B. CU AND

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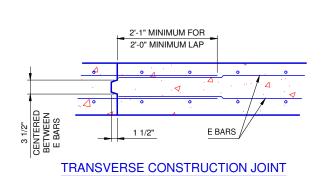
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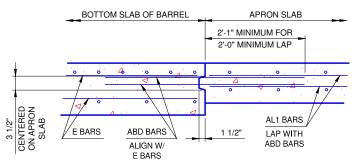
RCB-007

QUANT	TITIES		SE	EC1	ΓIO	N																RE	INF	ORC	ING	STEE	L														
PER FO BAR		ı	DIM				3		,	A1 BARS	i		P	2 BARS				ı	B1 BARS						B2 BARS				С	1 BARS			С	2 BARS			E1 BA T 12" I			E2 BA T 12" N	
CONC. (C.Y.)	REINF. (LB.)	S	н	Т	U	w	Z	SIZE	SPA.	LENGTH	WEIGHT PER FT.	SIZE	SPA.	LENGTH	WEIGHT PER FT.	SIZE	SPA.	"X" (HORIZ.)	"Y" (VERT.)	LENGTH	WEIGHT PER FT.	SIZE	SPA.	"X" (HORIZ.)	"Y" (VERT.)	LENGTH	WEIGHT PER FT.	SIZE	SPA.	LENGTH	WEIGHT PER FT.	SIZE	SPA.	LENGTH	WEIGHT PER FT.	NO.	SIZE	WEIGHT PER FT.	NO.	SIZE	WEIGHT PER FT.
1.09	117.0	5'	3'	10"	11"	10"	10"	#4	12"	12'-2"	16.3	#4	12"	12'-2"	16.3	#4	12"	2'-3"	2'-3"	4'-6"	6.0	#4	12"	2'-3"	3'-8"	5'-11"	7.9	#4	12"	2'-3"	6.0	#4	12"	3'-8"	9.8	64	#4	42.8	18	#4	12.0
1.18	125.0	5'	4'	10"	11"	10"	10"	#4	12"	12'-2"	16.3	#4	12"	12'-2"	16.3	#4	12"	2'-3"	2'-3"	4'-6"	6.0	#4	12"	2'-3"	4'-8"	6'-11"	9.2	#4	12"	2'-3"	6.0	#4	12"	4'-8"	12.5	64	#4	42.8	24	#4	16.0
1.27	133.0	5'	5'	10"	11"	10"	10"	#4	12"	12'-2"	16.3	#4	12"	12'-2"	16.3	#4	12"	2'-3"	2'-3"	4'-6"	6.0	#4	12"	2'-3"	5'-8"	7'-11"	10.6	#4	12"	2'-3"	6.0	#4	12"	5'-8"	15.1	64	#4	42.8	30	#4	20.0
1.22	159.6	6'	3'	10"	11"	10"	10"	#5	12"	14'-2"	29.6	#5	12"	14'-2"	29.6	#4	12"	2'-3"	2'-3"	4'-6"	6.0	#4	12"	2'-3"	3'-8"	5'-11"	7.9	#5	12"	2'-8"	11.1	#5	12"	3'-8"	15.3	72	#4	48.1	18	#4	12.0
1.31	169.1	6'	4'	10"	11"	10"	10"	#5	12"	14'-2"	29.6	#5	12"	14'-2"	29.6	#4	12"	2'-3"	2'-3"	4'-6"	6.0	#4	12"	2'-3"	4'-8"	6'-11"	9.2	#5	12"	2'-8"	11.1	#5	12"	4'-8"	19.5	72	#4	48.1	24	#4	16.0
1.40	178.6	6'	5'	10"	11"	10"	10"	#5	12"	14'-2"	29.6	#5	12"	14'-2"	29.6	#4	12"	2'-3"	2'-3"	4'-6"	6.0	#4	12"	2'-3"	5'-8"	7'-11"	10.6	#5	12"	2'-8"	11.1	#5	12"	5'-8"	23.6	72	#4	48.1	30	#4	20.0
1.50	188.1	6'	6'	10"	11"	10"	10"	#5	12"	14'-2"	29.6	#5	12"	14'-2"	29.6	#4	12"	2'-3"	2'-3"	4'-6"	6.0	#4	12"	2'-3"	6'-8"	8'-11"	11.9	#5	12"	2'-8"	11.1	#5	12"	6'-8"	27.8	72	#4	48.1	36	#4	24.0

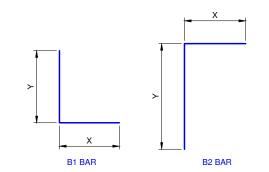
A, B AND C BARS ARE CENTERED PER L.F. OF BARREL LENGTH. FOR 0 SKEW END SECTIONS, ADJUST BAR QUANTITIES AS SHOWN ON END SECTION DETAILS, SHEET 2 OF 2. NO ADJUSTMENT IS REQUIRED FOR 30 DEGREE SKEW END SECTIONS.

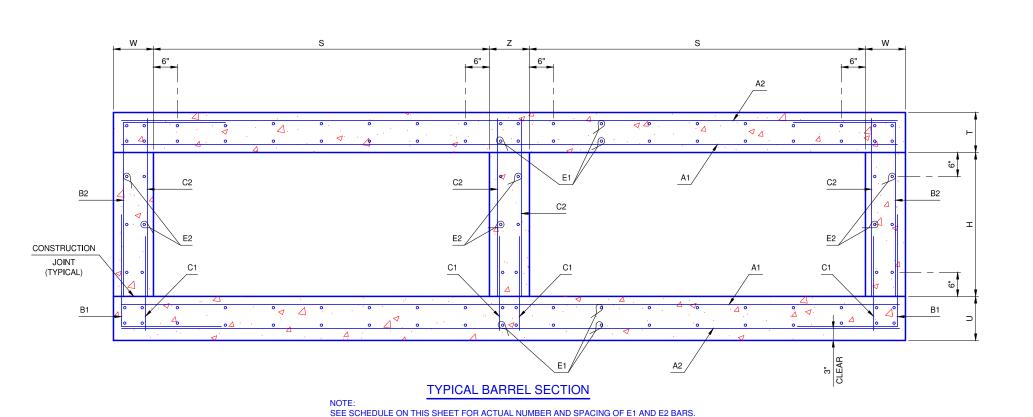
BA	SIS OF PAYMEN	Т
CODE	DESCRIPTION	UNIT
404-00	STRUCTURAL CONCRETE	C.Y.
411-00	REINFORCING STEEL	LBS.
982	PIPE RAILING	L.F.





