Time of Concentration Calculations

Time of Concentration (T_c) or Travel Time (T_t) Worksheet

Project: Goodwives River Drainage Evaluation — By: WM — Date:
Location: Darien — Checked: — Date:
Circle one: ***Present*** Developed — Watershed: Goodwives River
Circle one: ***Tc*** T_t — Subwatershed: MS-010

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			woods		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.600		
3. Flow Length, L (< 300ft)		ft.	300		
4. Two-year 24-hr rainfall, P_2		in.	3.30		
5. Land slope, s		ft./ft.	0.023		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$		hr.	1.104	=	1.104

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C								
7. Surface description			woods								
8. Manning's roughness coeff., n			0.100								
9. Paved or unpaved			unpaved								
10. Depth of flow, d (default: d=.4 unpaved, d=.2 paved)		ft.	0.40								
11. Flow Length, L		ft.	840								
12. Watercourse slope, s		ft./ft.	0.030								
13. Average velocity,	$V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.	1.40		0.00		0.00		0.00		
14. $T_t = \frac{L}{3600 * V}$		hr.	0.167	+	0.000	+	0.000	+	0.000	=	0.167

Channel flow

		Segment ID	C-D		D-E						
15. Channel Bottom width, b		ft.	4.00		4.00						
16. Horizontal side slope component, z (z horiz:1 vert)			1.00		1.00						
17. Depth of flow, d		ft.	0.50		0.50						
18. Cross sectional flow area, A (assume trapazoidal)		$ft.^2$	2.25		2.25		0.00		0.00		
19. Wetted perimeter, P_w		ft.	5.41		5.41		0.00		0.00		
20. Hydraulic Radius,	$R = \frac{A}{P_w}$	ft.	0.42		0.42		0.00		0.00		
21. Channel slope, s		ft./ft.	0.024		0.006						
22. Manning's roughness coeff., n			0.065		0.065						
23.	$V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.	1.98		1.01		0.00		0.00		
24. Flow length, L		ft.	905		160						
25. $T_t = \frac{L}{3600 * V}$		hr.	0.127	+	0.044	+	0.000	+	0.000	=	0.171
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)										hr.	1.442

Time of Concentration (T_c) or Travel Time (T_t) Worksheet

Project: Goodwives River Drainage Evaluation — By: WM — Date:
Location: Darien — Checked: — Date:
Circle one: ***Present*** Developed — Watershed: Goodwives River
Circle one: ***Tc*** T_t — Subwatershed: MS-020

Sheet flow (applicable to T_c only)

Segment ID		**A-B**		
1. Surface description (Table 3-1)		woods		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)		0.600		
3. Flow Length, L (< 300ft)	ft.	300		
4. Two-year 24-hr rainfall, P_2	in.	3.30		
5. Land slope, s	ft./ft.	0.047		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.	0.836	=	0.836

Shallow concentrated flow (assume hyd. radius = depth of flow)

Segment ID		**B-C**							
7. Surface description		grass							
8. Manning's roughness coeff., n		0.085							
9. Paved or unpaved		unpaved							
10. Depth of flow, d (default: d=.4 unpaved, d=.2 paved)	ft.	0.40							
11. Flow Length, L	ft.	705							
12. Watercourse slope, s	ft./ft.	0.098							
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.	2.98		0.00		0.00		0.00	
14. $T_t = \frac{L}{3600 * V}$	hr.	0.066	+	0.000	+	0.000	+	0.000	= 0.066

Channel flow

Segment ID		**C-D**							
15. Channel Bottom width, b	ft.	5.00							
16. Horizontal side slope component, z (z horiz:1 vert)		1.00							
17. Depth of flow, d	ft.	0.50							
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$	2.75		0.00		0.00		0.00	
19. Wetted perimeter, P_w	ft.	6.41		0.00		0.00		0.00	
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.	0.43		0.00		0.00		0.00	
21. Channel slope, s	ft./ft.	0.040							
22. Manning's roughness coeff., n		0.070							
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.	2.41		0.00		0.00		0.00	
24. Flow length, L	ft.	430							
25. $T_t = \frac{L}{3600 * V}$	hr.	0.050	+	0.000	+	0.000	+	0.000	= 0.050
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)								hr.	0.952

Time of Concentration (T_c) or Travel Time (T_t) Worksheet

Project: Goodwives River Drainage Evaluation — By: WM — Date:
Location: Darien — Checked: — Date:
Circle one: ***Present*** Developed — Watershed: Goodwives River
Circle one: ***Tc*** T_t — Subwatershed: MS-030

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			woodsf		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.500		
3. Flow Length, L (< 300ft)	ft.		300		
4. Two-year 24-hr rainfall, P_2	in.		3.30		
5. Land slope, s	ft./ft.		0.037		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.		0.796	=	0.796

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C		C-D		D-E				
7. Surface description			woods		grass		grass				
8. Manning's roughness coeff., n			0.090		0.080		0.075				
9. Paved or unpaved			unpaved		unpaved		unpaved				
10. Depth of flow, d (default: d=.4 unpaved, d=.2 paved)	ft.		0.40		0.40		0.40				
11. Flow Length, L	ft.		300		170		510				
12. Watercourse slope, s	ft./ft.		0.117		0.059		0.084				
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.		3.07		2.45		3.13		0.00		
14. $T_t = \frac{L}{3600 * V}$	hr.		0.027	+	0.019	+	0.045	+	0.000	=	0.092

Channel flow

		Segment ID									
15. Channel Bottom width, b	ft.										
16. Horizontal side slope component, z (z horiz:1 vert)											
17. Depth of flow, d	ft.										
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$		0.00		0.00		0.00		0.00		
19. Wetted perimeter, P_w	ft.		0.00		0.00		0.00		0.00		
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.		0.00		0.00		0.00		0.00		
21. Channel slope, s	ft./ft.										
22. Manning's roughness coeff., n											
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.		0.00		0.00		0.00		0.00		
24. Flow length, L	ft.										
25. $T_t = \frac{L}{3600 * V}$	hr.		0.000	+	0.000	+	0.000	+	0.000	=	0.000
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)										hr.	0.888

Time of Concentration (T_c) or Travel Time (T_t) Worksheet

Project: Goodwives River Drainage Evaluation — By: WM — Date:
Location: Darien — Checked: — Date:
Circle one: ***Present*** Developed — Watershed: Goodwives River
Circle one: ***Tc*** T_t — Subwatershed: MS-040

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			woodsf		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.500		
3. Flow Length, L (< 300ft)	ft.		300		
4. Two-year 24-hr rainfall, P_2	in.		3.30		
5. Land slope, s	ft./ft.		0.053		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.		0.687	=	0.687

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C		C-D		D-E				
7. Surface description			grass		grass		grss				
8. Manning's roughness coeff., n			0.080		0.080		0.080				
9. Paved or unpaved			unpaved		unpaved		unpvd				
10. Depth of flow, d (default: d=.4 unpaved, d=.2 paved)	ft.		0.40		0.40		0.04				
11. Flow Length, L	ft.		685		150		380				
12. Watercourse slope, s	ft./ft.		0.098		0.047		0.037				
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.		3.16		2.18		0.42		0.00		
14. $T_t = \frac{L}{3600 * V}$	hr.		0.060	+	0.019	+	0.252	+	0.000	=	0.331

Channel flow

		Segment ID	E-F		E-F						
15. Channel Bottom width, b	ft.		8.00		8.00						
16. Horizontal side slope component, z (z horiz:1 vert)			1.00		1.00						
17. Depth of flow, d	ft.		0.80		0.80						
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$		7.04		7.04		0.00		0.00		
19. Wetted perimeter, P_w	ft.		10.26		10.26		0.00		0.00		
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.		0.69		0.69		0.00		0.00		
21. Channel slope, s	ft./ft.		0.011		0.015						
22. Manning's roughness coeff., n			0.065		0.065						
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.		1.90		2.18		0.00		0.00		
24. Flow length, L	ft.		440		400						
25. $T_t = \frac{L}{3600 * V}$	hr.		0.064	+	0.051	+	0.000	+	0.000	=	0.115
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)									hr.		1.133

Time of Concentration (T_c) or Travel Time (T_t) Worksheet

Project: Goodwives River Drainage Evaluation — By: WM — Date:
Location: Darien — Checked: — Date:
Circle one: ***Present*** Developed — Watershed: Goodwives River
Circle one: ***Tc*** T_t — Subwatershed: MS-010

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			woods		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.600		
3. Flow Length, L (< 300ft)		ft.	300		
4. Two-year 24-hr rainfall, P_2		in.	3.30		
5. Land slope, s		ft./ft.	0.023		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$		hr.	1.104	=	1.104

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C							
7. Surface description			woods							
8. Manning's roughness coeff., n			0.100							
9. Paved or unpaved			unpaved							
10. Depth of flow, d (default: d=.4 unpaved, d=.2 paved)		ft.	0.40							
11. Flow Length, L		ft.	840							
12. Watercourse slope, s		ft./ft.	0.030							
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$		fps.	1.40		0.00		0.00		0.00	
14. $T_t = \frac{L}{3600 * V}$		hr.	0.167	+	0.000	+	0.000	+	0.000	= 0.167

Channel flow

		Segment ID	C-D		D-E					
15. Channel Bottom width, b		ft.	4.00		4.00					
16. Horizontal side slope component, z (z horiz:1 vert)			1.00		1.00					
17. Depth of flow, d		ft.	0.50		0.50					
18. Cross sectional flow area, A (assume trapazoidal)		$ft.^2$	2.25		2.25		0.00		0.00	
19. Wetted perimeter, P_w		ft.	5.41		5.41		0.00		0.00	
20. Hydraulic Radius, $R = \frac{A}{P_w}$		ft.	0.42		0.42		0.00		0.00	
21. Channel slope, s		ft./ft.	0.024		0.006					
22. Manning's roughness coeff., n			0.065		0.065					
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$		fps.	1.98		1.01		0.00		0.00	
24. Flow length, L		ft.	905		160					
25. $T_t = \frac{L}{3600 * V}$		hr.	0.127	+	0.044	+	0.000	+	0.000	= 0.171
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)									hr.	1.442

Time of Concentration (T_c) or Travel Time (T_t) Worksheet

Project: Goodwives River Drainage Evaluation — By: WM — Date:
Location: Darien — Checked: — Date:
Circle one: ***Present*** Developed — Watershed: Goodwives River
Circle one: ***Tc*** T_t — Subwatershed: MS-020

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			woods		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.600		
3. Flow Length, L (< 300ft)		ft.	300		
4. Two-year 24-hr rainfall, P_2		in.	3.30		
5. Land slope, s		ft./ft.	0.047		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$		hr.	0.836	=	0.836

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C							
7. Surface description			grass							
8. Manning's roughness coeff., n			0.085							
9. Paved or unpaved			unpaved							
10. Depth of flow, d (default: d=.4 unpaved, d=.2 paved)		ft.	0.40							
11. Flow Length, L		ft.	705							
12. Watercourse slope, s		ft./ft.	0.098							
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$		fps.	2.98		0.00		0.00		0.00	
14. $T_t = \frac{L}{3600 * V}$		hr.	0.066	+	0.000	+	0.000	+	0.000	= 0.066

Channel flow

		Segment ID	C-D							
15. Channel Bottom width, b		ft.	5.00							
16. Horizontal side slope component, z (z horiz:1 vert)			1.00							
17. Depth of flow, d		ft.	0.50							
18. Cross sectional flow area, A (assume trapazoidal)		$ft.^2$	2.75		0.00		0.00		0.00	
19. Wetted perimeter, P_w		ft.	6.41		0.00		0.00		0.00	
20. Hydraulic Radius, $R = \frac{A}{P_w}$		ft.	0.43		0.00		0.00		0.00	
21. Channel slope, s		ft./ft.	0.040							
22. Manning's roughness coeff., n			0.070							
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$		fps.	2.41		0.00		0.00		0.00	
24. Flow length, L		ft.	430							
25. $T_t = \frac{L}{3600 * V}$		hr.	0.050	+	0.000	+	0.000	+	0.000	= 0.050
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)									hr.	0.952

