GENERAL INFORMATION

INTRODUCTION

The project consists of 1.09 miles of the Zanesville Expressway, USR 40, beginning at Underwood Street and extending eastward and terminating approximately 800 feet east of the Nickel Plate Railroad.

The proposed grade indicates the following:

USR 40 - fill embankments generally on the order of 15 to 20 feet but in one area as high as 60 feet, and cuts as deep as 85 feet, on centerline.

Service Road "A" - cut ranging from 0 to 18 feet in depth, and fill embankment not exceeding 4 feet in height.

Ramp "N" - fill embankment ranging from 0 to 12 feet in height.

Ramp "O" - fill embankment ranging from 0 to 10 feet in height and cuts ranging from 0 to 16 feet in depth.

GEOLOGY OF THE SITE

The project is located in the highly dissected Allegheny Plateau region for the most part in two rather narrow, steep-sided valleys of tributaries to the Muskingum River. Bedrock, composed of sandstone, shale, indurated clay and associated coals of the Allegheny formation, Pennsylvanian age, is overlain by moderately thick residual soils and shallow drainage sediments.

EXPLORATION

Exploratory borings were made by means of truck mounted mechanical earth auger, hand auger (in areas of difficult access), and rotary type drill rig between October 1 1959 and May 6, 1960. Soil profile borings were supplemented by drive sample-core borings made in conjunction with the structure foundation investigations for the project.

INVESTIGATIONAL FINDINGS

USR 40

Embankment foundation areas:

Station 147+00 to 156+00 - at-surface, sandy silts and silts, in the A-4a and A-4b classifications, generally with relatively low moisture contents.

Station 158+00 to 169+00 - at-surface, wet, compressible silts, silt clays, and clays, generally 5 to 10 feet in thickness, overlying bedrock.

Station 183+00 to 199+00 - at-surface, wet, compressible silts, sandy silts and elastic clays, as much as 5 to 8 feet in thickness, overlying bedrock.

Station 201+00 to 202+00 - at-surface, wet, compressible, sandy silts, generally less than 5 feet in thickness, overlying bedrock.

Cut areas:

Station 159+00 to 182+00 - material immediately below proposed grade is predominantly siliceous shale, backslopes will be in shale and sandstone.

Attention is directed to the elevation interval 800 to 810 feet, which contains a coal seam approximately 2 feet thick, and which borings disclose has been somewhat extensively mined within this station interval, leaving voids 4 to 8 feet in height within 4 or 5 feet below grade in the vicinity of station 174+00 increasing in distance below grade upstation from this.

In the remaining cut areas predominant materials below grade are sands and clays in the A-3a, A-3, and A-7-6 classifications.

Service Road "A"

Bedrock, composed of sandstone and shale, will be encountered in the cut from station 3+00 to 7+00. It is noted that wet silts occur at station 1+75 at a depth of 7 to 13 feet below grade and that 2 to 4 feet of random fill, comprised of cinders, overlies wet sandy silts at station 2+85.

Ramp "N"

Embankment foundation materials consist of sandy silts and silt clay and range from approximately 5 to 8 feet in thickness, overlying bedrock, from station 5+00 to station 11+00; from station 11+00 to 18+50, the soil ranges from 12 to 27 feet in thickness and contains intervals (2 to 4 feet thick) of wet silts. Approximately 1 to 2 feet of random fill, comprised of cinders and bricks, was encountered at-surface between approximate stations 12+25 and 15+63.

Ramp "O"

In the cut area from station 1+30 to 6+00, materials are largely composed of sandy silt, varying in thickness from 8 to 23 feet, and overlie weathered shale bedrock. It is considered that the greater portion of the backslope cut will be in bedrock. The materials in the embankment foundation area, station 6+00 to 15+00, are comprised of 4 to 5 feet of wet, somewhat compressible, organic silts and clays, overlying shale bedrock.

LEGEND FOR PROJECT-AVERAGE RESULTS OF TESTS- 460 SAMPLES TESTED

DESCRIPTION	H. R. B. CLASS	OHIO CLASS	% AGG.	% C. SAND	% F. SAND	% SILT	% CLAY	LIQUID LIMIT	PLASTICITY INDEX	WATER CONTENT	SAMPLES TESTED
Gravel	A-1-a(0)	A-1-a	76	10	7	5	2	NP	NP	14	10
Gravel and/or stone fragments with sand	A-1-b(0)	A-1-b	43	22	21	9	6	NP	NP	20	17
Fine sand	A-3(0)	A-3	9	29	62		- 6 -	NP	NP	13	9
Coarse and fine sand	- - - -	A-3a	2	16	56	11	9	NP	NP	16	25
Gravel and/or stone fragments with sand and silt	A-2-4 (0)	A-2-4	42	8	21	19	10	NP	NP	17	19
Gravel and/or stone fragments with sand, silt and clay	A-2-6(0)	A-2-6	52	12	14	12	10	28	13	16	1
Sandy silt	A-4 (4)	A-4a	12	7	26	39	21	NP	NP	21	123
Silt	A-4 (8)	A-4b	2	3	9	60	26	21	4	23	69
Elastic, silt and clay with organic material	A-5(8)	A-5	0	3	9	55	33	42	8	48	1
Silt and clay	A-6 (8)	A-6a	9	4	11	40	36	32	11	22	66
Silty clay	A-6 (12)	A-6b	4	2	5	48	40	37	16	28	6
Elastic clay with organic material unless otherwise noted	A-7-5 (8)	A-7-5	1	3	8	43	45	64	26	54	11
Clay	A-7-6 (14)	A-7-6	1	3	5	34	57	48	22	31	30
Unclassified material											
Random fill		VISUAL CLASSIFICATION									2
Fine-Textured peat		VISUAL CLASSIFICATION									1
Coal		VISUAL CLASSIFICATION									2
Weathered indurated clay		VISUAL CLASSIFICATION									
Weathered shale		VISUAL CLASSIFICATION									15
Weathered sandstone		VISUAL CLASSIFICATION									6
Under Clay		VISUAL CLASSIFICATION									2
Indurated clay		VISUAL CLASSIFICATION									
Shale		VISUAL CLASSIFICATION									11
Sandstone		VISUAL CLASSIFICATION									1
Limestone		VISUAL CLASSIFICATION									

Sod and/or Topsoil = X'=approximate depth.

Berm material

Auger boring - plan view.

Drive rod - plan view.

Drive sample and/or core boring - plan view.

Auger boring plotted to vertical scale only.

Drive rod plotted to vertical scale only.

Drive sample and/or core boring plotted to vertical scale only.

Number of blows for "Standard Penetration" test.
X=number of blows for the first 6 inches.
Y=number of blows for the second 6 inches.

Water content nearly equal to or greater than water content.

Indicates a non-plastic material with high water content.

NOTE: Small vertical figures beside borings indicate loss on ignition. e.g. 15%

NOTE: Figures beside borings indicate water content in percent. e.g. 15

Free water.

S=indicates soft rock interval.

B=indicates broken rock interval.

Samples Tested
Lat. Nos. Sq.

39N55-39N38 incl. 39N55-39N59 incl.
39N0-39N00-39N09 incl.
15W2-15W27 incl. 10W0-10W00 incl.
10W67-16W72 incl. 16W17-16W19 incl.
16W71-16W72 incl. 17W25-17W31 incl.
17W25-17W26 incl. 17W03-17W04 incl.
17W0-17W02 incl. 18W0-18W00 incl.
18W66-18W02 incl. 18W71-18W75 incl.
18W77-18W03 incl. 18W66-18W68 incl.
18W66-18W0 incl. 19W1-19W3 incl.
19W11-19W28 incl. [illegible] incl.
19W75-19W[illegible] incl. [illegible] incl.
[illegible] incl.

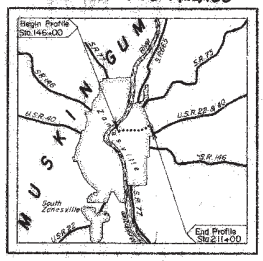
SOIL PROFILE
MUSKINGUM COUNTY
MUS-40-11.78

1/18

OHIO STATE HIGHWAY TESTING LABORATORY
O. S. U. CAMPUS COLUMBUS, OHIO

NOTE: INFORMATION SHOWN BY THIS SUBGRADE PROFILE WAS OBTAINED SOLELY FOR USE IN ESTABLISHING DESIGN CONTROLS FOR THE PROJECT. THE STATE OF OHIO DOES NOT GUARANTEE THE ACCURACY OF THIS DATA AND IT IS NOT TO BE CONSTRUED AS A PART OF THE PLANS GOVERNING CONSTRUCTION OF THE PROJECT.

FED. NO. I-70-7(22)158



LOCATION MAP

Recon. - J.S.M. - 2-1-60

Auger - L.M.F., C.E.G., J.R.G., - 2-29-60 - 3-30-60.

Drilling; Drive Sample-Core Boring - W.A.N., K.D.E., J.A.G., J.H.S., L.W.D., C.S.C., D.W.B., R.L.S., F.R.G., C.R.S., -10-1-59 - 4-6-60.

Drafting - L.N.L., D.J.T. -6-6-60

INDEX

CRAKING	PLAN VIEW SHEET	PROFILE SHEET
Sta. 146+00 to 165+00	5	5
Sta. 165+00 to 188+00	6	6
Sta. 188+00 to 211+00	7	7
Service Road A	5	8
Ramp N	5	9
Ramp O	5	9

CROSS SECTION	PLAN VIEW SHEET	CROSS SECTION SHEET
Sta. 152+00	5	9
Sta. 154+00	5	9
Sta. 156+00	5	10
Sta. 158+00	5	10
Sta. 160+00	5	11
Sta. 162+00	5	11
Sta. 163+00	5	11
Sta. 168+00	6	12
Sta. 171+00	6	12
Sta. 174+00	6	13
Sta. 176+00	6	14
Sta. 182+00	6	15
Sta. 183+00	7	15
Sta. 185+00	7	15
Sta. 190+00	7	16
Sta. 191+00	7	16
Sta. 193+00	7	16
Sta. 195+00	7	17
Sta. 197+00	7	17
Sta. 198+00	7	17
Sta. 201+00	7	15
Sta. 202+00	7	16

SOIL PROFILE
MUSKINGUM COUNTY
MUS-40-11.78
OHIO STATE HIGHWAY TESTING LABORATORY
O. S. U. CAMPUS, COLUMBUS, OHIO

2/18

SUMMARY OF SOIL TEST DATA

NOTE: NP shown in Liquid Limit and Plasticity Index columns indicate that the materials are non-plastic.
*Denotes sample taken at or near grade.

