83-01

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

Inter-Departmental Memorandum

TO: Roadway Design Division
Squad Leaders

DATE: November 2, 1995

FROM: Roadway Design Division
Irving Harris I.H.

SUBJECT OR PROJECT NO: Metric Structure Excavation Tables

INFORMATION COPY TO:
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Attached are the tentative Metric Structure Excavation Tables to be used on all metric projects. The depth is based on one (1) meter.

IH/ls

For structures other than pipe culverts, the area to be included in the measurement of structure excavation will be that area bounded by vertical planes 300 millimeters outside of the neat lines of the footing.

For pipe culverts, the vertical planes will be 300 millimeters each side of the nominal inside diameter of the pipe or less for tile and pipe underdrains if indicated on the plans. The length to be allowed will be 300 millimeters beyond each end of the pipe, except when the pipe is joined to another structure for which payment for structure excavation will be made. In this case, the length will be limited to the point of intersection of the centerline of the pipe with the boundary of structure excavation of joining structures.

The depth allowed will be that actually removed between the natural ground line or the bottom of the graded section (whichever is lower) and the bottom of the footing or the bottom of the trench in the case of pipe. Measurement will not be made for excavation beyond the neat lines described which the Contractor finds convenient or necessary for his particular operation.

The volume of structure excavation allowed for payment will be the summation of the products of the widths, depths and lengths described.

In case the Engineer orders additional excavation for foundation improvement below the depth indicated herein, this excavation within the designated neat lines will be measured as structure excavation.

Unless otherwise specified, selected backfill material shown on the plans or directed by the Engineer to be produced from an area to be excavated under one of the classes of excavation set out in the contract will be measured and paid for under the applicable item of excavation.

Any special ordered (select) material which is produced from excavation identified on the plans as E.S.F.E. will be measured for payment as contractor furnished select material. Select material ordered or authorized by Engineer to provide a satisfactory foundation for structures and conduit will be measured by the cubic meter (FM). Contractor furnished materials such as sand, gravel, granular materials, timber, etc. for backfilling will be paid at the contract unit price of the material used or as extra work in accordance with 104.03 when the pay item for select material for undercuts is not set up in the contract.

Haul necessary to supply the selected material (other than Contractor-furnished) will be measured as set out in Section 205.

No measurement will be made for water or other liquids removed.

STRUCTURE EXCAVATION [ONE METER DEPTH]
FOR FLARED END PIPE CULVERT FE-1

SIZE OF PIPE	"T" OF PIPE	SINGLE LINE Cu Meter per FES	SINGLE LINE Cu Meter per Meter Bbl	SINGLE LINE Cu Meter per Toewall	DOUBLE LINE Cu Meter per FES	DOUBLE LINE Cu Meter per Meter Bbl	DOUBLE LINE Cu Meter per Toewall	TRIPLE LINE Cu Meter per FES	TRIPLE LINE Cu Meter per Meter Bbl	TRIPLE LINE Cu Meter per Toewall
375	57	2.587	0.975	0.041	4.529	1.889	0.082	6.472	2.803	0.123
450	64	2.777	1.050	0.046	4.962	2.078	0.092	7.146	3.106	0.138
600	76	3.315	1.200	0.061	6.222	2.552	0.122	9.129	3.904	0.183
750	89	3.821	1.350	0.076	7.429	3.028	0.152	11.036	4.706	0.228
900	102	5.498	1.500	0.090	11.009	3.504	0.180	16.520	5.508	0.270
1050	114	5.910	1.650	0.098	11.900	3.828	0.196	17.889	6.006	0.294
1200	127	6.323	1.800	0.106	12.797	4.154	0.212	19.270	6.508	0.318
1350	140	6.855	1.950	0.114	13.939	4.480	0.228	21.023	7.010	0.342
1500	152	7.275	2.100	0.122	14.846	4.804	0.244	22.417	7.508	0.366
1650	165	7.695	2.250	0.130	15.759	5.130	0.260	23.823	8.010	0.390
1800	178	8.115	2.400	0.138	16.672	5.456	0.276	25.229	8.512	0.414

NOTE: Quantities for End Section do not include Toe Wall.
The quantities shown in Table 1 are correct and will be used on the final estimate as the basis of payment unless authorized modifications are made.

TABLE 1

STRUCTURE EXCAVATION [ONE METER DEPTH]
FOR FLARED END PIPE CULVERT FE-1A- Type I

SIZE OF PIPE	"T" OF PIPE	SINGLE LINE Cu Meter per FES	SINGLE LINE Cu Meter per Meter Bbl	SINGLE LINE Cu Meter per Toewall	DOUBLE LINE Cu Meter per FES	DOUBLE LINE Cu Meter per Meter Bbl	DOUBLE LINE Cu Meter per Toewall	TRIPLE LINE Cu Meter per FES	TRIPLE LINE Cu Meter per Meter Bbl	TRIPLE LINE Cu Meter per Toewall
550 X 325	64	2.835	1.150	0.046	4.994	2.178	0.092	7.153	3.206	0.138
725 X 450	76	3.353	1.325	0.061	6.192	2.677	0.122	9.031	4.029	0.183
900 X 550	89	3.870	1.500	0.076	7.394	3.178	0.152	10.918	4.856	0.228
1100 X 675	102	5.640	1.700	0.090	11.051	3.704	0.180	16.462	5.708	0.270
1275 X 775	114	6.075	1.875	0.098	11.956	4.053	0.196	17.836	6.231	0.294
1450 X 900	127	6.510	2.050	0.106	12.866	4.404	0.212	19.222	6.758	0.318
1625 X 1000	140	6.945	2.225	0.114	13.776	4.755	0.228	20.607	7.285	0.342
1825 X 1125	152	7.410	2.425	0.122	14.711	5.129	0.244	22.012	7.833	0.366
2200 X 1350	178	9.080	2.800	0.151	18.477	6.156	0.302	27.874	9.512	0.453

NOTE: Quantities for End Section do not include Toe Wall.
The quantities shown in Table 2 are correct and will be used on the final estimate as the basis of payment unless authorized modifications are made.

