SUPPLEMENTAL DRAINAGE REPORT
TO MARCH 2009 REPORT

FOR

NORTH POINTE SENIOR LIVING
WICHITA, KANSAS

MARCH 2009

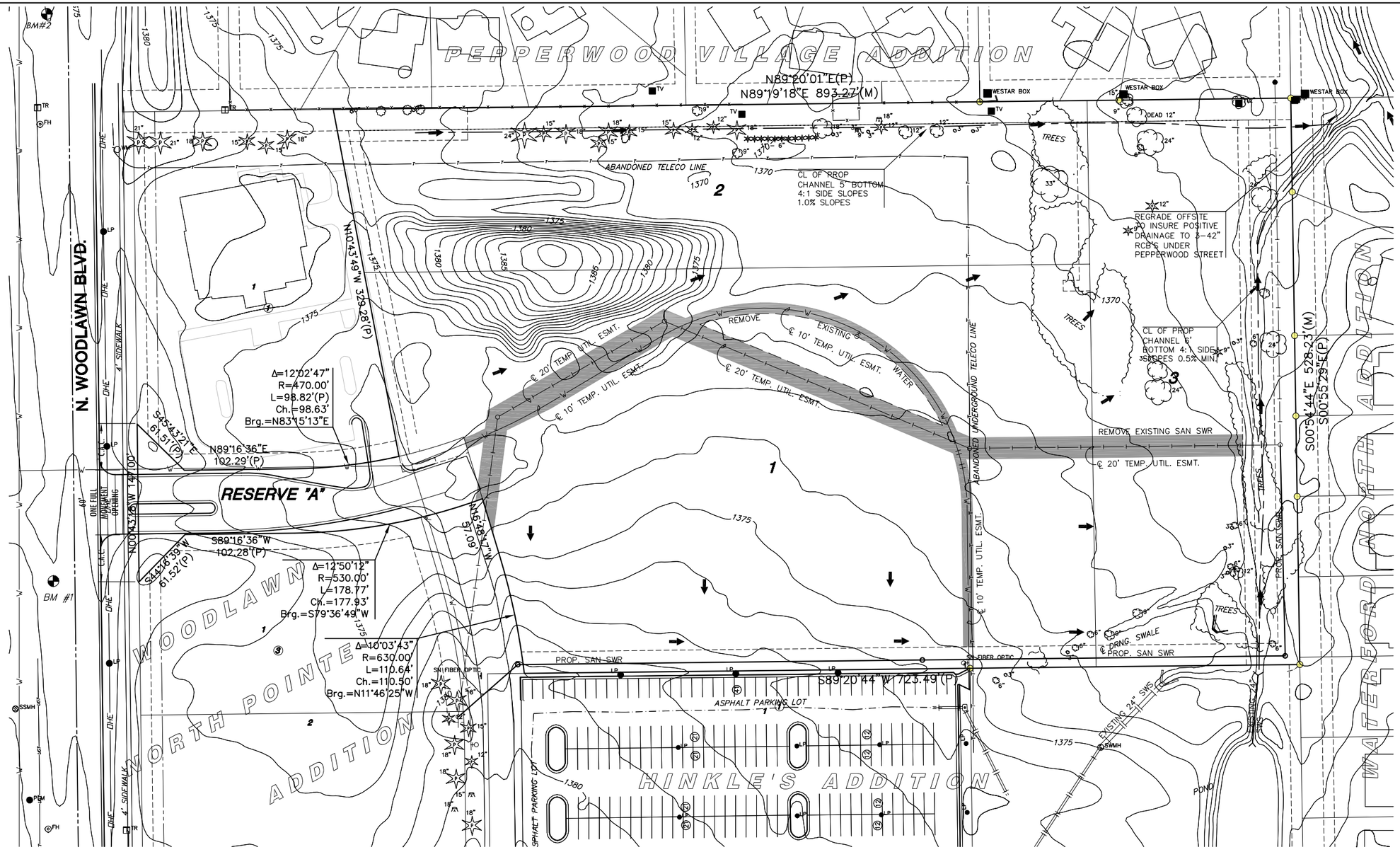
Summary

A. Additions and Revisions

The drainage and utility plan has been revised to show that grading will take place in the reserves downstream of the site as needed, Figure 1.1. A ditch has been added along the north property line of the property to convey backyard drainage from homes in Pepperwood Village Addition and this site to the drainage reserve. This ditch was sized using Hydraflow Express, Figure 1.2. The ditch will need a 5' bottom, 4:1 side slopes, and a minimum 1.0% slope. Depths in the ditch will be less than 1' in the 100-year design event. The 3-42" RCP's under Pepperwood Street were also analyzed in Hydraflow Express, Figure 1.3. Based on calculations it appears the RCP's are designed to handle the 63.7 acre developed flow without overtopping. The drainage reserve up to the RCP's needs to be re-graded to eliminate existing ponding and direct runoff to the pipes.