STATION & OFFSET		DEPTH FROM-TO	% ACC.	% C.S.	% F.S.	% SILT	% CLAY	L.L.	P.I.	% W.C.	SHTL CLASS.
			PROPOSED U.S.R. NO.								
146+50	CL	0.0-5.0	23	16	17	31	28	26	9	16	A-4b
		5.0-8.5	65	13	7	6	9	28	11	13	A-2-6
		8.5-15.0	67	16	8	5	4	25	13	10	A-2-6
		15.0-18.0	86	8	2	2	2	24	7	5	A-2-4
150+35	8'Rt	0.0-2.0	2	1	16	40	26	27	6	23	A-4b
		2.0-3.0	0	2	5	64	29	28	6	25	A-4b
		3.0-7.5	0	0	2	57	41	38	10	23	A-6a
		7.5-9.5	0	0	1	78	21	NP	NP	23	A-4b
		9.5-13.0	52	12	11	15	10	28	13	16	A-2-6
		13.0-16.0	71	12	7	8	2	NP	NP	12	A-1-a
		16.0-20.0	81	15	2	2	2	20	0	11	A-2-4
150+80	CL	0.5-2.0	0	1	12	57	25	26	7	22	A-4b
		2.0-5.0	0	1	12	62	25	NP	NP	17	A-4b
		5.0-6.0	0	1	2	51	46	32	10	22	A-4b
		6.0-11.5	0	1	1	65	31	32	9	20	A-4b
		11.5-14.0	17	7	12	41	23	27	7	17	A-4b
		14.0-20.0	50	12	12	14	11	26	8	13	A-2-4
151+70	5'Rt	0.0-0.8	Random Fill - Bricks								Visual
		0.8-2.0	0	1	7	65	27	28	6	22	A-4b
		2.0-7.0	0	1	1	57	41	35	12	23	A-6a
		7.0-10.0	0	0	1	66	33	33	10	17	A-4b
		10.0-15.0	50	7	13	18	11	27	15	13	A-2-4
		15.0-18.5	49	11	16	12	9	21	3	15	A-1-b
		18.5-20.0	Gray Broken Shale							11	Visual
		20.0-21.5	Gray Broken Shale								Visual
151+80	8'Rt	0.0-0.8	Random Fill - Bricks, Cinders & Sand								Visual
		0.8-4.0	0	2	13	62	23	NP	NP	28	A-4b
		4.0-7.5	0	1	2	65	32	36	9	26	A-4b
		7.5-10.5	0	1	2	63	34	32	12	25	A-6a
		10.5-15.0	35	6	14	13	8	25	7	14	A-2-4
		15.0-18.5	49	8	16	8	7	NP	NP	17	A-1-b
		18.5-21.0	Gray Broken Shale							9	Visual
152+70	15'Lt	0.0-5.0	Random Fill - Cinders, Sand, and Brick Bats								Visual
		5.0-10.0	0	1	2	94	13	32	17	10	A-6a
		10.0-15.5	0	1	15	56	27	31	11	20	A-6a
		15.5-18.0	0	2	1	39	58	37	11	17	A-6a
		18.0-21.5	0	1	14	14	70	27	11	8	A-6a
		21.5-23.0	Gray Soft Siliceous Shale							6	Visual
152+75	15'Rt	0.0-2.0	10	8	13	45	24	24	8	20	A-4b
		2.0-7.5	3	4	23	36	34	32	12	23	A-6a
		7.5-11.5	0	0	3	62	35	35	15	21	A-6a
		11.5-14.0	0	2	3	30	65	43	18	19	A-7-6
		14.0-17.0	0	3	6	26	65	44	20	19	A-7-6
154+05	15'Rt	0.5-5.0	55	8	8	24	15	34	11	12	A-6a
		5.0-8.5	46	3	3	20	25	38	15	12	A-6a
		8.5-10.0	Gray Broken Shale							9	Visual
155+52	CL	0.3-5.0	26	17	19	21	15	NP	NP	17	A-4b
		5.0-8.5	6	3	11	53	38	27	3	24	A-4b
		8.5-12.0	18	10	26	22	22	26	7	16	A-4b
		12.0-17.0	16	4	56	19	6	NP	NP	22	A-3a
		17.0-20.0	80	5	38	19	8	NP	NP	14	A-2-4
		20.0-24.0	18	7	36	21	15	NP	NP	12	A-4a
		24.0-26.5	55	2	5	23	37	33	11	24	A-6a
		26.5-30.0	10	1	5	21	63	NP	26	16	A-6b
156+10	25'Rt	0.5-5.0	22	24	16	22	6	NP	NP	14	A-2-4
		5.0-8.0	20	6	17	31	26	31	11	23	A-6a
		8.0-12.0	22	3	26	35	13	21	3	12	A-4b
		12.0-16.0	38	4	10	39	17	30	9	17	A-4a
		16.0-18.0	2	1	4	40	53	41	19	20	A-7-6
		18.0-20.5	23	3	6	29	39	36	13	23	A-6a
		20.5-22.0	Brown and Gray Weathered Shale							12	A-4b
159+00	5'Lt	0.5-1.0	0	7	5	52	36	29	8	20	A-4b
		1.0-6.0	10	4	26	26	34	32	12	22	A-6a
		6.0-8.0	7	5	19	43	26	28	8	27	A-4a
		8.0-11.0	16	7	27	29	21	28	5	20	A-4a
		11.0-16.0	9	2	3	38	48	37	11	17	A-6a
		16.0-18.5	5	4	10	33	48	34	11	22	A-6a
		18.5-21.5	16	4	8	32	40	28	4	19	A-4a
		21.5-24.0	38	2	4	36	20	30	5	20	A-4a
159+85	CL	0.5-3.0	0	10	21	47	22	40	10	15	56	A-6a
		3.0-4.5	13	9	17	32	29	28	3	31	A-4a
160+50	CL	0.3-1.5	0	1	12	54	33	33	13	33	A-6a
		1.5-4.5	0	1	16	45	38	30	11	28	A-6a
		4.5-5.0	Brown Soft Sandy Shale							14	Visual
161+50	CL	0.0-1.5	0	1	5	60	34	53	16	61	A-7-5
		1.5-5.5	19	3	16	27	35	43	13	23	A-6a
162+50	15'Rt	0.5-3.0	6	1	2	60	25	NP	NP	30	A-4b
		3.0-6.0	0	1	6	69	24	NP	NP	26	A-4b
		6.0-7.0	13	9	24	39	19	NP	NP	21	A-4a
		7.0-7.5	6	3	30	41	20	26	6	17	A-4a
162+60	12'Lt	0.5-3.0	0	0	6	49	45	43	20	36	A-7-6
		3.0-7.5	7	4	11	62	16	NP	NP	31	A-4b
		7.5-9.5	0	2	20	60	18	NP	NP	23	A-4b
		9.5-11.5	12	7	19	41	22	24	3	14	A-4a
		11.5-12.0	0	1	11	57	31	28	6	14	A-4b
164+50	CL	0.5-1.5	61	2	10	19	8	27	6	15	A-2-4
166+00	85'Rt	0.5-1.5	0	0	2	41	57	46	16	25	A-7-5
		1.5-5.5	10	4	5	34	47	38	17	15	A-6a
		5.5-8.5	29	0	1	50	20	21	11	9	A-2b
		8.5-9.0	Brownish Gray Weathered Shale							10	Visual
166+60	125'Rt	0.5-2.5	0	3	6	53	38	41	4	36	A-5
		2.5-5.0	0	2	2	45	51	40	16	26	A-7-5
		5.0-7.5	Gray & Brown Weathered Shale							15	Visual
168+00	20'Lt	0.0-2.0	8	11	15	42	23	NP	NP	32	A-4a
		2.0-3.0	Black Bone Coal							16	Visual
		3.0-6.0	0	2	8	69	20	24	5	21	A-4b
		6.0-8.0	0	2	10	59	29	28	6	23	A-4b
		8.0-11.0	0	0	1	56	41	33	13	14	A-6a
		11.0-13.5	8	1	3	51	37	29	5	12	A-4b
168+60	150'Rt	0.7-3.5	0	2	9	55	34	29	5	18	A-4b
		3.5-6.5	Gray & Brown Extremely Weathered Shale							11	Visual
169+50	140'Lt	0.5-4.5	6	1	26	46	19	NP	NP	17	A-4a
		4.5-6.0	Brown & Gray Weathered Siliceous Shale							11	Visual
169+50	75'Lt	0.0-3.5	18	8	18	42	14	NP	NP	23	A-4a
		3.5-7.5	0	1	9	60	30	31	7	22	A-4b
		7.5-11.0	0	1	20	64	15	NP	NP	24	A-4b
		11.0-14.0	0	2	18	65	15	NP	NP	21	A-4b
		14.0-14.5	Black Bone Coal								Visual
		14.5-17.0	Gray Underclay							22	Visual
		17.0-18.5	Gray Underclay							22	Visual
169+50	70'Rt	0.0-3.0	11	5	8	53	27	31	4	31	A-4b
		3.0-5.0	24	5	9	43	20	34	11	24	A-6a
170+75	30'Lt	0.5-1.5	0	2	8	53	36	40	16	38	A-7-5
		1.5-4.0	18	2	15	41	24	25	3	19	A-4b
		4.0-7.5	0	2	15	64	19	21	2	20	A-4b
		7.5-8.0	Coal Blossom								Visual
		8.0-11.0	Gray & Brown Extremely Weathered Shale							7	Visual
		11.0-13.0	Gray Broken Shale							9	Visual
171+50	120'Lt	0.5-3.0	22	3	15	38	22	NP	NP	15	A-4a
171+50	65'Lt	0.7-3.0	27	4	14	38	17	NP	NP	17	A-4a
		3.0-5.5	Brown Broken Shale							10	Visual
171+50	CL	0.5-3.5	0	4	9	58	29	28	5	22	A-4b
		3.5-6.0	31	4	7	42	16	NP	NP	14	A-4a
171+50	65'Rt	0.5-2.0	3	2	11	56	27	28	0	10	A-4b
		2.0-3.0	Brown Extremely Weathered Sandstone							14	Visual
172+70	CL	1.0-3.0	5	4	10	40	33	29	4	16	A-4a
175+85	12'Lt	0.5-4.0	0	0	2	74	24	NP	NP	23	A-4b
		4.0-8.0	0	0	2	78	21	NP	NP	22	A-4b
		8.0-11.5	7	4	4	58	25	22	2	20	A-4a
		11.5-16.5	30	2	0	40	28	28	13	14	A-6a
		16.5-17.5	Gray Extremely Weathered Shale							11	Visual
177+67	CL	0.6-4.0	0	0	2	74	24	NP	NP	23	A-4b
		4.0-7.0	0	0	2	73	25	NP	NP	23	A-4b
		7.0-8.0	0	0	2	77	21	NP	NP	27	A-4b
		8.0-13.5	0	6	6	47	41	33	11	19	A-6a
		13.5-16.5	0	1	5	58	36	41	16	19	A-7-6
		16.5-19.5	0	1	1	42	56	46	22	21	A-7-6
		19.5-21.0	Brown Weathered Siliceous Shale							9	Visual
182+00	11'Lt	0.0-2.0	25	5	10	38	22	NP	NP	27	A-4a
184+50	45'Lt	0.5-2.0	4	1	10	49	36	37	12	20	A-6a
		2.0-6.0	16	3	7	36	38	35	7	16	A-4b
		6.0-8.5	12	7	10	17	54	32	6	12	A-4a
185+00	25'Rt	0.0-3.0	32	23	13	23	9	NP	NP	27	A-2-4
		3.0-6.0	14	6	7	24	47	41	12	31	A-7-6
186+00	CL	1.0-4.0	6	2	2	57	33	35	7	31	A-4b
		4.0-5.5	0	3	4	41	52	44	6	24	A-5
		5.5-6.0	Gravel								Visual
		6.0-7.0	0	4	10	50	34	36	5	21	A-4b
186+00	30'Rt	0.0-2.0	28	11	21	23	15	NP	NP	15	A-4a
		2.0-5.0	6	4	17	36	37	32	2	20	A-4b
		5.0-7.0	13	10	11	20	46	42	11	25	A-6a
187+00	21'Lt	0.0-2.0	0	12	21	34	33	35	9	19	A-4a
		2.0-4.5	32	11	15	21	21	35	12	25	A-6a
187+00	45'Rt	0.0-1.0	0	4	18	60	17	NP	NP	26	A-4b
		1.0-3.5	0	5	0	53	35	NP	NP	31	A-4b
		3.5-4.0	15	0	12	33	39	NP	NP	22	A-4a
188+00	35'Lt	0.0-1.5	16	19	15	33	21	NP	NP	27	A-4a
		1.5-4.0	0	14	12	42	32	33	0	35	A-4a
188+00	15'Lt	0.0-3.5	NP	23	20	3	6	NP	NP	33	A-1-b
188+00	CL	0.5-3.5	10	8	16	32	34	48	14	33	A-7-6
		3.5-4.5	0	9	10	44	37	36	20	30	A-6a
189+00	45'Lt	0.3-3.0	4	8	14	32	42	37	11	29	A-6a
189+00	25'Lt	0.0-0.8	19	13	12	36	19	56	12	71	A-7-5
		0.8-4.5	11	10	0	26	53	42	13	40	A-7-6
		4.5-6.0	8	6	4	40	42	37	11	31	A-6a
189+00	10'Lt	0.0-4.0	0	4	8	73	15	46	16	30	A-7-5
		4.0-6.0	61	12	10	10	6	NP	NP	24	A-1-b
189+00	CL	0.0-1.0	0	4	14	58	24	64	16	68	A-7-5
		1.0-3.5	6	4	7	50	33	37	6	32	A-4b
		3.5-5.0	0	8	13	36	43	35	12	32	A-6a
190+00	40'Lt	0.0-1.5	0	4	8	60	30	70	28	31	A-7-5
		1.5-4.5	0	2	9	42	47	46	16	33	A-7-6
190+00	20'Lt	0.0-1.0	0	8	13	55	23	31	7	34	A-4b
		1.0-6.0	15	17	15	27	26	32	5	23	A-4a
		6.0-8.0	0	2	1	26	71	61	20	11	A-7-5
190+00	CL	0.0-1.5	Dark Brown Fine-Textured Peat							70	Visual
		1.5-2.0	65	10	11	9	5	NP	NP	27	A-1-a
190-31	6'Lt	0.0-3.0	0	3	13	50	34	28	11	30	A-6a
		3.0-5.0	8	3	10	45	34	37	15	25	A-6a
		5.0-10.0	Brown Weathered Sandstone							15	Visual
191+00	50'Lt	0.3-3.0	0	6	22	50	22	NP	NP	25	A-4b
		3.0-6.0	0	1	9	54	36	42	17	18	A-7-6
191+00	25'Lt	0.0-1.0	0	3	16	59	20	NP	NP	33	A-4b
		1.0-3.0	9	5	13	52	21	NP	NP	26	A-4b
		3.0-4.5	32	7	16	28	17	NP	NP	23	A-4a
191+00	25'Rt	0.0-1.5	0	7	5	12	76	40	11	26	A-6a
		1.5-3.5	Coal								Visual
192+00	CL	0.5-3.0	0	3	10	63	24	27	3	27	A-4b
		3.0-5.0	0	1	7	45	47	39	12	37	A-6a

SOIL PROFILE
MUSKINGUM COUNTY
MUS - 40 - 11.78

OHIO STATE HIGHWAY TESTING LABORATORY
O. S. U. CAMPUS, COLUMBUS, OHIO

3/18

SUMMARY OF SOIL TEST DATA

NOTE: NP shown in Liquid Limit and Plasticity Index columns indicate that the material is non-plastic.
*Denotes sample taken at or near grade.

STATION & OFFSET	DEPTH FROM-TO	% AGG.	% C.S.	% F.S.	% SILT	% CLAY	L.L.	P.I.	% W.C.	SMTL CLASS.
				PROPOSED U.S.R. NO						
100+00 25'Rt	0.0-1.5	35	18	15	17	14	NP	NP	37	A-2-4
	1.5-4.0	0	7	6	50	37	32	11	22	A-6a
100+00 120'Lt	0.0-5.5	0	1	7	68	23	NP	NP	23	A-4b
	5.5-10.0	0	1	33	17	28	NP	NP	19	A-4b
	10.0-13.0	3	17	72		- 8 -	NP	NP	10	A-4
	13.0-16.0	0	8	77		-15 -	NP	NP	13	A-4a
103+00 65'Lt	1.0-5.0	0	2	17	26	25	36	13	19	A-6a
	5.0-10.0	0	11	74	7	8	NP	NP	9	A-3a
	10.0-12.0	6	26	52	6	6	NP	NP	5	A-3a
105+00 CL	0.0-2.0	7	13	45	23	16	NP	NP	12	A-1a
	2.0-5.0	0	7	16	38	39	32	12	19	A-6a
102+00 55'Rt	0.0-1.5	30	19	12	10	9	NP	NP	30	A-1-b
	1.5-2.7	16	6	13	44	21	22	3	22	A-4b
100+00 30'Rt	1.0-2.0	0	6	13	42	39	76	41	56	A-7-5
	2.0-5.0	0	5	15	42	38	46	19	43	A-7-5
	5.0-6.0	0	1	10	28	21	32	8	23	A-4b
100+00 100'Rt	0.0-1.5	5	19	22	28	17	22	1	31	A-4a
	1.5-4.0	0	1	13	45	36	45	21	45	A-7-5
	4.0-5.5	0	2	11	38	49	61	22	42	A-7-5
105+00 90'Rt	0.0-1.5	28	27	25	12	7	NP	NP	12	A-1-b
	1.5-6.8	27	12	17	28	15	NP	NP	13	A-4b
105+00 120'Rt	0.0-1.5	0	0	11	52	31	28	5	26	A-4b
	1.5-2.0	Brown Weathered Sandstone							11	Visual
105+50 CL	0.5-3.0	0	17	15	18	50	28	6	11	A-4a
	3.0-8.0	0	28	57	15	0	NP	NP	11	A-3a
	8.0-13.0	18	21	43		- 7 -	NP	NP	11	A-3
	13.0-16.0	15	32	37		- 8 -	NP	NP	21	A-3a
	16.0-17.0	7	22	22	25	24	33	12	23	A-4a
105+50 50'Rt	0.0-3.0	0	0	4	15	81	43	19	26	A-7-6
107+00 50'Lt	0.5-4.0	1	20	20	25	13	NP	NP	11	A-4a
	4.0-8.0	10	11	35	22	21	NP	NP	22	A-4a
107+00 CL	0.5-4.0	1	0	22	26	29	25	1	20	A-4a
107+00 70'Rt	1.0-5.0	15	15	24	27	19	NP	NP	25	A-4b
108+00 50'Lt	1.0-3.0	0	12	19	19	27	NP	NP	15	A-4a
	3.0-5.0	0	12	47	25	16	NP	NP	29	A-4a
110+50 100'Lt	0.0-1.5	34	1	34	16	12	NP	NP	22	A-2-4
110+50 50'Lt	0.0-2.5	8	3	16	24	49	NP	NP	21	A-4a
110+50 CL	0.0-3.5	Brown Extremely Weathered Sandstone							12	Visual
110+50 55'Rt	0.0-6.0	0	1	16	42	40	35	12	25	A-6a
	6.0-12.0	Brown Extremely Weathered Sandstone							11	Visual
109+00 CL	0.5-1.0	0	0	5	28	67	45	24	21	A-7-6
	1.0-4.0	5	2	43	28	19	NP	NP	12	A-4a
	4.0-6.5	16	2	43	26	13	NP	NP	15	A-4a
200+00 CL	0.5-2.5	0	1	43	27	29	NP	NP	19	A-4a
	2.5-4.5	Grayish-Brown Weathered Sandstone							11	Visual
201+50 150'Lt	0.0-3.0	0	7	18	28	47	NP	NP	34	A-4a
201+50 100'Lt	0.0-2.0	0	12	40	34	14	NP	NP	22	A-4a
	2.0-5.5	24	20	34	21	11	NP	NP	25	A-3a
201+50 50'Lt	0.0-3.0	0	15	64	15	10	NP	NP	21	A-3a
	3.0-4.5	57	6	27	5	5	NP	NP	10	A-1-b
201+50 CL	0.0-2.0	6	13	50	25	16	NP	NP	22	A-4a
	2.0-3.3	24	6	46	17	7	NP	NP	20	A-3a
201+50 50'Rt	0.0-2.5	5	6	35	37	17	21	5	20	A-4a
	2.5-4.2	25	5	45	15	10	NP	NP	23	A-3a
201+50 100'Rt	0.0-3.0	10	11	47	20	12	NP	NP	19	A-3a
	3.0-5.0	29	11	42	8	10	NP	NP	27	A-3a

