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SHELBY TUBE UNIT WEIGHT

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Client	ICF KAISER	Tested By	JCM 7-30-97
Client Project	BAYER 51249	Checked By	JMO 9-3-97
Project No.	97178-02		
Boring No.	NA	Tube Recovery	0.75
Depth Pushed	3.0-5.0		
Shelby Tube No.	SM010-TB14-0305		

SOIL PROFILE AND SAMPLING

	DEPTH ( )	ELEV ( )	SECTION No.	SOIL PROFILE	SOIL DESCRIPTION AND REMARKS	TEST PERFORMED
3.00						
3.50						
4.00						
4.50			2		BROWN CLAYEY GAVEL WITH SAND	UNIT WGT. GRAIN SIZE PERM. HYDROMETER WATER CONTENT
5.00			1			

NOTE:WHEN FULL RECOVERY IS NOT ACHIEVED,SOIL ELEVATION CAN NOT BE ACCURATELY DEFINE
INDICATE EACH CUT OF THE TUBE WITH AN ARROW
INDICATE DIVIDING LINE BETWEEN SOIL TYPES BY A SOLID LINE
INDICATE WAX BY CROSS-HATCHING
INDICATE SOIL TYPES BY STANDARD SYMBOLS

MOISTURE CONTENT					
Section Number	1	2	3	4	5
Tare Number	1280				
Wt. Tare & WS(gm.)	235.45				
Wt. Tare & DS(gm.)	207.53				
Wt. Tare(gm.)	34.44				
Moisture Content(%)	16.1				

UNIT WEIGHT	
Wt. Tube & WS.(gms.)	1026.40
Wt. Of Tube(gms.)	275.01
Wt. Of WS.(gms.)	751.39
Length 1 (in.)	3.731
Length 2 (in.)	3.694
Length 3 (in.)	3.725
Top Diameter (in.)	2.883
Middle Diameter (in.)	2.885
Bottom Diameter (in.)	2.877
Sample Volume (cc)	397.22
Moisture Content(%)	16.13
Unit Wet Wt.(gms/cc)	1.89
Unit Wet Wt.(pcf.)	118.0
Unit Dry Wt.(pcf.)	101.6
Unit Dry Wt.(gms/cc)	1.63

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	4.5-4.8
Project No.	97178-02	Sample No.	SM010-TB14-0305
Lab ID	97178-02.013	Soil Color	**BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	1701	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	718.40	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	639.60	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	81.29	Weight of Tare (gm)	NA
Weight of Water (gm)	78.80	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	558.31	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**14.1**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	558.31
Dry Weight - 3/4" Sample (gm)	172.90	Weight of minus #200 material (gm)	211.29
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	347.02
Dry Weight + 3/4" Sample (gm)	174.12		
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	134.71	24.13	24.13	75.87	**75.87**
1"	25.0	39.41	7.06	31.19	68.81	**68.81**
3/4"	19.0	0.00	0.00	31.19	68.81	**68.81**
1/2"	12.5	19.55	3.50	34.69	65.31	**65.31**
3/8"	9.50	15.46	2.77	37.46	62.54	**62.54**
#4	4.75	18.85	3.38	40.83	59.17	**59.17**
#10	2.00	26.43	4.73	45.57	54.43	**54.43**
#20	0.85	20.77	3.72	49.29	50.71	**50.71**
#40	0.425	17.69	3.17	52.46	47.54	**47.54**
#60	0.250	19.46	3.49	55.94	44.06	**44.06**
#140	0.106	26.31	4.71	60.65	39.35	**39.35**
#200	0.075	8.38	1.50	62.16	37.84	**37.84**
Pan	-	211.29	37.84	100.00	-	-

Tested By JCM Date 8/11/97 Checked By [illegible] Date 8-21-97

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HYDROMETER ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	4.5-4.8
Project No.	97178-02	Sample No.	SM010-TB14-0305
Lab ID	97178-02.013	Soil Color	**BROWN**

Elapsed Time (min)		R Measured	Temp. (°C)	R Corrected	N (%)	Diameter (mm)	N' (%)
0	NA	NA	NA	NA	NA	NA	NA
2	44.0	45.5	24	39.7	88.7	0.0270	**33.6**
5		43.0	24	37.2	83.1	0.0174	**31.5**
17		37.0	24	31.2	69.7	0.0099	**26.4**
32		34.0	24	28.2	63.0	0.0074	**23.8**
61		31.0	23.4	25.2	56.3	0.0055	**21.3**
250		26.0	23.4	20.2	45.1	0.0028	**17.1**
1440		21.5	23.7	15.7	35.1	0.0012	**13.3**

Soil Specimen Data		Corrections	
Tare No.	863	K - Factor	0.01282
Tare + Dry Material (gm)	154.98	a - Factor	0.99
Weight of Tare (gm)	105.66	Composite Correction	5.80
Weight of Deflocculant (gm)	5.0	Percent Finer than # 200	37.84
Weight of Dry Material (gm)	44.32		
		Specific Gravity	2.7 Assumed

Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By TO Date 8/16/97 Checked By JCM Date 8-22-97

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SIEVE AND HYDROMETER ANALYSIS
ASTM D 422-63 (SOP-S3)

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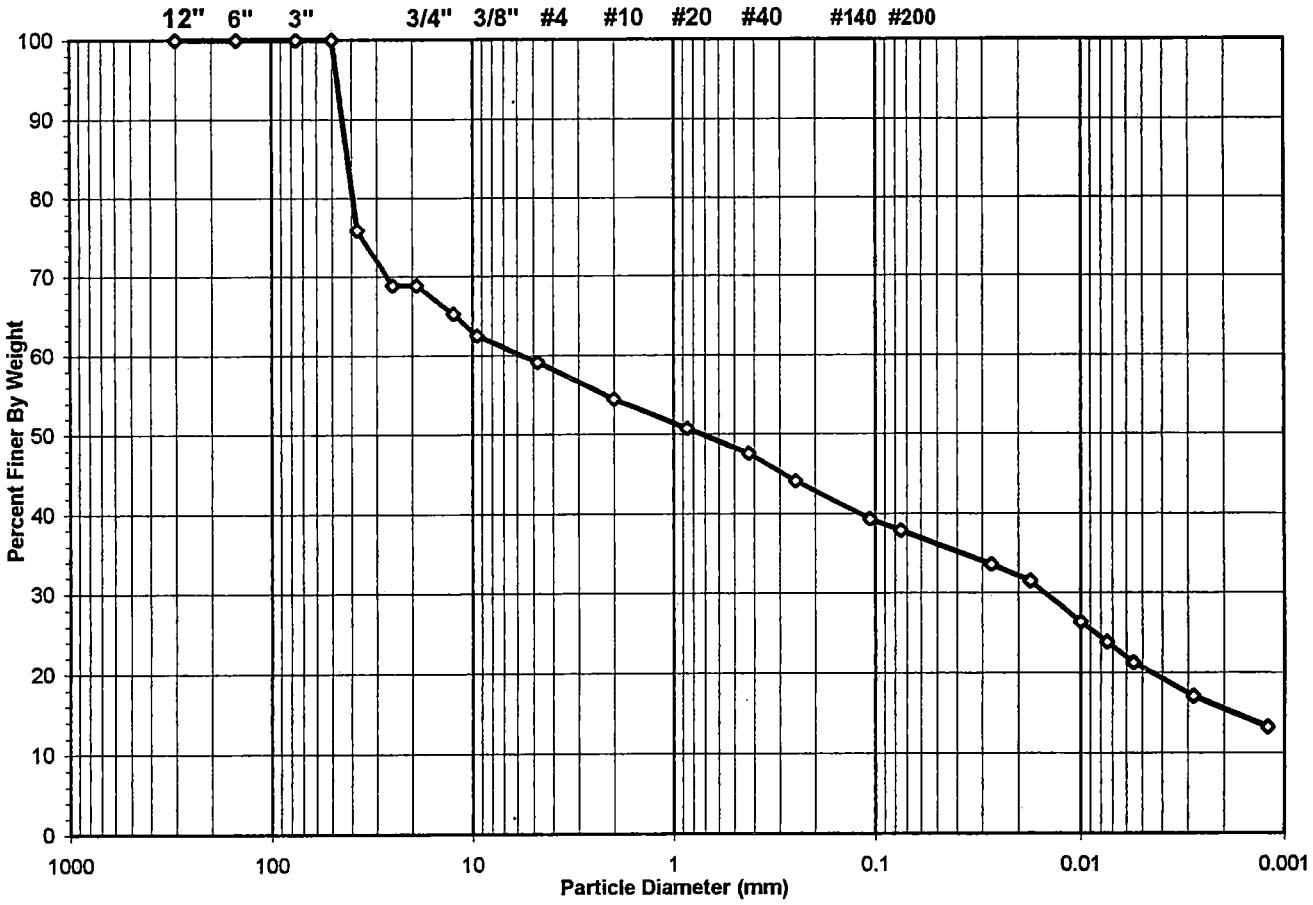
Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	4.5-4.8
Project No.	97178-02	Sample No.	SM010-TB14-0305
Lab ID	97178-02.013	Soil Color	BROWN

	SIEVE ANALYSIS		HYDROMETER	
USCS	gravel	sand	silt and clay fraction	
USDA	gravel	sand	silt	clay



Sieve Size (mm)	Percent Finer	Components	Percentage	Corrected % of Minus 2.0 mm material for USDA Classificat.
100	100.00	*Gravel*	45.57	**0.00**
2	54.43	*Sand*	18.28	**33.59**
0.075	37.84	*Silt*	20.60	**37.85**
0.05	36.15	*Clay*	15.54	**28.56**
0.002	15.54			

USDA Classification ***CLAY LOAM***

USCS Symbol ***gc, ASSUMED***

USCS Classification ***CLAYEY GRAVEL WITH SAND***

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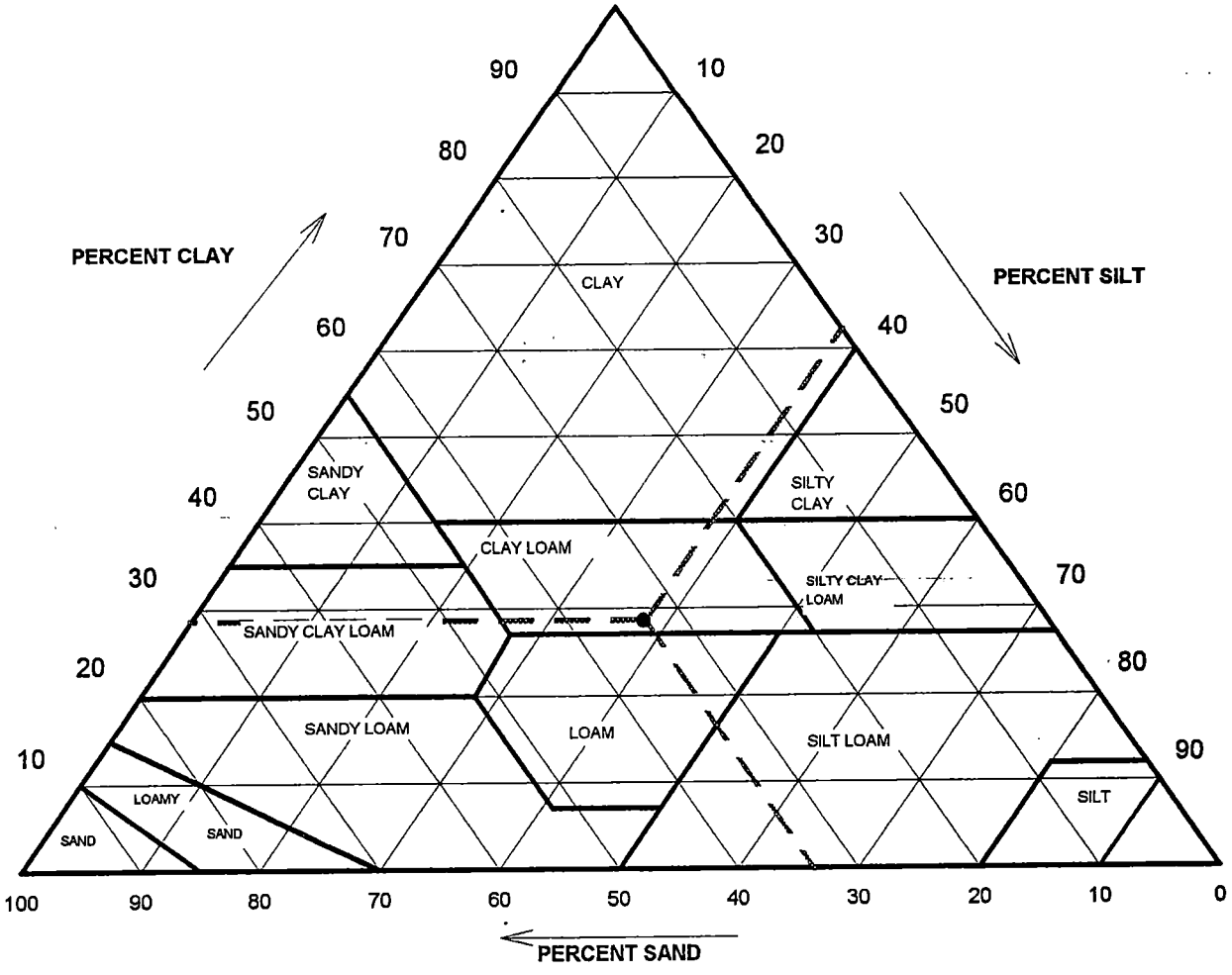
USDA CLASSIFICATION CHART

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	4.5-4.8
Project No.	97178-02	Sample No.	SM010-TB14-0305
Lab ID	97178-02.013	Soil Color	BROWN



Components	Corrected % of Minus 2.0 mm material for USDA Classificat.
Gravel	0.00
Sand	33.59
Silt	37.85
Clay	28.56
USDA Classification	***CLAY LOAM***

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PERMEABILITY TEST

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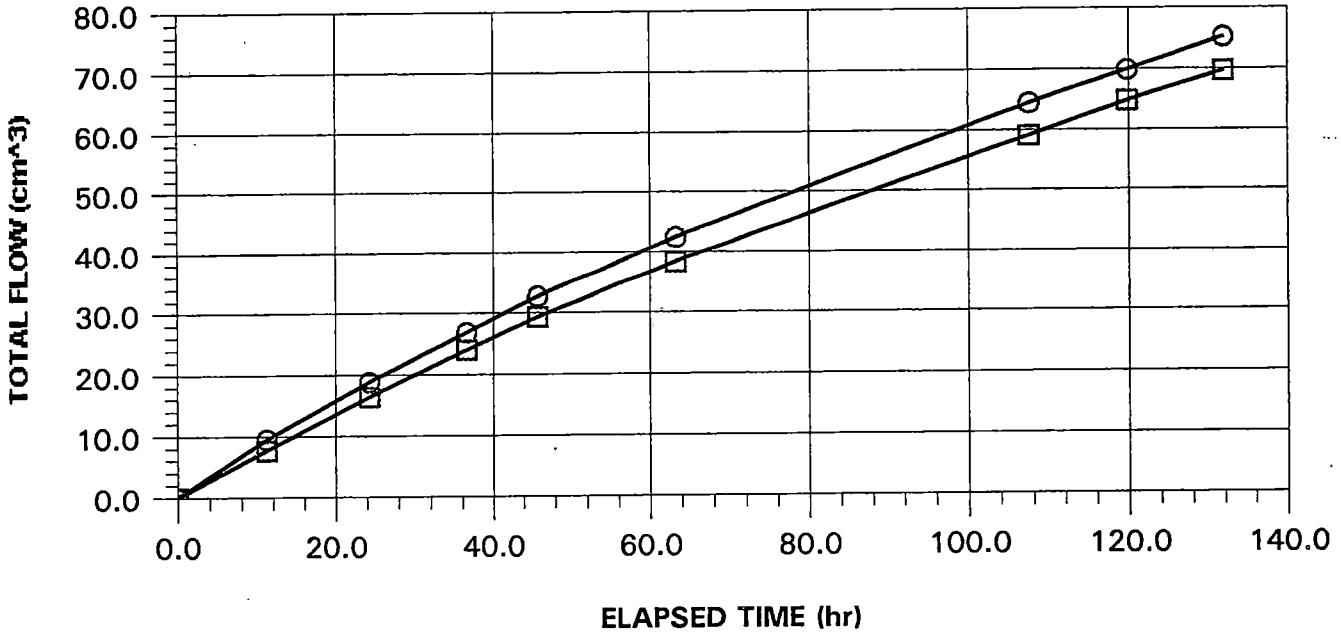
Client	ICF KAISER	Boring No.	NA
Client Project	BAYER 51249	Depth(ft.)	4.5-4.8
Project No.	97178-02	Sample No.	SM010-TB14-0305

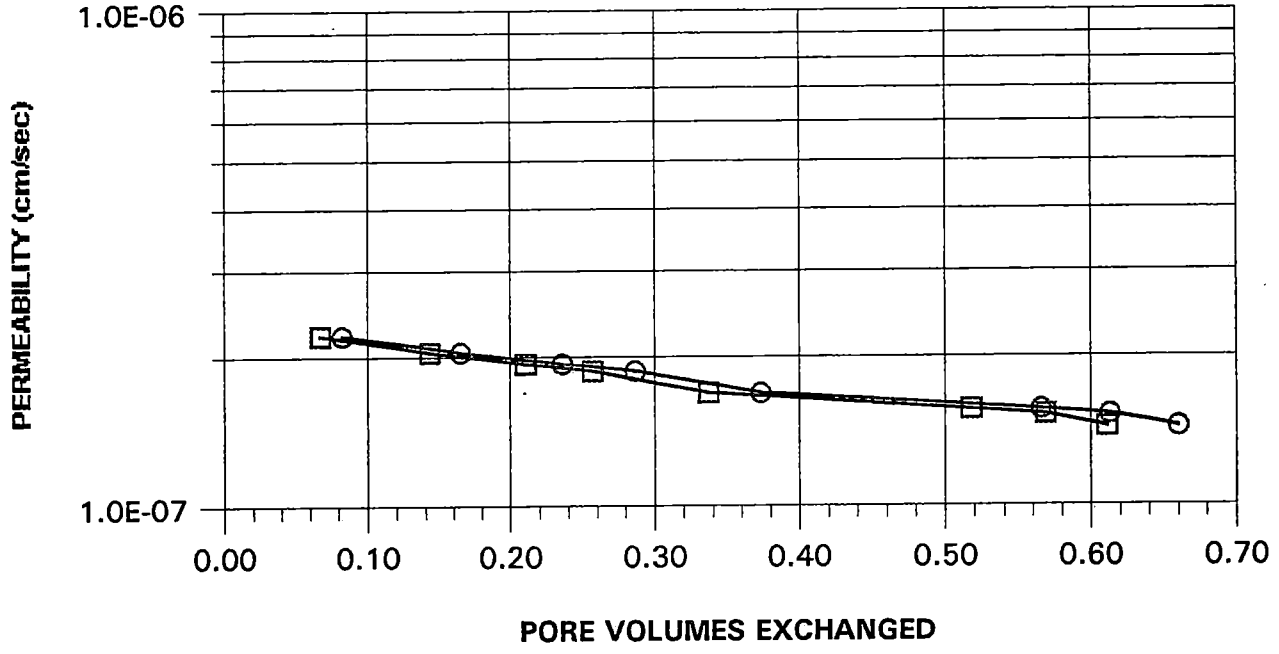
AVERAGE PERMEABILITY = 1.6E-07 cm/sec @ 20°C
AVERAGE PERMEABILITY = 1.6E-09 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY

⊖ INFLOW
⊟ OUTFLOW



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PERMEABILITY TEST

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Client	ICF KAISER	Tested By	JCM	Date	07-30-97
Client Project	BAYER 51249	Checked By	LB	Date	8-14-97
Project No.	97178-02				
Boring No.	NA	Specific Gravity	2.70 ASSUMED		
Depth(ft.)	4.5-4.8	Sample Condition	UNDISTURBED		
Sample No.	SM010-TB14-0305				

Visual Description BROWN CLAY AND LARGE ROCK FRAGMENTS

MOISTURE CONTENT	BEFORE TEST	AFTER TEST
Tare Number	1280	1701
Wt. Tare & WS(gm.)	235.45	718.40
Wt. Tare & DS(gm.)	207.53	639.60
Wt. Water(gm.)	27.92	78.80
Wt. Tare(gm.)	34.44	81.29
Wt. DS(gm.)	173.09	558.31
Moisture Content(%)	16.1	14.1

UNIT WEIGHT		
Wt. Tube & WS.(gms.)	1026.40	NA
Wt. Of Tube(gms.)	275.01	NA
Wt. Of WS.(gms.)	751.39	738.3
Length 1 (in.)	3.731	3.063
Length 2 (in.)	3.694	3.527
Length 3 (in.)	3.725	3.622
Top Diameter (in.)	2.883	2.826
Middle Diameter (in.)	2.885	2.837
Bottom Diameter (in.)	2.877	2.860
Average Length (in)	3.72	3.40
Average Area (in^2)	6.52	6.34
Sample Volume(cc.)	397.22	353.61
Unit Wet Wt.(gms/cc)	1.89	2.09
Unit Wet Wt.(pcf.)	118.0	130.3
Unit Dry Wt.(pcf.)	101.6	114.2
Unit Dry Wt.(gms/cc)	1.63	1.83
Void Ratio,e	0.66	0.48
Porosity, n	0.40	0.32
Pore Volume(cm^3)	157.6	114.0

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PERMEABILITY TEST

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Client	ICF KAISER	Tested By	JCM	Date	07-30-97
Client Project	BAYER 51249	Checked By	LB	Date	8-14-97
Project No.	97178-02				
Boring No.	NA				
Depth(ft.)	4.5-4.8				
Sample No.	SM010-TB14-0305				
Visual Description	BROWN CLAY AND LARGE ROCK FRAGMENTS				

Pressure Heads (Constant)	
Top Cap (psi)	27.5
Bottom Cap (psi)	30.0
Cell (psi)	35.0
Total Pressure Head (cm)	175.8

Final Sample Dimensions	
Sample Length (cm.), L	8.65
Sample Diameter (cm.)	7.22
Sample Area (cm.^2), A	40.90
Inflow Burette Area, (cm.^2), a-in	4.46
Outflow Burette Area, (cm.^2), a-out	4.63
B Parameter	98%

AVERAGE PERMEABILITY = 1.6E-07 cm/sec @ 20°C
AVERAGE PERMEABILITY = 1.6E-09 m/sec @ 20°C

DATE mon-dy-yr	TIME hr	TIME min	ELAPSED TIME (t) hr	TOTAL INFLOW cm^3	TOTAL OUTFLOW cm^3	TOTAL HEAD (h) cm	FLOW 0 FLOW 1 STOP	TEMP °C	INCREMENTAL PERMEABILITY @ 20°C cm/sec
07-30-97	20	0	0.0	0.0	0.0	191.3	0	23.0	NA
07-31-97	7	10	11.2	9.4	7.7	187.5	0	23.0	2.2E-07
07-31-97	20	20	24.3	18.8	16.3	183.5	0	22.5	2.0E-07
08-01-97	8	35	36.6	26.9	24.0	180.1	0	23.0	1.9E-07
08-01-97	17	45	45.8	32.7	29.3	177.6	0	22.5	1.9E-07
08-02-97	11	15	63.3	42.5	38.4	173.4	0	23.0	1.7E-07
08-04-97	7	30	107.5	64.5	59.1	164.1	0	23.0	1.6E-07
08-04-97	19	50	119.8	69.8	64.8	161.6	0	22.7	1.5E-07
08-05-97	7	50	131.8	75.2	69.6	159.4	0	23.2	1.4E-07

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SHELBY TUBE UNIT WEIGHT

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Client	ICF KAISER	Tested By	JCM 7-30-97
Client Project	BAYER 51249	Checked By	JMO 8-22-97
Project No.	97178-02		
Boring No.	NA	Tube Recovery	2.00
Depth Pushed	15.0-17.0		
Shelby Tube No.	SM010-TB14-1517		

SOIL PROFILE AND SAMPLING

DEPTH ( )	ELEV ( )	SECTION No.	SOIL PROFILE	SOIL DESCRIPTION AND REMARKS	TEST PERFORMED
15.00					
15.50					
16.00					
		3		BROWN LEAN CLAY	GRAIN SIZE HYDROMETER WC.
16.50					
		2			PERMEABILITY
		1			WATER CONTENT
17.00					

NOTE:WHEN FULL RECOVERY IS NOT ACHIEVED,SOIL ELEVATION CAN NOT BE ACCURATELY DEFINE
INDICATE EACH CUT OF THE TUBE WITH AN ARROW
INDICATE DIVIDING LINE BETWEEN SOIL TYPES BY A SOLID LINE
INDICATE WAX BY CROSS-HATCHING
INDICATE SOIL TYPES BY STANDARD SYMBOLS

MOISTURE CONTENT					
Section Number	1	2	3	4	5
Tare Number	1417		1131A		
Wt. Tare & WS(gm.)	292.51		685.40		
Wt. Tare & DS(gm.)	237.13		562.80		
Wt. Tare(gm.)	37.37		84.73		
Moisture Content(%)	27.7		25.6		

UNIT WEIGHT		
Wt. Tube & WS.(gms.)	1050.90	1693.70
Wt. Of Tube(gms.)	281.76	451.50
Wt. Of WS.(gms.)	769.14	1242.20
Length 1 (in.)	3.701	5.966
Length 2 (in.)	3.692	5.931
Length 3 (in.)	3.691	5.939
Top Diameter (in.)	2.876	2.876
Middle Diameter (in.)	2.878	2.871
Bottom Diameter (in.)	2.880	2.870
Sample Volume (cc)	393.87	631.30
Moisture Content(%)	27.72	25.64
Unit Wet Wt.(gms/cc)	1.95	1.97
Unit Wet Wt.(pcf.)	121.9	122.8
Unit Dry Wt.(pcf.)	95.4	97.7
Unit Dry Wt.(gms/cc)	1.53	1.57

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	16.0-16.5
Project No.	97178-02	Sample No.	SM010-TB14-1517
Lab ID	97178-02.014	Soil Color	BROWN

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	1131A	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	685.40	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	562.80	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	84.73	Weight of Tare (gm)	NA
Weight of Water (gm)	122.60	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	478.07	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**25.6**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	478.07
Dry Weight - 3/4" Sample (gm)	35.73	Weight of minus #200 material (gm)	442.34
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	35.73
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"	12.5	0.00	0.00	0.00	100.00	100.00
3/8"	9.50	0.00	0.00	0.00	100.00	100.00
#4	4.75	0.17	0.04	0.04	99.96	99.96
#10	2.00	1.10	0.23	0.27	99.73	99.73
#20	0.85	1.77	0.37	0.64	99.36	99.36
#40	0.425	1.44	0.30	0.94	99.06	99.06
#60	0.250	2.89	0.60	1.54	98.46	98.46
#140	0.106	20.02	4.19	5.73	94.27	94.27
#200	0.075	8.34	1.74	7.47	92.53	92.53
Pan	-	442.34	92.53	100.00	-	-

Tested By JCM Date 7/30/97 Checked By LB Date 8-8-97

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HYDROMETER ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	16.0-16.5
Project No.	97178-02	Sample No.	SM010-TB14-1517
Lab ID	97178-02.014	Soil Color	**BROWN**

Elapsed Time (min)		R Measured	Temp. (°C)	R Corrected	N (%)	Diameter (mm)	N' (%)
0	NA	NA	NA	NA	NA	NA	NA
2	51.5	51.0	23.2	44.8	85.7	0.0258	**79.3**
5		49.0	23.2	42.8	81.8	0.0166	**75.7**
15		43.5	23.2	37.3	71.3	0.0101	**66.0**
30		40.0	23.2	33.8	64.6	0.0074	**59.8**
60		36.0	22.7	29.8	57.0	0.0054	**52.7**
250		28.0	22.6	21.8	41.7	0.0028	**38.6**
1440		22.5	23.9	16.3	31.2	0.0012	**28.9**

Soil Specimen Data		Corrections	
Tare No.	1658	K - Factor	0.01294
Tare + Dry Material (gm)	149.63	a - Factor	0.99
Weight of Tare (gm)	92.84	Composite Correction	6.19
Weight of Deflocculant (gm)	5.0	Percent Finer than # 200	92.53
Weight of Dry Material (gm)	51.79		
		Specific Gravity	2.7 Assumed

Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By TO Date 8/1/97 Checked By LB Date 8-8-97

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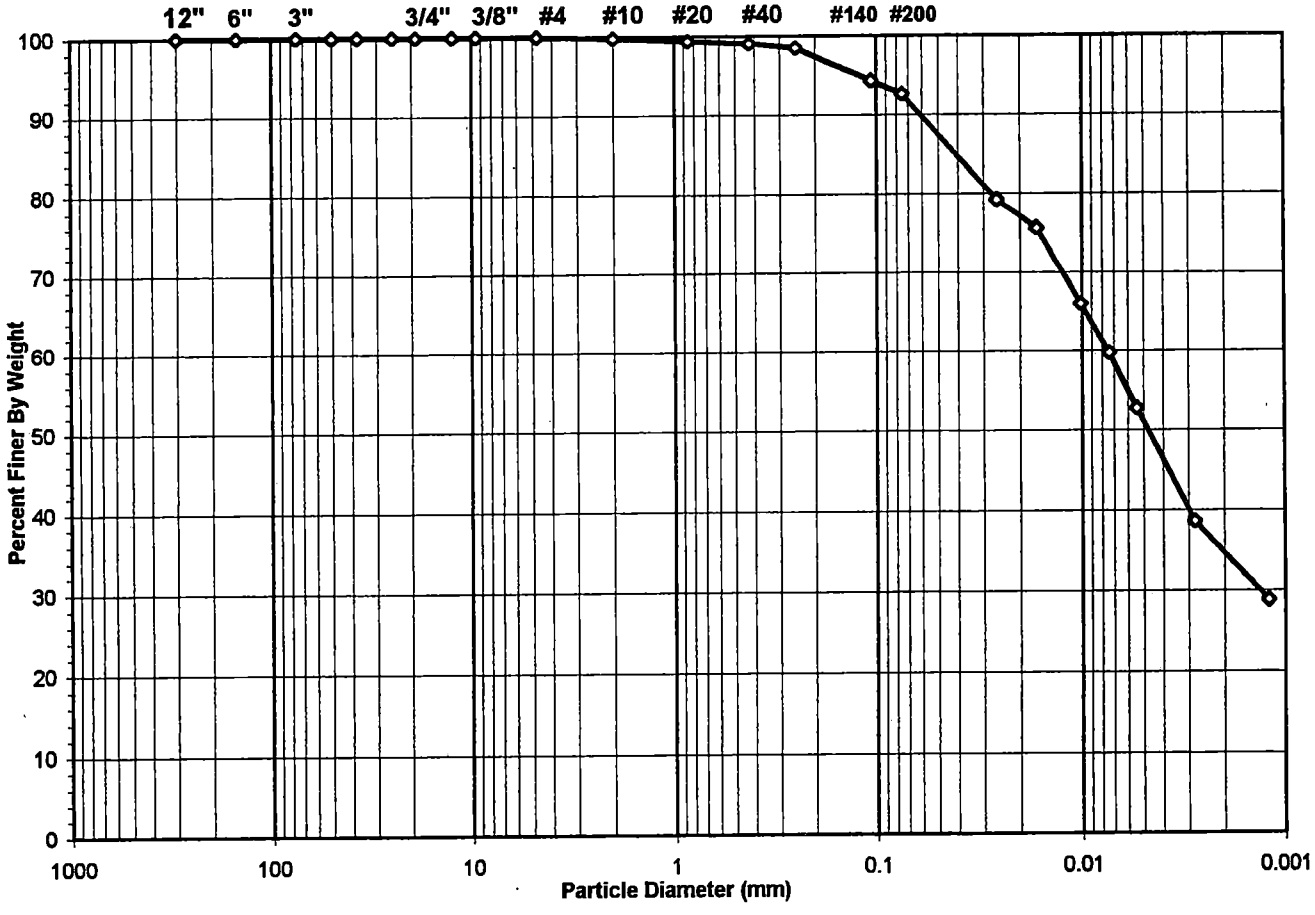
SIEVE AND HYDROMETER ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	16.0-16.5
Project No.	97178-02	Sample No.	SM010-TB14-1517
Lab ID	97178-02.014	Soil Color	BROWN

	SIEVE ANALYSIS		HYDROMETER	
USCS	gravel	sand	silt and clay fraction	
USDA	gravel	sand	silt	clay



Sieve Size (mm)	Percent Finer	Components	Percentage	Corrected % of Minus 2.0 mm material for USDA Classificat.
100	100.00	*Gravel*	0.27	**0.00**
2	99.73	*Sand*	12.25	**12.28**
0.075	92.53	*Silt*	52.82	**52.96**
0.05	87.49	*Clay*	34.67	**34.76**
0.002	34.67			

USDA Classification ***SILTY CLAY LOAM***

USCS Symbol ***cl, ASSUMED***

USCS Classification ***LEAN CLAY***

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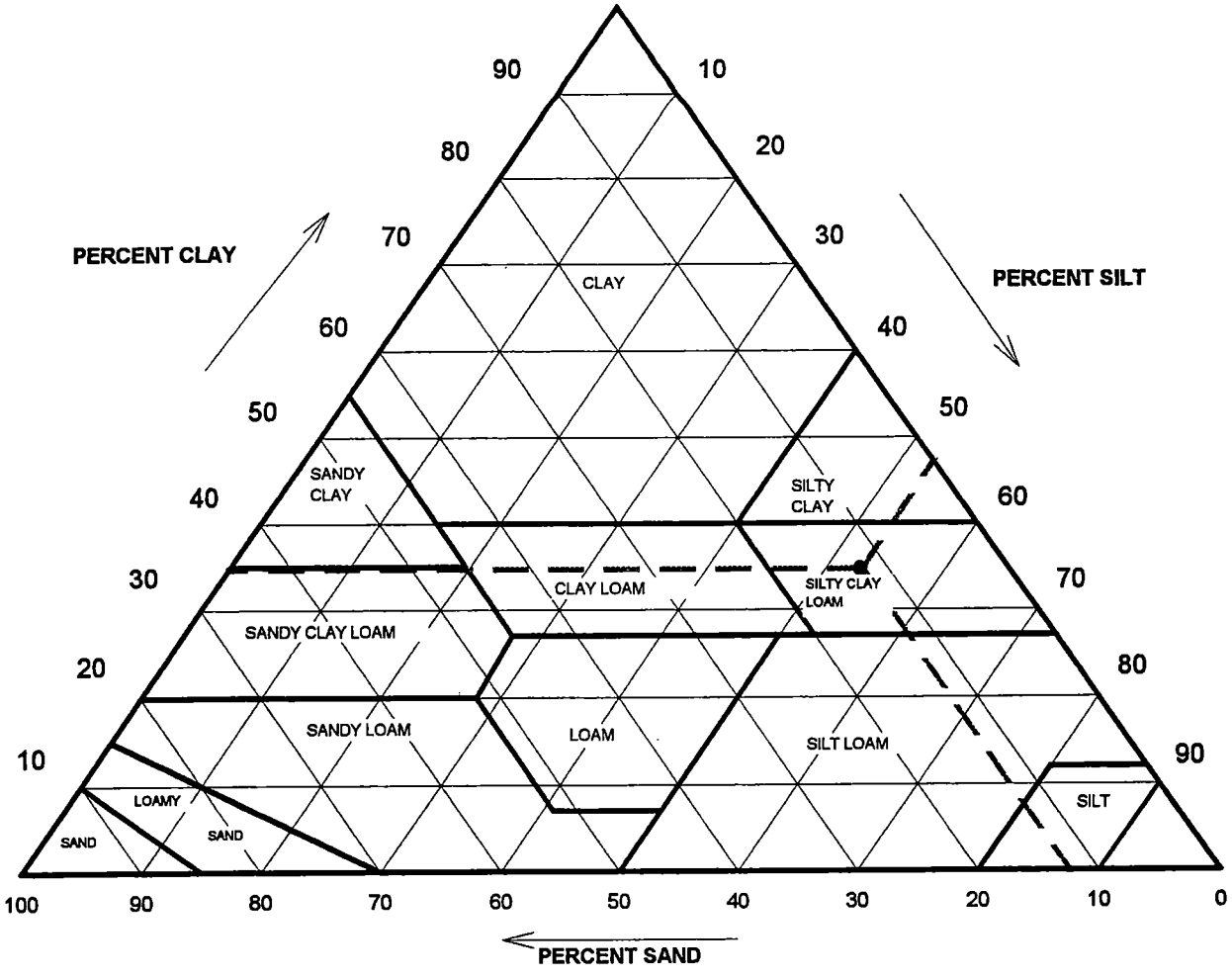
USDA CLASSIFICATION CHART

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	16.0-16.5
Project No.	97178-02	Sample No.	SM010-TB14-1517
Lab ID	97178-02.014	Soil Color	BROWN



Components	Corrected % of Minus 2.0 mm material for USDA Classificat.
Gravel	0.00
Sand	12.28
Silt	52.96
Clay	34.76
USDA Classification	***SILTY CLAY LOAM***

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PERMEABILITY TEST

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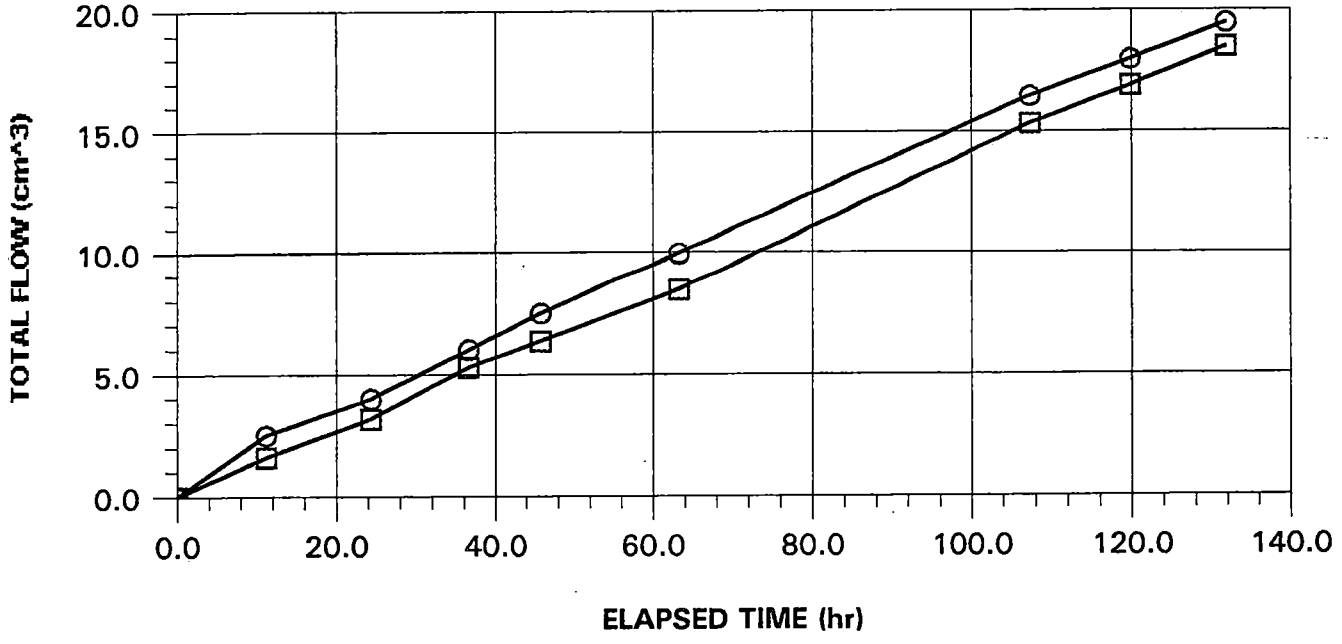
Client	ICF KAISER	Boring No.	NA
Client Project	BAYER 51249	Depth(ft.)	16.5-16.8
Project No.	97178-02	Sample No.	SM010-TB14-1517

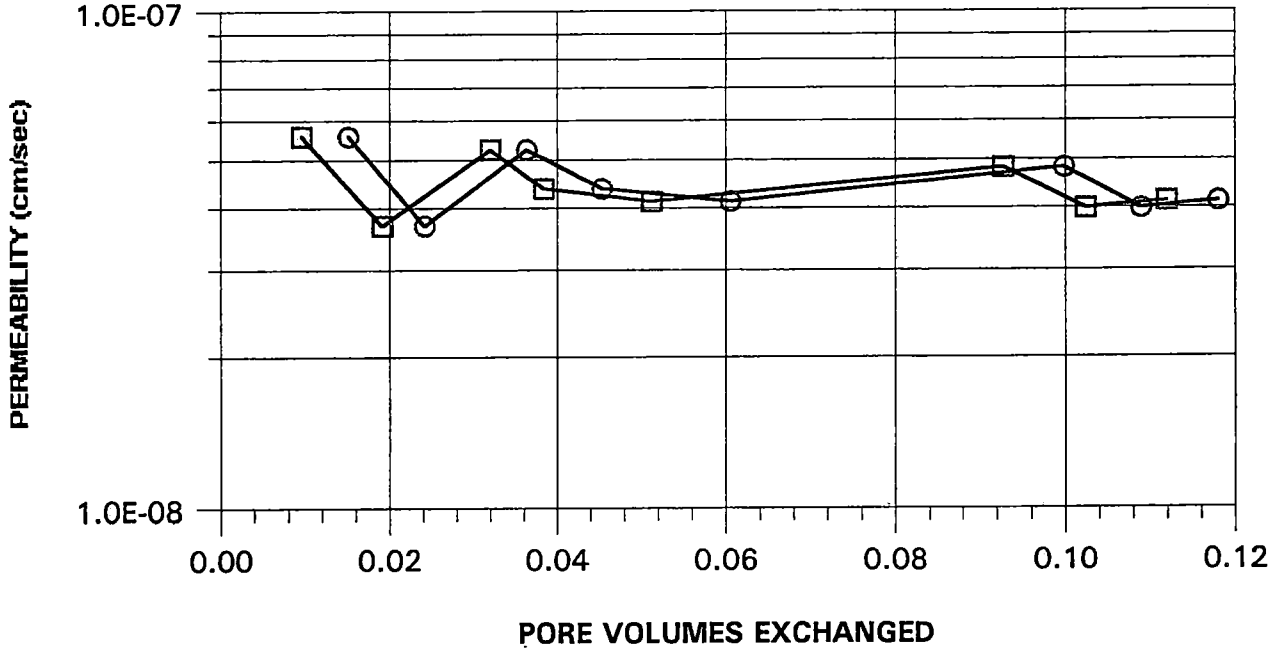
AVERAGE PERMEABILITY = 4.3E-08 cm/sec @ 20°C
AVERAGE PERMEABILITY = 4.3E-10 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY

INFLOW
OUTFLOW



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PERMEABILITY TEST

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Client	ICF KAISER	Tested By	JCM	Date	07-30-97
Client Project	BAYER 51249	Checked By	LB	Date	8-13-97
Project No.	97178-02				
Boring No.	NA	Specific Gravity	2.70 ASSUMED		
Depth(ft.)	16.5-16.8	Sample Condition	UNDISTURBED		
Sample No.	SM010-TB14-1517				

Visual Description BROWN CLAY

MOISTURE CONTENT	BEFORE TEST	AFTER TEST
Tare Number	1417	1720
Wt. Tare & WS(gm.)	292.51	372.61
Wt. Tare & DS(gm.)	237.13	310.61
Wt. Water(gm.)	55.38	62.00
Wt. Tare(gm.)	37.37	81.86
Wt. DS(gm.)	199.76	228.75
Moisture Content(%)	27.7	27.1

UNIT WEIGHT		
Wt. Tube & WS.(gms.)	1050.90	NA
Wt. Of Tube(gms.)	281.76	NA
Wt. Of WS.(gms.)	769.14	765.4
Length 1 (in.)	3.701	3.709
Length 2 (in.)	3.692	3.704
Length 3 (in.)	3.691	3.677
Top Diameter (in.)	2.876	2.856
Middle Diameter (in.)	2.878	2.854
Bottom Diameter (in.)	2.880	2.858
Average Length (in)	3.69	3.70
Average Area (in^2)	6.51	6.41
Sample Volume(cc.)	393.87	388.08
Unit Wet Wt.(gms/cc)	1.95	1.97
Unit Wet Wt.(pcf.)	121.9	123.1
Unit Dry Wt.(pcf.)	95.4	96.8
Unit Dry Wt.(gms/cc)	1.53	1.55
Void Ratio,e	0.77	0.74
Porosity, n	0.43	0.43
Pore Volume(cm^3)	170.8	165.0

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PERMEABILITY TEST

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Client	ICF KAISER	Tested By	JCM	Date	07-30-97
Client Project	BAYER 51249	Checked By	LB	Date	8-13-97
Project No.	97178-02				
Boring No.	NA				
Depth(ft.)	16.5-16.8				
Sample No.	SM010-TB14-1517				
Visual Description	BROWN CLAY				

Pressure Heads (Constant)	
Top Cap (psi)	27.5
Bottom Cap (psi)	30.0
Cell (psi)	35.0
Total Pressure Head (cm)	175.8

Final Sample Dimensions	
Sample Length (cm.), L	9.39
Sample Diameter (cm.)	7.25
Sample Area (cm.^2), A	41.33
Inflow Burette Area, (cm.^2), a-in	4.91
Outflow Burette Area, (cm.^2), a-out	4.45
B Parameter	95%

AVERAGE PERMEABILITY = 4.3E-08 cm/sec @ 20°C
AVERAGE PERMEABILITY = 4.3E-10 m/sec @ 20°C

DATE mon-dy-yr	TIME hr	TIME min	ELAPSED TIME (t) hr	TOTAL INFLOW cm^3	TOTAL OUTFLOW cm^3	TOTAL HEAD (h) cm	FLOW 0 FLOW 1 STOP	TEMP °C	INCREMENTAL PERMEABILITY @ 20°C cm/sec
07-30-97	20	0	0.0	0.0	0.0	190.4	0	23.0	NA
07-31-97	7	10	11.2	2.5	1.6	189.5	0	23.0	5.6E-08
07-31-97	20	20	24.3	4.0	3.2	188.9	0	22.5	3.7E-08
08-01-97	8	35	36.6	6.0	5.3	188.0	0	23.0	5.2E-08
08-01-97	17	45	45.8	7.5	6.3	187.4	0	22.5	4.4E-08
08-02-97	11	15	63.3	10.0	8.4	186.5	0	23.0	4.1E-08
08-04-97	7	20	107.3	16.5	15.3	183.6	0	23.0	4.8E-08
08-04-97	19	50	119.8	18.0	16.9	182.9	0	22.7	4.0E-08
08-05-97	7	50	131.8	19.5	18.5	182.3	0	23.2	4.1E-08

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	1.0-3.0
Project No.	97178-02	Sample No.	SM010-TB17-0103
Lab ID	97178-02.017	Soil Color	**BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	1058	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	1335.50	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	1204.00	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	103.67	Weight of Tare (gm)	NA
Weight of Water (gm)	131.50	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	1100.33	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**12.0**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	1100.33
Dry Weight - 3/4" Sample (gm)	516.56	Weight of minus #200 material (gm)	583.77
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	516.56
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"	12.5	28.76	2.61	2.61	97.39	**97.39**
3/8"	9.50	27.34	2.48	5.10	94.90	**94.90**
#4	4.75	85.58	7.78	12.88	87.12	**87.12**
#10	2.00	90.76	8.25	21.12	78.88	**78.88**
#20	0.85	62.01	5.64	26.76	73.24	**73.24**
#40	0.425	44.71	4.06	30.82	69.18	**69.18**
#60	0.250	51.07	4.64	35.46	64.54	**64.54**
#140	0.106	95.83	8.71	44.17	55.83	**55.83**
#200	0.075	30.50	2.77	46.95	53.05	**53.05**
Pan	-	583.77	53.05	100.00	-	-

Tested By TO Date 8/4/97 Checked By Jcm Date 8-12-97

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HYDROMETER ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	1.0-3.0
Project No.	97178-02	Sample No.	SM010-TB17-0103
Lab ID	97178-02.017	Soil Color	**BROWN**

Elapsed Time (min)		R Measured	Temp. (°C)	R Corrected	N (%)	Diameter (mm)	N' (%)
0	NA	NA	NA	NA	NA	NA	NA
2	34.0	34.0	23.6	28.0	82.6	0.0298	**43.8**
5		33.5	23.6	27.5	81.1	0.0189	**43.1**
17		29.0	23.6	23.0	67.9	0.0106	**36.0**
30		28.0	23.6	22.0	64.9	0.0080	**34.4**
60		26.0	23	20.0	59.0	0.0058	**31.3**
250		23.0	22.7	17.0	50.2	0.0029	**26.6**
1440		19.0	24	13.0	38.4	0.0012	**20.4**

Soil Specimen Data		Corrections	
Tare No.	1634	K - Factor	0.01288
Tare + Dry Material (gm)	138.17	a - Factor	0.99
Weight of Tare (gm)	99.61	Composite Correction	5.99
Weight of Deflocculant (gm)	5.0	Percent Finer than # 200	53.05
Weight of Dry Material (gm)	33.56		
		Specific Gravity	2.7 Assumed

Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By TO Date 8/4/97 Checked By JCM Date 8-12-97

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SIEVE AND HYDROMETER ANALYSIS
ASTM D 422-63 (SOP-S3)

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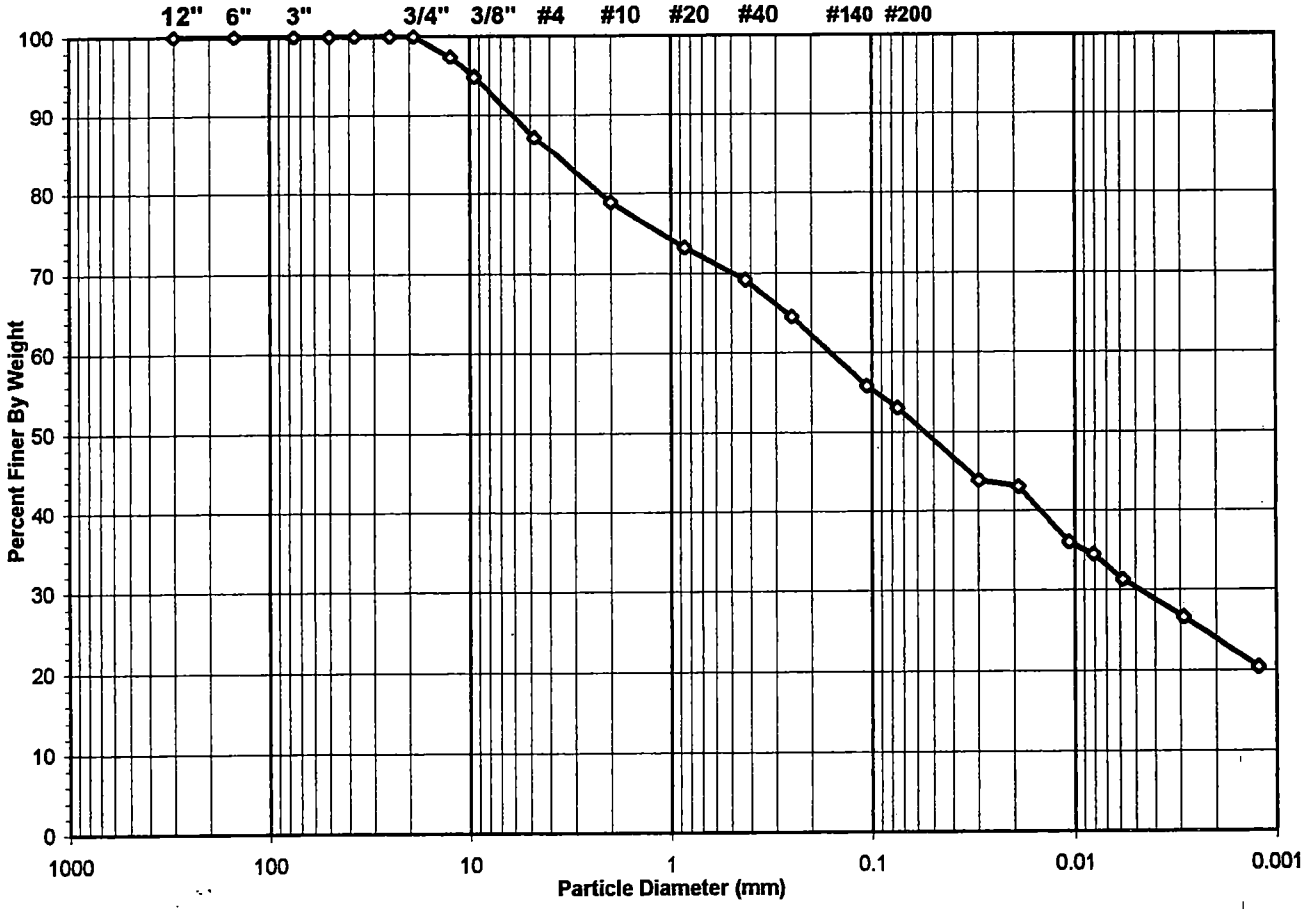
Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	1.0-3.0
Project No.	97178-02	Sample No.	SM010-TB17-0103
Lab ID	97178-02.017	Soil Color	BROWN

	SIEVE ANALYSIS		HYDROMETER	
USCS	gravel	sand	silt and clay fraction	
USDA	gravel	sand	silt	clay



Sieve Size (mm)	Percent Finer	Components	Percentage	Corrected % of Minus 2.0 mm material for USDA Classificat.
100	100.00	*Gravel*	21.12	**0.00**
2	78.88	*Sand*	29.88	**37.88**
0.075	53.05	*Silt*	25.08	**31.79**
0.05	49.00	*Clay*	23.92	**30.33**
0.002	23.92			

USDA Classification ***CLAY LOAM***

USCS Symbol ***cl, ASSUMED***

USCS Classification ***SANDY LEAN CLAY***

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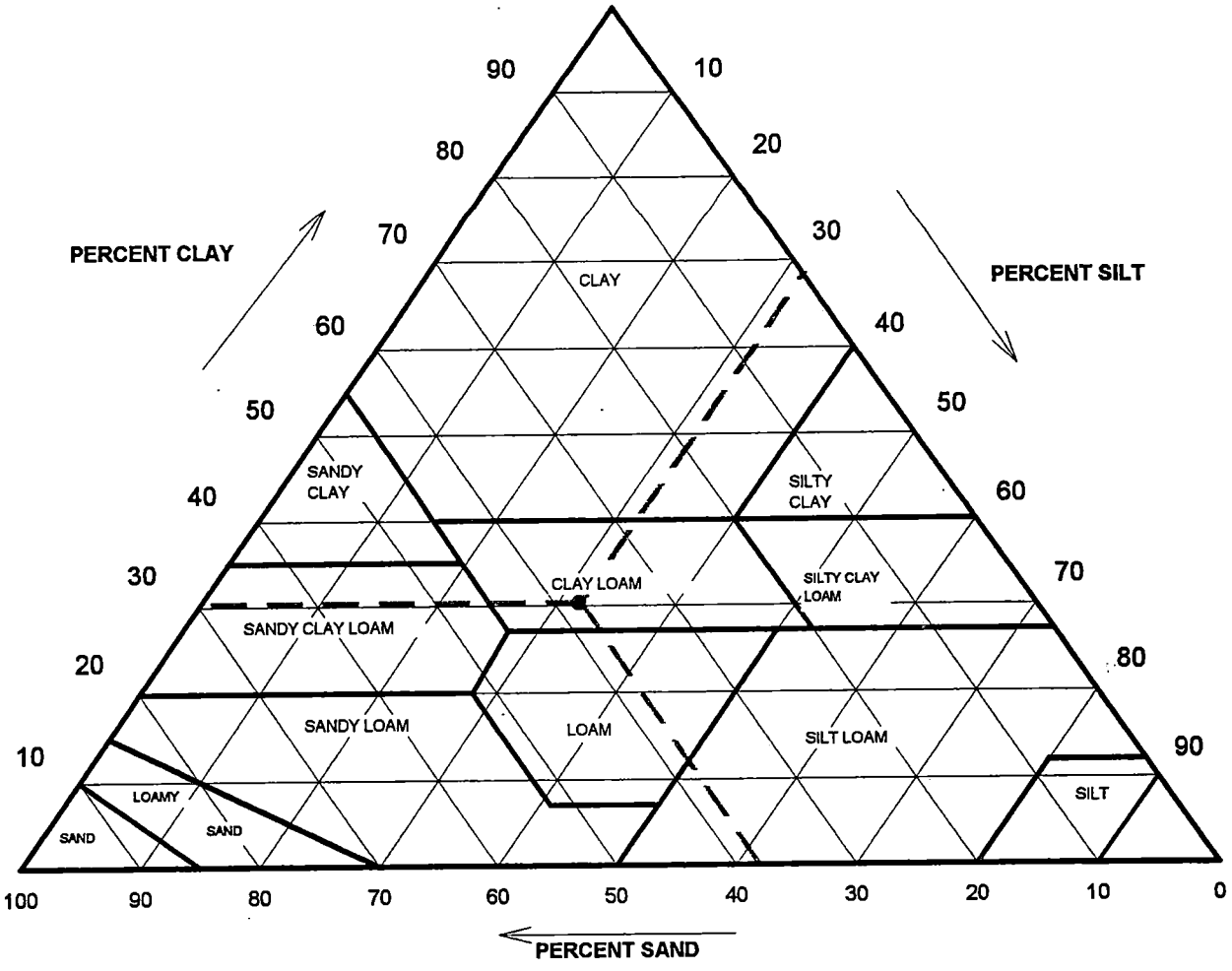
USDA CLASSIFICATION CHART

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	1.0-3.0
Project No.	97178-02	Sample No.	SM010-TB17-0103
Lab ID	97178-02.017	Soil Color	BROWN



Components	Corrected % of Minus 2.0 mm material for USDA Classificat.
Gravel	0.00
Sand	37.88
Silt	31.79
Clay	30.33
USDA Classification	***CLAY LOAM***

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MOISTURE CONTENT

ASTM D 2216 (SOP-S1)

Client	ICF KAISER
Client Reference	BAYER 51249
Project No.	97178-02

Test No.	**1**
Lab ID	.017
Boring No.	NA
Depth (ft)	1.0-3.0
Sample No.	SM010-TB17-0103
Tare Number	2004
Wt. of Tare & WS (gm)	280.29
Wt. of Tare & DS (gm)	249.03
Wt. of Tare (gm)	8.37
Wt. of Water (gm)	31.26
Wt. of DS (gm)	240.66
Water Content (%)	**13.0**

Notes : *NA*

Tested By *TO* *Date* *8/4/97* *Checked By* JCM *Date* 8-12-97

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SHELBY TUBE UNIT WEIGHT

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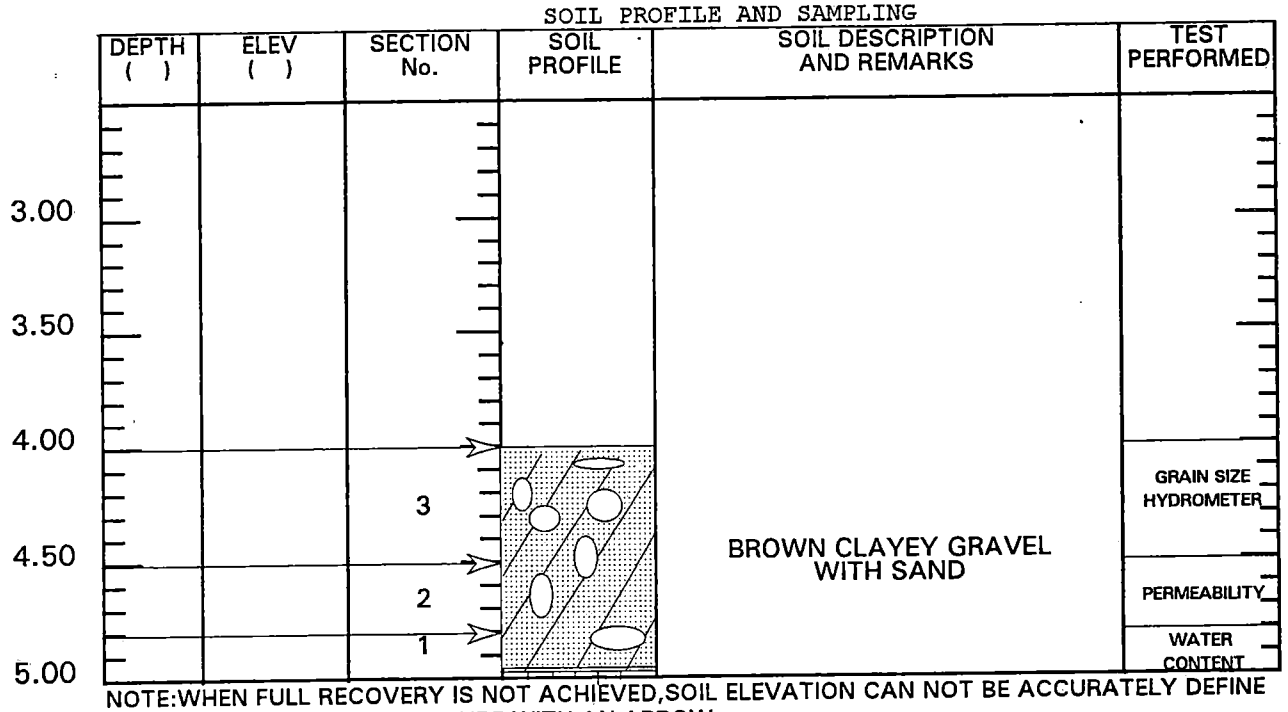
Client	ICF KAISER	Tested By	JCM 7-30-97
Client Project	BAYER 51249	Checked By	JMO 8/22/97
Project No.	97178-02		
Boring No.	NA	Tube Recovery	1.30
Depth Pushed	3.0-5.0		
Shelby Tube No.	SM010-TB17-0305		

SOIL PROFILE AND SAMPLING



NOTE:WHEN FULL RECOVERY IS NOT ACHIEVED,SOIL ELEVATION CAN NOT BE ACCURATELY DEFINE
INDICATE EACH CUT OF THE TUBE WITH AN ARROW
INDICATE DIVIDING LINE BETWEEN SOIL TYPES BY A SOLID LINE
INDICATE WAX BY CROSS-HATCHING
INDICATE SOIL TYPES BY STANDARD SYMBOLS

MOISTURE CONTENT					
Section Number	1	2	3	4	5
Tare Number	927		K13		
Wt. Tare & WS(gm.)	267.95		873.00		
Wt. Tare & DS(gm.)	231.84		773.60		
Wt. Tare(gm.)	45.03		74.45		
Moisture Content(%)	19.3		14.2		

UNIT WEIGHT		
Wt. Tube & WS.(gms.)	1062.20	1762.60
Wt. Of Tube(gms.)	264.15	453.60
Wt. Of WS.(gms.)	798.05	1309.00
Length 1 (in.)	3.573	6.159
Length 2 (in.)	3.574	6.158
Length 3 (in.)	3.585	6.153
Top Diameter (in.)	2.881	2.880
Middle Diameter (in.)	2.882	2.883
Bottom Diameter (in.)	2.889	2.879
Sample Volume (cc)	382.95	657.54
Moisture Content(%)	19.33	14.22
Unit Wet Wt.(gms/cc)	2.08	1.99
Unit Wet Wt.(pcf.)	130.0	124.2
Unit Dry Wt.(pcf.)	109.0	108.8
Unit Dry Wt.(gms/cc)	1.75	1.74

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	4.0-4.5
Project No.	97178-02	Sample No.	SM0010-TB17-0305
Lab ID	97178-02.015	Soil Color	**BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	K13	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	873.00	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	773.60	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	74.45	Weight of Tare (gm)	NA
Weight of Water (gm)	99.40	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	699.15	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**14.2**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	699.15
Dry Weight - 3/4" Sample (gm)	279.55	Weight of minus #200 material (gm)	307.75
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	391.40
Dry Weight + 3/4" Sample (gm)	111.85		
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	90.41	12.93	12.93	87.07	**87.07**
3/4"	19.0	21.44	3.07	16.00	84.00	**84.00**
1/2"	12.5	57.11	8.17	24.17	75.83	**75.83**
3/8"	9.50	33.37	4.77	28.94	71.06	**71.06**
#4	4.75	40.81	5.84	34.78	65.22	**65.22**
#10	2.00	37.83	5.41	40.19	59.81	**59.81**
#20	0.85	22.85	3.27	43.46	56.54	**56.54**
#40	0.425	15.06	2.15	45.61	54.39	**54.39**
#60	0.250	20.51	2.93	48.54	51.46	**51.46**
#140	0.106	39.69	5.68	54.22	45.78	**45.78**
#200	0.075	12.32	1.76	55.98	44.02	**44.02**
Pan	-	307.75	44.02	100.00	-	-

Tested By JCM Date 7/30/97 Checked By LB Date 8-7-97

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HYDROMETER ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	4.0-4.5
Project No.	97178-02	Sample No.	SM0010-TB17-0305
Lab ID	97178-02.015	Soil Color	**BROWN**

Elapsed Time (min)		R Measured	Temp. (°C)	R Corrected	N (%)	Diameter (mm)	N' (%)
0	NA	NA	NA	NA	NA	NA	NA
2	46.0	48.0	24.5	42.4	83.2	0.0262	**36.6**
5		45.0	24.5	39.4	77.3	0.0170	**34.0**
15		40.0	24.5	34.4	67.5	0.0103	**29.7**
30		37.0	24.5	31.4	61.7	0.0074	**27.1**
60		33.0	23.6	27.4	53.8	0.0054	**23.7**
250		27.0	22.7	21.4	42.1	0.0028	**18.5**
1440		23.0	23.5	17.4	34.2	0.0012	**15.1**

Soil Specimen Data		Corrections	
Tare No.	1221	K - Factor	0.01275
Tare + Dry Material (gm)	157.9	a - Factor	0.99
Weight of Tare (gm)	102.41	Composite Correction	5.55
Weight of Deflocculant (gm)	5.0	Percent Finer than # 200	44.02
Weight of Dry Material (gm)	50.49		
		Specific Gravity	2.7 Assumed

Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By TO Date 8/1/97 Checked By LB Date 8-7-97

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DCN: DS-S3A
DATE: 11/12/96
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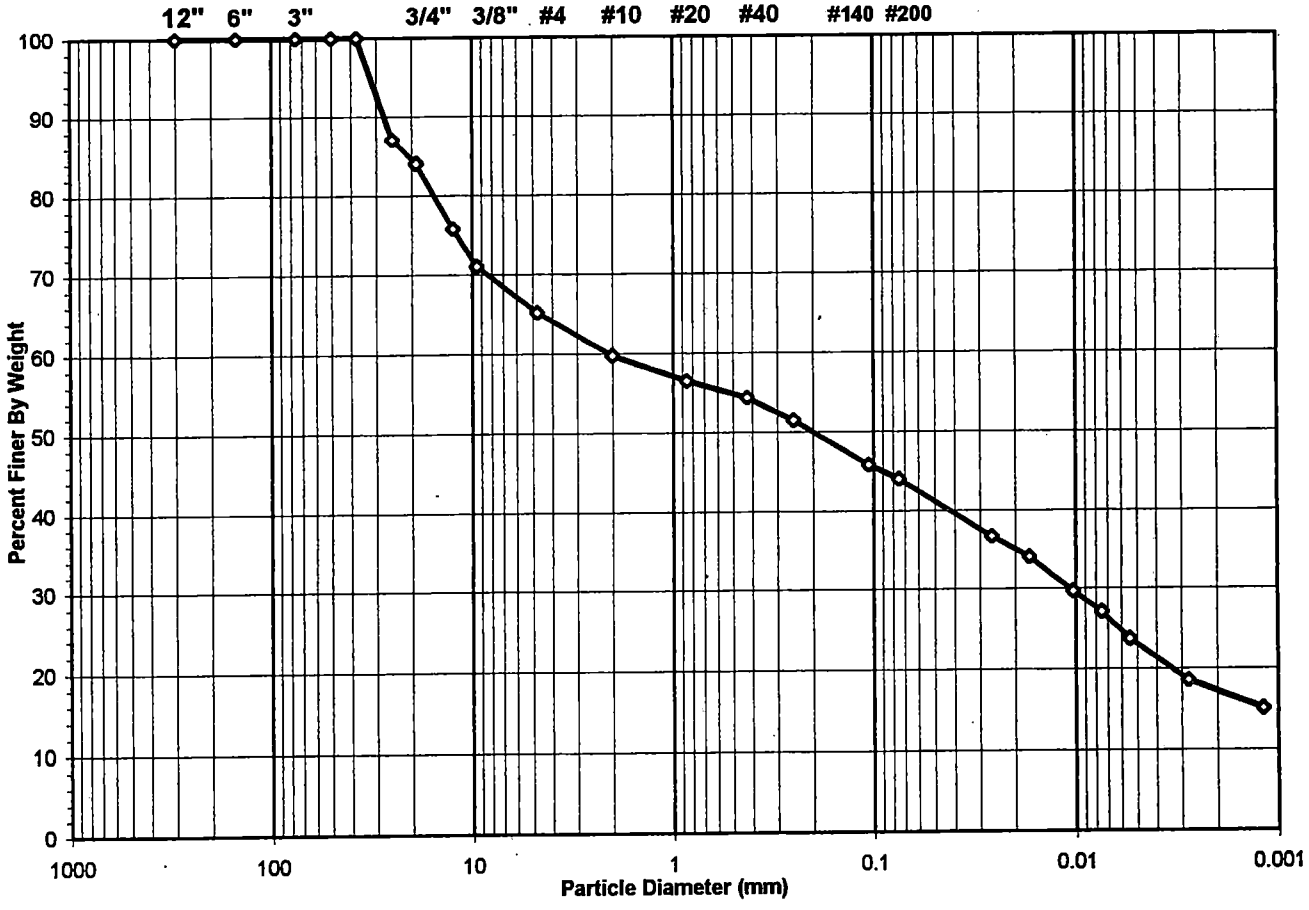
SIEVE AND HYDROMETER ANALYSIS
ASTM D 422-63 (SOP-S3)

geotechnics

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	4.0-4.5
Project No.	97178-02	Sample No.	SM0010-TB17-0305
Lab ID	97178-02.015	Soil Color	BROWN

	SIEVE ANALYSIS		HYDROMETER	
USCS	gravel	sand	silt and clay fraction	
USDA	gravel	sand	silt	clay



Sieve Size (mm)	Percent Finer	Components	Percentage	Corrected % of Minus 2.0 mm material for USDA Classificat.
100	100.00	*Gravel*	40.19	**0.00**
2	59.81	*Sand*	18.64	**31.16**
0.075	44.02	*Silt*	24.00	**40.13**
0.05	41.18	*Clay*	17.18	**28.72**
0.002	17.18			

USDA Classification ***CLAY LOAM***

USCS Symbol ***gc, ASSUMED***

USCS Classification ***CLAYEY GRAVEL WITH SAND***

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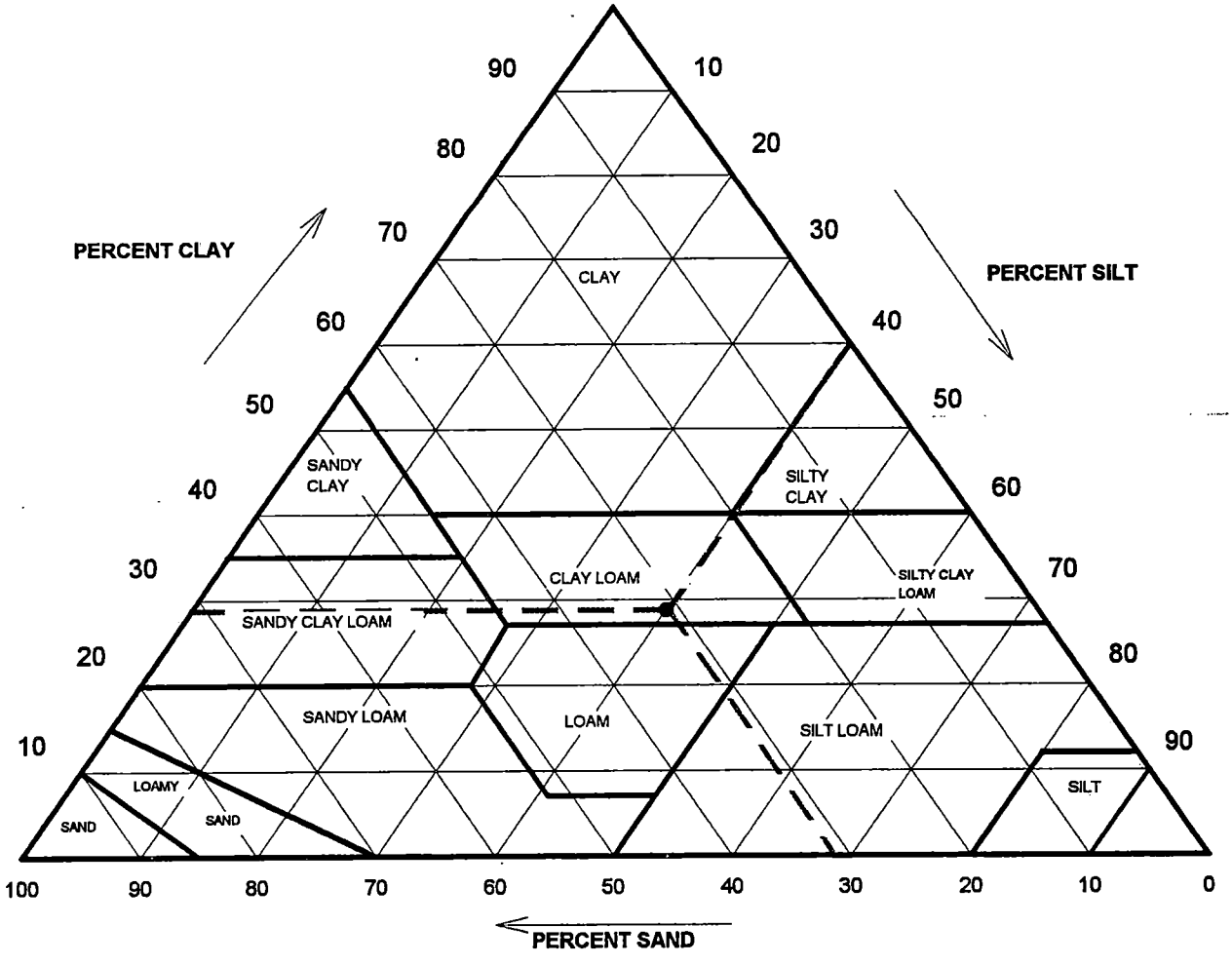
USDA CLASSIFICATION CHART

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	4.0-4.5
Project No.	97178-02	Sample No.	SM0010-TB17-0305
Lab ID	97178-02.015	Soil Color	BROWN



Components	Corrected % of Minus 2.0 mm material for USDA Classificat.
Gravel	0.00
Sand	31.16
Silt	40.13
Clay	28.72
USDA Classification	***CLAY LOAM***

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PERMEABILITY TEST

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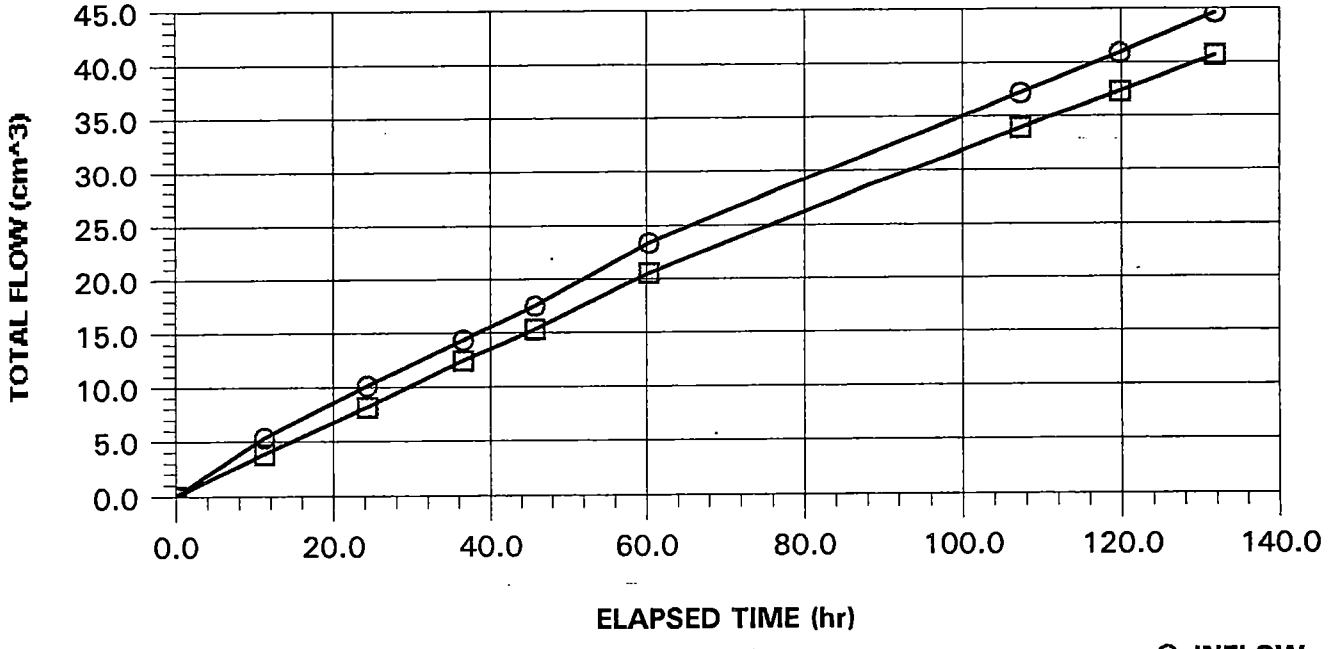
Client	ICF KAISER	Boring No.	NA
Client Project	BAYER 51249	Depth(ft.)	4.5-4.8
Project No.	97178-02	Sample No.	SM010-TB17-0305

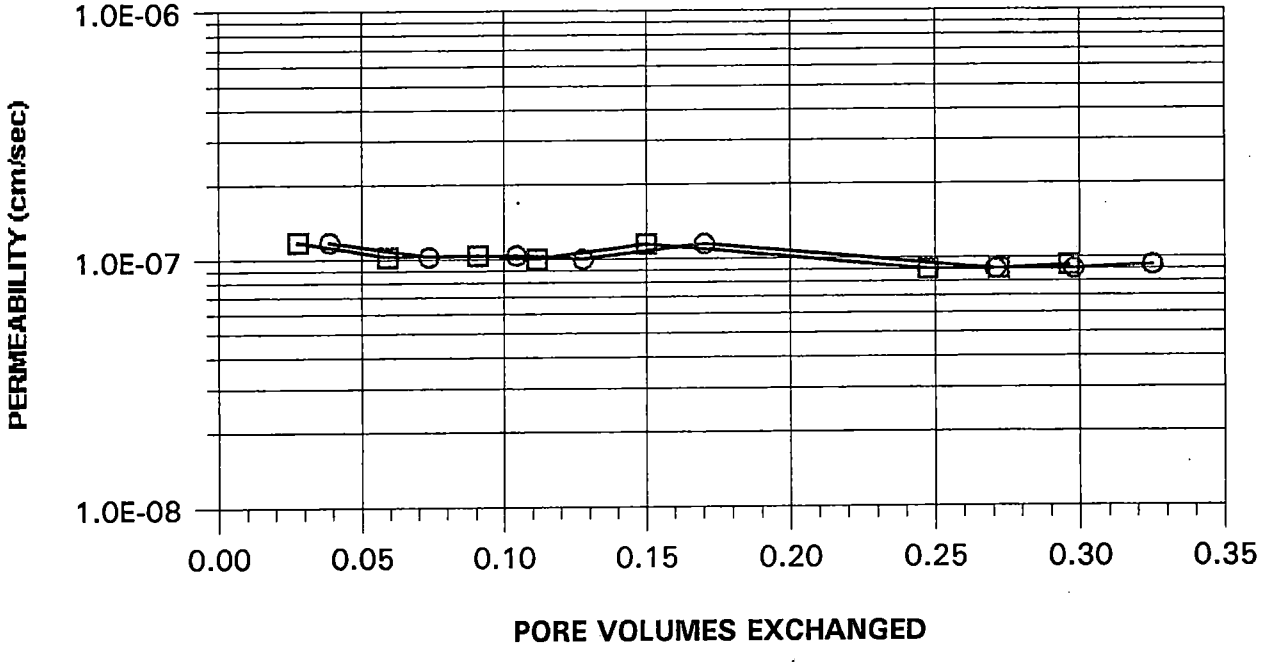
AVERAGE PERMEABILITY = 9.7E-08 cm/sec @ 20°C
AVERAGE PERMEABILITY = 9.7E-10 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY

⊖ INFLOW
⊟ OUTFLOW



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PERMEABILITY TEST

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Client	ICF KAISER	Tested By	JCM	Date	07-30-97
Client Project	BAYER 51249	Checked By	LB	Date	8-14-97
Project No.	97178-02				
Boring No.	NA	Specific Gravity	2.70 ASSUMED		
Depth(ft.)	4.5-4.8	Sample Condition	UNDISTURBED		
Sample No.	SM010-TB17-0305				

Visual Description BROWN CLAY AND ROCK FRAGMENTS

MOISTURE CONTENT	BEFORE TEST	AFTER TEST
Tare Number	927	1123
Wt. Tare & WS(gm.)	267.95	595.60
Wt. Tare & DS(gm.)	231.84	520.90
Wt. Water(gm.)	36.11	74.70
Wt. Tare(gm.)	45.03	85.45
Wt. DS(gm.)	186.81	435.45
Moisture Content(%)	19.3	17.2

UNIT WEIGHT		
Wt. Tube & WS.(gms.)	1062.20	NA
Wt. Of Tube(gms.)	264.15	NA
Wt. Of WS.(gms.)	798.05	783.5
Length 1 (in.)	3.573	3.646
Length 2 (in.)	3.574	3.705
Length 3 (in.)	3.585	3.635
Top Diameter (in.)	2.881	2.828
Middle Diameter (in.)	2.882	2.875
Bottom Diameter (in.)	2.889	2.869
Average Length (in)	3.58	3.66
Average Area (in^2)	6.53	6.41
Sample Volume(cc.)	382.95	384.80
Unit Wet Wt.(gms/cc)	2.08	2.04
Unit Wet Wt.(pcf.)	130.0	127.1
Unit Dry Wt.(pcf.)	109.0	108.5
Unit Dry Wt.(gms/cc)	1.75	1.74
Void Ratio,e	0.55	0.55
Porosity, n	0.35	0.36
Pore Volume(cm^3)	135.3	137.1

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PERMEABILITY TEST

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Client	ICF KAISER	Tested By	JCM	Date	07-30-97
Client Project	BAYER 51249	Checked By	LB	Date	8-14-97
Project No.	97178-02				
Boring No.	NA				
Depth(ft.)	4.5-4.8				
Sample No.	SM010-TB17-0305				
Visual Description	BROWN CLAY AND ROCK FRAGMENTS				

Pressure Heads (Constant)	
Top Cap (psi)	27.5
Bottom Cap (psi)	30.0
Cell (psi)	35.0
Total Pressure Head (cm)	175.8

Final Sample Dimensions	
Sample Length (cm.), L	9.30
Sample Diameter (cm.)	7.26
Sample Area (cm.^2), A	41.37
Inflow Burette Area, (cm.^2), a-in	4.65
Outflow Burette Area, (cm.^2), a-out	4.22
B Parameter	97%

AVERAGE PERMEABILITY = 9.7E-08 cm/sec @ 20°C
AVERAGE PERMEABILITY = 9.7E-10 m/sec @ 20°C

DATE mon-dy-yr	TIME hr	TIME min	ELAPSED TIME (t) hr	TOTAL INFLOW cm^3	TOTAL OUTFLOW cm^3	TOTAL HEAD (h) cm	FLOW 0 FLOW 1 STOP	TEMP °C	INCREMENTAL PERMEABILITY @ 20°C cm/sec
07-30-97	20	0	0.0	0.0	0.0	200.4	0	23.0	NA
07-31-97	7	10	11.2	5.3	3.8	198.3	0	23.0	1.2E-07
07-31-97	20	20	24.3	10.1	8.1	196.3	0	22.5	1.0E-07
08-01-97	8	35	36.6	14.3	12.4	194.3	0	23.0	1.0E-07
08-01-97	17	45	45.8	17.5	15.3	193.0	0	22.5	1.0E-07
08-02-97	8	20	60.3	23.3	20.6	190.5	0	23.0	1.2E-07
08-04-97	7	20	107.3	37.1	33.9	184.3	0	23.0	9.0E-08
08-04-97	19	50	119.8	40.9	37.3	182.7	0	22.7	9.0E-08
08-05-97	7	50	131.8	44.6	40.6	181.1	0	23.2	9.3E-08

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SHELBY TUBE UNIT WEIGHT

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Client	ICF KAISER	Tested By	JCM 7-30-97
Client Project	BAYER 51249	Checked By	JMO 8/22/97
Project No.	97178-02		
Boring No.	NA	Tube Recovery	2.00
Depth Pushed	10.0-12.0		
Shelby Tube No.	SM010-TB17-1012		

SOIL PROFILE AND SAMPLING

DEPTH ( )	ELEV ( )	SECTION No.	SOIL PROFILE	SOIL DESCRIPTION AND REMARKS	TEST PERFORMED
10.00					
10.50					
11.00					GRAIN SIZE HYDROMETER
		3		BROWN LEAN CLAY WITH SAND	
11.50					PERMEABILITY
		2			
		1			WATER CONTENT
12.00					

NOTE:WHEN FULL RECOVERY IS NOT ACHIEVED,SOIL ELEVATION CAN NOT BE ACCURATELY DEFINE
INDICATE EACH CUT OF THE TUBE WITH AN ARROW
INDICATE DIVIDING LINE BETWEEN SOIL TYPES BY A SOLID LINE
INDICATE WAX BY CROSS-HATCHING
INDICATE SOIL TYPES BY STANDARD SYMBOLS

MOISTURE CONTENT					
Section Number	1	2	3	4	5
Tare Number	1872		1698		
Wt. Tare & WS(gm.)	287.15		699.00		
Wt. Tare & DS(gm.)	242.66		589.10		
Wt. Tare(gm.)	44.47		81.45		
Moisture Content(%)	22.4		21.6		

