

Watershed Engineering

Assignment 7: Flood Routing (Due Oct 30)

Virgil Creek Flood Control Dam and Principal Spillway

In the mid-1990s, a dry dam was constructed on Virgil Creek in Dryden to decrease flood damage from a 100 year 24 hr event. You have been asked to independently analyze the performance of the system for the Town of Dryden and you have been asked to consider the 100 year-24 hour storm and the 100 year-"design" storm (rain duration = time of concentration). Use the outflow hydrograph you determined last week for the 24-hour, 100-year storm. Your report will be distributed among the town's board of trustees and engineering and road maintenance departments; it will also be available to the public. Please summarize your analysis in a short 2-3 page executive summary (with figures) and attach an appendix showing calculations.

You have been provided with graphs of the storage-water elevation and discharge-water elevation relationships determined by the design engineers and the watershed characteristics.

Watershed Parameters

Drainage Area = 11571 acres
Time of Concentration = 5.94 hr

Soil Type	% Area	Land Use	% Area
A	9	Forest	24
B	20	Row Crops	45
C	30	Pasture	12
D	41	Fallow	18
		Urban commercial	1

Relationship between Reservoir Storage and Water Elevation (Attached)

Relationship between Outlet Discharge and Water Elevation (Attached)

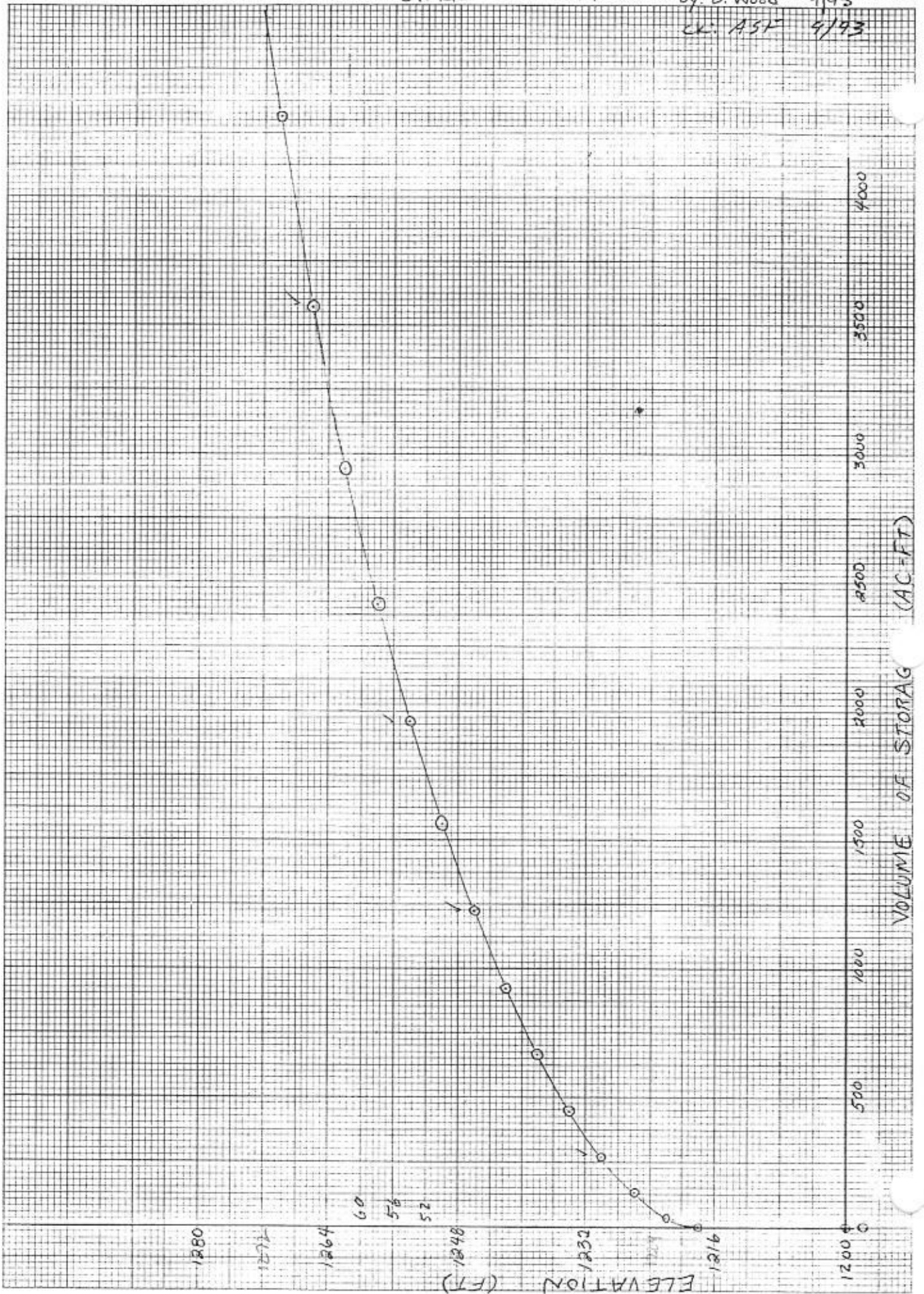
Other Data Design Specifications (may or may not be useful)

