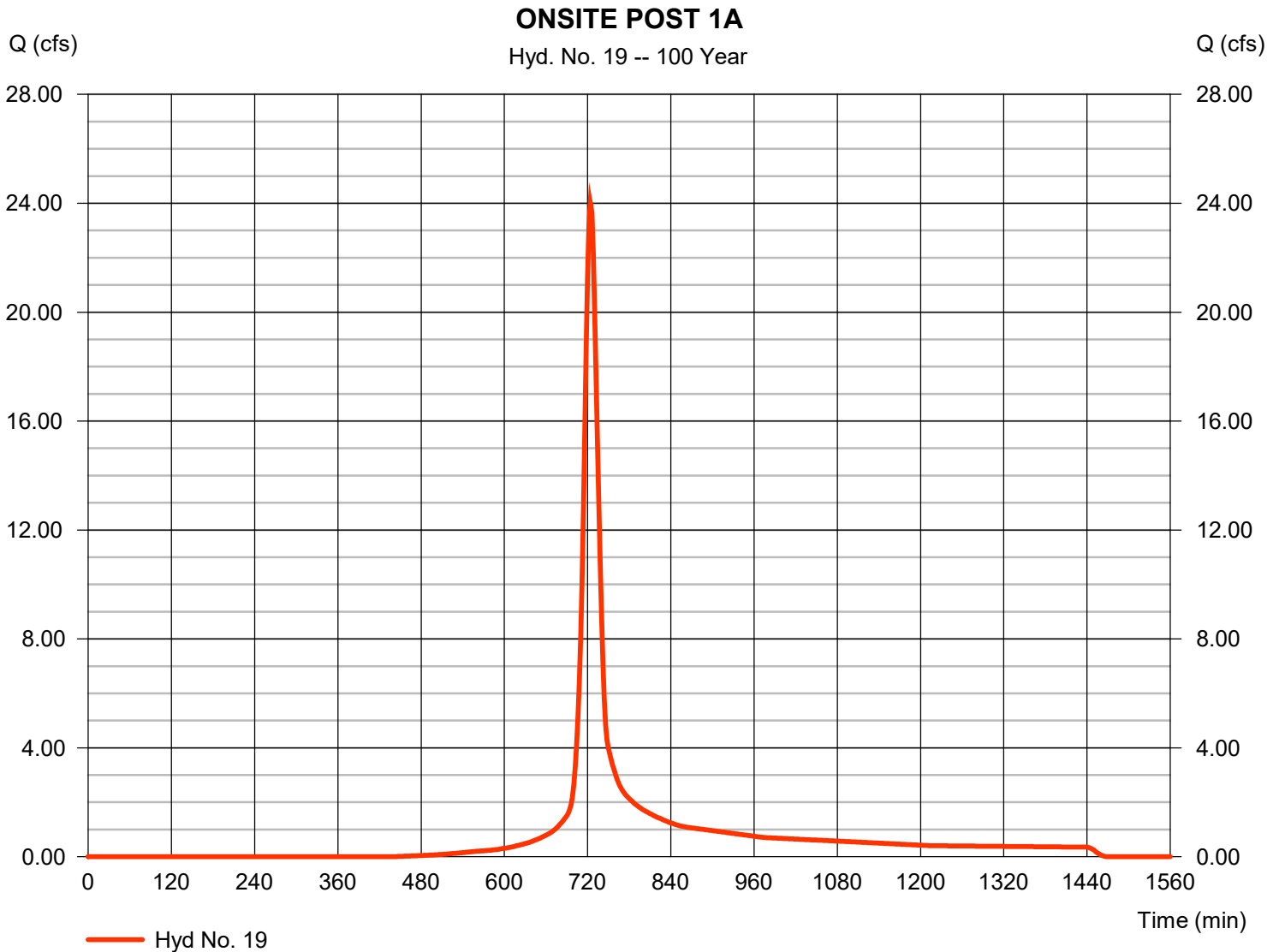
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 19

ONSITE POST 1A

Hydrograph type	= SCS Runoff	Peak discharge	= 24.01 cfs
Storm frequency	= 100 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 75,085 cuft
Drainage area	= 4.870 ac	Curve number	= 73
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 18.00 min
Total precip.	= 7.36 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

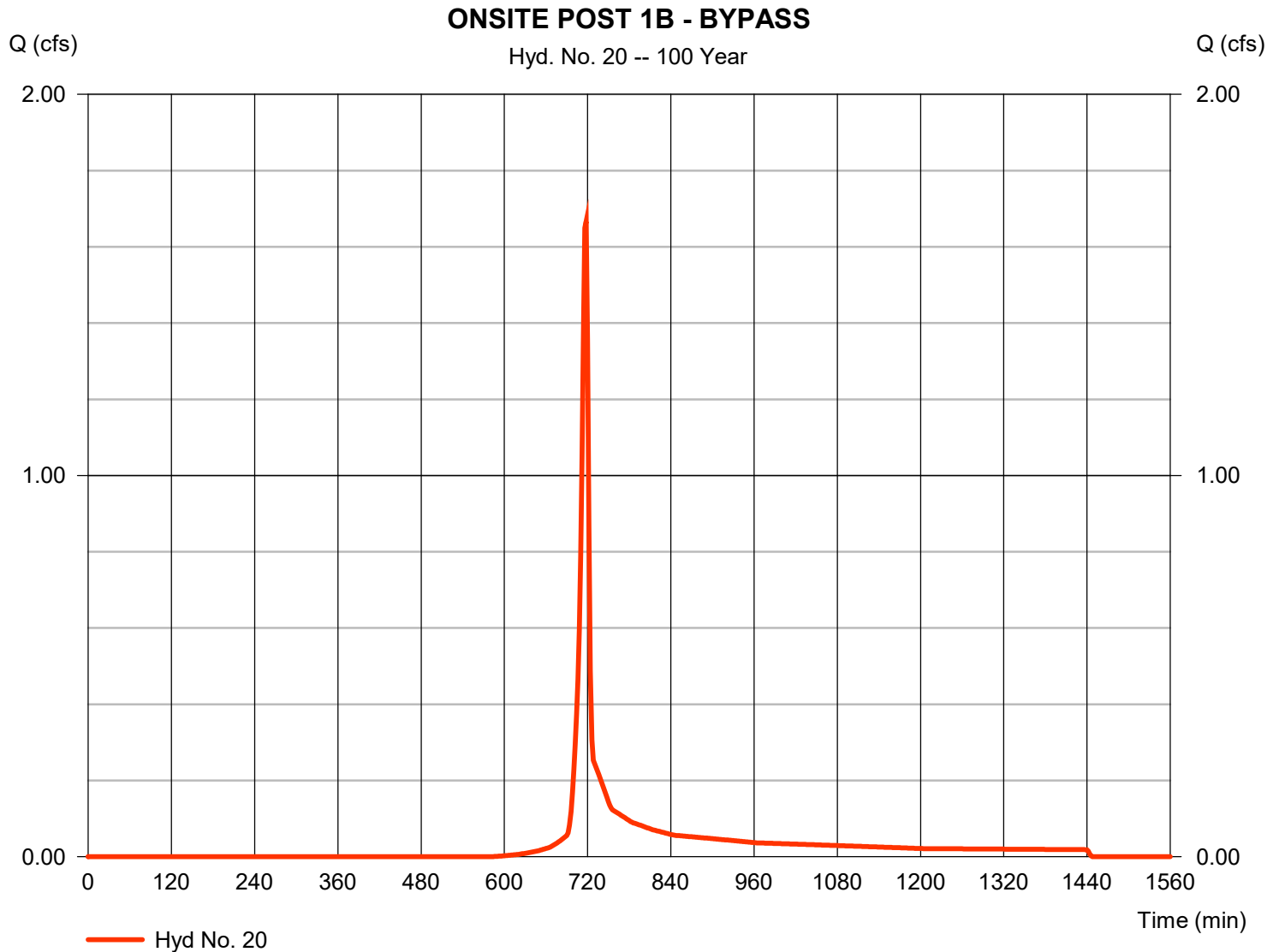
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 20

ONSITE POST 1B - BYPASS

Hydrograph type	= SCS Runoff	Peak discharge	= 1.667 cfs
Storm frequency	= 100 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 3,341 cuft
Drainage area	= 0.320 ac	Curve number	= 62
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 7.36 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

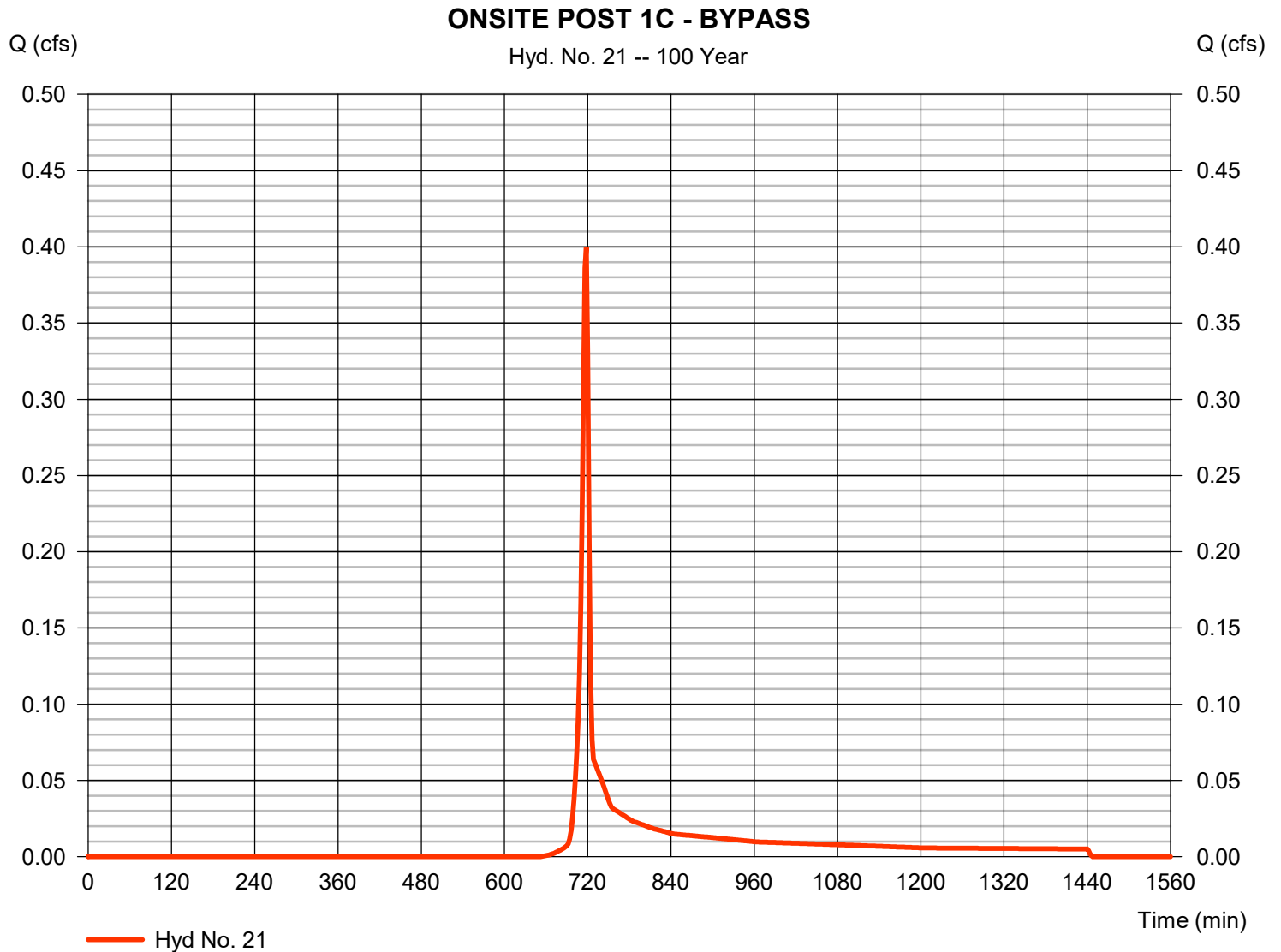
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 21

ONSITE POST 1C - BYPASS

Hydrograph type	= SCS Runoff	Peak discharge	= 0.400 cfs
Storm frequency	= 100 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 802 cuft
Drainage area	= 0.100 ac	Curve number	= 55
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 7.36 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

