

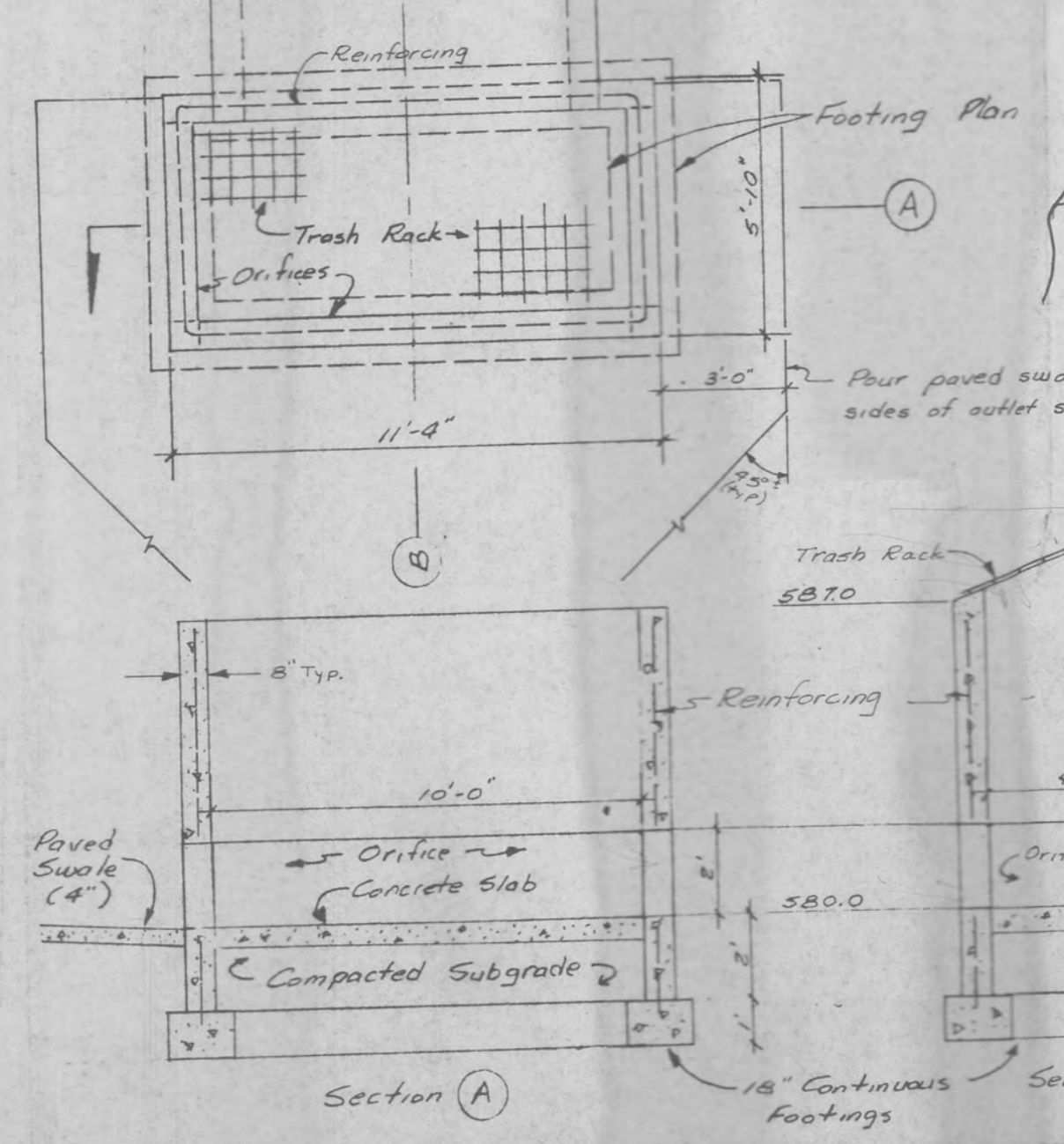
