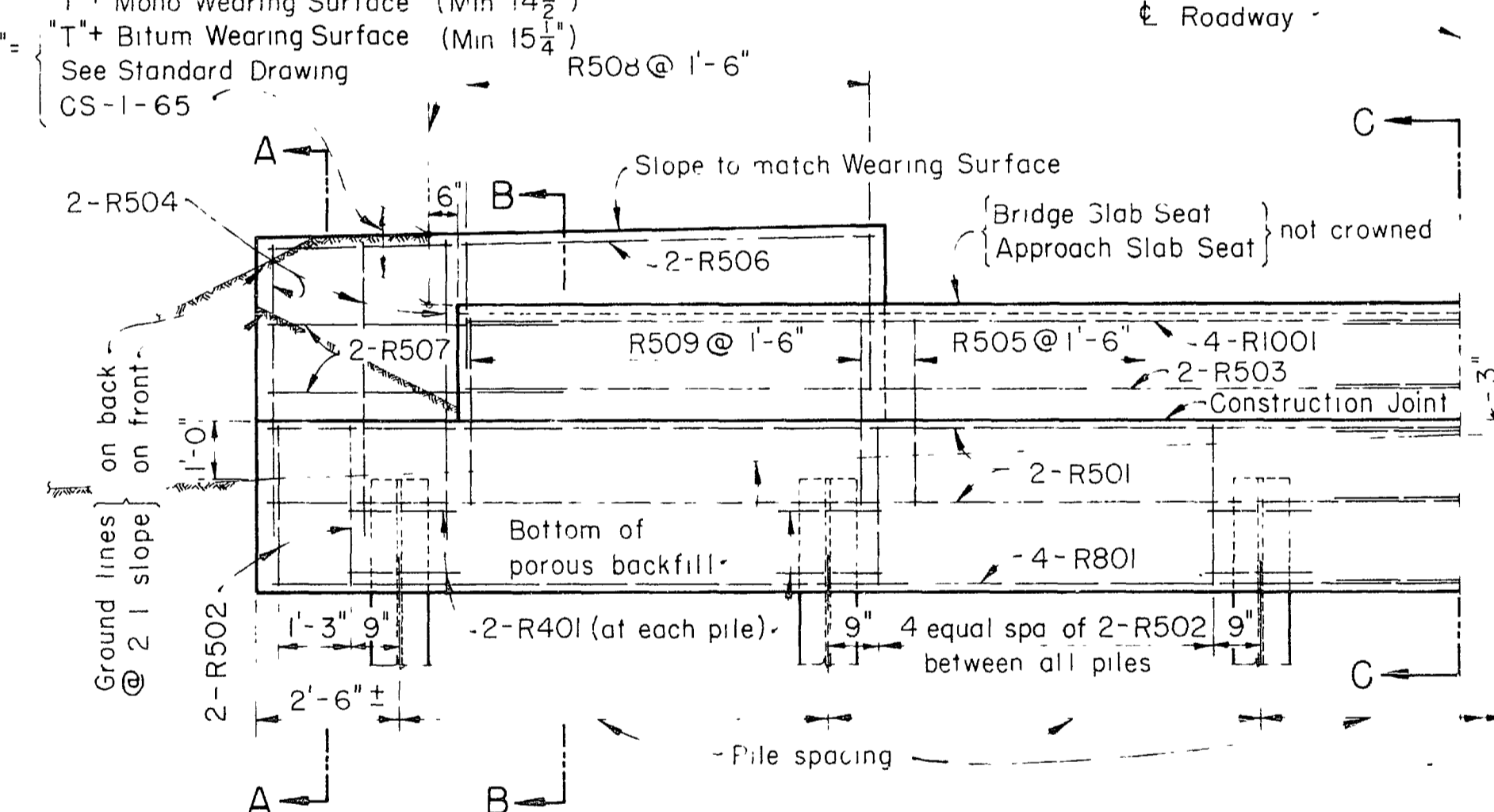
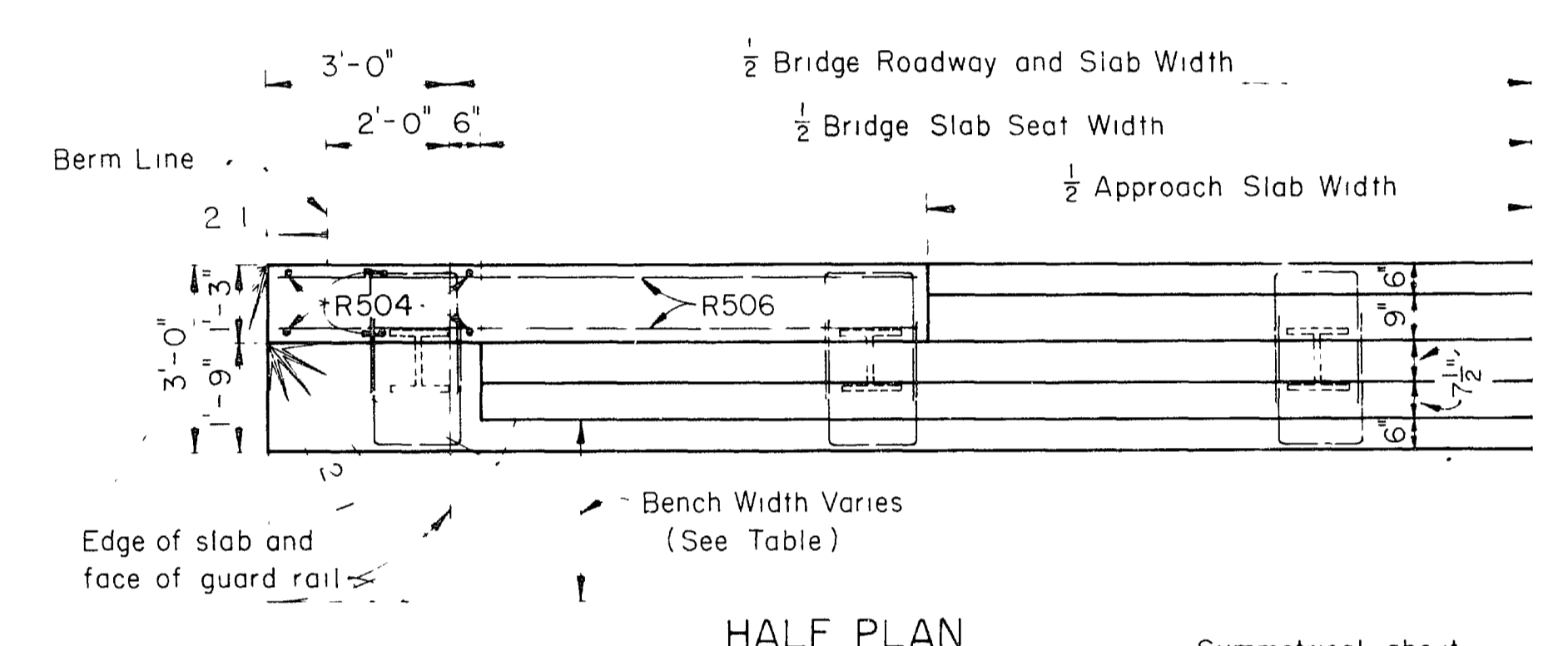