UNIT WEIGHT		
Wt. Tube & WS.(gms.)	992.30	1216.00
Wt. Of Tube(gms.)	263.46	0.00
Wt. Of WS.(gms.)	728.84	1216.00
Length 1 (in.)	3.590	5.969
Length 2 (in.)	3.570	5.983
Length 3 (in.)	3.572	6.003
Top Diameter (in.)	2.889	2.875
Middle Diameter (in.)	2.891	2.891
Bottom Diameter (in.)	2.889	2.897
Sample Volume (cc)	384.46	642.32
Moisture Content(%)	22.45	21.65
Unit Wet Wt.(gms/cc)	1.90	1.89
Unit Wet Wt.(pcf.)	118.3	118.1
Unit Dry Wt.(pcf.)	96.6	97.1
Unit Dry Wt.(gms/cc)	1.55	1.56

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	11.0-11.5
Project No.	97178-02	Sample No.	SM0010-TB17-1012
Lab ID	97178-02.016	Soil Color	**BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	1698	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	699.00	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	589.10	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	81.45	Weight of Tare (gm)	NA
Weight of Water (gm)	109.90	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	507.65	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**21.6**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	507.65
Dry Weight - 3/4" Sample (gm)	80.75	Weight of minus #200 material (gm)	426.90
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	80.75
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"	12.5	7.11	1.40	1.40	98.60	**98.60**
3/8"	9.50	4.49	0.88	2.29	97.71	**97.71**
#4	4.75	9.98	1.97	4.25	95.75	**95.75**
#10	2.00	8.99	1.77	6.02	93.98	**93.98**
#20	0.85	4.87	0.96	6.98	93.02	**93.02**
#40	0.425	3.93	0.77	7.76	92.24	**92.24**
#60	0.250	8.98	1.77	9.52	90.48	**90.48**
#140	0.106	23.99	4.73	14.25	85.75	**85.75**
#200	0.075	8.41	1.66	15.91	84.09	**84.09**
Pan	-	426.90	84.09	100.00	-	-

Tested By JCM Date 7/30/97 Checked By LB Date 8-7-97

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HYDROMETER ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	11.0-11.5
Project No.	97178-02	Sample No.	SM0010-TB17-1012
Lab ID	97178-02.016	Soil Color	**BROWN**

Elapsed Time (min)		R Measured	Temp. (°C)	R Corrected	N (%)	Diameter (mm)	N' (%)
0	NA	NA	NA	NA	NA	NA	NA
2	44.5	45.5	24.5	39.9	84.3	0.0268	**70.9**
5		43.0	24.5	37.4	79.0	0.0173	**66.4**
15		38.0	24.5	32.4	68.5	0.0104	**57.6**
30		35.0	24.5	29.4	62.1	0.0076	**52.2**
63		31.0	23.6	25.4	53.7	0.0054	**45.1**
250		25.5	22.7	19.9	42.1	0.0028	**35.4**
1440		20.0	23.5	14.4	30.5	0.0012	**25.6**

Soil Specimen Data		Corrections	
Tare No.	1678	K - Factor	0.01275
Tare + Dry Material (gm)	150.81	a - Factor	0.99
Weight of Tare (gm)	98.88	Composite Correction	5.55
Weight of Deflocculant (gm)	5.0	Percent Finer than # 200	84.09
Weight of Dry Material (gm)	46.93		
		Specific Gravity	2.7 Assumed

Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By TO Date 8/1/97 Checked By LB Date 8-7-97

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SIEVE AND HYDROMETER ANALYSIS
ASTM D 422-63 (SOP-S3)

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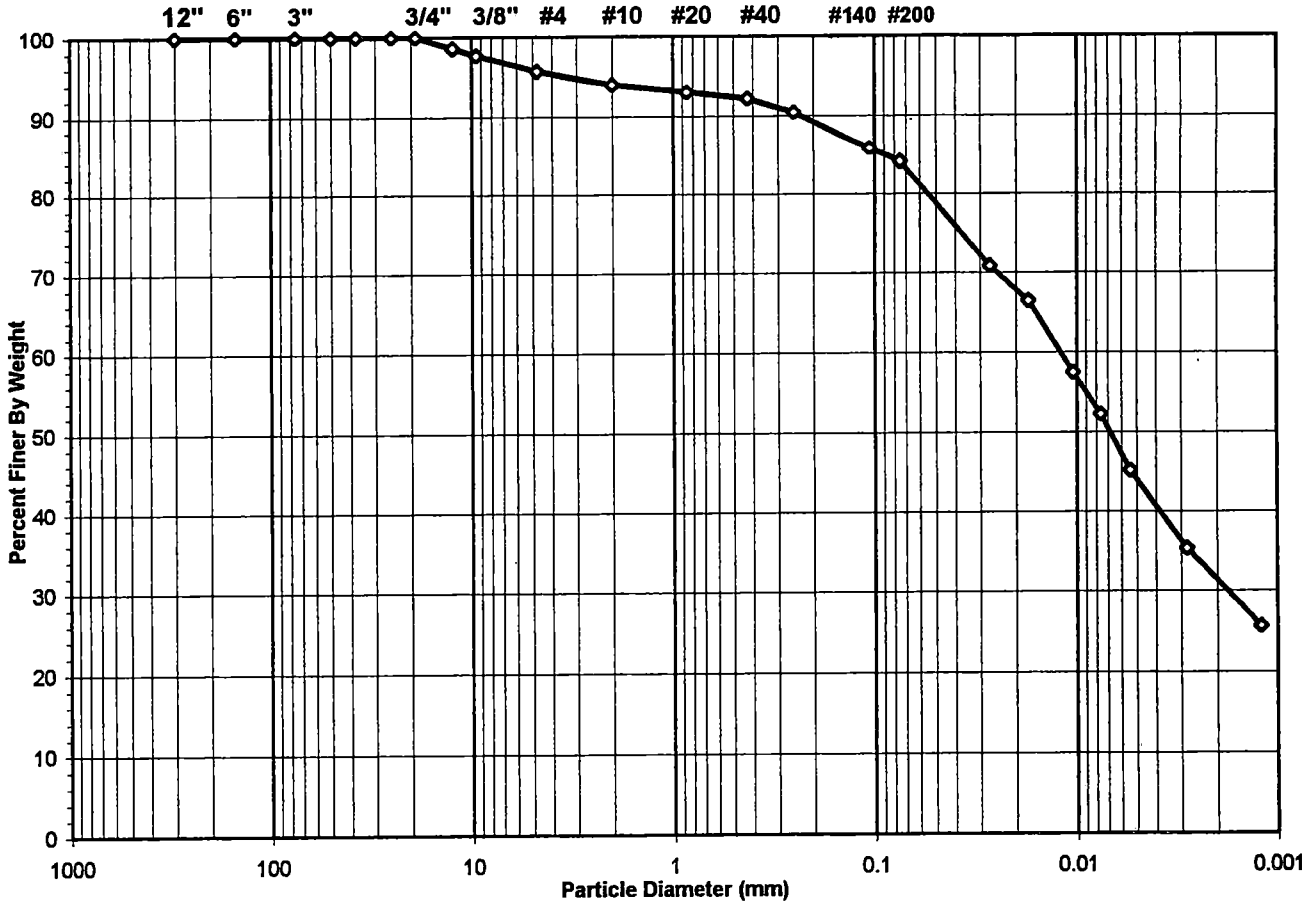
Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	11.0-11.5
Project No.	97178-02	Sample No.	SM0010-TB17-1012
Lab ID	97178-02.016	Soil Color	BROWN

	SIEVE ANALYSIS		HYDROMETER	
USCS	gravel	sand	silt and clay fraction	
USDA	gravel	sand	silt	clay



Sieve Size (mm)	Percent Finer	Components	Percentage	Corrected % of Minus 2.0 mm material for USDA Classificat.
100	100.00	*Gravel*	6.02	**0.00**
2	93.98	*Sand*	15.10	**16.06**
0.075	84.09	*Silt*	47.43	**50.47**
0.05	78.88	*Clay*	31.45	**33.47**
0.002	31.45			

USDA Classification ***SILTY CLAY LOAM***

USCS Symbol ***cl, ASSUMED***

USCS Classification ***LEAN CLAY WITH SAND***

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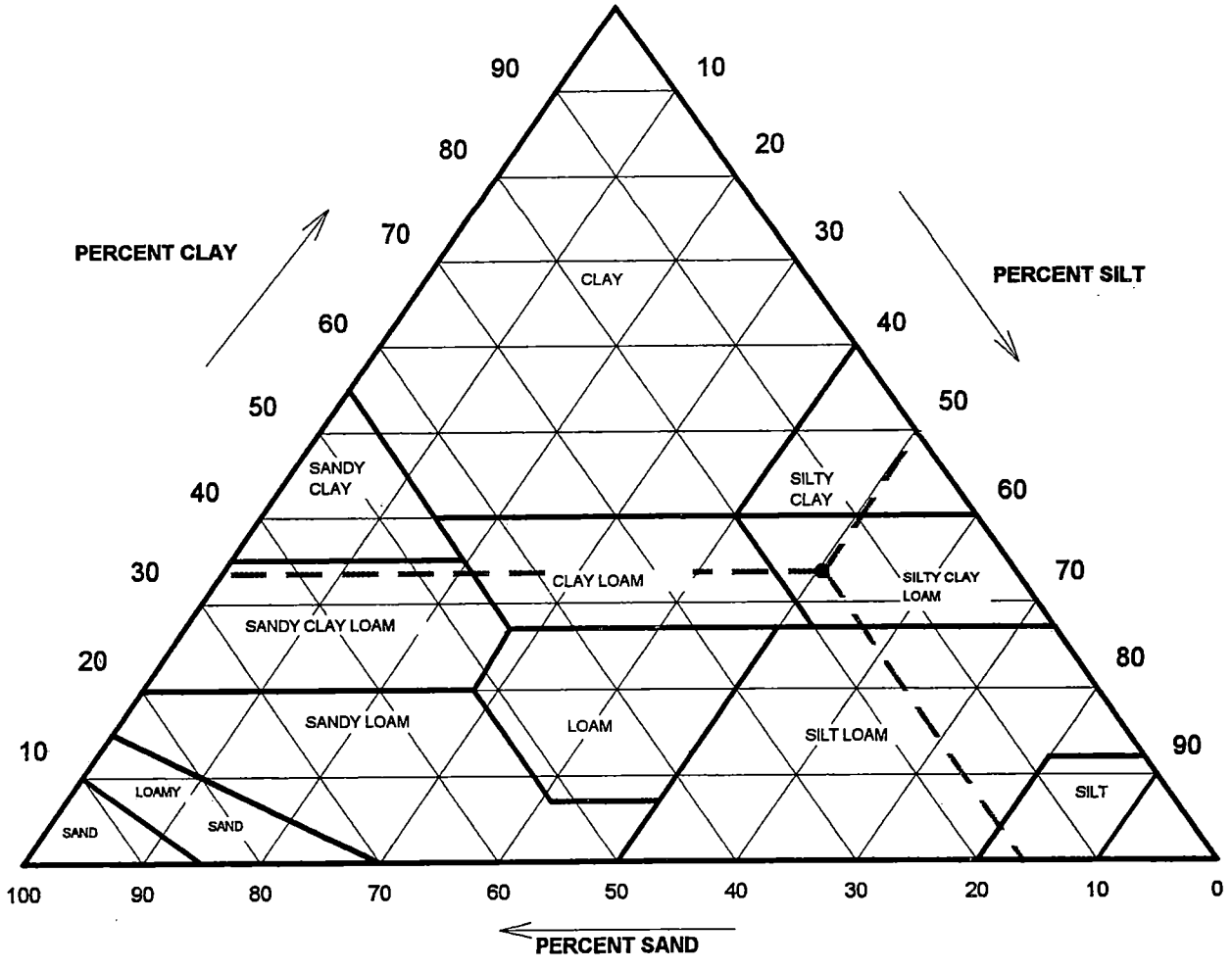
USDA CLASSIFICATION CHART

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	11.0-11.5
Project No.	97178-02	Sample No.	SM0010-TB17-1012
Lab ID	97178-02.016	Soil Color	BROWN



Components	Corrected % of Minus 2.0 mm material for USDA Classificat.
Gravel	0.00
Sand	16.06
Silt	50.47
Clay	33.47
USDA Classification	***SILTY CLAY LOAM***

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PERMEABILITY TEST

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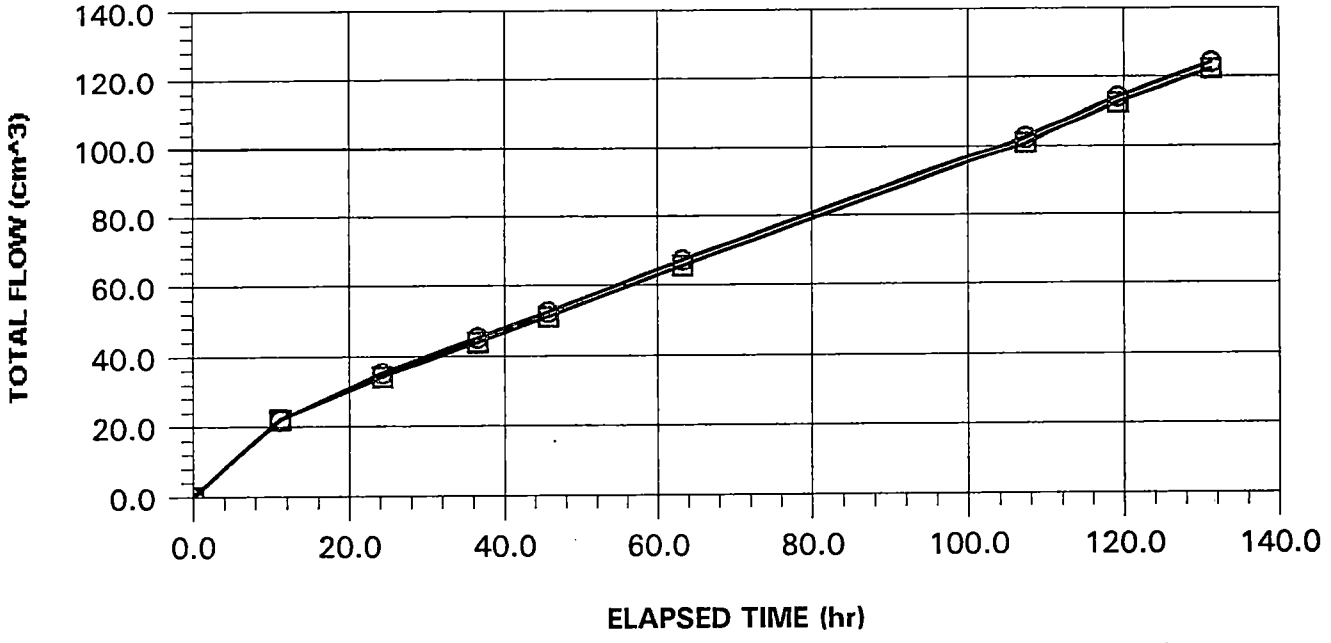
Client	ICF KAISER	Boring No.	NA
Client Project	BAYER 51249	Depth(ft.)	11.5-11.8
Project No.	97178-02	Sample No.	SM010-TB17-1012

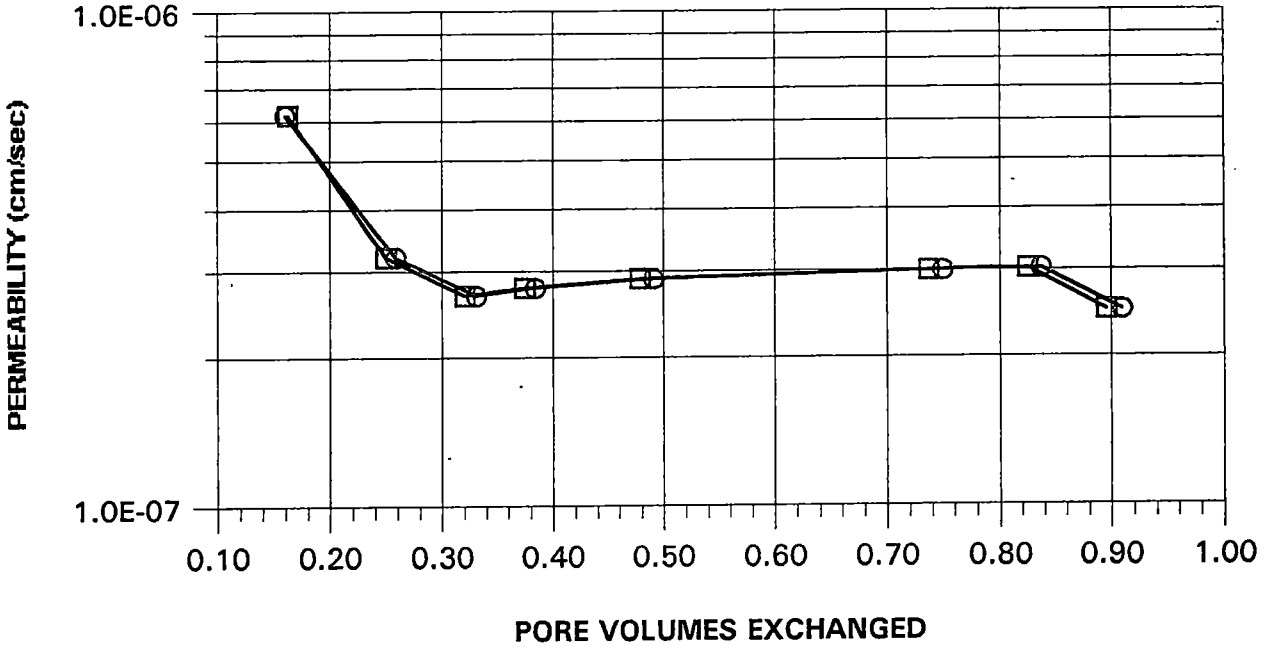
AVERAGE PERMEABILITY = 2.8E-07 cm/sec @ 20°C
AVERAGE PERMEABILITY = 2.8E-09 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY

⊖ INFLOW
⊟ OUTFLOW



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PERMEABILITY TEST

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Client	ICF KAISER	Tested By	JCM	Date	07-30-97
Client Project	BAYER 51249	Checked By	LB	Date	8-13-97
Project No.	97178-02				
Boring No.	NA	Specific Gravity	2.70 ASSUMED		
Depth(ft.)	11.5-11.8	Sample Condition	UNDISTURBED		
Sample No.	SM010-TB17-1012				

Visual Description BROWN CLAY

MOISTURE CONTENT	BEFORE TEST	AFTER TEST
Tare Number	1872	ZY
Wt. Tare & WS(gm.)	287.15	502.60
Wt. Tare & DS(gm.)	242.66	424.60
Wt. Water(gm.)	44.49	78.00
Wt. Tare(gm.)	44.47	85.74
Wt. DS(gm.)	198.19	338.86
Moisture Content(%)	22.4	23.0

UNIT WEIGHT		
Wt. Tube & WS.(gms.)	992.30	NA
Wt. Of Tube(gms.)	263.46	NA
Wt. Of WS.(gms.)	728.84	732.2
Length 1 (in.)	3.590	3.569
Length 2 (in.)	3.570	3.588
Length 3 (in.)	3.572	3.572
Top Diameter (in.)	2.889	2.730
Middle Diameter (in.)	2.891	2.822
Bottom Diameter (in.)	2.889	2.803
Average Length (in)	3.58	3.58
Average Area (in^2)	6.56	6.09
Sample Volume(cc.)	384.46	357.01
Unit Wet Wt.(gms/cc)	1.90	2.05
Unit Wet Wt.(pcf.)	118.3	128.0
Unit Dry Wt.(pcf.)	96.6	104.0
Unit Dry Wt.(gms/cc)	1.55	1.67
Void Ratio,e	0.74	0.62
Porosity, n	0.43	0.38
Pore Volume(cm^3)	164.0	136.6

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PERMEABILITY TEST

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Client	ICF KAISER	Tested By	JCM	Date	07-30-97
Client Project	BAYER 51249	Checked By	LB	Date	8-13-97
Project No.	97178-02				
Boring No.	NA				
Depth(ft.)	11.5-11.8				
Sample No.	SM010-TB17-1012				
Visual Description	BROWN CLAY				

Pressure Heads (Constant)	
Top Cap (psi)	27.5
Bottom Cap (psi)	30.0
Cell (psi)	35.0
Total Pressure Head (cm)	175.8

Final Sample Dimensions	
Sample Length (cm.), L	9.08
Sample Diameter (cm.)	7.07
Sample Area (cm.^2), A	39.30
Inflow Burette Area, (cm.^2), a-in	4.55
Outflow Burette Area, (cm.^2), a-out	4.97
B Parameter	96%

AVERAGE PERMEABILITY = 2.8E-07 cm/sec @ 20°C
AVERAGE PERMEABILITY = 2.8E-09 m/sec @ 20°C

DATE mon-dy-yr	TIME hr	TIME min	ELAPSED TIME (t) hr	TOTAL INFLOW cm^3	TOTAL OUTFLOW cm^3	TOTAL HEAD (h) cm	FLOW 0 FLOW 1 STOP	TEMP °C	INCREMENTAL PERMEABILITY @ 20°C cm/sec
07-30-97	20	0	0.0	0.0	0.0	195.0	0	23.0	NA
07-31-97	7	10	11.2	21.8	22.2	185.8	0	23.0	6.2E-07
07-31-97	20	20	24.3	35.3	34.1	180.4	0	22.5	3.2E-07
08-01-97	8	35	36.6	45.2	43.8	176.3	0	23.0	2.7E-07
08-01-97	17	45	45.8	52.5	51.2	173.2	0	22.5	2.8E-07
08-02-97	11	15	63.3	67.0	65.4	167.1	0	23.0	2.9E-07
08-04-97	7	20	107.3	102.4	100.7	152.3	1	23.0	3.0E-07
08-04-97	7	55	107.3	102.4	100.7	202.1	0	23.0	NA
08-04-97	19	50	119.3	114.3	112.7	197.1	0	22.7	3.0E-07
08-05-97	7	50	131.3	124.2	122.3	193.0	0	23.2	2.5E-07

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SHELBY TUBE UNIT WEIGHT

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Client	ICF KAISER	Tested By	TO 8-7-97
Client Project	BAYER 51249	Checked By	JMO 8/22/97
Project No.	97178-02		
Boring No.	NA	Tube Recovery	1.80
Depth Pushed	.5-2.5		
Shelby Tube No.	SM010-TB20-0103		

SOIL PROFILE AND SAMPLING

DEPTH ( )	ELEV ( )	SECTION No.	SOIL PROFILE	SOIL DESCRIPTION AND REMARKS	TEST PERFORMED
0.50					
1.00					
1.50					
2.00		2		BROWN SANDY LEAN CLAY	WATER CONTENT UNIT WGT
2.50		1			GRAIN SIZE HYDROMETER

NOTE:WHEN FULL RECOVERY IS NOT ACHIEVED,SOIL ELEVATION CAN NOT BE ACCURATELY DEFINE
INDICATE EACH CUT OF THE TUBE WITH AN ARROW
INDICATE DIVIDING LINE BETWEEN SOIL TYPES BY A SOLID LINE
INDICATE WAX BY CROSS-HATCHING
INDICATE SOIL TYPES BY STANDARD SYMBOLS

MOISTURE CONTENT					
Section Number	1	2	3	4	5
Tare Number		W-45			
Wt. Tare & WS(gm.)		493.10			
Wt. Tare & DS(gm.)		429.80			
Wt. Tare(gm.)		8.25			
Moisture Content(%)		15.0			
UNIT WEIGHT					
Wt. Tube & WS.(gms.)		734.10			
Wt. Of Tube(gms.)		183.98			
Wt. Of WS.(gms.)		550.12			
Length 1 (in.)		2.496			
Length 2 (in.)		2.474			
Length 3 (in.)		2.487			
Top Diameter (in.)		2.867			
Middle Diameter (in.)		2.875			
Bottom Diameter (in.)		2.873			
Sample Volume (cc)		263.79			
Moisture Content(%)		15.02			
Unit Wet Wt.(gms/cc)		2.09			
Unit Wet Wt.(pcf.)		130.1			
Unit Dry Wt.(pcf.)		113.1			
Unit Dry Wt.(gms/cc)		1.81			

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	2.2-2.5 SEC. 1
Project No.	97178-02	Sample No.	SM010-TB20-0103
Lab ID	97178-02.018	Soil Color	**BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	681	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	673.30	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	603.50	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	99.49	Weight of Tare (gm)	NA
Weight of Water (gm)	69.80	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	504.01	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**13.8**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	504.01
Dry Weight - 3/4" Sample (gm)	245.87	Weight of minus #200 material (gm)	223.65
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	280.36
Dry Weight + 3/4" Sample (gm)	34.49		
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	34.49	6.84	6.84	93.16	**93.16**
1/2"	12.5	33.47	6.64	13.48	86.52	**86.52**
3/8"	9.50	14.71	2.92	16.40	83.60	**83.60**
#4	4.75	33.97	6.74	23.14	76.86	**76.86**
#10	2.00	47.42	9.41	32.55	67.45	**67.45**
#20	0.85	38.40	7.62	40.17	59.83	**59.83**
#40	0.425	23.41	4.64	44.81	55.19	**55.19**
#60	0.250	18.48	3.67	48.48	51.52	**51.52**
#140	0.106	28.07	5.57	54.05	45.95	**45.95**
#200	0.075	7.94	1.58	55.63	44.37	**44.37**
Pan	-	223.65	44.37	100.00	-	-

Tested By TO Date 8/7/97 Checked By JCM Date 8-21-97

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HYDROMETER ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	2.2-2.5 SEC. 1
Project No.	97178-02	Sample No.	SM010-TB20-0103
Lab ID	97178-02.018	Soil Color	**BROWN**

Elapsed Time (min)		R Measured	Temp. (°C)	R Corrected	N (%)	Diameter (mm)	N' (%)
0	NA	NA	NA	NA	NA	NA	NA
2	40.0	40.0	24.7	34.5	82.0	0.0281	**36.4**
5		36.5	24.7	31.0	73.7	0.0183	**32.7**
17		31.5	24.7	26.0	61.8	0.0103	**27.4**
30		29.0	24.7	23.5	55.9	0.0079	**24.8**
60		26.0	23.2	20.5	48.7	0.0057	**21.6**
250		22.0	22.5	16.5	39.3	0.0029	**17.4**
1440		16.0	24.1	10.5	25.0	0.0012	**11.1**

Soil Specimen Data		Corrections	
Tare No.	1302	K - Factor	0.01272
Tare + Dry Material (gm)	147.82	a - Factor	0.99
Weight of Tare (gm)	101.09	Composite Correction	5.45
Weight of Deflocculant (gm)	5.0	Percent Finer than # 200	44.37
Weight of Dry Material (gm)	41.73		
		Specific Gravity	2.7 Assumed

Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By TO Date 8/7/97 Checked By Jam Date 8-21-97

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SIEVE AND HYDROMETER ANALYSIS
ASTM D 422-63 (SOP-S3)

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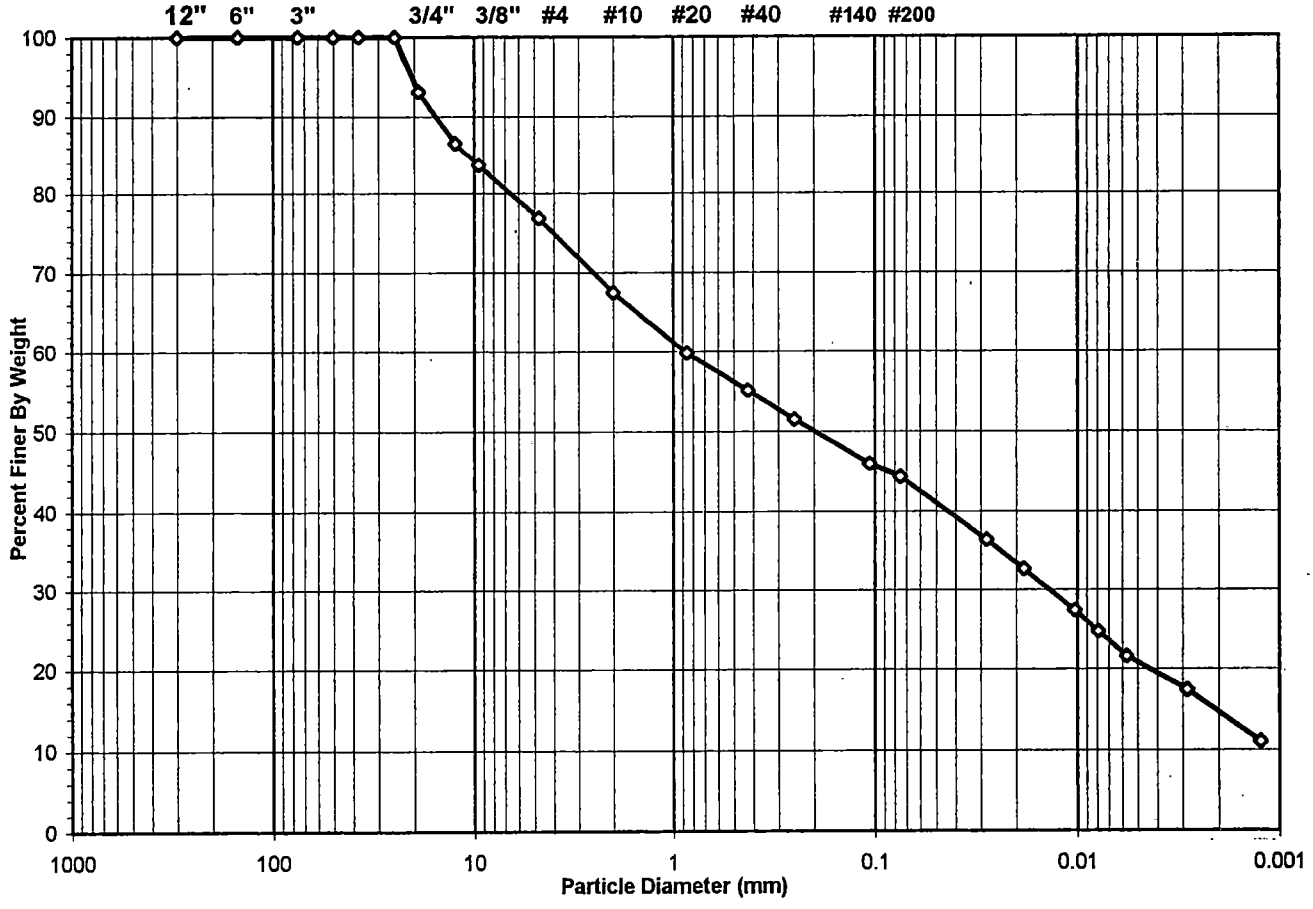
Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	2.2-2.5 SEC. 1
Project No.	97178-02	Sample No.	SM010-TB20-0103
Lab ID	97178-02.018	Soil Color	**BROWN**

	SIEVE ANALYSIS		HYDROMETER	
USCS	gravel	sand	silt and clay fraction	
USDA	gravel	sand	silt	clay



Sieve Size (mm)	Percent Finer	Components	Percentage	Corrected % of Minus 2.0 mm material for USDA Classificat.
100	100.00	*Gravel*	32.55	**0.00**
2	67.45	*Sand*	26.38	**39.11**
0.075	44.37	*Silt*	26.36	**39.09**
0.05	41.07	*Clay*	14.71	**21.81**
0.002	14.71			

USDA Classification ***LOAM***

USCS Symbol ***sc, ASSUMED***

USCS Classification ***CLAYEY SAND WITH GRAVEL***

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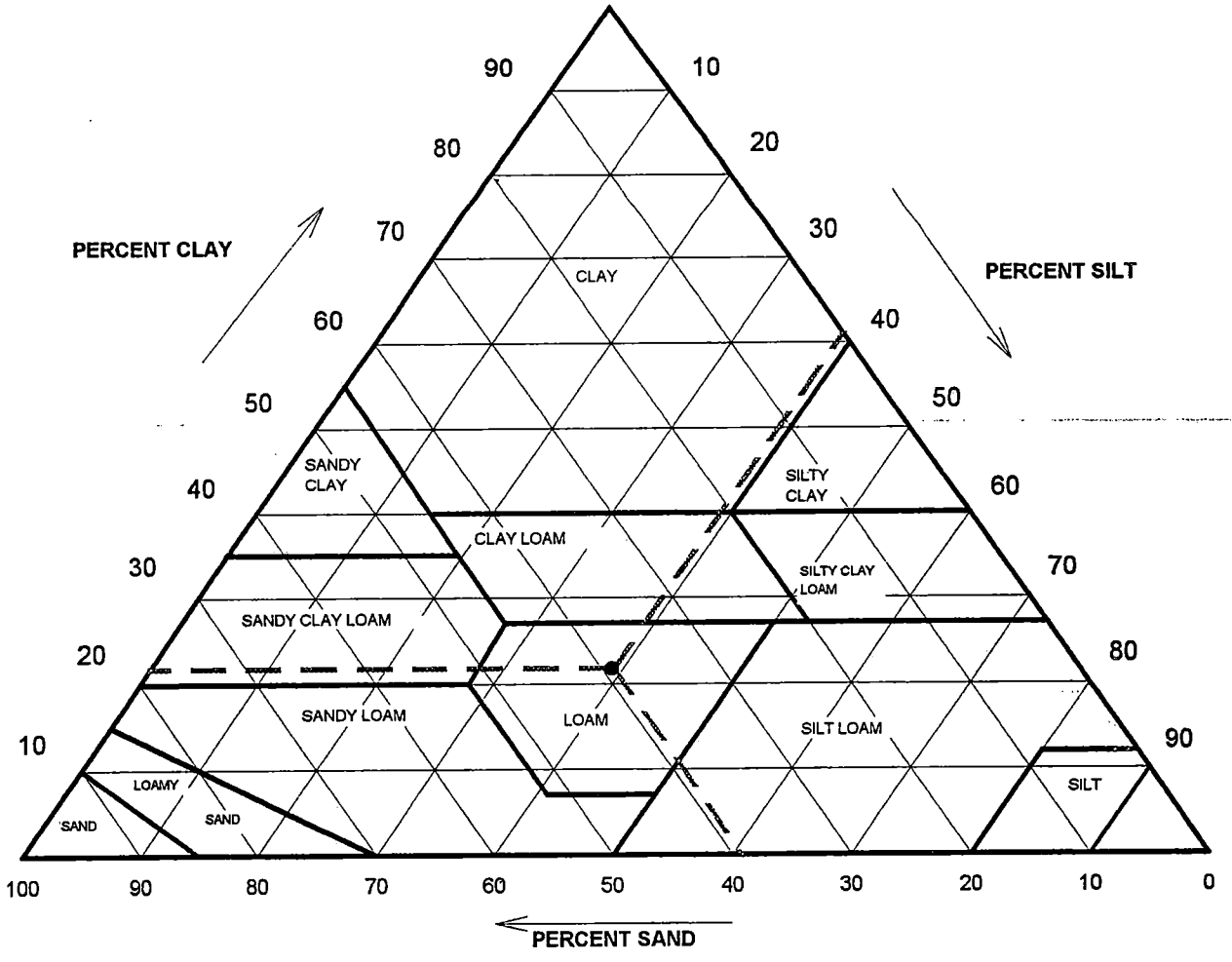
USDA CLASSIFICATION CHART

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	2.2-2.5 SEC. 1
Project No.	97178-02	Sample No.	SM010-TB20-0103
Lab ID	97178-02.018	Soil Color	BROWN



Components	Corrected % of Minus 2.0 mm material for USDA Classificat.
Gravel	0.00
Sand	39.11
Silt	39.09
Clay	21.81
USDA Classification	***LOAM***

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SHELBY TUBE UNIT WEIGHT

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Client	ICF KAISER	Tested By	JCM 7-30-97
Client Project	BAYER 51249	Checked By	JMD 8/22/97
Project No.	97178-02		
Boring No.	NA	Tube Recovery	2.20
Depth Pushed	3.0-5.0		
Shelby Tube No.	SM010-TB20-0305		

SOIL PROFILE AND SAMPLING

DEPTH ( )	ELEV ( )	SECTION No.	SOIL PROFILE	SOIL DESCRIPTION AND REMARKS	TEST PERFORMED
3.00					
3.50					
4.00					
		3			PERMEABILITY
4.50				BROWN GRAVELLY LEAN CLAY WITH SAND AND SOME ROOTS	WATER CONTENT
		2			GRAIN SIZE
					HYDROMETER
		1		VOID	NO TEST
5.00					

NOTE:WHEN FULL RECOVERY IS NOT ACHIEVED,SOIL ELEVATION CAN NOT BE ACCURATELY DEFINE
INDICATE EACH CUT OF THE TUBE WITH AN ARROW
INDICATE DIVIDING LINE BETWEEN SOIL TYPES BY A SOLID LINE
INDICATE WAX BY CROSS-HATCHING
INDICATE SOIL TYPES BY STANDARD SYMBOLS

MOISTURE CONTENT					
Section Number	1	2	3	4	5
Tare Number		1123			
Wt. Tare & WS(gm.)		888.30			
Wt. Tare & DS(gm.)		766.70			
Wt. Tare(gm.)		85.47			
Moisture Content(%)		17.9			

UNIT WEIGHT	
Wt. Tube & WS.(gms.)	1072.20
Wt. Of Tube(gms.)	273.43
Wt. Of WS.(gms.)	798.77
Length 1 (in.)	3.686
Length 2 (in.)	3.683
Length 3 (in.)	3.683
Top Diameter (in.)	2.877
Middle Diameter (in.)	2.893
Bottom Diameter (in.)	2.867
Sample Volume (cc)	393.00
Moisture Content(%)	17.85
Unit Wet Wt.(gms/cc)	2.03
Unit Wet Wt.(pcf.)	126.8
Unit Dry Wt.(pcf.)	107.6
Unit Dry Wt.(gms/cc)	1.72

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	4.4-4.8
Project No.	97178-02	Sample No.	SM0010-TB20-0305
Lab ID	97178-02.019	Soil Color	**BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	1123	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	888.30	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	766.70	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	85.47	Weight of Tare (gm)	NA
Weight of Water (gm)	121.60	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	681.23	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**17.9**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	681.23
Dry Weight - 3/4" Sample (gm)	204.62	Weight of minus #200 material (gm)	409.48
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	271.75
Dry Weight + 3/4" Sample (gm)	67.13		
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	23.03	3.38	3.38	96.62	**96.62**
3/4"	19.0	44.10	6.47	9.85	90.15	**90.15**
1/2"	12.5	13.72	2.01	11.87	88.13	**88.13**
3/8"	9.50	18.95	2.78	14.65	85.35	**85.35**
#4	4.75	39.96	5.87	20.52	79.48	**79.48**
#10	2.00	33.88	4.97	25.49	74.51	**74.51**
#20	0.85	20.27	2.98	28.46	71.54	**71.54**
#40	0.425	12.49	1.83	30.30	69.70	**69.70**
#60	0.250	18.34	2.69	32.99	67.01	**67.01**
#140	0.106	35.52	5.21	38.20	61.80	**61.80**
#200	0.075	11.49	1.69	39.89	60.11	**60.11**
Pan	-	409.48	60.11	100.00	-	-

Tested By JCM Date 7/30/97 Checked By LB Date 8-7-97

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HYDROMETER ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	4.4-4.8
Project No.	97178-02	Sample No.	SM0010-TB20-0305
Lab ID	97178-02.019	Soil Color	**BROWN**

Elapsed Time (min)		R Measured	Temp. (°C)	R Corrected	N (%)	Diameter (mm)	N' (%)
0	NA	NA	NA	NA	NA	NA	NA
2	48.5	50.5	24.5	44.9	84.6	0.0255	**50.9**
5		46.0	24.5	40.4	76.1	0.0169	**45.8**
15		42.0	24.5	36.4	68.6	0.0101	**41.2**
30		38.0	24.5	32.4	61.1	0.0074	**36.7**
60		34.5	23.6	28.9	54.5	0.0054	**32.8**
250		29.0	22.7	23.4	44.1	0.0027	**26.5**
1440		23.5	23.5	17.9	33.8	0.0012	**20.3**

Soil Specimen Data		Corrections	
Tare No.	1859	K - Factor	0.01275
Tare + Dry Material (gm)	160.53	a - Factor	0.99
Weight of Tare (gm)	102.93	Composite Correction	5.55
Weight of Deflocculant (gm)	5.0	Percent Finer than # 200	60.11
Weight of Dry Material (gm)	52.6		
		Specific Gravity	2.7 Assumed

Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By TO Date 8/1/97 Checked By LB Date 8-7-97

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SIEVE AND HYDROMETER ANALYSIS
ASTM D 422-63 (SOP-S3)

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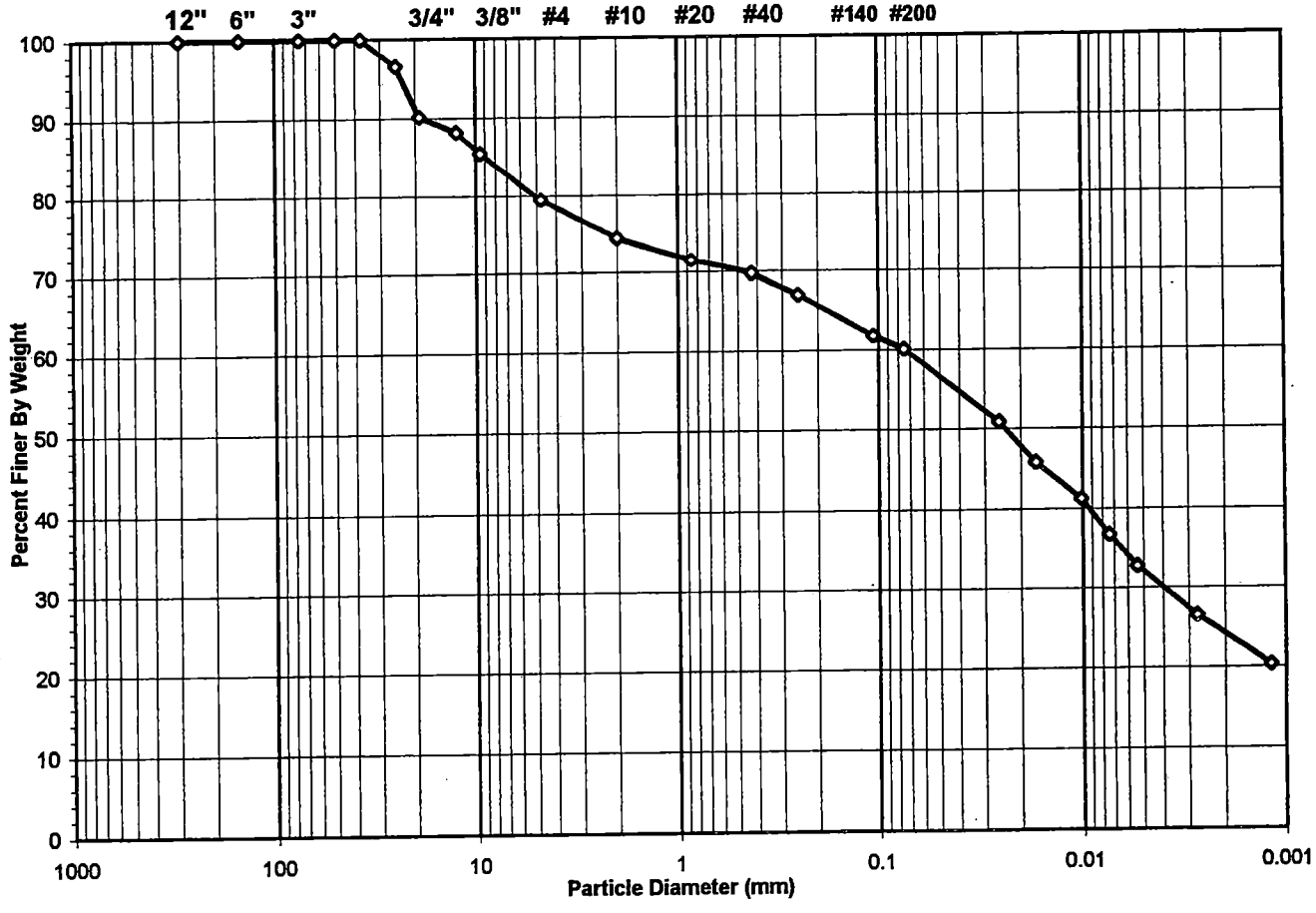
Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	4.4-4.8
Project No.	97178-02	Sample No.	SM0010-TB20-0305
Lab ID	97178-02.019	Soil Color	BROWN

	SIEVE ANALYSIS		HYDROMETER	
USCS	gravel	sand	silt and clay fraction	
USDA	gravel	sand	silt	clay



Sieve Size (mm)	Percent Finer	Components	Percentage	Corrected % of Minus 2.0 mm material for USDA Classificat.
100	100.00	*Gravel*	25.49	**0.00**
2	74.51	*Sand*	17.88	**24.00**
0.075	60.11	*Silt*	32.43	**43.53**
0.05	56.63	*Clay*	24.19	**32.47**
0.002	24.19			

USDA Classification ***CLAY LOAM***

USCS Symbol ***cl, ASSUMED***

USCS Classification ***GRAVELLY LEAN CLAY WITH SAND***

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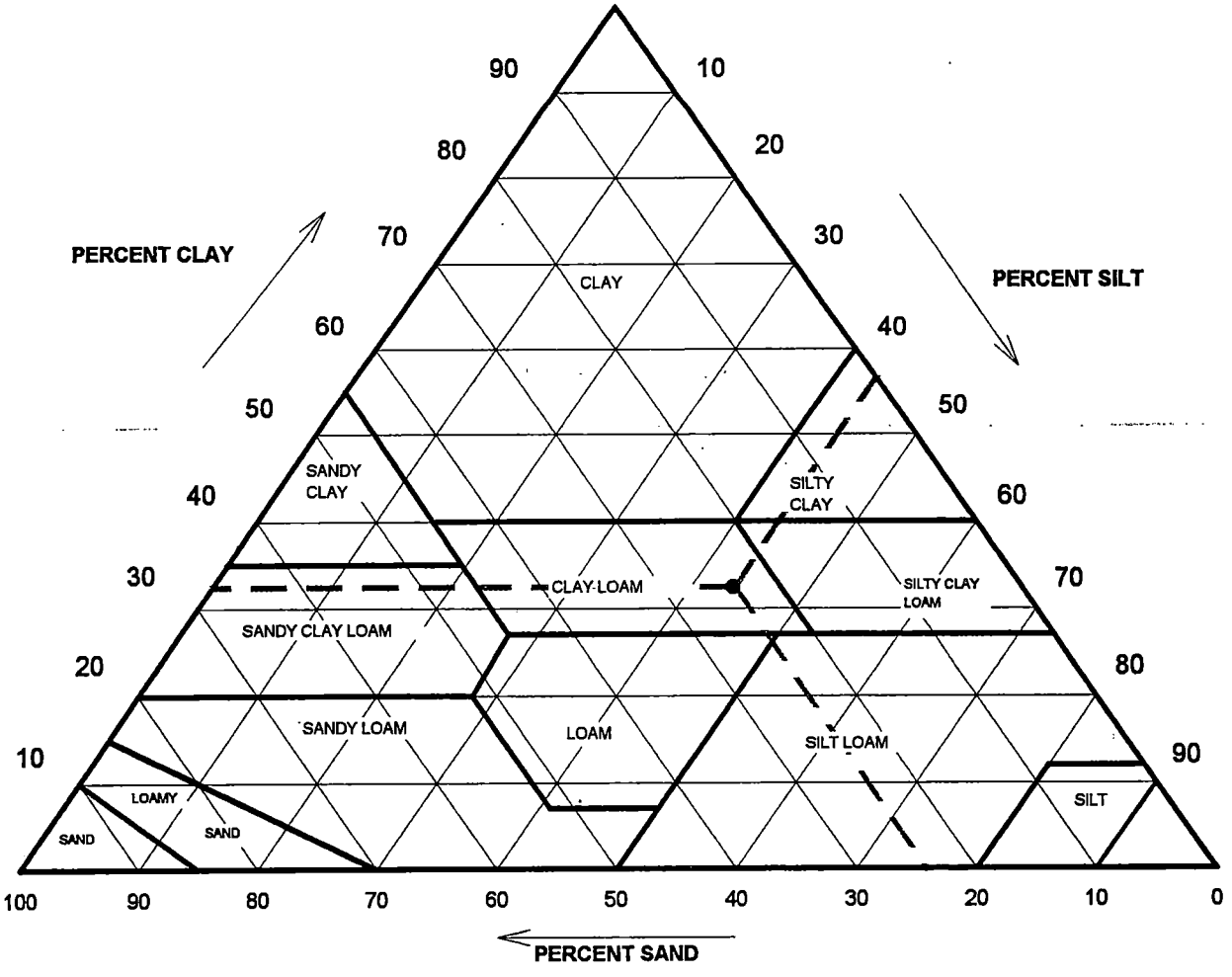
USDA CLASSIFICATION CHART

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	4.4-4.8
Project No.	97178-02	Sample No.	SM0010-TB20-0305
Lab ID	97178-02.019	Soil Color	BROWN



Components	Corrected % of Minus 2.0 mm material for USDA Classificat.
Gravel	0.00
Sand	24.00
Silt	43.53
Clay	32.47
USDA Classification	***CLAY LOAM***

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PERMEABILITY TEST

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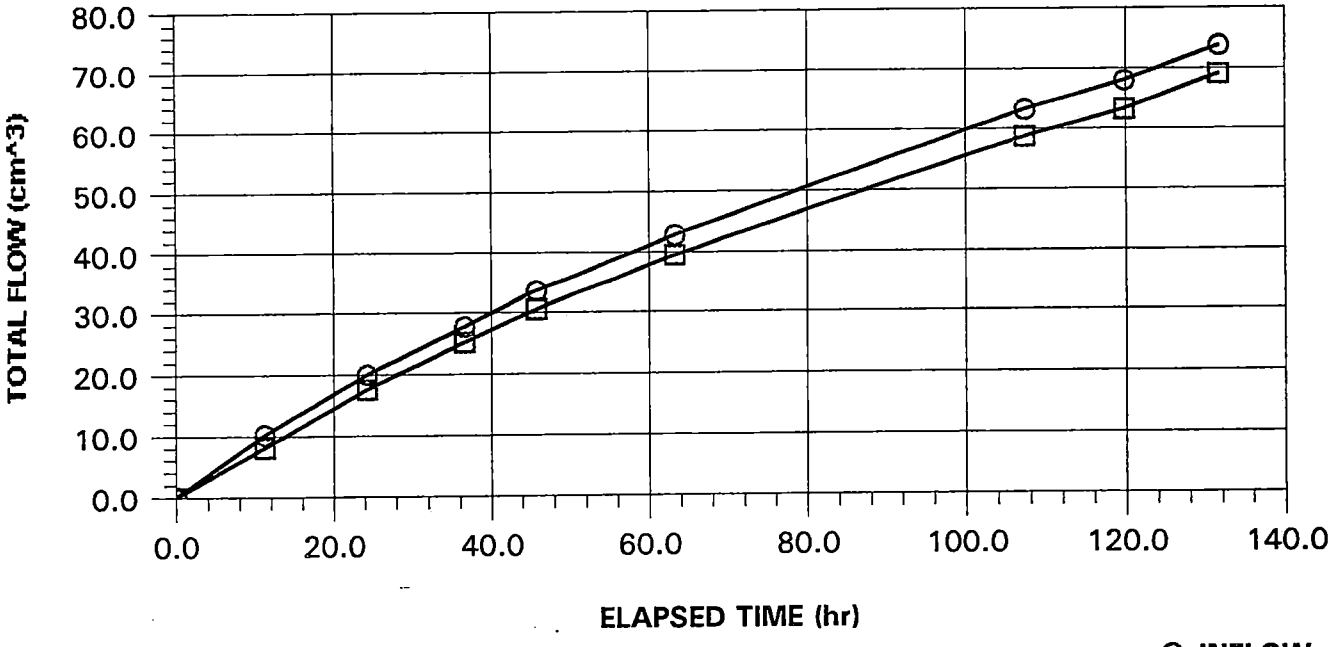
Client	ICF KAISER	Boring No.	NA
Client Project	BAYER 51249	Depth(ft.)	4.1-4.4
Project No.	97178-02	Sample No.	SM010-TB20-0305

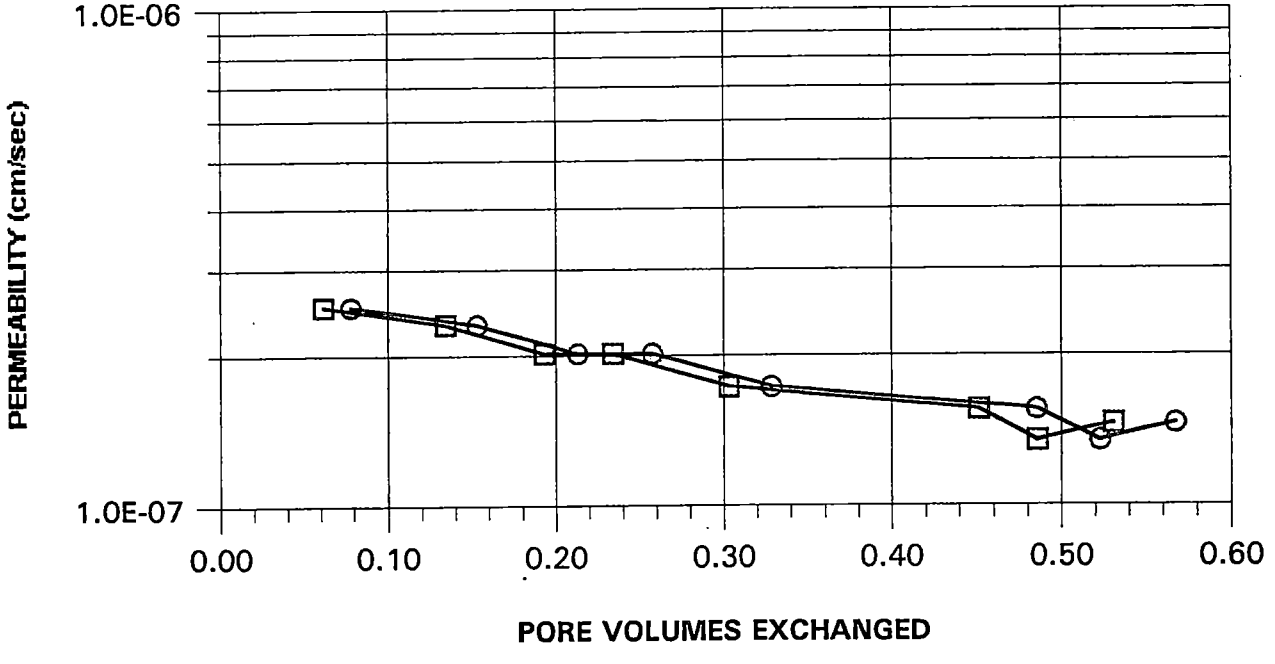
AVERAGE PERMEABILITY = 1.5E-07 cm/sec @ 20°C
AVERAGE PERMEABILITY = 1.5E-09 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



INFLOW
OUTFLOW

PORE VOLUMES EXCHANGED vs. PERMEABILITY



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PERMEABILITY TEST

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Client	ICF KAISER	Tested By	JCM	Date	07-30-97
Client Project	BAYER 51249	Checked By	LB	Date	8-13-97
Project No.	97178-02				
Boring No.	NA	Specific Gravity	2.70 ASSUMED		
Depth(ft.)	4.1-4.4	Sample Condition	UNDISTURBED		
Sample No.	SM010-TB20-0305				

Visual Description BROWN CLAY AND ROCK FRAGMENTS

MOISTURE CONTENT	BEFORE TEST	AFTER TEST
Tare Number	1123	1708
Wt. Tare & WS(gm.)	888.30	502.70
Wt. Tare & DS(gm.)	766.70	438.40
Wt. Water(gm.)	121.60	64.30
Wt. Tare(gm.)	85.47	82.92
Wt. DS(gm.)	681.23	355.48
Moisture Content(%)	17.9	18.1

UNIT WEIGHT		
Wt. Tube & WS.(gms.)	1072.20	NA
Wt. Of Tube(gms.)	273.43	NA
Wt. Of WS.(gms.)	798.77	800.4
Length 1 (in.)	3.686	3.724
Length 2 (in.)	3.683	3.639
Length 3 (in.)	3.683	3.673
Top Diameter (in.)	2.877	2.829
Middle Diameter (in.)	2.893	2.837
Bottom Diameter (in.)	2.867	2.846
Average Length (in)	3.68	3.68
Average Area (in^2)	6.51	6.32
Sample Volume(cc.)	393.00	381.16
Unit Wet Wt.(gms/cc)	2.03	2.10
Unit Wet Wt.(pcf.)	126.8	131.0
Unit Dry Wt.(pcf.)	107.6	111.0
Unit Dry Wt.(gms/cc)	1.72	1.78
Void Ratio,e	0.57	0.52
Porosity, n	0.36	0.34
Pore Volume(cm^3)	142.0	130.1

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PERMEABILITY TEST

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Client	ICF KAISER	Tested By	JCM	Date	07-30-97
Client Project	BAYER 51249	Checked By	LB	Date	8-13-97
Project No.	97178-02				
Boring No.	NA				
Depth(ft.)	4.1-4.4				
Sample No.	SM010-TB20-0305				
Visual Description	BROWN CLAY AND ROCK FRAGMENTS				

Pressure Heads (Constant)	
Top Cap (psi)	27.5
Bottom Cap (psi)	30.0
Cell (psi)	35.0
Total Pressure Head (cm)	175.8

Final Sample Dimensions	
Sample Length (cm.), L	9.34
Sample Diameter (cm.)	7.21
Sample Area (cm.^2), A	40.79
Inflow Burette Area, (cm.^2), a-in	4.22
Outflow Burette Area, (cm.^2), a-out	4.39
B Parameter	95%

AVERAGE PERMEABILITY = 1.5E-07 cm/sec @ 20°C
AVERAGE PERMEABILITY = 1.5E-09 m/sec @ 20°C

DATE mon-dy-yr	TIME hr	TIME min	ELAPSED TIME (t) hr	TOTAL INFLOW cm^3	TOTAL OUTFLOW cm^3	TOTAL HEAD (h) cm	FLOW 0 FLOW 1 STOP	TEMP °C	INCREMENTAL PERMEABILITY @ 20°C cm/sec
07-30-97	20	0	0.0	0.0	0.0	195.0	0	23.0	NA
07-31-97	7	10	11.2	10.2	8.1	190.7	0	23.0	2.5E-07
07-31-97	20	20	24.3	19.9	17.5	186.3	0	22.5	2.3E-07
08-01-97	8	35	36.6	27.7	25.1	182.7	0	23.0	2.0E-07
08-01-97	17	45	45.8	33.5	30.5	180.1	0	22.5	2.0E-07
08-02-97	11	15	63.3	42.7	39.5	175.9	0	23.0	1.7E-07
08-04-97	7	20	107.3	63.2	58.7	166.7	0	23.0	1.6E-07
08-04-97	19	50	119.8	68.0	63.2	164.5	1	22.7	1.3E-07
08-04-97	20	0	119.8	68.0	63.2	200.3	0	22.7	NA
08-05-97	7	50	131.7	73.8	69.0	197.6	0	23.2	1.5E-07

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SHELBY TUBE UNIT WEIGHT

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Client	ICF KAISER	Tested By	JCM 7-30-97
Client Project	BAYER 51249	Checked By	JMD 8/29/97
Project No.	97178-02		
Boring No.	NA	Tube Recovery	1.90
Depth Pushed	14.0-16.0		
Shelby Tube No.	SM010-TB20-1416		

SOIL PROFILE AND SAMPLING

DEPTH ( )	ELEV ( )	SECTION No.	SOIL PROFILE	SOIL DESCRIPTION AND REMARKS	TEST PERFORMED
14.00					
14.50					
15.00					UNIT WGT. WC. GRAINSIZE HYDROMETER
		3		BROWN LEAN CLAY	
15.50					PERMEABILITY
		2			
		1			WATER CONTENT
16.00					

NOTE:WHEN FULL RECOVERY IS NOT ACHIEVED,SOIL ELEVATION CAN NOT BE ACCURATELY DEFINE
INDICATE EACH CUT OF THE TUBE WITH AN ARROW
INDICATE DIVIDING LINE BETWEEN SOIL TYPES BY A SOLID LINE
INDICATE WAX BY CROSS-HATCHING
INDICATE SOIL TYPES BY STANDARD SYMBOLS

MOISTURE CONTENT					
Section Number	1	2	3	4	5
Tare Number	1280		1726		
Wt. Tare & WS(gm.)	239.50		745.70		
Wt. Tare & DS(gm.)	200.76		610.80		
Wt. Tare(gm.)	34.47		81.91		
Moisture Content(%)	23.3		25.5		

UNIT WEIGHT		
Wt. Tube & WS.(gms.)	1006.90	1693.00
Wt. Of Tube(gms.)	263.46	445.80
Wt. Of WS.(gms.)	743.44	1247.20
Length 1 (in.)	3.560	6.021
Length 2 (in.)	3.544	6.034
Length 3 (in.)	3.527	6.026
Top Diameter (in.)	2.876	2.881
Middle Diameter (in.)	2.874	2.885
Bottom Diameter (in.)	2.861	2.884
Sample Volume (cc)	375.76	644.88
Moisture Content(%)	23.30	25.51
Unit Wet Wt.(gms/cc)	1.98	1.93
Unit Wet Wt.(pcf.)	123.5	120.7
Unit Dry Wt.(pcf.)	100.1	96.2
Unit Dry Wt.(gms/cc)	1.60	1.54

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	15.0-15.5
Project No.	97178-02	Sample No.	SM010-TB20-1416
Lab ID	97178-02.020	Soil Color	**BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	1726	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	745.70	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	610.80	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	81.91	Weight of Tare (gm)	NA
Weight of Water (gm)	134.90	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	528.89	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**25.5**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	528.89
Dry Weight - 3/4" Sample (gm)	60.83	Weight of minus #200 material (gm)	468.06
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	60.83
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"	12.5	0.00	0.00	0.00	100.00	**100.00**
3/8"	9.50	0.00	0.00	0.00	100.00	**100.00**
#4	4.75	0.00	0.00	0.00	100.00	**100.00**
#10	2.00	1.19	0.22	0.22	99.78	**99.78**
#20	0.85	3.71	0.70	0.93	99.07	**99.07**
#40	0.425	6.18	1.17	2.09	97.91	**97.91**
#60	0.250	13.94	2.64	4.73	95.27	**95.27**
#140	0.106	26.47	5.00	9.74	90.26	**90.26**
#200	0.075	9.34	1.77	11.50	88.50	**88.50**
Pan	-	468.06	88.50	100.00	-	-

Tested By JCM Date 8/12/97 Checked By TW Date 8-21-97

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HYDROMETER ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	15.0-15.5
Project No.	97178-02	Sample No.	SM010-TB20-1416
Lab ID	97178-02.020	Soil Color	**BROWN**

Elapsed Time (min)		R Measured	Temp. (°C)	R Corrected	N (%)	Diameter (mm)	N' (%)
0	NA	NA	NA	NA	NA	NA	NA
2	51.5	52.5	24	46.7	89.7	0.0251	**79.4**
5		49.0	24	43.2	83.0	0.0165	**73.4**
15		44.5	24	38.7	74.3	0.0099	**65.8**
30		40.5	24	34.7	66.6	0.0073	**59.0**
60		37.0	23.4	31.2	59.9	0.0053	**53.0**
250		29.5	23.4	23.7	45.5	0.0027	**40.3**
1440		23.0	23.7	17.2	33.0	0.0012	**29.2**

Soil Specimen Data		Corrections	
Tare No.	865	K - Factor	0.01282
Tare + Dry Material (gm)	162.1	a - Factor	0.99
Weight of Tare (gm)	105.55	Composite Correction	5.80
Weight of Deflocculant (gm)	5.0	Percent Finer than # 200	88.50
Weight of Dry Material (gm)	51.55		
		Specific Gravity	2.7 Assumed

Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By TO Date 8/16/97 Checked By Jcm Date 8-21-97

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SIEVE AND HYDROMETER ANALYSIS
ASTM D 422-63 (SOP-S3)

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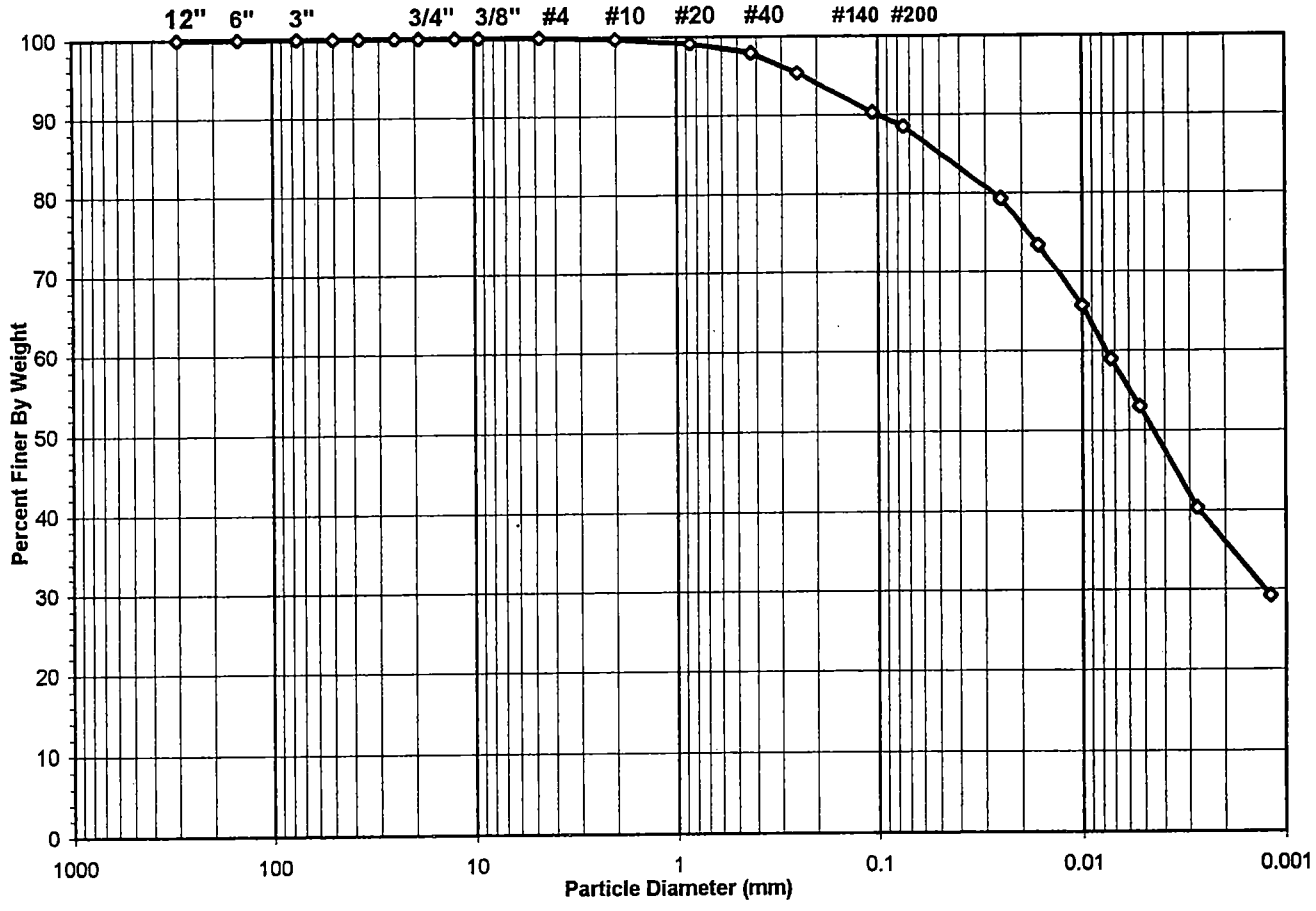
Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	15.0-15.5
Project No.	97178-02	Sample No.	SM010-TB20-1416
Lab ID	97178-02.020	Soil Color	**BROWN**

	SIEVE ANALYSIS		HYDROMETER	
USCS	gravel	sand	silt and clay fraction	
USDA	gravel	sand	silt	clay



Sieve Size (mm)	Percent Finer	Components	Percentage	Corrected % of Minus 2.0 mm material for USDA Classificat.
100	100.00	*Gravel*	0.22	**0.00**
2	99.78	*Sand*	14.66	**14.69**
0.075	88.50	*Silt*	49.04	**49.15**
0.05	85.11	*Clay*	36.08	**36.16**
0.002	36.08			

USDA Classification	***SILTY CLAY LOAM***
USCS Symbol	***cl, ASSUMED***
USCS Classification	***LEAN CLAY***

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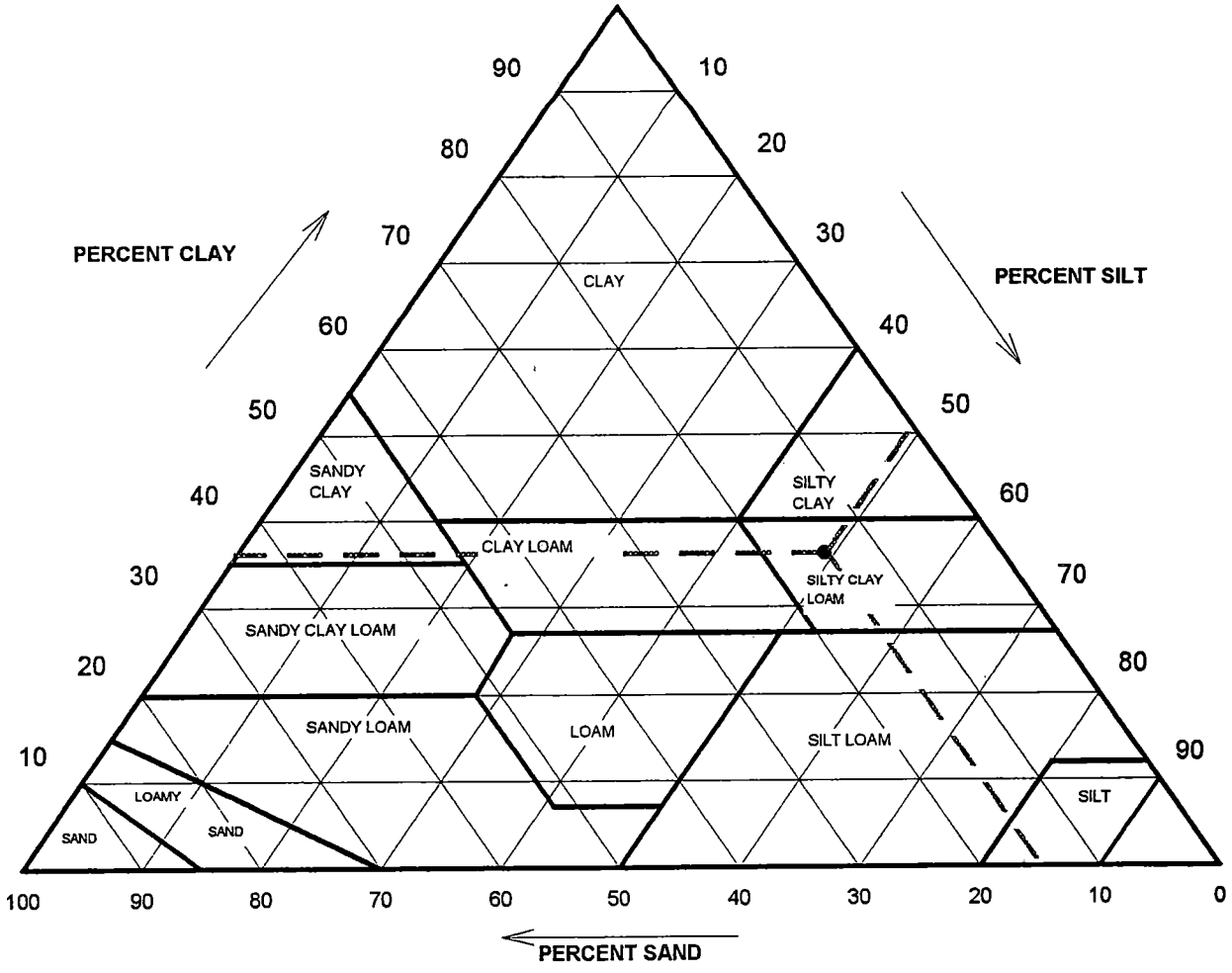
USDA CLASSIFICATION CHART

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	15.0-15.5
Project No.	97178-02	Sample No.	SM010-TB20-1416
Lab ID	97178-02.020	Soil Color	BROWN



Components	Corrected % of Minus 2.0 mm material for USDA Classificat.
Gravel	0.00
Sand	14.69
Silt	49.15
Clay	36.16

USDA Classification ***SILTY CLAY LOAM***

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PERMEABILITY TEST

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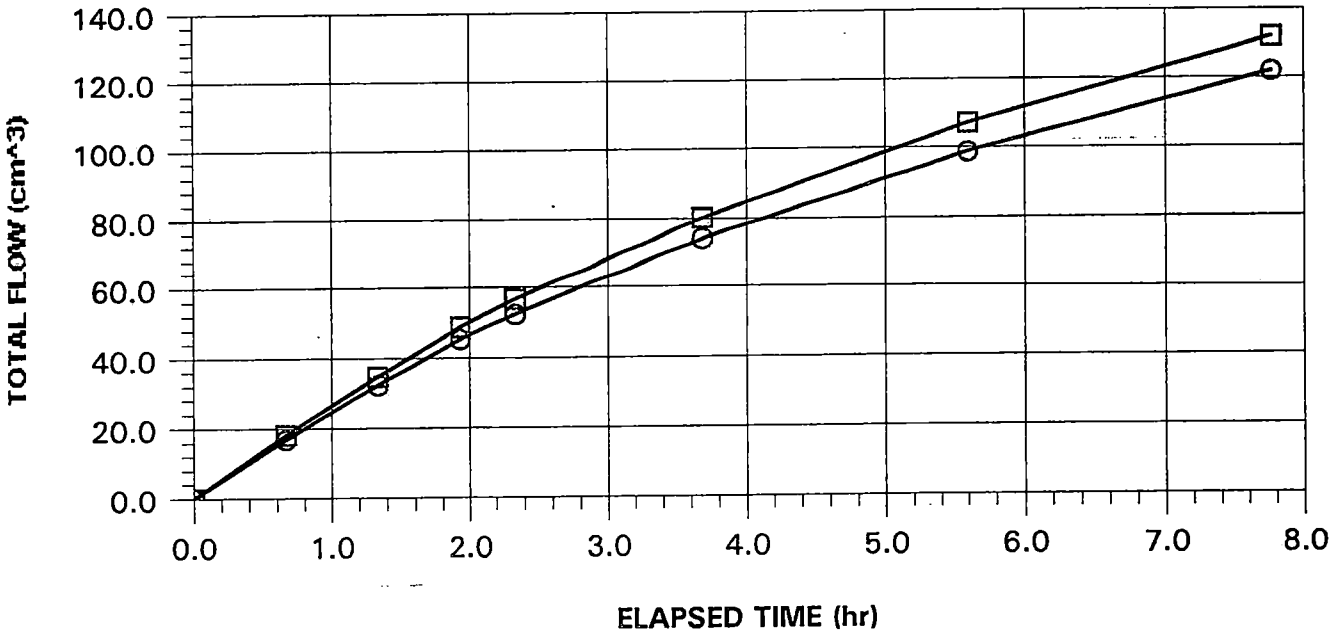
Client	ICF KAISER	Boring No.	NA
Client Project	BAYER 51249	Depth(ft.)	15.5-15.8
Project No.	97178-02	Sample No.	SM010-TB20-1416

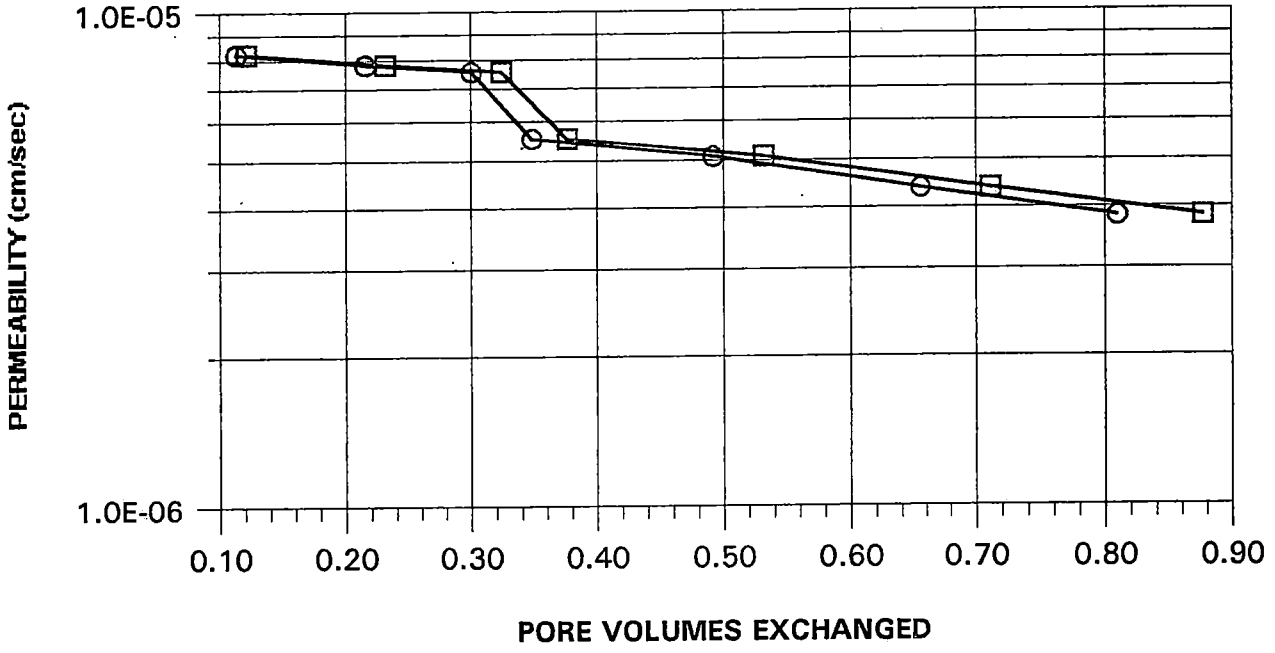
AVERAGE PERMEABILITY = 4.7E-06 cm/sec @ 20°C
AVERAGE PERMEABILITY = 4.7E-08 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY

⊖ INFLOW
⊟ OUTFLOW



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PERMEABILITY TEST

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Client	ICF KAISER	Tested By	JCM	Date	08-12-97
Client Project	BAYER 51249	Checked By	JHO	Date	8/22/97
Project No.	97178-02				
Boring No.	NA	Specific Gravity	2.70 ASSUMED		
Depth(ft.)	15.5-15.8	Sample Condition	UNDISTURBED		
Sample No.	SM010-TB20-1416				

Visual Description BROWN CLAY

MOISTURE CONTENT	BEFORE TEST	AFTER TEST
Tare Number	1280	1719
Wt. Tare & WS(gm.)	239.50	833.00
Wt. Tare & DS(gm.)	200.76	682.40
Wt. Water(gm.)	38.74	150.60
Wt. Tare(gm.)	34.47	84.87
Wt. DS(gm.)	166.29	597.53
Moisture Content(%)	23.3	25.2

UNIT WEIGHT		
Wt. Tube & WS.(gms.)	1006.90	NA
Wt. Of Tube(gms.)	263.46	NA
Wt. Of WS.(gms.)	743.44	754.9
Length 1 (in.)	3.560	3.588
Length 2 (in.)	3.544	3.578
Length 3 (in.)	3.527	3.569
Top Diameter (in.)	2.876	2.842
Middle Diameter (in.)	2.874	2.850
Bottom Diameter (in.)	2.861	2.856
Average Length (in)	3.54	3.58
Average Area (in^2)	6.47	6.38
Sample Volume(cc.)	375.76	373.90
Unit Wet Wt.(gms/cc)	1.98	2.02
Unit Wet Wt.(pcf.)	123.5	126.0
Unit Dry Wt.(pcf.)	100.1	100.6
Unit Dry Wt.(gms/cc)	1.60	1.61
Void Ratio,e	0.68	0.67
Porosity, n	0.41	0.40
Pore Volume(cm^3)	152.4	150.6

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PERMEABILITY TEST

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Client	ICF KAISER	Tested By	JCM	Date	08-12-97
Client Project	BAYER 51249	Checked By	JMO	Date	8/22/97
Project No.	97178-02				
Boring No.	NA				
Depth(ft.)	15.5-15.8				
Sample No.	SM010-TB20-1416				
Visual Description	BROWN CLAY				

Pressure Heads (Constant)	
Top Cap (psi)	77.5
Bottom Cap (psi)	80.0
Cell (psi)	85.0
Total Pressure Head (cm)	175.8

Final Sample Dimensions	
Sample Length (cm.), L	9.09
Sample Diameter (cm.)	7.24
Sample Area (cm.^2), A	41.14
Inflow Burette Area, (cm.^2), a-in	4.51
Outflow Burette Area, (cm.^2), a-out	4.60
B Parameter	98%

AVERAGE PERMEABILITY = 4.7E-06 **cm/sec @ 20°C**
AVERAGE PERMEABILITY = 4.7E-08 **m/sec @ 20°C**

DATE mon-dy-yr	TIME hr	TIME min	ELAPSED TIME (t) hr	TOTAL INFLOW cm^3	TOTAL OUTFLOW cm^3	TOTAL HEAD (h) cm	FLOW 0 FLOW 1 STOP	TEMP °C	INCREMENTAL PERMEABILITY @ 20°C cm/sec
08-14-97	15	59	0.0	0.0	0.0	188.8	0	22.5	NA
08-14-97	16	39	0.7	17.0	18.2	181.1	0	22.5	8.2E-06
08-14-97	17	19	1.3	32.4	34.8	174.1	0	22.5	7.8E-06
08-14-97	17	55	1.9	45.3	48.9	168.2	1	22.5	7.6E-06
08-15-97	7	54	1.9	45.3	48.9	195.4	0	23.0	NA
08-15-97	8	18	2.3	52.5	56.7	192.1	0	23.0	5.5E-06
08-15-97	9	39	3.7	74.1	80.1	182.2	0	23.0	5.1E-06
08-15-97	11	34	5.6	98.8	107.1	170.8	0	23.0	4.4E-06
08-15-97	13	44	7.8	121.9	132.0	160.3	0	23.0	3.8E-06

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SHELBY TUBE UNIT WEIGHT

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Client	ICF KAISER	Tested By	BL 8-12-97
Client Project	BAYER 51249	Checked By	JHO 9-3-97
Project No.	97178-02		
Boring No.	NA	Tube Recovery	1.80
Depth Pushed	1.0-3.0		
Shelby Tube No.	SM018-TB01-0103		

SOIL PROFILE AND SAMPLING

DEPTH ( )	ELEV ( )	SECTION No.	SOIL PROFILE	SOIL DESCRIPTION AND REMARKS	TEST PERFORMED
1.00					
1.50					
2.00					
2.50		2		BROWN SANDY LEAN CLAY	UNIT WGT. WC, GRAINSIZE HYDROMETER
3.00		1			NO TEST

NOTE:WHEN FULL RECOVERY IS NOT ACHIEVED,SOIL ELEVATION CAN NOT BE ACCURATELY DEFINE
INDICATE EACH CUT OF THE TUBE WITH AN ARROW
INDICATE DIVIDING LINE BETWEEN SOIL TYPES BY A SOLID LINE
INDICATE WAX BY CROSS-HATCHING
INDICATE SOIL TYPES BY STANDARD SYMBOLS

MOISTURE CONTENT					
Section Number	1	2	3	4	5
Tare Number		1693			
Wt. Tare & WS(gm.)		238.83			
Wt. Tare & DS(gm.)		218.01			
Wt. Tare(gm.)		83.31			
Moisture Content(%)		15.5			

UNIT WEIGHT	
Wt. Tube & WS.(gms.)	1025.80
Wt. Of Tube(gms.)	258.23
Wt. Of WS.(gms.)	767.57
Length 1 (in.)	3.436
Length 2 (in.)	3.469
Length 3 (in.)	3.462
Top Diameter (in.)	2.875
Middle Diameter (in.)	2.842
Bottom Diameter (in.)	2.880
Sample Volume (cc)	365.24
Moisture Content(%)	15.46
Unit Wet Wt.(gms/cc)	2.10
Unit Wet Wt.(pcf.)	131.1
Unit Dry Wt.(pcf.)	113.6
Unit Dry Wt.(gms/cc)	1.82

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	2.5-2.8
Project No.	97178-02	Sample No.	SM018-TB01-0103
Lab ID	97178-02.039	Soil Color	**BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	1135	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	581.20	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	520.10	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	101.83	Weight of Tare (gm)	NA
Weight of Water (gm)	61.10	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	418.27	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**14.6**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	418.27
Dry Weight - 3/4" Sample (gm)	165.53	Weight of minus #200 material (gm)	252.74
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	165.53
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"	12.5	3.97	0.95	0.95	99.05	**99.05**
3/8"	9.50	1.98	0.47	1.42	98.58	**98.58**
#4	4.75	10.73	2.57	3.99	96.01	**96.01**
#10	2.00	11.16	2.67	6.66	93.34	**93.34**
#20	0.85	7.27	1.74	8.39	91.61	**91.61**
#40	0.425	6.27	1.50	9.89	90.11	**90.11**
#60	0.250	11.26	2.69	12.59	87.41	**87.41**
#140	0.106	76.29	18.24	30.82	69.18	**69.18**
#200	0.075	36.60	8.75	39.57	60.43	**60.43**
Pan	-	252.74	60.43	100.00	-	-

Tested By BL Date 8/12/97 Checked By Jcm Date 8-22-97

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HYDROMETER ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	2.5-2.8
Project No.	97178-02	Sample No.	SM018-TB01-0103
Lab ID	97178-02.039	Soil Color	**BROWN**

Elapsed Time (min)		R Measured	Temp. (°C)	R Corrected	N (%)	Diameter (mm)	N' (%)
0	NA	NA	NA	NA	NA	NA	NA
2	28.0	29.0	24.3	23.4	73.6	0.0307	**44.4**
5		25.5	24.3	19.9	62.5	0.0199	**37.8**
15		21.0	24.3	15.4	48.4	0.0118	**29.2**
30		19.5	24.3	13.9	43.6	0.0084	**26.4**
60		17.5	23.4	11.9	37.3	0.0060	**22.6**
205		15.0	23.5	9.4	29.5	0.0033	**17.8**
1440		12.0	23.8	6.4	20.0	0.0013	**12.1**

Soil Specimen Data		**Corrections**	
Tare No.	1324	K - Factor	0.01278
Tare + Dry Material (gm)	137.92	a - Factor	0.99
Weight of Tare (gm)	101.49	Composite Correction	5.65
Weight of Deflocculant (gm)	5.0	Percent Finer than # 200	60.43
Weight of Dry Material (gm)	31.43		
		Specific Gravity	2.7 Assumed

Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By TO Date 8/14/97 Checked By JCM Date 8-22-97

