ATL, INC.

CONSTRUCTION QUALITY CONTROL
GEOTECHNICAL CONSULTANTS

RID CANAL OVERCHUTE/SIPHON
LITCHFIELD ROAD AND INDIAN SCHOOL ROAD
MCFCD CONTRACT NO. 94-07
ATL JOB NO. 194031

A470.942

ATL Job No. 194031 *September 26, 1994*

REPORT OF

GEOTECHNICAL INVESTIGATION

FOR

SFC ENGINEERING COMPANY

RID CANAL OVERCHUTE/SIPHON
LITCHFIELD ROAD AND INDIAN SCHOOL ROAD
MCFCD CONTRACT NO. 94-07
ATL JOB NO. 194031

Registered Professional Engineer
CERTIFICATE NO.
23577
JAMES D.
ROSE
Date Signed 9-27-94
ARIZONA

ATL, INC.
CONSTRUCTION QUALITY CONTROL
GEOTECHNICAL CONSULTATION

September 26, 1994

SFC Engineering Company
7776 Pointe Parkway West
Phoenix, AZ 85044

Attn: Mr. Russ Miracle, P.E.

Re: Rid Canal Overchute/Siphon
Litchfield Road & Indian School
MCFCD Contract No. 94-07
ATL Job No. 194031

Gentlemen:

This report presents the results of the field exploration, laboratory tests, and engineering analysis for this project. ATL's work was done in accordance with ATL's revised proposal P94064 dated August 3, 1994.

ATL has appreciated the opportunity to be of service to you on this project and looks forward to a continued association on future projects. Should any questions arise, please do not hesitate to contact us at your earliest convenience.

Very truly yours,

Registered Professional Engineer (Civil)
CERTIFICATE NO. 23577
JAMES D. ROSE
Date Signed 9-27-94

James D. Rose, P.E.
Vice President, Geotechnical

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ATL Job No. 194031 *September 26, 1994*

REPORT OF

GEOTECHNICAL INVESTIGATION

FOR

SFC ENGINEERING COMPANY

RID CANAL OVERCHUTE/SIPHON
LITCHFIELD ROAD AND INDIAN SCHOOL ROAD BYPASS
MCFCD CONTRACT NO. 94-07
ATL JOB NO. 194031

1.0 PROJECT DESCRIPTION

The project consists of a storm water collection channel to intercept storm water from the area north of the RID Canal at Litchfield Road and convey the storm water south across the canal into an existing drainage channel. The project also includes design of Overchute/Siphon structure at the RID Canal. The Overchute/Siphon structure will be a box type structure with an open channel for the overchute portion.

2.0 SCOPE OF WORK

Based upon ATL's revised proposal dated August 3, 1994 and the contract with SFC Engineering Company dated August 17, 1994, the following items are required:

a. Edited boring logs and laboratory data summary.

b. Foundation alternatives for the Overchute/Siphon structure.

c. Bearing capacity and estimated settlements.

d. Lateral earth pressures.

e. Expected ground compaction.

f. Corrosivity potential of the soil.

Eleven (11) copies of the geotechnical report are submitted. Please note that Plate 1 summarizes the guidelines to use in interpreting this report and is meant to clarify, for legal purposes, the way in which this report should be used.

3.0 SITE LOCATION AND GEOLOGIC DESCRIPTION

The proposed Overchute/Siphon is located at the intersection of the Litchfiled Road alignment and the RID Canal within the south boundary of Litchfield Park, Township 2 North Range 1 West, Section 27. The existing channel to the south of the ROD Canal is on Suncor property. The site is located on Quaternary Age valley fill deposits.

4.0 DRILLING AND SAMPLING PROCEDURES

A total of four (4) borings were drilled to depths of 20 to 30 feet. Two (2) borings were drilled to depths of 30 feet at the proposed Overchute/Siphon location. Two (2) borings were drilled to depths of 20 feet along the proposed channel alignment.

A Mobile B-50 drill rig with a 6-inch and 8-inch outside diameter hollow stem continuous flight auger as used to drill and sample the borings. Sampling of the subsurface material was achieved by collecting soil at the collar of the bore holes. Driven SPT and ring samples were also taken at selected intervals. Boring locations and general plan view of the site are presented on Plate No. 4.

Borings were sampled and logged by ATL's field representative and edited boring logs are presented in Appendix A.

5.0 LABORATORY TESTING

Representatives bulk samples of the subgrade were collected at each boring location for analysis. Selected driven samples were also collected for analysis.

The following table lists the types and quantities of tests performed to provide the project design information:

TEST	NUMBER OF TEST PERFORMED
Sieve Analysis	8
Atterberg Limit	8
Moisture Content	8
Consolidation	2
Direct Shear	1
Standard Proctor	2
pH and Resistivity	4

All laboratory tests were conducted in accordance with ASTM Standards, and are summarized in Appendix B, "Laboratory Test Results". Soils were classified using the Unified Soils Classification System.

6.0 SUMMARY OF EXISTING SUBSURFACE CONDITIONS

The soils encountered Boring Nos. 1 and 2 at the Overchute/Siphon structure consist of silty sand (SM) in the upper 4½ to 5½ feet, sand clay (CL) in the next layer to a depth of 14½ to 16½ feet with silty gravelly sand (SM) and gravelly sand (SP) below to the bottom of the boring. The sandy clay (CL) layer is soft to firm in relative firmness. The underlying layers of silty gravelly sand (SM) and gravelly sand (SP) range from medium dense to very dense in relative density.

The sandy clay (CL) exhibited moderate consolidation potential for loads up to 1.14 ton/ft^2. The soil classifications appearing in parentheses are from the Unified Soils Classification System (USCS).