Time of Concentration (T_c) or Travel Time (T_t) Worksheet

Project: Goodwives River Drainage Evaluation — By: WM — Date:
Location: Darien — Checked: — Date:
Circle one: ***Present*** Developed — Watershed: Goodwives River
Circle one: ***Tc*** T_t — Subwatershed: MS-030

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			woodsf		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.500		
3. Flow Length, L (< 300ft)		ft.	300		
4. Two-year 24-hr rainfall, P_2		in.	3.30		
5. Land slope, s		ft./ft.	0.037		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$		hr.	0.796	=	0.796

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C		C-D		D-E				
7. Surface description			woods		grass		grass				
8. Manning's roughness coeff., n			0.090		0.080		0.075				
9. Paved or unpaved			unpaved		unpaved		unpaved				
10. Depth of flow, d (default: d=.4 unpaved, d=.2 paved)		ft.	0.40		0.40		0.40				
11. Flow Length, L		ft.	300		170		510				
12. Watercourse slope, s		ft./ft.	0.117		0.059		0.084				
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$		fps.	3.07		2.45		3.13		0.00		
14. $T_t = \frac{L}{3600 * V}$		hr.	0.027	+	0.019	+	0.045	+	0.000	=	0.092

Channel flow

		Segment ID									
15. Channel Bottom width, b		ft.									
16. Horizontal side slope component, z (z horiz:1 vert)											
17. Depth of flow, d		ft.									
18. Cross sectional flow area, A (assume trapazoidal)		$ft.^2$	0.00		0.00		0.00		0.00		
19. Wetted perimeter, P_w		ft.	0.00		0.00		0.00		0.00		
20. Hydraulic Radius, $R = \frac{A}{P_w}$		ft.	0.00		0.00		0.00		0.00		
21. Channel slope, s		ft./ft.									
22. Manning's roughness coeff., n											
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$		fps.	0.00		0.00		0.00		0.00		
24. Flow length, L		ft.									
25. $T_t = \frac{L}{3600 * V}$		hr.	0.000	+	0.000	+	0.000	+	0.000	=	0.000
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)										hr.	0.888

Time of Concentration (T_c) or Travel Time (T_t) Worksheet

Project: Goodwives River Drainage Evaluation — By: WM — Date:
Location: Darien — Checked: — Date:
Circle one: ***Present*** Developed — Watershed: Goodwives River
Circle one: ***Tc*** T_t — Subwatershed: MS-040

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			woodsf		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.500		
3. Flow Length, L (< 300ft)	ft.		300		
4. Two-year 24-hr rainfall, P_2	in.		3.30		
5. Land slope, s	ft./ft.		0.053		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.		0.687	=	0.687

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C		C-D		D-E			
7. Surface description			grass		grass		grss			
8. Manning's roughness coeff., n			0.080		0.080		0.080			
9. Paved or unpaved			unpaved		unpaved		unpvd			
10. Depth of flow, d (default: d=.4 unpaved, d=.2 paved)	ft.		0.40		0.40		0.04			
11. Flow Length, L	ft.		685		150		380			
12. Watercourse slope, s	ft./ft.		0.098		0.047		0.037			
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.		3.16		2.18		0.42		0.00	
14. $T_t = \frac{L}{3600 * V}$	hr.		0.060	+	0.019	+	0.252	+	0.000	= 0.331

Channel flow

		Segment ID	E-F		E-F					
15. Channel Bottom width, b	ft.		8.00		8.00					
16. Horizontal side slope component, z (z horiz:1 vert)			1.00		1.00					
17. Depth of flow, d	ft.		0.80		0.80					
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$		7.04		7.04		0.00		0.00	
19. Wetted perimeter, P_w	ft.		10.26		10.26		0.00		0.00	
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.		0.69		0.69		0.00		0.00	
21. Channel slope, s	ft./ft.		0.011		0.015					
22. Manning's roughness coeff., n			0.065		0.065					
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.		1.90		2.18		0.00		0.00	
24. Flow length, L	ft.		440		400					
25. $T_t = \frac{L}{3600 * V}$	hr.		0.064	+	0.051	+	0.000	+	0.000	= 0.115
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)									hr.	1.133

Time of Concentration (T_c) or Travel Time (T_t) Worksheet

Project: Goodwives River Drainage Evaluation
By: WM
Date:
Location: Darien
Checked:
Date:
Circle one: ***Present*** Developed
Watershed: Goodwives River
Circle one: ***Tc*** T_t
Subwatershed: MS-050

Sheet flow (applicable to T_c only)

Segment ID		A-B		
1. Surface description (Table 3-1)		grass		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)		0.310		
3. Flow Length, L (< 300ft)	ft.	300		
4. Two-year 24-hr rainfall, P_2	in.	3.30		
5. Land slope, s	ft./ft.	0.033		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.	0.564	=	0.564

Shallow concentrated flow (assume hyd. radius = depth of flow)

Segment ID		B-C							
7. Surface description		grass							
8. Manning's roughness coeff., n		0.080							
9. Paved or unpaved		unpaved							
10. Depth of flow, d (default: d=.4 unpaved, d=.2 paved)	ft.	0.40							
11. Flow Length, L	ft.	715							
12. Watercourse slope, s	ft./ft.	0.020							
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.	1.41		0.00		0.00		0.00	
14. $T_t = \frac{L}{3600 * V}$	hr.	0.140	+	0.000	+	0.000	+	0.000	= 0.140

Channel flow

Segment ID		C-D							
15. Channel Bottom width, b	ft.	10.00							
16. Horizontal side slope component, z (z horiz:1 vert)		1.00							
17. Depth of flow, d	ft.	0.50							
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$	5.25		0.00		0.00		0.00	
19. Wetted perimeter, P_w	ft.	11.41		0.00		0.00		0.00	
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.	0.46		0.00		0.00		0.00	
21. Channel slope, s	ft./ft.	0.006							
22. Manning's roughness coeff., n		0.055							
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.	1.20		0.00		0.00		0.00	
24. Flow length, L	ft.	180							
25. $T_t = \frac{L}{3600 * V}$	hr.	0.042	+	0.000	+	0.000	+	0.000	= 0.042
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)								hr.	0.746

Time of Concentration (T_c) or Travel Time (T_t) Worksheet

Project: Goodwives River Drainage Evaluation
Location: Darien
Circle one: ***Present*** Developed
Circle one: ***Tc*** T_t

By: WM
Checked:
Watershed: Goodwives River
Subwatershed: MS-060

Date:
Date:

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			grass		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.400		
3. Flow Length, L (< 300ft)	ft.		225		
4. Two-year 24-hr rainfall, P_2	in.		3.30		
5. Land slope, s	ft./ft.		0.018		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.		0.707	=	0.707

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C							
7. Surface description			grass							
8. Manning's roughness coeff., n			0.080							
9. Paved or unpaved			unpaved							
10. Depth of flow, d (default: d=.4 unpaved, d=.2 paved)	ft.		0.40							
11. Flow Length, L	ft.		225							
12. Watercourse slope, s	ft./ft.		0.044							
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.		2.13		0.00		0.00		0.00	
14. $T_t = \frac{L}{3600 * V}$	hr.		0.029	+	0.000	+	0.000	+	0.000	= 0.029

Channel flow

		Segment ID	C-D							
15. Channel Bottom width, b	ft.		8.00							
16. Horizontal side slope component, z (z horiz:1 vert)			1.00							
17. Depth of flow, d	ft.		0.60							
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$		5.16		0.00		0.00		0.00	
19. Wetted perimeter, P_w	ft.		9.70		0.00		0.00		0.00	
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.		0.53		0.00		0.00		0.00	
21. Channel slope, s	ft./ft.		0.005							
22. Manning's roughness coeff., n			0.650							
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.		0.11		0.00		0.00		0.00	
24. Flow length, L	ft.		190							
25. $T_t = \frac{L}{3600 * V}$	hr.		0.483	+	0.000	+	0.000	+	0.000	= 0.483
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)									hr.	1.219

Time of Concentration (T_c) or Travel Time (T_t) Worksheet

Project: Goodwives River Drainage Evaluation — By: WM — Date:
Location: Darien — Checked: — Date:
Circle one: ***Present*** Developed — Watershed: Goodwives River
Circle one: ***Tc*** T_t — Subwatershed: MS-070

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			woodsf		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.400		
3. Flow Length, L (< 300ft)		ft.	300		
4. Two-year 24-hr rainfall, P_2		in.	3.30		
5. Land slope, s		ft./ft.	0.062		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$		hr.	0.540	=	0.540

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C		C-D		D-E				
7. Surface description			grss		grss		grss				
8. Manning's roughness coeff., n			0.080		0.080		0.080				
9. Paved or unpaved			unpaved		unpaved		unpaved				
10. Depth of flow, d (default: d=.4 unpaved, d=.2 paved)		ft.	0.40		0.40		0.40				
11. Flow Length, L		ft.	475		115		340				
12. Watercourse slope, s		ft./ft.	0.046		0.087		0.044				
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$		fps.	2.17		2.98		2.12		0.00		
14. $T_t = \frac{L}{3600 * V}$		hr.	0.061	+	0.011	+	0.045	+	0.000	=	0.116

Channel flow

		Segment ID									
15. Channel Bottom width, b		ft.									
16. Horizontal side slope component, z (z horiz:1 vert)											
17. Depth of flow, d		ft.									
18. Cross sectional flow area, A (assume trapazoidal)		$ft.^2$	0.00		0.00		0.00		0.00		
19. Wetted perimeter, P_w		ft.	0.00		0.00		0.00		0.00		
20. Hydraulic Radius, $R = \frac{A}{P_w}$		ft.	0.00		0.00		0.00		0.00		
21. Channel slope, s		ft./ft.									
22. Manning's roughness coeff., n											
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$		fps.	0.00		0.00		0.00		0.00		
24. Flow length, L		ft.									
25. $T_t = \frac{L}{3600 * V}$		hr.	0.000	+	0.000	+	0.000	+	0.000	=	0.000
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)										hr.	0.656

Time of Concentration (T_c) or Travel Time (T_t) Worksheet

Project: Goodwives River Drainage Evaluation — By: WM — Date:
Location: Darien — Checked: — Date:
Circle one: ***Present*** Developed — Watershed: Goodwives River
Circle one: ***Tc*** T_t — Subwatershed: MS-080

Sheet flow (applicable to T_c only)

		Segment ID		
		A-B		
1. Surface description (Table 3-1)		woodsf		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)		0.400		
3. Flow Length, L (< 300ft)	ft.	300		
4. Two-year 24-hr rainfall, P_2	in.	3.30		
5. Land slope, s	ft./ft.	0.027		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.	0.756	=	0.756

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID								
		B-C		**C-D**		**D-E**				
7. Surface description		grass		grass		grass				
8. Manning's roughness coeff., n		0.080		0.085		0.080				
9. Paved or unpaved		unpaved		unpaved		unpaved				
10. Depth of flow, d (default: d=.4 unpaved, d=.2 paved)	ft.	0.40		0.40		0.40				
11. Flow Length, L	ft.	210		145		390				
12. Watercourse slope, s	ft./ft.	0.038		0.117		0.018				
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.	1.97		3.26		1.35		0.00		
14. $T_t = \frac{L}{3600 * V}$	hr.	0.030	+	0.012	+	0.080	+	0.000	=	0.122

