R·A·M

Geotechnical Engineering Report
Skunk Creek Master Plan Final Design
FCD 95-38
ACDC to 51st Avenue
Peoria/Glendale, Arizona
R.A.M. Project No. G01319

RICKER • ATKINSON • McBEE & ASSOCIATES, INC.

Geotechnical Engineering • Construction Materials Testing

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Skunk Creek Master Plan Final Design
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For:
Simons, Li & Associates, Inc.
4600 S. Mill Avenue, Suite 200
Tempe, Arizona 85282

♦♦♦

By:
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4600 S. Mill Avenue, Suite 200
Tempe, Arizona 85282

May 8, 1997

Attention: Bert Bergendahl, P.E.

Subject: Geotechnical Engineering Report
Skunk Creek Master Plan Final Design
FCD 95-38
ACDC to 51st Avenue
Peoria/Glendale, Arizona

R.A.M. Project No. G01319

Attached to this letter is the Geotechnical Engineering Report for the proposed Skunk Creek Master Plan Final Design to be located in Peoria/Glendale, Arizona.

The proposed project will include constructing a protected drainage channel along the alignment of Skunk Creek with drop structures to limit flow velocities. The results of our field exploration; laboratory testing; and engineering analysis, evaluation and recommendations are presented in the report for the channel. A separate report will be prepared for the drop structures once the location and configuration of each structure has been determined.

The following is a brief summary of selected recommendations.

A. Protected Channel Slopes:

- Single layer gabion protection may be used on channel slopes of 2H:1V and 3H:1V.
- Erosion protection on the channel sides and bottom may be used at all bridge crossings to limit scour. The protection should extend up and down stream with cut-off walls.

The attached report was prepared based on project and site data available at this time and was prepared in a manner and to the standards of the local geotechnical engineering practice. Our

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services did not include evaluations for the presence of hazardous materials, for area subsidence resulting from groundwater withdrawal or other geologic hazards.

Respectfully submitted,

RICKER, ATKINSON, MCBEE & ASSOCIATES, INC.

By: Kenneth L. Ricker, P.E.

Reviewed by: Charles H. Atkinson, P.E.

/nk
Copies to: Addressee (5)

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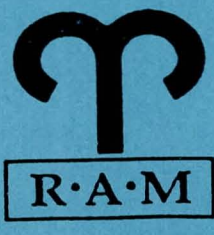
REPORT



INTRODUCTION

This report presents the results of our geotechnical engineering services for the proposed Skunk Creek Master Plan Final Design (FCD 95-38) in Peoria/Glendale, Arizona. The scope of our services included performing a field exploration program, laboratory analysis and geotechnical engineering evaluation, analysis and recommendations. The geotechnical recommendations presented herein consist of channel design, site development, material suitability and requirements, site preparation and grading procedures. We would be pleased to discuss with you any additional recommendations you may require. In addition, we are available to review project specifications and plans for conformance with our recommendations at no charge to you. A separate report will be prepared for drop structures when the location and configuration of the structures has been determined.

This firm should be notified for additional evaluation and recommendations should the facility design parameters (location, type, size), site use or conditions encountered during construction differ from those presented herein.

PROPOSED CONSTRUCTION

The Skunk Creek Master Plan Final Design will include a trapezoidal protected drainage channel and drop structures along the existing alignment of Skunk Creek from the Arizona Canal Diversion Channel (ACDC)(Sta. 50+00) to 51st Avenue (Sta. 253+73) in Peoria/Glendale, Arizona. The channel will have side slopes protected with a single layer gabion mat toed-down into an open unprotected channel bottom. The channel side slopes will be at 2H:1V and 3H:1V. The channel depth varies from 8 to 21 feet. The bottom width will vary depending on hydraulics and available right-of-way. The drainage channel is crossed by Paradise Lane (future bridge), 75th Avenue (existing low water crossing with future bridge), Bell Road (existing bridges), 69th Avenue (future low water crossing), 67th Avenue (existing low water crossing with future bridge), Union Hills Drive (existing bridge), 59th Avenue (existing bridge), 57th Avenue (existing low water crossing), 54th Drive (existing low water crossing) and 51st Avenue (existing bridge). Channel design has been accomplished by Dibble & Associates from Sta. 50+00 to 69+25 and will be incorporated into

this design. In addition, existing channel side slopes and protection between Sta. 124+15 and 130+94, Sta. 164+88 (north side) and 214+00 (north side), Sta. 171+20 (south side) and 197+53 (south side), Sta. 240+00 (south side) and 253+73 (south side) will be incorporated into the design. The new channel configuration will require numerous cuts and fills up to 20 feet high.

SITE CONDITIONS

Skunk Creek Master Plan Final Design project will be along the existing channel of Skunk Creek. The existing channel varies considerably in width, configuration and grade with some improved areas. The surface along the channel bottom and sides contains various amounts of debris and vegetation with areas of fill and large rubble. Side slopes along the channel vary from 1.5H:1V to 3H:1V.

FIELD EXPLORATIONS

Subsurface conditions in the channel bottom and along the side slopes were explored by excavating 50 test pits to depths of 4.0 to 10.0 feet as shown on the Site Plan in Appendix A. The test pits were excavated with a CAT 416B Extend-a-hoe using a 24-inch wide bucket. The excavation equipment and crew were provided by D & S Drilling, Inc. The test pit locations were determined in the field by a technician from our firm who also directed the drill crew. During the field explorations, representative disturbed samples were obtained, the test pits logged and soils field classified by our technician. The results of the field explorations are presented in Appendix A.

LABORATORY ANALYSIS

Representative samples obtained during the field exploration were subjected to the following laboratory tests.

Type of Test	Type of Sample	Number of Samples Tested
Sieve Analysis and Atterberg Limits (ASTM C136, D1140, D4318)	Representative	51
pH/Minimum Resistivity (ADOT 236A)	Representative	11

The results of the laboratory testing are presented in Appendix B. The above sieve analyses are representative of that portion of the in-situ sample test that passes a 3- to 4-inch sieve. The estimated percent of plus 3-inch material is shown on the test pit logs for each location where oversize material was present.

SUBSURFACE CONDITIONS

The subsurface conditions encountered at the test pit locations along the alignment were variable. The results of each test pit are presented in Appendix A in the test pit logs. In general, the soils encountered in the test pits were granular soils consisting of sandy gravel with cobbles, silty/clayey sandy gravel, gravelly silty sand, silty/clayey sand with some gravel, gravelly sand, gravelly sand with some silt, clayey sandy gravel with cobbles, sandy gravel with cobbles and some silt, clayey gravelly sand with cobbles and silty sand. The granular soils contained various amounts of cobbles and occasional trace to some boulders. In Test Pit 7 a sandy clay deposit was encountered for the full depth of exploration (7 feet). In Test Pits 36 and 36A, a four-foot thick layer of debris-laiden fill was encountered. In Test Pit 36A refusal to backhoe penetration occurred on large concrete slabs.

The soil moisture was described as nearly dry at most locations and damp in isolated areas. At the time of field explorations for the project no groundwater was encountered in our test pits. Groundwater at the sites is relatively deep and will not influence construction.

CHANNEL DESIGN RECOMMENDATIONS

Channel Slopes:

Channel construction will include cuts in native soils and existing fills up to 20 feet in height. In addition, slope areas in existing debris fills will be removed and replaced and in other areas new fill will be required to establish final configuration. For the most part, these slopes will be constructed in or with granular soils composed of sands and silty sand (fine granular soils) or sandy gravels with various amounts of silt, clay, cobbles and/or boulders (coarse granular soils). Planned slopes of 2H:1V and 3H:1V are designed for various areas. In addition, slopes of 1.5H:1V exist in some areas where additional construction will not be required. These slopes were evaluated using the following parameters.