The Boring Nos. 3 and 4 at the channel locations encountered sandy silty clay (CL-ML) and sandy clay (CL) to depths of 7 to 9 feet. The underlying layers are clayey sand (SC) and silty sand (SM).

Ground water was not encountered to the depths explored.

The site soils have box resistivity results ranging from 1737 ohm-cm at Boring No. 1 to 3006 ohm-cm at Boring No. 3. pH results ranged from 7.8 to 8.0. Ground compaction under compacted areas is estimated at 0.1 foot.

7.0 DISCUSSION AND RECOMMENDATIONS

7.1 General

The design plans call for a shallow, channel with earthen bottom and side slopes. The channel will be 5 to 6 feet deep with the maximum water surface at existing grade. The proposed siphon will be a double 8-foot by 8-foot box with a 5-foot deep overchute channel located above, orthogonal to the boxes. The bottom of the siphon will bear approximately 14 feet below existing grade.

7.2 Overchute/Siphon

The Overchute/Siphon will bear approximately 14 feet below existing grade in sandy clay. The sandy clay has moderate consolidation potential. Therefore, 1 foot of sandy clay should be overexcavated and replaced with compacted granular fill. The foundation design factors are summarized below in Table 1.

Table 1

Bearing Soils	1.0 foot of compacted granular fill over compacted native soil.
Allowable Bearing Capacity	2000 psf
Lateral Extent of Fill	1.0 foot beyond all footing edges
Total Estimated Settlement	Less than 0.5 inch

On-site granular soils may be used for support of the Overchute/Siphon. Backfill material should be on-site granular or an imported granular fill as specified in subsection 8.2 of this report.

Structure excavation and backfill shall conform to Section 206 of the Maricopa Association of Governments (MAG) "Uniform standard Specifications for Public Works Construction". Compaction requirements shall be as specified in Section 8.1 of this report.

7.3 Lateral Earth Pressures

For design purposes, the following lateral earth pressures expressed as equivalent fluid pressures (EFP) should be used for granular backfill.

Active	34 pcf
At-Rest	52 pcf
Passive	309 pcf

The above EFP's are based on a unit weight of 115 pcf and a 33° angle of internal friction for granular soil. The coefficient of sliding friction for the footing-soil interface is 0.55. Compaction requirements shall be specified in Section 8.1 of this report.

7.4 Corrosivity

Soils along the proposed channel have pH levels of 7.8 to 8.0 and Resistivities of 1737 to 3006 ohm-cm. Corrosion protection will be required for metal pipes where resistivities are below 1500 ohm-cm.

8.0 GENERAL CONSTRUCTION RECOMMENDATIONS

8.1 Backfill and Compaction

Compaction of structural Backfill type III shall be in accordance with MAG specifications Section 601, Table 601-2.

8.2 Imported Granular Fill

Imported granular fill shall conform to these specifications:

Sieve Size	Percent Passing
3"	100
#4	40-100
#200	0-25

The plasticity index shall not exceed five (5).

9.0 ADDITIONAL SERVICES

It is recommended that ATL be retained to provide material testing services during construction. Our staff of experienced technicians and field engineers can provide competent and reliable testing services. In addition, geotechnical expertise is readily available if needed.

It has been ATL's pleasure to serve SFC Engineering Company on this project. ATL has in-house expertise in a variety of geotechnical related areas and the firm looks forward to working with SFC Engineering Company in the near future.

PLATES

GUIDELINES IN THE USE AND INTERPRETATION OF THIS GEOTECHNICAL REPORT

ATL Job No. 194031

Our professional services were performed, our findings obtained, and our recommendations prepared in accordance with generally accepted engineering principles and practices. This warranty is in lieu of all other warranties, either expressed or implied.

The geotechnical report was prepared for the use of the Owner in the design of the subject facility and should be made available to potential contractors and/or the Contractor for information on factual data only. This report should not be used for contractual purposes as a warranty of interpreted subsurface conditions such as those indicated by the interpretive boring and test pit logs, cross sections, or discussion of subsurface conditions contained herein.

The analyses, conclusions and recommendations contained in the report are based on site conditions as they presently exist and assume that the exploratory borings, test pits, and/or probes are representative of the subsurface conditions of the site. If, during construction, subsurface conditions are found which are significantly different from those observed in the exploratory borings and test pits, or assumed to exist in the excavations, we should be advised at once so that we can review these conditions and reconsider our recommendations where necessary. If there is a substantial lapse of time between the submission of this report and the start of work at the site, or if conditions have changed due to natural causes or construction operations at or adjacent to the site, this report should be reviewed to determine the applicability of the conclusions and recommendations considering the changed conditions and time lapse.

The Summary Boring Logs are our opinion of the subsurface conditions revealed by periodic sampling of the ground as the borings progressed. The soil descriptions and interfaces between strata are interpretive and actual changes may be gradual.

The boring logs and related information depict subsurface conditions only at these specific locations and at the particular time designated on the logs. Soil conditions at other locations may differ from conditions occurring at these boring locations. Also, the passage of time may result in a change in the soil conditions at these boring locations.

Groundwater levels often vary seasonally. Groundwater levels reported on the boring logs or in the body of the report are factual data only for the dates shown.

Unanticipated soil conditions are commonly encountered on construction sites and cannot be fully anticipated by merely taking soil samples, borings or test pits. Such unexpected conditions frequently require that additional expenditures be made to attain a properly constructed project. It is recommended that the Owner consider providing a contingency fund to accommodate such potential extra costs.

This firm cannot be responsible for any deviation from the intent of this report including, but not restricted to, any changes to the scheduled time of construction, the nature of the project or the specific construction methods or means indicated in this report; nor can our firm be responsible for any construction activity on sites other than the specific site referred to in this report.

