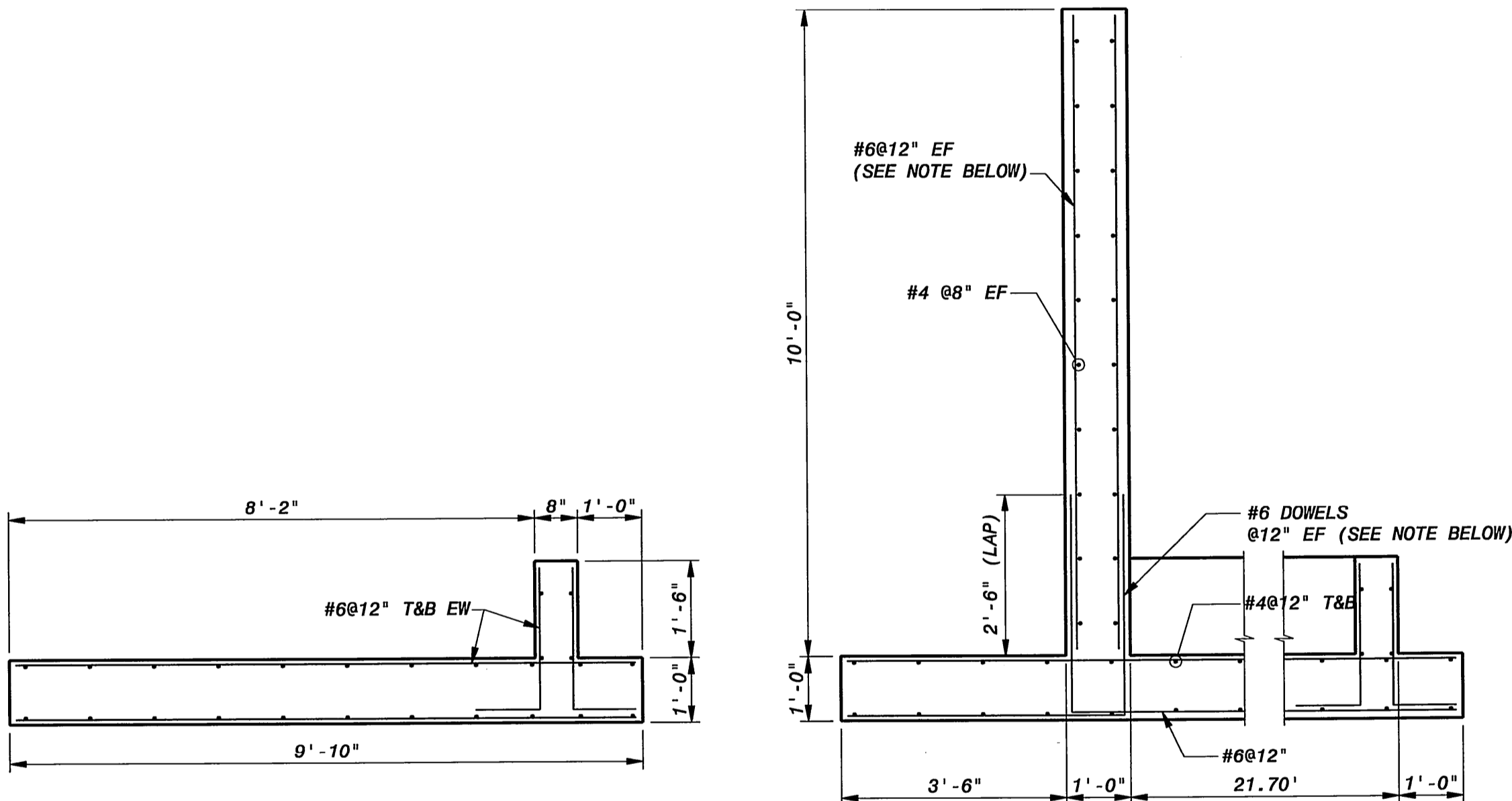


SECTION A
1/2" = 1'-0"