Elevation of Top of Dam = 1268 ft
Peak outflow* = 720 cfs
Thickness of Dam Base = 410 ft
Spillway should have same slope as channel
Elevation of channel at outlet = 1193.5 ft
Outlet Channel: Slope = 0.0024, Shape = trapezoid, Z = 1, Base = 8.4 ft

VIRGIL CREEK
STAGE - STORAGE

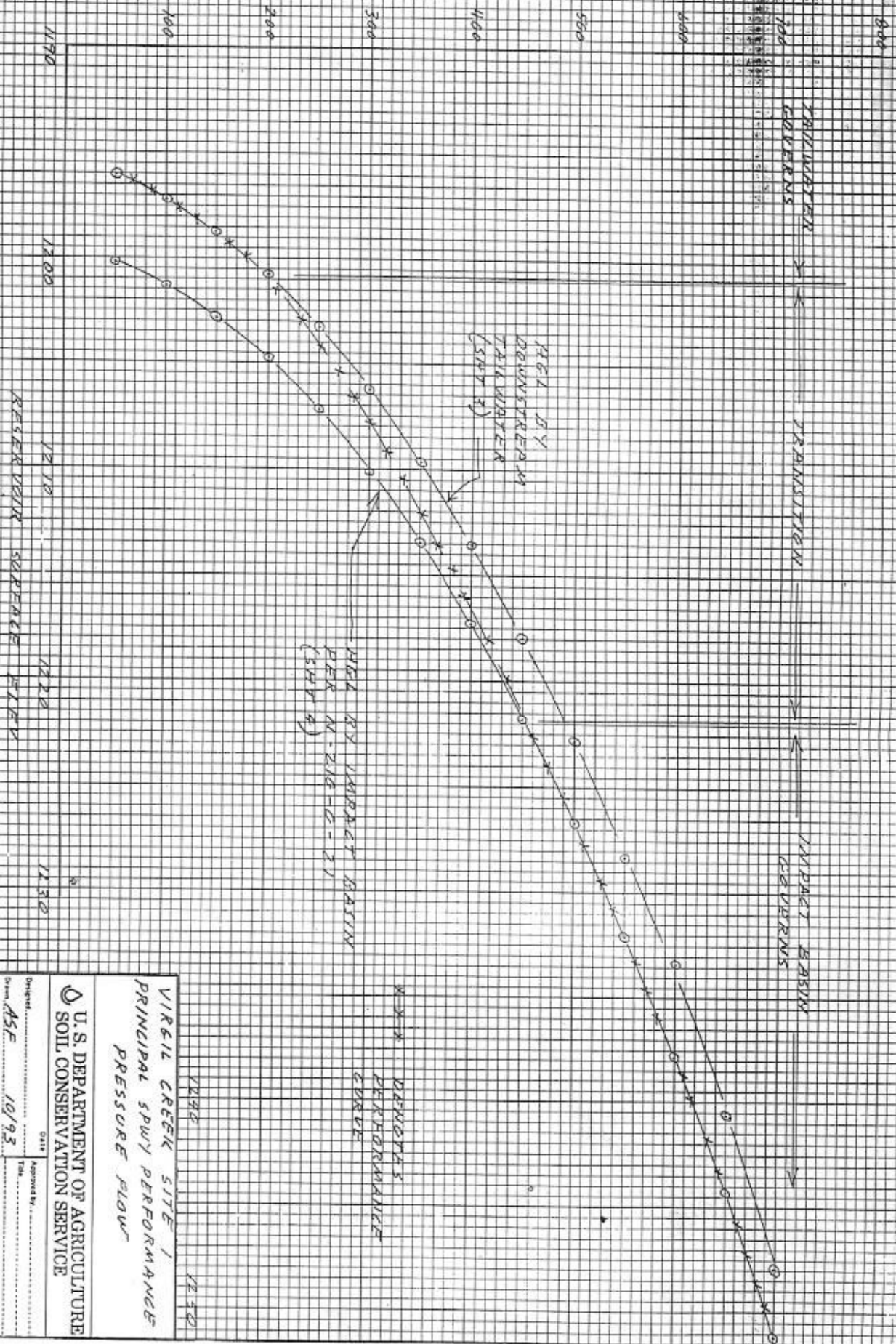
by: D. Wood 9/93
 CK: ASF 9/93

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PLOT ON 20 X 20 TO 1/4" = 1' GRID
 5/4 15" AND 20" LINE PROGRESSIVELY ACCENTED