PLATE 1

SOIL CLASSIFICATION & TERMINOLOGY

GRAPHIC SYMBOL	GROUP SYMBOL	TYPICAL NAMES
	GW	Well graded gravels, gravel - sand mixtures, or sand - gravel - cobble mixtures.
	GP	Poorly graded gravels, gravel - sand mixtures, or sand - gravel - cobble mixtures.
	GM	Silty gravels, gravel - sand - silt mixtures.
	GC	Clayey gravels, gravel - sand - clay mixtures.
	SW	Well graded sands, gravelly sands.
	SP	Poorly graded sands, gravelly sands.
	SM	Silty sands, sand - silt mixtures
	SC	Clayey sands, sand - clay mixtures
	ML	Inorganic silts, clayey silts with slight plasticity
	MH	Inorganic silts, micaceous or diatomaceous silty soils, elastic silts.
	CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
	CH	Inorganic clays of high plasticity, fat clays, sandy clays of high plasticity.

1. Relative Density. Terms for description of relative density of cohesionless, uncemented sands and sand - gravel mixtures.

N	Relative Density
0 - 4	Very loose
5 - 10	Loose
11 - 30	Medium dense
31 - 50	Dense
50	Very dense

2. Relative Consistency. Terms for description of clays which are saturated or near saturation.

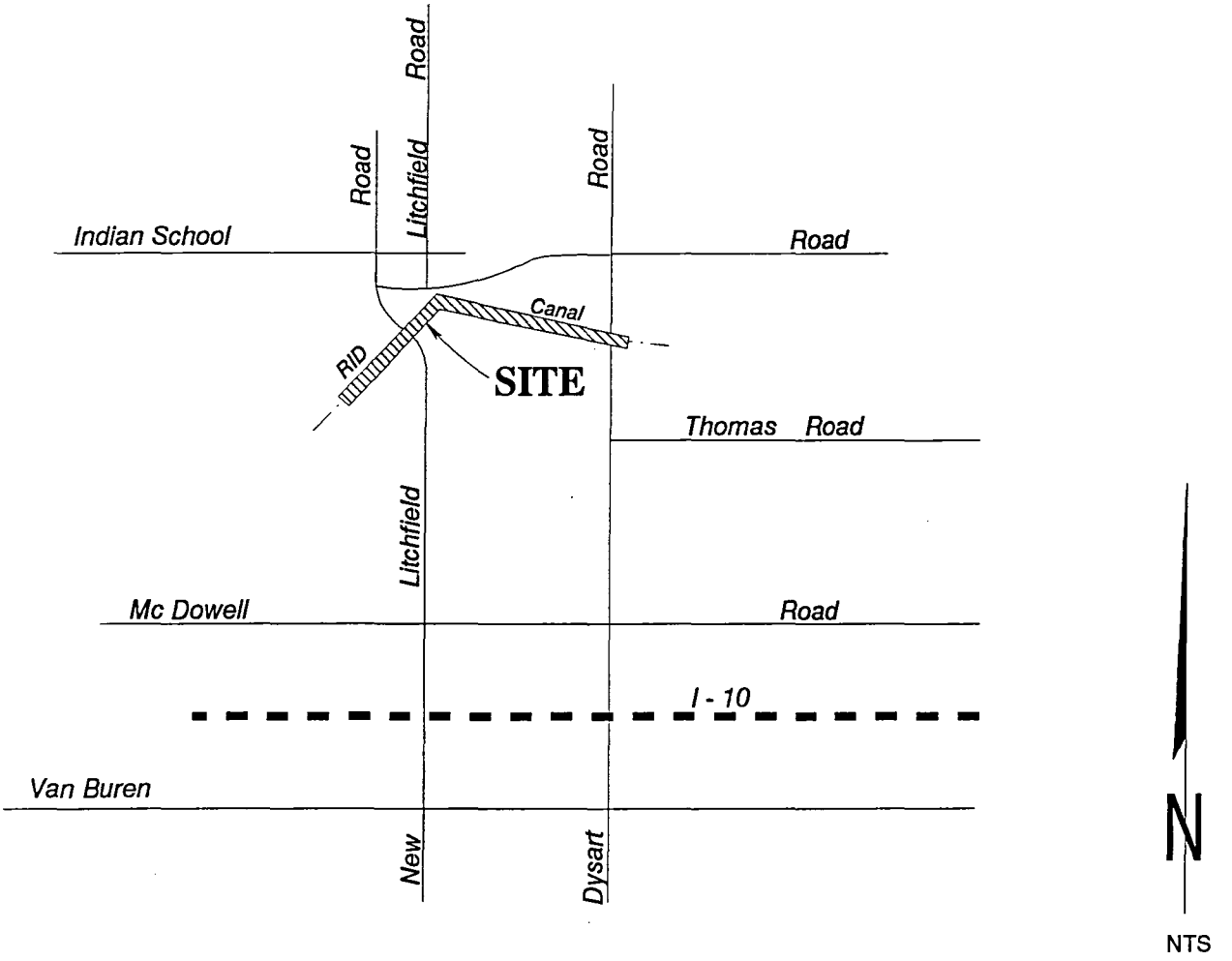
N	Relative Consistency	Remarks
0 - 4	Very soft	Easily penetrated several inches with fist.
3 - 4	Soft	Easily penetrated several inches with thumb.
5 - 8	Medium stiff	Can be penetrated several inches with thumb with moderate effort.
9 - 15	Stiff	Readily indented with thumb, but penetrated only with great effort.
16 - 30	Very stiff	Readily indented with thumb-nail.
30 +	Hard	Indented only with difficulty by thumbnail.

