

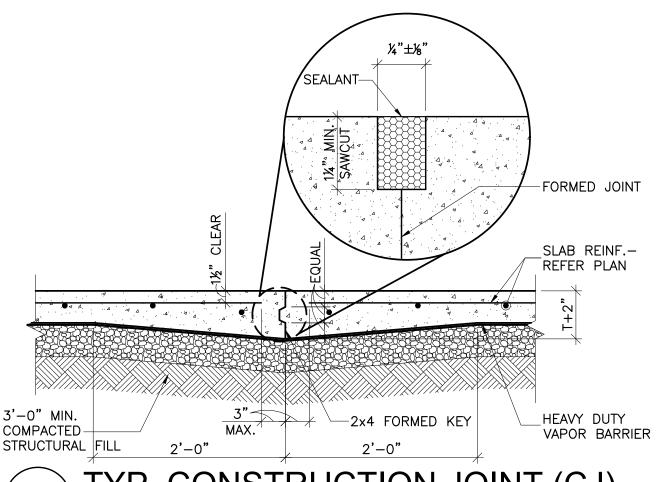
- FOOTING

TYPICAL FOOTING ADDITIONAL REINFORCING MATCHING CONTINUOUS REINF. FOOTING REINF. ♠ PENETRATION ADDITIONAL WIDER **STIRRUPS**

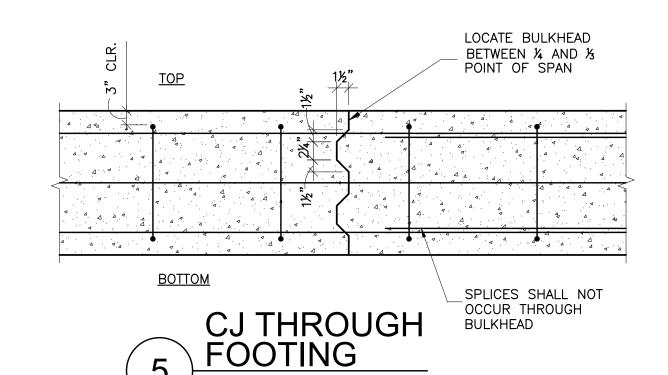
PLAN SECTION AT TYPICAL VERTICAL PENETRATION

TYP. FOOTING STIRRUP #5 EA. FACE **ADDITIONAL** DISCONTINUE FOOTING STIRRUP AT REINF. TO ALLOW PENETRATION AT PENETRATION IF NECESSARY ½ TYP. SPACING FOOTING REINF. PROVIDE SEALANT AT PENETRATION

FOOTING PENETRATION



TYP. CONSTRUCTION JOINT (CJ)



- SEALANT SLAB REINF. REFER PLAN SLAB REINF-#4x32" AT REFER PLAN 32" O.C. HEAVY DUTY AGGREGATE_ VAPOR BARRIER COMPACTED

TYP. SAWED JOINT (SJ)

STANDARD 90° OR 180° HOOK -STEP IN SLAB SIAB BY SIAB BY SIAB BY SIAB BY 1'-0" 3'-0" MIN.

