MEMORANDUM

ROBERTSON COUNTY DEVELOPMENT OFFICE
527 SOUTH BROWN STREET, SPRINGFIELD, TN 37172
TEL. (615) 384-3666

TO: Planning Commission Members
FROM: Planning Staff
DATE: July 18, 2024

The Robertson County Planning Commission will hold its monthly meeting on **Thursday July 25, 2024, at 7:00 P. M.** on the 2nd Floor, Judicial Complex, Robertson County Office Building. Chief Deputy Planner, Hunter Mantooth, is available to answer questions at (615) 384-3666 or hmantooth@robcotn.org.

AGENDA

1. Roll Call

2. Comments from Citizens: Persons wishing to speak for or against any item must sign the log sheet prior to the meeting.

3. Announcements: Rezonings from this agenda will be heard at the next County Commission meeting on August 19, 2024.

4. Approval of Minutes: Approval of Minutes from June 27, 2024, meeting.

5. Old Business: Vote on below item from June 27, 2024, meeting per the letter you all received from County Attorney, Clyde Richert.

    a. **Mac E Baggett, Sr.**: Preliminary Plat approval for Northwind Estates located on Hwy 41 N, Cedar Hill. Tax Map 055, Parcel 070 (7th Voting District). Represented by Steve Artz, Steve Artz & Associates, Inc.

6. New Business:

    A. **De-Annex from the City of White House:** The City of White House voted to De-Annex property at 7727 Boyles Rd., White House. Tax Map 095, Parcel 135.01 (3rd Voting District)

    B. **James and Linda Cantrell:** Rezone Request for 8.70 acres of property located at 2188 South Mt. Pleasant Rd., Greenbrier. Tax Map 125, Parcel 185.00 from AG-2 to R-40 (4th Voting District). Represented by Nathan Gregory, Surveyor.

C. **Steve and Patricia Pryor:** Rezone Request for 2.09 acres of the 5.17 acres of property located at 3821 Robert Pryor Rd., Springfield. Tax Map 101, Part of Parcel 139.00 from AG-2 to RP-80 (11th Voting District). Represented by Jeff Chandler, Chandler Surveying.

D. **Daryle Walker, Executor:** Rezone Request for 2.11 acres of the 11.4 acres of property located at 4552 Hwy 49 W., Springfield, Tax Map 101 Part of Parcel 026 from AG-2 to RP-80 (11th Voting District). Represented by Steve Artz, Steve Artz and Associates, Inc.

E. **Mac E Baggett, Sr.:** Construction Plan approval for Northwind Estates located on Hwy 41 N., Cedar Hill. Tax Map 055, Parcel 070.00 (7th Voting District). Represented by Charley Dean, PE, Dean Design Group, LLC.

7. Reports from Staff:

8. Adjourn

The Robertson County Planning Commission met on June 27, 2024 at 7:00 p.m. in the Judicial Complex, Second Floor, Robertson County Office Building, Springfield, Tennessee.

Roll Call:

MEMBERS PRESENT:	MEMBERS ABSENT:	OTHERS PRESENT:
Bill Jones	Keith Hoover	Hunter Mantooth
Daniel Borthick	Jeremy Stinson	Pam Groves
Charles "Gene" Federman		David Fauth - Planner
Jeremiah Pierce		
Cheryl Elliott		
Allan Heard		
William B Henry		

Meeting was called to order by Chairman, Bill Jones at 7:00 pm.

Roll Call was completed by Hunter Mantooth. All present but Keith Hoover and Jeremy Stinson.

Announcements: Chairman Bill Jones announced that the zoning from this agenda will be heard at the County Commission on July 15, 2024. Any citizens wishing to speak for or against any items on the agenda will need to sign in on the sheet provided. Eight signed in to speak.

Motion to approve Minutes from previous meeting of May 23, 2024, made by Cheryl Elliott with a second by Allan Heard.
Motion passed unanimously 7-0.

1. Old Business: None

2. New Business:

   A. **Eddie Smith:** Rezone Request for 2.51 acres of property located on Hwy 31W, Cottontown. Tax Map 096, Parcel 074.06 from RP-80 to C-1 (2nd Voting District). Represented by Josh Lyon, Klober Engineering Services.
   Josh Lyon was there to present and answer questions if needed, but also said landowner Eddie Smith was present.

   Motion to recommend was made by Daniel Borthick with a second from Gene Federman.
   Motion passed unanimously 7 - 0.

   It was brought to the attention of Chairman Bill Jones that there were people signed in to speak that didn't get a chance to speak prior to voting.
   Cheryl Elliott made a motion to reopen the vote after all the speakers, with a second from Gene Federman. Motion passed unanimously 7 - 0.
   The following people were able to speak on this matter: Jim Milam, Eric Skaggs, David Brown and David Judy.
   Eddie Smith also spoke after the others to address the questions and concerns.

   A 2nd Motion to recommend was made by Allan Heard with a second from Gene Federman.
   Motion passed unanimously 7 - 0.

B. **Jorge Madrid:** Final Site Plan for Cumberland Welding Fabrication, LLC, located on Tom Austin Hwy, Springfield. Tax Map 113, Parcel 021.02 (10th Voting District). Represented by Josh Lyon, Klober Engineering Services.
Josh Lyon was there to present and answer questions if needed.
Noone signed up to speak on this matter

Motion to approve was made by Daniel Borthick with a second from Cheryl Elliott.
Motion passed unanimously 7 - 0.

C. **Mac E Baggett, Sr.:** Preliminary Plat approval for Northwind Estates located on Hwy 41 N, Cedar Hill. Tax Map 055, Parcel 070 (7th Voting District). Represented by Steve Artz, Steve Artz & Associates, Inc.
Updated plat was given Hunter prior to the meeting and a copy was given to all planning commission members
Steve Artz, Mac Baggett, Jr. and Ken Morgan with MRW were there to answer questions.
The following people signed up and spoke on this matter: Mayor John Edwards, Michael Redfern, Amy Edwards and Jessica Marmando.
Steve Artz, Mac Baggett, Jr and Ken Morgan addressed questions and concerns brought up by the ones that spoke. Jeremiah Pierce asked a question to Planner David Fauth and he answered the question.

Motion to approve was made by Gene Federman with a second from Daniel Borthick.
Motion passed 6 - 1. Jeremiah Pierce voted no.

Reports from Staff: Commissioner Gina Head-Hieber had asked to address the Planning Commission. She spoke to them about water runoff and water and sewer issues. She hopes that they do their research and due diligence before approving more growth surrounding the cities.

A motion to adjourn made by Daniel Borthick with a second by Jeremiah Pierce
Motion passed unanimously 7-0 and the meeting was adjourned at 8:10 pm.

Respectfully submitted,

Gene Federman

Gene Federman, Secretary

Old Business: A

LAW OFFICES
RICHERT & DILLIHA
PLLC

Clyde W. Richert III
Gary L. Dilliha
Jarod C. Richert

516 South Main Street
Springfield, TN 37172
Telephone 615.384.8774
Facsimile 615.384.6708
www.richertdillihalaw.com

July 9, 2024

VIA US MAIL

Chairman William Jones
7707 Jones Road
White House, TN 37188

William B. Henry
5341 Henry Road
Springfield, TN 37172

Daniel E. Borthick
5566 Highway 431 N
Springfield, TN 37172

Keith Hoover
213 Blueberry Street
White House, TN 37188

Cheryl Elliott
3099 Elliott Road
Cedar Hill, TN 37032

Jeremiah Pierce
2058 Woodruff Avenue
Greenbrier, TN 37073

Charles E. Federman
3377 Oakland Road
Springfield, TN 37172

Jeremy Stinson
9145 Cross Plains Road
White House, TN 37188

Allan Heard
11970 Owens Chapel Road
Springfield, TN 37172

RE: **Mac E. Baggett, Sr. Cedar Hill Subdivision**

Dear Chairman Jones and Members of the Robertson County Planning Commission:

I have received a letter as County Attorney from John Edwards in Cedar Hill, copy enclosed.

I am not sure if Mr. Edwards is addressing this issue individually or formally as Mayor for the City of Cedar Hill.

I have met with Pam Groves and Hunter Mantooth in our Planning Office regarding this matter.

It is my understanding over the years that the formulation of a Preliminary Plat for review by the Planning Commission is somewhat "a work in progress". By that I mean that it is not usual that from the time that a Preliminary Plat is submitted to the Development Office until the actual meeting, the developer or his/her representative may have continued work on the plat upon until such meeting.

It is also my understanding over the years that a submitted Plat that is given preliminary approval is likewise a "work in progress", that there are construction plans later submitted and reviewed, there is also comment by our staff, and perhaps the County Engineer and other retained consultants review the plat before final approval. I understand from those comments, the approved Preliminary Plat and even the initial draft Final Plat often changes as the process goes forward toward Final Plat approval by the Planning Commission.

At the same time, I think that it is appropriate that, especially when there is opposition to a Preliminary Plat presentation as in this case, that the Planning Commission should vote upon the Preliminary Plat that was sent out with the meeting agenda, and also being the same plat that the general public would have had the opportunity to see before the meeting.

I am advised by Pam and Hunter that it is their opinion of the meeting that the Planning Commission actually voted upon the Preliminary Plat that was included in your meeting packet, and that the vote was NOT on the updated drawing submitted by Mr. Artz. I understand that such updated version made very nominal changes, none related to the lots themselves, and that this updated drawing was given to the Planning Commission members for the purpose of advising them of the ongoing process in the development of this subdivision.

It is my suggestion that you review this issue at your next meeting. If you take the position that the vote was on the submitted Preliminary Plat in your meeting packet, I believe you should so indicate by a vote taken at the upcoming meeting. On the other hand, if the Commission believes that you voted upon the plat drawing brought to the meeting by Mr. Artz, it would be my suggestion as set forth above that you request that this updated Plat be considered at another meeting such that the public can have the opportunity to address that different Preliminary Plat.

Sincerely,



Clyde W. Richert III

CWRIII: cl
Enclosures
CC: Pam Groves
Hunter Mantooth
Billy Vogle
LeaAnn Crockett
John Edwards

Clyde Richert

From: John Edwards <jedwardstn@gmail.com>
Sent: Thursday, June 27, 2024 10:55 PM
To: Clyde Richert
Subject: Request for Curing Planning Commission Issue

Clyde, I hope this email finds you well! Tonight I ran into a issue that really shook my confidence and many others with regards to transparency and conducting county business. I went to the Planning and Zoning Department and requested the preliminary plat one day (June 26th) before the planning meeting and received the map on the left and the application that was attached on the county website. This map was the one sent to the planning commissionin and in their packet.

At the Planning Commission Meeting a few minutes before the start of the meeting Hunter called me over to hand me a new preliminary plat that she said she "just received". Obviously this was very concerning and is a departure from the established protocol. She also started distributing these to the planning commission as well. I immediately went to the County website and pulled the Planning Commission Submittal and Meeting Calendar and Plat Application. I did in fact find where the application specifies "Complete applications received after the application deadline will be placed on the following month's agenda. Applications are NOT considered complete until the appropriate number of copies of the application (which must be signed by the owner or record), supporting documentation and fees have been paid to the Robertson County Development Office." The Due Date was 5/15/2024 and Corrections were due by 6/13/2024 to appear before 6/27/2024.

As you can see there were a significant amount of changes made to open space, wetlands, retention ponds, etc which are mostly all missing on the new one given right before the meeting. I am unsure how a preliminary plat is approved that does not address drainage or retention ponds, but that is the decision of the planning commission members and I respect their decision.

I would like to request that the action taken on this item be invalidated and rescheduled to be heard at the July Planning Commission Meeting to ensure that we are abiding by the established standards and rules and therefore ensuring transparency in conducting county business and to ensure we maintain the trust and confidence the general public should be afforded. Please notify me when a decision has been made in whether the office will proceed with curing the mistake by rehearing the application for the preliminary plat and voting again. Thank you & I wish you a great weekend and thank you for your service to our county.

John Edwards
615-585-5756

New Business: A

Robertson County Development Office
Agenda Review Sheet
Planning Commission Meeting
July 25, 2024

Applicant: Shawn and Deborah Delgado
Ordinance Received by the City of White House

Request: To zone **6.94 *acres***
Tax Map 095, Parcel 135.01



Property Information:

- Tax Map 095, Parcel 135.01
- 7727 Boyles Rd., White House
- Total lot acreage: 6.94
  (302,306.40 sq. ft.)

Discussion & Observations:
The attached letter for de-annexation and ordinance was received from the City of White House. Shawn and Deborah Delgado asked to be de-annexed from city. The City of White House had two readings and was passed on May 16, 2024, and June 20, 2024. Information was sent to the county. Zoning will need to be established for the newly obtained property.
It is the planning staff's recommendation to zone this property AG-2. The lot acreage and size appear to be dimensionally appropriate for AG-2 zoning.
Please see Exhibit 1 for zoning map exhibit.

Exhibit 1

Austin Peay University Zoning Map

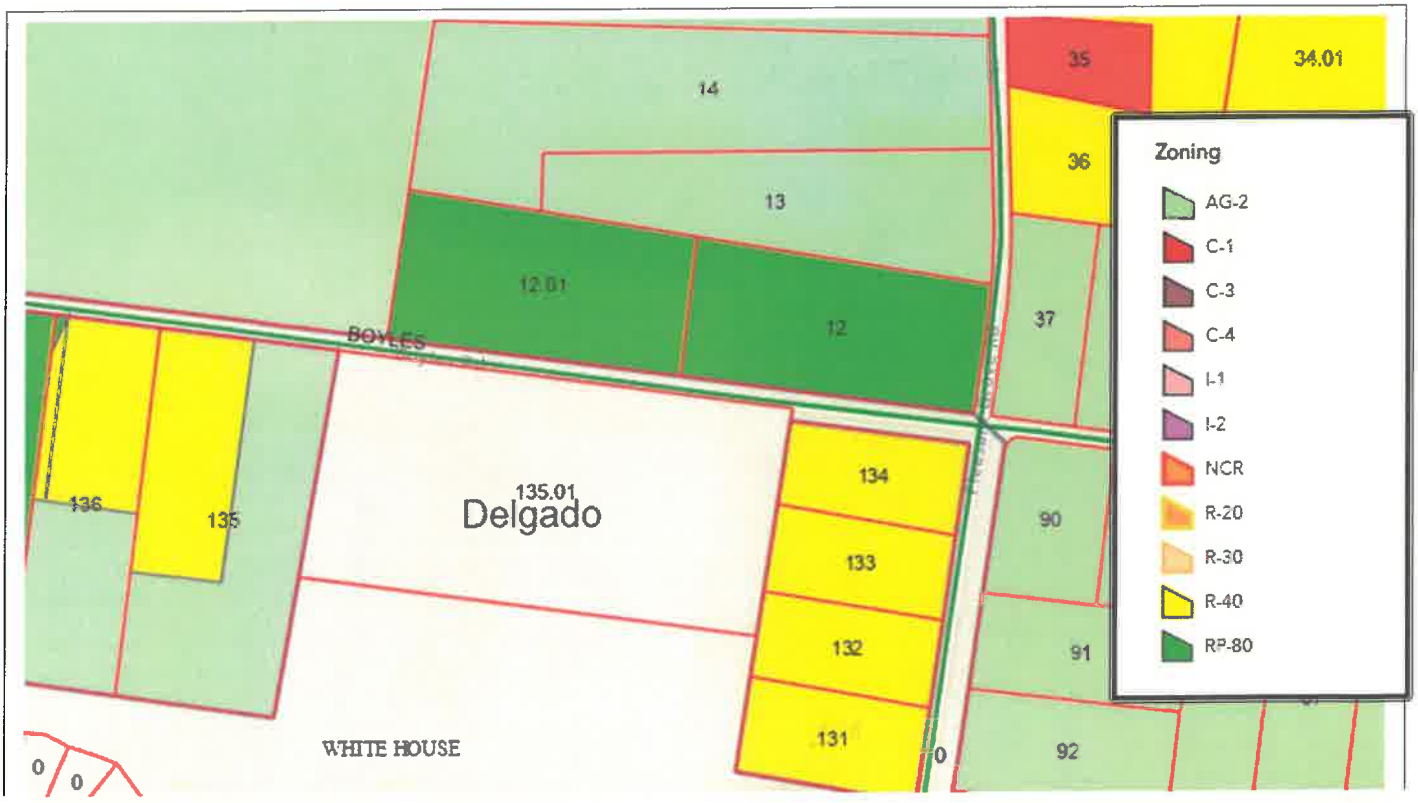


TABLE 6-5-A

DIMENSIONAL REQUIREMENTS FOR SINGLE FAMILY DWELLINGS IN AGRICULTURAL AND RESIDENTIAL DISTRICTS

	AG-1	AG-2	RP-80	R-40	R-30	R-20
Minimum Lot Size (sq. ft.)	15 ac.	130,000	80,000	40,000	30,000	20,000
Without Public Water		218,000	218,000	N.P.	N.P.	N.P.
Minimum Lot Width (ft.) at Building Setback Line [3]	400	250	175	150	125	100
Minimum Road Frontage (ft.) [1]	50	50	50	50	50	50
Minimum Front Yard Setback (ft.)[2]	100	75	60	50	40	30
Minimum Side Yard Setback (ft.)[2]	50	30	25	20	15	10
Without Public Water		50	50	N.P.	N.P.	N.P.
Minimum Rear Yard Setback	50	40	35	30	25	20
Without Public Water		50	50	N.P.	N.P.	N.P.
Maximum Height (ft.) [4]	35	35	35	35	35	35
Maximum Building Coverage (% of lot)	10	25	30	40	45	50

[1] Does not apply to lots on the circular portion of a cul-de-sac or lots with access by an ingress/egress easement.

[2] Setback measured from right-of-way line or property line. Setbacks along private streets shall be the same as along local streets.

[3] Lot widths shall be increased by twenty-five (25) percent for all roads providing direct access to and arterial or collector road as designated on the Robertson County Major Thoroughfare Plan. Developments using combined driveways or private roads as access are exempt from this provision

[4] No more than three (3) full or partial stories entirely above grade.

Notes:

I In overlay districts: greater requirements may apply. See any relevant overly district regulations.

II A corner lot has two (2) front yard setbacks. The property owner shall designate the front yard and the side yard for his corner lot. The rear setback shall be on the opposite side of the lot from the designated front yard setback.

III A through lot has two (2) front setbacks but no rear setback.

IV On a corner lot of record with a width of at least forty (40) feet, the side street setback may be reduced, if necessary, to yield a buildable with equal to sixty (60) percent of the lot width. However, the side street setback shall not be reduced to less than forty (40) feet from a major thoroughfare or minor thoroughfare right-of-way line.

V For any lot of record with a depth of at least seventy-five (75) feet, the street setback and the rear setback may be reduced, if necessary, to yield a buildable depth equal to forty (40) percent of the lot depth. The rear setback shall be reduced first, but not below fifteen (15) feet. However, the front yard setback shall not be reduced to less than forty (40) feet from a major thoroughfare right-of-way line.

City of White House, Tennessee
Planning and Codes Department
105 College Street • White House, TN 37188
www.cityofwhitehouse.com/yourgovernment/planning-and-codes
Phone (615) 672-4350 ext. 2120• Fax (615) 616-1050
"Valuing our Future while Protecting our Heritage"

June 27, 2024

Robertson County Planning & Zoning
527 S. Brown St.
Springfield, TN 37172

As per T.C.A. 6-51-102(a)(1) and 6-51-102(b)(1), we are forwarding to you copies of the approved de-annexation ordinance (Ordinance 24-05) for property recently de-annexed from the corporate boundary of the City of White House.

Ordinance 24-05, the de-annexation ordinance passed on first reading at the May 16, 2024 meeting of the Board of Mayor and Alderman. Approval of second reading and public hearing of the annexation ordinance occurred at the June 20, 2024 Board of Mayor and Aldermen Meeting.

Property referenced on Ordinance 24-05 as Robertson County Tax Map 095, Parcel 134.01.

Please feel free to contact me if you have any questions.

Sincerely,

Ceagus Clark

Ceagus Clark
Planning Director

CC/rh
Enclosure: Ordinance

ORDINANCE 24-05

AN ORDINANCE TO CONTRACT (DE-ANNEX) CERTAIN TERRITORY WITHIN THE CORPORATE BOUNDARIES OF THE CITY OF WHITE HOUSE, TENNESSEE LOCATED AT 7727 BOYLES ROAD, WHITE HOUSE TN

WHEREAS, Per Tennessee Code Annotated Section 6-51-201 provisions, cities may contract or de-annex property when the contraction or de-annexation is determined to be in the best interest of the affected territory; and.

WHEREAS, Maintaining the territory within the municipal corporate boundaries is no longer deemed necessary and would not affect the continuity of the city limits boundary; and.

WHEREAS, The White House Planning Commission at the May 13, 2024, meeting reviewed and discussed this contraction of the city limits boundaries and voted to recommend its passage to the Board of Commissioners; and

NOW, THEREFORE, BE IT ORDAINED AND IT IS HEREBY ORDAINED BY THE BOARD OF MAYOR AND ALDERMEN OF THE CITY OF WHITE HOUSE, TENNESSEE, THAT THE TERRITORY DESCRIBED BELOW BE CONTRACTED (DE-ANNEXED) AND REMOVED FROM THE CORPORATE BOUNDARIES OF THE CITY OF WHITE HOUSE:

SECTION 1. The contracted (de-annexed) territory contains property at 7727 Boyles Road, which is found on the Robertson County Tax Map 095, Parcel 134.01 per "EXHIBIT A".

SECTION 2. That the Board of Mayor and Aldermen of the City of White House, Tennessee, hereby certify that this Ordinance has been submitted to the Planning Commission of the City of White House for a recommendation, and a notice of hearing thereon has been ordered after at least fifteen (15) days' notice of the time and place of said meeting has been published in a newspaper circulated in the City of White House, Tennessee. This Ordinance shall take effect fifteen (15) days from the date of its final passage, the public welfare demanding it.

First Reading:	May 16, 2024	PASSED
Second Reading:	June 20, 2024	PASSED

John Corbitt, Mayor

ATTEST:

Derek Watson, City Recorder

ORDINANCE 24-05
"EXHIBIT A"

Area Requesting to be DeAnnexed



March 21, 2024

Ceagus Clark, Planning and Code Director
City of White House
105 Collage Street
White House, TN 37188

Dear Mr. Clark,

The purpose of this letter is to request the de-annexation of 6.94 acres from the city of White House. The subject property may be found on tax map 095, Parcel 134.01, in the Tax Assessor's Office for Robertson County, Tennessee. The property has road frontage on Boyles Road on the 11th Civil District. E=911 address is 7727 Boyles Road, White House, TN 37188.

The property is zoned 00 – Residential. We have recently purchased this property and we wish to de-annex from the City of White House as the adjacent properties to both the left and right of our property and across Boyles Road are not in White House City Limits. We were also told the option for sewer to this property would be at an unreasonable cost and our best option would be a Subsurface Sewage Disposal System which we have done and has now been approved by the State of Tennessee.

Thank you for your cooperation with this matter and if we may assist you in any manner, please contact us at your earliest convenience.

Sincerely,

Shawn and Debbie Delgado
7727 Boyles Road
White House, TN 37188
404-242-0411 or 404-787-8972

New Business: B

ROBERTSON COUNTY DEVELOPMENT OFFICE
ROBERTSON COUNTY OFFICE BUILDING
527 SOUTH BROWN STREET, SPRINGFIELD, TENNESSEE 37172
615-384-3666

Application for Rezoning

Applicant Information:

Name: James T. and Linda F. Cantrell
Mailing Address: 630 Watt Rd., Goodlettsville, TN 37072
Email: jcantrell653@gmail.com
Telephone Number: 615 969 4710

Applicant's Representative Information:

Name: Nathan Gregory
Name of Firm: same
Mailing Address: 1736 Friendship Rd., Cross Plains, TN 37049
Email: forgeengineering@yahoo.com
Telephone Number: 615 478 1850

Property Information:

Owner (if not applicant provide letter giving applicate permission): James T. and Linda F. Cantrell
Physical Address: 2177 South Mt. Pleasant Rd., Greenbrier, TN 37073
Tax Map and Parcel Number: Map 125 Parcel 185.00
Current Zoning Designation: AG-2
Requested Zoning Designation: R-40

Will this property be subdivided (or combined) in some way within the next year? (Yes) No

Purpose of rezoning request:

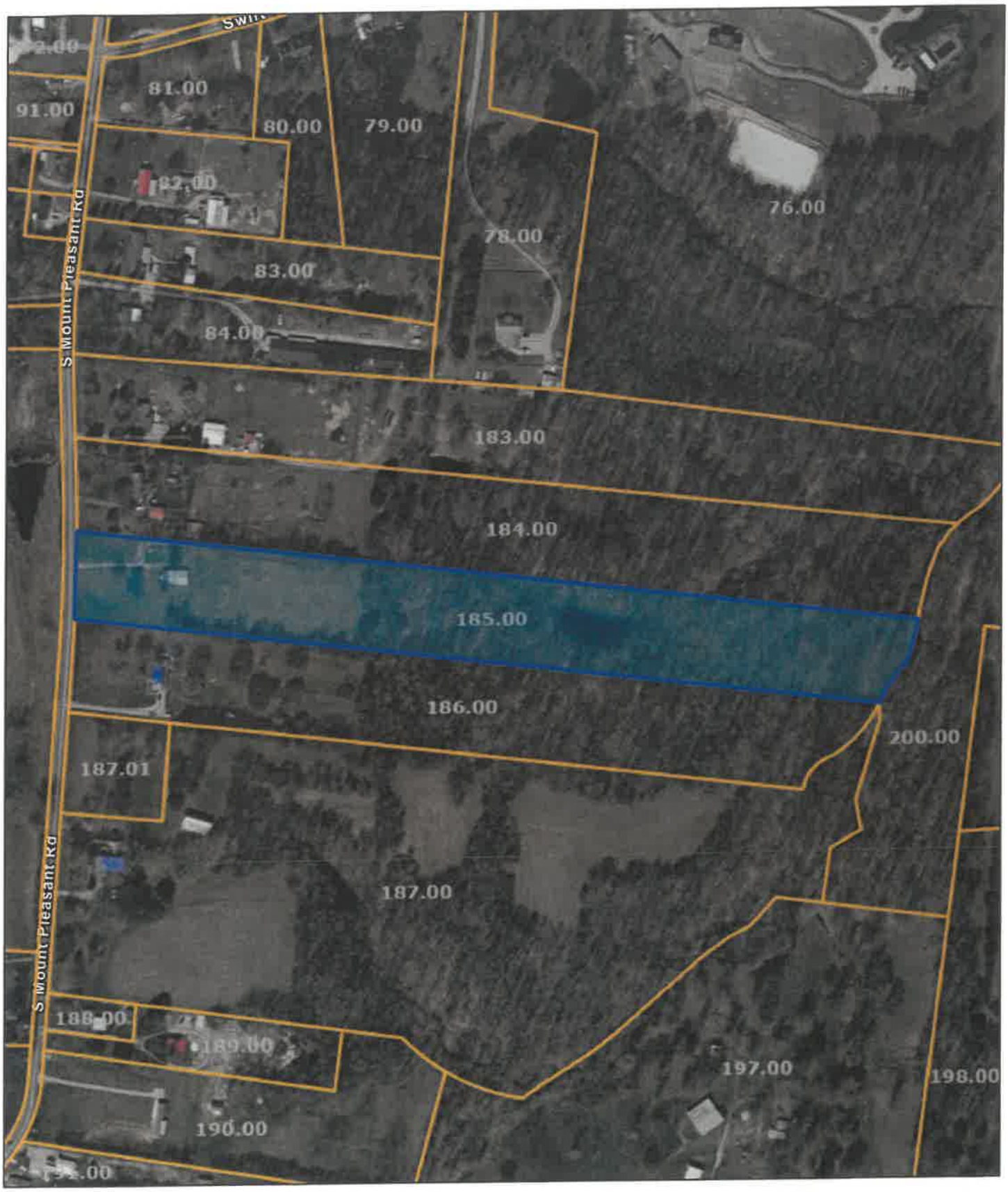
to subdivide

SUBMITTAL REVIEW PROCEDURE:

1. Deliver one (1) copy of this application & any supporting materials to the Development Office before or by the final due date (Please see attached schedule- the "Corrections Due" does not apply to this type of application)
2. Provide copy of deed to prove ownership.
3. Provide aerial photograph of the property from TN Property Viewer
4. Provide Legal description **AND** Survey of the areas to be rezoned including map and parcel number
5. Provide water letter from utility company stating location and size of current water line, adequate pressure for domestic use and if/where fire hydrants are required
6. Pay the review fee.
7. Email a .PDF of the application & supporting materials to hmantooth@robcotn.org
8. Attend the Planning Commission meeting. Be ready to present and answer questions. Failure to appear at the Planning Commission meeting may result in the denial of the application.

6/14/24
Owner of Record Signature & DATE

6/14/24
Applicant's Signature & DATE



Date: June 12, 2024

County: Robertson
Owner: FUQUA CARL L ETUX
Address: SOUTH MT PLEASANT RD 2177
Parcel Number: 125 185.00
Deeded Acreage: 0
Calculated Acreage: 8.7
Date of TDOT Imagery: 2021
Date of Vexcel Imagery: 2023

1:4,514

0 0.03 0.06 0.12 mi

0 0.05 0.1 0.2 km

Esri Community Maps Contributors, Tennessee STS GIS, © OpenStreetMap, Microsoft, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, USFWS, State of Tennessee, Comptroller of the Treasury, Division of Property Assessments (DPA)

The property lines are compiled from information maintained by your local county Assessor's office but are not conclusive evidence of property ownership in any court of law.

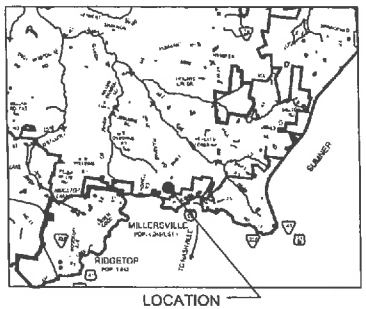
ENVIRONMENT AND CONSERVATION NOTES:

1. ANY CUTTING, GRADING, OR FILLING OF THE LOT AFTER MAY VOID DEPARTMENT OF ENVIRONMENT AND CONSERVATION APPROVAL
2. LOT 1 IS APPROVED FOR THREE BEDROOM RESIDENCE AND CAN BE REVIEWED ON A LOT BASIS.
3. A PERMIT FOR INSTALLATION OF SUBSURFACE SEWAGE DISPOSAL SYSTEMS MUST BE OBTAINED FROM DEPARTMENT OF ENVIRONMENT AND CONSERVATION.

TSPCS GRID NORTH
(NAD83)

N

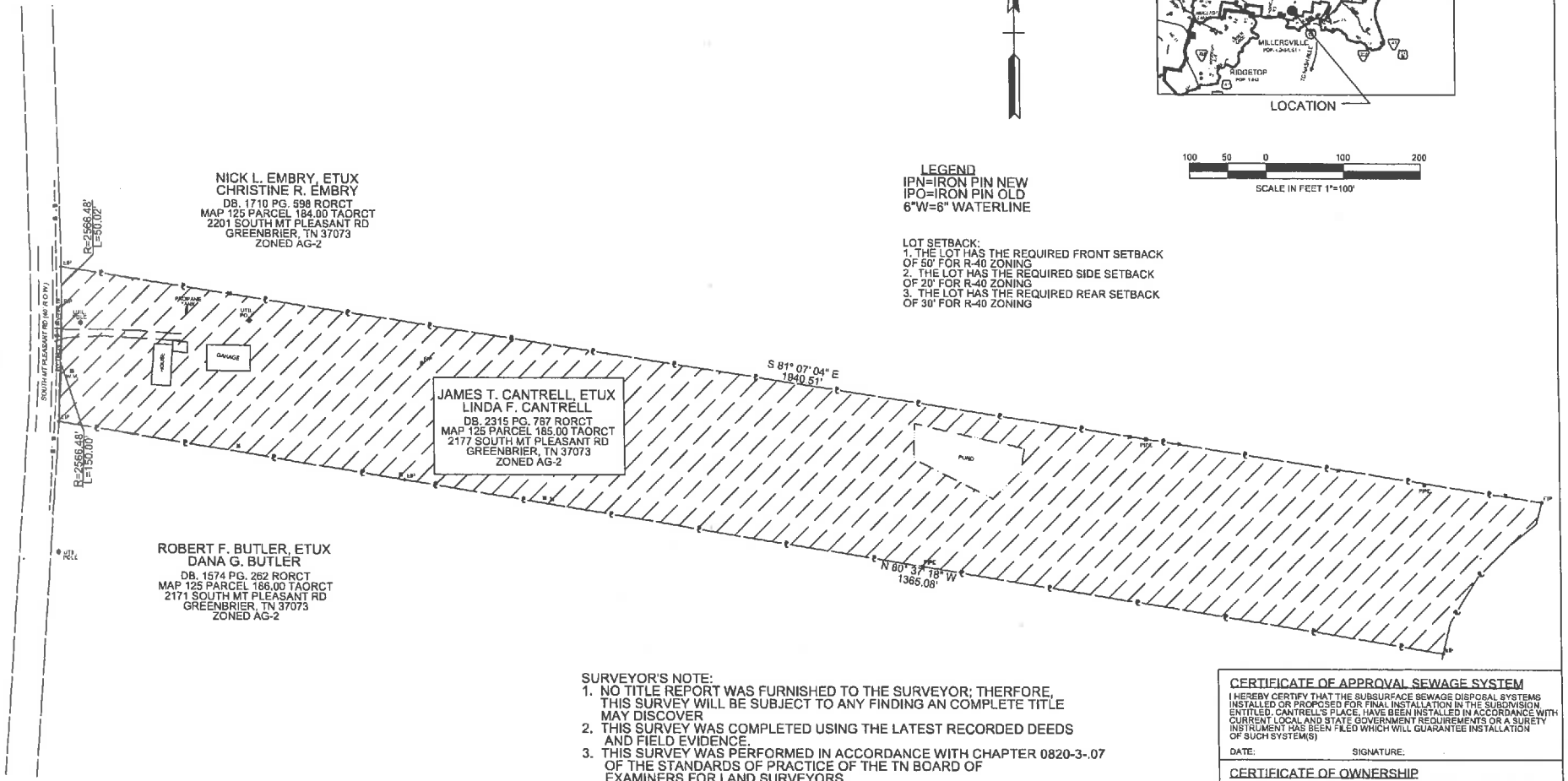
VICINITY



LEGEND
IPN=IRON PIN NEW
IPO=IRON PIN OLD
6"W=6" WATERLINE

100 50 0 100 200
SCALE IN FEET 1"=100'

LOT SETBACK:
1. THE LOT HAS THE REQUIRED FRONT SETBACK OF 50' FOR R-40 ZONING
2. THE LOT HAS THE REQUIRED SIDE SETBACK OF 20' FOR R-40 ZONING
3. THE LOT HAS THE REQUIRED REAR SETBACK OF 30' FOR R-40 ZONING



SURVEYOR'S NOTE:
1. NO TITLE REPORT WAS FURNISHED TO THE SURVEYOR; THERFORE, THIS SURVEY WILL BE SUBJECT TO ANY FINDING AN COMPLETE TITLE MAY DISCOVER
2. THIS SURVEY WAS COMPLETED USING THE LATEST RECORDED DEEDS AND FIELD EVIDENCE.
3. THIS SURVEY WAS PERFORMED IN ACCORDANCE WITH CHAPTER 0820-3-.07 OF THE STANDARDS OF PRACTICE OF THE TN BOARD OF EXAMINERS FOR LAND SURVEYORS.
4. THIS PROPERTY DOES NOT LIE WITIN A FEMA SPECIAL FLOOD HAZARD DETAILED STUDY AREA

CERTIFICATE OF SURVEY ACCURACY

I DO CERTIFY TO BEST OF MY ABILITY THAT THIS AN PRECISE AND ACCURATE SURVEY OF THE PROPERTY SHOWN. IT IS COMPLETED AS A CATEGORY II SURVEY AS DEFINED IN TITLE 62 CHAPTER 18 OF THE TENNESSEE CODE ANNOTATE, AND THE PRECISION RATIO IS EQUAL TO OR EXCEEDS 1:7500.

DATE: 05/27/2024 SIGNATURE:

NATHAN C. GREGORY
LAND SURVEYOR
1736 FRIENDSHIP RD
CROSS PLAINS, TN 37049
FORGEENGINEERING@YAHOO.COM
(615) 478-1850

CERTIFICATE OF APPROVAL SEWAGE SYSTEM

I HEREBY CERTIFY THAT THE SUBSURFACE SEWAGE DISPOSAL SYSTEMS INSTALLED OR PROPOSED FOR FINAL INSTALLATION IN THE SUBDIVISION ENTITLED: CANTRELL'S PLACE, HAVE BEEN INSTALLED IN ACCORDANCE WITH CURRENT LOCAL AND STATE GOVERNMENT REQUIREMENTS OR A SURETY INSTRUMENT HAS BEEN FILED WHICH WILL GUARANTEE INSTALLATION OF SUCH SYSTEM(S)

DATE: SIGNATURE:

CERTIFICATE OF OWNERSHIP

I (WE) HEREBY CERTIFY THAT I AM (WE ARE) THE OWNER(S) OF THE PROPERTY SHOWN AND DESCRIBED AS RECORDED IN RB 2315 PG 787 COUNTY REGISTER'S OFFICE. I (WE) AGREE TO THIS SUBDIVISION PLAN AND THE REQUIRED SETBACKS.

DATE SIGNATURE(S):

CERTIFICATE OF APPROVAL OF WATER SYSTEM

THE OWNER OF DESCRIBED PROPERTY HAS APPLIED FOR AND RECEIVED THE APPROVAL FOR SERVICE LETTER FROM WHUD. THE LETTER IS ATTACHED.

DATE: SIGNATURE *SEE ATTACHED LETTER*

CERTIFICATE OF APPROVAL FOR RECORDING

I HEREBY CERTIFY THAT THE SUBDIVISION PLAT SHOWN DOES COMPLY WITH THE ROBERTSON COUNTY SUBDIVISION REGULATIONS WITH ANY APPROVE VARIANCES, IF EXIST, AS ARE NOTED IN THE MINUTES OF THE PLANNING COMMISSION; AND IS APPROVED FOR RECORDING IN THE COUNTY REGISTER OFFICE.

DATE: SIGNATURE

CANTRELL'S PLACE REZONING REQUEST	REZONE FROM AG-2 TO R-40 DATE: 05 /27/2024
NO. LOTS - 1 ACRES TO REZONE - 6.85 REMAINING ACRES - 0.00 ROBERTSON CO. TN 12th CIVIL DISTRICT	MILES NEW ROAD - 0 CURRENTLY ZONED AG-2 DEED REFERENCE: RB. 2315, PG. 787 MAP 125, PART OF PARCEL 185.00

Legal Description

A certain tract of lying in the 12th Civil District of Robertson County, Tennessee described as follows by a survey performed by Nathan C. Gregory, Registered Land Surveyor No. 3200, dated May 27, 2024. This tract being parcel 185.00 of map 125 described in Record Book 2315 page 767 of the Robertson Co. Register of Deeds Office belonging to James T. and Linda F. Cantrell.

Beginning at an iron pin found in the easterly margin of South Mt. Pleasant Rd., a county road having a right of way of 40'. This POINT OF BEGINNING approximately 1550' from the intersection of SR 257 (Bethel Rd.) and South Mt. Pleasant Rd. in a northerly direction. Being the most northwesterly corner of this tract and being the most southwesterly corner of a parcel of land belonging to Nick L. and Christine R. Embry described in Record Book 1710 page 598 of the Robertson Co. Register of Deeds Office. Leaving this point of beginning and running with the line of Embry S 81°07'04"E, 1940.51'generally following a woven wire fence and flagged pipes to a point in the center of a branch; then with the meandering of the branch for approximately 238' in a southwesterly direction to a point in the center of the branch and a common corner with Robert F. and Dana G. Butler described in Record Book 1574 page 262 of the Robertson Co. Register of Deeds Office, then leaving said branch with the line of Butler N 80°37'18"W through a pipe on the property line at 683.18' for a total of 1365.08' to an ½" iron pin set in the easterly margin of South Mt. Pleasant Rd. being the southwesterly corner of this tract and the northwesterly corner of the Butler tract, then with a curve to the left in the margin of said road, having a radius of 2566.48' and length of 200' and chord bearing of N 02°00'18"E to a point to the POINT OF BEGINNING, containing 8.85 acres +/-.

Also, this conveyance is also subject to any and all existing easements of record.

WHITE HOUSE UTILITY DISTRICT
P.O. BOX 608, 3303 HIGHWAY 31-W—WHITE HOUSE, TENNESSEE 37188
TELEPHONE (615) 672-4110 — FAX (615) 672-8098

June 11, 2024

Mr. Nathan Gregory
1736 Friendship Rd
Cross Plains, TN 37049

RE: Water Availability for 2177 S Mount Pleasant Rd
Robertson County, Tax Map 125 Parcel 185.00
Greenbrier, TN

Dear Mr. Gregory,

This letter will confirm White House Utility District can provide one additional domestic water service for the property mentioned above as long as the new lot fronts S Mount Pleasant Rd or has an easement dedicated for the water service line to lie within. We understand you intend to alter an existing parcel such that two residential lots will result. There is currently one existing water tap associated with the property.

WHUD's existing six-inch water main located on the east side of S Mount Pleasant Rd can provide domestic water flow for this project. No fire sprinkler flows, fire hydrant flows, commercial flows, or irrigation flows have been requested.

A water facilities fee of $467 per new lot will need to be paid to WHUD before we will release a signed plat or before we will sell a water tap, whichever comes first. Standard water tap fees will be due at the time service is requested. WHUD's tap fee schedule is available on our web site at www.whud.org. The current tap fee for a ¾" residential tap is $2,000 with a $50 account setup fee applied to the first bill, but that is subject to change over time.

Please note that all fees, rates, and conditions noted in this letter are current as of the date of this letter and are subject to change over time. WHUD will hold the conditions stated above for a 90-day period past the date of this letter. You may request an extension of fee status in writing prior to expiration of the 90-day period. WHUD will review the request and either deny or grant the request in writing.

Please contact our Engineering Department at 615-672-4110 ext. 262 if you have any questions.

Sincerely,

Pat Harrell, PE
District Engineer

Robertson County Development Office
Agenda Review Sheet
Planning Commission Meeting
July 25, 2024

Applicant: James and Linda Cantrell
Surveyor: Nathan Gregory

Request: Rezone ***8.70 acres***
Tax Map 125, Parcel 185.00
from AG-2 to R-40

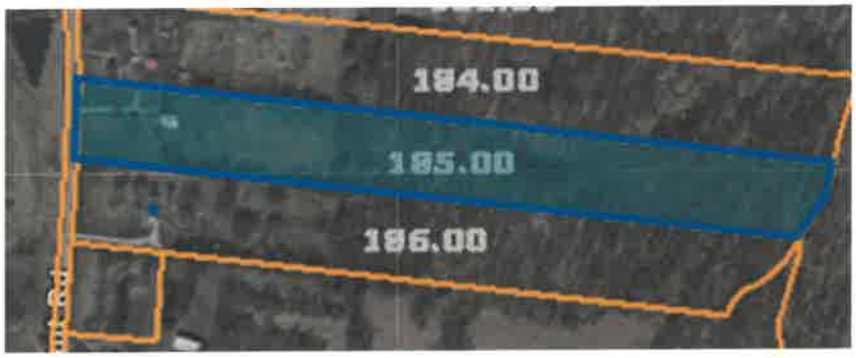


Figure 1: TN Property Viewer: Tax Map 125, Parcel 185.00 in its entirety is highlighted

Property Information:

- Tax Map 125, Parcel 185.00
- 2177 S. Mt. Pleasant Rd., Greenbrier
- Total lot acreage: 8.70 acres (378,972 sq. ft.)
- **Rezone Request: 8.70 acres (378,972 sq. ft.)**

Project Narrative:
R-40 Minimum Requirements
Minimum Lot Size: 40,000 sq. ft.
Front: 50'
Side: 20'
Rear: 30'
Min. Lot Width @ Front Bldg. Setback Line: 150'
Min Road Frontage: 50'
Maximum Height: 35'
Max Bldg. Coverage: 40%.

Discussion & Observations:
The applicant wishes to rezone 8.70 *acres*. Requesting R-40 due to lot width requirements per the zoning regulations. The subject property is mainly surrounded by AG-2, Millersville city limit property and one R-40 lot in the immediate vicinity with varying lot sizes. Several of the surrounding lots are nonconforming that would be considered RP-80 by today's zoning regulations.

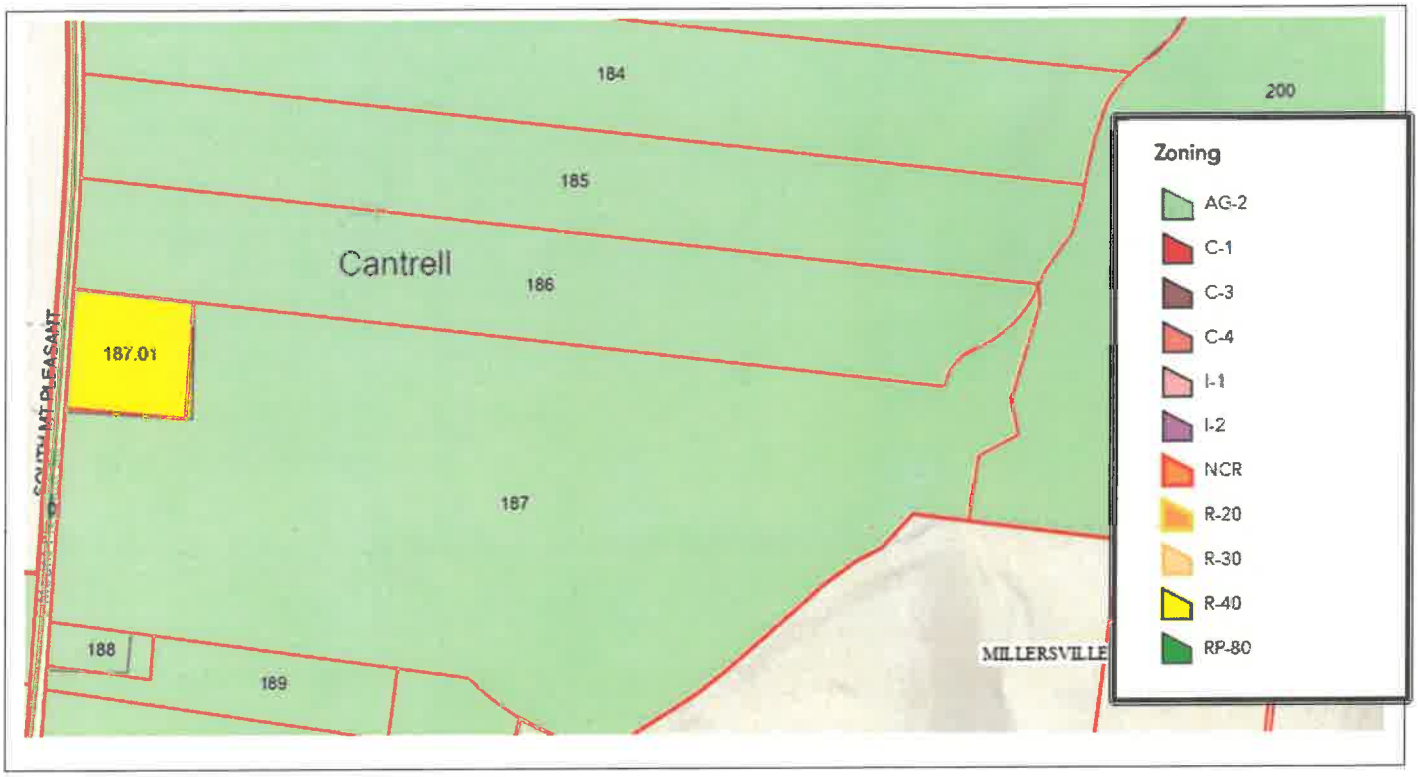
Please see Exhibit 1 for zoning map exhibit.

The applicant's request to rezone R-40 appears to be dimensionally appropriate.

**** END COMMENTS ****

Exhibit 1

Austin Peay University Zoning Map



Cantrell Land Use Information



- Conservation
- Employment Center
- General Urban
- Rural
- Recreation/Open Space
- Sub-Urban

Rural.

The purpose of the Rural character area in the County shall be to ensure the continuation of agrarian and rural type uses. The closer the Rural areas are to cities and villages, the focus of the area changes from mostly agrarian to mostly rural residential.

• Location of Rural Preservation Areas. The majority of the County shall remain designated as Rural during the planning horizon of this land use plan.

• Uses in Rural Areas. Agrarian and rural type uses ranging from open space to agriculture, homesteads associated with agricultural uses and agriculture service businesses are encouraged within this category.

New Business: C

ROBERTSON COUNTY DEVELOPMENT OFFICE
ROBERTSON COUNTY OFFICE BUILDING
527 SOUTH BROWN STREET, SPRINGFIELD, TENNESSEE 37172
615-384-3666

Application for Rezoning

Applicant Information:

Name: Steven + Patricia Payne
Mailing Address: 3821 Robert Payne Rd
Email: [redacted] pandspayne@gmail.com
Telephone Number: 615-478-7114

Applicant's Representative information:

Name: JEFF CHANDLER
Name of Firm: CHANDLER SURVEYING
Mailing Address: 3421 COOPER NICHOLSON ROAD PLEASANT VIEW TN 37146
Email: Chandlersurv@yahoo.com
Telephone Number: 615-746-5900 615-944-6489

Property Information:

Owner (if not applicant provide letter giving applicate permission): STEVEN & PATRICIA PAYNE
Physical Address: 3821 ROBERT PAYNE ROAD SPRINGFIELD TN 37172
Tax Map and Parcel Number: MAP 101 PARCEL 139.00
Current Zoning Designation: AGRICULTURAL
Requested Zoning Designation: RP 80

Will this property be subdivided (or combined) in some way within the next year? Yes (No)

Purpose of rezoning request:

SUBDIVIDING PROPERTY TO BUILD ON AND LOT IS TOO SMALL FOR CURRENT ZONING OF AGRICULTURAL

SUBMITTAL REVIEW PROCEDURE:

1. Deliver one (1) copy of this application & any supporting materials to the Development Office before or by the final due date (Please see attached schedule- the "Corrections Due" does not apply to this type of application)
2. Provide copy of deed to prove ownership.
3. Provide aerial photograph of the property from TN Property Viewer
4. Provide Legal description AND Survey of the areas to be rezoned including map and parcel number
5. Provide water letter from utility company stating location and size of current water line, adequate pressure for domestic use and if/where fire hydrants are required
6. Pay the review fee.
7. Email a .PDF of the application & supporting materials to hmantooth@robcotn.org
8. Attend the Planning Commission meeting. Be ready to present and answer questions. Failure to appear at the Planning Commission meeting may result in the denial of the application.

