

CITY OF PHOENIX, ARIZONA

ENGINEERING REPORT

PARADISE VALLEY INTERCEPTOR SEWER

October, 1967

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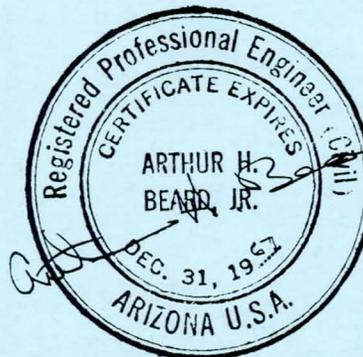
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PURPOSE OF REPORT

The continued growth and development of the northeast section of the City of Phoenix has created the necessity for the immediate construction of the Paradise Valley Interceptor Sewer.

This engineering report presents the results of an extensive study of the area and sets forth the necessary information, both engineering and financial, to enable the project to proceed.

DESCRIPTION OF PROJECT

The proposed Paradise Valley Interceptor Sewer will serve an area of approximately 35 square miles in the northeast corner of the City of Phoenix. This area is within the natural drainage basin of Indian Bend Wash which flows southeasterly through the City of Scottsdale to the Salt River. Plate 1 shows the topographic features of the drainage area to be served, the location of the proposed Paradise Valley Interceptor Sewer, existing trunk sewers, and the proposed trunk sewer system to be installed to furnish sanitary sewage service to the remainder of the area.

The western part of the area is presently partially sewered. These sewers terminate at a pumping station at 40th Street and Cactus Road, which is the upper terminus of the proposed interceptor. This pumping station pumps the sewage westerly over the divide to an existing sewer in Cave Creek Road. The average daily flow from this pumping station

during the month of August, 1967, was 452,000 gallons with a peak day flow of 999,000 gallons. This pumping station has been a source of trouble and, to avoid a possible public health hazard, should be eliminated as soon as possible.

The route of the interceptor has been selected to follow within existing right-of-way, yet to stay as close as possible to the natural drainage of Indian Bend Wash, to take advantage of minimum pipe sizes and to minimize excavation.

In order that the City of Phoenix can formulate plans, and make application for Federal assistance, an estimate of construction costs is shown on Table 1.

REGIONAL SEWERAGE PLAN

The proposed Paradise Valley Interceptor Sewer is coordinated with the regional sewerage plan endorsed by the Cities of Phoenix, Scottsdale, Mesa, Tempe and Glendale in their Multi-City Agreement.

As may be seen on Plate 2 the proposed Paradise Valley Interceptor Sewer will empty into the Scottsdale-Paradise Valley Interceptor Sewer at Judd Road and 64th Street. From this point the sewage will be conveyed through the Scottsdale-Paradise Valley Interceptor Sewer, aided by Housing and Urban Development Project No. WS-6-03-0007, and the Hayden Road Interceptor Sewer, aided by WPC-ARIZ-53, to the Salt River Outfall Sewer. Both of the above projects were financed,

for that portion of the total cost above the Federal Grants, by the cities of Scottsdale and Phoenix in proportion to the estimated flow capacity necessary to serve each city in 1990.

The Salt River Outfall Sewer, aided by WPC-ARIZ-62 and WPC-ARIZ-54 conveys the sewage to the existing 45.0 MGD activated-sludge sewage treatment plant at 91st Avenue and the Salt River. An application for a Federal Grant for a proposed 15.0 MGD addition to this plant is being made to the Federal Water Pollution Control Administration.

POPULATION AND USER FORECASTS

According to a special census taken by the City of Phoenix in 1965 there were 3,088 dwelling units and a population of 9,798 in the drainage area of the proposed Paradise Valley Interceptor Sewer. As of October, 1967, the City of Phoenix Planning Department estimated that there was a population of 11,887 in the area. The Planning Department's projections through 1990 for the tributary area are as follows:

1970	26,150
1975	42,228
1980	54,789
1985	69,418
1990	78,457

At the present time it is estimated that 4,300 persons are being served by the trunk sewer system tributary to the pumping station at 40th Street and Cactus Road.

The Paradise Valley area is the most rapidly developing area in the City of Phoenix. Existing subdivisions within the area are requesting

sewer service, and future development, especially in the eastern part of the drainage area, would benefit by having sewer service available thereby avoiding the ground water pollution hazard.

DESIGN CRITERIA

In accordance with the Multi-City Agreement this project has been designed to provide capacity for at least the estimated 1990 population, as have all other joint usage sewerage projects. The average daily rate of flow in the area tributary to this project has been based on a population density of 8 persons per acre and an average flow of 120 gallons per capita per day.