Channel flow

		Segment ID								
15. Channel Bottom width, b	ft.									
16. Horizontal side slope component, z (z horiz:1 vert)										
17. Depth of flow, d	ft.									
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$	0.00		0.00		0.00		0.00		
19. Wetted perimeter, P_w	ft.	0.00		0.00		0.00		0.00		
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.	0.00		0.00		0.00		0.00		
21. Channel slope, s	ft./ft.									
22. Manning's roughness coeff., n										
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.	0.00		0.00		0.00		0.00		
24. Flow length, L	ft.									
25. $T_t = \frac{L}{3600 * V}$	hr.	0.000	+	0.000	+	0.000	+	0.000	=	0.000
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)									hr.	0.878

Time of Concentration (T_c) or Travel Time (T_t) Worksheet

Project: Goodwives River Drainage Evaluation — By: WM — Date:
Location: Darien — Checked: — Date:
Circle one: ***Present*** Developed — Watershed: Goodwives River
Circle one: ***Tc*** T_t — Subwatershed: MS-090

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			woodsf		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.450		
3. Flow Length, L (< 300ft)	ft.		255		
4. Two-year 24-hr rainfall, P_2	in.		3.30		
5. Land slope, s	ft./ft.		0.039		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.		0.626	=	0.626

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C							
7. Surface description			woods							
8. Manning's roughness coeff., n			0.100							
9. Paved or unpaved			unpaved							
10. Depth of flow, d (default: d=.4 unpaved, d=.2 paved)	ft.		0.40							
11. Flow Length, L	ft.		380							
12. Watercourse slope, s	ft./ft.		0.053							
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.		1.86		0.00		0.00		0.00	
14. $T_t = \frac{L}{3600 * V}$	hr.		0.057	+	0.000	+	0.000	+	0.000	= 0.057

Channel flow

		Segment ID	C-D							
15. Channel Bottom width, b	ft.		8.00							
16. Horizontal side slope component, z (z horiz:1 vert)			1.00							
17. Depth of flow, d	ft.		0.60							
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$		5.16		0.00		0.00		0.00	
19. Wetted perimeter, P_w	ft.		9.70		0.00		0.00		0.00	
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.		0.53		0.00		0.00		0.00	
21. Channel slope, s	ft./ft.		0.008							
22. Manning's roughness coeff., n			0.058							
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.		1.49		0.00		0.00		0.00	
24. Flow length, L	ft.		900							
25. $T_t = \frac{L}{3600 * V}$	hr.		0.168	+	0.000	+	0.000	+	0.000	= 0.168
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)									hr.	0.850

Time of Concentration (T_c) or Travel Time (T_t) Worksheet

Project: Goodwives River Drainage Evaluation — By: WM — Date:
Location: Darien — Checked: — Date:
Circle one: ***Present*** Developed — Watershed: Goodwives River
Circle one: ***Tc*** T_t — Subwatershed: MS-100

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			woodsf		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.400		
3. Flow Length, L (< 300ft)		ft.	300		
4. Two-year 24-hr rainfall, P_2		in.	3.30		
5. Land slope, s		ft./ft.	0.020		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$		hr.	0.849	=	0.849

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C							
7. Surface description			grass							
8. Manning's roughness coeff., n			0.080							
9. Paved or unpaved			unpaved							
10. Depth of flow, d (default: d=.4 unpaved, d=.2 paved)		ft.	0.40							
11. Flow Length, L		ft.	750							
12. Watercourse slope, s		ft./ft.	0.021							
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$		fps.	1.48		0.00		0.00		0.00	
14. $T_t = \frac{L}{3600 * V}$		hr.	0.141	+	0.000	+	0.000	+	0.000	= 0.141

Channel flow

		Segment ID	C-D							
15. Channel Bottom width, b		ft.	8.00							
16. Horizontal side slope component, z (z horiz:1 vert)			1.00							
17. Depth of flow, d		ft.	0.60							
18. Cross sectional flow area, A (assume trapazoidal)		$ft.^2$	5.16		0.00		0.00		0.00	
19. Wetted perimeter, P_w		ft.	9.70		0.00		0.00		0.00	
20. Hydraulic Radius, $R = \frac{A}{P_w}$		ft.	0.53		0.00		0.00		0.00	
21. Channel slope, s		ft./ft.	0.007							
22. Manning's roughness coeff., n			0.058							
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$		fps.	1.42		0.00		0.00		0.00	
24. Flow length, L		ft.	425							
25. $T_t = \frac{L}{3600 * V}$		hr.	0.083	+	0.000	+	0.000	+	0.000	= 0.083
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)									hr.	1.073

Time of Concentration (T_c) or Travel Time (T_t) Worksheet

Project: Goodwives River Drainage Evaluation
Location: Darien
Circle one: ***Present*** Developed
Circle one: ***Tc*** T_t

By: WM
Checked:
Watershed: Goodwives River
Subwatershed: MS-110

Date:
Date:

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			woodsf		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.600		
3. Flow Length, L (< 300ft)	ft.		300		
4. Two-year 24-hr rainfall, P_2	in.		3.30		
5. Land slope, s	ft./ft.		0.030		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.		0.998	=	0.998

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C								
7. Surface description			woods								
8. Manning's roughness coeff., n			0.100								
9. Paved or unpaved			unpaved								
10. Depth of flow, d (default: d=.4 unpaved, d=.2 paved)	ft.		0.40								
11. Flow Length, L	ft.		165								
12. Watercourse slope, s	ft./ft.		0.024								
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.		1.26		0.00		0.00		0.00		
14. $T_t = \frac{L}{3600 * V}$	hr.		0.036	+	0.000	+	0.000	+	0.000	=	0.036

Channel flow

		Segment ID	C-D								
15. Channel Bottom width, b	ft.		7.00								
16. Horizontal side slope component, z (z horiz:1 vert)			1.00								
17. Depth of flow, d	ft.		0.50								
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$		3.75		0.00		0.00		0.00		
19. Wetted perimeter, P_w	ft.		8.41		0.00		0.00		0.00		
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.		0.45		0.00		0.00		0.00		
21. Channel slope, s	ft./ft.		0.007								
22. Manning's roughness coeff., n			0.060								
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.		1.22		0.00		0.00		0.00		
24. Flow length, L	ft.		705								
25. $T_t = \frac{L}{3600 * V}$	hr.		0.160	+	0.000	+	0.000	+	0.000	=	0.160
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)										hr.	1.195

Time of Concentration (T_c) or Travel Time (T_t) Worksheet

Project: Goodwives River Drainage Evaluation — By: WM — Date:
Location: Darien — Checked: — Date:
Circle one: ***Present*** Developed — Watershed: Goodwives River
Circle one: ***Tc*** T_t — Subwatershed: MS-120

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			woodsf		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.400		
3. Flow Length, L (< 300ft)		ft.	300		
4. Two-year 24-hr rainfall, P_2		in.	3.30		
5. Land slope, s		ft./ft.	0.013		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$		hr.	0.998	=	0.998

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C							
7. Surface description			woods							
8. Manning's roughness coeff., n			0.090							
9. Paved or unpaved			unpaved							
10. Depth of flow, d (default: d=.4 unpaved, d=.2 paved)		ft.	0.40							
11. Flow Length, L		ft.	760							
12. Watercourse slope, s		ft./ft.	0.045							
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$		fps.	1.90		0.00		0.00		0.00	
14. $T_t = \frac{L}{3600 * V}$		hr.	0.111	+	0.000	+	0.000	+	0.000	= 0.111

Channel flow

		Segment ID	C-D							
15. Channel Bottom width, b		ft.	12.00							
16. Horizontal side slope component, z (z horiz:1 vert)			0.80							
17. Depth of flow, d		ft.	1.00							
18. Cross sectional flow area, A (assume trapazoidal)		$ft.^2$	12.80		0.00		0.00		0.00	
19. Wetted perimeter, P_w		ft.	14.56		0.00		0.00		0.00	
20. Hydraulic Radius, $R = \frac{A}{P_w}$		ft.	0.88		0.00		0.00		0.00	
21. Channel slope, s		ft./ft.	0.015							
22. Manning's roughness coeff., n			0.060							
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$		fps.	2.76		0.00		0.00		0.00	
24. Flow length, L		ft.	1,090							
25. $T_t = \frac{L}{3600 * V}$		hr.	0.110	+	0.000	+	0.000	+	0.000	= 0.110
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)									hr.	1.219

Time of Concentration (T_c) or Travel Time (T_t) Worksheet

Project: Goodwives River Drainage Evaluation — By: WM — Date:
Location: Darien — Checked: — Date:
Circle one: ***Present*** Developed — Watershed: Goodwives River
Circle one: ***Tc*** T_t — Subwatershed: MS-130

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			woodsf		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.400		
3. Flow Length, L (< 300ft)	ft.		300		
4. Two-year 24-hr rainfall, P_2	in.		3.30		
5. Land slope, s	ft./ft.		0.027		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.		0.756	=	0.756

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C		C-D						
7. Surface description			woods		grass						
8. Manning's roughness coeff., n			0.090		0.070						
9. Paved or unpaved			unpaved		unpaved						
10. Depth of flow, d (default: d=.4 unpaved, d=.2 paved)	ft.		0.40		0.35						
11. Flow Length, L	ft.		600		425						
12. Watercourse slope, s	ft./ft.		0.050		0.064						
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.		2.01		2.66		0.00		0.00		
14. $T_t = \frac{L}{3600 * V}$	hr.		0.083	+	0.044	+	0.000	+	0.000	=	0.127

Channel flow

		Segment ID	D-E								
15. Channel Bottom width, b	ft.		12.50								
16. Horizontal side slope component, z (z horiz:1 vert)			1.00								
17. Depth of flow, d	ft.		1.10								
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$		14.96		0.00		0.00		0.00		
19. Wetted perimeter, P_w	ft.		15.61		0.00		0.00		0.00		
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.		0.96		0.00		0.00		0.00		
21. Channel slope, s	ft./ft.		0.014								
22. Manning's roughness coeff., n			0.058								
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.		2.96		0.00		0.00		0.00		
24. Flow length, L	ft.		640								
25. $T_t = \frac{L}{3600 * V}$	hr.		0.060	+	0.000	+	0.000	+	0.000	=	0.060
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)										hr.	0.944

Time of Concentration (T_c) or Travel Time (T_t) Worksheet

Project: Goodwives River Drainage Evaluation — By: WM — Date:
Location: Darien — Checked: — Date:
Circle one: ***Present*** Developed — Watershed: Goodwives River
Circle one: ***Tc*** T_t — Subwatershed: MS-140

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			woodsf		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.450		
3. Flow Length, L (< 300ft)		ft.	300		
4. Two-year 24-hr rainfall, P_2		in.	3.30		
5. Land slope, s		ft./ft.	0.037		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$		hr.	0.732	=	0.732

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C		C-D						
7. Surface description			grass		impervious						
8. Manning's roughness coeff., n			0.070		0.011						
9. Paved or unpaved			unpaved		paved						
10. Depth of flow, d (default: d=.4 unpaved, d=.2 paved)		ft.	0.40		0.20						
11. Flow Length, L		ft.	1,010		235						
12. Watercourse slope, s		ft./ft.	0.052		0.026						
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$		fps.	2.65		7.40		0.00		0.00		
14. $T_t = \frac{L}{3600 * V}$		hr.	0.106	+	0.009	+	0.000	+	0.000	=	0.115