CONSTRUCTION JOINT BETWEEN BARREL AND APRON





### **DESIGN DATA**

CLASS AA CONCRETE f'c = 4 K.S.I.

REINFORCING STEEL fy = 60 K.S.I.

HL-93 LOADING OR OKLAHOMA DEPARTMENT OF TRANSPORTATION OVERLOAD TRUCK

### H-20 TRUCK

HS-20 TRUCK

TYPE 3-3 (SPECIAL HAULING VEHICLE)

EV3 (TANDEM REAR AXLE EMERGENCY VEHICLE)

SHV NRL (SPECIAL HAULING VEHICLE NOTIONAL RATING LOAD)

ALL LOAD VEHICLES LISTED, EXCEPT HL-93 AND OKLAHOMA DEPARTMENT OF TRANSPORTATION OVERLOAD TRUCK, WERE ANALYZED USING LOAD FACTOR DESIGN (LFD).

AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 9TH EDITION AASHTO MANUAL FOR BRIDGE EVALUATION, 3RD EDITION, 2018, WITH 2019 INTERIM REVISIONS

### R.C.B. GENERAL NOTES

COMPLY WITH THE REQUIREMENTS OF THE CURRENT THE CITY OF OKLAHOMA CITY STANDARD SPECIFICATIONS.

PROVIDE A 1 1/2" CHAMFER ON ALL EXPOSED CONCRETE EDGES. USE SIZED LUMBER FOR ALL CHAMFER STRIPS.

PROVIDE 2" MINIMUM CLEAR COVER FOR ALL REINFORCING STEEL UNLESS NOTED OTHERWISE.

PLACE TRANSVERSE CONSTRUCTION JOINTS IN ALL CULVERTS 100 FT. OR MORE IN LENGTH AT A MAXIMUM SPACING OF 60 FT. SUBMIT LOCATIONS TO THE CITY ENGINEER FOR APPROVAL. SEE TRANSVERSE CONSTRUCTION JOINT DETAIL ON THIS SHEET.

THE QUANTITY FOR REINFORCING STEEL OF E1 AND E2 BARS DOES NOT INCLUDE LAP SPLICES IN THE LENGTH OF THE BARREL OR AT TRANSVERSE CONSTRUCTION JOINTS WITHIN THE BARREL. COSTS FOR SPLICES WILL NOT BE MEASURED FOR PAYMENT AND WILL BE INCLUDED IN THE CONTRACT UNIT PRICE FOR REINFORCING STEEL.

PIPE RAILING REQUIRED ON TOP OF HEADWALL AND WINGWALLS. SEE STD. RCB-015 PipeRailing.

PLACE WD AND ABD BARS FOR WINGWALLS AND APRON TIED TO BARREL REINFORCING BEFORE PLACING BARREL CONCRETE

REVISION NO.

DATE

S

								П	
RS			E1 B/ T12"	ARS MAX.		E2 B/ T 12"	ARS MAX.		
тн	WEIGHT PER FT.	NO.	SIZE	WEIGHT PER FT.	NO.	SIZE	WEIGHT PER FT.		•
"	4.9	80	#4	53.4	18	#4	12.0		(
"	6.2	80	#4	53.4	24	#4	16.0		
"	7.6	80	#4	53.4	30	#4	20.0		
"	8.9	80	#4	53.4	36	#4	24.0		
"	10.2	80	#4	53.4	42	#4	28.1		4
"	4.9	88	#4	58.8	18	#4	12.0		City of
"	6.2	88	#4	58.8	24	#4	16.0		⊳,
"	7.6	88	#4	58.8	30	#4	20.0		it
"	8.9	88	#4	58.8	36	#4	24.0		Ο,
"	10.2	88	#4	58.8	42	#4	28.1		, به
"	11.6	88	#4	58.8	48	#4	32.1		The

**BASIS OF PAYMENT** 

DESCRIPTION

404-00 STRUCTURAL CONCRETE

411-00 REINFORCING STEEL

982 PIPE RAILING

UNIT

C.Y.

LBS.