STATION & OFFSET	DEPTH FROM-TO	% AGG.	% C.S.	% F.S.	% SILT	% CLAY	L.L.	P.I.	% W.C.	SMTL CLASS.
				PROPOSED U.S.R. NO						
201+50 150'Rt	0.0-5.0	11	13	46	19	11	NP	NP	19	A-3a
	5.0-5.5	22	9	28	7	8	NP	NP	19	A-1-b
201+75 150'Lt	0.0-3.2	1	7	12	31	49	NP	NP	19	A-4a
201+75 100'Lt	0.0-1.0	0	9	29	20	27	NP	NP	27	A-4a
	1.0-3.5	20	4	41	26	9	NP	NP	19	A-2-4
201+75 50'Lt	0.0-3.0	0	13	45	28	16	NP	NP	23	A-4a
	3.0-5.8	0	2	17	35	26	35	6	14	A-4b
201+75 CL	0.5-3.5	0	18	43	22	17	NP	NP	23	A-3a
	3.5-5.0	1	10	47	26	11	NP	NP	37	A-3a
201+75 50'Rt	0.0-2.0	0	9	43	31	17	NP	NP	20	A-4a
	2.0-3.0	0	9	43	30	18	29	1	15	A-4a
201+75 100'Rt	0.0-2.0	1	14	46	19	18	NP	NP	30	A-4a
	2.0-3.1	33	6	26	8	7	NP	NP	26	A-1-b
201+75 150'Rt	0.0-2.5	0	1	33	18	15	NP	NP	25	A-4a
	2.5-4.1	0	3	23	36	38	35	13	27	A-6a
202+50 CL	0.0-1.5	21	14	33	10	14	NP	NP	15	A-2-4
	1.5-4.5	13	8	16	17	15	NP	NP	17	A-2a
204+50 CL	0.0-5.0	0	1	0	13	86	66	37	31	A-7-5
	5.0-8.0	0	0	0	14	86	68	36	33	A-7-5
	8.0-10.0	0	0	0	14	86	66	31	33	A-7-5
	10.0-12.0	0	6	27	14	53	NP	NP	21	A-4a
207+00 CL	0.5-4.0	12	28	57		- 3 -	NP	NP	7	A-3
	4.0-5.5	24	42	25		- 9 -	NP	NP	22	A-1-b
	5.5-7.0	0	6	5	34	55	56	27	37	A-7-6
	7.0-12.0	0	4	8	32	56	58	28	37	A-7-5
	12.0-18.0	0	3	2	12	83	50	27	42	A-7-6
208+50 CL	0.0-5.0	0	1	5	64	30	30	8	16	A-4b
	5.0-7.5	0	1	1	65	33	29	9	20	A-4b
	7.5-9.0	0	2	1	75	19	NP	NP	12	A-4b
	9.0-13.0	0	15	56	11	18	NP	NP	11	A-3a
	13.0-16.0	0	13	65		7	15	NP	NP	6	A-3a
209+75 CL	0.5-1.5	0	13	73	5	9	NP	NP	7	A-3a
	1.5-5.5	0	0	95	3	2	NP	NP	5	A-3
	5.5-7.0	28	28	35		- 3 -	NP	NP	7	A-1-b
	7.0-12.0	1	39	35		- 3 -	NP	NP	7	A-1-b
	12.0-16.0	1	51	42		- 3 -	NP	NP	8	A-3a
				SERVICE ROAD "A"						
1+75 15'Rt	0.5-1.5	15	8	4	50	23	32	9	20	A-4b
	1.5-4.0	20	1	22	30	27	33	13	16	A-4a
	4.0-7.0	0	1	4	55	40	38	7	20	A-4b
	7.0-9.0	0	3	21	42	34	30	9	18	A-4b
	9.0-11.0	0	0	6	68	26	NP	NP	23	A-4b
	11.0-15.0	0	2	11	56	31	27	7	27	A-4b
2+00 CL	0.0-2.0	Random Fill - Cinders								Visual
	2.0-5.0	7	4	23	36	27	NP	NP	23	A-4a
	5.0-9.5	21	4	23	38	14	25	5	14	A-4a
	9.5-11.0	14	5	3	30	47	33	6	14	A-4a
	11.0-12.5	Gray Weathered Shale							11	Visual
	12.5-17.0	Gray Weathered Shale							10	Visual
	17.0-20.0	Gray Weathered Shale							10	Visual
5+05 16'Lt	0.0-5.0	Brown Broken Siliceous Shale								Visual
	5.0-6.0	Brown Broken Siliceous Shale							8	Visual
6+50 20'Lt	0.5-3.0	Brown Soft Sandstone							7	Visual
		RAMP "M"								
7+52 7'Rt	0.5-2.0	3	5	0	53	34	29	7	26	A-4b
	2.0-3.5	0	0	11	43	45	42	15	29	A-6a
	3.5-6.5	0	1	3	12	84	50	23	31	A-7-6
	6.5-8.0	10	8	0	37	33	31	12	26	A-6a
8+55 29'Lt	0.5-2.0	0	0	11	49	34	48	17	42	A-7-6
	2.0-5.0	20	2	14	31	34	29	11	30	A-6a

STATION & OFFSET	DEPTH FROM-TO	% AGG.	% C.S.	% F.S.	% SILT	% CLAY	L.L.	P.I.	% W.C.	SMTL CLASS.
				RAMP "M" (Cont'd)						
9+82 28'Lt	0.5-3.0	7	4	11	47	31	28	11	28	A-6a
	3.0-5.0	0	4	16	45	35	33	11	30	A-6a
10+08 CL	0.5-2.5	0	1	23	49	27	20	9	20	A-4a
	2.5-5.5	8	1	21	47	22	27	7	13	A-4a
	5.5-6.0	Brown Soft Sandy Shale							8	Visual
12+25 CL	0.0-2.0	Random Fill - Cinders								Visual
	2.0-4.5	16	7	25	31	18	NP	NP	22	A-4a
	4.5-6.0	14	5	27	32	22	NP	NP	36	A-4a
	6.0-8.0	15	5	23	33	24	NP	NP	21	A-4a
	8.0-10.0	24	6	21	18	29	28	9	20	A-4a
	10.0-13.0	43	2	4	35	16	32	6	17	A-4a
	13.0-16.0	36	3	5	30	26	34	11	15	A-6a
15+63 28'Lt	0.0-0.5	Random Fill - Bricks								Visual
	0.5-3.0	9	4	20	46	25	NP	NP	21	A-4a
	3.0-6.0	9	6	10	26	29	NP	NP	21	A-4a
	6.0-8.0	16	9	40	17	15	NP	NP	12	A-2-4
	8.0-11.0	3	7	51	29	10	NP	NP	20	A-4a
	11.0-18.0	0	2	60	11	6	NP	NP	13	A-3a
	18.0-20.0	12	7	38	21	17	NP	NP	15	A-4a
	20.0-25.0	38	5	27	24	8	NP	NP	12	A-2-4
	25.0-27.0	9	3	15	34	39	28	7	20	A-6a
17+17 CL	0.5-5.0	0	1	3	55	41	30	12	23	A-6a
	5.0-8.5	0	0	2	67	31	31	11	22	A-6a
	8.5-12.5	0	0	1	70	29	28	9	25	A-4b
	12.5-16.0	6	4	17	59	14	NP	NP	22	A-4b
	16.0-17.0	50	7	16	18	9	23	5	18	A-2-4
	17.0-20.0	17	10	17	17	9	23	4	12	A-2-4
	20.0-23.5	18	6	18	15	43	NP	NP	16	A-4a
	23.5-25.0	28	2	16	18	35	NP	NP	21	A-4a
	25.0-26.0	11	4	13	36	36	31	13	20	A-6a
	26.0-29.0	0	6	9	47	38	30	11	14	A-6a
	29.0-30.0	Gray & Dark Gray Extremely Weathered Shale							14	Visual
		RAMP "R"								
2+00 10'Rt	0.0-3.0	Random Fill - Brown Silt, Sand, Gravel & Cinders								Visual
	3.0-8.0	0	6	11	42	37	41	17	23	A-7-6
	8.0-10.0	9	4	20	46	21	NP	NP	19	A-4a
	10.0-12.5	0	4	5	53	38	33	8	38	A-4b
	12.5-16.0	Gray Weathered Shale							16	Visual
	16.0-18.5	Gray Weathered Shale							11	Visual
	18.5-20.0	Gray Weathered Shale							10	Visual
5+00 18'Lt	0.5-5.0	14	4	26	29	27	28	3	15	A-4a
	5.0-8.0	13	12	25	31	19	24	3	13	A-4a
	8.0-10.0	28	5	28	24	15	20	2	16	A-4a
	10.0-14.5	10	6	20	47	17	NP	NP	16	A-4a
	14.5-16.5	52	1	12	22	13	26	4	10	A-2-4
8+63 CL	0.5-3.5	2	4	33	46	21	27	4	19	A-4a
	3.5-6.5	0	3	25	30	36	36	12	23	A-6a
	6.5-8.0	Gray & Brown Weathered Shale							9	Visual
	8.0-11.0	Gray & Brown Weathered Shale							9	Visual
	11.0-15.0	Gray & Brown Weathered Shale							7	Visual
10+58 7'Rt	0.5-2.0	0	5	11	62	22	47	12	18	A-7-5
	2.0-4.5	0	2	13	62	23	43	13	26	A-5
	4.5-6.5	32	7	15	29	22	29	8	38	A-4a
11+45 10'Rt	0.0-2.5	0	5	12	64	19	41	10	54	A-5
	2.5-6.0	27	10	18	29	16	27	6	33	A-4a
12+50 8'Rt	0.0-2.0	15	8	11	17	49	31	8	37	A-4a
	2.0-4.0	7	3	14	45	31	23	11	24	A-6a
	4.0-6.0	33	5	14	28	20	22	11	29	A-6a

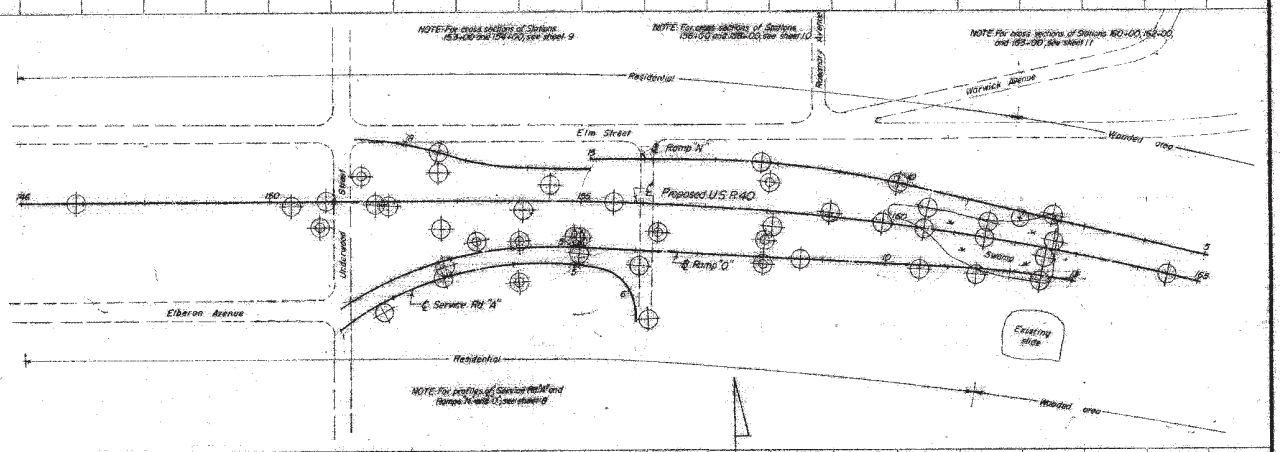
SOIL PROFILE
MUSKINGUM COUNTY
MUS-40-11.78
4/18
OHIO STATE HIGHWAY TESTING LABORATORY
O. S. U. CAMPUS, COLUMBUS, OHIO

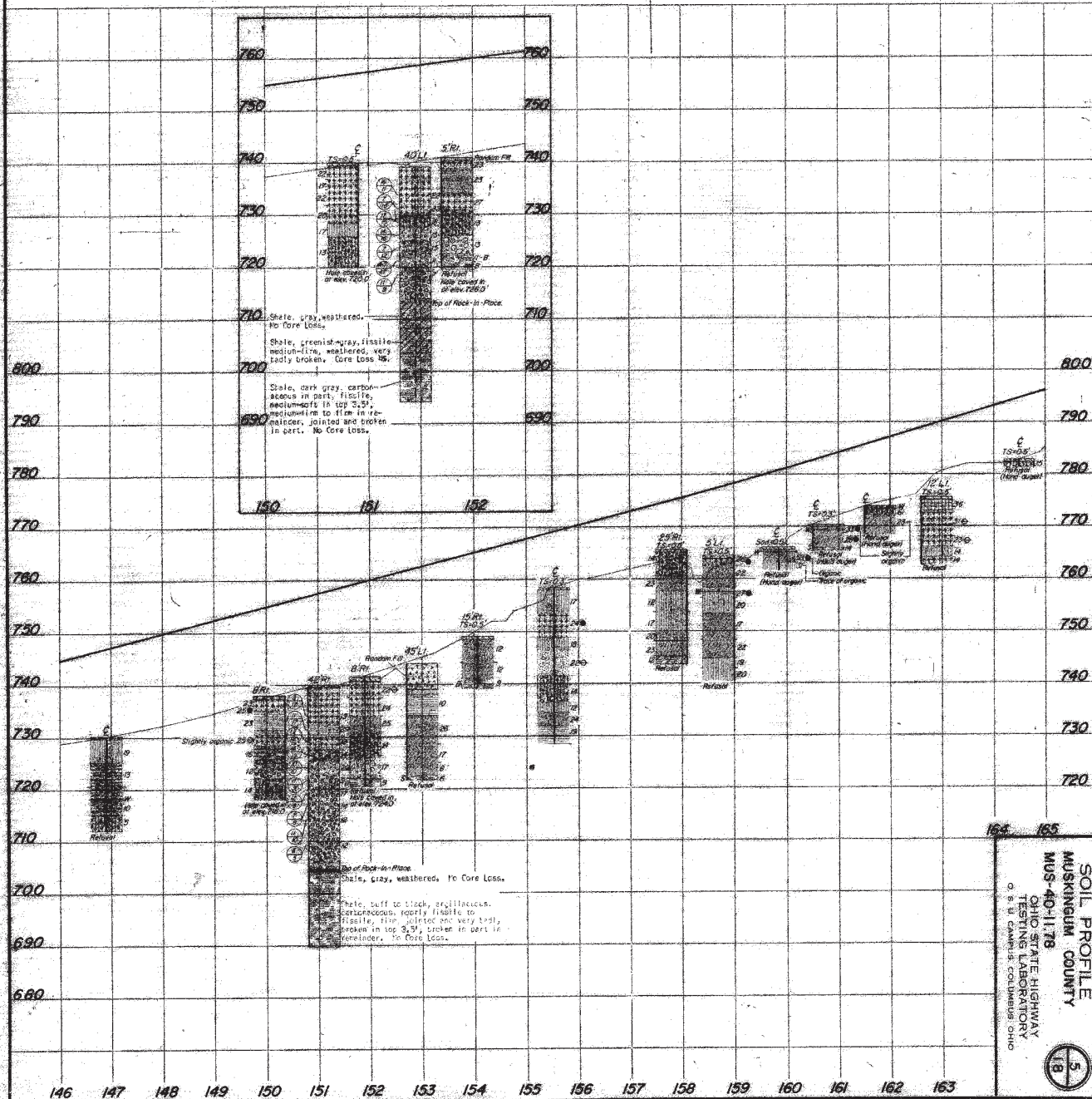
DRIVE SAMPLE BORING SOIL TEST DATA

NOTE: NP shown in Liquid Limit and Plasticity Index columns indicates that the material is non-plastic.
*Denotes sample taken at or near grade.