1. Embankment Material (native/fill)

Fine Granular Soils	$\phi = 32^\circ$	Coarse Granular Soils	$\phi = 38^\circ$
	$C = 100$ psf		$C = 100$ psf
	$\Upsilon_{sat} = 110$ pcf		$\Upsilon_{sat} = 130$ pcf
	$\Upsilon_{sub} = 48$ pcf		$\Upsilon_{sub} = 68$ pcf

2. Rapid draw-down.

3. Slope height 10 and 20 feet.

Our analysis indicates that 2H:1V and 3H:1V slopes are stable for both soil types and 1.5H:1V slopes are stable for coarse granular soils. All have factors of safety greater than 1.5. The fine granular soils at slopes of 1.5H:1V are marginally stable with a factor of safety slightly greater than 1. Since the existing embankments are in areas where coarse granular soils exist, then planned and existing slopes are stable.

SITE DEVELOPMENT RECOMMENDATIONS

Excavatability:

The excavatability of site materials is difficult to evaluate based only on the exploration equipment

used during this design report. Therefore, we recommend that the contractor evaluate the excavatability of site materials by performing test excavations with the size and type of equipment the contractor plans on using at the site. For design purposes the following paragraph presents our best analysis as to the excavatability of site soils.

The near surface soils can probably be removed with conventional excavating equipment. Excavations penetrating the granular deposits containing large amounts of gravel and various amounts of cobbles and boulders will be slower and more difficult to accomplish. OSHA requires all excavations over five feet in depth, in which personnel are to enter, be either braced or sloped in accordance with OSHA regulations.

Earthwork Factors:

Earthwork losses due to ground height losses and shrinkage were estimated based on past experiences in the area and limited test data. The materials encountered at the site were of low to medium density. The estimated ground height losses due to subgrade compaction are as follows for previously ungraded areas:

*Ground Height Loss at Given Percent Compaction	
95%	100%
1.0" to 2.0"	1.5" to 2.5"

*Based on maximum dry density obtained by ASTM D698, dry densities obtained from samples, and achieving an 8-inch deep compacted zone without stripping natural surface zones. These values do not include recompaction of zone disturbed by demolition or previous site usage.

The estimated shrinkage losses from cut to fill zones are as follows for naturally occurring soils. Where existing fills are reconditioned, considerable shrinkage to some gain in material is expected:

*Estimated Percent Shrinkage at Given Percent Compaction

Depth of Excavation	95%	100%	105%
0 to 10 feet	10%± 2%	15% ± 2%	20% ± 2%
10 to 20 feet	7%± 2%	12% ± 2%	17% ± 2%

*Based on maximum dry density obtained by ASTM D698 and dry densities obtained from samples for natural undisturbed soils from the near surface zone, and local experience.

Our experience with earthwork losses has generally indicated that subgrades and fill zones compacted to a minimum value of 95% of maximum dry density (ASTM D698) result in losses comparable to 100% compaction (similarly for 90% minimum use 95% and for 100% minimum use 105%). These estimates do not include compaction to greater depths than assumed, losses due to wind or wastage, over-excavation, etc. These values do not include recompaction of zones disturbed by demolition or previous site usage.

MATERIALS SUITABILITY AND REQUIREMENTS

Site Soils:

Site soils may be used as fill in channel slope and bottom areas. These soils must be mechanically compacted to required densities.

Corrosion Potential:

Based on laboratory pH and resistivity tests, site soils which are at high moisture content or which become wetted will exhibit high potential for corrosion at Test Pits 14A and 32A and low potential for corrosion at all other locations.

SITE PREPARATION AND GRADING PROCEDURES

Channel Areas:

The proposed channel will include construction of various heights and widths of fills. All earthwork should be accomplished with observation and testing by a qualified technician under the direction

of a registered geotechnical/ materials engineer. The following apply to the areas within and extending 5 feet beyond the channel areas.

1. Clear and grub the site by removing and disposing of all vegetation, debris, rubble and remnants of former developments.

2. Strip the site of any existing fill zones, backfill zones and unstable soils. During stripping observe the surface for evidence of buried debris, vegetation or disturbed materials which will require additional removal. If encountered, these materials should be removed. Areas steeper than 5H to 1V should be benched and any depressions widened to accommodate compaction equipment.

3. Prepare the ground surface in fill areas and in areas cut to grade by scarifying, moisture conditioning and compacting the exposed surface soils to a depth of 8 inches.

4. Moisture condition and place all fill and backfill materials required to achieve specified grades. Fill materials should be moisture conditioned, placed and compacted in horizontal lifts of thicknesses compatible with the compaction equipment being used.

5. Compact subgrade, fill, backfill, subbase fill or base material to the following minimum percent compaction of the ASTM D698 maximum dry density for each lift.

Material	Minimum Percent Compaction
Soil:	
Channel Areas	95
Backfill:*	90

* Outside of channel areas.

6. The moisture content of soil and base materials at the time of compaction should be:

Type	Area of Use	Moisture Content
On-site	Channel	Optimum plus or minus 3%
Imported	Channel	Optimum plus or minus 3%

7. Any soils which are disturbed or overexcavated by the contractor outside the limits of the plans or specifications should be replaced with materials compacted as specified above.

APPENDIX A
FIELD EXPLORATIONS

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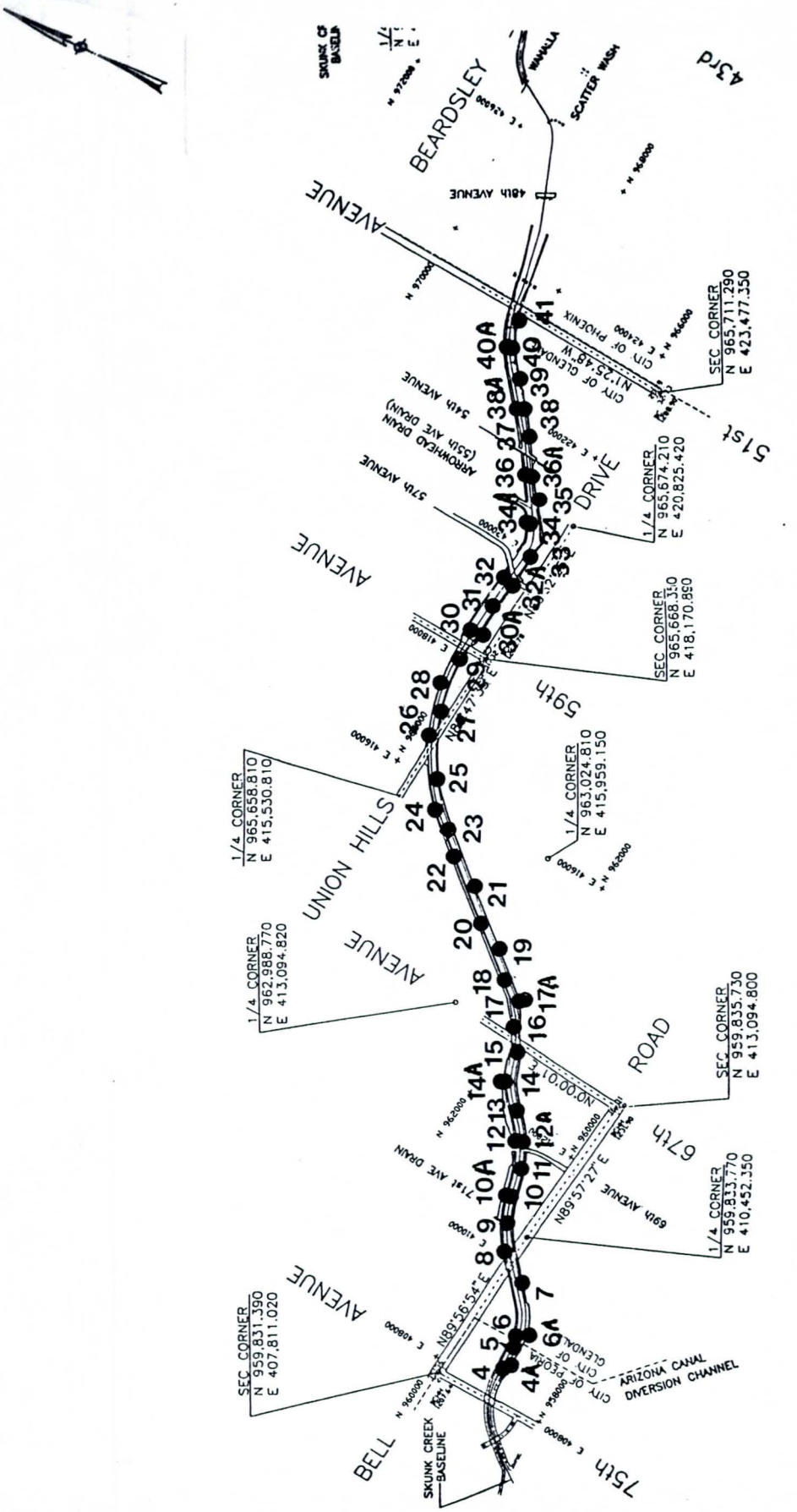