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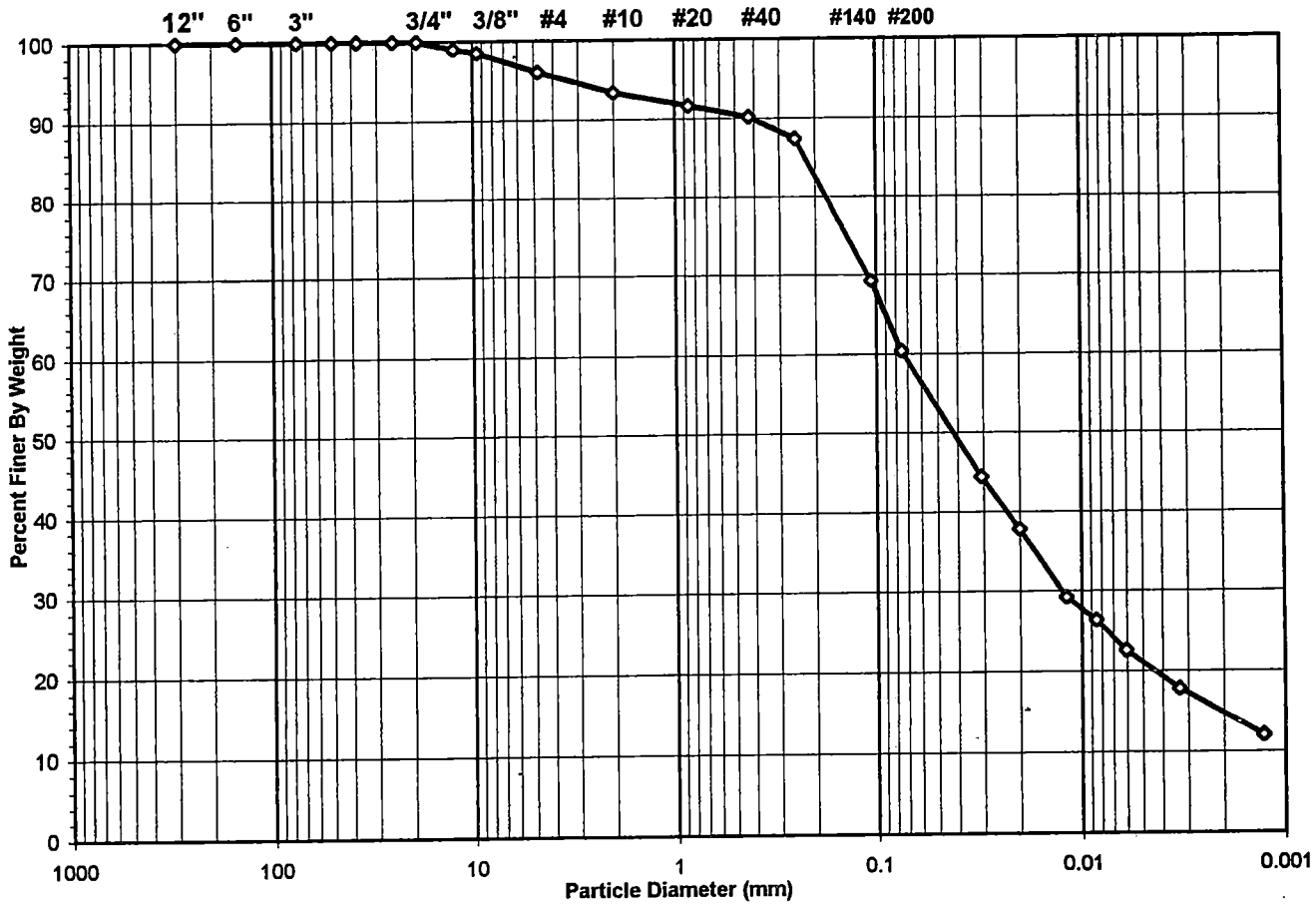
SIEVE AND HYDROMETER ANALYSIS
ASTM D 422-63 (SOP-S3)

geotechnics

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	2.5-2.8
Project No.	97178-02	Sample No.	SM018-TB01-0103
Lab ID	97178-02.039	Soil Color	BROWN

	SIEVE ANALYSIS		HYDROMETER	
USCS	gravel	sand	silt and clay fraction	
USDA	gravel	sand	silt	clay



Sieve Size (mm)	Percent Finer	Components	Percentage	Corrected % of Minus 2.0 mm material for USDA Classificat.
100	100.00	*Gravel*	6.66	**0.00**
2	93.34	*Sand*	40.17	**43.04**
0.075	60.43	*Silt*	38.40	**41.14**
0.05	53.17	*Clay*	14.77	**15.83**
0.002	14.77			

USDA Classification ***LOAM***

USCS Symbol ***cl, ASSUMED***

USCS Classification ***SANDY LEAN CLAY***

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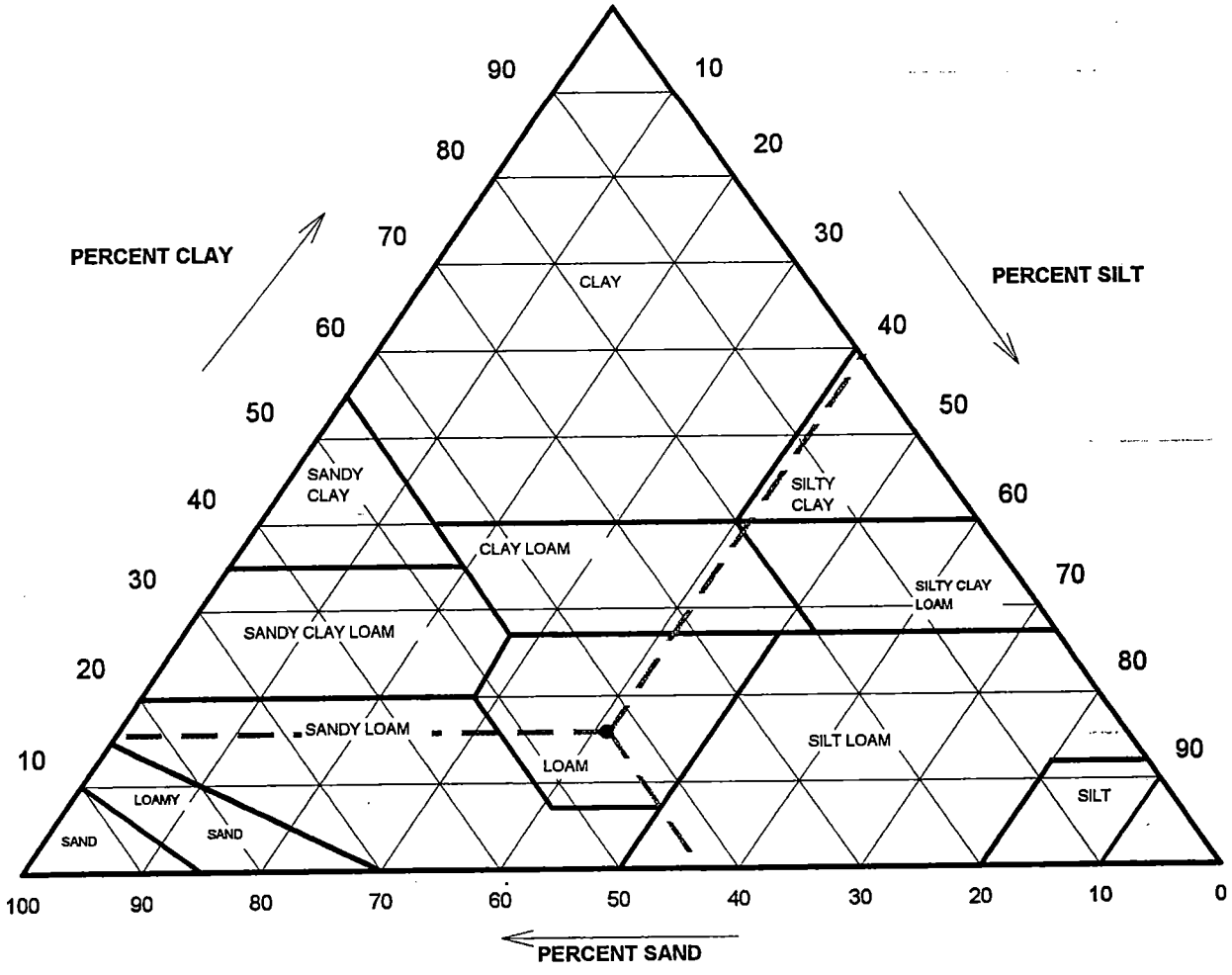
USDA CLASSIFICATION CHART

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	2.5-2.8
Project No.	97178-02	Sample No.	SM018-TB01-0103
Lab ID	97178-02.039	Soil Color	BROWN



Components	Corrected % of Minus 2.0 mm material for USDA Classificat.
Gravel	0.00
Sand	43.04
Silt	41.14
Clay	15.83
USDA Classification	***LOAM***

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SHELBY TUBE UNIT WEIGHT

geotechnics

Client	ICF KAISER	Tested By	BL 8-12-97
Client Project	BAYER 51249	Checked By	JMO 8/29/97
Project No.	97178-02		
Boring No.	NA	Tube Recovery	1.90
Depth Pushed	17.0-19.0		
Shelby Tube No.	SM018-TB01-1719		

SOIL PROFILE AND SAMPLING

DEPTH ( )	ELEV ( )	SECTION No.	SOIL PROFILE	SOIL DESCRIPTION AND REMARKS	TEST PERFORMED
17.00					
17.50					
18.00					
18.50		2		BROWN CLAYEY SAND	UNIT WGT. WC. GRAINSIZE HYDROMETER
19.00		1			NO TEST

NOTE:WHEN FULL RECOVERY IS NOT ACHIEVED,SOIL ELEVATION CAN NOT BE ACCURATELY DEFINE
INDICATE EACH CUT OF THE TUBE WITH AN ARROW
INDICATE DIVIDING LINE BETWEEN SOIL TYPES BY A SOLID LINE
INDICATE WAX BY CROSS-HATCHING
INDICATE SOIL TYPES BY STANDARD SYMBOLS

MOISTURE CONTENT					
Section Number	1	2	3	4	5
Tare Number		725			
Wt. Tare & WS(gm.)		219.41			
Wt. Tare & DS(gm.)		198.73			
Wt. Tare(gm.)		87.02			
Moisture Content(%)		18.5			

UNIT WEIGHT	
Wt. Tube & WS.(gms.)	1002.40
Wt. Of Tube(gms.)	257.89
Wt. Of WS.(gms.)	744.51
Length 1 (in.)	3.474
Length 2 (in.)	3.459
Length 3 (in.)	3.472
Top Diameter (in.)	2.855
Middle Diameter (in.)	2.879
Bottom Diameter (in.)	2.868
Sample Volume (cc)	367.00
Moisture Content(%)	18.51
Unit Wet Wt.(gms/cc)	2.03
Unit Wet Wt.(pcf.)	126.6
Unit Dry Wt.(pcf.)	106.8
Unit Dry Wt.(gms/cc)	1.71

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	18.5-18.8
Project No.	97178-02	Sample No.	SM018-TB01-1719
Lab ID	97178-02.040	Soil Color	**BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	1668	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	581.60	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	500.90	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	100.08	Weight of Tare (gm)	NA
Weight of Water (gm)	80.70	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	400.82	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**20.1**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	400.82
Dry Weight - 3/4" Sample (gm)	288.23	Weight of minus #200 material (gm)	112.59
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	288.23
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"	12.5	0.00	0.00	0.00	100.00	**100.00**
3/8"	9.50	0.00	0.00	0.00	100.00	**100.00**
#4	4.75	3.25	0.81	0.81	99.19	**99.19**
#10	2.00	3.37	0.84	1.65	98.35	**98.35**
#20	0.85	3.68	0.92	2.57	97.43	**97.43**
#40	0.425	7.09	1.77	4.34	95.66	**95.66**
#60	0.250	114.80	28.64	32.98	67.02	**67.02**
#140	0.106	140.04	34.94	67.92	32.08	**32.08**
#200	0.075	16.00	3.99	71.91	28.09	**28.09**
Pan	-	112.59	28.09	100.00	-	-

Tested By BL Date 8/12/97 Checked By Jam Date 8-22-97

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HYDROMETER ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	18.5-18.8
Project No.	97178-02	Sample No.	SM018-TB01-1719
Lab ID	97178-02.040	Soil Color	**BROWN**

Elapsed Time (min)		R Measured	Temp. (°C)	R Corrected	N (%)	Diameter (mm)	N' (%)
0	NA	NA	NA	NA	NA	NA	NA
2	19.0	19.0	24.3	13.4	76.4	0.0328	**21.5**
5		18.5	24.3	12.9	73.6	0.0208	**20.7**
17		17.5	24.3	11.9	67.9	0.0114	**19.1**
30		16.5	24.3	10.9	62.1	0.0086	**17.5**
60		15.0	23.4	9.4	53.5	0.0061	**15.0**
211		15.0	23.5	9.4	53.5	0.0033	**15.0**
1440		13.0	23.8	7.4	42.1	0.0013	**11.8**

Soil Specimen Data		Corrections	
Tare No.	1644	K - Factor	0.01278
Tare + Dry Material (gm)	124.69	a - Factor	0.99
Weight of Tare (gm)	102.4	Composite Correction	5.65
Weight of Deflocculant (gm)	5.0	Percent Finer than # 200	28.09
Weight of Dry Material (gm)	17.29		
		Specific Gravity	2.7 Assumed

Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By TO Date 8/14/97 Checked By JCM Date 8-22-97

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SIEVE AND HYDROMETER ANALYSIS
ASTM D 422-63 (SOP-S3)

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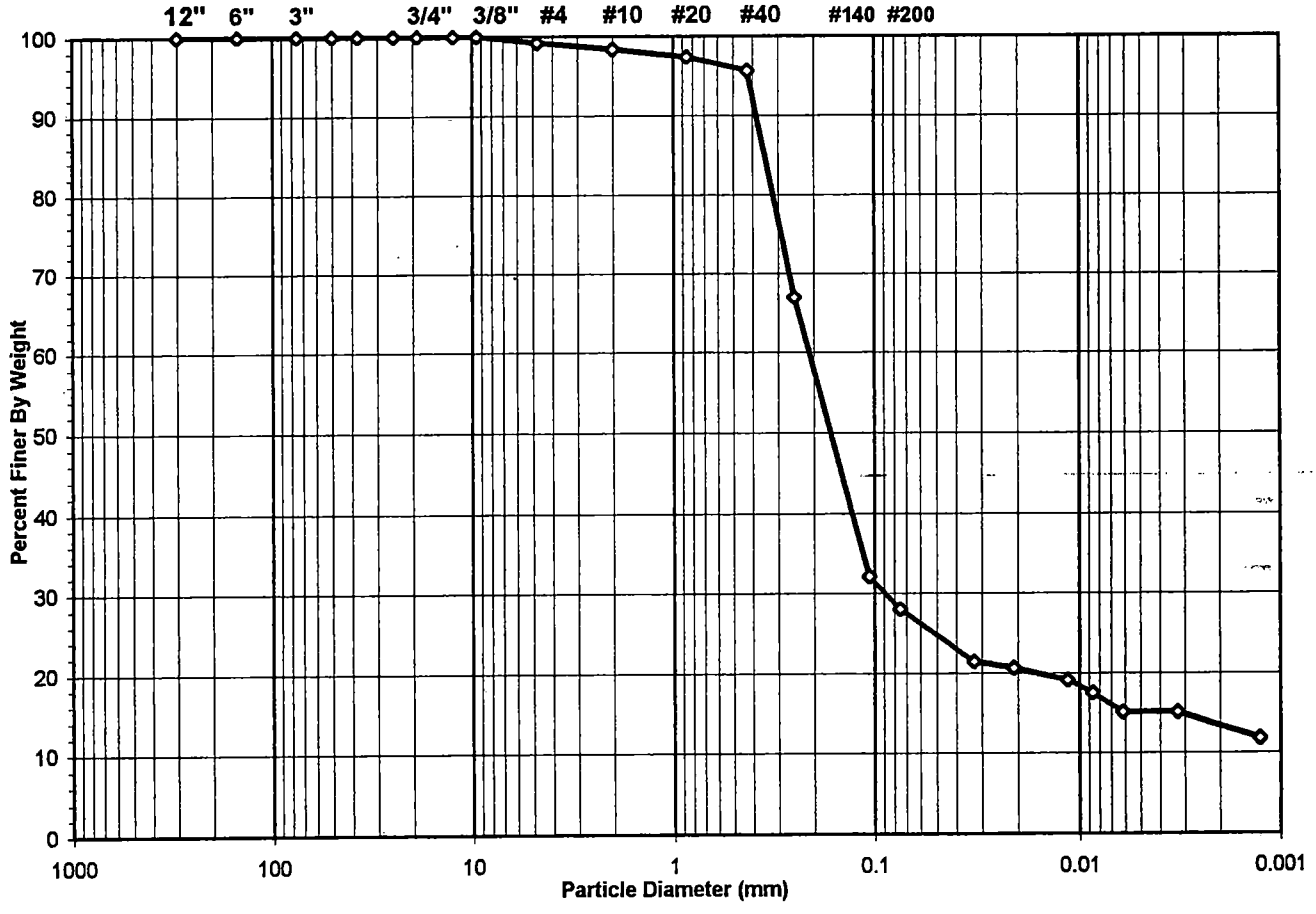
Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	18.5-18.8
Project No.	97178-02	Sample No.	SM018-TB01-1719
Lab ID	97178-02.040	Soil Color	BROWN

	SIEVE ANALYSIS		HYDROMETER	
USCS	gravel	sand	silt and clay fraction	
USDA	gravel	sand	silt	clay



Sieve Size (mm)	Percent Finer	Components	Percentage	Corrected % of Minus 2.0 mm material for USDA Classificat.
100	100.00	*Gravel*	1.65	**0.00**
2	98.35	*Sand*	73.50	**74.74**
0.075	28.09	*Silt*	11.48	**11.67**
0.05	24.85	*Clay*	13.37	**13.59**
0.002	13.37			

USDA Classification ***SANDY LOAM***

USCS Symbol ***sc, ASSUMED***

USCS Classification ***CLAYEY SAND***

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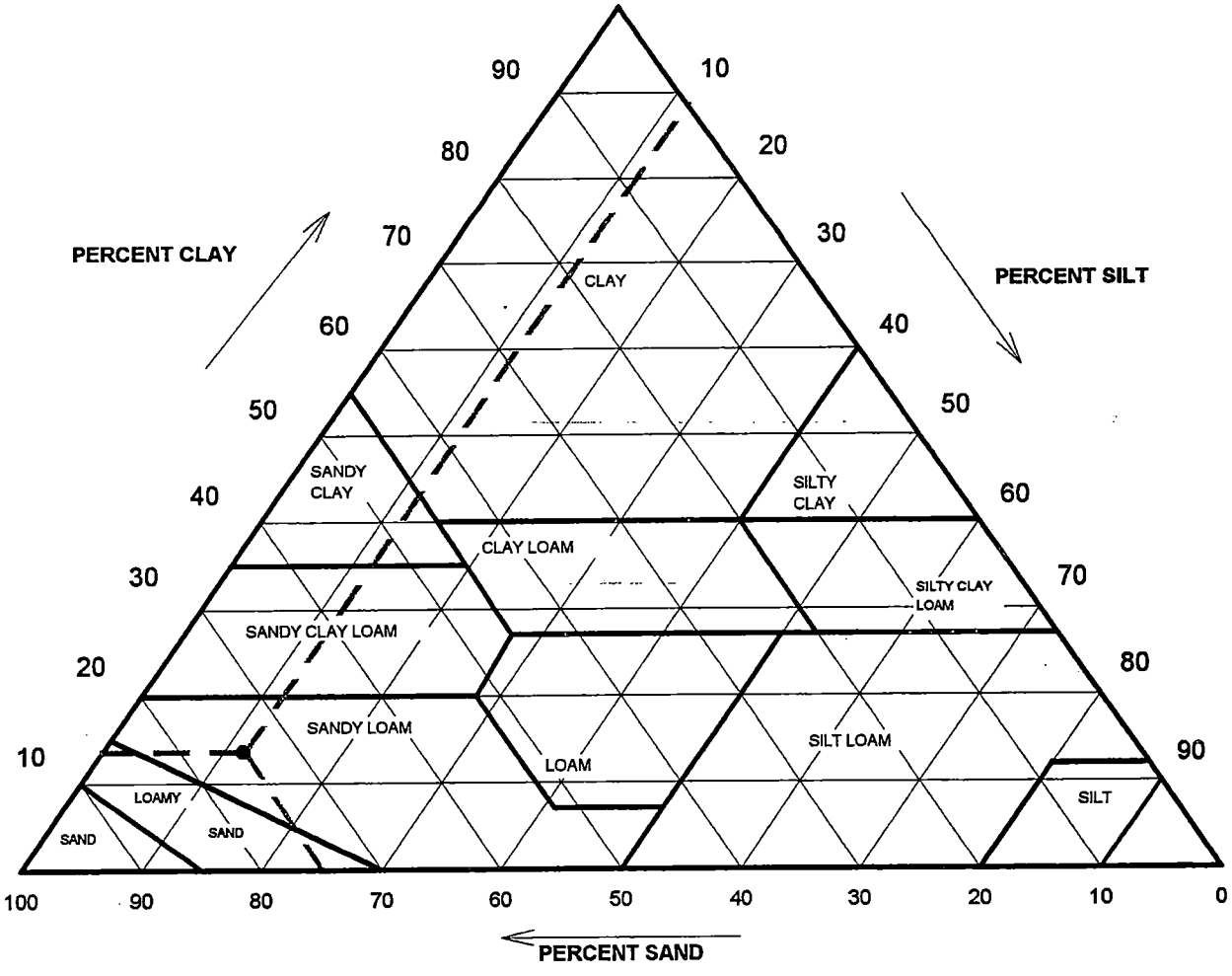
USDA CLASSIFICATION CHART

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	18.5-18.8
Project No.	97178-02	Sample No.	SM018-TB01-1719
Lab ID	97178-02.040	Soil Color	BROWN



Components	Corrected % of Minus 2.0 mm material for USDA Classificat.
Gravel	0.00
Sand	74.74
Silt	11.67
Clay	13.59
USDA Classification	***SANDY LOAM***

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SHELBY TUBE UNIT WEIGHT

geotechnics

Client	ICF KAISER	Tested By	BL 8-12-97
Client Project	BAYER 51249	Checked By	JMO 8/29/97
Project No.	97178-02		
Boring No.	NA	Tube Recovery	1.20
Depth Pushed	1.0-3.0		
Shelby Tube No.	SM019-TB02-0103		

SOIL PROFILE AND SAMPLING

DEPTH ( )	ELEV ( )	SECTION No.	SOIL PROFILE	SOIL DESCRIPTION AND REMARKS	TEST PERFORMED
1.00					
1.50					
2.00					
2.50		2		BROWN CLAYEY GRAVEL WITH SAND	UNIT WGT. WC, GRAINSIZE HYDROMETER
3.00		1			NO TEST

NOTE:WHEN FULL RECOVERY IS NOT ACHIEVED,SOIL ELEVATION CAN NOT BE ACCURATELY DEFINE
INDICATE EACH CUT OF THE TUBE WITH AN ARROW
INDICATE DIVIDING LINE BETWEEN SOIL TYPES BY A SOLID LINE
INDICATE WAX BY CROSS-HATCHING
INDICATE SOIL TYPES BY STANDARD SYMBOLS

MOISTURE CONTENT					
Section Number	1	2	3	4	5
Tare Number		1699			
Wt. Tare & WS(gm.)		186.14			
Wt. Tare & DS(gm.)		178.61			
Wt. Tare(gm.)		83.69			
Moisture Content(%)		7.9			

UNIT WEIGHT	
Wt. Tube & WS.(gms.)	968.20
Wt. Of Tube(gms.)	296.52
Wt. Of WS.(gms.)	671.68
Length 1 (in.)	3.573
Length 2 (in.)	3.590
Length 3 (in.)	3.581
Top Diameter (in.)	2.868
Middle Diameter (in.)	2.855
Bottom Diameter (in.)	2.872
Sample Volume (cc)	378.34
Moisture Content(%)	7.93
Unit Wet Wt.(gms/cc)	1.78
Unit Wet Wt.(pcf.)	110.8
Unit Dry Wt.(pcf.)	102.6
Unit Dry Wt.(gms/cc)	1.64

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	2.5-2.8
Project No.	97178-02	Sample No.	SM019-TB02-0103
Lab ID	97178-02.041	Soil Color	**BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	1658	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	563.90	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	534.40	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	92.94	Weight of Tare (gm)	NA
Weight of Water (gm)	29.50	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	441.46	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**6.7**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	441.46
Dry Weight - 3/4" Sample (gm)	267.76	Weight of minus #200 material (gm)	89.21
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	352.25
Dry Weight + 3/4" Sample (gm)	84.49		
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	38.73	8.77	8.77	91.23	**91.23**
3/4"	19.0	45.76	10.37	19.14	80.86	**80.86**
1/2"	12.5	70.91	16.06	35.20	64.80	**64.80**
3/8"	9.50	24.08	5.45	40.66	59.34	**59.34**
#4	4.75	70.90	16.06	56.72	43.28	**43.28**
#10	2.00	34.85	7.89	64.61	35.39	**35.39**
#20	0.85	12.75	2.89	67.50	32.50	**32.50**
#40	0.425	13.61	3.08	70.58	29.42	**29.42**
#60	0.250	13.55	3.07	73.65	26.35	**26.35**
#140	0.106	19.29	4.37	78.02	21.98	**21.98**
#200	0.075	7.82	1.77	79.79	20.21	**20.21**
Pan	-	89.21	20.21	100.00	-	-

Tested By BL Date 8/12/97 Checked By JMO Date 8/22/97

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HYDROMETER ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	2.5-2.8
Project No.	97178-02	Sample No.	SM019-TB02-0103
Lab ID	97178-02.041	Soil Color	**BROWN**

Elapsed Time (min)		R Measured	Temp. (°C)	R Corrected	N (%)	Diameter (mm)	N' (%)
0	NA	NA	NA	NA	NA	NA	NA
2	26.0	27.0	24.3	21.4	83.2	0.0311	**16.8**
5		24.0	24.3	18.4	71.6	0.0201	**14.5**
15		22.5	24.3	16.9	65.7	0.0117	**13.3**
30		20.0	24.3	14.4	56.0	0.0084	**11.3**
60		18.5	23.4	12.9	50.1	0.0060	**10.1**
214		16.0	23.5	10.4	40.4	0.0032	**8.2**
1440		12.0	23.8	6.4	24.8	0.0013	**5.0**

Soil Specimen Data		Corrections	
Tare No.	1914	K - Factor	0.01278
Tare + Dry Material (gm)	134.82	a - Factor	0.99
Weight of Tare (gm)	104.43	Composite Correction	5.65
Weight of Deflocculant (gm)	5.0	Percent Finer than # 200	- 20.21
Weight of Dry Material (gm)	25.39		
		Specific Gravity	2.7 Assumed

Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By TO Date 8/14/97 Checked By JMO Date 8/22/97

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SIEVE AND HYDROMETER ANALYSIS
ASTM D 422-63 (SOP-S3)

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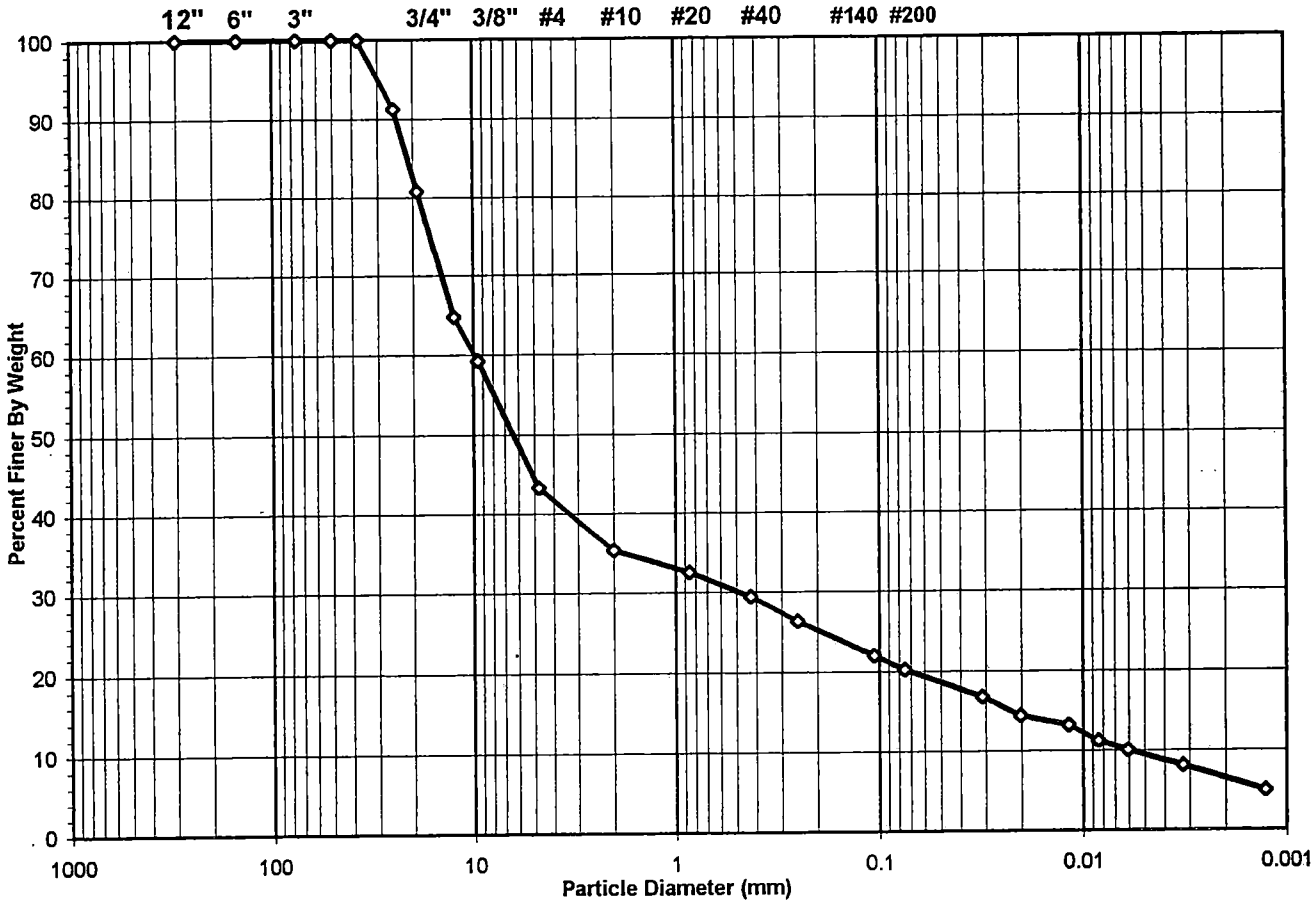
Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	2.5-2.8
Project No.	97178-02	Sample No.	SM019-TB02-0103
Lab ID	97178-02.041	Soil Color	BROWN

	SIEVE ANALYSIS		HYDROMETER	
USCS	gravel	sand	silt and clay fraction	
USDA	gravel	sand	silt	clay



Sieve Size (mm)	Percent Finer	Components	Percentage	Corrected % of Minus 2.0 mm material for USDA Classificat.
100	100.00	*Gravel*	64.61	**0.00**
2	35.39	*Sand*	16.74	**47.31**
0.075	20.21	*Silt*	12.12	**34.24**
0.05	18.65	*Clay*	6.53	**18.45**
0.002	6.53			

USDA Classification ***LOAM***

USCS Symbol ***gc, ASSUMED***

USCS Classification ***CLAYEY GRAVEL WITH SAND***

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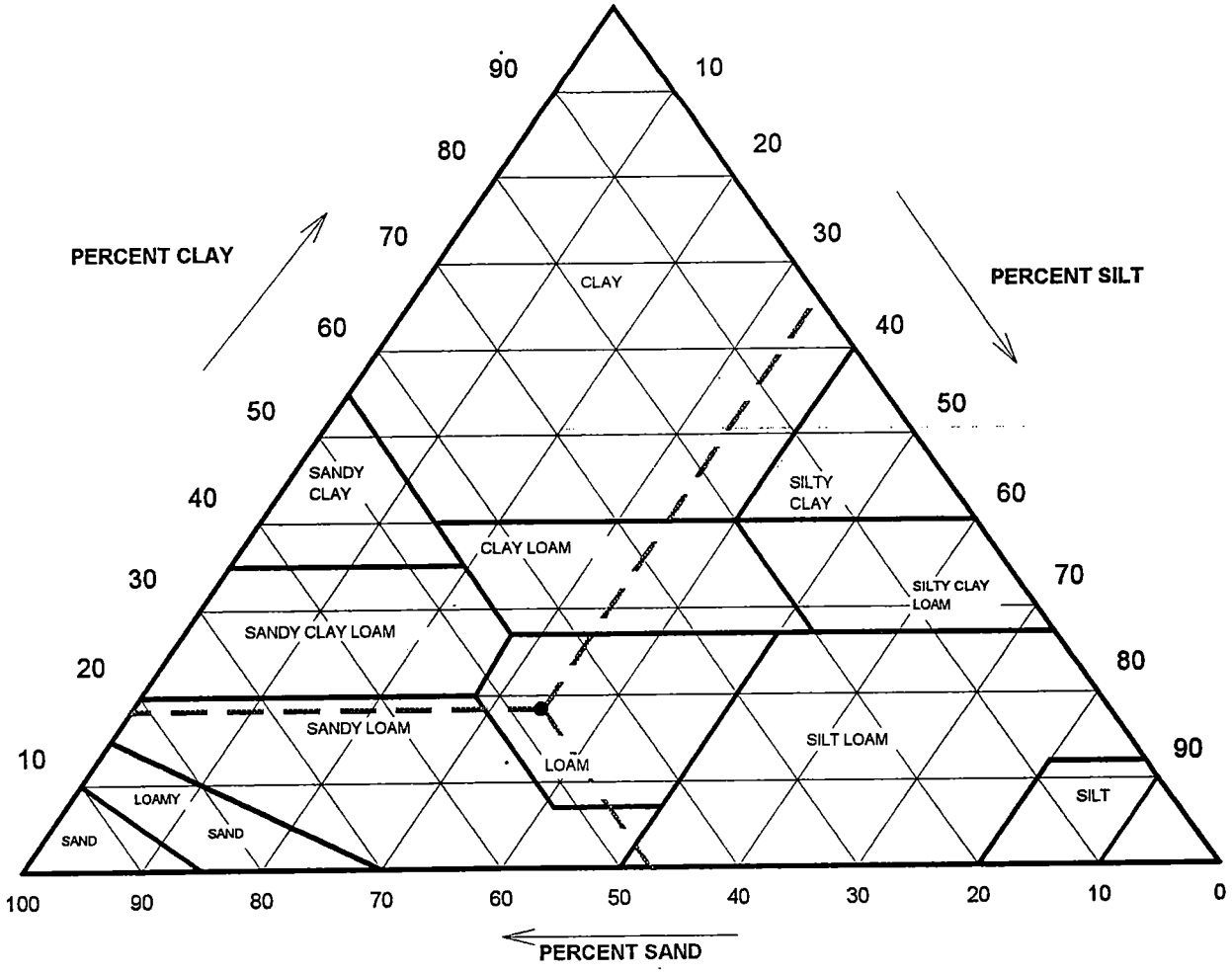
USDA CLASSIFICATION CHART

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	2.5-2.8
Project No.	97178-02	Sample No.	SM019-TB02-0103
Lab ID	97178-02.041	Soil Color	BROWN



Components	Corrected % of Minus 2.0 mm material for USDA Classificat.
Gravel	0.00
Sand	47.31
Silt	34.24
Clay	18.45
USDA Classification	***LOAM***

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SHELBY TUBE UNIT WEIGHT

geotechnics

Client	ICF KAISER	Tested By	BL 8-12-97
Client Project	BAYER 51249	Checked By	JCM 9-5-97
Project No.	97178-02		
Boring No.	NA	Tube Recovery	0.40
Depth Pushed	.5-1.0		
Shelby Tube No.	SM019-TB03-0001		

SOIL PROFILE AND SAMPLING

	DEPTH ( )	ELEV ( )	SECTION No.	SOIL PROFILE	SOIL DESCRIPTION AND REMARKS	TEST PERFORMED
0.00					UNABLE TO RUN DENSITY	
0.50					GRAY CLAYEY GRAVEL WITH SAND	WC GRAIN SIZE HYDROMETER
1.00			1			

NOTE:WHEN FULL RECOVERY IS NOT ACHIEVED,SOIL ELEVATION CAN NOT BE ACCURATELY DEFINE
INDICATE EACH CUT OF THE TUBE WITH AN ARROW
INDICATE DIVIDING LINE BETWEEN SOIL TYPES BY A SOLID LINE
INDICATE WAX BY CROSS-HATCHING
INDICATE SOIL TYPES BY STANDARD SYMBOLS

MOISTURE CONTENT					
Section Number	1	2	3	4	5
Tare Number	1686				
Wt. Tare & WS(gm.)	566.90				
Wt. Tare & DS(gm.)	548.60				
Wt. Tare(gm.)	98.92.				
Moisture Content(%)	4.1				

UNIT WEIGHT	
Wt. Tube & WS.(gms.)	
Wt. Of Tube(gms.)	
Wt. Of WS.(gms.)	
Length 1 (in.)	
Length 2 (in.)	
Length 3 (in.)	
Top Diameter (in.)	
Middle Diameter (in.)	
Bottom Diameter (in.)	
Sample Volume (cc)	
Moisture Content(%)	
Unit Wet Wt.(gms/cc)	
Unit Wet Wt.(pcf.)	
Unit Dry Wt.(pcf.)	
Unit Dry Wt.(gms/cc)	

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DCN: DS-S3A
DATE: 11/12/96
REVISION: 1

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	.6-1.0
Project No.	97178-02	Sample No.	SM019-TB03-0001
Lab ID	97178-02.042	Soil Color	**GRAY**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	1686	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	566.90	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	548.60	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	98.92	Weight of Tare (gm)	NA
Weight of Water (gm)	18.30	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	449.68	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**4.1**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	449.68
Dry Weight - 3/4" Sample (gm)	326.81	Weight of minus #200 material (gm)	99.95
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	349.73
Dry Weight + 3/4" Sample (gm)	22.92		
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	22.92	5.10	5.10	94.90	**94.90**
1/2"	12.5	33.81	7.52	12.62	87.38	**87.38**
3/8"	9.50	40.40	8.98	21.60	78.40	**78.40**
#4	4.75	79.87	17.76	39.36	60.64	**60.64**
#10	2.00	54.32	12.08	51.44	48.56	**48.56**
#20	0.85	44.37	9.87	61.31	38.69	**38.69**
#40	0.425	32.03	7.12	68.43	31.57	**31.57**
#60	0.250	18.45	4.10	72.53	27.47	**27.47**
#140	0.106	19.19	4.27	76.80	23.20	**23.20**
#200	0.075	4.37	0.97	77.77	22.23	**22.23**
Pan	-	99.95	22.23	100.00	-	-

Tested By BL Date 8/12/97 Checked By JMO Date 8/22/97

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HYDROMETER ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	.6-1.0
Project No.	97178-02	Sample No.	SM019-TB03-0001
Lab ID	97178-02.042	Soil Color	**GRAY**

Elapsed Time (min)		R Measured	Temp. (°C)	R Corrected	N (%)	Diameter (mm)	N' (%)
0	NA	NA	NA	NA	NA	NA	NA
2	36.0	35.5	24.3	29.9	87.1	0.0292	**19.4**
5		35.0	24.3	29.4	85.6	0.0186	**19.0**
15		33.5	24.3	27.9	81.3	0.0108	**18.1**
30		31.5	24.3	25.9	75.4	0.0078	**16.8**
62		29.0	23.4	23.4	68.1	0.0055	**15.1**
217		22.0	23.5	16.4	47.7	0.0031	**10.6**
1440		14.5	23.8	8.9	25.8	0.0013	**5.7**

Soil Specimen Data		Corrections	
Tare No.	1619	K - Factor	0.01278
Tare + Dry Material (gm)	136.2	a - Factor	0.99
Weight of Tare (gm)	97.27	Composite Correction	5.65
Weight of Deflocculant (gm)	5.0	Percent Finer than # 200	22.23
Weight of Dry Material (gm)	33.93		
		Specific Gravity	2.7 Assumed

Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By TO Date 8/14/97 Checked By JMO Date 8/22/97

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SIEVE AND HYDROMETER ANALYSIS

ASTM D 422-63 (SOP-S3)

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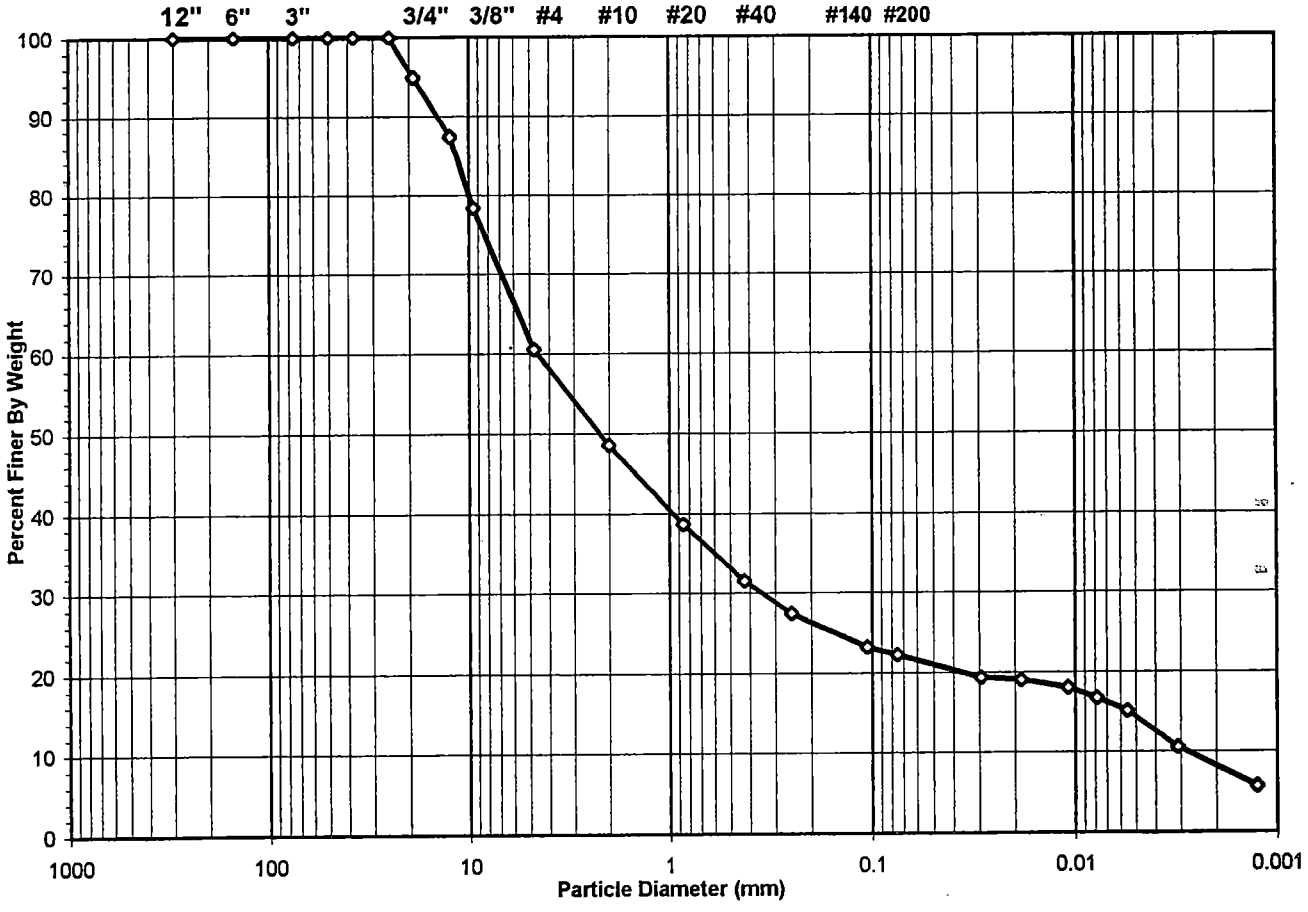
Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	.6-1.0
Project No.	97178-02	Sample No.	SM019-TB03-0001
Lab ID	97178-02.042	Soil Color	**GRAY**

	SIEVE ANALYSIS		*HYDROMETER*	
USCS	**gravel**	**sand**	**silt and clay fraction**	
USDA	**gravel**	**sand**	**silt**	**clay**



Sieve Size (mm)	Percent Finer	Components	Percentage	Corrected % of Minus 2.0 mm material for USDA Classificat.
100	100.00	*Gravel*	51.44	**0.00**
2	48.56	*Sand*	27.57	**56.77**
0.075	22.23	*Silt*	12.74	**26.23**
0.05	20.99	*Clay*	8.25	**17.00**
0.002	8.25			

USDA Classification ***SANDY LOAM***

USCS Symbol ***gc, ASSUMED***

USCS Classification ***CLAYEY GRAVEL WITH SAND***

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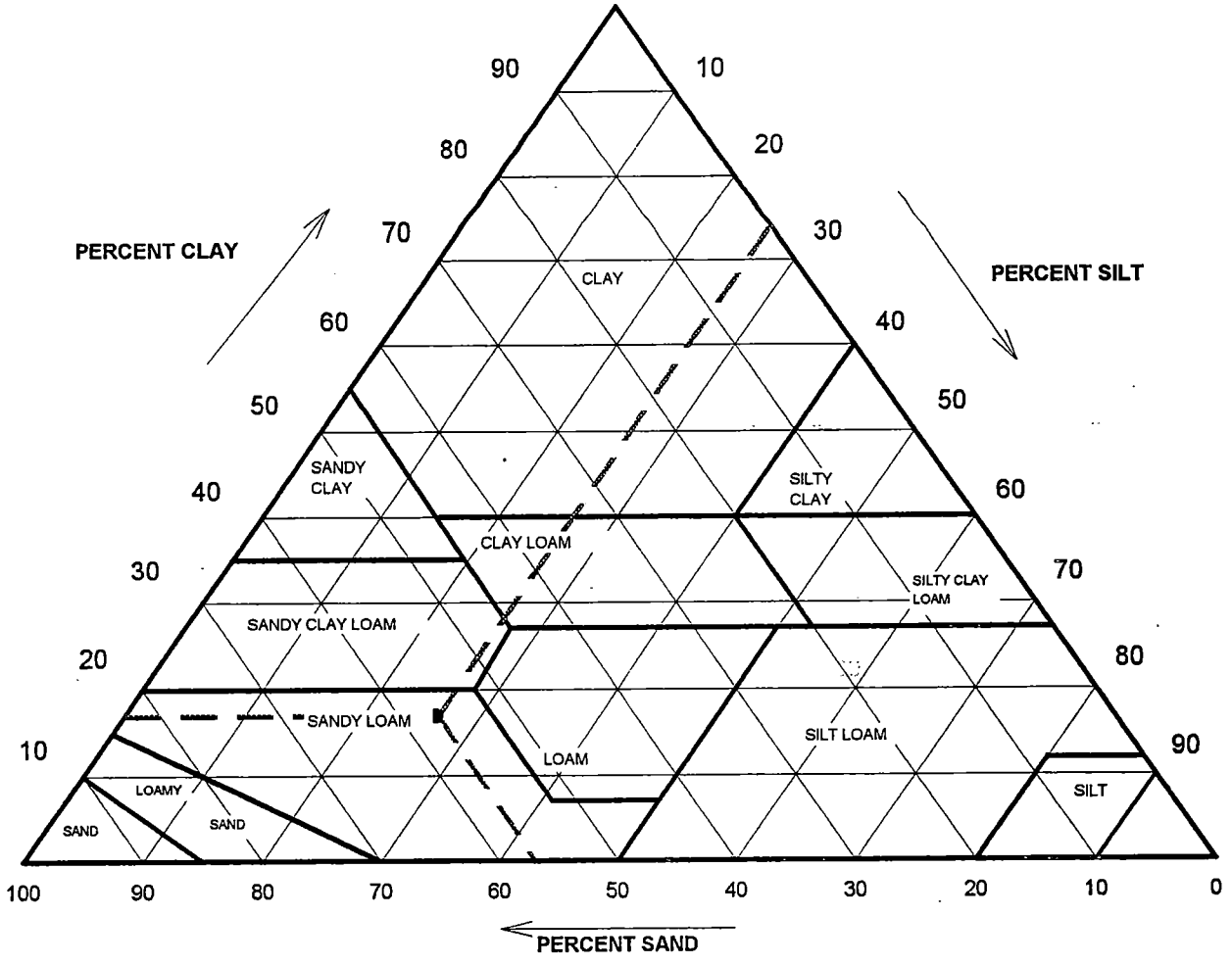
USDA CLASSIFICATION CHART

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	.6-1.0
Project No.	97178-02	Sample No.	SM019-TB03-0001
Lab ID	97178-02.042	Soil Color	GRAY



Components	Corrected % of Minus 2.0 mm material for USDA Classificat.
Gravel	0.00
Sand	56.77
Silt	26.23
Clay	17.00
USDA Classification	***SANDY LOAM***

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SHELBY TUBE UNIT WEIGHT

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Client	ICF KAISER	Tested By	JCM 8-12-97
Client Project	BAYER 51249	Checked By	JMO 8/29/97
Project No.	97178-02		
Boring No.	NA	Tube Recovery	1.70
Depth Pushed	3.0-5.0		
Shelby Tube No.	SM019-TB03-0305		

SOIL PROFILE AND SAMPLING

DEPTH ( )	ELEV ( )	SECTION No.	SOIL PROFILE	SOIL DESCRIPTION AND REMARKS	TEST PERFORMED
3.00					
3.50					
4.00					UNIT WGT. WC. GRAINSIZE HYDROMETER
		3		GRAY GRAVELLY LEAN CLAY WITH SAND	
4.50					PERMEABILITY
		2			
		1			WATER CONTENT
5.00					

NOTE:WHEN FULL RECOVERY IS NOT ACHIEVED,SOIL ELEVATION CAN NOT BE ACCURATELY DEFINE
INDICATE EACH CUT OF THE TUBE WITH AN ARROW
INDICATE DIVIDING LINE BETWEEN SOIL TYPES BY A SOLID LINE
INDICATE WAX BY CROSS-HATCHING
INDICATE SOIL TYPES BY STANDARD SYMBOLS

MOISTURE CONTENT					
Section Number	1	2	3	4	5
Tare Number	1843		1711		
Wt. Tare & WS(gm.)	253.62		888.80		
Wt. Tare & DS(gm.)	230.16		803.60		
Wt. Tare(gm.)	40.83		83.84		
Moisture Content(%)	12.4		11.8		

UNIT WEIGHT		
Wt. Tube & WS.(gms.)	1105.30	1502.70
Wt. Of Tube(gms.)	260.96	357.14
Wt. Of WS.(gms.)	844.34	1145.56
Length 1 (in.)	3.538	4.865
Length 2 (in.)	3.519	4.846
Length 3 (in.)	3.511	4.845
Top Diameter (in.)	2.873	2.866
Middle Diameter (in.)	2.891	2.870
Bottom Diameter (in.)	2.892	2.880
Sample Volume (cc)	377.45	515.09
Moisture Content(%)	12.39	11.84
Unit Wet Wt.(gms/cc)	2.24	2.22
Unit Wet Wt.(pcf.)	139.6	138.8
Unit Dry Wt.(pcf.)	124.2	124.1
Unit Dry Wt.(gms/cc)	1.99	1.99

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	4.1-4.5
Project No.	97178-02	Sample No.	SM019-TB03-0305
Lab ID	97178-02.043	Soil Color	GRAY

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	1711	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	888.80	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	803.60	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	83.84	Weight of Tare (gm)	NA
Weight of Water (gm)	85.20	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	719.76	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**11.8**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	719.76
Dry Weight - 3/4" Sample (gm)	289.33	Weight of minus #200 material (gm)	413.66
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	306.10
Dry Weight + 3/4" Sample (gm)	16.77		
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	16.77	2.33	2.33	97.67	**97.67**
1/2"	12.5	38.32	5.32	7.65	92.35	**92.35**
3/8"	9.50	34.07	4.73	12.39	87.61	**87.61**
#4	4.75	70.11	9.74	22.13	77.87	**77.87**
#10	2.00	60.07	8.35	30.47	69.53	**69.53**
#20	0.85	34.34	4.77	35.25	64.75	**64.75**
#40	0.425	20.12	2.80	38.04	61.96	**61.96**
#60	0.250	12.43	1.73	39.77	60.23	**60.23**
#140	0.106	16.01	2.22	41.99	58.01	**58.01**
#200	0.075	3.86	0.54	42.53	57.47	**57.47**
Pan	-	413.66	57.47	100.00	-	-

Tested By JCM Date 8/12/97 Checked By JMO Date 8/22/97

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HYDROMETER ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	4.1-4.5
Project No.	97178-02	Sample No.	SM019-TB03-0305
Lab ID	97178-02.043	Soil Color	**GRAY**

Elapsed Time (min)		R Measured	Temp. (°C)	R Corrected	N (%)	Diameter (mm)	N' (%)
0	NA	NA	NA	NA	NA	NA	NA
2	32.5	32.5	24	26.7	84.8	0.0300	**48.7**
5		30.5	24	24.7	78.4	0.0193	**45.1**
15		25.5	24	19.7	62.5	0.0115	**35.9**
32		23.0	24	17.2	54.6	0.0080	**31.4**
68		20.0	23.4	14.2	45.1	0.0056	**25.9**
250		15.5	23.4	9.7	30.8	0.0030	**17.7**
1440		11.0	23.7	5.2	16.5	0.0013	**9.5**

Soil Specimen Data		Corrections	
Tare No.	1301	K - Factor	0.01282
Tare + Dry Material (gm)	139.14	a - Factor	0.99
Weight of Tare (gm)	102.95	Composite Correction	5.80
Weight of Deflocculant (gm)	5.0	Percent Finer than # 200	57.47
Weight of Dry Material (gm)	31.19		
		Specific Gravity	2.7 Assumed

Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By TO Date 8/16/97 Checked By JMO Date 8/22/97

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SIEVE AND HYDROMETER ANALYSIS
ASTM D 422-63 (SOP-S3)

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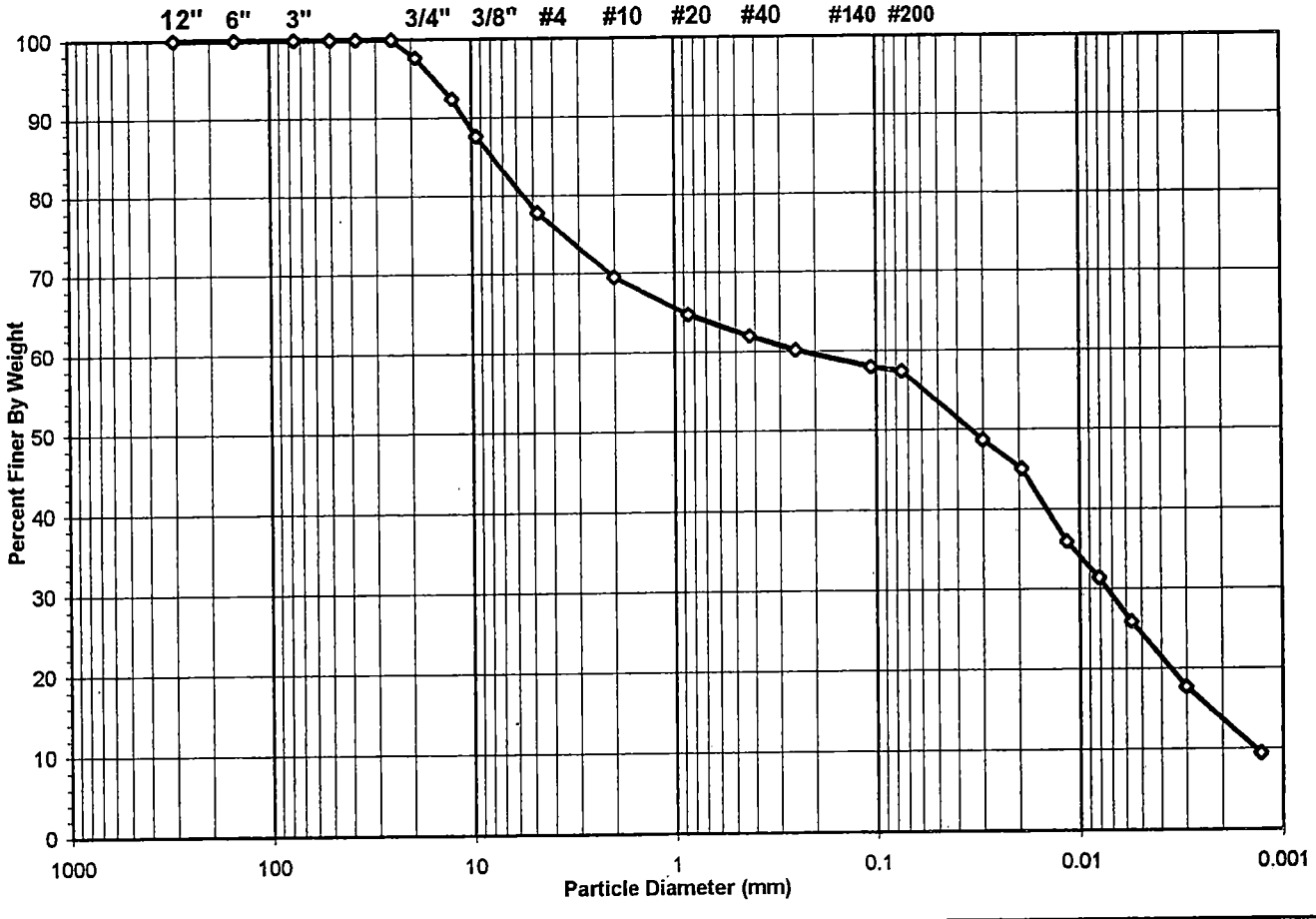
Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	4.1-4.5
Project No.	97178-02	Sample No.	SM019-TB03-0305
Lab ID	97178-02.043	Soil Color	GRAY

	SIEVE ANALYSIS		HYDROMETER	
USCS	gravel	sand	silt and clay fraction	
USDA	gravel	sand	silt	clay



Sieve Size (mm)	Percent Finer	Components	Percentage	Corrected % of Minus 2.0 mm material for USDA Classificat.
100	100.00	*Gravel*	30.47	**0.00**
2	69.53	*Sand*	15.93	**22.92**
0.075	57.47	*Silt*	39.83	**57.29**
0.05	53.59	*Clay*	13.76	**19.79**
0.002	13.76			

USDA Classification ***SILT LOAM***

USCS Symbol ***cl, ASSUMED***

USCS Classification ***GRAVELLY LEAN CLAY WITH SAND***

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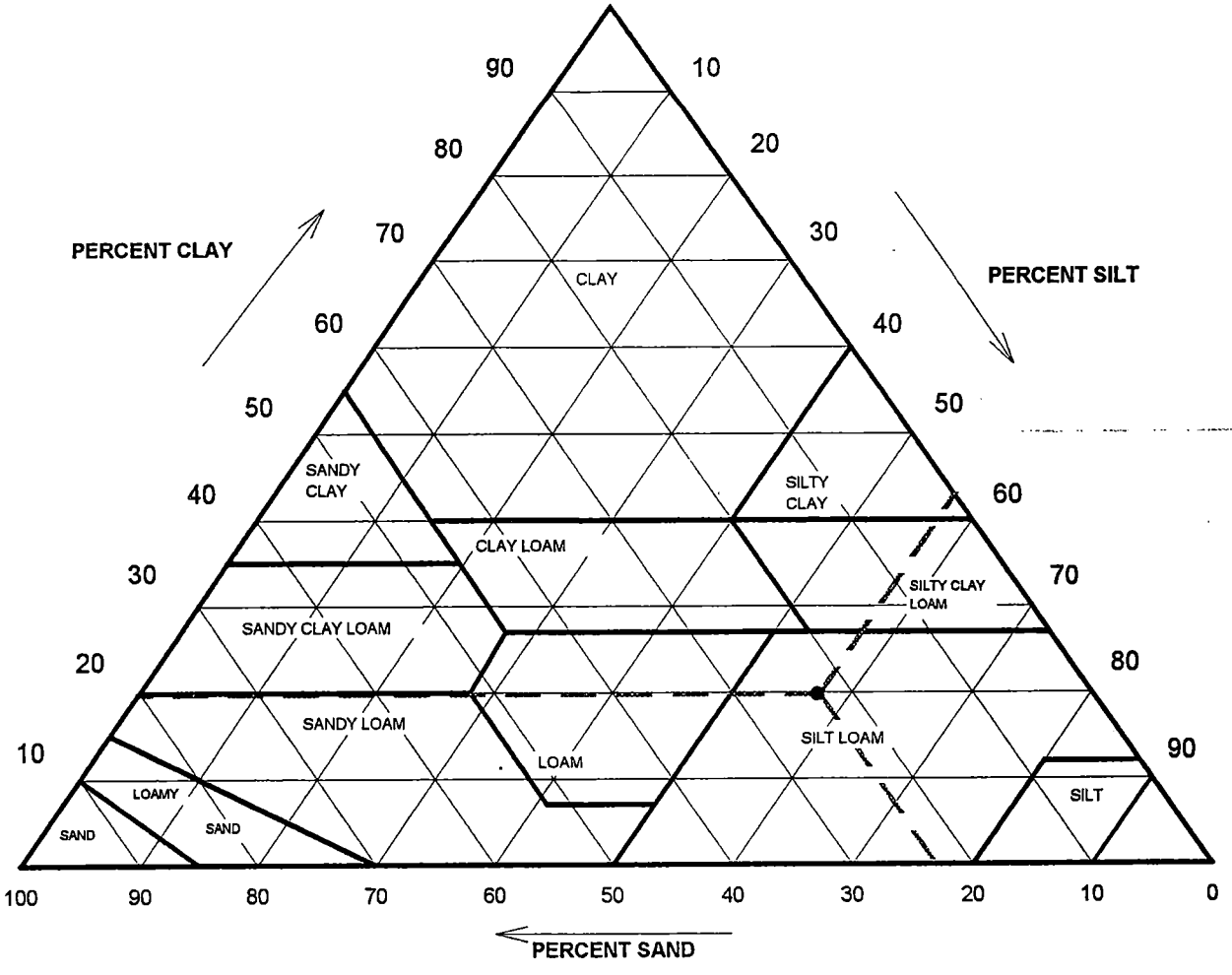
USDA CLASSIFICATION CHART

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	4.1-4.5
Project No.	97178-02	Sample No.	SM019-TB03-0305
Lab ID	97178-02.043	Soil Color	GRAY



Components	Corrected % of Minus 2.0 mm material for USDA Classificat.
Gravel	0.00
Sand	22.92
Silt	57.29
Clay	19.79
USDA Classification	***SILT LOAM***

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PERMEABILITY TEST

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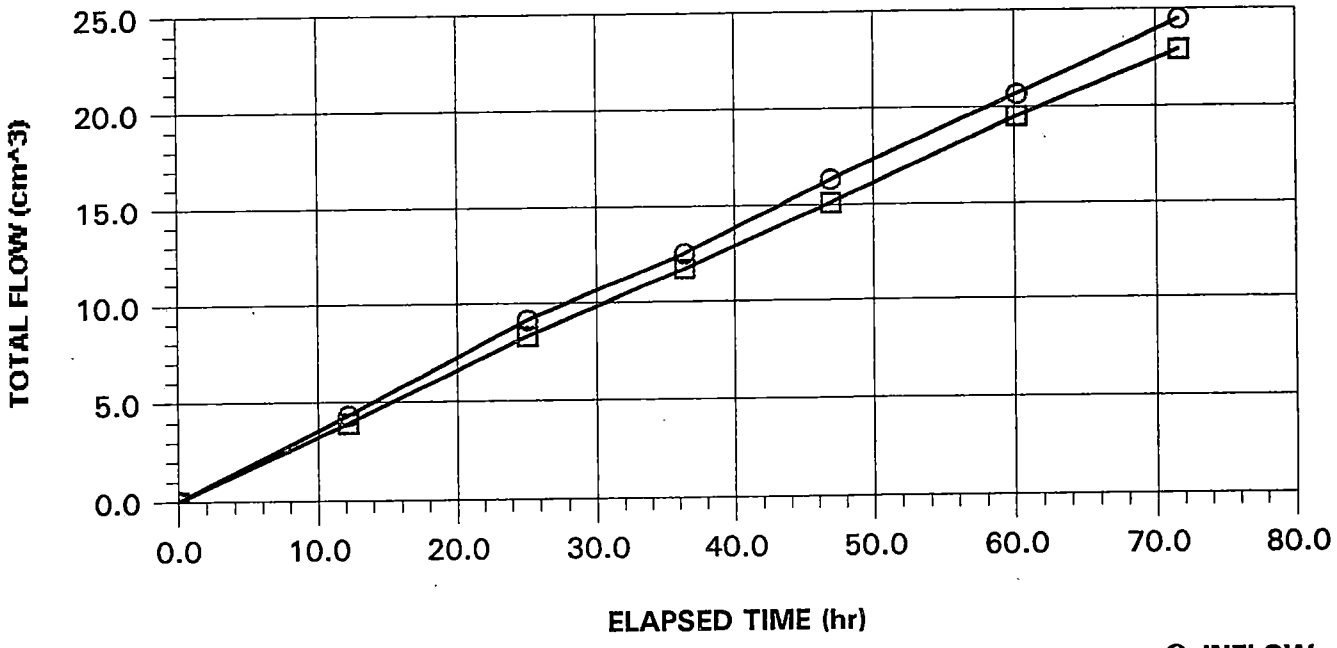
Client	ICF KAISER	Boring No.	NA
Client Project	BAYER 51249	Depth(ft.)	4.5-4.8
Project No.	97178-02	Sample No.	SM019-TB03-0305

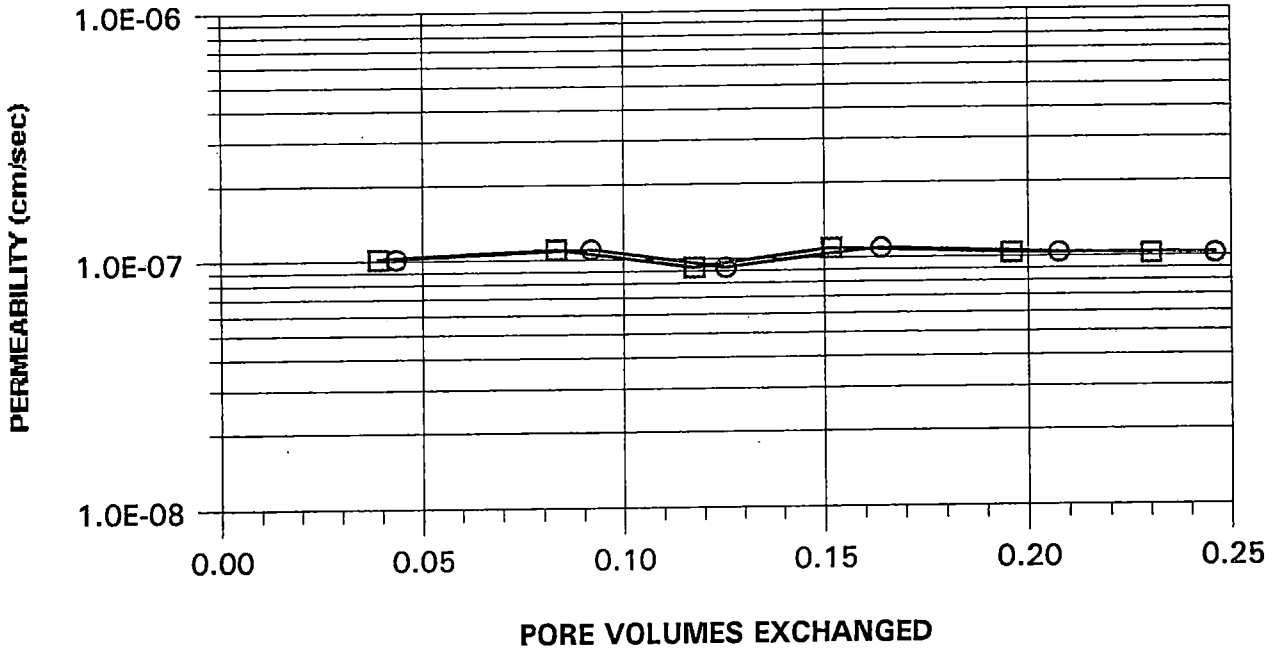
AVERAGE PERMEABILITY = 1.0E-07 cm/sec @ 20°C
AVERAGE PERMEABILITY = 1.0E-09 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY

⊖ INFLOW
⊟ OUTFLOW



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PERMEABILITY TEST

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Client	ICF KAISER	Tested By	JCM	Date	08-12-97
Client Project	BAYER 51249	Checked By	JMO	Date	8/22/97
Project No.	97178-02				
Boring No.	NA	Specific Gravity	2.70 ASSUMED		
Depth(ft.)	4.5-4.8	Sample Condition	UNDISTURBED		
Sample No.	SM019-TB03-0305				

Visual Description GRAY CLAY

MOISTURE CONTENT	BEFORE TEST	AFTER TEST
Tare Number	1843	ZZ
Wt. Tare & WS(gm.)	253.62	582.00
Wt. Tare & DS(gm.)	230.16	519.60
Wt. Water(gm.)	23.46	62.40
Wt. Tare(gm.)	40.84	84.72
Wt. DS(gm.)	189.32	434.88
Moisture Content(%)	12.4	14.3

UNIT WEIGHT		
Wt. Tube & WS.(gms.)	1105.30	NA
Wt. Of Tube(gms.)	260.96	NA
Wt. Of WS.(gms.)	844.34	859.0
Length 1 (in.)	3.538	3.580
Length 2 (in.)	3.519	3.581
Length 3 (in.)	3.511	3.588
Top Diameter (in.)	2.873	2.863
Middle Diameter (in.)	2.891	2.864
Bottom Diameter (in.)	2.892	2.860
Average Length (in)	3.52	3.58
Average Area (in^2)	6.54	6.43
Sample Volume(cc.)	377.45	377.81
Unit Wet Wt.(gms/cc)	2.24	2.27
Unit Wet Wt.(pcf.)	139.6	141.9
Unit Dry Wt.(pcf.)	124.2	124.1
Unit Dry Wt.(gms/cc)	1.99	1.99
Void Ratio,e	0.36	0.36
Porosity, n	0.26	0.26
Pore Volume(cm^3)	99.2	99.6

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PERMEABILITY TEST

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Client	ICF KAISER	Tested By	JCM	Date	08-12-97
Client Project	BAYER 51249	Checked By	JMO	Date	8/22/97
Project No.	97178-02				
Boring No.	NA				
Depth(ft.)	4.5-4.8				
Sample No.	SM019-TB03-0305				
Visual Description	GRAY CLAY				

Pressure Heads (Constant)	
Top Cap (psi)	27.5
Bottom Cap (psi)	30.0
Cell (psi)	35.0
Total Pressure Head (cm)	175.8

Final Sample Dimensions	
Sample Length (cm.), L	9.10
Sample Diameter (cm.)	7.27
Sample Area (cm.^2), A	41.51
Inflow Burette Area, (cm.^2), a-in	4.44
Outflow Burette Area, (cm.^2), a-out	4.43
B Parameter	96%

AVERAGE PERMEABILITY = 1.0E-07 cm/sec @ 20°C
AVERAGE PERMEABILITY = 1.0E-09 m/sec @ 20°C

DATE mon-dy-yr	TIME hr	TIME min	ELAPSED TIME (t) hr	TOTAL INFLOW cm^3	TOTAL OUTFLOW cm^3	TOTAL HEAD (h) cm	FLOW 0 FLOW 1 STOP	TEMP °C	INCREMENTAL PERMEABILITY @ 20°C cm/sec
08-12-97	19	0	0.0	0.0	0.0	187.6	0	22.5	NA
08-13-97	7	10	12.2	4.3	3.9	185.7	0	23.2	1.0E-07
08-13-97	20	5	25.1	9.1	8.3	183.7	0	22.6	1.1E-07
08-14-97	7	25	36.4	12.5	11.7	182.1	0	23.0	9.3E-08
08-14-97	17	55	46.9	16.3	15.1	180.5	0	22.5	1.1E-07
08-15-97	7	10	60.2	20.7	19.5	178.5	0	23.0	1.0E-07
08-15-97	18	40	71.7	24.5	22.9	176.9	0	22.2	1.0E-07

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SHELBY TUBE UNIT WEIGHT

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Client	ICF KAISER	Tested By	JCM 8-13-97
Client Project	BAYER 51249	Checked By	JMO 9-3-97
Project No.	97178-02		
Boring No.	NA	Tube Recovery	1.90
Depth Pushed	7.0-9.0		
Shelby Tube No.	SM019-TB03-0709		

SOIL PROFILE AND SAMPLING

DEPTH ( )	ELEV ( )	SECTION No.	SOIL PROFILE	SOIL DESCRIPTION AND REMARKS	TEST PERFORMED
7.00					
7.50					
8.00		3			GRAIN SIZE HYDROMETER UNIT WGT. WC
8.50		2		BROWN CLAYEY SAND WITH GRAVEL	PERMEABILITY
9.00		1			WATER CONTENT

NOTE:WHEN FULL RECOVERY IS NOT ACHIEVED,SOIL ELEVATION CAN NOT BE ACCURATELY DEFINE
INDICATE EACH CUT OF THE TUBE WITH AN ARROW
INDICATE DIVIDING LINE BETWEEN SOIL TYPES BY A SOLID LINE
INDICATE WAX BY CROSS-HATCHING
INDICATE SOIL TYPES BY STANDARD SYMBOLS

MOISTURE CONTENT					
Section Number	1	2	3	4	5
Tare Number	927		1122		
Wt. Tare & WS(gm.)	246.41		763.40		
Wt. Tare & DS(gm.)	212.92		653.70		
Wt. Tare(gm.)	45.03		84.66		
Moisture Content(%)	19.9		19.3		

UNIT WEIGHT		
Wt. Tube & WS.(gms.)	1111.70	1386.60
Wt. Of Tube(gms.)	273.40	349.28
Wt. Of WS.(gms.)	838.30	1037.32
Length 1 (in.)	3.696	4.704
Length 2 (in.)	3.714	4.707
Length 3 (in.)	3.727	4.722
Top Diameter (in.)	2.869	2.890
Middle Diameter (in.)	2.881	2.864
Bottom Diameter (in.)	2.884	2.875
Sample Volume (cc)	395.75	501.63
Moisture Content(%)	19.95	19.28
Unit Wet Wt.(gms/cc)	2.12	2.07
Unit Wet Wt.(pcf.)	132.2	129.0
Unit Dry Wt.(pcf.)	110.2	108.2
Unit Dry Wt.(gms/cc)	1.77	1.73

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	8.1-8.5
Project No.	97178-02	Sample No.	SM019-TB03-0709
Lab ID	97178-02.044	Soil Color	**BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	1122	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	763.40	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	653.70	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	84.66	Weight of Tare (gm)	NA
Weight of Water (gm)	109.70	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	569.04	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**19.3**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	569.04
Dry Weight - 3/4" Sample (gm)	242.11	Weight of minus #200 material (gm)	284.46
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	284.58
Dry Weight + 3/4" Sample (gm)	42.47		
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	25.60	4.50	4.50	95.50	**95.50**
3/4"	19.0	16.87	2.96	7.46	92.54	**92.54**
1/2"	12.5	35.98	6.32	13.79	86.21	**86.21**
3/8"	9.50	16.94	2.98	16.76	83.24	**83.24**
#4	4.75	28.91	5.08	21.84	78.16	**78.16**
#10	2.00	44.48	7.82	29.66	70.34	**70.34**
#20	0.85	32.28	5.67	35.33	64.67	**64.67**
#40	0.425	22.12	3.89	39.22	60.78	**60.78**
#60	0.250	20.43	3.59	42.81	57.19	**57.19**
#140	0.106	30.49	5.36	48.17	51.83	**51.83**
#200	0.075	10.48	1.84	50.01	49.99	**49.99**
Pan	-	284.46	49.99	100.00	-	-

Tested By JCM Date 8/13/97 Checked By JMC Date 8/27/97

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HYDROMETER ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	8.1-8.5
Project No.	97178-02	Sample No.	SM019-TB03-0709
Lab ID	97178-02.044	Soil Color	**BROWN**

Elapsed Time (min)		R Measured	Temp. (°C)	R Corrected	N (%)	Diameter (mm)	N' (%)
0	NA	NA	NA	NA	NA	NA	NA
2	39.0	40.0	24.2	34.3	85.1	0.0282	**42.5**
5		38.0	24.2	32.3	80.1	0.0182	**40.1**
15		34.5	24.2	28.8	71.5	0.0108	**35.7**
30		31.0	24.2	25.3	62.8	0.0078	**31.4**
63		28.5	23.5	22.8	56.6	0.0055	**28.3**
279		23.0	23	17.3	42.9	0.0027	**21.5**
1440		19.0	23.7	13.3	33.0	0.0012	**16.5**

Soil Specimen Data		Corrections	
Tare No.	804	K - Factor	0.01279
Tare + Dry Material (gm)	146.34	a - Factor	0.99
Weight of Tare (gm)	101.44	Composite Correction	5.70
Weight of Deflocculant (gm)	5.0	Percent Finer than # 200	49.99
Weight of Dry Material (gm)	39.9		
		Specific Gravity	2.7 Assumed

Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By TO Date 8/18/97 Checked By JMO Date 8/27/97

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SIEVE AND HYDROMETER ANALYSIS
ASTM D 422-63 (SOP-S3)

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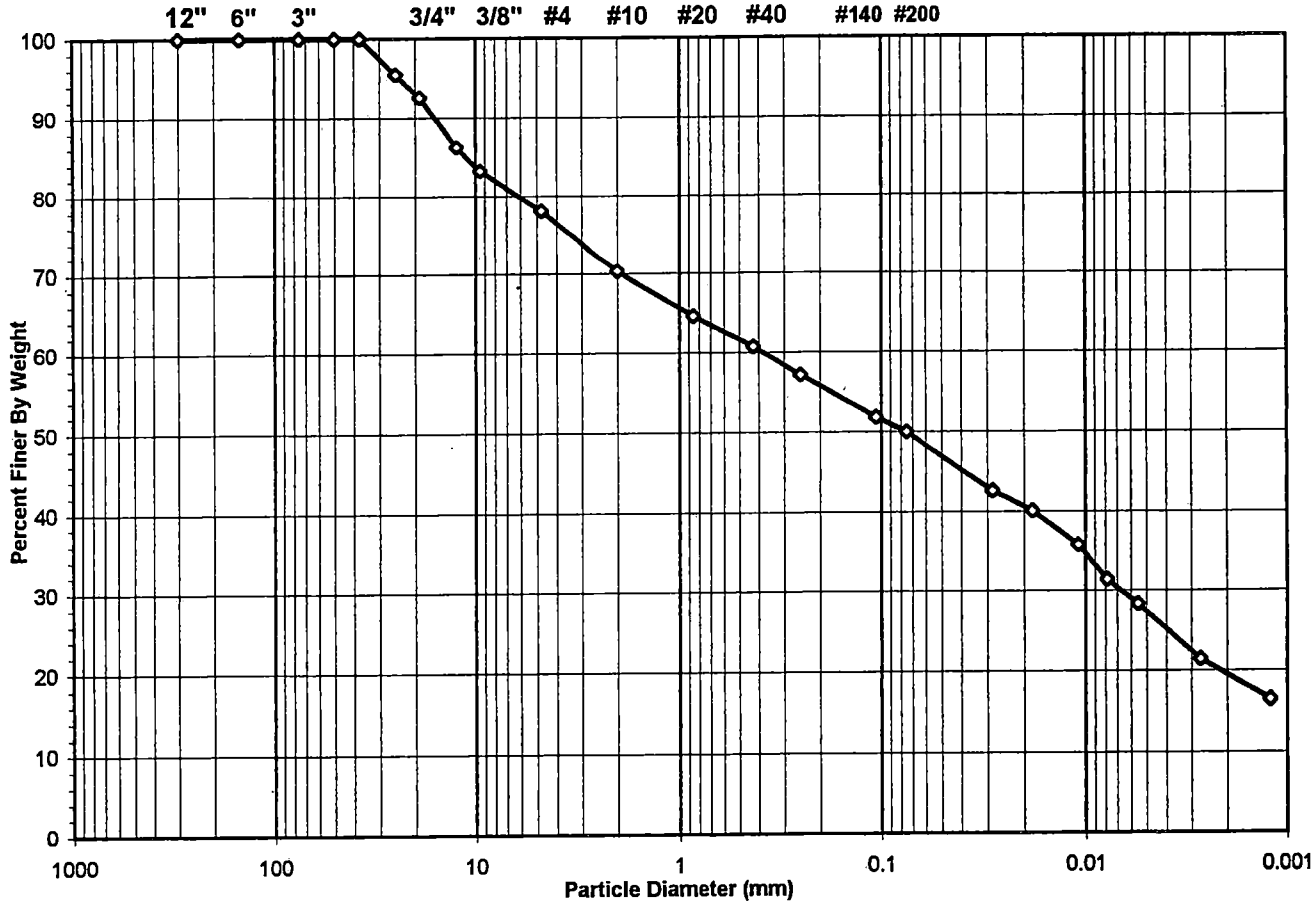
Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	8.1-8.5
Project No.	97178-02	Sample No.	SM019-TB03-0709
Lab ID	97178-02.044	Soil Color	BROWN

	SIEVE ANALYSIS		HYDROMETER	
USCS	gravel	sand	silt and clay fraction	
USDA	gravel	sand	silt	clay



Sieve Size (mm)	Percent Finer	Components	Percentage	Corrected % of Minus 2.0 mm material for USDA Classificat.
100	100.00	*Gravel*	29.66	**0.00**
2	70.34	*Sand*	23.44	**33.32**
0.075	49.99	*Silt*	27.34	**38.87**
0.05	46.90	*Clay*	19.56	**27.81**
0.002	19.56			

USDA Classification ***CLAY LOAM***

USCS Symbol ***sc, ASSUMED***

USCS Classification ***CLAYEY SAND WITH GRAVEL***

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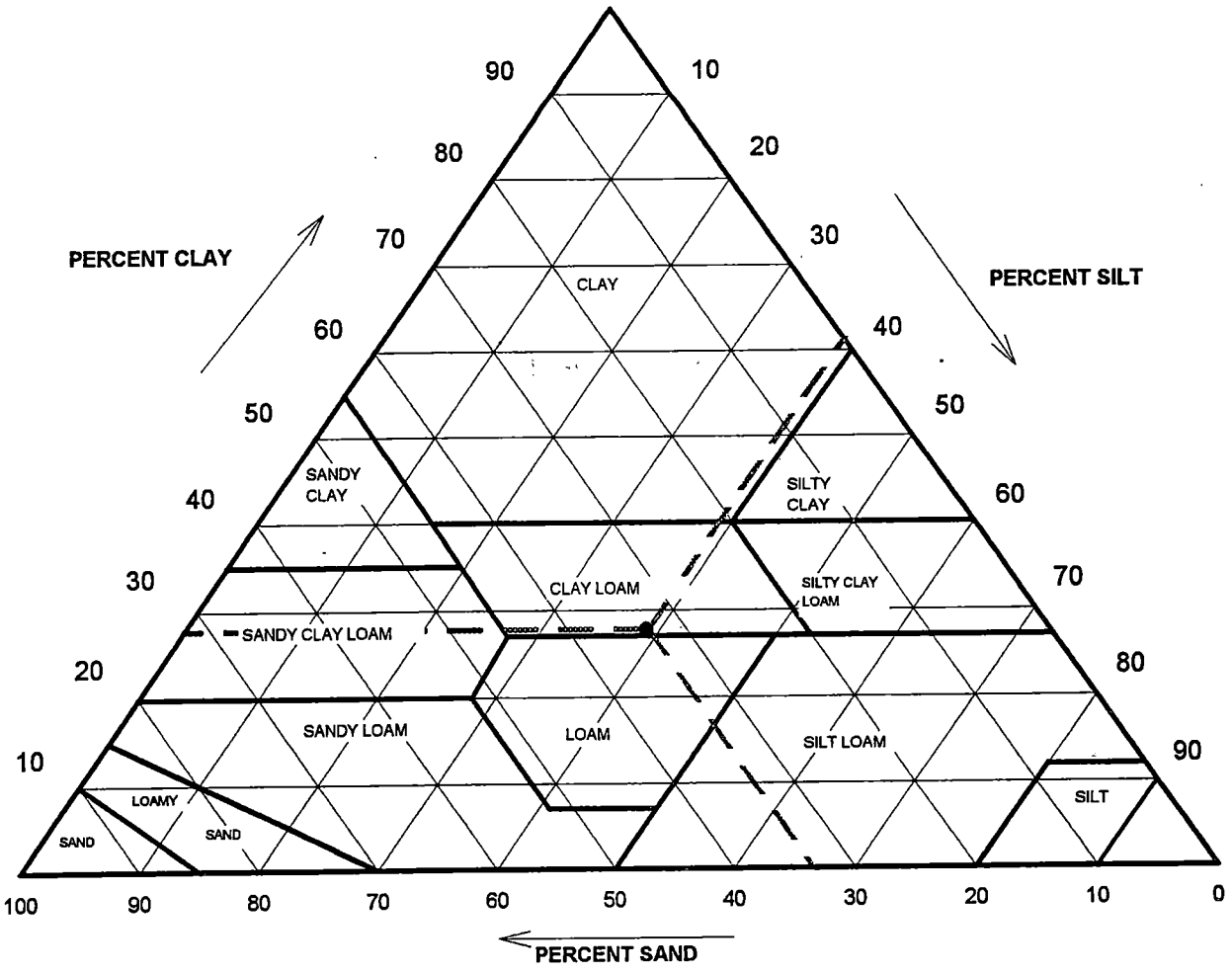
USDA CLASSIFICATION CHART

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	8.1-8.5
Project No.	97178-02	Sample No.	SM019-TB03-0709
Lab ID	97178-02.044	Soil Color	BROWN



Components	Corrected % of Minus 2.0 mm material for USDA Classificat.
Gravel	0.00
Sand	33.32
Silt	38.87
Clay	27.81
USDA Classification	***CLAY LOAM***