STATION	OFFSET	DEPTH FROM-TO	% AGG.	% C.S.	% F.S.	% SILT	% CLAY	L.L.	P.I.	% W.C.	SHTL CLASS.
150+80	42'Rt	5.0-6.0	0	1	46	66	33	28	7	16	A-4b
		7.5-8.5	0	1	3	96	97	NP	20	29	A-6b
		10.0-11.0	0	1	10	70	19	25	4	13	A-4b
		12.5-13.5	72	6	9	10	3	25	6	11	A-1-b
		15.0-16.0	58	8	8	16	7	27	8	20	A-1-b
		17.5-18.5	85	7	4	- 4 -		NP	NP	9	A-1-a
		20.0-21.0	80	10	6	- 4 -		NP	NP	17	A-1-a
		22.5-23.5	81	10	6	- 3 -		NP	NP	11	A-1-a
		25.0-26.0	88	8	3	- 3 -		NP	NP	12	A-1-a
		30.0-31.0	78	16	3	- 3 -		NP	NP	12	A-1-a
151+85	40'Lt	5.0-6.0	0	1	6	62	31	31	9	22	A-4b
		7.5-8.5	0	0	1	64	35	32	10	22	A-4b
		10.0-11.0	0	6	6	41	8	30	10	16	A-2-4
		12.5-13.5	85	10	11	7	10	NP	NP	15	A-1-b
		15.0-16.0	97	10	13	9	5	NP	NP	15	A-1-a
		17.5-18.5	83	11	11	13	6	NP	NP	11	A-1-b
		20.0-21.0	85	7	5	- 3 -		NP	NP	7	A-1-a
153+00	47'Rt	2.5-3.5	0	15	36	31	21	NP	NP	21	A-1-b
		5.0-6.0	7	9	30	16	18	NP	NP	25	A-4b
		10.0-11.0	2	8	19	19	28	31	8	21	A-4a
		12.5-13.5	6	8	7	45	34	38	5	18	A-4a
170+45	38'Lt	5.0-6.0	Brown Silty Clay					30	12	34	A-7-5
173+00	100'Rt	5.0-6.0	1	7	13	52	27	NP	NP	16	A-4b
174+17	CL	2.5-3.5	0	1	2	76	18	NP	NP	25	A-4b
		5.0-6.0	0	6	7	59	28	28	9	17	A-4b
175+72	108'Rt	5.0-6.0	0	0	1	66	33	NP	NP	26	A-4b
		10.0-11.0	0	7	7	53	33	31	6	19	A-4b
175+77	7'Lt	2.0-3.0	0	0	1	72	27	35	11	25	A-6a
		5.0-6.0	0	0	3	81	16	NP	NP	27	A-4b
		10.0-11.0	0	5	6	55	34	36	13	25	A-6a
175+86	136'Lt	5.0-6.0	0	0	1	83	16	NP	NP	28	A-4b
		10.0-11.0	0	6	3	41	47	37	13	25	A-6b
		12.5-13.5	0	6	6	39	47	41	16	20	A-7-6
		14.5-15.0	6	4	3	58	35	36	15	28	A-6a
177+65	32'Lt	2.5-3.5	0	0	2	67	31	36	16	26	A-6a
		5.0-6.0	0	0	1	63	36	27	3	25	A-4b
		10.0-11.0	0	3	2	35	60	54	24	26	A-7-6
178+74	119'Rt	5.0-6.0	0	2	6	53	39	34	13	21	A-6a
		10.0-11.0	0	3	11	59	27	27	6	21	A-4b
		15.0-16.0	0	5	38	45	17	24	6	14	A-4a
179+32	81'Lt	5.0-6.0	4	6	20	47	23	22	6	13	A-4a
		10.0-11.0	0	6	21	51	22	22	4	24	A-4b
		15.0-15.6	15	19	12	22	32	27	6	17	A-4a
182+00	82'Lt	0.0-1.0	0	1	9	58	31	28	10	28	A-6a
		1.5-2.0	0	1	13	43	43	34	10	21	A-4a
		2.0-2.6	3	2	30	35	30	25	4	16	A-4a
		2.6-5.0	0	4	19	52	27	31	8	27	A-4b
		5.0-6.0	0	1	51	28	20	NP	NP	13	A-4a
182+00	75'Rt	0.0-5.0	0	1	5	51	43	34	10	21	A-6a
		5.0-6.0	0	2	18	46	33	32	11	17	A-6a
184+13	21'Lt	0.0-5.0	0	3	8	64	24	NP	NP	24	A-4b
*		5.0-6.0	5	2	9	62	22	NP	NP	20	A-4b
193+09	65'Lt	5.0-6.0	0	15	73	- 12 -		NP	NP	14	A-3a
		10.0-11.0	8	27	45	9	11	NP	NP	15	A-2a
		15.0-16.0	0	26	60	- 14 -		NP	NP	11	A-3a
		18.0-21.0	0	1	2	74	23	30	9	25	A-4b
		25.0-26.0	0	2	33	40	25	28	7	24	A-4a
		30.0-31.0	0	1	13	55	31	30	6	24	A-4b
195+30	35'Lt	5.0-6.0	0	27	56	6	8	NP	NP	16	A-3a
		10.0-11.0	0	38	54	- 8 -		NP	NP	23	A-3
		15.0-16.0	11	51	23	- 15 -		NP	NP	21	A-1-b
		25.0-26.0	0	0	1	21	78	56	29	26	A-7-6
		30.0-31.0	0	1	4	43	52	33	12	23	A-6a
*191+00	CL	00-4.5	0	9	17	52	22	-	-	56	A-4b
		4.5-5.0	0	14	29	34	23	-	-	44	A-4b
		5.0-7.5	28	23	14	29	14	NP	NP	29	A-4b
		7.5-8.5	28	15	13	28	16	28	7	22	A-4b

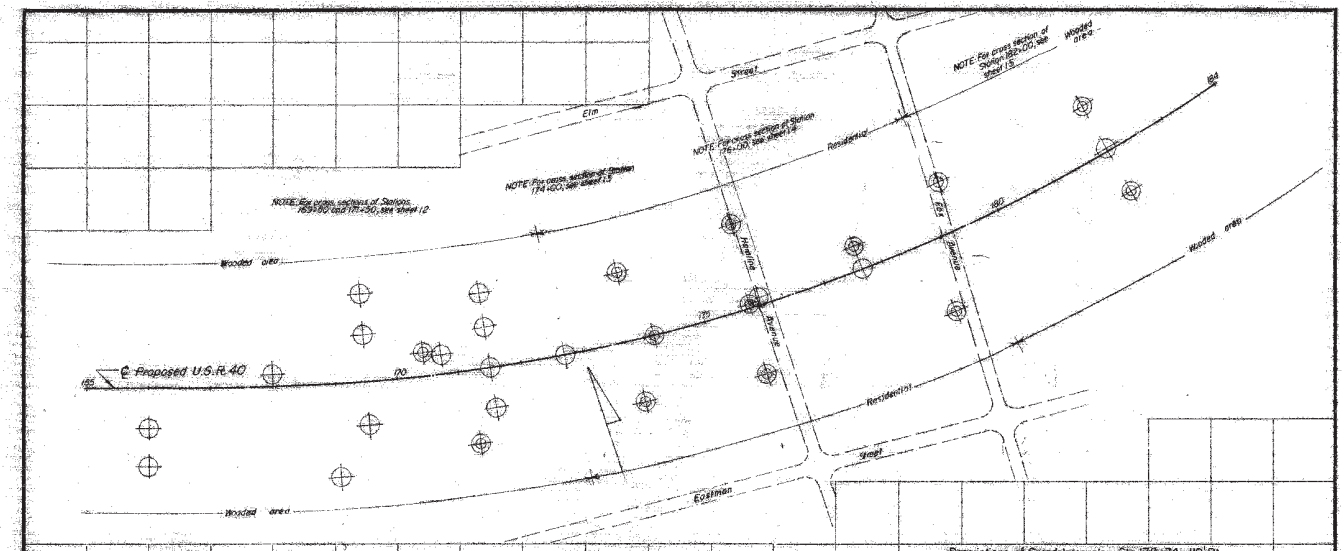
STATION	OFFSET	DEPTH FROM-TO	% AGG.	% C.S.	% F.S.	% SILT	% CLAY	L.L.	P.I.	% W.C.	SHTL CLASS.
200+00	10'Rt	0.0-1.5	0	4	26	52	18	NP	NP	24	A-4a
		1.5-2.0	0	3	31	46	20	NP	NP	22	A-4a
		2.0-5.0	0	4	43	33	20	NP	NP	15	A-4a
200+45	CL	0.0-1.0	6	4	39	38	13	NP	NP	28	A-4a
		1.0-2.0	0	5	45	32	18	NP	NP	22	A-4a
		2.0-5.0	0	3	51	31	15	NP	NP	17	A-4a
210+27	66'Lt	0.0-3.0	0	32	60	- 8 -		NP	NP	0	A-3
		3.0-5.0	11	34	47	- 8 -		NP	NP	11	A-3
		5.0-6.0	6	21	63	- 6 -		NP	NP	20	A-3
		10.0-11.0	26	10	37	- 7 -		NP	NP	22	A-3
		15.0-16.0	24	33	36	- 7 -		NP	NP	19	A-1-b
		20.0-21.0	0	1	2	16	81	55	28	43	A-7-5
		25.0-26.0	0	1	0	4	95	60	33	40	A-7-6
		30.0-31.0	0	1	0	21	78	61	32	41	A-7-6
		35.0-36.0	0	0	0	13	87	53	25	28	A-7-6
		40.0-41.0	0	0	0	34	66	40	15	22	A-6a
		15.0-16.0	0	2	76	11	9	NP	NP	26	A-3a
						SERVICE ROAD "A"					
4+00	30'Rt	5.0-6.0	23	9	15	30	23	32	12	21	A-6a
						RAMP "D"					
12+10	34'Lt	2.0-3.0	19	19	24	20	18	20	5	18	A-4a
		5.0-6.0	14	12	18	27	29	26	6	26	A-4b
		7.5-8.5	21	16	23	24	16	27	5	22	A-4a
		10.0-11.0	5	5	30	39	21	NP	NP	20	A-4b
		12.5-13.5	0	1	12	56	31	23	7	28	A-4b
		15.0-16.0	0	3	23	46	18	NP	NP	16	A-4a
		17.5-18.5	0	11	33	37	19	NP	NP	16	A-4a
		20.0-21.0	0	0	2	56	42	31	6	18	A-4b
						RAMP "C"					
3+50	18'Lt	2.5-3.5	25	2	14	40	19	28	4	19	A-4a
		5.0-6.0	10	16	42	30	14	NP	NP	18	A-4a
		7.5-8.5	10	17	15	44	20	26	6	22	A-4a
		10.0-11.0	8	5	7	58	30	29	7	17	A-4b
		12.5-13.5	0	2	9	58	31	28	7	23	A-4b
		15.0-16.0	8	15	33	31	23	NP	NP	18	A-4a
		17.5-18.5	27	2	10	28	28	30	10	27	A-4a
		20.0-21.0	8	4	26	58	20	NP	NP	18	A-4a
		27.5-28.5	5	4	5	46	38	35	7	20	A-4a
5+10	18'Lt	2.5-3.5	36	8	27	15	14	NP	NP	20	A-2-4
		5.0-6.0	0	10	45	27	18	NP	NP	19	A-4a
		7.5-8.5	10	15	23	32	20	21	1	19	A-4a
		10.0-11.0	0	1	22	46	31	29	6	15	A-4a
		12.5-13.5	0	6	16	55	23	29	5	14	A-4b
		15.0-16.0	0	1	9	67	23	28	7	15	A-4b
		17.5-18.5	13	6	14	46	21	29	6	12	A-4a
6+35	32'Lt	5.0-6.0	0	4	38	36	10	NP	NP	10	A-4a
		7.5-8.5	19	4	50	23	9	NP	NP	16	A-3a
		10.0-11.0	16	3	37	24	20	NP	NP	17	A-4a
		15.0-16.0	0	6	10	46	35	28	4	22	A-4b
		20.0-21.0	14	1	4	37	44	40	14	23	A-6a
8+05	10'Rt	2.5-3.5	0	3	35	43	19	NP	NP	20	A-4a
		5.0-6.0	0	0	4	60	36	33	12	17	A-6a





SOIL PROFILE
MUSKINGUM COUNTY
MUS-40-11.78
OHIO STATE HIGHWAY TESTING LABORATORY
O. S. U. CAMPUS, COLUMBUS, OHIO

5/18



Descriptions of Cored Intervals – Sta.179+32 – 81' Lt.

A. Sandstone, light gray, medium-fine- to fine-grained, micaceous along bedding planes, argillaceous in part, firm, thin-bedded, badly broken. Core Loss 22%.

B. Shale, buff, argillaceous, fissile in part, medium-firm, very badly broken. Core Loss 9%.

C. Sandstone, gray to buff, medium-fine- to fine-grained, micaceous along bedding planes, argillaceous in part, grading intermittently into a buff, siliceous, micaceous in part, medium-firm, fissile, shale, firm, thin-bedded, broken. Core Loss 12%.

D. Sandstone, light gray to gray, medium-fine-grained grading to fine-grained at base, becoming argillaceous below elev. 820.0' slightly micaceous, hard, thin-bedded. No Core Loss.

E. Shale, gray, siliceous, micaceous, fissile, firm, interbedded with a gray, fine-grained, argillaceous, micaceous, firm, thin-bedded, sandstone. Core loss 7%.

F. Shale, dark gray, argillaceous, siliceous in part, fissile, firm, broken below elev. 815.0'. Core Loss 2%.

G. Coal, partly fissile, broken. No Core Loss.

H. VOID-COAL MINE.

I. Mine waste. Core Loss 6%.

J. Shale, dark gray, slightly micaceous and siliceous, fissile, firm, broken. Core Loss 30%.

K. Indurated clay, dark gray, slickensided, medium-firm, badly broken. Core Loss 15%.

Descriptions of Cored Intervals – Sta.178+74 – 119' Rt.

A. Sandstone, buff, fine-grained, micaceous, soft above elev. 808.1', medium-firm in remainder, thin-bedded, extremely weathered above elev. 800.8', weathered in remainder, badly broken below elev. 802.1', broken in remainder. Core Loss 35%.

B. Shale, buff, soft, weathered, badly broken. Core Loss 10%.

C. Sandstone, buff, fine-grained, medium-firm to firm, weathered in part, badly broken. No Core Loss.

D. Shale, brownish-gray, siliceous and micaceous in part, fissile in part, medium-firm, weathered, badly broken. Core Loss 29%.

E. Sandstone, buff, fine-grained, micaceous along bedding planes, medium-firm, thin-bedded, weathered in part, badly broken. Core loss 5%.

F. Sandstone, buff and gray, medium-fine-grained grading to fine-grained at base, micaceous on bedding planes, argillaceous at base, firm to hard, thin-cross-bedded, tending to part along bedding planes, broken in part. Core Loss. 1%.

G. Shale, gray to dark gray, siliceous and micaceous in part containing carbonaceous material in part, fissile, firm to hard, broken in part, interbedded with a gray, fine-grained, micaceous, hard, thin-bedded, broken in part sandstone. Core Loss 1%.