Owner of Record Signature & DATE

Patricia Pryor 6/6/24

Applicant's Signature & DATE

Robertson County - Parcel: 101 139.00



Date: June 11, 2024

County: Robertson
Owner: PRYOR STEVEN LEE ETUX
Address: ROBERT PRYOR RD 3821
Parcel Number: 101 139.00
Deeded Acreage: 5.17
Calculated Acreage: 0
Date of TDOT Imagery: 2021
Date of Vexcel Imagery: 2023

1:4,514

0 0.03 0.06 0.12 mi

0 0.05 0.1 0.2 km

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The property lines are compiled from information maintained by your local county Assessor's office but are not conclusive evidence of property ownership in any court of law.

PROPERTY DESCRIPTION
REZONE 2.09 ACRES

Property located in the 13th Civil District of Robertson County, TN. and being described according to a survey by Jeffrey Patrick Chandler, RLS #2353, 3421 Cooper Nicholson Road, Pleasant View, TN 37146, Dated: 05-29-24, File Number 3-445, as follows:

Beginning in the center line of Robert Pryor Road approximately 196 feet east of and along the center line from the intersection of Flewellyn Road;
Thence with the center line of Robert Pryor Road and with a curve turning to the left with an arc length of 52.74 feet, with a radius of 167.89 feet, with a chord bearing of NORTH 71 DEGREES 37 MINUTES 51 SECONDS EAST, with a chord length of 52.52 feet;
Thence with a compound curve turning to the left with an arc length of 114.51 feet, with a radius of 586.67 feet, with a chord bearing of NORTH 55 DEGREES 42 MINUTES 22 SECONDS EAST, with a chord length of 114.33 feet;
Thence with a compound curve turning to the left with an arc length of 157.44 feet, with a radius of 2193.52 feet, with a chord bearing of NORTH 46 DEGREES 56 MINUTES 01 SECONDS EAST, with a chord length of 157.41 feet;
Thence NORTH 44 DEGREES 06 MINUTES 49 SECONDS EAST a distance of 188.10 feet;
Thence leaving said center line SOUTH 45 DEGREES 39 MINUTES 54 SECONDS EAST a distance of 25.00 feet to a set iron rod on the margin of Robert Pryor Road and having a Tennessee State Plane Coordinate of N:777235.9298, E:1688375.9788;
Thence along the same line and with the common line of Billy Smith (Record Book 2179, Page 624) SOUTH 45 DEGREES 39 MINUTES 54 SECONDS EAST a distance of 266.01 feet to an existing iron rod at a fence post;
Thence with the common line of said Billy Smith and Ewin Smith (Deed Book 264, Page 25) NORTH 44 DEGREES 07 MINUTES 41 SECONDS EAST a distance of 304.36 feet to a set iron rod;
Thence with the common line of Steven Pryor (Deed Book 214, Page 129)
SOUTH 42 DEGREES 52 MINUTES 52 SECONDS EAST a distance of 80.82 feet to a set iron rod having a TSPC of N:777209.2643, E:1688833.1580 and being the Point of Beginning of this description;
Thence continuing with said Steven Pryor
SOUTH 42 DEGREES 52 MINUTES 52 SECONDS EAST a distance of 145.73 feet to an existing iron rod;
Thence with the common line of Louis Vankirk (Record Book 1843, Page 769) and Ethen Ralph (Record Book 1623, Page 102)
SOUTH 04 DEGREES 36 MINUTES 45 SECONDS WEST a distance of 278.80 feet to an existing iron rod at a fence corner;
Thence with the north line of Rodney Fickett (Record Book 1500, Page 754)
NORTH 83 DEGREES 43 MINUTES 25 SECONDS WEST a distance of 110.35 feet to an existing iron rod in a metal disc;
Thence with the north line of Cameron Cryer (Record Book 2098, Page 901)
NORTH 83 DEGREES 36 MINUTES 05 SECONDS WEST a distance of 206.52 feet to a set iron rod having a TSPC of N:776859.6632, E:1688594.9832;
Thence with a new line and severing the property of Steven Pryor (Record Book 2248, Page 738) NORTH 15 DEGREES 22 MINUTES 31 SECONDS EAST a distance of 188.28 feet to a set iron rod;
Thence NORTH 48 DEGREES 14 MINUTES 39 SECONDS EAST a distance of 252.35 feet to a set iron rod which is the point of beginning,
having an area of 87120.00 square feet, 2.00 acres

Being the same property described as a "112.08 +/- Acre Tract" shown on the P.U.D. Boundary and Subdivision Plat of Pine Forest as of record in Book 9700, Page 476, Register's Office of Davidson County, Tn.

GENERAL NOTES

1. BEARING SYSTEM IS DERIVED FROM TENNESSEE STATE PLANE COORDINATE SYSTEM (NAD83) ZONE 4100. UNLESS OTHERWISE NOTED DISTANCES AND COORDINATES RECITED ARE BASED ON GROUND MEASUREMENTS, NO SCALE FACTOR APPLIED

2. G.P.S. EQUIPMENT USED TO ESTABLISH GRID NORTH: CARLSON BRX 7 DUAL FREQUENCY RECEIVER

3. PROPERTY SUBJECT TO ANY AND ALL FINDINGS OF A CURRENT AND ACCURATE TITLE SEARCH NO TITLE REPORT WAS FURNISHED TO THE SURVEYOR PRIOR TO SURVEY

4. THIS SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES. THE ABOVE GRADE AND UNDERGROUND UTILITIES SHOWN WERE TAKEN FROM VISIBLE APPURTENANCES AT THE SITE, PUBLIC RECORDS AND/OR MAPS PREPARED BY OTHERS. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES ARE IN THE EXACT LOCATION INDICATED. THEREFORE, RELIANCE UPON THE TYPE, SIZE AND LOCATION OF UTILITIES SHOWN SHOULD BE DONE SO WITH THIS CIRCUMSTANCE CONSIDERED DETAILED VERIFICATION OF EXISTENCE, LOCATION AND DEPTH SHOULD ALSO BE MADE PRIOR TO ANY DECISION RELATIVE THERETO IS MADE. AVAILABILITY AND COST OF SERVICE SHOULD BE CONFIRMED WITH THE APPROPRIATE UTILITY COMPANY.

5. IN TENNESSEE IT IS A REQUIREMENT OF THE UNDERGROUND UTILITY DAMAGE PREVENTION ACT, THAT ANYONE WHO ENGAGES IN EXCAVATION MUST NOTIFY ALL KNOWN UNDERGROUND UTILITY OWNER(S), NO LESS THAN (3) NOR MORE THAN (10) WORKING DAYS PRIOR TO THE DATE OF THE INTENT TO EXCAVATE AND ALSO TO AVOID ANY HAZARD OR CONFLICT. TENNESSEE ONE CALL 1-800-351-1111 UTILITIES NOT CHECKED

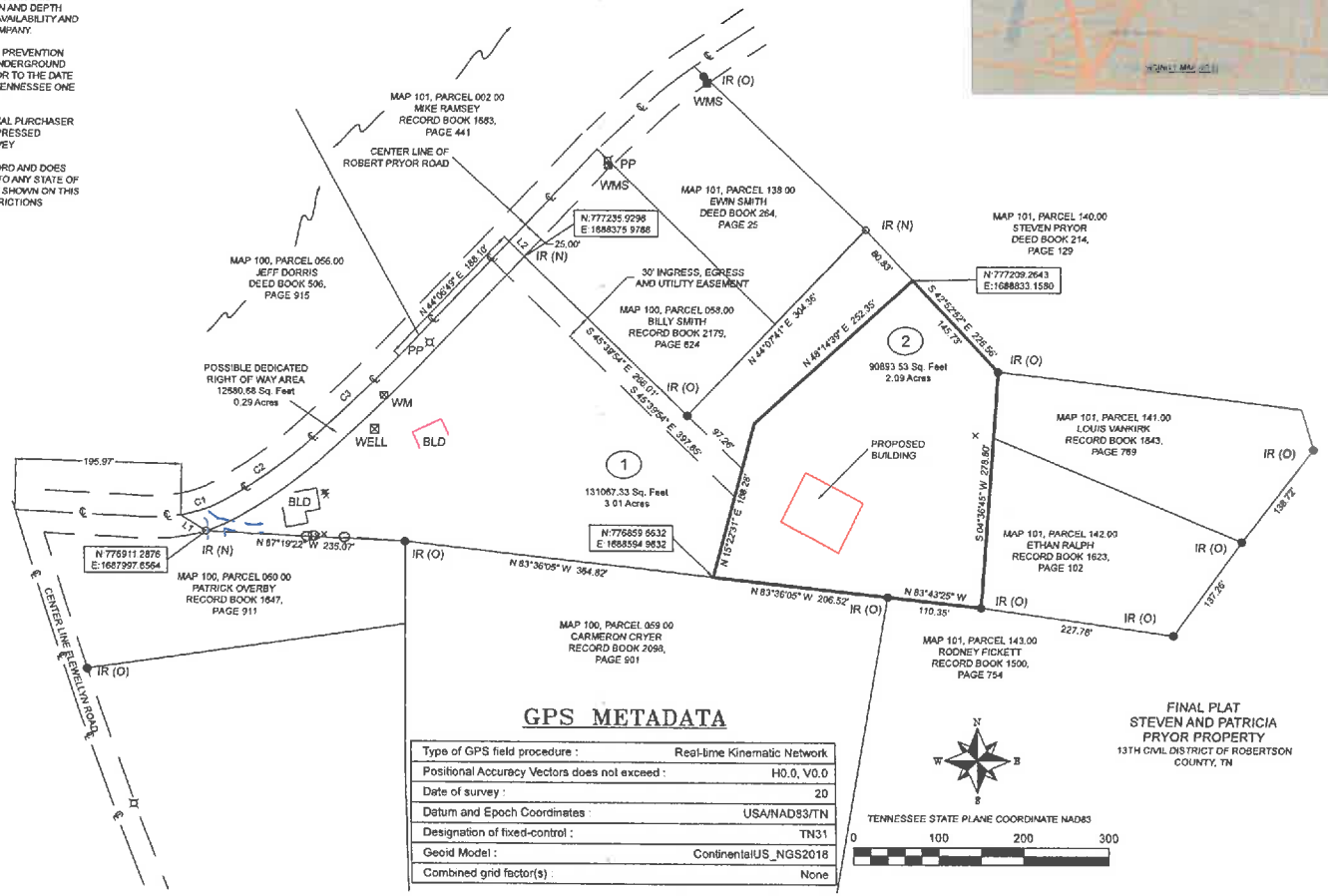
6. SURVEYORS LIABILITY FOR THIS DOCUMENT SHALL BE LIMITED TO THE ORIGINAL PURCHASER AND DOES NOT EXTEND TO ANY UNNAMED PERSON OR ENTITY WITHOUT AN EXPRESSED RE-CERTIFICATION BY THE SURVEYOR WHOSE NAME APPEARS UPON THIS SURVEY

7. THIS PROPERTY WAS PREPARED FROM CURRENT DEEDS AND PLATS OF RECORD AND DOES NOT REPRESENT A TITLE SEARCH OR A GUARANTEE OF TITLE AND IS SUBJECT TO ANY STATE OF FACTS A CURRENT AND ACCURATE TITLE SEARCH MAY REVEAL. THE PROPERTY SHOWN ON THIS PLAT IS SUBJECT TO ALL COVENANTS, RIGHT-OF-WAYS, EASEMENTS, AND RESTRICTIONS WHETHER IMPLIED OR OF RECORD.

CURVE	ARC LENGTH	RADIUS	CHORD BEARING	CHORD LENGTH
C1	52.74'	167.89'	N 71°37'51" E	52.52'
C2	114.51'	586.67'	N 55°42'22" E	114.33'
C3	157.44'	2193.52'	N 46°56'01" E	157.41'

LINE	BEARING	DISTANCE
L1	N 57°59'55" W	35.09'
L2	S 43°39'54" E	25.00'





GPS METADATA

Type of GPS field procedure :	Real-time Kinematic Network
Positional Accuracy Vectors does not exceed :	H0.0, V0.0
Date of survey :	20
Datum and Epoch Coordinates :	USA/NAD83/TN
Designation of fixed-control :	TN31
Geoid Model :	ContinentalUS_NGS2018
Combined grid factor(s) :	None

TENNESSEE STATE PLANE COORDINATE NAD83

0 100 200 300

I HEREBY CERTIFY THAT THIS IS A CATEGORY II SURVEY AS DEFINED BY THE STANDARDS OF PRACTICE AS ADOPTED BY THE TENNESSEE STATE BOARD OF EXAMINERS, AND THE RATIO OF PRECISION OF THE UNADJUSTED SURVEY IS GREATER THAN 1:7500 AS SHOWN HEREON

JEFFREY P. CHANDLER
RLS 2353

JEFFREY PATRICK CHANDLER
LAND SURVEYOR
AGRICULTURE
TENNESSEE NO. 2353

FINAL PLAT
STEVEN AND PATRICIA
PRYOR PROPERTY
13TH CIVIL DISTRICT OF ROBERTSON
COUNTY, TN

CHANDLER SURVEYING
3421 COOPER NICHOLSON ROAD
PLEASANT VIEW, TN. 37146
(615) 746-5900 FAX (615) 746-6420
email: chandlersurv@yahoo.com

PROJECT INFORMATION: BEING A PORTION OF THE SAME PROPERTY DESCRIBED IN RECORD BOOK 2248, PAGES 738,739,740,741, REGISTER'S OFFICE OF ROBERTSON COUNTY, TN

CLIENT INFORMATION: STEVEN LEE AND PATRICIA A. PRYOR
3841 ROBERT PRYOR ROAD
SPRINGFIELD, TN 37172

REVISIONS

REZONE

DRAWN	JEFF C	MAP AND PARCEL	MAP 101, P/O PARCEL 139.00
DATE	MAY 29, 2024		
APPROVED	JEFF C	CURRENTLY ZONED	AGRICULTURAL TO RPUD
DATE	MAY 29, 2024		
SCALE	1" = 100'	SHEET	ONE OF ONE
		PROJECT NO.	3-445

CITY OF SPRINGFIELD
Water/Wastewater Department

924 Central Avenue • Springfield, Tennessee 37172 • (615) 382-1600 • FAX (615) 384-6951
www.springfieldtn.gov

June 13, 2024

TO WHO IT MAY CONCERN:

There has been a water availability letter requested by Ms. Lisa Pryor for a property located at Robert Pryor Rd in Robertson County. The property is located by Tax Map 101 Parcel 139.00. This letter will serve as notice that there is an existing 6" water main adjacent to this property that can provide service for the request. The property is currently provided water services by the City of Springfield's Water and Wastewater Department. This water availability will be valid for one residential water tap for the period of one year. If there has been no activity by June 13, 2025, the property will need to be re-evaluated for service.

If you need further information or have questions, please contact me at 615-382-1600.

Thank you,

Terry Beers, P.E.
Director
Springfield Water and Wastewater Department

Robertson County Development Office
Agenda Review Sheet
Planning Commission Meeting
July 25, 2024

Applicant: Steve and Patricia Pryor
Surveyor: Jeff Chandler

Request: Rezone **2.09 *acres*** of the 5.17 acres Tax Map 101, Part of Parcel 139.00 from AG-2 to RP-80



Figure 1: TN Property Viewer: Tax Map 101, Part of Parcel 139.00 In its entirety is highlighted

Property Information:

- Tax Map 101, Part of Parcel 139.00
- 3821 Robert Pryor Rd., Springfield
- Total lot acreage: 5.17 acres (225,205.20 sq. ft.)
- **Rezone Request: 2.09 acres. (91,040.40 sq. ft.)**

Project Narrative:

RP-80 Minimum Requirements
Minimum Lot Size: 80,000 sq. ft.
Front: 60'
Side: 25'
Rear: 25'
Min. Lot Width @ Front Bldg. Setback Line: 175'
Min Road Frontage: 50'
Maximum Height: 35'
Max Bldg. Coverage: 30%.

Discussion & Observations:
The applicant wishes to rezone 2.09 acres of the 5.17 acres. The subject property is mainly surrounded by AG-2 and R-40 zones in the immediate vicinity with varying lot sizes. Several of the surrounding AG-2 zoned lots are nonconforming that would be considered RP-80 and R-40 by today's zoning regulations.

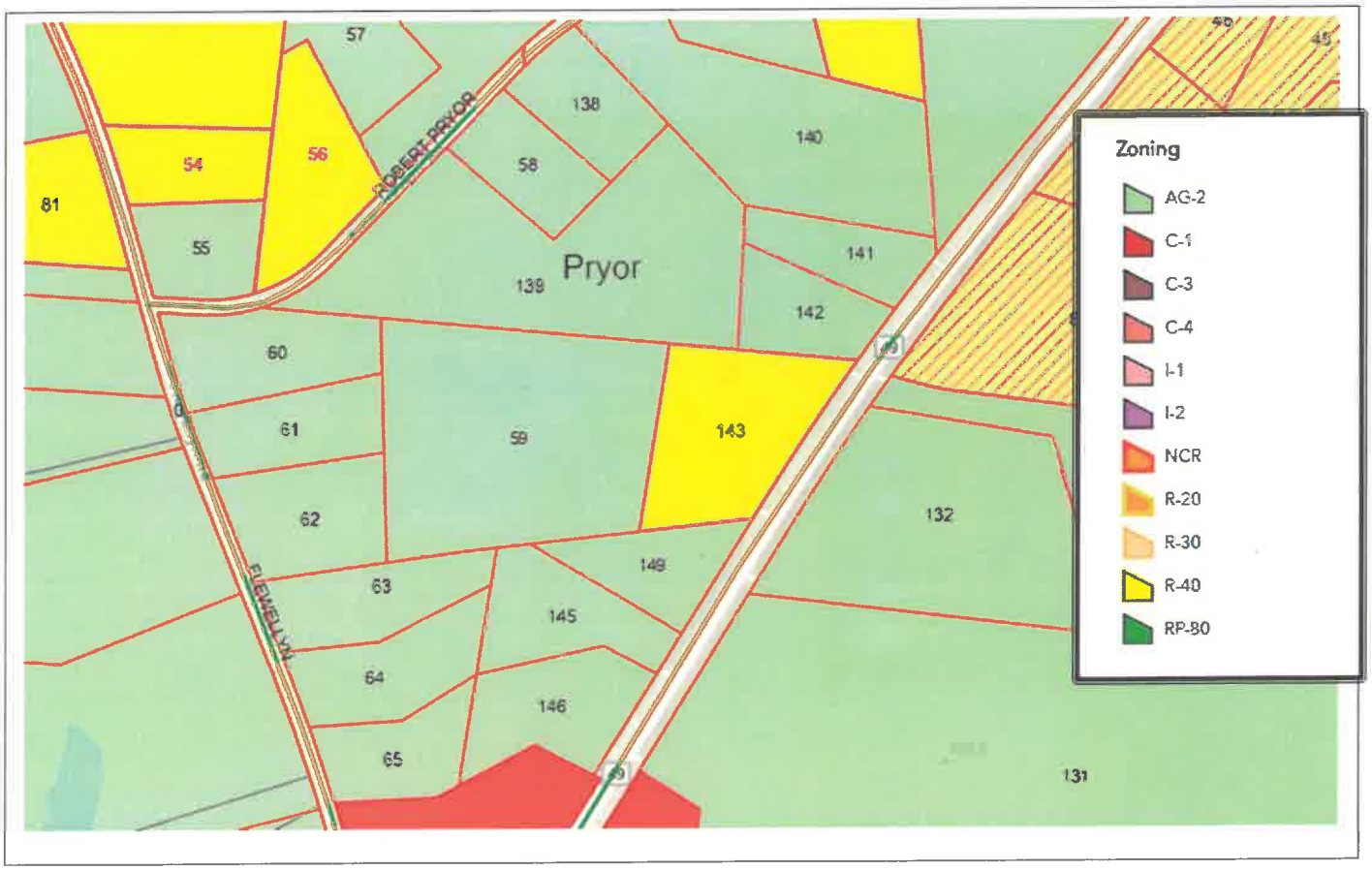
Please see Exhibit 1 for zoning map exhibit.

The applicant's request to rezone RP-80 appears to be dimensionally appropriate.

**** END COMMENTS ****

Exhibit 1

Austin Peay University Zoning Map



Pryor Land Use Information



- Conservation
- Employment Center
- General Urban
- Rural
- Recreation/Open Space
- Sub-Urban

Rural.

The purpose of the Rural character area in the County shall be to ensure the continuation of agrarian and rural type uses. The closer the Rural areas are to cities and villages, the focus of the area changes from mostly agrarian to mostly rural residential.

• Location of Rural Preservation Areas. The majority of the County shall remain designated as Rural during the planning horizon of this land use plan.

• Uses in Rural Areas. Agrarian and rural type uses ranging from open space to agriculture, homesteads associated with agricultural uses and agriculture service businesses are encouraged within this category.

New Business: D

ROBERTSON COUNTY DEVELOPMENT OFFICE
ROBERTSON COUNTY OFFICE BUILDING
527 SOUTH BROWN STREET, SPRINGFIELD, TENNESSEE 37172
615-384-3666

Application for Rezoning

Applicant Information:

Name: Charles R. Walker Estate (Daryle Walker)
Mailing Address: ~~4452~~ Hwy. 49 West Springfield, TN. 37172
Email: 4554 SDA
Telephone Number: (615) 406-6252

Applicant's Representative Information:

Name: Steve Artz
Name of Firm: Steven E. Artz and Associates, Inc.
Mailing Address: 4800 Hwy. 431 North Springfield, TN. 37172
Email: artz.steve@gmail.Com
Telephone Number: (615) 382-0481

Property Information:

4552 SDA

Owner (if not applicant provide letter giving applicate permission): Charles R. Walker Estate
Physical Address: ~~4452~~ Hwy. 49 West Springfield, TN. 37172
Tax Map and Parcel Number: Map 101, part of Parcel 26
Current Zoning Designation: AG-2
Requested Zoning Designation: RP80

Will this property be subdivided (or combined) in some way within the next year? *Yes*

Purpose of rezoning request:

To create a smaller lot around the existing house in order that it may be sold and so that Daryle Walker can retain the remaining property.

SUBMITTAL REVIEW PROCEDURE:

1. Deliver one (1) copy of this application & any supporting materials to the Development Office before or by the final due date (Please see attached schedule- the "Corrections Due" does not apply to this type of application)
2. Provide copy of deed to prove ownership.
3. Provide aerial photograph of the property from TN Property Viewer
4. Provide Legal description **AND** Survey of the areas to be rezoned including map and parcel number
5. Provide water letter from utility company stating location and size of current water line, adequate pressure for domestic use and if/where fire hydrants are required
6. Pay the review fee.
7. Email a .PDF of the application & supporting materials to hmantooth@robcotn.org
8. Attend the Planning Commission meeting. Be ready to present and answer questions. Failure to appear at the Planning Commission meeting may result in the denial of the application.

L. Dayle Walker Exec 5-23-24

Owner of Record Signature & DATE

Applicant's Signature & DATE

Robertson County - Parcel: 101 026.00



Date: February 22, 2024

County: Robertson
Owner: WALKER CHARLES R ETUX
Address: HWY 49W 4452 4552
Parcel Number: 101 026.00
Deeded Acreage: 0
Calculated Acreage: 11.4

1:4,514

0 0.03 0.06 0.12 mi

0 0.05 0.1 0.2 km

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The property lines are compiled from information maintained by your local

Robertson County - Parcel: 101 026.00



Date: July 16, 2024

County: Robertson
Owner: WALKER CHARLES R ETUX
Address: HWY 49W 4552
Parcel Number: 101 026.00
Deeded Acreage: 0
Calculated Acreage: 11.4
Date of TDOT Imagery: 2021
Date of Vexcel Imagery: 2023

1:4,514

0 0.03 0.06 0.12 mi

0 0.05 0.1 0.2 km

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The property lines are compiled from information maintained by your local county Assessor's office but are not conclusive evidence of property ownership in any court of law.

Line Table		
NUMBER	DIRECTION	DISTANCE
L1	S 59°48'17" W	598.90
L2	S 59°48'17" W	50.00
L3	N 49°34'27" W	71.18
L4	S 72°26'51" W	110.09
L5	N 45°00'00" W	117.28
L6	N 77°04'39" E	140.78
L7	S 55°39'47" E	84.62
L8	S 49°34'27" E	51.67

Bearing Basis Note:
Bearings shown hereon are based on the Tennessee State Plane Coordinate System of 1983. Two (2) control points were established using a Spectra Precision SP80 Dual Frequency Receiver on February 8, 2024. The grid coordinates of the control points were derived using the TDOT Real-Time Kinematic Network, Virtual Reference Station, (VRS) Northing: 669811.44, Easting: 1711514.71 - Referenced to NAD83 (2011) (EPOCH 2010), GEOID 12B.

TSPCS Grid North (NAD83)

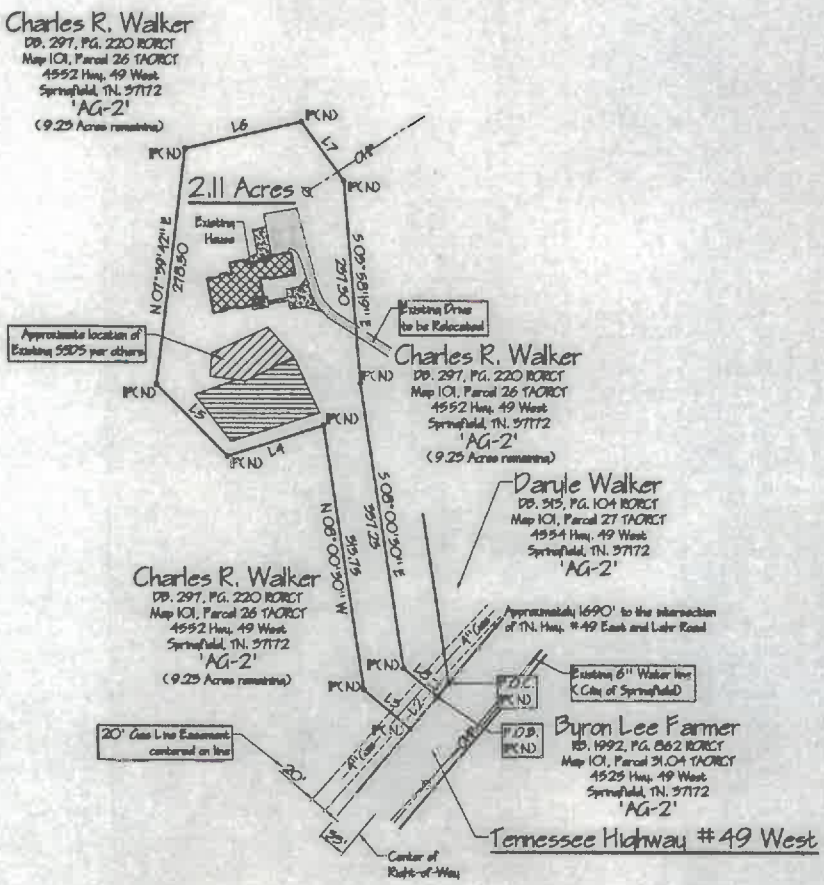
Surveying the Past, Present and Future

100 50 0 100 200

Scale in Feet
1"=100'

Surveyor's Notes:

1. No Title Report was furnished to this survey; therefore the survey shown hereon is subject to any and all findings on accurate Title Report may reveal.
2. This survey was made using the latest recorded deeds and physical evidence found in the field.
3. All distances shown hereon are based on a Field run survey using EDM equipment and have been adjusted for temperature.
4. The survey shown hereon was made in accordance with Chapter 0820-3-.07, Standards of Practice as adopted by the State of Tennessee Board of Examiners for Land Surveyors.



Legend
P.O.C. Point of Commencement
P.O.B. Point of Beginning
IPC.O Iron Pin (Old)
IPC.ND Iron Pin (New)
Power Pole
—OHP— Overhead Power Line
—Gas— Gas Line
L1 Refer to Line Table Shown Hereon for Data

Charles R. Walker Estate
Owner
4492 Hwy. 49 West
Springfield, TN. 37172
Contact: Daryle Walker
(615) 406-6212

Cad File No. 2400095
Coord. File No. 2400095

Property Address:
4492 Hwy. 49 West
Springfield, TN. 37172

Deed Reference:
Deed Book 297, Page 220 RORCT
Map 101, part of Parcel 26 TAORCT

CALL BEFORE YOU DIG
811 CALL 811 NATIONWIDE
Know what's below. Call before you dig.

Present Zoning Classification - 'AG-2'
Proposed Zoning - 'RP80'

I hereby certify that this General Property Survey is a Category III Survey and the Ratio of Precision of the Unadjusted Survey is 1:5000+ and that this survey meets the current Tennessee Minimum Standards of Practice.

STEVEN E. ARTZ
TENNESSEE NO. 1708

Rezoning Request For
Charles R. Walker Estate
15th Civil District
Robertson County, Tennessee

Revisions			
Number	Date	By	Comment

Steven E. Artz and Associates, Inc.
Land Surveyors
P.O. Box 939 Springfield, TN. 37172
and
(615) 502-0419

Drawn By: SEA
Checked By: JMM
Proj. No.: 2400095
Date: 2/22/24

RZ1
Sheet Number

Steven E. Artz and Associates, Inc.

Surveyor's Description
February 22, 2024

The following paragraph describes a tract of land in the 13th Civil District of Robertson County, Tennessee, said tract being a portion of that property which was conveyed to the Charles R. Walker, et ux, by, Steven N. Marion, et ux, in a deed of record which is recorded in Deed Book 297, Page 220, Register's Office for Robertson County, Tennessee, (RORCT).

Beginning at an iron pin (new) in the northwesterly margin of Tennessee Highway #49 West, said iron pin being located from an iron pin (new), in the northwesterly margin of said highway, the southwest corner of a tract of land which belongs to Daryle Walker, having a deed reference in Deed Book 313, Page 104, RORCT,
S 39°48'17" W, 398.90 feet, **to the point of beginning,** the southeast corner of this tract and continuing, as follows:
S 39°48'17" W, 50.00 feet to an iron pin (new), in the northwesterly margin of Tennessee Highway #49 West;
thence with a new line, as follows:
N 49°34'27" W, 71.18 feet to an iron pin (new);
thence, N 08°00'30" W, 313.75 feet to an iron pin (new);
thence, S 72°26'51" W, 110.03 feet to an iron pin (new);
thence, N 45°00'00" W, 117.28 feet to an iron pin (new);
thence, N 07°39'42" E, 278.50 feet to an iron pin (new);
thence, N 77°04'39" E, 140.78 feet to an iron pin (new);
thence, S 35°39'47" E, 84.62 feet to an iron pin (new);
thence, S 03°58'19" E, 237.30 feet to an iron pin (new);
thence, S 08°00'30" E, 337.23 feet to an iron pin (new);
thence, S 49°34'27" E, 51.67 feet, to the point of beginning, containing **2.11 acres,** as surveyed by Steven E. Artz, Tennessee License No. 1708, d/b/a, Steven E. Artz and Associates, Inc., 4800 Highway 431 North, Springfield, Tennessee, 37172, dated February 22, 2024.

The above described tract of land may be found on Tax Map 101, part of Parcel 26, in the Tax Assessor's Office for Robertson County, Tennessee.

File: Steve\240003L

Land Surveyors-Tennessee and Kentucky
Phone: (615) 382-0481 **Fax: (615) 382-0262**
4800 Highway 431 North **Springfield, Tennessee 37172**

CITY OF SPRINGFIELD
Water/Wastewater Department

924 Central Avenue • Springfield, Tennessee 37172 • (615) 382-1600 • FAX (615) 384-6951
www.springfieldtn.gov

May 20, 2024

TO WHO IT MAY CONCERN:

There has been a water availability letter requested by Mr. Charles Walker for a property located on Hwy 49 W in Robertson County. The property is located by Tax Map 101 Parcel 26. This letter will serve as notice that there is an existing 10" water main adjacent to this property. The aforementioned property is currently provided water services by the City of Springfield's Water and Wastewater Department. This water availability will be valid for the period of one year. If there has been no activity by May 20, 2025, the property will need to be re-evaluated for service.

If you need further information or have questions, please contact me at 615-382-1600.

Thank you,

Terry Beers, P.E.
Director
Springfield Water and Wastewater Department

Robertson County Development Office
Agenda Review Sheet
Planning Commission Meeting
July 25, 2024

Applicant: Daryle Walker, Executor of the Charles Walker Estate
Surveyor: Steve Artz

Request: Rezone **2.11 *acres*** of the 11.40 acres Tax Map 101, Part of Parcel 026.00 from AG-2 to RP-80



Figure 1: TN Property Viewer: Tax Map 101, Part of Parcel 026.00 In its entirety is highlighted.

Property Information:

- Tax Map 101, Part of Parcel 026.00
- 4552 Hwy. 49 W., Springfield
- Total lot acreage: 11.40 acres (496,584 sq. ft.)
- **Rezone Request: 2.11 acres. (91,911.60 sq. ft.)**

Project Narrative:

RP-80 Minimum Requirements
Minimum Lot Size: 80,000 sq. ft.
Front: 60'
Side: 25'
Rear: 25'
Min. Lot Width @ Front Bldg. Setback Line: 175'
Min Road Frontage: 50'
Maximum Height: 35'
Max Bldg. Coverage: 30%.

Discussion & Observations:
The applicant wishes to rezone 2.11 acres of the 11.40 acres. The subject property is mainly surrounded by AG-2 with a few RP-80 and R-40 zones in the immediate vicinity with varying lot sizes. Several of the surrounding AG-2 zoned lots are nonconforming that would be considered RP-80 and R-40 by today's zoning regulations.

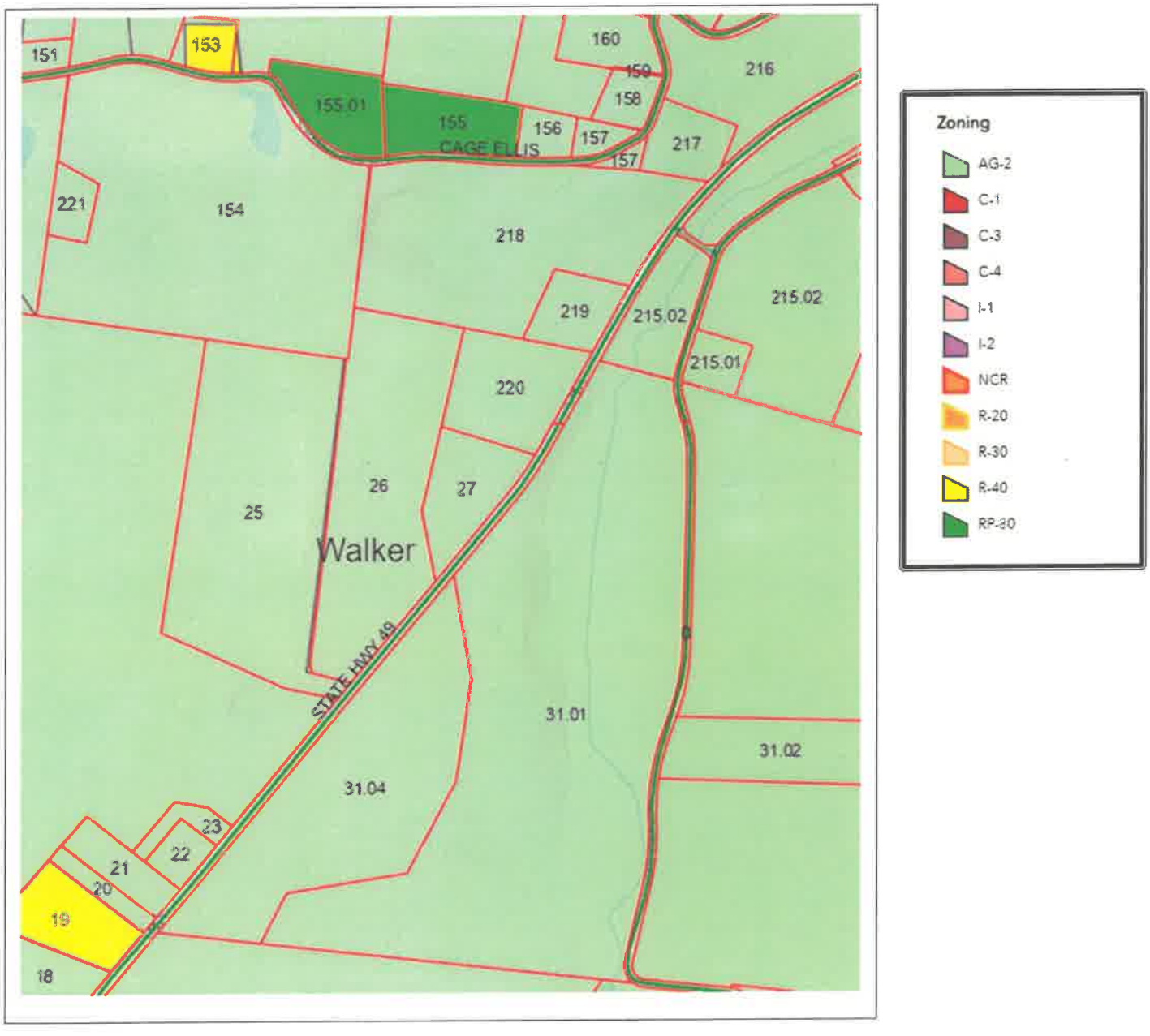
Please see Exhibit 1 for zoning map exhibit.

The applicant's request to rezone RP-80 appears to be dimensionally appropriate.

**** END COMMENTS ****

Exhibit 1

Austin Peay University Zoning Map



Walker Land Use Information



- Conservation
- Employment Center
- General Urban
- Rural
- Recreation/Open Space
- Sub-Urban

Rural.

The purpose of the Rural character area in the County shall be to ensure the continuation of agrarian and rural type uses. The closer the Rural areas are to cities and villages, the focus of the area changes from mostly agrarian to mostly rural residential.

• Location of Rural Preservation Areas. The majority of the County shall remain designated as Rural during the planning horizon of this land use plan.

• Uses in Rural Areas. Agrarian and rural type uses ranging from open space to agriculture, homesteads associated with agricultural uses and agriculture service businesses are encouraged within this category.

New Business: E

Hunter Mantooth

From: Rick Mayo <rickmayo3000@gmail.com>
Sent: Friday, July 12, 2024 4:26 PM
To: Traye Fann
Cc: Hunter Mantooth
Subject: [EXTERNAL]Comments of Northwind Estates Section 2 Revised Construction Plans for 7/25/24 Planning Commission Meeting
Attachments: Northwind Estates Section 2 Revised Construction Plans 071224.pdf

Traye,

Attached are my comments on the Northwind Estates Section 2 revised construction plans for the July 25 Planning Commission meeting. It should be noted that the cul-de-sac is longer than 1,000' but the engineer's response was that the road was going to be extended in the future. The Planning Commission should be aware of this. Also, for the two minor comments I have left, I do not feel another submission is necessary unless you do, assuming they address the final two comments.

Please let me know if you have any questions or comments.

Thanks.

Rick

EARL R. MAYO **CONSULTING ENGINEER AND SURVEYOR**
119 SUESAND COURT PLEASANT VIEW, TN 37146 (615)522-4704

July 12, 2024

Traye Fann
County Engineer
Robertson County Planning and Zoning
527 South Brown Street
Springfield, Tennessee 37172

RE: Review of Northwind Estates Section 2 Revised Construction Plans

Dear Traye:

I have reviewed the referenced revised construction plans that I received on July 11, 2024 for the July 25, 2024 Planning Commission meeting. If my remaining comments are addressed by the design engineer prior to final submission of the construction plans, I do not see a need to resubmit the plans for another review. Following is a list of my comments:

Sheet C2.1- Roadway Plan & Profile

1. Some of the PC and PT stations of the centerline curves do not appear to have the correct stations noted.

Sheet C3.1- Public Water Extension Plan

2. Show a valve at the end of the water line on East Heflin Street in order to accommodate the future extension.

Only a very cursory review has been performed of these documents in order to get an overall sense of general compliance with the surveying and engineering requirements contained in the Robertson County Subdivision Regulations. No planning related review was performed. This review is not intended as a check of accuracy of the documents or compliance with other state or federal laws and regulations, including Erosion Protection and Sediment Control or water quality design that was not reviewed by me but is to be reviewed by TDEC. No liability for the correctness or completeness of design or surveying performed by others is assumed by me or Robertson County by my review of these documents.

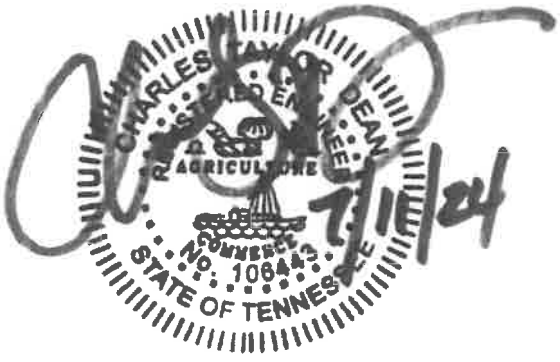
Please contact me if you have any questions or comments. Thank you for the opportunity to serve you.

Sincerely,

Rick Mayo, PE, RLS

NORTHWIND ESTATES, SECTION 2

Water Pressure/Flow Calculations
July 11, 2024



Charley Dean, PE
Dean Design Group, llc
1633 West Main Street, Suite 1002, Lebanon, TN 37087
E-mail: charley@deandesigngroupllc.com
Phone: 615-300-6316

Northwind Estates, Section 2
Dean Design Group Job: 24001
Water Pressure/Flow Calculations

Introduction:
These calculations are intended to calculate the anticipated flow for the proposed public fire hydrants for this development. The hydrants will be installed along the 8" public water line extension along East Heflin Street . This development is proposing 40 total lots. The total demand for the hydrant in this subdivision is the combination of the domestic peak demand (2 gpm per unit (40 x 2 = 80 gpm)) and the fire flow (500 gpm) = 580 total. The basis for the initial flow data used in these calculations is a flow test performed by West Robertson Water Authority on May 30th, 2024 on the hydrant along the east side of Highway 41 just north of our connection at East Heflin Street.

Initial Hydrant, Flow Test Results:

Static Pressure:	35 psi	Elevation:	674.0 +/-
Flow Pressure:	24 psi	Corresponding Flow Rate:	860 gpm

Calculation of Flow Data at Fire Hydrant A:

Convert pressure to feet:
Use initial Flow Pressure of 24 psi, multiplied by 2.31 = 55.4 feet

Calculate Hydraulic Grade Line at Existing FH:
HGL = Elevation of Initial Hydrant + Flow Pressure in Feet
= 674.0 + 55.4 = 624.3 feet

Compute Head Loss due to Friction from connection at existing line (STA 0+00) to FH-A (STA 3+31):
HL = $[10.44 \times L \times RF^{1.85}]/[C^{1.85} \times d^{4.87}]$, where
HL = Head Loss due to friction. in feet
L = Distance, in feet [27' from existing line to FH-A]
RF = Flow Rate at Initial point, in gpm
C = roughness coefficient, using 130 for PVC
d = diameter of pipe, in inches

HL = $[10.44 \times 331 \times 674^{1.85}]/[130^{1.85} \times 8^{4.87}]$
= 590948046.1 / 203630779.2 = 2.90 feet

Calculate Hydraulic Grade Line at Proposed FH:
HGL = Elevation of Initial Hydrant + Flow Pressure in Feet – Friction Loss
= 674.0 + 55.4 – 2.9 = 726.5 feet

CALCULATE RESIDUAL PRESSURE AT PROPOSED FH:
PR = [HGL – EA] / 2.31, where
HGL = Calculated hydraulic grade line
EA = Actual elevation at destination point

PR = [726.5 – 681.0] / 2.31 = 19.7 psi

Calculate Corresponding Flow Rate from Residual Pressure:

Q = K x $PR^{.5}$, where
K = 150
PR = residual pressure, in psi
Q = 150 x $19.7^{.5}$
= 665.7 gpm

The proposed fire hydrant A will have a calculated flow rate of 665.7 gpm at 19.7 psi.

Calculate pressure at the peak demand + fire flow scenario using Bernoulli's Equation. Condition 1 will be the calculated 665.7 gpm @ 19.7 psi, while Condition 2 will be the calculated pressure at the minimum requirement of 580 gpm:

Calculate Velocity in each condition [Use V = Q/A], where:
V = velocity (ft/sec)
Q = Flow Rate (ft^3/sec)
Flow for Condition 1 is 665.7 gpm (1.48 cfs), Condition 2 is 580 gpm (1.29 cfs)
A = cross-sectional area of flow (ft^2), 6" pipe is 0.19635 ft^2

V_1 = (1.48 ft^3/sec) / (0.19635 ft^2) = 7.54 ft/sec
V_2 = (1.29 ft^3/sec) / (0.19635 ft^2) = 6.57 ft/sec

$P_1 + (½)p(V_1)^2 + ph_1g = P_2 + (½)p(V_2)^2 + ph_2g$, where:
P_1 = pressure at Condition 1 (psf), Use 19.7 psi (2,836.8 psf)
P_2 = pressure at Condition 2 (psf), Solving for this
V_1 = velocity at Condition 1 (ft/sec), Use 7.54 ft/sec
V_2 = velocity at Condition 2 (ft/sec), Use 6.57 ft/sec
h_1 = height at Condition 1 (ft), Use elevation 681
h_2 = height at Condition 2 (ft), Use elevation 681
g = gravity (32 ft/sec)
p = fluid density of water (62.4 lb/ft^2)

$P_1 + (½)p(V_1)^2 + ph_1g = P_2 + (½)p(V_2)^2 + ph_2g$

(2836.8 psf) + (½)(62.4 lb/ft^2)(7.54 ft/sec)^2 + (62.4 lb/ft^2)(681 ft)(32 ft/sec)= P_2 + (½)(62.4 lb/ft^2)(6.57 ft/sec)^2 + (62.4 lb/ft^2)(681 ft)(32 ft/sec)

(2836.8) + (1773.8) + (1359820.8) = P2 + (1346.7) + (1359820.8)
1364431.4 = P2 + 1361167.5; P2 = 3263.9 psf = 22.7 psi

The proposed fire hydrant A will have a calculated pressure of 22.7 psi at the peak demand + fire flow scenario of 580 gpm.

Calculation of Flow Data at Fire Hydrant B:

Convert pressure to feet:
Use initial Flow Pressure of 24 psi, multiplied by 2.31 = 55.4 feet

Calculate Hydraulic Grade Line at Existing FH:

HGL = Elevation of Initial Hydrant + Flow Pressure in Feet
= 674.0 + 55.4 = 624.3 feet

Compute Head Loss due to Friction from connection at existing line (STA 0+00) to FH-B (STA 11+01):
HL = $[10.44 \times L \times RF^{1.85}]/[C^{1.85} \times d^{4.87}]$, where
HL = Head Loss due to friction, in feet
L = Distance, in feet [1,101' from existing line to FH-B]
RF = Flow Rate at Initial point, in gpm
C = roughness coefficient, using 130 for PVC
d = diameter of pipe, in inches

HL = $[10.44 \times 1101 \times 674^{1.85}]/[130^{1.85} \times 8^{4.87}]$
= 1965661023 / 203630779.2= 9.65 feet

Calculate Hydraulic Grade Line at Proposed FH:
HGL = Elevation of Initial Hydrant + Flow Pressure in Feet – Friction Loss
= 674.0 + 55.4 – 9.65 = 719.8 feet

CALCULATE RESIDUAL PRESSURE AT PROPOSED FH:
PR = [HGL – EA] / 2.31, where
HGL = Calculated hydraulic grade line
EA = Actual elevation at destination point

PR = [719.8 – 674] / 2.31 = 19.8 psi

Calculate Corresponding Flow Rate from Residual Pressure:
Q = $K \times PR^{0.5}$, where
K = 150
PR = residual pressure, in psi
Q = $150 \times 19.8^{0.5}$
= 667.9 gpm

The proposed fire hydrant A will have a calculated flow rate of 667.9 gpm at 19.8 psi.

Calculate pressure at the peak demand + fire flow scenario using Bernoulli's Equation. Condition 1 will be the calculated 667.9 gpm @ 19.8 psi, while Condition 2 will be the calculated pressure at the minimum requirement of 580 gpm:

Calculate Velocity in each condition [Use V = Q/A], where:
V = velocity (ft/sec)
Q = Flow Rate (ft^3/sec)
Flow for Condition 1 is 667.9 gpm (1.49 cfs), Condition 2 is 580 gpm (1.29 cfs)
A = cross-sectional area of flow (ft^2), 8" pipe is 0.3491 ft^2

V_1 = (1.49 ft^3/sec) / (0.3491 ft^2) = 4.27 ft/sec
V_2 = (1.29 ft^3/sec) / (0.3491 ft^2) = 3.70 ft/sec

$P_1 + (½)p(V_1)^2 + ph_1g = P_2 + (½)p(V_2)^2 + ph_2g$, where:
P_1 = pressure at Condition 1 (psf), Use 19.8 psi (2851.2 psf)

P_2 = pressure at Condition 2 (psf), Solving for this
V_1 = velocity at Condition 1 (ft/sec), Use 4.27 ft/sec
V_2 = velocity at Condition 2 (ft/sec), Use 3.70 ft/sec
h_1 = height at Condition 1 (ft), Use elevation 674
h_2 = height at Condition 2 (ft), Use elevation 674
g = gravity (32 ft/sec)
p = fluid density of water (62.4 lb/ft^2)

$P_1 + (½)p(V_1)^2 + ph_1g = P_2 + (½)p(V_2)^2 + ph_2g$

(2851.2 psf) + (½)(62.4 lb/ft^2)(4.27 ft/sec)^2 + (62.4 lb/ft^2)(674 ft)(32 ft/sec)= P_2 + (½)(62.4 lb/ft^2)(3.70 ft/sec)^2 + (62.4 lb/ft^2)(674 ft)(32 ft/sec)

(2851.2) + (568.9) + (1345843.2) = P2 + (427.1) + (1345843.2)
1349263.3 = P2 + 1346270.3; P2 = 2993 psf = 20.8 psi

The proposed fire hydrant B will have a calculated pressure of 20.8 psi at the peak demand + fire flow scenario of 580 gpm.

Calculation of Flow Data at Fire Hydrant C:

Convert pressure to feet:
Use initial Flow Pressure of 24 psi, multiplied by 2.31 = 55.4 feet

Calculate Hydraulic Grade Line at Existing FH:
HGL = Elevation of Initial Hydrant + Flow Pressure in Feet
= 674.0 + 55.4 = 624.3 feet

Compute Head Loss due to Friction from connection at existing line (STA 0+00) to FH-C (STA 20+09):
HL = $[10.44 \times L \times RF^{1.85}]/[C^{1.85} \times d^{4.87}]$, where
HL = Head Loss due to friction, in feet
L = Distance, in feet [2009' from existing line to FH-C]
RF = Flow Rate at Initial point, in gpm
C = roughness coefficient, using 130 for PVC
d = diameter of pipe, in inches

HL = $[10.44 \times 2009 \times 674^{1.85}]/[130^{1.85} \times 8^{4.87}]$
= 3586751132 / 203630779.2= 17.6 feet

Calculate Hydraulic Grade Line at Proposed FH:
HGL = Elevation of Initial Hydrant + Flow Pressure in Feet – Friction Loss
= 674.0 + 55.4 - 17.6 = 711.8 feet

CALCULATE RESIDUAL PRESSURE AT PROPOSED FH:
PR = [HGL – EA] / 2.31, where
HGL = Calculated hydraulic grade line
EA = Actual elevation at destination point

PR = [711.8 – 674] / 2.31 = 16.4 psi

Calculate Corresponding Flow Rate from Residual Pressure:

Q = K x $PR^{0.5}$, where

K = 150

PR = residual pressure, in psi

Q = 150 x $16.4^{0.5}$

= 607.5 gpm

The proposed fire hydrant A will have a calculated flow rate of 607.5 gpm at 16.4 psi.

