



Pond Design & Analysis

Alexander Mabrich, PE, Msc



Drainage / Routing

Pond Grading

Drainage Area Analysis

Time of Concentration computation

Drainage Area Delineation & computation

Culvert Design

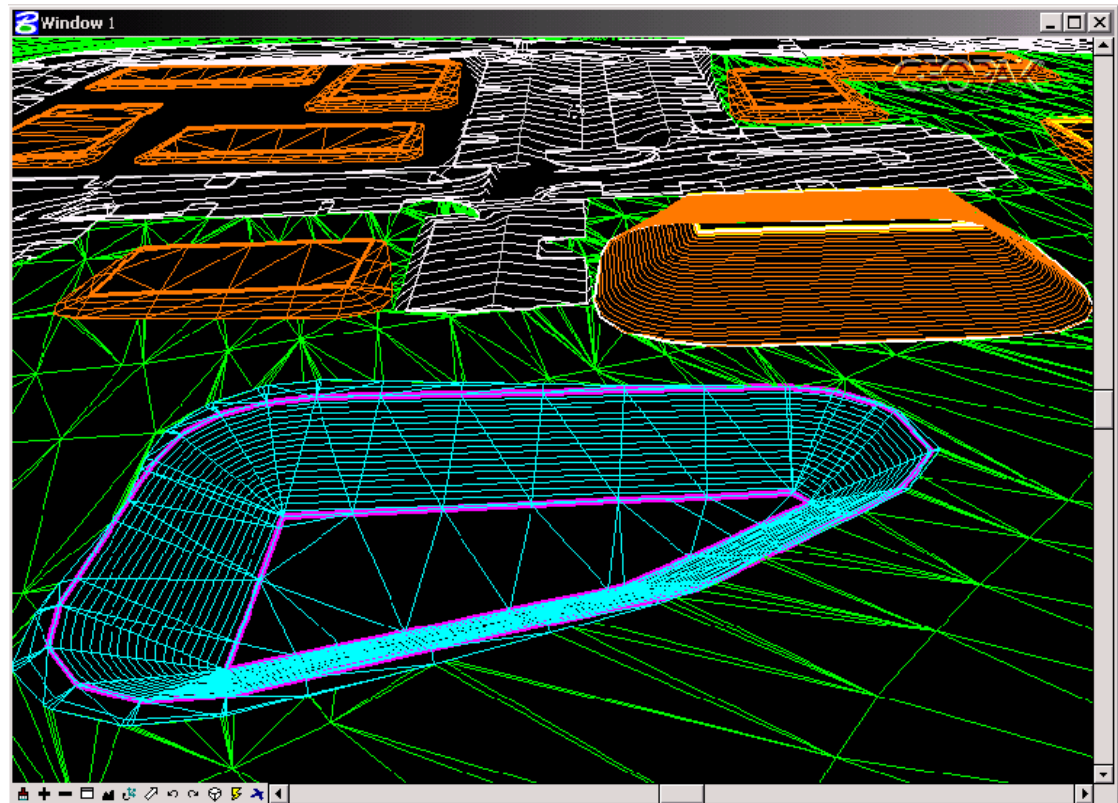
Routing

Reservoir



Pond Grading

Pond design via GEOPAK Site





Drainage Area Analysis

Drainage DTM Tools

- Delineate All Watersheds
- Delineate single Watershed
- Drainage Patterns
- Downstream/Upstream Trace
- Flow Arrow Maps
- HI/LO Points
- Ridge/Sump Lines
- Surface Ponds
- Pond Analysis

GEOPAK Pond Analysis

TIN File

Options

Display Only Ponds

Islands

Pond Volume : 442.932 CY
Pond Surface Area: 1227.439 SY
Maximum Surface Elevation : 831.187
Maximum Pond Depth : 2.870