CONSTRUCTION MATERIALS

The City of Phoenix has established standard specifications for construction materials to be used in the construction of sanitary sewerage projects. For the Paradise Valley Interceptor Sewer, with pipe sizes of 27" through 33", the Interceptor would be vitrified clay pipe with the possible alternate of Amerplate lined reinforced concrete pipe in selected locations in the larger diameters.

PROPOSED CONSTRUCTION SCHEDULE

The City of Scottsdale has just recently completed acquisition of all of the necessary easements and right-of-way required for the construction of the Scottsdale-Paradise Valley Interceptor Sewer.

Scottsdale plans to proceed with the construction of this interceptor as soon as the plans and specifications have been approved by the Department of Housing and Urban Development. This should be early in 1968.

Plans and Specifications have been prepared for the proposed Paradise Valley Interceptor Sewer, the bonds have been authorized, and the project could be advertised for bids early in 1968.

OPERATION AND MAINTENANCE COSTS

The estimated annual operation and maintenance cost, including the metering and sampling station but exclusive of administrative costs for the proposed interceptor, is \$1,750.00/year.

SUB-SURFACE INVESTIGATION

Soil borings have been made along the route of the Paradise Valley Interceptor Sewer. Logs of these borings are shown at the back of this report. The borings indicate that trench excavation will be normal and that no unusual construction problems will be encountered.

EASEMENTS AND RIGHT-OF-WAY

All easements and right-of-way required for the construction and installation of this project have been obtained.