PRINCIPAL SPILLWAY DISCHARGE - CFS



RESERVOIR SURFACE ELEV

1200

1210

1220

1230

1240

1250

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

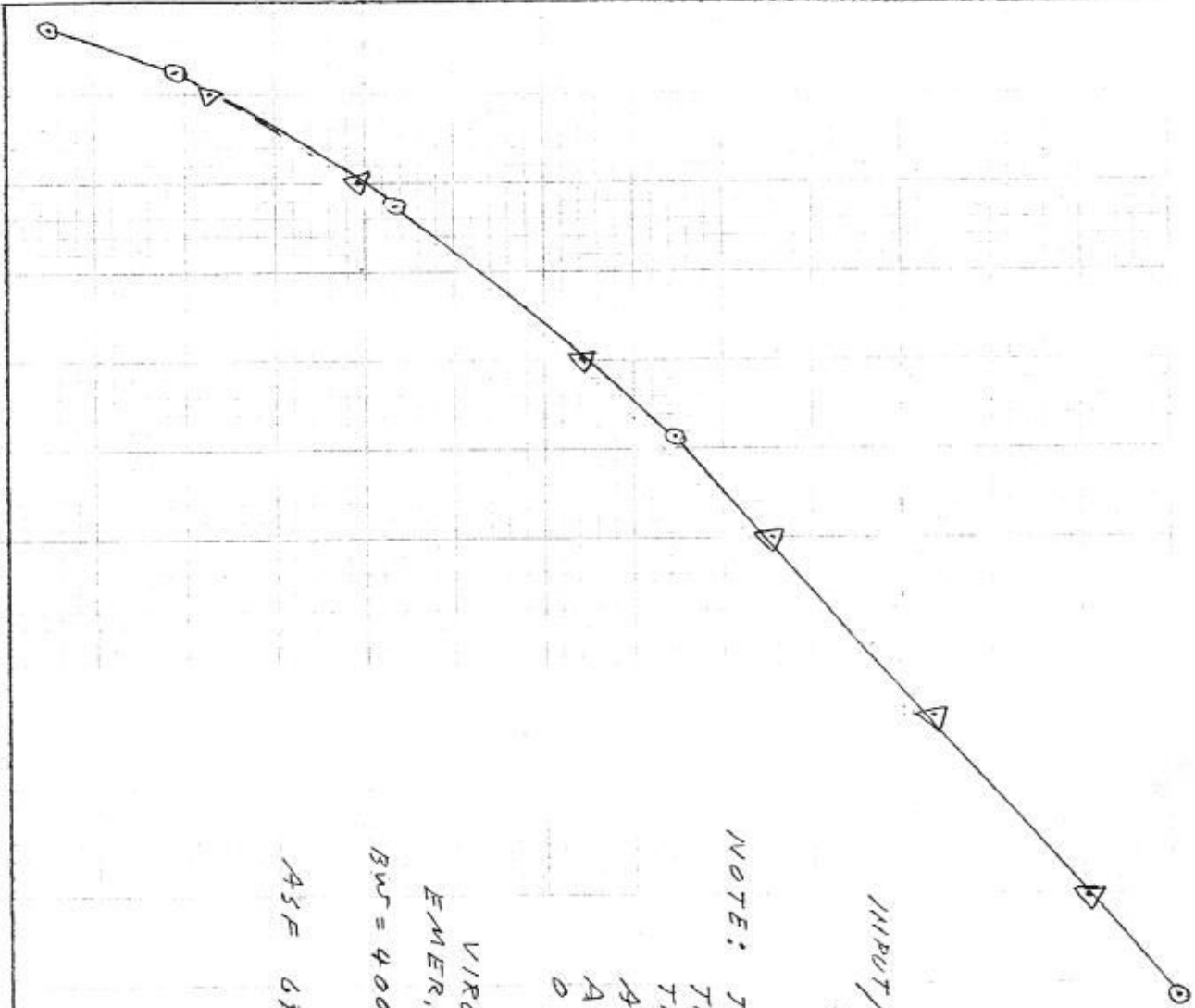
VIRGIL CREEK SITE 1
PRINCIPAL SPWY PERFORMANCE
PRESSURE FLOW

0111
 Date: 10/93
 Drawn by: ASE
 Title: PRINCIPAL SPWY PERFORMANCE PRESSURE FLOW
 Scale: 1" = 100'
 No. 6
 Drawing No. NV-4721
 Check: ASE

RESERVOIR ELEVATION

1264
1262
1260
1258
1256
1254

EMERGENCY SPI WAY DISCHARGE - 10.00 CFS.



INPUT/OUTPUT FILES FOLLOW THIS SHEET,
 ○ DAMS 2 OUTPUT
 △ HEC 2 OUTPUT X-SECTION 13+30 W.D. @ 20+00

NOTE: THIS COMPARISON SHOWS THAT HEC-2 CAN PRODUCE THE SAME RATING CURVE AS DAMS-2. IT CONSTITUTES A CHECK FOR VALIDITY OF THE PROCEDURE

VIRGIL CREEK SITE 1
 EMER, SPIWAY RATING CURVE
 BW = 400 Z = 3:1 S = .01 (EXIT)
 "N" = .04
 ASF 6/23/92