

LOCATE BULKHEAD

POINT OF SPAN

BETWEEN ¼ AND ⅓

SPLICES SHALL NOT

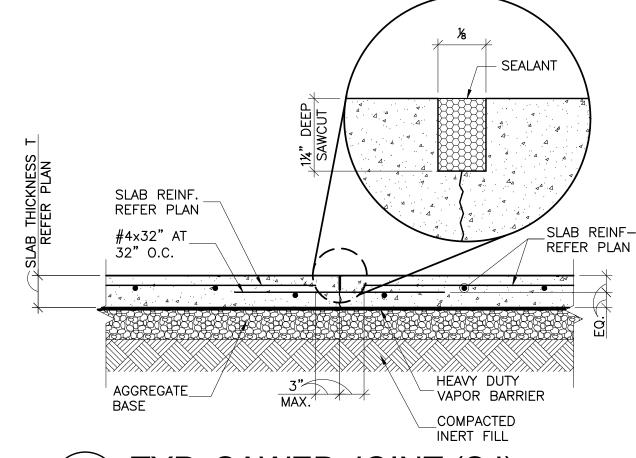
OCCUR THROUGH BULKHEAD

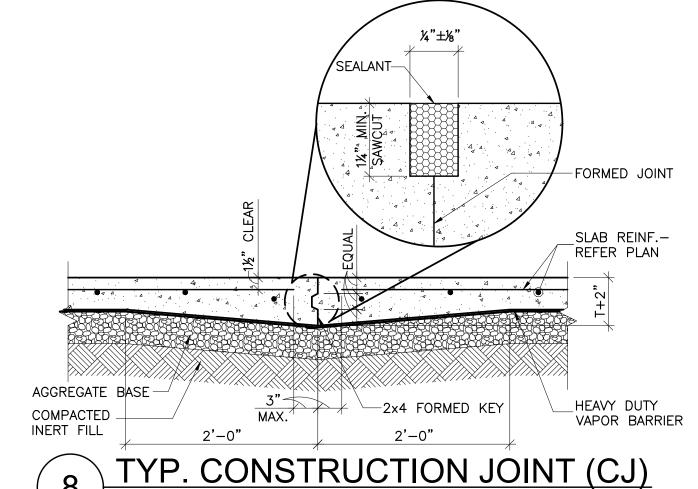
½ PENETRATION CLR. CLR. CLASS B LAP TYP. ADDITIONAL REINFORCING MATCHING CONTINUOUS TYPICAL FOOTING REINF FOOTING REINF. **©** PENETRATION ADDITIONAL WIDER

PLAN SECTION AT TYPICAL VERTICAL PENETRATION

TYP. FOOTING STIRRUP #5 EA. FACE **ADDITIONAL** DISCONTINUE AND OFFSET FOOTING REINF. OF EQ. SIZE STIRRUP AT PENETRATION AT TO ALLOW PENETRATION IF ½ TYP. SPACING PROVIDE SEALANT FOOTING REINF. AT PENETRATION CLASS B LAP CLASS B LAP

FOOTING PENETRATION





10" ELEMENT REQUIRING THICKENED SLAB SLAB REINF. 1'-3" HEAVY DUTY VAPOR AGGREGATE BARRIER -#4 AT 16" O.C. (3)-#5 CONT. COMPACTED INERT FILL TYP. THICKENED SLAB

TYP. SAWED JOINT (SJ)