Time of Concentration

Automatically compute Tc

- Sheet Flow
- Shallow Flow
- Concentrated Flow

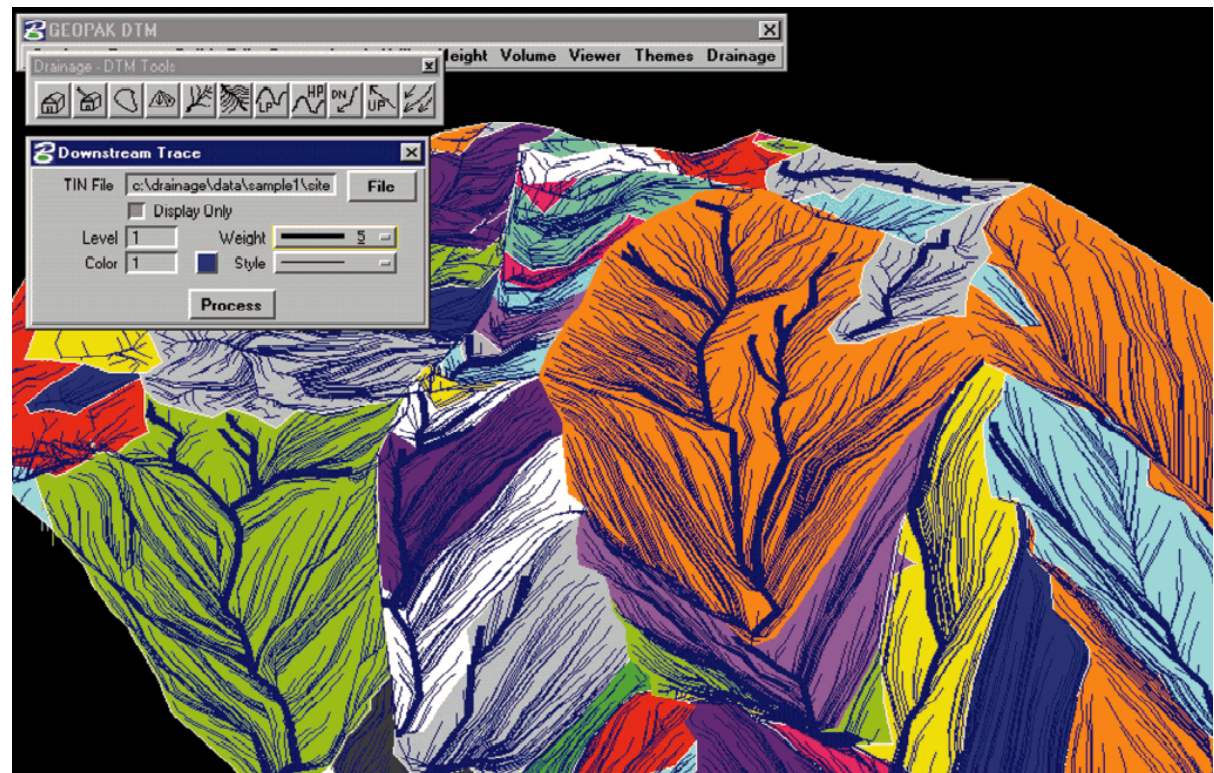
The screenshot shows the 'Time of Concentration' dialog box with the following settings:

- Drainage Area ID: CB - 1
- TIN File: contour.tin
- Define Path: Trace, Id, Id - Segments
- Sheet Flow
 - N Value: 0.000
 - Length: 0.000
 - Slope: 0.000
- Shallow Flow
 - Inter. K: 0.000
 - Length: 0.000
 - Slope: 0.000
- Concentrated Flow
 - Velocity: 0.000
 - Length: 0.000
- Accum. Distance: 0.000
- Accum. Avg. Slope: 0.000
- Tc = 0.000
- Buttons: Compute, Apply



