Appendix E – Mitered Inlet Design Form

Metric Version

PROJECT: _____

_____

_____

STATION: _____

SHEET _____ **OF** _____

MITERED INLET DESIGN FORM

DESIGNER/DATE: _____ / _____

REVIEWER/DATE: _____ / _____

DESIGN DATA: N _____; B _____; D _____

Q _____ = _____ (m^3/s); EL_{hi} _____ (m)

EL. THROAT INVERT _____ (m)

EL. STREAM BED AT CREST _____ (m)

FALL _____ (m/m); TAPER _____ : 1 (4H:1V TO 6H:1V)

STREAM SLOPE, S_o = _____ (m/m)

SLOPE OF BARREL, S = _____ (m/m)

SLOPE OF THE EMBANKMENT S_e = _____ : 1

S_f _____ : 1 (2H:1V TO 3H:1V)

BARREL SHAPE AND MATERIAL : _____

INLET EDGE DESCRIPTION : _____

COMMENTS

SLOPE-TAPERED INLET/MITERED FACE

Q (m^3/s)	EL_{hi}	EL. THROAT INVERT	y (1)	EL. FACE INVERT (2)	HW_f (3)	$\frac{HW_f}{E}$ (4)	$\frac{Q}{B_f}$ (5)	MIN. B_f (6)	SELECTED B_f	MIN. L_3 (7)	L_4 (8)	L_2 (9)	CHECK L_2 (10)	ADJ. L_3 (11)	ADJ. TAPER (12)	L_1 (13)	EL. CREST INV.	HW_c (14)	MIN. W (15)	W (16)

(1) $y = [(S_o - S_f) - 1)/((S_o + S_f)(S_f + 1)\ )] - D$

(2) EL. FACE INVERT = EL. STREAM BED AT CREST - y

(3) $HW_f = EL_{hi}$ - EL. FACE INVERT

(4) $1.1\ D \geq E \geq D$

(5) FROM DESIGN CHARTS

(6) MIN. $B_f = Q/(Q/B_f)$

(7) MIN. $L_3 = 0.5$ NB

(8) $L_4 = S_f y + D/S_f$

(9) L_2 = (EL.. CREST INVERT - EL. THROAT INVERT) S_f- L_4

*** IF L_2 IS NEGATIVE, DO NOT USE THIS INLET.

(10) CHECK $L_2 = ((B_f - NB)/2) * TAPER - L_3$

(11) IF (10) > (9), ADJ. $L_3 = ((B_f - NB)/2) * TAPER - L_2$

(12) IF (9) > (10), ADJ. TAPER = $(L_2 + L_3)/((B_f - NB)/2)$

(13) $L_1 = L_2 + L_3 + L_4$

(14) $HW_c = EL_{hi}$ - EL. CREST INVERT

(15) MIN. W = 0.634 Q/HW_c

(16) W = NB + 2 (L_1/TAPER)

IF W < MIN. W, ADJUST TAPER

SELECTED DESIGN

B_f _____

L_1 _____

L_2 _____

L_3 _____

L_4 _____

BEVELS ANGLE _____ *

b = __ mm, d = __ mm

TAPER _____ :1V

S = _____ :1V

Mitered Inlet Design Form (English Version)

MITERED INLET DESIGN FORM

PROJECT : _____

STATION : _____

SHEET _____ OF _____

DESIGNER / DATE : _____ / _____

REVIEWER / DATE : _____ / _____

DESIGN DATA : N _____ ; B _____ ; D _____

Q _____ " _____ cfs ; EL_{hi} _____ ft

EL. THROAT INVERT _____ ft EL. STREAM BED AT CREST _____ ft

FALL _____ ft ; TAPER _____ : (4:1 TO 6:1)

STREAM SLOPE , S_o _____ ft/ft ; BARREL SLOPE , S = _____ ft/ft

SLOPE OF THE EMBANKMENT S_e = _____ : 1 ; S_f _____ : 1 (2:1 TO 3:1)

BARREL SHAPE AND MATERIAL : _____

INLET EDGE DESCRIPTION : _____

COMMENTS

SLOPE-TAPERED INLET/MITERED FACE

Q (cfs)	EL_{hi}	EL. THROAT INVERT	y	EL. FACE INVERT	HW_f	$\frac{HW_f}{E}$	$\frac{Q}{B_f}$	MIN. B_f	SELECTED B_f	MIN. L_3	L_4	L_2	CHECK L_2	ADJ. L_3	ADJ. TAPER	L_1	EL. CREST INV.	HW_c	MIN. W	W
			(1)	(2)	(3)	(4)	(5)	(6)		(7)	(8)	(9)	(10)	(11)	(12)	(13)		(14)	(15)	(16)

(1) $y = \left[\frac{(S_e - S_f) - 1}{(S_e + S_f)\sqrt{(S_f^2 + 1)}^{0.5}}\right] \cdot D$

(2) EL. FACE INVERT = EL. STREAM BED AT CREST - y

(3) $HW_f = EL_{hi}$ - EL. FACE INVERT

(4) $1.1 D \geq E \geq D$

(5) FROM DESIGN CHARTS

(6) MIN. $B_f = Q/(Q/B_f)$

(7) MIN. $L_3 = 0.5$ NB

(8) $L_4 = S_f y + D/S_f$

(9) L_2 = (EL. CREST INVERT - EL. THROAT INVERT) $S_f - L_4$

*** IF L_2 IS NEGATIVE DO NOT USE THIS INLET

(10) CHECK $L_2 = \left[\frac{B_f - NB}{2}\right]$ TAPER $- L_3$

(11) IF (10)>(9), ADJ. $L_3 = \left[\frac{B_f - NB}{2}\right]$ TAPER $- L_2$

(12) IF (9)>(10), ADJ. TAPER $= (L_2 + L_3) / \left[\frac{B - NB}{2}\right]$

(13) $L_1 = L_2 + L_3 + L_4$

(14) $HW_c = EL_{hi}$ - EL. CREST INVERT

(15) MIN. $W = 0.35 Q / (HW_c)^{1.5}$

(16) $W = NB + 2 \left[\frac{L_1}{\text{TAPER}}\right]$

IF W<MIN. W, ADJUST TAPER

SELECTED DESIGN

B_f _____

L_1 _____

L_2 _____

L_3 _____

L_4 _____

BEVELS ANGLE _____ °

b = _____ in; d = _____ in

TAPER _____ : 1

S_f _____ : 1