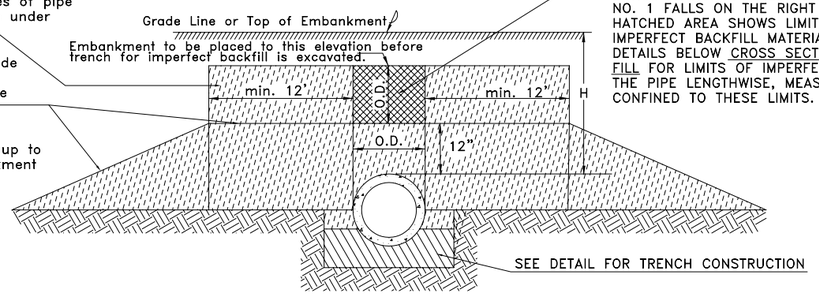
NORMAL BACKFILL

Backfill, as shown by the broken line sections, shall consist of placing compactable soil in 6"(Loose) layers and compacting each layer (according to Georgia Standard Specifications) on both sides of pipe for its full length. Measurement and payment will be made under Roadway Excavation items for formaton of embankments.

Normal embankment shall be placed a minimum of 12' wide on each side of the pipe and at least the minimum cover over the pipe and compacted to the required density before equipment is allowed to cross.

After backfill has been compacted, the balance of the fill up to grade line shall be constructed in accordance with embankment specifications.

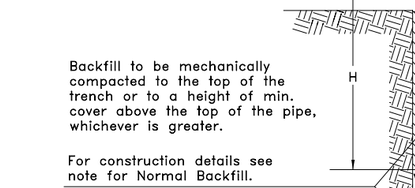
LONGITUDINAL SECTION OF IMPERFECT TRENCH BACKFILL AND BACKFILL METHODS



IMPERFECT BACKFILL

IMPERFECT BACKFILL WILL BE USED WITH CONCRETE PIPE IF AN EXTRAPOLATION OF FILL HEIGHT AND PIPE DIAMETER IN TABLE NO. 1 FALLS ON THE RIGHT SIDE OF THE HEAVY LINE, CROSS HATCHED AREA SHOWS LIMITS OF STRUCTURE EVACUATION AND IMPERFECT BACKFILL MATERIAL TYPE III IN THIS VIEW. SEE DETAILS BELOW CROSS SECTIONS OF IMPERFECT TRENCH BACK-FILL FOR LIMITS OF IMPERFECT BACKFILL AS MEASURED OVER THE PIPE LENGTHWISE, MEASUREMENT AND PAYMENT WILL BE CONFINED TO THESE LIMITS.

MULTIPLE PIPE CULVERT SPACING

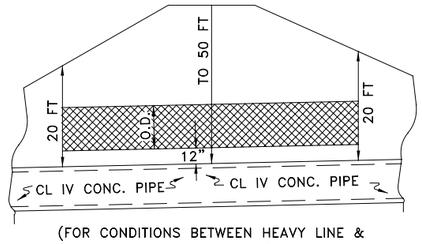


S= One inside diameter of pipe or 3 feet, whichever is smaller.
For pipe arch culverts, substitute span for inside diameter.

NOTE:
For Multiple Lines of C.M. Pipe with metal Flared End Sections, S may be increased enough to avoid overlap of End Section wingtips. Location of metal End Section should be determined before placement of pipe.

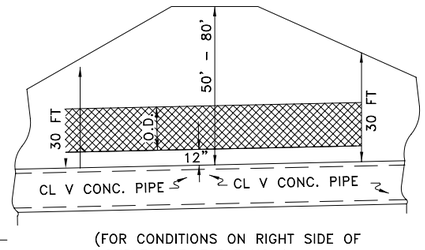
CROSS SECTIONS OF IMPERFECT TRENCH BACKFILL

CROSS HATCHED AREAS SHOW LIMITS OF CONSTRUCTION & MEASUREMENT FOR STRUCTURE EXCAVATION & IMPERFECT TRENCH BACKFILL MATERIAL, TYPE III



(FOR CONDITIONS BETWEEN HEAVY LINE & & DOUBLE LINE, TABLE NO.1)

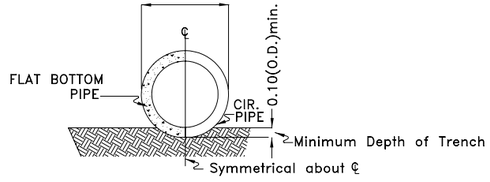
DETAIL "A"



(FOR CONDITIONS ON RIGHT SIDE OF DOUBLE LINE, TABLE NO.1)

DETAIL "B"

TRENCH CONSTRUCTION FOR SIDE DRAIN



NOTE:
THE PIPE SHALL BE BEDDED TO LINE AND GRADE IN A FIRM FOUDATION SHAPED TO FIT THE LOWER PART OF THE PIPE EXTERIOR. WHERE ROCK EXISTS, EXCAVATE AND BACKFILL WITH COMPRESSIBLE MATERIAL(Unclassified Excavation) A MINIMUM OF 6" BELOW THE PIPE.

TRENCH CONSTRUCTION FOR STORM DRAIN

NOTE: PIPE SHALL BE BEDDED IN A FOUNDATION SHAPED TO FIT THE LOWER PART OF PIPE EXTERIOR.

NOTE:
BELL HOLES SHALL BE PROVIDED IN BEDDING IF PIPE HAS BELL AND SPIGOT JOINTS.

minimum Depth of Trench 0.030(O.D.)