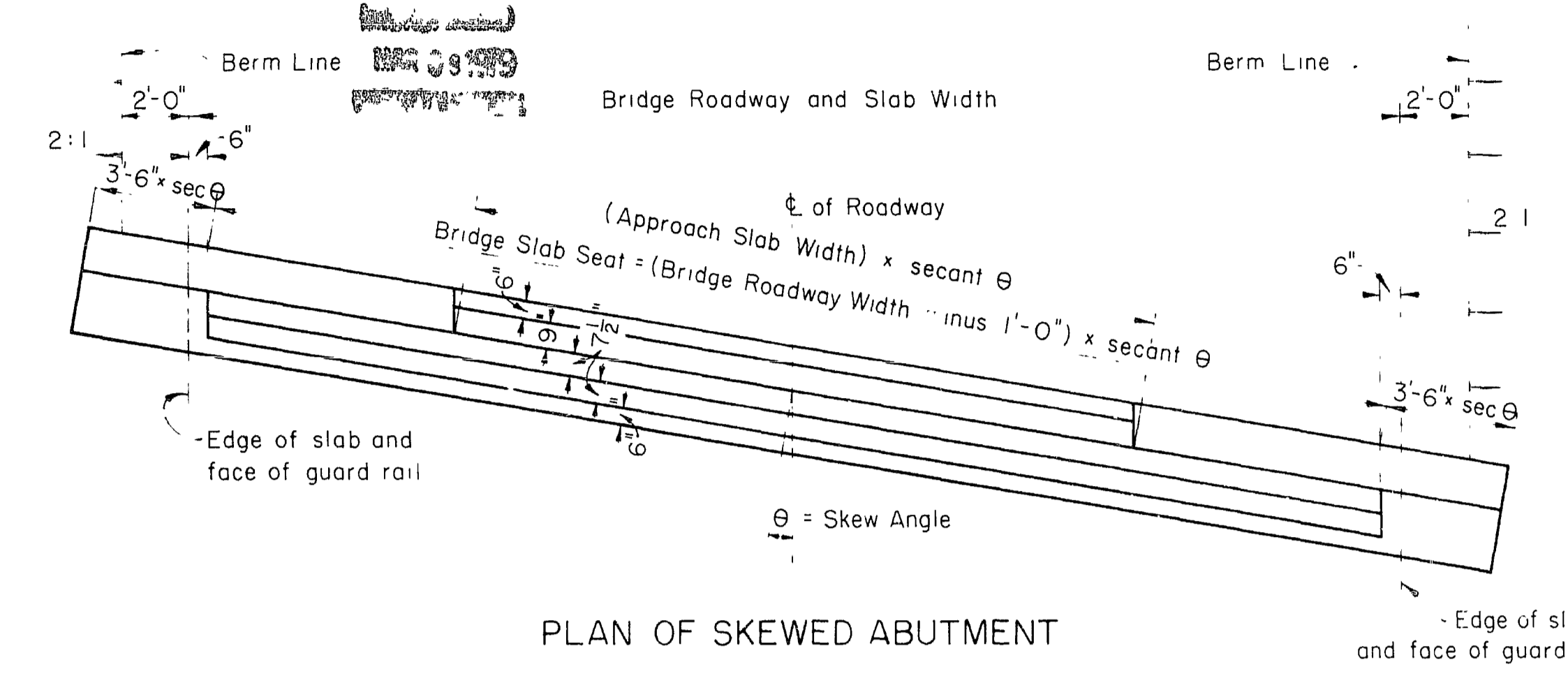


