DRAINAGE PLAN

DODGE ELEMENTARY ADDITION

WICHITA, SEDGWICK COUNTY, KANSAS

PREPARED BY

Baughman
ENGINEERING | SURVEYING | PLANNING
LANDSCAPE ARCHITECTURE

9 November 2009

Project # 09-10-P553

PATRICK SHAWN BAER
LICENSED
16976
11/9/09
KANSAS
PROFESSIONAL ENGINEER

ENGINEERING | SURVEYING | PLANNING
LANDSCAPE ARCHITECTURE

DODGE ELEMENTARY ADDITION

DRAINAGE REPORT

Prepared by Baughman Company, P.A.
23 October, 2009
Revised
9 November, 2009

By Patrick S. Baer, P.E.

REPORT CONTENTS

EXISTING CONDITIONS

This lot is located between First & Second Street and West of Anna, in the City of Wichita, KS. The site is currently three unplatted parcels with an existing school covering approximately 5.19 acres of the 7.18 acre site with the remaining area developed with single family homes. The site is bordered at the southeast and south west with single family residences and along the northwest by park land. The site is fronted by First, Second, and Anna Street.

The entire 7.18 acre tract of land currently allows the drainage to leave the site by surface runoff and limited storm sewer located along Second Street. The existing school site drains into Second Street and Anna, ultimately being routed into a existing 6'x3 RCB located under Second Street. The south 1.99 acres are 5 residential lots (4902, 4906, 4908, 4910, & 4912 West First Street), currently draining to the south as surface runoff and draining into the north curb of First Street.

The peak runoff was calculated using the Rational Method with the following site considerations: soil conditions, percentage of impervious area, surface slope and observed topography. The site drains to the North, East and South as shown on the Drainage Plan with limited ponding as a result of minimal slope on site.

PROPOSED CONDITIONS

The proposed development will remove the residential lots and ultimately the existing school, to allow the development of a new school building and parking area currently developed single family use. The proposed development will increase the impervious area on only the south 1.99 acres adjacent to First Street.

Drainage of the North area will be improved by reducing the runoff directed onto Anna and Second Street and route the runoff into a detention Basin located at the north east corner of the site. The discharge from this detention basin will discharge directly into the existing RCB. The south region of proposed development, (2.06 acres) will route runoff to a proposed dry detention pond located at the southwest corner of the lot. The detention basin will reduce the peak runoff leaving the site and route it to an existing storm sewer inlet located at the northwest corner of Clara and First St. This basin could also drain to the north and route to the existing RCB located in Second Street. Both the RCB in Second Street and the RCP in First Street route to the West and tie together at the corner of Elder and First St.

OFFSITE CONDITIONS

Drainage from the existing site drains into Anna, Second and First Street Right of way. This runoff then enters into a City of Wichita storm sewer system that routes to a pump station located at the south site of Maple Street and The Wichita-Valley Center Floodway. The proposed improvements for this development will not increase the peak discharge routed to this system.

EXISTING CONDITIONS RUNOFF CALCULATIONS

DRAINAGE METHODS

The following methods and standards, although not a complete list, were used in calculating the existing conditions runoff values. The existing conditions have been modeled using the Rational Method with values currently excepted by the City of Wichita Storm Water Drainage Design Manual. Site specific information was determined using USGS Quadrangle Sheet, Aerial Photos, and Site Visits.

- STORM SERIES
  - 2-year, 5-year, 10-year, 25-year, 100-year Storm Events Modeled
  - Time of Concentration (TR55 Method) varies 16-21 min
  - Rainfall Intensity and Runoff Coefficient per City of Wichita Drainage Design Manual.

SITE CHARACTERISTICS

The current site has groups B soil classifications; with impervious cover (buildings & parking lot) shown on the Drainage plan, Existing conditions. The land currently allows the drainage to leave the site by surface runoff and limited storm sewer located along Second Street.

EXISTING CONDITIONS HYDROLOGIC ANALYSIS

The site was analyzed for existing-development conditions using the rational method for the 2, 5, 10, 25 and 100 year storm events. The runoff coefficients were calculated for the existing soil conditions and percentage of impervious area for existing conditions. The time of concentration has been calculated using the TR-55 Method and known site conditions, per city of Wichita design requirements. Below is a table with the peak discharge calculated for the northeast corner of this parcel, Adjacent residential properties do not definitively show drainage onto this site. For this reason and minimal size of these areas, offsite drainage onto this site has been omitted.

Rational Method Factors:

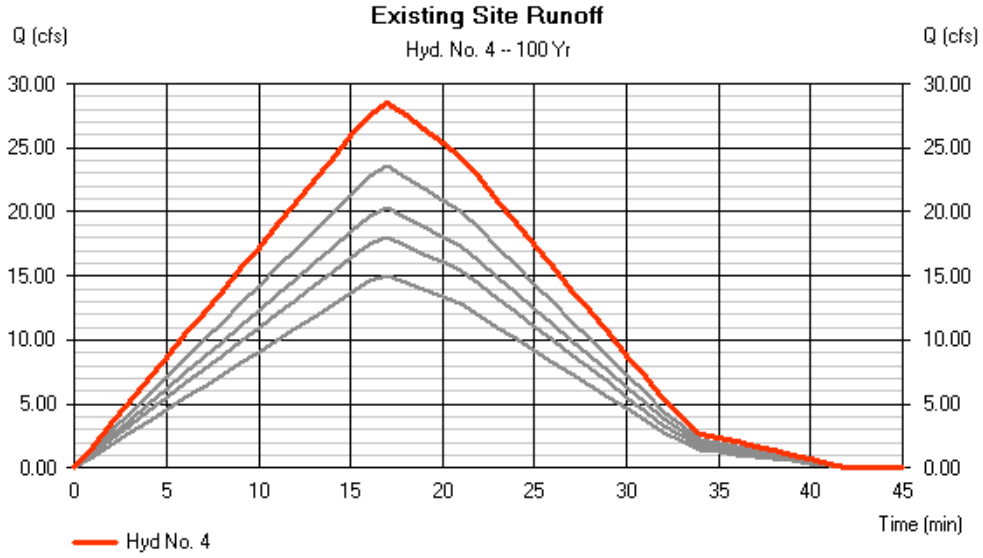
Basin #	Area (acres)	Tc (min)	Runoff Coeff.	I_2	I_5	I_{10}	I_{25}	I_{100}
				(Inches / Hour)				
1	3.70	17	0.66	3.67	4.40	4.94	5.73	6.95
3	1.33	21	0.52	3.30	3.98	4.49	5.23	6.36
2	2.15	16	0.66	3.78	4.52	5.07	5.88	7.12

Calculated Peak Runoff

Basin #	Area (acres)	Tc (min)	Q_2 (cfs)	Q_5 (cfs)	Q_{10} (cfs)	Q_{25} (cfs)	Q_{100} (cfs)
1	3.70	17.00	8.97	10.75	12.07	14.00	16.97
2	2.15	16.00	3.32	3.97	4.45	5.16	6.25
3	1.33	21.00	3.67	4.43	5.00	5.82	7.08
Total Site =	7.18	Q*	15.05	18.06	20.29	23.54	28.56

(Q*) See Hydraflow Report for table and report.

Runoff vs. Time Plot



DOWNSTREAM DRAINAGE CAPACITY

Basin 1 drains into a 72" RCB in Second Street, Basin 2 Drains in the north gutter in First Street and Basin 3 drains into the west gutter of Anna. From these Gutter and storm sewer locations, this runoff then enters into a City of Wichita storm sewer system that routes to a pump station located at the south site of Maple Street and The Wichita-Valley Center Floodway. This region has had past drainage problems overloading the existing storm sewer system.

POST-DEVELOPMENT HYDROLOGIC ANALYSIS

DRAINAGE METHODS & STANDARDS

The Rational method was used to calculate the peak runoff values. The detention basin calculations were accomplished with Hydraflow and standard detention basin construction techniques were used to develop the minimum detention basin design requirements and grading plan. Runoff is divided into two basins. Basin 1 will route runoff north into the existing City of Wichita storm sewer system, Basin 2 will route to the south into First Street. Detention basins will be necessary to limit peak runoff from the site. These detention basins will be located within Drainage Easements with Basin1 discharging directly into the RCB in Second Street and Basin 2 routing to an existing storm sewer inlet located at the northeast corner of 1st and Clara. Site runoff draining into Anna will be routed into the Detention Basin located in Basin 1. Time of Concentration has been revised to 15 minutes; to account for the use of new storm sewer systems on site.

- STORM SERIES & DATA
  - 2-year, 5-year, 10-year, 25-year, 100-year Storm Events Modeled
  - Time of Concentration (COW Std. Minimum) 15 min
  - 2-yr Rainfall Depth = 3.83 in
  - 5-yr Rainfall Depth = 4.54 in
  - 10-yr Rainfall Depth = 5.22 in
  - 25-yr Rainfall Depth = 6.06 in
  - 100-yr Rainfall Depth = 7.37 in
  - Runoff Coefficient: 0.66
  - Areas per USGS Quadrangle Sheet, Aerial Photos, and Site Visits

- GRADING CONSTRAINTS
  - Minimum 0.5% Street & Pavement Grades
  - Minimum 1.0% Rear Lot Grades, Goal of 1.5%
  - Curb Inlets utilized at all street sump locations
  - Emergency Overflows for 24-hr, 100-yr Storm Event

DETENTION FACILITIES

BASIN 1

In Basin 1, runoff will be improved by the reducing runoff entering Second Street & Anna and routing this runoff to a drainage basin. This will improve downstream conditions and eliminate an increase in peak runoff rates. See Appendix C for Drainage Basin complete calculations.

- DETENTION BASIN SIZE REQUIREMENTS

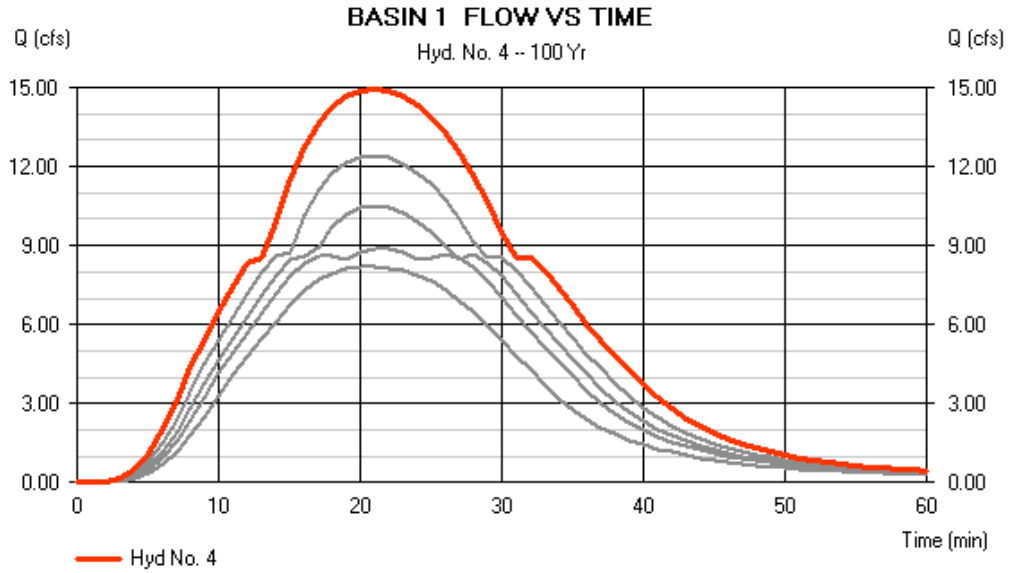
Elev.	Contour Area	Incremental Storage	Total Storage	Discharge Rate.
1303	2,116	0	0	0
1304	2,916	2,505	2,505	4.23
1305	3,845	3,369	5,875	8.44
1306	4,900	4,361	10,236	16.15
1307	6,100	5,481	15,717	21.23

- OUTLETS: 24" RCP

- DETENTION BASIN / TOTAL PEAK DISCHARGE

	Q_2 (cfs)	Q_5 (cfs)	Q_{10} (cfs)	Q_{25} (cfs)	Q_{100} (cfs)
Peak Inflow	13.17	15.71	17.61	20.37	24.65
Peak Discharge	**8.19**	**8.89**	**10.51**	**12.40**	**14.95**

- DETENTION BASIN DISCHARGE GRAPH
  See Appendix C for complete Hydraflow calculations.



BASIN 2

Basin 2 will be improved by reducing the peak runoff offsite and routing the runoff to the existing storm sewer system. See Appendix C for Drainage Basin complete calculations.

- DETENTION BASIN REQUIREMENTS

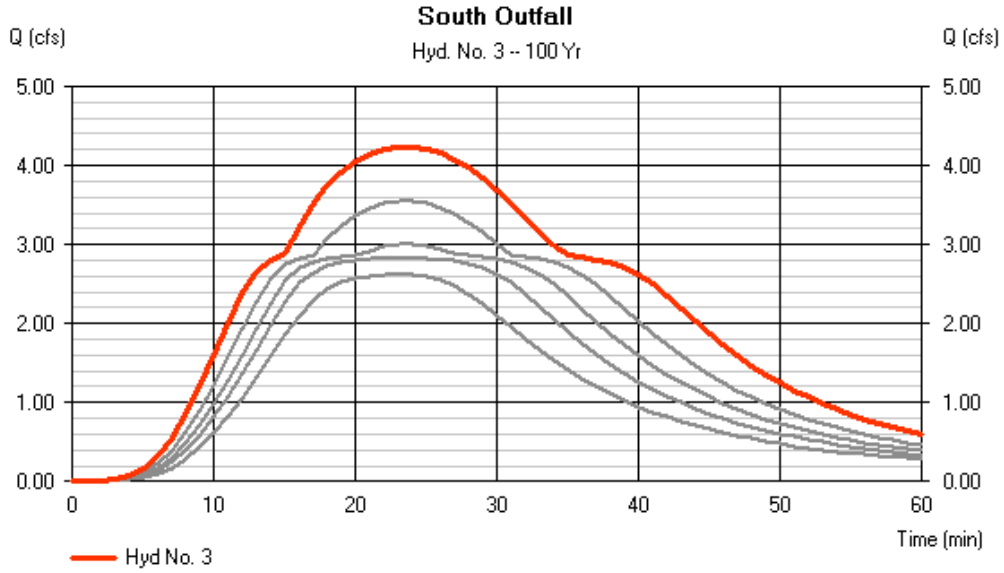
Elev.	Contour Area	Incremental Storage	Total Storage	Discharge Rate.
1304	2,116	0	0	0
1305	2,916	2,505	2,505	2.536
1306	3,845	3,369	5,875	4.693
1307	4,900	4,361	10,236	6.449

- OUTLETS: 15" RCP

- DETENTION BASIN / TOTAL PEAK DISCHARGE

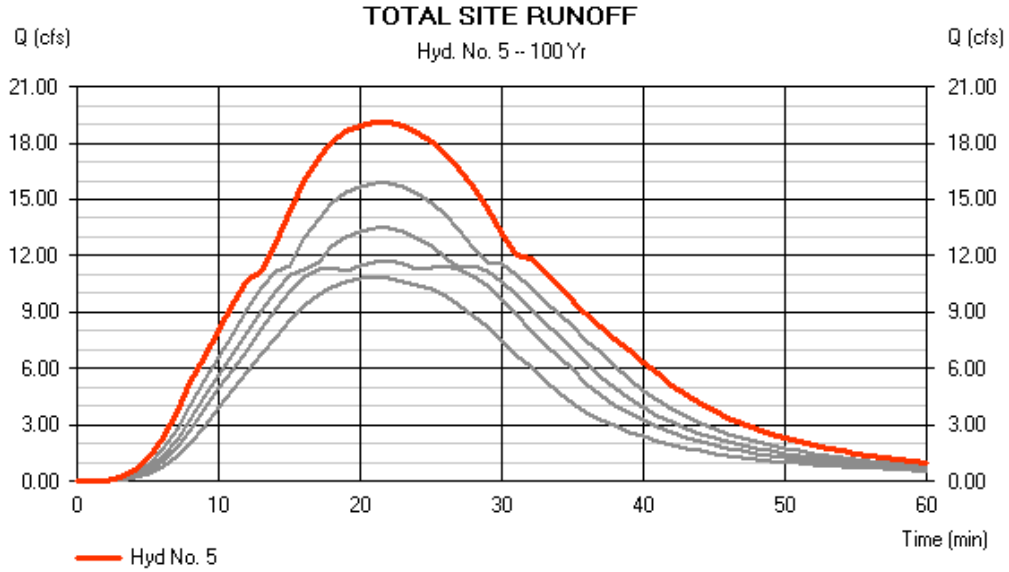
	Q_2 (cfs)	Q_5 (cfs)	Q_{10} (cfs)	Q_{25} (cfs)	Q_{100} (cfs)
Peak Inflow	5.30	6.32	7.08	8.20	9.92
Peak Discharge	**2.62**	**2.83**	**3.02**	**3.50**	**4.23**

- DETENTION BASIN DISCHARGE GRAPH
  See Appendix C for complete Hydraflow calculations.



CUMMULATIVE OUTFALL GRAPH

The proposed site improvements will reduce the peak discharge rate by an average of 69%.



DISCHARGE POINTS SUMMARY

The proposed development of this site will route runoff directly to the existing City of Wichita storm sewer system, located in First & Second Street. This will improve the Drainage conditions in Anna, First and Second Street. The detention basins will ensure the peak discharge does not increase from the existing conditions. The downstream sewer system routes to a pump station located at the south site of Maple Street and The Wichita-Valley Center Floodway. The proposed improvements for this development will not increase the peak discharge routed to this system. A new Storm sewer system has been installed to the intersection of Second Street and West, approximately one half a mile east of this location. Future expansion of this new system may be completed to enhance existing flooding conditions.

POTENTIAL UPSTREAM/DOWNSTREAM IMPACTS

There do not appear to be any significant impacts downstream of this site due to development.

SOURCE OF FLOODPLAIN INFORMATION

The site is not located within a mapped FEMA SFHA. The location of the property, on FEMA FIRM Panel 345 of 700, map 20173 C, is attached as Exhibit 5 (for Sedgwick County, Kansas; effective February 2, 2007).

FEDERAL, STATE, & LOCAL PERMITTING

US ARMY CORPS OF ENGINEERS

There does not appear to be any USACOE permitting needed on the proposed site at this time.

KANSAS DEPT OF AGRICULTURE – DWR PERMITTING

There does not appear to be any DWR permitting needed on the proposed site at this time.

FEMA

There is no mapped floodplain located upon the proposed site. Therefore, no FEMA permitting is expected at this time.

KANSAS DEPT OF TRANSPORTATION

There does not appear to be any KDOT permitting needed on the proposed project.

SEDGWICK COUNTY PERMITTING

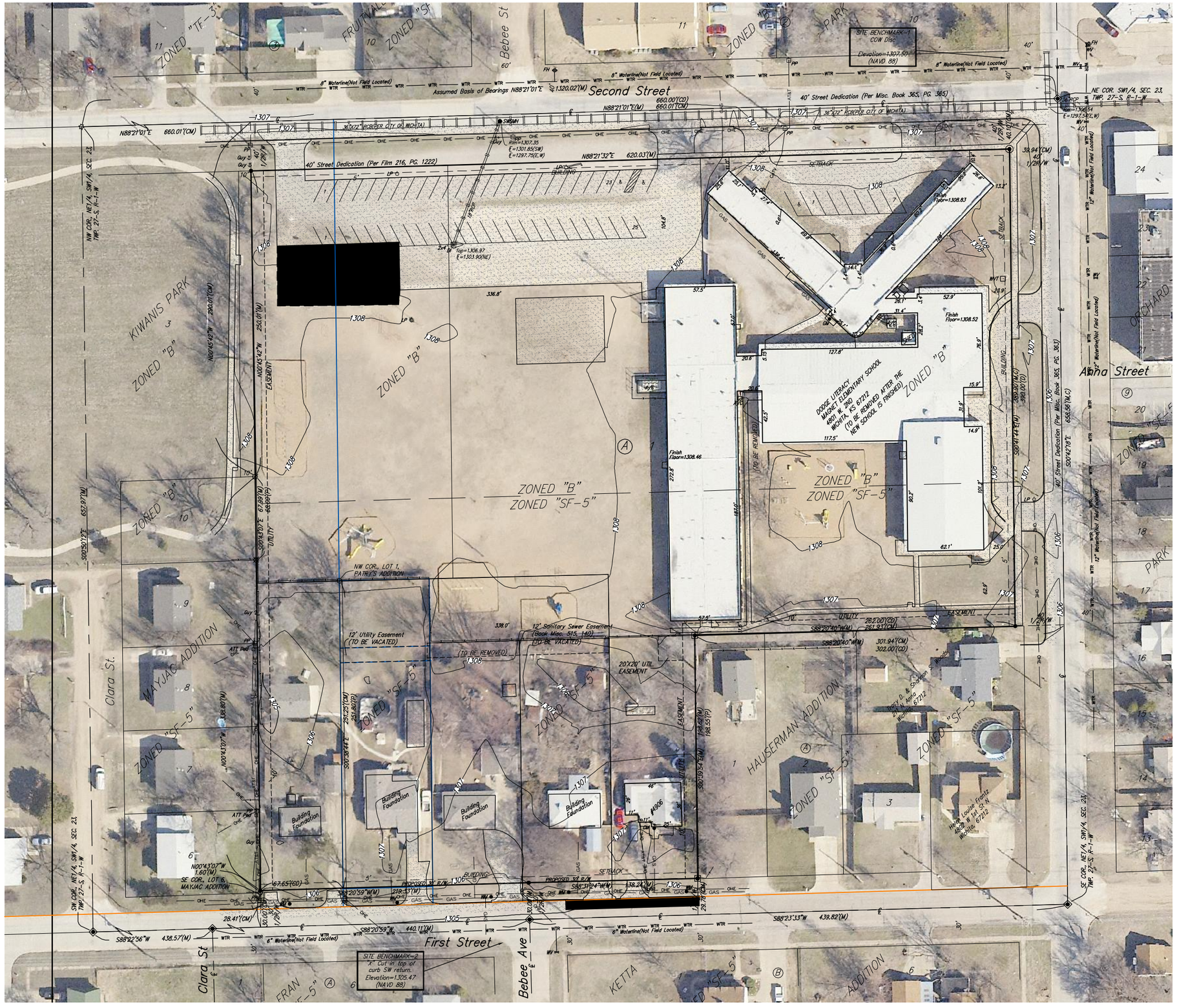
No portion of the site will discharge into Woodlawn Street ROW and will therefore not require a county ROW Permit.

EXHIBIT 1: Aerial Photo Exhibit with Topography

EXHIBIT 2: Plat – Half Scale

EXHIBIT 3: Drainage & Grading Plan – Half Scale

EXHIBIT 4: FIRMETTE



[redacted]

[redacted]

0 40 80

DATE OF PREPARATION: 26 OCTOBER 2009
DATE OF TOPOGRAPHY: 15 OCTOBER 2009
CONTOUR INTERVALS = 1 FOOT

OWNER:
UNIFIED SCHOOL DISTRICT 259
201 N. WATER
WICHITA, KS 67202
316-973-4000

· = #4 REBAR W/ "BAUGHMAN" CAP (SET)
• = 1" IRON (FOUND)
· = 3/4" IRON IN THIMBLE (FOUND)
• = BOLT IN THIMBLE (FOUND)
· = #5 REBAR W/ "ACLS" CAP (FOUND)
· = 3/4" IRON (FOUND)
· = 1/2" IRON (FOUND)
· = #4 REBAR (FOUND)

(M) = MEASURED
(D) = DESCRIBED
(P) = PLATTED
(C) = CALCULATED
(CP) = CALCULATED PER PLATTED INFO.
(CD) = CALCULATED PER DESCRIBED
(CM) = CALCULATED PER MEASURED
ACP ○ = A/C Post
CO ○ = Cleanout
CP ○ = Cable TV Pedestal
DI ⊠ = Drop Inlet
EB ▭ = Electric Box
FH = Fire Hydrant
GM ● = Gas Meter
GU ▫ = Guard Post(Bollard)
Guy = Guy Anchor
GV ● = Gas Valve
LP = Light Pole
MB = Mail Box
FP ○ = Flag Pole
PP ⊡ = Power Pole
Sign = Sign
SSMH ● = Sanitary Sewer Manhole
ATT Ped ⊡ = ATT Pedestal
SWSMH ● = Stormwater Sewer Manhole
TR = Tree
WM ● = Water Meter
WV ⋈ = Water Valve
WVT ⊡ = Water Vault
XFMR ⊡ = Transformer

STORM SEWER
WATER LINE — WTR — WTR — WTR — WTR —
SOUTHWESTERN BELL — AT&T — AT&T —
GAS LINE — GAS — GAS — GAS — GAS —
CABLE TV — CaTV — CaTV — CaTV — CaTV —
FENCE —x—x—x—
OVERHEAD ELECTRIC LINE — OHE — OHE — OHE — OHE —
SANITARY SEWER — EXSS — EXSS — EXSS — EXSS —
UNDERGROUND ELECTRIC LINE — UGE — UGE — UGE — UGE —

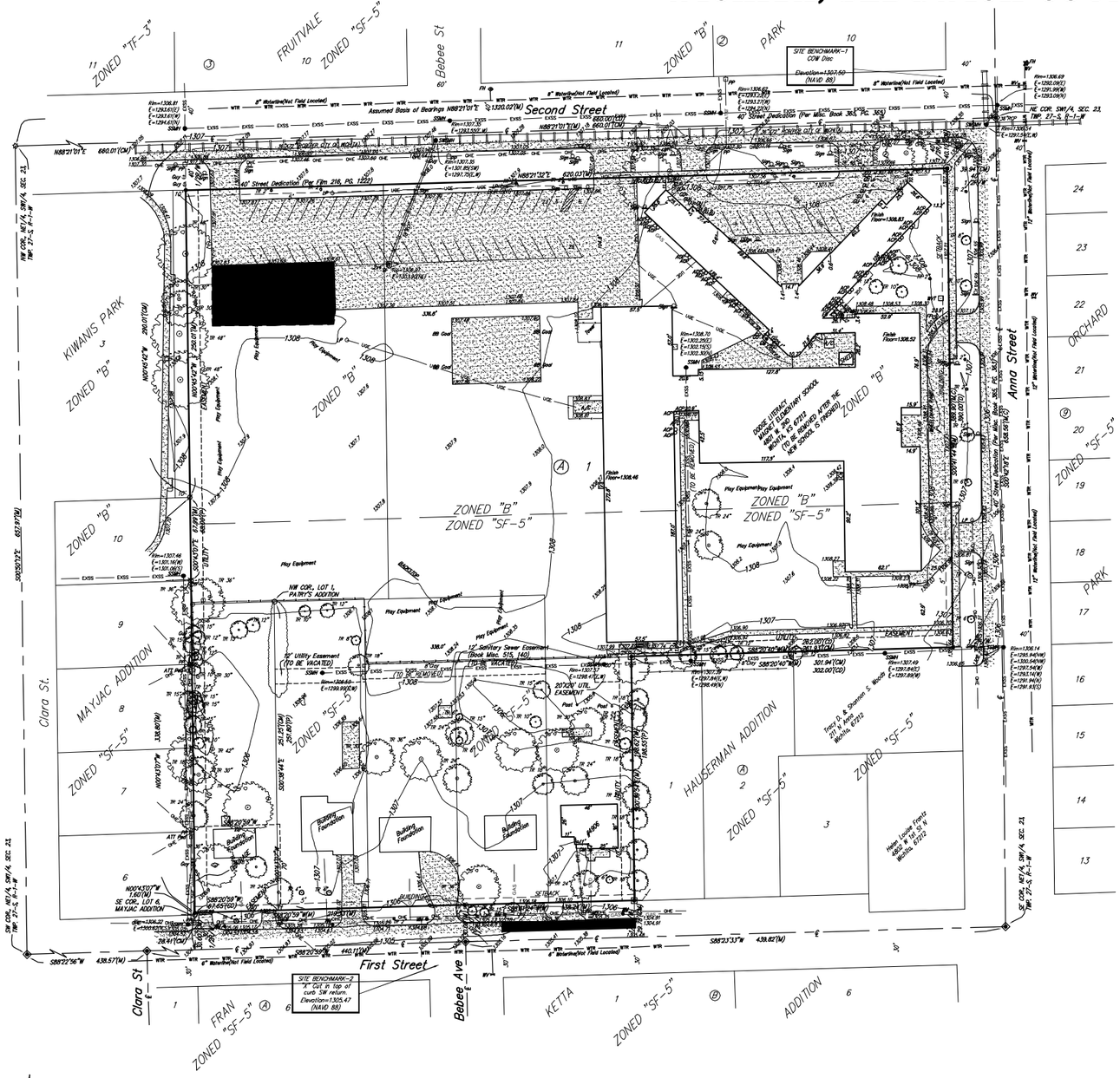
VICINITY MAP
SEC. 23, T27S, R1W

Aerial Phot Exhibit & Topography

DODGE ELEMENTARY SCHOOL ADDITION

25 October 2009

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



ONE-STEP FINAL PLAT

DODGE ELEMENTARY ADDITION

WICHITA, SEDGWICK COUNTY, KANSAS

0 50 100

DATE OF PREPARATION: 26 OCTOBER 2009
DATE OF TOPOGRAPHY: 15 OCTOBER 2009
CONTOUR INTERVALS = 1 FOOT

OWNER:
UNIFIED SCHOOL DISTRICT 259
201 N. WATER
WICHITA, KS 67202
316-973-4000

- ● = #4 REBAR W/ "BAUGHMAN" CAP (SET)
- ⊠ = 1" IRON (FOUND)
- ◈ = 3/4" IRON IN THIMBLE (FOUND)
- ☼ = BOLT IN THIMBLE (FOUND)
- ▣ = #5 REBAR W/ "ACLS" CAP (FOUND)
- Ø = 3/4" IRON (FOUND)
- ○ = 1/2" IRON (FOUND)
- ◉ = #4 REBAR (FOUND)

(M) = MEASURED
(D) = DESCRIBED
(P) = PLATTED
(C) = CALCULATED
(CP) = CALCULATED PER PLATTED INFO.
(CD) = CALCULATED PER DESCRIBED
(CM) = CALCULATED PER MEASURED

STORM SEWER
— WTR — WATER LINE
— AT&T — SOUTHWESTERN BELL
— GAS — GAS LINE
— CaTV — CABLE TV
—x—x— FENCE
— OHE — OVERHEAD ELECTRIC LINE
— EXSS — SANITARY SEWER
— UGE — UNDERGROUND ELECTRIC LINE

- ACP ○ = A/C Post
- CO ○ = Cleanout
- CP ○ = Cable TV Pedestal
- DI ⊠ = Drop Inlet
- EB □ = Electric Box
- FH ● = Fire Hydrant
- GM ● = Gas Meter
- GU ○ = Guard Post(Bollard)
- Guy ⚓ = Guy Anchor
- GV ● = Gas Valve
- LP ○ = Light Pole
- MB ▬ = Mail Box
- FP ○ = Flag Pole
- PP □ = Power Pole
- Sign = Sign
- SSMH ● = Sanitary Sewer Manhole
- ATT Ped □ = ATT Pedestal
- SWSMH ● = Stormwater Sewer Manhole
- TR = Tree
- WM ● = Water Meter
- WV = Water Valve
- WVT ▣ = Water Vault
- XFMR □ = Transformer

VICINITY MAP
SEC. 23, T27S, R1W

State of Kansas)
Sedgwick County) SS

We, Baughman Company, P.A., Surveyors in aforesaid county and state do hereby certify that we have surveyed and platted "DODGE ELEMENTARY ADDITION", Wichita, Sedgwick County, Kansas and that the accompanying plat is a true and correct exhibit of the property surveyed, described as A tract beginning at a point 660 feet west and 643.5 feet south of the Northeast corner of the Southwest Quarter of Section 23, Township 27 South, Range 1 West of the Sixth Principal Meridian, Sedgwick County, Kansas; thence north 266.5 feet; thence east 70 feet; thence south 266.5 feet; thence west 70 feet to the point of beginning, EXCEPT that part platted as Patry's Addition to Wichita, Kansas, Sedgwick County, Kansas, AND EXCEPT the south 14.7 feet thereof dedicated for street purposes, together with Lot 1, Patry's Addition to Wichita, Kansas, Sedgwick County, Kansas, together with beginning 430 feet south and 445.33 feet west of the Northeast corner of the Northeast Quarter of the Southwest Quarter of Section 23, Township 27 South, Range 1 West of the Sixth Principal Meridian, Sedgwick County, Kansas; thence south 213.5 feet to the North line of Academy Avenue, now 1st Street; thence west 73.33 feet; thence north, parallel to the West line of said Northeast Quarter of Northeast Quarter of Southwest Quarter, 213.5 feet; thence east 73.33 feet to the point of beginning, EXCEPT the south 14.7 feet thereof dedicated for street purposes, TOGETHER WITH a tract of land described as beginning at a point 430 feet South and 372 feet West of the Northeast Corner of the Northeast Quarter of the Northeast Quarter of the Southwest Quarter of Section 23, Township 27 South, Range 1 West of the 6th P.M., Sedgwick County, Kansas; thence south 213.5 feet to the North line of Academy Avenue, now First Street; thence West 73.33 feet; thence North parallel to the West line of said Northeast Quarter of the Northeast Quarter of the Southwest Quarter a distance of 213.5 feet; thence East 73.33. feet to the point of beginning, except the South 14.8 feet for First Street, TOGETHER WITH a tract in the Northeast Quarter of the Northeast Quarter of the Southwest Quarter of Section 23, Township 27 South, Range 1 West of the Sixth Principal Meridian, Sedgwick County, Kansas, described as follows: Beginning at a point 430 feet south and 302 feet west of the Northeast corner of said Southwest Quarter; thence south parallel with the East line of said Southwest Quarter, a distance of 213.5 feet to the North line of Academy Avenue, now First Street; thence west along the North line of said street, a distance of 70 feet; thence north parallel with the East line of said Southwest Quarter, a distance of 213.5 feet; thence east 70 feet to the place of beginning, TOGETHER WITH a tract of land in the Northeast Quarter of the Northeast Quarter of the Southwest Quarter of Section 23, Township 27 South, Range 1 West of the Sixth Principal Meridian, Sedgwick County, Kansas, described as beginning 375 feet south and 372 feet west of the Northeast corner of said Southwest Quarter; thence south, parallel with the East line of said Northeast Quarter of the Southwest Quarter, 55 feet; thence west, parallel with the North line of said Northeast Quarter of the Southwest Quarter, 146.66 feet; thence north, parallel with the West line of the Northeast Quarter of the Northeast Quarter of the Southwest Quarter, 53 feet; thence east 19.66 feet; thence north 2 feet; thence east 127 feet to the place of beginning, TOGETHER WITH a tract of land in the Southwest Quarter of Section 23, Township 27 South, Range 1 West of the Sixth Principal Meridian, Sedgwick County, Kansas, described as follows: Beginning at a point 330 feet west of the Northeast corner of the Southwest Quarter of Section 23, Township 27 South, Range 1 West of the Sixth Principal Meridian, Sedgwick County, Kansas; thence south 375 feet; thence west 169 feet; thence north 375 feet; thence east 169 feet to the place of beginning; TOGETHER WITH a tract of land described as beginning at the Northeast corner of the Southwest Quarter of Section 23, Township 27 South, Range 1 West of the Sixth Principal Meridian, Sedgwick County, Kansas; thence west 20 rods; thence south 12 rods; thence east 20 rods; thence north 12 rods to the place of beginning; TOGETHER WITH a tract of land described as beginning at a point 12 rods south of the Northeast corner of the Southwest Quarter of Section 23, Township 27 South, Range 1 West of the Sixth Principal Meridian, Sedgwick County, Kansas; thence west 20 rods; thence south 8 rods; thence east 20 rods; thence north to the place of beginning; TOGETHER WITH a tract of land described as beginning 330 feet south of the Northeast corner of the Southwest Quarter of Section 23, Township 27 South, Range 1 West of the Sixth Principal Meridian, Sedgwick County, Kansas; thence south 100 feet; thence west 165 feet; thence north 100 feet; thence east 165 feet to the place of beginning; TOGETHER WITH a tract of land described as beginning at a point 330 feet south and 170 feet of the Northeast corner of the Southwest Quarter of Section 23, Township 27 South, Range 1 West of the Sixth Principal Meridian, Sedgwick County, Kansas; thence west 132 feet; thence south 100 feet; thence east 132 feet; thence north 100 feet to the place of beginning; TOGETHER WITH a tract of land described as beginning at a point 330 feet south and 302 feet west of the Northeast corner of the Southwest Quarter of Section 23, Township 27 South, Range 1 West of the Sixth Principal Meridian, Sedgwick County, Kansas; thence west 28 feet; thence south 100 feet; thence east 28 feet; thence north 100 feet to the place of beginning, TOGETHER WITH a tract of land described as beginning 499 feet west of the Northeast corner of the Southwest Quarter of Section 23, Township 27 South, Range 1 West of the Sixth Principal Meridian, Sedgwick County, Kansas; thence south, parallel with the East line of said Southwest Quarter, 377 feet; thence west, parallel to the North line of said Southwest Quarter, 160.6 feet, more or less, to the West line of the Northeast Quarter of the Northeast Quarter of the Southwest Quarter; thence north on the West line of said Northeast Quarter of the Northeast Quarter of the Southwest Quarter, 377 feet to the North line of said Southwest Quarter; thence east 160.87, more or less, to the place of beginning.