3. Relative Firmness. Terms for description of partially saturated and / or cemented soils which commonly occur in the Southwest including clays, cemented granular materials, silts and silty and clayey granular soils.

N	Relative Firmness
0 - 4	Very soft
5 - 8	Soft
9 - 15	Moderately firm
16 - 30	Firm
31 - 50	Very firm
50 +	Hard

DEFINITIONS OF SOIL FRACTIONS

SOIL COMPONENT	PARTICLE SIZE RANGE
Cobbles	Above 3 inches
Gravel	3 inches to No. 4 sieve
Coarse gravel	3 inches to 3/4 inch
Fine gravel	3/4 inch to No. 4 sieve
Sand	No. 4 sieve to No. 200
Coarse	No. 4 sieve to No. 10
Medium	No. 10 sieve to No. 40
Fine	No. 40 sieve to No. 200
Fines (silt or clay)	Below No. 200 sieve

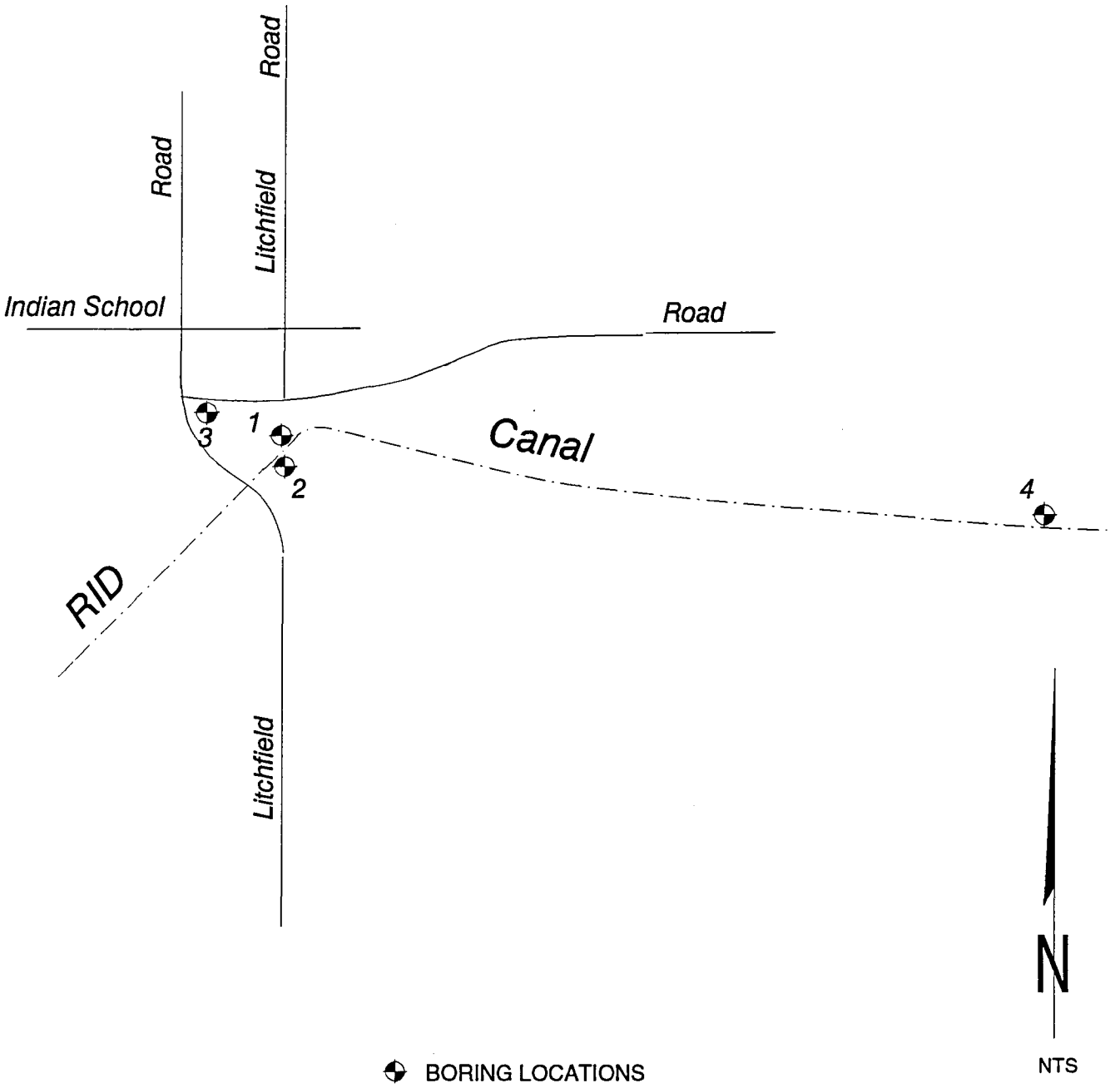


VICINITY MAP

RID CANAL - OVERCHUTE / SIPHON

ATL JOB NO. 194031

PLATE 3



BORING LOCATIONS

RID CANAL - OVERCHUTE / SIPHON

ATL JOB NO. 194031

PLATE 4

A P P E N D I X A

BORING LOGS

RID CANAL - OVERCHUTE / SIPHON

ATL Job No. *194031*

Boring No. *1*

Boring Location: *18 Feet WEST of Old Litchfield Road C/L, 26 Feet North C/L of RID Canal, North Side of RID*