WING WALL 2
1/2" = 1'-0"

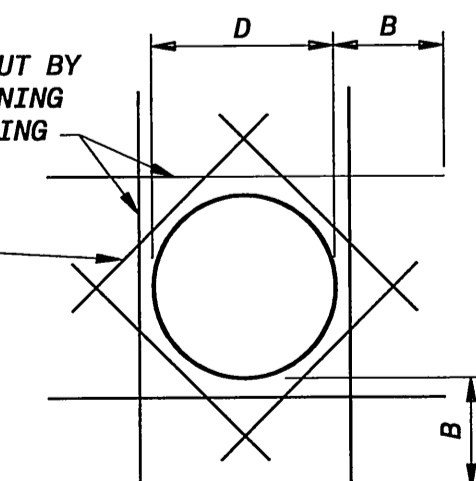
SILT WALL 1
1/2" = 1'-0"

EXTRA BARS EQUAL IN TOTAL AREA TO REGULAR REINFORCING CUT BY OPENING. PLACE ONE HALF TOTAL AREA TO EACH SIDE OF OPENING AND IN THE SAME TRANSVERSE POSITION AS REGULAR REINFORCING.

ONE EXTRA BAR EACH CORNER PER LAYER OF REGULAR REINFORCING (SEE TABLE BELOW). PLACE IN SAME TRANSVERSE POSITION AS REGULAR REINFORCING.

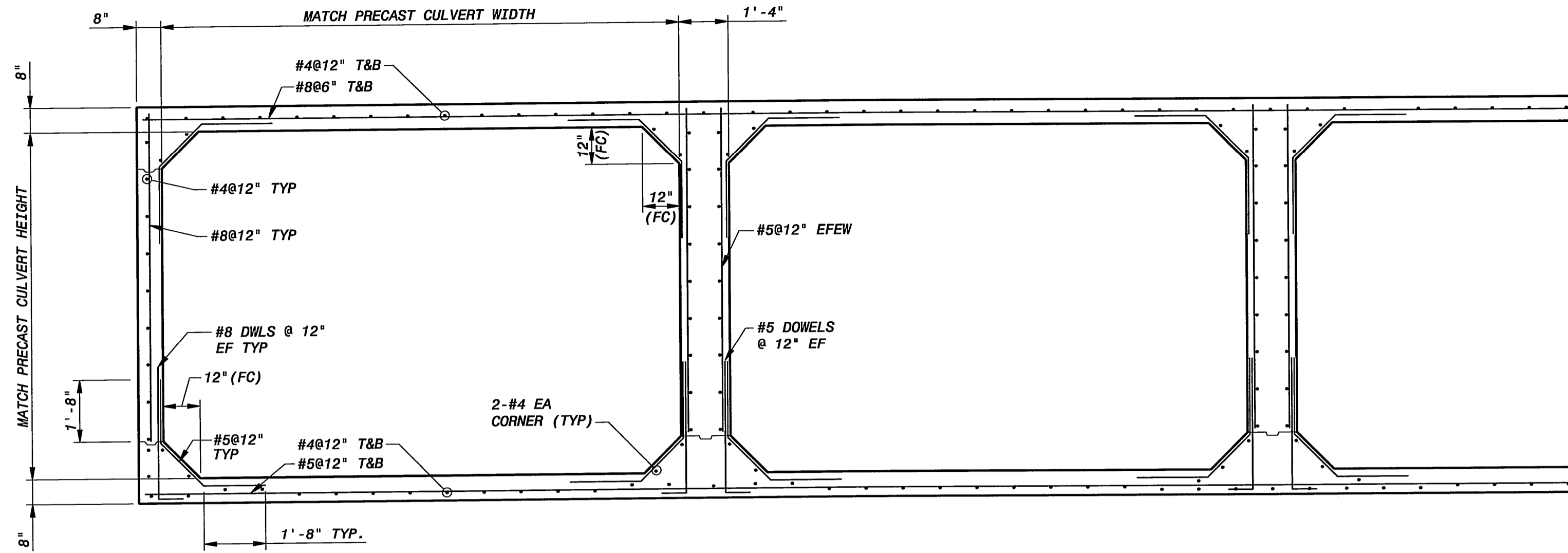
THICKNESS OF CONCRETE	BAR SIZE	BAR LENGTH
< 12"	4	D+12"
12" TO 18"	5	D+12"
> 18"	6	D+12"