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PERMEABILITY TEST

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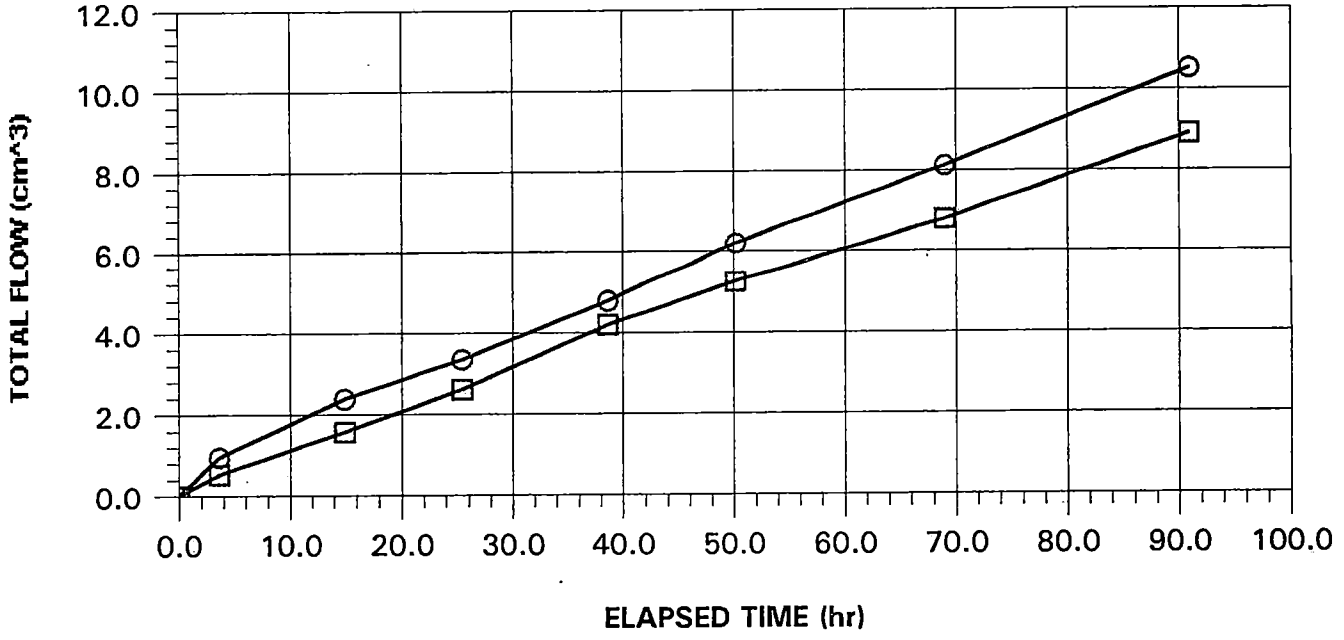
Client	ICF KAISER	Boring No.	NA
Client Project	BAYER 51249	Depth(ft.)	8.5-8.8
Project No.	97178-02	Sample No.	SM019-TB03-0709

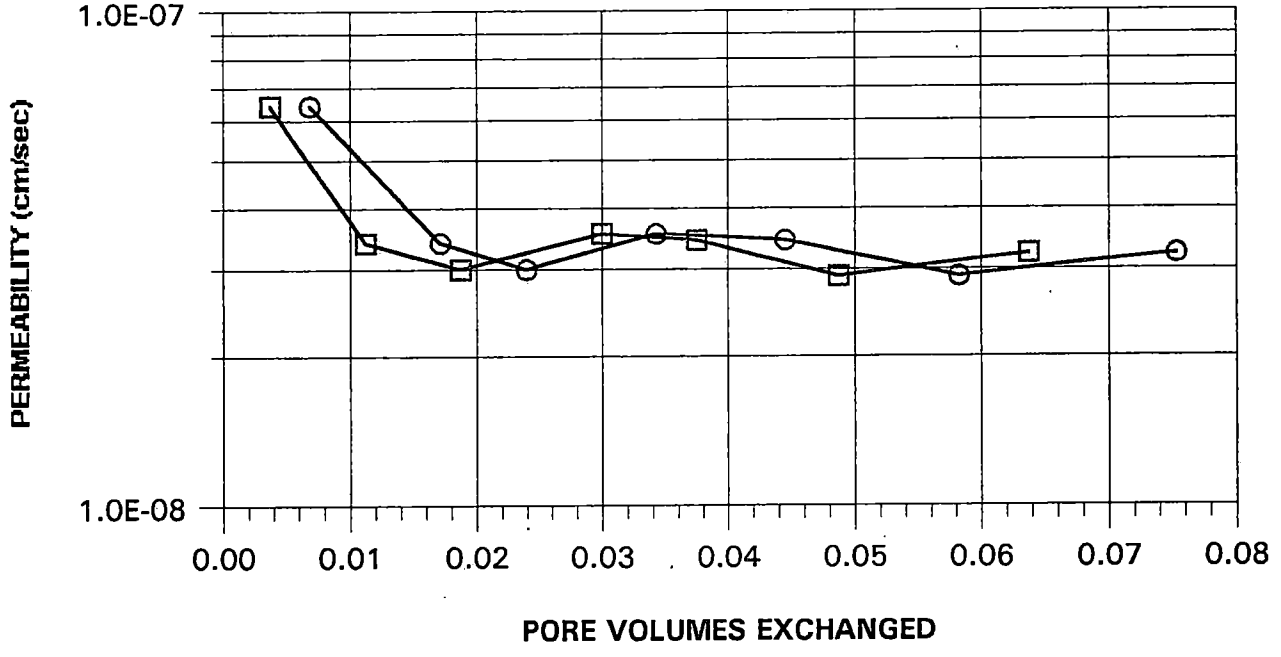
AVERAGE PERMEABILITY = 3.3E-08 cm/sec @ 20°C
AVERAGE PERMEABILITY = 3.3E-10 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



⊖ INFLOW
⊟ OUTFLOW

PORE VOLUMES EXCHANGED vs. PERMEABILITY



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PERMEABILITY TEST

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Client	ICF KAISER	Tested By	JCM	Date	08-13-97
Client Project	BAYER 51249	Checked By	JMO	Date	8/22/97
Project No.	97178-02				
Boring No.	NA	Specific Gravity	2.70 ASSUMED		
Depth(ft.)	8.5-8.8	Sample Condition	UNDISTURBED		
Sample No.	SM019-TB03-0709				

Visual Description BROWN CLAY

MOISTURE CONTENT	BEFORE TEST	AFTER TEST
Tare Number	927	7
Wt. Tare & WS(gm.)	246.41	510.30
Wt. Tare & DS(gm.)	212.92	440.10
Wt. Water(gm.)	33.49	70.20
Wt. Tare(gm.)	45.03	75.09
Wt. DS(gm.)	167.89	365.01
Moisture Content(%)	19.9	19.2

UNIT WEIGHT		
Wt. Tube & WS.(gms.)	1111.70	NA
Wt. Of Tube(gms.)	273.40	NA
Wt. Of WS.(gms.)	838.30	833.3
Length 1 (in.)	3.696	3.771
Length 2 (in.)	3.714	3.776
Length 3 (in.)	3.727	3.767
Top Diameter (in.)	2.869	2.862
Middle Diameter (in.)	2.881	2.864
Bottom Diameter (in.)	2.884	2.870
Average Length (in)	3.71	3.77
Average Area (in^2)	6.51	6.45
Sample Volume(cc.)	395.75	398.51
Unit Wet Wt.(gms/cc)	2.12	2.09
Unit Wet Wt.(pcf.)	132.2	130.5
Unit Dry Wt.(pcf.)	110.2	109.4
Unit Dry Wt.(gms/cc)	1.77	1.75
Void Ratio,e	0.53	0.54
Porosity, n	0.35	0.35
Pore Volume(cm^3)	136.9	139.7

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PERMEABILITY TEST

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Client	ICF KAISER	Tested By	JCM	Date	08-13-97
Client Project	BAYER 51249	Checked By	JMG	Date	8/22/97
Project No.	97178-02				
Boring No.	NA				
Depth(ft.)	8.5-8.8				
Sample No.	SM019-TB03-0709				
Visual Description	BROWN CLAY				

Pressure Heads (Constant)	
Top Cap (psi)	27.5
Bottom Cap (psi)	30.0
Cell (psi)	35.0
Total Pressure Head (cm)	175.8

Final Sample Dimensions	
Sample Length (cm.), L	9.58
Sample Diameter (cm.)	7.28
Sample Area (cm.^2), A	41.60
Inflow Burette Area, (cm.^2), a-in	4.74
Outflow Burette Area, (cm.^2), a-out	4.65
B Parameter	98%

AVERAGE PERMEABILITY = 3.3E-08 cm/sec @ 20°C
AVERAGE PERMEABILITY = 3.3E-10 m/sec @ 20°C

DATE mon-dy-yr	TIME hr	TIME min	ELAPSED TIME (t) hr	TOTAL INFLOW cm^3	TOTAL OUTFLOW cm^3	TOTAL HEAD (h) cm	FLOW 0 FLOW 1 STOP	TEMP °C	INCREMENTAL PERMEABILITY @ 20°C cm/sec
08-13-97	16	30	0.0	0.0	0.0	192.7	0	22.9	NA
08-13-97	20	5	3.6	1.0	0.5	192.3	0	22.6	6.4E-08
08-14-97	7	25	14.9	2.4	1.6	191.8	0	23.0	3.4E-08
08-14-97	17	55	25.4	3.3	2.6	191.4	0	22.5	3.0E-08
08-15-97	7	10	38.7	4.8	4.2	190.7	0	23.0	3.5E-08
08-15-97	18	40	50.2	6.2	5.2	190.2	0	22.2	3.4E-08
08-16-97	13	30	69.0	8.1	6.8	189.5	0	23.0	2.9E-08
08-17-97	11	25	90.9	10.5	8.9	188.5	0	23.0	3.2E-08

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SHELBY TUBE UNIT WEIGHT

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Client	ICF KAISER	Tested By	BL 8-12-97
Client Project	BAYER 51249	Checked By	JMO 9-3-97
Project No.	97178-02		
Boring No.	NA	Tube Recovery	2.10
Depth Pushed	1.0-3.0		
Shelby Tube No.	SM020-TB01-0103		

SOIL PROFILE AND SAMPLING

DEPTH ( )	ELEV ( )	SECTION No.	SOIL PROFILE	SOIL DESCRIPTION AND REMARKS	TEST PERFORMED
1.00					
1.50					
2.00					
2.50		2		GRAY SANDY LEAN CLAY WITH GRAVEL	UNIT WGT. WC, GRAIN SIZE HYDROMETER
		1			NO TEST
3.00					

NOTE:WHEN FULL RECOVERY IS NOT ACHIEVED,SOIL ELEVATION CAN NOT BE ACCURATELY DEFINE
INDICATE EACH CUT OF THE TUBE WITH AN ARROW
INDICATE DIVIDING LINE BETWEEN SOIL TYPES BY A SOLID LINE
INDICATE WAX BY CROSS-HATCHING
INDICATE SOIL TYPES BY STANDARD SYMBOLS

MOISTURE CONTENT					
Section Number	1	2	3	4	5
Tare Number		1743			
Wt. Tare & WS(gm.)		189.46			
Wt. Tare & DS(gm.)		169.96			
Wt. Tare(gm.)		83.77			
Moisture Content(%)		22.6			

UNIT WEIGHT	
Wt. Tube & WS.(gms.)	1069.00
Wt. Of Tube(gms.)	272.15
Wt. Of WS.(gms.)	796.85
Length 1 (in.)	3.596
Length 2 (in.)	3.604
Length 3 (in.)	3.611
Top Diameter (in.)	2.831
Middle Diameter (in.)	2.841
Bottom Diameter (in.)	2.870
Sample Volume (cc)	376.02
Moisture Content(%)	22.62
Unit Wet Wt.(gms/cc)	2.12
Unit Wet Wt.(pcf.)	132.2
Unit Dry Wt.(pcf.)	107.8
Unit Dry Wt.(gms/cc)	1.73

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	1-3
Project No.	97178-02	Sample No.	SM020-TB01-0103
Lab ID	97178-02.045	Soil Color	GRAY

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	1330	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	667.00	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	577.30	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	104.24	Weight of Tare (gm)	NA
Weight of Water (gm)	89.70	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	473.06	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**19.0**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	473.06
Dry Weight - 3/4" Sample (gm)	198.28	Weight of minus #200 material (gm)	247.19
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	225.87
Dry Weight + 3/4" Sample (gm)	27.59		
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	27.59	5.83	5.83	94.17	**94.17**
1/2"	12.5	15.58	3.29	9.13	90.87	**90.87**
3/8"	9.50	9.47	2.00	11.13	88.87	**88.87**
#4	4.75	45.04	9.52	20.65	79.35	**79.35**
#10	2.00	34.12	7.21	27.86	72.14	**72.14**
#20	0.85	17.07	3.61	31.47	68.53	**68.53**
#40	0.425	14.06	2.97	34.44	65.56	**65.56**
#60	0.250	21.55	4.56	39.00	61.00	**61.00**
#140	0.106	32.34	6.84	45.83	54.17	**54.17**
#200	0.075	9.05	1.91	47.75	52.25	**52.25**
Pan	-	247.19	52.25	100.00	-	-

Tested By BL Date 8/12/97 Checked By JMO Date 8/27/97

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HYDROMETER ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	1-3
Project No.	97178-02	Sample No.	SM020-TB01-0103
Lab ID	97178-02.045	Soil Color	**GRAY**

Elapsed Time (min)		R Measured	Temp. (°C)	R Corrected	N (%)	Diameter (mm)	N' (%)
0	NA	NA	NA	NA	NA	NA	NA
2	42.0	43.0	24.2	37.3	84.9	0.0275	**44.3**
5		39.5	24.2	33.8	76.9	0.0179	**40.2**
15		34.5	24.2	28.8	65.5	0.0108	**34.2**
30		32.0	24.2	26.3	59.8	0.0078	**31.3**
60		29.0	23.5	23.3	53.0	0.0056	**27.7**
250		23.5	23.2	17.8	40.5	0.0029	**21.2**
1440		19.5	23.9	13.8	31.4	0.0012	**16.4**

Soil Specimen Data		Corrections	
Tare No.	892	K - Factor	0.01279
Tare + Dry Material (gm)	154.55	a - Factor	0.99
Weight of Tare (gm)	106.04	Composite Correction	5.70
Weight of Deflocculant (gm)	5.0	Percent Finer than # 200	52.25
Weight of Dry Material (gm)	43.51		
		Specific Gravity	2.7 Assumed

Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By TO Date 8/18/97 Checked By JMC Date 8/27/97

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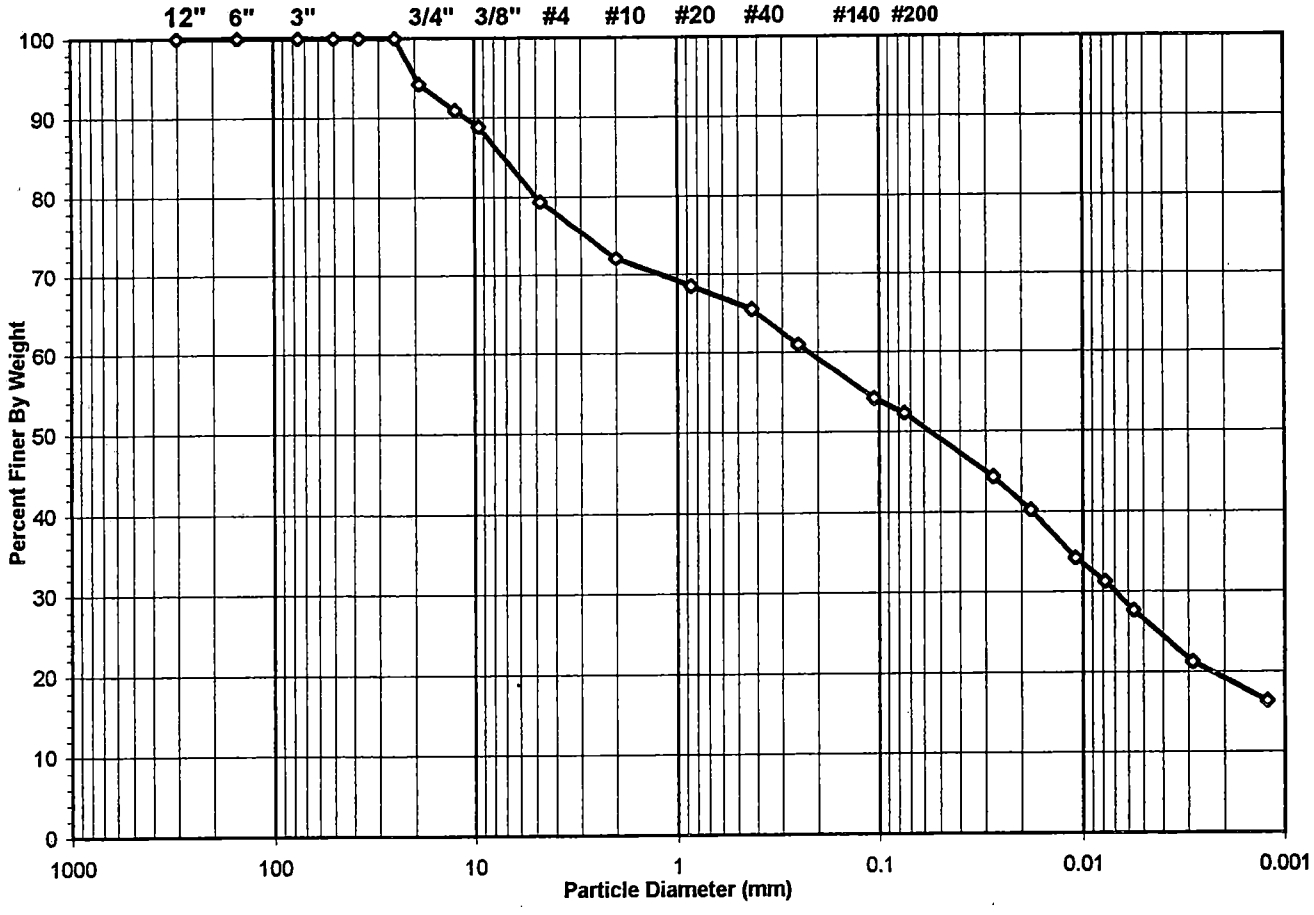
SIEVE AND HYDROMETER ANALYSIS
ASTM D 422-63 (SOP-S3)

geotechnics

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	1-3
Project No.	97178-02	Sample No.	SM020-TB01-0103
Lab ID	97178-02.045	Soil Color	GRAY

	SIEVE ANALYSIS		HYDROMETER	
USCS	gravel	sand	silt and clay fraction	
USDA	gravel	sand	silt	clay



Sieve Size (mm)	Percent Finer	Components	Percentage	Corrected % of Minus 2.0 mm material for USDA Classificat.
100	100.00	*Gravel*	27.86	**0.00**
2	72.14	*Sand*	23.08	**31.99**
0.075	52.25	*Silt*	29.88	**41.42**
0.05	49.06	*Clay*	19.17	**26.58**
0.002	19.17			

USDA Classification ***LOAM***

USCS Symbol ***cl, ASSUMED***

USCS Classification ***SANDY LEAN CLAY WITH GRAVEL***

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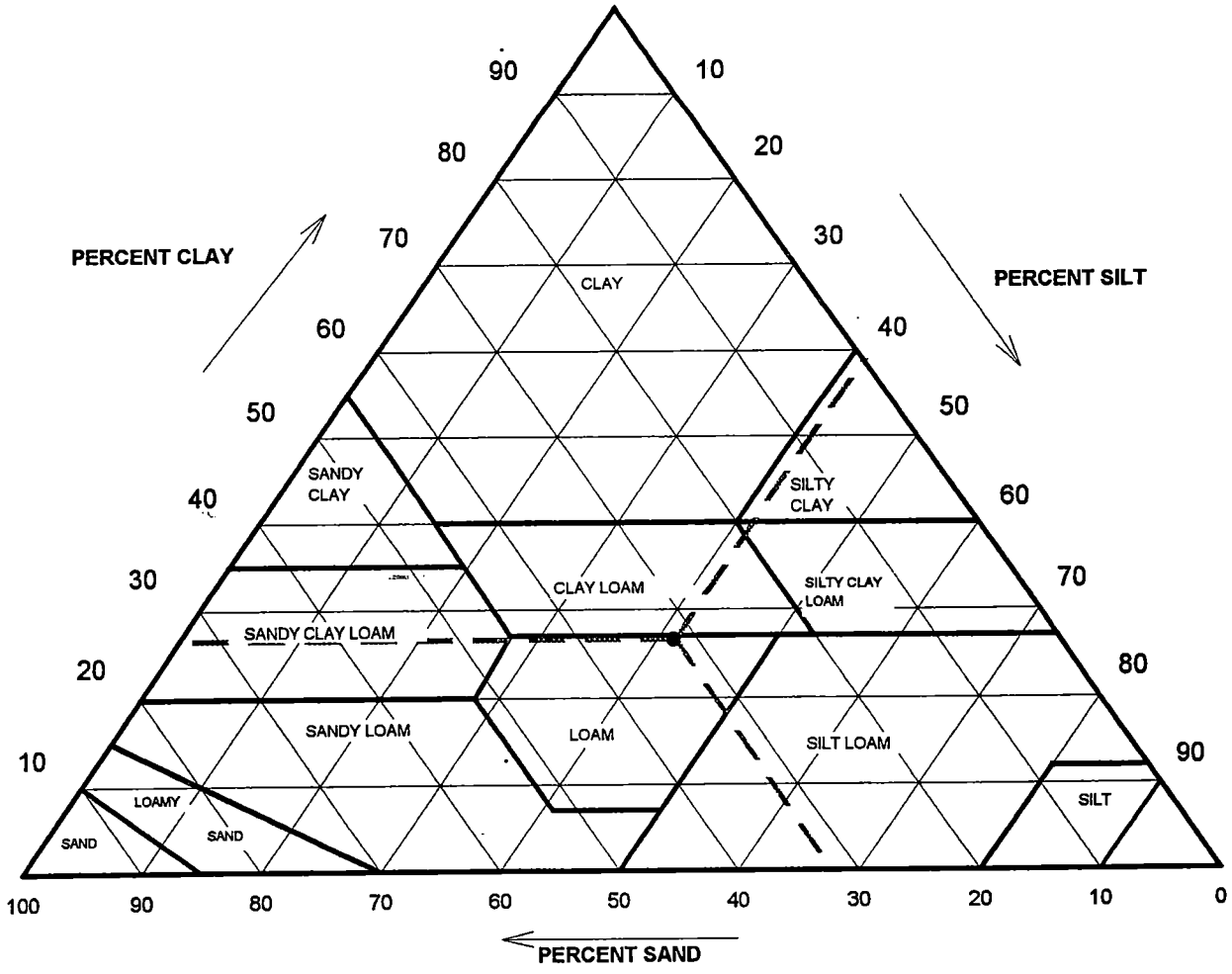
USDA CLASSIFICATION CHART

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	1-3
Project No.	97178-02	Sample No.	SM020-TB01-0103
Lab ID	97178-02.045	Soil Color	GRAY



Components	Corrected % of Minus 2.0 mm material for USDA Classificat.
Gravel	0.00
Sand	31.99
Silt	41.42
Clay	26.58
USDA Classification	***LOAM***

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SHELBY TUBE UNIT WEIGHT

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Client	ICF KAISER	Tested By	JCM 8-13-97
Client Project	BAYER 51249	Checked By	JMO 9-5-97
Project No.	97178-02		
Boring No.	NA	Tube Recovery	0.75
Depth Pushed	3.0-5.0		
Shelby Tube No.	SM020-TB02-0305		

SOIL PROFILE AND SAMPLING

DEPTH ( )	ELEV ( )	SECTION No.	SOIL PROFILE	SOIL DESCRIPTION AND REMARKS	TEST PERFORMED
3.00					
3.50					
4.00					
4.50		3		BROWN SANDY LEAN CLAY WITH GRAVEL	GRAIN SIZE HYDROMETER WC.
		2			PERMEABILITY
5.00		1			WC.

NOTE:WHEN FULL RECOVERY IS NOT ACHIEVED,SOIL ELEVATION CAN NOT BE ACCURATELY DEFINE
INDICATE EACH CUT OF THE TUBE WITH AN ARROW
INDICATE DIVIDING LINE BETWEEN SOIL TYPES BY A SOLID LINE
INDICATE WAX BY CROSS-HATCHING
INDICATE SOIL TYPES BY STANDARD SYMBOLS

MOISTURE CONTENT

Section Number	1	2	3	4	5
Tare Number	1808		1700		
Wt. Tare & WS(gm.)	374.99		657.10		
Wt. Tare & DS(gm.)	328.74		569.80		
Wt. Tare(gm.)	38.93		79.63		
Moisture Content(%)	16.0		17.8		

UNIT WEIGHT

Wt. Tube & WS.(gms.)	933.90
Wt. Of Tube(gms.)	247.90
Wt. Of WS.(gms.)	686.00
Length 1 (in.)	3.345
Length 2 (in.)	3.327
Length 3 (in.)	3.336
Top Diameter (in.)	2.869
Middle Diameter (in.)	2.866
Bottom Diameter (in.)	2.866
Sample Volume (cc)	352.92
Moisture Content(%)	15.96
Unit Wet Wt.(gms/cc)	1.94
Unit Wet Wt.(pcf.)	121.3
Unit Dry Wt.(pcf.)	104.6
Unit Dry Wt.(gms/cc)	1.68

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	4.3-4.6
Project No.	97178-02	Sample No.	SM020-TB02-0305
Lab ID	97178-02.046	Soil Color	**BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	1700	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	657.10	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	569.80	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	79.63	Weight of Tare (gm)	NA
Weight of Water (gm)	87.30	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	490.17	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**17.8**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	490.17
Dry Weight - 3/4" Sample (gm)	148.39	Weight of minus #200 material (gm)	264.77
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	225.40
Dry Weight + 3/4" Sample (gm)	77.01		
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	54.33	11.08	11.08	88.92	**88.92**
3/4"	19.0	22.68	4.63	15.71	84.29	**84.29**
1/2"	12.5	6.57	1.34	17.05	82.95	**82.95**
3/8"	9.50	2.92	0.60	17.65	82.35	**82.35**
#4	4.75	20.05	4.09	21.74	78.26	**78.26**
#10	2.00	30.19	6.16	27.90	72.10	**72.10**
#20	0.85	25.57	5.22	33.11	66.89	**66.89**
#40	0.425	17.83	3.64	36.75	63.25	**63.25**
#60	0.250	15.28	3.12	39.87	60.13	**60.13**
#140	0.106	22.95	4.68	44.55	55.45	**55.45**
#200	0.075	7.03	1.43	45.98	54.02	**54.02**
Pan	-	264.77	54.02	100.00	-	-

Tested By JCM Date 8/13/97 Checked By JMO Date 8/27/97

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HYDROMETER ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	4.3-4.6
Project No.	97178-02	Sample No.	SM020-TB02-0305
Lab ID	97178-02.046	Soil Color	**BROWN**

Elapsed Time (min)		R Measured	Temp. (°C)	R Corrected	N (%)	Diameter (mm)	N' (%)
0	NA	NA	NA	NA	NA	NA	NA
2	46.5	46.0	24.2	40.3	87.8	0.0268	**47.4**
5		43.0	24.2	37.3	81.3	0.0174	**43.9**
15		39.0	24.2	33.3	72.6	0.0104	**39.2**
30		35.5	24.2	29.8	64.9	0.0076	**35.1**
65		32.5	23.5	26.8	58.4	0.0053	**31.5**
282		26.5	23	20.8	45.3	0.0026	**24.5**
1440		22.0	23.7	16.3	35.5	0.0012	**19.2**

Soil Specimen Data		Corrections	
Tare No.	277	K - Factor	0.01279
Tare + Dry Material (gm)	156.52	a - Factor	0.99
Weight of Tare (gm)	106.09	Composite Correction	5.70
Weight of Deflocculant (gm)	5.0	Percent Finer than # 200	54.02
Weight of Dry Material (gm)	45.43		
		Specific Gravity	2.7 Assumed

Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By TO Date 8/18/97 Checked By JMD Date 8/27/97

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SIEVE AND HYDROMETER ANALYSIS
ASTM D 422-63 (SOP-S3)

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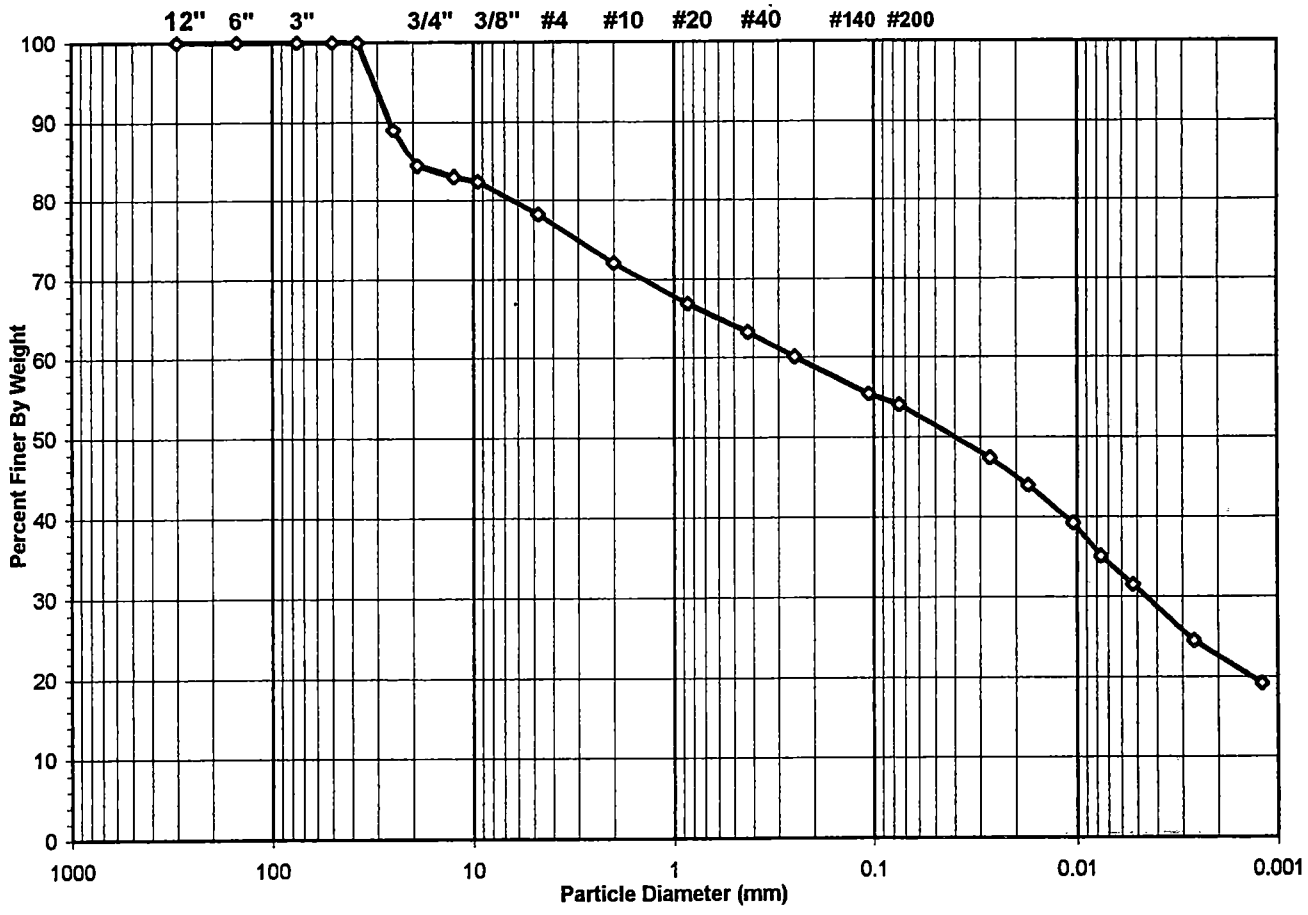
Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	4.3-4.6
Project No.	97178-02	Sample No.	SM020-TB02-0305
Lab ID	97178-02.046	Soil Color	BROWN

	SIEVE ANALYSIS		HYDROMETER	
USCS	gravel	sand	silt and clay fraction	
USDA	gravel	sand	silt	clay



Sieve Size (mm)	Percent Finer	Components	Percentage	Corrected % of Minus 2.0 mm material for USDA Classificat.
100	100.00	*Gravel*	27.90	**0.00**
2	72.10	*Sand*	20.68	**28.68**
0.075	54.02	*Silt*	28.80	**39.94**
0.05	51.43	*Clay*	22.63	**31.38**
0.002	22.63			

USDA Classification ***CLAY LOAM***

USCS Symbol ***cl, ASSUMED***

USCS Classification ***SANDY LEAN CLAY WITH GRAVEL***

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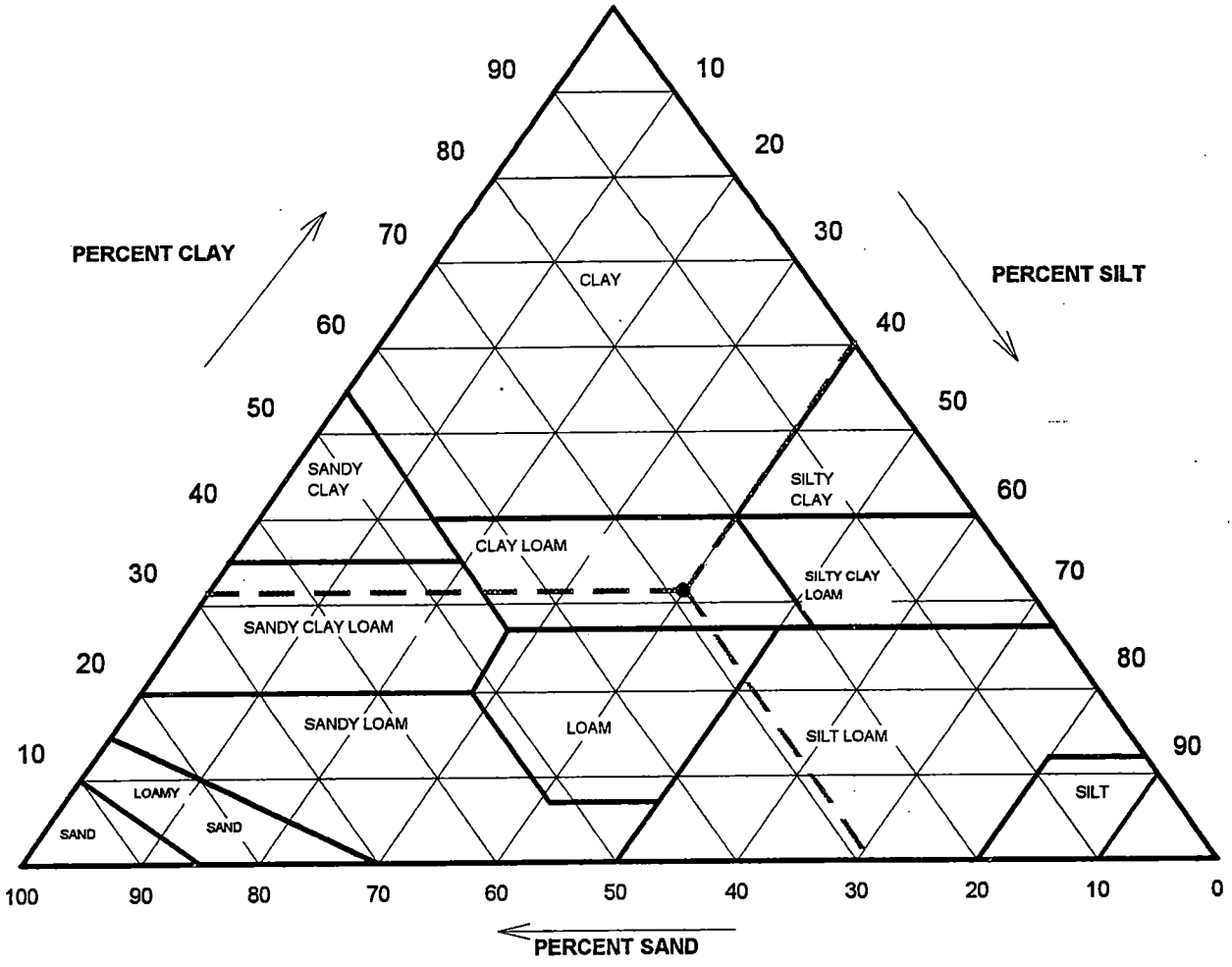
USDA CLASSIFICATION CHART

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	4.3-4.6
Project No.	97178-02	Sample No.	SM020-TB02-0305
Lab ID	97178-02.046	Soil Color	BROWN



Components	Corrected % of Minus 2.0 mm material for USDA Classificat.
Gravel	0.00
Sand	28.68
Silt	39.94
Clay	31.38
USDA Classification	***CLAY LOAM***

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PERMEABILITY TEST

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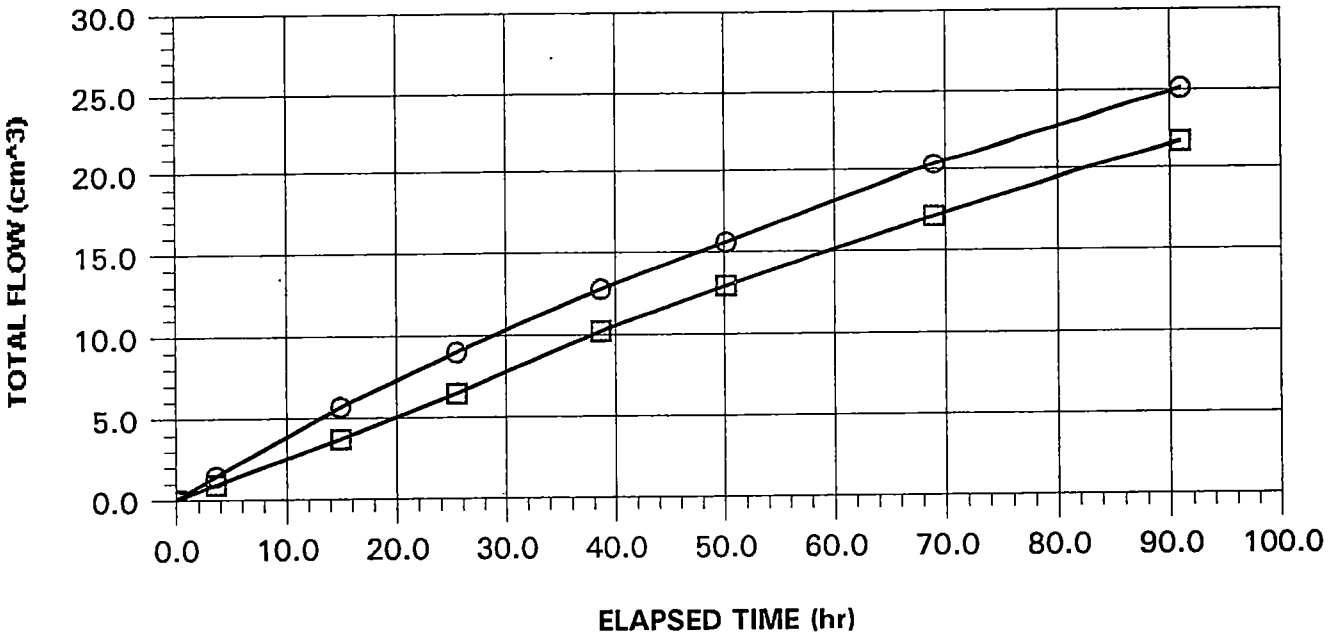
Client	ICF KAISER	Boring No.	NA
Client Project	BAYER 51249	Depth(ft.)	4.6-4.9
Project No.	97178-02	Sample No.	SM020-TB02-0305

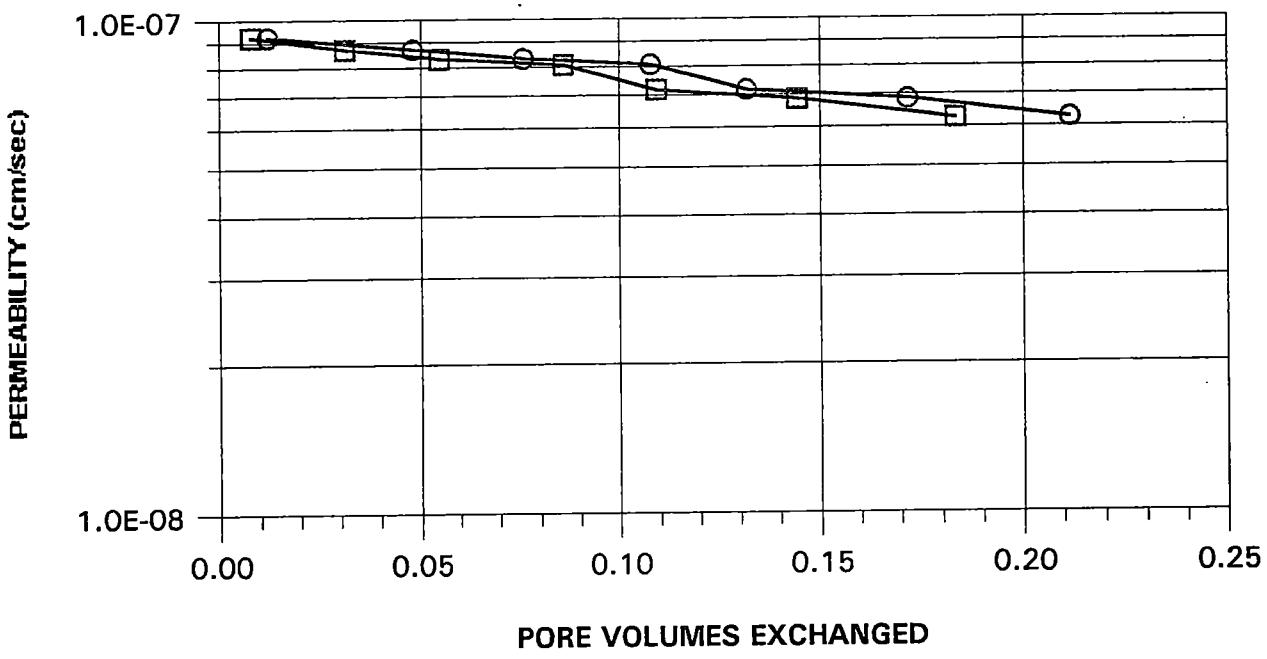
AVERAGE PERMEABILITY = 7.1E-08 cm/sec @ 20°C
AVERAGE PERMEABILITY = 7.1E-10 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



⊖ INFLOW
⊟ OUTFLOW

PORE VOLUMES EXCHANGED vs. PERMEABILITY



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PERMEABILITY TEST

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Client	ICF KAISER	Tested By	JCM	Date	08-13-97
Client Project	BAYER 51249	Checked By	JMO	Date	8/22/97
Project No.	97178-02				
Boring No.	NA	Specific Gravity	2.70 ASSUMED		
Depth(ft.)	4.6-4.9	Sample Condition	UNDISTURBED		
Sample No.	SM020-TB02-0305				

Visual Description BROWN CLAY AND ROCK FRAGMENTS

MOISTURE CONTENT	BEFORE TEST	AFTER TEST
Tare Number	1808	1691
Wt. Tare & WS(gm.)	374.99	493.70
Wt. Tare & DS(gm.)	328.74	424.50
Wt. Water(gm.)	46.25	69.20
Wt. Tare(gm.)	38.93	83.62
Wt. DS(gm.)	289.81	340.88
Moisture Content(%)	16.0	20.3

UNIT WEIGHT		
Wt. Tube & WS.(gms.)	933.90	NA
Wt. Of Tube(gms.)	247.90	NA
Wt. Of WS.(gms.)	686.00	711.7
Length 1 (in.)	3.345	3.306
Length 2 (in.)	3.327	3.299
Length 3 (in.)	3.336	3.329
Top Diameter (in.)	2.869	2.804
Middle Diameter (in.)	2.866	2.812
Bottom Diameter (in.)	2.866	2.828
Average Length (in)	3.34	3.31
Average Area (in^2)	6.46	6.22
Sample Volume(cc.)	352.92	337.64
Unit Wet Wt.(gms/cc)	1.94	2.11
Unit Wet Wt.(pcf.)	121.3	131.5
Unit Dry Wt.(pcf.)	104.6	109.3
Unit Dry Wt.(gms/cc)	1.68	1.75
Void Ratio,e	0.61	0.54
Porosity, n	0.38	0.35
Pore Volume(cm^3)	133.8	118.5

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PERMEABILITY TEST

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Client	ICF KAISER	Tested By	JCM	Date	08-13-97
Client Project	BAYER 51249	Checked By	JHC	Date	8/22/97
Project No.	97178-02				
Boring No.	NA				
Depth(ft.)	4.6-4.9				
Sample No.	SM020-TB02-0305				
Visual Description	BROWN CLAY AND ROCK FRAGMENTS				

Pressure Heads (Constant)	
Top Cap (psi)	27.5
Bottom Cap (psi)	30.0
Cell (psi)	35.0
Total Pressure Head (cm)	175.8

Final Sample Dimensions	
Sample Length (cm.), L	8.41
Sample Diameter (cm.)	7.15
Sample Area (cm.^2), A	40.14
Inflow Burette Area, (cm.^2), a-in	4.62
Outflow Burette Area, (cm.^2), a-out	4.46
B Parameter	96%

AVERAGE PERMEABILITY = 7.1E-08 cm/sec @ 20°C
AVERAGE PERMEABILITY = 7.1E-10 m/sec @ 20°C

DATE mon-dy-yr	TIME hr	TIME min	ELAPSED TIME (t) hr	TOTAL INFLOW cm^3	TOTAL OUTFLOW cm^3	TOTAL HEAD (h) cm	FLOW 0 FLOW 1 STOP	TEMP °C	INCREMENTAL PERMEABILITY @ 20°C cm/sec
08-13-97	16	30	0.0	0.0	0.0	193.9	0	22.9	NA
08-13-97	20	5	3.6	1.4	0.9	193.4	0	22.6	9.2E-08
08-14-97	7	25	14.9	5.7	3.7	191.8	0	23.0	8.7E-08
08-14-97	17	55	25.4	9.0	6.5	190.5	0	22.5	8.3E-08
08-15-97	7	10	38.7	12.8	10.2	188.8	0	23.0	8.1E-08
08-15-97	18	40	50.2	15.6	13.0	187.6	0	22.2	7.2E-08
08-16-97	13	30	69.0	20.3	17.1	185.6	0	23.0	6.9E-08
08-17-97	11	25	90.9	25.1	21.7	183.6	0	23.0	6.3E-08

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SHELBY TUBE UNIT WEIGHT

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Client	ICF KAISER	Tested By	BL 8-12-97
Client Project	BAYER 51249	Checked By	JMO 9-3-97
Project No.	97178-02		
Boring No.	NA	Tube Recovery	1.60
Depth Pushed	1.0-3.0		
Shelby Tube No.	SM021-TB01-0103		

SOIL PROFILE AND SAMPLING

DEPTH ( )	ELEV ( )	SECTION No.	SOIL PROFILE	SOIL DESCRIPTION AND REMARKS	TEST PERFORMED
1.00					
1.50					
2.00					
2.50		2		BROWN SANDY LEAN CLAY	UNIT WGT. WC. GRAIN SIZE HYDROMETER
		1			NO TEST
3.00					

NOTE:WHEN FULL RECOVERY IS NOT ACHIEVED,SOIL ELEVATION CAN NOT BE ACCURATELY DEFINE
INDICATE EACH CUT OF THE TUBE WITH AN ARROW
INDICATE DIVIDING LINE BETWEEN SOIL TYPES BY A SOLID LINE
INDICATE WAX BY CROSS-HATCHING
INDICATE SOIL TYPES BY STANDARD SYMBOLS

MOISTURE CONTENT					
Section Number	1	2	3	4	5
Tare Number		1741			
Wt. Tare & WS(gm.)		190.86			
Wt. Tare & DS(gm.)		176.78			
Wt. Tare(gm.)		83.64			
Moisture Content(%)		15.1			

UNIT WEIGHT	
Wt. Tube & WS.(gms.)	1114.70
Wt. Of Tube(gms.)	276.17
Wt. Of WS.(gms.)	838.53
Length 1 (in.)	3.641
Length 2 (in.)	3.613
Length 3 (in.)	3.613
Top Diameter (in.)	2.871
Middle Diameter (in.)	2.864
Bottom Diameter (in.)	2.873
Sample Volume (cc)	383.83
Moisture Content(%)	15.12
Unit Wet Wt.(gms/cc)	2.18
Unit Wet Wt.(pcf.)	136.3
Unit Dry Wt.(pcf.)	118.4
Unit Dry Wt.(gms/cc)	1.90

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	2.5-3.0
Project No.	97178-02	Sample No.	SM021-TB01-0103
Lab ID	97178-02.047	Soil Color	**BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	1133	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	700.80	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	619.00	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	105.25	Weight of Tare (gm)	NA
Weight of Water (gm)	81.80	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	513.75	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**15.9**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	513.75
Dry Weight - 3/4" Sample (gm)	182.06	Weight of minus #200 material (gm)	331.69
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	182.06
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"	12.5	29.94	5.83	5.83	94.17	**94.17**
3/8"	9.50	8.87	1.73	7.55	92.45	**92.45**
#4	4.75	22.44	4.37	11.92	88.08	**88.08**
#10	2.00	27.05	5.27	17.19	82.81	**82.81**
#20	0.85	19.53	3.80	20.99	79.01	**79.01**
#40	0.425	13.83	2.69	23.68	76.32	**76.32**
#60	0.250	18.47	3.60	27.28	72.72	**72.72**
#140	0.106	31.31	6.09	33.37	66.63	**66.63**
#200	0.075	10.62	2.07	35.44	64.56	**64.56**
Pan	-	331.69	64.56	100.00	-	-

Tested By BL Date 8/12/97 Checked By JCM Date 8-28-97

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HYDROMETER ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	2.5-3.0
Project No.	97178-02	Sample No.	SM021-TB01-0103
Lab ID	97178-02.047	Soil Color	**BROWN**

Elapsed Time (min)		R Measured	Temp. (°C)	R Corrected	N (%)	Diameter (mm)	N' (%)
0	NA	NA	NA	NA	NA	NA	NA
2	45.0	47.0	24.2	41.3	84.7	0.0265	**54.7**
5		43.5	24.2	37.8	77.5	0.0173	**50.0**
15		38.0	24.2	32.3	66.2	0.0105	**42.8**
30		35.5	24.2	29.8	61.1	0.0076	**39.4**
60		32.0	23.5	26.3	53.9	0.0055	**34.8**
250		28.0	23.2	22.3	45.7	0.0028	**29.5**
1440		22.0	23.9	16.3	33.4	0.0012	**21.6**

Soil Specimen Data		Corrections	
Tare No.	SGI 11	K - Factor	0.01279
Tare + Dry Material (gm)	160.28	a - Factor	0.99
Weight of Tare (gm)	106.99	Composite Correction	5.70
Weight of Deflocculant (gm)	5.0	Percent Finer than # 200	64.56
Weight of Dry Material (gm)	48.29		
		Specific Gravity	2.7 Assumed

Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By TO Date 8/18/97 Checked By Jcm Date 8.28.97

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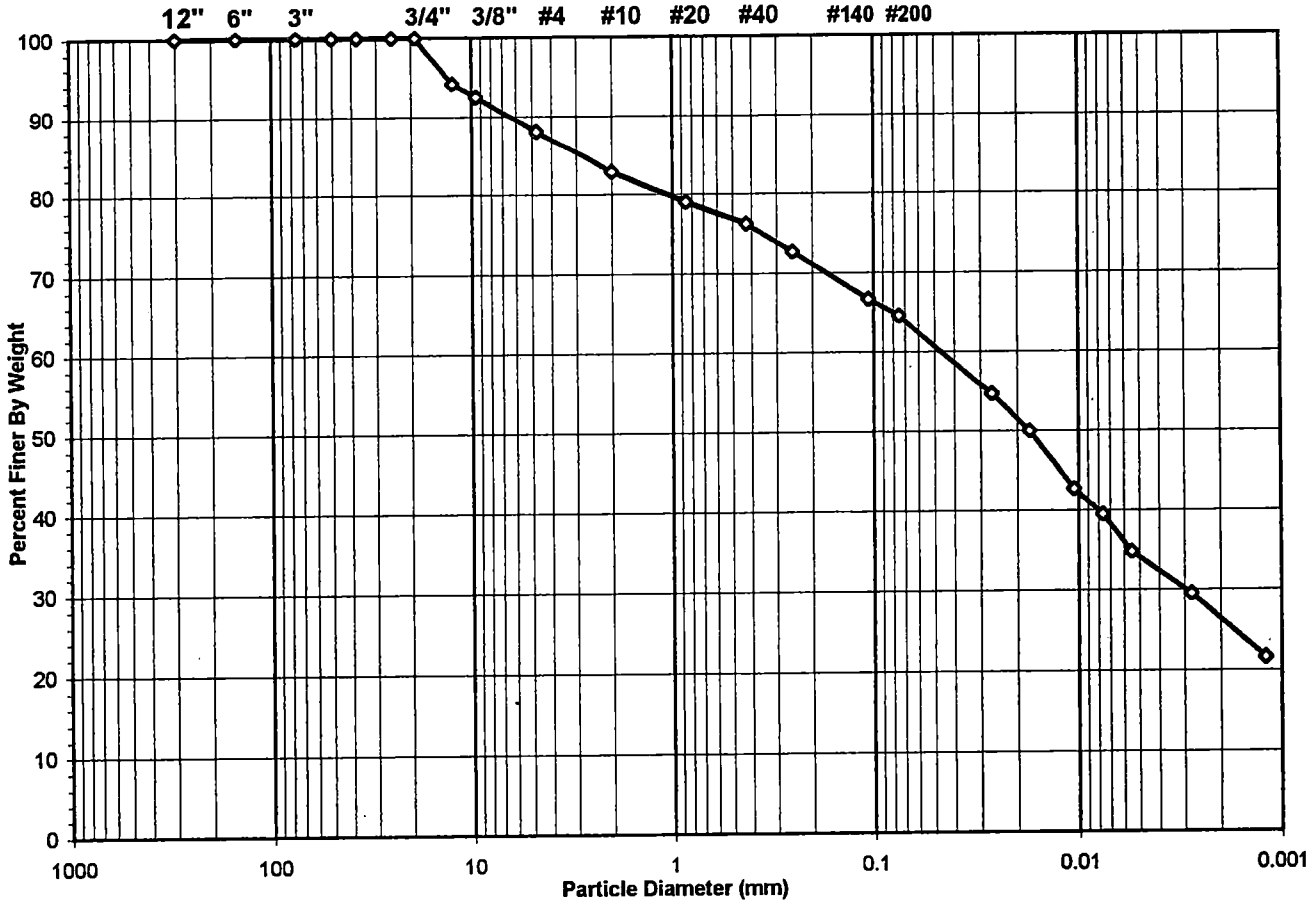
SIEVE AND HYDROMETER ANALYSIS
ASTM D 422-63 (SOP-S3)

geotechnics

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	2.5-3.0
Project No.	97178-02	Sample No.	SM021-TB01-0103
Lab ID	97178-02.047	Soil Color	BROWN

	SIEVE ANALYSIS		HYDROMETER	
USCS	gravel	sand	silt and clay fraction	
USDA	gravel	sand	silt	clay



Sieve Size (mm)	Percent Finer	Components	Percentage	Corrected % of Minus 2.0 mm material for USDA Classificat.
100	100.00	*Gravel*	17.19	**0.00**
2	82.81	*Sand*	22.11	**26.70**
0.075	64.56	*Silt*	34.28	**41.39**
0.05	60.70	*Clay*	26.43	**31.91**
0.002	26.43			

USDA Classification	***CLAY LOAM***
USCS Symbol	***cl, ASSUMED***
USCS Classification	***SANDY LEAN CLAY***

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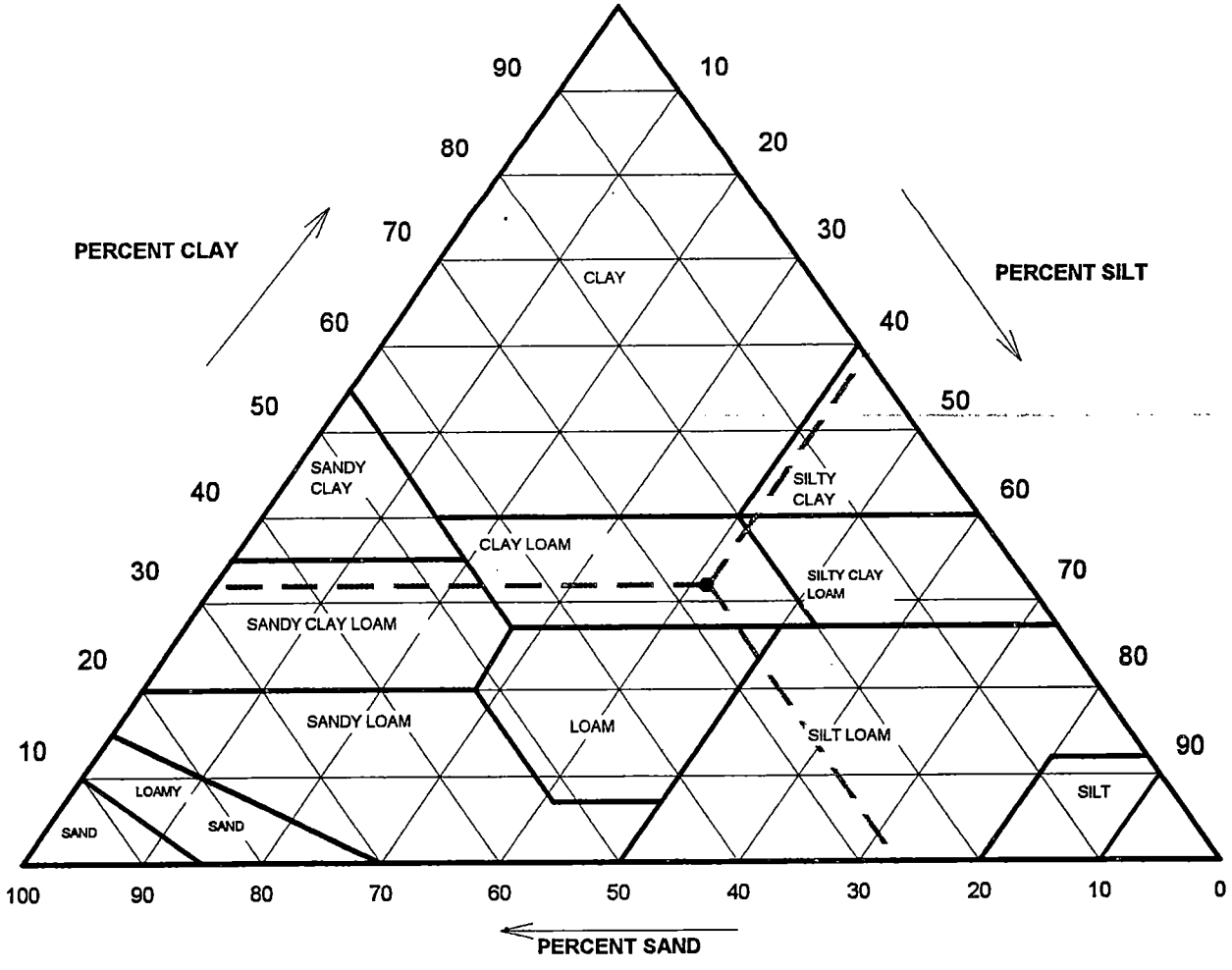
USDA CLASSIFICATION CHART

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	2.5-3.0
Project No.	97178-02	Sample No.	SM021-TB01-0103
Lab ID	97178-02.047	Soil Color	BROWN



Components	Corrected % of Minus 2.0 mm material for USDA Classificat.
Gravel	0.00
Sand	26.70
Silt	41.39
Clay	31.91
USDA Classification	***CLAY LOAM***

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SHELBY TUBE UNIT WEIGHT

geotechnics

Client	ICF KAISER	Tested By	JCM 8-13-97
Client Project	BAYER 51249	Checked By	JMD 8/29/97
Project No.	97178-02		
Boring No.	NA	Tube Recovery	1.85
Depth Pushed	3.0-5.0		
Shelby Tube No.	SM021-TB01-0305		

SOIL PROFILE AND SAMPLING

DEPTH ( )	ELEV ( )	SECTION No.	SOIL PROFILE	SOIL DESCRIPTION AND REMARKS	TEST PERFORMED
3.00					
3.50					
4.00					
		3			UNIT WGT. WC. GRAINSIZE HYDROMETER
4.50				GRAY GRAVELLY LEAN CLAY WITH SAND	
		2			PERMEABILITY
		1			WATER CONTENT
5.00					

NOTE:WHEN FULL RECOVERY IS NOT ACHIEVED,SOIL ELEVATION CAN NOT BE ACCURATELY DEFINE
INDICATE EACH CUT OF THE TUBE WITH AN ARROW
INDICATE DIVIDING LINE BETWEEN SOIL TYPES BY A SOLID LINE
INDICATE WAX BY CROSS-HATCHING
INDICATE SOIL TYPES BY STANDARD SYMBOLS

MOISTURE CONTENT					
Section Number	1	2	3	4	5
Tare Number	1845		1722		
Wt. Tare & WS(gm.)	247.72		674.80		
Wt. Tare & DS(gm.)	191.21		548.20		
Wt. Tare(gm.)	36.25		81.68		
Moisture Content(%)	36.5		27.1		

UNIT WEIGHT		
Wt. Tube & WS.(gms.)	1027.00	1324.90
Wt. Of Tube(gms.)	276.70	353.72
Wt. Of WS.(gms.)	750.30	971.18
Length 1 (in.)	3.706	4.768
Length 2 (in.)	3.715	4.778
Length 3 (in.)	3.721	4.790
Top Diameter (in.)	2.888	2.868
Middle Diameter (in.)	2.886	2.870
Bottom Diameter (in.)	2.883	2.868
Sample Volume (cc)	398.04	506.13
Moisture Content(%)	36.47	27.14
Unit Wet Wt.(gms/cc)	1.88	1.92
Unit Wet Wt.(pcf.)	117.6	119.7
Unit Dry Wt.(pcf.)	86.2	94.2
Unit Dry Wt.(gms/cc)	1.38	1.51

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	4.1-4.5
Project No.	97178-02	Sample No.	SM021-TB01-0305
Lab ID	97178-02.048	Soil Color	**GRAY**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	1722	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	674.80	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	548.20	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	81.68	Weight of Tare (gm)	NA
Weight of Water (gm)	126.60	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	466.52	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**27.1**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	466.52
Dry Weight - 3/4" Sample (gm)	122.86	Weight of minus #200 material (gm)	325.86
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	140.66
Dry Weight + 3/4" Sample (gm)	17.80		
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	17.80	3.82	3.82	96.18	**96.18**
1/2"	12.5	8.90	1.91	5.72	94.28	**94.28**
3/8"	9.50	7.55	1.62	7.34	92.66	**92.66**
#4	4.75	12.51	2.68	10.02	89.98	**89.98**
#10	2.00	17.59	3.77	13.79	86.21	**86.21**
#20	0.85	11.71	2.51	16.30	83.70	**83.70**
#40	0.425	9.46	2.03	18.33	81.67	**81.67**
#60	0.250	14.26	3.06	21.39	78.61	**78.61**
#140	0.106	30.51	6.54	27.93	72.07	**72.07**
#200	0.075	10.37	2.22	30.15	69.85	**69.85**
Pan	-	325.86	69.85	100.00	-	-

Tested By JCM Date 8/13/97 Checked By JMO Date 8/22/97

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HYDROMETER ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	4.1-4.5
Project No.	97178-02	Sample No.	SM021-TB01-0305
Lab ID	97178-02.048	Soil Color	**GRAY**

Elapsed Time (min)		R Measured	Temp. (°C)	R Corrected	N (%)	Diameter (mm)	N' (%)
0	NA	NA	NA	NA	NA	NA	NA
2	48.5	50.0	24	44.2	88.1	0.0258	**61.5**
5		46.0	24	40.2	80.1	0.0170	**56.0**
16		40.0	24	34.2	68.2	0.0100	**47.6**
30		36.0	24	30.2	60.2	0.0075	**42.0**
60		32.0	23.4	26.2	52.2	0.0055	**36.5**
250		26.0	23.4	20.2	40.3	0.0028	**28.1**
1440		21.0	23.7	15.2	30.3	0.0012	**21.2**

Soil Specimen Data		Corrections	
Tare No.	1624	K - Factor	0.01282
Tare + Dry Material (gm)	156.14	a - Factor	0.99
Weight of Tare (gm)	101.47	Composite Correction	5.80
Weight of Deflocculant (gm)	5.0	Percent Finer than # 200	69.85
Weight of Dry Material (gm)	49.67		
		Specific Gravity	2.7 Assumed

Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By TO Date 8/16/97 Checked By JMD Date 8/22/97

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SIEVE AND HYDROMETER ANALYSIS
ASTM D 422-63 (SOP-S3)

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Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	4.1-4.5
Project No.	97178-02	Sample No.	SM021-TB01-0305
Lab ID	97178-02.048	Soil Color	GRAY

	SIEVE ANALYSIS		HYDROMETER	
USCS	gravel	sand	silt and clay fraction	
USDA	gravel	sand	silt	clay

Sieve Size (mm)	Percent Finer	Components	Percentage	Corrected % of Minus 2.0 mm material for USDA Classificat.
100	100.00	*Gravel*	13.79	**0.00**
2	86.21	*Sand*	32.61	**37.83**
0.075	69.85	*Silt*	39.83	**46.21**
0.05	53.59	*Clay*	13.76	**15.96**
0.002	13.76			

USDA Classification ***SILT LOAM***

USCS Symbol ***cl, ASSUMED***

USCS Classification ***GRAVELLY LEAN CLAY WITH SAND***

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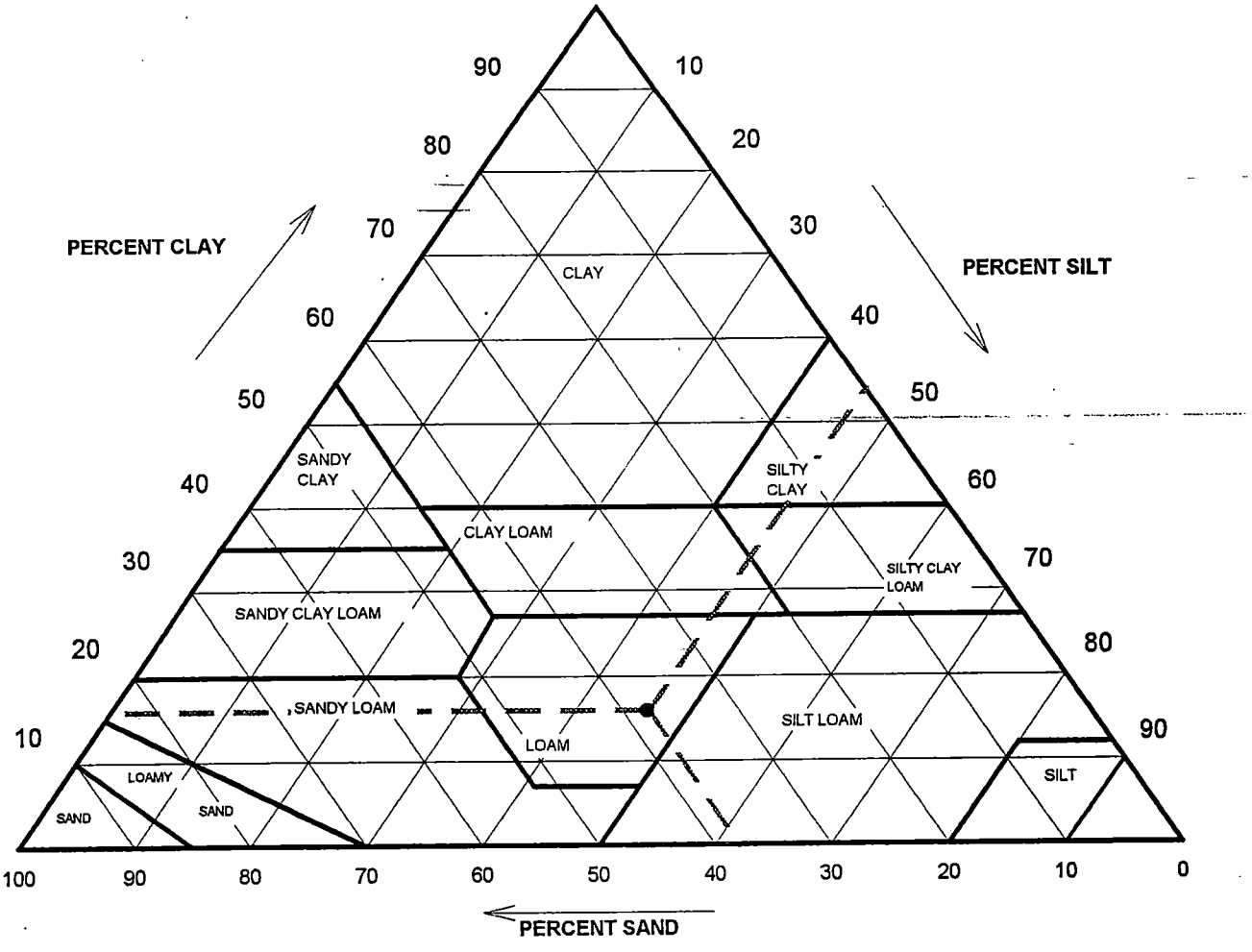
USDA CLASSIFICATION CHART

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	4.1-4.5
Project No.	97178-02	Sample No.	SM021-TB01-0305
Lab ID	97178-02.048	Soil Color	GRAY



Components	Corrected % of Minus 2.0 mm material for USDA Classificat.
Gravel	0.00
Sand	37.83
Silt	46.21
Clay	15.96
USDA Classification	***SILT LOAM***

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PERMEABILITY TEST

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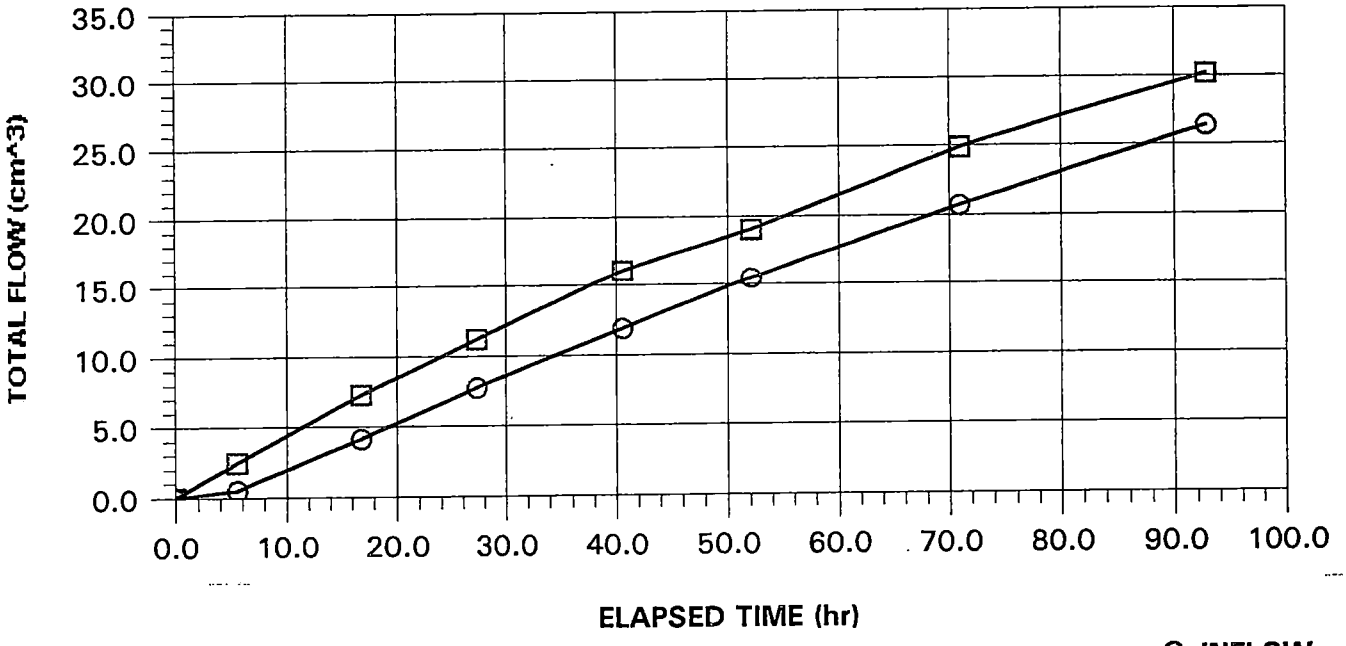
Client	ICF KAISER	Boring No.	NA
Client Project	BAYER 51249	Depth(ft.)	4.5-4.8
Project No.	97178-02	Sample No.	SM021-TB01-0305

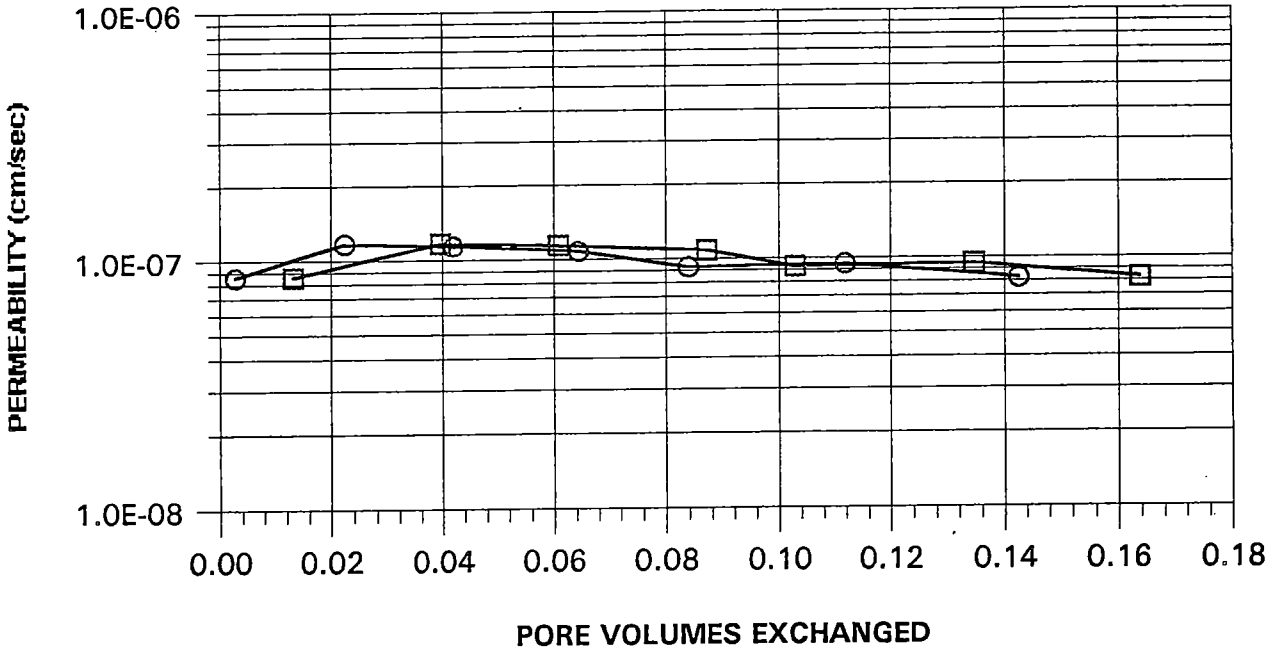
AVERAGE PERMEABILITY = 9.5E-08 cm/sec @ 20°C
AVERAGE PERMEABILITY = 9.5E-10 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



⊖ INFLOW
⊟ OUTFLOW

PORE VOLUMES EXCHANGED vs. PERMEABILITY



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PERMEABILITY TEST

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Client	ICF KAISER	Tested By	JCM	Date	08-13-97
Client Project	BAYER 51249	Checked By	JMO	Date	8/22/97
Project No.	97178-02				
Boring No.	NA	Specific Gravity	2.70 ASSUMED		
Depth(ft.)	4.5-4.8	Sample Condition	UNDISTURBED		
Sample No.	SM021-TB01-0305				

Visual Description GRAY CLAY

MOISTURE CONTENT	BEFORE TEST	AFTER TEST
Tare Number	1845	1723
Wt. Tare & WS(gm.)	247.72	459.00
Wt. Tare & DS(gm.)	191.21	373.69
Wt. Water(gm.)	56.51	85.31
Wt. Tare(gm.)	36.25	83.52
Wt. DS(gm.)	154.96	290.17
Moisture Content(%)	36.5	29.4

UNIT WEIGHT		
Wt. Tube & WS.(gms.)	1027.00	NA
Wt. Of Tube(gms.)	276.70	NA
Wt. Of WS.(gms.)	750.30	711.4
Length 1 (in.)	3.706	3.735
Length 2 (in.)	3.715	3.716
Length 3 (in.)	3.721	3.731
Top Diameter (in.)	2.888	2.847
Middle Diameter (in.)	2.886	2.847
Bottom Diameter (in.)	2.883	2.841
Average Length (in)	3.71	3.73
Average Area (in^2)	6.54	6.36
Sample Volume(cc.)	398.04	388.29
Unit Wet Wt.(gms/cc)	1.88	1.83
Unit Wet Wt.(pcf.)	117.6	114.3
Unit Dry Wt.(pcf.)	86.2	88.4
Unit Dry Wt.(gms/cc)	1.38	1.42
Void Ratio,e	0.95	0.91
Porosity, n	0.49	0.48
Pore Volume(cm^3)	194.4	184.7

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PERMEABILITY TEST

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Client	ICF KAISER	Tested By	JCM	Date	08-13-97
Client Project	BAYER 51249	Checked By	JMO	Date	8/22/97
Project No.	97178-02				
Boring No.	NA				
Depth(ft.)	4.5-4.8				
Sample No.	SM021-TB01-0305				
Visual Description	GRAY CLAY				

Pressure Heads (Constant)	
Top Cap (psi)	27.5
Bottom Cap (psi)	30.0
Cell (psi)	35.0
Total Pressure Head (cm)	175.8

Final Sample Dimensions	
Sample Length (cm.), L	9.47
Sample Diameter (cm.)	7.23
Sample Area (cm.^2), A	41.01
Inflow Burette Area, (cm.^2), a-in	4.77
Outflow Burette Area, (cm.^2), a-out	4.50
B Parameter	98%

AVERAGE PERMEABILITY = 9.5E-08 cm/sec @ 20°C
AVERAGE PERMEABILITY = 9.5E-10 m/sec @ 20°C

DATE mon-dy-yr	TIME hr	TIME min	ELAPSED TIME (t) hr	TOTAL INFLOW cm^3	TOTAL OUTFLOW cm^3	TOTAL HEAD (h) cm	FLOW 0 FLOW 1 STOP	TEMP °C	INCREMENTAL PERMEABILITY @ 20°C cm/sec
08-13-97	14	35	0.0	0.0	0.0	192.7	0	22.9	NA
08-13-97	20	5	5.5	0.5	2.4	192.0	0	22.6	8.6E-08
08-14-97	7	25	16.8	4.1	7.3	190.2	0	23.0	1.2E-07
08-14-97	17	55	27.3	7.7	11.2	188.6	0	22.5	1.1E-07
08-15-97	7	10	40.6	11.9	16.1	186.6	0	23.0	1.1E-07
08-15-97	18	40	52.1	15.5	19.0	185.2	0	22.2	9.3E-08
08-16-97	13	30	70.9	20.7	24.9	182.8	0	23.0	9.5E-08
08-17-97	11	25	92.8	26.3	30.2	180.4	0	23.0	8.3E-08

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SHELBY TUBE UNIT WEIGHT

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Client	ICF KAISER	Tested By	JCM 8-13-97
Client Project	BAYER 51249	Checked By	JMO 9-3-97
Project No.	97178-02		
Boring No.	NA	Tube Recovery	1.70
Depth Pushed	10.0-12.0		
Shelby Tube No.	SM021-TB01-1012		

SOIL PROFILE AND SAMPLING

	DEPTH ( )	ELEV ( )	SECTION No.	SOIL PROFILE	SOIL DESCRIPTION AND REMARKS	TEST PERFORMED
10.00						
10.50						
11.00						
			3			GRAIN SIZE HYDROMETER UNIT WGT. WC
11.50			2		BROWN LEAN CLAY WITH SAND	PERMEABILITY
			1			WATER CONTENT
12.00						

NOTE:WHEN FULL RECOVERY IS NOT ACHIEVED,SOIL ELEVATION CAN NOT BE ACCURATELY DEFINE
INDICATE EACH CUT OF THE TUBE WITH AN ARROW
INDICATE DIVIDING LINE BETWEEN SOIL TYPES BY A SOLID LINE
INDICATE WAX BY CROSS-HATCHING
INDICATE SOIL TYPES BY STANDARD SYMBOLS

MOISTURE CONTENT					
Section Number	1	2	3	4	5
Tare Number	1719		1315		
Wt. Tare & WS(gm.)	146.03		963.30		
Wt. Tare & DS(gm.)	127.40		798.70		
Wt. Tare(gm.)	45.11		107.28		
Moisture Content(%)	22.6		23.8		

UNIT WEIGHT		
Wt. Tube & WS.(gms.)	1025.90	1372.60
Wt. Of Tube(gms.)	270.45	362.15
Wt. Of WS.(gms.)	755.45	1010.45
Length 1 (in.)	3.580	4.811
Length 2 (in.)	3.604	4.815
Length 3 (in.)	3.596	4.819
Top Diameter (in.)	2.861	2.874
Middle Diameter (in.)	2.882	2.851
Bottom Diameter (in.)	2.874	2.870
Sample Volume (cc)	381.56	508.67
Moisture Content(%)	22.64	23.81
Unit Wet Wt.(gms/cc)	1.98	1.99
Unit Wet Wt.(pcf.)	123.5	124.0
Unit Dry Wt.(pcf.)	100.7	100.1
Unit Dry Wt.(gms/cc)	1.61	1.60

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	11.1-11.5
Project No.	97178-02	Sample No.	SM021-TB01-1012
Lab ID	97178-02.049	Soil Color	**BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	1315	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	963.30	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	798.70	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	107.28	Weight of Tare (gm)	NA
Weight of Water (gm)	164.60	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	691.42	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**23.8**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	691.42
Dry Weight - 3/4" Sample (gm)	197.99	Weight of minus #200 material (gm)	493.43
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	197.99
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"	12.5	2.34	0.34	0.34	99.66	**99.66**
3/8"	9.50	1.10	0.16	0.50	99.50	**99.50**
#4	4.75	10.33	1.49	1.99	98.01	**98.01**
#10	2.00	20.20	2.92	4.91	95.09	**95.09**
#20	0.85	25.66	3.71	8.62	91.38	**91.38**
#40	0.425	27.48	3.97	12.60	87.40	**87.40**
#60	0.250	37.30	5.39	17.99	82.01	**82.01**
#140	0.106	56.61	8.19	26.18	73.82	**73.82**
#200	0.075	16.97	2.45	28.64	71.36	**71.36**
Pan	-	493.43	71.36	100.00	-	-

Tested By BL Date 8/13/97 Checked By JMD Date 8/17/97

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HYDROMETER ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	11.1-11.5
Project No.	97178-02	Sample No.	SM021-TB01-1012
Lab ID	97178-02.049	Soil Color	**BROWN**

Elapsed Time (min)		R Measured	Temp. (°C)	R Corrected	N (%)	Diameter (mm)	N' (%)
0	NA	NA	NA	NA	NA	NA	NA
2	42.0	44.0	24.2	38.3	85.2	0.0273	**60.8**
5		40.5	24.2	34.8	77.4	0.0178	**55.2**
15		36.0	24.2	30.3	67.4	0.0106	**48.1**
30		32.0	24.2	26.3	58.5	0.0078	**41.7**
60		29.0	23.5	23.3	51.8	0.0056	**37.0**
276		23.0	23	17.3	38.5	0.0027	**27.5**
1440		18.0	23.7	12.3	27.3	0.0012	**19.5**

Soil Specimen Data		Corrections	
Tare No.	724	K - Factor	0.01279
Tare + Dry Material (gm)	158.35	a - Factor	0.99
Weight of Tare (gm)	108.82	Composite Correction	5.70
Weight of Deflocculant (gm)	5.0	Percent Finer than # 200	71.36
Weight of Dry Material (gm)	44.53		
		Specific Gravity	2.7 Assumed

Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By TO Date 8/18/97 Checked By JMO Date 8/27/97

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SIEVE AND HYDROMETER ANALYSIS
ASTM D 422-63 (SOP-S3)

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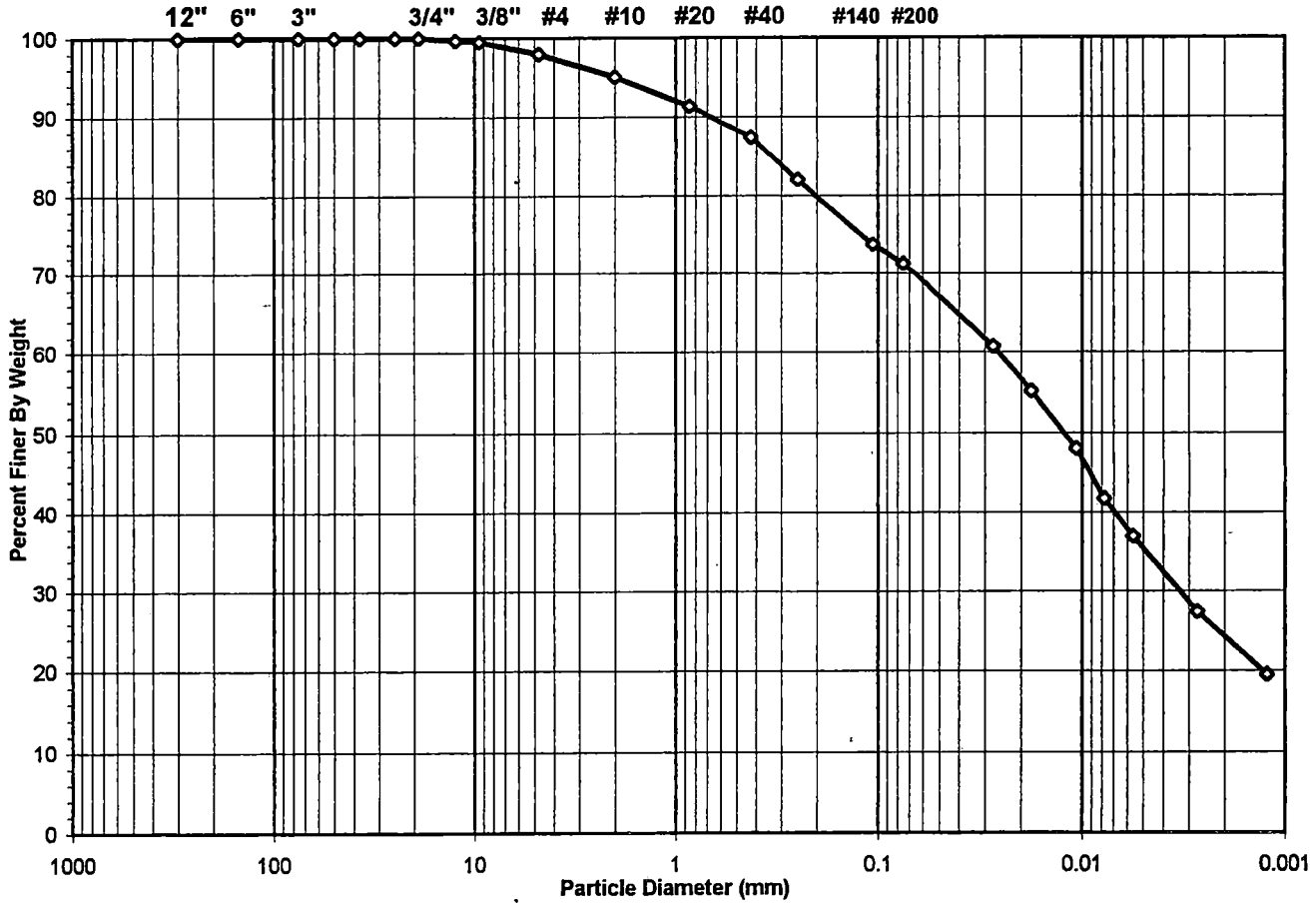
Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	11.1-11.5
Project No.	97178-02	Sample No.	SM021-TB01-1012
Lab ID	97178-02.049	Soil Color	**BROWN**