Existing public easements and dedications
being vacated by virtue of K.S.A. 12-512(b).

Baughman Company, P.A.

____________________, Surveyor
Michael G. Conrey

This plat of "DODGE ELEMENTARY 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 ____________, 2009.
Wichita-Sedgwick County Metropolitan Area Planning Commission

____________________, Chair
G. Nelson Van Fleet

____________________, Secretary
John L. Schlegel

This plat approved and all dedications shown hereon accepted by the City Council of the City of Wichita, Kansas, this _____ day of ____________, 2009.

____________________, Mayor
Carl Brewer

____________________, City Clerk
Karen Sublett

Reviewed in accordance with K.S.A. 58-2005 on this ______ day of __________, 2009.

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

Entered on transfer record this ______ day of __________ , 2009.

____________________, 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 __________, 2009 at _____ o'clock ___M; and is duly recorded.

____________________, Register of Deeds
Bill Meek

____________________, Deputy
Tonya Buckingham

Know all men by these presents that we, the undersigned, have caused the land in the surveyors certificate to be platted into a Lot and a Block, to be known as "DODGE ELEMENTARY ADDITION", Wichita, Sedgwick County, Kansas. The utility easements 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. The drainage easements are hereby granted as indicated for drainage purposes. The streets are hereby dedicated to and for the use of the public. Access controls shall be as depicted on the face of the plat and are hereby granted to the City of Wichita, Kansas. The permitted opening locations shall be as determined by the City Engineer of 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.

Unified School District 259

____________________, President
Barbara Fuller

State of Kansas)
Sedgwick County) SS

The foregoing instrument acknowledged before me, this _____ day of __________, 2009, by Barbara Fuller, President of Unified School District 259, on behalf of the Unified School District 259.

____________________ Notary Public

My App't. Exp. ________

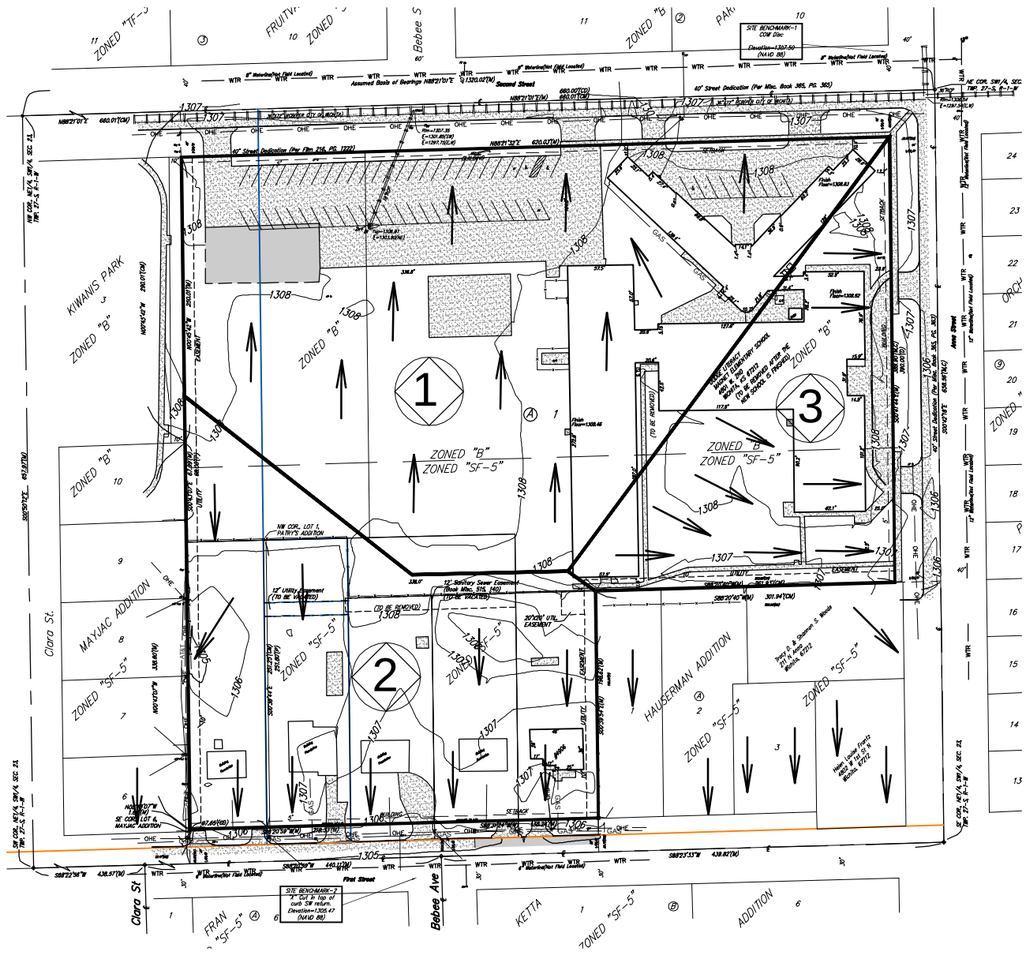
DODGE ELEMENTARY ADDITION
23 OCTOBER 2009

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

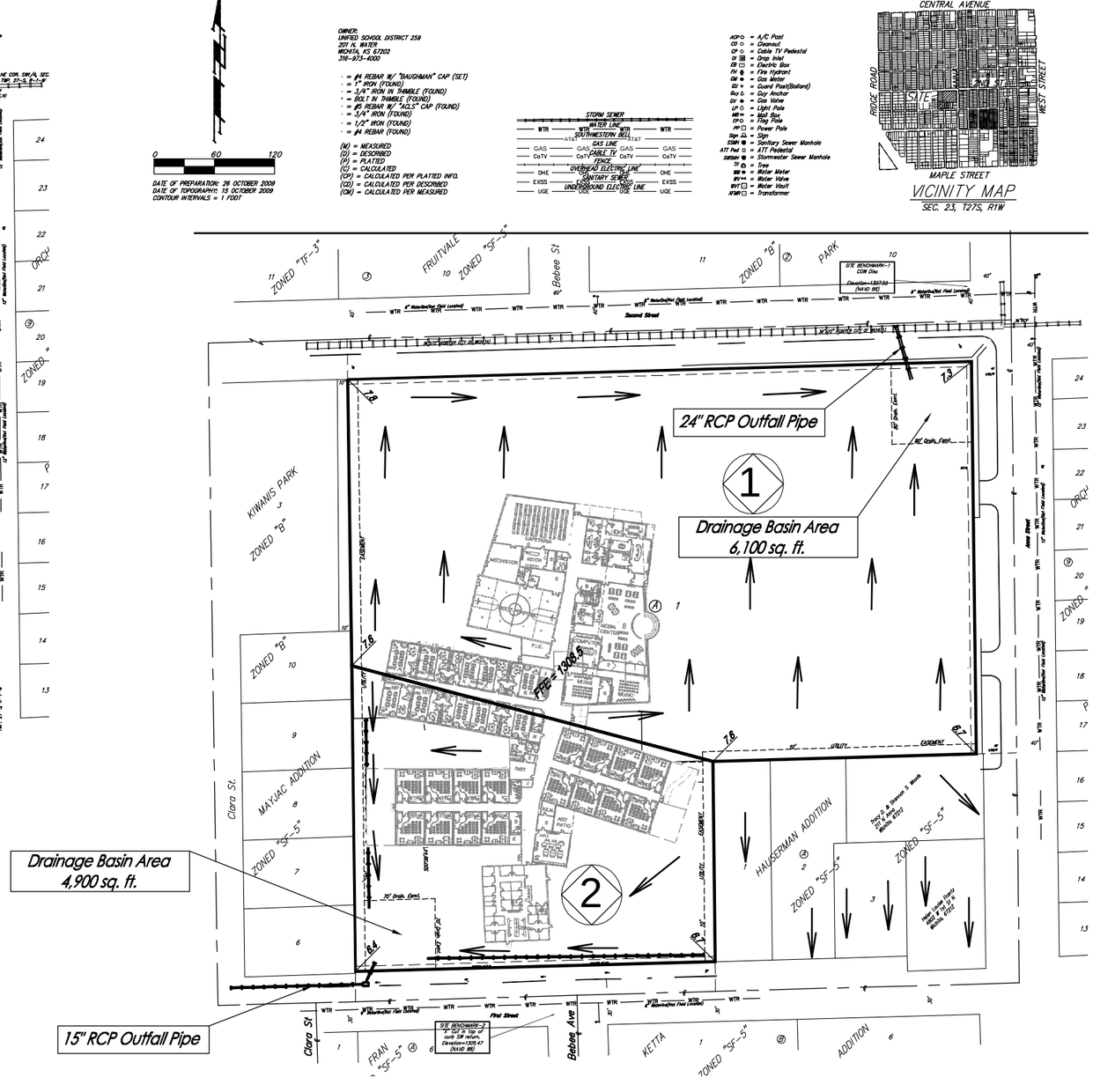
DRAINAGE & GRADING PLAN

DODGE ELEMENTARY ADDITION

WICHITA, SEDGWICK COUNTY, KANSAS



Existing Conditions



Proposed Conditions

OWNER:
UNIFIED SCHOOL DISTRICT 259
201 N. WATER
WICHITA, KS 67202
316-973-4000

- = #4 REBAR W/ "RAUSHMAN" CAP (SET)
- = 1" IRON (FOUND)
- = 1/4" IRON IN THIMBLE (FOUND)
- = BOLT IN THIMBLE (FOUND)
- = #5 REBAR W/ "ALS" CAP (FOUND)
- = 1/4" IRON (FOUND)
- = 1/2" IRON (FOUND)
- = #4 REBAR (FOUND)

(M) = MEASURED
(D) = DESCRIBED
(P) = PLATTED
(C) = CALCULATED
(CP) = CALCULATED PER PLATTED INFO.
(CD) = CALCULATED PER DESCRIBED
(CM) = CALCULATED PER MEASURED

0 60 120

DATE OF PREPARATION: 26 OCTOBER 2009
DATE OF TOPOGRAPHY: 15 OCTOBER 2009
CONTOUR INTERVALS = 1 FOOT

STORM SEWER
WATER LINE
SOUTHWESTERN BELL
GAS LINE
CABLE TV
FENCE
OVERHEAD ELECTRIC LINE
SANITARY SEWER
UNDERGROUND ELECTRIC LINE

AC/P = A/C Post
CO = Cleanout
CP = Cable TV Pedestal
DI = Drop Inlet
EB = Electric Box
FH = Fire Hydrant
GM = Gas Meter
GU = Guard Post(Bollard)
Guy = Guy Anchor
GV = Gas Valve
LP = Light Pole
MB = Mail Box
FP = Flag Pole
PP = Power Pole
Sign = Sign
SSMH = Sanitary Sewer Manhole
ATT Ped = ATT Pedestal
SWSMH = Stormwater Sewer Manhole
TP = Tree
WM = Water Meter
WV = Water Valve
WVT = Water Vault
XFMR = Transformer

VICINITY MAP
SEC. 23, T27S, R1W

NOTE: This site lies within Zone X based on FEMA FIRM panel 345 of 700 for Community Kit #20173C for Sedgwick County, Kansas, effective February 2, 2007. Zone X area areas of 0.2% annual chance flood; areas of 1% annual chance flood with aveage de3pths of less than 1 foot or with drainage areas left than 1 square mile; and areas protected by levees from 1% annual chance flood.

Detention basin will be required for basins 1 and 2 for development of this site.

Proposed Basin 1 design: A RCB is located in 2nd street, allowing a 24" RCP to be installed to a detention basin. This basin is to be located at the Northeast corner of the site. The basin will need to be 4 feet deep with 4:1 side slopes and High edge surface area of 6,100sq. ft. See Hydraflow report for calculations.

Proposed Basin 2 design: A curb inlet is located at the Northeast corner of Clair & First Street, allowing a 15" RCP to be installed to a detention basin to be located at the Southwest corner of the site. The basin will need to be 3 feet deep with 4:1 side slopes and High edge surface area of 4900sq. ft. See Hydraflow report for calculations.

Existing Conditions
Existing School and Residencial Lots

Basin #	Area (acres)	Tc (min)	Q_2 (cfs)	Q_5 (cfs)	Q_{10} (cfs)	Q_{25} (cfs)	Q_{100} (cfs)
1	3.70	17.00	8.97	10.75	12.07	14.00	16.97
2	2.15	16.00	3.32	3.97	4.45	5.16	6.25
3	1.33	21.00	3.67	4.43	5.00	5.82	7.08
Total Site =	7.18	Q*	15.05	18.06	20.29	23.54	28.56

(Q*) See Hydraflow Report for table and report.

Proposed Conditions
School Only

Basin #	Q_2 (cfs)	Q_5 (cfs)	Q_{10} (cfs)	Q_{25} (cfs)	Q_{100} (cfs)
1	8.19	8.89	10.51	12.40	14.95
2	2.62	2.83	3.02	3.50	4.23
Total =	**10.81**	**11.72**	**13.53**	**15.90**	**19.18**

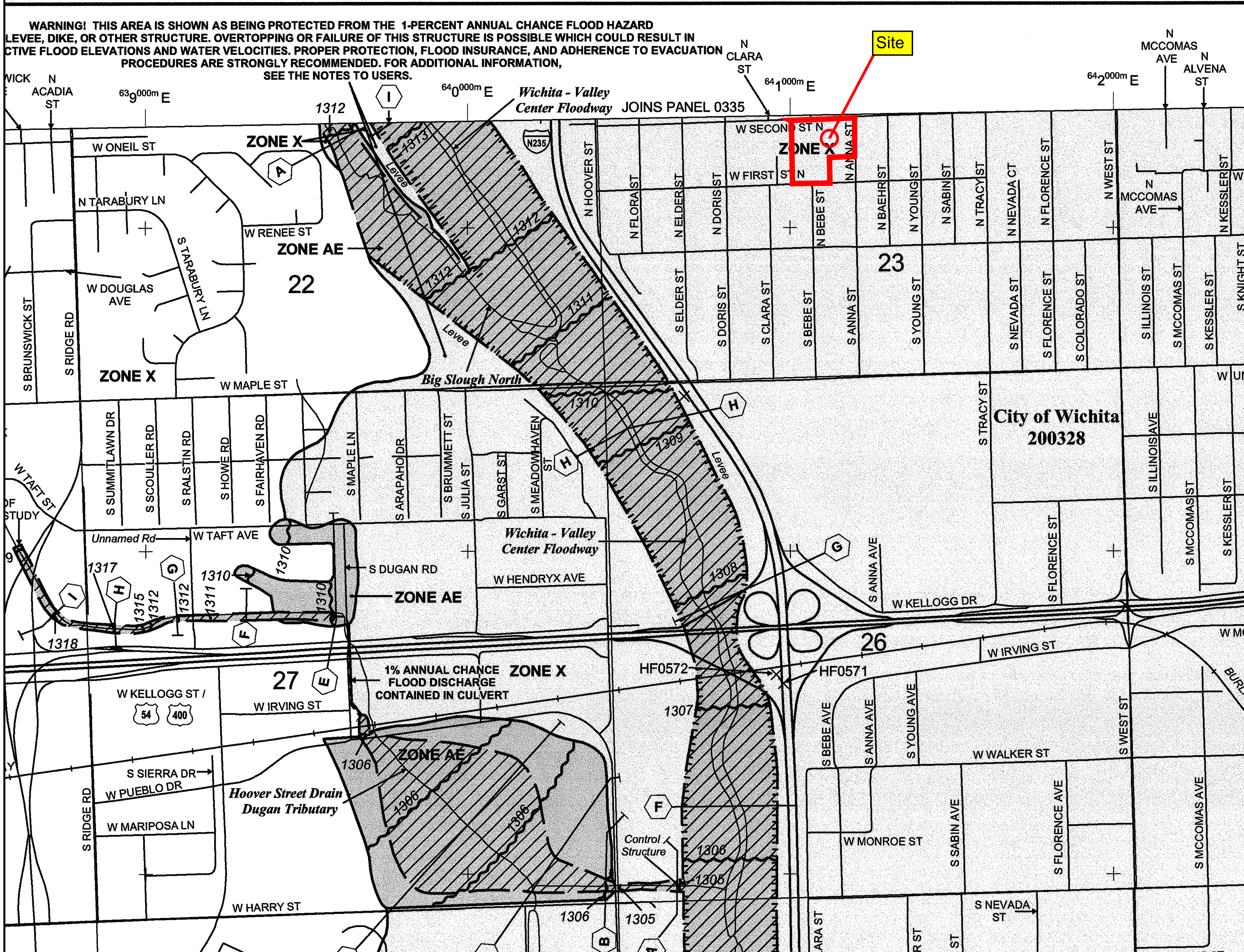
(Q*) See Hydraflow Report for table and report.

PATRICK SHAWN BAUGHMAN LICENSED 16976 11/9/09 KANSAS PROFESSIONAL ENGINEER

DRAINAGE & GRADING PLAN
DODGE ELEMENTARY SCHOOL ADDITION
25 October 2009

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\Dodge Elementary School Addition_09-10-USD\Water Resources\Drainage.dwg



MAP SCALE 1" = 1000'

500 0 1000 2000

00 0 300

PANEL 0345E

FIRM

FLOOD INSURANCE RATE MAP

SEDGWICK COUNTY, KANSAS
AND INCORPORATED AREAS

PANEL 345 OF 700

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
SEDGWICK COUNTY	200321	0345	E
WICHITA, CITY OF	200328	0345	E

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER 20173C0345E

EFFECTIVE DATE FEBRUARY 2, 2007

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

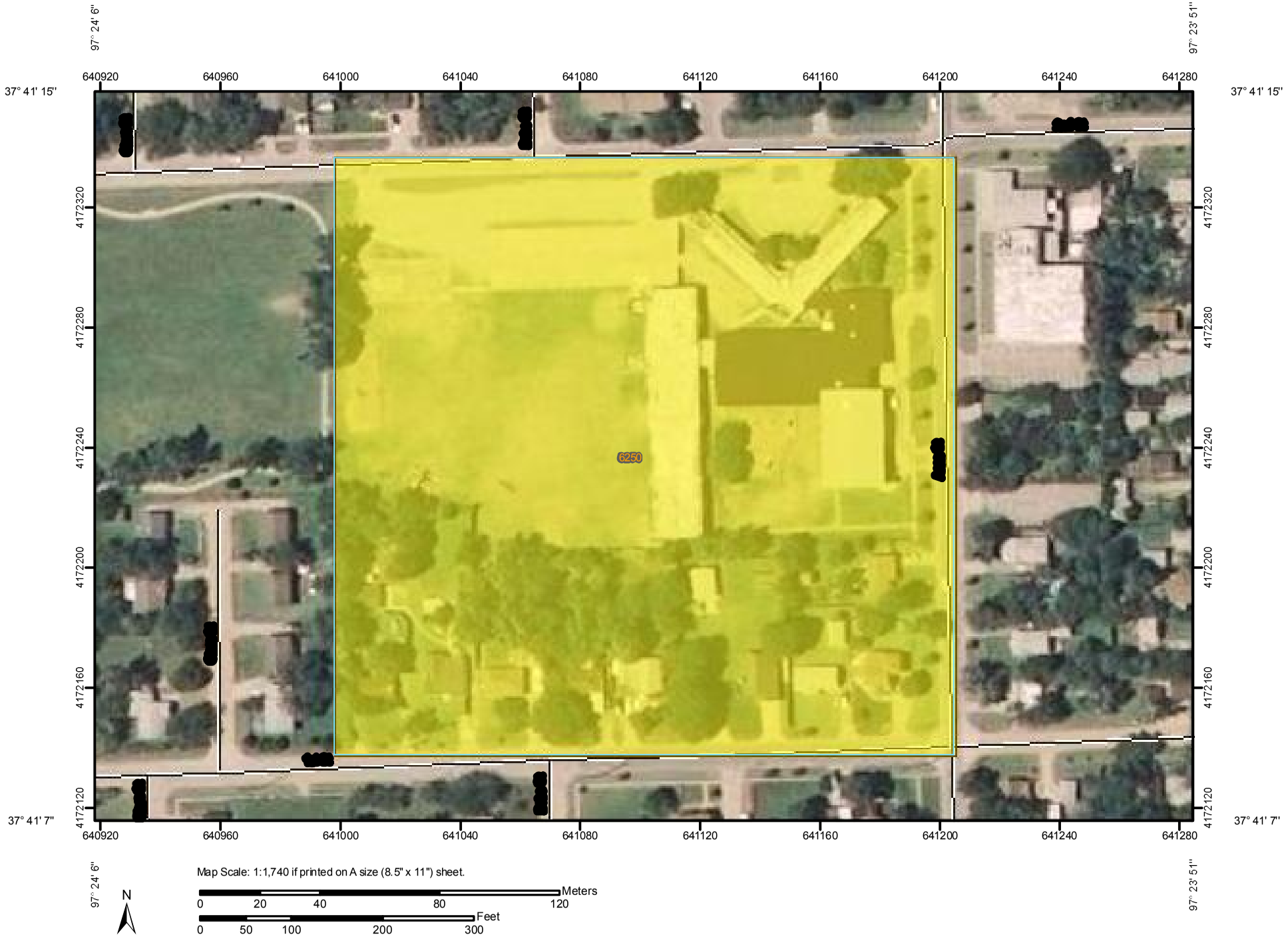
APPENDICES - SUPPORTING CALCULATIONS

APPENDIX A: CDM Soil Map

APPENDIX B: Existing HydraFlow Model

APPENDIX C: Proposed HydraFlow Model

CDM Soil Map


97° 24' 6"
97° 23' 51"
640920
640960
641000
641040
641080
641120
641160
641200
641240
641280
37° 41' 15"
37° 41' 7"
4172320
4172280
4172240
4172200
4172160
4172120
6250
Map Scale: 1:1,740 if printed on A size (8.5" x 11") sheet.
N
Meters
0 20 40 80 120
Feet
0 50 100 200 300

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Units

Soil Ratings

- Excessively drained
- Somewhat excessively drained
- Well drained
- Moderately well drained
- Somewhat poorly drained
- Poorly drained
- Very poorly drained
- Not rated or not available

Political Features

- Cities

Water Features

- Oceans
- Streams and Canals

Transportation

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

MAP INFORMATION

Map Scale: 1:1,740 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:24,000.

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 14N NAD83

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

Soil Survey Area: Sedgwick County, Kansas
Survey Area Data: Version 5, Dec 3, 2008

Date(s) aerial images were photographed: 6/20/2006

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

Drainage Class

Drainage Class— Summary by Map Unit — Sedgwick County, Kansas				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
6250	Urban land-Canadian complex, 0 to 3 percent slopes	Well drained	10.2	100.0%
Totals for Area of Interest			**10.2**	**100.0%**

Description

"Drainage class (natural)" refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized-excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained, and very poorly drained. These classes are defined in the "Soil Survey Manual."

Rating Options

Aggregation Method: Dominant Condition

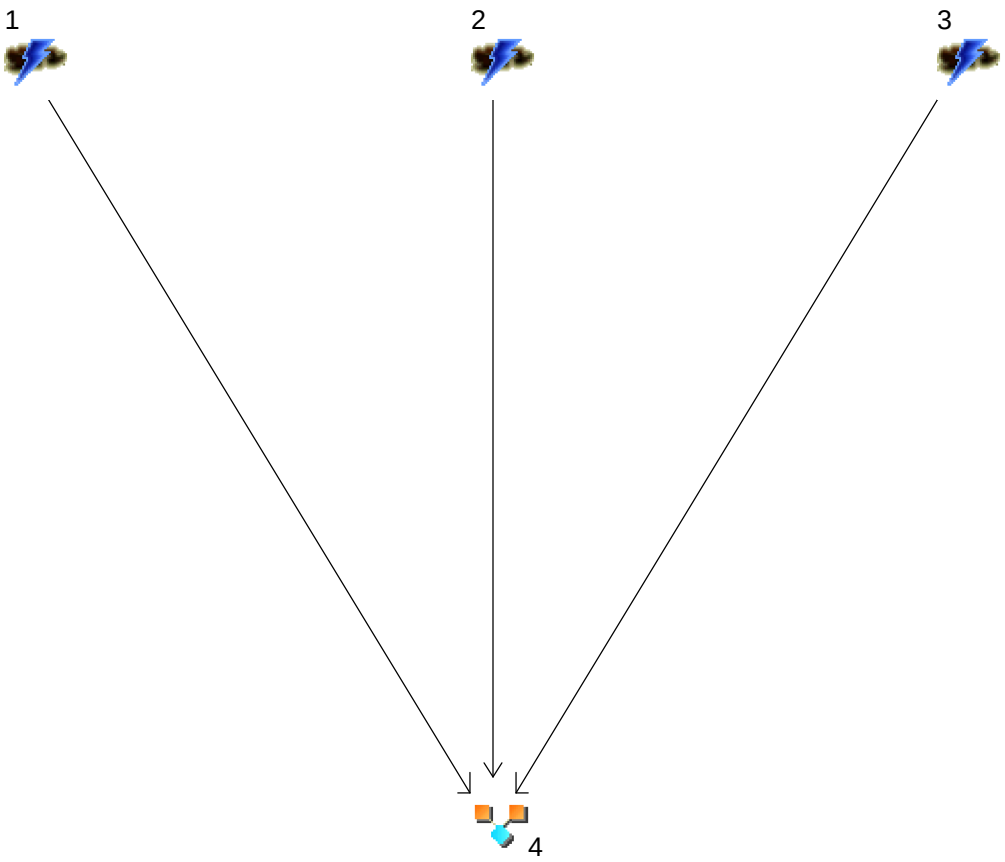
Component Percent Cutoff: *None Specified*

Tie-break Rule: Higher

Existing HydraFlow Model

Watershed Model Schematic

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066



Legend

Hyd.	Origin	Description
1	Rational	Northern Region
2	Rational	Southern region
3	Rational	South East (Anna)
4	Combine	<no description>

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	Rational	------	-------	8.967	-------	10.75	12.07	14.00	-------	16.97	Northern Region
2	Rational	------	-------	3.668	-------	4.433	4.996	5.815	-------	7.075	Southern region
3	Rational	------	-------	3.319	-------	3.969	4.453	5.159	-------	6.248	South East (Anna)
4	Combine	1, 2, 3	-------	15.05	-------	18.06	20.29	23.54	-------	28.56	<no description>

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

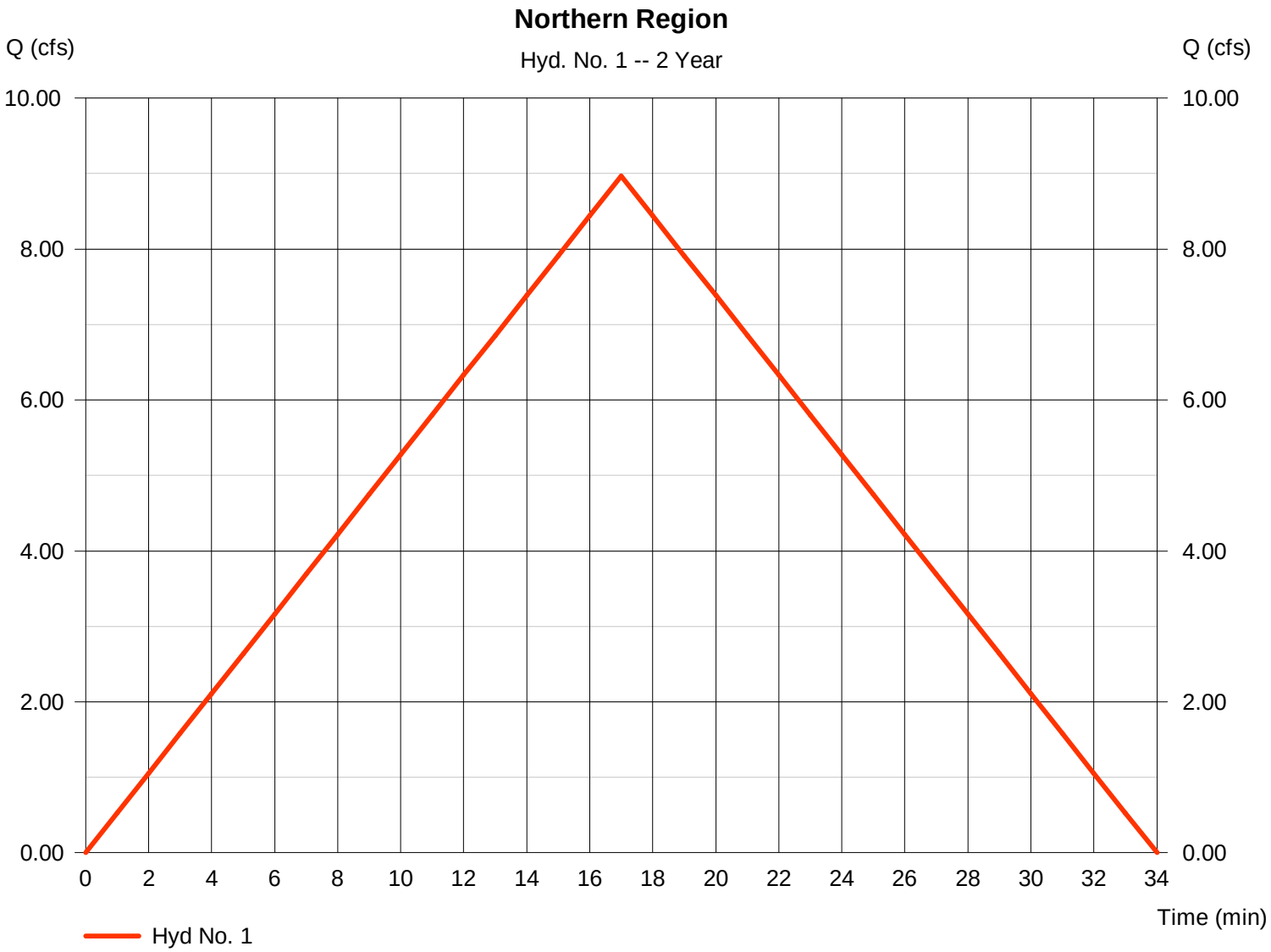
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	Rational	8.967	1	17	9,147	------	------	------	Northern Region
2	Rational	3.668	1	21	4,621	------	------	------	Southern region
3	Rational	3.319	1	16	3,186	------	------	------	South East (Anna)
4	Combine	15.05	1	17	16,954	1, 2, 3	------	------	<no description>

Hydrograph Report

Hyd. No. 1

Northern Region

Hydrograph type	=	Rational	Peak discharge	=	8.967 cfs
Storm frequency	=	2 yrs	Time to peak	=	17 min
Time interval	=	1 min	Hyd. volume	=	9,147 cuft
Drainage area	=	3.700 ac	Runoff coeff.	=	0.66
Intensity	=	3.672 in/hr	Tc by TR55	=	17.00 min
IDF Curve	=	wich_IDF.IDF	Asc/Rec limb fact	=	1/1



TR55 Tc Worksheet

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

Hyd. No. 1

Northern Region

Description		A		B		C		Totals
Sheet Flow								
Manning's n-value	=	0.050		0.011		0.011		
Flow length (ft)	=	250.0		0.0		0.0		
Two-year 24-hr precip. (in)	=	3.50		0.00		0.00		
Land slope (%)	=	0.30		0.00		0.00		
Travel Time (min)	**=**	**17.29**	**+**	**0.00**	**+**	**0.00**	**=**	**17.29**
Shallow Concentrated Flow								
Flow length (ft)	=	0.00		0.00		0.00		
Watercourse slope (%)	=	0.00		0.00		0.00		
Surface description	=	Paved		Paved		Paved		
Average velocity (ft/s)	=	0.00		0.00		0.00		
Travel Time (min)	**=**	**0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**
Channel Flow								
X sectional flow area (sqft)	=	0.00		0.00		0.00		
Wetted perimeter (ft)	=	0.00		0.00		0.00		
Channel slope (%)	=	0.00		0.00		0.00		
Manning's n-value	=	0.015		0.015		0.015		
Velocity (ft/s)	=	0.00		0.00		0.00		
Flow length (ft)	=	0.0		0.0		0.0		
Travel Time (min)	**=**	**0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

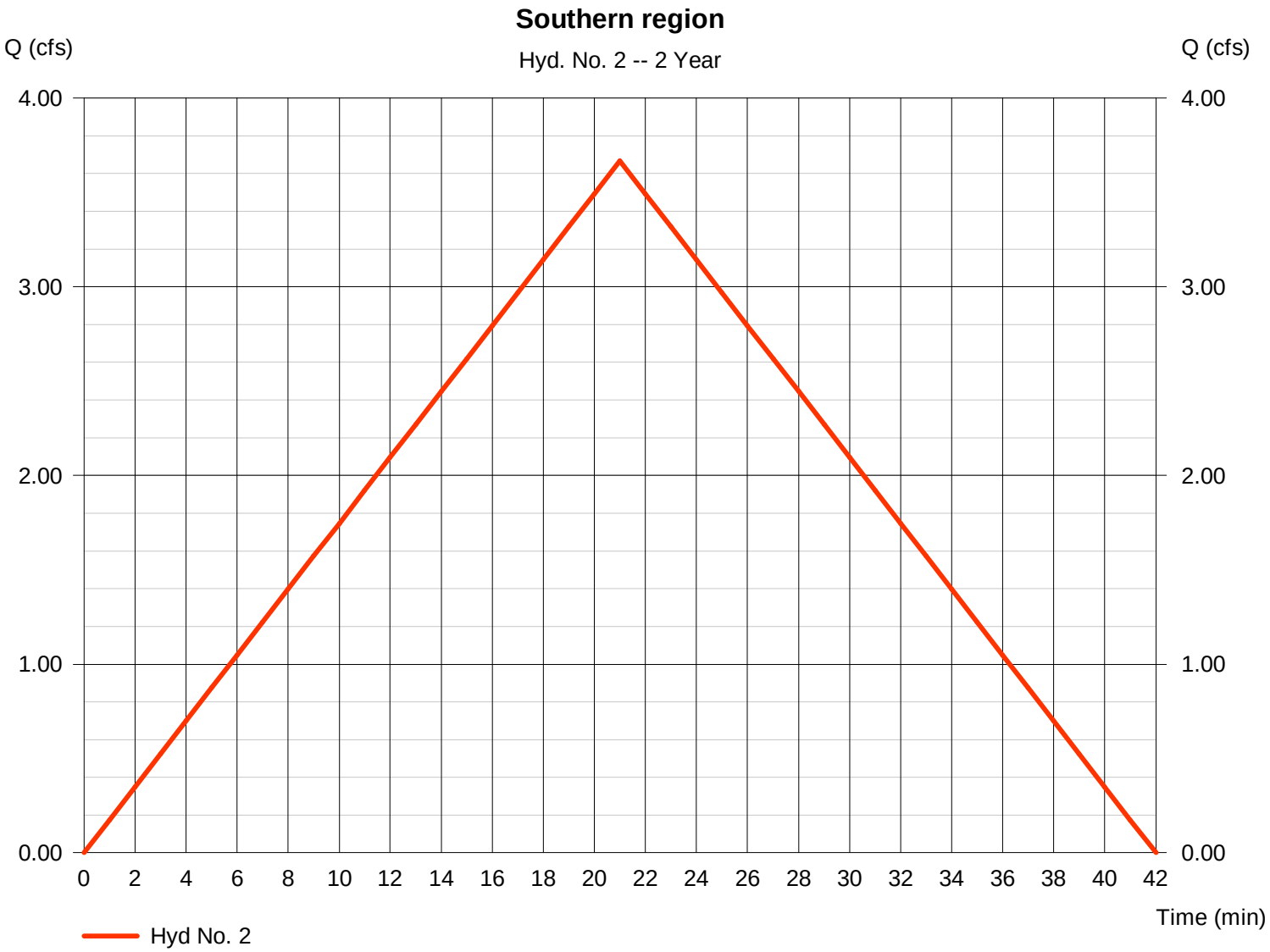
Total Travel Time, Tc ..... 17.00 min

Hydrograph Report

Hyd. No. 2

Southern region

Hydrograph type	=	Rational	Peak discharge	=	3.668 cfs
Storm frequency	=	2 yrs	Time to peak	=	21 min
Time interval	=	1 min	Hyd. volume	=	4,621 cuft
Drainage area	=	2.140 ac	Runoff coeff.	=	0.52
Intensity	=	3.296 in/hr	Tc by TR55	=	21.00 min
IDF Curve	=	wich_IDF.IDF	Asc/Rec limb fact	=	1/1