B = THE REQUIRED LENGTH FOR LAPPED SPLICE FOR TOP BARS AS SHOWN ON THIS SHEET

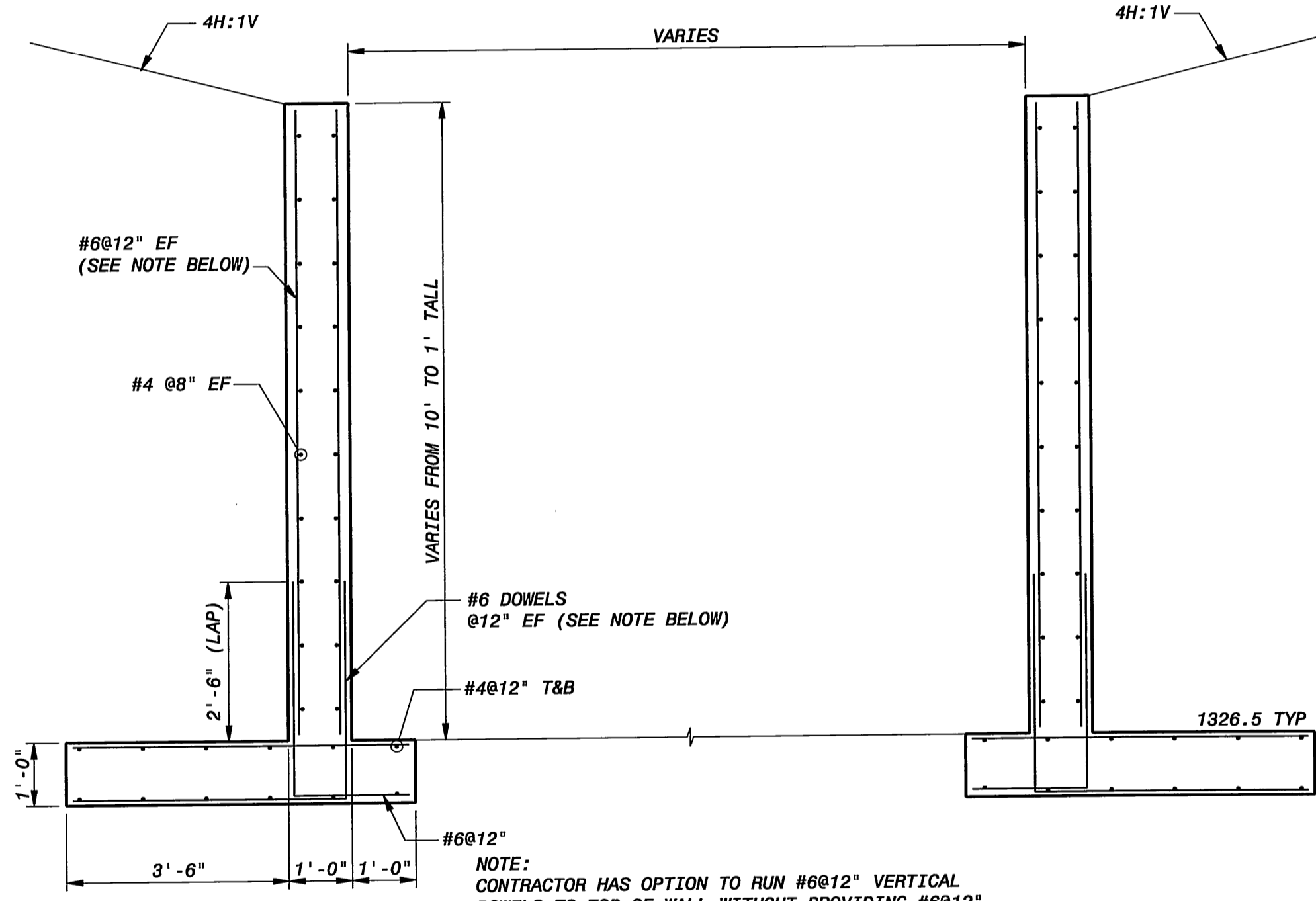


FOR CIRCULAR OPENINGS
