

ACCOMMODATES - 24" ROUND PIPE - 25" x 16" & 22" x 13" ARCHES & 2' x 2' R.C. BOX	BAR LIST																REQUIRES 6-30" SQ. GRATES		TOTAL LENGTH IN STR. 446'-3"	
DESIGN	BAR MARK																TOTAL WEIGHT		298 LB.	
6-1	A	AV	A2	BV	B2	C	D	D1	DM	DM1	DB	DB1	E	F	G	H	K	M	*N	R
SPACING	AS SHOWN	12" c/c	10" c/c	12" c/c	12" c/c	AS SHOWN	AS SHOWN	AS SHOWN			AS SHOWN	AS SHOWN	17" c/c	18" c/c	17" c/c	ON E OF FLR.	AS SHOWN	8 1/2" c/c	AS SHOWN	AS SHOWN
NUMBER	2	12	3	24	6	4	2	2			2	2	3	11	3	1	3	6	2	2
LENGTH EACH BAR	9'-3"	6'-8 3/4" AVG.	4'-2 1/2"	1'-6 3/8" AVG.	0'-3 1/4"	16'-1"	7'-10"	5'-8"			15'-11"	13'-5"	7'-1"	2'-10"	13'-7"	15'-10"	2'-10"	0'-7"	9'-8"	2'-10"
TOTAL LENGTH OF BAR	18'-6"	80'-9"	12'-7 1/2"	36'-9"	1'-7 1/2"	64'-4"	15'-8"	11'-4"			31'-10"	26'-10"	21'-3"	31'-2"	40'-9"	15'-10"	8'-6"	3'-6"	19'-4"	5'-8"