**REINFORCING STEEL** QUANTITIES **SECTION** PER FOOT OF **DIMENSIONS** A1 BARS A2 BARS A3 BARS B1 BARS B2 BARS C1 BARS C2 BARS C3 BARS C4 BAR CONC LENGTH LENGTH LENGTH PER LENGTH PER LENGTH LENGTH LENGTH (HORIZ.) (VERT.) (VERT.) (C.Y.) (HORIZ.) (LB.) #5 | 12" | 16'-2" | 33.7 1.35 174.7 #5 12" 2'-2" 2'-8" 4'-10" 10.1 #5 12" 2'-2" 12.2 6.0 #4 12" 16'-2" 21.6 #5 12" 3'-10" 8.0 3'-8" #4 6" 2'-3" 9.8 5'-10" 1.44 184.8 4' 10" 11" 10" 10" **#**5 | 12" | 16'-2" | 33.7 **#4** 12" 16'-2" 21.6 **#**5 12" 3'-10" 8.0 | #5 | 12" | 2'-2" | 2'-8" | 4'-10" | 10.1 | #5 | 12" | 2'-2" | 4'-8" | 6'-10" | 14.3 | #4 | 6" | 2'-3" | 6.0 #4 6" 4'-8" 12.5 #4 12" 2'-3" 1.53 195.0 5' 10" 11" 10" 10" #5 | 12" | 16'-2" | 33.7 | #4 | 12" | 16'-2" | 21.6 | #5 | 12" | 3:-10" | 8.0 | #5 | 12" | 2'-2" | 2'-8" | 4'-10" | 10.1 | #5 | 12" | 2'-2" | 5'-8" | 7'-10" | 16.3 | #4 | 6" | 2'-3" | 6.0 #4 6" 5'-8" 15.1 #4 12" 2'-3" 3.0 #4 6" 6'-8" 1.63 205.1 #5 12" 16'-2" 33.7 
 #4
 12"
 16'-2"
 21.6
 #5
 12"
 3'-10"
 8.0
 #5
 12"
 2'-2"
 2'-8"
 4'-10"
 10.1
 #5
 12"
 2'-2"
 6'-8"
 8'-10"
 18.4
 #4
 6"
 2'-3"
 6.0
 17.8 #4 12" 2'-3" #5 | 12" | 16'-2" | 33.7 | 14 | 12" | 16'-2" | 21.6 | 45 | 12" | 21.6 | 45 | 12" | 31-10" | 8.0 | 45 | 12" | 2'-2" | 2'-8" | 4'-10" | 10.1 | 45 | 12" | 2'-2" | 7'-8" | 9'-10" | 20.5 | 44 | 6" | 2'-3" | 6.0 | 44 | 6" | 1.72 215.2 1.48 201.4 #4 6" 18'-2" 48.5 | #4 12" 18'-2" 24.3 | #5 12" 3'-10" 8.0 | #4 12" 18'-2" 24.3 | #5 12" 3'-10" 8.0 | #4 6" 1'-11" 2'-3" 4'-2" 11.1 | #4 6" 1'-11" 3'-8" 5'-7" 14.9 | #4 6" 2'-3" | 1.57 
 #4
 6"
 1'-11"
 2'-3"
 4'-2"
 11.1
 #4
 6"
 1'-11"
 4'-8"
 6'-7"
 17.6
 #4
 6"
 2'-3"
 6.0
 #4 6" 4'-8" #4 6" 18'-2" 48.5 #4 12" 18'-2" 24.3 #5 12" 3'-10" 8.0 12.5 #4 12" 2'-3" 3.0 212 1 1.66 222.8 8' 5' 10" 11" 10" 10' 11.1 #4 6" 1'-11" 5'-8" 7'-7" 20.3 #4 6" 2'-3" 6.0 #4 6" 5'-8" 15.1 #4 12" 2'-3" 3.0 1.75 242.7 #4 | 6" | 18'-2" | 48.5 | #4 | 12" | 18'-2" | 24.3 | #6 | 12" | 5'-9" | 17.3 | #4 | 6" | 1'-11" | 2'-3" | 4'-2" | 11.1 | #4 | 6" | 1'-11" | 6'-8" | 8'-7" | 22.9 | #4 | 6" | 2'-3" | 6.0 | #4 | 6" | 6'-8" | 17.8 #4 12" 2'-3" 

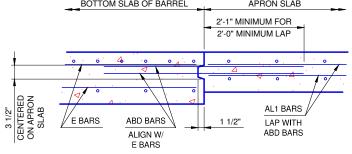
 #4
 6"
 18-2"
 48.5
 #4
 12"
 18-2"
 24.3
 #6
 12"
 5'-10"
 17.5
 #4
 6"
 2'-3"
 4'-6"
 2'-3"
 6.0
 #4
 6"
 7'-8"
 20.5
 #4
 12"
 2'-3"
 3.0
 #4
 12"
 2'-8"

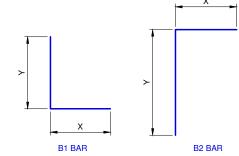
 1.85 254.1 8' 7' 10" 11" 10" 10" 2.03 #4 6" 18'-5" 49.2 #4 12" 18'-5" 24.6 #6 12" 5'-11" 17.8 #4 6" 2'-0" 2'-3" 4'-3" 11.4 #4 6" 2'-0" 8'-8" 10'-8" 28.5 #4 6" 2'-3" 6.0 #4 6" 8'-8" 23.2 #4 12" 2'-3" 3.0 #4 12" 8'-8"

A, B AND C BARS ARE CENTERED PER L.F. OF BARREL LENGTH. FOR 0 SKEW END SECTIONS, ADJUST BAR QUANTITIES AS SHOWN ON END SECTION DETAILS, SHEET 2 OF 2. NO ADJUSTMENT IS REQUIRED FOR 30 DEGREE SKEW END SECTIONS.

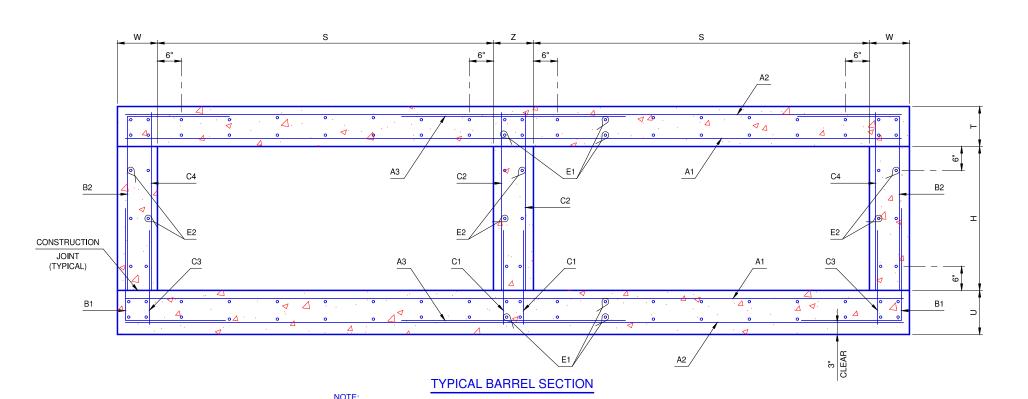


2'-1" MINIMUM FOR 2'-0" MINIMUM LAP ...\do E BARS 1 1/2" TRANSVERSE CONSTRUCTION JOINT





# CONSTRUCTION JOINT BETWEEN BARREL AND APRON



SEE SCHEDULE ON THIS SHEET FOR ACTUAL NUMBER AND SPACING OF E1 AND E2 BARS.

### R.C.B. GENERAL NOTES

2019 INTERIM REVISIONS

**DESIGN DATA** 

H-20 TRUCK HS-20 TRUCK

CLASS AA CONCRETE f'c = 4 K.S.I.

REINFORCING STEEL fy = 60 K.S.I.

TYPE 3-3 (SPECIAL HAULING VEHICLE)

EV3 (TANDEM REAR AXLE EMERGENCY VEHICLE)

ANALYZED USING LOAD FACTOR DESIGN (LFD).

OVERLOAD TRUCK

COMPLY WITH THE REQUIREMENTS OF THE CURRENT THE CITY OF OKLAHOMA CITY STANDARD SPECIFICATIONS.

