

COMPUTATIONS & SUB-SUMMARIES

FED. RD. DIVISION	STATE	PROJECT		
2	OHIO			19 384

F-329 (18)

STA. 651 + 00 TO STA. 676 + 88.54

U-329 (18)

STA. 680 + 00.83 TO STA. 770 + 62

LAKE COUNTY
LAK-2-14.22

T-71, 10" REINFORCED PORTLAND CEMENT CONCRETE PAVEMENT

TOTAL NET LENGTH AS PER S.R.2
TYPICAL SECTIONS = 2,563.54 FT.
WIDTH OF 4 LANES @ 12' = 48.00 FT.
 $2,563.54 \times 48.00 \div 9 = 13,672$ S.Y.

E-1, COMPACTED SUBGRADE

AREA AS T-71 = 13,672 S.Y.
AREA AS B-21 = 8,053 S.Y.
AREA AS I-7 = 167 S.Y.
TOTAL = 21,892 S.Y.

T-71, 10" REINFORCED PORTLAND CEMENT CONCRETE PAVEMENT

TOTAL NET LENGTH AS PER S.R.2
TYPICAL SECTIONS = 8,278.64 FT.
WIDTH OF 4 LANES @ 12' = 48.00 FT.
 $8,278.64 \times 48.00 \div 9 = 44,153$ S.Y.

EARTHWORK				
SHEET NO.	STATION	E-1 ROADWAY EXCAVATION		EMBANKMENT PLUS 20%
		FROM	TO	CU. YDS.
				CU. YDS.
32	680+00.83 - 685+00			0
33	685+00 - 695+00			602
34	695+00 - 705+00			844
35	705+00 - 715+00			1,228
36	715+00 - 725+00			1,519
37	725+00 - 735+00			1,579
38	735+00 - 745+00			139,155
39	745+00 - 755+00			300,234
40	755+00 - 765+00			346,398
41	765+00 - 770+62			177,530
146	RECONSTR. CHESTER ST.			309
146	RECONSTR. STAGE AVE.			201
146	RICHMOND ST.			4,671
149	RICHMOND ST.			5,154
152	RICHMOND ST.			7,576
152	S.R. 283			97
152	SKINNER AVE.			74
153	RICHMOND ST.			279
178	RAMP "CC"			1,150
178	RAMP "DD"			3,134
178	RAMP "EE"			3,255
178	RAMP "EE" SPUR			1,153
178	RAMP "FF"			1,715
225	SANFORD ST.			0
227	RELOC. TAYLOR PLACE			820
230	RECONSTR. ST. CLAIR ST.			0
232	RECONSTR. STATE ST.			59
234	WHEELING AVE. CONN.			1,208
238	RECONSTR. ELM ST.			72
239	RECONSTR. ELM ST.			677
243	CONN. TO ACCESS RD.			5,289
243	ACCESS RD.			38,352
244	ACCESS RD.			127,851
245	ACCESS RD.			91,311
	TOTALS			1,276,996

B-21, 3" WATERPROOFED AGGREGATE BASE COURSE

TOTAL NET LENGTH AS PER S.R.2
TYPICAL SECTIONS PLUS 1 APPROACH
SLAB @ 25 FT. = 2,588.54 FT.
WIDTH 2 SHOULDERS @ 4 FT. = 8 FT.
WIDTH 2 SHOULDERS @ 10 FT. = 20 FT.
TOTAL WIDTH = 28 FT.
 $2,588.54 \times 28 \div 9 = 8,053.24$ S.Y.
MINUS AREA THRU SPEED CHANGE LANE
 $388.54 \times 10 \div 9 = 431.71$ S.Y.
TOTAL AREA = 7,621.53 S.Y.
 $7,621.53 \times \frac{5}{36} = 635$ C.Y.