FOUNDATION BACKFILL MATERIAL TYPE I OR II

NOTE: Where an incompressible foundation exists, excavate an additional 6".
Where an unstable foundation material is encountered, excavate an additional depth as shown on Plans or as directed by the Engineer.

FOUNDATION BACKFILL MATERIAL TYPE I, WHEN REQUIRED SHALL BE CLASS I, II OR III-A SOILS APPROVED FOR USE BY THE ENGINEER, THE MATERIAL TO BE USED WILL BE OBTAINED AS UNCLASS-IFIED EXCAVATION OR BORROW FROM LOCATIONS APPROVED BY THE ENGINEER.

FOR EXCAVATION FOR PIPE-ARCH CULVERTS SUBSTITUTE SPAN AND RISE FOR OUTSIDE DIAMETER OF PIPE IN HORIZONTAL AND VERTICAL DIMENSIONS SPECIFIED IN DETAIL.

TABLE NO. 1

TABLE SHOWING THE MINIMUM CLASSES OF CONCRETE PIPE FOR VARIOUS HEIGHTS OF FILL ABOVE TOP OF PIPE

PIPE DIAMETER (inches)	HEIGHT OF FILL IN FEET ABOVE TOP OF PIPE											
	1-10	10-15	15-20	20-25	25-30	30-35	35-40	40-50	50-60	60-70	70-80	80-90
12	III	III	IV	V	V	IV	IV	IV	V	V	V	
15	III	III	IV	V	V	IV	IV	IV	V	V	V	
18	III	III	IV	V	V	IV	IV	IV	V	V	V	
24	III	III	IV	V	V	IV	IV	IV	V	V	V	
30	III	III	IV	V	V	IV	IV	IV	V	V	V	
36	III	III	IV	V	V	IV	IV	IV	V	V	V	
42	III	III	IV	V	V	IV	IV	IV	V	V	V	
48	III	III	IV	V	V	IV	IV	IV	V	V	V	
54	III	III	IV	V	V	IV	IV	IV	V	V	V	
60	III	III	IV	V	V	IV	IV	IV	V	V	V	
66	III	III	IV	V	V	IV	IV	IV	V	V		
72	III	III	IV	V	V	IV	IV	IV	V	V		
78	III	III	IV	IV	IV	IV	IV	IV	V			
84	III	III	IV	IV	IV	IV	IV	IV	V			
90	III	III										
96	III	III										
102	III	III										
108	III	III										

FOR CONDITIONS BETWEEN THE HEAVY LINE & DOUBLE LINE CLASS IV CONCRETE PIPE REQUIRES IMPERFECT BACKFILL ACCORDING TO DETAIL "A".

FOR CONDITIONS TO THE RIGHT OF THE DOUBLE LINE CLASS V CONCRETE PIPE REQUIRES IMPERFECT BACKFILL ACCORDING TO DETAIL "B".

DETAIL SHOWING MINIMUM COVER FOR PIPE CULVERTS

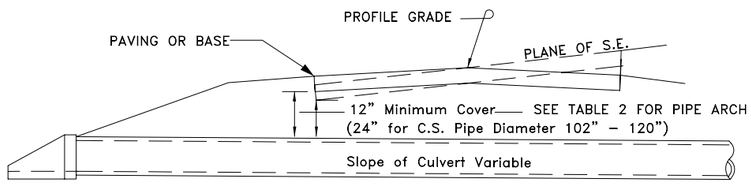


TABLE NO. 3 - (INFORMATION ONLY)		
	Cor. Metal Thickness	Equivalent Gage
STEEL	0.064	16
	0.079	14
	0.109	12
	0.138	10
	0.168	8
ALUMINUM	0.060	16
	0.075	14
	0.105	12
	0.135	10
	0.164	8

TABLE NO. 2 (PIPE-ARCH)

TABLE SHOWING MINIMUM THICKNESS IN INCHES OF CORRUGATED STEEL AND CORRUGATED ALUMINUM PIPE-ARCH AND MAXIMUM HEIGHTS OF FILL ABOVE THE TOP OF THE PIPE-ARCH.

Diameter of Pipe of Equal Periphery Inch	SPAN INCH	RISE INCH	MIN. THICKNESS (inches) COR. STEEL ①	COR. STEEL ②	COR. ALUMINUM	MINIMUM COVER INCHES	MAX. HT. FILL FEET
15	17	13	.064			18	13
					.060	18	15
18	21	15	.064			18	12
					.060	18	14
21	24	18	.064			18	10
					.060	18	13
24	28	20	.064			18	9
					.060	18	11
30	35	24	.064			18	9
					.060	18	9
36	42	29	.064			18	7
					.075	18	7
	40	31		.079		18	12
42	49	33	.079			18	7
					.105	18	7
	46	36	.079	.079		18	12
48	57	38	.109			18	7
					.135	18	7
	53	41		.079		18	12
54	64	43	.109			18	7
					.135	18	7
	60	46		.079		18	12
60	71	47	.138			18	7
					.164	18	7
	66	51		.079		18	12
66	77	52	.168			18	7
	73	55		.079		18	15
72	83	57	.168			18	8
	81	59		.079		18	15
78	87	63		.079		18	14
84	95	67		.109		18	12
90	103	71		.109		24	11

① DENOTES 2-2/3"X1/2" CORRUGATION.
② DENOTES 3"X1" CORRUGATION.

GWINNETT COUNTY
DEPARTMENT OF PLANNING & DEVELOPMENT
STANDARD DRAWING

Standard Pipe Culverts - Concrete Pipe

DATE: JANUARY 1988 SHEET: 703