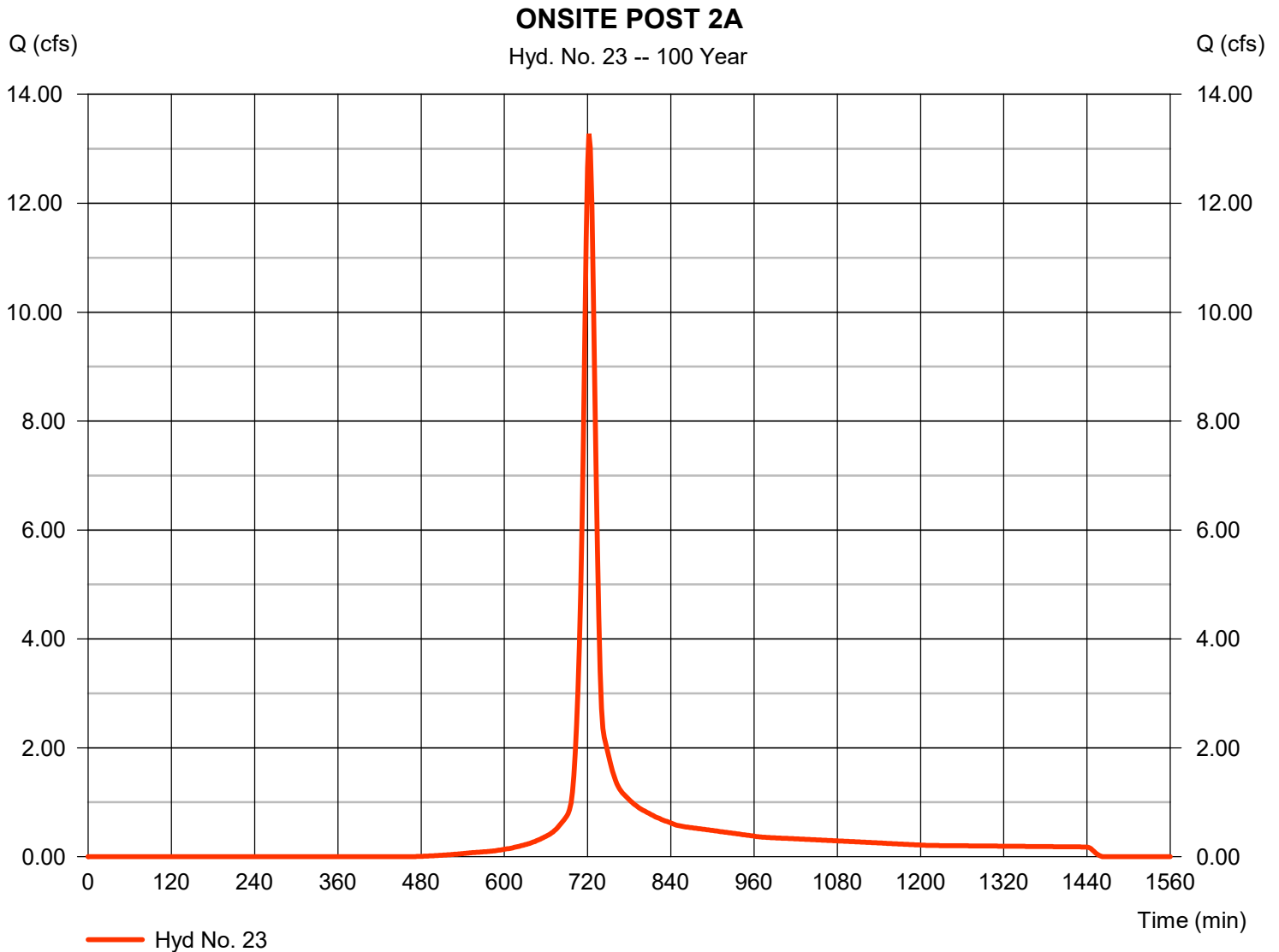
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 23

ONSITE POST 2A

Hydrograph type	= SCS Runoff	Peak discharge	= 13.28 cfs
Storm frequency	= 100 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 37,212 cuft
Drainage area	= 2.610 ac	Curve number	= 71
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 16.00 min
Total precip.	= 7.36 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

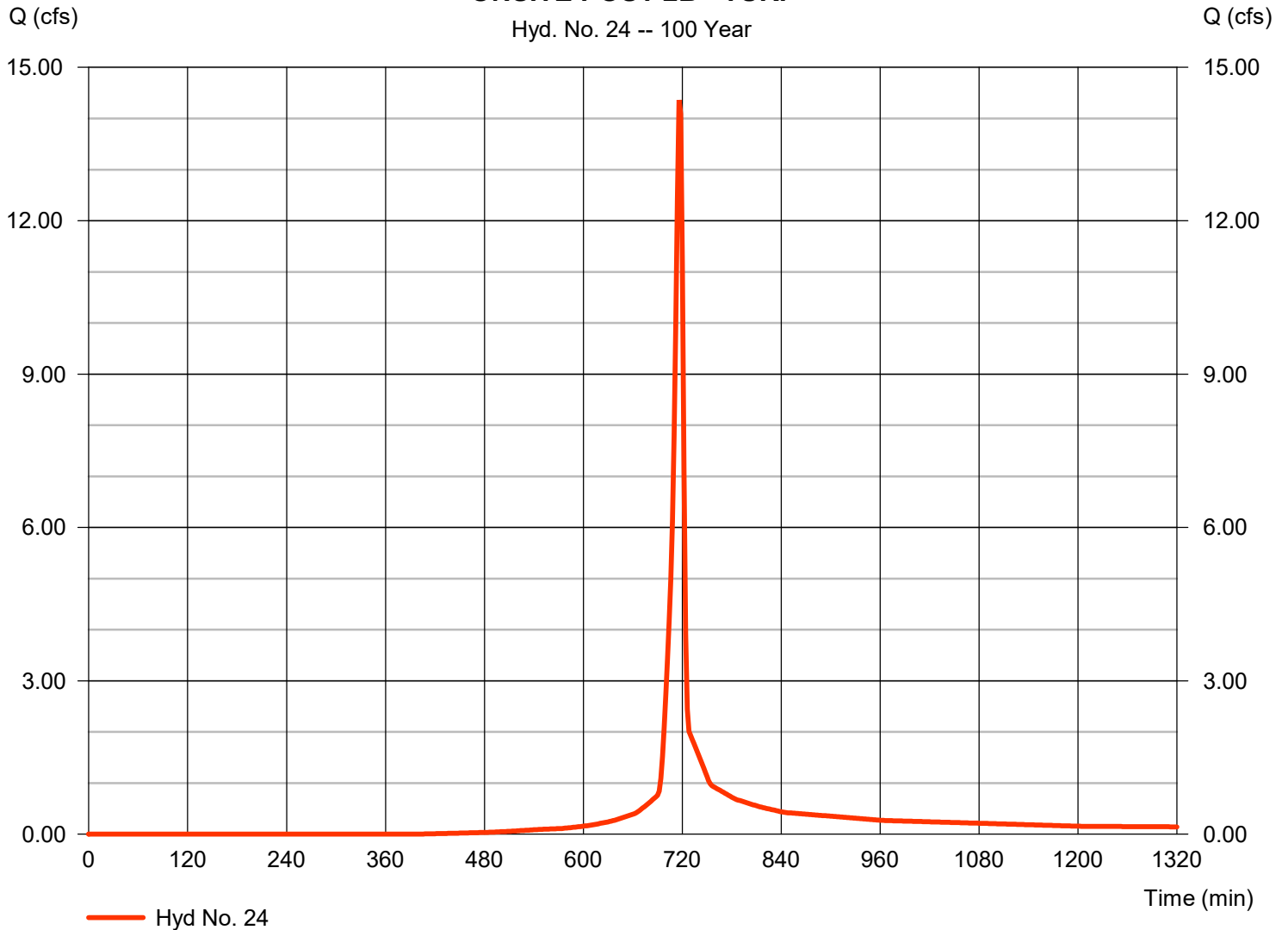
Monday, 05 / 8 / 2023

Hyd. No. 24

ONSITE POST 2B - TURF

Hydrograph type	= SCS Runoff	Peak discharge	= 14.36 cfs
Storm frequency	= 100 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 29,347 cuft
Drainage area	= 1.930 ac	Curve number	= 75
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 7.36 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

ONSITE POST 2B - TURF



Hydrograph Report

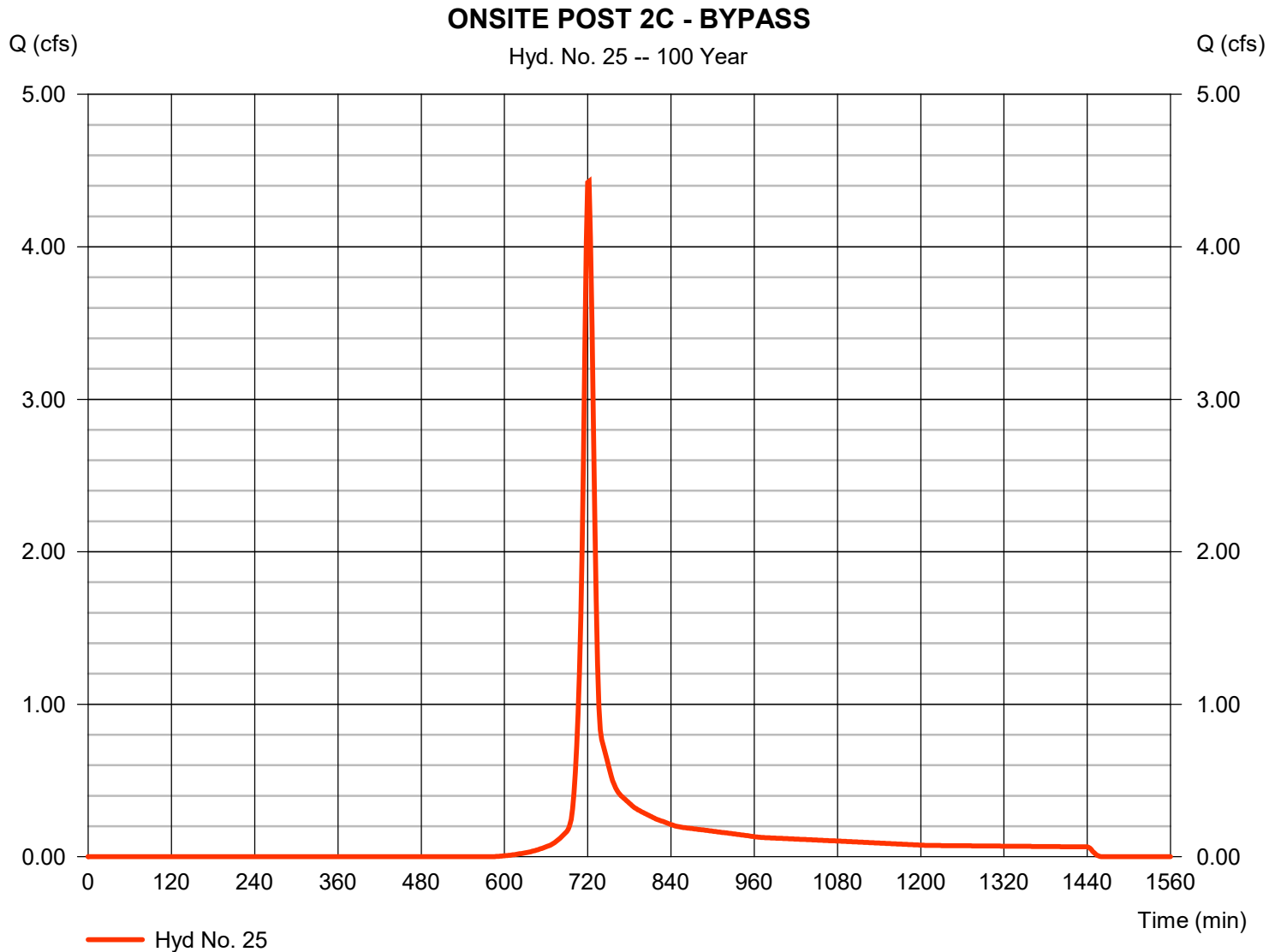
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 25

ONSITE POST 2C - BYPASS

Hydrograph type	= SCS Runoff	Peak discharge	= 4.430 cfs
Storm frequency	= 100 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 11,601 cuft
Drainage area	= 1.010 ac	Curve number	= 62
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 12.00 min
Total precip.	= 7.36 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