½ PENETRATION

BENT BOTTOM BAR TO MATCH SIZE AND SPACING OF TYPICAL

FOOTING REINFORCING

TYP. FOOTING PENETRATION

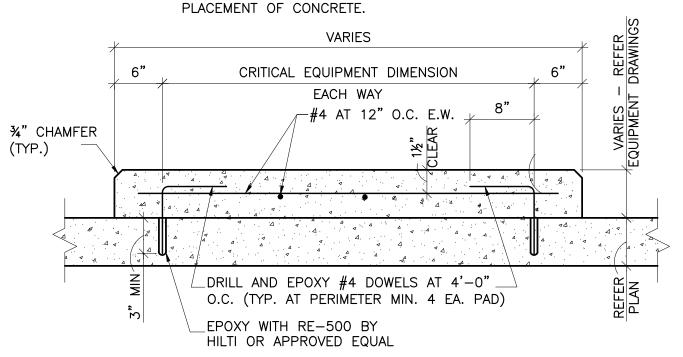
COMPACTED

STRUCTURAL FILL

CLASS B LAP

HEAVY DUTY

VAPOR BARRIER TYP. SLAB STEP SCALE: NONE



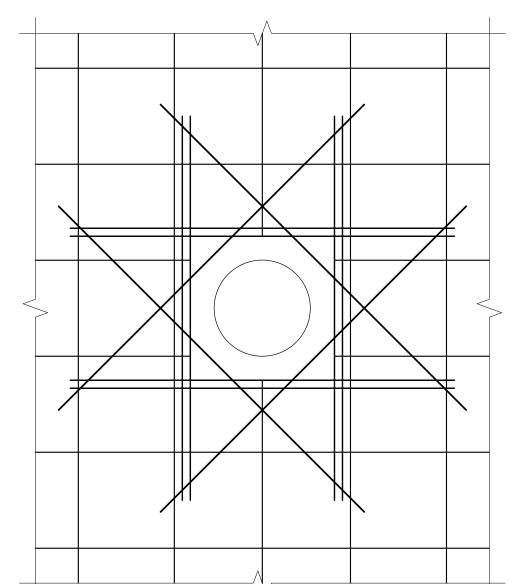
NOTES:
1. COORDINATE ANCHOR BOLT REQUIREMENTS FOR EQUIPMENT

2. ALLOW PROPER CURE TIME OF EPOXY PRIOR TO

TYP. HOUSEKEEPING PAD SCALE: NONE

CONCRETE EXPOSURE	MEMBER	REINFORCEMENTS	SPECIFIED COVER, IN.
CAST AGAINST AND PERMANENTLY IN CONTACT WITH GROUND	ALL	ALL	3
EXPOSED TO WEATHER OR IN CONTACT WITH GROUND	Al I.	NO. 6 THROUGH NO. 18 BAR	2
	ALL	NO. 5 BAR, W31 OR D31 WIRE, AND SMALLER	1-1/2
NOT EXPOSED TO WEATHER OR IN CONTACT WITH GROUND		NO. 14 AND NO. 18 AND SMALLER	1-1/2
	SLAB,JOISTS, AND WALLS	NO. 11 BAR AND SMALLER	3/4
	BEAMS, COLUMNS, PEDESTALS, AND TENSION TIES	PRIMARY REINFORCEMENT, STIRRUPS, TIES, SPIRALS, AND HOOPS	1-1/2

TYP. MIN. CONCRETE COVER



REINF. BARS SPACED LESS THAN 12" O.C. TO BE SPREAD WITHOUT INTERRUPTION TO CLEAR PENETRATIONS LESS THAN 12" DIAM. SIZE OF DIAGONAL AND EXTRA PARALLEL BARS TO EQUAL SIZE OF TYPICAL SLAB OR WALL REINFORCING BARS. SEE DESIGN DRAWINGS FOR DIAMETER AND LOCATION OF PENETRATIONS NUMBER OF EXTRA PARALLEL BARS PLACED EACH WAY AROUND PENETRATION TO BE EQUAL TO NUMBER OF BARS INTERRUPTED. (TYPICAL FOR EACH FACE OF SLAB OR WALL). MINIMUM OF ONE BAR EACH WAY, EACH FACE OF SLAB OR WALL FOR PENETRATIONS LESS THAN 12"Ø, PROVIDE 4-#4x4'-0" DIAGONAL