Channel flow

		Segment ID	D-E								
15. Channel Bottom width, b		ft.	12.00								
16. Horizontal side slope component, z (z horiz:1 vert)			1.00								
17. Depth of flow, d		ft.	1.00								
18. Cross sectional flow area, A (assume trapazoidal)		$ft.^2$	13.00		0.00		0.00		0.00		
19. Wetted perimeter, P_w		ft.	14.83		0.00		0.00		0.00		
20. Hydraulic Radius, $R = \frac{A}{P_w}$		ft.	0.88		0.00		0.00		0.00		
21. Channel slope, s		ft./ft.	0.008								
22. Manning's roughness coeff., n			0.060								
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$		fps.	2.08		0.00		0.00		0.00		
24. Flow length, L		ft.	720								
25. $T_t = \frac{L}{3600 * V}$		hr.	0.096	+	0.000	+	0.000	+	0.000	=	0.096
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)										hr.	0.943

Time of Concentration (T_c) or Travel Time (T_t) Worksheet

Project: Goodwives River Drainage Evaluation — By: WM — Date:
Location: Darien — Checked: — Date:
Circle one: ***Present*** Developed — Watershed: Goodwives River
Circle one: ***Tc*** T_t — Subwatershed: MS-150

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			woodsf		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.400		
3. Flow Length, L (< 300ft)	ft.		300		
4. Two-year 24-hr rainfall, P_2	in.		3.30		
5. Land slope, s	ft./ft.		0.040		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.		0.643	=	0.643

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C		C-D						
7. Surface description			grass		impervious						
8. Manning's roughness coeff., n			0.075		0.014						
9. Paved or unpaved			unpaved		paved						
10. Depth of flow, d (default: d=.4 unpaved, d=.2 paved)	ft.		0.40		0.20						
11. Flow Length, L	ft.		700		675						
12. Watercourse slope, s	ft./ft.		0.047		0.025						
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.		2.34		5.78		0.00		0.00		
14. $T_t = \frac{L}{3600 * V}$	hr.		0.083	+	0.032	+	0.000	+	0.000	=	0.115

Channel flow

		Segment ID	D-E								
15. Channel Bottom width, b	ft.		12.50								
16. Horizontal side slope component, z (z horiz:1 vert)			1.00								
17. Depth of flow, d	ft.		1.50								
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$		21.00		0.00		0.00		0.00		
19. Wetted perimeter, P_w	ft.		16.74		0.00		0.00		0.00		
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.		1.25		0.00		0.00		0.00		
21. Channel slope, s	ft./ft.		0.002								
22. Manning's roughness coeff., n			0.058								
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.		1.35		0.00		0.00		0.00		
24. Flow length, L	ft.		490								
25. $T_t = \frac{L}{3600 * V}$	hr.		0.101	+	0.000	+	0.000	+	0.000	=	0.101
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)										hr.	0.860

Time of Concentration (T_c) or Travel Time (T_t) Worksheet

Project: Goodwives River Drainage Evaluation — By: WM — Date:
Location: Darien — Checked: — Date:
Circle one: ***Present*** Developed — Watershed: Goodwives River
Circle one: ***Tc*** T_t — Subwatershed: MS-160

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			frst		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.400		
3. Flow Length, L (< 300ft)		ft.	125		
4. Two-year 24-hr rainfall, P_2		in.	3.30		
5. Land slope, s		ft./ft.	0.035		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$		hr.	0.337	=	0.337

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C		C-D						
7. Surface description			frst		frst						
8. Manning's roughness coeff., n			0.090		0.090						
9. Paved or unpaved			unpaved		unpaved						
10. Depth of flow, d (default: d=.4 unpaved, d=.2 paved)		ft.	0.40		0.40						
11. Flow Length, L		ft.	135		165						
12. Watercourse slope, s		ft./ft.	0.044		0.012						
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$		fps.	1.89		0.98		0.00		0.00		
14. $T_t = \frac{L}{3600 * V}$		hr.	0.020	+	0.047	+	0.000	+	0.000	=	0.066

Channel flow

		Segment ID	D-E		E-F		F-G				
15. Channel Bottom width, b		ft.	Conduit		5.00		13.00				
16. Horizontal side slope component, z (z horiz:1 vert)			---		2.00		1.00				
17. Depth of flow, d		ft.	---		1.00		1.50				
18. Cross sectional flow area, A (assume trapazoidal)		$ft.^2$	---		7.00		21.75		0.00		
19. Wetted perimeter, P_w		ft.	---		9.47		17.24		0.00		
20. Hydraulic Radius, $R = \frac{A}{P_w}$		ft.	---		0.74		1.26		0.00		
21. Channel slope, s		ft./ft.	---		0.025		0.004				
22. Manning's roughness coeff., n			---		0.045		0.060				
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$		fps.	5.00		4.28		1.83		0.00		
24. Flow length, L		ft.	380		170		270				
25. $T_t = \frac{L}{3600 * V}$		hr.	0.021	+	0.011	+	0.041	+	0.000	=	0.073
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)									hr.		0.476

Time of Concentration (T_c) or Travel Time (T_t) Worksheet

Project: Goodwives River Drainage Evaluation By: WM Date:
Location: Darien Checked: Date:
Circle one: ***Present*** Developed Watershed: Goodwives River
Circle one: ***Tc*** T_t Subwatershed: MS-170

* - This subbasin is entirely urbanized. An assumed lag time of 15 minutes was used - *

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)					
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)					
3. Flow Length, L (< 300ft)	ft.				
4. Two-year 24-hr rainfall, P_2	in.				
5. Land slope, s	ft./ft.				
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.		0.000	=	0.000

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C								
7. Surface description											
8. Manning's roughness coeff., n											
9. Paved or unpaved											
10. Depth of flow, d (default: d=.4 unpaved, d=.2 paved)	ft.										
11. Flow Length, L	ft.										
12. Watercourse slope, s	ft./ft.										
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.										
14. $T_t = \frac{L}{3600 * V}$	hr.		0.000	+	0.000	+	0.000	+	0.000	=	0.000

Channel flow

		Segment ID	C-D								
15. Channel Bottom width, b	ft.										
16. Horizontal side slope component, z (z horiz:1 vert)											
17. Depth of flow, d	ft.										
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$										
19. Wetted perimeter, P_w	ft.										
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.										
21. Channel slope, s	ft./ft.										
22. Manning's roughness coeff., n											
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.										
24. Flow length, L	ft.										
25. $T_t = \frac{L}{3600 * V}$	hr.		0.000	+	0.000	+	0.000	+	0.000	=	0.000
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)									hr.		0.000

Time of Concentration (T_c) or Travel Time (T_t) Worksheet

Project: Goodwives River Drainage Evaluation — By: WM — Date:
Location: Darien — Checked: — Date:
Circle one: ***Present*** Developed — Watershed: Goodwives River
Circle one: ***Tc*** T_t — Subwatershed: MS-180

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			woodsf		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.600		
3. Flow Length, L (< 300ft)	ft.		250		
4. Two-year 24-hr rainfall, P_2	in.		3.30		
5. Land slope, s	ft./ft.		0.024		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.		0.943	=	0.943

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C		C-D						
7. Surface description			woodsf		grass						
8. Manning's roughness coeff., n			0.090		0.080						
9. Paved or unpaved			unpaved		unpaved						
10. Depth of flow, d (default: d=.4 unpaved, d=.2 paved)	ft.		0.40		0.40						
11. Flow Length, L	ft.		1,920		425						
12. Watercourse slope, s	ft./ft.		0.015		0.019						
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.		1.10		1.39		0.00		0.00		
14. $T_t = \frac{L}{3600 * V}$	hr.		0.483	+	0.085	+	0.000	+	0.000	=	0.568

Channel flow

		Segment ID	C-D								
15. Channel Bottom width, b	ft.		5.00								
16. Horizontal side slope component, z (z horiz:1 vert)			1.00								
17. Depth of flow, d	ft.		1.00								
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$		6.00		0.00		0.00		0.00		
19. Wetted perimeter, P_w	ft.		7.83		0.00		0.00		0.00		
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.		0.77		0.00		0.00		0.00		
21. Channel slope, s	ft./ft.		0.019								
22. Manning's roughness coeff., n			0.045								
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.		3.82		0.00		0.00		0.00		
24. Flow length, L	ft.		425								
25. $T_t = \frac{L}{3600 * V}$	hr.		0.031	+	0.000	+	0.000	+	0.000	=	0.031
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)										hr.	1.542

Time of Concentration (T_c) or Travel Time (T_t) Worksheet

Project: Goodwives River Drainage Evaluation
Location: Darien
Circle one: ***Present*** Developed
Circle one: ***Tc*** T_t

By: WM
Checked:
Watershed: Goodwives River
Subwatershed: MS-190

Date:
Date:

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			woodsf		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.600		
3. Flow Length, L (< 300ft)	ft.		265		
4. Two-year 24-hr rainfall, P_2	in.		3.30		
5. Land slope, s	ft./ft.		0.034		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.		0.860	=	0.860

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C		C-D		D-E				
7. Surface description			woods		woods		woods				
8. Manning's roughness coeff., n			0.100		0.100		0.100				
9. Paved or unpaved			unpaved		unpaved		unpaved				
10. Depth of flow, d (default: d=.4 unpaved, d=.2 paved)	ft.		0.40		0.40		0.40				
11. Flow Length, L	ft.		650		110		125				
12. Watercourse slope, s	ft./ft.		0.023		0.155		0.040				
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.		1.23		3.18		1.62		0.00		
14. $T_t = \frac{L}{3600 * V}$	hr.		0.147	+	0.010	+	0.021	+	0.000	=	0.178

Channel flow

		Segment ID	E-F								
15. Channel Bottom width, b	ft.		14.00								
16. Horizontal side slope component, z (z horiz:1 vert)			1.00								
17. Depth of flow, d	ft.		1.50								
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$		23.25		0.00		0.00		0.00		
19. Wetted perimeter, P_w	ft.		18.24		0.00		0.00		0.00		
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.		1.27		0.00		0.00		0.00		
21. Channel slope, s	ft./ft.		0.011								
22. Manning's roughness coeff., n			0.055								
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.		3.29		0.00		0.00		0.00		
24. Flow length, L	ft.		375								
25. $T_t = \frac{L}{3600 * V}$	hr.		0.032	+	0.000	+	0.000	+	0.000	=	0.032
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)										hr.	1.070

Time of Concentration (T_c) or Travel Time (T_t) Worksheet

Project: Goodwives River Drainage Evaluation
Location: Darien
Circle one: ***Present*** Developed
Circle one: ***Tc*** T_t

By: WM
Checked:
Watershed: Goodwives River
Subwatershed: MS-200

Date:
Date:

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			woodsf		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.550		
3. Flow Length, L (< 300ft)	ft.		300		
4. Two-year 24-hr rainfall, P_2	in.		3.30		
5. Land slope, s	ft./ft.		0.047		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.		0.778	=	0.778

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C		C-D		D-E				
7. Surface description			grass		impervious		woods				
8. Manning's roughness coeff., n			0.070		0.011		0.100				
9. Paved or unpaved			unpaved		paved		unpaved				
10. Depth of flow, d (default: d=.4 unpaved, d=.2 paved)	ft.		0.40		0.20		0.40				
11. Flow Length, L	ft.		400		300		130				
12. Watercourse slope, s	ft./ft.		0.008		0.020		0.077				
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.		1.03		6.55		2.24		0.00		
14. $T_t = \frac{L}{3600 * V}$	hr.		0.108	+	0.013	+	0.016	+	0.000	=	0.136

Channel flow

		Segment ID	E-F		F-G						
15. Channel Bottom width, b	ft.		20.00		20.00						
16. Horizontal side slope component, z (z horiz:1 vert)			5.00		5.00						
17. Depth of flow, d	ft.		2.00		2.00						
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$		60.00		60.00		0.00		0.00		
19. Wetted perimeter, P_w	ft.		40.40		40.40		0.00		0.00		
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.		1.49		1.49		0.00		0.00		
21. Channel slope, s	ft./ft.		0.002		0.036						
22. Manning's roughness coeff., n			0.080		0.055						
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.		1.17		6.66		0.00		0.00		
24. Flow length, L	ft.		640		140						
25. $T_t = \frac{L}{3600 * V}$	hr.		0.151	+	0.006	+	0.000	+	0.000	=	0.157
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)									hr.		1.072

