

DRAINAGE CALCULATIONS

ROCKWALL SALON

POST-DEVELOPED CONDITIONS

for 100-year Storm using Q=CIA

C=0.9 for Commercial Business & I(100-year)=9.8

Capacity of 4' wide x 0.5' deep West Concrete Flume $A = 4^{\circ}0.5 = 2 \text{ sqft}$

 $Q(100) = A(1.486/n)*R^{(2/3)}*S^{(1/2)}$ $Q(100) = 2(114.31)*(2/5)^{(2/3)}*0.02^{(1/2)}$ = 17.55 cfs Flume Capacity 6.24 cfs required for West Flume, therefore CAPACITY EXCEEDS REQUIREMENTS

Capacity of 3.3' wide x 0.5' deep East Concrete Flume

A = 3.3*0.5 = 1.65 sqft

Q(100) = A(1.486/n)*R^(2/3)*S^(1/2)

Q(100) = 1.65(114.31)*(2/5)^(2/3)*0.02^(1/2)

= 14.48 cfs Flume Capacity

7.05 cfs required for East Flume, therefore

CAPACITY EXCEEDS REQUIREMENTS

Capacity of East Y-inlet
yo = 0.3' max depth of flow desired,
from Figure 3.16 = 8 cfs using 4'x4' inlet
East Y-inlet serves Drainage Areas 2, 3 & 4,
therefore 6.24 + 0.741 + 0.529 = 7.51 cfs required
for East Y-inlet and 18" RCP, therefore
CAPACITY EXCEEDS REQUIREMENTS

Capacity of 18" RCP Storm Sewer Pipe out of East Y-inlet (East Drop Inlet) A = 1.77 sqft, pipe slope = 2% Q(100) = 6.24 + 0.741 + 0.529 = 7.51 cfs Critical Depth = 12.96 in from Figure 3.23 wp = 4.39 ft

 $Q(cap) = 1.77*(1.486/.013)*(1.77/4.39)^(2/3)*0.0255^(1/2) = 17.63$ cfs V(max) = 17.63 cfs / 1.77 = 9.86 ft/s ≈ 9.5 ft/s from Figure 3.17 R = 1.77 / 4.39 = 0.403 $S=Qn^2 / 1.486AR^(2/3)$ $S=7.51(0.013^2) / 1.486(1.77)(0.403^2/3)$ S=0.088 %, therefore

Capacity of West Y-inlet
yo = 0.3' max depth of flow desired,
from Figure 3.16 = 8 cfs using 4'x4' inlet
East Y-inlet serves Drainage Areas 1 & 5,
therefore 7.05 + 0.794 = 7.84 cfs required
for West Y-inlet, therefore
CAPACITY EXCEEDS REQUIREMENTS

CAPACITY EXCEEDS REQUIREMENTS

Capacity of "A-A" Swale (see Sheet C-6)

Drainage Area (partial of Drainage Area 1) = 0.035 acre $Q(100) = 0.9^*9.8^*0.035 = 0.309 \text{ cfs}$ n = 0.030; slope = 1%; $Q^*n / 1.486^*s^*1/2 = 0.309^*0.030 / 1.486^*0.01^*1/2 = 0.062$ R = a / wp = 2.72 / 15.36 = 0.177 $R^*(2/3) = 0.177^*(2/3) = 0.315; a^*R^*(2/3) = 0.857$ therefore SWALE "A-A" IS OVERSIZED

Capacity of "B-B" Swale (see Sheet C-6)

Drainage Area (partial of Drainage Area 1) = 0.065 acre

Q(100) = 0.9*9.8*0.065 = 0.573 cfs n = 0.030; slope = 1%;

Q*n / 1.486*s^1/2 = 0.573*0.030 / 1.486*0.01^1/2 = 0.116 R = a / wp = 10.77 / 30.39 = 0.354 $R^{(2/3)} = 0.354^{(2/3)} = 0.500$; $a*R^{(2/3)} = 5.39$ therefore SWALE "B-B" IS OVERSIZED

Capacity of "C-C" Swale (see Sheet C-6)

Drainage Area = 0.009 acre Q(100) = 0.9*9.8*0.009 = 0.079 cfs n = 0.030; slope = 1%; $Q*n / 1.486*s^{1/2} = 0.079*0.030 / 1.486*0.01^{1/2} = 0.016$ R = a / wp = 1.04 / 20.38 = 0.051 $R^{(2/3)} = 0.051^{(2/3)} = 0.138$; $a*R^{(2/3)} = 1.43$ therefore SWALE "C-C" IS OVERSIZED

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11-13-12

ROCKWALL
SALONS, LLC
dba SALONS
ELITE

P.O. BOX 846 SEAGOVILLE, TX 75159

DON BROWN ENGINEERING, LC EBY STATES THAT THIS PLAN IS SEBUILT. THIS INFORMATION TIDED IS BASED ON SURVEYING THE SITE AND INFORMATION

PFEFFER/INMAN ADDITION
2 LOTS - 1.6989 ACRES
J.D. McFarland Survey, Abstract no. 145
CITY OF ROCKWALL, ROCKWALL COUNTY, TEXAS

SHEET TITLE:

AS-BUILT DRAINAGE AREA MAP

DATE: 11/13/12

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