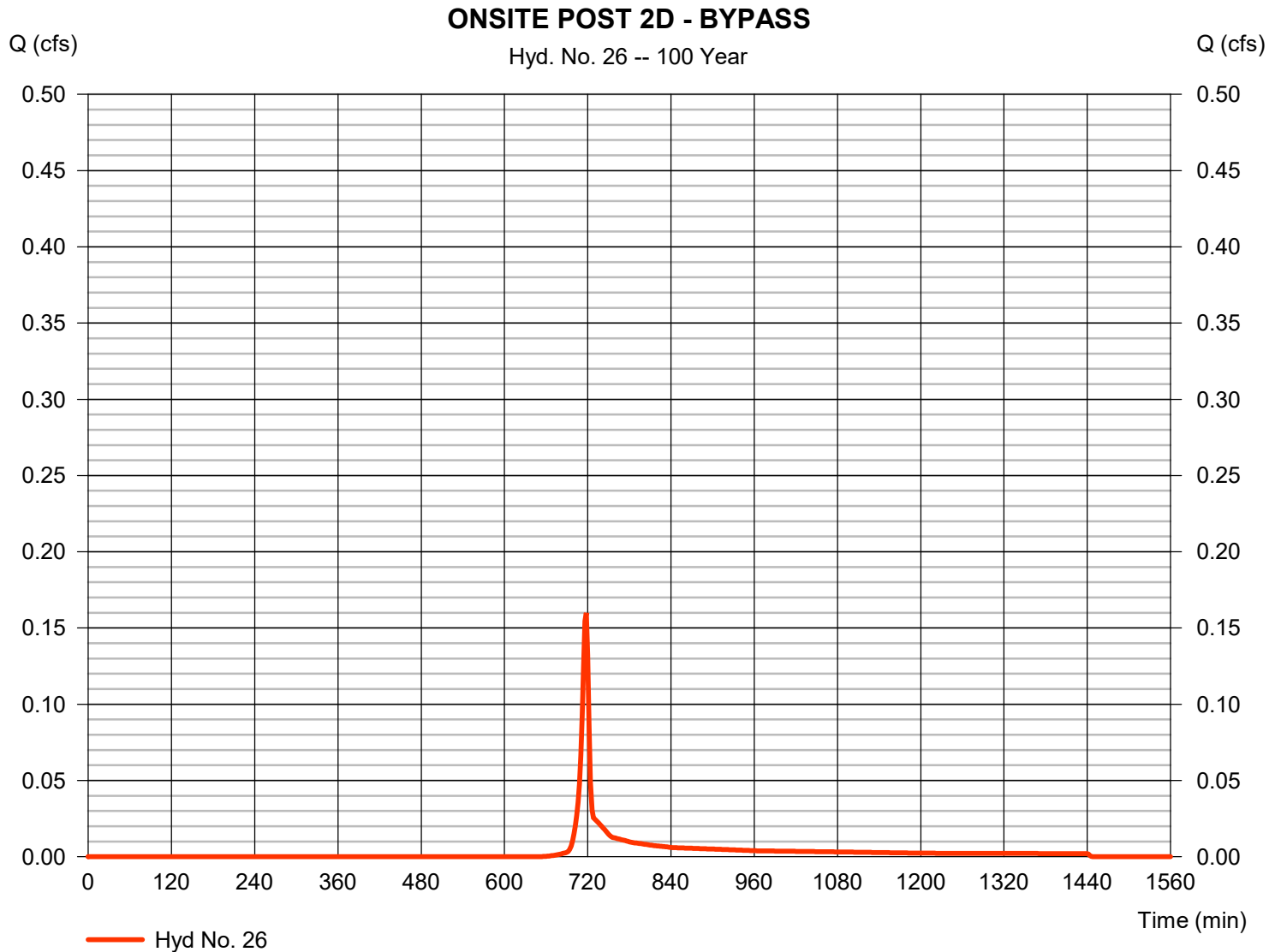
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 26

ONSITE POST 2D - BYPASS

Hydrograph type	= SCS Runoff	Peak discharge	= 0.160 cfs
Storm frequency	= 100 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 321 cuft
Drainage area	= 0.040 ac	Curve number	= 55
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 7.36 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

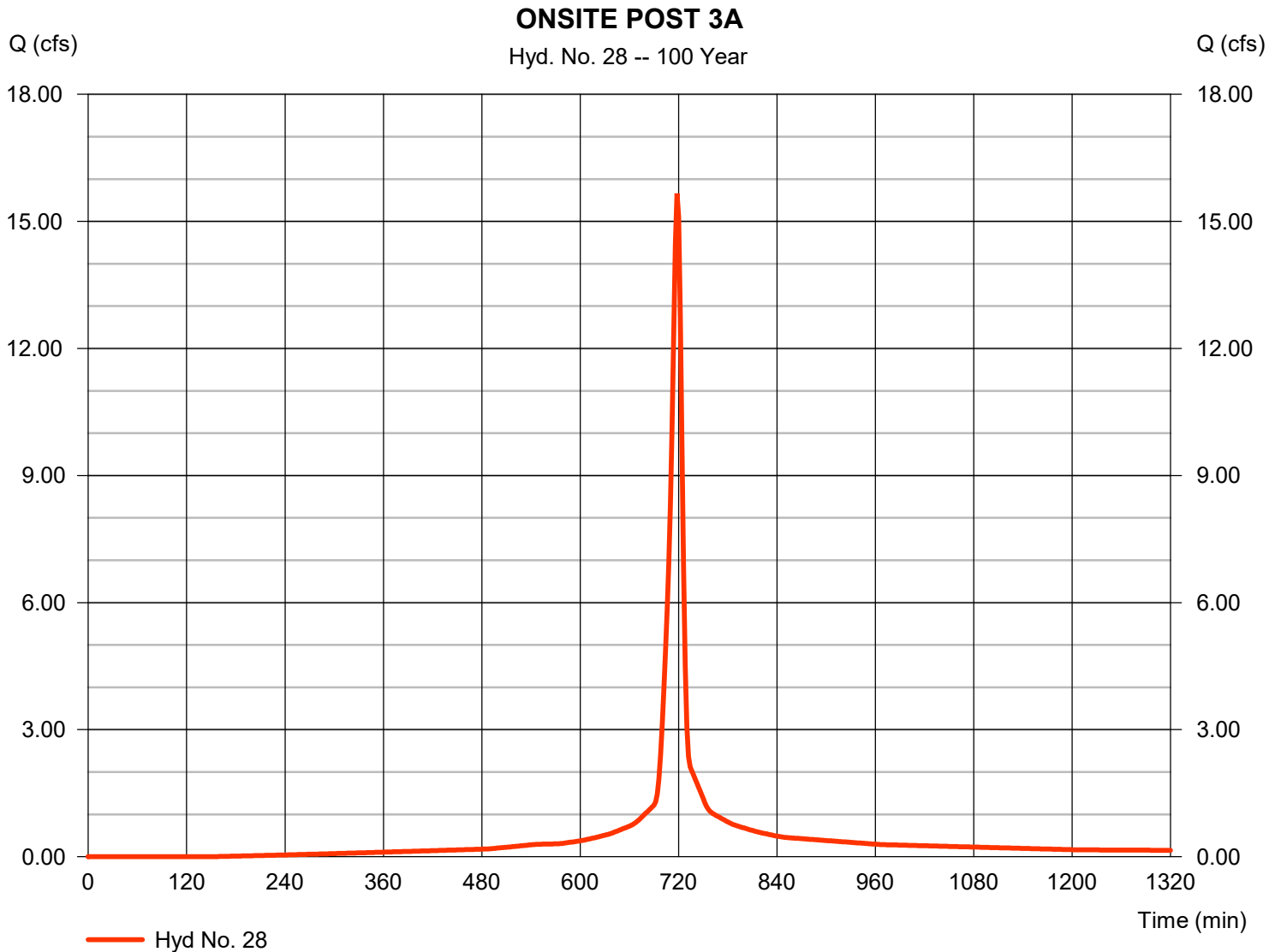
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 28

ONSITE POST 3A

Hydrograph type	= SCS Runoff	Peak discharge	= 15.66 cfs
Storm frequency	= 100 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 39,064 cuft
Drainage area	= 1.710 ac	Curve number	= 91
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 7.00 min
Total precip.	= 7.36 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

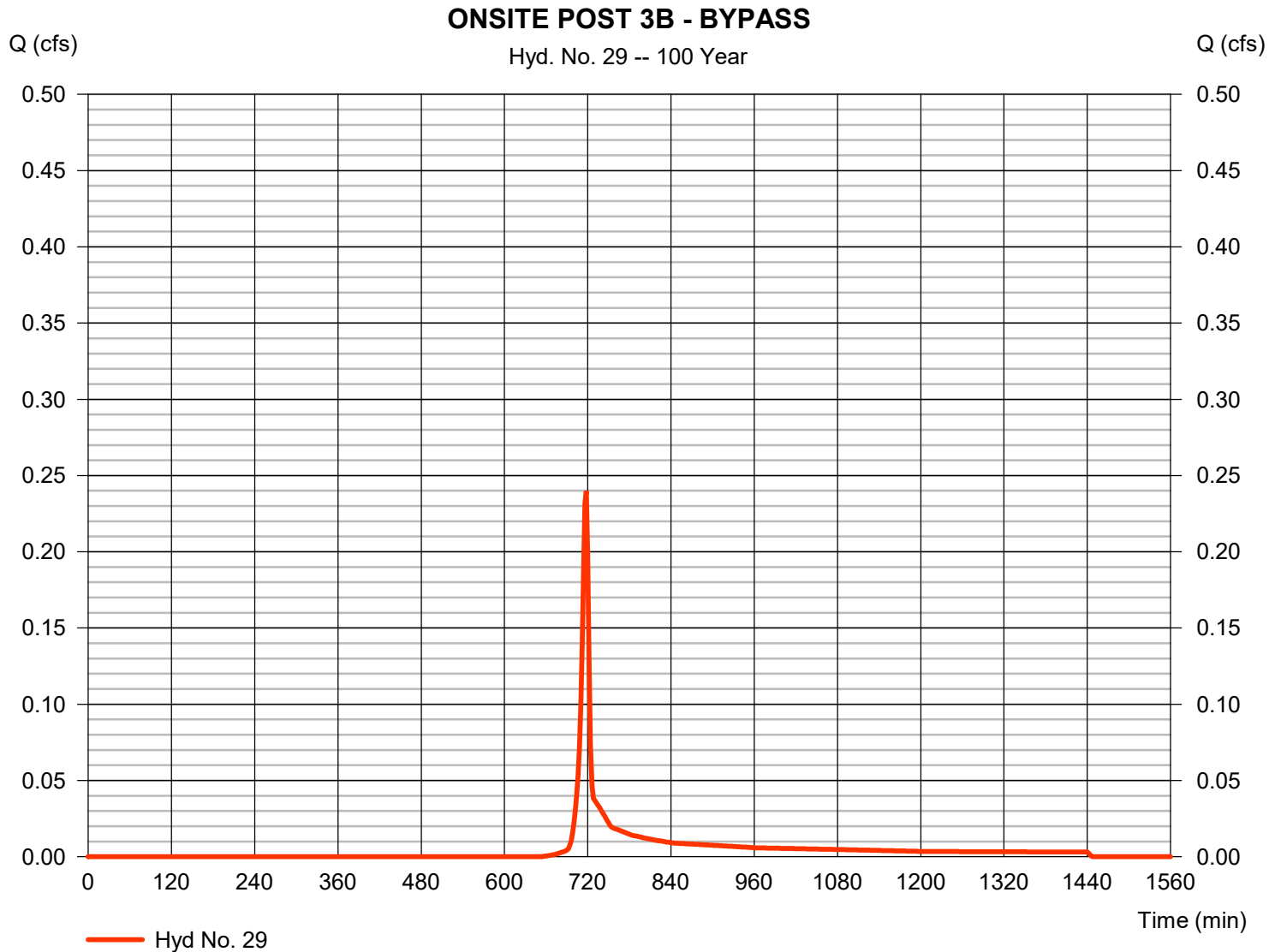
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 29

ONSITE POST 3B - BYPASS

Hydrograph type	= SCS Runoff	Peak discharge	= 0.240 cfs
Storm frequency	= 100 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 481 cuft
Drainage area	= 0.060 ac	Curve number	= 55
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 7.36 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