Time of Concentration (T_c) or Travel Time (T_t) Worksheet

Project: Goodwives River Drainage Evaluation
Location: Darien
Circle one: ***Present*** Developed
Circle one: ***Tc*** T_t

By: WM
Checked:
Watershed: Goodwives River
Subwatershed: T0-010

Date:
Date:

Sheet flow (applicable to T_c only)

Segment ID		A-B		
1. Surface description (Table 3-1)		woods		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)		0.600		
3. Flow Length, L (< 300ft)	ft.	300		
4. Two-year 24-hr rainfall, P_2	in.	3.30		
5. Land slope, s	ft./ft.	0.073		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.	0.698	=	0.698

Shallow concentrated flow (assume hyd. radius = depth of flow)

Segment ID		B-C								
7. Surface description		woods								
8. Manning's roughness coeff., n		0.100								
9. Paved or unpaved		unpaved								
10. Depth of flow, d (default: d=.4 unpaved, d=.2 paved)	ft.	0.40								
11. Flow Length, L	ft.	1,445								
12. Watercourse slope, s	ft./ft.	0.015								
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.	1.00		0.00		0.00		0.00		
14. $T_t = \frac{L}{3600 * V}$	hr.	0.402	+	0.000	+	0.000	+	0.000	=	0.402

Channel flow

Segment ID		C-D								
15. Channel Bottom width, b	ft.	5.00								
16. Horizontal side slope component, z (z horiz:1 vert)		1.00								
17. Depth of flow, d	ft.	0.50								
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$	2.75		0.00		0.00		0.00		
19. Wetted perimeter, P_w	ft.	6.41		0.00		0.00		0.00		
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.	0.43		0.00		0.00		0.00		
21. Channel slope, s	ft./ft.	0.017								
22. Manning's roughness coeff., n		0.080								
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.	1.39		0.00		0.00		0.00		
24. Flow length, L	ft.	290								
25. $T_t = \frac{L}{3600 * V}$	hr.	0.058	+	0.000	+	0.000	+	0.000	=	0.058
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)									hr.	1.158

Time of Concentration (T_c) or Travel Time (T_t) Worksheet

Project: Goodwives River Drainage Evaluation — By: WM — Date:
Location: Darien — Checked: — Date:
Circle one: ***Present*** Developed — Watershed: Goodwives River
Circle one: ***Tc*** T_t — Subwatershed: T1-010

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			woods		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.600		
3. Flow Length, L (< 300ft)	ft.		300		
4. Two-year 24-hr rainfall, P_2	in.		3.30		
5. Land slope, s	ft./ft.		0.020		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.		1.174	=	1.174

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C								
7. Surface description			woods								
8. Manning's roughness coeff., n			0.100								
9. Paved or unpaved			unpaved								
10. Depth of flow, d (default: d=.4 unpaved, d=.2 paved)	ft.		0.40								
11. Flow Length, L	ft.		1,635								
12. Watercourse slope, s	ft./ft.		0.015								
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.		0.98		0.00		0.00		0.00		
14. $T_t = \frac{L}{3600 * V}$	hr.		0.463	+	0.000	+	0.000	+	0.000	=	0.463

Channel flow

		Segment ID	C-D								
15. Channel Bottom width, b	ft.		5.00								
16. Horizontal side slope component, z (z horiz:1 vert)			1.00								
17. Depth of flow, d	ft.		0.50								
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$		2.75		0.00		0.00		0.00		
19. Wetted perimeter, P_w	ft.		6.41		0.00		0.00		0.00		
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.		0.43		0.00		0.00		0.00		
21. Channel slope, s	ft./ft.		0.026								
22. Manning's roughness coeff., n			0.080								
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.		1.69		0.00		0.00		0.00		
24. Flow length, L	ft.		470								
25. $T_t = \frac{L}{3600 * V}$	hr.		0.077	+	0.000	+	0.000	+	0.000	=	0.077
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)										hr.	1.715

Time of Concentration (T_c) or Travel Time (T_t) Worksheet

Project: Goodwives River Drainage Evaluation
Location: Darien
Circle one: ***Present*** Developed
Circle one: ***Tc*** T_t

By: WM
Checked:
Watershed: Goodwives River
Subwatershed: T1-020

Date:
Date:

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			Woods		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.600		
3. Flow Length, L (< 300ft)	ft.		300		
4. Two-year 24-hr rainfall, P_2	in.		3.30		
5. Land slope, s	ft./ft.		0.017		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.		1.263	=	1.263

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C								
7. Surface description			woods								
8. Manning's roughness coeff., n			0.100								
9. Paved or unpaved			unpaved								
10. Depth of flow, d (default: d=.4 unpaved, d=.2 paved)	ft.		0.40								
11. Flow Length, L	ft.		720								
12. Watercourse slope, s	ft./ft.		0.021								
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.		1.17		0.00		0.00		0.00		
14. $T_t = \frac{L}{3600 * V}$	hr.		0.171	+	0.000	+	0.000	+	0.000	=	0.171

Channel flow

		Segment ID	C-D								
15. Channel Bottom width, b	ft.		5.00								
16. Horizontal side slope component, z (z horiz:1 vert)			1.00								
17. Depth of flow, d	ft.		0.40								
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$		2.16		0.00		0.00		0.00		
19. Wetted perimeter, P_w	ft.		6.13		0.00		0.00		0.00		
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.		0.35		0.00		0.00		0.00		
21. Channel slope, s	ft./ft.		0.013								
22. Manning's roughness coeff., n			0.070								
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.		1.20		0.00		0.00		0.00		
24. Flow length, L	ft.		1,100								
25. $T_t = \frac{L}{3600 * V}$	hr.		0.255	+	0.000	+	0.000	+	0.000	=	0.255
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)									hr.		1.689

Time of Concentration (T_c) or Travel Time (T_t) Worksheet

Project: Goodwives River Drainage Evaluation — By: WM — Date:
Location: Darien — Checked: — Date:
Circle one: ***Present*** Developed — Watershed: Goodwives River
Circle one: ***Tc*** T_t — Subwatershed: T1-030

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			Woods		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.600		
3. Flow Length, L (< 300ft)	ft.		300		
4. Two-year 24-hr rainfall, P_2	in.		3.30		
5. Land slope, s	ft./ft.		0.020		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.		1.174	=	1.174

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C		C-D						
7. Surface description			grass		woods						
8. Manning's roughness coeff., n			0.075		0.100						
9. Paved or unpaved			unpaved		unpaved						
10. Depth of flow, d (default: d=.4 unpaved, d=.2 paved)	ft.		0.40		0.40						
11. Flow Length, L	ft.		615		290						
12. Watercourse slope, s	ft./ft.		0.020		0.041						
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.		1.51		1.65		0.00		0.00		
14. $T_t = \frac{L}{3600 * V}$	hr.		0.113	+	0.049	+	0.000	+	0.000	=	0.162

Channel flow

		Segment ID	D-E								
15. Channel Bottom width, b	ft.		5.00								
16. Horizontal side slope component, z (z horiz:1 vert)			1.00								
17. Depth of flow, d	ft.		0.40								
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$		2.16		0.00		0.00		0.00		
19. Wetted perimeter, P_w	ft.		6.13		0.00		0.00		0.00		
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.		0.35		0.00		0.00		0.00		
21. Channel slope, s	ft./ft.		0.010								
22. Manning's roughness coeff., n			0.070								
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.		1.05		0.00		0.00		0.00		
24. Flow length, L	ft.		1,025								
25. $T_t = \frac{L}{3600 * V}$	hr.		0.271	+	0.000	+	0.000	+	0.000	=	0.271
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)										hr.	1.608

Time of Concentration (T_c) or Travel Time (T_t) Worksheet

Project: Goodwives River Drainage Evaluation | By: WM | Date: 06/01/09
Location: Darien | Checked: | Date:
Circle one: ***Present*** Developed | Watershed: Goodwives River
Circle one: ***Tc*** T_t | Subwatershed: T1-040

Sheet flow (applicable to T_c only)

Segment ID		A-B		
1. Surface description (Table 3-1)		grass		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)		0.260		
3. Flow Length, L (< 300ft)	ft.	260		
4. Two-year 24-hr rainfall, P_2	in.	3.30		
5. Land slope, s	ft./ft.	0.012		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.	0.668	=	0.668

Shallow concentrated flow (assume hyd. radius = depth of flow)

Segment ID		B-C		C-D					
7. Surface description		woods		woods					
8. Manning's roughness coeff., n		0.090		0.090					
9. Paved or unpaved		unpaved		unpaved					
10. Depth of flow, d (default: d=.4 unpaved, d=.2 paved)	ft.	0.40		0.40					
11. Flow Length, L	ft.	335		275					
12. Watercourse slope, s	ft./ft.	0.024		0.069					
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.	1.39		2.36		0.00		0.00	
14. $T_t = \frac{L}{3600 * V}$	hr.	0.067	+	0.032	+	0.000	+	0.000	= 0.099

Channel flow

Segment ID									
15. Channel Bottom width, b	ft.								
16. Horizontal side slope component, z (z horiz:1 vert)									
17. Depth of flow, d	ft.								
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$	0.00		0.00		0.00		0.00	
19. Wetted perimeter, P_w	ft.	0.00		0.00		0.00		0.00	
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.	0.00		0.00		0.00		0.00	
21. Channel slope, s	ft./ft.								
22. Manning's roughness coeff., n									
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.	0.00		0.00		0.00		0.00	
24. Flow length, L	ft.								
25. $T_t = \frac{L}{3600 * V}$	hr.	0.000	+	0.000	+	0.000	+	0.000	= 0.000
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)								hr.	0.768

Time of Concentration (T_c) or Travel Time (T_t) Worksheet

Project: Goodwives River Drainage Evaluation — By: WM — Date:
Location: Darien — Checked: — Date:
Circle one: ***Present*** Developed — Watershed: Goodwives River
Circle one: ***Tc*** T_t — Subwatershed: T1-050

Sheet flow (applicable to T_c only)

Segment ID		**A-B**		
1. Surface description (Table 3-1)		grass		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)		0.260		
3. Flow Length, L (< 300ft)	ft.	275		
4. Two-year 24-hr rainfall, P_2	in.	3.30		
5. Land slope, s	ft./ft.	0.065		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.	0.349	=	0.349

Shallow concentrated flow (assume hyd. radius = depth of flow)

Segment ID		**B-C**							
7. Surface description		woods							
8. Manning's roughness coeff., n		0.100							
9. Paved or unpaved		unpaved							
10. Depth of flow, d (default: d=.4 unpaved, d=.2 paved)	ft.	0.40							
11. Flow Length, L	ft.	320							
12. Watercourse slope, s	ft./ft.	0.025							
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.	1.28		0.00		0.00		0.00	
14. $T_t = \frac{L}{3600 * V}$	hr.	0.069	+	0.000	+	0.000	+	0.000	= 0.069

Channel flow

Segment ID		**C-D**							
15. Channel Bottom width, b	ft.	6.00							
16. Horizontal side slope component, z (z horiz:1 vert)		1.00							
17. Depth of flow, d	ft.	0.40							
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$	2.56		0.00		0.00		0.00	
19. Wetted perimeter, P_w	ft.	7.13		0.00		0.00		0.00	
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.	0.36		0.00		0.00		0.00	
21. Channel slope, s	ft./ft.	0.005							
22. Manning's roughness coeff., n		0.070							
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.	0.72		0.00		0.00		0.00	
24. Flow length, L	ft.	220							
25. $T_t = \frac{L}{3600 * V}$	hr.	0.084	+	0.000	+	0.000	+	0.000	= 0.084
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)								hr.	0.503

