BAUGHMAN

DRAINAGE PLAN
BROOKFIELD ADDITION

AUGUST 2016

REPORT CONTENTS

EXISTING CONDITIONS

The property is located at the south east corner of 37th Street North and Greenwich Road in Wichita, Sedgwick County, Kansas. The site is bounded on the south Dry Creek Tributary on the south.

The site is currently open space farmland with multiple tree rows separating said land from the creek and pond on the south. There are two tributaries which entering from the west which drains into the existing pond, which appears to be heavily silted in from its original conditions. The creek flows to the east and onto the adjacent property. The majority of the south creek area is encumbered by FEMA Floodplain. There is also a small floodplain boundary located at the extreme north east corner of the site which 'corner clips' the property. The floodplain boundaries described above were obtained from the Future Effective Floodplain maps which will be in effect when this property is developed. Currently, the floodplain on the site is an unstudied Zone A which does not follow any topographical features.

Based on the above, there are three main points of discharge onto this site. Two of those are from the west via road crossings located under Greenwich. The other is a culvert at the northeast corner via a culvert under 37th Street.

The drainage patterns can be viewed on the Aerial and Lidar Exhibit (Exhibit 1). This exhibit also shows the existing basin boundaries and discharge points.

PROPOSED CONDITIONS

The property is being developed into a residential subdivision with associated streets, utilities, and storm water drain systems. The site will utilize the existing detention pond as well as construct a larger pond within the platted lots. The ponds will not only provide detention for the developed runoff, but will also serve as sedimentation basin for water quality treatment. The developed site will convey runoff to the ponds via overland flow or storm water sewer. The majority of the site runoff will be directed to the pond located within the platted lots as well as some directed to the existing pond located in-line with the creek flow.

The floodplain areas that encroach on platted lots will be permitted, filled, and removed from the floodplain prior to the construction of structures on these respective lots. None of the platted lots fall within the proposed 70% floodway, as provided to us by AMEC.

For a half-scale copy of the Plat, see Exhibit 2.

OFFSITE CONDITIONS

The property is located along multiple tributaries to Dry Creek. The creek enters the property from the west under Greenwich Road. Flowing east, it passes through the existing pond and then into a channel section before exiting the property into the platted Four Oaks Addition to the east. There is a smaller mapped floodplain area located at the northeast corner of the site which drains from the north to the southeast onto the aforementioned Four Oaks Addition.

The Offsite Drainage Exhibit can be seen as Exhibit 3.

EXISTING CONDITIONS RUNOFF CALCULATIONS

DRAINAGE METHODS & STANDARDS

The following methods and standards, although not a complete list, were used in calculating the existing conditions runoff values.

- STORM SERIES
  - 24-hour; 2-yr, 5-yr, 10-yr, 25-yr, 100-yr Storm Events
  - 2-yr Rainfall Intensity = 3.83 in
  - 10-yr Rainfall Intensity = 5.22 in
  - 100-yr Rainfall Intensity = 7.37 in

- FLOW DATA
  - Areas per LIDAR data, USGS Quadrangle Sheet, Aerial Photos, and Site Visits
  - SCS Curve Number Method (CN = 80, Pre-developed Undisturbed, Soil Type D)
  - Time of Concentration: Lag Method (minimum 15 min)

SITE CHARACTERISTICS

The topography on the site generally drains to the south and directly into Dry Creek East. The site is currently farm ground and pasture area covering the north and majority of the site. The creek and heavy treed/brush area borders the south. There is an existing pond located along the south directly on-line with Dry Creek East. There is mapped floodplain located on the property. This is discussed in more detail later in this report.

Three tributaries converge through and along the south of this site to form the main Dry Creek East channel. Two tributaries enter from the west under Greenwich Road and converge just upstream of the existing pond. The pond then drains to the east and off the property. Before exiting the property, Dry Creek East picks up another tributary from the south, which does not appear to affect this property at this time. There is a small portion of the site which drains to the north east and immediately offsite. This drainage flows to Dry Creek East just off the property via Dry Creek Tributary 6.

The drainage patterns can be seen on the Aerial and Lidar Exhibit, Exhibit 1.

EXISTING CONDITIONS HYDROLOGIC ANALYSIS

The property was analyzed for on-site flows based on existing conditions for peak runoff for the entire storm series. Conditions on the site are currently open space pasture and farmland in Type D soils. Using the storm water manual, a Curve Number of 80 was used for existing conditions. Peak flows were generated using hydrographs with a time of concentrations calculated by the Lag Method utilizing slope and run lengths. The majority of the runoff drains to the creek bypassing the existing pond.

DOWNSTREAM DRAINAGE CAPACITY

The site directly discharges into a channel section noted as Dry Creek East. This area is heavily treed and features channel characteristics. The creek flows from west to east and drains 3 tributaries before exiting the site at the southeast corner of the site. This area, the creek and its tributaries, are located within the mapped floodplain (based on the future effective FIRM Panel, effective December 22, 2016).

DRAINAGE METHODS & STANDARDS

The following methods and standards, although not a complete list, were used in developing the drainage and grading plans.

- STORM SERIES
  - 24-hour; 2-yr, 5-yr, 10-yr, 25-yr, 50-yr, 100-yr Storm Events Calculated
  - Rational Formula Method used for peak runoff
  - CN = 88 (Single family, 1/3 ac lots)
  - Time of Concentration; Lag Method, minimum Tc = 15min
  - Rational 'C' Factor = 0.73 (5-year event – where applicable)

- GRADING CONSTRAINTS TO BE OBSERVED AT SITE PLAN
  - Match all existing perimeter grades
  - Overflows utilized is existing ROW / curb grades
  - 2% rear yard grades – minimum
  - 0.5% street grades – minimum
  - Storm water sewer – 5-year event modeled with HGL underground

DEVELOPED CONDITIONS HYDROLOGIC ANALYSIS

The site is being platted and will be developed into a residential subdivision. The site will be re-graded to construct a large detention pond, utilities, streets, and homes. The site will detain runoff in the proposed detention pond as well as the on-line detention pond in its existing condition. The ponds will limit the developed runoff to less than existing conditions.

The site was modeled using HydraFlow Hydrographs based on developed conditions for a residential subdivision. A curve number of 88 was used based on 1/3 acre lots. A time of concentration of 15 minutes was used for the un-detained basins while the main basin to the main pond was calculated to be 20 minutes based on 2% site slops and a run length of 1200'. This is a conservative value for this area as in the larger rainfall events the areas around inlets will pond and store runoff before being conveyed to the pond.

The storm sewer system on the proposed property was designed to accommodate the 5 year storm event while holding the HGL underground. Emergency overflow elevations will be provided to protect structures for storm events exceeding the storm sewer design storm.

The majority of the site will discharge to the proposed detention pond. The remaining areas of the site will either flow to the existing pond via SWS, flow un-detained to the channel just downstream of the pond(s), or flow un-detained to the north east corner ditch section. This site will over detain in the ponds due to the areas of development that will discharge un-detained.

DETENTION FACILITY

There are two detention ponds on this proposed site. One is existing and the other will be constructed as part of the site development. The main pond, located within the platted lots, will house the majority of the detention and water quality treatment for the site. The existing pond will provide some detention as well as conveyance for the offsite runoff from the west tributaries. Each pond is covered in more detail below.

Main Pond

This pond is located near the middle of the property and will accept runoff from approximately 60 acres of developed area. This pond will have a static water surface elevation of a 1367.0. The main outflow for the pond is a 36" RCP in a drop structure configuration which will drain to the south and directly into the Dry Creek East channel. There will be an overflow weir located on the east edge of the lake which will be 10' in width and at an elevation of a 1369.75. We expect this weir to be utilized in events exceeding the 10-year design rainfall/runoff.

The pond established a 100-year peak WSE elevation of a 1370.3. This is with a free discharging outfall. Since this pond outlet will be located in the floodplain, we also modeled the pond with a tailwater equaling the BFE at the point discharge. With a tailwater elevation of a 1368, the design water surface rises to a 1371.0. The rear yards of the adjacent structures are being proposed to be at elevation 1371.0 with the homes having a 2' free board from there. Using the tailwater WSE of the pond for grading purposes allows more protection for the adjacent properties. Although the design takes into consideration the tailwater elevation at the creek, we do not anticipate this occurring as the creek would need to be flooding at 100-year levels and the local basin would then need to have a 100-year design storm at the same time.

South Pond

The south pond will accept runoff from just over 15 acres of developed property that bypasses the main pond. This pond is located directly on-line of the creek and also detains and conveys its corresponding runoff. The existing ponds outfall is not expected to be altered with this project at this time. Currently, there is 12" pipe outfall at static (located under a – what appears to be - non-jurisdictional dam) with an earthen overflow located along the south east corner at elevation 1367.2. The floodplain and floodway for this area completely envelopes the dam and pond system – on all sides of the dam.

The pond has a static elevation at a 1366.0 controlled primarily by the 12" pipe. This pond will have a 100-year water surface elevation of a 1370.6 on the upstream and a 1369.4 on the downstream end being completely controlled by the creek and overall basin runoff. In overall basin flooding conditions we do not expect this pond to have any measurable amount of detention, it will be conveyance for the creek at that time.

DISCHARGE POINTS SUMMARY

There are two main discharge points as shown on the plan sheet that this site utilizes. They are described below in more detail.

Dry Creek East

This is the main discharge point for the site. It is located along the south edge of the property and exists to the east into Four Oaks Addition. The site, not including any offsite flow from the overall basin, discharges approximately 220 cfs in the peak event from approximately 78 acres of farmland. After development, the site will drain approximately 85 acres of developed property. After detention, we expect approximately 75 cfs in the peak event. This is relatively inconsequential compared to the overall basin and flows in the Dry Creek East channel section.

North East Corner – Tributary 6

The north east corner of the property drains approximately 6.2 aces currently to the extreme north east corner at the 37th Street ROW producing approximately 36 cfs in the 100-year event. After development, this basin will be re-directed and decreased so that only 3.3 acres of developed property is directed to this point. We anticipate this peak

design flow to not exceed 25 cfs. This is a nominal decrease since this area also is in the floodplain and drains a much larger basin than this property's, respectively. This portion of the site will consist of runoff primarily of rear yards and will be conveyed via sheet flow.

POTENTIAL UPSTREAM/DOWNSTREAM IMPACTS

This site will detain runoff in its two ponds as well as re-direct some basins in order to minimize the impacts to downstream properties. Due to detention from this development, we will limit the runoff to less than existing conditions which will likely only have a nominal impact on the creek flows due to the large contributing upstream basins. This site will accept all offsite runoff and will not block drainage from offsite sources; therefore, we do not expect any negative upstream impacts with this development.

SOURCE OF FLOODPLAIN INFORMATION

Currently, based on the 2007 FEMA FIRM panels for this area, there is a Zone A floodplain located on the property. This floodplain is unstudied and does not appear to follow any topographical features. There are 3 apparent tributaries encroaching this property from the west and south as depicted on Panel 377. There is also a tributary encroaching at the north east corner of the site as depicted on Panel 240. All of these areas are Zone A floodplain.

The future effective floodplain maps will be released for Sedgwick County on December 22, 2016. This subdivision will be designed based on these maps due to the timing of the maps compared to the construction schedule as well as the maps being the best available data for the area. We have been provided the floodway (70% floodway analysis) by AMEC for this area. At this time, the proposed lots will be clear of the floodway along the south Dry Creek East.

Prior to the development of this site, a DWR permit will be required for fill to be placed in the floodplain. A LOMR-F will then be completed in order to remove the elevated portions from the floodplain. Prior to crossing the main channel for the main entrance, the HEC-RAS model will need to be obtained and re-modeled using the proposed crossing. This will likely require a LOMR after construction, and a channel change/structures permit prior to construction.

US ARMY CORPS OF ENGINEERS

The US Army Corps will be notified prior to construction in the channel. The first phase of this project will begin near the north west corner and will likely not require Corps permitting.

KANSAS DEPT OF AGRICULTURE – DWR PERMITTING

A DWR Floodplain Fill permit will be required prior to placing fill in the mapped floodplain.

FEMA

Lots and/or portions of lots located in the mapped floodplain will need to be removed via LOMR-F prior to construction of homes.

KANSAS DEPT OF TRANSPORTATION

There is no KDOT ROW adjacent or near this property which would require a permit at this time.

MABCD PERMITTING

A floodplain development permit will be required prior to fill being placed in the mapped floodplain.

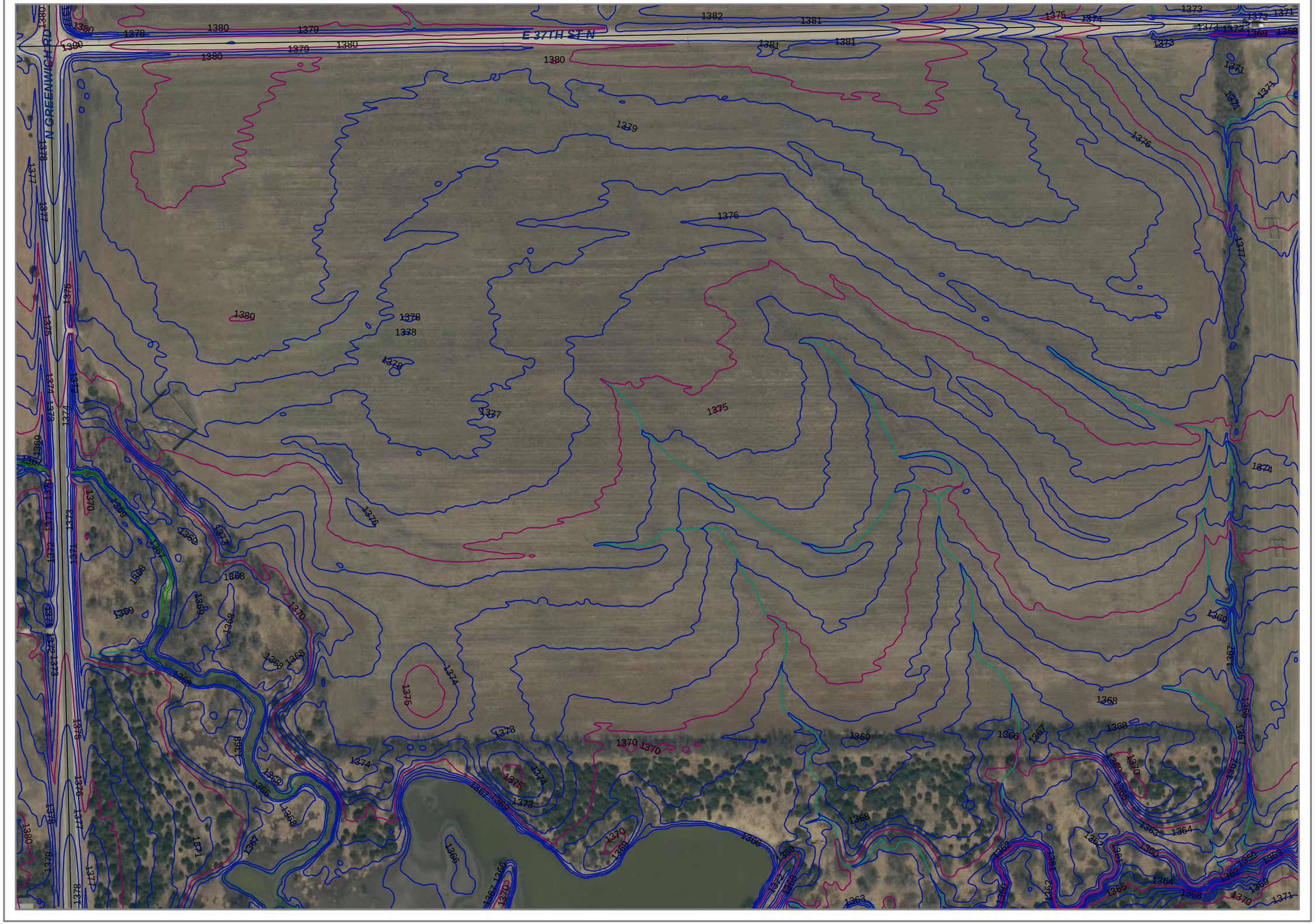
EXHIBIT 1: Aerial Photo Exhibit with Lidar Topography

EXHIBIT 2: Plat – Half Scale

EXHIBIT 3: Offsite Drainage Map

EXHIBIT 4: Drainage Plan – Half Scale

EXHIBIT 5: Floodplain Location (FIRM)



BAUGHMAN

Aerial Exhibit

0 100 200

Feet

BROOKFIELD ADDITION
WICHITA, SEDGWICK COUNTY, KANSAS

State of Kansas)
Sedgwick County) SS

We, Baughman Company, P.A., Surveyors in oforesaid county and state do hereby certify that we have surveyed and platted "BROOKFIELD ADDITION", Wichita, Sedgwick County, Kansas and that the accompanying plat is a true and correct exhibit of the property surveyed, described as that part of the Northwest Quarter of Section 34, Township 26 South, Range 2 East of the Sixth Principal Meridian, Sedgwick County, Kansas described as follows: Beginning at the northwest corner of said Northwest Quarter; thence N88°53'05"E along the north line of said Northwest Quarter, 2672.52 feet to the northeast corner of said Northwest Quarter; thence S01°15'49"E along the east line of said Northwest Quarter, 1842.45 feet; thence S83°46'45"W, 1103.84 feet; thence N27°38'26"E, 68.38 feet; thence N31°16'05"W, 65.90 feet; thence N68°58'44"W, 101.55 feet; thence S88°04'39"W, 136.87 feet; thence S57°28'11"W, 75.19 feet; thence S41°58'08"W, 89.95 feet; thence S78°39'05"W, 69.55 feet; thence N48°01'52"W, 165.19 feet; thence S16°13'44"W, 366.95 feet; thence N83°15'09"W, 487.82 feet to the point of curvature of a non-tangent curve to the right; thence westerly and northwesterly along said curve, having a central angle of 54°23'40" and a radius of 168.00 feet, an arc distance of 159.49 feet, (having a chord length of 153.57 feet bearing N46°24'30"W), to the point of tangency of said curve; thence N19°12'40"W, 104.14 feet to a point on a non-tangent curve to the right; thence southwesterly and westerly along said curve, through a central angle of 29°07'25" and having a radius of 232.00 feet, an arc distance of 117.93 feet, (having a chord length of 116.66 feet bearing S73°59'06"W), to the point of tangency of said curve; thence S88°32'49"W, 173.96 feet to a point on the west line of said Northwest Quarter; thence N01°27'11"W along the west line of said Northwest Quarter, 1899.38 feet to the point of beginning, all being subject to road rights-of-way of record.

Existing public easements, building setbacks, access controls, and dedications, if any, being vacated by virtue of K.S.A. 12-512b, as amended.

Baughman Company, P.A.

_____, Surveyor
Michael G. Conrey

Know all men by these presents that we, the undersigned, have caused the land in the surveyors certificate to be platted into Lots, Blocks, Streets and Reserves to be known as "BROOKFIELD ADDITION", Wichita, Sedgwick County, Kansas. The utility easements are are hereby granted as indicated for the construction and maintenance of all public utilities. The drainage and utility easements are hereby granted as indicated for drainage purposes and for the construction and maintenance of all public utilities. No signs, light poles, private drainage systems, masonry trash enclosures or other structures shall be located within public utility easements. The drainage easements are hereby granted as indicated for drainage purposes. The streets are hereby dedicated to and for the use of the public. Reserves "A", "E", "F", "G", "H", "K", and "L" are hereby reserved for open space, landscaping, drainage purposes, entry monuments, utilities, and streets. Reserves "B" and "C" are hereby reserved for open space, landscaping, drainage purposes, entry monuments, and utilities. Reserve "D" is hereby reserved for open space, landscaping, drainage purposes, lakes, and utilities as confined to easements. Reserve "I" is hereby reserved for open space, landscaping, drainage purposes, entry monuments, floodplain, a sanitary sewer lift station as confined to easement, and water lines as confined to easement. Reserve "J" is hereby reserved for open space, landscaping, drainage purposes, floodplain, and lakes. No fill, change of grade, creation of channel, or any other work shall be carried on within said Reserves "I" and "J" without the permission of the Engineer for the appropriate governing body. Reserves "A", "B", "C", "D", "E", "F", "G", "H", "I", "J", "K", and "L" shall be owned and maintained by the homeowners association for the addition provided, however, that the undersigned, or the homeowners association, as the undersigned's successor in interest, may, in their discretion, deed a parcel of a Reserve to an owner or owners of an adjacent Lot, subject to the obligation to maintain such deeded parcel of a Reserve in compliance with the provisions hereof and in compliance with the maintenance covenants or any applicable restrictive covenants and/or regulations. Reserves "15", "16", "17", "18", "19", "20", "21", "22", "23", "24", "25", "64", "65", "66", "67", "68", "69", "70", "71", "72", "73", "79", "81", "83", and "84" are hereby reserved for open space, landscaping, drainage reserve purposes, and floodplain. No fill, change of grade, creation of channel, or any other work shall be carried on within said floodplain without the permission of the Engineer for the appropriate governing body. Reserves "15", "16", "17", "18", "19", "20", "21", "22", "23", "24", "25", "64", "65", "66", "67", "68", "69", "70", "71", "72", "73", "79", "81", "83", and "84" shall be owned and maintained by the owners of the corresponding adjacent lots and shall be the responsibility of said corresponding adjacent lot owners until such time as the appropriate governing body elects to assume the responsibility for maintenance and improvements to the drainage. FEMA floodplain and regulatory floodway boundaries are subject to periodic change and such change may affect the intended land use within the subdivision. Access controls shall be as depicted on the face of the plat and are hereby granted to the City of Wichita, Kansas. The Minimum Building Pad Elevations for the lowest opening to the structures shall be as indicated on the face of the plat.

37th & Greenwich, LLC,
a Kansas limited liability company

_____, Manager
Kevin M. Mullen, President of
Ritchie Development Corporation,
a Kansas corporation

We the undersigned holders of a mortgage on the above described property, do hereby consent to this plat of "BROOKFIELD ADDITION", Wichita, Sedgwick County, Kansas.

INTRUST Bank, N.A.

_____, _____
(Title)

State of Kansas)
Sedgwick County) SS

The foregoing instrument acknowledged before me, this_____day of_____, 2016, by_____, _____ (Title) of INTRUST Bank, N.A., on behalf of the bank.

_____, Notary Public

My App't. Exp._____

State of Kansas)
Sedgwick County) SS

The foregoing instrument acknowledged before me, this_____day of_____, 2016, by Kevin M. Mullen, President of Ritchie Development Corporation, a Kansas corporation, as Manager of 37th & Greenwich, LLC, a Kansas limited liability company, on behalf of the limited liability company.

_____, Notary Public

My App't. Exp._____

This plat of "BROOKFIELD ADDITION", Wichita, Sedgwick County, Kansas has been submitted to and approved by the Wichita-Sedgwick County Metropolitan Area Planning Commission, Wichita, Kansas.

Dated this_____day of_____, 2016.
Wichita-Sedgwick County Metropolitan Area Planning Commission

_____, Chair
Carol Chapman Neugent

_____, Secretary
Dale Miller

This plat approved and all dedications shown hereon accepted by the City Council of the City of Wichita, Kansas, this_____day of_____, 2016.

_____, Mayor
Jeff Longwell

_____, City Clerk
Karen Sublett

Reviewed in accordance with K.S.A. 58-2005 on this_____day of_____, 2016.

_____
Tricia L. Robello, L.S. #1246
Deputy County Surveyor
Sedgwick County, Kansas

Entered on transfer record this_____day of_____, 2016.

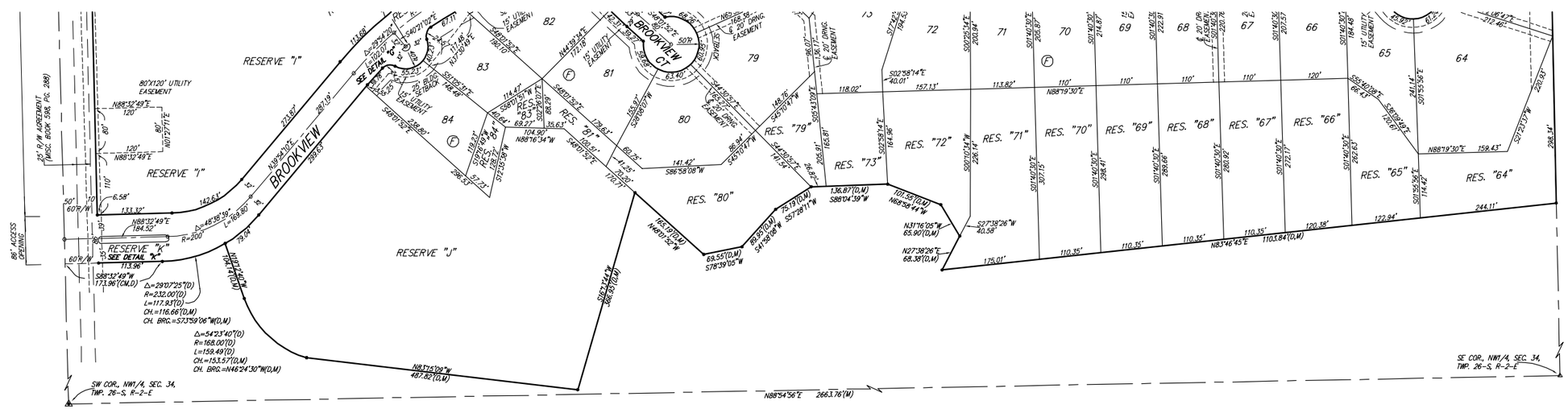
_____, County Clerk
Kelly B. Arnold

State of Kansas)
Sedgwick County) SS

This is to certify that this plat has been filed for record in the office of the Register of Deeds, this_____day of_____, 2016 at_____o'clock___M; and is duly recorded.

_____, Register of Deeds
Tonya Buckingham

_____, Deputy
Judy J. Paget



0' 100' 200'

- = #4 REBAR W/ "BAUGHMAN" CAP (SET)
- = #5 REBAR OVER STONE (FOUND)
- = 3/4" IRON IN THIMBLE (FOUND)
- = 3/4" IRON (FOUND)
- = #6 REBAR (FOUND)

(M) = MEASURED
(D) = DESCRIBED

BENCHMARK:
RR SPIKE IN ASPHALT, SW COR., N1/2, SW1/4, SEC. 34, TWP. 26-S, R-2-E. ELEV. = 1400.59 NAVD88

R.R. SPIKE IN E. FACE OF POWER POLE, 174'± N. OF S. LINE, N1/2, SW1/4 & 49'± E. OF W. LINE, SW1/4, SEC. 34, TWP. 26-S, R-2-E. ELEV. = 1398.64 NAVD88

R.R. SPIKE IN S. FACE OF POWER POLE, 294'± S. OF N. LINE, SW1/4, & 48'± E. OF W. LINE, SW1/4, SEC. 34, TWP. 26-S, R-2-E. ELEV. = 1396.14 NAVD88

MINIMUM BUILDING PAD ELEVATIONS FOR LOWEST OPENING TO THE STRUCTURES		
LOT	BLOCK	ELEVATION NAVD88
15-19	A	1376.0
20-22	A	1375.5
23-25	A	1375.0
5-7	F	1377.0
26-28 36-37 43-45 47-51 52-61	F	1372.8
62	F	1372.5
63-66	F	1370.8
67-71	F	1372.0
72-73	F	1372.7
79-80	F	1373.0
81-84	F	1373.5

NOTE:
A drainage plan has been developed for the plat and all drainage easements, rights-of-way, or reserves shall remain at established grades or as modified with the approval of the applicable City or County Engineer and unobstructed to allow for the conveyance of stormwater.

Baughman Company, P.A.
315 Ellis St. Wichita, KS 67211 P 316.262.7271 F 316.262.0149
ENGINEERING | SURVEYING | PLANNING | LANDSCAPE ARCHITECTURE

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BROOKFIELD ADDITION

WICHITA, SEDGWICK COUNTY, KANSAS

● = #4 REBAR W/ "BAUGHMAN" CAP (SET)
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26-28 36-37 43-45 47-51 52-61	F	1372.8
62	F	1372.5
63-66	F	1370.8
67-71	F	1372.0
72-73	F	1372.7
79-80	F	1373.0
81-84	F	1373.5

DETAIL "L" (NO SCALE)

DETAIL "K" (NO SCALE)

DETAIL "H" (NO SCALE)

DETAIL "F" (NO SCALE)

DETAIL "A" (NO SCALE)

DETAIL "E" (NO SCALE)

DETAIL "G" (NO SCALE)

NOTE:
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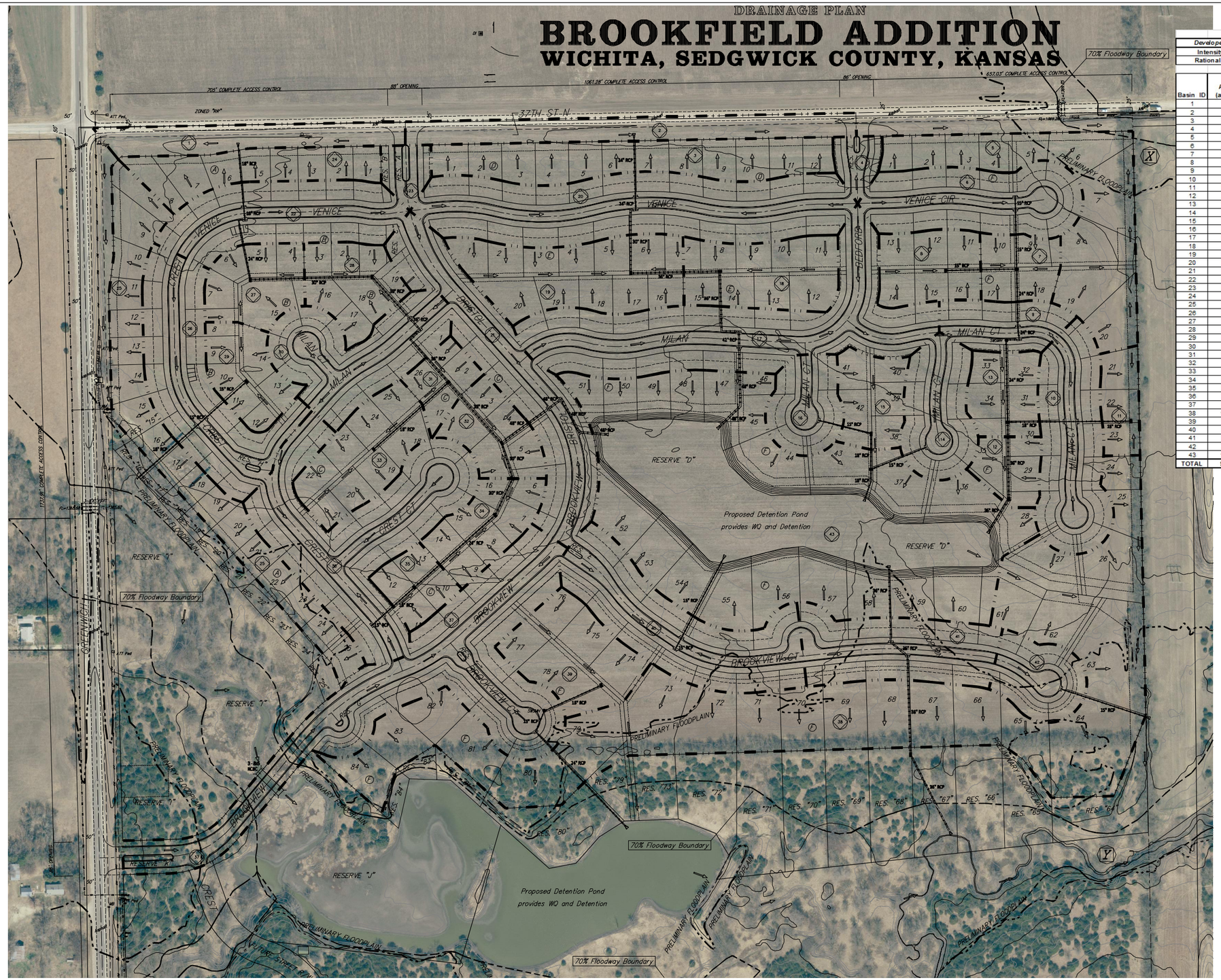
DRAINAGE PLAN

BROOKFIELD ADDITION

WICHITA, SEDGWICK COUNTY, KANSAS



Developed	2yr	10yr	100yr
Intensity	3.83	5.22	7.37
Rational C	0.46	0.59	0.73

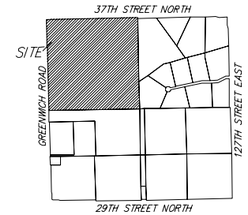
Basin ID	Area (acres)	Developed Flowrates 2-yr cfs	10-yr cfs	100-yr cfs
1	1.1	1.9	3.4	5.9
2	1.6	2.8	4.9	8.6
3	2.2	3.9	6.8	12
4	0.4	0.7	1.2	2.2
5	3.0	5.3	9.2	16
6	2.0	3.5	6.2	11
7	0.8	1.4	2.5	4.3
8	1.1	1.9	3.4	5.9
9	0.9	1.6	2.8	4.8
10	2.1	3.7	6.5	11
11	0.6	1.1	1.8	3.2
12	0.6	1.1	1.8	3.2
13	0.9	1.6	2.8	4.8
14	1.3	2.3	4.0	7.0
15	0.9	1.6	2.8	4.8
16	0.9	1.6	2.8	4.8
17	4.1	7.2	13	22
18	1.6	2.8	4.9	8.6
19	2.3	4.1	7.1	12
20	3.9	6.9	12	21
21	2.8	4.9	8.6	15
22	2.1	3.7	6.5	11
23	0.4	0.7	1.2	2.2
24	1.3	2.3	4.0	7.0
25	3.1	5.5	9.5	17
26	2.6	4.6	8.0	14
27	1.1	1.9	3.4	5.9
28	1.1	1.9	3.4	5.9
29	1.0	1.8	3.1	5.4
30	2.0	3.5	6.2	11
31	0.5	0.9	1.5	2.7
32	1.1	1.9	3.4	5.9
33	1.5	2.6	4.6	8.1
34	1.1	1.9	3.4	5.9
35	0.6	1.1	1.8	3.2
36	3.5	6.2	11	19
37	4.8	8.5	15	26
38	10.7	19	33	58
39	1.6	2.8	4.9	8.6
40	2.7	4.8	8.3	15
41	1.9	3.3	5.9	10
42	0.9	1.6	2.8	4.8
43	11.3	20	35	61
TOTAL	92.0	162	283	495

0' 120' 240'

DATE OF PREPARATION: 6 JUNE 2016
DATE OF TOPOGRAPHY: 12 DECEMBER 2008, 10 MAY 2016
CONTOUR INTERVALS = 1 FOOT (CONTOURS PROVIDED BY SEDGWICK COUNTY)

RESERVES "A", "E", "F", "G", "H", "K" AND "L" ARE RESERVED FOR OPEN SPACE, LANDSCAPING, ENTRY MONUMENTS, STREETS, DRAINAGE PURPOSES, AND UTILITIES.
RESERVES "B" AND "C" ARE RESERVED FOR OPEN SPACE, LANDSCAPING, ENTRY MONUMENTS, DRAINAGE PURPOSES, AND UTILITIES AS CONFINED TO EASEMENTS.
RESERVES "D" AND "J" ARE RESERVED FOR OPEN SPACE, LAKES, LANDSCAPING, AND DRAINAGE PURPOSES.
RESERVE "I" IS RESERVED FOR OPEN SPACE, LANDSCAPING, ENTRY MONUMENTS, SANITARY SEWER LIFT STATION AS CONFINED TO EASEMENT, DRAINAGE PURPOSES AND UTILITIES AS CONFINED TO EASEMENTS.

NOTE: FEMA Floodplain Boundaries are scaled per location per the Preliminary FEMA FIRM Panel 240 & 377 of 690, for Sedgwick County, Kansas, Map Number 20017C0240G AND 20173C0377G.



VICINITY MAP
SEC. 34, T26S, R2E

LEGEND
- Proposed SWS
- Proposed Flow Direction
- Future Effective FEMA FP

NORTHEAST DISCHARGE POINT

EXISTING	PROPOSED**
Area = 4.2 acres	Area = 3.3 acres
CN = 80	CN = 88
Tc = 22 min*	Tc = 15 min
Q2 = 11 cfs	Q2 = 9.4 cfs
Q5 = 16 cfs	Q5 = 13 cfs
Q10 = 20 cfs	Q10 = 16 cfs
Q25 = 26 cfs	Q25 = 19 cfs
Q100 = 36 cfs	Q100 = 25 cfs

* Tc calculated using 1.5% basin slope with a length of 780'. These figures only account for on site flows only.
** Proposed includes total developed area draining to this point after development. Basin size will be reduced.

MAIN POND (Static = 1367.0)			
STAGE	INFLOW	OUTFLOW	ELEVATION
2 yr	158 cfs	16 cfs	1368.5
5 yr	219 cfs	24 cfs	1369.2
10 yr	263 cfs	28 cfs	1369.6
25 yr	319 cfs	39 cfs	1370.1
100 yr	423 cfs	74 cfs	1371.0

POND		
STAGE (elev)	TOTAL STORAGE (ac-ft)	DISCHARGE (cfs)
1367	0.00	0.0
1368	4.12	0.0
1369	4.34	22
1370	4.58	35
1371	4.82	75
1372	5.05	132

Pond modeled using a tailwater elevation of 1368.0 based on the outfall pipe discharging to the floodplain.

Table 4-13 Volumetric Runoff Coefficients by Land Use and Hydrologic Soil Group

Land Use	Hydrologic Soil Group A	B	C	D	Land Use	Hydrologic Soil Group A	B	C	D
Undisturbed	0.02	0.03	0.04	0.05	Undisturbed	55	71	80	84
Turf or Disturbed Soils	0.15	0.20	0.22	0.25	Turf or Disturbed Soils	71	80	84	88
Impervious Cover	0.95	0.95	0.95	0.95	Impervious Cover	98	98	98	98

Basin #	Undist. ft²	Dist. ft²	Red. Imp. ft²	New Imp. ft²	Total Area ft²	Weighted Volumetric Runoff Coef. (R_v) (eq. 4-24*) U %	D %	Redev. I %	I %	R_v %	WQ, ft³ eq. 4-25*
Total Brookfield	0	2,548,260	0	1,372,140	3,920,400	0.000	0.163	0.000	0.333	0.4950	194,060

*Total TL is the entire 150 acres of Tyler's Landing Addition(s) which drain through the currently developed drainage and pond systems.

Pond Volume Below Static Pool

Basin	Static Sq. Ft.	Static Acre	Pond Bottom Area Sq. Ft.	Pond Bottom Area Acre	Depth Feet	Volume Acre-Ft.
Main Pond	175500	4.0	118300	2.7	8	27.0
South Pond	270000	6.2	209000	4.8	8	44.0
Totals:		10.2		7.5		71.0

Pond Volume > WQv

Pond	WQv	Check
71.0	4.5	Yes

Pond Volumes were estimated using a depth of 8' of water surface with 3:1 sideslopes below the static water surface. The pond volumes far exceed the water quality volume needed for the entire Brookfield development.

DRY CREEK DISCHARGE

EXISTING	PROPOSED**
Area = 78 acres	Area = 85 acres
CN = 80	CN = 88
Tc = 65 min*	Post Detention
Q2 = 45 cfs	Q2 = 26 cfs
Q5 = 100 cfs	Q5 = 37 cfs
Q10 = 125 cfs	Q10 = 45 cfs
Q25 = 157 cfs	Q25 = 54 cfs
Q100 = 220 cfs	Q100 = 73 cfs

* Tc calculated using 0.2% basin slope with a length of 1920'.
**Proposed includes total developed area after detention. These figures are for on site runoff only, not total basin runoff. Figures are for comparison purposes only.

NOTES: FEMA Floodplain and Floodway Boundaries were provided by AMEC for this reach and represent the boundaries that will be effective December 22, 2016. Properties located within the floodplain boudaries will require a LOMR-F and all applicable permitting before development in these areas.

Water quality will be performed in the wet surface of the two detention ponds. Storage and calculations are provided per this sheet. Channel protection is provided in the detention portion of the upper pond. The peak flows for this site have been greatly reduced in the detention areas.

Lots located in the floodplain, as shown, will need to be permitted for a floodplain fill with the Kansas Dept of Water Resources. Once permitted, the site can be filled and elevations raised above the BFE. After filling, the lots can be removed via a LOMR-F. We expect the site to develop in phases in which no lots in the 1st phase are expected to be located in the future effective floodplain.

SOUTH (EXISTING) POND (Static = 1366.0)			
STAGE	INFLOW	OUTFLOW	ELEVATION
2 yr	45 cfs	4 cfs	1367.2
5 yr	74 cfs	14 cfs	1367.5
10 yr	90 cfs	20 cfs	1367.7
25 yr	111 cfs	27 cfs	1367.8
100 yr	147 cfs	46 cfs	1368.1

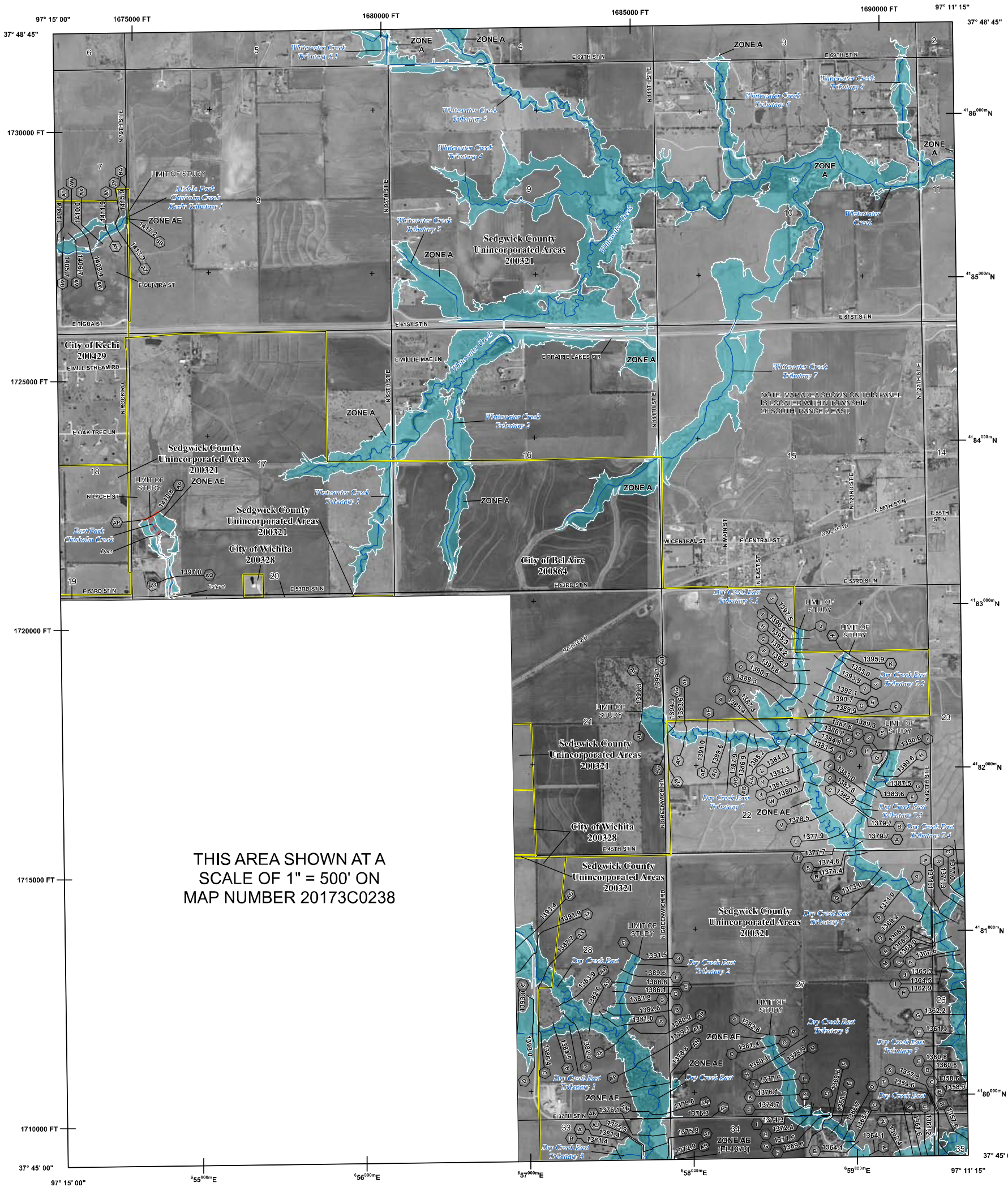
POND		
STAGE (elev)	TOTAL STORAGE (ac-ft)	DISCHARGE (cfs)
1366	0.00	0.0
1367	5.71	2.67
1368	11.7	41.8
1369	18.0	131.6

Peak inflow assumes a min Tc of 15 min with a CN of 88 for the total area draining to the pond. No offsite flow modeled in the pond as it is entire in a major flooding source. The outflow and peak elevations are for existing/developed comparisons only. Base Flood Elevations of the creek are much higher and are used for engineering design.

DRAINAGE PLAN
BROOKFIELD ADDITION
29 August 2016

Baughman Company, P.A.
315 Ellis St. Wichita, KS 67211 P 316-262-7271 F 316-262-0149
Baughman ENGINEERING | SURVEYING | PLANNING | LANDSCAPE ARCHITECTURE

E:\Projects\Brookfield Addition_1604-P190\Water Resources\Ritchie 37th & Greenwich_Drain Plan 8-10-16.dwg



FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR ZONE DESCRIPTIONS AND INDEX MAP

THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT HTTP://MSC.FEMA.GOV

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee See Notes. *Zone X*

OTHER AREAS
- NO SCREEN — Areas Determined to be Outside the 0.2% Annual Chance Floodplain *Zone X*
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, Control Structure, or Storm Sewer
- Accredited or Provisionally Accredited Levee, Dike, or Floodwall
- Non-accredited Levee, Dike, or Floodwall
- E 18.2 / 17.5 — Cross Sections with 1% Annual Chance Water Surface Elevation (BFE)

OTHER FEATURES
- Profile Baseline
- Hydrographic Feature
- 513 — Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary

NOTES TO USERS

For information and questions about this map, available products associated with this FIRM including historic versions of this FIRM, how to order products or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Map Service Center website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website. Users may determine the current map date for each FIRM panel by visiting the FEMA Map Service Center website or by calling the FEMA Map Information eXchange.

