

WASH SIEVE ANALYSIS ASTM D 422-63/AASHTO T88-00 (SOP-S3)

Client **PAUL C. RIZZO**
 Client Reference **TAUM SAUK 06-3551**
 Project No. **2006-060-01**
 Lab ID **2006-060-01-62**

Boring No. **TS-7**
 Depth (ft) **50-60**
 Sample No. **S-6**
 Soil Color **BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	861	Tare No.	603
Wgt. Tare + Wet Specimen (gm)	1445.80	Wgt. Tare + Wet Specimen (gm)	705.40
Wgt. Tare + Dry Specimen (gm)	1351.90	Wgt. Tare + Dry Specimen (gm)	683.80
Weight of Tare (gm)	100.80	Weight of Tare (gm)	84.40
Weight of Water (gm)	93.90	Weight of Water (gm)	21.60
Weight of Dry Soil (gm)	1251.10	Weight of Dry Soil (gm)	599.40
Moisture Content (%)	7.5	Moisture Content (%)	3.6

Wet Weight - 3/4" Sample (gm)	20450	Weight of the Dry Specimen (gm)	1251.10
Dry Weight - 3/4" Sample (gm)	19022.3	Weight of minus #200 material (gm)	144.05
Wet Weight + 3/4" Sample (gm)	26457.00	Weight of plus #200 material (gm)	1107.05
Dry Weight + 3/4" Sample (gm)	25536.76		
Total Dry Weight Sample (gm)	44559.1	J - Factor (Percent Finer than 3/4")	0.4269

Sieve Size	Sieve Opening (mm)	Wgt. of Soil Retained (gm)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	100.00
6"	150	0.00	0.00	0.00	100.00	100.00
3"	75	3630.00	7.86	7.86	92.14	92.14
2"	50	7265.00	15.74	23.60	76.40	76.40
1 1/2"	37.5	4985.00	10.80	34.40	65.60	65.60
1"	25	6860.00	14.86	49.26	50.74	50.74
3/4"	19	3717.00	8.05	57.31	42.69	42.69
1/2"	12.5	172.91	13.82	13.82	86.18	36.79
3/8"	9.5	120.96	9.67	23.49	76.51	32.66
#4	4.75	287.06	22.94	46.43	53.57	22.87
#10	2	247.47	19.78	66.21	33.79	14.42
#20	0.85	134.62	10.76	76.97	23.03	9.83
#40	0.425	59.60	4.76	81.74	18.26	7.80
#60	0.25	32.87	2.63	84.36	15.64	6.67
#140	0.106	39.26	3.14	87.50	12.50	5.33
#200	0.075	12.30	0.98	88.49	11.51	4.92
Pan	-	144.05	11.51	100.00	-	-

Notes : (*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample
 (**) The - 3/4" sieve analysis is based on the Weight of the Dry Specimen

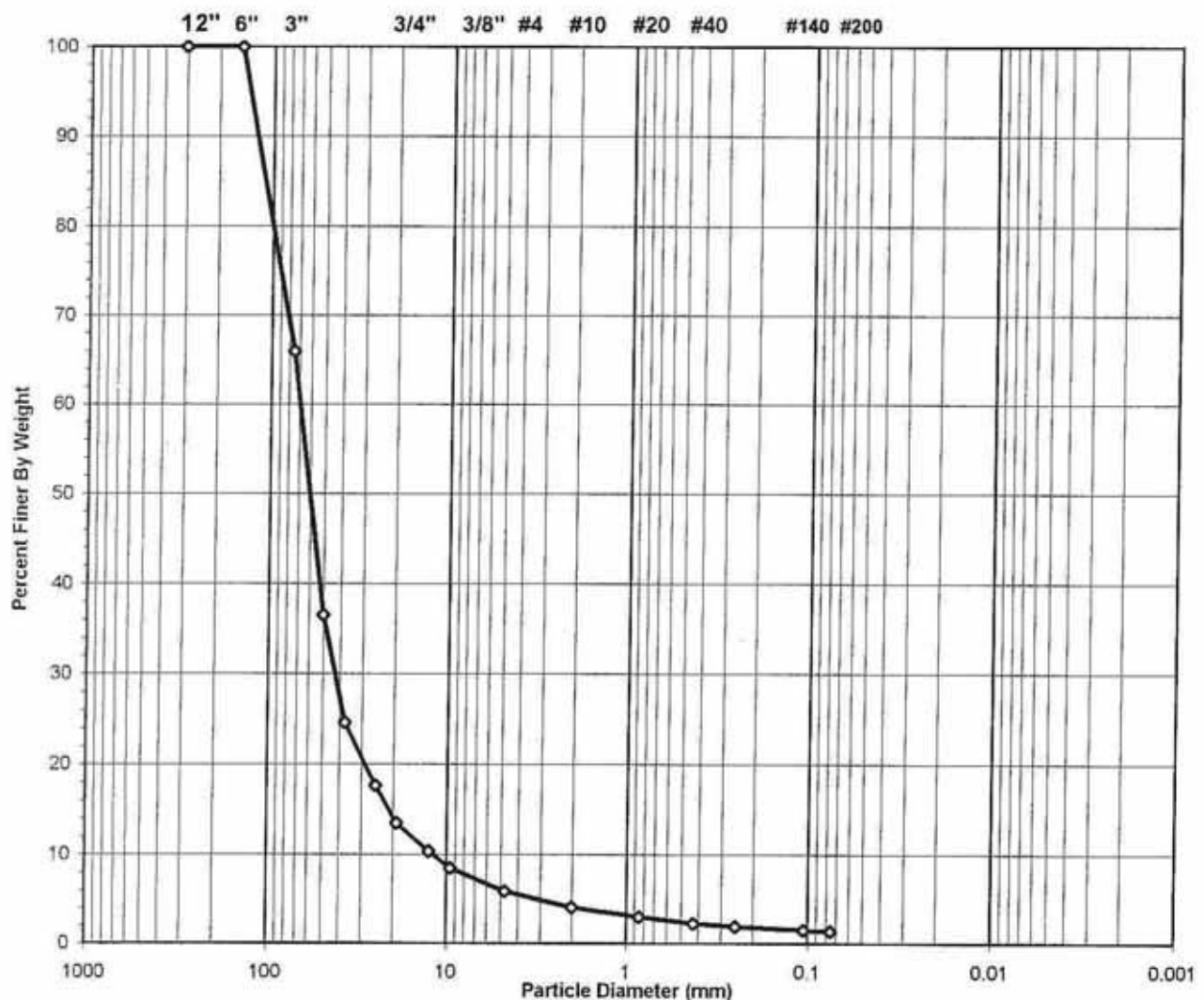
Tested By **JP** Date **2/21/06** Checked By **YHB** Date **2-22-06**

SIEVE ANALYSIS
ASTM D 422-63/AASHTO T88-00 (SOP-S3)

Client PAUL C. RIZZO
Client Reference TAUM SAUK 06-3551
Project No. 2006-060-01
Lab ID 2006-060-01-63

Boring No. TS-7
Depth (ft) NA
Sample No. S-7
Soil Color REDDISH BROWN

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



WASH SIEVE ANALYSIS

ASTM D 422-63/AASHTO T88-00 (SOP-S3)

 Client PAUL C. RIZZO
 Client Reference TAUM SAUK 06-3551
 Project No. 2006-060-01
 Lab ID 2006-060-01-63

 Boring No. TS-7
 Depth (ft) NA
 Sample No. S-7
 Soil Color REDDISH BROWN

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	1221	Tare No.	548
Wgt. Tare + Wet Specimen (gm)	1235.40	Wgt. Tare + Wet Specimen (gm)	919.40
Wgt. Tare + Dry Specimen (gm)	1164.40	Wgt. Tare + Dry Specimen (gm)	897.50
Weight of Tare (gm)	97.91	Weight of Tare (gm)	80.54
Weight of Water (gm)	71.00	Weight of Water (gm)	21.90
Weight of Dry Soil (gm)	1066.49	Weight of Dry Soil (gm)	816.96
Moisture Content (%)	6.7	Moisture Content (%)	2.7

Wet Weight - 3/4" Sample (gm)	2820	Weight of the Dry Specimen (gm)	1066.49
Dry Weight - 3/4" Sample (gm)	2644.0	Weight of minus #200 material (gm)	111.81
Wet Weight + 3/4" Sample (gm)	17477.00	Weight of plus #200 material (gm)	954.68
Dry Weight + 3/4" Sample (gm)	17020.73		
Total Dry Weight Sample (gm)	19664.7	J - Factor (Percent Finer than 3/4")	0.1345

Sieve Size	Sieve Opening (mm)	Wgt. of Soil Retained (gm)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	100.00
6"	150	0.00	0.00	0.00	100.00	100.00
3"	75	6883.00	34.09	34.09	65.91	65.91
2"	50	5928.00 (*)	29.36	63.45	36.55	36.55
1 1/2"	37.5	2412.00	11.95	75.39	24.61	24.61
1"	25	1410.00	6.98	82.37	17.63	17.63
3/4"	19	844.00	4.18	86.55	13.45	13.45
1/2"	12.5	247.57	23.21	23.21	76.79	10.32
3/8"	9.5	147.67	13.85	37.06	62.94	8.46
#4	4.75	207.41	19.45	56.51	43.49	5.85
#10	2	139.46	13.08	69.58	30.42	4.09
#20	0.85	88.93 (**)	8.34	77.92	22.08	2.97
#40	0.425	53.38	5.01	82.93	17.07	2.30
#60	0.25	27.07	2.54	85.47	14.53	1.95
#140	0.106	32.02	3.00	88.47	11.53	1.55
#200	0.075	11.17	1.05	89.52	10.48	1.41
Pan	-	111.81	10.48	100.00	-	-

Notes : (*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample

(**) The - 3/4" sieve analysis is based on the Weight of the Dry Specimen

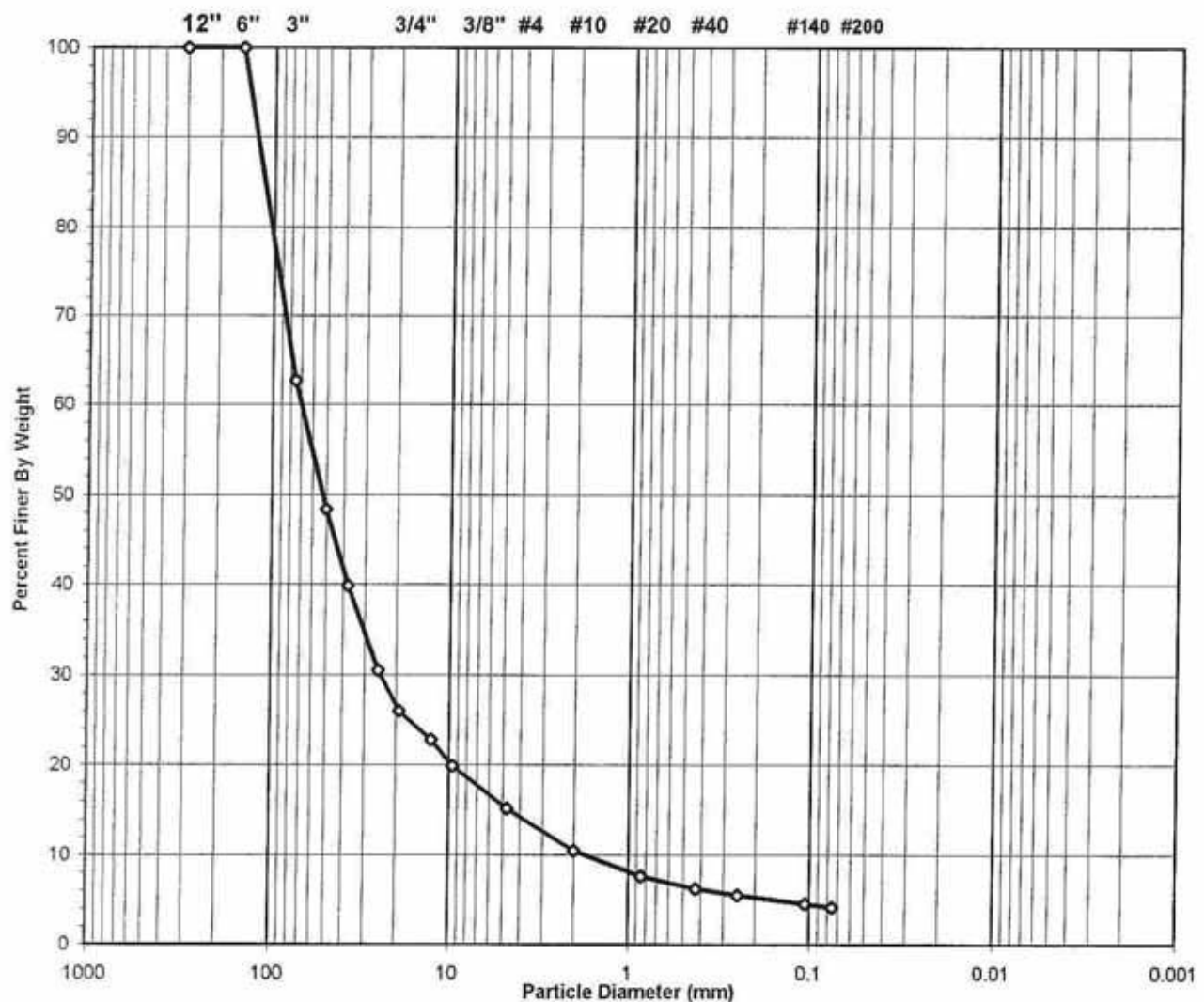
 Tested By JP Date 2/21/06 Checked By *YHB* Date 2-22-06

SIEVE ANALYSIS
ASTM D 422-63/AASHTO T88-00 (SOP-S3)

Client: PAUL C. RIZZO
Client Reference: TAUM SAUK 06-3551
Project No.: 2006-060-01
Lab ID: 2006-060-01-64

Boring No.: TS-7
Depth (ft): NA
Sample No.: S-8
Soil Color: BROWN

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol **gp, ASSUMED**

D60 = 69.5 CC = 4.8

USCS Classification **POORLY GRADED GRAVEL**

D30 = 24.2 CU = 39.8

D10 = 1.7

Tested By JP Date 2/21/06 Checked By *KB* Date 2-22-06

WASH SIEVE ANALYSIS

ASTM D 422-63/AASHTO T88-00 (SOP-S3)

Client	PAUL C. RIZZO	Boring No.	TS-7
Client Reference	TAUM SAUK 06-3551	Depth (ft)	NA
Project No.	2006-060-01	Sample No.	S-8
Lab ID	2006-060-01-64	Soil Color	BROWN

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	650	Tare No.	9
Wgt. Tare + Wet Specimen (gm)	1176.30	Wgt. Tare + Wet Specimen (gm)	735.60
Wgt. Tare + Dry Specimen (gm)	1107.50	Wgt. Tare + Dry Specimen (gm)	719.70
Weight of Tare (gm)	98.60	Weight of Tare (gm)	74.29
Weight of Water (gm)	68.80	Weight of Water (gm)	15.90
Weight of Dry Soil (gm)	1008.90	Weight of Dry Soil (gm)	645.41
Moisture Content (%)	6.8	Moisture Content (%)	2.5