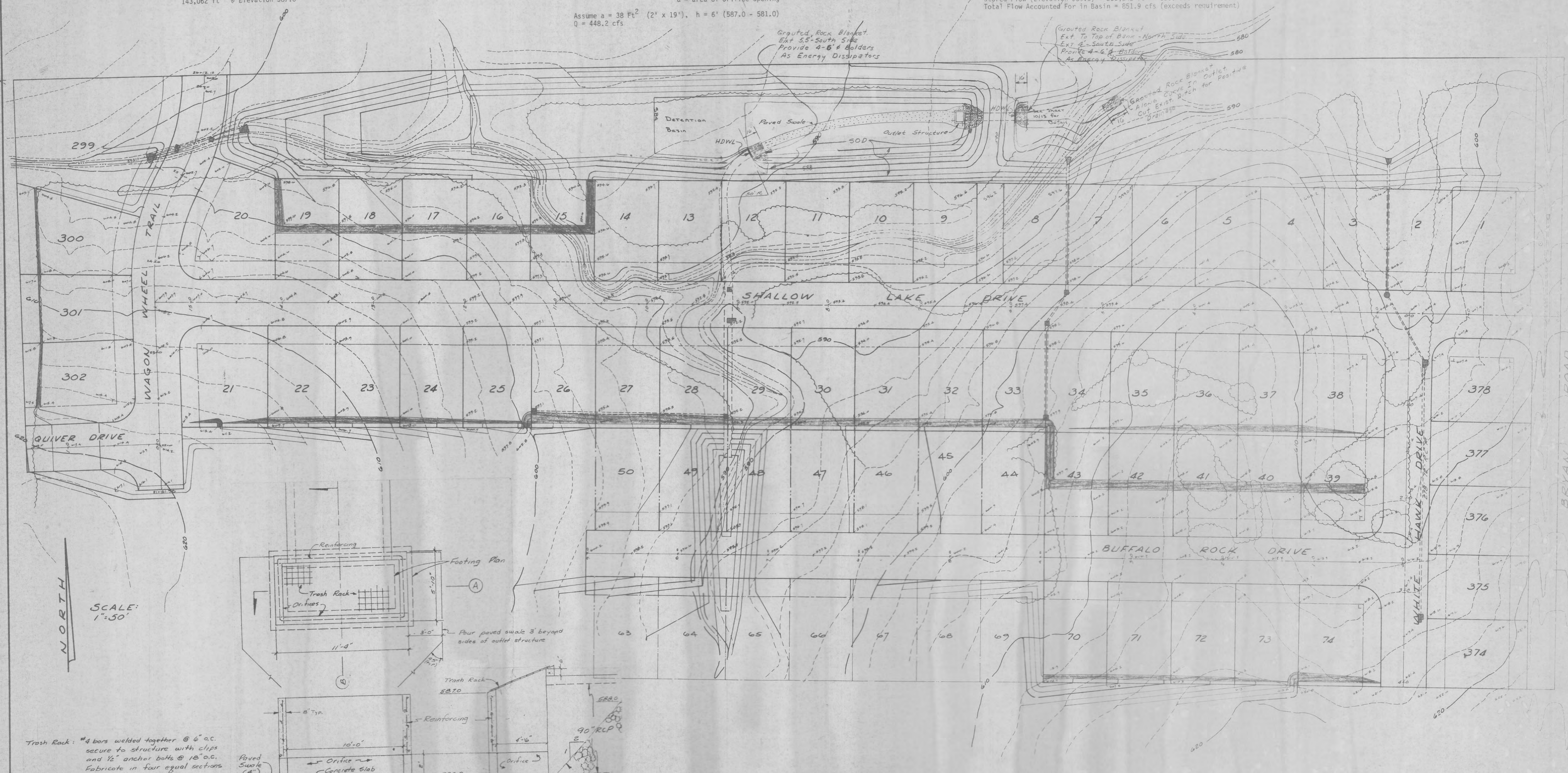
DETENTION CALCULATIONS
Osage Meadows