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SCALE

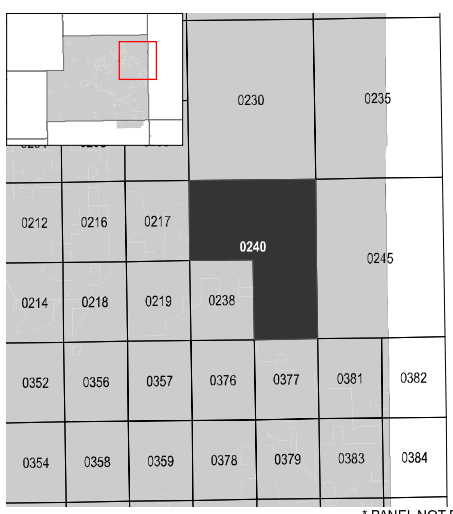
Map Projection:
NAD 1983 StatePlane Kansas South FIPS 1502 Feet;
Western Hemisphere; Vertical Datum: NAD 88

1 inch = 1,000 feet *1:12,000*

0 1,000 2,000 4,000 Feet

0 250 500 1,000 Meters

PANEL LOCATOR



* PANEL NOT PRINTED

National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP

SEDGWICK COUNTY, KANSAS
and Incorporated Areas

PANEL 240 OF 690

Panel Contains:

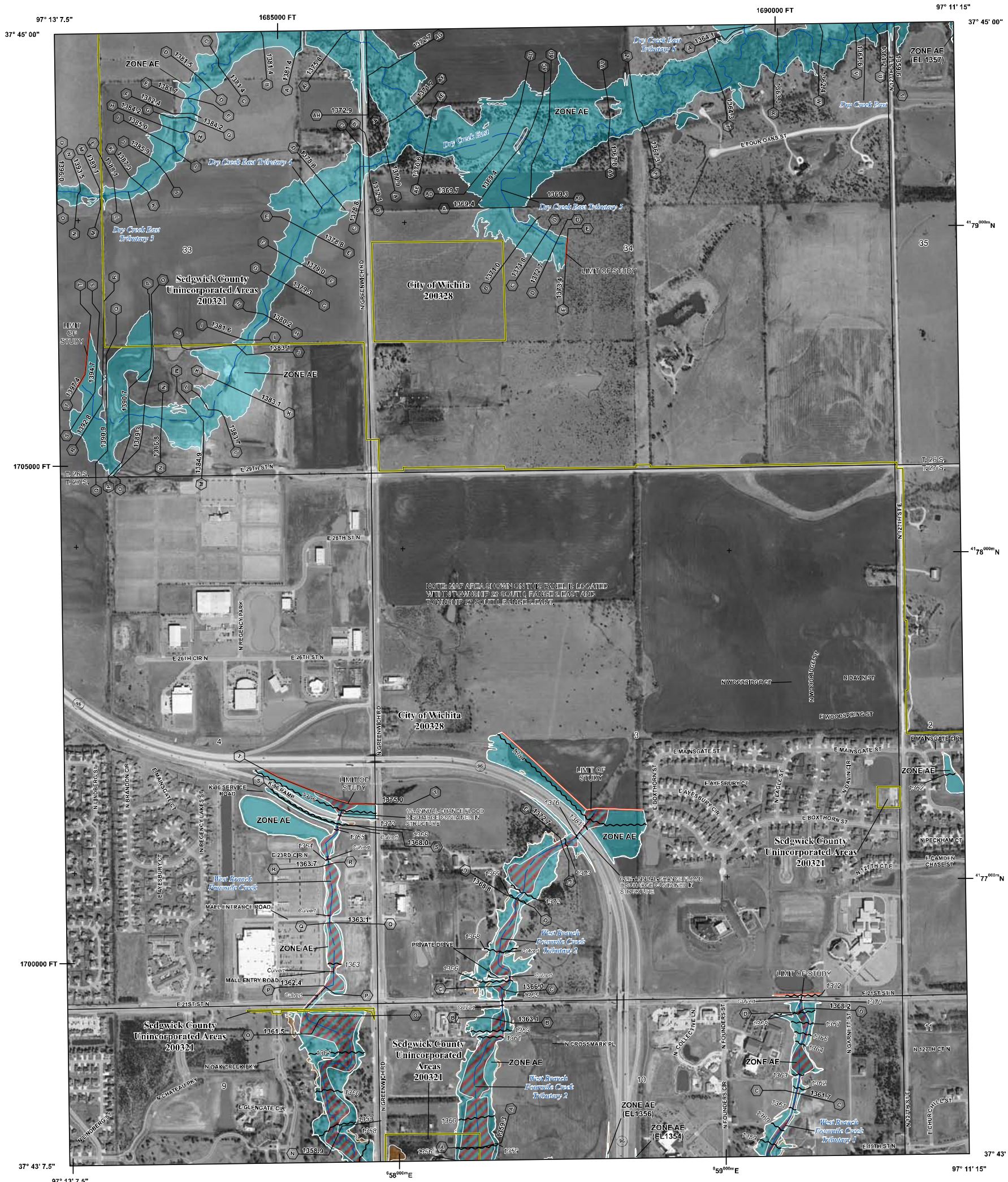
COMMUNITY	NUMBER	PANEL	SUFFIX
BEL AIRE, CITY OF	*200864*	*0240*	*G*
KECHI, CITY OF	*200429*	*0240*	*G*
SEDGWICK COUNTY	*200321*	*0240*	*G*
WICHITA, CITY OF	*200328*	*0240*	*G*

PRELIMINARY
JANUARY 23, 2015

VERSION NUMBER
2.2.2.1

MAP NUMBER
20173C0240G

MAP REVISED



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- 513 — Base Flood Elevation Line (BFE)
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SCALE

N

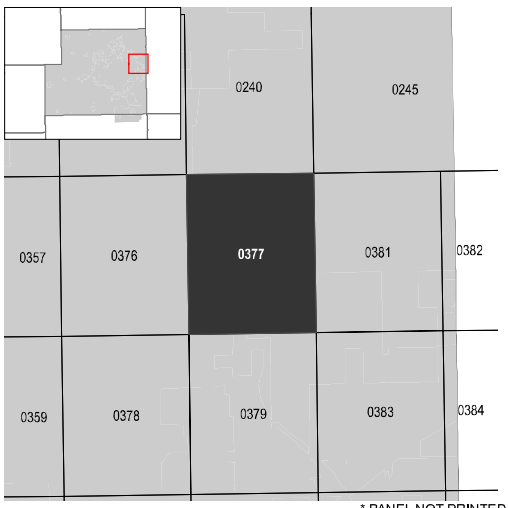
Map Projection:
NAD 1983 StatePlane Kansas South FIPS 1502 Feet;
Western Hemisphere; Vertical Datum: NAVD 88

1 inch = 500 feet *1:6,000*

0 500 1,000 2,000 Feet

0 125 250 500 Meters

PANEL LOCATOR



* PANEL NOT PRINTED

FEMA National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP

SEDGWICK COUNTY, KANSAS
and Incorporated Areas

PANEL 377 OF 690

FEMA

Panel Contains:

COMMUNITY	NUMBER	PANEL	SUFFIX
SEDGWICK COUNTY	200321	0377	G
WICHITA, CITY OF	200328	0377	G

PRELIMINARY
JANUARY 23, 2015

VERSION NUMBER
2.2.2.1

MAP NUMBER
20173C0377G

MAP REVISED

APPENDIX A: Hydraflow Hydrographs
Detention Pond & Site Flows

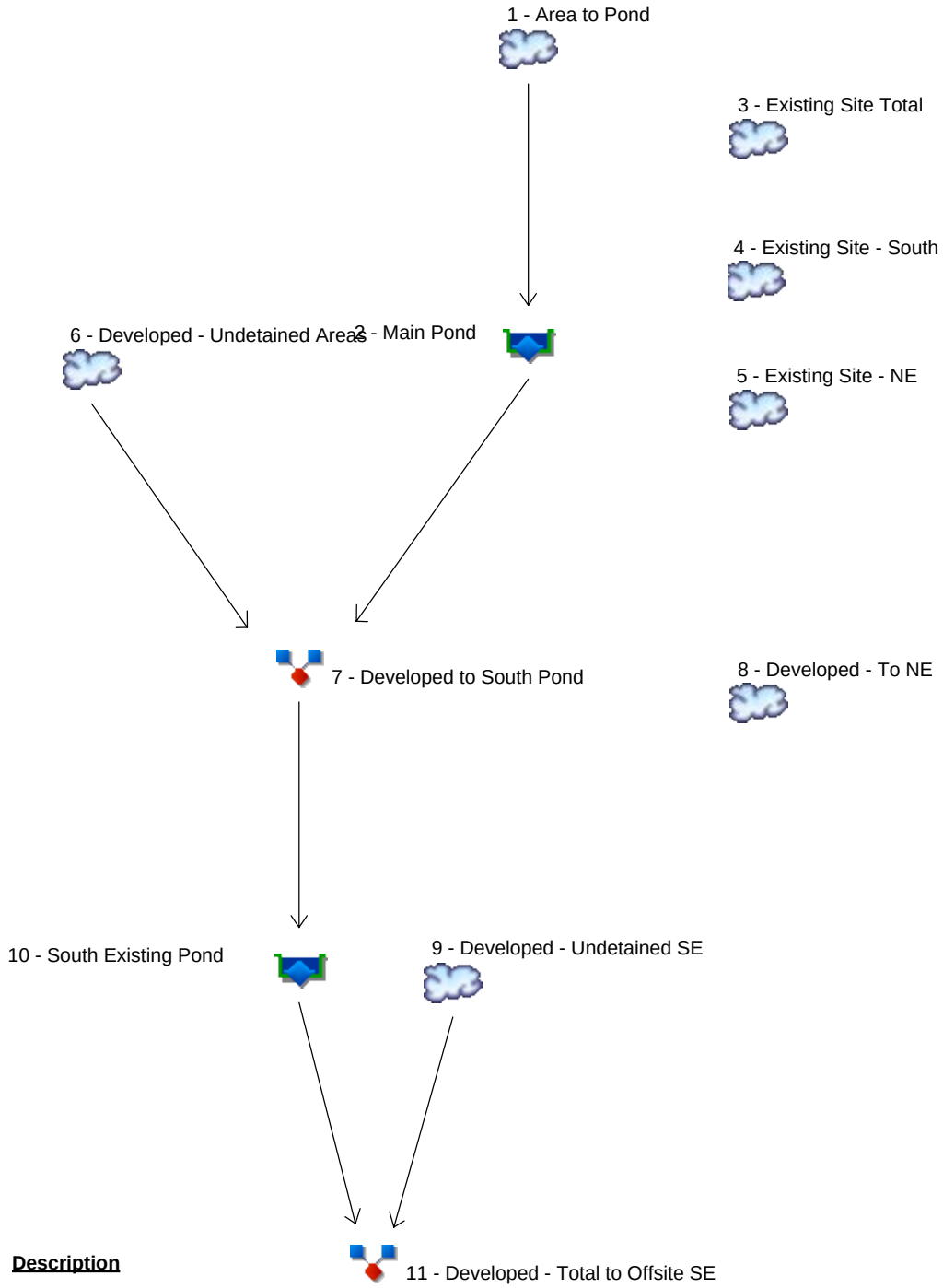
APPENDIX B: Hydraflow Storm Sewers

Hydraflow Hydrographs

Pond Sizing & Site Flows

Watershed Model Schematic

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2015 by Autodesk, Inc. v10.4



Legend

Hyd.	Origin	Description
1	SCS Runoff	Area to Pond
2	Reservoir	Main Pond
3	SCS Runoff	Existing Site Total
4	SCS Runoff	Existing Site - South
5	SCS Runoff	Existing Site - NE
6	SCS Runoff	Developed - Undetained Areas
7	Combine	Developed to South Pond
8	SCS Runoff	Developed - To NE
9	SCS Runoff	Developed - Undetained SE
10	Reservoir	South Existing Pond
11	Combine	Developed - Total to Offsite SE

Hydrograph Return Period Recap

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)								Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	SCS Runoff	------	114.32	157.25	24.68	219.29	262.80	318.61	368.04	423.42	Area to Pond
2	Reservoir	1	8.952	16.18	0.000	23.78	27.89	38.64	53.83	74.08	Main Pond
3	SCS Runoff	------	49.41	75.35	4.319	114.99	143.79	181.54	215.50	254.09	Existing Site Total
4	SCS Runoff	------	42.82	65.31	3.743	99.66	124.62	157.34	186.76	220.21	Existing Site - South
5	SCS Runoff	------	7.116	10.74	0.616	16.32	20.36	25.64	30.38	35.73	Existing Site - NE
6	SCS Runoff	------	32.49	44.61	7.086	62.09	74.35	90.06	103.97	119.55	Developed - Undetained Areas
7	Combine	2, 6	32.49	44.61	7.086	73.64	90.44	111.14	128.51	147.24	Developed to South Pond
8	SCS Runoff	------	6.830	9.376	1.489	13.05	15.63	18.93	21.85	25.13	Developed - To NE
9	SCS Runoff	------	19.25	26.42	4.197	36.78	44.04	53.35	61.59	70.82	Developed - Undetained SE
10	Reservoir	7	2.024	3.968	0.035	14.21	20.28	26.91	34.01	46.78	South Existing Pond
11	Combine	9, 10	19.31	26.56	4.206	37.09	44.55	54.18	62.81	72.60	Developed - Total to Offsite SE

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2015 by Autodesk, Inc. v10.4

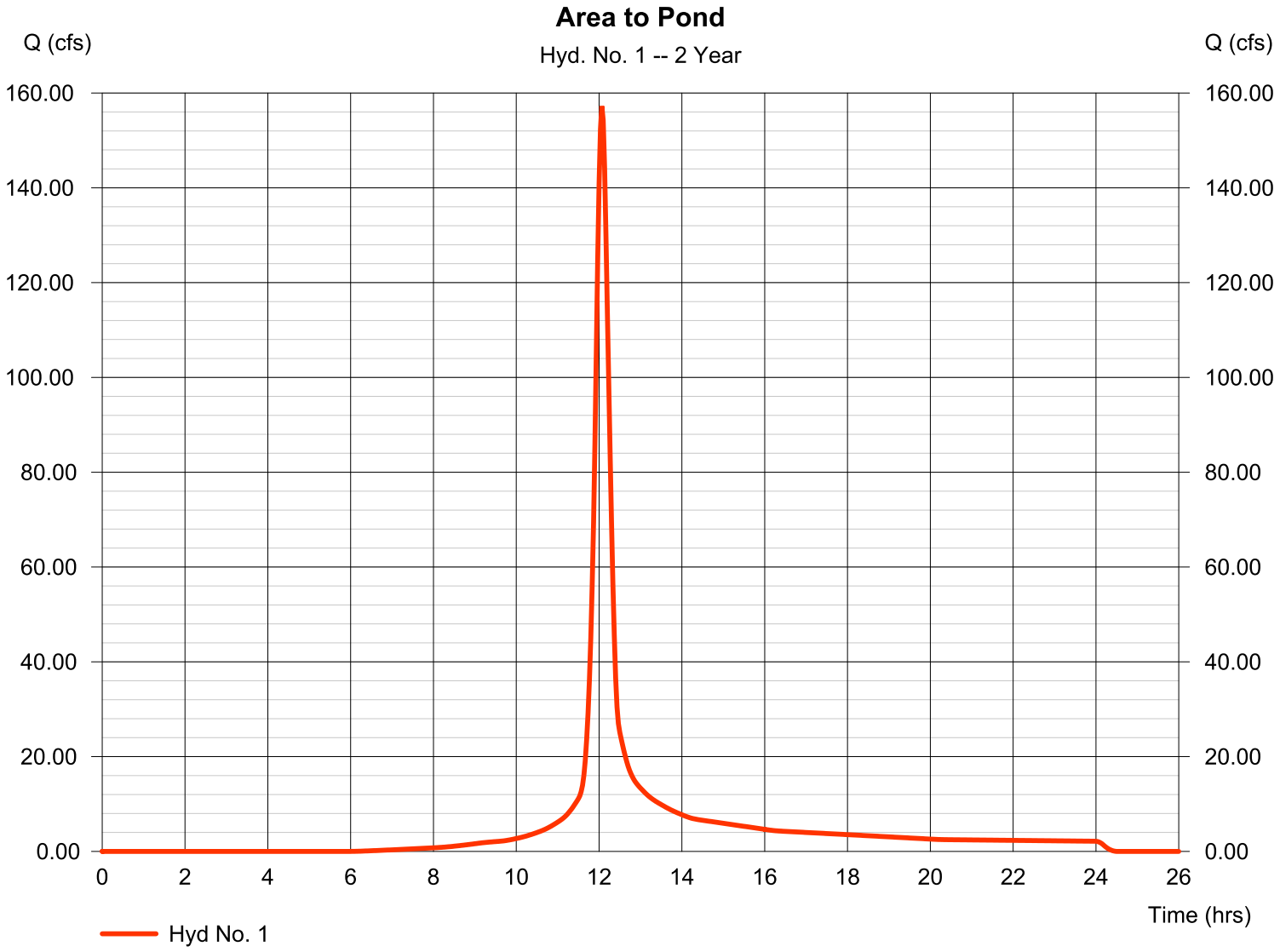
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph Description
1	SCS Runoff	157.25	2	724	11.343	------	------	------	Area to Pond
2	Reservoir	16.18	2	766	7.223	1	1368.54	6.47	Main Pond
3	SCS Runoff	75.35	2	754	12.196	------	------	------	Existing Site Total
4	SCS Runoff	65.31	2	754	10.570	------	------	------	Existing Site - South
5	SCS Runoff	10.74	2	726	0.861	------	------	------	Existing Site - NE
6	SCS Runoff	44.61	2	722	2.894	------	------	------	Developed - Undetained Areas
7	Combine	44.61	2	722	10.117	2, 6	------	------	Developed to South Pond
8	SCS Runoff	9.376	2	722	0.608	------	------	------	Developed - To NE
9	SCS Runoff	26.42	2	722	1.714	------	------	------	Developed - Undetained SE
10	Reservoir	3.968	2	1178	8.912	7	1367.24	7.17	South Existing Pond
11	Combine	26.56	2	722	10.626	9, 10	------	------	Developed - Total to Offsite SE

Hydrograph Report

Hyd. No. 1

Area to Pond

Hydrograph type	=	SCS Runoff	Peak discharge	=	157.25 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	11.343 acft
Drainage area	=	60.000 ac	Curve number	=	88
Basin Slope	=	2.0 %	Hydraulic length	=	1200 ft
Tc method	=	LAG	Time of conc. (Tc)	=	19.70 min
Total precip.	=	3.50 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



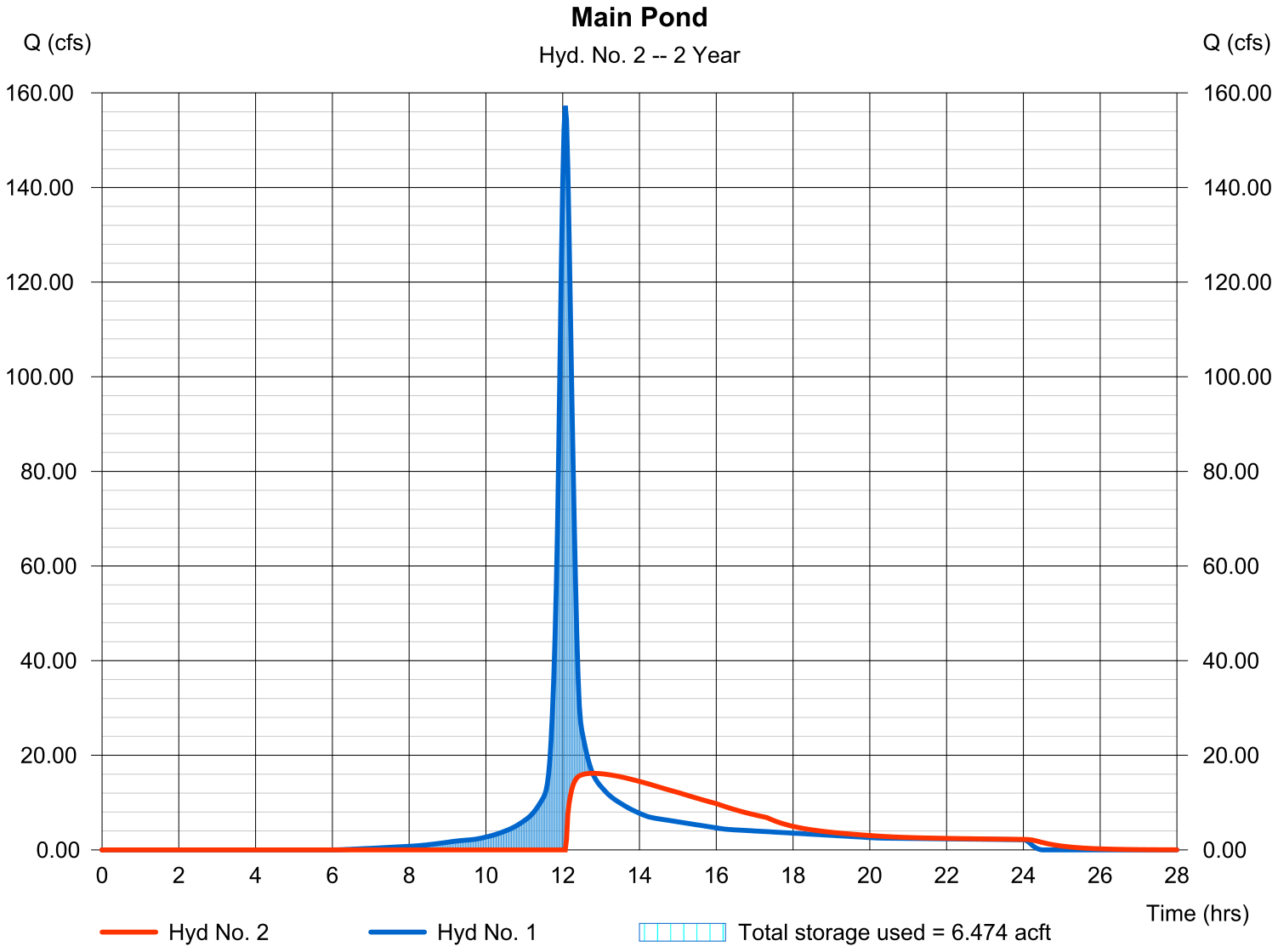
Hydrograph Report

Hyd. No. 2

Main Pond

Hydrograph type	=	Reservoir	Peak discharge	=	16.18 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.77 hrs
Time interval	=	2 min	Hyd. volume	=	7.223 acft
Inflow hyd. No.	=	1 - Area to Pond	Max. Elevation	=	1368.54 ft
Reservoir name	=	Main Pond	Max. Storage	=	6.474 acft

Storage Indication method used.



Pond Report

Pond No. 1 - Main Pond

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 1367.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	1367.00	175,000	0.000	0.000
1.00	1368.00	184,000	4.120	4.120
2.00	1369.00	194,000	4.338	8.458
3.00	1370.00	205,000	4.579	13.037
4.00	1371.00	215,000	4.820	17.857
5.00	1372.00	225,000	5.050	22.906

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 36.00	0.00	0.00	0.00
Span (in)	= 36.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 1363.50	0.00	0.00	0.00
Length (ft)	= 700.00	0.00	0.00	0.00
Slope (%)	= 0.20	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

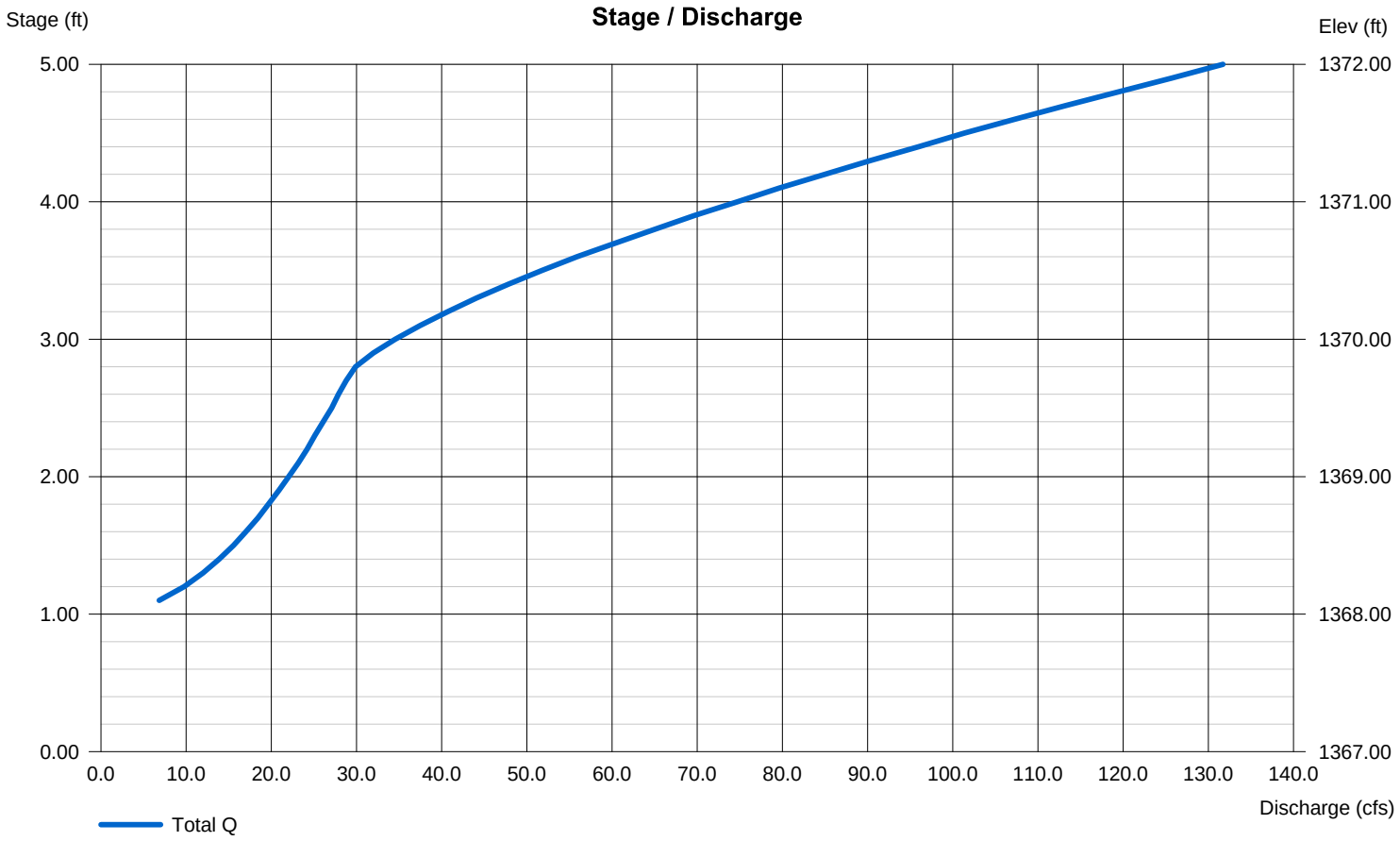
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 16.00	10.00	0.00	0.00
Crest El. (ft)	= 1367.00	1369.75	0.00	0.00
Weir Coeff.	= 3.33	2.60	3.33	3.33
Weir Type	= 1	Broad	---	---
Multi-Stage	= Yes	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 1368.00

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

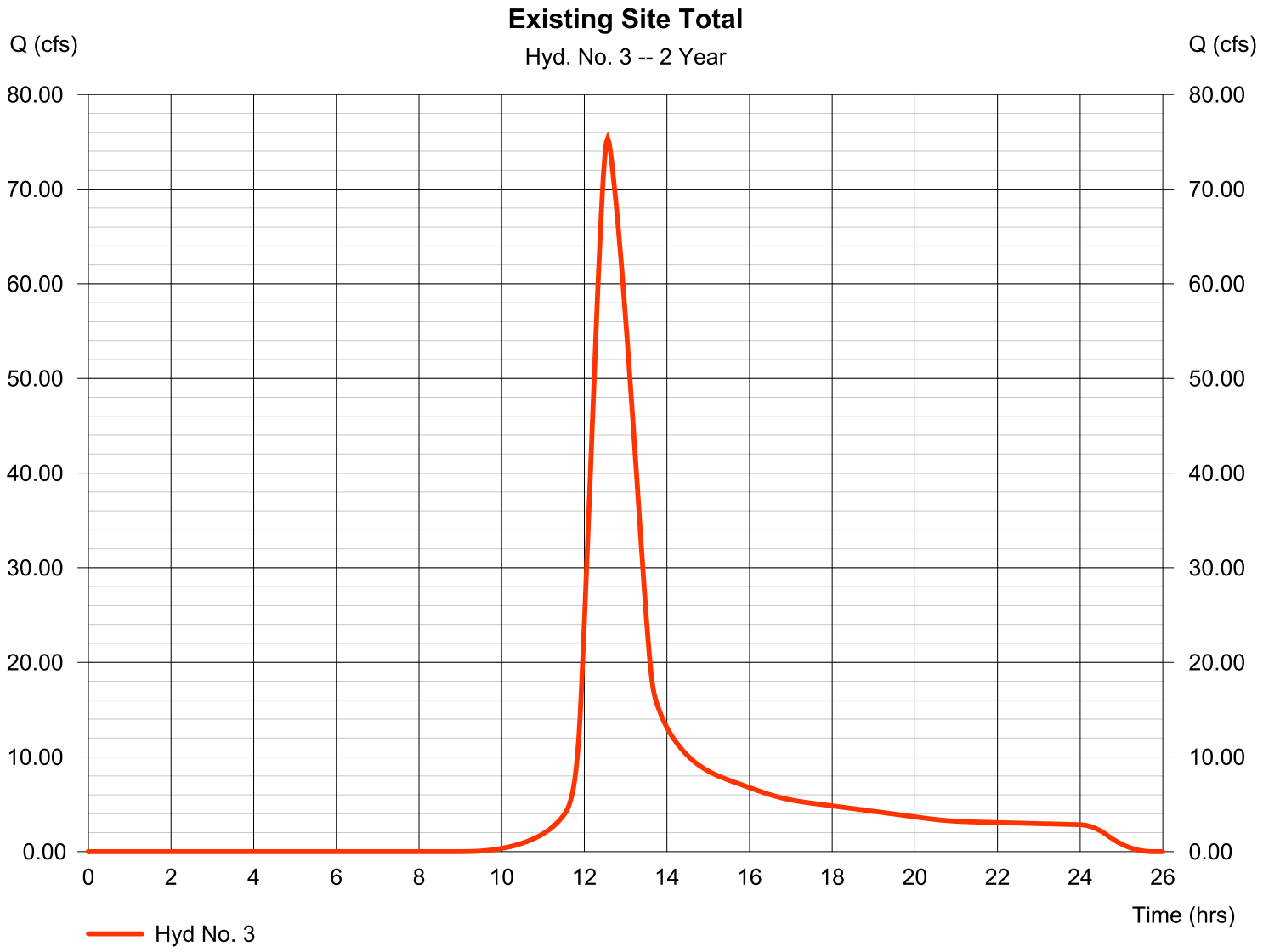


Hydrograph Report

Hyd. No. 3

Existing Site Total

Hydrograph type	= SCS Runoff	Peak discharge	= 75.35 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.57 hrs
Time interval	= 2 min	Hyd. volume	= 12.196 acft
Drainage area	= 90.000 ac	Curve number	= 80
Basin Slope	= 0.7 %	Hydraulic length	= 1950 ft
Tc method	= LAG	Time of conc. (Tc)	= 64.90 min
Total precip.	= 3.50 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

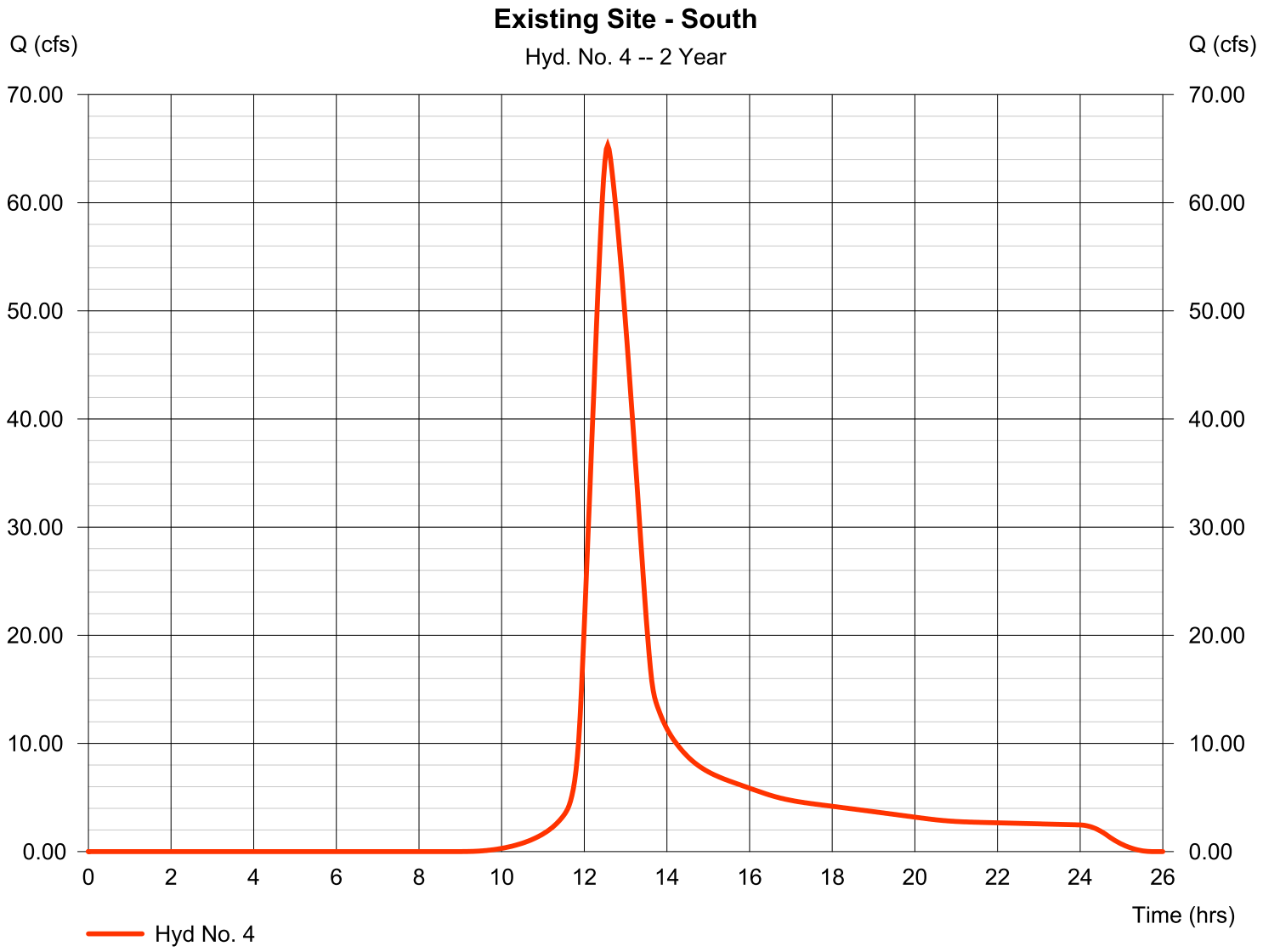


Hydrograph Report

Hyd. No. 4

Existing Site - South

Hydrograph type	= SCS Runoff	Peak discharge	= 65.31 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.57 hrs
Time interval	= 2 min	Hyd. volume	= 10.570 acft
Drainage area	= 78.000 ac	Curve number	= 80
Basin Slope	= 0.7 %	Hydraulic length	= 1950 ft
Tc method	= LAG	Time of conc. (Tc)	= 64.90 min
Total precip.	= 3.50 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

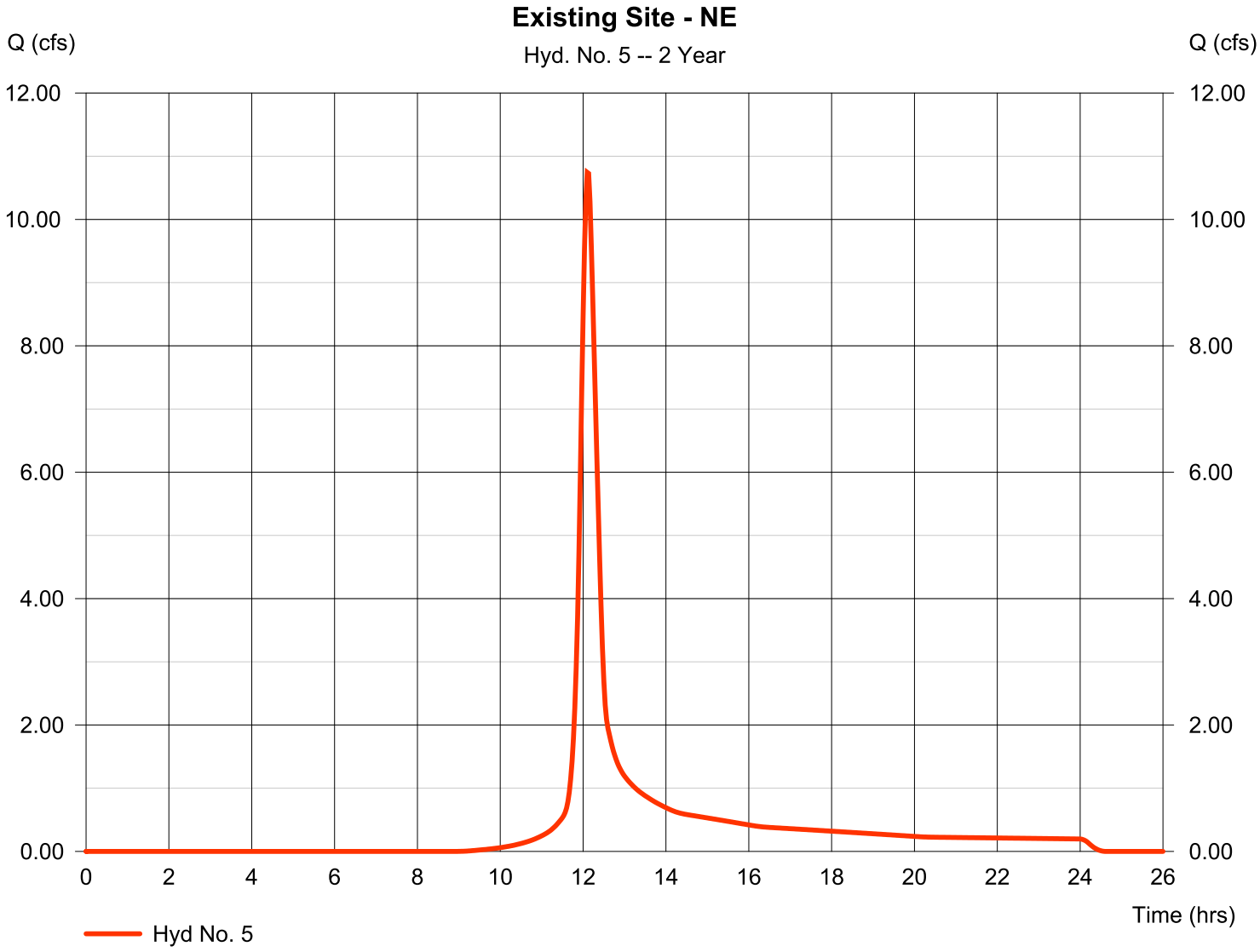


Hydrograph Report

Hyd. No. 5

Existing Site - NE

Hydrograph type	= SCS Runoff	Peak discharge	= 10.74 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.10 hrs
Time interval	= 2 min	Hyd. volume	= 0.861 acft
Drainage area	= 6.200 ac	Curve number	= 80
Basin Slope	= 1.3 %	Hydraulic length	= 750 ft
Tc method	= LAG	Time of conc. (Tc)	= 22.10 min
Total precip.	= 3.50 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

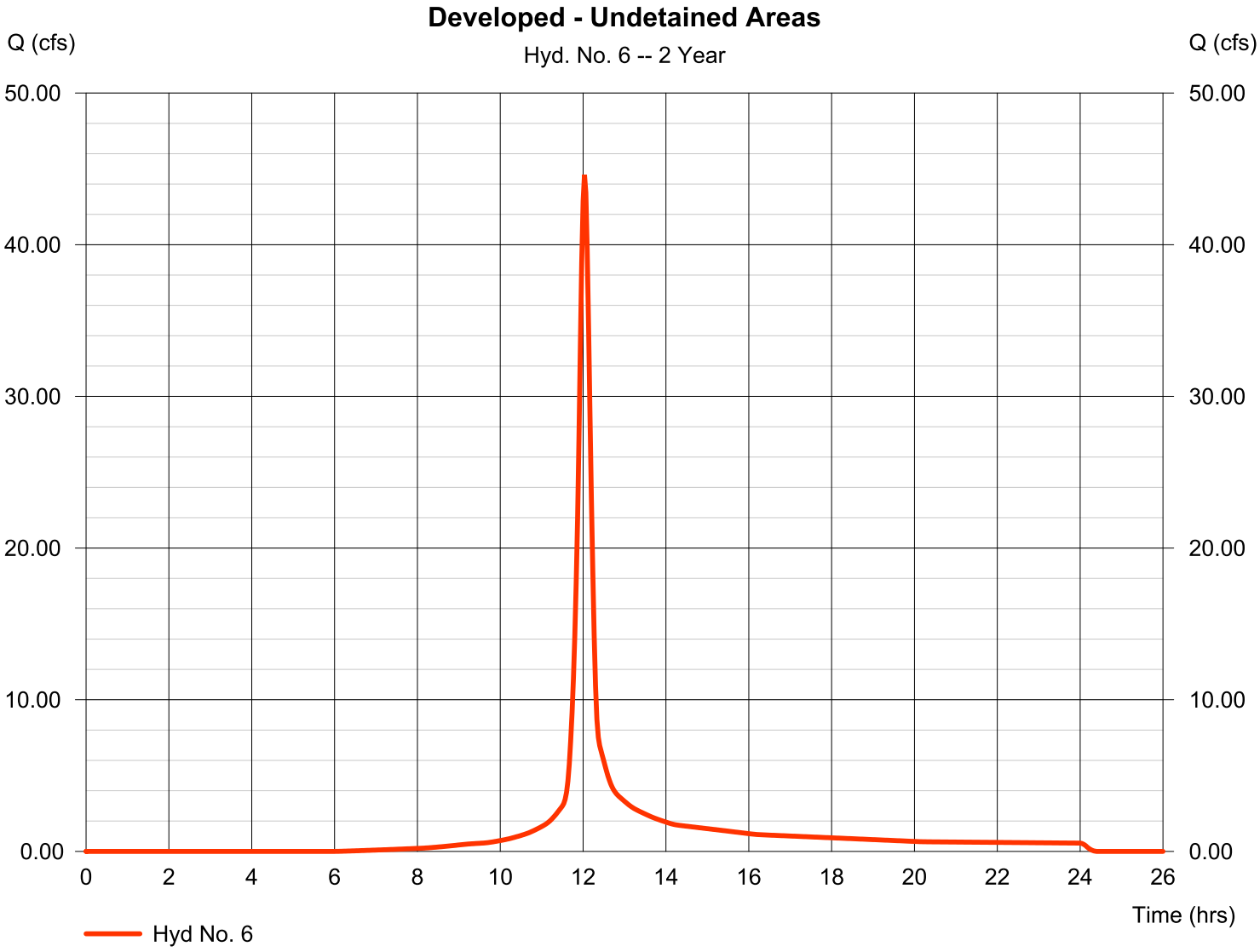


Hydrograph Report

Hyd. No. 6

Developed - Undetained Areas

Hydrograph type	=	SCS Runoff	Peak discharge	=	44.61 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.03 hrs
Time interval	=	2 min	Hyd. volume	=	2.894 acft
Drainage area	=	15.700 ac	Curve number	=	88
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	15.00 min
Total precip.	=	3.50 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