Drainage Area Delineation

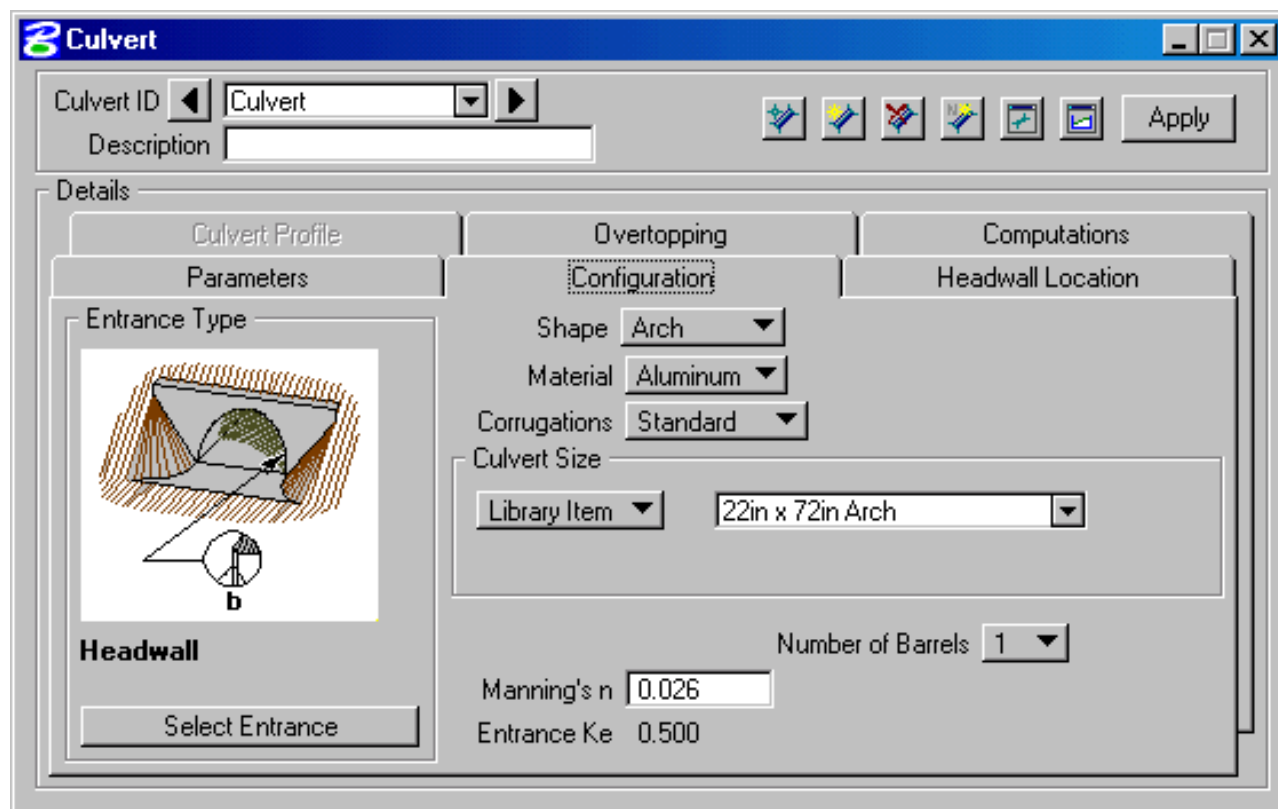
Determine Flow to Pond





Culvert Design

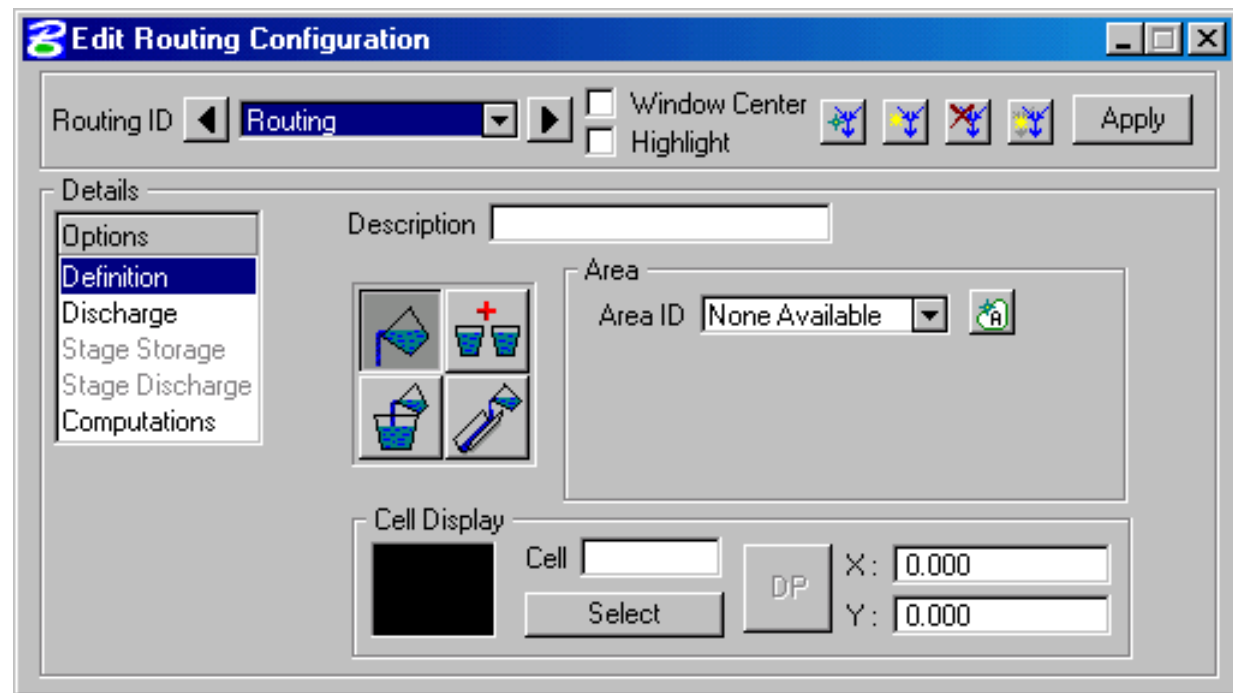
Insert Culvert Structure and Headwalls





Routing

Route stormwater from Area through Culvert or other structures





Reservoir

Detailed reports

File Edit Criteria

File Edit Print Copy Paste Undo Redo

Reservoir Start Elevation = 824.814 (ft)
Reservoir Peak Elevation (computed) = 834.
Peak Discharge = 5.687 (cfs)
Time to Peak = 41.500
Runoff Volume = 7.276 (acre-ft)
Volume = 88.035 (volft³/sHour)
Reservoir Routing Stage Storage Discharge

Stage	Storage	Discharge
824.814	2298.142	0.000
826.401	15517.219	0.000
827.989	62905.882	0.000
829.576	185441.103	0.000
831.163	434225.409	0.000
832.750	846518.477	0.000
834.337	1444395.794	0.535
835.925	2247253.813	42.325
837.512	3233034.743	73.339
839.099	4356850.545	95.710
840.686	5600503.084	113.355
842.273	6957764.675	128.484

Line: 1 Col: 1



Pond Design & Analysis

Alexander Mabrich, PE, Msc