● Test Pit Location

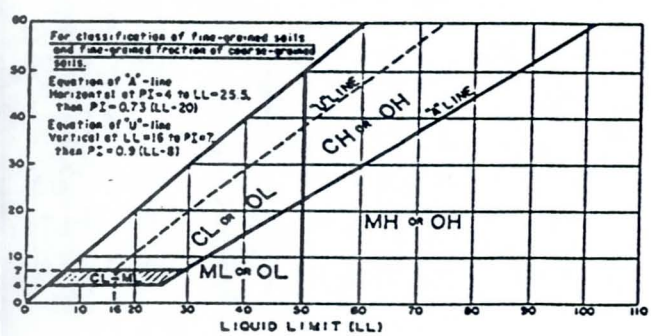
SITE PLAN

LEGEND

CLASSIFICATION OF SOILS

ASTM Designation: D2487-83
(Based on Unified Soil Classification System)

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests				Soil Classification	
				Group Symbol	Name
COARSE-GRAINED SOILS More than 50% retained on No. 200 Sieve	Gravels More than 50% coarse fraction retained on No. 4 Sieve	Clean Gravels Less than 5% fines	Cu≥4 and 1≤Cc≤3	GW	Well graded gravel
			Cu<4 and/or 1>Cc>3	GP	Poorly graded gravel
		Gravels with Fines More than 12% fines	Fines classify as ML or MH	GM	Silty gravel
			Fines classify as CL or CH	GC	Clayey gravel
	Sands 50% or more of coarse fraction passes No. 4 sieve	Clean Sands Less than 5% fines	Cu≥6 and 1≤Cc≤3	SW	Well-graded sand
			Cu<6 and/or 1>Cc>3	SP	Poorly graded sand
		Sands with Fines More than 12% fines	Fines classify as ML or MH	SM	Silty sand
			Fines classify as CL or CH	SC	Clayey sand
FINE-GRAINED SOILS 50% or more passes the No. 200 Sieve	Silts and Clays Liquid limit less than 50	Inorganic	PI>7 and plots on or above "A" line	CL	Lean clay
			PI<4 or plots below "A" line	ML	Silt
		Organic	Liquid Limit - oven dried / Liquid limit - not dried <0.75	OL	Organic clay / Organic silt
	Silts and Clays Liquid limit 50 or more	Inorganic	PI plots on or above "A" line	CH	Fat clay
			PI plots below "A" line	MH	Elastic silt
		Organic	Liquid limit - oven dried / Liquid limit - not dried <0.75	OH	Organic clay / Organic silt
HIGHLY ORGANIC SOILS	Primarily organic matter, dark in color, and organic odor			PT	Peat



TEST PIT LOG DEFINITIONS

Blows per foot using 140 pound hammer with 30 inch free-fall.

Depth, feet	Blows/Foot		Sample Type	Dry Density pcf	Water Content, %	Unified Classification	Description
	C	N/R					

C = Continuous Penetration Resistance (2 inch diameter rod)
N = Standard Penetration Resistance (ASTM D1586)
R = Penetration Resistance (3 inch diameter ring line sampler)

U.S. STANDARD SERIES SIEVE	200	40	10	4	3/4"	3"	12"
GRAIN SIZES	SILTS & CLAYS DISTINGUISHED ON BASIS OF PLASTICITY	SAND			GRAVEL		COBBLES / BOULDERS
		FINE	MEDIUM	COARSE	FINE	COARSE	

MOISTURE CONDITION (INCREASING MOISTURE →)

DRY — SLIGHTLY DAMP — DAMP (Plastic Limit) — MOIST — VERY MOIST — WELL (SATURATED) (Liquid Limit)

CONSISTENCY CORRELATION		RELATIVE DENSITY CORRELATION	
CLAYS & SILTS	BLOWS/FOOT*	SANDS & GRAVELS	BLOWS/FOOT*
VERY SOFT	0-2	VERY LOOSE	0-4
SOFT	2-4	LOOSE	4-10
FIRM	4-8	MEDIUM DENSE	10-30
STIFF	8-16	DENSE	30-50
VERY STIFF	16-32	VERY DENSE	OVER 50
HARD	OVER 32		

*Number of blows of 140 lb. hammer falling 30" to drive a 2" O.D. (1-3/8" I.D.) split-spoon sampler (ASTM D1586).

TEST PIT LOG

Project: Skunk Creek Improvements 71+00 35'R TEST PIT: 4

Elevation: 1200 Datum: --- Date: 3-20-97

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density, pcf	Water Content, %	Unified Classification	Description
						GP	Sandy Gravel with Cobbles; brown, nearly dry, medium dense to dense, trace non-plastic fines, (+3" ~ 15%) some boulders.
5						SP/ SW/ SC	Clayey Gravelly Sand; brown, nearly dry, medium dense to dense, some medium plasticity fines, with cobbles, (+3" ~ 15%) some boulders.
10							Stopped excavating at 10 feet. No Groundwater Observed.
15							
20							
25							

This test pit represents the conditions encountered on the date of excavation at this particular location. No other warranty is expressed or implied to the actual conditions which may exist within the vicinity of this test pit location.

TEST PIT LOG

Project: Skunk Creek Improvements 72+00 50'R TEST PIT: 4A

Elevation: 1215 Datum: --- Date: 3-20-97

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density, pcf	Water Content, %	Unified Classification	Description
						GP	Sandy Gravel with Cobbles; brown, nearly dry, medium dense to dense, trace non-plastic fines. Some Boulders (10% + 3").
5							
							Stopped excavating at 8 feet. No Groundwater Observed.
10							
15							
20							
25							

This test pit represents the conditions encountered on the date of excavation at this particular location. No other warranty is expressed or implied to the actual conditions which may exist within the vicinity of this test pit location.

TEST PIT LOG

Project: Skunk Creek Improvements 75+00 55'R TEST PIT: 5

Elevation: 1199 Datum: --- Date: 3-20-97

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density, pcf	Water Content, %	Unified Classification	Description
5						GP/ GW/ GC	Silty/Clayey Sandy Gravel; brown, nearly dry, some to trace low plasticity fines, with cobbles, (+3" ~ 15%) some boulders.
10							Stopped excavating at 7 feet. No Groundwater Observed.
15							
20							
25							

This test pit represents the conditions encountered on the date of excavation at this particular location. No other warranty is expressed or implied to the actual conditions which may exist within the vicinity of this test pit location.

TEST PIT LOG

Project: Skunk Creek Improvements 80+00 55'L TEST PIT: 6

Elevation: 1200 Datum: --- Date: 3-20-97

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density, pcf	Water Content, %	Unified Classification	Description
						GP	Sandy Gravel with Cobbles; brown, nearly dry, medium dense to dense, trace non-plastic fines, (+3" ~ 10%) some boulders.
5						SM	Gravelly Silty Sand; brown, nearly dry, medium dense to dense, high plasticity silt (MH) fines, light to moderate cementation.
10							Stopped excavating at 10 feet. No Groundwater Observed.
15							
20							
25							

This test pit represents the conditions encountered on the date of excavation at this particular location. No other warranty is expressed or implied to the actual conditions which may exist within the vicinity of this test pit location.

TEST PIT LOG

Project: Skunk Creek Improvements 80+00 95'R TEST PIT: 6A

Elevation: 1215 Datum: --- Date: 3-20-97

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density, pcf	Water Content, %	Unified Classification	Description
5						SM	Gravelly Silty Sand; brown, nearly dry, medium dense to dense, high plasticity silt (MH) fines, light to moderate cementation.
10							Stopped excavating at 10 feet. No Groundwater Observed.
15							
20							
25							

This test pit represents the conditions encountered on the date of excavation at this particular location. No other warranty is expressed or implied to the actual conditions which may exist within the vicinity of this test pit location.