Figure 1.1

Drainage and Utility Plan



LEGEND

- 6IN - CONIFEROUS TREE
- 3IN - DECIDUOUS TREE
- SN - SIGN
- PP - POWER POLE
- ELEC BOX - ELECTRIC BOX
- LP - LIGHT POLE
- FH - FIRE HYDRANT
- WV - WATER VALVE
- WM - WATER METER
- SECTION CORNER
- BM - BENCHMARK
- EASEMENT
- BUILDING SETBACK
- FENCE
- STORM SEWER PIPE
- WATER LINE
- SANITARY SEWER LINE
- GAS LINE
- GAS PIPELINE
- TELEPHONE LINE
- UNDERGROUND ELEC.
- OVERHEAD ELECTRIC
- FIBER OPTIC CABLE
- DRAINAGE SUB BASIN
- DRAINAGE BASIN
- FLOW ARROW
- A17 - AREA FOR SWS SIZING

N

SCALE: 1"=50'

0 50 100 150

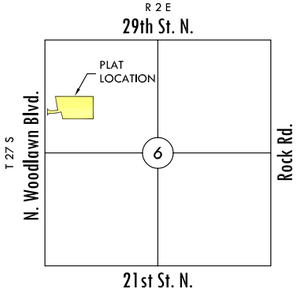
BENCH MARK

BM — C.O.W. Benchmark Disc 24' North and 95' West of the Southwest corner of Hinkle's Addition
Elev. = 1376.56 (NGVD 29)
1377.06 (NAVD 88)

BM#1 — RR Spike in West face of power pole, 443' South and 81' West of the Northwest Corner of Hinkle's Addition
Elev. = 1378.15 (NGVD 29)
1378.65 (NAVD 88)

BM#2 — RR spike in West Face of power pole, 116' North and 82' West of the Northwest Corner of Hinkle's Addition
Elev. = 1375.89 (NGVD 29)
1376.49 (NAVD 88)

BM



VICINITY MAP

MKEC ENGINEERING CONSULTANTS, INC.
411 N. WEBB ROAD
WICHITA, KS. 67206
316 - 684 - 9600

NORTH POINTE SENIOR LIVING

NORTH POINTE SENIOR LIVING
WICHITA, KANSAS

DRAINAGE AND UTILITY PLAN

DATE: FEBRUARY 2009
REVISED: MARCH 4, 2009

DESIGN BY: KLA
DRAWN BY: CMJ
CHECKED BY: GJA

SHEET NUMBER: 1

J:\Civil\09040 North Point Senior Living\dwg\Drng\09040_dup.dwg

Figure 1.2

North Ditch Analysis

Channel Report

Hydraflow Express Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. Wednesday, Mar 4 2009