HL-93 LOADING OR OKLAHOMA DEPARTMENT OF TRANSPORTATION

SHV NRL (SPECIAL HAULING VEHICLE NOTIONAL RATING LOAD) ALL LOAD VEHICLES LISTED, EXCEPT HL-93 AND OKLAHOMA DEPARTMENT OF TRANSPORTATION OVERLOAD TRUCK, WERE

AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 9TH EDITION AASHTO MANUAL FOR BRIDGE EVALUATION, 3RD EDITION, 2018, WITH

PROVIDE A 1 1/2" CHAMFER ON ALL EXPOSED CONCRETE EDGES. USE SIZED LUMBER FOR ALL CHAMFER STRIPS.

PROVIDE 2" MINIMUM CLEAR COVER FOR ALL REINFORCING STEEL **UNLESS NOTED OTHERWISE** 

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PIPE RAILING REQUIRED ON TOP OF HEADWALL AND WINGWALLS. SEE STD. RCB-015 PipeRailing.

PLACE WD AND ABD BARS FOR WINGWALLS AND APRON TIED TO BARREL BEINFORCING BEFORE PLACING BARREL CONCRETE

REVISION NO. DATE

RCB-008

J.V

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2.B. CULVERTS - BA AND 10' SPANS - I 2' TO 10' F

