STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA.			

REINFORCING STEEL - BARRELS

BARREL DESIGN NO. 1 — FOR 1.5' TO 12.0 DEPTH OF FILL OVER BBL. INCL. PAVING

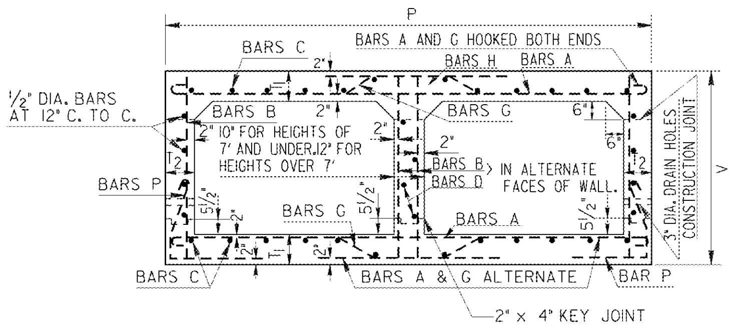
	CLEAR SPAN	CLEAR HEIGHT	"A" BARS SIZE	"A" BARS NO.	"A" BARS LENGTH	"A" BARS SPACE	"G" BARS SIZE	"G" BARS NO.	"G" BARS LENGTH	"G" BARS SPACE	"H" BARS SIZE	"H" BARS NO.	"H" BARS LENGTH	"H" BARS SPACE	"B" DIA. SIZE	"B" DIA. NO.	"B" DIA. LENGTH	"B" DIA. SPACE	"C" 1/2" DIA. NO.	"C" 1/2" DIA. LENGTH	"C" 1/2" DIA. SPACE	"D" 1/2" DIA. NO.	"D" 1/2" DIA. LENGTH	"D" 1/2" DIA. SPACE
DOUBLE	7'	4'	3/4" DIA.	2x ("L" IN INCHES / SPACING) + 2 BARS	16'-2"	15'	7/8" DIA.	2x ("L" IN INCHES / SPACING)	16'-5"	15"	7/8" DIA.	SAME AS "A" BARS	5'-0"	15"	1/2" DIA.	3x(L IN INCHES/SPACING) + 3 BARS	5'-2"	12"	32	1/2 AT "L" IN FT. + 5'-6" + 2'-0" FOR EACH LAP. 1/2 AT "L" IN FT. + 5'-7" + 2'-0" FOR EACH LAP.	12"	12	2/3 AT "L" IN FT. + 4'-6" + 2'-0" FOR EACH LAP. 1/3 AT "L" IN FT. + 1'-8" + 2'-0" FOR EACH LAP.	12"
		5'			16'-2"	15'			16'-5"	15"			5'-0"	15"			6'-2"	12"	32		12"	15		12"
		6'			16'-2"	15'			16'-5"	15"			5'-0"	15"	5/8" DIA.		7'-2"	12"	32		12"	18		12"
		7'			16'-2"	15'			16'-5"	15"			5'-0"	15"			8'-3"	10"	32		12"	21		12"
	8'	4'	5/8" DIA.		18'-2"	13"	7/8" DIA.		18'-6"	13"	7/8" DIA.		5'-6"	13"	1/2" DIA.		5'-4"	12"	36		12"	12		12"
		5'			18'-2"	13"			18'-6"	13"			5'-6"	13"			6'-4"	12"	36		12"	15		12"
		6'			18'-2"	13"			18'-6"	13"			5'-6"	13"	5/8" DIA.		7'-4"	12"	36		12"	18		12"
		7'			18'-2"	13"			18'-6"	13"			5'-6"	13"			8'-4"	10"	36		12"	21		12"
		8'			18'-8"	13"			19'-0"	13"			5'-6"	13"	3/4" DIA		9'-5"	12"	36		12"	24		12"
	9'	4'	5/8" DIA.		20'-2"	12"	7/8" DIA.		20'-6"	12"	7/8" DIA.		6'-0"	12"	1/2" DIA.		5'-6"	12"	40		12"	12		12"
		5'			20'-2"	12"			20'-6"	12"			6'-0"	12"			6'-6"	12"	40		12"	15		12"
		6'			20'-2"	12"			20'-6"	12"			6'-0"	12"	5/8" DIA.		7'-6"	12"	40		12"	18		12"
