LIST OF STANDARD FORMS

"DRAINAGE REPORT SUBMITTAL CHECKLIST"

PREPARED BY _____ DATE _____

The drainage report for the subdivision as noted below has been received and found to lack the information noted. This information must be submitted before the report will be accepted for review. Please provide the required information and return the checklist with your submittal.

SUBDIVISION: _____
LOCATION: _____
DATE SUBMITTED: _____
SUBMITTED BY: FIRM _____
CONTACT _____
PHONE _____
SUBMITTED DATE: (1) _____ (2) _____ (3) _____ (4) _____
DATE APPROVED: _____

CHECKLIST

ITEM	DESCRIPTION	RECEIVED OR NOT APPLICABLE	TO BE SUBMITTED
1	Typed, Bound Report		
2	Professional Engineers Certificate		
3	General Location and Description		
	(a) Location Map		
	(b) Existing Site Description		
	(c) Description of Existing Drainage Patterns and Facilities		
4	Drainage Basins and Sub-Basins		
	(a) Major Basin Description		
	(b) Sub-Basin Description		
5	Design Criteria		
	(a) Development Master Plan Discussion		
	(b) Hydrologic Criteria Discussion		
	(c) Hydraulic Criteria Discussion		
6	Drainage Facility Design		
	(a) Discussion of Proposed Facilities		
	(b) Discussion of Drainage Patterns		
	(c) Impact on Offsite Facilities		
	(d) Impact on Master Plan		
7	Drainage Plan		
	(a) Existing and Proposed Contours		
	(b) Property Lines and Easements		
	(c) Delineation of Basin and Sub-Basins		
	(d) Existing Drainage Patterns and Facilities		
	(e) Proposed Drainage Patterns and Facilities		
	(f) Proposed Outfall Points		
	(g) Routing of Offsite Drainage		

STANDARD FORM SF-2

DETERMINATION OF EFFECTIVE RAINFALL

LOCATION: SECTION _____, TOWNSHIP____, RANGE_____

DESIGN STORM: ____________

		PERVIOUS AREA ____%				IMPERVIOUS AREA ____%				
Time (min.) 1	Incremental Precipitation (in.) 2	Maximum Infiltration (in.) 3	Depression Storage (in.) 4	Effective Precipitation (in.) 5	___% Effective Precipitation (in.) 6	Depression Storage (in.) 7	Loss (in.) 8	Effective Precipitation (in.) 9	___% Effective Precipitation (in.) 10	Total Effective Precipitation (in.) 11

STANDARD FORM SF-3
DETERMINATION OF STORM HYDROGRAPH

Time (min)	Unit Hydrograph (cfs)	Effective Precipitation in Inches																						Storm Hydrograph (cfs)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)

STANDARD FORM SF-4
DIRECT TRANSLATION CHANNEL ROUTING

JOB NAME & LOCATION: _____

Job No. _____
By _____
Date _____
Chkd By _____
Date Chkd _____

Storm Recurrence: _____ - yrs. Unit Time Δt = _____ min. (hr.)

Reach	Hydrograph Pt.		Q_p	V	F	L	$t = \frac{L}{60V}$
	Inflow	Outflow	(cfs)	(fps)		(ft.)	(min)
							: Use _____
							: Use _____
							: Use _____

Time	Inflow	Reach _____			Reach _____			Reach _____		
		Routed Outflow (cfs)	Local Inflow (cfs)	Tot. Outflow New Inflow (cfs)	Routed Outflow (cfs)	Local Inflow (cfs)	Tot. Outflow New Inflow (cfs)	Routed Outflow (cfs)	Local Inflow (cfs)	Tot. Outflow New Inflow (cfs)
(min.) (1)	(cfs) (2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)

STANDARD FORM SF-5
CONVEX CHANNEL ROUTING

JOB NAME & LOCATION: _____

Job No _____
By _____
Date _____
Chkd By _____
Date Chkd _____

Storm Recurrence: _____ -yrs. Unit Time Δt = _____ min. (hr.)

Reach	Hydrograph Pt.		Q_p	$\frac{3}{4}Q_p$	C_1	K	B	C	Routing equation
	Inflow	Outflow	(cfs)	(cfs)	$\frac{V}{V+1.7}$	$\frac{L}{3600V}$	KC_1	$1-(1-C_1)^{\Delta t/B}$	$O_2=(1-C)O_1+(\ C\ )I$
									$O_2=(\ \ )O_1+(\ \ )I$
									$O_2=(\ \ )O_1+(\ \ )I$
									$O_2=(\ \ )O_1+(\ \ )I$

Time (min.) (1)	Inflow (cfs) (2)	Reach _____ Routed Outflow (cfs) (3)	Local Inflow (cfs) (4)	Tot. Outflow New Inflow (cfs) (5)	Reach _____ Routed Outflow (cfs) (6)	Local Inflow (cfs) (7)	Tot. Outflow New Inflow (cfs) (8)	Reach _____ Routed Outflow (cfs) (9)	Local Inflow (cfs) (10)	Tot. Outflow New Inflow (cfs) (11)