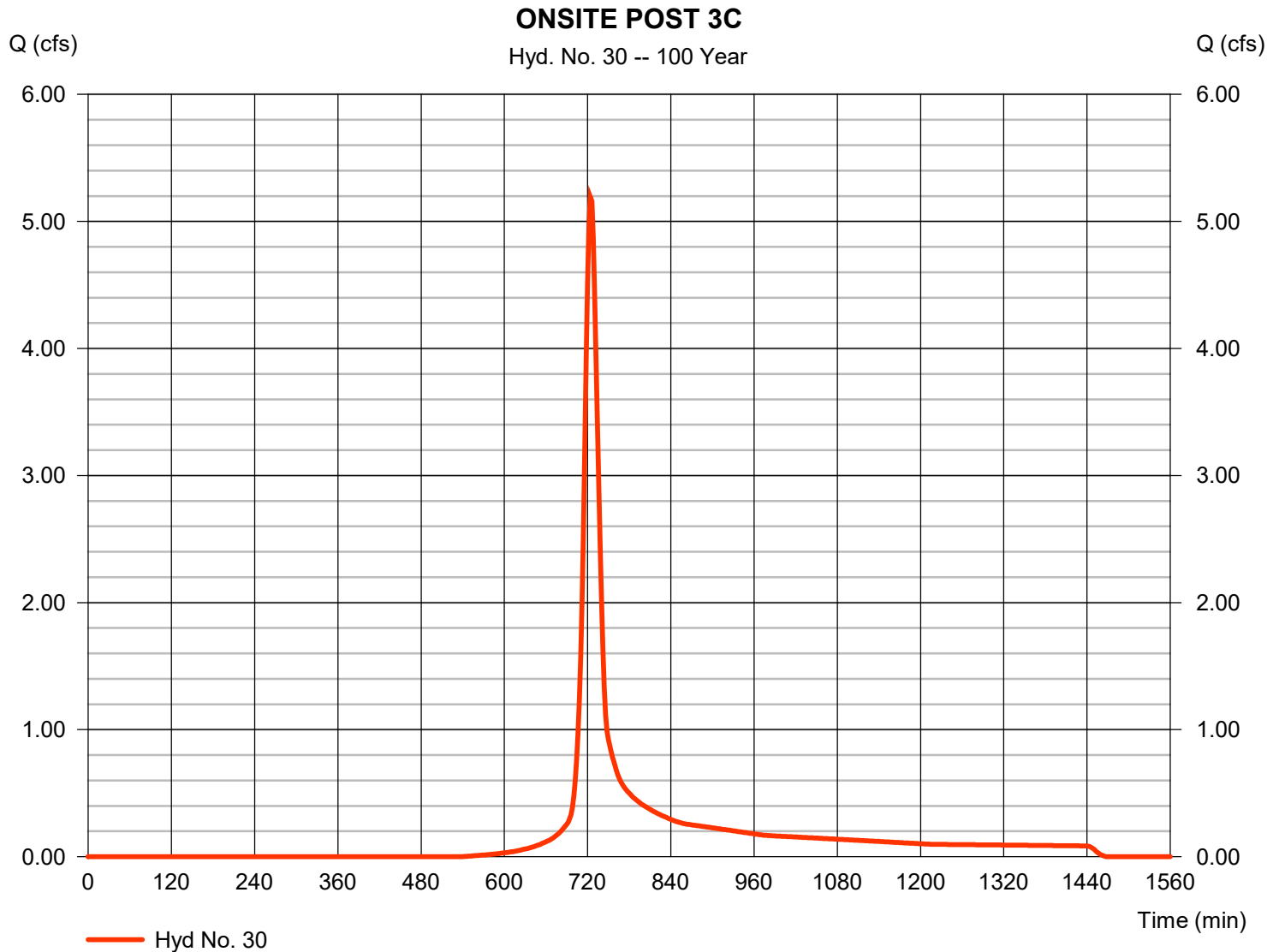
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 30

ONSITE POST 3C

Hydrograph type	= SCS Runoff	Peak discharge	= 5.193 cfs
Storm frequency	= 100 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 16,341 cuft
Drainage area	= 1.290 ac	Curve number	= 66
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 19.00 min
Total precip.	= 7.36 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

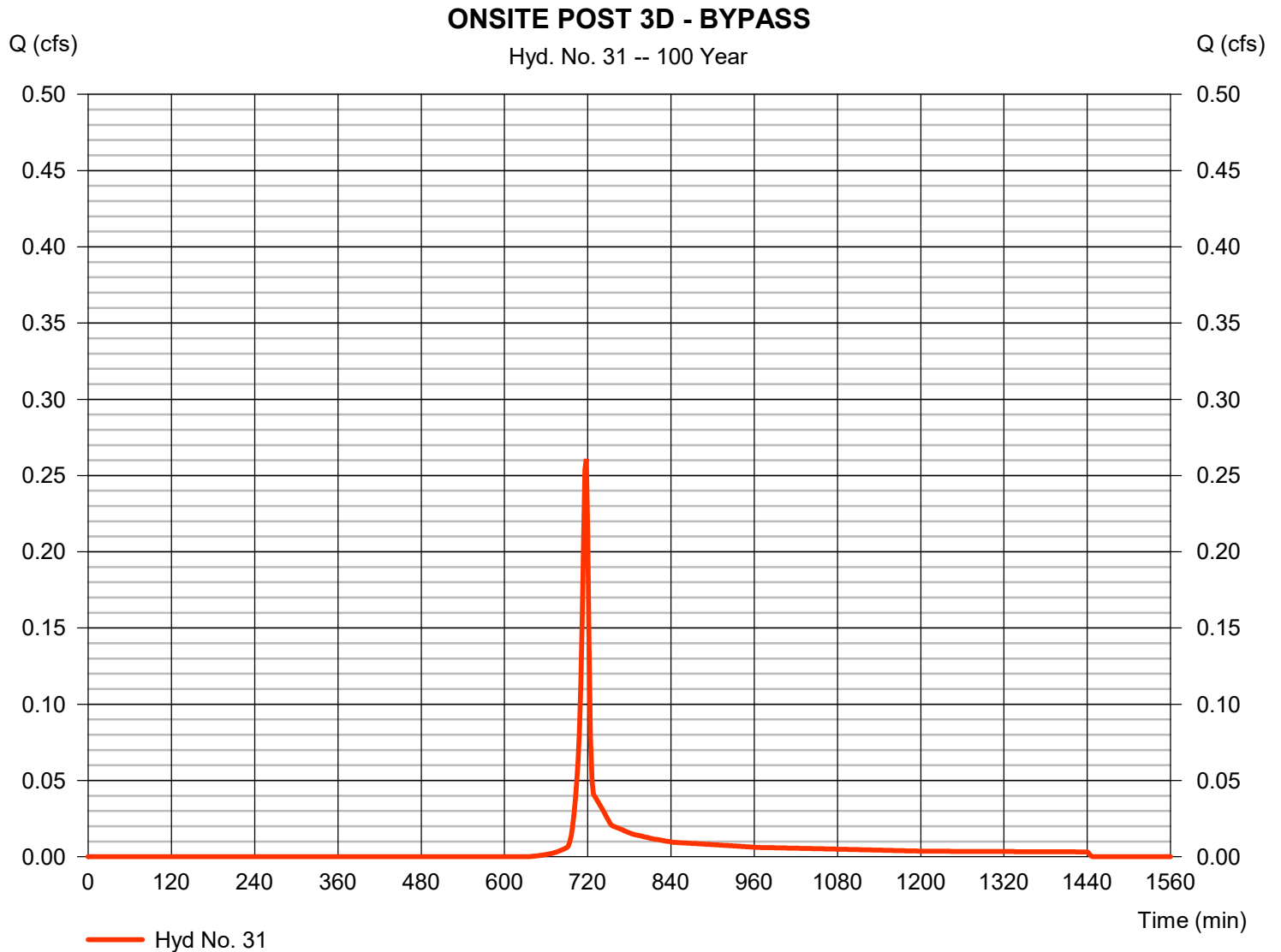
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 31

ONSITE POST 3D - BYPASS

Hydrograph type	= SCS Runoff	Peak discharge	= 0.261 cfs
Storm frequency	= 100 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 522 cuft
Drainage area	= 0.060 ac	Curve number	= 57
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 7.36 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

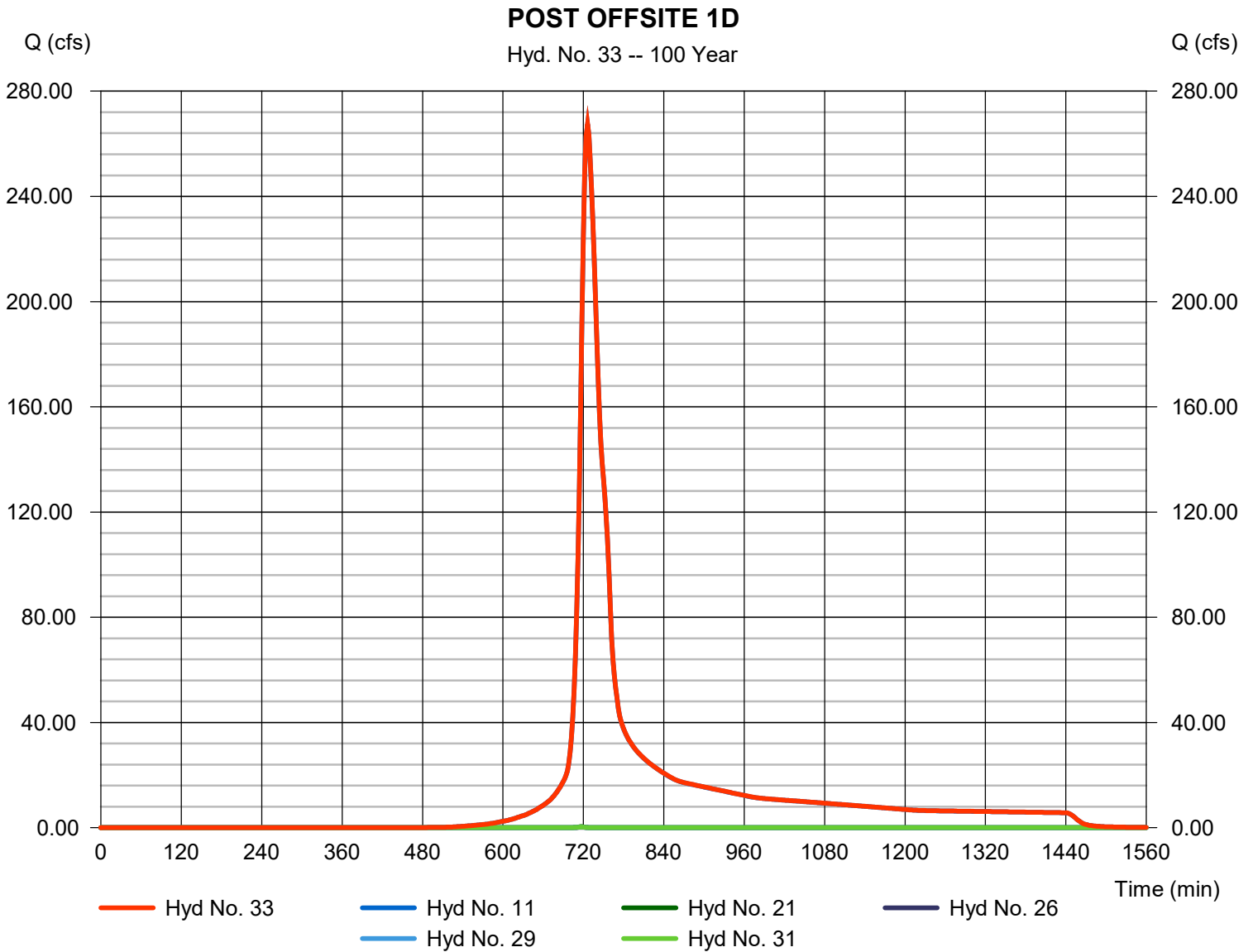
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 33

POST OFFSITE 1D

Hydrograph type	= Combine	Peak discharge	= 267.57 cfs
Storm frequency	= 100 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 1,130,073 cuft
Inflow hyds.	= 11, 21, 26, 29, 31	Contrib. drain. area	= 0.260 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 34