TEST PIT LOG

Project: Skunk Creek Improvements 85+00 70'R TEST PIT: 7

Elevation: 1215 Datum: --- Date: 3-20-97

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density, pcf	Water Content, %	Unified Classification	Description
						CL	Sandy Clay; brown, damp, stiff, medium plasticity, trace gravel.
5							
10							Stopped excavating at 10 feet. No Groundwater Observed.
15							
20							
25							

This test pit represents the conditions encountered on the date of excavation at this particular location. No other warranty is expressed or implied to the actual conditions which may exist within the vicinity of this test pit location.

TEST PIT LOG

Project: Skunk Creek Improvements 91+00 80'L TEST PIT: 8

Elevation: 1210 Datum: --- Date: 3-20-97

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density, pcf	Water Content, %	Unified Classification	Description
						GP	Sandy Gravel with Cobbles; brown, nearly dry, medium dense to dense, trace non-plastic fines.
						SM/ SC	Silty/Clayey Sand, some Gravel; brown, damp, medium dense to dense, low plasticity fines.
5							5
						GP/ GW/ GC	Silty/Clayey Sandy Gravel; brown, nearly dry, some to trace low plasticity fines, with cobbles, (+3" ~ 5%) trace boulders.
10							10
							Stopped excavating at 10 feet. No Groundwater Observed.
15							15
20							20
25							25

This test pit represents the conditions encountered on the date of excavation at this particular location. No other warranty is expressed or implied to the actual conditions which may exist within the vicinity of this test pit location.

TEST PIT LOG

Project: Skunk Creek Improvements 95+00 20'R TEST PIT: 9

Elevation: 1210 Datum: --- Date: 3-20-97

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density, pcf	Water Content, %	Unified Classification	Description
						SP	Gravelly Sand; brown, nearly dry, medium dense, trace non-plastic fines, some cobbles, (+3" ~ 10%) some boulders.
5							
10							Stopped excavating at 10 feet. No Groundwater Observed.
15							
20							
25							

This test pit represents the conditions encountered on the date of excavation at this particular location. No other warranty is expressed or implied to the actual conditions which may exist within the vicinity of this test pit location.

TEST PIT LOG

Project: Skunk Creek Improvements 100+00 70'L TEST PIT: 10
Elevation: 1218 Datum: --- Date: 3-20-97

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density, pcf	Water Content, %	Unified Classification	Description
						SP/ SM	Gravelly Sand, some Silt; brown, nearly dry, medium dense, non-plastic fines, some cobbles, (+3" ~ 10%) some boulders.
5							
10							
							Stopped excavating at 10 feet. No Groundwater Observed.
15							
20							
25							

This test pit represents the conditions encountered on the date of excavation at this particular location. No other warranty is expressed or implied to the actual conditions which may exist within the vicinity of this test pit location.

TEST PIT LOG

Project: Skunk Creek Improvements 100+00 90'L TEST PIT: 10A

Elevation: 1222 Datum: --- Date: 3-20-97

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density, pcf	Water Content, %	Unified Classification	Description
						SP/ SM	Gravelly Sand, some Silt; brown, nearly dry, medium dense, non-plastic fines, some cobbles, (+3" ~ 10%) some boulders.
5							
							Stopped excavating at 7.5 feet. No Groundwater Observed.
10							
15							
20							
25							

This test pit represents the conditions encountered on the date of excavation at this particular location. No other warranty is expressed or implied to the actual conditions which may exist within the vicinity of this test pit location.

TEST PIT LOG

Project: Skunk Creek Improvements 105+00 80'R TEST PIT: 11

Elevation: 1214 Datum: --- Date: 3-20-97

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density, pcf	Water Content, %	Unified Classification	Description
						GC	Clayey Sandy Gravel with Cobbles; brown, nearly dry, medium dense to dense, medium plasticity fines, (+3" ~ 15%) some boulders.
5							
10							Stopped excavating at 10 feet. No Groundwater Observed.
15							
20							
25							

This test pit represents the conditions encountered on the date of excavation at this particular location. No other warranty is expressed or implied to the actual conditions which may exist within the vicinity of this test pit location.

TEST PIT LOG

Project: Skunk Creek Improvements 110+00 50'L TEST PIT: 12

Elevation: 1218 Datum: --- Date: 3-20-97

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density, pcf	Water Content, %	Unified Classification	Description
						SP	Gravelly Sand; brown, nearly dry, medium dense, trace non-plastic fines, some cobbles, (+3" ~ 5%) trace boulders.
5							
						SP/ SM	Gravelly Sand, some Silt; brown, nearly dry, medium dense, non-plastic fines, some cobbles, (+3" ~ 5%) trace boulders.
10							Stopped excavating at 9 feet. No Groundwater Observed.
15							
20							
25							

This test pit represents the conditions encountered on the date of excavation at this particular location. No other warranty is expressed or implied to the actual conditions which may exist within the vicinity of this test pit location.

TEST PIT LOG

Project: Skunk Creek Improvements 110+00 85'L TEST PIT: 12A

Elevation: 1226 Datum: --- Date: 3-20-97

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density, pcf	Water Content, %	Unified Classification	Description
						SP/ SM	Gravelly Sand, some Silt; brown, nearly dry, medium dense, non-plastic fines, some cobbles, (trace +3").
5							
							Stopped excavating at 6 feet. No Groundwater Observed.
10							
15							
20							
25							

This test pit represents the conditions encountered on the date of excavation at this particular location. No other warranty is expressed or implied to the actual conditions which may exist within the vicinity of this test pit location.

TEST PIT LOG

Project: Skunk Creek Improvements 115+00 50'L TEST PIT: 13

Elevation: 1220 Datum: --- Date: 3-20-97

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density, pcf	Water Content, %	Unified Classification	Description
						SP	Gravelly Sand; brown, nearly dry, medium dense, trace non-plastic fines, some cobbles, (+3" ~ 10%) trace boulders.
5							
10							Stopped excavating at 10 feet. No Groundwater Observed.
15							
20							
25							

This test pit represents the conditions encountered on the date of excavation at this particular location. No other warranty is expressed or implied to the actual conditions which may exist within the vicinity of this test pit location.

TEST PIT LOG

Project: Skunk Creek Improvements 120+00 70'L TEST PIT: 14

Elevation: 1222 Datum: --- Date: 3-20-97

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density, pcf	Water Content, %	Unified Classification	Description
						SP	Gravelly Sand; brown, nearly dry, medium dense, trace non-plastic fines, some cobbles, (+3" ~ 10%) some boulders.
5						GP/ GW/ GC	Silty/Clayey Sandy Gravel; brown, nearly dry, some to trace low plasticity fines, with cobbles, (+3" ~ 15%) some boulders.
10							Stopped excavating at 10 feet. No Groundwater Observed.
15							
20							
25							

This test pit represents the conditions encountered on the date of excavation at this particular location. No other warranty is expressed or implied to the actual conditions which may exist within the vicinity of this test pit location.

TEST PIT LOG

Project: Skunk Creek Improvements 120+00 90'L TEST PIT: 14A

Elevation: 1228 Datum: --- Date: 3-20-97

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density, pcf	Water Content, %	Unified Classification	Description
						SM	Gravelly Silty Sand; brown, nearly dry, medium dense to dense, high plasticity silt (MH) fines, light to moderate cementation, (trace + 3").
5						GP/ GW/ GC	Silty/Clayey Sandy Gravel; brown, nearly dry, some to trace low plasticity fines, with cobbles, (+3" ~ 5%) trace boulders.
10							Stopped excavating at 8 feet. No Groundwater Observed.
15							
20							
25							

This test pit represents the conditions encountered on the date of excavation at this particular location. No other warranty is expressed or implied to the actual conditions which may exist within the vicinity of this test pit location.