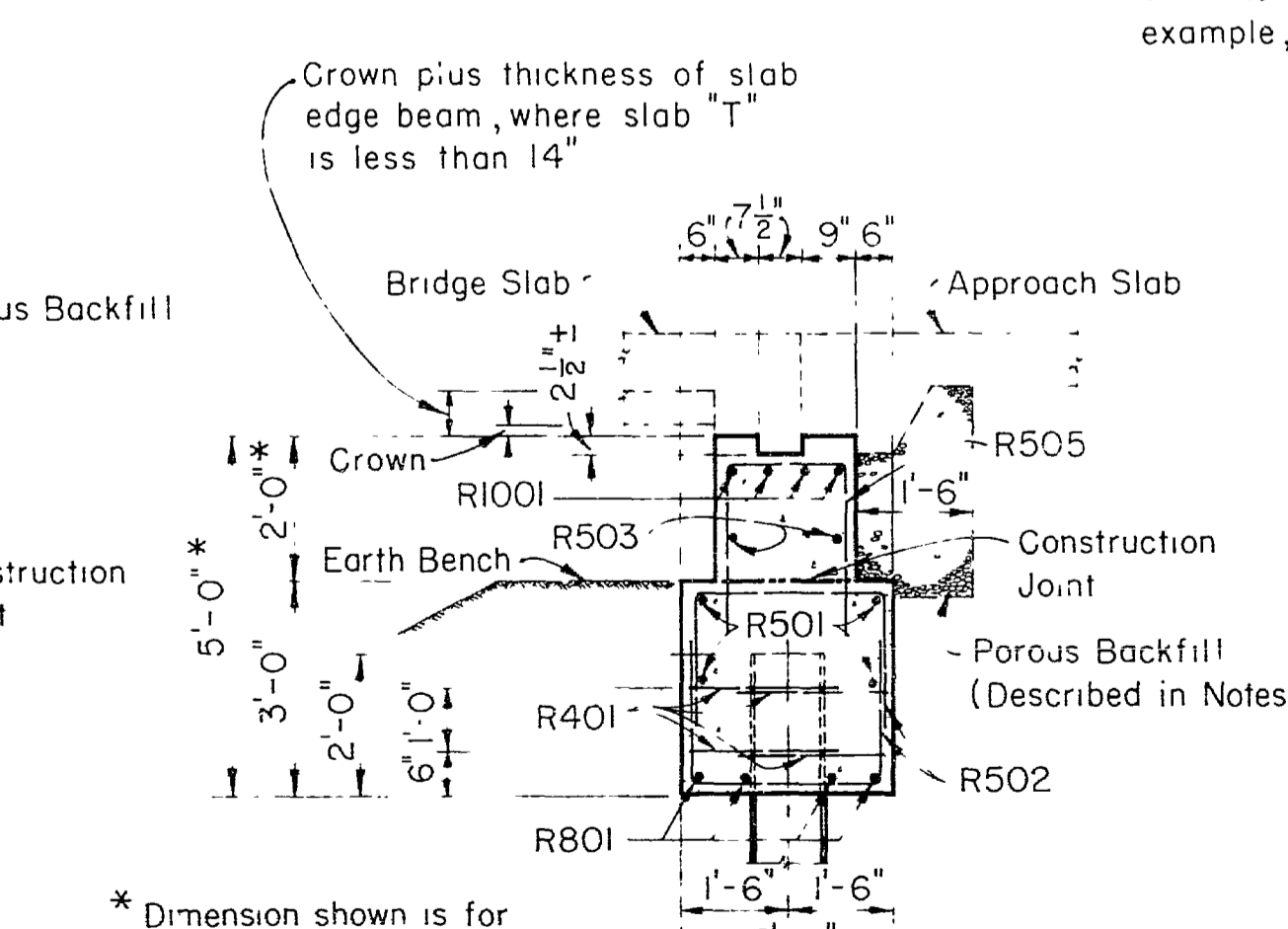
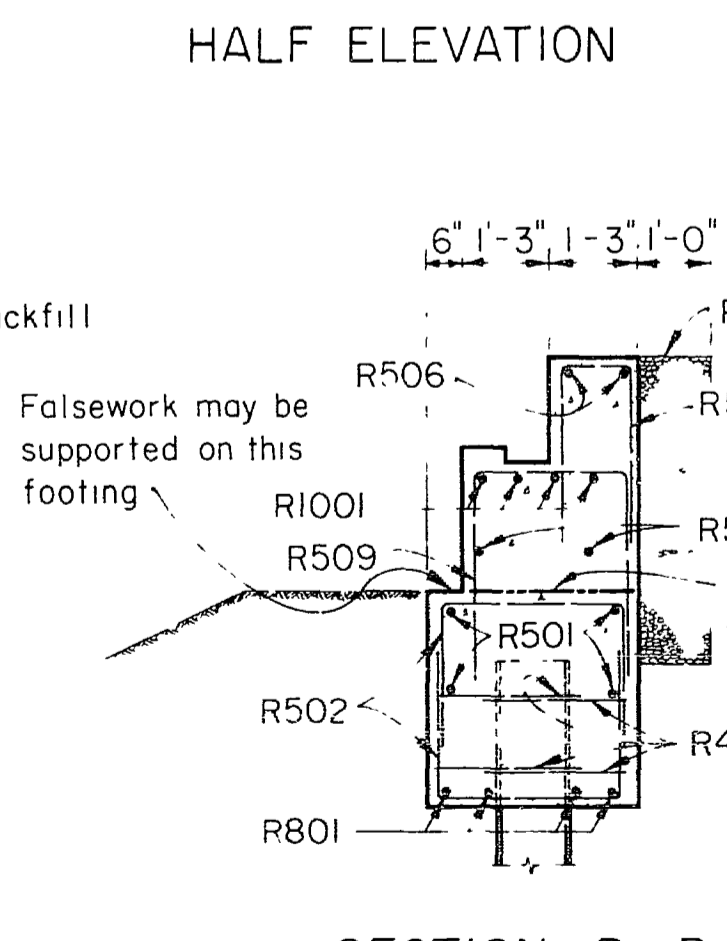
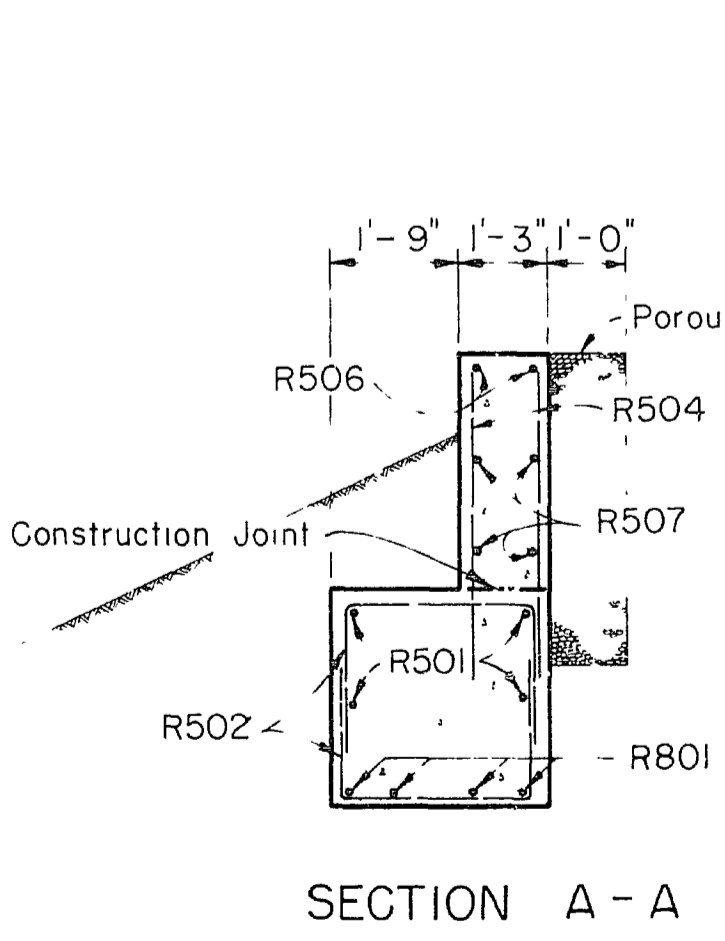
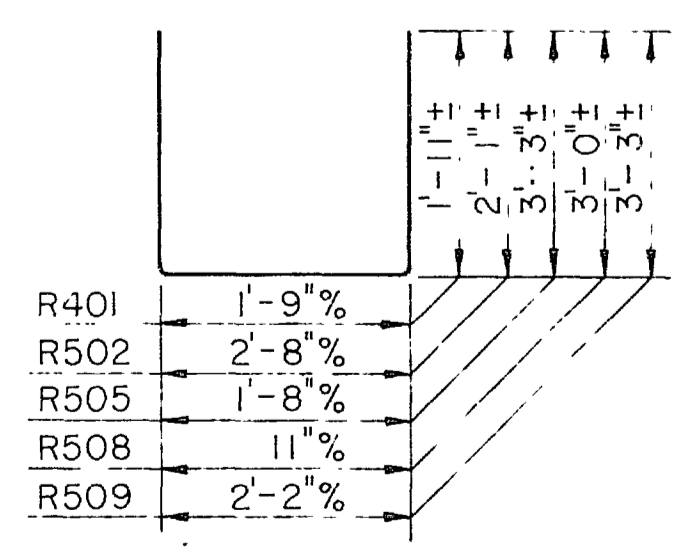
LOAD FREQUENCY	NUMBER, SPACING, AND DESIGN LOAD (IN TONS) OF PILES FOR ONE NON-SKEWED ABUTMENT								CONCRETE AND REINFORCING STEEL IN TWO NON-SKEWED ABUTMENTS															
	24' R'dwy		28' R'dwy		32' R'dwy		36' R'dwy		40' R'dwy		44' R'dwy		24' R'dwy		28' R'dwy		32' R'dwy		36' R'dwy		40' R'dwy		44' R'dwy	
	5 Piles @ 6'-3"	6 Piles @ 5'-10"	6 Piles @ 6'-7"	7 Piles @ 6'-2"	7 Piles @ 5'-10"	8 Piles @ 6'-10"	8 Piles @ 6'-5"	Reinf. Steel Lbs	Concrete Volume Cu Yds	Reinf. Steel Lbs	Concrete Volume Cu Yds	Reinf. Steel Lbs	Concrete Volume Cu Yds	Reinf. Steel Lbs	Concrete Volume Cu Yds	Reinf. Steel Lbs	Concrete Volume Cu Yds	Reinf. Steel Lbs	Concrete Volume Cu Yds	Reinf. Steel Lbs	Concrete Volume Cu Yds	Reinf. Steel Lbs	Concrete Volume Cu Yds	