Calculate pressure at the peak demand + fire flow scenario using Bernoulli's Equation. Condition 1 will be the calculated 607.5 gpm @ 16.4 psi, while Condition 2 will be the calculated pressure at the minimum requirement of 580 gpm:

Calculate Velocity in each condition [Use V = Q/A], where:

V = velocity (ft/sec)

Q = Flow Rate (ft^3/sec)

Flow for Condition 1 is 607.5 gpm (1.35 cfs), Condition 2 is 580 gpm (1.29 cfs)

A = cross-sectional area of flow (ft^2), 8" pipe is 0.3491 ft^2

V_1 = (1.35 ft^3/sec) / (0.3491 ft^2) = 3.87 ft/sec

V_2 = (1.29 ft^3/sec) / (0.3491 ft^2) = 3.70 ft/sec

$P_1 + (½)p(V_1)^2 + ph_1g = P_2 + (½)p(V_2)^2 + ph_2g$, where:

P_1 = pressure at Condition 1 (psf), Use 16.4 psi (2361.6 psf)

P_2 = pressure at Condition 2 (psf), Solving for this

V_1 = velocity at Condition 1 (ft/sec), Use 3.87 ft/sec

V_2 = velocity at Condition 2 (ft/sec), Use 3.70 ft/sec

h_1 = height at Condition 1 (ft), Use elevation 683

h_2 = height at Condition 2 (ft), Use elevation 683

g = gravity (32 ft/sec)

p = fluid density of water (62.4 lb/ft^2)

$P_1 + (½)p(V_1)^2 + ph_1g = P_2 + (½)p(V_2)^2 + ph_2g$

(2361.6 psf) + (½)(62.4 lb/ft^2)(3.87 ft/sec)^2 + (62.4 lb/ft^2)(683 ft)(32 ft/sec)= P_2 + (½)(62.4 lb/ft^2)(3.70 ft/sec)^2 + (62.4 lb/ft^2)(683 ft)(32 ft/sec)

(2361.6) + (467.3) + (1363814.4) = P2 + (427.1) + (1363814.4)

1366643.3 = P2 + 1364241.5; P2 = 2401.8 psf = 16.7 psi

The proposed fire hydrant C will have a calculated pressure of 16.7 psi at the peak demand + fire flow scenario of 580 gpm.

Construction Plans for

Northwind Estates

Section 2
Tax Map 055, Parcel 070.00 in Robertson Co.
Hwy 41N, Cedar Hill, Tennessee

GENERAL NOTES:

1. The contractor shall verify the location of all existing utilities in the proximity of the construction area and report any plan discrepancies to the owner's representative prior to beginning work.
2. The contractor shall conform to all local, state and federal codes and obtain all permits prior to beginning work.
3. The contractor shall check all finished grades and dimensions and report any discrepancies to the owner's representative prior to beginning work.
4. Dimensions are to the face of curb, edge of concrete and face of building unless noted otherwise.
5. Proposed building footprint is for graphic purposes only. Contractor shall use the current architectural drawings for building stakeout and verify that there are no discrepancies with these plans.
6. All traffic markings shall conform to the standard of uniform traffic control device (MUTCD). All pavement marking shall be thermoplastic unless directed otherwise by the owner's representative.
7. All handicap ramps, parking spaces and accessible routes shall comply with the current ADA requirements. If there is a discrepancy between the requirements and the plans, the contractor must notify the owner's representative prior to beginning work.
8. Exterior door landings shall be provided per the local building code. Contractor shall coordinate door locations and adjacent sidewalk/landing grades with these plans and the architectural plans and report any discrepancies to the owner's representative.
9. Maintain one set of as-built drawings on the job site for distribution to the architect/engineer upon completion: include all utility locations, materials and sizes, all new sidewalk ramps, elevations for all sanitary and storm sewer structures, vertical and horizontal information on all new utilities as well as existing utilities discovered during construction.
10. Provide a smooth transition between existing pavement and new pavement. Field adjustment of final grades may be necessary. Install all utilities prior to installation of pavement.
11. The necessary permits for the work shown on these site development plans must be obtained by the contractor prior to commencement of any work on this project. The contractor shall give all necessary notices and obtain all permits and pay all fees involved in securing all permits. They shall also comply with all city, county and state building laws, ordinances or regulations relating to the construction of the project.
12. The contractor shall be responsible for and shall bear all expenses of field staking necessary for site and building layout. All site layout shall be performed in accordance with the site layout plan. All building layout shall be performed in accordance with the latest architectural plans.
13. The location of existing piping and underground utilities, such as water and gas lines, electrical and telephone conduits, etc., as shown on this portion of the plans have been determined from the best available information by aerial surveys, or taken from the records and drawings of the existing utilities. However, the civil engineer does not assume responsibility that, during construction, the possibility of utilities other than those shown may be encountered or that actual location of those shown may vary somewhat from the location designated on this portion of the plans. In areas where it is necessary that the exact locations of underground lines be known, the contractor shall, at this own expense, furnish all labor and tools to either verify and substantiate or definitively establish the location of the lines.
14. The contractor must understand that all work is entirely at his risk until all work is accepted and he will be held responsible for its safety by the owner. Therefore, the contractor shall furnish and install all necessary temporary works for the protection of the work, including barricades, warning signs, and lights.
15. The site development portion of this project will be subject to the inspection and final approval of the local planning, codes, water and sewer departments (and/or utility districts), engineering/public works departments and fire marshal's office.
16. If during the construction of the site development portion of this project a question of livers or clarity arises from either the plans or specifications, the contractor will immediately bring the matter to the attention of the civil engineer or owner's representative for resolution before the affected work items are initiated or pursued further.
17. The contractor will exercise extreme caution in the use of equipment in and around overhead and/or underground power lines. If at any time in the pursuit of this work the contractor must work in close proximity of the above-noted lines, the electric and/or telephone companies shall be contacted prior to such work and the proper safety measures taken. The contractor should make a thorough examination of the overhead lines in the project area prior to the initiation of construction.
18. The contractor shall be responsible for any damage done to the premises or adjacent premises, or injuries to the public during the construction of the work, caused by himself, his subcontractors, or the carelessness of any of his employees.



LOCATION MAP
NOT TO SCALE

Sheet Schedule

C0.0	Cover
C1.0	Demolition & Erosion Control Plan
C1.1	Intermediate Erosion Control Plan
C2.0	Subdivision Layout Plan
C2.1	Roadway Plan & Profile
C2.2	Roadway Plan & Profile
C2.3	Layout Details
C3.0	Master Utility Plan
C3.1	Public Water Extension Plan
C4.0	Grading & Drainage Plan
C4.1	Drainage Details

SITE DATA TABLE	
PROJECT NAME:	NORTHWIND ESTATES
EXISTING ZONING	R20
PROPOSED DEVELOPMENT	SINGLE FAMILY RESIDENTIAL
ACREAGE OF PROPERTY	22.2 ACRES - 967,032 +/- S.F.
MAX DENSITY BY ZONING	40.74 UNITS
PROPOSED DENSITY	40 UNITS
TYPICAL SETBACKS	FRONT = 25' SIDE = 5' REAR = 10'
DISTURBED AREA	19.25 ACRES - 803,299 +/- S.F.
DEED BOOK & PAGE	BOOK: 1062 PAGE: 363
CIVIL DISTRICT	8

1. STREETS SHALL BE BUILT TO THE ROAD SPECIFICATIONS IN EFFECT AT THE TIME OF CONSTRUCTION.

2. ROAD CONSTRUCTION SHALL NOT BEGIN WITHOUT APPROVAL OF THE LOCAL DEPARTMENT OF PUBLIC WORKS.

3. THIS PROPERTY IS NOT IN AN AREA DESIGNATED AS A SPECIAL FLOOD AREA, AS SHOWN ON COMMUNITY MAP/PANEL NUMBER, 47147C0215C, EFFECTIVE DATE 4/16/2008.

4. DRAINAGE EASEMENTS OUTSIDE DEDICATED ROW'S ARE NOT THE RESPONSIBILITY OF ROBERTSON COUNTY OR THE CITY OF CEDAR HILL.

OWNER
CONTACT: MAC BAGGETT JR
4781 HWY-41N
SPRINGFIELD TN, 37172
PHONE: 615-347-3239
EMAIL: BGIMACJR@GMAIL.COM

SURVEYOR
STEVEN E. ARTZ & ASSOC.
CONTACT: STEVE ARTZ, RLS
PO BOX 923
SPRINGFIELD TN, 37172
PHONE: 615-382-0481
EMAIL: artz.steve@gmail.com

Cover Sheet

Initial Submittal:
June 14, 2024
Revisions:
July 11, 2024

Not to Scale

Designed By:
Charley Dean, PE

Dean Design Group
Civil Engineering, Land Planning & Zoning
1633 West Main Street, Suite 1002, Lebanon TN 37087
Phone: 615-300-6316; EMail: charley@deandesigngroupllc.com

Northwind Estates
Section 2
Tax Map 055, Parcel 070.00 in Robertson Co.
Hwy 41N, Cedar Hill, Tennessee

Project: 24001

C0.0

Sheet 1 of 11

Total Property Area = 22.2 acres (967,032 S.F.)
Disturbed Area = 19.25 acres (803,299 S.F.)

60 0 60 120
Scale 1" = 60'

SITE BENCHMARK:
FLANGE BOLT ON FIRE HYDRANT
ELEV.: 872.04 (NAVD88)

PROVIDE JOB BOX FOR PERMITS & REPORTS

INSTALL WIRE BACKED SILT FENCE WITH J-HOOKS AS NEEDED TO PREVENT SEDIMENT LOSS FROM THE CONSTRUCTION SITE AND SEDIMENTATION OF EXISTING WETLAND AREAS, SEE DETAIL.

EPSC SIZING:
LENGTH OF FENCING PROVIDED: 3,000 LF
ACRES DISTURBED: 19.25 ACRES
TREATMENT RATIO:
* 3,000 LF / 19.25 AC = 155.8 LF/AC
* 155.8 > 150 LF/AC (MIN. REQUIREMENT)

INSTALL TEMPORARY CONSTRUCTION ENTRANCE AND CONCRETE WASHOUT AS SHOWN. SEE DETAILS.

CONTRACTOR TO ENSURE SEDIMENT IS NOT TRACKED ON TO PUBLIC ROW. IF TRACKING OCCURS IT MUST BE REMOVED IMMEDIATELY

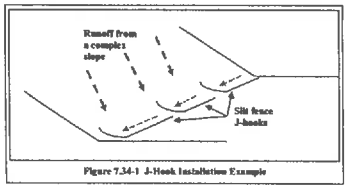


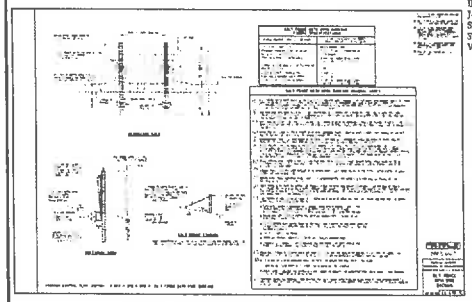
Figure 7.34-1 J-Hook Installation Example

J HOOK INSTALLATION
Not to Scale

PROPOSED LIMITS OF DISTURBANCE

INSTALL WIRE BACKED SILT FENCE WITH J-HOOKS AS NEEDED TO PREVENT SEDIMENT LOSS FROM THE CONSTRUCTION SITE AND SEDIMENTATION OF EXISTING WETLAND AREAS, SEE DETAIL.

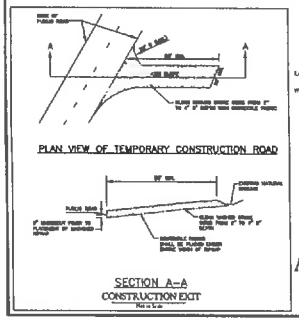
INSTALL WIRE BACKED SILT FENCE WITH J-HOOKS AS NEEDED TO PREVENT SEDIMENT LOSS FROM THE CONSTRUCTION SITE AND SEDIMENTATION OF EXISTING WETLAND AREAS, SEE DETAIL.



WIRE-BACKED SILT FENCE
Not to Scale

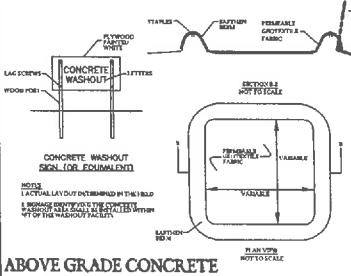
EXISTING TREES TO BE REMOVED AS NEEDED FOR DEVELOPMENT (typ)

PROPOSED LIMITS OF DISTURBANCE



PLAN VIEW OF TEMPORARY CONSTRUCTION ROAD

SECTION A–A
CONSTRUCTION EXIT



CONCRETE WASHOUT SIGN (OR EQUIVALENT)

NOTES:
1. ACTUAL LAY OUT DETERMINED IN THE FIELD
2. SIGNAGE SHALL BE POSTED AT THE ENTRANCE TO INDICATE THE LOCATION OF THE CONCRETE WASHOUT FACILITY

ABOVE GRADE CONCRETE WASHOUT AREA
Not to Scale

Initial Erosion Control
Demolition & Erosion Control Plan

Initial Submittal:
June 14, 2024
Revisions:
July 11, 2024

60 Scale

Designed By:
Charley Dean, PE

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Civil Engineering, Land Planning & Zoning
1633 West Main Street, Suite 1002, Lebanon TN 37087
Phone: 615-300-6316; EMail: charley@deandesigngroupllc.com

Northwind Estates
Section 2
Tax Map 055, Parcel 070.00 in Robertson Co.
Hwy 41N, Cedar Hill, Tennessee

Project: 24001

C1.0

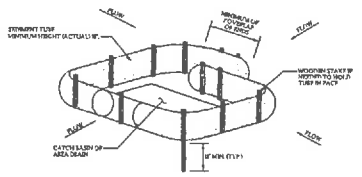
Sheet 2 of 11

Total Property Area = 22.2 acres (967,032 S.F.)
Disturbed Area = 19.25 acres (803,299 S.F.)

60 0 60 120
Scale 1" = 60'

MAINTAIN CONSTRUCTION ENTRANCE AND STAGING AREA DURING ALL CONSTRUCTION ACTIVITIES ADJUST WHEN NECESSARY AS FINAL GRADE IS OBTAINED

CONTRACTOR SHALL MAINTAIN SILT FENCE AS NEEDED TO PREVENT SEDIMENTATION (typ). UNTIL FINAL STABILIZATION IS ACHIEVED.



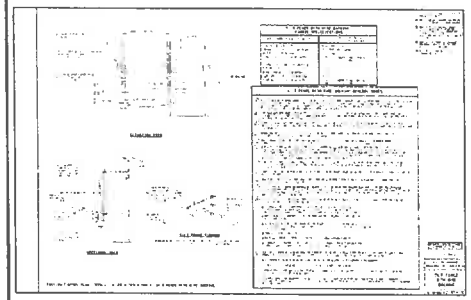
INLET PROTECTION

ONCE PROPOSED STORM DRAINAGE HAS BEEN INSTALLED, PROVIDE INLET PROTECTION AROUND GRATES AS NEEDED TO PREVENT SEDIMENTATION OF PROPOSED STORM SYSTEM , SEE DETAIL THIS SHEET (TYPICAL AS SHOWN)

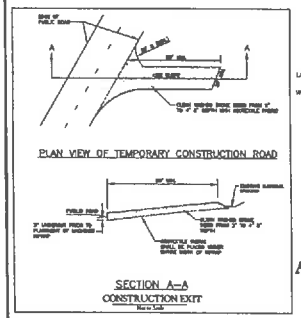
ONCE PROPOSED STORM DRAINAGE HAS BEEN INSTALLED, PROVIDE INLET PROTECTION AROUND GRATES AS NEEDED TO PREVENT SEDIMENTATION OF PROPOSED STORM SYSTEM , SEE DETAIL THIS SHEET (TYPICAL AS SHOWN)

CONTRACTOR SHALL MAINTAIN SILT FENCE AS NEEDED TO PREVENT SEDIMENTATION (typ).

ONCE PROPOSED STORM DRAINAGE HAS BEEN INSTALLED, PROVIDE INLET PROTECTION AROUND GRATES AS NEEDED TO PREVENT SEDIMENTATION OF PROPOSED STORM SYSTEM , SEE DETAIL THIS SHEET (TYPICAL AS SHOWN)

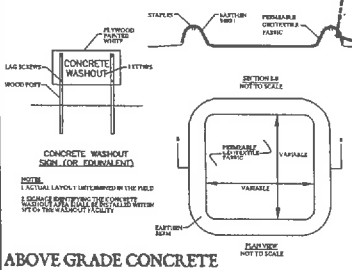


WIRE-BACKED SILT FENCE
Not to Scale



PLAN VIEW OF TEMPORARY CONSTRUCTION ROAD

SECTION A–A
CONSTRUCTION EXIT



CONCRETE WASHOUT SIGN (OR EQUIVALENT)

NOTES:
1. ACTUAL LAYOUT TO BE DETERMINED IN THE FIELD
2. SIGNAGE SHALL BE PLACED WITHIN 30 FEET OF THE CONCRETE WASHOUT AREA. DETAILS SHALL BE INSTALLED WITHIN 24 HOURS OF THE INITIAL WASHOUT FACILITY

ABOVE GRADE CONCRETE WASHOUT AREA
Not to Scale

Intermediate Erosion Control Plan

Initial Submittal: June 14, 2024
Revisions: July 11, 2024

60 Scale

Designed By: Charley Dean, PE

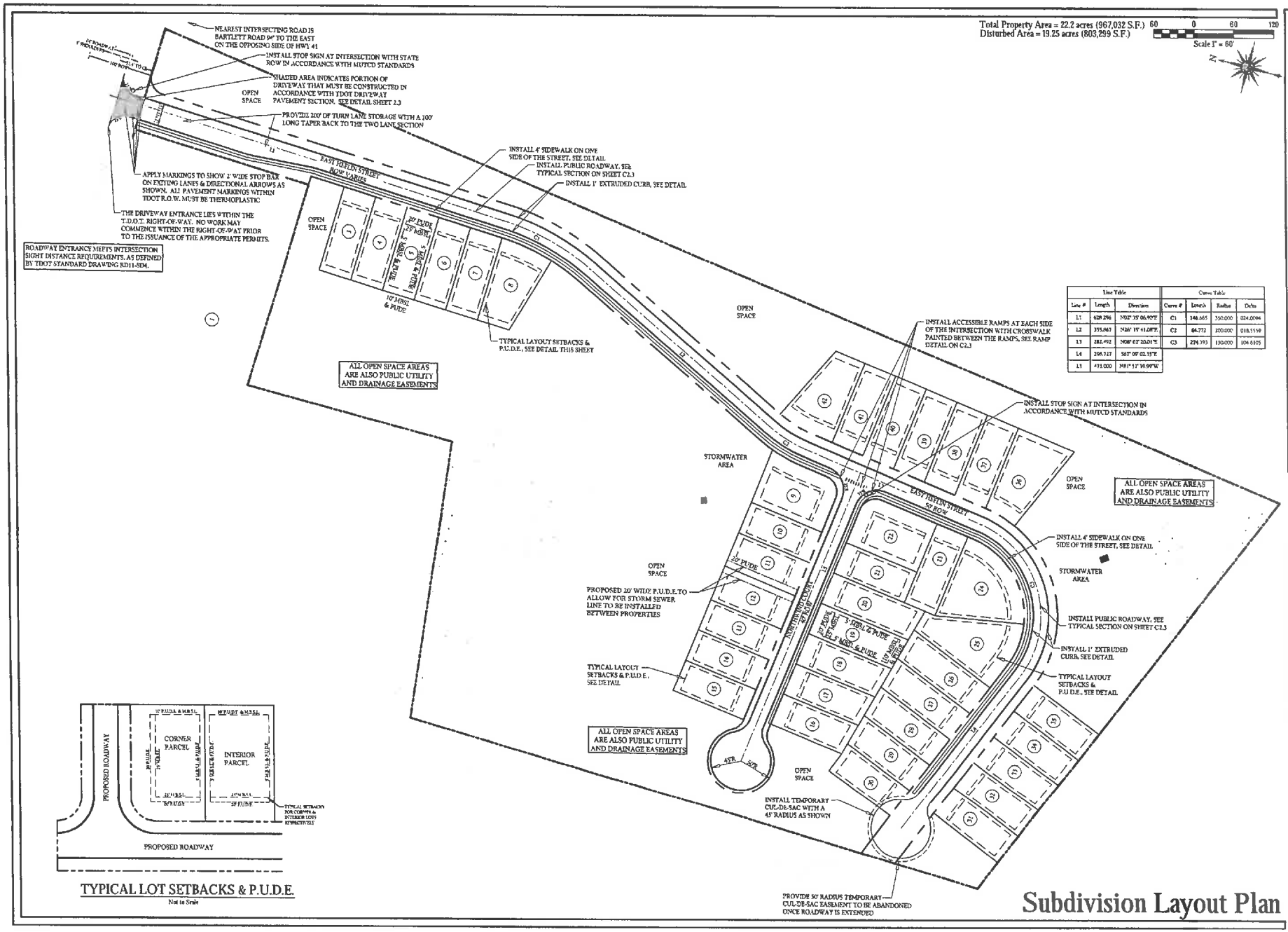
Dean Design Group
Civil Engineering, Land Planning & Zoning
1633 West Main Street, Suite 1002, Lebanon TN 37087
Phone: 615-300-6318; EMail: charley@deandesigngroupllc.com

Northwind Estates
Section 2
Tax Map 055, Parcel 070.00 in Robertson Co.
Hwy 41N, Cedar Hill, Tennesse

Project: 24001

C1.1

Sheet 3 of 11



Initial Submittal: June 14, 2024
Revisions July 11, 2024

60 Scale

Designed By: Charley Dean, PE

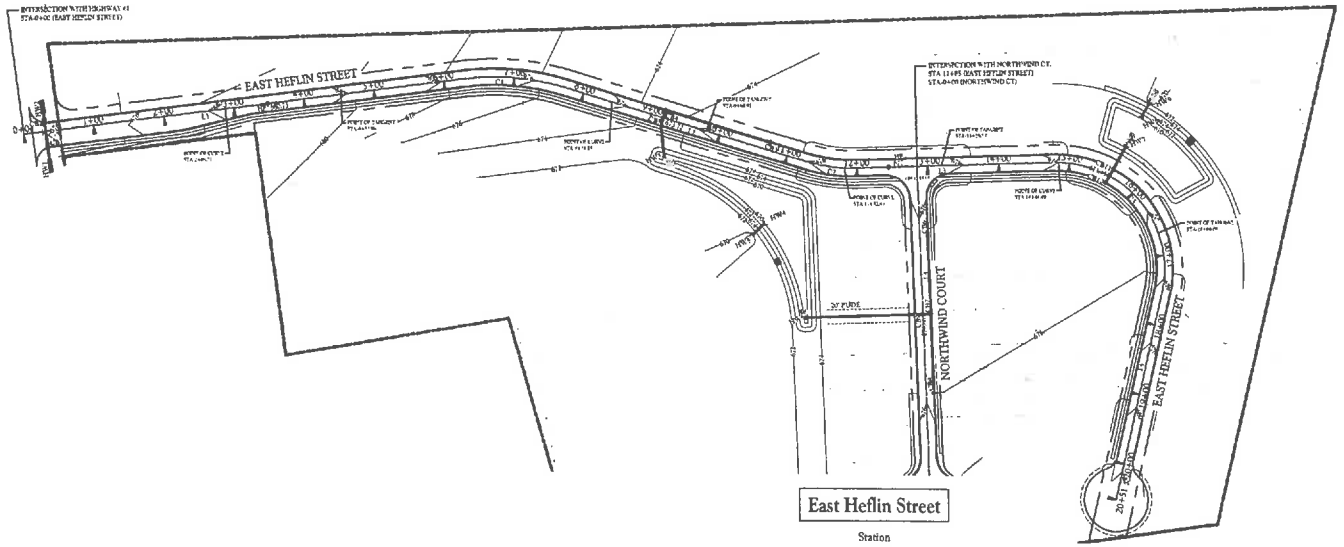
Dean Design Group
Civil Engineering, Land Planning & Zoning
1633 West Main Street, Suite 1002, Lebanon TN 37087
Phone: 615-300-6316; EMail: charley@deandesigngroupllc.com

Northwind Estates
Section 2
Tax Map 035, Parcel 070.00 in Roberson Co.
Hwy 41N, Cedar Hill, Tennessee

Project: 24001

C2.0

Sheet 4 of 11



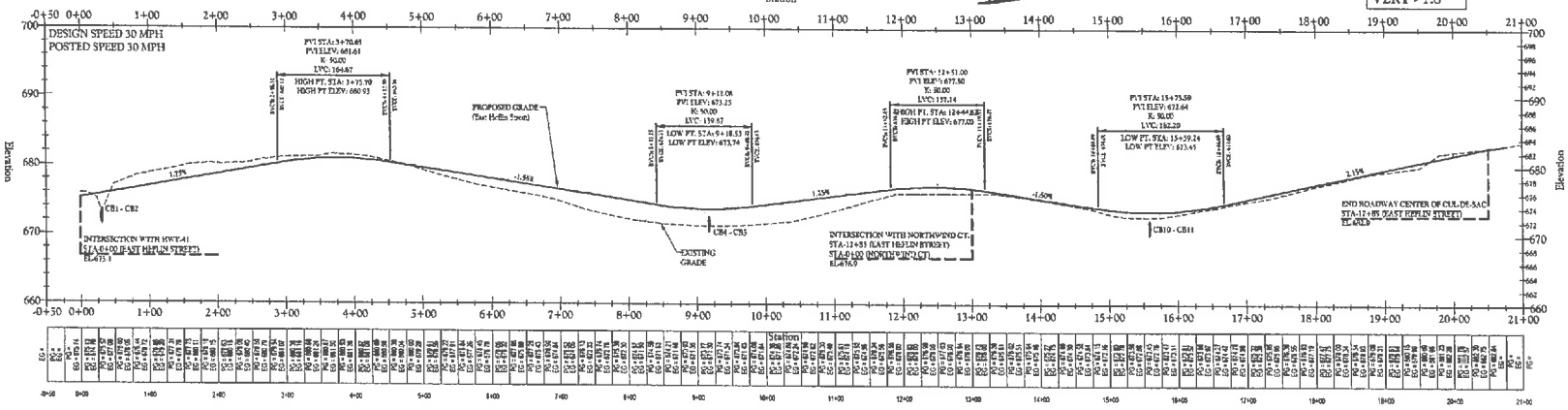
80 0 80 160
Scale 1" = 80'

Total Property Area = 22.2 acres (967,032 S.F.)
Disturbed Area = 19.25 acres (803,299 S.F.)

Line Table		
Line #	Length	Direction
L1	628.296	N02° 57' 06.90"E
L2	355.867	N29° 39' 41.08"E
L3	354.491	N09° 07' 20.31"E
L4	296.727	S67° 09' 02.13"E
L5	431.000	N81° 57' 30.99"W

Curve Table			
Curve #	Length	Radius	Delta
C1	146.565	150.000	034.0094
C2	84.772	300.000	016.5559
C3	276.993	150.000	104.8405

SCALE - 1:80
HORIZ - 1:80
VERT - 1:8



EG = EXISTING GRADE AT THIS STATION
PG = PROPOSED GRADE AT THIS STATION

Roadway Plan & Profile

Initial Submittal
June 14, 2024
Revisions:
July 12, 2024

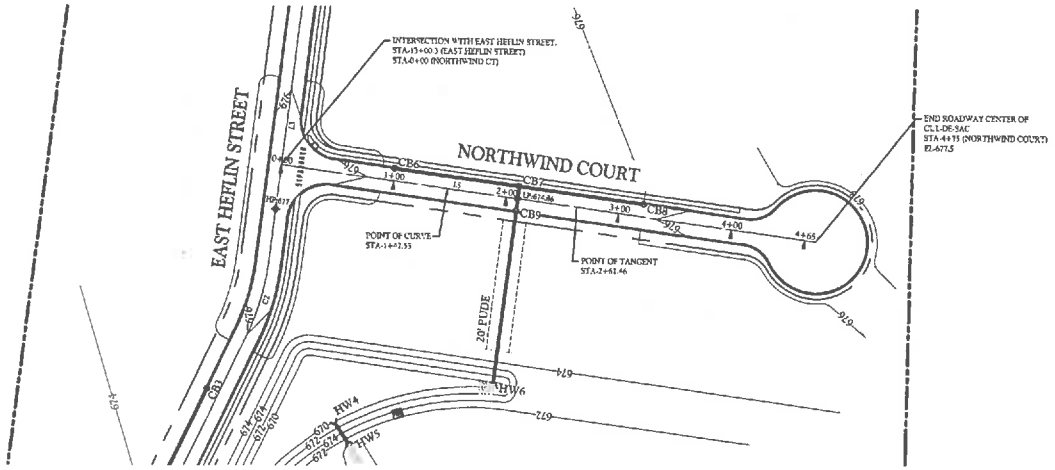
80 Scale

Designed By:
Charley Dean, P.E.

Dean Design Group
Civil Engineering, Land Planning & Zoning
1633 West Main Street, Suite 1002, Lebanon TN 37087
Phone: 615-300-6316; EMail: charley@deandesigngroupllc.com

Northwind Estates
Section 2
Tax Map 055, Parcel 070.00 in Robertson Co.
Hwy 41N, Cedar Hill, Tennesee

Project: 24001
C2.1
Sheet 5 of 11



50 0 50 100
Scale 1" = 50'

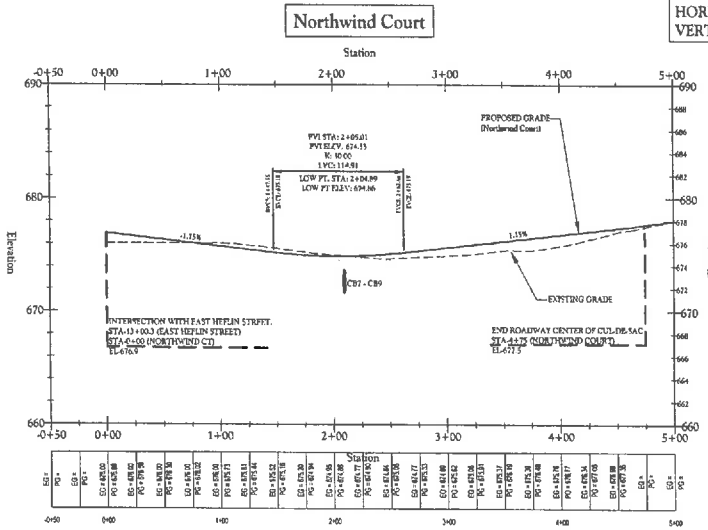
Total Property Area = 22.2 acres (967,032 S.F.)
Disturbed Area = 19.25 acres (803,299 S.F.)

N

Line Table		
Line #	Length	Direction
L1	638.296	N02° 33' 06.90"E
L2	353.867	N26° 33' 41.08"E
L3	282.492	N08° 02' 20.01"E
L4	296.727	S67° 09' 02.35"E
L5	475.000	N91° 57' 39.99"W

Curve Table			
Curve #	Length	Radius	Delta
C1	146.666	350.000	024.0094
C2	84.772	300.000	016.5539
C3	274.393	150.000	104.8105

SCALE - 1:50
HORIZ - 1:50
VERT - 1:5



EG = EXISTING GRADE AT THIS STATION
PG = PROPOSED GRADE AT THIS STATION

Roadway Plan & Profile

Initial Submittal: June 14, 2024
Revisions: July 11, 2024

50 Scale

Designed By: Charley Dean, PE

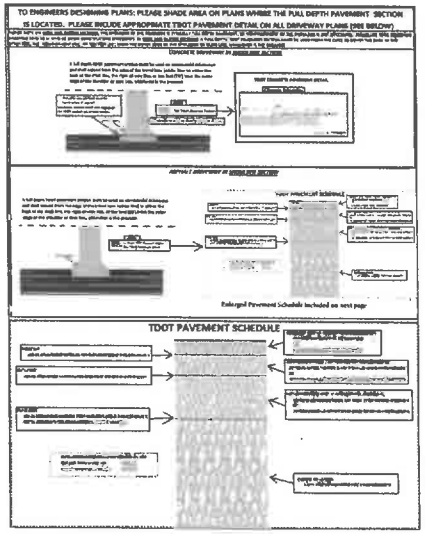
Dean Design Group
Civil Engineering, Land Planning & Zoning
1633 West Main Street, Suite 1002, Lebanon TN 37087
Phone: 615-300-6316; EMail: charley@deandesigngroupllc.com

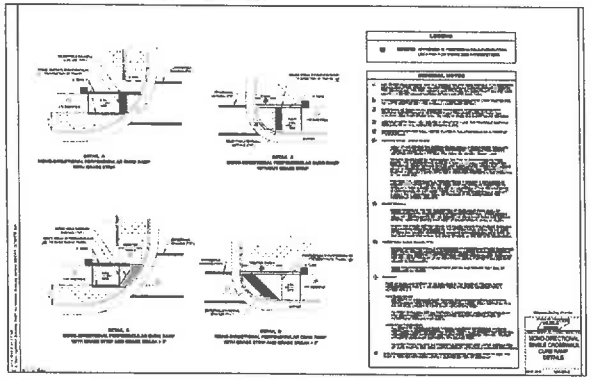
Northwind Estates
Section 2
Tax Map 055, Parcel 070.00 in Robertson Co.
Hwy 41N, Cedar Hill, Tennessee

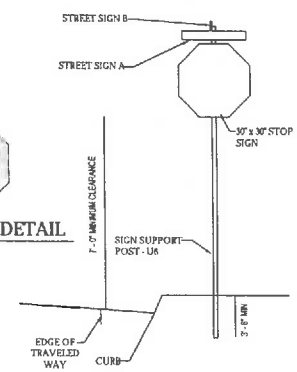
Project: 24001

C2.2

Sheet 6 of 11

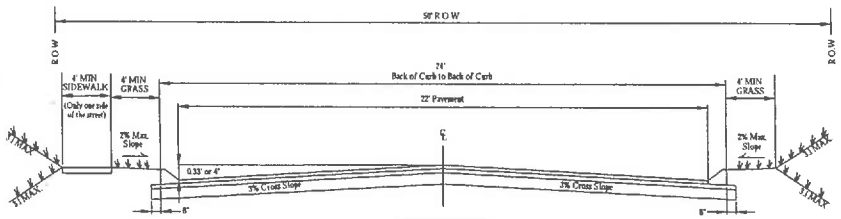






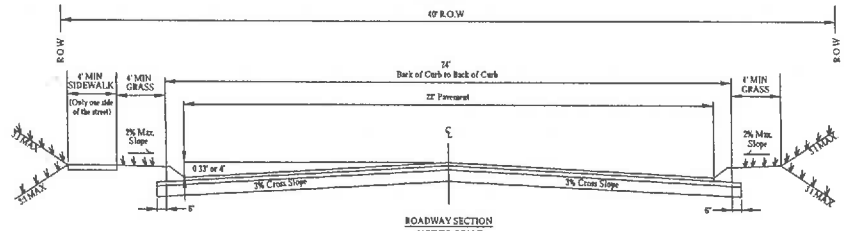
NOTES
1. ALL MARKINGS SHALL COMPLY WITH THE MILLENNIUM EDITION OF THE TENNESSEE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES AND TENNESSEE D.O.T. STANDARD DRAWINGS
2. MATERIAL SHALL BE HIGH DENSITY REFLECTIVE SHEETING (TYPE II)
3. ALL STREET NAME SIGNS SHALL BE MADE FROM A CITY APPROVED MATERIAL AND SHALL CONTAIN THE CITY APPROVED FONT.

TYPICAL SIGN DETAIL
Not to Scale



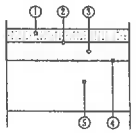
ROADWAY SECTION
NOT TO SCALE

TYPICAL ROADWAY SECTION
EAST HEFLIN STREET
RESIDENTIAL (50' R.O.W.)
Not to Scale



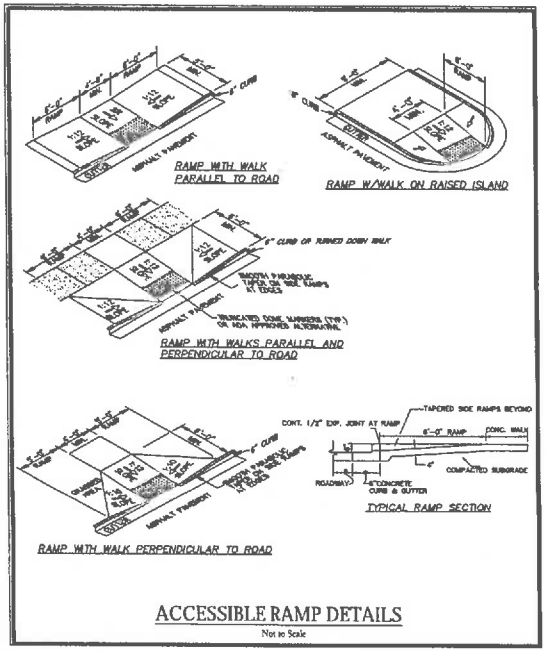
ROADWAY SECTION
NOT TO SCALE

TYPICAL ROADWAY SECTION
NORTHWIND CT
RESIDENTIAL (40' R.O.W.)
Not to Scale

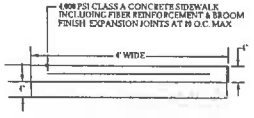


1. 1 1/2" ASPHALTIC CONCRETE SURFACE (TDOT, SECTION 411-E)
2. TACK COAT (TDOT, SECTION 403)
3. 2" BITUMINOUS BINDER (TDOT, B MODIFIED)
4. 0.35 Gallon/S.Y. PRIME COAT (TDOT, SECTION 307-B)
5. 8" BASE STONE (TDOT, 33C-1 or 33P-1)

PUBLIC ROADWAY
PAVEMENT SECTION
Use for both
EAST HEFLIN STREET & NORTHWIND COURT
Not to Scale

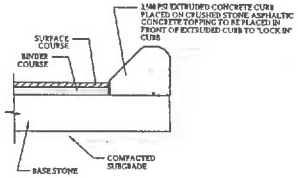


ACCESSIBLE RAMP DETAILS
Not to Scale



NOTE,
MAXIMUM CROSS SLOPE IS 2%

PUBLIC SIDEWALK
Not to Scale



EXTRUDED CURB
Not to Scale

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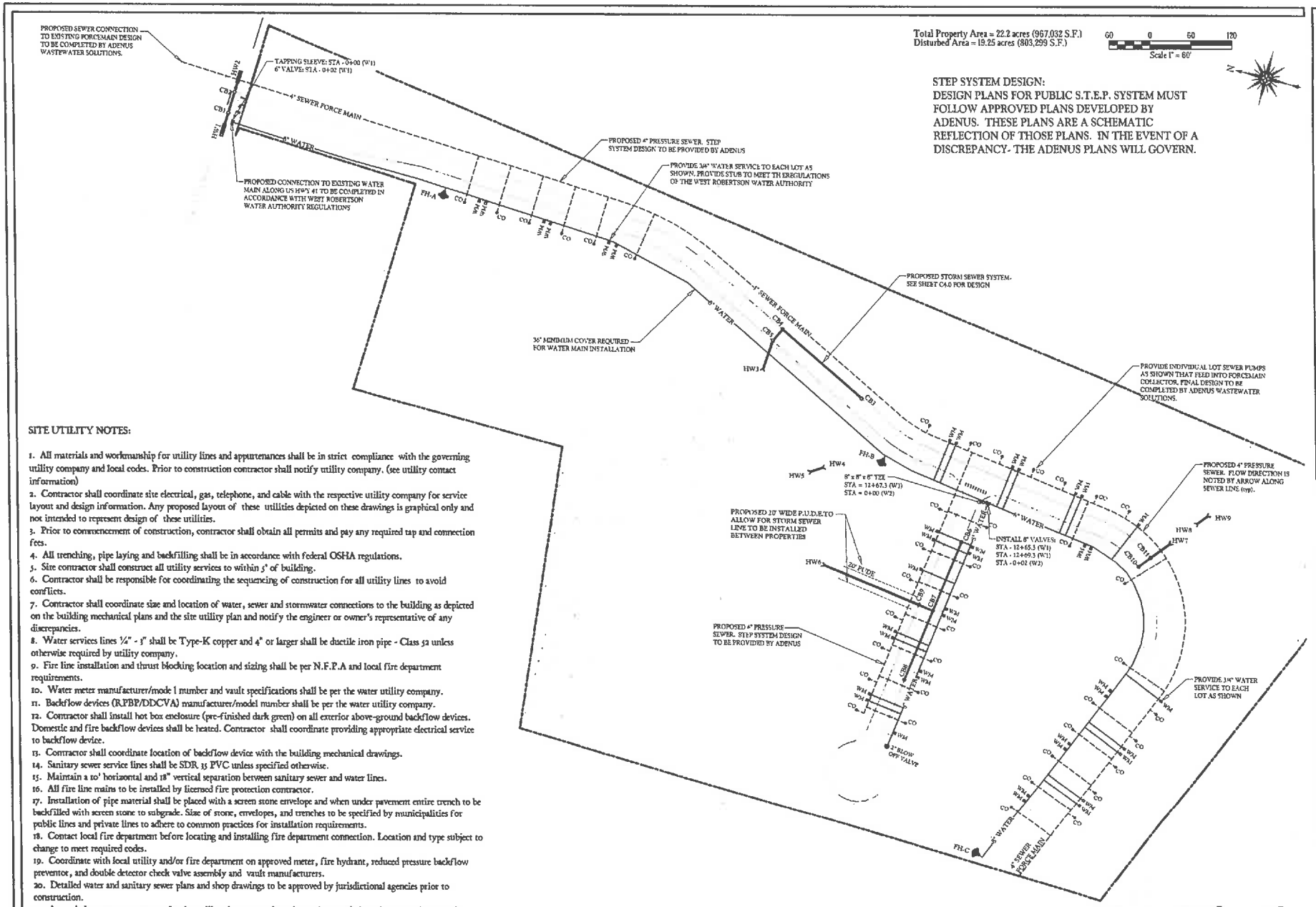
Northwind Estates
Section 2
Tax Map 055, Parcel 070.00 in Robertson Co.
Hwy 41N, Cedar Hill, Tennessee

Project: 24001

C2.3

Sheet 7 of 11

Layout Details



Total Property Area = 22.2 acres (967,032 S.F.)
Disturbed Area = 19.25 acres (803,299 S.F.)

60 0 60 120
Scale 1" = 60'

N

STEP SYSTEM DESIGN:
DESIGN PLANS FOR PUBLIC S.T.E.P. SYSTEM MUST FOLLOW APPROVED PLANS DEVELOPED BY ADENUS. THESE PLANS ARE A SCHEMATIC REFLECTION OF THOSE PLANS. IN THE EVENT OF A DISCREPANCY- THE ADENUS PLANS WILL GOVERN.

SITE UTILITY NOTES:

1. All materials and workmanship for utility lines and appurtenances shall be in strict compliance with the governing utility company and local codes. Prior to construction contractor shall notify utility company. (see utility contact information)
2. Contractor shall coordinate site electrical, gas, telephone, and cable with the respective utility company for service layout and design information. Any proposed layout of these utilities depicted on these drawings is graphical only and not intended to represent design of these utilities.
3. Prior to commencement of construction, contractor shall obtain all permits and pay any required tap and connection fees.
4. All trenching, pipe laying and backfilling shall be in accordance with federal OSHA regulations.
5. Site contractor shall construct all utility services to within 5' of building.
6. Contractor shall be responsible for coordinating the sequencing of construction for all utility lines to avoid conflicts.
7. Contractor shall coordinate size and location of water, sewer and stormwater connections to the building as depicted on the building mechanical plans and the site utility plan and notify the engineer or owner's representative of any discrepancies.
8. Water services lines ¼" - 3" shall be Type-K copper and 4" or larger shall be ductile iron pipe - Class 52 unless otherwise required by utility company.
9. Fire line installation and thrust blocking location and sizing shall be per N.F.P.A and local fire department requirements.
10. Water meter manufacturer/model number and vault specifications shall be per the water utility company.
11. Backflow devices (RPBP/DDCVA) manufacturer/model number shall be per the water utility company.
12. Contractor shall install hot box enclosure (pre-finished dark green) on all exterior above-ground backflow devices. Domestic and fire backflow devices shall be heated. Contractor shall coordinate providing appropriate electrical service to backflow device.
13. Contractor shall coordinate location of backflow device with the building mechanical drawings.
14. Sanitary sewer service lines shall be SDR 35 PVC unless specified otherwise.
15. Maintain a 10' horizontal and 18" vertical separation between sanitary sewer and water lines.
16. All fire line mains to be installed by licensed fire protection contractor.
17. Installation of pipe material shall be placed with a screen stone envelope and when under pavement entire trench to be backfilled with screen stone to subgrade. Size of stone, envelopes, and trenches to be specified by municipalities for public lines and private lines to adhere to common practices for installation requirements.
18. Contact local fire department before locating and installing fire department connection. Location and type subject to change to meet required codes.
19. Coordinate with local utility and/or fire department on approved meter, fire hydrant, reduced pressure backflow preventor, and double detector check valve assembly and vault manufacturers.
20. Detailed water and sanitary sewer plans and shop drawings to be approved by jurisdictional agencies prior to construction.
21. Any existing water or sewer service that will no longer remain active at the completion of construction must be removed and capped at the main.