TYP. PENETRATION THRU CONC. SLAB OR WALL

TENSION DEVELOPMENT AND LAP-SPLICE LENGTHS FOR UNCOATED REINFORCING BARS

		LAP LENGTH (IN.) PER SPACING AND COVER CASE						
		f'c=3500 psi (NORMAL WEIGHT)						
		TOP BARS		OTHER BARS				
BAR SIZE	LAP CLASS	CASE 1	CASE 2	CASE 1	CASE 2			
#3	A	22	32	17	25			
	В	28	42	22	32			
#4	A	29	43	22	33			
	В	37	56	29	43			
#5	Α	36	54	28	41			
	В	47	70	36	54			
#6	Α	43	64	33	50			
	В	56	84	43	64			
#7	Α	63	94	48	72			
	В	81	122	63	94			
#8	Α	72	107	55	82			
	В	93	139	72	107			
#9	Α	81	121	62	93			
	В	105	157	81	121			
#10	A	91	136	70	105			
	В	118	177	91	136			
#11	А	101	151	78	116			
	В	131	196	101	151			
#14	N/A	121	181	93	139			
#18	N/A	161	241	124	186			

TENSION DEVELOPMENT AND LAP-SPLICE LENGTHS FOR UNCOATED REINFORCING BARS

		LENGTHS (IN.) PER CONCRETE STRENGTH					
		f'c=4000 psi (NORMAL WEIGHT)					
		TOP BARS		OTHER BARS			
BAR SIZE	LAP CLASS	CASE 1	CASE 2	CASE 1	CASE 2		
#3	Α	19	28	15	22		
	В	24	36	19	28		
#4	Α	25	37	19	29		
	В	32	48	25	37		
#5	А	31	47	24	36		
	В	40	60	31	47		
#6	Α	37	56	29	43		
	В	48	72	37	56		
# 7	Α	54	81	42	63		
	В	70	106	54	81		
#8	A	62	93	48	71		
	В	80	121	62	93		
#9	A	70	105	54	81		
	В	91	136	70	105		
#10	A	79	118	61	91		
	В	102	153	79	118		
#11	А	87	131	67	101		
	В	113	170	87	131		
#14	N/A	105	157	81	121		
#18	N/A	139	209	107	161		

REINFORCING LAP LENGTHS

NOTES: 1 in.=25.4 mm. 1. TABULATED VALUES ARE BASED ON GRADE 60 REINFORCING BARS AND NORMAL WEIGHT CONCRETE.

2. TENSION DEVELOPMENT LENGTHS AND TENSION LAP-SPLICE LENGTHS ARE CALCULATED PER ACI 318, SECTIONS 25.4 AND 25.5, RESPECTIVELY. TABULATED VALUES FOR BEAMS OR COLUMNS ARE BASED ON TRANSVERSE REINFORCEMENT AND CONCRETE COVER MEETING MINIMUM CODE REQUIREMENTS.

3. CASES 1 AND 2, WHICH DEPEND ON THE TYPE OF STRUCTURAL ELEMENT, CONCRETE COVER, AND CENTER-TO-CENTER SPACING OF THE BARS, ARE DEFINED AS: BEAMS OR COLUMNS: CASE 1-COVER AT LEAST 1.0db AND CENTER-TO-CENTER SPACING AT LEAST 2.0db AND CASE 2-COVER LESS THAN 1.0db OR CENTER-TO-CENTER SPACING LESS THAN 2.0db. ALL OTHERS: CASE 1-COVER AT LEAST 1.0db AND CENTER-TO-CENTER SPACING AT LEAST 3.0db. CASE 2-COVER LESS THAN 1.0db OR CENTER-TO-CENTER SPACING LESS THAN 3.0db.

4. LAP SPLICE LENGTHS ARE MULTIPLES OF TENSION DEVELOPMENT LENGTHS; CLASS A=1.01 AND CLASS $B=1.3I_d$ (ACI 318, SECTION 25.5.2).

5. ACI 318 DOES NOT ALLOW TENSION LAP SPLICES OF #14 OR #18 BARS. THE TABULATED VALUES FOR THOSE BAR SIZES ARE THE TENSION DEVELOPMENT LENGTHS. 6. TOP BARS ARE HORIZONTAL BARS WITH MORE THAN 12 in. OF CONCRETE CAST BELOW THE BARS. 7. FOR LIGHTWEIGHT-AGGREGATE CONCRETE, MULTIPLY THE TABULATED VALUES BY 1.3.

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KFC ENGINEERING

STRUCTURAL

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MARCH 2023

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