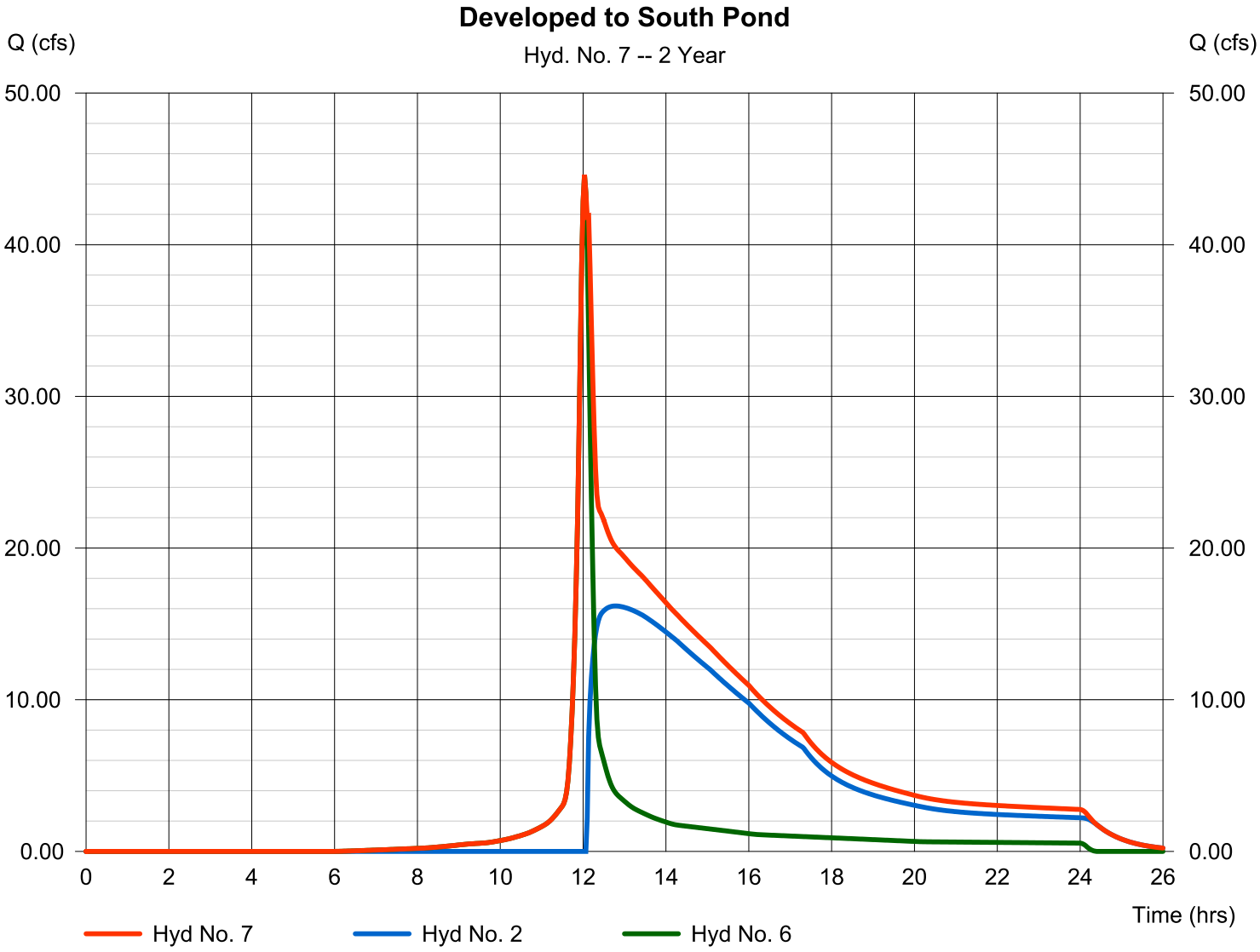


Hydrograph Report

Hyd. No. 7

Developed to South Pond

Hydrograph type	= Combine	Peak discharge	= 44.61 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.03 hrs
Time interval	= 2 min	Hyd. volume	= 10.117 acft
Inflow hyds.	= 2, 6	Contrib. drain. area	= 15.700 ac

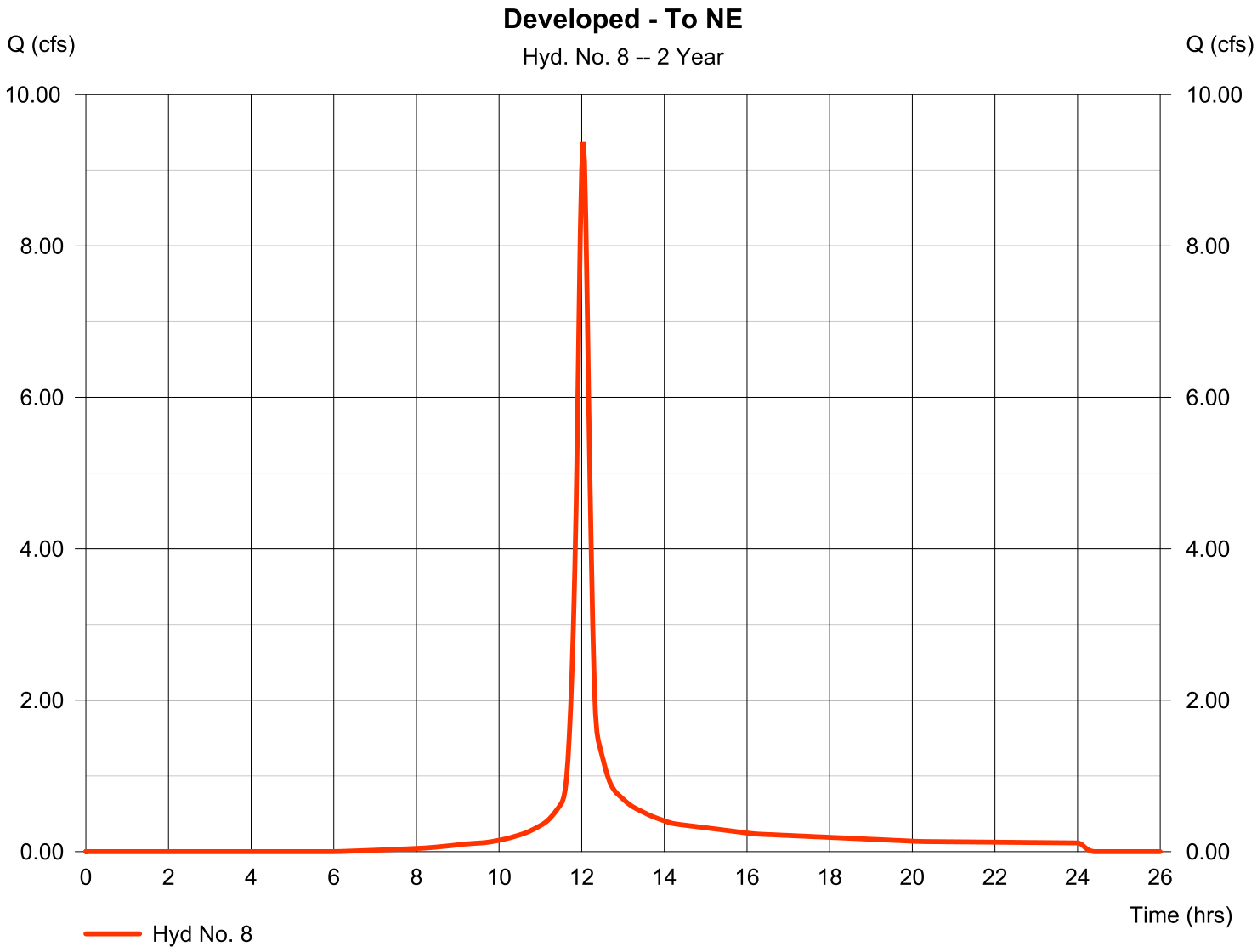


Hydrograph Report

Hyd. No. 8

Developed - To NE

Hydrograph type	=	SCS Runoff	Peak discharge	=	9.376 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.03 hrs
Time interval	=	2 min	Hyd. volume	=	0.608 acft
Drainage area	=	3.300 ac	Curve number	=	88
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	15.00 min
Total precip.	=	3.50 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

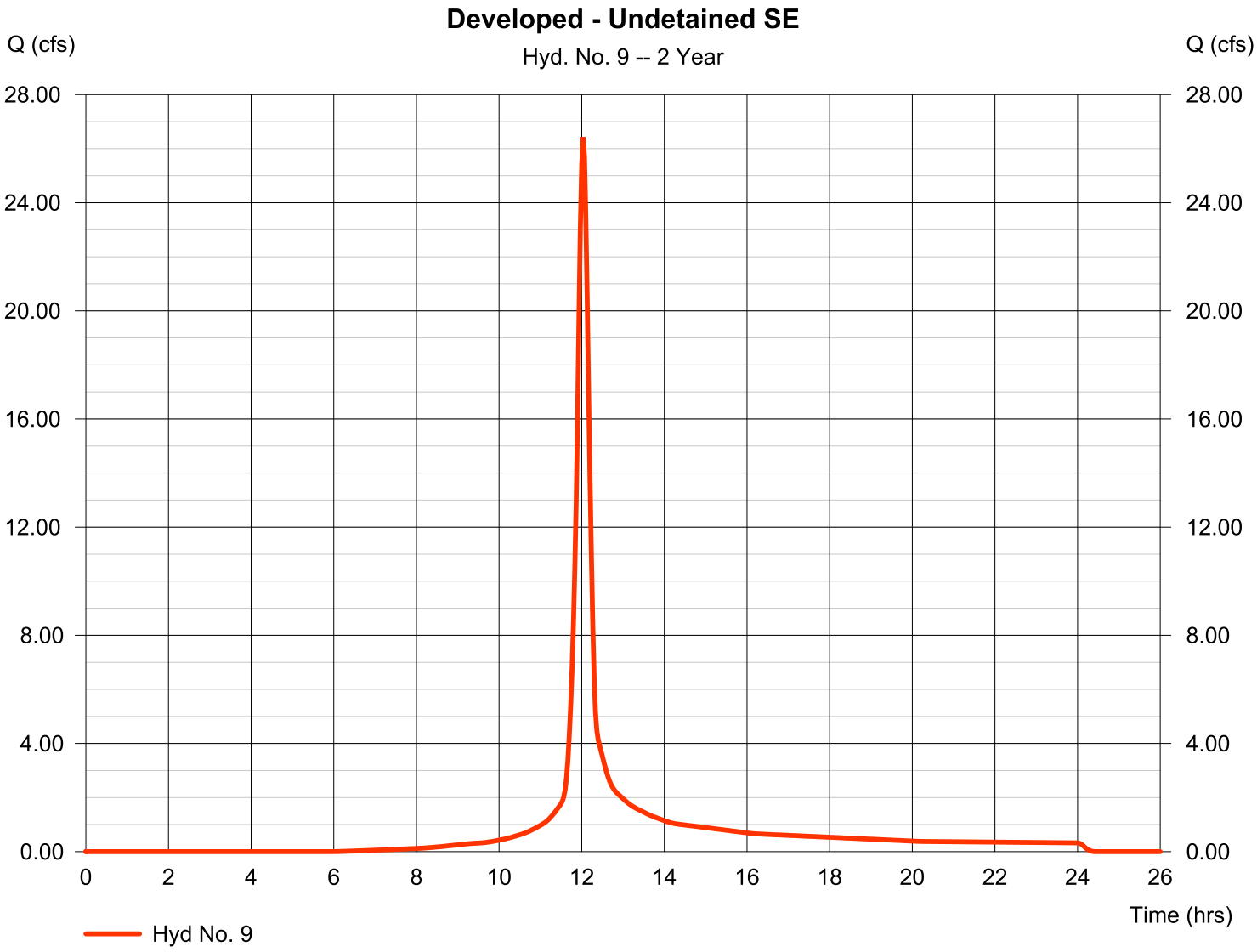


Hydrograph Report

Hyd. No. 9

Developed - Undetained SE

Hydrograph type	=	SCS Runoff	Peak discharge	=	26.42 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.03 hrs
Time interval	=	2 min	Hyd. volume	=	1.714 acft
Drainage area	=	9.300 ac	Curve number	=	88
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	15.00 min
Total precip.	=	3.50 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



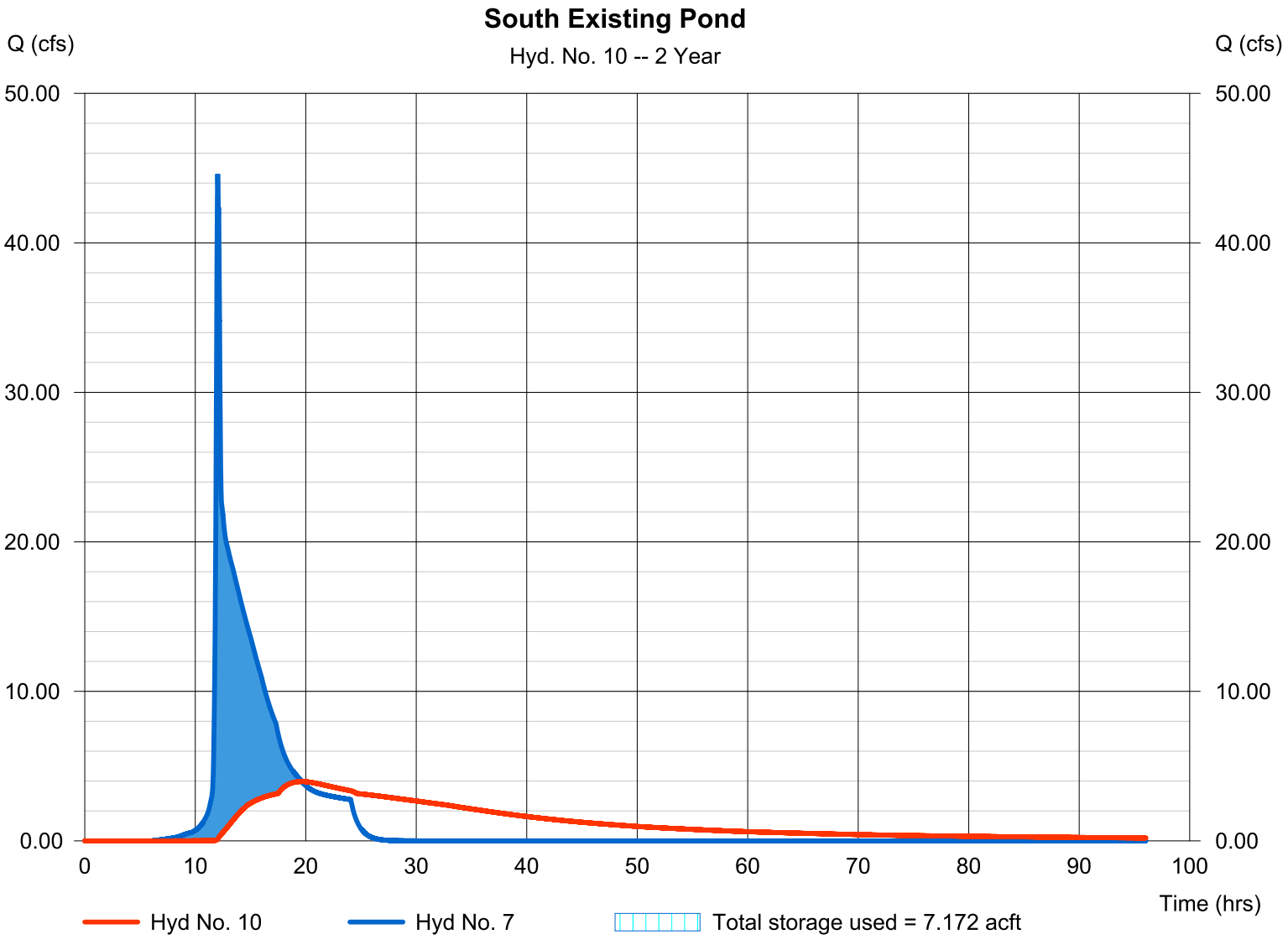
Hydrograph Report

Hyd. No. 10

South Existing Pond

Hydrograph type	=	Reservoir	Peak discharge	=	3.968 cfs
Storm frequency	=	2 yrs	Time to peak	=	19.63 hrs
Time interval	=	2 min	Hyd. volume	=	8.912 acft
Inflow hyd. No.	=	7 - Developed to South Pond	Max. Elevation	=	1367.24 ft
Reservoir name	=	South Pond	Max. Storage	=	7.172 acft

Storage Indication method used.



Pond Report

Pond No. 2 - South Pond

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 1366.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	1366.00	242,300	0.000	0.000
1.00	1367.00	255,300	5.710	5.710
2.00	1368.00	268,400	6.010	11.720
3.00	1369.00	281,600	6.312	18.032

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 12.00	0.00	0.00	0.00
Span (in)	= 12.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 1366.00	0.00	0.00	0.00
Length (ft)	= 65.00	0.00	0.00	0.00
Slope (%)	= 4.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

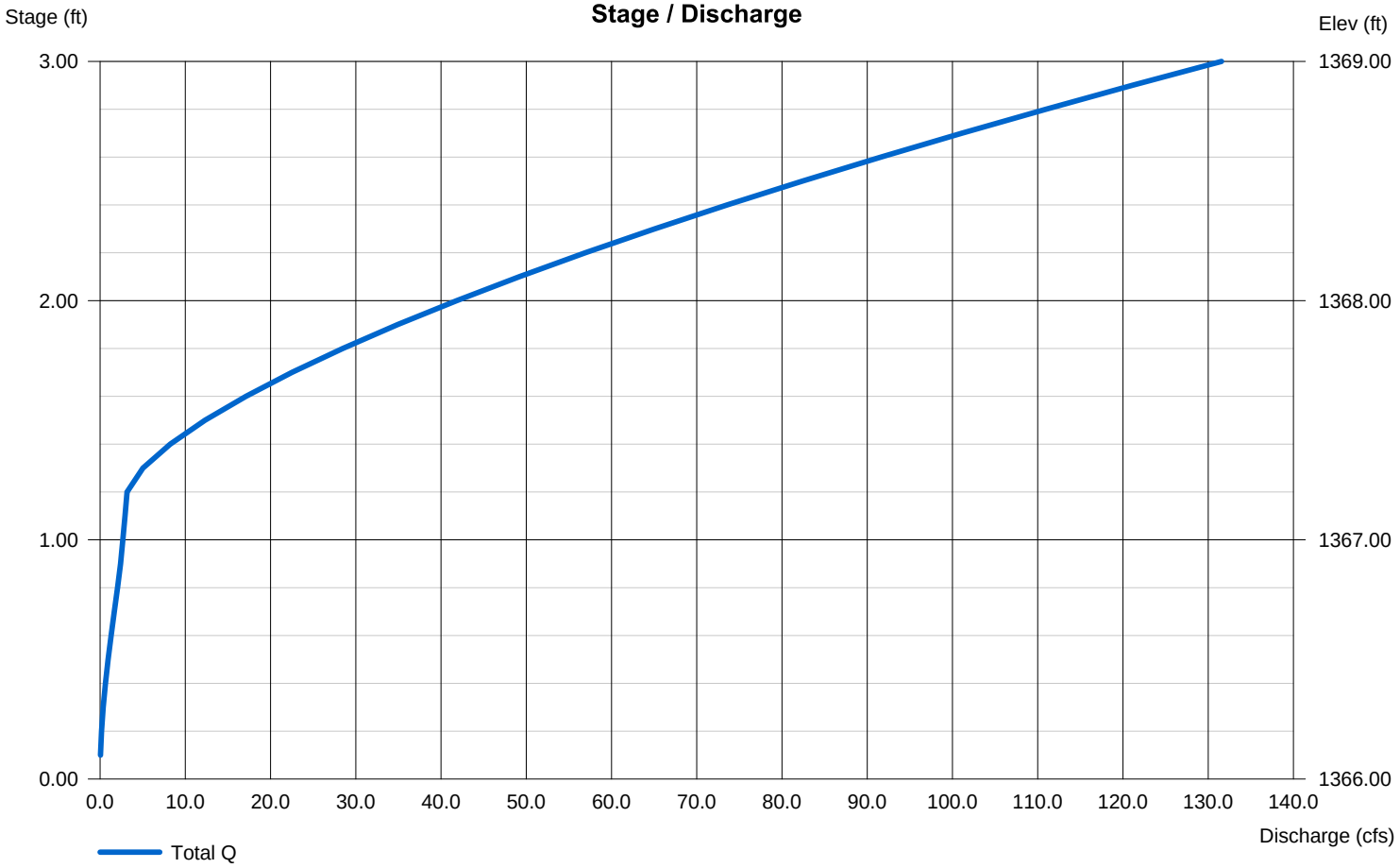
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 20.00	0.00	0.00	0.00
Crest El. (ft)	= 1367.20	0.00	0.00	0.00
Weir Coeff.	= 2.60	3.33	3.33	3.33
Weir Type	= Broad	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 0.00

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

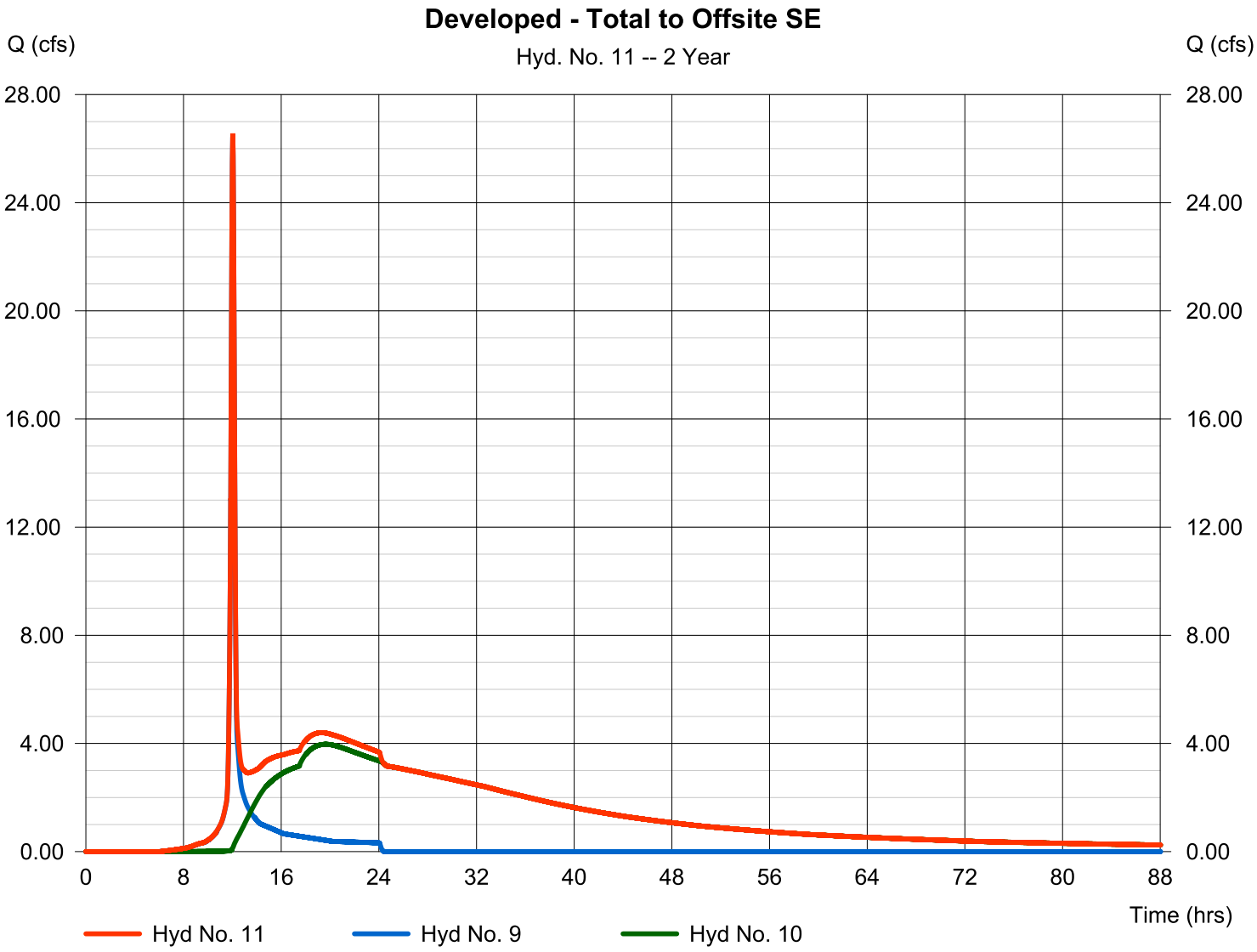


Hydrograph Report

Hyd. No. 11

Developed - Total to Offsite SE

Hydrograph type	= Combine	Peak discharge	= 26.56 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.03 hrs
Time interval	= 2 min	Hyd. volume	= 10.626 acft
Inflow hyds.	= 9, 10	Contrib. drain. area	= 9.300 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2015 by Autodesk, Inc. v10.4

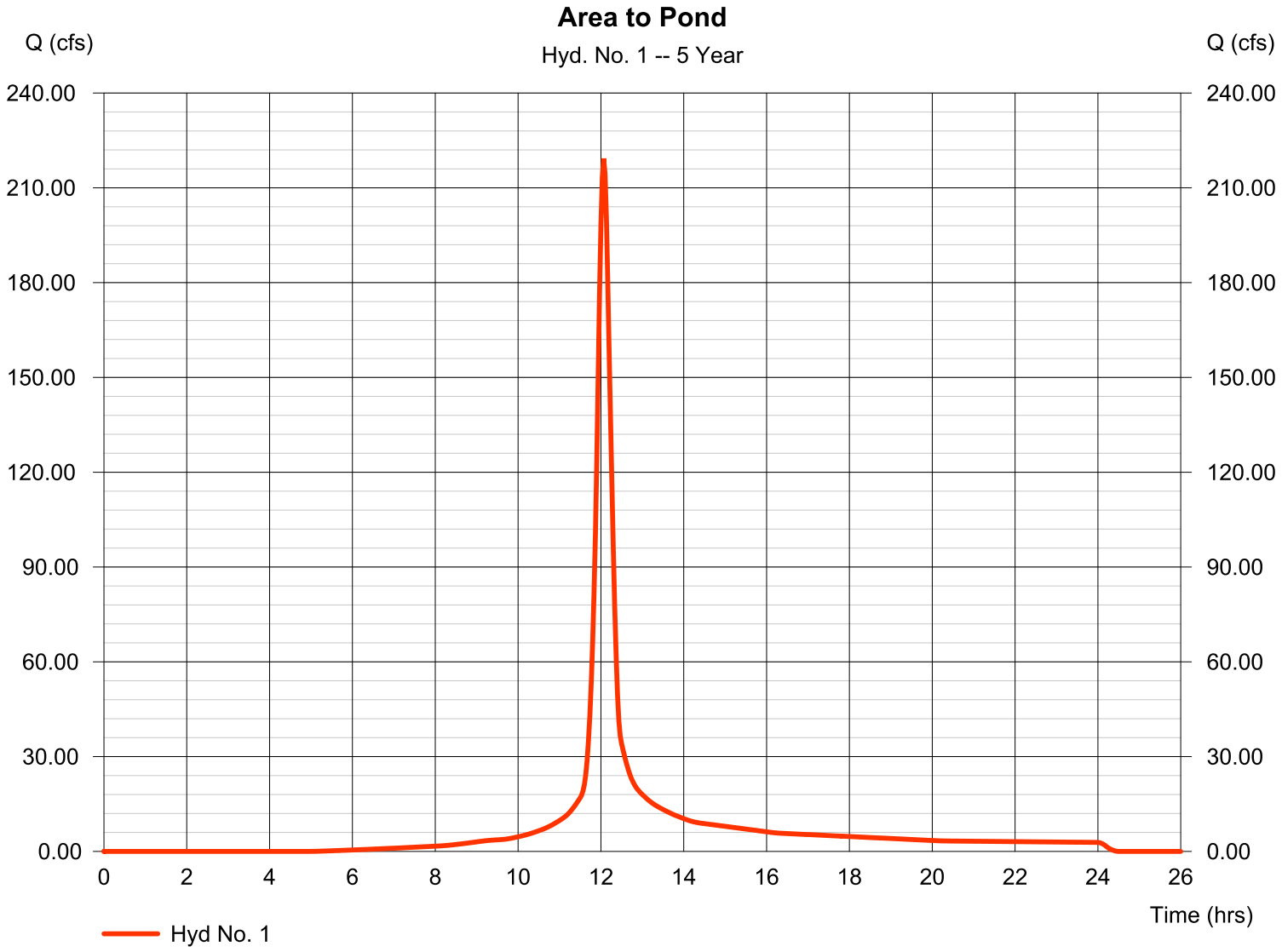
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph Description
1	SCS Runoff	219.29	2	724	15.981	------	------	------	Area to Pond
2	Reservoir	23.78	2	762	11.861	1	1369.16	9.19	Main Pond
3	SCS Runoff	114.99	2	754	18.346	------	------	------	Existing Site Total
4	SCS Runoff	99.66	2	754	15.900	------	------	------	Existing Site - South
5	SCS Runoff	16.32	2	726	1.295	------	------	------	Existing Site - NE
6	SCS Runoff	62.09	2	722	4.077	------	------	------	Developed - Undetained Areas
7	Combine	73.64	2	724	15.938	2, 6	------	------	Developed to South Pond
8	SCS Runoff	13.05	2	722	0.857	------	------	------	Developed - To NE
9	SCS Runoff	36.78	2	722	2.415	------	------	------	Developed - Undetained SE
10	Reservoir	14.21	2	1032	14.708	7	1367.54	8.95	South Existing Pond
11	Combine	37.09	2	722	17.123	9, 10	------	------	Developed - Total to Offsite SE

Hydrograph Report

Hyd. No. 1

Area to Pond

Hydrograph type	=	SCS Runoff	Peak discharge	=	219.29 cfs
Storm frequency	=	5 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	15.981 acft
Drainage area	=	60.000 ac	Curve number	=	88
Basin Slope	=	2.0 %	Hydraulic length	=	1200 ft
Tc method	=	LAG	Time of conc. (Tc)	=	19.70 min
Total precip.	=	4.50 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



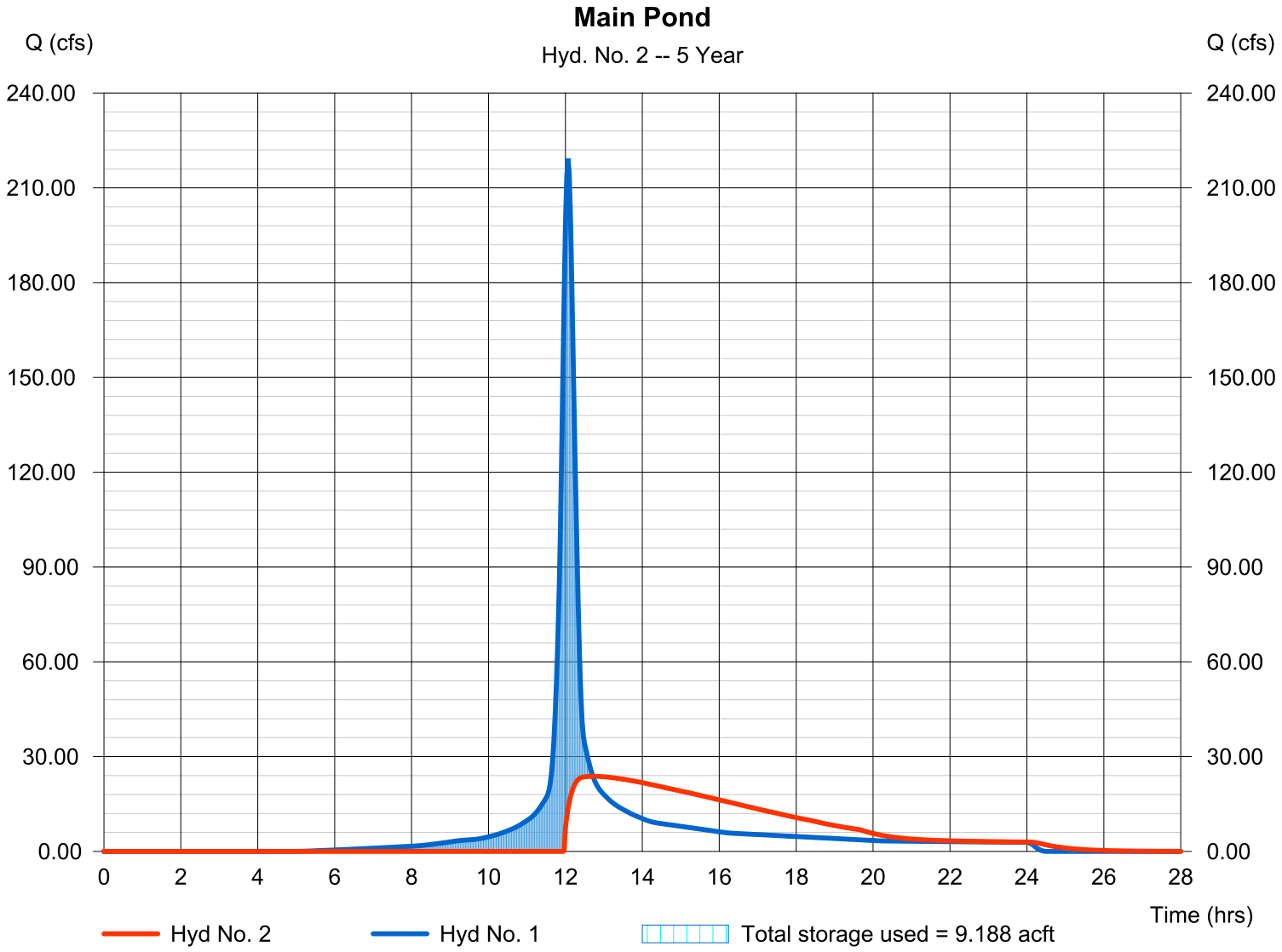
Hydrograph Report

Hyd. No. 2

Main Pond

Hydrograph type	=	Reservoir	Peak discharge	=	23.78 cfs
Storm frequency	=	5 yrs	Time to peak	=	12.70 hrs
Time interval	=	2 min	Hyd. volume	=	11.861 acft
Inflow hyd. No.	=	1 - Area to Pond	Max. Elevation	=	1369.16 ft
Reservoir name	=	Main Pond	Max. Storage	=	9.188 acft

Storage Indication method used.

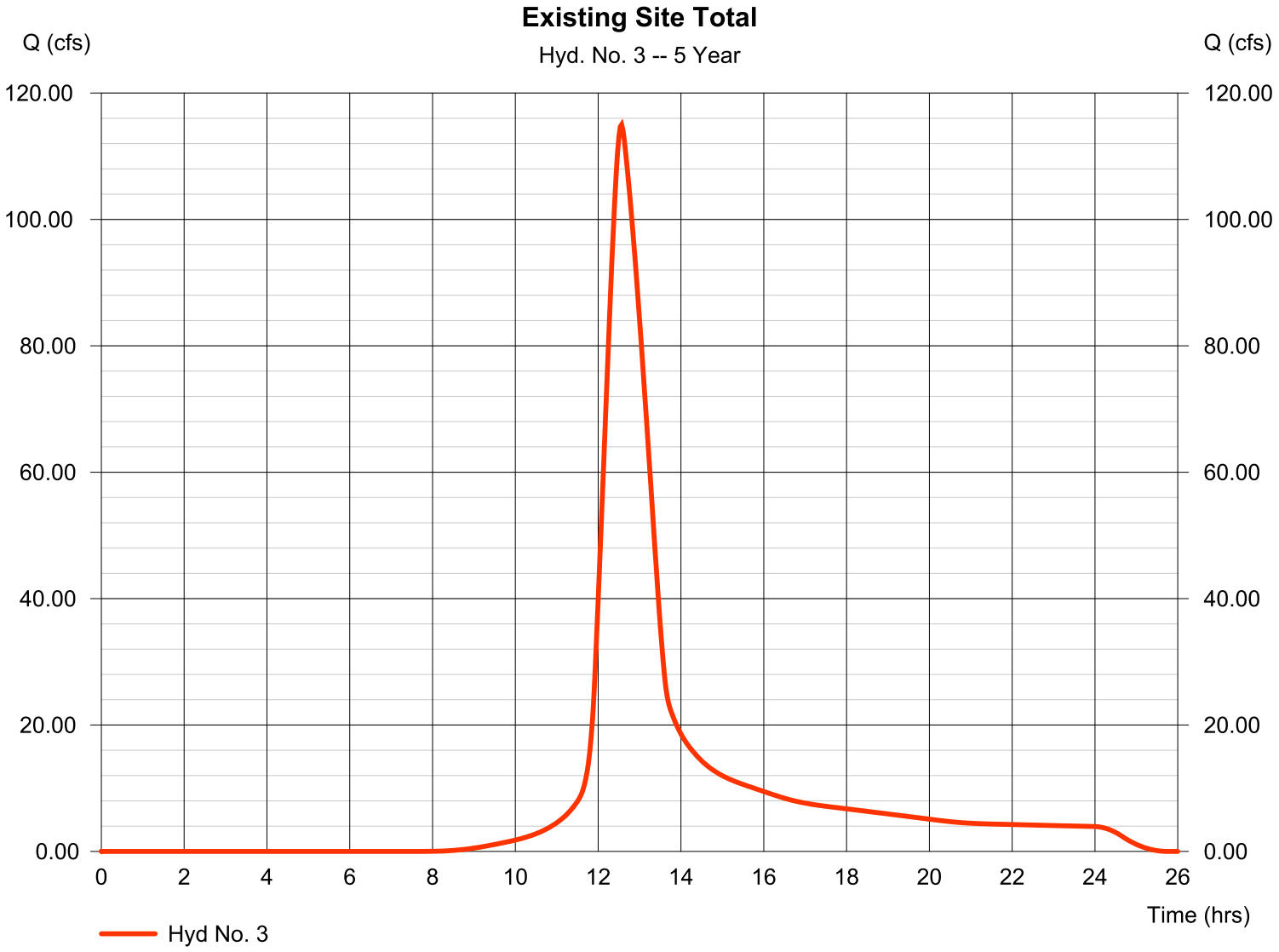


Hydrograph Report

Hyd. No. 3

Existing Site Total

Hydrograph type	= SCS Runoff	Peak discharge	= 114.99 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.57 hrs
Time interval	= 2 min	Hyd. volume	= 18.346 acft
Drainage area	= 90.000 ac	Curve number	= 80
Basin Slope	= 0.7 %	Hydraulic length	= 1950 ft
Tc method	= LAG	Time of conc. (Tc)	= 64.90 min
Total precip.	= 4.50 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

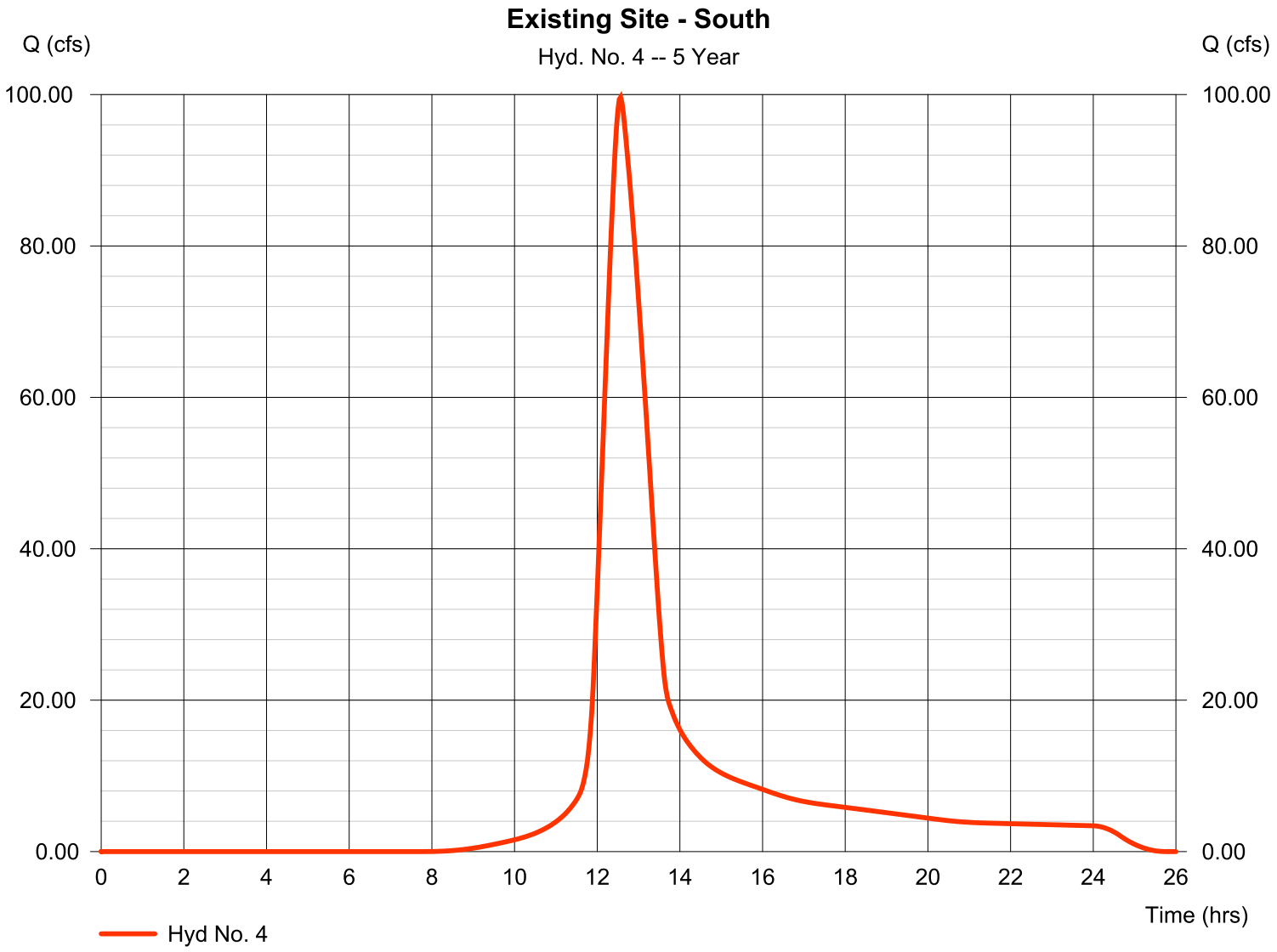


Hydrograph Report

Hyd. No. 4

Existing Site - South

Hydrograph type	= SCS Runoff	Peak discharge	= 99.66 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.57 hrs
Time interval	= 2 min	Hyd. volume	= 15.900 acft
Drainage area	= 78.000 ac	Curve number	= 80
Basin Slope	= 0.7 %	Hydraulic length	= 1950 ft
Tc method	= LAG	Time of conc. (Tc)	= 64.90 min
Total precip.	= 4.50 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

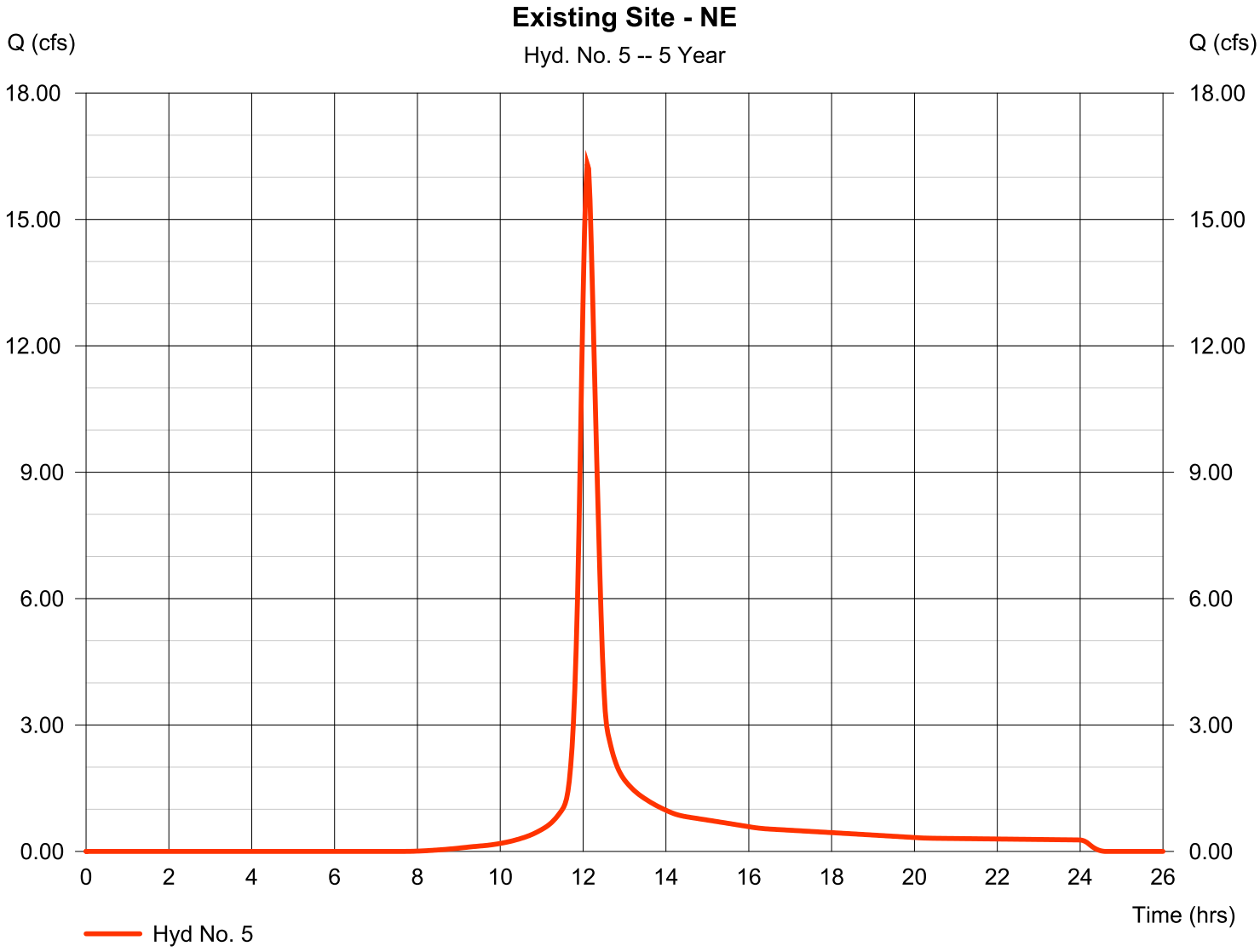


Hydrograph Report

Hyd. No. 5

Existing Site - NE

Hydrograph type	=	SCS Runoff	Peak discharge	=	16.32 cfs
Storm frequency	=	5 yrs	Time to peak	=	12.10 hrs
Time interval	=	2 min	Hyd. volume	=	1.295 acft
Drainage area	=	6.200 ac	Curve number	=	80
Basin Slope	=	1.3 %	Hydraulic length	=	750 ft
Tc method	=	LAG	Time of conc. (Tc)	=	22.10 min
Total precip.	=	4.50 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

