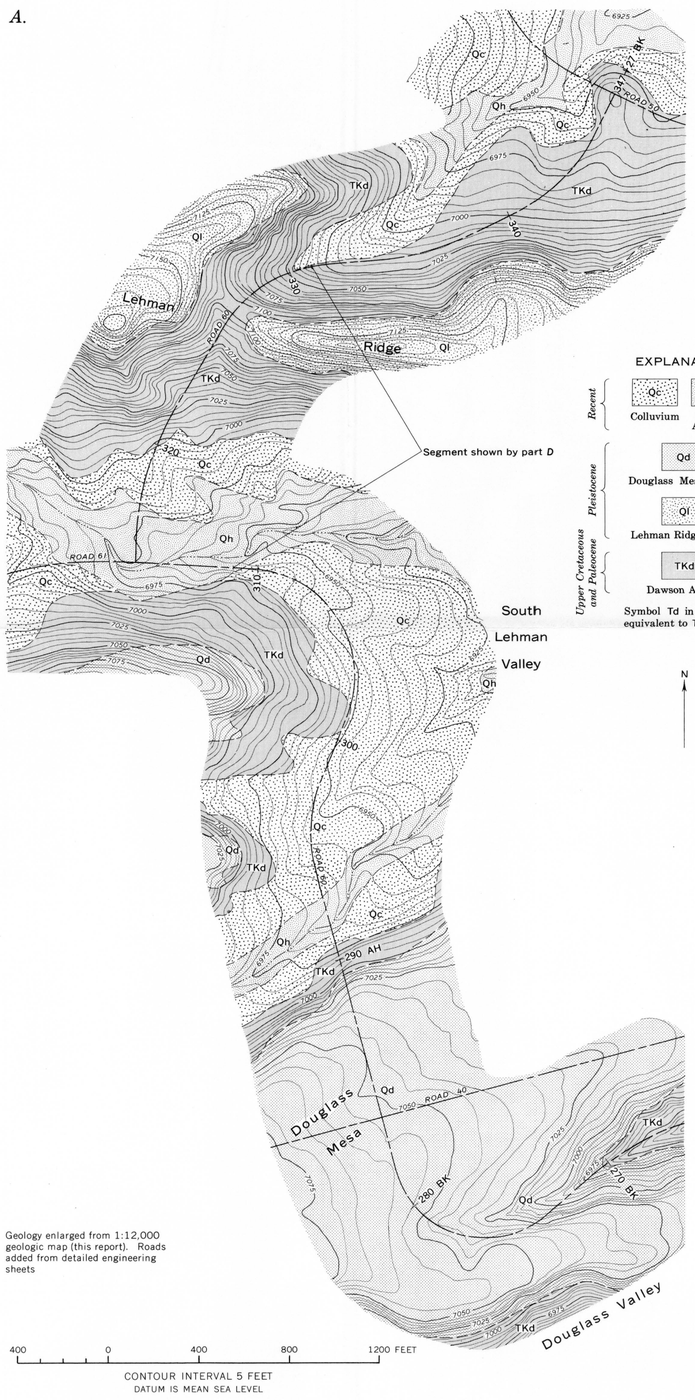
A.



Geology enlarged from 1:12,000 geologic map (this report). Roads added from detailed engineering sheets

B.

SOIL SURVEY OF PORTION OF ROAD #60
from
STA. 177+56 to Sta. 347+26

Portion is from junction of Road #10 south of Pine Mesa to junction of Road #50 on No Name Creek. Test holes were drilled with power auger by SOM personnel Survey was made during latter part of October 1955, and first part of November 1955.

The geological symbols are Qc, Qd.

The vegetat[illegible]

[illegible] some brown coarse to fine [illegible] none to trace of clay. The U. S. [illegible] Material is suitable for embankments.

[illegible] is a reddish brown, tan, light reddish brown and some light brown coarse to fine sand, with trace to some silt, clay and gravel. The U. S. classification is primarily SC and SM-SC, with some SM and SM-SW. Material is suitable for embankments.