North Pointe Senior Living - North Property Line Channel

Trapezoidal

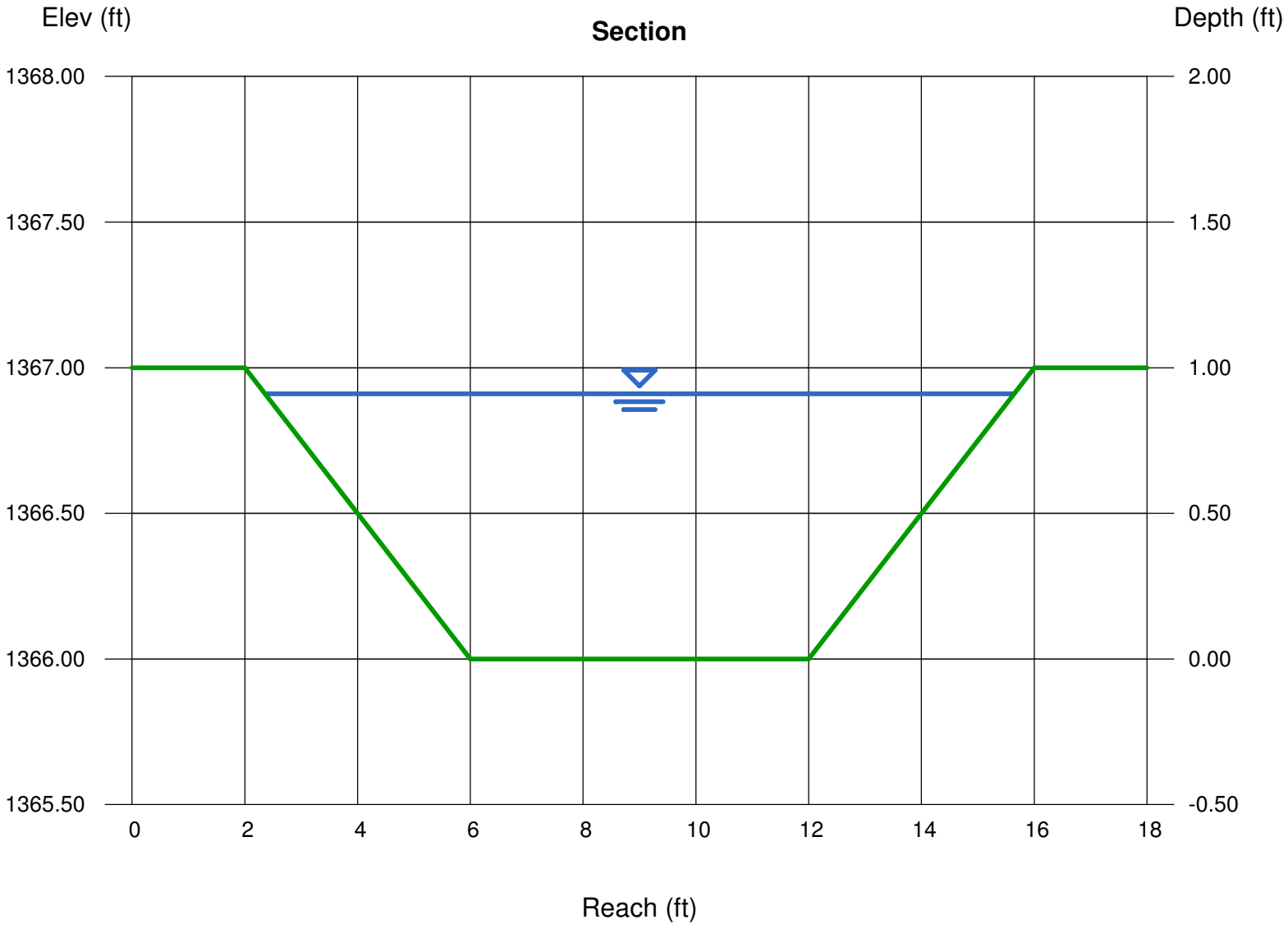
Bottom Width (ft)	= 6.00
Side Slopes (z:1)	= 4.00, 4.00
Total Depth (ft)	= 1.00
Invert Elev (ft)	= 1366.00
Slope (%)	= 1.00
N-Value	= 0.030

Calculations

Compute by:	Known Q
Known Q (cfs)	= 32.11

Highlighted

Depth (ft)	= 0.91
Q (cfs)	= 32.11
Area (sqft)	= 8.77
Velocity (ft/s)	= 3.66
Wetted Perim (ft)	= 13.50
Crit Depth, Yc (ft)	= 0.80
Top Width (ft)	= 13.28
EGL (ft)	= 1.12



Hydrology Report

Hydraflow Express Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. Wednesday, Mar 4 2009

North Property Line

Hydrograph type	=	Rational	Peak discharge (cfs)	=	32.11
Storm frequency (yrs)	=	100	Time interval (min)	=	1
Drainage area (ac)	=	4.900	Runoff coeff. (C)	=	0.87
Rainfall Inten (in/hr)	=	7.533	Tc by User (min)	=	15
IDF Curve	=	ButlerCoKS.IDF	Rec limb factor	=	1.00

Hydrograph Volume = 28,903 (cuft); 0.664 (acft)