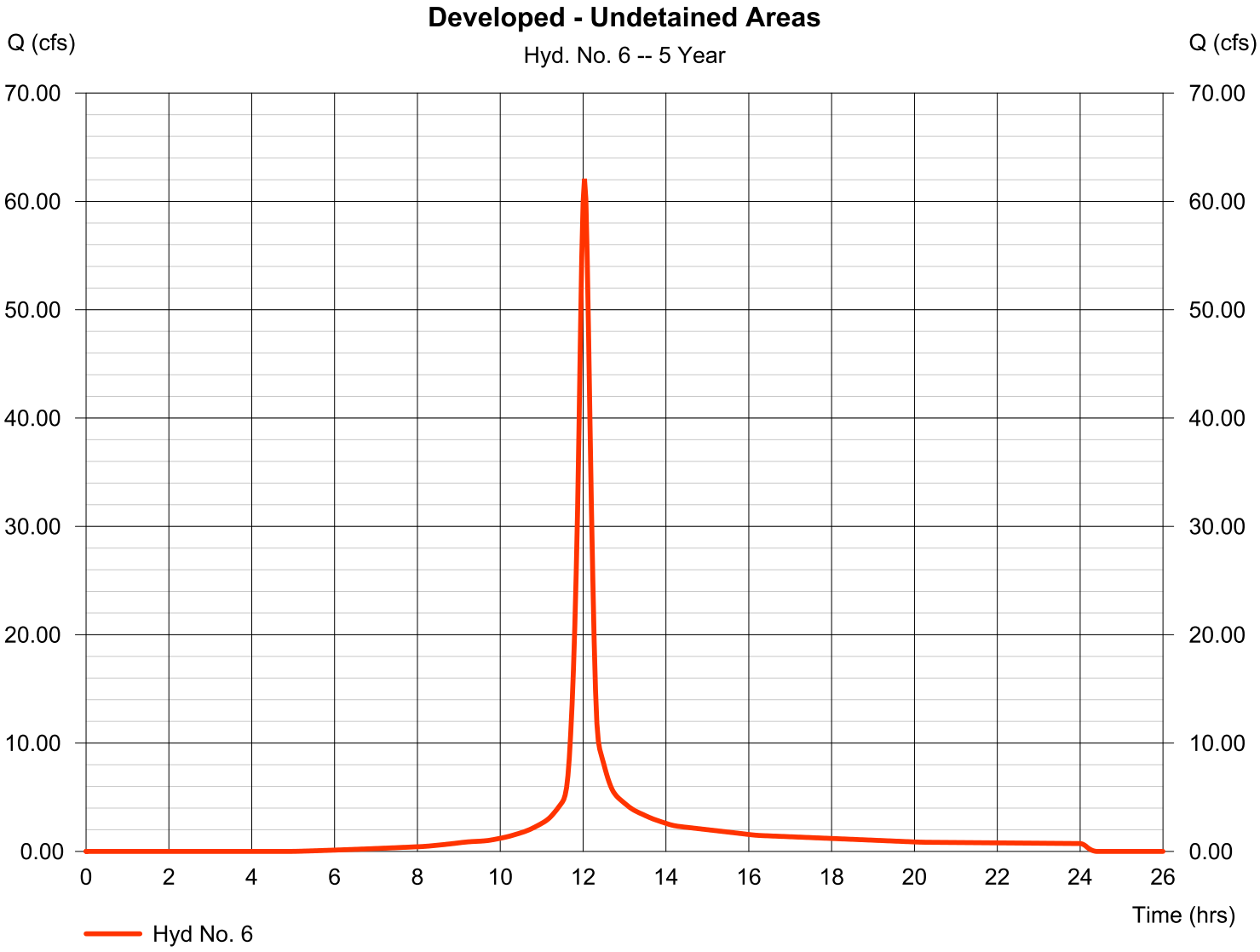


Hydrograph Report

Hyd. No. 6

Developed - Undetained Areas

Hydrograph type	=	SCS Runoff	Peak discharge	=	62.09 cfs
Storm frequency	=	5 yrs	Time to peak	=	12.03 hrs
Time interval	=	2 min	Hyd. volume	=	4.077 acft
Drainage area	=	15.700 ac	Curve number	=	88
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	15.00 min
Total precip.	=	4.50 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

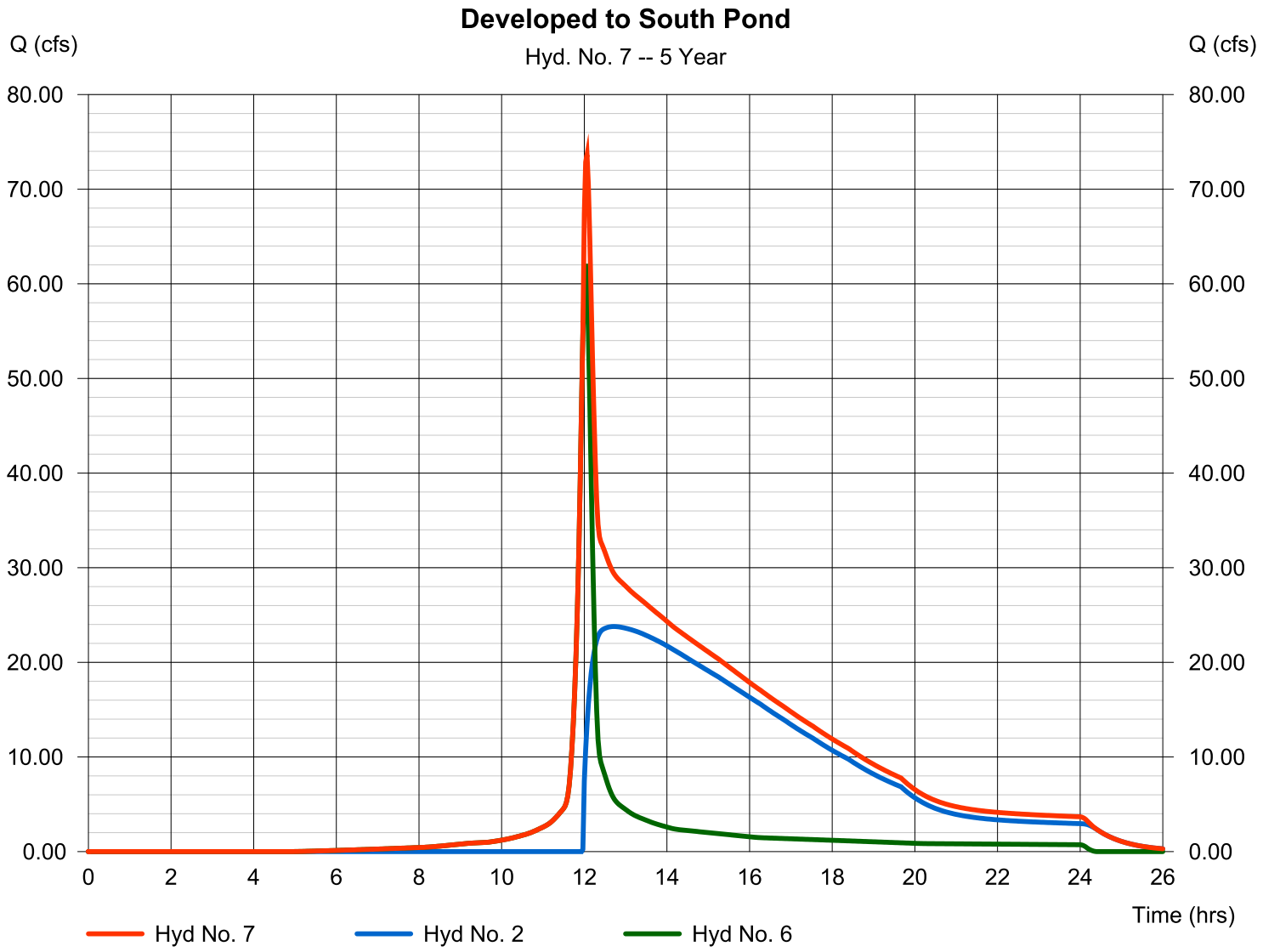


Hydrograph Report

Hyd. No. 7

Developed to South Pond

Hydrograph type	= Combine	Peak discharge	= 73.64 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 15.938 acft
Inflow hyds.	= 2, 6	Contrib. drain. area	= 15.700 ac

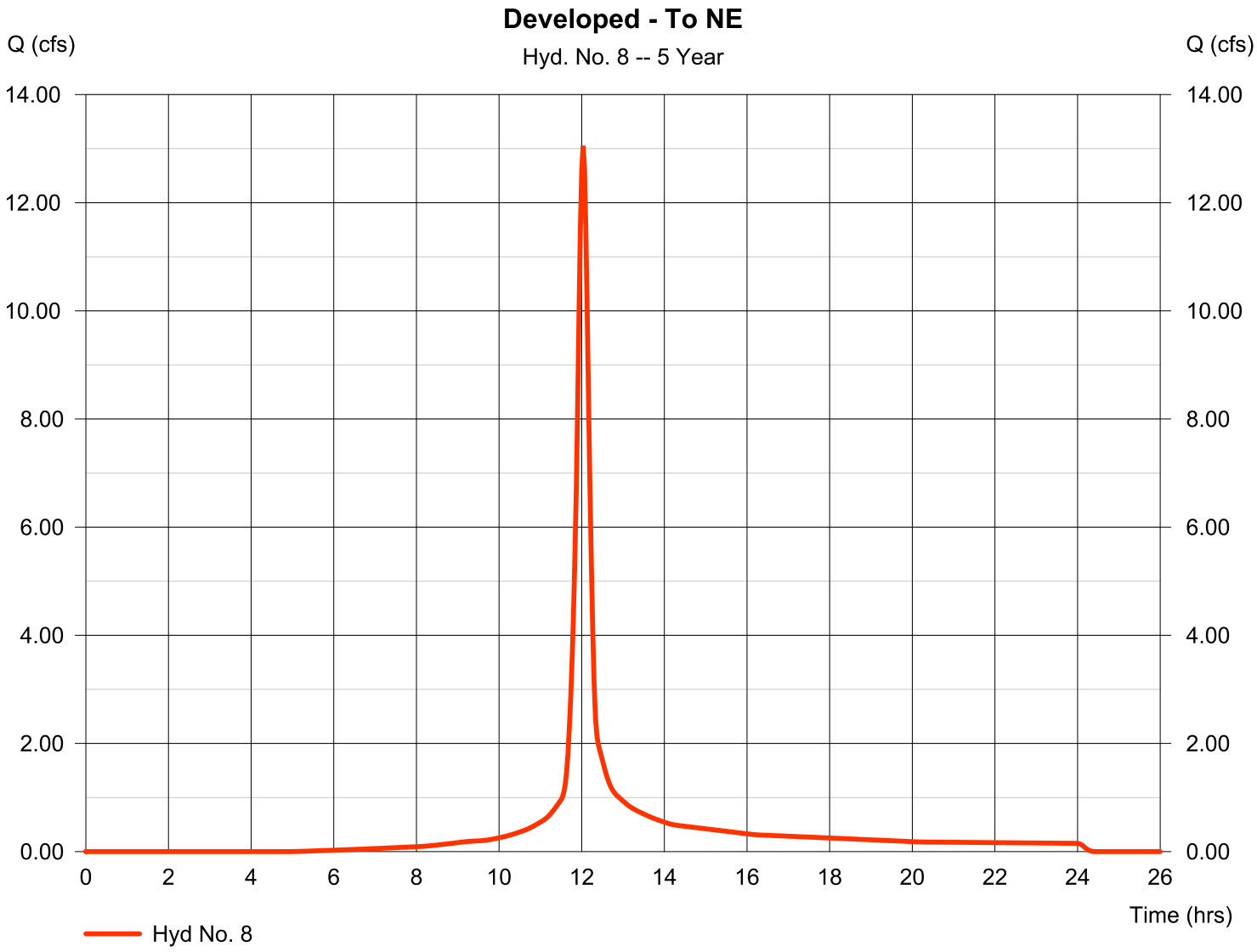


Hydrograph Report

Hyd. No. 8

Developed - To NE

Hydrograph type	= SCS Runoff	Peak discharge	= 13.05 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.03 hrs
Time interval	= 2 min	Hyd. volume	= 0.857 acft
Drainage area	= 3.300 ac	Curve number	= 88
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 15.00 min
Total precip.	= 4.50 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

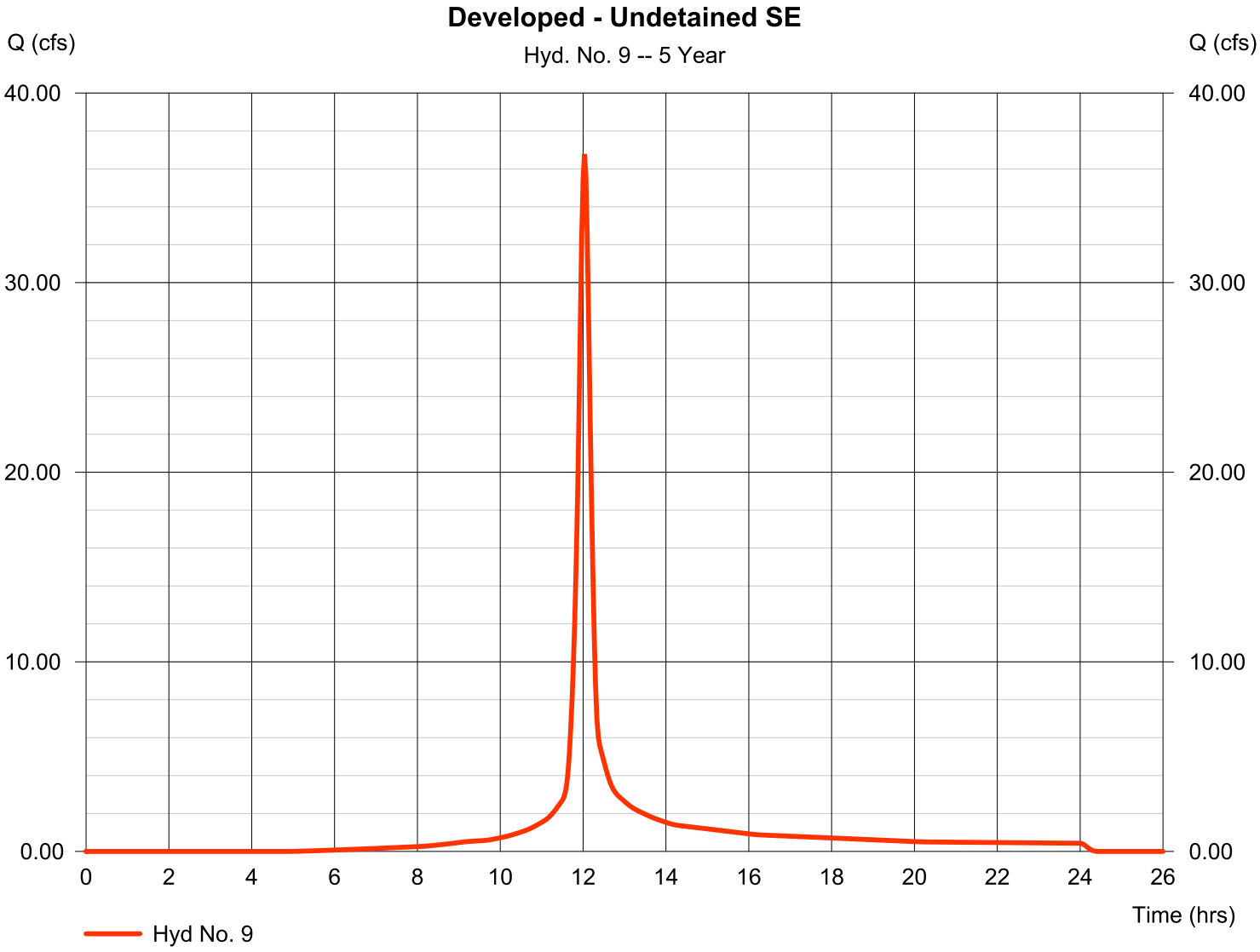


Hydrograph Report

Hyd. No. 9

Developed - Undetained SE

Hydrograph type	=	SCS Runoff	Peak discharge	=	36.78 cfs
Storm frequency	=	5 yrs	Time to peak	=	12.03 hrs
Time interval	=	2 min	Hyd. volume	=	2.415 acft
Drainage area	=	9.300 ac	Curve number	=	88
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	15.00 min
Total precip.	=	4.50 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



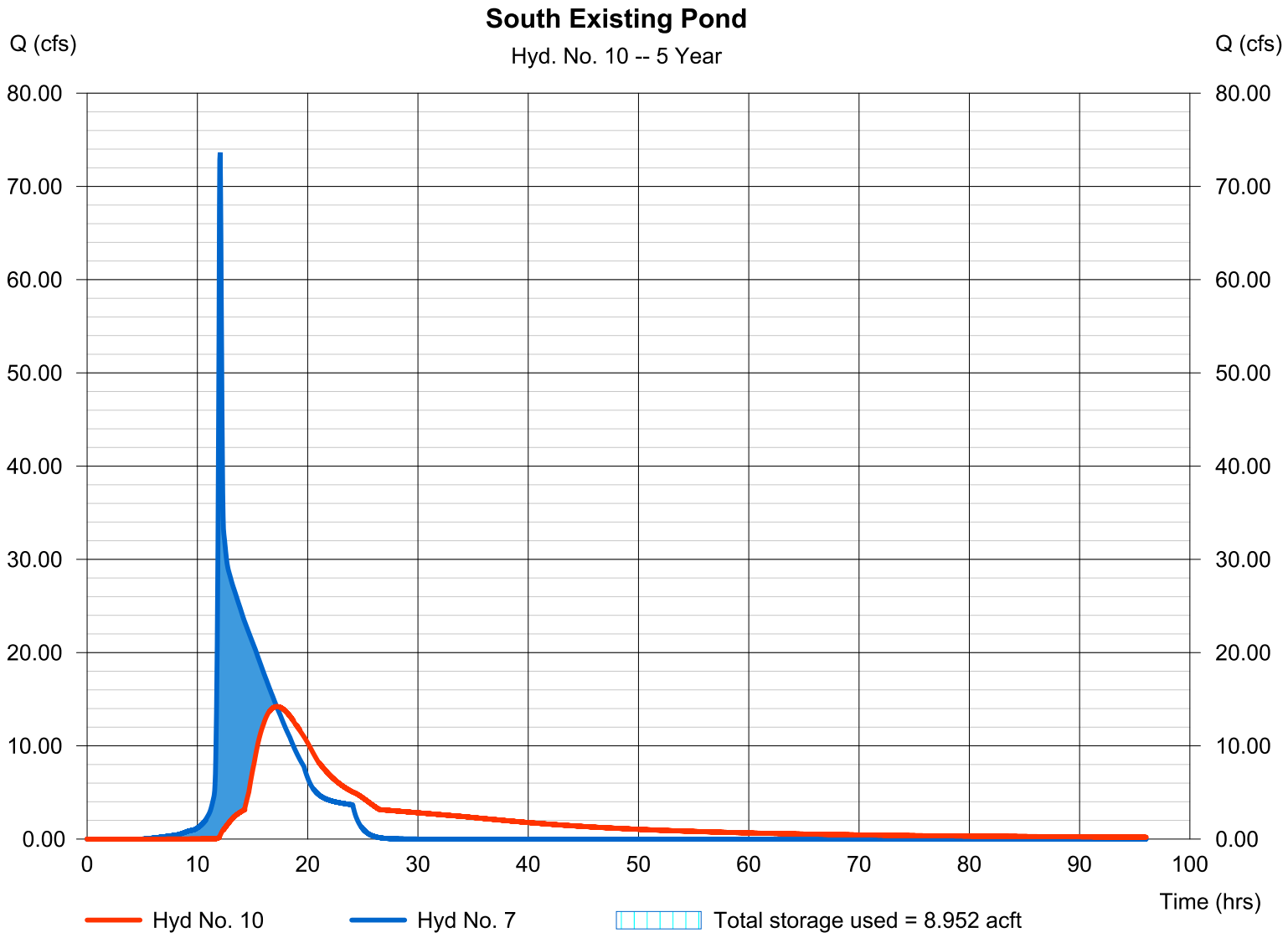
Hydrograph Report

Hyd. No. 10

South Existing Pond

Hydrograph type	=	Reservoir	Peak discharge	=	14.21 cfs
Storm frequency	=	5 yrs	Time to peak	=	17.20 hrs
Time interval	=	2 min	Hyd. volume	=	14.708 acft
Inflow hyd. No.	=	7 - Developed to South Pond	Max. Elevation	=	1367.54 ft
Reservoir name	=	South Pond	Max. Storage	=	8.952 acft

Storage Indication method used.

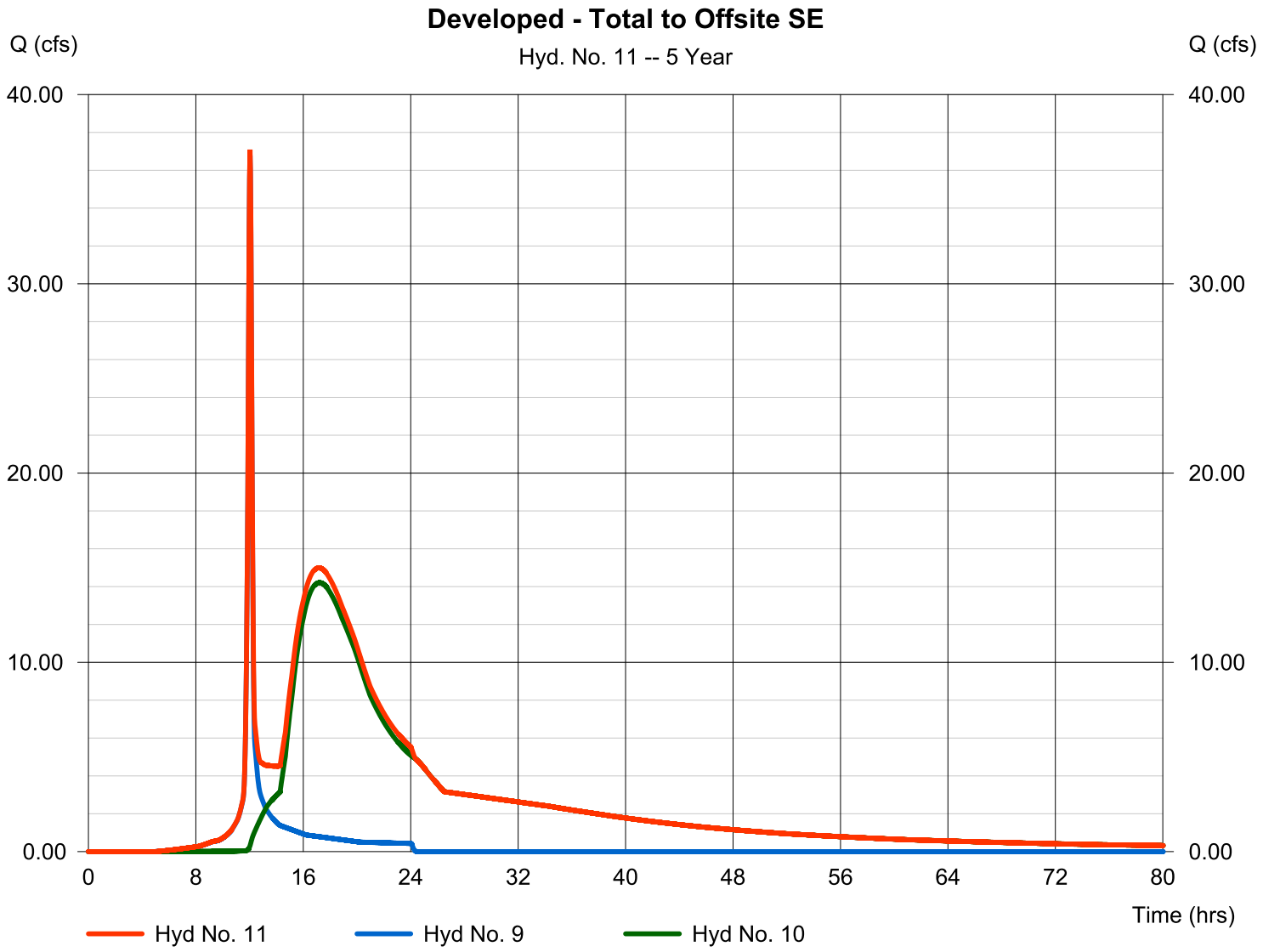


Hydrograph Report

Hyd. No. 11

Developed - Total to Offsite SE

Hydrograph type	= Combine	Peak discharge	= 37.09 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.03 hrs
Time interval	= 2 min	Hyd. volume	= 17.123 acft
Inflow hyds.	= 9, 10	Contrib. drain. area	= 9.300 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2015 by Autodesk, Inc. v10.4

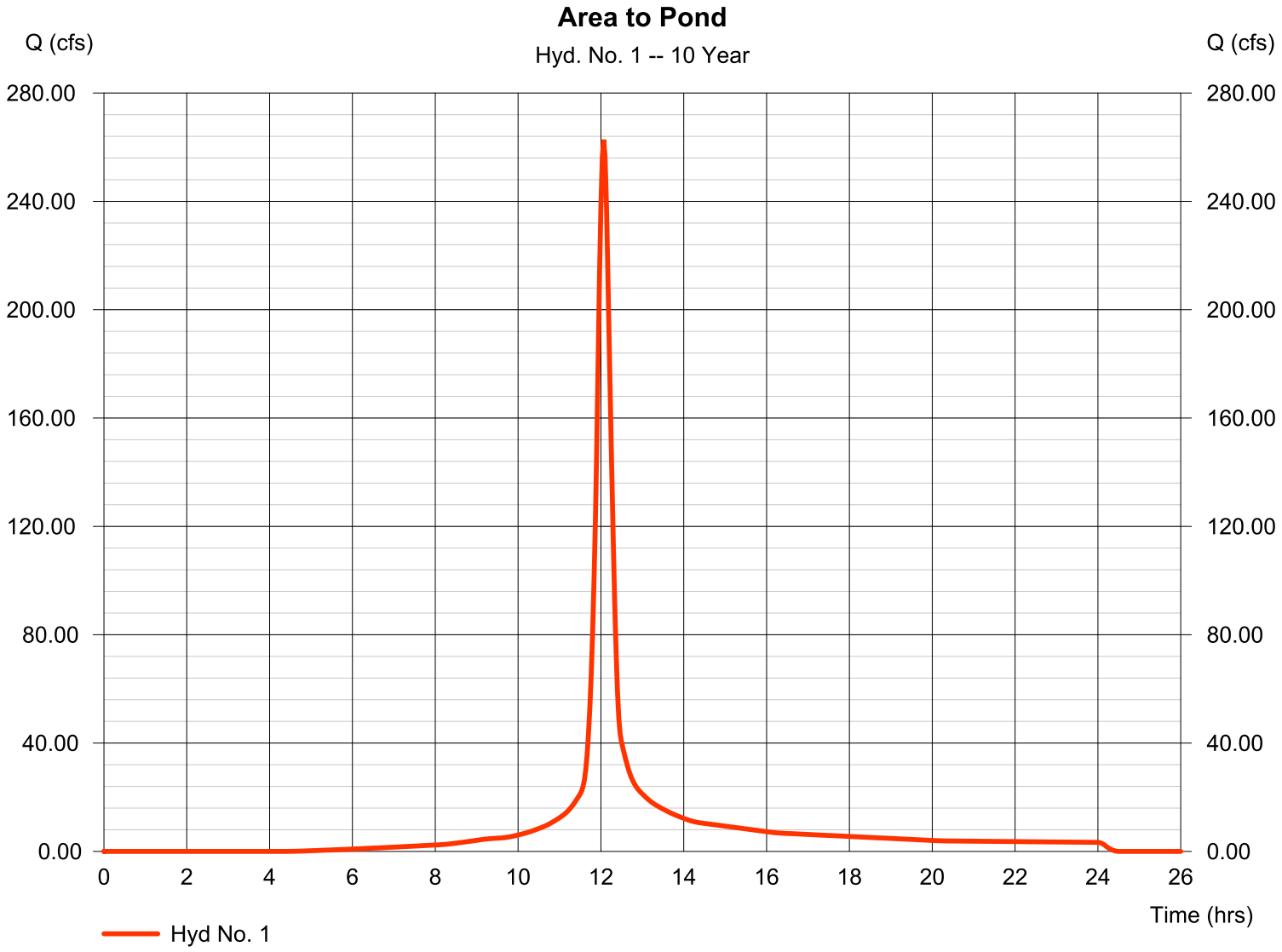
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph Description
1	SCS Runoff	262.80	2	724	19.296	------	------	------	Area to Pond
2	Reservoir	27.89	2	764	15.176	1	1369.60	11.2	Main Pond
3	SCS Runoff	143.79	2	754	22.867	------	------	------	Existing Site Total
4	SCS Runoff	124.62	2	754	19.818	------	------	------	Existing Site - South
5	SCS Runoff	20.36	2	726	1.613	------	------	------	Existing Site - NE
6	SCS Runoff	74.35	2	722	4.923	------	------	------	Developed - Undetained Areas
7	Combine	90.44	2	722	20.099	2, 6	------	------	Developed to South Pond
8	SCS Runoff	15.63	2	722	1.035	------	------	------	Developed - To NE
9	SCS Runoff	44.04	2	722	2.916	------	------	------	Developed - Undetained SE
10	Reservoir	20.28	2	998	18.859	7	1367.66	9.67	South Existing Pond
11	Combine	44.55	2	722	21.775	9, 10	------	------	Developed - Total to Offsite SE

Hydrograph Report

Hyd. No. 1

Area to Pond

Hydrograph type	=	SCS Runoff	Peak discharge	=	262.80 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	19.296 acft
Drainage area	=	60.000 ac	Curve number	=	88
Basin Slope	=	2.0 %	Hydraulic length	=	1200 ft
Tc method	=	LAG	Time of conc. (Tc)	=	19.70 min
Total precip.	=	5.20 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



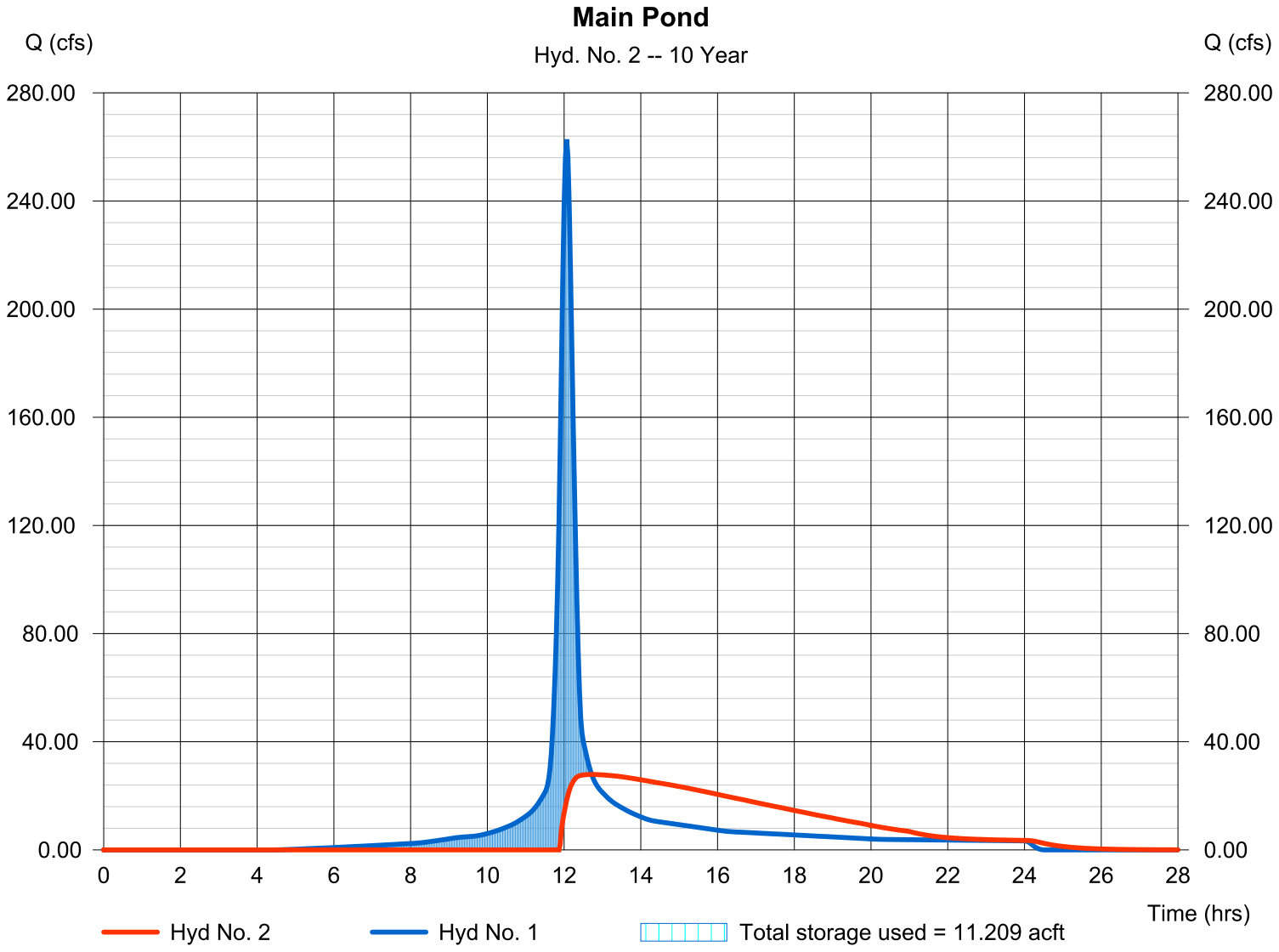
Hydrograph Report

Hyd. No. 2

Main Pond

Hydrograph type	=	Reservoir	Peak discharge	=	27.89 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.73 hrs
Time interval	=	2 min	Hyd. volume	=	15.176 acft
Inflow hyd. No.	=	1 - Area to Pond	Max. Elevation	=	1369.60 ft
Reservoir name	=	Main Pond	Max. Storage	=	11.209 acft

Storage Indication method used.

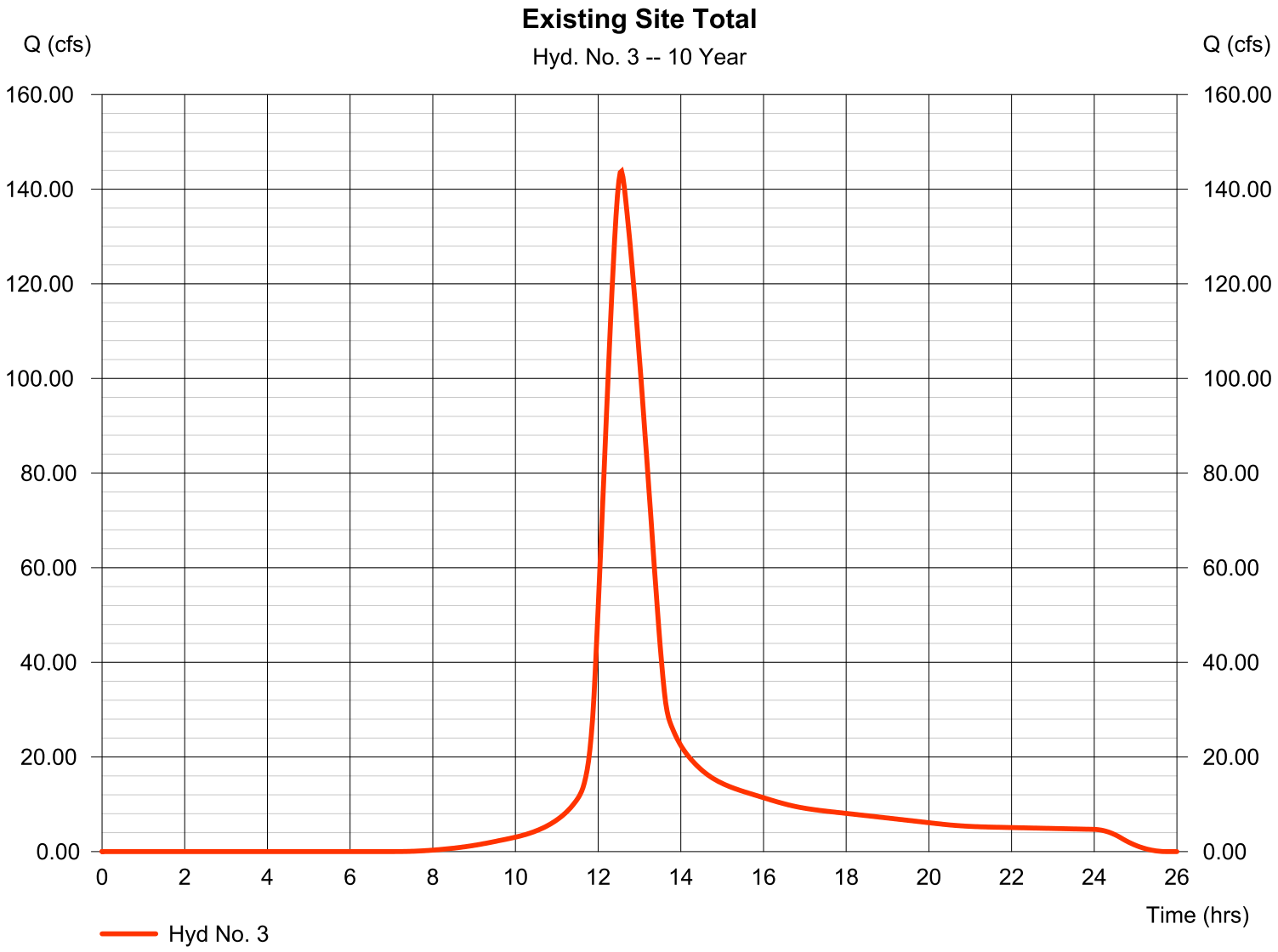


Hydrograph Report

Hyd. No. 3

Existing Site Total

Hydrograph type	=	SCS Runoff	Peak discharge	=	143.79 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.57 hrs
Time interval	=	2 min	Hyd. volume	=	22.867 acft
Drainage area	=	90.000 ac	Curve number	=	80
Basin Slope	=	0.7 %	Hydraulic length	=	1950 ft
Tc method	=	LAG	Time of conc. (Tc)	=	64.90 min
Total precip.	=	5.20 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

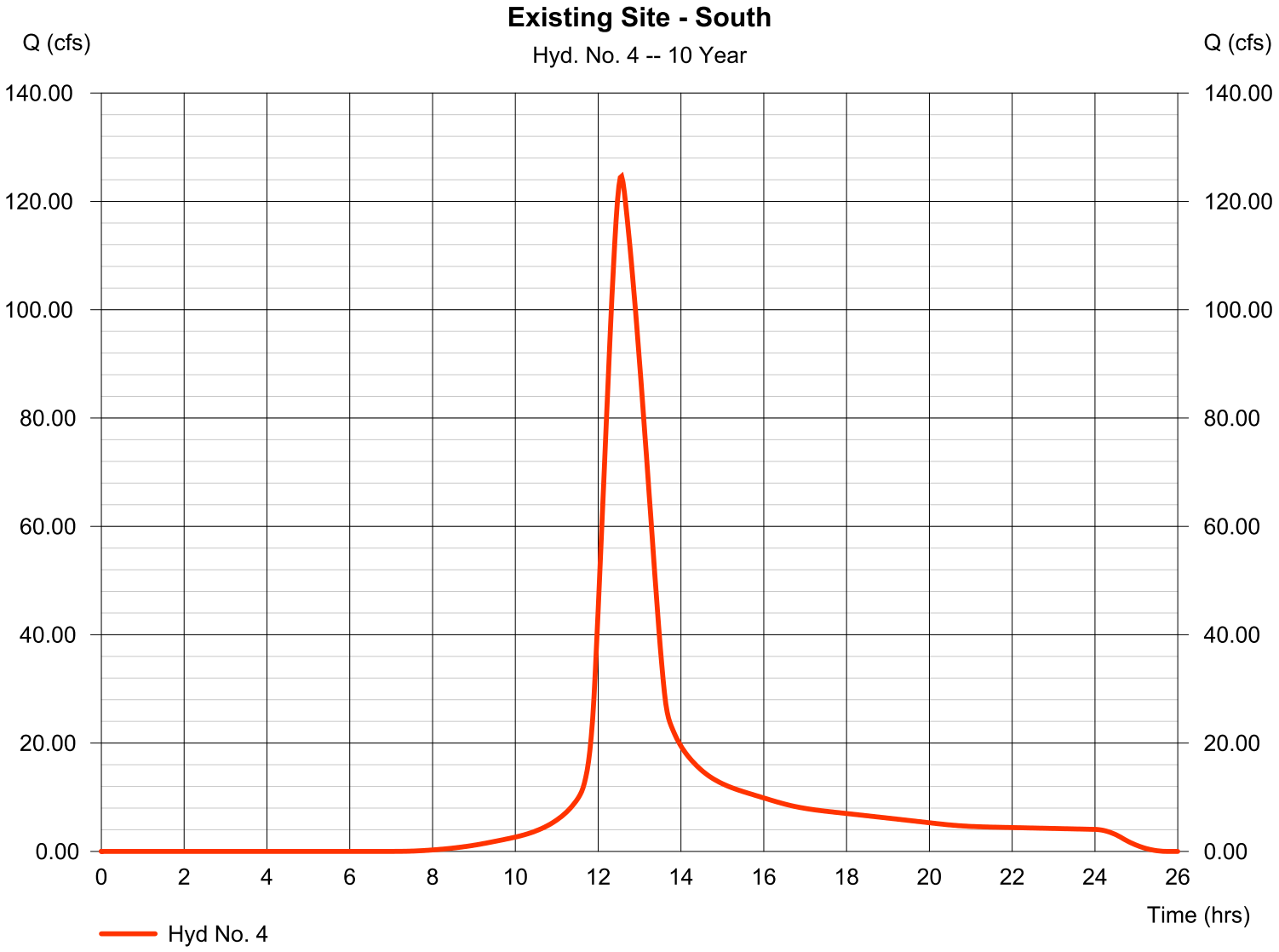


Hydrograph Report

Hyd. No. 4

Existing Site - South

Hydrograph type	=	SCS Runoff	Peak discharge	=	124.62 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.57 hrs
Time interval	=	2 min	Hyd. volume	=	19.818 acft
Drainage area	=	78.000 ac	Curve number	=	80
Basin Slope	=	0.7 %	Hydraulic length	=	1950 ft
Tc method	=	LAG	Time of conc. (Tc)	=	64.90 min
Total precip.	=	5.20 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

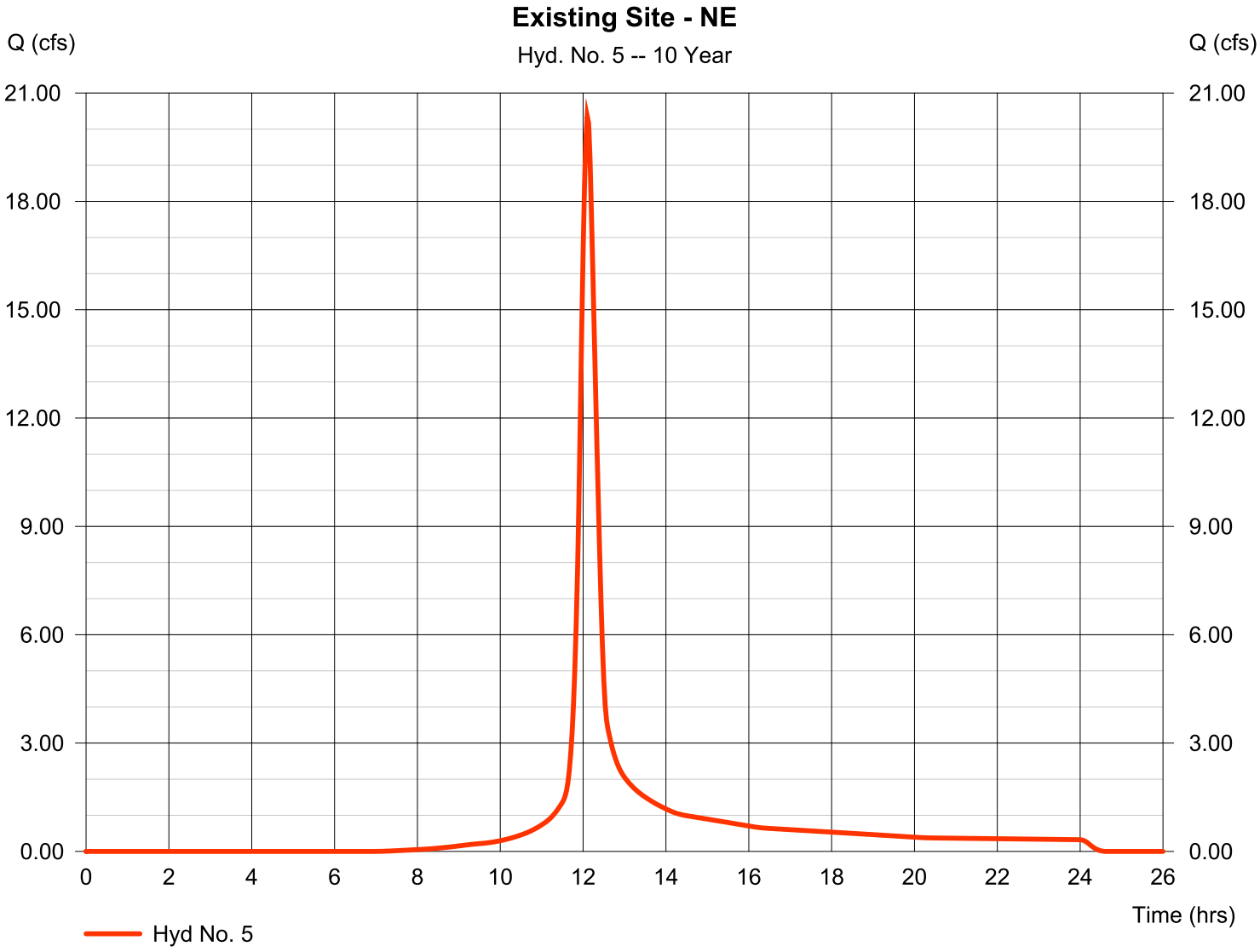


Hydrograph Report

Hyd. No. 5

Existing Site - NE

Hydrograph type	=	SCS Runoff	Peak discharge	=	20.36 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.10 hrs
Time interval	=	2 min	Hyd. volume	=	1.613 acft
Drainage area	=	6.200 ac	Curve number	=	80
Basin Slope	=	1.3 %	Hydraulic length	=	750 ft
Tc method	=	LAG	Time of conc. (Tc)	=	22.10 min
Total precip.	=	5.20 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

