

MODIFIED RATIONAL METHOD DETENTION BASIN DESIGN

PROJECT: Dobbs Elementary School 100 YR

February 14, 2017

Runoff Coefficient C = 0.65
 Drainage Area - A = 9.76 acres
 Time of Concentration - tc = 10 minutes
 Maximum Outflow Rate - Q = 48.3 cfs (50.7-2.4)

| Duration (minutes) | Intensity (inches/hr) | Depth (inches) | Inflow Discharge Q=CiA | Inflow Volume Cu. Ft. | Outflow Duration (minutes) | Outflow Volume Cu. Ft. | Storage Volume Cu. Ft. |
|-------------------------|-----------------------|----------------|------------------------|-----------------------|----------------------------|------------------------|------------------------|
| 10 | 9.80 | 1.63 | 62.2 | 37,303 | 20 | 28,980 | 8,323 |
| 15 | 9.00 | 2.25 | 57.1 | 51,386 | 25 | 36,225 | 15,161 |
| 20 | 8.30 | 2.77 | 52.7 | 63,186 | 30 | 43,470 | 19,716 |
| 30 | 6.90 | 3.45 | 43.8 | 78,792 | 40 | 57,960 | 20,832 |
| 40 | 5.80 | 3.87 | 36.8 | 88,308 | 50 | 72,450 | 15,858 |
| 50 | 5.00 | 4.17 | 31.7 | 95,160 | 60 | 86,940 | 8,220 |
| 60 | 4.50 | 4.50 | 28.5 | 102,773 | 70 | 101,430 | 1,343 |
| 70 | 4.00 | 4.67 | 25.4 | 106,579 | 80 | 115,920 | (9,341) |
| 80 | 3.70 | 4.93 | 23.5 | 112,669 | 90 | 130,410 | (17,741) |
| 90 | 3.50 | 5.25 | 22.2 | 119,902 | 100 | 144,900 | (24,998) |
| 100 | 3.40 | 5.67 | 21.6 | 129,418 | 110 | 159,390 | (29,972) |
| 110 | 3.20 | 5.87 | 20.3 | 133,985 | 120 | 173,880 | (39,895) |
| Required Storage Volume | | | | | | 20,832 | cubic feet |
| | | | | | | 0.48 | acre-feet |