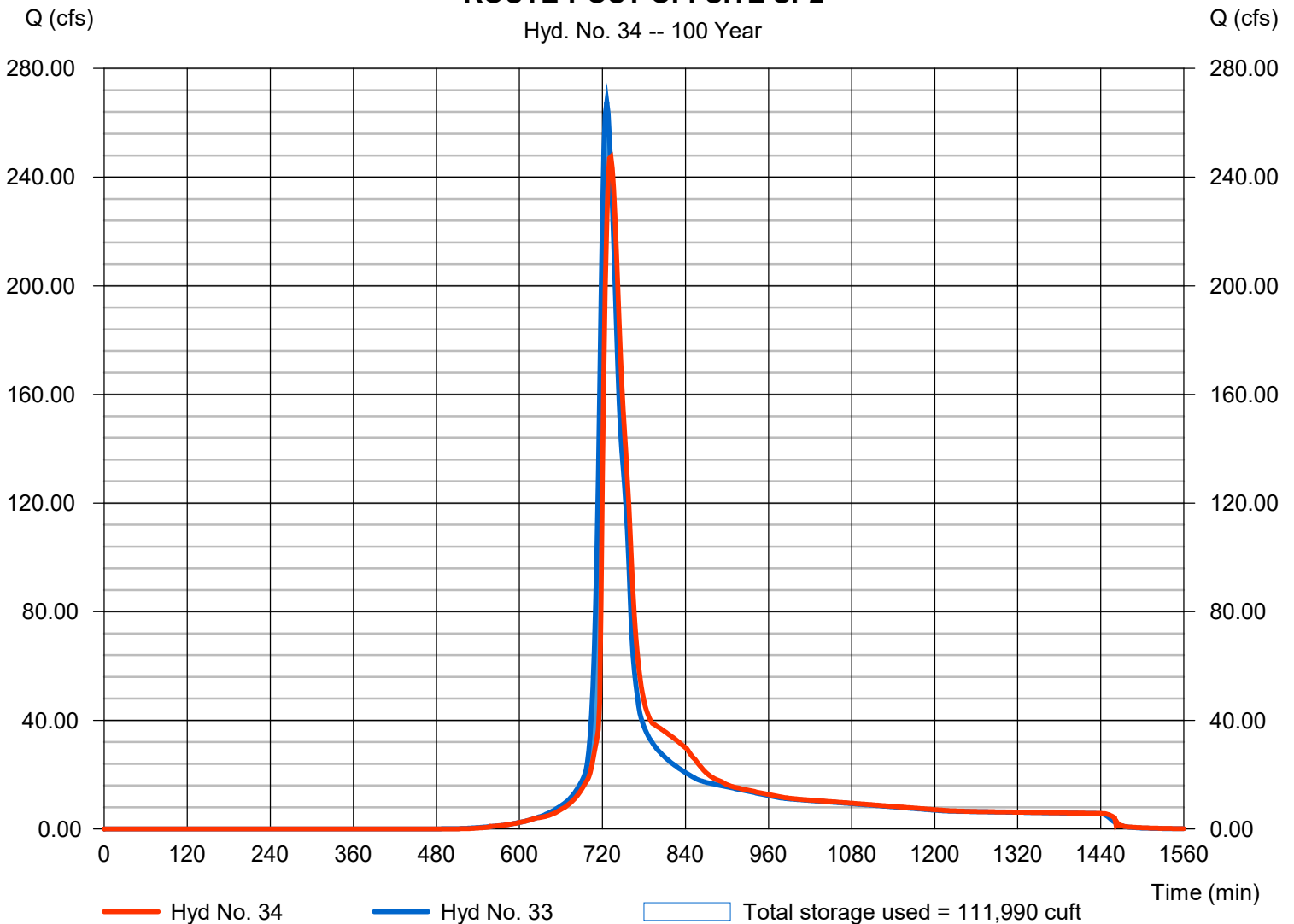
ROUTE-POST OFFSITE SP2

Hydrograph type	= Reservoir	Peak discharge	= 247.48 cfs
Storm frequency	= 100 yrs	Time to peak	= 732 min
Time interval	= 2 min	Hyd. volume	= 1,130,066 cuft
Inflow hyd. No.	= 33 - POST OFFSITE 1D	Max. Elevation	= 1014.61 ft
Reservoir name	= OFFSITE 1D	Max. Storage	= 111,990 cuft

Storage Indication method used.

ROUTE-POST OFFSITE SP2

Hyd. No. 34 -- 100 Year



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

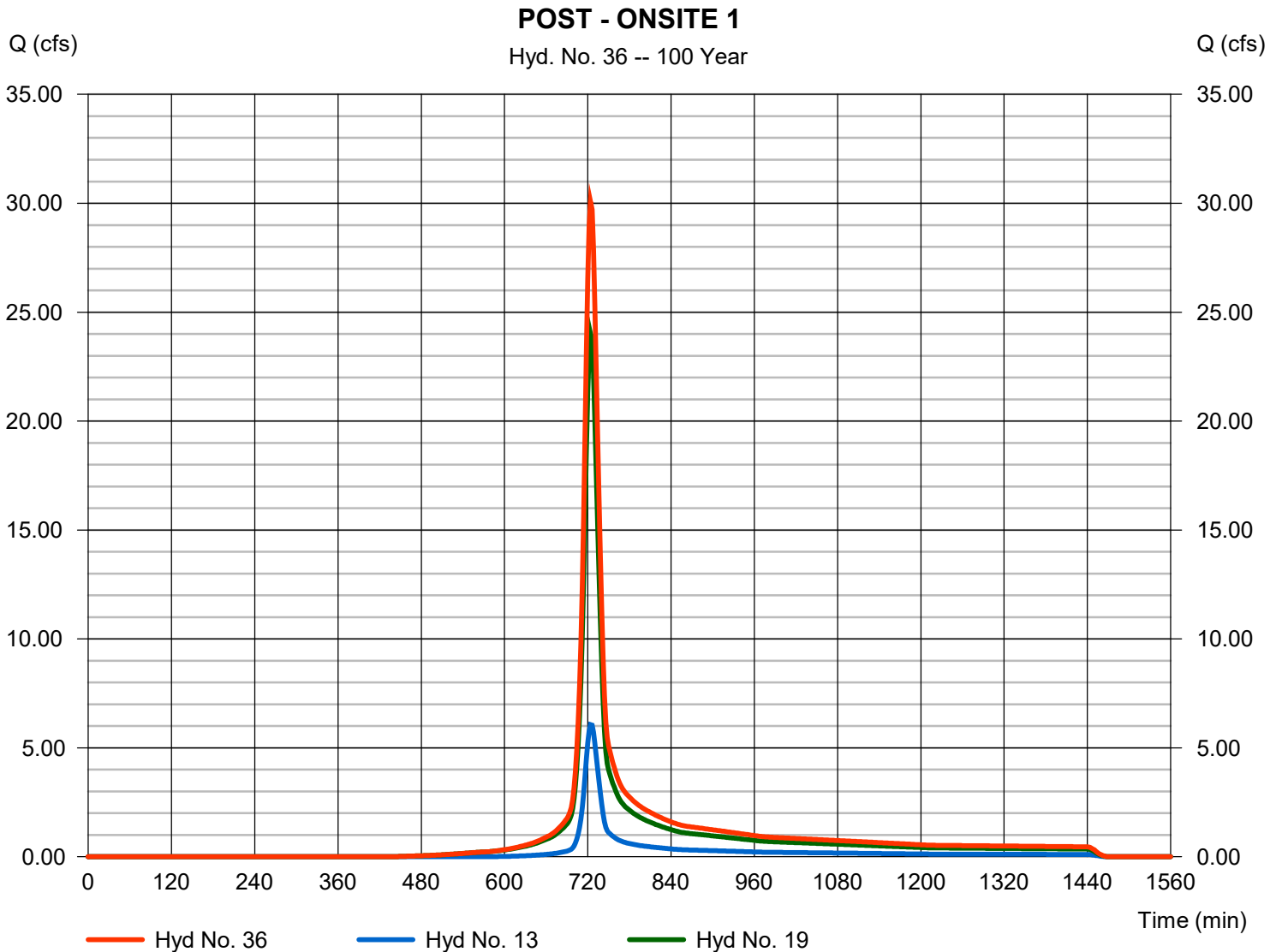
Monday, 05 / 8 / 2023

Hyd. No. 36

POST - ONSITE 1

Hydrograph type = Combine
Storm frequency = 100 yrs
Time interval = 2 min
Inflow hyds. = 13, 19

Peak discharge = 30.07 cfs
Time to peak = 724 min
Hyd. volume = 94,319 cuft
Contrib. drain. area = 6.540 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

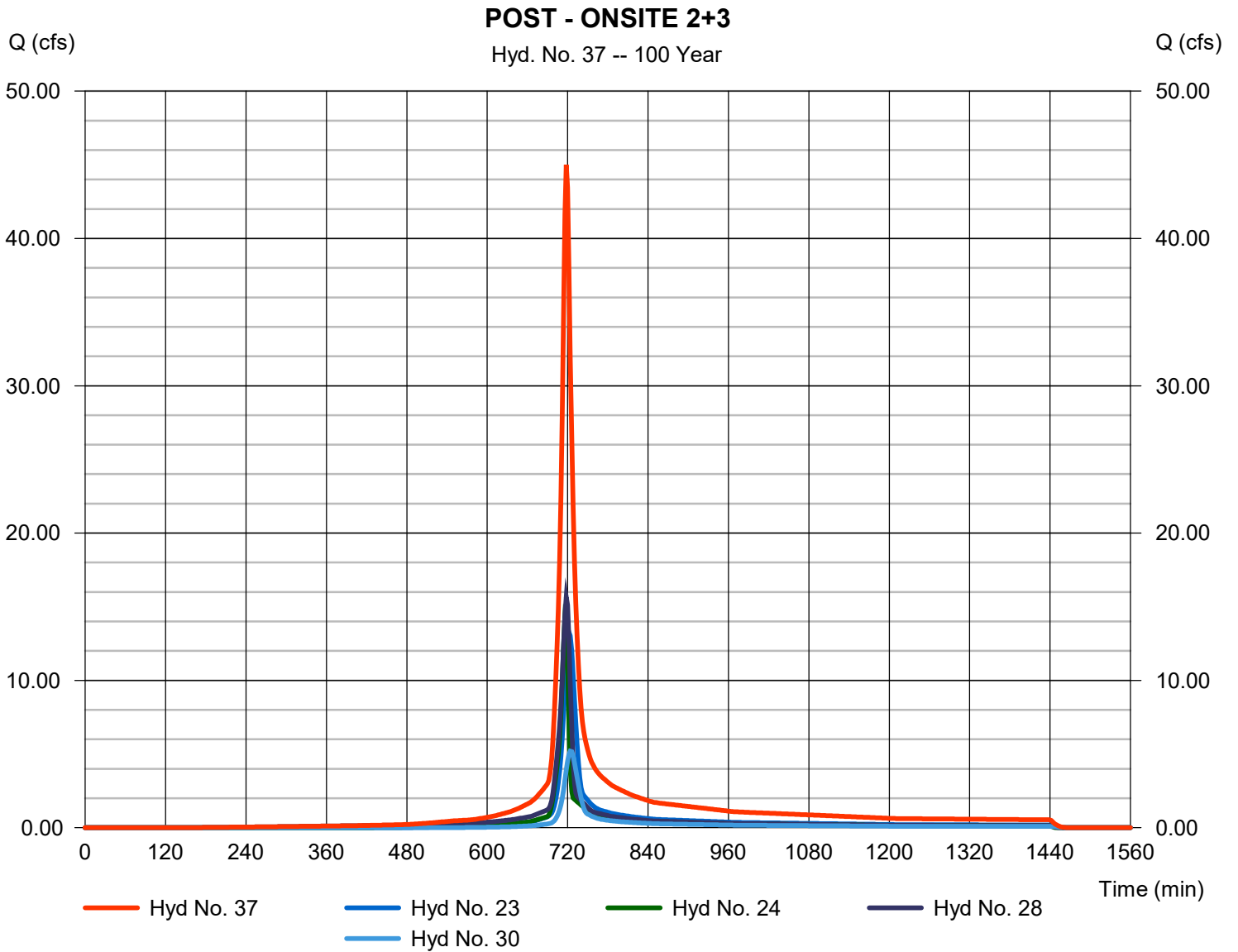
Monday, 05 / 8 / 2023

Hyd. No. 37

POST - ONSITE 2+3

Hydrograph type = Combine
 Storm frequency = 100 yrs
 Time interval = 2 min
 Inflow hyds. = 23, 24, 28, 30

Peak discharge = 44.99 cfs
 Time to peak = 718 min
 Hyd. volume = 121,964 cuft
 Contrib. drain. area = 7.540 ac



Hydrograph Report

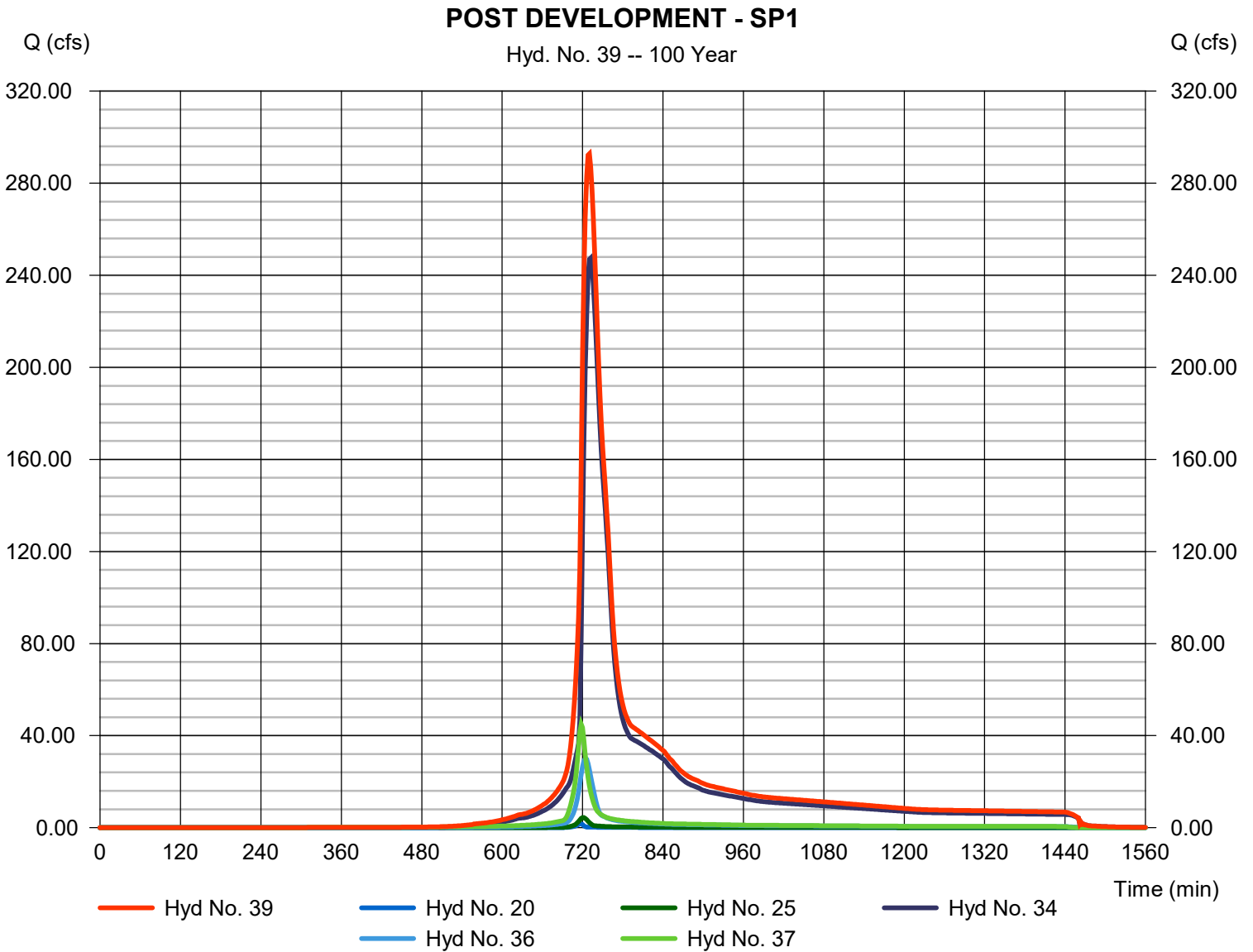
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2023