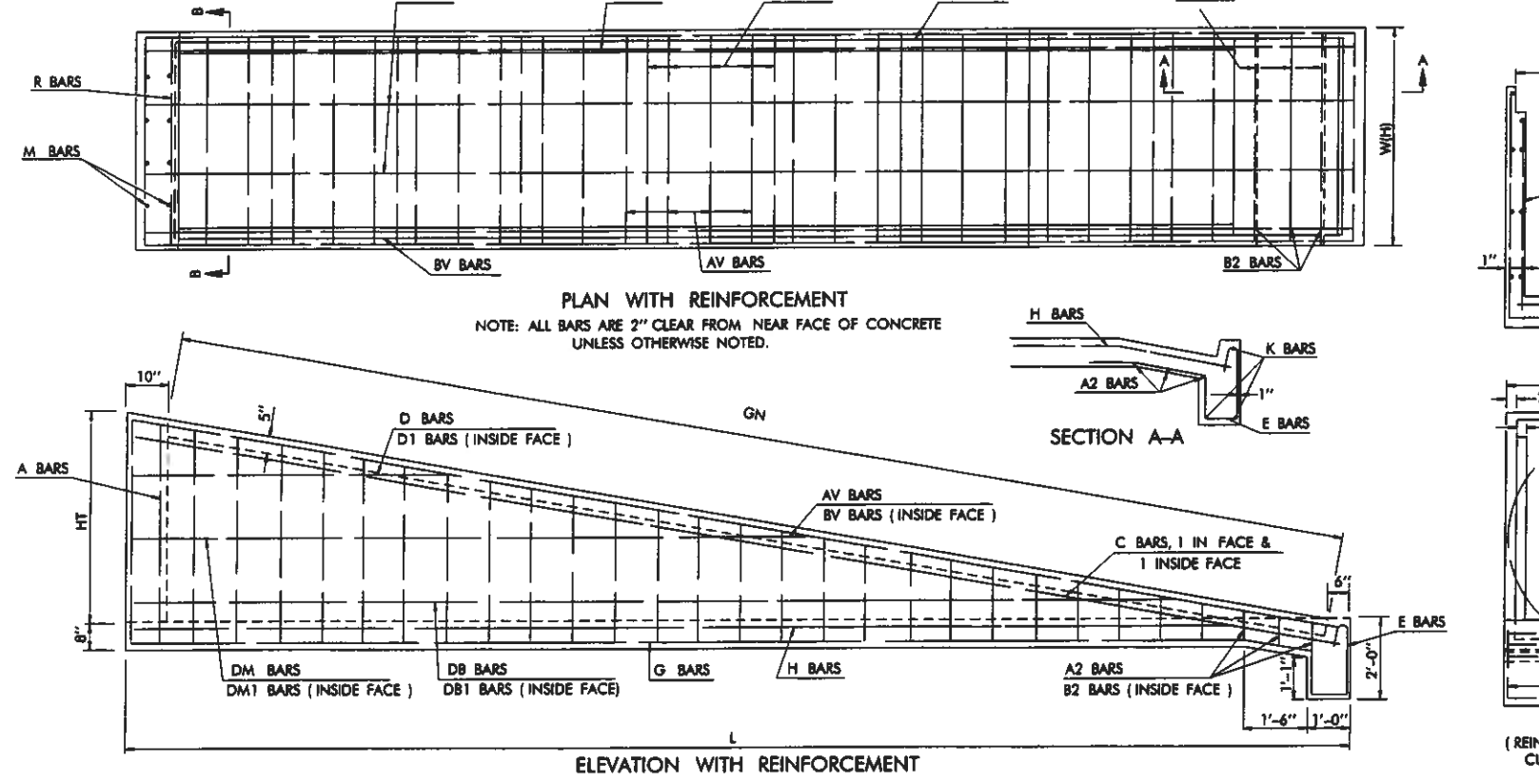
ACCOMMODATES - 30" ROUND PIPE - 29" x 18" & 30" x 19" ARCHES	BAR LIST																REQUIRES 6-36" SQ. GRATES		TOTAL LENGTH IN STR. 546'-4"	
DESIGN	BAR MARK																TOTAL WEIGHT		365 LB.	
6-2	A	AV	A2	BV	B2	C	D	D1	DM	DM1	DB	DB1	E	F	G	H	K	M	*N	R
SPACING	AS SHOWN	12" c/c	10" c/c	12" c/c	12" c/c	AS SHOWN	AS SHOWN	AS SHOWN			AS SHOWN	AS SHOWN	20" c/c	18" c/c	20" c/c	ON E OF FLR.	AS SHOWN	13 3/4" c/c	AS SHOWN	AS SHOWN
NUMBER	2	15	3	30	6	4	2	2			2	2	3	13	3	1	3	6	2	2
LENGTH EACH BAR	10'-9 1/2"	7'-8 1/2" AVG.	4'-4 1/2"	1'-9 1/4" AVG.	0'-3 1/4"	19'-3"	8'-0"	5'-10"			16'-0"	13'-10"	7'-1"	3'-4"	16'-7"	18'-10"	3'-4"	0'-6 1/2"	11'-5"	3'-4"
TOTAL LENGTH OF BAR	21'-7"	115'-7 1/2"	14'-7 1/2"	53'-9 1/2"	1'-7 1/2"	77'-0"	16'-0"	11'-8"			32'-0"	27'-8"	21'-3"	43'-4"	49'-9"	18'-10"	10'-0"	3'-3"	22'-10"	6'-8"

