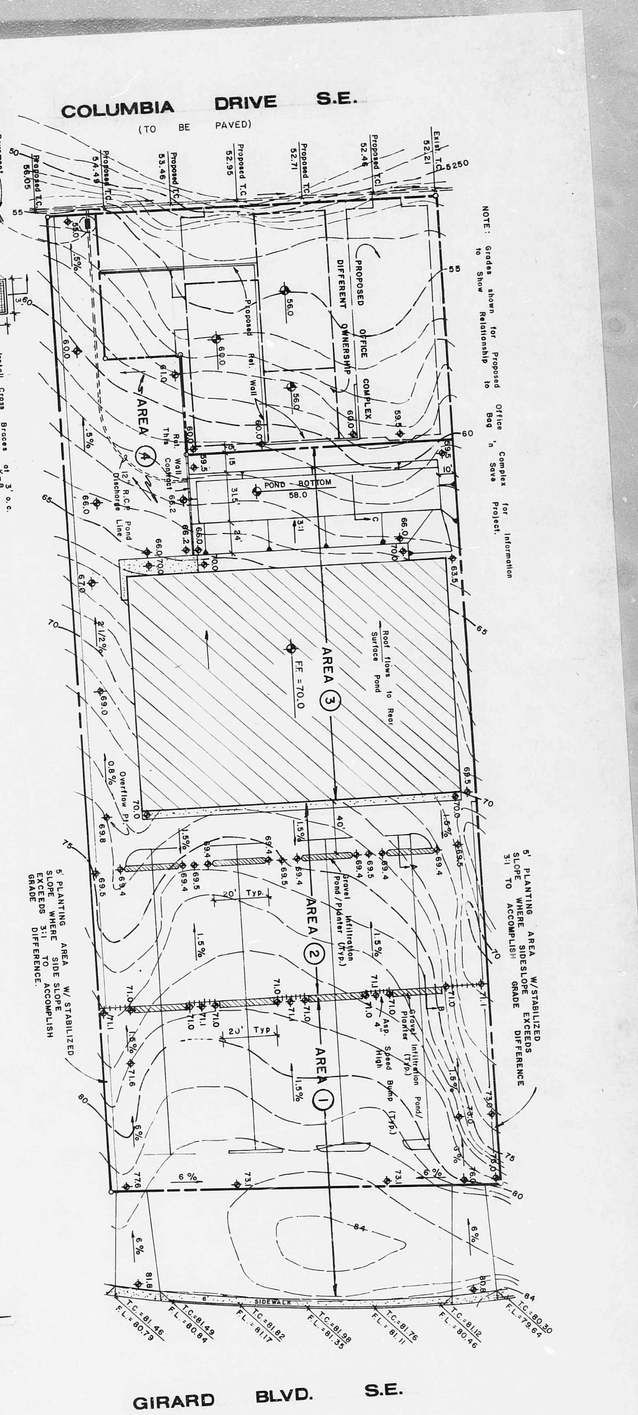
HYDROLOGY

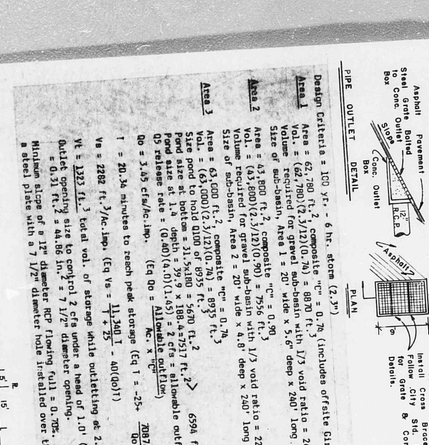
L16/D6
ONE PLAN

L16-D6

1 PLAN



PIPE OUTLET DETAIL



Design Criteria = 100 yr., 6 hr. storm (2.7")

Area 1 Area = 62,780 ft.^{2} composite "C" = 0.74 (includes offsite Girard R/W)
Vol. = (62,780)(2.7/12)(0.74) = 68,70 ft.^{3}
Volume required for gravel sub-basin (1/3 void ratio = 26,880 ft.^{3}
Size of sub-basin, Area 1 = 20' wide x 5.6' deep x 240' long