Boring Equipment: *Mobile B-50 With 8 - Inch Diameter Auger*

Date of Boring: *8/23/94* Elevation of Boring: *1012.0*

Driller: *J. Cowell* Logger: *J. Cowell* Reviewed By: *J. Rose*

Graphical Log	Depth (Feet)	SOIL DESCRIPTION	SPT Blows/Ft	Ring Blows/Ft	Water Content %	Dry Density (PCF)
		Silty sand, AC and AB				
	5	*Brown silty SAND, (SM), Moist*				
	10	*Brown sandy CLAY, (CL), Moist, Weak cementation, Soft to firm*	8 27	68	13.8	
	15		15	41		
	20	*Gray fine SAND with thin lines of gravelly sand, (SM), Moist, Medium dense, Non plastic*	18	26	8.3	
	25	*Gray gravelly SAND, (SP), Gravel to 2 - inch maximum size with strata of fine sand, Moist, Dense to very dense*	50	43		

Boring Stopped at *31.3* Feet Below Existing Grade

Groundwater	Initial Depth	Hour	24 Hour Depth
	Not Encountered		

NOTE: THE ABOVE DATA FOR DESIGN PURPOSES ONLY.

A1

RID CANAL - OVERCHUTE / SIPHON

ATL Job No. *194031*

Boring No. *1*

Boring Location: *18 Feet WEST of Old Litchfield Road C/L, 26 Feet North C/L of RID Canal, North Side of RID*

Boring Equipment: *Mobile B-50 With 8 - Inch Diameter Auger*

Date of Boring: *8/23/94* Elevation of Boring: *1012.0*

Driller: *J. Cowell* Logger: *J. Cowell* Reviewed By: *J. Rose*

Graphical Log	Depth (Feet)	SOIL DESCRIPTION	SPT Blows/Ft	Ring Blows/Ft	Water Content %	Dry Density (PCF)
		Gray gravelly SAND to 2 - inch maximum size with strata of fine sand, Moist				
		Bottom at 31.3 feet	*53/3"*			
	35					
	40					
	45					
	50					
	55					

Boring Stopped at *31.3* Feet Below Existing Grade

Groundwater	Initial Depth	Hour	24 Hour Depth
	Not Encountered		

NOTE: THE ABOVE DATA FOR DESIGN PURPOSES ONLY.

RID CANAL - OVERCHUTE / SIPHON

ATL Job No. 194031

Boring No. 2

Boring Location: *18 Feet East of Old Litchfield Road C/L, 30 Feet South of RID Canal C/L, South Side of RID*

Boring Equipment: *Mobile B-50 With 8 - Inch Diameter Auger*

Date of Boring: *8/23/94* Elevation of Boring: *1012.5*

Driller: *J. Cowell* Logger: *J. Cowell* Reviewed By: *J. Rose*

Graphical Log	Depth (Feet)	SOIL DESCRIPTION	SPT Blows/Ft	Ring Blows/Ft	Water Content %	Dry Density (PCF)
		Brown silty SAND, (SM), Moist				
	5	*Brown sandy CLAY, (CL), Moist, Moderately firm to firm*	10		13.7	
	10		18			
	15	*Gray silty fine SAND, (SM), Moist, Medium dense*	18			
	20		20			
	25					
		Gray gravelly SAND, (SP), Slightly moist, Dense to very dense	30			

Boring Stopped at *31.2* Feet Below Existing Grade

Groundwater	Initial Depth	Hour	24 Hour Depth
	Not Encountered		

NOTE: THE ABOVE DATA FOR DESIGN PURPOSES ONLY.

RID CANAL - OVERCHUTE / SIPHON

ATL Job No. 194031

Boring No. 2

Boring Location: *18 Feet East of Old Litchfield Road C/L, 30 Feet South of RID Canal C/L, South Side of RID*

Boring Equipment: *Mobile B-50 With 8 - Inch Diameter Auger*

Date of Boring: *8/23/94* Elevation of Boring: *1012.0*

Driller: *J. Cowell* Logger: *J. Cowell* Reviewed By: *J. Rose*

Graphical Log	Depth (Feet)	SOIL DESCRIPTION	SPT Blows/Ft	Ring Blows/Ft	Water Content %	Dry Density (PCF)
		Gray gravelly SAND , (SP), with tan sand stratum, Slightly moist				
		Bottom at 31.2 feet	50/2"			
	35					
	40					
	45					
	50					
	55					

Boring Stopped at *31.2* Feet Below Existing Grade

Groundwater	Initial Depth	Hour	24 Hour Depth
	Not Encountered		

NOTE: THE ABOVE DATA FOR DESIGN PURPOSES ONLY.

RID CANAL - OVERCHUTE / SIPHON

ATL Job No. *194031*

Boring No. *3*

Boring Location: *900 Feet West of Old Litchfield Road C/L, 33 Feet South of Curb of Indian School Road*

Boring Equipment: *Mobile B-50 With 6 - Inch Diameter Auger*

Date of Boring: *8/24/94* Elevation of Boring: *Existing Grade*

Driller: *J. Cowell* Logger: *J. Cowell* Reviewed By: *J. Rose*

Graphical Log	Depth (Feet)	SOIL DESCRIPTION	SPT Blows/Ft	Ring Blows/Ft	Water Content %	Dry Density (PCF)
		Light brown sandy silty CLAY, (CL-ML), with fine gravel, Damp,				
	5		53		3.9	
		Tan clayey SAND, (SC), Damp, Very firm				
	10		47		5.9	
	15	*Tan clayey SAND with fine gravel, (SC), Damp, Firm*	24			
	20	*Bottom at 21.5 feet*	26			
	25					

Boring Stopped at *21.5* Feet Below Existing Grade

Groundwater	Initial Depth	Hour	24 Hour Depth
	Not Encountered		

NOTE: THE ABOVE DATA FOR DESIGN PURPOSES ONLY.