Wet Weight - 3/4" Sample (gm)	9677	Weight of the Dry Specimen (gm)	1008.90
Dry Weight - 3/4" Sample (gm)	9059.2	Weight of minus #200 material (gm)	160.18
Wet Weight + 3/4" Sample (gm)	26433.00	Weight of plus #200 material (gm)	848.72
Dry Weight + 3/4" Sample (gm)	25797.47		
Total Dry Weight Sample (gm)	34856.7	J - Factor (Percent Finer than 3/4")	0.2599

Sieve Size	Sieve Opening (mm)	Wgt. of Soil Retained (gm)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	100.00
6"	150	0.00	0.00	0.00	100.00	100.00
3"	75	13331.00	37.33	37.33	62.67	62.67
2"	50	5098.00 (*)	14.27	51.60	48.40	48.40
1 1/2"	37.5	3048.00	8.53	60.13	39.87	39.87
1"	25	3343.00	9.36	69.49	30.51	30.51
3/4"	19	1613.00	4.52	74.01	25.99	25.99
1/2"	12.5	122.87	12.18	12.18	87.82	22.82
3/8"	9.5	112.62	11.16	23.34	76.66	19.92
#4	4.75	185.81	18.42	41.76	58.24	15.14
#10	2	181.86	18.03	59.78	40.22	10.45
#20	0.85	110.05 (**)	10.91	70.69	29.31	7.62
#40	0.425	54.88	5.44	76.13	23.87	6.20
#60	0.25	28.72	2.85	78.98	21.02	5.46
#140	0.106	37.51	3.72	82.70	17.30	4.50
#200	0.075	14.40	1.43	84.12	15.88	4.13
Pan	-	160.18	15.88	100.00	-	-

Notes : (*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample
 (**) The - 3/4" sieve analysis is based on the Weight of the Dry Specimen

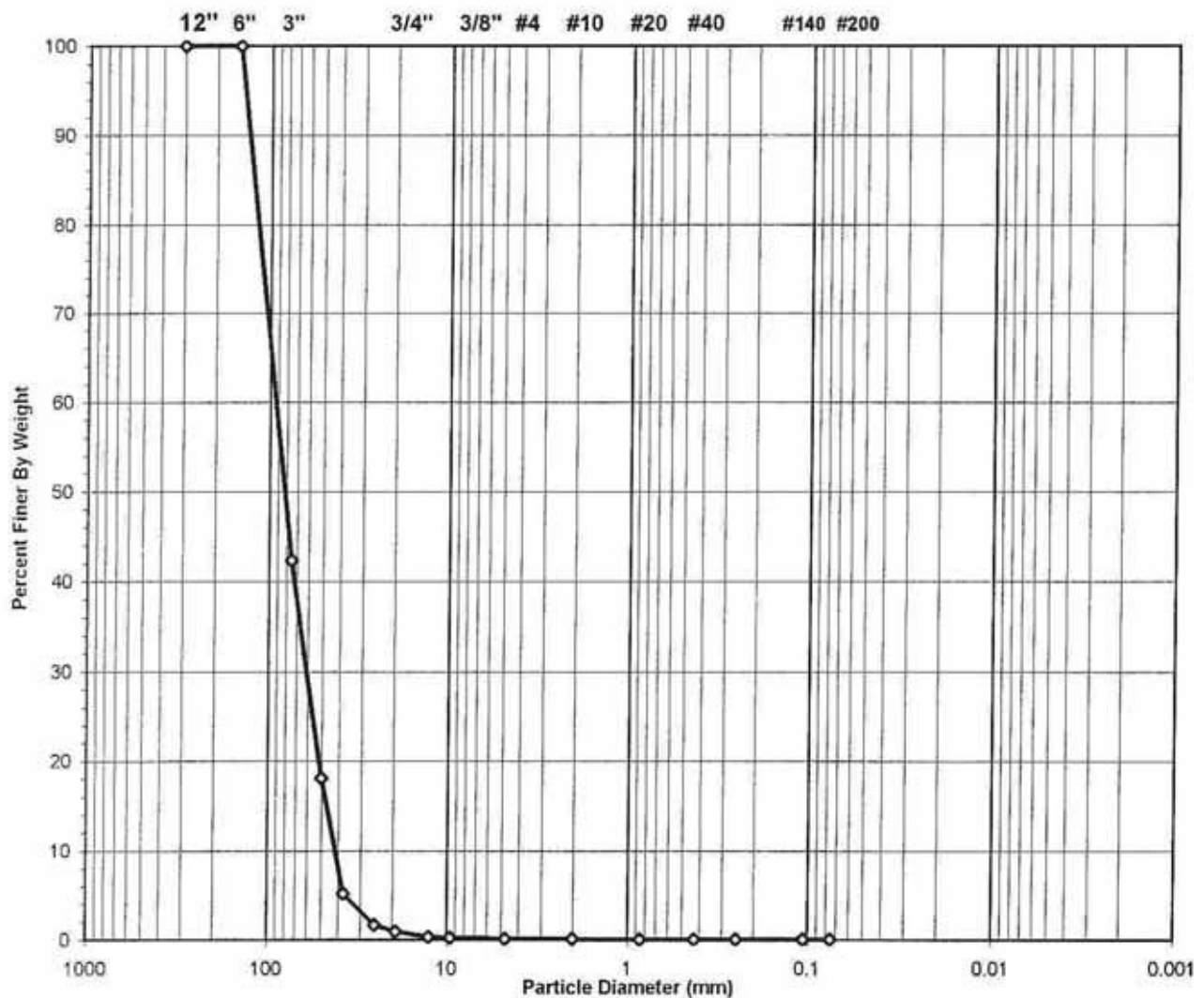
Tested By JP Date 2/21/06 Checked By YAB Date 2-22-06

SIEVE ANALYSIS
ASTM D 422-63/AASHTO T88-00 (SOP-S3)

Client PAUL C. RIZZO
Client Reference TAUM SAUK 06-3551
Project No. 2006-060-01
Lab ID 2006-060-01-65

Boring No. TS-7
Depth (ft) NA
Sample No. S-9
Soil Color REDDISH GRAY

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol **gp, ASSUMED**

USCS Classification **POORLY GRADED GRAVEL**

Tested By PC Date 2/22/06 Checked By *KPB* Date 2-23-06

WASH SIEVE ANALYSIS ASTM D 422-63/AASHTO T88-00 (SOP-S3)

Client	PAUL C. RIZZO	Boring No.	TS-7
Client Reference	TAUM SAUK 06-3551	Depth (ft)	NA
Project No.	2006-060-01	Sample No.	S-9
Lab ID	2006-060-01-65	Soil Color	REDDISH GRAY

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	667	Tare No.	641
Wgt. Tare + Wet Specimen (gm)	322.03	Wgt. Tare + Wet Specimen (gm)	1301.80
Wgt. Tare + Dry Specimen (gm)	321.79	Wgt. Tare + Dry Specimen (gm)	1299.40
Weight of Tare (gm)	95.80	Weight of Tare (gm)	98.50
Weight of Water (gm)	0.24	Weight of Water (gm)	2.40
Weight of Dry Soil (gm)	225.99	Weight of Dry Soil (gm)	1200.90
Moisture Content (%)	0.1	Moisture Content (%)	0.2

Wet Weight - 3/4" Sample (gm)	228	Weight of the Dry Specimen (gm)	225.99
Dry Weight - 3/4" Sample (gm)	227.8	Weight of minus #200 material (gm)	15.28
Wet Weight + 3/4" Sample (gm)	24310.90	Weight of plus #200 material (gm)	210.71
Dry Weight + 3/4" Sample (gm)	24262.41		
Total Dry Weight Sample (gm)	24490.2	J - Factor (Percent Finer than 3/4")	0.0093

Sieve Size	Sieve Opening (mm)	Wgt. of Soil Retained (gm)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	100.00
6"	150	0.00	0.00	0.00	100.00	100.00
3"	75	14148.00	57.65	57.65	42.35	42.35
2"	50	5956.00 (*)	24.27	81.93	18.07	18.07
1 1/2"	37.5	3163.00	12.89	94.82	5.18	5.18
1"	25	858.00	3.50	98.31	1.69	1.69
3/4"	19	185.90	0.76	99.07	0.93	0.93
1/2"	12.5	150.09	66.41	66.41	33.59	0.31
3/8"	9.5	15.62	6.91	73.33	26.67	0.25
#4	4.75	26.96	11.93	85.26	14.74	0.14
#10	2	7.62	3.37	88.63	11.37	0.11
#20	0.85	3.30 (**)	1.46	90.09	9.91	0.09
#40	0.425	2.09	0.92	91.01	8.99	0.08
#60	0.25	1.28	0.57	91.58	8.42	0.08
#140	0.106	2.61	1.15	92.73	7.27	0.07
#200	0.075	1.14	0.50	93.24	6.76	0.06
Pan	-	15.28	6.76	100.00	-	-

Notes : (*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample
 (**) The - 3/4" sieve analysis is based on the Weight of the Dry Specimen

Tested By PC Date 2/22/06 Checked By *YKB* Date *2-23-06*
 page 2 of 2 DCN: CT-53A DATE 5-17-00 REVISION 3 C:\MSOFFICE\Excel\PrintQ\U260.xls\Sheet1

SHELBY TUBE SAMPLE

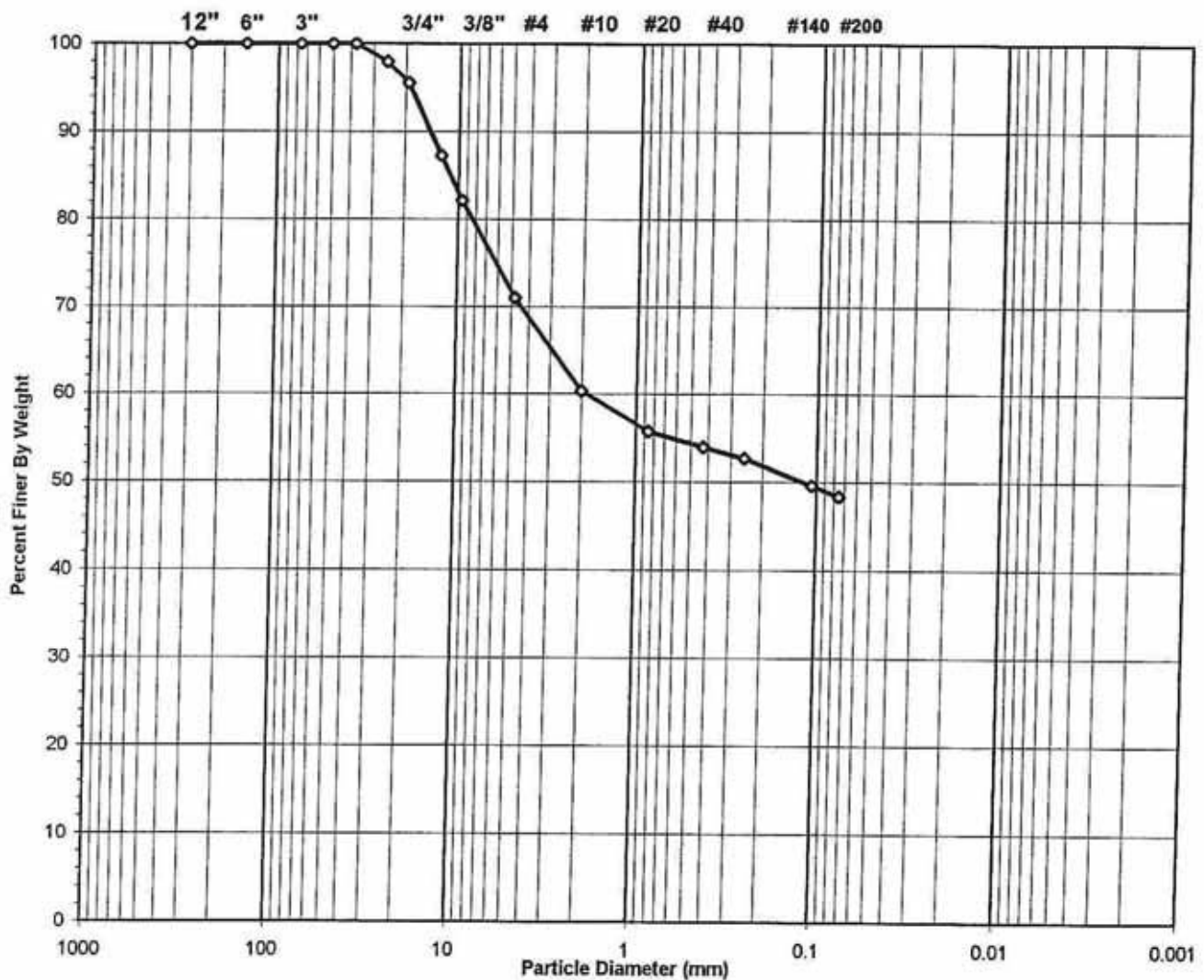
TS-ST01

SIEVE ANALYSIS
ASTM D 422-63/AASHTO T88-00 (SOP-S3)

Client PAUL C. RIZZO
Client Reference TAUM SAUK 06-3551
Project No. 2006-060-01
Lab ID 2006-060-01-75

Boring No. TS-ST-01
Depth (ft) NA
Sample No. NA
Soil Color BROWN AND GRAY

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol **GC, TESTED**

USCS Classification **CLAYEY GRAVEL WITH SAND**

WASH SIEVE ANALYSIS

ASTM D 422-63/AASHTO T88-00 (SOP-S3)

Client PAUL C. RIZZO
 Client Reference TAUM SAUK 06-3551
 Project No. 2006-060-01
 Lab ID 2006-060-01-75

Boring No. TS-ST-01
 Depth (ft) NA
 Sample No. NA
 Soil Color BROWN AND GRAY

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	920	Tare No.	NA
Wgt. Tare + Wet Specimen (gm)	856.04	Wgt. Tare + Wet Specimen (gm)	NA
Wgt. Tare + Dry Specimen (gm)	738.50	Wgt. Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	103.00	Weight of Tare (gm)	NA
Weight of Water (gm)	117.54	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	635.50	Weight of Dry Soil (gm)	NA
Moisture Content (%)	18.5	Moisture Content (%)	NA

Wet Weight - 3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	635.50
Dry Weight - 3/4" Sample (gm)	300.3	Weight of minus #200 material (gm)	306.92
Wet Weight + 3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	328.58
Dry Weight + 3/4" Sample (gm)	28.28		
Total Dry Weight Sample (gm)	NA		

Sieve Size	Sieve Opening (mm)	Wgt. of Soil Retained (gm)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	100.00
6"	150	0.00	0.00	0.00	100.00	100.00
3"	75	0.00	0.00	0.00	100.00	100.00
2"	50	0.00	0.00	0.00	100.00	100.00
1 1/2"	37.5	0.00	0.00	0.00	100.00	100.00
1"	25.0	12.96	2.04	2.04	97.96	97.96
3/4"	19.0	15.32	2.41	4.45	95.55	95.55
1/2"	12.50	52.44	8.25	12.70	87.30	87.30
3/8"	9.50	33.21	5.23	17.93	82.07	82.07
#4	4.75	70.63	11.11	29.04	70.96	70.96
#10	2.00	67.37	10.60	39.64	60.36	60.36
#20	0.850	29.39	4.62	44.27	55.73	55.73
#40	0.425	11.32	1.78	46.05	53.95	53.95
#60	0.250	8.10	1.27	47.32	52.68	52.68
#140	0.106	19.69	3.10	50.42	49.58	49.58
#200	0.075	8.15	1.28	51.70	48.30	48.30
Pan	-	306.92	48.30	100.00	-	-

Tested By JP Date 3/1/06 Checked By *KJB* Date 3-6-06

ATTERBERG LIMITS

ASTM D 4318-98 / AASHTO T89 (SOP - S4A)

Client	PAUL C. RIZZO	Boring No.	TS-ST-01
Client Reference	TAUM SAUK 06-3551	Depth (ft)	NA
Project No.	2006-060-01	Sample No.	NA
Lab ID	2006-060-01-75	Soil Description	BROWN AND GRAY LEAN CLAY

Note: The USCS symbol used with this test refers only to the minus No. 40 sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description.