Runoff Hydrograph

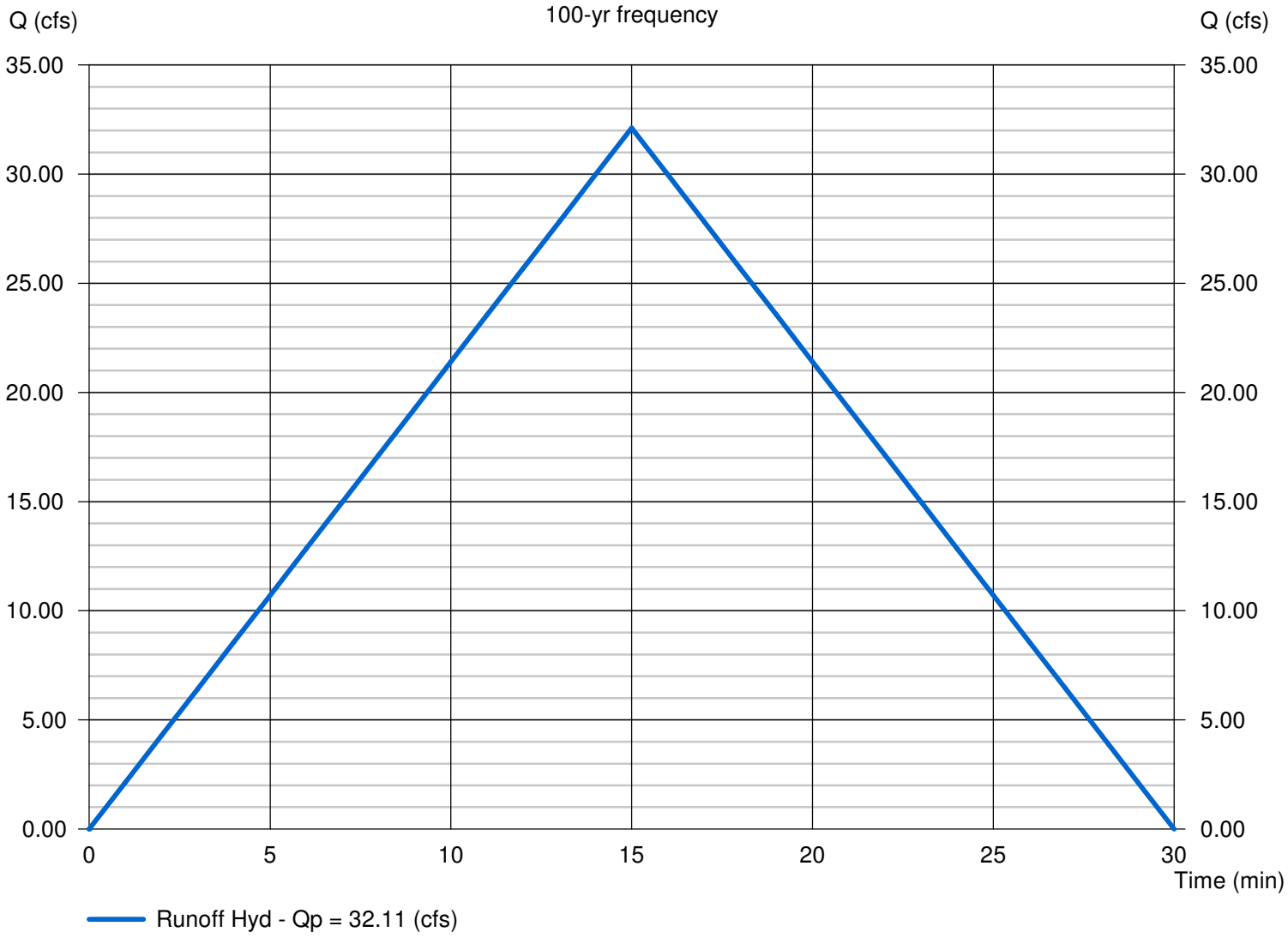


Figure 1.3

Pepperwood RCP Analysis

Culvert Report

Pepperwood Street

Invert Elev Dn (ft)	=	100.00
Pipe Length (ft)	=	80.00
Slope (%)	=	0.09
Invert Elev Up (ft)	=	100.07
Rise (in)	=	42.0
Shape	=	Cir
Span (in)	=	42.0
No. Barrels	=	3
n-Value	=	0.013
Inlet Edge	=	Projecting
Coeff. K,M,c,Y,k	=	0.0045, 2, 0.0317, 0.69, 0.5

Embankment

Top Elevation (ft)	=	105.50
Top Width (ft)	=	50.00
Crest Width (ft)	=	100.00

Calculations

Qmin (cfs)	=	145.00
Qmax (cfs)	=	281.00
Tailwater Elev (ft)	=	(dc+D)/2

Highlighted

Qtotal (cfs)	=	145.00
Qpipe (cfs)	=	145.00
Qovertop (cfs)	=	0.00
Veloc Dn (ft/s)	=	5.78
Veloc Up (ft/s)	=	5.51
HGL Dn (ft)	=	102.84
HGL Up (ft)	=	103.07
Hw Elev (ft)	=	103.30
Hw/D (ft)	=	0.92
Flow Regime	=	Outlet Control