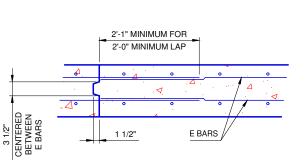
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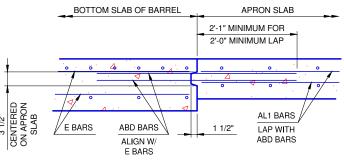
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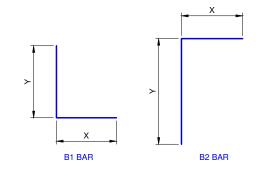
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QUAN	TITIES				ON																					REIN	IFOF	RCIN	G ST	EEL															
	OOT OF			NSI				A1	BARS			P	A2 BARS			A	3 BARS				B1 BARS					B2	BARS				C1 BARS			C2 BAR	S		C3 BAR	S		C4 BARS	3	E1 E AT 12	BARS " MAX.		BARS 2" MAX.
CONC. (C.Y.)	REINF. (LB.)	s	н	T U	ı w	z	SIZE	SPA.	.ENGTH	WEIGH PER FT.	SIZE	SPA.	LENGTH	WEIGHT PER FT.	SIZE	SPA.	LENGTH	WEIGHT PER FT.	SIZE SPA.	"X" (HORIZ.)	"Y" (VERT.)	LENGTH	WEIGHT PER FT.	SIZE	5		"Y" /ERT.)	LENGTH	Weight Per Ft.	SIZE SPA.	LENGTH	WEIGHT PER FT.	SIZE	E LENGT	WEIGHT H PER FT.	SIZE	E LENGT	WEIGHT H PER FT.	SIZE SPA.	LENGTH	WEIGHT PER FT.	NO. SZS	WEIGHT PER FT.	NO.	WEIGHT PER FT.
1.73	216.9	9'	3' 1	1" 12	." 10'	' 10"	#4	6"	20'-2"	53.9	#4	12"	20'-2"	26.9	#5	12"	4'-4"	9.0	#4 6"	1'-11"	2'-4"	4'-3"	11.4	#4 (	6" 1'-	11" :	3'-9"	5'-8"	15.1	#4 6'	" 2'-4"	6.2	#4 6	6" 3'-9"	10.0	#4 1	2" 2'-4"	3.1	#4 12	" 3'-9"	5.0	96 #4	64.1	18 #	12.0
1.83	227.8	9'	4' 1	1" 12	." 10'	' 10"	#4	6"	20'-2"	53.9	#4	12"	20'-2"	26.9	#5	12"	4'-5"	9.2	#4 6"	1'-11"	2'-4"	4'-3"	11.4	#4 (	3" 1'-	11" 4	4'-9"	6'-8"	17.8	#4 6	" 2'-4"	6.2	#4 6	6" 4'-9"	12.7	#4 1	2" 2'-4"	3.1	#4 12	" 4'-9"	6.3	96 #4	64.1	24 #	16.0
1.92	247.8	9'	5' 1	1" 12	." 10'	10"	#4	6"	20'-2"	53.9	#4	12"	20'-2"	26.9	#6	12"	6'-2"	18.5	#4 6"	1'-11"	2'-4"	4'-3"	11.4	#4 (	3" 1'-	11"	5'-9"	7'-8"	20.5	#4 6'	" 2'-4"	6.2	#4 6	5" 5'-9"	15.4	#4 1	2" 2'-4"	3.1	#4 12	" 5'-9"	7.7	96 #4	64.1	30 #	20.0
2.01	288.9	9'	6' 1	1" 12	." 10'	' 10"	#5	6"	20'-2"	84.1	#4	12"	20'-2"	26.9	#6	12"	6'-3"	18.8	#4 6"	1'-11"	2'-4"	4'-3"	11.4	#4 (	3" 1'-	11" (	6'-9"	8'-8"	23.2	#4 6'	" 2'-4"	6.2	#4 6	6'-9"	18.0	#4 1	2" 2'-4"	3.1	#4 12	" 6'-9"	9.0	96 #4	64.1	36 #	4 24.0
2.10	299.6	9'	7' 1	1" 12	." 10'	' 10"	#5	6"	20'-2"	84.1	#4	12"	20'-2"	26.9	#6	12"	6'-3"	18.8	#4 6"	1'-11"	2'-4"	4'-3"	11.4	#4 (	3" 1'-	11"	7'-9"	9'-8"	25.8	#4 6'	" 2'-4"	6.2	#4 6	5" 7'-9"	20.7	#4 1	2" 2'-4"	3.1	#4 12	" 7'-9"	10.4	96 #4	64.1	42 #	28.1
2.29	312.4	9'	8' 1	1" 12	" 11'	11"	#5	6"	20'-5"	85.2	#4	12"	20'-5"	27.3	#6	12"	6'-4"	19.0	#4 6"	2'-0"	2'-4"	4'-4"	11.6	#4 (	3" 2'	-0"	8'-9"	10'-9"	28.7	#4 6	" 2'-4"	6.2	#4 6	8'-9"	23.4	#4 1	2" 2'-4"	3.1	#4 12	" 8'-9"	11.7	96 #4	64.1	48 #	4 32.1
2.39	323.8	9'	9' 1	1" 12	" 11'	11"	#5	6"	20'-5"	85.2	#4	12"	20'-5"	27.3	#6	12"	6'-5"	19.3	#4 6"	2'-1"	2'-4"	4'-5"	11.8	#4 (	3" 2'	-1" !	9'-9"	11'-10"	31.6	#4 6	" 2'-4"	6.2	#4 6	8" 9'-9"	26.1	#4 1	2" 2'-4"	3.1	#4 12	" 9'-9"	13.0	96 #4	64.1	54 #	4 36.1
1.88	303.8	10'	3' 1	1" 12	" 10'	' 10"	#5	6"	22'-2"	92.5	#4	12"	22'-2"	29.6	#6	12"	6'-7"	19.8	#5 6"	2'-2"	2'-9"	4'-11"	20.5	#5 (	3" 2'	-2"	3'-9"	5'-11"	24.7	<b>#</b> 5 6'	" 2'-9"	11.5	#5 6	8" 3'-9"	15.6	#4 1	2" 2'-4"	3.1	#4 12	" 3'-9"	5.0	104 #4	69.5	18 #	12.0
1.97	305.1	10'	4' 1	1" 12	." 10'	10"	#5	6"	22'-2"	92.5	#4	12"	22'-2"	29.6	#6	12"	6'-7"	19.8	#5 6"	2'-2"	2'-9"	4'-11"	20.5	#5	3" 2'	-2"	4'-9"	6'-11"	28.9	#4 6	" 2'-4"	6.2	#4 6	6" 4'-9"	12.7	#4 1	2" 2'-4"	3.1	#4 12	" 4'-9"	6.3	104 #4	69.5	24 #	4 16.0
2.06	325.8	10'	5' 1	1" 12	." 10'	' 10"	#5	6"	22'-2"	92.5	#4	12"	22'-2"	29.6	#7	12"	6'-11"	28.3	#5 6"	2'-2"	2'-9"	4'-11"	20.5	#5 (	3" 2'	-2"	5'-9"	7'-11"	33.0	#4 6'	" 2'-4"	6.2	#4 6	5" 5'-9"	15.4	#4 1	2" 2'-4"	3.1	#4 12	" 5'-9"	7.7	104 #4	69.5	30 #	20.0
2.15	338.0	10'	6' 1	1" 12	." 10'	' 10"	#5	6"	22'-2"	92.5	#4	12"	22'-2"	29.6	#7	12"	6'-11"	28.3	#5 6"	2'-2"	2'-9"	4'-11"	20.5	#5 (	3" 2'	-2"	6'-9"	8'-11"	37.2	#4 6	" 2'-4"	6.2	#4 6	6'-9"	18.0	#4 1	2" 2'-4"	3.1	#4 12	" 6'-9"	9.0	104 #4	69.5	36 #	4 24.0
2.33	352.6	10'	7' 1	1" 12	" 11'	11"	#5	6"	22'-5"	93.5	#4	12"	22'-5"	29.9	#7	12"	7'-0"	28.6	#5 6"	2'-3"	2'-9"	5'-0"	20.9	#5	3" 2'	-3"	7'-9"	10'-0"	41.7	#4 6	" 2'-4"	6.2	#4 6	6" 7'-9"	20.7	#4 1	2" 2'-4"	3.1	#4 12	" 7'-9"	10.4	104 #4	69.5	42 #	28.1
2.43	364.8	10'	8' 1	1" 12	" 11'	11"	#5	6"	22'-5"	93.5	#4	12"	22'-5"	29.9	#7	12"	7'-0"	28.6	#5 6"	2'-3"	2'-9"	5'-0"	20.9	#5 (	5" 2'	-3"	8'-9"	11'-0"	45.9	#4 6	" 2'-4"	6.2	#4 6	8'-9"	23.4	#4 1	2" 2'-4"	3.1	#4 12	" 8'-9"	11.7	104 #4	69.5	48 #	4 32.1
2.53	377.3	10'	9' 1	1" 12	" 11'	11"	#5	6"	22'-5"	93.5	#4	12"	22'-5"	29.9	#7	12"	7'-1"	29.0	#5 6"	2'-3"	2'-9"	5'-0"	20.9	#5 (	3" 2'	-3" !	9'-9"	12'-0"	50.1	#4 6'	" 2'-4"	6.2	#4 6	6" 9'-9"	26.1	#4 1	2" 2'-4"	3.1	#4 12	" 9'-9"	13.0	104 #4	69.5	54 #	4 36.1
2.74	404.7	10'	10' 1	1" 12	." 12'	12"	#5	6"	22'-8"	94.6	#4	12"	22'-8"	30.3	#7	12"	7'-2"	29.3	#5 6"	2'-7"	2'-9"	5'-4"	22.3	#5 (	8" 2'	-7" 1	0'-9"	13'-4"	55.6	#4 6'	" 2'-4"	6.2	#4 6	6" 10'-9'	28.7	#5 1	2" 2'-9"	5.7	#5 12	" 10'-9"	22.4	104 #4	69.5	60 #	4 40.1

NOTE: A, B AND C BARS ARE CENTERED PER L.F. OF BARREL LENGTH. FOR 0 SKEW END SECTIONS, ADJUST BAR QUANTITIES AS SHOWN ON END SECTION DETAILS, SHEET 2 OF 2. NO ADJUSTMENT IS REQUIRED FOR 30 DEGREE SKEW END SECTIONS.