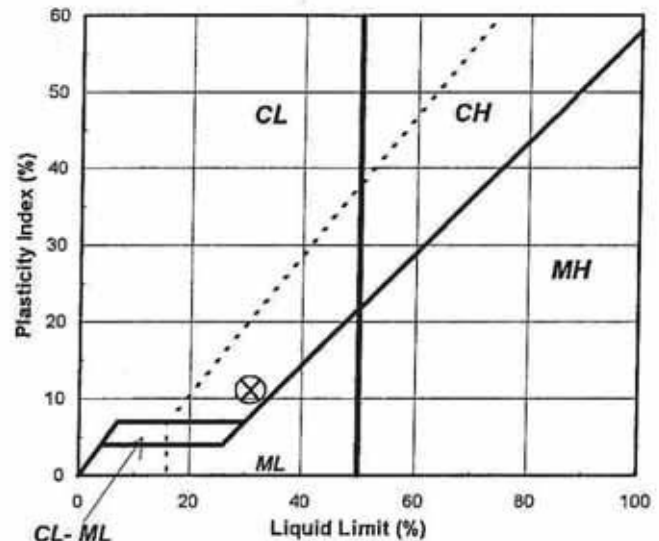
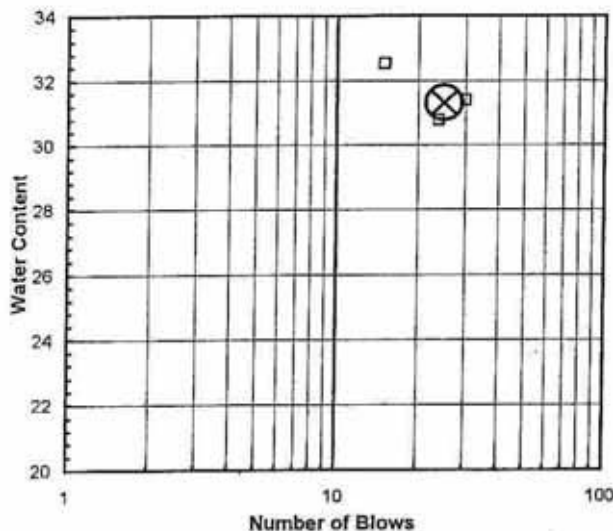
Liquid Limit Test	1	2	3	
Tare Number	45	O	9	M
Wt. of Tare & WS (gm)	40.08	40.31	36.55	U
Wt. of Tare & DS (gm)	34.71	35.56	31.45	L
Wt. of Tare (gm)	17.60	20.13	15.77	T
Wt. of Water (gm)	5.4	4.8	5.1	I
Wt. of DS (gm)	17.1	15.4	15.7	P
Moisture Content (%)	31.4	30.8	32.5	O
Number of Blows	30	24	15	I
				N
				T

Plastic Limit Test	1	2	Range	Test Results
Tare Number	58	4000		Liquid Limit (%) 31
Wt. of Tare & WS (gm)	23.65	26.75		Plastic Limit (%) 20
Wt. of Tare & DS (gm)	22.61	25.68		Plasticity Index (%) 11
Wt. of Tare (gm)	17.41	20.43		USCS Symbol CL
Wt. of Water (gm)	1.0	1.1		
Wt. of DS (gm)	5.2	5.3		
Moisture Content (%)	20.0	20.4	-0.4	

Note: The acceptable range of the two Moisture contents is ± 2.6

Flow Curve

Plasticity Chart



Tested By TO Date 3/5/06 Checked By KLB Date 3-6-06

PERMEABILITY TEST

ASTM D 5084-90(Reapproved 1997)
(SOP-S22A & S22B)



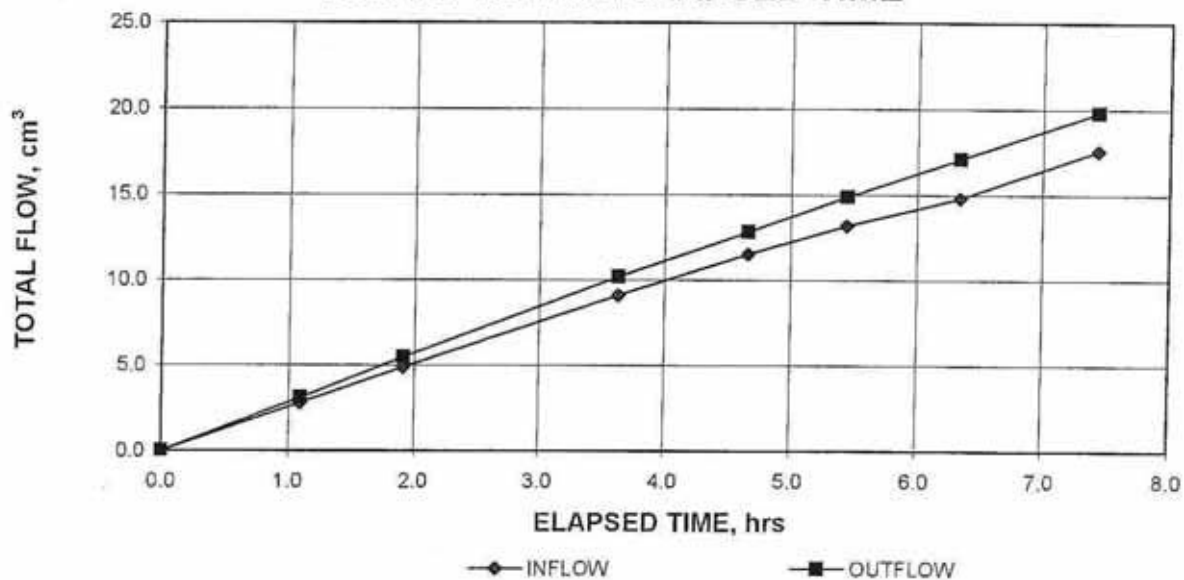
Client
Client Project
Project No.
Lab ID No.

PAUL C. RIZZO
TAUM SAUK 06-3551
2006-060-01
2006-060-01-75

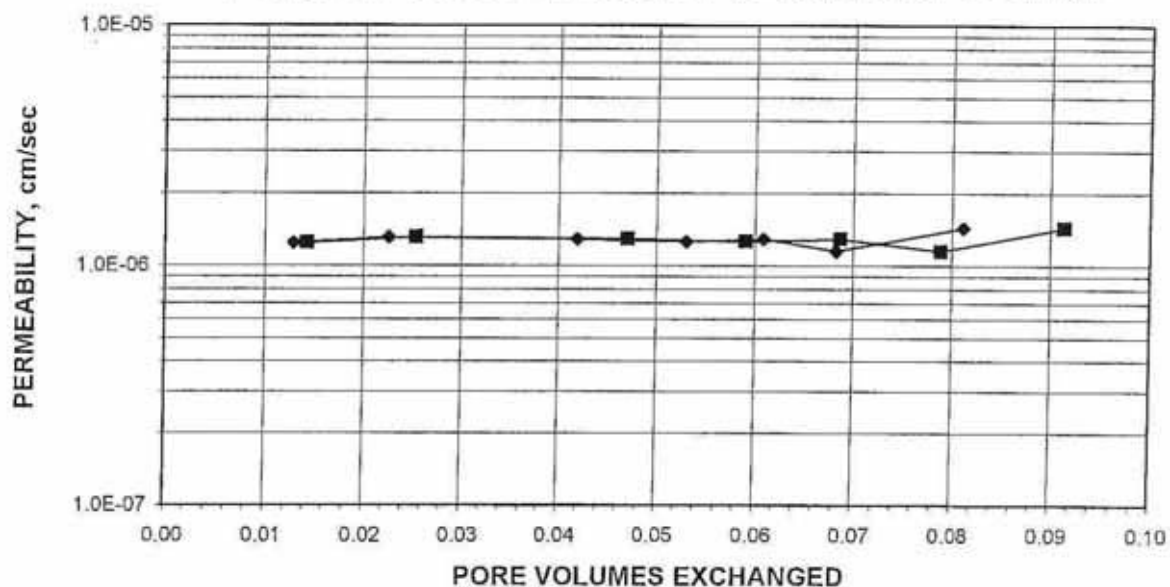
Boring No. TS-ST-01
Depth (ft.) NA
Sample No. NA

AVERAGE PERMEABILITY = $1.3\text{E-}06$ cm/sec @ 20°C
AVERAGE PERMEABILITY = $1.3\text{E-}08$ m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY



Tested By: JCM

Date: 02/17/06

Checked By: *YKB*

Date: 2-24-06

PERMEABILITY TEST

ASTM D 5084-03
(SOP-S22A & S22B)



Client PAUL C. RIZZO
Client Project TAUM SAUK 06-3551
Project No. 2006-060-01
Lab ID No. 2006-060-01-75

Boring No. TS-ST-01
Depth (ft.) NA
Sample No. NA

Specific Gravity 2.70 Assumed
Sample Condition Undisturbed

Visual Description: BROWN AND GRAY MOTTLED CLAY AND SAND

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	621	NO AFTER
Wt. of Tare & WS (gm.)	164.59	TEST WATER
Wt. of Tare & DS (gm.)	152.43	CONTENT,
Wt. of Tare (gm.)	86.94	SAMPLE
Wt. of Water (gm.)	12.16	USED FOR
Wt. of DS (gm.)	65.49	CU
Moisture Content (%)	18.6	

SPECIMEN:	BEFORE TEST	AFTER TEST
Wt. of Tube & WS (gm.)	1219.13	NA
Wt. of Tube (gm.)	0.00	NA
Wt. of WS (calc)(gm.)	1219.13	1219.13
Length 1 (in.)	5.775	5.659
Length 2 (in.)	5.764	5.703
Length 3 (in.)	5.801	5.707
Top Diameter (in.)	2.876	2.850
Middle Diameter (in.)	2.853	2.850
Bottom Diameter (in.)	2.876	2.869
Average Length (in.)	5.78	5.69
Average Area (in. ²)	6.46	6.41
Sample Volume (cm ³)	612.04	597.44
Unit Wet Wt. (gm./ cm ³)	1.99	2.04
Unit Wet Wt. (pcf)	124.3	127.4
Unit Dry Wt. (pcf)	104.9	
Unit Dry Wt. (gm./ cm ³)	1.68	
Void Ratio, e	0.61	
Porosity, n	0.38	
Pore Volume (cm ³)	231.2	
Total Wgt. Of Sample After Test		1230.9

Tested By: JCM

Date: 02/17/06 Checked By:

KVB

Date: 2-24-06

PERMEABILITY TEST

ASTM D 5084-90(Reapproved 1997)
(SOP-S22A & S22B)



Client PAUL C. RIZZO
Client Project TAUM SAUK 06-3551
Project No. 2006-060-01
Lab ID No. 2006-060-01-75

Boring No. TS-ST-01
Depth (ft.) NA
Sample No. NA

Pressure Heads (Constant)

Top Cap (psi) 67.5
Bottom Cap (psi) 70.0
Cell (psi) 75.0
Total Pressure Head (cm) 175.8
Hydraulic Gradient 12.16

Final Sample Dimensions

Sample Length (cm), L 14.45
Sample Diameter (cm) 7.26
Sample Area (cm²), A 41.34
Inflow Burette Area (cm²), a-in 0.877
Outflow Burette Area (cm²), a-out 0.904
B Parameter (%) 97

AVERAGE PERMEABILITY = 1.3E-06 cm/sec @ 20°C
AVERAGE PERMEABILITY = 1.3E-08 m/sec @ 20°C

DATE	TIME		ELAPSED TIME	TOTAL INFLOW	TOTAL OUTFLOW	TOTAL HEAD	FLOW	TEMP.	INCREMENTAL PERMEABILITY
(mm/dd/yy)	(hr)	(min)	t (hr)	(cm ³)	(cm ³)	h (cm)	(0 flow) (1 stop)	(°C)	@ 20°C (cm/sec)
02/20/06	8	57	0.0	0.0	0.0	200.9	0	22.6	NA
02/20/06	10	3	1.1	2.8	3.1	194.4	0	22.0	1.2E-06
02/20/06	10	52	1.9	4.9	5.5	189.4	0	22.0	1.3E-06
02/20/06	12	35	3.6	9.1	10.2	179.5	0	22.0	1.3E-06
02/20/06	13	37	4.7	11.5	12.8	173.9	0	22.0	1.3E-06
02/20/06	14	24	5.5	13.2	14.9	169.7	0	22.0	1.3E-06
02/20/06	15	18	6.4	14.8	17.1	165.4	0	22.0	1.2E-06
02/20/06	16	23	7.4	17.6	19.8	159.3	1	22.0	1.4E-06

