TOTAL EXISTING RUNOFF COEFFICIENT CALCULATION

PROJECT: **Waukesha McDonald's**
V3 FILE NO.: **06240.31A**
DATE: 01/17/17
PREPARED BY: JWG
REVIEWED DATE:
REVIEWED BY:

		SF
Impervious Area (ACRE)	1.04	45243.6
Impervious c-factor	0.95	
Pervious Area (ACRE)	0.17	7509.4
Pervious c-factor	0.30	
TOTAL AREA (ACRE)	1.21	

$$C = \frac{0.95 * (\text{Impervious Area}) + 0.30 * (\text{Pervious Area})}{\text{Total Area}}$$

$$C = \frac{0.95 * (1.04 \text{ acre}) + 0.3 * (0.25 \text{ acre})}{1.21}$$

C = 0.86

TOTAL PROPOSED RUNOFF COEFFICIENT CALCULATION

PROJECT: **Waukesha McDonald's**
V3 FILE NO.: **06240.31A**
DATE: 03/01/17
PREPARED BY: MDC
REVIEWED DATE:
REVIEWED BY:

		SF
Impervious Area (ACRE)	0.89	38774
Impervious c-factor	0.95	
Pervious Area (ACRE)	0.32	13980
Pervious c-factor	0.30	
TOTAL AREA (ACRE)	1.21	

$$C = \frac{0.95 * (\text{Impervious Area}) + 0.30 * (\text{Pervious Area})}{\text{Total Area}}$$

$$C = \frac{0.95 * (1.04 \text{ acre}) + 0.3 * (0.25 \text{ acre})}{1.21}$$

C = 0.78

NORTH DRAINAGE AREA RUNOFF COEFFICIENT CALCULATION

PROJECT: **Waukesha McDonald's**
V3 FILE NO.: **06240.31A**
DATE: 03/01/17
PREPARED BY: MDC
REVIEWED DATE:
REVIEWED BY:

		SF
Impervious Area (ACRE)	0.23	10230
Impervious c-factor	0.95	
Pervious Area (ACRE)	0.09	3878
Pervious c-factor	0.30	
TOTAL AREA (ACRE)	0.32	

$$C = \frac{0.95 * (\text{Impervious Area}) + 0.30 * (\text{Pervious Area})}{\text{Total Area}}$$

$$C = \frac{0.95 * (1.04 \text{ acre}) + 0.3 * (0.25 \text{ acre})}{0.32}$$

C = 0.77

SOUTH DRAINAGE AREA RUNOFF COEFFICIENT CALCULATION

PROJECT: **Waukesha McDonald's**
V3 FILE NO.: **06240.31A**
DATE: 03/01/17
PREPARED BY: MDC
REVIEWED DATE:
REVIEWED BY:

		SF
Impervious Area (ACRE)	0.17	7216
Impervious c-factor	0.95	
Pervious Area (ACRE)	0.07	3165
Pervious c-factor	0.30	
TOTAL AREA (ACRE)	0.24	

$$C = \frac{0.95 * (\text{Impervious Area}) + 0.30 * (\text{Pervious Area})}{\text{Total Area}}$$

$$C = \frac{0.95 * (1.04 \text{ acre}) + 0.3 * (0.25 \text{ acre})}{0.24}$$

C = 0.75

EAST DRAINAGE AREA RUNOFF COEFFICIENT CALCULATION

PROJECT: **Waukesha McDonald's**
V3 FILE NO.: **06240.31A**
DATE: 03/01/17
PREPARED BY: MDC
REVIEWED DATE:
REVIEWED BY:

		SF
Impervious Area (ACRE)	0.19	8348
Impervious c-factor	0.95	
Pervious Area (ACRE)	0.09	3890
Pervious c-factor	0.30	
TOTAL AREA (ACRE)	0.28	

$$C = \frac{0.95 * (\text{Impervious Area}) + 0.30 * (\text{Pervious Area})}{\text{Total Area}}$$