Time of Concentration (T_c) or Travel Time (T_t) Worksheet

Project: Goodwives River Drainage Evaluation
Location: Darien
Circle one: ***Present*** Developed
Circle one: ***Tc*** T_t

By: WM
Checked:
Watershed: Goodwives River
Subwatershed: T1-060

Date:
Date:

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			woods		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.600		
3. Flow Length, L (< 300ft)	ft.		300		
4. Two-year 24-hr rainfall, P_2	in.		3.30		
5. Land slope, s	ft./ft.		0.027		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.		1.046	=	1.046

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C								
7. Surface description			grass								
8. Manning's roughness coeff., n			0.080								
9. Paved or unpaved			unpaved								
10. Depth of flow, d (default: d=.4 unpaved, d=.2 paved)	ft.		0.40								
11. Flow Length, L	ft.		410								
12. Watercourse slope, s	ft./ft.		0.029								
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.		1.73		0.00		0.00		0.00		
14. $T_t = \frac{L}{3600 * V}$	hr.		0.066	+	0.000	+	0.000	+	0.000	=	0.066

Channel flow

		Segment ID	C-D								
15. Channel Bottom width, b	ft.		5.00								
16. Horizontal side slope component, z (z horiz:1 vert)			1.00								
17. Depth of flow, d	ft.		0.50								
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$		2.75		0.00		0.00		0.00		
19. Wetted perimeter, P_w	ft.		6.41		0.00		0.00		0.00		
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.		0.43		0.00		0.00		0.00		
21. Channel slope, s	ft./ft.		0.008								
22. Manning's roughness coeff., n			0.065								
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.		1.20		0.00		0.00		0.00		
24. Flow length, L	ft.		825								
25. $T_t = \frac{L}{3600 * V}$	hr.		0.191	+	0.000	+	0.000	+	0.000	=	0.191
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)										hr.	1.303

Time of Concentration (T_c) or Travel Time (T_t) Worksheet

Project: Goodwives River Drainage Evaluation — By: WM — Date:
Location: Darien — Checked: — Date:
Circle one: ***Present*** Developed — Watershed: Goodwives River
Circle one: ***Tc*** T_t — Subwatershed: T1-070

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			wods		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.600		
3. Flow Length, L (< 300ft)	ft.		300		
4. Two-year 24-hr rainfall, P_2	in.		3.30		
5. Land slope, s	ft./ft.		0.020		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.		1.174	=	1.174

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C							
7. Surface description			woods							
8. Manning's roughness coeff., n			0.090							
9. Paved or unpaved			unpaved							
10. Depth of flow, d (default: d=.4 unpaved, d=.2 paved)	ft.		0.40							
11. Flow Length, L	ft.		690							
12. Watercourse slope, s	ft./ft.		0.041							
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.		1.81		0.00		0.00		0.00	
14. $T_t = \frac{L}{3600 * V}$	hr.		0.106	+	0.000	+	0.000	+	0.000	= 0.106

Channel flow

		Segment ID	C-D		D-E					
15. Channel Bottom width, b	ft.		5.00		8.00					
16. Horizontal side slope component, z (z horiz:1 vert)			1.00		1.00					
17. Depth of flow, d	ft.		0.50		0.60					
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$		2.75		5.16		0.00		0.00	
19. Wetted perimeter, P_w	ft.		6.41		9.70		0.00		0.00	
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.		0.43		0.53		0.00		0.00	
21. Channel slope, s	ft./ft.		0.009		0.005					
22. Manning's roughness coeff., n			0.065		0.027					
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.		1.26		2.68		0.00		0.00	
24. Flow length, L	ft.		425		375					
25. $T_t = \frac{L}{3600 * V}$	hr.		0.093	+	0.039	+	0.000	+	0.000	= 0.132
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)									hr.	1.412

Time of Concentration (T_c) or Travel Time (T_t) Worksheet

Project: Goodwives River Drainage Evaluation
Location: Darien
Circle one: ***Present*** Developed
Circle one: ***Tc*** T_t

By: WM
Checked:
Watershed: Goodwives River
Subwatershed: T1-080

Date:
Date:

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			grass		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.260		
3. Flow Length, L (< 300ft)	ft.		300		
4. Two-year 24-hr rainfall, P_2	in.		3.30		
5. Land slope, s	ft./ft.		0.017		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.		0.647	=	0.647

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C								
7. Surface description			woods								
8. Manning's roughness coeff., n			0.090								
9. Paved or unpaved			unpaved								
10. Depth of flow, d (default: d=.4 unpaved, d=.2 paved)	ft.		0.40								
11. Flow Length, L	ft.		400								
12. Watercourse slope, s	ft./ft.		0.020								
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.		1.27		0.00		0.00		0.00		
14. $T_t = \frac{L}{3600 * V}$	hr.		0.087	+	0.000	+	0.000	+	0.000	=	0.087

Channel flow

		Segment ID	D-E								
15. Channel Bottom width, b	ft.		6.00								
16. Horizontal side slope component, z (z horiz:1 vert)			1.00								
17. Depth of flow, d	ft.		0.60								
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$		3.96		0.00		0.00		0.00		
19. Wetted perimeter, P_w	ft.		7.70		0.00		0.00		0.00		
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.		0.51		0.00		0.00		0.00		
21. Channel slope, s	ft./ft.		0.005								
22. Manning's roughness coeff., n			0.060								
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.		1.09		0.00		0.00		0.00		
24. Flow length, L	ft.		855								
25. $T_t = \frac{L}{3600 * V}$	hr.		0.218	+	0.000	+	0.000	+	0.000	=	0.218
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)										hr.	0.952

Time of Concentration (T_c) or Travel Time (T_t) Worksheet

Project: Goodwives River Drainage Evaluation — By: WM — Date:
Location: Darien — Checked: — Date:
Circle one: ***Present*** Developed — Watershed: Goodwives River
Circle one: ***Tc*** T_t — Subwatershed: T1-TA

Sheet flow (applicable to T_c only)

Segment ID		A-B	
1. Surface description (Table 3-1)		woods	
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)		0.600	
3. Flow Length, L (< 300ft)	ft.	300	
4. Two-year 24-hr rainfall, P_2	in.	3.30	
5. Land slope, s	ft./ft.	0.023	
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.	1.110	= 1.110

Shallow concentrated flow (assume hyd. radius = depth of flow)

Segment ID		B-C							
7. Surface description		grass							
8. Manning's roughness coeff., n		0.075							
9. Paved or unpaved		unpaved							
10. Depth of flow, d (default: d=.4 unpaved, d=.2 paved)	ft.	0.40							
11. Flow Length, L	ft.	410							
12. Watercourse slope, s	ft./ft.	0.039							
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.	2.13		0.00		0.00		0.00	
14. $T_t = \frac{L}{3600 * V}$	hr.	0.053	+	0.000	+	0.000	+	0.000	= 0.053

Channel flow

Segment ID		C-D		D-E					
15. Channel Bottom width, b	ft.	7.00		8.00					
16. Horizontal side slope component, z (z horiz:1 vert)		1.00		1.00					
17. Depth of flow, d	ft.	0.50		0.60					
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$	3.75		5.16		0.00		0.00	
19. Wetted perimeter, P_w	ft.	8.41		9.70		0.00		0.00	
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.	0.45		0.53		0.00		0.00	
21. Channel slope, s	ft./ft.	0.030		0.022					
22. Manning's roughness coeff., n		0.065		0.060					
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.	2.32		2.42		0.00		0.00	
24. Flow length, L	ft.	925		730					
25. $T_t = \frac{L}{3600 * V}$	hr.	0.111	+	0.084	+	0.000	+	0.000	= 0.195
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)								hr.	1.358

Time of Concentration (T_c) or Travel Time (T_t) Worksheet

Project: Goodwives River Drainage Evaluation — By: WM — Date:
Location: Darien — Checked: — Date:
Circle one: ***Present*** Developed — Watershed: Goodwives River
Circle one: ***Tc*** T_t — Subwatershed: T1-TB

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			woodsf		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.400		
3. Flow Length, L (< 300ft)		ft.	300		
4. Two-year 24-hr rainfall, P_2		in.	3.30		
5. Land slope, s		ft./ft.	0.017		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$		hr.	0.913	=	0.913

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C							
7. Surface description			woods							
8. Manning's roughness coeff., n			0.100							
9. Paved or unpaved			unpaved							
10. Depth of flow, d (default: d=.4 unpaved, d=.2 paved)		ft.	0.40							
11. Flow Length, L		ft.	565							
12. Watercourse slope, s		ft./ft.	0.018							
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$		fps.	1.08		0.00		0.00		0.00	
14. $T_t = \frac{L}{3600 * V}$		hr.	0.146	+	0.000	+	0.000	+	0.000	= 0.146

Channel flow

		Segment ID	C-D							
15. Channel Bottom width, b		ft.	5.00							
16. Horizontal side slope component, z (z horiz:1 vert)			1.00							
17. Depth of flow, d		ft.	0.50							
18. Cross sectional flow area, A (assume trapazoidal)		$ft.^2$	2.75							
19. Wetted perimeter, P_w		ft.	6.41							
20. Hydraulic Radius, $R = \frac{A}{P_w}$		ft.	0.43		0.00		0.00		0.00	
21. Channel slope, s		ft./ft.	0.046							
22. Manning's roughness coeff., n			0.070							
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$		fps.	2.59		0.00		0.00		0.00	
24. Flow length, L		ft.	655							
25. $T_t = \frac{L}{3600 * V}$		hr.	0.070	+	0.000	+	0.000	+	0.000	= 0.070
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)										hr. 1.129

Time of Concentration (T_c) or Travel Time (T_t) Worksheet

Project: Goodwives River Drainage Evaluation — By: WM — Date:
Location: Darien — Checked: — Date:
Circle one: ***Present*** Developed — Watershed: Goodwives River
Circle one: ***Tc*** T_t — Subwatershed: T2-010

Sheet flow (applicable to T_c only)

Segment ID		**A-B**		
1. Surface description (Table 3-1)		grass		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)		0.310		
3. Flow Length, L (< 300ft)	ft.	300		
4. Two-year 24-hr rainfall, P_2	in.	3.30		
5. Land slope, s	ft./ft.	0.037		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.	0.543	=	0.543

Shallow concentrated flow (assume hyd. radius = depth of flow)

Segment ID		**B-C**							
7. Surface description		grass							
8. Manning's roughness coeff., n		0.075							
9. Paved or unpaved		unpaved							
10. Depth of flow, d (default: d=.4 unpaved, d=.2 paved)	ft.	0.40							
11. Flow Length, L	ft.	635							
12. Watercourse slope, s	ft./ft.	0.110							
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.	3.58		0.00		0.00		0.00	
14. $T_t = \frac{L}{3600 * V}$	hr.	0.049	+	0.000	+	0.000	+	0.000	= 0.049

Channel flow

Segment ID		**C-D**							
15. Channel Bottom width, b	ft.	5.00							
16. Horizontal side slope component, z (z horiz:1 vert)		1.00							
17. Depth of flow, d	ft.	0.50							
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$	2.75		0.00		0.00		0.00	
19. Wetted perimeter, P_w	ft.	6.41		0.00		0.00		0.00	
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.	0.43		0.00		0.00		0.00	
21. Channel slope, s	ft./ft.	0.039							
22. Manning's roughness coeff., n		0.060							
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.	2.79		0.00		0.00		0.00	
24. Flow length, L	ft.	555							
25. $T_t = \frac{L}{3600 * V}$	hr.	0.055	+	0.000	+	0.000	+	0.000	= 0.055
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)								hr.	0.648