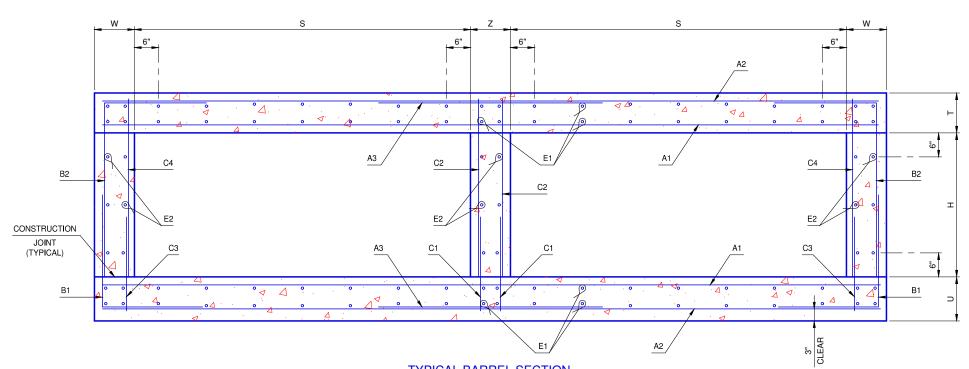






## TRANSVERSE CONSTRUCTION JOINT

## CONSTRUCTION JOINT BETWEEN BARREL AND APRON



## TYPICAL BARREL SECTION

SEE SCHEDULE ON THIS SHEET FOR ACTUAL NUMBER AND SPACING OF E1 AND E2 BARS.

# **DESIGN DATA**

CLASS AA CONCRETE f'c = 4 K.S.I. REINFORCING STEEL fy = 60 K.S.I.

HL-93 LOADING OR OKLAHOMA DEPARTMENT OF TRANSPORTATION OVERLOAD TRUCK

**BASIS OF PAYMENT** 

982 PIPE RAILING

DESCRIPTION 404-00 STRUCTURAL CONCRETE C.Y. 411-00 REINFORCING STEEL

LBS.

L.F.

### H-20 TRUCK

HS-20 TRUCK

TYPE 3-3 (SPECIAL HAULING VEHICLE)

EV3 (TANDEM REAR AXLE EMERGENCY VEHICLE)

SHV NRL (SPECIAL HAULING VEHICLE NOTIONAL RATING LOAD)

ALL LOAD VEHICLES LISTED, EXCEPT HL-93 AND OKLAHOMA DEPARTMENT OF TRANSPORTATION OVERLOAD TRUCK, WERE ANALYZED USING LOAD FACTOR DESIGN (LFD).

AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 9TH EDITION AASHTO MANUAL FOR BRIDGE EVALUATION, 3RD EDITION, 2018, WITH 2019 INTERIM REVISIONS

### R.C.B. GENERAL NOTES

COMPLY WITH THE REQUIREMENTS OF THE CURRENT THE CITY OF OKLAHOMA CITY STANDARD SPECIFICATIONS.

PROVIDE A 1 1/2" CHAMFER ON ALL EXPOSED CONCRETE EDGES. USE SIZED LUMBER FOR ALL CHAMFER STRIPS.

PROVIDE 2" MINIMUM CLEAR COVER FOR ALL REINFORCING STEEL UNLESS NOTED OTHERWISE.

PLACE TRANSVERSE CONSTRUCTION JOINTS IN ALL CULVERTS 100 FT. OR MORE IN LENGTH AT A MAXIMUM SPACING OF 60 FT. SUBMIT LOCATIONS TO THE CITY ENGINEER FOR APPROVAL. SEE TRANSVERSE CONSTRUCTION JOINT DETAIL ON THIS SHEET.

THE QUANTITY FOR REINFORCING STEEL OF E1 AND E2 BARS DOES NOT INCLUDE LAP SPLICES IN THE LENGTH OF THE BARREL OR AT TRANSVERSE CONSTRUCTION JOINTS WITHIN THE BARREL. COSTS FOR SPLICES WILL NOT BE MEASURED FOR PAYMENT AND WILL BE INCLUDED IN THE CONTRACT UNIT PRICE FOR REINFORCING STEEL.

PIPE RAILING REQUIRED ON TOP OF HEADWALL AND WINGWALLS. SEE STD. RCB-015 PipeRailing.

PLACE WD AND ABD BARS FOR WINGWALLS AND APRON TIED TO BARREL REINFORCING BEFORE PLACING BARREL CONCRETE

REVISION NO. DATE

RCB-010

.C.E

α.

REVISION NO.