Monday, 05 / 8 / 2023

Hyd. No. 39

POST DEVELOPMENT - SP1

Hydrograph type	= Combine	Peak discharge	= 292.76 cfs
Storm frequency	= 100 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 1,361,292 cuft
Inflow hyds.	= 20, 25, 34, 36, 37	Contrib. drain. area	= 1.330 ac



APPENDIX E

APPENDIX F

Storm Sewer Tabulation

Station	Line	To Line	Len (ft)	Drng Area (ac)		Rnoff coeff (C)	Area x C		Tc (min)		Rain (l) (in/hr)	Total flow (cfs)	Cap full (cfs)	Vel (ft/s)	Pipe		Invert Elev (ft)	HGL Elev (ft)		Grnd / Rim Elev (ft)		Line ID	
				Incr	Total		Incr	Total	Inlet	Syst					Size (in)	Slope (%)		Dn	Up	Dn	Up		Dn
1	End		22.148	0.00	5.72	0.00	0.00	2.93	0.0	24.3	4.9	14.38	31.31	5.97	30	0.50	1006.00	1006.11	1007.19	1007.39	1006.00	1013.00	A0-A1
2	1		49.710	0.50	5.72	0.67	0.34	2.93	15.0	24.0	4.9	14.48	31.51	5.73	30	0.50	1006.11	1006.36	1007.39	1007.64	1013.00	1013.04	A1-A2
3	2		40.050	0.13	5.22	0.84	0.11	2.59	5.0	23.8	5.0	12.87	24.18	6.91	24	0.97	1007.50	1007.89	1008.54	1009.18	1013.04	1013.16	A2-A3
4	3		72.570	0.00	5.09	0.00	0.00	2.48	0.0	23.5	5.0	12.42	24.41	5.86	24	0.99	1007.89	1008.61	1009.18	1009.88	1013.16	1014.15	A3-A4
5	4		199.890	0.09	5.09	0.86	0.08	2.48	5.0	22.8	5.1	12.67	21.30	6.52	24	0.76	1009.10	1010.61	1010.21	1011.89	1014.15	1017.02	A4-A5
6	5		154.240	0.00	2.73	0.00	0.00	1.65	0.0	21.9	5.2	8.59	34.63	7.16	24	2.00	1012.80	1015.88	1013.48	1016.92	1017.02	1020.86	A5-A7
7	6		108.909	0.10	2.73	0.86	0.09	1.65	5.0	21.2	5.3	8.74	54.76	5.24	24	4.99	1015.88	1021.32	1016.92	1022.37	1020.86	1026.54	A7-A8
8	7		81.071	0.00	0.71	0.00	0.00	0.59	0.0	14.0	6.6	3.89	11.37	3.83	18	1.00	1021.42	1022.23	1022.37	1022.98	1026.54	1030.92	A8-A14 (1)
9	8		202.660	0.08	0.58	0.86	0.07	0.47	5.0	12.4	7.1	3.31	26.08	7.12	18	5.26	1025.66	1036.31	1026.02	1037.00	1030.92	1041.40	A8-A14
10	9		213.702	0.14	0.36	0.86	0.12	0.29	6.0	9.7	7.9	2.28	27.28	3.28	18	5.75	1036.31	1048.60	1037.00	1049.17	1041.40	1053.74	A14-A16
11	10		31.000	0.22	0.22	0.76	0.17	0.17	9.0	9.0	8.2	1.37	10.62	3.04	18	0.87	1048.70	1048.97	1049.17	1049.41	1053.74	1053.80	A16-A17
12	9		24.667	0.14	0.14	0.79	0.11	0.11	7.0	7.0	9.1	1.01	11.22	2.22	18	0.97	1036.40	1036.64	1037.00	1037.01	1041.40	1041.44	A14-A15
13	7		28.330	0.00	1.92	0.00	0.00	0.97	0.0	21.0	5.4	5.21	49.37	3.78	24	4.06	1021.33	1022.48	1022.37	1023.28	1026.54	1027.48	A8-A9
14	13		82.804	1.26	1.26	0.31	0.39	0.39	19.0	19.0	5.7	2.21	38.65	2.98	24	2.49	1022.64	1024.70	1023.28	1025.22	1027.48	1029.52	CMP
15	8		27.110	0.13	0.13	0.91	0.12	0.12	5.0	5.0	10.2	1.21	6.85	3.71	15	0.96	1027.50	1027.76	1027.86	1028.19	1030.92	1030.93	A12 - A13
16	13		22.048	0.06	0.66	0.92	0.06	0.58	5.0	7.3	8.9	5.22	27.94	5.88	18	6.03	1022.62	1023.95	1023.28	1024.83	1027.48	1028.95	A9-A10
17	16		47.620	0.60	0.60	0.88	0.53	0.53	7.0	7.0	9.1	4.80	30.31	4.58	18	7.10	1023.95	1027.33	1024.83	1028.17	1028.95	1032.33	A10-A11
18	5		22.020	0.41	2.27	0.59	0.24	0.76	7.0	19.5	5.6	4.24	8.04	3.57	18	0.50	1010.61	1010.72	1011.89	1011.51	1017.02	1017.35	A5-A6
19	18		116.570	0.00	1.86	0.00	0.00	0.52	0.0	18.7	5.7	2.95	4.93	3.93	15	0.50	1010.72	1011.30	1011.51	1011.99	1017.35	1015.62	A6-A20
20	19		46.301	1.18	1.86	0.30	0.35	0.52	16.0	18.4	5.8	2.98	5.04	4.27	15	0.52	1011.30	1011.54	1011.99	1012.23	1015.62	1014.50	A20-A18
21	20		174.582	0.68	0.68	0.24	0.16	0.16	15.0	15.0	6.4	1.05	4.94	2.29	15	0.50	1011.54	1012.41	1012.23	1012.81	1014.50	1014.50	A18-A19

Project File: Storm System A v3.stm

Number of lines: 21

Run Date: 5/17/2023

NOTES: Intensity = 62.33 / (Inlet time + 6.40) ^ 0.74; Return period = Yrs. 25 ; c = cir e = ellip b = box

Storm Sewer Tabulation

Station	Line	To Line	Len (ft)	Drng Area (ac)		Rnoff coeff (C)	Area x C		Tc (min)		Rain (l) (in/hr)	Total flow (cfs)	Cap full (cfs)	Vel (ft/s)	Pipe		Invert Elev (ft)		HGL Elev (ft)		Grnd / Rim Elev (ft)		Line ID
				Incr	Total		Inlet	Syst	Size (in)	Slope (%)					Dn	Up	Dn	Up	Dn	Up			
1	End		44.087	1.25	4.34	0.26	0.33	1.76	18.0	22.4	5.2	9.04	22.31	9.06	18	4.51	1008.08	1010.07	1008.75	1011.23	1010.80	1016.44	B1-B2
2	1		46.751	0.03	2.64	0.85	0.03	1.17	5.0	22.2	5.2	6.08	10.53	4.64	18	1.01	1010.07	1010.54	1011.23	1011.49	1016.44	1015.54	B2-B3
3	2		52.424	2.61	2.61	0.44	1.15	1.15	22.0	22.0	5.2	5.98	9.14	6.42	15	2.00	1010.68	1011.73	1011.49	1012.72	1015.54	1016.73	B3-B4
4	1		87.687	0.45	0.45	0.57	0.26	0.26	17.0	17.0	6.0	1.54	9.12	2.47	15	2.00	1010.25	1012.00	1011.23	1012.49	1016.44	1017.00	B2-B5
5	End		50.687	0.53	2.16	0.36	0.19	0.92	15.0	18.3	5.8	5.32	16.62	6.63	18	2.51	1005.00	1006.27	1005.58	1007.16	1005.80	1014.71	C1-C2
6	5		88.186	0.25	0.25	0.70	0.18	0.18	15.0	15.0	6.4	1.12	12.92	4.79	15	4.00	1007.47	1011.00	1007.72	1011.42	1014.71	1016.00	C2-C5
7	5		54.770	0.46	1.38	0.75	0.35	0.56	6.0	17.8	5.9	3.26	10.52	3.56	18	1.00	1006.27	1006.82	1007.16	1007.51	1014.71	1012.66	C2-C3
8	7		35.352	0.92	0.92	0.23	0.21	0.21	17.0	17.0	6.0	1.27	7.49	2.37	18	0.51	1006.82	1007.00	1007.51	1007.42	1012.66	1011.83	C3-C4
Project File: Storm System B.stm																Number of lines: 8						Run Date: 5/17/2023	

NOTES: Intensity = 62.33 / (Inlet time + 6.40) ^ 0.74; Return period = Yrs. 25 ; c = cir e = ellip b = box

Storm Sewer Tabulation

Station	Line	To Line	Len (ft)	Drng Area		Rnoff coeff	Area x C		Tc		Rain (l)	Total flow (cfs)	Cap full (cfs)	Vel (ft/s)	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
				Incr (ac)	Total (ac)		Incr	Total	Inlet (min)	Syst (min)					Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End		111.366	4.94	6.70	0.44	2.17	3.14	17.0	18.3	5.8	18.16	21.28	7.32	24	0.75	1024.00	1024.84	1025.42	1026.37	1024.00	1031.70	D1-D2
2	1		49.869	1.76	1.76	0.55	0.97	0.97	18.0	18.0	5.8	5.64	16.11	6.65	18	2.01	1026.50	1027.50	1027.11	1028.42	1031.70	1033.52	D2-D3

Project File: Church Bypass - System D.stm

Number of lines: 2

Run Date: 5/17/2023

NOTES: Intensity = 62.33 / (Inlet time + 6.40) ^ 0.74; Return period = Yrs. 25 ; c = cir e = ellip b = box



CONTRACT AGREEMENT

ITB #2023-022 FITZGERALD PARK IMPROVEMENTS – PHASE II

This Agreement made and entered into this __ day of ____ in the year 202_ ; by and between the City of Tucker, Georgia, having its principal place of business at 1975 Lakeside Pkwy Suite 350, Tucker, Georgia 30084 and [REDACTED] ("Contractor"), located at [REDACTED].

WHEREAS, the City of Tucker is charged with the responsibility for the establishment of contracts for the acquisition of goods, materials, supplies and equipment, and services by the various departments of the City of Tucker; and

WHEREAS, the City of Tucker has caused **Invitation to Bid #2023-022** to be issued soliciting proposals from qualified Contractors to furnish all items, labor services, materials and appurtenances called for by them in accordance with this proposal. Selected ("Contractor") is required to provide the services as called for in the specifications; and

WHEREAS, the Contractor submitted a response to the **ITB #2023-022**; and

WHEREAS, the Contractor's submittal was deemed by the City of Tucker to be the lowest responsive and responsible bidder qualified per the scope of services.

NOW THEREFORE, in consideration of the mutual covenant and promises contained herein, the parties agree as follows:

1.0 Scope of Work

That the Contractor has agreed and by these present does agree with the City to furnish all equipment, tools, materials, skill, labor of every description, and all things necessary to carry out as delineated in "**Exhibit A**" (**Scope of Services**) and complete in a good, firm, substantial and workmanlike manner, the Work in strict conformity with the specifications which shall form an essential part of this agreement. In addition to the foregoing, and notwithstanding anything to the contrary stated herein, the following terms and conditions, amendments, and other documents are incorporated by reference and made a part of the terms and conditions of this Agreement as is fully set out herein:

EXHIBIT A - SCOPE OF SERVICE

EXHIBIT B - COST PROPOSAL

EXHIBIT C- W-9

EXHIBIT D - CERTIFICATE OF INSURANCE

EXHIBIT E – E-VERIFY AFFIDAVIT

EXHIBIT F- CONTACT INFORMATION

EXHIBIT G - ADDENDUMS

EXHIBIT H – PERFORMANCE AND PAYMENT BONDS (if applicable)

2.0 Key Personnel

The City of Tucker enters into this Agreement having relied upon Contractor's providing the services of the Key Personnel, if any, identified as such in the body of the Agreement. No Key Personnel may be replaced or transferred without the prior approval of the City's authorized representative. Any Contractor personnel to whom the City objects shall be removed from City work immediately. The City maintains the right to approve in its sole discretion all personnel assigned to the work under this Agreement.