TENSION DEVELOPMENT AND LAP-SPLICE

LENGTHS FOR UNCOATED REINFORCING BARS

TENSION DEVELOPMENT AND LAP-SPLICE LENGTHS FOR UNCOATED REINFORCING BARS

		LENGTHS (IN.) PER CONCRETE STRENGTH						LENGTHS (IN.) PER CONCRETE STRENGTH			
		f'c	=3500 psi (N	NORMAL WEIGH	L WEIGHT)			f'c=4000 psi (NORMAL WEIGHT)			
		TOP	BARS	OTHER	BARS			TOP	BARS	OTHER	BARS
AR SIZE	LAP CLASS	CASE 1	CASE 2	CASE 1	CASE 2	BAR SIZE	LAP CLASS	CASE 1	CASE 2	CASE 1	CASE 2
#3	Α	20	30	16	23	#3	Α	19	28	15	22
#3	В	26	39	20	30	#5	В	24	36	19	28
#4	Α	27	40	21	31	#4	Α	25	37	19	29
#4	В	35	52	27	40	#** 	В	32	48	25	37
# 5	Α	33	50	26	39	#5	Α	31	47	24	36
# ⁵	В	43	65	33	50		В	40	60	31	47
#6	Α	40	60	31	46	#6	Α	37	56	29	43
#0	В	52	78	40	60		В	48	72	37	56
# 7	Α	58	87	45	67	#7	Α	54	81	42	63
# ′	В	75	113	58	87		В	70	106	54	81
#8	Α	66	99	51	77	#8	Α	62	93	48	71
#° [В	86	129	66	99	πο	В	80	121	62	93
#o	Α	75	112	58	86	#9	А	70	105	54	81
#9	В	97	145	75	112		В	91	136	70	105
#10	Α	84	126	65	97	#10	А	79	118	61	91
#10	В	109	164	84	126		В	102	153	79	118
#11	Α	93	140	72	108	#11	#11 A 87 131	67	101		
#11	В	121	182	93	140	#''	В	113	170	87	131
#14	N/A	112	168	86	129	#14	N/A	105	157	81	121
#18	N/A	149	224	115	172	#18	N/A	139	209	107	161

1. TABULATED VALUES ARE BASED ON GRADE 60 REINFORCING BARS AND NORMAL WEIGHT CONCRETE. LENGTHS ARE IN

- 2. TENSION DEVELOPMENT LENGTHS AND TENSION LAP-SPLICE LENGTHS ARE CALCULATED PER ACI 318, SECTIONS 25.4.2.2 AND 25.5.2.1, 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 1.00 OR CENTER-TO-CENTER SPACING LESS THAN 3.00.
- 4. LAP SPLICE LENGTHS ARE MULTIPLES OF TENSION DEVELOPMENT LENGTHS; CLASS A=1.014 AND CLASS B=1.314 (ACI 318, SECTION 25.5.2.1).
- 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.

REINFORCING LAP LENGTHS



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KFC ENGINEERING

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MECHANICAL / ELECTRICAL



SEPTEMBER 2021

MOORE PUBLIC SCHOOLS **BOARD OF EDUCATION** MOORE, OKLAHOMA



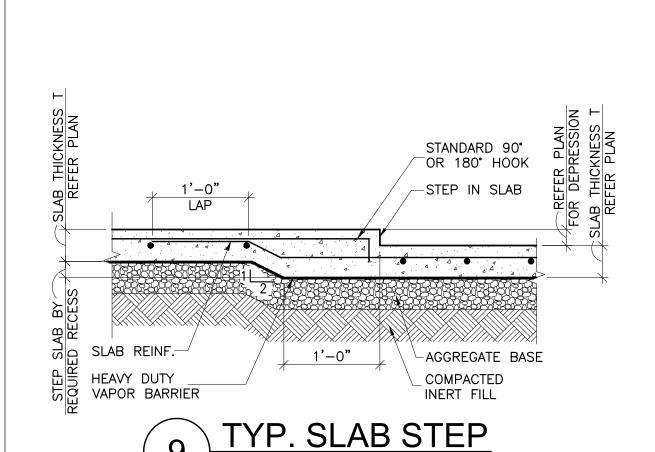
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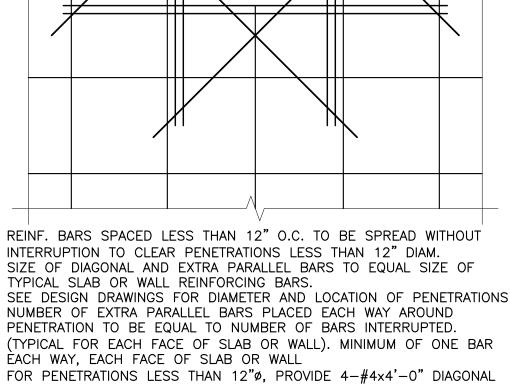
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CJ THROUGH FOOTING

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	ALL	NO. 6 THROUGH NO. 18 BAR	2
GROUND	ALL	NO. 5 BAR, W31 OR D31 WIRE, AND SMALLER	1-1/2
		NO. 14 AND NO. 18 AND SMALLER	1-1/2
NOT EXPOSED TO WEATHER OR IN CONTACT WITH GROUND	SLAB, JOISTS, AND WALLS	NO. 11 BAR AND SMALLER	3/4
CONTACT WITH GROOM	BEAMS, COLUMNS, PEDESTALS, AND TENSION TIES	PRIMARY REINFORCEMENT, STIRRUPS, TIES, SPIRALS, AND HOOPS	1-1/2

TYP. MIN. **CONCRETE COVER** SCALE: NONE



BARS EACH FACE. TYP. PENETRATION THRU CONC. SLAB OR WALL