RECOMMENDATIONS

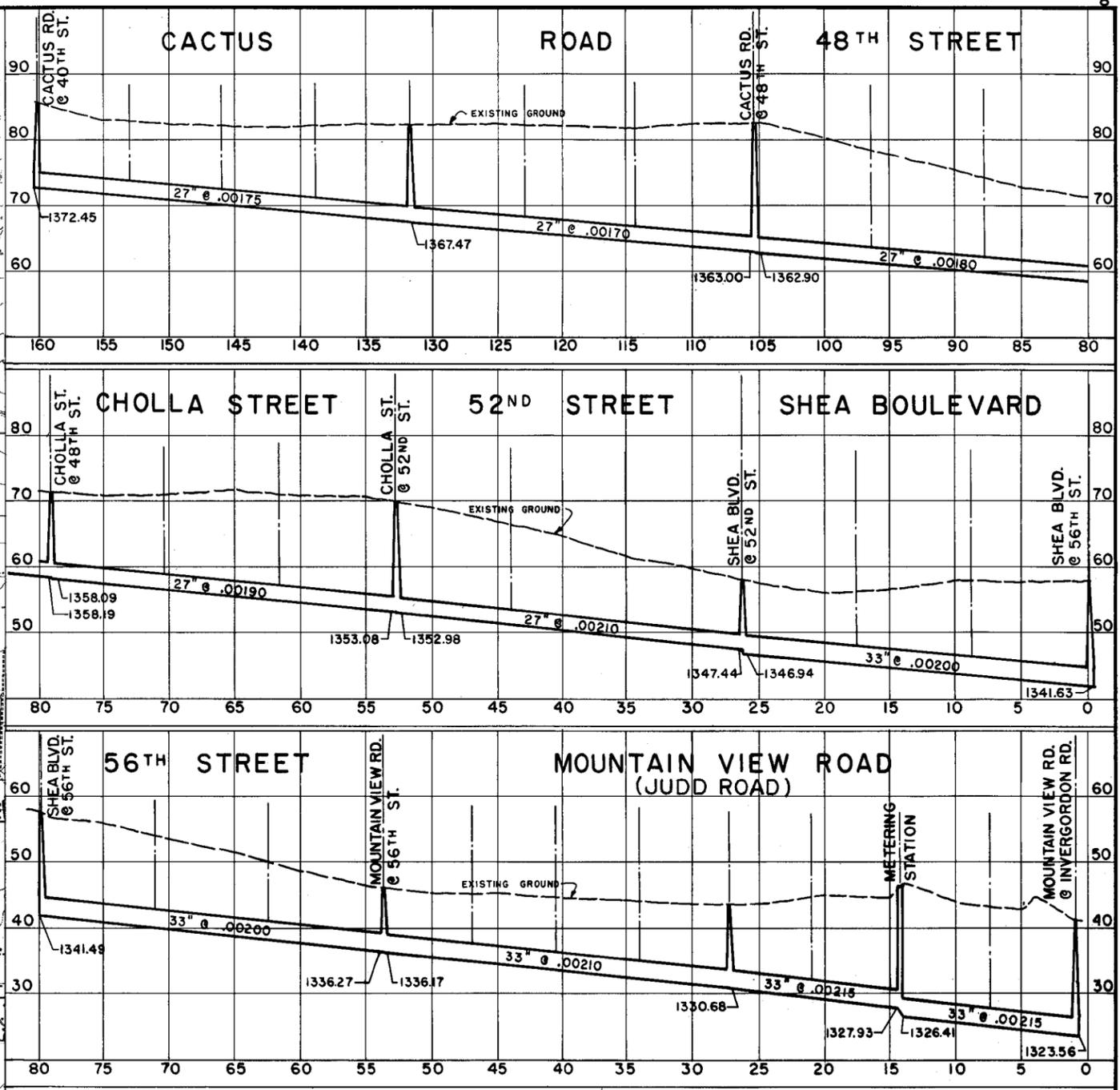
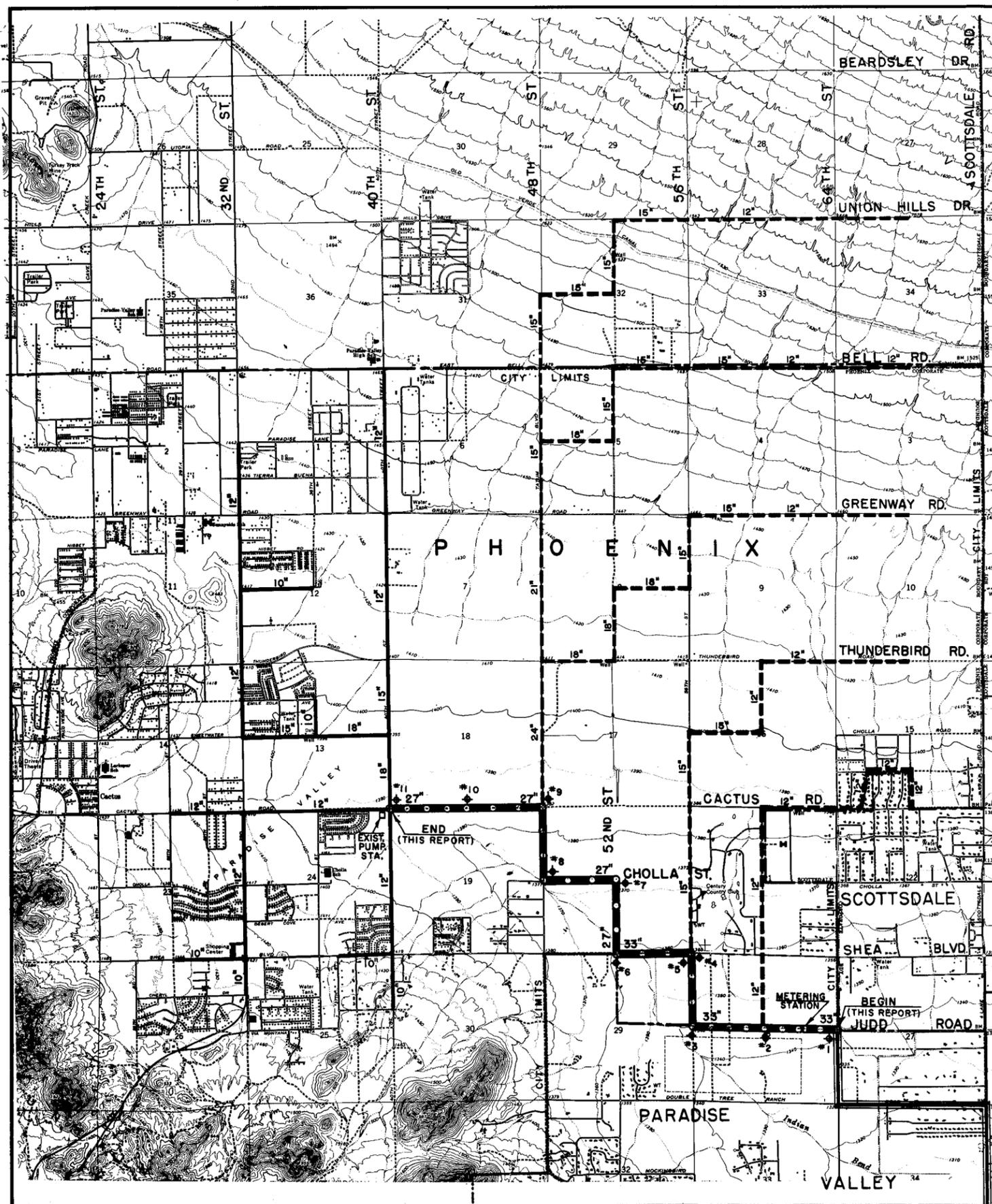
It is recommended that the City of Phoenix apply for Federal assistance in the construction of this project. Inasmuch as a considerable amount of time always elapses between the inception and completion of any project such as this, it is recommended that action be instigated in the immediate future.