3.0 Compensation

3.1. Pricing. The Contractor will be paid for the goods and services sold pursuant to the Contract in accordance with the bid and final pricing documents as incorporated into the terms of the Contract. All prices are firm and fixed and are not subject to variation. The prices quoted and listed on the attached Cost Proposal, a copy of which is attached hereto as **Exhibit "B" (Cost Proposal)** and incorporated herein, shall be firm throughout the term of this Contract. The maximum costs owed by the City, unless otherwise agreed to in writing, shall not exceed **\$00.00**

Billings. If applicable, the Contractor shall submit, on a regular basis, an invoice for goods and services supplied to the City under the Contract at the billing address specified in the Purchase Instrument or Contract. The invoice shall comply with all applicable rules concerning payment of such claims. The City shall pay all approved invoices in arrears and in accordance with applicable provisions of City law. Unless otherwise agreed in writing by the parties, the Contractor shall not be entitled to receive any other payment or compensation from the City for any goods or services provided by or on behalf of the Contractor under the Contract. The Contractor shall be solely responsible for paying all costs, expenses and charges it incurs in connection with its performance under the Contract.

Invoices are to be emailed to invoice@tuckerga.gov and must reference the PO# (see top of contract). A W-9 Request for Taxpayer Identification Number and Certification Form must be submitted "**Exhibit C" (W-9)**.

3.2. Delay of Payment Due to Contractor's Failure. If the City in good faith determines that the Contractor has failed to perform or deliver any service or product as required by the Contract, the Contractor shall not be entitled to any compensation under the Contract until such service or product is performed or delivered. In this event, the City may withhold that portion of the Contractor's compensation which represents payment for services or products that were not performed or delivered. To the extent that the Contractor's failure to perform or deliver in a timely manner causes the City to incur costs, the City may deduct the amount of such incurred costs from any amounts payable to Contractor. The City's authority to deduct such incurred costs shall not in any way affect the City's authority to terminate the Contract.

3.3. Set-Off Against Sums Owed by the Contractor. In the event that the Contractor owes the

City any sum under the terms of the Contract, pursuant to any judgment, or pursuant to any law, the City may set off the sum owed to the City against any sum owed by the City to the Contractor in the City's sole discretion.

4.0 Duration of Contract

- 4.1. **Contract Term.** The Contract between the City and the Contractor shall begin and end on the dates specified, unless terminated earlier in accordance with the applicable terms and conditions. Pursuant to O.C.G.A. Section 36-60-13, this Contract shall not be deemed to create a debt of the City for the payment of any sum beyond the fiscal year of execution or, in the event of a renewal, beyond the fiscal year of such renewal. The term of this contract shall align with the City's fiscal year from July 1 to June 30 and shall be from commencement of services and until all services are rendered. All invoices postmarked by the City during said term shall be filled at the contract price.
- 4.2. **Contract Extension.** In the event that this Standard Contract shall terminate or be likely to terminate prior to the making of an award for a new contract for the identified goods and ancillary services, the City may, with the written consent of Contractor, extend this Contract for such period as may be necessary to afford the City a continuous supply of the identified goods and ancillary services.

If not set forth in the Contractor's submittal, the City will determine the basic period of performance for the completion of any of Contractor's actions contemplated within the scope of this Agreement and notify Contractor of the same via written notice. If no specific period for the completion of Contractor's required actions pursuant to this Agreement is set out in writing, such period shall be a reasonable period of time based upon the nature of the activity. If the completion of this Contract is delayed by actions of the City, then and in such event the time of completion of this Contract shall be extended for such additional time within which to complete the performance of the Contract as is required by such delay.

This Contract may be extended by mutual consent of both the City and the Contractor for reasons of additional time, additional services and/or additional areas of work.

5.0 Independent Contractor

- 5.1. The Contractor shall be an independent Contractor. The Contractor is not an employee, agent or representative of the City of Tucker. The successful Contractor shall obtain and maintain, at the Contractor's expense, all permits, license or approvals that may be necessary for the performance of the services. The Contractor shall furnish copies of all such permits, licenses or approvals to the City of Tucker Representative within ten (10) day after issuance.
- 5.2. Inasmuch as the City of Tucker and the Contractor are independent of one another neither has the authority to bind the other to any third person or otherwise to act in any way as the representative of the other, unless otherwise expressly agreed to in writing signed by both parties hereto. The Contractor agrees not to represent itself as the City's agent for any purpose to any party or to allow any employee of the Contractor to do so, unless specifically authorized, in advance and in writing, to do so, and then only for the limited purpose stated in such authorization. The Contractor shall assume full liability for any contracts or agreements the Contractor enters into on behalf of the City of Tucker without the express knowledge and prior written consent of the City.

6.0 Indemnification

- 6.1 The Contractor agrees to indemnify, hold harmless and defend the City, its public officials, officers, employees, and agents from and against any and all liabilities, suits, actions, legal proceedings, claims, demands, damages, costs and expenses (including reasonable attorney's fees) to the extent rising out of any act or omission of the Contractor, its agents, subcontractors or employees in the performance of this Contract except for such claims that arise from the City's sole negligence or willful misconduct.
- 6.2 Notwithstanding the foregoing indemnification clause, the City may join in the defense of any claims raised against it in the sole discretion of the City. Additionally, if any claim is raised against the City, said claim(s) cannot be settled or compromised without the City's written consent, which shall not be unreasonably withheld.

7.0 Performance

Performance will be evaluated on a monthly basis. If requirements are not met, City of Tucker Procurement will notify the Contractor in writing stating deficiencies, substitutions, delivery schedule, and/or poor workmanship.

A written response from the Contractor detailing how correction(s) will be made is required to be delivered to the City. Contractor will have thirty (30) days to remedy the situation. If requirements are not remedied City of Tucker has the right to cancel this Agreement with no additional obligation to Contractor.

7.1 Final Completion, Acceptance, and Payment

- i. Final Completion shall be achieved when the work is fully and finally complete in accordance with the Contract Documents. The City shall notify Contractor once the date of final completion has been achieved in writing.
- ii. Final Acceptance is the formal action of City acknowledging Final Completion. Acceptance shall be final and conclusive except for latent defects, fraud, gross mistakes amounting to fraud, or the City's right under any warranty or guarantee. Prior to Final Acceptance, Contractor shall, in addition to all other requirements in the Contract Documents submit to City a Notice of any outstanding disputes or claims between Contractor and any of its subcontractors, including the amounts and other details thereof. Neither Final Acceptance nor final payment shall release Contractor or its sureties from any obligations of these Contract Documents or the bond, or constitute a waiver of any claims by City arising Contractor's failure to perform the work in accordance with the Contract Documents.
- iii. Acceptance of final payment by Contractor, or any subcontractor, shall constitute a waiver and release to City of all claims by Contractor, or any such subcontractor, for an increase in the Contract Sum or the Contract Time, and for every act or omission of City relating to or arising out of the work, except for those Claims made in accordance with the procedures, including the time limits, set forth in section 8.

8.0 Changes

City, within the general scope of the Agreement, may, by written notice to Contractor, issue additional instructions, require additional services or direct the omission of services covered by this Agreement. In such event, there will be made an equitable adjustment in price, but any claim for such an adjustment must be made within thirty (30) days of the receipt of said written notice.

9.0 Change Order Defined

Change order shall mean a written order to the Contractor executed by the City issued after the execution of this Agreement, authorizing and directing a change in services. The Price and Time may be changed only by a Change Order.

10.0 Insurance

- 10.1 The Contractor shall, at its own cost and expense, obtain and maintain worker's compensation and commercial general liability insurance coverage covering the period of this Agreement, such insurance to be obtained from a responsible insurance company legally licensed and authorized to transact business in the State of Georgia. The minimum limit for Worker's Compensation Insurance shall be the statutory limit for such insurance. The minimum limits for commercial general liability insurance, which must include personal liability coverage will be \$1,000,000 per person and \$3,000,000 per occurrence for bodily injury and \$500,000 per occurrence for property damage.
- 10.2 Contractor shall provide certificates of insurance evidencing the coverage requested herein before the execution of this agreement, and at any time during the term of this Agreement, upon the request of the City, Contractor shall provide proof sufficient to the satisfaction of the City that such insurance continues in force and effect. **"Exhibit D" (Certificate of Insurance).**

11.0 Termination

- 11.1. Immediate Termination. Pursuant to O.C.G.A. Section 36-60-13, this Contract will terminate immediately and absolutely if the City determines that adequate funds are not appropriated or granted or funds are de-appropriated such that the City cannot fulfill its obligations under the Contract, which determination is at the City's sole discretion and shall be conclusive. Further, the City may terminate the Contract for any one or more of the following reasons effective immediately without advance notice:
 - (i) In the event the Contractor is required to be certified or licensed as a condition precedent to providing goods and services, the revocation or loss of such license or certification may result in immediate termination of the Contract effective as of the date on which the license or certification is no longer in effect;
 - (ii) The City determines that the actions, or failure to act, of the Contractor, its agents, employees or subcontractors have caused, or reasonably could cause, life, health or safety to be jeopardized;

- (iii) The Contractor fails to comply with confidentiality laws or provisions; and/or
- (iv) The Contractor furnished any statement, representation or certification which is materially false, deceptive, incorrect or incomplete.

11.2. Termination for Cause. The occurrence of any one or more of the following events shall constitute cause or the City to declare the Contractor in default of its obligations under the Contract:

- (i) The Contractor fails to deliver or has delivered nonconforming goods or services or fails to perform to the City's satisfaction, any material requirement of the Contract or is in violation of a material provision of the Contract, including, but without limitation, the express warranties made by the Contractor;
- (ii) The City determines that satisfactory performance of the Contract is substantially endangered or that a default is likely to occur;
- (iii) The Contractor fails to make substantial and timely progress toward performance of the contract;
- (iv) The Contractor becomes subject to any bankruptcy or insolvency proceeding under federal or state law to the extent allowed by applicable federal or state law including bankruptcy laws; the Contractor terminates or suspends its business; or the City reasonably believes that the Contractor has become insolvent or unable to pay its obligations as they accrue consistent with applicable federal or state law;
- (v) The Contractor has failed to comply with applicable federal, state and local laws, rules, ordinances, regulations and orders when performing within the scope of the Contract;
- (vi) The Contractor has engaged in conduct that has or may expose the City to liability, as determined in the City's sole discretion; or
- (vii) The Contractor has infringed any patent, trademark, copyright, trade dress or any other intellectual property rights of the State, the City, or a third party.

11.3. Notice of Default. If there is a default event caused by the Contractor, the City shall provide written notice to the Contractor requesting that the breach or noncompliance be remedied within the period of time specified in the City's written notice to the Contractor. If the breach or noncompliance is not remedied by the date of the written notice, the City may:

- (i) Immediately terminate the Contract without additional written notice; and/or
- (ii) Procure substitute goods or services from another source and charge the difference between the Contract and the substitute contract to the defaulting Contractor; and/or,
- (iii) Enforce the terms and conditions of the Contract and seek any legal or equitable remedies.

11.4. Termination for Convenience. The City may terminate this Agreement for convenience at any time upon thirty (30) day written notice to the Contractor. In the event of a termination for convenience, Contractor shall take immediate steps to terminate work as quickly and effectively as possible and shall terminate all commitments to third parties unless otherwise instructed by the City. Provided that no damages are due to the City for Contractor's failure to perform in accordance with this Agreement, the City shall pay Vendor for work performed to date in accordance with Section 7 herein. The City shall have no further liability to Vendor for such termination.

City shall pay Contractor for work performed to date in accordance with Section herein. The City shall have no further liability to Contractor for such termination.

11.5. Payment Limitation in the event of Termination. In the event termination of the Contract for any reason by the City, the City shall pay only those amounts, if any, due and owing to the Contractor goods and services actually rendered up to and including the date of termination of the Contract and for which the City is obligated to pay pursuant to the Contract or Purchase Instrument. Payment will be made only upon submission of invoices and proper proof of the Contractor's claim. This provision in no way limits the remedies available to the City under the Contract in the event of termination. The City shall not be liable for any costs incurred by the Contractor in its performance of the Contract, including, but not limited to, startup costs, overhead or other costs associated with the performance of the Contract.