TR55 Tc Worksheet

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

Hyd. No. 2

Southern region

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.050		0.011		0.011		
Flow length (ft)	= 250.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.50		0.00		0.00		
Land slope (%)	= 0.30		0.00		0.00		
Travel Time (min)	**= 17.29**	**+**	**0.00**	**+**	**0.00**	**=**	**17.29**
Shallow Concentrated Flow							
Flow length (ft)	= 200.00		0.00		0.00		
Watercourse slope (%)	= 0.30		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	= 0.88		0.00		0.00		
Travel Time (min)	**= 3.77**	**+**	**0.00**	**+**	**0.00**	**=**	**3.77**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	= 0.00		0.00		0.00		
Flow length (ft)	= 0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

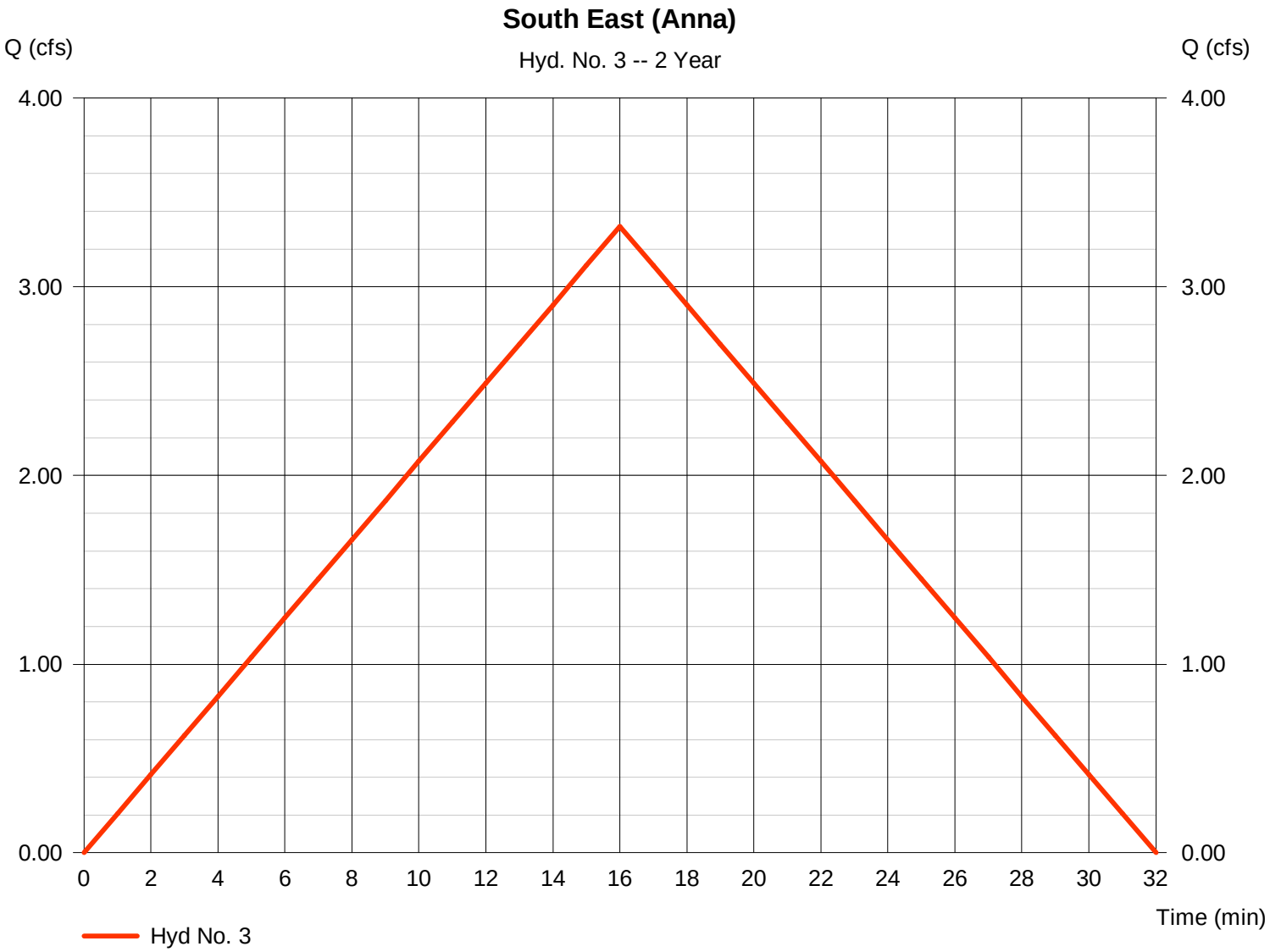
Total Travel Time, Tc ..... 21.00 min

Hydrograph Report

Hyd. No. 3

South East (Anna)

Hydrograph type	=	Rational	Peak discharge	=	3.319 cfs
Storm frequency	=	2 yrs	Time to peak	=	16 min
Time interval	=	1 min	Hyd. volume	=	3,186 cuft
Drainage area	=	1.330 ac	Runoff coeff.	=	0.66
Intensity	=	3.781 in/hr	Tc by TR55	=	16.00 min
IDF Curve	=	wich_IDF.IDF	Asc/Rec limb fact	=	1/1



TR55 Tc Worksheet

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

Hyd. No. 3

South East (Anna)

Description		A		B		C		Totals
Sheet Flow								
Manning's n-value	=	0.050		0.011		0.011		
Flow length (ft)	=	150.0		0.0		0.0		
Two-year 24-hr precip. (in)	=	3.50		0.00		0.00		
Land slope (%)	=	0.30		0.00		0.00		
Travel Time (min)	**=**	**11.49**	**+**	**0.00**	**+**	**0.00**	**=**	**11.49**
Shallow Concentrated Flow								
Flow length (ft)	=	300.00		0.00		0.00		
Watercourse slope (%)	=	0.30		0.00		0.00		
Surface description	=	Paved		Paved		Paved		
Average velocity (ft/s)	=	1.11		0.00		0.00		
Travel Time (min)	**=**	**4.49**	**+**	**0.00**	**+**	**0.00**	**=**	**4.49**
Channel Flow								
X sectional flow area (sqft)	=	0.00		0.00		0.00		
Wetted perimeter (ft)	=	0.00		0.00		0.00		
Channel slope (%)	=	0.00		0.00		0.00		
Manning's n-value	=	0.015		0.015		0.015		
Velocity (ft/s)	=	0.00		0.00		0.00		
Flow length (ft)	=	0.0		0.0		0.0		
Travel Time (min)	**=**	**0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

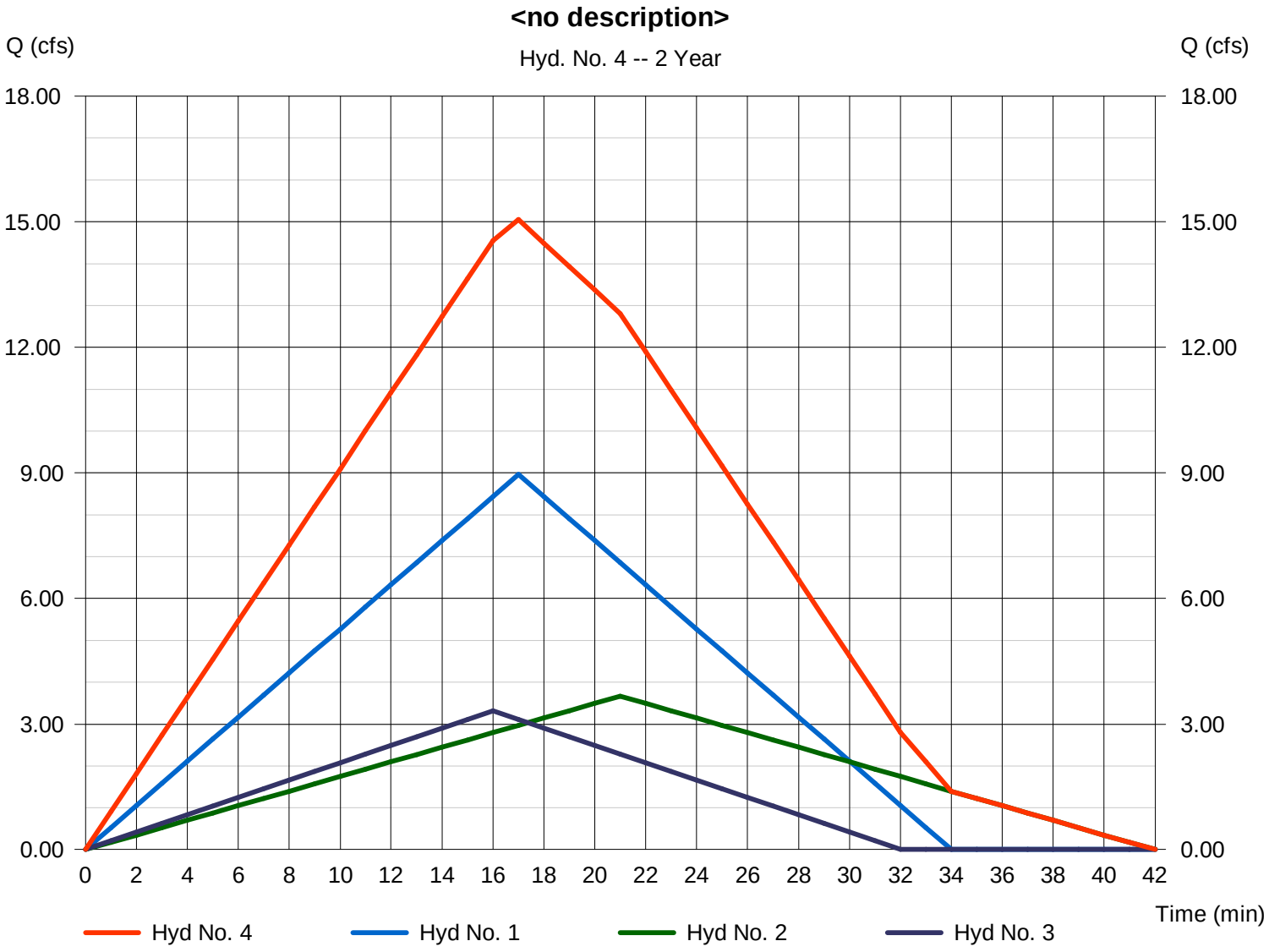
Total Travel Time, Tc ..... 16.00 min

Hydrograph Report

Hyd. No. 4

<no description>

Hydrograph type	=	Combine	Peak discharge	=	15.05 cfs
Storm frequency	=	2 yrs	Time to peak	=	17 min
Time interval	=	1 min	Hyd. volume	=	16,954 cuft
Inflow hyds.	=	1, 2, 3	Contrib. drain. area	=	7.170 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

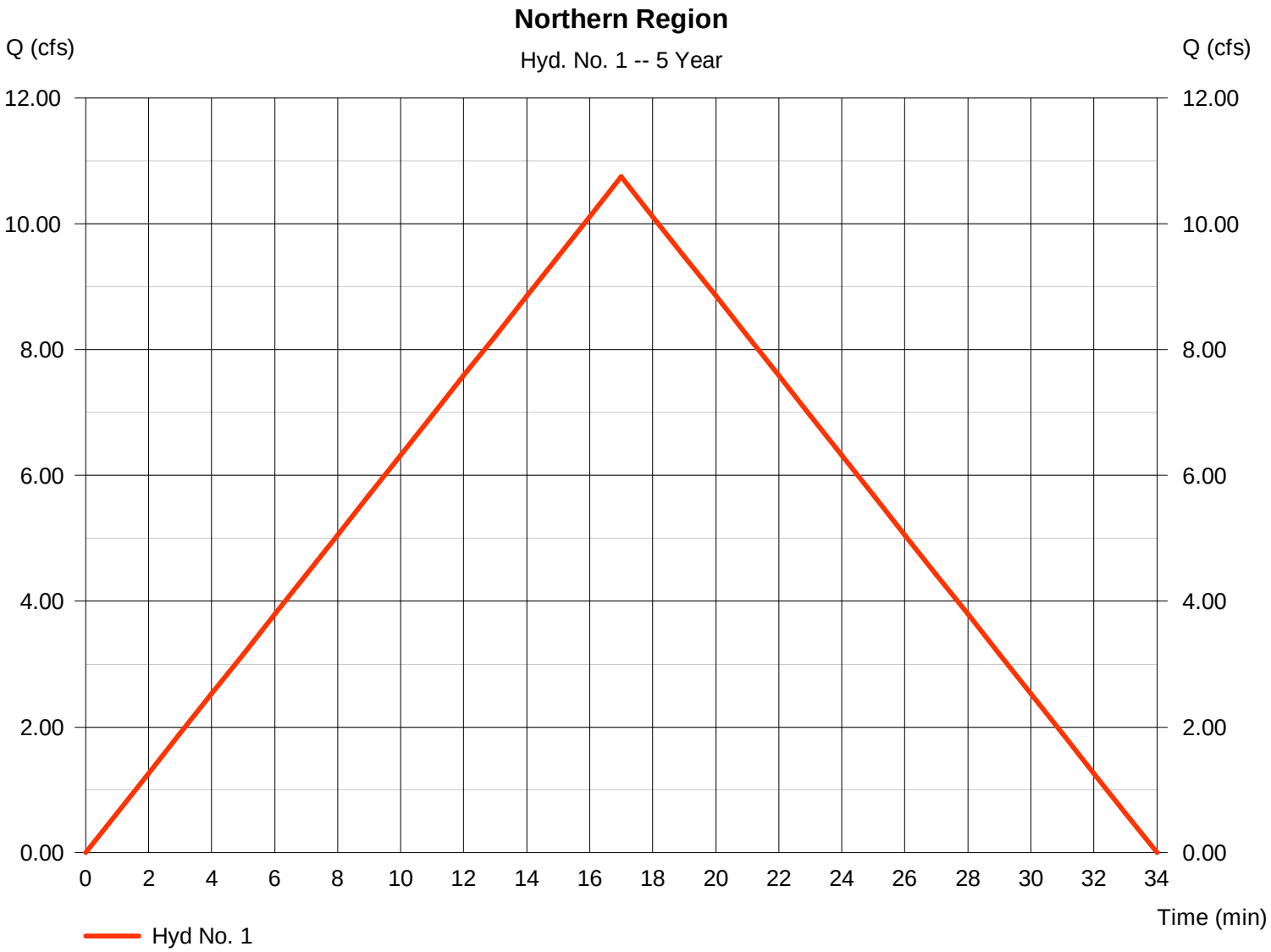
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	Rational	10.75	1	17	10,964	------	------	------	Northern Region
2	Rational	4.433	1	21	5,586	------	------	------	Southern region
3	Rational	3.969	1	16	3,811	------	------	------	South East (Anna)
4	Combine	18.06	1	17	20,360	1, 2, 3	------	------	<no description>

Hydrograph Report

Hyd. No. 1

Northern Region

Hydrograph type	=	Rational	Peak discharge	=	10.75 cfs
Storm frequency	=	5 yrs	Time to peak	=	17 min
Time interval	=	1 min	Hyd. volume	=	10,964 cuft
Drainage area	=	3.700 ac	Runoff coeff.	=	0.66
Intensity	=	4.402 in/hr	Tc by TR55	=	17.00 min
IDF Curve	=	wich_IDF.IDF	Asc/Rec limb fact	=	1/1

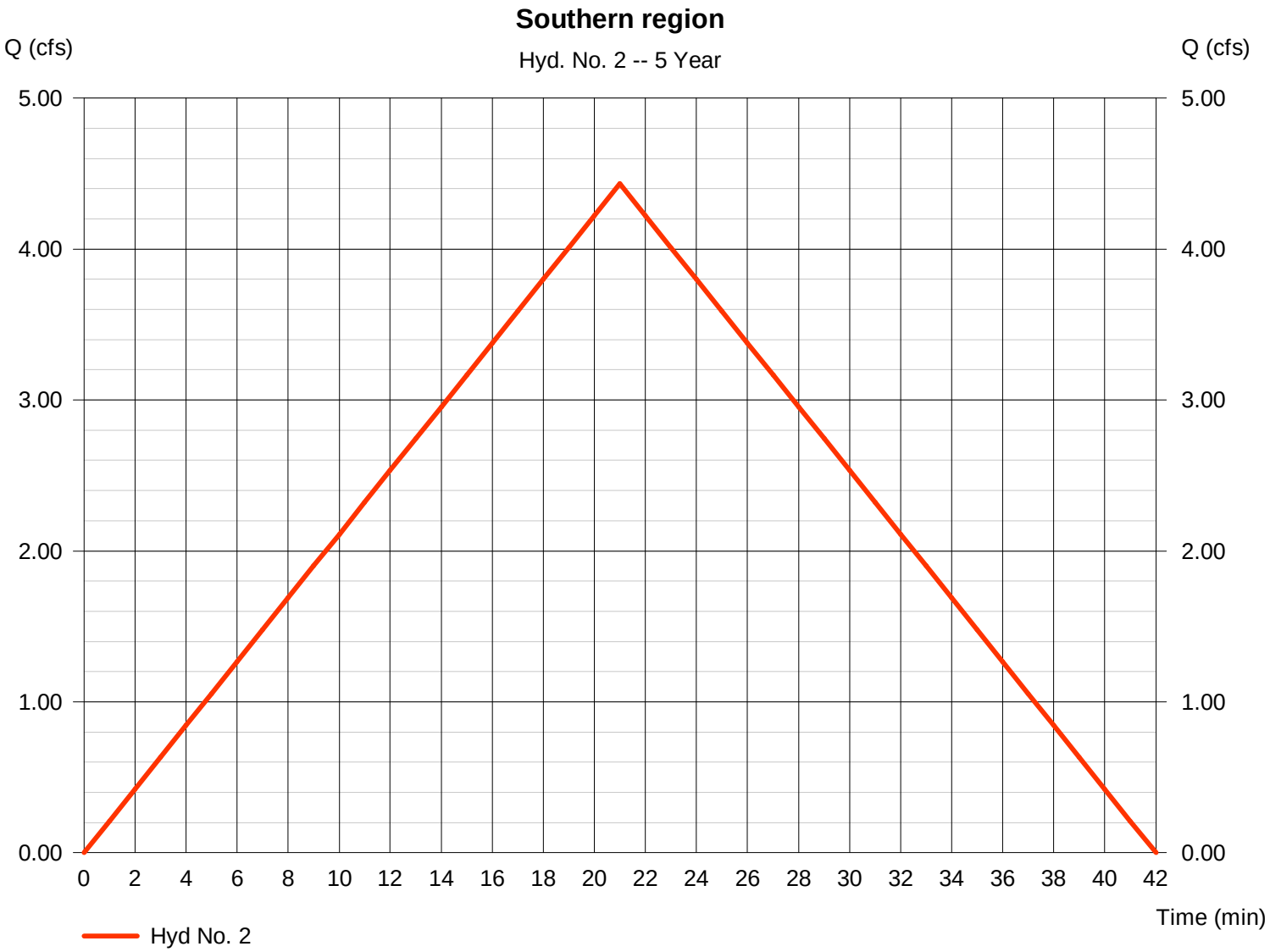


Hydrograph Report

Hyd. No. 2

Southern region

Hydrograph type	=	Rational	Peak discharge	=	4.433 cfs
Storm frequency	=	5 yrs	Time to peak	=	21 min
Time interval	=	1 min	Hyd. volume	=	5,586 cuft
Drainage area	=	2.140 ac	Runoff coeff.	=	0.52
Intensity	=	3.984 in/hr	Tc by TR55	=	21.00 min
IDF Curve	=	wich_IDF.IDF	Asc/Rec limb fact	=	1/1

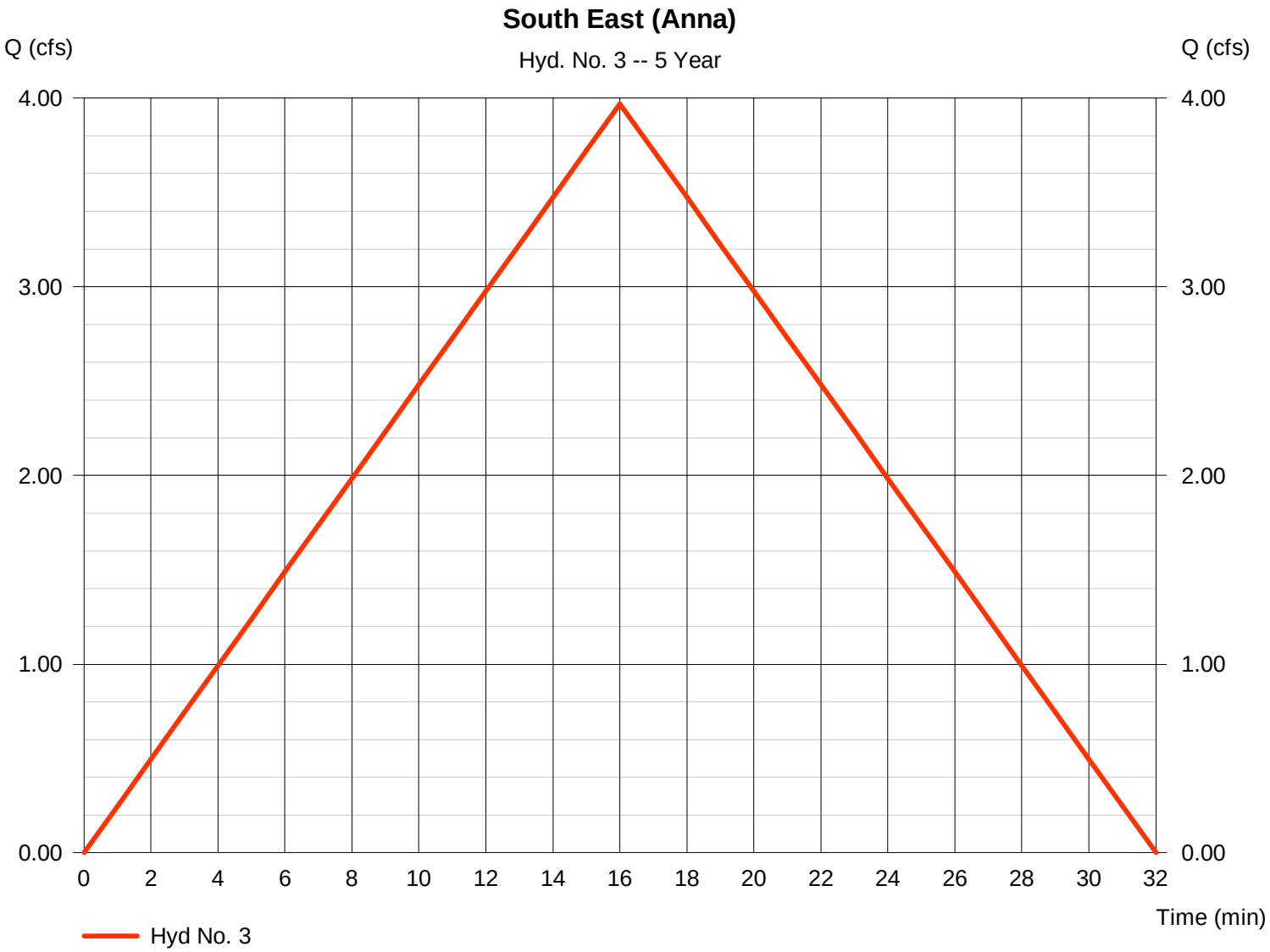


Hydrograph Report

Hyd. No. 3

South East (Anna)

Hydrograph type	=	Rational	Peak discharge	=	3.969 cfs
Storm frequency	=	5 yrs	Time to peak	=	16 min
Time interval	=	1 min	Hyd. volume	=	3,811 cuft
Drainage area	=	1.330 ac	Runoff coeff.	=	0.66
Intensity	=	4.522 in/hr	Tc by TR55	=	16.00 min
IDF Curve	=	wich_IDF.IDF	Asc/Rec limb fact	=	1/1



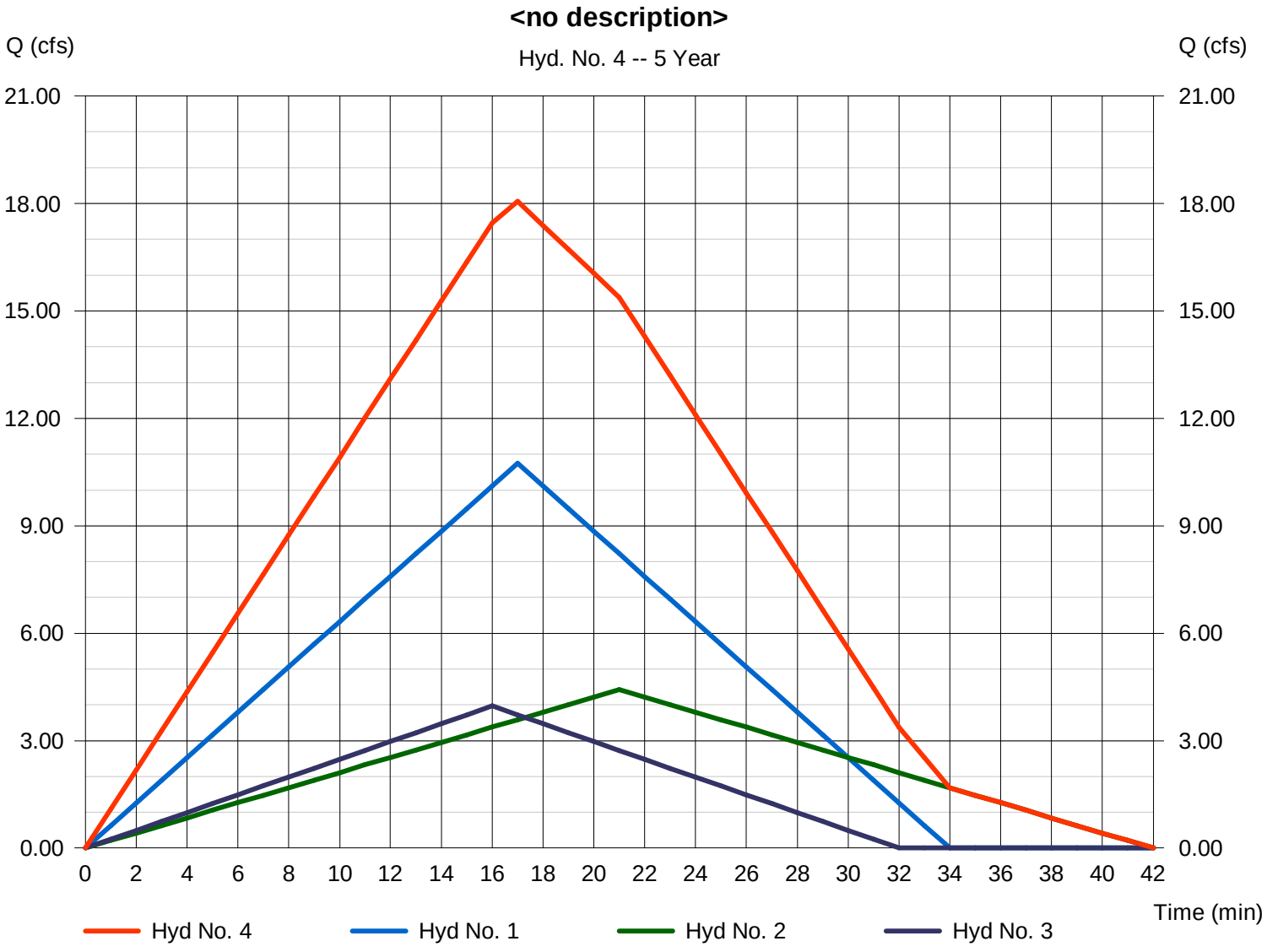
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, Oct 22, 2009

Hyd. No. 4

<no description>

Hydrograph type	= Combine	Peak discharge	= 18.06 cfs
Storm frequency	= 5 yrs	Time to peak	= 17 min
Time interval	= 1 min	Hyd. volume	= 20,360 cuft
Inflow hyds.	= 1, 2, 3	Contrib. drain. area	= 7.170 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

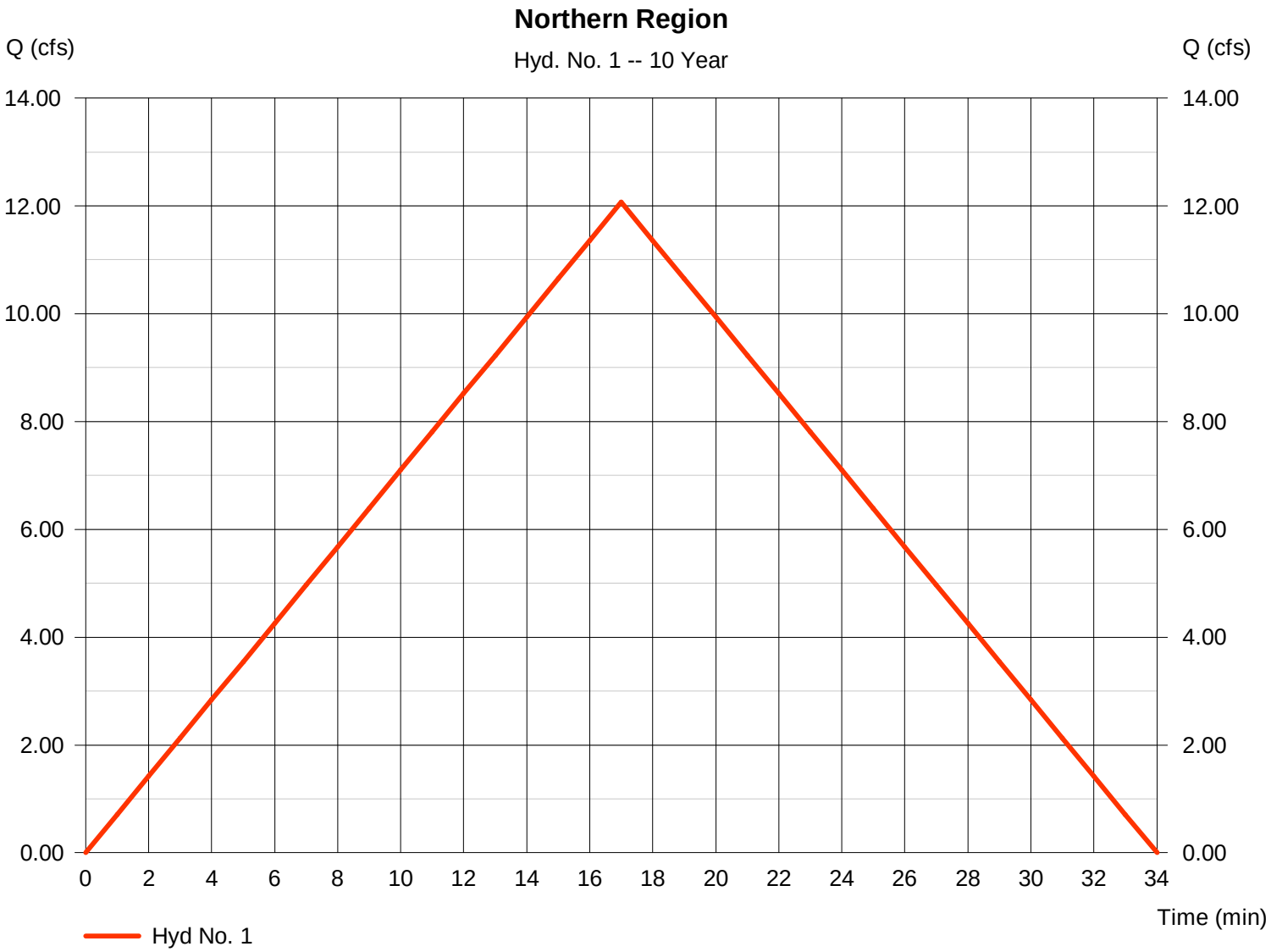
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	Rational	12.07	1	17	12,312	------	------	------	Northern Region
2	Rational	4.996	1	21	6,294	------	------	------	Southern region
3	Rational	4.453	1	16	4,275	------	------	------	South East (Anna)
4	Combine	20.29	1	17	22,881	1, 2, 3	------	------	<no description>

Hydrograph Report

Hyd. No. 1

Northern Region

Hydrograph type	=	Rational	Peak discharge	=	12.07 cfs
Storm frequency	=	10 yrs	Time to peak	=	17 min
Time interval	=	1 min	Hyd. volume	=	12,312 cuft
Drainage area	=	3.700 ac	Runoff coeff.	=	0.66
Intensity	=	4.943 in/hr	Tc by TR55	=	17.00 min
IDF Curve	=	wich_IDF.IDF	Asc/Rec limb fact	=	1/1