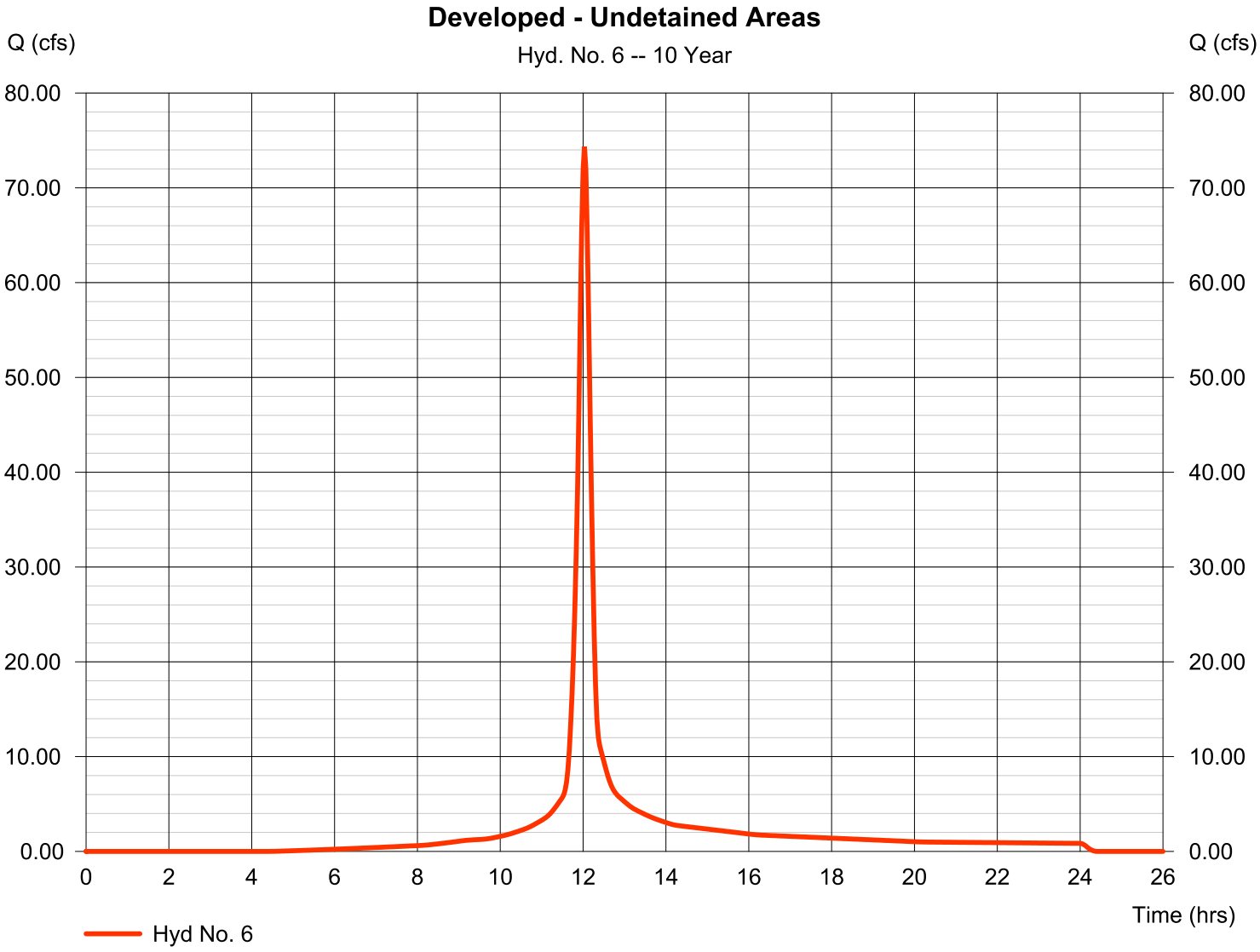


Hydrograph Report

Hyd. No. 6

Developed - Undetained Areas

Hydrograph type	=	SCS Runoff	Peak discharge	=	74.35 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.03 hrs
Time interval	=	2 min	Hyd. volume	=	4.923 acft
Drainage area	=	15.700 ac	Curve number	=	88
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	15.00 min
Total precip.	=	5.20 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

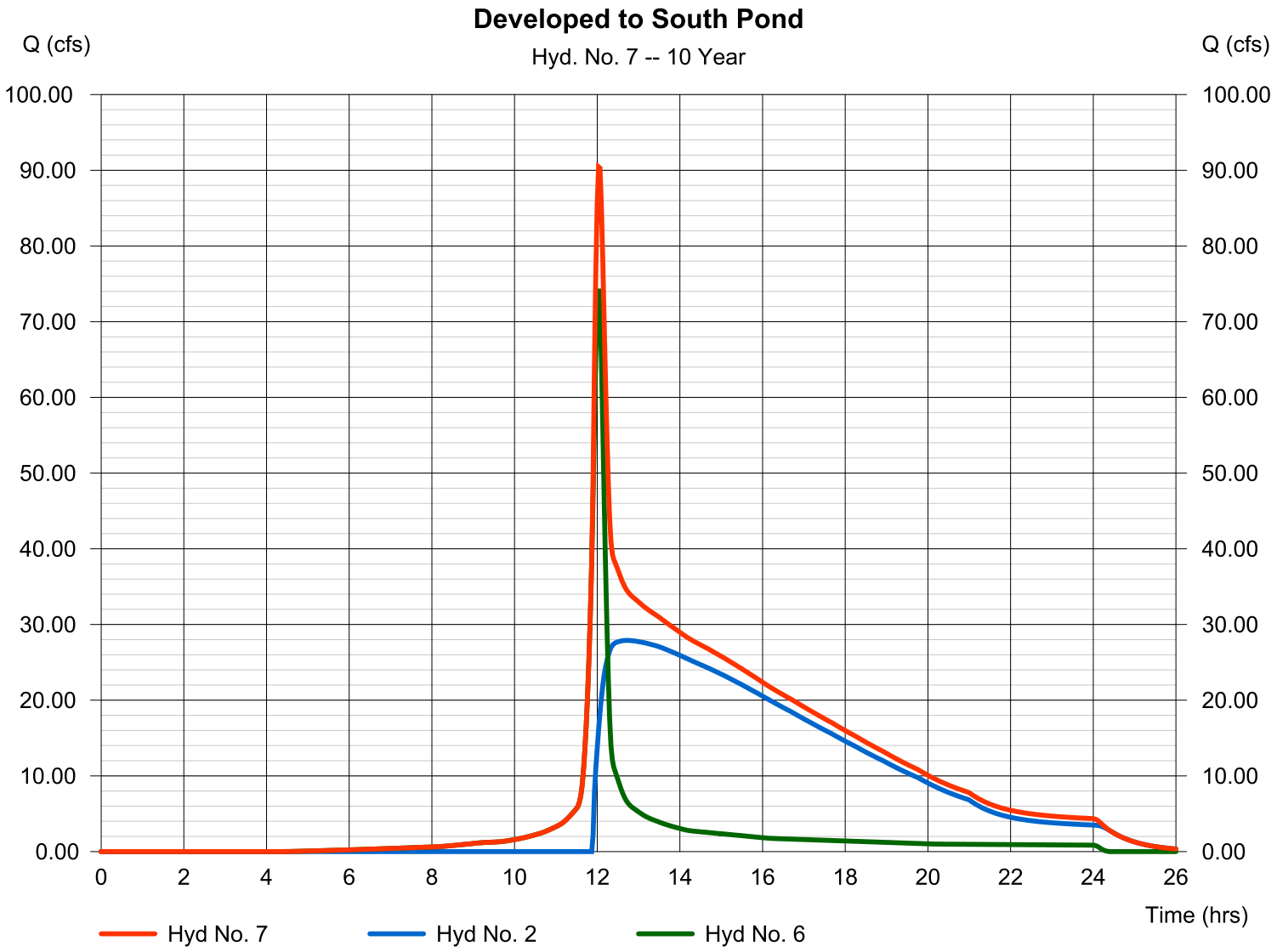


Hydrograph Report

Hyd. No. 7

Developed to South Pond

Hydrograph type	=	Combine	Peak discharge	=	90.44 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.03 hrs
Time interval	=	2 min	Hyd. volume	=	20.099 acft
Inflow hyds.	=	2, 6	Contrib. drain. area	=	15.700 ac

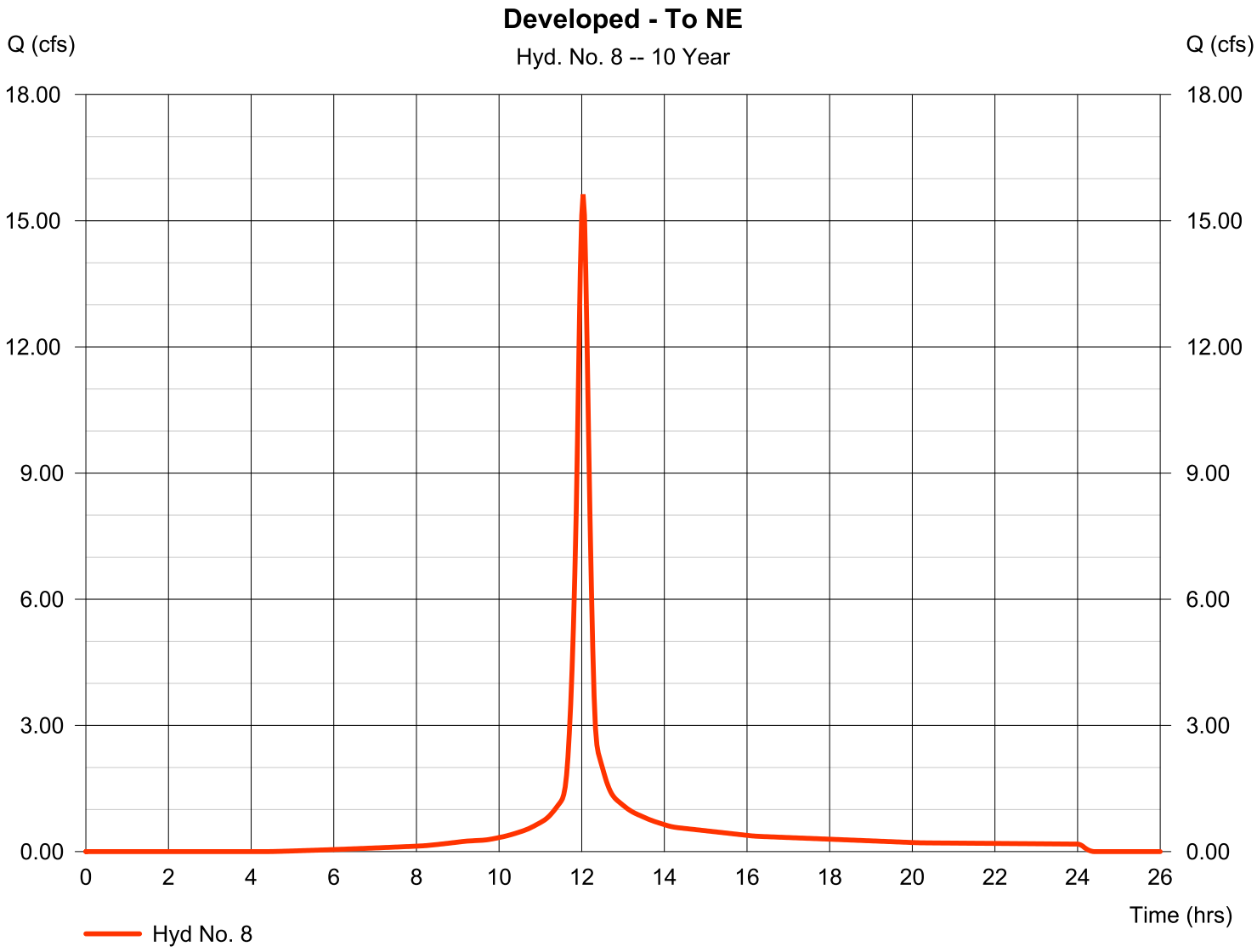


Hydrograph Report

Hyd. No. 8

Developed - To NE

Hydrograph type	=	SCS Runoff	Peak discharge	=	15.63 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.03 hrs
Time interval	=	2 min	Hyd. volume	=	1.035 acft
Drainage area	=	3.300 ac	Curve number	=	88
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	15.00 min
Total precip.	=	5.20 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

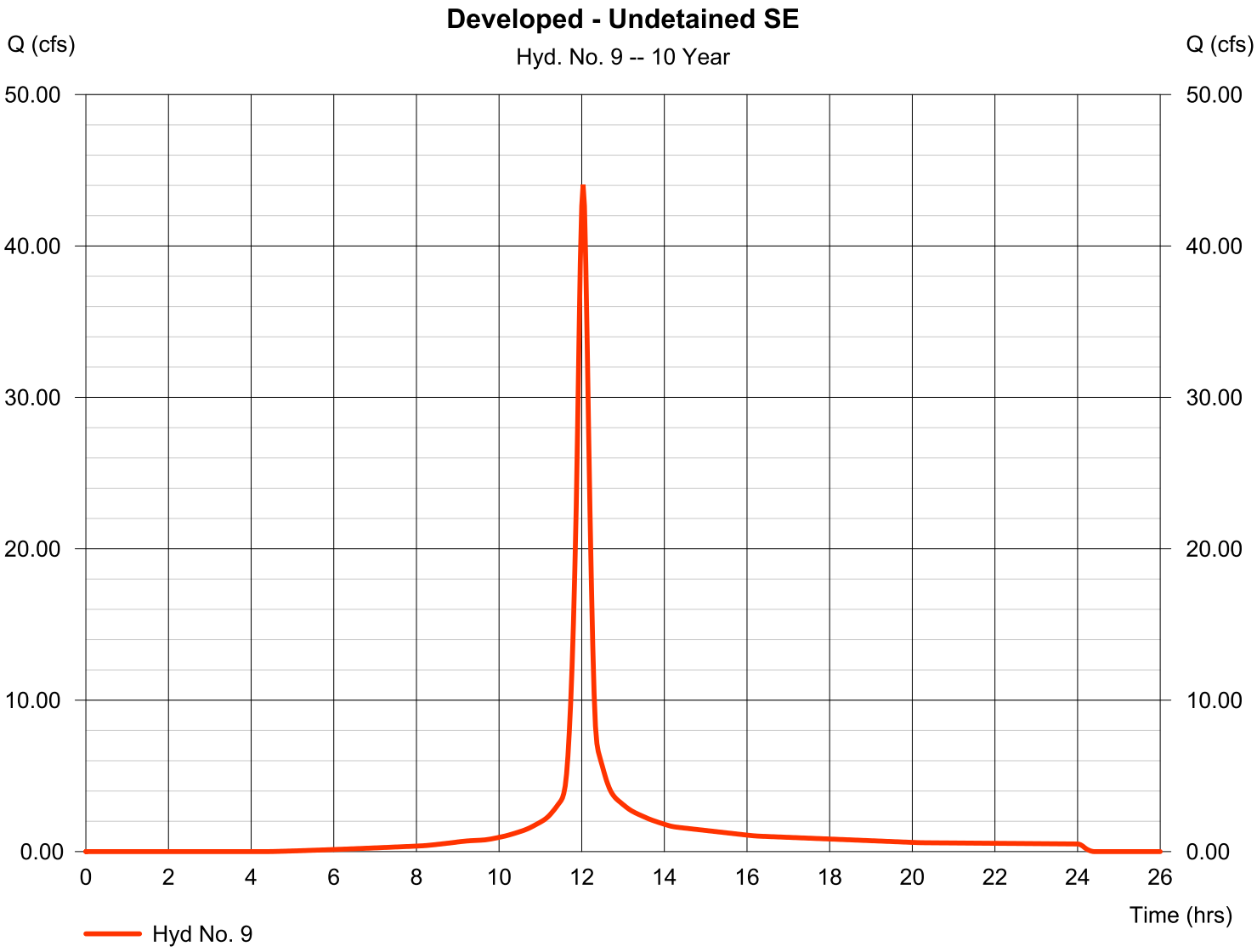


Hydrograph Report

Hyd. No. 9

Developed - Undetained SE

Hydrograph type	=	SCS Runoff	Peak discharge	=	44.04 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.03 hrs
Time interval	=	2 min	Hyd. volume	=	2.916 acft
Drainage area	=	9.300 ac	Curve number	=	88
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	15.00 min
Total precip.	=	5.20 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



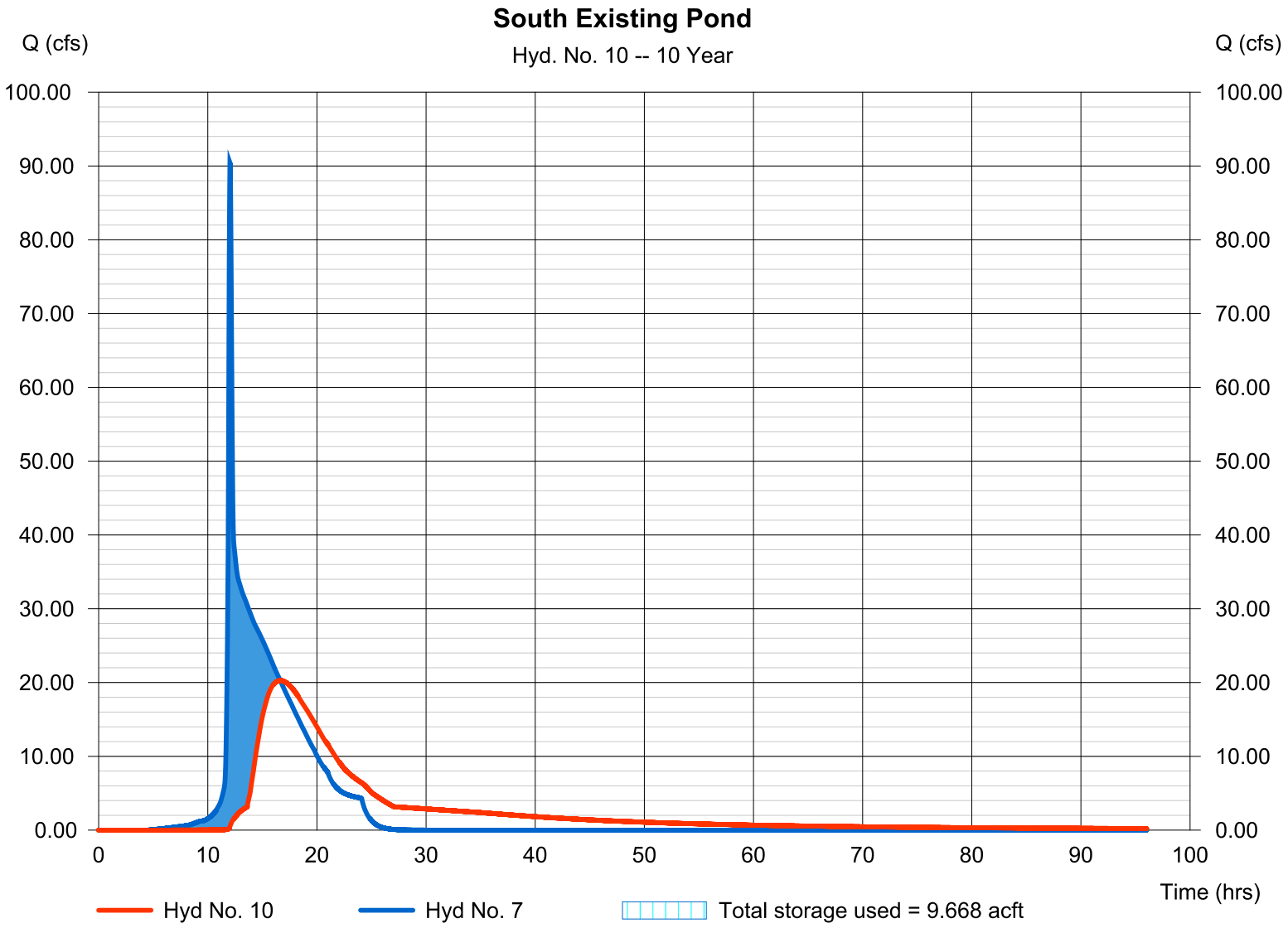
Hydrograph Report

Hyd. No. 10

South Existing Pond

Hydrograph type	=	Reservoir	Peak discharge	=	20.28 cfs
Storm frequency	=	10 yrs	Time to peak	=	16.63 hrs
Time interval	=	2 min	Hyd. volume	=	18.859 acft
Inflow hyd. No.	=	7 - Developed to South Pond	Max. Elevation	=	1367.66 ft
Reservoir name	=	South Pond	Max. Storage	=	9.668 acft

Storage Indication method used.

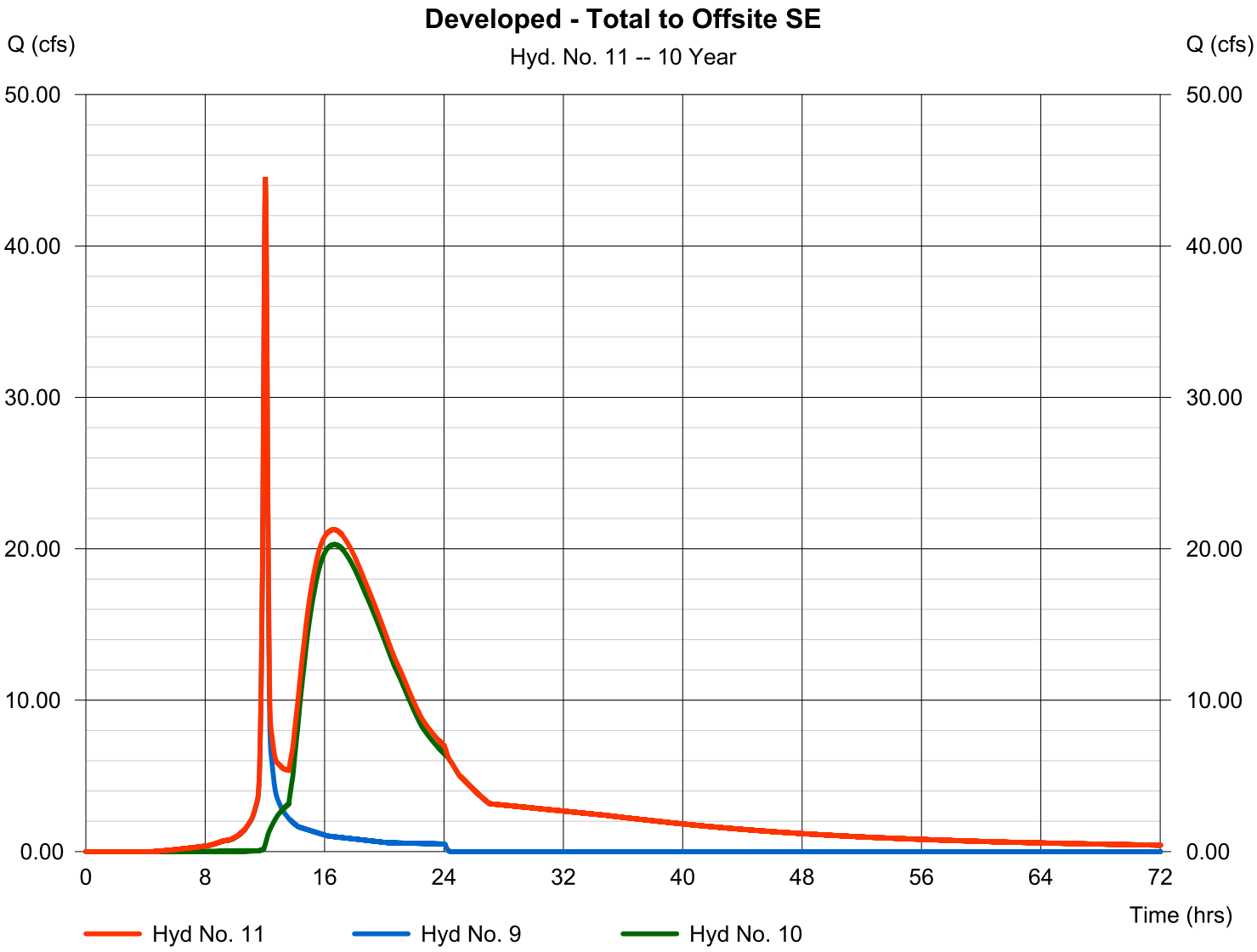


Hydrograph Report

Hyd. No. 11

Developed - Total to Offsite SE

Hydrograph type	= Combine	Peak discharge	= 44.55 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.03 hrs
Time interval	= 2 min	Hyd. volume	= 21.775 acft
Inflow hyds.	= 9, 10	Contrib. drain. area	= 9.300 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2015 by Autodesk, Inc. v10.4

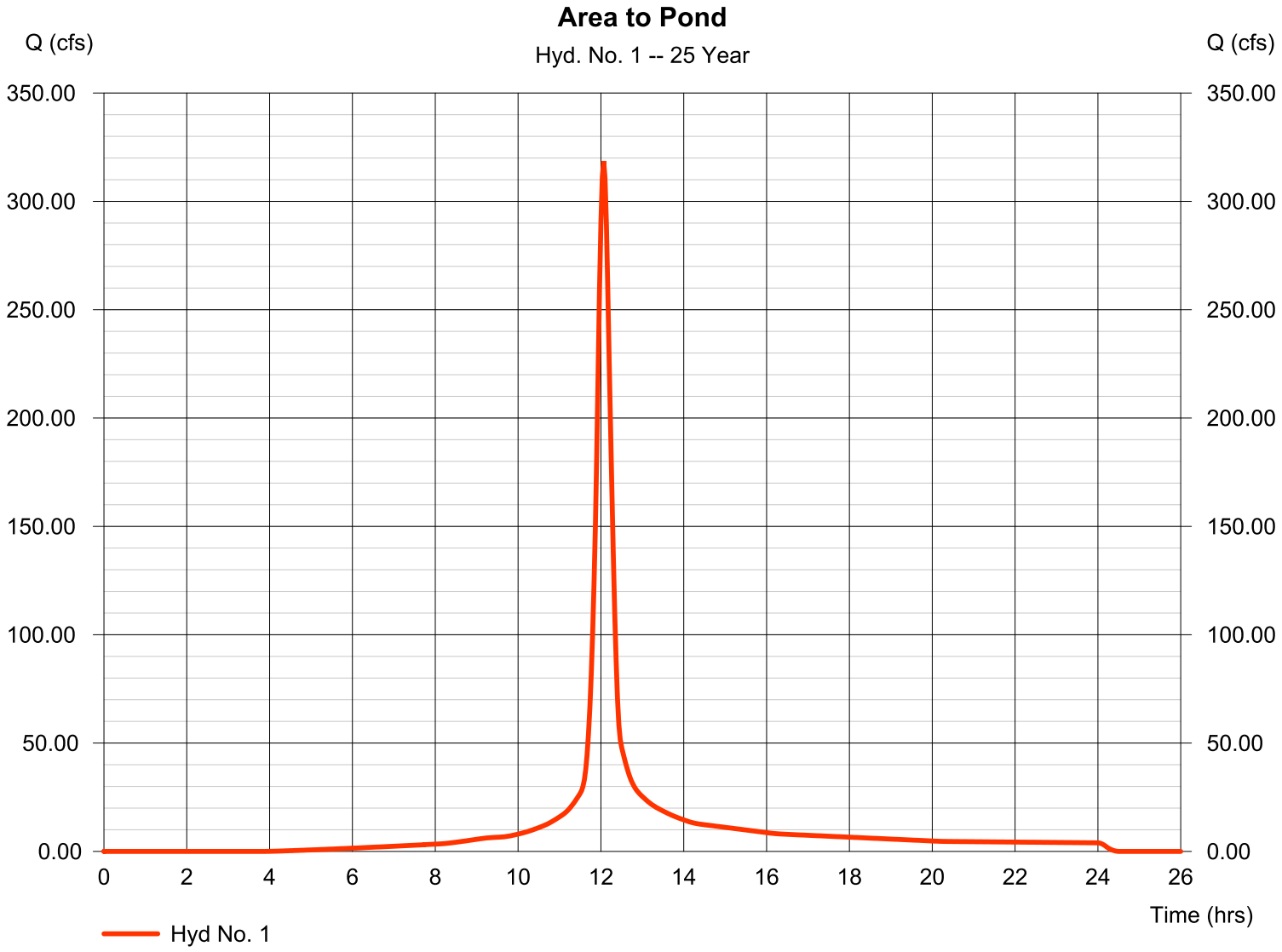
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph Description
1	SCS Runoff	318.61	2	724	23.611	------	------	------	Area to Pond
2	Reservoir	38.64	2	758	19.491	1	1370.14	13.7	Main Pond
3	SCS Runoff	181.54	2	754	28.856	------	------	------	Existing Site Total
4	SCS Runoff	157.34	2	754	25.008	------	------	------	Existing Site - South
5	SCS Runoff	25.64	2	726	2.036	------	------	------	Existing Site - NE
6	SCS Runoff	90.06	2	722	6.024	------	------	------	Developed - Undetained Areas
7	Combine	111.14	2	722	25.515	2, 6	------	------	Developed to South Pond
8	SCS Runoff	18.93	2	722	1.266	------	------	------	Developed - To NE
9	SCS Runoff	53.35	2	722	3.568	------	------	------	Developed - Undetained SE
10	Reservoir	26.91	2	958	24.265	7	1367.77	10.4	South Existing Pond
11	Combine	54.18	2	722	27.833	9, 10	------	------	Developed - Total to Offsite SE

Hydrograph Report

Hyd. No. 1

Area to Pond

Hydrograph type	=	SCS Runoff	Peak discharge	=	318.61 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	23.611 acft
Drainage area	=	60.000 ac	Curve number	=	88
Basin Slope	=	2.0 %	Hydraulic length	=	1200 ft
Tc method	=	LAG	Time of conc. (Tc)	=	19.70 min
Total precip.	=	6.10 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



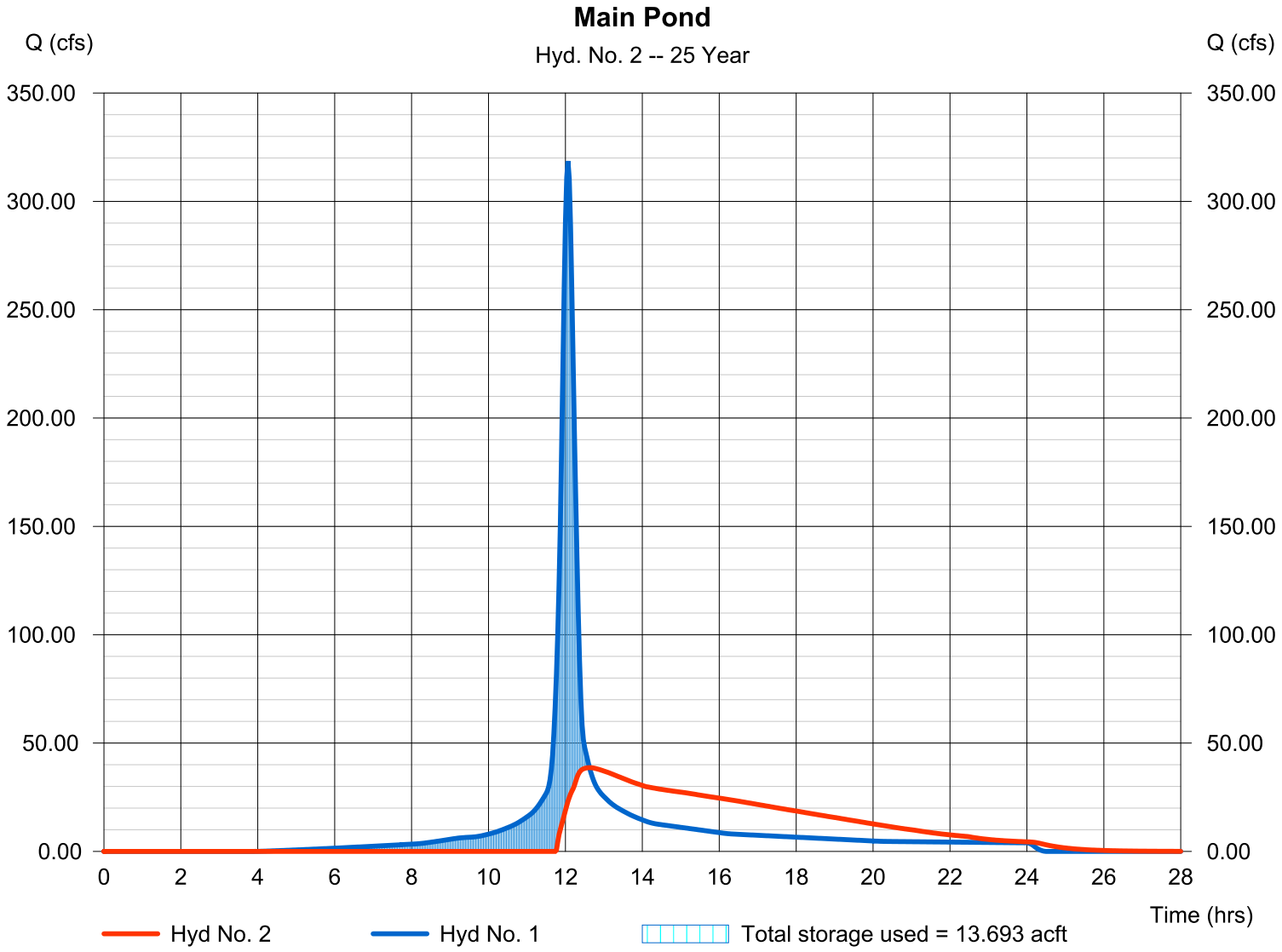
Hydrograph Report

Hyd. No. 2

Main Pond

Hydrograph type	=	Reservoir	Peak discharge	=	38.64 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.63 hrs
Time interval	=	2 min	Hyd. volume	=	19.491 acft
Inflow hyd. No.	=	1 - Area to Pond	Max. Elevation	=	1370.14 ft
Reservoir name	=	Main Pond	Max. Storage	=	13.693 acft

Storage Indication method used.

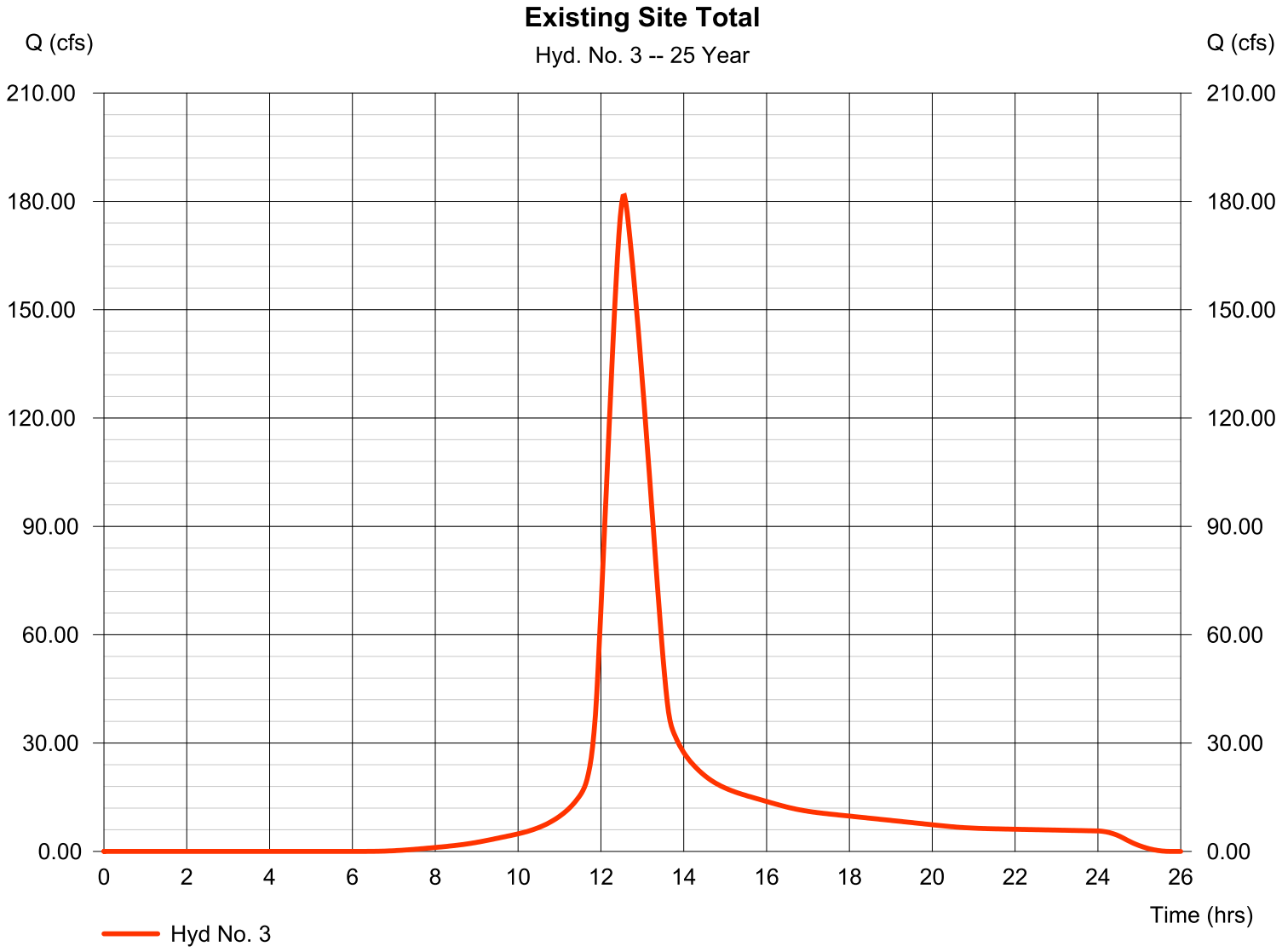


Hydrograph Report

Hyd. No. 3

Existing Site Total

Hydrograph type	=	SCS Runoff	Peak discharge	=	181.54 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.57 hrs
Time interval	=	2 min	Hyd. volume	=	28.856 acft
Drainage area	=	90.000 ac	Curve number	=	80
Basin Slope	=	0.7 %	Hydraulic length	=	1950 ft
Tc method	=	LAG	Time of conc. (Tc)	=	64.90 min
Total precip.	=	6.10 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

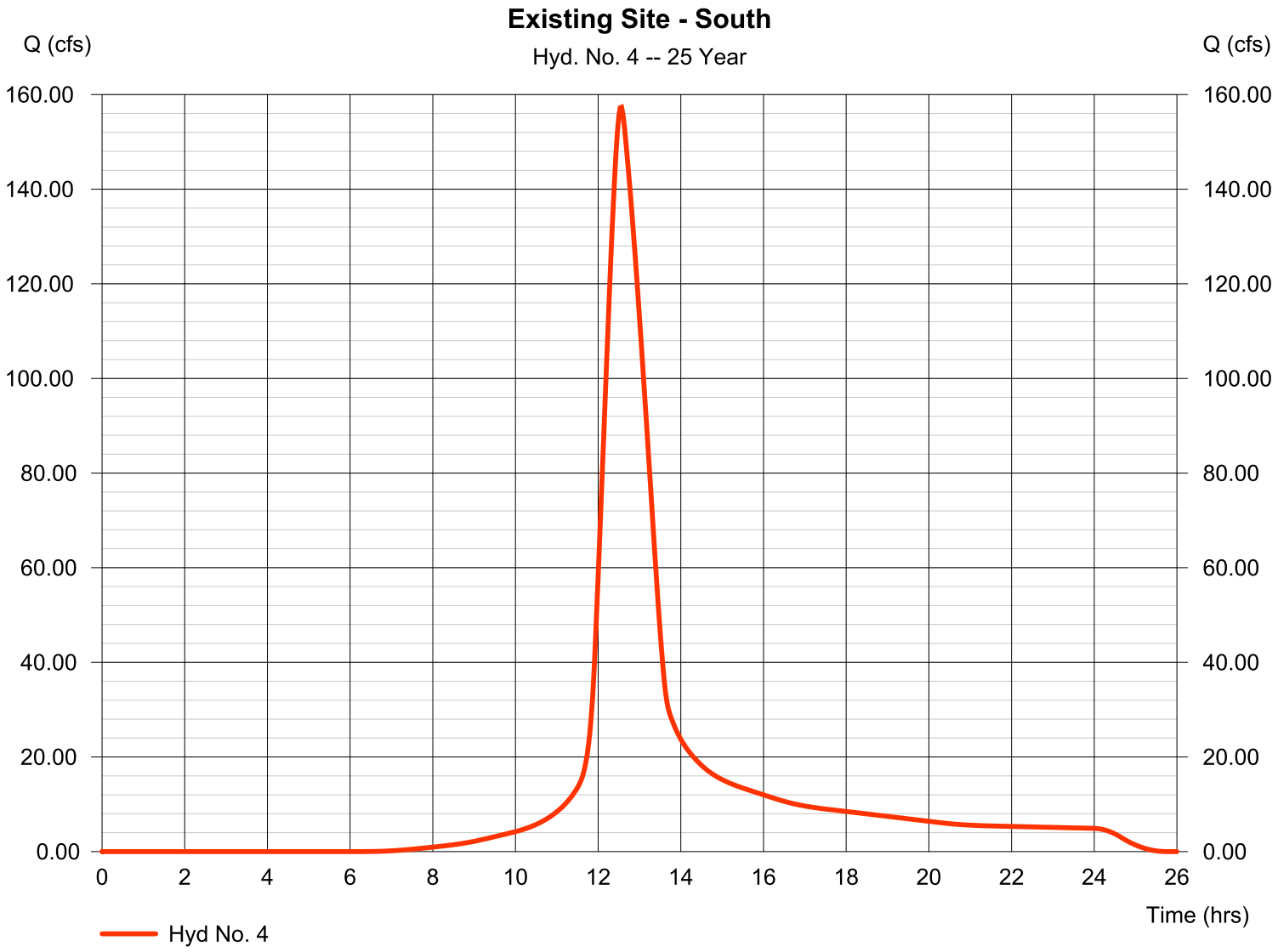


Hydrograph Report

Hyd. No. 4

Existing Site - South

Hydrograph type	=	SCS Runoff	Peak discharge	=	157.34 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.57 hrs
Time interval	=	2 min	Hyd. volume	=	25.008 acft
Drainage area	=	78.000 ac	Curve number	=	80
Basin Slope	=	0.7 %	Hydraulic length	=	1950 ft
Tc method	=	LAG	Time of conc. (Tc)	=	64.90 min
Total precip.	=	6.10 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

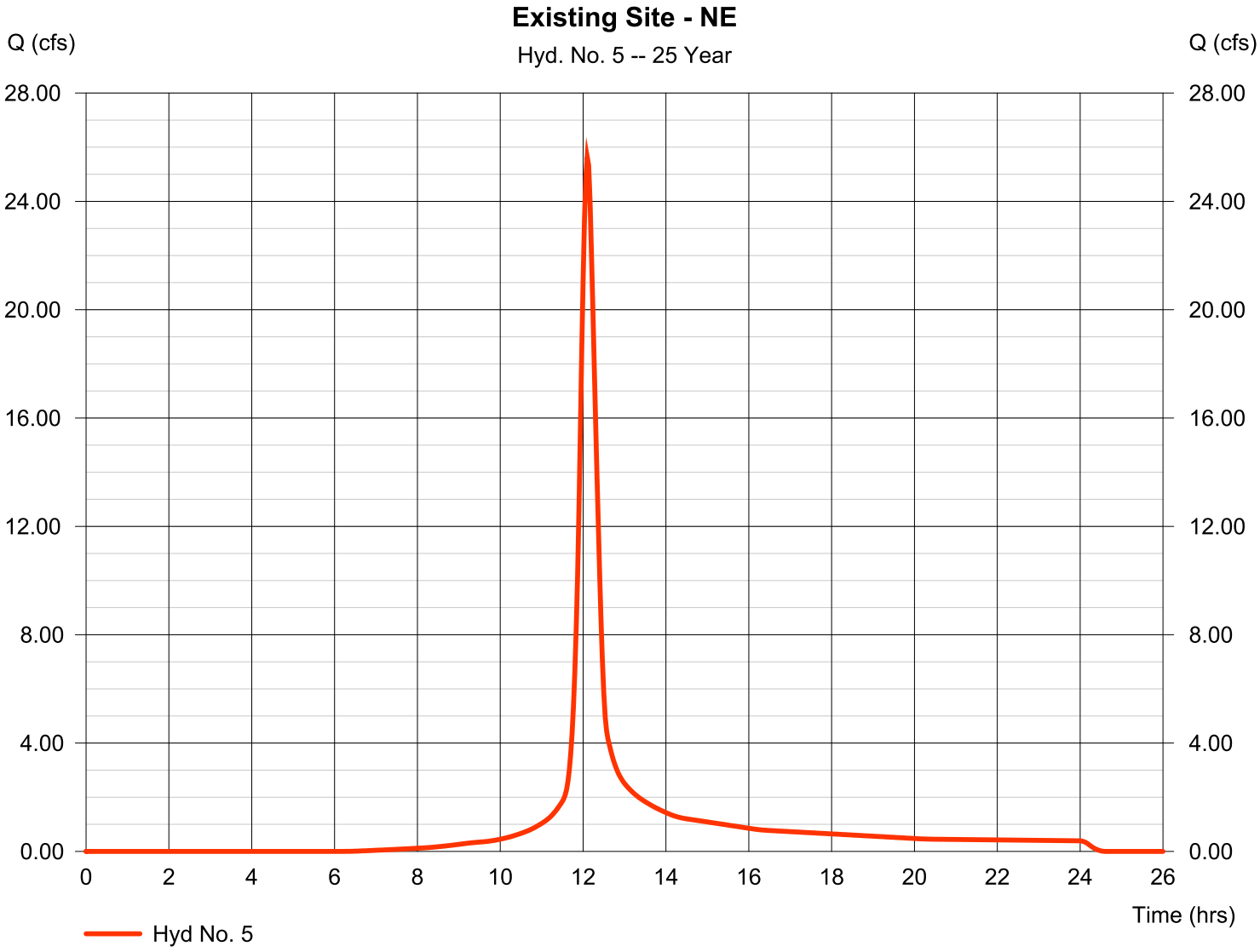


Hydrograph Report

Hyd. No. 5

Existing Site - NE

Hydrograph type	=	SCS Runoff	Peak discharge	=	25.64 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.10 hrs
Time interval	=	2 min	Hyd. volume	=	2.036 acft
Drainage area	=	6.200 ac	Curve number	=	80
Basin Slope	=	1.3 %	Hydraulic length	=	750 ft
Tc method	=	LAG	Time of conc. (Tc)	=	22.10 min
Total precip.	=	6.10 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