TABLE 1
COST ESTIMATE

<u>Quantity</u>	<u>Unit</u>	<u>Item</u>	<u>Unit Price</u>	<u>Total Amount</u>
10,480	L.F.	33" Sewer	\$ 33.00	\$345,840.00
13,390	L.F.	27" Sewer	\$ 27.00	361,530.00
4	L.F.	21" Sewer	\$ 25.00	100.00
13	L.F.	15" Sewer	\$ 20.00	260.00
8	L.F.	12" Sewer	\$ 15.00	120.00
5	L.F.	10" Sewer	\$ 10.00	50.00
5	L.F.	8" Sewer	\$ 10.00	50.00
29	Each	5' Dia. Manholes	\$700.00	20,300.00
7	Each	Plugs for Future Use	\$ 76.00	532.00
15	S.Y.	Type "B" Pavement Replacement	\$ 13.00	195.00
18	S.Y.	Type "D" Pavement Replacement	\$ 7.00	126.00
1,417	S.Y.	Type "E" Pavement Replacement	\$ 1.00	1,417.00
20	S.Y.	Type "F" Pavement Replacement	\$ 4.00	80.00
1	L.S.	Metering & Sampling Station		<u>100,000.00</u>
TOTAL CONSTRUCTION COSTS				\$830,600.00
Engineering & Contingencies (20%)				<u>\$166,120.00</u>
TOTAL PROJECT COST				\$996,720.00

24

S.R.



PROFILE — SCALE

HORIZONTAL — 1000' 500' 0' 1000'

VERTICAL — 10' 5' 0' 10'

LEGEND

- PROPOSED PARADISE VALLEY INTERCEPTOR SEWER
- =— SCOTTSDALE — PARADISE VALLEY INTERCEPTOR SEWER
- - - - FUTURE TRUNK SEWER
- — — — EXISTING TRUNK SEWER
- ◆ 4" TEST HOLE

SCALE

0 2000' 4000'

BASE MAP BY U. S. G. S.