ACCOMMODATES - 36" ROUND PIPE - 36" x 22" & 38" x 24" ARCHES & 3' x 3' R.C. BOX	BAR LIST																REQUIRES 6-42" SQ. GRATES		TOTAL LENGTH IN STR. 655'-3"	
DESIGN	BAR MARK																TOTAL WEIGHT		438 LB.	
6-3	A	AV	A2	BV	B2	C	D	D1	DM	DM1	DB	DB1	E	F	G	H	K	M	*N	R
SPACING	AS SHOWN	12" c/c	10" c/c	12" c/c	10" c/c	AS SHOWN	AS SHOWN	AS SHOWN			AS SHOWN	AS SHOWN	20" c/c	18" c/c	23" c/c	ON E OF FLR.	AS SHOWN	9 3/4" c/c	AS SHOWN	AS SHOWN
NUMBER	2	18	3	36	6	4	2	2			2	2	3	15	3	1	3	8	2	2
LENGTH EACH BAR	12'-3"	8'-8 1/4" AVG.	5'-2 1/2"	2'-0 1/8" AVG.	0'-3 1/4"	22'-2 1/2"	8'-0"	5'-10"			16'-0"	13'-10"	7'-1"	3'-10"	19'-6"	21'-8"	3'-10"	0'-6"	13'-3"	3'-10"
TOTAL LENGTH OF BAR	24'-6"	156'-4 1/2"	15'-7 1/2"	72'-4 1/2"	1'-7 1/2"	88'-10"	16'-0"	11'-8"			32'-0"	27'-8"	21'-3"	57'-6"	58'-6"	21'-8"	11'-6"	4'-0"	26'-6"	7'-8"

ACCOMMODATES - 42" ROUND PIPE - 43" x 27" & 42" x 27" ARCHES	BAR LIST																REQUIRES 6-50" SQ. GRATES		TOTAL LENGTH IN STR. 966'-10"	
DESIGN	BAR MARK																TOTAL WEIGHT		646 LB.	
6-4	A	AV	A2	BV	B2	C	D	D1	DM	DM1	DB	DB1	E	F	G	H	K	M	*N	R
SPACING	AS SHOWN	12" c/c	10" c/c	12" c/c	10" c/c	AS SHOWN	AS SHOWN	AS SHOWN			AS SHOWN	AS SHOWN	20" c/c	18" c/c	18" c/c	18" c/c	AS SHOWN	11" c/c	AS SHOWN	AS SHOWN
NUMBER	2	22	3	44	6	4	2	2			2	2	4	17	4	2	3	8	2	2
LENGTH EACH BAR	13'-11"	9'-10 1/4" AVG.	5'-10 1/2"	3'-3 3/8" AVG.	0'-3 1/4"	26'-1"	8'-6"	6'-2"	17'-0"	14'-8"	25'-8"	23'-4"	7'-1"	4'-6"	23'-6"	25'-8"	4'-6"	0'-5 1/2"	15'-2"	4'-6"
TOTAL LENGTH OF BAR	27'-10"	217'-8 1/2"	17'-7 1/2"	100'-4 1/4"	1'-7 1/2"	104'-4"	17'-0"	12'-4"	34'-0"	29'-4"	51'-4"	46'-8"	28'-4"	76'-6"	94'-0"	51'-4"	13'-6"	3'-8"	30'-4"	9'-0"

ACCOMMODATES - 48" ROUND PIPE - 50" x 31" & 53" x 34" ARCHES & 4' x 4' R.C. BOX	BAR LIST																REQUIRES 6-56" SQ. GRATES		TOTAL LENGTH IN STR. 1108'-3 1/2"	
DESIGN	BAR MARK																TOTAL WEIGHT		740 LB.	
6-5	A	AV	A2	BV	B2	C	D	D1	DM	DM1	DB	DB1	E	F	G	H	K	M	*N	R
SPACING	AS SHOWN	12" c/c	10" c/c	12" c/c	10" c/c	AS SHOWN	AS SHOWN	AS SHOWN			AS SHOWN	AS SHOWN	20" c/c	18" c/c	20" c/c	20" c/c	AS SHOWN	12" c/c	AS SHOWN	AS SHOWN
NUMBER	2	25	3	50	6	4	2	2			2	2	4	19	4	2	3	8	2	2
LENGTH EACH BAR	15'-7"	10'-10 3/4" AVG.	6'-4 1/2"	2'-6 3/8" AVG.	0'-3 1/4"	29'-1"	8'-6"	6'-2"	17'-0"	14'-8"	26'-0"	23'-8"	7'-1"	5'-0"	26'-6"	28'-8"	5'-0"	0'-5 1/2"	17'-0"	5'-0"
TOTAL LENGTH OF BAR	31'-2"	272'-4 3/4"	19'-1 1/2"	126'-6 1/4"	1'-7 1/2"	116'-4"	17'-0"	12'-4"	34'-0"	29'-4"	52'-0"	47'-4"	28'-1"	95'-0"	106'-0"	57'-4"	15'-0"	3'-8"	34'-0"	10'-0"