$$C = \frac{0.95 * (1.04 \text{ acre}) + 0.3 * (0.25 \text{ acre})}{0.28}$$

C = 0.74

WEST DRAINAGE AREA RUNOFF COEFFICIENT CALCULATION

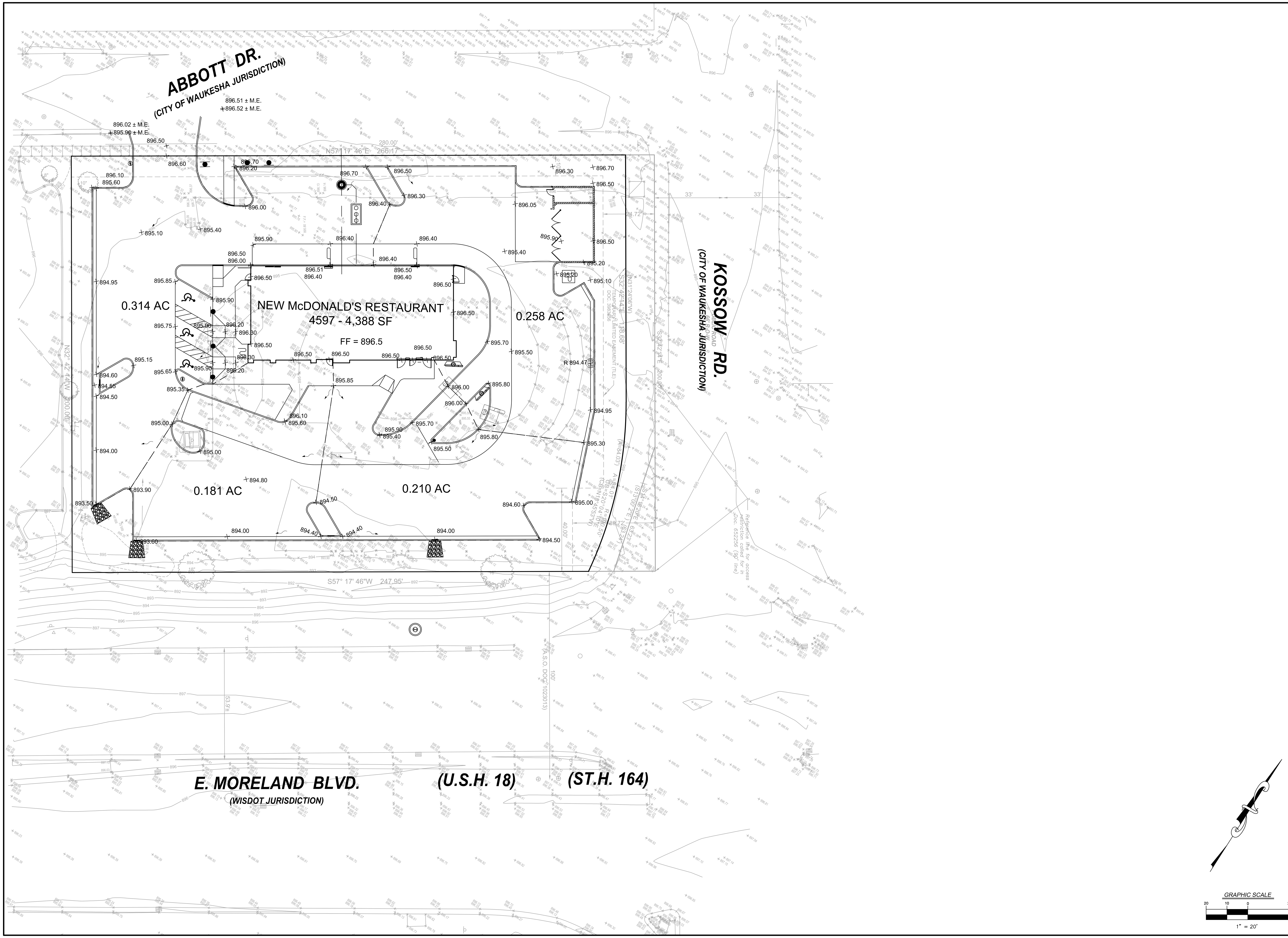
PROJECT: **Waukesha McDonald's**
V3 FILE NO.: **06240.31A**
DATE: 03/01/17
PREPARED BY: MDC
REVIEWED DATE:
REVIEWED BY:

		SF
Impervious Area (ACRE)	0.30	12980
Impervious c-factor	0.95	
Pervious Area (ACRE)	0.07	3047
Pervious c-factor	0.30	
TOTAL AREA (ACRE)	0.37	

$$C = \frac{0.95 * (\text{Impervious Area}) + 0.30 * (\text{Pervious Area})}{\text{Total Area}}$$

$$C = \frac{0.95 * (1.04 \text{ acre}) + 0.3 * (0.25 \text{ acre})}{0.37}$$

C = 0.83



REV	DATE	DESCRIPTION	BY

PREPARED BY:

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"Visio, Vertere, Virtute... "The Vision to Transform with Excellence"

PREPARED FOR:

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DRAWN BY	STD ISSUE DATE	REVIEWED BY	DATE ISSUED
REI	01-19-17	JWG	01-19-17

TITLE: PROPOSED DRAINAGE AREA EXHIBIT

DESCRIPTION: MCDONALD'S - WAUKESHA, WI

SITE ID: 048-0107

SITE ADDRESS: 2340 E. MORELAND BLVD., WAUKESHA, WI

SHEET NO.: 048-0107

EX

DRAINAGE AREA

C-4.0 GRD06240.31A.DWG - 3/09/2017 4:47 PM

Inlet Calculations

PROJECT: **WAUKESHA MCDONALDS**
V3 FILE NO: **06240.31A**
DATE: **3/10/2017**
PREPARED BY: **MDC**

Max Ponding in Sag (ft) =
Max Spread (ft) =
Clogging (%) =
Traverse Slope (ft/ft) =
Grate Type (in Sag) =
Grate Type (on Grade) =

Notes:
1) The "Total Flow" includes by-pass flows
2) All structures in sag locations are assumed to have full ponding depth unless otherwise noted
3) DS = Double Structure

Special Instruction	Structure Contributing to the Grate	Storm Structure Info								Flow Tributary to Grate Q_{CIA} (cfs)	TOTAL FLOW Q_T (cfs)	Type of Flow in Grate	Grate Capacity Q_{GRATE} (cfs)	By-Pass Flow Q_B (cfs)	Curb Depth (ft)	Curb Spread (ft)	Curb Spread Check	Sag Grate Capacity Check
		On Grade OR In Sag	Curb Depth Override		On Grade Slope (ft/ft)	Grate Inlet Coeff.	Free Open Area of Grate (sq ft)	Perimeter of Grate (ft)	By-Pass to Structure									
			Yes	Depth (ft)														
R-3233-D (Neenah Cat.)	ST 1-1	SAG	X	0.25			2.80	6.40		1.92	1.92	Weir	2.64	N/A	0.25	N/A	N/A	OK
											0.00	FALSE	FALSE	0.00	N/A	N/A	N/A	N/A
											0.00	FALSE	FALSE	0.00	N/A	N/A	N/A	N/A
											0.00	FALSE	FALSE	0.00	N/A	N/A	N/A	N/A
											0.00	FALSE	FALSE	0.00	N/A	N/A	N/A	N/A
											0.00	FALSE	FALSE	0.00	N/A	N/A	N/A	N/A
											0.00	FALSE	FALSE	0.00	N/A	N/A	N/A	N/A
											0.00	FALSE	FALSE	0.00	N/A	N/A	N/A	N/A
											0.00	FALSE	FALSE	0.00	N/A	N/A	N/A	N/A
											0.00	FALSE	FALSE	0.00	N/A	N/A	N/A	N/A
											0.00	FALSE	FALSE	0.00	N/A	N/A	N/A	N/A
											0.00	FALSE	FALSE	0.00	N/A	N/A	N/A	N/A
											0.00	FALSE	FALSE	0.00	N/A	N/A	N/A	N/A
											0.00	FALSE	FALSE	0.00	N/A	N/A	N/A	N/A
											0.00	FALSE	FALSE	0.00	N/A	N/A	N/A	N/A
											0.00	FALSE	FALSE	0.00	N/A	N/A	N/A	N/A
											0.00	FALSE	FALSE	0.00	N/A	N/A	N/A	N/A
											0.00	FALSE	FALSE	0.00	N/A	N/A	N/A	N/A
											0.00	FALSE	FALSE	0.00	N/A	N/A	N/A	N/A
											0.00	FALSE	FALSE	0.00	N/A	N/A	N/A	N/A
											0.00	FALSE	FALSE	0.00	N/A	N/A	N/A	N/A
											0.00	FALSE	FALSE	0.00	N/A	N/A	N/A	N/A
											0.00	FALSE	FALSE	0.00	N/A	N/A	N/A	N/A
											0.00	FALSE	FALSE	0.00	N/A	N/A	N/A	N/A
											0.00	FALSE	FALSE	0.00	N/A	N/A	N/A	N/A
											0.00	FALSE	FALSE	0.00	N/A	N/A	N/A	N/A
											0.00	FALSE	FALSE	0.00	N/A	N/A	N/A	N/A
											0.00	FALSE	FALSE	0.00	N/A	N/A	N/A	N/A
											0.00	FALSE	FALSE	0.00	N/A	N/A	N/A	N/A
											0.00	FALSE	FALSE	0.00	N/A	N/A	N/A	N/A
											0.00	FALSE	FALSE	0.00	N/A	N/A	N/A	N/A
											0.00	FALSE	FALSE	0.00	N/A	N/A	N/A	N/A
											0.00	FALSE	FALSE	0.00	N/A	N/A	N/A	N/A
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											0.00	FALSE	FALSE	0.00	N/A	N/A	N/A	N/A
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											0.00	FALSE	FALSE	0.00	N/A	N/A	N/A	N/A
											0.00	FALSE	FALSE	0.00	N/A	N/A	N/A	N/A
											0.00	FALSE	FALSE	0.00	N/A	N/A	N/A	N/A
											0.00	FALSE	FALSE	0.00	N/A	N/A	N/A	N/A
											0.00	FALSE	FALSE	0.00	N/A	N/A	N/A	N/A
											0.00	FALSE	FALSE	0.00	N/A	N/A	N/A	N/A
											0.00	FALSE	FALSE	0.00	N/A	N/A	N/A	N/A
											0.00	FALSE	FALSE	0.00	N/A	N/A	N/A	N/A
											0.00	FALSE	FALSE	0.00	N/A	N/A	N/A	N/A
											0.00	FALSE	FALSE	0.00	N/A	N/A	N/A	N/A
											0.00	FALSE	FALSE	0.00	N/A	N/A	N/A	N/A
											0.00	FALSE	FALSE	0.00	N/A	N/A	N/A	N/A
											0.00	FALSE	FALSE	0.00	N/A	N/A	N/A	N/A
											0.00	FALSE	FALSE	0.00	N/A	N/A	N/A	N/A
											0.00	FALSE	FALSE	0.00	N/A	N/A	N/A	N/A
											0.00	FALSE	FALSE	0.00	N/A	N/A	N/A	N/A
											0.00	FALSE	FALSE	0.00	N/A	N/A	N/A	N/A
											0.00	FALSE	FALSE	0.00	N/A	N/A	N/A	N/A