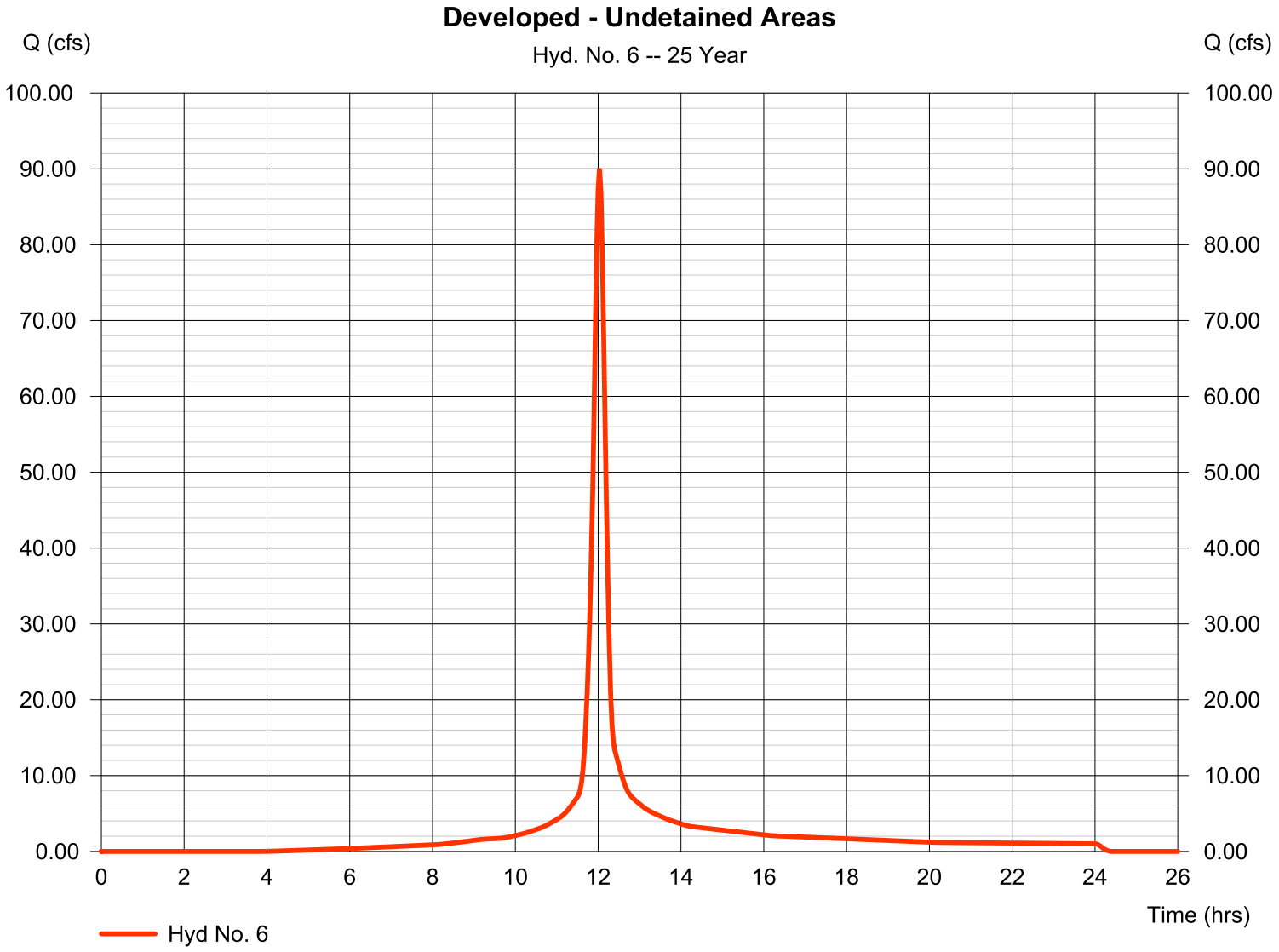


Hydrograph Report

Hyd. No. 6

Developed - Undetained Areas

Hydrograph type	=	SCS Runoff	Peak discharge	=	90.06 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.03 hrs
Time interval	=	2 min	Hyd. volume	=	6.024 acft
Drainage area	=	15.700 ac	Curve number	=	88
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	15.00 min
Total precip.	=	6.10 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

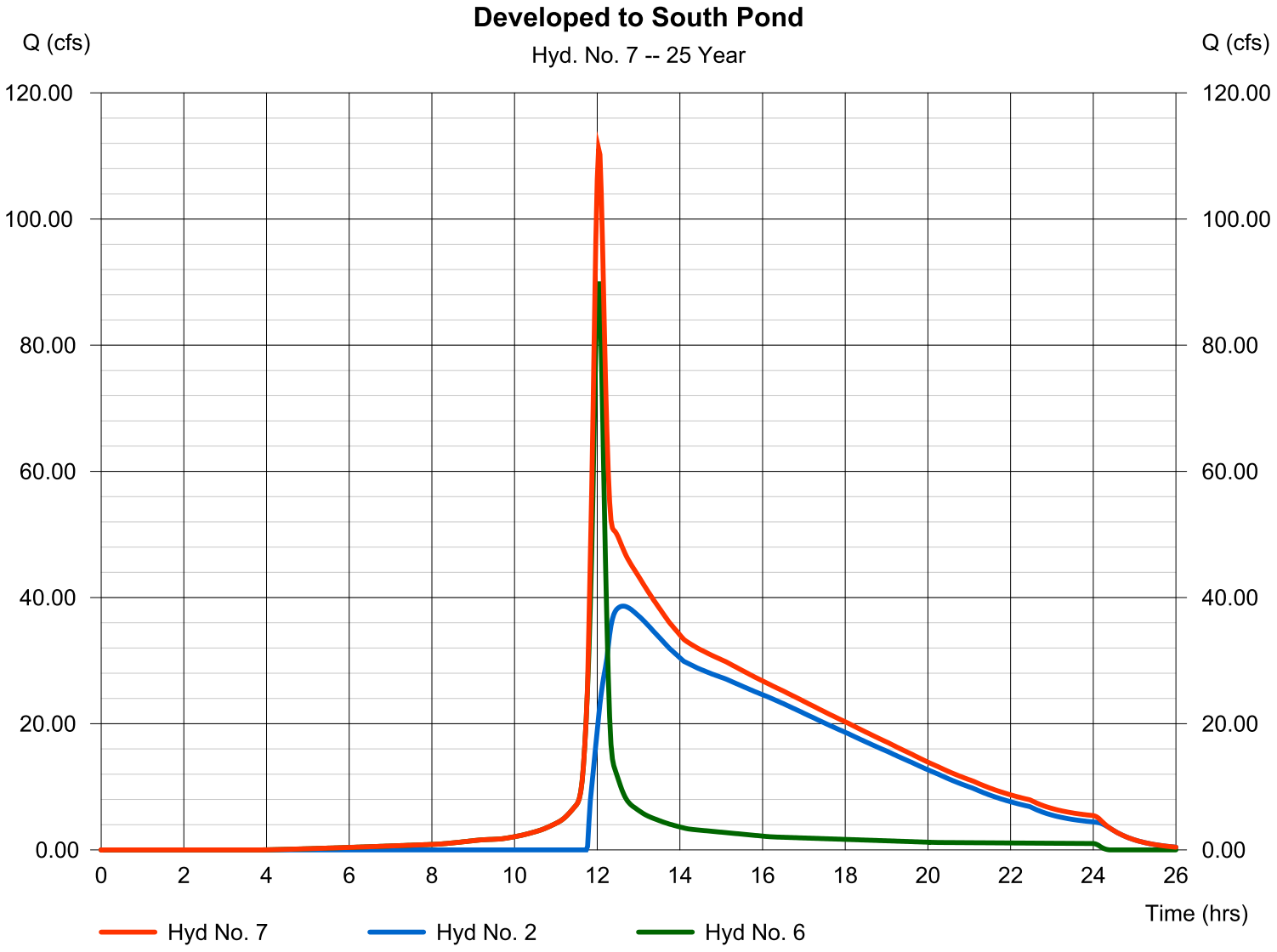


Hydrograph Report

Hyd. No. 7

Developed to South Pond

Hydrograph type	= Combine	Peak discharge	= 111.14 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.03 hrs
Time interval	= 2 min	Hyd. volume	= 25.515 acft
Inflow hyds.	= 2, 6	Contrib. drain. area	= 15.700 ac

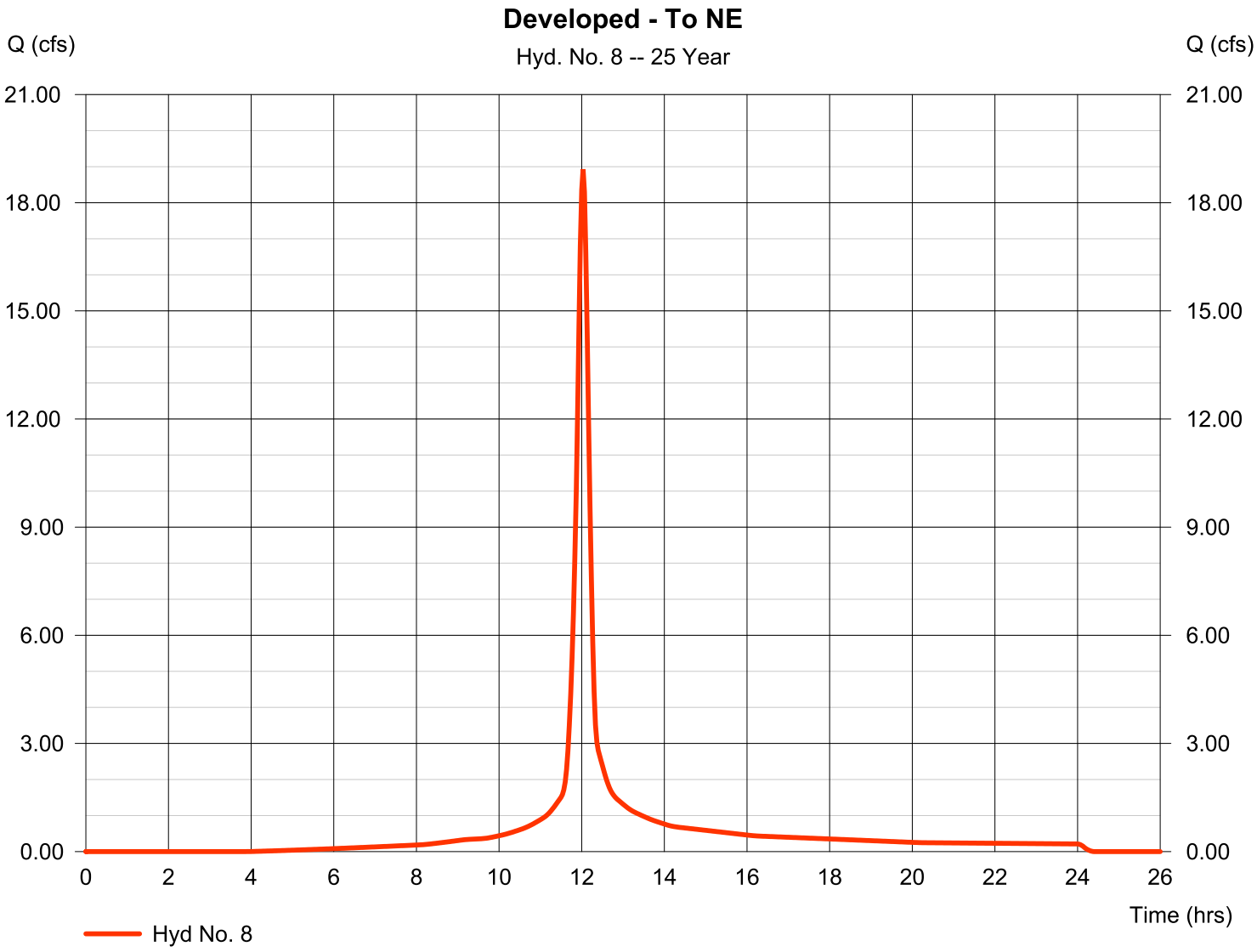


Hydrograph Report

Hyd. No. 8

Developed - To NE

Hydrograph type	=	SCS Runoff	Peak discharge	=	18.93 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.03 hrs
Time interval	=	2 min	Hyd. volume	=	1.266 acft
Drainage area	=	3.300 ac	Curve number	=	88
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	15.00 min
Total precip.	=	6.10 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

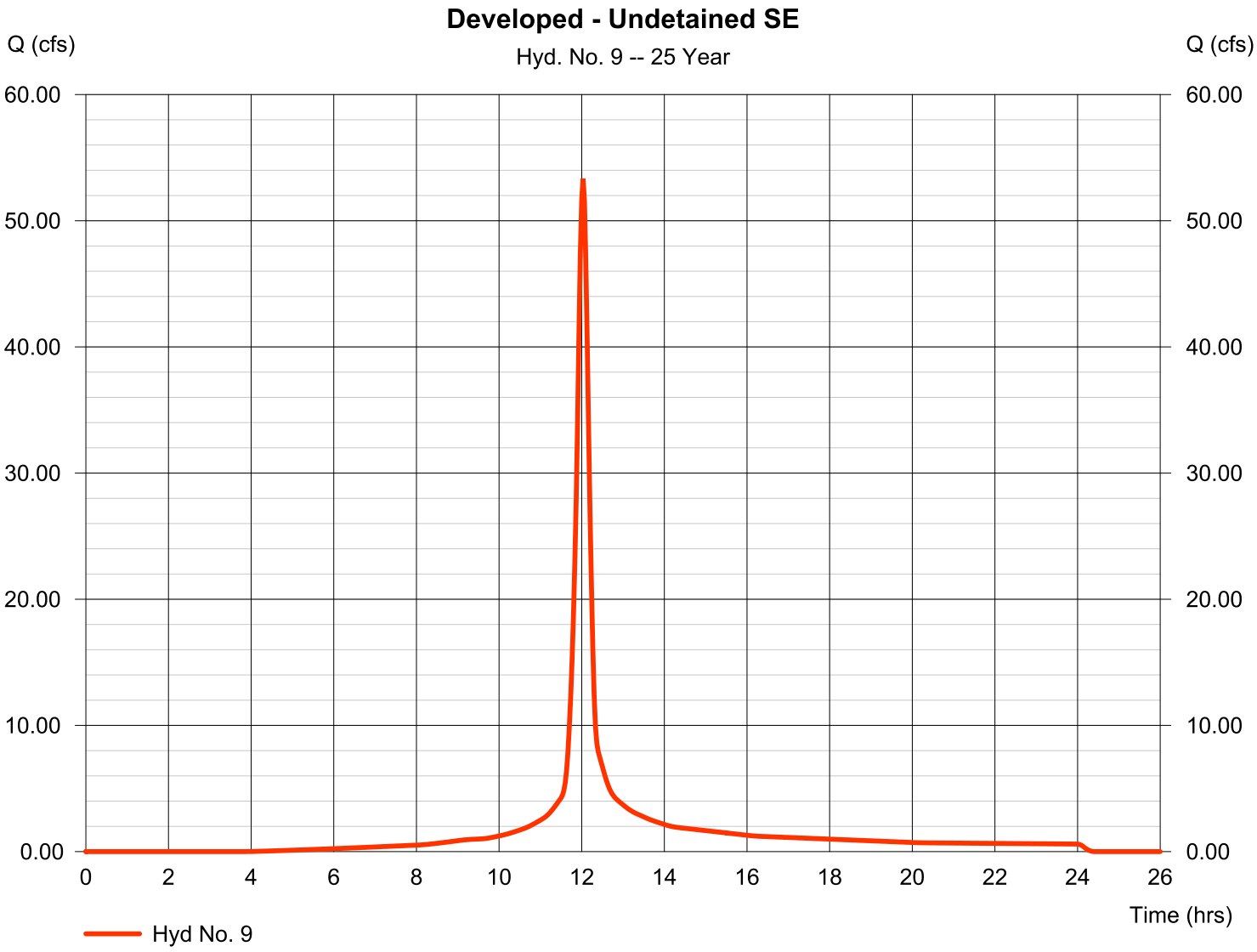


Hydrograph Report

Hyd. No. 9

Developed - Undetained SE

Hydrograph type	=	SCS Runoff	Peak discharge	=	53.35 cfs
Storm frequency	=	25 yrs	Time to peak	=	12.03 hrs
Time interval	=	2 min	Hyd. volume	=	3.568 acft
Drainage area	=	9.300 ac	Curve number	=	88
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	15.00 min
Total precip.	=	6.10 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



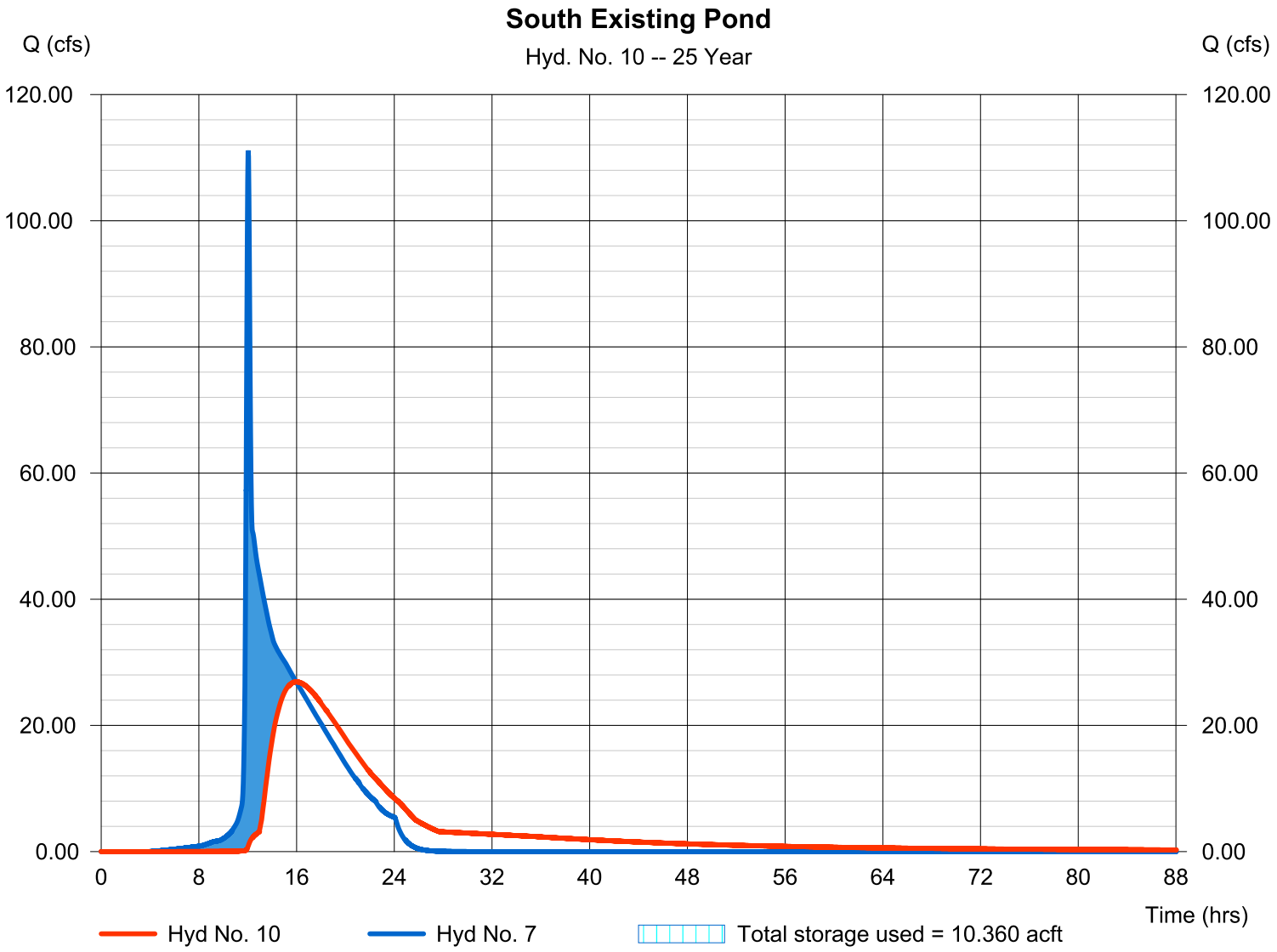
Hydrograph Report

Hyd. No. 10

South Existing Pond

Hydrograph type	=	Reservoir	Peak discharge	=	26.91 cfs
Storm frequency	=	25 yrs	Time to peak	=	15.97 hrs
Time interval	=	2 min	Hyd. volume	=	24.265 acft
Inflow hyd. No.	=	7 - Developed to South Pond	Max. Elevation	=	1367.77 ft
Reservoir name	=	South Pond	Max. Storage	=	10.360 acft

Storage Indication method used.

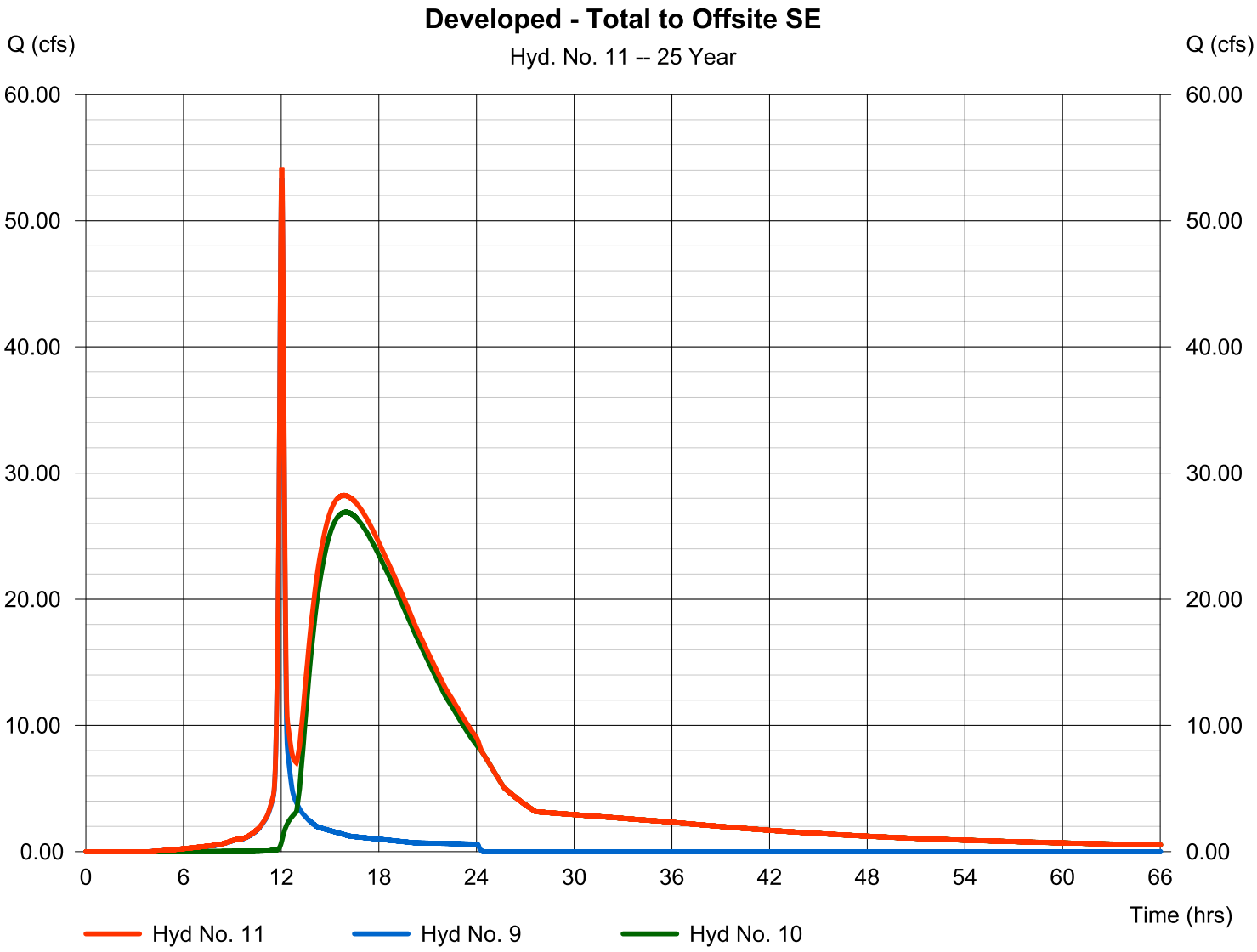


Hydrograph Report

Hyd. No. 11

Developed - Total to Offsite SE

Hydrograph type	= Combine	Peak discharge	= 54.18 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.03 hrs
Time interval	= 2 min	Hyd. volume	= 27.833 acft
Inflow hyds.	= 9, 10	Contrib. drain. area	= 9.300 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2015 by Autodesk, Inc. v10.4

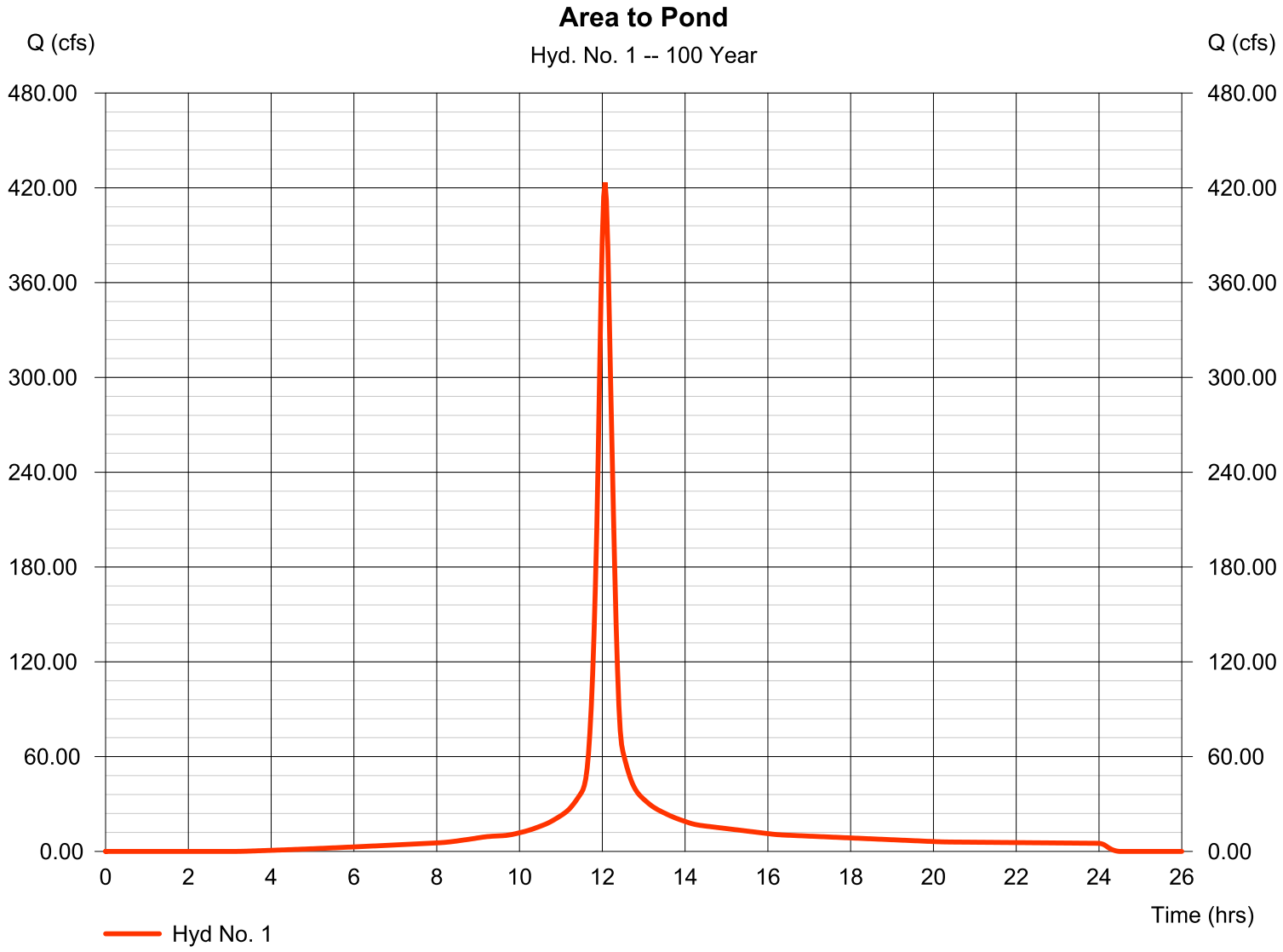
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph Description
1	SCS Runoff	423.42	2	724	31.864	------	------	------	Area to Pond
2	Reservoir	74.08	2	746	27.744	1	1370.99	17.8	Main Pond
3	SCS Runoff	254.09	2	752	40.528	------	------	------	Existing Site Total
4	SCS Runoff	220.21	2	752	35.125	------	------	------	Existing Site - South
5	SCS Runoff	35.73	2	726	2.860	------	------	------	Existing Site - NE
6	SCS Runoff	119.55	2	722	8.129	------	------	------	Developed - Undetained Areas
7	Combine	147.24	2	722	35.873	2, 6	------	------	Developed to South Pond
8	SCS Runoff	25.13	2	722	1.709	------	------	------	Developed - To NE
9	SCS Runoff	70.82	2	722	4.815	------	------	------	Developed - Undetained SE
10	Reservoir	46.78	2	846	34.610	7	1368.07	12.1	South Existing Pond
11	Combine	72.60	2	722	39.425	9, 10	------	------	Developed - Total to Offsite SE

Hydrograph Report

Hyd. No. 1

Area to Pond

Hydrograph type	=	SCS Runoff	Peak discharge	=	423.42 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	31.864 acft
Drainage area	=	60.000 ac	Curve number	=	88
Basin Slope	=	2.0 %	Hydraulic length	=	1200 ft
Tc method	=	LAG	Time of conc. (Tc)	=	19.70 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



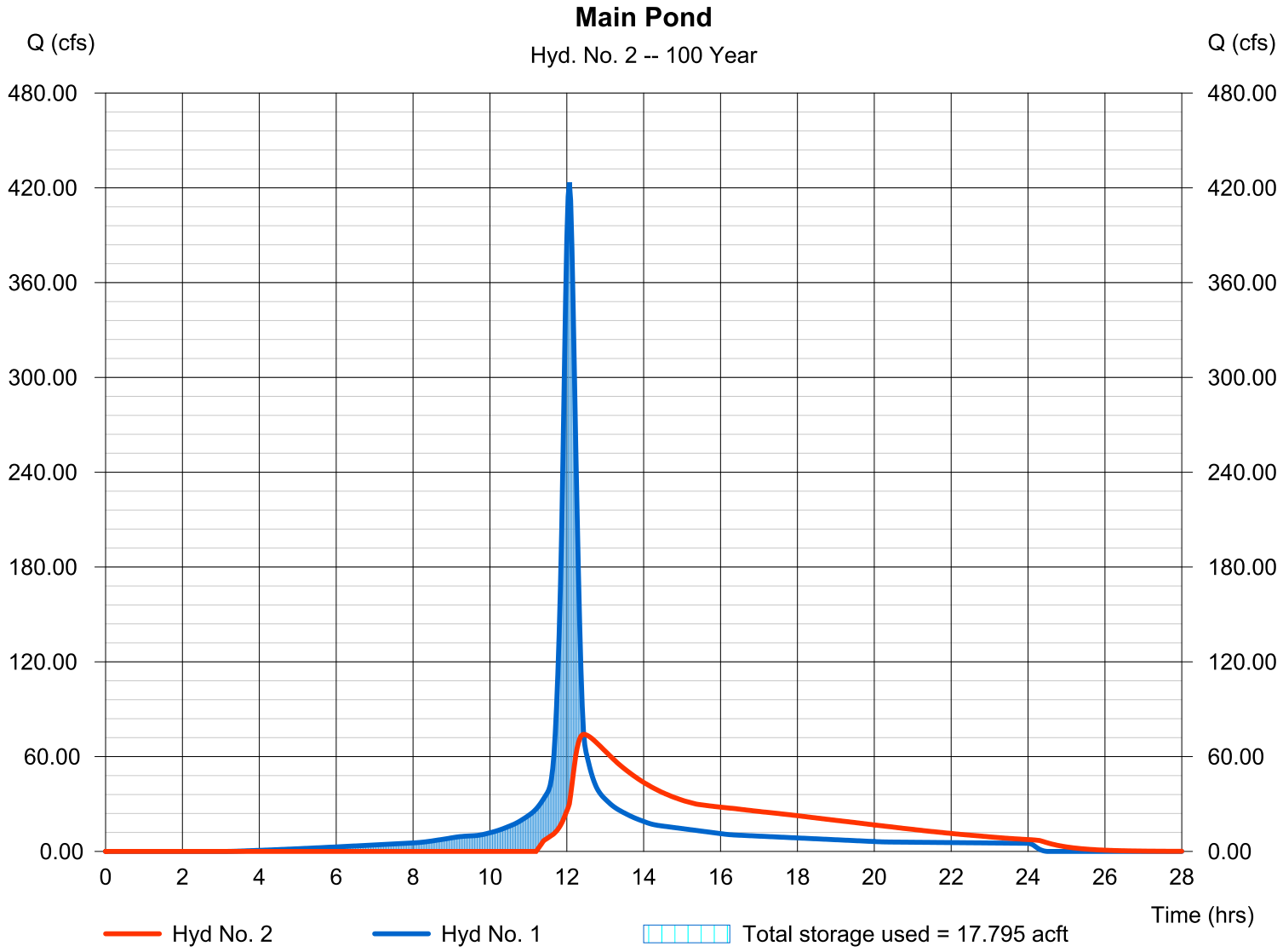
Hydrograph Report

Hyd. No. 2

Main Pond

Hydrograph type	=	Reservoir	Peak discharge	=	74.08 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.43 hrs
Time interval	=	2 min	Hyd. volume	=	27.744 acft
Inflow hyd. No.	=	1 - Area to Pond	Max. Elevation	=	1370.99 ft
Reservoir name	=	Main Pond	Max. Storage	=	17.795 acft

Storage Indication method used.

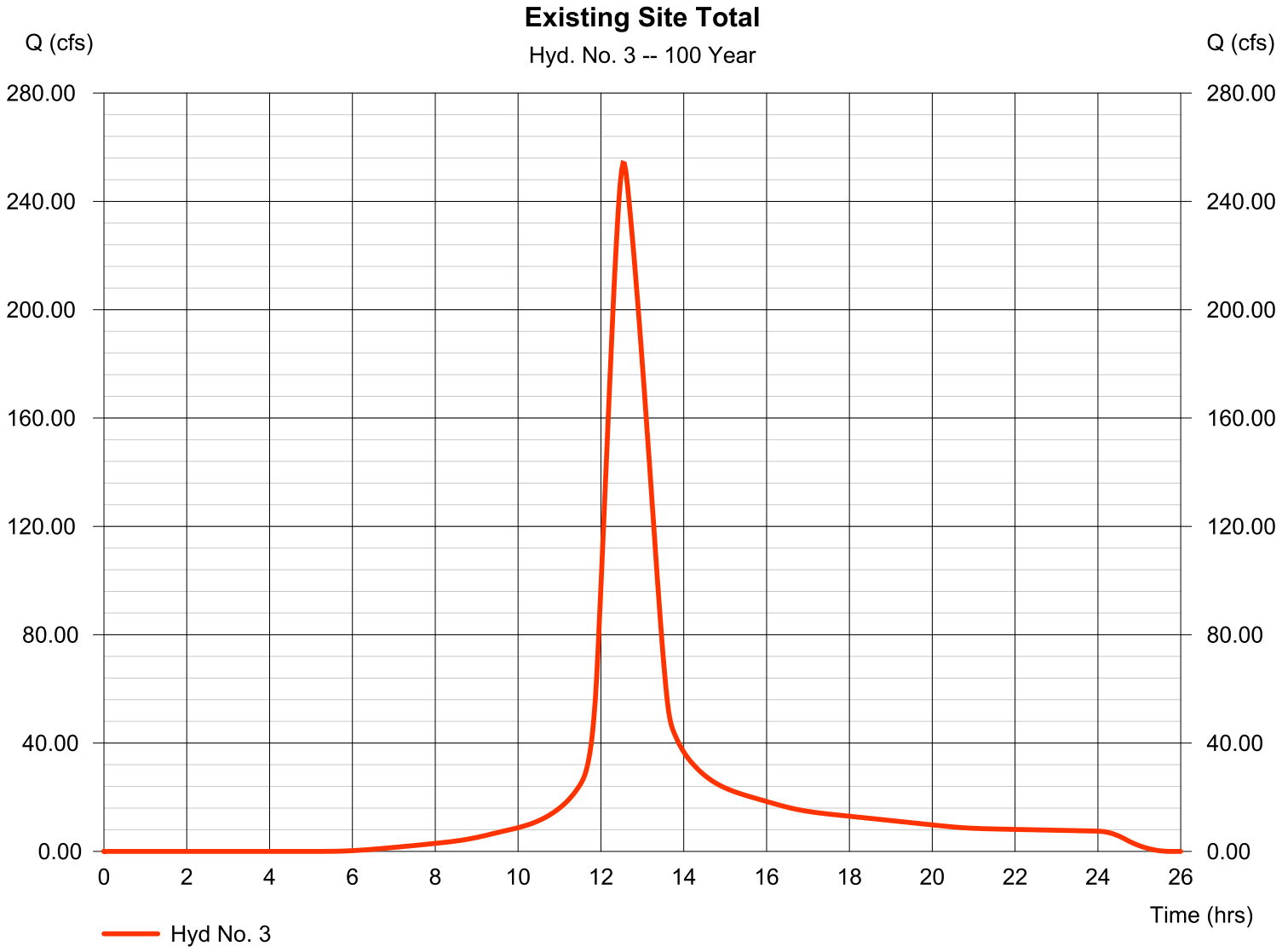


Hydrograph Report

Hyd. No. 3

Existing Site Total

Hydrograph type	= SCS Runoff	Peak discharge	= 254.09 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.53 hrs
Time interval	= 2 min	Hyd. volume	= 40.528 acft
Drainage area	= 90.000 ac	Curve number	= 80
Basin Slope	= 0.7 %	Hydraulic length	= 1950 ft
Tc method	= LAG	Time of conc. (Tc)	= 64.90 min
Total precip.	= 7.80 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

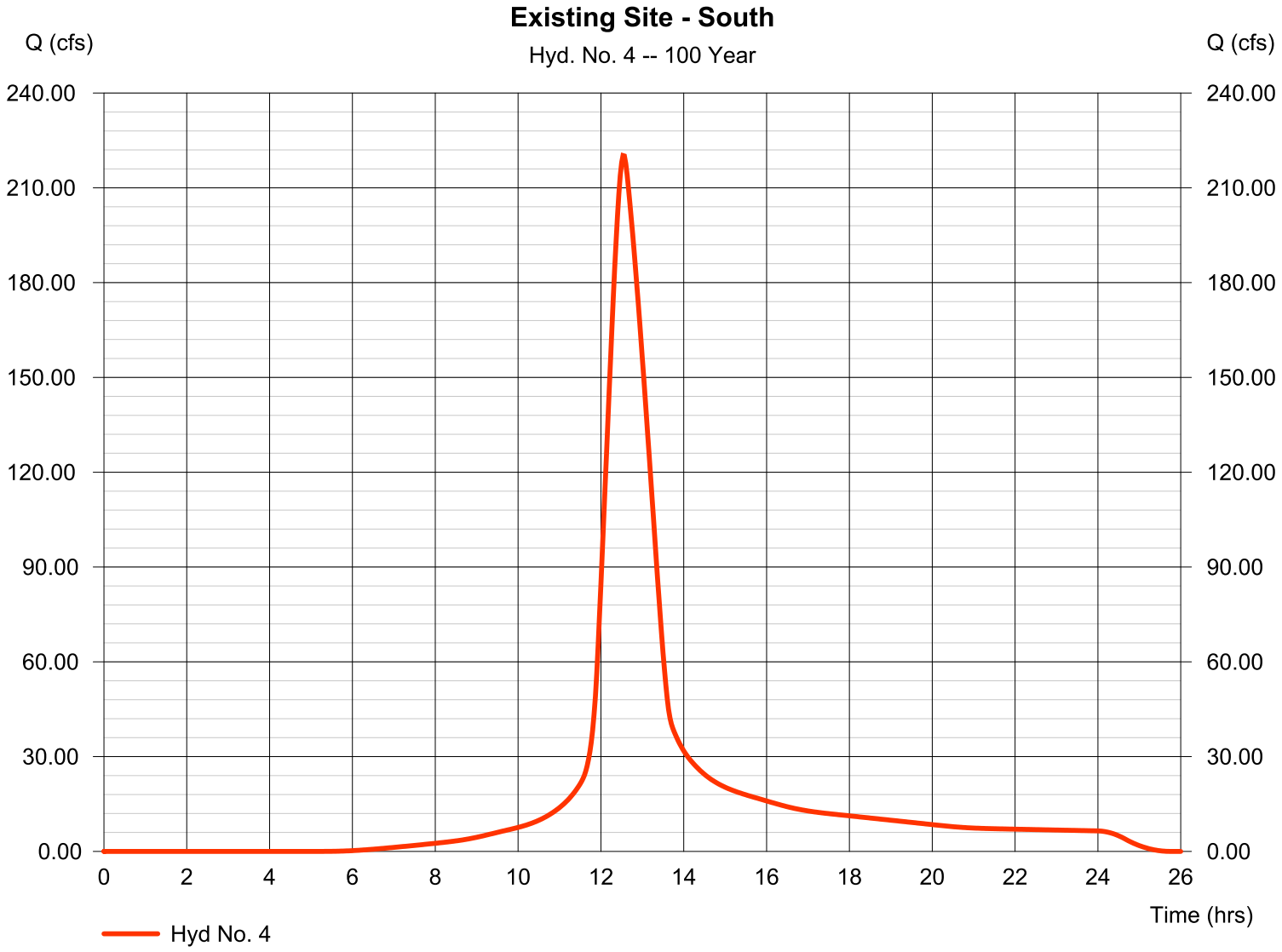


Hydrograph Report

Hyd. No. 4

Existing Site - South

Hydrograph type	=	SCS Runoff	Peak discharge	=	220.21 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.53 hrs
Time interval	=	2 min	Hyd. volume	=	35.125 acft
Drainage area	=	78.000 ac	Curve number	=	80
Basin Slope	=	0.7 %	Hydraulic length	=	1950 ft
Tc method	=	LAG	Time of conc. (Tc)	=	64.90 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

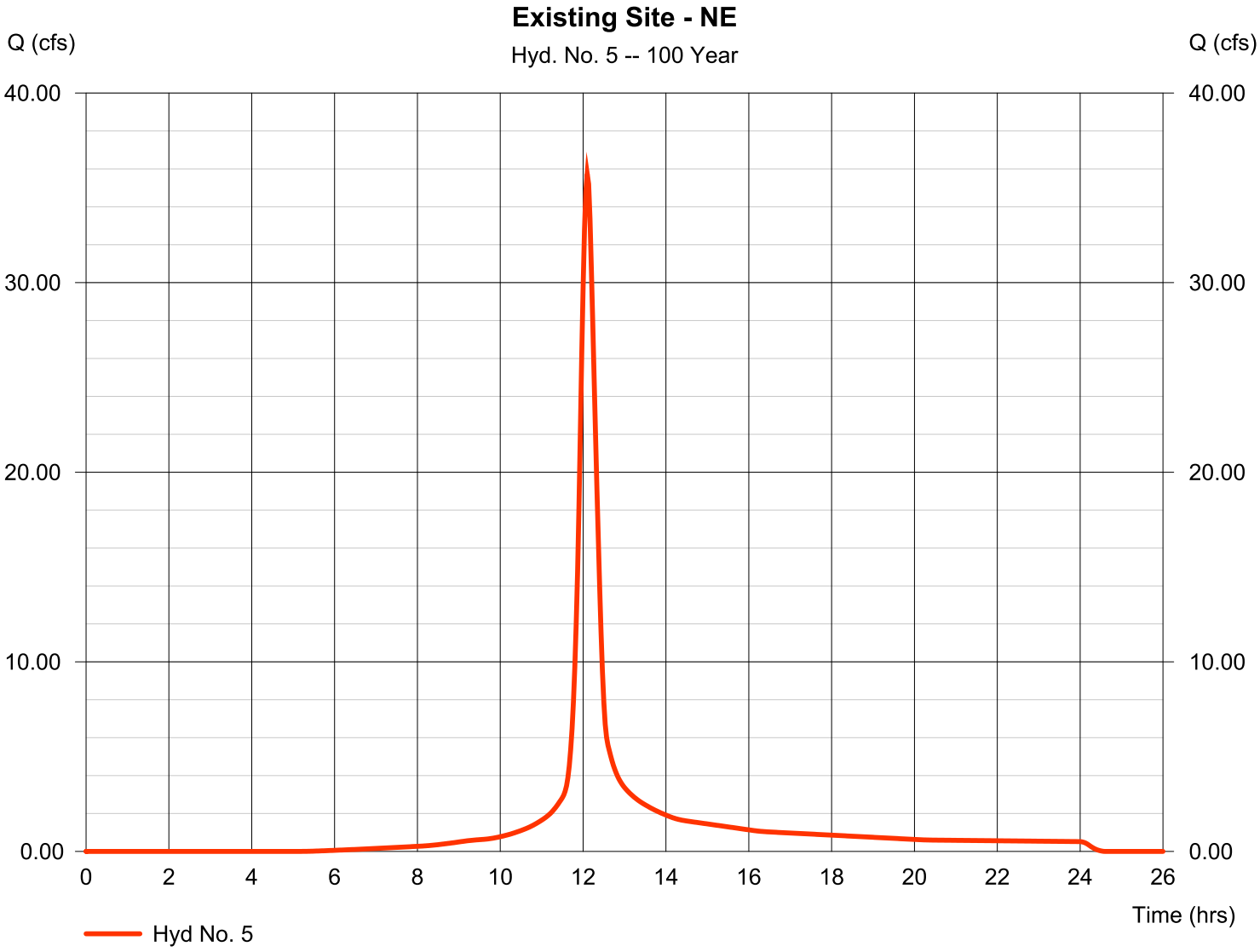


Hydrograph Report

Hyd. No. 5

Existing Site - NE

Hydrograph type	=	SCS Runoff	Peak discharge	=	35.73 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.10 hrs
Time interval	=	2 min	Hyd. volume	=	2.860 acft
Drainage area	=	6.200 ac	Curve number	=	80
Basin Slope	=	1.3 %	Hydraulic length	=	750 ft
Tc method	=	LAG	Time of conc. (Tc)	=	22.10 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