E-11, WATER M-GAL. = $\frac{VOL. \times 5}{1000}$

EMBANKMENT 331,827 C.Y.
I-22 149 C.Y.
I-18 300 C.Y.
B-19 1,178 C.Y.
TOTAL VOLUME 333,454 C.Y.
M-GALLONS 1,667

B-21, 3" WATERPROOFED AGGREGATE BASE COURSE

TOTAL NET LENGTH AS PER S.R.2
TYPICAL SECTIONS PLUS 7 APPROACH
SLABS @ 25 FT. = 8,453.64 FT.
WIDTH 2 SHOULDERS @ 4 FT. = 8 FT.
WIDTH 2 SHOULDERS @ 10 FT. = 20 FT.
TOTAL WIDTH = 28 FT.
 $8,453.64 \times 28 \div 9 = 26,300.21$ S.Y.
MINUS AREA THRU SPEED CHANGE LANES
 $2,212.07 \times 10 \div 9 = 2,457.86$ S.Y.
TOTAL AREA = 23,842.35 S.Y.
 $23,842.35 \times \frac{5}{36} = 1,987$ C.Y.

EARTHWORK				
SHEET NO.	STATION	E-1 ROADWAY EXCAVATION		EMBANKMENT PLUS 20%
		FROM	TO	CU. YDS.
				CU. YDS.
29	651+00 - 655+00			8,353
30	655+00 - 665+00			8,430
31	665+00 - 675+00			7,070
32	675+00 - 676+88.54			569
115	BLACKBROOK RD.			9
118	NEWELL ST.			166
119	NEWELL ST.			39
120	NEWELL ST.			151
139	BUTTON AVE.			547
	TOTALS			25,334

T-31, BITUMINOUS SURFACE TREATMENT

BITUMINOUS MATERIAL, 1 SEAL
OPERATION OF 0.25 GAL. PER SQ. YD. OF B-21.
AREA AS ABOVE = 23,842.35 S.Y.
 $23,842.35 \times 0.25 = 5,961$ GAL.

No. 6 AGGREGATE APPLIED AT THE RATE OF 0.008 CU. YD. PER SQ. YD. OF B-21.
 $23,842.35 \times 0.008 = 191$ C.Y.

T-31, BITUMINOUS SURFACE TREATMENT

BITUMINOUS MATERIAL, 1 SEAL
OPERATION OF 0.25 GAL. PER SQ. YD. OF B-21
AREA AS ABOVE = 7,621.53 S.Y.
 $7,621.53 \times 0.25 = 1,905$ GAL.

No. 6 Aggregate Applied @ 0.008 CU. YD. PER SQ. YD. OF B-21
 $7,621.53 \times 0.008 = 61$ C.Y.

EXCESS E-1 ROADWAY EXCAVATION

EMBANKMENT +20% 644,522 C.Y.
E-1 ROADWAY EXCAVATION 1,276,996 C.Y.
UNSUITABLE EXCAVATION 371,845 C.Y.
905,151 C.Y.
E-3 CHANNEL EXCAVATION 4,006 C.Y.
TOTAL SUITABLE EXCAVATION 909,157 C.Y.

EXCESS EXCAVATION 264,635 C.Y.

ADDITIONAL INTERCHANGE EMB.+20% 168,567 C.Y.
UNSUITABLE MATERIAL 371,845 C.Y.
EXCESS E-1 ROADWAY EXC. -203,278 C.Y.
(UNSUITABLE MATERIAL)

E-4 BORROW

EMBANKMENT +20% 331,827 C.Y.
E-1 ROADWAY EXCAVATION 25,334 C.Y.
E-3 CHANNEL EXCAVATION 1,840 C.Y.
EXCESS EXCAVATION U-329(18) 264,635 C.Y.
TOTAL EXCAVATION 291,809 C.Y.
E-4 BORROW 40,018 C.Y.

I-18, STABILIZED CRUSHED AGGREGATE SHOULDER MATERIAL

TOTAL NET LENGTH AS PER B-219 = 28.00 FT.
TOTAL WIDTH = 28.00 + 4 x 0.25 = 29.00 FT.
 $8,453.64 \times 29.00 \div 9 = 27,239.51$ S.Y.
MINUS AREA THRU SPEED CHANGE LANES
 $2,212.07 \times 10.25 \div 9 = 2,519.30$ S.Y.
TOTAL AREA = 24,720.21 S.Y.
 $24,720.21 \times \frac{5}{36} = 3,433$ C.Y.

I-18, STABILIZED CRUSHED AGGREGATE SHOULDER MATERIAL

TOTAL NET LENGTH AS PER B-219 = 2,588.54 FT.
TOTAL WIDTH = 28.00 + 4 x 0.25 = 29.00 FT.
 $2,588.54 \times 29.00 \div 9 = 8,340.85$ S.Y.
MINUS AREA THRU SPEED CHANGE LANE
 $388.54 \times 10.25 \div 9 = 442.50$ S.Y.
TOTAL AREA = 7,898.35 S.Y.
 $7,898.35 \times \frac{5}{36} = 1,097$ C.Y.