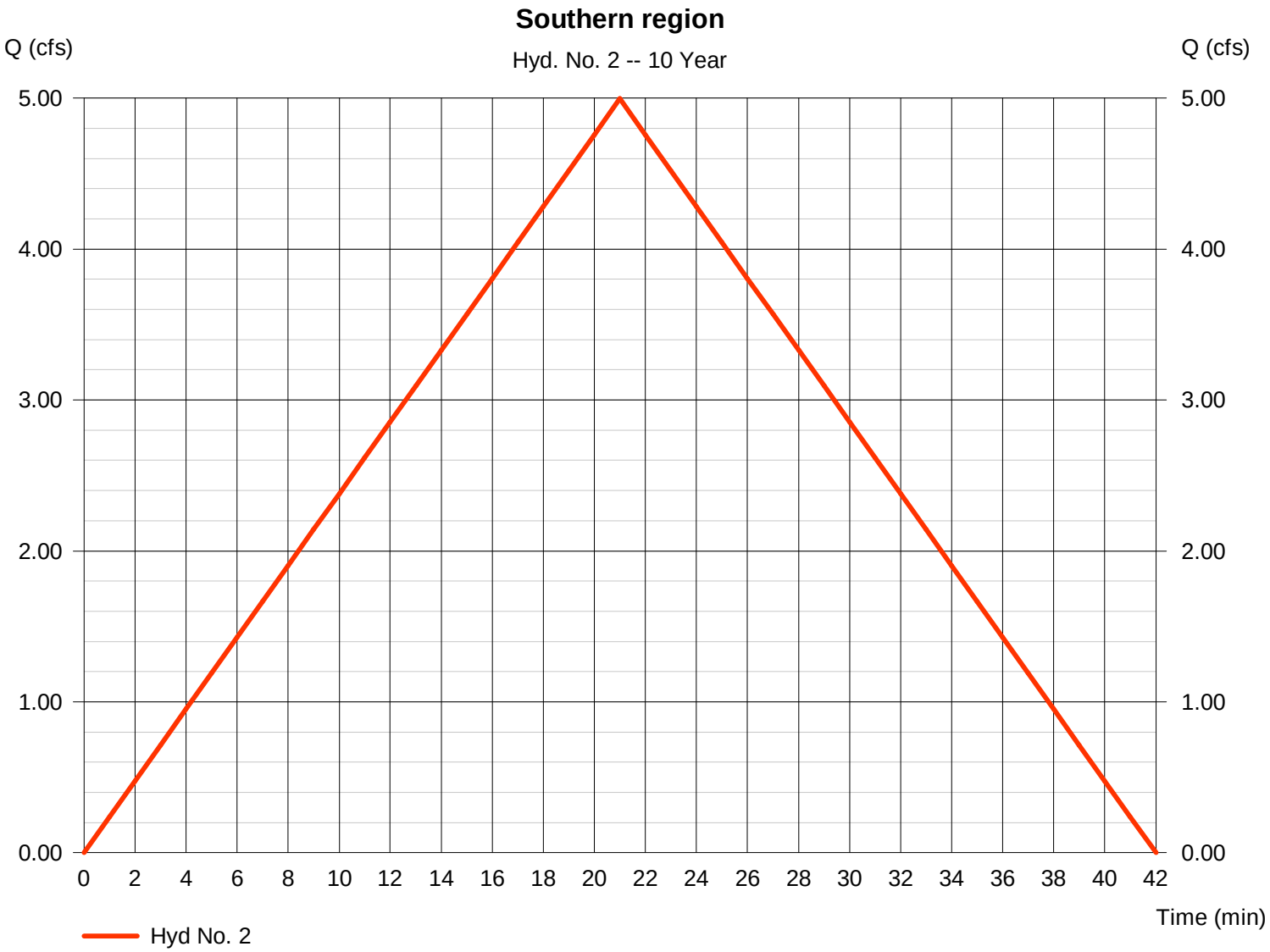


Hydrograph Report

Hyd. No. 2

Southern region

Hydrograph type	=	Rational	Peak discharge	=	4.996 cfs
Storm frequency	=	10 yrs	Time to peak	=	21 min
Time interval	=	1 min	Hyd. volume	=	6,294 cuft
Drainage area	=	2.140 ac	Runoff coeff.	=	0.52
Intensity	=	4.489 in/hr	Tc by TR55	=	21.00 min
IDF Curve	=	wich_IDF.IDF	Asc/Rec limb fact	=	1/1

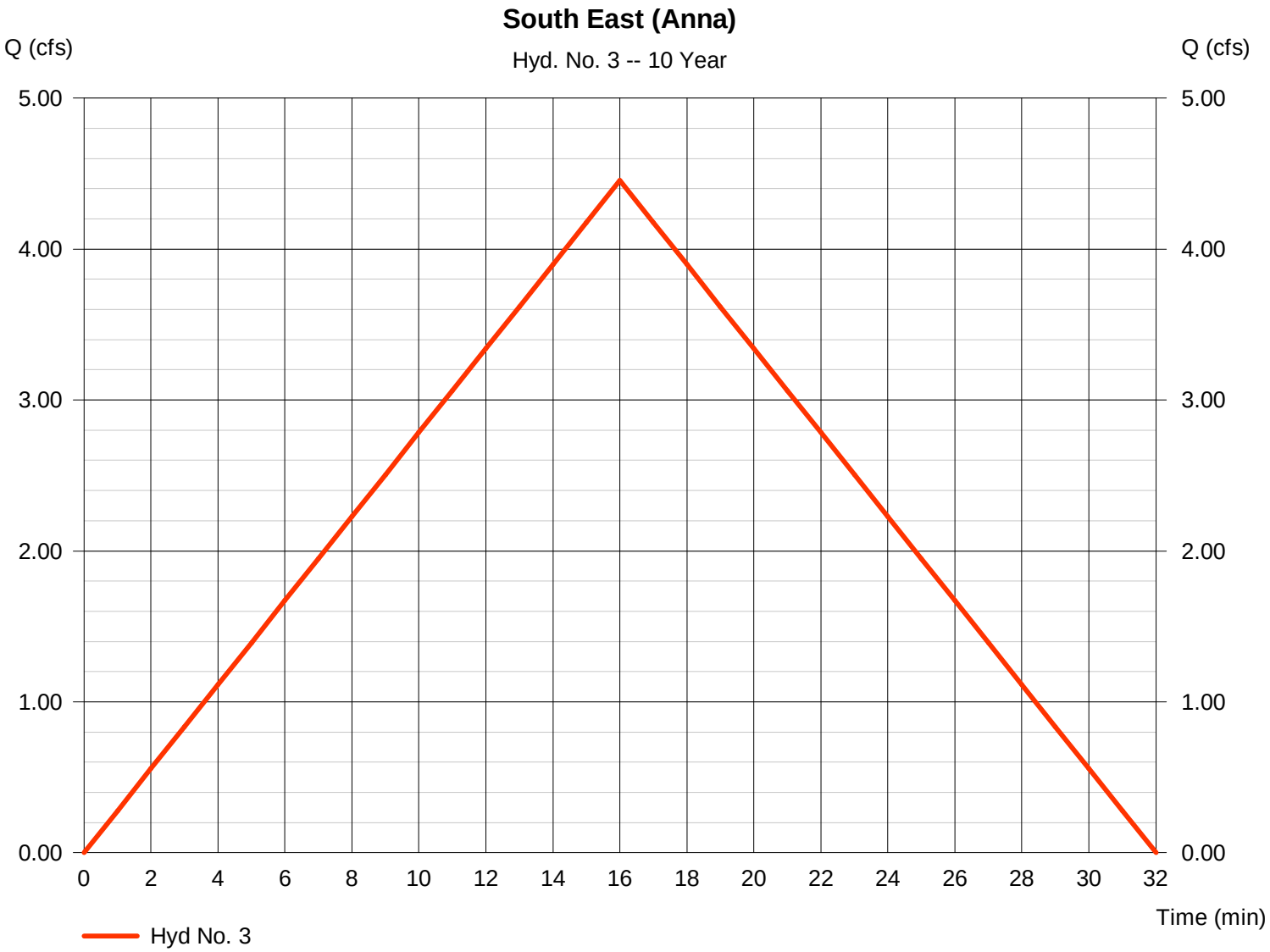


Hydrograph Report

Hyd. No. 3

South East (Anna)

Hydrograph type	=	Rational	Peak discharge	=	4.453 cfs
Storm frequency	=	10 yrs	Time to peak	=	16 min
Time interval	=	1 min	Hyd. volume	=	4,275 cuft
Drainage area	=	1.330 ac	Runoff coeff.	=	0.66
Intensity	=	5.073 in/hr	Tc by TR55	=	16.00 min
IDF Curve	=	wich_IDF.IDF	Asc/Rec limb fact	=	1/1

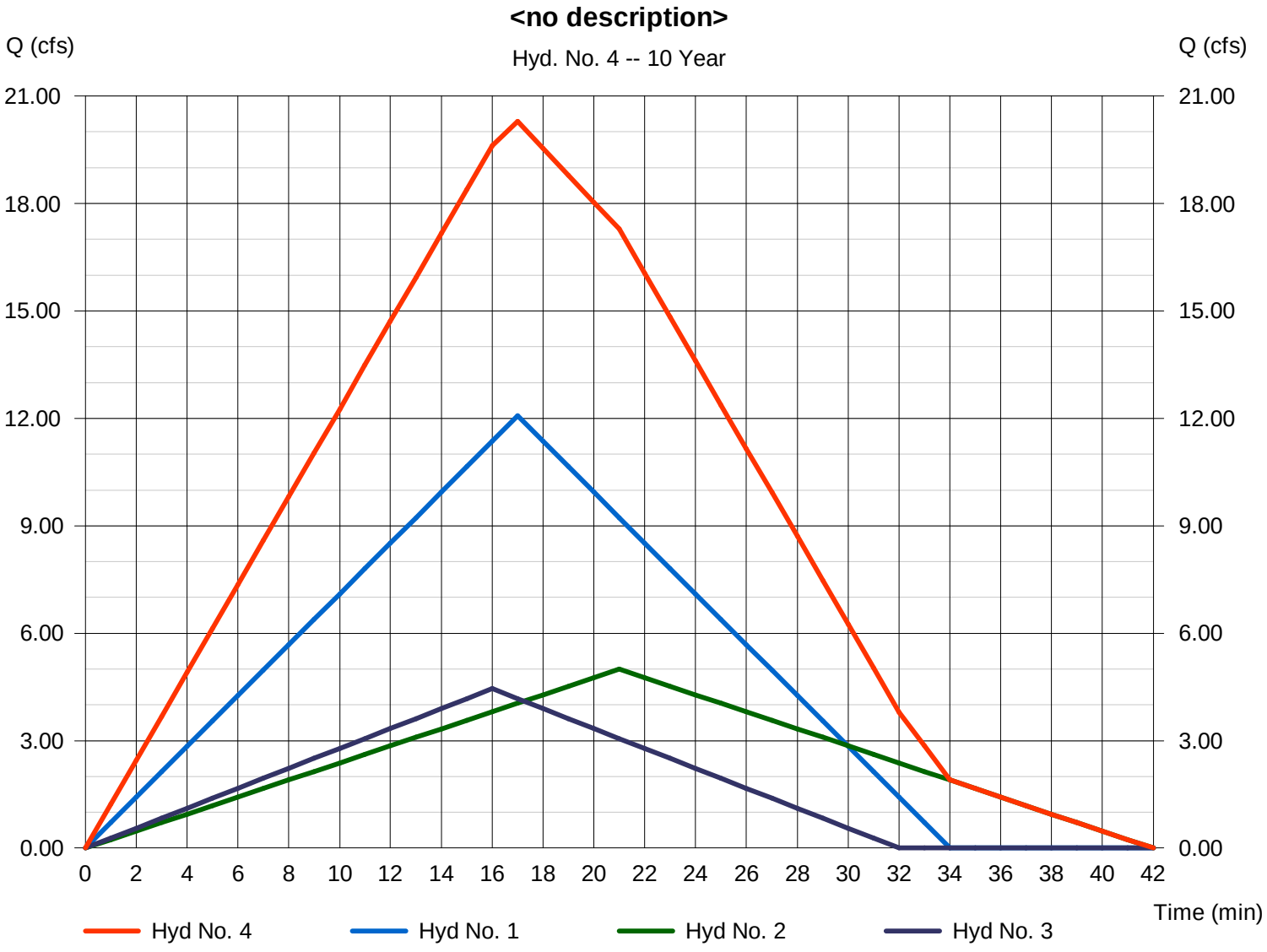


Hydrograph Report

Hyd. No. 4

<no description>

Hydrograph type	= Combine	Peak discharge	= 20.29 cfs
Storm frequency	= 10 yrs	Time to peak	= 17 min
Time interval	= 1 min	Hyd. volume	= 22,881 cuft
Inflow hyds.	= 1, 2, 3	Contrib. drain. area	= 7.170 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

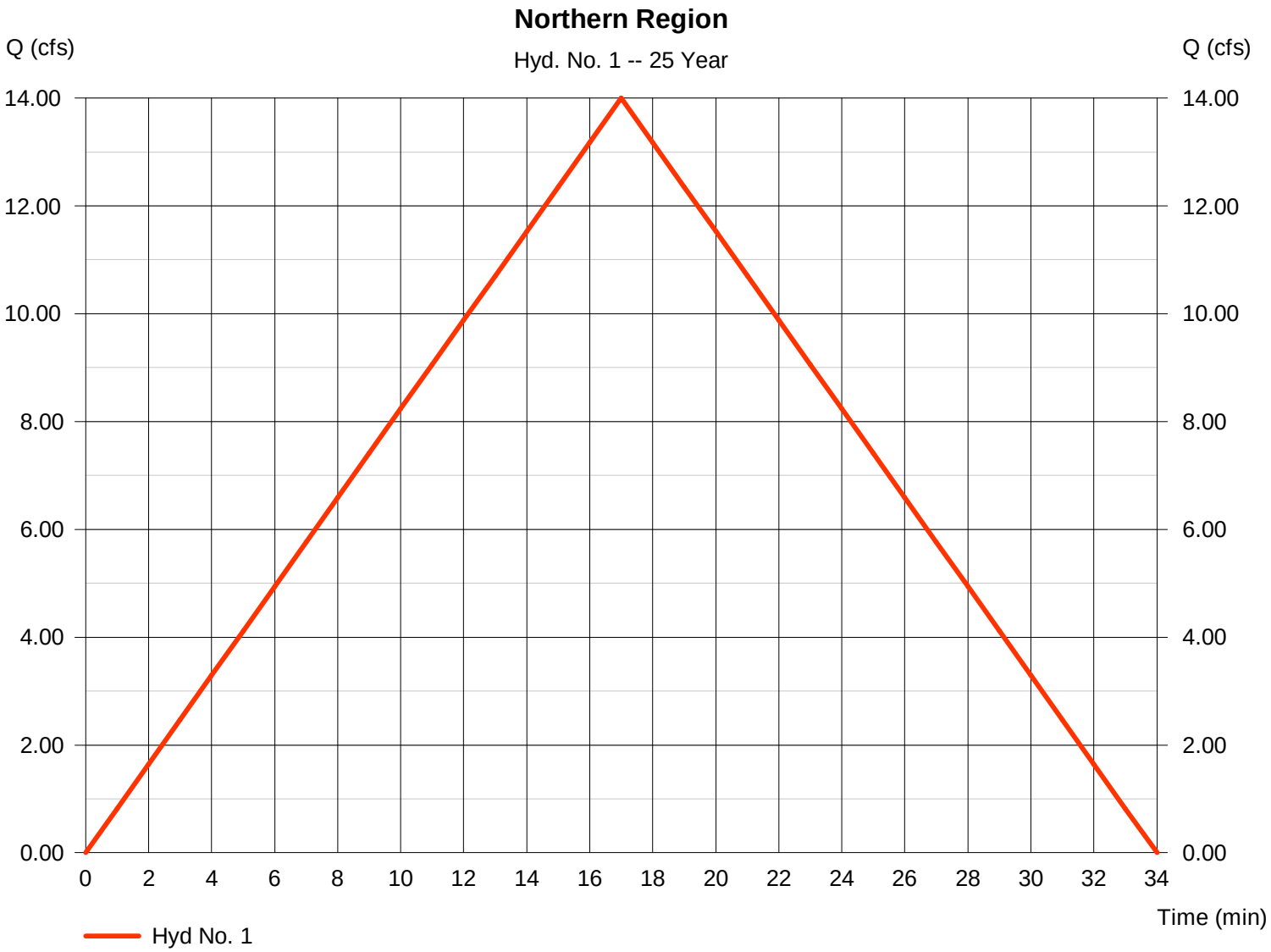
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	Rational	14.00	1	17	14,279	------	------	------	Northern Region
2	Rational	5.815	1	21	7,327	------	------	------	Southern region
3	Rational	5.159	1	16	4,952	------	------	------	South East (Anna)
4	Combine	23.54	1	17	26,558	1, 2, 3	------	------	<no description>

Hydrograph Report

Hyd. No. 1

Northern Region

Hydrograph type	=	Rational	Peak discharge	=	14.00 cfs
Storm frequency	=	25 yrs	Time to peak	=	17 min
Time interval	=	1 min	Hyd. volume	=	14,279 cuft
Drainage area	=	3.700 ac	Runoff coeff.	=	0.66
Intensity	=	5.732 in/hr	Tc by TR55	=	17.00 min
IDF Curve	=	wich_IDF.IDF	Asc/Rec limb fact	=	1/1

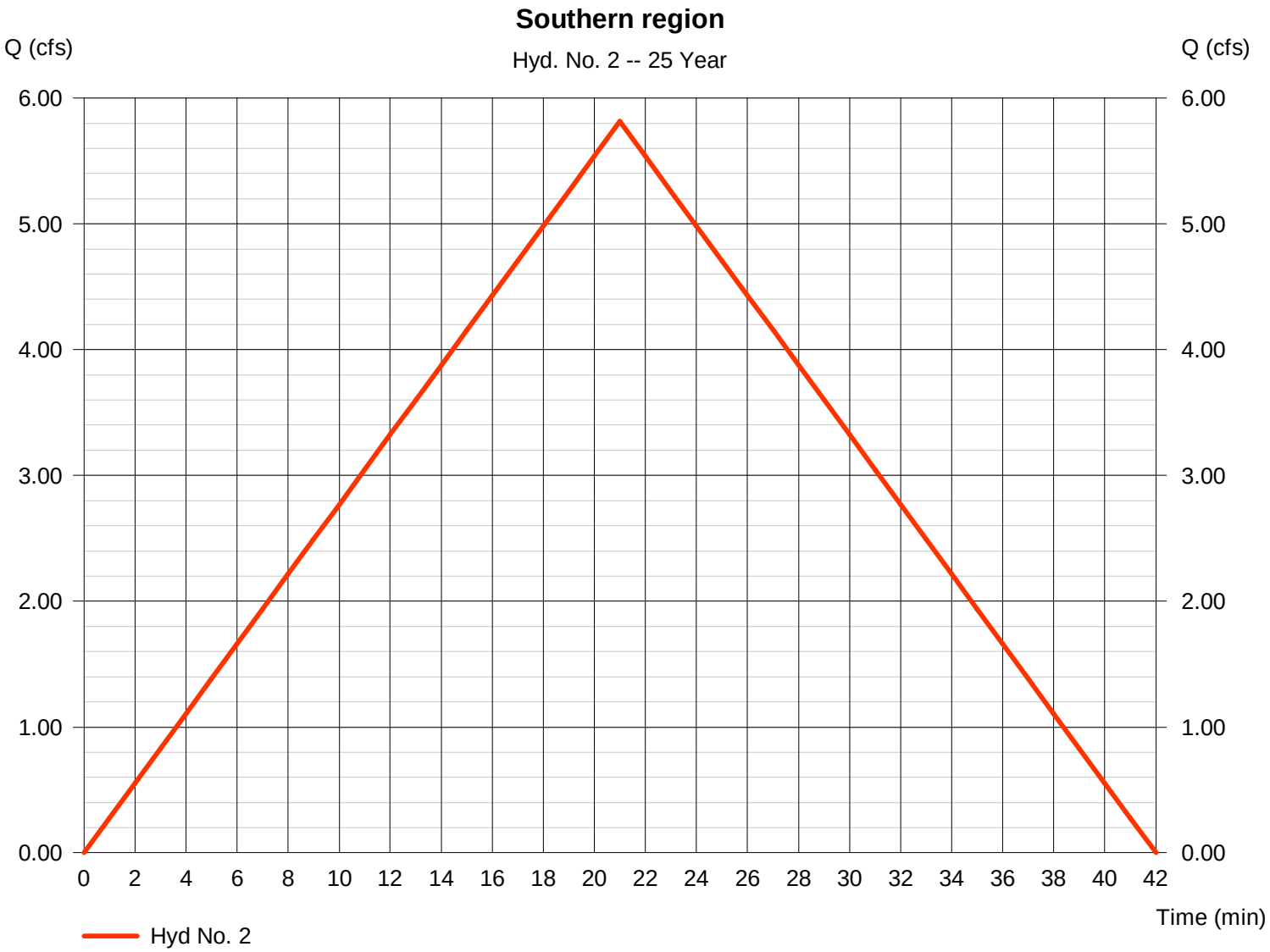


Hydrograph Report

Hyd. No. 2

Southern region

Hydrograph type	=	Rational	Peak discharge	=	5.815 cfs
Storm frequency	=	25 yrs	Time to peak	=	21 min
Time interval	=	1 min	Hyd. volume	=	7,327 cuft
Drainage area	=	2.140 ac	Runoff coeff.	=	0.52
Intensity	=	5.226 in/hr	Tc by TR55	=	21.00 min
IDF Curve	=	wich_IDF.IDF	Asc/Rec limb fact	=	1/1

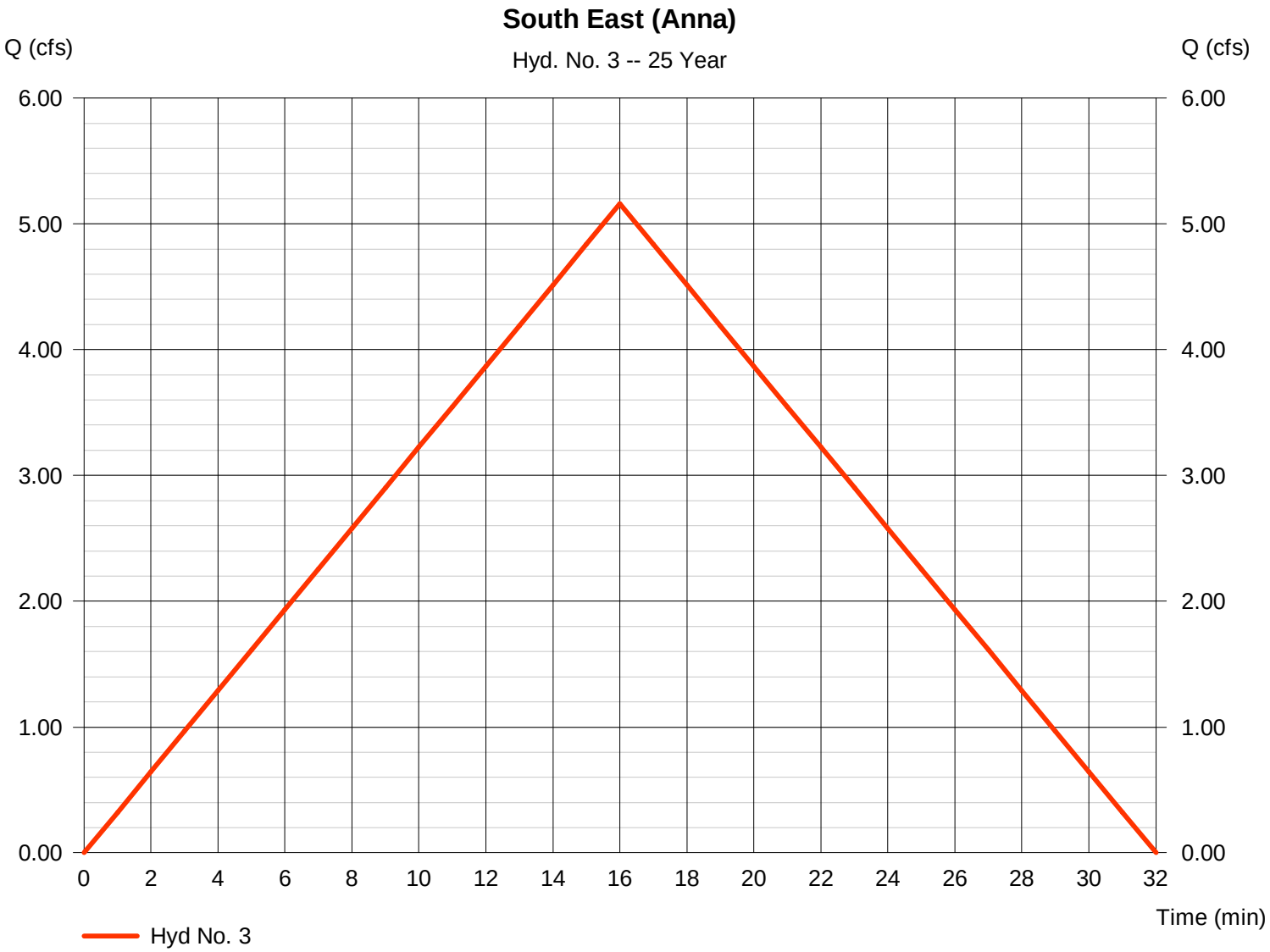


Hydrograph Report

Hyd. No. 3

South East (Anna)

Hydrograph type	=	Rational	Peak discharge	=	5.159 cfs
Storm frequency	=	25 yrs	Time to peak	=	16 min
Time interval	=	1 min	Hyd. volume	=	4,952 cuft
Drainage area	=	1.330 ac	Runoff coeff.	=	0.66
Intensity	=	5.877 in/hr	Tc by TR55	=	16.00 min
IDF Curve	=	wich_IDF.IDF	Asc/Rec limb fact	=	1/1

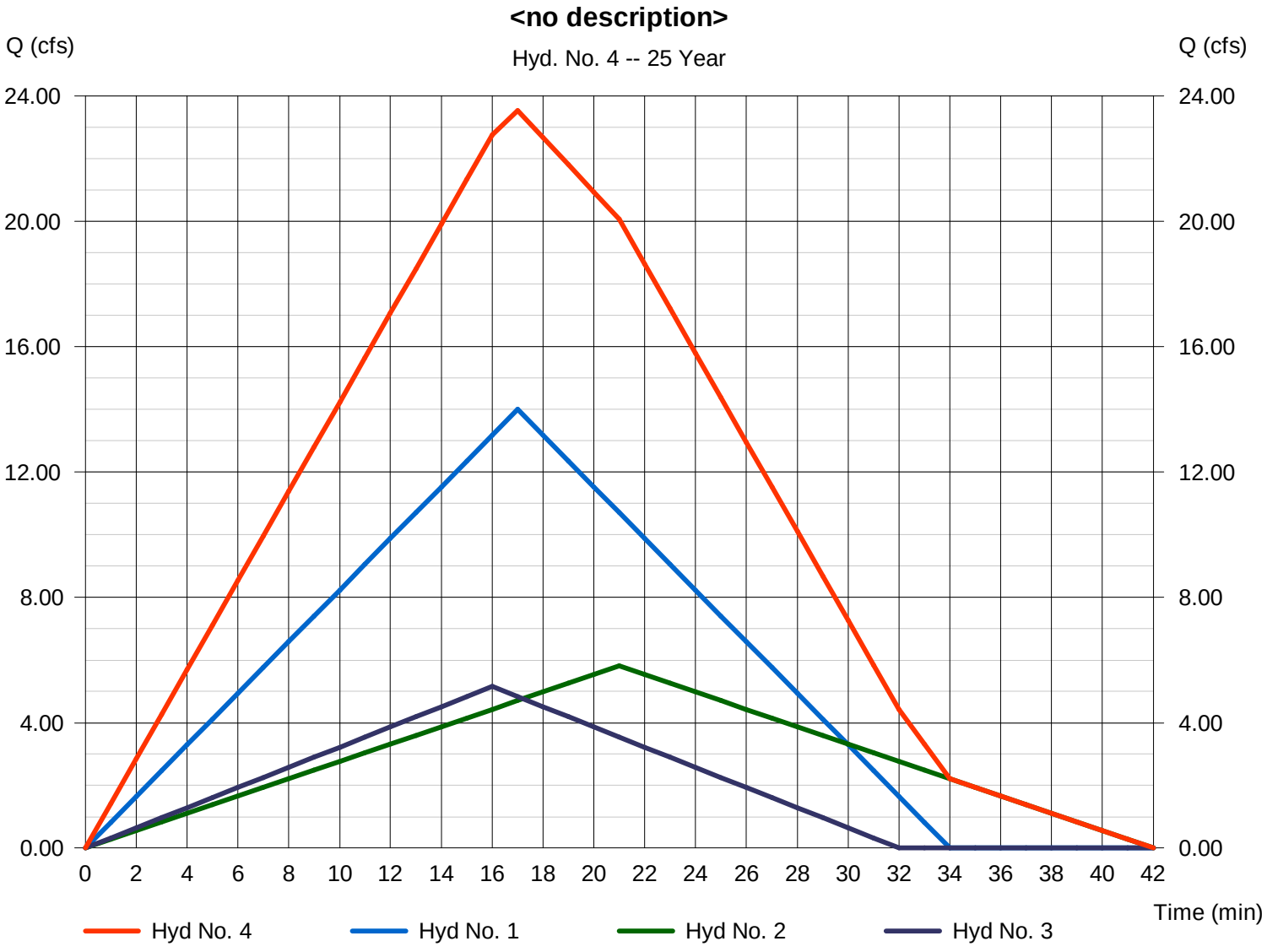


Hydrograph Report

Hyd. No. 4

<no description>

Hydrograph type	=	Combine	Peak discharge	=	23.54 cfs
Storm frequency	=	25 yrs	Time to peak	=	17 min
Time interval	=	1 min	Hyd. volume	=	26,558 cuft
Inflow hyds.	=	1, 2, 3	Contrib. drain. area	=	7.170 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

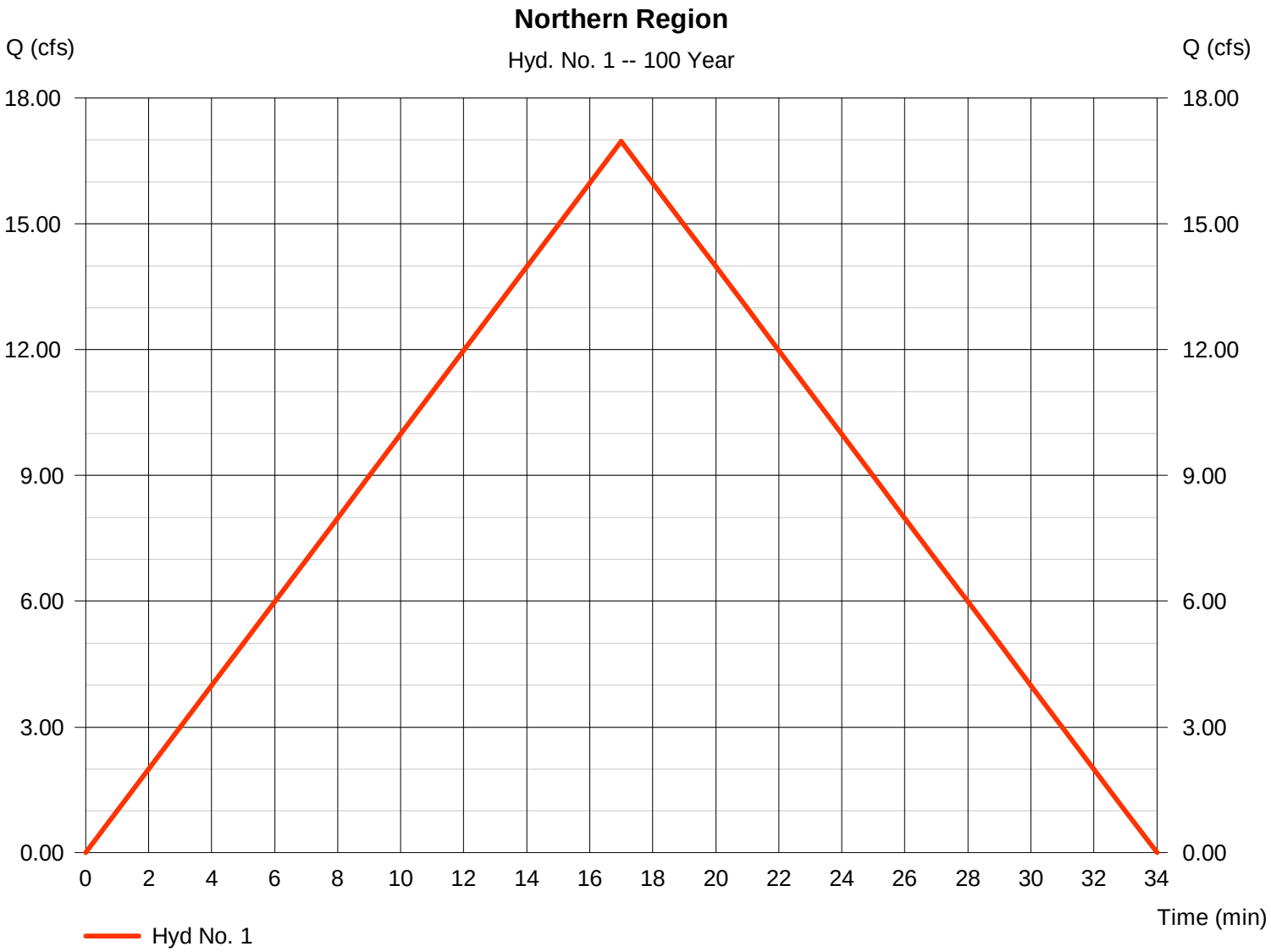
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	Rational	16.97	1	17	17,311	------	------	------	Northern Region
2	Rational	7.075	1	21	8,914	------	------	------	Southern region
3	Rational	6.248	1	16	5,998	------	------	------	South East (Anna)
4	Combine	28.56	1	17	32,224	1, 2, 3	------	------	<no description>

Hydrograph Report

Hyd. No. 1

Northern Region

Hydrograph type	=	Rational	Peak discharge	=	16.97 cfs
Storm frequency	=	100 yrs	Time to peak	=	17 min
Time interval	=	1 min	Hyd. volume	=	17,311 cuft
Drainage area	=	3.700 ac	Runoff coeff.	=	0.66
Intensity	=	6.950 in/hr	Tc by TR55	=	17.00 min
IDF Curve	=	wich_IDF.IDF	Asc/Rec limb fact	=	1/1

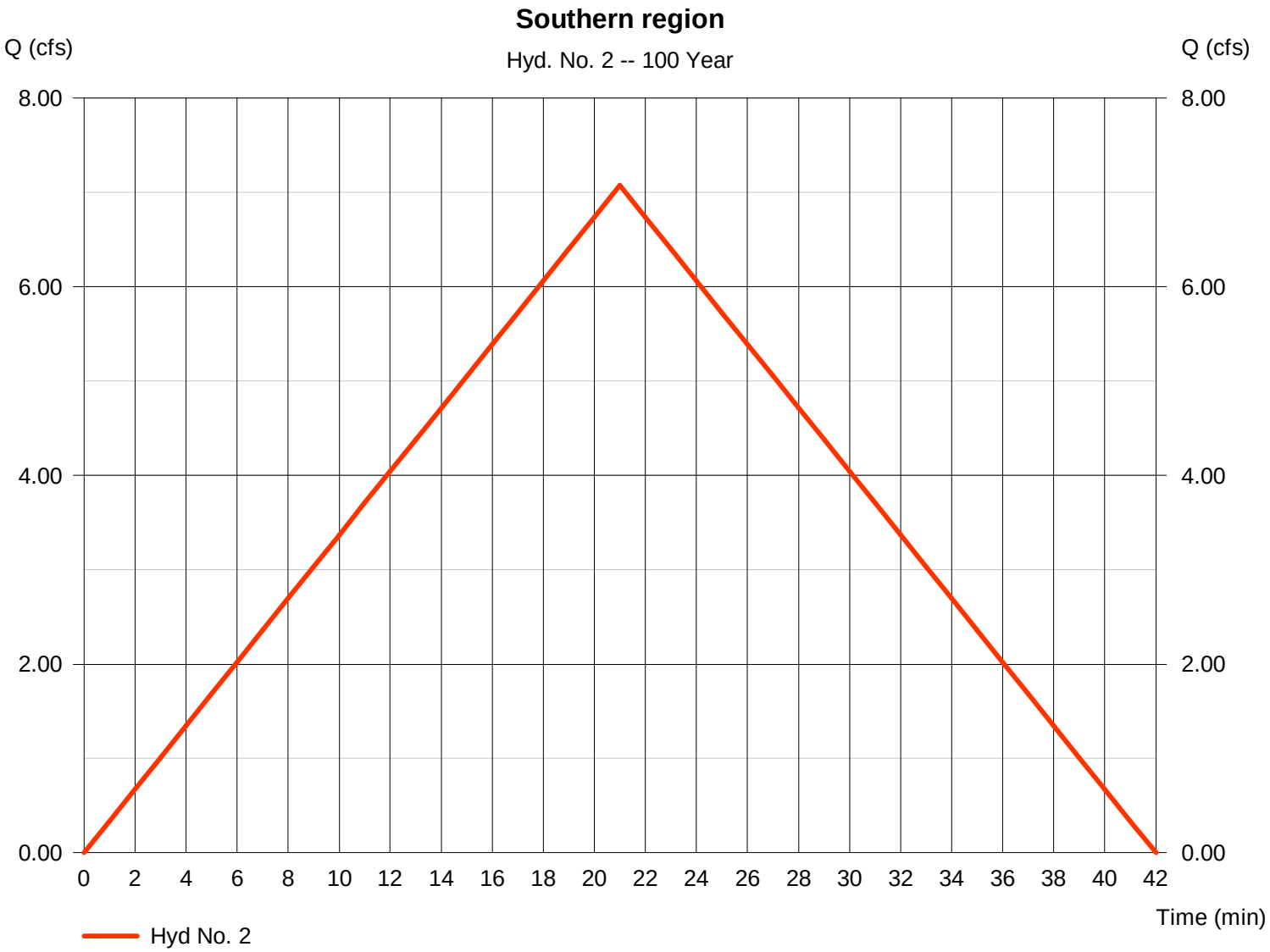


Hydrograph Report

Hyd. No. 2

Southern region

Hydrograph type	=	Rational	Peak discharge	=	7.075 cfs
Storm frequency	=	100 yrs	Time to peak	=	21 min
Time interval	=	1 min	Hyd. volume	=	8,914 cuft
Drainage area	=	2.140 ac	Runoff coeff.	=	0.52
Intensity	=	6.358 in/hr	Tc by TR55	=	21.00 min
IDF Curve	=	wich_IDF.IDF	Asc/Rec limb fact	=	1/1