CF = 30	16'-20" - 16'	19	17	19	18	20	19	20	20	21	20	21	29	32	32	37	41	45	49	49	49	49	49	49
	18'-22 1/2" - 18'	19	18	20	19	21	20	21	21	22	21	22	29	32	32	37	41	45	49	49	49	49	49	49
	20'-25" - 20'	20	19	21	20	22	21	22	22	23	22	23	29	33	33	37	41	45	49	49	49	49	49	49
	22'-27 1/2" - 22'	21	20	22	21	23	22	23	23	24	23	24	29	33	33	37	41	45	49	49	49	49	49	49
	24'-30" - 24'	22	21	23	22	24	23	24	24	25	24	25	29	33	33	37	41	45	49	49	49	49	49	49
CF = 130	16'-20" - 16'	19	17	19	18	20	19	20	19	20	19	20	29	32	32	37	41	45	49	49	49	49	49	49
	18'-22 1/2" - 18'	19	18	20	19	21	20	21	21	22	21	22	29	32	32	37	41	45	49	49	49	49	49	49
	20'-25" - 20'	20	19	21	20	22	21	22	22	23	22	23	29	33	33	37	41	45	49	49	49	49	49	49
	22'-27 1/2" - 22'	21	20	22	21	23	22	23	23	24	23	24	29	33	33	37	41	45	49	49	49	49	49	49
	24'-30" - 24'	22	21	23	22	24	23	24	24	25	24	25	29	33	33	37	41	45	49	49	49	49	49	49