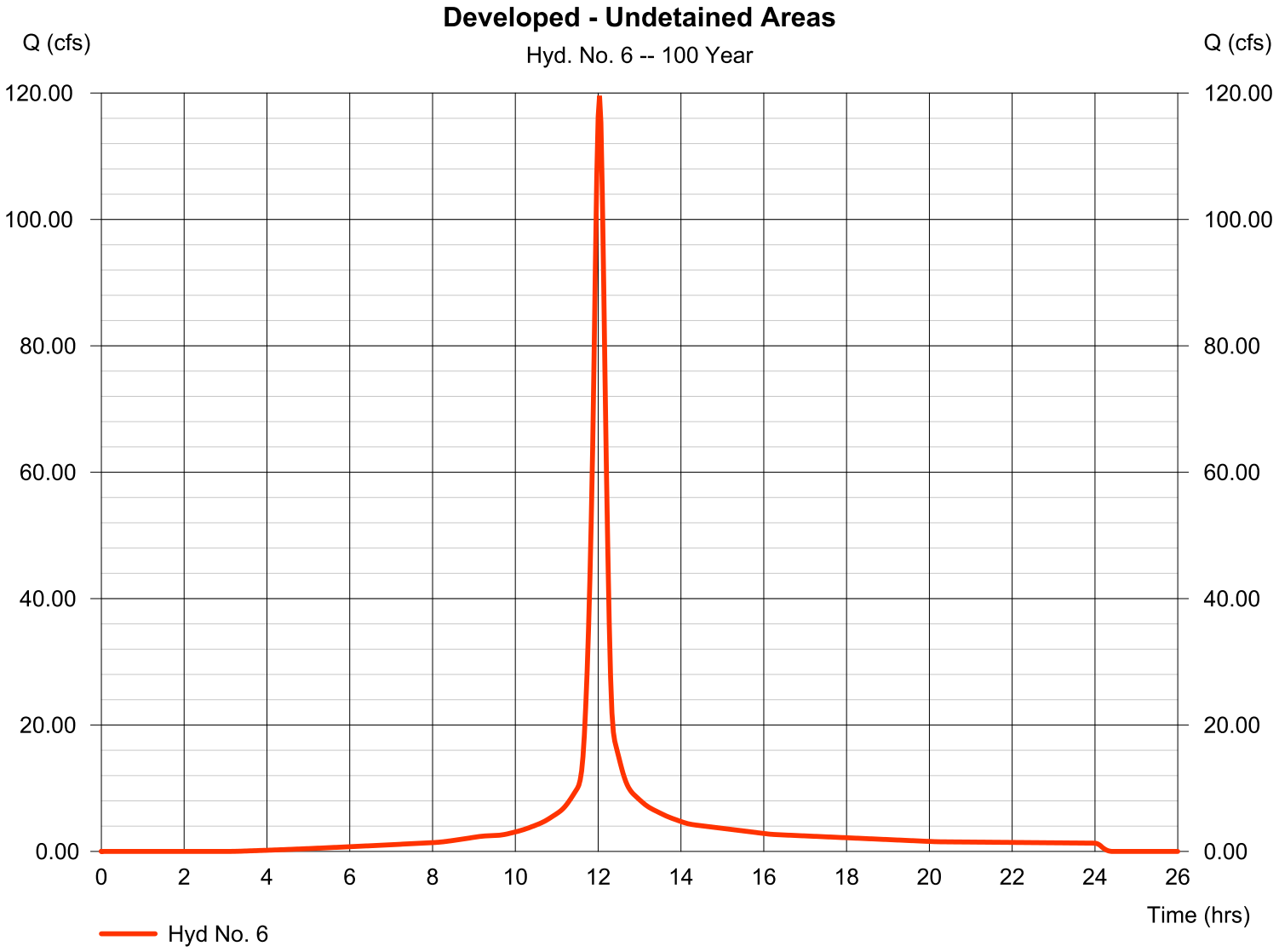


Hydrograph Report

Hyd. No. 6

Developed - Undetained Areas

Hydrograph type	=	SCS Runoff	Peak discharge	=	119.55 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.03 hrs
Time interval	=	2 min	Hyd. volume	=	8.129 acft
Drainage area	=	15.700 ac	Curve number	=	88
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	15.00 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

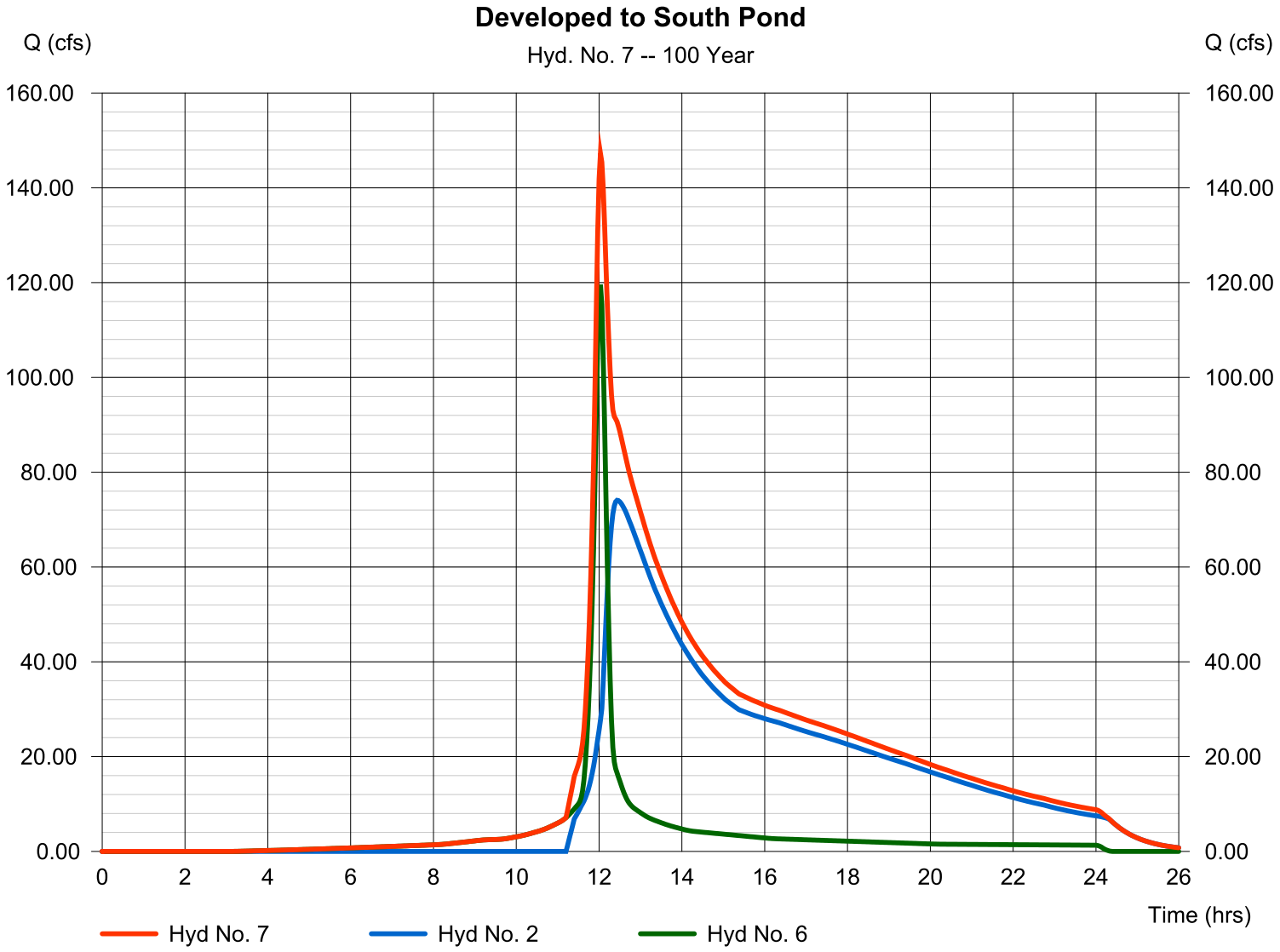


Hydrograph Report

Hyd. No. 7

Developed to South Pond

Hydrograph type	=	Combine	Peak discharge	=	147.24 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.03 hrs
Time interval	=	2 min	Hyd. volume	=	35.873 acft
Inflow hyds.	=	2, 6	Contrib. drain. area	=	15.700 ac

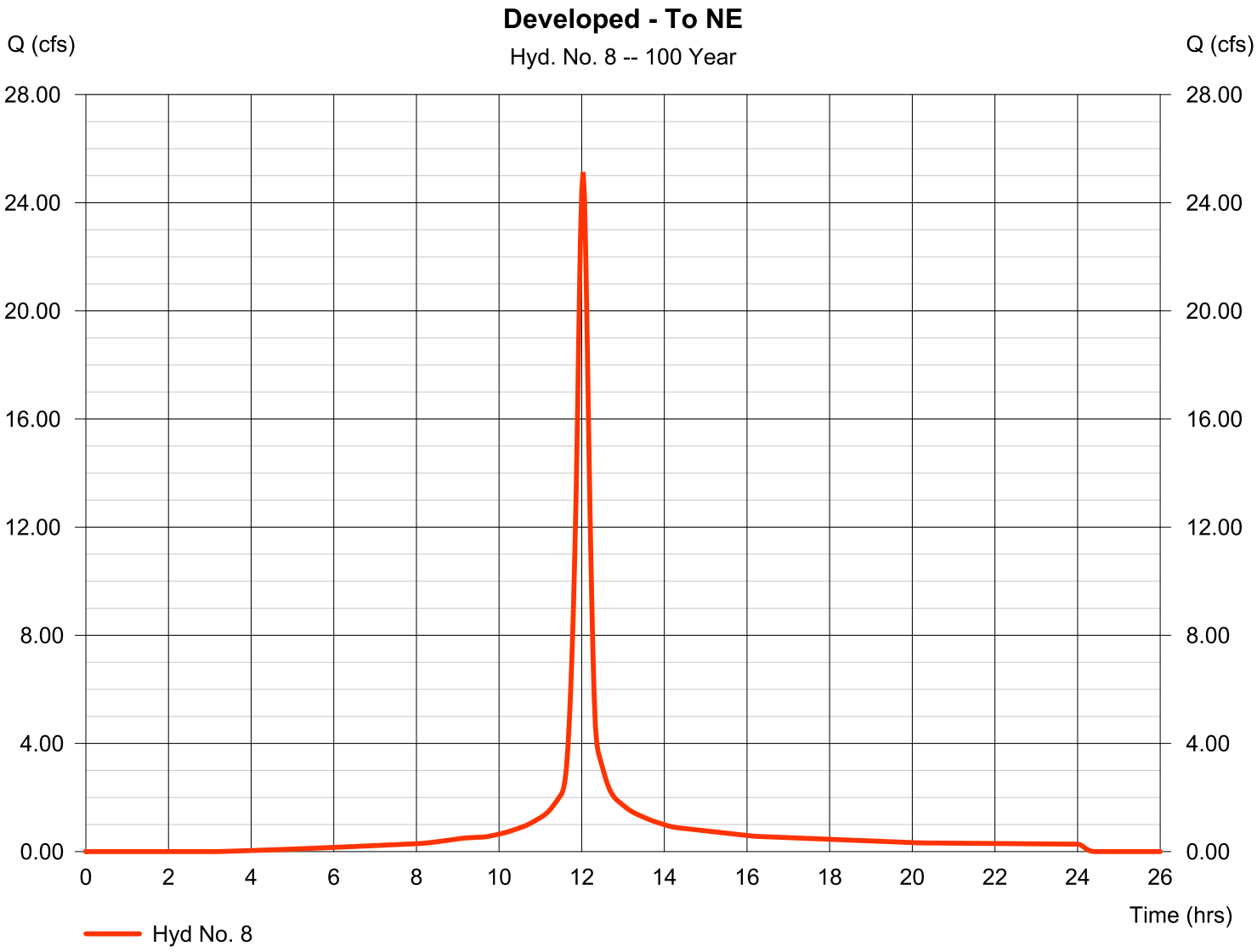


Hydrograph Report

Hyd. No. 8

Developed - To NE

Hydrograph type	= SCS Runoff	Peak discharge	= 25.13 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.03 hrs
Time interval	= 2 min	Hyd. volume	= 1.709 acft
Drainage area	= 3.300 ac	Curve number	= 88
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 15.00 min
Total precip.	= 7.80 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

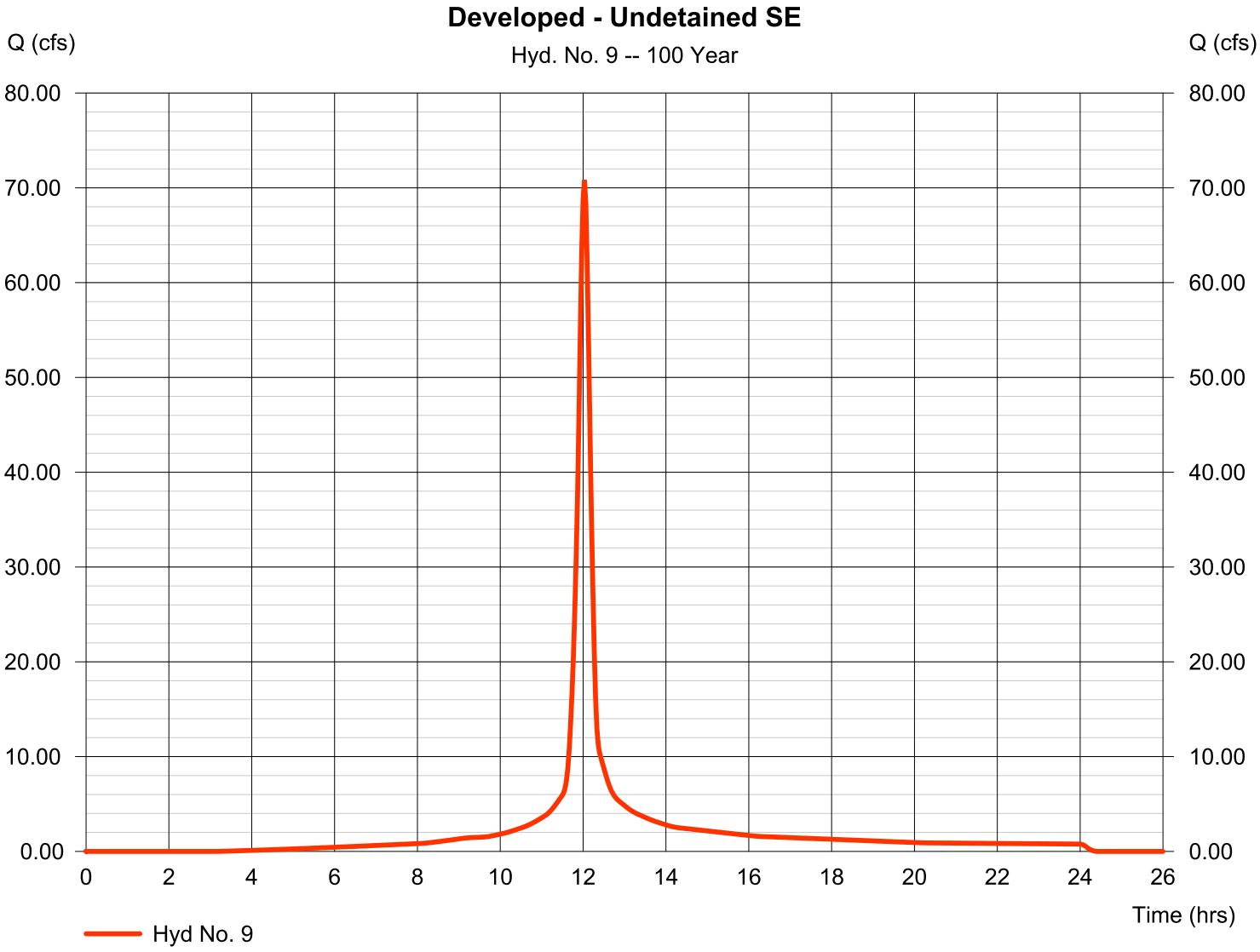


Hydrograph Report

Hyd. No. 9

Developed - Undetained SE

Hydrograph type	=	SCS Runoff	Peak discharge	=	70.82 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.03 hrs
Time interval	=	2 min	Hyd. volume	=	4.815 acft
Drainage area	=	9.300 ac	Curve number	=	88
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	15.00 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



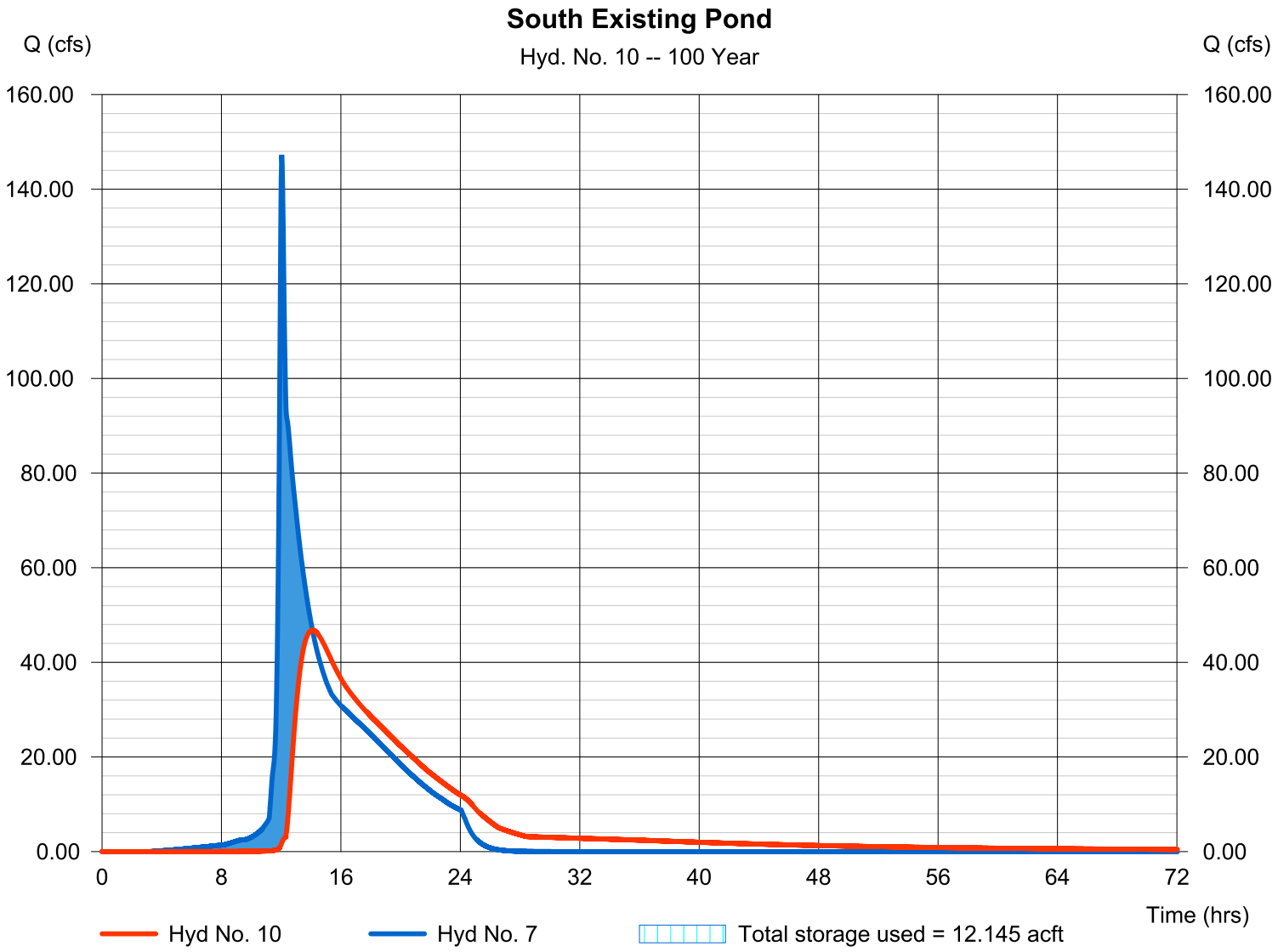
Hydrograph Report

Hyd. No. 10

South Existing Pond

Hydrograph type	=	Reservoir	Peak discharge	=	46.78 cfs
Storm frequency	=	100 yrs	Time to peak	=	14.10 hrs
Time interval	=	2 min	Hyd. volume	=	34.610 acft
Inflow hyd. No.	=	7 - Developed to South Pond	Max. Elevation	=	1368.07 ft
Reservoir name	=	South Pond	Max. Storage	=	12.145 acft

Storage Indication method used.

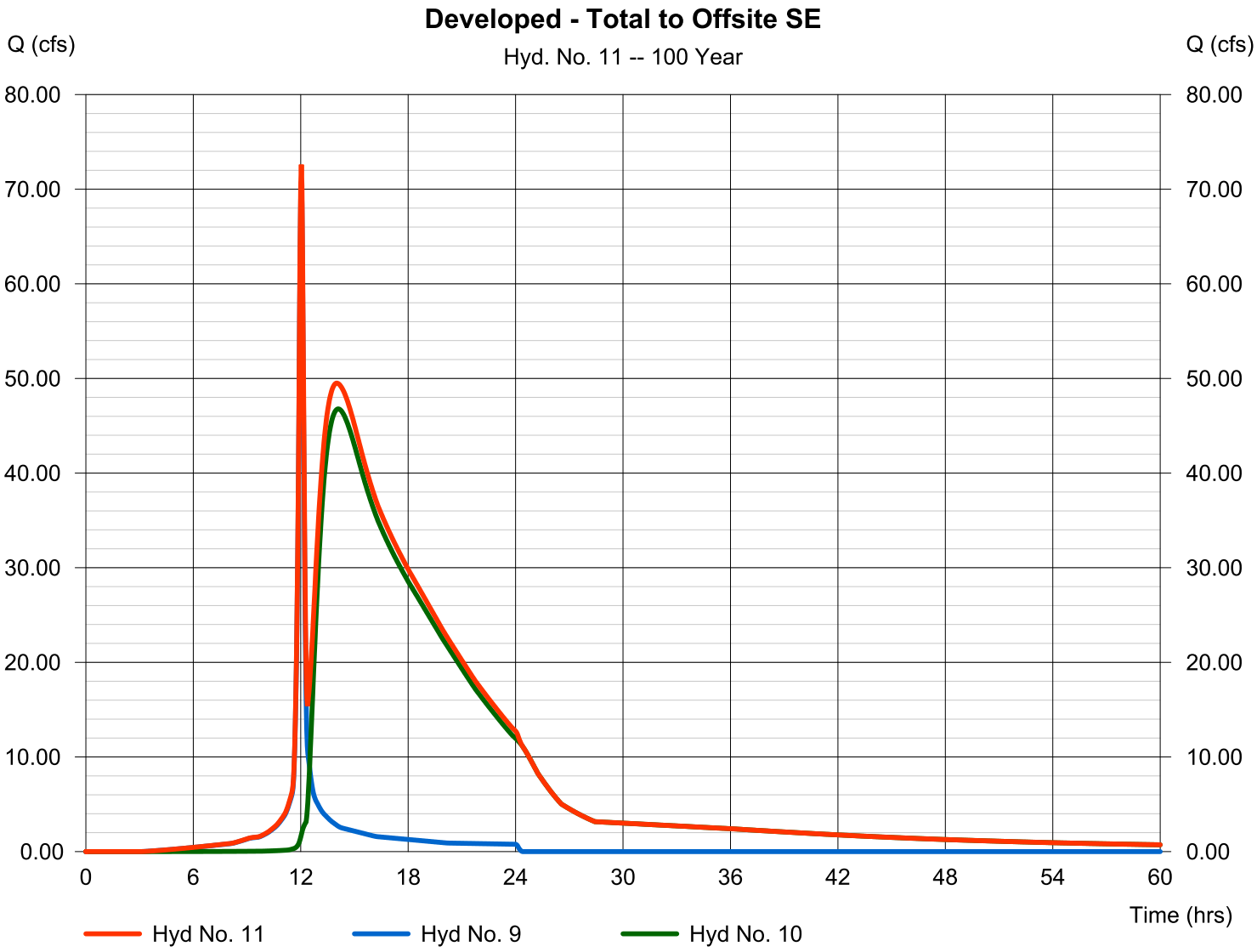


Hydrograph Report

Hyd. No. 11

Developed - Total to Offsite SE

Hydrograph type	= Combine	Peak discharge	= 72.60 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.03 hrs
Time interval	= 2 min	Hyd. volume	= 39.425 acft
Inflow hyds.	= 9, 10	Contrib. drain. area	= 9.300 ac



Hydraflow Rainfall Report

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	27.8967	9.8000	0.7047	--------
2	76.3137	14.3000	0.8844	--------
3	1.2000	0.1000	0.0000	--------
5	52.6224	11.2000	0.7497	--------
10	55.1841	11.1000	0.7229	--------
25	60.7012	11.1000	0.7068	--------
50	66.9222	11.3000	0.7004	--------
100	62.2794	10.1000	0.6624	--------

File name: wich_IDF.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	4.18	3.40	2.90	2.55	2.29	2.08	1.91	1.78	1.66	1.56	1.48	1.40
2	5.57	4.54	3.85	3.35	2.97	2.67	2.43	2.23	2.06	1.92	1.80	1.69
3	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
5	6.52	5.33	4.55	3.99	3.57	3.24	2.97	2.75	2.57	2.41	2.27	2.15
10	7.40	6.09	5.22	4.60	4.13	3.76	3.46	3.21	3.00	2.82	2.67	2.53
25	8.51	7.03	6.05	5.35	4.81	4.39	4.05	3.76	3.52	3.32	3.14	2.98
50	9.47	7.86	6.78	6.00	5.41	4.94	4.56	4.24	3.98	3.75	3.55	3.37
100	10.31	8.53	7.37	6.53	5.90	5.40	5.00	4.66	4.37	4.13	3.92	3.73

Tc = time in minutes. Values may exceed 60.

Precip. file name: wich_24hr.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	2.80	3.50	1.20	4.50	5.20	6.10	6.90	7.80
SCS 6-Hr	0.00	1.80	0.00	0.00	2.60	0.00	0.00	4.00
Huff-1st	0.00	1.55	0.00	2.75	4.00	5.38	6.50	8.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	1.75	0.00	2.80	3.90	5.25	6.00	7.10

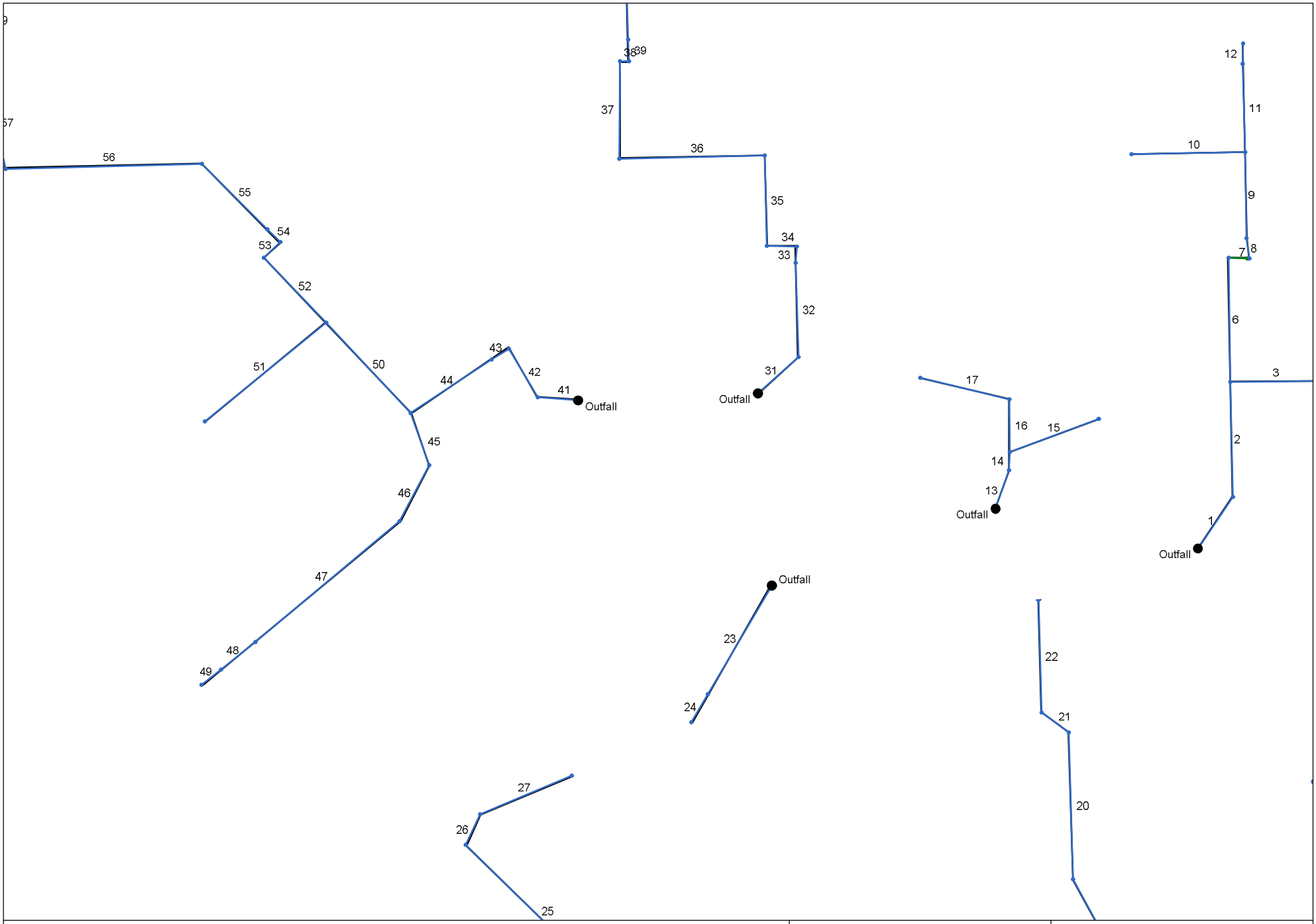
Hydraflow Table of Contents

pre pond size.gpw

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2015 by Autodesk, Inc. v10.4 Monday, 08 / 29 / 2016

Hydraflow Storm Sewers

Hydraflow Storm Sewers Extension for Autodesk® AutoCAD® Civil 3D® Plan



Project File: sws.stm	Number of lines: 59	Date: 8/29/2016

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr Line No.	Line Length (ft)	Defl angle (deg)	Junc Type	Known Q (cfs)	Drng Area (ac)	Runoff Coeff (C)	Inlet Time (min)	Invert El Dn (ft)	Line Slope (%)	Invert El Up (ft)	Line Size (in)	Line Shape	N Value (n)	J-Loss Coeff (K)	Inlet/ Rim El (ft)	
1	End	103.244	-57.811	DrGrt	0.00	0.60	0.73	15.0	1367.00	0.20	1367.20	Cir		0.013	0.91	1372.00	
2	1	195.046	-33.438	DrGrt	0.00	0.90	0.73	15.0	1367.31	0.20	1367.70	Cir		0.013	1.82	1374.00	
3	2	133.630	90.766	Curb	0.00	1.00	0.73	15.0	1367.70	0.25	1368.04	Cir		0.013	0.50	1378.00	
4	3	45.261	-0.784	Curb	0.00	1.10	0.73	15.0	1368.14	0.25	1368.25	Cir		0.013	0.50	1378.00	
5	4	130.380	0.772	Curb	0.00	0.60	0.73	15.0	1368.25	0.33	1368.68	Cir		0.013	1.00	1373.40	
6	2	210.137	0.635	Curb	0.00	0.20	0.73	15.0	1367.70	0.20	1368.12	Cir		0.013	1.50	1381.00	
7	6	32.390	92.383	Curb	0.00	0.20	0.73	15.0	1368.12	0.20	1368.18	Cir		0.013	1.50	1380.50	
8	7	34.776	-98.996	Curb	0.00	0.50	0.73	15.0	1368.28	0.20	1368.35	Cir		0.013	0.50	1380.50	
9	8	145.516	6.390	DrGrt	0.00	0.80	0.73	15.0	1368.45	0.20	1368.74	Cir		0.013	1.51	1375.80	
10	9	178.905	-90.204	DrGrt	0.00	1.10	0.73	15.0	1368.74	0.33	1369.32	Cir		0.013	1.00	1375.80	
11	9	149.810	-0.789	Curb	0.00	1.00	0.73	15.0	1368.74	0.25	1369.12	Cir		0.013	0.50	1378.00	
12	11	34.514	3.286	Curb	0.00	1.00	0.73	15.0	1369.12	0.33	1369.25	Cir		0.013	1.00	1378.00	
13	End	68.584	-72.060	MH	0.00	0.00	0.00	15.0	1367.00	0.20	1367.14	Cir		0.013	0.31	1371.00	
14	13	30.656	-15.369	DrGrt	0.00	0.00	0.00	15.0	1367.24	0.20	1367.30	Cir		0.013	1.71	1371.00	
15	14	150.392	65.363	Curb	0.00	1.30	0.73	15.0	1367.30	0.33	1367.79	Cir		0.013	1.00	1376.00	
16	14	89.753	-3.050	DrGrt	0.00	0.90	0.73	15.0	1367.30	0.25	1367.53	Cir		0.013	1.46	1371.00	
17	16	144.707	-75.065	Curb	0.00	0.90	0.73	15.0	1367.53	0.33	1368.01	Cir		0.013	1.00	1376.00	
18	End	234.127	-162.000	Curb	0.00	0.90	0.73	15.0	1366.00	0.33	1366.76	Cir		0.013	1.00	1372.00	
19	End	219.863	-116.798	DrGrt	0.00	0.10	0.73	15.0	1362.00	0.20	1362.44	Cir		0.013	0.72	1366.00	
20	19	249.085	25.303	Curb	0.00	0.90	0.73	15.0	1362.54	0.20	1363.04	Cir		0.013	1.21	1373.20	
21	20	54.608	-50.664	Curb	0.00	1.00	0.73	15.0	1363.04	0.20	1363.15	Cir		0.013	1.22	1373.20	
22	21	189.800	50.839	Hdwl	42.00	0.00	0.00	15.0	1363.10	0.21	1363.50	Cir		0.013	1.00	1371.00	
23	End	209.757	118.551	Curb	0.00	1.40	0.73	15.0	1367.00	0.25	1367.55	Cir		0.013	0.50	1375.50	

Project File: sws.stm | Number of lines: 59 | Date: 8/29/2016

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr Line No.	Line Length (ft)	Defl angle (deg)	Junc Type	Known Q (cfs)	Drng Area (ac)	Runoff Coeff (C)	Inlet Time (min)	Invert El Dn (ft)	Line Slope (%)	Invert El Up (ft)	Line Size (in)	Line Shape	N Value (n)	J-Loss Coeff (K)	Inlet/ Rim El (ft)	
24	23	54.090	0.028	Curb	0.00	1.30	0.73	15.0	1367.54	0.32	1367.71	Cir		0.013	1.00	1375.50	
25	End	328.647	-133.536	Curb	0.00	1.20	0.73	15.0	1367.00	0.25	1367.84	Cir		0.013	1.40	1375.00	
26	25	56.530	67.267	MH	0.00	0.00	0.00	15.0	1367.84	0.32	1368.02	Cir		0.013	0.71	1375.50	
27	26	158.642	41.784	DrGrt	0.00	1.60	0.73	15.0	1368.12	0.25	1368.55	Cir		0.013	1.00	1371.00	
28	End	175.510	-42.027	Curb	0.00	1.30	0.73	15.0	1370.00	0.20	1370.35	Cir		0.013	0.50	1380.00	
29	28	50.471	0.440	Curb	0.00	1.30	0.73	15.0	1370.35	0.25	1370.48	Cir		0.013	0.50	1380.00	
30	29	146.566	0.148	DrGrt	0.00	1.00	0.73	15.0	1370.48	0.33	1370.96	Cir		0.013	1.00	1376.00	
31	End	88.403	-43.969	DrGrt	0.00	0.10	0.73	15.0	1362.80	0.20	1362.98	Cir		0.013	1.17	1372.00	
32	31	159.560	-47.602	Curb	0.00	2.00	0.73	15.0	1363.63	0.20	1363.96	Cir		0.013	0.50	1378.00	
33	32	28.090	6.165	Curb	0.00	2.00	0.73	15.0	1365.10	0.20	1365.42	Cir		0.013	1.50	1378.00	
34	33	47.513	-93.237	Curb	0.00	0.10	0.73	15.0	1366.25	0.20	1366.36	Cir		0.013	1.50	1378.00	
35	34	153.035	87.426	DrGrt	0.00	1.60	0.73	15.0	1367.20	0.20	1367.56	Cir		0.013	1.50	1374.00	
36	35	228.563	-90.131	DrGrt	0.00	2.30	0.73	15.0	1367.75	0.20	1368.26	Cir		0.013	1.50	1373.40	
37	36	165.000	91.738	Curb	0.00	1.10	0.73	15.0	1368.71	0.20	1369.04	Cir		0.013	1.50	1381.50	
38	37	14.000	89.609	Curb	0.00	1.80	0.73	15.0	1369.14	0.20	1369.17	Cir		0.013	1.50	1381.50	
39	38	36.767	-91.753	Curb	0.00	2.00	0.73	15.0	1369.17	0.20	1369.24	Cir		0.013	0.50	1381.50	
40	39	145.562	0.080	DrGrt	0.00	3.80	0.73	15.0	1369.24	0.20	1369.53	Cir		0.013	1.00	1376.50	
41	End	63.727	-175.162	Curb	0.00	0.20	0.73	15.0	1367.00	0.20	1367.48	Cir		0.013	1.29	1376.00	
42	41	93.717	56.204	Curb	0.00	1.30	0.73	15.0	1367.23	0.20	1367.42	Cir		0.013	1.50	1375.00	
43	42	32.556	-95.403	Curb	0.00	1.30	0.73	15.0	1367.52	0.20	1367.58	Cir		0.013	0.50	1375.00	
44	43	156.150	-1.059	DrGrt	0.00	1.10	0.73	15.0	1367.58	0.20	1367.89	Cir		0.013	1.49	1372.20	
45	44	93.051	-72.820	DrGrt	0.00	0.10	0.73	15.0	1367.89	0.20	1368.08	Cir		0.013	1.11	1374.10	
46	45	105.603	44.290	DrGrt	0.00	1.00	0.73	15.0	1368.18	0.20	1368.39	Cir		0.013	0.64	1372.00	

Project File: sws.stm | Number of lines: 59 | Date: 8/29/2016

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr Line No.	Line Length (ft)	Defl angle (deg)	Junc Type	Known Q (cfs)	Drng Area (ac)	Runoff Coeff (C)	Inlet Time (min)	Invert El Dn (ft)	Line Slope (%)	Invert El Up (ft)	Line Size (in)	Line Shape	N Value (n)	J-Loss Coeff (K)	Inlet/ Rim El (ft)	
47	46	305.235	21.822	DrGrt	0.00	0.60	0.73	15.0	1368.39	0.20	1369.00	Cir		0.013	0.50	1373.70	
48	47	71.086	1.407	Curb	0.00	2.00	0.73	15.0	1369.10	0.20	1369.24	Cir		0.013	0.50	1375.50	
49	48	40.572	1.097	Curb	0.00	1.50	0.73	15.0	1369.24	0.32	1369.37	Cir		0.013	1.00	1375.50	
50	44	202.481	84.501	DrGrt	0.00	0.50	0.73	15.0	1367.89	0.20	1368.30	Cir		0.013	1.50	1374.50	
51	50	253.524	-90.282	DrGrt	0.00	1.50	0.73	15.0	1368.30	0.33	1369.12	Cir		0.013	1.00	1372.70	
52	50	147.323	-0.778	Curb	0.00	0.10	0.73	15.0	1368.30	0.20	1368.59	Cir		0.013	1.50	1380.50	
53	52	37.307	85.612	Curb	0.00	0.90	0.73	15.0	1368.69	0.20	1368.77	Cir		0.013	1.50	1380.00	
54	53	29.797	-87.384	Curb	0.00	1.00	0.73	15.0	1368.87	0.20	1368.96	Cir		0.013	0.50	1380.00	
55	54	151.002	0.785	DrGrt	0.00	1.10	0.73	15.0	1368.93	0.20	1369.23	Cir		0.013	1.19	1375.00	
56	55	308.496	-48.917	DrGrt	0.00	1.10	0.73	15.0	1369.33	0.20	1369.95	Cir		0.013	1.48	1376.00	
57	56	159.418	80.160	Curb	0.00	1.10	0.73	15.0	1369.95	0.20	1370.26	Cir		0.013	1.50	1382.00	
58	57	15.470	89.315	Curb	0.00	1.00	0.73	15.0	1370.36	0.20	1370.39	Cir		0.013	1.49	1382.00	
59	58	184.922	-82.759	DrGrt	0.00	2.40	0.73	15.0	1370.39	0.25	1370.85	Cir		0.013	1.00	1376.00	

Project File: sws.stm | Number of lines: 59 | Date: 8/29/2016

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
1		27.21	36	43.244	Cir		1367.00	1367.21	0.201	1368.69	1369.32	0.37	1369.69	End	DropGrate
2		25.99	36	45.046	Cir		1367.31	1367.70	0.200	1369.69	1370.00	0.57	1370.56	1	DropGrate
3		8.60	18	43.630	Cir		1367.70	1368.04	0.255	1370.56*	1371.46*	n/a	1371.64	2	Curb-Horiz
4		5.44	15	45.260	Cir		1368.14	1368.25	0.255	1371.64*	1371.96*	n/a	1372.12	3	Curb-Horiz
5		1.99	15	30.380	Cir		1368.25	1368.68	0.325	1372.12*	1372.24*	n/a	1372.28	4	Curb-Horiz
6		15.14	24	40.137	Cir		1367.70	1368.12	0.200	1370.56*	1371.50*	n/a	1372.05	2	Curb-Horiz
7		14.56	24	32.390	Cir		1368.12	1368.18	0.200	1372.05*	1372.18*	n/a	1372.68	6	Curb-Horiz
8		13.97	24	34.776	Cir		1368.28	1368.35	0.200	1372.68*	1372.81*	n/a	1372.97	7	Curb-Horiz
9		12.59	24	45.516	Cir		1368.45	1368.74	0.200	1372.97*	1373.42*	n/a	1373.80	8	DropGrate
10		3.65	15	38.905	Cir		1368.74	1369.32	0.325	1373.80*	1374.37*	n/a	1374.51	9	DropGrate
11		6.60	18	49.810	Cir		1368.74	1369.12	0.255	1373.80*	1375.36*	n/a	1375.59	9	Curb-Horiz
12		3.32	15	34.514	Cir		1369.12	1369.24	0.325	1375.59*	1375.68*	n/a	1375.79	11	Curb-Horiz
13		9.86	18	68.584	Cir		1367.00	1367.14	0.200	1368.21*	1368.99*	n/a	1369.14	End	Manhole
14		9.89	18	30.656	Cir		1367.24	1367.30	0.200	1369.14*	1369.41*	n/a	1370.24	13	DropGrate
15		4.32	15	50.392	Cir		1367.30	1367.79	0.325	1370.24*	1370.92*	n/a	1371.11	14	Curb-Horiz
16		5.81	18	89.753	Cir		1367.30	1367.53	0.255	1370.24*	1370.52*	n/a	1370.76	14	DropGrate
17		2.99	15	44.707	Cir		1367.53	1368.00	0.325	1370.76*	1371.07*	n/a	1371.17	16	Curb-Horiz
18		2.99	15	24.127	Cir		1366.00	1366.76	0.325	1366.70	1367.80	n/a	1367.91	End	Curb-Horiz
19		48.44	36	69.863	Cir		1362.00	1362.44	0.200	1364.26*	1365.92*	n/a	1366.44	End	DropGrate
20		48.22	36	69.085	Cir		1362.54	1363.04	0.200	1366.44*	1367.74*	n/a	1368.62	19	Curb-Horiz
21		45.29	36	54.606	Cir		1363.04	1363.15	0.200	1368.62*	1368.87*	n/a	1369.65	20	Curb-Horiz
22		42.00	36	39.800	Cir		1363.10	1363.50	0.211	1369.65*	1371.64*	n/a	1372.78	21	OpenHeadwall
23		8.90	24	39.757	Cir		1367.00	1367.54	0.255	1368.15*	1371.94*	n/a	1372.35	End	Curb-Horiz
24		4.32	15	54.090	Cir		1367.54	1367.71	0.325	1372.35*	1372.59*	n/a	1372.78	23	Curb-Horiz

Project File: sws.stm | Number of lines: 59 | Run Date: 8/29/2016

NOTES: Return period = 5 Yrs. ; *Surcharged (HGL above crown).