Master Utility Plan

Initial Submittal
June 14, 2024
Revisions
July 11, 2024

60 Scale

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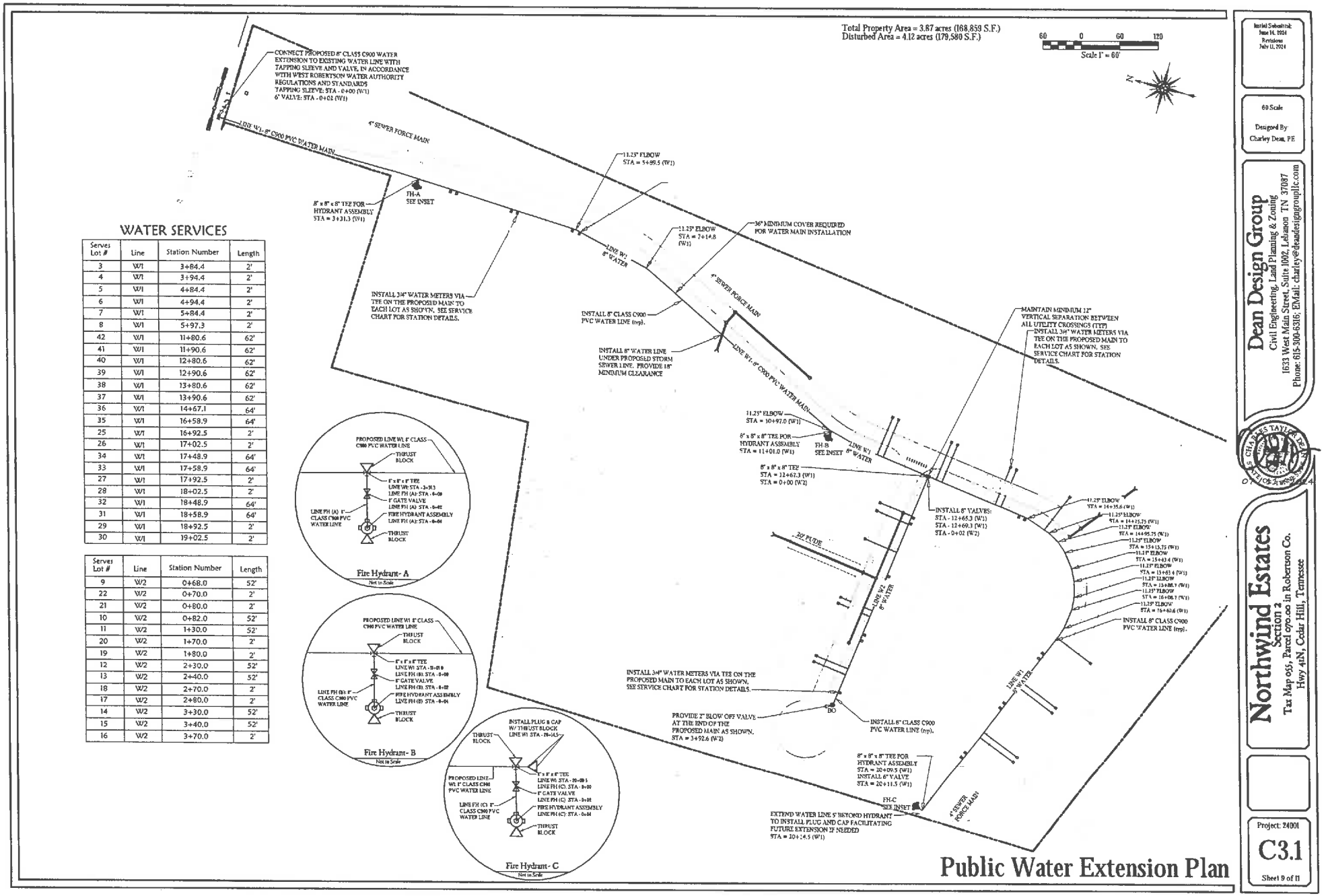
CHARLES TAYLOR DEAN
STATE OF TENNESSEE
07/11/2024

Northwind Estates
Section 2
Tax Map 035, Parcel 070.00 in Robertson Co.
Hwy 41N, Cedar Hill, Tennesee

Project: 24001

C3.0

Sheet 8 of 11



WATER SERVICES

Serves Lot #	Line	Station Number	Length
3	W1	3+84.4	2'
4	W1	3+94.4	2'
5	W1	4+84.4	2'
6	W1	4+94.4	2'
7	W1	5+84.4	2'
8	W1	5+97.3	2'
42	W1	11+80.6	62'
41	W1	11+90.6	62'
40	W1	12+80.6	62'
39	W1	12+90.6	62'
38	W1	13+80.6	62'
37	W1	13+90.6	62'
36	W1	14+67.1	64'
35	W1	16+58.9	64'
25	W1	16+92.5	2'
26	W1	17+02.5	2'
34	W1	17+48.9	64'
33	W1	17+58.9	64'
27	W1	17+92.5	2'
28	W1	18+02.5	2'
32	W1	18+48.9	64'
31	W1	18+58.9	64'
29	W1	18+92.5	2'
30	W1	19+02.5	2'

Serves Lot #	Line	Station Number	Length
9	W2	0+68.0	52'
22	W2	0+70.0	2'
21	W2	0+80.0	2'
10	W2	0+82.0	52'
11	W2	1+30.0	52'
20	W2	1+70.0	2'
19	W2	1+80.0	2'
12	W2	2+30.0	52'
13	W2	2+40.0	52'
18	W2	2+70.0	2'
17	W2	2+80.0	2'
14	W2	3+30.0	52'
15	W2	3+40.0	52'
16	W2	3+70.0	2'

Public Water Extension Plan

Initial Submittal: June 14, 2024
Revisions: July 12, 2024

60 Scale

Designed By: Charley Dean, PE

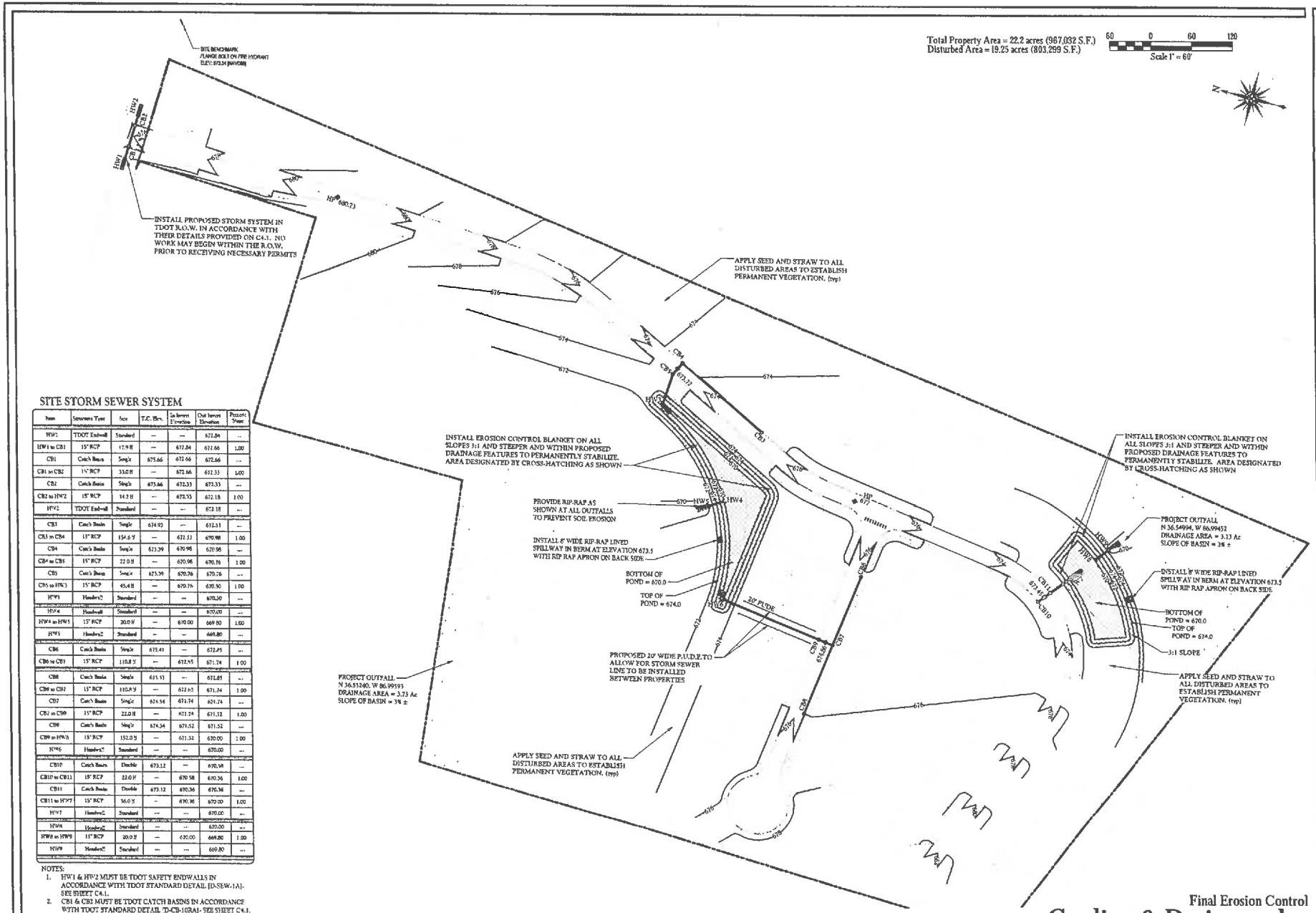
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1633 West Main Street, Suite 1002, Lebanon TN 37087
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Northwind Estates
Section 2
Tax Map 055, Parcel 070.00 in Roberson Co.
Hwy 41N, Cedar Hill, Tennesee

Project: 24001

C3.1

Sheet 9 of 11



SITE STORM SEWER SYSTEM

Item	Structure Type	Size	T.C. Elev.	In Invert Elevation	Out Invert Elevation	Percent Slope
HW1	TDOT Endwall	Standard	--	--	672.04	--
HW1 to CB1	15" RCP	17.9 lf	--	672.04	672.66	3.00
CB1	Catch Basin	Single	675.66	672.66	672.66	--
CB1 to CB2	15" RCP	33.0 lf	--	672.66	672.33	1.00
CB2	Catch Basin	Single	675.66	672.33	672.33	--
CB2 to HW2	15" RCP	14.2 lf	--	672.33	672.18	1.00
HW2	TDOT Endwall	Standard	--	--	672.18	--
CB3	Catch Basin	Single	674.93	--	671.51	--
CB3 to CB4	15" RCP	154.6 lf	--	671.33	670.98	1.00
CB4	Catch Basin	Single	673.39	670.98	670.98	--
CB4 to CB5	15" RCP	22.0 lf	--	670.98	670.76	1.00
CB5	Catch Basin	Single	673.39	670.76	670.76	--
CB5 to HW3	15" RCP	45.4 lf	--	670.76	670.30	1.00
HW3	Headwall	Standard	--	--	670.30	--
HW4	Headwall	Standard	--	--	670.00	--
HW4 to HW5	15" RCP	20.0 lf	--	670.00	669.80	1.00
HW5	Headwall	Standard	--	--	669.80	--
CB6	Catch Basin	Single	675.41	--	672.05	--
CB6 to CB7	15" RCP	110.8 lf	--	672.05	671.74	1.00
CB8	Catch Basin	Single	675.93	--	672.85	--
CB8 to CB7	15" RCP	110.9 lf	--	672.65	671.74	1.00
CB7	Catch Basin	Single	674.54	671.74	671.74	--
CB7 to CB9	15" RCP	22.0 lf	--	671.74	671.52	1.00
CB9	Catch Basin	Single	674.54	671.52	671.52	--
CB9 to HW6	15" RCP	152.0 lf	--	671.52	670.00	1.00
HW6	Headwall	Standard	--	--	670.00	--
CB10	Catch Basin	Double	673.12	--	670.58	--
CB10 to CB11	18" RCP	22.0 lf	--	670.58	670.36	1.00
CB11	Catch Basin	Double	673.12	670.36	670.36	--
CB11 to HW7	15" RCP	36.0 lf	--	670.36	670.00	1.00
HW7	Headwall	Standard	--	--	670.00	--
HW8	Headwall	Standard	--	--	670.00	--
HW8 to HW9	15" RCP	20.0 lf	--	670.00	669.80	1.00
HW9	Headwall	Standard	--	--	669.80	--

NOTES:
1. HW1 & HW2 MUST BE TDOT SAFETY ENDWALLS IN ACCORDANCE WITH TDOT STANDARD DETAIL [D-SEW-1A]. SEE SHEET C4.1.
2. CB1 & CB2 MUST BE TDOT CATCH BASINS IN ACCORDANCE WITH TDOT STANDARD DETAIL [D-CB-1GRA]. SEE SHEET C4.1.
3. CATCH BASIN #10 MUST BE A DOUBLE INLET.

Final Erosion Control

Grading & Drainage plan

Initial Submittal: June 14, 2024
Revisions: July 11, 2024

60 Scale

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CHARLES TAYLOR DEAN
REGISTERED
PROFESSIONAL ENGINEER
STATE OF TENNESSEE

Northwind Estates
Section 2
Tax Map 095, Parcel 070.00 in Robertson Co.
Hwy 41N, Cedar Hill, Tennesse

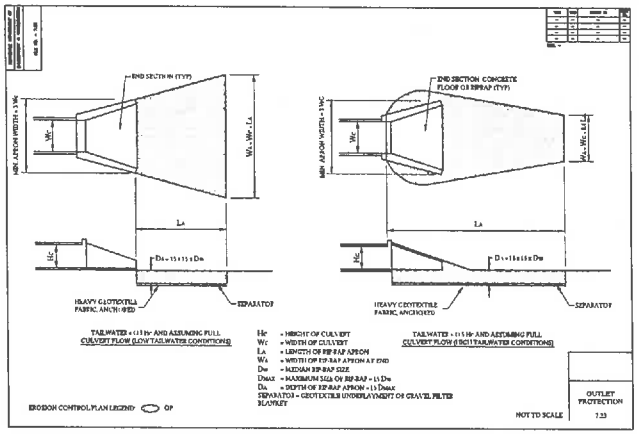
Project: 24001

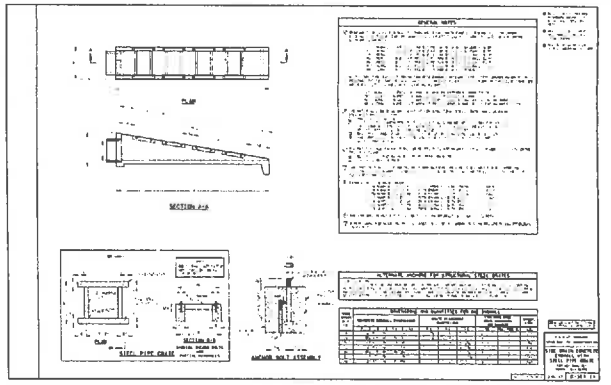
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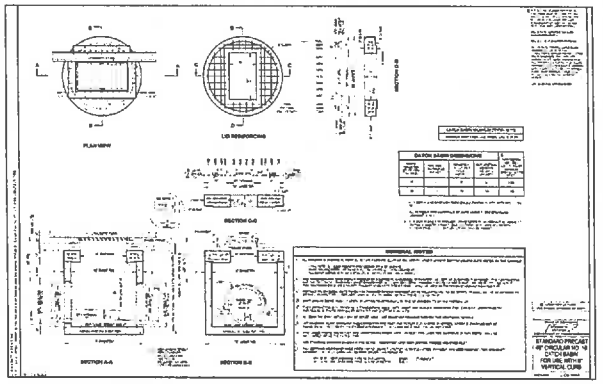
Sheet 10 of 11

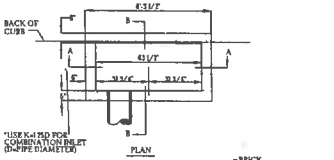
SITE GRADING & DRAINAGE NOTES:

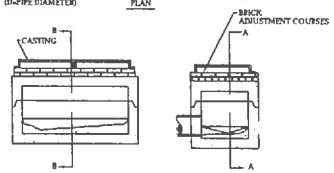
1. Erosion control sediment barriers shall be installed prior beginning site work.
2. No heavy equipment shall cross or be stored outside the limits of construction, within tree protections zones, or under the drip line of existing trees to remain.
3. Topsoil stripped from areas to be graded shall be stockpiled on site in a location approved by the owner's representative. Drainage shall be routed around stockpile locations for the duration of grading operations. Erosion control measures shall be installed to prevent loss of topsoi l material.
4. . All cut and fill shall be performed under the direction/observation of the geotechnical engineer.
5. The suitability of soils for fill material shall be determined by the geotechnical engineer.
6. Unless directed otherwise by geotechnical engineer, all fill areas shall be raised in lifts not exceeding 8" in thickness . The relative compaction of each layer shall not be less than 95% of the standard proctor maximum dry density (ASTM D-698) in all areas of fill within open areas and 98% of same specification for areas under roads, parking, sidewalks, building slabs, and foundations.
7. All grading shall be completed to the grades indicated within these plans. Final grades shall provide proper drainage and prevent standing water.
8. All storm drainage castings to be John Bouchard & Sons Co. or approved equal, unless otherwise noted.
9. All storm drainage pipes to be RCP, Class III, unless otherwise noted.
10. Installation of pipe material shall be placed with a screen stone envelope and when under pavement entire trench to be backfilled with screen stone to subgrade. Size of stone, envelopes, and trenches to be specified by municipalities for public lines and private lines to adhere to common practices for installation requirements.
11. Existing structure castings to remain shall be adjusted to match new grade.



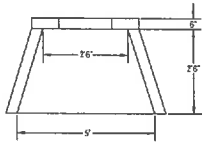






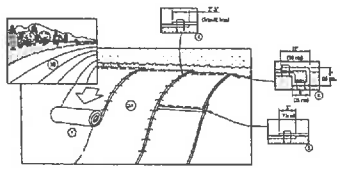


Double Inlet
Not to Scale

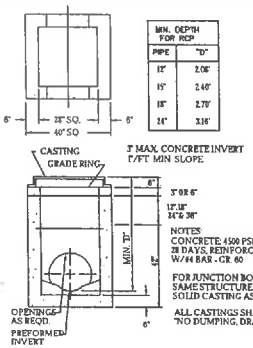


NOTES:
1. CONCRETE SHALL BE 4000 PSI @ 28 DAYS REINFORCED WITH #4 BARS @ 18"O.C., EACH WAY WITH WINGS AND TOE SLAB DOWELED TO HEADWALL WITH #5 BARS
2. 3/4" CHAMFER ON ALL EXPOSED EDGES.

PRECAST CONCRETE HEADWALL
Not to Scale



EROSION CONTROL MATTING DETAIL
Not to Scale



SINGLE INLET / JUNCTION BOX

Drainage Details

Initial Submittal: June 14, 2024
Revisions: July 12, 2024

Not to Scale

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Northwind Estates
Section 2
Tax Map 055, Parcel 070.00 in Robertson Co.
Hwy 41N, Cedar Hill, Tennesee

Project: 24001

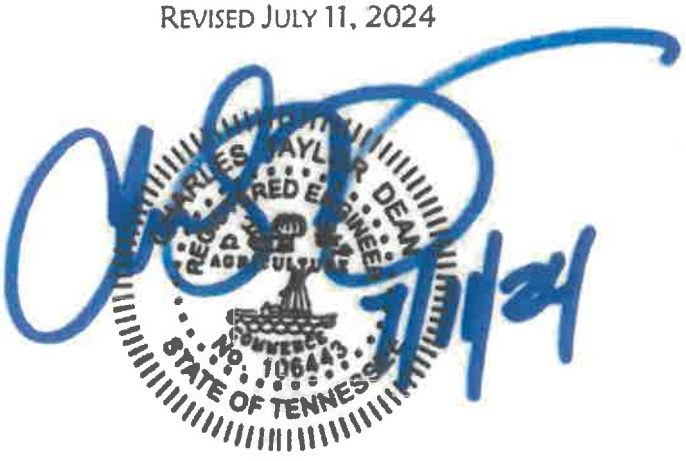
C4.1

Sheet 11 of 11

NORTHWIND ESTATES

SECTION 2

Drainage Calculations
June 14, 2024
REVISED JULY 11, 2024



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Northwind Estates Section 2
Dean Design Group Job: 24001
Drainage Calculations

Project Site Description:
This development will consist of the construction of a 40 lot residential subdivision and the associated roadways. The project site is approximately 22.2 acres and is currently vacant. This property has two drainage basins. One basin drains northwest to a wetland feature along the northwestern property line. The second basin drains southeast to a wetland feature on the southeastern property line. The disturbance for the project is over 1 acre, so we will be obtaining TDEC permitting.

Soil Type Information
The soil information from this site indicates that it consists of: 45.8% Dickson (DsB) which is in soil group C, 32.5% Guthrie (Gu) which is in soil group C, 3.7% Hamblen (Hb) which is in soil group C, 1.4% Newark (Ne) which is in soil group B, 0.9% Pembroke (PeB) which is in soil group B, 2.2% Pickwick (PkC3) which is in soil group B, and 13.7% Taft (Ta) which is in soil group C. Supporting information is included in the Appendix.

Curve Number Calculations:
The pre-development condition of the property is vacant. The post -development condition for the site will be the vegetated areas and the developed areas of building, asphalt and structure coverage. See the calculations below for the interpolated curve numbers we will be using.
Fair Open Space: 95.7% (79) + 4.3% (69) = 78.6
Impervious: Use 98

Pre-Development Northern Basin [Total = 13.54 ac]	13.54 ac Pervious Area @ 78.6 **Curve Number of 78.6**
Post-Development to Northern Pond [Total = 3.73 ac]	0.68 ac Impervious Area @ 98 3.05 ac Pervious Coverage @ 78.6 **Composite Curve Number of 82.14**
Post-Development Bypass Northern Basin [Total = 9.81 ac]	0.30 ac Impervious Area @ 98 9.51 ac Pervious Coverage @ 78.6 **Composite Curve Number of 79.2**
Pre-Development Southern Basin [Total = 8.66 ac]	8.66 ac Pervious Area @ 78.6 **Curve Number of 78.6**
Post-Development to Southern Pond [Total = 3.13 ac]	0.8 ac Impervious Area @ 98 2.33 ac Pervious Coverage @ 78.6 **Composite Curve Number of 83.6**
Post-Development Bypass Southern Basin [Total = 5.53 ac]	5.53 ac Pervious Coverage @ 78.6 **Curve Number of 78.6**

DRAINAGE CALCULATIONS:
Storm water runoff hydrographs for the project have been created using Hydroflow Hydrographs 2018, and the summary printout for the 2, 5, 10, 25, 50 & 100-year storms are included in the Appendix. Hydrographs were calculated for both the pre-development and post-development conditions. I have included detailed printouts of the pre and post-development 25-year events to display the variables I used. Also included are Hydrographs for the onsite areas draining to the detention pond, and an additional Hydrograph for the on-site that will be by-passing the pond.

Pipe Capacities:

Pipe HW1 to CB1 is part of the proposed culvert allowing drainage to flow east along Hwy 41. an 18" RCP @ 1.0% minimum slope will be adequate to carry the calculated runoff for the calculated storm event.

Pipe CB1 to CB2 is part of the proposed culvert allowing drainage to flow east along Hwy 41. an 18" RCP @ 1.0% minimum slope will be adequate to carry the calculated runoff for the calculated storm event.

Pipe CB2 to HW2 is part of the proposed culvert allowing drainage to flow east along Hwy 41. an 18" RCP @ 1.0% minimum slope will be adequate to carry the calculated runoff for the calculated storm event.

Pipe CB3 to CB4 will carry the flow from CB3 (2.34 cfs) = 2.34 cfs. Using Figure 6-11 in the Appendix, a 15" RCP at 1.0% minimum slope will be adequate to carry the calculated runoff for the calculated storm event.

Pipe CB4 to CB5 will carry the flow from CB3 (2.34 cfs) & CB4 (5.06 cfs) = 7.4 cfs. Using Figure 6-11 in the Appendix, an 18" RCP at 1.0% minimum slope will be adequate to carry the calculated runoff for the calculated storm event.

Pipe CB5 to HW3 will carry the flow from CB3 (2.34 cfs), CB4 (5.06 cfs) & CB5 (3.52 cfs) = 10.92 cfs. Using Figure 6-11 in the Appendix, an 18" RCP at 1.0% minimum slope will be adequate to carry the calculated runoff for the calculated storm event.

Pipe CB6 to CB7 will carry the flow from CB6 (0.58 cfs) = 0.58 cfs. Using Figure 6-11 in the Appendix, a 15" RCP at 1.0% minimum slope will be adequate to carry the calculated runoff for the calculated storm event.

Pipe CB8 to CB7 will carry the flow from CB8 (3.48 cfs) = 3.48 cfs. Using Figure 6-11 in the Appendix, a 15" RCP at 1.0% minimum slope will be adequate to carry the calculated runoff for the calculated storm event.

Pipe CB7 to CB9 will carry the flow from CB6 (0.58 cfs), CB7 (2.21 cfs) & CB8 (3.48 cfs) = 6.27 cfs. Using Figure 6-11 in the Appendix, a 15" RCP at 1.0% minimum slope will be adequate to carry the calculated runoff for the calculated storm event.

Pipe CB9 to HW6 will carry the flow from CB6 (0.58 cfs), CB7 (2.21 cfs), CB8 (3.48 cfs) & CB9 (2.17 cfs) = 8.44 cfs. Using Figure 6-11 in the Appendix, an 18" RCP at 1.0% minimum slope will be adequate to carry the calculated runoff for the calculated storm event.

Pipe CB10 to CB11 will carry the flow from CB10 (7.64 cfs) = 7.64 cfs. Using Figure 6-11 in the Appendix, an 18" RCP at 1.0% minimum slope will be adequate to carry the calculated runoff for the calculated storm event.

Pipe CB11 to HW7 will carry the flow from CB10 (7.64 cfs) & CB11 (4.08 cfs) = 11.72 cfs. Using Figure 6-11 in the Appendix, an 18" RCP at 1.0% minimum slope will be adequate to carry the calculated runoff for the calculated storm event.

On-Site Detention:
A detention facility will be constructed in both the Northern and Southern portions of the site to limit peak flows to a value that when combined with the peak flow from the area by-passing the pond- will show a reduced overall peak flow value from the basin. The ponds have been modeled and routed using Hydroflow Hydrographs 2024, and the summary printouts for the 2, 5, 10, 25, 50 & 100-year storms are included in the Appendix.

Drainage Summary Table for each basin has also been included in the Appendix indicating that with the inclusion of the pond, the improvements will result in an overall reduction in peak flow.

Gutter Spread:
The Appendix includes Figure 4-1, a Nomograph for Gutter Flow. The inlets all lie on roadways with a 3% cross slope and approximately 1% longitudinal slope for the proposed roadway, and we'll use the allowable gutter spread of 8 feet. The nomograph identifies a maximum flow of 2.8 cfs will be contained within the allowable 8 foot gutter spread. As demonstrated in the Drainage Basin Worksheet, all 25-year design storm flows are less than 2.8 cfs except for CB4, CB5, CB7, CB10 & CB11. All of these inlets are in the sump condition and are receiving flow from two directions, bringing the flow under 2.7 for the single given direction- except for CB10. CB10 has road slopes of 1.5% from the north and 2.15% from the west. The nomograph demonstrates that at 1.5% the 8' spread can accommodate 3.8 cfs and at 2.0% the 8' spread can accommodate 4.3 cfs. The combined capacity of 8.1 cfs at the 8' spread exceeds the calculated 7.65 cfs.

Summary:
The construction of the detention pond will function to reduce the peak flow from the site as indicated in the calculations and attachments in the appendix.



Appendix

NORTHWIND ESTATES SECTION 2

Pre and Post-Development
Drainage Area Maps

USGS Soil Information

SCS Curve Number Chart

Figure 2-1: IDF Curve for Nashville

Drainage Map for Basins

Drainage Basin Worksheet

Figure 4-8: Inlet Capacity Chart

Figure 4-1: Gutter Flow Nomograph

Figure 6-11. Nomograph for Manning's Flow

Pre/Post Development Hydrograph Summaries for
2, 5, 10, 25, 50 & 100 year storm events in Northern Basin

Reservoir Report for
Proposed Northern Detention Area

Pond Routing Summaries for Northern Pond

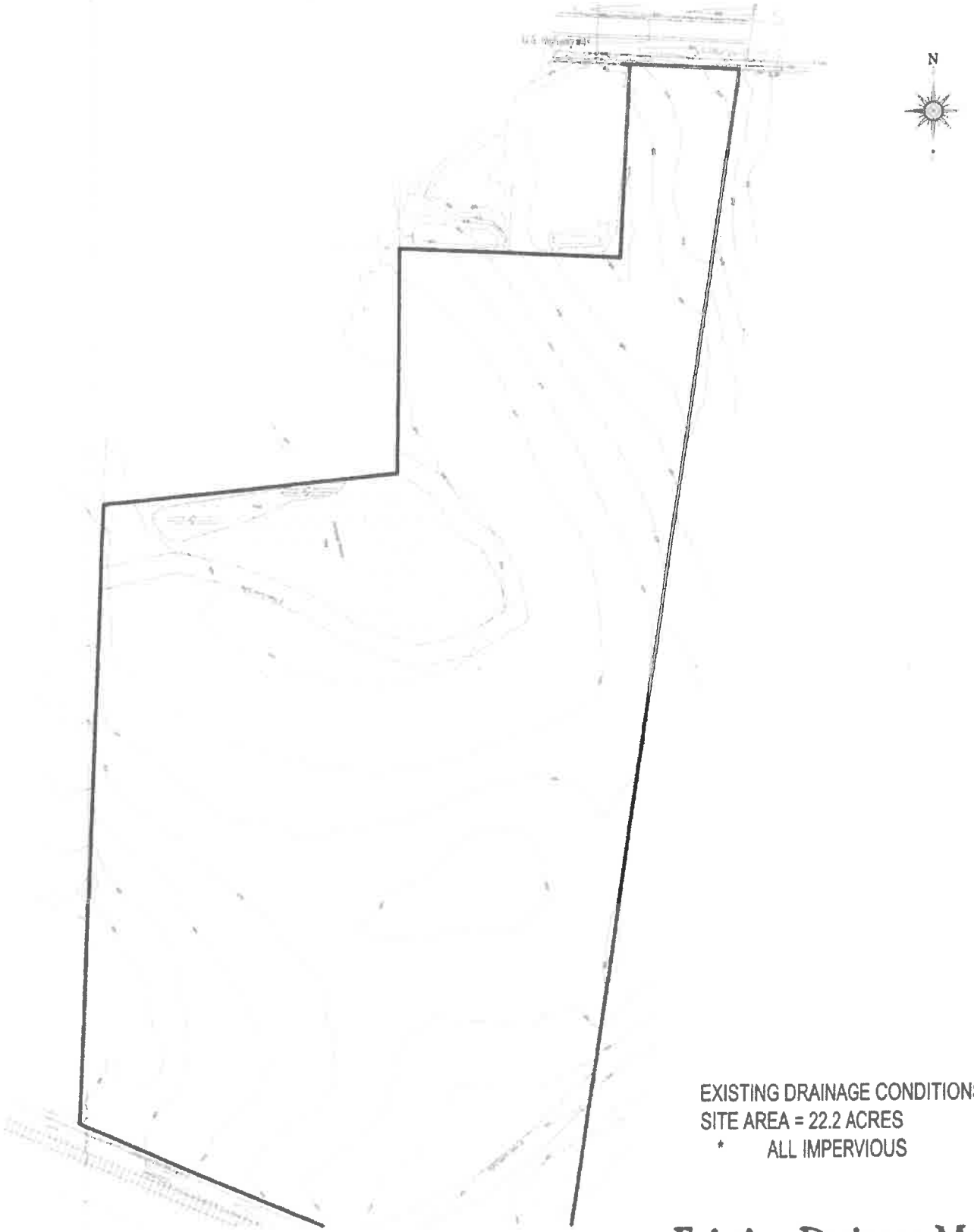
Peak Flow Summary Table for Northern Basin

Pre/Post Development Hydrograph Summaries for
2, 5, 10, 25, 50 & 100 year storm events in Southern Basin

Reservoir Report for
Proposed Southern Detention Area

Pond Routing Summaries for Southern Pond

Peak Flow Summary Table for Southern Basin



EXISTING DRAINAGE CONDITIONS:
SITE AREA = 22.2 ACRES
* ALL IMPERVIOUS

Existing Drainage Map

Scale:
1" = 200'

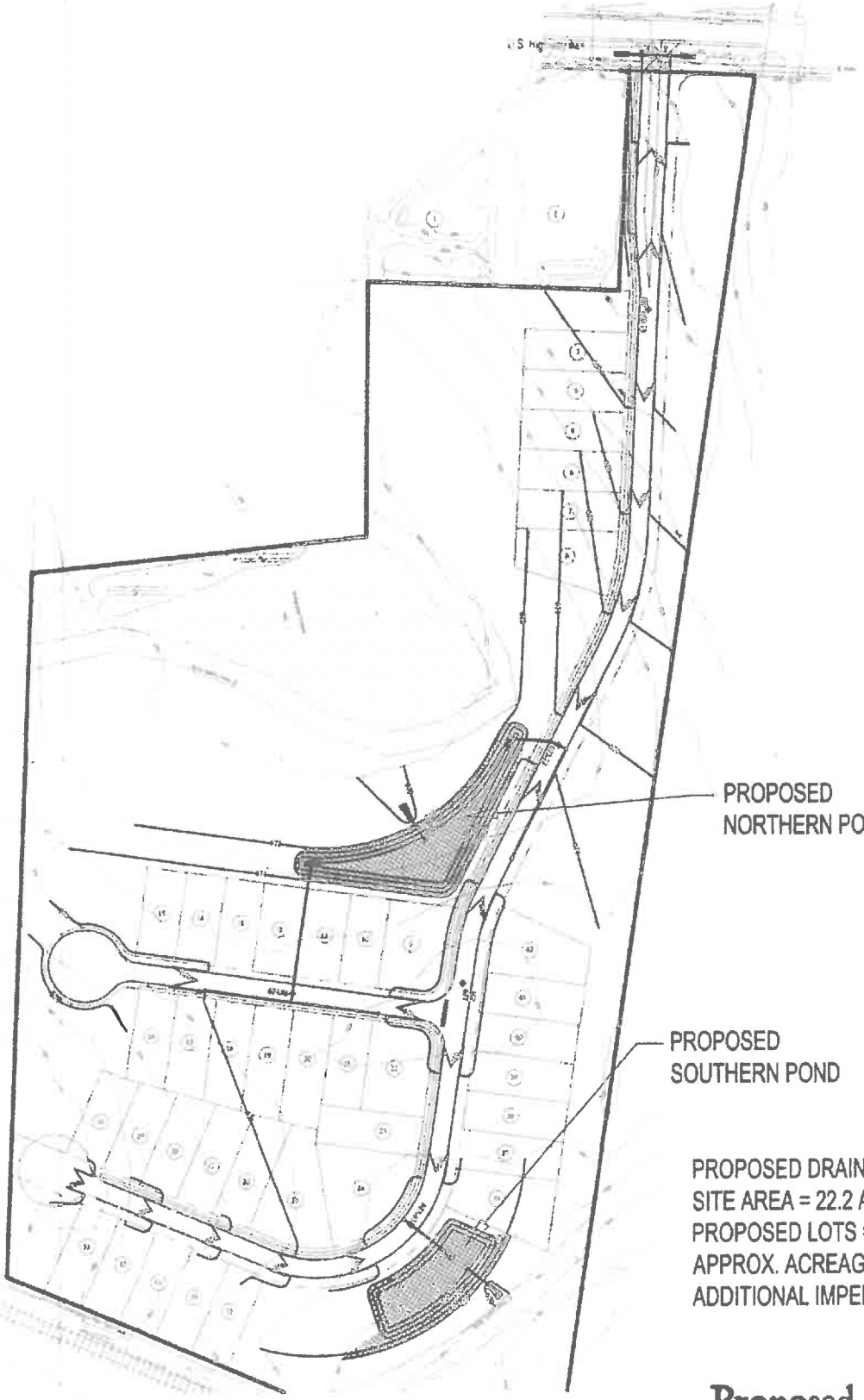
Created:
June 2024

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Northwind Estates, Sect 2
Tax Map 055, Parcel 070.00 in Robertson Co.
Hwy 41N, Cedar Hill, Tennessee

Project: 24001

E



PROPOSED DRAINAGE CONDITIONS:
SITE AREA = 22.2 ACRES
PROPOSED LOTS = 40
APPROX. ACREAGE PER LOT = 1.8 ac
ADDITIONAL IMPERVIOUS = 2.0 ACRES

Proposed Drainage Map

Scale:
1" = 80'

Created:
June 2024

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Northwind Estates, Sect 2
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Hwy 41N, Cedar Hill, Tennessee

Project: 24001

P



Map Scale: 1:3,190 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 45 90 180 270

Feet: 0 150 300 600 900

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 Rating Polygons
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

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: Robertson County, Tennessee
Survey Area Data: Version 21, Sep 12, 2023

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

Date(s) aerial images were photographed: Mar 21, 2021—Mar 30, 2021

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.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
DsB	Dickson silt loam, 2 to 5 percent slopes	C/D	10.1	45.8%
Gu	Guthrie silt loam, 0 to 2 percent slopes, frequently ponded	C/D	7.1	32.5%
Hb	Hamblen silt loam	C	0.8	3.7%
Ne	Newark silt loam	B/D	0.3	1.4%
PeB	Pembroke silt loam, 2 to 6 percent slopes	B	0.2	0.9%
PkC3	Pickwick silty clay loam, 5 to 12 percent slopes, severely eroded	B	0.5	2.2%
Ta	Taft silt loam, 0 to 2 percent slopes	C/D	3.0	13.7%
Totals for Area of Interest			**22.0**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation. are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential. soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D. B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

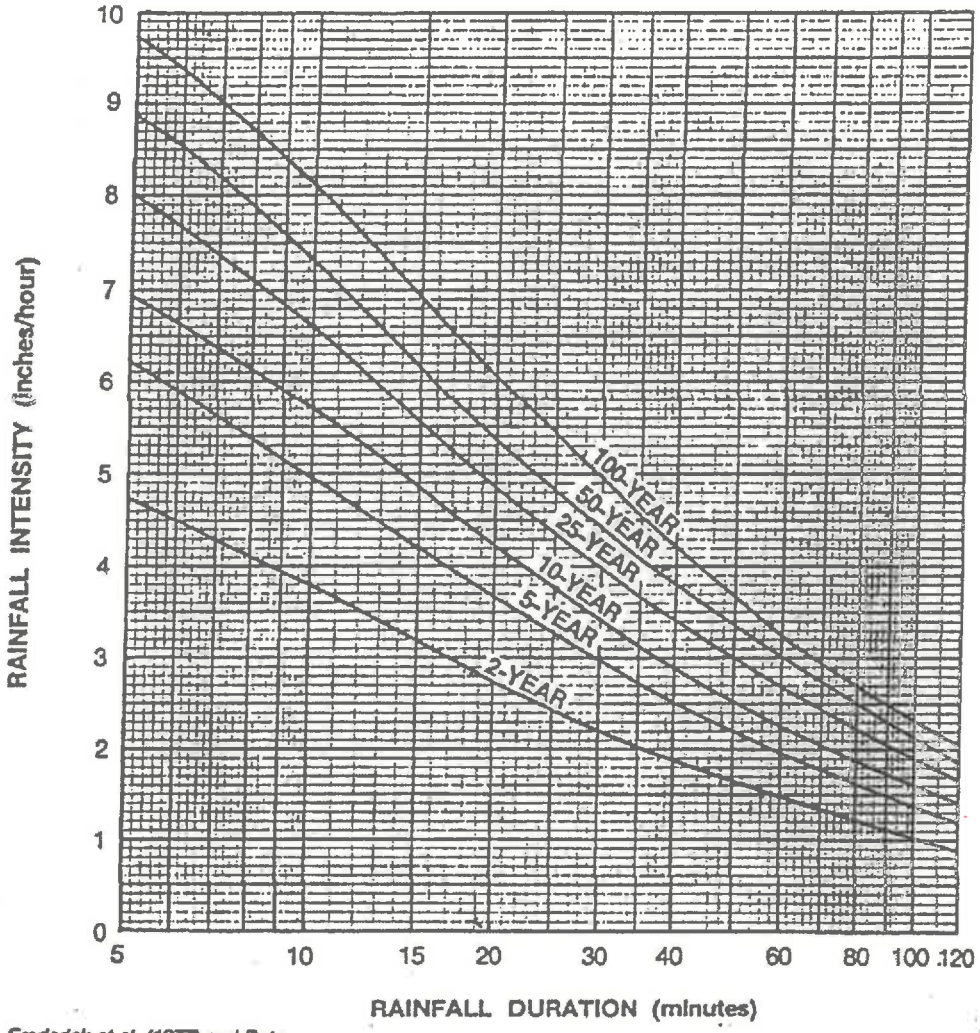
Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Table 20.4 Runoff Curve Numbers of Urban Areas (ARC II)

cover description		curve numbers for hydrologic soil			
cover type and hydrologic condition	average percent impervious area	group A	group B	group C	group D
fully developed urban areas (vegetation established)					
open space (lawns, parks, golf courses, cemeteries, etc.)					
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 sewers (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
western desert urban areas					
natural desert landscaping (pervious areas only)		63	77	85	88
artificial desert landscaping (impervious weed barrier, desert shrub with 1 to 2 in sand or gravel mulch and basin borders)		96	96	96	96
urban districts					
commercial and business	85	89	92	94	95
industrial	72	81	88	91	93
residential districts by average lot size					
⅛ acre or less (townhouses)	65	77	85	90	92
¼ acre	38	61	75	83	87
⅓ acre	30	57	72	81	86
½ acre	25	54	70	80	85
1 acre	20	51	68	79	84
2 acres	12	46	65	77	82
developing urban areas					
newly graded areas (pervious areas only, no vegetation)		77	86	91	94

Reprinted from *Urban Hydrology for Small Watersheds*, Technical Release TR 55, United States Department of Agriculture, Soil Conservation Service, Table 2-2a, 1986.



Reference: Frederick et al. (1977) and Data from Nashville Airport, 1949 to 1985, Climatic Data Center, NOAA.

RAINFALL VOLUME (inches)										
	5 Min	10 Min	15 Min	30 Min	1 Hr	2 Hr	3 Hr	6 Hr	12 Hr	24 Hr
2-Year	0.40	0.64	0.80	1.11	1.51	1.75	1.96	2.31	2.73	3.39
5-Year	0.52	0.83	1.05	1.50	1.97	2.39	2.71	3.30	3.83	4.50
10-Year	0.58	0.95	1.21	1.73	2.27	2.82	3.21	3.96	4.57	5.23
25-Year	0.67	1.10	1.38	2.00	2.66	3.36	3.84	4.79	5.49	6.16
50-Year	0.74	1.22	1.52	2.23	2.94	3.76	4.30	5.41	6.18	6.85
100-Year	0.81	1.35	1.72	2.50	3.21	4.16	4.77	6.02	6.86	7.53

RAINFALL INTENSITY (inches/hour)										
	5 Min	10 Min	15 Min	30 Min	1 Hr	2 Hr	3 Hr	6 Hr	12 Hr	24 Hr
2-Year	4.75	3.81	3.20	2.22	1.51	0.88	0.65	0.39	0.23	0.14
5-Year	6.25	4.99	4.20	3.00	1.97	1.20	0.90	0.55	0.32	0.19
10-Year	6.97	5.71	4.84	3.46	2.27	1.41	1.07	0.66	0.38	0.22
25-Year	8.00	6.60	5.50	4.00	2.66	1.68	1.28	0.80	0.46	0.26
50-Year	8.90	7.35	6.08	4.45	2.94	1.88	1.43	0.90	0.52	0.29
100-Year	9.72	8.06	6.88	4.99	3.21	2.08	1.59	1.00	0.57	0.31

FIGURE 2-1
Intensity-Duration-Frequency Curves and Depth-Duration Data for Metro Nashville and Davidson County, Tennessee



Proposed Drainage Map

Scale:
1" = 80'

Created:
June 2024

Dean Design Group
Civil Engineering, Land Planning & Zoning
Phone: 615-300-6316
EMail: charley@deandesigngroupllc.com

Northwind Estates, Sect 2

Tax Map 055, Parcel 070.00 in Robertson Co.
Hwy 41N, Cedar Hill, Tennessee

Project: 24001

DB

Northwind Estates Section 2

Drainage Basins

Charley Dean, PE
Dean Design Group, LLC
Phone: 300-6316

Inlet ID	Total Area (sf)	Total Area (acres)	Pervious Area (sf)	Pervious Area (acres)	Impervious Area (sf)	Impervious Area (acres)	Composite C Value	25-Year Intensity (in/hr)	25-year Peak Flow (cfs)
CB1	10,630	0.24	2,600	0.06	8,030	0.18	0.80	8.00	1.57
CB2	8,792	0.20	3,500	0.08	5,292	0.12	0.71	8.00	1.15
CB3	32,822	0.75	30,600	0.70	2,222	0.05	0.39	8.00	2.35
CB4	64,117	1.47	55,500	1.27	8,617	0.20	0.43	8.00	5.07
CB5	22,382	0.51	3,500	0.08	18,882	0.43	0.86	8.00	3.52
CB6	6,318	0.15	4,770	0.11	1,548	0.04	0.50	8.00	0.58
CB7	31,433	0.72	22,073	0.51	9,360	0.21	0.53	8.00	3.05
CB8	39,116	0.90	38,006	0.87	1,110	0.03	0.37	8.00	2.64
CB9	19,785	0.45	11,603	0.27	8,182	0.19	0.60	8.00	2.17
CB10	87,857	2.02	69,700	1.60	18,157	0.42	0.47	8.00	7.65
CB11	35,050	0.80	18,500	0.42	16,550	0.38	0.63	8.00	4.08
TOTALS:		8.23		5.98		2.25			33.82

* A SINGLE INLET WILL HAVE THE NECESSARY CPACITY FOR CATCH BASINS 1 THROUGH 9 AND 11.
* A DOUBLE INLET WILL BE REQUIRED FOR CATCH BASIN 10.

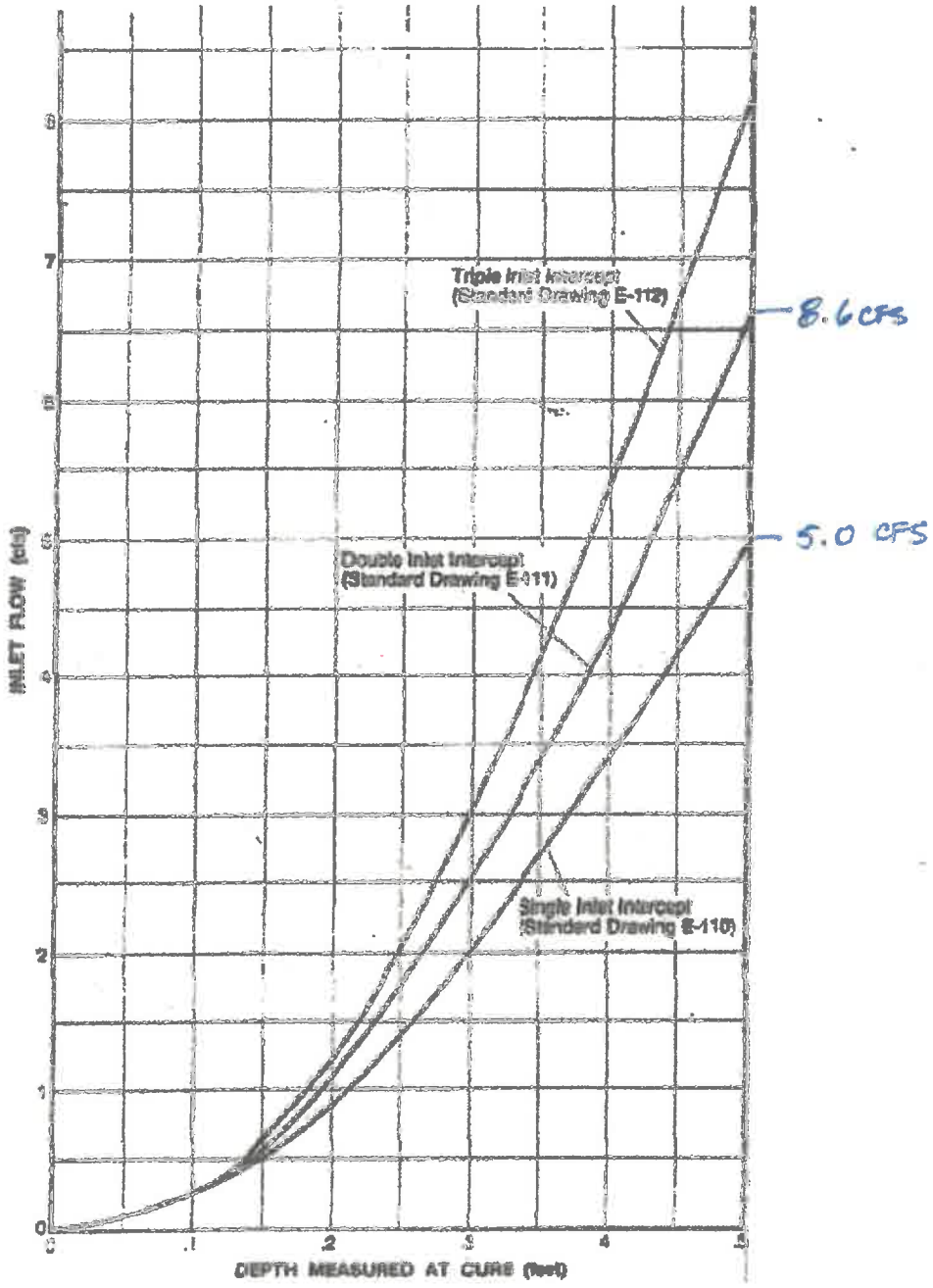
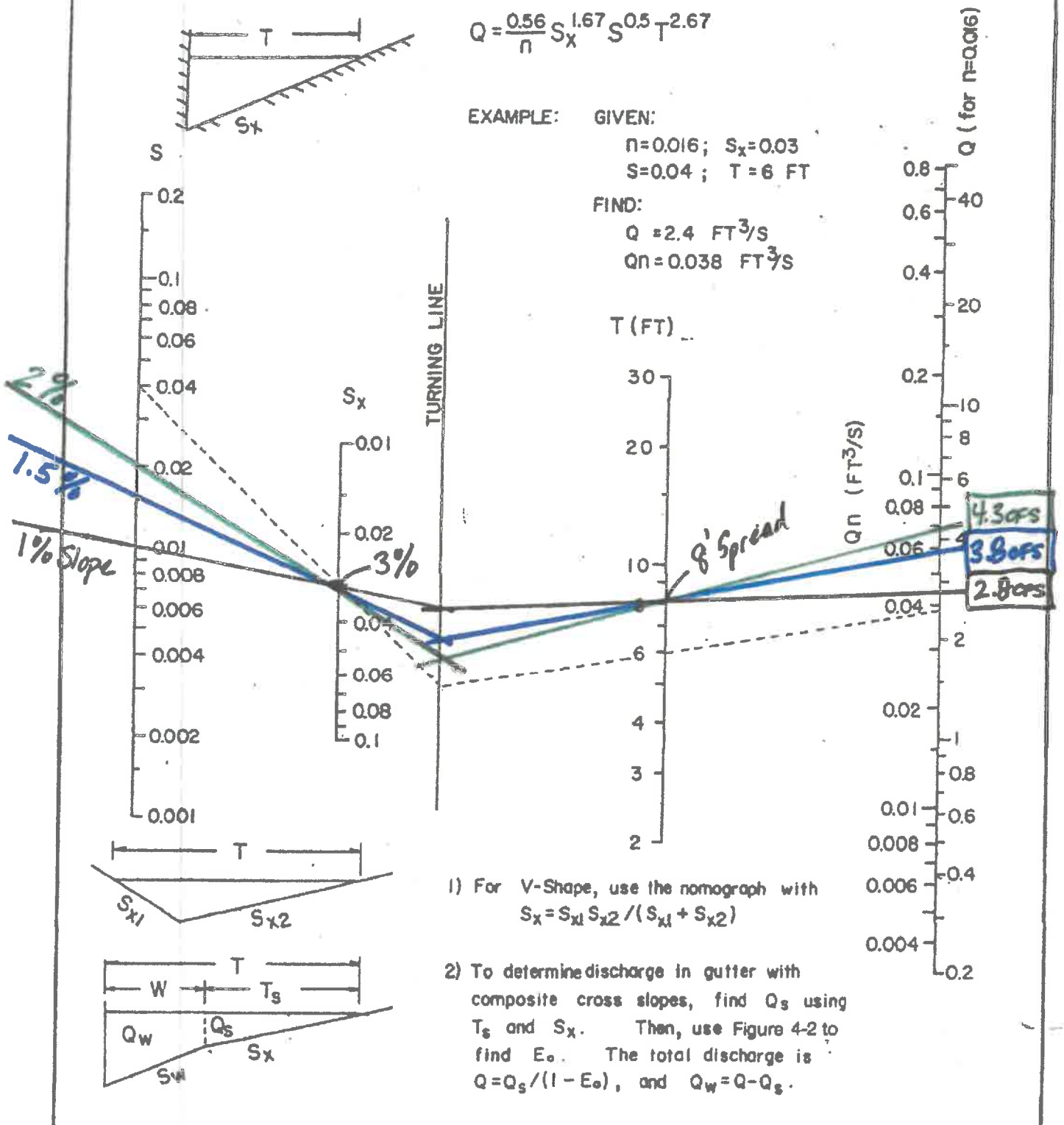


Figure 4-8
Hydraulic Capacity of Nashville Standard Grate Inlets
Under Sump Conditions



1) For V-Shape, use the nomograph with $S_x = S_{x1} S_{x2} / (S_{x1} + S_{x2})$

2) To determine discharge in gutter with composite cross slopes, find Q_s using T_s and S_x. Then, use Figure 4-2 to find E_o. The total discharge is $Q = Q_s / (1 - E_o)$, and $Q_w = Q - Q_s$.

Reference: USDOT, FHWA, HEC-12 (1984).