RID CANAL - OVERCHUTE / SIPHON

ATL Job No. 194031

Boring No. 4

Boring Location: *6/10 Mile East of Old Litchfield Road C/L, 40 Feet North of North Bank of RID Canal*

Boring Equipment: *Mobile B-50 With 6 - Inch Diameter Auger*

Date of Boring: *8/24/94* Elevation of Boring: *Existing Grade*

Driller: *J. Cowell* Logger: *J. Cowell* Reviewed By: *J. Rose*

Graphical Log	Depth (Feet)	SOIL DESCRIPTION	SPT Blows/Ft	Ring Blows/Ft	Water Content %	Dry Density (PCF)
		Light brown sandy CLAY. (CL), Damp			7.2	
	5	*Brown sandy CLAY, (CL), Damp, Very firm*	43		11.8	
	10	*Light brown silty fine SAND, (SM), Damp, Dense*	40			
		2 - inch thick strongly cemented stratum				
	15	*Gray silty SAND, (SM), Damp, Dense*				
		Light brown siltyy SAND with fine gravel, (SM), Damp, Dense	43			
		Color changing to gray with decrease in percent silt below 18 feet				
	20	*Bottom at 21.5 feet*	30			
	25					

Boring Stopped at *21.5* Feet Below Existing Grade

Groundwater	Initial Depth	Hour	24 Hour Depth
	Not Encountered		

NOTE: THE ABOVE DATA FOR DESIGN PURPOSES ONLY.

A6

A P P E N D I X B

LABORATORY TEST RESULTS

SUMMARY OF LABORATORY ANALYSIS

PROJECT: RID CANAL OVERCHUTE AND SIPHON DATE: 09-14-94

LOCATION: LITCHFIELD ROAD AND INDIAN SCHOOL ROAD BYPASS

MATERIAL: BOREHOLE SAMPLES SAMPLING DATE: 8-23 TO 8-24-94

REQUESTED BY: J. ROSE ATL JOB NO: 194031

LOG NO.	DEPTH (IN)	MOIST (%)	USCS	LL	PI	SIEVE ANALYSIS - PERCENT PASSING											
						200	100	50	40	30	16	10	4	3/8	3/4	1 1/2	3
1	5.5-16.5	13.8	CL	36	15	53.2	66	78	82	84	88	90	94	98	100		
1	16.5-23	8.3	SM		NP	18.5	41	89	96	98	99	99	100				
2	4.5-14.5	13.7	CL	40	19	54.2	67	78	82	84	88	90	94	98	100		
2	14.5-26.5	6.8	SM		NP	12.8	30	67	84	93	99	100					
3	0-7	3.9	CL-ML	25	6	50.6	64	76	82	86	91	94	97	100			
3	7-14	5.9	SC	33	12	38.4	50	63	69	73	78	81	87	96	100		
4	0-3	7.2	CL	28	9	70.6	81	89	92	94	97	98	99	100			
4	3-9	11.8	CL	39	21	61.5	71	80	84	88	94	96	99	99	99	100	

RID CANAL OVERCHUTE/SIPHON
LITCHFIELD ROAD & INDIAN SCHOOL BYPASS ROAD
MCFCD CONTRACT 94-07
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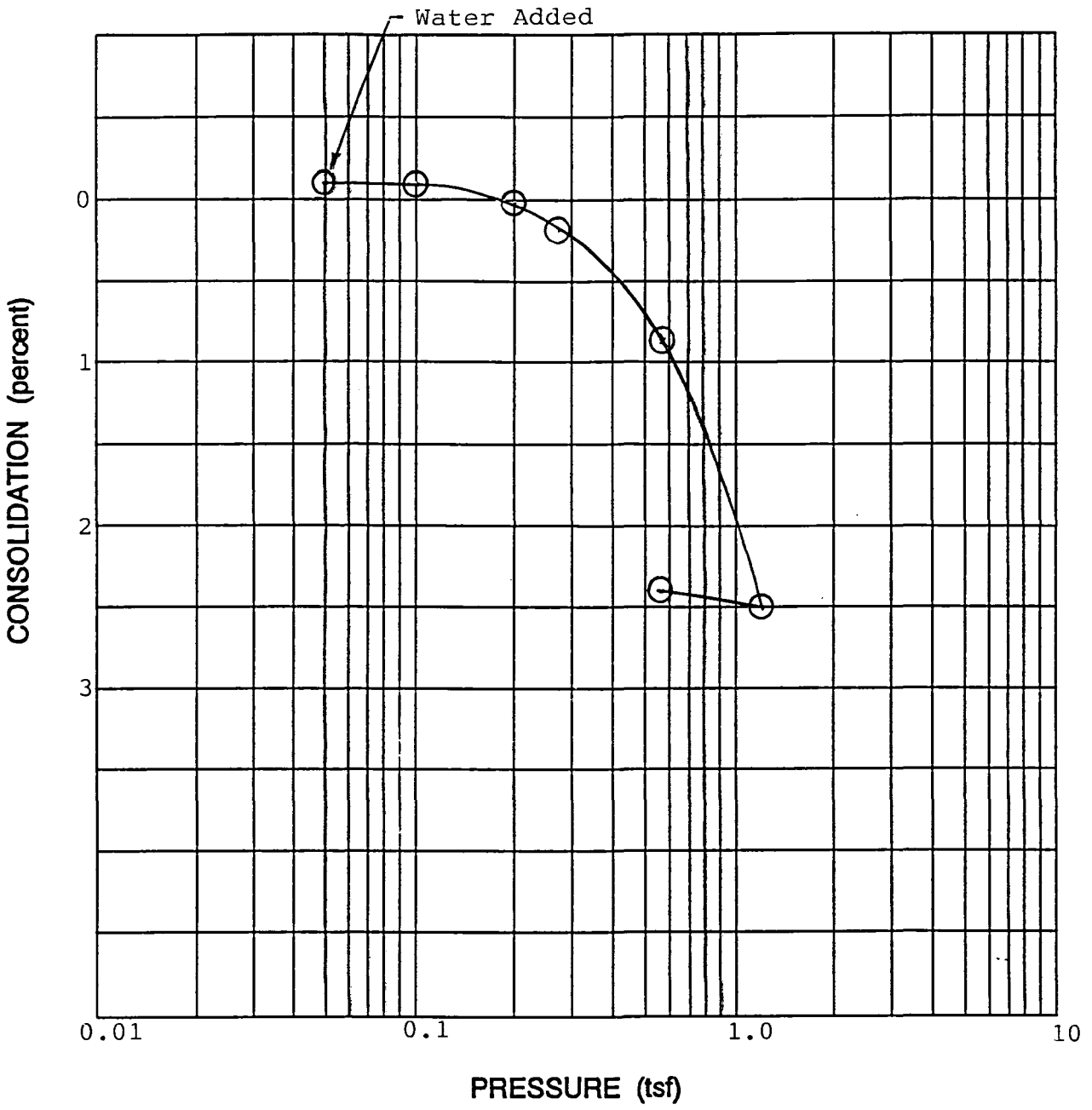
RESISTIVITY AND pH TEST RESULTS