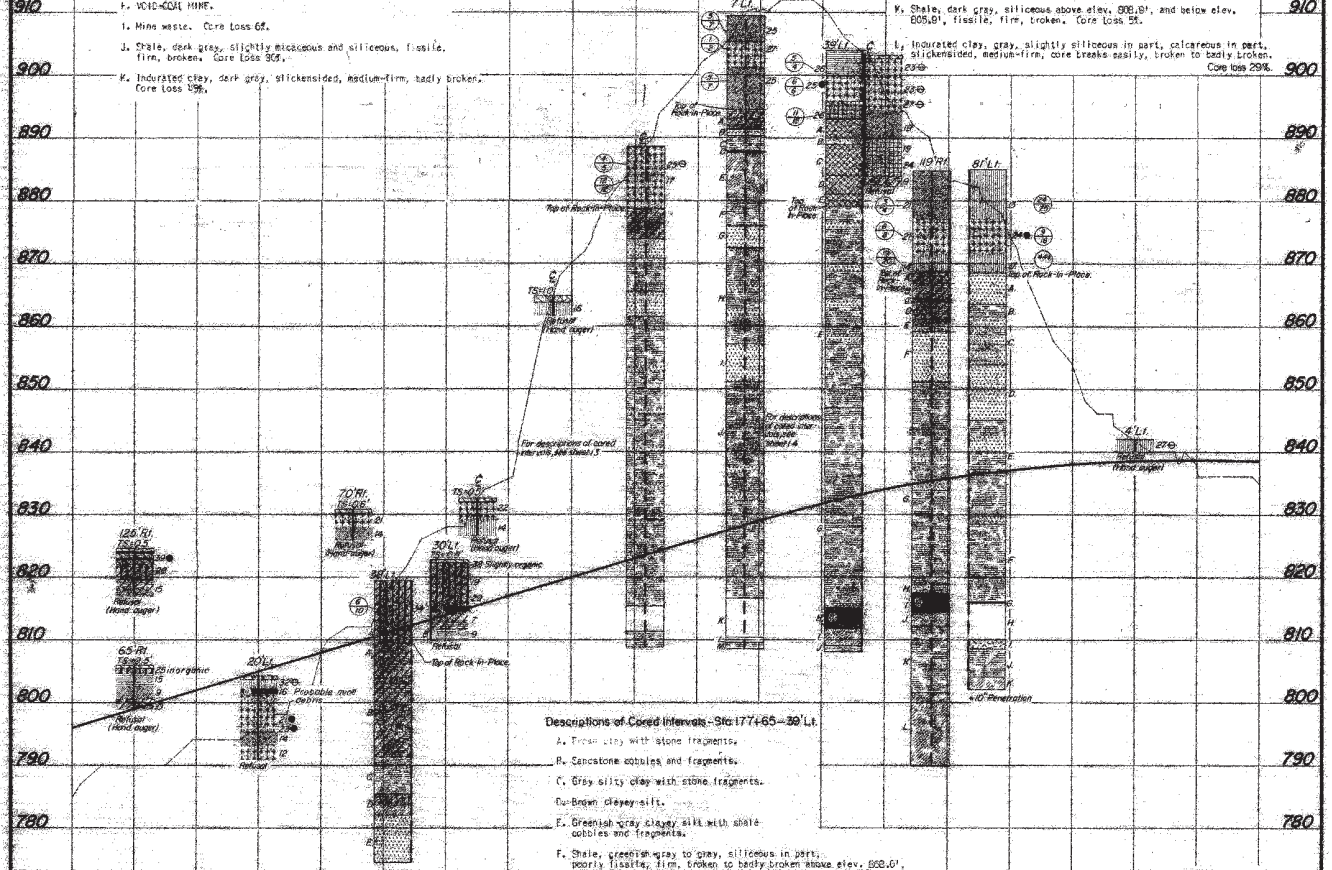
H. Shale, black, carbonaceous, becoming very carbonaceous with few pyritized fossils at base, fissile, firm, broken. Core loss 7%.

I. Coal, blocky, broken. No Core Loss.

J. Indurated clay, gray, containing carbonaceous material above elev. 812.3', slickensided, medium-firm, broken. No Core Loss.

K. Shale, dark gray, siliceous above elev. 808.8', and below elev. 805.8', fissile, firm, broken. Core Loss 5%.

L. Indurated clay, gray, slightly siliceous in part, calcareous in part, slickensided, medium-firm, core breaks easily, broken to badly broken. Core loss 29%.



Descriptions of Cored Intervals – Sta.177+65 – 39' Lt.

A. Brown clay with stone fragments.

B. Sandstone cobbles and fragments.

C. Gray silty clay with stone fragments.

D. Brown clayey silt.

E. Greenish-gray clayey silt with shale cobbles and fragments.

F. Shale, greenish-gray to gray, siliceous in part, poorly fissile, firm, broken to badly broken above elev. 808.0', grading intermittently into a gray, fine-grained, firm sandstone (comprises approximately 15% of interval). Core Loss 2%.

G. Shale, gray, siliceous in part, carbonaceous in bottom 2.0', poorly fissile to fissile, firm. Core Loss 1%.

H. Coal, with few thin carbonaceous shale seams, blocky and broken. Core Loss 12%.

I. Indurated clay, gray, firm. Core Loss 2%.

J. Shale, gray, argillaceous, fissile, firm. No Core Loss.

Descriptions of Cored Intervals – Sta.170+45 – 38' Lt.

A. Brown and gray extremely weathered shale. No Core Loss.

B. Shale, brownish-gray, soft to medium-firm, weathered, broken, grading intermittently into a grey, slickensided, soft to medium-firm, extremely weathered, broken indurated clay. Core Loss 22%.

C. Shale, gray, siliceous in part, argillaceous in part, fissile, firm, broken in part. No Core Loss.

D. Indurated clay, gray, slickensided, soft and badly broken where weathered, firm to hard, broken in part in remainder, weathered from elev. 765.0' to 763.6'. No Core Loss.

E. Sandstone, light gray, medium-fine-grained, micaceous on bedding planes, firm, thin-bedded. No Core Loss.

165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184

SOIL PROFILE

MUSKINGUM COUNTY

MUS-40-11.78

OHIO STATE HIGHWAY TESTING LABORATORY

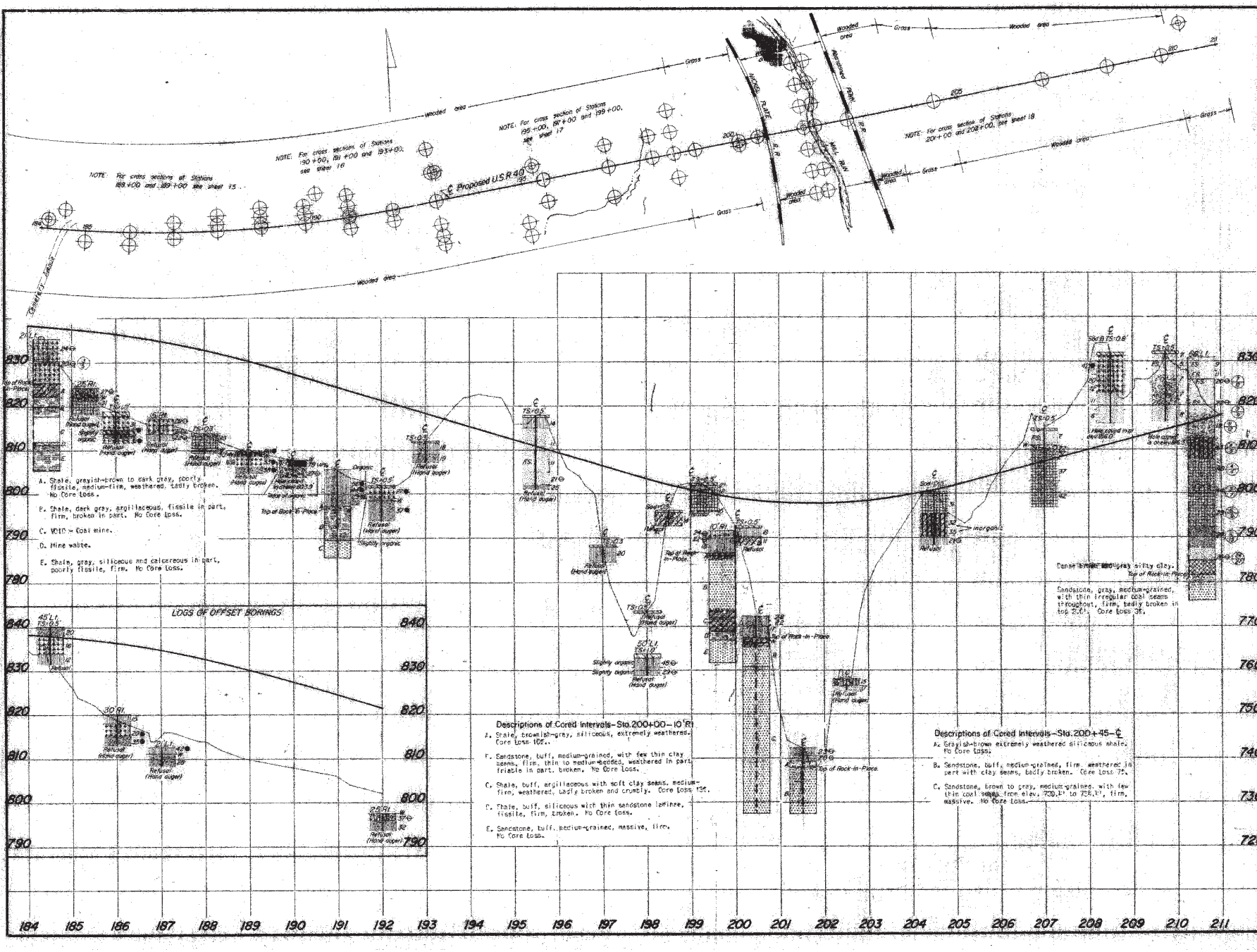
O. S. U. CAMPUS, COLUMBUS, OHIO

6/18

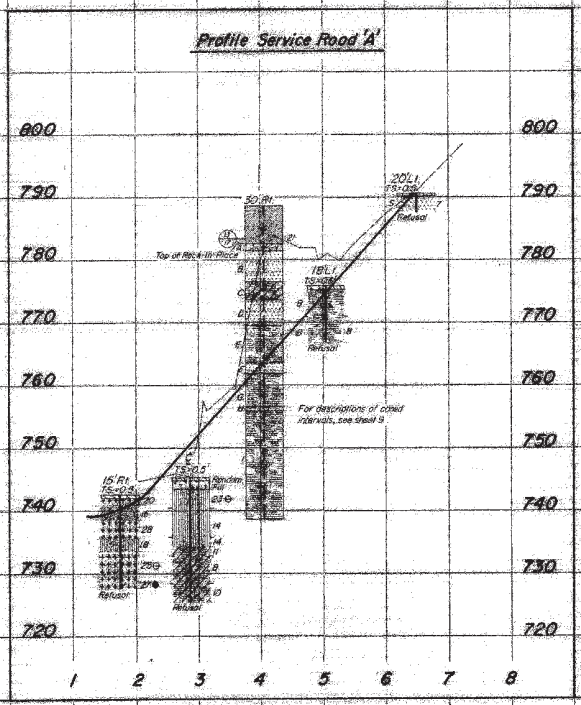
SOIL PROFILE
MUSKINGUM COUNTY
MUS-40-11.78

OHIO STATE HIGHWAY TESTING LABORATORY
O. S. U. CAMPUS, COLUMBUS, OHIO

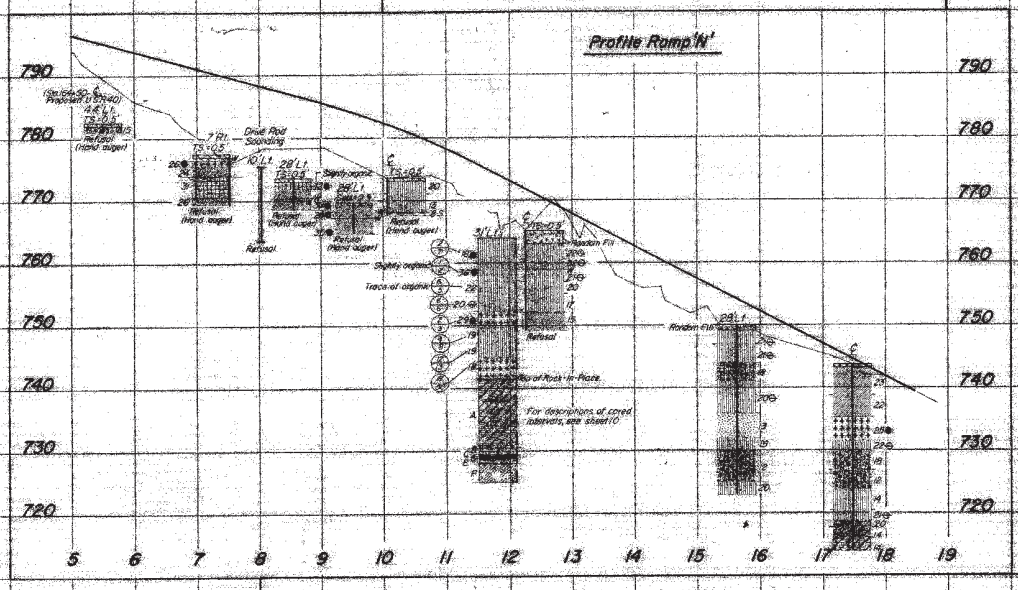
7/18



Profile Service Road 'A'



Profile Ramp 'N'



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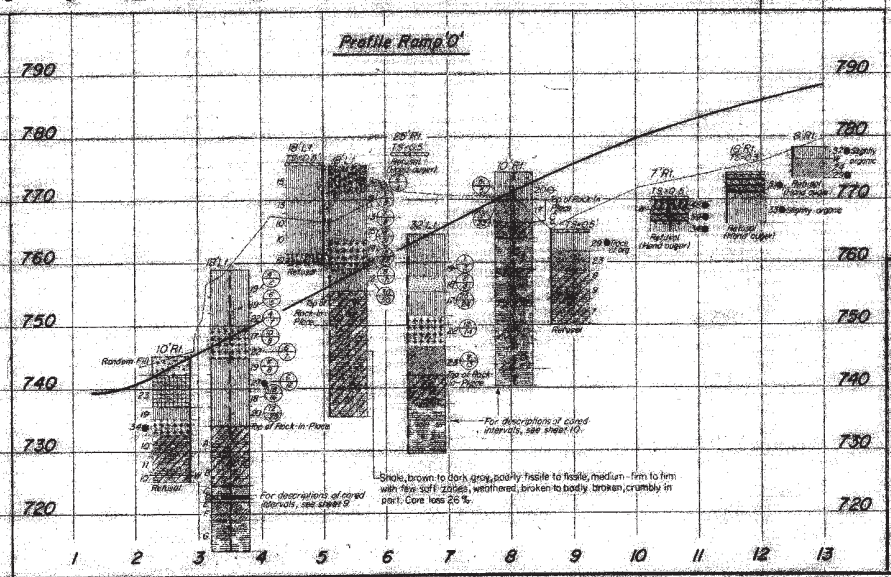