TEST PIT LOG

Project: Skunk Creek Improvements 125+00 20'L TEST PIT: 15
Elevation: 1224 Datum: --- Date: 3-20-97

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density, pcf	Water Content, %	Unified Classification	Description
						SP	Gravelly Sand; brown, nearly dry, medium dense, trace non-plastic fines, some cobbles, (+3" ~ 15%) trace boulders.
5							Loose to Medium Dense Below 6 Feet.
10							Stopped excavating at 9 feet. No Groundwater Observed.
15							
20							
25							

This test pit represents the conditions encountered on the date of excavation at this particular location. No other warranty is expressed or implied to the actual conditions which may exist within the vicinity of this test pit location.

TEST PIT LOG

Project: Skunk Creek Improvements 130+00 60'L TEST PIT: 16

Elevation: 1226 Datum: --- Date: 3-20-97

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density, pcf	Water Content, %	Unified Classification	Description
						SP/ SW/ SC	Clayey Gravelly Sand; brown, nearly dry, medium dense to dense, some medium plasticity fines, with cobbles, (+3" ~ 10%) trace to some boulders.
5							
10							Stopped excavating at 10 feet. No Groundwater Observed.
15							
20							
25							

This test pit represents the conditions encountered on the date of excavation at this particular location. No other warranty is expressed or implied to the actual conditions which may exist within the vicinity of this test pit location.

TEST PIT LOG

Project: Skunk Creek Improvements 135+00 30'R TEST PIT: 17

Elevation: 1230 Datum: --- Date: 3-20-97

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density, pcf	Water Content, %	Unified Classification	Description
						GP	Sandy Gravel with Cobbles; brown, nearly dry, medium dense to dense, trace non-plastic fines, (+3" ~ 10%) trace boulders.
5						GP/ GW/ GC	Silty/Clayey Sandy Gravel; brown, nearly dry, some to trace low plasticity fines, with cobbles, (+3" ~ 10%) some boulders.
10							Stopped excavating at 10 feet. No Groundwater Observed.
15							
20							
25							

This test pit represents the conditions encountered on the date of excavation at this particular location. No other warranty is expressed or implied to the actual conditions which may exist within the vicinity of this test pit location.

TEST PIT LOG

Project: Skunk Creek Improvements 135+00 80'R TEST PIT: 17A

Elevation: 1235 Datum: --- Date: 3-20-97

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density, pcf	Water Content, %	Unified Classification	Description
						SP	Gravelly Sand; brown, nearly dry, medium dense, trace non-plastic fines, some cobbles, (+3" ~ 5%) trace boulders.
5							
							Stopped excavating at 8 feet. No Groundwater Observed.
10							
15							
20							
25							

This test pit represents the conditions encountered on the date of excavation at this particular location. No other warranty is expressed or implied to the actual conditions which may exist within the vicinity of this test pit location.

TEST PIT LOG

Project: Skunk Creek Improvements 140+00 25'L
Elevation: 1231 Datum: ---

TEST PIT: 18
Date: 3-20-97

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density, pcf	Water Content, %	Unified Classification	Description
						GP	Sandy Gravel with Cobbles; brown, nearly dry, medium dense to dense, trace non-plastic fines, (+3" ~ 15%) some boulders.
5							
							Stopped excavating at 5 feet. No Groundwater Observed.
10							
15							
20							
25							

This test pit represents the conditions encountered on the date of excavation at this particular location. No other warranty is expressed or implied to the actual conditions which may exist within the vicinity of this test pit location.

TEST PIT LOG

Project: Skunk Creek Improvements 145+00 50'R TEST PIT: 19

Elevation: 1230 Datum: --- Date: 3-20-97

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density, pcf	Water Content, %	Unified Classification	Description
						GP/ GW/ GC	Silty/Clayey Sandy Gravel; brown, nearly dry, some to trace low plasticity fines, with cobbles, (+3" ~ 15%) some boulders.
5							
10							
							Stopped excavating at 10 feet. No Groundwater Observed.
15							
20							
25							

This test pit represents the conditions encountered on the date of excavation at this particular location. No other warranty is expressed or implied to the actual conditions which may exist within the vicinity of this test pit location.

TEST PIT LOG

Project: Skunk Creek Improvements 150+00 30'L TEST PIT: 20

Elevation: 1238 Datum: --- Date: 3-20-97

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density, pcf	Water Content, %	Unified Classification	Description
						GC	Clayey Sandy Gravel with Cobbles; brown, nearly dry, medium dense to dense, medium plasticity fines, (+3" ~ 15%) some boulders.
5							
10							Stopped excavating at 10 feet. No Groundwater Observed.
15							
20							
25							

This test pit represents the conditions encountered on the date of excavation at this particular location. No other warranty is expressed or implied to the actual conditions which may exist within the vicinity of this test pit location.

TEST PIT LOG

Project: Skunk Creek Improvements 155+00 70'R TEST PIT: 21

Elevation: 1238 Datum: --- Date: 3-20-97

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density, pcf	Water Content, %	Unified Classification	Description
5						GP/ GW/ GC	Silty/Clayey Sandy Gravel; brown, nearly dry, some to trace low plasticity fines, with cobbles, (+3" ~ 20%) some boulders.
10							Stopped excavating at 7 feet. No Groundwater Observed.
15							
20							
25							

This test pit represents the conditions encountered on the date of excavation at this particular location. No other warranty is expressed or implied to the actual conditions which may exist within the vicinity of this test pit location.

TEST PIT LOG

Project: Skunk Creek Improvements 160+00 30'L TEST PIT: 22

Elevation: 1238 Datum: --- Date: 3-20-97

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density, pcf	Water Content, %	Unified Classification	Description
						GP/ GW/ GC	Silty/Clayey Sandy Gravel; brown, nearly dry, some to trace low plasticity fines, with cobbles, (+3" ~ 20%) some boulders.
5							
10							
							Stopped excavating at 10 feet. No Groundwater Observed.
15							
20							
25							

This test pit represents the conditions encountered on the date of excavation at this particular location. No other warranty is expressed or implied to the actual conditions which may exist within the vicinity of this test pit location.

TEST PIT LOG

Project: Skunk Creek Improvements 165+00 60'R
Elevation: 1245 Datum: ---

TEST PIT: 23
Date: 3-20-97

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density, pcf	Water Content, %	Unified Classification	Description
						GP/ GM	Sandy Gravel with Cobbles, some Silt; brown, nearly dry, medium dense to dense, no to low plasticity fines, (+3" ~ 25%) some boulders.
5							
10							
							Stopped excavating at 10 feet. No Groundwater Observed.
15							
20							
25							

This test pit represents the conditions encountered on the date of excavation at this particular location. No other warranty is expressed or implied to the actual conditions which may exist within the vicinity of this test pit location.

TEST PIT LOG

Project: Skunk Creek Improvements 170+00 15'L
Elevation: 1241 Datum: ---

TEST PIT: 24
Date: 3-20-97

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density, pcf	Water Content, %	Unified Classification	Description
						GC	Clayey Sandy Gravel with Cobbles; brown, nearly dry, medium dense to dense, medium plasticity fines, (+3" ~ 15%) some boulders.
5							
10							Stopped excavating at 10 feet. No Groundwater Observed.
15							
20							
25							

This test pit represents the conditions encountered on the date of excavation at this particular location. No other warranty is expressed or implied to the actual conditions which may exist within the vicinity of this test pit location.

TEST PIT LOG

Project: Skunk Creek Improvements 175+00 30'R TEST PIT: 25

Elevation: 1246 Datum: --- Date: 3-20-97

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density, pcf	Water Content, %	Unified Classification	Description
						GP/ GW/ GC	Silty/Clayey Sandy Gravel; brown, nearly dry, some to trace low plasticity fines, with cobbles, (+3" ~ 20%) some boulders.
5							
10							
							Stopped excavating at 10 feet. No Groundwater Observed.
15							
20							
25							

This test pit represents the conditions encountered on the date of excavation at this particular location. No other warranty is expressed or implied to the actual conditions which may exist within the vicinity of this test pit location.