E-11, WATER M-GAL. = $\frac{VOL. \times 5}{1000}$

EMBANKMENT 644,522 C.Y.
I-22 6,850 C.Y.
I-18 1,206 C.Y.
B-19 1,718 C.Y.
TOTAL VOLUME 654,296 C.Y.
M-GALLONS 3,271 C.Y.

L-9 SEEDING & PROTECTING

STA. 651+00 TO STA. 655+00 6,172 S.Y.
STA. 655+00 TO STA. 665+00 19,910 S.Y.
STA. 665+00 TO STA. 675+00 29,677 S.Y.
STA. 675+00 TO STA. 676+88.54 5,691 S.Y.
TOTAL 61,450 S.Y.

I-22 SUBBASE

TOTAL NET LENGTH
NORMAL SECTION = 4,085.80 FT.
AVERAGE END AREA = 38.947 S.F.
TOTAL NET LENGTH
TRANSITION SECTION = 601.00 FT.
AVERAGE END AREA = 38.762 S.F.
TOTAL NET LENGTH
SUPER SECTION = 3,766.84 FT.
AVERAGE END AREA = 38.555 S.F.
 $4,085.80 \times 38.947 \div 27 = 5,893.69$ C.Y.
 $601.00 \times 38.762 \div 27 = 862.81$ C.Y.
 $3,766.84 \times 38.555 \div 27 = 5,378.91$ C.Y.
MINUS VOLUME THRU SPEED CHANGE LANES
 $2,212.07 \times 5.39 \div 27 = 441.59$ C.Y.
TOTAL 11,694 C.Y.

I-22 SUBBASE

TOTAL NET LENGTH
NORMAL SECTION = 858.00 FT.
AVERAGE END AREA = 38.947 S.F.
TOTAL NET LENGTH
TRANSITION SECTION = 269.00 FT.
AVERAGE END AREA = 38.924 S.F.
TOTAL NET LENGTH
SUPER SECTION = 1,461.54 FT.
AVERAGE END AREA = 38.749 S.F.
 $858.00 \times 38.947 \div 27 = 1,237.65$ C.Y.
 $269.00 \times 38.924 \div 27 = 387.80$ C.Y.
 $1,461.54 \times 38.749 \div 27 = 2,092.55$ C.Y.
MINUS VOLUME THRU SPEED CHANGE LANE
 $388.54 \times 5.520 \div 27 = 79.43$ C.Y.
TOTAL 3,639 C.Y.

L-9 SEEDING & PROTECTING

STA. 680+00.83 TO STA. 685+00 1,200 S.Y.
STA. 685+00 TO STA. 695+00 7,428 S.Y.
STA. 695+00 TO STA. 705+00 15,797 S.Y.
STA. 705+00 TO STA. 715+00 17,970 S.Y.
STA. 715+00 TO STA. 725+00 17,735 S.Y.
STA. 725+00 TO STA. 735+00 19,311 S.Y.
STA. 735+00 TO STA. 745+00 22,538 S.Y.
STA. 745+00 TO STA. 755+00 29,663 S.Y.
STA. 755+00 TO STA. 765+00 22,354 S.Y.
STA. 765+00 TO STA. 770+62 17,043 S.Y.
INTERCHANGE SEEDING FOR LANDSCAPED AREA 51,673 S.Y.
TOTAL 222,712 S.Y.

L-9 COMMERCIAL FERTILIZER TONS = $\frac{SF \times 20}{1,000 \times 2,000}$

$\frac{61,450 \times 9 \times 20}{1,000 \times 2,000} = 5.530$ TONS

E-1, COMPACTED SUBGRADE

AREA AS T-71 = 44,153 S.Y.
AREA AS B-21 = 23,842 S.Y.
AREA AS I-7 = 1,011 S.Y.
TOTAL 69,006 S.Y.

L-9 COMMERCIAL FERTILIZER TONS = $\frac{SF \times 20}{1,000 \times 2,000}$

$\frac{222,712 \times 9 \times 20}{1,000 \times 2,000} = 20.044$ TONS