Sta. 276+00 BK to Sta. 290+00 AH

Area is across Douglas Mesa. The geological symbol is Qd. A red silty sandy clay was encountered at Sta. 280+04 at 9.0 feet (elevation 7046.0). Undercut according to specifications from Sta. 278+50 to Sta. 281+00. No other unsuitable material was encountered, except topsoil and boulders.

The "A" horizon is a brown humic coarse to fine sand, with some silt, trace of clay and none to trace of gravel. Local concentration of boulders were encountered. The U. S. classification is SC and SC-SM. Material is not suitable for embankments. Depth to be stripped is 0.5 feet, including "B" horizon in some areas.

The "B" horizon when present in any appreciable thickness is a light reddish brown coarse to fine sand, coarse to fine sand with some silt and trace of clay. The U. S. classification is SC. Material is suitable for embankments, except where horizon is thin and is included in the "A" horizon to be stripped.

The "C" horizon is variable. The material is primarily a reddish brown coarse to fine sand with some to trace of silt and clay, and some gravel. The U. S. classification is SC or SM-SC. At Station 288+46 a tan cemented coarse to fine sand with trace to some silt and trace of gravel was encountered at 6.0 feet.

The U. S. Classification is SM-SW. Material is suitable for embankments; however, every effort should be made during construction to mix the various types. As the clayier soil is in the top 3 to 6 feet, all excavations should be face cuts. Most of the material is difficult to excavate.

Sta. 290+00 to Sta. 311+00

Area is in south Lehman Valley. The geological symbol is primarily Qc and Qp, with Qc and Qh in drainage ways.

At Sta. 307+89, 8 feet right of center line, soil was wet below 3.0 feet. Although no free water came into the hole, apparently area has a perched water table from Sta. 307+00 to Sta. 310+00. A more thorough investigation should be undertaken during a period of more rainfall.

The "A" horizon is a brown humic coarse to fine sand with some silt and trace of gravel. From Sta. 305+00 to Sta. 311+00, the horizon contains boulders up to 5.0 feet in diameter. In drainage way at Sta. 291+90, the horizon is a sandy gravel with a trace of silt. Material not suitable for embankments. The depth to be stripped is 1.0 feet including the "B" horizon in some areas.

The "B" horizon is a light brown coarse to fine sand with some silt and trace to some gravel. The U. S. classification is SM. Material is suitable for embankments, except where horizon is thin and is included in the "A" horizon to be stripped.

The "C" horizon is primarily a tan coarse to fine sand with trace to some silt, and some gravel to gravelly. The U. S. classification is SM-SW, SM-SP and SP. The tan sand is underlain by a reddish brown coarse to fine sand with a trace silt, clay and gravel. The U. S. classification is SM-SC and SC. At Station 219+89, the "C" horizon is a light brown sandy gravel whose U. S. classification is GW. No "C" horizon was encountered at Sta. 296+98.

Sta. 311+00 BK to Sta. 316+00 AH

Area is across a low poorly drained drainage way. The geological symbol is Qh. The top soil contains thin layers of peat and is humic. All topsoil between slope stakes should be stripped and backfilled with a free draining granular material. The U. S. classification of backfill material should be SW, SP, SM-SP or SM-SW. The average depth of topsoil to be stripped is 4.0 feet.

The topsoil is primarily a dark brown, brown or grayish brown humic coarse to fine sand, with some silt and clay, with thin lenses of peat. The U. S. classification is SC and OL. Some areas have lenses of tan coarse to fine sand, with some gravel and trace of silt at various depths. Material has musty acrid odor.

Material under the topsoil is primarily yellow brown, reddish brown and light brown coarse to fine sand, with trace to some silt, and with none to some gravel. At Sta. 311+50, a greenish gray clay was encountered at 3.0 feet.

Area was dry at time of survey. However, condition of ground surface indicates a high water table for long periods of time.