FIGURE 4-1
Nomograph for Flow in Triangular Gutter Sections

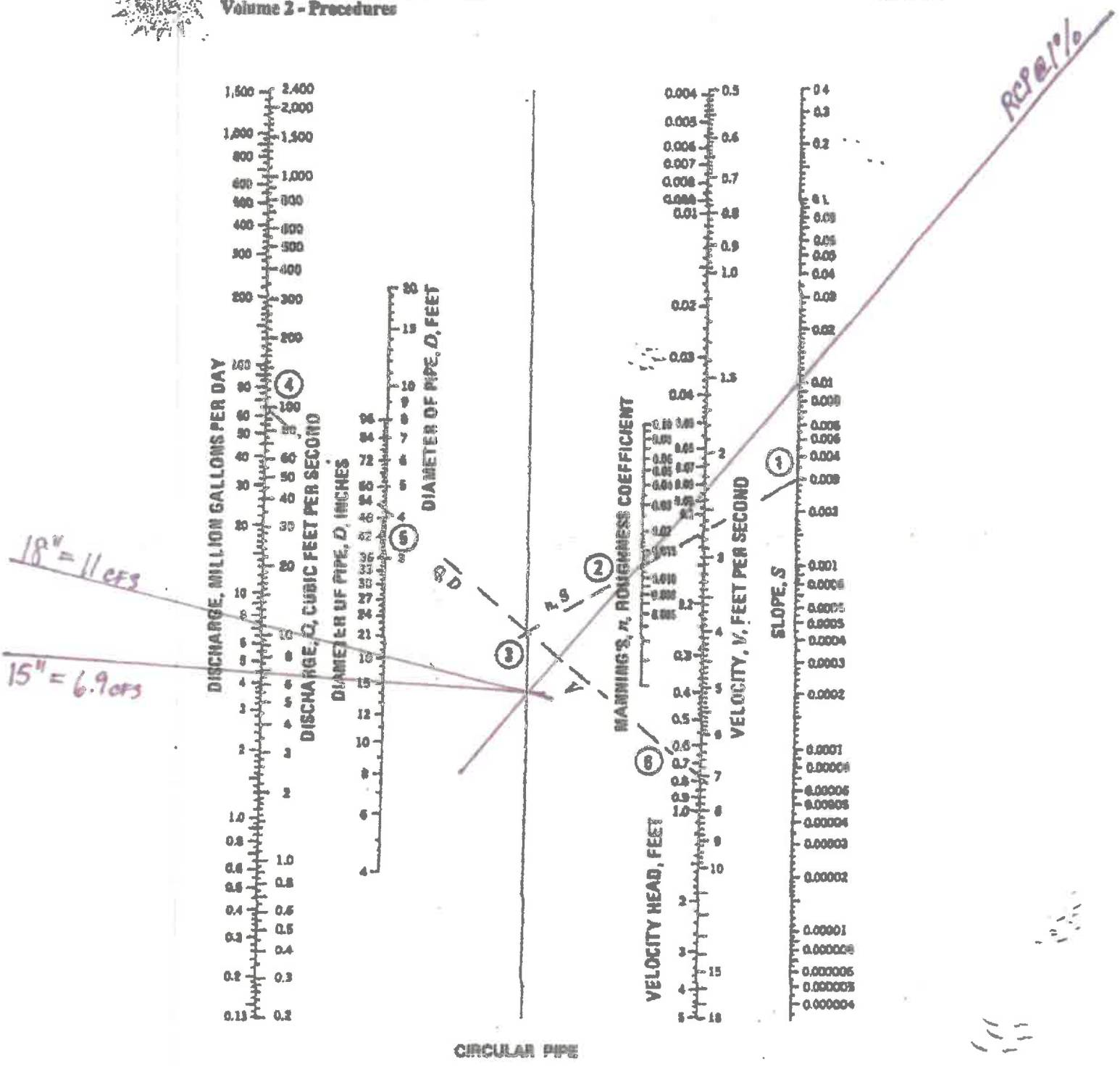


Figure 6-11
Circular Pipe Nomograph for Solving Manning's Equation

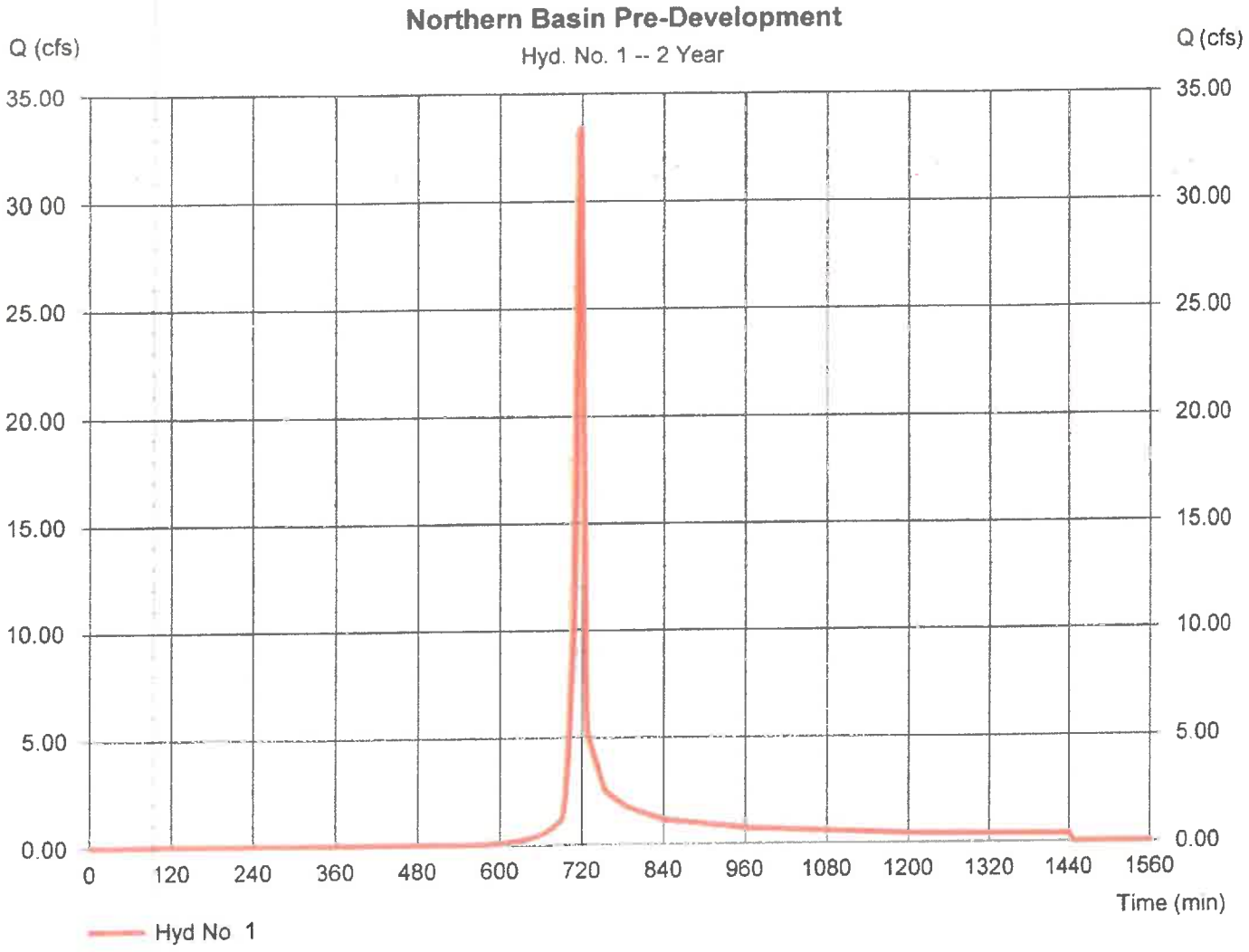
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 — Thursday, 06 / 13 / 2024

Hyd. No. 1

Northern Basin Pre-Development

Hydrograph type	= SCS Runoff	Peak discharge	= 33.39 cfs
Storm frequency	= 2 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 67,003 cuft
Drainage area	= 13.540 ac	Curve number	= 78.6
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.39 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



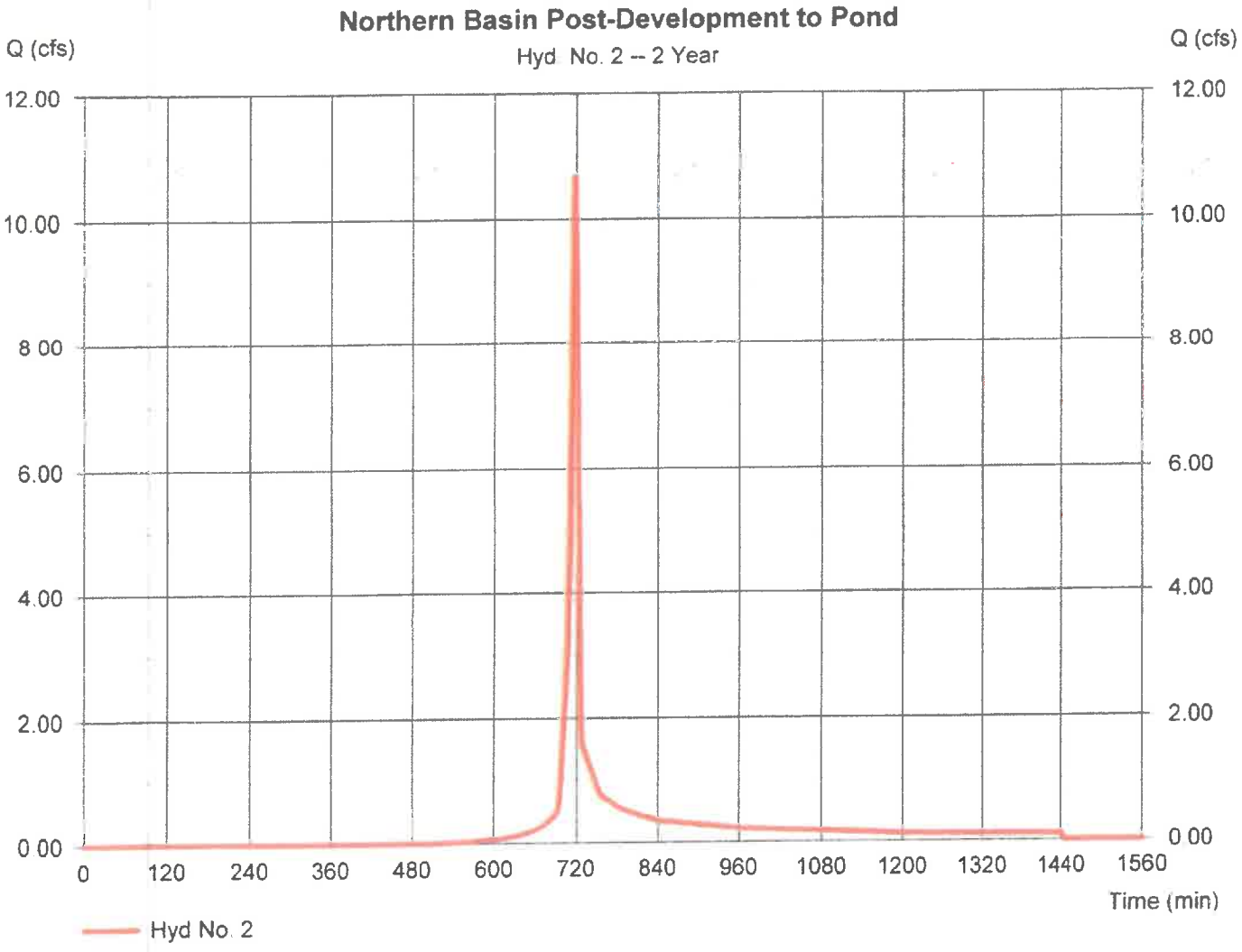
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 — Thursday, 06 / 13 / 2024

Hyd. No. 2

Northern Basin Post-Development to Pond

Hydrograph type	= SCS Runoff	Peak discharge	= 10.68 cfs
Storm frequency	= 2 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 21,573 cuft
Drainage area	= 3.730 ac	Curve number	= 82.1
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.39 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



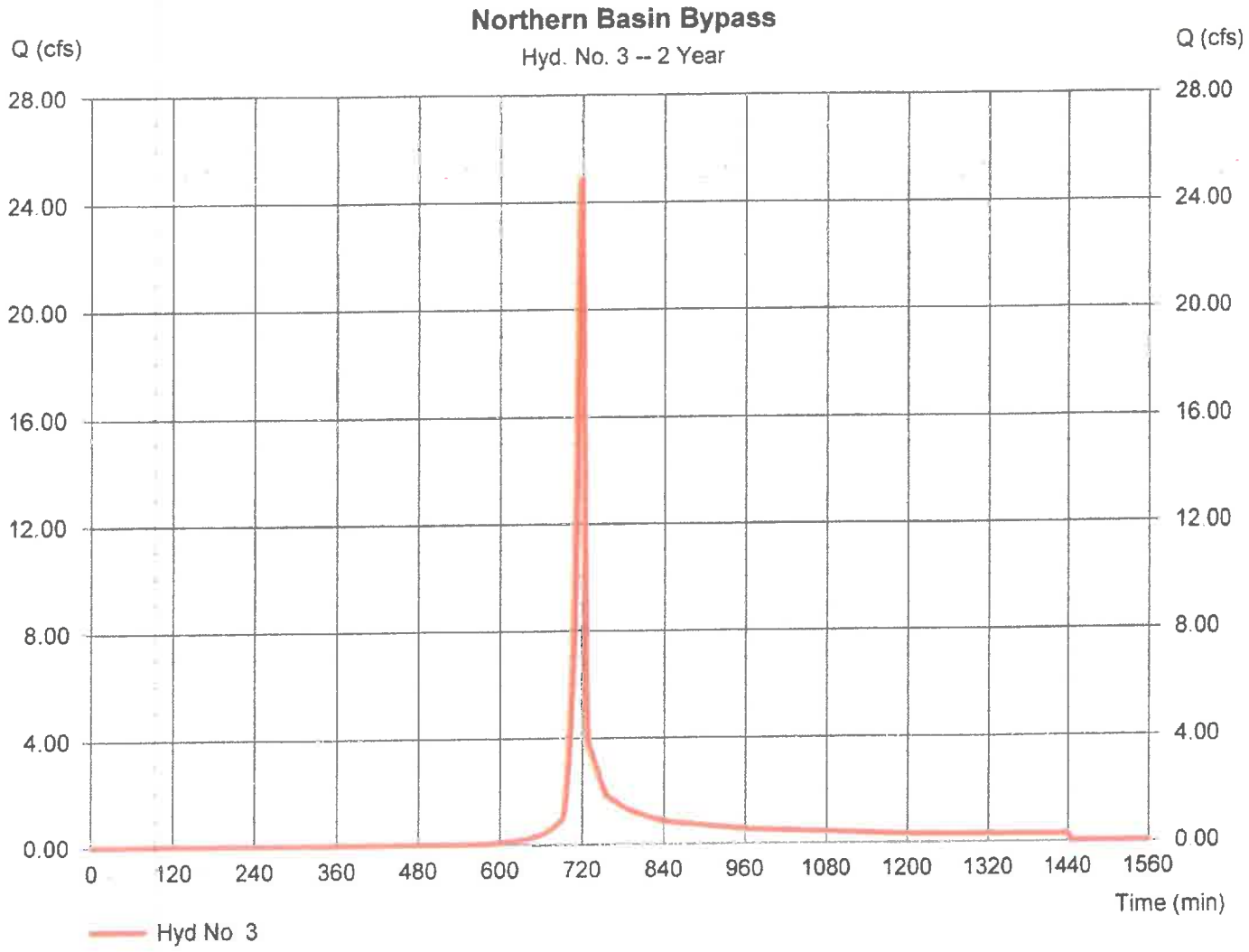
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc v2024 — Thursday, 06 / 13 / 2024

Hyd. No. 3

Northern Basin Bypass

Hydrograph type	= SCS Runoff	Peak discharge	= 24.83 cfs
Storm frequency	= 2 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 49,896 cuft
Drainage area	= 9.810 ac	Curve number	= 79.2
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.39 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



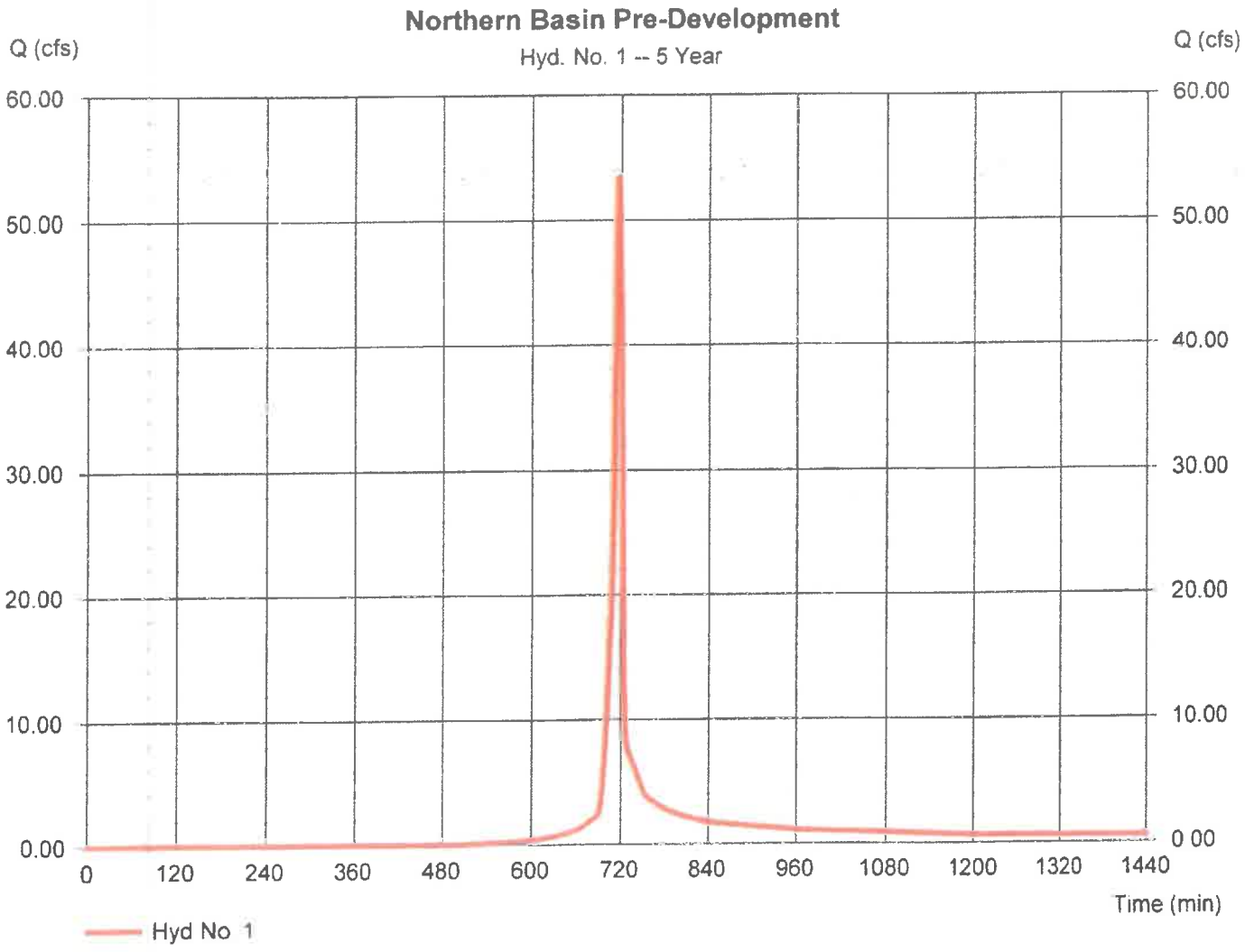
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Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 — Thursday, 06 / 13 / 2024

Hyd. No. 1

Northern Basin Pre-Development

Hydrograph type	= SCS Runoff	Peak discharge	= 53.39 cfs
Storm frequency	= 5 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 107,954 cuft
Drainage area	= 13.540 ac	Curve number	= 78.6
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 4.50 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



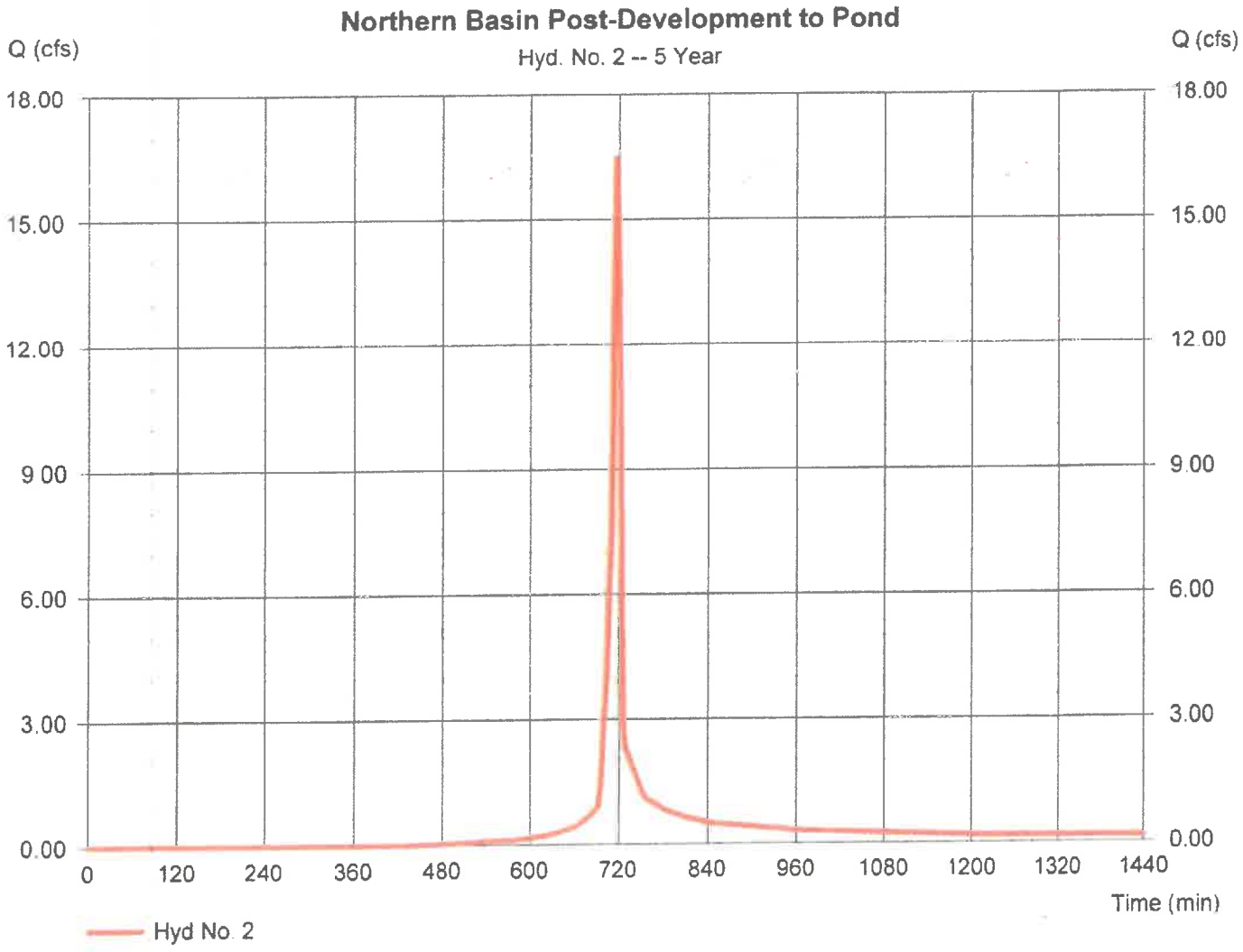
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 — Thursday, 06 / 13 / 2024

Hyd. No. 2

Northern Basin Post-Development to Pond

Hydrograph type	= SCS Runoff	Peak discharge	= 16.48 cfs
Storm frequency	= 5 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 33,574 cuft
Drainage area	= 3.730 ac	Curve number	= 82.1
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 4.50 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



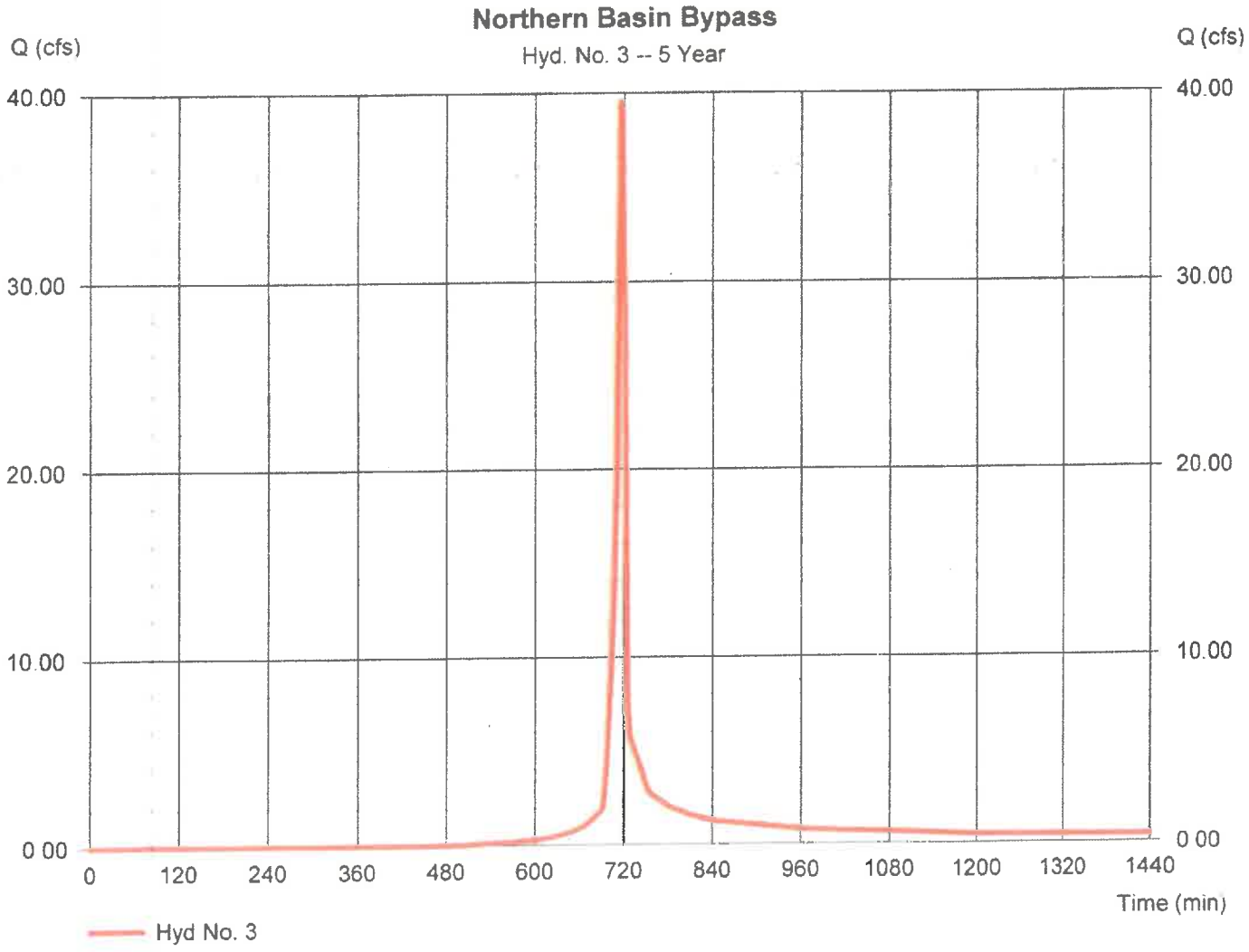
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 — Thursday, 06 / 13 / 2024

Hyd. No. 3

Northern Basin Bypass

Hydrograph type	= SCS Runoff	Peak discharge	= 39.49 cfs
Storm frequency	= 5 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 79,902 cuft
Drainage area	= 9.810 ac	Curve number	= 79.2
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 4.50 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



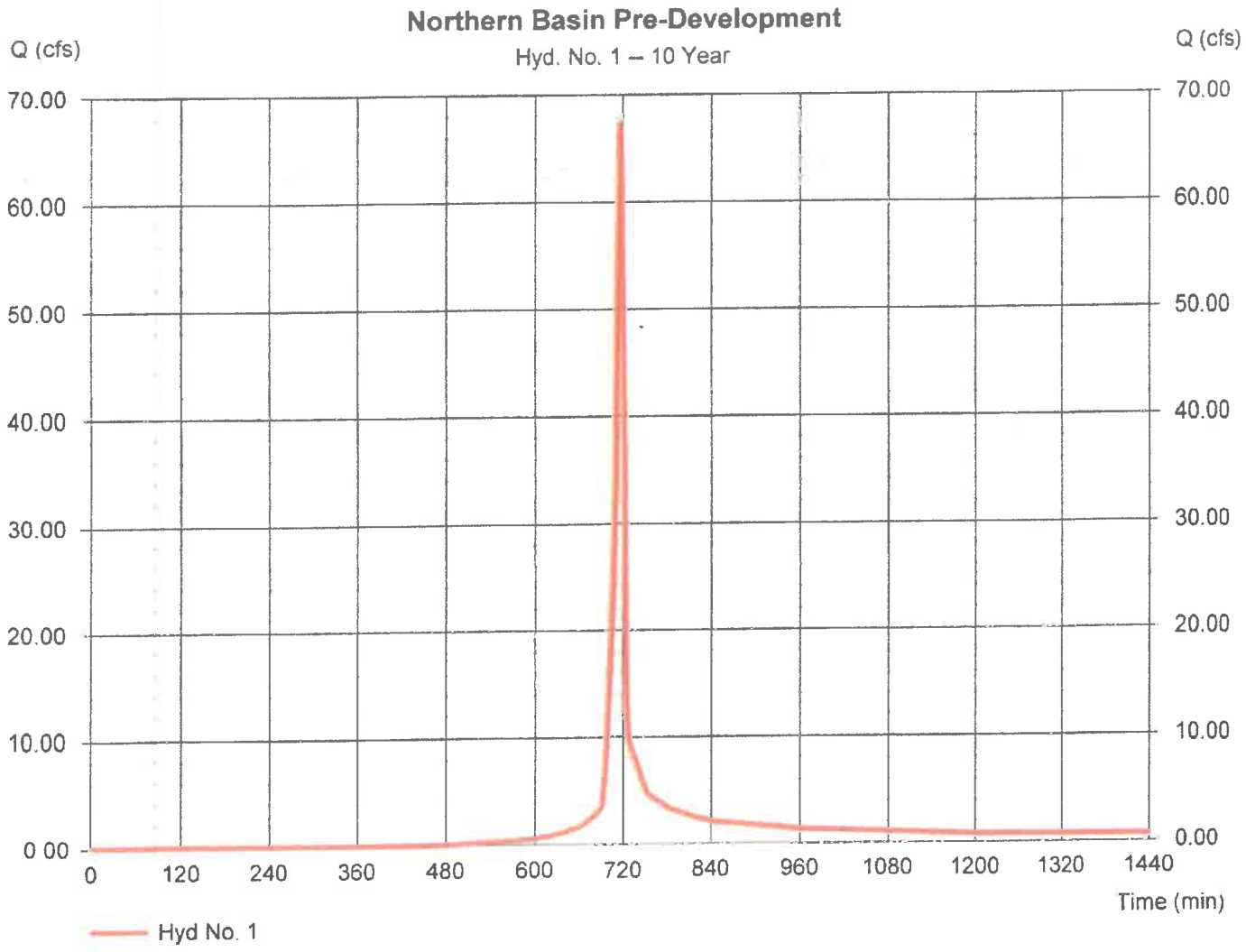
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 — Thursday, 06 / 13 / 2024

Hyd. No. 1

Northern Basin Pre-Development

Hydrograph type	= SCS Runoff	Peak discharge	= 67.24 cfs
Storm frequency	= 10 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 136,551 cuft
Drainage area	= 13.540 ac	Curve number	= 78.6
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.23 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



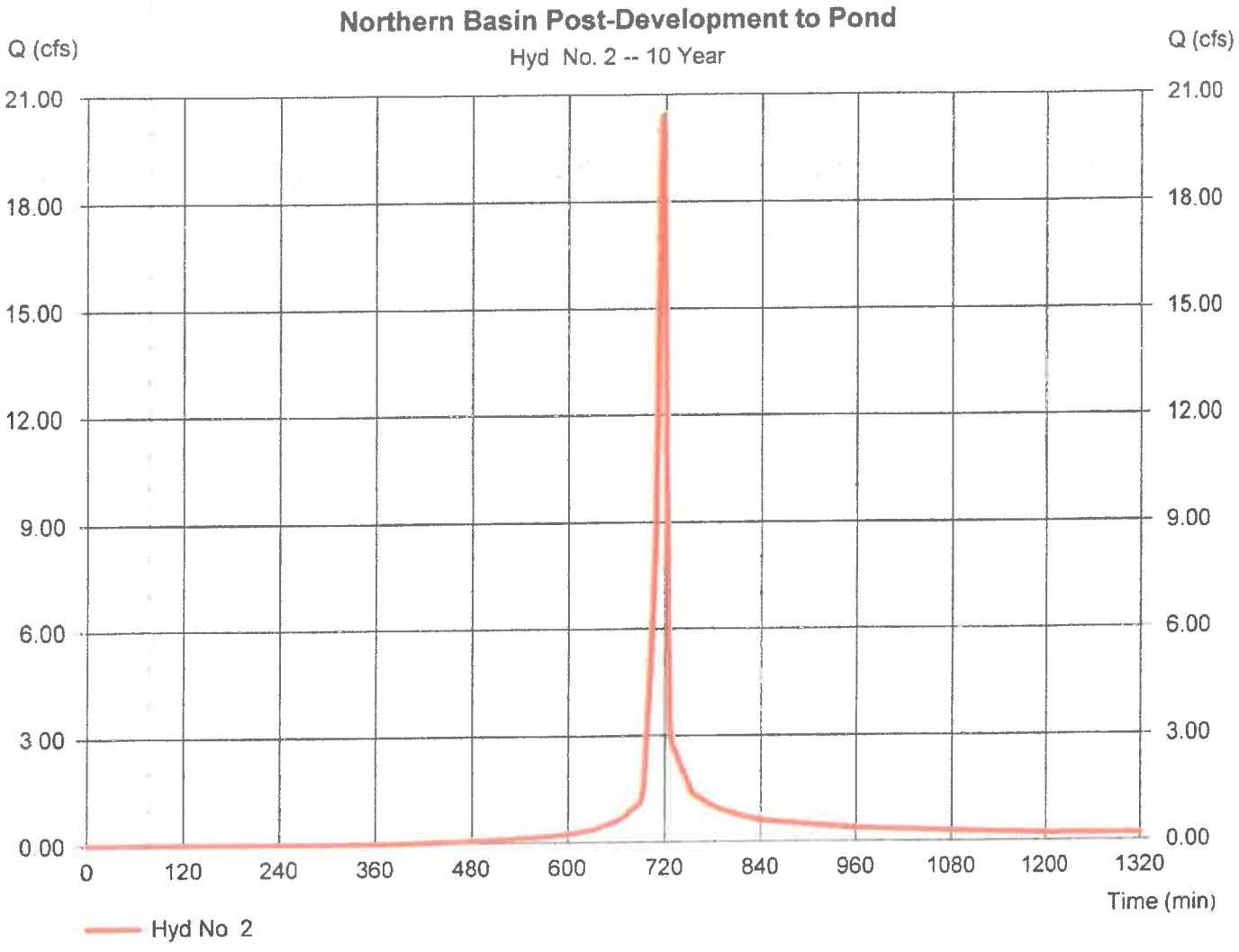
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk. Inc. v2024 — Thursday, 06 / 13 / 2024

Hyd. No. 2

Northern Basin Post-Development to Pond

Hydrograph type	= SCS Runoff	Peak discharge	= 20.38 cfs
Storm frequency	= 10 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 41,829 cuft
Drainage area	= 3.730 ac	Curve number	= 82.1
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.23 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



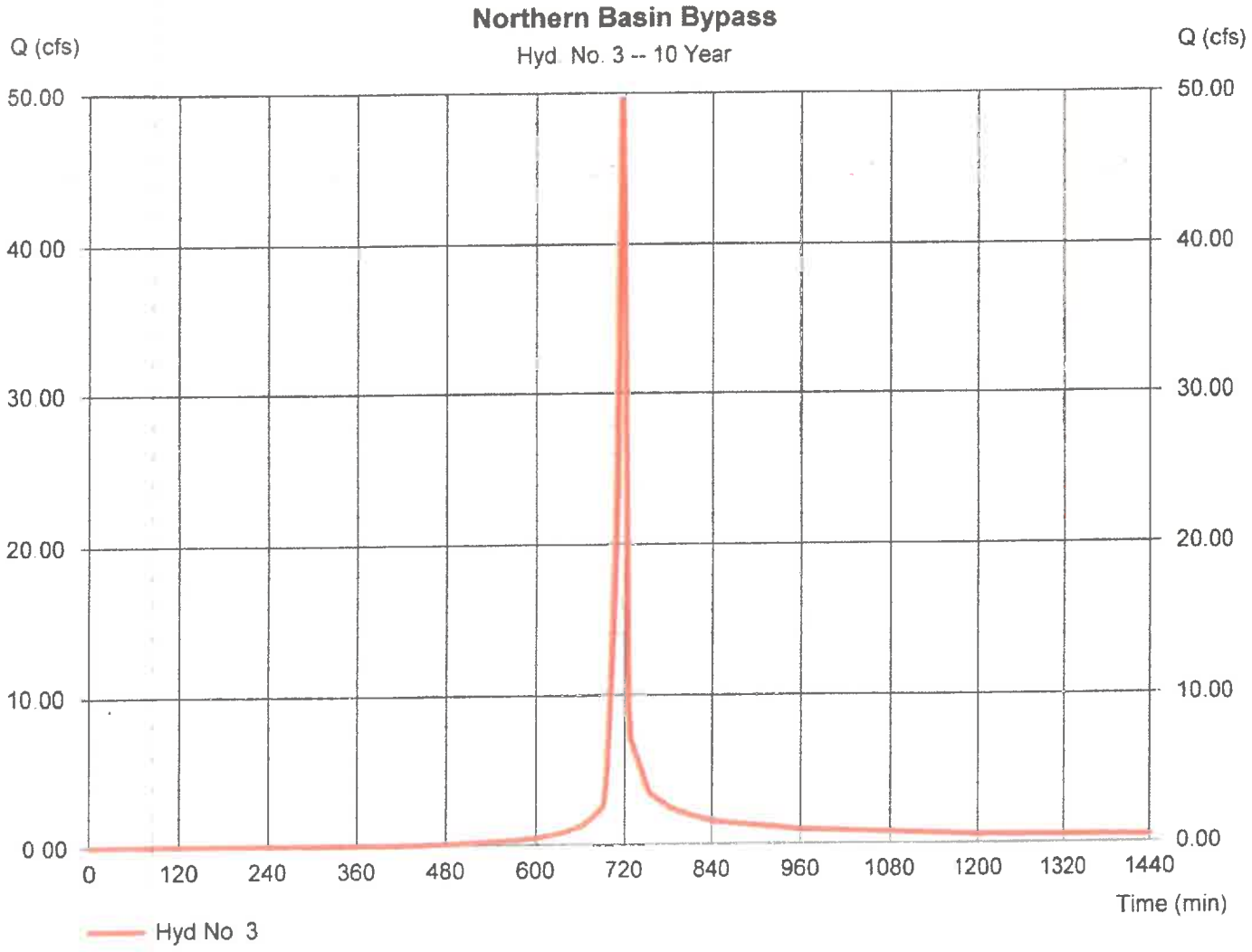
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 — Thursday, 06 / 13 / 2024

Hyd. No. 3

Northern Basin Bypass

Hydrograph type	= SCS Runoff	Peak discharge	= 49.56 cfs
Storm frequency	= 10 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 100,799 cuft
Drainage area	= 9.810 ac	Curve number	= 79.2
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.23 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



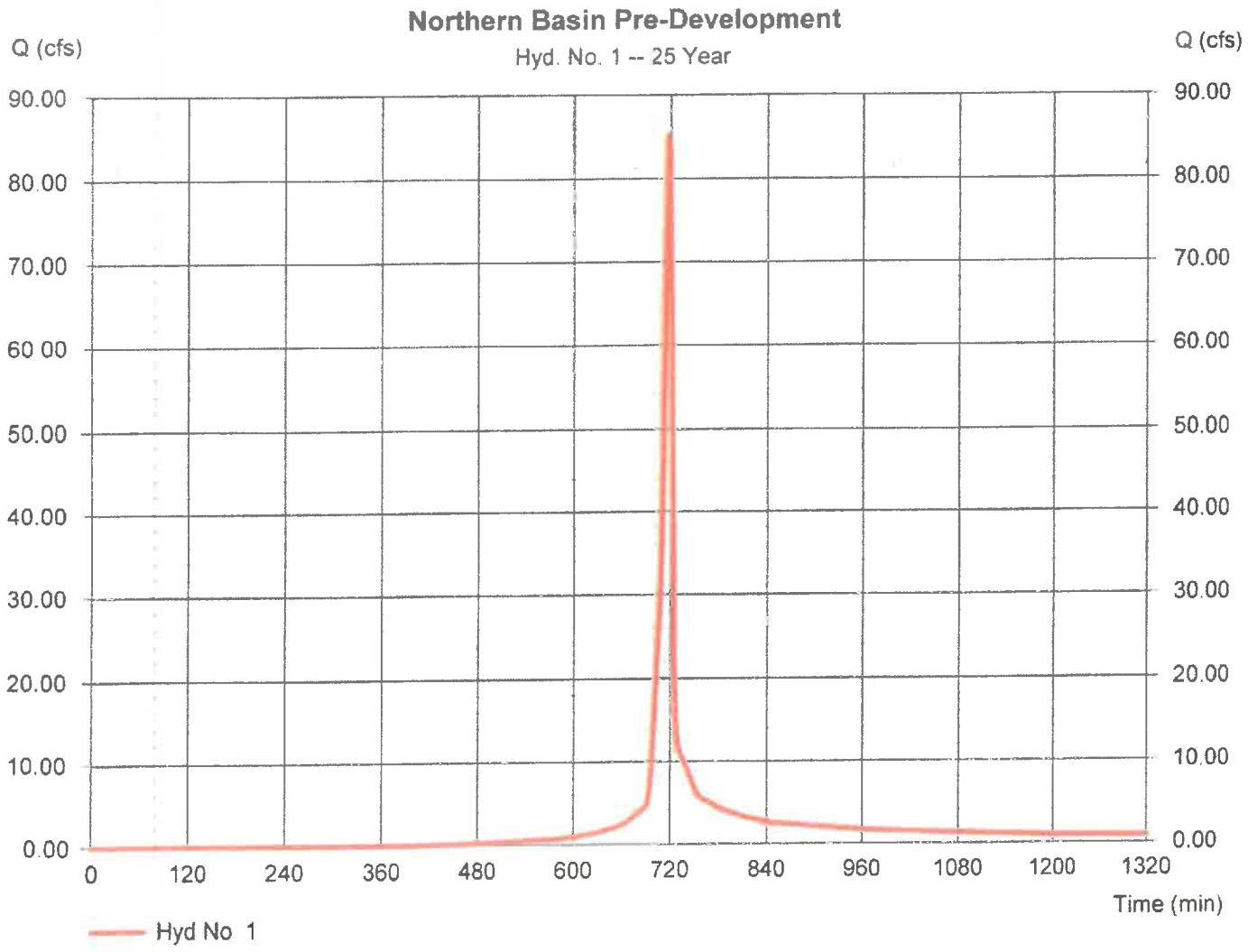
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 — Thursday, 06 / 13 / 2024

Hyd. No. 1

Northern Basin Pre-Development

Hydrograph type	= SCS Runoff	Peak discharge	= 85.17 cfs
Storm frequency	= 25 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 174,261 cuft
Drainage area	= 13.540 ac	Curve number	= 78.6
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.16 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



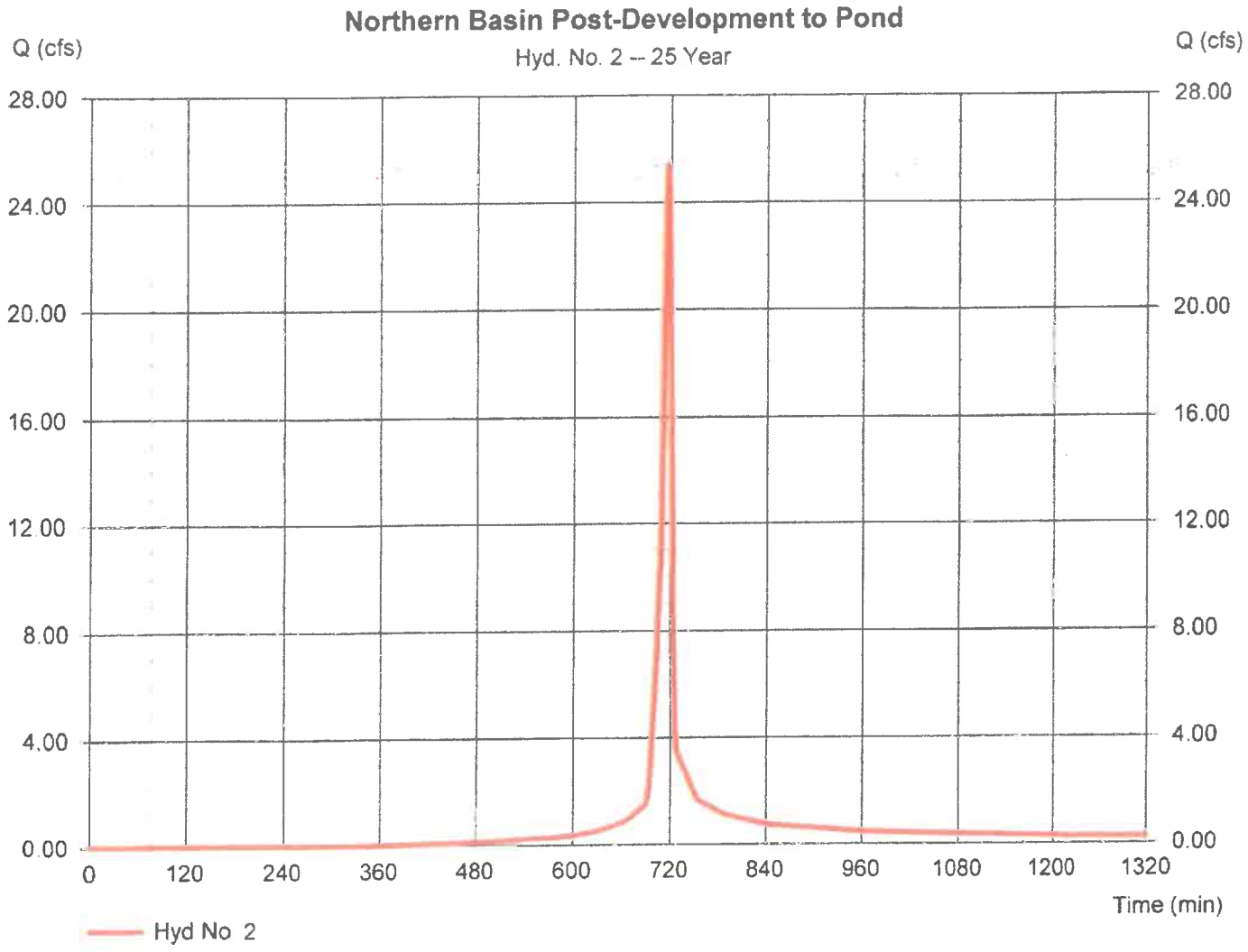
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 — Thursday, 06 / 13 / 2024

Hyd. No. 2

Northern Basin Post-Development to Pond

Hydrograph type	= SCS Runoff	Peak discharge	= 25.38 cfs
Storm frequency	= 25 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 52,616 cuft
Drainage area	= 3.730 ac	Curve number	= 82.1
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.16 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



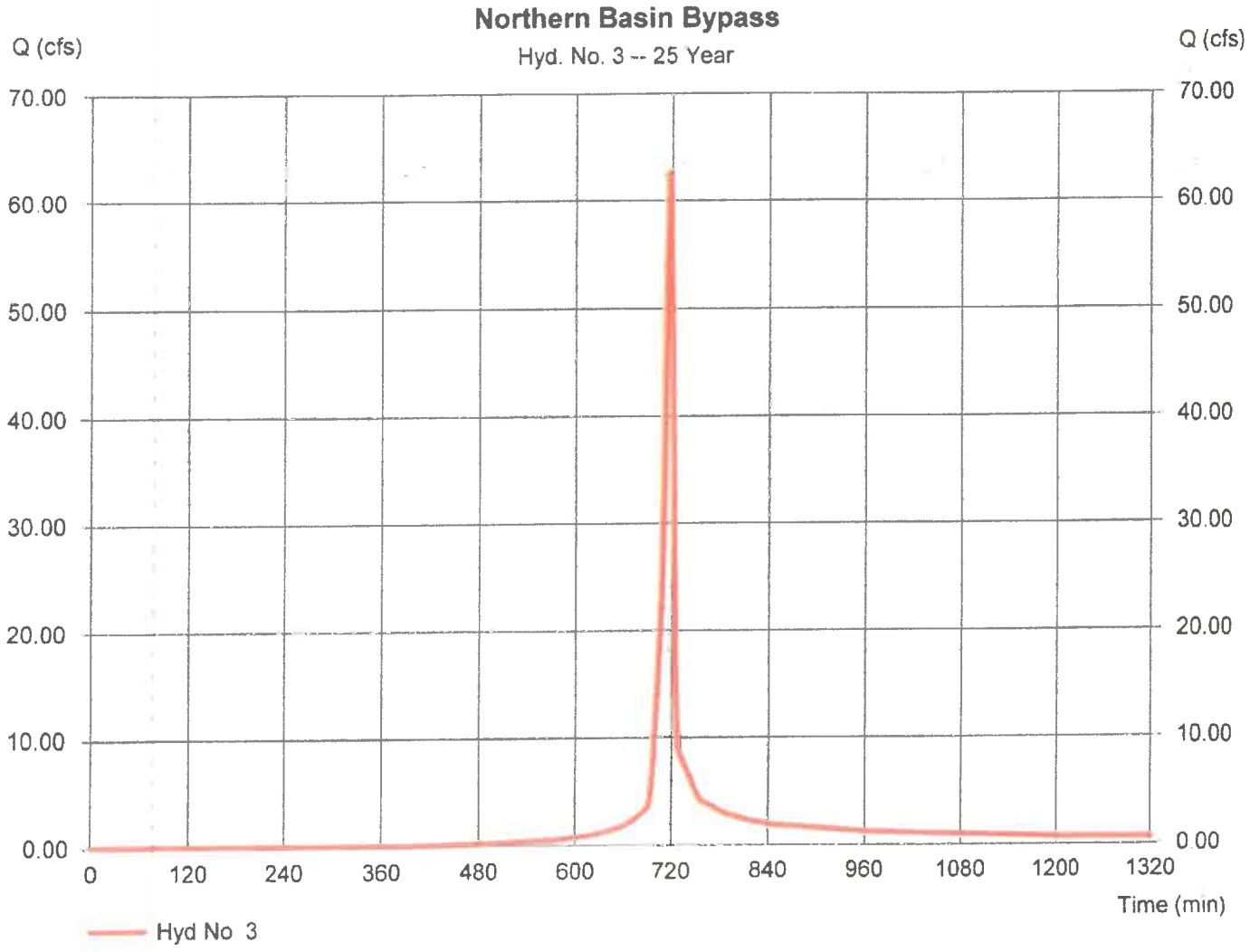
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 — Thursday, 06 / 13 / 2024

Hyd. No. 3

Northern Basin Bypass

Hydrograph type	= SCS Runoff	Peak discharge	= 62.59 cfs
Storm frequency	= 25 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 128,311 cuft
Drainage area	= 9.810 ac	Curve number	= 79.2
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.16 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