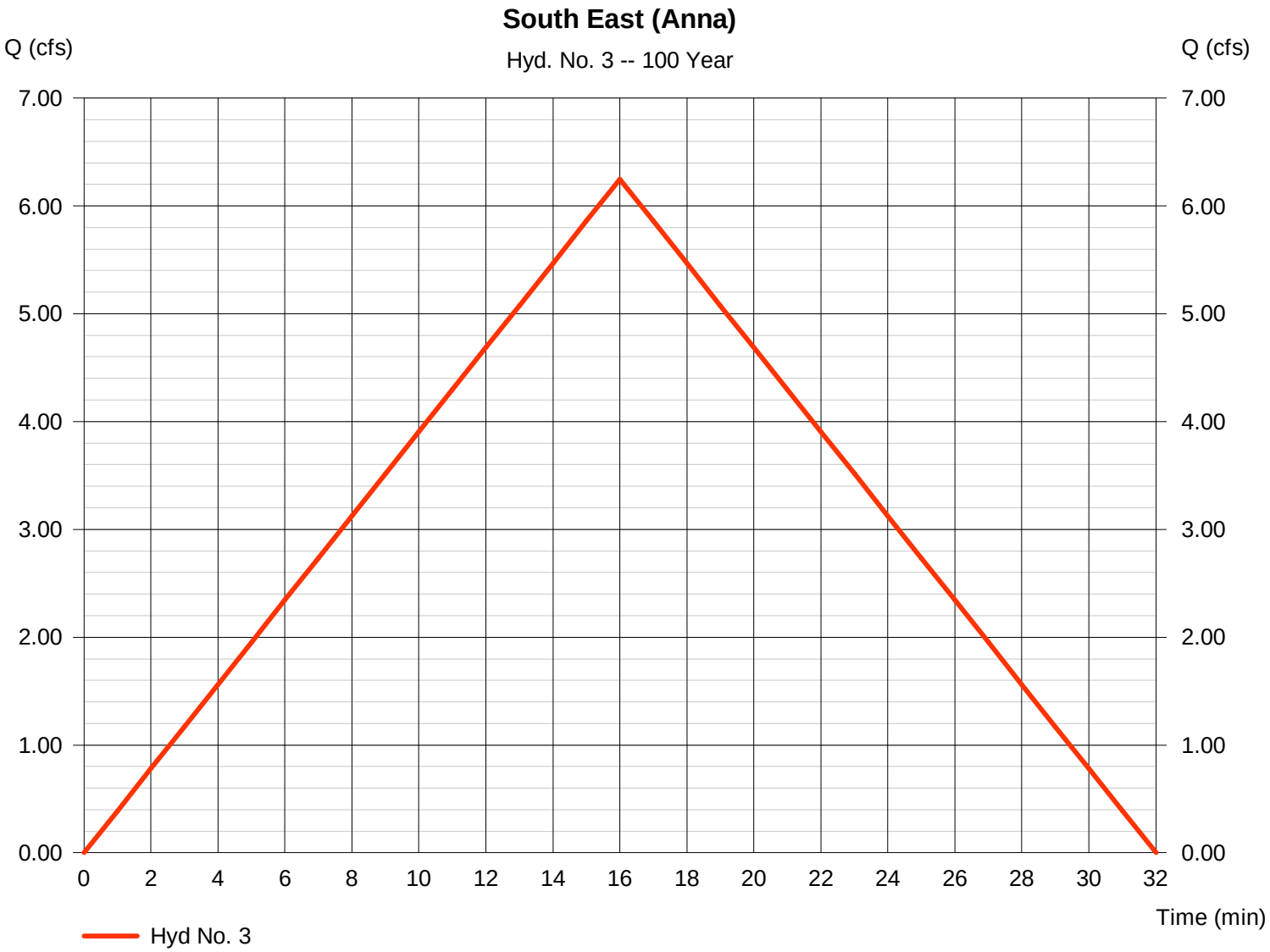


Hydrograph Report

Hyd. No. 3

South East (Anna)

Hydrograph type	=	Rational	Peak discharge	=	6.248 cfs
Storm frequency	=	100 yrs	Time to peak	=	16 min
Time interval	=	1 min	Hyd. volume	=	5,998 cuft
Drainage area	=	1.330 ac	Runoff coeff.	=	0.66
Intensity	=	7.118 in/hr	Tc by TR55	=	16.00 min
IDF Curve	=	wich_IDF.IDF	Asc/Rec limb fact	=	1/1

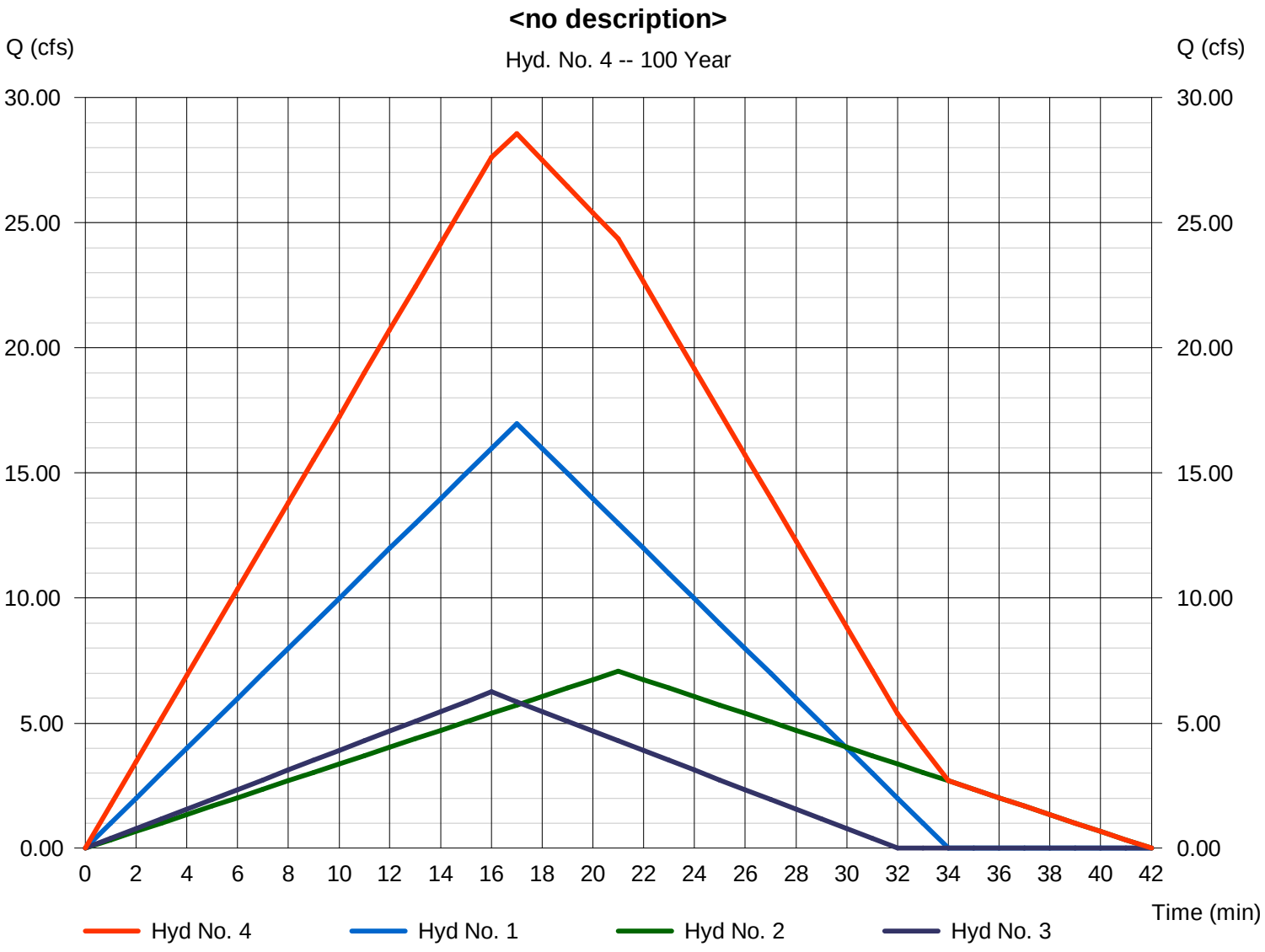


Hydrograph Report

Hyd. No. 4

<no description>

Hydrograph type	=	Combine	Peak discharge	=	28.56 cfs
Storm frequency	=	100 yrs	Time to peak	=	17 min
Time interval	=	1 min	Hyd. volume	=	32,224 cuft
Inflow hyds.	=	1, 2, 3	Contrib. drain. area	=	7.170 ac



Hydraflow Table of Contents

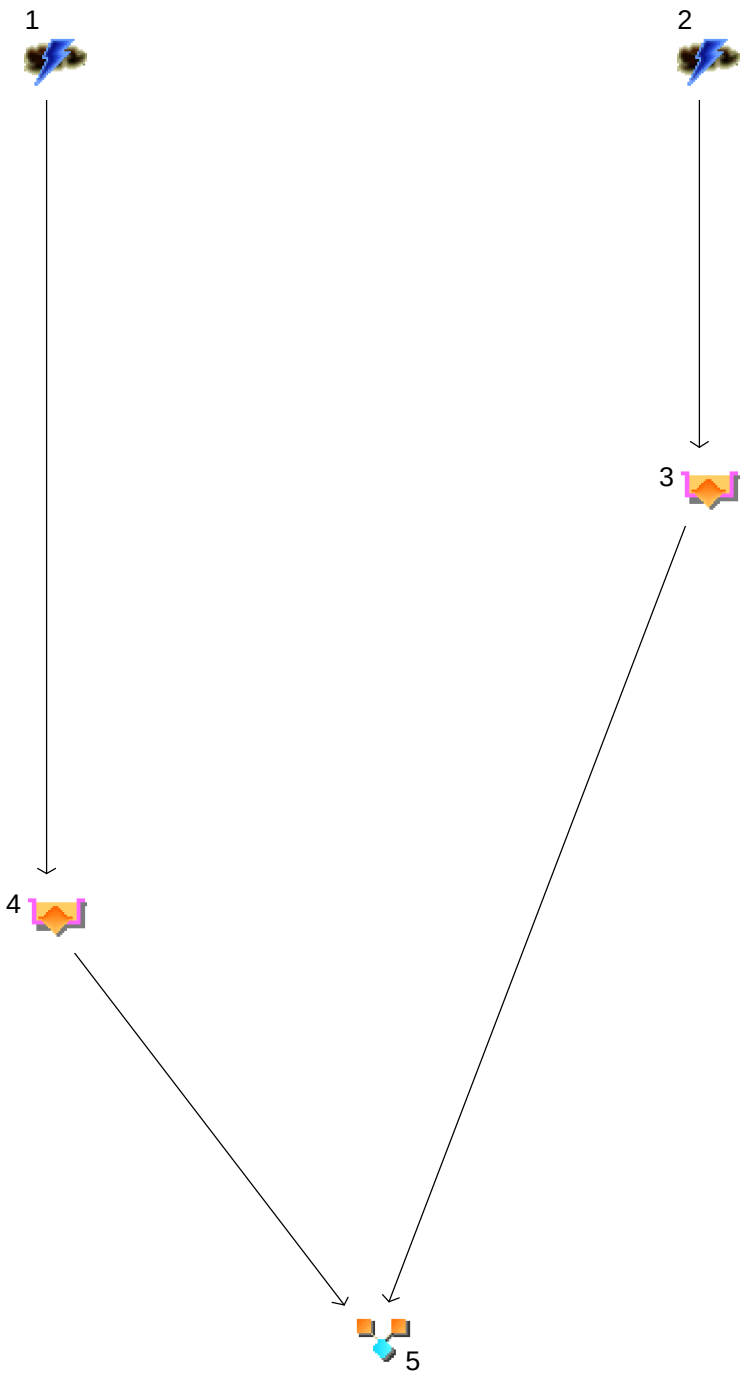
Existing.gpw

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Thursday, Oct 22, 2009

Proposed HydraFlow Model

Watershed Model Schematic

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066



Legend

Hyd.	Origin	Description
1	Rational	Northern Region
2	Rational	Southern region
3	Reservoir	South Outfall
4	Reservoir	<no description>
5	Combine	<no description>

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	Rational	------	-------	13.17	-------	15.71	17.61	20.37	-------	24.65	Northern Region
2	Rational	------	-------	5.299	-------	6.322	7.084	8.197	-------	9.919	Southern region
3	Reservoir	2	-------	2.620	-------	2.830	3.015	3.543	-------	4.233	South Outfall
4	Reservoir	1	-------	8.192	-------	8.888	10.51	12.40	-------	14.95	<no description>
5	Combine	3, 4	-------	10.05	-------	11.31	12.21	13.62	-------	15.53	<no description>

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

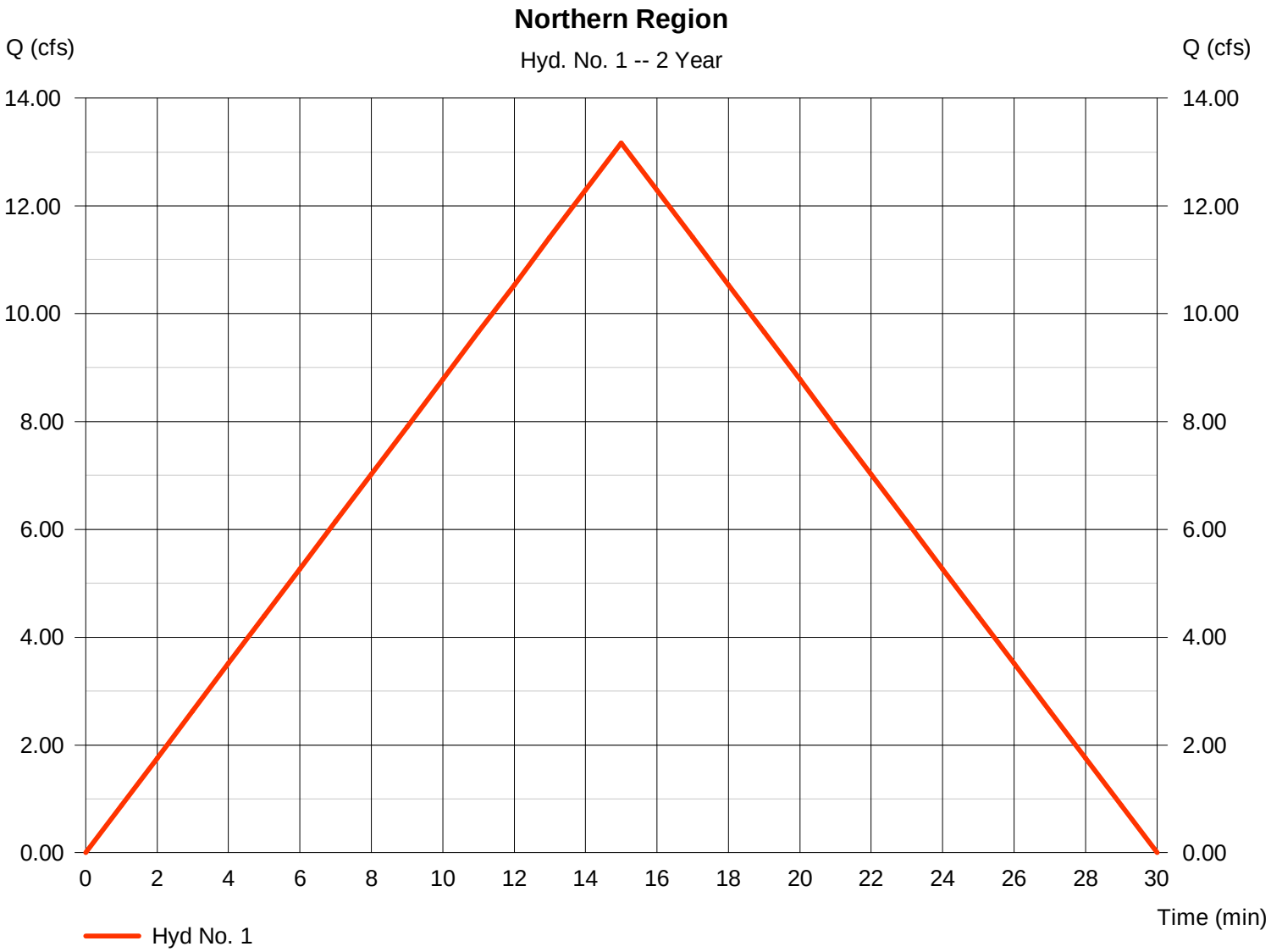
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	Rational	13.17	1	15	11,853	------	------	------	Northern Region
2	Rational	5.299	1	15	4,769	------	------	------	Southern region
3	Reservoir	2.620	1	23	4,763	2	1305.04	2,641	South Outfall
4	Reservoir	8.192	1	21	11,848	1	1304.71	4,883	<no description>
5	Combine	10.05	1	22	16,612	3, 4	------	------	<no description>

Hydrograph Report

Hyd. No. 1

Northern Region

Hydrograph type	=	Rational	Peak discharge	=	13.17 cfs
Storm frequency	=	2 yrs	Time to peak	=	15 min
Time interval	=	1 min	Hyd. volume	=	11,853 cuft
Drainage area	=	5.120 ac	Runoff coeff.	=	0.66
Intensity	=	3.897 in/hr	Tc by User	=	15.00 min
IDF Curve	=	wich_IDF.IDF	Asc/Rec limb fact	=	1/1

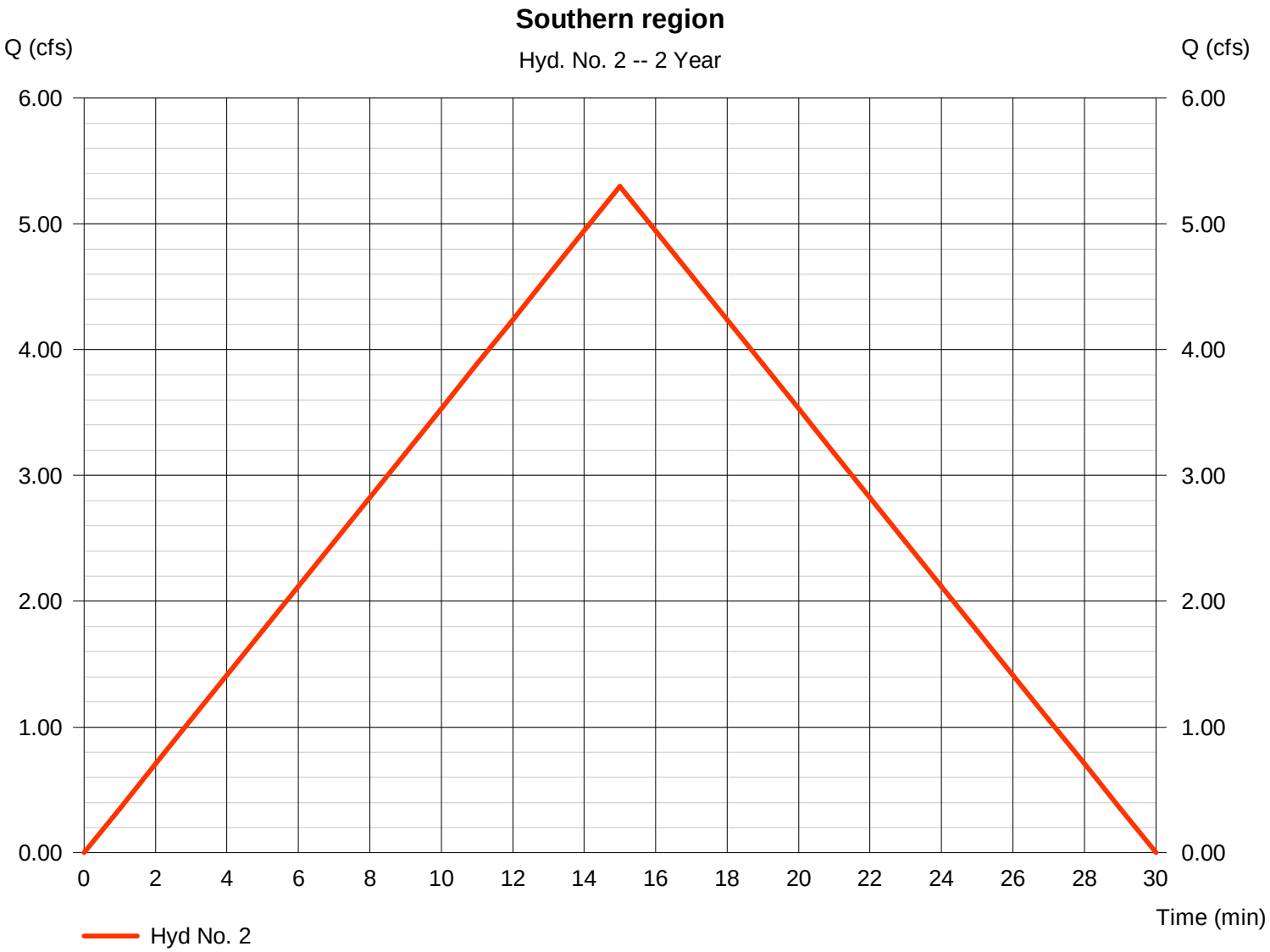


Hydrograph Report

Hyd. No. 2

Southern region

Hydrograph type	=	Rational	Peak discharge	=	5.299 cfs
Storm frequency	=	2 yrs	Time to peak	=	15 min
Time interval	=	1 min	Hyd. volume	=	4,769 cuft
Drainage area	=	2.060 ac	Runoff coeff.	=	0.66
Intensity	=	3.897 in/hr	Tc by User	=	15.00 min
IDF Curve	=	wich_IDF.IDF	Asc/Rec limb fact	=	1/1



Hydrograph Report

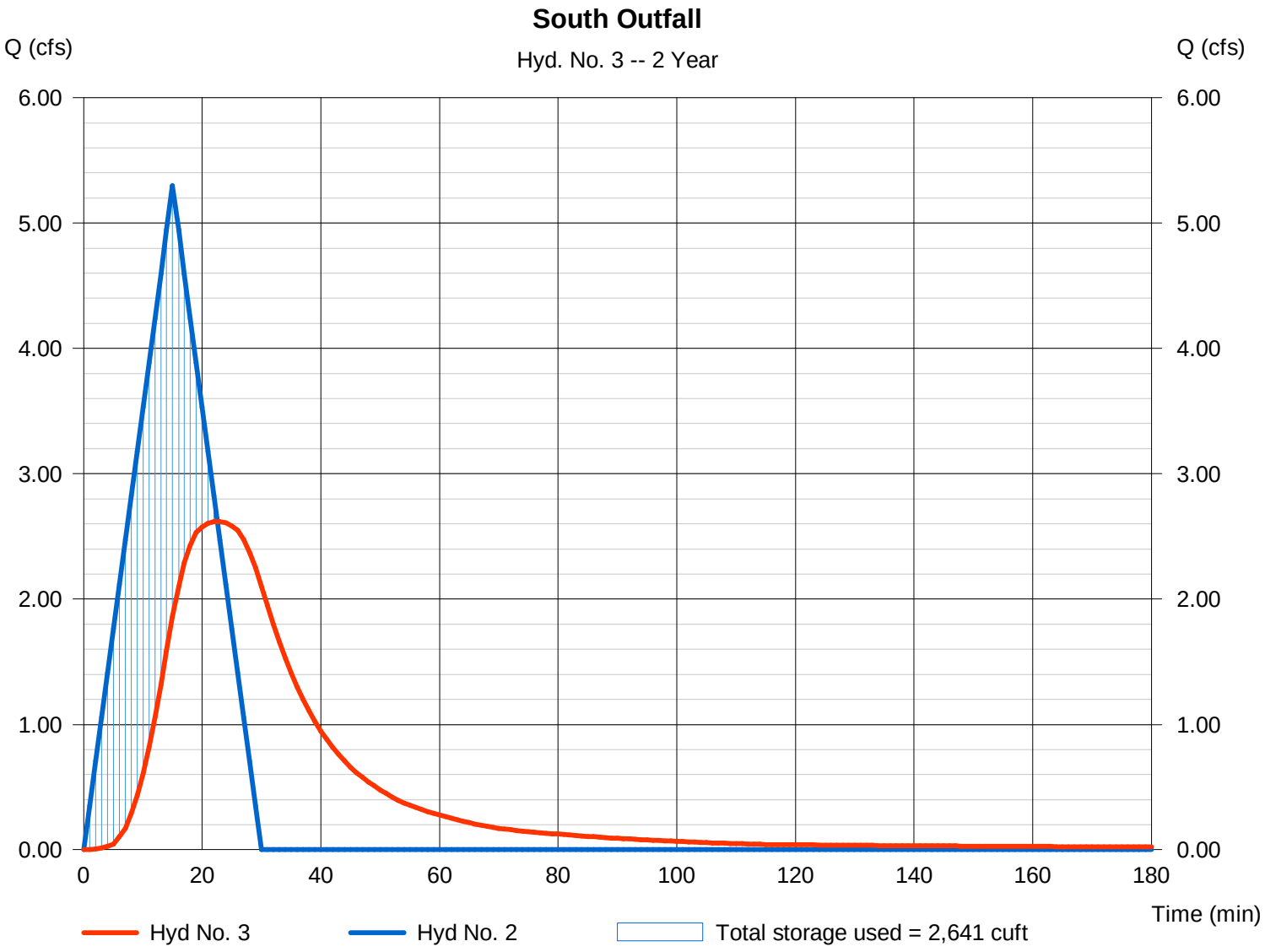
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Monday, Nov 9, 2009

Hyd. No. 3

South Outfall

Hydrograph type	=	Reservoir	Peak discharge	=	2.620 cfs
Storm frequency	=	2 yrs	Time to peak	=	23 min
Time interval	=	1 min	Hyd. volume	=	4,763 cuft
Inflow hyd. No.	=	2 - Southern region	Max. Elevation	=	1305.04 ft
Reservoir name	=	South West Pond	Max. Storage	=	2,641 cuft

Storage Indication method used.



Pond Report

Pond No. 2 - South West Pond

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 1304.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1304.00	2,116	0	0
1.00	1305.00	2,916	2,505	2,505
2.00	1306.00	3,845	3,369	5,875
3.00	1307.00	4,900	4,361	10,236

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 15.00	0.00	0.00	0.00
Span (in)	= 15.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 1304.00	0.00	0.00	0.00
Length (ft)	= 150.00	0.00	0.00	0.00
Slope (%)	= 0.25	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

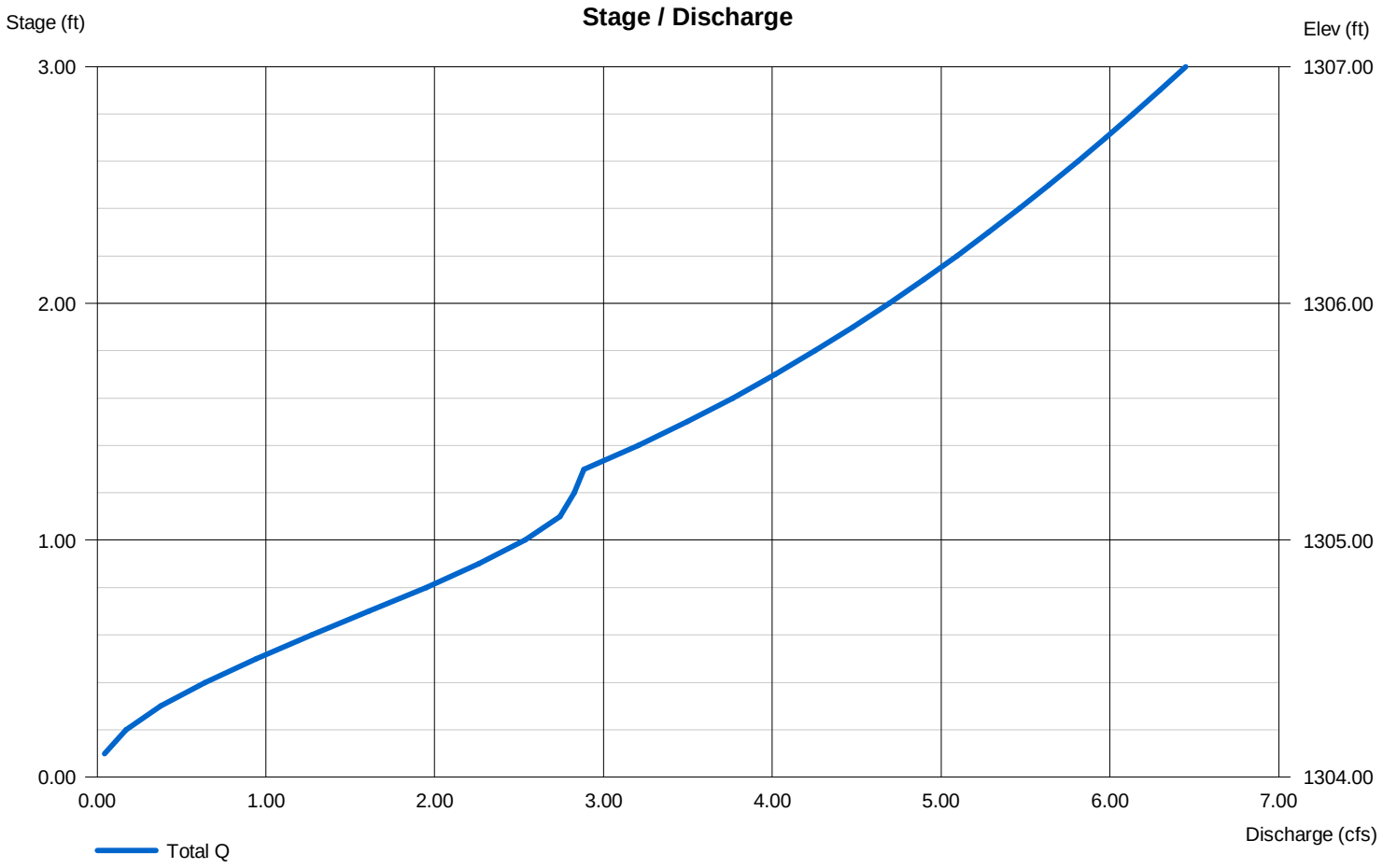
Weir Structures

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

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

TW Elev. (ft) = 0.00

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



Hydrograph Report

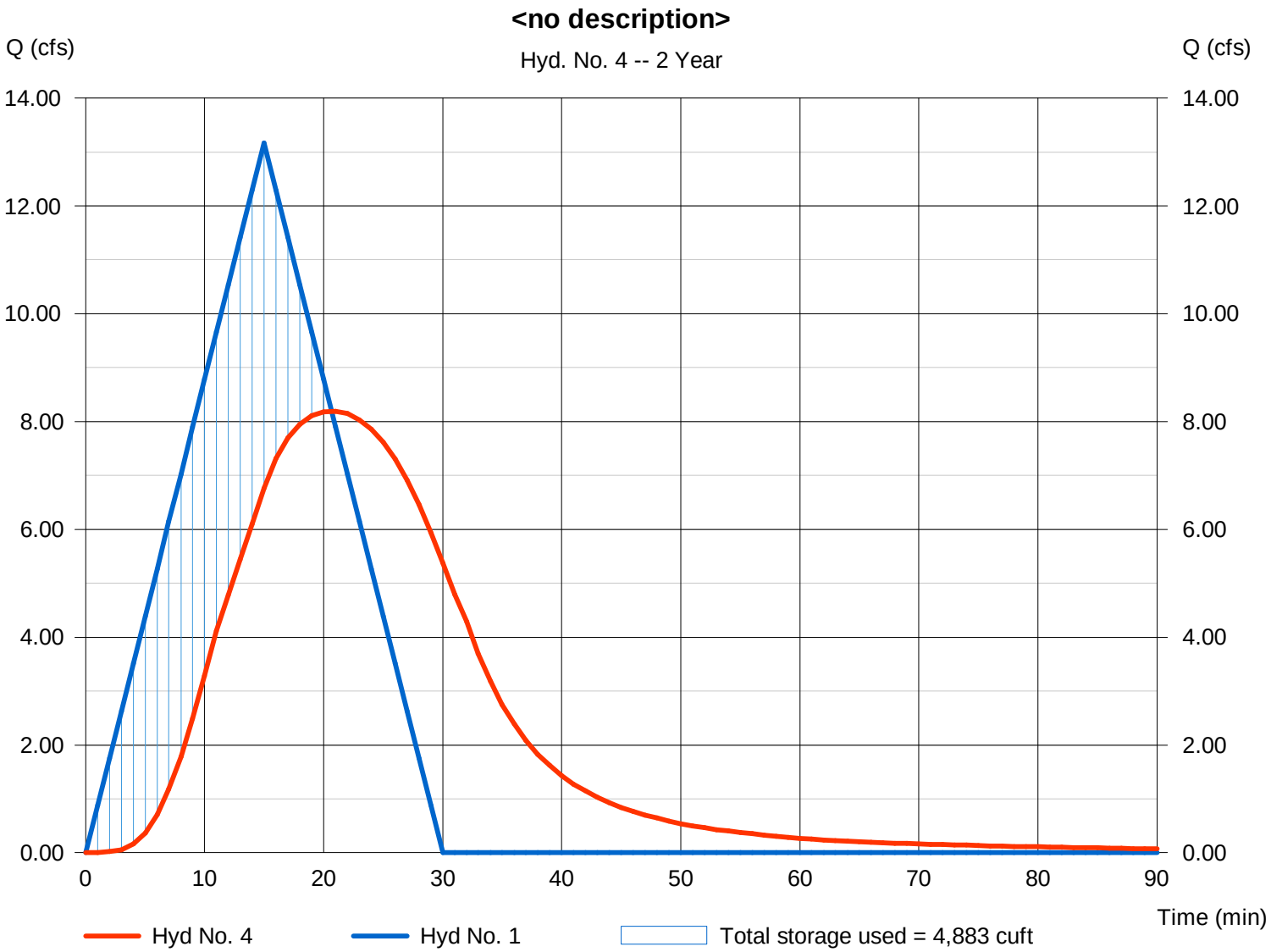
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Monday, Nov 9, 2009

Hyd. No. 4

<no description>

Hydrograph type	=	Reservoir	Peak discharge	=	8.192 cfs
Storm frequency	=	2 yrs	Time to peak	=	21 min
Time interval	=	1 min	Hyd. volume	=	11,848 cuft
Inflow hyd. No.	=	1 - Northern Region	Max. Elevation	=	1304.71 ft
Reservoir name	=	NorthEast Pond	Max. Storage	=	4,883 cuft

Storage Indication method used.