Sta. 316+00 to Sta. 347+26 BK

Area is across Lehman Ridge to junction of Road #60 and #50. The geological symbol is as follows:

Sta. 316+00 to Sta. 323+00 - Qc
Sta. 323+00 to Sta. 338+00 - Td
Sta. 338+00 to Sta. 347+26 BK - Td-Qc

The "A" horizon is a brown and grayish brown humic coarse to fine sand, with some silt and none to trace of gravel. In some areas, the "A" horizon is bouldery, especially from Sta. 316+00 to Sta. 331+00. The U. S. classification is SM. Material is not suitable for embankments. Depth to be stripped is 0.5 feet including the "B" horizon in some areas.

The "B" horizon is a light brown coarse to fine sand with some silt, with local concentrations of boulders. The U. S. classification is SM. The material is suitable for embankments, except boulders.

The "C" horizon is variable. The usable embankment material is a tan bouldery coarse to fine sand with some silt, none to some gravel and trace of clay, whose U. S. classification is SM; yellowish brown coarse to fine sand with some silt, none to trace of clay and gravel; and tan and light reddish brown coarse to fine sand with trace to some silt, and none to some gravel.

The unsuitable material is red, gray, yellow brown silty sands, clays and silts. The U. S. classification is SM, SC, ML and CL.

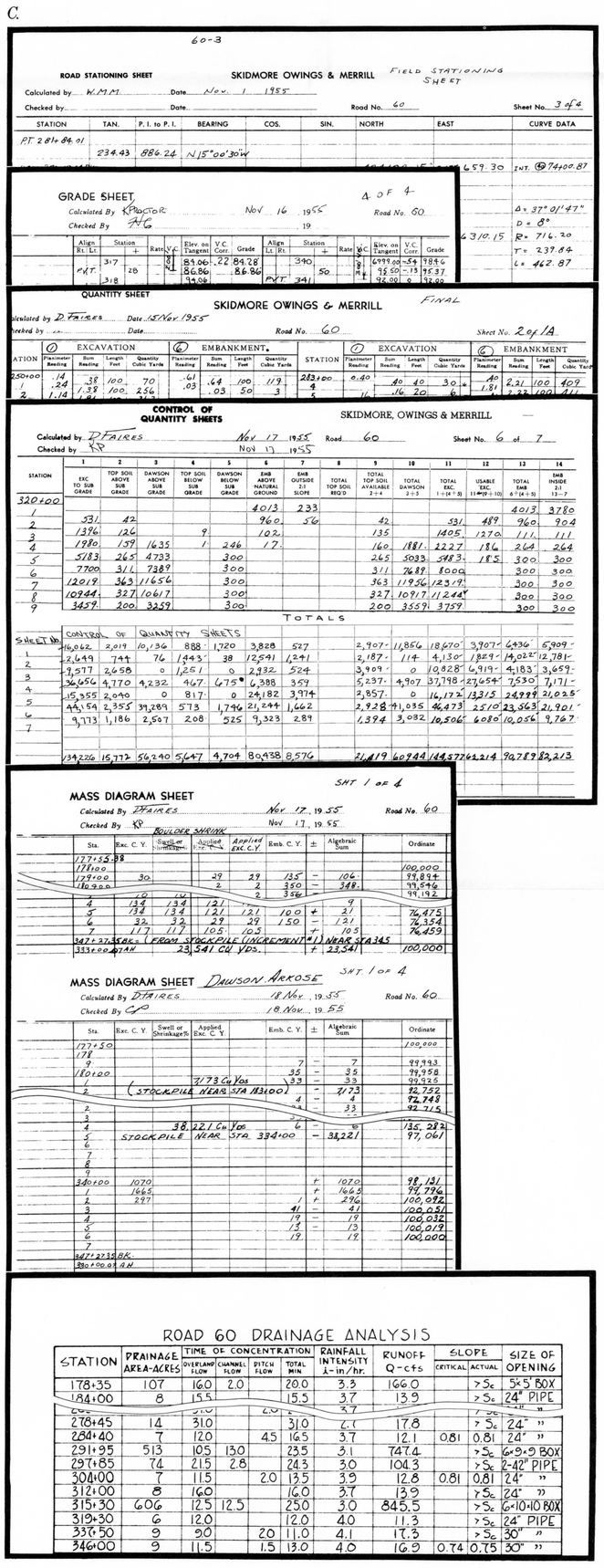
From Sta. 323+00 to Sta. 330+00, surface is covered with 0.5 to 3.0 feet of usable material underlain by clay. Lenses of sand of various thickness can be found within the clay but these lenses are too erratic for correlation. With close construction inspection and with the full cooperation of the contractor, a small portion of this cut can be salvaged, and used in embankments. However, not over 10% of this excavation can be anticipated.