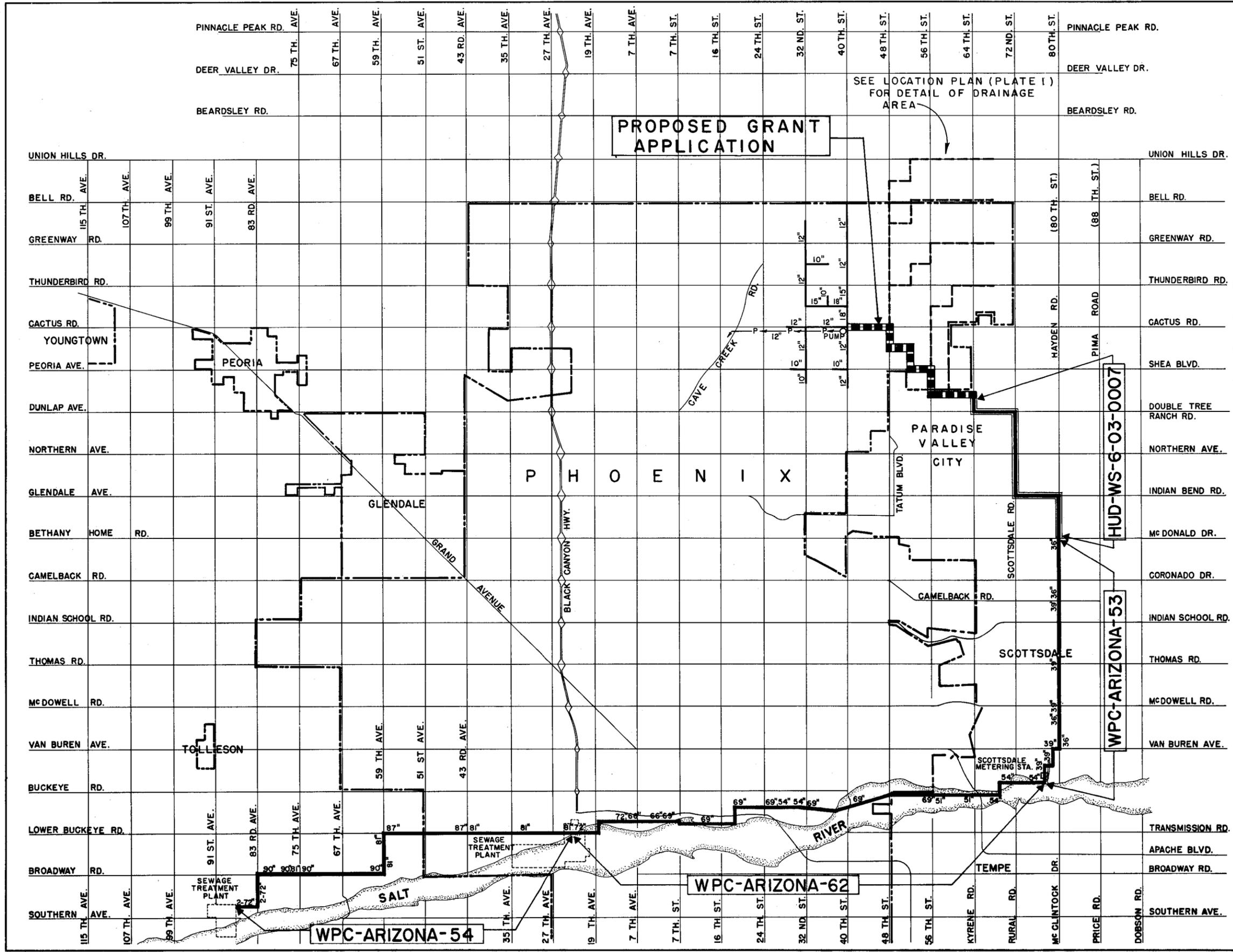
PLATE I

CITY OF PHOENIX
PUBLIC WORKS DEPARTMENT
DIVISION OF ENGINEERING

PARADISE VALLEY INTERCEPTOR SEWER LOCATION PLAN

ARTHUR H. BEARD, JR. CONSULTING ENGINEER
PHOENIX, ARIZONA TUCSON, ARIZONA

DESIGNED	TRACED	DATE	SHEET NO.
DRAWN	CHECKED	REVISED	TOTAL SHEETS



SEE LOCATION PLAN (PLATE 1) FOR DETAIL OF DRAINAGE AREA



SCALE
1/2 0 MILES

- LEGEND**
- PROPOSED PARADISE VALLEY INTERCEPTOR SEWER
 - SCOTTSDALE-PARADISE VALLEY INTERCEPTOR SEWER
 - EXISTING INTERCEPTOR SEWER
 - FUTURE TRUNK SEWER
 - EXISTING TRUNK SEWER
 - CITY LIMITS