	SIEVE ANALYSIS		*HYDROMETER*	
USCS	gravel	sand	silt and clay fraction	
USDA	gravel	sand	silt	clay



Sieve Size (mm)	Percent Finer	Components	Percentage	Corrected % of Minus 2.0 mm material for USDA Classificat.
100	100.00	*Gravel*	4.91	**0.00**
2	95.09	*Sand*	27.97	**29.41**
0.075	71.36	*Silt*	42.76	**44.97**
0.05	67.12	*Clay*	24.36	**25.62**
0.002	24.36			

USDA Classification ***LOAM***

USCS Symbol ***cl, ASSUMED***

USCS Classification ***LEAN CLAY WITH SAND***

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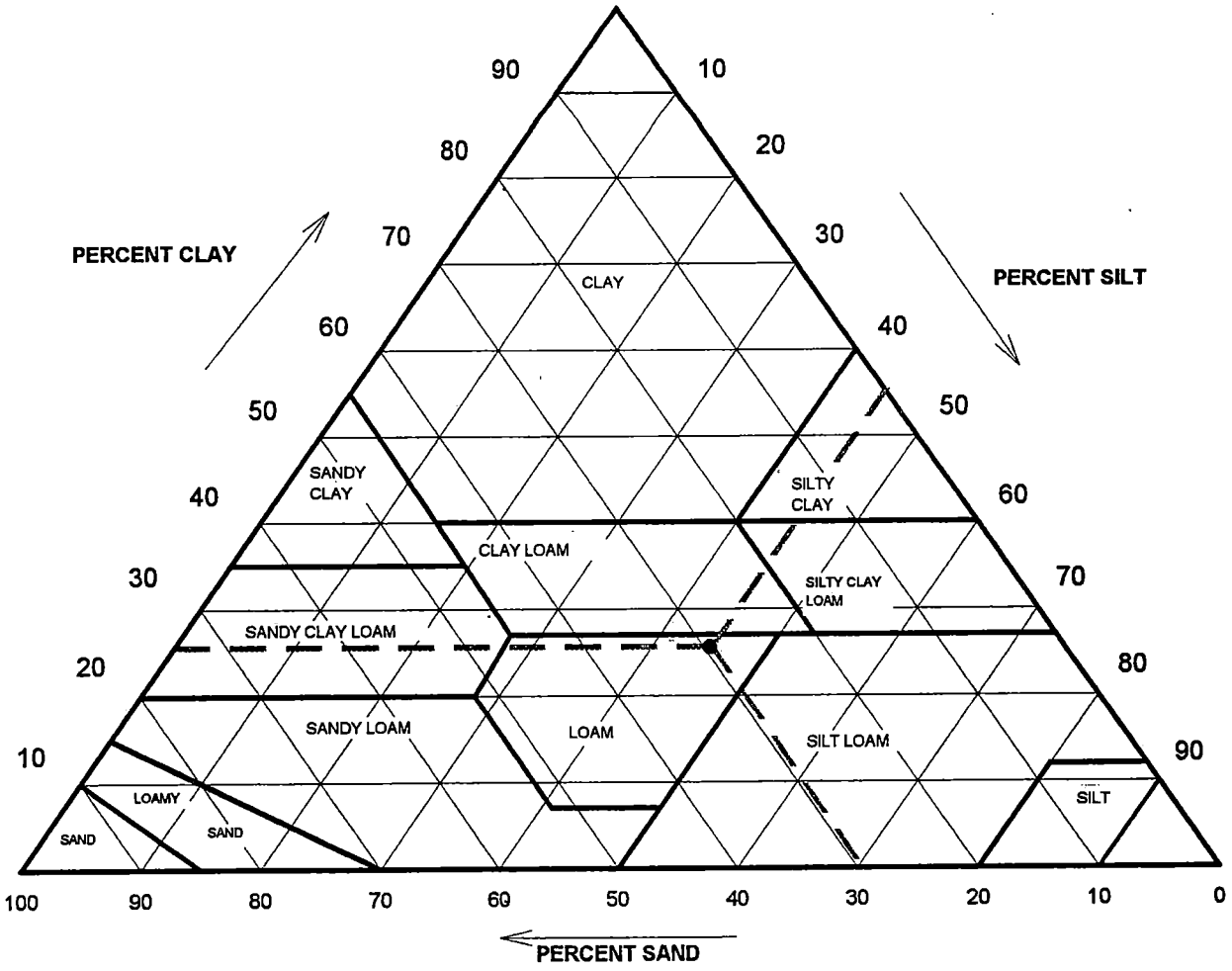
USDA CLASSIFICATION CHART

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	11.1-11.5
Project No.	97178-02	Sample No.	SM021-TB01-1012
Lab ID	97178-02.049	Soil Color	BROWN



Components	Corrected % of Minus 2.0 mm material for USDA Classificat.
Gravel	0.00
Sand	29.41
Silt	44.97
Clay	25.62
USDA Classification	***LOAM***

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PERMEABILITY TEST

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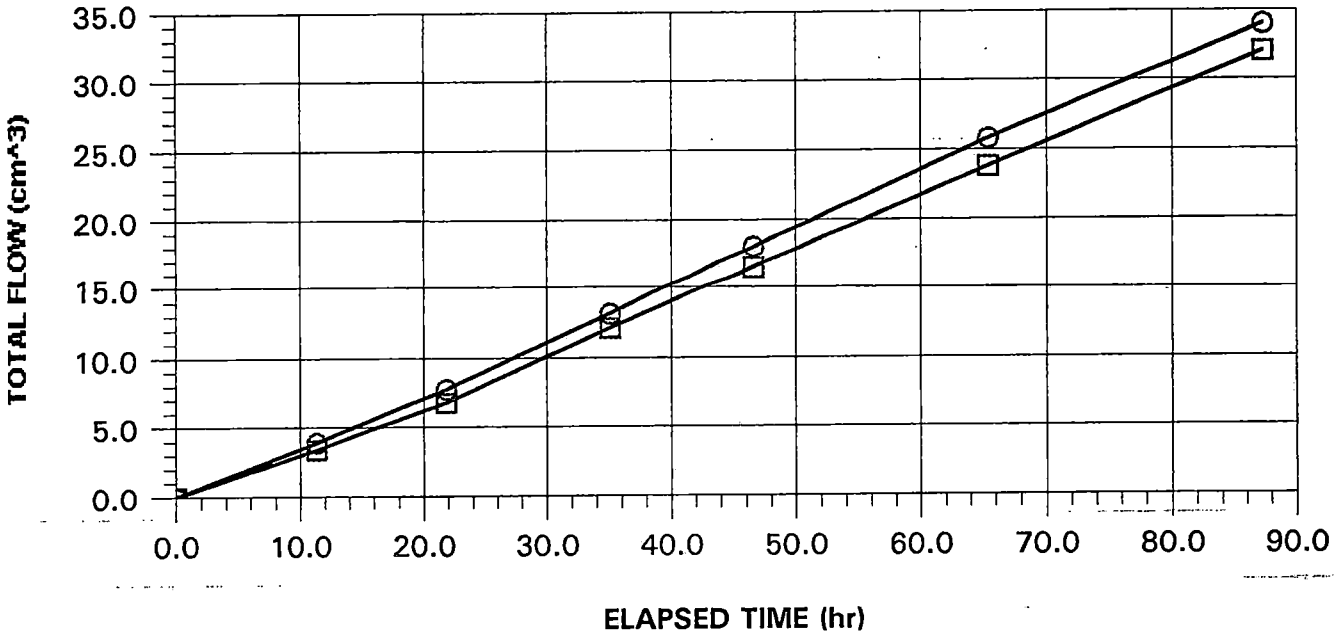
Client	ICF KAISER	Boring No.	NA
Client Project	BAYER 51249	Depth(ft.)	11.5-11.8
Project No.	97178-02	Sample No.	SM021-TB01-1012

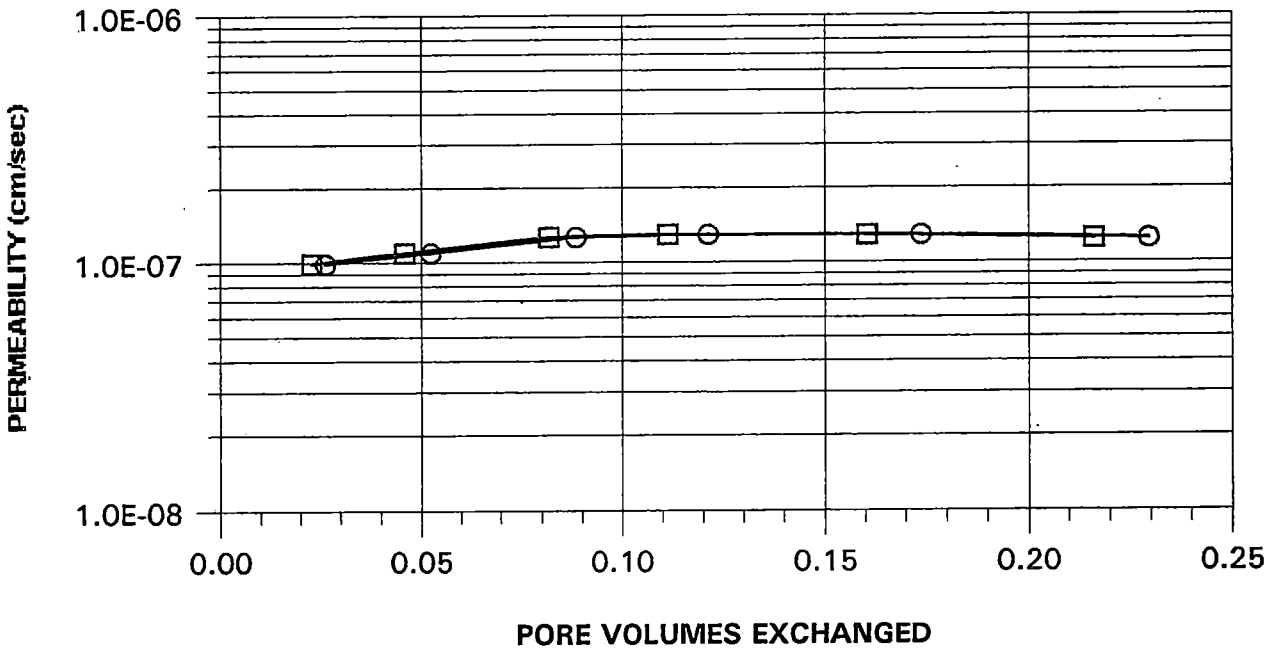
AVERAGE PERMEABILITY = 1.3E-07 cm/sec @ 20°C
AVERAGE PERMEABILITY = 1.3E-09 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



INFLOW
OUTFLOW

PORE VOLUMES EXCHANGED vs. PERMEABILITY



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PERMEABILITY TEST

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Client	ICF KAISER	Tested By	JCM	Date	08-13-97
Client Project	BAYER 51249	Checked By	JHO	Date	8/22/97
Project No.	97178-02				
Boring No.	NA	Specific Gravity	2.70 ASSUMED		
Depth(ft.)	11.5-11.8	Sample Condition	UNDISTURBED		
Sample No.	SM021-TB01-1012				

Visual Description BROWN CLAY

MOISTURE CONTENT	BEFORE TEST	AFTER TEST
Tare Number	1719	1705
Wt. Tare & WS(gm.)	146.03	508.00
Wt. Tare & DS(gm.)	127.40	428.90
Wt. Water(gm.)	18.63	79.10
Wt. Tare(gm.)	45.11	83.49
Wt. DS(gm.)	82.29	345.41
Moisture Content(%)	22.6	22.9

UNIT WEIGHT		
Wt. Tube & WS.(gms.)	1025.90	NA
Wt. Of Tube(gms.)	270.45	NA
Wt. Of WS.(gms.)	755.45	757.1
Length 1 (in.)	3.580	3.648
Length 2 (in.)	3.604	3.690
Length 3 (in.)	3.596	3.683
Top Diameter (in.)	2.861	2.825
Middle Diameter (in.)	2.882	2.829
Bottom Diameter (in.)	2.874	2.811
Average Length (in)	3.59	3.67
Average Area (in^2)	6.48	6.25
Sample Volume(cc.)	381.56	376.45
Unit Wet Wt.(gms/cc)	1.98	2.01
Unit Wet Wt.(pcf.)	123.5	125.5
Unit Dry Wt.(pcf.)	100.7	102.1
Unit Dry Wt.(gms/cc)	1.61	1.64
Void Ratio,e	0.67	0.65
Porosity, n	0.40	0.39
Pore Volume(cm^3)	153.4	148.3

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PERMEABILITY TEST

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Client	ICF KAISER	Tested By	JCM	Date	08-13-97
Client Project	BAYER 51249	Checked By	JMO	Date	8/22/97
Project No.	97178-02				
Boring No.	NA				
Depth(ft.)	11.5-11.8				
Sample No.	SM021-TB01-1012				
Visual Description	BROWN CLAY				

Pressure Heads (Constant)	
Top Cap (psi)	27.5
Bottom Cap (psi)	30.0
Cell (psi)	35.0
Total Pressure Head (cm)	175.8

Final Sample Dimensions	
Sample Length (cm.), L	9.33
Sample Diameter (cm.)	7.17
Sample Area (cm.^2), A	40.34
Inflow Burette Area, (cm.^2), a-in	4.49
Outflow Burette Area, (cm.^2), a-out	4.48
B Parameter	95%

AVERAGE PERMEABILITY = 1.3E-07 cm/sec @ 20°C
AVERAGE PERMEABILITY = 1.3E-09 m/sec @ 20°C

DATE mon-dy-yr	TIME hr	TIME min	ELAPSED TIME (t) hr	TOTAL INFLOW cm^3	TOTAL OUTFLOW cm^3	TOTAL HEAD (h) cm	FLOW 0 FLOW 1 STOP	TEMP °C	INCREMENTAL PERMEABILITY @ 20°C cm/sec
08-13-97	20	5	0.0	0.0	0.0	194.4	0	22.6	NA
08-14-97	7	25	11.3	3.9	3.4	192.8	0	23.0	9.9E-08
08-14-97	17	55	21.8	7.8	6.8	191.2	0	22.5	1.1E-07
08-15-97	7	10	35.1	13.1	12.1	188.8	0	23.0	1.3E-07
08-15-97	18	40	46.6	18.0	16.5	186.7	0	22.2	1.3E-07
08-16-97	13	30	65.4	25.8	23.8	183.4	0	23.0	1.3E-07
08-17-97	11	25	87.3	34.0	32.1	179.7	0	23.0	1.2E-07

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SHELBY TUBE UNIT WEIGHT

geotechnics

Client	ICF KAISER	Tested By BL 8-12-97	
Client Project	BAYER 51249	Checked By JMO 9-3-97	
Project No.	97178-02		
Boring No.	NA	Tube Recovery	1.60
Depth Pushed	1.0-3.0		
Shelby Tube No.	SM022-TB01-0103		

SOIL PROFILE AND SAMPLING

DEPTH ( )	ELEV ( )	SECTION No.	SOIL PROFILE	SOIL DESCRIPTION AND REMARKS	TEST PERFORMED
1.00					
1.50					
2.00				HOLE ENTIRE LENGTH OF SAMPLE UNABLE TO OBTAIN DENSITY	
2.50		2		BROWN CLAYEY SAND WITH GRAVEL	GRAIN SIZE,WC, HYDROMETER
3.00		1			NO TEST

NOTE:WHEN FULL RECOVERY IS NOT ACHIEVED,SOIL ELEVATION CAN NOT BE ACCURATELY DEFINE
INDICATE EACH CUT OF THE TUBE WITH AN ARROW
INDICATE DIVIDING LINE BETWEEN SOIL TYPES BY A SOLID LINE
INDICATE WAX BY CROSS-HATCHING
INDICATE SOIL TYPES BY STANDARD SYMBOLS

MOISTURE CONTENT					
Section Number	1	2	3	4	5
Tare Number		1642			
Wt. Tare & WS(gm.)		596.40			
Wt. Tare & DS(gm.)		537.80			
Wt. Tare(gm.)		101.75			
Moisture Content(%)		13.4			

UNIT WEIGHT	
Wt. Tube & WS.(gms.)	
Wt. Of Tube(gms.)	
Wt. Of WS.(gms.)	
Length 1 (in.)	
Length 2 (in.)	
Length 3 (in.)	
Top Diameter (in.)	
Middle Diameter (in.)	
Bottom Diameter (in.)	
Sample Volume (cc)	
Moisture Content(%)	
Unit Wet Wt.(gms/cc)	
Unit Wet Wt.(pcf.)	
Unit Dry Wt.(pcf.)	
Unit Dry Wt.(gms/cc)	

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	2.5-3.0
Project No.	97178-02	Sample No.	SM022-TB01-0103
Lab ID	97178-02.051	Soil Color	**BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	1642	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	596.40	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	537.80	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	101.75	Weight of Tare (gm)	NA
Weight of Water (gm)	58.60	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	436.05	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**13.4**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	436.05
Dry Weight - 3/4" Sample (gm)	239.19	Weight of minus #200 material (gm)	181.73
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	254.32
Dry Weight + 3/4" Sample (gm)	15.13		
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	15.13	3.47	3.47	96.53	**96.53**
1/2"	12.5	30.79	7.06	10.53	89.47	**89.47**
3/8"	9.50	16.68	3.83	14.36	85.64	**85.64**
#4	4.75	35.40	8.12	22.47	77.53	**77.53**
#10	2.00	29.85	6.85	29.32	70.68	**70.68**
#20	0.85	20.77	4.76	34.08	65.92	**65.92**
#40	0.425	24.11	5.53	39.61	60.39	**60.39**
#60	0.250	38.00	8.71	48.33	51.67	**51.67**
#140	0.106	36.10	8.28	56.61	43.39	**43.39**
#200	0.075	7.49	1.72	58.32	41.68	**41.68**
Pan	-	181.73	41.68	100.00	-	-

Tested By BL Date 8/12/97 Checked By JMO Date 8/27/97

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HYDROMETER ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	2.5-3.0
Project No.	97178-02	Sample No.	SM022-TB01-0103
Lab ID	97178-02.051	Soil Color	**BROWN**

Elapsed Time (min)		R Measured	Temp. (°C)	R Corrected	N (%)	Diameter (mm)	N' (%)
0	NA	NA	NA	NA	NA	NA	NA
2	39.5	41.0	24.2	35.3	84.0	0.0280	**35.0**
5		38.0	24.2	32.3	76.9	0.0182	**32.0**
15		34.5	24.2	28.8	68.5	0.0108	**28.6**
30		31.5	24.2	25.8	61.4	0.0078	**25.6**
60		28.5	23.5	22.8	54.3	0.0056	**22.6**
250		24.5	23.2	18.8	44.7	0.0028	**18.6**
1440		20.0	23.9	14.3	34.0	0.0012	**14.2**

Soil Specimen Data		Corrections	
Tare No.	889	K - Factor	0.01279
Tare + Dry Material (gm)	152.18	a - Factor	0.99
Weight of Tare (gm)	105.58	Composite Correction	5.70
Weight of Deflocculant (gm)	5.0	Percent Finer than # 200	41.68
Weight of Dry Material (gm)	41.6		
		Specific Gravity	2.7 Assumed

Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By TO Date 8/18/97 Checked By JMO Date 8/27/97

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SIEVE AND HYDROMETER ANALYSIS
ASTM D 422-63 (SOP-S3)

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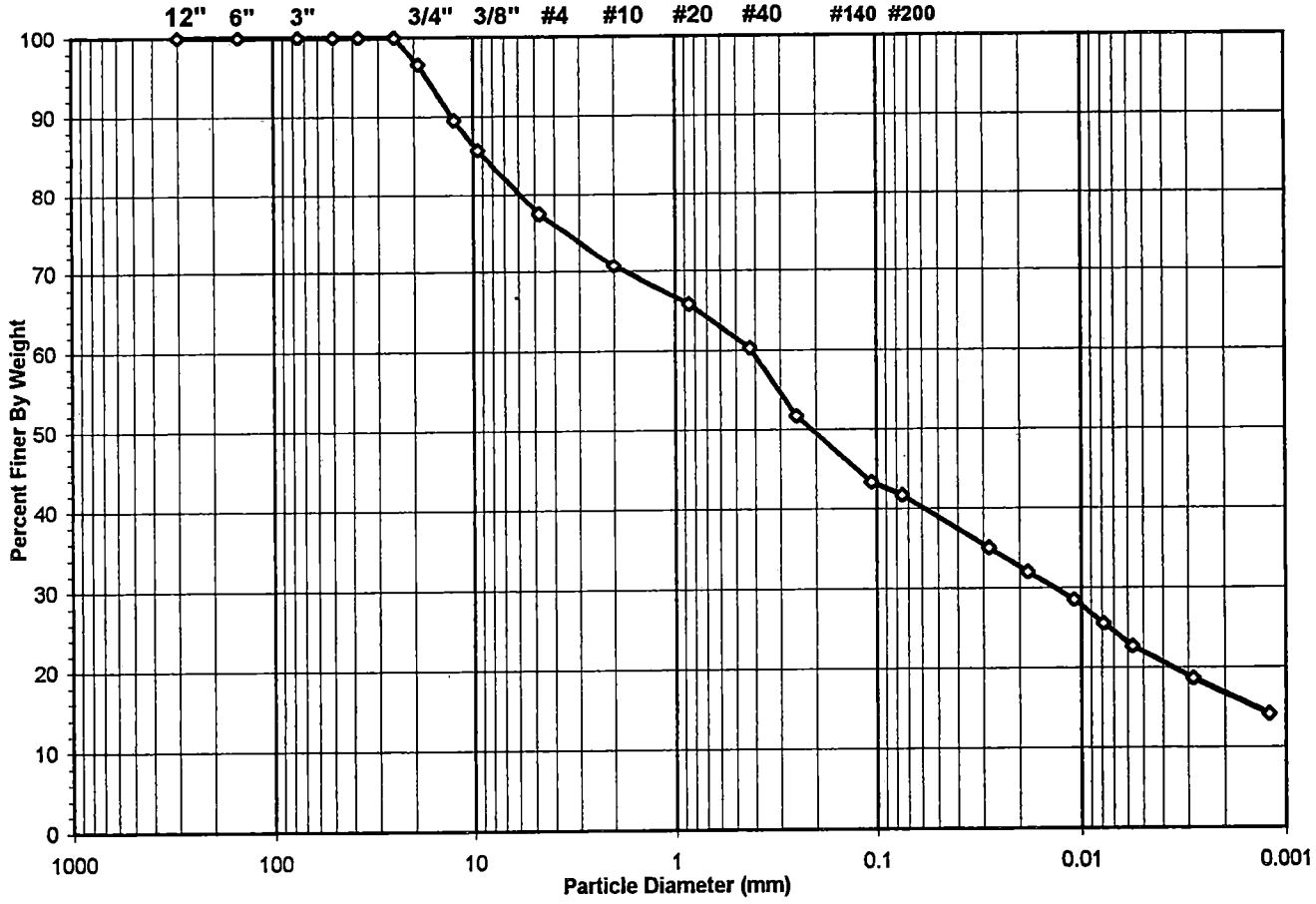
Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	2.5-3.0
Project No.	97178-02	Sample No.	SM022-TB01-0103
Lab ID	97178-02.051	Soil Color	BROWN

	SIEVE ANALYSIS		HYDROMETER	
USCS	gravel	sand	silt and clay fraction	
USDA	gravel	sand	silt	clay



Sieve Size (mm)	Percent Finer	Components	Percentage	Corrected % of Minus 2.0 mm material for USDA Classificat.
100	100.00	*Gravel*	29.32	**0.00**
2	70.68	*Sand*	31.74	**44.91**
0.075	41.68	*Silt*	22.13	**31.31**
0.05	38.94	*Clay*	16.81	**23.78**
0.002	16.81			

USDA Classification ***LOAM***

USCS Symbol ***sc, ASSUMED***

USCS Classification ***CLAYEY SAND WITH GRAVEL***

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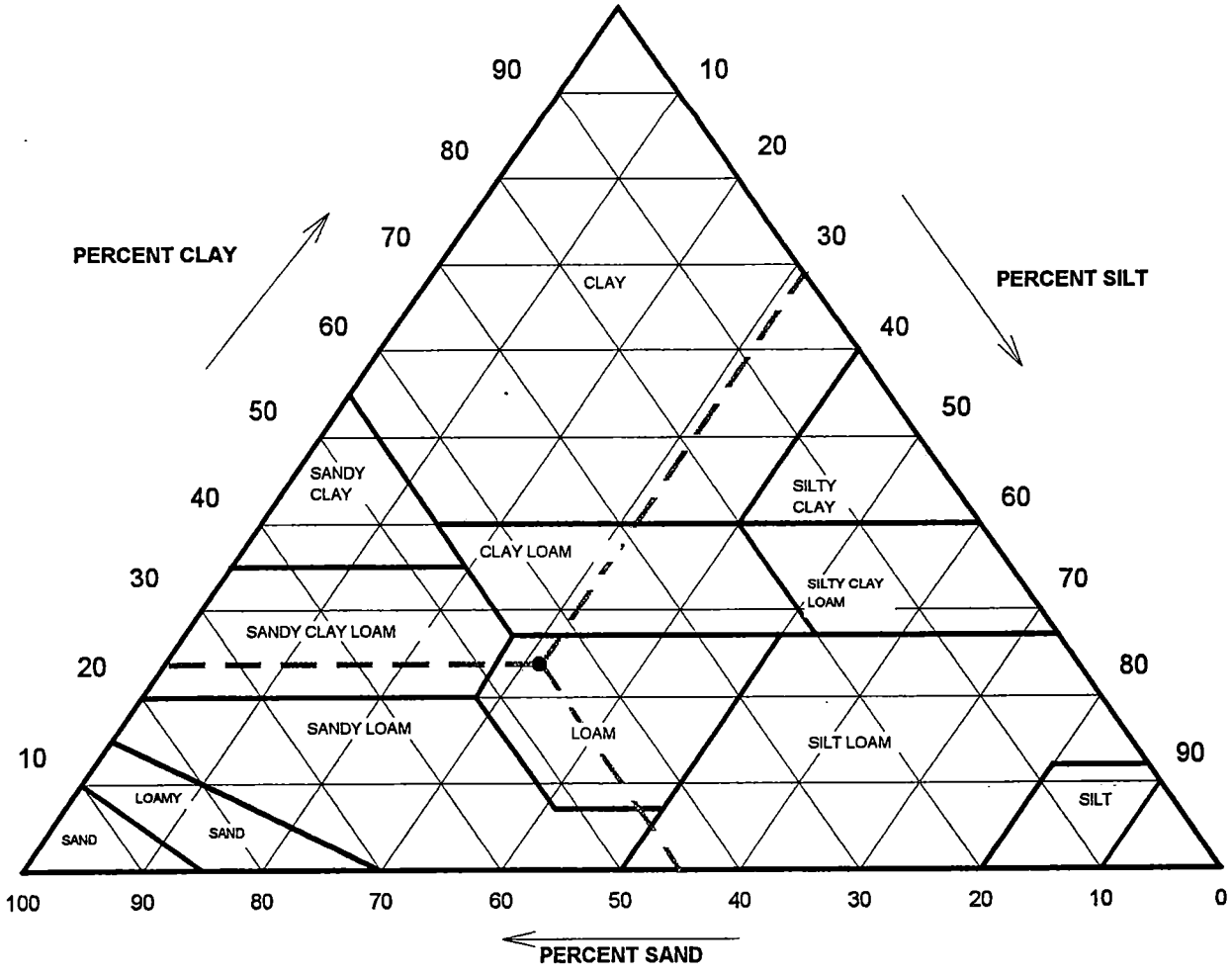
USDA CLASSIFICATION CHART

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	2.5-3.0
Project No.	97178-02	Sample No.	SM022-TB01-0103
Lab ID	97178-02.051	Soil Color	BROWN



Components	Corrected % of Minus 2.0 mm material for USDA Classificat.
Gravel	0.00
Sand	44.91
Silt	31.31
Clay	23.78
USDA Classification	***LOAM***

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SHELBY TUBE UNIT WEIGHT

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Client	ICF KAISER	Tested By	JCM 8-13-97
Client Project	BAYER 51249	Checked By	JMD 9-3-97
Project No.	97178-02		
Boring No.	NA	Tube Recovery	2.00
Depth Pushed	3.0-5.0		
Shelby Tube No.	SM022-TB02-0305		

SOIL PROFILE AND SAMPLING

DEPTH ( )	ELEV ( )	SECTION No.	SOIL PROFILE	SOIL DESCRIPTION AND REMARKS	TEST PERFORMED
3.00					
3.50					
4.00				SAND POCKET	
		3			GRAIN SIZE HYDROMETER UNIT WGT. WC
4.50					
		2		BROWN CLAYEY SAND WITH GRAVEL	PERMEABILITY
		1			WATER CONTENT
5.00					

NOTE:WHEN FULL RECOVERY IS NOT ACHIEVED,SOIL ELEVATION CAN NOT BE ACCURATELY DEFINE
INDICATE EACH CUT OF THE TUBE WITH AN ARROW
INDICATE DIVIDING LINE BETWEEN SOIL TYPES BY A SOLID LINE
INDICATE WAX BY CROSS-HATCHING
INDICATE SOIL TYPES BY STANDARD SYMBOLS

MOISTURE CONTENT

Section Number	1	2	3	4	5
Tare Number	1872		1345		
Wt. Tare & WS(gm.)	227.92		1033.30		
Wt. Tare & DS(gm.)	198.65		880.50		
Wt. Tare(gm.)	44.49		103.87		
Moisture Content(%)	19.0		19.7		

UNIT WEIGHT

Wt. Tube & WS.(gms.)	1089.50	1414.30
Wt. Of Tube(gms.)	256.64	340.25
Wt. Of WS.(gms.)	832.86	1074.05
Length 1 (in.)	3.650	4.834
Length 2 (in.)	3.652	4.866
Length 3 (in.)	3.628	4.816
Top Diameter (in.)	2.898	2.889
Middle Diameter (in.)	2.876	2.894
Bottom Diameter (in.)	2.902	2.873
Sample Volume (cc)	392.18	518.45
Moisture Content(%)	18.99	19.67
Unit Wet Wt.(gms/cc)	2.12	2.07
Unit Wet Wt.(pcf.)	132.5	129.3
Unit Dry Wt.(pcf.)	111.4	108.0
Unit Dry Wt.(gms/cc)	1.78	1.73

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	4.1-4.5
Project No.	97178-02	Sample No.	SM022-TB02-0305
Lab ID	97178-02.052	Soil Color	**BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	1345	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	1033.30	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	880.50	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	103.87	Weight of Tare (gm)	NA
Weight of Water (gm)	152.80	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	776.63	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**19.7**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	776.63
Dry Weight - 3/4" Sample (gm)	360.99	Weight of minus #200 material (gm)	379.31
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	397.32
Dry Weight + 3/4" Sample (gm)	36.33		
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	27.19	3.50	3.50	96.50	**96.50**
3/4"	19.0	9.14	1.18	4.68	95.32	**95.32**
1/2"	12.5	45.14	5.81	10.49	89.51	**89.51**
3/8"	9.50	32.97	4.25	14.74	85.26	**85.26**
#4	4.75	47.89	6.17	20.90	79.10	**79.10**
#10	2.00	51.48	6.63	27.53	72.47	**72.47**
#20	0.85	38.11	4.91	32.44	67.56	**67.56**
#40	0.425	34.24	4.41	36.85	63.15	**63.15**
#60	0.250	41.08	5.29	42.14	57.86	**57.86**
#140	0.106	55.21	7.11	49.24	50.76	**50.76**
#200	0.075	14.87	1.91	51.16	48.84	**48.84**
Pan	-	379.31	48.84	100.00	-	-

Tested By BL Date 8/13/97 Checked By JMO Date 9/27/97

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HYDROMETER ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	4.1-4.5
Project No.	97178-02	Sample No.	SM022-TB02-0305
Lab ID	97178-02.052	Soil Color	**BROWN**

Elapsed Time (min)		R Measured	Temp. (°C)	R Corrected	N (%)	Diameter (mm)	N' (%)
0	NA	NA	NA	NA	NA	NA	NA
2	43.0	44.0	24.2	38.3	85.6	0.0273	**41.8**
5		41.0	24.2	35.3	78.9	0.0177	**38.5**
16		37.5	24.2	31.8	71.1	0.0102	**34.7**
30		35.0	24.2	29.3	65.5	0.0076	**32.0**
60		33.0	23.5	27.3	61.0	0.0054	**29.8**
273		27.0	23	21.3	47.6	0.0027	**23.2**
1440		22.5	23.7	16.8	37.5	0.0012	**18.3**

Soil Specimen Data		Corrections	
Tare No.	1673	K - Factor	0.01279
Tare + Dry Material (gm)	150.15	a - Factor	0.99
Weight of Tare (gm)	100.84	Composite Correction	5.70
Weight of Deflocculant (gm)	5.0	Percent Finer than # 200	48.84
Weight of Dry Material (gm)	44.31		
		Specific Gravity	2.7 Assumed

Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By TO Date 8/18/97 Checked By JMO Date 8/27/97

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SIEVE AND HYDROMETER ANALYSIS
ASTM D 422-63 (SOP-S3)

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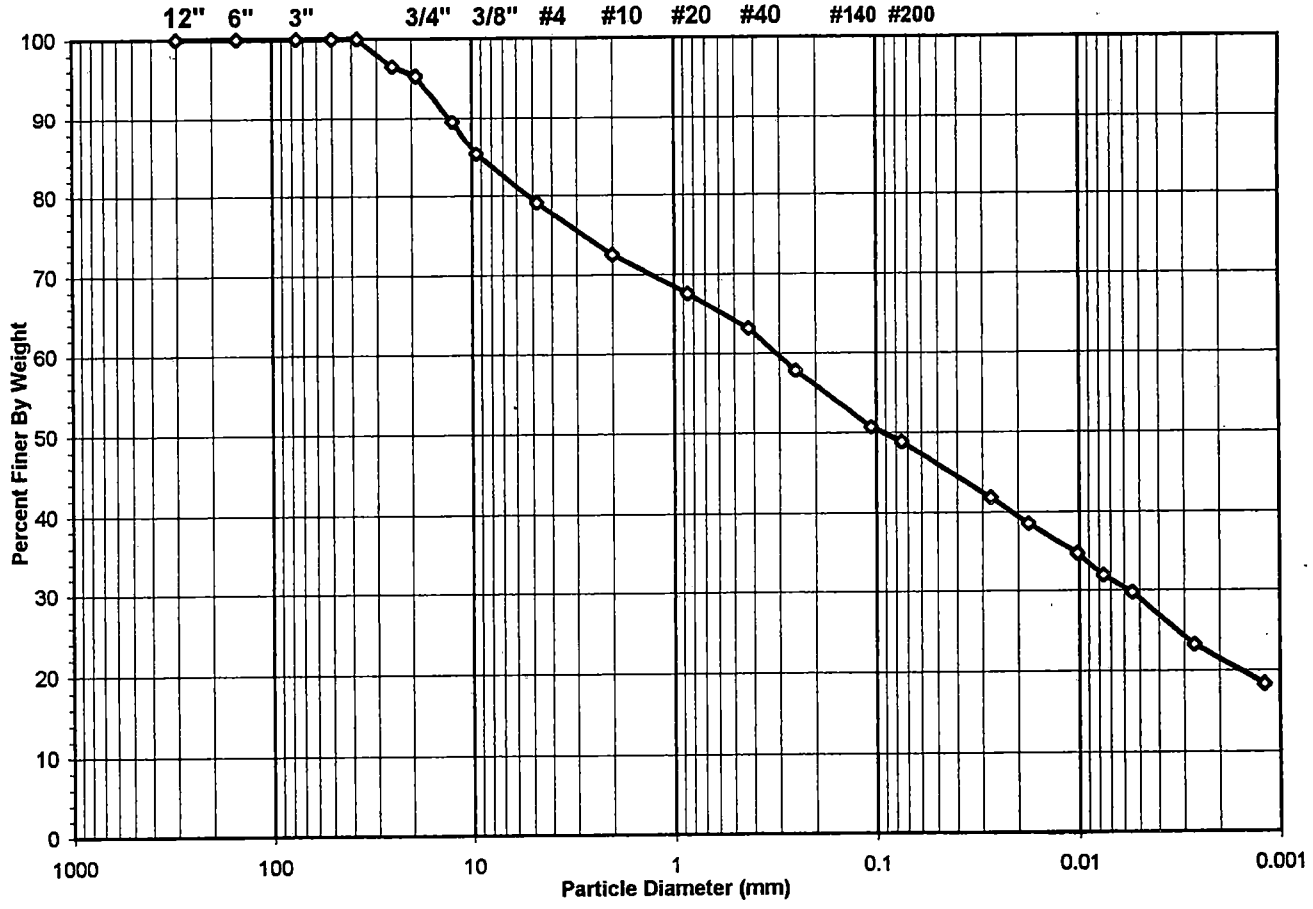
Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	4.1-4.5
Project No.	97178-02	Sample No.	SM022-TB02-0305
Lab ID	97178-02.052	Soil Color	BROWN

	SIEVE ANALYSIS		HYDROMETER	
USCS	gravel	sand	silt and clay fraction	
USDA	gravel	sand	silt	clay



Sieve Size (mm)	Percent Finer	Components	Percentage	Corrected % of Minus 2.0 mm material for USDA Classificat.
100	100.00	*Gravel*	27.53	**0.00**
2	72.47	*Sand*	26.45	**36.50**
0.075	48.84	*Silt*	24.54	**33.86**
0.05	46.02	*Clay*	21.48	**29.64**
0.002	21.48			

USDA Classification ***CLAY LOAM***

USCS Symbol ***sc, ASSUMED***

USCS Classification ***CLAYEY SAND WITH GRAVEL***

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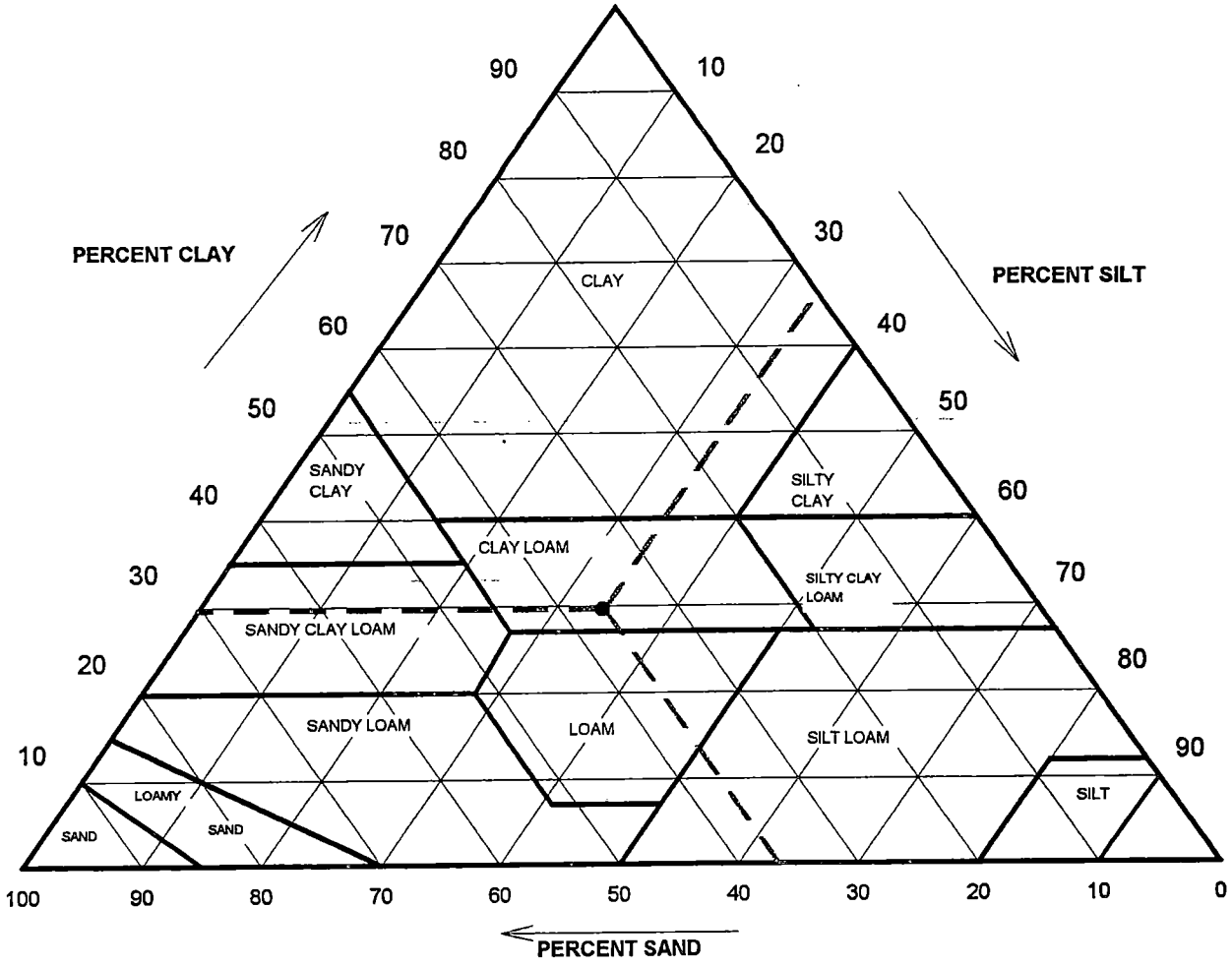
USDA CLASSIFICATION CHART

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	4.1-4.5
Project No.	97178-02	Sample No.	SM022-TB02-0305
Lab ID	97178-02.052	Soil Color	BROWN



Components	Corrected % of Minus 2.0 mm material for USDA Classificat.
Gravel	0.00
Sand	36.50
Silt	33.86
Clay	29.64
USDA Classification	***CLAY LOAM***

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PERMEABILITY TEST

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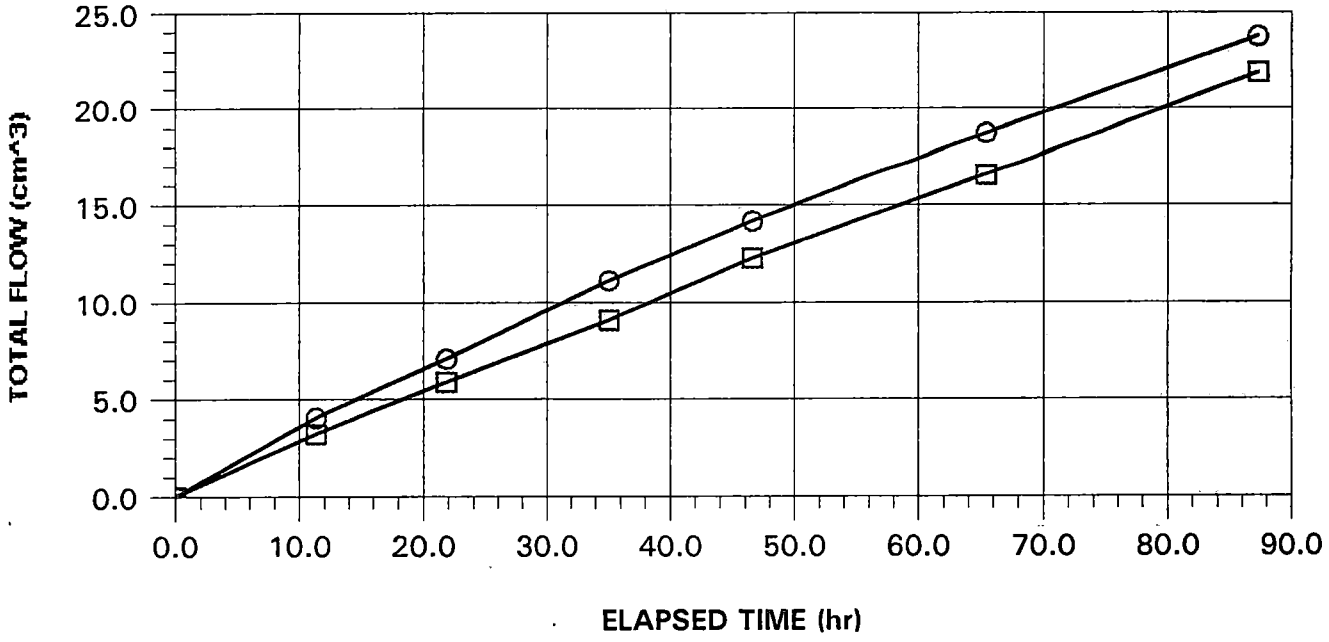
Client	ICF KAISER	Boring No.	NA
Client Project	BAYER 51249	Depth(ft.)	4.5-4.8
Project No.	97178-02	Sample No.	SM022-TB02-0305

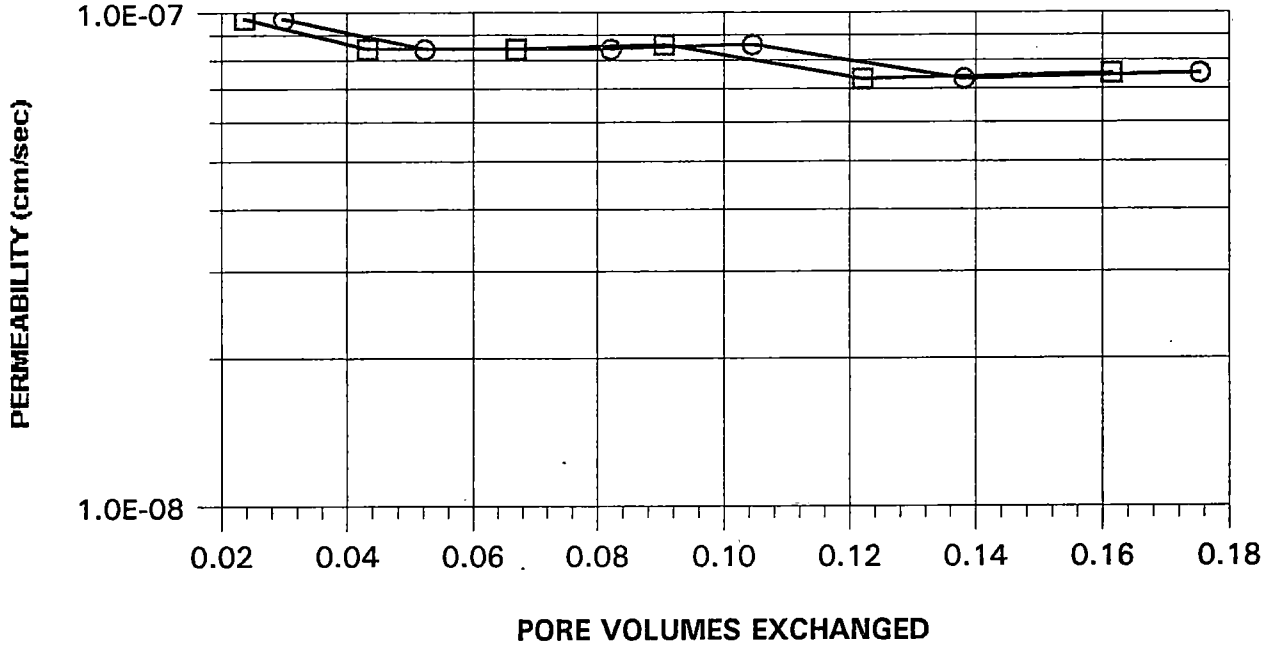
AVERAGE PERMEABILITY = 8.0E-08 cm/sec @ 20°C
AVERAGE PERMEABILITY = 8.0E-10 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY

⊖ INFLOW
⊟ OUTFLOW



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PERMEABILITY TEST

geotechnics

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Client	ICF KAISER	Tested By	JCM	Date	08-13-97
Client Project	BAYER 51249	Checked By	JMO	Date	8/22/97
Project No.	97178-02				
Boring No.	NA	Specific Gravity	2.70 ASSUMED		
Depth(ft.)	4.5-4.8	Sample Condition	UNDISTURBED		
Sample No.	SM022-TB02-0305				

Visual Description BROWN CLAY SOME SAND

MOISTURE CONTENT	BEFORE TEST	AFTER TEST
Tare Number	1872	1713
Wt. Tare & WS(gm.)	227.92	489.50
Wt. Tare & DS(gm.)	198.65	426.80
Wt. Water(gm.)	29.27	62.70
Wt. Tare(gm.)	44.49	83.10
Wt. DS(gm.)	154.16	343.70
Moisture Content(%)	19.0	18.2

UNIT WEIGHT		
Wt. Tube & WS.(gms.)	1089.50	NA
Wt. Of Tube(gms.)	256.64	NA
Wt. Of WS.(gms.)	832.86	827.7
Length 1 (in.)	3.650	3.744
Length 2 (in.)	3.652	3.712
Length 3 (in.)	3.628	3.713
Top Diameter (in.)	2.898	2.870
Middle Diameter (in.)	2.876	2.871
Bottom Diameter (in.)	2.902	2.869
Average Length (in)	3.64	3.72
Average Area (in^2)	6.57	6.47
Sample Volume(cc.)	392.18	394.68
Unit Wet Wt.(gms/cc)	2.12	2.10
Unit Wet Wt.(pcf.)	132.5	130.9
Unit Dry Wt.(pcf.)	111.4	110.7
Unit Dry Wt.(gms/cc)	1.78	1.77
Void Ratio,e	0.51	0.52
Porosity, n	0.34	0.34
Pore Volume(cm^3)	132.9	135.4

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PERMEABILITY TEST

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Client	ICF KAISER	Tested By	JCM	Date	08-13-97
Client Project	BAYER 51249	Checked By	JMO	Date	8/22/97
Project No.	97178-02				
Boring No.	NA				
Depth(ft.)	4.5-4.8				
Sample No.	SM022-TB02-0305				
Visual Description	BROWN CLAY SOME SAND				

Pressure Heads (Constant)	
Top Cap (psi)	27.5
Bottom Cap (psi)	30.0
Cell (psi)	35.0
Total Pressure Head (cm)	175.8

Final Sample Dimensions	
Sample Length (cm.), L	9.46
Sample Diameter (cm.)	7.29
Sample Area (cm.^2), A	41.74
Inflow Burette Area, (cm.^2), a-in	4.93
Outflow Burette Area, (cm.^2), a-out	4.66
B Parameter	99%

AVERAGE PERMEABILITY = 8.0E-08 cm/sec @ 20°C
AVERAGE PERMEABILITY = 8.0E-10 m/sec @ 20°C

DATE mon-dy-yr	TIME hr	TIME min	ELAPSED TIME (t) hr	TOTAL INFLOW cm^3	TOTAL OUTFLOW cm^3	TOTAL HEAD (h) cm	FLOW 0 FLOW 1 STOP	TEMP °C	INCREMENTAL PERMEABILITY @ 20°C cm/sec
08-13-97	20	5	0.0	0.0	0.0	193.2	0	22.6	NA
08-14-97	7	25	11.3	4.0	3.2	191.7	0	23.0	9.7E-08
08-14-97	17	55	21.8	7.1	5.9	190.5	0	22.5	8.4E-08
08-15-97	7	10	35.1	11.1	9.1	189.0	0	23.0	8.4E-08
08-15-97	18	40	46.6	14.2	12.3	187.7	0	22.2	8.6E-08
08-16-97	13	30	65.4	18.7	16.5	185.9	0	23.0	7.3E-08
08-17-97	11	25	87.3	23.8	21.9	183.7	0	23.0	7.5E-08

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SHELBY TUBE UNIT WEIGHT

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Client	ICF KAISER	Tested By	BL 8-18-97
Client Project	BAYER 51249	Checked By	JMO 9-5-97
Project No.	97178-03		
Boring No.	NA	Tube Recovery	0.80
Depth Pushed	1.5-3.0		
Shelby Tube No.	SM023-TB01-0103		

SOIL PROFILE AND SAMPLING

DEPTH ( )	ELEV ( )	SECTION No.	SOIL PROFILE	SOIL DESCRIPTION AND REMARKS	TEST PERFORMED
1.00					
1.50					
2.00					
2.50		2		BROWN CLAYEY GRAVEL WITH SAND	UNIT WGT. WC. GRAIN SIZE HYDROMETER
3.00		1			NO TEST

NOTE:WHEN FULL RECOVERY IS NOT ACHIEVED,SOIL ELEVATION CAN NOT BE ACCURATELY DEFINE
INDICATE EACH CUT OF THE TUBE WITH AN ARROW
INDICATE DIVIDING LINE BETWEEN SOIL TYPES BY A SOLID LINE
INDICATE WAX BY CROSS-HATCHING
INDICATE SOIL TYPES BY STANDARD SYMBOLS

MOISTURE CONTENT					
Section Number	1.	2	3	4	5
Tare Number		1618			
Wt. Tare & WS(gm.)		668.70			
Wt. Tare & DS(gm.)		602.60			
Wt. Tare(gm.)		100.04			
Moisture Content(%)		13.2			

UNIT WEIGHT	
Wt. Tube & WS.(gms.)	957.80
Wt. Of Tube(gms.)	248.49
Wt. Of WS.(gms.)	709.31
Length 1 (in.)	3.542
Length 2 (in.)	3.517
Length 3 (in.)	3.527
Top Diameter (in.)	2.861
Middle Diameter (in.)	2.847
Bottom Diameter (in.)	2.848
Sample Volume (cc)	369.40
Moisture Content(%)	13.15
Unit Wet Wt.(gms/cc)	1.92
Unit Wet Wt.(pcf.)	119.8
Unit Dry Wt.(pcf.)	105.9
Unit Dry Wt.(gms/cc)	1.70

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	2.5-2.8
Project No.	97178-03	Sample No.	SM023-TB01-0103
Lab ID	97178-03.006	Soil Color	**BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	1618	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	668.70	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	602.60	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	100.04	Weight of Tare (gm)	NA
Weight of Water (gm)	66.10	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	502.56	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**13.2**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	502.56
Dry Weight - 3/4" Sample (gm)	287.30	Weight of minus #200 material (gm)	194.29
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	308.27
Dry Weight + 3/4" Sample (gm)	20.97		
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	20.97	4.17	4.17	95.83	**95.83**
1/2"	12.5	62.19	12.37	16.55	83.45	**83.45**
3/8"	9.50	21.10	4.20	20.75	79.25	**79.25**
#4	4.75	57.69	11.48	32.23	67.77	**67.77**
#10	2.00	43.86	8.73	40.95	59.05	**59.05**
#20	0.85	23.18	4.61	45.56	54.44	**54.44**
#40	0.425	18.03	3.59	49.15	50.85	**50.85**
#60	0.250	21.43	4.26	53.42	46.58	**46.58**
#140	0.106	30.24	6.02	59.43	40.57	**40.57**
#200	0.075	9.58	1.91	61.34	38.66	**38.66**
Pan	-	194.29	38.66	100.00	-	-

Tested By BL Date 8/18/97 Checked By JMO Date 8/29/97

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HYDROMETER ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	2.5-2.8
Project No.	97178-03	Sample No.	SM023-TB01-0103
Lab ID	97178-03.006	Soil Color	**BROWN**

Elapsed Time (min)		R Measured	Temp. (°C)	R Corrected	N (%)	Diameter (mm)	N' (%)
0	NA	NA	NA	NA	NA	NA	NA
2	44.5	45.0	24.4	39.4	84.9	0.0270	**32.8**
5		42.0	24.4	36.4	78.4	0.0175	**30.3**
15		37.5	24.4	31.9	68.7	0.0105	**26.6**
32		34.0	24.4	28.4	61.2	0.0074	**23.7**
60		32.0	23.7	26.4	56.9	0.0055	**22.0**
277		27.0	22.7	21.4	46.1	0.0026	**17.8**
1440		22.0	23.9	16.4	35.3	0.0012	**13.7**

Soil Specimen Data		Corrections	
Tare No.	1686	K - Factor	0.01276
Tare + Dry Material (gm)	149.97	a - Factor	0.99
Weight of Tare (gm)	99.03	Composite Correction	5.60
Weight of Deflocculant (gm)	5.0	Percent Finer than # 200	38.66
Weight of Dry Material (gm)	45.94		
		Specific Gravity	2.7 Assumed

Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By TO Date 8/22/97 Checked By JMO Date 8/29/97

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SIEVE AND HYDROMETER ANALYSIS
ASTM D 422-63 (SOP-S3)

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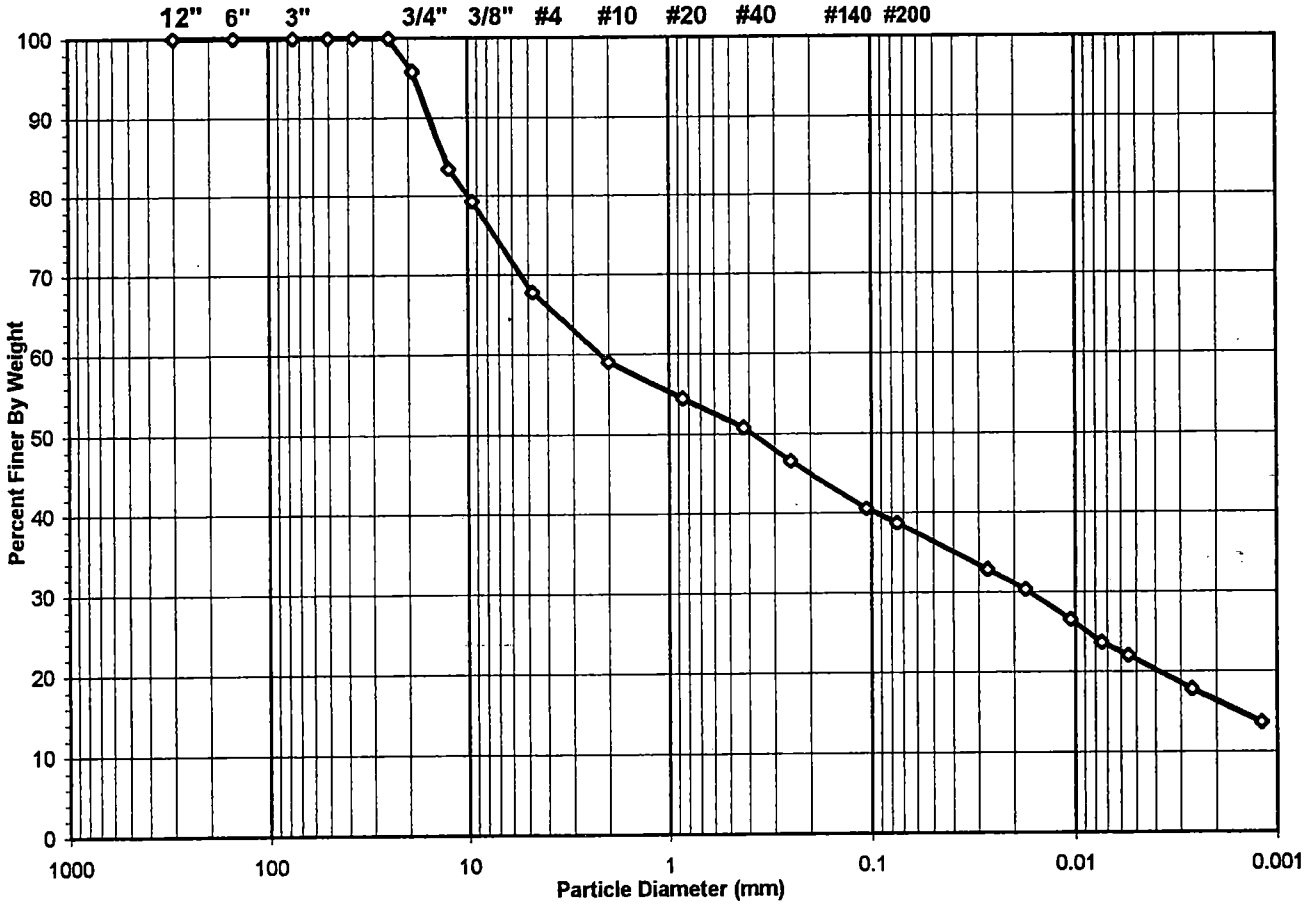
Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	2.5-2.8
Project No.	97178-03	Sample No.	SM023-TB01-0103
Lab ID	97178-03.006	Soil Color	BROWN

	SIEVE ANALYSIS		HYDROMETER	
USCS	gravel	sand	silt and clay fraction	
USDA	gravel	sand	silt	clay



Sieve Size (mm)	Percent Finer	Components	Percentage	Corrected % of Minus 2.0 mm material for USDA Classificat.
100	100.00	*Gravel*	40.95	**0.00**
2	59.05	*Sand*	22.70	**38.44**
0.075	38.66	*Silt*	19.99	**33.85**
0.05	36.35	*Clay*	16.36	**27.71**
0.002	16.36			

USDA Classification ***CLAY LOAM***

USCS Symbol ***gc, ASSUMED***

USCS Classification ***CLAYEY GRAVEL WITH SAND***

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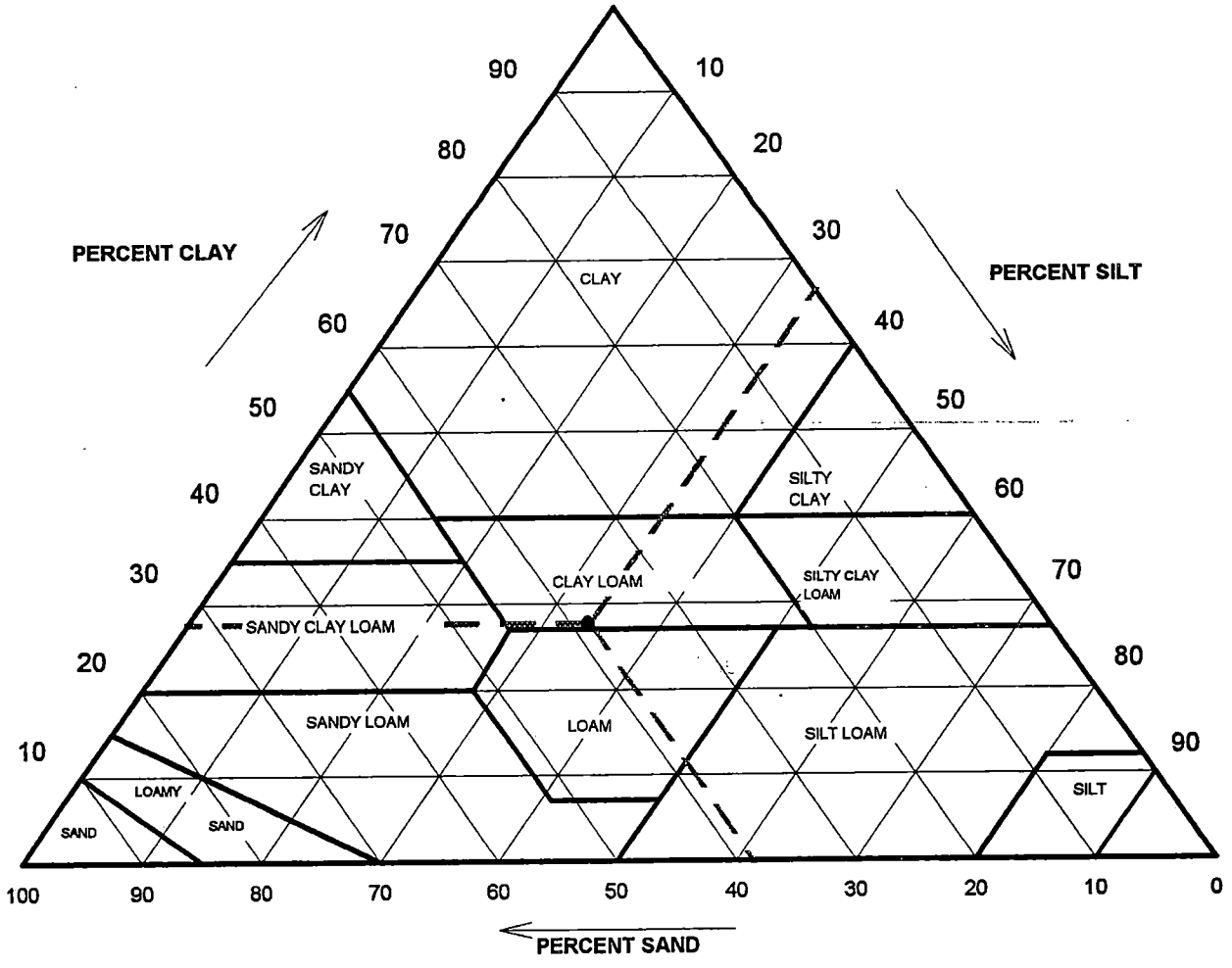
USDA CLASSIFICATION CHART

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	2.5-2.8
Project No.	97178-03	Sample No.	SM023-TB01-0103
Lab ID	97178-03.006	Soil Color	BROWN



Components	Corrected % of Minus 2.0 mm material for USDA Classificat.
Gravel	0.00
Sand	38.44
Silt	33.85
Clay	27.71
USDA Classification	***CLAY LOAM***

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SHELBY TUBE UNIT WEIGHT

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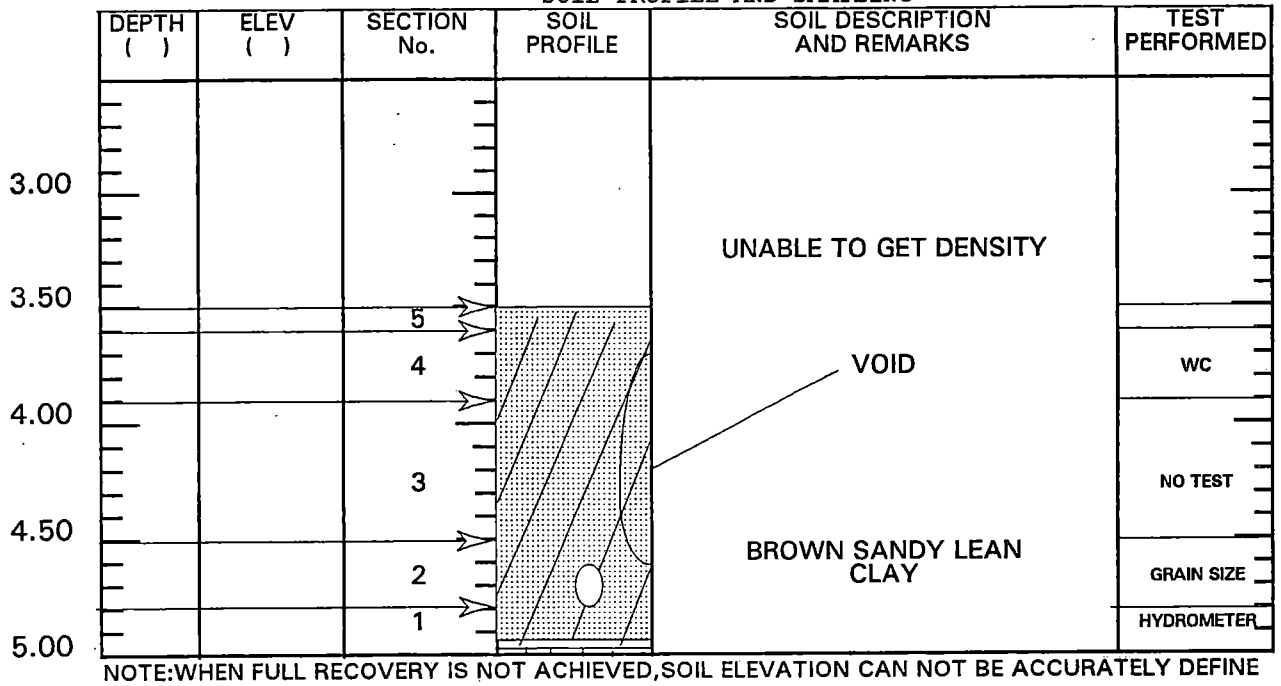
Client	ICF KAISER	Tested By	BL 8-18-97
Client Project	BAYER 51249	Checked By	JMD 9-5-97
Project No.	97178-03		
Boring No.	NA	Tube Recovery	1.70
Depth Pushed	3.0-5.0		
Shelby Tube No.	SM023-TB01-0305		

SOIL PROFILE AND SAMPLING



NOTE:WHEN FULL RECOVERY IS NOT ACHIEVED,SOIL ELEVATION CAN NOT BE ACCURATELY DEFINE
INDICATE EACH CUT OF THE TUBE WITH AN ARROW
INDICATE DIVIDING LINE BETWEEN SOIL TYPES BY A SOLID LINE
INDICATE WAX BY CROSS-HATCHING
INDICATE SOIL TYPES BY STANDARD SYMBOLS

MOISTURE CONTENT					
Section Number	1	2	3	4	5
Tare Number				1743	
Wt. Tare & WS(gm.)				319.30	
Wt. Tare & DS(gm.)				289.76	
Wt. Tare(gm.)				83.78	
Moisture Content(%)				14.3	

UNIT WEIGHT
Wt. Tube & WS.(gms.)
Wt. Of Tube(gms.)
Wt. Of WS.(gms.)
Length 1 (in.)
Length 2 (in.)
Length 3 (in.)
Top Diameter (in.)
Middle Diameter (in.)
Bottom Diameter (in.)
Sample Volume (cc)
Moisture Content(%)
Unit Wet Wt.(gms/cc)
Unit Wet Wt.(pcf.)
Unit Dry Wt.(pcf.)
Unit Dry Wt.(gms/cc)

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	4.5-4.8
Project No.	97178-03	Sample No.	SM023-TB01-0305
Lab ID	97178-03.007	Soil Color	BROWN

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	878	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	576.90	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	503.80	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	102.11	Weight of Tare (gm)	NA
Weight of Water (gm)	73.10	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	401.69	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**18.2**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	401.69
Dry Weight - 3/4" Sample (gm)	180.25	Weight of minus #200 material (gm)	221.44
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	180.25
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"	12.5	26.61	6.62	6.62	93.38	**93.38**
3/8"	9.50	8.58	2.14	8.76	91.24	**91.24**
#4	4.75	19.91	4.96	13.72	86.28	**86.28**
#10	2.00	25.59	6.37	20.09	79.91	**79.91**
#20	0.85	18.15	4.52	24.61	75.39	**75.39**
#40	0.425	16.06	4.00	28.60	71.40	**71.40**
#60	0.250	20.78	5.17	33.78	66.22	**66.22**
#140	0.106	35.19	8.76	42.54	57.46	**57.46**
#200	0.075	9.38	2.34	44.87	55.13	**55.13**
Pan	-	221.44	55.13	100.00	-	-

Tested By BL Date 8/18/97 Checked By JMO Date 8/29/97

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HYDROMETER ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	4.5-4.8
Project No.	97178-03	Sample No.	SM023-TB01-0305
Lab ID	97178-03.007	Soil Color	BROWN

Elapsed Time (min)		R Measured	Temp. (°C)	R Corrected	N (%)	Diameter (mm)	N' (%)
0	NA	NA	NA	NA	NA	NA	NA
2	43.0	44.0	24.4	38.4	86.9	0.0272	**47.9**
5		40.5	24.4	34.9	79.0	0.0177	**43.6**
15		36.0	24.4	30.4	68.8	0.0106	**37.9**
30		33.0	24.4	27.4	62.0	0.0077	**34.2**
60		31.0	23.7	25.4	57.5	0.0055	**31.7**
274		25.5	22.7	19.9	45.1	0.0027	**24.8**
1440		20.5	23.9	14.9	33.7	0.0012	**18.6**

Soil Specimen Data		Corrections	
Tare No.	1636	K - Factor	0.01276
Tare + Dry Material (gm)	148.35	a - Factor	0.99
Weight of Tare (gm)	99.62	Composite Correction	5.60
Weight of Deflocculant (gm)	5.0	Percent Finer than # 200	55.13
Weight of Dry Material (gm)	43.73		
		Specific Gravity	2.7 Assumed

Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By TO Date 8/22/97 Checked By [illegible] Date 8/29/97

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SIEVE AND HYDROMETER ANALYSIS
ASTM D 422-63 (SOP-S3)

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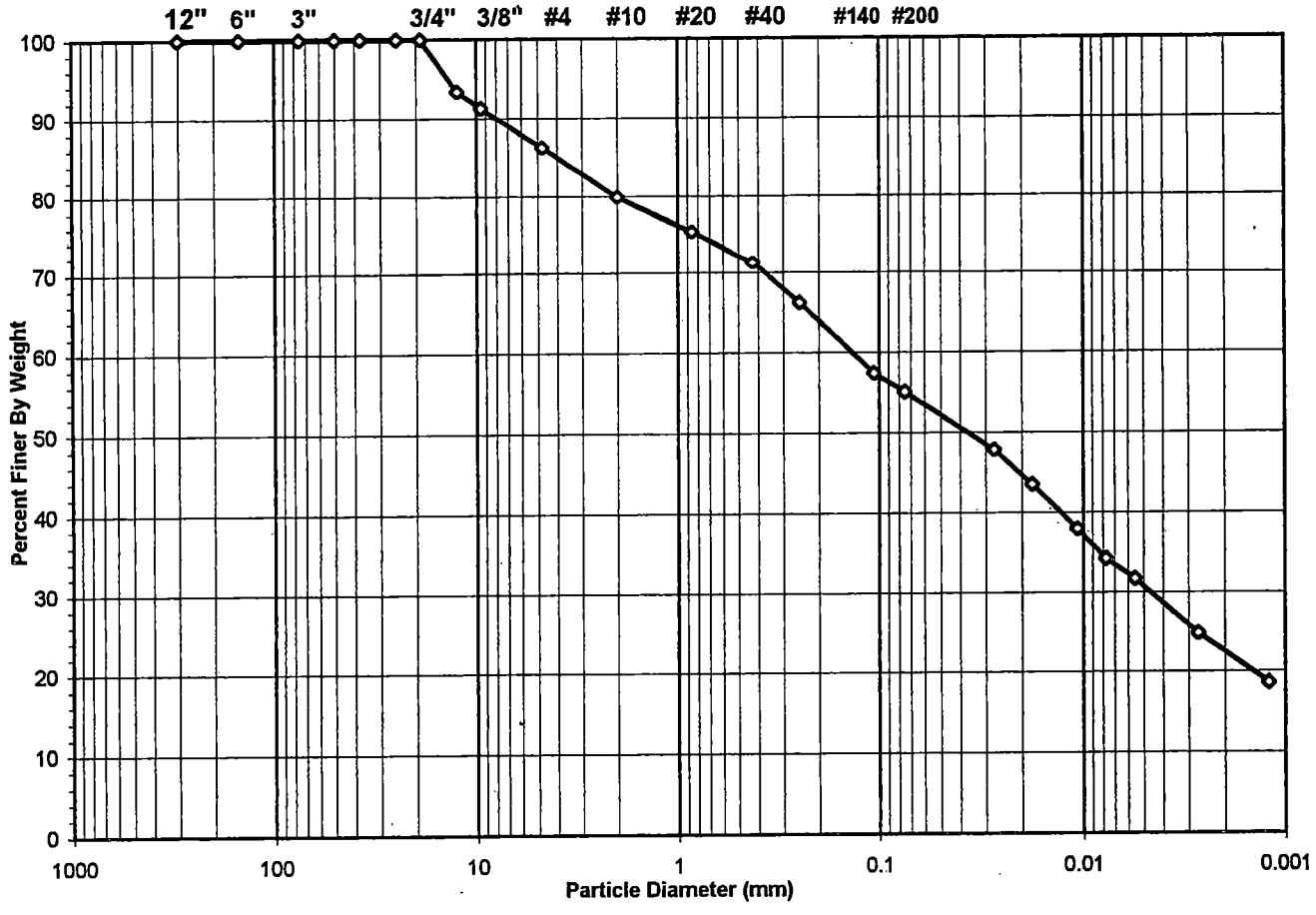
Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	4.5-4.8
Project No.	97178-03	Sample No.	SM023-TB01-0305
Lab ID	97178-03.007	Soil Color	**BROWN**

	SIEVE ANALYSIS		HYDROMETER	
USCS	gravel	sand	silt and clay fraction	
USDA	gravel	sand	silt	clay



Sieve Size (mm)	Percent Finer	Components	Percentage	Corrected % of Minus 2.0 mm material for USDA Classificat.
100	100.00	*Gravel*	20.09	**0.00**
2	79.91	*Sand*	27.67	**34.62**
0.075	55.13	*Silt*	29.72	**37.19**
0.05	52.25	*Clay*	22.53	**28.20**
0.002	22.53			

USDA Classification ***CLAY LOAM***

USCS Symbol ***cl, ASSUMED***

USCS Classification ***SANDY LEAN CLAY***

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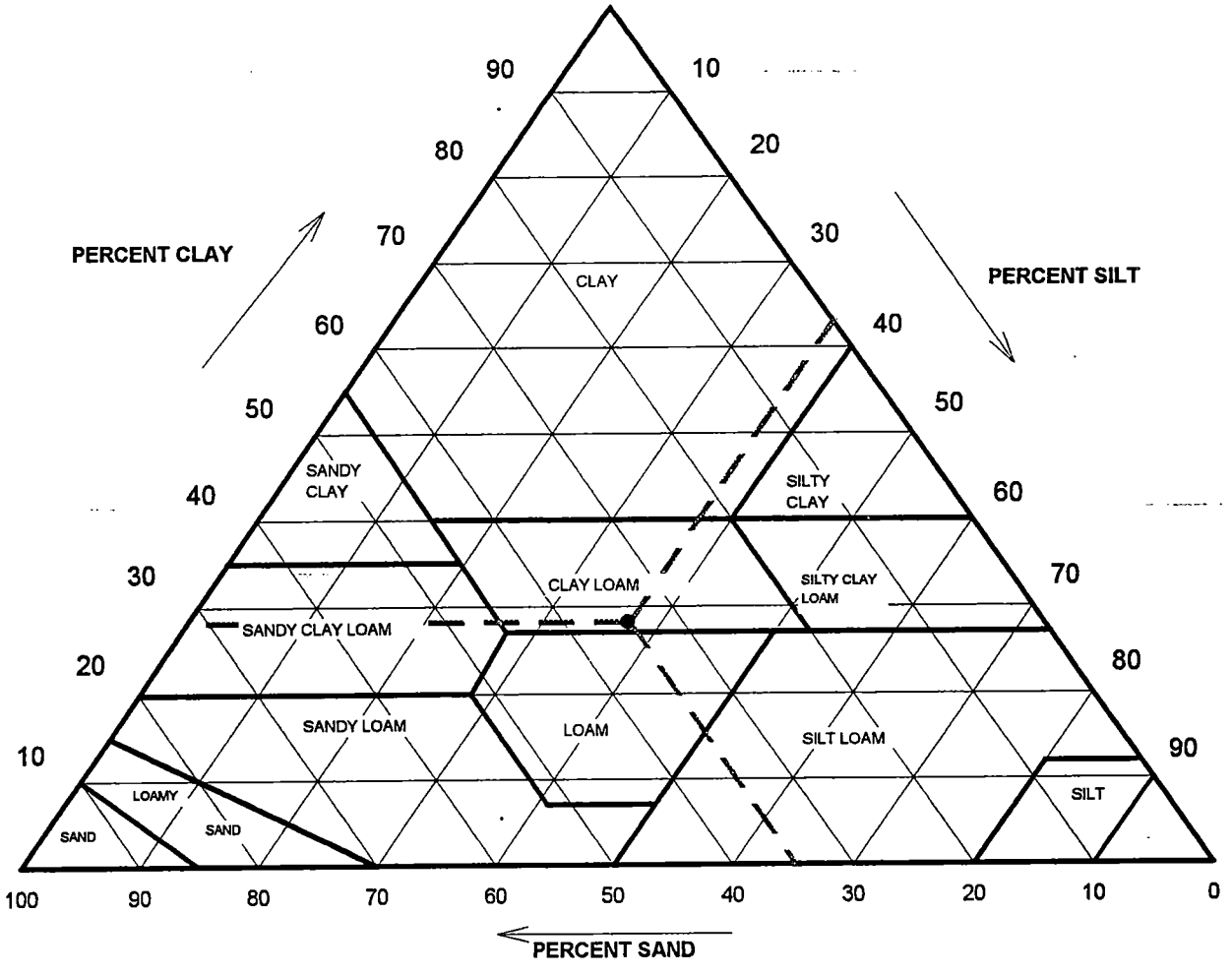
USDA CLASSIFICATION CHART

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	4.5-4.8
Project No.	97178-03	Sample No.	SM023-TB01-0305
Lab ID	97178-03.007	Soil Color	BROWN



Components	Corrected % of Minus 2.0 mm material for USDA Classificat.
Gravel	0.00
Sand	34.62
Silt	37.19
Clay	28.20
USDA Classification	***CLAY LOAM***

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SHELBY TUBE UNIT WEIGHT

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Client	ICF KAISER	Tested By	BL 8-18-97
Client Project	BAYER 51249	Checked By	JMO 9-5-97
Project No.	97178-03		
Boring No.	NA	Tube Recovery	1.75
Depth Pushed	17.0-19.0		
Shelby Tube No.	SM023-TB01-1719		

SOIL PROFILE AND SAMPLING

DEPTH ( )	ELEV ( )	SECTION No.	SOIL PROFILE	SOIL DESCRIPTION AND REMARKS	TEST PERFORMED
17.00					
17.50					
18.00					
18.50		2		BROWN SANDY LEAN CLAY	UNIT WGT. WC. GRAIN SIZE HYDROMETER NO TEST
19.00		1			

NOTE:WHEN FULL RECOVERY IS NOT ACHIEVED,SOIL ELEVATION CAN NOT BE ACCURATELY DEFINE
INDICATE EACH CUT OF THE TUBE WITH AN ARROW
INDICATE DIVIDING LINE BETWEEN SOIL TYPES BY A SOLID LINE
INDICATE WAX BY CROSS-HATCHING
INDICATE SOIL TYPES BY STANDARD SYMBOLS

MOISTURE CONTENT					
Section Number	1	2	3	4	5
Tare Number		1005			
Wt. Tare & WS(gm.)		789.20			
Wt. Tare & DS(gm.)		675.20			
Wt. Tare(gm.)		106.26			
Moisture Content(%)		20.0			

UNIT WEIGHT	
Wt. Tube & WS.(gms.)	1112.70
Wt. Of Tube(gms.)	270.13
Wt. Of WS.(gms.)	842.57
Length 1 (in.)	3.861
Length 2 (in.)	3.836
Length 3 (in.)	3.835
Top Diameter (in.)	2.869
Middle Diameter (in.)	2.871
Bottom Diameter (in.)	2.881
Sample Volume (cc)	408.55
Moisture Content(%)	20.04
Unit Wet Wt.(gms/cc)	2.06
Unit Wet Wt.(pcf.)	128.7
Unit Dry Wt.(pcf.)	107.2
Unit Dry Wt.(gms/cc)	1.72

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	18.5-18.8
Project No.	97178-03	Sample No.	SM023-TB01-1719
Lab ID	97178-03.008	Soil Color	**BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	1005	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	789.20	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	675.20	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	106.26	Weight of Tare (gm)	NA
Weight of Water (gm)	114.00	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	568.94	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**20.0**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	568.94
Dry Weight - 3/4" Sample (gm)	233.21	Weight of minus #200 material (gm)	335.73
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	233.21
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"	12.5	0.00	0.00	0.00	100.00	**100.00**
3/8"	9.50	0.00	0.00	0.00	100.00	**100.00**
#4	4.75	0.00	0.00	0.00	100.00	**100.00**
#10	2.00	0.00	0.00	0.00	100.00	**100.00**
#20	0.85	0.05	0.01	0.01	99.99	**99.99**
#40	0.425	0.44	0.08	0.09	99.91	**99.91**
#60	0.250	12.83	2.26	2.34	97.66	**97.66**
#140	0.106	176.31	30.99	33.33	66.67	**66.67**
#200	0.075	43.58	7.66	40.99	59.01	**59.01**
Pan	-	335.73	59.01	100.00	-	-

Tested By BL Date 8/18/97 Checked By JMO Date 8/29/97

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HYDROMETER ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	18.5-18.8
Project No.	97178-03	Sample No.	SM023-TB01-1719
Lab ID	97178-03.008	Soil Color	**BROWN**

Elapsed Time (min)		R Measured	Temp. (°C)	R Corrected	N (%)	Diameter (mm)	N' (%)
0	NA	NA	NA	NA	NA	NA	NA
2	33.0	33.5	24.4	27.9	71.0	0.0297	**41.9**
5		29.5	24.4	23.9	60.8	0.0193	**35.9**
15		25.0	24.4	19.4	49.4	0.0115	**29.1**
30		22.0	24.4	16.4	41.7	0.0083	**24.6**
63		20.0	23.7	14.4	36.6	0.0058	**21.6**
271		17.0	22.7	11.4	29.0	0.0028	**17.1**
1440		14.5	23.9	8.9	22.6	0.0013	**13.4**

Soil Specimen Data		Corrections	
Tare No.	724	K - Factor	0.01276
Tare + Dry Material (gm)	152.8	a - Factor	0.99
Weight of Tare (gm)	108.89	Composite Correction	5.60
Weight of Deflocculant (gm)	5.0	Percent Finer than # 200	59.01
Weight of Dry Material (gm)	38.91		
		Specific Gravity	2.7 Assumed

Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By TO Date 8/22/97 Checked By JMO Date 8/29/97

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SIEVE AND HYDROMETER ANALYSIS
ASTM D 422-63 (SOP-S3)