CF = 400	16'-20" - 16'	19	18	20	19	21	20	21	21	22	21	22	29	32	32	37	41	45	49	49	49	49	49	49
	18'-22 1/2" - 18'	20	19	21	20	22	21	22	22	23	22	23	29	32	32	37	41	45	49	49	49	49	49	49
	20'-25" - 20'	21	20	22	21	23	22	23	23	24	23	24	29	33	33	37	41	45	49	49	49	49	49	49
	22'-27 1/2" - 22'	22	21	23	22	24	23	24	24	25	24	25	29	33	33	37	41	45	49	49	49	49	49	49
	24'-30" - 24'	23	22	24	23	25	24	25	25	26	25	26	29	33	33	37	41	45	49	49	49	49	49	49
CF = 2000	16'-20" - 16'	19	18	20	19	21	20	21	21	22	21	22	29	32	32	37	41	45	49	49	49	49	49	49
	18'-22 1/2" - 18'	20	19	21	20	22	21	22	22	23	22	23	29	32	32	37	41	45	49	49	49	49	49	49
	20'-25" - 20'	21	20	22	21	23	22	23	23	24	23	24	29	33	33	37	41	45	49	49	49	49	49	49
	22'-27 1/2" - 22'	22	21	23	22	24	23	24	24	25	24	25	29	33	33	37	41	45	49	49	49	49	49	49
	24'-30" - 24'	23	22	24	23	25	24	25	25	26	25	26	29	33	33	37	41	45	49	49	49	49	49	49