DATE

QUAN	TITIES		SEC	TIOI	V																				REIN	NFOR	CIN	G ST	EEL															
PER F BAI	OOT OF REL			ISIO			A1	I BARS			A2 BA	ARS			A3 BARS	6			B1 B	ARS					B2	BARS				C1 BAR	6		C2 BARS	8		C3 BAR	S		C4 BARS		E1 B AT 12"			BARS 2" MAX.
CONC. (C.Y.)	REINF. (LB.)	s	н т	U	wZ	SIZE	SPA.	LENGTH	WEIGHT PER FT.	SIZE	S LEN		VEIGHT PER FT.	SIZE SPA.	LENGTH	WEIGHT PER FT.	SIZE	SPA.		Y" :RT.)	NGTH	WEIGHT PER FT.	SIZE			"Y" VERT.)	.ENGTH	Weight Per Ft.	SIZE SPA.	LENGTH	WEIGHT PER FT.	SIZE SPA.	LENGTH	WEIGHT PER FT.	SIZE	ENGTI	WEIGHT H PER FT.	SIZE SPA.	LENGTH	WEIGHT PER FT.	NO. SIZE	WEIGHT PER FT.	NO.	WEIGHT PER FT.
2.02	330.0	11'	3' 11'	12" 1	0" 10"	#5	6"	24'-2"	100.8	#4	12" 24'	-2"	32.3	#7 12	" 7'-3"	29.6	#5	6" 2	2'-2" 2'	-9" 4	'-11"	20.5	#5 (	5" 2'-	-2"	3'-9"	5'-11"	24.7	#5 6'	" 2'-9"	11.5	#5 6"	' 3'-9"	15.6	#4 1	2" 2'-4"	3.1	#4 12	" 3'-9"	5.0	112 #4	74.8	18 #	1 12.0
2.11	344.1	11'	4' 11'	12" 1	0" 10"	#5	6"	24'-2"	100.8	#4	12" 24'	-2"	32.3	#7 12	" 7'-4"	30.0	#5	6" 2	2'-2" 2'	-9" 4	'-11"	20.5	#5 (	3" 2'-	-2"	4'-9"	6'-11"	28.9	#5 6'	" 2'-9"	11.5	#5 6"	' 4'-9"	19.8	#4 1	2" 2'-4"	3.1	#4 12	" 4'-9"	6.3	112 #4	74.8	24 #	16.0
2.20	357.7	11'	5' 11'	' 12" 1	0" 10"	#5	6"	24'-2"	100.8	#4	12" 24'	-2"	32.3	#7 12	" 7'-4"	30.0	#5	6" 2	2'-2" 2'	-9" 4	'-11"	20.5	#5 (	3" 2'-	-2"	5'-9"	7'-11"	33.0	#5 6'	" 2'-9"	11.5	#5 6"	' 5'-9"	24.0	#4 1	2" 2'-4"	3.1	#4 12	" 5'-9"	7.7	112 #4	74.8	30 #	4 20.0
2.37	373.8	11'	6' 11'	' 12" 1	1" 11"	#5	6"	24'-5"	101.9	#4	12" 24'	-5"	32.6	#7 12	" 7'-5"	30.3	#5	6" 2	2'-3" 2'	-9" (	5'-0"	20.9	#5 (	5" 2'-	-3"	6'-9"	9'-0"	37.5	#5 6'	" 2'-9"	11.5	#5 6"	' 6'-9"	28.2	#4 1	2" 2'-4"	3.1	#4 12	" 6'-9"	9.0	112 #4	74.8	36 #	4 24.0
2.47	387.5	11'	7' 11'	' 12" 1	1" 11"	#5	6"	24'-5"	101.9	#4	12" 24'	-5"	32.6	#7 12	" 7'-5"	30.3	#5	6" 2	2'-3" 2'	-9" (	5'-0"	20.9	#5 (	3" 2'-	-3"	7'-9"	10'-0"	41.7	#5 6'	" 2'-9"	11.5	#5 6"	' 7'-9"	32.3	#4 1	2" 2'-4"	3.1	#4 12	" 7'-9"	10.4	112 #4	74.8	42 #	4 28.1
2.57	412.3	11'	8' 11'	12" 1	1" 11"	#5	6"	24'-5"	101.9	#4	12" 24'	-5"	32.6	#8 12	" 7'-9"	41.4	#5	6" 2	2'-3" 2'	-9" (	5'-0"	20.9	#5 (	3" 2'-	-3"	8'-9"	11'-0"	45.9	#5 6'	" 2'-9"	11.5	#5 6"	' 8'-9"	36.5	#4 1	2" 2'-4"	3.1	#4 12	" 8'-9"	11.7	112 #4	74.8	48 #-	32.1
2.67	406.6	11'	9' 11'	' 12" 1	1" 11"	#5	6"	24'-5"	101.9	#4	12" 24'	-5"	32.6	#8 12	" 7'-10"	41.8	#5	6" 2	2'-3" 2'	-9" (	5'-0"	20.9	#5 (	6" 2'-	-3"	9'-9"	12'-0"	50.1	#4 6'	" 2'-4"	6.2	#4 6"	' 9'-9"	26.1	#4 1	2" 2'-4"	3.1	#4 12	" 9'-9"	13.0	112 #4	74.8	54 #-	4 36.1
2.89	434.3	11' 1	10' 11'	' 12" 1	2" 12"	#5	6"	24'-8"	102.9	#4	12" 24'	-8"	33.0	#8 12	" 7'-10"	41.8	#5	6" 2	2'-8" 2'	-9" (	5'-5"	22.6	#5 (	5" 2'-	-8" 1	10'-9"	13'-5"	56.0	#4 6'	" 2'-4"	6.2	#4 6"	' 10'-9"	28.7	#5 1	2" 2'-9"	5.7	#5 12	" 10'-9"	22.4	112 #4	74.8	60 #	40.1
3.00	450.4	11' 1	11' 11'	' 12" 1	2" 12"	#5	6"	24'-8"	102.9	#4	12" 24'	-8"	33.0	#8 12	" 7'-11"	42.3	#5	6" 3	3'-0" 2'	-9" (	5'-9"	24.0	#5 (	3'-	-0" 1	11'-9"	14'-9"	61.5	#4 6'	" 2'-4"	6.2	#4 6"	' 11'-9"	31.4	#5 1	2" 2'-9"	5.7	#5 12	" 11'-9"	24.5	112 #4	74.8	66 #	44.1
2.57	428.3	12'	5' 12'	' 13" 1	1" 11"	#6	6"	26'-5"	158.7	#4	12" 26'	-5"	35.3	#7 12	" 7'-10"	32.0	#5	6" 2	2'-3" 2'-	10" - 5	5'-1"	21.2	#5 (	6" 2'-	-3" 5	5'-10"	8'-1"	33.7	#5 6'	" 2'-10"	11.8	#5 6"	5'-10"	24.3	#4 1	2" 2'-5"	3.2	#4 12	" 5'-10"	7.8	120 #4	80.2	30 #	4 20.0
2.68	453.6	12'	6' 12'	' 13" 1	1" 11"	#6	6"	26'-5"	158.7	#4	12" 26'	-5"	35.3	#8 12	" 8'-2"	43.6	#5	6" 2	2'-3" 2'-	10" - 5	5'-1"	21.2	#5 (	3" 2'-	-3" 6	6'-10"	9'-1"	37.9	#5 6'	" 2'-10"	11.8	#5 6"	' 6'-10"	28.5	#4 1	2" 2'-5"	3.2	#4 12	" 6'-10"	9.1	120 #4	80.2	36 #	4 24.0
2.78	467.3	12'	7' 12'	' 13" 1	1" 11"	#6	6"	26'-5"	158.7	#4	12" 26'	-5"	35.3	#8 12	" 8'-2"	43.6	#5	6" 2	2'-3" 2'-	10" - 5	5'-1"	21.2	#5 (	3" 2'-	-3" 7	7'-10"	10'-1"	42.1	#5 6'	" 2'-10"	11.8	#5 6"	' 7'-10"	32.7	#4 1	2" 2'-5"	3.2	#4 12	" 7'-10"	10.5	120 #4	80.2	42 #	4 28.1
2.97	465.4	12'	8' 12'	' 13" 1	2" 12"	#6	6"	26'-8"	160.2	#4	12" 26'	-8"	35.6	#8 12	" 8'-3"	44.1	#5	6" 2	2'-4" 2'-	10" - 5	5'-2"	21.6	#5 (	3" 2'-	-4" 8	3'-10"	11'-2"	46.6	#4 6'	" 2'-5"	6.5	#4 6"	' 8'-10"	23.6	#4 1	2" 2'-5"	3.2	#4 12	" 8'-10"	11.8	120 #4	80.2	48 #	32.1
3.08	477.5	12'	9' 12'	' 13" 1	2" 12"	#6	6"	26'-8"	160.2	#4	12" 26'	-8"	35.6	#8 12	" 8'-3"	44.1	#5	6" 2	2'-4" 2'-	10" - 5	5'-2"	21.6	#5 (	3" 2'-	-4" 9	9'-10"	12'-2"	50.8	#4 6'	" 2'-5"	6.5	#4 6"	9'-10"	26.3	#4 1	2" 2'-5"	3.2	#4 12	" 9'-10"	13.1	120 #4	80.2	54 #	4 36.1
3.19	492.7	12'	10' 12'	13" 1	2" 12"	#6	6"	26'-8"	160.2	#4	12" 26'	-8"	35.6	#8 12	" 8'-5"	44.9	#5	6" 2	2'-7" 2'-	10" 5	5'-5"	22.6	#5 (	3" 2'-	-7" 1	0'-10"	13'-5"	56.0	#4 6'	" 2'-5"	6.5	#4 6"	' 10'-10"	28.9	#4 1	2" 2'-5"	3.2	#4 12	" 10'-10"	14.5	120 #4	80.2	60 #	4 40.1
3.31	527.4	12' '	11' 12'	' 13" 1	2" 12"	#6	6"	26'-8"	160.2	#4	12" 26'	-8"	35.6	#8 12	" 8'-5"	44.9	#5	6" 3	3'-0" 2'-	10" 5	'-10"	24.3	#5 (	3'-	-0" 1	1'-10" 1	14'-10"	61.9	#4 6'	" 2'-5"	6.5	#4 6"	' 11'-10"	31.6	#4 (	6" 2'-5"	6.5	#4 6"	11'-10"	31.6	120 #4	80.2	66 #	44.1
3.42	617.8	12'	12' 12'	' 13" 1	2" 12"	#6	6"	26'-8"	160.2	#5	12" 26'	-8"	55.6	#9 12	" 8'-9"	59.5	#6	6" 3	3'-0" 3'	-3" (	6'-3"	37.6	#6	3'-	-0" 1:	2'-10" 1	15'-10"	95.1	#4 6'	" 2'-5"	6.5	#4 6"	' 12'-10"	34.3	#4 (	6" 2'-5"	6.5	#4 6"	12'-10"	34.3	120 #4	80.2	72 #	48.1