Area 2 Area = 43,800 ft.^{2} composite "C" = 0.90
Vol. = (43,800)(2.7/12)(0.90) = 79,56 ft.^{3}
Volume required for gravel sub-basin with 1/3 void ratio = 22, 895 ft.^{3}
Size of sub-basin, Area 2 = 20' wide x 4.8' deep x 240' long

Area 3 Area = 6,000 ft.^{2} composite "C" = 0.74
Vol. = (6,000)(2.7/12)(0.74) = 8,995 ft.^{3}
Size pond to hold Q100 of 8995 ft.^{3} = 5,670 ft.^{2}
Pond size at bottom = 31' x 39.9 x 188.4=5917 ft.^{2} > 5670 ft.^{2} 694 ft.^{2}(1.4) = 9231 ft.^{3} capacity.
Pond size at top = 31' x 39.9 x 188.4=5917 ft.^{2} allowable outflow
Q5 release rate = (0.40)(4.0)(1.45) = 2.3 cfs
Q5 release rate = $\frac{\text{Allowable Q}}{\text{Ac x CC}}$
Qo = 5.85 cfs/Ac.-hrs. (Eq Qo = $\frac{\text{Allowable Q}}{\text{Ac x CC}}$)

T = 20.34 minutes to reach peak storage (Eq T = $\frac{25+}{\text{Qo}}$ - $\frac{20(T-5)}{\text{Qo}}$)

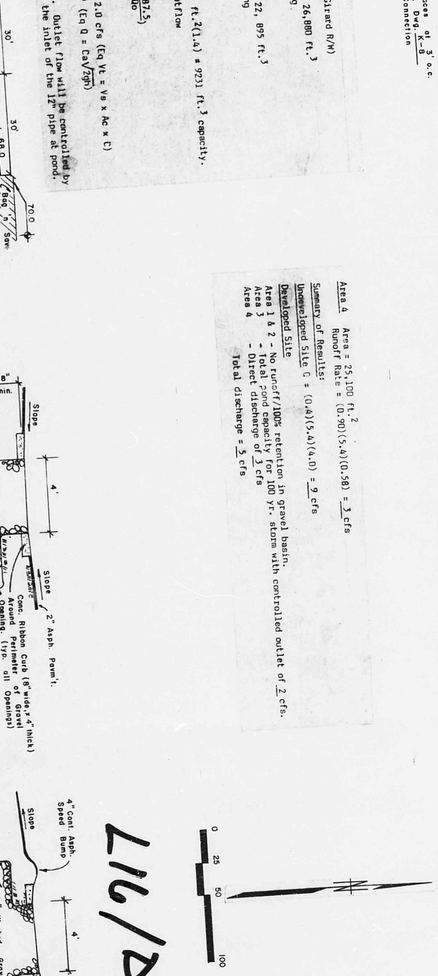
Vs = 2282 ft.^{3}/ac.-hrs. (Eq Vs = $\frac{T(T-25)}{2}$ - 40(Qo)T)

Vt = 1323 ft.^{3} total vol. of storage within outletting at 2.0 cfs (Eq Vt = Vs x Ac x Cf)

Outlet opening size to control 2 cfs under a head of 1.0' (Eq Q = CaV$\sqrt{2gh}$)
= 0.31 ft.^{2} = 44.86 in.^{2} = 7 1/2" diameter opening.

Outlet flow will be controlled by a 12" RCP flowing full = 0.785. Outlet flow will be controlled by a steel plate with a 7 1/2" diameter hole installed over the inlet of the 12" pipe at pond.

Minimum slope of a 12" diameter RCP flowing full = 0.785.



Area 4 Area = 25,100 ft.^{2}
Runoff Rate = (0.90)(5.4)(0.58) = 3 cfs

Summary of Results:

Undeveloped Site Q = (0.4)(5.4)(4.0) = 9 cfs

Developed Site
Area 1 & 2 - No runoff/100% retention in gravel basin
Area 3 - Total pond capacity for 100 yr. storm with controlled outlet of 2 cfs.
Area 4 - Direct discharge of 3 cfs
Total discharge = 5 cfs

Consultants terrasol inc.

GRADING & DRAINAGE PLAN
BAG & SAVE STORE
GIRARD BLVD. S.E.

ALBUQUERQUE
NEW MEXICO

96/917