SOIL PROFILE
MUSKINGUM COUNTY
MUS-40-11.78
OHIO STATE HIGHWAY TESTING LABORATORY
O. S. U. CAMPUS, COLUMBUS, OHIO

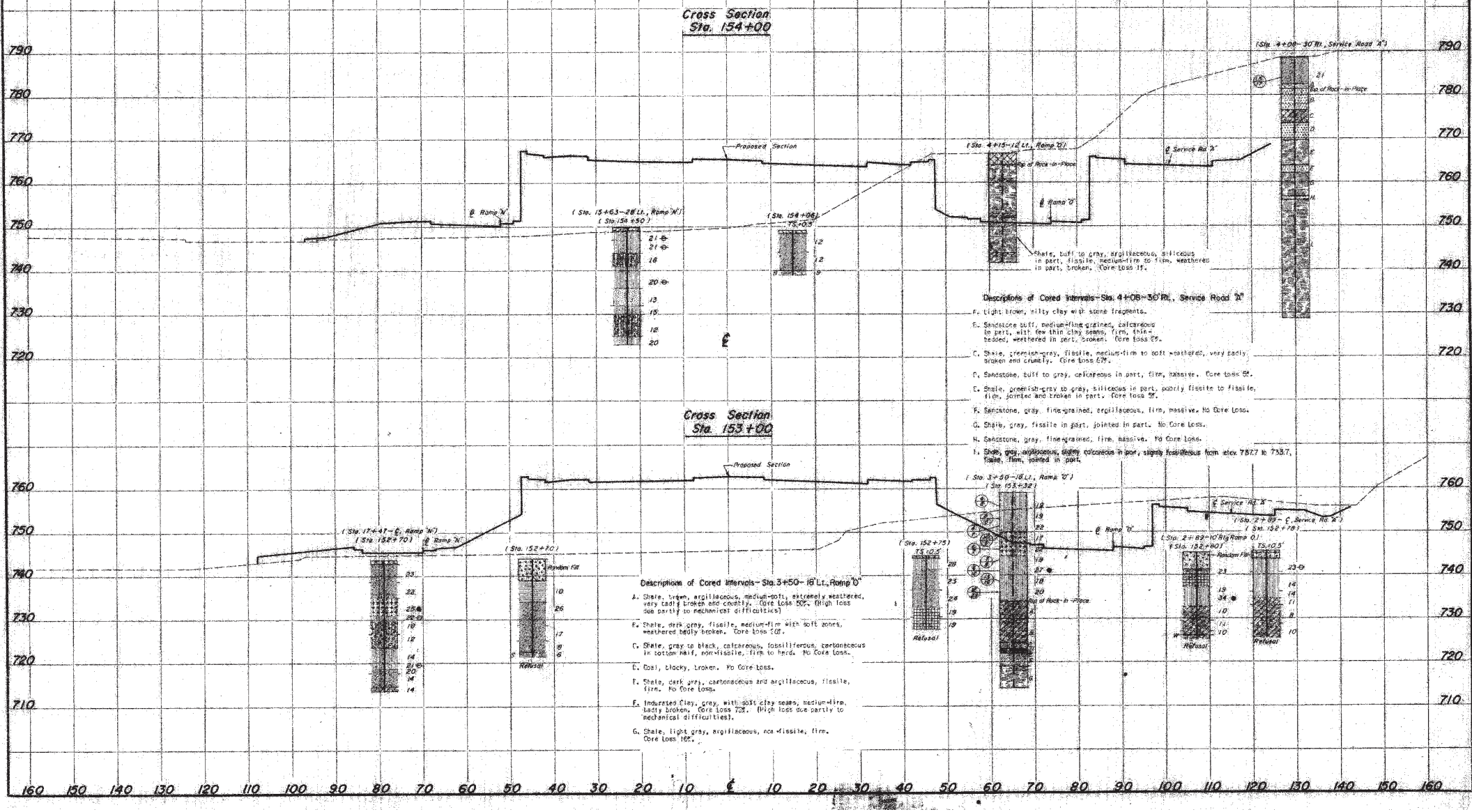
SOIL PROFILE

MUSKINGUM COUNTY

MUS-40-11.78

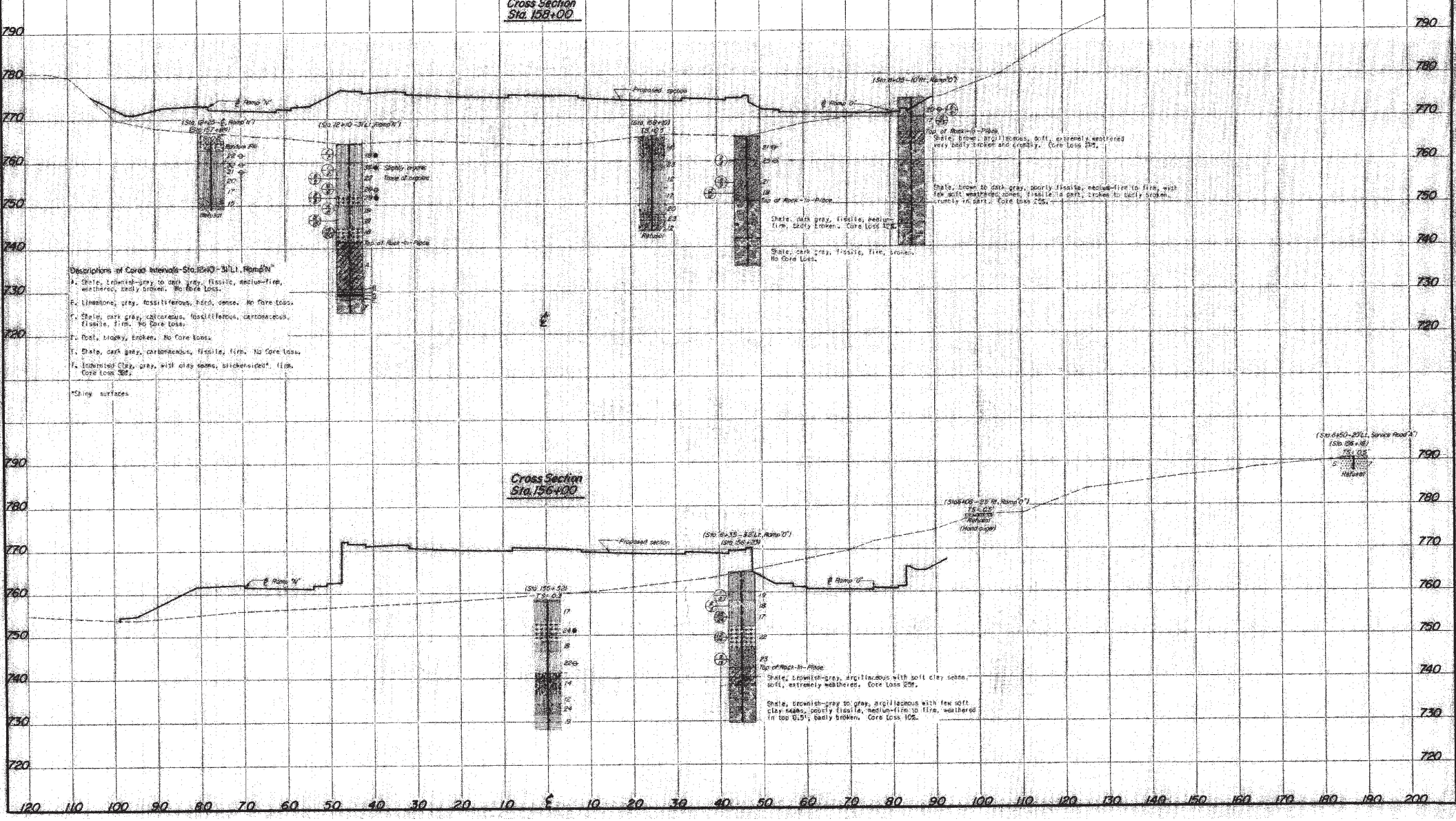
OHIO STATE HIGHWAY
TESTING LABORATORY
O. S. U. CAMPUS, COLUMBUS, OHIO

9/18



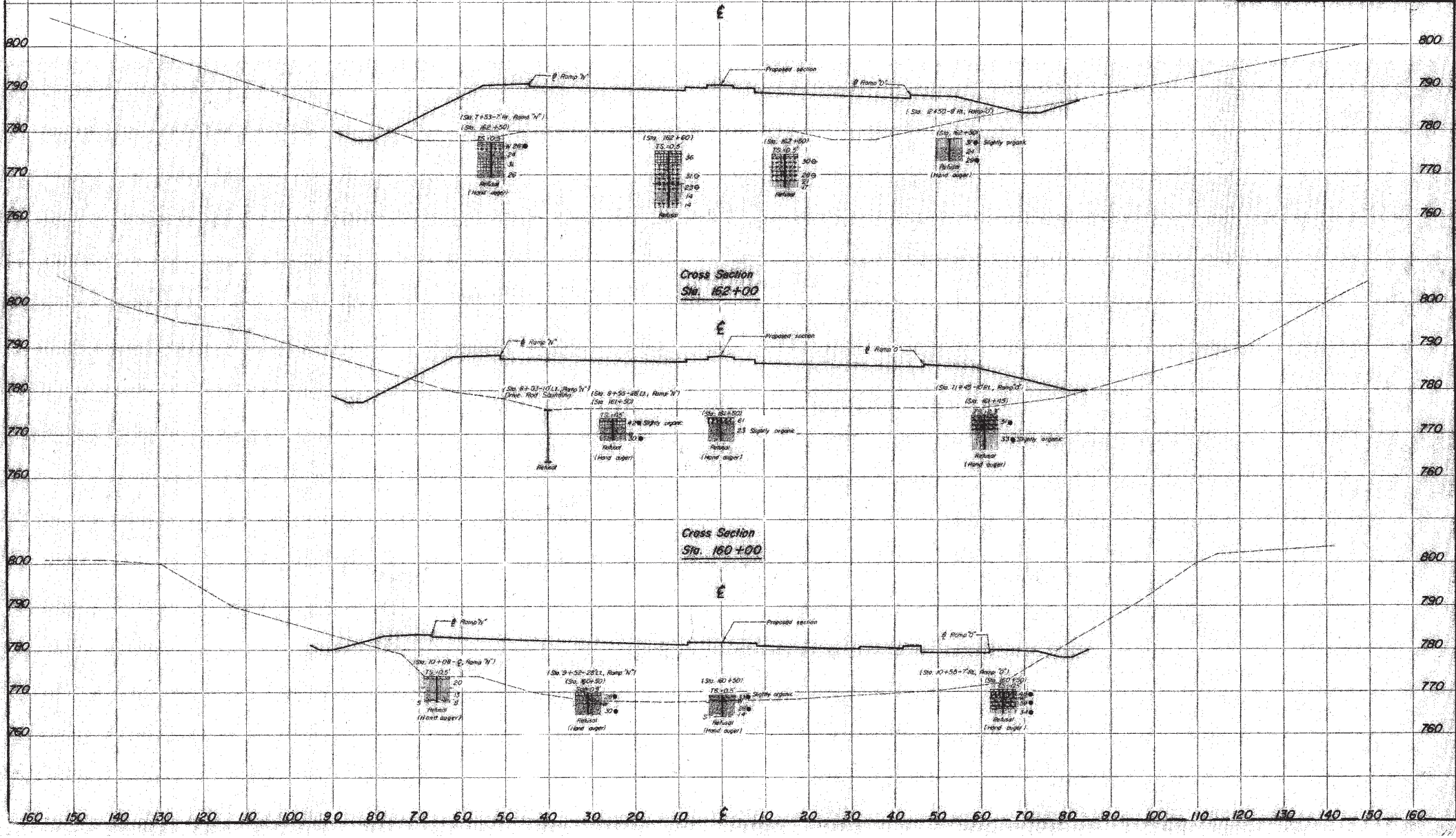
SOIL PROFILE
MUSKINGUM COUNTY
MUS-40-11.78
OHIO STATE HIGHWAY
TESTING LABORATORY
O. S. U. CAMPUS, COLUMBUS, OHIO