21" < D <= 54"

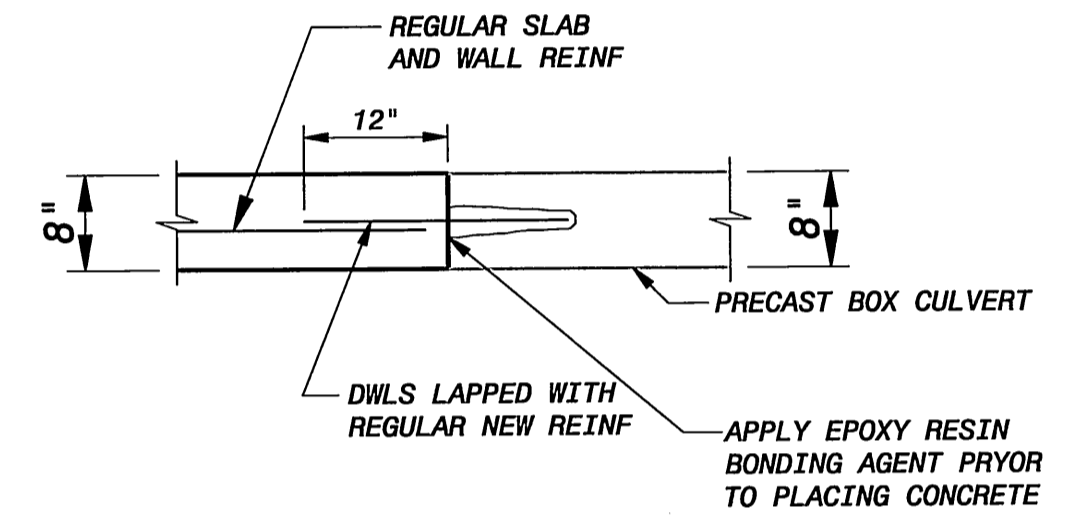
TYPICAL EXTRA REINFORCING AT OPENINGS



CAST IN PLACE CULVERT DETAIL
3/8" = 1'-0"