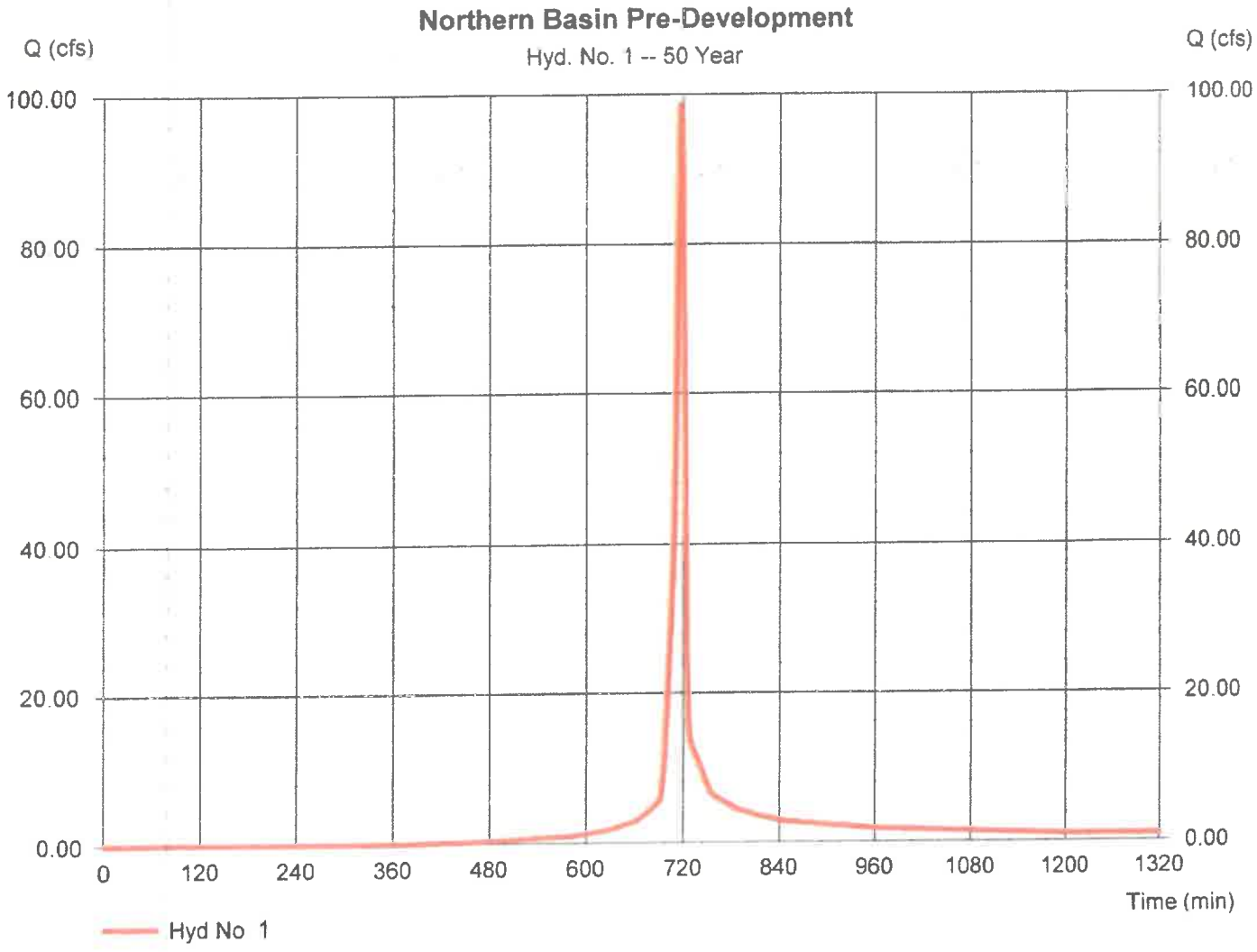
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 — Thursday, 06 / 13 / 2024

Hyd. No. 1

Northern Basin Pre-Development

Hydrograph type	= SCS Runoff	Peak discharge	= 98.60 cfs
Storm frequency	= 50 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 202,924 cuft
Drainage area	= 13.540 ac	Curve number	= 78.6
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.85 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



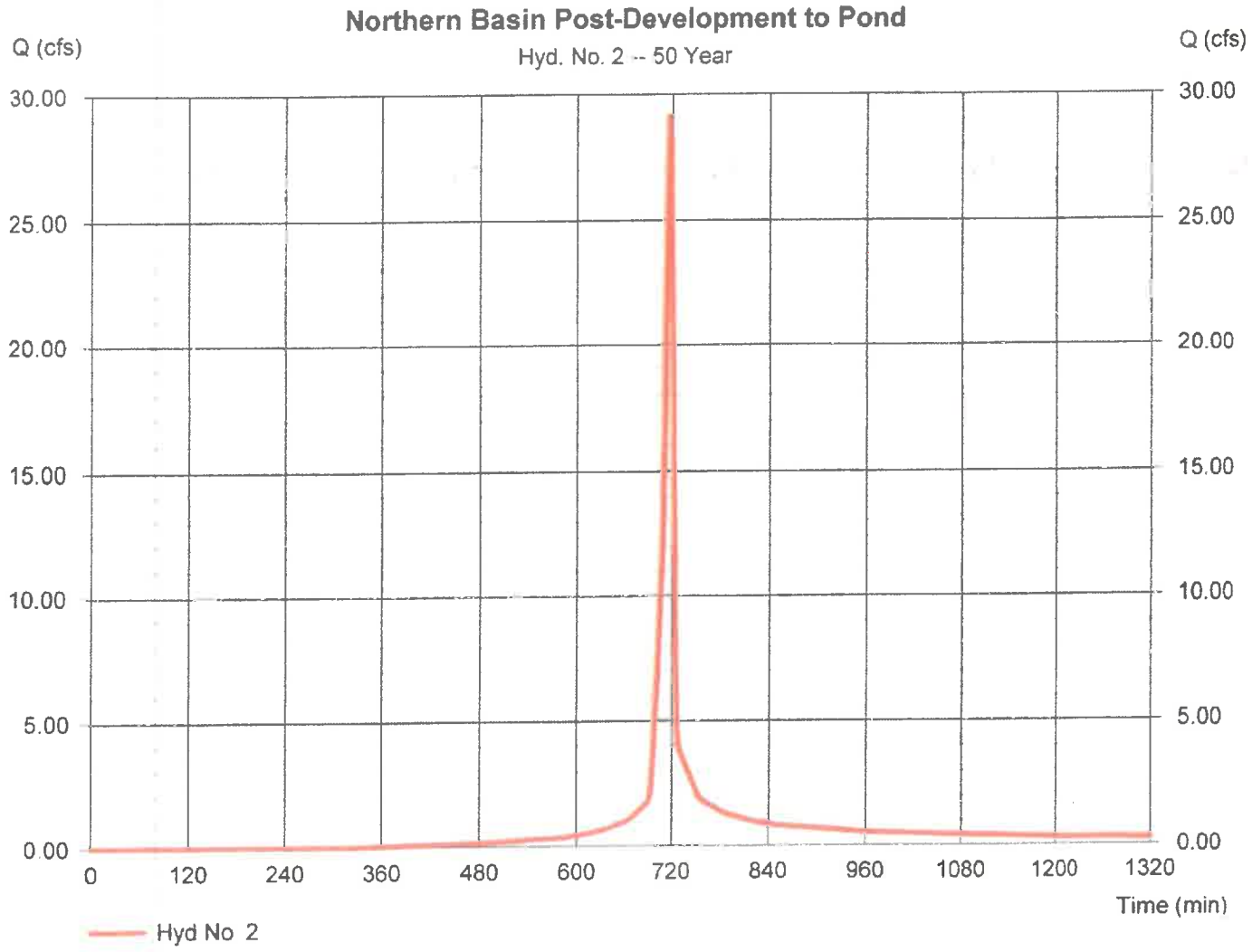
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 — Thursday, 06 / 13 / 2024

Hyd. No. 2

Northern Basin Post-Development to Pond

Hydrograph type	= SCS Runoff	Peak discharge	= 29.10 cfs
Storm frequency	= 50 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 60,762 cuft
Drainage area	= 3.730 ac	Curve number	= 82.1
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.85 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



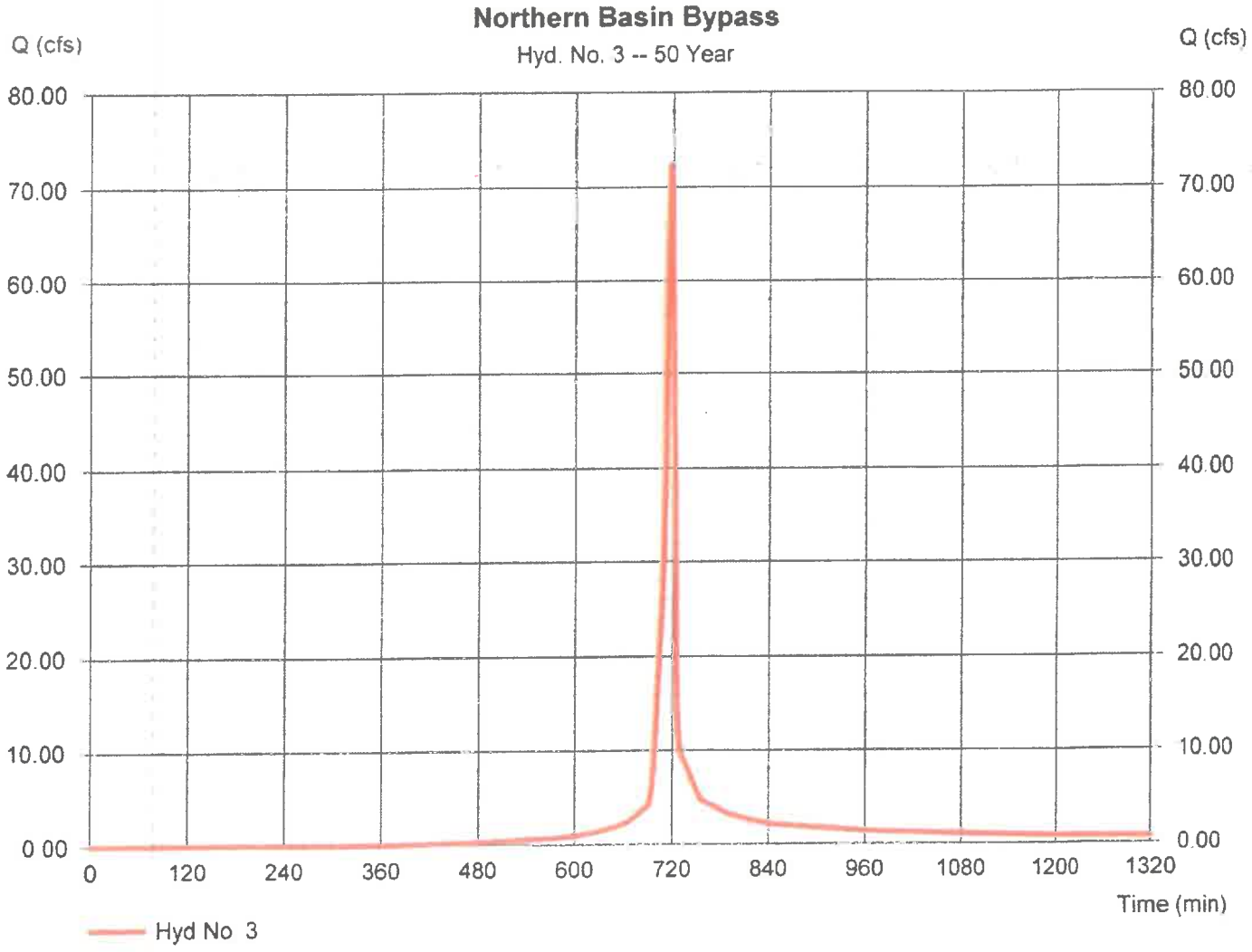
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 — Thursday, 06 / 13 / 2024

Hyd. No. 3

Northern Basin Bypass

Hydrograph type	= SCS Runoff	Peak discharge	= 72.33 cfs
Storm frequency	= 50 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 149,197 cuft
Drainage area	= 9.810 ac	Curve number	= 79.2
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.85 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



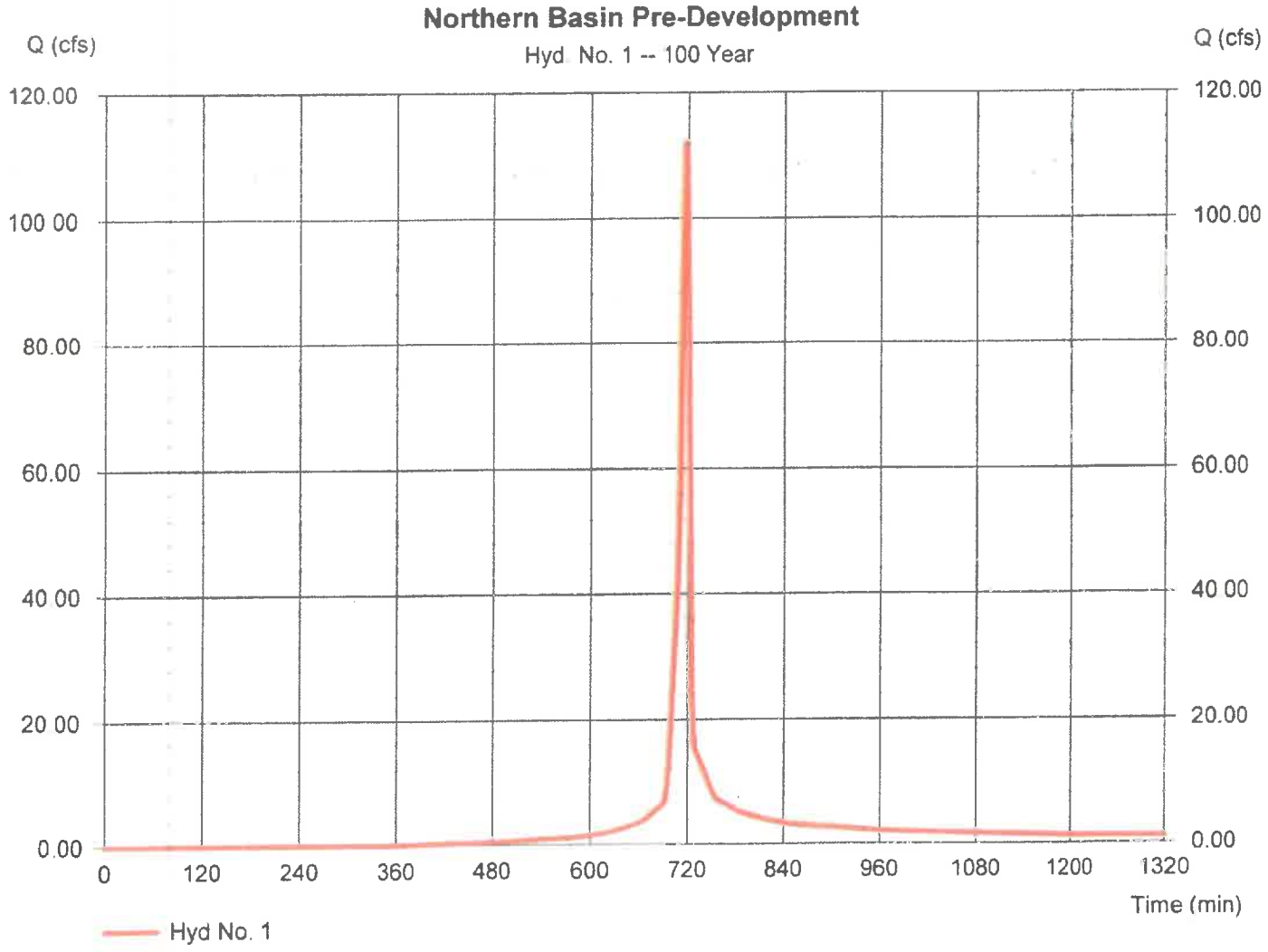
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 — Thursday, 06 / 13 / 2024

Hyd. No. 1

Northern Basin Pre-Development

Hydrograph type	= SCS Runoff	Peak discharge	= 111.87 cfs
Storm frequency	= 100 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 231,608 cuft
Drainage area	= 13.540 ac	Curve number	= 78.6
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 7.53 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



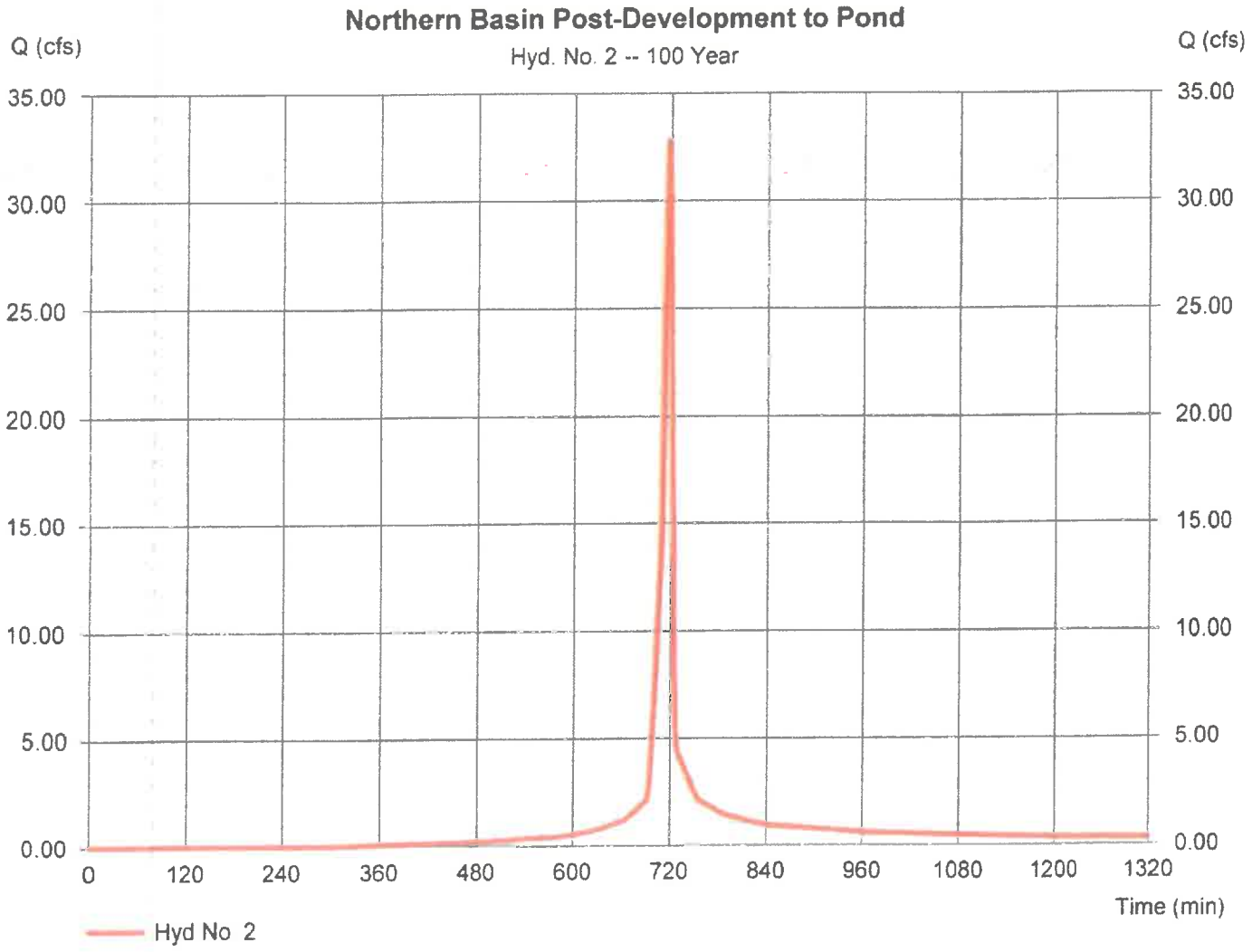
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 — Thursday, 06 / 13 / 2024

Hyd. No. 2

Northern Basin Post-Development to Pond

Hydrograph type	= SCS Runoff	Peak discharge	= 32.76 cfs
Storm frequency	= 100 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 68,879 cuft
Drainage area	= 3.730 ac	Curve number	= 82.1
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 7.53 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



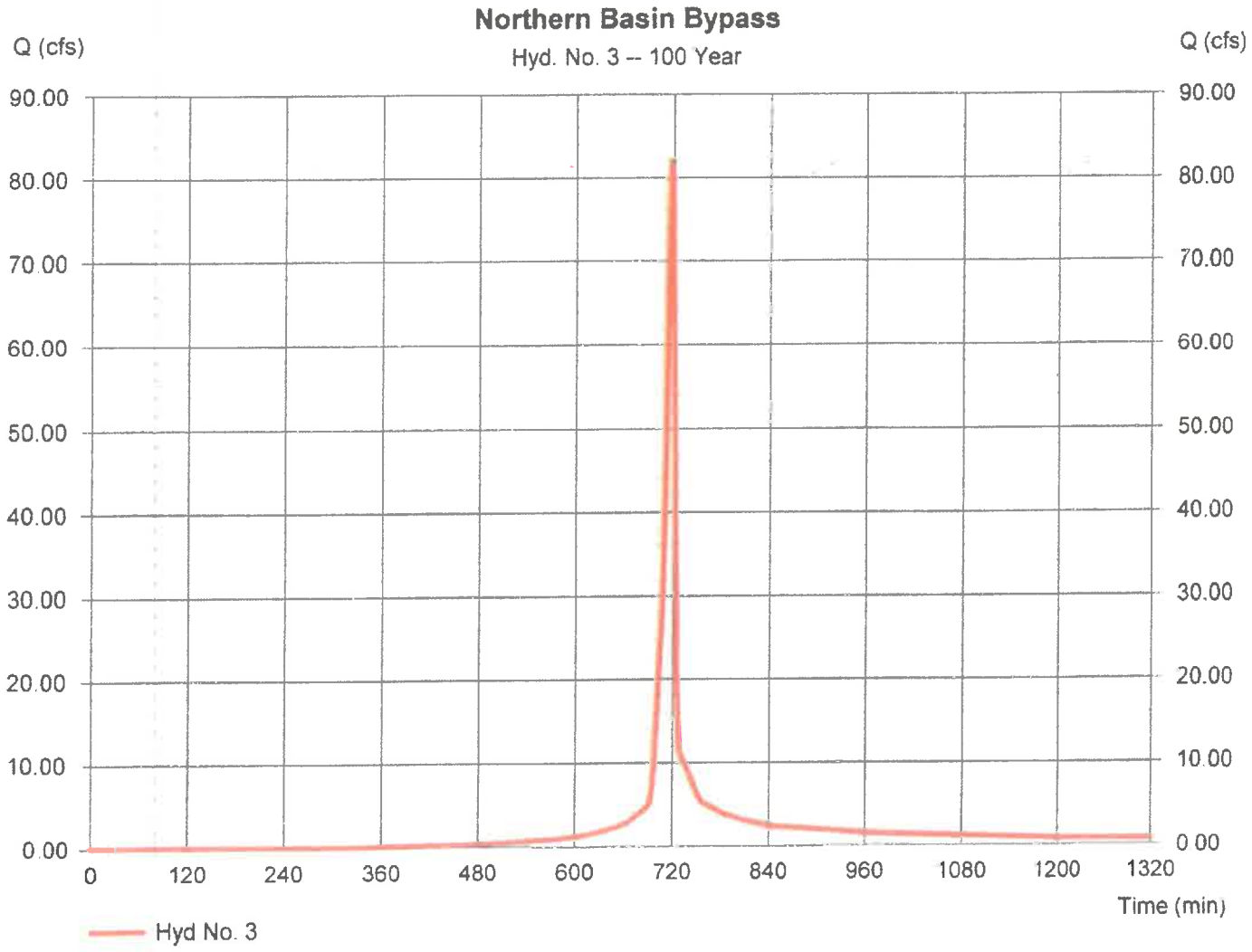
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc v2024 — Thursday, 06 / 13 / 2024

Hyd. No. 3

Northern Basin Bypass

Hydrograph type	= SCS Runoff	Peak discharge	= 81.96 cfs
Storm frequency	= 100 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 170,083 cuft
Drainage area	= 9.810 ac	Curve number	= 79.2
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 7.53 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Pond Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc v2024 — Thursday, 06 / 13 / 2024

Pond No. 1 - Northern Pond

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 670.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	670.00	7,700	0	0
2.00	672.00	12,780	20,265	20,265
4.00	674.00	16,890	29,572	49,836

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 15.00	15.00	0.00	0.00
Span (in)	= 15.00	15.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 670.00	670.00	0.00	0.00
Length (ft)	= 31.00	0.33	0.00	0.00
Slope (%)	= 1.00	1.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

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

Exfil.(in/hr) = 0.000 (by Contour)

TW Elev. (ft) = 0.00

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

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	670.00	0.00	0.00	---	---	---	---	---	---	---	---	0.000
0.20	2,026	670.20	0.13 ic	0.13 ic	---	---	---	---	---	---	---	---	0.127
0.40	4,053	670.40	0.48 ic	0.48 ic	---	---	---	---	---	---	---	---	0.481
0.60	6,079	670.60	1.01 ic	1.01 ic	---	---	---	---	---	---	---	---	1.013
0.80	8,106	670.80	1.69 ic	1.69 ic	---	---	---	---	---	---	---	---	1.686
1.00	10,132	671.00	2.41 ic	2.41 ic	---	---	---	---	---	---	---	---	2.413
1.20	12,159	671.20	3.07 oc	3.05 ic	---	---	---	---	---	---	---	---	3.054
1.40	14,185	671.40	3.46 oc	3.46 ic	---	---	---	---	---	---	---	---	3.461
1.60	16,212	671.60	3.73 oc	3.73 ic	---	---	---	---	---	---	---	---	3.729
1.80	18,238	671.80	4.09 oc	4.09 ic	---	---	---	---	---	---	---	---	4.087
2.00	20,265	672.00	4.54 oc	4.54 ic	---	---	---	---	---	---	---	---	4.538
2.20	23,222	672.20	4.95 oc	4.95 ic	---	---	---	---	---	---	---	---	4.947
2.40	26,179	672.40	5.33 oc	5.33 ic	---	---	---	---	---	---	---	---	5.325
2.60	29,136	672.60	5.68 oc	5.68 ic	---	---	---	---	---	---	---	---	5.678
2.80	32,093	672.80	6.01 oc	6.01 oc	---	---	---	---	---	---	---	---	6.011
3.00	35,050	673.00	6.33 oc	6.33 ic	---	---	---	---	---	---	---	---	6.326
3.20	38,008	673.20	6.63 oc	6.63 ic	---	---	---	---	---	---	---	---	6.626
3.40	40,965	673.40	6.91 oc	6.91 ic	---	---	---	---	---	---	---	---	6.913
3.60	43,922	673.60	7.19 oc	7.19 ic	---	---	---	---	---	---	---	---	7.188
3.80	46,879	673.80	7.44 ic	7.44 ic	---	---	---	---	---	---	---	---	7.444
4.00	49,836	674.00	7.68 ic	7.67 ic	---	---	---	---	---	---	---	---	7.675

Hydrograph Report

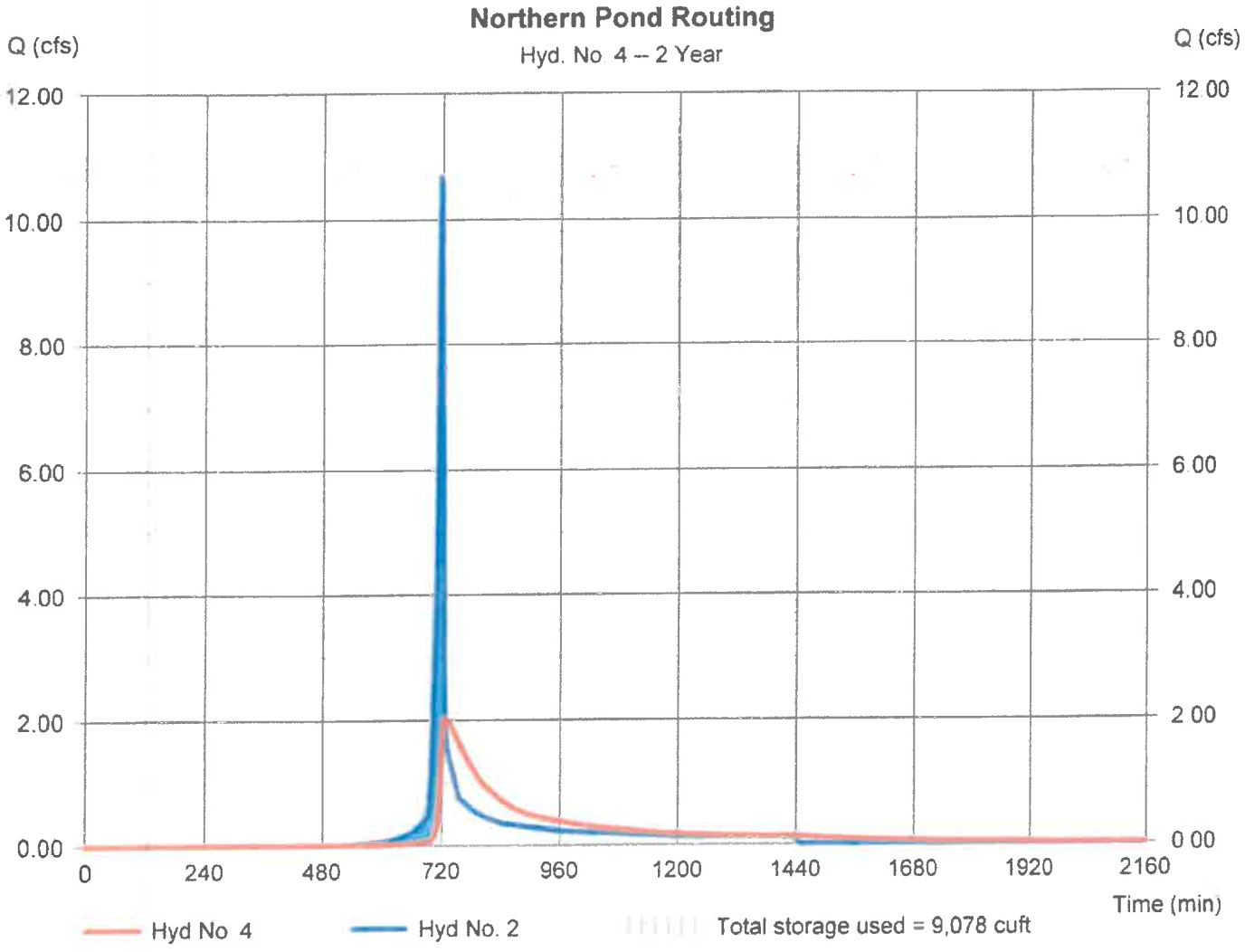
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 — Thursday, 06 / 13 / 2024

Hyd. No. 4

Northern Pond Routing

Hydrograph type	= Reservoir	Peak discharge	= 2.035 cfs
Storm frequency	= 2 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 21,557 cuft
Inflow hyd. No.	= 2 - Northern Basin Post-Development	Max. Elevation	= 670.90 ft
Reservoir name	= Northern Pond	Max. Storage	= 9,078 cuft

Storage Indication method used.



Hydrograph Report

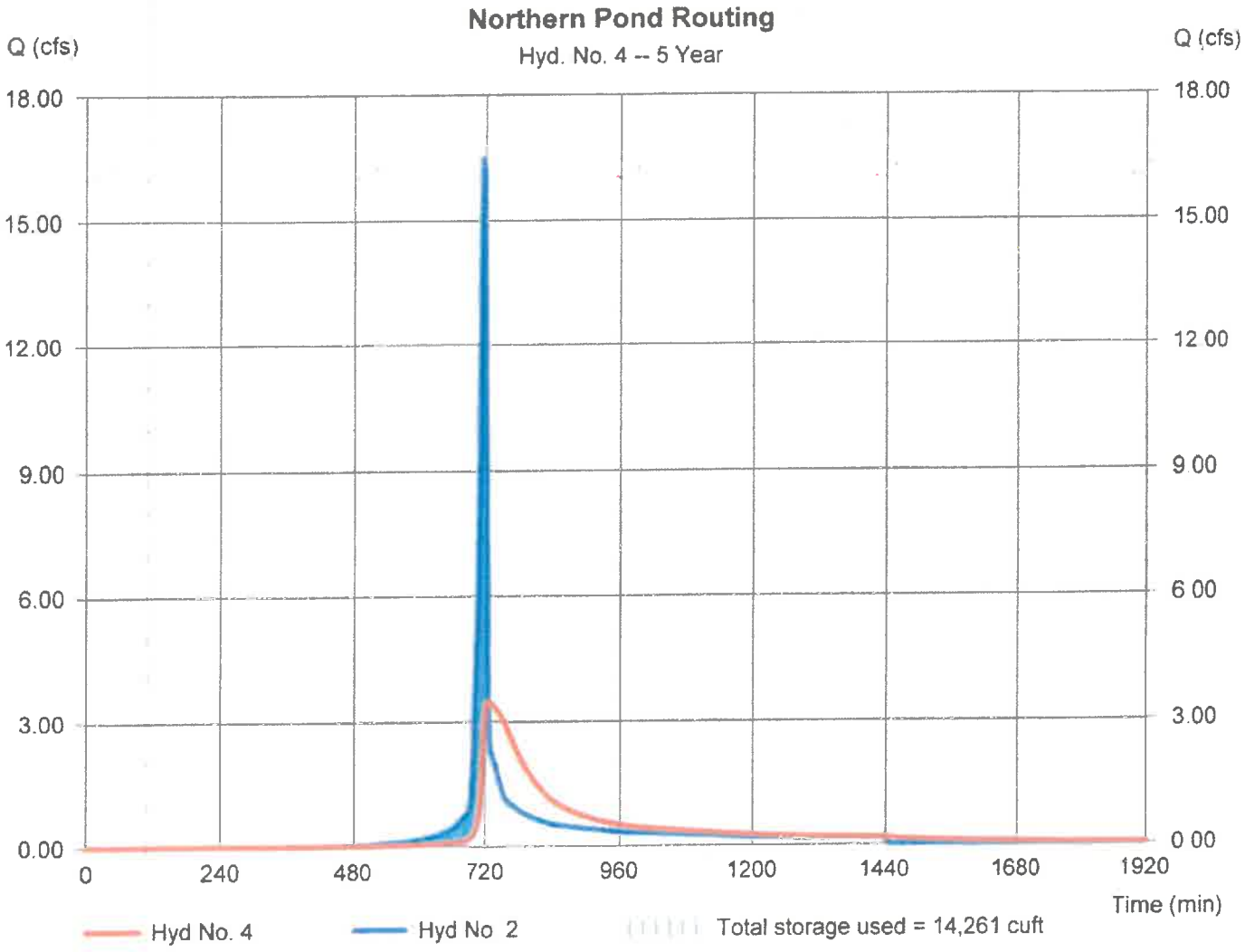
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 — Thursday, 06 / 13 / 2024

Hyd. No. 4

Northern Pond Routing

Hydrograph type	= Reservoir	Peak discharge	= 3.471 cfs
Storm frequency	= 5 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 33,558 cuft
Inflow hyd. No.	= 2 - Northern Basin Post-Development	Max. Elevation	= 671.41 ft
Reservoir name	= Northern Pond	Max. Storage	= 14,261 cuft

Storage Indication method used.



Hydrograph Report

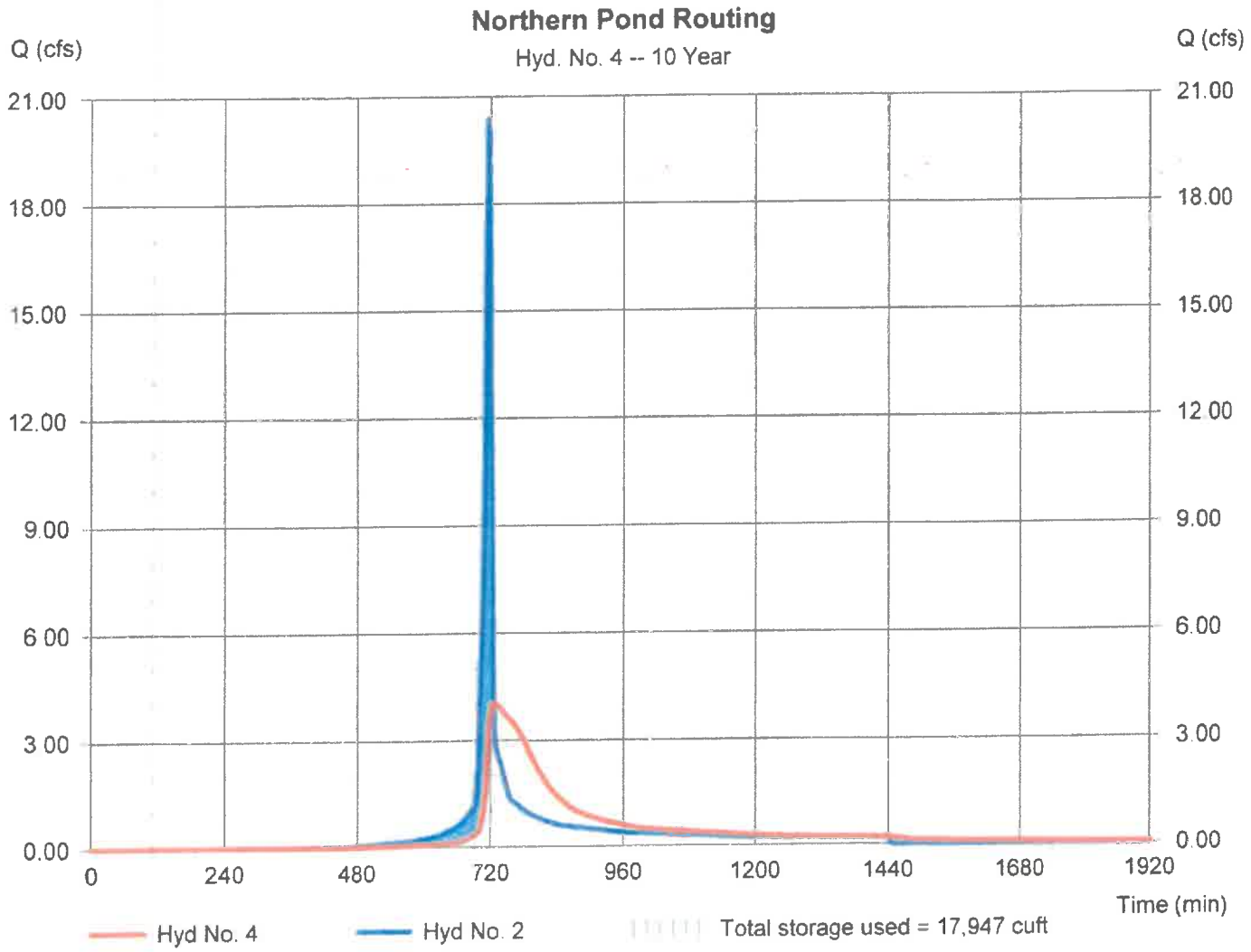
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 — Thursday, 06 / 13 / 2024

Hyd. No. 4

Northern Pond Routing

Hydrograph type	= Reservoir	Peak discharge	= 4.036 cfs
Storm frequency	= 10 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 41,813 cuft
Inflow hyd. No.	= 2 - Northern Basin Post-Development	Max. Elevation Pond	= 671.77 ft
Reservoir name	= Northern Pond	Max. Storage	= 17,947 cuft

Storage Indication method used



Hydrograph Report

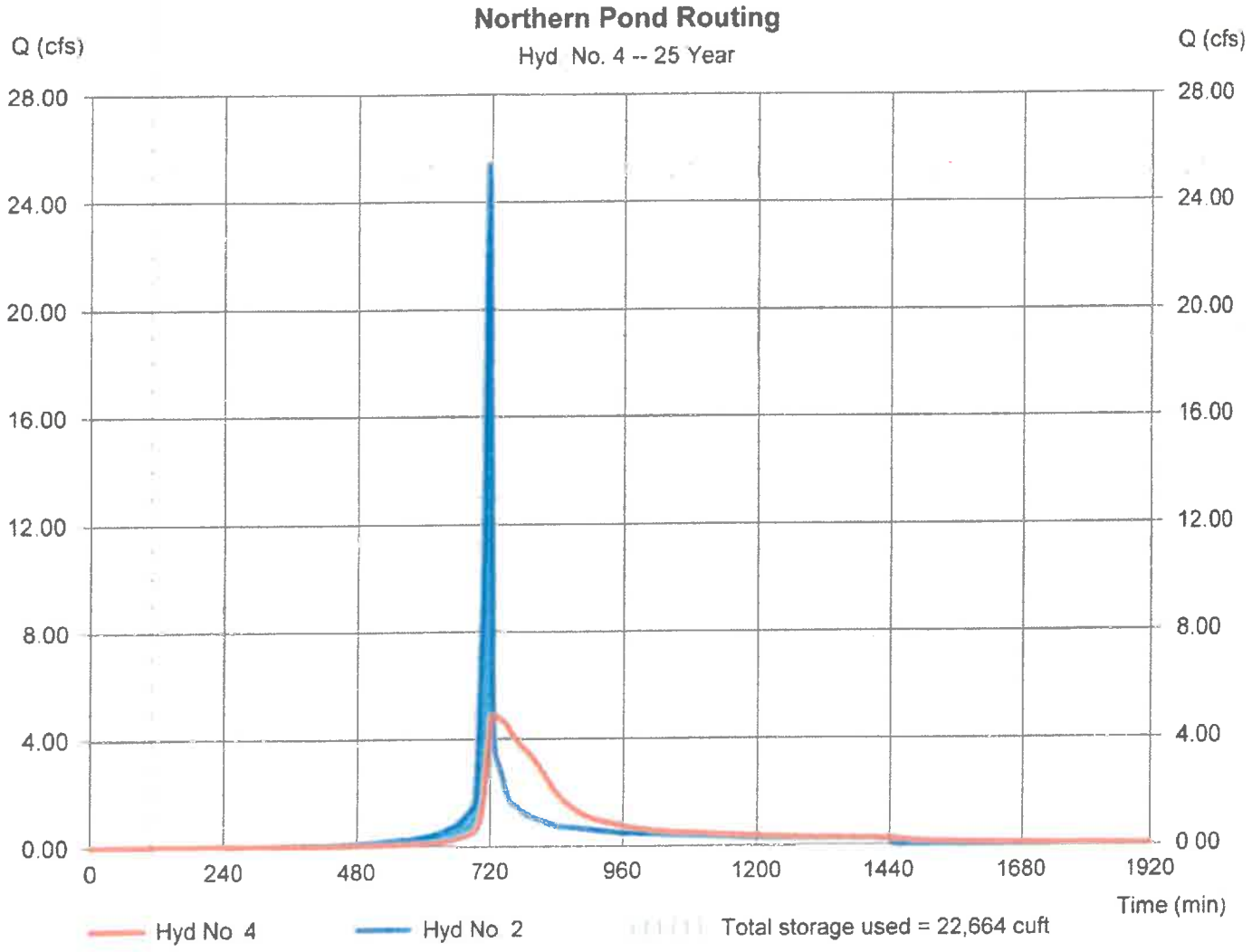
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 — Thursday, 06 / 13 / 2024

Hyd. No. 4

Northern Pond Routing

Hydrograph type	= Reservoir	Peak discharge	= 4.870 cfs
Storm frequency	= 25 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 52,600 cuft
Inflow hyd. No.	= 2 - Northern Basin Post-Development	Max. Elevation	= 672.16 ft
Reservoir name	= Northern Pond	Max. Storage	= 22,664 cuft

Storage Indication method used.



Hydrograph Report

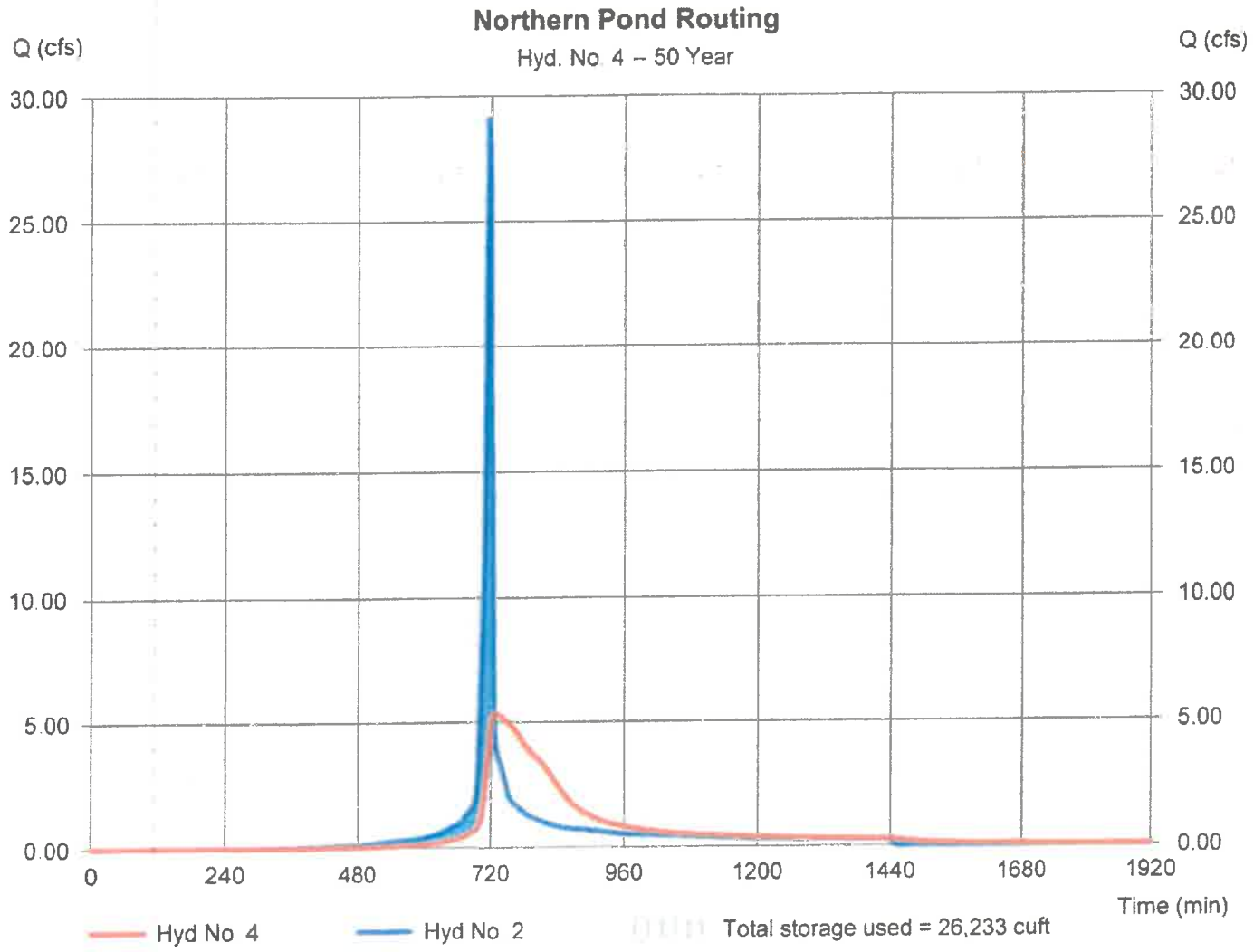
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 — Thursday, 06 / 13 / 2024

Hyd. No. 4

Northern Pond Routing

Hydrograph type	= Reservoir	Peak discharge	= 5.332 cfs
Storm frequency	= 50 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 60,746 cuft
Inflow hyd. No.	= 2 - Northern Basin Post-Deve	Max. Elevation	= 672.40 ft
Reservoir name	= Northern Pond	Max. Storage	= 26,233 cuft

Storage Indication method used



Hydrograph Report

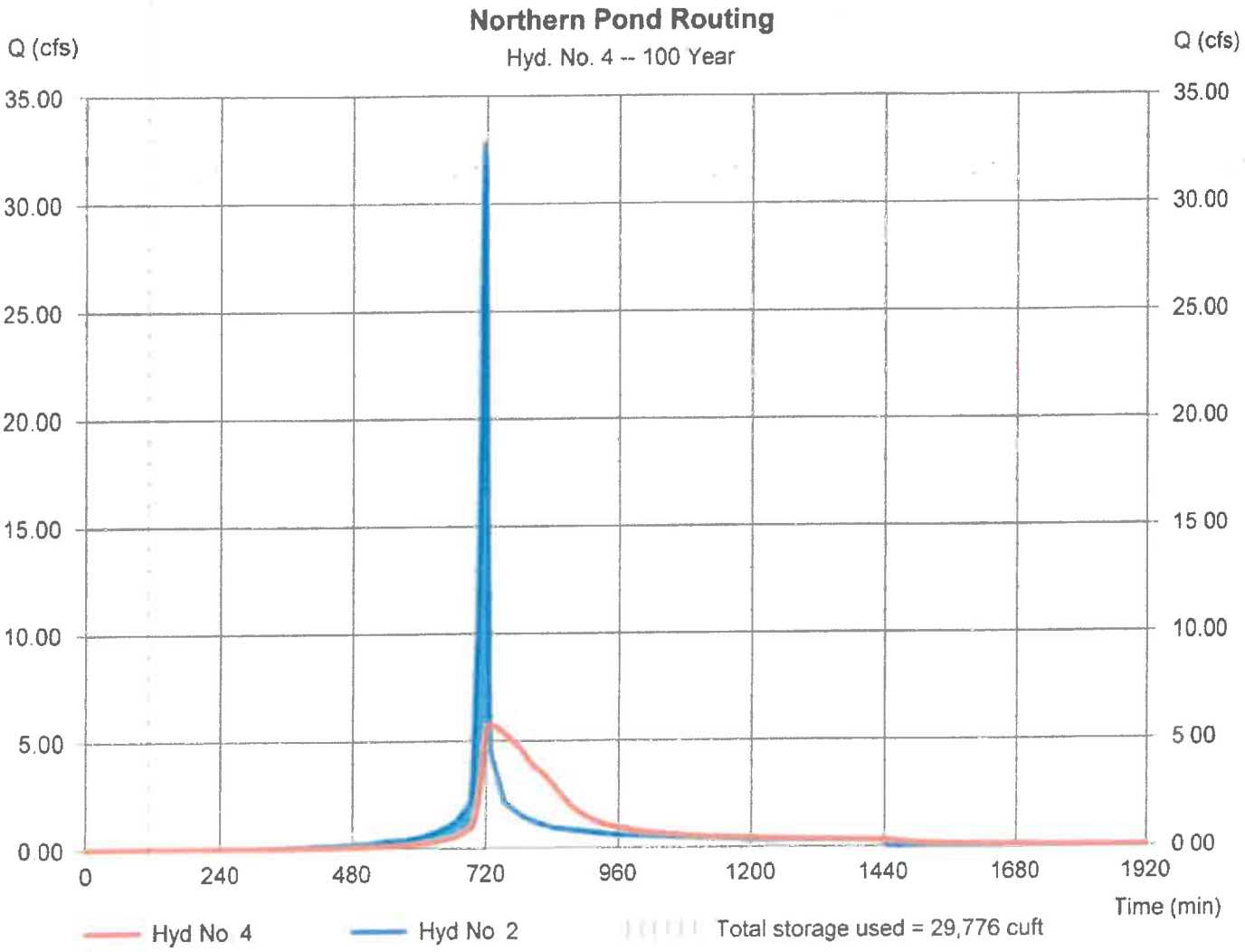
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 — Thursday, 06 / 13 / 2024

Hyd. No. 4

Northern Pond Routing

Hydrograph type	= Reservoir	Peak discharge	= 5.750 cfs
Storm frequency	= 100 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 68,863 cuft
Inflow hyd. No.	= 2 - Northern Basin Post-Deve	Max. Elevation	= 672.64 ft
Reservoir name	= Northern Pond	Max. Storage	= 29,776 cuft

Storage Indication method used.



