

File.... \\S10svr01\M\p\0403734\STORM\BASHER\_KILL\_PROPOSED.PPW

.....  
TIME OF CONCENTRATION CALCULATOR  
.....

-----  
Segment #1: Tc: TR-55 Sheet

Mannings n .4000  
Hydraulic Length 100.00 ft  
2yr, 24hr P 3.5000 in  
Slope .330000 ft/ft

Avg.Velocity .25 ft/sec

Segment #1 Time: .1115 hrs

-----  
Segment #2: Tc: TR-55 Shallow

Hydraulic Length 1308.00 ft  
Slope .150000 ft/ft  
Unpaved

Avg.Velocity 6.25 ft/sec

Segment #2 Time: .0581 hrs

-----  
Segment #3: Tc: TR-55 Shallow

Hydraulic Length 120.00 ft  
Slope .015000 ft/ft  
Paved

Avg.Velocity 2.49 ft/sec

Segment #3 Time: .0134 hrs  
-----

File.... \\S10svr01\M\p\0403734\STORM\BASHER\_KILL\_PROPOSED.PPW

Segment #4: Tc: TR-55 Channel

Flow Area 1.2270 sq.ft  
Wetted Perimeter 3.93 ft  
Hydraulic Radius .31 ft  
Slope .010000 ft/ft  
Mannings n .0130  
Hydraulic Length 344.00 ft  
  
Avg.Velocity 5.28 ft/sec

Segment #4 Time: .0181 hrs

---

Segment #5: Tc: TR-55 Channel

Flow Area 1.2270 sq.ft  
Wetted Perimeter 3.93 ft  
Hydraulic Radius .31 ft  
Slope .035000 ft/ft  
Mannings n .0130  
Hydraulic Length 498.00 ft  
  
Avg.Velocity 9.88 ft/sec

Segment #5 Time: .0140 hrs

---

Segment #6: Tc: TR-55 Channel

Flow Area 1.2270 sq.ft  
Wetted Perimeter 3.93 ft  
Hydraulic Radius .31 ft  
Slope .030000 ft/ft  
Mannings n .0130  
Hydraulic Length 143.00 ft  
  
Avg.Velocity 9.14 ft/sec

Segment #6 Time: .0043 hrs

---

Type.... Tc Calcs  
Name.... SUBAREA 1P

File.... \\S10svr01\M\p\0403734\STORM\BASHER\_KILL\_PROPOSED.PPW

Segment #7: Tc: TR-55 Channel

Flow Area 1.2270 sq.ft  
Wetted Perimeter 3.93 ft  
Hydraulic Radius .31 ft  
Slope .120000 ft/ft  
Mannings n .0130  
Hydraulic Length 220.00 ft  
  
Avg.Velocity 18.29 ft/sec

Segment #7 Time: .0033 hrs

Segment #8: Tc: TR-55 Channel

Flow Area 1.2270 sq.ft  
Wetted Perimeter 3.93 ft  
Hydraulic Radius .31 ft  
Slope .190000 ft/ft  
Mannings n .0130  
Hydraulic Length 200.00 ft  
  
Avg.Velocity 23.01 ft/sec

Segment #8 Time: .0024 hrs

=====  
Total Tc: .2252 hrs  
=====

File.... \\S10svr01\M\p\0403734\STORM\BASHER\_KILL\_PROPOSED.PPW

-----  
Tc Equations used...  
-----

==== SCS TR-55 Sheet Flow =====

$$Tc = (.007 * ((n * Lf)**0.8)) / ((P**.5) * (Sf**.4))$$

Where: Tc = Time of concentration, hrs  
n = Mannings n  
Lf = Flow length, ft  
P = 2yr, 24hr Rain depth, inches  
Sf = Slope, %

==== SCS TR-55 Shallow Concentrated Flow =====

Unpaved surface:

$$V = 16.1345 * (Sf**.5)$$

Paved surface:

$$V = 20.3282 * (Sf**.5)$$

$$Tc = (Lf / V) / (3600sec/hr)$$

Where: V = Velocity, ft/sec  
Sf = Slope, ft/ft  
Tc = Time of concentration, hrs  
Lf = Flow length, ft

Type.... Tc Calcs  
Name.... SUBAREA 1P

File.... \\S10svr01\M\p\0403734\STORM\BASHER\_KILL\_PROPOSED.PPW

==== SCS Channel Flow =====

$$R = Aq / Wp$$
$$V = (1.49 * (R^{2/3}) * (Sf^{*-0.5})) / n$$

$$Tc = (Lf / V) / (3600sec/hr)$$

Where: R = Hydraulic radius  
Aq = Flow area, sq.ft.  
Wp = Wetted perimeter, ft  
V = Velocity, ft/sec  
Sf = Slope, ft/ft  
n = Mannings n  
Tc = Time of concentration, hrs  
Lf = Flow length, ft

File.... \\s10svr01\M\p\0403734\STORM\BASHER\_KILL\_PROPOSED.PPW

.....  
TIME OF CONCENTRATION CALCULATOR  
.....