Tested By: JCM

Date: 02/17/06 Checked By: KYB

Date: 2-24-06

SHELBY TUBE SAMPLE

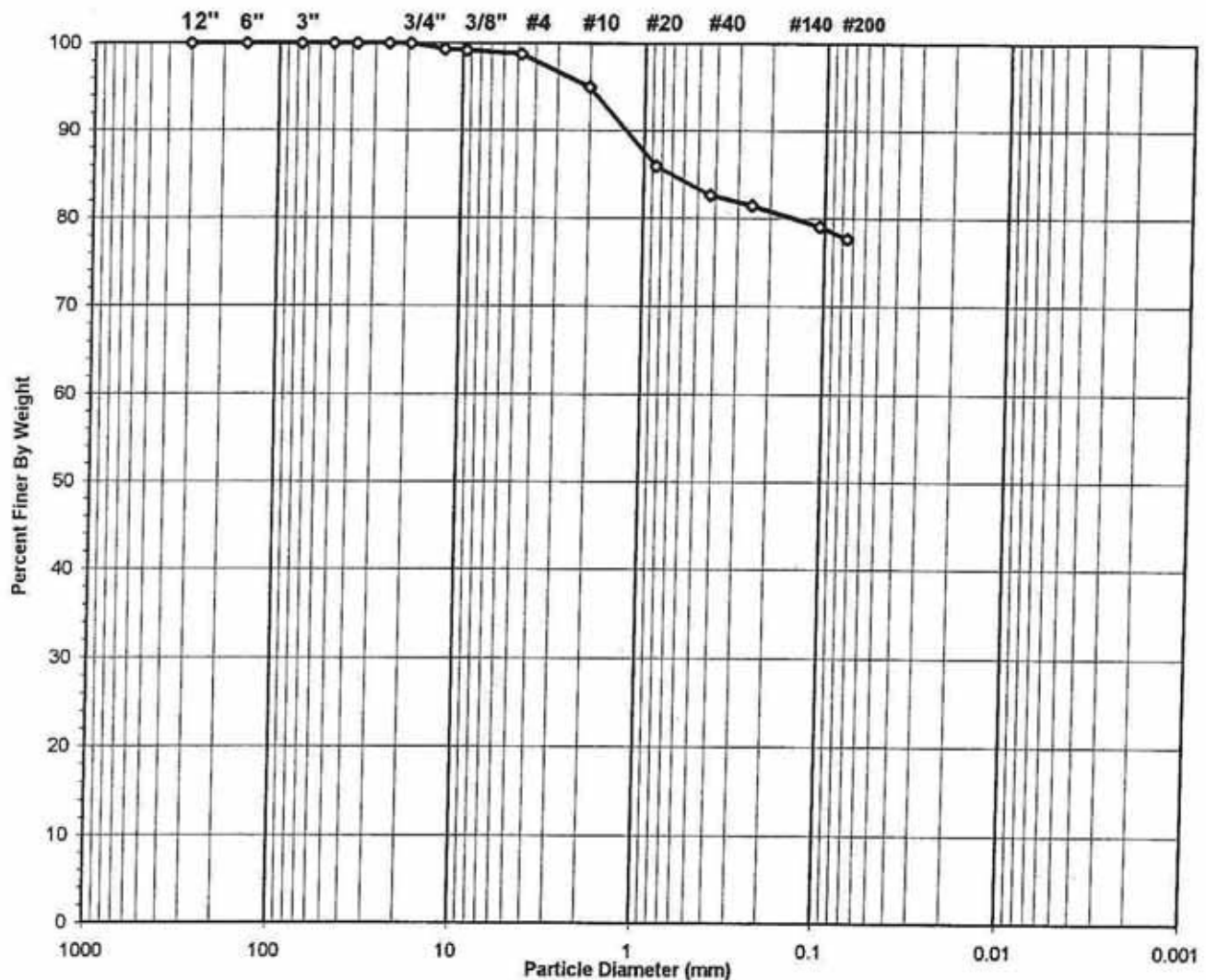
TS-ST02

SIEVE ANALYSIS
ASTM D 422-63/AASHTO T88-00 (SOP-S3)

Client PAUL C. RIZZO
Client Reference TAUM SAUK 06-3551
Project No. 2006-060-01
Lab ID 2006-060-01-76

Boring No. TS-ST-02
Depth (ft) NA
Sample No. NA
Soil Color BROWN AND GRAY

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol **CH, TESTED**

USCS Classification **FAT CLAY WITH SAND**

WASH SIEVE ANALYSIS

ASTM D 422-63/AASHTO T88-00 (SOP-S3)

Client PAUL C. RIZZO
Client Reference TAUM SAUK 06-3551
Project No. 2006-060-01
Lab ID 2006-060-01-76

Boring No. TS-ST-02
Depth (ft) NA
Sample No. NA
Soil Color BROWN AND GRAY

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	966	Tare No.	NA
Wgt. Tare + Wet Specimen (gm)	683.25	Wgt. Tare + Wet Specimen (gm)	NA
Wgt. Tare + Dry Specimen (gm)	553.90	Wgt. Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	103.11	Weight of Tare (gm)	NA
Weight of Water (gm)	129.35	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	450.79	Weight of Dry Soil (gm)	NA
Moisture Content (%)	28.7	Moisture Content (%)	NA

Wet Weight - 3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	450.79
Dry Weight - 3/4" Sample (gm)	100.9	Weight of minus #200 material (gm)	349.91
Wet Weight + 3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	100.88
Dry Weight + 3/4" Sample (gm)	0.00		
Total Dry Weight Sample (gm)	NA		

Sieve Size	Sieve Opening (mm)	Wgt. of Soil Retained (gm)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	100.00
6"	150	0.00	0.00	0.00	100.00	100.00
3"	75	0.00	0.00	0.00	100.00	100.00
2"	50	0.00	0.00	0.00	100.00	100.00
1 1/2"	37.5	0.00	0.00	0.00	100.00	100.00
1"	25.0	0.00	0.00	0.00	100.00	100.00
3/4"	19.0	0.00	0.00	0.00	100.00	100.00
1/2"	12.50	2.93	0.65	0.65	99.35	99.35
3/8"	9.50	0.80	0.18	0.83	99.17	99.17
#4	4.75	1.55	0.34	1.17	98.83	98.83
#10	2.00	17.10	3.79	4.96	95.04	95.04
#20	0.850	40.93	9.08	14.04	85.96	85.96
#40	0.425	15.10	3.35	17.39	82.61	82.61
#60	0.250	5.36	1.19	18.58	81.42	81.42
#140	0.106	10.57	2.34	20.93	79.07	79.07
#200	0.075	6.54	1.45	22.38	77.62	77.62
Pan	-	349.91	77.62	100.00	-	-

Tested By JP

Date 3/1/06

Checked By

YKB

Date

3-6-06

ATTERBERG LIMITS

ASTM D 4318-98 / AASHTO T89 (SOP - S4A)

Client	PAUL C. RIZZO	Boring No.	TS-ST-02
Client Reference	TAUM SAUK 06-3551	Depth (ft)	NA
Project No.	2006-060-01	Sample No.	NA
Lab ID	2006-060-01-76	Soil Description	BROWN AND GRAY FAT CLAY

Note: The USCS symbol used with this test refers only to the minus No. 40 sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description.

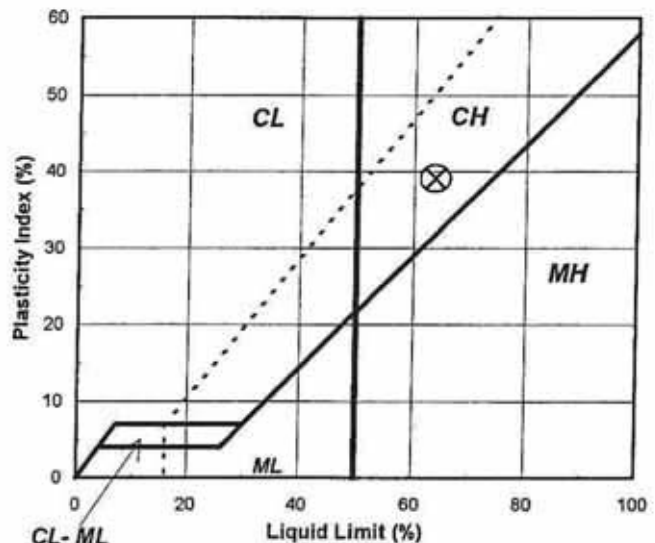
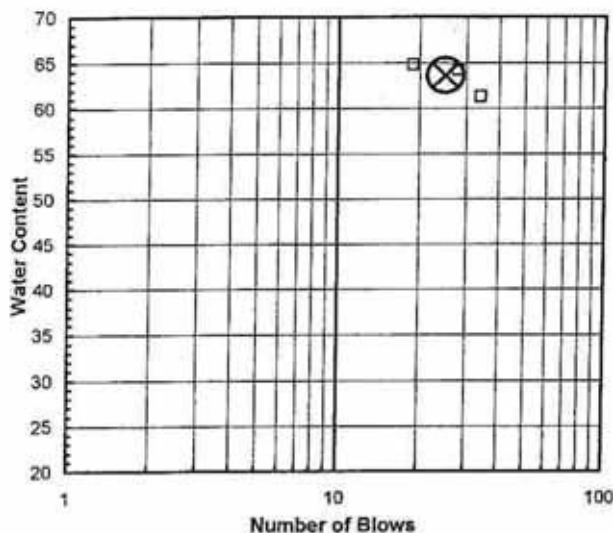
Liquid Limit Test	1	2	3	
Tare Number	4	1158	222	MULTIPOINT
Wt. of Tare & WS (gm)	28.79	38.27	39.48	
Wt. of Tare & DS (gm)	23.34	30.86	31.97	
Wt. of Tare (gm)	14.45	19.32	20.38	
Wt. of Water (gm)	5.5	7.4	7.5	
Wt. of DS (gm)	8.9	11.5	11.6	
Moisture Content (%)	61.3	64.2	64.8	
Number of Blows	34	28	19	

Plastic Limit Test	1	2	Range	Test Results
Tare Number	246	242		Liquid Limit (%) 64
Wt. of Tare & WS (gm)	23.70	26.53		Plastic Limit (%) 25
Wt. of Tare & DS (gm)	22.52	25.26		Plasticity Index (%) 39
Wt. of Tare (gm)	17.65	20.14		USCS Symbol CH
Wt. of Water (gm)	1.2	1.3		
Wt. of DS (gm)	4.9	5.1		
Moisture Content (%)	24.2	24.8	-0.6	

Note: The acceptable range of the two Moisture contents is ± 2.6

Flow Curve

Plasticity Chart



Tested By JAC Date 3/3/06 Checked By *YJB* Date 3-6-06

PERMEABILITY TEST

ASTM D 5084-90(Reapproved 1997)
(SOP-S22A & S22B)



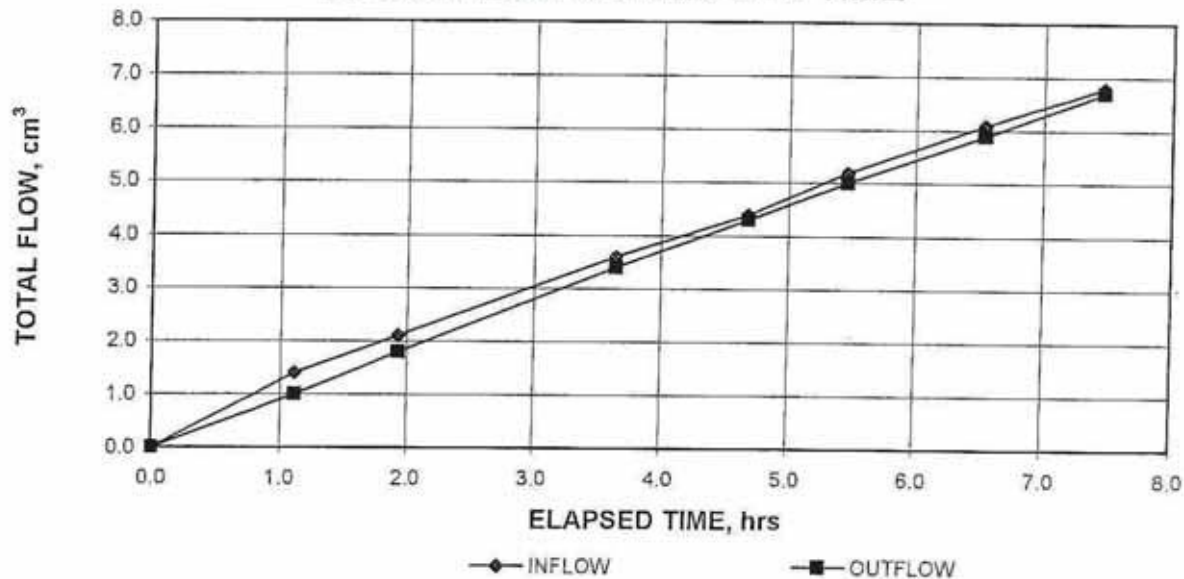
Client
Client Project
Project No.
Lab ID No.

PAUL C. RIZZO
TAUM SAUK 06-3551
2006-060-01
2006-060-01-76

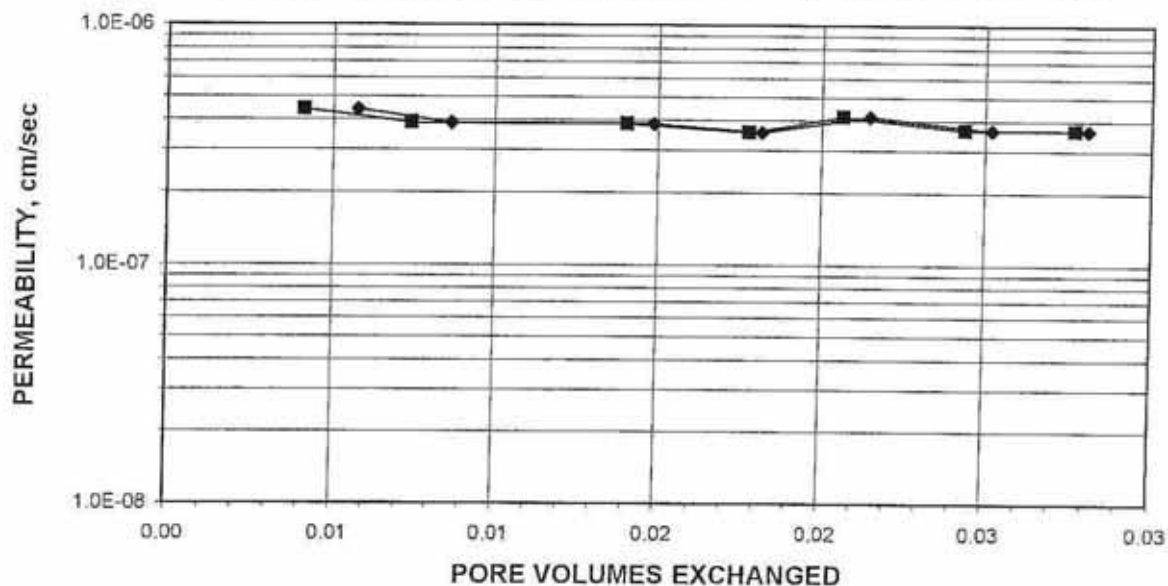
Boring No. TS-ST-02
Depth (ft.) NA
Sample No. NA

AVERAGE PERMEABILITY = $3.8\text{E-}07$ cm/sec @ 20°C
AVERAGE PERMEABILITY = $3.8\text{E-}09$ m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY



Tested By: JCM

Date: 02/16/06 Checked By: *KJB*

Date: 2-24-06

PERMEABILITY TEST

ASTM D 5084-03
(SOP-S22A & S22B)



Client PAUL C. RIZZO
Client Project TAUM SAUK 06-3551
Project No. 2006-060-01
Lab ID No. 2006-060-01-76

Boring No. TS-ST-02
Depth (ft.) NA
Sample No. NA

Specific Gravity 2.70 Assumed
Sample Condition Undisturbed

Visual Description: BROWN SANDY CLAY

MOISTURE CONTENT:	BEFORE TEST	AFTER TEST
Tare Number	1710	NO AFTER
Wt. of Tare & WS (gm.)	96.73	TEST WATER
Wt. of Tare & DS (gm.)	93.53	CONTENT,
Wt. of Tare (gm.)	82.33	SAMPLE
Wt. of Water (gm.)	3.20	USED FOR
Wt. of DS (gm.)	11.20	CU
Moisture Content (%)	28.6	