11.6. The Contractor's Termination Duties. Upon receipt of notice of termination or upon request of the City, the Contractor shall:

- (i) Cease work under the Contract and take all necessary or appropriate steps to limit disbursements and minimize costs, and furnish a report within thirty (30) days of the date of notice of termination, describing the status of all work under the Contract, including, without limitation, results accomplished, conclusions resulting therefrom, and any other matters the City may require;
- (ii) Immediately cease using and return to the City, any personal property or materials, whether tangible or intangible, provided by the City to the Contractor;
- (iii) Comply with the City's instructions for the timely transfer of any active files and work product produced by the Contractor under the Contract;
- (iv) Cooperate in good faith with the City, its employees, agents and Contractors during the transition period between the notification of termination and the substitution of any replacement Contractor; and
- (v) Immediately return to the City any payments made by the City for goods and services that were not delivered or rendered by the Contractor.

12.0 Claims and Dispute Resolution

12.1 Claims Procedure

- (i) If the parties fail to reach agreement regarding any dispute arising from the Contract Documents, including a failure to reach agreement on the terms of any Change Order for City- directed work as provided in section 8, or on the resolution of any request for an equitable adjustment in the Contract Sum or the Contract Time, Contractor's only remedy shall be to file a Claim with City as provided in this section.
- (ii) Contractor shall file its Claim within the earlier of: 120 Days from City's final instructions in accordance with section 8; or the date of Final Acceptance,
- (iii) The Claim shall be deemed to cover all changes in cost and time (including direct, indirect impact, and consequential) to which Contractor may be entitled. It shall be fully substantiated and documented. The Claim shall contain a detailed factual statement of the Claim for additional compensation and time, if any, providing all necessary dates, locations, and items of work affected by the Claim.
- (iv) If an adjustment in the Contract Time is sought: the specific Days and dates for which it is sought; the specific reasons Contractor believes an extension in the Contract Time should be granted; and Contractor's analysis of its Progress Schedule to demonstrate the reason for the extension in Contract Time.
- (v) If any adjustment in the Contract Sum is sought: the exact amount sought and a breakdown of that amount into the categories; and a statement certifying, under penalty of perjury, that the Claim is made in good faith, that the supporting cost and pricing data are true and accurate to the best of Contractor's knowledge and belief, that the Claim is fully supported by the accompanying data, and that the amount requested accurately reflects the adjustment in the Contract Sum or Contract Time for which Contractor believes City is liable.
- (vi) After Contractor has submitted a fully documented Claim, the City shall respond, in writing, to Contractor with a decision within sixty (60) days of the date the Claim is received, or with notice to Contractor of the date by which it will render its decision.

12.2 Arbitration

- i) If Contractor disagrees with City's decision rendered in accordance with section 12. If, Contractor shall provide City with a written demand for arbitration. No demand for arbitration of any such Claim shall be made later than thirty (30) Days after the date of City's decision on such Claim, failure to demand arbitration with said thirty (30) Day period shall result in City's decision being final and binding upon Contractor and its subcontractors,
- ii) Notice of the demand for arbitration shall be filed with the American Arbitration Association (AAA), with a copy provide to City. The parties shall negotiate or mediate under the Voluntary Construction Mediation Rules of the AAA, or mutually acceptable service, before seeking arbitration in accordance with the Construction Industry Arbitration Rules of AAA as follows:

1. Disputes involving \$30,000 or less shall be conducted in accordance with the Southeast Region Expedited Commercial Arbitration Rules; or
2. Disputes over \$30,000 shall be conducted in accordance with the Construction Industry Arbitration Rules of the AAA, unless the parties agree to use the expedited rules.
 - All Claims arising out of the work shall be resolved by arbitration. The judgment upon the arbitration award may be entered, or review of the award may occur, in the Superior Court of DeKalb County.
 - If the parties resolve the Claim prior to arbitration judgment, the terms of the resolution shall be incorporated in a Change Order. The Change Order shall constitute full payment and final settlement of the Claim, including all claims for time and for direct, indirect, or consequential costs, including costs of delays, inconvenience, disruption of schedule, or loss of efficiency or productivity.
 - Choice of Law and Forum. The laws of the State of Georgia shall govern and determine all matters arising out of or in connection with this Contract without regard to the choice of law provisions of State law. The Superior Court of DeKalb County, Georgia shall have exclusive jurisdiction to try disputes arising under or by virtue of this contract. In the event any proceeding of a quasi-judicial or judicial nature is commenced in connection with this Contract, such proceeding shall solely be brought in a court or other forum of competent jurisdiction within DeKalb County, Georgia. This provision shall not be construed as waiving any immunity to suit or liability, including without limitation sovereign immunity, which may be available to the City.
 - All Claims filed against City shall be subject to audit at any time following the filing of the Claim. Failure of Contractor, or subcontractor of any tier, to maintain and retain sufficient records to allow City to verify all or a portion of the Claim or to permit City access to the books and records of Contractor, or subcontractor of any tier, shall constitute a waiver of the Claim and shall bar any recovery.

13.0 Confidential Information

- 13.1. Access to Confidential Data. The Contractor's employees, agents and subcontractors may have access to confidential data maintained by the City to the extent necessary to carry out the Contractor's responsibilities under the Contract. The Contractor shall presume that all information received pursuant to the Contract is confidential unless otherwise designated by the City. If it is reasonably likely the Contractor will have access to the City's confidential information, then:
 - (i) The Contractor shall provide to the City a written description of the Contractor's policies and procedures to safeguard confidential information;

- (ii) Policies of confidentiality shall address, as appropriate, information conveyed in verbal, written, and electronic formats;
 - (iii) The Contractor must designate one individual who shall remain the responsible authority in charge of all data collected, used, or disseminated by the Contractor in connection with the performance of the Contract; and
 - (iv) The Contractor shall provide adequate supervision and training to its agents, employees and subcontractors to ensure compliance with the terms of the Contract. The private or confidential data shall remain the property of the City at all times. Some services performed for the City may require the Contractor to sign a nondisclosure agreement. Contractor understands and agrees that refusal or failure to sign such a nondisclosure agreement, if required, may result in termination of the Contract.
- 13.2. No Dissemination of Confidential Data. No confidential data collected, maintained, or used in the course of performance of the Contract shall be disseminated except as authorized by law and with the written consent of the City, either during the period of the Contract or thereafter. Any data supplied to or created by the Contractor shall be considered the property of the City. The Contractor must return any and all data collected, maintained, created or used in the course of the performance of the Contract, in whatever form it is maintained, promptly at the request of the City.
- 13.3. Subpoena. In the event that a subpoena or other legal process is served upon the Contractor for records containing confidential information, the Contractor shall promptly notify the City and cooperate with the City in any lawful effort to protect the confidential information.
- 13.4. Reporting of Unauthorized Disclosure. The Contractor shall immediately report to the City any unauthorized disclosure of confidential information.
- 13.5. Survives Termination. The Contractor's confidentiality obligation under the Contract shall survive termination of the Contract.

14.0 Inclusion of Documents

Contractor's documents submitted in response to any RFP or other solicitation from the City, including any best and final offer, are incorporated in this Agreement by reference and form an integral part of this agreement. In the event of a conflict in language between this Agreement and the foregoing documents incorporated herein, the provisions and requirements set forth in this Agreement shall govern. In the event of a conflict between the language of the RFP or other city solicitation, as amended, and the Contractor's submittal, the language in the former shall govern.

- 14.1 Counterparts: This Agreement may be executed in any number of counterparts, each of which shall be an original, but all of which together shall constitute one and the same instrument.

15.0 Compliance with All Laws and Licenses

The Contractor must obtain all necessary licenses and comply with local, state and federal requirements. The Contractor shall comply with all laws, rules and regulations of any governmental entity pertaining to its performance under this Agreement.

15.1 Federal Requirements.

15.1.1 Federal Compliance Regulations

Federal regulations apply to all City of Tucker contracts using Federal funds as a source for the solicitation of goods and services. Successful bidders must comply with the following Federal requirement as they apply to:

1. Equal Employment Opportunity - The Contractor shall not discriminate against any employee or applicant or employment because of race, color, religion, sex, or national origin. The Contractor shall take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, or national origin. Such action shall include, but not be limited to: employment, upgrading, demotion, transfer, recruitment or recruitment advertising, layoff or termination, rates of pay or other forms of compensation, and selection for training, including apprenticeship. The Contractor shall comply with Executive Order 1 1246, as amended, and the rules, regulations, and orders of the Secretary of Labor.
2. Reports - The submission of reports to the City on behalf of the U.S. Department of Housing and Urban Development as may be determined necessary for the activities covered by this contract, which is federally funded;
3. Patents - The U.S. Department of Housing and Urban Development reserves a royalty-free, nonexclusive and irrevocable right to use, and to authorize others to use, for Federal Government purposes:
 - a. Any patent that shall result under this contract; and
 - b. Any patent rights to which the Contractor purchases ownership with grant support
4. Copyrights - The U.S. Department of Housing and Urban Development reserves a royalty- free, nonexclusive and irrevocable license to reproduce, publish or otherwise use, and to authorize others to use, for Federal Government purposes:
 - a. The copyright in any work developed under this contract; and
 - b. Any rights of copyright to which the Contractor purchases ownership with grant support.
5. Access to books, documents, papers and records of the Contractor which are directly pertinent to the specific contract for the purposes of making audit, examination, excerpts and transcriptions by Federal agencies, the Comptroller General of the United States,

or any of their duly authorized representatives; and

6. Retention of all required records for three years after the City makes final payment and all other pending matters are closed.

15.2 Georgia Security and Immigration Compliance Act

- a. The parties certify that Contractor has executed an affidavit verifying that Contractor has registered and participates in the federal work authorization program to verify information of all new employees, per O.C.G.A. 13-10-90, et. seq., and Georgia Department of Labor Regulations Rule 300-10-1-02. The appropriate affidavit is attached hereto as "**Exhibit E**" (**E-Verify Form**) and incorporated herein by reference and made a part of this contract.
- b. The Contractor further certifies that any subcontractor employed by Contractor for the performance of this agreement has executed an appropriate subcontractor affidavit verifying its registration and participation in the federal work authorization program and compliance with O.C.G.A. 13-10-90, et. seq., and Georgia Department of Labor Regulations Rule 300-10-1-02, and that all such affidavits are incorporated into and made a part of every contract between the Contractor and each subcontractor.
- c. Contractor's compliance with O.C.G.A. 13-10-90, et. seq., and Georgia Department of Labor Regulations Rule 300-10-1-02 is a material condition of this agreement and Contractor's failure to comply with said provisions shall constitute a material breach of this agreement.

16.0 Assignment

The Contractor shall not assign or subcontract the whole or any part of this Agreement without the City of Tucker's prior written consent.

17.0 Amendments in Writing

No amendments to this Agreement shall be effective unless it is in writing and signed by duly authorized representatives of the parties.

18.0 Drug-Free and Smoke-Free Workplace

- 18.1 A drug-free and smoke-free workplace will be provided for the Contractor's employees during the performance of this Agreement; and
- 18.2 The Contractor will secure from any sub-Contractor hired to work in a drug-free and smoke-free work place a written certification so stating and in accordance with Paragraph 7, subsection B of the Official Code of Georgia Annotated Section 50-24-3.
- 18.3 The Contractor may be suspended, terminated, or debarred if it is determined that:

18.3.1 The Contractor has made false certification herein; or

18.3.2 The Contractor has violated such certification by failure to carry out the requirements of Official Code of Georgia Annotated Section 50-24-3.

19.0 Additional Terms

Neither the City nor any Department shall be bound by any terms and conditions included in any Contractor packaging, Invoice, catalog, brochure, technical data sheet, or other document which attempts to impose any condition in variance with or in addition to the terms and conditions contained herein.

20.0 Antitrust Actions

For good cause and as consideration for executing this Contract or placing this order, Contractor acting herein by and through its duly authorized agent hereby conveys, sells, assigns, and transfers to the City of Tucker all rights, title, and interest to and to all causes of action it may now or hereafter acquire under the antitrust laws of the United States and the State of Georgia relating to the particular goods or services purchased or acquired by the City of Tucker pursuant hereto.

21.0 Reporting Requirement

Reports shall be submitted to the Project Manager on a quarterly basis providing, as a minimum, data regarding the number of items purchased as well as the total dollar volume of purchases made from this contract.

22.0 Governing Law

This Agreement shall be governed in all respects by the laws of the State of Georgia. The Superior Court of DeKalb County, Georgia shall have exclusive jurisdiction to try disputes arising under or by virtue of this contract.

23.0 Entire Agreement

This Agreement constitutes the entire Agreement between the parties with respect to the subject matter contained herein; all prior agreements, representations, statement, negotiations, and undertakings are suspended hereby. Neither party has relied on any representation, promise, or inducement not contained herein.

24.0 Special Terms and Conditions

- This project does not require any Right of Ways or Easements

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be duly executed by their duly authorized officers as of the day and year set forth next to each signature.

CITY OF TUCKER:

CONTRACTOR:

By: _____

By: _____

Title: _____

Title: _____

Name: _____

Name: _____

Date: _____

Date: _____

Attest:

Bonnie Warne, City Clerk

(Seal)

Approved as to form:

Ted Baggett, City Attorney

DRAFT