Boring NO.	Sample Depth (ft)	USCS	Resistivity (ohm-cm)	pH
1	5.5 - 16.5	CL	1737	8.0
2	4.5 - 14.5	CL	2605	8.0
3	0 - 7.0	CL-ML	3006	7.9
4	3.0 - 9.0	CL	1804	7.8

RID CANAL OVERCHUTE/SIPHON
LITCHFIELD ROAD & INDIAN SCHOOL BYPASS ROAD
MCFCD CONTRACT 94-07
ATL JOB NO. 194031

STANDARD PROCTOR TESTS (ASTM D698)

Boring NO.	Sample Depth (ft)	USCS	Maximum Dry Density (pcf)	Optimum Moisture (%)
1	5.5 - 16.5	CL	110.9	13.8
1	16.5 - 30	SM	115.4	13.6



Key	Boring No.	Depth (ft.)	Soil Description	Liquid Limit (%)	Plastic Limit (%)	Moisture Content (%)		Dry Density (pcf)
						Before	After	
	1	8.5 - 10	Sandy Clay (CL)	36	15	16.4	24.8	104.2

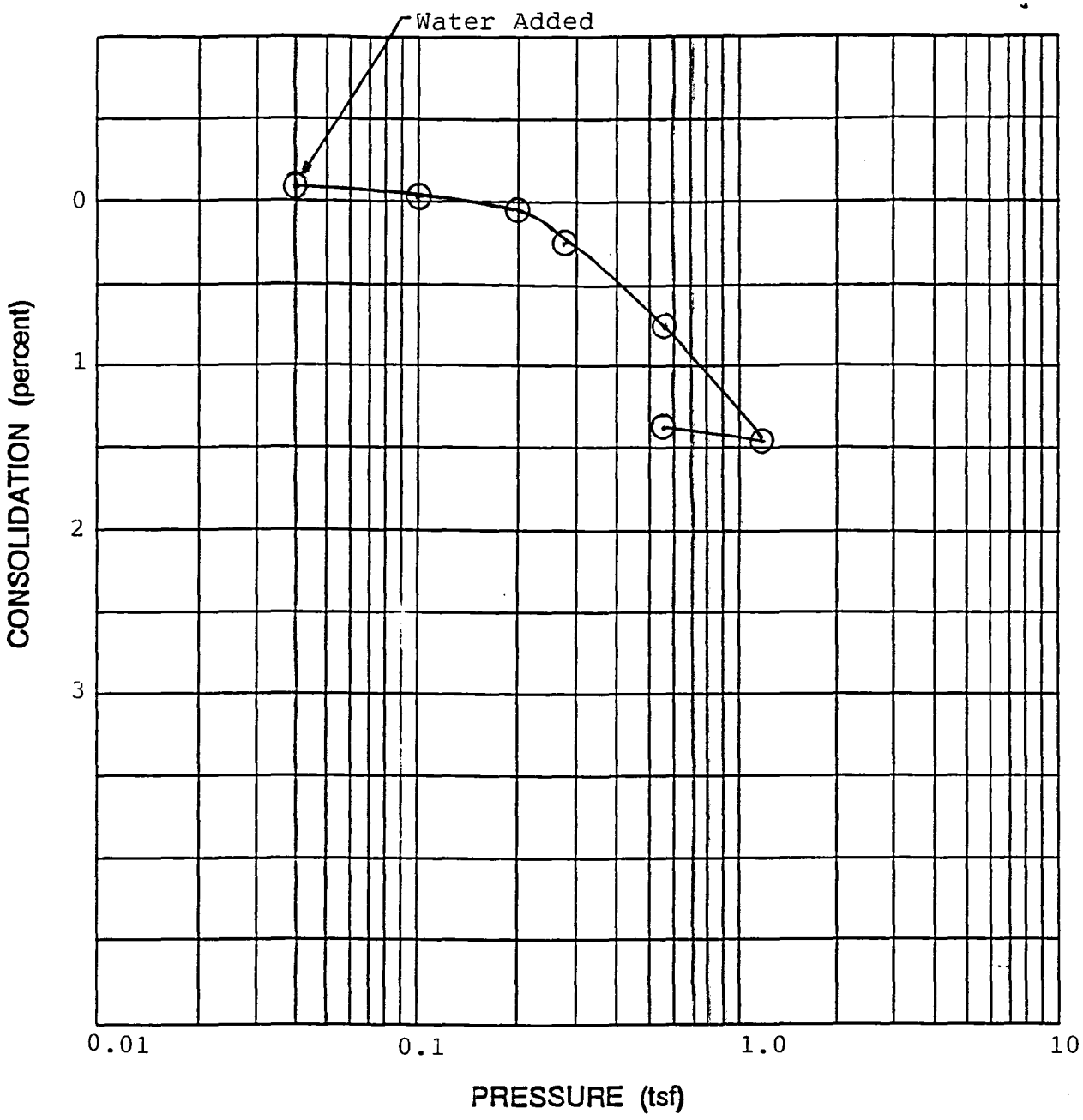