SPECIMEN:	BEFORE TEST	AFTER TEST
Wt. of Tube & WS (gm.)	1006.30	NA
Wt. of Tube (gm.)	0.00	NA
Wt. of WS (calc.)(gm.)	1006.30	1006.30
Length 1 (in.)	5.083	5.064
Length 2 (in.)	5.070	5.072
Length 3 (in.)	5.060	5.065
Top Diameter (in.)	2.852	2.857
Middle Diameter (in.)	2.852	2.853
Bottom Diameter (in.)	2.856	2.857
Average Length (in.)	5.07	5.07
Average Area (in. ²)	6.39	6.40
Sample Volume (cm ³)	531.36	531.81
Unit Wet Wt. (gm./ cm ³)	1.89	1.89
Unit Wet Wt. (pcf)	118.2	118.1
Unit Dry Wt. (pcf)	91.9	
Unit Dry Wt. (gm./ cm ³)	1.47	
Void Ratio, e	0.83	
Porosity, n	0.45	
Pore Volume (cm ³)	241.5	
Total Wgt. Of Sample After Test		1014.1

Tested By: JCM

Date: 02/16/06 Checked By: *YKB*

Date: 2-24-06

PERMEABILITY TEST

ASTM D 5084-90(Reapproved 1997)
(SOP-S22A & S22B)



Client PAUL C. RIZZO
Client Project TAUM SAUK 06-3551
Project No. 2006-060-01
Lab ID No. 2006-060-01-76

Boring No. TS-ST-02
Depth (ft.) NA
Sample No. NA

Pressure Heads (Constant)

Top Cap (psi) 67.5
Bottom Cap (psi) 70.0
Cell (psi) 75.0
Total Pressure Head (cm) 175.8
Hydraulic Gradient 13.66

Final Sample Dimensions

Sample Length (cm), L 12.87
Sample Diameter (cm) 7.25
Sample Area (cm²), A 41.32
Inflow Burette Area (cm²), a-in 0.984
Outflow Burette Area (cm²), a-out 0.842
B Parameter (%) 98

AVERAGE PERMEABILITY = 3.8E-07 cm/sec @ 20°C
AVERAGE PERMEABILITY = 3.8E-09 m/sec @ 20°C

DATE	TIME		ELAPSED TIME	TOTAL INFLOW	TOTAL OUTFLOW	TOTAL HEAD	FLOW	TEMP.	INCREMENTAL PERMEABILITY
(mm/dd/yy)	(hr)	(min)	t (hr)	(cm ³)	(cm ³)	h (cm)	(0 flow) (1 stop)	(°C)	@ 20°C (cm/sec)
02/20/06	8	57	0.0	0.0	0.0	199.7	0	22.6	NA
02/20/06	10	4	1.1	1.4	1.0	197.1	0	22.0	4.4E-07
02/20/06	10	53	1.9	2.1	1.8	195.5	0	22.0	3.9E-07
02/20/06	12	36	3.7	3.6	3.4	192.0	0	22.0	3.9E-07
02/20/06	13	38	4.7	4.4	4.3	190.2	0	22.0	3.6E-07
02/20/06	14	25	5.5	5.2	5.0	188.5	0	22.0	4.2E-07
02/20/06	15	30	6.6	6.1	5.9	186.5	0	22.0	3.7E-07
02/20/06	16	25	7.5	6.8	6.7	184.9	1	22.0	3.7E-07

Tested By: JCM

Date: 02/16/06 Checked By: *KJB*

Date: 2-24-06

SHELBY TUBE SAMPLE

TS-ST01 & 02

**CONSOLIDATED UNDRAINED TRIAXIAL TEST
WITH PORE PRESSURE READINGS
ASTM D4767-95 / AASHTO T297-94 (SOP-S28)**

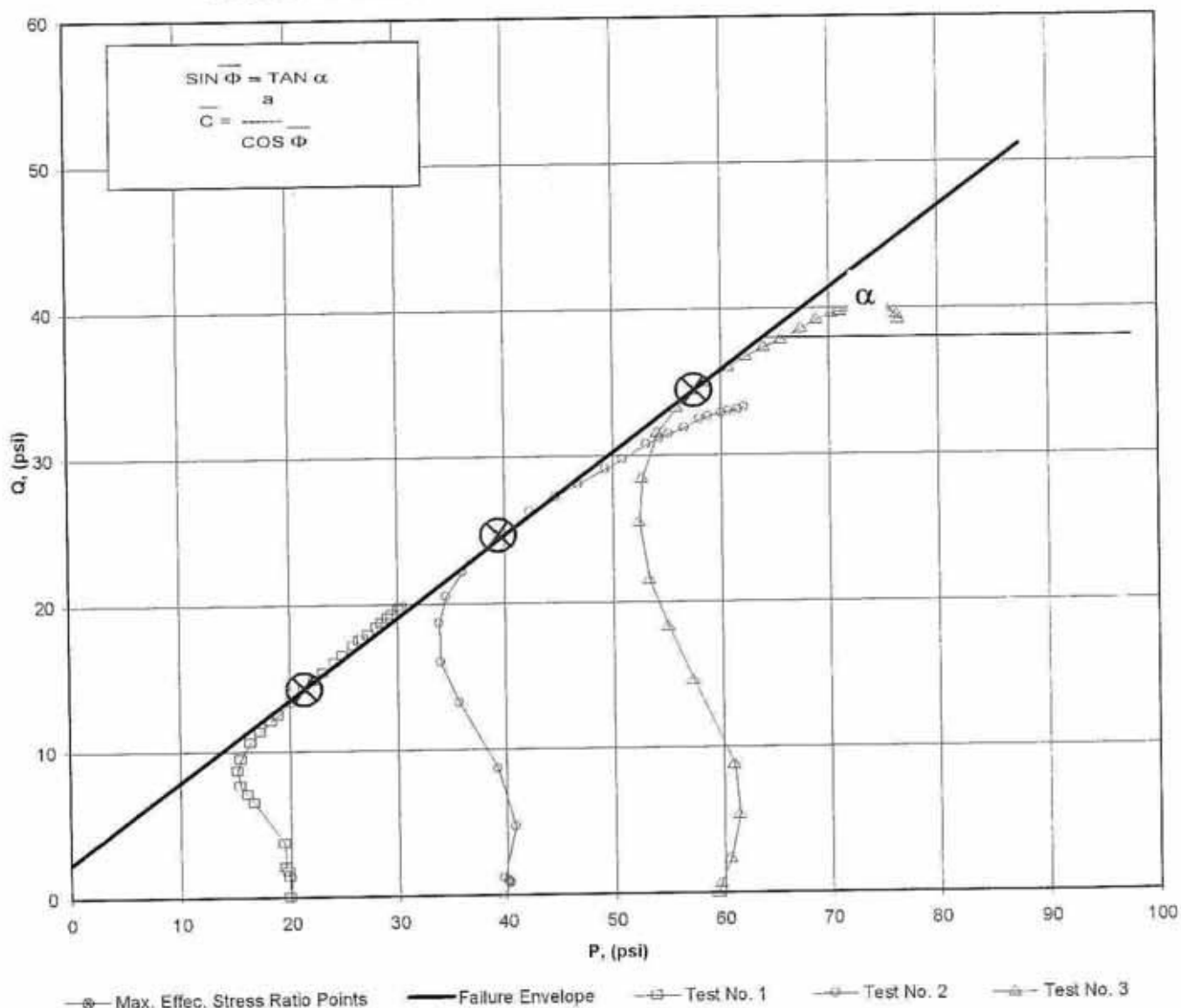
Client
Client Reference
Project No.
Lab ID

PAUL C. RIZZO
TAUM SAUK 06-3551
2006-060-01
2006-060-01-75& 76

Boring No.
Depth(ft.)
Sample No.

TS-ST-01 & 02
NA
NA

Consolidated Undrained Triaxial Test with Pore Pressure



a	$=$	2.30	$\bar{C}$	$=$	2.78
α	$=$	29.2	$\bar{\Phi}$	$=$	33.96

Tested By

JCM

Date

02/22/06

Approved By

DB

Date

2/27/06

**CONSOLIDATED UNDRAINED TRIAXIAL TEST
WITH PORE PRESSURE READINGS
ASTM D4767-95 / AASHTO T297-94 (SOP-S28)**

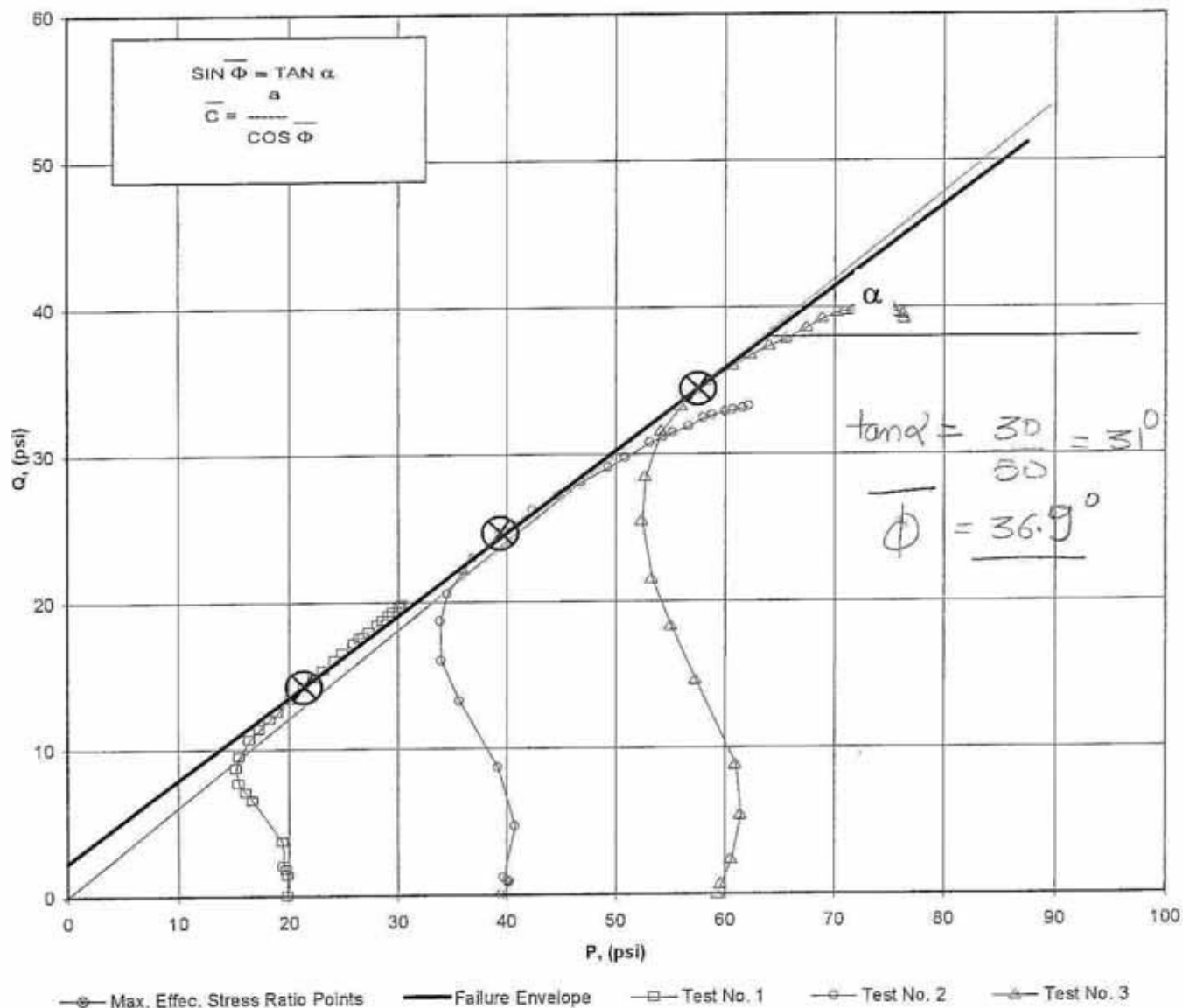
Client
Client Reference
Project No.
Lab ID

PAUL C. RIZZO
TAUM SAUK 06-3551
2006-060-01
2006-060-01-75& 76

Boring No.
Depth(ft.)
Sample No.

TS-ST-01 & 02
NA
NA

Consolidated Undrained Triaxial Test with Pore Pressure



a	$=$	2.30	$\bar{C}$	$=$	2.78
α	$=$	29.2	$\bar{\Phi}$	$=$	33.96

Tested By

JCM

Date

02/22/06

Approved By

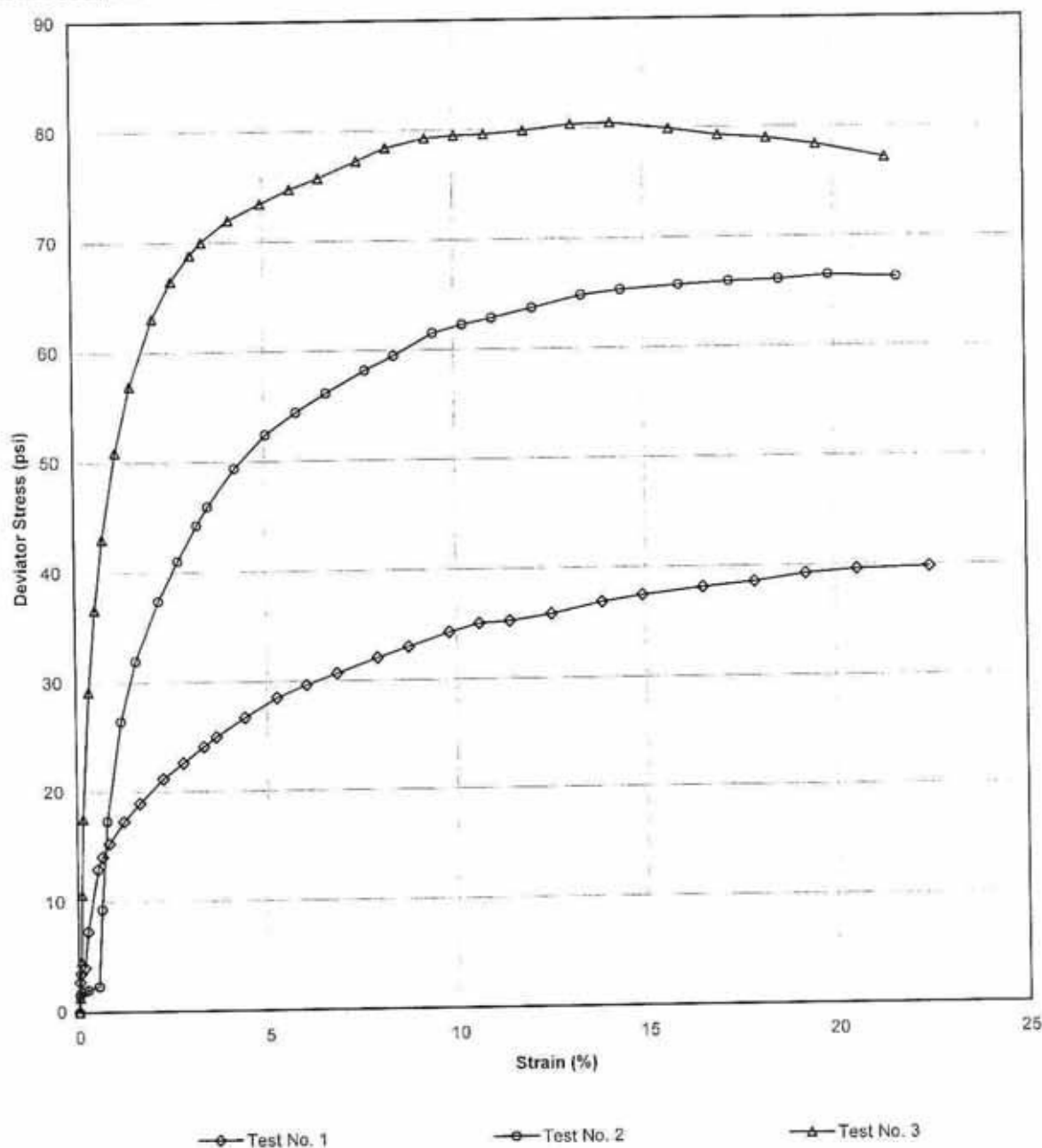
DB

Date

2/27/06

**CONSOLIDATED UNDRAINED TRIAXIAL TEST
WITH PORE PRESSURE READINGS
ASTM D4767-95 / AASHTO T297-94 (SOP-S28)**

Client	PAUL C. RIZZO	Boring No.	TS-ST-01& 02
Client Reference	TAUM SAUK 06-3551	Depth(ft.)	NA
Project No.	2006-060-01	Sample No.	NA
Lab ID	2006-060-01-75&76		
Visual Description:	BROWN & GRAY MOTTLED CLAY & SAND (UNDISTURBED & AFTER PERMEABILITY)		