		7'			20'-2"	12"			20'-6"	12"			6'-0"	12"			8'-6"	10"	40		12"	21		12"
		8'			20'8"	12"			21'-0"	12"			6'-0"	12"	3/4" DIA.		9'-7"	12"	40		12"	24		12"
		9'			20'8"	12"			21'-0"	12"			6'-0"	12"			10'-7"	10"	40		12"	27		12"
		10'			20'8"				21'-0"	12"			6'-0"	12"			11'-7"	10"	40		12"	30		12"
TRIPLE	7'	4'	3/4" DIA.	2x ("L" IN INCHES / SPACING) + 2 BARS	24'-0"	15'	7/8" DIA.	2x ("L" IN INCHES / SPACING)	24'-6"	15"	7/8" DIA.	SAME AS "A" BARS	13'-0"	15"	1/2" DIA.	4x(L IN INCHES/SPACING) + 4 BARS	5'-2"	12"	48	1/2 AT "L" IN FT. + 5'-6" + 2'-0" FOR EACH LAP. 1/2 AT "L" IN FT. + 5'-7" + 2'-0" FOR EACH LAP.	12"	16	1/2 AT "L" IN FT. + 4'-6" + 2'-0" FOR EACH LAP. 1/2 AT "L" IN FT. + 1'-8" + 2'-0" FOR EACH LAP.	12"
		5'			24'-0"	15'			24'-6"	15"			13'-0"	15"			6'-2"	12"	48		12"	20		12"
		6'			24'-0"	15'			24'-6"	15"			13'-0"	15"	5/8" DIA.		7'-2"	12"	48		12"	24		12"
		7'			24'-0"	15'			24'-7"	15"			13'-0"	15"			8'-3"	10"	48		12"	28		12"
	8'	4'	5/8" DIA.		27'-0"	13"	7/8" DIA.		27'-7"	13"	7/8" DIA.		14'-6"	13"	1/2" DIA.		5'-4"	12"	54		12"	16		12"
		5'			27'-0"	13"			27'-7"	13"			14'-6"	13"			6'-4"	12"	54		12"	20		12"
		6'			27'-0"	13"			27'-7"	13"			14'-6"	13"	5/8" DIA.		7'-4"	12"	54		12"	24		12"
		7'			27'-0"	13"			27'-7"	13"			14'-6"	13"			8'-4"	10"	54		12"	28		12"
		8'			27'-8"	13"			28'-4"	13"			14'-6"	13"	3/4" DIA		9'-5"	12"	54		12"	32		12"
	9'	4'	5/8" DIA.		30'-0"	12"	7/8" DIA.		30'-7"	12"	7/8" DIA.		16'-0"	12"	1/2" DIA.		5'-6"	12"	60		12"	16		12"
		5'			30'-0"	12"			30'-7"	12"			16'-0"	12"			6'-6"	12"	60		12"	20		12"
		6'			30'-0"	12"			30'-7"	12"			16'-0"	12"	5/8" DIA.		7'-6"	12"	60		12"	24		12"
		7'			30'-0"	12"			30'-7"	12"			16'-0"	12"			8'-6"	10"	60		12"	28		12"
		8'			30'-8"	12"			31'-4"	12"			16'-0"	12"	3/4" DIA.		9'-7"	12"	60		12"	32		12"
		9'			30'-8"	12"			31'-4"	12"			16'-0"	12"			10'-7"	10"	60		12"	36		12"
		10'			30'-8"	12"			31'-4"	12"			16'-0"	12"			11'-7"	10"	60		12"	40		12"