TEST PIT LOG

Project: Skunk Creek Improvements 180+00 20'L
Elevation: 1248 Datum: ---

TEST PIT: 26
Date: 3-20-97

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density, pcf	Water Content, %	Unified Classification	Description
						GC	Clayey Sandy Gravel with Cobbles; brown, nearly dry, medium dense to dense, medium plasticity fines, (+3" ~ 15%) some boulders.
5							Large Boulders at 6 Feet.
							Stopped excavating at 7.5 feet. No Groundwater Observed.
10							
15							
20							
25							

This test pit represents the conditions encountered on the date of excavation at this particular location. No other warranty is expressed or implied to the actual conditions which may exist within the vicinity of this test pit location.

TEST PIT LOG

Project: Skunk Creek Improvements 185+00 50'R TEST PIT: 27

Elevation: 1251 Datum: --- Date: 3-20-97

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density, pcf	Water Content, %	Unified Classification	Description
						GP/ GW/ GC	Silty/Clayey Sandy Gravel; brown, nearly dry, some to trace low plasticity fines, with cobbles, (+3" ~ 20%) some boulders.
5							
10							Stopped excavating at 10 feet. No Groundwater Observed.
15							
20							
25							

This test pit represents the conditions encountered on the date of excavation at this particular location. No other warranty is expressed or implied to the actual conditions which may exist within the vicinity of this test pit location.

TEST PIT LOG

Project: Skunk Creek Improvements 190+00 40'L TEST PIT: 28

Elevation: 1253 Datum: --- Date: 3-20-97

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density, pcf	Water Content, %	Unified Classification	Description
						GP/ GW/ GC	Silty/Clayey Sandy Gravel; brown, nearly dry, some to trace low plasticity fines, with cobbles, (+3" ~ 10%) some boulders.
5							
10							Stopped excavating at 10 feet. No Groundwater Observed.
15							
20							
25							

This test pit represents the conditions encountered on the date of excavation at this particular location. No other warranty is expressed or implied to the actual conditions which may exist within the vicinity of this test pit location.

TEST PIT LOG

Project: Skunk Creek Improvements 195+00 50'R
Elevation: 1254 Datum: ---

TEST PIT: 29
Date: 3-20-97

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density, pcf	Water Content, %	Unified Classification	Description
5						SP	Gravelly Sand; brown, nearly dry, medium dense, trace non-plastic fines, some cobbles, (+3" ~ 15%) trace boulders.
10						GP/ GW/ GC	Silty/Clayey Sandy Gravel; brown, nearly dry, some to trace low plasticity fines, with cobbles, (+3" ~ 15%) some boulders.
15							Stopped excavating at 10 feet. No Groundwater Observed.
20							
25							

This test pit represents the conditions encountered on the date of excavation at this particular location. No other warranty is expressed or implied to the actual conditions which may exist within the vicinity of this test pit location.

TEST PIT LOG

Project: Skunk Creek Improvements 200+00 90'L TEST PIT: 30

Elevation: 1258 Datum: --- Date: 3-20-97

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density, pcf	Water Content, %	Unified Classification	Description
						GP/ GW/ GC	Silty/Clayey Sandy Gravel; brown, nearly dry, some to trace low plasticity fines, with cobbles, (+3" ~ 15%) some boulders.
5							Very Hard
10							Stopped excavating at 8.5 feet. No Groundwater Observed.
15							
20							
25							

This test pit represents the conditions encountered on the date of excavation at this particular location. No other warranty is expressed or implied to the actual conditions which may exist within the vicinity of this test pit location.

TEST PIT LOG

Project: Skunk Creek Improvements 200+00 100'R
Elevation: 1262 Datum: ---

TEST PIT: 30A
Date: 3-20-97

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density, pcf	Water Content, %	Unified Classification	Description
						SP	Gravelly Sand; brown, nearly dry, medium dense, trace non-plastic fines, some cobbles, (+3" ~ 3%).
5							
							Stopped excavating at 8 feet. No Groundwater Observed.
10							
15							
20							
25							

This test pit represents the conditions encountered on the date of excavation at this particular location. No other warranty is expressed or implied to the actual conditions which may exist within the vicinity of this test pit location.

TEST PIT LOG

Project: Skunk Creek Improvements 205+00 70'R TEST PIT: 31

Elevation: 1259 Datum: --- Date: 3-20-97

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density, pcf	Water Content, %	Unified Classification	Description
						SP/ SW/ SC	Clayey Gravelly Sand; brown, nearly dry, medium dense to dense, some medium plasticity fines, with cobbles, (+3" ~ 5%) trace boulders.
5							
10							Stopped excavating at 10 feet. No Groundwater Observed.
15							
20							
25							

This test pit represents the conditions encountered on the date of excavation at this particular location. No other warranty is expressed or implied to the actual conditions which may exist within the vicinity of this test pit location.

TEST PIT LOG

Project: Skunk Creek Improvements 210 +00 90'L TEST PIT: 32

Elevation: 1262 Datum: --- Date: 3-20-97

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density, pcf	Water Content, %	Unified Classification	Description
						GP	Sandy Gravel with Cobbles; brown, nearly dry, medium dense to dense, trace non-plastic fines, (+3" ~ 10%) some boulders.
5							
10							
							Stopped excavating at 10 feet. No Groundwater Observed.
15							
20							
25							

This test pit represents the conditions encountered on the date of excavation at this particular location. No other warranty is expressed or implied to the actual conditions which may exist within the vicinity of this test pit location.

TEST PIT LOG

Project: Skunk Creek Improvements 209+25 100'R
Elevation: 1268 Datum: ---

TEST PIT: 32A
Date: 3-20-97

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density, pcf	Water Content, %	Unified Classification	Description
						GC	Clayey Sandy Gravel with Cobbles; brown, nearly dry, medium dense to dense, medium plasticity fines.
5						SP/ SM	Gravelly Sand, some Silt; brown, nearly dry, medium dense, non-plastic fines, some cobbles, (+3" ~ 25%) trace boulders.
10							Stopped excavating at 9 feet. No Groundwater Observed.
15							
20							
25							

This test pit represents the conditions encountered on the date of excavation at this particular location. No other warranty is expressed or implied to the actual conditions which may exist within the vicinity of this test pit location.

TEST PIT LOG

Project: Skunk Creek Improvements 215+00 70'R TEST PIT: 33

Elevation: 1268 Datum: --- Date: 3-20-97

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density, pcf	Water Content, %	Unified Classification	Description
						GP/ GM	Sandy Gravel with Cobbles, some Silt; brown, nearly dry, medium dense to dense, no to low plasticity fines, (+3" ~ 15%) some boulders.
5						GP/ GW/ GC	Silty/Clayey Sandy Gravel; brown, nearly dry, some to trace low plasticity fines, with cobbles, (+3" ~ 10%) some boulders.
10							Stopped excavating at 10 feet. No Groundwater Observed.
15							
20							
25							

This test pit represents the conditions encountered on the date of excavation at this particular location. No other warranty is expressed or implied to the actual conditions which may exist within the vicinity of this test pit location.

TEST PIT LOG

Project: Skunk Creek Improvements 220+00 80'L TEST PIT: 34

Elevation: 1270 Datum: --- Date: 3-20-97

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density, pcf	Water Content, %	Unified Classification	Description
						GP/ GM	Sandy Gravel with Cobbles, some Silt; brown, nearly dry, medium dense to dense, no to low plasticity fines, (+3" ~ 10%) some boulders.
5						SC	Clayey Gravelly Sand with Cobbles; brown, nearly dry, dense, medium plasticity fines, (+3" ~ 15%) some boulders.
10							Stopped excavating at 10 feet. No Groundwater Observed.
15							
20							
25							

This test pit represents the conditions encountered on the date of excavation at this particular location. No other warranty is expressed or implied to the actual conditions which may exist within the vicinity of this test pit location.

TEST PIT LOG

Project: Skunk Creek Improvements 220+00 100'L TEST PIT: 34A

Elevation: 1275 Datum: --- Date: 3-20-97

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density, pcf	Water Content, %	Unified Classification	Description
						GP/ GW/ GC	Silty/Clayey Sandy Gravel; brown, nearly dry, some to trace low plasticity fines, with cobbles, (+3" ~ 10%) some boulders.
5							
							Stopped excavating at 7.5 feet. No Groundwater Observed.
10							
15							
20							
25							

This test pit represents the conditions encountered on the date of excavation at this particular location. No other warranty is expressed or implied to the actual conditions which may exist within the vicinity of this test pit location.