STANDARD FORM SF-6
RESERVOIR STORAGE ROUTING
(MODIFIED-PULS METHOD)

JOB NAME & LOCATION: _____

Job No. _____
By _____
Date _____
Chkd By _____
Date Chkd _____

Storm Recurrence _____ yrs Unit Time _____ min

Time Interval (1)	Time (min) (2)	Inflow I (cfs) (3)	$\frac{2S}{t} - D$ (cfs) (4)	$\frac{2S}{t} + D$ (cfs) (5)	Discharge D (cfs) (6)
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					

(7) Caculate Maximum Storage(S_{max}) for maximum discharge(D)

$$S_{max} = \left(\left(\frac{2S}{t} + D\right) - D\right)\left(\frac{t}{2}\right) = ((\quad) - (\quad))(\quad) = \_\_\_\_\_ \text{ cfs-min} = \_\_\_\_\_ \text{ AF}$$

WRC ENGINEERING, INC.

STANDARD FORM SF-7
FLOW PROFILE COMPUTATION
(Direct step method)

WRC ENGINEERING

Q=_____ n=_____ S_o =_____ α =_____ y_c =_____ y_n =_____

y (1)	A (2)	R (3)	V (4)	$\alpha V^2/2g$ (5)	E (6)	ΔE (7)	S_f (8)	$\bar{S}_f$ (9)	$S_o - \bar{S}_f$ (10)	ΔX (11)	X (12)

$$S_f = \frac{n^2 V^2}{2.22\, R^{4/3}} \qquad \Delta X = \frac{\Delta E}{S_o - \bar{S}_f}$$

STANDARD FORM SF-8

TIME OF CONCENTRATION

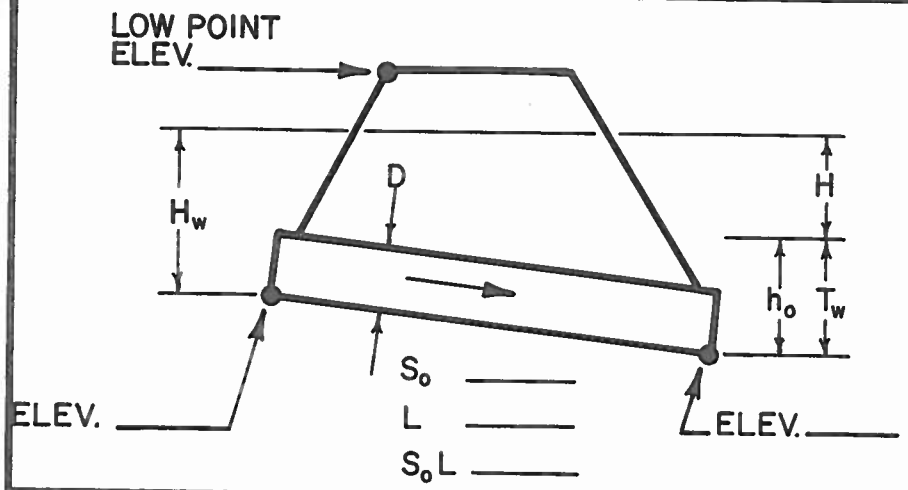
SUBDIVISION _____

CACULATED BY _____ DATE _____ $t_c = t_i + t_t$

SUB-BASIN DATA			INITIAL/OVERLAND TIME (t_i)			TRAVEL TIME (t_t)				t_c CHECK (URBANIZED BASINS)		FINAL t_c	REMARKS
DESIG: (1)	C_5 (2)	AREA Ac (3)	LENGTH Ft (4)	SLOPE % (5)	t_i Min (6)	LENGTH Ft (7)	SLOPE % (8)	VEL. FPS (9)	t_t Min (10)	TOTAL LENGTH Ft (11)	$t_c = (L/180)+10$ Min (12)	Min (13)	

STANDARD FORM SF-10
CULVERT RATING

PROJECT: _____ LOCATION: _____ STATION: _____



CULVERT DATA

TYPE: _____ n: _____

INLET: _____ Q_{FULL}: _____

K_e : _____ V_{FULL}: _____

OUTLET CONTROL EQUATIONS

(1) $H_w = H + h_o - LS_o$

(2) For $T_w < D$; $h_o = \frac{d_c + D}{2}$ or T_w (whichever is greater)

$T_w > D$; $h_o = T_w$

(3) For Box Culvert: $d_c = 0.315(Q/B)^{2/3} \leq D$

Q	INLET CONTROL		OUTLET CONTROL						CONT.	CONTROL	ELEV.
	$\frac{H_w}{D}$	H_w	H	T_w	$T_w < D$		$T_w > D$	H_w	H_w		
					d_c	$\frac{d_c+D}{2}=h_o$	h_o				
1	2	3	4	5	6	7	8	9	10	11	12