Hydrology Report

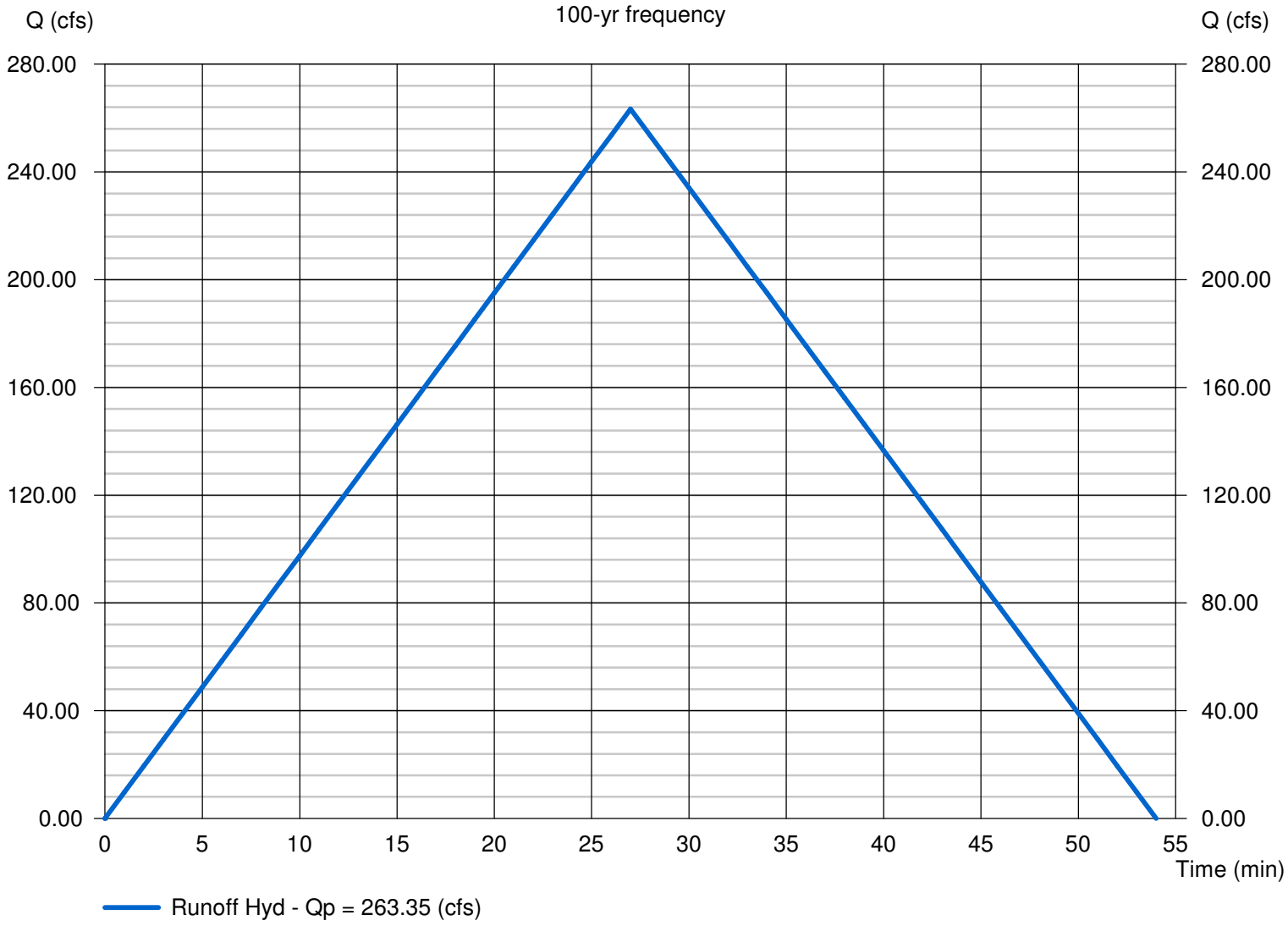
Hydraflow Express Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. Wednesday, Mar 4 2009

Drainage to Pepperwood

Hydrograph type	=	Rational	Peak discharge (cfs)	=	263.35
Storm frequency (yrs)	=	100	Time interval (min)	=	1
Drainage area (ac)	=	63.700	Runoff coeff. (C)	=	0.71
Rainfall Inten (in/hr)	=	5.823	Tc by FAA (min)	=	27
IDF Curve	=	ButlerCoKS.IDF	Rec limb factor	=	1.00

Hydrograph Volume = 426,620 (cuft); 9.794 (acft)

Runoff Hydrograph



FAA Formula Tc Worksheet

Tc = 1.8(1.1 - C) x Flow length^0.5 / Watercourse slope^0.333 Hydraflow Express by Intelisolve

Rational

Drainage to Pepperwood

Description

Flow length (ft)	= 1800.00
Watercourse slope (%)	= 1.39
Runoff coefficient (C)	= 0.71
Time of Conc. (min)	**= 27**