TEST PIT LOG

Project: Skunk Creek Improvements 225+00 30'R TEST PIT: 35

Elevation: 1275 Datum: --- Date: 3-20-97

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density, pcf	Water Content, %	Unified Classification	Description
						SC	Clayey Gravelly Sand with Cobbles; brown, nearly dry, dense, medium plasticity fines, (+3" ~ 20%) some boulders.
5							
10							Stopped excavating at 10 feet. No Groundwater Observed.
15							
20							
25							

This test pit represents the conditions encountered on the date of excavation at this particular location. No other warranty is expressed or implied to the actual conditions which may exist within the vicinity of this test pit location.

TEST PIT LOG

Project: Skunk Creek Improvements 230+00 10'L TEST PIT: 36

Elevation: 1280 Datum: --- Date: 3-20-97

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density, pcf	Water Content, %	Unified Classification	Description
						SM/ SC	Fill - Silty/Clayey Sand, some Gravel; brown, damp, medium dense to dense, low plasticity fines, (+3" ~ 25%) slabs of concrete and AC and boulders.
5						SP/ SW/ SC	Clayey Gravelly Sand; brown, nearly dry, medium dense to dense, some medium plasticity fines, with cobbles, (+3" ~ 5%).
10							Stopped excavating at 10 feet. No Groundwater Observed.
15							
20							
25							

This test pit represents the conditions encountered on the date of excavation at this particular location. No other warranty is expressed or implied to the actual conditions which may exist within the vicinity of this test pit location.

TEST PIT LOG

Project: Skunk Creek Improvements 230+00 85'R TEST PIT: 36A

Elevation: 1282 Datum: --- Date: 3-20-97

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density, pcf	Water Content, %	Unified Classification	Description
						SM/ SC	Fill - Silty/Clayey Sand, some Gravel; brown, damp, medium dense to dense, low plasticity fines, mostly buried slabs of concrete.
5							Refusal at 4 feet. No Groundwater Observed.
10							
15							
20							
25							

This test pit represents the conditions encountered on the date of excavation at this particular location. No other warranty is expressed or implied to the actual conditions which may exist within the vicinity of this test pit location.

TEST PIT LOG

Project: Skunk Creek Improvements 235+00 40'R TEST PIT: 37

Elevation: 1271 Datum: --- Date: 3-18-97

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density, pcf	Water Content, %	Unified Classification	Description
						SP/ SM	Gravelly Sand, some Silt; brown, nearly dry, medium dense, non-plastic fines, some cobbles, (+3" ~ 15%) some boulders.
5						GP/ GW/ GC	Silty/Clayey Sandy Gravel; brown, nearly dry, some to trace low plasticity fines, with cobbles, (+3" ~ 15%) some boulders.
10							Stopped excavating at 10 feet. No Groundwater Observed.
15							
20							
25							

This test pit represents the conditions encountered on the date of excavation at this particular location. No other warranty is expressed or implied to the actual conditions which may exist within the vicinity of this test pit location.

TEST PIT LOG

Project: Skunk Creek Improvements 240+00 10'L
Elevation: 1279 Datum: ---

TEST PIT: 38
Date: 3-18-97

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density, pcf	Water Content, %	Unified Classification	Description
5						GP	Sandy Gravel with Cobbles; brown, nearly dry, medium dense to dense, trace non-plastic fines, (+3" ~ 15%) some boulders.
10						GP/ GW/ GC	Silty/Clayey Sandy Gravel; brown, nearly dry, some to trace low plasticity fines, with cobbles, (+3" ~ 15%) some boulders.
15							Stopped excavating at 10 feet. No Groundwater Observed.
20							
25							

This test pit represents the conditions encountered on the date of excavation at this particular location. No other warranty is expressed or implied to the actual conditions which may exist within the vicinity of this test pit location.

TEST PIT LOG

Project: Skunk Creek Improvements 240+00 90'L TEST PIT: 38A

Elevation: 1283 Datum: --- Date: 3-18-97

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density, pcf	Water Content, %	Unified Classification	Description
5						GP	Sandy Gravel with Cobbles; brown, nearly dry, medium dense to dense, trace non-plastic fines, (+3" ~ 15%) some boulders.
10							Stopped excavating at 7 feet. No Groundwater Observed.
15							
20							
25							

This test pit represents the conditions encountered on the date of excavation at this particular location. No other warranty is expressed or implied to the actual conditions which may exist within the vicinity of this test pit location.

TEST PIT LOG

Project: Skunk Creek Improvements 245+00 40'R TEST PIT: 39

Elevation: 1276 Datum: --- Date: 3-18-97

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density, pcf	Water Content, %	Unified Classification	Description
						SP	Gravelly Sand; brown, nearly dry, medium dense, trace non-plastic fines, some cobbles, (+3" ~ 5%).
5						GP/ GW/ GC	Silty/Clayey Sandy Gravel; brown, nearly dry, some to trace low plasticity fines, with cobbles, (+3" ~ 20%) some boulders.
10							Stopped excavating at 10 feet. No Groundwater Observed.
15							
20							
25							

This test pit represents the conditions encountered on the date of excavation at this particular location. No other warranty is expressed or implied to the actual conditions which may exist within the vicinity of this test pit location.

TEST PIT LOG

Project: Skunk Creek Improvements 250+00 30'L TEST PIT: 40
Elevation: 1280 Datum: --- Date: 3-18-97

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density, pcf	Water Content, %	Unified Classification	Description
						SM	Gravelly Silty Sand; brown, nearly dry, medium dense to dense, high plasticity silt (MH) fines, light to moderate cementation, (+3" ~ 10%) boulders.
5						SM	Silty Sand, trace Gravel; brown, nearly dry, medium dense, non-plastic fines.
						GP	Sandy Gravel with Cobbles; brown, nearly dry, medium dense to dense, trace non-plastic fines, (+3" ~ 10%) some boulders.
10							Stopped excavating at 10 feet. No Groundwater Observed.
15							
20							
25							

This test pit represents the conditions encountered on the date of excavation at this particular location. No other warranty is expressed or implied to the actual conditions which may exist within the vicinity of this test pit location.

TEST PIT LOG

Project: Skunk Creek Improvements 250+00 90'L
Elevation: 1281 Datum: ---

TEST PIT: 40A
Date: 3-18-97

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density, pcf	Water Content, %	Unified Classification	Description
						GP	Sandy Gravel with Cobbles; brown, nearly dry, medium dense to dense, trace non-plastic fines, (+3" ~ 15%) some boulders.
5							
							Stopped excavating at 7 feet. No Groundwater Observed.
10							Note: Toe-down from gabions extend to at least bottom.
15							
20							
25							

This test pit represents the conditions encountered on the date of excavation at this particular location. No other warranty is expressed or implied to the actual conditions which may exist within the vicinity of this test pit location.

TEST PIT LOG

Project: Skunk Creek Improvements 255+00 50'R TEST PIT: 41

Elevation: 1287 Datum: --- Date: 3-18-97

Depth, feet	Blows/Foot C	Blows/Foot N/R	Sample Type	Dry Density, pcf	Water Content, %	Unified Classification	Description
						SP	Gravelly Sand; brown, nearly dry, medium dense, trace non-plastic fines, some cobbles, (+3" ~ 5%).
5						SP/ SW/ SC	Clayey Gravelly Sand; brown, nearly dry, medium dense to dense, some medium plasticity fines, with cobbles, (+3" ~ 10%) trace boulders.
10							Stopped excavating at 10 feet. No Groundwater Observed.
15							
20							
25							

This test pit represents the conditions encountered on the date of excavation at this particular location. No other warranty is expressed or implied to the actual conditions which may exist within the vicinity of this test pit location.