APRON SLAB

AL1 BARS

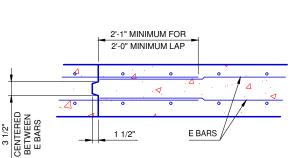
LAP WITH

ABD BARS

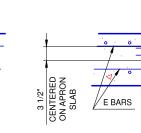
2'-1" MINIMUM FOR

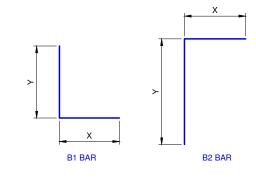
2'-0" MINIMUM LAP

NOTE:
A, B AND C BARS ARE CENTERED PER L.F. OF BARREL LENGTH.
FOR 0 SKEW END SECTIONS, ADJUST BAR QUANTITIES AS SHOWN
ON END SECTION DETAILS, SHEET 2 OF 2. NO ADJUSTMENT IS
REQUIRED FOR 30 DEGREE SKEW END SECTIONS.



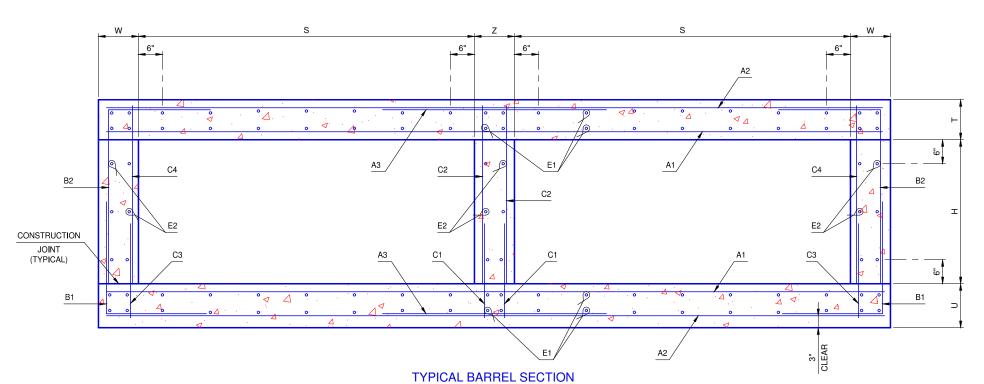
TRANSVERSE CONSTRUCTION JOINT





### CONSTRUCTION JOINT BETWEEN BARREL AND APRON

1 1/2"



BOTTOM SLAB OF BARREL

ALIGN W/

## **DESIGN DATA** CLASS AA CONCRETE f'c = 4 K.S.I.

REINFORCING STEEL fy = 60 K.S.I.

HL-93 LOADING OR OKLAHOMA DEPARTMENT OF TRANSPORTATION OVERLOAD TRUCK

**BASIS OF PAYMENT** 

LBS.

CODE DESCRIPTION 404-00 STRUCTURAL CONCRETE C.Y. 411-00 REINFORCING STEEL

982 PIPE RAILING

### H-20 TRUCK

HS-20 TRUCK

### TYPE 3-3 (SPECIAL HAULING VEHICLE)

EV3 (TANDEM REAR AXLE EMERGENCY VEHICLE)

SHV NRL (SPECIAL HAULING VEHICLE NOTIONAL RATING LOAD)

ALL LOAD VEHICLES LISTED, EXCEPT HL-93 AND OKLAHOMA DEPARTMENT OF TRANSPORTATION OVERLOAD TRUCK, WERE ANALYZED USING LOAD FACTOR DESIGN (LFD).

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PIPE RAILING REQUIRED ON TOP OF HEADWALL AND WINGWALLS. SEE STD. RCB-015 PipeRailing.

PLACE WD AND ABD BARS FOR WINGWALLS AND APRON TIED TO BARREL REINFORCING BEFORE PLACING BARREL CONCRETE

SEE SCHEDULE ON THIS SHEET FOR ACTUAL NUMBER AND SPACING OF E1 AND E2 BARS.