Tested By JCM Date

02/22/06

Approved By

DB

Date

2/27/06

**CONSOLIDATED UNDRAINED TRIAXIAL TEST
WITH PORE PRESSURE READINGS**
ASTM D4767-95 / AASHTO T297-94 (SOP-S28)



Client	PAUL C. RIZZO	Boring No.	TS-ST-01
Client Reference	TAUM SAUK 06-3551	Depth(ft.)	NA
Project No.	2006-060-01	Sample No.	NA
Lab ID	2006-060-01-75		

Visual Description: BROWN & GRAY MOTTLED CLAY & SAND (AFTER PERMEABILITY)

Stage No.	1
Test No	1

INITIAL SAMPLE DIMENSIONS (in)

Length 1	5.659	Diameter 1	2.850
Length 2	5.703	Diameter 2	2.850
Length 3	5.707	Diameter 3	2.869
Avg Leng. =	5.690	Avg. Diam. =	2.856

PRESSURES (psi)

Cell Pressure(psi)	60.0
Back Pressure(psi)	40.1
Eff. Cons. Pressure(psi)	19.9
Pore Pressure	
Response (%)	98

VOLUME CHANGE

Initial Burette Reading (ml)	72.0
Final Burette Reading (ml)	48.7
Final Change (ml)	23.3

MAXIMUM OBLIQUITY POINTS

P	=	21.37
Q	=	14.24

Initial Dial Reading (D.R.), mils	45
D.R. After Saturation, mils	101
D.R. After Consolidation, mils	139

LOAD (LBS)	DEFORMATION (INCHES)	PORE PRESSURE (PSI)
14.1	0.000	40.1
31.0	0.001	41.5
35.6	0.003	41.9
38.8	0.009	42.5
58.8	0.014	44.2
93.2	0.030	49.7
100.3	0.037	50.9
107.9	0.047	52.2
120.5	0.069	53.5
131.1	0.092	54.0
145.7	0.127	54.2
155.3	0.156	54.0
165.3	0.187	53.7
171.3	0.205	53.5
183.7	0.248	53.2
196.5	0.295	52.9
205.5	0.339	52.5
213.9	0.384	52.2
225.4	0.444	51.8
233.7	0.490	51.6
244.9	0.550	51.2
252.2	0.594	51.0
255.7	0.639	50.8
262.8	0.700	50.6
273.8	0.775	50.3
281.2	0.835	50.1
291.1	0.925	49.9
299.1	1.001	49.8
309.0	1.076	49.5
316.7	1.151	49.5
325.7	1.257	49.3

Tested By JCM Date 02/22/06 Input Checked By *KVB* Date 2-27-06

**CONSOLIDATED UNDRAINED TRIAXIAL TEST
WITH PORE PRESSURE READINGS
ASTM D4767-95 / AASHTO T297-94 (SOP-S28)**



Client	PAUL C. RIZZO	Boring No.	TS-ST-01
Client Reference	TAUM SAUK 06-3551	Depth(ft.)	NA
Project No.	2006-060-01	Sample No.	NA
Lab ID	2006-060-01-75		

Visual Description: BROWN & GRAY MOTTLED CLAY & SAND (AFTER PERMEABILITY)

Effective Confining Pressure (psi)	19.9	Stage No.	1
		Test No	1

INITIAL DIMENSIONS

Initial Sample Length (in.)	5.69
Initial Sample Diameter (in.)	2.86
Initial Sample Area (in ²)	6.41
Initial Sample Volume (in ³)	36.46

VOLUME CHANGE

Volume After Consolidation (in ³)	33.96
Length After Consolidation (in)	5.60
Area After Consolidation (in ²)	6.069

Strain (%)	Deviation Stress	ΔU	$\bar{\sigma}_1$	$\bar{\sigma}_3$	Effective Principle Stress Ratio	$\bar{A}$	$\bar{P}$	Q
0.02	2.78	1.38	21.29	18.5	1.150	0.51	19.90	1.39
0.05	3.54	1.85	21.59	18.1	1.196	0.53	19.82	1.77
0.15	4.07	2.36	21.61	17.5	1.232	0.59	19.58	2.03
0.25	7.34	4.10	23.14	15.8	1.464	0.57	19.47	3.67
0.53	12.97	9.64	23.22	10.3	2.264	0.76	16.74	6.48
0.66	14.12	10.85	23.17	9.1	2.560	0.78	16.11	7.06
0.84	15.32	12.07	23.15	7.8	2.958	0.80	15.49	7.66
1.23	17.32	13.36	23.86	6.5	3.647	0.79	15.20	8.66
1.65	18.96	13.87	24.99	6.0	4.142	0.75	15.51	9.48
2.26	21.19	14.07	27.02	5.8	4.633	0.68	16.43	10.59
2.79	22.62	13.86	28.66	6.0	4.744	0.63	17.35	11.31
3.34	24.09	13.65	30.34	6.3	4.854	0.58	18.30	12.05
3.67	24.95	13.44	31.42	6.5	4.861	0.55	18.94	12.48
4.42	26.72	13.06	33.55	6.8	4.907	0.50	20.20	13.36
5.27	28.48	12.77	35.60	7.1	4.995	0.46	21.37	14.24
6.06	29.63	12.43	37.10	7.5	4.965	0.43	22.29	14.81
6.86	30.66	12.06	38.49	7.8	4.913	0.40	23.16	15.33
7.94	32.05	11.72	40.23	8.2	4.920	0.37	24.20	16.03
8.75	33.02	11.47	41.45	8.4	4.918	0.35	24.94	16.51
9.82	34.29	11.10	43.09	8.8	4.898	0.33	25.94	17.15
10.62	35.06	10.94	44.02	9.0	4.914	0.32	26.49	17.53
11.42	35.26	10.71	44.45	9.2	4.836	0.31	26.82	17.63
12.51	35.85	10.51	45.24	9.4	4.818	0.30	27.32	17.93
13.86	36.87	10.21	46.55	9.7	4.805	0.28	28.12	18.43
14.92	37.45	10.05	47.30	9.9	4.801	0.27	28.58	18.73
16.53	38.10	9.82	48.18	10.1	4.778	0.26	29.13	19.05
17.88	38.56	9.72	48.74	10.2	4.789	0.26	29.46	19.28
19.22	39.25	9.42	49.73	10.5	4.745	0.24	30.11	19.63
20.57	39.60	9.36	50.15	10.5	4.757	0.24	30.34	19.80
22.47	39.80	9.16	50.54	10.7	4.708	0.23	30.64	19.90

Tested By JCM Date 02/22/06 Input Checked By KVS Date 2-27-06

**CONSOLIDATED UNDRAINED TRIAXIAL TEST
WITH PORE PRESSURE READINGS**
ASTM D4767-95 / AASHTO T297-94 (SOP-S28)



Client	PAUL C. RIZZO	Boring No.	TS-ST-02
Client Reference	TAUM SAUK 06-3551	Depth(ft.)	NA
Project No.	2006-060-01	Sample No.	NA
Lab ID	2006-060-01-76		

Visual Description: BROWN & GRAY MOTTLED CLAY & SAND (UNDISTURBED)

Stage No.	1
Test No	2

INITIAL SAMPLE DIMENSIONS (in)

Length 1	4.682	Diameter 1	2.864
Length 2	4.759	Diameter 2	2.862
Length 3	4.730	Diameter 3	2.897
Avg Leng.=	4.724	Avg. Diam.=	2.874

PRESSURES (psi)

Cell Pressure(psi)	89.9
Back Pressure(psi)	50.3
Eff. Cons. Pressure(psi)	39.6
Pore Pressure Response (%)	96

VOLUME CHANGE

Initial Burette Reading (ml)	72.0
Final Burette Reading (ml)	49.2
Final Change (ml)	22.8

MAXIMUM OBLIQUITY POINTS

P	=	39.45
Q	=	24.68

Initial Dial Reading (D.R.), mils	74
D.R. After Saturation, mils	127
D.R. After Consolidation, mils	232

LOAD (LBS)	DEFORMATION (INCHES)	PORE PRESSURE (PSI)
17.2	0.000	50.3
26.8	0.001	50.4
28.4	0.003	50.5
29.0	0.006	50.7
29.7	0.011	50.8
31.6	0.024	51.3
75.1	0.028	53.7
125.3	0.036	59.3
182.5	0.053	67.4
217.9	0.072	71.9
253.4	0.100	74.7
277.7	0.123	75.9
299.6	0.146	76.0
311.5	0.160	75.9
335.8	0.192	75.1
358.5	0.230	73.7
374.5	0.267	72.4
389.0	0.303	71.1
406.9	0.350	69.7
418.9	0.385	68.7
437.4	0.432	67.5
446.2	0.467	66.7
454.0	0.503	66.1
465.4	0.551	65.1
479.9	0.611	64.3
488.6	0.658	63.7
500.2	0.729	62.7
510.0	0.789	62.2
519.2	0.849	61.3
530.1	0.908	60.9
539.9	0.990	60.2

Tested By JCM Date 02/22/06 Input Checked By YAB Date 2-27-06

**CONSOLIDATED UNDRAINED TRIAXIAL TEST
WITH PORE PRESSURE READINGS**
ASTM D4767-95 / AASHTO T297-94 (SOP-S28)



Client	PAUL C. RIZZO	Boring No.	TS-ST-02
Client Reference	TAUM SAUK 06-3551	Depth(ft.)	NA
Project No.	2006-060-01	Sample No.	NA
Lab ID	2006-060-01-76		

Visual Description: BROWN & GRAY MOTTLED CLAY & SAND (UNDISTURBED)

Effective Confining Pressure (psi)	39.6	Stage No.	1
		Test No	2

INITIAL DIMENSIONS

Initial Sample Length (in.)	4.72
Initial Sample Diameter (in.)	2.87
Initial Sample Area (in ²)	6.49
Initial Sample Volume (in ³)	30.65

VOLUME CHANGE

Volume After Consolidation (in ³)	28.23
Length After Consolidation (in)	4.57
Area After Consolidation (in ²)	6.183

Strain (%)	Deviation Stress	ΔU	$\bar{\sigma}_1$	$\bar{\sigma}_3$	Effective Principle Stress Ratio	$\bar{A}$	$\bar{P}$	Q
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0.01	1.56	0.13	41.02	39.5	1.039	0.09	40.24	0.78
0.06	1.82	0.16	41.26	39.4	1.046	0.09	40.35	0.91
0.14	1.90	0.38	41.12	39.2	1.048	0.21	40.17	0.95
0.24	2.02	0.54	41.08	39.1	1.052	0.28	40.07	1.01
0.52	2.32	1.02	40.90	38.6	1.060	0.46	39.74	1.16
0.62	9.31	3.44	45.47	36.2	1.257	0.38	40.82	4.66
0.79	17.35	9.05	47.90	30.6	1.568	0.54	39.22	8.67
1.17	26.43	17.10	48.92	22.5	2.175	0.67	35.71	13.21
1.58	31.95	21.59	49.96	18.0	2.774	0.70	33.98	15.97
2.19	37.37	24.40	52.57	15.2	3.459	0.68	33.88	18.69
2.70	41.00	25.59	55.01	14.0	3.926	0.65	34.51	20.50
3.20	44.22	25.65	58.16	13.9	4.171	0.60	36.06	22.11
3.50	45.93	25.59	59.94	14.0	4.277	0.58	36.98	22.97
4.21	49.35	24.83	64.13	14.8	4.341	0.52	39.45	24.68
5.04	52.42	23.43	68.59	16.2	4.242	0.47	42.38	26.21
5.84	54.41	22.09	71.92	17.5	4.107	0.42	44.72	27.21
6.64	56.14	20.81	74.93	18.8	3.988	0.39	46.86	28.07
7.67	58.20	19.36	78.44	20.2	3.875	0.35	49.34	29.10
8.43	59.50	18.43	80.67	21.2	3.811	0.32	50.92	29.75
9.46	61.53	17.25	83.89	22.4	3.752	0.29	53.12	30.77
10.24	62.29	16.41	85.48	23.2	3.686	0.27	54.34	31.15
11.02	62.87	15.80	86.66	23.8	3.642	0.26	55.23	31.43
12.08	63.73	14.80	88.53	24.8	3.570	0.24	56.66	31.87
13.37	64.83	13.99	90.45	25.6	3.531	0.22	58.03	32.42
14.41	65.26	13.37	91.48	26.2	3.488	0.21	58.86	32.63
15.96	65.65	12.38	92.87	27.2	3.412	0.20	60.05	32.83
17.28	65.93	11.87	93.66	27.7	3.378	0.19	60.70	32.97
18.59	66.10	11.04	94.66	28.6	3.315	0.17	61.61	33.05
19.89	66.46	10.65	95.41	29.0	3.295	0.17	62.18	33.23
21.68	66.22	9.92	95.89	29.7	3.231	0.16	62.79	33.11

Tested By JCM Date 02/22/06 Input Checked By *KPB* Date *2-27-06*

**CONSOLIDATED UNDRAINED TRIAXIAL TEST
WITH PORE PRESSURE READINGS**
ASTM D4767-95 / AASHTO T297-94 (SOP-S28)

Client	PAUL C. RIZZO	Boring No.	TS-ST-02
Client Reference	TAUM SAUK 06-3551	Depth(ft.)	NA
Project No.	2006-060-01	Sample No.	NA
Lab ID	2006-060-01-76		