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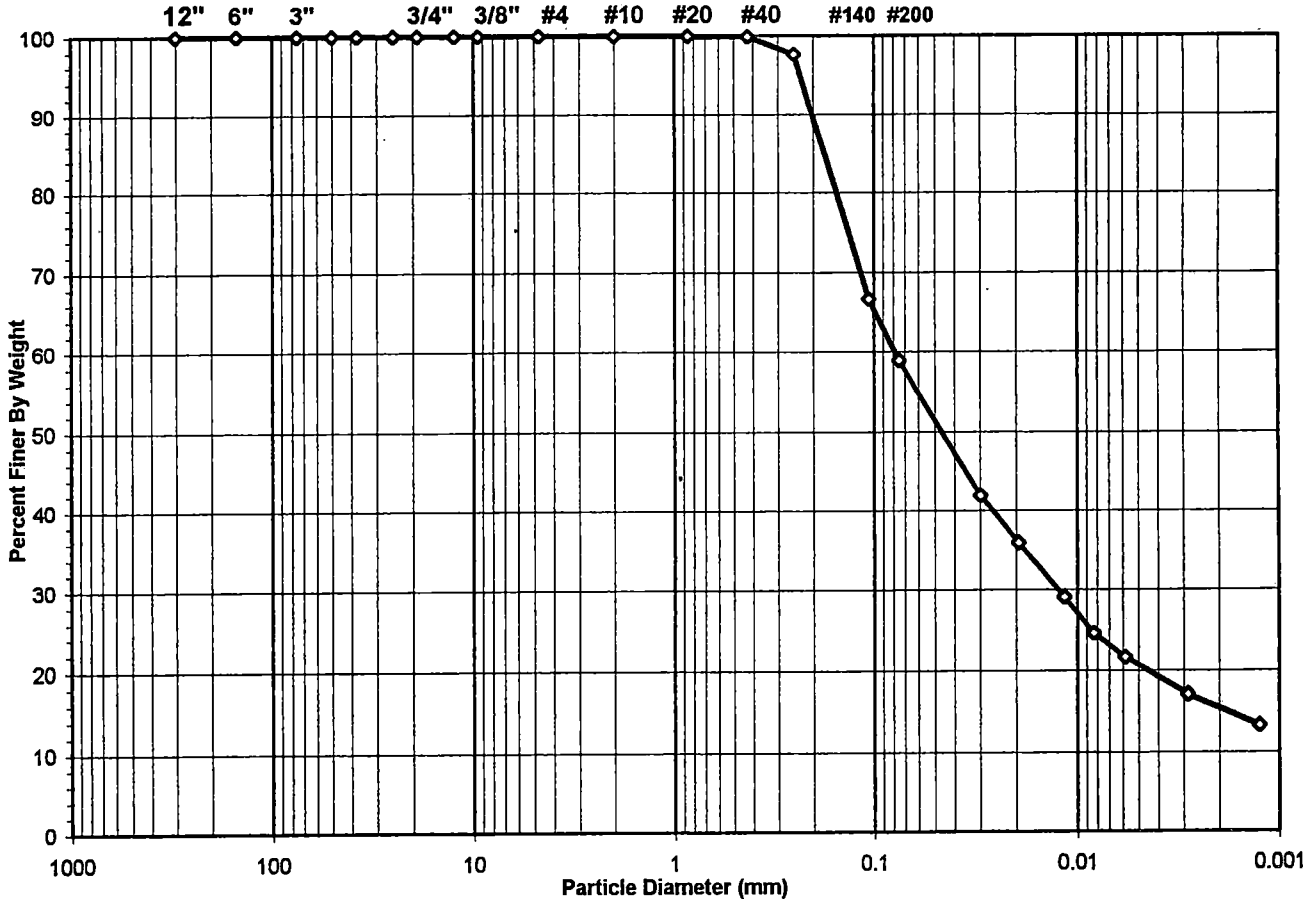
Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	18.5-18.8
Project No.	97178-03	Sample No.	SM023-TB01-1719
Lab ID	97178-03.008	Soil Color	**BROWN**

	SIEVE ANALYSIS		HYDROMETER	
USCS	gravel	sand	silt and clay fraction	
USDA	gravel	sand	silt	clay



Sieve Size (mm)	Percent Finer	Components	Percentage	Corrected % of Minus 2.0 mm material for USDA Classificat.
100	100.00	*Gravel*	0.00	**0.00**
2	100.00	*Sand*	48.47	**48.47**
0.075	59.01	*Silt*	36.03	**36.03**
0.05	51.53	*Clay*	15.49	**15.49**
0.002	15.49			

USDA Classification ***LOAM***

USCS Symbol ***cl, ASSUMED***

USCS Classification ***SANDY LEAN CLAY***

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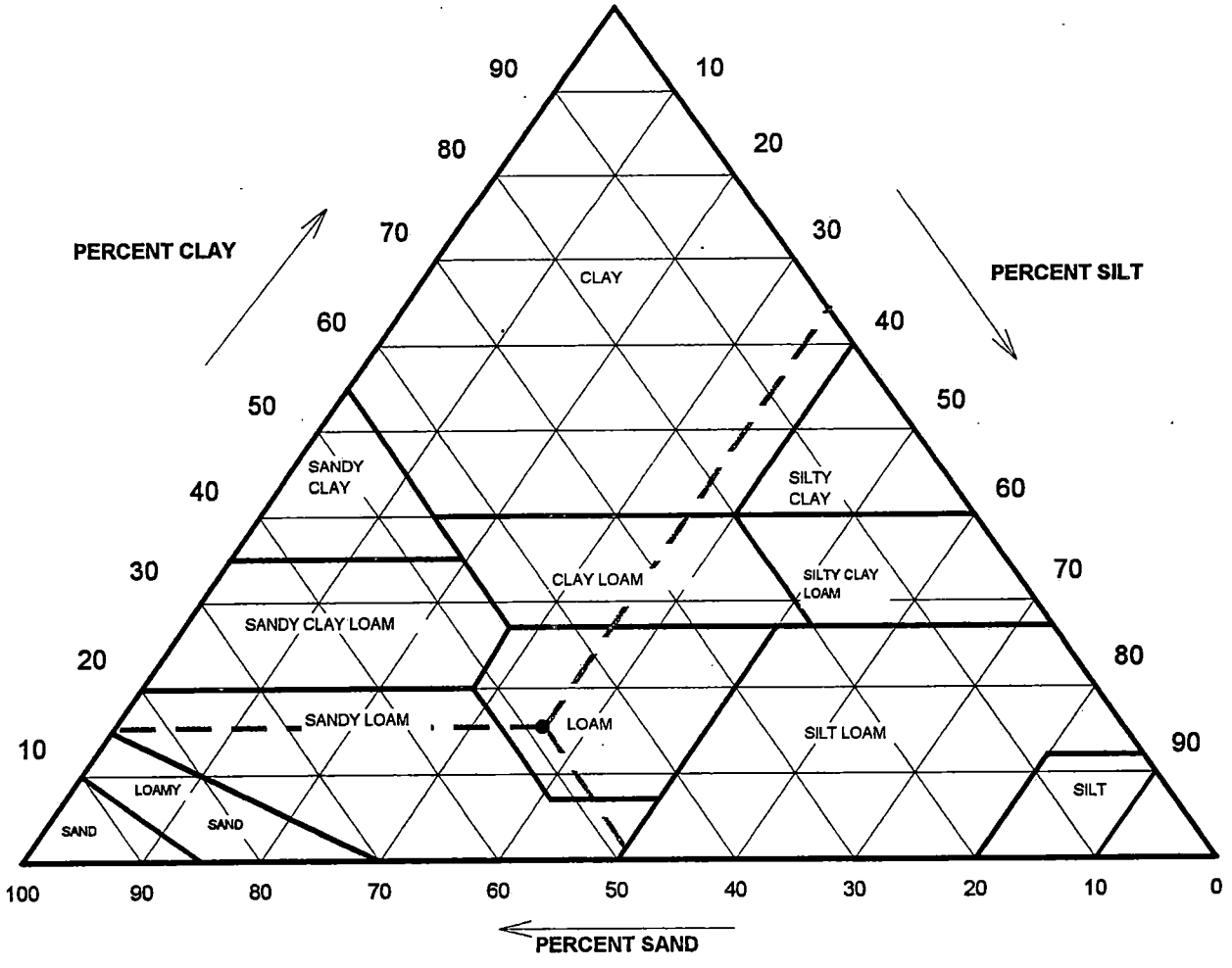
USDA CLASSIFICATION CHART

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	18.5-18.8
Project No.	97178-03	Sample No.	SM023-TB01-1719
Lab ID	97178-03.008	Soil Color	BROWN



Components	Corrected % of Minus 2.0 mm material for USDA Classificat.
Gravel	0.00
Sand	48.47
Silt	36.03
Clay	15.49
USDA Classification	***LOAM***

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SHELBY TUBE UNIT WEIGHT

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Client	ICF KAISER	Tested By	BL 8-12-97
Client Project	BAYER 51249	Checked By	JCM 9-5-97
Project No.	97178-02		
Boring No.	NA	Tube Recovery	1.70
Depth Pushed	1.0-3.0		
Shelby Tube No.	SM024-TB01-0103		

SOIL PROFILE AND SAMPLING

DEPTH ( )	ELEV ( )	SECTION No.	SOIL PROFILE	SOIL DESCRIPTION AND REMARKS	TEST PERFORMED
1.00					
1.50		1		BROWN CLAYEY SAND WITH GRAVEL	GRAIN SIZE HYDROMETER WC
2.00					NO TEST
2.50				TUBE CREASED OUT OF ROUND	
3.00					

NOTE:WHEN FULL RECOVERY IS NOT ACHIEVED,SOIL ELEVATION CAN NOT BE ACCURATELY DEFINE
INDICATE EACH CUT OF THE TUBE WITH AN ARROW
INDICATE DIVIDING LINE BETWEEN SOIL TYPES BY A SOLID LINE
INDICATE WAX BY CROSS-HATCHING
INDICATE SOIL TYPES BY STANDARD SYMBOLS

MOISTURE CONTENT					
Section Number	1	2	3	4	5
Tare Number	1065				
Wt. Tare & WS(gm.)	810.60				
Wt. Tare & DS(gm.)	759.50				
Wt. Tare(gm.)	104.94				
Moisture Content(%)	7.8				

UNIT WEIGHT
Wt. Tube & WS.(gms.)
Wt. Of Tube(gms.)
Wt. Of WS.(gms.)
Length 1 (in.)
Length 2 (in.)
Length 3 (in.)
Top Diameter (in.)
Middle Diameter (in.)
Bottom Diameter (in.)
Sample Volume (cc)
Moisture Content(%)
Unit Wet Wt.(gms/cc)
Unit Wet Wt.(pcf.)
Unit Dry Wt.(pcf.)
Unit Dry Wt.(gms/cc)

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	1.3-1.5
Project No.	97178-02	Sample No.	SM024-TB01-0103
Lab ID	97178-02.053	Soil Color	**BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	1065	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	810.60	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	759.50	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	104.94	Weight of Tare (gm)	NA
Weight of Water (gm)	51.10	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	654.56	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**7.8**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	654.56
Dry Weight - 3/4" Sample (gm)	416.97	Weight of minus #200 material (gm)	237.59
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	416.97
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"	12.5	26.89	4.11	4.11	95.89	**95.89**
3/8"	9.50	23.05	3.52	7.63	92.37	**92.37**
#4	4.75	58.33	8.91	16.54	83.46	**83.46**
#10	2.00	71.94	10.99	27.53	72.47	**72.47**
#20	0.85	67.66	10.34	37.87	62.13	**62.13**
#40	0.425	70.59	10.78	48.65	51.35	**51.35**
#60	0.250	40.91	6.25	54.90	45.10	**45.10**
#140	0.106	46.19	7.06	61.96	38.04	**38.04**
#200	0.075	11.41	1.74	63.70	36.30	**36.30**
Pan	-	237.59	36.30	100.00	-	-

Tested By BL Date 8/12/97 Checked By JMO Date 8/27/97

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HYDROMETER ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	1.3-1.5
Project No.	97178-02	Sample No.	SM024-TB01-0103
Lab ID	97178-02.053	Soil Color	**BROWN**

Elapsed Time (min)		R Measured	Temp. (°C)	R Corrected	N (%)	Diameter (mm)	N' (%)
0	NA	NA	NA	NA	NA	NA	NA
2	32.5	34.0	24.2	28.3	83.6	0.0296	**30.3**
5		31.5	24.2	25.8	76.2	0.0191	**27.7**
15		29.0	24.2	23.3	68.8	0.0112	**25.0**
30		26.0	24.2	20.3	60.0	0.0081	**21.8**
60		24.5	23.5	18.8	55.5	0.0058	**20.2**
250		20.5	23.2	14.8	43.7	0.0029	**15.9**
1440		16.5	23.9	10.8	31.9	0.0012	**11.6**

Soil Specimen Data		Corrections	
Tare No.	1619	K - Factor	0.01279
Tare + Dry Material (gm)	136.07	a - Factor	0.99
Weight of Tare (gm)	97.55	Composite Correction	5.70
Weight of Deflocculant (gm)	5.0	Percent Finer than # 200	36.30
Weight of Dry Material (gm)	33.52		
		Specific Gravity	2.7 Assumed

Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By TO Date 8/18/97 Checked By JMO Date 8/21/97

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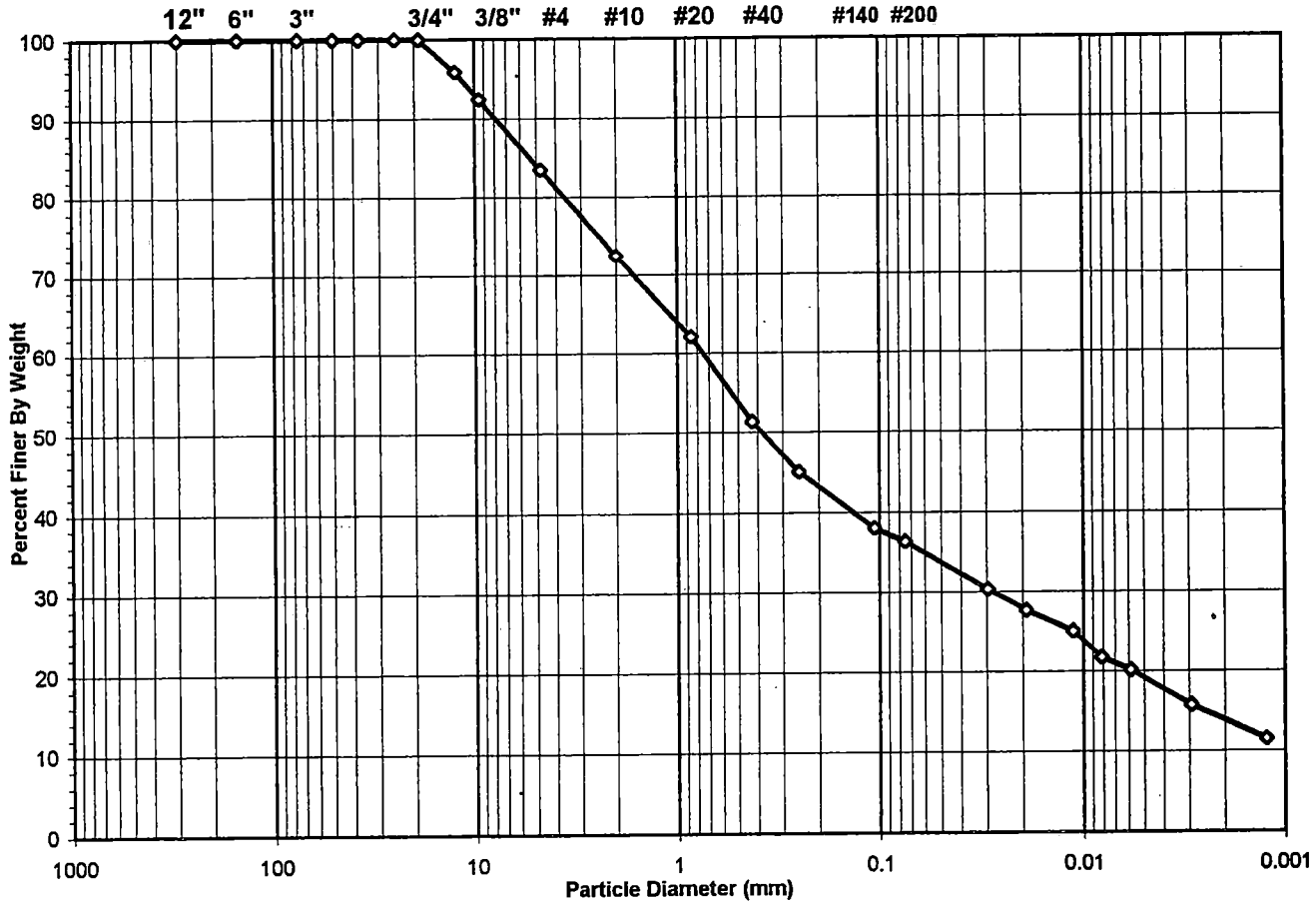
SIEVE AND HYDROMETER ANALYSIS
ASTM D 422-63 (SOP-S3)

geotechnics

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	1.3-1.5
Project No.	97178-02	Sample No.	SM024-TB01-0103
Lab ID	97178-02.053	Soil Color	BROWN

	SIEVE ANALYSIS		HYDROMETER	
USCS	gravel	sand	silt and clay fraction	
USDA	gravel	sand	silt	clay



Sieve Size (mm)	Percent Finer	Components	Percentage	Corrected % of Minus 2.0 mm material for USDA Classificat.
100	100.00	*Gravel*	27.53	**0.00**
2	72.47	*Sand*	38.77	**53.50**
0.075	36.30	*Silt*	19.72	**27.21**
0.05	33.70	*Clay*	13.98	**19.29**
0.002	13.98			

USDA Classification ***SANDY LOAM***

USCS Symbol ***sc, ASSUMED***

USCS Classification ***CLAYEY SAND WITH GRAVEL***

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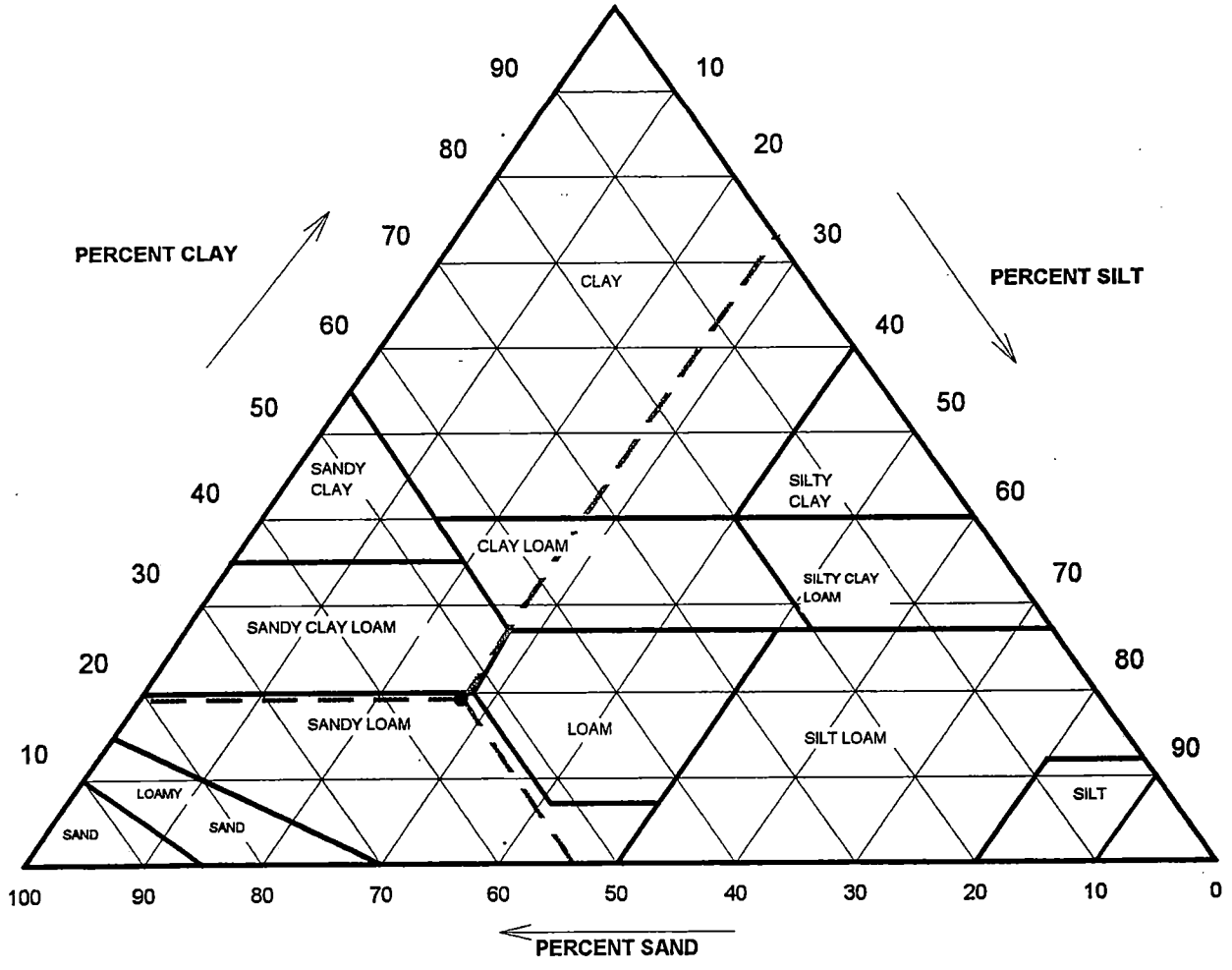
USDA CLASSIFICATION CHART

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	1.3-1.5
Project No.	97178-02	Sample No.	SM024-TB01-0103
Lab ID	97178-02.053	Soil Color	BROWN



Components	Corrected % of Minus 2.0 mm material for USDA Classificat.
Gravel	0.00
Sand	53.50
Silt	27.21
Clay	19.29
USDA Classification	***SANDY LOAM***

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SHELBY TUBE UNIT WEIGHT

geotechnics

Client	ICF KAISER	Tested By	JCM 8-13-97
Client Project	BAYER 51249	Checked By	JMO 9-3-97
Project No.	97178-02		
Boring No.	NA	Tube Recovery	1.00
Depth Pushed	3.0-5.0		
Shelby Tube No.	SM024-TB02-0305		

SOIL PROFILE AND SAMPLING

DEPTH ( )	ELEV ( )	SECTION No.	SOIL PROFILE	SOIL DESCRIPTION AND REMARKS	TEST PERFORMED
3.00					
3.50				UNABLE TO GET GOOD DENSITY BECAUSE OF WAX	
4.00					
		3			GRAIN SIZE HYDROMETER
4.50		2		BROWN CLAYEY GRAVEL WITH SAND	PERMEABILITY
		1			WATER CONTENT
5.00					

NOTE:WHEN FULL RECOVERY IS NOT ACHIEVED,SOIL ELEVATION CAN NOT BE ACCURATELY DEFINE
INDICATE EACH CUT OF THE TUBE WITH AN ARROW
INDICATE DIVIDING LINE BETWEEN SOIL TYPES BY A SOLID LINE
INDICATE WAX BY CROSS-HATCHING
INDICATE SOIL TYPES BY STANDARD SYMBOLS

MOISTURE CONTENT

Section Number	1	2	3	4	5
Tare Number	1906		1712		
Wt. Tare & WS(gm.)	257.25		794.70		
Wt. Tare & DS(gm.)	238.84		735.40		
Wt. Tare(gm.)	41.51		82.78		
Moisture Content(%)	9.3		9.1		

UNIT WEIGHT

Wt. Tube & WS.(gms.)	1084.20
Wt. Of Tube(gms.)	267.56
Wt. Of WS.(gms.)	816.64
Length 1 (in.)	3.605
Length 2 (in.)	3.623
Length 3 (in.)	3.633
Top Diameter (in.)	2.910
Middle Diameter (in.)	2.846
Bottom Diameter (in.)	2.880
Sample Volume (cc)	386.12
Moisture Content(%)	9.33
Unit Wet Wt.(gms/cc)	2.11
Unit Wet Wt.(pcf.)	132.0
Unit Dry Wt.(pcf.)	120.7
Unit Dry Wt.(gms/cc)	1.93

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	4.1-4.5
Project No.	97178-02	Sample No.	SM024-TB02-0305
Lab ID	97178-02.055	Soil Color	**BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	1712	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	794.70	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	735.40	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	82.78	Weight of Tare (gm)	NA
Weight of Water (gm)	59.30	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	652.62	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**9.1**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	652.62
Dry Weight - 3/4" Sample (gm)	282.72	Weight of minus #200 material (gm)	122.47
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	530.15
Dry Weight + 3/4" Sample (gm)	247.43		
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	222.22	34.05	34.05	65.95	**65.95**
3/4"	19.0	25.21	3.86	37.91	62.09	**62.09**
1/2"	12.5	84.36	12.93	50.84	49.16	**49.16**
3/8"	9.50	22.79	3.49	54.33	45.67	**45.67**
#4	4.75	52.92	8.11	62.44	37.56	**37.56**
#10	2.00	43.30	6.63	69.08	30.92	**30.92**
#20	0.85	26.79	4.10	73.18	26.82	**26.82**
#40	0.425	19.32	2.96	76.14	23.86	**23.86**
#60	0.250	14.15	2.17	78.31	21.69	**21.69**
#140	0.106	15.19	2.33	80.64	19.36	**19.36**
#200	0.075	3.90	0.60	81.23	18.77	**18.77**
Pan	-	122.47	18.77	100.00	-	-

Tested By JCM Date 8/13/97 Checked By JMO Date 8/27/97

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HYDROMETER ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	4.1-4.5
Project No.	97178-02	Sample No.	SM024-TB02-0305
Lab ID	97178-02.055	Soil Color	**BROWN**

Elapsed Time (min)		R Measured	Temp. (°C)	R Corrected	N (%)	Diameter (mm)	N' (%)
0	NA	NA	NA	NA	NA	NA	NA
2	36.0	36.0	24.2	30.3	86.7	0.0292	**16.3**
5		33.5	24.2	27.8	79.5	0.0188	**14.9**
15		30.0	24.2	24.3	69.5	0.0111	**13.0**
30		27.0	24.2	21.3	60.9	0.0080	**11.4**
60		24.5	23.5	18.8	53.8	0.0058	**10.1**
250		20.0	23.2	14.3	40.9	0.0029	**7.7**
1440		15.5	23.9	9.8	28.0	0.0013	**5.3**

Soil Specimen Data		Corrections	
Tare No.	803	K - Factor	0.01279
Tare + Dry Material (gm)	140.21	a - Factor	0.99
Weight of Tare (gm)	100.6	Composite Correction	5.70
Weight of Deflocculant (gm)	5.0	Percent Finer than # 200	18.77
Weight of Dry Material (gm)	34.61		
		Specific Gravity	2.7 Assumed

Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By TO Date 8/18/97 Checked By JMO Date 8/27/97

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SIEVE AND HYDROMETER ANALYSIS
ASTM D 422-63 (SOP-S3)

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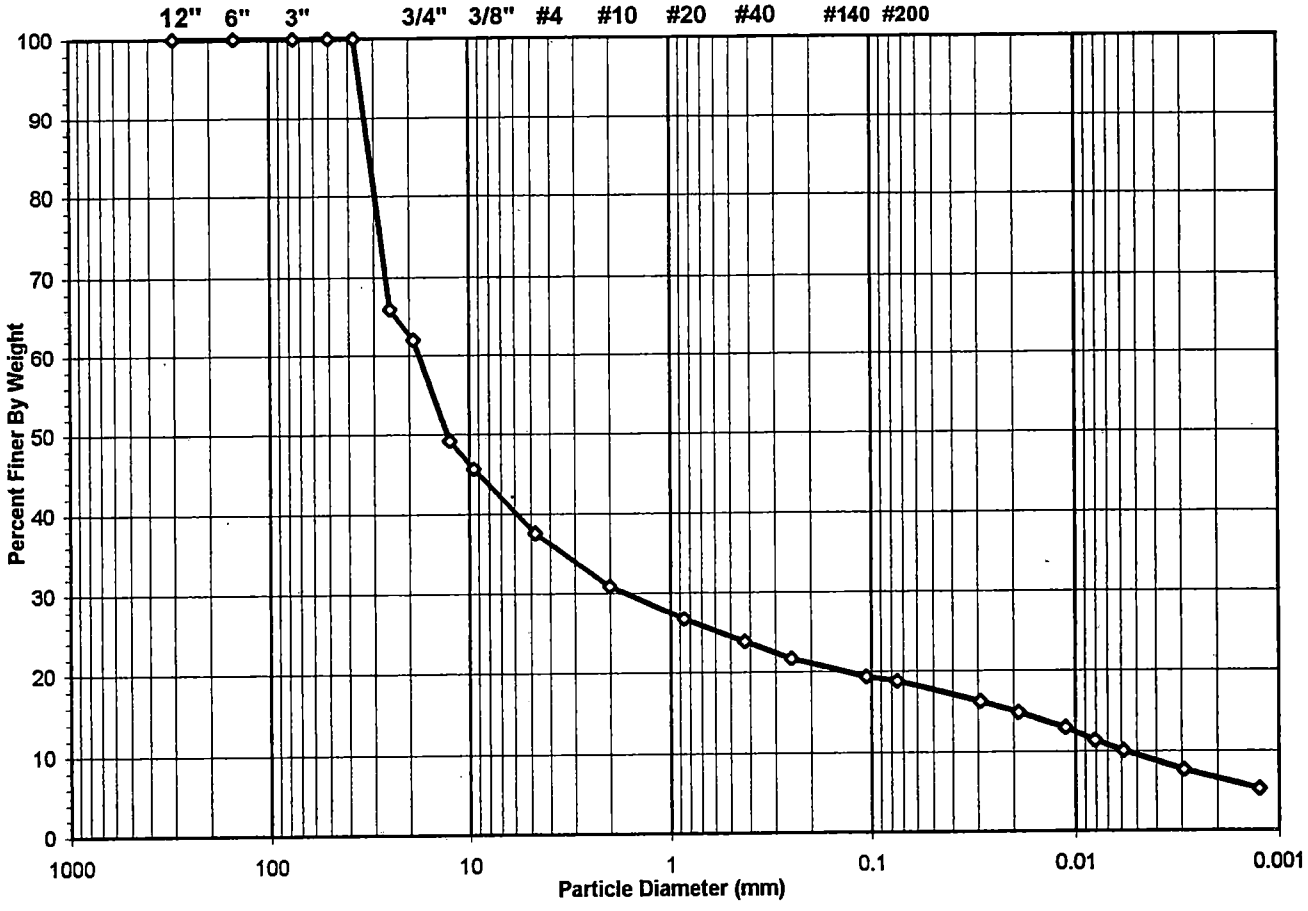
Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	4.1-4.5
Project No.	97178-02	Sample No.	SM024-TB02-0305
Lab ID	97178-02.055	Soil Color	BROWN

	SIEVE ANALYSIS		HYDROMETER	
USCS	gravel	sand	silt and clay fraction	
USDA	gravel	sand	silt	clay



Sieve Size (mm)	Percent Finer	Components	Percentage	Corrected % of Minus 2.0 mm material for USDA Classificat.
100	100.00	*Gravel*	69.08	**0.00**
2	30.92	*Sand*	13.23	**42.79**
0.075	18.77	*Silt*	11.09	**35.87**
0.05	17.69	*Clay*	6.60	**21.34**
0.002	6.60			

USDA Classification *LOAM*

USCS Symbol *gc, ASSUMED*

USCS Classification *CLAYEY GRAVEL WITH SAND*

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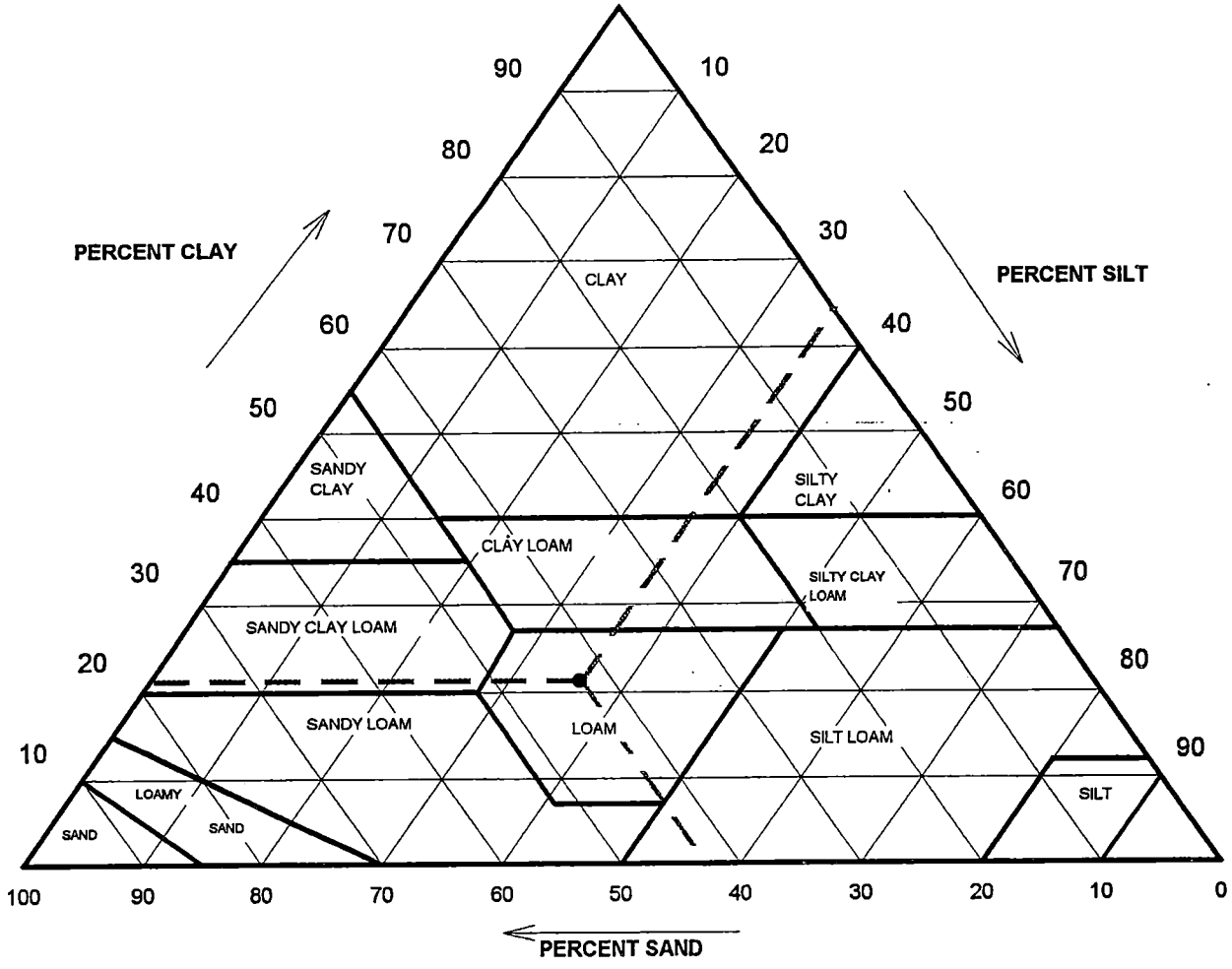
USDA CLASSIFICATION CHART

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	4.1-4.5
Project No.	97178-02	Sample No.	SM024-TB02-0305
Lab ID	97178-02.055	Soil Color	BROWN



Components	Corrected % of Minus 2.0 mm material for USDA Classificat.
Gravel	0.00
Sand	42.79
Silt	35.87
Clay	21.34
USDA Classification	***LOAM***

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PERMEABILITY TEST

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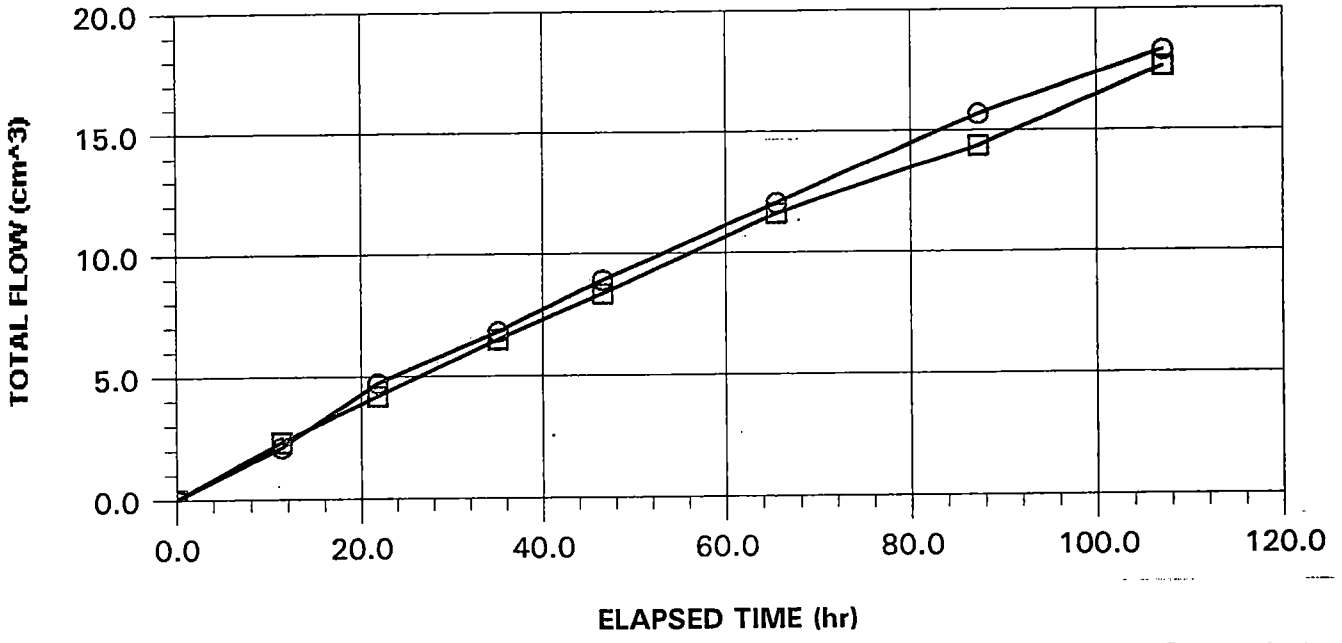
Client	ICF KAISER	Boring No.	NA
Client Project	BAYER 51249	Depth(ft.)	4.5-4.8
Project No.	97178-02	Sample No.	SM024-TB02-0305

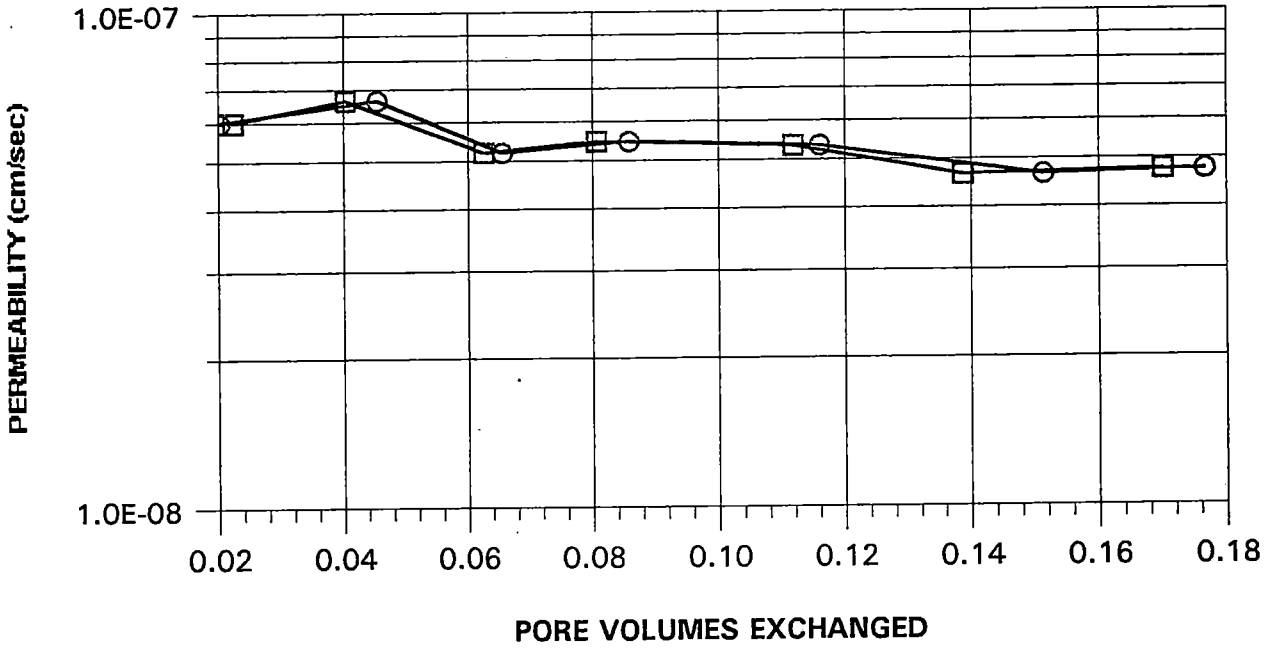
AVERAGE PERMEABILITY = 5.0E-08 cm/sec @ 20°C
AVERAGE PERMEABILITY = 5.0E-10 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



⊖ INFLOW
⊟ OUTFLOW

PORE VOLUMES EXCHANGED vs. PERMEABILITY



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PERMEABILITY TEST

geotechnics

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Client	ICF KAISER	Tested By	JCM	Date	08-13-97
Client Project	BAYER 51249	Checked By	JMD	Date	8/22/97
Project No.	97178-02				
Boring No.	NA	Specific Gravity	2.70 ASSUMED		
Depth(ft.)	4.5-4.8	Sample Condition	UNDISTURBED		
Sample No.	SM024-TB02-0305				

Visual Description BROWN CLAY AND ROCK FRAGMENTS

MOISTURE CONTENT	BEFORE TEST	AFTER TEST
Tare Number	1906	ZZ
Wt. Tare & WS(gm.)	257.25	572.10
Wt. Tare & DS(gm.)	238.84	510.90
Wt. Water(gm.)	18.41	61.20
Wt. Tare(gm.)	41.51	84.65
Wt. DS(gm.)	197.33	426.25
Moisture Content(%)	9.3	14.4

UNIT WEIGHT		
Wt. Tube & WS.(gms.)	1084.20	NA
Wt. Of Tube(gms.)	267.56	NA
Wt. Of WS.(gms.)	816.64	854.2
Length 1 (in.)	3.605	3.649
Length 2 (in.)	3.623	3.660
Length 3 (in.)	3.633	3.722
Top Diameter (in.)	2.910	2.817
Middle Diameter (in.)	2.846	2.835
Bottom Diameter (in.)	2.880	2.852
Average Length (in)	3.62	3.68
Average Area (in^2)	6.51	6.31
Sample Volume(cc.)	386.12	380.27
Unit Wet Wt.(gms/cc)	2.11	2.25
Unit Wet Wt.(pcf.)	132.0	140.2
Unit Dry Wt.(pcf.)	120.7	122.6
Unit Dry Wt.(gms/cc)	1.93	1.96
Void Ratio,e	0.40	0.37
Porosity, n	0.28	0.27
Pore Volume(cm^3)	109.5	103.6

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PERMEABILITY TEST

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Client	ICF KAISER	Tested By	JCM	Date	08-13-97
Client Project	BAYER 51249	Checked By	JMi	Date	8/22/97
Project No.	97178-02				
Boring No.	NA				
Depth(ft.)	4.5-4.8				
Sample No.	SM024-TB02-0305				
Visual Description	BROWN CLAY AND ROCK FRAGMENTS				

Pressure Heads (Constant)	
Top Cap (psi)	27.5
Bottom Cap (psi)	30.0
Cell (psi)	35.0
Total Pressure Head (cm)	175.8

Final Sample Dimensions	
Sample Length (cm.), L	9.34
Sample Diameter (cm.)	7.20
Sample Area (cm.^2), A	40.72
Inflow Burette Area, (cm.^2), a-in	4.68
Outflow Burette Area, (cm.^2), a-out	4.49
B Parameter	97%

AVERAGE PERMEABILITY = 5.0E-08 cm/sec @ 20°C
AVERAGE PERMEABILITY = 5.0E-10 m/sec @ 20°C

DATE mon-dy-yr	TIME hr	TIME min	ELAPSED TIME (t) hr	TOTAL INFLOW cm^3	TOTAL OUTFLOW cm^3	TOTAL HEAD (h) cm	FLOW 0 FLOW 1 STOP	TEMP °C	INCREMENTAL PERMEABILITY @ 20°C cm/sec
08-13-97	20	5	0.0	0.0	0.0	193.0	0	22.6	NA
08-14-97	7	25	11.3	2.1	2.3	192.0	0	23.0	6.0E-08
08-14-97	17	55	21.8	4.7	4.2	191.0	0	22.5	6.6E-08
08-15-97	7	10	35.1	6.8	6.5	190.1	0	23.0	5.2E-08
08-15-97	18	40	46.6	8.9	8.3	189.2	0	22.2	5.5E-08
08-16-97	13	30	65.4	12.0	11.6	187.8	0	23.0	5.3E-08
08-17-97	11	25	87.3	15.7	14.4	186.4	0	23.0	4.6E-08
08-18-97	7	10	107.1	18.3	17.6	185.1	0	23.0	4.7E-08

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SHELBY TUBE UNIT WEIGHT

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Client	ICF KAISER	Tested By	JCM 8-15-97
Client Project	BAYER 51249	Checked By	JHD 9-3-97
Project No.	97178-02		
Boring No.	NA	Tube Recovery	2.00
Depth Pushed	16.0-18.0		
Shelby Tube No.	SM024-TB02-1618		

SOIL PROFILE AND SAMPLING

DEPTH ( )	ELEV ( )	SECTION No.	SOIL PROFILE	SOIL DESCRIPTION AND REMARKS	TEST PERFORMED
16.00					
16.50					
17.00					GRAIN SIZE HYDROMETER UNIT WGT. WC.
		3			
17.50		2		BROWN SANDY LEAN CLAY	PERMEABILITY
		1			WATER CONTENT
18.00					

NOTE:WHEN FULL RECOVERY IS NOT ACHIEVED,SOIL ELEVATION CAN NOT BE ACCURATELY DEFINE
INDICATE EACH CUT OF THE TUBE WITH AN ARROW
INDICATE DIVIDING LINE BETWEEN SOIL TYPES BY A SOLID LINE
INDICATE WAX BY CROSS-HATCHING
INDICATE SOIL TYPES BY STANDARD SYMBOLS

MOISTURE CONTENT					
Section Number	1	2	3	4	5
Tare Number	11006		731		
Wt. Tare & WS(gm.)	259.28		804.00		
Wt. Tare & DS(gm.)	238.76		698.70		
Wt. Tare(gm.)	90.23		85.07		
Moisture Content(%)	13.8		17.2		

UNIT WEIGHT		
Wt. Tube & WS.(gms.)	1004.60	1426.50
Wt. Of Tube(gms.)	269.54	360.55
Wt. Of WS.(gms.)	735.06	1065.95
Length 1 (in.)	3.598	4.841
Length 2 (in.)	3.610	4.848
Length 3 (in.)	3.604	4.834
Top Diameter (in.)	2.890	2.878
Middle Diameter (in.)	2.879	2.874
Bottom Diameter (in.)	2.872	2.875
Sample Volume (cc)	384.82	515.23
Moisture Content(%)	13.82	17.16
Unit Wet Wt.(gms/cc)	1.91	2.07
Unit Wet Wt.(pcf.)	119.2	129.1
Unit Dry Wt.(pcf.)	104.7	110.2
Unit Dry Wt.(gms/cc)	1.68	1.77

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	17.1-17.5
Project No.	97178-02	Sample No.	SM024-TB02-1618
Lab ID	97178-02.056	Soil Color	**BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	731	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	804.00	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	698.70	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	85.07	Weight of Tare (gm)	NA
Weight of Water (gm)	105.30	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	613.63	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**17.2**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	613.63
Dry Weight - 3/4" Sample (gm)	287.09	Weight of minus #200 material (gm)	326.54
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	287.09
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"	12.5	0.00	0.00	0.00	100.00	**100.00**
3/8"	9.50	0.00	0.00	0.00	100.00	**100.00**
#4	4.75	0.00	0.00	0.00	100.00	**100.00**
#10	2.00	6.65	1.08	1.08	98.92	**98.92**
#20	0.85	13.22	2.15	3.24	96.76	**96.76**
#40	0.425	10.90	1.78	5.01	94.99	**94.99**
#60	0.250	69.08	11.26	16.27	83.73	**83.73**
#140	0.106	145.13	23.65	39.92	60.08	**60.08**
#200	0.075	42.11	6.86	46.79	53.21	**53.21**
Pan	-	326.54	53.21	100.00	-	-

Tested By JCM Date 8/15/97 Checked By JMD Date 8/27/97

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HYDROMETER ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	17.1-17.5
Project No.	97178-02	Sample No.	SM024-TB02-1618
Lab ID	97178-02.056	Soil Color	**BROWN**

Elapsed Time (min)		R Measured	Temp. (°C)	R Corrected	N (%)	Diameter (mm)	N' (%)
0	NA	NA	NA	NA	NA	NA	NA
2	28.5	30.0	24.2	24.3	75.9	0.0305	**40.4**
5		27.0	24.2	21.3	66.5	0.0197	**35.4**
15		23.5	24.2	17.8	55.6	0.0117	**29.6**
30		21.5	24.2	15.8	49.4	0.0083	**26.3**
60		20.0	23.5	14.3	44.7	0.0060	**23.8**
250		16.5	23.2	10.8	33.7	0.0030	**18.0**
1440		14.5	23.9	8.8	27.5	0.0013	**14.6**

Soil Specimen Data		Corrections	
Tare No.	1024	K - Factor	0.01279
Tare + Dry Material (gm)	135.28	a - Factor	0.99
Weight of Tare (gm)	98.59	Composite Correction	5.70
Weight of Deflocculant (gm)	5.0	Percent Finer than # 200	53.21
Weight of Dry Material (gm)	31.69		
		Specific Gravity	2.7 Assumed

Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By TO Date 8/16/97 Checked By JMO Date 8/27/97

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SIEVE AND HYDROMETER ANALYSIS
ASTM D 422-63 (SOP-S3)

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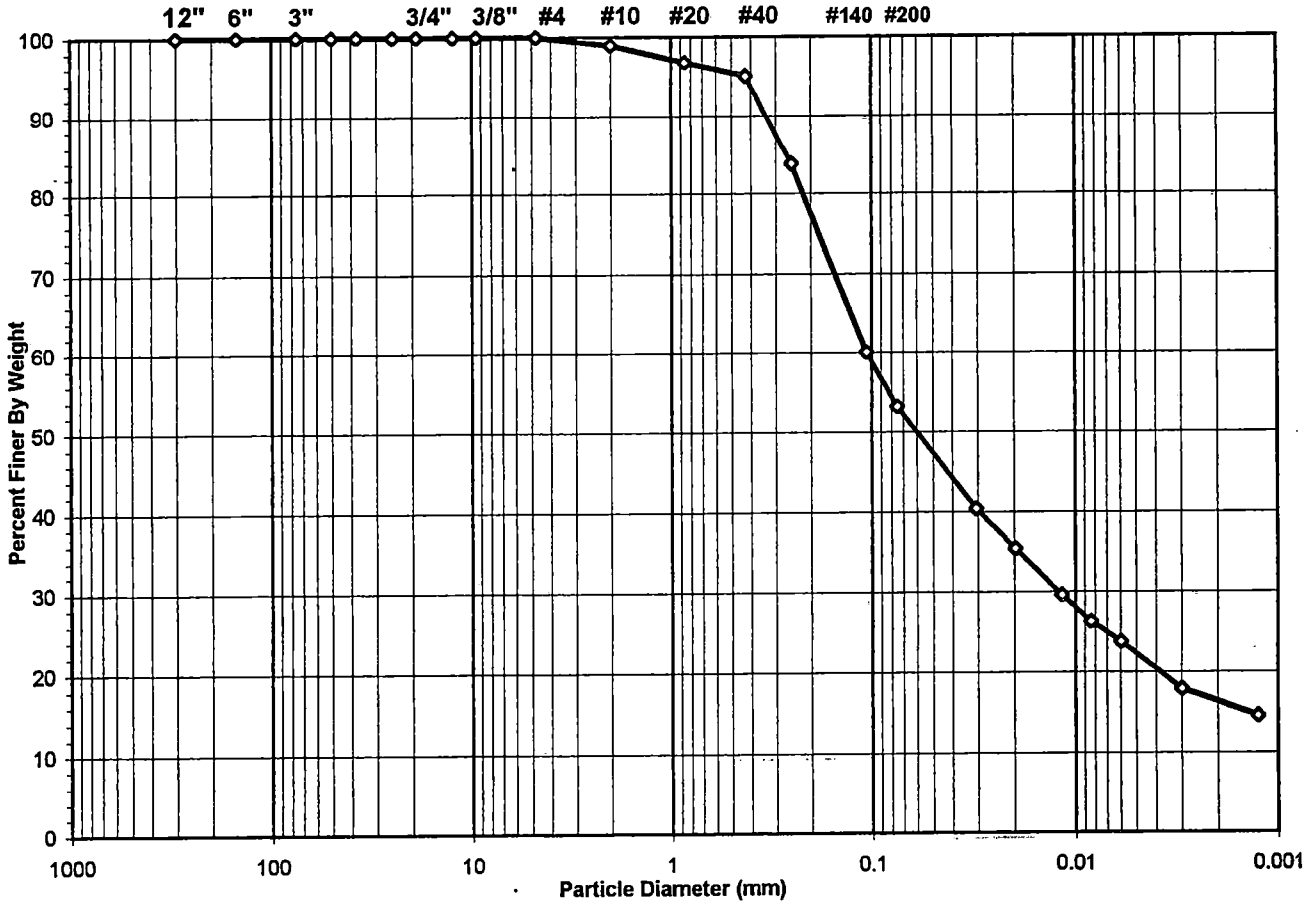
Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	17.1-17.5
Project No.	97178-02	Sample No.	SM024-TB02-1618
Lab ID	97178-02.056	Soil Color	**BROWN**

	SIEVE ANALYSIS			HYDROMETER	
USCS	gravel		sand	silt and clay fraction	
USDA	gravel		sand	silt	clay



Sieve Size (mm)	Percent Finer	Components	Percentage	Corrected % of Minus 2.0 mm material for USDA Classificat.
100	100.00	*Gravel*	1.08	**0.00**
2	98.92	*Sand*	51.48	**52.04**
0.075	53.21	*Silt*	31.02	**31.36**
0.05	47.44	*Clay*	16.42	**16.60**
0.002	16.42			

USDA Classification	***SANDY LOAM***
USCS Symbol	***cl, ASSUMED***
USCS Classification	***SANDY LEAN CLAY***

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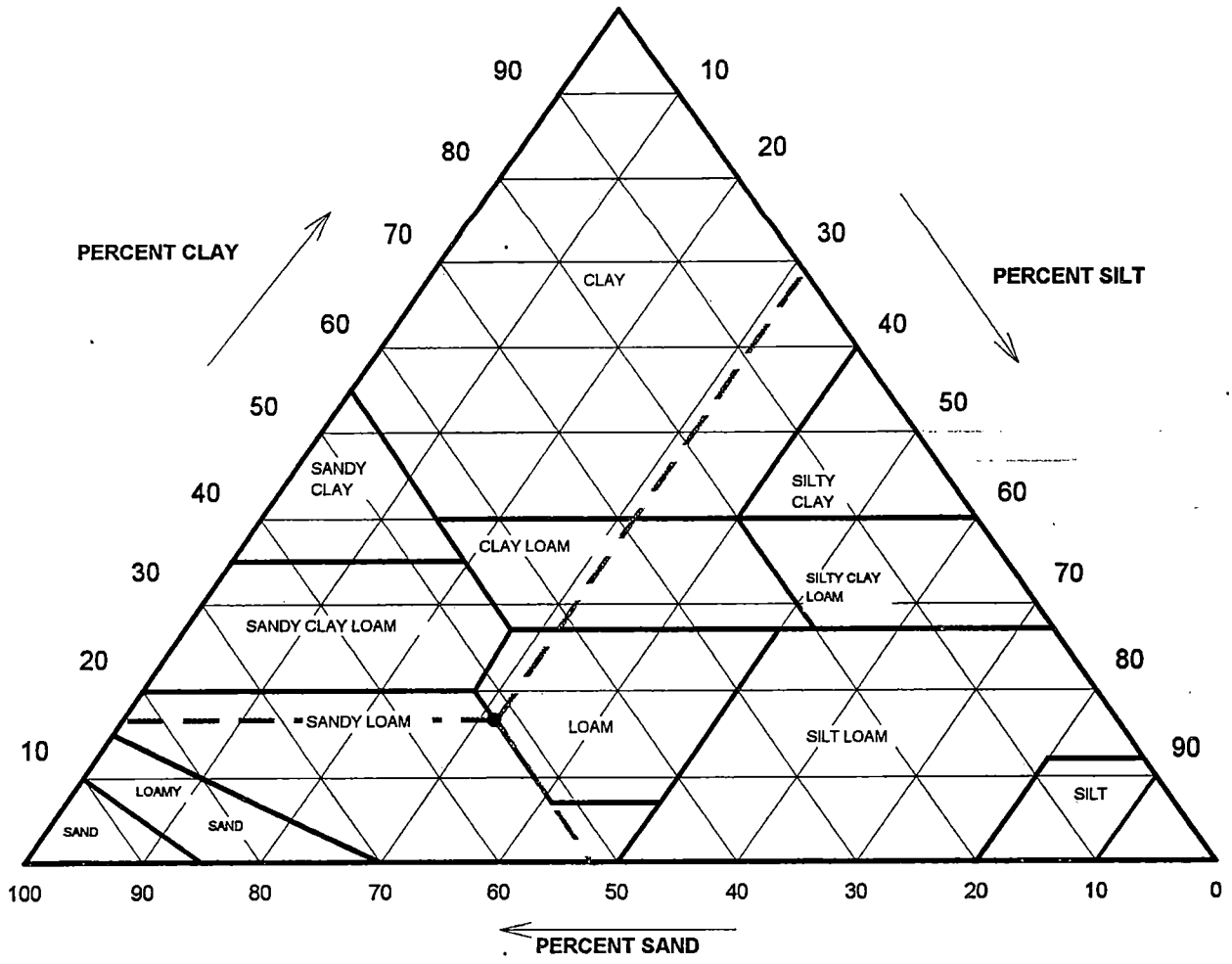
USDA CLASSIFICATION CHART

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	17.1-17.5
Project No.	97178-02	Sample No.	SM024-TB02-1618
Lab ID	97178-02.056	Soil Color	BROWN



Components	Corrected % of Minus 2.0 mm material for USDA Classificat.
Gravel	0.00
Sand	52.04
Silt	31.36
Clay	16.60
USDA Classification	***SANDY LOAM***

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PERMEABILITY TEST

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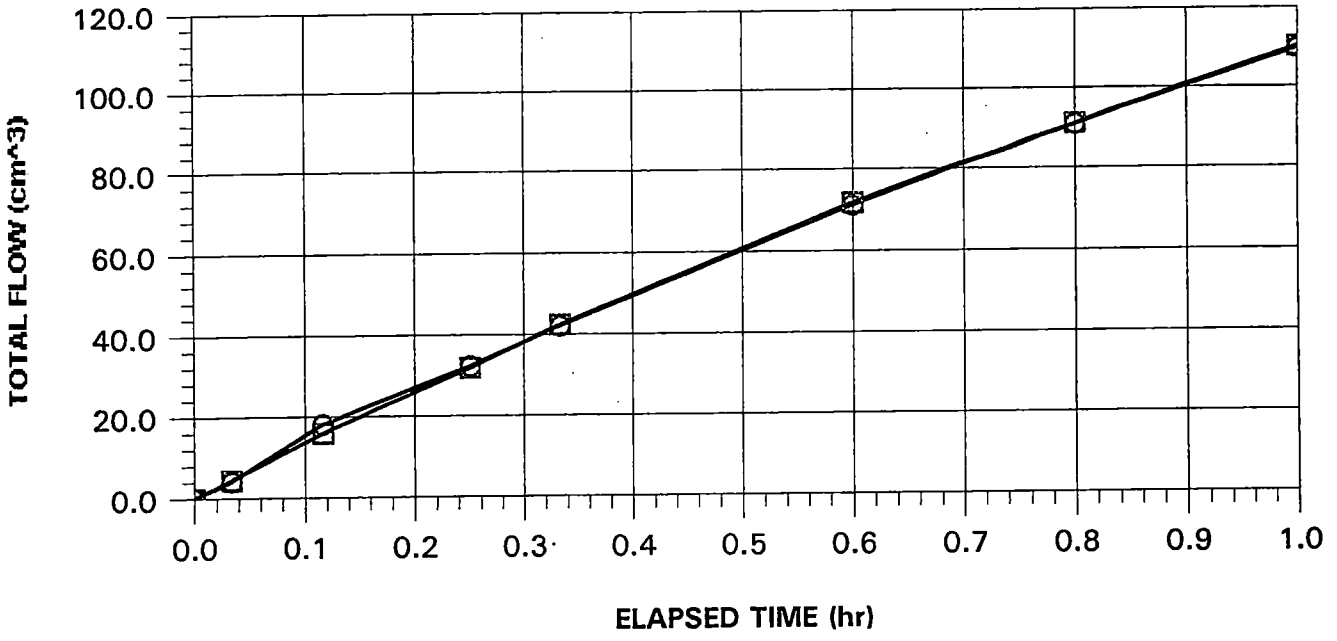
Client	ICF KAISER	Boring No.	NA
Client Project	BAYER 51249	Depth(ft.)	17.5-17.8
Project No.	97178-02	Sample No.	SM024-TB02-1618

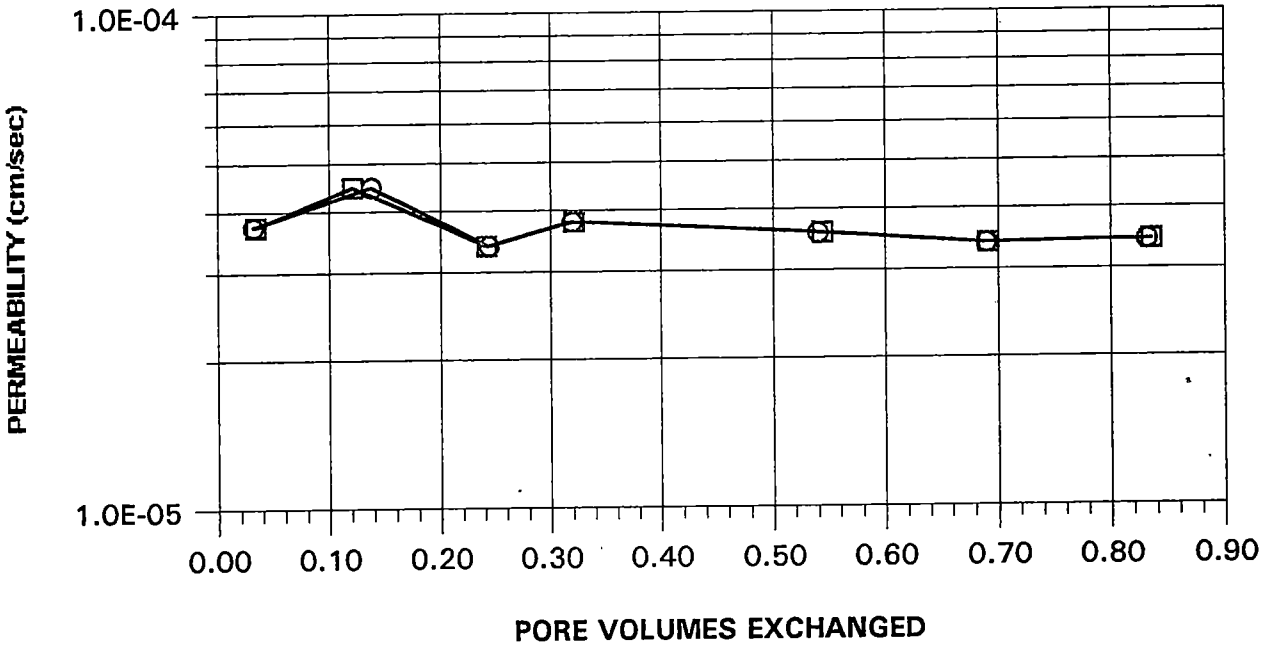
AVERAGE PERMEABILITY = 3.5E-05 cm/sec @ 20°C
AVERAGE PERMEABILITY = 3.5E-07 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



⊖ INFLOW
⊟ OUTFLOW

PORE VOLUMES EXCHANGED vs. PERMEABILITY



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PERMEABILITY TEST

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Client	ICF KAISER	Tested By	JCM	Date	08-15-97
Client Project	BAYER 51249	Checked By	JMO	Date	8/22/97
Project No.	97178-02				
Boring No.	NA	Specific Gravity	2.70 ASSUMED		
Depth(ft.)	17.5-17.8	Sample Condition	UNDISTURBED		
Sample No.	SM024-TB02-1618				

Visual Description BROWN SANDY CLAY

MOISTURE CONTENT	BEFORE TEST	AFTER TEST
Tare Number	11006	1713
Wt. Tare & WS(gm.)	259.28	480.00
Wt. Tare & DS(gm.)	238.76	411.90
Wt. Water(gm.)	20.52	68.10
Wt. Tare(gm.)	90.23	83.10
Wt. DS(gm.)	148.53	328.80
Moisture Content(%)	13.8	20.7

UNIT WEIGHT		
Wt. Tube & WS.(gms.)	1004.60	NA
Wt. Of Tube(gms.)	269.54	NA
Wt. Of WS.(gms.)	735.06	779.6
Length 1 (in.)	3.598	3.599
Length 2 (in.)	3.610	3.575
Length 3 (in.)	3.604	3.591
Top Diameter (in.)	2.890	2.841
Middle Diameter (in.)	2.879	2.832
Bottom Diameter (in.)	2.872	2.832
Average Length (in)	3.60	3.59
Average Area (in^2)	6.52	6.31
Sample Volume(cc.)	384.82	371.18
Unit Wet Wt.(gms/cc)	1.91	2.10
Unit Wet Wt.(pcf.)	119.2	131.1
Unit Dry Wt.(pcf.)	104.7	108.6
Unit Dry Wt.(gms/cc)	1.68	1.74
Void Ratio,e	0.61	0.55
Porosity, n	0.38	0.36
Pore Volume(cm^3)	145.6	132.0

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PERMEABILITY TEST

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Client	ICF KAISER	Tested By	JCM	Date	08-15-97
Client Project	BAYER 51249	Checked By	JMO	Date	8/22/97
Project No.	97178-02				
Boring No.	NA				
Depth(ft.)	17.5-17.8				
Sample No.	SM024-TB02-1618				
Visual Description	BROWN SANDY CLAY				

Pressure Heads (Constant)	
Top Cap (psi)	87.5
Bottom Cap (psi)	90.0
Cell (psi)	95.0
Total Pressure Head (cm)	175.8

Final Sample Dimensions	
Sample Length (cm.), L	9.11
Sample Diameter (cm.)	7.20
Sample Area (cm.^2), A	40.73
Inflow Burette Area, (cm.^2), a-in	4.52
Outflow Burette Area, (cm.^2), a-out	4.48
B Parameter	99%

AVERAGE PERMEABILITY = 3.5E-05 cm/sec @ 20°C
AVERAGE PERMEABILITY = 3.5E-07 m/sec @ 20°C

DATE mon-dy-yr	TIME hr	TIME min	ELAPSED TIME (t) hr	TOTAL INFLOW cm^3	TOTAL OUTFLOW cm^3	TOTAL HEAD (h) cm	FLOW 0 FLOW 1 STOP	TEMP °C	INCREMENTAL PERMEABILITY @ 20°C cm/sec
08-19-97	7	54	0.0	0.0	0.0	203.4	0	23.0	NA
08-19-97	7	56	0.0	4.2	4.5	201.5	0	23.0	3.7E-05
08-19-97	8	1	0.1	18.2	16.0	195.8	0	23.0	4.5E-05
08-19-97	8	9	0.3	32.3	31.9	189.2	0	23.0	3.4E-05
08-19-97	8	14	0.3	42.1	42.4	184.6	0	23.0	3.8E-05
08-19-97	8	30	0.6	71.3	71.8	171.6	0	23.0	3.6E-05
08-19-97	8	42	0.8	91.0	91.3	162.9	0	23.0	3.4E-05
08-19-97	8	54	1.0	109.8	110.3	154.6	0	23.0	3.4E-05

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SHELBY TUBE UNIT WEIGHT

geotechnics

Client	ICF KAISER	Tested By	BL 8-18-97
Client Project	BAYER 51249	Checked By	JCM 9-5-97
Project No.	97178-03		
Boring No.	NA	Tube Recovery	1.40
Depth Pushed	1.0-3.0		
Shelby Tube No.	SM025-TB01-0103		

SOIL PROFILE AND SAMPLING

DEPTH ( )	ELEV ( )	SECTION No.	SOIL PROFILE	SOIL DESCRIPTION AND REMARKS	TEST PERFORMED
1.00					
1.50					
2.00					
		2			UNIT WGT. WC.
2.50				BROWN GRAVELLY LEAN CLAY WITH SAND	GRAIN SIZE HYDROMETER
		1			
3.00					

NOTE:WHEN FULL RECOVERY IS NOT ACHIEVED,SOIL ELEVATION CAN NOT BE ACCURATELY DEFINE
INDICATE EACH CUT OF THE TUBE WITH AN ARROW
INDICATE DIVIDING LINE BETWEEN SOIL TYPES BY A SOLID LINE
INDICATE WAX BY CROSS-HATCHING
INDICATE SOIL TYPES BY STANDARD SYMBOLS

MOISTURE CONTENT					
Section Number	1	2	3	4	5
Tare Number		677			
Wt. Tare & WS(gm.)		729.60			
Wt. Tare & DS(gm.)		671.90			
Wt. Tare(gm.)		74.63			
Moisture Content(%)		9.7			
UNIT WEIGHT					
Wt. Tube & WS.(gms.)		952.10			
Wt. Of Tube(gms.)		266.28			
Wt. Of WS.(gms.)		685.82			
Length 1 (in.)		3.588			
Length 2 (in.)		3.568			
Length 3 (in.)		3.582			
Top Diameter (in.)		2.866			
Middle Diameter (in.)		2.852			
Bottom Diameter (in.)		2.857			
Sample Volume (cc)		376.37			
Moisture Content(%)		9.66			
Unit Wet Wt.(gms/cc)		1.82			
Unit Wet Wt.(pcf.)		113.7			
Unit Dry Wt.(pcf.)		103.7			
Unit Dry Wt.(gms/cc)		1.66			

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	2.4-3.0
Project No.	97178-03	Sample No.	SM025-TB01-0103
Lab ID	97178-03.009	Soil Color	**BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	1089	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	986.60	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	862.80	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	105.92	Weight of Tare (gm)	NA
Weight of Water (gm)	123.80	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	756.88	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**16.4**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	756.88
Dry Weight - 3/4" Sample (gm)	266.20	Weight of minus #200 material (gm)	381.22
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	375.66
Dry Weight + 3/4" Sample (gm)	109.46		
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	84.72	11.19	11.19	88.81	**88.81**
3/4"	19.0	24.74	3.27	14.46	85.54	**85.54**
1/2"	12.5	15.91	2.10	16.56	83.44	**83.44**
3/8"	9.50	29.58	3.91	20.47	79.53	**79.53**
#4	4.75	42.83	5.66	26.13	73.87	**73.87**
#10	2.00	39.80	5.26	31.39	68.61	**68.61**
#20	0.85	27.18	3.59	34.98	65.02	**65.02**
#40	0.425	21.95	2.90	37.88	62.12	**62.12**
#60	0.250	29.11	3.85	41.73	58.27	**58.27**
#140	0.106	47.46	6.27	48.00	52.00	**52.00**
#200	0.075	12.38	1.64	49.63	50.37	**50.37**
Pan	-	381.22	50.37	100.00	-	-

Tested By BL Date 8/18/97 Checked By JMD Date 8/29/97

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HYDROMETER ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	2.4-3.0
Project No.	97178-03	Sample No.	SM025-TB01-0103
Lab ID	97178-03.009	Soil Color	**BROWN**

Elapsed Time (min)		R Measured	Temp. (°C)	R Corrected	N (%)	Diameter (mm)	N' (%)
0	NA	NA	NA	NA	NA	NA	NA
2	43.0	44.0	24.4	38.4	85.4	0.0272	**43.0**
5		41.0	24.4	35.4	78.8	0.0177	**39.7**
15		37.0	24.4	31.4	69.9	0.0105	**35.2**
34		33.0	24.4	27.4	61.0	0.0072	**30.7**
61		30.5	23.7	24.9	55.4	0.0055	**27.9**
268		26.0	22.7	20.4	45.4	0.0027	**22.9**
1440		21.5	23.9	15.9	35.4	0.0012	**17.8**

Soil Specimen Data		Corrections	
Tare No.	1673	K - Factor	0.01276
Tare + Dry Material (gm)	150.5	a - Factor	0.99
Weight of Tare (gm)	101	Composite Correction	5.60
Weight of Deflocculant (gm)	5.0	Percent Finer than # 200	50.37
Weight of Dry Material (gm)	44.5		
		Specific Gravity	2.7 Assumed

Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By TO Date 8/22/97 Checked By JMO Date 8/29/97

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SIEVE AND HYDROMETER ANALYSIS
ASTM D 422-63 (SOP-S3)

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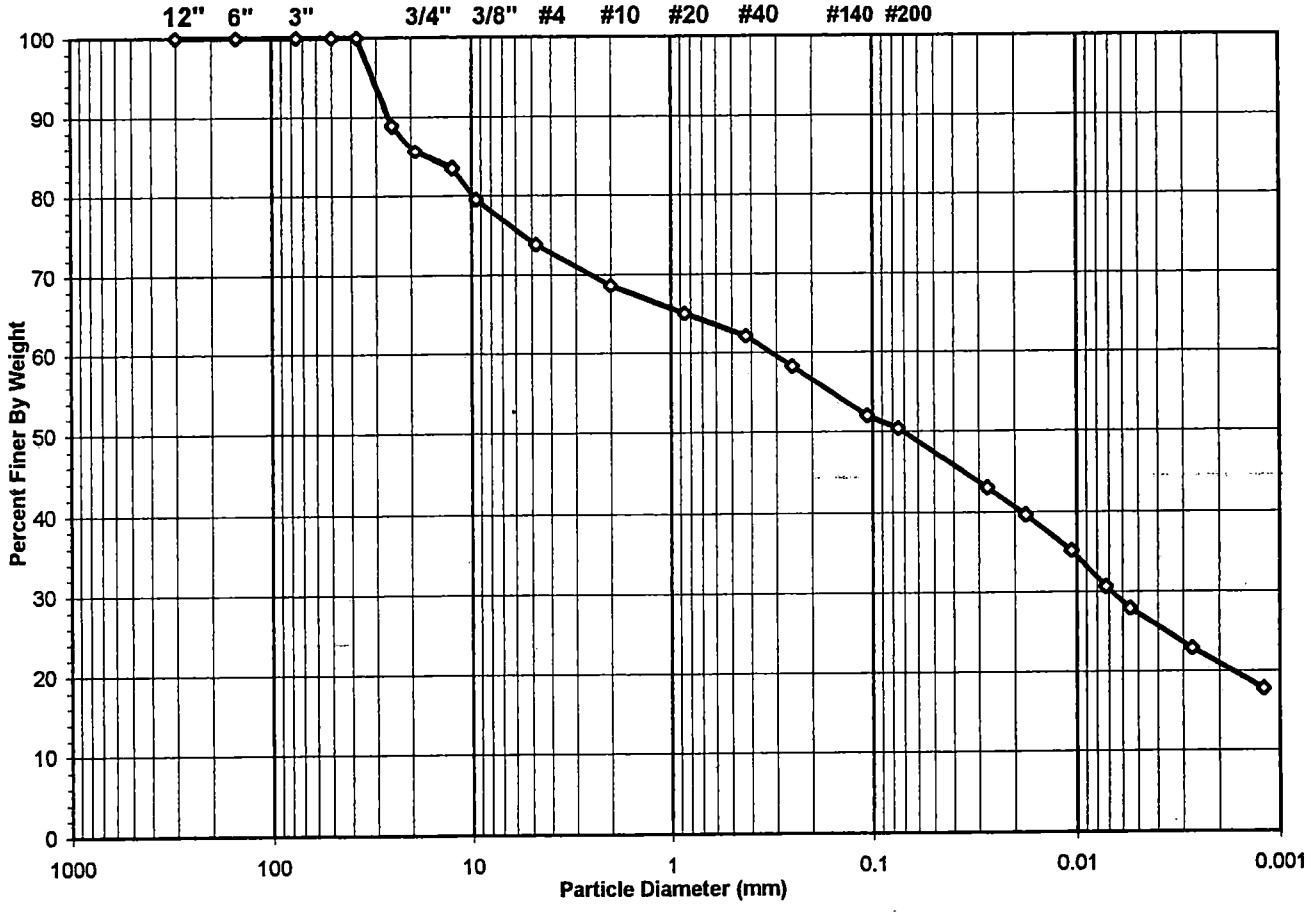
Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	2.4-3.0
Project No.	97178-03	Sample No.	SM025-TB01-0103
Lab ID	97178-03.009	Soil Color	BROWN

	SIEVE ANALYSIS		HYDROMETER	
USCS	gravel	sand	silt and clay fraction	
USDA	gravel	sand	silt	clay



Sieve Size (mm)	Percent Finer	Components	Percentage	Corrected % of Minus 2.0 mm material for USDA Classificat.
100	100.00	*Gravel*	31.39	**0.00**
2	68.61	*Sand*	21.18	**30.87**
0.075	50.37	*Silt*	26.45	**38.55**
0.05	47.43	*Clay*	20.98	**30.58**
0.002	20.98			

USDA Classification ***CLAY LOAM***

USCS Symbol ***cl, ASSUMED***

USCS Classification ***GRAVELLY LEAN CLAY WITH SAND***

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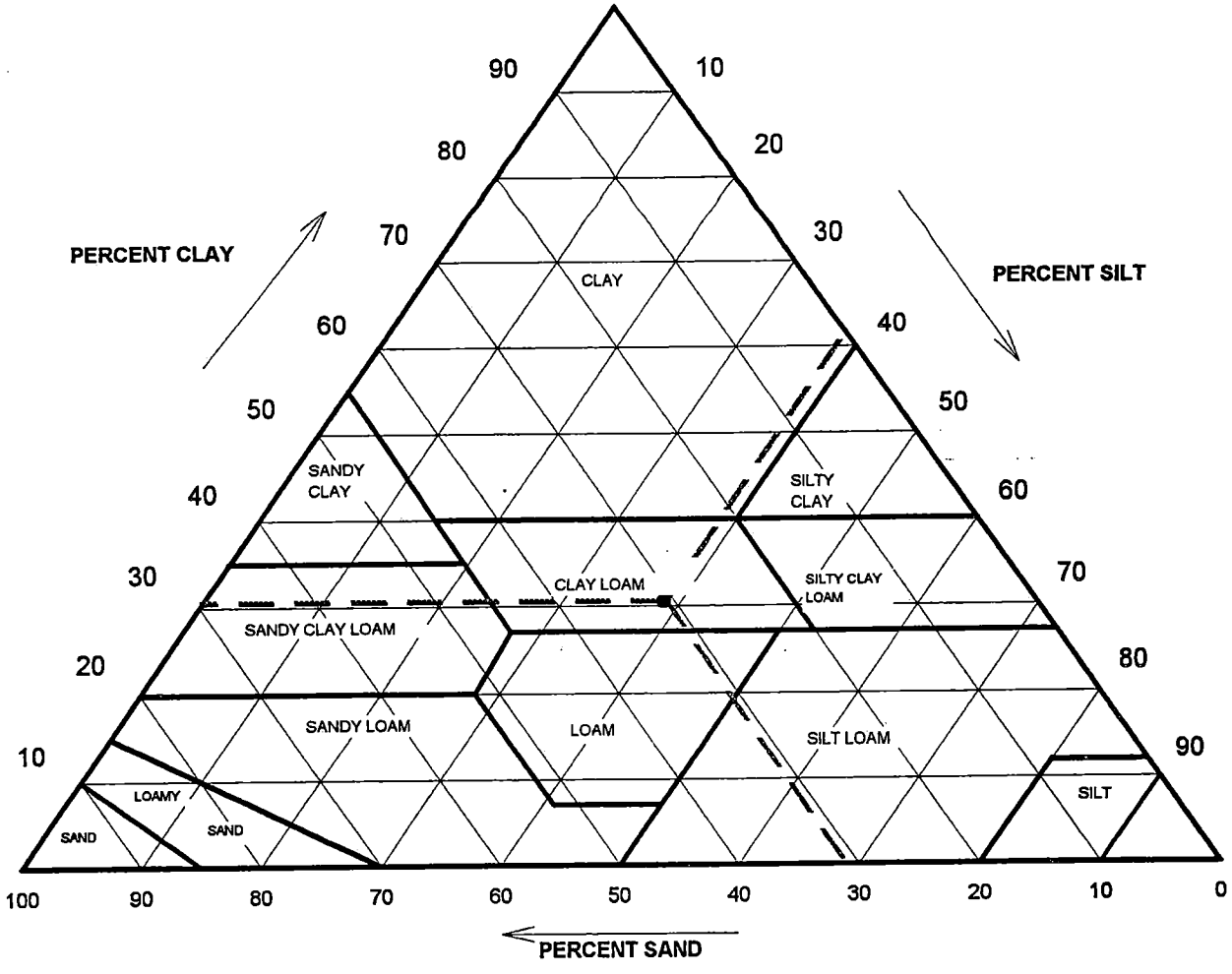
USDA CLASSIFICATION CHART

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	2.4-3.0
Project No.	97178-03	Sample No.	SM025-TB01-0103
Lab ID	97178-03.009	Soil Color	BROWN



Components	Corrected % of Minus 2.0 mm material for USDA Classificat.
Gravel	0.00
Sand	30.87
Silt	38.55
Clay	30.58
USDA Classification	***CLAY LOAM***

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SHELBY TUBE UNIT WEIGHT

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Client	ICF KAISER	Tested By	BL 8-12-97
Client Project	BAYER 51249	Checked By	JMO 9-3-97
Project No.	97178-02		
Boring No.	NA	Tube Recovery	1.50
Depth Pushed	3.0-5.0		
Shelby Tube No.	SM026-TB01-0305		

SOIL PROFILE AND SAMPLING

DEPTH ( )	ELEV ( )	SECTION No.	SOIL PROFILE	SOIL DESCRIPTION AND REMARKS	TEST PERFORMED
3.00					
3.50					
4.00					
4.50		2		BROWN CLAYEY GAVEL WITH SAND	UNIT WGT. WC. GRAIN SIZE HYDROMETER
5.00		1			NO TEST

NOTE:WHEN FULL RECOVERY IS NOT ACHIEVED,SOIL ELEVATION CAN NOT BE ACCURATELY DEFINE
INDICATE EACH CUT OF THE TUBE WITH AN ARROW
INDICATE DIVIDING LINE BETWEEN SOIL TYPES BY A SOLID LINE
INDICATE WAX BY CROSS-HATCHING
INDICATE SOIL TYPES BY STANDARD SYMBOLS

MOISTURE CONTENT					
Section Number	1	2	3	4	5
Tare Number		1717			
Wt. Tare & WS(gm.)		200.20			
Wt. Tare & DS(gm.)		182.53			
Wt. Tare(gm.)		83.36			
Moisture Content(%)		17.8			

UNIT WEIGHT	
Wt. Tube & WS.(gms.)	1115.40
Wt. Of Tube(gms.)	271.42
Wt. Of WS.(gms.)	843.98
Length 1 (in.)	3.670
Length 2 (in.)	3.644
Length 3 (in.)	3.688
Top Diameter (in.)	2.887
Middle Diameter (in.)	2.882
Bottom Diameter (in.)	2.879
Sample Volume (cc)	392.22
Moisture Content(%)	17.82
Unit Wet Wt.(gms/cc)	2.15
Unit Wet Wt.(pcf.)	134.3
Unit Dry Wt.(pcf.)	114.0
Unit Dry Wt.(gms/cc)	1.83

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	4.5-4.8
Project No.	97178-02	Sample No.	SM026-TB01-0305
Lab ID	97178-02.057	Soil Color	**BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	1343	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	686.50	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	603.60	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	103.09	Weight of Tare (gm)	NA
Weight of Water (gm)	82.90	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	500.51	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**16.6**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	500.51
Dry Weight - 3/4" Sample (gm)	255.05	Weight of minus #200 material (gm)	207.51
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	293.00
Dry Weight + 3/4" Sample (gm)	37.95		
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	37.95	7.58	7.58	92.42	**92.42**
1/2"	12.5	54.66	10.92	18.50	81.50	**81.50**
3/8"	9.50	20.92	4.18	22.68	77.32	**77.32**
#4	4.75	42.87	8.57	31.25	68.75	**68.75**
#10	2.00	44.13	8.82	40.07	59.93	**59.93**
#20	0.85	25.13	5.02	45.09	54.91	**54.91**
#40	0.425	16.21	3.24	48.32	51.68	**51.68**
#60	0.250	18.88	3.77	52.10	47.90	**47.90**
#140	0.106	25.09	5.01	57.11	42.89	**42.89**
#200	0.075	7.16	1.43	58.54	41.46	**41.46**
Pan	-	207.51	41.46	100.00	-	-

Tested By BL Date 8/12/97 Checked By JMD Date 8/27/97

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HYDROMETER ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	4.5-4.8
Project No.	97178-02	Sample No.	SM026-TB01-0305
Lab ID	97178-02.057	Soil Color	**BROWN**

Elapsed Time (min)		R Measured	Temp. (°C)	R Corrected	N (%)	Diameter (mm)	N' (%)
0	NA	NA	NA	NA	NA	NA	NA
2	46.0	47.0	24.2	41.3	85.7	0.0265	**35.5**
5		43.0	24.2	37.3	77.4	0.0174	**32.1**
18		39.0	24.2	33.3	69.1	0.0095	**28.7**
30		35.5	24.2	29.8	61.9	0.0076	**25.6**
60		32.0	23.5	26.3	54.6	0.0055	**22.6**
250		26.0	23.2	20.3	42.1	0.0028	**17.5**
1440		20.5	23.9	14.8	30.7	0.0012	**12.7**