Northwind Estates Section 2 Northern Pond

Drainage Data Summary Table

Dean Design Group, LLC
Charley Dean, PE
Phone: 615-300-6316

Design Storm	Pre-Development Peak Flow	Area By-Passing Pond	Routed Peak Discharge from Detention Pond	Combined Peak Discharge	Summary			% Reduction from *Existing*
2	33.39	24.83	2.03	26.86	**Peak Flow Reduction**	**6.53**	**cfs**	**19.6%**
5	53.39	39.49	3.47	42.96	**Peak Flow Reduction**	**10.43**	**cfs**	**19.5%**
10	67.24	49.56	4.04	53.60	**Peak Flow Reduction**	**13.64**	**cfs**	**20.3%**
25	85.17	62.59	4.87	67.46	**Peak Flow Reduction**	**17.71**	**cfs**	**20.8%**
50	98.60	72.33	5.33	77.66	**Peak Flow Reduction**	**20.94**	**cfs**	**21.2%**
100	111.87	81.96	5.75	87.71	**Peak Flow Reduction**	**24.16**	**cfs**	**21.6%**

MAXIMUM POND ELEVATIONS	
Storm Event	Elevation
2	670.90
5	671.41
10	671.77
25	672.16
50	672.40
100	672.64

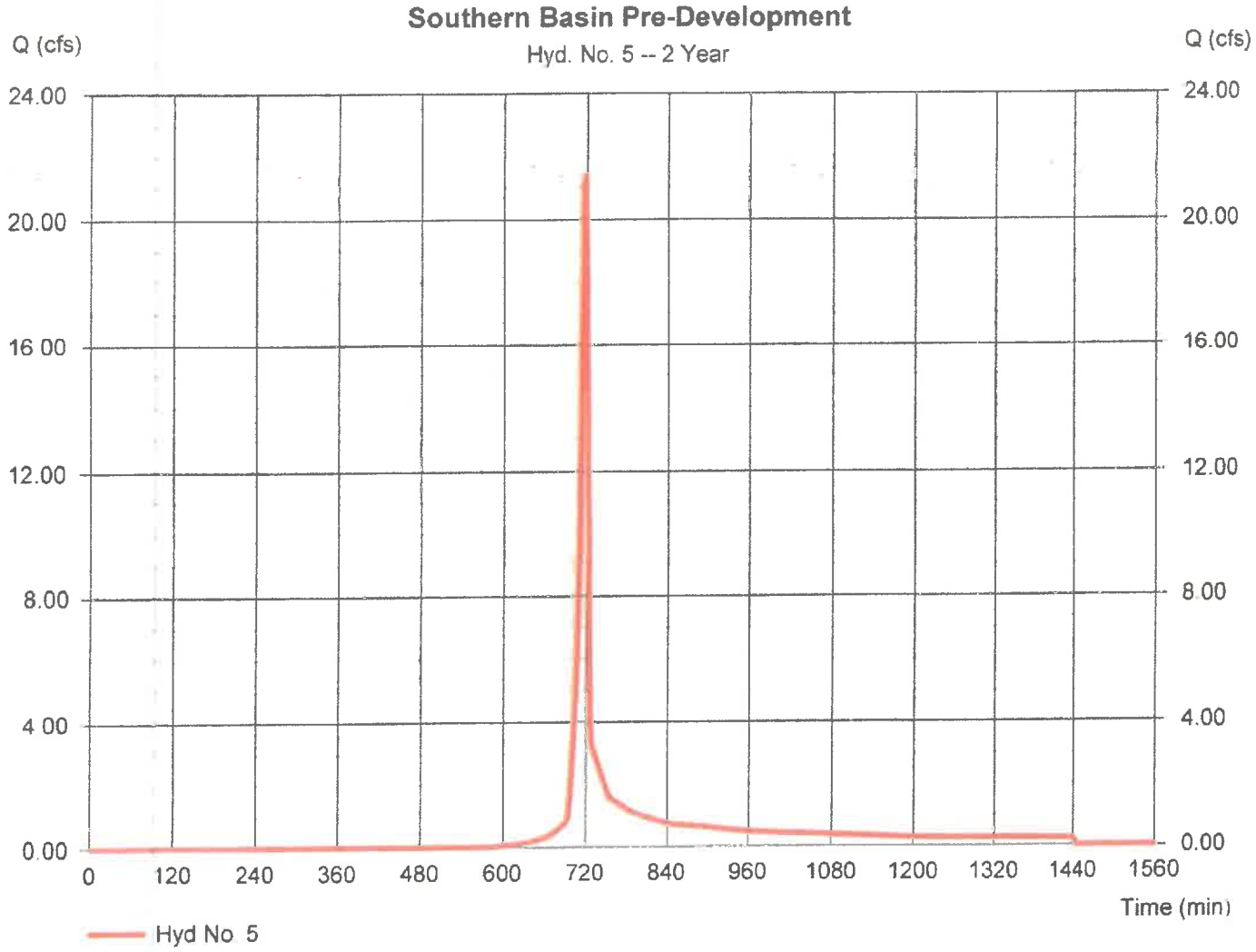
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 — Thursday, 06 / 13 / 2024

Hyd. No. 5

Southern Basin Pre-Development

Hydrograph type	= SCS Runoff	Peak discharge	= 21.36 cfs
Storm frequency	= 2 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 42,854 cuft
Drainage area	= 8.660 ac	Curve number	= 78.6
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.39 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



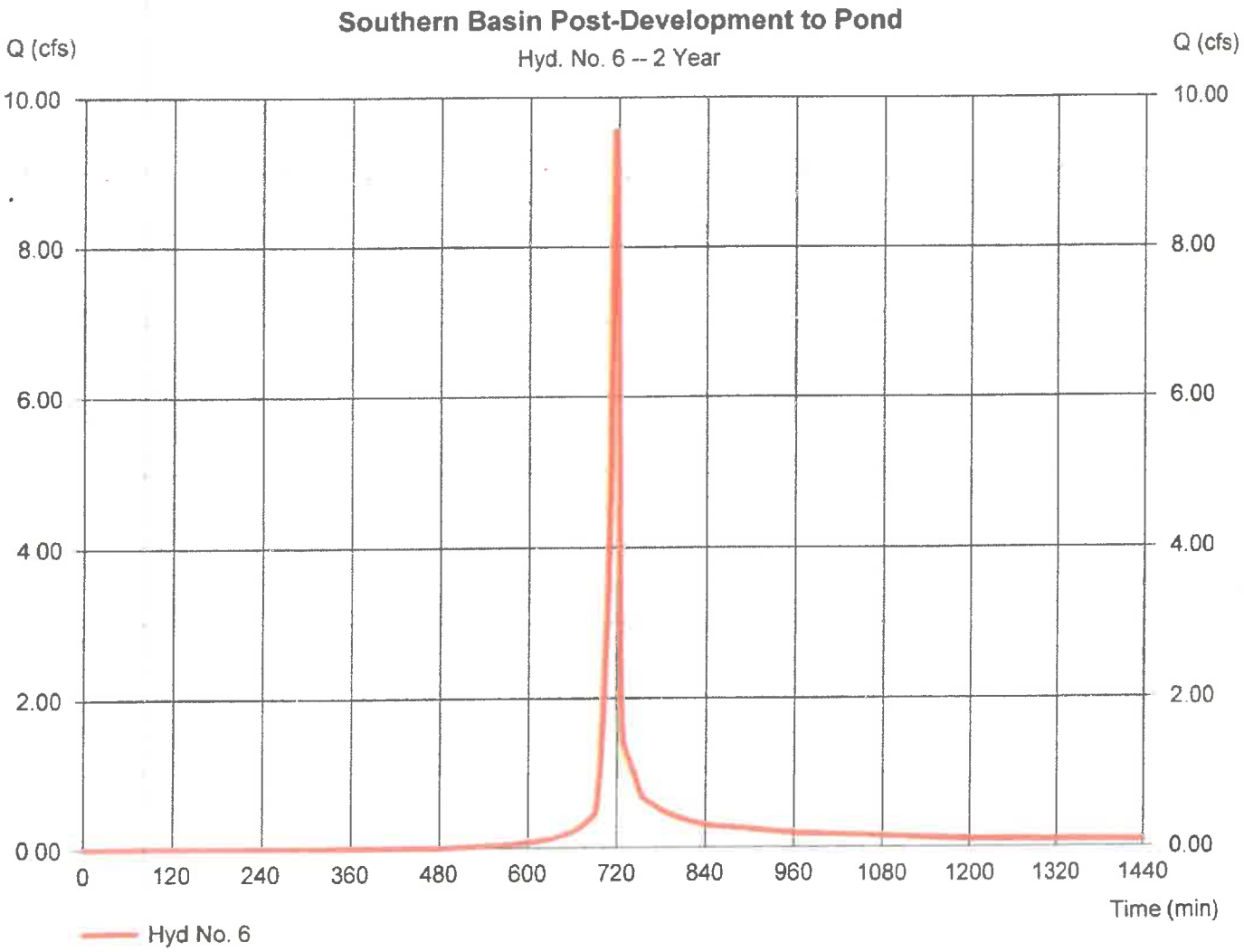
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 — Thursday, 06 / 13 / 2024

Hyd. No. 6

Southern Basin Post-Development to Pond

Hydrograph type	= SCS Runoff	Peak discharge	= 9.536 cfs
Storm frequency	= 2 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 19,300 cuft
Drainage area	= 3.130 ac	Curve number	= 83.6
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.39 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



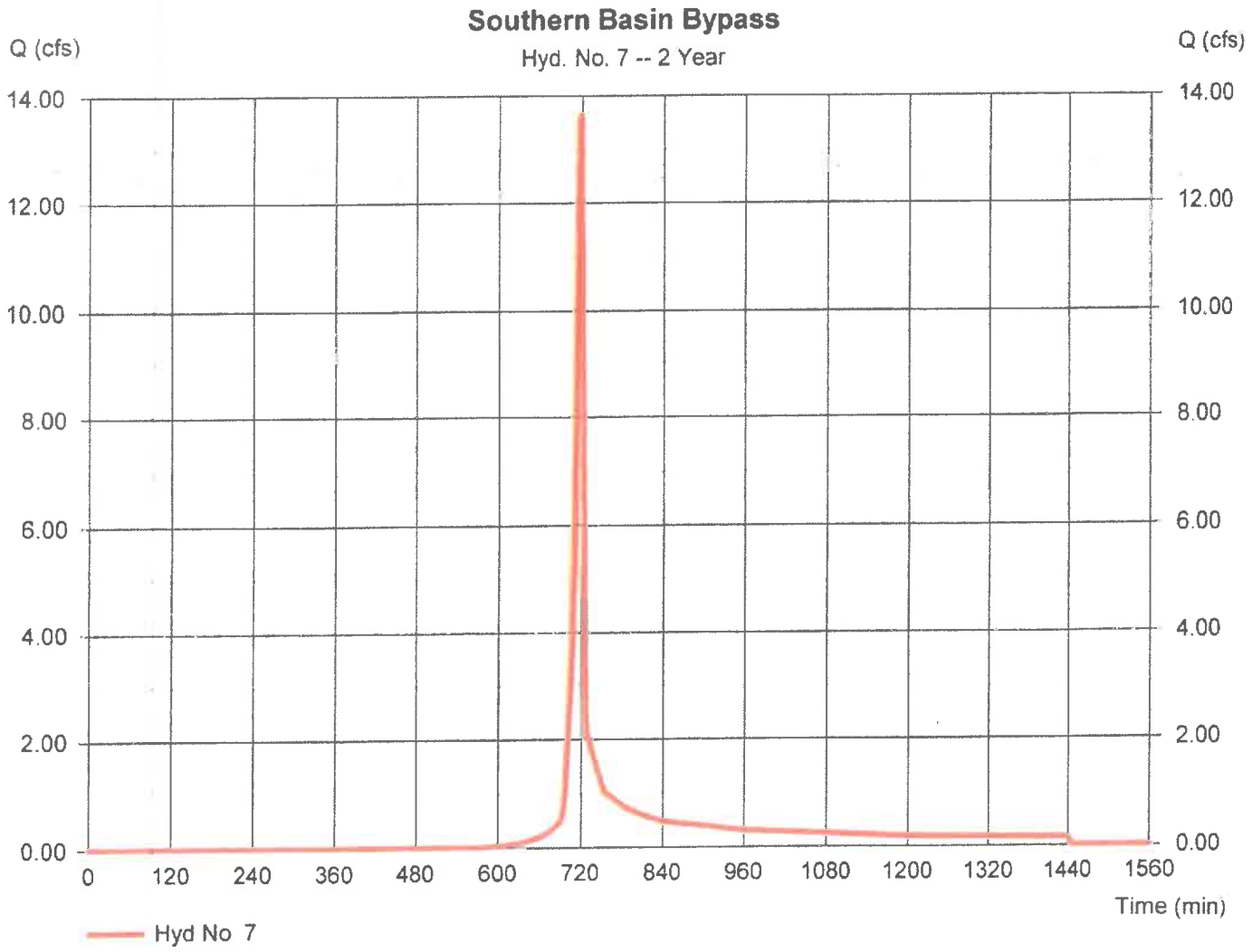
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 — Thursday, 06 / 13 / 2024

Hyd. No. 7

Southern Basin Bypass

Hydrograph type	= SCS Runoff	Peak discharge	= 13.64 cfs
Storm frequency	= 2 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 27,365 cuft
Drainage area	= 5.530 ac	Curve number	= 78.6
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 3.39 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



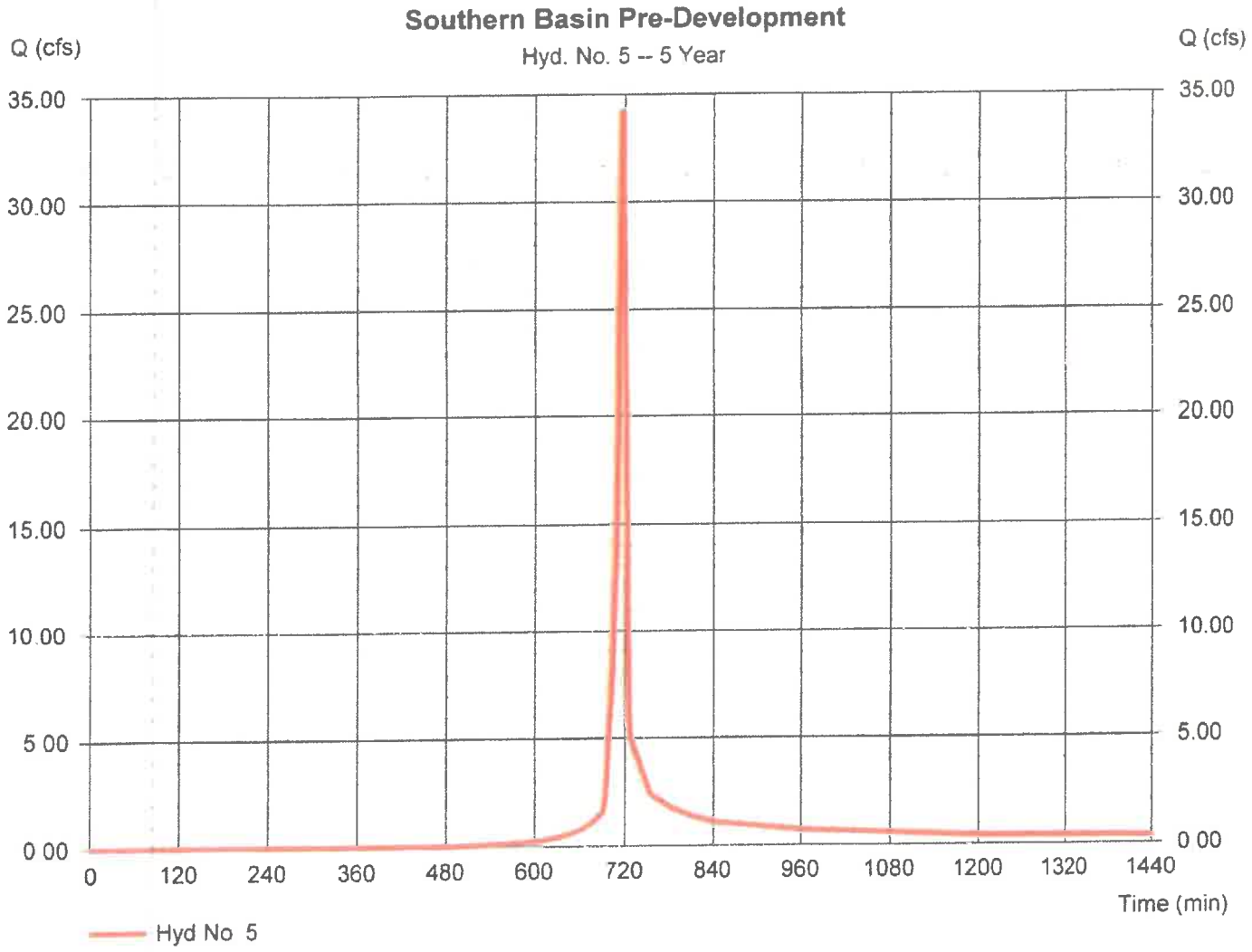
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 — Thursday, 06 / 13 / 2024

Hyd. No. 5

Southern Basin Pre-Development

Hydrograph type	= SCS Runoff	Peak discharge	= 34.15 cfs
Storm frequency	= 5 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 69,046 cuft
Drainage area	= 8.660 ac	Curve number	= 78.6
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 4.50 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



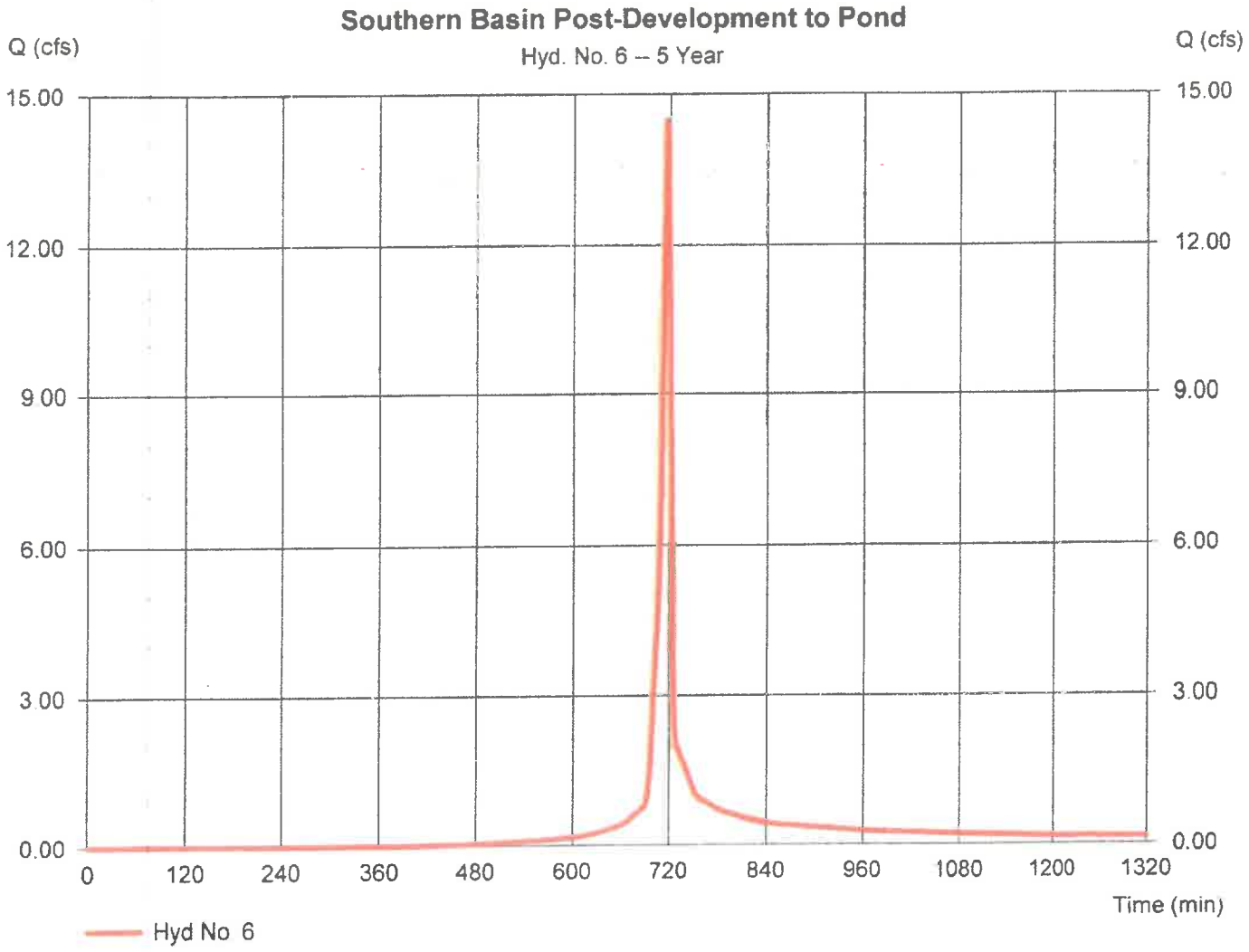
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 — Thursday, 06 / 13 / 2024

Hyd. No. 6

Southern Basin Post-Development to Pond

Hydrograph type	= SCS Runoff	Peak discharge	= 14.46 cfs
Storm frequency	= 5 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 29,612 cuft
Drainage area	= 3.130 ac	Curve number	= 83.6
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 4.50 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



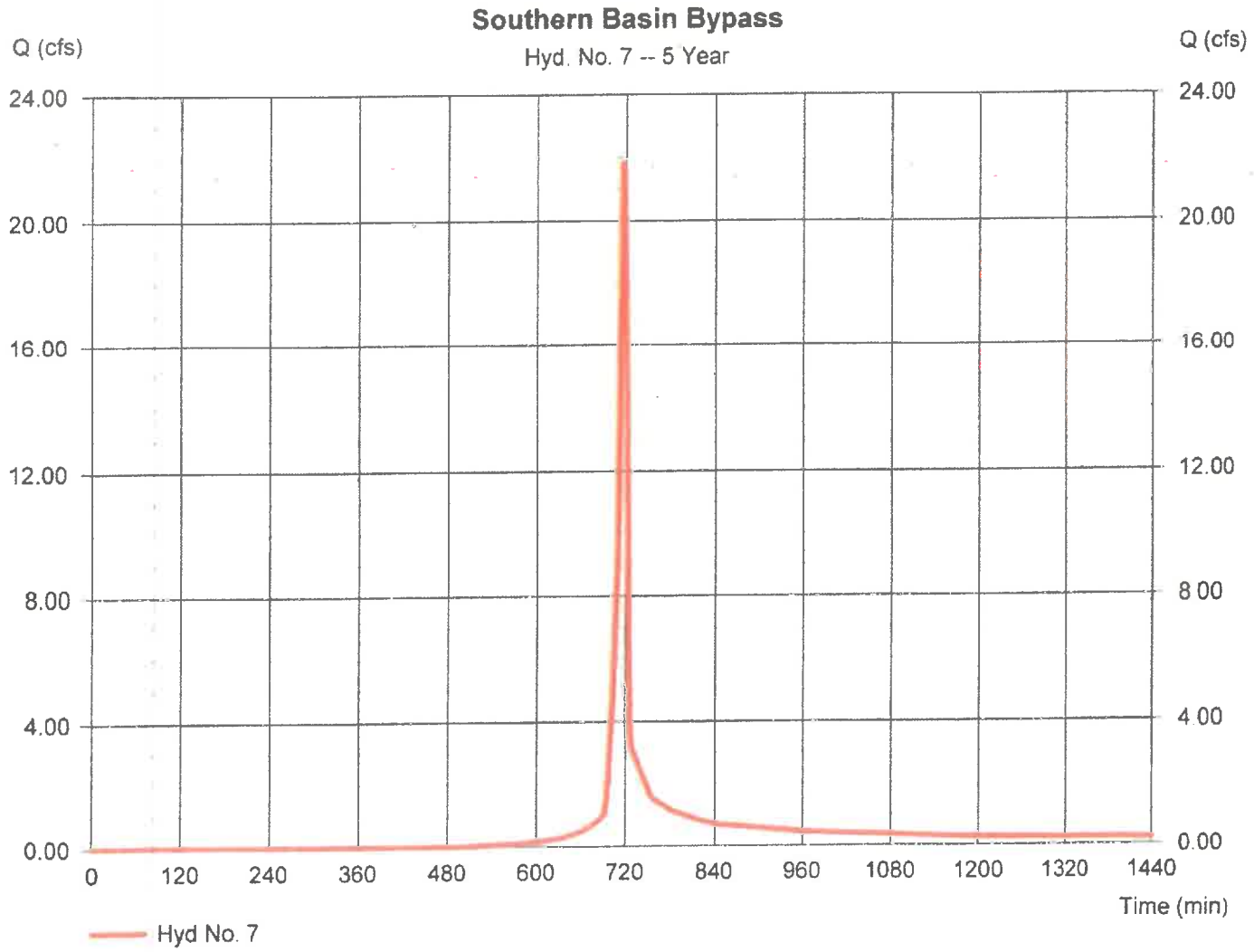
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 — Thursday, 06 / 13 / 2024

Hyd. No. 7

Southern Basin Bypass

Hydrograph type	= SCS Runoff	Peak discharge	= 21.81 cfs
Storm frequency	= 5 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 44,090 cuft
Drainage area	= 5.530 ac	Curve number	= 78.6
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 4.50 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



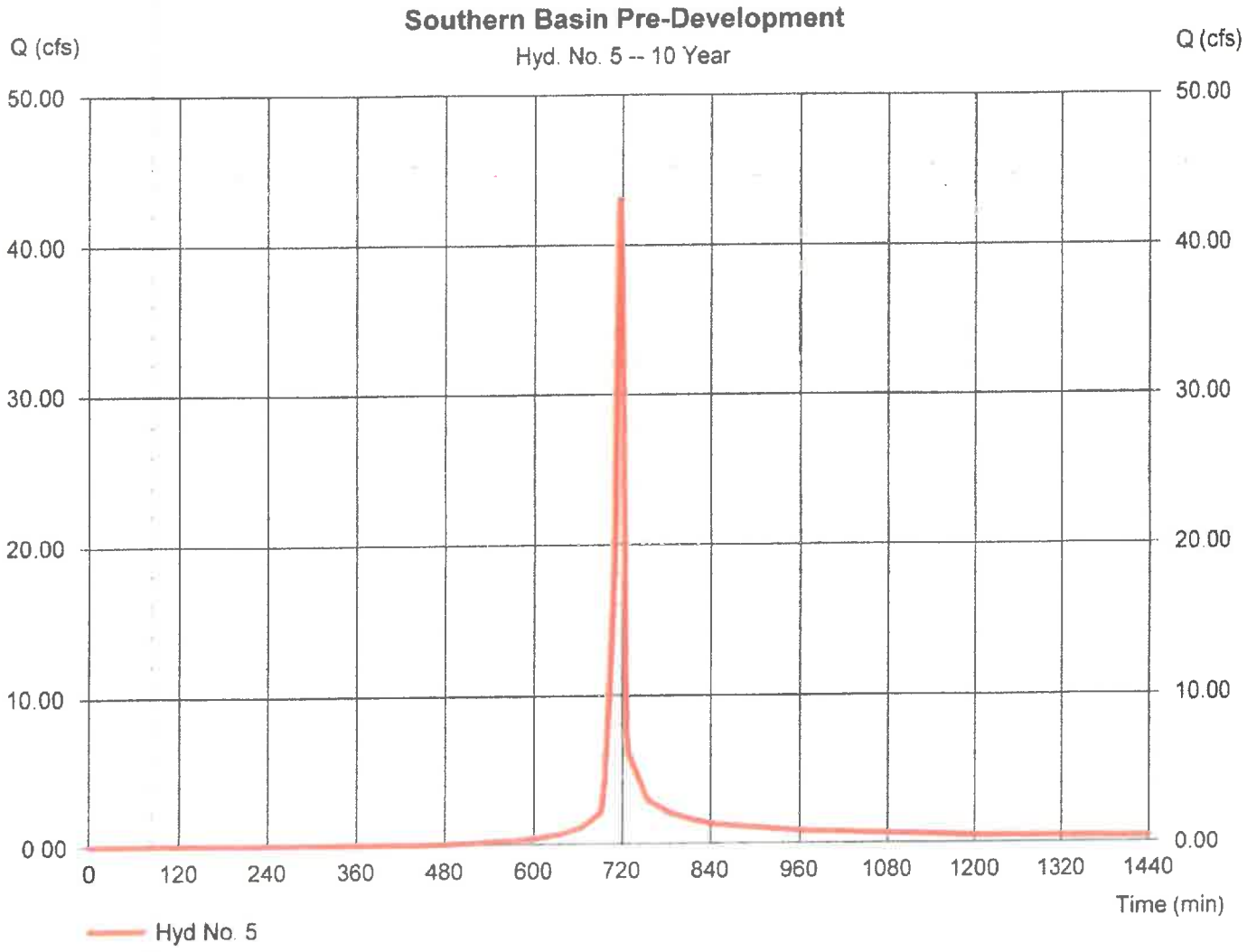
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 — Thursday, 06 / 13 / 2024

Hyd. No. 5

Southern Basin Pre-Development

Hydrograph type	= SCS Runoff	Peak discharge	= 43.00 cfs
Storm frequency	= 10 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 87,336 cuft
Drainage area	= 8.660 ac	Curve number	= 78.6
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.23 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



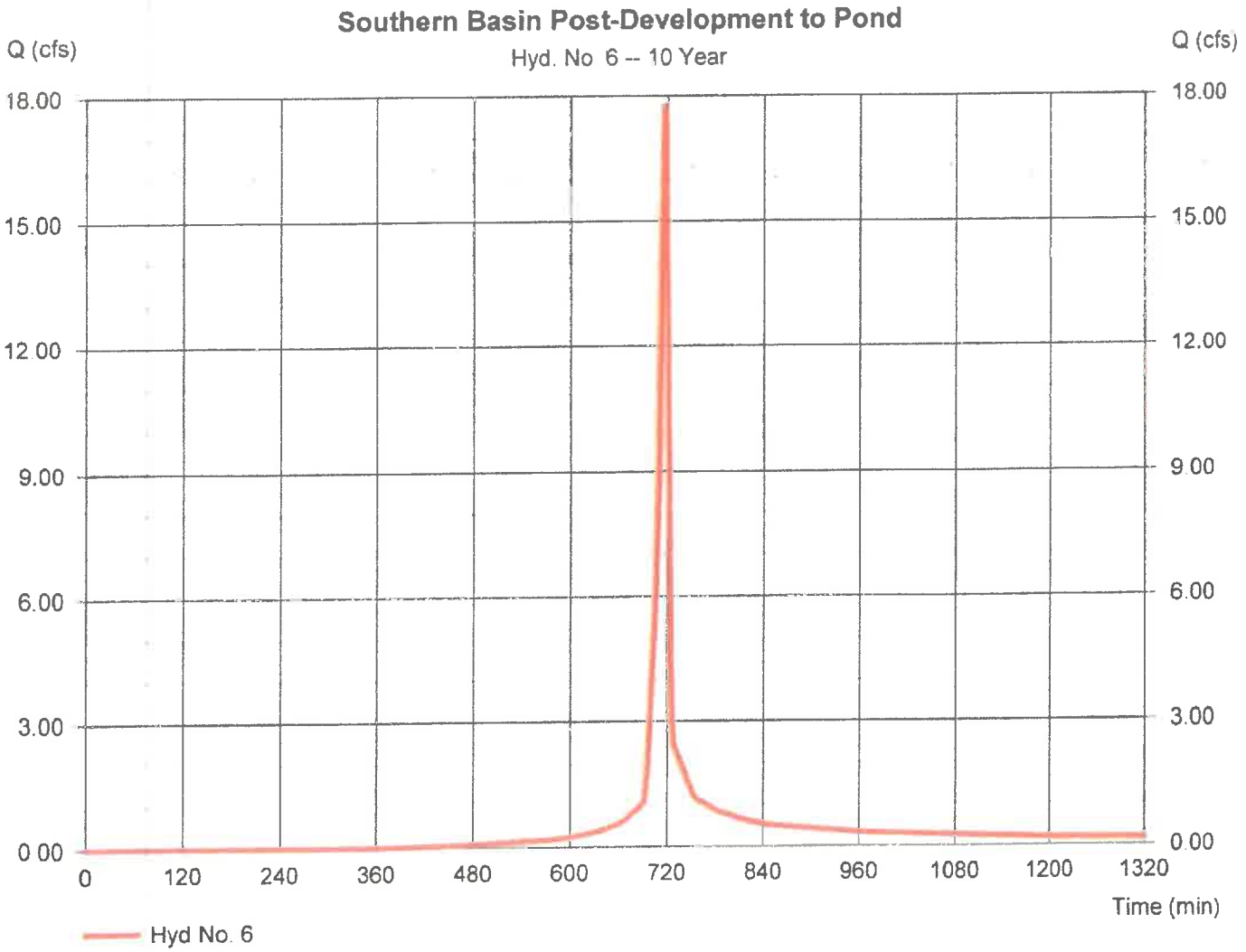
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 — Thursday, 06 / 13 / 2024

Hyd. No. 6

Southern Basin Post-Development to Pond

Hydrograph type	= SCS Runoff	Peak discharge	= 17.75 cfs
Storm frequency	= 10 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 36,663 cuft
Drainage area	= 3.130 ac	Curve number	= 83.6
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.23 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



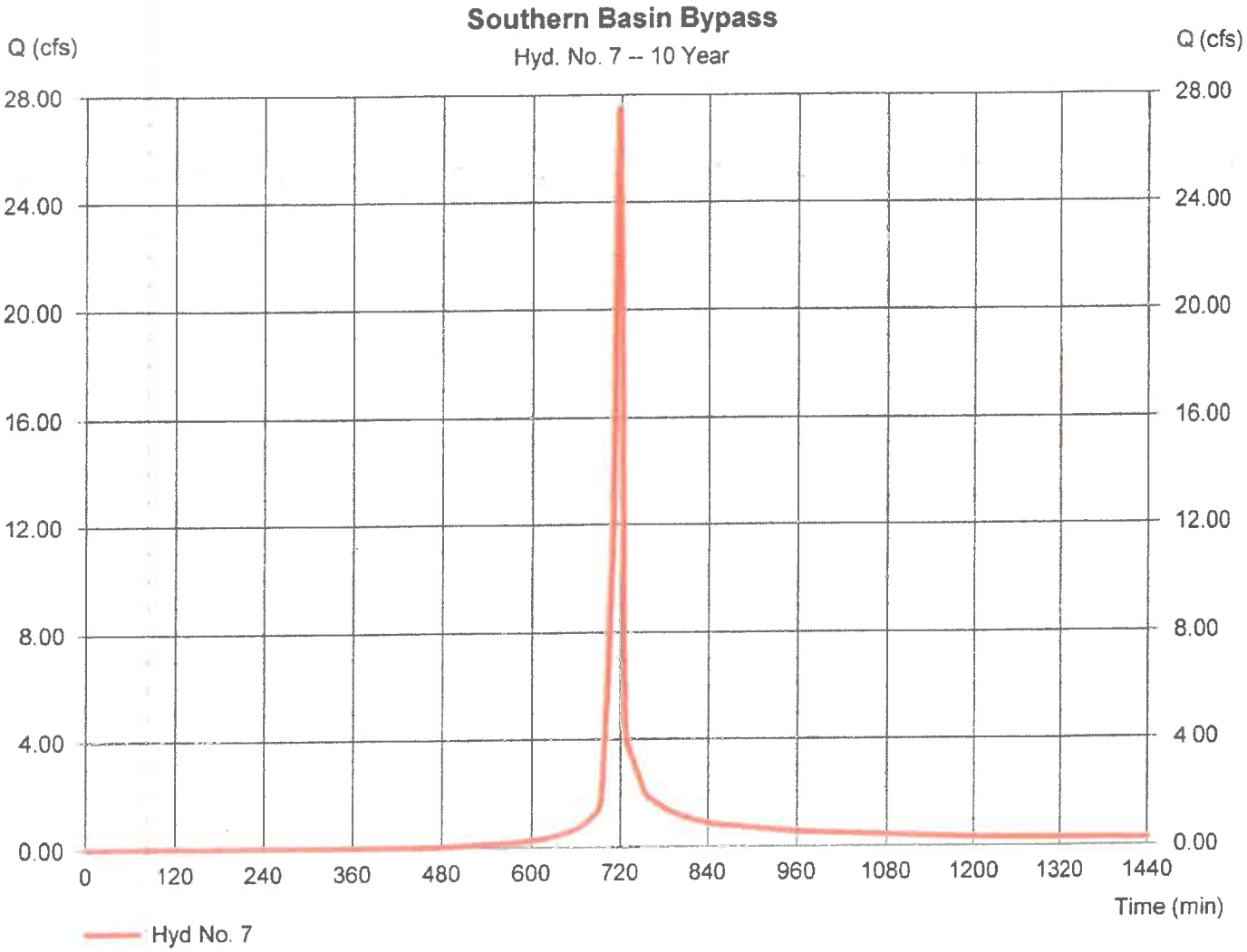
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 — Thursday, 06 / 13 / 2024

Hyd. No. 7

Southern Basin Bypass

Hydrograph type	= SCS Runoff	Peak discharge	= 27.46 cfs
Storm frequency	= 10 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 55,770 cuft
Drainage area	= 5.530 ac	Curve number	= 78.6
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.23 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



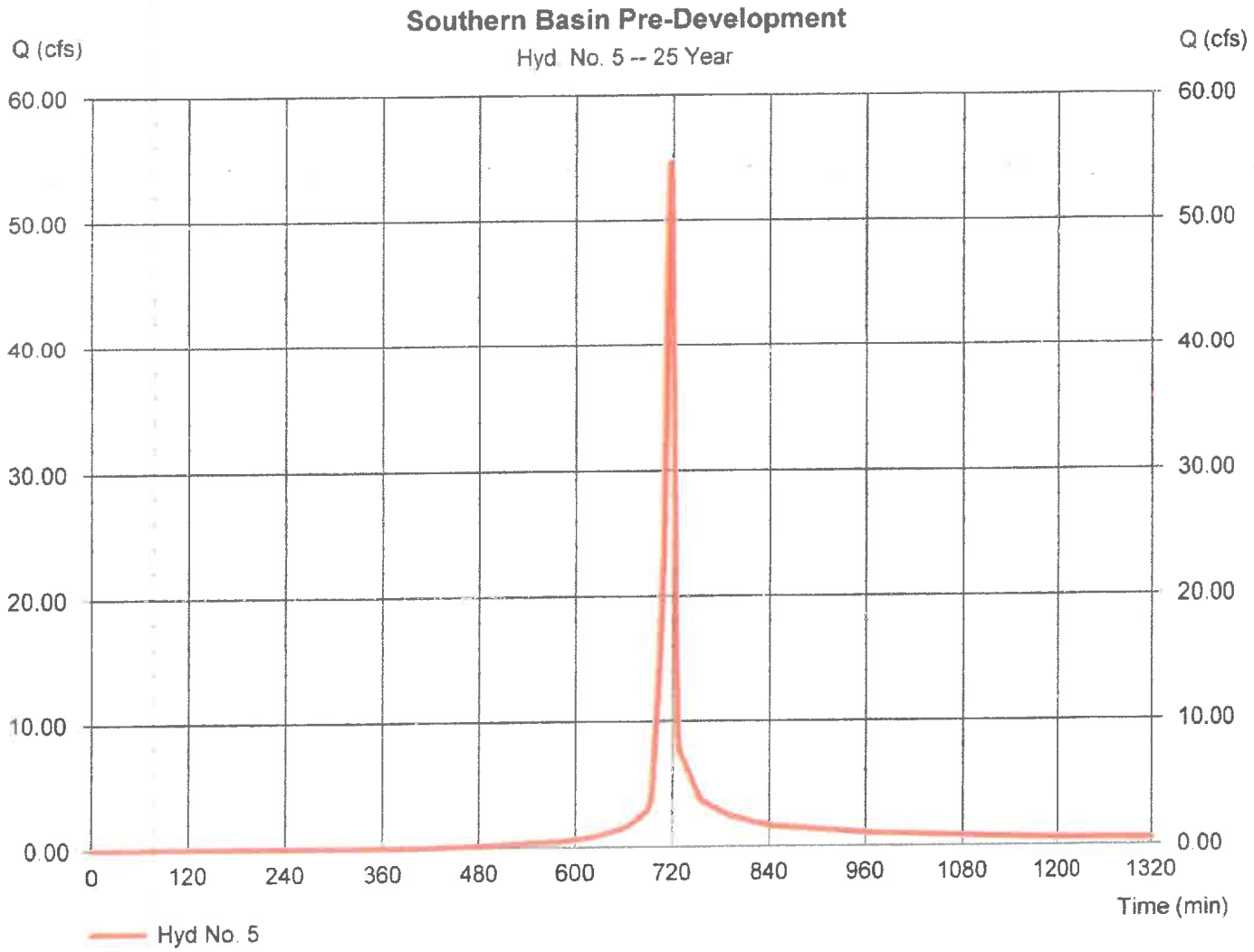
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 — Thursday, 06 / 13 / 2024

Hyd. No. 5

Southern Basin Pre-Development

Hydrograph type	= SCS Runoff	Peak discharge	= 54.48 cfs
Storm frequency	= 25 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 111,455 cuft
Drainage area	= 8.660 ac	Curve number	= 78.6
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.16 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



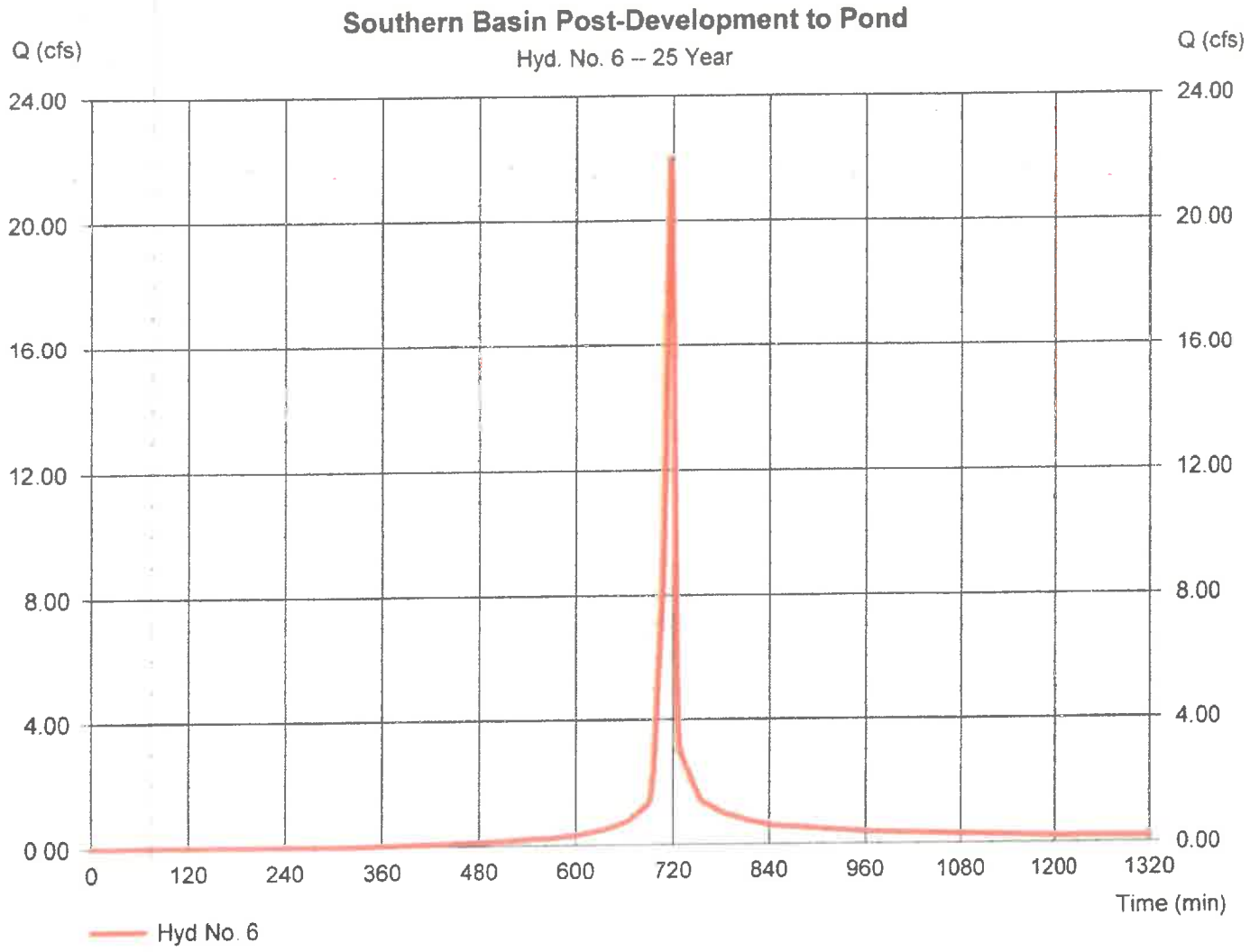
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 — Thursday, 06 / 13 / 2024

Hyd. No. 6

Southern Basin Post-Development to Pond

Hydrograph type	= SCS Runoff	Peak discharge	= 21.95 cfs
Storm frequency	= 25 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 45,843 cuft
Drainage area	= 3.130 ac	Curve number	= 83.6
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.16 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



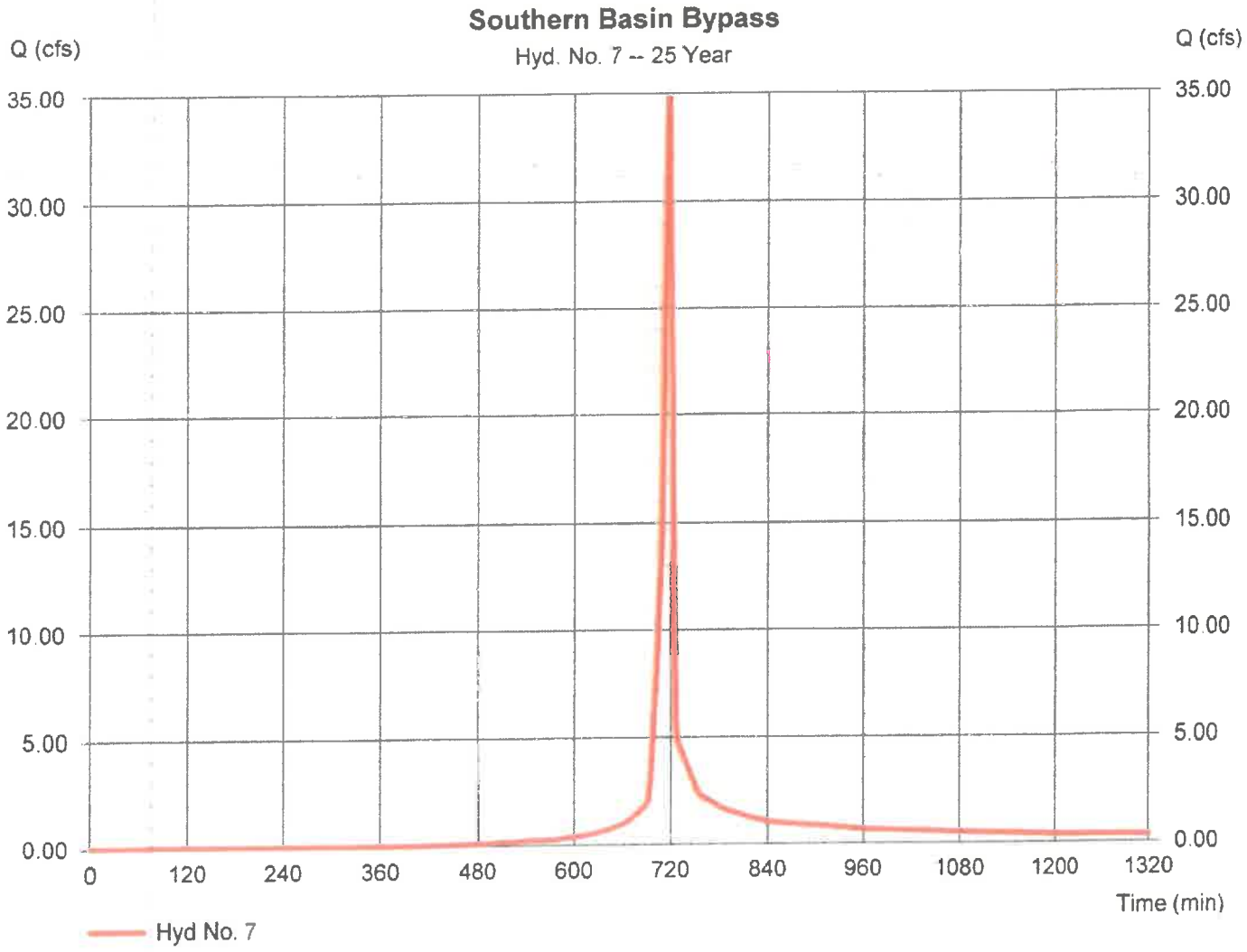
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 — Thursday, 06 / 13 / 2024

Hyd. No. 7

Southern Basin Bypass

Hydrograph type	= SCS Runoff	Peak discharge	= 34.79 cfs
Storm frequency	= 25 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 71,172 cuft
Drainage area	= 5.530 ac	Curve number	= 78.6
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.16 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



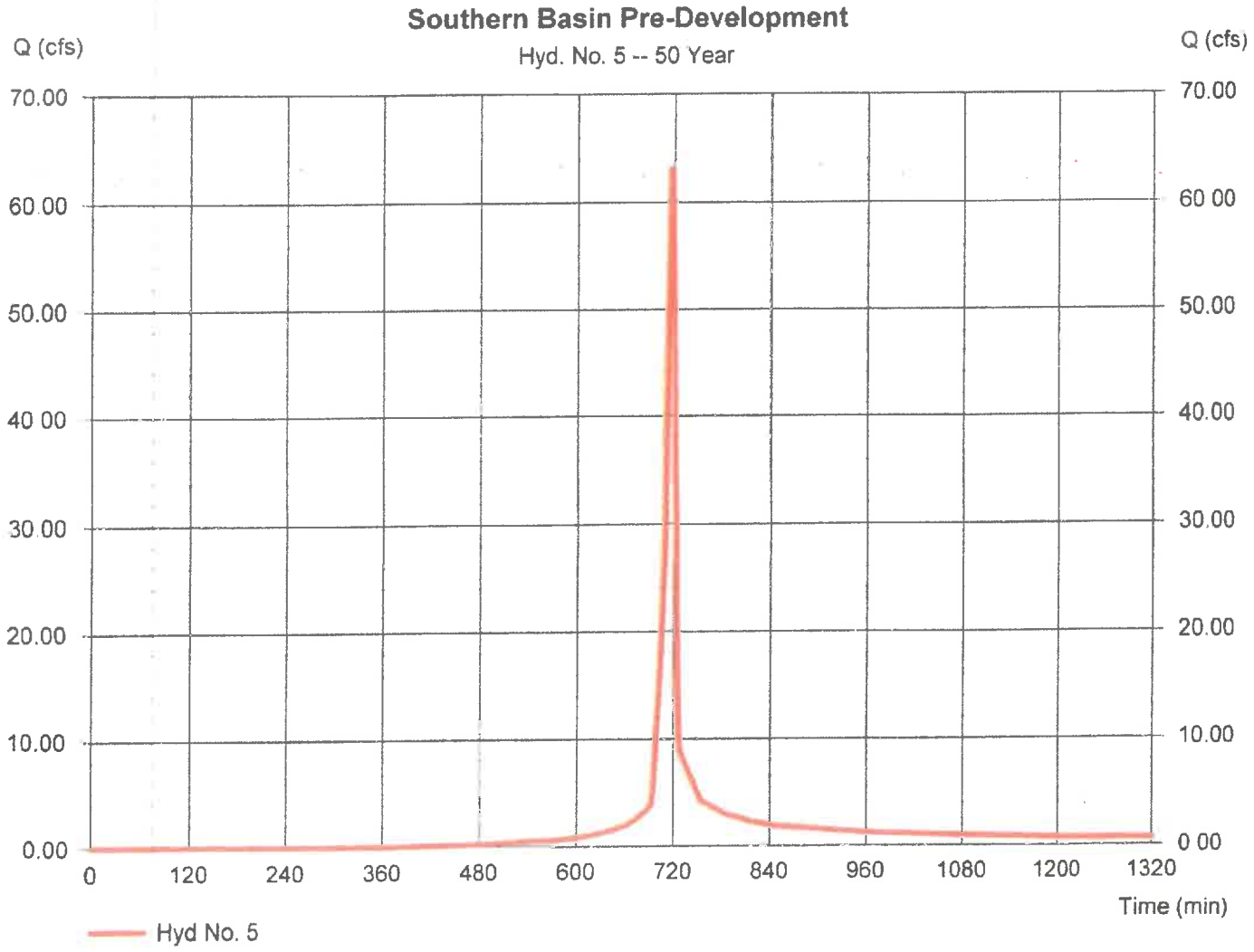
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 — Thursday, 06 / 13 / 2024