* OPTIONAL BARS - TO BE USED ON ROUND PIPE STUDS ONLY.



NOTE: ALL BARS ARE 2" CLEAR FROM NEAR FACE OF CONCRETE UNLESS OTHERWISE NOTED.

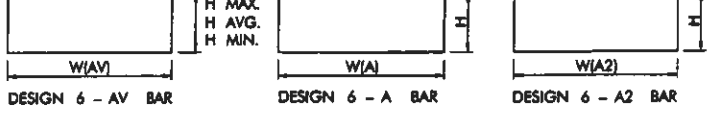
BAR LOCATION SCHEDULE			
BAR MARK	SHAPE	SIZE	LOCATION IN STRUCTURE
A	BENT	#4	BACK OUTSIDE VERTICAL BARS - U BEND
AV	BENT	#4	OUTSIDE VERT. BARS IN SLOPING WING - U BEND
A2	BENT	#4	OUTSIDE VERTICAL BARS AT FRONT - U BEND
BV	STR.	#4	INSIDE VERTICAL BARS IN SLOPING WINGS
B2	STR.	#4	INSIDE VERTICAL BARS AT FRONT OF STRUCTURE
C	STR.	#4	TOP OF SLOPING WING - LONGITUDINAL BAR (INSIDE & OUTSIDE FACES)
D	STR.	#4	OUTSIDE HORIZONTAL BAR IN WING (TOP)
D1	STR.	#4	INSIDE HORIZONTAL BAR IN WING (TOP)
DM	STR.	#4	OUTSIDE HORIZONTAL BAR IN WING (MIDDLE)
DM1	STR.	#4	INSIDE HORIZONTAL BAR IN WING (MIDDLE)
DB	STR.	#4	OUTSIDE HORIZONTAL BAR IN WING (BOTTOM)
DB1	STR.	#4	INSIDE HORIZONTAL BAR IN WING (BOTTOM)
E	BENT	#4	BAR IN CURTAIN WALL AND FLOOR AT FRONT
F	STR.	#4	TRANSVERSE HORIZONTAL BAR IN TOP OF FLOOR
G	STR.	#4	LONGITUDINAL HORIZ. BAR IN BOTTOM OF FLOOR
H	STR.	#4	LONGITUDINAL HORIZONTAL BAR IN TOP OF FLOOR
K	STR.	#4	TRANSVERSE HORIZONTAL BAR IN CURTAIN WALL
M	STR.	#4	VERTICAL BAR IN BACK OF STRUCTURE AT TOP
*N	BENT	#4	SPECIAL BENT BAR (OPTIONAL) AT BACK OF STRUCTURE
R	STR.	#4	TRANSVERSE HORIZ. BAR AT BACK TOP OF STRUCTURE

TO BE FIELD BENT TO MAINTAIN 2" CLEAR FROM TOP OF FLOOR AT GRATE NOTCH.
* OPTIONAL BARS - TO BE USED ON ROUND PIPE STUDS ONLY.