Visual Description: BROWN & GRAY MOTTLED CLAY & SAND (AFTER PERMEABILITY)

Stage No.	1
Test No	3

INITIAL SAMPLE DIMENSIONS (in)

Length 1	5.064	Diameter 1	2.857
Length 2	5.072	Diameter 2	2.853
Length 3	5.060	Diameter 3	2.857
Avg Leng.=	5.065	Avg. Diam.=	2.856

PRESSURES (psi)

Cell Pressure(psi)	99.7
Back Pressure(psi)	40.3
Eff. Cons. Pressure(ps	59.4
Pore Pressure	
Response (%)	98

VOLUME CHANGE

Initial Burette Reading (ml)	48.0
Final Burette Reading (ml)	28.2
Final Change (ml)	19.8

MAXIMUM OBLIQUITY POINTS

P	=	57.51
Q	=	34.43

Initial Dial Reading (D.R.), mils	49
D.R. After Saturation, mils	59
D.R. After Consolidation, mils	160

LOAD (LBS)	DEFORMATION (INCHES)	PORE PRESSURE (PSI)
18.8	0.000	40.3
27.3	0.001	40.7
48.1	0.003	41.4
85.8	0.005	43.6
129.1	0.008	47.5
202.1	0.016	56.9
249.4	0.025	63.0
290.5	0.036	67.9
341.2	0.054	72.7
380.8	0.074	75.4
422.5	0.104	77.1
446.4	0.129	76.9
464.0	0.153	76.6
472.9	0.168	76.0
489.2	0.204	74.9
503.0	0.245	74.0
515.4	0.284	72.9
526.2	0.322	71.9
541.9	0.372	70.8
554.4	0.410	69.9
566.2	0.461	69.0
572.6	0.499	68.4
577.9	0.537	67.7
586.7	0.589	67.0
598.8	0.651	65.9
606.3	0.702	65.3
612.9	0.779	64.3
617.3	0.844	63.7
624.4	0.906	62.9
629.2	0.970	62.4
633.5	1.060	61.8

Tested By	JCM	Date	02/22/06	Input Checked By	KRB	Date	2-27-06
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**CONSOLIDATED UNDRAINED TRIAXIAL TEST
WITH PORE PRESSURE READINGS**
ASTM D4767-95 / AASHTO T297-94 (SOP-S28)

Client	PAUL C. RIZZO	Boring No.	TS-ST-02
Client Reference	TAUM SAUK 06-3551	Depth(ft.)	NA
Project No.	2006-060-01	Sample No.	NA
Lab ID	2006-060-01-76		

Visual Description: BROWN & GRAY MOTTLED CLAY & SAND (AFTER PERMEABILITY)

Effective Confining Pressure (psi)	59.4	Stage No.	1
		Test No	3

INITIAL DIMENSIONS

Initial Sample Length (in.)	5.07
Initial Sample Diameter (in.)	2.86
Initial Sample Area (in ²)	6.40
Initial Sample Volume (in ³)	32.44

VOLUME CHANGE

Volume After Consolidation (in ³)	31.04
Length After Consolidation (in)	4.95
Area After Consolidation (in ²)	6.266

Strain (%)	Deviation Stress	ΔU	$\bar{\sigma}_1$	$\bar{\sigma}_3$	Effective Principle Stress Ratio	$\bar{A}$	$\bar{P}$	Q
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0.02	1.36	0.39	60.37	59.0	1.023	0.29	59.69	0.68
0.06	4.67	1.11	62.96	58.3	1.080	0.24	60.63	2.33
0.10	10.69	3.28	66.81	56.1	1.190	0.31	61.47	5.34
0.16	17.57	7.15	69.82	52.2	1.336	0.42	61.03	8.78
0.33	29.16	16.63	71.93	42.8	1.682	0.58	57.35	14.58
0.51	36.62	22.67	73.35	36.7	1.997	0.63	55.04	18.31
0.73	43.04	27.59	74.86	31.8	2.353	0.65	53.33	21.52
1.10	50.90	32.44	77.86	27.0	2.888	0.65	52.41	25.45
1.50	56.92	35.13	81.18	24.3	3.345	0.63	52.72	28.46
2.10	63.07	36.76	85.71	22.6	3.786	0.59	54.18	31.54
2.60	66.47	36.62	89.25	22.8	3.917	0.56	56.02	33.23
3.10	68.86	36.32	91.94	23.1	3.983	0.54	57.51	34.43
3.40	70.01	35.69	93.72	23.7	3.953	0.52	58.71	35.01
4.11	71.99	34.62	96.77	24.8	3.905	0.49	60.78	36.00
4.95	73.45	33.72	99.13	25.7	3.860	0.47	62.40	36.72
5.73	74.71	32.64	101.47	26.8	3.792	0.45	64.11	37.35
6.49	75.72	31.60	103.52	27.8	3.724	0.43	65.66	37.86
7.50	77.22	30.49	106.13	28.9	3.671	0.40	67.52	38.61
8.27	78.41	29.64	108.18	29.8	3.635	0.39	68.97	39.21
9.30	79.25	28.66	109.99	30.7	3.578	0.37	70.36	39.62
10.07	79.49	28.05	110.84	31.3	3.536	0.36	71.09	39.74
10.85	79.55	27.37	111.59	32.0	3.483	0.35	71.81	39.78
11.89	79.86	26.70	112.56	32.7	3.442	0.34	72.63	39.93
13.14	80.41	25.59	114.22	33.8	3.378	0.32	74.02	40.20
14.18	80.47	24.98	114.89	34.4	3.338	0.32	74.66	40.24
15.73	79.90	23.97	115.33	35.4	3.255	0.31	75.38	39.95
17.03	79.26	23.41	115.25	36.0	3.203	0.30	75.62	39.63
18.29	78.98	22.56	115.82	36.8	3.144	0.29	76.33	39.49
19.58	78.34	22.15	115.59	37.3	3.103	0.29	76.42	39.17
21.39	77.12	21.52	115.00	37.9	3.036	0.28	76.44	38.56

Tested By JCM Date 02/22/06 Input Checked By *KPB* Date *2-27-06*

**CONSOLIDATED UNDRAINED TRIAXIAL TEST
WITH PORE PRESSURE READINGS**
ASTM D4767-95 / AASHTO T297-94 (SOP-S28)

Client: PAUL C. RIZZO
Client Reference: TAUM SAUK 06-3551
Project No.: 2006-060-01
Lab ID: 2006-060-01-75 & 76 Specific Gravity (assumed) 2.7

Visual Description: BROWN AND GRAY MOTTLED CLAY AND SAND (UNDISTURBED)

SAMPLE CONDITION SUMMARY

	TS-ST-01	TS-ST-02	TS-ST-02
Boring No.	NA	NA	NA
Depth (ft)	NA	NA	NA
Sample No.			
Test No.	T1	T2	T3
Deformation Rate (in/min)	0.002	0.002	0.002
Back Pressure (psi)	40.1	50.3	40.3
Consolidation Time (days)	1	1	1
Initial State (w%)	18.6	26.5	28.6
Total Unit Weight (pcf)	124.4	114.9	118.2
Dry Unit Weight (pcf)	104.9	90.8	92.0
Final State (w%)	18.5	27.2	28.7
Initial State Void Ratio, e	0.607	0.856	0.833

Tested By JCM Date 02/22/06 Input Checked By *YKB* Date *2-28-06*
page 1 of 1 DCN: CT-S28 DATE 6-25-99 REVISION: 1 C:\MSOFFICE\Excel\Printq\{D319.xls}Sheet1

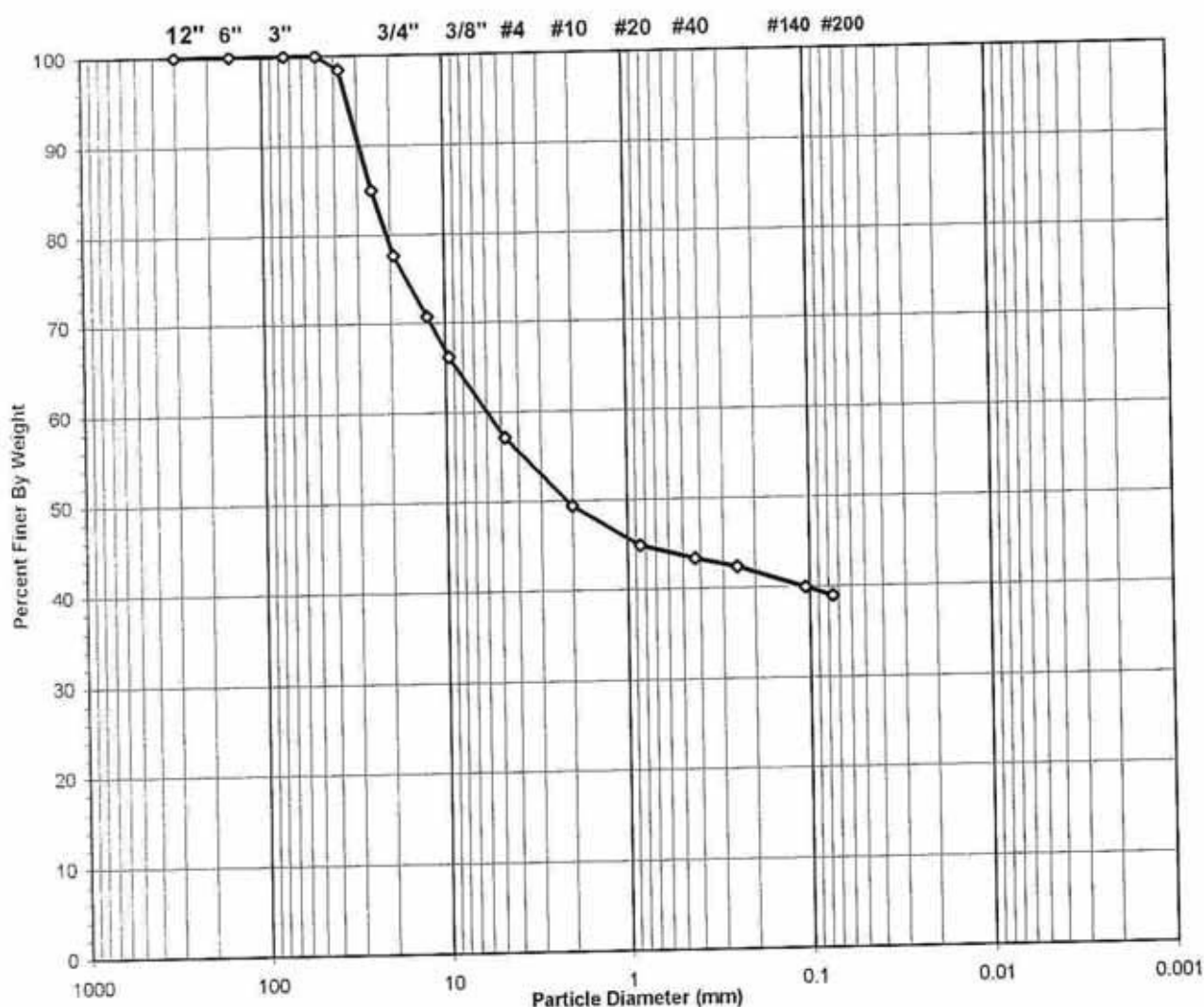
SOIL SAMPLE TS-SOIL 01

SIEVE ANALYSIS
ASTM D 422-63/AASHTO T88-00 (SOP-S3)

Client PAUL C. RIZZO
Client Reference TAUM SAUK 06-3551
Project No. 2006-060-01
Lab ID 2006-060-01-67

Boring No. TS-SOIL-01
Depth (in) 9-14
Sample No. S-2
Soil Color BROWN

USCS	SIEVE ANALYSIS		HYDROMETER	
	gravel	sand	silt and clay	



USCS Symbol **GC, TESTED**

USCS Classification **CLAYEY GRAVEL WITH SAND**

Tested By JP Date 2/28/06 Checked By *KJB* Date *3-1-06*
page 1 of 2 DCN: CT-S3A DATE 6-25-98 REVISION 2 C:\MSOFFICE\Excel\PrintQ\U426.xls]Sheet1

WASH SIEVE ANALYSIS
ASTM D 422-63/AASHTO T88-00 (SOP-S3)

Client **PAUL C. RIZZO**
Client Reference **TAUM SAUK 06-3551**
Project No. **2006-060-01**
Lab ID **2006-060-01-67**

Boring No. **TS-SOIL-01**
Depth (in) **9-14**
Sample No. **S-2**
Soil Color **BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	967	Tare No.	1126
Wgt. Tare + Wet Specimen (gm)	1111.50	Wgt. Tare + Wet Specimen (gm)	383.04
Wgt. Tare + Dry Specimen (gm)	975.60	Wgt. Tare + Dry Specimen (gm)	358.34
Weight of Tare (gm)	103.44	Weight of Tare (gm)	84.82
Weight of Water (gm)	135.90	Weight of Water (gm)	24.70
Weight of Dry Soil (gm)	872.16	Weight of Dry Soil (gm)	273.52
Moisture Content (%)	15.6	Moisture Content (%)	9.0

Wet Weight - 3/4" Sample (gm)	3141	Weight of the Dry Specimen (gm)	872.16
Dry Weight - 3/4" Sample (gm)	2717.6	Weight of minus #200 material (gm)	437.28
Wet Weight + 3/4" Sample (gm)	854.72	Weight of plus #200 material (gm)	434.88
Dry Weight + 3/4" Sample (gm)	783.93		
Total Dry Weight Sample (gm)	3501.5	J - Factor (Percent Finer than 3/4")	0.7761

Sieve Size	Sieve Opening (mm)	Wgt. of Soil Retained (gm)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	100.00
6"	150	0.00	0.00	0.00	100.00	100.00
3"	75	0.00	0.00	0.00	100.00	100.00
2"	50	0.00	0.00	0.00	100.00	100.00
1 1/2"	37.5	59.19	1.55	1.55	98.45	98.45
1"	25	514.80	13.48	15.04	84.96	84.96
3/4"	19	280.73	7.35	22.39	77.61	77.61
1/2"	12.5	77.24	8.86	8.86	91.14	70.74
3/8"	9.5	51.02	5.85	14.71	85.29	66.20
#4	4.75	101.30	11.61	26.32	73.68	57.18
#10	2	87.62	10.05	36.37	63.63	49.39
#20	0.85	51.28	5.88	42.25	57.75	44.82
#40	0.425	16.62	1.91	44.15	55.85	43.34
#60	0.25	11.19	1.28	45.44	54.56	42.35
#140	0.106	27.36	3.14	48.57	51.43	39.91
#200	0.075	11.25	1.29	49.86	50.14	38.91
Pan	-	437.28	50.14	100.00	-	-

Notes : (*) The + 3/4" sieve analysis is based on the Total Dry Weight of the Sample
(**) The - 3/4" sieve analysis is based on the Weight of the Dry Specimen

Tested By **JP**

Date **2/28/06**

Checked By **YKB**

Date **3-1-06**

ATTERBERG LIMITS
ASTM D 4318-98 / AASHTO T89 (SOP - S4A)

Client	PAUL C. RIZZO	Boring No.	TS-SOIL-01
Client Reference	TAUM SAUK 06-3551	Depth (in)	9-14
Project No.	2006-060-01	Sample No.	S-2
Lab ID	2006-060-01-67	Soil Description	BROWN LEAN CLAY

Note: The USCS symbol used with this test refers only to the minus No. 40 sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description.