Hyd. No. 5

Southern Basin Pre-Development

Hydrograph type	= SCS Runoff	Peak discharge	= 63.06 cfs
Storm frequency	= 50 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 129,788 cuft
Drainage area	= 8.660 ac	Curve number	= 78.6
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.85 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



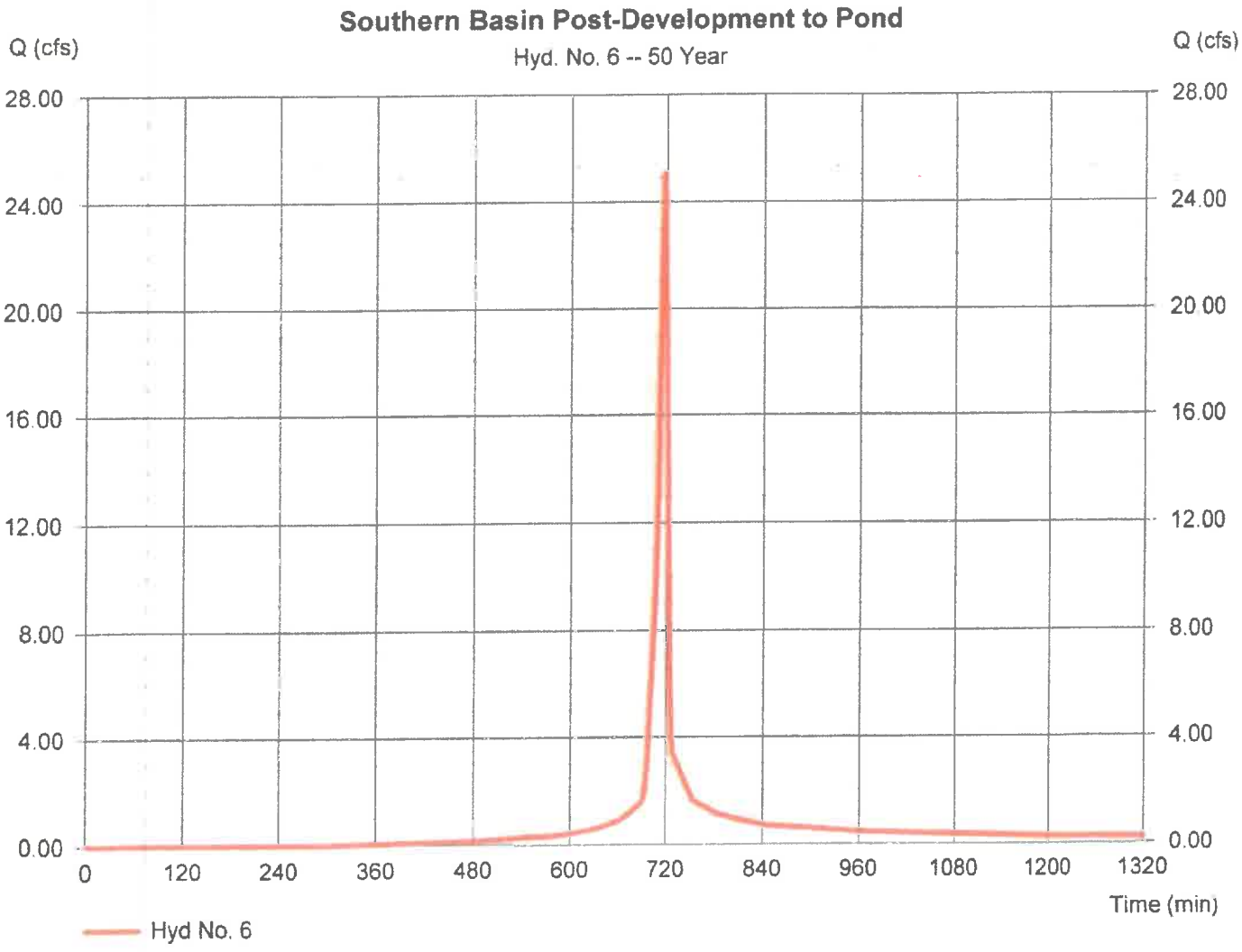
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 — Thursday, 06 / 13 / 2024

Hyd. No. 6

Southern Basin Post-Development to Pond

Hydrograph type	= SCS Runoff	Peak discharge	= 25.07 cfs
Storm frequency	= 50 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 52,758 cuft
Drainage area	= 3.130 ac	Curve number	= 83.6
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.85 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



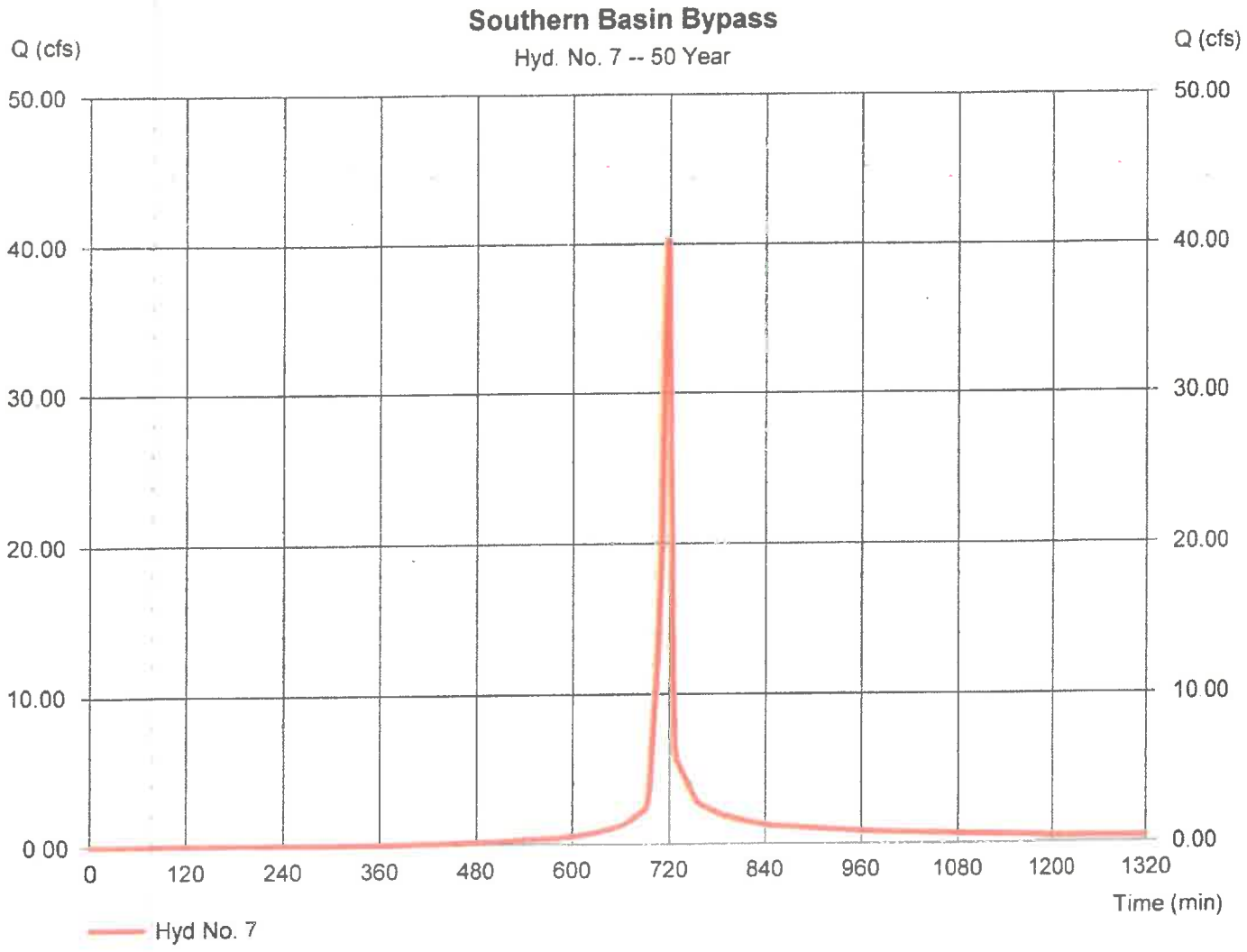
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 — Thursday, 06 / 13 / 2024

Hyd. No. 7

Southern Basin Bypass

Hydrograph type	= SCS Runoff	Peak discharge	= 40.27 cfs
Storm frequency	= 50 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 82,878 cuft
Drainage area	= 5.530 ac	Curve number	= 78.6
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 6.85 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



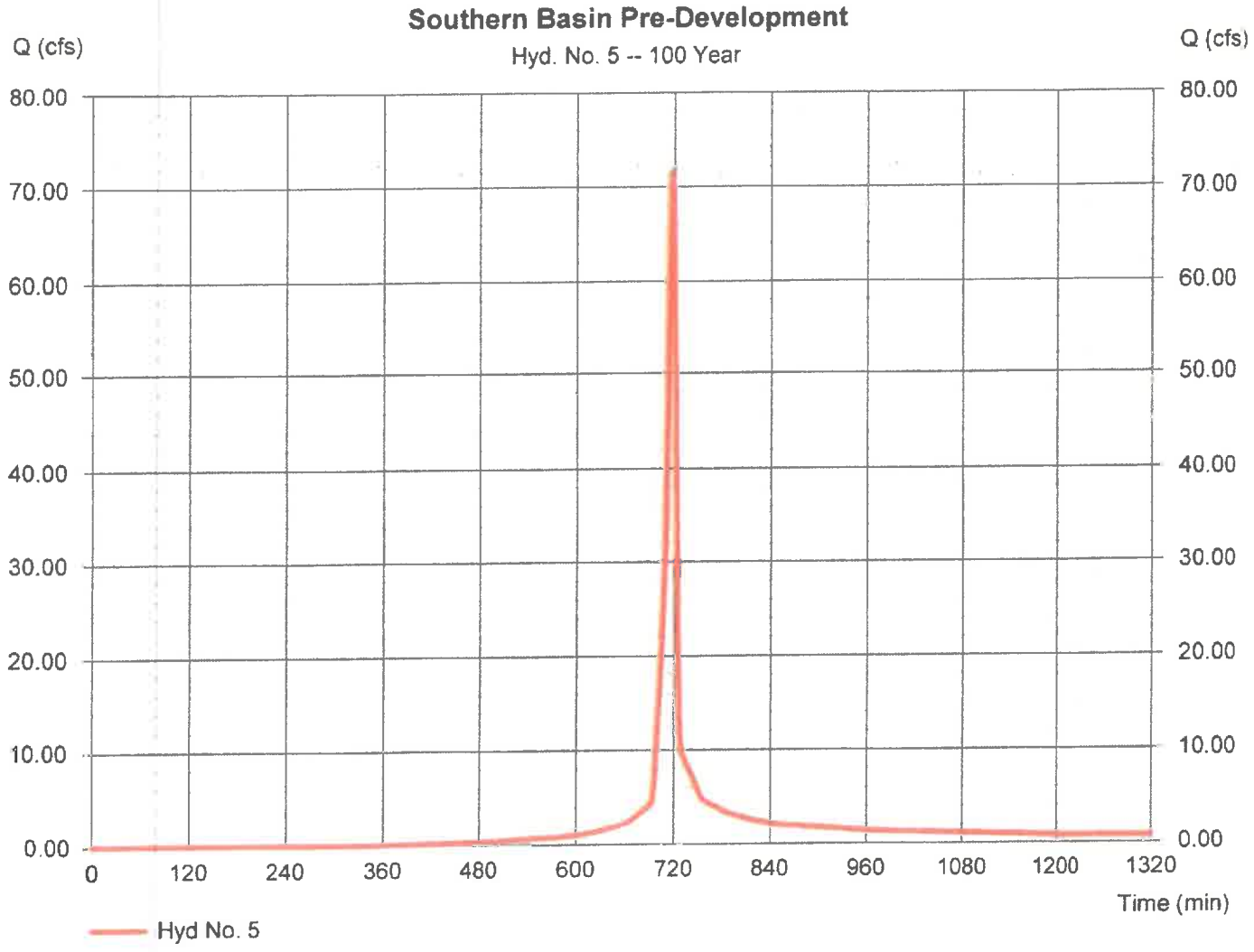
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 — Thursday, 06 / 13 / 2024

Hyd. No. 5

Southern Basin Pre-Development

Hydrograph type	= SCS Runoff	Peak discharge	= 71.55 cfs
Storm frequency	= 100 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 148,133 cuft
Drainage area	= 8.660 ac	Curve number	= 78.6
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 7.53 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



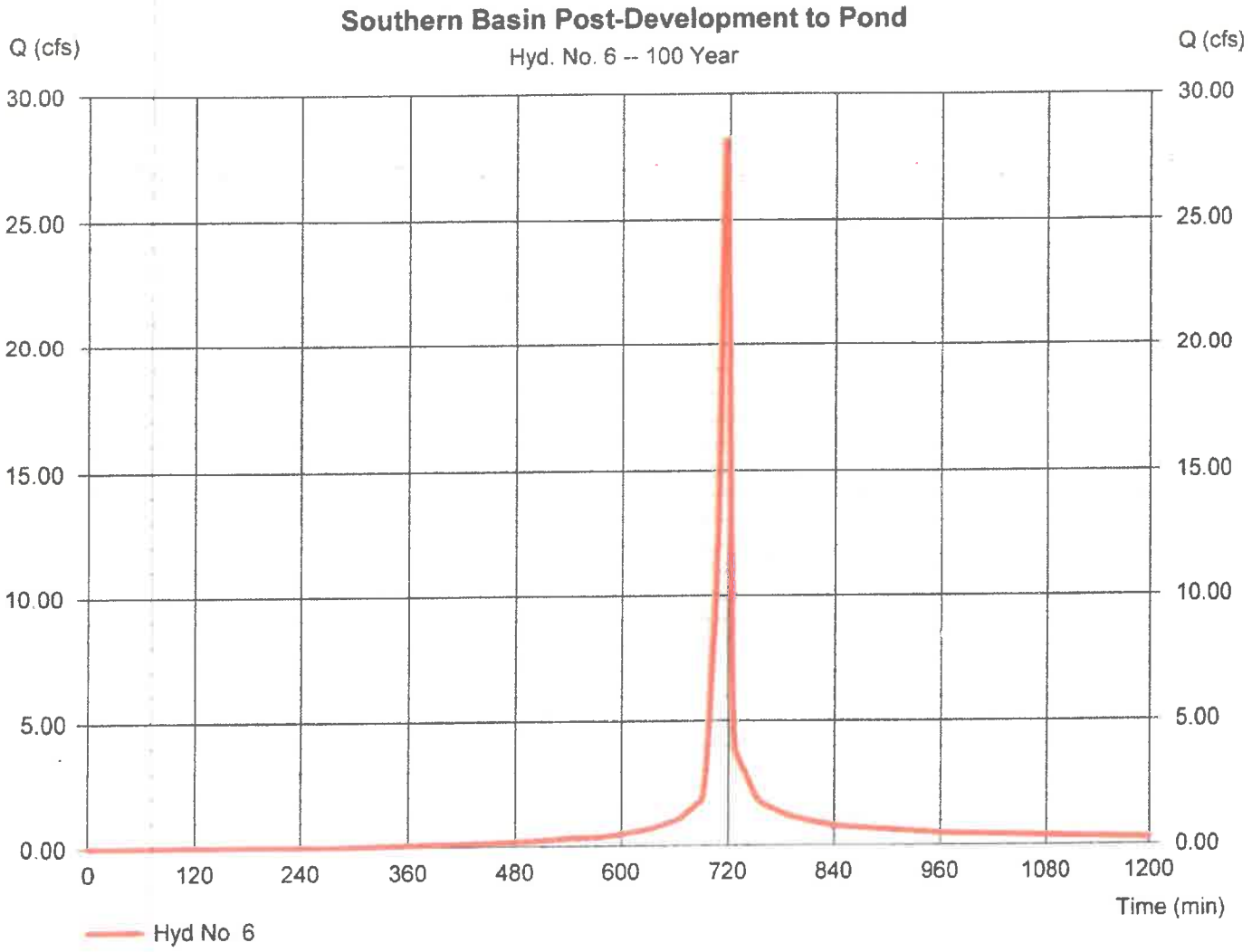
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 — Thursday, 06 / 13 / 2024

Hyd. No. 6

Southern Basin Post-Development to Pond

Hydrograph type	= SCS Runoff	Peak discharge	= 28.14 cfs
Storm frequency	= 100 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 59,638 cuft
Drainage area	= 3.130 ac	Curve number	= 83.6
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 7.53 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



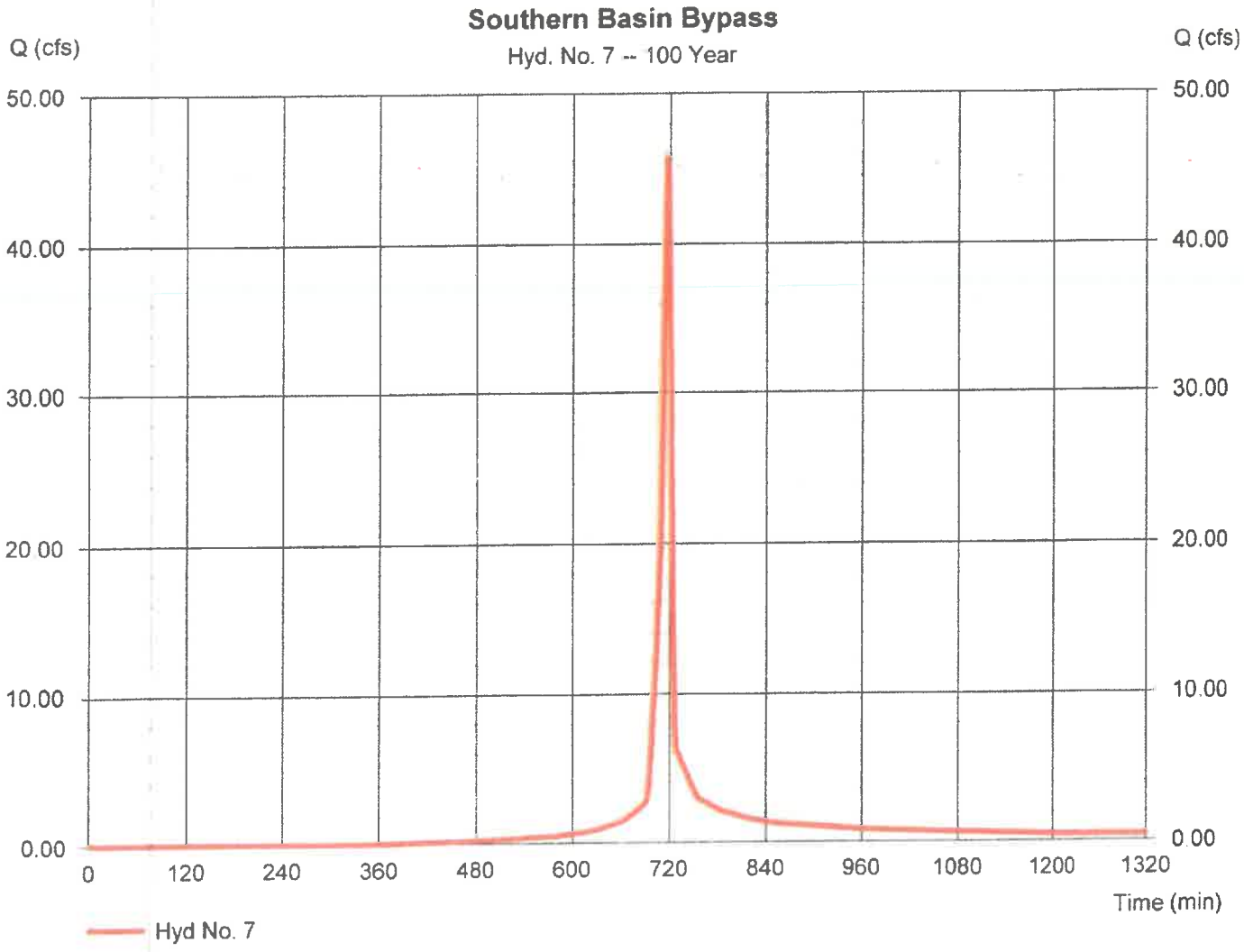
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 — Thursday, 06 / 13 / 2024

Hyd. No. 7

Southern Basin Bypass

Hydrograph type	= SCS Runoff	Peak discharge	= 45.69 cfs
Storm frequency	= 100 yrs	Time to peak	= 716 min
Time interval	= 2 min	Hyd. volume	= 94,593 cuft
Drainage area	= 5.530 ac	Curve number	= 78.6
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 7.53 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



Pond Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2024 — Thursday, 06 / 13 / 2024

Pond No. 3 - Southern Pond

Pond Data

Contours -User-defined contour areas Conic method used for volume calculation. Begining Elevation = 670.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	670.00	6,640	0	0
2.00	672.00	9,060	15,636	15,636
4.00	674.00	11,700	20,702	36,338

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 15.00	10.00	0.00	0.00
Span (in)	= 15.00	10.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 670.00	670.00	0.00	0.00
Length (ft)	= 34.50	0.33	0.00	0.00
Slope (%)	= 1.00	1.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

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

Exfil.(in/hr) = 0.000 (by Contour)

TW Elev. (ft) = 0.00

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

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	670.00	0.00	0.00	---	---	---	---	---	---	---	---	0.000
0.20	1,564	670.20	0.19 ic	0.04 oc	---	---	---	---	---	---	---	---	0.231
0.40	3,127	670.40	0.73 ic	0.10 oc	---	---	---	---	---	---	---	---	0.827
0.60	4,691	670.60	1.54 ic	0.16 oc	---	---	---	---	---	---	---	---	1.695
0.80	6,254	670.80	2.53 ic	0.20 oc	---	---	---	---	---	---	---	---	2.729
1.00	7,818	671.00	3.41 oc	1.47 oc	---	---	---	---	---	---	---	---	4.882
1.20	9,382	671.20	3.87 oc	2.16 oc	---	---	---	---	---	---	---	---	6.035
1.40	10,945	671.40	4.57 oc	2.60 ic	---	---	---	---	---	---	---	---	7.178
1.60	12,509	671.60	5.42 oc	2.86 ic	---	---	---	---	---	---	---	---	8.276
1.80	14,072	671.80	6.15 oc	3.09 ic	---	---	---	---	---	---	---	---	9.239
2.00	15,636	672.00	6.80 oc	3.30 ic	---	---	---	---	---	---	---	---	10.11
2.20	17,706	672.20	7.40 oc	3.51 ic	---	---	---	---	---	---	---	---	10.90
2.40	19,776	672.40	7.87 ic	3.70 ic	---	---	---	---	---	---	---	---	11.57
2.60	21,846	672.60	8.30 ic	3.88 ic	---	---	---	---	---	---	---	---	12.18
2.80	23,917	672.80	8.71 ic	4.05 ic	---	---	---	---	---	---	---	---	12.77
3.00	25,987	673.00	9.11 ic	4.22 ic	---	---	---	---	---	---	---	---	13.33
3.20	28,057	673.20	9.48 ic	4.38 ic	---	---	---	---	---	---	---	---	13.86
3.40	30,127	673.40	9.84 ic	4.54 ic	---	---	---	---	---	---	---	---	14.38
3.60	32,197	673.60	10.19 ic	4.69 ic	---	---	---	---	---	---	---	---	14.88
3.80	34,267	673.80	10.53 ic	4.83 ic	---	---	---	---	---	---	---	---	15.36
4.00	36,338	674.00	10.85 ic	4.97 ic	---	---	---	---	---	---	---	---	15.82

Hydrograph Report

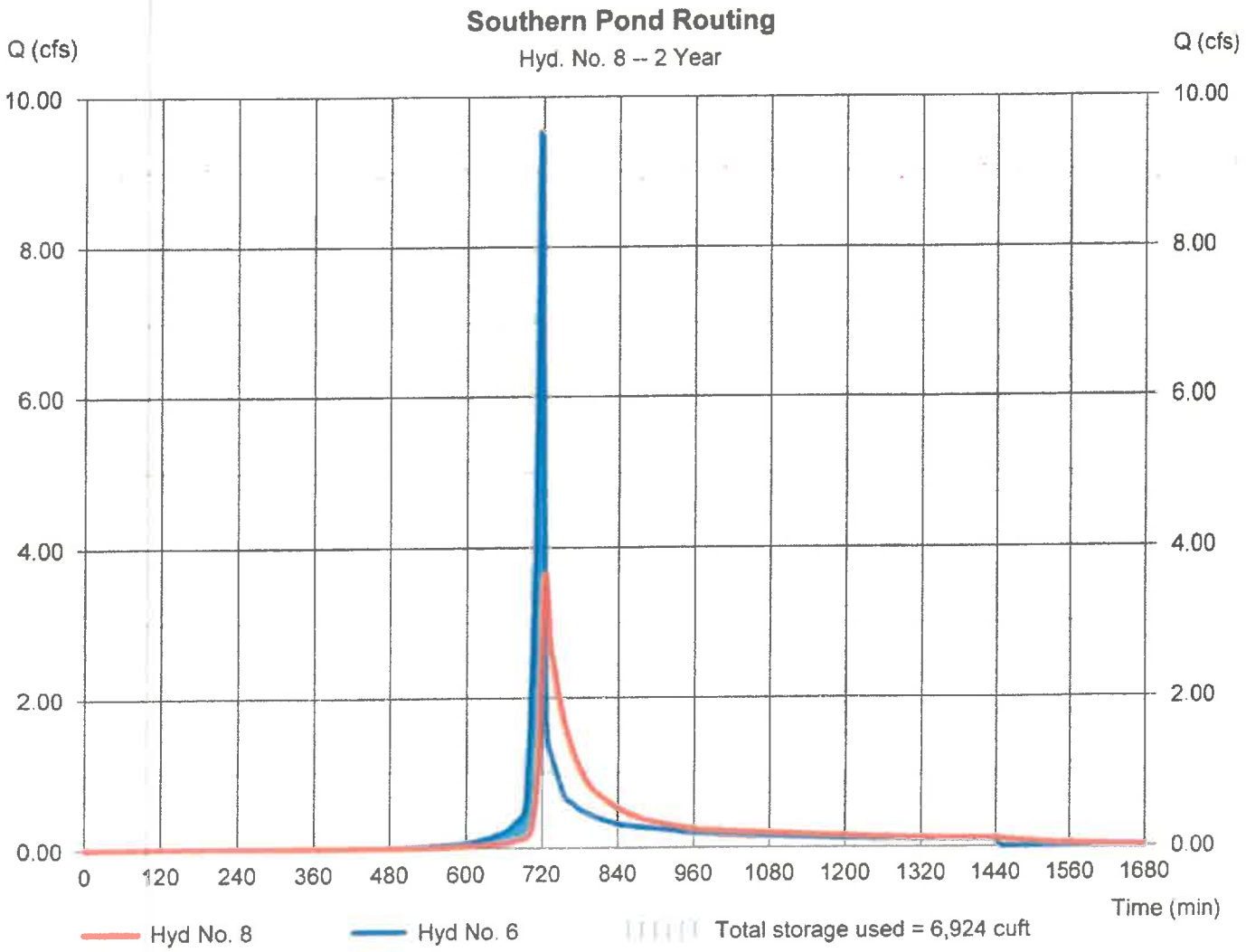
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Hyd. No. 8

Southern Pond Routing

Hydrograph type	= Reservoir	Peak discharge	= 3.651 cfs
Storm frequency	= 2 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 19,293 cuft
Inflow hyd. No.	= 6 - Southern Basin Post-Development	Max. Elevation	= 670.89 ft
Reservoir name	= Southern Pond	Max. Storage	= 6,924 cuft

Storage Indication method used.



Hydrograph Report

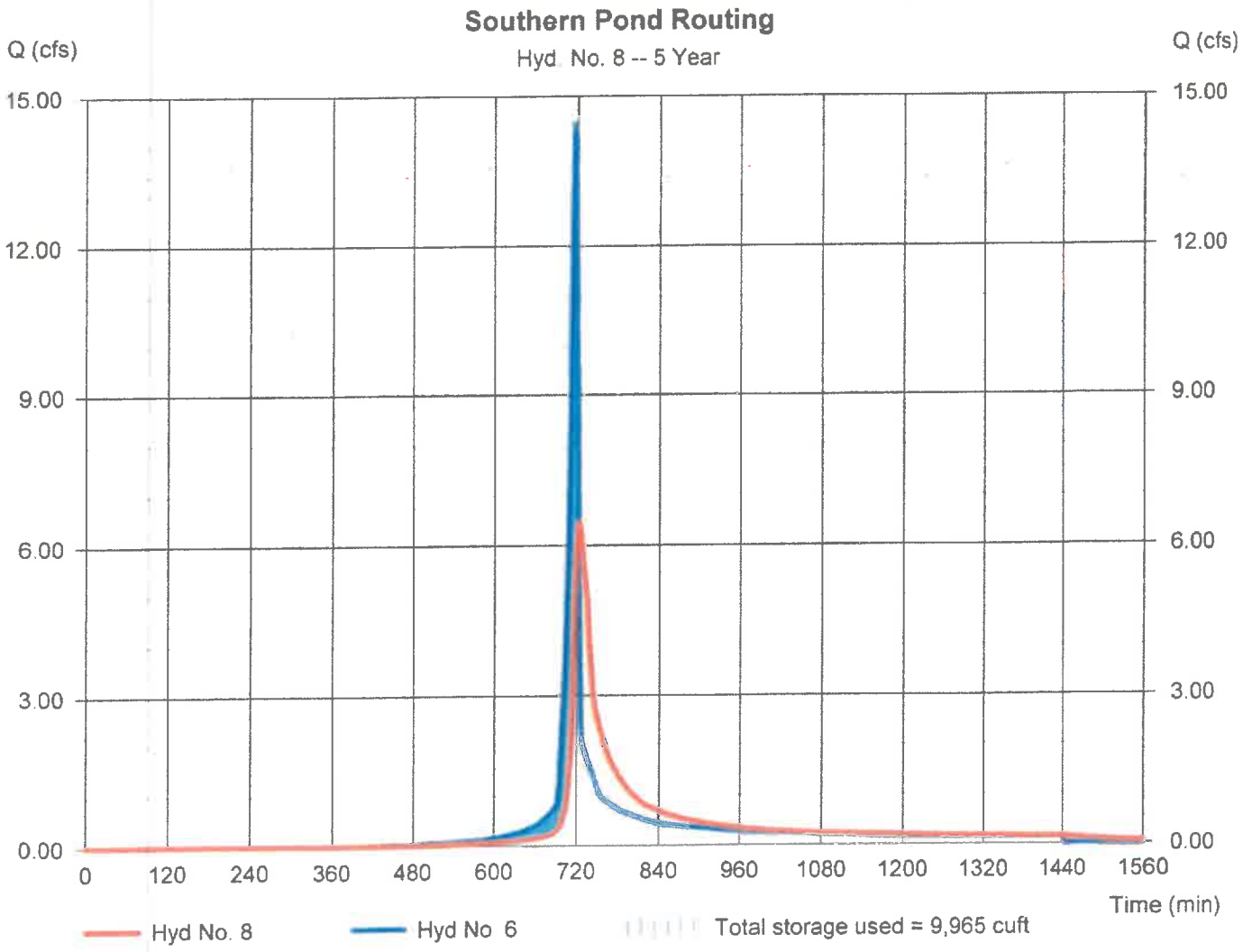
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Hyd. No. 8

Southern Pond Routing

Hydrograph type	= Reservoir	Peak discharge	= 6.461 cfs
Storm frequency	= 5 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 29,605 cuft
Inflow hyd. No.	= 6 - Southern Basin Post-Development	Max. Elevation	= 671.27 ft
Reservoir name	= Southern Pond	Max. Storage	= 9,965 cuft

Storage Indication method used.



Hydrograph Report

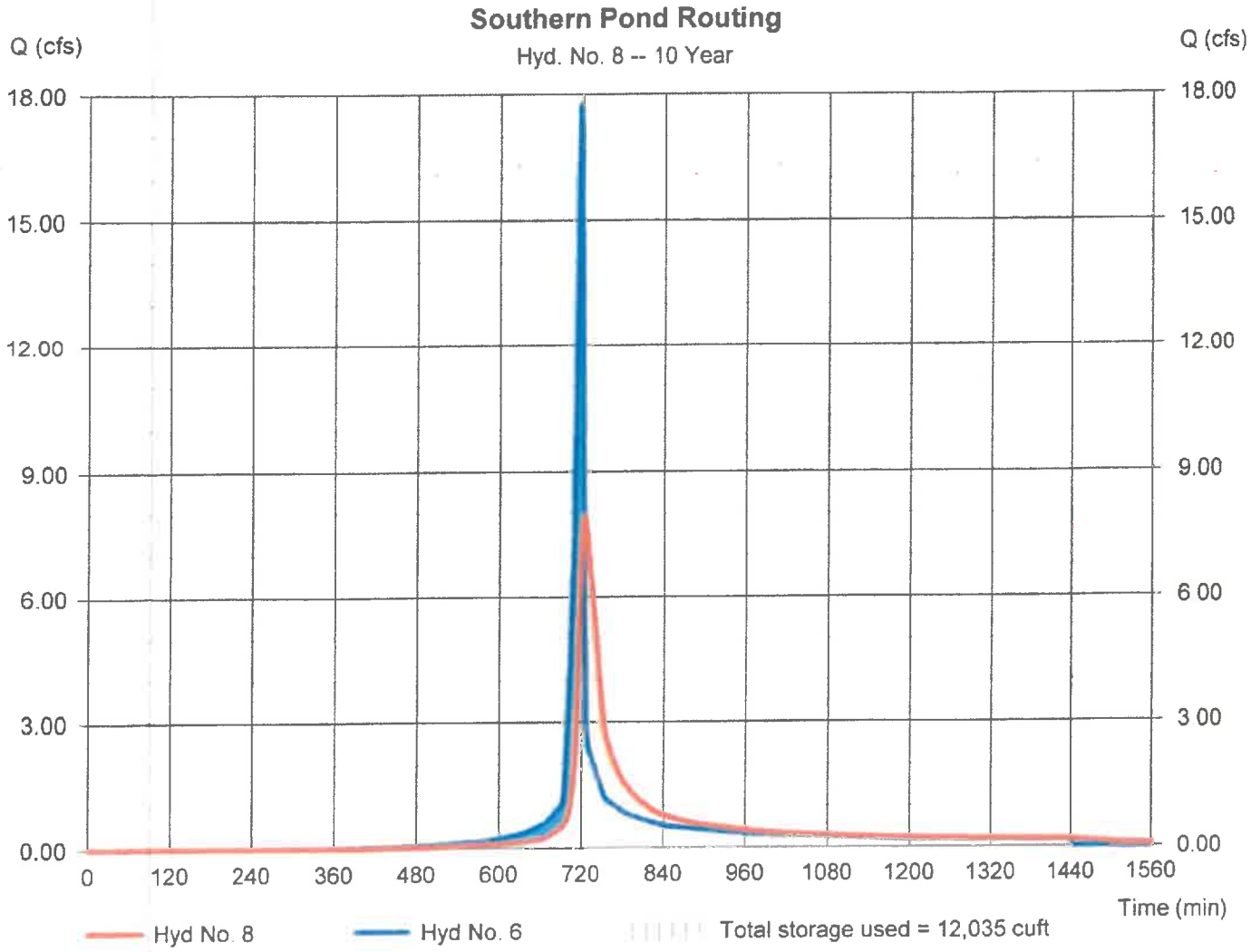
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Hyd. No. 8

Southern Pond Routing

Hydrograph type	= Reservoir	Peak discharge	= 7.944 cfs
Storm frequency	= 10 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 36,656 cuft
Inflow hyd. No.	= 6 - Southern Basin Post-Development	Max. Elevation	= 671.54 ft
Reservoir name	= Southern Pond	Max. Storage	= 12,035 cuft

Storage Indication method used.



Hydrograph Report

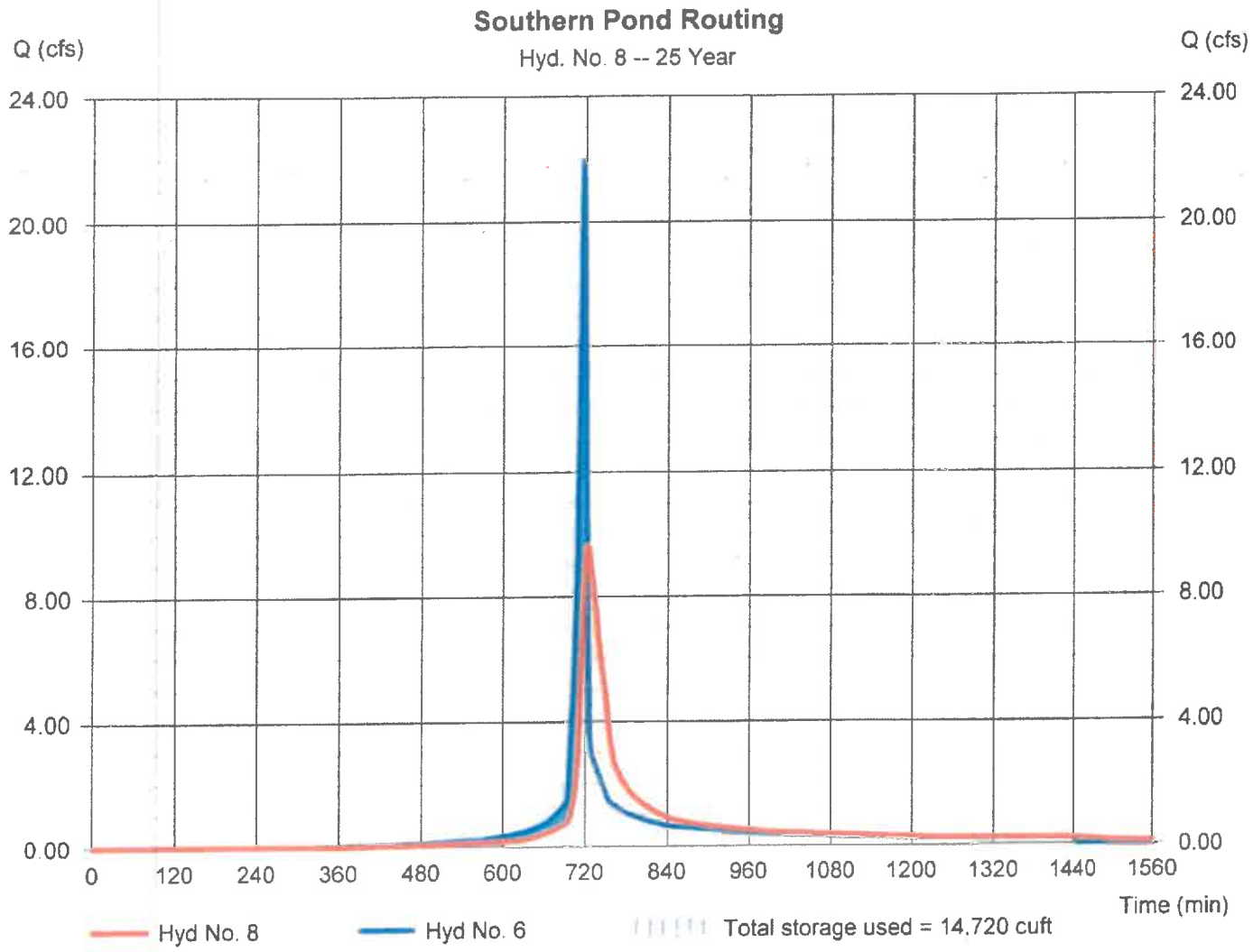
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Hyd. No. 8

Southern Pond Routing

Hydrograph type	= Reservoir	Peak discharge	= 9.598 cfs
Storm frequency	= 25 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 45,837 cuft
Inflow hyd. No.	= 6 - Southern Basin Post-Development	Max. Elevation	= 671.88 ft
Reservoir name	= Southern Pond	Max. Storage	= 14,720 cuft

Storage Indication method used.



Hydrograph Report

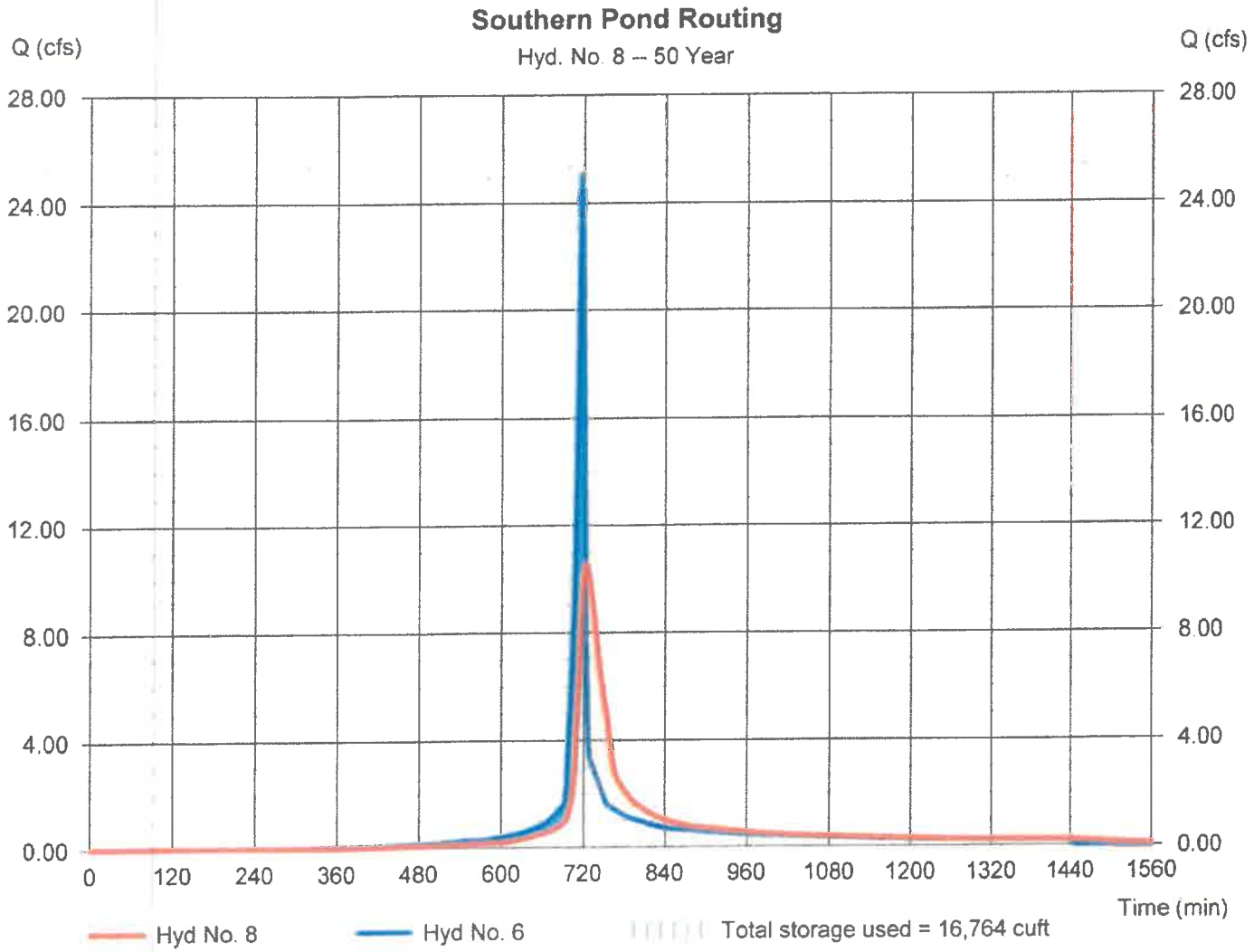
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Hyd. No. 8

Southern Pond Routing

Hydrograph type	= Reservoir	Peak discharge	= 10.54 cfs
Storm frequency	= 50 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 52,752 cuft
Inflow hyd. No.	= 6 - Southern Basin Post-Development	Max. Elevation	= 672.11 ft
Reservoir name	= Southern Pond	Max. Storage	= 16,764 cuft

Storage Indication method used.



Hydrograph Report

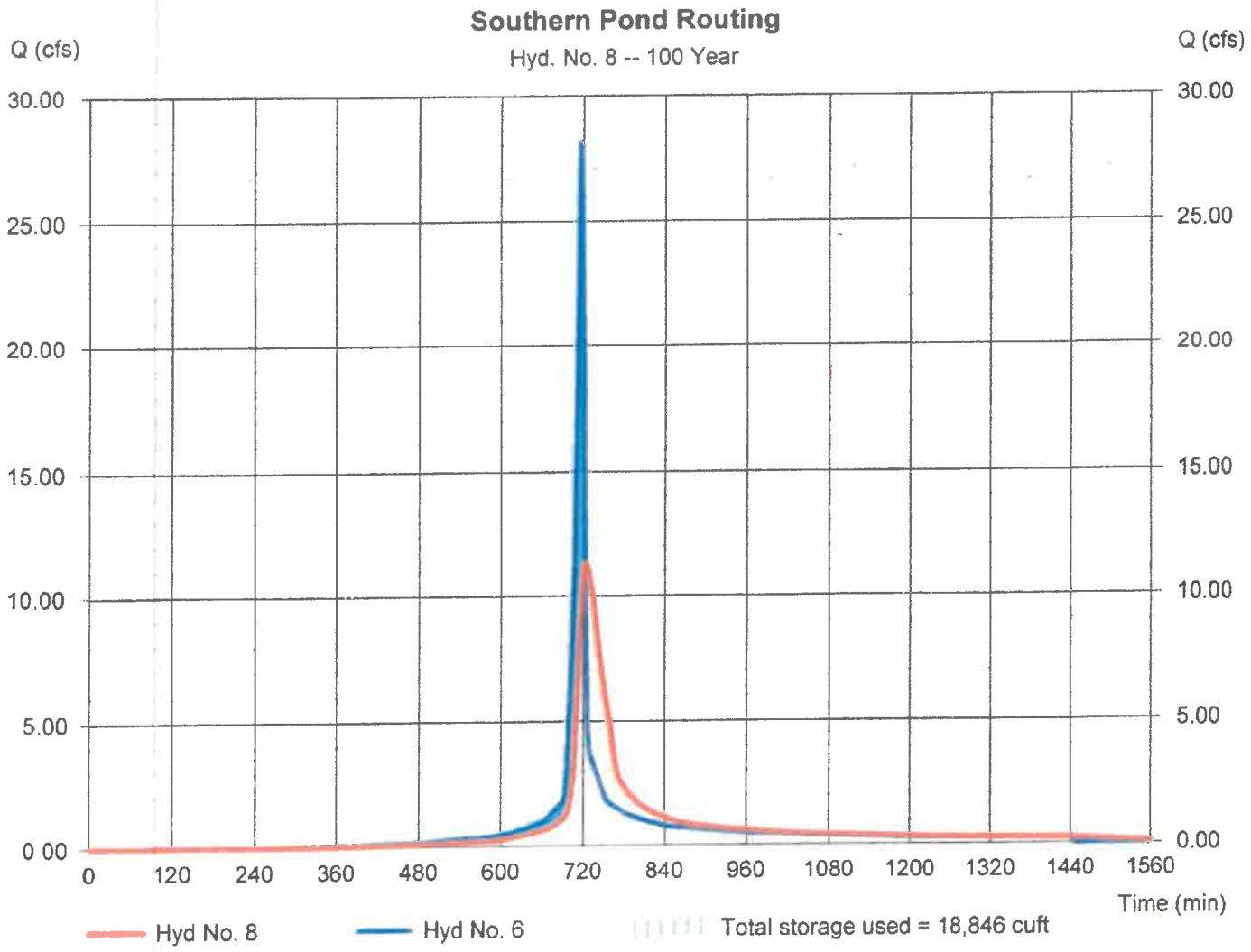
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Hyd. No. 8

Southern Pond Routing

Hydrograph type	= Reservoir	Peak discharge	= 11.27 cfs
Storm frequency	= 100 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 59,631 cuft
Inflow hyd. No.	= 6 - Southern Basin Post-Development	Max. Elevation	= 672.31 ft
Reservoir name	= Southern Pond	Max. Storage	= 18,846 cuft

Storage Indication method used.



Northwind Estates Section 2 Southern Pond

Drainage Data Summary Table

Dean Design Group, LLC
Charley Dean, PE
Phone: 615-300-6316

Design Storm	Pre-Development Peak Flow	Area By-Passing Pond	Routed Peak Discharge from Detention Pond	Combined Peak Discharge	Summary			% Reduction from *Existing*
2	21.36	13.64	3.65	17.29	**Peak Flow Reduction**	**4.07**	**cfs**	**19.0%**
5	34.15	21.81	6.46	28.27	**Peak Flow Reduction**	**5.88**	**cfs**	**17.2%**
10	43.00	27.46	7.94	35.40	**Peak Flow Reduction**	**7.60**	**cfs**	**17.7%**
25	54.48	34.79	9.60	44.39	**Peak Flow Reduction**	**10.09**	**cfs**	**18.5%**
50	63.06	40.27	10.54	50.81	**Peak Flow Reduction**	**12.25**	**cfs**	**19.4%**
100	71.55	45.69	11.27	56.96	**Peak Flow Reduction**	**14.59**	**cfs**	**20.4%**

MAXIMUM POND ELEVATIONS	
Storm Event	Elevation
2	670.89
5	671.27
10	671.54
25	671.88
50	672.11
100	672.31