BARREL DESIGN NO. 2 — FOR 12.1 TO 20.0 DEPTH OF FILL

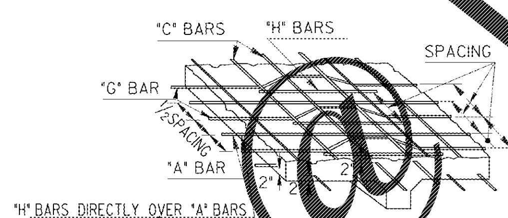
	CLEAR SPAN	CLEAR HEIGHT	"A" BARS SIZE	"A" BARS NO.	"A" BARS LENGTH	"A" BARS SPACE	"G" BARS SIZE	"G" BARS NO.	"G" BARS LENGTH	"G" BARS SPACE	"H" BARS SIZE	"H" BARS NO.	"H" BARS LENGTH	"H" BARS SPACE	B LENGTH	C LENGTH	"D" 1/2" DIA. NO.	"D" 1/2" DIA. LENGTH	"D" 1/2" DIA. SPACE
DOUBLE	7'	4'	5/8" DIA.	2x ("L" IN INCHES / SPACING) + 2 BARS	17'-10"	13"	3/4" DIA.	2x ("L" IN INCHES / SPACING)	18'-3"	13"	1" DIA.	SAME AS "A" BARS	5'-0"	13"	5'-6" (NUMBER, SIZE & SPACING SAME AS DESIGN I)	NUMBER, SIZE & SPACING SAME AS DESIGN I. 1/2 AT "L" IN FT. + 5'-10" + 2'-0" FOR EACH LAP. 1/2 AT "L" IN FT. + 5'-6" + 2'-0" FOR EACH LAP.	12	2/3 AT "L" IN FT. + 4'-6" + 2'-0" FOR EACH LAP. 1/3 AT "L" IN FT. + 1'-8" + 2'-0" FOR EACH LAP.	12
		5'			18'-2"	12"			18'-7"	12"			5'-0"	12"	6'-6"		15		12
		6'			18'-2"	12"			18'-7"	12"			5'-0"	12"	7'-6"		18		12
		7'			18'-6"	12"			18'-11"	12"			5'-0"	12"	8'-7"		21		12
	8'	4'	5/8" DIA.		19'-10"	13"	7/8" DIA.		20'-3"	13"	1" DIA.		5'-6"	13"	5'-8"		12		12
		5'			20'-2"	12"			20'-8"	12"			5'-6"	12"	6'-9"		15		12
		6'			20'-2"	12"			20'-8"	12"			5'-6"	12"	7'-9"		18		12
		7'			20'-6"	12"			21'-0"	12"			5'-6"	12"	8'-9"		21		12
		8'			20'-8"	11"			21'-2"	11"			5'-6"	11"	9'-9"		24		12
	9'	4'	5/8" DIA.		22'-2"	11"	7/8" DIA.		22'-9"	11"	1" DIA.		6'-0"	11"	5'-11"		12		12
		5'			22'-6"	11"			23'-1"	11"			6'-0"	11"	6'-11"		15		12
		6'			22'-6"	11"			23'-1"	11"			6'-0"	11"	7'-11"		18		12
		7'			22'10"	10"			23'-5"	10"			6'-0"	10"	9'-0"		21		12
		8'			23'-0"	10"			23'-7"	10"			6'-0"	10"	10'-0"		24		12
		9'			23'-2"	10"			23'-9"	10"			6'-0"	10"	11'-0"		27		12
		10'			23'-6"	10"			24'-1"	10"			6'-0"	10"	12'-1"		30		12
TRIPLE	7'	4'	5/8" DIA.	2x ("L" IN INCHES / SPACING) + 2 BARS	25'-8"	13"	3/4" DIA.	2x ("L" IN INCHES / SPACING)	26'-6"	13"	1" DIA.	SAME AS "A" BARS	13'-0"	13"	5'-6" (NUMBER, SIZE & SPACING SAME AS DESIGN I)	NUMBER, SIZE & SPACING SAME AS DESIGN I. 1/2 AT "L" IN FT. + 5'-10" + 2'-0" FOR EACH LAP. 1/2 AT "L" IN FT. + 5'-6" + 2'-0" FOR EACH LAP.	16	1/2 AT "L" IN FT. + 4'-6" + 2'-0" FOR EACH LAP. 1/2 AT "L" IN FT. + 1'-8" + 2'-0" FOR EACH LAP.	12
		5'			26'-0"	12"			26'-10"	12"			13'-0"	12"	6'-6"		20		12
		6'			26'-0"	12"			26'-10"	12"			13'-0"	12"	7'-6"		24		12
		7'			26'-4"	12"			27'-3"	12"			13'-0"	12"	8'-7"		28		12
	8'	4'	5/8" DIA.		28'-8"	13"	7/8" DIA.		29'-7"	13"	1" DIA.		14'-6"	13"	5'-8"		[illegible]		[illegible]
		5'			29'-0"	12"			29'-11"	12"			14'-6"	12"	6'-9"		20		12
		6'			29'-0"	12"			29'-11"	12"			14'-6"	12"	7'-9"		24		12
		7'			29'-4"	12"			30'-3"	12"			14'-6"	12"	8'-9"		28		12
		8'			29'-8"	11"			30'-7"	11"			14'-6"	11"	9'-9"		[illegible]		[illegible]
	9'	4'	5/8" DIA.		32'-0"	11"	7/8" DIA.		33'-0"	11"	1" DIA.		16'-0"	11"	5'-11"		[illegible]		12
		5'			32'-4"	11"			33'-4"	11"			16'-0"	[illegible]	6'-11"		20		12
		6'			32'-4"	11"			33'-4"	11"			[illegible]	11"	[illegible]		24		12
		7'			32'-8"	10"			33'-9"	10"			[illegible]	[illegible]	[illegible]		28		12
		8'			33'-0"	10"			34'-1"	10"			16'-0"	[illegible]	[illegible]		32		12
		9'			33'-2"	10"			34'-3"	[illegible]			[illegible]	10"	[illegible]		36		12
		10'			33'-6"	10"			[illegible]	[illegible]			[illegible]	10"	[illegible]		40		12