APPENDIX B
LABORATORY ANALYSIS

R·A·M

LABORATORY TEST RESULTS

Date: 7-Apr-97

SAMPLE SOURCE: As noted below

TESTING PERFORMED: Sieve Analysis, Percent Passing No. 200 Sieve, Atterberg Limits (ASTM C136, D1140, D4318)

SAMPLED BY: RAM/Miller

RESULTS:

Sample	Atterberg Limits		Sieve Size - Accumulative Percent Passing											Soil
Source	LL	PI	200	100	50	30	16	8	4	3/4"	1"	2"	3"	Class.*
4 @ 0'-3'		NP	3	4	7	17	28	39	49	71	76	83	100	GP
4 @ 3'-10'	53	28	9	11	14	23	34	50	62	76	80	88	97	SW-SC
5 @ 0'-8'	23	6	8	10	13	18	24	31	38	57	63	85	96	GW-GC
6 @ 0'-3'		NP	1	2	4	14	25	35	44	67	74	88	100	GP
6 @ 3'-10'	45	16	35	42	48	56	64	75	83	97	98	100		SM
7 @ 0'-10'	42	18	78	85	89	91	94	96	97	100				CL
8 @ 1'-6'	22	4	45	58	70	77	82	85	88	97	98	100		SC-SM
8 @ 6'-10'	22	5	8	11	15	23	33	43	53	72	75	89	100	GP-GC
9 @ 0'-10'		NP	2	3	7	20	37	53	65	81	83	93	100	SP
10 @ 0'-10'		NP	6	11	22	36	47	57	65	78	81	87	93	SP-SM
11 @ 0'-10'	26	11	15	20	26	38	44	47	50	65	69	76	93	GC
12 @ 0'-9'		NP	2	4	9	27	45	57	63	73	75	82	93	SP
13 @ 0'-10'		NP	4	7	15	31	46	58	65	81	84	94	100	SP
14 @ 0'-3'		NP	3	4	8	17	29	44	56	77	81	90	97	SP
14 @ 3'-10'	38	23	7	8	10	16	25	38	49	80	86	99	100	GW-GC
15 @ 0'-9'		NP	3	3	7	20	37	53	64	80	84	90	91	SP
16 @ 0'-3'	28	13	8	9	13	22	38	54	67	84	87	93	100	SW-SC
16 @ 3'-10'	33	18	6	7	10	20	33	47	58	80	85	100		SP-SC
17 @ 0'-4'		NP	4	4	6	13	30	47	57	77	82	90	100	GP
17 @ 4'-10'	59	37	6	7	8	11	18	30	43	65	71	86	93	GP-GC
18 @ 0'-5'	29	7	4	6	9	16	25	35	46	66	71	84	88	GP
19 @ 0'-10'	28	13	5	6	8	14	23	34	45	67	72	87	90	GP-GC
20 @ 0'-7'	28	11	17	19	21	26	33	42	51	69	72	90	96	GC
21 @ 0'-7'	57	35	7	8	10	14	20	31	42	65	71	86	97	GP-GC
22 @ 0'-10'	32	16	11	13	16	21	29	39	49	72	80	93	100	GP-GC
23 @ 0'-10	20	3	7	10	14	24	32	40	47	60	63	71	93	GP-GM
24 @ 0'-10'	24	8	23	28	34	41	48	55	60	72	75	93	100	GC
25 @ 0'-10'	35	17	9	11	15	25	37	45	52	66	69	78	95	GP-GC

NP = Non-Plastic

* Unified Soil Classification System

LABORATORY TEST RESULTS

Date: 7-Apr-97

SAMPLE SOURCE: As noted below

TESTING PERFORMED: Sieve Analysis, Percent Passing No. 200 Sieve, Atterberg Limits (ASTM C136, D1140, D4318)

SAMPLED BY: RAM/Miller

RESULTS:

Sample	Atterberg Limits		Sieve Size - Accumulative Percent Passing											Soil
Source	LL	PI	200	100	50	30	16	8	4	3/4"	1"	2"	3"	Class.*
26 @ 0'-7'	29	11	14	18	22	27	35	43	50	67	70	79	90	GC
27 @ 0'-10'	25	11	9	11	15	23	31	39	47	68	73	83	91	GP-GC
28 @ 0'-10'	38	21	7	8	10	15	23	35	48	75	80	88	93	GW-GC
29 @ 0'-6'		NP	3	4	8	17	32	48	60	77	80	91	100	SP
29 @ 6'-10'	30	15	5	6	8	14	24	39	51	72	77	91	100	GP-GC
30 @ 0'-10'	35	15	5	6	8	13	20	29	39	58	63	79	88	GP-GC
31 @ 0'-10'	41	22	5	7	10	19	31	46	62	86	90	97	100	SW-SC
32 @ 0'-10'	38	18	5	6	9	18	29	41	51	70	72	81	92	GP
33 @ 0'-3'		NP	6	8	19	36	45	53	61	76	80	87	92	GP-GM
33 @ 3'-10'	41	21	6	7	11	21	32	44	54	70	73	87	93	GP-GC
34 @ 0'-4'	21	3	8	10	14	24	36	48	56	78	83	93	100	GP-GM
34 @ 4'-10'	27	11	15	19	24	31	41	54	63	77	80	88	93	SC
35 @ 0'-10'	34	16	32	37	42	49	55	61	68	86	89	93	93	SC
36 @ 0'-4'	25	7	12	16	23	34	44	53	60	74	78	86	89	SC-SM
36 @ 4'-10'	41	18	8	10	15	27	47	65	77	90	92	98	100	SW-SC
37 @ 0'-3'		NP	7	8	12	22	37	54	64	81	83	90	100	SW-SM
37 @ 3'-10'	32	15	7	9	15	27	38	47	53	82	85	90	100	GP-GC
38 @ 0'-6'	22	4	4	4	7	14	23	34	43	65	69	79	88	GP
38 @ 6'-10'	43	23	5	6	7	12	21	33	44	75	82	97	100	GP-GC
39 @ 0'-2'		NP	3	4	10	26	41	57	72	89	92	97	100	SP
40 @ 0'-3'		NP	13	20	31	43	54	64	71	81	84	93	96	SM
40 @ 3'-6'		NP	46	66	78	84	88	93	96	100				SM
41 @ 0'-2'		NP	2	4	9	26	46	66	84	97	98	100		SP
41 @ 2'-10'	39	21	10	13	16	24	34	47	59	85	85	100		SW-SC

NP = Non-Plastic

* Unified Soil Classification System

LABORATORY TEST RESULTS

Date: 7-Apr-97

SAMPLE SOURCE: As noted below

TESTING PERFORMED: Sieve Analysis, Percent Passing No. 200 Sieve, Atterberg Limits (ASTM C136, D1140, D4318)

SAMPLED BY: RAM/Miller

RESULTS:

Sample	Atterberg Limits		Sieve Size - Accumulative Percent Passing											Soil
Source	LL	PI	200	100	50	30	16	8	4	3/4"	1"	2"	3"	Class.*
14A @ 0'-3'		NP	21	25	31	41	51	61	68	80	82	91	100	SM
17A @ 0'-8'		NP	5	7	13	25	37	47	57	73	77	83	100	SP
30A @ 0'-8'		NP	4	6	10	20	31	43	57	79	83	92	94	SP
32A @ 0'-2'	35	15	25	28	31	34	37	40	43	51	53	100		GC
32A @ 2'-9'		NP	6	9	13	22	31	44	57	81	85	95	100	SP-SM

NP = Non-Plastic

* Unified Soil Classification System

LABORATORY TEST RESULTS

Date: 7-Apr-97

SAMPLE SOURCE: As noted below

TESTING PERFORMED: pH, Minimum Resistivity (ADOT 236a)

SAMPLED BY: RAM/Miller

RESULTS:

Sample Source	pH	Minimum Resistivity (ohm-cm)
4A @ 0'-8'	8.5	5352
6A @ 0'-10'	8.5	2244
10A @ 0'-7.5'	8.5	5544
12A @ 0'-6'	8.4	2025
14A @ 3'-8'	8.2	1700
17A @ 0'-8'	8.5	5883
30A @ 0'-8'	9.4	2590
32A @ 2'-9'	9.2	332
34A @ 0'-7'	8.7	9495
38A @ 0'-7'	8.7	9163
40A @ 0'-7'	8.6	4781