-----

Segment #1: Tc: TR-55 Sheet

Mannings n .4000  
Hydraulic Length 100.00 ft  
2yr, 24hr P 3.5000 in  
Slope .045000 ft/ft

Avg.Velocity .11 ft/sec

Segment #1 Time: .2474 hrs

-----

Segment #2: Tc: TR-55 Shallow

Hydraulic Length 402.00 ft  
Slope .268000 ft/ft  
Unpaved

Avg.Velocity 8.35 ft/sec

Segment #2 Time: .0134 hrs

-----

Segment #3: Tc: TR-55 Shallow

Hydraulic Length 270.00 ft  
Slope .107000 ft/ft  
Paved

Avg.Velocity 6.65 ft/sec

Segment #3 Time: .0113 hrs

-----

File.... \\S10svr01\M\p\0403734\STORM\BASHER\_KILL\_PROPOSED.PPW

Segment #4: Tc: TR-55 Channel

Flow Area 1.2270 sq.ft  
Wetted Perimeter 3.93 ft  
Hydraulic Radius .31 ft  
Slope .033000 ft/ft  
Mannings n .0130  
Hydraulic Length 385.00 ft

Avg.Velocity 9.59 ft/sec

Segment #4 Time: .0112 hrs

Segment #5: Tc: TR-55 Channel

Flow Area 1.2270 sq.ft  
Wetted Perimeter 3.93 ft  
Hydraulic Radius .31 ft  
Slope .150000 ft/ft  
Mannings n .0130  
Hydraulic Length 220.00 ft

Avg.Velocity 20.45 ft/sec

Segment #5 Time: .0030 hrs

=====  
Total Tc: .2862 hrs  
=====

File.... \\s10svr01\M\p\0403734\STORM\BASHER\_KILL\_PROPOSED.PPW

-----  
Tc Equations used...  
-----

==== SCS TR-55 Sheet Flow =====

$$Tc = (.007 * ((n * Lf)**0.8)) / ((P**.5) * (Sf**.4))$$

Where: Tc = Time of concentration, hrs  
n = Mannings n  
Lf = Flow length, ft  
P = 2yr, 24hr Rain depth, inches  
Sf = Slope, %

==== SCS TR-55 Shallow Concentrated Flow =====

Unpaved surface:  
 $V = 16.1345 * (Sf**.5)$

Paved surface:  
 $V = 20.3282 * (Sf**.5)$

$$Tc = (Lf / V) / (3600sec/hr)$$

Where: V = Velocity, ft/sec  
Sf = Slope, ft/ft  
Tc = Time of concentration, hrs  
Lf = Flow length, ft

Type.... Tc Calcs  
Name.... SUBAREA 1R

File.... \\S10svr01\M\p\0403734\STORM\BASHER\_KILL\_PROPOSED.PPW

==== SCS Channel Flow =====

$$R = Aq / Wp$$
$$V = (1.49 * (R^{2/3}) * (Sf^{0.5})) / n$$

$$Tc = (Lf / V) / (3600\text{sec/hr})$$

Where: R = Hydraulic radius  
Aq = Flow area, sq.ft.  
Wp = Wetted perimeter, ft  
V = Velocity, ft/sec  
Sf = Slope, ft/ft  
n = Mannings n  
Tc = Time of concentration, hrs  
Lf = Flow length, ft

File.... \\S10svr01\M\p\0403734\STORM\BASHER\_KILL\_PROPOSED.PPW

.....  
TIME OF CONCENTRATION CALCULATOR  
.....

-----  
Segment #1: Tc: TR-55 Sheet

Mannings n .1500  
Hydraulic Length 100.00 ft  
2yr, 24hr P 3.5000 in  
Slope .175000 ft/ft

Avg.Velocity .42 ft/sec

Segment #1 Time: .0656 hrs

-----  
Segment #2: Tc: TR-55 Shallow

Hydraulic Length 1005.00 ft  
Slope .074000 ft/ft  
Unpaved

Avg.Velocity 4.39 ft/sec

Segment #2 Time: .0636 hrs

-----  
=====  
Total Tc: .1292 hrs  
=====