Time of Concentration (T_c) or Travel Time (T_t) Worksheet

Project: Goodwives River Drainage Evaluation
Location: Darien
Circle one: ***Present*** Developed
Circle one: ***Tc*** T_t

By: WM
Checked:
Watershed: Goodwives River
Subwatershed: T3-010

Date:
Date:

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			grass		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.280		
3. Flow Length, L (< 300ft)	ft.		300		
4. Two-year 24-hr rainfall, P_2	in.		3.30		
5. Land slope, s	ft./ft.		0.010		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.		0.842	=	0.842

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C								
7. Surface description			grass								
8. Manning's roughness coeff., n			0.080								
9. Paved or unpaved			unpaved								
10. Depth of flow, d (default: d=.4 unpaved, d=.2 paved)	ft.		0.40								
11. Flow Length, L	ft.		550								
12. Watercourse slope, s	ft./ft.		0.013								
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.		1.14		0.00		0.00		0.00		
14. $T_t = \frac{L}{3600 * V}$	hr.		0.134	+	0.000	+	0.000	+	0.000	=	0.134

Channel flow

		Segment ID	C-D								
15. Channel Bottom width, b	ft.		6.00								
16. Horizontal side slope component, z (z horiz:1 vert)			1.00								
17. Depth of flow, d	ft.		0.50								
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$		3.25		0.00		0.00		0.00		
19. Wetted perimeter, P_w	ft.		7.41		0.00		0.00		0.00		
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.		0.44		0.00		0.00		0.00		
21. Channel slope, s	ft./ft.		0.016								
22. Manning's roughness coeff., n			0.060								
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.		1.79		0.00		0.00		0.00		
24. Flow length, L	ft.		1,280								
25. $T_t = \frac{L}{3600 * V}$	hr.		0.198	+	0.000	+	0.000	+	0.000	=	0.198
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)									hr.		1.174

Time of Concentration (T_c) or Travel Time (T_t) Worksheet

Project: Goodwives River Drainage Evaluation
Location: Darien
Circle one: ***Present*** Developed
Circle one: ***Tc*** T_t

By: WM
Checked:
Watershed: Goodwives River
Subwatershed: T3-020

Date:
Date:

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			grass		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.260		
3. Flow Length, L (< 300ft)	ft.		300		
4. Two-year 24-hr rainfall, P_2	in.		3.30		
5. Land slope, s	ft./ft.		0.013		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.		0.707	=	0.707

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C							
7. Surface description			grass							
8. Manning's roughness coeff., n			0.080							
9. Paved or unpaved			unpaved							
10. Depth of flow, d (default: d=.4 unpaved, d=.2 paved)	ft.		0.40							
11. Flow Length, L	ft.		1,130							
12. Watercourse slope, s	ft./ft.		0.013							
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.		1.16		0.00		0.00		0.00	
14. $T_t = \frac{L}{3600 * V}$	hr.		0.269	+	0.000	+	0.000	+	0.000	= 0.269

Channel flow

		Segment ID	C-D		D-E					
15. Channel Bottom width, b	ft.		5.00		5.00					
16. Horizontal side slope component, z (z horiz:1 vert)			1.00		1.00					
17. Depth of flow, d	ft.		0.50		0.50					
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$		2.75		2.75		0.00		0.00	
19. Wetted perimeter, P_w	ft.		6.41		6.41		0.00		0.00	
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.		0.43		0.43		0.00		0.00	
21. Channel slope, s	ft./ft.		0.015		0.007					
22. Manning's roughness coeff., n			0.068		0.066					
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.		1.53		1.05		0.00		0.00	
24. Flow length, L	ft.		1,255		745					
25. $T_t = \frac{L}{3600 * V}$	hr.		0.228	+	0.197	+	0.000	+	0.000	= 0.425
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)									hr.	1.402

Time of Concentration (T_c) or Travel Time (T_t) Worksheet

Project: Goodwives River Drainage Evaluation
Location: Darien
Circle one: ***Present*** Developed
Circle one: ***Tc*** T_t

By: WM
Checked:
Watershed: Goodwives River
Subwatershed: T4-010

Date:
Date:

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			woods		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.600		
3. Flow Length, L (< 300ft)	ft.		300		
4. Two-year 24-hr rainfall, P_2	in.		3.30		
5. Land slope, s	ft./ft.		0.020		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.		1.174	=	1.174

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C		C-D						
7. Surface description			woodsf		woodsf						
8. Manning's roughness coeff., n			0.100		0.100						
9. Paved or unpaved			unpaved		unpaved						
10. Depth of flow, d (default: d=.4 unpaved, d=.2 paved)	ft.		0.40		0.40						
11. Flow Length, L	ft.		520		1,400						
12. Watercourse slope, s	ft./ft.		0.027		0.018						
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.		1.33		1.09		0.00		0.00		
14. $T_t = \frac{L}{3600 * V}$	hr.		0.109	+	0.358	+	0.000	+	0.000	=	0.467

Channel flow

		Segment ID	D-E								
15. Channel Bottom width, b	ft.		6.00								
16. Horizontal side slope component, z (z horiz:1 vert)			1.00								
17. Depth of flow, d	ft.		0.60								
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$		3.96		0.00		0.00		0.00		
19. Wetted perimeter, P_w	ft.		7.70		0.00		0.00		0.00		
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.		0.51		0.00		0.00		0.00		
21. Channel slope, s	ft./ft.		0.011								
22. Manning's roughness coeff., n			0.060								
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.		1.68		0.00		0.00		0.00		
24. Flow length, L	ft.		540								
25. $T_t = \frac{L}{3600 * V}$	hr.		0.089	+	0.000	+	0.000	+	0.000	=	0.089
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)										hr.	1.730

Time of Concentration (T_c) or Travel Time (T_t) Worksheet

Project: Goodwives River Drainage Evaluation — By: WM — Date:
Location: Darien — Checked: — Date:
Circle one: ***Present*** Developed — Watershed: Goodwives River
Circle one: ***Tc*** T_t — Subwatershed: T4-020

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			woodsf		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.400		
3. Flow Length, L (< 300ft)	ft.		275		
4. Two-year 24-hr rainfall, P_2	in.		3.30		
5. Land slope, s	ft./ft.		0.022		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.		0.765	=	0.765

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C								
7. Surface description			woods								
8. Manning's roughness coeff., n			0.100								
9. Paved or unpaved			unpaved								
10. Depth of flow, d (default: d=.4 unpaved, d=.2 paved)	ft.		0.40								
11. Flow Length, L	ft.		266								
12. Watercourse slope, s	ft./ft.		0.041								
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.		1.64		0.00		0.00		0.00		
14. $T_t = \frac{L}{3600 * V}$	hr.		0.045	+	0.000	+	0.000	+	0.000	=	0.045

Channel flow

		Segment ID	C-D		D-E						
15. Channel Bottom width, b	ft.		6.00		6.00						
16. Horizontal side slope component, z (z horiz:1 vert)			1.00		1.00						
17. Depth of flow, d	ft.		0.50		0.50						
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$		3.25		3.25		0.00		0.00		
19. Wetted perimeter, P_w	ft.		7.41		7.41		0.00		0.00		
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.		0.44		0.44		0.00		0.00		
21. Channel slope, s	ft./ft.		0.023		0.016						
22. Manning's roughness coeff., n			0.065		0.065						
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.		2.00		1.69		0.00		0.00		
24. Flow length, L	ft.		615		855						
25. $T_t = \frac{L}{3600 * V}$	hr.		0.086	+	0.140	+	0.000	+	0.000	=	0.226
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)										hr.	1.035

Time of Concentration (T_c) or Travel Time (T_t) Worksheet

Project: Goodwives River Drainage Evaluation
Location: Darien
Circle one: ***Present*** Developed
Circle one: ***Tc*** T_t

By: WM
Checked:
Watershed: Goodwives River
Subwatershed: T4-TA

Date:
Date:

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			woodsf		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.500		
3. Flow Length, L (< 300ft)		ft.	240		
4. Two-year 24-hr rainfall, P_2		in.	3.30		
5. Land slope, s		ft./ft.	0.033		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$		hr.	0.692	=	0.692

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C							
7. Surface description			woods							
8. Manning's roughness coeff., n			0.080			#				
9. Paved or unpaved			unpaved							
10. Depth of flow, d (default: d=.4 unpaved, d=.2 paved)		ft.	0.40							
11. Flow Length, L		ft.	460							
12. Watercourse slope, s		ft./ft.	0.026							
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$		fps.	1.63	0.00		0.00		0.00		
14. $T_t = \frac{L}{3600 * V}$		hr.	0.078	+ 0.000	+	0.000	+	0.000	=	0.078

Channel flow

		Segment ID	C-D							
15. Channel Bottom width, b		ft.	5.00							
16. Horizontal side slope component, z (z horiz:1 vert)			1.00							
17. Depth of flow, d		ft.	0.30							
18. Cross sectional flow area, A (assume trapazoidal)		$ft.^2$	1.59	0.00		0.00		0.00		
19. Wetted perimeter, P_w		ft.	5.85	0.00		0.00		0.00		
20. Hydraulic Radius, $R = \frac{A}{P_w}$		ft.	0.27	0.00		0.00		0.00		
21. Channel slope, s		ft./ft.	0.020							
22. Manning's roughness coeff., n			0.060							
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$		fps.	1.46	0.00		0.00		0.00		
24. Flow length, L		ft.	815							
25. $T_t = \frac{L}{3600 * V}$		hr.	0.155	+ 0.000	+	0.000	+	0.000	=	0.155
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)									hr.	0.925

Time of Concentration (T_c) or Travel Time (T_t) Worksheet

Project: Goodwives River Drainage Evaluation — By: WM — Date:
Location: Darien — Checked: — Date:
Circle one: ***Present*** Developed — Watershed: Goodwives River
Circle one: ***Tc*** T_t — Subwatershed: T5-010

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			woodsf		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.400		
3. Flow Length, L (< 300ft)	ft.		300		
4. Two-year 24-hr rainfall, P_2	in.		3.30		
5. Land slope, s	ft./ft.		0.017		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.		0.913	=	0.913

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C		C-D		D-E				
7. Surface description			woodsf		grass		woodsf				
8. Manning's roughness coeff., n			0.090		0.075		0.090				
9. Paved or unpaved			unpaved		unpaved		unpaved				
10. Depth of flow, d (default: d=.4 unpaved, d=.2 paved)	ft.		0.40		0.30		0.40				
11. Flow Length, L	ft.		920		555		140				
12. Watercourse slope, s	ft./ft.		0.011		0.002		0.064				
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.		0.94		0.38		2.28		0.00		
14. $T_t = \frac{L}{3600 * V}$	hr.		0.273	+	0.408	+	0.017	+	0.000	=	0.698

Channel flow

		Segment ID	E-F								
15. Channel Bottom width, b	ft.		6.00								
16. Horizontal side slope component, z (z horiz:1 vert)			1.00								
17. Depth of flow, d	ft.		0.50								
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$		3.25		0.00		0.00		0.00		
19. Wetted perimeter, P_w	ft.		7.41		0.00		0.00		0.00		
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.		0.44		0.00		0.00		0.00		
21. Channel slope, s	ft./ft.		0.011								
22. Manning's roughness coeff., n			0.070								
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.		1.26		0.00		0.00		0.00		
24. Flow length, L	ft.		285								
25. $T_t = \frac{L}{3600 * V}$	hr.		0.063	+	0.000	+	0.000	+	0.000	=	0.063
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)									hr.		1.674

Time of Concentration (T_c) or Travel Time (T_t) Worksheet

Project: Goodwives River Drainage Evaluation — By: WM — Date:
Location: Darien — Checked: — Date:
Circle one: ***Present*** Developed — Watershed: Goodwives River
Circle one: ***Tc*** T_t — Subwatershed: T5-020