Soil Specimen Data		**Corrections**	
Tare No.	1636	K - Factor	0.01279
Tare + Dry Material (gm)	152.22	a - Factor	0.99
Weight of Tare (gm)	99.53	Composite Correction	5.70
Weight of Deflocculant (gm)	5.0	Percent Finer than # 200	41.46
Weight of Dry Material (gm)	47.69		
		Specific Gravity	2.7 Assumed

Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By TO Date 8/18/97 Checked By JMO Date 8/27/97

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SIEVE AND HYDROMETER ANALYSIS
ASTM D 422-63 (SOP-S3)

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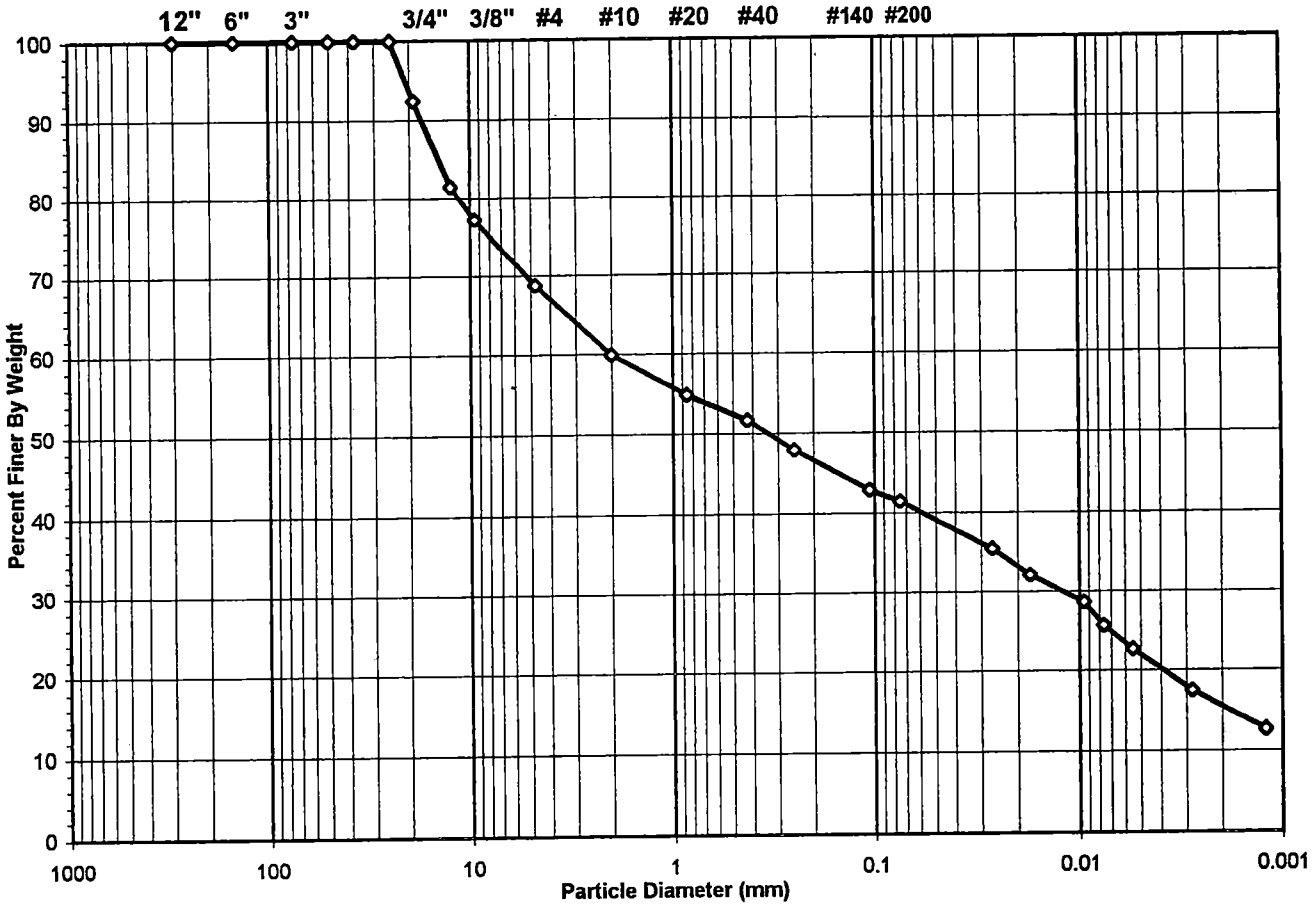
Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	4.5-4.8
Project No.	97178-02	Sample No.	SM026-TB01-0305
Lab ID	97178-02.057	Soil Color	BROWN

	SIEVE ANALYSIS		HYDROMETER	
USCS	gravel	sand	silt and clay fraction	
USDA	gravel	sand	silt	clay



Sieve Size (mm)	Percent Finer	Components	Percentage	Corrected % of Minus 2.0 mm material for USDA Classificat.
100	100.00	*Gravel*	40.07	**0.00**
2	59.93	*Sand*	20.78	**34.67**
0.075	41.46	*Silt*	23.59	**39.36**
0.05	39.15	*Clay*	15.56	**25.96**
0.002	15.56			

USDA Classification *LOAM*

USCS Symbol *gc, ASSUMED*

USCS Classification *CLAYEY GRAVEL WITH SAND*

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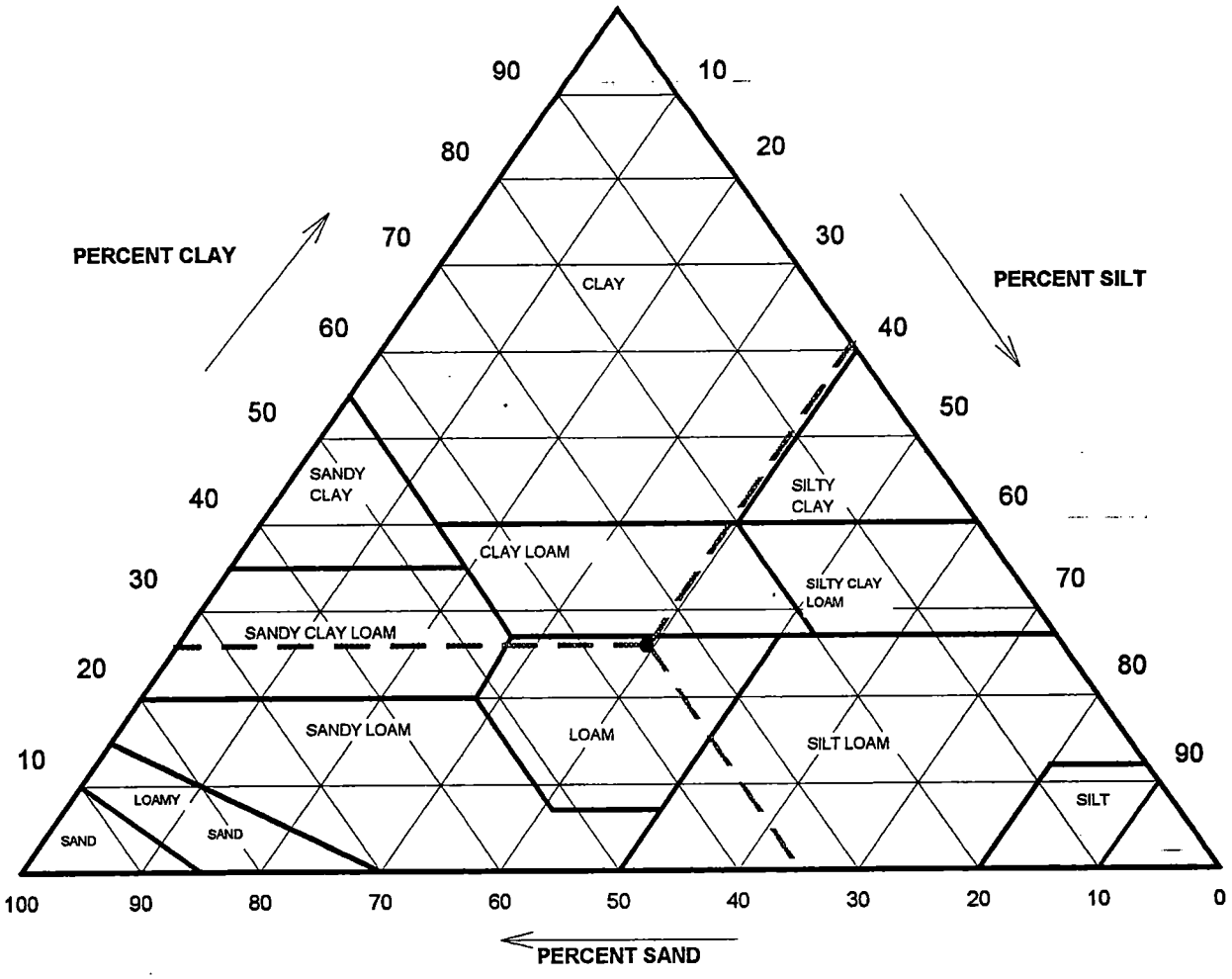
USDA CLASSIFICATION CHART

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	4.5-4.8
Project No.	97178-02	Sample No.	SM026-TB01-0305
Lab ID	97178-02.057	Soil Color	BROWN



Components	Corrected % of Minus 2.0 mm material for USDA Classificat.
Gravel	0.00
Sand	34.67
Silt	39.36
Clay	25.96
USDA Classification	***LOAM***

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SHELBY TUBE UNIT WEIGHT

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Client	ICF KAISER	Tested By	BL 8-13-97
Client Project	BAYER 51249	Checked By	JMO 8/29/97
Project No.	97178-02		
Boring No.	NA	Tube Recovery	2.10
Depth Pushed	1.0-3.0		
Shelby Tube No.	SM026-TB02-0103		

SOIL PROFILE AND SAMPLING

DEPTH ( )	ELEV ( )	SECTION No.	SOIL PROFILE	SOIL DESCRIPTION AND REMARKS	TEST PERFORMED
1.00					
1.50					
2.00					
2.50		2		BROWN SANDY LEAN CLAY	UNIT WGT. WC. GRAINSIZE HYDROMETER
3.00		1			NO TEST

NOTE:WHEN FULL RECOVERY IS NOT ACHIEVED,SOIL ELEVATION CAN NOT BE ACCURATELY DEFINE
INDICATE EACH CUT OF THE TUBE WITH AN ARROW
INDICATE DIVIDING LINE BETWEEN SOIL TYPES BY A SOLID LINE
INDICATE WAX BY CROSS-HATCHING
INDICATE SOIL TYPES BY STANDARD SYMBOLS

MOISTURE CONTENT					
Section Number	1	2	3	4	5
Tare Number		1704			
Wt. Tare & WS(gm.)		198.61			
Wt. Tare & DS(gm.)		178.20			
Wt. Tare(gm.)		84.34			
Moisture Content(%)		21.7			

UNIT WEIGHT	
Wt. Tube & WS.(gms.)	1022.00
Wt. Of Tube(gms.)	264.46
Wt. Of WS.(gms.)	757.54
Length 1 (in.)	3.559
Length 2 (in.)	3.534
Length 3 (in.)	3.561
Top Diameter (in.)	2.876
Middle Diameter (in.)	2.874
Bottom Diameter (in.)	2.871
Sample Volume (cc)	377.45
Moisture Content(%)	21.75
Unit Wet Wt.(gms/cc)	2.01
Unit Wet Wt.(pcf.)	125.2
Unit Dry Wt.(pcf.)	102.9
Unit Dry Wt.(gms/cc)	1.65

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	2.5-2.8
Project No.	97178-02	Sample No.	SM026-TB02-0103
Lab ID	97178-02.058	Soil Color	**BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	11	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	598.60	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	512.00	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	101.24	Weight of Tare (gm)	NA
Weight of Water (gm)	86.60	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	410.76	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**21.1**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	410.76
Dry Weight - 3/4" Sample (gm)	153.06	Weight of minus #200 material (gm)	257.70
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	153.06
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"	12.5	3.02	0.74	0.74	99.26	**99.26**
3/8"	9.50	4.52	1.10	1.84	98.16	**98.16**
#4	4.75	11.64	2.83	4.67	95.33	**95.33**
#10	2.00	23.33	5.68	10.35	89.65	**89.65**
#20	0.85	25.22	6.14	16.49	83.51	**83.51**
#40	0.425	18.49	4.50	20.99	79.01	**79.01**
#60	0.250	23.35	5.68	26.67	73.33	**73.33**
#140	0.106	33.62	8.18	34.86	65.14	**65.14**
#200	0.075	9.87	2.40	37.26	62.74	**62.74**
Pan	-	257.70	62.74	100.00	-	-

Tested By BL Date 8/13/97 Checked By JMO Date 8/22/96

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HYDROMETER ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	2.5-2.8
Project No.	97178-02	Sample No.	SM026-TB02-0103
Lab ID	97178-02.058	Soil Color	**BROWN**

Elapsed Time (min)		R Measured	Temp. (°C)	R Corrected	N (%)	Diameter (mm)	N' (%)
0	NA	NA	NA	NA	NA	NA	NA
2	46.5	47.5	24	41.7	87.0	0.0264	**54.6**
5		44.5	24	38.7	80.8	0.0172	**50.7**
15		40.5	24	34.7	72.4	0.0103	**45.4**
32		37.0	24	31.2	65.1	0.0073	**40.8**
60		34.0	23.4	28.2	58.8	0.0054	**36.9**
250		28.5	23.4	22.7	47.4	0.0028	**29.7**
1440		23.0	23.7	17.2	35.9	0.0012	**22.5**

Soil Specimen Data		Corrections	
Tare No.	1079	K - Factor	0.01282
Tare + Dry Material (gm)	155.82	a - Factor	0.99
Weight of Tare (gm)	103.37	Composite Correction	5.80
Weight of Deflocculant (gm)	5.0	Percent Finer than # 200	62.74
Weight of Dry Material (gm)	47.45		
		Specific Gravity	2.7 Assumed

Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By TO Date 8/16/97 Checked By JMO Date 8/22/96

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SIEVE AND HYDROMETER ANALYSIS
ASTM D 422-63 (SOP-S3)

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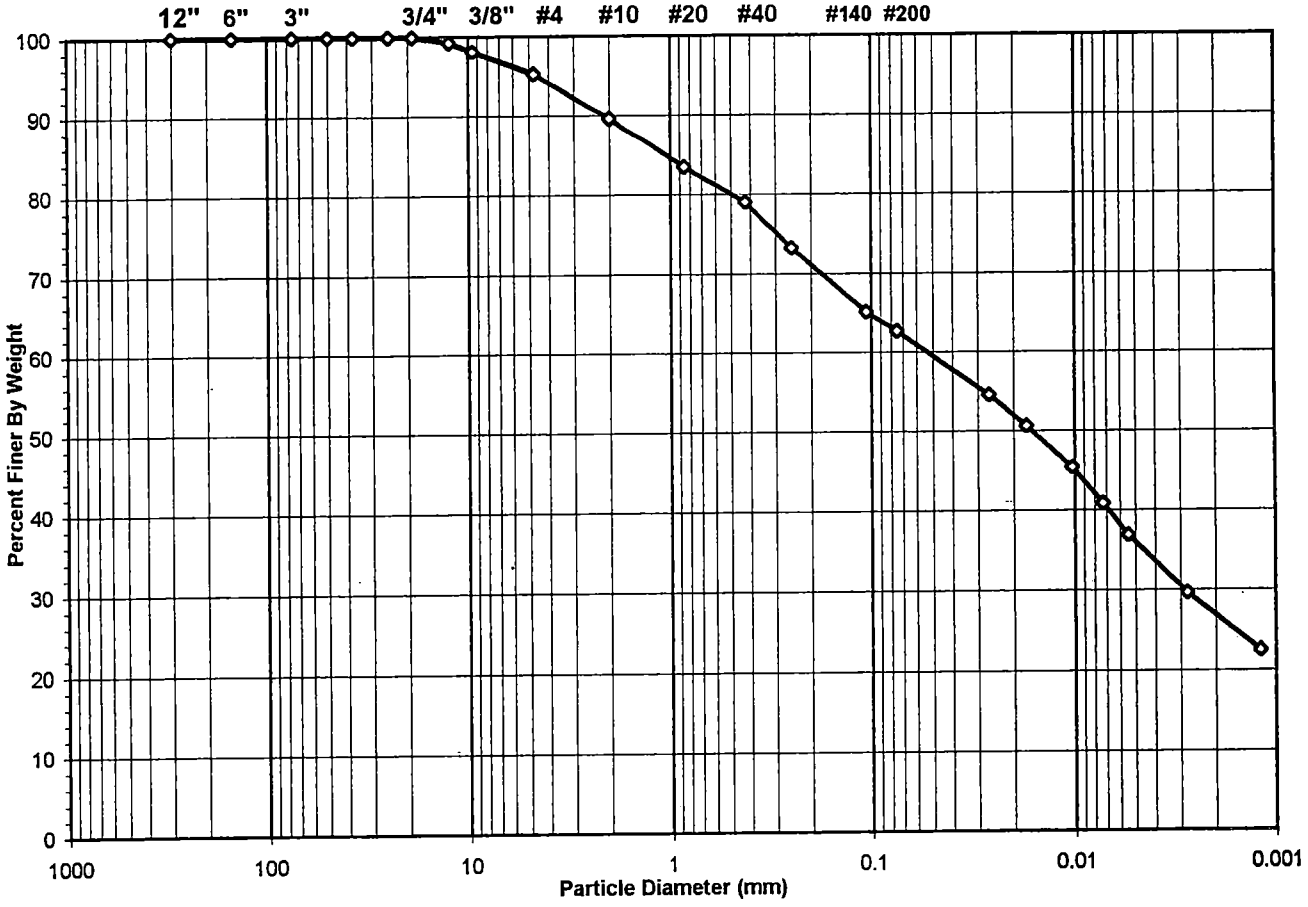
Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	2.5-2.8
Project No.	97178-02	Sample No.	SM026-TB02-0103
Lab ID	97178-02.058	Soil Color	**BROWN**

	SIEVE ANALYSIS		HYDROMETER	
USCS	gravel	sand	silt and clay fraction	
USDA	gravel	sand	silt	clay



Sieve Size (mm)	Percent Finer	Components	Percentage	Corrected % of Minus 2.0 mm material for USDA Classificat.
100	100.00	*Gravel*	10.35	**0.00**
2	89.65	*Sand*	30.08	**33.56**
0.075	62.74	*Silt*	32.63	**36.40**
0.05	59.57	*Clay*	26.94	**30.05**
0.002	26.94			

USDA Classification ***CLAY LOAM***

USCS Symbol ***cl, ASSUMED***

USCS Classification ***SANDY LEAN CLAY***

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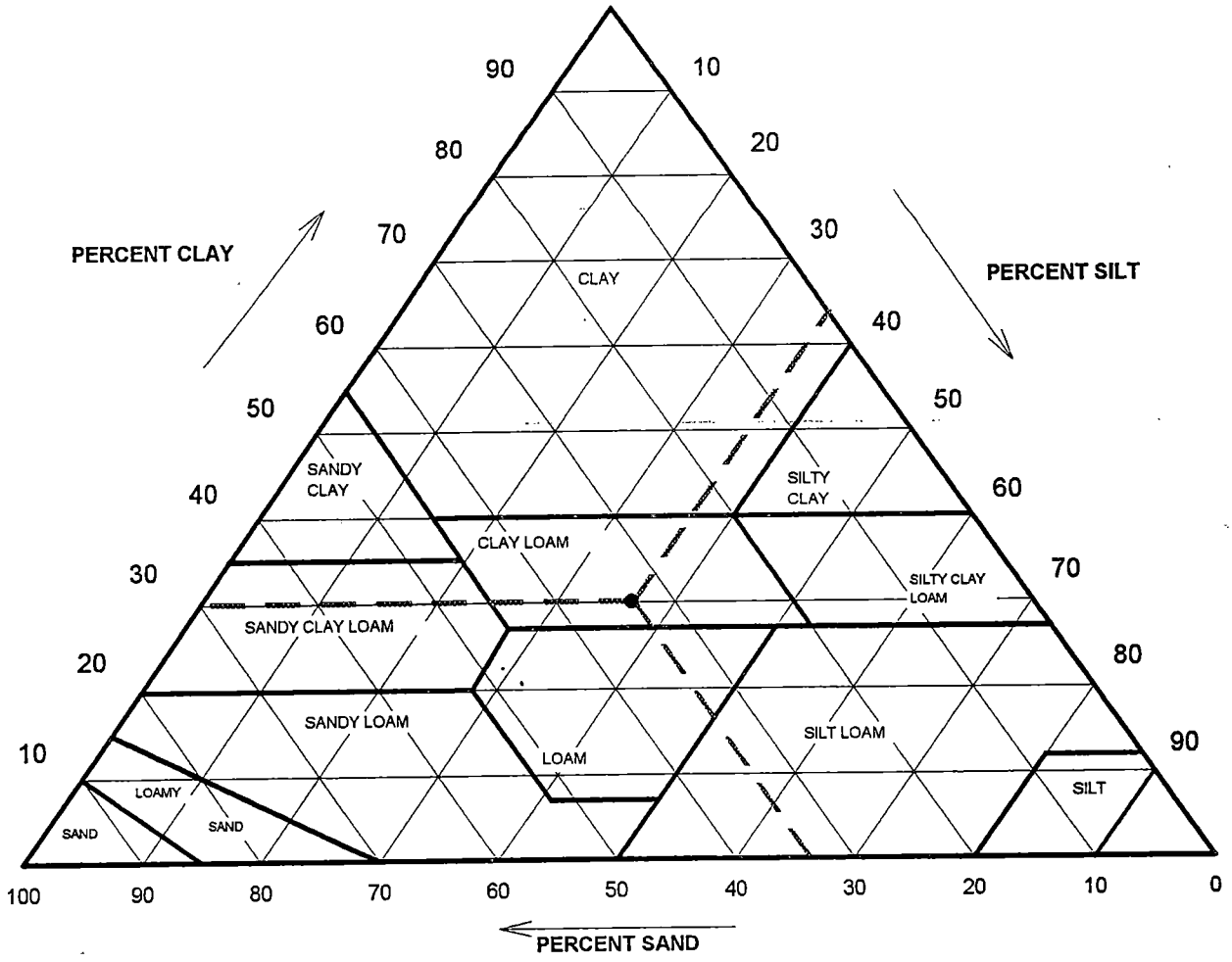
USDA CLASSIFICATION CHART

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	2.5-2.8
Project No.	97178-02	Sample No.	SM026-TB02-0103
Lab ID	97178-02.058	Soil Color	BROWN



Components	Corrected % of Minus 2.0 mm material for USDA Classificat.
Gravel	0.00
Sand	33.56
Silt	36.40
Clay	30.05
USDA Classification	***CLAY LOAM***

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SHELBY TUBE UNIT WEIGHT

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Client	ICF KAISER	Tested By	BL 8-13-97
Client Project	BAYER 51249	Checked By	JMC 8/29/97
Project No.	97178-02		
Boring No.	NA	Tube Recovery	2.10
Depth Pushed	6.0-8.0		
Shelby Tube No.	SM026-TB02-0608		

SOIL PROFILE AND SAMPLING

DEPTH ( )	ELEV ( )	SECTION No.	SOIL PROFILE	SOIL DESCRIPTION AND REMARKS	TEST PERFORMED
6.00					
6.50					
7.00					
7.50		2		BROWN SANDY LEAN CLAY	UNIT WGT. WC. GRAINSIZE HYDROMETER
8.00		1			NO TEST

NOTE:WHEN FULL RECOVERY IS NOT ACHIEVED,SOIL ELEVATION CAN NOT BE ACCURATELY DEFINE
INDICATE EACH CUT OF THE TUBE WITH AN ARROW
INDICATE DIVIDING LINE BETWEEN SOIL TYPES BY A SOLID LINE
INDICATE WAX BY CROSS-HATCHING
INDICATE SOIL TYPES BY STANDARD SYMBOLS

MOISTURE CONTENT					
Section Number	1	2	3	4	5
Tare Number		1718			
Wt. Tare & WS(gm.)		190.05			
Wt. Tare & DS(gm.)		170.13			
Wt. Tare(gm.)		82.35			
Moisture Content(%)		22.7			

UNIT WEIGHT	
Wt. Tube & WS.(gms.)	1041.80
Wt. Of Tube(gms.)	263.86
Wt. Of WS.(gms.)	777.94
Length 1 (in.)	3.522
Length 2 (in.)	3.548
Length 3 (in.)	3.532
Top Diameter (in.)	2.860
Middle Diameter (in.)	2.885
Bottom Diameter (in.)	2.863
Sample Volume (cc)	374.47
Moisture Content(%)	22.69
Unit Wet Wt.(gms/cc)	2.08
Unit Wet Wt.(pcf.)	129.6
Unit Dry Wt.(pcf.)	105.7
Unit Dry Wt.(gms/cc)	1.69

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	7.5-7.8
Project No.	97178-02	Sample No.	SM026-TB02-0608
Lab ID	97178-02.059	Soil Color	**BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	1092	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	642.40	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	545.70	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	105.02	Weight of Tare (gm)	NA
Weight of Water (gm)	96.70	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	440.68	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**21.9**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	440.68
Dry Weight - 3/4" Sample (gm)	184.95	Weight of minus #200 material (gm)	255.73
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	184.95
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"	12.5	2.37	0.54	0.54	99.46	**99.46**
3/8"	9.50	13.30	3.02	3.56	96.44	**96.44**
#4	4.75	22.39	5.08	8.64	91.36	**91.36**
#10	2.00	35.41	8.04	16.67	83.33	**83.33**
#20	0.85	22.72	5.16	21.83	78.17	**78.17**
#40	0.425	21.57	4.89	26.72	73.28	**73.28**
#60	0.250	23.13	5.25	31.97	68.03	**68.03**
#140	0.106	34.17	7.75	39.72	60.28	**60.28**
#200	0.075	9.89	2.24	41.97	58.03	**58.03**
Pan	-	255.73	58.03	100.00	-	-

Tested By BL Date 8/13/97 Checked By JMO Date 8/22/97

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HYDROMETER ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	7.5-7.8
Project No.	97178-02	Sample No.	SM026-TB02-0608
Lab ID	97178-02.059	Soil Color	**BROWN**

Elapsed Time (min)		R Measured	Temp. (°C)	R Corrected	N (%)	Diameter (mm)	N' (%)
0	NA	NA	NA	NA	NA	NA	NA
2	47.0	48.5	24	42.7	84.7	0.0262	**49.1**
5		45.5	24	39.7	78.7	0.0170	**45.7**
15		39.5	24	33.7	66.8	0.0104	**38.8**
30		36.0	24	30.2	59.9	0.0075	**34.8**
64		31.5	23.4	25.7	51.0	0.0053	**29.6**
250		26.0	23.4	20.2	40.1	0.0028	**23.3**
1440		20.5	23.7	14.7	29.2	0.0012	**16.9**

Soil Specimen Data		Corrections	
Tare No.	1341	K - Factor	0.01282
Tare + Dry Material (gm)	154.85	a - Factor	0.99
Weight of Tare (gm)	99.93	Composite Correction	5.80
Weight of Deflocculant (gm)	5.0	Percent Finer than # 200	58.03
Weight of Dry Material (gm)	49.92		
		Specific Gravity	2.7 Assumed

Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By TO Date 8/16/97 Checked By JMO Date 8/22/97

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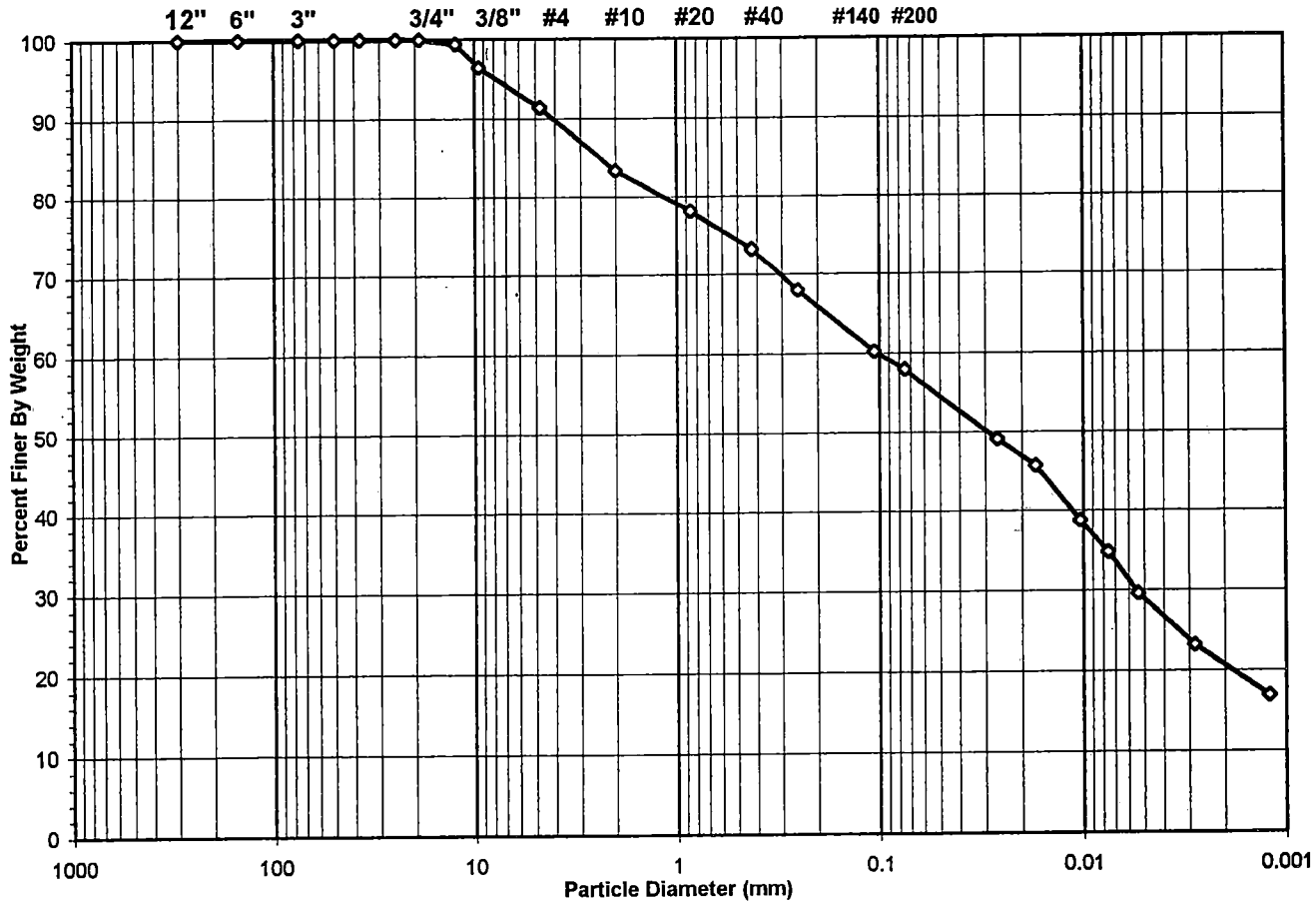
SIEVE AND HYDROMETER ANALYSIS
ASTM D 422-63 (SOP-S3)

geotechnics

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	7.5-7.8
Project No.	97178-02	Sample No.	SM026-TB02-0608
Lab ID	97178-02.059	Soil Color	BROWN

	SIEVE ANALYSIS		HYDROMETER	
USCS	gravel	sand	silt and clay fraction	
USDA	gravel	sand	silt	clay



Sieve Size (mm)	Percent Finer	Components	Percentage	Corrected % of Minus 2.0 mm material for USDA Classificat.
100	100.00	*Gravel*	16.67	**0.00**
2	83.33	*Sand*	28.72	**34.47**
0.075	58.03	*Silt*	33.93	**40.72**
0.05	54.61	*Clay*	20.68	**24.82**
0.002	20.68			

USDA Classification ***LOAM***

USCS Symbol ***cl, ASSUMED***

USCS Classification ***SANDY LEAN CLAY***

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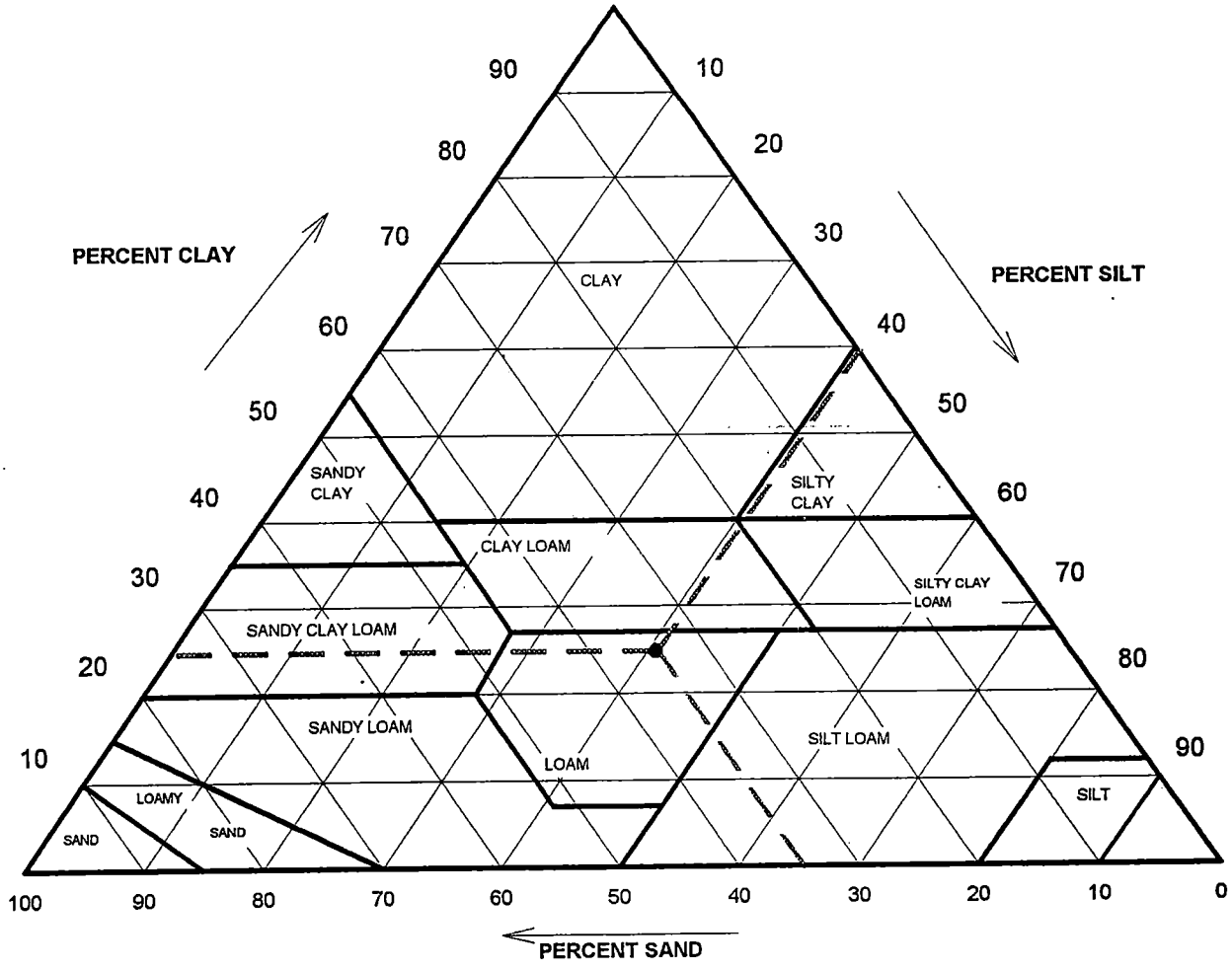
USDA CLASSIFICATION CHART

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	7.5-7.8
Project No.	97178-02	Sample No.	SM026-TB02-0608
Lab ID	97178-02.059	Soil Color	BROWN



Components	Corrected % of Minus 2.0 mm material for USDA Classificat.
Gravel	0.00
Sand	34.47
Silt	40.72
Clay	24.82
USDA Classification	***LOAM***

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SHELBY TUBE UNIT WEIGHT

geotechnics

Client	ICF KAISER	Tested By	BL 8-18-97
Client Project	BAYER 51249	Checked By	JMD 9-5-97
Project No.	97178-03		
Boring No.	NA	Tube Recovery	1.10
Depth Pushed	1.0-2.5		
Shelby Tube No.	SM027-TB01-0103		

SOIL PROFILE AND SAMPLING

DEPTH ( )	ELEV ( )	SECTION No.	SOIL PROFILE	SOIL DESCRIPTION AND REMARKS	TEST PERFORMED
0.50					
1.00					
1.50					
2.00		2		BROWN SANDY LEAN CLAY WITH GRAVEL	UNIT WGT. WC. GRAIN SIZE HYDROMETER
2.50		1			NO TEST

NOTE:WHEN FULL RECOVERY IS NOT ACHIEVED,SOIL ELEVATION CAN NOT BE ACCURATELY DEFINE
INDICATE EACH CUT OF THE TUBE WITH AN ARROW
INDICATE DIVIDING LINE BETWEEN SOIL TYPES BY A SOLID LINE
INDICATE WAX BY CROSS-HATCHING
INDICATE SOIL TYPES BY STANDARD SYMBOLS

MOISTURE CONTENT					
Section Number	1	2	3	4	5
Tare Number		1075			
Wt. Tare & WS(gm.)		670.10			
Wt. Tare & DS(gm.)		585.00			
Wt. Tare(gm.)		104.38			
Moisture Content(%)		17.7			

UNIT WEIGHT	
Wt. Tube & WS.(gms.)	1050.90
Wt. Of Tube(gms.)	256.37
Wt. Of WS.(gms.)	794.53
Length 1 (in.)	3.591
Length 2 (in.)	3.582
Length 3 (in.)	3.608
Top Diameter (in.)	2.881
Middle Diameter (in.)	2.874
Bottom Diameter (in.)	2.891
Sample Volume (cc)	384.16
Moisture Content(%)	17.71
Unit Wet Wt.(gms/cc)	2.07
Unit Wet Wt.(pcf.)	129.1
Unit Dry Wt.(pcf.)	109.6
Unit Dry Wt.(gms/cc)	1.76

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	2.0-2.3
Project No.	97178-03	Sample No.	SM027-TB01-0103
Lab ID	97178-03.010	Soil Color	**BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	1075	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	670.10	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	585.00	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	104.38	Weight of Tare (gm)	NA
Weight of Water (gm)	85.10	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	480.62	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**17.7**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	480.62
Dry Weight - 3/4" Sample (gm)	190.34	Weight of minus #200 material (gm)	277.92
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	202.70
Dry Weight + 3/4" Sample (gm)	12.36		
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	12.36	2.57	2.57	97.43	**97.43**
1/2"	12.5	20.60	4.29	6.86	93.14	**93.14**
3/8"	9.50	9.56	1.99	8.85	91.15	**91.15**
#4	4.75	31.93	6.64	15.49	84.51	**84.51**
#10	2.00	27.82	5.79	21.28	78.72	**78.72**
#20	0.85	21.16	4.40	25.68	74.32	**74.32**
#40	0.425	15.98	3.32	29.01	70.99	**70.99**
#60	0.250	19.84	4.13	33.13	66.87	**66.87**
#140	0.106	33.99	7.07	40.21	59.79	**59.79**
#200	0.075	9.46	1.97	42.17	57.83	**57.83**
Pan	-	277.92	57.83	100.00	-	-

Tested By BL Date 8/18/97 Checked By JMO Date 8/29/97

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HYDROMETER ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	2.0-2.3
Project No.	97178-03	Sample No.	SM027-TB01-0103
Lab ID	97178-03.010	Soil Color	**BROWN**

Elapsed Time (min)		R Measured	Temp. (°C)	R Corrected	N (%)	Diameter (mm)	N' (%)
0	NA	NA	NA	NA	NA	NA	NA
2	47.0	48.5	24.4	42.9	87.2	0.0261	**50.4**
5		45.0	24.4	39.4	80.1	0.0170	**46.3**
15		40.5	24.4	34.9	70.9	0.0102	**41.0**
32		36.5	24.4	30.9	62.8	0.0072	**36.3**
62		33.0	23.7	27.4	55.7	0.0053	**32.2**
250		27.5	22.7	21.9	44.5	0.0028	**25.7**
1440		22.0	23.9	16.4	33.3	0.0012	**19.3**

Soil Specimen Data		Corrections	
Tare No.	SGI 11	K - Factor	0.01276
Tare + Dry Material (gm)	160.99	a - Factor	0.99
Weight of Tare (gm)	107.29	Composite Correction	5.60
Weight of Deflocculant (gm)	5.0	Percent Finer than # 200	57.83
Weight of Dry Material (gm)	48.7		
		Specific Gravity	2.7 Assumed

Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By TO Date 8/22/97 Checked By JMO Date 8/29/97

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SIEVE AND HYDROMETER ANALYSIS
ASTM D 422-63 (SOP-S3)

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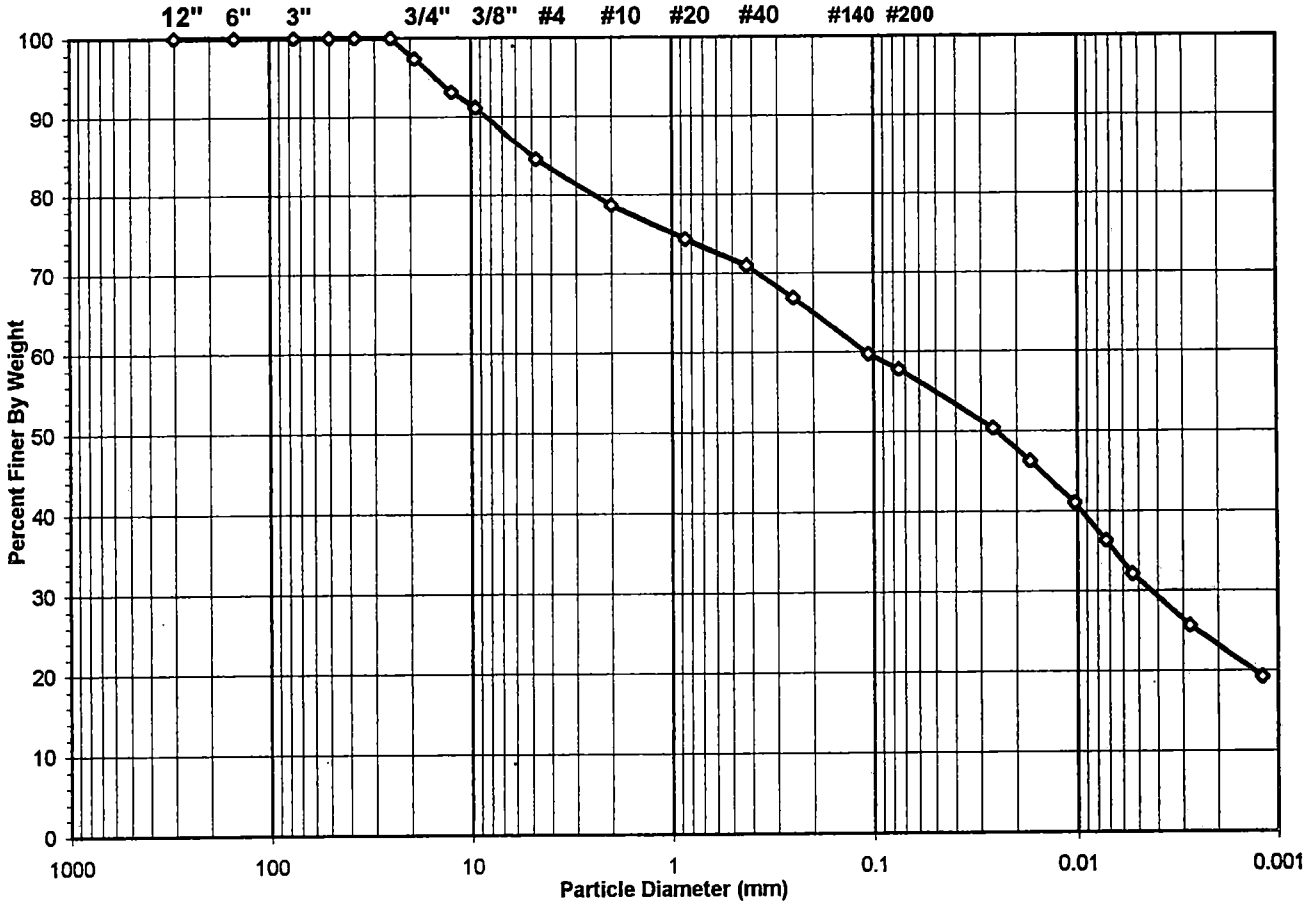
Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	2.0-2.3
Project No.	97178-03	Sample No.	SM027-TB01-0103
Lab ID	97178-03.010	Soil Color	BROWN

	SIEVE ANALYSIS			HYDROMETER	
USCS	gravel		sand	silt and clay fraction	
USDA	gravel		sand	silt	clay



Sieve Size (mm)	Percent Finer	Components	Percentage	Corrected % of Minus 2.0 mm material for USDA Classificat.
100	100.00	*Gravel*	21.28	**0.00**
2	78.72	*Sand*	23.73	**30.15**
0.075	57.83	*Silt*	31.76	**40.34**
0.05	54.99	*Clay*	23.23	**29.51**
0.002	23.23			

USDA Classification ***CLAY LOAM***

USCS Symbol ***cl, ASSUMED***

USCS Classification ***SANDY LEAN CLAY WITH GRAVEL***

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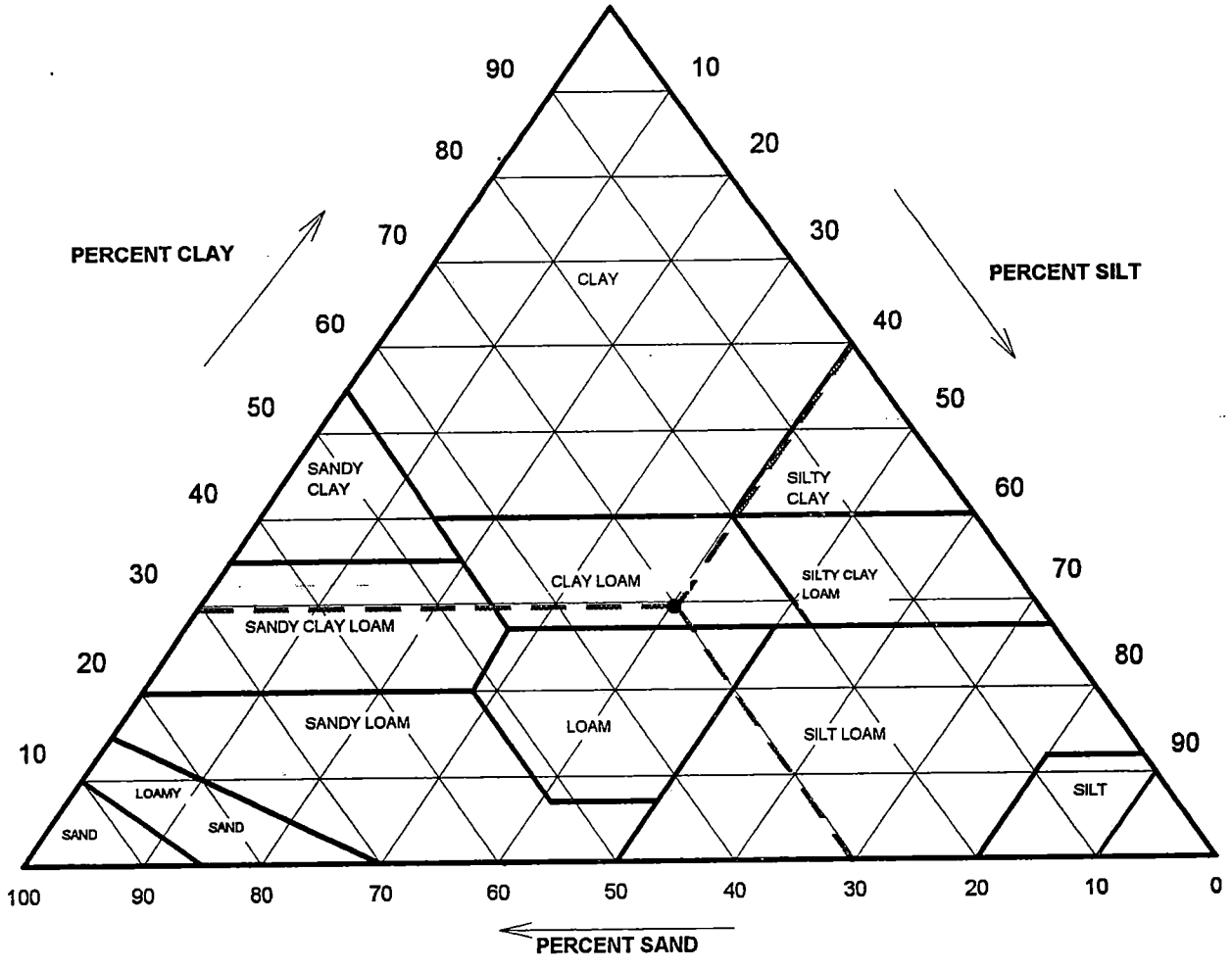
USDA CLASSIFICATION CHART

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	2.0-2.3
Project No.	97178-03	Sample No.	SM027-TB01-0103
Lab ID	97178-03.010	Soil Color	BROWN



Components	Corrected % of Minus 2.0 mm material for USDA Classificat.
Gravel	0.00
Sand	30.15
Silt	40.34
Clay	29.51
USDA Classification	***CLAY LOAM***

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SHELBY TUBE UNIT WEIGHT

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Client	ICF KAISER	Tested By	JCM 8-18-97
Client Project	BAYER 51249	Checked By	JMO 9-5-97
Project No.	97178-03		
Boring No.	NA	Tube Recovery	1.85
Depth Pushed	3.0-5.0		
Shelby Tube No.	SM027-TB02-0305		

SOIL PROFILE AND SAMPLING

DEPTH ( )	ELEV ( )	SECTION No.	SOIL PROFILE	SOIL DESCRIPTION AND REMARKS	TEST PERFORMED
3.00					
3.50					
4.00		4			PERMEABILITY
		3		BROWN CLAYEY GRAVEL	GRAIN SIZE HYDROMETER UNIT WGT. WC
4.50		2			NO TEST
5.00		1			WC

NOTE:WHEN FULL RECOVERY IS NOT ACHIEVED,SOIL ELEVATION CAN NOT BE ACCURATELY DEFINE
INDICATE EACH CUT OF THE TUBE WITH AN ARROW
INDICATE DIVIDING LINE BETWEEN SOIL TYPES BY A SOLID LINE
INDICATE WAX BY CROSS-HATCHING
INDICATE SOIL TYPES BY STANDARD SYMBOLS

MOISTURE CONTENT					
Section Number	1	2	3	4	5
Tare Number	452		K1		
Wt. Tare & WS(gm.)	311.04.		810.30		
Wt. Tare & DS(gm.)	279.48		714.10		
Wt. Tare(gm.)	100.69		74.02		
Moisture Content(%)	17.7		15.0		

UNIT WEIGHT		
Wt. Tube & WS.(gms.)	1367.60	990.20
Wt. Of Tube(gms.)	371.40	285.61
Wt. Of WS.(gms.)	996.20	704.59
Length 1 (in.)	4.795	3.672
Length 2 (in.)	4.801	3.670
Length 3 (in.)	4.796	3.674
Top Diameter (in.)	2.875	2.873
Middle Diameter (in.)	2.847	2.860
Bottom Diameter (in.)	2.863	2.870
Sample Volume (cc)	505.63	388.64
Moisture Content(%)	15.03	15.03
Unit Wet Wt.(gms/cc)	1.97	1.81
Unit Wet Wt.(pcf.)	122.9	113.1
Unit Dry Wt.(pcf.)	106.9	98.3
Unit Dry Wt.(gms/cc)	1.71	1.58

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	4.1-4.5
Project No.	97178-03	Sample No.	SM027-TB02-0305
Lab ID	97178-03.011	Soil Color	**BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	K1	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	810.30	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	714.10	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	74.02	Weight of Tare (gm)	NA
Weight of Water (gm)	96.20	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	640.08	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**15.0**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	640.08
Dry Weight - 3/4" Sample (gm)	126.66	Weight of minus #200 material (gm)	304.20
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	335.88
Dry Weight + 3/4" Sample (gm)	209.22		
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	38.08	5.95	5.95	94.05	**94.05**
1"	25.0	121.26	18.94	24.89	75.11	**75.11**
3/4"	19.0	49.88	7.79	32.69	67.31	**67.31**
1/2"	12.5	19.67	3.07	35.76	64.24	**64.24**
3/8"	9.50	8.55	1.34	37.10	62.90	**62.90**
#4	4.75	22.77	3.56	40.65	59.35	**59.35**
#10	2.00	16.00	2.50	43.15	56.85	**56.85**
#20	0.85	7.22	1.13	44.28	55.72	**55.72**
#40	0.425	5.41	0.85	45.13	54.87	**54.87**
#60	0.250	12.60	1.97	47.09	52.91	**52.91**
#140	0.106	26.26	4.10	51.20	48.80	**48.80**
#200	0.075	8.18	1.28	52.47	47.53	**47.53**
Pan	-	304.20	47.53	100.00	-	-

Tested By JCM Date 8/18/97 Checked By JCM Date 8-28-97

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HYDROMETER ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	4.1-4.5
Project No.	97178-03	Sample No.	SM027-TB02-0305
Lab ID	97178-03.011	Soil Color	**BROWN**

Elapsed Time (min)		R Measured	Temp. (°C)	R Corrected	N (%)	Diameter (mm)	N' (%)
0	NA	NA	NA	NA	NA	NA	NA
2	44.5	45.0	24.2	39.3	84.7	0.0270	**40.3**
5		42.5	24.2	36.8	79.3	0.0175	**37.7**
15		37.0	24.2	31.3	67.5	0.0106	**32.1**
30		34.5	24.2	28.8	62.1	0.0076	**29.5**
60		30.5	23.5	24.8	53.5	0.0056	**25.4**
287		24.5	22.6	18.8	40.5	0.0026	**19.3**
1440		19.5	22.4	13.8	29.8	0.0012	**14.1**

Soil Specimen Data		Corrections	
Tare No.	1622	K - Factor	0.01279
Tare + Dry Material (gm)	151.81	a - Factor	0.99
Weight of Tare (gm)	100.89	Composite Correction	5.70
Weight of Deflocculant (gm)	5.0	Percent Finer than # 200	47.53
Weight of Dry Material (gm)	45.92		
		Specific Gravity	2.7 Assumed

Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By TO Date 8/18/97 Checked By JCM Date 8-28-97

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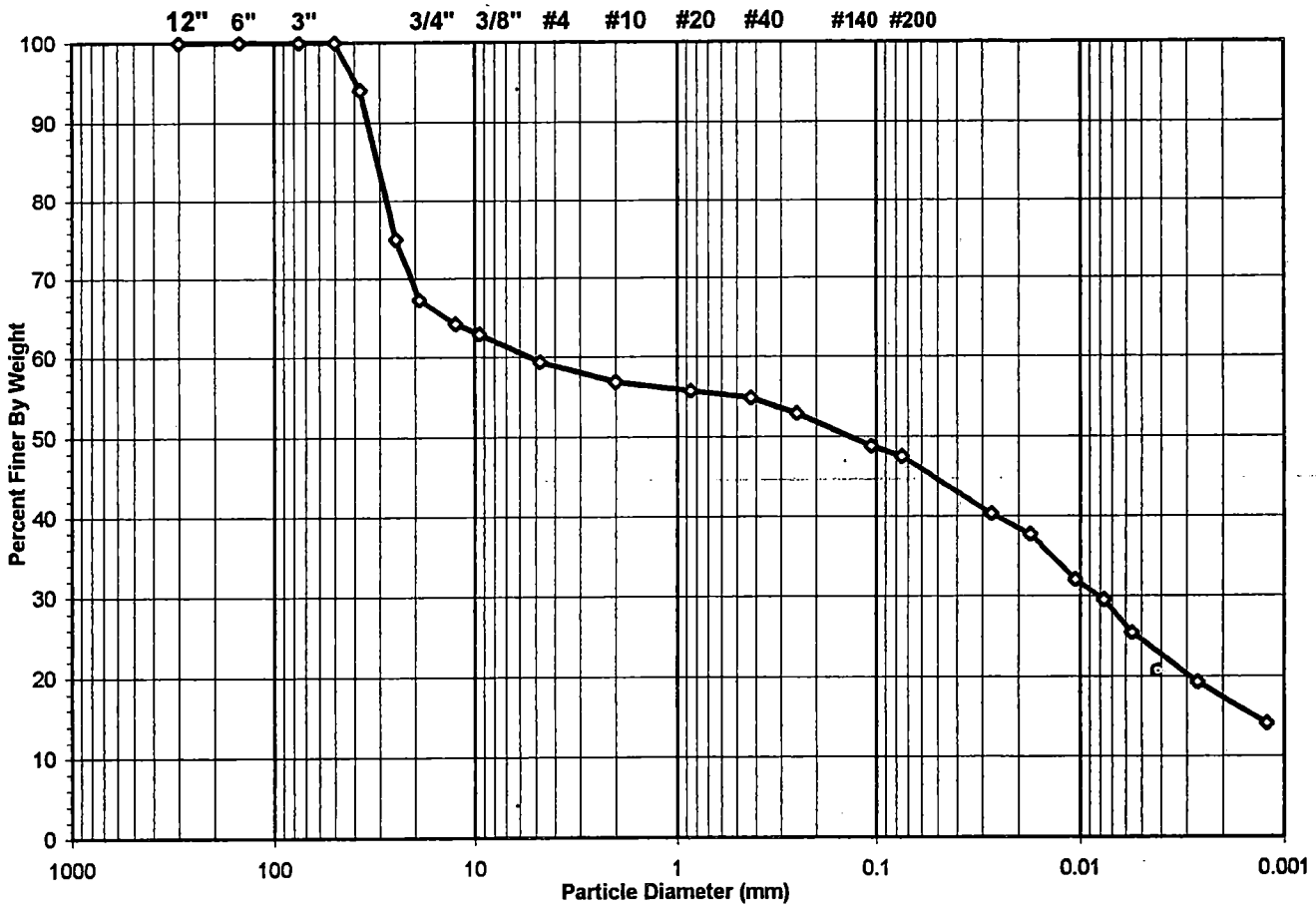
SIEVE AND HYDROMETER ANALYSIS
ASTM D 422-63 (SOP-S3)

geotechnics

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	4.1-4.5
Project No.	97178-03	Sample No.	SM027-TB02-0305
Lab ID	97178-03.011	Soil Color	BROWN

	SIEVE ANALYSIS		HYDROMETER	
USCS	gravel	sand	silt and clay fraction	
USDA	gravel	sand	silt	clay



Sieve Size (mm)	Percent Finer	Components	Percentage	Corrected % of Minus 2.0 mm material for USDA Classificat.
100	100.00	*Gravel*	43.15	**0.00**
2	56.85	*Sand*	12.20	**21.47**
0.075	47.53	*Silt*	27.23	**47.90**
0.05	44.64	*Clay*	17.41	**30.63**
0.002	17.41			

USDA Classification ***CLAY LOAM***

USCS Symbol ***gc, ASSUMED***

USCS Classification ***CLAYEY GRAVEL***

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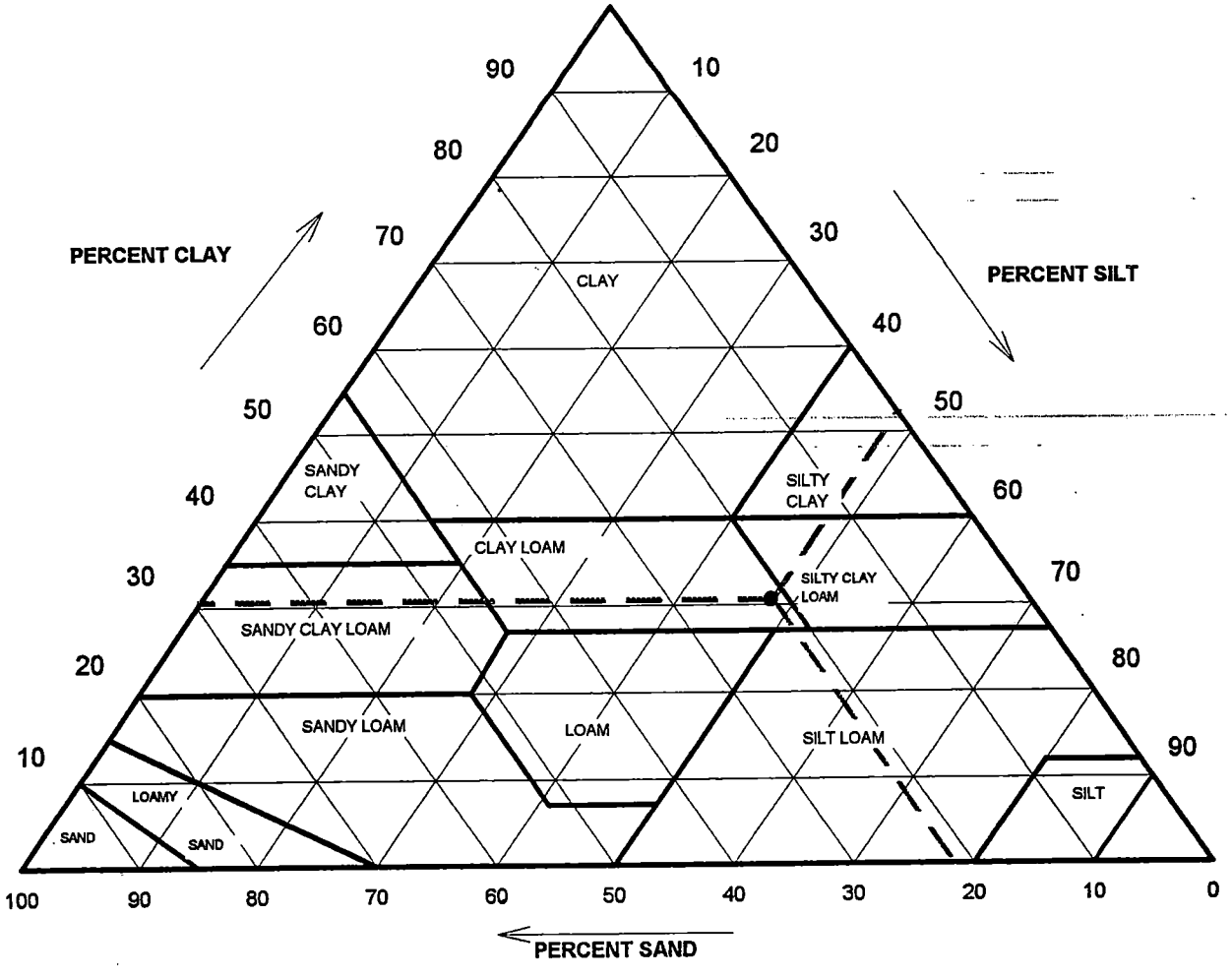
USDA CLASSIFICATION CHART

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	4.1-4.5
Project No.	97178-03	Sample No.	SM027-TB02-0305
Lab ID	97178-03.011	Soil Color	BROWN



Components	Corrected % of Minus 2.0 mm material for USDA Classificat.
Gravel	0.00
Sand	21.47
Silt	47.90
Clay	30.63
USDA Classification	***CLAY LOAM***

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PERMEABILITY TEST

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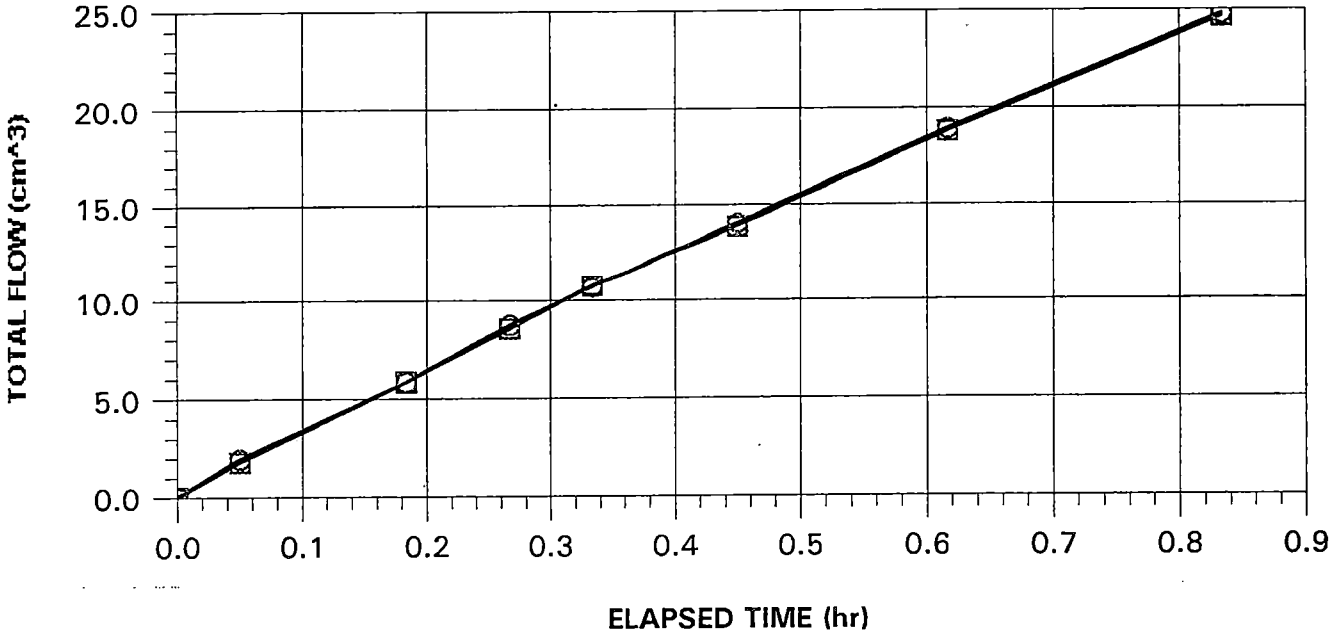
Client	ICF KAISER	Boring No.	NA
Client Project	BAYER 51249	Depth(ft.)	3.8-4.1
Project No.	97178-03	Sample No.	SM027-TB02-0305

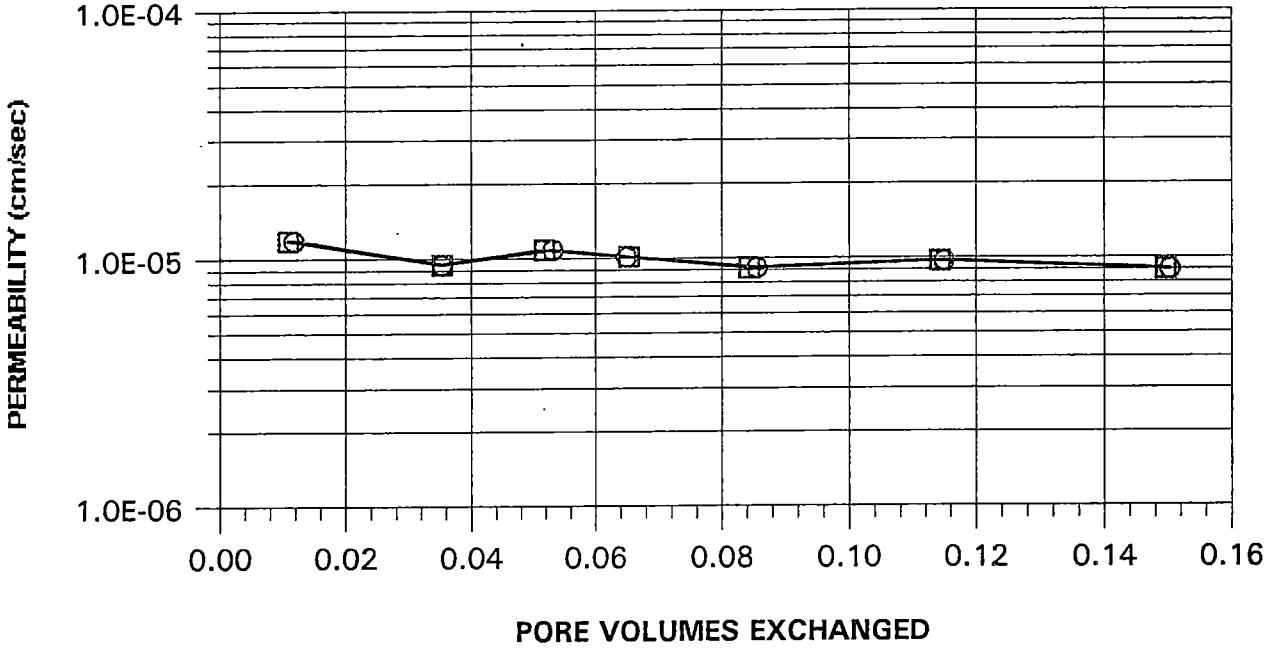
AVERAGE PERMEABILITY = 9.5E-06 cm/sec @ 20°C
AVERAGE PERMEABILITY = 9.5E-08 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY

INFLOW
OUTFLOW



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PERMEABILITY TEST

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Client	ICF KAISER	Tested By	JCM	Date	08-18-97
Client Project	BAYER 51249	Checked By	JMO	Date	8-27-97
Project No.	97178-03				
Boring No.	NA	Specific Gravity	2.70 ASSUMED		
Depth(ft.)	3.8-4.1	Sample Condition	UNDISTURBED		
Sample No.	SM027-TB02-0305				

Visual Description BROWN CLAY & ROCK FRAGMENTS

MOISTURE CONTENT	BEFORE TEST	AFTER TEST
Tare Number	K1	1741
Wt. Tare & WS(gm.)	810.30	587.20
Wt. Tare & DS(gm.)	714.10	480.40
Wt. Water(gm.)	96.20	106.80
Wt. Tare(gm.)	74.02	83.62
Wt. DS(gm.)	640.08	396.78
Moisture Content(%)	15.0	26.9

UNIT WEIGHT		
Wt. Tube & WS.(gms.)	990.20	NA
Wt. Of Tube(gms.)	285.61	NA
Wt. Of WS.(gms.)	704.59	777.4
Length 1 (in.)	3.672	3.719
Length 2 (in.)	3.670	3.695
Length 3 (in.)	3.674	3.741
Top Diameter (in.)	2.873	2.829
Middle Diameter (in.)	2.860	2.921
Bottom Diameter (in.)	2.870	2.832
Average Length (in)	3.67	3.72
Average Area (in^2)	6.46	6.43
Sample Volume(cc.)	388.64	391.63
Unit Wet Wt.(gms/cc)	1.81	1.99
Unit Wet Wt.(pcf.)	113.1	123.9
Unit Dry Wt.(pcf.)	98.3	97.6
Unit Dry Wt.(gms/cc)	1.58	1.56
Void Ratio,e	0.71	0.73
Porosity, n	0.42	0.42
Pore Volume(cm^3)	161.8	164.8

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PERMEABILITY TEST

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Client	ICF KAISER	Tested By	JCM	Date	08-18-97
Client Project	BAYER 51249	Checked By	JMO	Date	8-27-97
Project No.	97178-03				
Boring No.	NA				
Depth(ft.)	3.8-4.1				
Sample No.	SM027-TB02-0305				
Visual Description	BROWN CLAY & ROCK FRAGMENTS				

Pressure Heads (Constant)	
Top Cap (psi)	92.5
Bottom Cap (psi)	95.0
Cell (psi)	100.0
Total Pressure Head (cm)	175.8

Final Sample Dimensions	
Sample Length (cm.), L	9.44
Sample Diameter (cm.)	7.27
Sample Area (cm.^2), A	41.47
Inflow Burette Area, (cm.^2), a-in	4.22
Outflow Burette Area, (cm.^2), a-out	4.39
B Parameter	95%

AVERAGE PERMEABILITY = 9.5E-06 cm/sec @ 20°C
AVERAGE PERMEABILITY = 9.5E-08 m/sec @ 20°C

DATE mon-dy-yr	TIME hr	TIME min	ELAPSED TIME (t) hr	TOTAL INFLOW cm^3	TOTAL OUTFLOW cm^3	TOTAL HEAD (h) cm	FLOW 0 FLOW 1 STOP	TEMP °C	INCREMENTAL PERMEABILITY @ 20°C cm/sec
08-21-97	18	3	0.0	0.0	0.0	189.0	0	22.3	NA
08-21-97	18	6	0.1	1.9	1.8	188.2	0	22.3	1.2E-05
08-21-97	18	14	0.2	5.8	5.8	186.3	0	22.3	9.5E-06
08-21-97	18	19	0.3	8.7	8.5	185.0	0	22.3	1.1E-05
08-21-97	18	23	0.3	10.7	10.8	184.1	0	22.3	1.0E-05
08-21-97	18	30	0.4	14.1	13.9	182.5	0	22.3	9.2E-06
08-21-97	18	40	0.6	18.9	18.8	180.3	0	22.3	9.7E-06
08-21-97	18	53	0.8	24.8	24.7	177.6	0	22.3	9.0E-06

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SHELBY TUBE UNIT WEIGHT

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Client	ICF KAISER	Tested By	JCM 8-18-97
Client Project	BAYER 51249	Checked By	JMO 9-3-97
Project No.	97178-03		
Boring No.	NA	Tube Recovery	1.60
Depth Pushed	12.0-14.0		
Shelby Tube No.	SM027-TB02-1214		

SOIL PROFILE AND SAMPLING

	DEPTH ( )	ELEV ( )	SECTION No.	SOIL PROFILE	SOIL DESCRIPTION AND REMARKS	TEST PERFORMED
12.00						
12.50						
13.00						
			3			GRAIN SIZE HYDROMETER UNIT WGT. WC
13.50			2		BROWN LEAN CLAY	PERMEABILITY
			1			WATER CONTENT
14.00						

NOTE:WHEN FULL RECOVERY IS NOT ACHIEVED,SOIL ELEVATION CAN NOT BE ACCURATELY DEFINE
INDICATE EACH CUT OF THE TUBE WITH AN ARROW
INDICATE DIVIDING LINE BETWEEN SOIL TYPES BY A SOLID LINE
INDICATE WAX BY CROSS-HATCHING
INDICATE SOIL TYPES BY STANDARD SYMBOLS

MOISTURE CONTENT					
Section Number	1	2	3	4	5
Tare Number	1872		700		
Wt. Tare & WS(gm.)	262.24		591.50		
Wt. Tare & DS(gm.)	215.70		486.60		
Wt. Tare(gm.)	44.47		76.19		
Moisture Content(%)	27.2		25.6		

UNIT WEIGHT		
Wt. Tube & WS.(gms.)	1069.30	1385.50
Wt. Of Tube(gms.)	286.31	371.44
Wt. Of WS.(gms.)	782.99	1014.06
Length 1 (in.)	3.683	4.816
Length 2 (in.)	3.741	4.796
Length 3 (in.)	3.708	4.801
Top Diameter (in.)	2.879	2.870
Middle Diameter (in.)	2.887	2.878
Bottom Diameter (in.)	2.859	2.874
Sample Volume (cc)	394.75	510.74
Moisture Content(%)	27.18	25.56
Unit Wet Wt.(gms/cc)	1.98	1.99
Unit Wet Wt.(pcf.)	123.8	123.9
Unit Dry Wt.(pcf.)	97.3	98.7
Unit Dry Wt.(gms/cc)	1.56	1.58

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	13.1-13.5
Project No.	97178-03	Sample No.	SM027-TB02-1214
Lab ID	97178-03.012	Soil Color	**BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	700	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	591.50	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	486.60	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	76.09	Weight of Tare (gm)	NA
Weight of Water (gm)	104.90	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	410.51	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**25.6**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	410.51
Dry Weight - 3/4" Sample (gm)	38.86	Weight of minus #200 material (gm)	371.65
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	38.86
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"	12.5	0.00	0.00	0.00	100.00	**100.00**
3/8"	9.50	2.66	0.65	0.65	99.35	**99.35**
#4	4.75	0.22	0.05	0.70	99.30	**99.30**
#10	2.00	1.20	0.29	0.99	99.01	**99.01**
#20	0.85	1.55	0.38	1.37	98.63	**98.63**
#40	0.425	3.16	0.77	2.14	97.86	**97.86**
#60	0.250	7.01	1.71	3.85	96.15	**96.15**
#140	0.106	16.23	3.95	7.80	92.20	**92.20**
#200	0.075	6.83	1.66	9.47	90.53	**90.53**
Pan	-	371.65	90.53	100.00	-	-

Tested By JCM Date 8/18/97 Checked By JCM Date 8-28-97

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HYDROMETER ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	13.1-13.5
Project No.	97178-03	Sample No.	SM027-TB02-1214
Lab ID	97178-03.012	Soil Color	**BROWN**

Elapsed Time (min)		R Measured	Temp. (°C)	R Corrected	N (%)	Diameter (mm)	N' (%)
0	NA	NA	NA	NA	NA	NA	NA
2	49.5	50.0	24.2	44.3	87.1	0.0257	**78.8**
5		46.0	24.2	40.3	79.2	0.0169	**71.7**
15		40.5	24.2	34.8	68.4	0.0103	**61.9**
30		37.0	24.2	31.3	61.5	0.0075	**55.7**
62		33.0	23.5	27.3	53.6	0.0054	**48.6**
290		26.0	22.6	20.3	39.9	0.0026	**36.1**
1440		20.5	22.4	14.8	29.1	0.0012	**26.3**

Soil Specimen Data		Corrections	
Tare No.	1326	K - Factor	0.01279
Tare + Dry Material (gm)	156.94	a - Factor	0.99
Weight of Tare (gm)	101.56	Composite Correction	5.70
Weight of Deflocculant (gm)	5.0	Percent Finer than # 200	90.53
Weight of Dry Material (gm)	50.38		
		Specific Gravity	2.7 Assumed

Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By TO Date 8/20/97 Checked By Jcm Date 8-28-97

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SIEVE AND HYDROMETER ANALYSIS
ASTM D 422-63 (SOP-S3)

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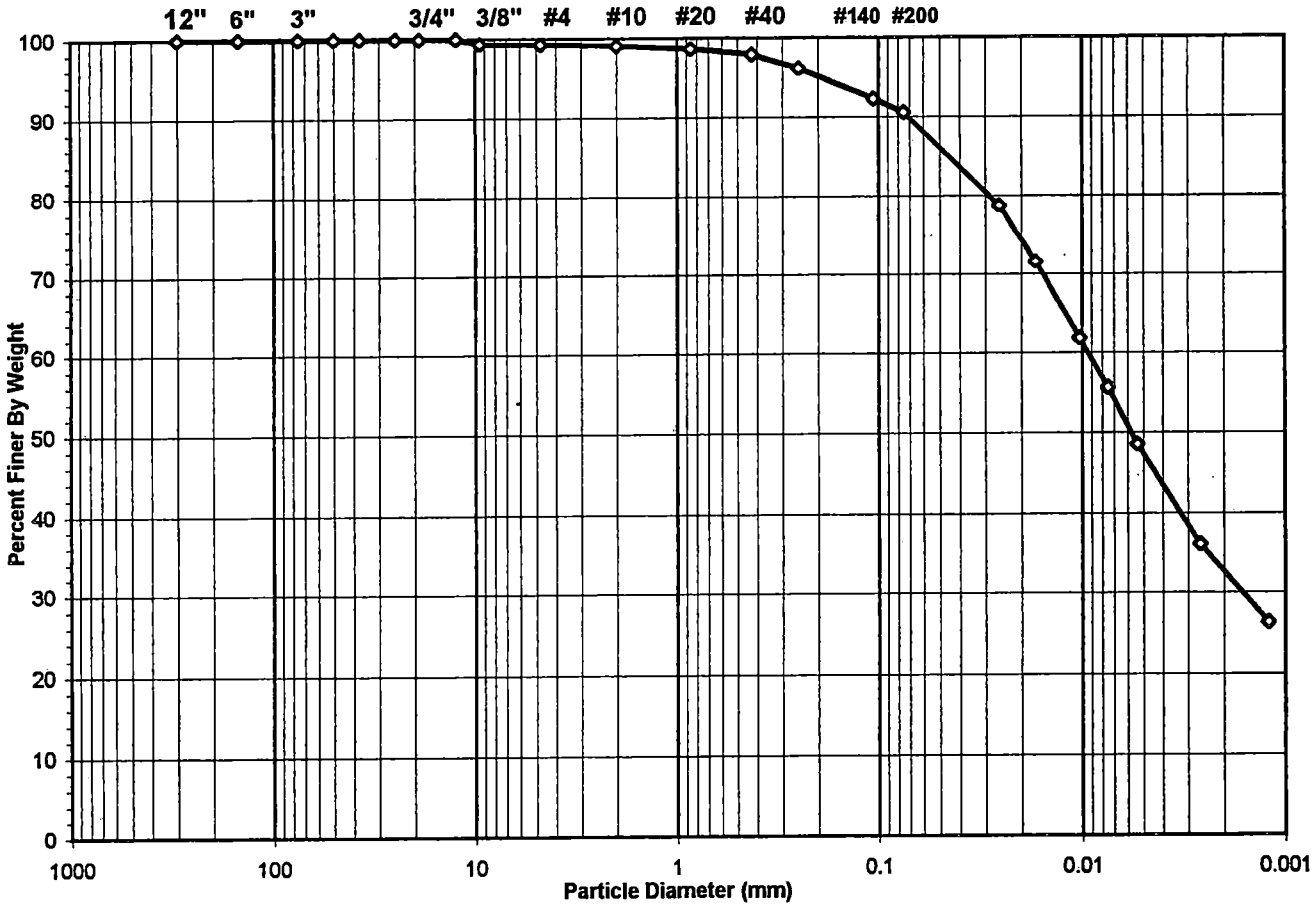
Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	13.1-13.5
Project No.	97178-03	Sample No.	SM027-TB02-1214
Lab ID	97178-03.012	Soil Color	BROWN

	SIEVE ANALYSIS		HYDROMETER	
USCS	gravel	sand	silt and clay fraction	
USDA	gravel	sand	silt	clay



Sieve Size (mm)	Percent Finer	Components	Percentage	Corrected % of Minus 2.0 mm material for USDA Classificat.
100	100.00	*Gravel*	0.99	**0.00**
2	99.01	*Sand*	12.92	**13.05**
0.075	90.53	*Silt*	53.36	**53.89**
0.05	86.09	*Clay*	32.73	**33.06**
0.002	32.73			

USDA Classification	***SILTY CLAY LOAM***
USCS Symbol	***cl, ASSUMED***
USCS Classification	***LEAN CLAY***

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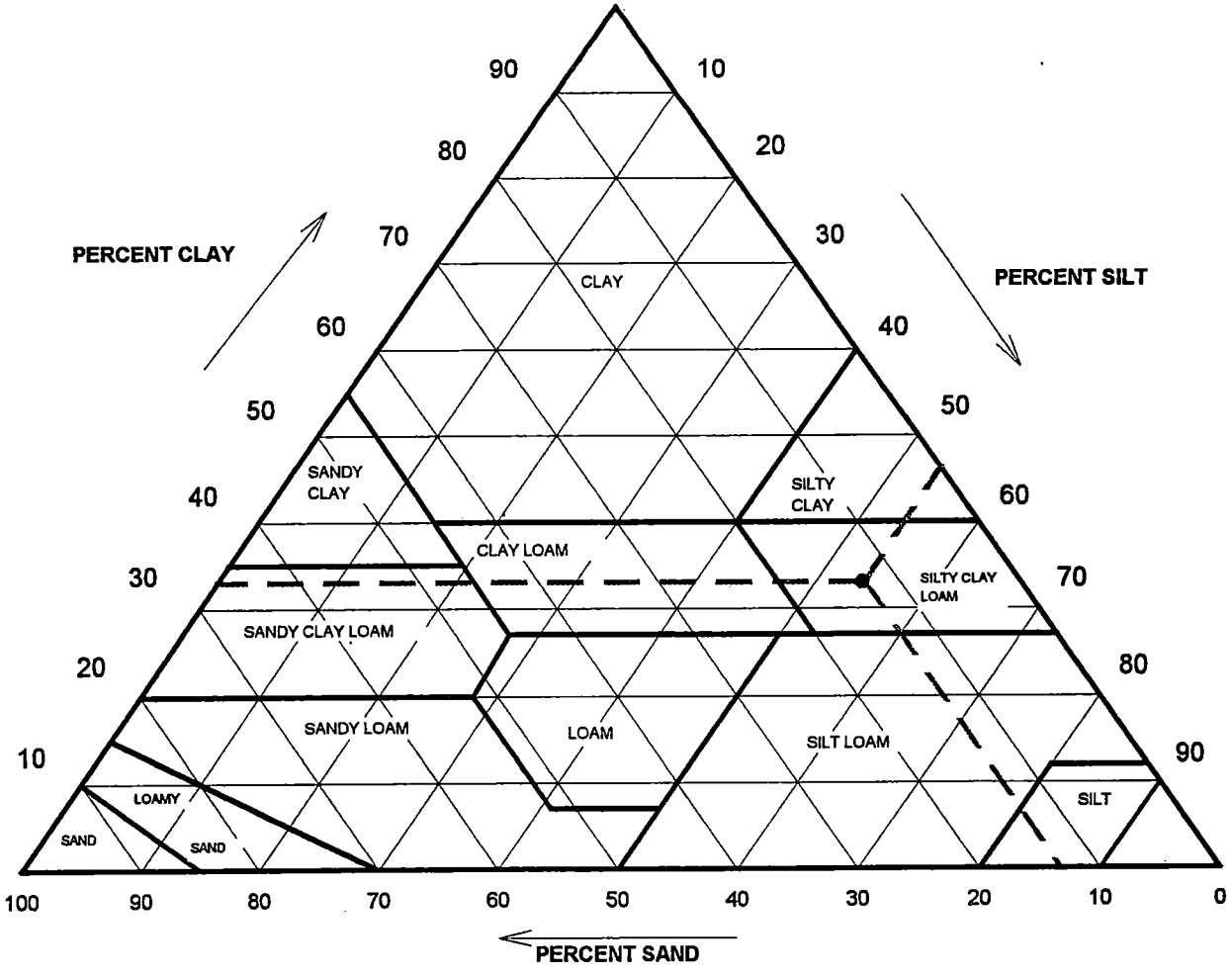
USDA CLASSIFICATION CHART

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	13.1-13.5
Project No.	97178-03	Sample No.	SM027-TB02-1214
Lab ID	97178-03.012	Soil Color	BROWN



Components	Corrected % of Minus 2.0 mm material for USDA Classificat.
Gravel	0.00
Sand	13.05
Silt	53.89
Clay	33.06
USDA Classification	***SILTY CLAY LOAM***