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
25		9.08	24 8.647	Cir		1367.00	1367.84	0.255	1368.08	1369.43	n/a	1369.68	End	Curb-Horiz
26		5.22	15 56.530	Cir		1367.84	1368.02	0.325	1369.68*	1370.05*	n/a	1370.25	25	Manhole
27		5.31	15 8.642	Cir		1368.12	1368.53	0.255	1370.25*	1371.32*	n/a	1371.62	26	DropGrate
28		11.61	18 5.510	Cir		1370.00	1370.35	0.200	1371.30*	1373.48*	n/a	1373.81	End	Curb-Horiz
29		7.45	15 50.470	Cir		1370.35	1370.48	0.255	1373.81*	1374.48*	n/a	1374.77	28	Curb-Horiz
30		3.32	18 6.566	Cir		1370.48	1370.96	0.325	1374.77*	1375.16*	n/a	1375.27	29	DropGrate
31		50.89	48 88.403	Cir		1362.80	1362.98	0.201	1367.00*	1367.11*	n/a	1367.41	End	DropGrate
32		51.48	48 9.560	Cir		1363.63	1363.95	0.200	1367.41	1367.57	n/a	1367.72	31	Curb-Horiz
33		45.44	42 28.090	Cir		1365.10	1365.15	0.200	1368.00	1368.05	n/a	1368.71	32	Curb-Horiz
34		39.41	36 47.513	Cir		1366.25	1366.35	0.200	1369.25*	1369.42*	n/a	1370.14	33	Curb-Horiz
35		39.58	36 3.035	Cir		1367.20	1367.50	0.200	1370.20*	1370.74*	n/a	1371.47	34	DropGrate
36		35.29	30 8.563	Cir		1367.75	1368.21	0.200	1371.47*	1372.11*	n/a	1372.69	35	DropGrate
37		28.28	36 5.000	Cir		1368.71	1369.04	0.200	1372.69*	1373.47*	n/a	1374.25	36	Curb-Horiz
38		24.74	30 14.000	Cir		1369.14	1369.17	0.200	1374.25*	1374.30*	n/a	1374.89	37	Curb-Horiz
39		18.93	24 36.767	Cir		1369.17	1369.24	0.200	1374.89*	1375.15*	n/a	1375.43	38	Curb-Horiz
40		12.62	24 5.562	Cir		1369.24	1369.53	0.200	1375.43*	1375.89*	n/a	1376.14	39	DropGrate
41		55.86	48 63.727	Cir		1367.00	1367.13	0.200	1369.25	1369.74	n/a	1370.57	End	Curb-Horiz
42		55.77	48 93.717	Cir		1367.23	1367.42	0.200	1370.57	1370.69	n/a	1371.29	41	Curb-Horiz
43		52.24	48 32.556	Cir		1367.52	1367.58	0.200	1371.29	1371.32	n/a	1371.47	42	Curb-Horiz
44		49.32	48 6.150	Cir		1367.58	1367.89	0.200	1371.47	1371.61	n/a	1371.99	43	DropGrate
45		16.30	30 93.050	Cir		1367.89	1368.08	0.200	1371.99*	1372.14*	n/a	1372.33	44	DropGrate
46		16.23	30 5.603	Cir		1368.18	1368.39	0.200	1372.33*	1372.50*	n/a	1372.61	45	DropGrate
47		13.48	24 5.235	Cir		1368.39	1369.00	0.200	1372.61*	1373.69*	n/a	1373.83	46	DropGrate
48		11.57	18 71.086	Cir		1369.10	1369.24	0.200	1373.83*	1374.70*	n/a	1375.03	47	Curb-Horiz

Project File: sws.stm | Number of lines: 59 | Run Date: 8/29/2016

NOTES: Return period = 5 Yrs. ; *Surcharged (HGL above crown).

Storm Sewer Summary Report

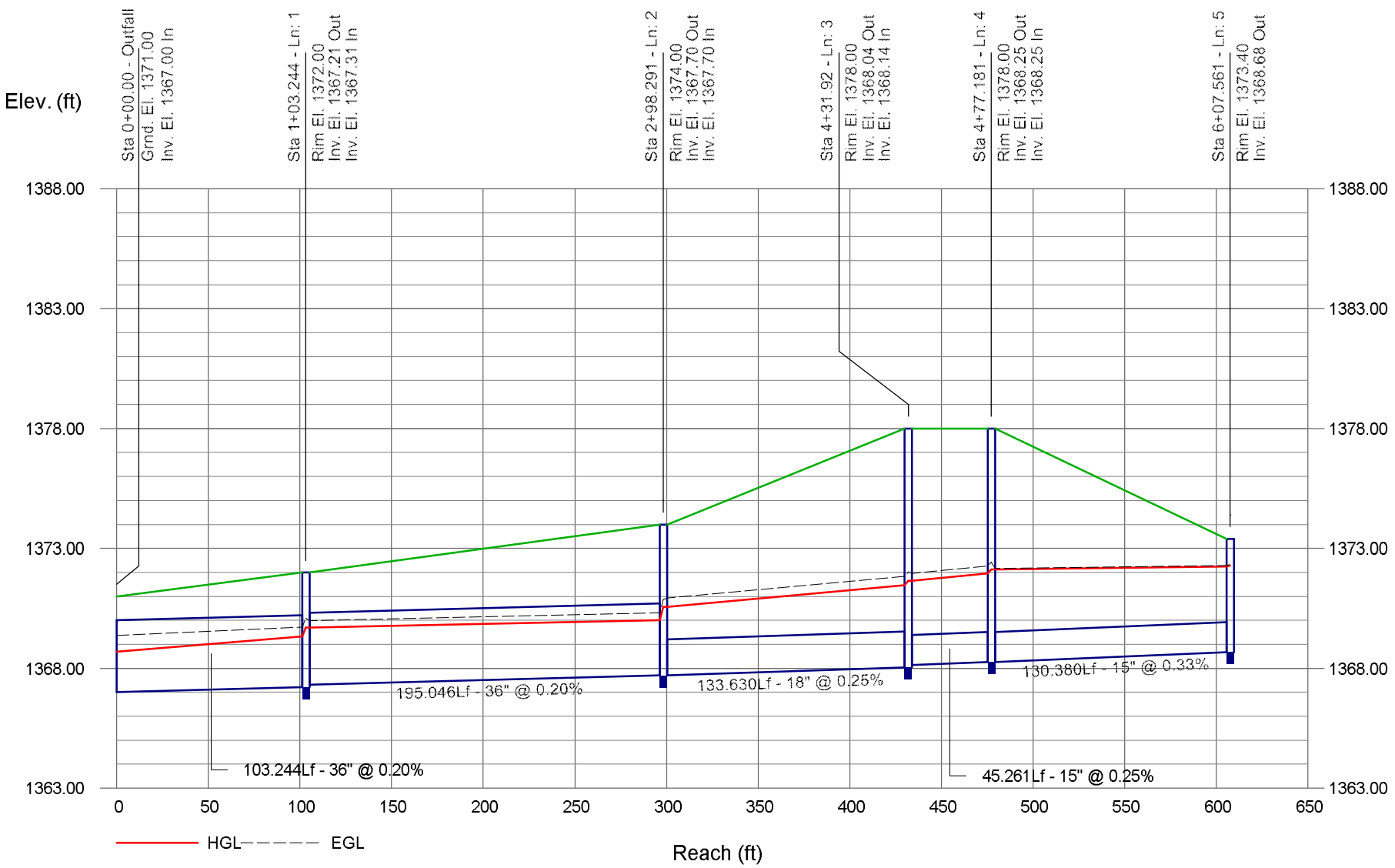
Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
49		4.98	15 40.572	Cir		1369.24	1369.37	0.325	1375.03*	1375.27*	n/a	1375.53	48	Curb-Horiz
50		31.63	36 2.481	Cir		1367.89	1368.30	0.200	1371.99*	1372.45*	n/a	1372.92	44	DropGrate
51		4.98	18 3.524	Cir		1368.30	1369.12	0.325	1372.92*	1373.49*	n/a	1373.61	50	DropGrate
52		26.16	36 7.323	Cir		1368.30	1368.59	0.200	1372.92*	1373.14*	n/a	1373.46	50	Curb-Horiz
53		25.97	36 37.307	Cir		1368.69	1368.77	0.200	1373.46*	1373.52*	n/a	1373.83	52	Curb-Horiz
54		23.35	36 29.797	Cir		1368.87	1368.93	0.200	1373.83*	1373.87*	n/a	1373.96	53	Curb-Horiz
55		20.64	36 1.002	Cir		1368.93	1369.23	0.200	1373.96*	1374.34*	n/a	1374.67	54	DropGrate
56		17.92	30 8.496	Cir		1369.33	1369.95	0.200	1374.67*	1375.25*	n/a	1375.56	55	DropGrate
57		14.63	24 9.418	Cir		1369.95	1370.26	0.200	1375.56*	1376.23*	n/a	1376.73	56	Curb-Horiz
58		11.08	24 15.470	Cir		1370.36	1370.39	0.200	1376.73*	1376.77*	n/a	1377.06	57	Curb-Horiz
59		7.97	18 4.922	Cir		1370.39	1370.87	0.255	1377.06*	1378.12*	n/a	1378.44	58	DropGrate

Project File: sws.stm | Number of lines: 59 | Run Date: 8/29/2016

NOTES: Return period = 5 Yrs. ; *Surcharged (HGL above crown).

Storm Sewer Profile

Proj. file: sws.stm



Storm Sewer Profile

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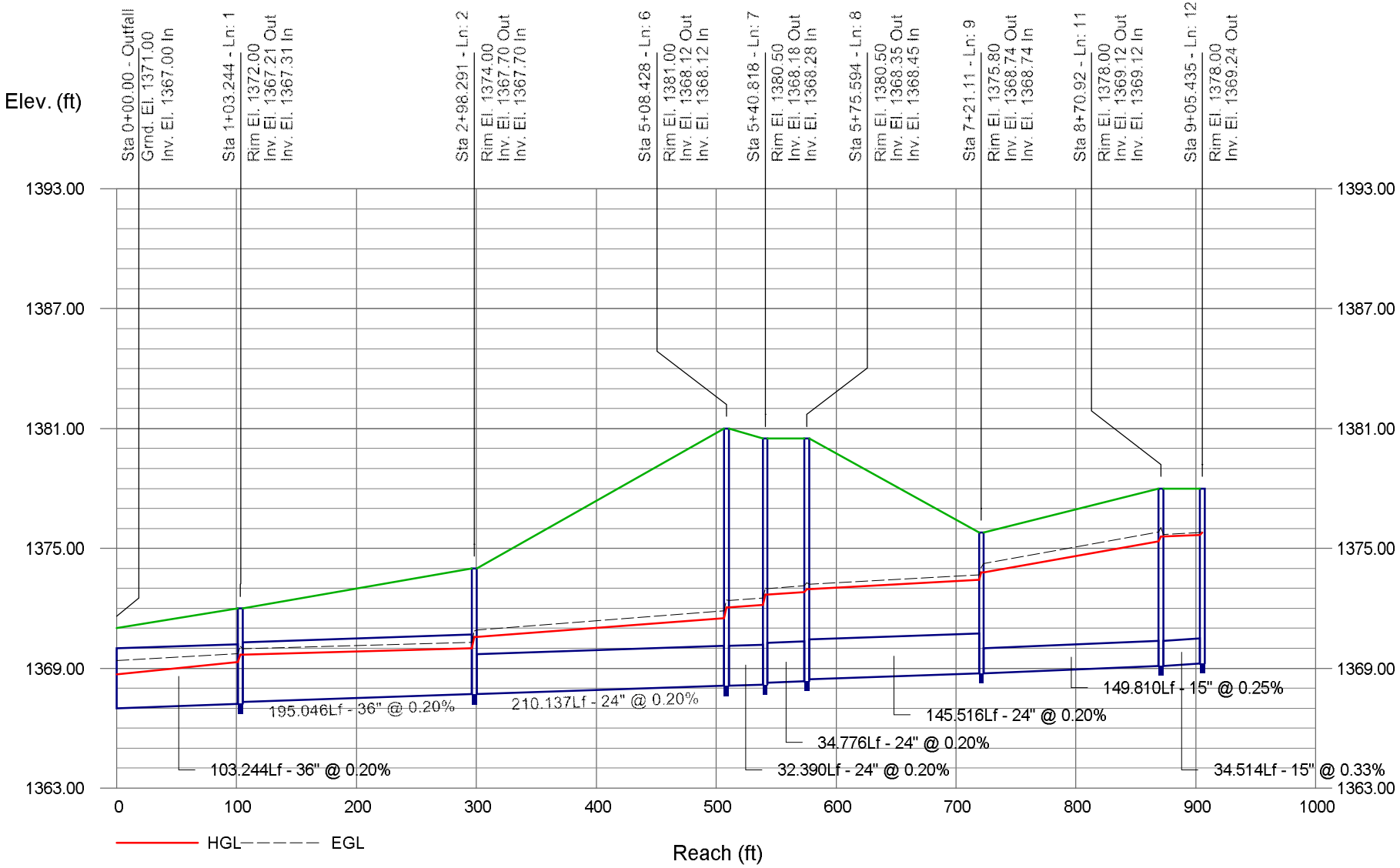

Storm Sewer Profile

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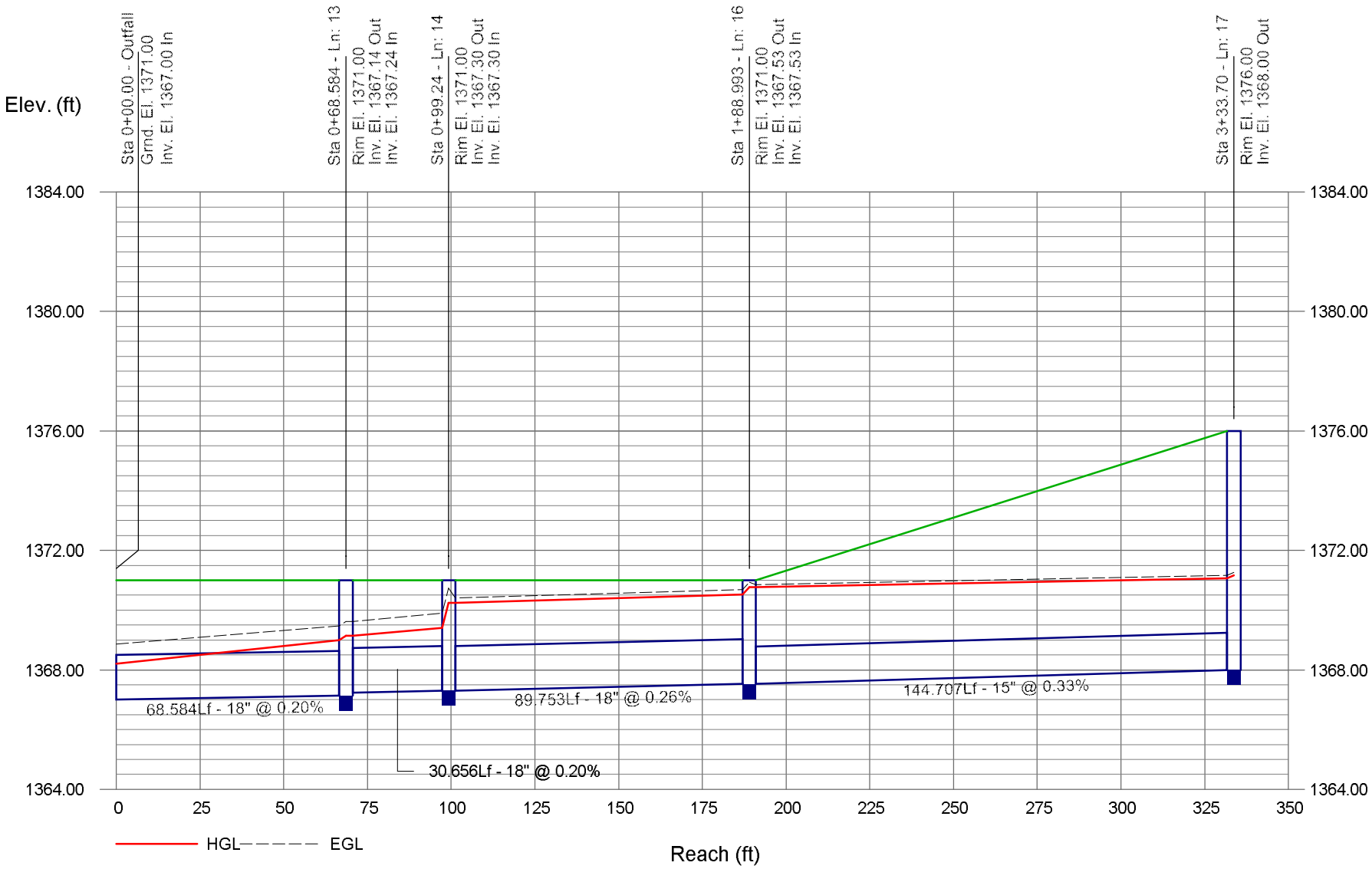

Storm Sewer Profile

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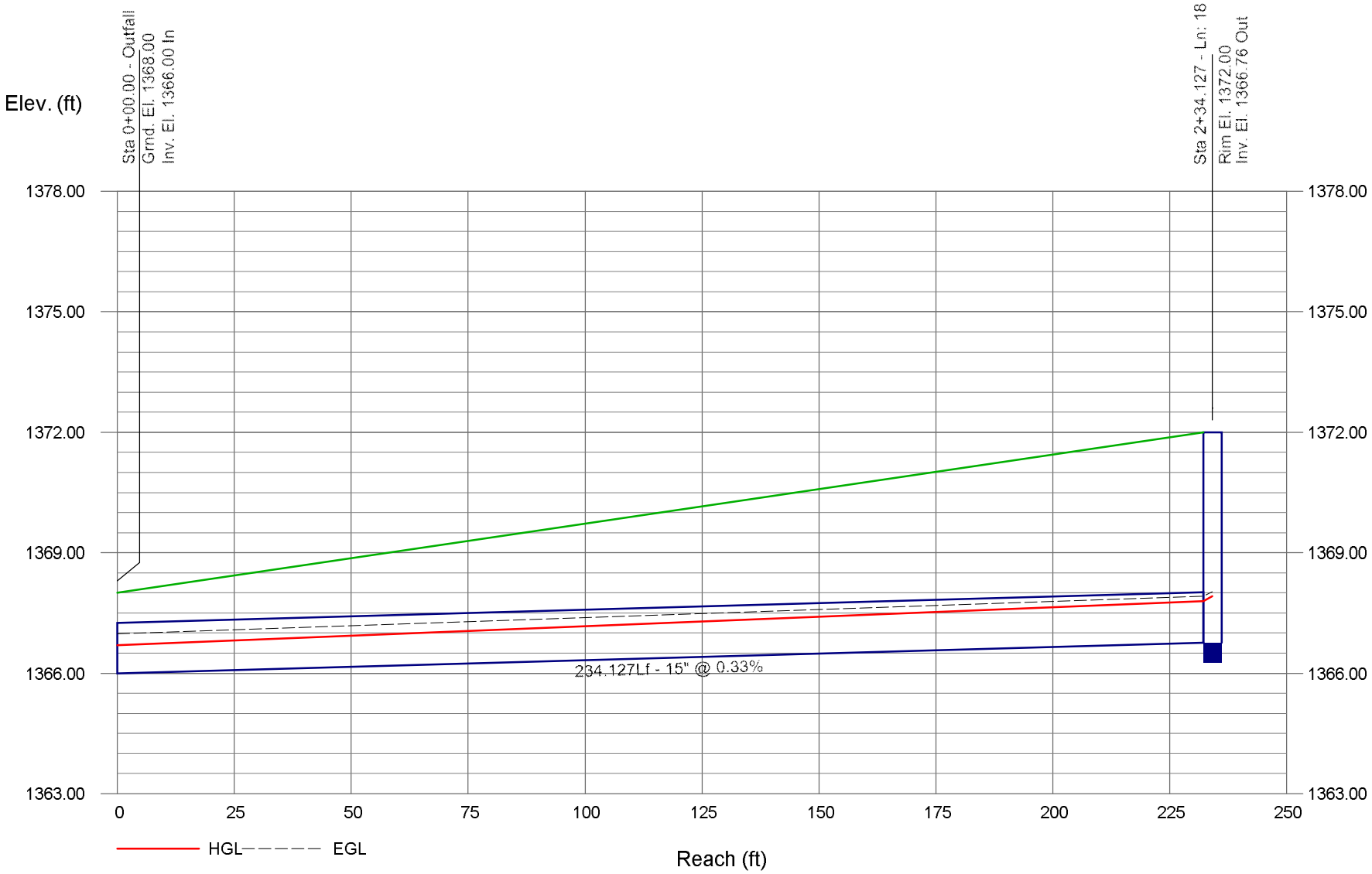

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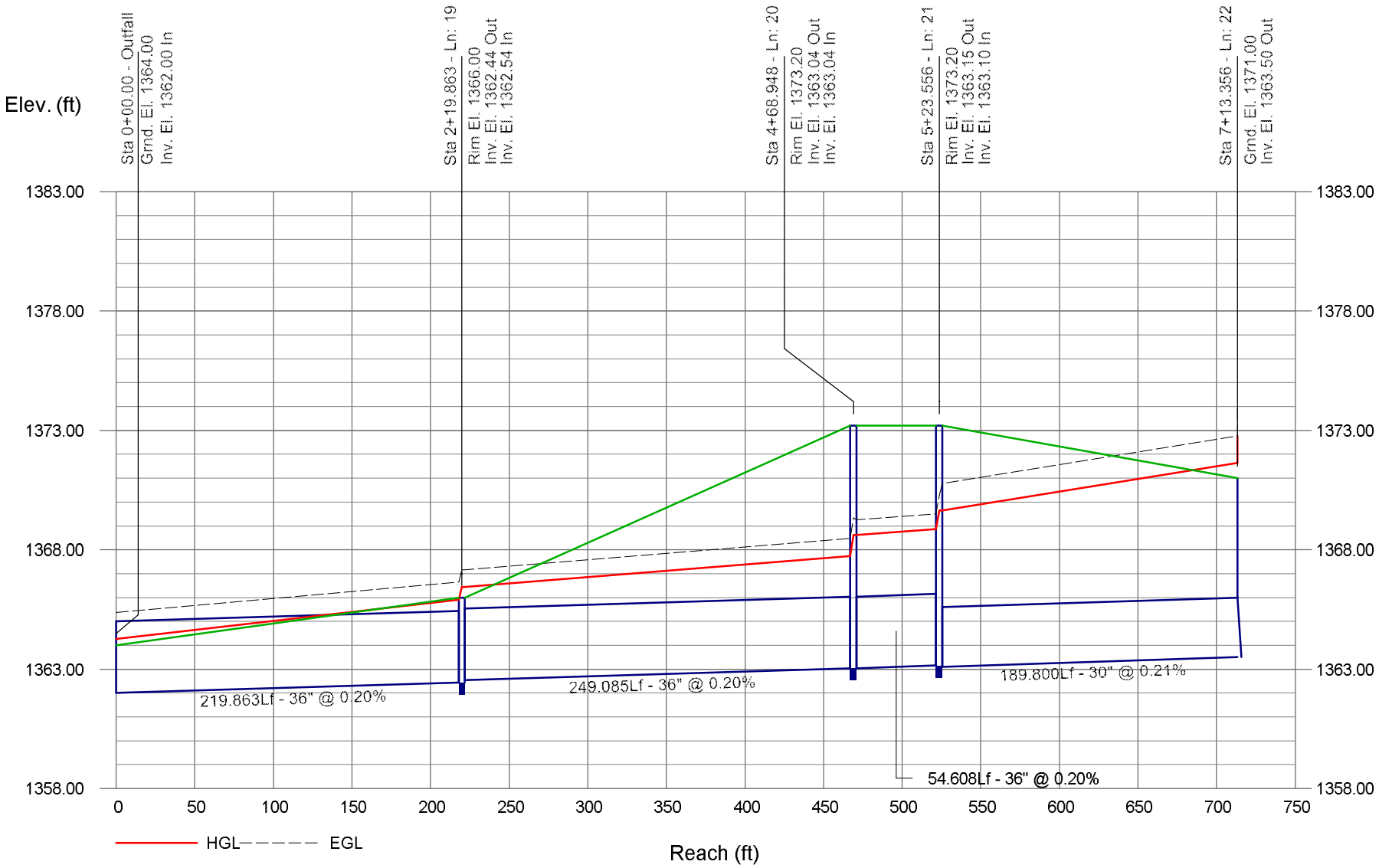

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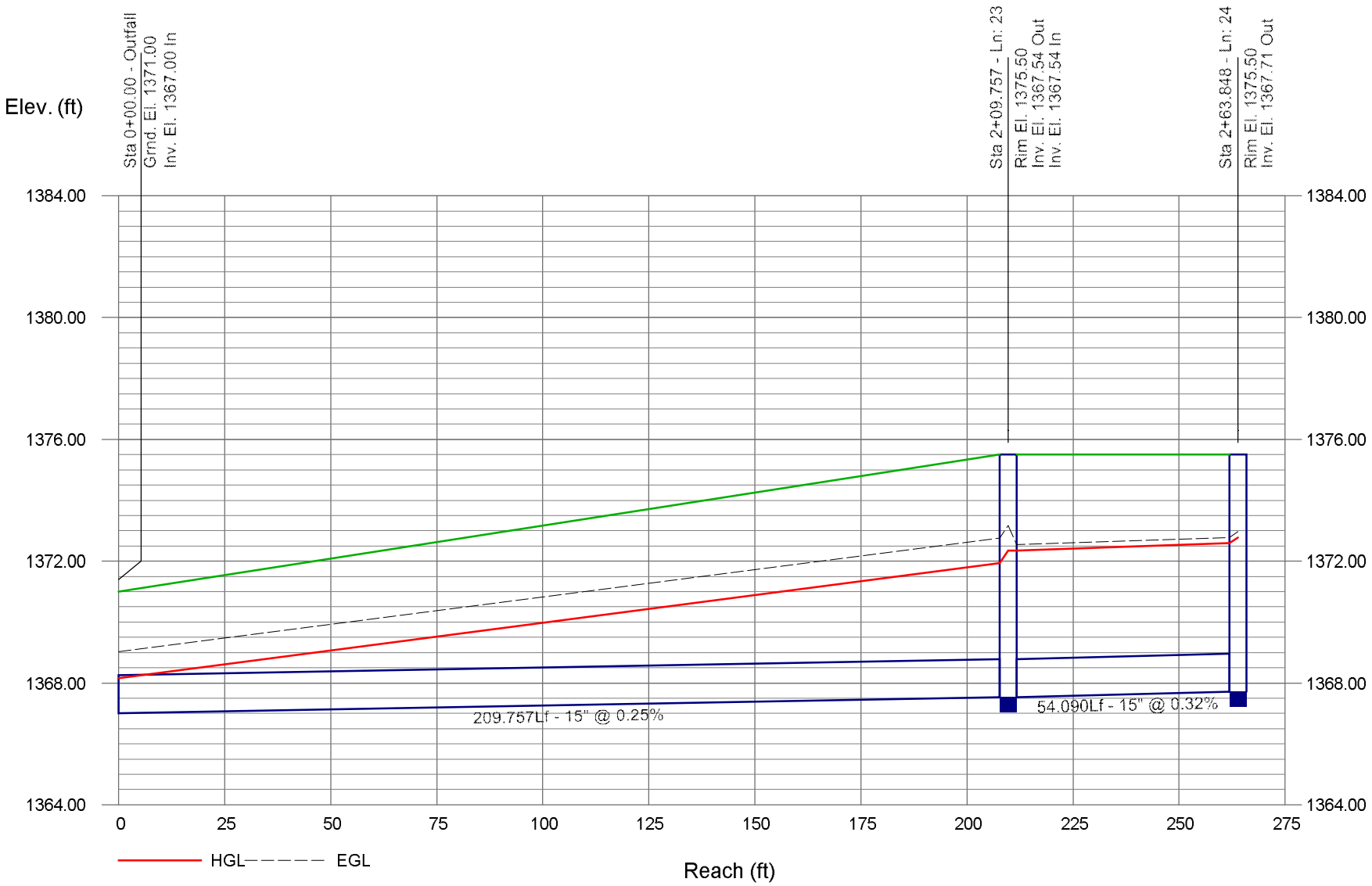

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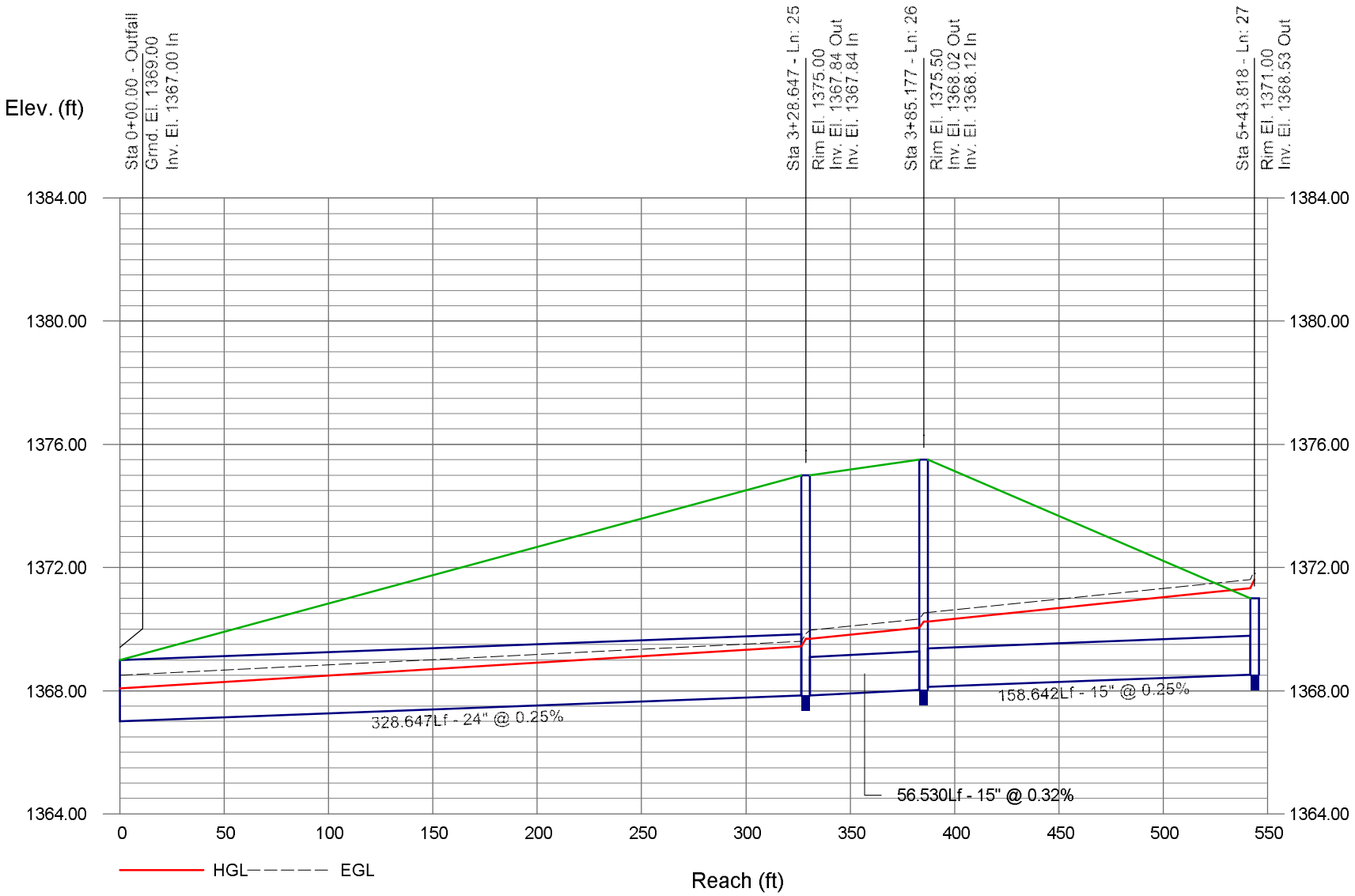

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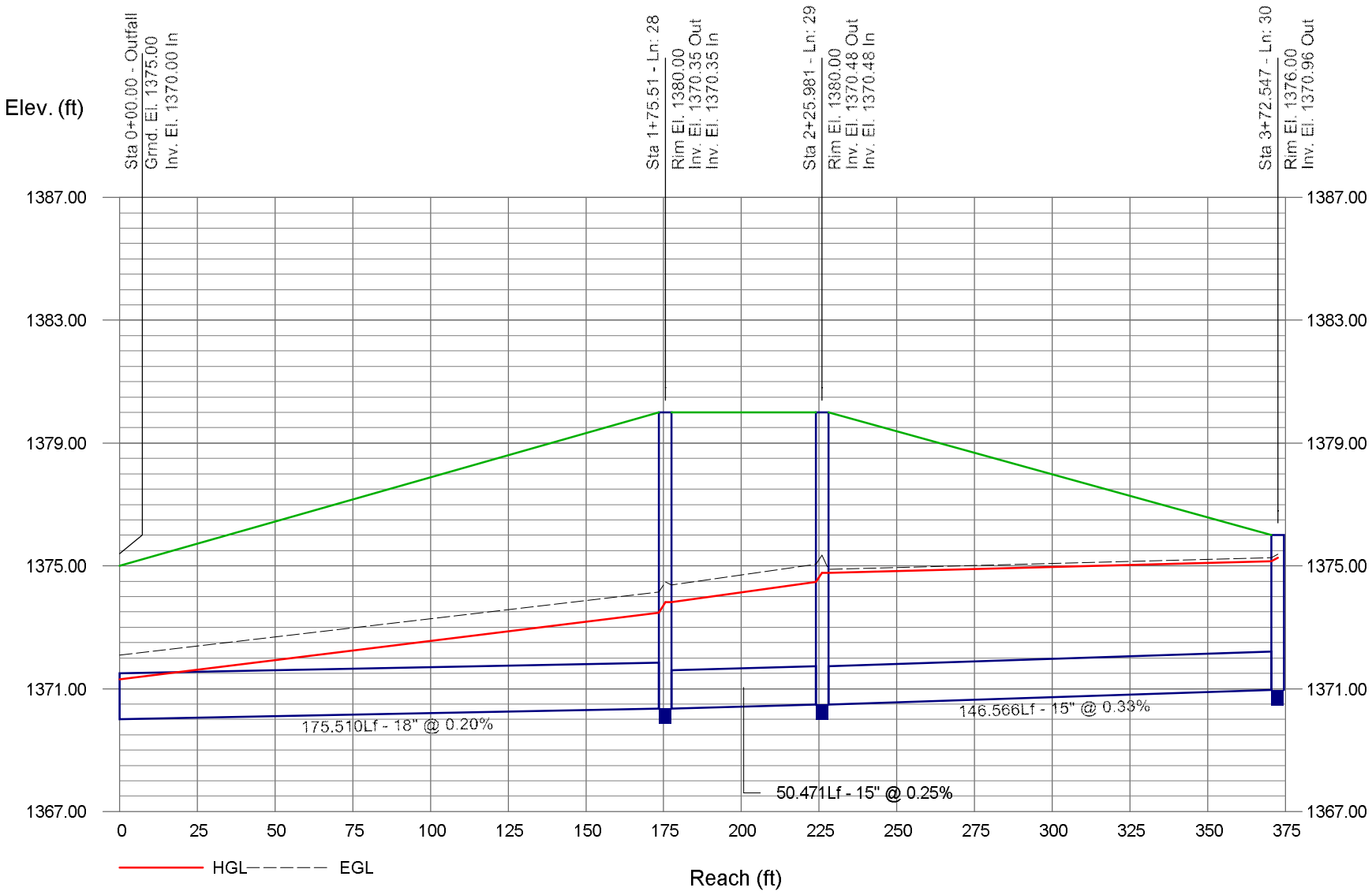

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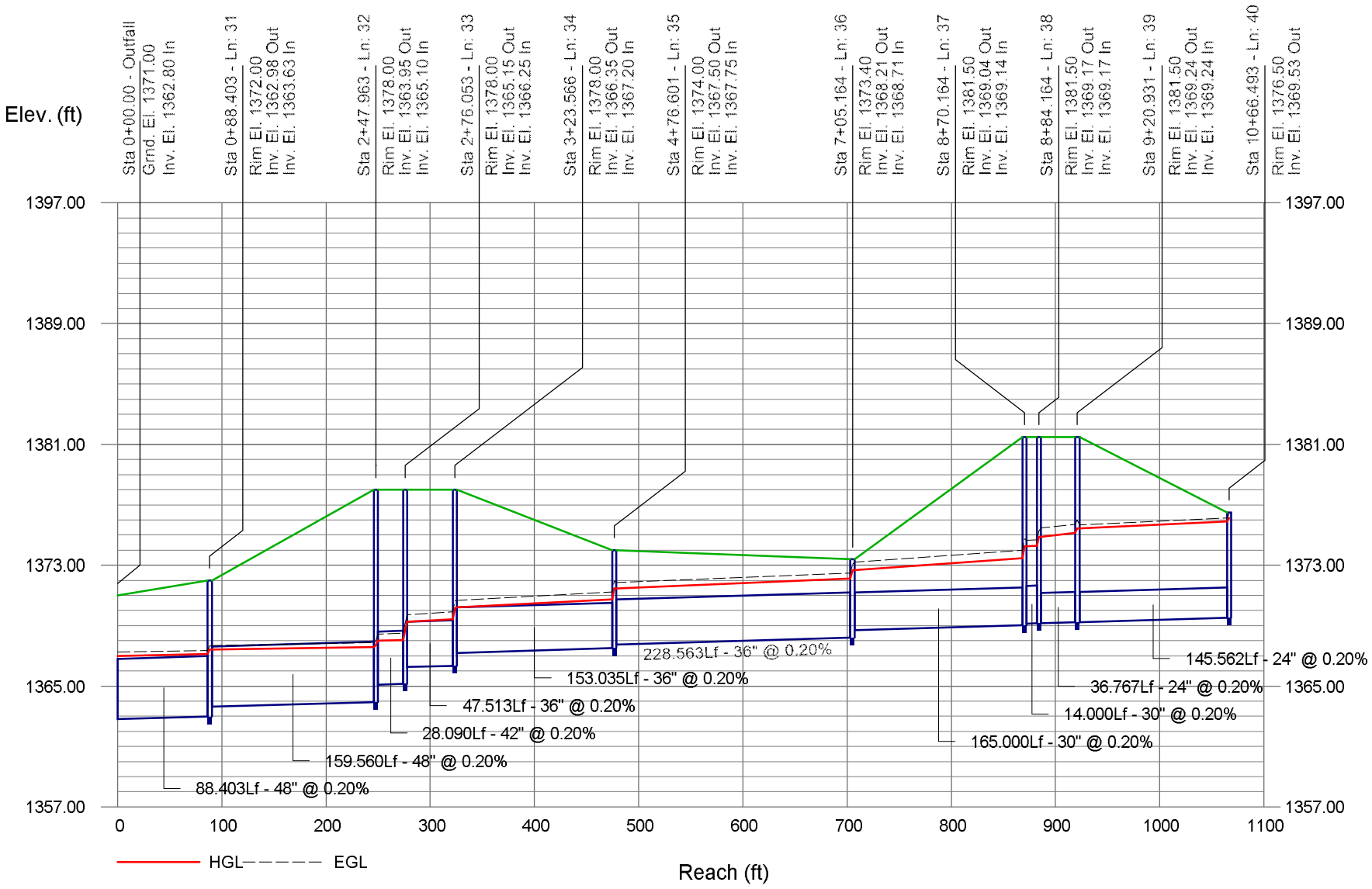

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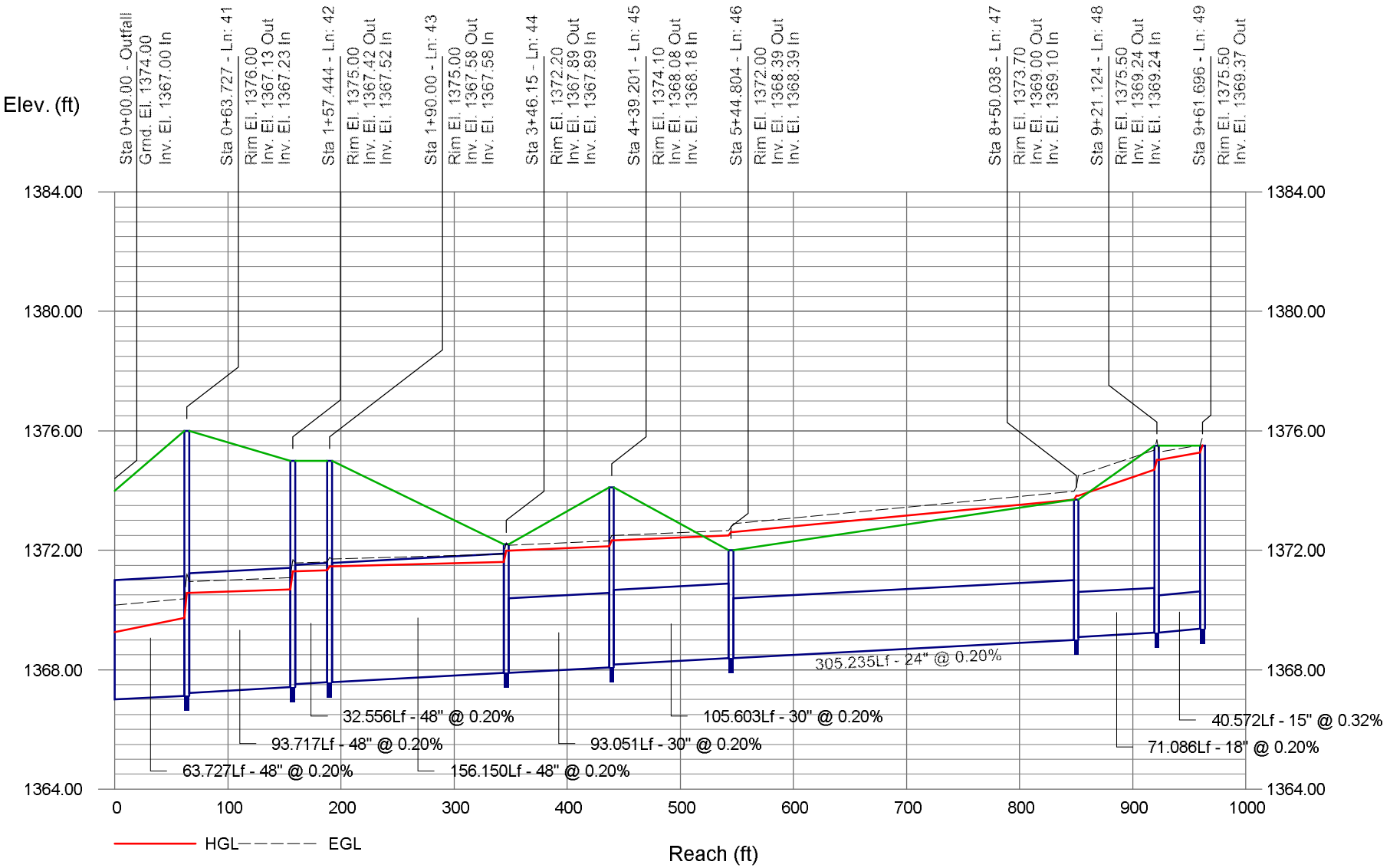

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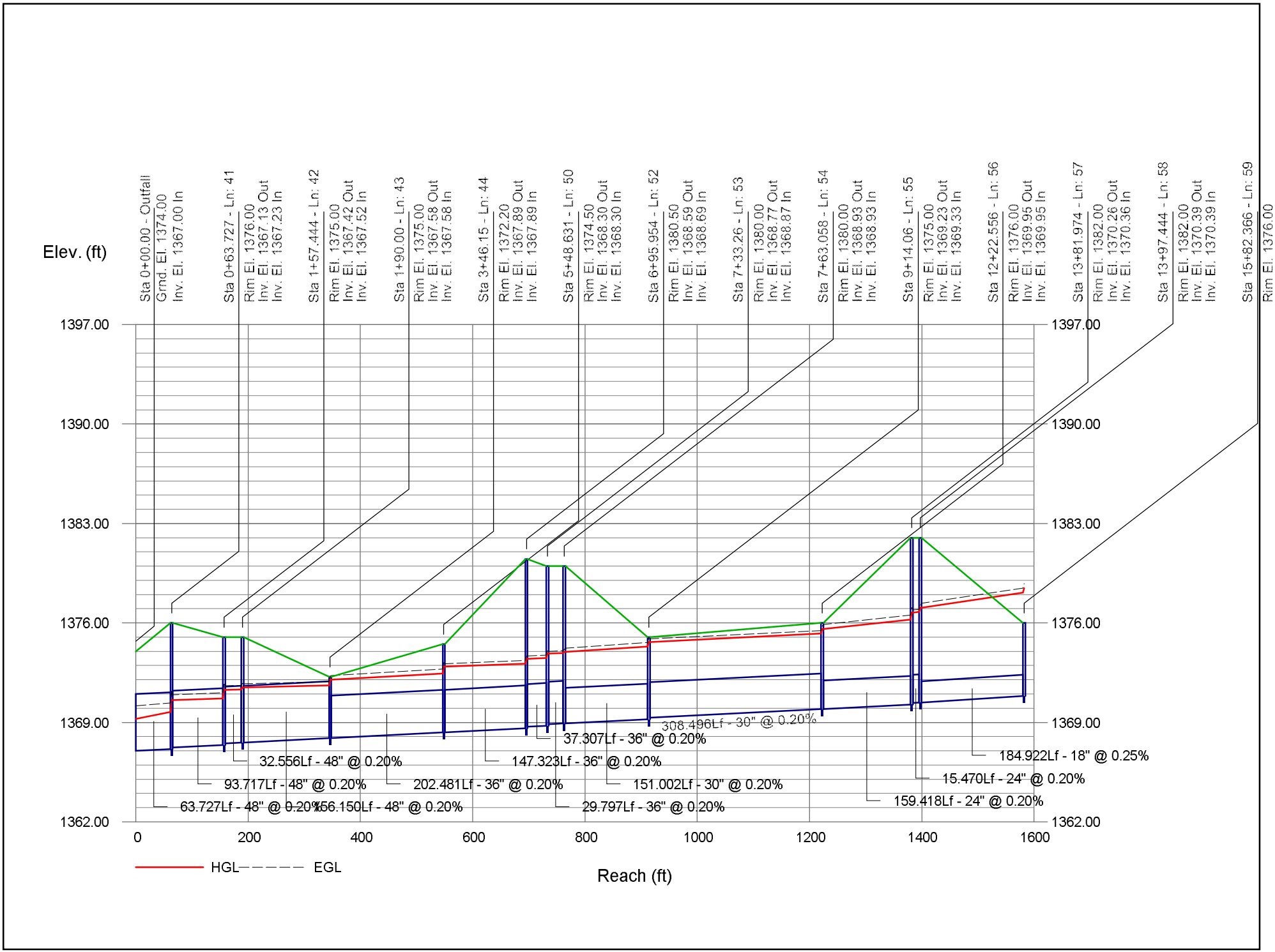

Drainage Plan

1:60 Scale