Pond No. 1 - NorthEast Pond

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 1303.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	1303.00	2,116	0	0
1.00	1304.00	2,916	2,505	2,505
2.00	1305.00	3,845	3,369	5,875
3.00	1306.00	4,900	4,361	10,236
4.00	1307.00	6,084	5,481	15,717

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 24.00	0.00	0.00	0.00
Span (in)	= 24.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 1303.00	0.00	0.00	0.00
Length (ft)	= 150.00	0.00	0.00	0.00
Slope (%)	= 0.25	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

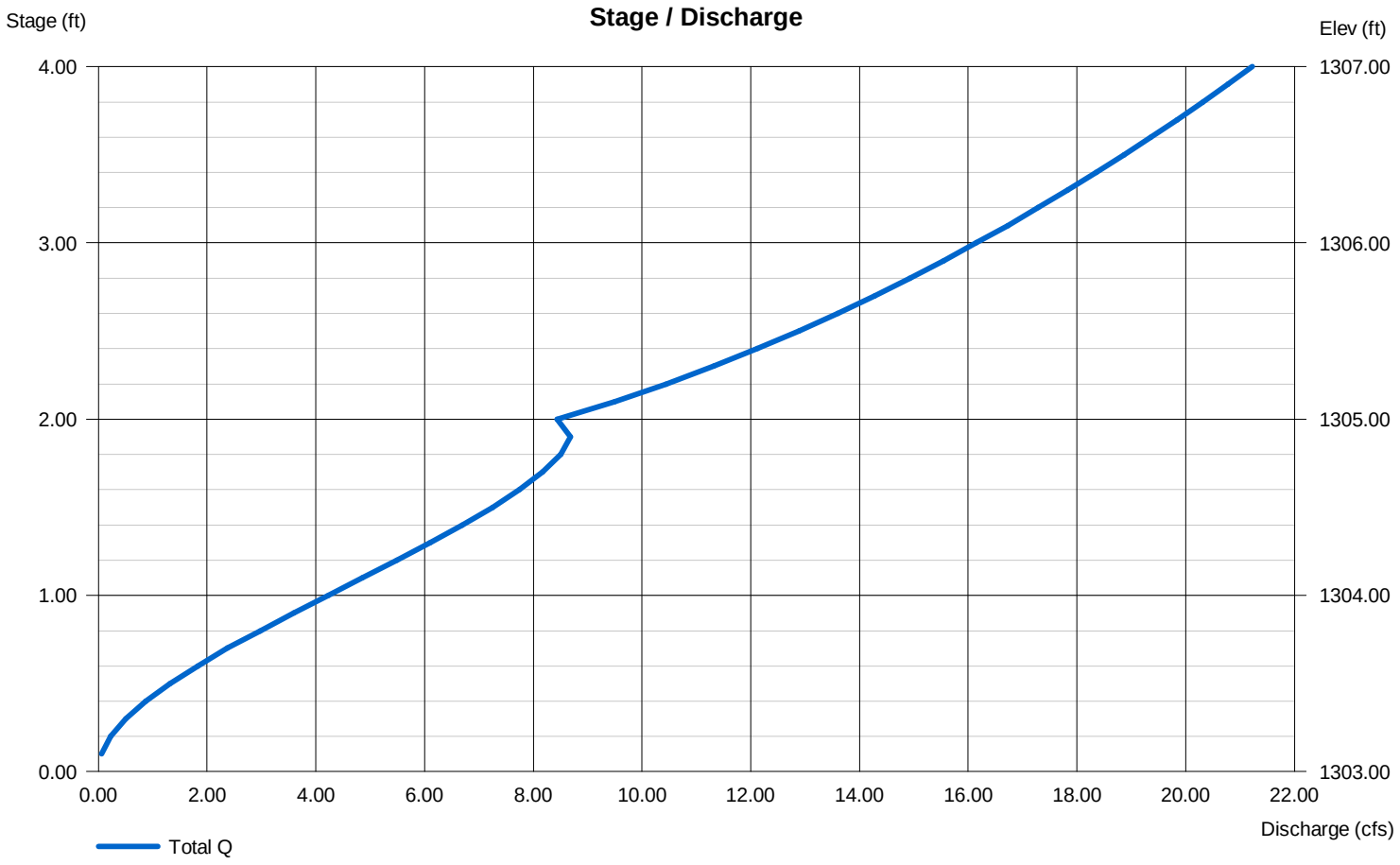
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	Inactive	0.00	0.00	0.00
Crest El. (ft)	= 1305.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= No	No	No	No

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

TW Elev. (ft) = 0.00

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

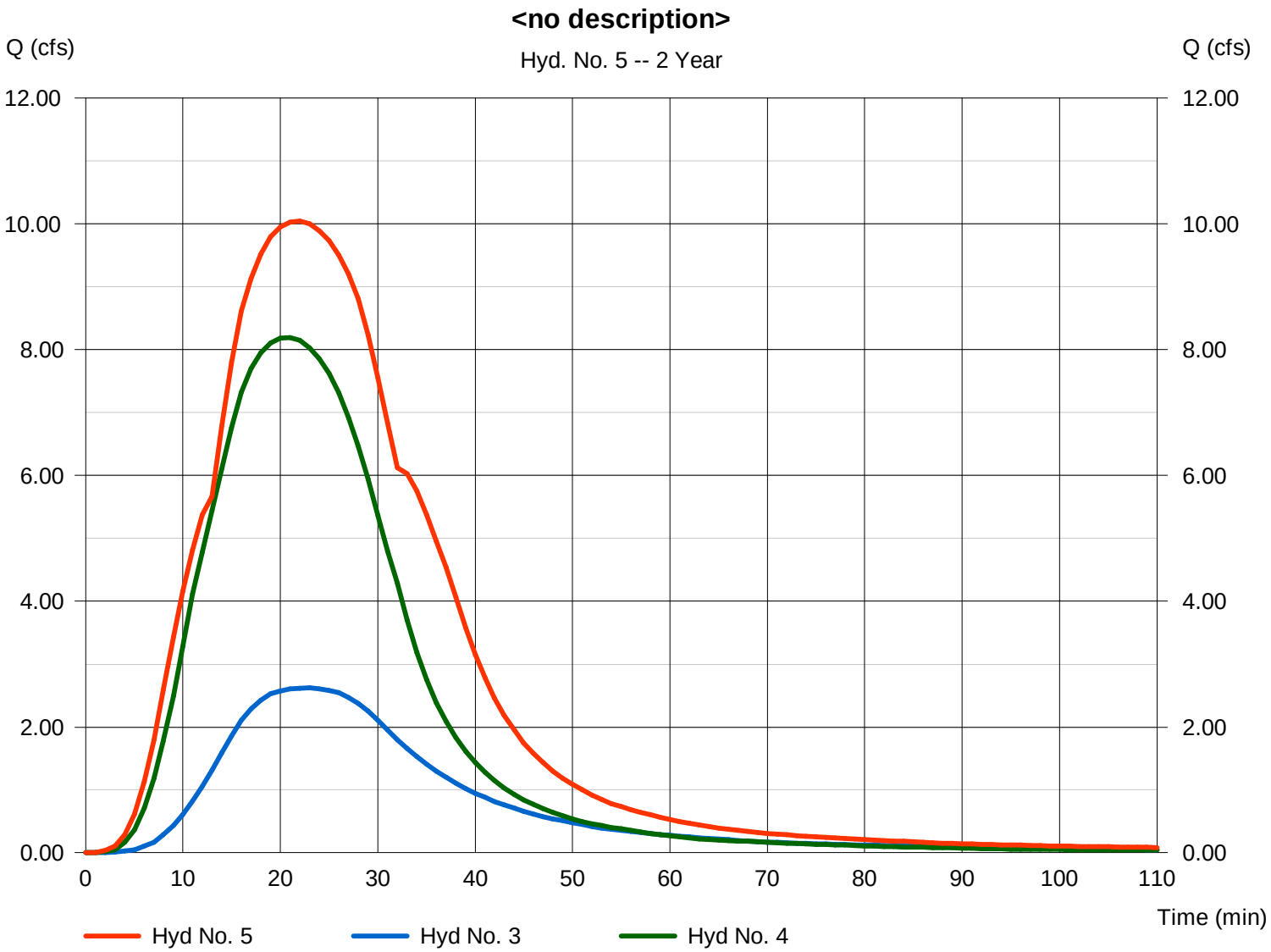


Hydrograph Report

Hyd. No. 5

<no description>

Hydrograph type	=	Combine	Peak discharge	=	10.05 cfs
Storm frequency	=	2 yrs	Time to peak	=	22 min
Time interval	=	1 min	Hyd. volume	=	16,612 cuft
Inflow hyds.	=	3, 4	Contrib. drain. area	=	0.000 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

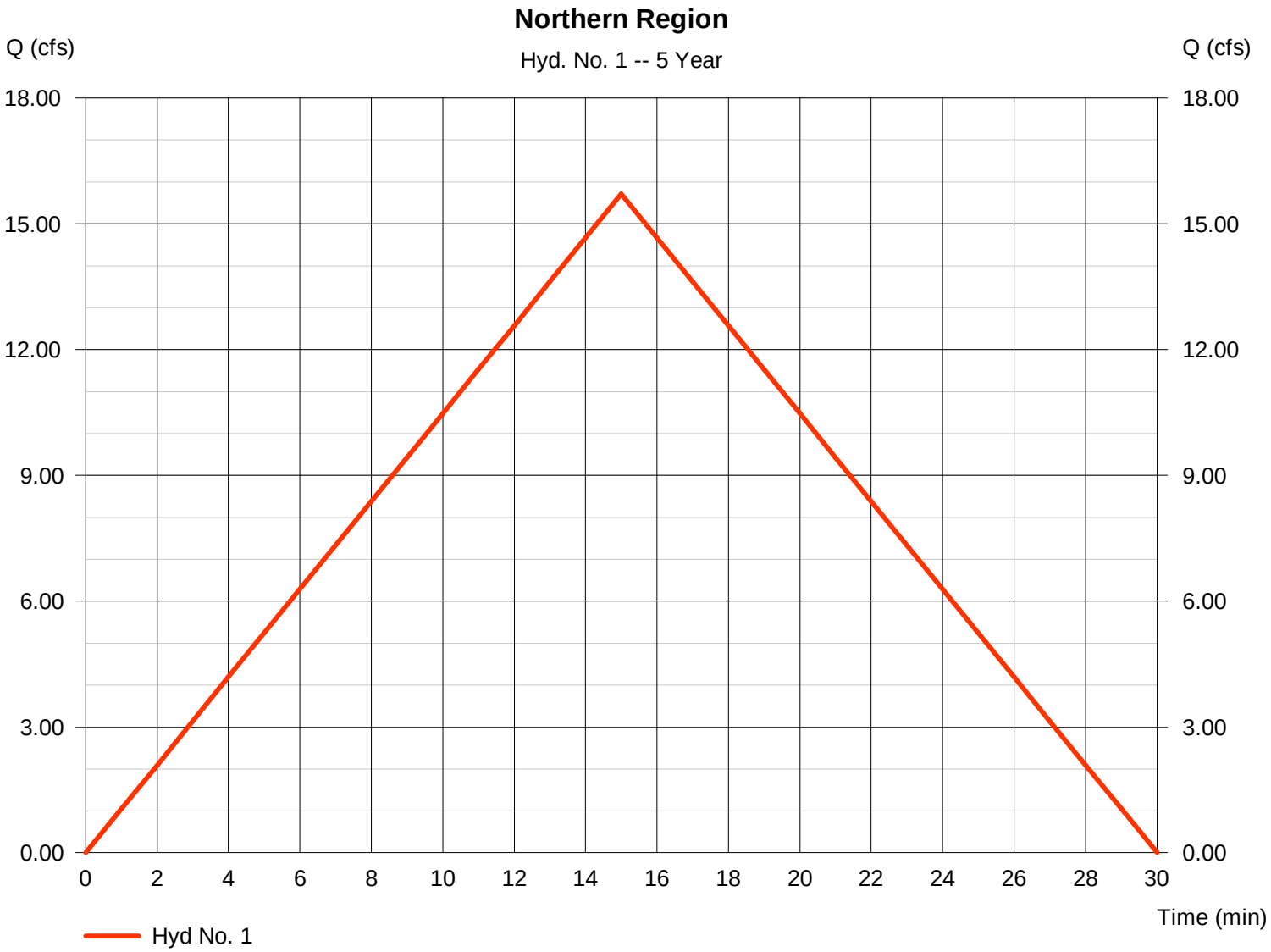
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	Rational	15.71	1	15	14,141	------	------	------	Northern Region
2	Rational	6.322	1	15	5,689	------	------	------	Southern region
3	Reservoir	2.830	1	23	5,683	2	1305.21	3,196	South Outfall
4	Reservoir	8.888	1	22	14,136	1	1305.05	6,061	<no description>
5	Combine	11.31	1	22	19,821	3, 4	------	------	<no description>

Hydrograph Report

Hyd. No. 1

Northern Region

Hydrograph type	=	Rational	Peak discharge	=	15.71 cfs
Storm frequency	=	5 yrs	Time to peak	=	15 min
Time interval	=	1 min	Hyd. volume	=	14,141 cuft
Drainage area	=	5.120 ac	Runoff coeff.	=	0.66
Intensity	=	4.650 in/hr	Tc by User	=	15.00 min
IDF Curve	=	wich_IDF.IDF	Asc/Rec limb fact	=	1/1

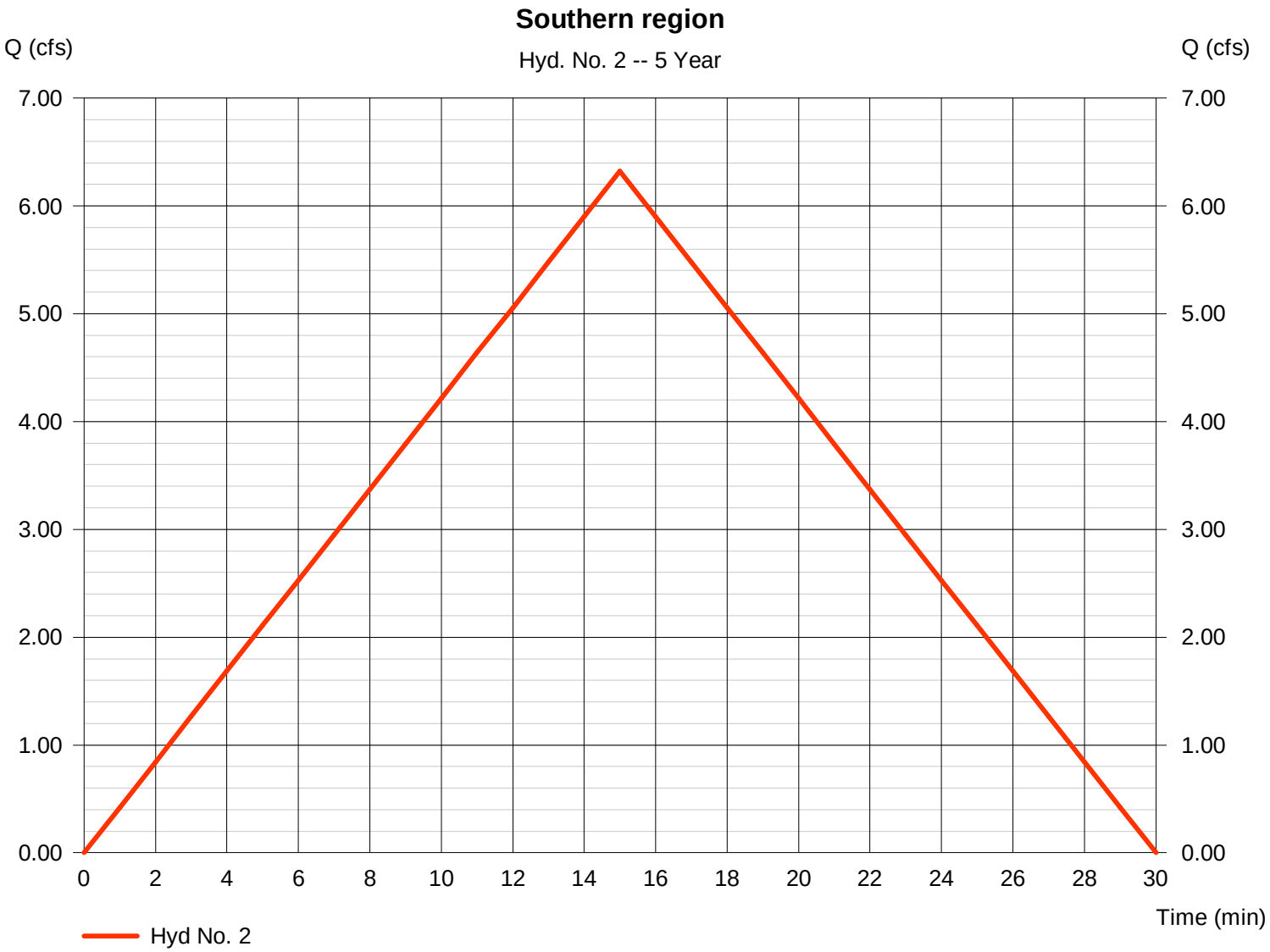


Hydrograph Report

Hyd. No. 2

Southern region

Hydrograph type	=	Rational	Peak discharge	=	6.322 cfs
Storm frequency	=	5 yrs	Time to peak	=	15 min
Time interval	=	1 min	Hyd. volume	=	5,689 cuft
Drainage area	=	2.060 ac	Runoff coeff.	=	0.66
Intensity	=	4.650 in/hr	Tc by User	=	15.00 min
IDF Curve	=	wich_IDF.IDF	Asc/Rec limb fact	=	1/1



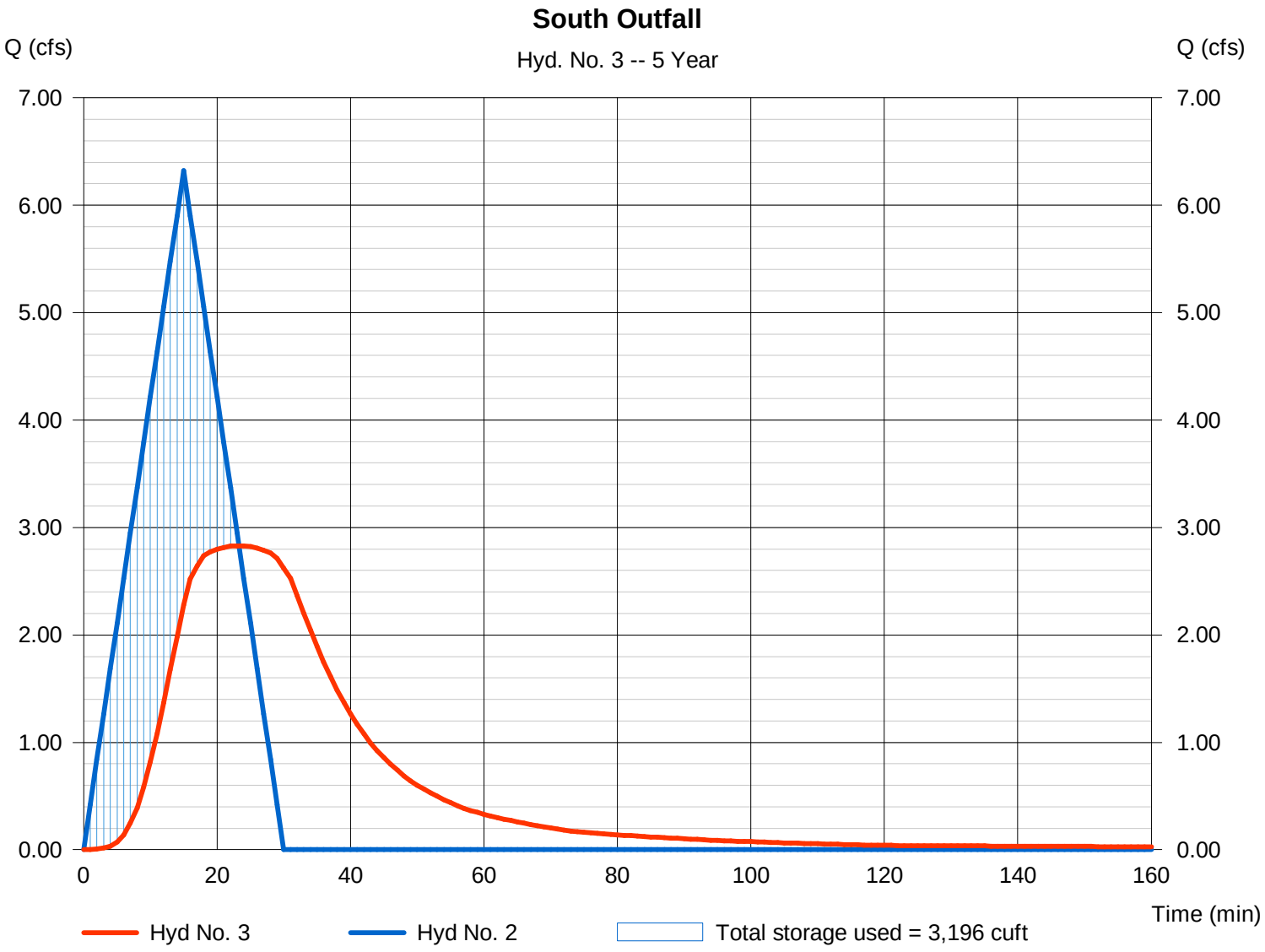
Hydrograph Report

Hyd. No. 3

South Outfall

Hydrograph type	=	Reservoir	Peak discharge	=	2.830 cfs
Storm frequency	=	5 yrs	Time to peak	=	23 min
Time interval	=	1 min	Hyd. volume	=	5,683 cuft
Inflow hyd. No.	=	2 - Southern region	Max. Elevation	=	1305.21 ft
Reservoir name	=	South West Pond	Max. Storage	=	3,196 cuft

Storage Indication method used.



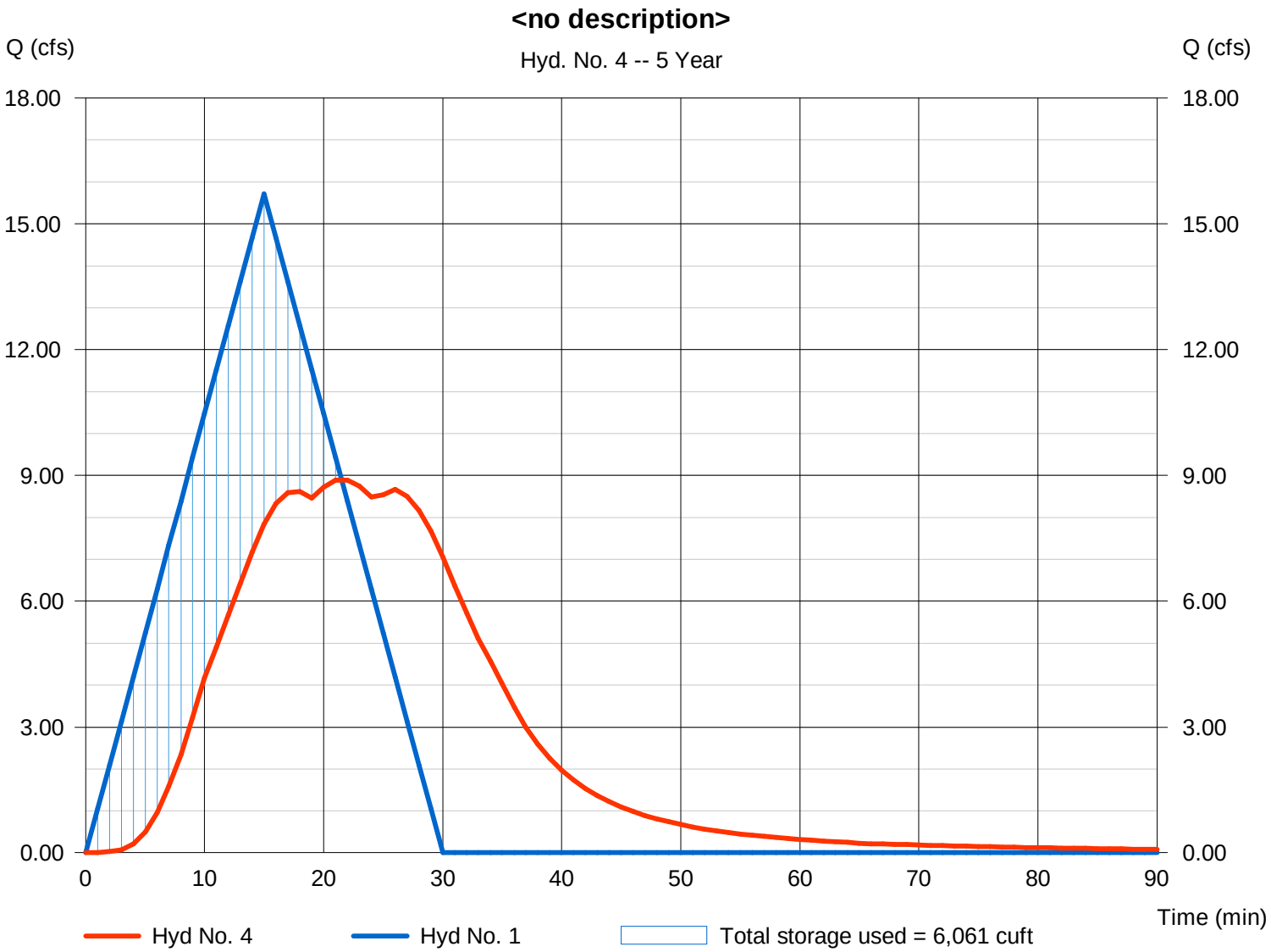
Hydrograph Report

Hyd. No. 4

<no description>

Hydrograph type	=	Reservoir	Peak discharge	=	8.888 cfs
Storm frequency	=	5 yrs	Time to peak	=	22 min
Time interval	=	1 min	Hyd. volume	=	14,136 cuft
Inflow hyd. No.	=	1 - Northern Region	Max. Elevation	=	1305.05 ft
Reservoir name	=	NorthEast Pond	Max. Storage	=	6,061 cuft

Storage Indication method used.

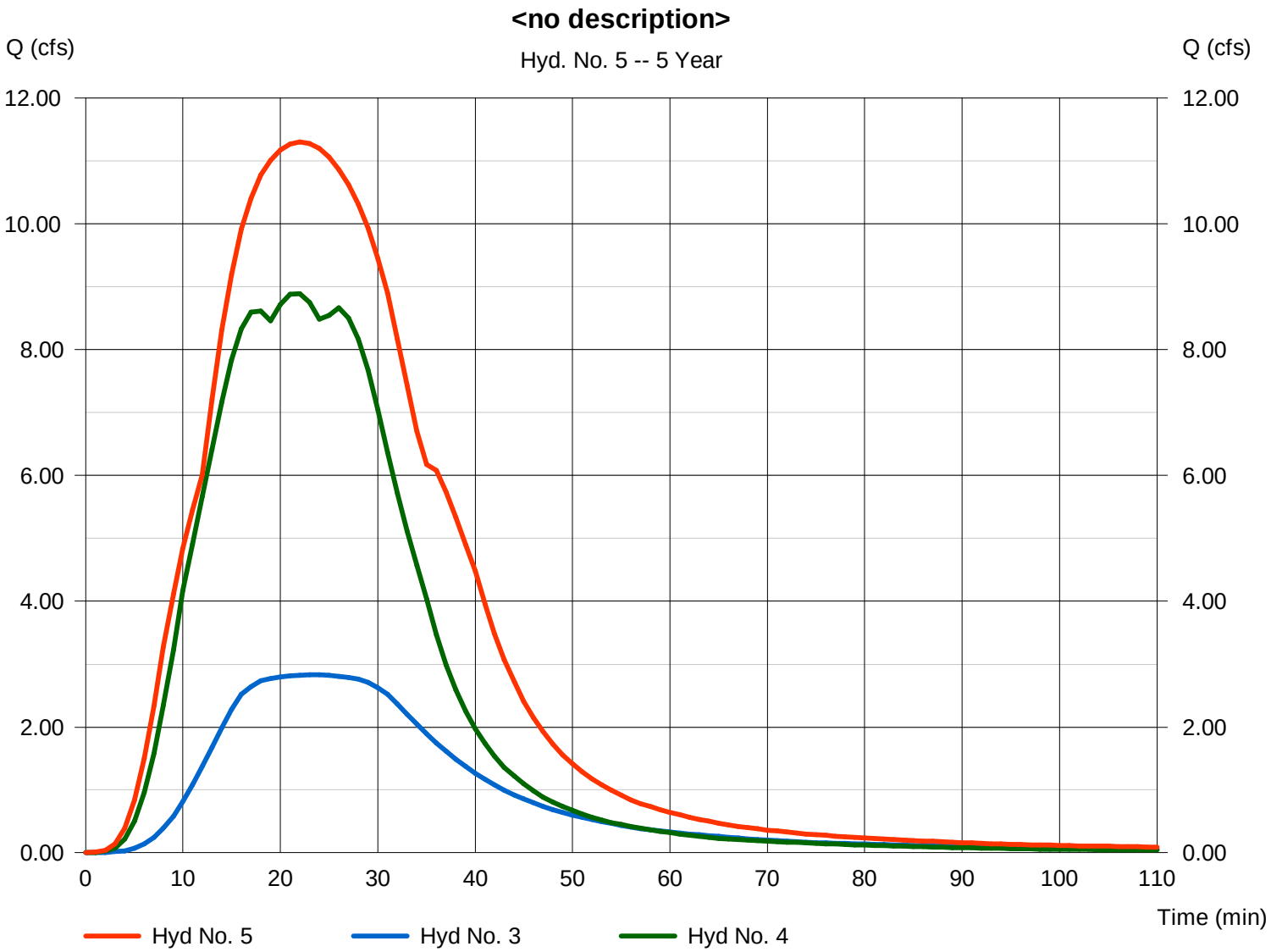


Hydrograph Report

Hyd. No. 5

<no description>

Hydrograph type	= Combine	Peak discharge	= 11.31 cfs
Storm frequency	= 5 yrs	Time to peak	= 22 min
Time interval	= 1 min	Hyd. volume	= 19,821 cuft
Inflow hyds.	= 3, 4	Contrib. drain. area	= 0.000 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

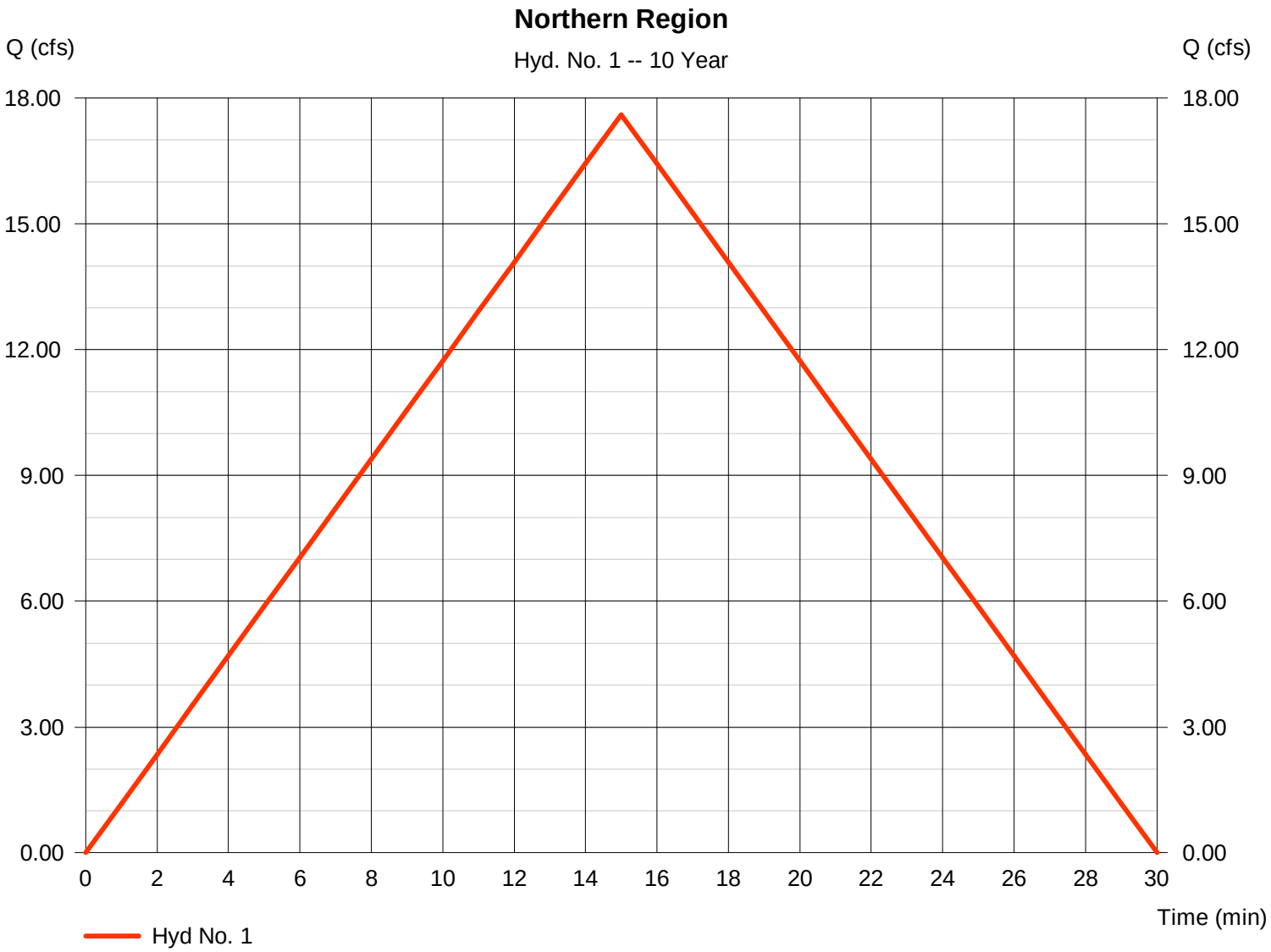
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	Rational	17.61	1	15	15,846	------	------	------	Northern Region
2	Rational	7.084	1	15	6,375	------	------	------	Southern region
3	Reservoir	3.015	1	24	6,369	2	1305.34	3,653	South Outfall
4	Reservoir	10.51	1	21	15,841	1	1305.21	6,778	<no description>
5	Combine	12.21	1	23	22,211	3, 4	------	------	<no description>

Hydrograph Report

Hyd. No. 1

Northern Region

Hydrograph type	=	Rational	Peak discharge	=	17.61 cfs
Storm frequency	=	10 yrs	Time to peak	=	15 min
Time interval	=	1 min	Hyd. volume	=	15,846 cuft
Drainage area	=	5.120 ac	Runoff coeff.	=	0.66
Intensity	=	5.210 in/hr	Tc by User	=	15.00 min
IDF Curve	=	wich_IDF.IDF	Asc/Rec limb fact	=	1/1