Curb Notch Weir Calculations - Waukesha McDonald's

	Drainage Area (A) Ac.	Proposed Runoff Coeff. (C)	(Area) X (C)	Intensity in/hr		Flow (Q) cfs		Outflow Type
				10-YR	100-YR	10-YR	100-YR	
Area 1 (N)	0.258	0.77	0.199	5.2	9.6	1.04	1.92	Curb Inlet
Area 2 (E)	0.210	0.74	0.155	5.2	9.6	0.81	1.50	Curb Notch
Area 3 (S)	0.181	0.75	0.136	5.2	9.6	0.71	1.31	Curb Notch
Area 4 (W)	0.314	0.83	0.261	5.2	9.6	1.37	2.52	Curb Notch

Overflow Type: Curb Notch (Rectangular Weir)

$Q = 3.33(b-0.2h)(h^{3/2})$

where:

Q = flow through inlet (ft^3/s)
b = width of curb notch/weir (ft)
h = head on weir (ft)

Area 2 (E)		
b =	**3**	ft
h =	**0.5**	ft
Q =	**3.41**	**cfs**

Capacity =	3.41 cfs	
10-YR Flow =	0.81 cfs	< 3.41 cfs OK!
100-YR Flow =	1.50 cfs	< 3.41 cfs OK!

Area 3 (S)		
b =	**3**	ft
h =	**0.5**	ft
Q =	**3.41**	**cfs**

Capacity =	3.41 cfs	
10-YR Flow =	0.71 cfs	< 3.41 cfs OK!
100-YR Flow =	1.31 cfs	< 3.41 cfs OK!

Area 4 (W)		
b =	**3** ft	
h =	**0.5** ft	
Q =	**3.41 cfs**	
Capacity =	3.41 cfs	
10-YR Flow =	1.37 cfs	< 3.41 cfs OK!
100-YR Flow =	2.52 cfs	< 3.41 cfs OK!