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PERMEABILITY TEST

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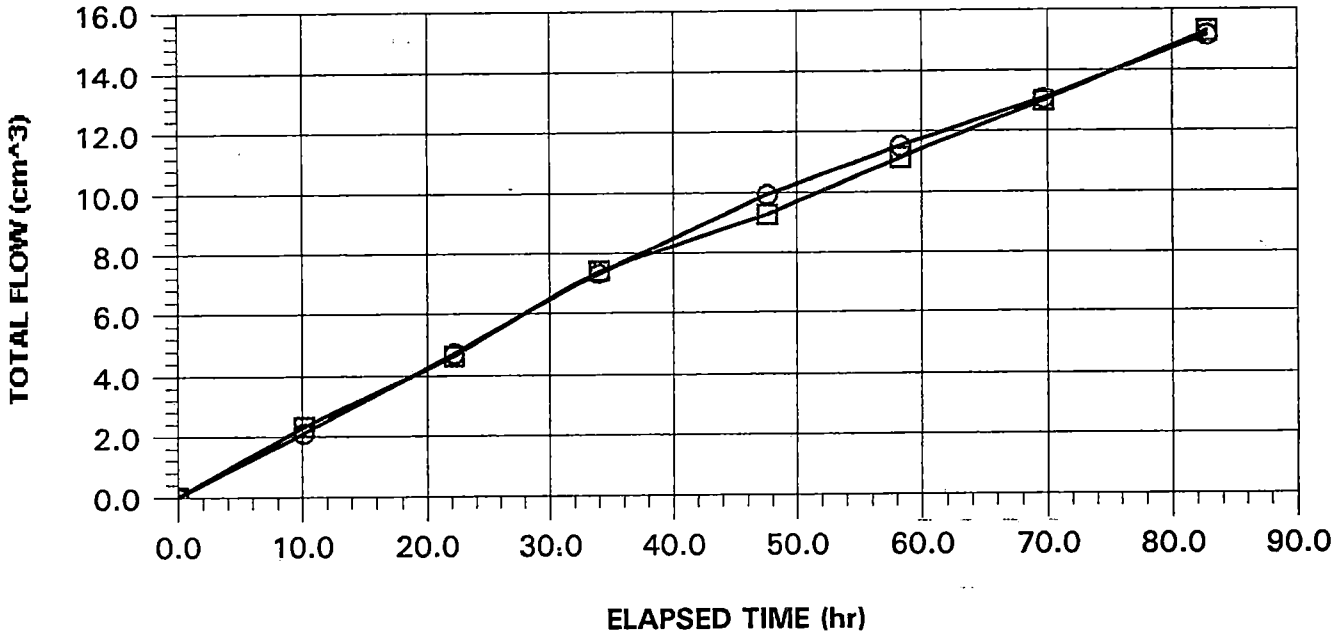
Client	ICF KAISER	Boring No.	NA
Client Project	BAYER 51249	Depth(ft.)	13.5-13.8
Project No.	97178-03	Sample No.	SM027-TB02-1214

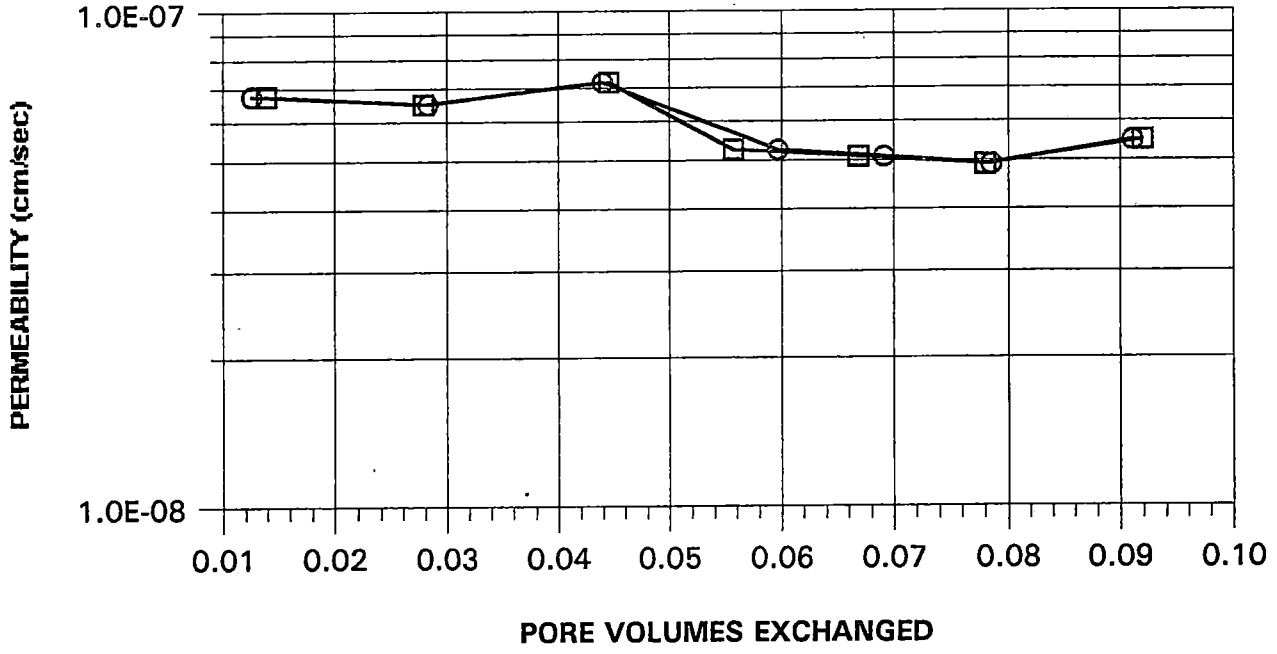
AVERAGE PERMEABILITY = 5.2E-08 cm/sec @ 20°C
AVERAGE PERMEABILITY = 5.2E-10 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY

⊖ INFLOW
⊟ OUTFLOW



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PERMEABILITY TEST

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Client	ICF KAISER	Tested By	JCM	Date	08-18-97
Client Project	BAYER 51249	Checked By	JMO	Date	8/29/97
Project No.	97178-03				
Boring No.	NA	Specific Gravity	2.70 ASSUMED		
Depth(ft.)	13.5-13.8	Sample Condition	UNDISTURBED		
Sample No.	SM027-TB02-1214				

Visual Description BROWN CLAY

MOISTURE CONTENT	BEFORE TEST	AFTER TEST
Tare Number	1872	1728
Wt. Tare & WS(gm.)	262.24	520.30
Wt. Tare & DS(gm.)	215.70	427.00
Wt. Water(gm.)	46.54	93.30
Wt. Tare(gm.)	44.47	81.72
Wt. DS(gm.)	171.23	345.28
Moisture Content(%)	27.2	27.0

UNIT WEIGHT		
Wt. Tube & WS.(gms.)	1069.30	NA
Wt. Of Tube(gms.)	289.31	NA
Wt. Of WS.(gms.)	779.99	779.0
Length 1 (in.)	3.683	3.750
Length 2 (in.)	3.741	3.759
Length 3 (in.)	3.708	3.750
Top Diameter (in.)	2.879	2.853
Middle Diameter (in.)	2.887	2.857
Bottom Diameter (in.)	2.859	2.854
Average Length (in)	3.71	3.75
Average Area (in^2)	6.49	6.40
Sample Volume(cc.)	394.75	393.62
Unit Wet Wt.(gms/cc)	1.98	1.98
Unit Wet Wt.(pcf.)	123.3	123.5
Unit Dry Wt.(pcf.)	96.9	97.2
Unit Dry Wt.(gms/cc)	1.55	1.56
Void Ratio,e	0.74	0.73
Porosity, n	0.42	0.42
Pore Volume(cm^3)	167.6	166.5

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PERMEABILITY TEST

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Client	ICF KAISER	Tested By	JCM	Date	08-18-97
Client Project	BAYER 51249	Checked By	JMO	Date	8/29/97
Project No.	97178-03				
Boring No.	NA				
Depth(ft.)	13.5-13.8				
Sample No.	SM027-TB02-1214				
Visual Description	BROWN CLAY				

Pressure Heads (Constant)	
Top Cap (psi)	27.5
Bottom Cap (psi)	30.0
Cell (psi)	35.0
Total Pressure Head (cm)	175.8

Final Sample Dimensions	
Sample Length (cm.), L	9.53
Sample Diameter (cm.)	7.25
Sample Area (cm.^2), A	41.29
Inflow Burette Area, (cm.^2), a-in	4.68
Outflow Burette Area, (cm.^2), a-out	4.49
B Parameter	96%

AVERAGE PERMEABILITY = 5.2E-08 cm/sec @ 20°C
AVERAGE PERMEABILITY = 5.2E-10 m/sec @ 20°C

DATE mon-dy-yr	TIME hr	TIME min	ELAPSED TIME (t) hr	TOTAL INFLOW cm^3	TOTAL OUTFLOW cm^3	TOTAL HEAD (h) cm	FLOW 0 FLOW 1 STOP	TEMP °C	INCREMENTAL PERMEABILITY @ 20°C cm/sec
08-18-97	21	5	0.0	0.0	0.0	191.8	0	23.0	NA
08-19-97	7	15	10.2	2.1	2.3	190.8	0	23.0	6.8E-08
08-19-97	19	15	22.2	4.7	4.6	189.7	0	22.5	6.5E-08
08-20-97	7	5	34.0	7.3	7.4	188.6	0	23.0	7.2E-08
08-20-97	20	40	47.6	9.9	9.3	187.6	0	22.5	5.3E-08
08-21-97	7	25	58.3	11.5	11.1	186.8	0	23.0	5.1E-08
08-21-97	18	45	69.7	13.1	13.0	186.1	0	22.5	4.9E-08
08-22-97	7	50	82.8	15.2	15.3	185.1	0	22.5	5.5E-08

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SHELBY TUBE UNIT WEIGHT

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Client	ICF KAISER	Tested By	BL 8-13-97
Client Project	BAYER 51249	Checked By	JHO 9-3-97
Project No.	97178-02		
Boring No.	NA	Tube Recovery	2.10
Depth Pushed	1.0-3.0		
Shelby Tube No.	SM027-TB04-0103		

SOIL PROFILE AND SAMPLING

DEPTH ( )	ELEV ( )	SECTION No.	SOIL PROFILE	SOIL DESCRIPTION AND REMARKS	TEST PERFORMED
1.00					
1.50					
2.00					
2.50		2		BROWN CLAYEY GAVEL WITH SAND	UNIT WGT. WC. GRAIN SIZE HYDROMETER
3.00		1			NO TEST

NOTE:WHEN FULL RECOVERY IS NOT ACHIEVED,SOIL ELEVATION CAN NOT BE ACCURATELY DEFINE
INDICATE EACH CUT OF THE TUBE WITH AN ARROW
INDICATE DIVIDING LINE BETWEEN SOIL TYPES BY A SOLID LINE
INDICATE WAX BY CROSS-HATCHING
INDICATE SOIL TYPES BY STANDARD SYMBOLS

MOISTURE CONTENT					
Section Number	1	2	3	4	5
Tare Number		1703			
Wt. Tare & WS(gm.)		194.94			
Wt. Tare & DS(gm.)		175.73			
Wt. Tare(gm.)		83.81			
Moisture Content(%)		20.9			

UNIT WEIGHT	
Wt. Tube & WS.(gms.)	1095.00
Wt. Of Tube(gms.)	275.48
Wt. Of WS.(gms.)	819.52
Length 1 (in.)	3.714
Length 2 (in.)	3.716
Length 3 (in.)	3.726
Top Diameter (in.)	2.886
Middle Diameter (in.)	2.875
Bottom Diameter (in.)	2.874
Sample Volume (cc)	396.52
Moisture Content(%)	20.90
Unit Wet Wt.(gms/cc)	2.07
Unit Wet Wt.(pcf.)	129.0
Unit Dry Wt.(pcf.)	106.7
Unit Dry Wt.(gms/cc)	1.71

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	2.5-2.8
Project No.	97178-02	Sample No.	SM027-TB04-0103
Lab ID	97178-02.060	Soil Color	**BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	1672	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	691.00	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	610.20	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	99.40	Weight of Tare (gm)	NA
Weight of Water (gm)	80.80	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	510.80	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**15.8**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	510.80
Dry Weight - 3/4" Sample (gm)	165.24	Weight of minus #200 material (gm)	196.87
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	313.93
Dry Weight + 3/4" Sample (gm)	148.69		
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	95.68	18.73	18.73	81.27	**81.27**
1"	25.0	40.73	7.97	26.71	73.29	**73.29**
3/4"	19.0	12.28	2.40	29.11	70.89	**70.89**
1/2"	12.5	17.23	3.37	32.48	67.52	**67.52**
3/8"	9.50	9.42	1.84	34.33	65.67	**65.67**
#4	4.75	22.02	4.31	38.64	61.36	**61.36**
#10	2.00	25.68	5.03	43.66	56.34	**56.34**
#20	0.85	17.35	3.40	47.06	52.94	**52.94**
#40	0.425	12.50	2.45	49.51	50.49	**50.49**
#60	0.250	20.96	4.10	53.61	46.39	**46.39**
#140	0.106	31.62	6.19	59.80	40.20	**40.20**
#200	0.075	8.46	1.66	61.46	38.54	**38.54**
Pan	-	196.87	38.54	100.00	-	-

Tested By BL Date 8/13/97 Checked By JMO Date 8/27/97

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HYDROMETER ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	2.5-2.8
Project No.	97178-02	Sample No.	SM027-TB04-0103
Lab ID	97178-02.060	Soil Color	**BROWN**

Elapsed Time (min)		R Measured	Temp. (°C)	R Corrected	N (%)	Diameter (mm)	N' (%)
0	NA	NA	NA	NA	NA	NA	NA
2	42.0	43.0	24.2	37.3	85.4	0.0275	**32.9**
5		39.5	24.2	33.8	77.4	0.0179	**29.8**
15		36.0	24.2	30.3	69.3	0.0106	**26.7**
30		33.0	24.2	27.3	62.5	0.0077	**24.1**
60		30.0	23.5	24.3	55.6	0.0056	**21.4**
250		25.5	23.2	19.8	45.3	0.0028	**17.5**
1440		20.0	23.9	14.3	32.7	0.0012	**12.6**

Soil Specimen Data		Corrections	
Tare No.	1324	K - Factor	0.01279
Tare + Dry Material (gm)	149.71	a - Factor	0.99
Weight of Tare (gm)	101.45	Composite Correction	5.70
Weight of Deflocculant (gm)	5.0	Percent Finer than # 200	38.54
Weight of Dry Material (gm)	43.26		
		Specific Gravity	2.7 Assumed

Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By TO Date 8/18/97 Checked By JMO Date 8/27/97

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SIEVE AND HYDROMETER ANALYSIS
ASTM D 422-63 (SOP-S3)

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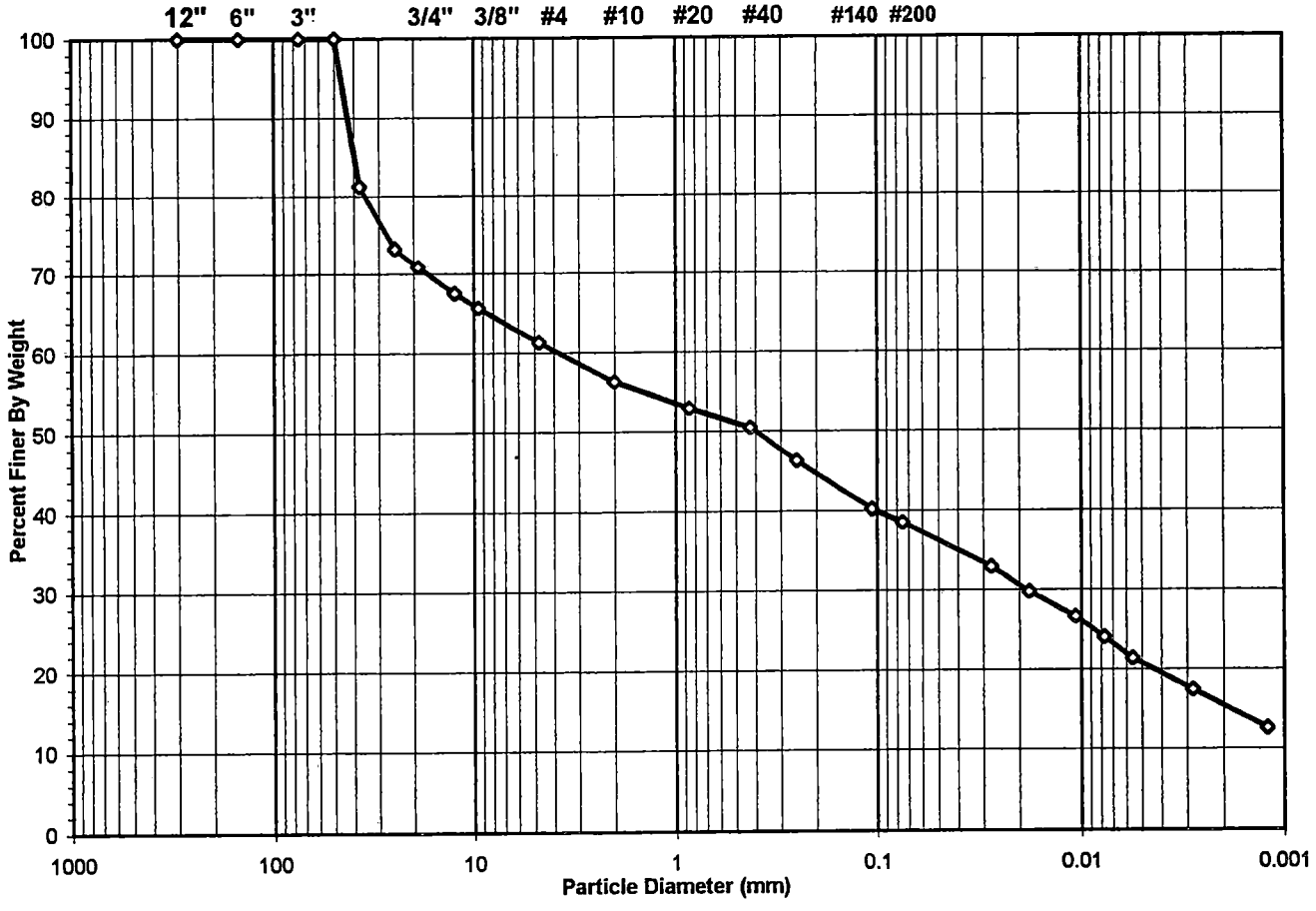
Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	2.5-2.8
Project No.	97178-02	Sample No.	SM027-TB04-0103
Lab ID	97178-02.060	Soil Color	BROWN

	SIEVE ANALYSIS		HYDROMETER	
USCS	gravel	sand	silt and clay fraction	
USDA	gravel	sand	silt	clay



Sieve Size (mm)	Percent Finer	Components	Percentage	Corrected % of Minus 2.0 mm material for USDA Classificat.
100	100.00	*Gravel*	43.66	**0.00**
2	56.34	*Sand*	20.07	**35.63**
0.075	38.54	*Silt*	20.77	**36.87**
0.05	36.26	*Clay*	15.49	**27.49**
0.002	15.49			

USDA Classification ***CLAY LOAM***

USCS Symbol ***gc, ASSUMED***

USCS Classification ***CLAYEY GRAVEL WITH SAND***

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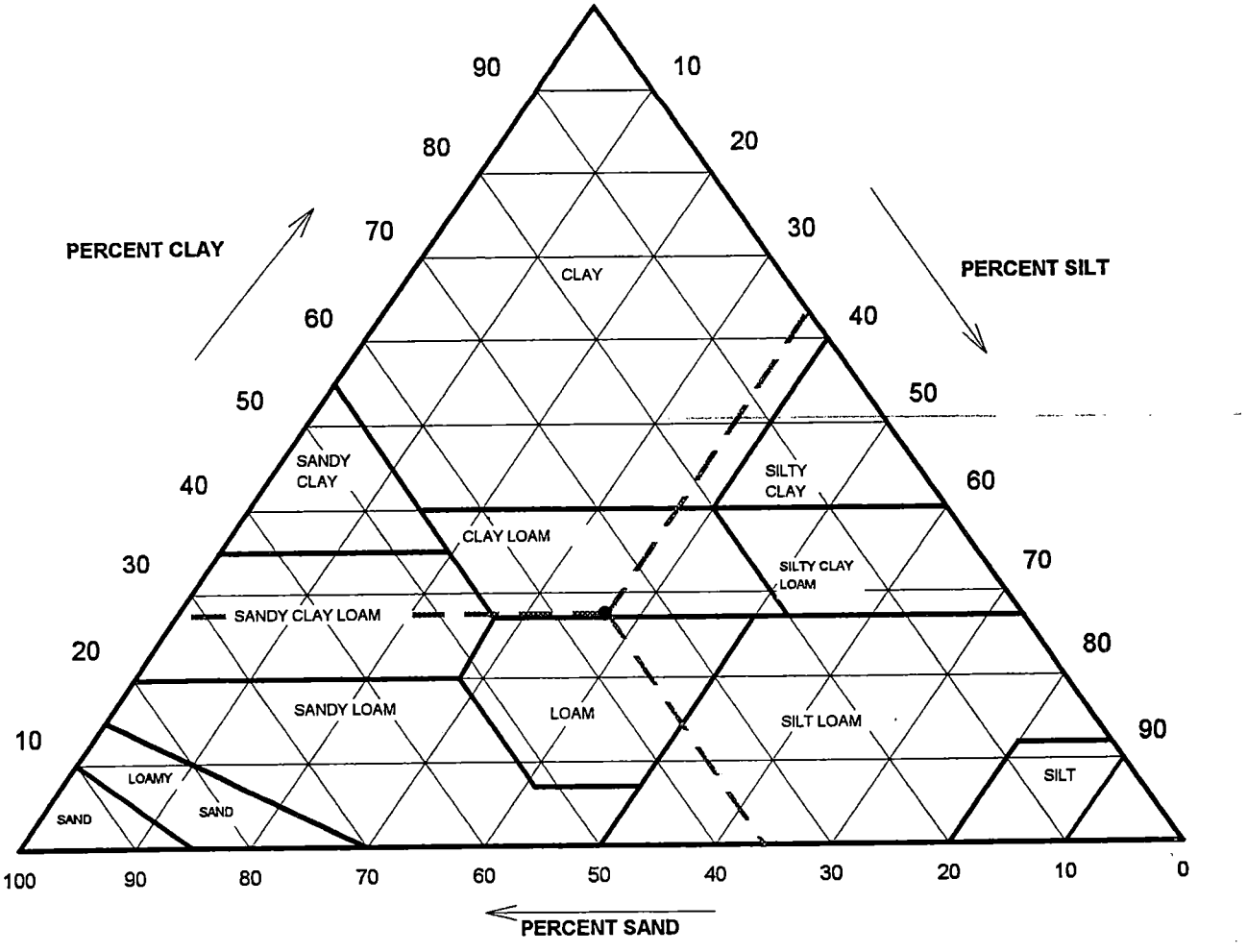
USDA CLASSIFICATION CHART

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	2.5-2.8
Project No.	97178-02	Sample No.	SM027-TB04-0103
Lab ID	97178-02.060	Soil Color	BROWN



Components	Corrected % of Minus 2.0 mm material for USDA Classificat.
Gravel	0.00
Sand	35.63
Silt	36.87
Clay	27.49
USDA Classification	***CLAY LOAM***

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SHELBY TUBE UNIT WEIGHT

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Client	ICF KAISER	Tested By	BL 8-18-97
Client Project	BAYER 51249	Checked By	JCM 9-5-97
Project No.	97178-03		
Boring No.	NA	Tube Recovery	0.70
Depth Pushed	3.0-5.0		
Shelby Tube No.	SM027-TB05-0305		

SOIL PROFILE AND SAMPLING

DEPTH ( )	ELEV ( )	SECTION No.	SOIL PROFILE	SOIL DESCRIPTION AND REMARKS	TEST PERFORMED
3.00					
3.50				VOID ENTIRE LENGTH UNABLE TO GET DENSITY	
4.00					
4.50		3		GRAY & BROWN GRAVELLY LEAN CLAY WITH SAND	GRAIN SIZE HYDROMETER WC.
		2			
5.00		1			NO TEST

NOTE:WHEN FULL RECOVERY IS NOT ACHIEVED,SOIL ELEVATION CAN NOT BE ACCURATELY DEFINE
INDICATE EACH CUT OF THE TUBE WITH AN ARROW
INDICATE DIVIDING LINE BETWEEN SOIL TYPES BY A SOLID LINE
INDICATE WAX BY CROSS-HATCHING
INDICATE SOIL TYPES BY STANDARD SYMBOLS

MOISTURE CONTENT					
Section Number	1	2	3	4	5
Tare Number		1613			
Wt. Tare & WS(gm.)		711.40			
Wt. Tare & DS(gm.)		585.90			
Wt. Tare(gm.)		99.23			
Moisture Content(%)		25.8			

UNIT WEIGHT
Wt. Tube & WS.(gms.)
Wt. Of Tube(gms.)
Wt. Of WS.(gms.)
Length 1 (in.)
Length 2 (in.)
Length 3 (in.)
Top Diameter (in.)
Middle Diameter (in.)
Bottom Diameter (in.)
Sample Volume (cc)
Moisture Content(%)
Unit Wet Wt.(gms/cc)
Unit Wet Wt.(pcf.)
Unit Dry Wt.(pcf.)
Unit Dry Wt.(gms/cc)

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	4.5-4.8
Project No.	97178-03	Sample No.	SM027-TB05-0305
Lab ID	97178-03.013	Soil Color	**GRAY & BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	1613	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	711.40	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	585.90	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	99.23	Weight of Tare (gm)	NA
Weight of Water (gm)	125.50	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	486.67	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**25.8**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	486.67
Dry Weight - 3/4" Sample (gm)	122.17	Weight of minus #200 material (gm)	307.46
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	179.21
Dry Weight + 3/4" Sample (gm)	57.04		
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	37.18	7.64	7.64	92.36	**92.36**
3/4"	19.0	19.86	4.08	11.72	88.28	**88.28**
1/2"	12.5	12.20	2.51	14.23	85.77	**85.77**
3/8"	9.50	10.63	2.18	16.41	83.59	**83.59**
#4	4.75	11.54	2.37	18.78	81.22	**81.22**
#10	2.00	12.23	2.51	21.30	78.70	**78.70**
#20	0.85	8.54	1.75	23.05	76.95	**76.95**
#40	0.425	8.24	1.69	24.74	75.26	**75.26**
#60	0.250	16.36	3.36	28.11	71.89	**71.89**
#140	0.106	30.69	6.31	34.41	65.59	**65.59**
#200	0.075	11.74	2.41	36.82	63.18	**63.18**
Pan	-	307.46	63.18	100.00	-	-

Tested By BL Date 8/18/97 Checked By JMO Date 8/27/97

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HYDROMETER ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	4.5-4.8
Project No.	97178-03	Sample No.	SM027-TB05-0305
Lab ID	97178-03.013	Soil Color	**GRAY & BROWN**

Elapsed Time (min)		R Measured	Temp. (°C)	R Corrected	N (%)	Diameter (mm)	N' (%)
0	NA	NA	NA	NA	NA	NA	NA
2	38.5	39.5	23	33.2	85.5	0.0287	**54.0**
5		37.0	23	30.7	79.0	0.0186	**49.9**
15		33.5	23	27.2	70.0	0.0110	**44.2**
32		30.0	23	23.7	61.0	0.0077	**38.6**
60		27.5	22.2	21.2	54.6	0.0058	**34.5**
250		23.0	22.7	16.7	43.0	0.0029	**27.2**
1440		18.5	23.5	12.2	31.4	0.0012	**19.9**

Soil Specimen Data		Corrections	
Tare No.	681	K - Factor	0.01297
Tare + Dry Material (gm)	143.01	a - Factor	0.99
Weight of Tare (gm)	99.54	Composite Correction	6.29
Weight of Deflocculant (gm)	5.0	Percent Finer than # 200	63.18
Weight of Dry Material (gm)	38.47		
		Specific Gravity	2.7 Assumed

Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By TO Date 8/20/97 Checked By JMO Date 8/27/97

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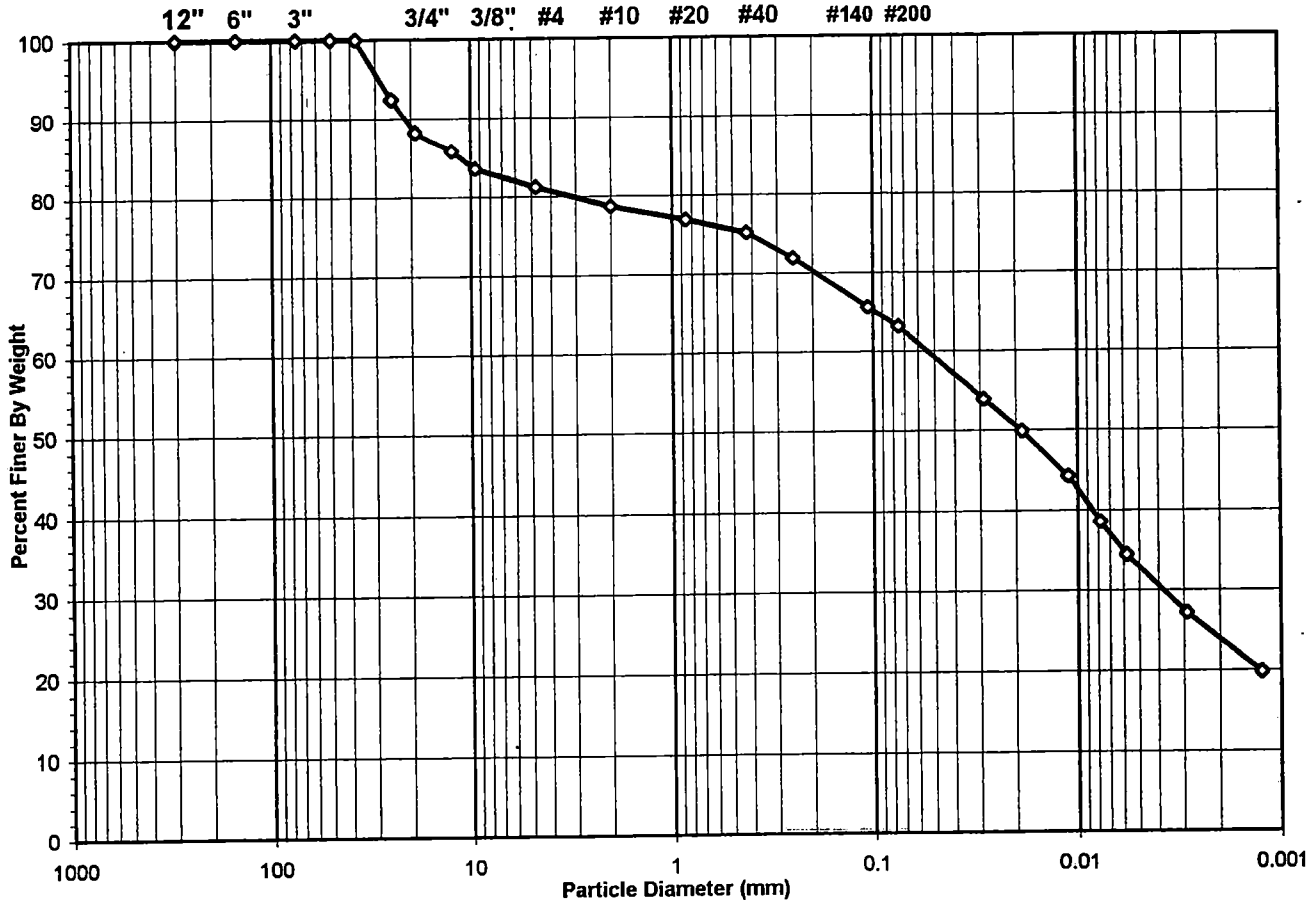
SIEVE AND HYDROMETER ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	4.5-4.8
Project No.	97178-03	Sample No.	SM027-TB05-0305
Lab ID	97178-03.013	Soil Color	GRAY & BROWN

	SIEVE ANALYSIS		HYDROMETER	
USCS	gravel	sand	silt and clay fraction	
USDA	gravel	sand	silt	clay



Sieve Size (mm)	Percent Finer	Components	Percentage	Corrected % of Minus 2.0 mm material for USDA Classificat.
100	100.00	*Gravel*	21.30	**0.00**
2	78.70	*Sand*	19.41	**24.66**
0.075	63.18	*Silt*	35.34	**44.91**
0.05	59.30	*Clay*	23.95	**30.43**
0.002	23.95			

USDA Classification ***CLAY LOAM***

USCS Symbol ***cl, ASSUMED***

USCS Classification ***GRAVELLY LEAN CLAY WITH SAND***

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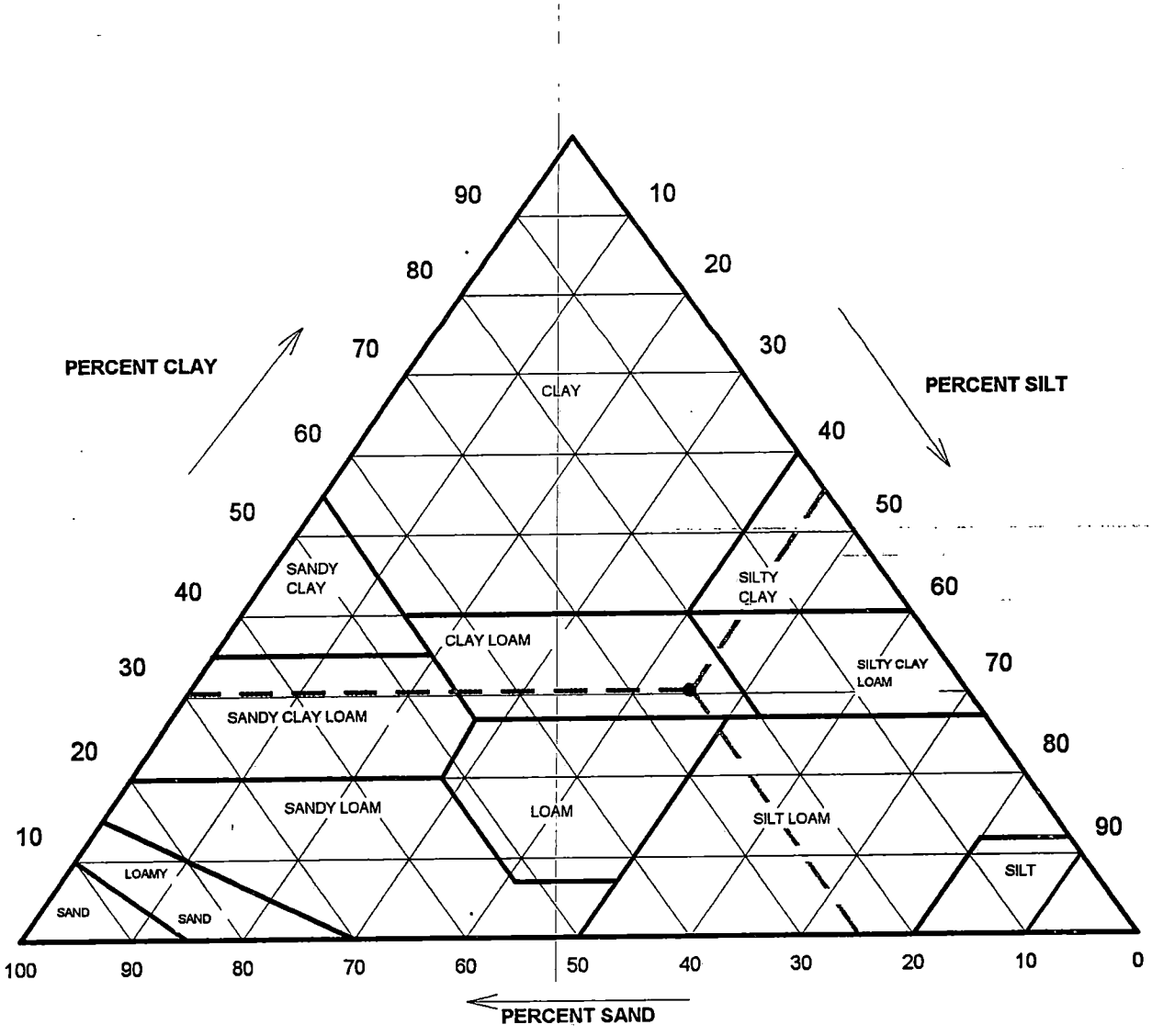
USDA CLASSIFICATION CHART

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	4.5-4.8
Project No.	97178-03	Sample No.	SM027-TB05-0305
Lab ID	97178-03.013	Soil Color	GRAY & BROWN



Components	Corrected % of Minus 2.0 mm material for USDA Classificat.
Gravel	0.00
Sand	24.66
Silt	44.91
Clay	30.43
USDA Classification	***CLAY LOAM***

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SHELBY TUBE UNIT WEIGHT

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Client	ICF KAISER	Tested By	JCM 8-18-97
Client Project	BAYER 51249	Checked By	JMO 9-3-97
Project No.	97178-03		
Boring No.	NA	Tube Recovery	1.60
Depth Pushed	4.0-6.0		
Shelby Tube No.	SM027-TB05-0406		

SOIL PROFILE AND SAMPLING

DEPTH ( )	ELEV ( )	SECTION No.	SOIL PROFILE	SOIL DESCRIPTION AND REMARKS	TEST PERFORMED
4.00					
4.50					
5.00					
		3			GRAIN SIZE HYDROMETER UNIT WGT. WC
5.50		2		BROWN LEAN CLAY	PERMEABILITY
		1			WATER CONTENT
6.00					

NOTE:WHEN FULL RECOVERY IS NOT ACHIEVED,SOIL ELEVATION CAN NOT BE ACCURATELY DEFINE
INDICATE EACH CUT OF THE TUBE WITH AN ARROW
INDICATE DIVIDING LINE BETWEEN SOIL TYPES BY A SOLID LINE
INDICATE WAX BY CROSS-HATCHING
INDICATE SOIL TYPES BY STANDARD SYMBOLS

MOISTURE CONTENT					
Section Number	1	2	3	4	5
Tare Number	1393		K13		
Wt. Tare & WS(gm.)	266.12		592.50		
Wt. Tare & DS(gm.)	233.79		492.10		
Wt. Tare(gm.)	50.49		74.43		
Moisture Content(%)	17.6		24.0		

UNIT WEIGHT		
Wt. Tube & WS.(gms.)	1038.90	1354.70
Wt. Of Tube(gms.)	283.95	370.30
Wt. Of WS.(gms.)	754.95	984.40
Length 1 (in.)	3.706	4.831
Length 2 (in.)	3.692	4.820
Length 3 (in.)	3.681	4.809
Top Diameter (in.)	2.878	2.887
Middle Diameter (in.)	2.852	2.862
Bottom Diameter (in.)	2.872	2.876
Sample Volume (cc)	390.77	512.76
Moisture Content(%)	17.64	24.04
Unit Wet Wt.(gms/cc)	1.93	1.92
Unit Wet Wt.(pcf.)	120.6	119.8
Unit Dry Wt.(pcf.)	102.5	96.6
Unit Dry Wt.(gms/cc)	1.64	1.55

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	5.1-5.5
Project No.	97178-03	Sample No.	SM027-TB05-0406
Lab ID	97178-03.014	Soil Color	**BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	K13	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	592.50	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	492.10	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	74.43	Weight of Tare (gm)	NA
Weight of Water (gm)	100.40	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	417.67	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**24.0**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	417.67
Dry Weight - 3/4" Sample (gm)	57.07	Weight of minus #200 material (gm)	360.60
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	57.07
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"	12.5	0.00	0.00	0.00	100.00	**100.00**
3/8"	9.50	0.00	0.00	0.00	100.00	**100.00**
#4	4.75	0.23	0.06	0.06	99.94	**99.94**
#10	2.00	0.31	0.07	0.13	99.87	**99.87**
#20	0.85	0.60	0.14	0.27	99.73	**99.73**
#40	0.425	2.95	0.71	0.98	99.02	**99.02**
#60	0.250	12.67	3.03	4.01	95.99	**95.99**
#140	0.106	29.21	6.99	11.01	88.99	**88.99**
#200	0.075	11.10	2.66	13.66	86.34	**86.34**
Pan	-	360.60	86.34	100.00	-	-

Tested By JCM Date 8/18/97 Checked By JMO Date 8/27/97

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HYDROMETER ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	5.1-5.5
Project No.	97178-03	Sample No.	SM027-TB05-0406
Lab ID	97178-03.014	Soil Color	**BROWN**

Elapsed Time (min)		R Measured	Temp. (°C)	R Corrected	N (%)	Diameter (mm)	N' (%)
0	NA	NA	NA	NA	NA	NA	NA
2	46.5	47.0	23	40.7	83.6	0.0269	**72.2**
5		43.5	23	37.2	76.4	0.0176	**66.0**
15		37.5	23	31.2	64.1	0.0107	**55.3**
30		35.0	23	28.7	59.0	0.0077	**50.9**
60		32.0	22.2	25.7	52.8	0.0056	**45.6**
250		25.0	22.7	18.7	38.4	0.0029	**33.2**
1440		19.5	23.5	13.2	27.1	0.0012	**23.4**

Soil Specimen Data		Corrections	
Tare No.	1913	K - Factor	0.01297
Tare + Dry Material (gm)	157.74	a - Factor	0.99
Weight of Tare (gm)	104.52	Composite Correction	6.29
Weight of Deflocculant (gm)	5.0	Percent Finer than # 200	86.34
Weight of Dry Material (gm)	48.22		
		Specific Gravity	2.7 Assumed

Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By TO Date 8/20/97 Checked By JMO Date 8/27/97

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DATE: 11/12/96
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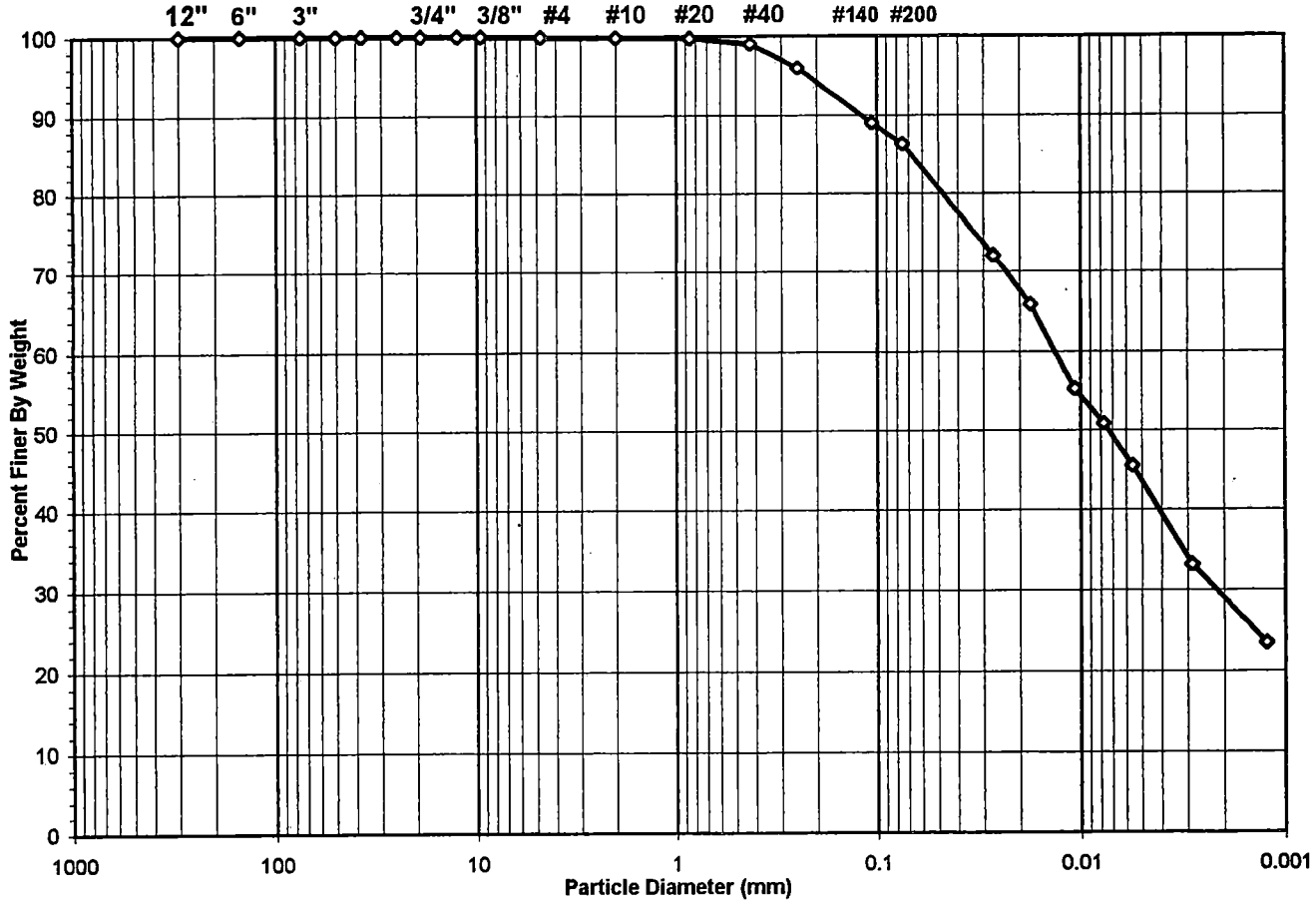
SIEVE AND HYDROMETER ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	5.1-5.5
Project No.	97178-03	Sample No.	SM027-TB05-0406
Lab ID	97178-03.014	Soil Color	BROWN

	SIEVE ANALYSIS		HYDROMETER	
USCS	gravel	sand	silt and clay fraction	
USDA	gravel	sand	silt	clay



Sieve Size (mm)	Percent Finer	Components	Percentage	Corrected % of Minus 2.0 mm material for USDA Classificat.
100	100.00	*Gravel*	0.13	**0.00**
2	99.87	*Sand*	19.13	**19.16**
0.075	86.34	*Silt*	51.74	**51.81**
0.05	80.74	*Clay*	29.00	**29.03**
0.002	29.00			

USDA Classification ***SILTY CLAY LOAM***

USCS Symbol ***cl, ASSUMED***

USCS Classification ***LEAN CLAY***

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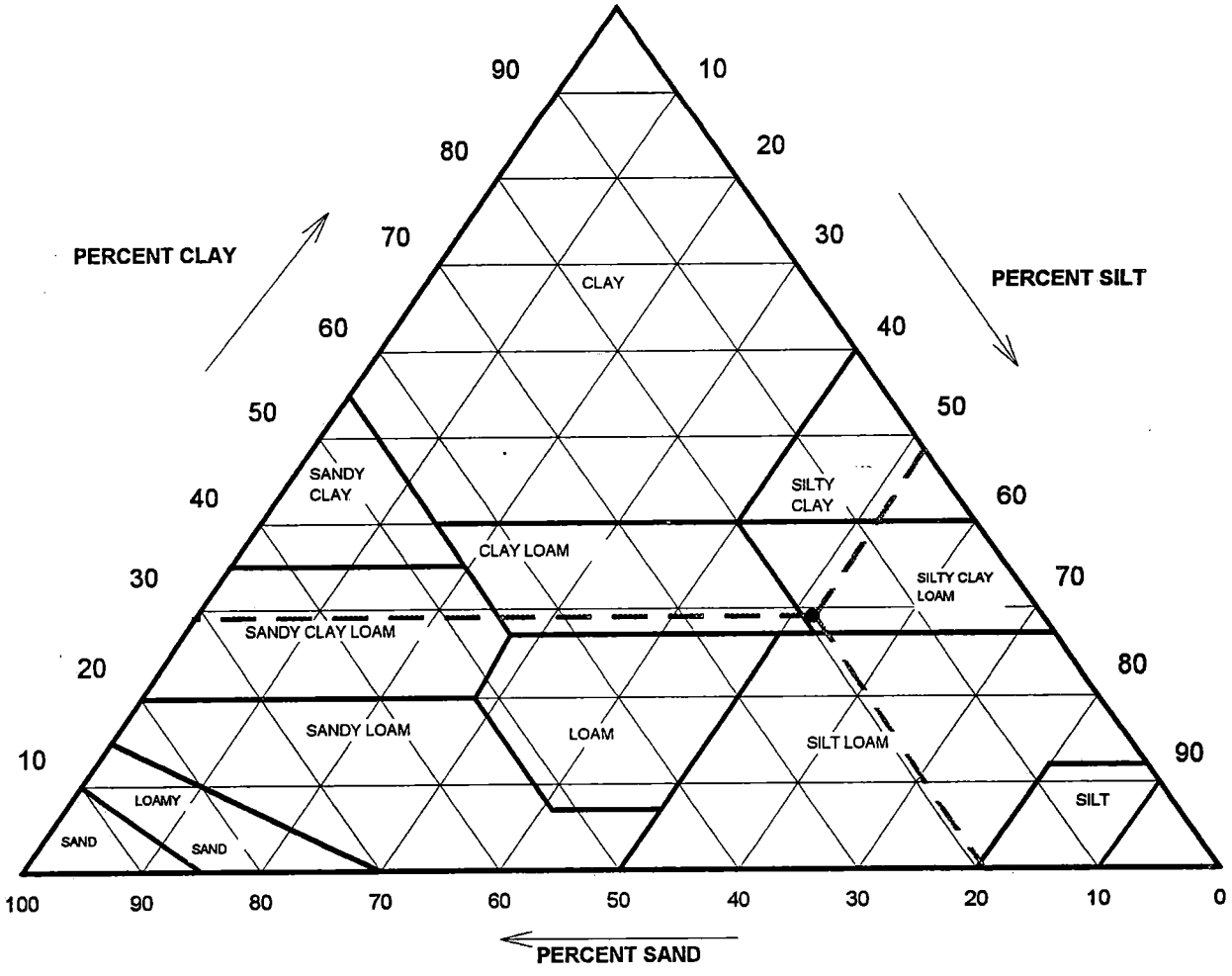
USDA CLASSIFICATION CHART

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	5.1-5.5
Project No.	97178-03	Sample No.	SM027-TB05-0406
Lab ID	97178-03.014	Soil Color	BROWN



Components	Corrected % of Minus 2.0 mm material for USDA Classificat.
Gravel	0.00
Sand	19.16
Silt	51.81
Clay	29.03
USDA Classification	***SILTY CLAY LOAM***

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PERMEABILITY TEST

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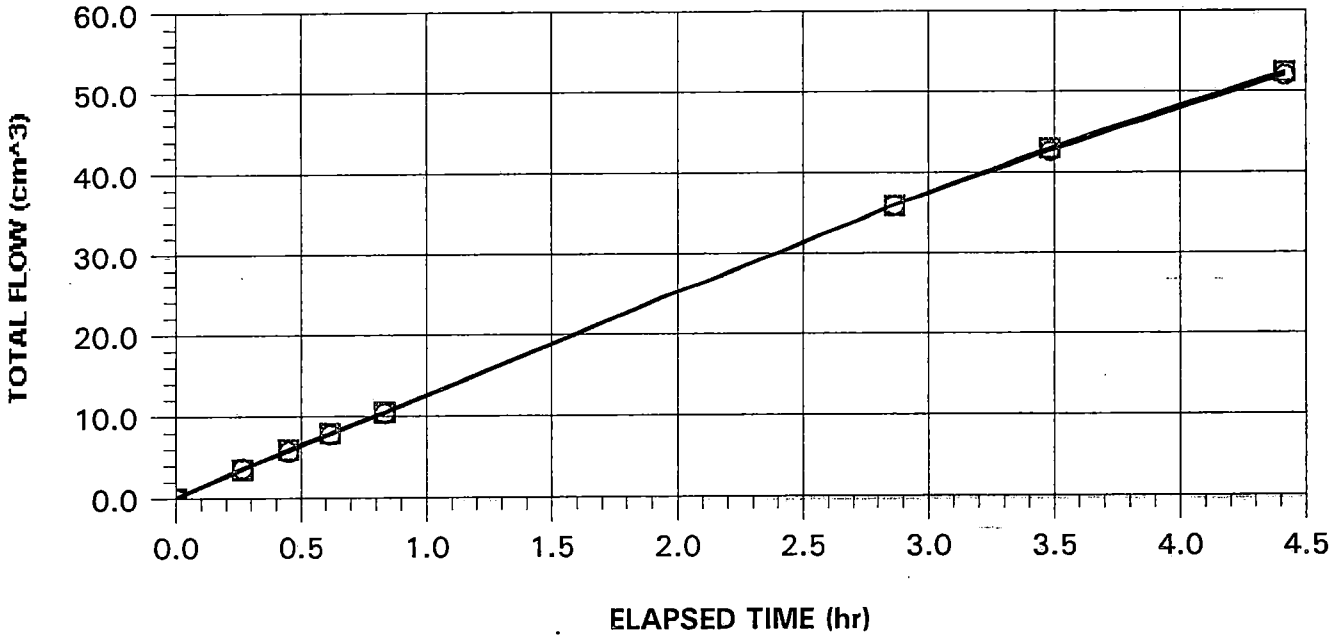
Client	ICF KAISER	Boring No.	NA
Client Project	BAYER 51249	Depth(ft.)	5.5-5.8
Project No.	97178-03	Sample No.	SM027-TB05-0406

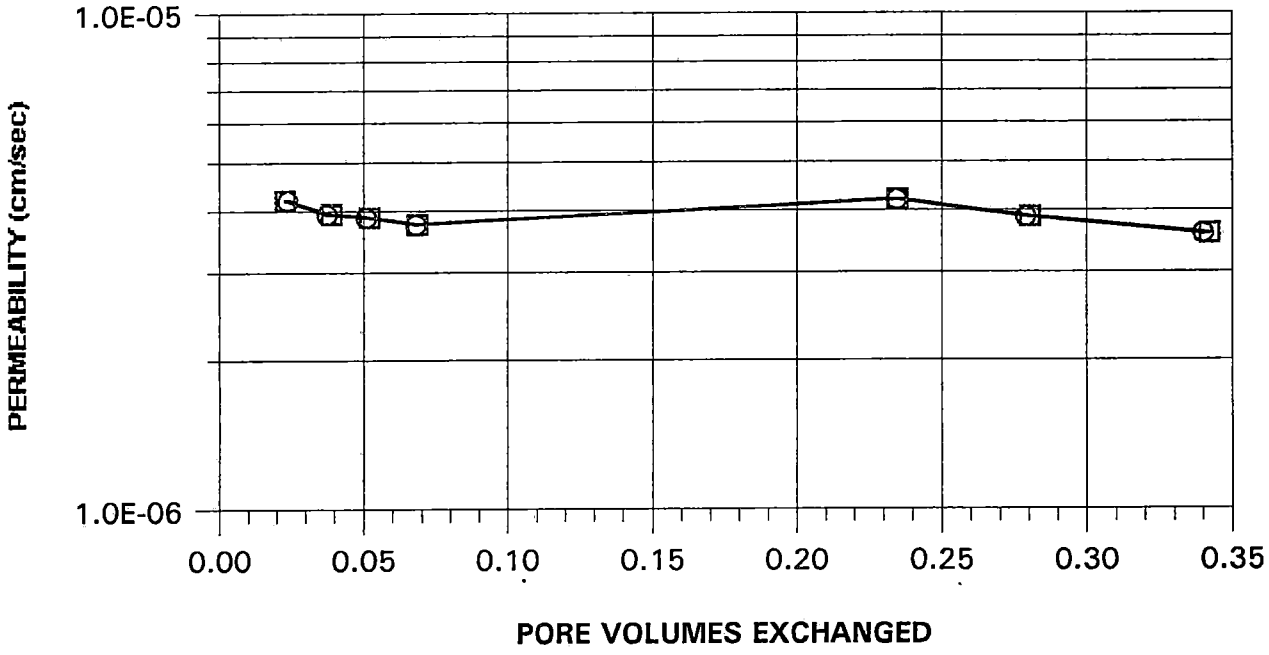
AVERAGE PERMEABILITY = 3.8E-06 cm/sec @ 20°C
AVERAGE PERMEABILITY = 3.8E-08 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



PORE VOLUMES EXCHANGED vs. PERMEABILITY

⊖ INFLOW
⊟ OUTFLOW



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PERMEABILITY TEST

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Client	ICF KAISER	Tested By	JCM	Date	08-18-97
Client Project	BAYER 51249	Checked By	JMO	Date	8-27-97
Project No.	97178-03				
Boring No.	NA	Specific Gravity	2.70 ASSUMED		
Depth(ft.)	5.5-5.8	Sample Condition	UNDISTURBED		
Sample No.	SM027-TB05-0406				

Visual Description BROWN CLAY

MOISTURE CONTENT	BEFORE TEST	AFTER TEST
Tare Number	1393	1719
Wt. Tare & WS(gm.)	266.12	524.80
Wt. Tare & DS(gm.)	233.79	431.40
Wt. Water(gm.)	32.33	93.40
Wt. Tare(gm.)	50.49	84.83
Wt. DS(gm.)	183.30	346.57
Moisture Content(%)	17.6	26.9

UNIT WEIGHT		
Wt. Tube & WS.(gms.)	1038.90	NA
Wt. Of Tube(gms.)	283.95	NA
Wt. Of WS.(gms.)	754.95	814.7
Length 1 (in.)	3.706	3.751
Length 2 (in.)	3.692	3.744
Length 3 (in.)	3.681	3.775
Top Diameter (in.)	2.878	2.844
Middle Diameter (in.)	2.852	2.828
Bottom Diameter (in.)	2.872	2.856
Average Length (in)	3.69	3.76
Average Area (in^2)	6.46	6.35
Sample Volume(cc.)	390.77	390.70
Unit Wet Wt.(gms/cc)	1.93	2.09
Unit Wet Wt.(pcf.)	120.6	130.1
Unit Dry Wt.(pcf.)	102.5	102.5
Unit Dry Wt.(gms/cc)	1.64	1.64
Void Ratio,e	0.64	0.64
Porosity, n	0.39	0.39
Pore Volume(cm^3)	153.1	153.0

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PERMEABILITY TEST

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Client	ICF KAISER	Tested By	JCM	Date	08-18-97
Client Project	BAYER 51249	Checked By	JLO	Date	8-27-97
Project No.	97178-03				
Boring No.	NA				
Depth(ft.)	5.5-5.8				
Sample No.	SM027-TB05-0406				
Visual Description	BROWN CLAY				

Pressure Heads (Constant)	
Top Cap (psi)	92.5
Bottom Cap (psi)	95.0
Cell (psi)	100.0
Total Pressure Head (cm)	175.8

Final Sample Dimensions	
Sample Length (cm.), L	9.54
Sample Diameter (cm.)	7.22
Sample Area (cm.^2), A	40.95
Inflow Burette Area, (cm.^2), a-in	4.52
Outflow Burette Area, (cm.^2), a-out	4.48
B Parameter	100%

AVERAGE PERMEABILITY = 3.8E-06 cm/sec @ 20°C
AVERAGE PERMEABILITY = 3.8E-08 m/sec @ 20°C

DATE mon-dy-yr	TIME hr	TIME min	ELAPSED TIME (t) hr	TOTAL INFLOW cm^3	TOTAL OUTFLOW cm^3	TOTAL HEAD (h) cm	FLOW 0 FLOW 1 STOP	TEMP °C	INCREMENTAL PERMEABILITY @ 20°C cm/sec
08-21-97	18	3	0.0	0.0	0.0	196.4	0	22.3	NA
08-21-97	18	19	0.3	3.6	3.5	194.8	0	22.3	4.2E-06
08-21-97	18	30	0.4	5.7	6.0	193.8	0	22.3	3.9E-06
08-21-97	18	40	0.6	7.8	8.0	192.9	0	22.3	3.9E-06
08-21-97	18	53	0.8	10.4	10.5	191.8	1	22.3	3.7E-06
08-22-97	14	8	0.8	10.4	10.5	189.4	0	22.2	NA
08-22-97	16	10	2.9	35.9	35.9	178.1	0	22.2	4.2E-06
08-22-97	16	47	3.5	42.7	42.9	175.0	0	22.2	3.9E-06
08-22-97	17	43	4.4	52.0	52.4	170.9	0	22.2	3.6E-06

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SHELBY TUBE UNIT WEIGHT

geotechnics

Client	ICF KAISER	Tested By	JCM 8-18-97
Client Project	BAYER 51249	Checked By	JMO 9-5-97
Project No.	97178-03		
Boring No.	NA	Tube Recovery	2.00
Depth Pushed	8.0-10.0		
Shelby Tube No.	SM027-TB05-0810		

SOIL PROFILE AND SAMPLING

DEPTH ( )	ELEV ( )	SECTION No.	SOIL PROFILE	SOIL DESCRIPTION AND REMARKS	TEST PERFORMED
8.00					
8.50					
9.00		4			PERMEABILITY
		3		BROWN LEAN CLAY WITH SAND	GRAIN SIZE HYDROMETER WC
9.50		2		VOID	NO TEST
10.00		1			NO TEST

NOTE:WHEN FULL RECOVERY IS NOT ACHIEVED,SOIL ELEVATION CAN NOT BE ACCURATELY DEFINE
INDICATE EACH CUT OF THE TUBE WITH AN ARROW
INDICATE DIVIDING LINE BETWEEN SOIL TYPES BY A SOLID LINE
INDICATE WAX BY CROSS-HATCHING
INDICATE SOIL TYPES BY STANDARD SYMBOLS

MOISTURE CONTENT					
Section Number	1	2	3	4	5
Tare Number			1718		
Wt. Tare & WS(gm.)			535.90		
Wt. Tare & DS(gm.)			451.50		
Wt. Tare(gm.)			82.35		
Moisture Content(%)			22.9		

UNIT WEIGHT	
Wt. Tube & WS.(gms.)	1042.90
Wt. Of Tube(gms.)	279.96
Wt. Of WS.(gms.)	762.94
Length 1 (in.)	3.610
Length 2 (in.)	3.622
Length 3 (in.)	3.615
Top Diameter (in.)	2.869
Middle Diameter (in.)	2.884
Bottom Diameter (in.)	2.878
Sample Volume (cc)	385.18
Moisture Content(%)	22.86
Unit Wet Wt.(gms/cc)	1.98
Unit Wet Wt.(pcf.)	123.6
Unit Dry Wt.(pcf.)	100.6
Unit Dry Wt.(gms/cc)	1.61

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	9.2-9.5
Project No.	97178-03	Sample No.	SM027-TB05-0810
Lab ID	97178-03.015	Soil Color	**BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	1718	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	535.90	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	451.50	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	82.35	Weight of Tare (gm)	NA
Weight of Water (gm)	84.40	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	369.15	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**22.9**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	369.15
Dry Weight - 3/4" Sample (gm)	71.55	Weight of minus #200 material (gm)	297.60
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	71.55
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"	12.5	0.00	0.00	0.00	100.00	**100.00**
3/8"	9.50	0.00	0.00	0.00	100.00	**100.00**
#4	4.75	1.01	0.27	0.27	99.73	**99.73**
#10	2.00	3.53	0.96	1.23	98.77	**98.77**
#20	0.85	6.63	1.80	3.03	96.97	**96.97**
#40	0.425	11.79	3.19	6.22	93.78	**93.78**
#60	0.250	17.95	4.86	11.08	88.92	**88.92**
#140	0.106	22.72	6.15	17.24	82.76	**82.76**
#200	0.075	7.92	2.15	19.38	80.62	**80.62**
Pan	-	297.60	80.62	100.00	-	-

Tested By JCM Date 8/18/97 Checked By JMO Date 8/27/97

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HYDROMETER ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	9.2-9.5
Project No.	97178-03	Sample No.	SM027-TB05-0810
Lab ID	97178-03.015	Soil Color	**BROWN**

Elapsed Time (min)		R Measured	Temp. (°C)	R Corrected	N (%)	Diameter (mm)	N' (%)
0	NA	NA	NA	NA	NA	NA	NA
2	53.0	53.0	23	46.7	85.7	0.0253	**69.1**
5		49.5	23	43.2	79.3	0.0166	**63.9**
15		44.5	23	38.2	70.1	0.0100	**56.5**
30		41.0	23	34.7	63.7	0.0073	**51.4**
60		37.0	22.2	30.7	56.4	0.0054	**45.4**
250		30.5	22.7	24.2	44.4	0.0028	**35.8**
1440		24.0	23.5	17.7	32.5	0.0012	**26.2**

Soil Specimen Data		Corrections	
Tare No.	1005	K - Factor	0.01297
Tare + Dry Material (gm)	165.08	a - Factor	0.99
Weight of Tare (gm)	106.13	Composite Correction	6.29
Weight of Deflocculant (gm)	5.0	Percent Finer than # 200	80.62
Weight of Dry Material (gm)	53.95		
		Specific Gravity	2.7 Assumed

Note: *Hydrometer test is performed on - # 200 sieve material.*

Tested By TO Date 8/20/97 Checked By JMO Date 8/27/97

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SIEVE AND HYDROMETER ANALYSIS
ASTM D 422-63 (SOP-S3)

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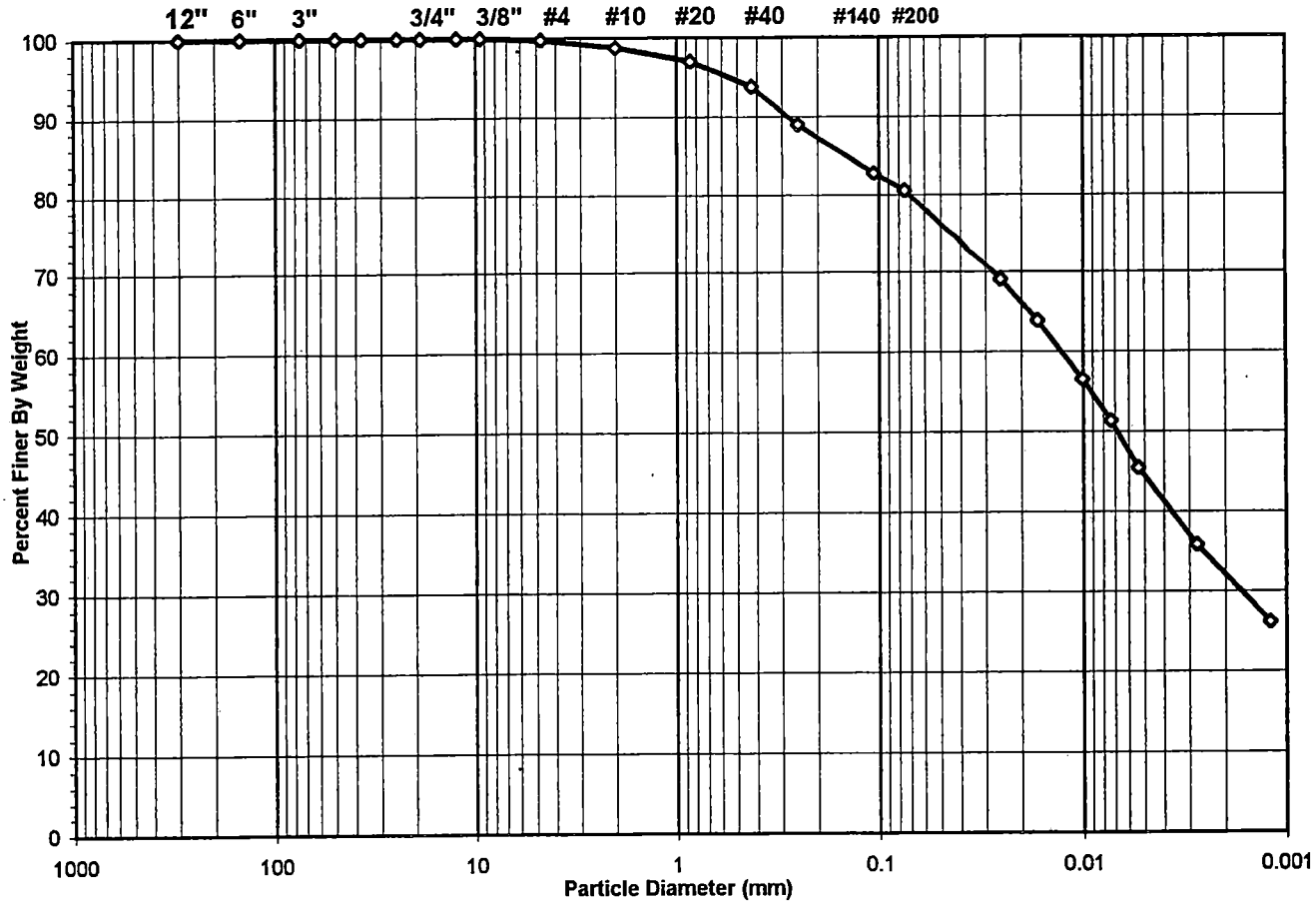
Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	9.2-9.5
Project No.	97178-03	Sample No.	SM027-TB05-0810
Lab ID	97178-03.015	Soil Color	BROWN

	SIEVE ANALYSIS		HYDROMETER	
USCS	gravel	sand	silt and clay fraction	
USDA	gravel	sand	silt	clay



Sieve Size (mm)	Percent Finer	Components	Percentage	Corrected % of Minus 2.0 mm material for USDA Classificat.
100	100.00	*Gravel*	1.23	**0.00**
2	98.77	*Sand*	22.45	**22.73**
0.075	80.62	*Silt*	44.22	**44.77**
0.05	76.32	*Clay*	32.10	**32.50**
0.002	32.10			

USDA Classification	***CLAY LOAM***
USCS Symbol	***cl, ASSUMED***
USCS Classification	***LEAN CLAY WITH SAND***

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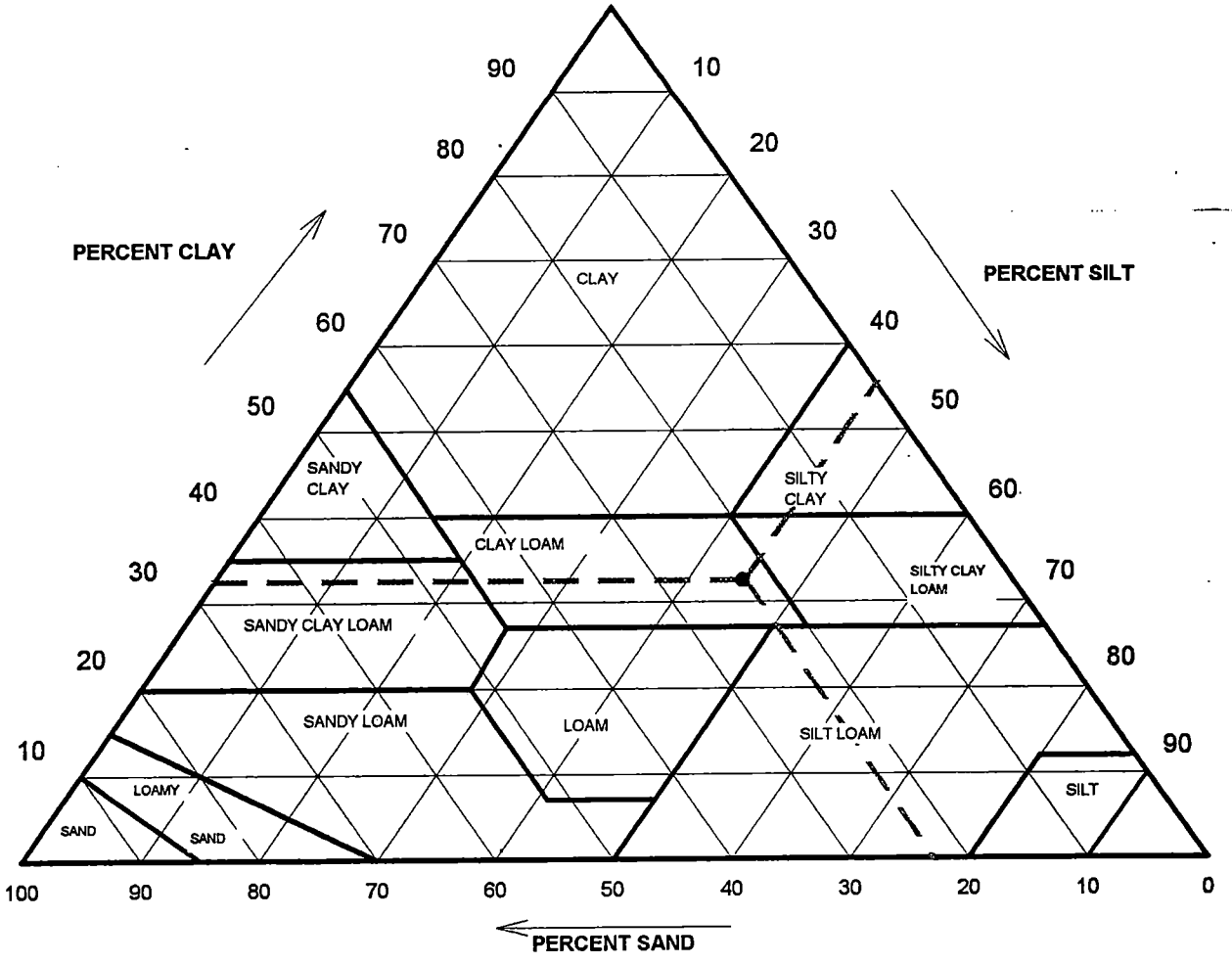
USDA CLASSIFICATION CHART

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	9.2-9.5
Project No.	97178-03	Sample No.	SM027-TB05-0810
Lab ID	97178-03.015	Soil Color	BROWN



Components	Corrected % of Minus 2.0 mm material for USDA Classificat.
Gravel	0.00
Sand	22.73
Silt	44.77
Clay	32.50
USDA Classification	***CLAY LOAM***

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PERMEABILITY TEST

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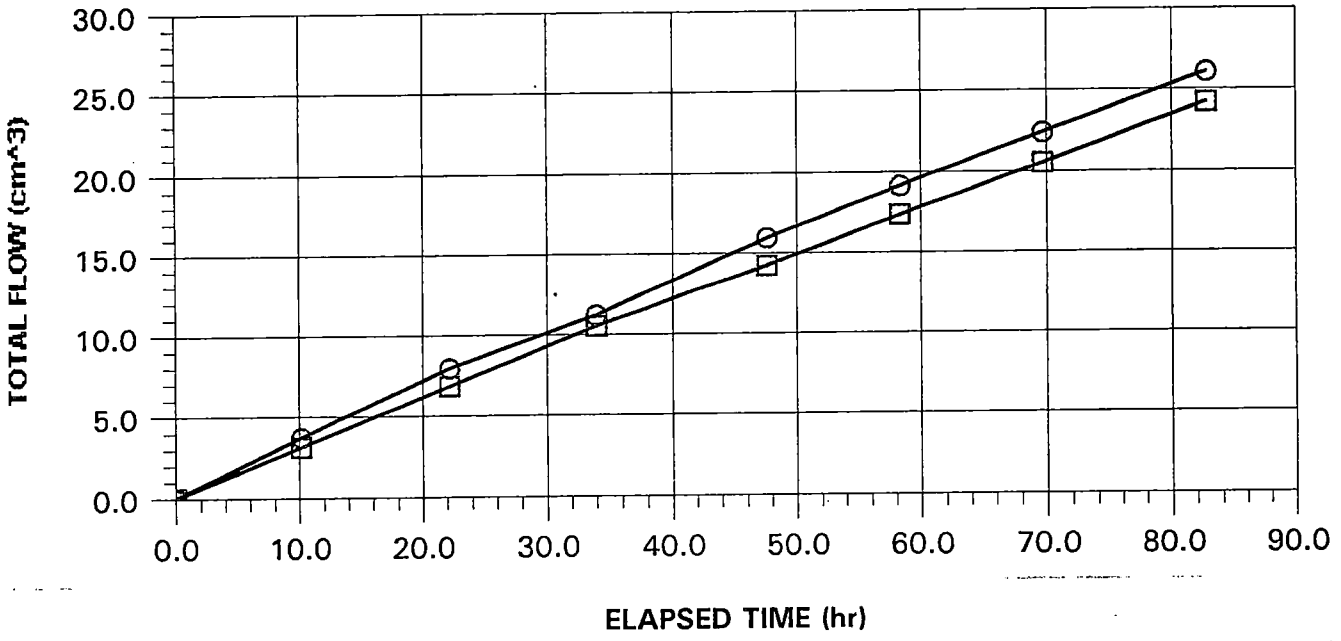
Client	ICF KAISER	Boring No.	NA
Client Project	BAYER 51249	Depth(ft.)	8.9-9.3
Project No.	97178-03	Sample No.	SM027-TB05-0810

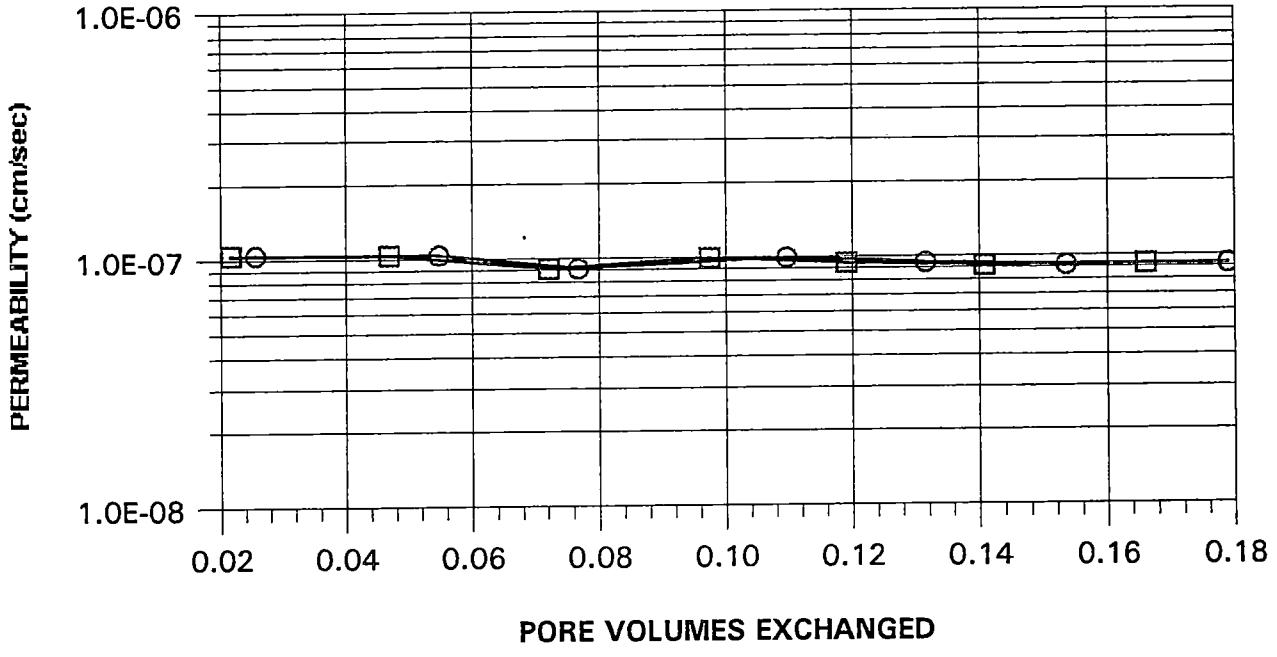
AVERAGE PERMEABILITY = 9.5E-08 cm/sec @ 20°C
AVERAGE PERMEABILITY = 9.5E-10 m/sec @ 20°C

TOTAL FLOW vs. ELAPSED TIME



INFLOW
OUTFLOW

PORE VOLUMES EXCHANGED vs. PERMEABILITY



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PERMEABILITY TEST

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Client	ICF KAISER	Tested By	JCM	Date	08-18-97
Client Project	BAYER 51249	Checked By	JMO	Date	8-29-97
Project No.	97178-03				
Boring No.	NA	Specific Gravity	2.70 ASSUMED		
Depth(ft.)	8.9-9.3	Sample Condition	UNDISTURBED		
Sample No.	SM027-TB05-0810				

Visual Description BROWN CLAY

MOISTURE CONTENT	BEFORE TEST	AFTER TEST
Tare Number	1718	1705
Wt. Tare & WS(gm.)	535.90	525.80
Wt. Tare & DS(gm.)	451.50	440.30
Wt. Water(gm.)	84.40	85.50
Wt. Tare(gm.)	82.35	83.50
Wt. DS(gm.)	369.15	356.80
Moisture Content(%)	22.9	24.0

UNIT WEIGHT		
Wt. Tube & WS.(gms.)	1042.90	NA
Wt. Of Tube(gms.)	279.96	NA
Wt. Of WS.(gms.)	762.94	769.8
Length 1 (in.)	3.610	3.638
Length 2 (in.)	3.622	3.594
Length 3 (in.)	3.615	3.616
Top Diameter (in.)	2.869	2.855
Middle Diameter (in.)	2.884	2.841
Bottom Diameter (in.)	2.878	2.828
Average Length (in)	3.62	3.62
Average Area (in^2)	6.50	6.34
Sample Volume(cc.)	385.18	375.72
Unit Wet Wt.(gms/cc)	1.98	2.05
Unit Wet Wt.(pcf.)	123.6	127.8
Unit Dry Wt.(pcf.)	100.6	103.1
Unit Dry Wt.(gms/cc)	1.61	1.65
Void Ratio,e	0.67	0.63
Porosity, n	0.40	0.39
Pore Volume(cm^3)	155.2	145.7

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PERMEABILITY TEST

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Client	ICF KAISER	Tested By	JCM	Date	08-18-97
Client Project	BAYER 51249	Checked By	JMO	Date	8-29-97
Project No.	97178-03				
Boring No.	NA				
Depth(ft.)	8.9-9.3				
Sample No.	SM027-TB05-0810				
Visual Description	BROWN CLAY				

Pressure Heads (Constant)	
Top Cap (psi)	27.5
Bottom Cap (psi)	30.0
Cell (psi)	35.0
Total Pressure Head (cm)	175.8

Final Sample Dimensions	
Sample Length (cm.), L	9.18
Sample Diameter (cm.)	7.22
Sample Area (cm.^2), A	40.91
Inflow Burette Area, (cm.^2), a-in	4.80
Outflow Burette Area, (cm.^2), a-out	4.76
B Parameter	98%

AVERAGE PERMEABILITY = 9.5E-08 cm/sec @ 20°C
AVERAGE PERMEABILITY = 9.5E-10 m/sec @ 20°C

DATE mon-dy-yr	TIME hr	TIME min	ELAPSED TIME (t) hr	TOTAL INFLOW cm^3	TOTAL OUTFLOW cm^3	TOTAL HEAD (h) cm	FLOW 0 FLOW 1 STOP	TEMP °C	INCREMENTAL PERMEABILITY @ 20°C cm/sec
08-18-97	21	5	0.0	0.0	0.0	189.1	0	23.0	NA
08-19-97	7	15	10.2	3.7	3.2	187.7	0	23.0	1.0E-07
08-19-97	19	15	22.2	8.0	6.8	186.0	0	22.5	1.0E-07
08-20-97	7	5	34.0	11.2	10.5	184.6	0	23.0	9.1E-08
08-20-97	20	40	47.6	16.0	14.2	182.8	0	22.5	1.0E-07
08-21-97	7	25	58.3	19.2	17.4	181.5	0	23.0	9.4E-08
08-21-97	18	45	69.7	22.4	20.5	180.2	0	22.3	9.1E-08
08-22-97	7	50	82.8	26.1	24.2	178.6	0	22.5	9.3E-08

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SHELBY TUBE UNIT WEIGHT

geotechnics

Client	ICF KAISER	Tested By	JCM 8-18-97
Client Project	BAYER 51249	Checked By	JMC 9-3-97
Project No.	97178-03		
Boring No.	NA	Tube Recovery	2.10
Depth Pushed	14.0-16.0		
Shelby Tube No.	SM027-TB05-1416		

SOIL PROFILE AND SAMPLING

DEPTH ( )	ELEV ( )	SECTION No.	SOIL PROFILE	SOIL DESCRIPTION AND REMARKS	TEST PERFORMED
14.00					
14.50					
15.00					GRAIN SIZE HYDROMETER UNIT WGT. WC
		3			
15.50		2		BROWN LEAN CLAY	PERMEABILITY
		1			WATER CONTENT
16.00					

NOTE:WHEN FULL RECOVERY IS NOT ACHIEVED,SOIL ELEVATION CAN NOT BE ACCURATELY DEFINE
INDICATE EACH CUT OF THE TUBE WITH AN ARROW
INDICATE DIVIDING LINE BETWEEN SOIL TYPES BY A SOLID LINE
INDICATE WAX BY CROSS-HATCHING
INDICATE SOIL TYPES BY STANDARD SYMBOLS

MOISTURE CONTENT					
Section Number	1	2	3	4	5
Tare Number	439		1739		
Wt. Tare & WS(gm.)	307.00		685.60		
Wt. Tare & DS(gm.)	263.34		541.90		
Wt. Tare(gm.)	99.52		83.80		
Moisture Content(%)	26.7		31.4		

UNIT WEIGHT		
Wt. Tube & WS.(gms.)	1037.60	1348.50
Wt. Of Tube(gms.)	276.53	364.37
Wt. Of WS.(gms.)	761.07	984.13
Length 1 (in.)	3.630	4.772
Length 2 (in.)	3.649	4.807
Length 3 (in.)	3.618	4.772
Top Diameter (in.)	2.884	2.886
Middle Diameter (in.)	2.878	2.879
Bottom Diameter (in.)	2.873	2.881
Sample Volume (cc)	387.31	511.38
Moisture Content(%)	26.65	31.37
Unit Wet Wt.(gms/cc)	1.97	1.92
Unit Wet Wt.(pcf.)	122.6	120.1
Unit Dry Wt.(pcf.)	96.8	91.4
Unit Dry Wt.(gms/cc)	1.55	1.46

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DCN: DS-S3A
DATE: 11/12/96
REVISION: 1

geotechnics

WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	ICF KAISER	Boring No.	NA
Client Reference	BAYER 51249	Depth (ft)	15.1-15.5
Project No.	97178-03	Sample No.	SM027-TB05-1416
Lab ID	97178-03.016	Soil Color	**BROWN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	1739	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	685.60	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	541.90	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	83.80	Weight of Tare (gm)	NA
Weight of Water (gm)	143.70	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	458.10	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**31.4**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	458.10
Dry Weight - 3/4" Sample (gm)	40.05	Weight of minus #200 material (gm)	418.05
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	40.05
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"	12.5	0.00	0.00	0.00	100.00	**100.00**
3/8"	9.50	1.87	0.41	0.41	99.59	**99.59**
#4	4.75	2.52	0.55	0.96	99.04	**99.04**
#10	2.00	1.85	0.40	1.36	98.64	**98.64**
#20	0.85	2.29	0.50	1.86	98.14	**98.14**
#40	0.425	4.77	1.04	2.90	97.10	**97.10**
#60	0.250	7.02	1.53	4.44	95.56	**95.56**
#140	0.106	14.55	3.18	7.61	92.39	**92.39**
#200	0.075	5.18	1.13	8.74	91.26	**91.26**
Pan	-	418.05	91.26	100.00	-	-

Tested By JCM Date 8/18/97 Checked By JMO Date 8/27/97

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