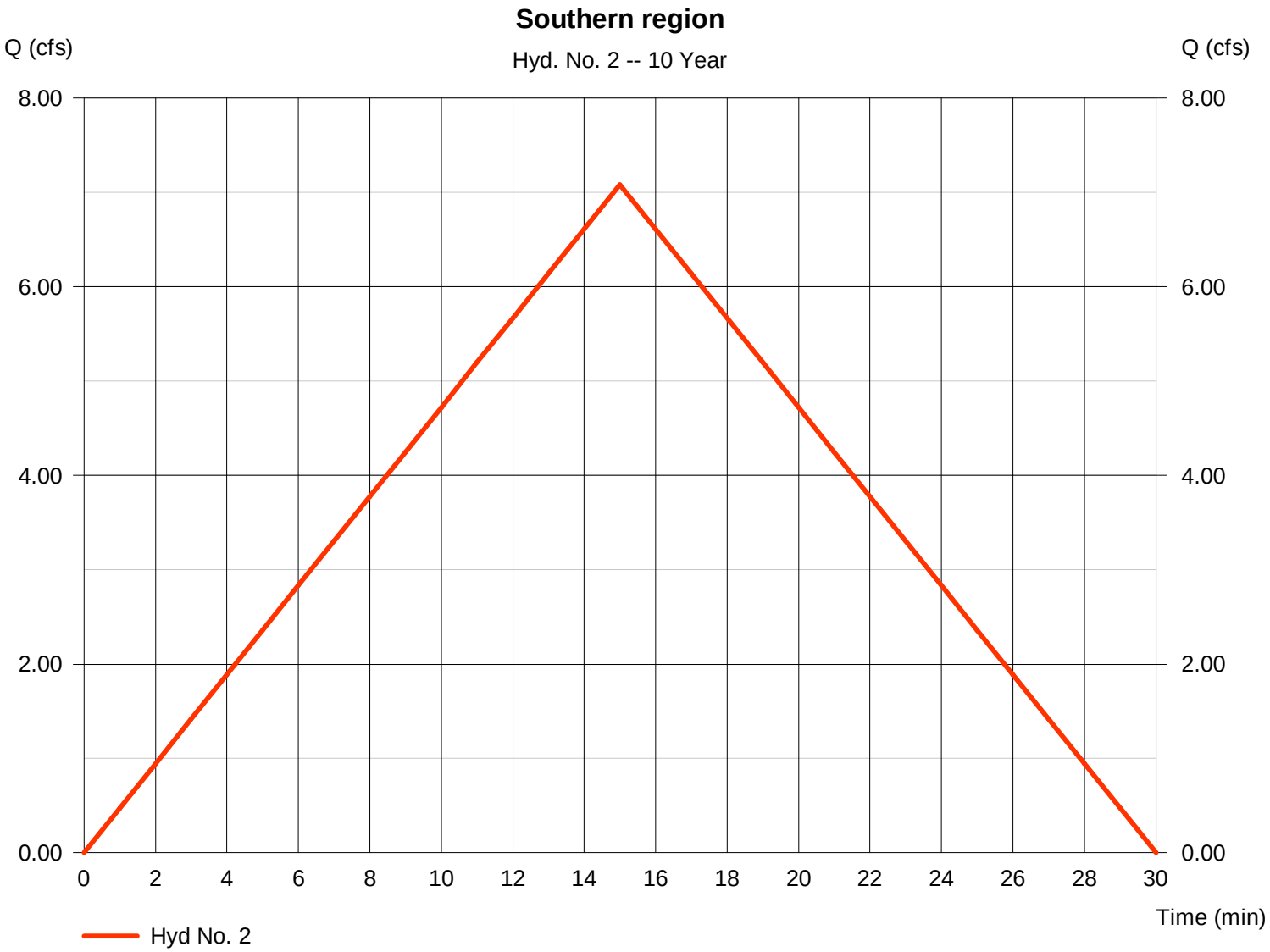


Hydrograph Report

Hyd. No. 2

Southern region

Hydrograph type	=	Rational	Peak discharge	=	7.084 cfs
Storm frequency	=	10 yrs	Time to peak	=	15 min
Time interval	=	1 min	Hyd. volume	=	6,375 cuft
Drainage area	=	2.060 ac	Runoff coeff.	=	0.66
Intensity	=	5.210 in/hr	Tc by User	=	15.00 min
IDF Curve	=	wich_IDF.IDF	Asc/Rec limb fact	=	1/1



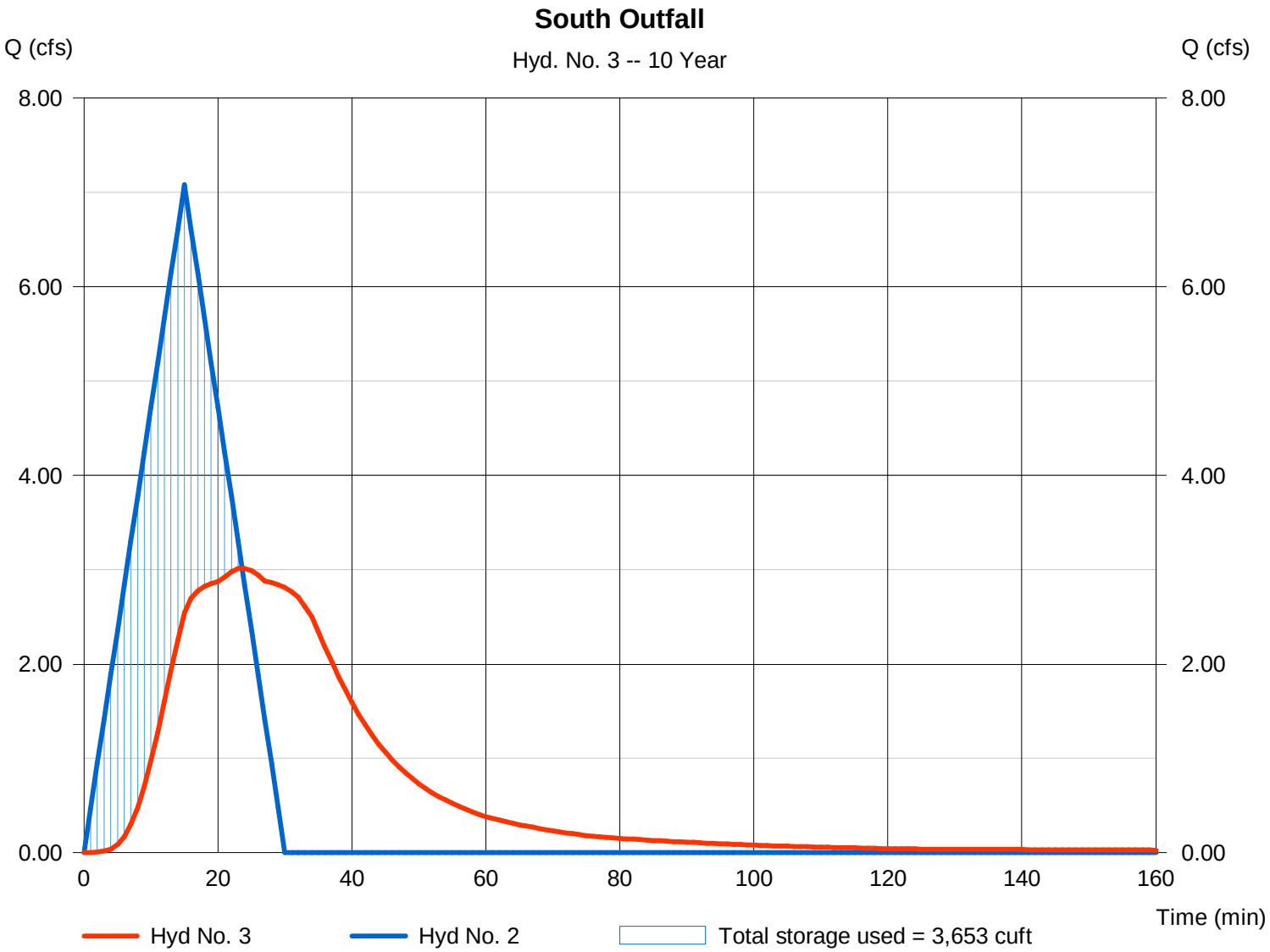
Hydrograph Report

Hyd. No. 3

South Outfall

Hydrograph type	=	Reservoir	Peak discharge	=	3.015 cfs
Storm frequency	=	10 yrs	Time to peak	=	24 min
Time interval	=	1 min	Hyd. volume	=	6,369 cuft
Inflow hyd. No.	=	2 - Southern region	Max. Elevation	=	1305.34 ft
Reservoir name	=	South West Pond	Max. Storage	=	3,653 cuft

Storage Indication method used.



Hydrograph Report

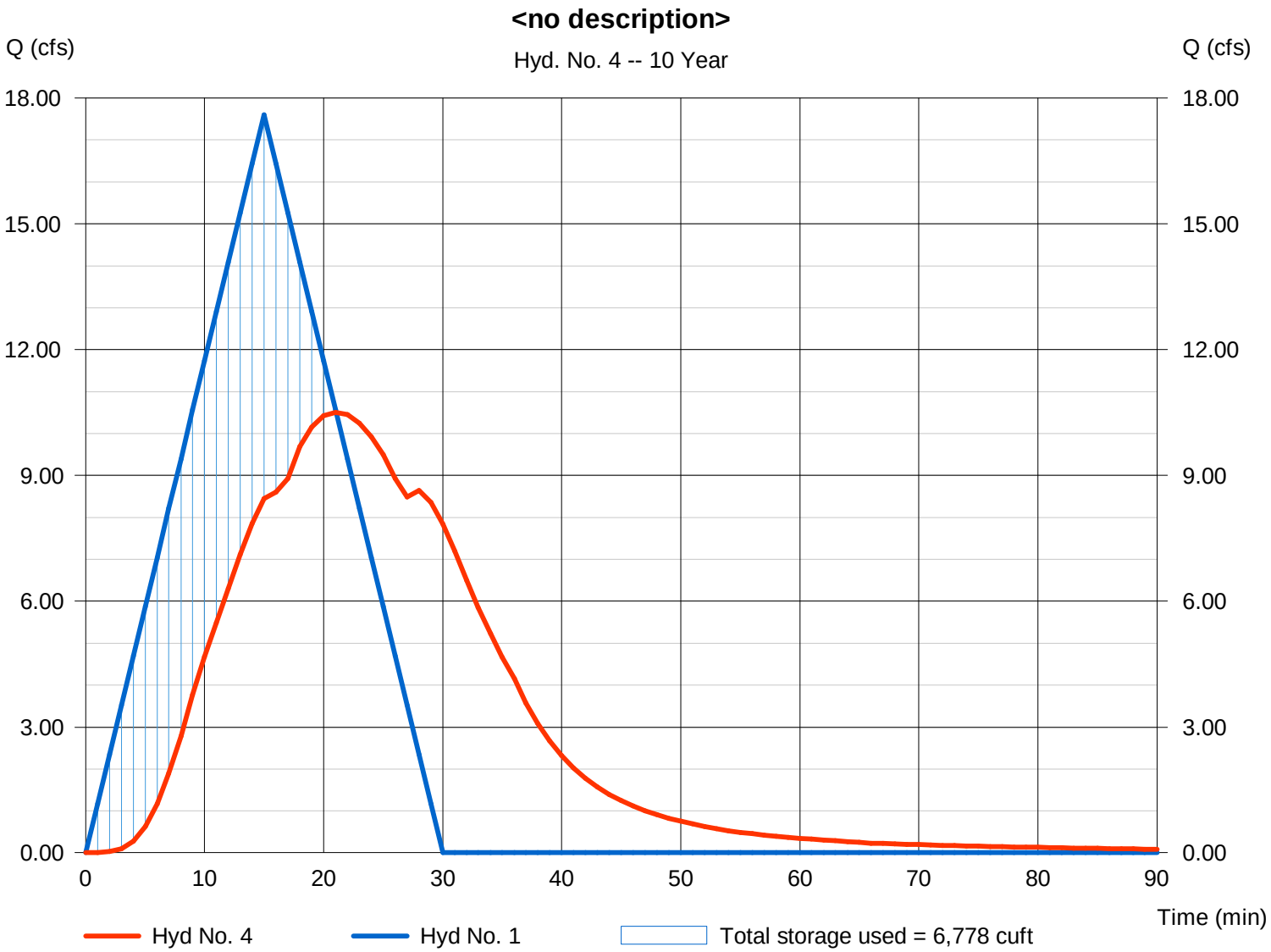
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Monday, Nov 9, 2009

Hyd. No. 4

<no description>

Hydrograph type	=	Reservoir	Peak discharge	=	10.51 cfs
Storm frequency	=	10 yrs	Time to peak	=	21 min
Time interval	=	1 min	Hyd. volume	=	15,841 cuft
Inflow hyd. No.	=	1 - Northern Region	Max. Elevation	=	1305.21 ft
Reservoir name	=	NorthEast Pond	Max. Storage	=	6,778 cuft

Storage Indication method used.

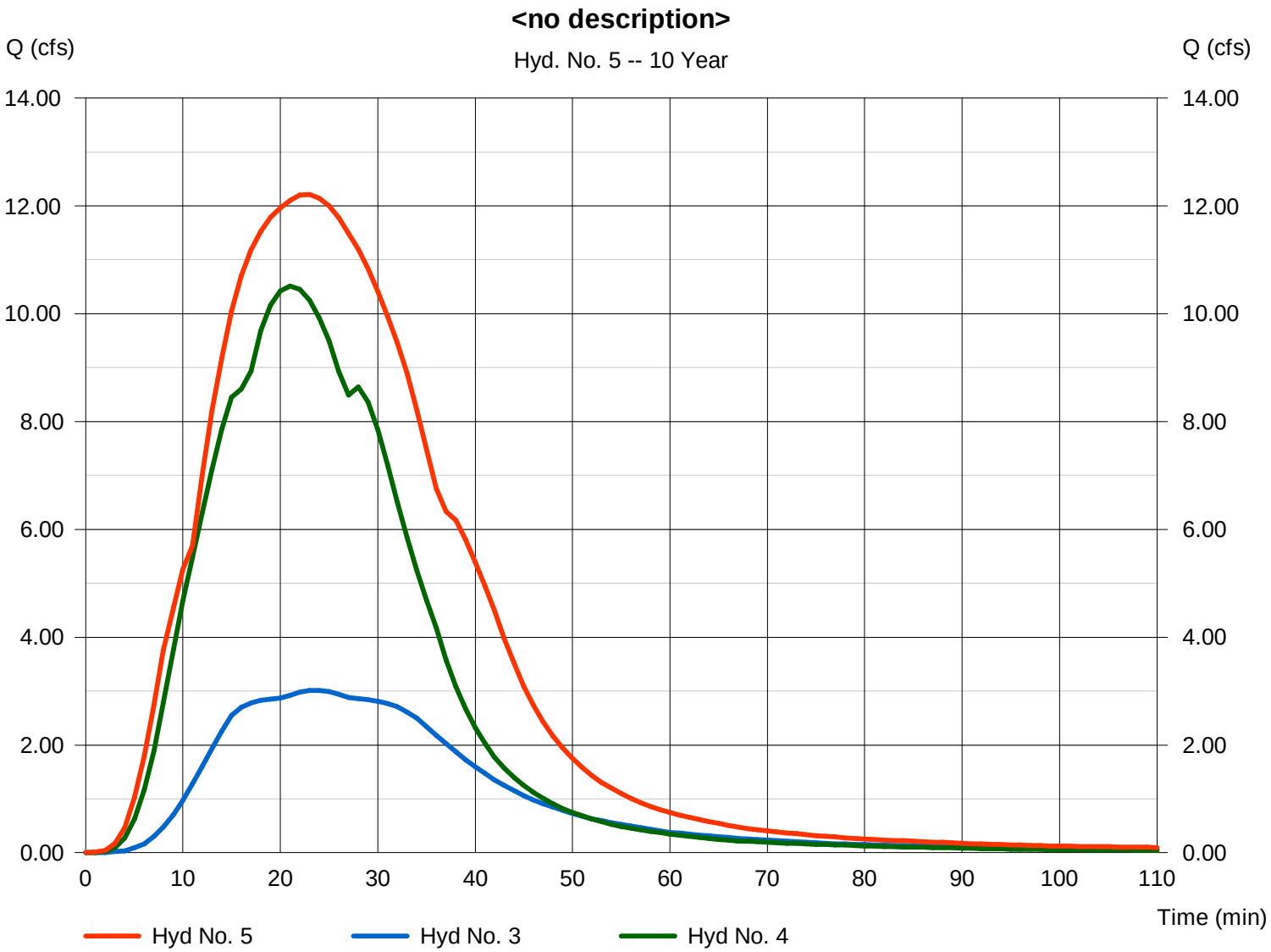


Hydrograph Report

Hyd. No. 5

<no description>

Hydrograph type	= Combine	Peak discharge	= 12.21 cfs
Storm frequency	= 10 yrs	Time to peak	= 23 min
Time interval	= 1 min	Hyd. volume	= 22,211 cuft
Inflow hyds.	= 3, 4	Contrib. drain. area	= 0.000 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

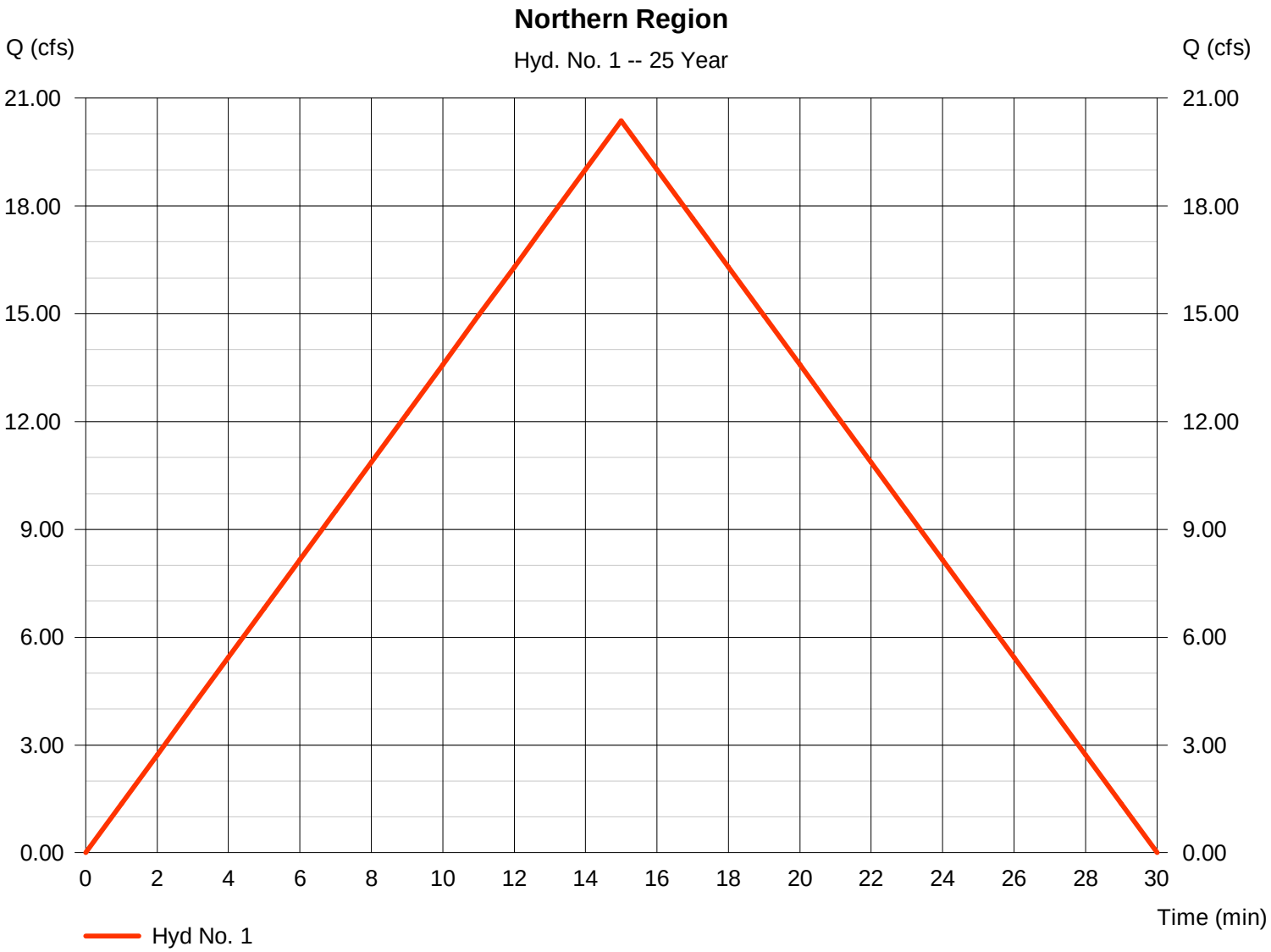
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	Rational	20.37	1	15	18,337	------	------	------	Northern Region
2	Rational	8.197	1	15	7,378	------	------	------	Southern region
3	Reservoir	3.543	1	24	7,372	2	1305.52	4,247	South Outfall
4	Reservoir	12.40	1	21	18,332	1	1305.44	7,778	<no description>
5	Combine	13.62	1	23	25,705	3, 4	------	------	<no description>

Hydrograph Report

Hyd. No. 1

Northern Region

Hydrograph type	=	Rational	Peak discharge	=	20.37 cfs
Storm frequency	=	25 yrs	Time to peak	=	15 min
Time interval	=	1 min	Hyd. volume	=	18,337 cuft
Drainage area	=	5.120 ac	Runoff coeff.	=	0.66
Intensity	=	6.029 in/hr	Tc by User	=	15.00 min
IDF Curve	=	wich_IDF.IDF	Asc/Rec limb fact	=	1/1

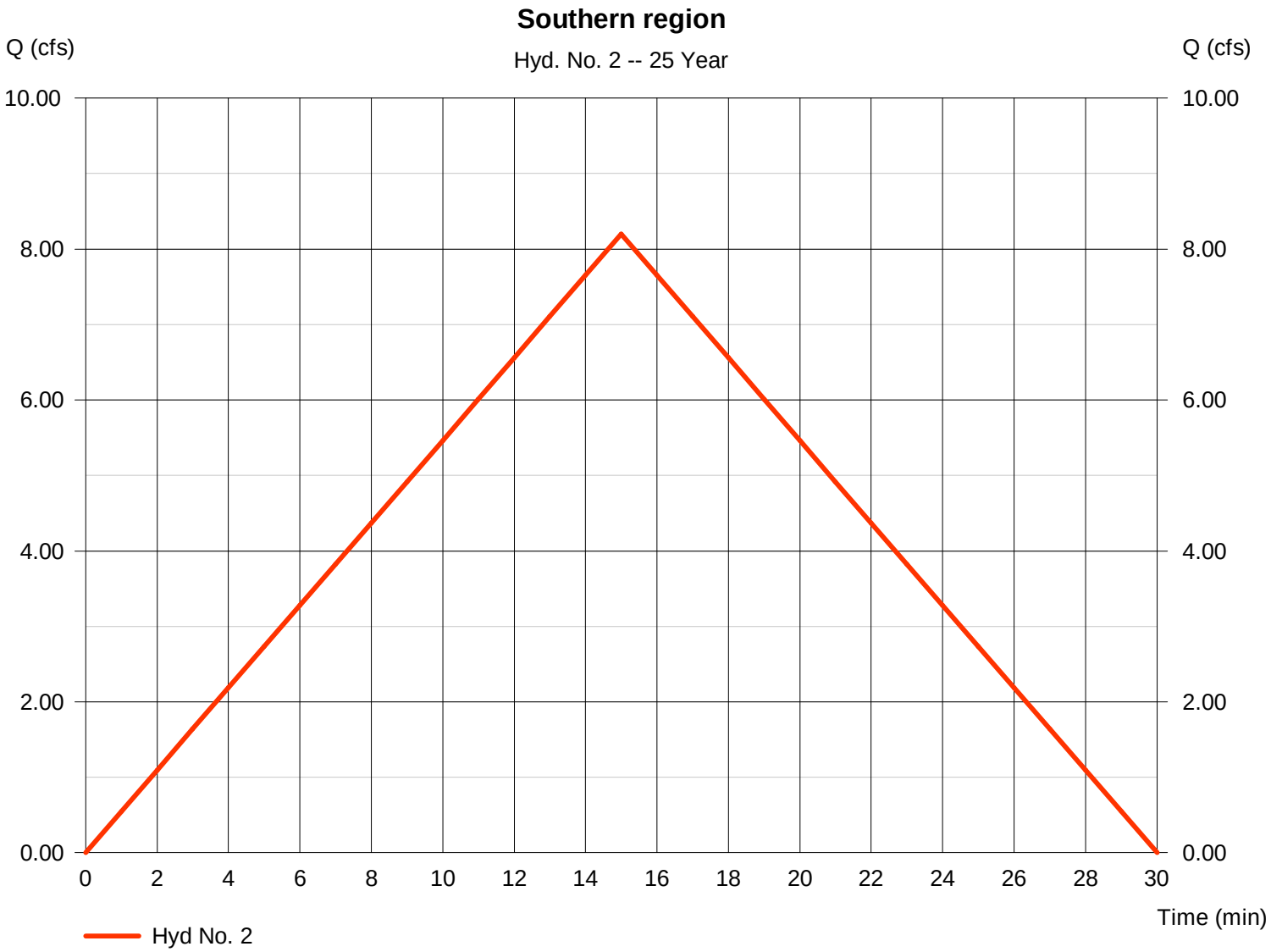


Hydrograph Report

Hyd. No. 2

Southern region

Hydrograph type	=	Rational	Peak discharge	=	8.197 cfs
Storm frequency	=	25 yrs	Time to peak	=	15 min
Time interval	=	1 min	Hyd. volume	=	7,378 cuft
Drainage area	=	2.060 ac	Runoff coeff.	=	0.66
Intensity	=	6.029 in/hr	Tc by User	=	15.00 min
IDF Curve	=	wich_IDF.IDF	Asc/Rec limb fact	=	1/1



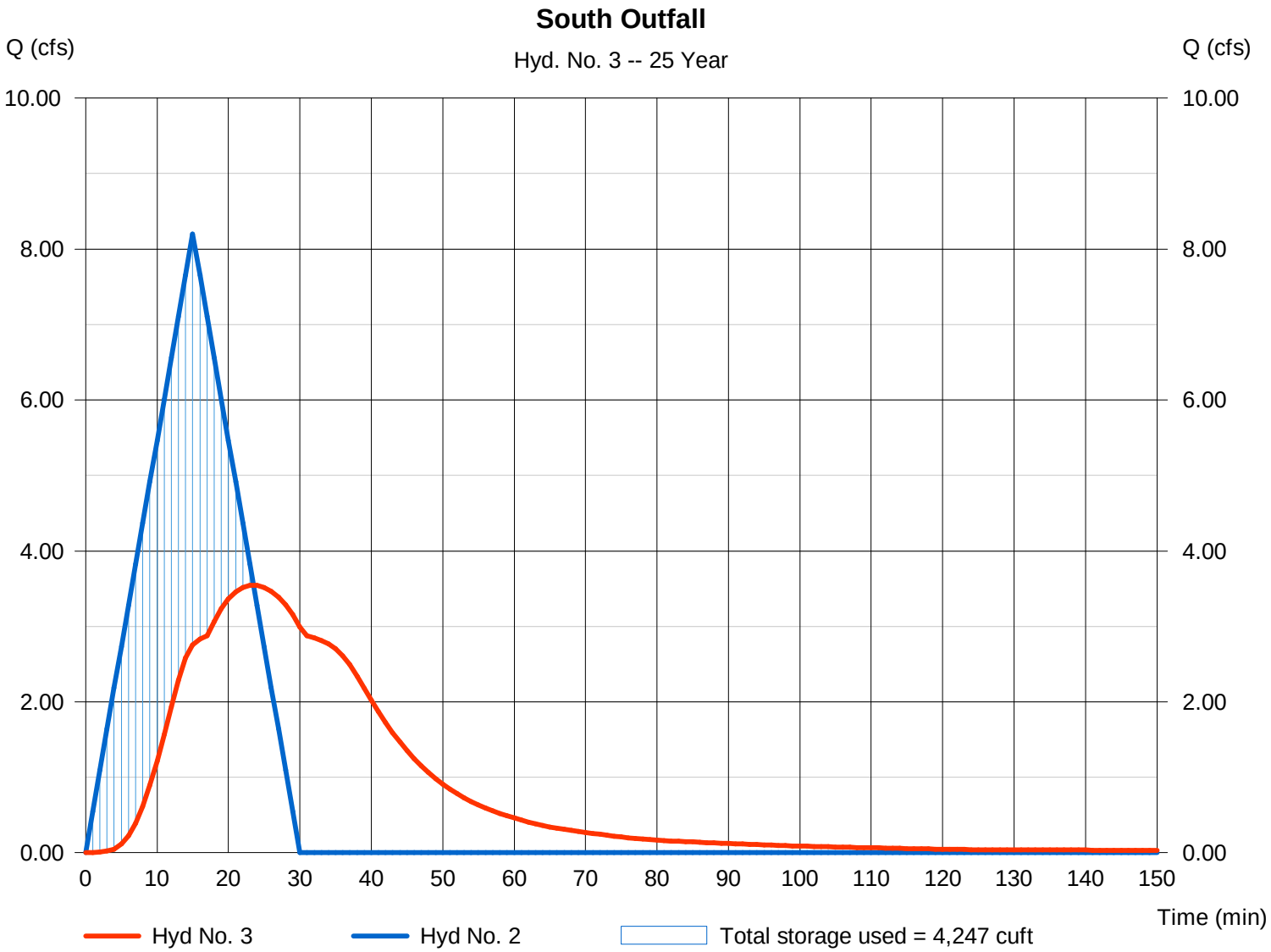
Hydrograph Report

Hyd. No. 3

South Outfall

Hydrograph type	=	Reservoir	Peak discharge	=	3.543 cfs
Storm frequency	=	25 yrs	Time to peak	=	24 min
Time interval	=	1 min	Hyd. volume	=	7,372 cuft
Inflow hyd. No.	=	2 - Southern region	Max. Elevation	=	1305.52 ft
Reservoir name	=	South West Pond	Max. Storage	=	4,247 cuft

Storage Indication method used.



Hydrograph Report

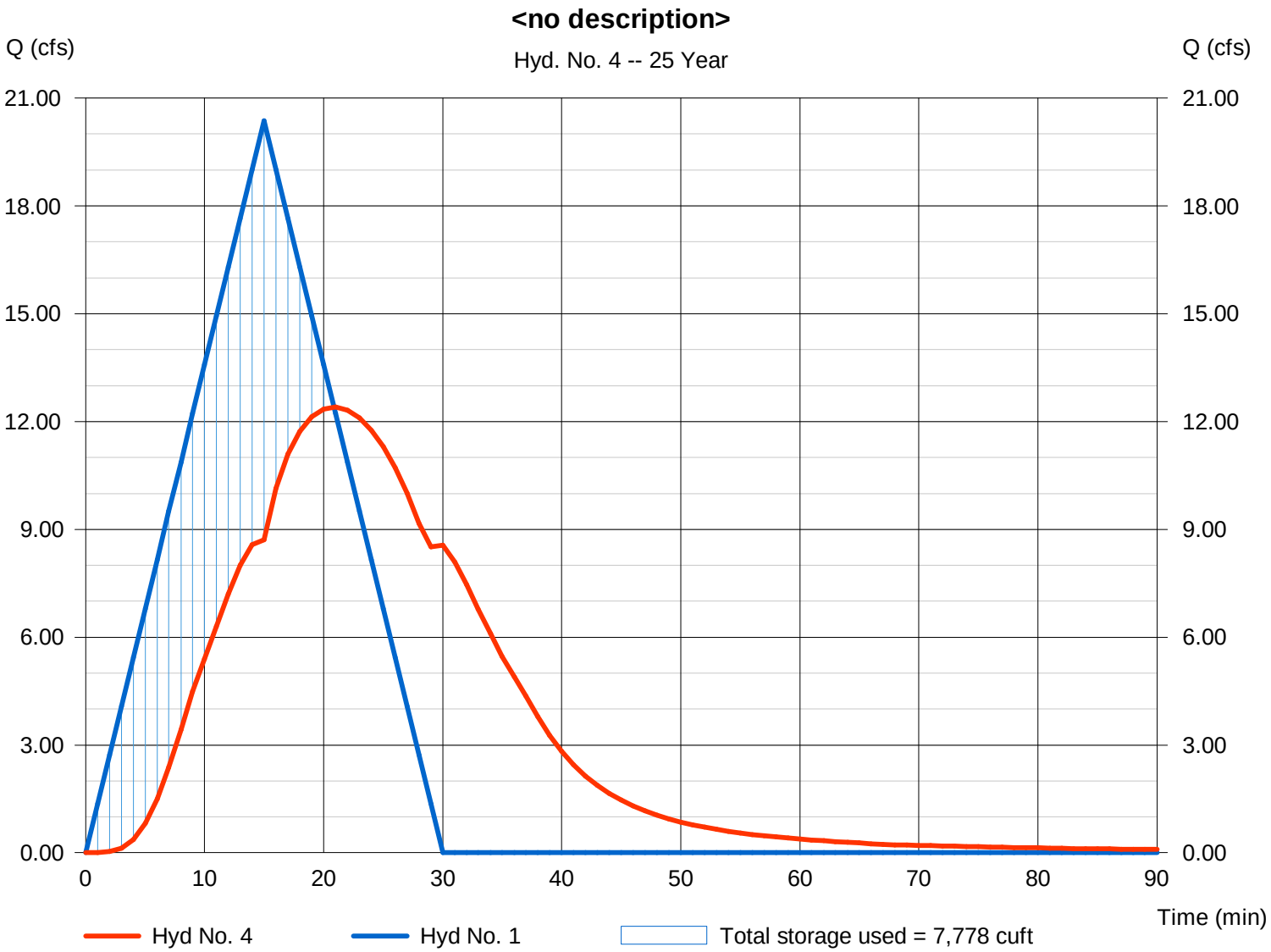
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Monday, Nov 9, 2009

Hyd. No. 4

<no description>

Hydrograph type	=	Reservoir	Peak discharge	=	12.40 cfs
Storm frequency	=	25 yrs	Time to peak	=	21 min
Time interval	=	1 min	Hyd. volume	=	18,332 cuft
Inflow hyd. No.	=	1 - Northern Region	Max. Elevation	=	1305.44 ft
Reservoir name	=	NorthEast Pond	Max. Storage	=	7,778 cuft

Storage Indication method used.