ATL Testing Laboratories

CONSOLIDATION TEST DATA

Project No. 194031

Date 9-6-94

ATL INC.



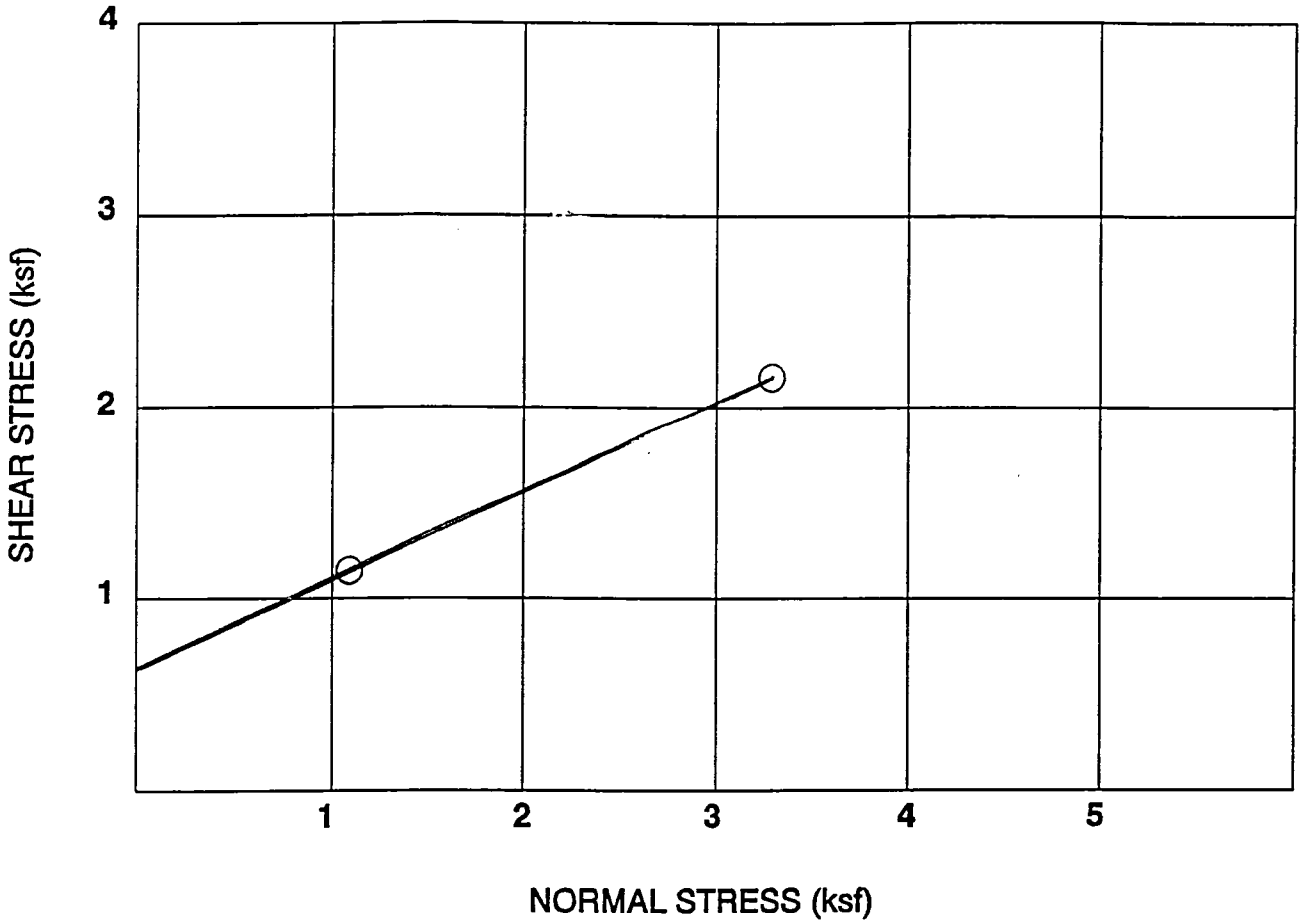
Key	Boring No.	Depth (ft.)	Soil Description	Liquid Limit (%)	Plastic Limit (%)	Moisture Content (%)		Dry Density (pcf)
						Before	After	
	1	15-16.5	Sandy Clay (CL), Bottom of Layer	36	15	17.5	20.5	111.1

ATL Testing Laboratories

CONSOLIDATION TEST DATA

Project No. 194031 Date 9-6-94

ATL INC.



Boring or Test Pit no.	Depth (ft.)	USCS	Soil Description	Cohesive Strength (ksf)	Internal Friction Angle	Moisture Content (%)	Dry Density (pcf)
1	8.5 - 10.5	CL	Sandy Clay	0.65	25.0	16.4	107.1

DIRECT SHEAR TEST DATA

JOB NO. 194031

ATL INC.