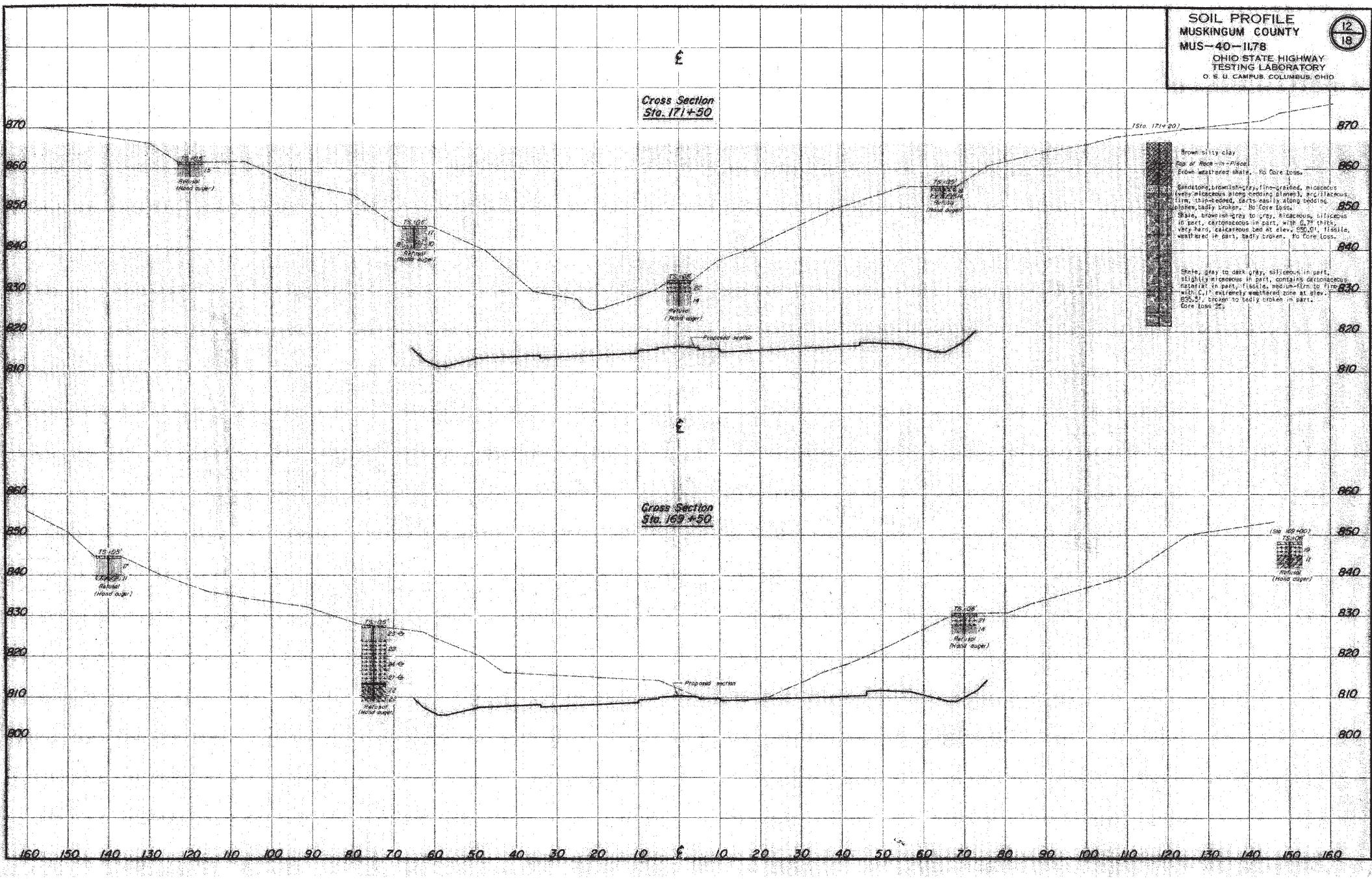
10/18



SOIL PROFILE
MUSKINGUM COUNTY
MUS-40-11.78
OHIO STATE HIGHWAY TESTING LABORATORY
O. S. U. CAMPUS, COLUMBUS, OHIO

11/18

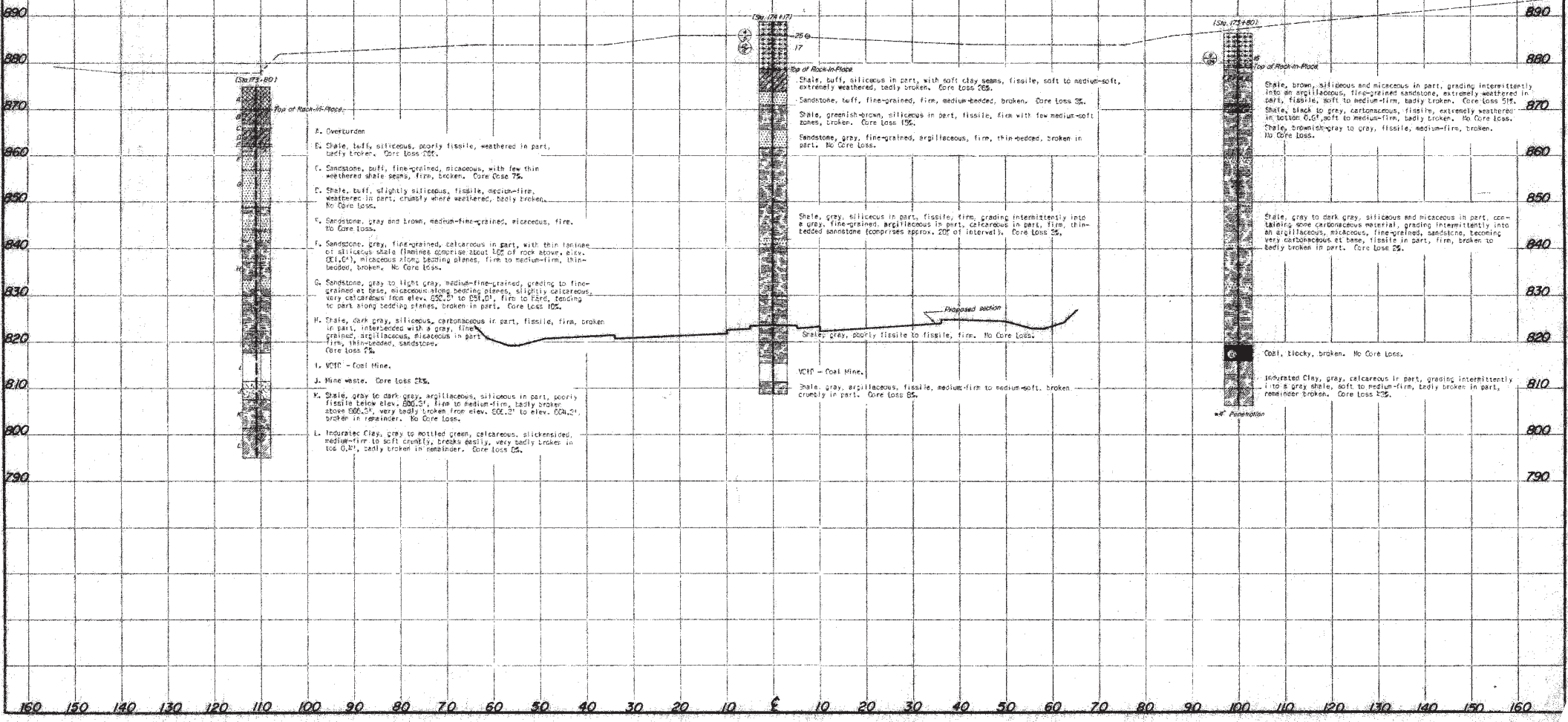



SOIL PROFILE
MUSKINGUM COUNTY
MUS-40-11.78
OHIO STATE HIGHWAY TESTING LABORATORY
O. S. U. CAMPUS, COLUMBUS, OHIO
12/18
Cross Section Sta. 171+50
Cross Section Sta. 169+50
Proposed section
Refusal (Hand auger)
(Sta. 171+20)
(Sta. 169+00)
Brown silty clay
Top of Rock-in-Place
Brown weathered shale. No Core loss.
Sandstone, brownish-gray, fine-grained, micaceous (very micaceous along bedding planes), argillaceous, firm, thin-bedded, parts easily along bedding planes, badly broken. No Core loss.
Shale, brownish-gray to gray, micaceous, siliceous in part, carbonaceous in part, with 0.7' thick, very hard, calcareous bed at elev. 835.0', fissile, weathered in part, badly broken. No Core loss.
Shale, gray to dark gray, siliceous in part, slightly micaceous in part, contains carbonaceous material in part, fissile, medium-firm to firm with 0.1' extremely weathered zone at elev. 835.5', broken to badly broken in part. Core loss 3%.

SOIL PROFILE
MUSKINGUM COUNTY
MUS-40-11.78
OHIO STATE HIGHWAY TESTING LABORATORY
O. S. U. CAMPUS, COLUMBUS, OHIO

13/18

Cross Section Sta. 174+00



A. Overburden

B. Shale, buff, siliceous, poorly fissile, weathered in part, badly broken. Core Loss 20%.

C. Sandstone, buff, fine-grained, micaceous, with few thin weathered shale seams, firm, broken. Core Loss 7%.

D. Shale, buff, slightly siliceous, fissile, medium-firm, weathered in part, crumbly where weathered, badly broken. No Core Loss.

E. Sandstone, gray and brown, medium-fine-grained, micaceous, firm. No Core Loss.

F. Sandstone, gray, fine-grained, calcareous in part, with thin laminae of siliceous shale (laminae comprise about 1% of rock above elev. 861.0'), micaceous along bedding planes, firm to medium-firm, thin-bedded, broken. No Core Loss.

G. Sandstone, gray to light gray, medium-fine-grained, grading to fine-grained at base, micaceous along bedding planes, slightly calcareous, very calcareous from elev. 852.5' to 851.0', firm to hard, tending to part along bedding planes, broken in part. Core Loss 10%.

H. Shale, dark gray, siliceous, carbonaceous in part, fissile, firm, broken in part, interbedded with a gray, fine-grained, argillaceous, micaceous in part, firm, thin-bedded, sandstone. Core Loss 2%.

I. VCHP - Coal Mine.

J. Mine waste. Core Loss 25%.

K. Shale, gray to dark gray, argillaceous, siliceous in part, poorly fissile below elev. 800.5', firm to medium-firm, badly broken above 800.5', very badly broken from elev. 802.2' to elev. 804.2', broken in remainder. No Core Loss.

L. Indurated Clay, gray to mottled green, calcareous, slickensided, medium-firm to soft crumbly, breaks easily, very badly broken in top 0.4', badly broken in remainder. Core Loss 0%.

Shale, buff, siliceous in part, with soft clay seams, fissile, soft to medium-soft, extremely weathered, badly broken. Core Loss 20%.

Sandstone, buff, fine-grained, firm, medium-bedded, broken. Core Loss 3%.

Shale, greenish-brown, siliceous in part, fissile, firm with few medium-soft zones, broken. Core Loss 15%.

Sandstone, gray, fine-grained, argillaceous, firm, thin-bedded, broken in part. No Core Loss.

Shale, gray, siliceous in part, fissile, firm, grading intermittently into a gray, fine-grained, argillaceous in part, calcareous in part, firm, thin-bedded sandstone (comprises approx. 20% of interval). Core Loss 2%.

Shale, gray, poorly fissile to fissile, firm. No Core Loss.

VCHP - Coal Mine.

Shale, gray, argillaceous, fissile, medium-firm to medium-soft, broken crumbly in part. Core Loss 8%.

Shale, brown, siliceous and micaceous in part, grading intermittently into an argillaceous, fine-grained sandstone, extremely weathered in part, fissile, soft to medium-firm, badly broken. Core Loss 51%.

Shale, black to grey, carbonaceous, fissile, extremely weathered in bottom 0.6', soft to medium-firm, badly broken. No Core Loss.

Shale, brownish-gray to gray, fissile, medium-firm, broken. No Core Loss.

Shale, gray to dark gray, siliceous and micaceous in part, containing some carbonaceous material, grading intermittently into an argillaceous, micaceous, fine-grained, sandstone, becoming very carbonaceous at base, fissile in part, firm, broken to badly broken in part. Core Loss 2%.

Coal, blocky, broken. No Core Loss.

Indurated Clay, gray, calcareous in part, grading intermittently into a gray shale, soft to medium-firm, badly broken in part, remainder broken. Core Loss 10%.

SOIL PROFILE

MUSKINGUM COUNTY

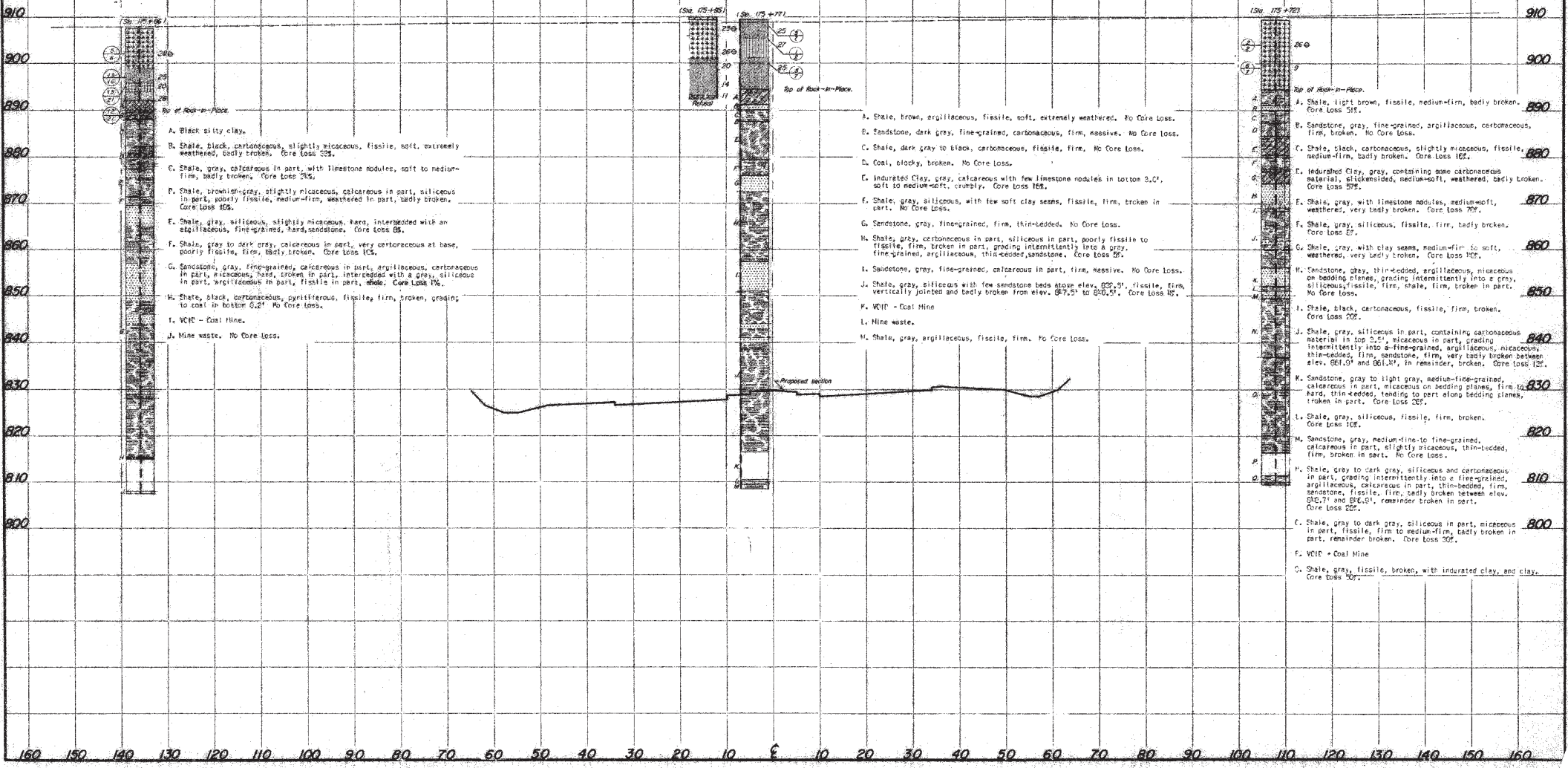
MUS - 40 - 11.78

OHIO STATE HIGHWAY TESTING LABORATORY

O. S. U. CAMPUS, COLUMBUS, OHIO

14/18

Cross Section Sta. 176 + 00



A. Black silty clay.

B. Shale, black, carbonaceous, slightly micaceous, fissile, soft, extremely weathered, badly broken. Core Loss 20%.

C. Shale, gray, calcareous in part, with limestone nodules, soft to medium-firm, badly broken. Core Loss 24%.

D. Shale, brownish-gray, slightly micaceous, calcareous in part, siliceous in part, poorly fissile, medium-firm, weathered in part, badly broken. Core Loss 10%.

E. Shale, gray, siliceous, slightly micaceous, hard, interbedded with an argillaceous, fine-grained, hard, sandstone. Core Loss 8%.

F. Shale, gray to dark gray, calcareous in part, very carbonaceous at base, poorly fissile, firm, badly broken. Core Loss 10%.

G. Sandstone, gray, fine-grained, calcareous in part, argillaceous, carbonaceous in part, micaceous, hard, broken in part, interbedded with a gray, siliceous in part, argillaceous in part, fissile in part, shale. Core Loss 1%.

H. Shale, black, carbonaceous, pyritiferous, fissile, firm, broken, grading to coal in bottom 0.2'. No Core Loss.

I. VOID - Coal Mine.

J. Mine waste. No Core Loss.

A. Shale, brown, argillaceous, fissile, soft, extremely weathered. No Core Loss.

B. Sandstone, dark gray, fine-grained, carbonaceous, firm, massive. No Core Loss.

C. Shale, dark gray to black, carbonaceous, fissile, firm. No Core Loss.

D. Coal, blocky, broken. No Core Loss.

E. Indurated Clay, gray, calcareous with few limestone nodules in bottom 3.0', soft to medium-soft, crumbly. Core Loss 18%.

F. Shale, gray, siliceous, with few soft clay seams, fissile, firm, broken in part. No Core Loss.

G. Sandstone, gray, fine-grained, firm, thin-bedded. No Core Loss.

H. Shale, gray, carbonaceous in part, siliceous in part, poorly fissile to fissile, firm, broken in part, grading intermittently into a gray, fine-grained, argillaceous, thin-bedded, sandstone. Core Loss 5%.

I. Sandstone, gray, fine-grained, calcareous in part, firm, massive. No Core Loss.

J. Shale, gray, siliceous with few sandstone beds above elev. 838.5', fissile, firm, vertically jointed and badly broken from elev. 847.5' to 840.5'. Core Loss 18%.

K. VOID - Coal Mine

L. Mine waste.

M. Shale, gray, argillaceous, fissile, firm. No Core Loss.

A. Shale, light brown, fissile, medium-firm, badly broken. Core Loss 5%.

B. Sandstone, gray, fine-grained, argillaceous, carbonaceous, firm, broken. No Core Loss.

C. Shale, black, carbonaceous, slightly micaceous, fissile, medium-firm, badly broken. Core Loss 16%.

D. Indurated Clay, gray, containing some carbonaceous material, slickensided, medium-soft, weathered, badly broken. Core Loss 57%.

E. Shale, gray, with limestone nodules, medium-soft, weathered, very badly broken. Core Loss 70%.

F. Shale, gray, siliceous, fissile, firm, badly broken. Core Loss 5%.

G. Shale, gray, with clay seams, medium-firm to soft, weathered, very badly broken. Core Loss 100%.

H. Sandstone, gray, thin-bedded, argillaceous, micaceous on bedding planes, grading intermittently into a gray, siliceous, fissile, firm, shale, firm, broken in part. No Core Loss.

I. Shale, black, carbonaceous, fissile, firm, broken. Core Loss 20%.

J. Shale, gray, siliceous in part, containing carbonaceous material in top 3.5', micaceous in part, grading intermittently into a fine-grained, argillaceous, micaceous, thin-bedded, firm, sandstone, firm, very badly broken between elev. 861.0' and 861.4', in remainder, broken. Core loss 12%.

K. Sandstone, gray to light gray, medium-fine-grained, calcareous in part, micaceous on bedding planes, firm to hard, thin-bedded, tending to part along bedding planes, broken in part. Core Loss 20%.

L. Shale, gray, siliceous, fissile, firm, broken. Core Loss 10%.

M. Sandstone, gray, medium-fine-to fine-grained, calcareous in part, slightly micaceous, thin-bedded, firm, broken in part. No Core Loss.

N. Shale, gray to dark gray, siliceous and carbonaceous in part, grading intermittently into a fine-grained, argillaceous, calcareous in part, thin-bedded, firm, sandstone, fissile, firm, badly broken between elev. 818.7' and 816.9', remainder broken in part. Core Loss 20%.

O. Shale, gray to dark gray, siliceous in part, micaceous in part, fissile, firm to medium-firm, badly broken in part, remainder broken. Core Loss 30%.