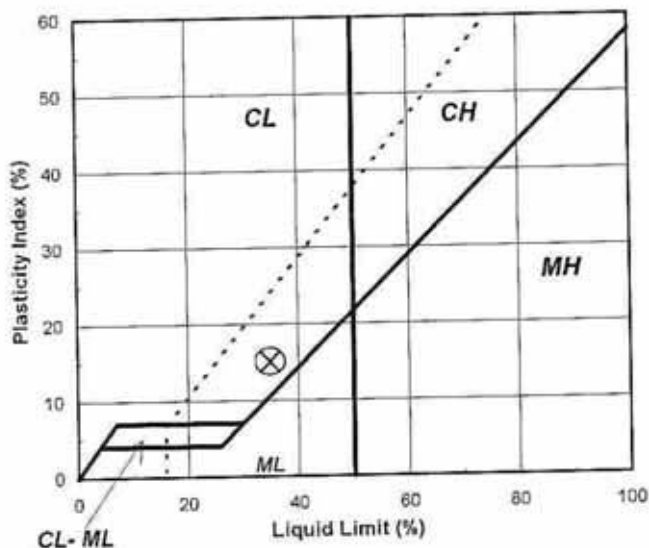
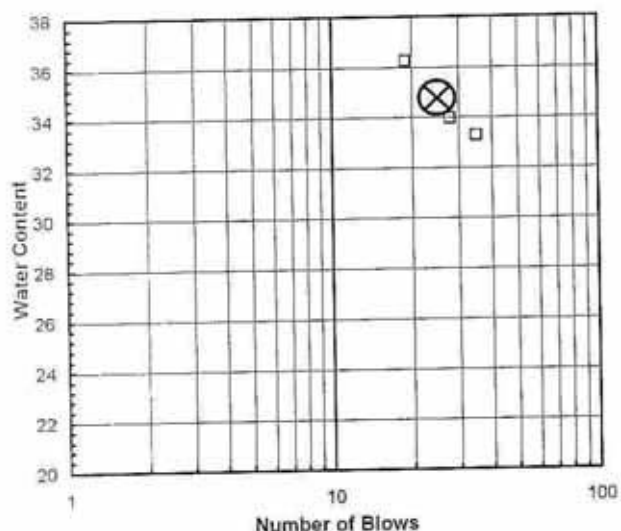
Liquid Limit Test	1	2	3	MULTIPOINT
Tare Number	119	230	250	
Wt. of Tare & WS (gm)	42.20	41.68	37.78	
Wt. of Tare & DS (gm)	36.08	35.75	32.39	
Wt. of Tare (gm)	17.69	18.28	17.52	
Wt. of Water (gm)	6.1	5.9	5.4	
Wt. of DS (gm)	18.4	17.5	14.9	
Moisture Content (%)	33.3	33.9	36.2	
Number of Blows	35	28	19	

Plastic Limit Test	1	2	Range	Test Results
Tare Number	2294	2365		Liquid Limit (%) 35
Wt. of Tare & WS (gm)	25.73	23.92		Plastic Limit (%) 20
Wt. of Tare & DS (gm)	24.72	22.87		Plasticity Index (%) 15
Wt. of Tare (gm)	19.68	17.61		USCS Symbol CL
Wt. of Water (gm)	1.0	1.1		
Wt. of DS (gm)	5.0	5.3		
Moisture Content (%)	20.0	20.0	0.1	

Note: The acceptable range of the two Moisture contents is ± 2.6

Flow Curve

Plasticity Chart



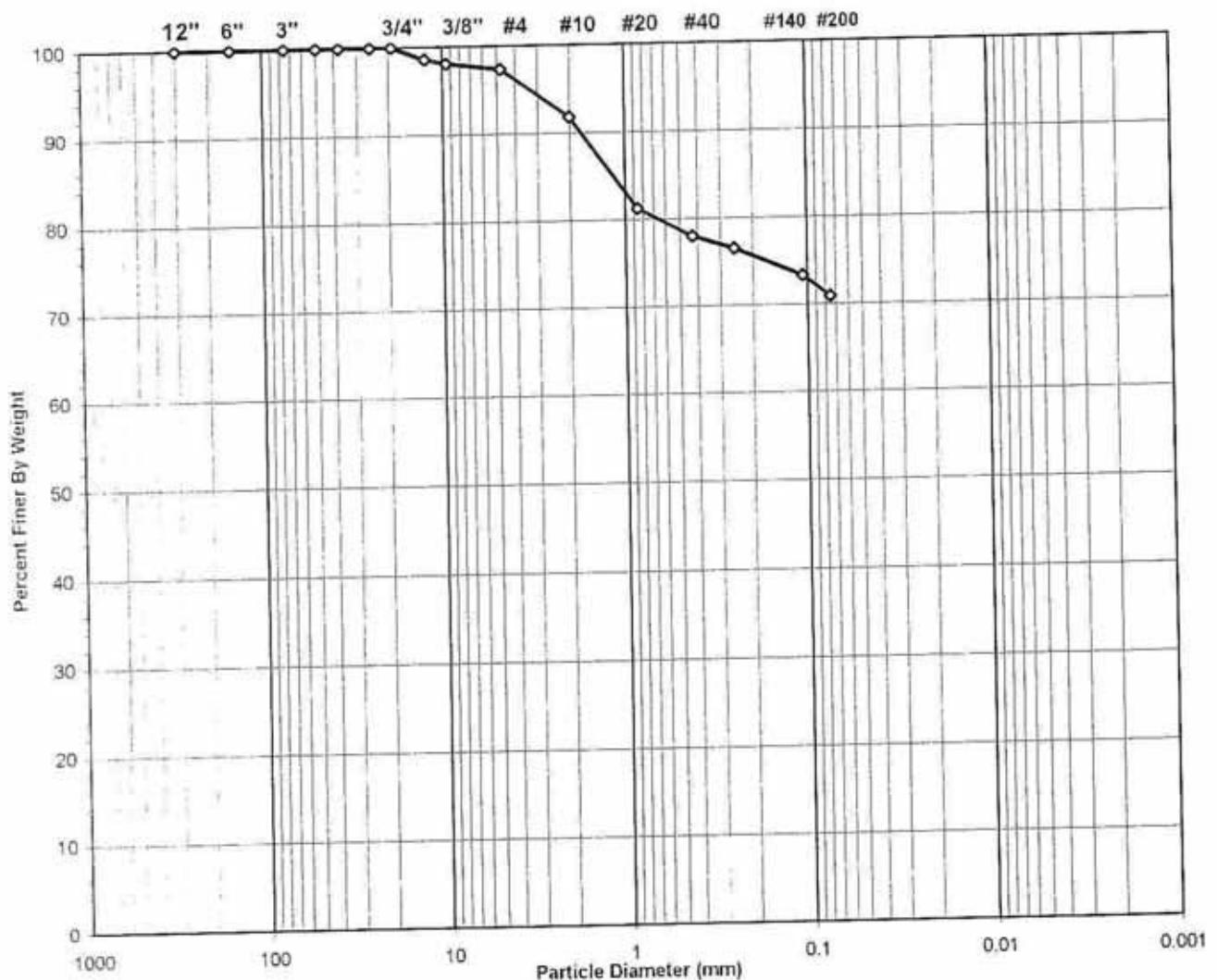
Tested By	BS	Date	2/28/06	Checked By	YJB	Date	3-1-06
DCN:	CT-S4B	DATE:	10/8/01	REVISION:	2		

SOIL SAMPLE TS-SOIL 02

SIEVE ANALYSIS
ASTM D 422-63/AASHTO T88-00 (SOP-S3)

Client	PAUL C. RIZZO	Boring No.	TS-SOIL-02
Client Reference	TAUM SAUK 06-3551	Depth (in)	7-12
Project No.	2006-060-01	Sample No.	S-2
Lab ID	2006-060-01-69	Soil Color	REDDISH BROWN

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol **CH, TESTED**

USCS Classification **FAT CLAY WITH SAND**

Tested By **JP** Date **2/28/06** Checked By **KLB** Date **3-2-06**

page 1 of 2 DCN: CT-S3C DATE 6-25-98 REVISION: 2 C:\MSOFFICE\Excel\Print\Q\U473.xls\Sheet1

WASH SIEVE ANALYSIS

ASTM D 422-63/AASHTO T88-00 (SOP-S3)

Client PAUL C. RIZZO
Client Reference TAUM SAUK 06-3551
Project No. 2006-060-01
Lab ID 2006-060-01-69

Boring No. TS-SOIL-02
Depth (in) 7-12
Sample No. S-2
Soil Color REDDISH BROWN

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	690	Tare No.	NA
Wgt. Tare + Wet Specimen (gm)	715.89	Wgt. Tare + Wet Specimen (gm)	NA
Wgt. Tare + Dry Specimen (gm)	580.28	Wgt. Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	99.39	Weight of Tare (gm)	NA
Weight of Water (gm)	135.61	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	480.89	Weight of Dry Soil (gm)	NA
Moisture Content (%)	28.2	Moisture Content (%)	NA

Wet Weight - 3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	480.89
Dry Weight - 3/4" Sample (gm)	139.8	Weight of minus #200 material (gm)	341.05
Wet Weight + 3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	139.84
Dry Weight + 3/4" Sample (gm)	0.00		
Total Dry Weight Sample (gm)	NA		

Sieve Size	Sieve Opening (mm)	Wgt. of Soil Retained (gm)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	100.00
6"	150	0.00	0.00	0.00	100.00	100.00
3"	75	0.00	0.00	0.00	100.00	100.00
2"	50	0.00	0.00	0.00	100.00	100.00
1 1/2"	37.5	0.00	0.00	0.00	100.00	100.00
1"	25.0	0.00	0.00	0.00	100.00	100.00
3/4"	19.0	0.00	0.00	0.00	100.00	100.00
1/2"	12.50	6.61	1.37	1.37	98.63	98.63
3/8"	9.50	2.67	0.56	1.93	98.07	98.07
#4	4.75	3.52	0.73	2.66	97.34	97.34
#10	2.00	26.41	5.49	8.15	91.85	91.85
#20	0.850	50.94	10.59	18.75	81.25	81.25
#40	0.425	15.84	3.29	22.04	77.96	77.96
#60	0.250	6.89	1.43	23.47	76.53	76.53
#140	0.106	15.34	3.19	26.66	73.34	73.34
#200	0.075	11.62	2.42	29.08	70.92	70.92
Pan	-	341.05	70.92	100.00	-	-

Tested By JP Date 2/28/06 Checked By *YVB*

Date 3-2-06

ATTERBERG LIMITS

ASTM D 4318-98 / AASHTO T89 (SOP - S4A)

Client PAUL C. RIZZO
Client Reference TAUM SAUK 06-3551
Project No. 2006-060-01
Lab ID 2006-060-01-69

Boring No.
Depth (in)
Sample No.
Soil Description

TS-SOIL-02

7-12

S-2

REDDISH BROWN FAT CLAY

(Minus No. 40 sieve material, Airdried)

Note: The USCS symbol used with this test refers only to the minus No. 40

sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description.

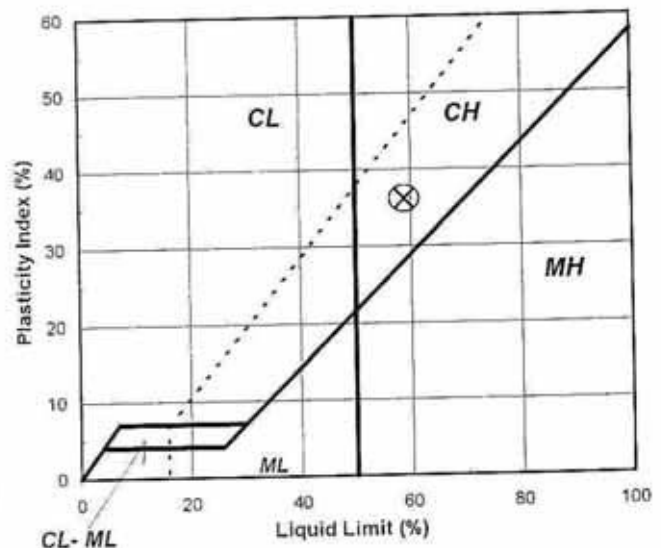
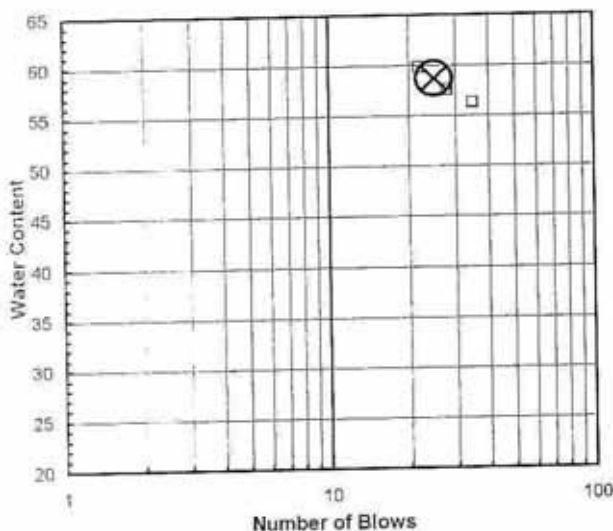
Liquid Limit Test	1	2	3	
Tare Number	16	26	27	
Wt. of Tare & WS (gm)	39.30	42.18	42.97	
Wt. of Tare & DS (gm)	32.01	33.31	34.55	
Wt. of Tare (gm)	19.06	17.90	20.48	
Wt. of Water (gm)	7.3	8.9	8.4	
Wt. of DS (gm)	13.0	15.4	14.1	
Moisture Content (%)	56.3	57.6	59.8	
Number of Blows	35	28	22	

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Plastic Limit Test	1	2	Range	Test Results
Tare Number	48	53		
Wt. of Tare & WS (gm)	24.27	25.48		
Wt. of Tare & DS (gm)	23.11	24.21		
Wt. of Tare (gm)	18.15	18.82		
Wt. of Water (gm)	1.2	1.3		
Wt. of DS (gm)	5.0	5.4		
Moisture Content (%)	23.4	23.6	-0.2	
Note: The acceptable range of the two Moisture contents is ± 2.6				
				Liquid Limit (%) 59
				Plastic Limit (%) 23
				Plasticity Index (%) 36
				USCS Symbol CH

Flow Curve

Plasticity Chart



Tested By BS Date 3/1/06 Checked By KB Date 3-2-06
page 1 of 1 DCN: CT-S4B DATE: 10/8/01 REVISION: 2

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