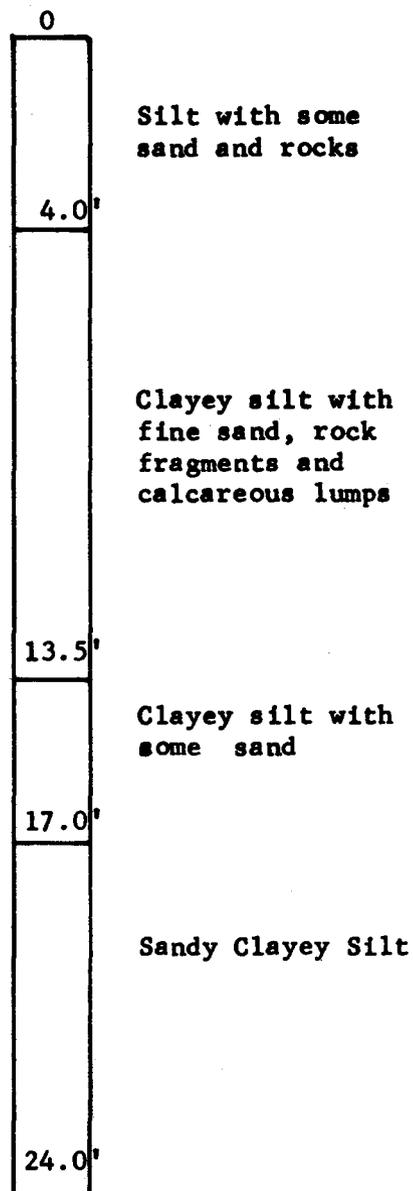
PLATE 2



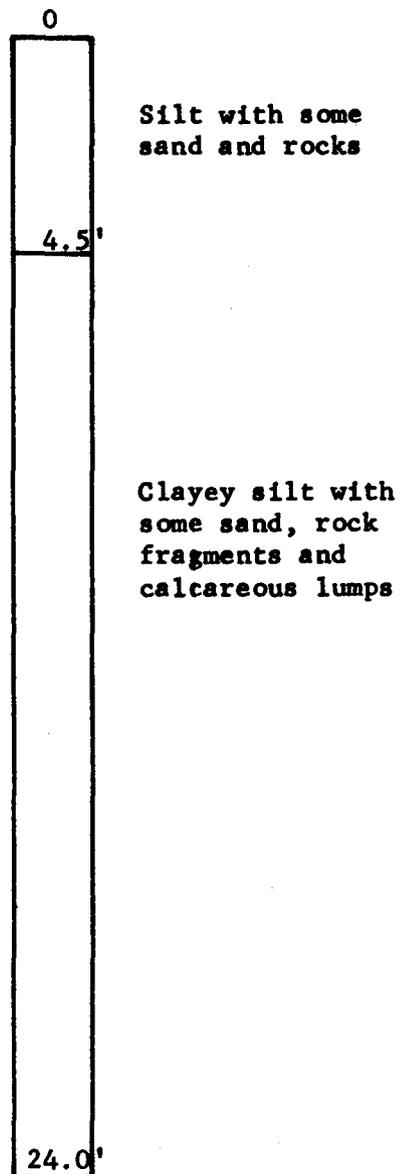
CITY OF PHOENIX PUBLIC WORKS DEPARTMENT DIVISION OF ENGINEERING			
PARADISE VALLEY INTERCEPTOR SEWER			
REGIONAL SEWERAGE PLAN			
ARTHUR H. BEARD, JR. CONSULTING ENGINEER PHOENIX, ARIZONA TUCSON, ARIZONA			
DESIGNED	TRACED	DATE	SHEET
CHECKED	REVISION		TOTAL

LOG OF BORINGS
(For Location See Plate 1)