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			wwodsg		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.600		
3. Flow Length, L (< 300ft)	ft.		300		
4. Two-year 24-hr rainfall, P_2	in.		3.30		
5. Land slope, s	ft./ft.		0.013		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.		1.381	=	1.381

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C							
7. Surface description			woods							
8. Manning's roughness coeff., n			0.090							
9. Paved or unpaved			unpaved							
10. Depth of flow, d (default: d=.4 unpaved, d=.2 paved)	ft.		0.40							
11. Flow Length, L	ft.		820							
12. Watercourse slope, s	ft./ft.		0.016							
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.		1.13		0.00		0.00		0.00	
14. $T_t = \frac{L}{3600 * V}$	hr.		0.201	+	0.000	+	0.000	+	0.000	= 0.201

Channel flow

		Segment ID	C-D							
15. Channel Bottom width, b	ft.		7.00							
16. Horizontal side slope component, z (z horiz:1 vert)			1.00							
17. Depth of flow, d	ft.		0.50							
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$		3.75		0.00		0.00		0.00	
19. Wetted perimeter, P_w	ft.		8.41		0.00		0.00		0.00	
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.		0.45		0.00		0.00		0.00	
21. Channel slope, s	ft./ft.		0.037							
22. Manning's roughness coeff., n			0.070							
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.		2.38		0.00		0.00		0.00	
24. Flow length, L	ft.		190							
25. $T_t = \frac{L}{3600 * V}$	hr.		0.022	+	0.000	+	0.000	+	0.000	= 0.022
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)										hr. 1.604

Time of Concentration (T_c) or Travel Time (T_t) Worksheet

Project: Goodwives River Drainage Evaluation — By: WM — Date:
Location: Darien — Checked: — Date:
Circle one: ***Present*** Developed — Watershed: Goodwives River
Circle one: ***Tc*** T_t — Subwatershed: T5-030

Sheet flow (applicable to T_c only)

		Segment ID		
		A-B		
1. Surface description (Table 3-1)		woods		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)		0.600		
3. Flow Length, L (< 300ft)	ft.	180		
4. Two-year 24-hr rainfall, P_2	in.	3.30		
5. Land slope, s	ft./ft.	0.006		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.	1.302	=	1.302

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID								
		B-C								
7. Surface description		woods								
8. Manning's roughness coeff., n		0.100								
9. Paved or unpaved		unpaved								
10. Depth of flow, d (default: d=.4 unpaved, d=.2 paved)	ft.	0.40								
11. Flow Length, L	ft.	340								
12. Watercourse slope, s	ft./ft.	0.012								
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.	0.88		0.00		0.00		0.00		
14. $T_t = \frac{L}{3600 * V}$	hr.	0.108	+	0.000	+	0.000	+	0.000	=	0.108

Channel flow

		Segment ID								
15. Channel Bottom width, b	ft.									
16. Horizontal side slope component, z (z horiz:1 vert)										
17. Depth of flow, d	ft.									
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$	0.00		0.00		0.00		0.00		
19. Wetted perimeter, P_w	ft.	0.00		0.00		0.00		0.00		
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.	0.00		0.00		0.00		0.00		
21. Channel slope, s	ft./ft.									
22. Manning's roughness coeff., n										
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.	0.00		0.00		0.00		0.00		
24. Flow length, L	ft.									
25. $T_t = \frac{L}{3600 * V}$	hr.	0.000	+	0.000	+	0.000	+	0.000	=	0.000
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)									hr.	1.410

Time of Concentration (T_c) or Travel Time (T_t) Worksheet

Project: Goodwives River Drainage Evaluation
Location: Darien
Circle one: ***Present*** Developed
Circle one: ***Tc*** T_t

By: WM
Checked:
Watershed: Goodwives River
Subwatershed: T5-040

Date:
Date:

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			grass		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.300		
3. Flow Length, L (< 300ft)	ft.		280		
4. Two-year 24-hr rainfall, P_2	in.		3.30		
5. Land slope, s	ft./ft.		0.025		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.		0.584	=	0.584

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C		C-D						
7. Surface description			grass		impervious						
8. Manning's roughness coeff., n			0.070		0.020						
9. Paved or unpaved			unpaved		paved						
10. Depth of flow, d (default: d=.4 unpaved, d=.2 paved)	ft.		0.40		0.20						
11. Flow Length, L	ft.		330		390						
12. Watercourse slope, s	ft./ft.		0.042		0.021						
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.		2.38		3.65		0.00		0.00		
14. $T_t = \frac{L}{3600 * V}$	hr.		0.039	+	0.030	+	0.000	+	0.000	=	0.068

Channel flow

		Segment ID	C-D		D-E						
15. Channel Bottom width, b	ft.		6.00		12" RCP						
16. Horizontal side slope component, z (z horiz:1 vert)			1.00		---						
17. Depth of flow, d	ft.		0.40		FULL						
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$		2.56		1.80		0.00		0.00		
19. Wetted perimeter, P_w	ft.		7.13		6.28		0.00		0.00		
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.		0.36		0.29		0.00		0.00		
21. Channel slope, s	ft./ft.		0.040		0.007						
22. Manning's roughness coeff., n			0.070		0.013						
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.		2.15		4.03		0.00		0.00		
24. Flow length, L	ft.		100		1,680						
25. $T_t = \frac{L}{3600 * V}$	hr.		0.013	+	0.116	+	0.000	+	0.000	=	0.129
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)										hr.	0.780

Time of Concentration (T_c) or Travel Time (T_t) Worksheet

Project: Goodwives River Drainage Evaluation — By: WM — Date:
Location: Darien — Checked: — Date:
Circle one: ***Present*** Developed — Watershed: Goodwives River
Circle one: ***Tc*** T_t — Subwatershed: T6-010

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			woodsf		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.400		
3. Flow Length, L (< 300ft)	ft.		200		
4. Two-year 24-hr rainfall, P_2	in.		3.30		
5. Land slope, s	ft./ft.		0.035		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.		0.491	=	0.491

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C		C-D						
7. Surface description			woods		impervious						
8. Manning's roughness coeff., n			0.090		0.011						
9. Paved or unpaved			unpaved		paved						
10. Depth of flow, d (default: d=.4 unpaved, d=.2 paved)	ft.		0.40		0.20						
11. Flow Length, L	ft.		435		640						
12. Watercourse slope, s	ft./ft.		0.014		0.016						
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.		1.06		5.86		0.00		0.00		
14. $T_t = \frac{L}{3600 * V}$	hr.		0.114	+	0.030	+	0.000	+	0.000	=	0.144

Channel flow

		Segment ID	D-E								
15. Channel Bottom width, b	ft.		8.00								
16. Horizontal side slope component, z (z horiz:1 vert)			1.00								
17. Depth of flow, d	ft.		0.50								
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$		4.25		0.00		0.00		0.00		
19. Wetted perimeter, P_w	ft.		9.41		0.00		0.00		0.00		
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.		0.45		0.00		0.00		0.00		
21. Channel slope, s	ft./ft.		0.025								
22. Manning's roughness coeff., n			0.065								
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.		2.13		0.00		0.00		0.00		
24. Flow length, L	ft.		40								
25. $T_t = \frac{L}{3600 * V}$	hr.		0.005	+	0.000	+	0.000	+	0.000	=	0.005
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)										hr.	0.640

Time of Concentration (T_c) or Travel Time (T_t) Worksheet

Project: Goodwives River Drainage Evaluation — By: WM — Date:
Location: Darien — Checked: — Date:
Circle one: ***Present*** Developed — Watershed: Goodwives River
Circle one: ***Tc*** T_t — Subwatershed: T7-010

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			woods		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.600		
3. Flow Length, L (< 300ft)	ft.		200		
4. Two-year 24-hr rainfall, P_2	in.		3.30		
5. Land slope, s	ft./ft.		0.045		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.		0.614	=	0.614

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C		C-D						
7. Surface description			woods		woods						
8. Manning's roughness coeff., n			0.100		0.100						
9. Paved or unpaved			unpaved		unpaved						
10. Depth of flow, d (default: d=.4 unpaved, d=.2 paved)	ft.		0.40		0.40						
11. Flow Length, L	ft.		460		245						
12. Watercourse slope, s	ft./ft.		0.041		0.020						
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.		1.64		1.16		0.00		0.00		
14. $T_t = \frac{L}{3600 * V}$	hr.		0.078	+	0.059	+	0.000	+	0.000	=	0.137

Channel flow

		Segment ID	D-E		E-F						
15. Channel Bottom width, b	ft.		6.00		7.00						
16. Horizontal side slope component, z (z horiz:1 vert)			1.00		1.00						
17. Depth of flow, d	ft.		0.50		0.50						
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$		3.25		3.75		0.00		0.00		
19. Wetted perimeter, P_w	ft.		7.41		8.41		0.00		0.00		
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.		0.44		0.45		0.00		0.00		
21. Channel slope, s	ft./ft.		0.004		0.034						
22. Manning's roughness coeff., n			0.070		0.065						
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.		0.76		2.47		0.00		0.00		
24. Flow length, L	ft.		1,300		870						
25. $T_t = \frac{L}{3600 * V}$	hr.		0.474	+	0.098	+	0.000	+	0.000	=	0.572
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)									hr.		1.322

Time of Concentration (T_c) or Travel Time (T_t) Worksheet

Project: Goodwives River Drainage Evaluation — By: WM — Date:
Location: Darien — Checked: — Date:
Circle one: ***Present*** Developed — Watershed: Goodwives River
Circle one: ***Tc*** T_t — Subwatershed: MS-160

Sheet flow (applicable to T_c only)

		Segment ID	A-B		
1. Surface description (Table 3-1)			woods		
2. Manning's roughness coeff. for sheet flow, n (Table 3-1)			0.600		
3. Flow Length, L (< 300ft)	ft.		300		
4. Two-year 24-hr rainfall, P_2	in.		3.30		
5. Land slope, s	ft./ft.		0.070		
6. $T_t = \frac{0.007(nL)^{0.8}}{P_2^{0.5}(s^{0.4})}$	hr.		0.711	=	0.711

Shallow concentrated flow (assume hyd. radius = depth of flow)

		Segment ID	B-C								
7. Surface description											
8. Manning's roughness coeff., n											
9. Paved or unpaved											
10. Depth of flow, d (default: d=.4 unpaved, d=.2 paved)	ft.										
11. Flow Length, L	ft.										
12. Watercourse slope, s	ft./ft.										
13. Average velocity, $V = \frac{1.49}{n}(d^{2/3})(s^{1/2})$	fps.		0.00		0.00		0.00		0.00		
14. $T_t = \frac{L}{3600 * V}$	hr.		0.000	+	0.000	+	0.000	+	0.000	=	0.000

Channel flow

		Segment ID	C-D								
15. Channel Bottom width, b	ft.		13.00								
16. Horizontal side slope component, z (z horiz:1 vert)			1.00								
17. Depth of flow, d	ft.		0.70								
18. Cross sectional flow area, A (assume trapazoidal)	$ft.^2$		9.59		0.00		0.00		0.00		
19. Wetted perimeter, P_w	ft.		14.98		0.00		0.00		0.00		
20. Hydraulic Radius, $R = \frac{A}{P_w}$	ft.		0.64		0.00		0.00		0.00		
21. Channel slope, s	ft./ft.		0.006								
22. Manning's roughness coeff., n			0.055								
23. $V = \frac{1.49}{n}(R^{2/3})(s^{1/2})$	fps.		1.52		0.00		0.00		0.00		
24. Flow length, L	ft.		525								
25. $T_t = \frac{L}{3600 * V}$	hr.		0.096	+	0.000	+	0.000	+	0.000	=	0.096
26. Watershed or subarea T_c or T_t (add T_t in steps 6, 14 & 25)										hr.	0.807