From Sta. 330+00 to Sta. 347+25 (BK) material encountered was predominately usable sand. However, approximately 10% of cut material is expected to be usable. Unsuitable material was encountered at Sta. 340+03 at elevation 6998. (Red silty clay). Red clay was also encountered at Sta. 347+26 (BK) in excavation at Road #50 and #60 junction.

Undercut according to specifications as follows:

Sta. 323+00 to Sta. 329+00
Sta. 339+50 to Sta. 341+00
Sta. 346+50 (BK) to Sta. 347+25 (BK)

C.



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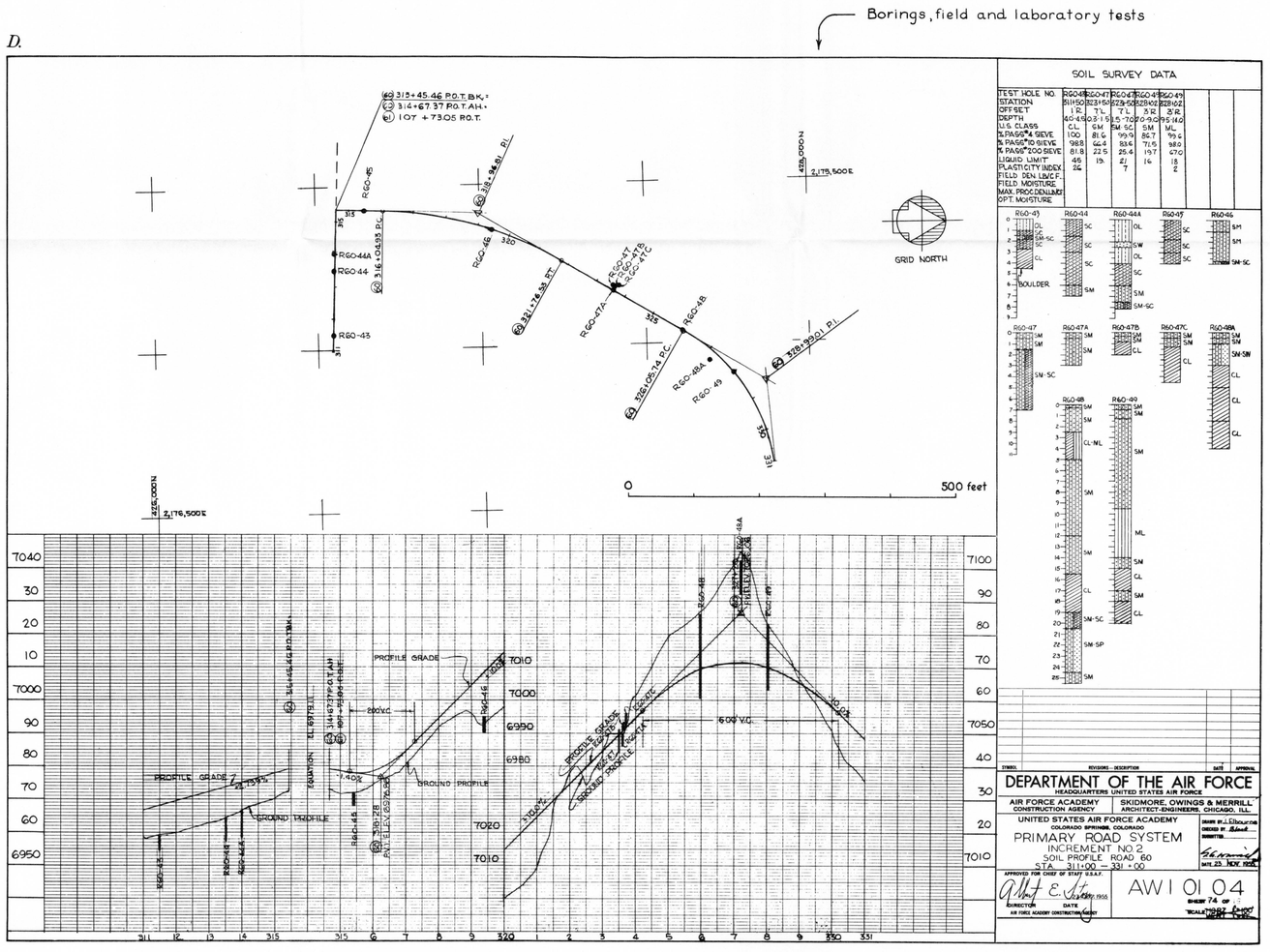
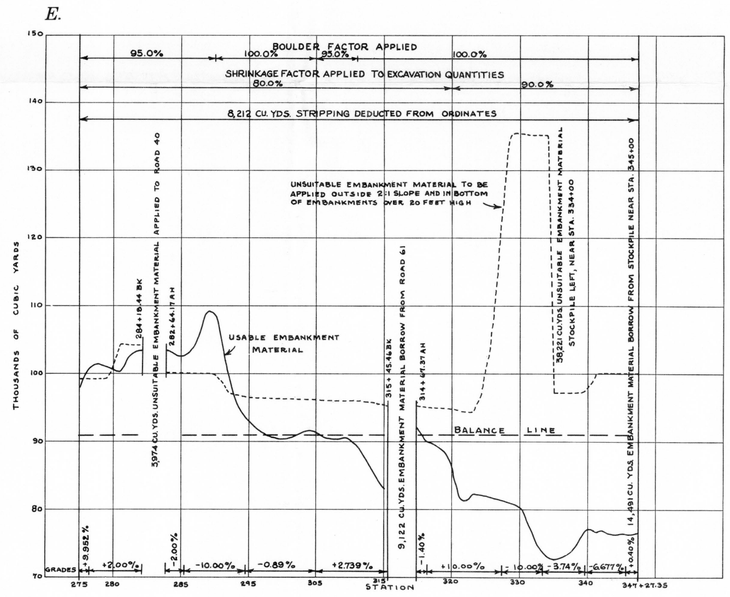


E.



SPECIFICATIONS
Special provisions
Statement of work
Schedule of drawings
Clearing and grubbing
Excavation for roadways, embankment, and preparation of subgrade
Pipe culverts, drainage structures, and subdrains
Select material sub-base course
Concrete
Erosion control

Plus 102 drawings pertaining to other segments of Road 60, Roads 10, 30, 40, and 61, intersections, overlook parking areas, and details of culverts

CONSTRUCTION DRAWINGS
PRIMARY ROAD SYSTEM
Increment No 2

SPECIFICATIONS

Parts B, C, D, and E are reproduced from actual engineering reports and data sheets submitted by Skidmore, Owings, and Merrill, Architect-Engineers to the Air Force Academy Construction Agency

INTERIOR—GEOLOGICAL SURVEY, WASHINGTON, D. C.—1966—G66124

TYPICAL EXAMPLES OF INFORMATION USED FOR PLANNING AND DESIGN OF PARTS OF ROAD 60, UNITED STATES AIR FORCE ACADEMY, SITE, COLORADO