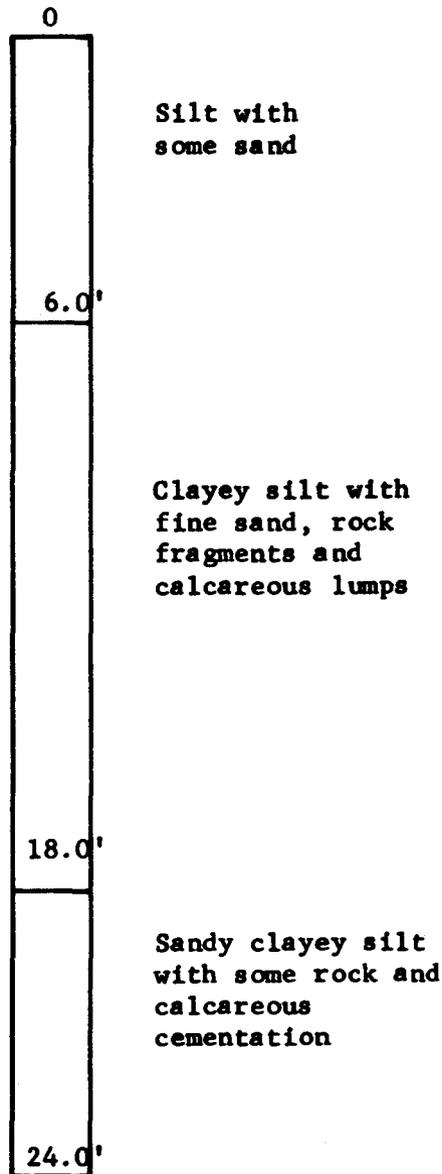
Test Hole No. 1



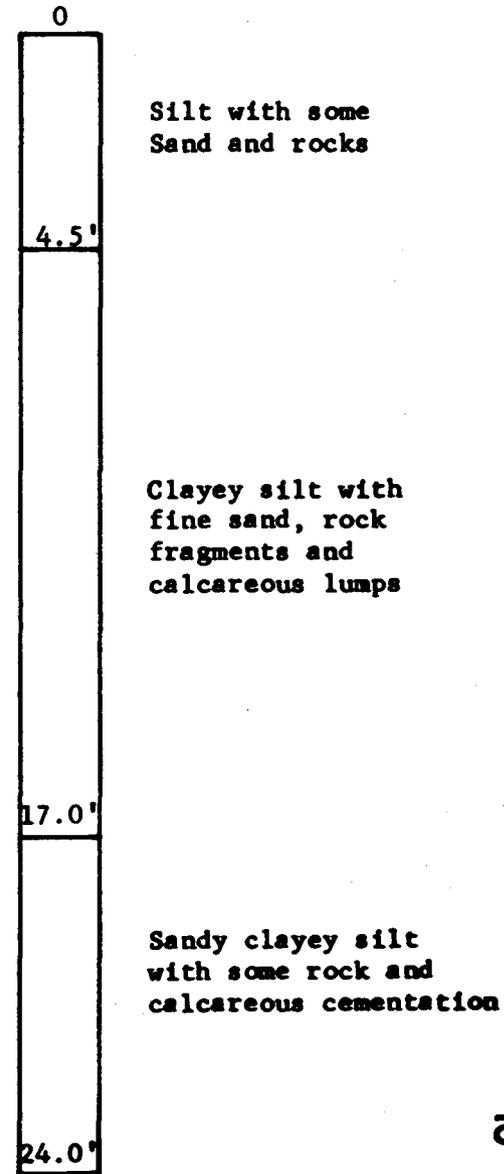
Test Hole No. 2



Test Hole No. 3



Test Hole No. 4



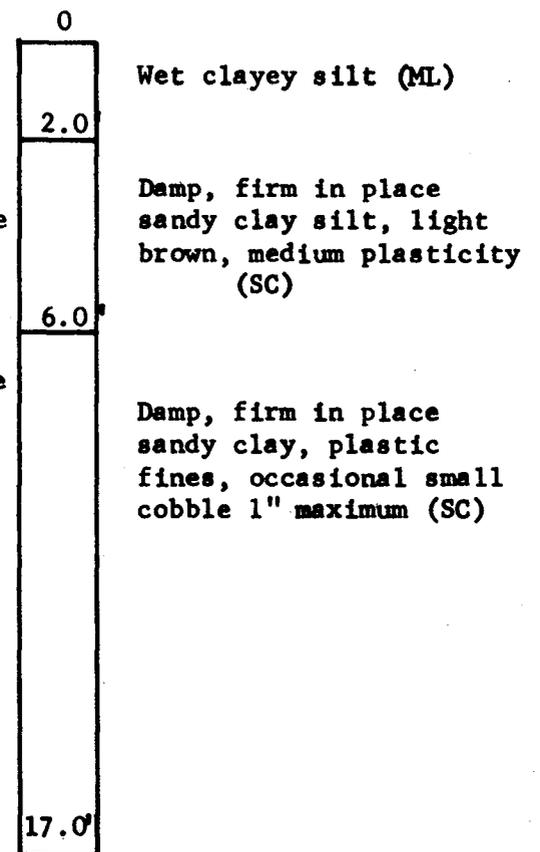
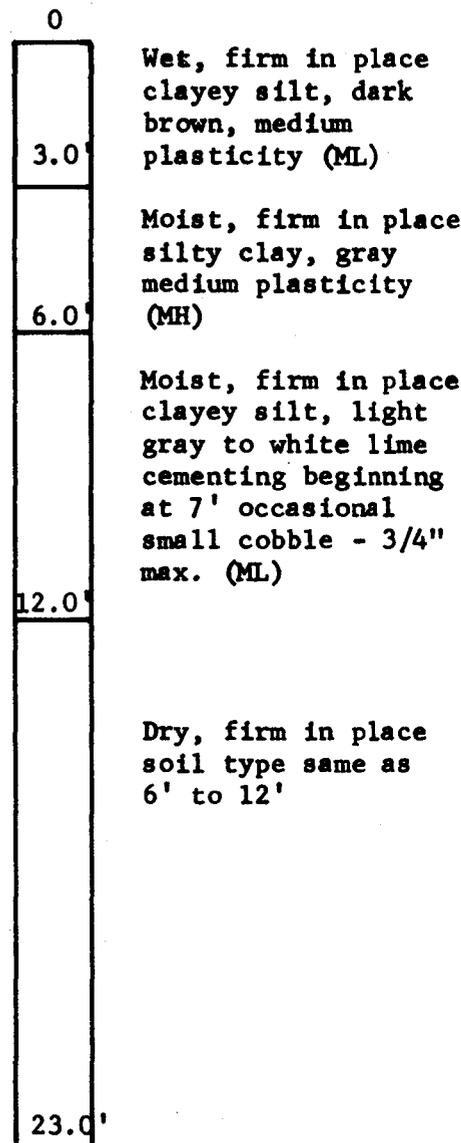
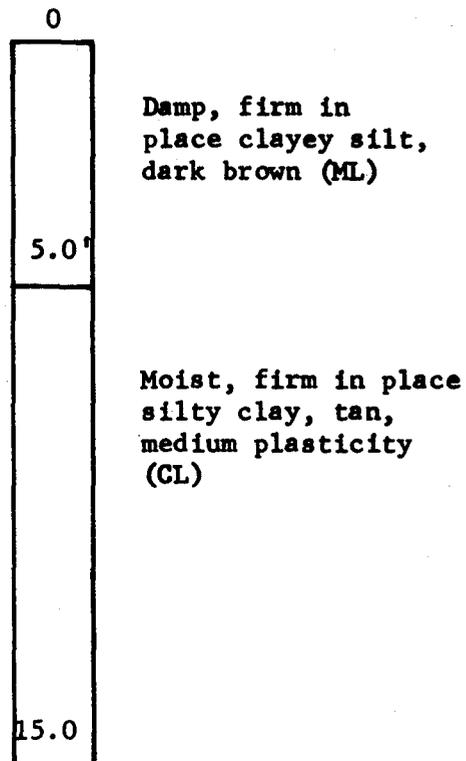
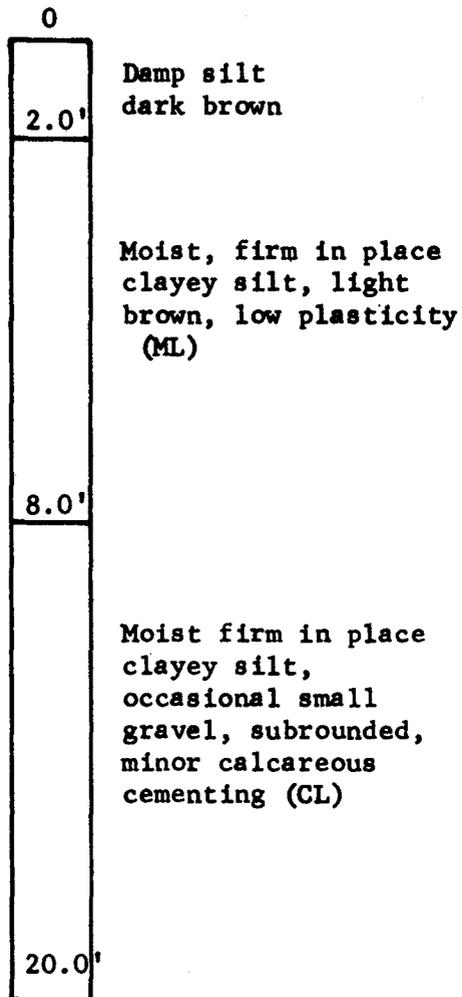
LOG OF BORINGS
(For location see Plate 1)

Test Hole No. 5

Test Hole No. 6

Test Hole No. 7

Test Hole No. 8



LOG OF BORINGS

(For Location See Plate 1)

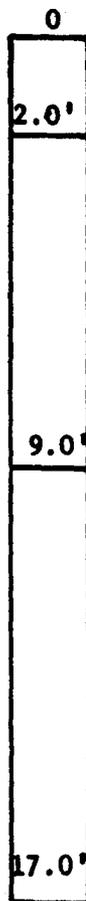
Test Hole No. 9

Test Hole No. 10

Test Hole No. 11



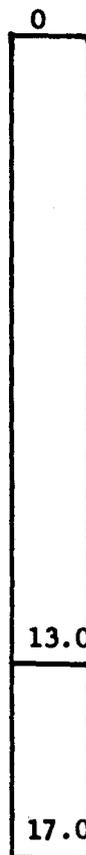
Moist, firm in place silty sand-clay mixture, light tan medium plasticity, about 40% plastic fines. Minor calcareous cementing below 8' (SC)



Wet clayey silt, light brown (MH)

Dry, firm in place clayey silt, light brown (MH)

Dry, firm in place clayey silt, about 10% small gravel 1/4" maximum (SM)



Dry, firm in place silty clay buff, medium plasticity (CL)

Dry, firm in place silty clay, slight lime cementing, occasional gravel 1/4" maximum (CL)