"A"	BENCH WIDTH
14 1/2" thru 16"	3'-0"
16 1/4" thru 17 1/2"	3'-3"
17 3/4" thru 19"	3'-6"
19 3/4" thru 20 1/2"	3'-9"
20 3/4" thru 22"	4'-0"
22 1/4" thru 23 1/2"	4'-3"
23 3/4" thru 24 3/4"	4'-6"

BRIDGE ROADWAY WIDTH	REINFORCING STEEL FOR TWO NON-SKEWED ABUTMENTS											
	R1001 Straight 16 Reqd	R801 Straight 16 Reqd	R501 Straight 16 Reqd	R502 Bent 6'-7" Long	R503 Straight 8 Long	R504 Straight 5'-4" Long	R505 Bent 7'-11" Long	R506 Straight 8 Reqd	R507 Straight 16 Reqd	R508 Bent 6'-8" Long	R509 Bent 8'-5" Long	R401 Bent 5'-5" Long
24'	12'-11"	16'-11"	15'-7"	96	12'-11"	24	+	+	4'-11"	+	+	40
28'	14'-11"	18'-11"	17'-7"	116	14'-11"	24	+	+	4'-11"	+	+	48
32'	16'-11"	20'-11"	19'-7"	116	16'-11"	24	+	+	4'-11"	+	+	48
36'	18'-11"	22'-11"	21'-7"	136	18'-11"	24	+	+	4'-11"	+	+	56
40'	20'-11"	24'-11"	23'-7"	136	20'-11"	24	+	+	4'-11"	+	+	56
44'	22'-11"	26'-11"	25'-7"	156	22'-11"	24	+	+	4'-11"	+	+	64