TABLE 2

STRUCTURE EXCAVATION [ONE METER DEPTH]
FOR FLARED END PIPE CULVERT FE-1A- Type II

SIZE OF PIPE	"T" OF PIPE	SINGLE LINE Cu Meter per FES	SINGLE LINE Cu Meter per Meter Bbl	SINGLE LINE Cu Meter per Toewall	DOUBLE LINE Cu Meter per FES	DOUBLE LINE Cu Meter per Meter Bbl	DOUBLE LINE Cu Meter per Toewall	TRIPLE LINE Cu Meter per FES	TRIPLE LINE Cu Meter per Meter Bbl	TRIPLE LINE Cu Meter per Toewall
550 X 325	64	2.638	1.150	0.046	4.797	2.178	0.092	6.956	3.206	0.138
725 X 450	76	3.173	1.325	0.062	6.084	2.677	0.124	8.995	4.081	0.186
900 X 550	89	4.624	1.500	0.077	9.246	3.178	0.154	13.868	4.908	0.231
1100 X 675	102	5.346	1.700	0.091	10.847	3.704	0.182	16.348	5.756	0.273
1275 X 775	114	5.795	1.875	0.098	11.703	4.053	0.196	17.611	6.231	0.294
1450 X 900	127	6.243	2.050	0.106	12.628	4.404	0.212	19.013	6.758	0.318
1625 X 1000	140	6.699	2.225	0.114	13.570	4.755	0.228	20.440	7.285	0.342
1825 X 1125	152	7.189	2.425	0.122	14.532	5.129	0.244	21.875	7.833	0.366

NOTE: Quantities for End Section do not include Toe Wall.
The quantities shown in Table 3 are correct and will be used on the final estimate as the basis of payment unless authorized modifications are made.

TABLE 3

STRUCTURE EXCAVATION [ONE METER DEPTH]

ROUND CORRUGATED STEEL PIPE AND FLARED END SECTION				ARCH CORRUGATED STEEL PIPE AND FLARED END SECTION			
SIZE OF PIPE	"T" OF PIPE mm	Cu Meter per FES	Cu Meter per Meter Bbl	SIZE OF PIPE	"T" OF PIPE mm	Cu Meter per FES	Cu Meter per Meter Bbl
300	12	1.080	0.900	425 X 325	12	1.157	1.025
375	12	1.379	0.975	525 X 375	12	1.410	1.125
450	12	1.713	1.050	600 X450	12	1.753	1.200
600	12	2.081	1.200	700 X 500	12	2.095	1.300
750	12	2.484	1.350	875 X 600	24	2.767	1.475
900	24	3.392	1.500	1050 X 725	24	3.639	1.650
1050	24	4.380	1.650	1225 X 825	24	4.458	1.825
1200	24	5.492	1.800	1425 X 950	24	5.673	2.025
1350	24	6.536	1.950	1600 X 1075	24	6.684	2.200
1500	24	7.515	2.100	1775 X 1175	24	7.778	2.375
1650	24	8.319	2.250	1925 X 1300	24	8.301	2.525
1800	24	8.691	2.4	2075 X 1425	24	8.824	2.675

NOTE In the event Corrugated Steel Structural Plate Pipe (not to be confused with the above pipe) is used, Structure Excavation will be determined using "T" as 24 milimeters regardless of size pipe, which starts at 1500mm and may be as large as 6300mm for round pipe and starting at 1825 X 1375mm to as large as 6175 X 3950mm for arch pipe.

TABLE 4

STRUCTURE EXCAVATION (ONE METER DEPTH)
FOR
PRECAST BOX CULVERTS

SIZE	"T" OF CULVERT	"V" OF CULVERT	"T" OF APRON	CU METER PER BBL	CU METER PER HDWL	CU METER PER TOEWALL
1800 X 1200	175	175	200	2.75	12.311	0.183
2400 X 1200	200	200	200	3.4	13.931	0.207
3000 X 1200	250	250	200	4.1	15.551	0.231
1800 X 1500	175	175	200	2.75	12.311	0.183
2400 X 1500	200	200	200	3.5	13.931	0.207
3000 X 1500	250	250	200	4.1	15.551	0.231
1800 X 1800	175	175	200	2.75	19.524	0.218
2400 X 1800	200	200	200	3.4	21.864	0.242
3000 X 1800	250	250	200	4.1	24.204	0.266
2400 X 2400	200	200	200	3.4	30.857	0.277
3000 X 2400	250	250	200	4.1	33.917	0.301

NOTE: **Quantities for End Section do not include Toe Wall.**
The quantities shown in Table 5 are correct and will be used on the final estimate as a basis of payment unless authorized modifications are made.

TABLE 5