DIMENSIONS AND QUANTITIES

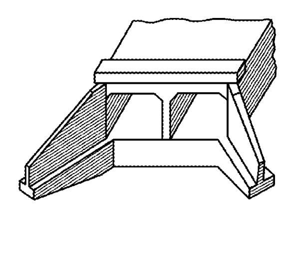
	CLEAR SPAN	CLEAR HEIGHT	BARREL DESIGN NO. 1 T1	T2	V	P	BARREL DESIGN NO. 2 T1	T2	V	P	REINFORCING STEEL LBS. PER LIN. FT. OF BARREL DES. NO. 1	DES. NO. 2	WINGWALLS AND PARAPETS TOTAL LBS.	CONCRETE CU. YDS. PER LINEAR FT. OF BARREL DES. NO. 1	DES. NO. 2	WINGWALLS & PARAPETS CU. YDS. CONC.	[illegible]
DOUBLE	7'	4'	9"	10"	5'-6"	16'-6"	11"	10"	5'-10"	16'-6"	155.8	157.1	599	[illegible]	1.509	[illegible]	2'-1"
		5'	9"	10"	6'-6"	16'-6"	11"	12"	6'-10"	16'-10"	160.1	172.0	731	[illegible]	1.686	18.04	2'-1"
		6'	9"	10"	7'-6"	16'-6"	11"	12"	7'-10"	16'-10"	172.7	185.0	856	1.491	1.791	20.82	2'-1"
		7'	9 1/2"	10"	8'-7"	16'-6"	11 1/2"	14"	8'-11"	17'-2"	183.6	197.9	[illegible]	1.634	2.058	23.96	2'-1 1/2"
	8'	4'	10"	10"	5'-8"	18'-6"	12"	10"	6'-0"	18'-6"	175.9	[illegible]	[illegible]	[illegible]	1.759	16.30	2'-2"
		5'	10"	10"	6'-8"	18'-6"	12 1/2"	12"	7'-1"	18'-10"	[illegible]	[illegible]	[illegible]	1.623	1.996	18.90	2'-2"
		6'	10"	10"	7'-8"	18'-6"	12 1/2"	12"	8'-1"	18'-10"	[illegible]	[illegible]	886	1.716	2.101	21.70	2'-2"
		7'	10"	10"	8'-8"	18'-6"	12 1/2"	14"	[illegible]	19'-2"	203.8	237.7	[illegible]	1.809	2.318	24.82	2'-2"
		8'	10 1/2"	12"	9'-9"	19'-0"	12 1/2"	14"	10'-1"	19'-4"	220.5	[illegible]	2698	2.139	2.498	29.77	2'-2 1/2"
	9'	4'	11"	10"	5'-10"	20'-6"	13 1/2"	[illegible]	6'-3"	[illegible]	[illegible]	243.2	682	1.781	2.097	17.47	2'-3"
		5'	11"	10"	6'-10"	20'-6"	13 1/2"	12"	[illegible]	[illegible]	[illegible]	249.8	798	1.873	2.279	20.13	2'-3"
		6'	11"	10"	7'-10"	[illegible]	[illegible]	12"	[illegible]	[illegible]	221.6	263.3	948	1.966	2.384	23.00	2'-3"
		7'	11"	10"	8'-10"	[illegible]	14"	[illegible]	[illegible]	[illegible]	232.4	294.5	1093	2.059	2.669	26.14	2'-3"
		8'	11 1/2"	12"	9'-11"	[illegible]	14"	[illegible]	10'-4"	21'-4"	249.5	309.7	2806	2.398	2.850	31.17	2'-3 1/2"