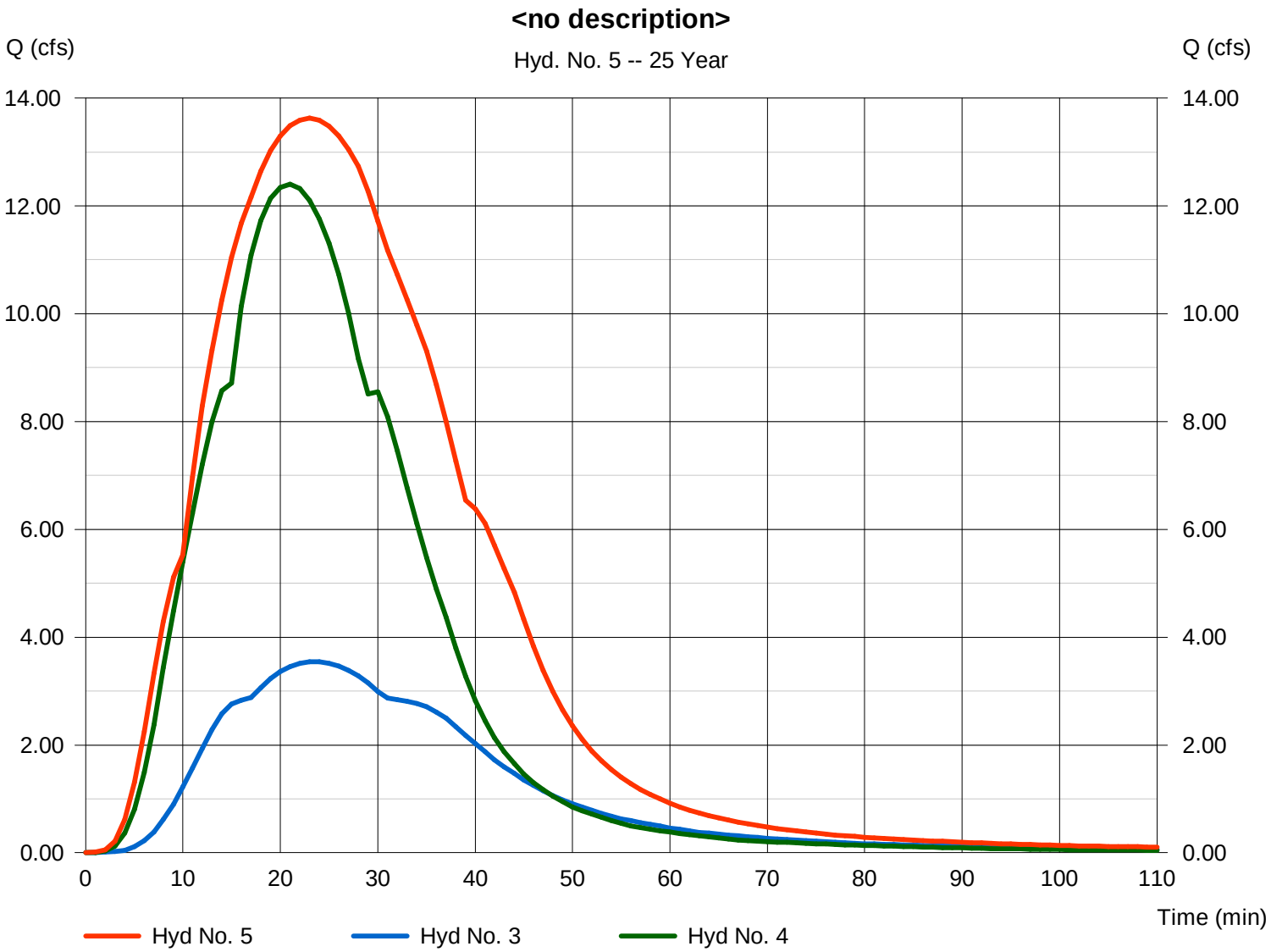


Hydrograph Report

Hyd. No. 5

<no description>

Hydrograph type	=	Combine	Peak discharge	=	13.62 cfs
Storm frequency	=	25 yrs	Time to peak	=	23 min
Time interval	=	1 min	Hyd. volume	=	25,705 cuft
Inflow hyds.	=	3, 4	Contrib. drain. area	=	0.000 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

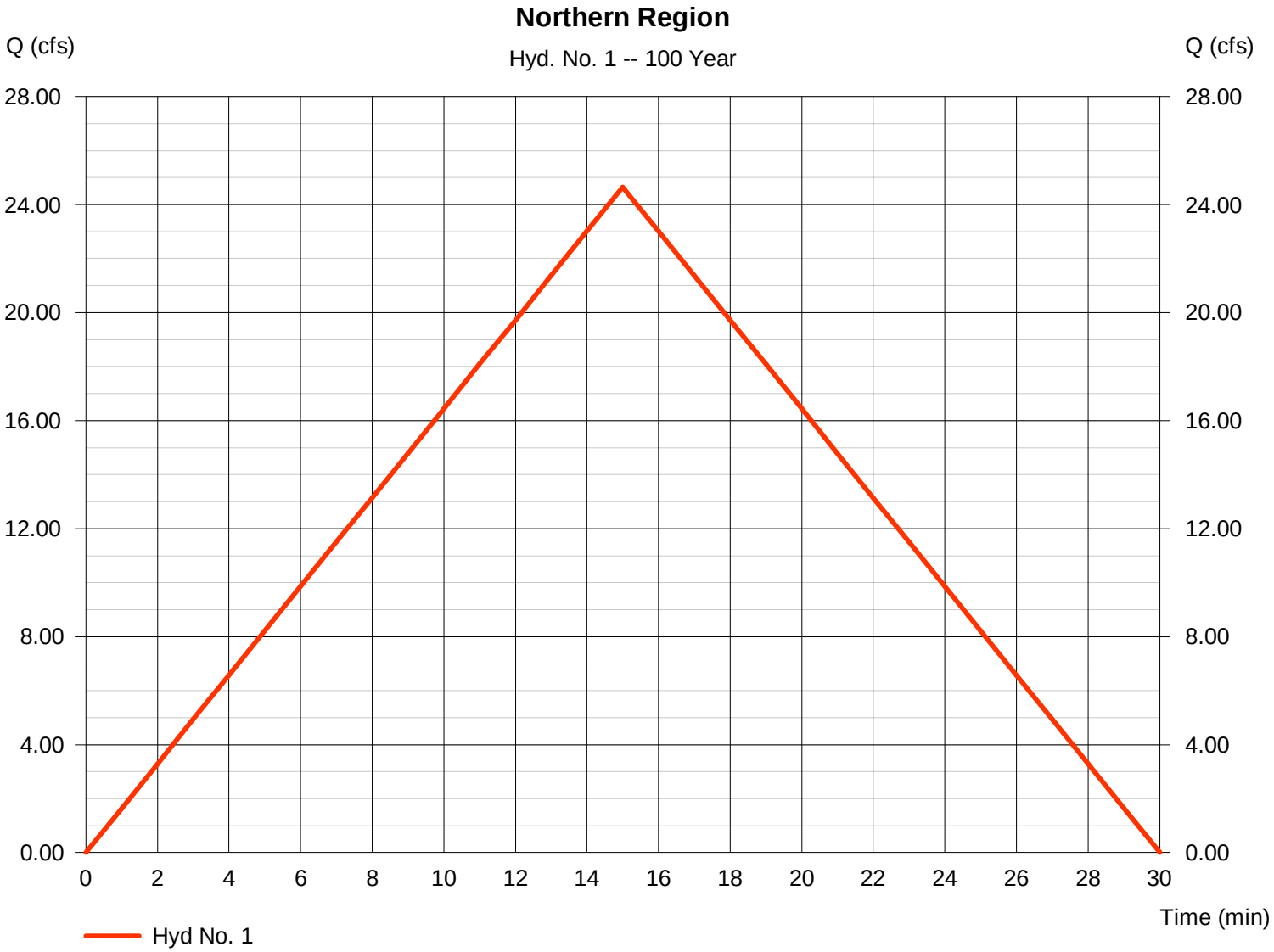
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	Rational	24.65	1	15	22,187	------	------	------	Northern Region
2	Rational	9.919	1	15	8,927	------	------	------	Southern region
3	Reservoir	4.233	1	24	8,921	2	1305.79	5,170	South Outfall
4	Reservoir	14.95	1	21	22,183	1	1305.81	9,380	<no description>
5	Combine	15.53	1	23	31,104	3, 4	------	------	<no description>

Hydrograph Report

Hyd. No. 1

Northern Region

Hydrograph type	=	Rational	Peak discharge	=	24.65 cfs
Storm frequency	=	100 yrs	Time to peak	=	15 min
Time interval	=	1 min	Hyd. volume	=	22,187 cuft
Drainage area	=	5.120 ac	Runoff coeff.	=	0.66
Intensity	=	7.295 in/hr	Tc by User	=	15.00 min
IDF Curve	=	wich_IDF.IDF	Asc/Rec limb fact	=	1/1

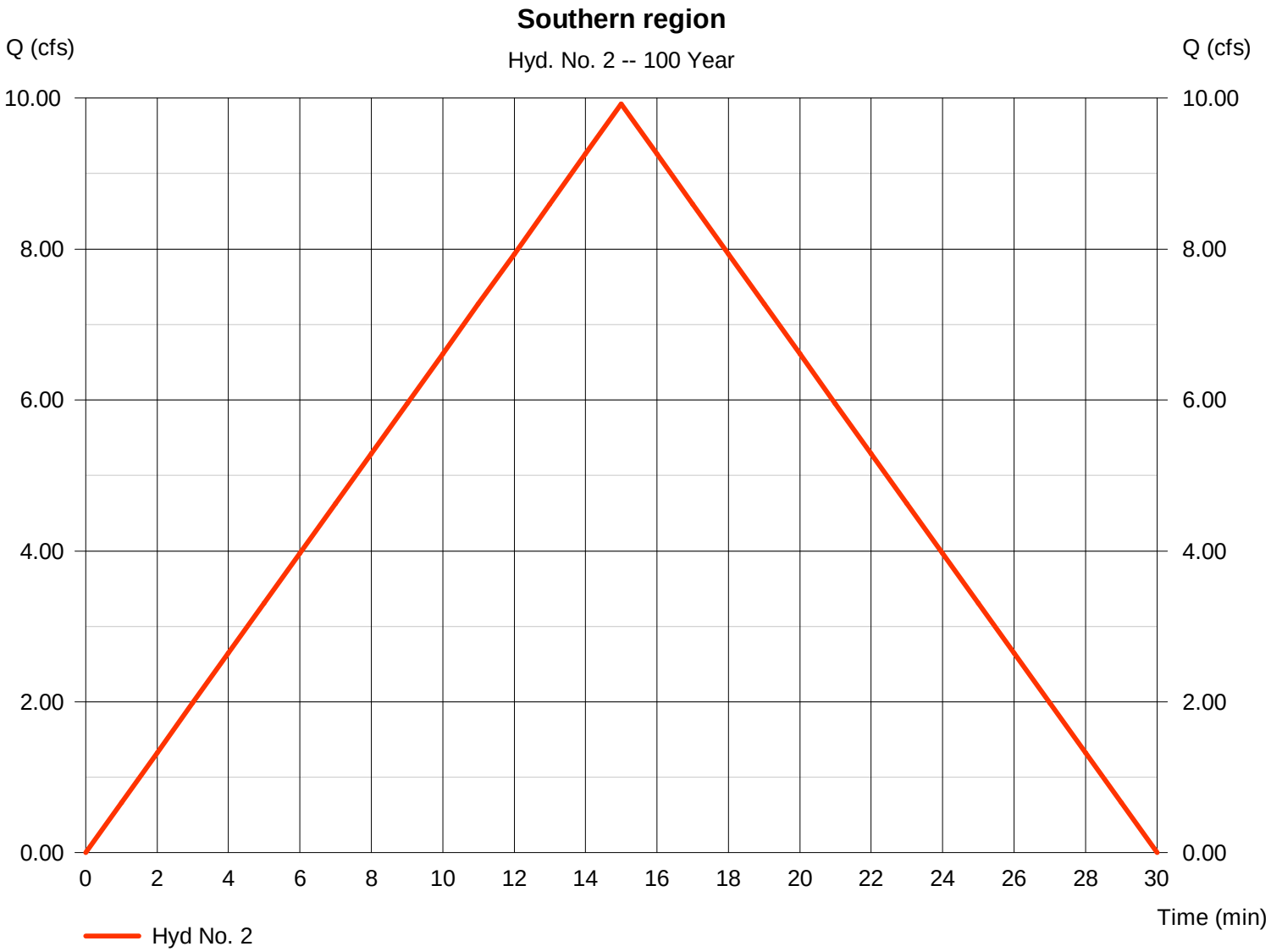


Hydrograph Report

Hyd. No. 2

Southern region

Hydrograph type	=	Rational	Peak discharge	=	9.919 cfs
Storm frequency	=	100 yrs	Time to peak	=	15 min
Time interval	=	1 min	Hyd. volume	=	8,927 cuft
Drainage area	=	2.060 ac	Runoff coeff.	=	0.66
Intensity	=	7.295 in/hr	Tc by User	=	15.00 min
IDF Curve	=	wich_IDF.IDF	Asc/Rec limb fact	=	1/1



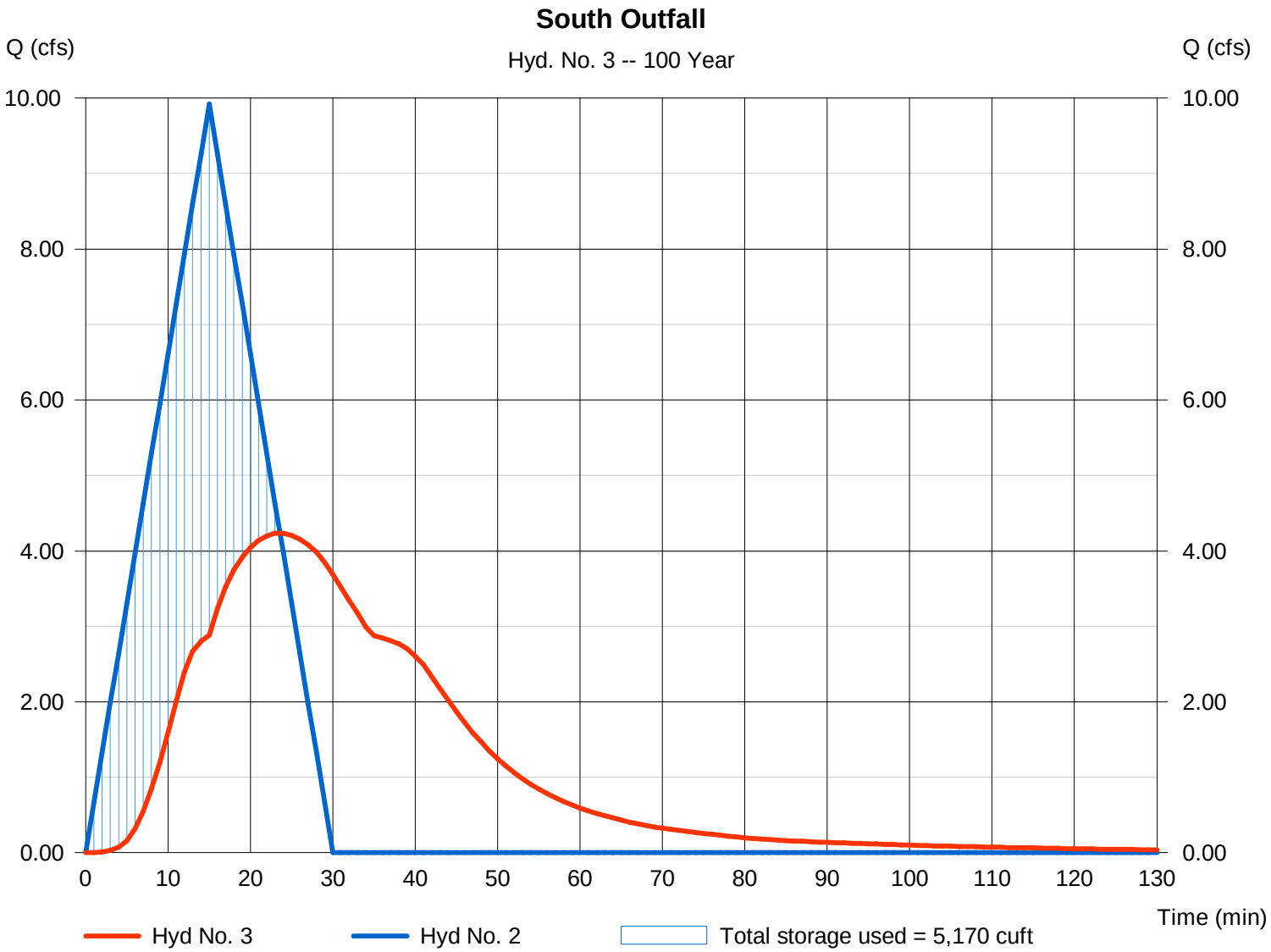
Hydrograph Report

Hyd. No. 3

South Outfall

Hydrograph type	=	Reservoir	Peak discharge	=	4.233 cfs
Storm frequency	=	100 yrs	Time to peak	=	24 min
Time interval	=	1 min	Hyd. volume	=	8,921 cuft
Inflow hyd. No.	=	2 - Southern region	Max. Elevation	=	1305.79 ft
Reservoir name	=	South West Pond	Max. Storage	=	5,170 cuft

Storage Indication method used.



Hydrograph Report

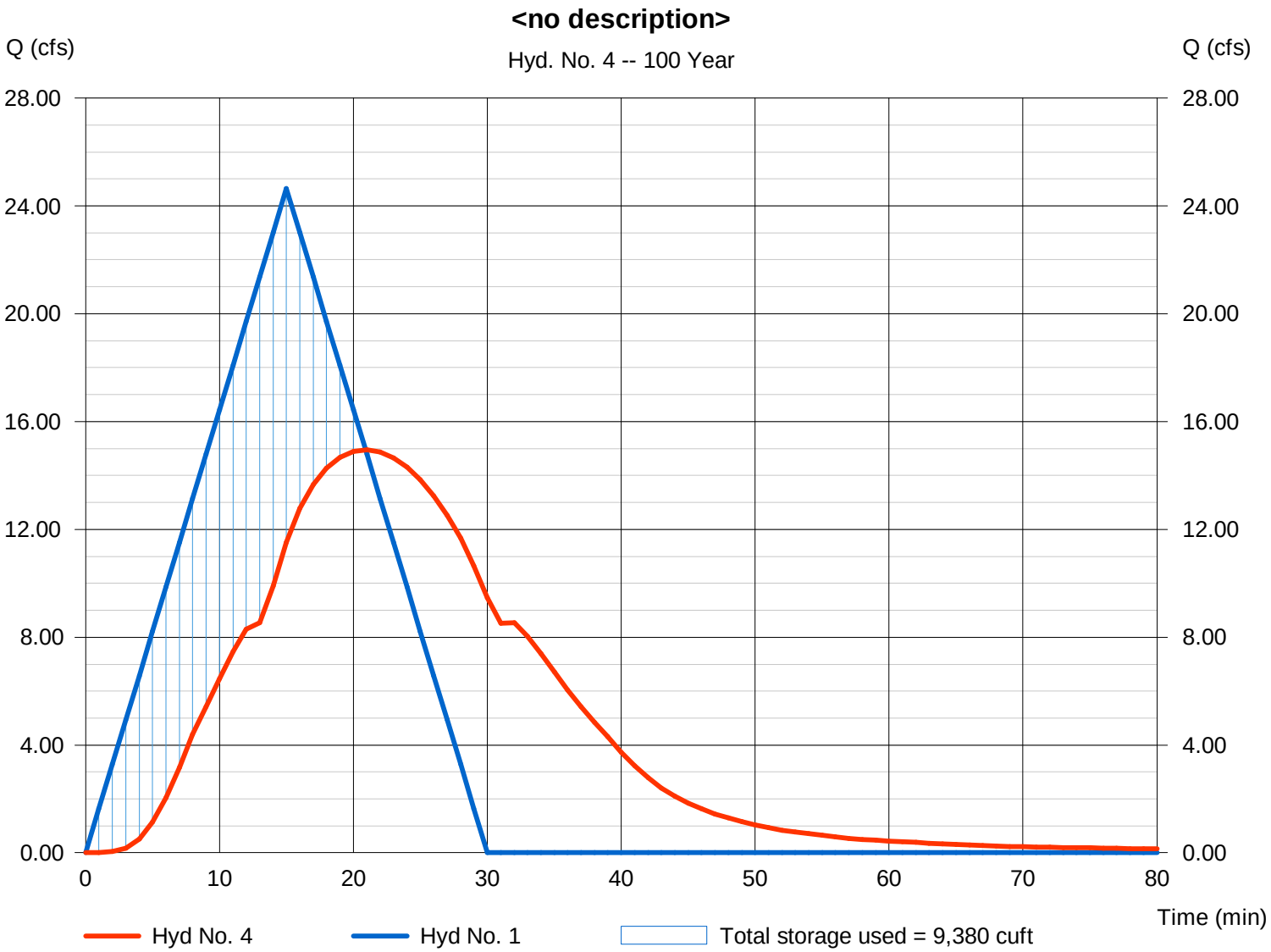
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Monday, Nov 9, 2009

Hyd. No. 4

<no description>

Hydrograph type	=	Reservoir	Peak discharge	=	14.95 cfs
Storm frequency	=	100 yrs	Time to peak	=	21 min
Time interval	=	1 min	Hyd. volume	=	22,183 cuft
Inflow hyd. No.	=	1 - Northern Region	Max. Elevation	=	1305.81 ft
Reservoir name	=	NorthEast Pond	Max. Storage	=	9,380 cuft

Storage Indication method used.

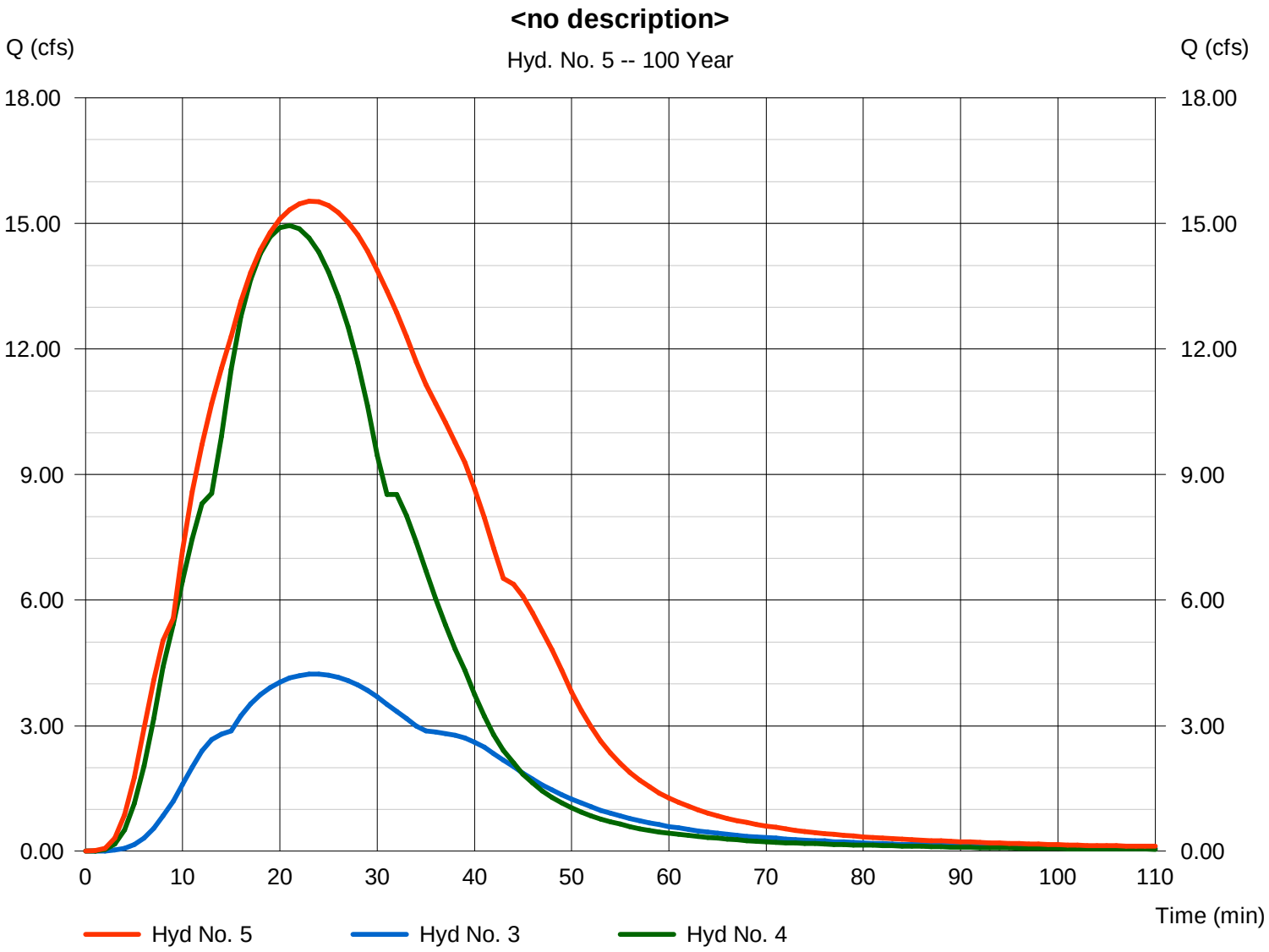


Hydrograph Report

Hyd. No. 5

<no description>

Hydrograph type	= Combine	Peak discharge	= 15.53 cfs
Storm frequency	= 100 yrs	Time to peak	= 23 min
Time interval	= 1 min	Hyd. volume	= 31,104 cuft
Inflow hyds.	= 3, 4	Contrib. drain. area	= 0.000 ac



Hydraflow Table of Contents

Proposed SE pond only.gpw

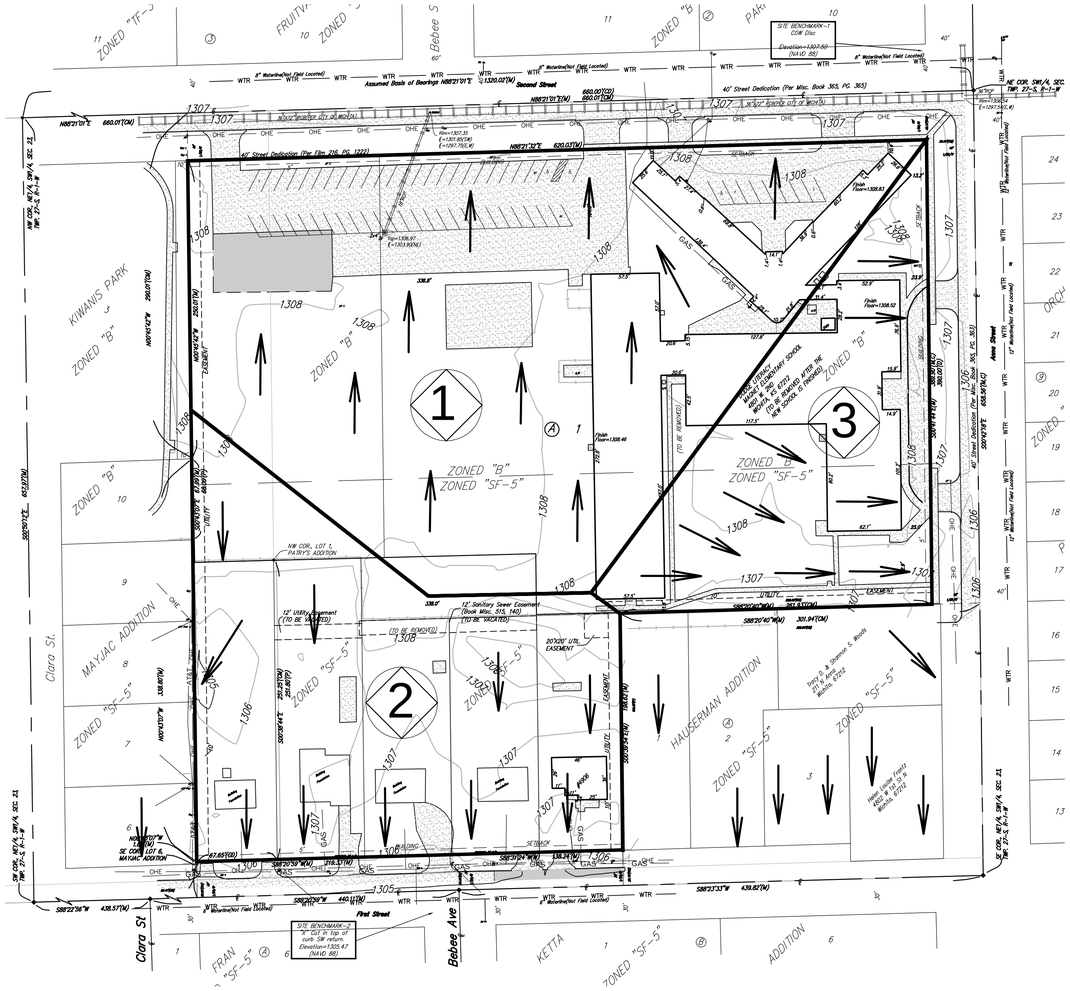
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 — Monday, Nov 9, 2009

DRAINAGE & GRADING PLAN Scale 1:60

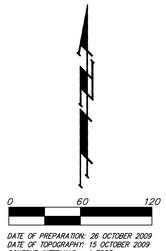
DRAINAGE & GRADING PLAN

DODGE ELEMENTARY ADDITION

WICHITA, SEDGWICK COUNTY, KANSAS



Existing Conditions



DATE OF PREPARATION: 26 OCTOBER 2009
DATE OF TOPOGRAPHY: 15 OCTOBER 2009
CONTOUR INTERVALS = 1 FOOT

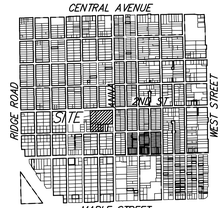
OWNER:
UNIFIED SCHOOL DISTRICT 259
201 N. WATER
WICHITA, KS 67202
316-973-4000

- = #4 REBAR W/ "BAUGHMAN" CAP (SET)
- = 1" IRON (FOUND)
- = 3/4" IRON IN THIMBLE (FOUND)
- = BOLT IN THIMBLE (FOUND)
- = #5 REBAR W/ "ACLS" CAP (FOUND)
- = 3/4" IRON (FOUND)
- = 1/2" IRON (FOUND)
- = #4 REBAR (FOUND)

(M) = MEASURED
(D) = DESCRIBED
(P) = PLATTED
(C) = CALCULATED
(CP) = CALCULATED PER PLATTED INFO.
(CD) = CALCULATED PER DESCRIBED
(CM) = CALCULATED PER MEASURED

STORM SEWER
WATER LINE
SOUTHWESTERN BELL
AT&T GAS LINE
GAS CABLE TV
CoTV FENCE
OVERHEAD ELECTRIC LINE
SANITARY SEWER
EXSS UNDERGROUND ELECTRIC LINE
UGE

AGP = A/C Post
CO = Cleanout
CP = Cable TV Pedestal
DI = Drop Inlet
EB = Electric Box
FH = Fire Hydrant
GM = Gas Meter
GU = Guard Post(Bollard)
GUY = Guy Anchor
GV = Gas Valve
LP = Light Pole
MB = Mail Box
FPO = Flag Pole
PP = Power Pole
Sign = Sign
SSMH = Sanitary Sewer Manhole
ATT Ped = ATT Pedestal
SWSMH = Stormwater Sewer Manhole
= Tree
WM = Water Meter
WV = Water Valve
WVT = Water Vault
XFMR = Transformer



VICINITY MAP
SEC. 23, T27S, R1W

NOTE: This site lies within Zone X based on FEMA FIRM panel 345 of 700 for Community Kit #20173C for Sedgwick County, Kansas, effective February 2, 2007. Zone X area areas of 0.2% annual chance flood; areas of 1% annual chance flood with aveage de3pths of less than 1 foot or with drainage areas leff than 1 square mile; and areas protected by levees from 1% annual chance flood.

Detention basin will be required for basins 1 and 2 for development of this site.

Proposed Basin 1 design: A RCB is located in 2nd street, allowing a 24" RCP to be installed to a detention basin. This basin is to be located at the Northeast corner of the site. The basin will need to be 4 feet deep with 4:1 side slopes and High edge surface area of 6,100sq. ft. See Hydraflow report for calculations.

Proposed Basin 2 design: A curb inlet is located at the Northeast corner of Clair & First Street, allowing a 15" RCP to be installed to a detention basin to be located at the Southwest corner of the site. The basin will need to be 3 feet deep with 4:1 side slopes and High edge surface area of 4900sq. ft. See Hydraflow report for calculations.

Existing Conditions
Existing School and Residencial Lots

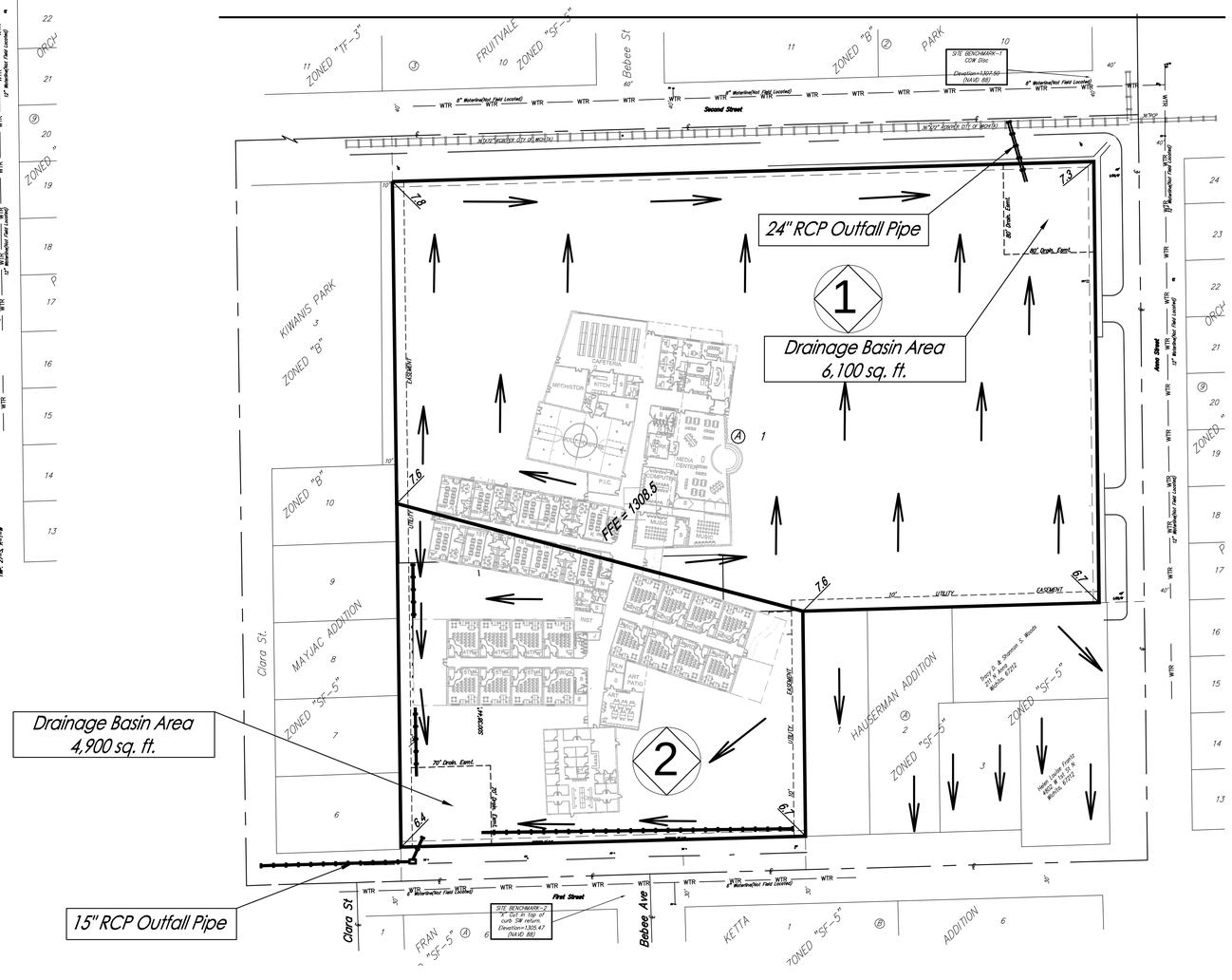
Basin #	Area (acres)	Tc (min)	Q_2 (cfs)	Q_5 (cfs)	Q_{10} (cfs)	Q_{25} (cfs)	Q_{100} (cfs)
1	3.70	17.00	8.97	10.75	12.07	14.00	16.97
2	2.15	16.00	3.32	3.97	4.45	5.16	6.25
3	1.33	21.00	3.67	4.43	5.00	5.82	7.08
Total Site =	7.18	Q*	15.05	18.06	20.29	23.54	28.56

(Q*) See Hydraflow Report for table and report.

Proposed Conditions
School Only

Basin #	Q_2 (cfs)	Q_5 (cfs)	Q_{10} (cfs)	Q_{25} (cfs)	Q_{100} (cfs)
1	8.19	8.89	10.51	12.40	14.95
2	2.62	2.83	3.02	3.50	4.23
Total =	**10.81**	**11.72**	**13.53**	**15.90**	**19.18**

(Q*) See Hydraflow Report for table and report.



Proposed Conditions

PATRICK SHAWN BAER
LICENSED
16976
KANSAS
PROFESSIONAL ENGINEER
11/9/09

DRAINAGE & GRADING PLAN
DODGE ELEMENTARY SCHOOL ADDITION
25 October 2009

Baughman Company, P.A.
315 Ellis St. Wichita, KS 67211 P 316.262.7271 F 3162620149
Baughman ENGINEERING | SURVEYING | PLANNING | LANDSCAPE ARCHITECTURE

E:\Projects\Dodge Elementary School Addition_09-10-P357\Water Resources\Drainage.dwg