P. VOID - Coal Mine

Q. Shale, gray, fissile, broken, with indurated clay, and clay. Core loss 50%.

SOIL PROFILE

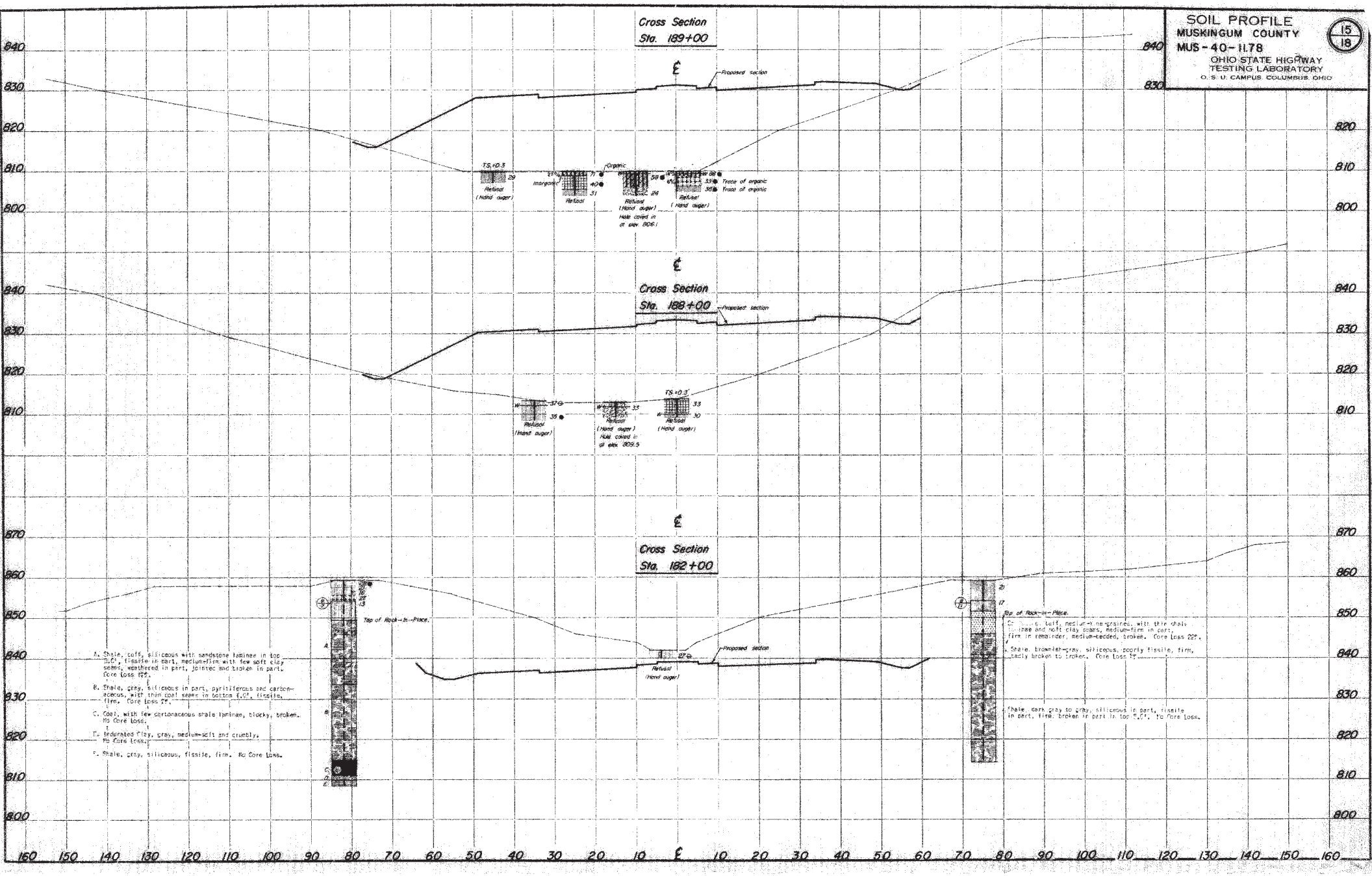
MUSKINGUM COUNTY

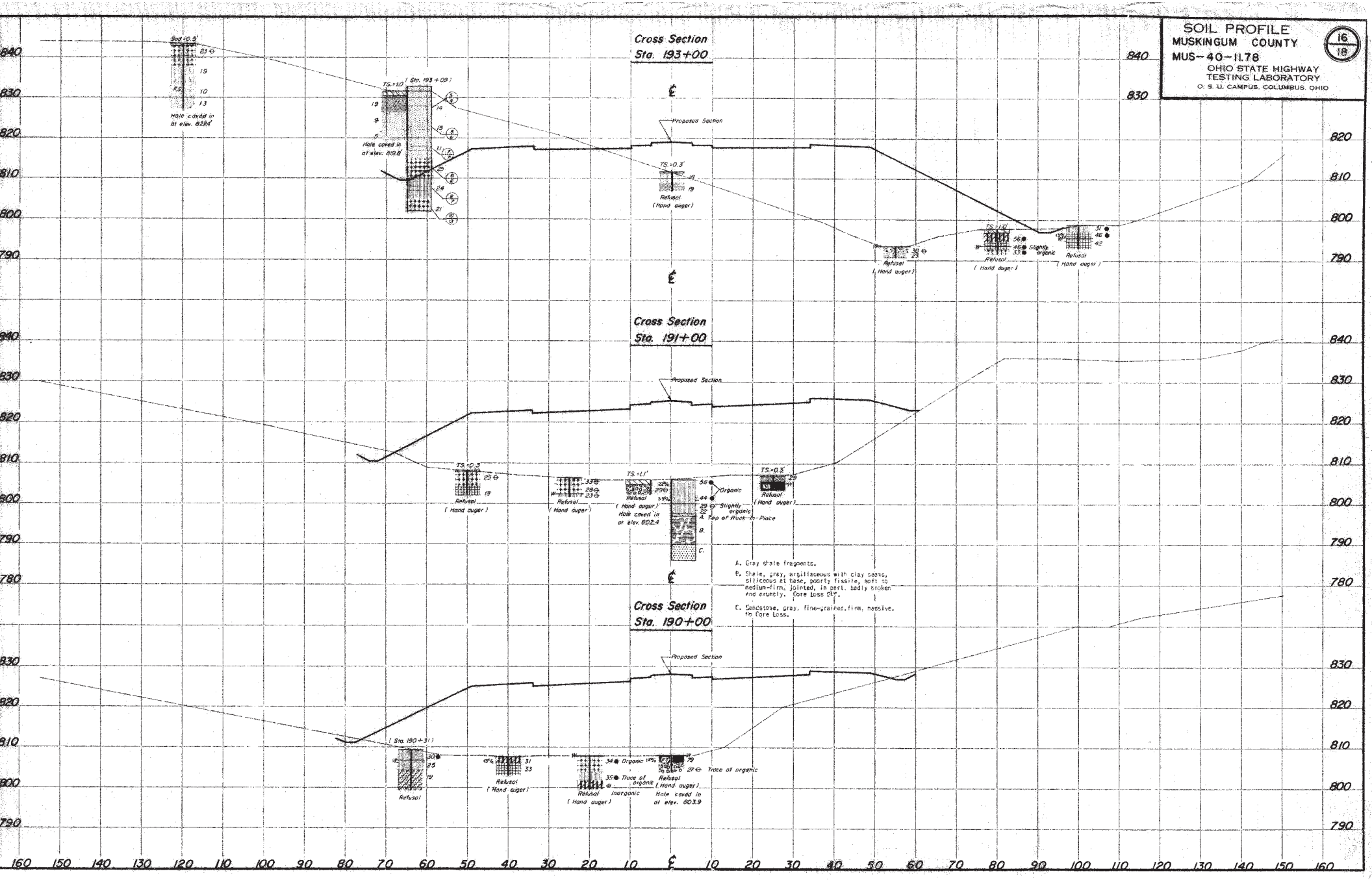
MUS-40-11.78

OHIO STATE HIGHWAY TESTING LABORATORY

O. S. U. CAMPUS COLUMBUS, OHIO

15/18




SOIL PROFILE
MUSKINGUM COUNTY
MUS-40-11.78
OHIO STATE HIGHWAY TESTING LABORATORY
O. S. U. CAMPUS, COLUMBUS, OHIO
16/18
Cross Section Sta. 193+00
Cross Section Sta. 191+00
Cross Section Sta. 190+00
Proposed Section
Refusal (Hand auger)
Hole caved in at elev. 819.8'
Hole caved in at elev. 822.4'
Hole caved in at elev. 802.4
Hole caved in at elev. 803.9
Slightly organic
Organic
Trace of organic
Top of Rock-In-Place
A. Gray shale fragments.
B. Shale, gray, argillaceous with clay seams, siliceous at base, poorly fissile, soft to medium-firm, jointed, in part, badly broken and crushed. Core Loss 0%.
C. Sandstone, gray, fine-grained, firm, massive. No Core Loss.

SOIL PROFILE

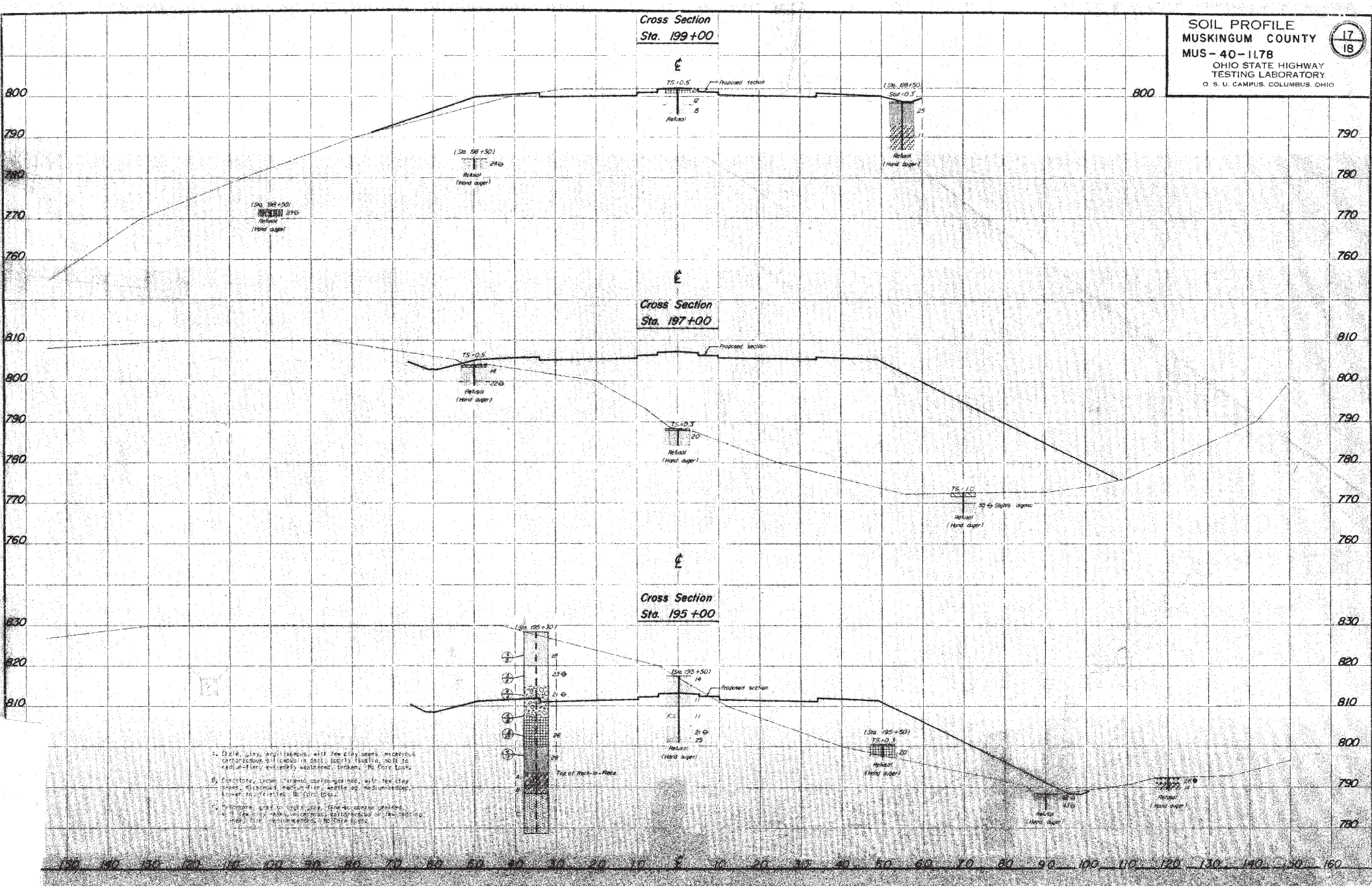
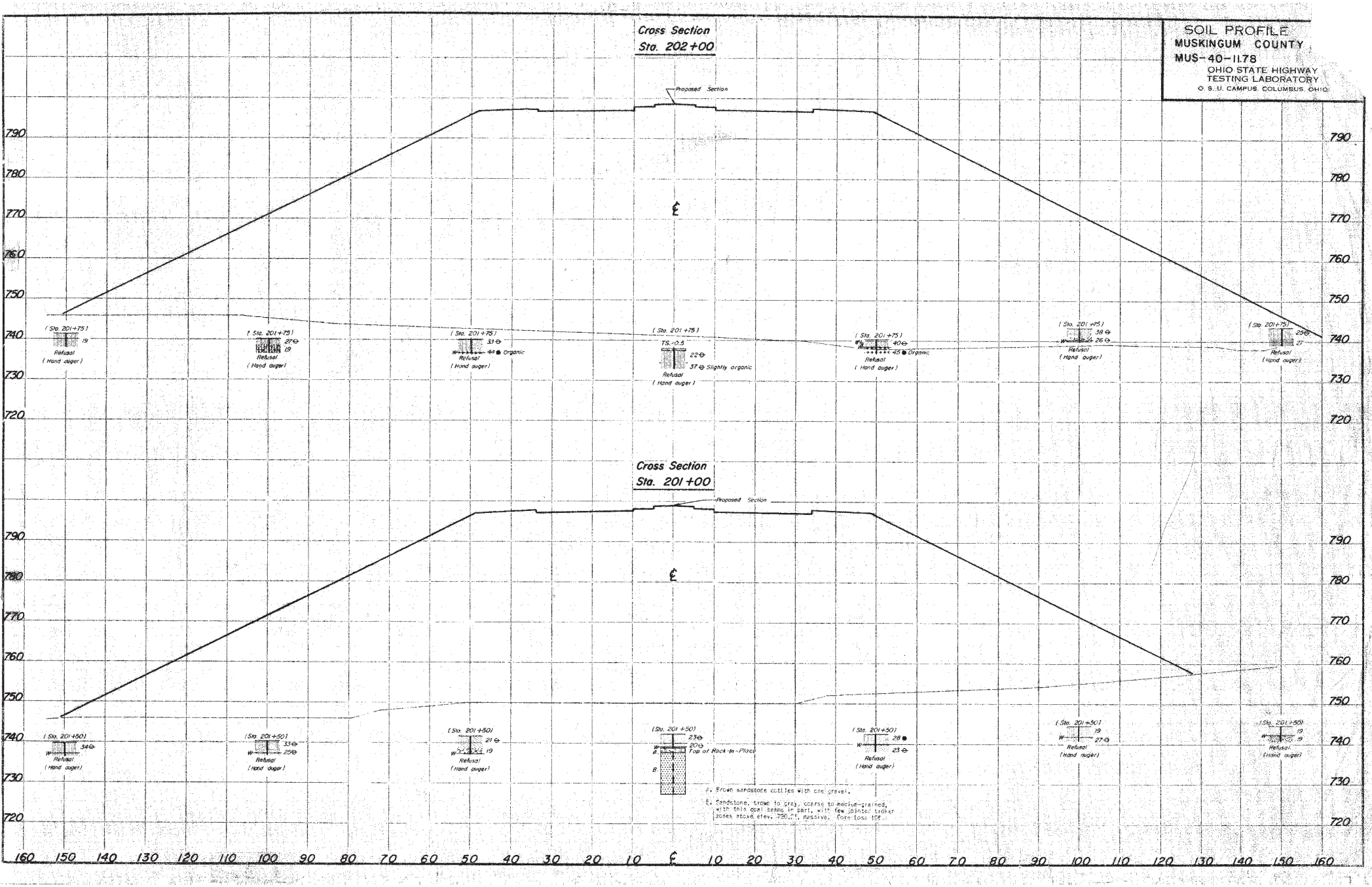
MUSKINGUM COUNTY

MUS-40-11.78

OHIO STATE HIGHWAY TESTING LABORATORY

O. S. U. CAMPUS, COLUMBUS, OHIO

17/18



SOIL PROFILE
MUSKINGUM COUNTY
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OHIO STATE HIGHWAY
TESTING LABORATORY
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