		9'	11 1/2"	12"	10'-11"	[illegible]	14"	[illegible]	11'-4"	21'-6"	265.9	327.7	3239	2.509	3.043	35.00	2'-3 1/2"
		10'	11 1/2"	12"	11'-11"	[illegible]	14 1/2"	[illegible]	12'-5"	21'-10"	273.7	338.6	3812	2.620	3.393	40.23	2'-3 1/2"
TRIPLE	7'	4'	9"	[illegible]	5'-6"	24'-4"	11"	[illegible]	5'-10"	24'-4"	247.8	255.7	681	1.873	2.174	18.40	2'-1"
		5'	9"	10"	6'-6"	24'-4"	[illegible]	12"	6'-10"	24'-8"	253.5	278.4	813	1.997	2.382	21.04	2'-1"
		6'	9"	10"	[illegible]	24'-4"	11"	12"	7'-10"	24'-8"	270.3	295.7	938	2.120	2.517	23.87	2'-1"
		7'	9 1/2"	10"	[illegible]	[illegible]	11 1/2"	14"	8'-11"	25'-0"	284.9	312.3	1101	2.319	2.840	27.08	2'-1 1/2"
	8'	4'	10"	10"	[illegible]	27'-4"	12"	10"	6'-0"	27'-4"	283.6	312.6	720	2.209	2.546	19.57	2'-2"
		5'	10"	10"	[illegible]	27'-4"	12 1/2"	12"	7'-1"	27'-8"	289.4	340.1	854	2.332	2.842	22.24	2'-2"
		6'	10"	10"	7'-8"	27'-4"	12 1/2"	12"	8'-1"	27'-8"	306.4	357.7	978	2.456	2.977	25.10	2'-2"
		7'	10"	10"	8'-8"	27'-4"	12 1/2"	14"	9'-1"	28'-0"	320.7	374.4	1144	2.579	3.225	28.29	2'-2"
		8'	10 1/2"	12"	9'-9"	28'-0"	12 1/2"	14"	10'-1"	28'-4"	343.0	421.2	2792	3.028	3.498	33.46	2'-2 1/2"
	9'	4'	11"	10"	5'-10"	30'-4"	13 1/2"	10"	6'-3"	30'-4"	331.0	395.4	784	2.581	3.049	21.10	2'-3"
		5'	11"	10"	6'-10"	30'-4"	13 1/2"	12"	7'-3"	30'-8"	336.7	403.5	901	2.705	3.262	23.81	2'-3"
		6'	11"	10"	7'-10"	30'-4"	13 1/2"	12"	8'-3"	30'-8"	354.0	421.8	1051	2.828	3.398	26.75	2'-3"
		7'	11"	10"	8'-10"	30'-4"	14"	14"	9'-4"	31'-0"	358.4	468.0	1196	2.952	3.744	29.95	2'-3"
		8'	11 1/2"	12"	9'-11"	31'-0"	14"	14"	10'-4"	31'-4"	391.5	489.1	2910	3.414	4.019	35.20	2'-3 1/2"
		9'	11 1/2"	12"	10'-11"	31'-0"	14"	15"	11'-4"	31'-6"	413.3	512.7	3344	3.562	4.250	39.10	2'-3 1/2"
		10'	11 1/2"	12"	11'-11"	31'-0"	14 1/2"	17"	12'-5"	31'-10"	426.7	526.3	3916	3.710	4.667	44.41	2'-3 1/2"