Total Site: 97.8 Acres
 Developed Conditions: 97.8 Acres @ 2.4 cfs/Acre = 234.72 cfs
 Undeveloped Conditions: 97.8 Acres @ 1.7 cfs/Acre = 166.26 cfs
 Differential = 68.46 cfs
 Required Storage (30 minutes):
 68.46 cfs x 1800 sec. = 123,228 ft.³
 Storage Provided:
 143,062 ft.³ @ Elevation 587.0

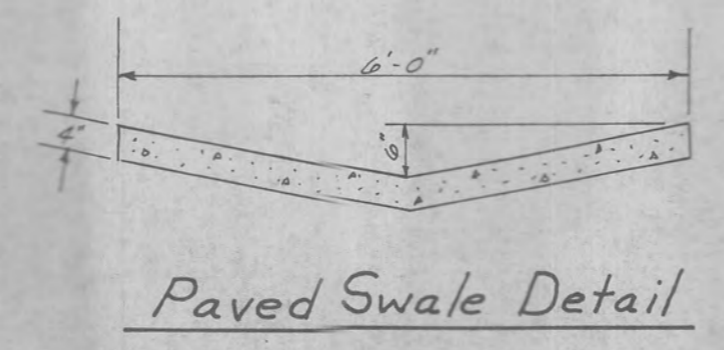
Allowable Release Rate:
 Undeveloped Conditions:
 Flow at North Property Line: 286 Acres @ 1.7 cfs/Acre = 486.2 cfs
 Developed Flow Not Tributary to Detention Basin:
 14 Acres @ 2.4 = 33.6 cfs
 Detention Basin Release Rate:
 486.2 - 33.6 = 452.6 cfs
 Detention Basin Outlet Structure:
 Assume 2' high orifices per drawing
 Flow through orifice:
 $Q = Ca\sqrt{2gh}$
 $Q = 452.6$ (max)
 $c = 0.6$
 $a =$ area of orifice opening
 Assume $a = 38 \text{ Ft}^2$ (2' x 19'), $h = 6'$ (587.0 - 581.0)
 $Q = 448.2$ cfs

Size Outlet Pipe:
 Design Storm Flow to Detention Area:
 (286 - 14) = 272 Acres @ 2.4 cfs/Acre = 652.8 cfs
 Use 90" RCP @ 0.8%; capacity = 687 cfs
 Size Outlet Structure:
 Total Flow through structure is combination of weir flow and orifice flow
 Weir flow: $Q = CLH^{3/2}$ $C = 3.0$ $H = 2'$
 $L = 23'4"$ $Q = 195$ cfs
 Orifice Flow: $Q = Ca\sqrt{2gh}$ $C = 0.6$ $a = 38 \text{ ft}^2$ $g = 32.2 \text{ ft/sec}^2$
 $h = 8 \text{ ft}$ (589.0 - 581.0)
 $Q = 517.5$ cfs
 Total Flow Through Structure = 712 cfs
 Stored Flow (Elevation 589.0) = 251,842 ft.³ 1800 sec = 139.9 cfs
 Total Flow Accounted For in Basin = 851.9 cfs (exceeds requirement)

Rev 12-8-83 Storm Sewers
 5-24-84 Storm Water Detention
 5-24-84 Details
 8-27-84 Orifice Structure



Trash Rack: #4 bars welded together @ 6" o.c. secure to structure with clips and 1/2" anchor bolts @ 18" o.c. Fabricate in four equal sections
 Concrete Slab: 6" thick reinforced with 6x6 W29x29 W.W.F.
 Reinforcing: Walls of Outlet Structure to be reinforced with #4 bars @ 6" o.c., centered in walls. Footing to be reinforced with two #5 bars, continuously



OUTLET STRUCTURE
N.T.S.

Paved Swale Detail

Osage Meadows I
 Received 8-27-84
 Approved 8-28-84 GAA
 GRH
 BID YARDAGE = 66,500 cu. yds.
 Revised 2-12-85 Bid Yardage
 Revised 11-21-85 Bid Yardage