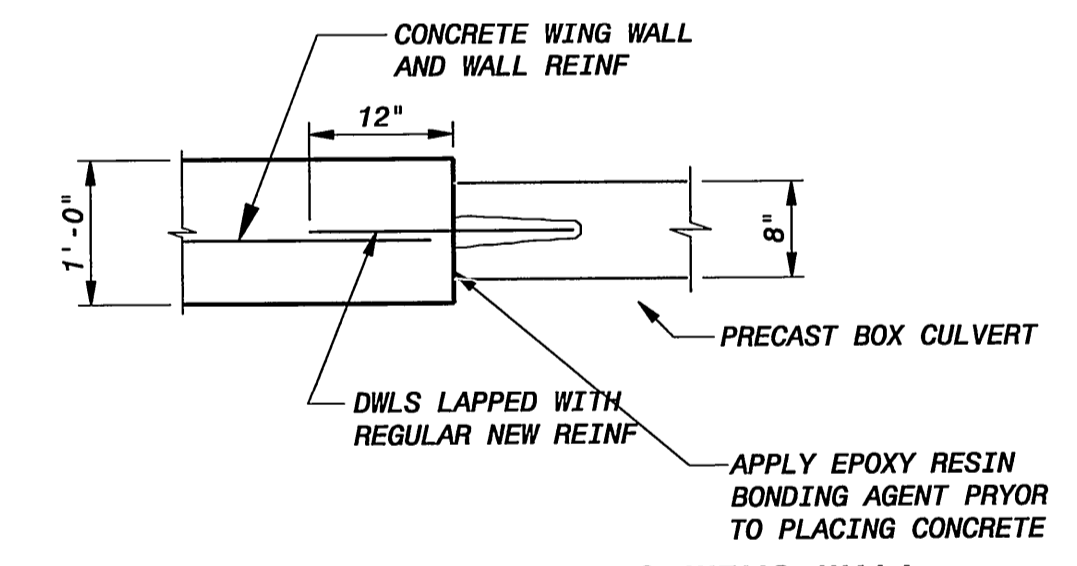


SECTION B
1/2" = 1'-0"



CAST-IN PLACE CULVERT TO PRECAST CULVERT

TYP DOWEL DETAIL A
3/4" = 1'-0"



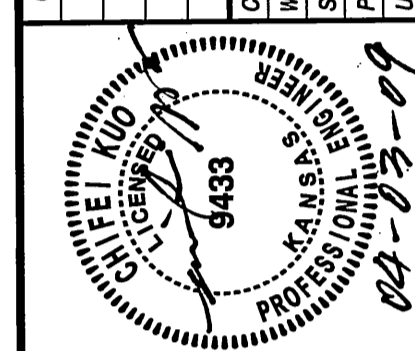
CAST-IN PLACE CULVERT TO WING WALL

TYP DOWEL DETAIL B
3/4" = 1'-0"

LENGTH OF LAPPED SPLICES FOR REINFORCEMENT (INCHES)					CONCRETE COVER FOR REINFORCEMENT	
(F'c=4000 PSI)					LOCATION	
BAR SIZE	BEAMS & COLUMNS		WALLS & SLABS		BAR SIZE	MINIMUM COVER
	*TOP BARS	OTHERS	*TOP BARS	OTHERS		
3	16	16	16	16	3	UNFORMED SURFACES ADJACENT TO EXCAVATION
4	20	16	20	16	4	SURFACES INSIDE OF OZONE CONTACTORS EXPOSED TO OZONE IN WATER OR AIR
5	26	20	29	22	5	FORMED OR TOP SURFACES EXPOSED TO WEATHER OR SATURATED AIR, SUBMERGED OR IN CONTACT WITH EARTH, INCLUDING STIRRUPS, TIES OR SPIRALS
6	37	29	29	23	6	OTHER LOCATIONS:
7	60	47	48	37	7	BARS IN BEAMS OR GIRDERS, INCLUDING STIRRUPS AND COLUMN SPIRALS OR TIES
8	70	54	60	47	8	SLABS, WALLS AND JOISTS
9	80	62	74	57	9	#6 AND LARGER
10	92	70	91	70	10	#5 AND SMALLER
11	103	79	109	84	11	

* TOP BARS ARE HORIZONTAL BARS SO PLACED THAT MORE THAN 12" OF CONCRETE IS CAST IN THE MEMBER BELOW THE BAR. HORIZONTAL BARS IN WALLS ARE TO BE PROVIDED WITH LAP LENGTHS AS REQUIRED FOR TOP BARS. VERTICAL BARS MAY BE CONSIDERED AS OTHER BARS

NO.	DATE	BY	CHK	APP
4	DEC			
3	DEC			
2	DEC			
1	DEC			



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Black & Veatch Corporation
Kansas City, Missouri

DRY CREEK CHANNEL IMPROVEMENTS
WICHITA, KANSAS
LINCOLN TO ORME
STRUCTURAL
DETAILS

DESIGNED: HW,CK
DETAILED: DEC
CHECKED: AKS
APPROVED:
DATE: 03 APR 2009

PROJECT NO.
143234
032
SHEET
32 OF 42