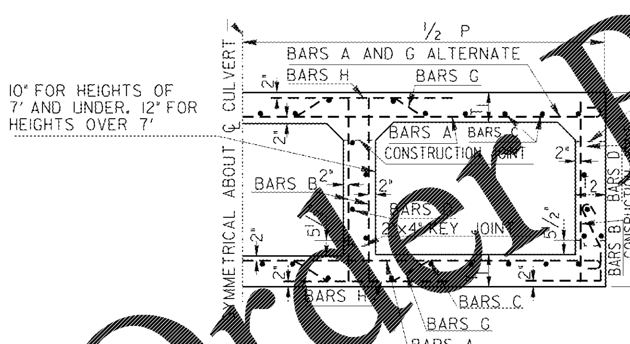


SECTION OF BARREL

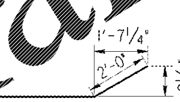


SECTION OF SLAB SHOWING REINFORCING

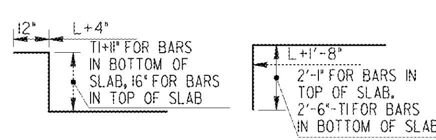




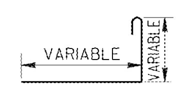
HALF SECTION OF BARREL



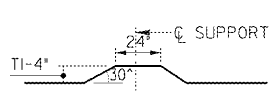
BARS D



TOP BARS C BOTTOM



BARS E



BENDING FOR G BARS

GENERAL NOTES

1. CHAMFER-CHAMFER ALL EXPOSED EDGES 3/4".
2. APRON WALLS MAY BE OMITTED IF ENGINEER APPROVES. ENGINEER MAY ALSO REQUIRE BOTTOM SLAB TO EXTEND TO END OF WINGS AND APRON PLACED AT THIS POINT.
3. QUANTITIES FOR STEEL SHOWN ARE COMPUTED CONSIDERING ALL A,B,C,D,G AND H BARS AS PART OF BARREL QUANTITIES. STEEL PER LIN. FT. IS AN AVERAGE VALUE FOR A CULVERT OF 40' LENGTH ALLOWING ONE LAP IN LONGITUDINAL BARS.
4. SIZE OF CULVERT - IN DESIGNATION SIZES OF CULVERTS STATE CLEAR SPAN FIRST, I.E., A 9' X 4' CULVERT HAS A 9' CLEAR SPAN AND A 4' CLEAR HEIGHT.
5. COVER-CULVERT TO HAVE MINIMUM OF 1.0' BELOW BOTTOM OF BASE OR CONCRETE PAVEMENT.

BOX CULVERT REQUIREMENTS:

MINIMUM FILL HEIGHT FROM TOP OF CULVERT TO BOTTOM OF BASE WITHIN TRAVELWAY SHALL BE 12 INCHES.

MAXIMUM POUR LENGTH SHALL NOT EXCEED 30 FEET ALONG THE LENGTH OF THE CULVERT.

TRANSVERSE CONSTRUCTION JOINTS SHALL BE PLACED IN THE BARREL, NORMAL TO THE CENTERLINE OF CULVERT, AT THE OUTSIDE SHOULDER BREAK POINTS. LONGITUDINAL BARREL REINFORCING STEEL SHALL NOT BE CONTINUOUS THROUGH THESE JOINTS, PROVIDED THAT THE JOINTS ARE MORE THAN 15 FEET FROM THE BARREL ENDS.
WHEN TRANSVERSE CONSTRUCTION JOINTS OCCUR WITHIN 15 FEET OF THE BARREL ENDS OR WITHIN THE LIMITS OF THE PAVEMENT, THE LONGITUDINAL BARREL REINFORCING SHALL THEN BE CONTINOUS THROUGH SUCH JOINTS. THE MINIMUM LENGTH OF LAP SPLICE FOR LONGITUDINAL REINFORCING SHALL BE 24 INCHES.

TRANSVERSE CONSTRUCTION JOINTS PLACED AT ANY OTHER LOCATION NOT SPECIFIED ABOVE SHALL BE FORMED WITH NO LONGITUDINAL REINFORCING STEEL PASSING THROUGH THE JOINTS.

DATE | REVISION | BY

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

STANDARD
REINFORCED CONCRETE BOX CULVERTS
DOUBLE 7' X 4' TO TRIPLE 9' X 10'
FOR DEPTHS OF FILL UP TO 20 FEET

NO SCALE — REV. & REDR. NOV., 2001

DES. ____ DRW. ____ TRA. ____ CHK. ____

(SUBMITTED) James A. Kennel — STATE ROAD & AIRPORT DESIGN ENGR.

(APPROVED) [signature] — CHIEF ENGINEER

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