DESIGN NO.	DIMENSIONS				TOTAL LENGTH
	W(AV)	H AVG.	H MIN.	H MAX.	
6-1	2'-10"	1'-11 3/8"	10 1/2"	3'-0"	6'-8 3/4"
6-2	3'-4"	2'-2 1/2"	10 1/2"	3'-6"	7'-8 1/2"
6-3	3'-10"	2'-5 1/2"	10 1/2"	4'-0"	8'-8 1/2"
6-4	4'-6"	2'-8 3/8"	10 1/2"	4'-6"	9'-10 3/4"
6-5	5'-0"	2'-11 3/8"	10 1/2"	5'-1/2"	10'-10 3/4"

DESIGN NO.	DIMENSIONS		TOTAL LENGTH
	W(A)	H	
6-1	2'-10"	3'-2 1/2"	9'-3"
6-2	3'-4"	3'-8 1/2"	10'-9 1/2"
6-3	3'-10"	4'-2 1/2"	12'-3"
6-4	4'-6"	4'-8 1/2"	13'-11"
6-5	5'-0"	5'-3 1/2"	15'-7"

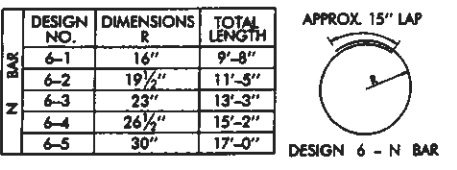
DESIGN NO.	DIMENSIONS		TOTAL LENGTH
	W(A2)	H	
6-1	2'-10"	0'-8 1/4"	4'-2 1/2"
6-2	3'-4"	0'-8 1/4"	4'-8 1/2"
6-3	3'-10"	0'-8 1/4"	5'-2 1/2"
6-4	4'-6"	0'-8 1/4"	5'-10 1/2"
6-5	5'-0"	0'-8 1/4"	6'-4 1/2"



CONCRETE QUANTITIES	
DESIGN NO.	CONC. C.Y.
6-1	2.15
6-2	2.96
6-3	3.89
6-4	5.17
6-5	6.55

TABLE OF INLET DIMENSIONS				
DESIGN NO.	DIMENSION			GRATE Ø
	L	HT	W	
6-1	16'-3"	3'-0"	3'-0"	30" SQ.
6-2	19'-3"	3'-6"	3'-6"	18'-2" 36" SQ.
6-3	22'-2"	4'-0"	4'-0"	21'-2" 42" SQ.
6-4	26'-2"	4'-6"	4'-8"	25'-2" 50" SQ.
6-5	29'-2"	5'-0"	5'-2"	28'-2" 56" SQ.

* DIMENSION GN IS A MINIMUM DIMENSION - MAY BE FORMED LONGER.
Ø G.W. DIMENSION IS 1/2" GREATER THAN "GRATE SIZE" Ø.



- GENERAL NOTES**
- ALL CONSTRUCTION AND MATERIAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE 1999 ENGLISH STANDARD SPECIFICATIONS.
 - NO EDGE CHAMFER IS REQUIRED.
 - ALL REBARS SHALL BE 2" CLEAR FROM NEAREST CONCRETE FACE UNLESS SHOWN OTHERWISE IN THE DRAWING.
 - USE IN CONJUNCTION WITH STANDARD WSG-2, LATEST REVISION.
 - WINGWALL CURB AND APRON CONSTRUCTION SHALL CONSIST OF THE SAME CLASS OF CONCRETE USED FOR THE REINFORCED CONCRETE BOX.

BASIS OF PAYMENT		
ITEM NO.	ITEM	UNIT
509.06(A)	CLASS AA CONCRETE	C. Y.
509.06(B)	CLASS A CONCRETE	C. Y.
509.06(C)	CLASS A CONCRETE FOR SMALL STRUCTURES	C. Y.
511.06(A)	REINFORCING STEEL	LBS.

▲ FOR QUANTITIES OF CLASS A CONCRETE LESS THAN 20.0 C.Y.

APPROVED BY ROADWAY ENGINEER *Penelope A. Ogden* DATE 3/1/07
OKLAHOMA DEPT. OF TRANSPORTATION
ROADWAY STANDARD (ENGLISH)
SLOPED AND GRATED WING WALLS
(DESIGN 6:1)