* See Notes for explanation of length or number.



* Dimension shown is for non-skewed and non-superelevated bridge

GENERAL: This drawing provides design and general construction details and is intended to be used with Standard Drawing CS-1-65. The project plans for each structure will show span lengths, roadway width, skew, elevations, type, size and required capacity of piles, estimated quantities, reinforcing steel list; and other necessary notes and details.

DESIGN SPECIFICATIONS: This standard drawing conforms to the "Design Specifications for Highway Structures" of the State of Ohio, Department of Highways, dated October 1, 1951, together with revisions dated July 15, 1952 and April 1, 1954.

EXPANSION: Where provision for expansion is required, this drawing should not be used.

PILE TYPE AND SIZE: The piles usually will be specified on the project plans as cast-in-place reinforced concrete or steel H. The type and size generally will be the same as for the pier piles if the piers are of the type shown on Standard Drawing P-1-54. If the type of pier is different from that shown on Standard Drawing P-1-54, the abutment piles, if of the steel H type, generally will be specified as I2BP53, or if of the cast-in-place concrete type, as 12" diameter if the sum of the spans is less than 100 feet, and as 14" diameter if more than 100 feet.

PILE SPACING: In case of skew, the number of piles shall be the same as shown but the tabulated spacing dimension shall be multiplied by the secant of theta (the angle of skew).

PILE CAPACITY shall be as specified on the project plans. The required capacity according to the formula in Sec. 507.05 of the Construction and Material Specifications, generally will be the same as the design load listed in the table, except for steel H piles that are to be driven to firm contact with rock or other hard material, in which case the required pile capacity generally will be greater than the design load and will be dependent upon the relative magnitude of the design load and size of hammer, and upon the kind and relative depth of the penetrated soil.

EARTH EMBANKMENT shall be placed up to the elevation of the earth bench, after which the excavation shall be made for the abutment and the piles driven.

CONCRETE shall be Class "E" and payment will be made on this basis, but Class "C" concrete may be used for any or all parts of the abutments.

REINFORCING STEEL: For a skewed abutment the tabulated length of the R1001, R801, R501, R503, R506 and R507 bars will be multiplied by the secant of theta (the angle of skew). The number of the R505, R508 and R509 bars and the length of the R506 bars will be determined for each individual bridge. The R1001, R801, R501 and R503 bars, at the option of the Contractor, may be furnished in two lengths as indicated hereon, with a 30-diameter lap, or as single bars of equal net length, except where such length would be greater than 52'-0"; and the determination of pay quantity shall be based on two lapped lengths unless otherwise called for on the project plans. The clearance from the face of the concrete to the reinforcing steel shall be 2".

POROUS BACKFILL shall extend upward to the approach slab and to the surface of the earth shoulders, and outward to the surface of the embankment slopes. Excavation therefor, in excess of that required for construction of the footing, shall be considered as paid for in the bid price per cu yd. paid for porous backfill.

EXCAVATION QUANTITY includes the removal of embankment material between the bottom of the abutment footing and the top of the earth bench.

CONCRETE QUANTITY: For skewed bridges the concrete quantity as tabulated will be multiplied by the secant of theta (the angle of skew).

BAR SIZE is indicated in the bar mark. The first digit where three digits are used and the first two digits where four are used, indicate the bar size number. For example, R801 is a No. 8 size bar and R1001 is a No. 10 size.

REVISIONS		STATE OF OHIO DEPARTMENT OF HIGHWAYS DIVISION OF DESIGN AND CONSTRUCTION BUREAU OF BRIDGES	
12-1-54		STANDARD	
11-8-65		CAPPED PILE ABUTMENTS FOR CONTINUOUS SLAB BRIDGES WITHOUT CURBS MIDDLE SPAN 20 FEET TO 55 FEET LOAD FREQUENCY CF = 30, CF = 130, CF = 400, CF = 2000	
APPROVED	DATE: 7-1-54	DESIGNED BY: [Signature]	DRAWING NUMBER
PREPARED BY: CEJ LJE RAG CFB JCM WHE	TRACED: CEJ	CHECKED: FHR	REVIEWED: GSD BFB BHA RLF BHO
			A-1-54